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U. S.
OFFICIAL GAZETTE
UNITED STATES
PATENT OFFICE

VOL. 961
AUGUST
1977

MICRO PHOTO DIVISION

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 2, 1977 Volume 961 Number 1

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PATENT AND TRADEMARK OFFICE NOTICES

Board of Appeals Decisions Rendered in the Month of June 1977

Affirmed	200
Affirmed in part	38
Reversed	77
Total	315

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,736,880, J. W. Forrester, MULTI-COORDINATE DIGITAL INFORMATION STORAGE DEVICE, **filed** Mar. 21, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1052–RJK, *Electronic Memories & Magnetics Corporation* v. *Massachusetts Institute of Technology.*

2,955,301, R. E. Burt, TOOL FOR DEFORMING THE CONICAL EXTENSION OF A NUT TO RENDER THE NUT SELF-LOCKING; **3,208,494,** H. J. Skidmor, PREVAILING TORQUE LOCK NUT, **filed** Mar. 22, 1977, D.C., C.D. Calif. (Los Angeles) Doc. C77–1067–RJK, *Bristol Locknut Co.* v. *Standard Pressed Steel Co.*

2,962,844, Orlando and Schub, MACHINE FOR MAKING DRY CELLS, **filed** Feb. 4, 1974, D.C.N.J. (Newark) Doc. 74–150, *Acme Battery Corporation* v. *Bright Star Industries, Inc.* Stipulation of dismissal, Dec. 16, 1976.

3,055,988, B. B. Bauer, MAGNETIC PHONOGRAPH PICKUP; **3,077,521,** Ahrens, Kuhn and Richter, STEREOPHONIC MOVING MAGNET PHONOGRAPH PICKUP; **3,077,522,** Gunter, Jr. and Anderson, STEREOPHONIC PICKUP CARTRIDGE; **3,463,889,** E. Ahrens, MOVING MAGNET STEREOPHONIC PICKUP, **filed** Mar. 23, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c971, *Shure Brothers* v. *Fidelitone, Inc., Dai-Ichi Shoji and Nagaoka & Co.*

3,077,521. (See 3,055,988).

3,077,522. (See 3,055,988).

3,083,510, H. Ganz, METHOD AND MACHINE FOR PACKAGING ARTICLES; **3,187,479,** R. H. Ganz, PACKAGING MACHINE FOR CARTON WITH END IDENTIFICATION PANEL AND METHOD; **3,202,421,** H. Ganz, MACHINE FOR PACKAGING ARTICLES; **3,456,420,** R. H. Ganz, METHOD OF AND APPARATUS FOR FORMING A PACKAGE; **3,474,590,** same, CARTON, METHOD OF AND APPARATUS FOR FORMING A PACKAGE THEREWITH, **filed** Jan. 17, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c0170, *Federal Paper Board Company, Inc.* v. *Container Corporation of America.*

3,113,115, Ziegler, Breil, Martin and Holzkamp, POLYMERIZATION CATALYST; **3,377,332,** same, PURIFICATION OF OLEFIN POLYMERS WITH METHANOL; **3,903,017,** same, POLYMERIZATION CATALYSTS, **filed** Dec. 21, 1976, D.C. Del. (Wilmington) Doc. 76–451, *Amoco Chemicals Corporation* v. *Studiengesellschaft Kohle m.b.H.*

3,158,424, R. Bowen, CONTACT MOUNTING, **filed** Nov. 4, 1976, D.C. Conn. (Bridgeport), Doc. B–76–328, *International Telephone and Telegraph Corporation* v. *Burndy Corporation.*

3,187,479. (See 3,083,510).

3,202,421. (See 3,083,510).

3,218,588, J. G. Badger, TELEVISION TUNER; **3,842,683,** A. A. Valdettaro, UHF TUNER ARRANGEMENT, **filed** Nov. 18, 1975, D.C.N.J. (Newark) Doc. 75–1981, *Mitsumi Electronics Corporation* v. *Sarkes Tarzian, Inc.* Stipulation and order of dismissal of action, Mar. 18, 1977.

3,281,747, A. O. Winsand, MULTI-TAP PLUG, **filed** Jan. 7, 1977, D.C., E.D. Mich. (Detroit), Doc. 77–70057, *Dollar Electric Company* v. *Syndevco, Inc.*

3,377,332. (See 3,113,115).

3,400,038, C. D. Burgess, SEAMING TAPE; **3,533,876,** C. D. Burgess, PROCESS FOR FACE SEAMING CARPETING; **3,563,830,** same, PROCESS FOR PREPARING SEAMING TAPE; **3,755,058,** A. Winkler, CARPET SEAMING TAPE, **filed** Aug. 9, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–1676–GBH, *Carpet Seaming Tape Licensing Corporation* v. *Orcon Corporation.*

3,456,420. (See 3,083,510).

3,463,889. (See 3,055,988).

3,474,590. (See 3,083,510).

3,484,835, Trounstine and McCauley, EMBOSSED PLASTIC FILM, **filed** Apr. 11, 1972, D.C. Del. (Wilmington) Doc. 4363, *Clopay Corporation* v. *Associated Baby Services Incorporated and Blessings, Incorporated.* Judgment, Defendant is enjoined and permanently restrained from directly or indirectly infringing said patent. Defendnat's counterclaim is dismissed with prejudice, Mar. 30, 1977.

3,485,736, O. A. Y. Vesterberg, METHOD OF ISOELECTRIC FRACTIONATION, **filed** Mar. 21, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c7cg, *LKB-Produkter AB* v. *Brinkmann Instruments, Inc.*

3,531,724, G. H. Fathauer, SIGNAL-SEEKING RADIO RECEIVER; **3,873,924,** G. H. Fathauer, SIGNAL-SEEKING RADIO RECEIVERS, **filed** Dec. 22, 1976, D.C. Del. (Wilmington) Doc. 76–454, *Sanyo Electric Trading Co., Ltd.* v. *Masco Corporation (a corporation of Delaware) and Masco Corporation (a corporation of Indiana).*

3,533,876. (See 3,400,038).

3,554,862, Hervey and George, METHOD FOR PRODUCING A FIBER PUMP SHEET BY IMPREGNATION WITH A LONG CHAIN CATIONIC DEBONDING AGENT; **3,554,863,** same, CELLULOSE FIBER PULP SHEET IMPREGNATED WITH A LONG CHAIN CATIONIC DEBONDING AGENT; **Re. 26,939,** same, METHOD FOR IMPROVING A FLUFFED FIBROUS WOOD PULP BATT FOR USE IN SANITARY PRODUCTS AND THE PRODUCTS THEREOF, **filed** Apr. 1, 1977, D.C., W.D. Wash. (Seattle) Doc. C77–1648, *Weyerhaeuser Company* v. *Riegel Textile Corporation.*

3,554,863. (See (3,554,862).

3,563,830. (See 3,400,038).

3,649,853, C. F. Kerchner, Jr., ELECTRIC HEAT CONTROL SYSTEM; **3,731,055,** Kerchner and Ball, RADIANT HEATING APPARATUS, **filed** Nov. 16, 1976, D.C. *Kalglo Electronics Co., Inc.* v. *Electro Industries Inc.*

3,755,058. (See 3,400,038).

3,842,683. (See 3,218,588).

3,864,768, R. Fraige and J. Reed, WATER MATTRESS WITH INTERNAL FLOAT TUBE; **Reg. No. 1,028,680** (AIR-FLOAT), Vinyl Products Mfg., Inc., **filed** Mar. 8, 1977, D.C. Calif. (San Francisco) Doc. C77–0482–SW, *Vinyl Products Manufacturing, Inc.* v. *Robert P. Piche, Larry E. Gilmore, Arthur L. Dunlap, Michael Schroader, doing business as Body Comfort Waterbeds.*

3,873,924. (See 3,531,724).

3,903,017. (See 3,113,115).

3,961,460, Jelling, Kahn, Moore and Friedman, BAGGING APPARATUS WITH BAG SPREADING DEVICE AND BRAKING DEVICE; **3,990,625,** same, SPECIAL BAGS FOR BAGGING APPARATUS, **filed** Apr. 1, 1977, D.C.N.J. (Newark) Doc. 77–0645, *Murray Jelling et al.* v. *American Poly Bag Corporation.*

3,990,625. (See 3,961,460).

Re. 26,939. (See 3,554,362).

Reg. No. 1,028,680. (See 3,864,768).

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,557,265, Re. S.N. 805,041, Filed June 9, 1977, Cl. 264/47, METHOD OF EXTRUDING LAMINATES, Douglas S. Chisholm, et al., Owner of Record: *The Dow Chemical Company, Midland, Mich.,* Attorney or Agent: Merton B. Lilly, et al., Ex. Gp.: 147

3,625,348, Re. S.N. 807,189, Filed June 16, 1977, Cl. 206/46 F, PACKAGING ARTICLES IN CONTAINERS HAVING SELF-ADHERING INNER LAYERS, Oliver R. Titchenal, et al., Owner of Record: *American Can Company, Greenwich, Conn.,* Attorney or Agent: Robert P. Auber, et al., Ex. Gp.: 241

3,726,918, Re. S.N. 806,253, Filed June 13, 1977, Cl. 260/543 P, PROCESS FOR PREPARING ALKYL AND ARYL PHOSPHONOTHIOIC AND PHOSPHINOTHIOC HALIDES, Arthur D. F. Toy, et al., Owner of Record: *Stauffer Chemical Company, New York, N.Y.,* Attorney or Agent: Daniel S. Ortiz, et al., Ex. Gp.: 126

3,837,981, Re. S.N. 806,923, Filed June 15, 1977, Cl. 428/189, EPOXY TAPE, Theodore R. Flint, Owner of Record: *Inventor,* Attorney or Agent: Gordon S. Rogers, et al., Ex. Gp.: 164

3,897,311, Re. S.N. 807,192, Filed June 16, 1977, Cl. 202/262, PUSHER RAM AND QUENCH CAR TRAVEL SYNCHRONIZATION SYSTEM, Vincent G. Krenke, Owner of Record: *Koppers Company, Inc., Pittsburgh, Pa.,* Attorney or Agent: R. Lawrence Sahr, et al., Ex. Gp.: 171

3,905,110, Re. S.N. 806,993, Filed June 16, 1977, Cl. 32/15, COMPOSITION AND METHOD FOR DRYING DENTAL SURFACES, Henry L. Lee, Jr., et al., Owner of Record: *Lee Pharmaceuticals, South El Monte, Calif.,* Attorney or Agent: Edward S. Irons, et al., Ex. Gp.: 333

3,915,026, Re. S.N. 806,295, Filed June 13, 1977, Cl. 74/401, LOBE TYPE PUMP ADJUSTMENT, Albert D. Otto, Owner of Record: *Wallace Murray Corporation, New York, N.Y.,* Attorney or Agent: Thomas J. Greer, Jr., et al., Ex. Gp.: 345

3,925,692, Re. S.N. 804,119, Filed June 6, 1977, Cl. 310/8.7, REPLACEABLE ELEMENT ULTRASONIC FLOWMETER TRANSDUCER, Walter C. Leschek, et al., Owner of Record: *Westinghouse Electric Corporation, Pittsburgh, Pa.,* Attorney or Agent: C. F. Renz, et al., Ex. Gp.: 212

3,928,607, Re. S.N. 800,473, Filed May 25, 1977, Cl. 424/249, ANTIBACTERIAL COMPOSITION AND METHOD EMPLOYING A CERTAIN HEXAMETHYLENETETRAMINE ADDUCT, Jerome S. Luloff, et al., Owner of Record: *Cosan Chemical Corporation, Clifton, N.J.,* Attorney or Agent: Willis H. Taylor, Jr., et al., Ex. Gp.: 125

3,941,070, Re. S.N. 807,193, Filed June 16, 1977, Cl. 113/7 A, PRODUCT TRANSFER SYSTEM, Elton G. Kaminski, Owner of Record: *The Stolle Corporation, Sidney, Ohio,* Attorney or Agent: John W. Melville, et al., Ex. Gp.: 321

3,943,552, Re. S.N. 805,970, Filed June 13, 1977, Cl. 357/15, SEMICONDUCTOR DEVICES, John Martin Shannon, et al., Owner of Record: *U.S. Philips Corporation, New York, N.Y.,* Attorney or Agent: Frank R. Trifari, Ex. Gp.: 254

3,952,180, Re. S.N. 806,924, Filed June 15, 1977, Cl. 219/121 LM, CLADDING, Daniel S. Gnanamuthu, Owner of Record: *Avco Everett Research Laboratory, Inc., Everett, Mass.,* Attorney or Agent: M. E. Frederick, et al., Ex. Gp.: 213

3,959,276, Re. S.N. 800,480, Filed May 25, 1977, Cl. 260/248.5, ANTIBACTERIAL PRODUCT, Jerome S. Luloff, et al., Owner of Record: *Cosan Chemical Corporation, Clifton, N.J.,* Attorney or Agent: Willis H. Taylor, Jr., et al., Ex. Gp.: 121

3,961,215, Re. S.N. 806,207, Filed June 13, 1977, Cl. 310/168, ROTOR FOR WHEEL SPEED SENSOR ASSEMBLY, Thomas A. Gee, et al., Owner of Record: *Eaton Corporation, Cleveland, Ohio,* Attorney or Agent: Howard D. Gordon, et al., Ex. Gp.: 212

3,965,702, Re. S.N. 807,042, Filed June 16, 1977, Cl. 66/173, HOSIERY SUPPORT, Kurt Ernst Findeisen, Owner of Record: *Inventor,* Attorney or Agent: Edward U. Dithmar, et al., Ex. Gp.: 352

4,004,247, Re. S.N. 804,548, Filed June 8, 1977, Cl. 330/30 D, VOLTAGE-CURRENT CONVERTER, Rudy Johan Van De Plassche, Owner of Record: *U.S. Philips Corporation, New York, N.Y.,* Attorney or Agent: Frank R. Trifari, Ex. Gp.: 252

PATENT NOTICES

Certificates of Correction for the Week of Aug. 2, 1977

3,608,826	3,994,893	4,017,767	4,021,715
3,663,606	3,995,145	4,017,979	4,021,750
3,775,462	3,995,187	4,017,982	4,021,899
3,782,933	4,000,561	4,018,156	4,021,903
3,812,172	4,000,995	4,018,260	4,021,979
3,816,467	4,001,608	4,018,315	4,022,370
3,838,166	4,001,715	4,018,649	4,022,383
3,847,982	4,003,721	4,018,770	4,022,516
3,869,714	4,004,267	4,018,806	4,022,562
3,910,284	4,005,187	4,018,867	4,022,609
3,921,340	4,005,593	4,018,992	4,022,628
3,923,740	4,005,755	4,019,049	4,022,666
3,928,880	4,006,349	4,019,052	4,022,866
3,931,466	4,006,737	4,019,159	4,022,882
3,934,340	4,008,204	4,019,207	4,022,897
3,941,882	4,008,959	4,019,384	4,022,961
3,953,596	4,009,129	4,019,434	4,022,986
3,954,824	4,009,308	4,019,479	4,022,994
3,962,296	4,009,566	4,019,648	4,023,063
3,962,588	4,009,699	4,020,054	4,023,064
3,965,108	4,010,139	4,020,099	4,023,075
3,968,305	4,011,030	4,020,132	4,023,224
3,970,572	4,011,223	4,020,516	4,023,540
3,975,235	4,011,250	4,020,744	4,023,765
3,975,325	4,011,533	4,020,936	4,023,973
3,977,022	4,011,825	4,020,946	4,024,036
3,979,480	4,011,843	4,020,967	4,024,434
3,980,137	4,012,286	4,021,041	4,024,657
3,983,008	4,012,445	4,021,063	4,024,688
3,983,157	4,012,770	4,021,092	4,024,766
3,983,186	4,012,807	4,021,096	4,024,852
3,987,651	4,013,101	4,021,237	4,024,939
3,987,797	4,013,574	4,021,284	4,025,115
3,988,706	4,014,099	4,021,317	4,025,258
3,988,929	4,014,146	4,021,320	4,025,269
3,988,930	4,015,451	4,021,331	4,025,491
3,989,696	4,015,554	4,021,334	4,025,500
3,990,568	4,015,757	4,021,459	4,025,633
3,991,888	4,016,340	4,021,551	4,025,646
3,992,095	4,016,553	4,021,557	4,026,576
3,993,258	4,017,181	4,021,597	4,026,577
3,993,735	4,017,570	4,021,714	

Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,635,529, W. R. Nass, MOTOR VEHICLE WHEEL ASSEMBLY, Interference No. 98,196, decided Jan. 28, 1977, claims 1, 2 and 3.

Patent No. 3,767,793, M. Shibata, K. Hatano, E. Higashide, H. Yamana and T. Kishi, JUVENIMICIN AND PRODUCTION THEREOF, Interference No. 99,203, decided Apr. 29, 1977, claim 2.

Patent No. 3,818,017, P. A. J. Janssen, I. V. Wijngaarden and W. Soudijn, 1-[1-(2-HYDROXY-3-ARYLOXYPROPYL)-4-PIPERIDYL]-2-BENZIMIDAZOLINONES AND RELATED COMPOUNDS, Interference No. 99,216, decided Apr. 20, 1977, claims 2 and 12.

Patent No. 3,846,156, G. Seibert and H. Pitowski, PROCESS FOR PRODUCING A SOFT, DRAPABLE ARTIFICIAL LEATHER, Interference No. 99,308, decided Apr. 21, 1977, claims 1–12.

Patent No. 3,853,820, R. N. Vachon, BLENDS OF LINEAR WATER-DISSIPATABLE POLYESTERS AND ALIPHATIC OR CYCLOALIPHATIC DICARBOXYLIC ACIDS, Interference No. 99,432, decided Apr. 14, 1977, claims 1–6.

Patent No. 3,860,443, W. L. Lachman, R. A. Penty and A. F. Jahn, GRAPHITE COMPOSITE, Interference No. 99,222, decided Apr. 29, 1977, claims 1–10.

Patent No. 3,874,900, R. C. Post, A. W. McCullough and J. H. McClure, ARTICLE COATED WITH TITANIUM CARBIDE AND TITANIUM NITRIDE, Interference No. 99,391, decided Apr. 28, 1977, claims 1, 2 and 4.

Patent No. 3,894,237, G. E. Choate and L. M. Dugan, METHOD AND APPARATUS FOR CURING INKS ON METAL CONTAINERS BY ULTRA VIOLET LIGHT, Interference No. 99,325, decided Apr. 14, 1977, claims 1, 2, 4 and 5.

Patent No. 3,900,650, J. W. Sedore, FIBRILLAR LOCKING SYSTEM, Interference No. 99,314, decided Apr. 28, 1977, claims 1, 2, 5, 8 and 10.

Patent No. 3,908,610, H. Stahle, HOUSING FOR A ROTARY ENGINE, Interference No. 99,347, decided Apr. 6, 1977, claim 1.

Disclaimers

3,445,165.—*Wendell P. Dubbs*, Palo Alto, Calif. PHOTOGRAPHIC DISTORTION DEVICE. Patent dated May 20, 1969. Disclaimer filed June 13, 1977, by the assignee, *Snook Corporation*.

Hereby enters this disclaimer to claim 11 of said patent.

3,541,308.—*George S. Ruby*, Scarsdale, N.Y. AUTOMATED PARKING FACILITY. Patent dated Nov. 17, 1970. Disclaimer filed June 10, 1977, by the assignee, *International Business Machines Corporation*.

Hereby enters this disclaimer to claims 1, 3 and 4 of said patent.

3,926,776.—*Roy E. Irwin*, Oakville, Ontario, Canada and *Alfred Aufhauser*, New York, N.Y. METHOD AND APPARATUS FOR WAX DEOILING. Patent dated Dec. 16, 1975. Disclaimer filed June 8, 1977, by the inventors.

Hereby enter this disclaimer to claims 7 and 8 of said patent.

4,014,734.—*Richard A. Patterson*, Village of Woodbury, Washington County, Minn. TUBE FORMING DEVICE. Patent dated Mar. 29, 1977. Disclaimer filed Apr. 4, 1977, by the inventor, the assignee *Minnesota Mining and Manufacturing Company*, assenting.

The term of this patent subsequent to Mar. 22, 1994, has been disclaimed.

4,022,741.—*Richard F. Tuka*, Oak Lawn, *Peter H. Vossos*, Lisle, *Ralph R. Nielsen*, Oak Lawn, and *Carl J. Guardia*, Joliet, Ill. CONTINUOUS PROCESS FOR THE PREPARATION OF A CATIONICALLY MODIFIED ACRYLAMIDE POLYMER. Patent dated May 10, 1977. Disclaimer filed May 23, 1977, by the assignee, *Nalco Chemical Company*.

The term of this patent subsequent to May 3, 1994, has been disclaimed.

Dedication

3,964,153.—*Graham Frank Clifford*, Stanley, N.C., and *Mack W. Spurrier*, Clover, S. C. METHOD FOR TRANSFERRING YARN PACKAGES FROM A WINDING TUBE TO A CORE DYEING. Patent dated June 22, 1976. Dedication filed June 10, 1977, by the assignee, *Gaston County Dyeing Machine Company*.

Hereby dedicates to the Public the remaining term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors: Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

DEFENSIVE PUBLICATIONS

PUBLISHED AUGUST 2, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T961,001
ELECTRONIC WATCH-CHRONOGRAPH

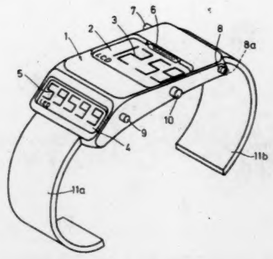
François Prinz, Brugg, Switzerland, assignor to Heuer-Léonedas S.A., Bern, Switzerland

Continuation of Ser. No. 651,508, Jan. 22, 1976, abandoned. This application Dec. 23, 1976, Ser. No. 753,718

Int. Cl.[2] G04F *8/00*; G04B *19/30*

U.S. Cl. 58—39.5

1 Sheets Drawing. 11 Pages Specification



An electronic watch-chronograph comprising a watch portion having an electronic arrangement for the measurement and display of the time of day, and a chronograph portion having an electronic arrangement for the measurement and display of the duration of a period of counted time, the first-mentioned display comprising statically-controlled display elements and the second-mentioned display comprising electroluminescent display elements.

T961,002
ELECTRON CURRENT REGULATOR FOR AN ELECTRON DISCHARGE DEVICE

Alan V. Hall, Wappingers Falls, and Ollie C. Woodard, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

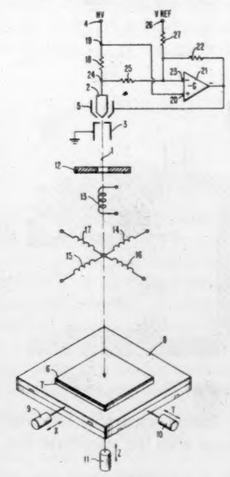
Continuation of Ser. No. 542,462, Jan. 20, 1975, abandoned, which is a continuation of Ser. No. 268,284, July 3, 1972, abandoned. This application Oct. 7, 1976, Ser. No. 730,548

Int. Cl.[2] H01J *37/30*; H05B *7/02*

U.S. Cl. 315—107

2 Sheets Drawing. 26 Pages Specification

Circuit for controlling the electron discharge from a cathode, of an electron discharge device, which provides a control voltage signal, proportional to the cathode current, for comparison with a reference value to provide a correction bias to a grid interposed between the cathode and an anode.



T961,003
FEMALE CONNECTOR

Charles Louis Krumreich, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 4, 1977, Ser. No. 765,845

Int. Cl.[2] H04M *11/04*

U.S. Cl. 339—176 M

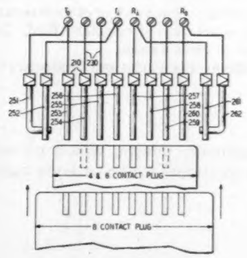
3 Sheets Drawing. 14 Pages Specification

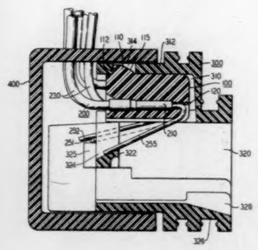
A female connector or jack in accordance with the present invention includes a plurality of contact springs that are arranged in a row side by side one another and extend rearwardly cantilever fashion within a plug-receiving opening. It further includes a switch disposed on each side of the connector contacts. Each switch comprises a movable contact spring that is normally in engagement with a stationary contact spring. The movable contact springs extend within the plug-receiving opening while the stationary contact springs are remote to the opening.

The jack is intended to be connected to a telephone line by respectively wiring the switches in series with the ring and tip conductors and wiring an individual connector contact in parallel with each of the switch contacts. Continuity in the telephone line is then provided by the closed switches of the jack when no plug is inserted into the jack. In addition, if a plug of a size not to engage the movable switch contacts is inserted into the jack and the contacts on the plug only engage one of the connector contacts wired to the tip conductor and one of the connector contacts wired to the ring conductor, line continuity continues and the station apparatus terminated by the plug is bridged across the telephone line.

But if a plug of a size to engage the movable switch contacts is inserted into the jack, the movable contacts are deflected from their associated stationary contacts to interrupt the continuity of the telephone line. Then by providing the plug with

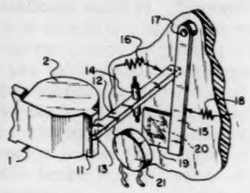
contacts that engage both connector contacts wired to the tip conductor and both connector contacts wired to the ring





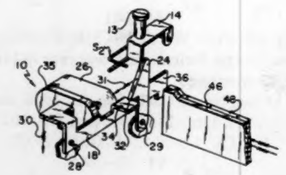
conductor, the station apparatus terminated by the plug is connected in series with the telephone line.

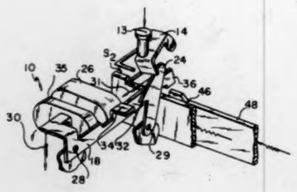
T961,004
FILM SPEED SENSING DEVICE
William Howard Horton, 901 Elmgrove Rd., Rochester, N.Y. 14650
Filed Oct. 27, 1976, Ser. No. 736,055
Int. Cl.² G03B *17/26*
U.S. Cl. 354—21
2 Sheets Drawing. 14 Pages Specification



A photographic still camera utilizes film cartridges of the type having two parallel cylindrical film compartments connected by a wall member that extends between the two compartments in a plane generally parallel to the compartment axes. A rib extends from one end of the cartridge, i.e., from the outer surface of one of the film compartments. The presence of the rib signifies that the film in the cartridge has a particular film speed rating. When a cartridge provided with such a rib is inserted into the camera, in a direction perpendicular to its wall member, its rib engages a cam surface of a pivotally mounted sensing member in the camera and displaces that cam surface in a direction that is generally endwise with respect to the cartridge. Displacement of the sensing member effects an adjustment of the camera to compensate for the film speed designated by the rib.

T961,005
CAMERA ELECTROMAGNETIC SHUTTER RELEASE
Edmund Frank Deffenbaugh, 45 Cohasset Drive, Rochester, N.Y. 14618
Filed Oct. 26, 1976, Ser. No. 735,484
Int. Cl.² G03B *9/64*
U.S. Cl. 354—238
1 Sheets Drawing. 9 Pages Specification



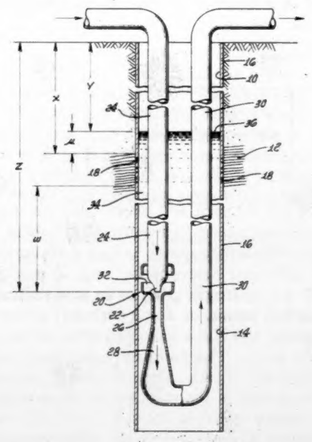


A shutter release mechanism for a camera uses an electromagnetic shutter latch that is operated by an exposure initiating button to delay opening movement of the shutter for a predetermined time after operation of the exposure initiating button.

T961,006
OIL WELL COMPLETION WITH HIGH SUBMERGENCE JET PUMP
Francis Barton Brown, La Crescenta, and Phillip M. Wilson, Downey, both of Calif., assignors to Kohe, Inc., Huntington Park, Calif.
Continuation of Ser. No. 506,251, Sept. 16, 1974, abandoned, which is a division of Ser. No. 381,863, July 23, 1973, abandoned. This application Mar. 15, 1976, Ser. No. 667,135
Int. Cl.² F04F *5/44*
U.S. Cl. 417—196
1 Sheets Drawing. 10 Pages Specification

An oil well completion comprising a well bore drilled from the surface through and below an oil producing formation to provide an extension below the producing formation, a jet pump in the extension below and in communication with the producing formation, means for conducting power fluid under pressure downwardly in the well bore from the surface to the jet pump, and means for conducting spent power fluid, and fluid from said producing formation discharged by said jet pump, upwardly in the well bore from the jet pump to the surface. The purpose of locating the jet pump in a downward

extension of the well bore below the producing formation is to provide sufficient submergence of the jet pump to avoid cavi-



tation, without curtailing the flow of fluid from the producing formation into the well bore.

T961,007
PRODUCTION OF ELECTRICALLY CONDUCTIVE PATHS ON AN INSULATING SUBSTRATE
Alan William Jukes, St. Albans, and Michael John Packham, Welwyn Garden City, both of England, assignors to Imperial Chemical Industries Limited, London, England
Filed Aug. 6, 1976, Ser. No. 712,373
Claims priority, application United Kingdom, Aug. 12, 1975, 33542/75
Int. Cl.² H05K *3/18*
U.S. Cl. 427—54
No Drawing. 12 Pages Specification

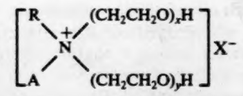
This process applies to printed circuits obtained by the imagewise deposition of nickel using a procedure such as that described in U.S. Pat. No. 3,853,589 followed by electroless copper plating onto the nickel pattern. We have found that by depositing the nickel before the copper, as compared with direct deposition of the copper, gives less deposition on the areas between the conductive paths and hence better insulation between them.

The process can be performed in five stages including (a) coating a substrate, for instance by a gravure technique, with an active agent including a water-soluble quaternized bipyridilium compound, e.g. N,N′-dimethyl-4,4′-bipyridilium dimethosulphate or N,N′-bis(4-cyanophenyl)4,4″-bipyridilium dichloride and a suitable binder therefore such as polyvinyl alcohol, (b) imagewise exposing the coating where the conductive paths are to be deposited to sensitizing radiation, (c) contacting the surface with a solution of palladium chloride in hydrochloric acid, preferably containing 0.5 to 0.15 g/l $PdCl_2$, (d) contacting the substrate with an aqueous electroless nickel plating bath, preferably at pH 8 to 9, and (e) contacting the substrate with an electroless copper plating bath.

Further reduction in the metal deposition between the conductive paths is obtained by contacting the surface of the substrate with an aqueous solution of a reducing agent such as sodium hypophosphite between steps (c) and (d), rubbing the surface of the substrate between steps (d) and (e), or both procedures.

T961,008
ORIENTED POLYOLEFIN FILM TREATED WITH QUATERNARY AMMONIUM SALTS
Brian Norman Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Jan. 24, 1977, Ser. No. 762,157
Claims priority, application United Kingdom, Feb. 6, 1976, 4767/76
Int. Cl.² B05D *1/00, 3/00*
U.S. Cl. 427—401
No Drawing. 12 Pages Specification

Oriented polyolefin, especially polypropylene, films are produced having antistatic properties by applying to the cast extrudate an aqueous solution on at least one surface of the film of a quaternary ammonium salt of the general formula



where X is a univalent anion or an equivalent of a multivalent anion, *x* and *y* are positive integers the sum of which is from 2 to 5, A is lower alkyl group, and R is a univalent aliphatic radical containing from 1 to 22 carbon atoms, then the thus coated film is heated and stretched to orient it. Film forming polyolefins such as homo and co-polymers of ethylene, propylene, butene-1 and 4-methylpentene-1 are suitable, preference being given to a high molecular weight stereoregular predominantly crystalline polymer of propylene, either as a homopolymer or copolymerized with up to 15 weight percent of other unsaturated monomers, such as ethylene.

Preferred quaternary ammonium salts of the above formula, especially chlorides, are those in which X plus *y* is 2, A is methyl and R is a mixture of aliphatic carbon radicals having 8–18 carbon atoms, or 12–18 carbon atoms, particularly those derived from tallow or soya oil, or derived from coconut oil. Examples of commercially available materials include Ethoquad C/12 and O/12 for formed by the addition of methyl chloride to the tertiary amines sold as Ethomeen T/12 and S/12. Use of the corresponding tertiary amine as the hydrochloride salt does not provide the oriented film with antistator properties.

The amount of the quaternary ammonium salt present on the surface of the treated film constitutes from 0.05 to 2.5, preferably 0.1 to 1%, by weight of the coated film. The coating solution may also be supplemented by one or more antistatic agents such as the monoethoxylated quaternary ammonium salt chlorine chloride.

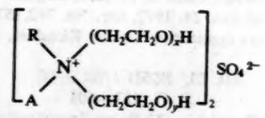
The substrate may also be a multiple-layer substrate having a polypropylene layer and at least one surface layer of a copolymer of propylene with from 5 to 20 by weight of the copolymer of another alpha-olefin containing from 4 to 10 carbon atoms in its molecule.

Films so treated exhibit a surface resistivity not exceeding 10, and preferably less than 0.5, gigohms.

T961,009
ORIENTED POLYOLEFIN FILM TREATED WITH AMINE SULPHATES
Brian Norman Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Jan. 24, 1977, Ser. No. 762,166
Claims priority, application United Kingdom, Feb. 6, 1976, 4769/76; Apr. 9, 1976, 14547/76
Int. Cl.² B05D *1/00, 3/00*
U.S. Cl. 427—401
No Drawing. 20 Pages Specification

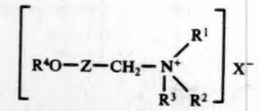
Antistatic polyolefin films, particularly oriented polyolefin, are produced by extruding a polyolefin to form a cast extrudate, and applying to at least one surface of the cast extrudate a

solution or dispersion in a volatile vehicle an amine sulfate or mixture of amine sulfates having the general formula



where x is a positive integer, y is zero or a positive integer, the sum of x and y is from 2 to 5, A is a hydrogen atom and when y is zero A may also be a lower alkyl group, and R is a univalent aliphatic radical containing from 8 to 22 carbon atoms, and afterwards heating and stretching the extrudate to orient it. Preferred materials include amine sulphates in which the sum of $x + y$ is 2, A is hydrogen and R is a mixture of aliphatic hydrocarbon radicals having 8 to 18, preferably 12 to 18, carbon atoms particularly those derived from tallow or soya oil or derived from coconut oil. Examples of suitable amines from which amine sulfates may be prepared are the Endomeen's T/12, S/12 and C/12. It has been found that the corresponding hydrochloride does not provide the oriented film with satisfactory properties. The amine sulfate is conveniently employed at a concentration of up to about 60% by weight of the solution or dispersion and preferably from 10 to 50%.

Preferably the solution or dispersion also contains as a supplementary additive a quaternary ammonium compound of the general formula:



where each of R^1, R^2, and R^3, which may be the same or different, is a hydrogen atom or a lower alkyl radical, or R^1 and R^2 are each methylene groupings within a common five- or six-membered saturated heterocyclic ring, Z is a methylene group when R^4 is a hydrogen atom or an acyl radical containing up to 15 carbon atoms, or Z is a carbonyl group when R^4 is a hydrogen atom, and X is a univalent anion or an equivalent of a multivalent anion. The preferred quaternary ammonium compound is choline chloride. The presence of the quaternary ammonium compound in the solution or dispersions reduces the amount of amine sulfate to about 0.25 to 2.5% required to achieve the desired film properties, the total concentration of the amine sulfate and additional additive within the range of up to 60%.

REISSUES

AUGUST 2, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,327
METHOD AND APPARATUS FOR CORRECTING TIME IN AN ELECTRONIC WRISTWATCH

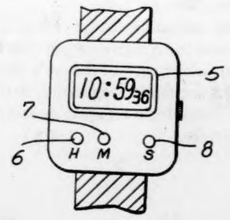
Hideaki Yasukawa, and Okito Naito, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Original No. 3,889,460, dated June 17, 1975, Ser. No. 371,084, June 18, 1973. Application for reissue Aug. 18, 1976, Ser. No. 715,478

Claims priority, application Japan, June 19, 1972, 47-61101

Int. Cl.² G04C *3/00*; G04B *19/38, 27/00*

U.S. Cl. 58—23 R **6 Claims**



1. An electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider means for producing low frequency timing signals from said high frequency time standard signals including a plurality of series-connected divider stages, certain of said divider stages corresponding to seconds display, means for the digital display of time in response to said timing signals, said digital display means displaying at least seconds and minutes, said seconds divider stages providing a substantially squarewave output signal having a period of 1 minute to the next divider stage, and correction means for applying a reset signal to said certain divider stages which correspond to the incorrect time displayed, said correction means being adapted to set the second digital display to zero without affecting the minute digital display when said reset signal is applied to said certain dividers during the first half cycle of said output signal when the seconds digital display means is 30 or less and to set the second digital display to zero and increase the minute digital display by one when said reset signal is applied to said certain dividers during the second half cycle of said output signal when said seconds digital display read more than 30.

Re. 29,328
TRANSMISSION DEVICE

Yves Jean Kemper, Yvelines, France, assignor to Vadetec S.A., Switzerland

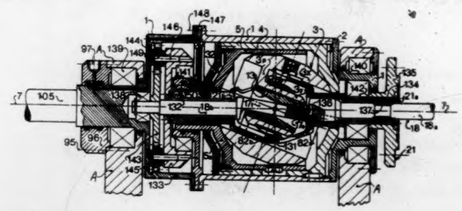
Original No. 3,955,432, dated May 11, 1976, Ser. No. 486,859, July 9, 1974. Application for reissue Nov. 11, 1976, Ser. No. 741,050

Claims priority, application France, July 13, 1973, 73.25788

Int. Cl.² F16H *13/06, 15/50*

U.S. Cl. 74—190 **18 Claims**

1. A power transmission comprising, a first element comprising two axially spaced closed surfaces of revolution about a first axis defining two rolling surfaces on opposite sides of a plane normal to said first axis and passing through a point on said first axis, a second element driven conically about said point on the first axis and circumferentially of said first axis, said second element having two second rolling closed surfaces of revolution about a second axis and axially spaced on opposite sides of a plane passing through said point and normal to said second axis, said second axis intersecting said first axis at said point and being inclined to the first axis by an angle a, input torque means comprising a first shaft to impart conical movement to said second element conically about said point on the first axis and circumferentially of said first axis, said second element having means effective to develop gyroscopically when driven a gyroscopic torque effective for applying said rolling surfaces on each other for relative rolling thereon and contacting at two areas disposed on opposite sides of both axes and effective to couple said first and second element, to prevent a sliding movement therebetween, *the forces applying said rolling surfaces on each other consisting essentially of forces mechanically applied to said first and second elements, said mechanically applied forces including said gyroscopic torque,* and means comprising a second shaft connected for taking out an output torque transmitted through said element from said input torque means.



Re. 29,329
HYDRAULIC SYSTEMS

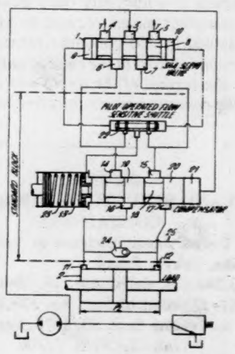
Ronald Bernard Walters, Wembley, England, assignor to Sperry Rand Limited, London, England

Original No. 3,903,786, dated Sept. 9, 1975, Ser. No. 467,082, May 6, 1974. Application for reissue Oct. 15, 1976, Ser. No. 732,704

Claims priority, application United Kingdom, May 15, 1974, 22950/74

Int. Cl.² F15B *11/08*

U.S. Cl. 91—444 **4 Claims**



2. A hydraulic system [according to claim 1 in which the compensator is connected in both service lines and is arranged to restrict flow equally in each of them] *including a source of hydraulic pressure, a load, a four-way control valve arranged to control the supply of hydraulic pressure to said load, said valve having a pair of service ports, a pair of service lines connecting said service ports to said load, a compensator being connected in at least one of said service lines and being arranged to restrict the flow of*

hydraulic fluid in said service line so as to maintain a constant pressure difference between said source pressure and said pressure at that one of the valve service ports that supplies fluid to said load, said compensator being connected in both service lines and is arranged to restrict flow equally in each of them.

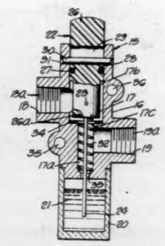
Re. 29,330
LEAK DETECTOR VALVE ASSEMBLY

Buster D. Stewart, Lake View Terrace, Calif., assignor to Rosan Enterprises, Newport Beach, Calif.

Original No. 3,583,435, dated June 8, 1971, Ser. No. 855,829, Sept. 8, 1969. Application for reissue Apr. 13, 1976, Ser. No. 676,462

Int. Cl.[2] G01M *3/08*; F16K *37/00*

U.S. Cl. 137—551 **18 Claims**



1. A leak detector valve assembly comprising:

a body, said body being provided with an internal cavity and inlet and outlet openings [interconnecting said cavity:] *linearly misaligned relative to each other and interconnected by means of a restricted opening within such cavity;*

shoulder means and sealing means to provide a fluid tight seal located around the restricted opening;

a normally open plunger means [positioned in said body cavity, said plunger means] being *slideably* axially displaceable within said cavity so as to substantially close *the restricted opening in* said body cavity between the inlet and outlet openings, said plunger means being provided with bleeder means *communicating with the inlet,* and an elongated tubular means interconnected therewith for conducting fluid through said plunger means;

an annular groove on the plunger means and a sealing means contained therein;

means engaging said plunger means for returning said plunger means to a normally open position;

transparent container means secured to said body;

a liquid contained in said container means;

the plunger means at least in the closed position having one open end below the surface of the liquid and the space above the liquid in the container communicating with the outlet opening.

Re. 29,331
METHOD AND STRUCTURE FOR RECLOSABLE CONTAINERS

Kakuji Naito, Tokyo, Japan, assignor to Kabushiki Kaisha Seisan Nihon Sha, Tokyo, Japan

Original No. 3,246,672, dated Apr. 19, 1966, Ser. No. 89,540, Feb. 15, 1961. Division of Ser. No. 325,197, Oct. 23, 1963. Application for reissue Sept. 30, 1975, Ser. No. 618,231

Int. Cl.[2] F16L *11/00*

U.S. Cl. 138—118 **4 Claims**

3. In combination,

an elongated closed flexible integral tube of a flexible plastic film,

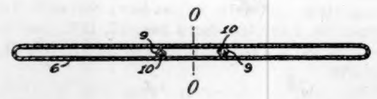
first and second rib elements extending axially along within said tube,

first and second groove elements extending axially along within said tube,

said first rib and groove elements and said second rib and groove elements being complementary shaped and positioned to be capable of being interlocked with the application of force to the outer surface of the tube at the element and to separate when forcibly drawn apart,

said elements spaced apart from each other in circumferential directions,

said film including body forming sheet portions positioned outside of elements when interlocked to be at one side



of each of the male elements for forming the bodies of bags formed from the tube,

and said film including flange forming sheet portions being between the elements when interlocked and being at the other side of each of the male elements and which may be subsequently separated axially along their length for providing a separate opening gripping flange for each element.

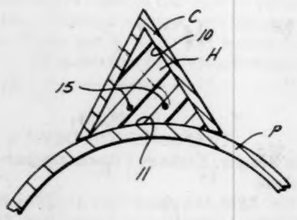
Re. 29,332
PIPE HEAT TRANSFER ASSEMBLY AND METHOD OF MAKING SAME

James E. Bilbro, Whitman County, Wash., and Ben C. Johnson, Jr., Comal County, Tex., assignors to Thermon Manufacturing Company

Original No. 3,834,458, dated Sept. 10, 1974, Ser. No. 370,396, June 15, 1973. Application for reissue Nov. 18, 1974, Ser. No. 526,895

Int. Cl.[2] B23P *15/26*

U.S. Cl. 165—164 **11 Claims**



1. A method of making a pipe heat transfer assembly adapted for mounting on a pipe or the like having a channel member with heat transfer material and a heat transfer element in the channel member, the improvement comprising the steps of:

preshaping heat transfer material to a solid flexible shape-retaining elongated strip prior to mounting said heat transfer material on a pipe or the like;

embedding a heat transfer element in said heat transfer material prior to mounting said heat transfer material on such pipe or the like; and,

said preshaping including shaping the external surface of said strip to closely conform to the interior of the channel member and to such pipe or the like to which the assembly is to be applied.

Re. 29,333
HYDRAULIC APPARATUS FOR REGULATING THE FLOW OF ONE OR MORE PUMPS

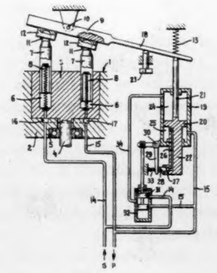
Carlo Pensa, Ensino Lario, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Original No. 3,694,108, dated Sept. 26, 1972, Ser. No. 28,425, Apr. 14, 1970. Application for reissue Sept. 25, 1974, Ser. No. 509,181

Claims priority, application Italy, Apr. 23, 1969, 15873/69

Int. Cl.[2] F01B *13/04*

U.S. Cl. 417—216 **19 Claims**



1. A hydraulic apparatus for regulating the fluid flow of pump means as a function of the pressure generated by said pump means, comprising pump means having suction inlet means and pressure outlet means, and including adjusting means for varying the fluid flow through said pressure outlet means; hydraulic motor means for operating said adjusting means and including a working piston connected with said adjusting means, a first chamber located on one side of said piston and communicating with said pressure outlet means, and a second chamber located on the other side of said piston; said piston having a greater effective surface area in said second chamber than in said first chamber; distributor valve means having a closed position, and a first operative position connecting said second chamber with said suction inlet means, and a second operative position connecting said second chamber with said pressure outlet means; control means responsive to an increased pressure at said pressure outlet means; and variable transmission means connecting said control means with said distributor valve means; at a predetermined maximum pressure said control means actuates said distributor valve means to move to said first operative position to reduce the pressure in said second chamber from a pressure which is higher than the pressure in said suction inlet means, so that said hydraulic motor means operates said adjusting means to reduce the flow at said pressure outlet means at a predetermined minimum pressure said variable transmission is actuated to move said distributor valve to said second operative position to increase the pressure in said second chamber to equal the pressure in said first chamber, so that said hydraulic motor means operates said adjusting means to increase the flow of said pressure outlet means; said adjusting means being operatively connected with said variable transmission means so as to move said distributor valve means to said closed position when said adjusting means has been operated by said hydraulic motor means to reduce, or increase the flow at said pressure outlet means.

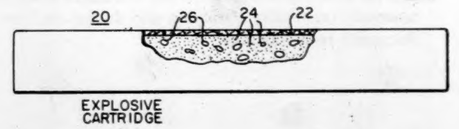
Re. 29,334
PHOSPHOR COMBINATION AND METHOD, PARTICULARLY ADAPTED FOR USE WITH EXPLOSIVES, FOR PROVIDING A DISTINCTIVE INFORMATION LABEL

Frederick M. Ryan, New Alexandria, and Robert C. Miller, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Original No. 3,772,099, dated Nov. 13, 1973, Ser. No. 143,772, May 17, 1971. Application for reissue Sept. 8, 1975, Ser. No. 611,576

Int. Cl.[2] C06B *45/06, 45/02, 39/00*; C03C *3/28*

U.S. Cl. 149—18 **21 Claims**



1. In combination, explosive agent or explosive material and associated means which will provide an indicia of information regarding said explosive agent or explosive material, said combination comprising:

a. an explosive agent or explosive material; and

b. a relatively small amount of inorganic phosphor means incorporated with and retained in intimate association with said explosive agent or explosive material and receptive to the shock, pressure, high temperature and reactive atmospheres resulting from the ultimate detonation thereof, and the fluorescence of said phosphor means comprising a readily identifiable indicia of information regarding said explosive agent or explosive material.

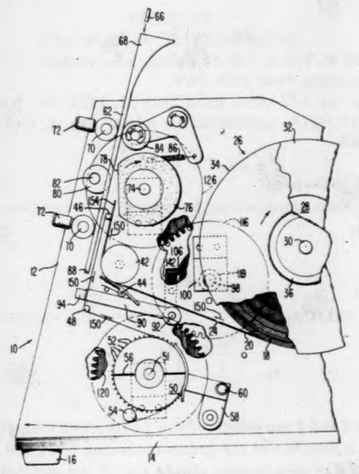
Re. 29,335
APPARATUS FOR AUTOMATICALLY ATTACHING A PATCH TO A COMMERCIAL DOCUMENT

Robert R. Gates, Rochester, and Dunham B. Seeley, Fairport, both of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Original No. 3,833,448, dated Sept. 3, 1974, Ser. No. 287,336, Sept. 8, 1972. Application for reissue Aug. 19, 1976, Ser. No. 715,670

Int. Cl.[2] B44C *3/00*; B32B *35/00*

U.S. Cl. 156—541 **12 Claims**



1. Apparatus for applying [a magnetizable] *an* overlay, e.g.

stripe, to an item or document such as a savings bank passbook comprising:

a supply of [magnetizable] tapes or patches,

a document receiving area adjacent said supply of tape including document support means forming a throat into which said document is inserted and advanced, and thereafter retracted and removed,

means adjacent said document receiving area for advancing an individual patch from said supply into contact with said document,

means over which said patches are caused to pass effective to detach a patch from said supply for application to said document, and

means for adhering said patch to said document while simultaneously removably retracting said document from said document receiving area.

Re. 29,336

METHOD OF ETCHING A SURFACE OF A SUBSTRATE COMPRISING $LiTaO_3$ AND CHEMICALLY SIMILAR MATERIALS

Mahn-Jick Lim, Lower Makefield Township, Bucks County, Pa., assignor to Western Electric Company, Inc., New York, N.Y.

Original No. 3,860,467, dated Jan. 14, 1975, Ser. No. 445,039, Feb. 22, 1974. Application for reissue Dec. 17, 1976, Ser. No. 751,926

Int. Cl.² H01L *21/306*

U.S. Cl. 156—626 **7 Claims**

5. A method of etching a surface of a substrate comprising lithium tantalate, which comprises contacting the surface with a mixture comprising HF and H_2SO_4.

Re. 29,337

DICARBOXYLIC ACID SOAPS

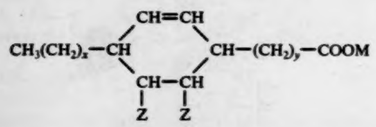
Benjamin F. Ward, Isle of Palms, S.C., assignor to Westvaco Corporation, New York, N.Y.

Original No. 3,734,859, dated May 22, 1973, Ser. No. 188,458, Oct. 12, 1971. Application for reissue Feb. 3, 1976, Ser. No. 654,862

Int. Cl.² C11D *9/00*

U.S. Cl. 252—108 **16 Claims**

1. A soap composition consisting of a compound of the formula



wherein x and y are integers from 3 to 9, x and y together equal 12, Z is a member of the group consisting of H and $COOM_1$, with one Z of each moiety, and M and M_1 are selected from the group consisting of [hydrogen,] sodium, potassium, lithium, ammonium and mixture thereof.

Re. 29,338

PROCESS FOR THE PREPARATION OF ESTERS OF CARBONIC ACID

Emilio Perrotti, and Gioacchino Cipriani, both of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Original No. 3,846,468, dated Nov. 5, 1974, Ser. No. 121,193, Mar. 4, 1971. Application for reissue Sept. 28, 1976, Ser. No. 727,348

Claims priority, application Italy, Mar. 4, 1970, 21468/70

Int. Cl.² C07C *69/00*

U.S. Cl. 260—463 **6 Claims**

1. A process for the preparation of esters of carbonic acid having the general formula:



wherein R is a hydrocarbon radical selected from the class consisting of alkyl, aryl or cycloalkyl radicals characterized in that an alcohol represented by the formula ROH in which R has the aforesaid meaning is reacted with carbon monoxide and oxygen in the presence of a catalyst consisting of cuprous chloride complexed with an organic ligand selected from the group consisting of pyridine, dipyridyl, imidazole, phenanthroline alkyl or aryl, phosphines, dimethylsulfoxide, dimethylformamide, quinuclidine, CH_3CN, C_6H_5CN, malonitrile, succinodinitrile and adiponitrile.

Re. 29,339

PRODUCTION OF N-ALKYLATED AMINES

Seymour Baron, Wayne, N.J., assignor to Hexcel Corporation, Dublin, Calif.

Original No. 3,732,311, dated May 8, 1973, Ser. No. 13,793, Feb. 24, 1970. Application for reissue Apr. 2, 1976, Ser. No. 673,150

Int. Cl.² 544 *178*; C07C *85/06, 87/127, 87/14, 87/28*

U.S. Cl. 260—585 B **9 Claims**

1. The production of N-alkylated amines by reaction of an alcohol with a member of the group consisting of [ammonia,] primary amines and secondary amines, by vapor phase reaction with thorium sulfate as a catalyst and at a temperature range of 200–500° C., and without high pressures.

Re. 29,340

COMPOSITE FILM

Koichi Matsunami, and Ikuya Hayashi, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Original No. 3,843,479, dated Oct. 22, 1974, Ser. No. 213,811, Dec. 29, 1971. Application for reissue Oct. 7, 1976, Ser. No. 730,464

Claims priority, application Japan, Dec. 29, 1970, 46-128180; Dec. 29, 1970, 46-128181

Int. Cl.² B32B *7/02*

U.S. Cl. 428—216 **11 Claims**

1. A composite film comprising (A) a biaxially drawn film of a polyamide containing in the molecule not less than 70% (mol) of the repeating unit consisting of metaxylylenediamine or its mixture with paraxylyenediamine, wherein the paraxylylenediamine content is not more than 30% (mol) on the basis of the total amount of methaxylylenediamine and paraxylylenediamine, and an α,ω-aliphatic dicarboxylic acid having 6 to 10 carbon atoms and (B) a layer of a thermoplastic resin having a melting point or the softening point at least 50° C. below the melting point or the softening point of the polyamide provided on at least one surface of the biaxially drawn film;

the biaxially drawn film having the following physical constants:

(1) [Gas] *Oxygen* permeability constant (at 30° C.): not more than 9×10^{-13} ml. cm./cm.² sec. cm. Hg;

(2) Plane orientation index: not less than 0.025;

(3) Degree of balance: not more than 0.045;

(4) Breaking strength: not less than 10 kg./mm.² in machine and transverse directions;

(5) Breaking elongation: 30 to 150% in machine and transverse directions;

(6) Yield strength: not less than 5 kg./mm.² in machine and transverse directions; and

(7) Yield elongation: 2 to 6% in machine and transverse directions;

and the composite film having the following physical constant:

(8) [Gas] *Oxygen* transmission rate (at 30° C.): not more than 50 ml./m.²·24 hr.·atm.

Re. 29,341

LOCKING APPARATUS

Sherman M. Peters, 5209 S. Vandalia, Apt. 5, Tulsa, Okla. 74135, and Lawrence M. Smith, 297 E. Valley Drive NE., Marietta, Ga. 30060

Original No. 3,794,848, dated Feb. 26, 1974, Ser. No. 256,975, May 25, 1972. Application for reissue July 14, 1975, Ser. No. 595,893

Int. Cl.² E05B *49/00*

U.S. Cl. 307—129 **3 Claims**

1. An electronic control actuating system comprising in combination:

a. signal transmitting means including

(1) a plurality of signal transmitting elements comprising self-contained oscillator circuits with each signal transmitting oscillator circuit operable for producing a different radio frequency output signal[;],

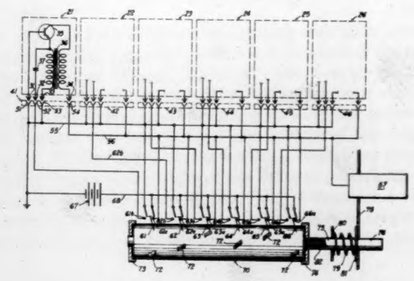
(2) actuator means operable for sequentially supplying energy to each of said oscillator circuits for sequentially producing a plurality of coded radio frequency output signals [and with said actuator means comprising a rotatable drum having a set of camming elements;], [and]

(3) means for selectively relocating said signal transmitting elements relative to said actuator means including a plurality of sets of releasable connectors with the relative spacing and orientation of the releasable connection of each set being substantially identical,

(4) a plurality of switches located adjacent said [rotatable drum in operative association with said camming means,] *actuator means* and

(5) a plurality of [conductor] *conductors* coupling said switches with said releasable connectors whereby said coded output signal produced by said signal transmitting means can be selectively [programmed] *reprogrammed* for changing the sequence of said coded output signals; and

b. signal receiving means operatively associated with said signal transmitting means for sequentially receiving only said plurality of coded output signals produced by said signal transmitting means and including



(1) a plurality of signal receiving elements, each signal receiving element operable for receiving one of said plurality of coded output signals and wherein said signal receiving elements are selectively [programmable] *reprogrammable to respond to* [so that said signal receiving elements can be altered in response to changing of said] *a programmed sequence* coded output signal *of said transmitter,* and

(2) means for producing an actuator signal in response to and only when a complete reception of said coded signals are received *from said transmitter* in a programmed sequential manner.

PLANT PATENTS

GRANTED AUGUST 2, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,086

ROSE PLANT

Ethel J. Permenter, Los Alamitos, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Sept. 13, 1976, Ser. No. 722,714
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—15 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the generally yellow color of bud and bloom on a plant otherwise identical to the variety Medallion.

4,087

CHRYSANTHEMUM PLANT

Edmund R. Niklas, Clackamas, Oreg.; Jack M. Meek, Barberton, and William E. Duffett, Akron, both of Ohio, assignors to Edmund R. Niklas, Clackamas, Oreg.

Filed Apr. 15, 1976, Ser. No. 677,411
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—76 **1 Claim**

1. A new and distinct cultivar of chrysanthemum plant known by the cultivar name Pinktive and particularly characterized as to uniqueness by the combined characteristics of decorative inflorescence type and semi-incurve inflorescence form; purple inflorescence color with uniform color oxidation; diameter across face of inflorescence up to 4 inches at maturity; uniform 9 week flowering response to photoperiodic short-day control; tall plant height; semi-spreading branching pattern, and dark green foliage with deeply lobed shape and coarsely serrated margin.

4,088

ROSE PLANT

Thomas B. Kyle, Tipp City, Ohio, assignor to Spring Hill Nurseries Co., Tipp City, Ohio

Filed Aug. 3, 1976, Ser. No. 711,361
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—5 **1 Claim**

1. A new and distinct variety of climbing rose plant substantially as shown and described, which is a mutation of the hyrid tea rose known as "Kolner Karneval" (also known as "Blue Girl"), characterized particularly by strong canes of vigorous growth capable of attaining a length of 10 to 12 feet in the first growing season and flower form and foliage of the original variety, i.e., bluish lavender-pink coloring displaying pleasing bluish silver tones at the heart of the flowers combining with abundant, large, deep green, glossy, thick foliage, on a vigorous profusely blooming plant bearing flowers both singly and in clusters on a recurring basis throughout the growing season.

4,089

ROSE PLANT

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Aug. 30, 1976, Ser. No. 718,983
Int. Cl.[2] A01H *5/00*
U.S. Cl. Plt.—27 **1 Claim**

1. A new and distinct variety of rose plant of the floribunda class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its very vigorous growth, extremely free branching habit, continuity of blooms of a Phlox Pink (W) color, resistance to powdery mildew and little fragrance.

PATENTS

GRANTED AUGUST 2, 1977

ERRATA

For CLASS	See PATENT NO.
126–299 D	4,038,912
015–053 AB	4,039,014
128–087 R	4,039,039
181–106	4,039,042
282–022 R	4,039,046
206–606	4,039,120
346–110 R	4,039,127
252–028	4,039,143
214–021	4,039,148
029–105 A	4,039,295
428–553	4,039,296
428–566	4,039,297
428–558	4,039,298
134–022 R	4,039,350
206–217	4,039,435
542–462	4,039,531
544–017	4,039,532
544–017	4,039,533
544–017	4,039,534
544–026	4,039,535
544–026	4,039,536
544–030	4,039,537
544–219	4,039,538
548–370	4,039,557
423–592	4,039,582
260–336	4,039,627
260–857 UN	4,039,628
260–876 B	4,039,629
260–878 R	4,039,630
260–878 R	4,039,631
260–878 B	4,039,632
260–879	4,039,633
260–895	4,039,634
260–954	4,039,635
260–963	4,039,636
261–036 A	4,039,637
261–072 R	4,039,638
261–121 R	4,039,639
264–003 B	4,039,640
264–028	4,039,641
264–071	4,039,642
264–092	4,039,643
264–097	4,039,644
264–118	4,039,645
235–030 R	4,039,780
260–651 R	4,039,793

ERRATA – continued

219–216	4,039,770
219–328	4,039,771
219–328	4,039,772
219–364	4,039,773
219–370	4,039,774
219–385	4,039,775
219–401	4,039,776
219–439	4,039,777
219–544	4,039,778
219–696	4,039,779
235–030 R	4,039,780
235–092 EV	4,039,781
235–150.2	4,039,782
235–150.3	4,039,783
235–151	4,039,784
235–151	4,039,785
250–360	4,039,807
250–370	4,039,808
250–390	4,039,809
250–396 ML	4,039,810
250–409	4,039,811
250–413	4,039,812
361–388	4,039,900
361–422	4,039,901
361–395	4,039,902
361–187	4,039,903
361–433	4,039,904
361–433	4,039,905
361–293	4,039,906
363–022	4,039,921
363–009	4,039,922
363–079	4,039,923
363–065	4,039,924
363–070	4,039,925
363–138	4,039,926
363–017	4,039,927
364–200	4,040,021
364–900	4,040,022
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364–900	4,040,028
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354–049	4,040,037
358–213	4,040,111
	4,040,112

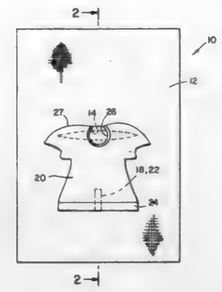
PATENTS

GRANTED AUGUST 2, 1977

NOTE—A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

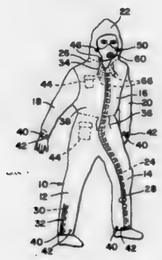
GENERAL AND MECHANICAL

4,038,697
SHEET-AND-BIB COMBINATION
Sylvia Levitt, 16 Sutton Place, New York, N.Y. 10022
Filed Sept. 27, 1976, Ser. No. 726,535
Int. Cl.[2] A41B *13/10*
U.S. Cl. 2—49 A **6 Claims**



1. A sheet-and-bib device comprising in combination:
a sheet of water-repellent material having a slot formed approximately ½ sheet length from one edge thereof of sufficient length to permit the passage therethrough of a person's head and shoulders;
a strip of adhesive material provided on said sheet extending longitudinally thereof at approximately the center of the width thereof; and
a bib of disposable material positioned in outwardly extending relationship to said sheet material and detachably adhered thereto by means of an adhesive strip extending along substantially the longitudinal center line thereof in mating engagement with the strip of adhesive material on said sheet.

4,038,698
ONE-PIECE RAINSUIT AND FACE MASK
Leroy Smith, 103 Ariel Place, Bricktown, N.J. 08723
Filed June 4, 1976, Ser. No. 692,951
Int. Cl.[2] A41D *13/02*
U.S. Cl. 2—79 **3 Claims**



1. A garment for inclement weather comprising:
1. a one-piece rainsuit including leg receiving and arm-receiving portions,
a torso-enveloping portion including a plurality of drawstrings for additional securement of said garment to the body of a wearer,
a hood connected to said torso-enveloping portion,
a first zipper means extending from the top of said torso-enveloping portion to the bottom of one of said leg receiving portions for opening and closing said rainsuit,
a second zipper means on the bottom of the other of said leg receiving portions, and
means on the end of each of said leg receiving portions and each of said arm receiving portions for rendering said garment water tight, said means including cooperative snap and snap closures, and
2. A face mask removably atttached to said hood, said face mask including
a mouthpiece adapted to be inserted in the mouth of the wearer,
an air chamber between said mouthpiece and an exterior surface of said mask,
a plurality of air passages through the exterior surface of said mask establishing communication of said air chamber with air exterior of said mask,
at least one exhale pipe in communication with said air chamber adapted to be inserted within said rainsuit adjacent an interior surface of said rainsuit, and
valve means attached to the wall surrounding said air chamber for admitting air to chamber and into said mouthpiece through said air passages in response to inhaling by the wearer and for closing said air passages and directing air to said exhale pipe in response to exhaling of the wearer.

4,038,699
SOCK WITH INTEGRALLY KNIT POCKET AND METHOD
William H. Burn, Niota, Tenn., assignor to The Pocket Socks Corporation, Niota, Tenn.
Continuation-in-part of Ser. No. 623,982, Oct. 20, 1975, Pat. No. 4,005,494. This application Aug. 25, 1976, Ser. No. 717,767
Int. Cl.[2] A41B *11/00*
U.S. Cl. 2—239 **9 Claims**



1. A sock including integrally and circularly knit foot, leg and cuff portions with said leg portion being knit throughout at least a major portion thereof of complete seamless courses of body yarn, and a pocket having an opening positioned below said cuff portion and extending partially around said leg portion, said pocket extending downwardly along said leg portion from said opening and comprising first and second layers of knit fabric formed of partial courses, the lower ends of said first and second layers of said pocket being integrally knit and joined along a fold line extending across the lower end of said pocket, said first layer of said pocket including an upper end portion integrally knit with said leg portion and comprising a plurality of said partial courses gradually reducing in length and the remainder of said partial courses in the lower portion of said first layer being of equal length, said second layer of said pocket including an upper end portion integrally knit with said leg portion and comprising a plurality of said partial courses gradually increasing in length and the remainder of said partial courses in the lower portion of said second layer being of equal length, opposed ends of said gradually reducing

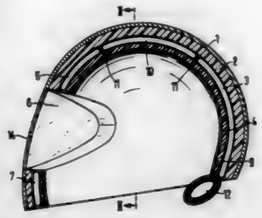
partial courses of said first layer being joined along gore lines to the corresponding opposed ends of said gradually increasing partial courses of said second layer, and stitching means extending along opposite sides of said pocket and joining said equal length partial courses of said first and second layers to each other.

4,038,700

SAFETY HELMETS FOR MOTORCYCLISTS OR THE LIKE

Kálmán György, Ahrwaldstr. 7, 3141 Garlstorf a. Walde, Germany

Filed June 11, 1976, Ser. No. 695,115
Claims priority, application Germany, June 12, 1975, 2526336
Int. Cl.² A42B *3/02*
U.S. Cl. 2—413 **3 Claims**



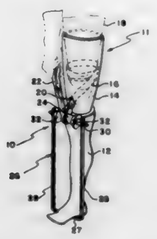
1. A safety helmet for enclosing the entire head and extending below the chin of a motorcyclist of the type having a hard outer shell with a semi-hardened foam lining and having a viewing aperature in the front thereof, comprising a plurality of inflatable interconnected air cushions arranged interior to said helmet such that a first cushion protects the neck, a second and third cushion protect the cheeks and a fourth cushion protects the top of the cranium, and wherein interconnecting of said cushions is achieved by air conduits each having located therein a pressure drop delay means whereby upon rupturing one of said air cushions a rapid release of inflation of all air cushions is prevented.

4,038,701

ABOVE THE KNEE PROSTHESIS DONNING DEVICE

Jim McFall; Jim Cicero, and Tom Phillips, all of 2827 Commerce, Dallas, Tex. 75226

Filed Aug. 23, 1976, Ser. No. 716,424
Int. Cl.² A61F *1/00, 1/02*
U.S. Cl. 3—1 **4 Claims**



1. An artificial leg donning aid to be used with a leg stump wrapping device utilized to pull the stump into engagement with the artificial leg comprising, in combination;

a stirrup adapted to receive only one foot of the person donning such an aritificial leg and further adapted to extend upwardly towards the knee of such an aritificial leg; and

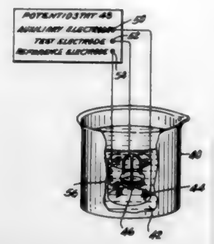
means adapted to be supported by said stirrup adjacent the knee of the artificial leg for permitting the direction of pull on the leg stump wrapping device by the person donning the artificial leg to be changed so that the wrapping device can be pulled from a substantially upright position by the person donning the artificial leg.

4,038,702

ELECTROCHEMICAL AND CHEMICAL METHODS FOR PRODUCTION OF NON-THROMBOGENIC METAL HEART VALVES

Philip Nicholas Sawyer, 606 Third St., Brooklyn, N.Y. 11215

Filed Sept. 21, 1973, Ser. No. 399,466
Int. Cl.² A61F *1/22, 1/24;* C25F *1/04*
U.S. Cl. 3—1.5 **1 Claim**



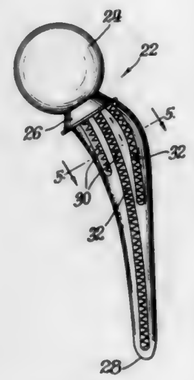
1. A prosthetic device including a metal structure having a metal surface, said metal surface being electrolytically treated to render more negative and homogeneous the electrochemical surface charge which the surface will exhibit in blood or a blooklike fluid, said surface having thereon no more than two foreign particles not exceeding 0.5 microns in maximum diameter per 25 square microns of surface.

4,038,703

PROSTHETIC DEVICES HAVING A REGION OF CONTROLLED POROSITY

Jack C. Bokros, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Nov. 14, 1975, Ser. No. 631,868
Int. Cl.² A61F *1/22, 1/24*
U.S. Cl. 3—1.5 **14 Claims**



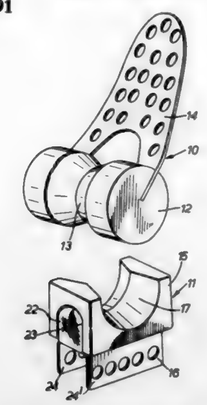
10. An improved prosthetic device having an exterior surface formed at least in part to provide a region of conrolled porosity to promote the ingrowth of bone and/or tissue, which device comprises a metal substrate which is formed with groove means in a surface portion thereof plus metal coil spring means, said groove means having a depth not greater than 150 percent of the loop diameter of said spring means, and said spring means being disposed in said groove and being joined to the surface of said groove at a plurality of points along the length of said spring means.

4,038,704

ELBOW PROSTHESIS

Peter Alexander Ring, Chaldon, England, assignor to Downs Surgical Limited, Mitcham, England

Filed June 9, 1976, Ser. No. 694,341
Claims priority, application United Kingdom, June 11, 1975, 25020/75
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **15 Claims**



1. A human elbow prosthesis having humeral and ulnar members with joint portions capable of fitting in a snap-fit engagement permitting the humeral member to pivot relative to the ulnar member and with implant portions capable of being rigidly fixed in bone without the use of cement, said prosthesis consisting essentially of:

a. a humeral member of a metal compatible with body tissue having

i. a substantially cylindrical joint portion with a central annular neck portion capable of being received in said snap-fit engagement with the joint portion of said ulnar member, and

ii. a substantially laminar implant portion capable of being inserted into a humerus, said implant portion being rigidly secured to said joint portion and extending therefrom in a direction substantially at right angles to the pivotal axis of said prosthesis, said implant portion being perforated so that bone can grow through the perforations to insure rigid fixation thereof; and

b. an ulnar member for receiving said humeral member, said ulnar member having

i. a substantially cuboidal joint portion of a resilient plastic compatible with body tissue and having a complimentary recess for receiving the joint portion of said humeral member in said snap-fit engagement while permitting the humeral member to pivot relative to the ulnar member along a pivotal axis coincident with the longitudinal axis of said humeral joint portion; and

ii. an implant portion of a metal compatible with body tissue comprising a base plate having means for attachment to said ulnar portion and a substantially laminar flange capable of being inserted into an ulna, said flange being perforated so that bone can grow through the perforations to ensure rigid fixation thereof.

4,038,705

ROTATIONAL JOINT ASSEMBLY FOR THE PROSTHETIC LEG

Lester J. Owens, Titusville, and William C. Jones, Merritt Island, both of Fla., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

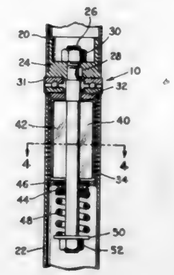
Filed July 30, 1976, Ser. No. 710,032
Int. Cl.² A61F *1/08, 1/04*
U.S. Cl. 3—2 **3 Claims**

1. A rotational joint assembly for a prosthetic leg which applies retarding and restoring forces to an artificial foot as it rotated during the walking, running and turning of a wearer of said prosthetic leg, said joint assembly comprising:

A. an upper member adapted to be connected to the wearer's body;

B. a lower member adapted to be connected to said artificial foot;

C. bearing means connecting said upper and lower members and permitting relative rotation therebetween;



D. a resilient means carried by one of said members;

E. a shaft carried by said other member; and

F. an outwardly extending flange carried by said shaft for engaging said resilient means;

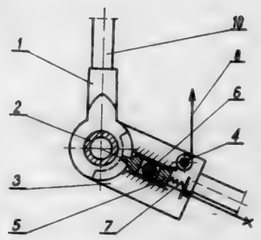
G. whereby as said foot is rotated during walking, said flange bears against said resilient means for restricting the degree of rotation of said foot and for restoring said foot to its normal position.

4,038,706

ARTIFICIAL ELBOW MECHANISM

Jan Ober, and Zygmunt Platek, both of Poznan, Poland, assignors to Centralnt Osrodek Techniki Medycznej, Warsaw, Poland

Filed Dec. 15, 1975, Ser. No. 641,087
Claims priority, application Poland, Dec. 20, 1974, 176647
Int. Cl.² A61F *1/06*
U.S. Cl. 3—12.3 **6 Claims**



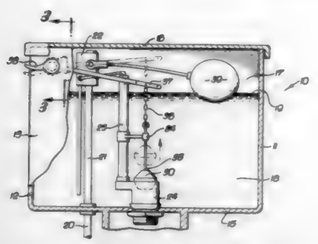
1. Artificial elbow mechanism comprising an arm part including cut-out portions, a forearm part containing a first and a second pulley, said forearm part being rotatably connected to said arm part, a control cable, a locking mechanism operatively associated with said cut-out portions and being operated by said cable, said second pulley being located on said locking mechanism, said locking mechanism being located in said forearm part and being attached to said control cable in such a way that said control cable passes on said first pulley in the forearm part creating the point of application of forearm flexion force and then on said second pulley on said locking mechanism creating the point of application of a force for pulling out said locking mechanism from said cut-out in said arm part.

4,038,707

FLUSH CONTROLLER

Earl T. Cass, 3560 Via Gaia, Lompoc, Calif. 93436

Filed Sept. 8, 1976, Ser. No. 721,225
Int. Cl.² E03D *1/34, 5/02*; A61B *19/00*
U.S. Cl. 4—67 R **3 Claims**



1. A controller for use on a toilet water flush tank which includes a discharge valve seat at the bottom of the tank,
a flexible discharge valve element,
and a handle pivotally mounted on a tank having a lifting lever connected to the discharge valve element by means of a flexible tie,
said controller comprising
a stop on the tank having a position of engagement with said handle,
the engagement of the stop with the handle being at a first handle position wherein the handle is limited to a first range of movement in which the discharge valve is lifted from the discharge valve seat a distance sufficient to permit outflow of water from the tank but insufficient to allow full discharge of the tank,
said handle having a second range of movement out of the influence of said stop wherein at the end of said second range of movement the handle is at a second position and the discharge valve is at a distance from the discharge valve seat sufficient to allow full discharge of the tank,
said stop comprising an auxiliary fixture including a portion having a nonrotatable mounting on said tank at a location adjacent said handle,
said auxiliary fixture comprising a lever pivotally mounted on the fixture,
a first arm on said lever adapted to engage said handle at a movable portion of said handle,
a stationary shoulder mounted on the tank and a second lever on said fixture having a position of engagement with said shoulder wherein the handle is moved to said first handle position.

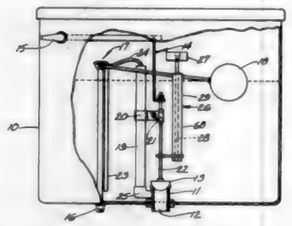
4,038,708

COMMODE WATER CONSERVATION APPARATUS

Paul M. Perrine, P.O. Box 270; Vincent C. Janes, Box 222 R. No. 1, both of Aurora, Ind. 47001, and James A. Cassera, 679 Funston Ave., San Luis Obispo, Calif. 93401

Filed Aug. 16, 1976, Ser. No. 714,779
Int. Cl.² E03D *1/34, 5/02*
U.S. Cl. 4—67 A **11 Claims**

1. In a commode flush tank of the type having a buoyant valve operable for opening and closing the flush water outlet of said tank, the improvement comprising:
a. an elongated stem member;
b. a plate member having adjustable means for wedging said plate member between two spaced and opposed walls of said tank, said plate further including means for carrying said stem extending downwardly into said tank at any one of a plurality of positions between said opposed walls; and
c. an elongated float having a longitudinally disposed aperture extending therethrough and slidably receiving said stem, said float including contact means in association therewith, said stem being positioned relative to said plate to slidably maintain said float such that said float contact means is positioned generally over said buoyant valve, whereby upon partial emptying of said tank after flushing



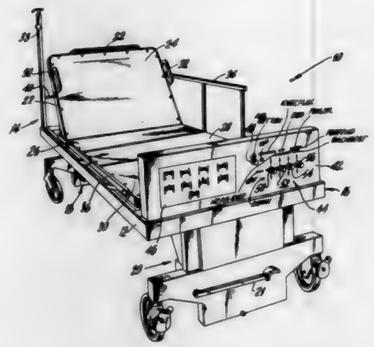
said float contact means contacts said buoyant valve to effect premature closure thereof.

4,038,709

DUAL HYDRAULIC HOSPITAL BED

Malcolm Kerwit, Edison, N.J., assignor to Kerwit Medical Products, Inc., Edison, N.J.

Filed Dec. 24, 1975, Ser. No. 643,947
Int. Cl.² A61G *7/10*; A47C *3/32*
U.S. Cl. 5—68 **9 Claims**



1. A hospital bed, comprising:
a rigid rectangular bed frame;
a segmented patient supporting frame coupled to said bed frame including a plurality of panels disposed transversely of said bed frame and intermediate the ends thereof, said panels being collectively proportioned so as to accommodate thereon a patient in a fully prone position when said panels are arranged in a planar relationship, at least one of said panels being movable with respect to the remainder of said panels and with respect to said bed frame about an axis extending transversely of said bed frame;
support means for supporting said bed frame;
hydraulic means coupled to said support means and to said patient supporting frame for raising said bed frame and at least some of said panels; and
dual mode pump means coupled to said hydraulic means for actuating said hydraulic means, said pump means being operable in at least one mode by compressed air.

4,038,710

CROSS RAIL AND SUPPORT FOR BED FRAMES

Nickolas A. Tambascio, Willoughy, Ohio, assignor to Rusco Industries, Inc., Los Angeles, Calif.

Filed Nov. 26, 1975, Ser. No. 635,404
Int. Cl.² A47C *19/00*
U.S. Cl. 5—200 R **3 Claims**



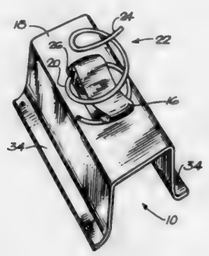
1. In a bed frame including side rails, a center cross rail means comprising a pair of telescopically engaged cross rail sections each having an outer end, a longitudinally ribbed top wall and a pair of longitudinally ribbed side flanges each terminating at its lower end in an inwardly and upwardly directed reinforcing edge portion, and support legs individually engaged with individual ones of said cross rail sections adjacent the outer ends thereof, said cross rail sections each being of uniform shape in vertical section for the length thereof and being readily movable axially with relation to each other, a support means engaging a lower end of each support leg, said support legs each having a vertical slot in one side thereof extending the height of the leg and defined by inwardly folded wall edge portions, the lower lengths of such edge portions and an opposite wall of said support leg telescopically engaging the upper ends of said support means to position said support means, and said cross rail sections each have a horizontal slot formed at the outer end thereof in the opposed side flanges thereof to receive a horizontal leg of said side rail therein, and said cross rail sections each having an upwardly turned flange formed from its top wall at the outer end thereof to aid in positioning a bed frame side rail engaged with said slot.

4,038,711

SPRING ASSEMBLIES AND PREFABRICATED SUB-ASSEMBLIES FOR MANUFACTURE THEREOF

Gerald A. Golembeck, Lake Elmo, and Ralph J. Marx, St. Paul, both of Minn., assignors to The United States Bedding Company, St. Paul, Minn.

Filed Jan. 16, 1976, Ser. No. 649,710
Int. Cl.² A47C *23/02*
U.S. Cl. 5—263 **6 Claims**



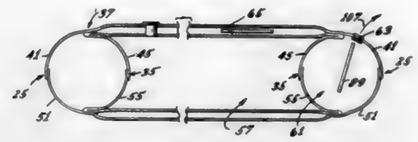
1. A sub-assembly for use in the manufacture of spring assemblies comprising an elongate slat of relatively rigid material, a plurality of longitudinally spaced nodules projecting upwardly from the top surface of the slat, a plurality of helical ciol springs, a lowermost coil of a coil spring being entwined about each nodule releasably to secure the coil springs onto the slat to extend upwardly from the top surface thereof in a longitudinally spaced apart relation corresponding to the longitudinally spaced relation between nodules, said nodules having an upper portion spaced from the slat dimensioned to have a length corresponding to the cross section of the lowermost coil and a portion of lesser cross section between said upper portion and the slat to provide a recessed portion in which the terminal coil of the coil spring is seated releasably to secure the coil spring onto the nodule.

4,038,712

MATTRESS CONSTRUCTION

Craig Salvatore Miller, 1221 S. Marine, Santa Ana, Calif. 92704

Filed Apr. 21, 1975, Ser. No. 569,665
Int. Cl.² A47C *27/08*
U.S. Cl. 5—371 **22 Claims**



1. A mattress comprising:
a first sheet of flexible material defined by a plurality of peripheral edges;
a second sheet of flexible material defined by a plurality of peripheral edges;
means forming a first continuous seal between the first sheet and the second sheet along a line displaced from the peripheral edges of the first sheet and the second sheet, the first seal defining with the peripheral edge of the first sheet a first lateral portion and defining with the peripheral edge of the second sheet a second lateral portion;
a third sheet of flexible material defined by a plurality of peripheral edges;
a fourth sheet of flexible material defined by a plurality of peripheral edges;
means forming a second continuous seal between the third sheet and the fourth sheet along a line displaced from the peripheral edges of the third sheet and the fourth sheet, the second seal defining with the peripheral edge of the third sheet a third lateral portion and defining with the peripheral edge of the fourth sheet a fourth lateral portion;
means forming a third continuous seal between the second sheet and the third sheet along the peripheral edges of the second sheet and the third sheet;
means forming a fourth continuous seal between the first sheet and the fourth sheet along the peripheral edges of the first sheet and the fourth sheet; whereby
the second and third sheets define a first cavity and the first, second, third and fourth lateral portions define a second cavity extending around the periphery of the first cavity.

4,038,713

PERSONAL FLOTATION DEVICE

Maurice H. O'Link, St. Cloud, Minn., assignor to Stearns Manufacturing Company, St. Cloud, Minn.

Continuation-in-part of Ser. No. 543,407, Jan. 23, 1975, Pat. No. 3,956,786. This application Mar. 19, 1976, Ser. No. 668,592
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.² B63C *9/10*
U.S. Cl. 9—345 **5 Claims**

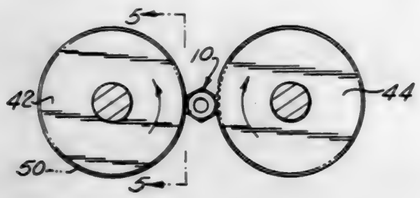
1. A personal flotation device including:
a. a collar comprising a pair of cooperating front and rear collar sections, each including a buoyant element, said sections cooperating to define a transversely generally central opening for reception of the neck of a wearer, said front section having an outer peripheral portion removed from said neck receiving opening;

b. means pivotally connecting said collar sections together on a normally generally horizontal axis extending transversely of the device at said central opening;
c. a front bib member having an upper end secured to the front collar section at said peripheral portion thereof;
d. a rear back member having an upper end secured to the rear collar section at said opening;
said bib and back members having transversely extending lower portions;
f. fasteners on said lower portions for releasably attaching the lower portions of one of said members in overlapping



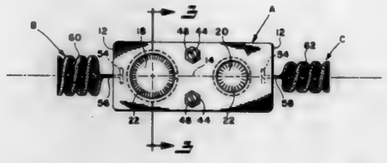
relationship to the lower portions of the other of said members to dispose said members in snugly encompassing relationship to the chest portion of the wearer and provide side portions that cooperate with said collar to define arm holes;
g. and a buoyant element in said bib member, the buoyant elements in said bib member and front collar section together having greater buoyancy than the buoyant element in said rear collar section, so as to bias the body of the wearer toward a generally faceup position with the body normally leaning slightly rearwardly from a vertical position.

4,038,714
METHOD OF MAKING LOCKNUTS
Adalbert Werner, Plettenberg, Germany, assignor to The Lamson & Sessions Co., Brooklyn, Ohio
Division of Ser. No. 528,848, Dec. 2, 1974, Pat. No. 3,952,785. This application Apr. 23, 1976, Ser. No. 679,820
Claims priority, application Germany, May 30, 1974, 2425897; May 30, 1974, 7418545
Int. Cl.² B21D *53/24;* **B21K** *1/70*
U.S. Cl. 10—86 A **18 Claims**



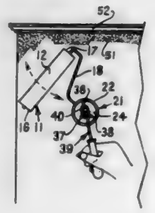
1. A method of making a locknut having a threaded central opening with noncircular thread convolutions adjacent to one end of the nut to interfere with a mating thread convolution and circular thread convolutions adjacent to the opposite end of the nut to freely engage the mating thread convolution, said method comprising the steps of providing a nut having a body with a plurality of flat side surfaces and a threaded central opening with a circular thread convolution extending between opposite end portions of the opening, providing a pair of rotatable externally toothed wheels spaced apart to define a nip between the crest portions of the external teeth on the wheels, rotating the wheels about their central axes, moving the nut through the nip defined between the crest portions of the external teeth on the rotating wheels, and deforming the thread convolutions adjacent to one end of the nut from the circular configuraion to a noncircular configuraion, said step of deforming the thread convolutions adjacent to one end of the nut including the steps of engaging opposite flat side surfaces of the nut body with the crest portions of the teeth on the rotating wheels as the nut passes through the nip, and indenting the opposite flat side surfaces of the nut body at spaced apart locations with the external teeth on the wheels to form a series of spaced apart indentations in the opposite flat side surfaces of the nut body, said step of indenting the opposite flat side surfaces of the nut body includes the step of pressing the crest portions of the external teeth on the wheels into the nut body and maintaining a space between the root portions of the external teeth and the nut body to prevent deformation of the nut body by the root portions of the external teeth on the wheels.

4,038,715
SCARIFYING TOOL FOR PIPE ENDS
Sanford Litt, 27050 Cedar Road, Beechwood, Ohio 44122
Filed Mar. 25, 1976, Ser. No. 670,346
Int. Cl.² A46B *3/18, 7/00*
U.S. Cl. 15—106 **9 Claims**



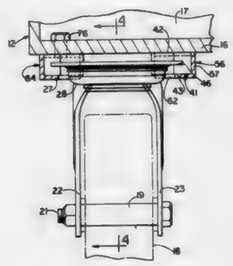
1. A tool for scarifying at least the ends of generally cylindrical areas comprising; a generally rigid body member having a longitudinal axis extending across opposite ends and being adapted to be held in a person's hand for manipulation, wire brushes manufactured separate from said body member and being secured to said body member against axial and rotational movement relative thereto in outwardly extending relationship to said opposite ends, said brushes having longitudinal brush axes extending generally parallel to said longitudinal axes of said body member and having generally circular cross-sectional configurations perpendicular to said brush axes, and at least one hole in said body member intermediate said ends extending transversely of said body member and being lined with abrasive material for receiving the ends of generally cylindrical members to abrade the exterior surfaces of same.

4,038,716
SWINGABLE YIELDING PAINT ROLLER
Marvin F. Polsfuss, 676 Silver St., San Francisco, Calif. 94115
Filed Jan. 19, 1976, Ser. No. 650,420
Int. Cl.² B05C *17/02;* **B25G** *3/38;* **F16C** *11/00*
U.S. Cl. 15—230.11 **3 Claims**



1. A swingable yielding paint roller device comprising an axle, a paint-applying roller rotatably mounted on said axle, an axle extension depending from said axle, a handle for manipulating said roller in rolling engagement with a paint-receiving surface, an intermediate two-plate oscillatable connector comprising a back plate fixedly secured to said axle extension and a cover plate fixedly secured to said handle and detachably secured to said back plate; said cover plate having a recess therein, a pair of compression springs in said recess arranged in opposed relation to one another, means for establishing relative pivotal movement between said back plate and said cover plate including a thumb screw extending through said back and cover plates and a shakeproof wing nut threaded on said thumb screw, and means on said connector for yieldingly compressing said springs during relative movement between said back plate and said cover plate upon the oscillatable movement of said handle to the left and to the right while maintaining the roller in engagement with areas of a paint-receiving surface thereby painting otherwise inaccessible areas from one position of the user.

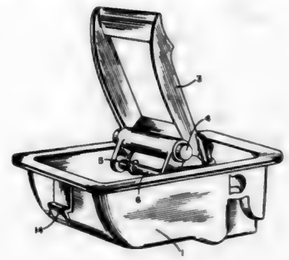
4,038,717
CASTER MOUNTING STRUCTURE
Chester K. Greathouse, Sharonville, Ohio, assignor to The Hamilton Caster & Mfg. Company, Hamilton, Ohio
Filed July 29, 1976, Ser. No. 709,948
Int. Cl.² B60B *33/00*
U.S. Cl. 16—29 **7 Claims**



1. The combination of a cart having a substantially horizontal lower panel and a caster assembly including a caster wheel, a substantially horizontal mounting plate, and means for supporting the mounting plate above the caster wheel with a mounting structure for the caster assembly which comprises mounting block means of viscoelastic rubber-like material mounted on opposed edge portions of the mounting plate, said mounting block means including upper flange means between an upper face of the mounting plate and the lower panel and lower flange means supporting a lower face of the mounting plate, and bracket means attached to the lower panel and including means underlying the lower flange means and holding the flange means in compression against the upper and lower faces of the mounting plate, whereby the caster wheel viscoelastically supports the cart.

4,038,718
DOOR HANDLES, NOTABLY FOR VEHICLES
André Jean Reilhac, and Robert Cherbourg, both of Billancourt, France, assignors to Regie Nationale des Usines Renault et Automobiles Peugeot, France
Filed Aug. 10, 1972, Ser. No. 279,292
Claims priority, application France, Aug. 12, 1971, 71.29591
Int. Cl.² A47G *27/04*
U.S. Cl. 16—110 R **4 Claims**

1. A single unit door handle assembly for snap fastening in the door of a motor vehicle comprising a casing with means adapted to snap said casing in the door panel structure, bearing means provided in said casing, an opening tongue mounted inside said casing with means to engage a control element



connected to the door latch, said tongue having integral trunnions for engaging in said bearing means.

4,038,719
HANDLE FOR TOOLS AND SPORTING EQUIPMENT
John F. Bennett, 600 Fondulac Drive, East Peoria, Ill. 61611
Continuation-in-part of Ser. No. 400,172, Sept. 24, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,201
Int. Cl.² B25G *1/10*
U.S. Cl. 16—110 R **3 Claims**



1. A handle for implements such as tools and sporting equipment adapted to be held by a hand and moved by at least a forearm of a user comprising a gripping portion, means adapted to connect said gripping portion to an elongated member so that when said gripping portion is held by said user said elongated member is intermediate said gripping portion and said implement, the longitudinal axis of said elongated member being substantially coaxial to the longitudinal axis of said implement whereby rotation of said longitudinal axis of said forearm of said user causes substantially coaxial rotation of said elongated member of said implement about said longitudinal axes, said elongated member is intermediate said gripping portion and said implement, and means being constructed arranged whereby said gripping portion is angularly disposed from said elongated member so that when placed in the hand of said user the longitudinal axis of said elongated member is substantially coaxial to the longitudinal axis of said forearm of said user, and wherein said gripping portion has a substantially oval cross-section, said oval cross-section decreasing in circumference as the distance from said connecting means increases, and said substantially oval cross-section has substantially flattened end surfaces traverse to the long axis of the oval.

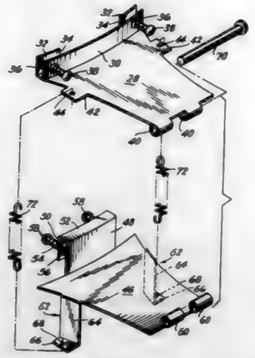
4,038,720
GARBAGE CAN COVER SPRING CLOSURE
Laszlo Fulop, 139-06 253rd St., Rosedale, N.Y. 11422
Filed Apr. 1, 1976, Ser. No. 672,646
Int. Cl.² E05D *11/10*
U.S. Cl. 16—145 **11 Claims**

1. An attachment for securing a garbage can cover having a peripheral lip portion to a garbage can having an open end, a basewall in opposition to the open end and a sidewall, said attachment comprising:
a. a first, elongated plate including means at one end thereof for gripping the peripheral lip portion of the garbage can cover;
b. a second elongaged plate including means at one end

thereof for gripping an edge portion of the sidewall of the garbage can proximate the open end thereof;

c. hinge means for coupling the opposite end of said first and second plates to each other; and

d. at least one elongated spring coupled to said first and second plates for selectively urging said garbage can cover to a first, closed position overlaying the open end of the garbage can whereby said first and said second plates overlay each other and are in planes that are substantially perpendicular to the axis of the garbage can with the axis



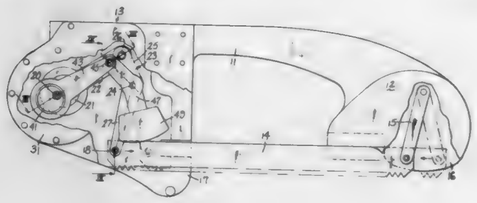
of said spring being substantially perpendicular to the planes of said first and said second plates, said spring being adapted to selectively urge said garbage can cover to a second, open position, whereby the garbage can cover is positioned next to the sidewall of the garbage can, said spring being stretched when said first plate moves from said first position to a plane that is coincidental with the plane of said second plate, said spring normally contracting when said first plate moves from the plane coincidental with said second plate to said second position.

4,038,721

RECIPROCATING BLADE SAW

Leo J. Kendzior, Meriden, Conn., assignor to Jarvis Products Corporation, Middletown, Conn.

Filed Jan. 28, 1976, Ser. No. 652,986
Int. Cl.[2] A22B *5/20*; B27B *19/04*
U.S. Cl. 17—23 **4 Claims**



1. A reciprocating blade saw comprising an eccentric mounted on a drive shaft, means for driving said shaft, a bell crank on a second shaft, a pitman connecting the eccentric to one arm of the bell crank, a saw blade connected to the other end of the bell crank and supported for substantially linear reciprocation upon rocking of the bell crank, constituting the saw drive train, and counterbalancing means including at least one additional eccentric mounted on the drive shaft closely adjacent the first eccentric and oriented angularly 180° therefrom, at least one lever pivoted intermediate its ends on the second shaft, a second pitman connecting the additional eccentric to one end of the lever, and a mass carried by the other end of said lever, the sizes and location of the counterbalancing means being calculated to substantially counterbalance the centrifugal and inertial forces developed by operation of the saw drive train.

4,038,722

METHOD FOR PROCESSING EUPHAUSIA SUPERBA

Tsuneo Terase; Ryuzo Onishi, both of Tokyo, and Haruo Akazawa, Fuchu, all of Japan, assignors to Nichiro Gyogyo Kaisha Ltd., Tokyo; Taihei Shiryo Kaisha, Ltd.; Nippon Sanso K.K., Tokyo and Sintokogio, Ltd., all of, Japan

Filed Mar. 1, 1976, Ser. No. 662,722
Claims priority, application Japan, Mar. 14, 1975, 50-30181
Int. Cl.[2] A22C *29/00*
U.S. Cl. 17—48 **7 Claims**

1. A method for processing the animal plankton *Euphausia superba* to an edible food form acceptable for human consumption comprising the steps of:

applying force to a mass of raw unfrozen bodies of *Euphausia superba* in such a way as to substantially remove internal organs, especially the liver, from each body of the plankton but to leave the meat portion retained in the shell;

heating the mass of said bodies after removal of internal organs, in water at such a temperature as to substantially thermally coagulate protein of the meat portion of the plankton;

removing a liquid material contained in a gap formed between the shell and the thermally shrunk meat portion;

freezing the mass of the said bodies so treated in such a condition that the bodies are free of each other; and

projecting pellets against the frozen bodies held at a low temperature for keeping each body brittle, thereby to crush and remove the shell, exposed gill portion, eyes, feelers and legs from the remaining meat portion of the body,

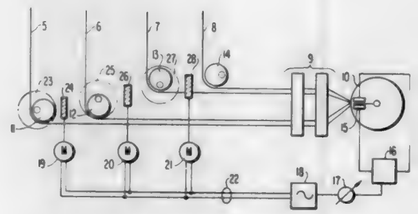
whereby a mass of the meat portions may be isolated undamaged.

4,038,723

METHOD OF AND AN ARRANGEMENT FOR STANDARDIZING COMBER SLIVERS

Ernst Felix, Uster, Switzerland, assignor to Zellweger, Ltd., Switzerland

Filed Jan. 28, 1975, Ser. No. 544,684
Claims priority, application Switzerland, Feb. 28, 1974, 2868/74
Int. Cl.[2] D01G *19/00*; D01H *5/38*
U.S. Cl. 19—215 **7 Claims**



1. Apparatus for reducing the periodicity of a complete sliver formed by combining a plurality of combing machine slivers, each of said combing machine slivers exhibiting a periodicity, said apparatus comprising

means for combining a plurality of combing machine slivers to form a complete sliver,

measuring means for measuring the magnitude and phase position of the density variations in said complete sliver, and

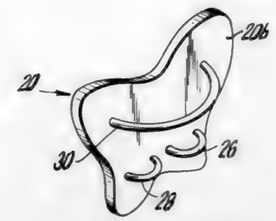
adjusting means responsive to said measuring means for simultaneously and continuously varying the phase positions of the respective combing machine slivers at respectively different rates until the combing periods of the respective combing slivers approximately compensate one another.

4,038,724

SCARF RETAINER AND PENDANT

Jaro Parizek, 1 Holiday Park Drive, Williston Park, Long Island, N.Y. 11596

Filed Sept. 3, 1976, Ser. No. 720,436
Int. Cl.[2] A41D *25/04*
U.S. Cl. 24—49 S **4 Claims**



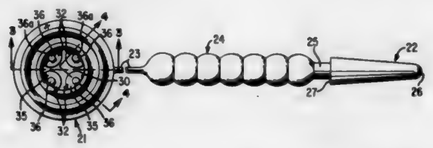
1. A friction grip pendant for retaining the corners of a scarf positioned about a wearer's neck in separated flaired relationship comprising the combination of a planar base plate having front and rear sides and top and bottom ends, a plurality of wire segments, the segments being fixedly mounted in spaced relationship, one to another, to the rear side of the base plate at right angles thereto, each segment when mounted to the base plate forming, respectively, a closed loop, the segments being mounted to form two parallel juxtaposed loops adjacent to the bottom end of the base plate, at least one segment being mounted to form a closed loop adjacent to the top end of the base plate, whereby the pendant may be frictionally suspended and the scarf ends retained in spaced apart flaired positions by passing the scarf corners through the upper, then separately, through the bottom parallel adjacent loops whereupon the scarf may be retained by the bottom loops when the scarf ends are pulled respectively into separated flaired positions.

4,038,725

FASTENER AND METHOD OF USING SAME

Jack D. Keefe, Dayton, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 560,433, March 20, 1975, Pat. No. 3,973,229. This application Apr. 5, 1976, Ser. No. 673,771
Int. Cl.[2] B65D *63/16*
U.S. Cl. 24—150 FP **10 Claims**



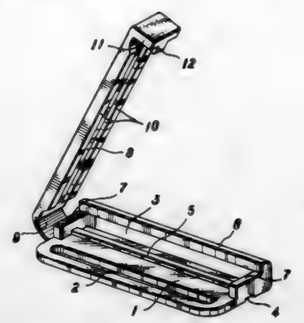
1. A one-piece fastener composed of molded, polymeric, plastics material, the fastener comprising: a head, a pair of relatively rigid sockets, a flexible hinge connecting the sockets to each other, and a flexible filament connecting the head and the pair of sockets, each socket having an opening, the sockets being movable from a position in which the openings are out of alignment to a position wherein the socket openings are generally aligned, the head being insertable through both socket openings while the sockets are generally aligned.

4,038,726

PLASTIC ADJUSTER FOR A BELT

Teruo Takabayashi, Kyoto, Japan, assignor to Kohshoh Limited, Kyoto, Japan

Filed Mar. 4, 1976, Ser. No. 663,804
Claims priority, application Japan, July 1, 1975, 50-92546
Int. Cl.[2] A44B *11/06, 11/20*
U.S. Cl. 24—198 **1 Claim**



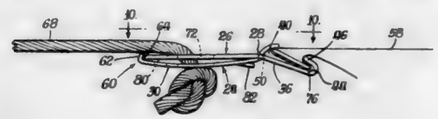
1. A plastic adjuster for adjusting the length of a belt or the like comprising an elongated generally flat plate member (1) and a cover plate (8) which are integrally formed, the plate member having a pair of elongated side edges and a pair of transversely extending end edges and an elongated slot (2) adjacent one of the side edges and extending parallel thereto, a guide projection (7) extending upwardly from the plate member adjacent each of the end edges thereof and extending perpendicularly to the slot, and a bar (6) extending across the guide projections above the plane of the plate and adjacent the other side edge of the plate member to form a second slot (3) between the bar and the plate member which extends parallel to the first slot, said first slot (2) being adapted to receive a looped end portion of the belt and said second slot (3) being constructed and arranged to permit the belt to pass through the slot in a direction generally parallel to the flat plate member, at least one longitudinally extending clamping means (5) on the plate member extending between the guide projections for clamping the belt against the cover plate, and locking means provided on one end of the plate member, the cover plate being connected to the other end of the plate member by a bendable portion, the cover plate including locking means engageable with the locking means on the plate member, the cover plate extending parallel to and adjacent said bar (6) when the two locking means are engaged, and at least one longitudinally extending clamping means (10) for clamping the belt against the plate member, the clamping means of the plate member and the cover plate being offset relative to each other.

4,038,727

OPENABLE AND CLOSEABLE SELF-TIGHTENING CLIP

F. Peter Robbins, Box 332, Northfield, Ill. 60093

Filed Aug. 16, 1976, Ser. No. 714,579
Int. Cl.[2] A44B *21/00*
U.S. Cl. 24—248 C **10 Claims**



1. An openable and closeable self-tightening clip for flexible sheeting material comprising two plier-like lever members connected by a pivotal joint;

each of said lever members having handle and jaw portions

respectively rearwardly and forwardly of said pivotal joint;

said jaw portions enclosing a hook-like space within them and terminating in elongated lips defining between them a slot-like gap extending generally parallel to the axis of said pivotal joint and providing access to said hook-like space;

said lever members being relatively movable between opened and closed positions in which said gap is respectively enlarged and reduced;

an elongated core member adapted to have sheeting material wrapped around it and to be set into the hook-like space within said jaw portions through said slot-like gap when said lever members are in said opened position, said core member and said hook-like space having non-circular cross-sections preventing rotation of said core member under tension applied to said sheeting material and thereby torque-locking said core member and sheeting material within said space, said sheeting material extending through said gap out of said clip from between one of said jaw portions and one edge of said core member seated thereon;

said sheeting material being compressed between said jaw portions and said core member when said lever members are in said closed position so that, when tension is applied to said sheeting material, an edge of said core member opposite said one edge and said sheeting material wrapped around it are pulled against the other of said jaw portions to retain said sheeting material in a self-tightening manner; and,

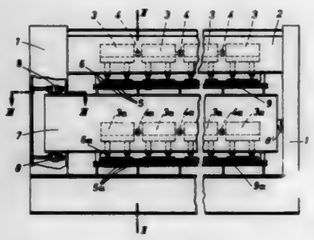
detent means between the rearward ends of said lever member handle portions releasable locking said lever members in said closed position.

4,038,728

NEEDLING MACHINE FOR MANUFACTURING ENDLESS FIBROUS WEBS

Ernst Fehrer, Auf der Gugl 28, Linz, Austria

Continuation-in-part of Ser. No. 661,745, Feb. 26, 1976, abandoned. This application Oct. 22, 1976, Ser. No. 735,015
Claims priority, application Austria, Apr. 3, 1975, 2543/75
Int. Cl.² D04H *18/00*
U.S. Cl. 28—110 **4 Claims**



1. A needling machine for manufacturing endless fibrous webs, comprising

a. a machine frame,

b. a perforated table pivoted on a vertical axis to the machine frame on one side thereof,

c. an upper set of juxtaposed, closely spaced needling units arranged over the table in a transverse row,

d. a perforated stripper disposed between said upper set of needling units and said table,

e. a lower set of juxtaposed, closely spaced needling units secured to said table and arranged on the underside thereof in a transverse row,

f. each of said rows of needling units of said upper and lower sets having the same length defining the working width of the machine, and

g. drive means for operating said needling units of each of said upper and lower sets in unison, said drive means comprising flexible couplings between adjacent needling units in each set,

1. each of said needling units being provided on the underside with needles and operable by said drive means to move said needles up an down,

2. said needles of said upper set of needling units being operable to penetrate through said stripper and from the outside through a fibrous web which lies on said table and extends across said row of needling units of said upper set, and

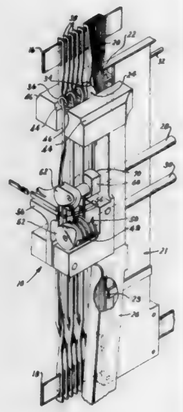
3. said needles of said lower set of needling units being operable to penetrate from the inside through said fibrous web when the same extends around one end of said table and on the underside thereof and across said row of the needling units of said lower set toward the opposite end of said table.

4,038,729

HEDDLE SELECTING AND POSITIONING APPARATUS

Franklin L. Townsend, Rockford, Ill., assignor to Barber-Colman Company, Rockford, Ill.

Filed Oct. 4, 1976, Ser. No. 729,361
Int. Cl.² D03J *1/14*
U.S. Cl. 28—206 **19 Claims**



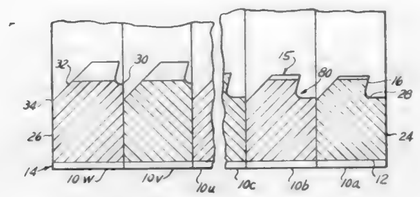
1. In a warp drawing-in frame, a duplex heddle selecting and positioning apparatus for retaining in compression against a backer mechanism a plurality of front and rear duplex heddles supported in overlapping alternate arrangement, for alternately releasing front and rear heddles, and for positioning the released heddles for drawing-in of warp strands, said apparatus comprising: a heddle releasing means having a surface for engaging the leading one of said compressed front and rear heddles, thereby retaining said heddles in compression, said surface movable to release the leading one of said front and rear duplex heddles while retaining the remaining front and rear heddles in compression.

4,038,730

POT BROACH RINGS

Richard W. Tersch, Grosse Pointe Woods, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.

Continuation-in-part of Ser. No. 262,289, June 13, 1972, which is a continuation of Ser. No. 85,508, Oct. 30, 1970, abandoned, which is a division of Ser. No. 851,208, Aug. 19, 1969, Pat. No. 3,553,909. This application Feb. 3, 1976, Ser. No. 654,928
Int. Cl.² B23P *15/42*
U.S. Cl. 29—95.1 **2 Claims**



1. A broach comprising a series of rings,

radially inwardly extending teeth at the interior of said rings,

said rings having flat front and rear sides adapted to abut in assembly,

said rings having identically dimensioned exterior cylindrical surfaces provided with key-receiving recesses for receiving an aligning key,

the front faces of all of said rings having concave annular surfaces of substantially identical radial width extending radially outwardly and rearwardly from the interior diameter thereof and curved forwardly to intersect the flat front sides thereof to define a front circle, to provide positive cutting rake and to form smoothly curved chip guiding gullets.

the crests of the teeth of successive rings having uniformly decreasing radial spacing from the axes thereof from front to rear of the series of rings to provide for cutting tooth spaces in a work piece to a predetermined depth determined by the difference in radial spacing of the tooth crests between the leading and trailing rings of said series,

the concave surfaces at the front of said rings having corresponding uniformly decreasing radial spacing from the axes thereof from front to rear to define front circles of decreasing radius from front to rear,

all of said rings having identical inclined back slopes forming a continuous annular surface of revolution extending from the inside diameter of said rings intersecting the flat rear surface thereof to define therewith back circles, the diameter of said back circles on all of said rings being at least as great as the diameter of the front circle at the front of the leading ring of said series.

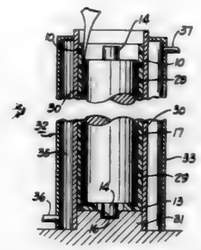
4,038,731

FORMING INTEGRATED ROLLER FROM CORE, TELESCOPING SLEEVE AND FILLER ADHESIVE

Edward D. Hill, 3140 W. 32nd St., Cleveland, Ohio 44109

Filed June 19, 1975, Ser. No. 588,384
Int. Cl.² B21B *27/00*
U.S. Cl. 29—132 **16 Claims**

1. In combination: an elastomeric sleeve member expandable in an outward radial direction and a core member, said sleeve member telescopically receiving the core member and defining therebetween a casting area to receive liquid, dual, concentric tubular adhesive coats that are settable, one of said sleeve and core members having axially extending grooves on a side facing the other member to facilitate substantially even distribution of said liquid adhesive coats between it and said other member, said sleeve member and at least the outer of said tubular adhesive coats, when set, having densities so marginally close that upon receipt and setting of said adhesive coats, the sleeve member, set coats, and core member define integrated roller means of substantially uniformly distributed balance and weight and adapted to avoid thumping in use.

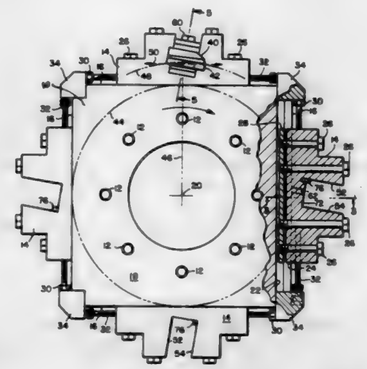


4,038,732

VERSATILE CUTTING TOOL FOR GEAR MANUFACTURE

Ernst J. Hunkeler, Fairport, N.Y., assignor to The Gleason Works, Rochester, N.Y.

Filed Sept. 15, 1976, Ser. No. 723,424
Int. Cl.² B26D *1/12*
U.S. Cl. 29—105 A **12 Claims**



1. In a rotatable face mill tool for cutting gear teeth and the like, including a body portion having a center of rotation and a plurality of blade-holders adjustably mounted on said body each adapted to receive and hold the shank of a respective cutting blade in a predetermined orientation relative to said body so that the cutting edges of the blades project axially from a front face of the body, the improvement comprising:

a plurality of mounting means

each positioned relative to one of a respective plurality of straight lines which, when extended, form an equilateral convex polygon about the center of rotation of the body,

said mounting means each being adapted to support a respective one of said blade-holders in at least one orientation in which the blade holder can be adjusted along a linear path parallel to a respective one of said straight lines; and

each said blade holder including adjustment means and being adapted to hold its respective blade with a cutting edge offset from the radial line of the body passing through the point of tangency between its respective straight line and an imaginary circle inscribed within said equilateral convex polygon so that

adjustment of the blade holder in one direction along its respective linear path increases the radial distance be-

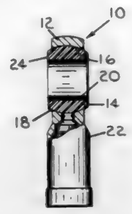
tween the balde's cutting edge and the center of rotation of said body and
adjustment of the blade holder in the opposite direction decreases said radial distance.

4,038,733

METHOD OF MANUFACTURING A SELF-ALIGNING BEARING WITH A DEFORMABLE INNER MEMBER

Albert R. McCloskey, Fairfield, Conn., assignor to Heim Universal Corporation, Fairfield, Conn.

Filed May 6, 1975, Ser. No. 574,859
Int. Cl.[2] B21D *53/10*
U.S. Cl. 29—149.5 B **3 Claims**



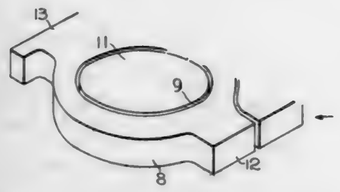
1. A method of manufacturing a self-aligning bearing comprising the steps of preforming an outer member having a spherical concave inner surface, preforming an inner member having a convex spherical outer surface generally complememtary to said concave inner surface, and providing said inner member with an opening therethrough, said opening being in the form of an outwardly divergent conical depression formed at each end of said inner member, said inner member being a deformable plastic member, deforming said plastic member inwardly such that the diameter of the convex outer surface of said inner member is reduced dimensionally, inserting said inner member within said outer member, releasing said inner member such that it regains its original dimension whereby it is operatively supported within said outer member at said outer member's concave inner surface.

4,038,734

METHOD OF MANUFACTURING A BUTTERFLY VALVE

Holliday L. Goldman, Red Lion, Pa., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed July 12, 1976, Ser. No. 704,641
Int. Cl.[2] B23P *15/00*; B21D *53/00*; F16K *1/22*
U.S. Cl. 29—157.1 R **2 Claims**



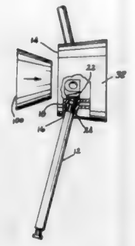
1. The method of manufacturing a butterfly valve from solid plate steel comprising the steps of:
a. flame cutting a valve body of the desired outside configuration from the steel plate;
b. flame cutting a closure disc member from the center portion of the valve body thereby providing an opening through the valve body of the desired size to permit fluid flow therethrough;
c. providing a pair of aligned shaft openings in said valve body member transverse to said fluid opening;
d. locating said valve disc within said fluid opening through said valve body member;
e. pivotally mounting a shaft means in said shaft opening:
f. rigidly attaching said shaft means to said valve disc member;
g. attaching an annular seal to one of said members whereby said seal closes the annular space between said members when the disc member is in a closed position; and
h. providing a plurality of circumferentially spaced mounting holes in said body member about said fluid opening.

4,038,735

METHOD OF FABRICATING STEERING WHEEL

Donald Allen Dekker, Grand Rapids, Mich., assignor to Attwood Corporation, Lowell, Mich.

Division of Ser. No. 625,895, Oct. 28, 1975. This application Oct. 4, 1976, Ser. No. 729,030
Int. Cl.[2] B21D *53/26*
U.S. Cl. 29—159 B **5 Claims**



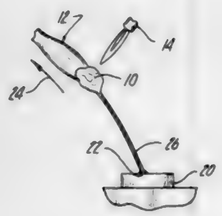
1. A method of fabricating a steering wheel comprising:
forming a central hub having a plurality of radial openings connecting to a central axial opening;
inserting a plurality of elongated radial spokes into the openings, the spokes having rim coupling means and hub coupling means;
forming a steering rim around the periphery of the spokes;
radially positioning the spokes to form the rim into a desired shape; and
staking the spokes at the central hub to prevent radial movement, by deforming a more easily deformed portion of the central hub so the portion extends into the radial openings and secures the radial spokes against radial movement.

4,038,736

METHOD OF MANUFACTURING JEWELRY COMPONENTS

Reginald P. Horky, 1729 Arizona Ave., Flint, Mich. 48506

Filed May 27, 1976, Ser. No. 690,663
Int. Cl.[2] B23P *13/00*
U.S. Cl. 29—160.6 **5 Claims**



1. A method of manufacturing elongated jewelry components having a solid cross section from metal comprising the steps of:
mounting a portion of the metal on a pick,

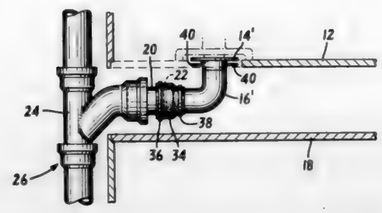
heating said metal portion on said pick until said metal portion is molten,
contacting a portion of said metal portion to a cool base whereby said metal portion hardens and bonds with said base at the point of contact, and
moving said pick away from said base while simultaneously heating and maintaining the metal portion remaining on said pick in a molten state.

4,038,737

METHOD OF REPLACING PLUMBING

John Bretone, Jr., 91 Woodview Road, West Hempstead, N.Y. 11552

Filed Sept. 5, 1975, Ser. No. 610,863
Int. Cl.[2] B22D *19/10*; B23P *7/00*
U.S. Cl. 29—401 F **6 Claims**



1. A method of replacing a discharge pipe which extends from a toilet to a ferrule structure projecting from a section of a sewage system, the method comprising:
obtaining access to the space for the discharge pipe at the ferrule structure by removing the toilet and a portion of a floor therebeneath;
forming the ferrule structure with a bead about the end which projects from the section of the sewage system by separating the discharge pipe to be replaced from the ferrule structure at a wiped solder joint between the ferrule structure and the discharge pipe, leaving the bead formed by the solder on the ferrule structure;
positioning a new discharge pipe with one end adjacent the ferrule structure and the other end positioned for connection to the toilet;
attaching a flange to the other end of the discharge pipe for connecting and sealing the discharge pipe to the toilet;
placing a compressible sleeve over the adjacent ends of the discharge pipe and ferrule structure; and
compressing portions of the sleeve about the discharge pipe and ferrule structure with clamps for sealing the sleeve to the discharge pipe and ferrule structure.

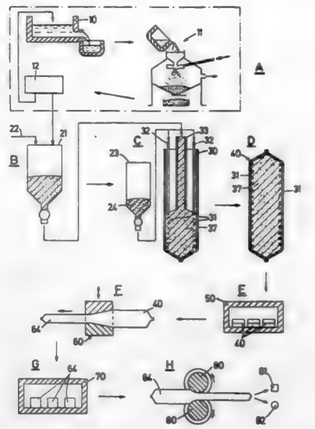
4,038,738

METHOD AND MEANS FOR THE PRODUCTION OF BAR STOCK FROM METAL POWDER

Hellmut Fischmeister, Molndal; Väino Lampe, Hagfors, and Leif Olsson, Goteborg, all of Sweden, assignors to Uddeholms Aktiebolag, Hagfors, Sweden

Filed Jan. 10, 1975, Ser. No. 539,996
Int. Cl.[2] B22F *3/24*
U.S. Cl. 29—420.5 **13 Claims**

1. A method for producing from a powder of alloys based on iron, nickel or cobalt bar stock having low porosity and good particle bonding, comprising the sequential steps of providing along the inner side only a hollow capsule an oxygen-affinitive reducing material having the ability to bind oxygen to itself more firmly than has the metal which is the predominant constituent of the powder particles, filling the capsule with the powder and an oxygen carrier to constitute a powder mass in the capsule, hermetically sealing the capsule and compacting the powder mass in the capsule by progressive forging of the capsule at a temperature in the range of 900°–1200° C, whereby a blank is formed and the oxygen carrier combines with oxygen in the powder mass to form a gas which is transported towards the inner side of the capsule and reacts there with the



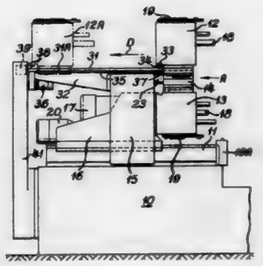
oxygen-affinitive material and removing the capsule from the blank.

4,038,739

MACHINE TOOLS HAVING INTERCHANGEABLE TOOL CARRYING UNITS

Antonin Nohejl, Surbiton, England, assignor to The Mollart Engineering Company, Limited, Surbiton, England

Filed Dec. 1, 1975, Ser. No. 636,716
Claims priority, application United Kingdom, Dec. 4, 1974, 52482/74
Int. Cl.[2] B23Q *3/157*
U.S. Cl. 29—568 **10 Claims**



1. A machine tool having means for interchanging tool carrying units, said machine tool comprising:
at least two tool carrying units;
a guideway having means for slidably supporting said tool units;
a substantially horizontal slideway;
a pivot member adjacent one end of said guideway, said tool carrying units being mounted about said pivot member; at least two means on said pivot member for slidably interconnecting said tool carrying units thereto;
means for rotating said pivot member about an axis parallel to said slideway for angularly moving said tool carrying units about said axis from an inoperative position where one of said means on said pivot member is aligned with said guideway to an operative position above said slideway or vice versa;
a movable structure slidably mounted on said slideway;
means for moving said movable structure along said slideway to engage the tool carrying unit in said operative

position and to move said interconnected movable structure and tool carrying unit along slideway in a direction parallel to said axis to detach said tool carrying unit from said pivot member and to move said unit to a working position;

drive means on said movable structure for driving the tools on said units in said working position for performing a machining operation; and

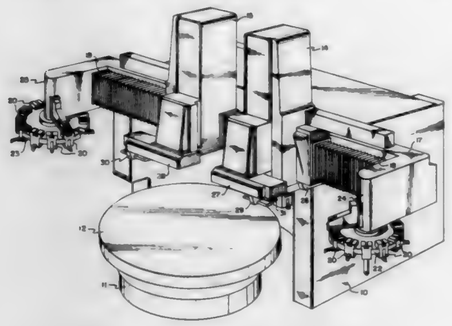
means for selectively moving the tool carrying units along said guideway from a storage position to said inoperative position on said pivot member and vice versa.

4,038,740

VERTICAL LATHE WITH AUTOMATIC TOOL CHANGE FACILITY

Claude M. Grinage, Stratford, Conn., assignor to The Bullard Company, Bridgeport, Conn.

Filed Sept. 16, 1974, Ser. No. 506,584
Int. Cl.² B23Q *3/155*
U.S. Cl. 29—568 **19 Claims**



1. A machine tool having a tool mounting element and tool transport and loading means, which comprises

a. tool clamping means associated with said tool mounting element having tool guide means having lateral sliding engagement with tool elements,

b. tool transport means movable to present a new tool at a loading position adjacent the tool mounting element,

c. a laterally movable tool loader having an element movable in a direction generally at right angles to the direction of said laterally movable tool loader, and having tool engaging members for simultaneously engaging a tool in said tool clamping means and a tool in said transport means, and d. means for effecting lateral movement of said loader with a pair of engaged tools, simultaneously to slide the used tool laterally out of engagement with the clamping means and to slide a new tool laterally into engagement with said clamping means,

e. the tool engaging member engaged with said used tool being operative to support said used tool for movement away from said clamping means.

4,038,741

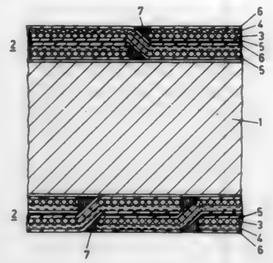
METHOD OF MAKING ELECTRICAL COILS FOR DYNAMO-ELECTRIC MACHINES HAVING BAND-FORMED INSULATION MATERIAL

Roland Schuler, Wettingen, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Division of Ser. No. 467,836, May 7, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,801
Claims priority, application Switzerland, May 17, 1973, 6962
Int. Cl.² H02K *15/04*; H01F *41/12*
U.S. Cl. 29—596 **6 Claims**

1. The method of producing an electrical coil for installation in an electrical machine and wherein each turn of the coil is formed by a group of pre-insulated conductors which comprises the steps of:

winding a composite insulating tape onto a bare conductor so as to completely cover the surface of the conductor, said composite tape including an inner layer of insulating material containing mica and facing layers of a polycarbonate foil secured to opposite sides thereof by an epoxy resin which impregnates the inner layer.



shaping and grouping conductors so pre-insulated into the form required for subsequent installation in the electrical machine, and

subjecting the grouped and shaped pre-insulated conductors to heat and pressure thereby to cure the impregnating resin and glue the pre-insulated conductors together.

4,038,742

METHOD OF MAKING STYROFOAM SLOTTED PLANE-ARRAY ANTENNA

John K. Kimball, Pepperell, and Troy E. Plunk, Bedford, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 15, 1976, Ser. No. 723,352
Int. Cl.² H01P *11/00*; H01Q *13/00*
U.S. Cl. 29—600 **1 Claim**



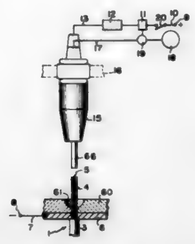
1. A fabricating process for an antenna comprising the steps of providing a plurality of styrofoam sections, machining these sections to identical predetermined shapes; drilling an alignment hole in the center of each section; drilling two columns of holes on either side of said alignment hole in each section; copper plating, including all holes, each section; providing a conductive epoxy; bonding the sections together in a side by side fashion with the epoxy; placing alignment pins in the alignment holes for holding the sections in place during milling; milling a plurality of slots through the copper plating of each section; machining the ends of the bonded sections to a predetermined shape; and replating the ends.

4,038,743

TERMINATING AND SPLICING ELECTRICAL CONDUCTORS

Gideon A. DuRocher, and Ellsworth S. Miller, both of Mount Clemens, Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 254,530, May 18, 1972, Pat. No. 3,826,000. This application Oct. 24, 1972, Ser. No. 299,752
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **13 Claims**



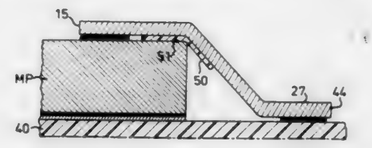
1. A method of joining adjacent ends of a pair of metallic, electrical conductors comprising supporting said conductors with adjacent ends thereof in vertically spaced, confronting relation; heating the confronting ends of said conductors to a temperature at which the ends of said conductors become molten; collecting the molten metal of the lowermost conductor in a well of such size as to form an enlarged molten mass at the end of said lowermost conductor; continuing the heating of the end of at least the uppermost conductor for a period of time such that the combined forces of gravity and surface tension shape the molten metal into an enlarged, pear-shaped molten mass suspended from said uppermost conductor while maintaining the end of the lowermost conductor molten; relatively moving said conductors toward one another a distance sufficient to engage said molten mass of the uppermost conductor with the molten metal of said lowermost conductor to form a molten nodule; and solidifying the molten nodule.

4,038,744

METHODS OF MANUFACTURING CARRIER SUPPORTS FOR INTEGRATED CHIPS AND MOUNTING OF INTEGRATED CIRCUIT CHIPS TO A SUBSTRATE

Jean Marie Cheype, Gagny; Patrick Courant, Paris, and Karel Kurzweil, Eaubonne, all of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 27, 1976, Ser. No. 680,749
Claims priority, application France, May 13, 1975, 75.14872
Int. Cl.² H01R *9/00*
U.S. Cl. 29—630 A **13 Claims**



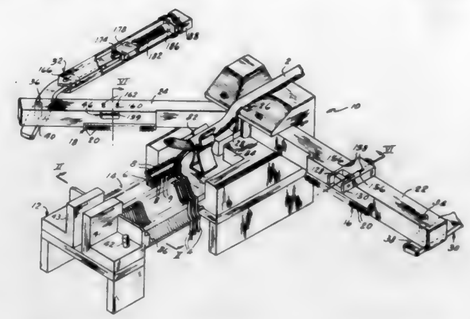
1. A method of fabricating a carrier support for integrated circuit chips to be mounted subsequently on a substrate, comprises coating a flexible strip of an inextensible insulating material having equidistant openings in the center of each of which a chip is to be mounted and a conductive film on one of the faces of the strip with a layer of photosensitive lacquer on the film, partly removing the said photosensitive layer to bare the film in selective regions, electrodepositing a layer of synthetic resin on the bared regions of the film, removing the remaining portions of the photosensitive lacquer and cutting away the said film to form in each opening interface conductors which overhang towards the center of the opening.

4,038,745

FIELD TERMINATION TOOL HAVING A REMOVABLE CONNECTOR MOUNTING MECHANISM AND AN INSERTION CONTROL MECHANISM

John P. Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed May 27, 1975, Ser. No. 580,577
Int. Cl.² H01R *43/04*
U.S. Cl. 29—749 **39 Claims**



1. Apparatus for terminating insulated conductors in spaced insulation-piercing contact portions supported on opposite sides of an electrical connector, comprising:

a frame;

support and alignment means removably mounted on said frame for supporting an electrical connector and aligning the electrical conductors adjacent respective insulation-piercing contact portions;

first and second insertion arms rotatably mounted on said frame for movement toward and away from respective sides of an electrical connector;

a plurality of insertion members carried by each of said insertion arms to engage and press respective insulated conductors into respective insulation-piercing contact portions; and

insertion control means carried by said insertion arms for providing a positive indication of completion of insertion, said insertion control means comprising means responsive to the application of a predetermined torque to an insertion arm to generate a signal indicative of such torque.

4,038,746

OPENER FOR A COIN PACKAGE

Meryl L. Bromley, R.R. 5, Meadowbrook, Dowagiac, Mich. 49047

Filed Dec. 24, 1975, Ser. No. 644,103
Int. Cl.² B26B *27/00*
U.S. Cl. 30—2 **6 Claims**

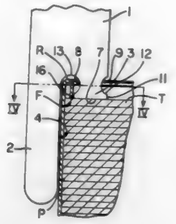
1. In an opening device for a coin package, said package having an end closure portion and an axially extending turned-over rim retaining said end closure portion, the combination comprising:

a manually graspable handle terminating in a rigid plate-like portion divided into only two prongs;

the first said prong extending in one direction from said handle;

the second said prong extending from said handle in the same said direction and flanked at one side thereof by said first prong and spaced therefrom by a gap, the second prong having a free end locatable adjacent the end closure piece of said package in response to straddling of the rim of said package by said prongs, said first prong being several times longer than said second prong, said first

prong having a linear inside edge facing toward said second prong and protruding several second prong lengths beyond said second prong, so as to lie snugly in axially extended contact with the coin package periphery, the inside edge of said second prong having a portion extending toward said first prong;



rim releasing means projecting from said second prong adjacent said free end thereof in a direction away from the first prong and responsive to twisting of said handle for pushing the opposed part of said rim out of its normal retaining position.

4,038,747

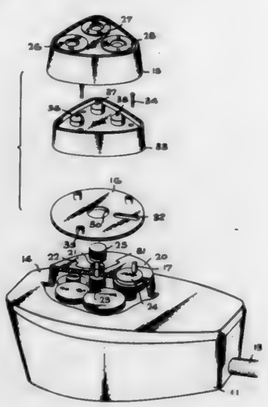
ELECTRIC RAZOR HAVING AN OSCILLATING CUTTING HEAD

Douglas J. Upton, 18740 Devonshire, Northridge, Calif. 91324

Division of Ser. No. 401,163, Sept. 27, 1973, Pat. No. 3,921,270. This application Nov. 19, 1975, Ser. No. 633,471

Int. Cl.² B26B *19/26, 19/42*

U.S. Cl. 30—34.2 **4 Claims**



1. In a shaving apparatus including a housing

for enclosing a motor means, a cutting means assembly adapted to engage and cut hair bristles or shafts and gear means operably interconnecting said motor means to said cutting means, the improvement which comprises:

means movably supporting said cutting assembly means on said housing so that said cutting means assembly moves as a unit in a predetermined path with respect to said housing;

means operably mounted on said cutting means for engaging with the skin of the user to stretch the skin in the area of the bristles being cut;

said skin stretching means comprises:

an endless rotatable coil encircling said cutting means and operably carried on said cutting means assembly so that portions of said coil rotate in opposite directions separated by said cutting means.

4,038,748

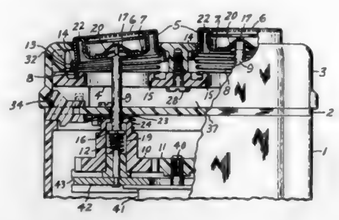
ROTARY DRY SHAVER WITH TILTABLE SHEAR PLATES

Tracy B. Tyler, 7936 Byron Ave., Miami Beach, Fla. 33141

Filed Mar. 27, 1972, Ser. No. 238,426

Int. Cl.² B26B *19/14*

U.S. Cl. 30—43.6 **4 Claims**



1. In a rotary dry shaver, a component housing, a universally tiltable cutting element comprising a flanged apertured shear plate exposedly retained in the housing under an apertured frame, a rotary cutting member cooperative with the shear plate and coactively tiltable therewith, a driving shaft for the cutting member, means tiltably connecting the driving shaft to the cutting member, means to bias the cutting member into contact with the shear plate, and the said cutting element tiltably supported in the axial direction by a coil spring surrounding said driving shaft and disposed against the flanged periphery of said shear plate, said spring being separate from the cutting member and its biasing means and the means tiltably connecting the driving shaft to the cutting member.

2. A dry shaver comprising a shaver housing including a shaving head having at least one opening therein, a shear plate disposed within said opening and adapted for universally tilting relative thereto, a cutting member disposed adjacent said opening beneath said shear plate and tiltable with the latter, and means disposed within said head beneath said shear plate and free of said cutting member for floatingly supporting the periphery of said plate for axial movement thereof relative to said opening, the periphery of said shear plate freely resting on said floatingly supporting means.

4,038,749

ELECTRIC DRY SHAVER

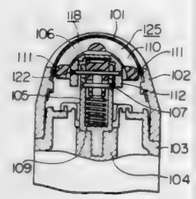
Norio Yamada; Masao Matsumoto; Tsutomu Adachi, all of Hikone; Hirozo Imai, Hirakata, and Masao Kubo, Hikone, all of Japan, assignors to Matsushita Electric Works Ltd., Osaka, Japan

Filed Jan. 23, 1976, Ser. No. 651,636

Claims priority, application Japan, Jan. 27, 1975, 50-11793

Int. Cl.² B26B *14/02*

U.S. Cl. 30—43.92 **7 Claims**



3. An electric dry shaver comprising, in combination, a shaver body, an outer shearing blade of semi-cylindrical shape mounted at the upper end of the body and defining a longitudinal axis having a vertical axis perpendicular thereto, an inner blade assembly including (a) a rectangular frame having a plurality of semi-annular blades spaced parallel to one another and (b) a yoke nested longitudinally in the frame and forming an integral unit therewith, the yoke having a central opening accessible from the underside, a drive coupling extending upwardly into the region enclosed by the central opening, a pivot pin bridging the central opening in the yoke and pivotally engaging the drive coupling, a drive shaft extending vertically in the shaver body, means including a motor for swinging the shaft back and forth in the direction of the longitudinal axis, the shaft having a telescoping connection with the drive coupling providing limited freedom of the drive coupling with respect to the drive shaft along the vertical axis and limited rotational freedom of the drive coupling with respect to the drive shaft about the vertical axis, a push-up spring interposed between the shaft and the drove coupling so that the inner blade assembly is resiliently pressed upwardly into engagement with the outer shearing blade, the pivot pin being perpendicular to the longitudinal axis and vertical axis and located substantially at the center of gravity of the inner blade assembly so that purely translational force is applied by the drive coupling to the blade assembly.

4,038,750

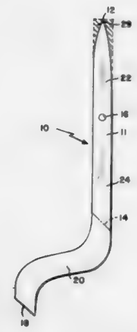
SCISSORS WITH HANDLE FORMED FROM SINUSOIDAL BLANK

Joseph F. Moran, Jr., 60 W. Winona Ave., Apt. C-6, Norwood, Pa. 19074

Continuation of Ser. No. 483,458, June 26, 1974, abandoned. This application June 19, 1975, Ser. No. 588,208

Int. Cl.² B26B *13/12*

U.S. Cl. 30—254 **2 Claims**



1. A scissors comprising a pair of scissor halves pivotally mounted together at a medial portion thereof, one of said scissor halves consisting of a one-piece strip of metal having a blade portion extending in one direction from said medial portion and a handle forming portion extending in the other direction of said medial portion, said blade portion being relatively flat and having a cutting edge formed thereon, said handle portion being formed into a hollow-cylinder adapted to receive a finger in the natural position and angle to the blade portion for applying a cutting force to the scissors, said handle forming portion being formed from a flat blank portion having a sinusoidal shape extending as a continuation of said medial portion is the direction of the longitudinal extent of said medial portion.

4,038,751

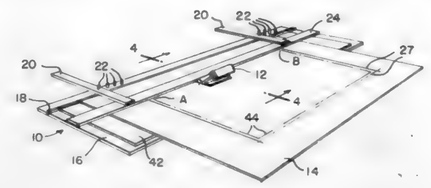
MAT CUTTING DEVICE

Alto O. Albright, 818 - 16th Ave. West, Kirkland, Wash. 98033

Continuation of Ser. No. 506,230, Sept. 16, 1974, abandoned, which is a continuation-in-part of Ser. No. 466,534, May 3, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 627,967

Int. Cl.² B26B *3/08;* **B26D** *5/00*

U.S. Cl. 30—293 **4 Claims**



1. Apparatus for cutting a flat article having a rectilinear edge comprising:

cutter means for making a cut in the article;

platform means for supporting the article, said platform means including rectilinear shoulder means upstanding therefrom for engaging and positioning the rectilinear edge of the article;

cutter guide means for guiding said cutter means along a rectilinear path; and

cutter guide positioning means extending in overlying relation with the article from the rectilinear edge thereof for selectively positioning said cutter guide means to guide said cutter means along a rectilinear path spaced from and substantially parallel to the rectilinear edge, when the article is supported and positioned by said platform means; said cutter guide positioning means including connecting means for adjustably connecting said cutter guide means with said platform means adjacent said shoulder means, to vary the distance between said rectilinear path and the rectilinear edge of the article in preselected increments, said connecting means comprising means forming a plurality of positioning holes and peg means upstanding from said platform means adjacent said shoulder means for engaging selected ones of said holes.

4,038,752

DENTAL ALLOYS

Robert Edward Phelps, 73 Chesterton Park, Gloucester; Robin Spill, 44 Kerrs Way, and Barry Edward Print, 78 Salisbury Street, both of Wiltshire, all of England

Continuation-in-part of Ser. No. 568,284, April 15, 1975, abandoned. This application Dec. 30, 1975, Ser. No. 645,318

Int. Cl.² A61C *13/00*

U.S. Cl. 32—2 **9 Claims**

1. A dental prosthesis of an alloy consisting essentially of:

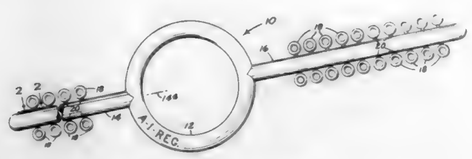
Constituent	% by weight of alloy
Carbon	up to 0.25
Chromium	10.0 to 25.0
Silicon	0.5 to 7.5
Manganese	0.1 to 1.5
Iron	up to 3.0
Boron	0.1 to 0.6
Copper	up to 3.0
Nickel	Balance

4,038,753

ORTHODONTIC APPARATUS INCLUDING UNITARY DISPENSER AND DISPENSED ARTICLES

Paul E. Klein, Lake Oswego, Oreg., assignor to Modcom, Inc., Clackamas, Oreg.

Continuation of Ser. No. 468,529, May 9, 1974, abandoned. This application Sept. 8, 1975, Ser. No. 611,017
Int. Cl.² A61C 7/00
U.S. Cl. 32—14 E **11 Claims**



1. Orthodontic apparatus comprising
a carrier portion including an annular ring fittable on a person's finger unitarily joined with an elongated prong which projects outwardly from a side of the ring, and
a plurality of intraoral orthodontic devices severably joined to and integral with said prong in said carrier portion,
said carrier portion and said devices being formed of an elastomeric material, and said carrier portion being configured to facilitate digital maneuvering of said apparatus to position a device joined to said prong adjacent an orthodontic appliance contained within a person's mouth.

4,038,754

ORTHODONTIC APPLIANCE GUARD

Maclay M. Armstrong, Seattle, Wash., assignor to Northwest Orthodontics, Inc., Seattle, Wash.

Filed Feb. 27, 1976, Ser. No. 661,973
Int. Cl.² A61C 7/00
U.S. Cl. 32—14 D **23 Claims**



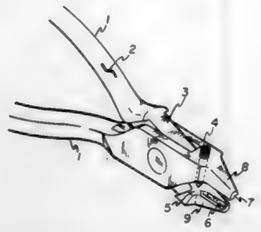
1. A guard for an intraoral orthodontic appliance including an arch wire having a rearwardly projecting end portion for insertion in a tubular socket of a tooth attachment, comprising guard means including a guard wire shank having a blunt end portion substantially larger than the rearwardly projecting arch wire end portion, and mounting means mounting said guard means on the arch wire with said guard wire shank extending alongside the rearwardly projecting arch wire end portion in generally parallel relationship to such arch wire end portion and spaced laterally therefrom a distance sufficient to receive a side of such tubular socket between said guard wire shank and such arch wire end portion, said guard wire shank blunt end portion extending rearwardly at least as far as the arch wire rearward end portion for shielding the rearwardly projecting arch wire end portion against jabbing by rearward movement of the arch wire.

4,038,755

INTRA-ORAL WIRE BENDING PLIERS

Joseph L. Hernandez, 1972 Hopi, Santa Fe, N. Mex. 87501

Filed Sept. 2, 1975, Ser. No. 609,524
Int. Cl.² A61C 7/00
U.S. Cl. 32—66 **2 Claims**



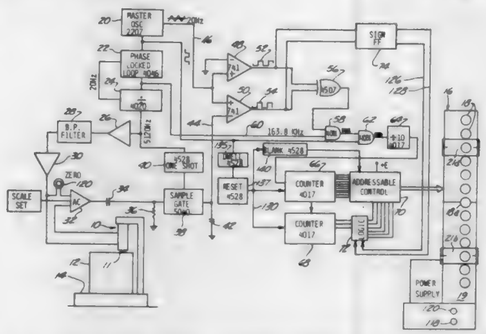
1. A set of two pliers for intra-oral wire bending, each of said pliers including:
a. a pair of handles secured at and movable around a pivot means,
b. a pair of jaws retained and movable by linkage members connected to and actuated by the movement of the handles so as to be movable in a parallel manner towards and away from each other, and
c. hardened work surfaces formed in both the lower and upper jaw of said pliers, said surfaces containing male and female bevel portions being contoured to about a 45° angle.

4,038,756

ELECTRONIC COLUMN GAGE

David L. Smith, Brighton, and Norman J. Scherr, Jr., Warren, both of Mich., assignors to The Valeron Corporation, Oak Park, Mich.

Filed Aug. 21, 1975, Ser. No. 606,444
Int. Cl.² G01B 7/02
U.S. Cl. 33—172 E **53 Claims**



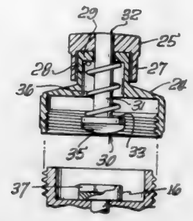
1. A sizing gage having a columnar display for indicating the measured sense and degree of part size deviation from a mean size comprising: probe means for measuring part size; display means including a plurality of individually excitable indicators; means exciting one of said indicators in response to measuring a part of said mean size and also including means exciting the indicators on opposite sides thereof in response to measuring increments of part size deviation of respectively opposite sense; said means including: first signal means for generating a first waveform the relative timing corresponding to a size reference; second signal means connected to said probe means for generating a second periodic waveform, said second signal including means varying the relative timing of said second waveform in accordance with measured size of said part; comparator means sensing the degree and sense of the timing difference of said first and second waveforms; third signal means responsive to said comparator means producing a digital count corresponding to said degree of relative timing difference between the first and second waveforms; fourth signal means responsive to said comparator means producing a signal corresponding to the sense of said relative timing difference; and addressable control means connecting the third and fourth signal means to the display means and responsive to the character of said count and sense to excite a particular one of said indicators.

4,038,757

EXTERNAL ADJUSTMENT KNOB FOR TELESCOPIC SIGHTS

Edward H. Hicks, Santa Barbara, and Charlene Lenhart, Whittier, both of Calif., assignors to Hicks Associates, Inc., El Toro, Calif.

Filed Nov. 8, 1976, Ser. No. 739,660
Int. Cl.² F41G 1/38; B25B 15/00; G02B 27/32, 23/10
U.S. Cl. 33—247 **10 Claims**



1. In a telescopic sight of the type having windage and elevation adjustment screws, which screws are surrounded by a support ring with holding means to permit the attachment of turret caps thereon, wherein the approvement comprises:
a cylindrical member having a first open end and a second end, said cylindrical member having holding means of an appropriate size to match the holding means on the support ring of the telescopic sight;
a knob affixed to the second end of said cylindrical member in a freely rotatable and co-axial position with respect thereto;
screwdriving means affixed to said knob and positioned along the central axis of said knob; and
biasing means between said screwdriving means and said cylindrical member, said biasing means urging said screwdriving means inwardly toward the open end of said cylindrical member.

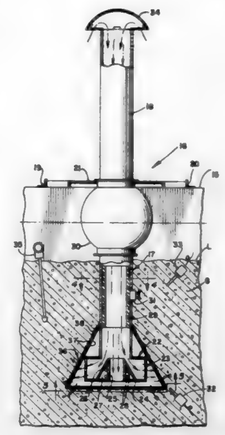
4,038,758

GRAIN DRYER

Russell A. Miller, 1412 W. Woodside Drive, Dunlap, Ill. 61525

Continuation-in-part of Ser. No. 618,004, Sept. 30, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 665,917
Int. Cl.² F26B 19/00
U.S. Cl. 34—48 **17 Claims**

1. In combination, a combine or the like for harvesting grain crops and having a grain storage bin thereon, and a grain dryer associated with the grain storage bin for drying the grain crops as they are harvested, said grain dryer supported on the bin and having an air discharge portion extending into the bin and an air intake portion external of the bin, heater means in the dryer in a position to heat air flowing through the dryer and discharged therefrom, and control means connected with the dryer to control both the flow of air therethrough and the temperature of the heated air discharged from the dryer, said air discharge portion normally being disposed below the surface and within grain stored or held in the bin, and comprising at its lower end an air discharge header having openings in the side thereof and openings in the bottom thereof, for flow of heated air both radially outwardly and axially downwardly into the grain, whereby heated air discharged from the discharge end of the dryer is circulated outwardly and upwardly through the grain in the bin to dry the grain.

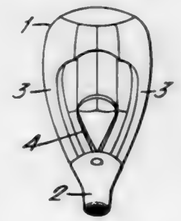


4,038,759

HAIRDRYER

Hugh Edric Trenchard Dyer, and John Richard Armstrong, both of Dorset, England, assignors to Firth Cleveland Limited, London, England

Filed Nov. 15, 1973, Ser. No. 416,160
Claims priority, application United Kingdom, Nov. 17, 1972, 53317/72
Int. Cl.² A45D 20/24
U.S. Cl. 34—99 **17 Claims**



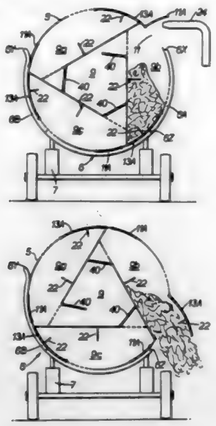
1. A hairdryer apparatus comprising:
a. a collapsible helmet having a head portion to be supported on the user's head, said head portion having a double skin section for inflation by drying air flow so as to help maintain the helmet erect;
b. an electric fan-heater unit;
c. a pair of tubes connecting the helmet head portion to the fan-heater unit to lead drying air flow from the fan-heater unit to the head portion, said pair of tubes being capable of supporting the fan-heater unit from the helmet head portion with the fan-heater unit in the region of the user's chest; and
d. means to discharge heated air emanating from the fan-heater unit to the head of the user.

4,038,760

CROP DRYING APPARATUS

John M. Monck, and Charles S. P. Monck, both of Aldern Bridge House, Newbury, Berkshire, England

Filed May 10, 1976, Ser. No. 684,766
Int. Cl.[2] F26B *11/02*
U.S. Cl. 34—109 16 Claims



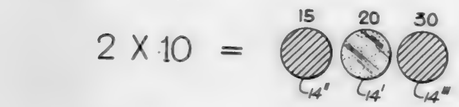
1. Crop drying apparatus comprising a rotatable drum mounted with its axis extending generally horizontally, means dividing the interior of the drum into a plurality of outer chambers for containing crop to be dried, and a central, axially-extending, multi-sided duct having an inlet at one end portion to receive an axial air flow, doors on the outer surface of the drum, each door being associated with a respective chamber to enable filling or discharge of the crop into or from the chamber, each chamber having means defining an inner perforate area to permit flow of air from the duct into the chamber to dry the crop therein and means defining an outer perforate area to permit discharge of moisture-laden air from the chamber to the surrounding atmosphere, and the inner perforate area of each chamber leading the associated outer perforate area in the normal direction of rotation of the drum, and means for controlling the air flow through the inner perforate area during rotation of the drum.

4,038,761

ELEMENT AND METHOD FOR TEACHING WITH LIQUID CRYSTALS

Richard E. Thomas, Chicago, Ill., assignor to A. B. Dick Company, Niles, Ill.

Filed Feb. 17, 1976, Ser. No. 658,614
Int. Cl.[2] G09B *3/06*
U.S. Cl. 35—9 G 11 Claims



1. A device comprising a sheet, a visible image imprinted on the sheet, and coded images keyed to the visible image in which each of the coded images is formed with a layer containing a material which changes color in response to a change in temperature and in which the coded images are substantially identical in appearance at ambient temperature but in which one of the coded images is formed with a material having a color transition temperature differing from the corresponding material in the others of the coded images.

4,038,762

VISCOUS, FLOWABLE, PRESSURE-COMPENSATING FITTING MATERIALS AND THEIR USE, INCLUDING THEIR USE IN BOOTS

Jack C. Swan, Jr., Boulder, Colo., assignor to Hanson Industries Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 663,213, March 2, 1976, abandoned. This application Sept. 16, 1976, Ser. No. 723,981
Int. Cl.[2] A43B *7/20, 19/00, 5/04*
U.S. Cl. 36—89 86 Claims



35. In a boot that covers the ankle of the wearer, the improvement comprising:

providing in combination with said boot along selected portions thereof, including, but not limited to, selected front and side portions of the foot, a pressure-compensating fitting pad which assumes the shape of the foot covered thereby, which provides proper and ready fitting, firm support and comfort to said selected portions of the foot, and which comprises

a shaped, flexible, protective enclosure having retained therein and distributed substantially throughout its confine, a predetermined amount of a viscous, flowable, substantially homogeneous, substantially stable, pressure-compensating fitting material, which, together, provide a pressure-compensating fitting pad, which, in turn, provides firm pressure-compensating support and comfort,

said enclosure being constructed to allow the confined fitting material to flow therein in response and conformance to continuously applied pressure exerted by the foot on the fitting pad and the relief of such exerted, flow-producing pressure,

said fitting material being characterized by a predominant, substantially homogeneous, substantially stable, viscous, flowable, continuous phase essentially consisting of wax and oil, and having substantially uniformly distributed therethrough, a discontinuous phase of discrete, lightweight, sturdy microbeads,

said wax and oil phase being present in an amount sufficient (a) to more than merely thinly coat substantially the entire outer surface of essentially each of said microbeads or to more than merely form a film over the surface of essentially each of said microbeads, and (b) to provide a volume that is substantially more than the volume of the interstitial spaces of the quantity of microbeads alone,

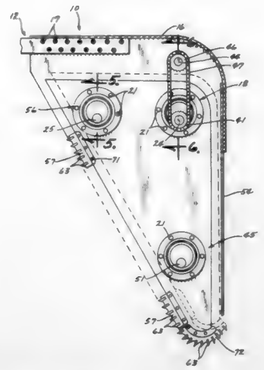
said fitting material being further characterized by having a substantially homogeneous consistency and not substantially changing in volume responsive to ambient temperatures or ambient temperature changes, being resistant to sag, flowing in response and conformance to continuously applied pressure, and, when confined during conditions of use, being resistant to flow in response to instantaneously applied pressure, to provide pressure on those portions of the foot that can best withstand it and to allow portions of the foot at least momentarily to move away from pressure.

4,038,763

ORBITAL TRENCH FORMING APPARATUS

Marion Edward Hutchison, 1241 Ackermant, Waterloo, Iowa 50703

Filed Oct. 10, 1975, Ser. No. 621,492
Int. Cl.[2] E02F *5/02, 9/28*
U.S. Cl. 37—80 R 19 Claims



1. A trenching apparatus comprising:

a housing;

means for connecting said housing to a prime mover;

a first crank assembly rotatably mounted to said housing about a first axis, said first crank assembly having a first circular portion and a second circular portion, the axes of said first and second circular portions being different than said first axis and different from each other;

a second crank assembly rotatably mounted to said housing about a second axis, said second crank assembly including a third and a fourth circular portion, the axes of said third and fourth circular portions being different than said second axis and different from each other;

a timing crank assembly rotatably mounted about a third axis, said timing crank assembly including a fifth and a sixth circular portion, the axes of said fifth and sixth circular portions being different than said third axis and different from each other;

a first member having first, second and third circular openings therein and said first, third, and fifth circular portions being rotatably received respectively therein;

a second member having fourth, fifth and sixth circular openings therein and said second, fourth and sixth circular portions being rotatably received respectively therein;

a first set of teeth connected to a leading edge of said first member;

a second set of teeth connected to a leading edge of said second member; and

means connected to said housing for rotating said first crank assembly about said first axis, and thereby rotating said first and second members.

4,038,764

SHEARING EXCAVATOR

Raymond A. Hanson, P.O. Box 7400, Spokane, Wash. 99207

Filed Apr. 20, 1976, Ser. No. 678,691
Int. Cl.[2] E02F *5/00*
U.S. Cl. 37—110 5 Claims

1. A shearing excavator for stripping earth from a horizontally elongated upright face extending elevationally between a longitudinal top edge and a longitudinal bottom edge by removing successive layers of earth along the length of the face, comprising:

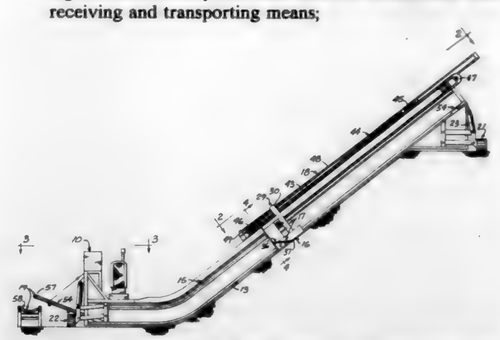
a longitudinally elongated framework extending along the length of the face in substantial parallel relation thereto:

a carriage movably mounted to the framework for longitudinal movement thereon in opposite forward and backward directions along the length of the framework adjacent the face;

earth receiving and transporting means mounted on said framework;

a blade assembly mounted to the carriage including:

a. upright first blade means having an upright blade edge leading downwardly from the top edge of the face to a bottom blade end at an elevation above that of the bottom edge of the face for scraping against the face to make a cut while the carriage is moved in a forward direction, said first blade means including a deflection surface for directing loose earth away from said face and toward said earth receiving and transporting means;



b. inclined second blade means having a horizontal cutting edge leading outward from the framework to the bottom face edge, said horizontal cutting edge being located rearward of the upright blade edge of said first blade means, said second blade means leading rearwardly from the horizontal cutting edge to a rearward blade end adjacent earth receiving and transporting means at an elevation above the cut made by the bottom blade end of said first blade means;

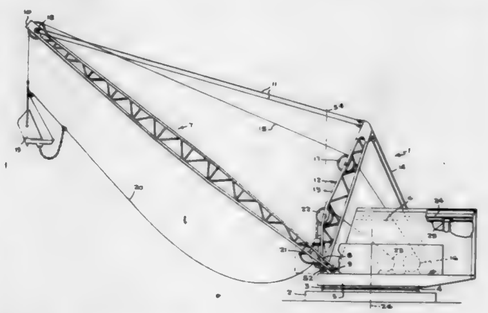
and drive means for moving the carriage and blade assembly relative to the framework along the face in the forward and rearward directions.

4,038,765

BOOM SUPPORT STRUCTURE FOR WALKING DRAGLINE EXCAVATOR

Edwin W. Sankey; Kenneth L. Barden, both of Marion, and Paul Ruch, Nussbaumen, all of Ohio, assignors to Marion Power Shovel Company, Inc., Marion, Ohio

Continuation of Ser. No. 427,428, Dec. 21, 1973, abandoned, which is a continuation of Ser. No. 120,167, March 2, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,400
Int. Cl.[2] E02F *3/48, 9/14;* B66C *23/62*
U.S. Cl. 37—116 18 Claims



1. In a walking dragline excavator having a roller circle, a main frame mounted on said roller circle for swing movement about the central vertical swing axis of said roller circle, a boom provided with a pair of boom feet connected to a front end of said main frame forwardly of said central vertical swing

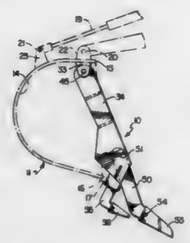
axis and proximate to a segment of said roller circle, a hoist line operatively connected to hoist machinery mounted on said main frame and passing over and suspending from a point of said boom, a bucket operatively connected to a suspended portion of said hoist line, a drag line operatively interconnecting said bucket and drag machinery mounted on said main frame, the front end of said main frame having insufficient stiffness for adequately resisting deflection and substantially uniformly distributing the boom weight and hoist load imposed thereon over a segment of said roller circle disposed beneath the front end of said main frame, an improved means for supporting said boom by means of pendants and substantially uniformly distributing the boom weight and hoist load on said roller circle comprising an upright structure having an upper end and a pair of lower legs connected to said main frame, the upper end of said upright structure being operatively connected to said pendants and also being operatively connected to said main frame rearwardly of said lower leg connections, said lower leg connections of said upright structure being disposed intermediate said boom feet connections, proximate to a segment of said roller circle, and spaced arcuately from said boom feet connections, said lower leg connections of said upright structure being separate from and independent of said boom feet connections, whereby loads transmitted through said boom feet connections and the lower leg connections of said upright structure, and through the front end of said main frame to said roller circle, will be substantially uniformly distributed over a segment of said roller circle disposed beneath the front of said main frame.

4,038,766

EXCAVATOR BUCKET RIPPER TOOL

Rickerd M. Feistet, Box 341, East Helena, Mont. 59635

Filed Dec. 23, 1975, Ser. No. 643,889
Int. Cl.[2] E02F *3/76*
U.S. Cl. 37—141 T **4 Claims**



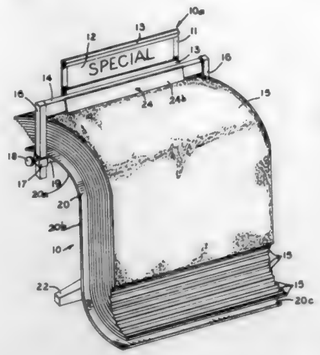
1. A detachably mounted ripper tool for use with an excavator bucket having upper and lower surfaces, a vehicle boom support for the bucket connected to the upper surface of the bucket and a plurality of earth-working teeth disposed along the lower surface thereof, said ripper apparatus comprising, a generally T-shaped mounting frame means having first and second mounting means, said first mounting means having an upper wall, a bottom wall, and generaly parallel side walls which define an opening of a configuration to cooperatively receive the earth-working teeth of the bucket in a slidable engagement, said second mounting means being connected at one end to said upper surface of said first mounting means and extending therefrom across the mouth of the bucket means to releasably connect the other end of said second mounting means to the bucket, said means to connect said second bucket mounting means to said bucket including bracket means mounted to the inner surface of the bucket, retainer means selectively connecting said second bucket mounting means to said bracket, said bracket means being disposed generally opposite the connection of the bucket with the boom support means, ripper tooth means selectively connected to said second mounting means and extending outwardly therefrom beyond the earth-working teeth, and side wall cutter means mounted on said bottom wall and adjacent each side wall of said first mounting portion and extending outwardly therefrom.

4,038,767

FLEXIBLE FLAG ADVERTISING SIGN

David Chasin, 1953 Edward Lane, Merrick, N.Y. 11566; Vincent Russo, Jr., 1152 85th St., Brooklyn, N.Y. 11228, and Sam Foglio, 59 Paper Mill Road, Plandom Manor, N.Y. 11030 (4)

Filed Dec. 9, 1975, Ser. No. 638,987
Int. Cl.[2] G09F *7/22*
U.S. Cl. 40—125 H **2 Claims**



1. A yieldable sign structure comprising a merchandise display support, an elongated base member and means to spacedly mount said base member on said support, an elongated springable securing clip of substantial channel formation removably and frictionally engaged to said base member along the side and bottom walls thereof and having a rear wall projecting above the top of said base member, an elongated panel member adapted to receive and feature advertising and informational material relating to said merchandise and adapted normally to project vertically above and spaced from said rear wall of said clip for viewing purposes, and resilient connecting means along and between said panel member adjacent the lower longitudinal edge thereof and said clip member along the upper longitudinal rear wall edge thereof for maintenance of normal vertical position of the said panel member, for yieldability of said panel member when weight of merchandise is thrown or placed thereagainst and for automatic return to normal vertical position when the weight of said merchandise is removed therefrom, said display support having a table component for support of of merchandise, and said means to spacedly mount said base member on said support including adjustable means for clamping merchandise between the clip bottom wall and the said table component, said table component has an upper curved and a vertical portion for displaying superposed articles of merchandise supported thereon and adapted to be clamped between said base member having said clip engaged thereto and said curved portion whereby the uppermost article or articles are capable of being thrown over said panel member when said article or articles are returned back to their normal position.

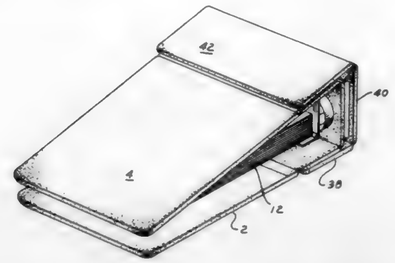
4,038,768

VIEWER STORING MICROFICHE FILE BINDER

Robert B. Wilson, Holyoke, and Raymond T. Cassidy, Ashfield, both of Mass., assignors to National Blank Book Company, Inc., Holyoke, Mass.

Filed May 17, 1976, Ser. No. 687,155
Int. Cl.[2] G09F *1/04*
U.S. Cl. 40—106.1 **3 Claims**

1. Binder device for filing and storing microfiche cards and the like together with a portable viewer of the type having a flat card holding handle and a magnifying lens barrel projecting outwardly from said handle, said device comprising a pair of cover panels, a generally U-shaped assembly including a back panel and spaced opposed side panels from which said covers hingedly extend, a looseleaf binder mechanism extending between said side panels above said back panel and spaced therefrom a distance not less than the length of said barrel, an aperture extending through said back panel to receive said barrel therethrough, and retaining means releasably interconnectible with said binder to cover over at least a portion of said back panel for holding said viewer against said back panel when the lens of the viewer is disposed in said aperture, said aperture being located adjacent one end of said back panel so that the handle of the viewer will be generally coextensive with the back panel when the barrel of the viewer is in said aperture.

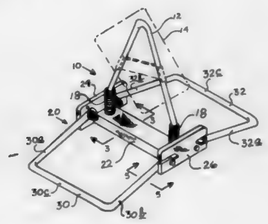


4,038,769

PORTABLE SIGN HOLDER

William A. Werner, 1022 Koala, Salem, Oreg. 97303

Filed Sept. 15, 1975, Ser. No. 613,303
Int. Cl.[2] G09F *7/18*
U.S. Cl. 40—125 H **11 Claims**



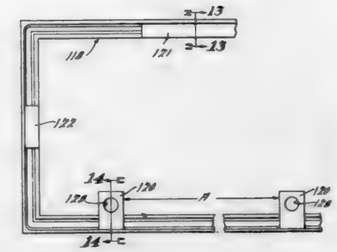
1. A portable sign holder comprising
an upright sign support, and
a collapsible base to which said support is connected, said base including a bracket member adjacent the bottom of said sign support, at least a pair of elongate leg members pivotally connected adjacent an inner set of their ends to said bracket member adjacent said sign support for swinging relative to said bracket member and toward and away from said sign support about substantially horizontal pivot axes between support positions extending outwardly at substantial angles from said bracket member to opposite sides of said sign support and upwardly therefrom to collapsed positions extending upwardly from said bracket member adjacent opposite faces of said sign support, and releasable locking means for holding each of said leg members in one of said positions, the locking means and pivot connections between said leg and bracket members being so positioned that when said leg members are held in their support positions a leg member is disposed at a low angle to the horizontal with its outer end lower than its inner end, said locking means for a leg member including a pair of depressions formed in said bracket member spaced substantially equal distances radially outwardly from said pivot connection and spaced at greater than 90° from each other about said pivot connection, and an engaging member mounted on said leg member for engagement with one of said depressions when the leg member is in its support position and for engaging the other depression when the leg member is in its collapsed position, said engaging member comprising an elongate pin mounted on said leg member for shifting toward and away from said bracket member between locking and retracted positions, and yieldable biasing means for urging said pin toward said bracket member.

4,038,770

LICENSE PLATE FRAME ASSEMBLY

John A. Bott, 931 Lakeshore Drive, Grosse Pointe Shores, Mich. 48236

Continuation-in-part of Ser. No. 683,421, May 5, 1976. This application Aug. 30, 1976, Ser. No. 718,941
Int. Cl.[2] G09F *7/00*
U.S. Cl. 40—209 **1 Claim**



1. A one-piece molded plastic license plate frame adapted for cooperation with a license plate having a width dimension of approximately twice its height dimension and having a pair of spaced apart fastener receiving openings formed adjacent one horizontally extending edge thereof,
said frame being of a generally rectangular shape and comprising upper and lower horizontally extending sections and vertically disposed end sections extending between and integrally connected to the opposite ends of said horizontal sections,
each of said frame sections comprising an outer enclosure wall portion arranged at substantially right angles to the plane of said license plate, and an integral frontal wall portion that extends substantially parallel to the plane of the license plate and inwardly from the forwardmost part of the associated outer enclosure wall portion,
said frontal wall portions providing an unobstructed rectangular opening having linear side edges through which the forward face of the license plate may be viewed,
said frontal wall portions overlying the outer marginal edge portions of the forward face of said license plate and defining inwardly and rearwardly beveled face portions adjacent said opening and a decorative face area,
said decorative face areas including a pair of spaced parallel forwardly projecting ribs between which is located an intermediate recessed surface area provided with an appearance enhancing treatment, said ribs protecting said intermediate area from the deleterious effects of car washing brushes, flying objects, such as stones, and the like,
a plurality of plate retaining flange elements formed integrally of selective of said sections and including a first flange element on the uppermost of said horizontally extending sections and a second flange element on the lowermost of said horizontally extending sections, and third and fourth flange elements on said vertically disposed flange sections,
said flange elements defining plate edge receiving recesses with said outer and frontal wall portion of the associated frame sections and being located on the rearward side of said license plate and thus being totally concealed from

the forward side of said frame by said plate when the same is assembled into said frame,

one of said flange elements associated with one of said horizontally extending sections being formed with an opening adapted to be aligned with one of said openings formed in said plate upon assembly of said plate within said frame whereby fastening means may be inserted through the aligned openings to secure said plate and frame in a unitized assembly,

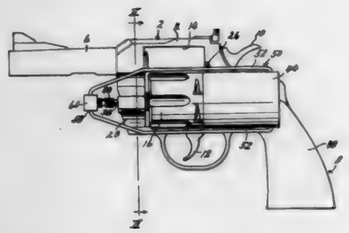
said frame being fabricated of a rigid yet deflectable material, such as ABS plastic, whereby assembly of said license plate into said frame may be achieved by inserting the side edges of said plate into the recesses defined by said third and fourth flange elements and moving said plate relative to said frame to a position wherein the leading horizontal edge of said plate is inserted into the slot of the adjacent horizontally extending frame section, and thereafter biasing the horizontal section of said frame associated with the opposite horizontal edge of the plate outwardly to permit said opposite horizontal edge of said plate to be inserted behind the associated flange element, and when said force on said biased horizontal frame section is relieved, said section will move under the influence of the natural elasticity of the plastic material toward its normal position retaining said opposite horizontal plate edge within the associated of said slots.

4,038,771

LOAD SAFETY DEVICE FOR REVOLVERS

Leland D. Miller, R.R. No. 1, Tonganoxie, Kans. 66086

Filed Sept. 30, 1976, Ser. No. 728,043
Int. Cl.[2] F41C *17/00*
U.S. Cl. 42—1 LP 8 Claims



1. In combination with a revolver having a receiver and a cylinder having cartridge chambers formed therein parallel to its axis, said cylinder normally being disposed within said receiver in a firing position but being movable transversely of said barrel axis to an extended position outside of said receiver to expose the rearward end thereof for the insertion or removal of cartridges into or from the chambers thereof, and an ejector mechanism operable by a manually movable operating member to move cartridges in said chambers to the rear so as to be only partially engaged in said chambers, a safety device comprising:

a. a generally cylindrical, cup-shaped receptacle open at one end and adapted to be applied open end first to the rearward end of said cylinder coaxially with said cylinder, when said cylinder is in said extended position whereby to receive therein the rearward end portions of said cartridges as said cartridges are partially ejected from said cylinder chambers by said ejector mechanism, and

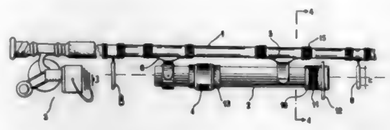
b. securing means carried by said receptacle and releasably engageable with said operating member of said ejector mechanism, and being operable when so engaged both to secure said receptacle in engagement with said cylinder, and to secure said ejector mechanism in a position to maintain said cartridges in a position partially ejected from said cylinder into said receptacle.

4,038,772

FISHING ROD WITH AN IMPROVED BITE DETECTOR ARRANGEMENT

Németh Mihály, Kalaszi u. 22, H-1039 Budapest, and Honthegyi Mátyás, Zarand u. 10, H-1031 Budapest, both of Hungary

Filed Apr. 7, 1976, Ser. No. 674,402
Claims priority, application Hungary, Feb. 20, 1976, HO 1882
Int. Cl.[2] A01K *97/12*
U.S. Cl. 43—17 3 Claims



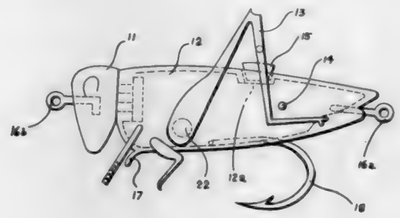
1. A bite detector arrangement for fishing rods, comprising a tipping tube for guiding the fishing line when led therethrough; a pivoted supporting means pivotally supporting an end region of said tipping tube; a supporting member releasably engaging the other end region of said tipping tube in which said engagement being released at opening forces exceeding a predetermined value; a slide-weight placed onto the tipping tube and being adjustable along the length of the tipping tube; a signalling means mounted onto the tipping tube; and said pivoted supporting means and said supporting member having foot-parts having adjustable heights.

4,038,773

FISHING LURE

Robert Castelletti, and George Spector, both of c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Mar. 22, 1976, Ser. No. 669,232
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—26.2 5 Claims



1. An insect simulating plug lure attachable to a fishing line for catching fish which comprises:

a. a hollow body with an aperture for inserting effervescent material into it,

b. a cap to close that aperture,

c. leg-like with an aperture for inserting effervescent extensions pivoted on the exterior of said body,

d. a hook for fish retention, mounted on the body exterior

e. a link connecting said leg-like extensions with a means communicating with said body interior for transmitting pressure changes in said body resulting from the effervescent material into a movement of the pivoted legs,

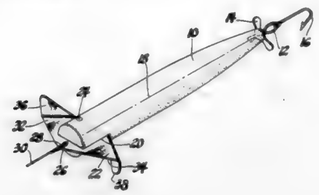
f. a vent opening sealed by said means whereby buoyant upward movement of said extensions causes opening of said vent opening for entry of water.

4,038,774

FISHING PLUG

Carl W. Misiak, 31395 Minton, Livonia, Mich. 48150

Filed Mar. 4, 1976, Ser. No. 664,021
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.09 2 Claims



1. A fishing plug, comprising:

an elongated body formed of a buoyant material, and having a blunt forward end extending perpendicular to the longitudinal axis of the body, a tapered rearward end, said body having a slot in said forward end along the longitudinal axis, the slot having a length less than ¼ the length of the body;

fish hook means connected to the body;

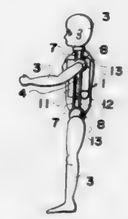
a thin control member received in the slot to form a first wing integrally connected to a second wing such that the first wing is disposed on the opposite lateral side of the body as the second wing, each wing having a rearward edge forming a planar tab at substantially 90° to the plane of said control member disposed at an angle of about 55° with respect to that portion of the longitudinal axis of the body, passing through the blunt forward end thereof, the tab on the first wing being bent in the opposite direction with respect to the tab on the second wing, the thin control member having a first opening disposed in the slot and a second opening for connection to a fishing line, the second opening being spaced from the blunt forward end of the body and aligned with said longitudinal axis, a pin carried on the body and received in the first opening of the control member to releasably prevent removal of the control member from the body, whereby the body moves in a non-linear motion as it is being pulled through the water by a fish line connected to the second opening of the control member.

4,038,775

DOLL BODY WITH MAGNET AND POLE PIECES AND DETACHABLE APPENDAGES

Yasuta Sato, Tokyo, Japan, assignor to Takara Co, Ltd., Tokyo, Japan

Filed June 9, 1975, Ser. No. 584,851
Claims priority, application Japan, Oct. 31, 1974, 49-132236[U]
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—22 4 Claims



1. In a toy doll having a magnetic joint structure, the improvement comprising:

a body member including a magnet, having at least two flat parallel surfaces, for producing magnetic flux;

a plurality of removable appendage members having respectively spherical magnetizable joint portions, said appendage members configured and positioned on the body member to represent respectively a head, legs and arms;

a first flat metal plate pole piece positioned on one parallel surface of said magnet and having a peripheral extension portion extending beyond said magnet;

a second flat metal plate pole piece positioned on said other parallel surface of said magnet and having an identical configuration to said first pole piece including a peripheral extension portion extending beyond said magnet, the first pole piece being spaced separate and apart from said second pole piece; and

a plurality of joint means formed between said first and second pole pieces and including a plurality of respective complementary arc like edge configurations on each of said respective peripheral extension portions and spaced outwardly from and about said magnet to receive and removably secure the appendage members in general configurational positions to represent the nexus of the body member to said head, arms and legs, said appendage members being rotatably movable relative to the body member when retained by a respective joint means, said joint means being capable of contacting and transmitting magnetic flux to said spherical magnetizable joint portions of said appendage members while permitting relative movement therebetween.

4,038,776

ROCKET TOY

James Michael Filipeli, Woodland Hills, Calif., assignor to A. J. Filipeli Co., Inc., Woodland Hills, Calif.

Filed June 28, 1976, Ser. No. 700,390
Int. Cl.[2] A63H *33/20*
U.S. Cl. 46—76 A 14 Claims



1. A rocket toy comprising:

a unitary, generally cylindrical rocket body having a set of fins projecting outwardly therefrom, a partition wall closing the cylindrical interior of said rocket body near the front end thereof, and a nose-cone receiving tapered cylindrical lip projecting forwardly from said body front end,

a parachute-retaining nose cone having a streamlined exterior surface and dimensioned for loose-fitting reception by said cylindrical lips, there being an air flow resisting brake surface interrupting the streamlined exterior surface, air resistance against said brake surface holding said nose cone onto said rocket body during forward flight of said rocket toy, and

a parachute having cords attachable to said rocket body, said

parachute being furlable for retention within said nose cone,

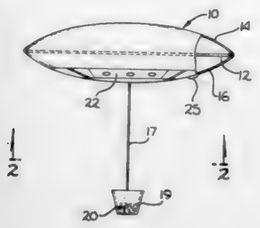
said parachute-retaining nose cone dropping off of said rocket body when the rocket toy slows down during flight, thereby permitting said parachute to deploy.

4,038,777

AIRBORNE, HOVERING, DECORATIVE OBJECT, TOY OR THE LIKE

Seymour S. Schwartz, Los Angeles, Calif., assignor to Gambit Enterprises, Beverly Hills, Calif.

Filed Feb. 4, 1976, Ser. No. 655,087
Int. Cl.[2] A63H *27/10*
U.S. Cl. 46—87 **9 Claims**



1. A lighter-than-air decorative object having a general lenticular shape comprising:

an epoxy impregnated graphite ring;

a generally curved upper skin;

a generally curved lower skin, said upper skin material and said lower skin defining a seam disposed along said rings, and said upper skin and said lower skin defining a volume for containing gas; and,

a valve for communicating with said volume for allowing a gas to be placed within said volume;

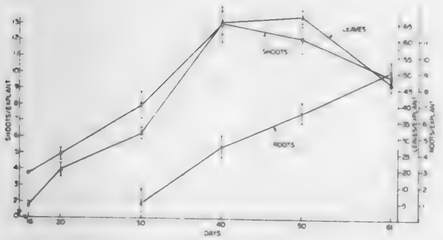
whereby a generally "flying saucer" shaped lighter-than-air decorative object of relatively small size is realizable.

4,038,778

TISSUE CULTURE TECHNIQUE FOR ASEXUAL PLANT REPRODUCTION AND A MEDIUM FOR USE THEREWITH

Prakash G. Kadkade, Marlboro, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sept. 27, 1976, Ser. No. 727,323
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—58 **11 Claims**



1. A method for asexually propagating plants comprising the steps of:

a. excising a part of the donor plant;

b. culturing the excised part on a nutrient medium containing to 1mg/l of IAA, 0.1 to 0.5 mg/l of kinetin, and 20-40 mg/l of a salt of adenine to promote the simultaneous growth of shoots and roots and induce the differentiation of the excised part into a plurality of plantlets; and

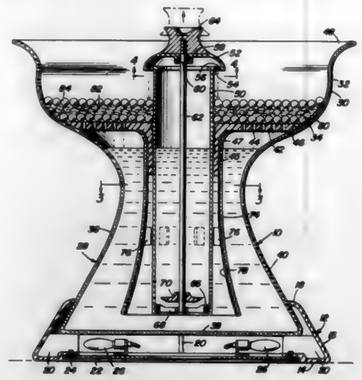
c. transplanting the plantlets into soil.

4,038,779

EDUCATIONAL AND MULTI-FUNCTION HYDROPONICS GARDEN CONTAINER

David B. Roberts, Jr., 211 4th Place, SW., and Joseph L. Wells, 10366 Antilles Drive, both of Largo, Fla. 33540

Filed Oct. 10, 1975, Ser. No. 621,538
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—62 **12 Claims**



1. In combination with a hydroponics container having a lower portion for containing liquid plant nutrient and provided with at least one upstanding transparent wall portion, said container including an upper generally horizontal foraminated portion for support of plants to be grown in said container with the roots of the plants projecting downwardly through said foraminated portion to a position horizontally registered with said transparent wall portion, mirror surface defining structure disposed within said container spaced horizontally inwardly of said transparent wall portion, the area of the interior of said container between said mirror surface defining structure and said transparent wall portion being adapted to receive descending root systems of plants growing in said container, and illumination means operative to cast light upwardly through said area and incident upon said mirror surface defining structure as well as the inner surface of said transparent wall portion, whereby the descending roots of plants being grown on said forminated portion and disposed in said area may be viewed from all sides through said transparent wall portion from the outer side thereof at close range.

4,038,780

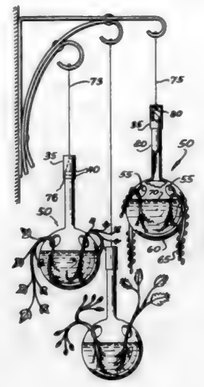
WATER CONTAINER DEVICE FOR PLANTS

Edward C. Bruno, Denver, Colo., assignor to Polycraft Corporation, Denver, Colo.

Filed Apr. 26, 1976, Ser. No. 680,202
Int. Cl.[2] A01G *31/00*
U.S. Cl. 47—63 **1 Claim**

1. A house plant watering and rooting device having a water storage portion comprising a hollow spherical ball of translucent plastic material; an elongated hollow cylindrical neck portion having one end thereof integrally attached to an upper portion of said ball; a plastic cap having cylindrical walls, an upper end and an open lower end, said cap having ridges on its interior wall surface; the neck portion having a free end, said cap enveloping the free end of said neck portion and said ridges frictionally grasping a portion of said neck portion; a string extending through said upper cap end and positioned intermediate said cap and the exterior wall surfaces of said neck portion; said cap ridges and the outer surface of said neck portion thereby

securing said string for supporting and suspending said plant watering device; and a plurality of openings on said upper portion of the ball for permitting the stem portion of plants to be easily inserted therein.

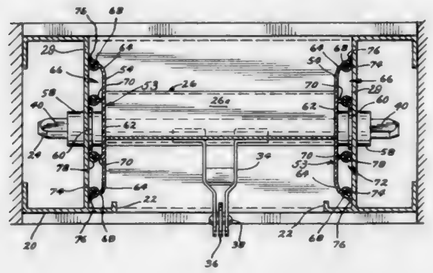


4,038,781

JAMB SEAL

Richard W. Graham, Williamstown, W. Va., assignor to The Airolite Company, Marietta, Ohio

Filed Mar. 19, 1976, Ser. No. 668,505
Int. Cl.[2] E06B *7/086*
U.S. Cl. 49—91 **13 Claims**



1. In a louver assembly having a frame including a first top end frame member, a second bottom end frame member and two opposed mutually parallel side frame members, a plurality of spaced apart, substantially parallel louver blades extending between said side frame members, louver blade pivot shafts integral with said blades along the longitudinal axes of each and extending outwardly from said blades, the louver blades and pivot shafts being pivotally mounted with respect to said side frame members for rotation about their longitudinal axes between open positions and a closed position wherein said blades are in sealing relation to each other and to said first and second end frame members, each louver blade having two transverse blade ends, one such blade end spaced from and facing each side frame member, and means for pivoting said blades between said open and closed positions; wherein said louver assembly includes a jamb seal for sealing the space between each side frame member and its associated louver blade ends, said jamb seal including:

an elongated, rigid panel having a substantially flat face portion in facing, sealing, contacting relation to said louver blade ends at a first end of said blades when said blades are in said closed position, and a plurality of elongated, parallel, spaced apart, rigid ribs integral with and extending outwardly from said face portion in direction away from said louver blade ends to lie in supported relation to a first of said side frame members;

said rigid ribs being provided with resilient cushioning and sealing means positioned between said rigid ribs and said side frame members;

wherein said panel is provided with transverse slots positioned to receive said louver blade pivot shafts when said panel is assembled with the balance of said louver assembly between said side frame and said louver blade ends;

wherein at least one of said ribs is in continuous sealing relationship with respect to said side frame member from said first top frame member to said second bottom frame member and such sealing relationship is not interrupted by said transverse slots; and

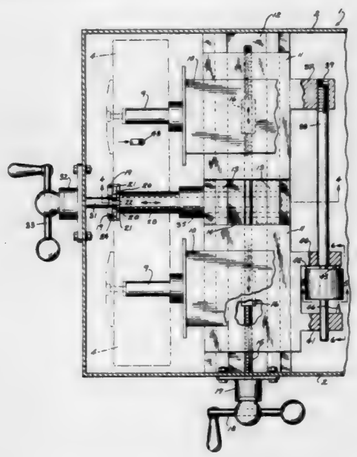
means for sealing second ends of each of said louver blades with respect to a second of said side frame members.

4,038,782

HONING MECHANISM

Artemio S. Cozzini, 3464 N. Dousman, Milwaukee, Wis. 53212

Filed Nov. 3, 1975, Ser. No. 628,362
Int. Cl.[2] B24B *3/54*
U.S. Cl. 51—5 D **19 Claims**



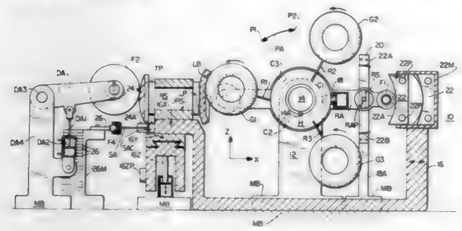
1. An apparatus for performing a working operation on an article, comprising a supporting structure, a pair of rotating working members, carriage means for mounting the working members for movement between a working position in which the working members are in proximate relation and the article is inserted therebetween and an outer dressing position, means operably connected to said carriage means for moving the working members between said working position and said dressing position, dressing means for dressing the surfaces of the working members when in the dressing position, said dressing means comprises a pair of dressing members, each dressing member being mounted for movement along a path of travel to dress the surface of the respective working member, and indexing means for automatically adjusting the spacing between the working members each time the working members are moved to the dressing position and for automatically adjusting the spacing between the working members each time the working members are returned to the working position to compensate for material removed from the working members in the dressing operation.

4,038,783

METHOD AND APPARATUS FOR GENERATING OPTIC LENSES

Leon Rosenthal, 7403 Kalton Court, Baltimore, Md. 21208

Filed Sept. 3, 1976, Ser. No. 720,370
Int. Cl.[2] B24B *13/00, 1/00*
U.S. Cl. 51—33 W **7 Claims**



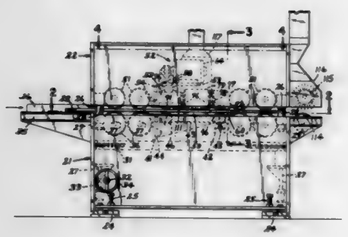
1. A lens grinding apparatus, comprising:
first mounting means mounting a lens blank substantially for linear motion on X, Y and Z orthogonal coordinate axes and for selective rotation on its X-axis;
first drive means selectively driving said lens blank in rotation;
second drive means indexing said lens blank along said Y-axis;
toroidal grinding means;
second mounting means mounting said grinding means for simultaneous oscillation and rotation in an X-Z plane; and
template means superimposing cross radius and base radius lens parameters on said lens blank mounting means along said X-axis and constraining said lens blank into engagement with said grinding means in cooperation with said second drive means to generate an opthalmic lens surface on said lens blank;
said second drive means indexing said lens blank during selective rotation thereof along said Y-axis to cause said grinding means to traverse half the diameter of said lens blank and thereby generate a complete ophthalmic surface on said lens blank.

4,038,784

METHOD AND APPARATUS FOR CROSS GRAIN ABRADING TO PRODUCE A ROUGH-SAWN EFFECT

Howard W. Grivna, Fridley, Minn., assignor to Acrometal Products, Inc., Minneapolis, Minn.

Filed May 7, 1976, Ser. No. 684,010
Int. Cl.[2] B24B *1/00, 21/08*
U.S. Cl. 51—139 **25 Claims**



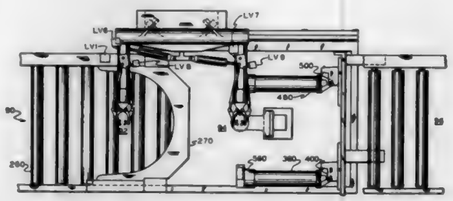
1. Apparatus for creating a rough, cross-sawn effect over the surface of a workpiece of wood or the like having longitudinal and lateral dimensions comprising:
a. means for moving the workpiece through a work area in the direction of said longitudinal dimension;
b. and means for producing a plurality of observable grooves in said workpiece transverse to said longitudinal direction to create said rough, cross-sawn effect, comprising
i. endless abrasive belt means movable through said work area transverse to said longitudinal dimension, said abrasive belt means having abrasive grit thereon sized to create said observable grooves;
ii. longitudinal platen means disposed on the opposite side of the endless abrasive belt means from the workpiece for forcing the endless abrasive belt means into engagement with the workpiece;
iii. the platen means having a longitudinal region of contact with the endless abrasive belt means which is disposed obliquely to its line of movement, said contact region having a lateral dimension that is sufficiently narrow to restrict the transverse abrasive engagement of the grit with the workpiece surface to produce grooves that are short relative to the lateral dimension and generally parallel to the line of movement of the endless abrasive belt means, whereby said cross-sawn effect is created.

4,038,785

METHOD AND APPARATUS FOR TRANSFERRING AND OPERATING ON ARTICLES

John E. Scott, Columbus, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 299,348, Oct. 20, 1972, Pat. No. 3,875,704, which is a division of Ser. No. 158,376, June 30, 1971, Pat. No. 3,739,532. This application Dec. 10, 1974, Ser. No. 531,241
Int. Cl.[2] B24B *21/16*
U.S. Cl. 51—145 R **4 Claims**



1. Apparatus for beveling the edges or rims of television picture tube funnel or viewing panel components comprising
a. an input station, an edge beveling station, and a discharge station in linear alignment, said input and discharge stations being spaced the same distance from said beveling station;
b. said input station including a delivery conveyor; and an alignment fixture having an alignment channel above and opening upstream of the run of said conveyor; said aligning channel including a semicircular terminal portion having a diameter equal to the diagonal of the component, and channel sides extending outwardly toward the edge of the conveyor to direct the component into the terminal portion of the channel;
c. transfer means for moving components between stations including a first carriage horizontally movable along said stations and a second vertically movable carriage, one of said first and second carriages being mounted on and movable with the other of said carriages;
d. said second carriage having two spaced component handling arms extending over said stations, the spacing of said arms matching the spacing between said beveling station and each of said input and output stations;
e. means for raising and lowering said second carriage to enable pickup of components at said input and edge beveling stations simultaneously and the deposit of said components at said beveling and discharge simultaneously, respectively;
f. means for moving said first carriage back and forth enabling transfer of components between successive stations; and
g. means at said edge beveling station for beveling the sealing edge or rim of a component in said edge beveling station.

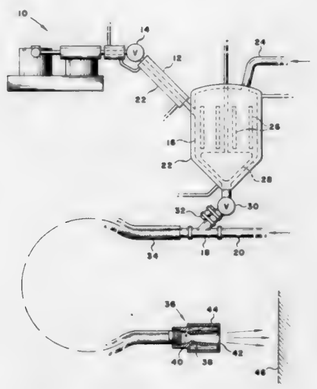
2. A method for automatically beveling the edges or rims of television picture tube funnel or viewing panel components, comprising the steps of
a. automatically delivering components to an input station,
b. automatically in response to the presence of a component at the input station successively transferring each component from said input station to an edge beveling station,
c. automatically clamping each component at said beveling station with the rim at a predetermined height,
d. automatically contacting the rim edges with edge beveling means also located at said predetermined height,
e. automatically moving said edge beveling means and said rim with respect to each other at said predetermined height until the beveling is completed to obtain a uniform bevel completely around said rim,
f. automatically sensing bevel completion to release the clamping of a component, and
g. automatically transferring said beveled component from said beveling station to a discharge station, the steps of transferring a component from said input station to an edge beveling station and transferring a beveled component from said beveling station to a discharge station being accomplished simultaneously.

4,038,786

SANDBLASTING WITH PELLETS OF MATERIAL CAPABLE OF SUBLIMATION

Calvin C. Fong, Beverly Hills, Calif., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Continuation-in-part of Ser. No. 509,916, Sept. 27, 1974, abandoned, which is a continuation-in-part of Ser. No. 306,154, Nov. 13, 1972, abandoned. This application Aug. 27, 1975, Ser. No. 608,165
Int. Cl.[2] B24C *1/00, 7/00*
U.S. Cl. 51—320 **5 Claims**



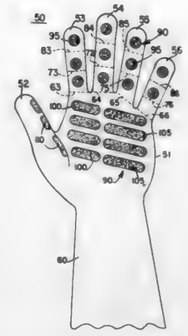
1. A process in which solid pellets are entrained in a stream of pressurized gas in a conduit and are propelled by the gas through a nozzle out of the conduit against a surface in which the improvement comprises:
said particles being solid particles of a material which will sublime after engaging the surface,
said nozzle being a supersonic nozzle contoured to maximize the flow momentum of the particles by producing a total static pressure at the exit of the nozzle which was equal to the static pressure in the surrounding environment,
said particles are in the equipment utilized to practice said process a sufficiently short time so that no more than about 10 percent by weight is lost from said particles during the time from when said particles are introduced into the equipment for practicing the process to when said particles engage said surface.

4,038,787

ABRASIVE GLOVE

Albert A. Bianchi, Mount Prospect, Ill., assignor to RB Products Corporation, Skokie, Ill.

Filed Mar. 1, 1976, Ser. No. 662,734
Int. Cl.[2] B24D *11/00*
U.S. Cl. 51—391 **18 Claims**



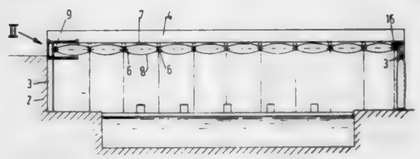
1. A glove having a flexible body with a palm, a thumb and finger stalls, each of said finger stalls in use covering three finger joints lines, a plurality of discrete abrading units on said palm, said thumb and each of said finger stalls disposed to permit free flexing of said finger stalls at the joint lines and to permit free flexing of said thumb and palm, each of said abrading units consisting of a plurality of hard and sharp particles dispersed in a layer of adhesive, and securing means free of hard and sharp particles intermediate said glove and said abrading units for securing each of said abrading units to said glove and for insulating said glove therefrom, whereby said glove may be used to abrade potatoes to peel same producing easily disposable pulp, or to abrade paint and the like while permitting free flexing of the thumb, finger and palm, without the hard and sharp particles in said abrading units tearing said glove.

4,038,788

SLIDING ROOF

Willem Maria August Claessens, Schubertstraat 15, Zutphen, Netherlands

Continuation of Ser. No. 433,776, Jan. 16, 1974, abandoned. This application July 14, 1975, Ser. No. 595,691
Claims priority, application Netherlands, Jan. 16, 1973, 7300641
Int. Cl.[2] E04B *1/345*
U.S. Cl. 52—2 **8 Claims**



1. In combination with a building structure having a supporting framework having roof opening of predetermined length and width and a series of fixed parallel supports within said opening, a sliding roof structure adapted selectively to cover and uncover said roof opening, said roof structure comprising:

a plurality of parallel beams spanning said roof opening and disposed transverse to and below said fixed supports, said beams being constructed of rigid material such as metal;

means slidably suspending the said beams from said fixed beams supports for movement between a retracted position in which the beams are crowded together at one end of said roof opening and an exended position in which the beams are spaced apart throughout the length of said roof opening;

upper flexible covering means connecting adjacent pairs of beams for allowing relative movement therebetween and lower flexible covering means connecting adjacent pairs of beams for allowing relative movement therebetween, each said flexible covering means being of gas-tight material to define a chamber between each adjacent pair of beams and means for closing each end of each chamber whereby said roof structure is essentially airtight;

means for selectively filling said chambers with gas and discharging gas therefrom whereby each covering means is ballooned out between each adjacent pair of beams when the roof structure is extended and each covering means is flaccid to permit the retracted positioning of said beams; and

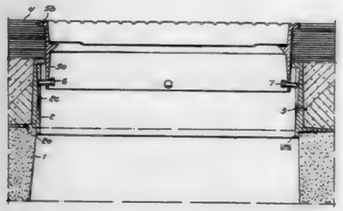
means for physically displacing only the leading one of said beams, and flexible connecting means joining each adjacent pair of beams for displacing all but the last of said beams in train-like fashion behind said leading beam.

4,038,789

ADJUSTABLE MANHOLE FRAME ASSEMBLY

Gunnar Albert Axgärde, Stockholm; Bengt Börje Axelsson, Jonkoping, and Alf Klingwall, Stockholm, all of Sweden, assignors to Parca-Norrahammar AB, Sweden

Filed Mar. 18, 1975, Ser. No. 559,559
Claims priority, application Sweden, Mar. 19, 1974, 7403646
Int. Cl.² E02D *29/14*
U.S. Cl. 52—20 **5 Claims**



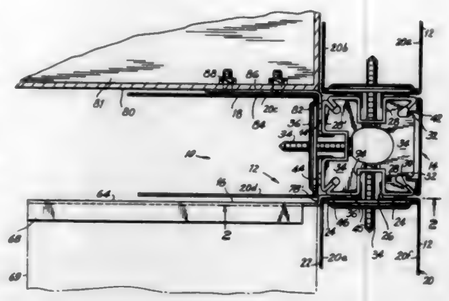
1. A manhole assembly comprising a top frame for carrying a cover; a bottom frame supported on a base for the manhole, a portion of said top frame being telescoped in the bottom frame; a plurality of lock means for locking the frames in a mutually-adjusted position, said lock means extending between the portion of the top frame inserted in the bottom frame and including laterally projecting screws terminating outside of the portion telescoped in the bottom frame, a bottom frame including counterpressure surfaces confrontingly disposed adjacent the ends of the screws for engagement therewith when the screws are tightened, said counterpressure surfaces extending at a vertical angle with respect to the vertical axis of the bottom frame and converging downwardly, said protruding screws having a plurality of adjusted positions along the angular counterpressure surface positioning the frames at different adjusted levels, the longitudinal axes of said screws being substantially perpendicular to a corresponding counterpressure surface with which it cooperates and the end portion of the screws moving substantially parallel against the counterpressure surface when the screw is tightened.

4,038,790

PARTITION STRUCTURE

John C. Paisley, Rte. 1, Box 4A, Orange, Va. 22960

Filed Sept. 16, 1976, Ser. No. 723,894
Int. Cl.² E04B *2/78*
U.S. Cl. 52—36 **18 Claims**



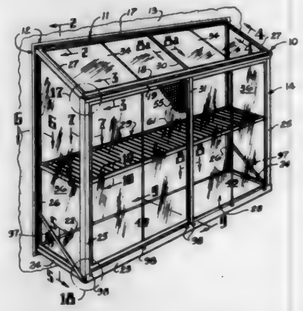
1. A partition structure including a support post having a plurality of vertical sides and a partition panel secured to one of said sides, said panel having a bent flange portion located in parallel, closely spaced alignment with one side of the post having a plurality of vertically spaced embossments of predetermined configuration formed thereon extending outwardly of said one side towards said flange portion of the panel to define a cavity therebetween, and a support bracket having an inner edge portion including a plurality of spaced mounting tabs formed thereon, said mounting tabs being spaced from each other at regular intervals selected to enter said cavity between said embossments and having an edge configuration selected to mate with at least a portion of the predetermined configuration of said embossments.

4,038,791

WINDOW GREENHOUSE

John W. Atkinson, 420 Huchison St., Vista, Calif. 92083

Filed Nov. 1, 1976, Ser. No. 737,696
Int. Cl.² E04B *1/34*
U.S. Cl. 52—36 **8 Claims**



1. A window greenhouse comprising in combination:

a frame formed of a plurality of interconnected sections defining an enclosure,

one part of said frame comprising a head section, a sill section and a pair of jamb sections,

said head section and sill section being arranged in spaced parallel arrangement to fit juxtapositioned to the head and sill members of a window frame,

each of said jamb sections interconnecting a different end of the head section and sill section forming a frame defining an opening fitting within the opening of the window,

said head section comprising an extrusion having a longitudinally projecting flange or spline extending over a flange on the head member of the window for interlocking said rectangular frame to said head member of said window,

said sill section comprising an extrusion having a longitudinal projecting flange extending over a flange on the sill member of the window for interlocking said sill section of said rectangular frame to said window,

attachment means extending through each end of said sill section and said head section and into the frame of said window for anchoring said rectangular frame to the window,

said frame further comprising gable side rail sections extending laterally outwardly one from each end of said head section, an eave section interconnecting the free ends of said gable side rail sections, side sill sections extending outward from each end of said sill section in the same direction as said gable side rail sections and a second sill section interconnecting the free ends of said side sill sections, and

a pair of corner jamb sections one interconnecting each of the ends of said gable side rail sections, said eave section, and said sill sections to form said enclosure,

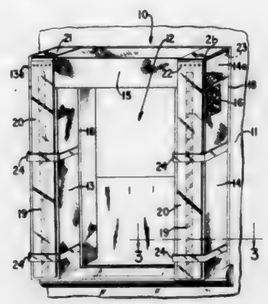
each of the gable side rails detachably interlocking with said head section and further provided with an outstanding flange which interlocks with a bracket fastened to the head member of the window.

4,038,792

WEAR PROTECTOR FOR TRUCK DOCK DOOR SEAL

Winston B. McGuire, and Stanley Makas, both of Hudson, N.Y., assignors to W. B. McGuire Co., Inc., Hudson, N.Y.

Filed Nov. 28, 1975, Ser. No. 635,899
Int. Cl.² E04B *1/92;* A47B *95/00*
U.S. Cl. 52—105 **5 Claims**



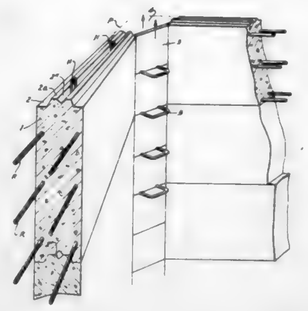
1. In a truck dock door seal including compressible pads arranged along the opposite sides and over the top of a door opening for sealing engagement by the back ends of truck bodies docked at said opening, the face of each of said side pads bearing a bright guide stripe, means for protecting the pads along said sides against wear by the truck bodies, comprising on each of said side pads a facing strip composed of a tough flexible transparent polymeric sheet material which is hung loose over and substantially covers the length and width of the face of the pad, said strip hanging free at its lower end and having fastened to its upper end a flexible strap extending from the strip over the top front corner and the top of the pad to a backing member thereof for holding the strip yieldably onto a top portion of the pad, and means including straps of tough flexible sheet material extending loose across and over said strip and over the opposite sides of the pad at intervals spaced apart along the pad, and having end portions fastened to a backing member of the pad, for confining said strip next to said face yet keeping it displaceable relative thereto with motion of a truck body pressed against the pad.

4,038,793

WALL STRUCTURE

Juan Armengol Roca, c/Pompeu Fabra, 5, Bellpuig (Lerida), Spain

Filed Jan. 14, 1975, Ser. No. 540,947
Int. Cl.² E04D *15/00*
U.S. Cl. 52—125 **10 Claims**



1. Wall structure comprising a plurality of generally planar wall panels, each panel having a pair of edge faces opposite and parallel to one another and a pair of vertical edges, at least one vertical edge of a respective panel being spaced from the vertical edge of a successive panel; an edge portion integral with the panel and projecting from one of said edge faces, generally in the plane of the plane of the panel; another edge portion recessed into the opposite edge face and fitting the projecting edge portion of a successive panel; a relatively narrow groove extending into each of said edge portions intermediate the lateral sides thereof, the grooves in the edge portions of successive panels facing one another, at least some of said panels having recesses in side surface portions thereof between said edge faces and adapted to permit the insertion of scaffold means during the erection of the wall structure; sealing material in the facing grooves; and vertical concrete pillar structures each located in the space bounded by the respective vertical edges of successive panels, including relatively thin concrete plates spanning said space and constituting inner surface portions of the wall structure, said plates being both thinner and narrower than said panels.

4,038,794

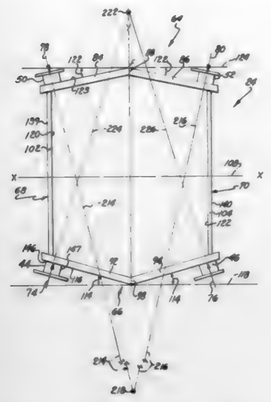
BOOM ASSEMBLY

Warren C. Young, Madison, Wis., assignor to The Warner & Swasey Company, Cleveland, Ohio

Filed Oct. 28, 1975, Ser. No. 626,244
Int. Cl.² E04H *12/18;* E04G *25/04;* B66C *23/62*
U.S. Cl. 52—127 **20 Claims**

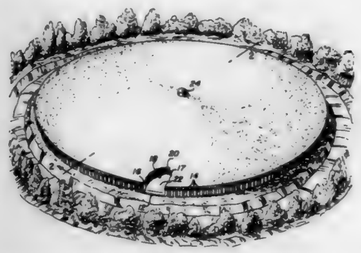
1. A boom assembly comprising a plurality of longitudinally extending boom sections disposed in a telescopic relationship with each other, first slider means connected with an outer end portion of a first one of said boom sections and disposed in engagement with a second one of said boom sections for at least partially supporting said second boom section for axial movement relative to said first boom section, second slider means connected with an inner end portion of said second boom section and disposed in engagement with said first boom section for further supporting said second boom section for axial movement relative to said first boom section, said second boom section including longitudinally extending top and bottom walls interconnected by a pair of longitudinally extending side walls, said top, bottom and side walls having longitudinal central axes extending parallel to the central axis of said second boom section, said top wall including a pair of interconnected longitudinally extending top plate sections which extend upwardly from said side walls and intersect at a top peak between said side walls, said top plate sections having major side sur-

faces which extend at acute angles to a plane extending perpendicular to one of said side walls and which intersect at an obtuse angle at said top peak, said bottom wall including a pair of interconnected longitudinally extending bottom plate sections which extend downwardly from said side walls and intersect at a bottom peak between said side walls, said bottom plate sections having major side surfaces which extend at acute angles to a plane extending perpendicular to one of said side walls and which intersect at an obtuse angle at said bottom peak, said first slider means includes means for applying a first force to a first one of said bottom plate sections and means for



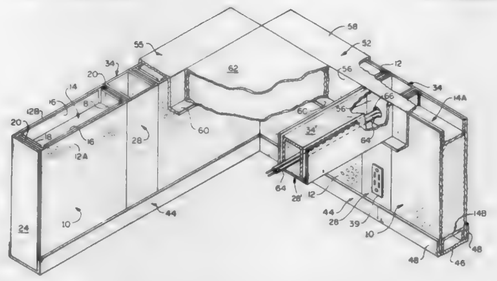
applying a second force to a second one of said bottom plate sections, said first and second forces having lines of action which intersect at a point above a plane which contains the central longitudinal axis of said second boom section and which extends perpendicular to a vertical plane, said second slider means including means for applying a third force to a first one of said top plate sections and means for applying a fourth force to a second one of said top plate sections, said third and fourth forces having lines of action which intersect at a point below the plane which contains the central longitudinal axis of said second boom section.

4,038,795
CONCRETE STORAGE TANK AND METHOD OF MAKING SAME
Ned H. Abrams, 1363 Zurich Terrace, Sunnyvale, Calif. 94087
Filed Aug. 15, 1975, Ser. No. 604,958
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—169.7 **11 Claims**



1. A tank structure comprising:
a perimeter footing forming the lower outer side limits of the tank structure;
a plurality of vertically elongated wall elements each having a generally Y-shaped transverse cross section, said wall elements being disposed consecutively along said footing and rigidly affixed thereto, each such wall element having a first leg extending in an outwardly direction relative to said footing, and second and third legs extending in generally inwardly directions relative to said footing with each angularly intersecting and being joined with a leg of an adjacent wall member to form a closed tank wall;
a tie beam tieing the tops of said wall members rigidly together and forming the upper outer limits of said tank;
a tank floor covering the area circumscribed by said footing;
an access tower disposed in a central portion of said tank structure; and
means forming a passageway extending beneath said footing and through said tower to provide means for filling and emptying said tank structure with material to be stored.

4,038,796
WALL PANEL ASSEMBLY
Alan Eckel, Westford, Mass., assignor to Eckel Industries, Inc., Cambridge, Mass.
Filed Dec. 23, 1975, Ser. No. 643,698
Int. Cl.[2] E04F *17/00*
U.S. Cl. 52—221 **19 Claims**

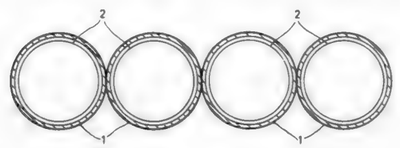


1. A modular wall assembly comprising, in combination:
at least two panels each including a substantially flat body and a tongue at each of two opposite edges extending substantially parallel to and spaced from said body so as to form a channel therebetween, said channels being open at corresponding ends thereof, along one side of each panel, said panels being aligned and oriented so that one of said opposite edges of one of the panels is in mutually confronting and spaced relationship with one of the opposite edges of another panel;
a first connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, each of said side plates extending within a corresponding one of said channels and making a snug fit with the adjacent tongue and flat body; and
a second connector member having two parallel spaced-apart side plates and a web connected to and supporting said side plates, the side plates of said second connector extending between and making a snug fit with said tongues.

4,038,797
EVACUATED THERMAL INSULATING GLAZING UNIT WITH AN INFRARED REFLECTING COATING
Wilhelm Hermann, and Horst Horster, both of Roetgen, Germany, assignors to U.S. Philips Corporation, New York, N.Y.
Filed May 5, 1976, Ser. No. 683,549
Claims priority, application Germany, May 17, 1975, 2522159
Int. Cl.[2] E04B *5/45, 2/28*
U.S. Cl. 52—306 **7 Claims**

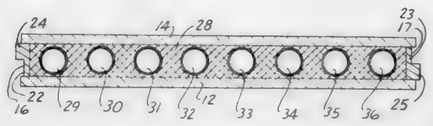
1. A thermal insulating glazing unit comprising a plurality of sealed and evacuated glass tubes having respective longitudinal axes, the tubes being covered on their respective inner sides by a light-transmitting infrared-reflecting coating and arranged

in a layer in contact with each other with their longitudinal axes parallel, whereby light may be transmitted through the



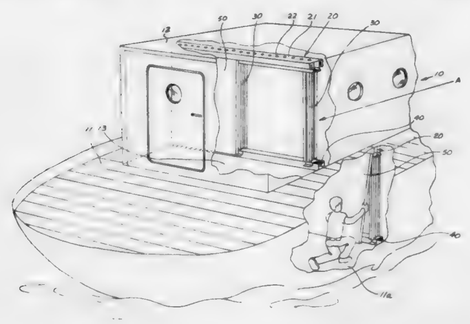
unit transverse to the longitudinal axes of the tubes while infrared energy is reflected.

4,038,798
COMPOSITE PERMANENT BLOCK-FORM FOR REINFORCED CONCRETE CONSTRUCTION AND METHOD OF MAKING SAME
Melvin H. Sachs, Farmington, Mich., assignor to U-Forms International, Inc., Livonia, Mich.
Filed Mar. 5, 1975, Ser. No. 555,535
Int. Cl.[2] E04C *1/40;* **E04B** *2/20;* **B29H** *7/20, 23/00*
U.S. Cl. 52—309.7 **16 Claims**



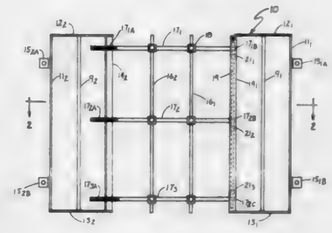
1. A block having voids adapted to act as forms for molding reinforced concrete for use in forming a reinforced concrete structure which said blocks provide the walls, comprising: a closed rectangular sheath having walls formed of a porous, non-combustible inorganic material; a central core formed of a foamed plastic adhered to the entire interior surfaces of said sheath; and central voids extending through said foamed plastic section generally parallel to the walls of said sheath.

4,038,799
JOINER BULKHEAD METHOD AND APPARATUS
Gerald R. Shanks, Somers, N.Y., assignor to Frigitemp Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 573,165, April 30, 1975. This application Aug. 20, 1975, Ser. No. 606,086
Int. Cl.[2] B63B *3/56;* **E04B** *2/28*
U.S. Cl. 52—241 **1 Claim**



1. The method for installing sub enclosures within a primary enclosure including:
1. Forming a plurality of insulated rigid panels, each having a clip element upon each of two opposed edges;
2. Forming a multiplicity of double elongated post elements, each including clip accommodation means on their opposed elongated edges;
3. Placing heat arresting blocks between said double post elements, each of which blocks is thermally and electrically insulative;
4. Fastening a footing to the floor element of the primary enclosure;
5. Fastening a header element to the overhead structure of the primary enclosure;
6. Fastening a plurality of said posts at spaced distances from one another extending between said footing and header elements;
7. Inserting a plurality of said panels with their clip edges within the clip accommodation means of said posts; and
8. Placing a plurality of ceiling panels in cooperative relationship above said wall panels.

4,038,800
ADJUSTABLE GRILLS FOR USE AS DOORS, WINDOWS, GATES OR THE LIKE
Richard John Daley, Jr., Rte. 2, Box 86B, Alexandria, La. 71301
Filed Aug. 16, 1976, Ser. No. 714,619
Int. Cl.[2] E06B *3/68*
U.S. Cl. 52—507 **7 Claims**



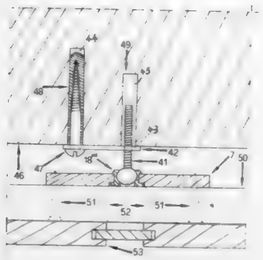
1. Apparatus constituting a grill for use as a gate, door, window or the like adjustably is fitting upon a frame to cover an opening, and which thereafter is permanently secured upon the frame by a relatively unskilled workman with ordinary household tools, which comprises
a locking bar,
a pair of flat, substantially parallelogram shaped frames constituted of vertical and horizontal members, a first frame which includes an inward vertically oriented channel member of length substantially equal to the length of the inward side of said frame and within which is mounted a plurality of spaced apart, open centered metal sections, through which the locking bar is passed, and a second frame which includes an inward vertically oriented member provided with a plurality of spaced apart internally threaded openings,
a plurality of horizontally oriented rods, one end of each of which is externally threaded and is in threadable engagement with said spaced apart internally threaded openings of said second frame. and the opposite end of each of which is provided with an eye through which said locking bar is passed to lock the horizontally oriented rods in place within the channel member of said first frame, after the horizontally oriented rods have been screwed into said spaced apart internally threaded openings of said second frame to provide the desired total width.

4,038,801

DEVICE FOR CONNECTING PARTS ON WALLS AND CEILINGS

Günter Busch, Budericher Strasse 11, 5 Cologne 60, Germany (5)

Filed Dec. 31, 1975, Ser. No. 645,872
Claims priority, application Germany, Jan. 3. 1975, 2500214; July 10, 1975, 2530854
Int. Cl.² E04B *1/38*
U.S. Cl. 52—698 **10 Claims**



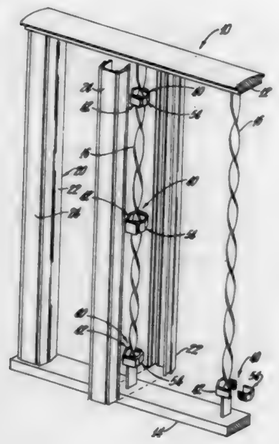
1. A device for connecting and fastening parts to walls and ceilings having a bore therein which can form any suitable angle with respect thereto, which includes in combination: a plate and a screw having said plate detachably connected thereto, said screw having a spherical screw head, and a pivot bearing provided in said plate and releasably connected with said plate, said plate being rotatably and pivotally connected by said pivot bearing relative to said screw within the region of said screw head, said plate being pivotable relative to said screw in every desired direction of movement to provide optimum possibility of adjustment regardless of positioning of the bore.

4,038,802

TUBULAR SPINDLE COVER

Jay E. Bajorek, Wadsworth, and Albert L. Newman, Cleveland Heights, both of Ohio, assignors to Questor Corporation, Toledo, Ohio

Filed May 17, 1976, Ser. No. 687,320
Int. Cl.² E04C *3/30*; B44F *7/00*
U.S. Cl. 52—731 **8 Claims**



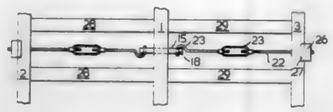
1. A tubular construction for enclosing a baluster including, in combination, mounting means on the baluster comprising pairs of interlockable elements spaced lengthwise of the baluster and in interlocked relation thereon, a pair of elongated channel-shaped mating hollow sections, said sections having recesses and ridges, the ridges and recesses being configurated for snapping interlocking engagement when the sections are assembled in mating relation, said sections in mating relation engaging and enclosing the interlocked elements and enclosing the baluster.

4,038,803

METHOD FOR STRAIGHTENING JOISTS

Siegmund Schoeller, 9 Darke Crescent, Regina, Saskatchewan, Canada (S4S 2W5)

Filed Feb. 11, 1976, Ser. No. 657,287
Claims priority, application Canada, Oct. 23, 1975, 238206
Int. Cl.² E04G *23/00*
U.S. Cl. 52—741 **3 Claims**



1. Method of staightening of a horizontally uneven floor joist made of lumber and comprised in a joist assembly, said joist assembly defining a first generally horizontal level and a second generally horizontal level, said levels being vertically spaced apart and being defined by top and bottom surfaces, respectively, of the joists comprised in said assembly, said method comprising the steps of:

a. providing said uneven joist at said first generally horizontal level with a transversely extending, generally horizontal opening having a longitudinal axis generally coincident with a vertical plane perpendicular to the longitudinal axis of the uneven joist, the said vertical plane intersecting and extreme of unevenness of the joist;

b. inserting into said opening an elongated connecting rod member, whereby the ends of the member protrude to both sides of said uneven joist, adjacent said first generally horizontal level;

c. applying tension to the rod member by subjecting its each respective end to a force directed away of the respective side of said uneven joist and towards said second generally horizontal level;

d. the application of said tension forces being effected by adjustable tension means anchored to joists of said assembly located to both sides of said uneven joist;

e. the anchoring of said tension means being effected in an area adjacent to said second generally horizontal level.

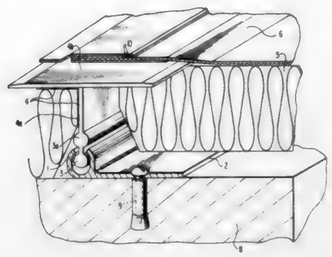
4,038,804

MOUNTING ELEMENT FOR ROOFING HAVING LOOSELY LAID SYNTHETIC RESIN FILMS

Karl Haage, Troisdorf-Spich; Helmut Thelen, Troisdorf-Friedrich-Wilhelms-Hutte, and Heinz Uedelhoven, Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Division of Ser. No. 370,694, June 18, 1973, abandoned. This application May 5, 1975, Ser. No. 574,450
Claims priority, application Germany, June 16, 1972, 2229423
Int. Cl.² E04D *1/28, 1/34, 3/36*
U.S. Cl. 52—746 **13 Claims**

1. A roofing system for covering a roof foundation comprising: at least two adjacent thermal insulating panels loosely arranged on said roof foundation and defining a space therebetween, a mounting element for mounting said thermal insulating panels to said roof foundation comprising a T-shaped panel securing means defining a generally planar connecting flange and a vertical web perpendicular to said connecting flange, and a mounting flange means connected at the base point of the T-shaped means and arranged at a right angle thereto on one side thereof, said mounting flange means being attached to said roof foundation, said T-shaped means being positioned in said space whereby said thermal insulating panels are loosely mounted to said roof foundation by said T-shaped means; and a plurality of adjoining cover sheets loosely covering said thermal insulating panels and the connecting flange of said



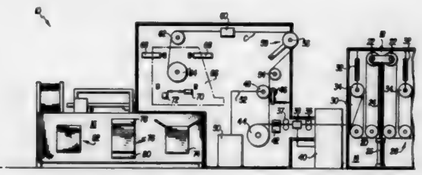
T-shaped panel securing means, adjoining cover sheets contacting one another over said connecting flange, adjoining cover sheets being secured to one another and to said T-shaped panel securing means at the connecting flange of said T-shaped panel securing means.

4,038,805

METHOD AND APPARATUS FOR COILING AND PACKAGING ELECTRICAL CABLE

James F. Holladay; R. Emory Starnes, Jr., and Alvan E. Duke, all of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 23, 1975, Ser. No. 643,921
Int. Cl.² B65B *63/04, 57/00*
U.S. Cl. 53—21 FW **11 Claims**



1. A method of coiling and packaging an electrical cable comprising the steps of:

feeding said cable to a coiling apparatus;

continuously monitoring a selected parameter of said cable during feeding of said cable to said coiling apparatus;

generating a fault signal indicative of a predetermined deviation from a standard value of the selected parameter of said cable;

continually measuring predetermined lengths of said cable;

coiling successive ones of a plurality of individual coils of said predetermined length;

positioning a package receptacle for receiving an individual cable coil;

continually severing said individual coils from said cable after coiling thereof;

transferring the individual cable coil to said package receptacle;

transferring said package receptacle containing the cable coil to a sealer unit for sealing said package receptacle;

automatically discriminating between a fault signal generated by reason of a fault in an individual coil transferred to said package receptacle and a fault signal generated by reason of a fault in a next successive coil to be wound;

transmitting said discriminated fault signal to said sealer unit; and

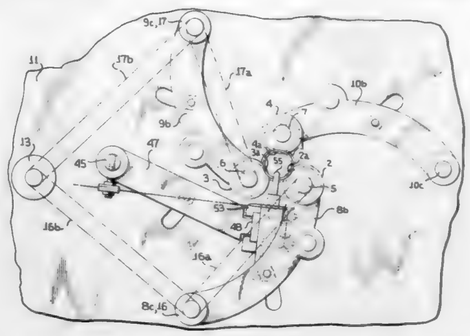
disabling the sealer unit in response to said transmitted fault signal to prevent sealing of said package receptacle only when a fault exists in the cable coil contained in said receptacle.

4,038,806

COIN PACKAGING MACHINE

Bernard Rothman, Paris; Julien G. Fiks, Le Vesinet, both of France, and Friedrich C. Bang, Bad-Wuerttemberg, Germany, assignors to Werner F. Westermann, Falls Church, Va.

Filed Nov. 12, 1975, Ser. No. 631,201
Int. Cl.² B65B *11/04*
U.S. Cl. 53—32 **11 Claims**



11. A method of stacking and packaging generally rigid disc-shaped elements of varying diameter comprising the steps of stacking, a first group of disc-shaped elements of a first diameter in a first housing having a first longitudinal slot and a first stop immovably fixedly carried thereby, feeding a web of paper generally tangentially into the first housing, moving a rotating roller having a vertical axis transversely of the first housing in the longitudinal slot toward the first group of disc-shaped elements, limiting the last-mentioned movement by the first stop, rotating the guide roller to rotate the first group of stacked disc-shaped elements and wrap the web of paper thereabout, substituting a second housing having a second longitudinal slot and a second immovably fixedly carried stop differing from said first stop for said first housing, stacking in said second housing a second group of disc-shaped elements of a second diameter differing from said first diameter, feeding a web of paper generally tangentially into the second housing, moving said rotating roller transversely of the second housing in the longitudinal slot thereof toward the second group of disc-shaped elements, and limiting the last-mentioned movement by the second stop.

4,038,807

APPARATUS FOR PACKAGING AND THE LIKE

Paul G. Beardsley, Gobles, and Albert W. Patzlaff, Holland, both of Mich., assignors to Blueberry Equipment, Inc., South Haven, Mich.

Filed Oct. 17, 1975, Ser. No. 623,463
Int. Cl.² B65B *1/06, 7/28*
U.S. Cl. 53—282 **16 Claims**

1. An apparatus for packaging produce such as berries and the like in a slotted container, comprising:

a main support frame;

a conveyor mounted on and extending the length of said support frame;

a stack retaining and denesting means mounted at one end of said main support frame above said conveyor for retaining a stack of the slotted containers and for separating the lowermost container of the stack and depositing the container on the conveyor;

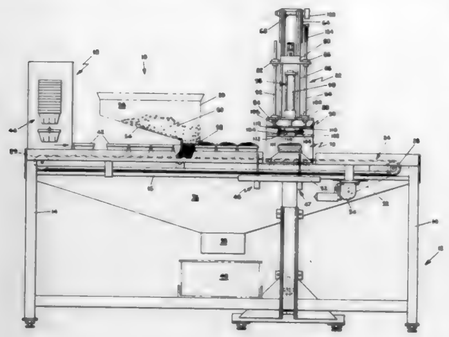
a dispenser mounted above said conveyor and spaced from said denesting means, said dispenser adapted to fill each container positioned on said conveyor with produce;

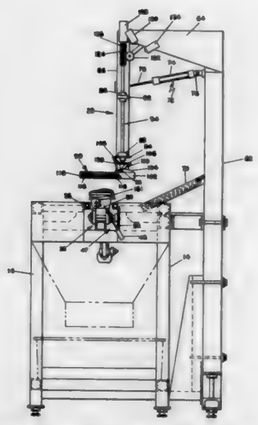
a cover wiping means supported above and adjacent said

conveyor and spaced from said dispenser for wiping a wrapper down and around a filled containe, said stack retaining and denesting means comprising:

a pair of spaced support members;

a magazine secured to said spaced support members for retaining a vertical stack of bottom corner-slotted containers, said magazine having an open bottom exposing the lower portion of the lowermost container in the stack; separating means supported on said support members for reciprocating movement for lifting the stack of containers from the lowermost container and depressing the lowermost container away from the remainder of the stack to separate it and deposit the container on said conveyor, wherein said magazine further includes rim engagement lugs pivotally supported relative to said magazine and said stack of containers, said lugs engageable with the top rim of the bottom container of the stack; and





means biasing said lugs to a stack retention position, said lugs being shiftable against the bias of said biasing means to a container release position by depressing the lowermost container and raising the stack of containers with said separating means.

11. A cover pick-up and applicator assembly for picking up and wiping a flexible cover over a filled container, comprising:

a container support;

a cover holder disposedadjacent said container support containing a supply of covers;

a cover pick-up and applicator means mounted for movement between said cover holder and a position above a filled container disposed on said container support, said pick-up and applicator means including means for temporarily retaining the cover thereon and means for peripherally placing the cover around the outer periphery of the container;

first power means operatively connected to said pick-up and applicator means for shifting said pick-up and applicator means between said cover holder and said container support;

second power means operatively connected to said pick-up and applicator means for shifting said cover pick-up and applicator means down around the outer periphery of the container; and wherein said cover pick-up and applicator means includes a wiper plate having a rectangular central opening matching the container configuration and wherein said means for temporarily retaining a cover thereon includes said plate having internal passages terminating in openings at the undersurface of said plate, said openings being in communication with a vacuum source.

4,038,808

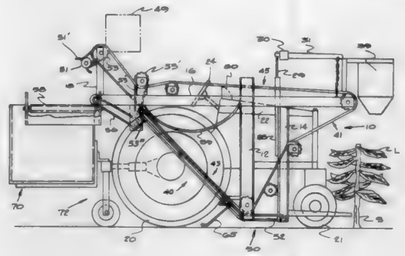
TOBACCO HARVESTER

Frank C. Patten, and John G. Alphin, both of Florence, S.C., assignors to Clemson University, Clemson, S.C.

Filed Oct. 16, 1975, Ser. No. 622,906

Int. Cl.[2] A01D *45/16*

U.S. Cl. 56—27.5 **27 Claims**



1. Apparatus for removing leaves from free standing plant stalks comprising:

a. endless defoliating means having a downward inclined front portion, said front portion being divided into at least a first inclined section at a predetermined angle with respect to horizontal and a second inclined portion at a second, larger angle with respect to horizontal, said defoliating means having a plurality of longitudinally spaced apart stalk-receiving and leaf-removing apertures;

b. a mobile frame for supporting said defoliating means; and

c. means for moving said defoliating means so that horizontal velocity of said apertures across said complete first inclined portion is approximately equal and opposite to the velocity of said mobile frame, the horizontal velocity of said first section being greater than the horizontal velocity of said mobile frame whereby relative rearward motion tends to stabilize the plant and the second section of said first inclined portion moves at a horizontal velocity less than said first section, apertures in said second section moving downwardly over said stalks and removing leaves therefrom.

4,038,809

CROP GATHERING APPARATUS FOR GRAIN CROP HARVESTERS

Jean Arnould, Paris; James B. McNaught, St. Germain-en-Laye, and Jose Andiano, Morsang, all of France, assignors to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

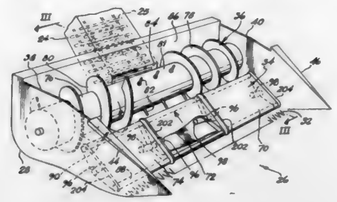
Filed Dec. 17, 1975, Ser. No. 641,706

Claims priority, application United Kingdom, Dec. 20, 1974, 55246/74

Int. Cl.[2] A01D *41/06*

U.S. Cl. 56—124 **5 Claims**

1. A crop gathering table for a combine harvester including a table frame, an auger trough mounted on the rear portion of the frame and extending the length of the table, a rear table wall extending upwardly from the rear portion of the auger trough, an end wall mounted on each end of the frame and connected to the auger trough and each end of the rear table wall, an auger rotatably journaled on the end walls and extending from one end wall to the other end wall above the auger trough, drive means to drive the auger to convey material from each end of the table to the center, an aperture in the center portion of the rear table wall, conveyor means on the center portion of the auger for feeding crop material through the aperture in the center portion of the rear table wall, a reciprocating knife mounted on the front portion of the table frame and extending from one end wall to the other end wall, and a conveyor belt mechanism mounted on the table frame between the reciprocating knife and the auger for conveying crop material from the knife to the auger, the conveyor belt mechanism including at least two roller support members attached to the table frame, a rear end roller rotatably journaled on the rear



portion of the roller support members, a front end roller rotatably journaled on the forward portion of the roller support members, at least one conveyor belt trained around the front end roller and the rear end roller with an upper crop material conveying run and a lower return run, and a pair of guide rollers attached to an adjustable mounting structure on the roller support members between the upper and lower runs of the conveyor belt with one guide roller engaging the upper surface of each free edge of the lower run of the conveyor belt, the adjustable mounting structure for each guide roller includes a guide roller support shaft with one end pivotally attached to a frame member attached to at least one of the roller support members and adjusting means attached to one of the roller support members and to the other end of the guide roller support shaft to move the other end of the guide roller support shaft generally up and down and thereby adjust the downward deflection of the outer edge of the lower run of the conveyor belt.

4,038,810

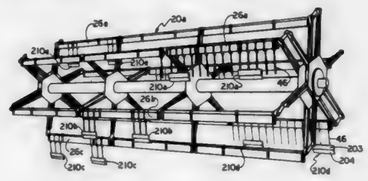
CROP HARVESTING MACHINE WITH IMPROVED PICKUP REEL ASSEMBLY

Millard M. Williams, Celina, and John W. Arnold, Coldwater, both of Ohio, assignors to Avco Corporation, Coldwater, Ohio

Continuation-in-part of Ser. No. 614,396, Sept. 18, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,592

Int. Cl.[2] A01D *57/02*

U.S. Cl. 56—220 **6 Claims**



1. In combination with a grain and bean harvesting machine of the type intended for transverse mounting in front of a mobile thresher and including a main supporting frame, a contoured horizontal platform supported from the lower part of said frame, a cutter bar assembly flexibly mounted to the leading edge of said horizontal platform, a rotating cross auger supported on said frame at the rear of said platform, a feeder conveyor supported on said frame aft of said auger, said conveyor providing for the transfer of crop cuttings from said auger to said mobile thresher, and a reel assembly rotatably mounted on adjustable arms supporting said reel from said frame above said horizontal platform adjacent the front thereof, with said reel assembly having a plurality of bat sections along its periphery, each of said bat sections carrying a multiplicity of reel tines for picking up down grain, the improvement which comprises:

a plurality of flexible flaps, each comprising a sheet of flexible material, and

means connecting said flaps to selected ones of a small fraction of said tines, said flaps being longitudinally spaced and angularly staggered on said bats, the spacing and staggering of said flaps providing for the sweeping of substantially the entire width of said platform, the outward extending edges of said flexible flap sections, which are connected to the tines occurpying the lowest horizontal position, contacting the contoured horizontal platform over which said reel assembly rotates whereby loose kernels of grain are brushed into said rotating cross auger at least once per each revolution of said reel assembly.

4,038,811

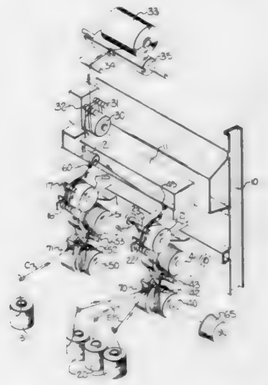
APPARATUS FOR CONTINUOUSLY DRAWING AND TEXTURING CORE AND EFFECT YARNS

Joseph L. Ansin, Lowell, Mass., and Stephen C. Harris, East Greenwich, R.I., assignors to Joan Fabrics Corporation, Lowell, Mass.

Filed Aug. 31, 1976, Ser. No. 719,122

Int. Cl.[2] D02G *1/18, 3/24;* D01H *13/28, 5/74*

U.S. Cl. 57—34 B **4 Claims**



1. An apparatus for continuously drawing and texturing synthetic thermoplastic yarn by a texturing jet, said apparatus comprising

a. a supply of core yarn,

b. a plurality of separate supplies of individual undrawn effect yarns,

c. a texturing jet spaced from said core and effect yarn supplies,

d. first guide means for directing the individual effect yarns from said supplies and into said jet, said first guide means including positive feed roll means positioned in advance of said jet for feeding the individual effect yarns into said jet at a predetermined rate,

e. second guide means for directing the core yarn from said supply into said jet, said second guide means including

positive feed roll means positioned in advance of said jet for feeding the core yarn into said jet at a lesser rate than the individual effect yarns are fed into said jet,

f. yarn drawing means positioned between said supplies of the effect yarns and said jet for drawing the individual effect yarns prior to entry of the effect yarns into said jet,

g. means for varying the draw of the effect yarns, said draw varying means including replacement hubs for said heated draw rolls of different outer diameters to change the ratio of draw of the effect yarns,

h. yarn take-up means spaced from said air jet, and

i. guide means for directing the core and effect yarns from said jet to said yarn take-up means, said guide means including positive feed roll means positioned between said jet and said yarn take-up means for withdrawing both the core and effect yarns from said jet at the same rate.

4,038,812

OPEN-END SPINNING MACHINE HAVING SPINNING UNITS WITH REMOVAL OPENING FOR IMPURITIES

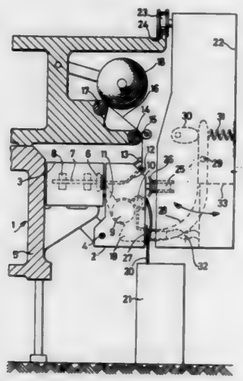
Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany

Filed Dec. 2, 1975, Ser. No. 636,832

Claims priority, application Germany, Dec. 11, 1974, 2458538

Int. Cl.[2] D01H *11/00, 1/12*

U.S. Cl. 57—56 **27 Claims**



1. An open-end spinning machine having a plurality of spinning units arranged one next to the other, each of said spinning units having supply and opening means with a removal opening for impurities in the area of an opener roller, each of said removal openings being followed by a collection chamber for said impurities, each of said collection chambers having a connection opening for exhausting means, said exhausting means being arranged on a maintenance unit travelling along said open-end spinning machine and containing means for advancement to said connection opening.

4,038,813

SPINNING OF TWISTLESS YARNS BY WET DRAFTING

Sydney Allan Heap, Marple, England, and Willem Jacobus Naarding, Stad Delden, Netherlands, assignors to International Institute for Cotton, England

Filed Mar. 24, 1976, Ser. No. 670,207

Claims priority, application United Kingdom, Mar. 25, 1975, 12331/75

Int. Cl.[2] D02G *3/40*

U.S. Cl. 57—153 **15 Claims**

1. A continuous process for the spinning of twistless yarn from staple fibres which comprises the steps of:

a. drafting a sliver or roving containing not more than 80% by weight, based on the weight of fibre, of a liquid containing a dispersed potential binding agent, said liquid containing a dispersed potential binding agent having a surface tension no greater than about 50 dyne/cm and a viscosity no greater than about 10 cp, the size of the particles of the potential binding agent being no greater than the average fibre diameter,

b. consolidating the drafted sliver or roving,

c. rendering the potential binding agent adhesive,

d. drying the yarn, and

e. winding the yarn.

15. Twistless yarn whenever made by a process as claimed in claim **1.**

4,038,814

WRISTWATCH STRUCTURE

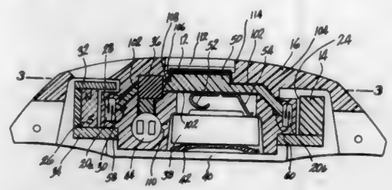
Yutaka Niida, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1976, Ser. No. 659,024

Claims priority, application Japan, Feb. 18, 1975, 50-20035

Int. Cl.[2] G04B *19/30; G04C 3/00*

U.S. Cl. 58—23 R **9 Claims**



1. An electronic watch comprising:

a crystal vibrator which generates electric pulses;

an electronic circuit which includes an oscillator circuit with said vibrator and a divider which converts said pulses into signals suited for being displayed;

a display device which makes said signals visible;

a battery for powering said crystal vibrator, electronic circuit and display device;

at least two magnetic-sensitive switch means for controlling said electronic circuit and said display device; and

a magnet arranged in a rotatable shaft which has a crown such that when said crown is rotated, said magnetic-sensitive switch means are selectively operated by said magnet.

4,038,815

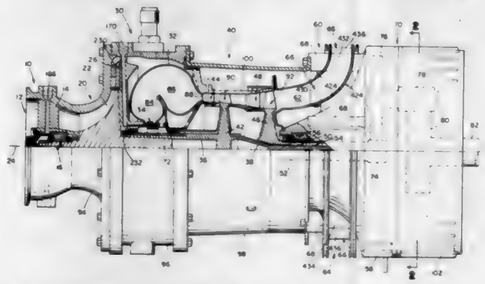
GAS TURBINE

Arnold M. Heitmann, Swampscott; Walter L. Brassert, Belmont, and Donald B. Chouinard, Peabody, all of Mass., assignors to Northern Research and Engineering Corporation, Cambridge, Mass.

Continuation of Ser. No. 346,651, March 30, 1973, abandoned. This application June 4, 1975, Ser. No. 583,793

Int. Cl.[2] F02C *3/10, 7/06, 7/22*

U.S. Cl. 60—39.08 **25 Claims**



1. A gas turbine comprising housing structure,

a rotatable unit disposed within said housing structure, said rotatable unit including a compression component and an expansion component,

a toroidal combustion chamber disposed between said compression and expansion components, said gas turbine having a gas flow path serially through said compression component, said combustion chamber, and said expansion component, a shroud of ceramic material surrounding said expansion component, said shroud having an annular surface portion,

and support structure that has a coefficient of thermal expansion that is substantially greater than the coefficient of thermal expansion of said shroud and substantially the same as the coefficient of thermal expansion of said housing structure, said support structure including a ring portion surrounding and applying compressive force to said annular surface of said shroud, and a cantilever support portion extending axially from said ring portion and connected to said housing structure, said support structure maintaining concentricity between said shroud and said expansion component over the range of operating conditions of the gas turbine with said ring portion maintaining compressive force on said annular surface of said shroud and the change in dimensional values of said cantilever support portion corresponding to the change in dimensional values of said housing structure over said operating range.

4,038,816

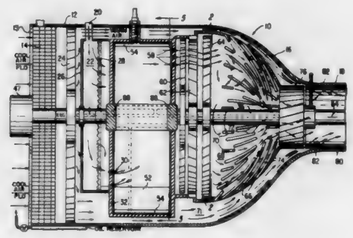
ROTARY ENGINE AND TURBINE ASSEMBLY

Charles H. Wright, P.O. Box 367, Sand Hill, Miss. 39161

Division of Ser. No. 488,990, July 16, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,370

Int. Cl.[2] F02C *7/02, 7/18*

U.S. Cl. 60—39.17 **3 Claims**



1. An apparatus comprising:

an outer housing;

an inner housing disposed in said outer housing;

a turbine disposed in said inner housing;

a chamber disposed in said outer housing downstream of said inner housing and in fluid communication with said turbine;

discharge means mounted downstream of said chamber for discharging gases therefrom;

said outer housing having a wall portion spaced from said inner housing and said chamber to define an air duct, said air duct being in fluid communication with said chamber;

means for introducing high pressure gases into said turbine; whereupon the gases pass through said turbine into and through said discharge means;

a plurality of elongated tubular nozzles being directed into said chamber to establish said fluid communication with said air duct, said nozzles comprising at least a first set of relatively short tubular nozzles projecting into said chamber and a second set of relatively longer tubular nozzles projecting into said chamber, said longer nozzles being disposed downstream from said shorter nozzles, said nozzles having inlets which lie in fluidic flow cooperation with said air duct and outlets which direct the incoming air toward said discharge means, said inlets being flush with the wall of said chamber and said outlets being disposed predetermined varying distances within said chamber;

means for introducing air into said air duct whereupon at least a portion of the air enters said chamber through said nozzles, said air mixing with the gases discharged into said chamber from said turbine and discharging through said discharge means in admixture therewith.

4,038,817

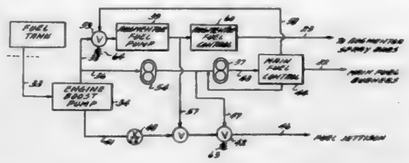
FUEL JETTISON SYSTEM

Barton H. Snow, and Donald F. Sargisson, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed June 2, 1975, Ser. No. 582,606

Int. Cl.[2] F02K *3/08;* F02C *7/22*

U.S. Cl. 60—204 **13 Claims**



1. An improved fuel jettison system for an aircraft jet engine of the type having a main fuel line and a fuel supply pump for pumping fuel to the engine, wherein the improvement comprises:

a. pipe means connected to the discharge end of the pump to provide for the overboard discharge of fuel during certain periods of flight;

b. valve means placed within said pipe means to selectively regulate the discharge flow of fuel; and

c. means responsive to a predetermined pressure in the main fuel line of the engine to activate the valve means for selective operation.

4,038,818

GAS TURBINE POWER PLANT HAVING SERIES-PARALLEL VALVE ARRANGEMENT

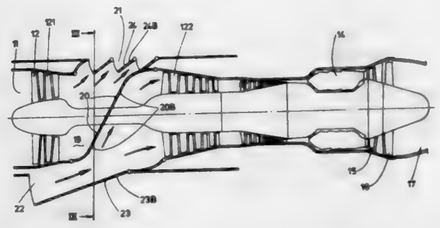
Leonard Stanley Snell, Bristol, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed May 22, 1973, Ser. No. 362,682

Claims priority, application United Kingdom, May 25, 1972, 24662/72

Int. Cl.[2] F02K *3/06*

U.S. Cl. 60—226 R **2 Claims**



1. A gas turbine powerplant comprisihng a gas turbine engine having a casing; a compressor located within said casing, said compressor having an upstream part and a downstream part, valve means disposed between said upstream and downstream compressor parts; a combustor located downstream of and in flow series with the downstream part of said compressor; turbine means in flow series with said combustor and arranged to drive said compressor; an exhaust nozzle arranged to receive the turbine exhaust and a bypass duct arranged for discharge to atmosphere, wherein

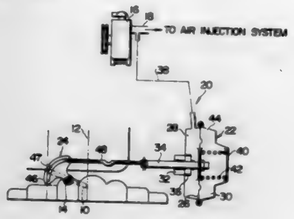
said valve means has two alternative positions and further wherein the valve means comprises a first flap means hinged at its upstream end and arranged to form part of the casing in said first position and to pivot inwardly to said second position, and a second flap means hinged at its downstream end and arranged to form part of the casing in said first position and to pivot inwardly to the second position, and wherein in the first position the flap means are disposed for directing the delivery of the upstream part of the compressor into the downstream part of the compressor, and, in the second position the flap means are disposed for directing the delivery of the upstream part of the compressor into the bypass duct while simultaneously directing ambient air into the downstream part of the compressor.

4,038,819

THROTTLE OPENER

Eiji Yoshikawa, and Tsuneo Kobayashi, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 26, 1974, Ser. No. 536,599
Claims priority, application Japan, June 10, 1974, 49-65087
Int. Cl.[2] F02B *75/10*
U.S. Cl. 60—307 **3 Claims**



1. A throttle opener for use in controlling the opening of a throttle valve of a vehicle engine having an air injection device to enhance the burning of an air-fuel mixture, comprising: an air pump for delivering air to the air injection device; a diaphragm apparatus including a diaphragm member movable in response to the delivery pressure from said air pump to maintain the opening of the throttle valve soon after deceleration of the vehicle and reduce the opening to an idling opening in accordance with the vehicle speed; said diaphragm apparatus including a casing which is divided into a first chamber and a second chamber by said diaphragm member, said first chamber being provided with a bearing member having an opening, and a bellows member around the opening of said bearing member within said first chamber for making it airtight; a shaft member forced to move by movement of said diaphragm member; a link member connected at one end to said shaft member and provided at the other end with a guide pin member; an arm member having a groove or slot in the form of a circular arc therein for guiding said guide pin member; and means for fixing said arm member to said throttle valve.

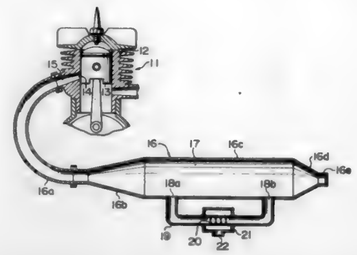
4,038,820

TWO-CYCLE ENGINE WAVE INTERFERENCE MUFFLER MEANS

Magohei Tsukamoto, Iwata, Japan, assignor to Yamaha, Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 18, 1974, Ser. No. 534,082
Claims priority, application Japan, Dec. 25, 1973, 49-3768
Int. Cl.[2] F02B *27/02*; F01N *1/06*
U.S. Cl. 60—314 **7 Claims**

1. Means to discharge and silence the exhaust from an internal combustion engine having one end connected with exhaust port means of the engine to receive the exhaust gases therefrom, the other end being closed, said means including a first portion of substantially constant cross-sectional area which extends from said first end, a second portion connected to and receiving the exhaust gases from said first portion and having a cross-sectional area which increases as the second portion extends away from the first portion, and third portion having a substantially uniform cross-sectional connected to and receiving the exhaust gases from said second portion, closure means closing the other end of said third portion, and exhaust gas



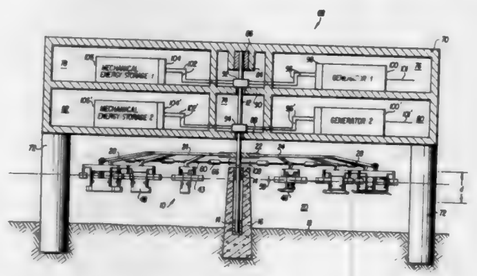
outlet port means from said third portion spaced apart from the closure means and from the second portion, no part of the first portion overhanging the said exhaust gas outlet port means, said outlet port means comprising a plurality of axially spaced outlet ports which are connected together through conduit means having further opening means for exhaust of said gases.

4,038,821

FLUID CURRENT MOTOR

Jerimiah B. Black, 2065 Church Creek Drive, Charleston, S.C. 29407

Filed Feb. 12, 1976, Ser. No. 657,460
Int. Cl.[2] F03B *7/00, 9/00*
U.S. Cl. 60—398 **14 Claims**



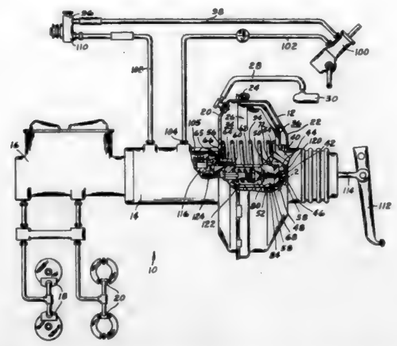
1. A fluid current motor comprising:
a base;
a vertical shaft supported by said base;
a hub mounted on said shaft and rotatable about the axis thereof;
a plurality of spokes extending radially from said hub; and
a plurality of fluid reaction blades each having a first fluid reaction surface and mounted adjacent the end of a respective spoke, each blade being pivotable between a substantially vertical position wherein a fluid current imparts a force to the blade to rotate said hub and a substantially horizontal position wherein the fluid current imparts substantially no force to the blade, each blade further including means for hydrodynamically urging the blade between its vertical and horizontal positions when the first fluid reaction surface thereof is oriented substantially in the direction of flow of the fluid current.

4,038,822

FASTENER MEANS FOR CONNECTING A CYLINDRICAL BODY TO A HUB MEANS

Harley J. Dodge, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Dec. 22, 1975, Ser. No. 642,930
Int. Cl.[2] B60T *13/20*
U.S. Cl. 60—554 **4 Claims**



1. In a power brake apparatus having a wall means moved by a pneumatic pressure force and a piston means jointly moved by a hydraulic pressure force and said wall means to develop an output force, fastener means for connecting the piston means to the wall means; and fastener means comprising:
cylindrical means having a first end secured to said piston means and a second end, said cylindrical means having an oval groove on the outer peripheral surface thereof and located adjacent the second end;
hub means connected to said wall means, said hub means having an axial bore therein with a first slot and a second slot extending along the axial bore for a predetermined distance, said first slot having a first recess on the end thereof, said second slot having a second recess on the end thereof; and
connecting means including a first clip means mounted in said oval groove of the cylindrical means and having a first tab located in said first recess and a second clip means mounted in said oval groove of the cylindrical means and having a second tab located in said second recess for connecting the cylindrical means to the hub means while allowing said cylindrical means a predetermined amount of linear movement with respect to said hub means to permit a reactionary force applied to the wall means from the piston means to be freely transmitted therethrough to resist an operator input force.

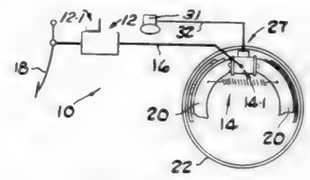
4,038,823

METHOD OF BLEEDING A HYDRAULIC SYSTEM AND MEANS THEREFOR

Jacob Johan Mostert, Muldersdrift, South Africa, assignor to Reverse Injection Company (Proprietary) Limited, Johannesburg, South Africa

Filed Oct. 21, 1975, Ser. No. 624,457
Claims priority, application South Africa, Oct. 21, 1974, 74/6675; Feb. 28, 1975, 75/1285
Int. Cl.[2] F15B *7/10*; B60T *11/30*
U.S. Cl. 60—584 **12 Claims**

1. In an hydraulic system comprising a master cylinder and piston assembly, a servo cylinder and piston assembly, and a hydraulic line connecting the master cylinder to the servo cylinder for operatively conducting hydraulic fluid between the cylinders, the method of bleeding the system, which includes the steps of connecting a hydraulic fluid line to the servo cylinder, of introducing hydraulic fluid into the servo cylinder along a closable feed passage to cause flow of hydraulic fluid along the feed passage into and through the servo cylinder and along the hydraulic line to the master cylinder and of thereafter closing the feed passge at the servo cylinder,



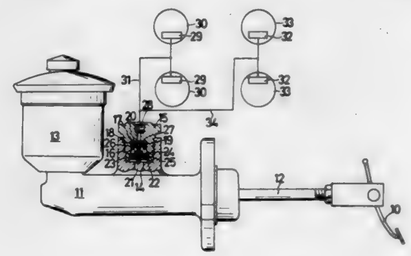
and of disconnecting the hydraulic fluid feed line from the servo cylinder.

4,038,824

FLOW CONTROL APPARATUS OF MASTER CYLINDER

Toshiaki Okamoto, Chiryu; Yoshihisa Kato, Nagoya, and Masashi Ban, Kariya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Filed June 30, 1975, Ser. No. 591,832
Claims priority, application Japan, July 9, 1974, 49-81461[U]
Int. Cl.[2] F15D *1/10*
U.S. Cl. 60—591 **3 Claims**



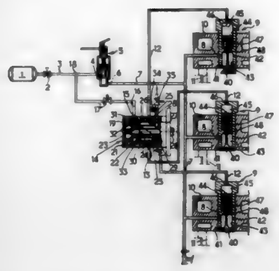
1. A flow control apparatus of a brake master cylinder, including the wheel cylinders, comprising:
an outlet port formed in said master cylinder being fluidically communicated with each of said wheel cylindrs;
a plug threadably secured into said outlet port so as to prevent flow about the threaded periphery of said plug between said plug and said outlet port;
a valve chamber formed within said plug and having an opening therefrom hydraulically connected to said wheel cylinders;
a flow control valve including a flat portion having an oil passage therethrough and a plurality of projecting portions on the end surface thereof facing said valve opening and being slidably disposed within said valve chamber, said projecting portions being arranged to contact the inner wall of said plug in which said valve chamber opening is formed so as to provide a stop for limiting movement of said valve in the direction of said valve opening wherein said flat portion of said valve is maintained spaced from said inner wall of said plug to provide a gap therebetween;
a spring retainer having a pluralty of oil passages therethrough being fixed into said plug by pressing; and
a compression spring interposed between said flow control valve and said spring retainer for urging said flow control valve in a direction toward said valve chamber opening so as to contact said projecting portions of said flow control valve with the inner wall of said plug.

4,038,825

PNEUMATIC METHOD AND DEVICE FOR DIESEL ENGINE BRAKING AND RESTARTING IN THE REVERSE DIRECTION

Dirk Bastenhof, Eaubonne, and Alain Devaux, Saint Mande, both of France, assignors to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Sept. 22, 1975, Ser. No. 615,367
Claims priority, application France, Sept. 26, 1974, 74.32495
Int. Cl.[2] F02N *9/04*
U.S. Cl. 60—631 **8 Claims**



1. A method of pneumatically braking a running, reversing engine having a plurality of cylinders at least some of which are provided with permanently intercommunicating individual starting air valves which are selectively simultaneously supplied with and cut off from main starting air pressure and which are alternately opened and closed during each normal engine starting period for allowing and discontinuing admission of said main starting air pressure therethrough to the cylinders; an engine-driven cam means for each cylinder, which cam means is selectively shiftable between a forward-run cam-operative position and a reverse-run cam-operative position, said method comprising braking said engine in two successive stages and comprising (a) a first stage of (1) keeping the main starting air pressure shut off from said starting air valves; (2) cutting off fuel supplied to said cylinders; (3) shifting said cam means to a position for running said engine in the reverse direction; (4) causing said starting air valves to open in a proper sequence and time relation to the cycle of the cylinders and preventing the starting air valves from being closed so as to remain open for a major part of said first stage in order to brake the operation of said engine through the mutually opposing air-pumping work of the engine cylinders which communicate with each other through their starting air valves having remained open; (5) allowing the engine to slow down to a particular rotational speed at which the braking by the admission of main starting air pressure to said cylinders in their normal reverse starting sequence becomes more effective than the braking by said air-pumping work; and (b) a second stage of (1) allowing said starting air valves to close and to resume their normal sequential operation; and (2) feeding main starting air pressure simultaneously and continuously to all of said starting air valves at least until said engine is stopped.

4,038,826

SOLAR ENERGY SYSTEM UTILIZING BUOYANCY AS A CONVERSION FORCE

John S. Shaw, 1812 E. Marlette, Phoenix, Ariz. 85016

Filed Mar. 3, 1975, Ser. No. 554,463
Int. Cl.[2] F03G *7/06*
U.S. Cl. 60—641 **6 Claims**

1. a unitized mechanism utilizing the buoyancy effect of gas in liquid for generating mechanical shaft energy comprising:

a substantially vertically positioned water containing rotatable column mounted on a base and having a bottom and a top.

an endless conveyor mounted in said rotatable column longitudinally thereof on a pair of spaced sprockets and having a plurality of similarly arranged cups spacedly positioned along said conveyor for rotation around a fixed path,

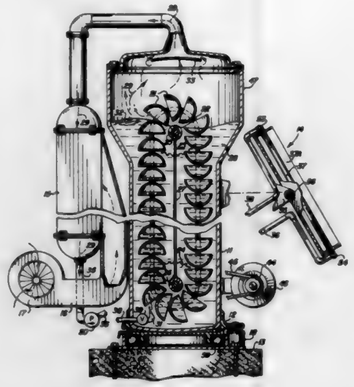
said cups being inverted when moving from the bottom to the top of said rotatable column,

means for injecting a pressurized heated gas sequentially into each of said cups at substantially the base of said rotatable column while said cups are achieving their inverted position,

said gas comprising a hydrocarbon in its gaseous

said heated gas expanding in each of said cups to rotate said conveyor in a given direction from the bottom to the top of the column around its fixed path thereby driving said sprockets and generating useful rotative movement,

a condenser connected to the top of said rotatable column for receiving said gas spilled from said cups at the top surface of the water,



said condenser cooling and liquifying said gas, means for pressurizing and heating the liquified gas comprising a solar collector having an array of fluid conducting tubes arranged adjacent a reflecting surface,

said solar collector being horizontally pivotally mounted on said rotatable column for optimum exposure to solar rays,

means for throttling said pressurized heated liquid for controlling it and to transfrom it into a gaseous state for injecting into said cups,

pressurizing means for conducting the liquified gas through the tubes of said collector to heat it prior to gasification and injection into each of said cups, and

means for rotating said rotatable column and said collector to follow the sun in two planes of motion for optimum focal absorption of solar radiation.

4,038,827

PILE

John Fordham Speaight Pryke, Broxbourne, England, assignor to Pynford Limited, London, England

Filed Mar. 26, 1976, Ser. No. 671,021
Claims priority, application United Kingdom, July 25, 1975, 31323/75
Int. Cl.[2] E02D *5/34*
U.S. Cl. 61—53.62 **17 Claims**

1. A pile comprising:

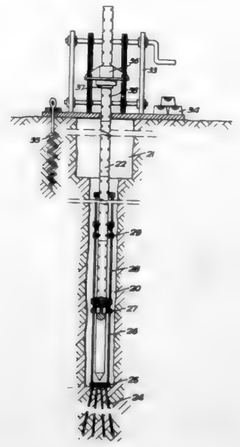
a. an elongated columnar body extending into a hole in the ground that approximates the size and shape of said columnar body,

b. a first plurality of elongated elements extending axially within said body,

c. said first plurality of elongated elements projecting downwardly beyond said columnar body through the bottom of the hole and into the ground,

d. a second plurality of elongated elements extending outwardly and downwardly from the side of the pile body and into the ground surrounding the pile,

e. each one of said first and second plurality of elongated elements having a smaller cross-sectional area than said columnar body, and



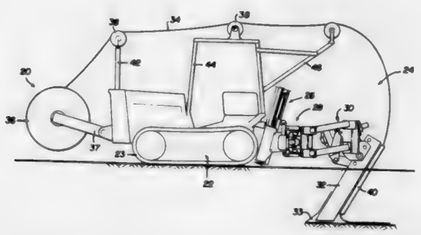
f. said columnar body being formed of a cast in situ material that has the ends of said first and second plurality of elongated elements embedded therein.

4,038,828

VERTICAL LIFT AND CONTROL FOR PLOWS

Paul R. Schuck, Daven Port, and John M. Baylor, Bettendorf, both of Iowa, assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 12, 1976, Ser. No. 648,426
Int. Cl.[2] B63B *35/04;* **E02F** *5/02*
U.S. Cl. 61—72.6 **5 Claims**



1. A cable laying plow for laying cable, pipe and the like underground comprising:

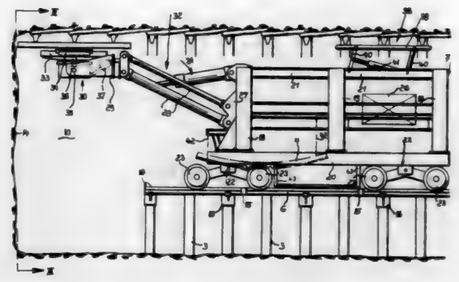
a vehicle, a mast assembly including a support frame pivotally connected to said vehicle, a pair of laterally spaced generally vertical rails supported on said frame assembly including a top end plate interconnecting said rails and a slide frame slideably mounted on said rails including two opposed frame members each slideably mounted on one of said rail a generally vertical plow blade operably supported on said slide frame including a cable guide means for feeding cable, pipe and the like into the cut made by said blade, a fluid operated piston having an extensible piston rod interconnected between said support and slide frames adapted to raise and lower said slide frame and blade relative to said vehicle and an extensible fluid piston means pivotally connected to said vehicle and to said support frame spaced from the pivotal connection to said vehicle, said piston means adapted to adjust the tilt angle of said mast assembly relative to said vehicle and thereby the angle of said plow blade.

4,038,829

METHOD OF AND APPARATUS FOR LINING A TUNNEL

Dieter Moebus, Bochum; Werner Mennekes, Altlunen-Wethmar, and Rudi Podjadtke, Bochum, all of Germany, assignors to Bochumer Eisenhutte Heintzmann & Company, Bochum, Germany

Filed Sept. 21, 1976, Ser. No. 725,194
Claims priority, application Germany, Sept. 25, 1975, 2542778
Int. Cl.[2] E01G *5/00*
U.S. Cl. 61—84 **28 Claims**



1. A tunneling method comprising the steps of:

a. assembling on one assembly pallet the upper part of a tunnel-lining arch in a tunnel at an assembly location remote from the tunnel face;

b. thereafter transporting said one assembly pallet and the assembled upper part thereon to the tunnel face and positioning the upper part against the tunnel roof;

c. thereafter securing lower parts of the lining arch to the upper part positioned against the roof while holding said upper part in place with said one pallet;

d. assembling another upper part of another lining arch at said assembly location on another assembly pallet simultaneously with steps (b) and (c); and

e. thereafter transporting said one pallet back to said assembly location and picking up said other pallet with said other upper part and repeating steps (b) and (c) with said other pallet and said other upper part and repeating steps (d) with said one pallet.

4,038,830

MODULAR GEOMETRIC OFFSHORE STRUCTURES SYSTEM

Maurice N. Sumner, 1718 Lubbock, Houston, Tex. 77007

Continuation-in-part of Ser. No. 539,301, Jan. 8, 1975, which is a division of Ser. No. 243,790, April 13, 1972, Pat. No. 3,874,180, which is a continuation-in-part of Ser. No. 107,288, Jan. 18, 1971, Pat. No. 3,716,993, which is a continuation-in-part of Ser. No. 649,889, June 29, 1967, Pat. No. 3,575,005. This application Apr. 7, 1975, Ser. No. 565,860
Int. Cl.[2] E02B *17/00*
U.S. Cl. 61—89 **7 Claims**

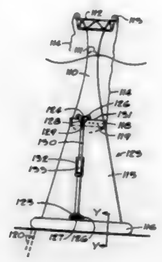
1. An offshore marine structure comprising

a pile array receiving means,

a pile lead means, movably associated about said pile array receiving means, said pile lead means being pivotally attached for indexing arcuately about an axis, said axis being near the closest approach of the center of said pile array receiving means,

means operably associated with said pile lead means for

indexing said pile lead means about said pile array receiving means, and



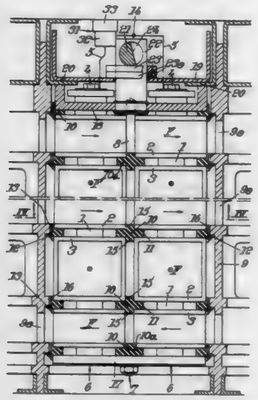
submerged pile driving means operatively connected to said pile lead means.

4,038,831

THERMOELECTRIC INSTALLATIONS

Gerard Gaudel, Pont-a-Mousson, and Robert Krafft, Ermont, both of France, assignors to Air Industrie, Courbevoie, France

Filed June 22, 1976, Ser. No. 698,345
Claims priority, application France, June 27, 1975, 75.20343
Int. Cl.[2] F25B *21/02*
U.S. Cl. 62—3 **25 Claims**



1. In a thermoelectric installation, particularly a heat pump, including thermoelements mounted between thermal exchange walls belonging to hot exchangers through which a hot fluid circulates and cold exchangers through which a cold fluid circulates, said hot and cold exchangers alternating with thermoelements to form batteries arranged side by side or imbricated in such a way as to constitute a drawer of parallelepipedal appearance in which the thermoelements are arranged in parallel planes and the exchangers facing each other, the elements constituting said drawer being held together by means of attachment and protected by a framework, the improvement consisting in

a joint provided in each plane of thermoelements, this joint being constituted by a plate including the same number of apertures as there are thermoelements in said plane, this joint being nipped between the facing walls of the hot exchanger and of the cold exchanger and including, in addition, a peripheral rim acting in conjunction over the whole or part of its length with a bearing surface formed in the framework,

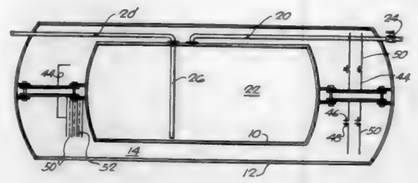
and a displacement mechanism producing a relative displacement between the drawer and the framework, this relative displace allowing either the putting of the peripheral rim of each joint into sealing contact with the corresponding bearing surface of the framework, with the installation in operation, or separation of the peripheral rim of each joint from the corresponding bearing surface of the framework, with the drawer in position to be removed from the framework.

4,038,832

LIQUEFIED GAS CONTAINER OF LARGE CAPACITY

Harold Michael Lutgen, Montgomery, and Terrence E. Rezac, New Prague, both of Minn., assignors to Beatrice Foods Co., Chicago, Ill.

Filed Sept. 8, 1975, Ser. No. 610,917
Int. Cl.[2] F17C *3/02*
U.S. Cl. 62—45 **7 Claims**



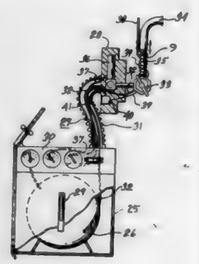
1. A low boiling liquefied gas container of large capacity comprising an inner vessel having a length of considerably greater dimension that its width with the vessel being disposed with the major dimension extending in the horizontal direction, an outer vessel surrounding the inner vessel and spaced therefrom to provide an intervening insulated space, conduit means between the outer vessel and the upper portion of the interior of the inner vessel for the removal of boil-off from within the inner vessel and for the introduction and removal of liquefied gas, means for supporting the inner vessel from the outer vessel in a manner to prevent rotational movement of the inner vessel relative to the outer vessel about a horizontal axis while permitting movement of the inner vessel relative to the outer vessel in the horizontal direction in response to expansions and contractions of the inner vessel relative to the outer vessel due to temperature change in which the means for support comprises cylindrical members interconnecting the adjacent end walls of the inner and outer vessels along the horizontal axis and engaged in telescoping relation with each other, said means for supporting the inner vessel from the outer vessel providing the entire support for the inner vessel and for stabilizing the inner vessel within the outer vessel.

4,038,833

DETACHABLE REFRIGERATION SYSTEM FOR CONTAINERS

John K. Foessl, 40 de Gaspesie, Candiac, Quebec, Canada

Filed Oct. 21, 1975, Ser. No. 624,445
Claims priority, application Canada, Sept. 16, 1975, 235730
Int. Cl.[2] F25B *41/04*
U.S. Cl. 62—223 **8 Claims**



1. A self-contained detachable refrigeration unit operably connectable to a cargo carrying container having at least one porthole therein, said detachable refrigeration unit comprising:

a frame assembly having detachable means for mounting on the container adjacent the porthole, an insulated tank supported within said frame assembly, said tank adapted to contain liquid carbon dioxide, and a control panel mounted on said frame assembly having temperature selective control means;

a porthole closure assembly having a portion adapted to detachably fit and substantially close the porthole of the container, said porthole closure assembly comprising integrally therewith a venting means, a temperature sensing means, a discharge nozzle directed into the container, and a valve means adapted to control the flow of liquid carbon dioxide to said discharge nozzle;

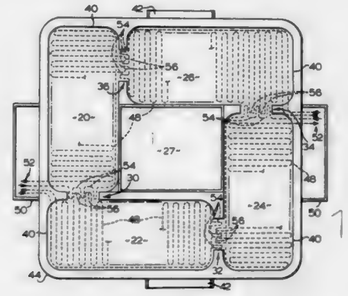
and a flexible connector between said porthole closure assembly and said frame assembly containing a liquid carbon dioxide line providing fluid communication between said insulated tank and said discharge nozzle, a temperature transmission line providing communication between said temperature sensing means and said temperature selective control means, and a control line providing communication between said valve means and said control panel, and a vent line from said venting means to said frame assembly.

4,038,834

ICE SKATING ARENA

Richard Whitside Roberts, 23 Pearen Sreet, Toronto, Ontario, Canada

Filed Oct. 9, 1975, Ser. No. 621,091
Claims priority, application Canada, Oct. 11, 1974, 211317
Int. Cl.[2] A63C *19/10*
U.S. Cl. 62—235 **8 Claims**



5. An ice skating arena having:

a skating area defining: a plurality of individual ice rinks arranged in seriatim around a central area, the individual rinks being spaced from one another to provide walkways there between; and interconnecting bridging sections arranged to permit skaters to circulate around said central area by way of the rinks and bridging sections; each of said rinks being of the shape and size of a hockey rink and being surrounded by boards of the kind conventionally located around hockey rinks, the boards defining a gap at the position of each of said bridging sections of the skating area;

cooling means disposed below the said ice skating area and arranged to provide a continuous ice covering over said rinks and bridging sections in use; and,

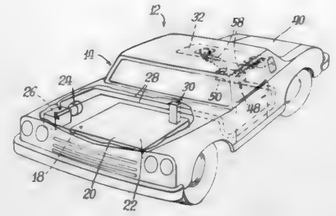
in association with each said bridging section, barrier means adapted to be selectively positioned across the section or to be moved to a non-obstructing position to allow free skating over the section, whereby, with all of the barrier means positioned across the associated sections, the individual rinks can be used as self-contained skating areas or, with all of the barriers moved to said non-obstructing positions, skaters can pass freely between the rinks by way of said bridging section; each said barrier means comprising a generally U-shaped structure having flat elongate sides, each of which is adapted to fit into and close the gap in the boards around one of the rinks, while the other side of the structure is adapted to fit into and close the gap in the boards of an adjacent rink, the portion of the structure beween said side forming part of said walkways between the rinks and the structure being adapted to be releasably locked to the boards in use.

4,038,835

AIR CONDITIONING FOR AUTOMOBILES

Charles Arnieri, 2216 N. Nordica St., Chicago, Ill. 60635

Filed Mar. 4, 1976, Ser. No. 664,032
Int. Cl.[2] B60H *3/04, 3/00*
U.S. Cl. 62—244 **5 Claims**



1. Air conditioning apparatus for an automobile having a power plant which includes a battery, an alternator, and a converter; an interior passenger space with a back shelf in the interior space rearwardly of the back seat; and a rear trunk with surrounding side walls and a main floor element and a ledge at the front of the trunk elevated above the main floor element and itself forming a floor element,

the air conditioning apparatus comprising,

a self-contained main operating unit mounted on the ledge in the trunk, and incorporating a coil including a cooling element and a heat dissipating element,

means forming an air inlet passage from the exterior through the floor element of the ledge and heading into the operating unit to the cooling element therein,

a flexible and extendible hose forming a cool air duct leading from the operating unit and communication with the interior space through the back shelf,

a flexible and extendible hose heading from the operating unit through the floor element on the ledge to the exterior and forming an exhaust duct leading from the heat dissipating element to the exterior,

means for receiving condensation from the cooling element in the operating unit and conveying it through the floor element on the ledge to the exterior,

means for drawing air from the exterior, forcing it over the cooling unit and through the air duct to the interior space of the automobile, and

means for driving air over the heat dissipating element and through the exhaust duct to the exterior.

4,038,836

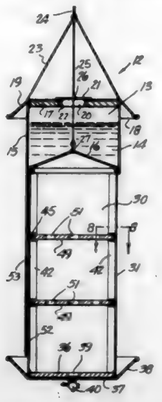
PORTABLE, FOLDABLE EVAPORATIVE COOLER

Billy L. Rose, 4321 Appain Way, El Sobrante, Calif. 94803

Filed July 30, 1976, Ser. No. 710,188
Int. Cl.[2] F28D *5/00;* **F25D** *3/08*
U.S. Cl. 62—316 **10 Claims**

1. An outdoor food cooler comprising a water compartment made of substantially waterproof material, suspension means connected to said water compartment, said water compartment having a rigid top wall, a flexible bottom wall and a flexible peripheral wall, an enclosure comprising peripherally extending depending wall and means to fasten it between said flexible peripheral wall and the periphery of said bottom wall, the fastening means being sufficiently permeable to allow seepage of water from the water compartment to said depending wall

means, said depending wall means being of a relatively porous water-absorbent material, a rigid bottom wall peripherally secured to the bottom edge of said depending wall means, whereby to define a food storage space thereabove, said depending wall means having an opening providing access to said storage space, flexible closure means on said depending wall means shaped to overlie said opening, and means to detachably secure said closure means in overlying relationship to said opening.

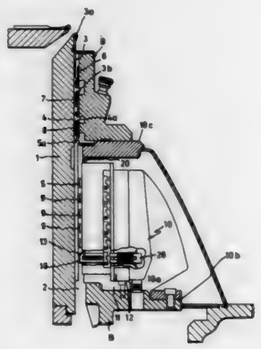


4,038,837

NEEDLE SELECTION MECHANISM FOR KNITTING MACHINES

José María Dalmau Güell, Barcelona, Spain, assignor to Jumberca, S.A., Badalona, Spain

Filed July 20, 1976, Ser. No. 707,011
Claims priority, application Spain, July 24, 1975, 439702
Int. Cl.[2] D04B *15/78*
U.S. Cl. 66—50 R **1 Claim**



1. A needle selection mechanism for a knitting machine of the type having a frame; a needle bed rotatably moveable relative to said frame; a plurality of needles mounted in said needle bed and capable of occupying at least two positions including a working position and a rest position; needle bed drive means; means for lifting said needles from one of said positions to the other of said positions and vice versa; a selection mechanism for said lifting means comprising at least one selector member mounted to the machine frame and positioned in a substantially radial position with respect to said needle bed and capable of radial movement between a first active position wherein it engages said needle lifting means and a second inactive position in which it is disassociated from said lifting means, resilient return means urging said selector member to said first position, cocking members adapted for moving said selector member from said first position to said second position against the force of said resilient return means, and electromagnet means for selectively retaining said selector member in said other of said positions in accordance with a programmed control, wherein there are selector members at a plurality of levels and each selector member is provided in the direction of rotation of said needle bed with a first selection cam shaped portion having at its front end and upper surface having the form of an upwardly inclined selector plane, said inclined plane having at the top portion thereof an angular slot, and a second cocking member engaging portion, and wherein said needle lifting means comprises for each needle a transmission jack housed in a vertical slot of said needle bed and capable of longitudinal movement in said slot, said jack having a butt adapted to be engaged by said selection cam shaped portion and also adapted to act as a said cocking member against said second engaging portion of said selector member such that in a first stage said first cam shaped portion of said selector member selectively causes longitudinal movement of said transmission jack in said slot of said needle bed according to whether said selector member is in said first or said second of said positions and in a second stage said selector member, if it is in said first of said positions, is moved to said second of said positions by said butt acting as a said cocking member engaging said second engaging portion of said selector member, said selector member selectively remaining in said second of said positions according to whether it is held or released by said electromagnet means, whereby said selector member selectively acts on the following transmission jack having a butt at the same level, and wherein the apex of said inclined plane of said selection cam shaped portion is always located further removed from the axis of said needle bed than the end of said transmission jack butt and has a first side positioned radially with respect to said needle bed and a second side of said second portion of said selector member forms an acute angle with said first side towards said needle bed so as to be closer thereto than the end of said transmission jack butt when said selector member is in the first stage of said positions so that in a first stage said selector member front end inclined selector plane engages or misses said transmission jack butt according to whether said selector member is in the first or in the second of said positions whereby said transmission jack is caused to rise longitudinally in said needle bed slot or is left unengaged, respectively, and in a second stage, if said selector member is in the first of said positions, when the butt reaches the height of the first side of said angular slot, and wherein said butt, acting as a said cocking member, engages the second side of said angular slot and pushes said selector member in a radial direction with respect to said needle bed towards said other position in which said selector member remains according to whether it is held or not retained by said electromagnetic means, whereby said selector member acts or misses the following transmission jack having a butt at the same level.

4,038,838

KNITTING MACHINES AND METHODS FOR KNITTING FABRICS HAVING TERRY LOOPS ON BOTH SIDES THEREOF

Victor J. Lombardi, Burlington, N.C., and Jose Ma Dalmau, Barcelona, spain, assignors to Jumberca, S. A., Spain, a part interest

Division of Ser. No. 569,742, April 21, 1975, Pat. No. 3,977,216.
This application June 21, 1976, Ser. No. 698,213
Int. Cl.[2] D04B *35/00*
U.S. Cl. 66—147 **7 Claims**

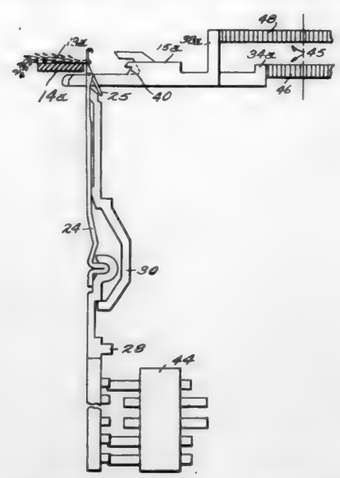
1. Improved knitting apparatus for knitting terry loop fabric having knitted-in terry loops on both the technical front and technical back surfaces of a base fabric, said apparatus comprising:

needle means for forming a knitted base fabric;

a plurality of sinker elements cooperating with said needle means, each said sinker element comprising a back loop-forming portion and a front loop-forming portion, said back loop-forming portion being spaced from said front loop-forming portion defining a space therebetween forming a sinker throat, said front loop forming portion being provided along its front surface with a front loop throat, said front loop-forming portion having an upper edge containing a recessed portion,

means for feeding ground, front loop and back loop yarns;

fabric lifting means for lifting the level of the base fabric sufficiently high so that said fabric will be at least as high as the upper edge of the front loopforming portion of said sinker means so as to permit feeding of the front loop yarn below the fabric;



fabric shoe means for depressing said fabric into the recessed portion in said front loop-forming portion of said sinker means so that loops forming said base fabric which are still retained by said needle means are depressed away from a position where severing of previously formed loops could occur; and

means for operating needles means and said sinker elements.

4,038,839

TAKE-UP APPARATUS

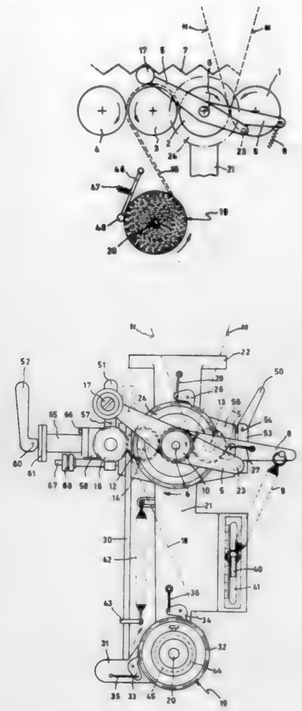
José María Dalmau Güell, Barcelona, Spain, assignor to Jumberca, S.A., Badalona, Spain

Filed May 10, 1976, Ser. No. 684,844
Claims priority, application Spain, May 13, 1975, 437639
Int. Cl.[2] D04B *15/88*
U.S. Cl. 66—151 **7 Claims**

1. An apparatus for taking up the fabric emerging from a circular knitting machine having a wave-shaped annular cam-track, said apparatus comprising a first transversally movable rotatory roller, a second rotatory roller and third and fourth transversally movable rotatory rollers, the respective shafts of which are parallel and substantially coplanar, said rollers being adapted to occupy a first position in which they are spaced apart from one another and a second position, in which they are adjacent to one another, each roller having attached thereto a coaxial gear wheel or pinion so that in said second position, the second roller pinion may mesh with the first and third roller pinions and the third roller pinion with the fourth roller pinion,

means for causing the rollers to move from one to the other of said positions,

a ratchet wheel coaxially affixed to said second roller, a primary driving lever and a secondary driving lever, mounted coaxially but not fixedly to said second roller, a first lever, said wave-shaped annular track of the circular knitting machine bearing against one end of said first lever, thereby causing it to oscillate and transmit such oscillations through the other end thereof to the secondary driving lever, which is pulled in turn by one or more springs tending to maintain it in mechanical contact with said primary lever and having moreover a feed pawl adapted to act on the ratchet wheel so that in one period of its oscillation said primary lever causes said secondary lever to move through said other end thereof tensioning the spring and sliding its pawl along the ratchet wheel while in a second period of oscillation, said spring causes opposite movement of the secondary lever, said feed pawl then acting on the ratchet to cause rotation of said second roller,



an emerging fabric take-up station,

all so arranged that the tubular fabric emerging from the circular knitting machine enters in the nip between the first and second rollers, successively wraps half the periphery of the second and third rollers and exits between the third and fourth rollers towards said take-up station.

4,038,840

METHOD OF COLLAR FABRICATION

Leo J. Castello, 3702 Burnett Lane, Huntingdon Valley, Pa. 19006

Continuation of Ser. No. 470,598, May 16, 1974, abandoned.
This application Jan. 29, 1976, Ser. No. 653,380
Int. Cl.[2] A41B *3/00*; D04B *9/10, 1/22*
U.S. Cl. 66—170 **8 Claims**



1. A method for knitting collars, each of which has a top, a bottom, a right side and a left side, the bottom and the respective right and left sides defining angular right and left collar points therebetween, the steps of

A. knitting of tubular cloth of rib type links and links stitches on a circular links and links knitting machine and forming a plurality of juxtaposed tubular strips each having a top and a bottom defining the collar height

1. inserting a draw thread between adjacent tubular strips;

B. knitting a plurality of angularly inclined right and left cutting guide lines in the tubular strips between the top and the bottom to define the right and left sides and angular right and left collar points of a plurality of collars programming the machine to form a plurality of different size collars along a coursewise direction within a tubular strip by varying the distances between said guide lines yet causing adjacent patterns in a walewise direction between the juxtaposed tubular strips to be the same size;

C. knitting a plurality of fold crease lines in a plurality of said tubular strips to define fold lines for the knitted collars,

1. said fold crease lines being knit near the tops of the tubular strips;

D. pulling the draw thread and separating adjacent tubular strips; and

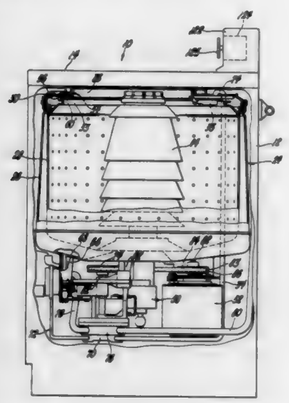
E. severing angularly the tubular strips at the guide lines to form a plurality of individual collars having right and left collar points wherein the top and bottom of the collars are formed by said top and bottom of the tubular strips and the right and left sides of the collars are defined where the tubular strips are angularly severed.

4,038,841

CLOTHES WASHER SPIN DELAY MECHANISM

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 13, 1976, Ser. No. 714,048
Int. Cl.² D06F *23/04, 33/04*
U.S. Cl. 68—12 R **1 Claim**



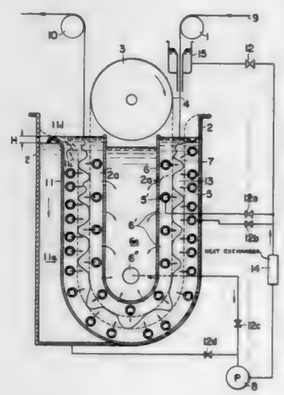
1. In a washing machine, a tub adapted to receive articles and contin cleaning water at various levels therein, rotatable spin shaft drivingly connected to said tub, water inlet fill means for supplying cleaning water to said tub, a pump operable for draining water from said tub, means for agitating the articles in the presence of the cleaning water, a support means, an electric motor, presettable sequence control means for conditioning said electric motor for effecting a predetermined series of operating cycles including concurrent spin and drain cycles for said tub, a roller drive mechanism for rotating said tub, said mechanism including, a spin wheel drivingly connected to said spin shaft, a power shaft drivingly connected to said motor and having a power shaft spin driver adjacent said spin wheel, means for self-energizingly positioning a spin roller in power transmitting relationship between said spin driver and said spin wheel in acordance with a signal from said sequence control means controlling motor rotation during said spin and drain cycles, the improvement wherein a lever arm mounted on said support for pivotal motion about a first axis, spin roller bracket means pivotally connected to said lever arm adjacent one end thereof for rotatively relatively laterally movably supporting said spin roller for movement relative to said first axis, a control housing including a fluid pressure responsive diaphragm therein in communication with said tub and movably responsive to pressure created by the water level in said tub, a rod operated by movement of said diaphragm between spin delay and power transmitting positions in response to increasing and decreasing pressure on said diaphragm; means pivotally connecting said rod member to said lever arm about a second axis adjacent the other end of said arm, spring means connected between said arm second axis and said support, said spring means normally biasing said rod into its power transmitting position whereby said lever arm moves said spin roller into said power transmitting relationship between said spin driver and said spin wheel, the fluid pressure on said diaphragm operative upon said tub being filled to a predetermined first cleaning water level by said fill means to move said rod and diaphragm to said spin delay position and to retain them in said spin delay position, the biasing force of said spring means progressively diminishing as said rod moves toward its spin delay position, said sequence control means enabling the initiation of said spin cycle and commencing the operation of said pump by said motor to lower the water level in said tub to a predetermined second level below said first level, whereby said spring means overrides the pressure on said diaphragm to exert a progressively increasing snap-acting bias forcing said rod again into its power transmitting position to move said spin roller into positive non-chattering power transmitting relationship between said spin driver and said spin wheel to initiate a delayed rotation of said tub in its spin cycle after the water level in said tub has been lowered to said predetermined second level.

4,038,842

APPARATUS OF CONTINUOUSLY TREATING WIDE KNITTED FABRIC

Hiroshi Mizutani, Mie, Japan, assignor to Nippon Dyeing Machine Mfg. Co., Ltd., Japan

Filed June 24, 1976, Ser. No. 699,646
Claims priority, application Japan, July 9, 1975, 50-84106
Int. Cl.² D06B *3/20*
U.S. Cl. 68—177 **12 Claims**



1. An apparatus for continuously treating knitted fabric, comprising

walls defining a treatment bath therein, said walls including at least an inner wall and an outer wall,

a drive wheel rotatably mounted above said treating bath,

an endless net conveyor operatively suspended about said drive wheel and having a portion thereof hanging into said treating bath, the portion of said net conveyor in said treating bath being spaced from said walls,

a metallic gauze member stationarily mounted in said treating bath spaced from said walls, said gauze member extending about said net conveyor and spaced therefrom so as to define a U-shaped path between said net conveyor and said gauze member, said U-shaped path having an upper introduction opening on one side of the U-shaped path and an upper exit opening on the other side of the U-shape path,

means for continuously passing a fabric into said introduction opening and for continuously removing said fabric from said exit opening, respectively, so that the fabric being treated is continuously conveyed through said treating bath,

a plurality of inner injection pipes having first ports, respectively, disposed in said bath exterior to said path between said net conveyor and said inner of said walls, and a plurality of outer injection pipes having second ports, respectively, disposed in said bath exterior to said path between said gauze member and said outer of said walls, said first and second ports being directed alternatingly toward said path,

circulation pump means disposed exterior to said treating bath for circulating a treating liquid, and including a suction side operatively communicating with said treating bath from a portion exterior to said path inwardly thereof, and including a blowing side operatively communicating with an upper part of said U-shaped path and communicating with said inner and outer injection pipes, respectively,

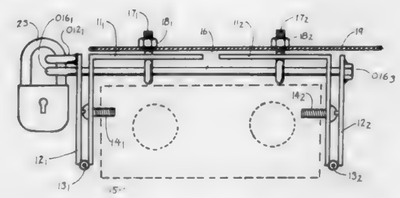
injection flow control valves operatively connected in communication with said inner and outer injection pipes, respectively, and said circulation pump.

4,038,843

SECURITY DEVICES FOR MOUNTING CB RADIO, TAPE PLAYER, STEREO OR THE LIKE IN MOTOR VEHICLES

Richard John Daley, Jr., Rte. 2, Box 86B, Alexandria, La. 71301

Filed Aug. 16, 1976, Ser. No. 714,620
Int. Cl.² E05B *73/00*
U.S. Cl. 70—58 **9 Claims**



1. Apparatus for mounting a CB radio, tape player, stereo or the like beneath the instrument panel of a motor vehicle which comprises

a pair of hasp-like hinged metal straps, each being constituted of an angular segment of metal, the two legs of which are provided with openings, a leg of each angular segment of metal being hinged to a substantially straight segment of metal also provided with an opening, and the straight metal segment of one of the hasp-like hinged metal straps is provided with an outwardly projected eye opening.

screws for projection through an opening in a first leg of each of the angular strips of metal of the hasp-like hinged metal straps for projection into the sides of said CB radio, tape player, stereo or the like when the pair of hasp-like hinged metal straps are oppositely disposed and the angular segments thereof are fitted to correspond generally with the corners of said CB radio, tape player, stereo or the like,

eye bolts, the shaft portions being projected upwardly through the openings of the second leg of each of the angular strips of metal of the hasp-like hinged metal straps for projection through openings within an instrument panel, and means for securing the terminal ends of said eye bolts to said instrument panel for support of said CB radio, tape player, stereo or the like.

an elongated eye bolt for passage of the shaft portion thereof through the openings within said first legs of said angular straps of metal of the hasp-like hinged metal straps, and

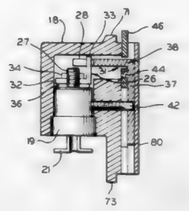
means for locking said elongated eye bolt in place.

4,038,844

PICK PROOF MONEY BOX

Richard E. Carlson, 4521 W. 100 Place, Oak Lawn, Ill. 60453

Filed July 24, 1975, Ser. No. 598,714
Int. Cl.² E05B *65/46*
U.S. Cl. 70—86 **5 Claims**



1. A pick proof money box for use with coin operated devices,

said money box having a front panel,

drawer means attached to the back of said front panel,

locking means on said front panel for locking said drawer means to prevent access to the contents of said money box,

said locking means including a key operated lock,

said lock having a longitudinal axis with a keyhole at one end of the longitudinal axis,

lock holding protrusion means extending from the front panel,

said lock holding protrusion means holding said lock with said longitudinal axis parallel to the plane of said front panel and with

said keyhole proximate to a top surface of said coin operated device, whereby said lock is virtually inaccessible to picking tools,

said locking means including interlocking wings operated to extended and distended positions responsive to the operation of the lock to the locked and unlocked positions, respectively,

moving means on one of said interlocking wings for causing said interlocking wings to move to the distended and extended positions responsive to the operation of the lock,

said moving means comprising an off-center control slot at one of said interlocking wings,

shaft means on said lock,

cam means on said shaft means,

stud means secured to said lock holding protrusion means and extending perpendicularly to the shaft of said lock toward said front panel,

fork means having a main body in a plane parallel to the front panel rotatably mounted on said stud means,

tines on said fork means normal to said mean body and extending for interception by said cam means for rotating said fork means responsive to the operation of said cam means by said lock, and

a control nipple on the main body of said fork means extending into said control slot for moving said interlocking wings to the distended and extended positions responsive to the operation of the lock, whereby the operation of said lock with the shaft in a plane parallel to said front panel operates said interlocking wings to extend beyond the limits of said front panel for locking purposes and to

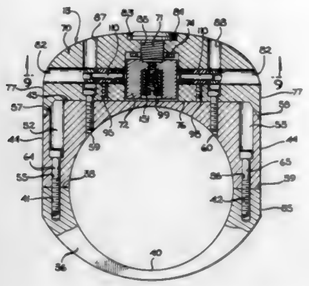
distend within the limits of said front panel for unlocking purposes.

4,038,845

AUTOMOBILE SECURITY APPARATUS

Nathan Szlakman, 3627 W. 104th St., Inglewood, Calif. 90303

Filed July 12, 1976, Ser. No. 704,313
Int. Cl.[2] B60R *25/02*; B62H *5/04*; E05B *67/22*
U.S. Cl. 70—211 **8 Claims**



1. An automobile security apparatus for securing the steering wheel of an automobile to its steering housing, comprising:
a. a locking block having a base surface, first and second side surfaces, a pair of face surfaces, and a top surface and having a first aperture which is disposed through said locking block from said first side surface to said second side surface being parallel to said base surface, a centerline cavity disposed perpendicular through said base surface and intersecting said first aperture, first and second locking sockets disposed perpendicular through said face surfaces and intersecting said first aperture, and first and second connecting apertures disposed parallel to said face surface through said base surface, each of said connecting apertures intersecting said first aperture and one of said locking sockets respectively;
b. a U-shaped steering wheel lock having first and second ends, each adapted to be coupled within one said first and second locking sockets of said locking block;
c. locking means for locking said first and second ends of said steering wheel lock in said first and second locking sockets of said locking block cooperatively disposed within said centerline cavity; and
d. steering housing connector means for connecting said locking block to the steering housing of the automobile coupled to the connecting apertures of said locking block.

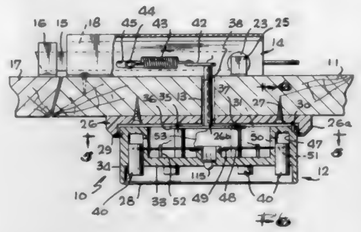
4,038,846

ELECTRONIC COMBINATION LOCK

Paul Klann, P. O. Box 2398, Waynesboro, Va. 22980

Filed Oct. 24, 1975, Ser. No. 625,464
Int. Cl.[2] E05B *49/02*
U.S. Cl. 70—220 **10 Claims**

1. A lock, comprising: coupling
a bolt moveable in the housing between a locking position and an open position,
a solenoid having a pin insertable into a bore in said bolt so as to prevent said bolt from moving from said locking position, said solenoid pin being removeable from said bore to permit movement of said bolt to said open position,
a moveable member, connected by a spring to said bolt, so that movement of said member imparts opening movement to said bolt when said solenoid pin is removed, and wherein like movement of said member causes expansion of said spring without imparting motion to said bolt when said bolt is restrained in said locking position by said inserted solenoid pin,
said moveable member including a shaft mounted for rotation, an arm affixed to one end of said shaft and attached to said spring, and a handle mounted to the other end of said shaft,
an electronic combination lock for providing a current to actuate said solenoid and thereby remove said solenoid pin from said bore when the proper combination is selected, said lock having combination selection switches mounted on said handle,
said handle including a disc-shaped faceplate and a cylindrical skirt at the periphery of said faceplate, there being a plurality of pushbuttons disposed in a circle on said faceplate,
a like plurality of spring wires extending radially from adjacent the center of said faceplate, rearwardly thereof, in spoke-like array, the outer end of each of said spring wires



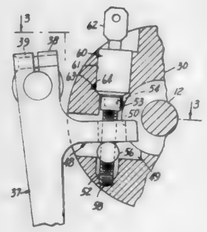
being connected to a respective one of said pushbuttons, said spring wires thereby maintaining said pushbuttons in an outwardly projecting position,
a like plurality of inclined contacts affixed to the rear of said faceplate, each being radially aligned with a respective one of said spring wires and positioned between the respective pushbutton and said faceplate center, so that upon depression of any pushbutton the spring wire associated therewith will be deflected rearward of said faceplate into electrical connection with the associated contact, and
electrical circuitry means connecting all of said spring wires and each of said contacts to said electronic combination lock so that said lock is actuated upon depression of the proper subset of said pushbuttons.

4,038,847

MOTORCYCLE LOCK

Bruce A. Bennett, Larkspur, Calif., assignor to Creative Innovations, Corte Madera, Calif.

Continuation-in-part of Ser. No. 568,977, April 17, 1975. This application Dec. 15, 1975, Ser. No. 640,718
Int. Cl.[2] B60H *5/00*
U.S. Cl. 70—233 **4 Claims**



1. In combination with a cycle having a rear axle and a frame member connected to said axle, a brake plate fixed relative to said axle, and a brake actuating lever swingably mounted on said plate, a lock for said cycle comprising:

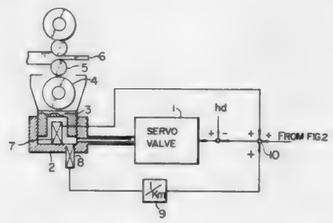
a housing interposed on said axle between said frame member and said brake plate,
an extension integral with said lever and formed with a smooth abutment surface,
said housing being fixed relative to said brake plate and formed with a cavity for receiving said extension therein,
holding means in said housing engageable with said abutment surface for holding said lever in brake actuating position, and
a key actuated lock in said housing obstructing access to said holding means.

4,038,848

METHOD AND APPARATUS FOR CONTROLLING ECCENTRICITY OF ROLLS IN ROLLING MILL

Ken Ichiryu, Mito; Masayuki Shigeta, Katsuta; Toyotsugu Masuda, and Haruo Kinoshita, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 29, 1975, Ser. No. 581,774
Claims priority, application Japan, May 31, 1974, 49-60827
Int. Cl.[2] B21B *37/00*
U.S. Cl. 72—8 **14 Claims**



1. A method for controlling the roll eccentricity in a rolling mill during the rolling of material comprising the steps of producing at least one reference input by converting a train of pulses generated in synchronism with the rotation of the rolls into at least one sinusoidal wave, providing an input including a roll eccentricity component during the rolling of material, detecting simultaneously the amplitude and phase of the roll eccentricity from the correlation between the reference input and a roll eccentricity component, and controlling a reducing device in accordance with the detected amplitude and phase.

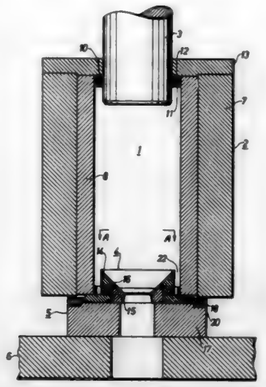
4,038,849

HIGH PRESSURE PRESS

Hans Gunnar Larsson, Vasteras, Sweden, assignor to Asea Aktiebolag, Vasteras, Sweden

Filed Dec. 1, 1975, Ser. No. 636,577
Claims priority, application Sweden, Dec. 6, 1974, 7415293
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—60 **3 Claims**

1. Press for hydrostatic extrusion having a press chamber intended to enclose a pressure medium, which press chamber is formed of a high pressure cylinder, a pressure generating piston, a die and/or a die support and seals, the die support having a surface which is pressed against the end surface of the liner of the high pressure cylinder and a support surface for the press die against which the die and surface seals, and one single cylindrical sealing ring of metal, the outer cylindrical surface of which seals against the inner surface of the liner and one end surface of which seals against the die support and which thickness is less than the difference between the external diameter of the die or die support and the internal diameter of the liner whereby the inner cylindrical surface of said sealing ring and



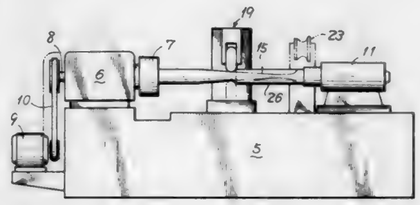
the outer surface of the die or die support form an annular gap along the entire axial extension of the sealing ring.

4,038,850

METHOD OF AND APPARATUS FOR PRODUCING BASEBALL BATS

Mamoru Sakagami, Chiryu, Japan, assignor to Fuji Kikai Seizo Kabushiki Kaisha, Chiryu, Japan

Filed May 19, 1976, Ser. No. 688,082
Claims priority, application Japan, June 5, 1975, 50-68068
Int. Cl.[2] B21B *19/12*; B21D *51/16*
U.S. Cl. 72—85 **3 Claims**



1. A method of producing an integral baseball bat having a body portion, a grip and a large end portion from a single piece of metal tubing having an axis, the method comprising the following steps, all steps being carried out without applying any heat to the tubing:
a. chucking said piece of metal tubing with a mandrel inserted therein at one end of said tubing by a chucking device of a headstock of a forming maching having a bed and axially movably supporting said tubing at the other end thereof by a tailstock of the machine, being defined radially in an annular groove, the mandrel having previously been formed substantially in accordance with desired contour of said body portion of said bat;
b. rotating said tubing to reproduce thereon the contour of said mandrel by a first forming step which includes pressing synchronously a first plurality of at least three rotatable rollers onto the outer surface of said rotating tubing while slidably reciprocating these rollers along said axis of said tubing along the bed of the machine to form said body portion of said bat;
c. retracting the tailstock a certain distance and advancing a second plurality of rotatable rollers of concave configuration in vertical section onto an end portion of said tubing to form said grip end of said bat by a second forming step,

leaving an opening in its center to be able to withdraw the mandrel therethrough;

d. interrupting the rotation of said tubing, taking out the mandrel from said tubing, and re-chucking said tubing in order to form said large end portion of said bat; and

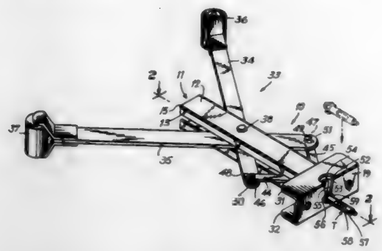
e. thereafter forming said large end portion of said bat using the first plurality of rotatable rollers.

4,038,851

TOGGLE BOLT SETTING TOOL

Antonio Coloma, 25-69 33rd St., Astoria, N.Y. 11102

Filed Oct. 27, 1976, Ser. No. 736,076
Int. Cl.² B21J *15/34*
U.S. Cl. 72—114 **9 Claims**



1. A setting tool for collapsible shank toggle bolts of the type which include a stop flange, a collapsible shank extending from said flange, a threaded receiver portion at the distal end of said shank and a bolt member having a head disposed adjacent said flange and a shank axially movable within said shank of said toggle and threadedly engaging said receiver portion, comprising a frame member including a base plate having an inner and an outer face and a slot formed between said faces, said slot including first portions sized to permit the passage therethrough of said head and shank of said bolt, and other portions sized to prevent the passage of said flange, a puller plate abutting said inner face of said base plate, said puller plate including a slot in registry with said slot of said base plate, said slot of said puller plate including first portions sized to permit the passage therethrough of said head and shank of said bolt and other portions sized to prevent the passage of said head and permit the passage of said shank, said first and other portions of said slot of said base plate being in registry with said first and other portions, respectively, of said slot of said pulley plate, whereby a said toggle may be mounted in clamping relation of said plates with said flange engaging said outer face of said base plate and the under surface of said head engaging the face of said puller plate remote from said base plate, and mechanical advantage means on said frame engaging said puller plate for shifting said puller plate inwardly away from said base plate, thereby to shift said receiver portion toward said flange and collapse said shank.

4,038,852

SCROLL-FORMING DEVICE

Ronald Lear, 4 Bellgrave Road, Eastwood, Leigh-on-Sea, Essex, England

Filed May 3, 1976, Ser. No. 682,678
Claims priority, application United Kingdom, May 6, 1975, 18893/75
Int. Cl.² B21C *47/00*
U.S. Cl. 72—147 **10 Claims**

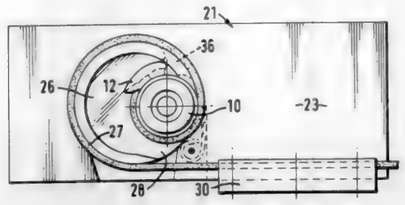
1. A device for forming a scroll from a strip of material, which device comprises:

a base plate;

a hollow outer former having a substantially cylindrical forming surface with an axial slot therein, the outer former being rotatably mounted about its cylindrical axis to said base plate;

an inner former also having a substantially cylindrical forming surface and rotatably mounted on and within said outer former, the axes of said two formers being parallel;

a clamping member rotatably mounted eccentrically on said inner former, the clamping member having a clamping surface facing said forming surface of the inner former, which clamping surface is movable nearer to and further from said forming surface of the inner former as the inner former and the clamping member are relatively rotated; and



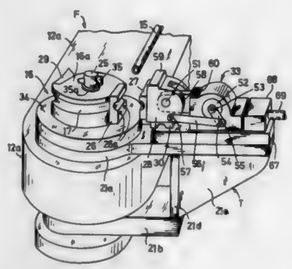
releasable stop means provided on said base plate to prevent rotation of said outer former relative to the base plate during an initial rotation of said inner former in which a strip to be formed into a scroll and extending through said slot is first clamped by said clamping member to the forming surface of said inner former and then wrapped partially around the forming surface of said inner former, said stop means then being releasable to allow said outer former to be rotated with said inner former so as to wrap the strip around said outer forming surface.

4,038,853

TUBE BENDING MACHINE

Rigobert Schwarze, Olpener Str. 46-474, Cologne 91, Germany (5000)

Filed Aug. 30, 1976, Ser. No. 718,775
Claims priority, application Germany, June 11, 1976, 2626202
Int. Cl.² B21D *7/04*
U.S. Cl. 72—157 **12 Claims**



1. A tube bending machine comprising:

a bending table supporting frame providing a bed,

a swingable bending table pivotally supported by the frame,

a bending forming die supported by the table having a tube-forming arcuately extending peripheral groove with its curved groove centerline disposed in a die plane perpendicular to the table pivotal axis,

a clamping jaw displaceable on the table to and fro relative to the said die for cooperative jaw-die clamping of a tube adjacent

a tube portion to be bent; with

a tube-supporting feed carriage shiftable on the bed,

said carriage bearing a rotatable tube-gripping collet, and being freely shiftable toward the die along the direction of the axis of a collet-gripped tube portion during a table-swing-effected bending operation on a tube adjacent a portion cooperatively clamped and engaged by said die and jaw,

the improvement comprising:

the said bending forming die and the said clamping jaw on their peripheries each having as tube clamping formations a respective straight clamping groove and respectively at least one curved clamping groove spaced from the straight groove,

all the said grooves ccorresponding in cross-sectional shape to the external semi-circumference of a tube to be bent, on the die the straight groove and at least a portion of the curved clamping groove having groove centerlines disposed substantially in said die plane,

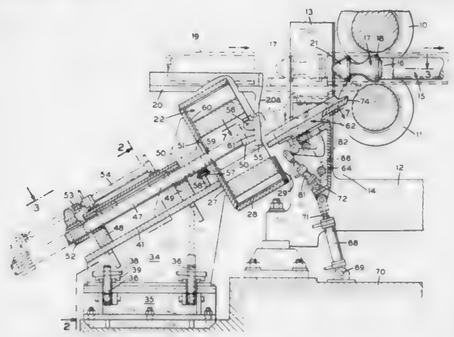
the said bending forming die and the said clamping jaw being each mounted rotatably on and relative to the bending table, whereby selectively the said straight grooves and the said curved clamping grooves may be swung into opposed tube-clamping working disposition.

4,038,854

PLUG CHANGER FOR PLUG MILL

Russell E. Jones, New Castle, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed May 4, 1976, Ser. No. 682,920
Int. Cl.² B21B *25/06*
U.S. Cl. 72—209 **13 Claims**



1. A plug changer for a plug mill or the like, wherein the mill has a pair of mill rolls, a guide trough upstream of the mill rolls for guiding a tubular workpiece into the roll bite, a mandrel supported on the discharge side of the mill rolls and adapted to supported a mandrel plug at the roll bits, which comprises

a. a plug holding drum mounted adjacent and below said guide trough, for rotation about an inclined central axis, and having pockets for the reception of a plurality of mandrel plugs,

b. means for controllably rotating said drum about its inclined central axis for bringing plug receiving pockets successively into a predetermined inclined working position below and at an intersecting angle with said guide trough.

c. a transfer trough mounted between said plug holding drum and said mill rolls,

d. means movably supporting said transfer trough for angular movement between a loading position, substantially at said intersecting angle with said guide trough, and a transfer position,

e. said transfer trough, in said loading position, being generally aligned with the drum pocket in said working position, to accommodate movement of a mandrel plug into or out of such drum pocket,

f. said transfer trough in said transfer position being substantially aligned with and effectively forming an extension of said main guide trough, whereby to enable a mandrel plug, supported on said transfer trough in the transfer position, to be picked up by an incoming tubular workpiece and carried out mandrel-supported position in said roll bite,

g. a plug pusher ram aligned with and, when retracted, effectively forming the lower end of the plug receiving pocket located at said working position, and

h. means to advance said ram from its retracted position to displace a mandrel plug out of said last mentioned pocket and onto said transfer trough,

i. said ram forming a guide surface for upwardly guiding a mandrel plug while said transfer trough is being moved from said loading position to said transfer position,

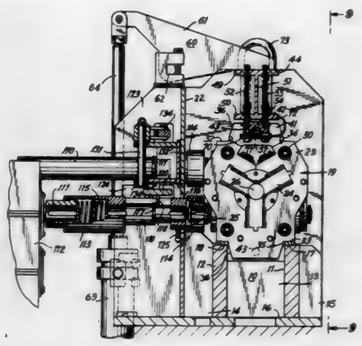
j. said transfer trough, when in said loading position, forming a discharge chute for guiding a used mandrel by gravity back into a drum pocket in said working position.

4,038,855

STRETCH REDUCING MILL

William R. Scheib, Sewickley, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed Apr. 19, 1976, Ser. No. 677,891
Int. Cl.² B21B *31/08, 17/00*
U.S. Cl. 72—238 **15 Claims**



1. In a rolling mill of the type comprising a foundation, a plurality of individual mill stands adapted for removable reception in said foundation, mill drive means, means for clamping the mill stands in said foundation, and means for coupling the mill stands to said drive means, the improvement in said clamping which comprises,

a. a heavy, relatively rigid retaining beam extending over the tops of each of the mill stands and urging said stands forcibly downward into seated positions on said foundation,

b. said foundation forming a rigid support upon which said mill stands are seated,

c. means connecting said mill stands individually to said retaining beam, and

d. means for bodily lifting said retaining beam from said foundation together with said individually connected mill stands for effecting a mill change-over.

4,038,856

DRIVEN ROLLER ASSEMBLY FOR SUPPORTING, CONVEYING, BENDING, STRAIGHTENING OR DEFORMING A CONTINUOUSLY CAST STRAND

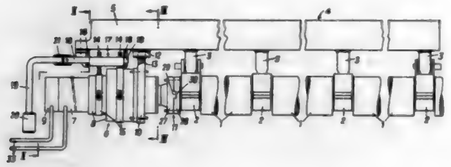
Franz Bayer, and Werner Scheurecker, both of Linz, Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Oct. 4, 1976, Ser. No. 729,404
Claims priority, application Austria, Oct. 8, 1975, 7686/75
Int. Cl.² B21B *31/08*
U.S. Cl. 72—238 **11 Claims**

1. In a driven roller assembly for supporting, conveying bending, straightening or deforming a continuously cast strand, with a roller rotatably journaled on a strand guide

stand, and having a drive unit detachably connected to one end of the roller, the improvement comprising

a holding means for supporting the drive unit, which holding



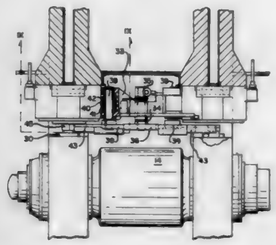
means is journaled on the strand guide stand and movable perpendicularly relative to the roller axis, the roller being removable from the strand guide stand independently of the drive unit remaining on the strand guide stand.

4,038,857

HYDRAULIC MILL STAND

Werner W. Eibe, McCandless Township, Allegheny County, and Wilfred T. Farrell, Corsopolis, both of Pa., assignors to Blaw-Knox Foundry & Mill Machinery, Inc., Pittsburgh, Pa.

Filed Apr. 26, 1976, Ser. No. 679,900
Int. Cl.² B21B *31/30*
U.S. Cl. 72—244 **9 Claims**



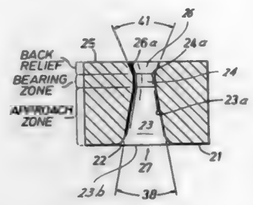
1. In a mill stand for a four-high strip mill including a pair of closed top and bottom housings, upper and lower work rolls disposed within the housings above and below the pass line of the strip, upper and lower back up rolls disposed within the housing above and below the upper and lower work rolls respectively, chocks for the upper back up rolls movable vertically in the housings and chocks for the lower back up roll movable vertically in the housings, the improvement comprising a pair of hydraulic pressure cylinders, each positioned centrally within a housing at the top thereof and adapted with the bottom of the housing to exert rolling pressure through the upper and lower back up roll chocks on the rolls within the housing, a pair of staircases, one in each housing, each comprising a single series of steps of uniformly increasing height, each staircase being a circular staircase disposed about a vertical axis parallel to the axis of the hydraulic pressure cylinder and spaced therefrom, and means for introducing those staircases, step-by-step in pressure-transmitting sequence with the hydraulic pressure cylinders, upper and lower roll chocks and bottom of the housing, those means comprising a member carrying the staircase rotatable about the axis of the staircase so as to carry successive steps of the staircase singly through the axis of the hydraulic pressure cylinder and means for rotating that member, whereby when the travel of the chocks in the housing exceeds the stroke of the cylinders, that stroke is extended in increments by the introduction of the successive steps of the staircase.

4,038,858

CERAMIC DIE AND METHOD OF USING SAME

James M. DeZuba, Houston, Tex., assignor to Rose M. DeZuba, Houston, Tex.

Continuation-in-part of Ser. No. 524,076, Nov. 15, 1974, abandoned. This application May 24, 1976, Ser. No. 682,360
Int. Cl.² B21C *3/00*
U.S. Cl. 72—274 **11 Claims**



8. The method of drawing wire for reducing its cross-sectional area, which comprises:

pulling said wire through a set of dies, said set of dies comprising a pressure die and a drawing die, said drawing die having a tapered approach zone with an included angle from about 17° to 30° and a bearing surface for maintaining uniform pressure upon the wire for a distance approximately equal to 30 percent of the drawn diameter of the wire; and

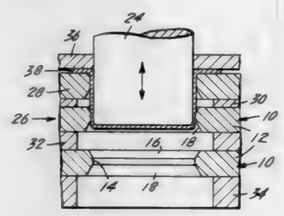
pulling said wire through said set of dies without providing any lubricant thereto.

4,038,859

METAL FORMING DIE

John Pavleszek, Colonia, N.J., assignor to American Can Company, Greenwich, Conn.

Filed July 14, 1976, Ser. No. 705,340
Int. Cl.² B21D *22/00*
U.S. Cl. 72—347 **8 Claims**



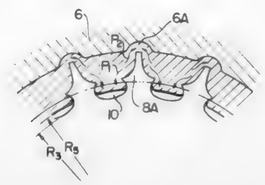
1. A metal forming die adapted for coaction with a cylindrical punch, comprising a body having a uniform circular opening therein, said opening being defined by a generally cylindrical land surface, an inwardly tapered frustoconical entrance surface leading to said land surface, an inwardly tapered exit surface extending from said land surface, and circular transition surfaces at the junctures of said entrance and exit surfaces with said land surface, in cross-section said entrance and land surfaces being rectilinear and said transition surfaces being arcuate, whereby smooth transition is afforded from said surface to said land surface and from said land surface to said exit surface.

4,038,860

PLASTIC MOLDING PROCESS FOR METAL

Hisanobu Kanamaru, and Yasushi Ohuchi, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 20, 1975, Ser. No. 624,057
Int. Cl.² B21D *22/26*
U.S. Cl. 72—358 **6 Claims**



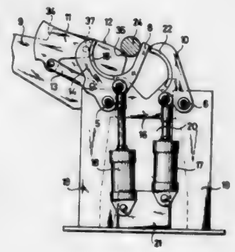
1. In a plastic molding process including the step of pressing a tubular blank to cause plastic deformation thereof into a product having a tooth-like configuration along at least one of the outer and inner peripheries thereof, the improvement comprising utilizing a male die having teeth around the periphery thereof and said teeth having a constant cross-sectional surface along the entire blank forming portion of the die, feeding said die axially of said blank deform and simultaneously shape the deformed material of the blank into the desired tooth-like configuration in a single deforming and shaping step providing grooves between the teeth of said die of sufficient depth so that the deformed material which flows toward the bottoms of the grooves of said teeth exerts substantially no contact force thereat.

4,038,861

WORKPIECE FEED CHANNEL

Heinz Hartkopf, Solingen, and Horst Schneider, Witzhelden, both of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Germany

Filed Oct. 8, 1975, Ser. No. 620,773
Claims priority, application Germany, Oct. 16, 1974, 2449241
Int. Cl.² B23B *25/00*; B21D *37/10*
U.S. Cl. 72—416 **13 Claims**



1. A feed channel for elongated workpieces of varying diameters, said channel having a plurality of longitudinally spaced-apart adjustable workpiece receiving openings, each said opening being formed by a plurality of profiled segments, at least one segment for each said opening defining a movable segment and being movable for exposing said openings to generally lateral introduction of an elongated workpiece thereinto,

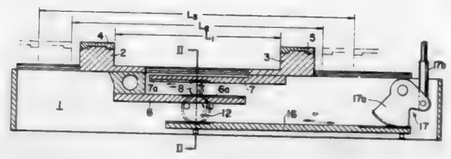
a fixed segment constructed with a profile and arranged to receive and support the workpiece to effect that the lateral position of the axis of elongation of the workpiece in the feed channel is substantially the same for each workpiece, said plurality of segments for each said opening being longitudinally spaced-apart from one another along said channel, and said movable segments being movable to a position closing said openings so that the workpiece is completely surrounded by said segments.

4,038,862

DEVICE FOR ADJUSTING THE LATERAL DISTANCE BETWEEN A PAIR OF PARALLEL TRANSFER BARS OF A TRANSFER FEEDER FOR A TRANSFER PRESS

Hisateru Yamashita, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed June 10, 1975, Ser. No. 585,670
Int. Cl.² B21D *43/10*
U.S. Cl. 72—421 **17 Claims**



1. A device for adjusting the lateral distance between a pair of parallel transfer bars of a transfer feeder for a transfer press comprising:

a. a pair of slides, said transfer bars being mounted on said slide, said pair of slides being a predetermined distance apart;

b. first drive means for driving said transfer bars toward and away from each other in a reciprocating motion in synchronism with the operation of said press for successively transferring work pieces to succeeding work positions;

c. second drive means for resetting said predetermined distance;

d. coupling means connected to said pair of slides; and

e. first engaging means for engaging and disengaging said first drive means and said coupling means from each other wherein said first drive means and said coupling means are engaged for reciprocating said transfer bars and said first drive means and said coupling means are disengaged from each other when said second drive means resets said predetermined distance.

4,038,863

MACHINE FOR TESTING AND COMPARING BEARINGS AND BEARING MATERIALS

Harrison Clay Mellor, Newtown Square, and Lawrence A. Peacock, Norristown, both of Pa., assignors to Arguto, Inc., Aston, Pa.

Filed Nov. 19, 1976, Ser. No. 743,505
Int. Cl.² G01N *19/02*
U.S. Cl. 73—9 **22 Claims**

1. In a machine for testing and comparing sliding bearings,

an annular test bearing housing comprising radially spaced concentric outer and inner rings, said inner ring having an internal diameter dimensioned to receive and fixedly retain therein a selected test bearing,

bearing means intermediate the outer and inner rings rotatably supporting said rings relative to each other,

a rotatable shaft dimensioned for coaxially mounting thereon the selected test bearing secured in the inner ring of said housing,

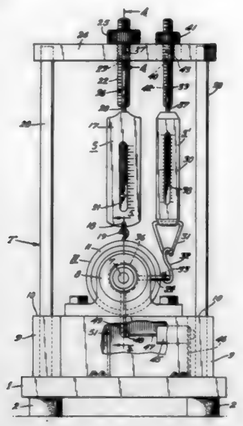
means operable to rotationally drive said shaft at a selected constant speed,

test bearing loading means connected to the housing outer ring arranged and adjustably operable to apply a predetermined load radially on the test bearing secured in the inner ring of said housing,

a lever arm secured to an extending radially outward from the inner ring of the housing adapted to be disposed at an angle of 90° from said radially applied load,

and friction force measuring means connected to said lever

arm arranged and adjustably operable to exert thereon a counter force equal to the friction force generated by rotation of the shaft in the test bearing and thereby maintain the lever arm disposed at said angle of 90° from the radial load,



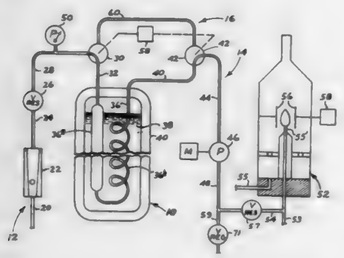
said friction force measuring means including means indicating the amount of said counter force and thereby the amount of the generated friction force.

4,038,864

HYDROCARBON MEASUREMENT

John C. Cooper, Eugene; Harvey E. Birdseye, Cottage Grove, and Russell J. Donnelly, Eugene, all of Oreg., assignors to State Board of Higher Education for and on Behalf of the University of Oregon, Eugene, Oreg.

Filed Oct. 15, 1974, Ser. No. 514,448
Int. Cl.² G01N *31/00*
U.S. Cl. 73—23 **5 Claims**



1. In apparatus for monitoring a gas supply to determine the level of certain gas constituents in the gas supply, the combination of

a flame ionization detector, and

means for introducing gas from said gas supply into said detector,

said means including a cold trap having feed and discharge ends,

conduit means connecting said supply to the feed end of said cold trap for feeding gas from the supply to the cold trap, said conduit means including restricting means offering restriction to the flow of gas into the trap,

another conduit means connecting the discharge end of the cold trap to the ionization detector, said other conduit means including pump means connected so as to pull gas from said supply through said restricting means and said trap,

a third conduit means connecting said supply to said ionization detector with bypassing of said cold trap, and

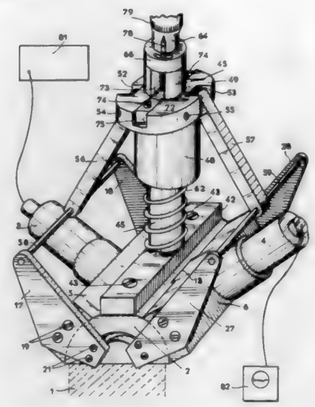
valve means adjustable to produce flow from said supply into said detector selectively either through said cold trap or through said thrid conduit means.

4,038,865

DEVICE FOR NON-DESTRUCTIVE MEASUREMENT OF A SURFACE LAYER OF A MATERIAL

Christian Flambard, Gagny, and Alain Lambert, Creil, both of France, assignors to Centre Technique des Industries Mecaniques, France

Filed June 3, 1971, Ser. No. 149,587
Claims priority, application France, June 3, 1970, 70.20302; Feb. 11, 1971, 71.04558
Int. Cl.² G01N *29/00*
U.S. Cl. 73—67.7 **10 Claims**



1. A device for non-destructive measurement of the extent to which a surface layer of a material has been affected by a superficial treatment, particularly for measuring the depth to which a material has been affected by a thermal and/or thermochemical treatment, the device including a block of ultrasonic vibration transmitting material, said block having a convex surface, a non-arcuate surface and an axis, and being arranged to have its non-arcuate surface engaged with a sample to be studied, an emitter of ultrasonic waves and a receiver therefor, each having an axis, the axes of the emitter and receiver being located in a common plane which is normal to the axis of the convex surface of said block, a slide carrying each of the emitter and receiver, the slides being symmetrically movable on the convex surface of said block, measuring means for measuring the angle which the emitter and receiver form between them a support provided on the block and entrainment means for moving the two slides comprising an entrainment element movable on the support and a system of levers connecting the entrainment element to the slides, and a regulation-control element movable on the said support and connected to the entrainment element, the measuring means including locating means for precisely locating the position of the regulation-control element relative to the support.

4,038,866

ELECTRONIC PROBE FOR SENSING AND REPRODUCING THE SOUND OF MECHANICAL MOVEMENT

John F. Johnson, 2535 E. Linda Circle, Phoenix, Ariz. 85024

Filed Aug. 13, 1976, Ser. No. 714,108
Int. Cl.² G01H *1/00*
U.S. Cl. 73—71.2 **8 Claims**

1. A vibration detector for translating mechanical vibratory motion into electrical values comprising:

a casing formed with an internal chamber,

a transducer assembly mounted in the chamber of said casing,

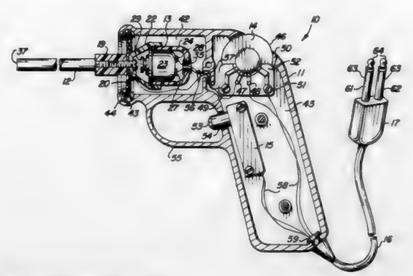
said assembly comprising a hollow non-ferrous cone having an apex,

a first metallic diaphragm attached on one of its sides to an opening through the apex of said cone,

a dynamic microphone,

said microphone being mounted within a housing attached to said cone and comprising a voice coil, an associated second diaphragm, and a permanent magnet attached to said housing,

said housing being arranged to extend within said cone,



an elongated insulator,

a metallic probe connected to one end of said insulator,

the other end of said insulator being connected to said first diaphragm, and

weight means attached to said second diaphragm for holding it and said voice coil relatively stationary,

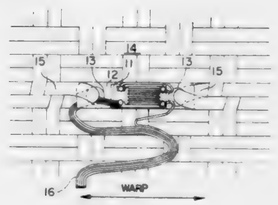
whereby vibrations transmitted through said probe produce sympathetic vibrations in said housing while said weight means attached to said second diaphragm holds it and said voice coil relatively stationary thus inducing a voltage in said voice coil representative of the vibration by said probe.

4,038,867

TRANSDUCER ASSEMBLY AND METHOD OF MANUFACTURING SAME

Arthur William Andrews, East Cowes; Eric Lewis Heber, Wootton; John Roger Michelmore, Ryde, and John Nicholls, Wootton, all of England, assignors to British Hovercraft Corporation Limited, Yeovil, England

Filed Feb. 19, 1976, Ser. No. 659,356
Claims priority, application United Kingdom, Feb. 24, 1975, 11714/75
Int. Cl.² G01B *7/16*
U.S. Cl. 73—88.5 R **18 Claims**



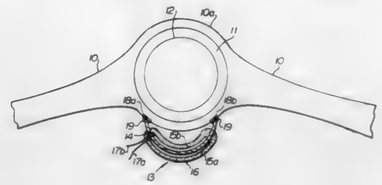
1. A transducer assembly comprising at least one strain gauge attached to a transducer plate bonded between first and second sheets of flexible material and a cable having a requisite number of electrical conductors attached to the strain gauge(s) and arranged to extend from an edge of the assembled sheets, wherein a pair of spaced PTFE tapes are attached to mating surfaces of the first and second sheets so that the pair of tapes attached to the second sheet overlie the pair of tapes attached to the first sheet when assembled, the tapes being arranged so that a longitudinal direction of the space between the tapes represents a mean route line of the cable, the cable being sandwiched between the mating pairs of tapes in a generally sinusoidal pattern so that the cable crosses the space at a plurality of separate locations throughout the length of the tapes and so that at each said location the cable crosses the space in a direction generally perpendicular to the longitudinal direction thereof.

4,038,868

TRANSDUCER FOR MEASURING INJECTION PRESSURES OF DIESEL ENGINES

William S. Heggie, Bell's Corners, Canada, assignor to Canadian Patents and Development Limited, Ottowa, Canada

Filed Oct. 14, 1976, Ser. No. 732,402
Int. Cl.² G01M *15/00*; G01L *9/04*
U.S. Cl. 73—119 A **4 Claims**



1. A transducer for measuring injection pressure of diesel engines of the type having unit fuel injectors operated by a rocker arm having a boss or hub rotatably mounted on a bearing shaft on the engine head comprising:

a. a bowed strip of flexible material;

b. a strain gauge element rigidly attached to a central portion of the inner or outer surface of the bowed strip such as to measure surface strain of the strip and thus the amount of bowing;

c. an encapsulation layer of epoxy resin covering the strain gauge element and the bowed strip over most of its central extent;

d. electrical leads from the strain gauge element through the encapsulation layer to the exterior; and

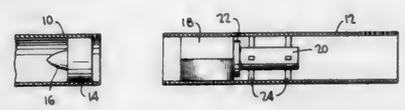
e. the ends of the bowed metal strip being adapted for rigid fixing into two openings formed in the inner or outer surface of the rocker arm and spaced apart in the longitudinal direction along the rocker arm.

4,038,869

SIMULATOR FOR SETBACK FOLLOWED BY DRAG

Herbert D. Curchack, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,922
Int. Cl.² G01M *19/00*
U.S. Cl. 73—167 **8 Claims**



1. A system for providing deceleration followed by acceleration to an impacting projectile comprising:

a. a catch tube for receiving said projectile;

b. deceleration means normally positioned in said catch tube to provide a deceleration reaction to said projectile when said projectile enters said catch tube; and

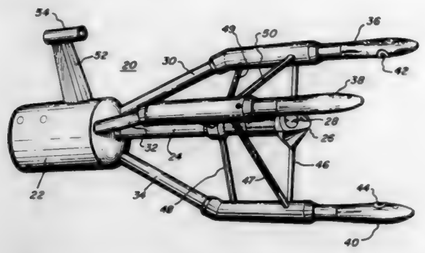
c. acceleration means positioned in said catch tube to accelerate said projectile;
d. whereby the launch setback followed by drag experienced by artillery launched fuzes may be simulated.

4,038,870

AIR MOVEMENT MEASURING APPARATUS

Donald Jack Rotier, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 8, 1976, Ser. No. 675,036
Int. Cl.² G01C *21/12*; G01P *5/00*
U.S. Cl. 73—181 **1 Claim**



1. A gaseous movement sensing apparatus comprising:
an ultrasonic wave transmitting and receiving transducer means comprising a common support having along a central axis thereof a central support element with a conical outer surface, the vertex of which lies along said axis and defines the forward direction of said apparatus, said conical surface having three transmitting transducer elements mounted in the surface thereof and displaced relative to each other by approximately 120°, said three transmitting transducer elements each facing outwardly and in a forward direction relative to said central axis so that each of said transmitting transducer elements when mounted within said conical surface will be facing directly into the path of the gas whose movement is being sensed, three separate ultrasonic receiver transducer means each separately carried by said common support and spatially positioned about said central support element and each aligned with one each of said transmitting transducer elements along a line extending perpendicular from said conical surface, each of said receiver transducer means being flush mounted within the side of a separate elongated streamlined housing, carried by said common support, and each of said receiver transducer means when mounted facing toward its corresponding transmitting transducer element;
an ultrasonic wave energy source connected to said transmitting transducer elements to energize said elements to project ultrasonic wave energy in one direction only from each of said transmitter transducer elements toward each corresponding one of said receiver transducer means;
and means connected to said receiver transducer means to measure the time difference in the received signals received by said receiving transducer means and thereby the movement of a gaseous medium relative to said sensing apparatus.

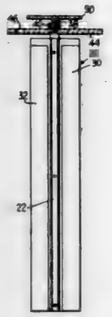
4,038,871

LIQUID LEVEL GAUGE

Harrison F. Edwards, Norwich, N.Y., assignor to Liquidometer Corporation, Norwich, N.Y.

Filed Nov. 6, 1975, Ser. No. 629,653
Int. Cl.² G01F *23/00*
U.S. Cl. 73—304 C **16 Claims**

1. A liquid level gauging apparatus for monitoring the height of liquid contained in a storage tank or the like, comprising in combination:
a. an upright probe element adapted for immersion in said liquid,
b. said probe element being constituted as an elongate circuit board having a conductive strip presenting a flat, exposed area running for a substantial length therealong and being substantially rigidly bonded thereto,
c. an additional upright probe element adapted for immersion in said liquid in proximity to the first, said additional probe element being constituted as an elongate circuit board coextensive with the first and having a conductive strip presenting a flat, exposed area running for a substantial length therealong and being substantially rigidly bonded thereto,
d. an elongate spacer rod disposed along said probe elements and constituting spacer means for maintaining the conductive strips of the probe elements in substantially coextensive spaced relation,
e. the flat, exposed area of said conductive strips being spaced apart, facing one another, being substantially parallel to one another and generally coextensive with said spacer rod,



f. mean mechanically connecting the probe elements to the spacer rod,
g. means for applying a driving voltage to one of said conductive strips, and
h. detector means connected to the other of said conductive strips to sense the potential assumed thereby and obtained from said driving voltage, said potential being a function of the degree of immersion of the probe elements in the liquid being gauged,
i. said spacer rod and the probe elements forming a U-shaped channel with the legs of the channel being formed by the probe elements, respectively, and the connecting portion of the channel being formed by the rod, said spacer rod maintaining uniform spacing between the flat, exposed areas of said conductive strips, and the space between the flat, exposed areas of said strips being devoid of dielectric material other than the liquid being gauged, whereby no upwardly facing surfaces exist on which debris can become lodged,
j. said channel being completely open at its mouth and providing unobstructed and free access of the liquid being gauged to said strips along their entire lengths.

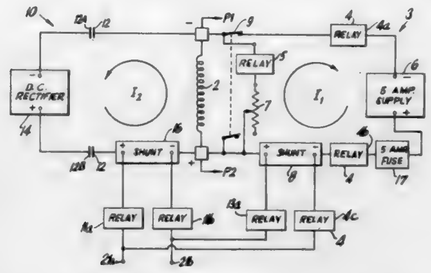
4,038,872

TEMPERATURE MEASUREMENT SYSTEM FOR CABLES

Robert Allen Spear, Oakland, and Kenneth Roger Strandberg, Mahwah, both of N.J., assignors to The Okonite Company, Ramsey, N.J.

Filed Jan. 12, 1976, Ser. No. 648,013
Int. Cl.² G01K *7/16*
U.S. Cl. 73—362 AR **7 Claims**

1. A cable temperature measurement circuit including
a heating circuit comprising a series connection of a first current generating means, first switch means, said cable and first resistance means;
a testing circuit comprising a series connection of a second current generating means, second switch means, said cable and second resistance means;
a first relay connected to said first and second switch means such that said first relay is deactivated by the closing of said first switch means to open said second switch means and deactivate said testing circuit, and is activated in response to the opening of said first switch means to close said second switch means and activate said testing circuit;
third switch means having a first pair of input terminals connected across said first resistance means, a second pair of input terminals connected across said second resistance means and output terminals, said third switch means being connected to said first relay and being responsive to the activation of said first relay to connect said second pair of input terminals to said output terminals and being responsive to the deactivation of said first relay to connect said first pair of input terminals to said output terminals;



a voltage divider having a first and second input terminals and an output terminal, said voltage divider being adapted to provide an output signal which is a function of the input signal applied to said first and second input terminals;
a first amplifier circuit having input terminals connected across said cable and an output terminal connected to said first input terminal of said voltage divider; a second amplifier circuit having input terminals connected to the output terminals of said third switch means and an output terminal connected to said second input terminal of said voltage divider;
a source of reference voltage; and
indicator means connected between said voltage divider and said source of reference voltage, said indicator means being adapted to provide a readout representative of the temperature of said cable.

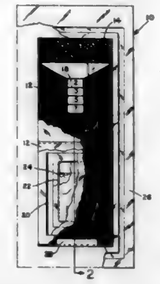
4,038,873

TEMPERATURE MONITOR AND INDICATOR

Elias Kimmel, Great Neck, N.Y., assignor to Big Three Industries, Inc. (Tempil Div.), S. Plainfield, N.J.

Filed June 18, 1975, Ser. No. 588,050
Int. Cl.² G01K *11/06, 11/12*
U.S. Cl. 73—358 **20 Claims**

12. A time/temperature indicator for use with a frozen food package comprising:
a. carrier means made of porous material and having longitudinally extending indicating means thereon,
b. a diffusing medium substantially fully impregnating said carrier means initially, said diffusing medium having a sharp melting point at a predetermined temperature and changing from a solid state to a liquid state whenever said predetermined temperature is exceeded,
c. a dye composition coating a portion of the surface of said carrier means adjacent said indicating means,
said dye composition diffusable at a controlled rate through said diffusing medium whenever said diffusing medium is in a liquid state to provide progressive coloration along said indicaing means on the carrier means as an irreversible record of the time said time/temperature indicator is exposed to a temperature in excess of said predetermined temperature at which the diffusing medium is in a liquid state.

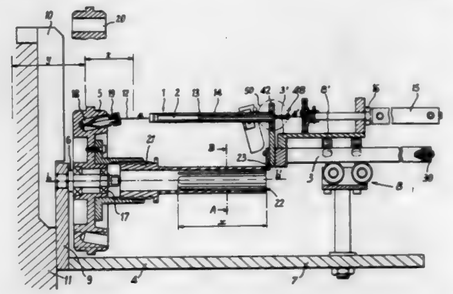


4,038,874

DEVICE FOR THE INSERTION OF SAMPLES INTO A CHROMATOGRAPHY COLUMN

Pierre Baldin, Bizanos; Albert Brocco, Jurancon, and Jean-Paul Winstel, Lescar, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Apr. 21, 1976, Ser. No. 679,095
Claims priority, application France, Apr. 24, 1975, 75.12749
Int. Cl.² G01N *1/14*
U.S. Cl. 73—422 GC **7 Claims**



1. In a device for the insertion of samples into a generally vertical chromatography column comprising:
a sample holder comprising a plate mounted to rotate about an axis transverse to said column, said plate defining a plurality of cavities arranged in a ring about said axis,
said chromatography column being located on one side of the sample holder,
a syringe mounted on the other side of said sample holder in a position such that said cavities become successively aligned with said syringe as said plate rotates, said syringe comprising an elongated hollow body, a needle at one end of said body, and a piston mounted in said body, and both said piston and said body being mounted for translational movement parallel to said axis, and
the improvement according to which at least some of said cavities are adapted to receive a sample cell while others are holes passing through said plate, the axis of rotation of the plate and the path of translational movement of said syringe lie in the same vertical plane, and the center line of a cavity aligned with said syringe, taken in a vertical plane containing said axis, is at an acute angle of at least 10° to the horizontal,
and said device comprises control means for correlating the rotation of said plate to the translational movements of

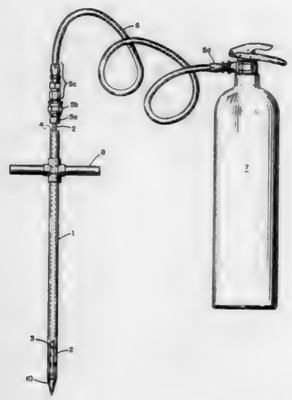
said syringe and piston in order to carry out a cycle of operations including the withdrawal of a sample from a cell in one of said cavities and the injection of said sample through one of said holes into said column.

4,038,875

CRYOGENIC SEDIMENT SAMPLER

William J. Walkotten, Juneau, Alaska, assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed May 18, 1976, Ser. No. 687,489
Int. Cl.² F25D *3/14*; G01N *1/08*
U.S. Cl. 73—425 **7 Claims**



1. An apparatus for sampling the sediment compositions of stream beds and the like comprising,

a. A first tube of heat-conducting material open at one end and closed at the other end, the open end being open to the atmosphere;

b. A second tube open at one end and closed at the other end having an outside diameter smaller than the inside diameter of said first tube and a length at least as long as said first tube, said second tube loosely fitting inside said first tube so that the closed end of said second tube is in close proximity to the closed end of said first tube;

c. A plurality of nozzles of a size which allows a controlled release of a gas under pressure from inside said second tube, said nozzles being located near the closed end of said second tube in a sufficiently symmetrical array so that said second tube remains stable within said first tube when the gas is released to atmospheric pressure within said first tube;

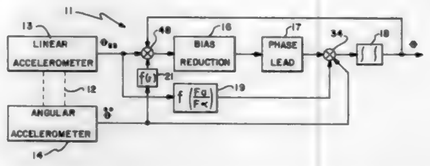
d. A means connected to the open end of said second tube for delivering to said second tube a gas under pressure sufficient to decrease the temperature of said gas to below the freezing point of water when said gas is released through said nozzles to the atmosphere in said first tube thereby quickly decreasing the temperature of said first tube to below the freezing point of water in the stream beds and the like into which said first tube is inserted.

4,038,876

ACCELERATION ERROR COMPENSATED ATTITUDE SENSING AND CONTROL APPARATUS AND METHOD

Harold D. Morris, Orinda, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Filed Mar. 4, 1976, Ser. No. 664,059
Int. Cl.² G01P *3/00*
U.S. Cl. 73—432 R **24 Claims**



1. An error compensated attitude sensing apparatus comprising

a support structure

an angular accelerometer mounted on said support structure for producing an angular acceleration indicative output, said angular accelerometer having an angular acceleration sensing axis and a linear acceleration sensitive axis oriented orthogonally thereto,

whereby said angular acceleration indicative output may include a linear acceleration sensitivity output component,

a tilt sensor mounted on said support structure for producing an angle of tilt indicative output wherein said angle of tilt is relative to a reference plane,

said tilt sensor having tilt axis and a linear acceleration sensing axis in orthogonal relation, said tilt axis being aligned substantially parallel with said angular acceleration sensing axis and said angular accelerometer linear acceleration sensitive axis being aligned substantially parallel with said linear acceleration sensing axis,

means for receiving said angular acceleration indicative output and for producing an angle indicative output,

means for receiving said angle indicative output and said angle of tilt indicative output and producing a combined angle indicative output,

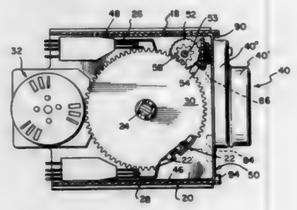
and means for coupling said angle of tilt indicative output to said angular acceleration indicative output in predetermined proportion so that said linear acceleration sensitivity output component therein is substantially cancelled.

4,038,877

TIMING MECHANISM

Ernest F. Kloenne, Beech Grove, and Richard C. Downing, Indianapolis, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Feb. 23, 1976, Ser. No. 660,375
Int. Cl.² F16H *29/00*; H01H *7/08, 43/10*
U.S. Cl. 74—125 **14 Claims**



1. A timing mechanism comprising:

a. cam means and switch means responsive to a rotation of said cam means,

b. constant speed drive means,

c. first and second cooperating bevel gears, and

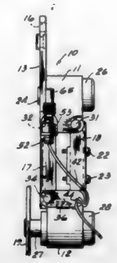
d. first coupling means coupling said first bevel gear to said constant speed drive means and a second coupling means coupling said second bevel gear to said cam means.

4,038,878

BICYCLE DERAILLER

Walter Dian, Downers Grove, Ill., assignor to Beatrice Foods Co., Elgin, Ill.

Filed May 17, 1976, Ser. No. 687,294
Int. Cl.² F16H *7/22, 11/08*
U.S. Cl. 74—217 B **9 Claims**



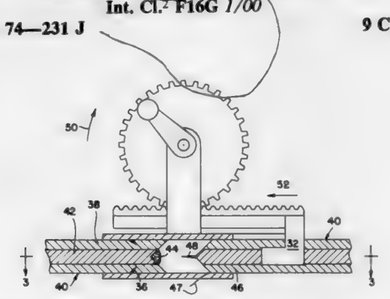
1. A bicycle derailler having upper and lower main derailler members, a pair of links pivotally attached to said upper and lower main derailler members, an actuating lever pivotally attached to said lower main derailler member, a spring mounted between one of said links adjacent said lower main derailler member and said actuating lever to bias said actuating lever and an actuating cable attached to said actuating lever.

4,038,879

PULLEY BELT AND ITS INHERENT INSTALLATION DEVICE

James Courtney, Miami, Fla., assignor to Jerome H. Lacheen, Philadelphia, Pa.

Filed July 26, 1976, Ser. No. 708,558
Int. Cl.² F16G *1/00*
U.S. Cl. 74—231 J **9 Claims**



1. A Pulley Belt comprising

a two-ended belt,

a synthetic core passing through the entire length of the belt, one end of the belt containing a pocket of adhering means, the other end of the belt containing a pin on the end thereof

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4,038,880

DRIVE TRAIN AND TRANSMISSION FOR FORAGE HARVESTER

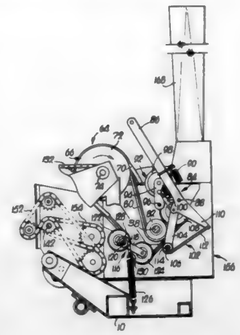
Harold Keith Garrison, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Oct. 30, 1975, Ser. No. 627,055
Int. Cl.² F16H *7/12, 7/10*; A01D *69/10, 69/08*
U.S. Cl. 74—242.1 R **19 Claims**

1. In a power transmission:

a first power train including a first rotatable driven member and a first endless, flexible element entraining said first member;

a second power train including a second rotatable driven member, mounted for rotation with said first member about a common axis, and a second endless, flexible element entraining said second member; and



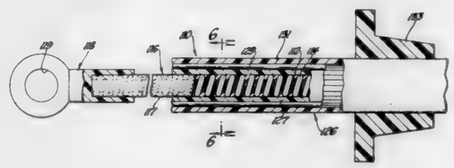
clutch mechanism shiftable between a first position driving the members and both elements in one direction and a second position driving the members and said second element in the opposite direction while said first element remains idle.

4,038,881

MOTION TRANSMITTING REMOTE CONTROL ASSEMBLY

Winthrop B. Conrad, Rosemont, Pa., assignor to Teleflex Incorporated, North Wales, Pa.

Filed May 11, 1973, Ser. No. 359,320
Int. Cl.² F16C *1/10* F16H *1/04*
U.S. Cl. 74—501 P **8 Claims**



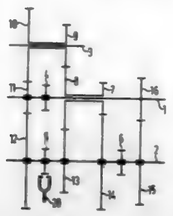
1. A motion transmitting remote control assembly comprising: an elongated flexible motion transmitting element including a solid core made up of a plurality of individual wire strands helically wound together on a long lead and a helically coiled wire disposed in direct engagement about said core in spaced convolutions, terminal means of organic polymeric material which is inflexible in all directions and disposed about said element along a predetermined section of the length thereof to encase said coiled wire and said strands of said core to fill the areas between adjacent convolutions of said wire so that said strands of said core and said coiled wire are embedded in said terminal means, and a guide disposed about said element and said terminal means for supporting said element and said terminal means for longitudinal movement, said terminal means including a strengthening section extending along said predetermined section of said element for preventing the bending of said element along its longitudinal axis along said predetermined section thereof and an attachment portion extending from said guide for connection to a movable member.

4,038,882

VARIABLE RATIO GEAR TRANSMISSION

Dieter Keller, Friedrichsdorf, Germany, assignor to Fichtel & Sachs A.G., Schweinfurt am Main, Germany

Filed Sept. 18, 1975, Ser. No. 614,354
Claims priority, application Germany, Sept. 21, 1974, 2445241
Int. Cl.² F16H *3/08*
U.S. Cl. 74—331 **7 Claims**



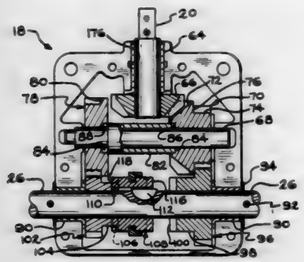
1. A variable ratio gear transmission comprising:
a. a first shaft;
b. a second shaft;
c. first and second gear rotatable on each of said shafts in axially fixed respective positions,
   1. each gear on one of said shafts permanently meshing with the corresponding gear on the other shaft;
d. a countershaft;
e. first and second gears mounted on said countershaft and permanently connected for joint rotation in permanent meshing engagement with said first and second gears on said first shaft respectively;
f. first coupling means for coupling one of said first and second gears on said first shaft to said first shaft for joint rotation; and
g. second coupling means for coupling to said second shaft one of said first and second gears on said second shaft.

4,038,883

COMPACT TRANSMISSION

Ronald N. Jones, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Sept. 10, 1975, Ser. No. 612,257
Int. Cl.² B60K *17/04*; F16H *3/08, 5/06, 57/02*
U.S. Cl. 74—337.5 **4 Claims**



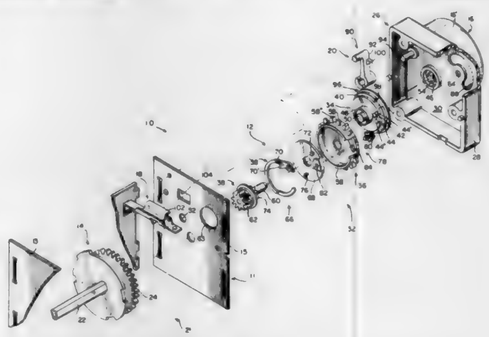
1. A compact two-speed transmission comprising an input shaft, a first bevel gear mounted on said input shaft for rotation therewith, an intermediate shaft, a combination second bevel gear and first spur gear on said intermediate shaft, said second bevel gear being engaged with said first bevel gear, a second spur gear on said intermediate shaft, a sleeve around said intermediate shaft between said second bevel gear and said second spur gear and having toothed means engageable with each of said second bevel gear and said second spur gear for enabling said second spur gear to be driven by said second bevel gear and for maintaining said second bevel gear and said second spur gear in fixed, spaced relationship on said intermediate shaft, an output shaft, a third spur gear rotatably mounted on said output shaft and meshing with said first spur gear, a fourth spur gear rotatably mounted on said output shaft and meshing with said second spur gear, said third spur gear having teeth facing toward said fourth spur gear, said fourth spur gear having teeth facing toward said third spur gear, a clutch dog on said output shaft for rotation therewith between said third and fourth spur gears and having teeth facing toward the teeth of both of said third and fourth spur gears, said clutch dog being mounted for axial movement relative to said output shaft, said combination gear having shoulder means extending along the side of the teeth of said third spur gear to retain said third spur gear in a fixed axial position relative to said output shaft, said second spur gear having shoulder means extending along the side of the teeth of said fourth spur gear to retain said fourth spur gear in a fixed axial position relative to said output shaft, a shifter fork engageable with said clutch dog, and lever means engageable with said shifter fork for moving said clutch dog between a position engageable with said third spur gear and a position engageable with said fourth spur gear.

4,038,884

TIMING MECHANISM HAVING IN LINE INTERMITTENT DRIVE MEANS

Benjamin F. Chestnut, Greenwood, and Ray A. Altenschulte, Indianapolis, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Jan. 30, 1976, Ser. No. 654,048
Int. Cl.² F16H *53/00*
U.S. Cl. 74—568 T **4 Claims**



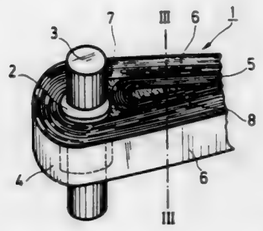
1. A timing mechanism comprising:
a. a first housing including first and second oppositely disposed end plates defining a first space therebetween, a rotatable shaft carried within said first space by said end plates, cam means fixedly carried by said shaft, a gear connected to said shaft, and apertures in said first end plate providing access to said first space,
b. a second housing including a third end plate disposed from and in alignment with said first and second end plates to provide a second space between said first and third end plates in line with said first space,
c. a constant speed drive means carried by said third end plate and having an output means communicating with said second space through an aperture provided in said third end plate, and
d. an intermittent drive means carried in said second space to impart intermittent rotation to said cam means in response to a constant speed output of said constant speed drive means, including
   1. a cylindrical drive means coupled to and responsive to movement of said constant speed drive means, said cylindrical drive means including at least one peripheral recess, and actuator means disposed on each side of said recess,
   2. gear means responsive to movement of said cylindrical drive means, said gear means including two sets of teeth, one of said sets having a thickness greater than the other,
   3. rotation of said cylindrical drive means causing engagement of said actuator means with said sets of teeth so as to rotate said gear means as the set of teeth of greater thickness rotates through said recess, further rotation of said cylindrical drive means engaging said set of teeth of greater thickness with the side of said cylindrical drive means so as to hold said gear means from rotation, and
   4. a ratchet wheel carried by a second shaft and coupled to said gear, and substantially semi-circular pawl carried by a rotating disc mounted on said second shaft and coupled to said gear means, and a tooth extending from said semi-circular pawl and engaging said ratchet wheel, whereby intermittent rotation is imparted to said gear in a predetermined direction.

4,038,885

CONNECTING ELEMENT FOR A PART OF FIBER-REINFORCED PLASTIC

Wolfgang Jonda, Oberpframmern, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Nov. 20, 1975, Ser. No. 633,712
Claims priority, application Germany, Nov. 26, 1974, 2455810
Int. Cl.² G05G *1/00*
U.S. Cl. 74—581 **8 Claims**



1. A stress-reducing arrangement for a connecting element having a part of fiber-reinforced plastic subject to being stressed by longitudinal and/or bending forces, comprising:
a bush;
a retaining element for said bush;
a first fiber strand of fiber-reinforced plastic, said fiber strand composed of a bundle of fibers, forming an end loop being disposed around said bush, said end loop having side portions; and
a second fiber strand of fiber-reinforced plastic, said fiber strand composed of a bundle of fibers, forming an inner loop being disposed within said end loop between the bush and said side portions of said end loop, said inner loop bearing with its outer curved boundary on the bush.

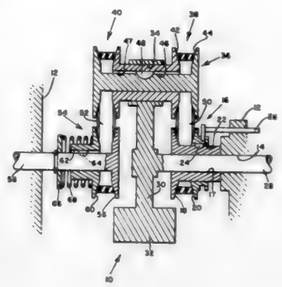
4,038,886

FORWARD, NEUTRAL AND REVERSE V-BELT PLANETARY DRIVE

Richard Arthur Wittren, Cedar Falls, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 22, 1976, Ser. No. 669,321
Int. Cl.² F16H *9/26, 11/02*
U.S. Cl. 74—793 **4 Claims**

1. A variable speed drive comprising: sun pulley means having an adjustable effective diameter and non-rotatably positioned about a central axis, said sun pulley means having an axial bore therethrough and having an adjustable effective diameter; means for changing the effective diameter of the sun pulley means; input arm means rotatable in the axial bore and having a planet bore provided therein with an axis parallel to and orbital about the central axis; planet pulley means rotatably positioned in the planet bore including a first and second pulley respectively having first and second inversely adjustable effective diameters disposed on either side of said input arm means; first V-belt means wrapping the effective diameter of the sun pulley means and the first effective diameter of the planet pulley means; output pulley means having an adjustable effective diameter biased towards the maximum effective diameter and rotatable about the central axis; and second V-belt means wrapping the effective diameter of the output pulley means and the second effective diameter of the planet pulley means.

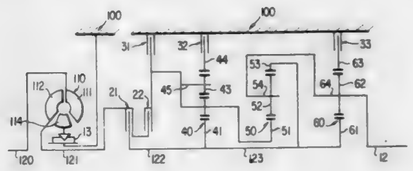


4,038,887

SPEED CHANGE GEAR

Noboru Murakami, Nagoya; Koichiro Hirosawa, Kariya; Kazuo Ohara, and Koichi Matsuo, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Division of Ser. No. 440,544, Feb. 7, 1974, Pat. No. 3,946,624.
This application Dec. 24, 1975, Ser. No. 644,030
Claims priority, application Japan, Feb. 26, 1973, 48-22830; May 22, 1973, 48-57372
Int. Cl.² F16H *57/10*
U.S. Cl. 74—769 **12 Claims**



1. A speed change gear comprising:
first, second and third planetary gear sets suitably interposed between an input shaft and an output shaft;
said first planetary gear set including a first sun gear, a first planetary gear engaged with said first sun gear, a second planetary gear engaged with said first planetary gear, a first ring gear engaged with said second planetary gear, and a first carrier rotatably supporting said first and second planetary gears;
sais second planetary gear set includes a second sun gear drivingly coupled to said first carrier, a third planetary gear engaged with said second sun gear, a second ring gear enmeshed with said third planetary gear, and a second carrier rotatably supporting said third planetary gear;
said third planetary gear set includes a third sun gear drivingly coupled to said first sun gear and to said second ring gear, a fourth planetary gear interengaged with said third sun gear, a third ring gear engaged with said fourth planetary gear, and a third carrier rotatably supporting said fourth planetary gear and drivingly coupled to said second carrier and to said output shaft;
a first clutch for coupling or uncoupling said input shaft to or from said first sun gear, said second ring gear and said third sun gear;

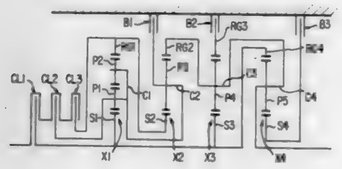
a second clutch for coupling or uncoupling said input shaft to or from said first carrier and said second sun gear;
a first brake means capable of being actuated for locking said first carrier and said second sun gear to the gear casing;
a second brake means capable of being actuated for locking said first ring gear to said casing; and
a third brake means capable of being actuated for locking said third ring gear to said casing.

4,038,888

SPEED CHANGE GEAR SYSTEM

Noboru Murakami, Nagoya; Koichi Matsuo, Toyota; Koichiro Hirosawa, Kariya, and Kazuo Ohara, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Japan

Division of Ser. No. 501,686, Aug. 29, 1974, Pat. No. 3,946,623. This application Dec. 24, 1975, Ser. No. 644,031
Int. Cl.² F16H *57/10*
U.S. Cl. 74—765 **18 Claims**



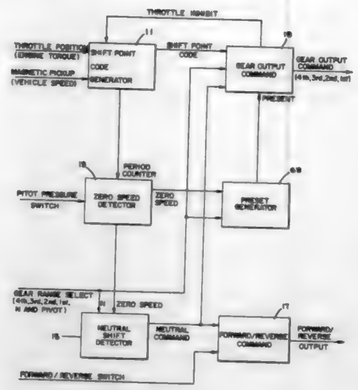
1. A speed change gear system comprising:
an input shaft;
a first sun gear;
a first planetary gear engaged with said first sun gear;
a second planetary gear engaged with said first planetary gear;
a first ring gear engaged with said second planetary gear;
a first carrier rotatably supporting said first and second planetary gears;
a second sun gear engaged with said first ring gear;
a third planetary gear engaged with said second sun gear;
a second ring gear engaged with said third planetary gear;
a second carrier rotatably supporting said third planetary gear and engaged with said first carrier;
a third sun gear engaged with said first sun gear;
a fourth planetary gear engaged with said third sun gear;
a third ring gear engaged with said fourth planetary gear;
a third carrier rotatably supporting said fourth planetary gear and engaged with said second ring gear;
an output shaft engaged with said third carrier;
a first clutch being capable of coupling or uncoupling simultaneously said first and third sun gears to or from said input shaft;
a second clutch being capable of coupling or uncoupling simultaneously said first and second carriers or from said input shaft;
a third clutch being capable of coupling or uncoupling simultaneously said first ring gear and said second sun gear to or from said input shaft;
a first brake being capable of locking simultaneously said first and second carriers to said gear casing; and
a second brake being capable of locking said third ring gear to said gear casing.

4,038,889

ELECTRONIC TRANSMISSION CONTROLLER

Carl E. Lindow; Craig L. Joseph, both of San Jose; Fred J. Caterina, Cupertino, and Harlan N. Howard, Sunnyvale, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed May 14, 1975, Ser. No. 577,522
Int. Cl.² B60K *21/00*
U.S. Cl. 74—866 **7 Claims**



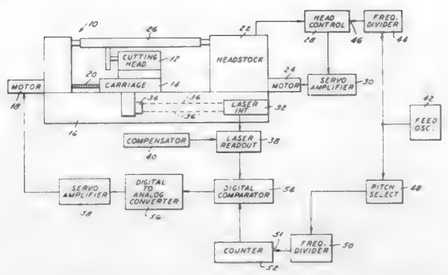
1. In an electronic transmission controller for a vehicle having an engine, a throttle for controlling the torque of the engine, a ground engaging wheel, a transmission with a neutral gear shifting position and a plurality of reverse and forward gear ratios, selector means for selecting a range of said gear ratios in which said transmission is to be operated, and gear-shift means for shifting from one range of gear ratios to another, the controller comprising throttle signal generating means connected to the throttle for producing a throttle setting signal indicative of a throttle setting variable up to a full throttle setting, wheel speed strobe generating means operatively associated with the ground engaging wheel for producing a sequence of wheel speed strobe signals with periods indicative of the rotational speed of the wheel, oscillatory signal generating means operatively associated with the throttle signal generating means for producing an AC signal of varying frequency, the frequency being indicative of the throttle setting signal, shift point code signal generating means operatively associated with the wheel speed generating means and with the oscillatory signal generating means for producing a shift point code signal indicative of permissible transmission gear choices, gear range select signal generating means operatively associated with said gear range selector of the transmission for producing a gear range select signal indicative of the gear range presently selected in the transmission by the operator, gear comparison and selection means operatively associated with the shift point code signal generating means and the gear range select signal generating means for comparing the shift point code signal and the gear range select signal and for producing a gear command signal which controls the transmission, and further producing a throttle inhibit signal whenever the gear command signal requires a higher gear than called for by the gear range select signal, throttle inhibit means responsive to the throttle inhibit signal for overriding said throttle setting signal and simulating a throttle setting signal at the oscillatory signal generating means indicative of a full throttle setting, and said gear comparison and selection means being operatively associated with the gear shift means for shifting the transmission in response to the gear command signal, whereby the controller will expeditiously issue a gear command signal for shifting the transmission to a next lower gear ratio in response to a shift point code signal derived from the wheel speed signal and the simulated full throttle setting signal without regard to the actual throttle setting signal.

4,038,890

MACHINE CONTROL SYSTEM

James L. Winget, Ferndale, Mich., assignor to U.S. Industries, Inc., Ferndale, Mich.

Filed Nov. 24, 1975, Ser. No. 634,855
Int. Cl.² B23B *3/00, 5/46*
U.S. Cl. 82—5 **9 Claims**



1. In combination with a machine for cutting a helical lead of uniform pitch and contour on a rotary member and including means adapted to support and rotate a workpiece, a carriage, and a cutting head mounted on said carriage for linear motion with respect to said workpiece, a circuit to control the rate of rotary displacement of said workpiece and the rate of linear displacement of said carriage and cutting head at a preselected uniform ratio with respect to one another comprising a first incremental servo loop operatively connected to said rotating means to divide each revolution of said workpiece into a preselected number of increments N and responsive to a first indexing signal to index said workpiece as a function of said rotational increments, a second incremental servo loop operatively connected to said carriage to divide a selected interval of linear motion of said carriage into a preselected number of increments M and responsive to a second indexing signal to index said carriage as a function of said linear increments, a fixed frequency oscillator, means connecting said oscillator to said first servo loop to provide said first indexing signal at a frequency R, and means connecting said oscillator to said second servo to provide said second indexing signal at a frequency L, said second indexing signal being timed uniformly with respect to said first indexing signal, the pitch of said helical lead and said ratio being equal to RM/LN threads per selected length interval.

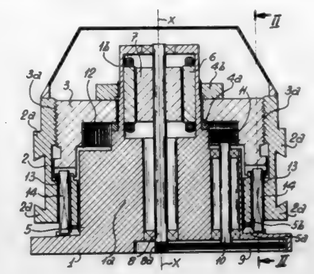
4,038,891

DEVICE FOR THE AUTOMATIC POSITIONING OF A TOOL

Ettore Zaninelli, Milan, Italy, assignor to Baruffaldi Frizioni S.p.A., Milan, Italy

Filed May 3, 1976, Ser. No. 682,646
Claims priority, application Italy, May 6, 1975, 23055/75
Int. Cl.² B23B *29/28*
U.S. Cl. 82—36 A **3 Claims**

1. A turret for machine tools, comprising
1. a base having an axis and defining an annular track coaxial therewith,
2. a support member mounted on the base for rotation about the axis and against axial displacement,
3. means for rotating the rupport member about the axis,
4. a tool carrier defining a guide parallel to the axis and in alignment with the track,
5. means mounting the tool carrier on the support member for axial displacement during an initial angular movement of the support member upon rotation thereof and subsequent rotation therewith upon further angular movement of the rotating support member,
6. a pair of coaxial rings of teeth respectively mounted on the base and on the tool carrier, the teeth of the two rings being in meshing engagement to locate the tool carrier on the base in a working position and the teeth being disengaged upon the axial displacement of the tool carrier for enabling the tool carrier to be rotated upon the further angular movement of the support member,
7. a bolt slidably mounted in the guide and having ends projecting therebeyond, the bolt being displaced along the track with the tool carrier upon the subsequent rotation thereof,
8. the annular track having a succession of tool carrier positioning recesses each adapted to receive a projecting end of the bolt for locking the tool carrier in position on the base, (a) the projecting bolt end and the recesses having corresponding inclined camming surfaces for moving the bolt out of the recesses upon the subsequent rotation,



9. resilient means biasing the bolt end into a respective one of the tool carrier positioning recesses,
10. the support member having a recess adapted to receive the opposite projecting bolt end when the first-mentioned bolt end is moved out of a preceding one of the tool carrier positioning recesses upon the subsequent rotation and, p1 11. cooperating abutment surfaces parallel to the axis on the support member and the tool carrier, the abutment surfaces being spaced apart in the working position of the tool carrier, the initial angular movement of the support member moving the abutment surfaces into engagement and the abutment surface on the support member entraining the tool carrier upon said engagement during the subsequent rotation.

4,038,892

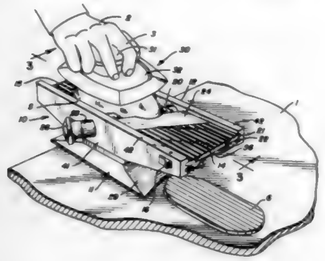
FOOD SLICER WITH INDEXING TURRET

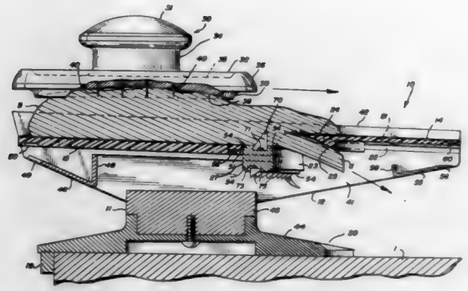
Samuel J. Popeil, Chicago, Ill., assignor to Popeil Brothers, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 595,148, July 11, 1975, abandoned. This application July 6, 1976, Ser. No. 702,470
Int. Cl.² B26D *4/42, 4/70*
U.S. Cl. 83—4 **30 Claims**

1. A food slicer with indexing turret comprising, in combination,
a body having a base portion and opposed sides,
a blade angled across the body portion and between the sides thereof,
a table blade segment insertable into the body portion at two different levels,
a table lock segment which, along with the table blade segment, comprises the table of the slicer,
and an indexing turret mounted for rotation along an axis substantially parallel with that of the blade and therebeneath having a plurality of surfaces, at least two flat surfaces offset at different positions from the axis of the indexing turret, and at least one other side having upstanding blade segments with the blades having uniform spacing therealong,

whereby, upon indexing the turret in combination with positioning the table blade segment at two different levels, four





different thicknesses of flat slices may be made, and cuts such as french fries may be made.

4,038,893

APPARATUS FOR CUTTING CONTINUOUSLY ARRIVING FLAT STRUCTURES

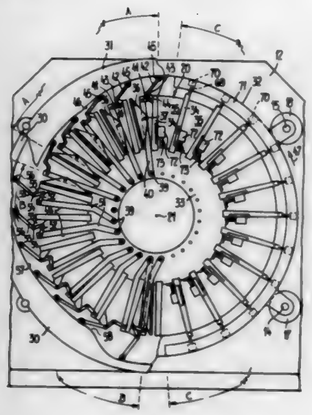
Walter Reist, Hinwil, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Mar. 29, 1976, Ser. No. 671,413

Claims priority, application Switzerland, Apr. 8, 1975, 4407/75

Int. Cl.[2] B26D *7/06*

U.S. Cl. 83—154 **26 Claims**



1. An apparatus for cutting continuously arriving flat structures, especially printed products, comprising a revolving driven rim of essentially similar cutter tools provided with traveling follower elements, a common control cam for actuating the cutter tools via the traveling follower elements, individual feed means provided for each of the cutter tools for the infeed and withdrawal of a flat structure.

4,038,894

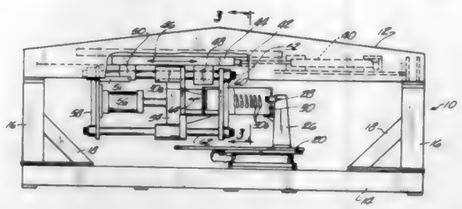
PIERCING APPARATUS

Jan C. Knibbe, Detroit, and Willard J. McPhee, Bloomfield Hills, both of Mich., assignors to Springfield Tool and Die, Inc., Dearborn, Mich.

Filed July 18, 1975, Ser. No. 596,995

Int. Cl.[2] B26F *1/02*

U.S. Cl. 83—411 R **5 Claims**



1. Apparatus for performing work on a workpiece, said apparatus comprising:

a frame,

an index table mounted on said frame, said table being selectively rotatable about an axis;

means for mounting said workpiece to said table comprising a holder extending upwardly from said table near one edge thereof and a clamp carried at the upper end thereof for releasably engaging one portion of said workpiece, said clamp being swivelly mounted to said holder and

work performing means mounted to said frame and including a portion selectively movable in a direction substantially perpendicular to the axis of rotation of said index table to perform work on said workpiece in a different location at each rotated position of said table.

4,038,895

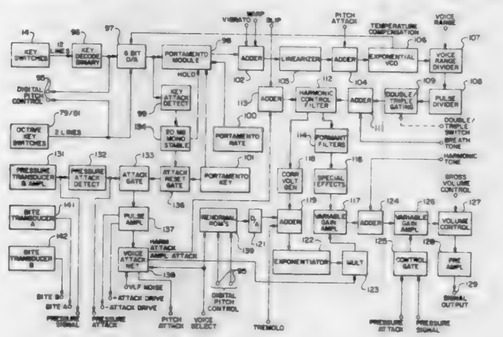
BREATH PRESSURE ACTUATED ELECTRONIC MUSICAL INSTRUMENT

Carl Jennings Clement, Los Altos; Kenneth Strong Campbell, Palo alto, and James Terrell Walker, Stanford, all of Calif., assignors to Clement Laboratories, Mountain View, Calif.

Filed July 2, 1976, Ser. No. 702,124

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.01 **34 Claims**



1. An electronic musical instrument for operation by means of combination mouth and finger manipulation by a player, comprising a framework, a key panel attached to said framework, a plurality of key switches mounted for access by the player's fingers at said key panel, each of said plurality of key switches providing a key signal corresponding to the player's finger pressure, a key decoder for receiving said key signal from each of said plurality of key switches, said key decoder

providing a digital code output for each of a plurality of predetermined key signal combinations, a digital to analog converter for receiving said digital code output and providing a tone signal corresponding thereto, an exponential voltage controlled oscillator coupled to said digital to analog converter for receiving said tone signal and providing a tone frequency which is an exponential function of said tone signal, said tone frequency having a fundamental frequency, a harmonic control filter coupled to said exponential voltage controlled oscillator and providing a harmonic controlled frequency containing substantially the same proportion of harmonics for any tone frequency, a formant filter for receiving said harmonic controlled frequency and providing a voice frequency having a harmonic content dependent upon said fundamental frequency, whereby the waveshape of said voice frequency is similar to the frequency of a predetermined voice, a mouthpiece attached to said framework adapted to be received in the player's mouth, a channel extending through said mouthpiece for communication with the player's mouth at one end, a pressure transducer mounted in said mouthpiece in communication with said channel and providing a pressure signal corresponding to pressure in said channel, whereby said pressure signal corresponds to breath pressure at the player's mouth, a pressure attack detection circuit for receiving said pressure signal and providing a pressure attack signal, and a variable gain amplifier coupled to said formant filter for receiving said voice frequency and coupled to said pressure transducer and said pressure attack detection circuit for control by said pressure signal and said pressure attack signal and providing an instrument voice signal, whereby introduction of breath pressure into said mouthpiece simultaneously with finger pressure by the player on a predetermined combination of said plurality of key switches produces predetermined pitch and timbre characteristics in said instrument voice signal which are peculiar to said predetermined voice.

4,038,896

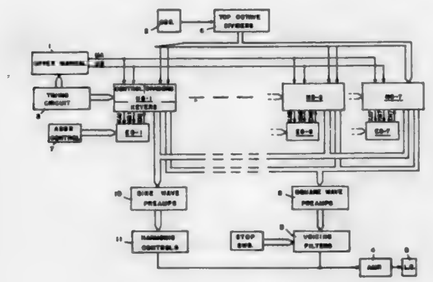
ELECTRONIC ORGAN WITH MULTI-PITCH NOTE GENERATORS

Alfred H. Faulkner, 1324 Portesuello Ave., Santa Barbara, Calif. 93105

Division of Ser. No. 610,772, Sept. 5, 1975. This application Sept. 5, 1975, Ser. No. 610,773

Int. Cl.[2] G10H *1/00*

U.S. Cl. 84—1.01 **19 Claims**



1. In a musical instrument, a common set of top octave dividers and active binary dividers extending to the bottom octave of the instrument's range, a plurality of normally inactive binary dividers at times operated to produce tone signals, selection circuits connecting said normally inactive binary dividers to said top octave dividers so as to produce tone signals in corresponding octave intervals in response to operation of playing keys, and a synchronizing circuit operative to start said normally inactive binary dividers under control of the bottom octave of said active dividers.

4,038,897

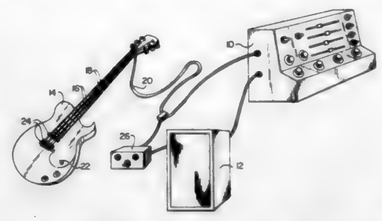
ELECTRONIC MUSIC SYSTEM AND STRINGED INSTRUMENT INPUT DEVICE THEREFOR

Jeffrey J. Murray, Ellington; Jeffrey L. Bachiochi, Rockville, and Norman L. Milliard, Stafford, all of Conn., assignors to Electronic Music Laboratories, Inc., Rockville, Conn.

Filed Oct. 14, 1975, Ser. No. 621,966

Int. Cl.[2] G10H *1/00, 3/00, 3/06*

U.S. Cl. 84—1.16 **13 Claims**



1. An electronic music system comprising a voltage controlled tone generator, a stringed instrument having at least one string and a plurality of frets spaced from one another along the length of said string with each string-fret pair representing an assigned musical tone, and means responsive to said string being pressed into contact with any one of said frets for producing and supplying to said voltage controlled tone generator, as the driving input signal for said tone generator, a voltage signal having a voltage value analogously related to the frequency of the musical tone assigned to the contacting string-fret pair, said voltage controlled tone generator including means for producing an intermediate signal having a frequency related to said input voltage signal, an amplifier having a voltage controlled gain for varying the amplitude of said intermediate signal, an envelope generator for providing a voltage waveform controlling the gain of said amplifier, and means for turning said envelope generator on to initiate the production of a new voltage waveform therefrom in response to said at least one string being brought into contact with any one of said frets.

4,038,898

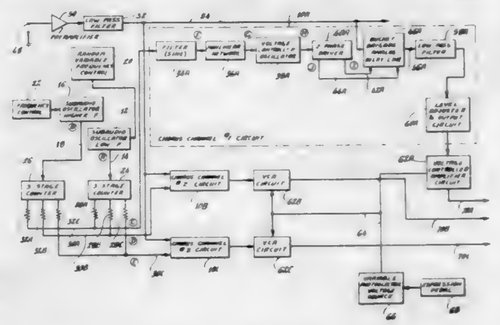
SYSTEM FOR PRODUCING CHORUS EFFECT

Alberto Kniepkamp, Arlington Heights, and Douglas Moore, Niles, both of Ill., assignors to Norlin Music, Inc., Lincolnwood, Ill.

Filed Mar. 3, 1975, Ser. No. 554,727

Int. Cl.[2] G10H *1/02*

U.S. Cl. 84—1.24 **34 Claims**



1. In an electronic musical instrument, a circuit for producing a chorus effect comprising:

a source of tone signals;

N separate channels where N is an integer greater than one, each of said channels having an analog delay line;

means for applying a tone signal as an input to each of said delay lines; and

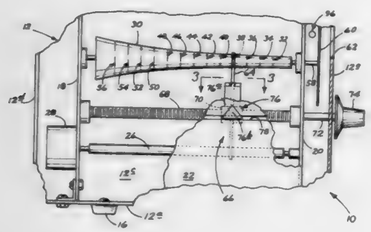
means for generating clock pulses for said delay lines, the clock pulse variations for the delay lines of each channel being out of phase with those for each other channel by a selected amount, said means including first and second N stage counters, means for stepping said first counter at a first predetermined relatively low frequency and for stepping the second counter at a second frequency, the second frequency being several times greater than the first frequency, means for combining the output from each stage of the first counter with the output from a selected stage of the second counter and applying each of said combined outputs to a single line, a filter means for each channel, a voltage controlled oscillator for each channel, means for applying the combined output on each of said lines through a different one of said filter means to control the output frequency of the corresponding oscillator, and means for utilizing the output from each oscillator to produce the clock pulses for the corresponding delay line;
the outputs from said delay lines being utilized to produce a chorus effect output from said instrument.

4,038,899

MUSICAL INSTRUMENT TUNING APPARATUS

Roderic A. MacMillan, 2757 SW. English Court, Portland, Oreg. 97201

Filed Feb. 17, 1976, Ser. No. 658,612
Int. Cl.[2] G10G *7/02*
U.S. Cl. 84—454 **11 Claims**



1. Tuning apparatus for a musical instrument the notes of which are intended to be frequency-distributed in accordance with a known mathematical formula, said apparatus comprising

a strobe wheel mounted for rotation,

an elongated shaft for rotating said wheel operatively connected thereto, said shaft including an elongated non-stepped unidirectionally tapered outside surface of revolution extending at least partially along its length, the taper of said surface directly relating to said known mathematical formula, and

substantially constant-speed drive means for driving said shaft, said drive means including means infinitely adjustable to impart drive to said shaft an an infinite number of points distributed in unbroken adjacency along the full length of said surface, thus to drive the shaft at different speeds.

4,038,900

EXPLOSIVE CLOSURE VALVE

Alvaro G. Lopez, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 19, 1976, Ser. No. 706,869
Int. Cl.[2] F42C *19/02*
U.S. Cl. 89—1 B **2 Claims**

1. In an explosive device including an explosive charge in a pressure chamber and a detonating fuse for detonating said charge in communication with the exterior of said chamber, the improvement comprising:

an explosive valve in the path of said detonating fuse for preventing backfire from said chamber when said explosive charge is detonated;

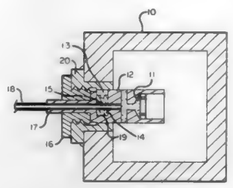
said explosive valve comprising;

valve housing means in the wall of the chamber;

said valve housing means having a cylinder-like portion formed therein;

a piston-like valve means mounted in said cylinder like portion;

a passageway formed in said valve housing means and said



piston-like valve means such that in an unfired condition the passageway is in communication with the interior and exterior of the explosive chamber;

detonating fuse means in said passageway adapted to detonate the explosive charge;

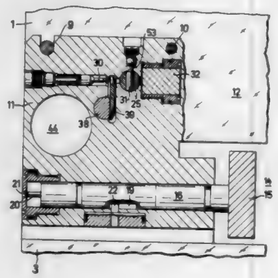
the relationship of said piston-like valve means to said valve housing means being such that when said detonating fuse is detonated the passageways through said piston-like valve means and said valve housing means are off-set laterally sufficiently to effectively seal the chamber.

4,038,901

SUBMERGIBLE DETONATING DEVICE

Günter Backstein, Meerbusch, Germany, assignor to Rheinmetall G.m.b.H., Duesseldorf, Germany

Filed May 28, 1976, Ser. No. 690,968
Claims priority, application Germany, July 10, 1975, 2530707
Int. Cl.[2] F42C *5/00*
U.S. Cl. 89—1 B **10 Claims**



1. A submergible ignition device for a submarine explosive cable cutter, adapted to cut the anchoring chains and steel cables of sea mines by detonating an explosive charge, comprising in combination,

a housing;

a detonator operatively mounted in the housing;

a shearing force safety means operatively mounted in said housing;

a cotter pin safety means operatively connected to said shearing force safety means and adapted to release said shearing force safety means when a predetermined external force has been applied to said cotter pin safety means;

a water pressure safety means operatively mounted in said housing;

a blocking rotor means rotatably mounted in said housing;

an ignition needle blocking means operatively mounted in said housing; and

a dummy position setting means operatively mounted in said housing;

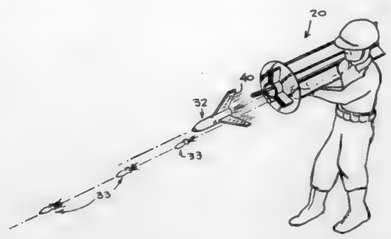
all of the aforesaid means being adapted to move from an unblocking to a blocking position and being operatively connected to each other or coacting with each other so that said detonator can only be triggered after all said means have been positively moved to their respective unblocking positions.

4,038,902

ARTILLERY WEAPON

Robert B. Welsh, 725 Providence Road, Charlotte, N.C. 28207

Filed Aug. 17, 1976, Ser. No. 715,144
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.807 **9 Claims**



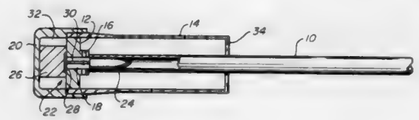
1. A hand-held artillery weapon for aiming a rocket projectile at a desired target by targeting the weapon with rocket darts, said weapon comprising a projectile barrel for lauching the rocket projectile, a dart barrel mounted on the projectile barrel with the axis of the dart barrel generally parallel to the axis of the projectile barrel, magazine means for supplying an unfired dart to the dart barrel after a dart has been fired, means for retaining the dart in the dart barrel prior to firing of the dart, means for firing a dart retained in the dart barrel, means for retaining a projectile in the projectile barrel prior to firing of the projectile and means for firing the projectile thereby providing an artillery weapon which can be targeted on a desired target by firing as many rocket darts as necessary to position the projectile barrel in the desired orientation for firing of the rocket projectile.

4,038,903

TWO STAGE TELESCOPED LAUNCHER

William P. Wohlford, Bettendorf, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 23, 1976, Ser. No. 716,842
Int. Cl.[2] F41F *1/00*
U.S. Cl. 89—8 **5 Claims**



3. A two stage telescoped launcher comprising a barrel from which a projectile may be launched,

a pump tube with piston means therein adapted to exert pressure behind said projectile thereby to launch it from said barrel, and

pressure generating means for moving said piston and thus pressurizing said pump tube,

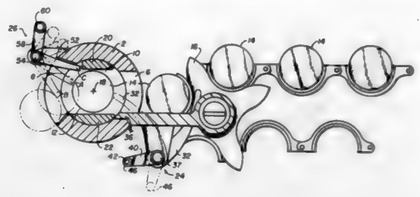
said barrel extending into said pump tube, said piston being floatingly mounted for longitudinal movement thereover.

4,038,904

CARTRIDGE FEED, POSITIONING AND EJECTION CONTROL SYSTEM

John G. Rocha, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 30, 1976, Ser. No. 701,459
Int. Cl.[2] F41D *9/02*
U.S. Cl. 89—33 MC **13 Claims**



1. In an automatic weapon system including a receiver having a round receiving opening with a feed inlet and an ejection outlet, a reciprocable firing chamber carrying a bolt and firing mechanism between in and out of battery positions, means for reciprocating said firing chamber, and a feed tray mechanism for indexing rounds in position for introduction into the receiver opening, the improvement comprising:

a cam actuated round feed, positioning and ejection assembly, said assembly including:

feed pawl means having a round receiving position and a round stop position,

ejection stop means having one limiting position to permit unobstructed ejection of a spent round casing from the receiver opening,

a second limiting position,

and an intermediate position in the receiver opening to obstruct movement and to permit centering of a round in the receiver opening in cooperation with the feed pawl means when in its round stop position,

cam follower means carried by the feed pawl means for moving the feed pawl means between said positions,

cam follower means carried by the ejection stop means for moving the ejection stop means between said intermediate and limiting positions, and

cam follower actuator means carried by the receiver for operating said cam follower means to synchronize movement of said pawl means between said positions to permit round feeding, positioning and ejection sequentially and repetitively in response to the movement of the firing chamber.

4,038,905

COMPRESSIBLE FLUID RECOIL SYSTEM

Achiel M. DuPont, Jr.; J. Burnett Moody, both of Rock Island, Ill., and Roger L. Newlon, Davenport, Iowa, assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,353
Int. Cl.[2] F41F *19/10*
U.S. Cl. 89—43 R **5 Claims**

1. In a weapon system including a movable gun tube having a breech and muzzle and having recoil and counterrecoil operating functions and a stationary gun mount cradle concentric with the gun tube, the improvement comprising:

a pressure chamber having end walls formed concentrically between said gun tube and cradle,

a movable cylindrical sleeve piston having sections of different diameters in said chamber concentric with said gun

tube and movably extending through said chamber end walls,

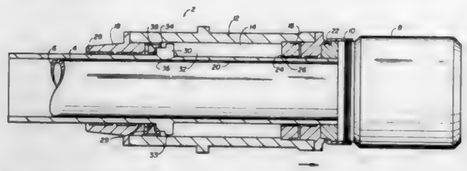
means sealing said end walls to permit pressurization of said chamber,

means connecting said gun tube and piston for movement together,

a circular stepped head in said chamber carried by and circumscribing said piston and separating said chamber into a breech compartment and a muzzle compartment, the larger diameter section of said piston being located in said muzzle compartment, said head being of lesser cross section on the muzzle compartment side of the chamber,

said cradle and head being spaced to define therebetween an annular orifice to throttle liquid passage between said compartments,

buffer means facing into the muzzle compartment actable with the smaller diameter portion of said piston head to damp movement of said piston near the end of counterrecoil movement, and a pressurizable compressible liquid in said chamber,



whereby, during recoil movement of said piston, said piston compresses liquid in the chamber by reducing the volume thereof and, at the end of the recoil movement, the compressed liquid force acting on the larger area of the smaller diameter section of the piston produces a counterrecoil force for returning the piston and gun tube to their battery positions,

said seal means including a retainer member forming the end wall of the muzzle compartment,

said buffer means including spaced grooves in the seal retainer for receiving the seals, and a chamber in said seal retainer located between said seals and in fluid communication with said muzzle compartment, said retainer chamber being sized relative to the muzzle compartment to maintain a pressure greater than the pressure in the muzzle compartment upon initiation of the recoil cycle and greater than atmospheric pressure thereby to prevent air intake into the muzzle compartment.

4,038,906

METHOD OF AND DEVICE FOR ACHIEVING A RAPID TRANSFER IN A TANK OF A ROUND FROM A MAGAZINE TO THE RAMMING POSITION AT THE FIREARM OF THE TANK

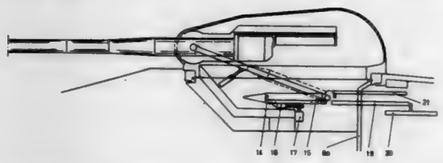
Bror Erling Tidstrom, Karlskoga, Sweden, assignor to AB Bofors, Bofors, Sweden

Filed Sept. 23, 1975, Ser. No. 616,098

Claims priority, application Sweden, Oct. 18, 1974, 74131269

Int. Cl.[2] F41H *7/06*

U.S. Cl. 89—46 **12 Claims**



1. In a tank, a magazine having elongated rounds stored therein, said magazine being located at a fixed position relative to the tank chassis, means defining a loading space in said tank, said means including a wall in said tank separating said magazine from said loading space, said wall having an opening therein through which rounds may be individually transferred, a firearm on said tank for firing said rounds, said firearm having a breech ring and an elongated barrel which is mounted for traversing movement in a first azimuth plane, said firearm being supported on trunnions for selective elevation of said barrel relative to said chassis whereby said first azimuth plane is variably inclinable relative to a second azimuth plane, and a device for effecting rapid transfer of a round from said magazine to a ramming position adjacent the breech ring of said firearm, said device comprising an elongated round cradle located in said loading space in spaced relation to said magazine at a position below and to the rear of the breech ring of said firearm, said elongated round cradle being mounted for elevational movement and also being mounted for rotation in said second azimuth plane about an axis transverse to said first azimuth plane of said firearm, means for setting said cradle into a predetermined feeding position relative to said magazine, one end of said elongated cradle being disposed in facing relation to said opening in said wall when said cradle is in its said feeding position, feeding means for transferring a round from said magazine through said opening along the direction of elongation of said round onto said elongated round cradle when said cradle is in its said feeding position, drive means for thereafter rotating said cradle in said second azimuth plane about said axis to angularly reposition said elongated round into a third plane which is oriented at right angles of each of said first and second azimuth planes and which passes through the center line of said elongated barrel, and gripping means operative subsequent to operation of said drive means for engaging said repositioned round to move said round along said third plane away from said cradle and into said ramming position adjacent the breech ring of said firearm.

4,038,907

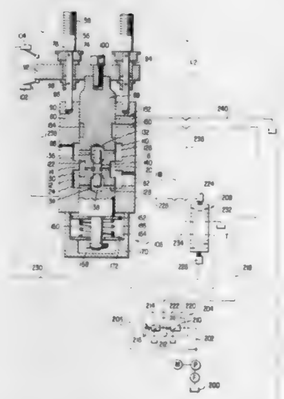
STROKE LIMITING MECHANISM WITH FAIL-SAFE FEATURE

Adolf F. Weiss, Easton, Pa., assignor to Alpha Press Company, Alpha, N.J.

Filed Jan. 21, 1976, Ser. No. 650,940

Int. Cl.[2] F15B *13/16, 15/22*

U.S. Cl. 91—20 **3 Claims**



1. In a high pressure hydraulic machine which includes a ram movably mounted within a cylinder; hydraulic operating means for effecting movement of said ram; and flow control means for controlling hydraulic flow to and from said hydraulic operating means; said flow control means including a valve body, a valve member movable within said valve body, signal generating means and actuating means connected to and movable with said valve body to actuate said signal generating means; the improvement which enables the aforesaid apparatus to function as a precise stroke limiting means for said movable member while at the same time incorporating a fail-safe mode of operation, which comprises:

said valve body having first and second spaced internal cavities and first and second ports connected respectively therewith;

said valve body additionally having third and fourth ports therein spaced away from said first and second ports;

said valve member having cross-flow passage means extending tranversely therethrough which enables said first and second cavities to be in flow communication with each other;

said valve member also having an elongated annular recess therein disposed at all times in flow communication with said third port, said annular recess being set off between a pair of spaced shoulders which can be defined as an upper shoulder and a lower shoulder;

said valve member being movable within said valve body during normal operation of said machine to reach certain opposed maximum positions which can be defined as a normal maximum upper position and a normal maximum lower position;

said valve member in said normal maximum upper position being disposed with said upper shoulder immediately adjacent to said fourth port but with said annular recess being out of flow communication with said fourth port;

said valve member in said normal maximum lower position being disposed with said lower shoulder being disposed immediately adjacent to said second internal cavity but with said annular recess being out of flow communication with said second internal cavity;

said hydraulic operating means including:

power means for delivering hydraulic fluid from a supply thereof;

first and second flow lines for receiving hydraulic fluid from said power means;

said first flow line being connected to a pressure relief valve and to said third port;

said second flow line being connected through a flow control valve to said first port;

a third flow line connected from said second port to said cylinder to provide hydraulic fluid beneath said ram to effect upward movement thereof;

a fourth flow line connected from said flow control valve to said cylinder to provide hydraulic fluid above said ram to effect downward movement thereof; and

a fifth flow line connected from said fourth port to said fluid supply;

said improvement being operative, in the event of a failure wherein said ram moves upward beyond its desired limit, to enter into a fail-safe mode of operation wherein said valve member moves upward beyond its normal maximum upward position, thereby moving said upper shoulder sufficiently to place said annular recess in flow communication with said fourth port whereupon hydraulic fluid being supplied through said first flow line and third port will pass through said annular recess and fourth port and will return to said fluid supply through said fifth flow line;

said improvement being operative, in the event of a failure wherein said ram moves downward beyond its desired limit, to enter into a fail-safe mode of operation wherein said valve member moves downward beyond its normal maximum lower position, thereby moving said lower shoulder sufficiently to place said annular recess in flow communication with said second internal cavity and said second pot whereupon hydraulic fluid being supplied through said first flow line and third port will pass through said annular recess, second internal cavity and second port and through said third flow line to apply upward pressure against said ram.

4,038,908

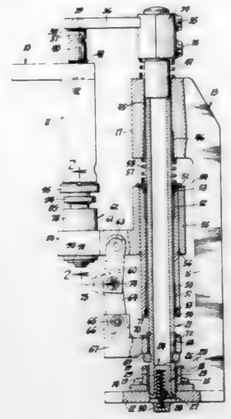
FLOATING SEALING PRESSURE MEANS FOR CARTON ENDS

Ivan L. Kauffman, Commerce Township, Oakland County, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Oct. 12, 1976, Ser. No. 731,383

Int. Cl.[2] B31B *1/64*

U.S. Cl. 93—36.3 **7 Claims**



1. In a carton packaging machine, including a support structure carrying a carton forming mandrel carried by the machine, the combination comprising:

a. a support means;

b. a carrier shaft movably mounted on said support means;

c. an upper support arm carried by support shaft;

d. a reaction pad mounted on said upper support arm and movably mounted over a carton forming mandrel and in alignment with the longitudinal axis thereof;

e. means for normally biasing said carrier shaft upwardly to an inoperative position with the reaction pad raised above the mandrel;

f. housing slidably mounted on said carrier shaft;

g. a lower support arm carried by said last mentioned housing;

h. pressure pad means mounted on said lower support arm and movable from a lowered inoperative position to a raised operative position against the bottom of the mandrel when said housing carrying said lower support arm is moved upwardly; and

i. toggle actuator means operatively connected to said lower support arm and to said carrier shaft for moving said lower support arm upwardly and said carrier shaft downwardly, to move the reaction pad into operative engagement with the mandrel carrier structure and to move the compression pad means into operative engagement with the lower end of the mandrel.

4,038,909

METHOD AND APPARATUS FOR COUNTING A PLURALITY OF FOLDED BOX BLANKS IN A STREAM OF BOX BLANKS AND SEPARATING THE COUNTED BLANKS AS A BATCH

Roland Preisig, Yens, Switzerland, assignor to J. Bobst & Fils, S.A., Switzerland

Filed Feb. 12, 1976, Ser. No. 657,612

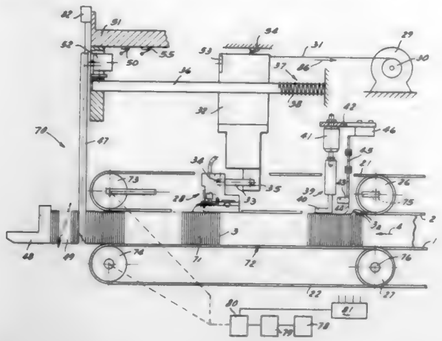
Claims priority, application Switzerland, Feb. 21, 1975, 2222/75

Int. Cl.[2] B31B *1/98*

U.S. Cl. 93—93 M **25 Claims**

1. A method for counting a predetermined number of folded box blanks which are disposed on edge in a continuous flow and for separating the predetermined number of box blanks

from the flow as a batch, said method comprising providing track means for receiving and supporting a flow of folded box blanks disposed on their edges and having a first and second end, a separating device at the second end of the track means and movable from a first position extending across the second end to prevent discharge of box blanks therefrom and a second position enabling discharge of box blanks, a counting head having means including a counting blade for counting folded box blanks and creating a signal; introducing a flow of box blanks to the first end of the track means; positioning the separating means to prevent discharge of box blanks from the second end; moving the counting head from a first position adjacent the separating device toward the first end to sequen-



tially count blanks in the flow contained therein; stopping movement of the counting head when a predetermined number of box blanks has been counted; holding the blade of the counting means between the last counted blank and next following blank; moving the separating means to the second position; moving the flow in the track means with the counting head moving therealong to discharge the counted blanks as a batch from the second end; stopping the moving of the flow as the counting head reaches the first position; moving the separating means to the first position extending between the last counted box blank and the next following blank to separate the batch from the flow, releasing the blade and moving the counting head toward the first end to count the next succeeding batch of blanks.

4,038,910

SLIDING ROOF FOR AUTOMOBILE ROOFS

Max B. Kneusels, Russelsheim; Dieter Federmann, Hainhausen, and Rainer Hattass, Grundau, all of Germany, assignors to American Sunroof Manufacturing Company, Southgate, Mich.

Filed Apr. 5, 1976, Ser. No. 673,783
Claims priority, application Germany, Apr. 4, 1975, 2514779
Int. Cl.[2] B60H *1/24*
U.S. Cl. 98—2.14 **2 Claims**



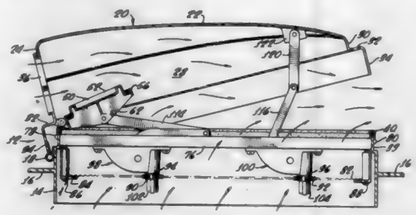
1. In a sliding ventilator for an automobile roof having an opening therein, a ventilator plate, means for pivotally mounting said ventilator plate in the vicinity of the front edge thereof about a pivotal axis which is slidably guided in the roof opening, means including link lever means for displacing said ventilator plate in an oblique position partially out of the roof opening into positions above the surface of the roof, said link lever means comprising two spaced apart link levers pivotally attached to said ventilator plate near the rear edge thereof and pivotal in planes perpendicular thereto, said link levers being pivotally journalled in the roof opening, shaft means extending parallel to said ventilator plate and rotatably mounted on said ventilator plate, said link levers being disengageably connected to said shaft, each of said link levers having a slit therein terminating in an eye having a diameter exceeding the width of the slit, an axially slidable bearing rod mounted on the rear edge of the roof opening and parallel thereto, said rod having, for each of said two link levers, a portion having a diameter substantially corresponding to the diameter of the eye and a constricted portion having a diameter substantially corresponding to the width of the slit, the spacing between said constrictions being substantially equal to the spacing between said link levers.

4,038,911

MULTI-DIRECTIONAL VENT

Arthur C. Hart, Buena Park, Calif., assignor to Elixir Industries, Gardena, Calif.

Filed Dec. 29, 1975, Ser. No. 644,607
Int. Cl.[2] B60H *1/26*
U.S. Cl. 98—2.14 **20 Claims**



1. A vent assembly for a vehicle having a ventilation opening formed in a wall thereof, said assembly comprising

a vent frame adapted to be mounted to said vehicle to frame said opening,

a vent cover having a primary wall element and at least side and front wall elements extending therefrom, said front wall element having a cover opening formed therein,

a door mounted to said vent cover for movement to a first position in which said cover opening is closed and sealed by said door and to a second position displaced from said cover opening,

means for selectively securing said door in at least said first and second positions,

means for pivotally connecting said vent cover front wall element to said vent frame to permit displacement of the rear and sides of said cover from said frame and provide ventilation passages between said frame and cover at the rear and sides of said cover, and

means for adjustably positioning said vent cover in different positions of its motion with respect to said vent frame to provide different areas of such ventilation passages.

4,038,912

COMBINATION FORCED-FLOW AND CONVECTIVE-FLOW GREASE-HOOD SYSTEM AND METHOD HAVING A LOW-LEVEL ENTRY PORTION OVER A PROTRUDING COOKING APPLIANCE

Irvin R. Kuechler, San Bernardino, Calif., assignor to Vent-Cair, Inc., San Bernardino, Calif.

Continuation-in-part of Ser. No. 497,690, Aug. 15, 1974, Pat. No. 3,943,836. This application Oct. 1, 1975, Ser. No. 618,832
Int. Cl.[2] F23J *11/00*
U.S. Cl. 126—299 D **12 Claims**

1. A method of filtering and removing cooking fumes from the space above a cooking appliance which is located in a room in a restaurant, which method comprises:

a. providing a grease-hood system at least the lower portion

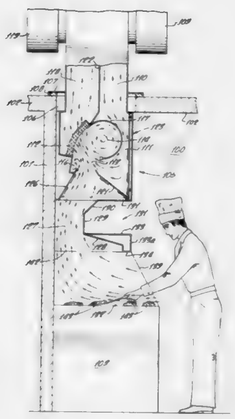
of which has a front-to-rear dimension which is substantially less than the front-to-rear dimension of the cooking surface of the cooking appliance with which said grease-hood system is to be associated,

b. mounting said grease-hood system in such manner that said lower portion is disposed over the rear portion of said cooking surface, whereby a front portion of said cooking surface protrudes forwardly a substantial distance from beneath said lower portion,

said mounting also being such that said lower portion is disposed at an elevation below that of the head of a normal-stature adult male cook who is standing on the floor at the front of said cooking appliance, with the lower end of said lower portion spaced substantially above said cooking surface and far below the head of said cook,

c. cooking food on said cooking surface, including on said front portion thereof which protrudes from beneath said lower portion of said grease-hood system,

said cooking resulting in convective flow of air from said room in a rearward direction over said food and thence



in an upward direction to said lower end of said lower portion,

d. passing said convectively-flowing air and the cooking fumes extrained therein upwardly into said lower end of said lower portion,

said rearward flow of air and fumes over said food, and said passing of air and cooking fumes into said lower end of said lower portion, being effected substantially entirely by said convective flow of room air, in the absence of any substantial venturi, blowing or sucking action,

e. effecting direct forced flow of air into said grease-hood system from a region exterior to said room,

said forced-flow air entering said system at a region above said lower end of said lower portion, and entraining therein the air and fumes which pass upwardly as recited in step (d),

f. passing through grease-filter means the forced-flow air and the convected air and fumes, and

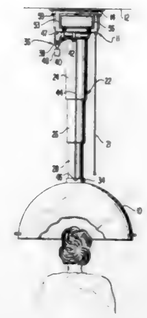
g. exhausting to the exterior of said room the air and fumes thus filtered by said grease filter means.

4,038,913

HAIR SPRAY EXHAUST SYSTEM

Sa Lomie C. Earley, Rte. 2, Box 631, Orangeburg, S.C. 29115

Filed May 14, 1976, Ser. No. 686,579
Int. Cl.[2] F23J *11/00*
U.S. Cl. 98—115 R **10 Claims**



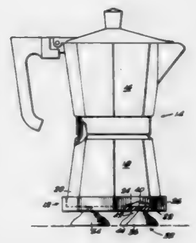
1. A self-contained ventilating unit for use at a beautician's work station or the like to gently circulate air in the airspace surrounding hair on a customer's head and exhaust the air and entrained hairspray and the like upwardly and away from the customer and the operator, which unit comprises a transparent hood means for the operator to view all hair on the customer's head from positions thereabove, said hood means being adapted to be positioned adjacent to and defining an inlet to the airspace surrounding the customer's head to be ventilated; duct means connected to said hood to convey the air flow away from said ventilated airspace, said duct means being adjustable between an operative position with said hood adjacent to said airspace and a stored position away from said work station; a plenum chamber having inlet and outlet passage means with said duct connected to said inlet passage and said outlet passage leading to ambient air; and air circulating means for drawing ambient air into the inlet defined by said hood means and through said airspace surrounding the customer's head and creating an air flow into said duct to exhaust the air and extrained hairspray from the hood through the duct to the plenum chamber.

4,038,914

DEVICE FOR USE IN SEPARATING COFFEE BREWERS WHICH ARE IN TWO SCREW-THREADED PORTIONS

Osmundo Crespo, 1938 SW. 22nd Terrace, Miami, Fla. 33145, and Carmen Sophia Carratala, 4701 NW. 4 St., Miami, Fla. 33126

Filed Nov. 14, 1975, Ser. No. 631,818
Int. Cl.[2] A47J *31/00*
U.S. Cl. 99—279 **2 Claims**



1. In combination, a coffee brewer including an upper portion and a lower portion and screw-thread means interconnecting the upper and lower portion, said lower portion having a

bottom and including a plurality of upstanding peripheral walls extending from the bottom which, forms as seen in bottom plan view, an equi-angle polygon, and a receptacle member having a plurality of upstanding walls corresponding to said bottom portion and defining a mating receptacle to nest the bottom with the upstanding walls of the receptacle member in close adjacent relation to the upstanding peripheral side walls extending upwardly from the bottom of said lower portion, and means to fix the receptacle member to a surface comprising a plurality of suction cup means, said mating walls permitting the upper and lower portion of the brewer to be separated from one another by rotating the upper portion and lower portion of the coffee brewer relative to one another, said separation accomplished by pressing the coffee brewer downwardly in the receptacle and, simultaneously, the upper portion of the coffee brewer is rotated about a vertical axis through the coffee brewer and receptacle member, said coffee brewer including a handle extending radially of the upper portion for lifting the upper portion and, also, for applying torque to the upper portion to rotate it relative to the lower portion.

4,038,915

APPARATUS FOR PEELING A FLESH OF VEGETABLES TO FORM A TAPE-LIKE FLESH

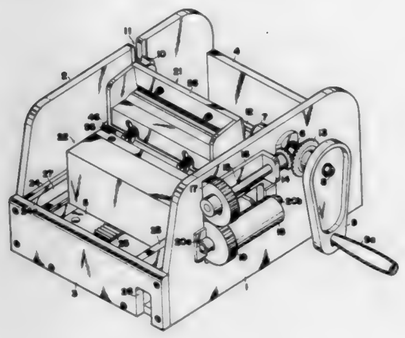
Shoji Saito, No. 3-12-9, Shin-chiba, Chiba, Chiba, Japan

Filed Mar. 11, 1976, Ser. No. 666,140

Claims priority, application Japan, July 22, 1975, 50-101385[U]

Int. Cl.[2] A23N *7/00*; B26D *7/06*

U.S. Cl. 99—594 **4 Claims**



1. An apparatus for peeling a flesh of vegetables to produce a continuous flesh in the form of a thin tape, comprising:
   1. a housing having a generally right angle configuration;
   2. an elongated member which is to be inserted through the vegetable to secure said vegetable while it is being rotated and peeled;
   3. means for rotating said elongated member together with the vegetable, said rotating means having a handle;
   4. means for holding and removably securing the ends of said elongated member to the housing, allowing said elongated member to rotate;
   5. a cutting device which has a longitudinal blade;
   6. means for reciprocating said cutting device in the longitudinal direction of said blade, said reciprocating means having a longitudinal base which has a recess in the longitudinal direction thereof, a slidable block which is slidably secured by said longitudinal base and is connected to said cutting device, a coil spring disposed between the slidable block and a rotary member which is communicated with, and driven by, said rotating means so that rotation of the rotary member reciprocates said slidable block against the force of said coil spring the rotation of said rotary member and the force of said coil spring providing the reciprocal movement of said cutting device; and
   7. means for uniformly pressing said blade onto the vegetable which is to be continuously peeled, the blade being connected to said cutting device which slides longitudinally along said recess, said pressing means having a movable casing, a shaft rotatably supported by said movable casing, a toothed wheel connected to said shaft, a rack fixedly disposed on said housing and engaged with said toothed wheel, and a spring which is connected at its inner end to said shaft and connected at its outer end to said movable casing, the force of said spring causing the blade to be in close contact with said vegetable, whereby the driving of said rotating means rotates the said elongated member as well as the vegetable, simultaneously reciprocates the cutting device and provides uniform pressure on said vegetable as said movable casing moves along said rack by means of said toothed wheel, thereby forming a continuous flesh in the form of a thin tape.

4,038,916

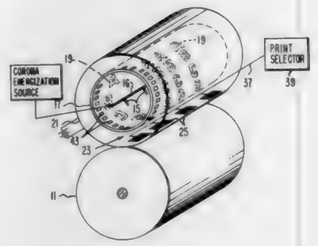
ELECTROSTATIC IMAGING APPARATUS

Stephen Barasch, Southfield, and Richard C. Fedder, Detroit, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,682

Int. Cl.[2] G01D *15/06*

U.S. Cl. 101—1 **12 Claims**



1. A solid character electrostatic imaging apparatus for forming electrostatic solid character charge patterns on a dielectric surface comprising:
   corona means for generating ions and electrostatically accelerating said ions away therefrom;
   rotatable endless character forming means for forming said accelerated ions into a plurality of solid patterns of charge;
   stationary shield means surrounding said corona means and said character forming means, said shield means separating said character forming means from said dielectric surface, said stationary shield means having an array of openings therethrough positioned in the path of said solid patterns of charge;
   a plurality of conductive grids one of which is disposed in each of said openings; and
   means for selectively biasing each of said grids individually into one of two states, said first state confines said solid patterns of charge within said stationary shield means and said second state transmits said patterns of charge through said openings in said shield means, whereby extraneous solid patterns of charge are confined within said shield means and solid patterns of charge selected for printing are transmitted through the openings in the shield to impinge upon the dielectric surface.

4,038,917

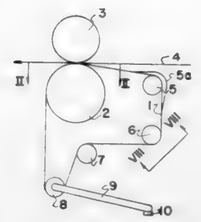
THIN BELT EMBOSSING METHOD AND APPARATUS

John DeLigt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 272,733, July 18, 1972, abandoned, and a continuation-in-part of Ser. No. 750,659, Aug. 6, 1968, abandoned. This application May 10, 1976, Ser. No. 685,104

Int. Cl.[2] B44B *5/00*

U.S. Cl. 101—23 **18 Claims**



3. An embossing machine comprising:
   a. an engraved embossing roll;
   b. a backup roll forming an embossing nip with said engraved embossing roll;
   c. an endless resilient belt having a width to thickness ratio of greater than **1000:1** and an appreciably greater periphery than the circumference of said backup roll, said belt being disposed for traveling about closed course passing through said nip; and
   d. belt tensioning means for applying substantially uniform longitudinal tensile stress to and across substantially the entire width of said belt from said nip regardless of reasonable dimensional variations in the proximity between said belt and fixed position structure of said tension means, said fixed position structure comprising a fluid conduit transversely disposed across said course and antecedently proximate of said nip, said conduit having fluid discharge apertures oriented to direct fluid flow against one face of said belt.

4,038,918

HAND STAMP

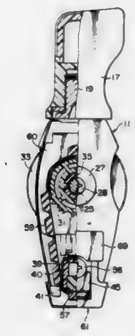
Takaji Funahashi, No. 1, 2-chome, Kitatakasho, Nishi, Nagoya, Aichi, Japan

Filed Oct. 6, 1975, Ser. No. 619,814

Claims priority, application Japan, Oct. 15, 1974, 49-124421[U]; Dec. 26, 1974, 50-2360[U]

Int. Cl.[2] B41J *1/60*

U.S. Cl. 101—111 **2 Claims**



1. A hand stamp comprising a frame body having a substantially reverse U-figured shape and including a top plate and side plates connected to edges of said top plate, each of said side plates having a lower opening at a lower portion thereof; a shaft attached to a substantially central portion of said side plates; a plurality of rotary members rotatably supported on said shaft, each rotary member comprising an annular plate having nonskid teeth on a peripheral edge thereof and a hanging cylinder formed on one side face of said annular plate, a plurality of ridges having a triangular cross-section being formed on a circumferential surface of said hanging cylinder to extend parallel to an axial direction thereof so that they are spaced from one another in the peripheral direction of said hanging cylinder; said ridges being divided into two front and rear groups with respect to the axial direction of said hanging cylinder, the ridges of said front group being staggered with respect to the ridges of said rear group; a bridge member on a lower end of said frame body; an ink absorber supported in said bridge member; printing bodies comprising a plurality of sections in the form of an endless belt, each section of said printing bodies being hung around the corresponding hanging cylinder of the rotary member and a lower face of the ink absorber supported in said bridge member and being composed of a porous material having a relatively large number of open cells, said printing bodies including printing letter portions projecting from the lower portion of said frame body when the printing letter portions occupy their lowest position with respect to said ink absorber; a leg frame comprising a long plate having a long hole, upwardly extending side walls, upwardly extending end walls having guiding openings and a lateral flange disposed on a top end of each of said upwardly extending end walls, said leg frame being mounted to be movable in an upward and a downward directon from the lowest position of said printing letter portions, said long hole of said leg frame allowing said printing letter portions to pass therethrough, said upwardly extending end and side walls of said leg frame being disposed so as to surround the outside of the respective side plates of said frame body, said bridge member comprising a bridge girder including upwardly bent portions, said upwardly bent portions being disposed in the guiding openings of the corresponding end walls of the leg frame; and spring means for pushing said leg frame to project from the lowest position of said printing letter portions, said spring means comprising a pair of spring members, each spring member including a supporting member having a leg portion and a spring supported on said leg portion, the respective leg portions of said spring means being engaged with the lower openings of the corresponding side plates of said frame body, said lateral flanges on the upwardly extending end walls of said leg frame being disposed so that they are pressed by the corresponding springs of said spring means.

4,038,919

DOCTOR BLADE HOLDERS FOR SCREEN PROCESS PRINTING MACHINES

André M. Lotte, Mulhouse, France, assignor to Societe Alsacienne de Constructions Mecaniques de Mulhouse, Mulhouse Cedex, France

Filed Feb. 3, 1976, Ser. No. 654,775

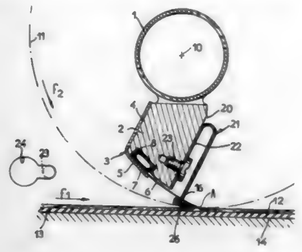
Claims priority, application France, Feb. 25, 1975, 75.05749

Int. Cl.[2] B41F *15/44*

U.S. Cl. 101—120 **4 Claims**

1. An apparatus for use with a printing machine having a screen, comprising:
   an elongated doctor-holder body;
   a doctor including an elongated strip of thin flexible material having a longitudinal securing marginal portion secured to said doctor-holder body and an opposite longitudinal free wiping marginal portion having one side to be operably engaged against the screen of said printing machine; and
   a rigid undeformable doctor-backing bar positively attached to said doctor-holder body at at least one and no more than two separate points along said doctor-holder body for possible deformation of said doctor-holder body relative to said doctor-backing bar at said points to allow said

doctor-holder body to be able to bend while said rigid doctor-backing bar remains undeformed, said doctor-backing bar having a free edge, said free edge being ap-



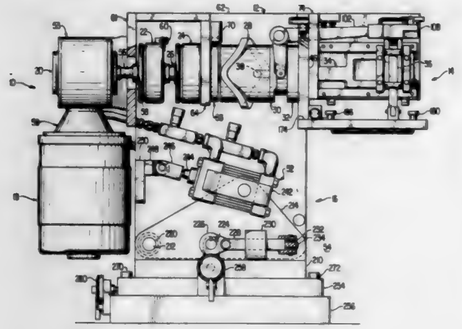
plied against said longitudinal free wiping marginal portion of said doctor on the side of said longitudinal free wiping portion remote from said screen.

4,038,920

SCREEN POSITIONING AND SQUEEGEE DRIVE MEANS FOR SCREEN PRINTER

Norman R. Crowley, and Gilbert N. Fuchs, both of Evansville, Ind., assignors to Evana Tool & Engineering Inc., Evansville, Ind.

Filed May 7, 1975, Ser. No. 575,267
Int. Cl.[2] B41F *15/08, 15/46*
U.S. Cl. 101—123 **8 Claims**



1. A printing apparatus for printing a workpiece comprising:
an elongate drive shaft;
means for rotating said elongate drive shaft; first and second cams coaxially mounted on said drive shaft so as to rotate therewith;
a squeegee carrier arm for carrying a squeegee; and
first and second slides operatively connected to said first and second cams and to said squeegee carrier arm for controlling movement of said squeegee carrier arm in accordance with the angular position of said drive shaft, said second slide being slidably mounted on said first slide, said printing apparatus further including a set screw with an elongate threaded shank, said second slide having a smooth bore, through which said shank extends, for rotatably mounting said threaded shank and wherein said squeegee carrier arm has a threaded bore for receiving

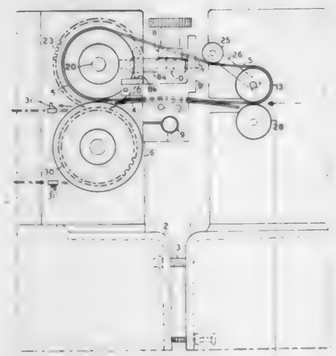
6. A silk screen printing apparatus comprising:
a housing;
a squeegee carrier arm for carrying a squeegee;
a silk screen frame holder for mounting a frame holding a silk screen;
a single drive shaft mounted to said housing;
means for rotating said drive shaft mounted to said housing
control means responsive to rotation of said drive shaft for controlling the movement of said squeegee carrier arm and said silk screen holder such that, during a first half rotation of said shaft, said silk screen is moved into engagement with a workpiece and simultaneously said squeegee carried by said squeegee arm follows a first operating path wherein the squeegee comes into contact with said silk screen mounted on said silk screen frame holder, translates thereacross in a first direction so as to provide printing on a workpiece in contact with said silk screen and lifts from the silkscreen and said silk screen lifting from the workpiece, such that, during a second half rotation of said shaft, said silk screen is moved into engagement with another workpiece that has replaced the first workpiece and the squeegee follows a second operating path, wherein the squeegee comes into contact with the silk screen, translates across the silk screen in a direction opposite to said first direction to provide printing on the workpiece in contact with the silk screen, and thereafter lifts from the silk screen wherein said control means includes a first cam, second cam, and a third cam mounted coaxially on said single drive shaft, said control means further including a first slide having a cam follower for engaging said first cam, said first slide being translationally displaced along a path generally parallel to the axis of said drive shaft as said drive shaft rotates, said control means including a second slide responsive to said second cam, said second slide slidably mounted on said first slide, said second slide translationally displaced along a path generally perpendicular to the path of said first slide as said drive shaft rotates, said squeegee carrier arm mounted on said second slide, and said control means including a third slide having a cam follower engaging said third cam, said third slide translationally displaced along a path generally parallel to the displacement path of said second slide, as said drive shaft rotates, said silk screen frame holder mounted on said third slide, the plane of said silk screen being generally perpendicular to the displacement path of said third slide.

4,038,921

MEANS TO CONNECT PRINTING PRESSES IN TANDEM

Henry Harrison, Locust Valley, and Clement R. Konars, Glen Cove, both of N.Y., assignors to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Apr. 28, 1976, Ser. No. 681,265
Int. Cl.[2] B41J *13/08*
U.S. Cl. 101—232 **1 Claim**



1. Means to connect first and second printing press frames in tandem comprising,
first and second support members mounted on a first printing press frame,
a curved plate mounted on said first support member, said plate bridging the gap between an output of a first printing press and the input of a second printing press,
an endless belt mounted on said second support member over said curved plate and running in contact with said curved plate,

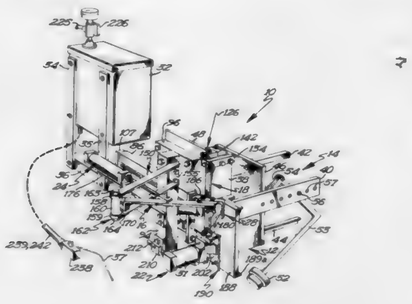
means connected to adjustably bolt the first and second printing press frames together,
means connected to one of the printing press frames to drive the belt at substantially the same linear speed as the linear paper feed speed of the printing presses,
whereby papers are delivered from one printing press and inserted between the belt and the plate and delivered to the other printing press,
the second support member being pivotally mounted so that the belt assembly may be rotated out of the way for servicing the apparatus,
means connected to the belt to adjust the belt laterally with respect to the printing presses,
and means connected to the curved plate to tilt the curved plate.

4,038,922

APPARATUS FOR FEEDING TAGS

Harold R. McGregor, 210 Nixon Ave. SW., Wadena, Minn. 56482

Filed Dec. 8, 1975, Ser. No. 638,757
Int. Cl.[2] B41F *13/24*
U.S. Cl. 101—232 **16 Claims**



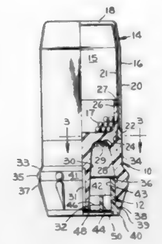
1. Apparatus for outputting tags or the like, said apparatus comprising:
magazine means for storing a predetermined quantity of said tags;
feed gate dispensing means for automatically and periodically moving a predetermined number of tags out of said magazine means, said dispensing means comprising:
rigid means adjacent said magazine means for defining an elongated channel portion; and
reciprocally movable push plate means slidably received within said elongated channel portion, said push plate means adapted to selectively contact said predetermined number of tags for moving same out of said dispensing means;
swinging arm means for selectively moving said predetermined number of tags outputted by said dispensing means to a predetermined remote position, said swinging arm means comprising:
pivotal arm means swingable from a tag receptive position adjacent said dispensing means to said remote position, said arm means comprising a gripping arm head, a gripping clamp, and actuation means for selectively urging said gripping clamp into compressive abutment with said arm head thereby securing said predetermined number of tags outputted by said push plate means therebetween; and
means for selectively swinging said arm means from said tag receptive position to said remote position.

4,038,923

EXPENDABLE CASE AMMUNITION

William T. Cole; Joseph P. Pavone, both of Bridgeport, and John J. Scanlon, Monroe, all of Conn., assignors to Remington Arms Company, Inc., Bridgeport, Conn.

Filed Apr. 6, 1976, Ser. No. 674,142
Int. Cl.[2] F42B *5/02, 7/06*
U.S. Cl. 102—43 R **7 Claims**



1. Expendable case ammunition comprising:
a body having an imperforate transverse wall therein separating and defining a forward chamber for containing projectile means and a rearward chamber terminating in a rearwardly-facing opening and adapted to contain a quantity of propellant;
imperforate cap means attached to the rearward end of said body and sealing said rearward chamber prior to firing of the ammunition, said cap means being formed as an integral body of substantially non-combustible material;
primer means and anvil means adjacent to said cap means within said rearward chamber;
said cap means having a thickened tubular rim portion attached to said body and spanned by a transverse diaphragm portion having thickened reinforcing regions joining said rim and a thinned region penetrable by a forwardly-moving firing pin for initiating said primer means, said thinned region being rupturable by pressure generated by said primer means within said rearward chamber upon initiation of said primer means to open said rearward chamber prior to the establishment therein of the full pressure generated by ignition of said propellant, for propulsion of said body and cap as a unit by ignition of said propellant.

4,038,924

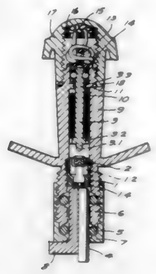
IGNITER FOR FUSES AND THE LIKE

Paul Beermann, Lendringsen; Wilhelm Grosse-Benne, Menden; Hans Guntermann, Essen-Steele, and Johann-Hugo Wirtz, Essen-Bredeney, all of Germany, assignors to Hagenuk & Co GmbH, Menden, Germany

Filed Mar. 17, 1975, Ser. No. 559,157
Claims priority, application Germany, Mar. 19, 1974, 7409502[U]
Int. Cl.[2] F42C *15/00*
U.S. Cl. 102—70 S **11 Claims**

1. A water-tight igniter for fuses and the like, comprising a housing; a firing cap in said housing for producing, when detonated, a fuse-igniting fire jet; a firing pin mechanism at one side of said firing cap for impacting and detonating the latter; a fuse at the other side of said firing cap; deflecting means extending across the path of said fire jet and including passage means through which the jet is compelled to pass, for controlling the fire jet and for directing the latter towards said fuse so as to ignite the same; at least one gas-venting opening laterally of said firing cap; and means for mounting said fuse on said housing in water-tight condition, including a plug surrounding

said fuse, a sleeve surrounding said plug and mountable on said housing, and sealing means intermediate said plug and said



sleeve for preventing access of water into the interior of said housing, so as to maintain said firing cap moisture-proof.

4,038,925

COUPLING ARRANGEMENT FOR TOWING CONVEYOR

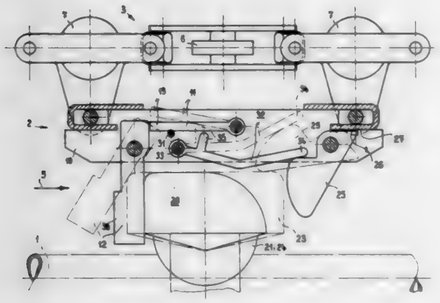
Erich Kuwertz, Trippstadt, Germany, assignor to Pfalzstahlbau GmbH., Pirmasens, Pfalz, Germany

Filed Sept. 10, 1975, Ser. No. 612,002

Claims priority, application Germany, Sept. 14, 1974, 2444127

Int. Cl.² B61J *3/00*

U.S. Cl. 104—88 **2 Claims**



1. In accordance with the invention a coupling arrangement for towing conveyors is provided comprising a towing chain having catchers, a suspended track disposed below said towing chain, running carts equipped with two running mechanisms rolling on said track, said catchers having movable coupling parts and said running carts having coupling elements securely disposed on said running mechanisms cooperating with said coupling parts, where further the coupling parts disposed on the catchers of the towing chain comprise a housing in which a catcher finger and a setting lever which is in operative relationship thereto are pivotally mounted for movement in opposite directions about horizontal axes in a manner that the setting lever normally holds the catcher finger in its position of engagement and for a raised position of a run up part provided at the rear running mechanism of each running cart with a local running mechanism as seen in the direction of feed causes a pivoting upwardly of the catcher finger, while the roller carriers' supports of the running cart are designed simultaneously as coupling parts associated with the running carts and carry curved members for this which are formed as roller caps, while the roller cap which is forward in the direction of feed has a rounded portion in front and a vertical abutment surface in back, whereas the roller cap that is rearward relative to the direction of feed has vertical front and rear sides, while furthermore the setting lever that simultaneously serves as latch lever has a nose which engages and stops the carry along finger in its vertical position and in its raised position frees the same for upward pivotal movement in opposite direction to the feed direction, said latch lever being releasable upwardly about its pivot axis, its lower position being secured by a member such as a pin and an intermediate lever for establishing an operating connection between said setting lever in the form of a drop lever and said latch lever.

4,038,926

TROLLEY CONVEYOR SYSTEM WITH MAGNETICALLY ACTUATED READING MEANS

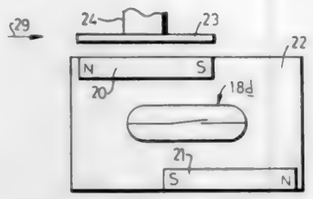
Charles Thomas Holberry, Wolverhampton, England, assignor to Redman Fisher Engineering Limited, Tipton, England

Filed May 14, 1976, Ser. No. 686,582

Claims priority, application United Kingdom, Jan. 23, 1976, 2612/76

Int. Cl.² B61J *3/00*; B61L *13/04*

U.S. Cl. 104—88 **2 Claims**



1. In a conveyor system comprising a track, a trolley which runs along the track, information-carrying means on the trolley and reading means at a reading station on the track for reading information from the information-carrying means as the trolley passes through the reading station, the improvement wherein the reading means comprises a switch and two magnets associated therewith, said switch being adapted to be actuated by changes in the field of said magnets, said magnets being arranged on opposite sides of the switch;

one magnet being situated between the switch and the path followed by the information-carrying means when the trolley moves through the reading station;

both of said magnets being arranged with their respective poles spaced apart in a direction substantially parallel to said path, one of said magnets being off-set in the direction of its length from the other of said magnets;

said switch and said magnets being disposed in a space; and

screens of ferro-magnetic material arranged on opposite sides of said space, each screen extending from a position adjacent one of said magnets to a position adjacent the other of said magnets.

4,038,927

POSITIONING MEANS

David Arthur Evans, Bristol, England, assignor to Strachan & Henshaw Limited, Bristol, England

Filed Nov. 20, 1975, Ser. No. 633,790

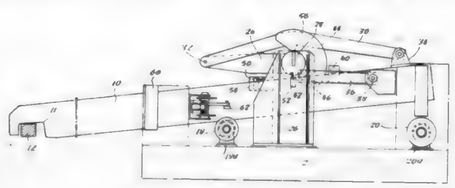
Claims priority, application United Kingdom, Nov. 27, 1974, 51491/74

Int. Cl.² B61J *3/12*

U.S. Cl. 104—162 **13 Claims**

1. Positioning means for a train of rail vehicles on a track comprising, in combination, a positioning carriage, a guide way for said carriage parallel to the track of the train, an elongate positioner arm on the carriage, displacement and guide means on the carriage for displacing said arm in a first direction, substantially corresponding to the direction of axial extent of the arm, from a retracted position spaced from the train to an extended position in which the arm projects transversely of the carriage into the path of the train and an outer end of the arm is located between a pair of vehicles of the train,

the arm being movable when in said extended position by said displacement and guide means to displace said end of the arm in a second direction in a vertical plane and transverse to said first direction, to connect it with at least one of said pair of vehicles for controlling the movement of the train by operation



of the positioning carriage, said displacement and guide means comprising rotary drive means on the carriage, a mechanical linkage connecting said drive to the arm whereby rotation of said drive means produces said displacement of the arm in said first direction substantially corresponding to the direction of axial extent of the arm.

4,038,928

LATERAL MAGNETIC TRUCK WHEEL POSITIONING ASSEMBLY

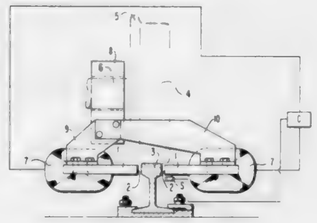
Norbert Degen, Munich, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Germany

Filed Apr. 1, 1974, Ser. No. 457,215

Claims priority, application Germany, Mar. 30, 1973, 2315948

Int. Cl.² B61C *17/00*; B61F *5/38, 5/50, 9/00*

U.S. Cl. 104—242 **10 Claims**



1. Lateral guidance apparatus for laterally guiding a wheel set of a rail vehicle as wheel means of the wheel set travel in a longitudinal direction along a support rail; said apparatus comprising:

magnet means and

magnet support means for supporting said magnet means of said wheel set such that magnet pole means of the magnet means are disposed laterally directly beside the support rail and below an upper wheel support surface of said support rail and the force interaction between the magnet pole means and support rail effects lateral guidance of said wheel set with respect to said support rail so as to maintain spacing between said magnet means and said support rail.

4,038,929

PORTABLE MEAT RAILER SHIPPING ASSEMBLY

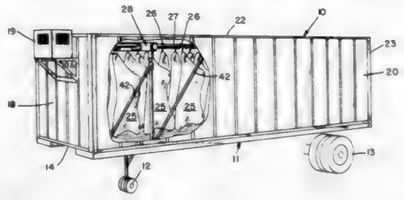
Bernard S. Sain, Houston, Tex., assignor to Sea-Land Service, Inc., Elizabeth, N.J.

Filed Sept. 22, 1975, Ser. No. 615,605

Int. Cl.² A47F *5/01, 7/00*; B61D *3/16, 45/00*

U.S. Cl. 105—367 **5 Claims**

1. A demountable and portable meat railer for an enclosed refrigerated cargo container having a base with floor mounted flanged rails, side and end walls and a top, said meat railer comprising a plurality of inverted U-shaped sections releasably supported in spaced relation to each other on said floor mounted flanged rails in the container, means for retaining said sections in an upright position, a plurality of meat supporting rails detachably connected and extending between said sections each section having a horizontal portion and pair of laterally-spaced vertical stanchions, each stanchion having a



bottom and a top end, a flange mounted on the stanchion's bottom end for releasably engaging said floor mounted flange rails, and means on each stanchion for releasably engaging said top ends of the stanchion with said horizontal portion.

4,038,930

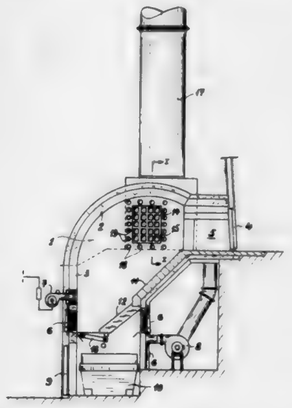
FURNACE FOR INCINERATING REFUSE

Per W. Barkhuus, 1699 Chesalles-sur-Oron, Switzerland

Filed Mar. 17, 1976, Ser. No. 667,609

Int. Cl.² F23G *5/00*

U.S. Cl. 110—8 A **8 Claims**



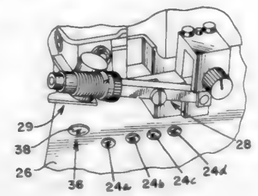
1. A furnace for burning refuse comprising in combination: a combustion chamber having at least a first orifice and a second orifice formed therein, said first orifice disposed to permit unburned refuse to be loaded into said combustion chamber, said second orifice disposed to permit combustion gases to leave said combustion chamber; means including a first source of air to effect a first burning of refuse in said combustion chamber whereby combustion gases, including unburned particles of refuse suspended therein, are created and directed toward said second orifice; a second source of air; heating means connected to said second source of air and to said combustion chamber in close proximity to said second orifice and formed to heat air from said second source and further formed to direct said heated air from said second source into said combustion chamber in a direction substantially opposite to the direction along which said combustion gases and suspended particles, from said first combustion, are moving toward said second orifice to effect a second burning of said suspended particles in said combustion chamber with a minimum loss of heat resulting from the introduction of said second air.

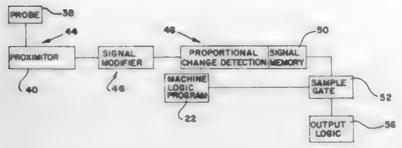
4,038,931

FABRIC PANEL DISCONTINUITY SENSOR

Robert Leslie Kosrow, Hoffman Estates; Robert Emmet Smith, Crystal Lake, and Robert Clarence Talsma, Glen Ellyn, Benjamin T. Bernstein, Highland Park, all of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Nov. 25, 1975, Ser. No. 635,200
Int. Cl.[2] D05B *69/36*
U.S. Cl. 112—272 **10 Claims**





8. An Automatic Sewing System having a work cycle during which work is performed on a fabric means, including a sensing means monitoring fabric continuity and being capable of causing overriding control of said sewing machine comprising:

a self compensating fabric contacting proximity sensor means, including: a probe means, a moveable guide means operative with said probe means whereby the distance therebetween is measurable, and a proximitor means for measuring the distance between said probe means and said moveable guide means, said proximitor means including means for producing a first signal means reflective of said measured distance;

a signal modifier means, modifying said first signal means of said proximity sensor means;

a machine logic program means capable of generating a second signal means conveying information concerning the work cycle of the Automatic Sewing System;

a proportional change detector system means receiving said first signal means from said signal modifier and generating a third signal means characterized by discontinuity of said fabric means; and

a sample gate means generating a fourth signal means in response to an input signal from said proportional change detector system and an enabling input signal from said machine logic program means.

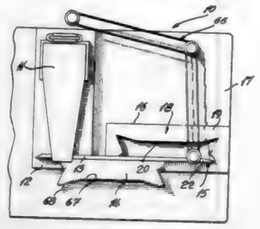
4,038,932

CHAIN CARRIAGE SYSTEM

Julius Drew, 70 Joly Street, Ile Bizarre, Quebec, Canada

Filed Sept. 25, 1975, Ser. No. 616,827
Int. Cl.[2] D05B *21/00*
U.S. Cl. 112—121.12 **14 Claims**

1. A contour stitching machine for making a predetermined stitch pattern in juxtaposed garment pieces, said machine comprising a sewing head having a threaded needle positioned above a fabric support surface, pattern guide means having a guide slot disposed relative to said needle and defining a predetermined stitch pattern path, a clamping member for releasably securing said juxtaposed garment pieces in a predetermined plane and for displacement of said secured garment pieces under said needle, follower means associated with said clamping member for displacing same, said follower means engaging said guide slot, engagement drive means for displacing said follower means along said guide slot in a predetermined manner whereby said garment pieces will be displaced under said needle in a manner determined by the pattern path of said guide slot, said engagement drive means including an endless driven member, positioned below said guide slot, and guide



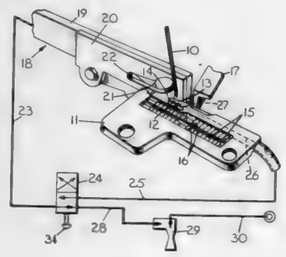
means for guiding said endless driven member along said stitch pattern path from a first end to a second end, said guide means further guiding said endless driven member along a non-reversing back tacking path at both said first and second ends and between said back tacking paths, the back tacking at each of the first and second ends being along an initial stitching line.

4,038,933

DEVICE FOR RETAINING A CHAIN OF STITCHES IN A SEWING MACHINE

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Aug. 20, 1976, Ser. No. 716,118
Claims priority, application Italy, Sept. 11, 1975, 27122/75
Int. Cl.[2] D05B *65/00*
U.S. Cl. 112—288 **2 Claims**



1. A device for retaining a chain of stitches during commencement of stitching in a sewing machine of the type having a cutting device for severing the chain of stitches connecting one workpiece with another and a feed dog operatively associated with a needle plate for advancing a workpiece to the stitch forming instrumentalities, said device comprising:

a. a tongue (**13**) forming an integral part of the needle plate on on which a chain of stitches is formed having an internal bore (**26**) extending longitudinally through said tongue and needle plate;

b. vacuum means (**29**) pneumatically connected to one end of said internal bore; and

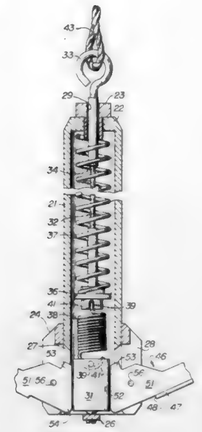
c. control means (**34**) for selectively activating said vacuum means for drawing a chain of stitches severed by the cutting device into the internal bore of said tongue and into alignment for incorporation in the stitches to be formed in the next workpiece.

4,038,934

ANCHOR HAVING RELEASABLE FLUKES

George Thomson, Redwood City, Calif., assignor to Columbian Rope Company, Auburn, N.Y.

Continuation of Ser. No. 634,445, Nov. 24, 1975, abandoned.
This application Oct. 1, 1976, Ser. No. 728,645
Int. Cl.[2] B63B *21/30*
U.S. Cl. 114—298 **11 Claims**



1. A releasable anchor comprising

a. an elongated hollow body;

b. a plurality of flukes pivotally mounted to the lower end of said body, said flukes moveable between an extended position and an inoperative position wherein said flukes extend below said body;

c. a stem slideable within said body, said stem having an upper end extending out of the upper end of said body and having means for attachment to an anchor line;

d. a plug slideable within said body and normally positioned at the lower end of said body, said plug having a first position for locking said flukes in said extended position, and a second position for releasing said flukes whereby said flukes can pivot to said inoperative position;

e. means for connecting said stem and said plug, said connecting means including a first spring capable of being loaded when said stem is raised to an elevated position by a tension pull applied to the anchor line, said first spring, when loaded, biasing said plug towards said second position; and

f. means for holding said stem is said elevated position whereby releasing the tension on the anchor line will enable said first spring to move said plug to said second position thereby releasing said flukes for movement to said inoperative position.

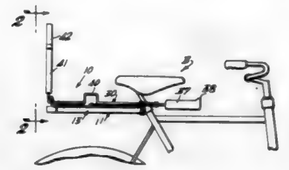
4,038,935

TRAFFIC SIGNALING ATTACHMENT DEVICE FOR BICYCLES

Henry Margiloff, 1817 S. Ocean Drive, West Bldg. P.H. 28, Hallandale, Fla. 33009

Filed Oct. 19, 1976, Ser. No. 733,927
Claims priority, application United Kingdom, Dec. 23, 1975, 52588/75
Int. Cl.[2] B60Q *1/34*; B62J *5/00*
U.S. Cl. 116—35 R **9 Claims**

1. A traffic signaling attachment device for bicycles or the like comprising, in combination, an elongated supporting framework, means for attaching said supporting framework to a bicycle so as to extend rearwardly of the bicycle seat above the rear bicycle wheel, an elongated control rod journaled along the length of said supporting framework, an elongated signal arm member fixed with respect to an extending substantially perpendicularly outwardly of said control rod, means yieldingly constraining said control rod so that said signal arm member normally extended in a vertically upward direction, and resilient handle means connected to the control rod for turning said control rod about its longitudinal axis for moving



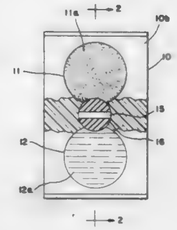
said signal arm member, selectively, to and between opposed, sidewardly outwardly-extending positions for signaling traffic, said signal arm member being of a resilient and collapsible material, thereby enabling its bending to minimize obstruction to the bicycle rider upon his mounting and demounting the bicycle.

4,038,936

CONDITION CHANGE INDICATOR

Jane R. Kessler, 115 Pinewood Drive, Downington, Pa. 19335

Filed Oct. 9, 1975, Ser. No. 621,016
Int. Cl.[2] G01K *11/06, 11/08*
U.S. Cl. 116—114.5 **17 Claims**



1. A temperature indicator comprising:

a pair of chambers;

channel means extended between said chambers to provide communication therebetween;

valve means to be placed in two positions in said channel means, in a first position of which it closes the channel means and in the second position of which it does not,

said valve means comprising non-return means to prevent placing the valve means in the first position after it has been placed in the second position; and

means responsive to different temperatures to permit or prevent entry into one chamber of substance supplied from the other chamber via the channel means.

4,038,937

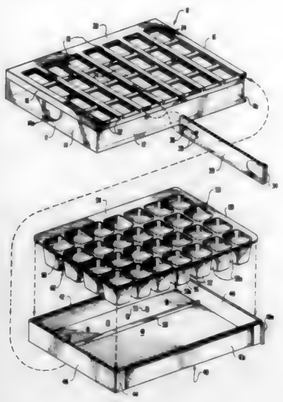
MEDICINE DISPENSER AND METHOD

Kjell Möe, Stockbyvagen 3A, Stocksund, Sweden

Filed Apr. 26, 1976, Ser. No. 680,176
Int. Cl.[2] G09F *9/00*
U.S. Cl. 116—121 **24 Claims**

1. A medicine dispenser for storing and dispensing medicines according to certain prescribed times, the dispenser including in combination, a case having a base, side walls upstanding from the base and a top on the side walls defining a space for receiving a tray, a tray receivable in the case below the top and being removable from the case, means in the tray forming a number of compartments for receiving and storing medicine in

accordance with certain prescribed times at which the medicine is to be taken, and wherein said top includes transparent portions movable over the compartments to open the compartments for dispensing medicine or for closing the compartments for storing medicine, and wherein said means forming said compartments in the tray is an insert, including said compartments, said insert being removably received in the tray.

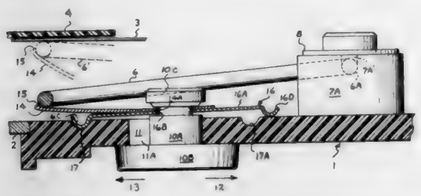


4,038,938

BISTABLE CLAMPING MECHANISM FOR AN INDICATING NEEDLE OF AN INSTRUMENT

Warren N. Kernander, Boxford, and William J. Schultz, Lynnfield, both of Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,776
Int. Cl.² G01D *11/16, 11/18*
U.S. Cl. 116—129 N **8 Claims**



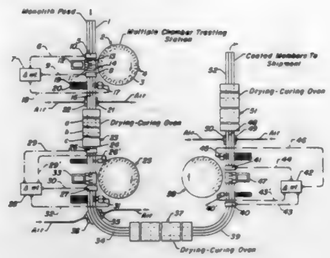
1. In an instrument having a scale and an indicating pointer mounted for movement relative to the scale the improvement comprising a bistable, manually operable clamping mechanism for selectively retaining an instrument pointer clamping member in either a pointer-clamping position or a stored position and for positively moving the clamping member between said position, said mechanism comprising an instrument housing element, an instrument pointer clamping member, mounting means disposed in fixed relationship to the instrument housing element for pivotally mounting the clamping member, wall means defining an aperture through said housing element, a manually operable actuating member supported in said aperture for movement relative thereto, a connector coupled to said actuating member and fastened to said clamping member at a point thereon remote from the mounting means, said connector being operable responsive to movement of the actuating member in a first direction to move the clamping member to its stored position and being further operable responsive to movement of the actuating member in a second direction to move the clamping member to its clamping position against an instrument indicating pointer, and a bistable retaining means for selectively holding the clamping member respectively in either said clamping or stored position upon termination of movement of the actuating member.

4,038,939

CONTINUOUS SYSTEM FOR PROVIDING A CATALYTIC COATING ON SUPPORT MEMBERS

William A. Hoyer, Evanston; Lowell W. Johnson, and Richard J. Schoenenberger, both of Kildeer, all of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 516,519, Oct. 21, 1974, Pat. No. 3,948,213.
This application Dec. 15, 1975, Ser. No. 641,117
Int. Cl.² B05C *11/06, 3/109*
U.S. Cl. 118—4 **7 Claims**



1. A processing apparatus system for providing a continuous, assembly-line, placement of catalytic coatings on refractory support members, which comprises in combination:

a. a plurality of pressure tight chambers spaced apart on a moving table means, with each chamber having a movable wall portion to permit the insertion and withdrawal of a support member;
b. conduit and valving means connective to said chamber to admit timed flow streams to the interior thereof;
c. valved outlet means from the base portion of each chamber;
d. member handling means adjacent said moving table means to provide for the insertion of a support member into said chamber and the removal of a treated member therefrom.
e. conveyor means to bring members to the table and chamber and to carry members therefrom;
f. additional conveyor means further providing movement of support members through a high temperature drying a curing heater means, with
g. said heater means in turn having heated air blower means to effect hot air flow over and through said support members; and
h. means for discharging a fully coated and heat cured member.

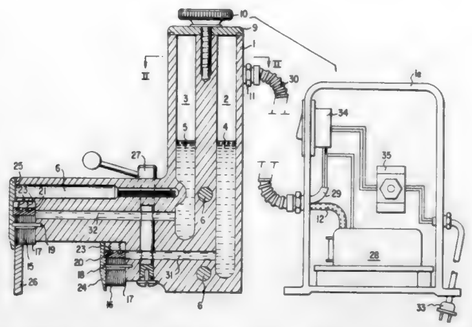
4,038,940

DEVICE FOR THE APPLICATION OF MELTABLE OR LIQUID COLORS

Heinz Gierse, Taunusstrasse 33, 5 Cologne (kalk) 91, Germany

Filed July 22, 1975, Ser. No. 598,011
Claims priority, application Germany, July 24, 1974, 2435557
Int. Cl.² B05C *1/02*
U.S. Cl. 118—5 **5 Claims**

1. A device for applying a liquid material to the edge of a workpiece comprising a storage tank containing a chamber for holding liquid material, a horn fixed at one end to the lower end of the tank so as to extend right angularly therefrom, said horn containing a passage in communication at one end with the chamber near the bottom thereof so that the head of liquid material in the chamber maintains the passage filled with liquid material, a marking head at the distal end of the horn through which the liquid material is caused to flow onto the workpiece when the latter is presented thereto, said marking head comprising a bank of closely spaced, vertically disposed flat blades supported in said head with the planes of the blades perpendicular to the axis of the passage, with their upper ends in communication with the passage and their lower ends situated in a common plane below the passage, said bank of blades being vertically movable within the head, spring means yieldably holding the blades in the bank of blades distended, means connected to the chamber within the tank for maintaining a vacuum therein above the liquid material and a regulating valve at the top of the tank in communication with the chamber for regulating the vacuum.

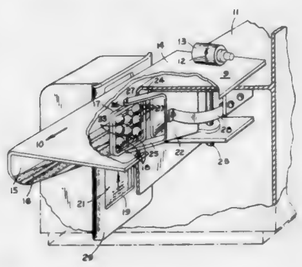


4,038,941

ENVELOPE FLAP MOISTENER

James R. Swaniger, Bridgeport, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Sept. 27, 1976, Ser. No. 726,640
Int. Cl.² B05C *1/02*
U.S. Cl. 118—243 **9 Claims**



1. An envelope flap moistening apparatus, comprising:

a reservoir containing an envelope flap moistening fluid;

means defining an envelope feed path;

transport means for conveying an envelope along said feed path;

a bead chain apparatus disposed along said envelope feed path and having a number of moistener beads for contacting and wetting a gum portion of said envelope, as said envelope is conveyed passed said beads; and

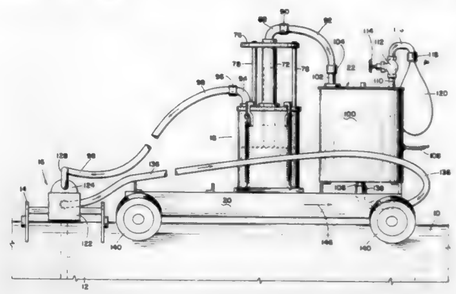
wetting means partially disposed within said reservoir and engaging with said bead chain apparatus for conveying said moistening fluid from said reservoir to said bead chain apparatus for wetting said moistener beads, whereby said moistener beads will contain moisture for wetting a passing envelope flap.

4,038,942

SYSTEM FOR SPRAYING A POWDER CIRCUMFERENTIALLY AROUND A PIPE

Robert J. Hart, Tulsa, Okla., assignor to Commercial Resins Company, Tulsa, Okla.

Filed Aug. 4, 1976, Ser. No. 711,635
Int. Cl.² B05B *13/02*
U.S. Cl. 118—305 **5 Claims**



1. A system for spraying a powder circumferentially around a pipe or the like comprising a yoke engagable with the pipe for more than 180° of the circumference of the pipe, means for driving the yoke circumferentially about the pipe, a powder dispenser mounted on the yoke, a powder suspension device, a combined blower-suction device having a suction inlet and an outlet supplying a stream of air under pressure, a first conduit connecting the outlet of said blower-suction device to the interior of said powder suspension device for creating an air-powder suspension therein, said powder dispenser having an inner housing, said inner housing having an opening positioned adjacent the surface of the pipe for supplying a quantity of air-powder suspension to the surface of the pipe, said powder dispensing device having an outer housing surrounding said inner housing and having an opening positioned adjacent said pipe and surrounding the opening of said inner housing, said inner and outer housing being spaced from each other to form a space there between, a second conduit connected at one end to the interior of said powder suspension device and connected at an opposite end to the inner housing of said powder dispenser to provide a stream of air-powder suspension under pressure to said powder dispensing device, and a third conduit connected at one end to the space between said inner and outer housings and at an opposite end to the suction inlet for said blower-suction device for returning excess powder from the pipe back into the system.

4,038,943

SIGNAL AMPLIFICATION BY CHARGING AND ILLUMINATING A PARTIALLY DEVELOPED LATENT ELECTROSTATIC IMAGE

Alan C. Nelson, Los Angeles, and Lothar S. Jeromin, Sierra Madre, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

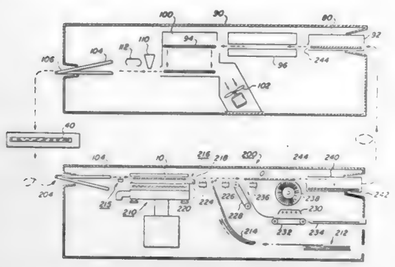
Division of Ser. No. 476,348, June 5, 1974, Pat. No. 3,981,727.
This application June 20, 1975, Ser. No. 588,573
Int. Cl.² G03G *15/08*
U.S. Cl. 118—647 **6 Claims**

1. Apparatus for increasing the potential difference between two adjacent charge patterns of differing charge density formed on a photoconductive surface comprising:

a. a photoconductive surface having at least two adjacent charge patterns of differing charge density thereon, said charge patterns being of a first polarity,
b. means for depositing a developer powder which is charged to said first polarity on said photoconductive surface whereby said developer powder is deposited denser in the areas of lower surface charge density, thereby providing a developed charge pattern,
c. means for applying charge of said first polarity to said

developed charge pattern, said means for applying charge of said first polarity comprising additional means for applying charge other than said associated with providing said adjacent charge patterns of differing charge density,

d. means for exposing the charged developed charge pattern to light, and



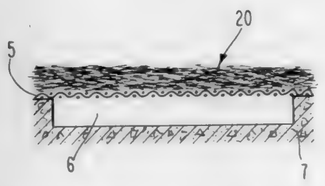
e. means for applying additional developer powder charged to a second polarity to said developed charge pattern whereby the potential difference between adjacent charge patterns of differing density is at least equal to the initial potential difference therebetween.

4,038,944

ARTIFICIAL BEDDING MATERIAL FOR ANIMALS

Frank J. Tucci, 16 Lujune Road, Cinnaminson, N.J. 08077

Filed Dec. 22, 1975, Ser. No. 618,050
Int. Cl.[2] A01K *29/00*
U.S. Cl. 119—1 **9 Claims**



1. Reusable synthetic plastic animal bedding being nonflammable and nontoxic, said animal bedding facilitating removal of liquid animal excretory material from the animal bed by permitting liquid excretory material to flow freely through said animal bedding while retaining solid excretory material comprising a plurality of elongate pieces of substantially impermeable hydrophobic synthetic plastic, randomly positioned relative to each other to form said bedding, whereby selected elongate pieces may be individually and readily removed from said animal bedding to facilitate said removal of animal excretory material.

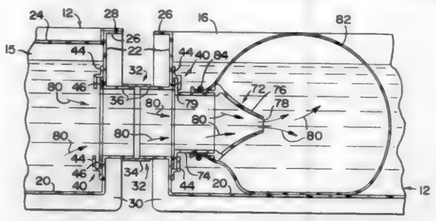
4,038,945

BREEDING TANK

Jiri Taborsky, R.R. No. 1, Box 430 D-2, Palmetto, Fla. 33561

Filed July 30, 1976, Ser. No. 709,969
Int. Cl.[2] A01K *64/00*
U.S. Cl. 119—3 **27 Claims**

1. A breeding facility for marine life, said facility comprising: a plurality of tank means, at least two of said tank means disposed in successive, interconnected relation to one another; interconnecting means attached in fluid communicating relation between at least two of said plurality of tank means; access means mounted on at least one of said tank means and comprising an aperture formed in said one tank means in communcating relation to said interconnecting means, said access means further comprising a closure assembly positionable in flow interruptive position relative to said aperture, whereby a predetermined number of said plurality of tank means are arranged in fluid communicating relation to interconnect said plurality of tank means and define a predetermined flow path therebetween; flow regulating means connected to at least one access means in fluid communicating position relative to the interior and exterior of said one tank means, said flow regulating means comprising a flow regulating conduit including



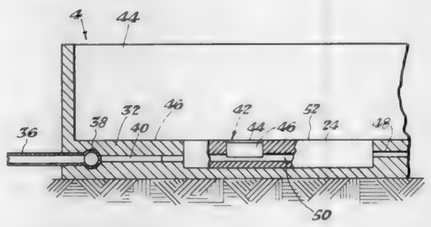
oppositely disposed apertures defined at the extremities of said flow regulating conduit, one of said oppositely disposed apertures positioned furthest from said access means having a substantially lesser diameter than the other of said oppositely disposed apertures, whereby flow of marine life in said tank means is regulated to flow through said conduit only in a single direction.

4,038,946

FISH FARM AND WATER CONDITIONING APPARATUS

Lance E. Leuthesser, 6054 Forest Hill Blvd., Apt. 207, West Palm Beach, Fla. 33406, and Edward G. Leuthesser, 1515 Lake Drive, Delray Beach, Fla. 33344

Division of Ser. No. 510,600, Sept. 30, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,648
Int. Cl.[2] A01K *63/00*
U.S. Cl. 119—5 **2 Claims**



1. A method of constructing a fish rearing tank floor with a generally flat floor and aeration means for the tank water comprising the steps of;

pre-fabricating at least one discharge holding means each of which includes an inlet, and an outlet adjacent an upper surface, at least one aerating discharge outlet therein connected to said inlet,

positioning each said holding means with its upper surface in the plane of the proposed floor surface,

placing air pressure conduits below the proposed upper floor surface and connecting each said holding means inlet to said conduits, and

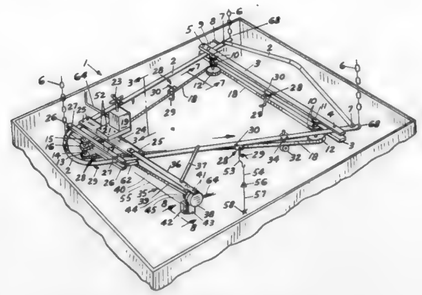
pouring a flooring material up to the surface of said holding means to provide a generally flat fish rearing floor.

4,038,947

FROG FEEDING APPARATUS

Dozier Lester, Jr., Rte. 1, Box 156F, Duson, La. 70529

Filed July 12, 1976, Ser. No. 704,245
Int. Cl.[2] A01K *5/02*
U.S. Cl. 119—51 R **10 Claims**



1. A frog feeding apparatus comprising:

a. a frame located above a frog enclosure;

b. a conveyor rotatably carried by said frame;

c. drive means in cooperation with said conveyor to facilitate rotation of said conveyor with respect to said frame;

d. a plurality of carrier means positioned in spaced relationship on said conveyor;

e. a plurality of carriers having frog food attached thereto and removable carried by said carrier means;

f. release means in cooperation with said frame and said conveyor for automatically dispensing said carriers sequentially on said plurality of carrier means as said carrier means traverse said frame on said conveyor; and

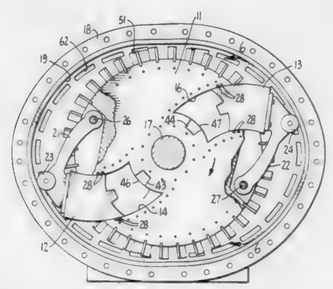
g. collection means in cooperation with said frame and said conveyor and positioned at a predetermined point with respect to said frame and said conveyor for sequentially collecting said carriers after said frog food has been removed from said carriers.

4,038,948

ROTARY INTERNAL COMBUSTION ENGINE

William A. Blackwood, 295 Polaris Ave., Mountain View, Calif. 94040

Continuation of Ser. No. 388,985, Aug. 16, 1973, Pat. No. 3,927,647. This application June 23, 1975, Ser. No. 589,017
Int. Cl.[2] F02B *57/00, 57/04*
U.S. Cl. 123—43 C **9 Claims**



1. In a rotary engine having an oblong inner cam surface,

a rotor mountable to rotate within said cam surface and comprising,

a body member of axially thickened disk-like shape having a generally cylindrical periphery and flat end faces perpendicular to the axis thereof,

a pair of end plates releasably secured to said end faces of said body member,

a portion of said body member being cut through from face to face so as to define with said end plates an arcuate combustion chamber of rectangular cross section having parallel curved walls and opening through said periphery,

an arcuate piston of rectangular cross section having parallel curved walls and slidable in said arcuate combustion chamber,

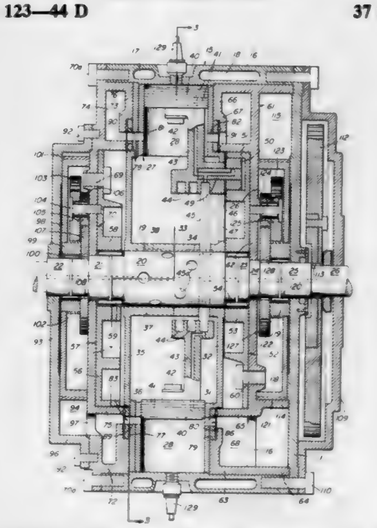
and a cam follower secured to said piston and extending beyind said periphery into contact with said inner cam surface.

4,038,949

ROTARY-RADIAL INTERNAL COMBUSTION ENGINE

Victor W. Farris, 840 S. Ocean Blvd., Palm Beach, Fla. 33480

Filed Apr. 16, 1975, Ser. No. 568,675
Int. Cl.[2] F02B *57/06*
U.S. Cl. 123—44 D **37 Claims**



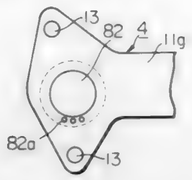
1. An internal combustion engine comprising: an engine housing, a cylinder housing, and cam means; said cylinder housing and said cam means being mounted in said engine housing for relative rotary motion with respect to each other; said cylinder housing incorporating at least one pair of diametrically opposite combustion chambers each of which contains a piston mounted for reciprocation therein; a rigid link connecting diametrically opposite pistons of each pair thereof, each such link being of such length that when each piston connected thereto is at the top of its stroke, the diametrically opposite piston is at the bottom of its stroke; cam follower means carried by one piston of each pair of diametrically opposite pistons and engaging said cam means; a drive shaft rotatably mounted in said engine housing and being receptive of and driven by the relative rotary motion between said cylinder housing and said cam means; means for supplying fuel to said combustion chambers under pressure; means for firing said fuel in said combustion chambers; and means for scavenging the resulting burnt fuel from said combustion chambers.

4,038,950

INTAKE MANIFOLD OF THE INTERNAL COMBUSTION ENGINE

Toshiaki Konomi; Joji Nurita, both of Susono, and Yasushi Tanazawa, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Division of Ser. No. 412,021, Nov. 1, 1973, Pat. No. 3,965,873. This application Dec. 11, 1975, Ser. No. 639,707
Claims priority, application Japan, July 12, 1973, 48-77871
Int. Cl.[2] F02B *75/18*
U.S. Cl. 123—52 M **5 Claims**



1. An intake manifold for a multicylinder internal combustion engine including a riser connected to a carburetor and branch pipes connecting the riser to intake ports of respective cylinders of the engine, the manifold being separable from the engine at an interface lying in a plane intersecting positions in each of the respective branch pipes, wherein the improvment comprises:

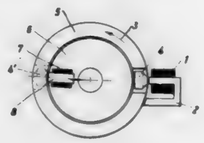
a flat gasket inserted at said interface and having orifices located at said positions in said respective branch pipes, the area of each orifice being individually and separately predetermined to equalize the pressure drops across said orifices, wherein each orifice is circular in cross section, and the area of at least one of the orifices is smaller than the cross-sectional area of its respective branch pipe at said intersecting plane.

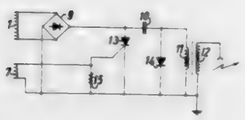
4,038,951

DEVICE FOR LIMITING THE SPEED OF INTERNAL-COMBUSTION ENGINE

Horst Schweikart, Offenburg, Germany, assignor to Gehap Gesellschaft fur Handel und Patentverwertung mbH & Co. KG, Sasbachwalden, Germany

Continuation-in-part of Ser. No. 414,591, Nov. 9, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,819
Claims priority, application Germany, Nov. 9, 1972, 2254811
Int. Cl.[2] F02D *11/10*
U.S. Cl. 123—102 **7 Claims**





1. A device limiting the speed of an internal combustion engine having a shaft, an ignition coil including a primary winding **(11, 31)** and a secondary winding **(12, 32)**, an engine spark plug **(17, 37)** connected with the secondary winding, and a charging capacitor **(10, 30)** connected in circuit with the primary winding for controlling the discharge of the capacitor to produce a controlled discharge voltage therefrom to controllably activate the spark plug, comprising:

a rotatable member **(5, 25)** connected with said shaft;

a single rotatable magnet system **(4, 24)** carried by said rotatable member for rotation therewith;

a stationary first core **(2, 22)** including a front face disposed adjacent to and in close proximity to the outer periphery of said rotatable member, a charging coil **(1, 21)** mounted about said core for producing an electric pulse for each rotation of said rotatable member;

a stationary second core **(8, 28)** mounted in close proximity to said rotatable member and displaced in phase from said stationary first core by an adjustable angular position relative to said charging coil, a single stationary triggering coil **(7, 27)** mounted about said second core, the position of said second core being present with respect to said first core to satisfy a predetermined maximum speed value of said engine;

rectifier means **(9, 29*a*)** coupled to said charging coil responsive to the electric pulse output therefrom for rectifying the pulse output, said capacitor having an input coupled to the output of said rectifying means;

a simi-conductor switch **(13, 33)** connected between said rectifier means output and said input of said capacitor, the input gate of said switch being coupled to said triggering coil and responsive to a pulse therefrom to inhibit said capacitor from being fully charged from a rectifier means and thereby limiting the discharge voltage from said capacitor to said primary winding, thereby limiting the engine to a maximum speed value;

a resistor **(15, 35)** connected parallel with said triggering coil, said resistor having a value correlated to the maximum speed value and the characteristics of said magnet system; and

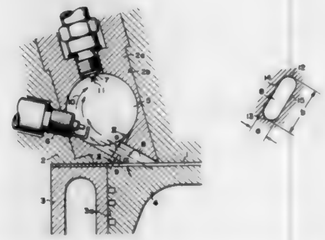
means adjusting the angular position of said triggering coil with respect to said charging coil to activate the spark plug when engine rotation is below said maximum speed value, said switch being responsive to said triggering coil to prevent full build up of charge on said capacitor in response to engine rotation at said maximum speed value thereby applying said pulse from a triggering coil to said switch while the output from said rectifier means is applied to said capacitor, said spark plug being prevented from being activated in response to less than full build up of charge on said capacitor when said maximum speed value is attained.

4,038,952

INTERNAL COMBUSTION ENGINE

Tetsuro Nagano, Shizuoka, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 19, 1975, Ser. No. 559,793
Claims priority, application Japan, Aug. 8, 1974, 49-90998
Int. Cl.[2] F02B *23/00*
U.S. Cl. 123—32 K **1 Claim**



1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head secured to the cylinder block;

a piston reciprocably disposed in the cylinder bore, said piston having a head with a flat upper surface;

a main combustion chamber, to which only air is directly supplied, defined by the cylinder bore, said piston, and said cylinder head;

an auxiliary combustion chamber, circular in cross-section, defined in the cylinder head above the main combustion chamber;

an ignition plug having an electrode in said auxiliary combustion chamber;

a fuel injection nozzle in said auxiliary combustion chamber;

means defining a passage in the cylinder head for fluidly communicating the main combustion chamber and the auxiliary combustion chamber, said passage being disposed tangentially to the periphery of the auxiliary combustion chamber, extending at an angle of no more than 45° to the upper surface of the piston head, and having a cross-sectional area of 1 to 10% of the transverse cross-sectional area of the piston head, one end of said passage opening into said main combustion chamber and the other end thereof opening directly into one end of said auxiliary combustion chamber in a direction directly toward said ignition plug, said passage being in the form of a flat envelope in cross-section with flat sides and substantially semicircular ends and having a major axis, parallel to the upper surface of the piston head, and a minor axis within the ratio of 1.5 to 3 in length;

said fuel injection nozzle is positioned adjacent a portion of the auxiliary combustion chamber diametrically opposite said one end thereof; and

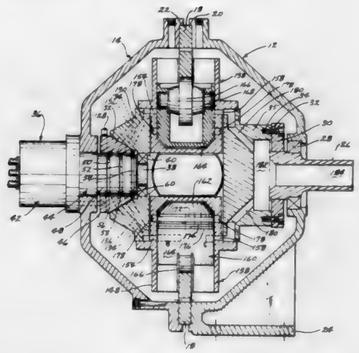
said electrode is positioned between said passage and said fuel injection nozzle.

4,038,953

ROTARY INTERNAL COMBUSTION ENGINE HAVING ROTARY VALVE MEANS FOR FUEL AND AIR INTRODUCTION

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation-in-part of Ser. No. 286,189, Sept. 5, 1972, abandoned, and Ser. No. 301,096, Oct. 26, 1972, Pat. No. 3,857,372, Continuation-in-part of Ser. No. 286,189, Sept. 5, 1972, abandoned, and Ser. No. 378,701, July 12, 1973, Pat. No. 3,874,348. This application Aug. 5, 1974, Ser. No. 494,409
Int. Cl.[2] F02B *57/00;* **F02M** *59/12*
U.S. Cl. 123—44 E **5 Claims**



1. A rotary internal combustion engine comprising,

an engine frame means including a rotatable power output means,

a rotor means in said frame means connected to said power output means,

a plurality of cylinders mounted on said rotor means,

a piston movably mounted in each of said cylinders and being movable between compression and expansion positions with respect thereto,

a cam plate means on said frame means extending around said rotor means and having a cam surface,

means mounted on each of said pistons which engages said cam surface to cause said piston to be moved in said cylinder as said rotor means is rotated with respect to said cam plate,

a rotary valve means secured to said rotor means for rotation therewith,

an air passageway means for supplying air to said rotary valve means,

a fuel supply passageway means for supplying fuel to said rotary valve means,

means for supplying air and fuel, respectively, to said air passageway means and said fuel passageway means,

each of said cylinders having air openings formed therein and extending therethrough,

each of said cylinders having fuel openings formed therein and extending therethrough,

said rotary valve means having an air passageway means provided therein for supplying air to said air openings in said cylinders,

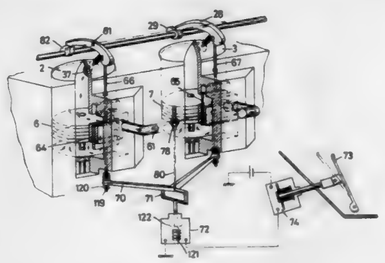
said rotary valve means having a fuel passageway means provided therein for supplying fuel to said fuel openings in said cylinders.

4,038,954

MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Walter Franke, Seevetal, Germany, assignor to Motoren-Forschungs GmbH KG, Hamburg, Germany

Continuation-in-part of Ser. No. 402,171, Oct. 1, 1973, abandoned. This application June 17, 1975, Ser. No. 587,691
Claims priority, application Germany, Sept. 29, 1972, 2247908
Int. Cl.[2] F02B *75/18, 25/00*
U.S. Cl. 123—75 CC **12 Claims**



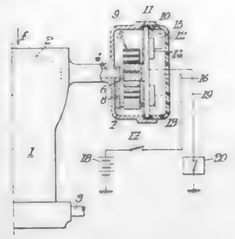
1. A multi-cylinder valve-controlled four-stroke internal combustion engine comprising an engine cam shaft, a plurality of pistons, cylinder means defining a combustion chamber on one side of each of said pistons and a pumping chamber on the opposite side of each, means at the underside of each piston functioning as a compression and scavenging pump, transfer ports in the pumping chamber controlled by the edge of the piston, transfer conduits connecting said ports with the cylinder combustion chamber, connector pipes between the transfer conduits of cylinders, transfer valves controlling connection of the transfer conduits through said connection pipes, and control means controlling operation of the transfer valves in dependence on the engine cam shaft, the control means being responsive to operation of the engine at half load or less to so control operation of the transfer valves that a cylinder operating as a pump additionally contains the compressed air from the pump chamber of a cylinder of which the piston works at a phase displacement of 180°.

4,038,955

AUTOMATIC CHOKE SYSTEMS FOR CARBURETORS

Claude Paulmier, Creteil, France, assignor to Societe Industrielle de Brevets et d'Etudes S.I.B.E., France

Filed Mar. 7, 1975, Ser. No. 556,388
Claims priority, application France, Mar. 19, 1974, 74.09330; May 17, 1974, 74.17360
Int. Cl.[2] F02M *1/10, 23/04;* F02D *11/08*
U.S. Cl. 123—119 F 9 Claims



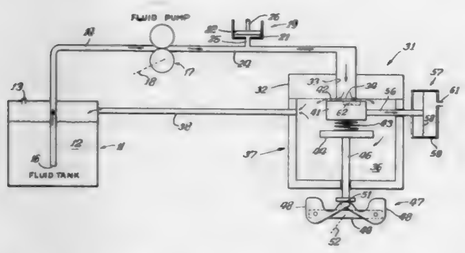
1. An automatic cold start and warmup system for use in a carburetor having an air introduction passage, comprising a choke valve mounted across the induction passage to control air flow therethrough; a temperature-responsive element connected to said choke valve; means for heating said element including at least first and second positive temperature coefficient (PTC) electrical heating resistors permanently connected in series with one another electrically, said first resistor having a higher switching temperature than said second resistor; and switch means operable above a predetermined temperature level for short-circuiting said second resistor having the lower switching temperature, whereby in sequence from a cold start condition current initially flows through said first and second resistors in series to effect rapid opening of said choke valve, the switching temperature of said second resistor is exceeded producing a decrease in the rate of opening of said choke valve, said switch means closes short-circuiting said second resistor resulting in an increase in the rate of opening of said choke valve and the switching temperature of said first resistor is exceeded at substantially full opening of said choke valve.

4,038,956

FLUID PRESSURE REGULATOR

Julius P. Perr, Columbus; Edward D. Smith, Greensburg, and Harry L. Wilson, Columbus, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Sept. 9, 1974, Ser. No. 504,047
Int. Cl.[2] F02D *1/04, 1/06*
U.S. Cl. 123—139 AF 15 Claims



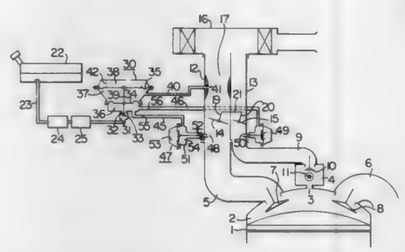
1. In a fuel supply system for an internal combustion engine which burns a combustible fluid, the improvement of a fluid pressure regulator comprising a first member having a fluid passage formed therein and leading to an opening in a side thereof, said passage being adapted to receive fluid under pressure which flows through said passage and out of said opening, a closure member positioned adjacent said first member at said opening, means mounting said members for relative movement in a first direction toward and away from one another to form a space therebetween, force applying means engaging at least one of said members and urging said members toward one another so as to close said space, a recess formed in the side of said closure member which faces said first member, said recess at least partially overlying said opening, fluid in said passage exerting pressure over an area of said closure member and moving said closure member away from said first member to form said space therebetween and thereby to enable the fluid to flow out of said opening and through said space, and means mounting said members for relative movement in a second direction which is generally lateral of said first direction in order to vary the amount of said recess which lies outside of said opening, the pressure of the fluid in said passage being equal to the force of said force applying means divided by said area, and said area being equivalent to the area of said opening plus any area of said recess which lies outside the margin of said opening.

4,038,957

FUEL CONTROL SYSTEM FOR USE IN INTERNAL COMBUSTION ENGINE

Yukio Hosho, and Hisanori Moriya, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed June 19, 1975, Ser. No. 588,362
Claims priority, application Japan, June 21, 1974, 49-70170
Int. Cl.[2] F02M *59/00*
U.S. Cl. 123—139 AW 5 Claims



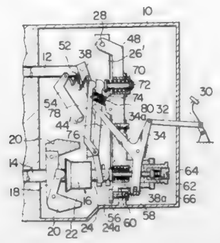
1. A fuel control system for use in an internal combustion engine wherein the combustion device thereof comprises a main combustion chamber and an auxiliary combustion chamber provided therein with an ignition plug, the main and auxiliary combustion chambers being in communication with each other through a through-hole and the mixture of gasified fuel and air in the main combustion chamber being ignited by the flames of combustion produced in said auxiliary combustion chamber, characterized in that throttle valves operationally associated with each other are provided respectively in a main air intake duct in communication with the main combustion chamber and in an auxiliary air intake duct in communication with the auxiliary combustion chamber, fuel pressure booster means for supplying fuel boosted to a pressure higher than atmospheric pressure, fuel pressure control means for varying the pressure of the fuel supplied from said fuel pressure booster means in accordance with the negative pressure at a Venturi flume provided upstream of the throttle valve in said main air intake duct first and second fuel passageways connected to said fuel pressure control means for supplying the fuel controlled by said fuel pressure control means respectively to the main and auxiliary air intake ducts, and first and second discharge valves connecting said respective first and second fuel passageways to said main and auxiliary air intake ducts, the opening degrees of said respective discharge valves being set to maintain the pressure of fuel upstream of the discharge valves constant.

4,038,958

FUEL INJECTION PUMP GOVERNOR

Yasuhide Susuki, Saitama, Japan, assignor to Diesel Kiki Co., Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,452
Claims priority, application Japan, Apr. 23, 1974, 49-45099
Int. Cl.[2] F02D *1/04*
U.S. Cl. 123—140 R 10 Claims



1. In a fuel injection pump governor having a fuel injection control member, an engine speed control member movable from a minimum engine speed position in a direction to increase engine speed, an engine driven flyweight assembly, a linkage connecting the flyweight assembly to the fuel injection control member so that movement of the flyweight assembly causes movement of the fuel injection control member, the linkage further connecting the speed control member to the fuel injection control member so that movement of the speed control member causes movement of the fuel injection control member and an idling counterforce spring to resist movement of the flyweight assembly when the engine speed is below a predetermined value, the improvement comprising:

a spring assembly engageable with the idling counterforce spring to apply a force thereto in a direction opposite to the force of the idling counterforce spring;

the speed control member being engageable with the assembly to cause the spring assembly to be disengaged from the idling counterforce spring when the speed control member is between the minimum engine speed position and a predetermined position spaced from the minimum engine speed position in the direction to increase engine speed and cause the spring assembly to engage with the idling counterforce spring when the speed control member is spaced farther from the minimum engine speed position that the predetermined position in the direction to increase engine speed.

4,038,959

INTERNAL COMBUSTION ENGINE WITH A SUBSIDIARY COMBUSTION CHAMBER

Masaaki Takizawa, Mishima, and Tsutomu Hiyoshi, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 10, 1976, Ser. No. 694,710
Claims priority, application Japan, Mar. 17, 1976, 51-31001[U]
Int. Cl.[2] F02B *23/00, 3/00*
U.S. Cl. 123—191 S 5 Claims

1. An internal combustion engine comprising:

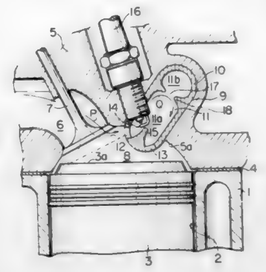
a cylinder block;

a piston reciprocably movable in the cylinder block;

a cylinder head fixed onto the cylinder block and having an intake valve;

a main combustion chamber formed between the inner surface of the cylinder head and the top surface of the piston;

a subsidiary combustion chamber disposed in the cylinder head and comprising restricted opening means, a first chamber located in the vicinity of the main combustion chamber and a second chamber located remote from the main combustion chamber, said first and second chambers being interconnected via said restricted opening means, and an ignition plug having an ignition gap located in the first chamber, said first chamber having at least two connecting passages communicating the first chamber and the main combustion chamber, one of said connecting passages being directed to an intake valve so that a part of an air-fuel mixture fed into the main combustion chamber through the intake valve is introduced into the first chamber when the engine is operating under a heavy load, said second chamber on one hand storing a residual gas introduced thereinto from the first chamber through said restricted opening means at the time of the compression stroke when the engine is operating under a light load, and on the other hand, receiving a combustible gas thereinto from the first chamber through said restricted opening means at the time of the compression stroke so that the combustible gas is ignited by the combustion gas in the first chamber when the engine is operating under a heavy load, said restricted opening means delaying a start of the combustion in the second chamber compared with the combustion in the first chamber when the engine is operating under a heavy load.

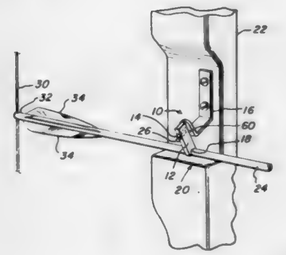


4,038,960

ARROW HOLDER

James E. Ludwig, 4063 Ensign Ave. North, New Hope, County of Hennepin, Minn. 55427

Filed May 12, 1975, Ser. No. 576,622
Int. Cl.[2] F41B *5/00*
U.S. Cl. 124—41 A 15 Claims



1. An arrow holder for continuously holding an arrow having a shaft, a nock on one end of the arrow and three vanes on the same end of the shaft as the nock, two of which vanes face toward a side of the bow when the arrow is in a strung position and the other of which vanes faces away from and is perpindicular to said bow side, in emplacement when the holder is attached to a bow and under virtually every condition including when a bow and strung arrow are being carried in a non-shooting position, while an arrow is being drawn to a fully-drawn position and while an arrow is being held in a fully-drawn position comprising:

means for holding an arrow shaft which means includes a

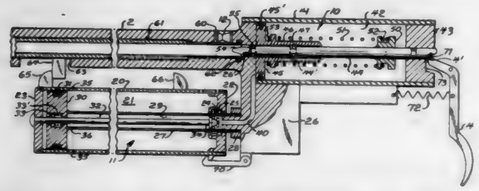
bifurcated end; and, a pivot means for providing when said arrow holder is attached to a bow and an arrow is in proper emplacement pivotal movement of said arrow shaft holding means between positions providing engagement and disengagement of said bifurcated end with and from the arrow shaft, which bifurcated end cooperates with a bow member to apply a holding force of at least a predetermined magnitude to the arrow shaft when said bifurcated end is in engagement on the arrow shaft in a start position to hold the arrow in emplacement, which movement of said bifurcated end is in response to an initial forward movement of the shaft of said arrow to correspondingly move forward, and which pivoting of said holding means is in response to said bifurcated end's forward movement to pivot relative to said pivot means and disengage said bifurcated end from the arrow shaft whereby the cooperation between said bifurcated end and said bow member is broken to release an arrow for free flight.

4,038,961

PNEUMATIC RIFLE AND HAND GUN

Sigfrid M. Olofsson, Munkedal, Sweden, assignor to Dahltron Corporation, Lombard, Ill.

Filed Aug. 22, 1975, Ser. No. 606,972
Int. Cl.² F41B *11/00*; F41F *1/04*
U.S. Cl. 124—69 **15 Claims**



1. A device for selectively discharging projectiles under the influence of a source of fluid pressure comprising:
- chamber means adapted to receive a projectile for discharge therefrom;
- a source of discharge fluid pressure operatively coupled to the chamber means and having an initial volume when said chamber means is pressurized;
- pressurizing means to selectively create said discharge fluid pressure in the source;
- pressurizing control means imposed between said chamber means and said source blocking pressure to a projectile;
- actuation means coupled to the pressure control means to selectively permit said source of discharge fluid pressure to contact a projectile for discharge from the chamber means;
- said source of discharge fluid pressure includes a source chamber in fluid communication with said pressure control means and said source chamber having pressure equalization means mounted therein; and
- said pressure equalization means acting to subject a projectile to substantially constant pressure during discharge thereof by maintaining the combined volume of those portions of said source chamber and said chamber means between said pressure equalization means and said projectile substantially equal to said initial volume after pressurization thereof to said discharge fluid pressure until said source of discharge pressure is substantially exhausted of fluid pressurized to said discharge fluid pressure during discharge of said projectile.

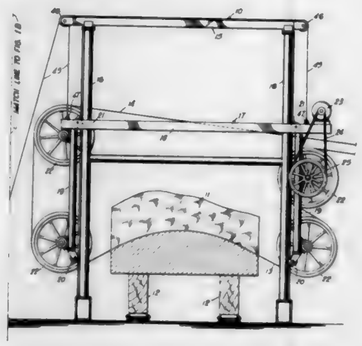
13. A device for selectively discharging projectiles comprising:
- barrel means adapted to receive a projectile for discharge therefrom;
- chamber means operatively coupled to the barrel means;
- a source of pressure coupled to said chamber means to selectively pressurize said chamber means to a discharge pressure;
- actuation means coupled to the barrel means to selectively permit said discharge pressure within said chamber means to contact the projectile for discharge;
- said chamber means having movable means mounted for movement toward said barrel means while said source of pressure contacts a projectile;
- a compensation member mounted for movement and coupled to said movable means to compensate for recoil occurring during discharge;
- said compensation member being coupled to said movable means by resilient means, said resilient means acting to cause movement of said compensation member in the same direction of movement as said movable means in response thereto to apply a force to said chamber means opposite to the force created by discharge of the projectile; and
- said compensation means applies a force to the chamber means opposite to the force created by discharge of the projectile.

4,038,962

AUTOMATIC POWER CONTROLLER FOR A WIRE SAW

Roy Lynnard Tessner, Atlanta, Ga., assignor to Coggins Industries, Inc., Elberton, Ga.

Filed Aug. 25, 1976, Ser. No. 717,642
Int. Cl.² B28D *1/08*
U.S. Cl. 125—21 **7 Claims**



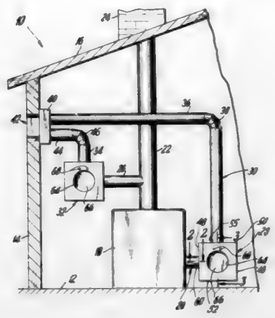
1. In a wire saw having a support frame, a dolly for transporting a cutting wire movably mounted on the support frame, a cutting wire driving motor on the dolly, and a feed down motor means for the dolly, an automatic power controller comprising:
- a current measuring meter electrically coupled with said cutting wire driving motor to constantly measure the current flowing to said motor, said current measuring meter including a relay having an electrical contact coupled with said dolly feed down motor means and responsive to a decrease in the measured current to the cutting wire driving motor, resulting from a lessening of a load on the cutting wire driving motor due to reduced cutting pressure and drag on the cutting wire for turning on said dolly feed down motor means until normal cutting pressure and drag is restored to said wire and the load and current of the cutting wire driving motor are returned to normal values.

4,038,963

HEATING SYSTEM USING OUTSIDE AIR

Gloria L. Dingwall, Hamlin Road, Mahopac, N.Y. 10541

Filed Feb. 9, 1976, Ser. No. 656,398
Int. Cl.² F24C *3/00*
U.S. Cl. 126—85 B **12 Claims**



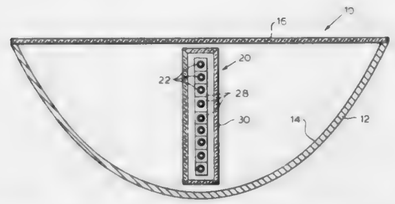
1. A heating system for heating a building comprising a furnace having an inlet and an outlet, a flue pipe leading from said outlet to a first exterior of the building for escape of exhaust gases, a draft opening in said flue pipe, an air intake pipe coupled to said inlet for receiving air into said furnace, first and second pipes respectively having one end thereof coupled to a second exterior of the building, first coupling means interconnecting the other end of said first pipe to said draft opening for allowing air outside of said building to provide a draft to said flue pipe, a second coupling means interconnecting the other end of said second pipe to said air intake pipe for allowing air outside of said building to be used as the air supply for said furnace, and at least one of said coupling means including safety means for admitting air from inside the building when the air flow from outside the building becomes restricted.

4,038,964

PARABOLIC SOLAR CONCENTRATOR EMPLOYING FLAT PLATE COLLECTOR

George F. Drew, 1113 - 28th St., NW., Winter Haven, Fla. 33880

Filed July 25, 1975, Ser. No. 599,183
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **7 Claims**



1. A solar energy and concentrator collector comprising:
- a trough having a generally parabolic cross section, said trough having a reflective inner surface adapted to receive and reflect direct and indirect solar radiation;
- a flat plate solar collector extending along the apex line of said parabolic cross section, said flat plate collector having means therein defining a circuitous path for a fluid passing therethrough;
- selective means for admitting shortwave solar radiation into said flat plate collector and reducing longwave heat radiation from said flat plate collector; and wherein

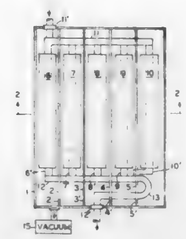
the ratio of the dimensions from the apex to the focal line of said trough to the dimension between the extremities of said trough is approximately in a range between 1:5 to 1:9.

4,038,965

EVACUATED SOLAR HEAT COLLECTOR

Floyd A. Lyon, Brookville, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed July 23, 1975, Ser. No. 598,549
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **4 Claims**



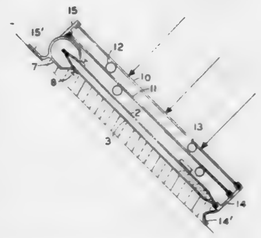
1. Solar heat collector means comprising,
- a shallow hollow member,
- a transparent cover connected on said member,
- a plurality of load bearing partitions in said hollow member, said cover resting on said partitions,
- a plurality of heat collecting plates in said hollow member spaced between said partitions,
- a plurality of fluid conveying means each connected along one of said collector plates, said fluid conveying means being connected in parallel,
- inlet and outlet means connected to said fluid conveying means,
- and means connected to apply vacuum to said hollow member, said partitions being apertured so that the entire hollow member may be evacuated,
- said partitions being proportioned and spaced so as to support the cover against external atmospheric pressure,
- whereby conduction and convection losses from said heat collector plates will be minimized because of the vacuum.

4,038,966

SOLAR HEAT COLLECTOR TANK

Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed Oct. 9, 1975, Ser. No. 621,133
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **5 Claims**



1. A solar heat collector comprising,
- a thin evacuated tank having upper and lower parallel sides, said upper side havinga black exterior surface, said tank being mounted at an angle to the horizontal,
- a predetermined amount of vaporizable fluid in said tank,
- a fluid conduit connected in heat exchanging relation with the upper end of said tank,

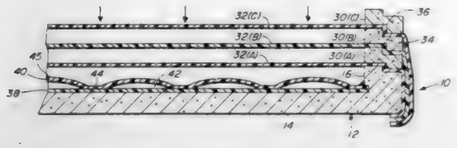
whereby solar rays striking said upper tank surface will vaporize said fluid in said tank and the vapor will rise to the upper portion of the tank where it will be condensed and transfer its heat to fluid in said conduit.

4,038,967

SOLAR HEATING SYSTEM AND COMPONENTS THEREOF

Harry E. Stout, and Brian Stout, both of 2 Brastow Ave., Somerville, Mass. 02143

Continuation-in-part of Ser. No. 489,150, July 17, 1974, Pat. No. 3,918,430. This application Nov. 6, 1975, Ser. No. 629,288
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **2 Claims**



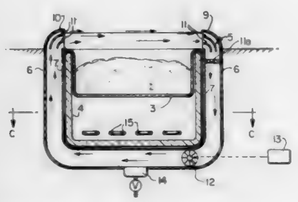
1. A solar heating system, comprising
   a. a frame of rigid foam plastic material formed with a flat rear wall and integral marginal side and end walls extending from one face and along the edges thereof,
   b. a reflective stratum disposed over said one face of said rear wall in flush face-to-face contact therewith,
   c. a ply of waterproof, plastic black body material bonded to said stratum along spaced parallel lines extending lengthwise of said panel to form a plurality of elongated, parallel, thin and relatively flat panels between said end walls,
   d. said end walls being hollow and communicating with said channels,
   e. conduit means connected to said end walls for delivering a liquid medium into one end wall through said channels and from the other end wall, and
   f. at least one stratum of transparent, flexible plastic sheet material mounted to said side end walls in spaced relation to said rear wall,
   g. said liquid medium being an aqueous mixture of carbon black.

4,038,968

AIR SCREEN FOR FOOD WARMING TABLE

Alfred Rovell, 2623 New Jersey Road, Lakeland, Fla. 33803

Filed June 3, 1975, Ser. No. 583,436
Int. Cl.² A47G *23/04*
U.S. Cl. 126—261 **6 Claims**



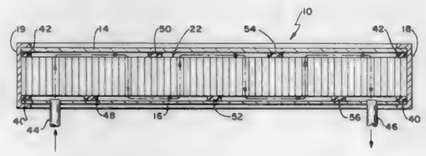
1. A food warming table for maintaining food at a hot serving temperature and to prevent loss of moisture which comprises:
   at least one trough-like receptacle having heating means located at its lower portion;
   at least one stationary food receiving pan location within the said receptacle having hot food therein and spaced above said heating means, whereby said pan is heated by the heating means;
   the trough-like receptacle and the pan having upper perimeters that are substantially flush and horizontal;
   a moving air current confined essentially to the lateral boundaries of the pan, and moving in a direction parallel to the plans of the upper perimeter whereby an air curtain over the food in the pan is maintained;
   said air current being adapted to absorb moisture, heat and flavor components from the food in its passage over the said food, so that said air current is heated, moist and contains flavor components;
   means for accepting the air current at a location adjacent one end of the pan and redirecting it to an opposite end of said pan; and
   means for imparting motion to said air current.

4,038,969

SOLAR ENERGY COLLECTOR

Philip D. Smith, 385 Camelback Road, Pleasant Hill, Calif. 94523

Filed Nov. 20, 1974, Ser. No. 525,407
Int. Cl.² F24J *3/02*
U.S. Cl. 126—270 **8 Claims**



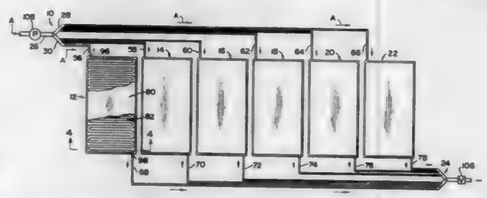
1. A flat plate radiant energy collector comprising the combination of a housing having a transparent front panel and an opaque black panel, an energy absorbing structure mounted within the housing, said structure comprising a plurality of cells each of which is defined by opaque, radiant energy absorbing sidewalls extending along parallel axes substantially orthogonal to the plane of the front panel with adjacent pairs of the cells sharing at least a common sidewall, each of the cells having an open front end spaced from the front panel and an open rear end spaced from the back panel whereby radiant energy which passes through the front panel impinges upon and is absorbed as thermal energy on the cell sidewalls and on the back panel, with the ratio of the depth of the cells to the diameter of cells being in the range of **2** to **10**, and means for directing fluid into the housing through the cells in heat exchange relationship with the sidewalls and with the back panel for absorbing said thermal energy thereon.

4,038,970

SOLAR WATER HEATER

John D'Ascoli, 3 S. Shore Drive; Benny F. Rappa, 5 Seaway Drive, both of New Port Richey, Fla. 33552, and Thomas M. Sculley, 126 Gulf Highlands Drive, Port Richey, Fla. 33568

Filed Oct. 24, 1975, Ser. No. 625,688
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



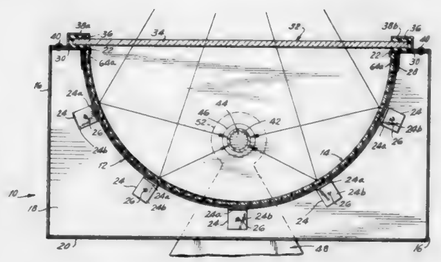
1. An improved solar heater of the type primarily intended for use in heating water; comprising in combination: a plurality of heater panel means including substantially identical length water flow channeling means formed therein, each of said plurality of heater panel means comprising an intake orifice formed at one end of said water flow channeling means and an exhaust orifice formed at the other end of said water flow channeling means whereby water may enter said intake orifice and travel through said water flow channeling means and exit from said exhaust orifice; intake manifold means including a main intake conduit disposed in fluid communicating relation to a water supply, said intake manifold means further including a pair of substantially oppositely extending supply branches formed thereon and communicating with said main intake conduit, said intake manifold means including a plurality of supply heads formed on said supply branches, a first plurality of water conduits disposed in interconnecting relationship between said plurality of supply heads and said intake orifices of said plurality of heater panel means; exhaust manifold means including a main exhaust conduit comprising a pair of substantially oppositely extending exhaust branches formed thereon and communicating with said main exhaust conduit, said exhaust manifold means including a plurality of exhaust heads formed on said exhaust branches, a second plurality of water conduits disposed in interconnecting relationship between said plurality of exhaust heads and said exhaust orifices of said plurality of heater panel means, and means establishing the sum of the longitudinal dimensions of each pair of said first and second water conduits to be substantially identical throughout said solar heater to provide a balanced flow of water through said heater panel means without the use of mechanical valves.

4,038,971

CONCAVE, MIRRORED SOLAR COLLECTOR

Joseph A. I. B. Bezborodko, 699 W. 239th St., Bronx, N.Y. 10463

Filed Oct. 22, 1975, Ser. No. 624,848
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **14 Claims**



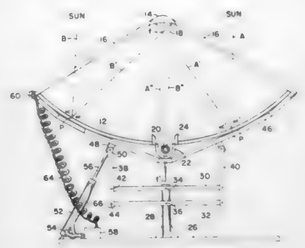
1. A solar collector comprising a supporting shell having a generally elongate concave shape; a mirrored glass reflecting surface formed from a mirrored sheet supported within the supporting shell and including a plurality of mirrored strips cut from the mirrored sheet, a stretchable backing disposed against said supporting shell; a layer of glue adapted to stretch with the stretchable backing for connecting the stretchable backing to the mirrored strips; the layer of glue and the stretchable backing connecting the mirrored strips together so that adjacent edges of the strips furthermost away from the supporting shell rest contiguously next to each other and so that adjacent edges of the mirrored strips nearest the supporting shell are separated from each other thereby enabling the reflecting surface to generally conform to the concave shape of the supporting shell; a cover disposed over the supporting shell for allowing sunlight to penetrate onto the reflecting surface, the cover formed in part of a transparent material; means for sealing the cover over the top of the supporting shell including a gasket disposed along the edges of the cover and a plurality of clamps for removably fastening the gasket and cover to the top of the supporting shell; a collector body for supporting the supporting shell and including at least two end walls and two side walls; means for connecting the side walls of the collector body to the supporting shell; and means disposed between the end walls of the collector body for carrying heatable material through said collector whereby sunlight incident on the reflecting surface is reflected onto said carrying means to heat the material carried therein.

4,038,972

SOLAR ENERGY COLLECTOR APPARATUS

William W. Orrison, 100 Aylesbury Hill, San Antonio, Tex. 78209

Filed Mar. 29, 1976, Ser. No. 671,340
Int. Cl.² F24J *3/02*
U.S. Cl. 126—271 **14 Claims**



1. A solar energy system for collecting the sun's rays, said system comprising:
   an elongated primary reflector with an upper concave reflective surface and an elongated secondary reflector with a lower concave reflective surface, said elongated primary reflector reflecting and concentrating said sun's rays on said elongated secondary reflector attached to and carried above said primary reflector, said secondary reflector being smaller than and parallel to said primary reflector;
   stationary conduit means located below and parallel to an opening in a bottom of said primary reflector, said conduit means receiving said sun's rays further reflected and concentrated by said secondary reflector;
   means for pivotally adjusting said primary and secondary reflectors about said stationary conduit means for continually concentrating said sun's rays thereon;
   means for pumping a fluid through said conduit means to heat said fluid by said sun's rays, said conduit means being at an incline;
   means for converting heat from said fluid to usable energy.

4,038,973

SYSTEM FOR MONITORING THE WEIGHT OF A PATIENT

Mary A. Moore, 5793 Truelson Drive, Fort Worth, Tex. 76134

Continuation of Ser. No. 436,550, Jan. 25, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,563
Int. Cl.² A61G *11/00*
U.S. Cl. 128—1 B **1 Claim**

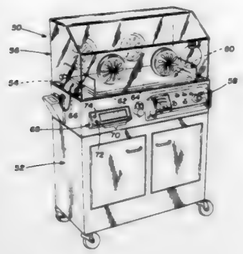
1. A system for monitoring the weight of an infant patient comprising:
   incubator means for maintaining a predetermined atmosphere surrounding an infant patient and including enclosure means comprising a substantially rigid horizontal bottom wall and side walls extending upwardly from the bottom wall for cooperation therewith to define the enclosure means;
   an infant patient receiving and supporting flexible envelope supported on said bottom wall of the enclosure means of the incubator means and comprising a normally horizontally disposed, continuous flexible top wall for receiving and supporting an infant patient, with the entire weight of the patient being supported by said flexible top wall, and

a flexible bottom wall underlying said flexible top wall and engaging said rigid bottom wall of the incubator means;

a fluid layer enclosed by the envelope and underlying and supporting the receiving and supporting flexible top wall of the envelope;

said fluid layer being enclosed by the envelope so that the pressure within the fluid layer is indicative of the total load supported on the receiving and supporting top wall thereof;

said flexible top and bottom walls of said flexible envelope being connected together in sealed relationship at spaced intervals forming a plurality of adjacent cells contiguous throughout the surface areas of said top and bottom walls, the sealing connections between said flexible walls being discontinuous so that said cells are interconnected for fluid communication to permit pressure equalization



therebetween, said cells serving to prevent the formation of waves in the fluid layer enclosed by the flexible envelope;

transducer means responsive to the pressure within the envelope caused by the fluid layer for generating an electrical output indicative of the total load supported by the receiving and supporting top wall of the envelope with the receiving and supporting envelope in place on the bottom wall of the enclosure means of the incubator means and with the receiving and supporting top wall thereof in its normal horizontally disposed, substantially planar state; and

means responsive to the electrical output of said transducer means for selectively generating a digital visual readout indicative of the total weight of an infant supported on the receiving and supporting top wall of the receiving and supporting envelope.

4,038,974

APPARATUS FOR PRODUCING A GERM-FREE AIR FLOW IN THE VICINITY OF AN OPERATING TABLE

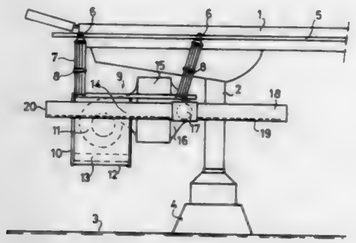
Simon Pielkenrood, Jaandijk, Netherlands, assignor to Pielkenrood-Vinitex B. V., Assendelft, Netherlands

Filed Apr. 9, 1976, Ser. No. 675,283

Claims priority, application Netherlands, Apr. 18, 1975, 7504683

Int. Cl.² A61B *19/00*

U.S. Cl. 128—1 R **10 Claims**



1. An apparatus, including a filter and a blower connected to the filter for driving air through it, to produce a substantially germ-free air flow in the vicinity of an operating table, and apparatus comprising:

two tubes, connected to the filter and having air discharge openings for producing a generally laterally downwardly directed flow of air, said two tubes extending generally parallel to the lateral edges of the operating table and located along with the filter and the blower beneath the operating table.

4,038,975

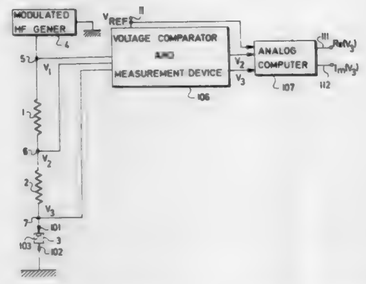
METHOD OF AND APPARATUS FOR THE DETECTOR OF NEOPLASMS AND OTHER MORPHOLOGIC CHANGES IN MUCOUS MEMBRANE SAMPLES

Jiri Vrana, and Jaroslav Setka, both of Prague, Czechoslovakia, assignors to Vyvojova a provozni zakladna vyzkumnych ustavu, Bechovice, Czechoslovakia

Continuation-in-part of Ser. No. 488,402, July 15, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,422

Int. Cl.² A61B *5/05*

U.S. Cl. 128—2.1 Z **5 Claims**



1. In an electrically instrumented method of diagnosing the presence of a neoplast in a mucous membrane sample wherein the electrical impedance of the sample has resistive and capacitive components and wherein the relative values of said components are indicative of the presence or absence of said neoplast, the steps of associating the sample with the terminals of a series circuit including in succession a grounded, amplitude-modulated high-frequency generator and first and second equal-valued resistors wherein the impedance of the generator and the resistance of both resistors are low relative to the impedance of the sample, said association being made by connecting a test spot on the sample to the terminal of the second resistor remote from the junction of the first and second resistors and by connecting the bulk of the sample to the grounded terminal of the generator, simultaneously measuring the amplitudes of the potentials of the test spot and of the junction of the first and second resistors with respect to a reference value established at the junction of the generator and the first resistor, and computing from the measured values and from the reference value the resistive and capacitive portions of the potential of the test spot.

4. In an apparatus for the automatic measurement of values proportional to the impedance of a mucous membrane sample, a series circuit comprising in succession a grounded, amplitude-modulated high-frequency generator and first and second equal-valued resistors, the total impedance of the series circuit being low relative to that of the sample, a relatively small-area contact associated with the terminal of the second resistor remote from the first resistor, a relatively largearea contact associated with the grounded terminal of the generator, the sample adapted to be connected between the relatively small-area contact and the relatively large-area contact, a first comparator having a first input connected to a first junction of the generator and the first resistor and a second input connected to a reference voltage, a clock voltage generator having a triggering input connected to the output of the first comparator, second and third comparators individually having first inputs connected to a second junction of the first and second resistors and a third junction of the second resistor and the relatively small-area contact, respectively, first and second means for recording the values of voltages at the second and third junctions, first and second gate means having outputs individually connected to the inputs of the first and second recording means, respectively, the first and second gate means further having first inputs individually connected to the outputs of the second and third comparators, respectively, and second inputs connected to the output of the clock voltage generator, and feedback means for individually coupling the outputs of the first and second recording means to second inputs of the second and third comparators, respectively.

4,038,976

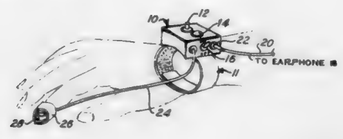
PULSE INDICATOR

Frank M. Hardy, 1322 Dauphine St., Silver Spring, Md. 20906, and Theodore W. Coffey, 806 College Parkway, Rockville, Md. 20850

Filed Mar. 14, 1975, Ser. No. 558,366

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 P **17 Claims**



1. A portable pulse signaling device comprising a portable pressure sensor comprising a transducer and means for supporting said transducer in pressure sensitive contact with a body pulse area, means for discriminately adjusting the pressure of said transducer upon said pulse area whereby the periodic pulsing pressure therein upon said transducer is coverted into electrical signals significant of component pressure variations in said pulse, a portable amplifier electrical circuit means connected to and responsive to said pressure adjusted transducer to produce amplified electrical pulses, and a light emitter in said circuit responsive to the adjusted pressure visibly indicating said pulses by corresponding light flashes.

4,038,977

ENDOSCOPE EQUIPPED WITH A FILM CASSETTE

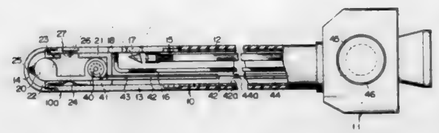
Takeshi Okada, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed July 8, 1976, Ser. No. 703,606

Claims priority, application Japan, July 11, 1975, 50-85077

Int. Cl.² A61B *1/06*

U.S. Cl. 128—6 **5 Claims**



1. An endoscope having a sheath; a control section disposed at the base of the sheath; said a film cassette disposed within the forward end section of the sheath said cassette having a housing means with an exposure window, a film received within said cassette housing means and a film take-up shaft rotatably supported in said cassette housing means, said shaft extending from the cassette housing means in a manner to be integral with the film take-up shaft; a pulley means fixed integral with said shaft means; a string whose one end is wound around the pulley means; a single passage provided in the longitudinal direction of the sheath to permit a delivery end of said string to be passed through the single passage; and a string pulling means adapted to rotate said pulley means by pulling said string at said control section to permit said film to be wound around said film take-up shaft.

4,038,978

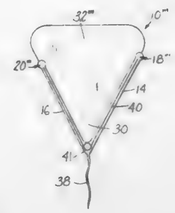
INTRAUTERINE DEVICE

John McLean Morris, Woodbridge, Conn.; John P. Bennett, Portola Valley, and Josef E. Kercso, Palo Alto, both of Calif., assignors to John McLean Morris, Woodbridge, Conn.

Filed Feb. 13, 1975, Ser. No. 549,584

Int. Cl.² A61F *5/46*

U.S. Cl. 128—130 **13 Claims**



1. An intrauterine device comprising a resilient Y- or V-shaped member, said resilient member having two arms gradually and continuously diverging upwardly and outwardly from an intersection thereof adjacent the base portion of said resilient member; each of said arms terminating, at the free ends thereof in an enlarged end portion having surfaces adapted to contact the adjacent wall of a uterus when said intrauterine device is in position within the uterus, said contact being maintained during use by the resilient nature of said resilient member; said arms being sufficiently resilient so said arms can be urged together during positioning of said intrauterine device in a tabular inserter for inserting said intrauterine device into the uterus, said arms being of unequal length whereby when said device is positioned within the inserter said end portions reside in said inserter one above the other.

4,038,979

SANITARY FACE MASK

Doris C. McCosker, 9206 Winchester Ave., Margate, N.J. 08402

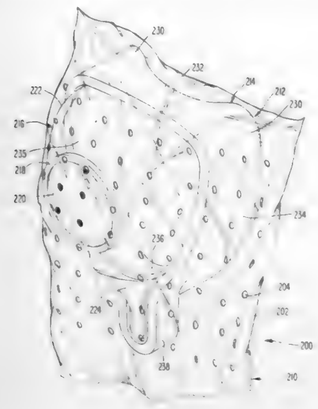
Continuation-in-part of Ser. No. 338,208, March 5, 1973, Pat. No. 3,908,648, which is a continuation-in-part of Ser. No. 210,962, Dec. 22, 1971, Pat. No. 3,740,768. This application Aug. 27, 1975, Ser. No. 608,395

Int. Cl.² A61F *9/00*; A61M *15/00*

U.S. Cl. 128—141 R **3 Claims**

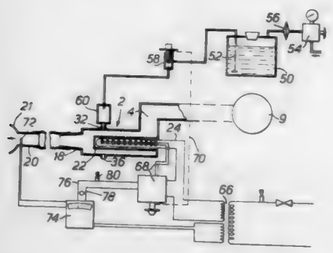
1. In a sanitary face mask having a transparent facial insert for shielding at least the eyes, nose and mouth of the user, the improvement wherein said mask further comprises a tri-lateral elastomeric frame having a first perimeter, and a second perimeter spaced apart from the first perimeter and providing substantial depth to said frame, said frame comprising first and second sides of equal length which join in a curved bottom portion, said second perimeter substantially parallel to said first perimeter along said first and second sides, said bottom portion providing a means for positively locating said mask during use whereby said bottom portion engages the underside of the chin of said user, said frame further comprising a third side, which joins with said first and second sides of said frame to form the top portion of said frame which is spaced apart from said bottom portion, said sides of said frame forming a taper which terminates in a continuous feathered edge along said first perimeter, said third side having a depth of concave shape which,

at its smallest point, is between 30 and 70 percent of the maximum depth of said first side, said frame further including handle portion comprised of a lateral extension of said frame, said handle portion for manually supporting said mask, said handle



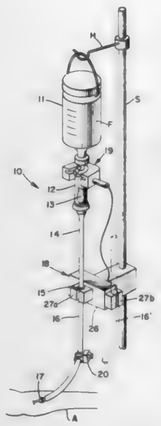
portion joining said bottom portion, said handle portion being spaced apart from said first perimeter by at least 30 percent of the depth of said bottom portion and said first, second and third sides being of one-piece construction.

4,038,980
AIR HUMIDIFIERS
Imre Fodor, 7 Hernes Close, Hernes Road, Oxford, England
Filed Nov. 8, 1974, Ser. No. 522,100
Claims priority, application United Kingdom, Nov. 12, 1973, 52495/73
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—193 **11 Claims**



1. A surgical breathing machine incorporation an air humidifier, said machine including an air flow generator and conduit means connecting said generator to said humidifier, said humidifier comprising a body member defining an air heating and water evaporating chamber, an air inlet to said chamber an and an air outlet from said chamber provided in said body member, said air inlet being in communication with said conduit means, a heater disposed in said chamber, means for adjusting the temperature of the heater, a source of water, water inlet means in said body member for directing a supply of water from said source into said chamber and towards said heater, a member of porous material disposed adjacent said heater, whereby to intercept said water supply and bring water into a heat exchange relationship with said heater, means for adjusting the rate of supply of water from said water source to said water inlet means, and coupling means coupling said temperature adjusting means supply rate adjusting means so that one adjusting means is varied when the other adjusting means is varied, whereby in operation regulation of the heater temperature and water supply rate can be obtained to cause substantially complete and instantaneous evaporation of the water by the heater in the manner of a flash boiler, the vaporized water passing into the air flowing through and heated within the chamber to create an air temperature and relative humidity within predetermined limits.

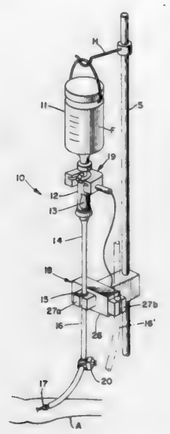
4,038,981
ELECTRONICALLY CONTROLLED INTRAVENOUS INFUSION SET
Robert J. LeFevre, Bethlehem, and Robert E. Thomas, Wind Gap, both of Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.
Continuation-in-part of Ser. No. 492,280, July 26, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,206
Int. Cl.[2] A61M *5/16*
U.S. Cl. 128—214 E **14 Claims**



1. An electronically controlled intravenous infusion set, comprising: a supply of intravenous fluid; a drip chamber connected with said supply; a length of IV tubing connected with the drip chamber for receiving IV fluid from the supply and drip chamber; said drip chamber and length of IV tubing comprising a fluid flow passage means; valve means connected in the intravenous infusion set downstream of the supply of IV fluid within the flow passage means and being operated between open and closed positions; valve operating means external of the flow passage means and operative to operate the valve means between open and closed positions to control flow of IV fluid through the intravenous infusion set; electrical circuit means connected with the valve operating means to control operation of the valve means, said circuit means including a variable timer means having means to generate a plurality of pulses per unit of time at a constant repetition rate and directly corresponding to a desired number of drops of IV fluid per unit of time, a bistable latching flip-flop connected between the timer means and the valve operating means and operative to maintain the valve operating means de-energized until a pulse is received from the timer means and then operative to enable energization of the valve operating means to open the valve and hold the valve open until a drop falls, drop detector means operatively associated with the drip chamber to sense a drop falling through the drip chamber and produce a pulse in response thereto, said drop detector means operatively connected with the bistable latching flip-flop to send the pulse thereto produced when a drop is sensed to reset the flip-flop and thus de-energize the valve operating means to enable the valve to close, and no-drop detector means operatively connected with the drop detector means and with the timer means and bistable latching flip-flop and operative to receive a pulse from the drop detector means when a drop is sensed and to receive pulses from the timer means to indicate

a no-drop condition when a pulse is received from the timer means but no pulse is received from the drop detector means, and including means operative to send a signal to the latching flip-flop in response to sensing said no-drop condition to lock the latching flip-flop and prevent energization of the valve operating means when said no-drop condition is sensed.

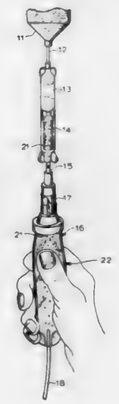
4,038,982
ELECTRICALLY CONTROLLED INTRAVENOUS INFUSION SET
George K. Burke; Robert J. LeFevre, both of Bethlehem; Robert E. Thomas, Wind Gap; James W. Turner, Bethlehem, and Peter L. Krohn, Easton, all of Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.
Filed Dec. 3, 1975, Ser. No. 637,208
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 E **25 Claims**



1. An intervenous infusion set for use with a supply of intravenous fluid, said set comprising in combination, a drip chamber adapted to be connected to said supply, a length of IV tubing connected to said drip chamber and forming with said drip chamber a fluid flow passage, valve means within said passage, electromagnetic valve operating means associated with said valve means, drop detector means associated with said drip chamber for sensing drops falling therethrough, a variable frequency clock, digital switch means coupled to said clock for digitally selecting the output frequency of said clock, said variable frequency clock including a time base generator having a preset frequency, a variable modulus counter, said digital switch means being coupled to said counter for allowing an attendant to select the modulus thereof, and means for multiplying said preset frequency by the selected modulus of said counter for digitally selecting the output frequency of said clock, whereby a desired drop rate may be selected by manipulation of the digital switch means, switch means coupled to said valve operating means for controlling energization of said valve operating means, circuit means coupling said clock to said switch means for actuating said switch means to energize the valve operating means to open the valve at the rate selected by said digital switch means, said circuit means including means responsive to said drop detector means for deactuating said switch means to deenergize the valve operating means and thus enable said valve to close upon sensing of a drop by said drop detector means, and alarm means for detecting errors in the drop rate from that set on said digital switch means and entering an alarm mode in response thereto, said alarm means including means for preventing energization of said switch means whenever said alarm means is in said alarm mode.

7. An intravenous infusion set for use with a supply of intravenous fluid, said set comprising in combination, a drip chamber adapted to be connected to said supply, a length of IV tubing connected to said drip chamber and forming with said drip chamber a fluid flow passage, valve means in the passage for controlling flow of fluid in said passage, circuit means including a timer for opening the valve means at a preselected rate to cause the falling of drops at said rate, and drop detector means associated with said drip chamber and operative upon said circuit means for closing the valve in response to sensing of a drop falling through said drip chamber, said drop detector means including light emitting means at one side of the drip chamber for illuminating at least a portion of said drip chamber, photosensor means at the other side of the drip chamber in opposed relation to said light emitting means for sensing the light from said light emitting means passing through said drip chamber, first circuit means driven by said photosensor means and responsive to the average light sensed by said photosensor means for regulating the intensity of said light emitting means, and second circuit means driven by said photosensor means and responsive to sudden transitions in light as produced by a falling drop and sensed by said photosensor means for producing a drop signal in response to the detection of a drop, whereby said photosensor means serves the dual function of detecting drops and compensating for varying levels of illumination received thereby.

4,038,983
FLUID INFUSION PUMP
Herbert Mittleman, Deerfield, and Ricky Robert Ruschke, Wheeling, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed Jan. 26, 1976, Ser. No. 652,938
Int. Cl.[2] A61M *5/14*
U.S. Cl. 128—214 C **12 Claims**



1. In a flow system for infusing fluid into the human body, a pressure pump comprising, in combination:

a pump housing defining a chamber for said pump and an inlet passageway extending to said chamber;

means including a valve insert member disposed in said passageway for controlling fluid flow through said passageway; and

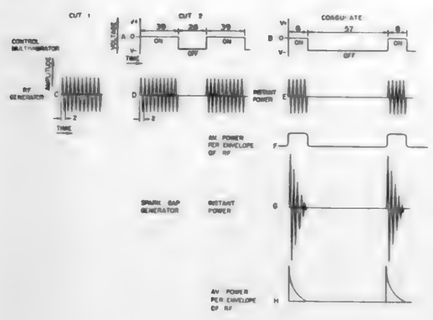
user-actuable valve control means for selectively deforming said valve insert member to open said insert member, said valve control means and said valve insert means cooperating to enable the purging of trapped air from said chamber through said inlet passageway.

4,038,984

METHOD AND APPARATUS FOR HIGH FREQUENCY ELECTRIC SURGERY

Weldon Rex Sittner, Englewood, Colo., assignor to Electro Medical Systems, Inc., Englewood, Colo.

Continuation-in-part of Ser. No. 8,549, Feb. 4, 1970, Pat. No. 3,675,655. This application Mar. 29, 1972, Ser. No. 239,095
Int. Cl.[2] A61N *3/04*
U.S. Cl. 128—303.14 **9 Claims**



1. A method for high frequency electric surgery comprising the steps of:

generating a continuous periodic waveform of high frequency electric energy wherein the period of the waveform is between fifty and sixty-five microseconds and within each period of the waveform there is at least one burst of substantially constant amplitude oscillations of high frequency electric energy with the duration of the burst being a predetermined fraction of the period of the waveform; and

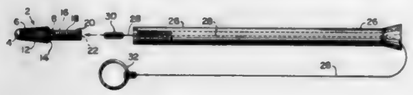
continuously applying the generated energy to a body site where a surgical change is desired in said body site.

4,038,985

DEVICE FOR REPAIRING ARTERIES

Robert D. Chiulli, Somerville, Mass., assignor to Medico Developments, Inc., Somerville, Mass.

Filed Oct. 7, 1975, Ser. No. 620,393
Int. Cl.[2] A61B *17/22*
U.S. Cl. 128—304 **9 Claims**



1. A device for surgical use in repairing arteries, said device comprising a substantially rigid member having a smooth rounded first end and a generally conically shaped body portion extending therefrom toward a second end, said substantially rigid member having on said body portion thereof a plurality of ridges extending from said smooth first end to said second end and adapted to engage interior walls of an artery and plaque disposed thereon, said device, upon insertion into an incised artery being adapted to center itself within said artery, to support said artery and guide and deflect a surgical needle penetrating the wall of said artery and, upon turning of said device to ream the interior wall of said artery and to taper said plaque.

4,038,986

DERMATOME

Dan E. Mahler, 16 Hakneset Hagdulla, Tel Aviv, Israel

Filed Oct. 22, 1975, Ser. No. 624,830
Int. Cl.[2] A61B *17/322*; B26B *3/00*
U.S. Cl. 128—305.5 **6 Claims**



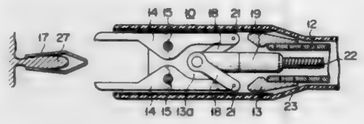
1. A dermatome comprising a thin resilient cutting band provided with a cutting surface disposed along a longitudinal edge of said cutting band, a support member having a transverse head portion for positioning said cutting surface of said cutting band, said head portion including holding means for maintaining a first end of said cutting band in a predetermined spaced apart relationship to a second end of said cutting band to provide a loop-like arrangement for said cutting band with said cutting surface extending along a bight portion of said loop-like arrangement, said predetermined spaced apart relationship determining width of cut, said first and second cutting band ends extending through a surface of said head portion and being disposed within said head portion, said bight portion being spaced from said surface of said head portion in a facing relationship with said surface of said head portion, said support member including guide means for determining depth of cut, said guide means being disposed between said first and second cutting band ends and spaced a preselected distance from said bight portion, and said support member including attachment means to permit connection of said support member to a handle member.

4,038,987

FORCEPS DEVICE FOR ENDOSCOPE

Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 4, 1975, Ser. No. 546,929
Claims priority, application Japan, Feb. 8, 1974, 49-16219[U]
Int. Cl.[2] A61B *17/28*
U.S. Cl. 128—321 **6 Claims**



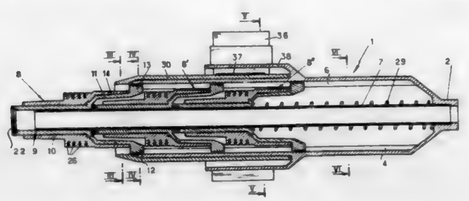
1. A forceps device to be inserted through an endoscope into a body cavity, comprising an outer covering tube, a forceps holder attached to one end portion of said outer covering tube, a pair of forceps levers each having operating end portions forming jaws, connecting end portions and intermediate portions therebetween pivotally supported on said forceps holder, means for operating said levers consisting of a pair of links each respectively pivotally connected to said one end of said connecting end portions of said forceps levers, a wire coupling pivotally connected to the other ends of said pair of links at a pivot point, and a wire having one end connected to said wire coupling and the other end extended through said outer covering tube, therealong, said pair of forceps levers and said pair of links constituting a toggle joint whereby when said wire coupling has been moved by pulling the same from its other end, said links are moved to a position approaching a substantially straight line drawn between the pivots connecting said forceps levers and links, and the pivot point of said wire coupling, said forceps levers being rocked through said links to permit said operating end portions of said levers to be moved in a clamping direction approaching each other.

4,038,988

SURGICAL APPARATUS

Pierre Perisse, 8, rue du Stade, 31370 Rieumes, France

Filed Dec. 31, 1975, Ser. No. 645,561
Int. Cl.[2] A61B *17/12*
U.S. Cl. 128—326 **10 Claims**



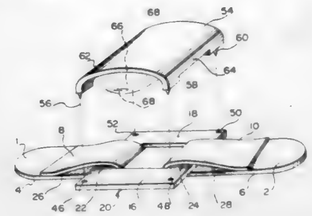
1. Surgical apparatus for carrying out a ligature of sectioned blood vessels, repetitively and automatically, comprising a tubular body **(1)** having on its inside wall at least two longitudinal grooves **(3, 4)** and/or **(5, 6)** which are angularly offset and which extend over the entire length of the body, a rigid tubular spindle **(7)** disposed according to the axis of the body and having first and second ends, said first end being fitted in sealing-tight manner to one end **(2)** of the body, said one end of said body having an orifice in alignment with said spindle, and adapted to be connected to a vacuum source at said orifice, said second end forming a stem, several suture carrying cartridges **(8, 8', 8'')**, fitted onto said stem and biased en bloc by a spring **(29)** mounted around said stem and between said one end of said body and the innermost cartridge, urging said cartridges towards the other end of the body, each cartridge being composed of two coaxial tubular members **(9, 10)** capable of turning one with respect to the other and provided with flanges **(11, 14)** of the same diameter, each carrying on its outer wall at least one stud **(12, 15)** and/or **(13, 16)**, the two studs being mounted to slide in the longitudinal grooves mentioned, the internal tubular member or journal **(9)** carrying a preformed suture **(22)**, the ends of which **(23, 24)** are fixed on the outer tubular member or bush **(10)**, being so dimensioned that, when the said studs are in their respective grooves, the suture is opened out and may thus be applied around the zone where the blood vessel to be ligatured is located and so that, when the studs are brought into alignment by rotation of the bush about the journal, the suture is completely tightened and constricts the base of the knob of tissue drawn in at the end of the tubular spindle **(7)**, sectioning means **(27, 28)** mounted on the bush and being provided to cut off the said ends when the suture has been tightened, a tubular sleeve **(30)** mounted to rotate about the said other end of the tubular body, at least one frontal stop **(31)** and/or **(32)** projecting from the inside wall of the sleeve, said sleeve extending beyond said other end of said body, said stop extending in an arc of a circle of sufficient amplitude to intercept only the stud on the bush of the outermost cartridge, and moreover, at least one lateral stud **(33)** rigid with the sleeve and which, when this latter is caused to rotate, is capable of turning the bush **(10)** of the outermost cartridge **(8)** around the journal **(9)**, bearing on the stud **(15)** of the bush, until the two studs **(12, 15)** are brought into alignment, and an elastically returned manual operating means **(36)** adapted to rotate the said sleeve **(30)**.

4,038,989

SURGICAL SKIN CLOSURE

Cesar Aurelio Romero-Sierra, Bath, and Joseph A. Tanner, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 7, 1976, Ser. No. 684,455
Claims priority, application Canada, July 4, 1975, 230780
Int. Cl.[2] A61B *17/08*
U.S. Cl. 128—335 **8 Claims**



1. A therapeutic device for skin lesions, comprising:

a. at least two flexible strip members with an adhesive coating on one side for securing the flexible strips to skin on opposing sides of a lesion,

b. at least one flap member for each flexible strip and secured to a portion of that flexible strip which is intended to lie alongside the lesion,

c. means for aligning the flaps to avoid lateral displacement of the skin on the opposing sides of a lesion to which the flexible strips are to be secured by the adhesive coatings,

d. means for drawing and holding the flexible strips closer to one another, in a direction extending across the lesion, after the strips have been secured to the skin on opposing sides of the lesion, to substantially close the skin over the lesion, and wherein the improvement comprises:

e. a rectangular shaped buckle member having two opposite side bars around which the flaps are looped and corner portions, and

f. means for securing the looped ends of the flaps to their respective flexible members whereby,

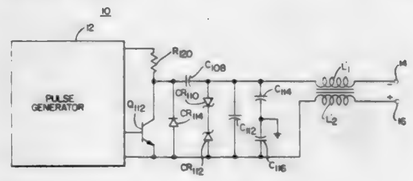
g. the corner portions form said means for aligning the flaps, and the side bars together with the means for securing the looped ends of the flaps to their respective flexible members form said means for drawing and holding the flexible strips closer to one another.

4,038,990

CAUTERY PROTECTION CIRCUIT FOR A HEART PACEMAKER

David L. Thompson, Fridley, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Nov. 19, 1975, Ser. No. 633,561
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **1 Claim**



1. A bipolar heart pacemaker circuit comprising:

a. a pulse generator for generating a control signal at a desired rate according to that with which it is desired to stimulate a patient's heart;

b. output switch means responsive to the control signal for providing a heart stimulating output pulse to be applied by first and second leads to the patient's heart; and

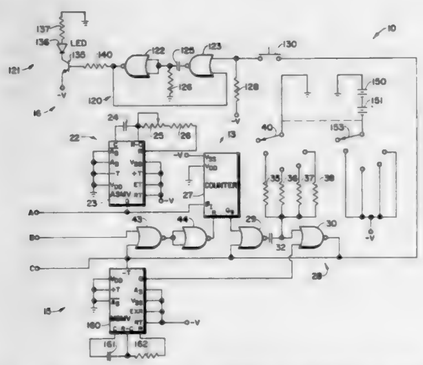
c. a torroidal inductor including first and second inductors, each connected in-series with a corresponding one of said first and second leads and coupled together by a high coefficient of coupling to operate in a first mode in the presence of a cautery-inducted field, wherein the signals applied to said first and second inductors by the cautery-induced field induce fields in the same direction through said coupling and the inductances offered to the cautery-induced signals are correspondingly increased, and in a second, differential mode in response to the application of a pacemaker pulse signal wherein opposing fields are established through said coupling between said first and second inductors so that the inductances offered by said first and second inductors are significantly reduced, said torroidal inductor comprising a torroidal core having permeability in the order of 120, a bandwidth of not less than 10MHz and a resonant frequency of not less than 5MHz, whereby the impedance presented to said pulse generator is reduced and distortion applied to the heart stimulating output pulse is reduced.

4,038,991

CARDIAC PACER WITH RATE LIMITING MEANS

Robert A. Walters, Pittsburgh, Pa., assignor to ARCO Medical Products Company, Leechburg, Pa.

Filed Mar. 15, 1976, Ser. No. 666,737
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **2 Claims**



1. A cardiac pacer for producing stimulation pulses for delivery to electrodes adapted to be connected to a heart, comprising:

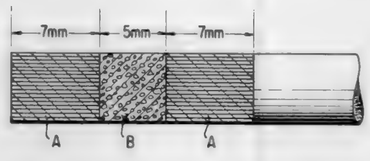
1. a stimulation pulse generator, comprising a one-shot multivibrator for producing a stimulation pulse, including:
   a. first and second gates of the type which produce an output state coinciding with selected coinciding input states, each gate having first and second inputs and an output the output of said second gate being connected to the first input of said first gate,
   b. a capacitor interconnecting the output of said first gate to the first input of said second gate, and
   c. resistor means connected to discharge said capacitor to time the width of the pulse produced by said stimulation pulse generator,
2. a source of clock pulses,
3. a counter connected to receive said clock pulses for applying an output state to the second input of said first gate after counting a number of said clock pulses corresponding to a stimulation pulse interval to trigger said stimulation pulse generator, and having a reset terminal connected to the output of said second gate,
4. a monostable multivibrator having an input operative to reinitiate a timing period thereof less than the stimulation pulse interval, and having an output which changes state for said timing period after a signal is applied to the input,
   a. the input being connected to the output of said second gate,
   b. the output being connected to the second input of said second gate,
   c. whereby when said monostable multivibrator is triggered, the output thereof disables said stimulation pulse generator for the timing period thereby limiting the rate of said stimulation pulse generator to the timing period,
5. and means for amplifying the pulse from the output of said second gate for delivery to said electrodes.

4,038,992

GRANULAR COMPOSITION FOR TOBACCO FILTER

Katsuhiro Ogasa, Yokohama; Joji Ono, Chiba; Tsutomu Kudo; Kazuyoshi Doi, both of Kawasaki; Katsuichi Noguchi, and Kazuo Maeda, both of Yokohama, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation and Morinaga Milk Industry Co., Ltd., both of Tokyo, Japan

Filed Sept. 29, 1975, Ser. No. 617,582
Int. Cl.[2] A24B *15/02, 15/033*
U.S. Cl. 131—10.7 **6 Claims**



1. A granular composition suitable for use in a tobacco filter and having an ability to selectively and effectively remove the carcinogenic and deleterious components from tobacco smoke comprising a blend of:

a. from 40 to 80%, by weight, of granules having a grain size of 10 to 50 mesh and a bulk density of 0.5 to 0.7 g/cm^3 which are composed of 5 to 70%, by weight, of protein powder selected from the group consisting of bovine milk whey protein powder, egg white protein powder, and mixtures thereof, which is coated onto 30 to 95%, by weight, of excipient granules, and

b. from 20 to 60%, by weight, of active charcoal granules having a grain size of 10 to 50 mesh and a bulk density of 0.5 to 0.7 g/cm^3.

4,038,993

PROCESS FOR REDUCTION OF NICOTINE CONTENT OF TOBACCO BY MICROBIAL TREATMENT

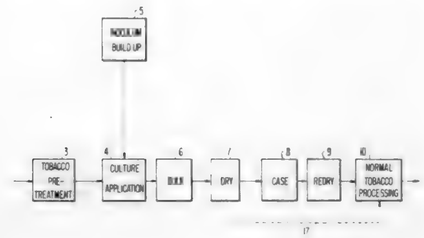
Vernon L. Geiss, Floyd Knobs, Ind.; Charles F. Gregory, Louisville, Ky.; Richard P. Newton, Louisville, Ky., and Lawrence E. Gravely, Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed Nov. 17, 1975, Ser. No. 632,804
Int. Cl.[2] A24B *15/02, 15/04*
U.S. Cl. 131—141 **7 Claims**

1. A process for reducing the nicotine content of tobacco comprising:

a. contacting said tobacco with an aqueous medium containing at least 1×10^7 cells per gram based on the dry weight of said tobacco of a microorganism which degrades nicotine through a biochemical mechanism in which 3-succinoylpyridine is formed; and

b. maintaining said tobacco in contact with said microorganism for from about 1 to about 50 hours at a moisture level of at least 50% by weight based on the total weight of tobacco and water, a temperature of from about 20° C, and an initial pH of from about 5 to about 8.

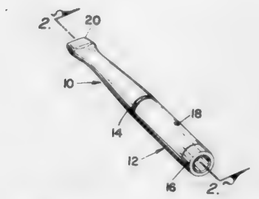


4,038,994

TOBACCO SMOKE FILTER UNIT

Leslie N. Aikman, P.O. Box 321, Balboa Island, Calif. 92662

Continuation-in-part of Ser. No. 630,092, Nov. 10, 1975, abandoned. This application June 7, 1976, Ser. No. 693,347
Int. Cl.[2] A24F *13/02*
U.S. Cl. 131—187 **3 Claims**



1. In a smoker's withdrawal kit of the kind in which a cigarette holder comprising a mouth piece attached to one end of a barrel is formed with a barrier wall which extends across the interior of the barrel at a point spaced from the mouth piece such that a cylindrical cavity is formed within the barrel between the barrier wall and mount piece into which smoke may flow through a central opening in the barrier and from which it flows through an opening in the mouth piece, the improvement which includes:

a filter element disposed in said cylindrical cavity;

said element comprising a cylindrical body disposed with its axis substantially coincident with the axis of said cavity and having a diameter greater than said central opening in said barrier and less than the outside diameter of said cavity;

said element being formed with an outwardly extending flange intermediate its ends, the flange extending in a plane perpendicular to the axis of the element and having a diameter nearly equal to but less than the inner diameter of said cavity in the region of said flange, the outer periphery of said flange being formed with at least one cut-out to form a passageway through said cavity via said cut-out;

said flange being formed with a plurality of cut-outs spaced around its outer periphery to form parallel paths for smoke past said flange;

said cut-outs being formed as scallops and being spaced around the periphery of said flange; and

the forward face of said filter element being spaced downstream from said barrier and means comprising the central opening in said barrier for accelerating the passage of smoke through the barrier and directing its flow toward said forward face of the filter element.

4,038,995

HAIR TREATING COMPOSITION CONTAINING A MINK OIL FATTY ACID QUATERNARY AMMONIUM SALT

Norman L. Edelberg, Des Plaines, and Chester A. Davis, Berwyn, both of Ill., assignors to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Feb. 27, 1976, Ser. No. 661,950
Int. Cl.[2] A45D *7/04*; A61K *7/09*
U.S. Cl. 132—7 **10 Claims**

1. A hair treating composition comprising in an aqueous medium from about 0.5 to about 15% by weight of a reducing agent selected from the group consisting of ammonium sulfite, sodium sulfite, ammonium bisulfite and sodium bisulfite, and from about 0.17 to about 5.0% by weight of a mink oil fatty acid based quaternary ammonium salt, said composition having a pH of between 6.5 and 6.9, inclusive.

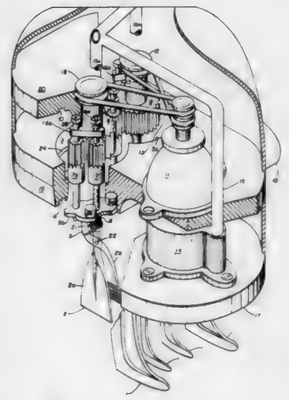
8. A method of imparting a new stable configuration to the hair which comprises applying to the hair the composition of claim **1**, setting the hair in a desired configuration, rinsing the hair and thereafter applying an oxidizing solution to the hair while said hair is maintained in said desired configuration.

4,038,996

HAIR BRAIDER

Iheanyichukwu E. Eronini, 708 Washington Ave., Albany, Calif. 94706, and Abia Sunday Abia, No. 4 Admiral Drive, Emeryville, Calif. 94608

Filed Dec. 3, 1975, Ser. No. 637,380
Int. Cl.[2] A45D *1/00*
U.S. Cl. 132—9 **3 Claims**



1. A hair braider movable over the head of hair and including a body with a bottom plate;

a. a plurality of hair parters carried by and extending below said bottom plate and arranged in a row extending at right angles to the line of movement of said body over the head, said hair parters being spaced apart to form hair receiving areas therebetween;

b. hair grabbers movable past said hair parters and to the rear thereof for individually gripping the portions of hair separated from the rest of the hair on the head; and

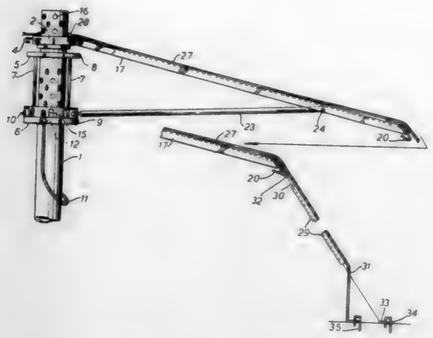
c. means for moving the hair grabbers in the path of a figure eight and for twisting the grabbers for causing them to twist and to weave the portions of hair thus gripped into a tight braid before releasing the hair.

4,038,997

TENT SUPPORT POLE WITH DETACHABLE STRUT AND RIB MEANS

John Robert Smith, 21 Aireworth Road, Keighley, Yorks, England

Filed Sept. 4, 1975, Ser. No. 610,145
Int. Cl.² A45F *1/16*
U.S. Cl. 135—15 PQ **22 Claims**



1. A support structure for a tent comprising a tent pole and a plurality of support member means which fold and unfold with respect to the pole, the support member means being freely engageable and disengageable from the pole; the pole having a plurality of anchoring means spaced apart circumferentially around the pole adjacent to the first end thereof for freely engaging and disengaging the support member means, a first stop means secured to the pole adjacent to the anchoring means, a second stop means secured to the pole and spaced along the pole from the first stop means; a sleeve slidable on the pole between the first and second stop means; and a plurality of locating means spaced apart around the circumference of the sleeve; each support member means having an arm and a strut, the arm having an anchoring member means at one end for freely engaging and disengaging the anchoring means and a guy securing element at the other end and the strut pivoted at one end intermediate the ends of the arm and having a locating member means at its free end for freely engaging and disengaging the locating means; wherein with the sleeve adjacent to the first stop means and each support member means in a folded condition the arm of each support member means has its anchoring member means freely engageable and disengageable with a respective anchoring means on the pole and the strut of each support member has its locating member means freely engageable and disengageable with a respective locating means on the sleeve and axially aligned with the respective anchoring means on the pole, so that, with the anchoring member means and anchoring means engaged and with the locating member means and locating means engaged, movement of the sleeve to adjacent the second stop means causes unfolding of the support arms to an unfolded state wherein disengagement of the anchoring member means from the anchoring means and of the locating member means from the locating means is substantially inhibited.

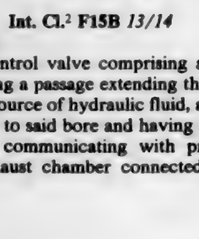
4,038,998

FLUID FLOW DIVIDER

Alistair Gordon Taig, Bristol, England, assignor to Bendix Westinghouse Limited, Bristol, England

Filed Mar. 15, 1976, Ser. No. 666,834
Claims priority, application United Kingdom, Apr. 11, 1975, 14889/75
Int. Cl.² F15B *13/043*
U.S. Cl. 137—101 **5 Claims**

1. A fluid flow divider comprising:
a hollow body having first, second, third and fourth ports;
a hollow spool member reciprocably slidable within said hollow body and dividing the interior of said hollow body into first, second, third, fourth, and fifth volumes;
said first port being an inlet port for receiving pressurized hydraulic fluid;
said inlet port leading via first and second passages to said first and second volumes respectively;
a first part of said spool member hydraulically separating said first and second volumes;
said spool member being slidable between first and second extreme positions relative to said hollow body and being capable of resting at a third position intermediate said first and second positions;
a second part of said spool member cooperating with said hollow body to inhibit communication between said first and third volumes when said spool member is in said first position, and mutually communicating said first and third volumes when the spool member is in said second and third positions;
a third part of said spool member cooperating with said hollow body to inhibit communication between said second and fourth volumes when said spool member is in said second position, and mutually communicating said second and fourth volumes when said spool member is in said first and third positions;



a fourth part of said spool member hydraulically separating said fourth volume from said fifth volume;
a third passage passing through the body of said spool member between the ends thereof and communicating said third volume with said fifth volume; and
a fluid flow restriction in said third passage;
said second port leading from said third volume to means for coupling said second port to a first side of a fluid flow control means;
said third port leading from said fourth volume to means for coupling said third port to a second side of said fluid flow control means and also to one side of a hydraulic power output piston;
said fourth port leading from said fifth volume to means for coupling said fourth port to the other side of said hydraulic power output piston.

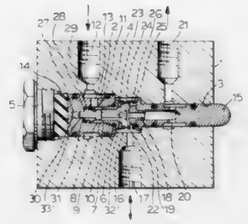
4,038,999

HYDRAULIC PRESSURE CONTROL VALVE

Yoshihiro Hayashida, Chigasaki, Japan, assignor to Tokico Ltd., Japan

Continuation of Ser. No. 566,770, April 10, 1975, abandoned, which is a continuation of Ser. No. 421,640, Dec. 4, 1973, abandoned. This application July 26, 1976, Ser. No. 708,758
Claims priority, application Japan, Dec. 4, 1972, 47-121300; Feb. 6, 1973, 48-14904; Apr. 20, 1973, 48-44872; Apr. 20, 1973, 48-44873
Int. Cl.² F15B *13/14*
U.S. Cl. 137—116.3 **1 Claim**

1. A pressure control valve comprising a housing having therein a bore having a passage extending therefrom for communicating with a source of hydraulic fluid, a control pressure chamber connected to said bore and having a passage extending therefrom for communicating with pressure actuating means, and an exhaust chamber connected to said control pressure chamber and having a passage extending therefrom for communicating with a reservoir of hydraulic fluid,
a piston slidably disposed in said bore and a fixed abutment in said bore and elastic means in said bore acting on one end of sai piston for urging said piston against said fixed abutment, said piston having a supply pressure space therewithin and a radial opening communicating with said passage to said source of hydraulic fluid,
a member in said housing defining an axial opening connecting said supply pressure space to the control pressure chamber,
an elongated valve member extending axially of the housing within said supply pressure space and extending only into said control pressure chamber and a valve body on the outer circumference thereof and cooperating with the inner end of said member defining the axial opening from the supply pressure space into the control pressure chamber to form a supply



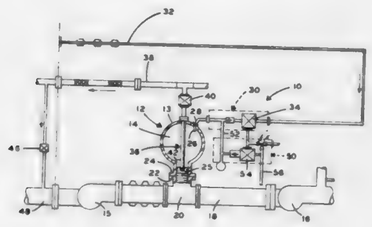
valve, one end of the piston having a blind bore therein in which one end of said valve member is slidably supported, the other end of said valve member in said control pressure chamber having a valve head integrally formed thereon, said valve member having an axial bore extending therethrough from said one end to adjacent said valve head and then opening laterally of the valve member into said control pressure chamber, the hydraulic pressure in the control pressure chamber being supplied into the blind bore through the axial bore, and
a manually operable push rod slidably mounted in said exhaust chamber and having one end extending into the control pressure chamber and having a bore therein extending from said control pressure chamber and opening out of said push rod adjacent the passage to the reservoir, said one end of said push rod cooperating with the valve head to form an exhaust valve between the control pressure chamber and the bore in said push rod.

4,039,000

ACCUMULATOR

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; James R. Fenwick, Chatsworth, and George H. Karigan, Canoga Park, both of Calif.

Filed Dec. 18, 1975, Ser. No. 641,802
Int. Cl.² F02K *9/02*
U.S. Cl. 137—207 **4 Claims**



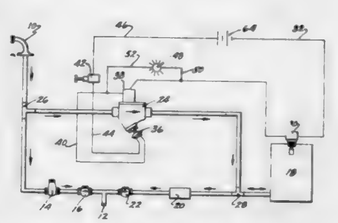
1. In combination with a feed system for a rocket engine including a liquid oxygen conduit for conducting a flow of liquid oxygen under pressure between a low-pressure point and a high-pressure point in the system, an improved cryogenic accumulator coupled with said conduit for substantially stabilizing the pressure at which the liquid oxygen is conducted, comprising:
A. a shell defining an accumulator chamber and having a liquid oxygen entry port defined therein;
B. means connecting said shell to said conduit in a manner such that the chamber is disposed in continuous communication with said conduit via said entry port, whereby pressures established within said chamber continuously are applied to a flow of liquid oxygen within said conduit;
C. venting means for substantially stabilizing pressures within said chamber including a pressure and gas volume relief tube connected with the low point in said system and projected into said chamber having fluid exit means disposed adjacent to the entry port for accommodating flow of fluid from said chamber into said tube as the pressure within the chamber exceeds the pressure within the tube, whereby a flow of fluid between said chamber and said low-pressure point is established; and
D. means for continuously charging said chamber with oxygen gas including a gaseous oxygen inlet connected with a pressurized source of oxygen gas for continuously delivering flow of oxygen gas to said chamber.

4,039,001

WATER STORAGE REFILL SYSTEM

Keith E. Weldy, 3218 Reeds Lake Blvd., Grand Rapids, Mich. 49506

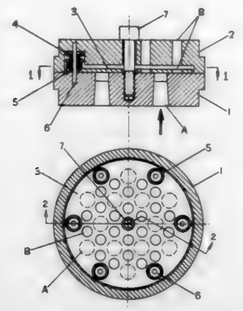
Filed July 28, 1975, Ser. No. 599,548
Int. Cl.² F16K *21/18*; B60R *15/00*
U.S. Cl. 137—389 **13 Claims**



1. A water supply and storage refill system for a portable plumbing system having a water storage tank comprising, in combination:
an inlet conduit detachably connectable to an external water supply, said inlet conduit being in communication with a first conduit to said storage tank and alternatively through a second conduit to the remainder of said plumbing system;
a valve in one of said inlet conduit and first conduit for controlling the supply of water to said storage tank;
first means for sensing a need for water in said storage tank including a float resting on the surface of the water in the water storage tank;
second means for sensing the availability of water from an external water supply;
third means electrically connected to said first and second means to actuate said valve to permit passage of water from the external water supply to said storage tank when there is need for water in said storage tank and an availability from an external water supply;
a rod having a first end connected to the floor and extending upward outside the water storage tank;
a permanent magnet attached to the second end of said rod;
a magnetically operated electrical switch positioned in close proximity to said permanent magnet such that when a sufficiently high water level is not present in the water storage tank the permanent magnet can close the switch; and

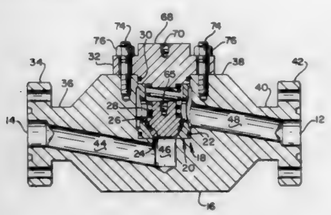
said second means comprising a pressure operated electrical switch assembly having a diaphragm which can be deflected by the pressure of said external water and close an electrical switch to indicate the presence of said external water supply pressure.

4,039,002
GAS COMPRESSOR VALVE
Fred K. Broyan, 885 York Road, Warminster, Pa. 18974
Filed May 28, 1976, Ser. No. 691,018
Int. Cl.² F16K *15/08, 15/12*
U.S. Cl. 137—516.17 **6 Claims**



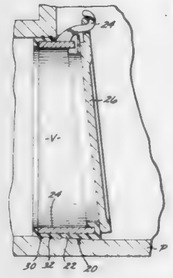
1. A valve assembly for a piston type compressor comprising:
- a. a valve seat and valve guard in spaced relationship to said valve seat;
- b. a valve plate located between the valve seat and valve guard wherein said plate quiescently rests on said seat, and moves away from said seat and toward said guard when a pressurized gas passes through said valve from said compressor;
- c. a plurality of tapered inlet ports in said valve seat positioned through the said seat;
- d. a plurality of exhaust ports in said plate and guard which are in registry, and which are of smaller diameter than said seat ports;
- e. said plate and guard ports being arranged around respective seat ports such that six exhaust ports are provided around each inlet port at 60° intervals.

4,039,003
DROP CHECK VALVE
Robert L. Cheek, Odessa, Tex., assignor to Carl Lane McCartney, Conroe, Tex.
Filed Apr. 6, 1976, Ser. No. 674,079
Int. Cl.² F16K *15/02*
U.S. Cl. 137—516.29 **13 Claims**



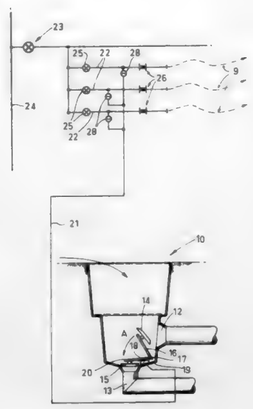
1. A one-way check valve device for series connection in a flow line to a borehole comprising:
- a main body in the form of a valve bonnet, an upwardly opening vertical bore formed in said main body, a crossbore connected to said vertical bore to form an inlet passageway and an outlet passageway in said main body; said inlet passageway having an inlet formed at one extremity of said crossbore, said outlet passageway having an outlet formed at one extremity of said crossbore; said outlet passageway commences at a midportion of said vertical bore;
- a removable seat member, said seat member being cylindrical in form, an axial bore through said seat member, a circumferentially extending, conical seating surface formed on the interior of said seat member, a plurality of radially disposed ports formed about a midbody portion of said seat member, a bonnet seal between said seat member and said vertical bore;
- a dart slidably received within said seat member, said dart having a seat engaging face formed thereon which is a frustum of a cone and moves lengthwise of its axis when sealingly seated against said seating surface to prevent flow through said seam member, means biasing said dart towards said seating surface;
- a counterbore underlying said vertical bore, said counterbore upwardly enlarges into said vertical bore, said inlet passageway terminates within said counterbore; said radial ports being axially aligned along a common horizontal plane and placed in fluid communication with said outlet passageway; and
- a closure member removably received by said main body for closing the upper extremity of said vertical bore.

4,039,004
BACKFLOW VALVE MOUNTING AND SEALING DEVICE
Ronald K. Luthy, Garden Grove, Calif., assignor to West American Rubber Co., Orange, Calif.
Filed Oct. 14, 1975, Ser. No. 621,754
Int. Cl.² F16K *15/03*
U.S. Cl. 137—527 **4 Claims**



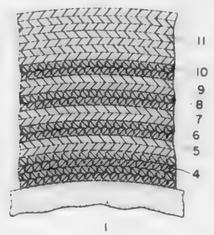
1. A mounting and sealing device for supporting a backflow valve in a pipe fitting, said backflow valve having a cylindrical mounting portion telescopically received within said pipe fitting, with one end of said cylindrical mounting portion serving as a valve seat for a flapper element that is carried by said one end of said mounting portion, and the pipe fitting being formed with circumferential grooves, said mounting and sealing device being of resilient material and comprising:
- an annular main body that telescopically encompasses the exterior surface of the mounting portion of said valve and fills the space between said exterior portion and the adjoining portion of the pipe fitting;
- said main body being formed on its exterior periphery with annular ribs that are snugly received by the grooves of said pipe fitting to removably support the mounting portion of said valve within said pipe fitting while forming a seal between said valve mounting portion and the interior of said pipe fitting; and
- one end of said main body being formed with a radially inwardly extending lip that receives said one end of the mounting portion of the valve so as to form a seat for said flapper element.

4,039,005
FLOW DIVERSION MEANS
Gary John Clifford, 11 Beck Street, Clontarf, Queensland 4109, Australia
Filed Dec. 17, 1975, Ser. No. 641,691
Claims priority, application Australia, Dec. 19, 1974, 0078/74
Int. Cl.² F16K *31/12*
U.S. Cl. 137—609 **13 Claims**



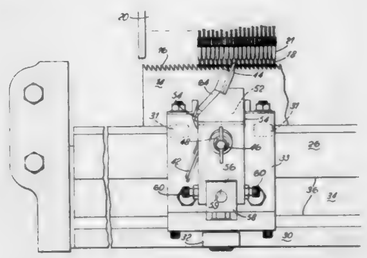
10. A system for diverting fluid, spilled from a supply pipe and collected at a common drainage station, to a process fluid outlet remote from a common outlet for fluids collected at said common drainage station, said system comprising valve means to control flow of fluids through said outlet; means biasing the valve means controlling flow through said common outlet to an open condition and the valve means controlling flow through said process fluid outlet to a normally closed position, and control means connected between said supply pipe and said valve means for causing, upon commencement of flow through said supply pipe, actuation of said valve means to open said process fluid outlet and close said common outlet.

4,039,006
CARBON FILAMENT WOUND CYLINDER AND METHOD OF PRODUCING THE SAME
Mitsuhiro Inoue; Yo Maeda, both of Shimodate; Satoshi Suzuki, Yuki; Shozo Ohashi, and Yoshiharu Nakamura, both of Shimodate, all of Japan, assignors to Hitachi Chemical Company, Ltd. and Hitachi, Ltd., both of Tokyo, Japan
Filed June 24, 1974, Ser. No. 482,405
Claims priority, application Japan, June 25, 1973, 48-70853
Int. Cl.² F16L *11/00, 9/00*
U.S. Cl. 138—129 **1 Claim**



1. A hollow cylinder suited for use as the rotary drum of an ultracentrifuge comprising a plurality of superposed laminates each comprising resin-impregnated carbon filaments, each laminate comprising an inner filament layer and an outer filament layer, the filaments in the inner filament layers being arranged at an angle of 0° to 20° with reference to the axis of the cylinder and the filaments in the outer layers being arranged at an angle of 80° to 90° with reference to the axis of the cylinder, the ratio of the filament weight of the outer layer to the filament weight of the inner layer in each laminate being at least equal to the ratio in the next inner laminate and the ratio in the innermost laminate being lower than that in the outermost laminate, the modulus of longitudinal elasticity in the circumferential direction of the inner layer of each laminate being 5000 Kg/mm² or less and the modulus of longitudinal elasticity in the circumferential direction of the outer layer of each laminate being at least 8000 Kg/mm² higher than that of the respective inner layer, each subsequent laminate having an average modulus of elasticity equal to or greater than the inner laminate.

4,039,007
CARPET WEAVING LOOMS
Kenneth John Coleman, Bridgnorth; Phillip John Brown, Bewdley, and Howard John Stephen Watkins, Far Forest, near Kidderminster, all of England, assignors to Carpets International Limited, Kidderminster, England
Filed Mar. 29, 1976, Ser. No. 671,247
Claims priority, application United Kingdom, Apr. 2, 1975, 13489/75
Int. Cl.² D03D *39/02*
U.S. Cl. 139—7 F **15 Claims**



1. In an Axminster carpet loom having cutting means for severing pile yarns, said cutting means of the type including a serrated blade arranged to engage and locate the pile yarns during cutting; at least one carriage mounted on said loom for reciprocable movement in a substantially weft-wise direction; and a knife carried by the carriage, said knife being positioned for movement by the carriage across said blade to sever said pile yarns trapped by serrations of said blade, the improvement comprising:
- a removable knife holder for said knife mounted on the carriage;
- and locating means to accurately and reproducibly mount said holder on the carriage, said locating means comprising a locating surface on said holder, a mating surface on said carriage, and means for maintaining said surfaces in contact to thereby locate said holder accurately and reproducibly relative to said carriage and simultaneously maintain said knife in fixed, reproducible position relative to the serrated blade.

4,039,008

METHOD OF AND A MACHINE FOR MANUFACTURING AT LEAST ONE NAP FABRIC STRIP

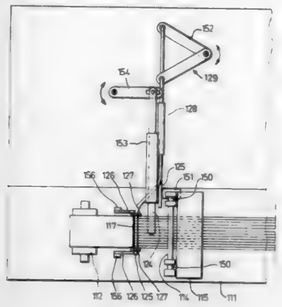
Ferdinand Diesner, Murg-Hanner, Germany, assignor to Patax Trust Reg., Liechtenstein

Filed Oct. 28, 1975, Ser. No. 626,274

Claims priority, application Switzerland, Oct. 29, 1974, 14503/74; Oct. 29, 1974, 14504/74; Sept. 3, 1975, 11397/75

Int. Cl.² D03D *39/16, 39/00*

U.S. Cl. 139—21 **12 Claims**



1. A method of weaving at least one nap fabric strip in a shuttle-strip loom, the method comprising the steps of: forming a first shed from a first layer of warp threads and from a second layer of warp threads; forming a second shed from said second layer of warp threads and from a third layer of warp threads; introducing a weft thread into said first shed; introducing a free end portion of an elongate resiliently and elastically deformable element into said second shed to extend perpendicular to the warp thread direction; bodily displacing the free end portion of said elongate resiliently and elastically deformable element towards the rear edge of said fabric strip, while maintaining it substantially perpendicular to the warp thread direction and maintaining a portion of said elongate resiliently and elastically deformable element, external of and spaced from said second shed, against movement in the warp thread direction, such that an intermediate portion of said elongate element, external of said second shed, is deformed in the direction of warp thread movement with portions of said third warp threads partially surrounding the free end portion of said deformable element to form nap loops; securing the free end portion of said resiliently and elastically deformable element in the deformed displaced position at least until the beating up of the next weft thread; and then withdrawing said elongate deformable element laterally from said second shed, whereby, in consequence of its resilent and elastic deformability, said elongate deformable element returns to its initial undeformed shape.

4,039,009

HYDRAULIC CONTROL SYSTEM FOR A TREE FELLING UNIT

Karl Thore Lindblom, Alfta, Sweden, assignor to Ostbergs Fabriks AB, Alfta, Sweden

Continuation-in-part of Ser. No. 582,930, June 2, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,244

Claims priority, application Sweden, June 5, 1974, 7407372

Int. Cl.² A01G *23/08*

U.S. Cl. 144—34 E **3 Claims**

1. A tree felling unit comprising

a frame;

grip arms and cutting means supported on said frame;

a crane boom;

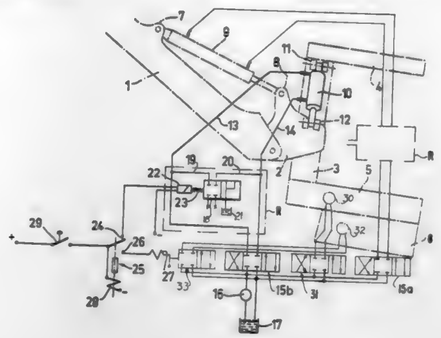
said frame being mounted at the end of said crane boom for tilting in two mutually perpendicular vertical planes;

first hydraulic means acting between said boom end and said frame for tilting the same sidewise;

second hydraulic means acting between said boom end and said frame for tilting the same upwards or downwards,

the inlet and outlet of each of the first and second hydraulic means being connected respectively to first and second control valves for energizing the respective hydraulic meand from a common hydraulic source,

the improvement wherein a third control valve interconnects the inlets and outlets of the first and second hydraulic means,



said third control valve having a first and second position for blocking and opening, respectively, the path between said inlets and outlets, said third control valve normally being in its blocking position; and

means for momentarily bringing said third control valve to its opening position after said grip arms have firmly gripped a tree, so that the biasing force of the tree is neutralized over the path between said inlets and outlets, before the cutting operation.

4,039,010

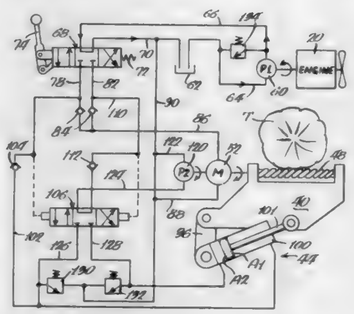
HYDRAULIC CIRCUIT FOR TREE HARVESTING IMPLEMENT

Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Nov. 3, 1975, Ser. No. 628,226

Int. Cl.² A01G *23/08;* **F15B** *11/20*

U.S. Cl. 144—34 R **11 Claims**



1. In combination with a tree harvesting implement having a cutter (**48**) mounted on a movable frame (**40**) with a hydraulic ram (**44**) advancing said frame, a hydraulic motor (**52**) driving said cutter and a hydraulic circuit for supplying hydraulic fluid to said ram and motor, the improvement of said hydraulic circuit including a reservoir (**62**), a first pressurized hydraulic fluid source (**60**) connected to said reservoir, a second pressurized fluid source including a pump **120** driven by said motor

and connected to said reservoir, first conduit means (**66, 82, 86, 110, 126**) connecting said first fluid source to said motor and with one end of said fluid ram, said first conduit means having unidirectional valve means (**112**) preventing flow from said first fluid source to said one end of said fluid ram, second conduit means (**124, 128**) connecting said second fluid source to an opposite end of said fluid ram, first relief valve means (**130, 134**) in said first conduit means, second relief valve means (**132**) in said second conduit means, said first relief valve means having a pressure setting that is higher than the pressure setting of said second relief valve means so that the movement of said frame is a function of cutter resistance, and return conduit means (**88, 90**) connecting said first and second relief valve means and said motor to said reservoir.

4,039,011

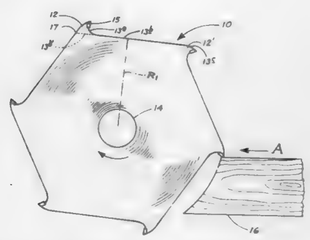
CHIPPER SAW

Irvin E. Sword, Arlington, Wash., assignor to Northwest Hardwoods, Inc., Portland, Oreg.

Filed Mar. 26, 1976, Ser. No. 670,639

Int. Cl.² B23D *57/00;* **B27G** *13/00*

U.S. Cl. 144—218 **6 Claims**



1. A circular saw adapted to produce chip material when cutting wood comprising,

a saw blade,

teeth distributed about the circumference of the blade in a substantially circular zone extending about the perimeter of the blade,

said teeth having at least about a 40° spacing from each other about the perimeter of the saw and each tooth including a cutting portion,

the edge of the saw blade, extending from the cutting portion of a tooth to the next tooth preceding it, extending in a curved reach which initially curves at a negative angle inwardly toward the center of the saw and then curves to join smoothly and without convexity with a substantially lineal expanse which is normal to and intersects a radius in the saw, the location of said intersection being closer to said one tooth than said next preceding tooth and being in advance of said cutting portion, said edge thence continuing from said lineal reach smoothly to join without concavity with another curved reach which curves convexly and over a smaller radius than the radius of the saw to form the back of the next preceding tooth.

4,039,012

NON-REBOUND HAMMER

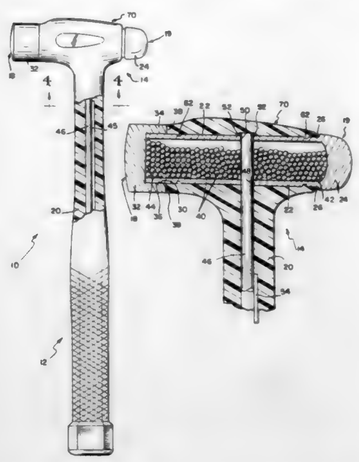
William H. Cook, Indianapolis, Ind., assignor to C. E. S., Inc., Indianapolis, Ind.

Filed Jan. 12, 1976, Ser. No. 648,415

Int. Cl.² B25D *1/00*

U.S. Cl. 145—29 R **2 Claims**

1. A hammer comprising a hollow cylindrical core having front and rear ends, first and second metal end caps respectively closing the front and rear ends of said core and each having an impact surface formed thereon, said first end cap being threadably received over the front end of said core and said second end cap being formed integrally with said core at the rear end thereof, said end caps providing a pair of opposed abutments extending peripherally and radially outwardly from said core, recoil inhibiting pellets carried in said core between said end caps, a handle member having one of its ends extending through and connected to said core between said end caps and its opposite end projecting outwardly perpendicular to the longitudinal axis of said core to form a handle for the hammer,



and a unitary resilient encasement covering said handle member and said core and engaging said abutments on said end caps to leave said impact surfaces exposed, said encasement having a central portion encircling said core between said end caps with a diameter larger than the diameter of said end caps, said core and said handle member each including locking means for lockingly engaging said encasement.

4,039,013

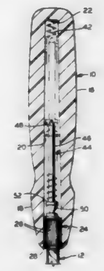
HAND TOOL WITH HELICAL DRIVE

Carl C. Stoutenberg, Avon, Conn., assignor to The Stanley Works, New Britain, Conn.

Continuation-in-part of Ser. No. 508,255, Sept. 23, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,731

Int. Cl.² B25B *17/00*

U.S. Cl. 145—53 **8 Claims**



1. In a hand tool for imparting rotational movement to tool bits, the combination comprising:

A. an integrally formed synthetic resin handle having an elongated bore extending coaxially inwardly from one end thereof and providing a transversely extending abutment shoulder at the inner end of said bore adjacent the other end of said handle, said bore being of generally circular cross section and having an enlarged diameter portion at said one end of said handle providing an annular circumferential shoulder at said one end;

B. a guide member of generally circular cross section in the

outer end of said bore firmly engaged with the wall of said handle defining said bore, said guide member having a bore extending coaxially therethrough from the inner end to the outer end thereof with said inner end being disposed adjacent said abutment shoulder, the wall of said guide member defining said bore therethrough having a helical extending along the length of said bore, said bore member having axially extending ribs about the periphery thereof terminating inwardly of the outer end thereof to provide a circumferential collar about the outer end thereof, said ribs interlocking with the material of said handle to prevent relative rotation, said guide member collar abutting said handle bore circumferential shoulder to limit movement of said guide member inwardly of said bore:

C. a drive spindle of generally circular cross section having a cooperating helical thread extending along the outer surface thereof, said spindle having its inner end extending through said guide member with the helical thead thereof slidably engaged with the helical thread of said guide member;

D. compression spring means in said bore including a compression spring having one end abutting against said abutment shoulder at the inner end of said bore in said handle and the other end biasing said spindle outwardly of said bore in said guide member;

E. means engaging the inner end of said spindle and limiting movement outwardly of said guide member;

F. bit mounting means on the outer end of said drive spindle for detachably engaging a tool bit; and

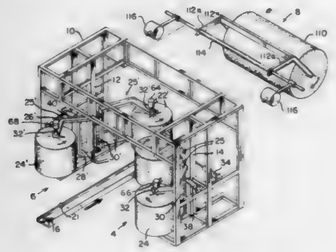
G. a bit detachably seated in said bit mounting means.

4,039,014

AUTOMATIC CAR WASH APPARATUS AND SIDE BRUSH ASSEMBLY FOR WASHING CARS OF VARYING WIDTHS

James H. Sellars, 1818 Bigelow N., Seattle, Wash. 98109

Filed May 21, 1975, Ser. No. 579,668
Int. Cl.[2] B60S *3/06*
U.S. Cl. 15—53 AB **14 Claims**



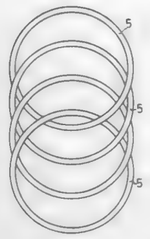
1. Car wash apparatus, comprising: brush means including independently operable brushes for contacting the side end surfaces of a car as it is advanced through a washing station; and brush control means for independently maintaining the contact pressure applied by said brushes substantially constant such that substantially the same contact pressure is applied to cars of varying widths; wherein said brush means comprises frame means providing two directly opposed spaced apart members between which the car can be advanced through the washing station, and two side brush assemblies respectively operatively associated with said members; each side brush assembly including two rotatable brushes, first and second brush support means pivotally mounted by a respective one of said members for pivotally supporting said brushes such that each can swing independently relative to the respective member between an extended washing position projecting toward the path of car advance and a retracted position averted from the path of car advance; and wherein said brush control means comprises positioning means respectively exerting controlled rotational effort upon and independently swinging the first and second brush support means of said two side brush assemblies toward their extended washing positions such that substantially constant brush contact pressure is applied to cars of warying widths.

4,039,015

BEAD CORE FOR PNEUMATIC TIRES

Henryk Pakur, Buckeburg, and Reinhard Tiemann, Hemmingen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Feb. 4, 1976, Ser. No. 655,124
Claims priority, application Germany, Feb. 12, 1975, 2505741
Int. Cl.[2] B60C *15/04*
U.S. Cl. 152—362 R **6 Claims**



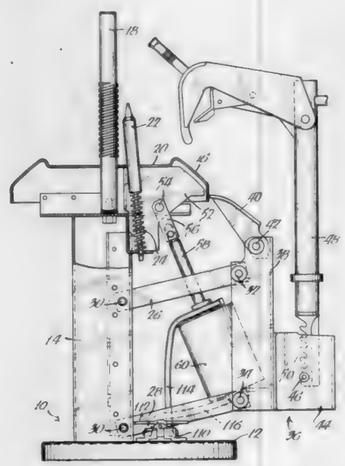
1. A tire having a bead core composed of thread-shaped strength carrier means including a plurality of strength carrier sections each of which has an approximate ring configuration wherein any one section interlocks with the remaining sections forming said strength carrier means.

4,039,016

TIRE SERVICING APPARATUS

Charles L. Cunningham, Nashville, Tenn., assignor to The Coats Company, Inc., La Vergne, Tenn.

Filed July 8, 1976, Ser. No. 703,681
Int. Cl.[2] B60C *25/06*
U.S. Cl. 157—1.28 **8 Claims**



5. Tire changing apparatus comprising;

a stand having a base;

a wheel receiving table mounted on said base;

a bead breaker shoe moveable toward and away from said table;

a linkage movably connected to said shoe and to said base;

a cylinder having an interior bore of a diameter less than the cylinder length;

a piston rod;

a piston rod receiving first closure closing one end of said cylinder, said rod being slidable within said first closure;

opposed elements defining a pivot mounted on the other end of said cylinder to partial close the same while leaving an opening of substantial width and a length equal to said diameter;

a piston received in said cylinder through said opening and removably secured to said rod;

a second closure received in said cylinder through said opening and closing the same, said second closure abutting said opposed elements;

a pivot pin extending between said opposed elements and pivotally securing said cylinder to one of said linkage and said base; and

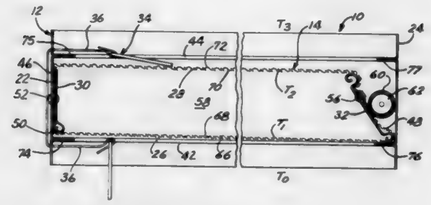
a pivot securing said rod to the other of said linkage and said base.

4,039,017

HEAT RADIATION CLOSURE

Sherwin S. Tarnoff, Northbrook, Ill., assignor to Air Balance, Inc., Chicago, Ill.

Continuation of Ser. No. 625,855, Oct. 28, 1975, abandoned, which is a continuation of Ser. No. 541,523, Jan. 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 385,475, Aug. 3, 1973, Pat. No. 3,861,443. This application June 4, 1976, Ser. No. 693,270
Int. Cl.[2] E05F *15/20;* **E06B** *3/94*
U.S. Cl. 160—1 **12 Claims**



1. A ceiling closure comprising

a metallic frame of rectangular shape formed by first and second end walls, and two side walls joining the end walls to encompass a rectangular opening in said metallic frame through which air may flow,

first and second radiation shields each formed of a substantially air impermeable, heat resistant, flexible fabric sheet secured at one end to said first end wall, said sheets being coated with reflective coating material for reducing the transfer of heat,

means for holding said first and second radiation shields in a stowed position adjacent said first end wall permitting air to flow through said opening, and operable in response to high temperatures to release said first and second radiation shields for movement to a closed position in which said shields extend across said opening and substantially close the latter to air flow therethrough,

means for moving said first and second radiation shields from said stowed position to said closed position, said means shifting the other ends of said first and second radiation shields to positions adjacent said second end wall,

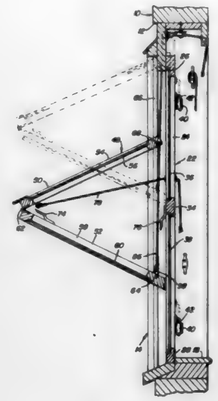
and means associated with said first and second radiation shields for spacing said first and second radiation shields from each other when in said closed position to enclose a dead air space therebetween with said first and second radiation shields having respective surfaces substantially parallel to and facing each other across said air space, thereby limiting heat transfer by conduction therebetween.

4,039,018

AWNING WINDOW CONSTRUCTION

Carmine De Maria, 39 E. Madison Ave., Collingswood, N.J. 08908

Filed Sept. 2, 1975, Ser. No. 609,736
Int. Cl.[2] E06B *3/32*
U.S. Cl. 160—89 **6 Claims**



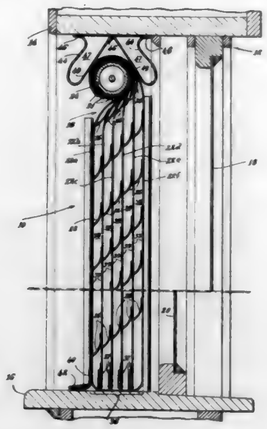
1. A window construction comprising a frame, full vertical length inner and outer window structures mounted in same frame, support means mounting one of said window structures in said frame for vertical shifting therein between upper and lower limit positions therein, the other of said window structures including upper and lower sections each having upper and lower marginal edges, means hingedly securing the lower and upper marginal edges of the upper and lower sections together, first coacting means on said frame and opposite end portions of the lower marginal edge of said lower section guiding the lower marginal edge from said frame for vertical movement therealong and for angular displacement relative thereto, and second coacting means hingedly supporting the upper marginal edge portion of said upper section for swinging relative to said frame, whereby the adjacent marginal edges of said upper and lower sections may be outwardly displaced from said frame while the lower marginal edge of said lower section shifts upwardly along said frame to open said other window structure, said support means including coacting portions on one upstanding edge portion of said one window construction and said frame also supporting said one window construction from said frame for inward horizontal swinging about an upstanding axis relative to said frame from a closed position to an open position, the vertical mid-portions of said window structures including third coacting means operative, when said other window structure is closed and said one window structure is in the closed position thereof and responsive to downward shifting of said one window structure from its upper limit position toward its lower limit position, to lock one of said adjacent marginal edges of said upper and lower sections relative to the vertical midportion of said one window construction against outward displacement relative thereto.

4,039,019

APPARATUS FOR INSULATING AGAINST CONDUCTIVE, CONVECTIVE, AND RADIANT HEAT TRANSMISSION

Thomas P. Hopper, R.F.D. No. 1, Box 689, Durham, Conn. 06422

Filed Jan. 26, 1976, Ser. No. 652,628
Int. Cl.² E06B *9/08*
U.S. Cl. 160—121 R **8 Claims**



1. An apparatus for insulating an area such as a window, door, or wall against conductive, convective, and radiant heat transmission comprising:

A. at least three essentially non-transparent, imperforate shade sheets;

B. retracting means for mounting said sheets for selective movement between a drawn position covering the area and a retracted position not covering the area; and

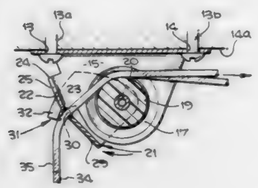
C. spacer means mounted with at least one shade sheet of each pair of adjacent sheets for separating said adjacent sheets to provide a dead air space therebetween, said spacer means including at least one spacer device which comprises an elongated strip formed of sheet material having high elastic memory with an arcuate cross-sectional shape having an axis extending in the direction of the major axis of said strip, one of the edges of said strip being attached to one of said sheets.

4,039,020

CORD LOCKING DEVICE FOR BLINDS OR THE LIKE

Abraham Jacobson, 7900 Garner St., Long Beach, Calif. 90808

Filed Mar. 18, 1976, Ser. No. 668,181
Int. Cl.² E06B *9/38*
U.S. Cl. 160—178 C **7 Claims**



1. In a pull-cord locking device for pull-up shades, blinds, or the like having a housing, said housing having a top wall and a pair of downwardly extending side walls, aperture means in said top wall for securing said housing in a position above a shade, blind or the like, a rotatable wheel rotatably mounted in said housing between said side walls for receiving a pull-cord connected to said shade, blind or the like over said wheel and down below said housing, and pull-cord locking means associated with said housing movable from a first position out of locking engagement with said pull-cord in a fixed position with respect to said housing, the improvement which comprises:

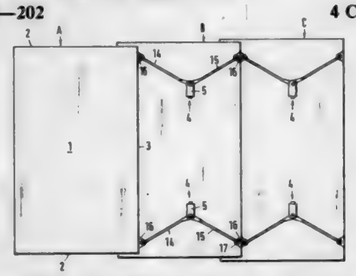
said pull-cord locking means including pull-cord clamping means comprising a stationary facing having an upper edge and a lower edge mounted on said housing extending generally parallel to the axis of rotation of said wheel between said side walls, and a clamping member including a front wall interconnected by a pair of side flanges pivotally mounted on the outside of said side walls and said front wall being movable from a first position below and remote from the lower edge of said facing to a second position substantially abutting against the lower edge of said facing to thereby clamp said pull-cord between said front wall and said facing when a pull-cord is inserted into said housing between said facing and said wheel and over said wheel down out of said housing, said front wall being generally parallel to said facing and said side walls including generally circular concave portions therein opening into the interior of said housing having midpoints lying along generally the axis of rotation of said wheel and of a diameter slightly greater than the diameter of said wheel for receiving said wheel therebetween in a manner preventing binding of a pull-cord passing over said wheel between the sides of said wheel and the side walls of said housing, the outer periphery of said wheel being substantially smooth on substantially the entire outer periphery thereof wherein no internal moving parts are present interiorly of said housing other than said wheel with said side flanges moving externally of said housing thereby presenting no moving parts to interfere with the pull-cord during clamping of said pull-cord.

4,039,021

PROTECTIVE COVER FOR GUIDING PATHS OF MACHINE TOOLS

Werner Moritz, Siegen; Kurt Loos, Netphen-Dreistiefenbach, and Friedrich Haschek, Huttental-Weidenau, all of Germany, assignors to Kabelschlepp Gesellschaft mit beschrankter Haftung, Siegen, Germany

Filed Nov. 11, 1975, Ser. No. 631,132
Claims priority, application Germany, Nov. 12, 1974, 2453514
Int. Cl.² E05D *15/06*
U.S. Cl. 160—202 **4 Claims**



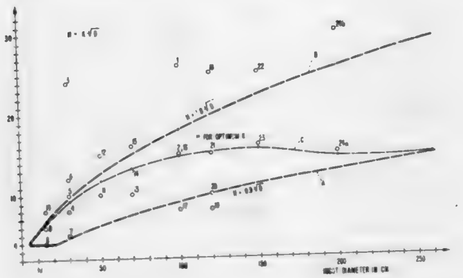
1. A protective cover system which includes: a guiding path for use in connection with machine tools, a plurality of cover plates overlapping each other and telescopically movable into and out of each other, said cover plates successively decreasing in size from one end of said protective cover system to the other end thereof from an intermediate position in one direction into a first end position and in the opposite direction into a second end position, each of said cover plates having a front end face wall section resting on said guiding path and also having a rear end section resting on the respective adjacent next smaller cover plate, and energy storing means arranged between said individual cover plates and operable to exert a return force amounting to substantially zero in said intermediate position and having its greatest magnitude in said first and second end positions, each of said energy storing means comprising a cylinder-piston system and an elastic body interposed between said piston and an end wall in said cylinder and also comprising at least one cam segment between said cylinder and said piston for selectively compressing and relieving said elastic body, and fork-shaped rods for affecting a relative movement of said cylinder-piston system and said cam segment by said fork-shaped rods, said fork-shaped rods having arms defining said fork-shaped portion and being linked to said cover plates, said energy storing means being arranged at the outer end of a fork-shaped rod, two pairs each of fork-shaped rods being arranged between the front end face wall sections of said cover plates, each of said cylinder-piston systems including a counter piston, and means for selectively adjusting said counter piston, the elastic bodies being tubular and made of a fatigue-resistant elastic substance, the pistons of said cylinder-piston systems and said counter pistons being made of a self-lubricating material.

4,039,022

PROCESS FOR PRODUCING ELONGATED INGOTS OF STEEL

Wolfgang Holzgruber, and Adolf Schneidhofer, both of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke AG, Vienna, Austria

Continuation-in-part of Ser. No. 250,972, May 8, 1972, abandoned. This application Jan. 30, 1976, Ser. No. 654,057
Claims priority, application Germany, May 19, 1971, 2124960
Int. Cl.² B22D *7/00*
U.S. Cl. 164—52 **5 Claims**



1. A process of producing elongated ingots of steel in a cooled ingot mold having a diameter of between about 10 and about 250 centimeters, which comprises the steps

of fusing down a plurality of electrodes in succession in a slag bath contained in said ingot mold and having a depth H, wherein said slag bath depth is adjusted according to the formula

$$H = K\sqrt{D} \text{ (centimeters)},$$

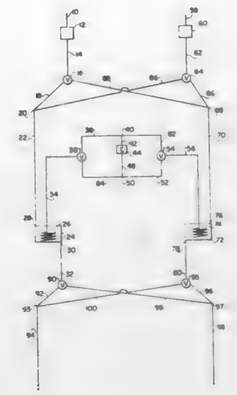
D standing for the diameter of the ingot mold in centimeters and K representing a factor lying between 0.9 and 1.8, the factor of 0.9 being optimum with an ingot mold diameter of about 250 centimeters and the factor of 1.8 being optimum with an ingot mold diameter of about 10 centimeters, provided that said depth amounts to at least 4 centimeters, and replacing each succeeding electrode for the preceding electrode within 150 seconds.

4,039,023

METHOD AND APPARATUS FOR HEAT TRANSFER, USING METAL HYDRIDES

Andrew W. McClaine, Ventura, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1976, Ser. No. 661,069
Int. Cl.² F25B *13/00*; F28D *15/00*
U.S. Cl. 165—2 **14 Claims**



1. A method of transfering heat which comprises:

a. establishing a two phase equilibrium at a certain pressure and temperature for a first metal-hydrogen system;

b. establishing a two phase equilibrium at a pressure and temperature higher than said first equilibrium pressure and temperature for a second metal-hydrogen system having the same metal as said first metal-hydrogen system;

c. removing hydrogen from said first metal-hydrogen system thereby causing a portion of said hydride to decompose and the heat content of said system to decrease;

d. adding an amount of heat equal to the amount of lost heat to said first system, thereby returning said system to equilibrium;

e. introducing said hydrogen into said second metal-hydrogen system thereby causing the formation of a hydride and the generation of heat;

f. removing said heat from said second metal-hydrogen system, thereby returning said system to equilibrium;

10. An apparatus for transfering heat which comprises:

two containers, each of which comprises

a core located inside each container;

a mixture of a metal, the hydride of said metal, and hydrogen contained in each core;

an inlet in each container;

an outlet in each container; and

an opening in each core whereby hydrogen passes;

a gas compressing means;

a means connecting said gas compressing means with said opening in each core of each container.

4,039,024

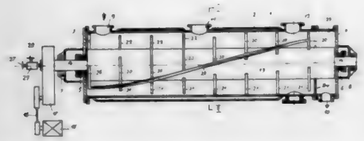
HEAT EXCHANGER

Heinz List, St. Jakobsstrasse 43, Pratteln, Switzerland

Continuation of Ser. No. 416,791, Nov. 19, 1973, abandoned. This application May 6, 1975, Ser. No. 575,010
Claims priority, application Switzerland, Nov. 21, 1972, 16913/72
Int. Cl.² F28F *5/04*
U.S. Cl. 165—92 **10 Claims**

1. Heat exchanger, particularly for treating flowable products, comprising a horizontally arranged axially elongated

casing at least partly cylindrical in the circumferential direction transverse to the elongated direction thereof and closed at its ends forming an axially elongated space therein, said casing having a first opening adjacent one end for admitting material to be treated and a second opening adjacent its opposite end for removing the material after it is moved through said space, a shaft rotatably mounted in said casing and extending centrally through said space therein in the axially elongated direction of said casing, a plurality of disc elements secured to and extending radially outwardly from said shaft substantially perpendicularly of the axial direction of said shaft, each said disc element having a radially inner edge secured to said shaft, a radially outer edge spaced outwardly from said shaft and located closely adjacent the at least partly cylindrical surface of said casing for permitting movement of said disc elements relative to said casing, a first edge and a second edge spaced apart from one another around said shaft and extending outwardly from said inner edge to said outer edge, said first edge leading said second edge in the direction of rotation of said shaft, said disc elements providing a continuous imperforate surface from said shaft to the radially outer edge thereof and between said first and second edges thereof, said disc elements arranged in a number of uniformly axially spaced parallel planes extending between the first and second opening and each said plane disposed substantially perpendicularly of the axial direction of said shaft and containing at least one said disc element extending around said shaft said disc elements with the first and second edges thereof spaced apart and forming a passage extending outwardly from said shaft to said casing so that at least one passage is provided in each plane of said disc elements for



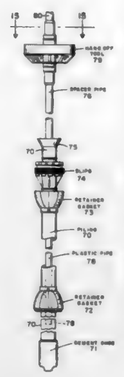
permitting the flowable products to pass therethrough in moving from the first opening to the second opening in said casing stirrer means for moving the flowable product from the first opening to the second opening in said casing, said stirrer means extending for approximately the axial length of said casing between the plane of said disc elements closest to said second opening, said stirring means comprising at least one stirrer element secured to at least certain ones of said disc elements disposed in spaced planes of said disc elements and located at the intersections of said first edges and said radially outer edges thereof and extending generally in the axial direction of said shaft, the radially outer surface of said stirrer element being spaced closely from the inner surface of said casing for permitting movement of said stirrer element rlative to said casing, the leading edge of said stirrer element facing in the direction of rotation of said shaft extends generally in the axial direction of said shaft and is arranged at an angle to the axis of the shaft, the at least one opening located in each plane of said disc elements being positioned at the first edge of said disc element on which said stirrer element is secured so that the flowable product moved by said stirrer element passes through the at least one opening, and the openings between said disc elements in adjacent planes of said disc elements following the angular disposition of said at least one stirrer element for facilitating the passage of the flowable product through the space in said casing, and a baffle plate located within said casing and extending perpendicularly of the axial direction of said shaft from the lower inner surface of said casing in the upward direction, said baffle plate located between said second opening and said plane of said disc elements most closely adjacent to said second opening for maintaining a certain filling level in said space.

4,039,025

APPARATUS FOR ANCHORING AN OFFSHORE STRUCTURE

Joseph A. Burkhardt, New Orleans; William D. Loth, Covington, both of La., and Martin O. Pattison, Palos Verdes Estates, Calif., assignors to Exxon Production Research Company, Houston, Tex.

Division of Ser. No. 513,429, Oct. 9, 1974, Pat. No. 3,987,638.
This application Aug. 23, 1976, Ser. No. 716,923
Int. Cl.[2] E21B *33/035*
U.S. Cl. 166—.5 **9 Claims**



1. Apparatus for use in cementing a pile sleeve to anchor submerged offshore structures comprising:
a pipe extending between the surface of the water and said submerged structure;
a hang-off tool connected to said pipe engageable with the upper end of said pile sleeve;
a spacer pipe connected to said hang-off tool at its upper end and releasably connected to a cylindrical piling at its lower end;
a plastic pipe releasably connected to said piling and to said spacer pipe and extending into said piling;
slips arranged on said piling and engaging said piling sleeve;
spaced apart retainer baskets arranged on said piling below said slips; and
a cement shoe arranged on the lower end of said piling.

4,039,026

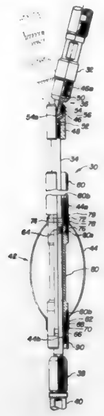
KICKOVER TOOL

John H. Yonker, Dallas, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation of Ser. No. 587,400, June 16, 1975, abandoned.
This application July 14, 1976, Ser. No. 705,348
Int. Cl.[2] E21B *7/06*
U.S. Cl. 166—117.5 **11 Claims**

10. A kickover tool for running and retrieving well equipment in a side pocket mandrel of a tubing comprising:
an elongate body;
a centralizing device including:
a plurality of outwardly expansible longitudinal bow springs,
mounting means to mount said bow springs on said body, one of said bow springs being capable of flexing independently of other bow springs mounted normal to it;
means rendering said bow springs ineffective to kickover said body to a tool landing or retrieving position while the kickover tool is moving in a first direction through the tubing; and

means rendering said bow springs effective to kickover said body to a tool landing or retrieving position upon move-



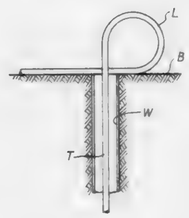
ment of the kickover tool in another direction through the tubing.

4,039,027

CIRCUMFERENTIAL CENTRALIZER

Ronald K. Churchman, Plano, and John H. Yonker, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed Feb. 2, 1976, Ser. No. 654,520
Int. Cl.[2] E21B *41/00*
U.S. Cl. 166—153 **7 Claims**



1. A pumpdown tool for wells comprising:
elongate housing means adapted to be run in a well tubing and having an outer surface of a first diameter;
circumferentially extending seal means around said housing means adapted to effect a seal in the well after the tool has been run into the well and landed therein, said seal means having an outer surface of a second diameter which is greater than said first diameter;
said housing means having at least one circumferentially extending annular groove means in its outer surface in close proximity to said seal means;
expandable and contractible ring means surrounding said housing means and carried in said groove means, said ring means assuming its expanding form when unstressed, being normally carried around said housing means in expanded form, and having an outer boss, which boss, when said ring means is in expanded form, is of a diameter greater than said second diameter for protecting said seal means against damage as the tool is run in a well tubing;
said groove means being of a depth sufficient to permit contraction of said ring means into said groove means; and
resilient backing means in said groove means between said ring means and said housing maintaining said ring means substantially concentric with respect to said housing means as the tool is run in a well tubing during contraction of said ring means and permitting contraction of said ring means until its outer surface is substantially the diameter of said housing.

4,039,028

MOBILITY CONTROL OF AQUEOUS FLUIDS IN POROUS MEDIA

Robert K. Knight, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Nov. 3, 1975, Ser. No. 628,534
Int. Cl.[2] E21B *43/22*
U.S. Cl. 166—246 **13 Claims**

4. In a process for recovering petroleum from a subterranean oil-bearing formation which comprisses introducing into an input well penetrating said formation a flooding medium comprising an aqueous solution of a water-soluble organic polymer and forcing said medium through said formation towards at least one output well penetrating said formation at a distance from said input well, the improvement which consists in employing as the water-soluble organic polymer from 0.005 to 5 weight percent of a mixture of from 25 to 75 weight percent of a heteropolysaccharide produced by the genus Xanthomonas and 75 to 25 weight percent of a polyacrylamide or a chemically altered polyacrylamide having a molecular weight of above about 0.2×10^6.

4,039,029

RETREATMENT OF WELLS TO REDUCE WATER PRODUCTION

James W. Gall, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 6, 1975, Ser. No. 629,355
Int. Cl.[2] E21B *33/138, 43/22*
U.S. Cl. 166—294 **10 Claims**

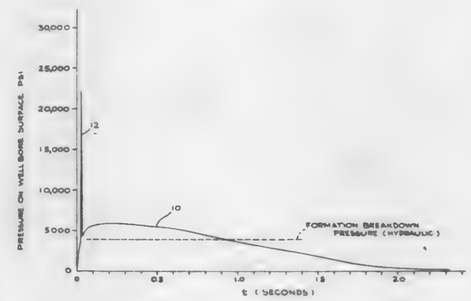
1. A method for retreating a subterranean formation penetrated by at least one well bore, said formation having been previously treated by partially gelled or ungelled polymer and thereafter returned to production, said method comprising:
a. injecting into the formation a crosslinking ionic solution capable of crosslinking residual ungelled polymer present in the formation from the previous treatment, and
b. injecting into the formation an aqueous solution of polymer capable of being crosslinked by said crosslinking solution.

4,039,030

OIL AND GAS WELL STIMULATION

Charles S. Godfrey; E. T. Moore, Jr., both of Berkeley, and Douglas M. Mumma, Livermore, all of Calif., assignors to Physics International Company, San Leandro, Calif.

Filed June 28, 1976, Ser. No. 700,094
Int. Cl.[2] E21B *43/26*
U.S. Cl. 166—299 **12 Claims**

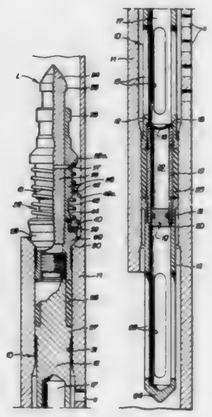


1. A method for fracturing the rock formation at a pay zone located at a predetermined depth in a well comprising

filling said well above said pay zone with a fluid,
closing siad well, above said pay zone,
generating a pressure wave in said fluid at the
region of said pay zone which has an amplitude and duration such that it can force said fluid into fractures which are created in the pay zone for extending these fractures, and
generating a shock wave in said fluid during the interval of said pressure wave which has a rise time less than the time required for sound to tranverse one-half of the periphery of the well opening at said pay zone and in which when transmitted to said rock formation has an amplitude which will fracture but not crush said rock formation.

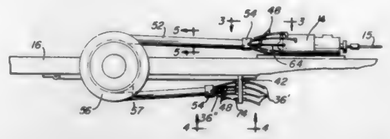
7. Means for fracturing the rock formation at a pay zone located at a predetermined depth in a well whereat the well casing, if any, has been perforated comprising
means for filling said well above said pay zone with a fluid,
means for closing said well, above said pay zone,
means for generating a pressure wave in said fluid at the region of said pay zone which has an amplitude such that it can force said fluid into fractures created in the pay zone for extending these fractures, and
means for generating a shock wave in said fluid during the interval of said pressure wave which has a rise time less than the time require for sound to traverse one-half of the periphery of the well opening at said pay zone and which when transmitted to said rock formation has an amplitude which will fracture but not crush said rock formation.

4,039,031
WELL CONTROL VALVE APPARATUS
Talmadge L. Crowe, Houston, Tex., assignor to Baker Oil Tools, Inc., Orange, Calif.
Filed Jan. 26, 1976, Ser. No. 652,483
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—317 **21 Claims**



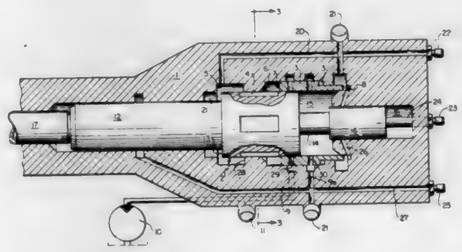
1. Control valve apparatus for use in a tubular string disposed in a well bore having a producing formation: comprising a valve body structure having an inlet opening, an outlet opening, and a fluid passage between said openings, first closure means in said body structure to one side of said inlet opening fully closing said passage, said first closure means being subject to fluid pressure in said inlet opening only and movable to open position when subjected to a predetermined increase in fluid pressure in said inlet opening, second closure means in said body structure to one side of said outlet opening and spaced from said first closure means to initially fully close said passage simultaneously with closing of said passage by said first closure means to provide a confined portion of said passage between said first and second closure means into which fluid internally and externally of the tubing string cannot enter, said second closure means being subject to fluid pressure in said outlet opening only, subjecting said first closure means to said predetermined fluid pressure effecting opening of said confined portion of said passage to permit said fluid pressure to enter said confined portion and shift said second closure means to open position permitting fluid flow through said inlet opening, confined portion, and outlet opening.

4,039,032
HOSE TRAINING MEANS
Ward D. Morrison, S. Acworth, N.H., assignor to Joy Manufacturing Company, Pittsburgh, Pa.
Filed Oct. 24, 1975, Ser. No. 625,501
Int. Cl.[2] E21C *5/00*
U.S. Cl. 173—43 **11 Claims**



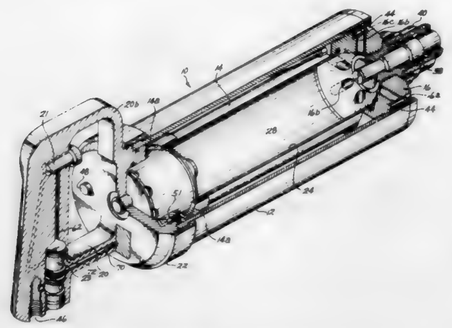
1. A powered apparatus comprising: an elongated guide frame; a power driven means carried by said guide frame and movable longitudinally thereon; conduit means cooperable with said power driven means for providing motive power thereto; at least a portion of said conduit means extending intermediate said power driven means and a support means spaced from said power driven means; elongated means defining an elongated path intermediate said power driven means and said support means and having opposed end portions thereof connected by connector means to said power driven means and said support means, respectively, to maintain said elongated means in uniform tension therebetween; said elongated means encompassing said portion of said conduit means along at least a major part of the length thereof; and guide means for guiding said elongated means within such a path.

4,039,033
HYDRAULIC ROCK DRILL
Pekka M. Salmi, Tampere, Finland, assignor to Oy Tampella AB, Tampere, Finland
Filed Jan. 16, 1976, Ser. No. 649,679
Claims priority, application Finland, Jan. 16, 1975, 750097
Int. Cl.[2] B25D *9/00*
U.S. Cl. 173—105 **2 Claims**



1. An hydraulically operated striking apparatus comprising the combination of
a body having an interior space;
a striking piston movable between first and second positions within said space;
a source of liquid under pressure;
means for defining a valve space;
a pressure liquid-operated distributing valve movable in said valve space for controlling application of said liquid under pressure to said interior space to control movement of said piston;
first outlet means for exhausting liquid from said interior space after said liquid has operated said piston;
second outlet means for exhausting liquid from said valve space after said liquid has operated said distributing valve;
an hydraulic rotating motor; and
means for conveying liquid from said second outlet means to said motor to rotate said motor.

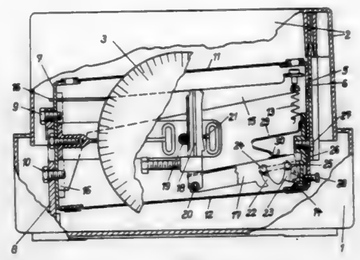
4,039,034
PNEUMATIC IMPACT GUN
David Lee Wagner, Kent, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation-in-part of Ser. No. 591,972, June 30, 1975, abandoned. This application June 25, 1976, Ser. No. 699,772
Int. Cl.[2] B21J *15/18*
U.S. Cl. 173—137 **7 Claims**



1. A pneumatic impact gun for upsetting one end of a rivet in a single impact comprising:
piston means slidably arranged in a cylinder for impacting an anvil disposed at the downstream end of said cylinder;
means for returning and maintaining said piston means at an upstream position within said cylinder;
means for admitting a manually adjustable flow of air into said cylinder to displace said piston means a predetermined distance downstream within said cylinder over a variable time;
means for storing an accumulated charge of compressed air arranged to communicate with said piston means; and,
means for passing compressed air from said storage means so that when said piston means has been displaced a predetermined distance by the flow of compressed air from said admitting means, said storing means dumps an accumulated charge of compressed air into contact with the upstream side of said piston means to displace said piston means rapidly downstream in said cylinder to thereupon impact said anvil.

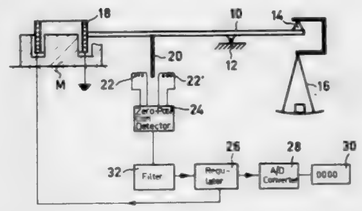
4,039,035
WEIGHING BALANCE
Paul Terraillon, Monnetier-Mornex, France, assignor to Terraillon, Annemasse, France
Filed Feb. 9, 1976, Ser. No. 656,270
Claims priority, application Switzerland, May 16, 1975, 6333/75
Int. Cl.[2] G01G *23/06*
U.S. Cl. 177—186 **4 Claims**

1. A weighing balance comprising a base, a chassis mounted on said base for vertical movement relative thereto, a receiving plate for objects to be weighed mounted on said chassis, a rotatable dial member, a rack and pinion, said pinion being mounted to rotate said dial upon actuation by its cooperating rack, a transmission lever articulated to said rack, said transmission lever also being connected to said chassis by antishock means, said antishock means including two fingers and two cooperating arcuate slots, elastic means for holding said fingers in contact with the ends of their respective slots in the absence of a shock, said elastic means yielding when said receiving plate is subjected to a shock to allow the transmission lever to



turn about its articulation on the rack instead of actuating the rack, the yielding of said elastic means also providing a relative movement between one of the fingers and its slot for a shock in one direction and between the other finger and its slot for a shock in the opposite direction.

4,039,036
WEIGHING APPARATUS OF THE ELECTROMAGNETIC LOAD COMPENSATION TYPE INCLUDING FILTER MEANS
Max Baumgartner; Anton Bucher, both of Stafa, and Diethelm Utzinger, Zurich, all of Switzerland, assignors to Mettler Instrumente AG, Zurich, Switzerland
Filed Jan. 19, 1976, Ser. No. 649,974
Claims priority, application Switzerland, Feb. 4, 1975, 1339/75
Int. Cl.[2] G01G *7/00*
U.S. Cl. 177—212 **8 Claims**



1. In a weighing apparatus of the electromagnetic load compensation type including weighing pan means **(16,42)** movable between no-load and load positions relative to fixed support means; zero-position detector means **(24,52)** for producing a weighing pan position signal that is a function of the extent of displacement of the weighing pan from its no-load position; electromagnetic means including a compensation coil **(18,44)** associated with one of said weighing pan and support means; regulator means **(26, 54)** for supplying to said compensation coil a compensating current that is a function of said weighing pan displacement signal; and indicator means **(30,58)** responsive to the magnitude of the compensating current for providing an indication of the magnitude of the load applied to the weighing pan means; the improvement which comprises
band-rejection filter means **(32,56)** connected between said zero-position detector means and said regulator means for suppressing from the pan position signal those discrete frequencies, resulting from forces imparted to the weighing apparatus by shock or vibration, which correspond with the inherent resonance frequencies of the weighing apparatus.

4,039,037

VEHICLE DRIVE TRAIN

Jean-Pierre Vin, 12, Place Guy d'Arezzo, Uccle, Belgium

Filed Dec. 1, 1975, Ser. No. 636,422
Claims priority, application Belgium, Dec. 13, 1974, 151482
Int. Cl.[2] B60K *17/22*
U.S. Cl. 180—24.11 **5 Claims**



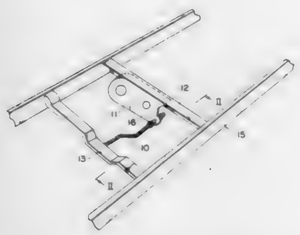
1. A vehicle drive train comprising an engine, an output shaft driven from said engine and drivingly connected to a differential gear train positioned near the front of the vehicle, said differential gear train driving a pair of laterally spaced apart parallel shafts extending generally vertically downwardly of said vehicle near the front thereof, a pair of drive shaft means driven from said parallel shafts and extending rearwardly of said vehicle, a pair of rear gear trains interconnecting said drive shaft means to respective ones of a pair of rear wheels, said rear gear trains each including a generally vertically extending shaft extending upwardly from said drive shaft means toward the center of said rear wheels.

4,039,038

VEHICLE TRANSFER CASE STABILIZER BAR

Bartel Wilhelm, Carson City, Nev., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 9, 1975, Ser. No. 639,210
Int. Cl.[2] B60K *17/34*
U.S. Cl. 180—70 R **3 Claims**



1. A support rod for reinforcing the support of a four wheel drive transfer case to an attached vehicle frame, such that the transfer case is rigidly joined by the support rod to a transverse frame member adjacent to the transverse frame member on which the transfer case is mounted, said rod shaped to provide adjustment of the distance between the opposed mounting points of the installed rod between the transfer case and the vehicle frame, along three mutually perpendicular axes, comprising

a rod formed with an intermediate segment bent at an angle to each of two opposed end segments, with both end segments oriented about axes mutually parallel to each other and with said axes offset from each other,

each of said end segments formed with a male threaded section extending to the end of the end segment, together with

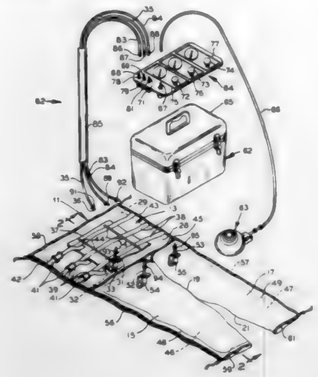
a pair of nuts and a pair of rubber washers associated with each end segment adaptable for fastening a first end segment through a hole in a flange of a vehicle transverse frame member in fixed relation to the said frame member, and the second end segment through a hole in the wall of a four wheel drive transfer case in fixed relation to the transfer case wall.

4,039,039

INFLATABLE ANTI-SHOCK AND SPLINTING TROUSERS

Max Gottfried, Rossford, Ohio, assignor to Jobst Institute Inc., Toledo, Ohio

Filed Mar. 1, 1976, Ser. No. 662,801
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—87 R **16 Claims**



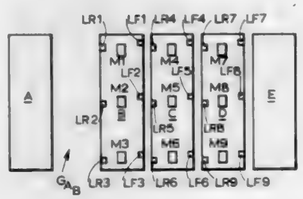
1. A pressure garment comprising a front face panel and a rear face panel of flexible fabric; an abdominal region on each of said front and rear panels adapted to cover a portion of the abdomen of a patient; a pair of leg regions on each of said front and rear panels adapted to cover a portion of respective legs of a patient, said leg regions of each panel being dependent from and integral with said abdominal region of said panel; a permanent junction between said front and rear panels along the inseam portion of each leg; said front and rear panels being separate along outer side margins of said abdominal region and said leg regions; fastener means along each outer side margin of said abdominal and leg regions for separably securing said front and rear panels together along said outer side margins; a gas chamber of flexible gas impervious fabric between said front and rear panels and extending over a preponderance of the area of at least one of said regions of at least one panel; and a gas conduit in gas flow communication between the exterior of said garment and said chamber.

4,039,040

STORAGE ASSEMBLIES

Peter John Spears, Pershore, and Richard Grahame Dugard Showell, Bishampton, both of England, assignors to Bar Productions (Bromsgrove) Limited, Bromsgrove, England

Filed Nov. 14, 1975, Ser. No. 632,102
Claims priority, application United Kingdom, Nov. 15, 1974, 49334/74
Int. Cl.[2] A47B *53/00*
U.S. Cl. 180—96 **23 Claims**



1. A storage assembly in which a row of storage units, such as racks, are movable between fixed limits along the length of the row in either of two opposite directions so that a gangway can be provided between the sides of any two adjacent units,

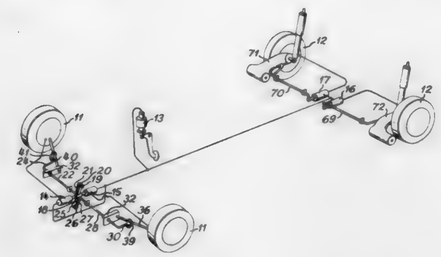
and in which each storage unit is provided with a set of reversible electric motors adapted to drive individual independently rotatable drive wheels to move that storage unit, and a set of switches is provided along each side of each storage unit so as to be operated by means at the side of an adjacent storage unit, each switch in each set being associated with a respective reversible motor in the vicinity of the switch so as to control operation of that motor independently of the others and to cut-off the supply of electricity to the motor when it is operated.

4,039,041

FLUID PRESSURE BRAKING SYSTEMS FOR VEHICLES

Robert Michael Farrow, Leamington Spa, England, assignor to Automotive Products Company Limited, Leamington Spa, England

Filed Apr. 12, 1976, Ser. No. 675,948
Claims priority, application United Kingdom, Apr. 14, 1975, 15285/75
Int. Cl.[2] B60T *8/24*
U.S. Cl. 180—104 **9 Claims**



1. A fluid pressure braking system for a vehicle which includes a driver controlled source of liquid pressure, a first liquid pressure control device for controlling the pressure that acts in a first liquid pressure motor cylinder to apply a brake to a first wheel which is on one side of the vehicle, a second liquid pressure control device for controlling the pressure that acts in a second liquid pressure motor cylinder to apply a brake to a second wheel which is on the other side of the vehicle, and control means which are responsive to conditions which are indicative of load transfer from one of said wheels to the other and which are operable to modify the performance of one of said liquid pressure control devices in response to such conditions so that any pressure which acts in the other liquid pressure motor cylinder to apply the brake to the other of said wheels is higher than any pressure which acts in said one liquid pressure motor cylinder to apply the brake to said one wheel, wherein each liquid pressure control device is a liquid pressure intensifier.

4,039,042

ACOUSTICAL SPARKER PROBE APPARATUS

Richard C. Edwards, Kennewick, and Richard L. Wilson, Richland, both of Wash., assignors to Holosonics, Inc., Richland, Wash.

Filed Sept. 17, 1976, Ser. No. 724,324
Int. Cl.[2] G01V *1/06*
U.S. Cl. 181—106 **10 Claims**

1. An acoustical sparker probe apparatus capable of generating and transmitting high energy acoustical pulses into the earth surrounding a borehole at desired locations along the length of the borehole, in which the borehole has a length greater than 40 meters and a diameter between 50 mm and 100 mm, comprising:

a. an uphole low voltage AC electrical power source having an output voltage less than 250 volts (RMS) and an output current of less than 5 amperes (RMS);

b. an elongated probe having an outer diameter less than the diameter of the borehole for being inserted into the borehole and being positioned along the borehole length;

c. an electrical conduit extending between the probe and the uphole low voltage AC power source for transmitting the low voltage AC electrical energy from the uphole low voltage AC power source to the probe;

d. said elongated probe having an elongated sparker section containing an electrode means for creating a high energy electrical discharge through an ionizable liquid and generating a resultant high energy acoustical pulse and transmitting the acoustical pulse into the surrounding earth; and



e. said elongated probe having an elongated downhole high electrical energy section containing, (1) a cascading voltage multiplying and high energy storage network operatively connected to the sparker electrode assembly for receiving the low voltage AC electrical energy and for generating and storing high voltage DC energy of greater than 1000 volts and 100 joules; and (2) a pulse triggering network for repetitiously discharging the high energy storage network to apply high energy electrical pulses of greater than 1000 volts and 100 joules to the sparker electroe to generate the high energy acoustical pulses.

4,039,043

APPARATUS FOR CONTROLLING THE TRAVELING SPEED OF A MOTOR VEHICLE

Arnold Mann, Bieber; Ludolf Heimbach, Neuenhain, and Horst Schlick, Schwalbach, all of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Mar. 9, 1976, Ser. No. 665,312
Claims priority, application Germany, Mar. 17, 1975, 2511609
Int. Cl.[2] B60K *31/00*
U.S. Cl. 180—108 **22 Claims**

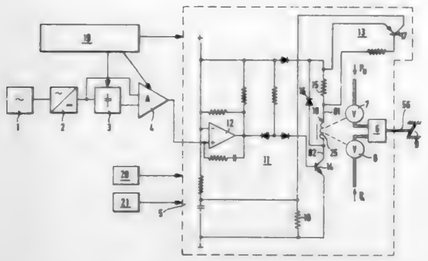
1. An apparatus for controlling the traveling speed of a motor vehicle with an electric control unit acted upon by a speed dependent signal, which unit compares the actual traveling speed with a predetermined desired traveling speed and upon a deviation transmits a signal which is dependent on the size of the deviation to a control stage which acts on an element, preferably a throttle valve, which influences the ratio of a fuel-air mixture fed to a motor of the vehicle, comprising

a control stage including anactuator means performing a stroke and for actuating the element,

two electromagnetically actuatable valve means operatively coordinated to said actuator means for admitting said actuator means with reduced pressure and normal pressure, respectively,

said control stage further comprising an electromagnetic system having an excitation coil and an armature means operatively cooperating therewith,

spring means for biasing said armature means and having a spring force dependent on the stroke of said actuator means,



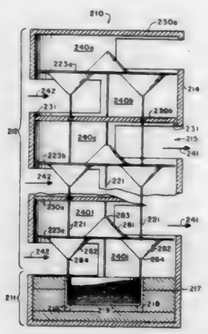
said armature means being pivotally mounted for smooth pivoting from a rest position in which both of said two valve means are closed, against the force of said spring means into operating positions, respectively, in which one of said two valve means is opened and the other of said two valve means is closed.

4,039,044

LOW FREQUENCY ELECTRO-ACOUSTIC TRANSDUCER WITH INTERCONNECTED DIAPHRAGMS INTERLEAVED WITH FIXED DIAPHRAGMS

Oskar Heil, 1775 Parrott Drive, San Mateo, Calif. 94402

Continuation of Ser. No. 526,667, Nov. 25, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,812
Int. Cl.² H04R *1/02, 7/02*
U.S. Cl. 181—144 **1 Claim**



1. A low frequency electro-acoustic transducer comprising

a plurality of spaced apart, generally parallel arranged, alternately disposed fixed and movable diaphragms defining a plurality of narrow air spaces having open sides facing in opposite directions,

each of said fixed diaphragms comprising,

a first acoustic barrier disposed generally parallel and spaced apart from said movable diaphragm,

a second barrier attached to said first acoustic barrier and extending approximately one-half the periphery of said first acoustic barrier and depending upwardly therefrom,

a third acoustic barrier attached to said first acoustic barrier and depending downwardly therefrom oppositely disposed from said second barrier,

means for stacking and connecting like fixed diaphragms to each other to define a stack of fixed diaphragms, said stack defining said plurality of narrow air spaces having open sides facing in opposite directions,

each of said movable diaphragms comprising,

a sheet member having disposed thereon a plurality of upwardly and downwardly protruding cones arranged in ordered array, each cone having an apex and a base, disposed with said bases adjacent one another, and

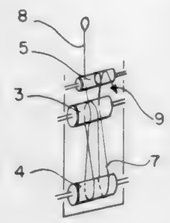
means connected at the apex of at least three of said cones for moving said movable diaphragm alternately toward and away from said fixed diaphragm.

4,039,045

DEVICE FOR LOWERING OBJECTS AND PERSONS BY ROPES

Rudölf Hoger, Hauptstrasse 20, 2061 Tonningstedt, Germany

Filed Apr. 3, 1975, Ser. No. 564,729
Claims priority, application Germany, Apr. 3, 1974, 115790
Int. Cl.² A62B *1/06*
U.S. Cl. 182—5 **7 Claims**



1. A device for lowering a person by rope, comprising the combination of a rope and a frame having means to support a person being lowered, said frame including a pair of spaced, vertical side plates, a pair of vertically spaced main rollers mounted in said side plates with their axes in a vertical plane passing through said side plates, guide means spaced above said main rollers, said guide means overlying said main rollers, said rope having a connection means for supporting said rope at its upper end, said rope extending past said guide means and at an angle to said vertical plane to the upper main roller, downwardly across said vertical plane to the lower main roller, around said lower main roller and upwardly across said vertical plane to said upper main roller, downwardly across said vertical plane and around said lower main roller a second time and upwardly across said vertical plane to said upper roller and at an angle to said guide to leave a free end beyond said frame for controlling movement of said rope around said rollers and through said frame, said plates being spaced apart such a distance as to press said rope together in crossing said vertical plane between said plates so that said rope resists movement through said frame and around said rollers.

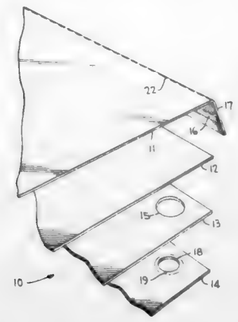
4,039,046

STUBLESS MULTI-PLY ASSEMBLY

Emil A. D'Luhy, Youngstown, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,393
Int. Cl.² B41L *1/24*
U.S. Cl. 282—22 R **3 Claims**

1. A unit set of multiple plies, comprising at least superimposed first, second, third and fourth plies, said first ply having a folded flap removably connected along one edge of said top ply by a line of weakening extending along the fold between said flap and said top ply, said third ply having at least one first hole of a predetermined first size lying adjacent one edge thereof, said flap underlying said fourth ply and having a quantity of detachable adhesive thereon securing said first ply to said fourth ply, said fourth ply having at least one second hole of a predetermined second size lying adjacent one edge thereof in axial alignment with said first hole, the size of said second hole being less than the size of said first hole, a portion of said quantity of adhesive extending through said first and second holes and securing said second and fourth plies together along one edge of said second ply, said quantity of adhesive lying inwardly of said first hole by reason of the difference in size between said holes to thereby immobilize said third ply in place, said edges of each said plies lying at a common end of said unit set, and said plies each being devoid of



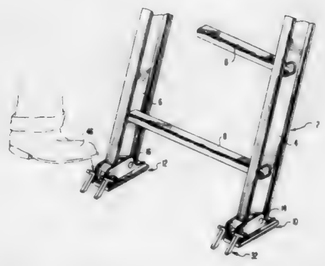
any tear lines which may form a stub, whereby removal of said first ply along said line of weakening leaves said second, third and fourth plies intact, or separation of said second and fourth plies effects a break of said adhesive and frees said third ply from the set while leaving said first and fourth plies interconnected, or removal of said first ply together with separation of said second and fourth plies separates each of said plies from one another.

4,039,047

LADDERS INCORPORATING RETRACTABLE GROUND SPIKES

Clayton E. Larson, Brooklyn, N.Y., and Earl T. Records, Warsaw, Ind., assignors to White Metal Rolling & Stamping Corporation, Brooklyn, N.Y.

Filed May 26, 1976, Ser. No. 690,175
Int. Cl.² E06C *7/46*
U.S. Cl. 182—111 **4 Claims**



1. In a ladder comprising a pair of side rails and a plurality of steps or rungs fixed at spaced intervals between said side rails, the improvement for improving safety in use of the ladder which comprises:

a foot member pivoted upon the lower end of each side rail of the ladder,

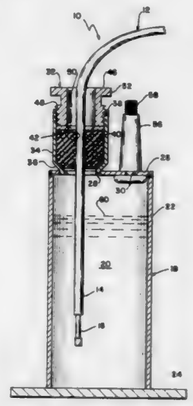
said foot members comprising a transverse web and a pair of flanges fixed normally to said web spaced apart at least the width of said side rails, said web having a width greater that the distance between said flanges providing a ledge portion at each side of the foot member, and a T-shaped spike member carried on one side of each foot member, the pivot bearing for each spike member being at one end of the top of T whereby the spike member moves from a storage position, wherein the free-end of said top rests upon a respective ledge portion, to an operative position wherein the leg of the T depends below the foot member with the pivoted side of the top of the T engaging said ledge portion, the pivot bearing for each spike member being journaled rearwardly of the front edge of its respective foot member a distance such that when the spike member is in said operative position the rear edge of the leg of the T substantially abuts said front edge of the foot member.

4,039,048

APPARATUS FOR LUBRICATING OR CLEANING SHEATHED CABLES

Alwyn K. Safholm, 340 Kent Ave., Kentfield, Calif. 94904

Filed Aug. 22, 1975, Ser. No. 607,027
Int. Cl.² F16N *7/14*
U.S. Cl. 184—15 R **4 Claims**



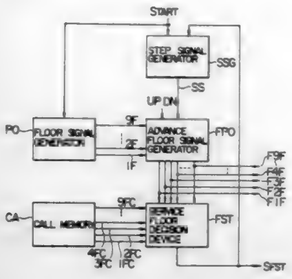
2. Apparatus for lubricating or cleaning out a cable assembly having a cable carried within an elongate sheath, the apparatus comprising the combination of a housing defining a fluid reservoir, means forming an opening in the housing, means forming a hollow cylindrical sealing member having an axial bore with an inner diameter commensurate generally with the outer diameter of said sheath, said sealing member being axially split along at least one side thereof and being formed of a resilient material which is capable of being compressed, a hollow cylindrical resilient jacket mounted on the housing about the opening, jacket means for mounting the sealing member in co-axial alignment with the opening, means for compressing the sealing member for causing its bore to move into fluid-sealing contact with the outer surface of the sheath when an open end thereof is mounted through the sealing member and projecting into the reservoir, said compressing means including a packing nut removably mounted for threading engagement within the jacket means, said packing nut being formed with an axial bore for receiving the sheath, said packing nut being releasable from the jacket means to facilitate mounting of the sealing member about the sheath with the sealing member thereafter being compressed in the jacket means upon threading engagement with the packing nut, and means for injecting a charge of gas under pressure into the reservoir for forcing fluid therefrom along a path within the sheath through the latter's open end.

4,039,049

ELEVATOR CAR CALL SELECTION APPARATUS

Kennzi Yoneda; Takeo Yuminaka, both of Katsuta, and Masao Takizawa, Kashiwa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 9, 1974, Ser. No. 531,160
Claims priority, application Japan, Dec. 12, 1973, 48-137711; June 7, 1974, 49-64093
Int. Cl.[2] B66B *1/30*
U.S. Cl. 187—29 R 8 Claims



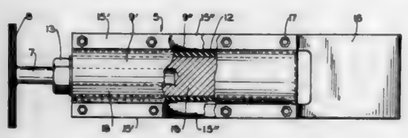
1. An elevator car call selection apparatus comprising means for generating step signals at a plurality of predetermined time points, means for initiating operation of said step signal generating means after said car starts from a given floor, means for generating a floor signal representing a car starting floor from which said car starts, means responsive to said step signals for sequentially generating advance floor signals of successive floors representative of the advance position at which the travelling car can be stopped by deceleration; memory means for storing at least a hall call and cage call; and means responsive to a call stored in said memory means for a floor corresponding to the floor designated by the presently generated advance floor signal for designating that floor to be served by said car, whereby said car covers a plurality of floors to answer at least a hall call and a cage call.

4,039,050

DAMPING SYSTEM

George W. Bowling, Olivette; Peter J. Conlisk, Creve Coeur, both of Mo., and Kenneth H. Lenzen, Lawrence, Mass., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 824,131, May 13, 1969, Pat. No. 3,691,712.
This application June 7, 1971, Ser. No. 81,532
Int. Cl.[2] F16F *7/08*
U.S. Cl. 188—1 B 2 Claims



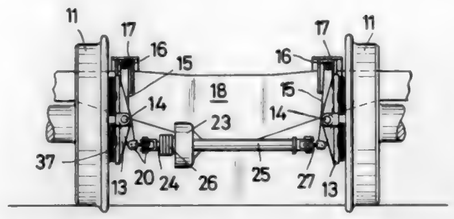
1. A vibration damping element for floor and ceiling structures comprising structural members adapted for attachment repectively to said structure and to a fixed support, at least one of said structural members provided with a length adjusting means, and a viscoelastic material sandwiched between and bonded to said structural members, said viscoelastic material having a modulus of elasticity lower than that of the structural members and a loss factor higher than that of the structural members.

4,039,051

DISC BRAKE CONSTRUCTION, ESPECIALLY FOR RAIL VEHICLES

Alfred Otto, Remscheid, Germany, assignor to Bergische Stahl-Industrie, Remscheid, Germany

Filed Sept. 8, 1975, Ser. No. 611,415
Claims priority, application Germany, Sept. 9, 1974, 2443095
Int. Cl.[2] B61H *13/24*
U.S. Cl. 188—58 6 Claims



1. In a disc brake construction for rail vehicles in which at least two spaced axles having wheels thereon are rotatably supported on lateral axes in a bogie; a brake disc on, each wheel on the inner sides thereof, brake shoe means adjacent said discs on the inner sides of the discs, a brake lever on the inner sides of each brake shoe means and pivotally connected near end thereof on a fore and aft axis on the bogie, a fore and aft brake beam on each side of the bogie at the inner sides of the said levers on the same side of the bogie and pivotally connected with the respective levers, transversely extending power operated actuating means pivotally connected and operable for moving the levers about the pivotal connections thereof with the bogie, pivot means pivotally connecting each brake shoe means near the center of gravity thereof with an intermediate point on the respective lever, said actuating means comprising fluid operable cylinder-piston means having the cylinder connected to one of said beams and the piston connected to the other of said beams, mechanically operable means extending transversely between and connected to said beams, said mechanically operable means being accessible from at least one side of the bogie for manual operation to spread said beams and having a lost motion connection with at least one of said beams.

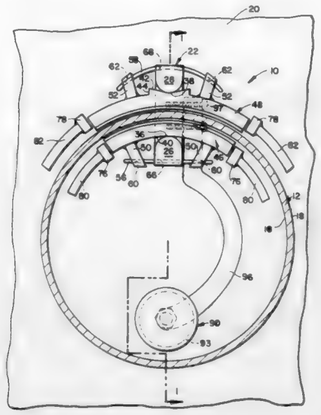
4,039,052

BRAKE WITH INNER AND OUTER SWIVEL-MOUNTED SHOES

John H. Murphy, Salem, and Joseph Treantos, Lynn, both of Mass., assignors to Disk Brake Drum Company, Lynn, Mass.

Continuation of Ser. No. 487,232, July 10, 1974, abandoned.
This application Feb. 26, 1976, Ser. No. 661,621
Int. Cl.[2] F16D *53/00*
U.S. Cl. 188—76 14 Claims

1. A brake comprising:
a. a rotatable drum having a cylindrical wall defining inner and outer braking surfaces;
b. a non-rotating structure positioned near said drum;
c. a yoke movably carried by said structure and having spaced inner and outer arm members which respectively overlie said inner and outer surfaces, said yoke being movable between brake engaged and brake disengaged positions and being operable during such movement to concurrently move said arm members toward and away from said surfaces;
d. an inner brake shoe member carried by said yoke and interposed between said inner arm member and said inner surface;
e. an outer brake shoe member carried by said yoke and interposed between said outer arm member and said outer surface;
f. first connection means establishing a swivel mounting between said inner shoe member and said inner arm member, and second connection means establishing a swivel mounting between said outer shoe member and said outer arm member;
g. each of said connection means including a rounded projection formed on one of said members and extending into a concave recess formed on the other associated one of said members;
h. each of said rounded projections having a radius of curvature which is substantially less than the radius of curvature of its associated concave recess to establish a rolling engagement when said yoke is moved between said brake engaged and disengaged positions, whereby said shoe members are caused to move circumferentially of the rotatable drum when said yoke is moved between said brake engaged and disengaged positions; and,
i. stop means including inner and outer pairs of stops carried by said structure for permitting limited circumferential movement of said shoe members when said yoke is moved between said brake engaged and disengaged positions, said inner and outer stops being positioned near opposite ends of said inner and outer shoe members, respectively, and being spaced from the ends of their associated shoe members when said yoke is in said brake disengaged position.

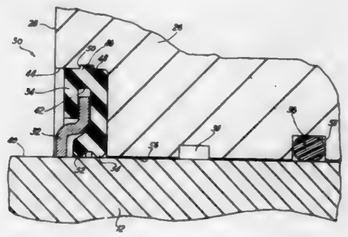


4,039,053

PROTECTING DEVICE FOR THE CYLINDRICAL SLIDING SURFACES OF A DISC BRAKE

Yves Meyer, Taverny; Claude Le Marchand, Domont, and Jean-Louis Gerard, Paris, all of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed July 19, 1976, Ser. No. 706,427
Claims priority, application France, Aug. 8, 1975, 75.24801; Jan. 23, 1976, 76.01768
Int. Cl.[2] F16D *55/22*
U.S. Cl. 188—73.3 14 Claims



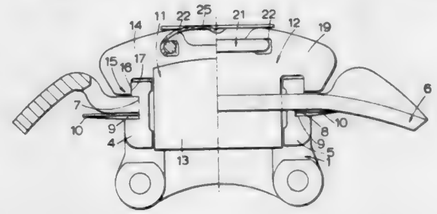
1. A disc brake in which a movable member is slidable on a support member by means of at least one column; actuating means being assoicated to said movable member to apply a first friction element on to a first face of a disc and, by reaction a second friction element on to the other face of the disc, said column being assoicated to one of said members and emerging from at least one face to the other member, wherein the protection of the sliding surfaces of the said column is provided by means of at least one protecting device comprising a seal of resilient material assoicated in a fluid-tight manner with the said face of the other member and cooperating by means of at least one first lip with the outside surface of the column, the seal bearing on the side remote from the said face to the other member a scraper element of rigid material, said scraper element being mounted in a groove in said seal and extending from an external surface of said seal to said column.

4,039,054

DISC BRAKES FOR VEHICLES

Heinrich Bernhard Rath, Vallendar (Rhine), Germany, assignor to Girling Limited, Birmingham, England

Filed Dec. 18, 1975, Ser. No. 641,231
Claims priority, application United Kingdom, Dec. 19, 1974, 55057/74
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—73.4 5 Claims



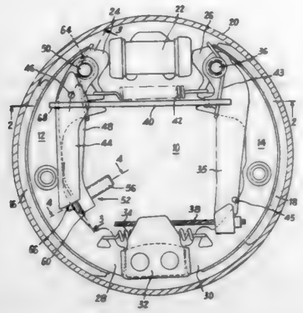
1. A disc brake for a vehicle comprising a rotatable disc, a stationary member located on one side of said disc, a yoke extending over the peripheral edge of the disc, circumferentially spaced arms provided in said stationary member and on which said yoke is guided for sliding movement in a direction generally parallel to the axis of said disc, said arms having spaced inner faces and external guiding and drag-taking surfaces, first directly actuated friction pad assembly for engagement with one face of said disc located between said arms and spaced from said inner faces of said arms, a second indirectly actuated friction pad assembly for engagement with the opposite face of said disc, hook-like lugs at opposite ends of said first friction pad assembly engaging over said arms, and having inner faces which engage slidably with said guiding surfaces to guide said first friction pad assembly for movement in said stationary member towards and away from said disc and to transmit drag to said arms from said first friction pad assembly when the brake is applied, the drag on said first friction pad assembly being transmitted to said guiding and drag-taking surface at the one of the said arms which is positioned at the end of the brake with which any point on said disc first comes into alignment for a given direction of rotation of said disc, the drag being transmitted to the said guiding and drag-taking surface from said inner face of said lug which engages with the said one arm, and actuating means for applying said first friction pad assembly directly to said disc with the reaction thereof acting through said yoke to apply said second friction pad to said disc.

4,039,055

AUTOMATIC SLACK ADJUSTER FOR DRUM BRAKES

Yves Meyer, Taverny, and Pierre Courbot, Villiers le Bel, both of France, assignors to Societe Anonyme D.B.A., Paris, France

Filed June 7, 1976, Ser. No. 693,389
Claims priority, application France, June 23, 1975, 75.19523
Int. Cl.[2] F16D *65/56*
U.S. Cl. 188—79.5 GC **6 Claims**



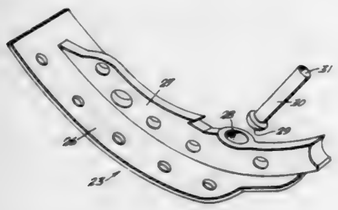
1. A drum brake comprising two brake shoes, a brake applying means disposed between said two brake shoes, an intermediate lever pivotally mounted on one of the brake shoes, an adjusting lever pivotally mounted on said intermediate lever, a spacer engaging the other of the brake shoes and said adjusting lever, an extensible member carried by said intermediate lever and including two elements, one of which non-rotatably engages the one brake shoe and the other element engages the adjusting lever, said spacer being movable upon a brake application to pivot said adjusting lever relative to said intermediate lever and to rotate the other element via the engagement with the adjustment lever and a resilient means normally biasing the extensible member into engagement with the one brake shoe and said spacer also being engageable with said intermediate lever to limit relative rotation between said adjusting lever and said intermediate lever when the rotation therebetween exceeds a predetermined value to limit the extension of said extensible member.

4,039,056

BRAKE SHOE ASSEMBLY

Robert H. Zankl, 10735 SW. 58th Ave., Miami, Fla. 33173

Filed May 5, 1975, Ser. No. 574,578
Int. Cl.[2] F16D *51/24*
U.S. Cl. 188—325 **1 Claim**



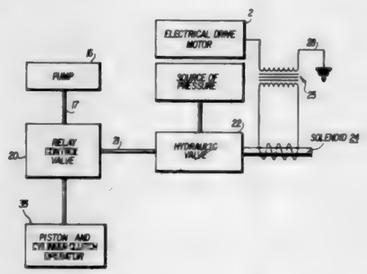
1. In a brake shoe assembly for use in cylindrical automotive brake drums in hydraulic brake systems including a pair of brake shoes, a common hydraulic brake wheel cylinder having opposed actuating pistons, and actuating pins extending between abutting surface portions of the pistons and associated brake shoes, the improvement comprising, a spheroidal, concavely-rounded end surface formed at the piston end of each of the actuating pins and complementary protrusions at the outer ends of each of the hydraulic cylinder actuating pistons for face-to-face sliding abutment contact with said concavely-rounded end surfaces, said actuating pins being of unitary, integral construction, each of the brake shoes being integrally formed with a substantially flat, arcuately-bent brake lining support plate portion of uniform thickness and a web portion of substantially greater uniform thickness extending centrally outwardly of and along the inside of said arcuate support plate portion, each of said actuating pins, at their brake shoe ends, having a sphereoidal, convexly-rounded end surface, said web portions of each of said brake shoes being integrally formed with a sphereoidal concavity for face-to-face sliding abutment contact therewith of said convexly-rounded end surfaces of said actuating pins.

4,039,057

ELECTRIC MOTOR WITH FLUID OPERATED CLUTCH

Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Dec. 19, 1975, Ser. No. 642,678
Claims priority, application United Kingdom, Jan. 3, 1975, 00260/75
Int. Cl.[2] F16D *23/00*
U.S. Cl. 192—.02 R **2 Claims**



1. Control means for controlling a hydraulically actuated clutch drivably connectable intermediate an electrical drive assembly and a driven assembly, comprising sensor means mountable on the electric drive assembly for sensing if electrical current is being supplied to the drive assembly, solenoid means energized in response to an output from the sensor means, hydraulic valve means mechanically linked to the solenoid means and thereby actuated in response to the solenoid means being energized by said output of the sensor means, relay control means hydraulically linked to the hydraulic valve means and thereby actuated in response to actuation of the hydraulic valve means, and hydraulic pump means driven by the electrical drive assembly to supply hydraulic fluid for actuating the clutch and being hydraulically connected thereto by the relay control means when it is actuated.

4,039,058

ONE-WAY CLUTCH AND BACKSTOP INCORPORATING THE SAME

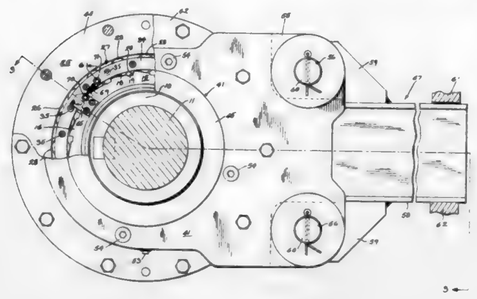
Peter M. Trzebiatowski, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Oct. 6, 1975, Ser. No. 619,808
Int. Cl.[2] F16D *15/00*
U.S. Cl. 192—45 **6 Claims**

1. In a one-way clutch, the combination comprising:

coaxial inner and outer race members, one of said race members having a smooth cylindrical surface and the other of said race members having a cam portion which includes a plurality of spaced indentations confronting said smooth surface and spaced therefrom, said indentations being so shaped as to deefine a generally wedge-shaped space with said smooth surface and each indentation terminating in a generally radially upright trailing surface;

a roller assembly including a roller cage and a plurality of rollers disposed for rotation in said cage, each of said rollers being disposed within a respective one of said indentations to coact between the indentation and the smooth surface of the confronting race member; a pair of stop lugs, each stop lug secured to and extending radially



from said cam portion at a position axially outwardly of said indentations and overlying a respective side of said cage; and

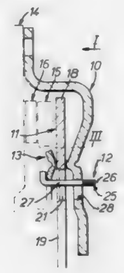
a projection on each side of said cage and adapted to engage one of said stop lugs before said rollers engage the trailing surfaces of said indentations.

4,039,059

DIAPHRAGM CLUTCH ASSEMBLY

Gerard de Gennes, Senlis, France, assignor to Societe Anonyme Francaise du Ferodo, France

Filed Mar. 18, 1976, Ser. No. 668,140
Claims priority, application France, Mar. 27, 1975, 75.09588; Feb. 12, 1976, 76.03810
Int. Cl.[2] F16D *13/71*
U.S. Cl. 192—89 B **11 Claims**



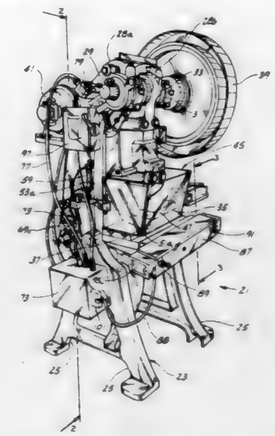
1. An assembly for a diaphragm clutch, comprising a generally annular cover element adapted for connection to a reaction plate, means for fixing the cover element for rotation with a pressure plate, a generally annular diaphragm having a peripheral portion forming an elastic washer of the Belleville washer type adapted to act on the said pressure plate and a central portion divided into radial fingers for operation by a clutch release bearing, connecting means pivotably fastening the diaphragm to the cover element, and a support element interposed between the connecting means and the diaphragm, the connecting means having at one end a support head in contact with either the cover element or the supporting element, and at the other end claws which extend generally axially and pass through passages formed in the diaphragm between the radial fingers thereof, in the zone in which the fingers are connected to said peripheral portion of the diaphragm, the ends of the said claws passing through the other of said elements and being folded radially into contact with this element, and the supporting head of the said connecting means forming at least a part of a cylinder whose generatrices are parallel to the axis of the assembly.

4,039,060

BARRIER-GUARDED STAMPING PRESS CONTROL

Roy G. Williams, St. Louis County, and Robert L. Cantrell, Jr., St. Louis, both of Mo., assignors to Essex Cryogenics Industries, Inc., St. Louis, Mo.

Filed Apr. 16, 1975, Ser. No. 568,600
Int. Cl.[2] F16D *7/00*
U.S. Cl. 192—134 **12 Claims**



1. In a stamping press system including a stamping press, said press having a ram, means for driving said ram, ram control means electrically energizable for causing said driving means to drive said ram through a stamping cycle, the improvement comprising the combination of a barrier movable between an open portion permitting access by the hands of a human press operator to the point of stamping operation of said ram and a closed position barring said access, press trip control means, including a pair of actuators each of which is adapted for actuation by a respective one of the hands of said press operator, for causing movement of said barrier to said closed position and energization of said ram control means, thereby to initiate a stamping cycle, in response to substantially simultaneous actuation of said actuators by both hands of said press operator, by substantially simultaneous actuation meaning actuation at least within a short predetermined interval of one another, means for preventing energization of said ram control means, thereby to prevent initiation of a stamping cycle, if said barrier is not in the closed position, and means for preventing re-energization of said ram control means for a further stamping cycle until removal of both of said press operator's hands from said actuators.

4,039,061

AUTOMATICALLY CONTROLLING THE TRANSMISSION RATIOS OF AN AUTOMOTIVE VEHICLE ENGINE FOR DECREASING THE VEHICLE SPEED

Francois C. Pruvot; Roger Maistrelli, and Pierre Bauchet, all of Billancourt, France, assignors to Regie Nationale des Usines Renault and Automobiles Peugeot, both of, France

Filed June 28, 1972, Ser. No. 267,208
Claims priority, application France, July 30, 1971, 71.28168
Int. Cl.[2] B60K *21/00*
U.S. Cl. 192—4 A **12 Claims**

1. In a vehicle having an engine driving the wheels of the vehicle through a variable speed ratio transmission, means to vary the ratio of the transmission, engine speed control means

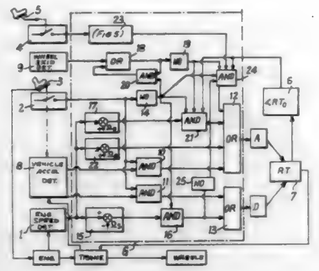
and manual braking means, a method for controlling the transmission ratio for braking the vehicle, comprising the steps of:

detecting the speed of said engine and generating a signal proportional to the detected speed;

comparing the detected engine speed signal with a predetermined reference speed signal;

detecting the transmission ratio of said transmission and comparing the detected ratio with a predetermined reference ratio;

generating a ratio signal as long as the detected ratio remains below said reference ratio;



maintaining the detected ratio constant until said detected engine speed signal falls below said predetermined reference speed signal;

generating a signal to increase said transmission ratio when said engine speed signal falls below said predetermined reference speed signal; and

increasing said transmission ratio in the direction of said predetermined reference ratio as long as said detected speed signal remains below said reference speed signal and said detected ratio is less than said reference ratio.

4,039,062

FLOW DIVIDER FOR A POWDERY MATERIAL

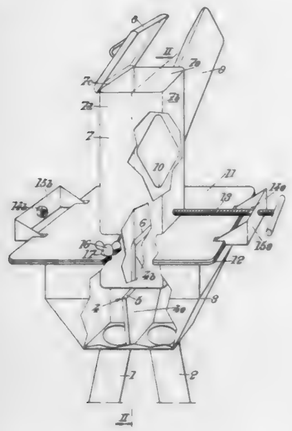
Christian Carre, Houilles, and Albert Rebours, Chatou, both of France, assignors to Air-Industrie, Courbevoie, France

Filed Nov. 18, 1975, Ser. No. 632,983

Claims priority, application France, Nov. 28, 1974, 74.39012

Int. Cl.[2] B65G *11/20*

U.S. Cl. 193—31 R **8 Claims**



1. Flow divider for a powdery material, comprising:

a. a duct having an inlet and outlet and adapted for gravity flow of material therethrough;

b. a closed chamber communicating with said outlet of the duct;

c. two eduction chutes connected to the bottom of the chamber;

d. knife means mounted in a vertical plane at the outlet of said duct for dividing the material into two outflows, the respective flow rates of which are determined by the position of said knife means, said knife means including an upper part extending between two opposite walls of the duct and a lower part wider than the upper part and forming a partition in said chamber between the two eduction chutes; and

e. adjustment means for adjusting the distance between the upper part of the knife means and the other two opposite walls of the duct in a direction perpendicular to the plane of the knife means.

4,039,063

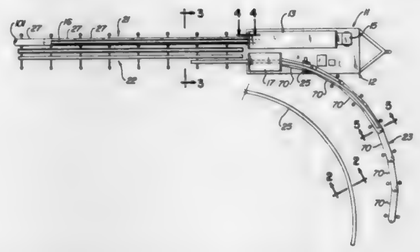
RUN-OUT APPARATUS AND METHOD FOR ROLL-FORMED PANELS

Gary A. Knudson, 17356 W. 57th Ave., Golden, Colo. 80401

Filed Dec. 19, 1975, Ser. No. 642,665

Int. Cl.[2] B21B *39/16*

U.S. Cl. 193—35 R **25 Claims**



1. Run-out apparatus for use in combination with an apparatus for forming and curving panels having a forming section and a curving section, said run-out apparatus comprising:

table means in receiving relation to the forming section providing a supporting surface onto which a formed panel is run and supported as the formed panels runs out from said forming section,

support means adjacent said table means onto which the formed panel is positioned for feeding into said curving section, and

table and guide means including support surface portions for supporting a down-facing surface of the curved panel for sliding movement thereon and guide surface portions extending substantially normal to and projecting away from said support surface portions at spaced intervals along the course of travel for the curved panel established by said support surface portions against which the curved panel is slidably moved to be guided through a selected curved path as the curved panel is run out from said curving section.

4,039,064

ADJUSTABLE WORK SUPPORT

Roy S. Kirby, Rte. 1, Box 73-A, Deer Park, Wash. 99006

Filed June 28, 1976, Ser. No. 700,318

Int. Cl.[2] B65G *13/12*

U.S. Cl. 193—42 **8 Claims**

1. An adjustable work support, comprising:

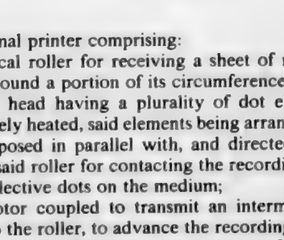
an upright post formed of standard lumber of rectangular cross section;

first oppositely projecting horizontal braces fixed to opposite sides of the post at a bottom end thereof;

second oppositely projecting horizontal braces abutting remaining opposite sides of the post at the bottom end thereof and projecting at right angles from the first braces;

two hinge members each interconnecting a second brace with an adjacent first brace such that the second braces may be folded into juxtaposition with the first braces;

an elongated work support arm slidably received on the upright post for protruding laterally from the post to provide a support surface for a workpiece;



lugs pivotably mounted to the first horizontal braces selectively operable to lock the second set of braces in an operative position wherein the first and second sets of braces are substantially perpendicular to one another; and

wherein the work support arm includes elevationally offset post engaging means for binding against the post when the arm is in a horizontal position and for releasing the post when the arm is inclined from the horizontal position.

4,039,065

THERMAL PRINTER

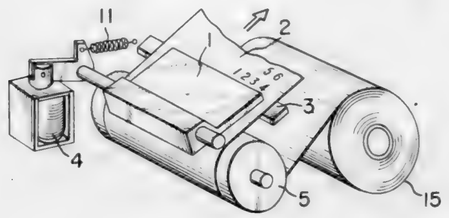
Mitsuaki Seki, Tokyo, and Takayoshi Hanagata, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 569,610, April 21, 1975, abandoned, which is a continuation of Ser. No. 387,166, Aug. 9, 1973, abandoned. This application Nov. 29, 1976, Ser. No. 745,639

Claims priority, application Japan, Aug. 15, 1972, 47-81577; Aug. 15, 1972, 47-81578; June 25, 1973, 48-71891

Int. Cl.[2] B41J *3/20*

U.S. Cl. 197—1 R **10 Claims**



1. A thermal printer comprising:

a cylindrical roller for receiving a sheet of recording medium around a portion of its circumference;

a thermal head having a plurality of dot elements to be selectively heated, said elements being arranged in a single line disposed in parallel with, and directed toward, the axis of said roller for contacting the recording medium to print selective dots on the medium;

a step motor coupled to transmit an intermittent turning force to the roller, to advance the recording medium to a next printing position after each heating of selective ones of said single line of dot elements, wherein characters are formed each having a plurality of dots formed by repetitive printing and advancing steps;

means for continuously pressing said single line of dot elements against the recording medium, at a position wherein the recording medium contacts said roller, by applying a force to said thermal head, directed toward the axis of said roller, while said dot elements are heated to print characters on the recording medium and while the recording medium is intermittently advanced, wherein said pressing force is maintained at a value sufficient to simultaneously print dots along the entire length of said single line of dot elements and to permit uniform advancement of the recording medium in response to the turning force applied to the roller by the step motor.

4,039,066

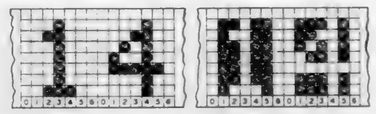
FORGERY-RESISTANT IMPACT PRINTING WITH MATRIX PRINTER

William D. Quigley, Nutley, N.J., assignor to Sweda International, Inc., Pine Brook, N.J.

Continuation of Ser. No. 440,374, Feb. 7, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,478

Int. Cl.[2] B41J *7/70*

U.S. Cl. 197—1 R **4 Claims**



1. A printing system comprising:

character complementing means having an input and output, for converting input data representative of a character coupled thereto,

input means, for coupling said input data to said input of said character complementing means,

control means, coupled to said input of said character complementing means, for selectively providing sequential control signals to said character complementing means,

said character complementing means being capable of generating, under control of corresponding sequential control signals from said control means, signals representative of the complement of a character and the character itself, and

printing means, coupled to the output of said character complementing means, for visually printing in the same form said input data both as a character and as the character's complement.

4,039,067

CHARACTER PRINTING DEVICE

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 452,973, March 20, 1974, Pat. No. 3,957,151. This application Dec. 8, 1975, Ser. No. 638,851

Claims priority, application Japan, Mar. 24, 1973, 48-33723; July 3, 1973, 48-74396; July 3, 1973, 48-74397; July 3, 1973, 48-74398; Aug. 14, 1973, 48-90505

Int. Cl.[2] B14J *1/32*

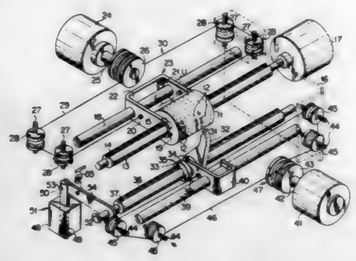
U.S. Cl. 197—49 **6 Claims**

1. A character printing device comprising a printing drum on the peripheral wall of which a plurality of character types are arranged in the axial direction of the drum and in the circumferential direction thereof; a printing information source for generating printing instruction signals for selectively printing any of said character types of the drum on a record medium; a first driving means for shifting the drum along the axis thereof in accordance with the printing instruction signals from the printing information source to position any character type column on the drum opposite a desired character printing position on the record medium; a second driving means for rotating the drum around the axis thereof in accordance with the printing instruction signals from the printing information source to position any character type row on the drum opposite the desired character printing position on the record medium; a hammer disposed close to the drum and

opposed to an outer peripheral wall portion of the drum with the record medium interposed therebetween; a thrid driving means for shifting the hammer at least step by step in a direction parallel with the axis of the drum to determine a character printing position relative to the record medium; and a striking means for striking with the hammer said opposed peripheral wall portion of the drum through the record medium,

the improvement wherein said first driving means comprises:

a first memory means **(81, 91, 187)** coupled with said printing information source to store that coded signal of the printing instruction signals from said printing information source which represents a character type column containing the character type on said drum printed immediately before a character to be printed next;



a character type column selection circuit means **(83, 93, 189)** coupled with said first memory means **(81, 91, 187)** and said printing information source to determine the direction and distance of the axial shift of said drum being moved to face the striking wall surface of said hammer by comparing coded signals stored in said first memory means **(81, 91, 187)** with printing instruction signals generated by said printing information source and representing a character type column containing that of the character types of said drum which is going to be printed next, thereby to provide an output corresponding to said determined direction and distance; and

a shift control means **(64, 98, 194)** coupled with said character type column selection means **(83, 93, 189)** axially to shift said drum in accordance with the output from said character type column selection means **(83, 93, 189)**.

4,039,068

KEYBOARD OF ELASTIC MATERIAL FOR OFFICE MACHINES

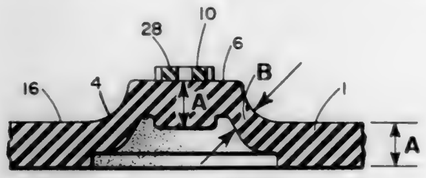
Virgilio Giorza, Cuorgne (Turin), and Piero Giovanetti, Ivrea (Turin), both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Continuation of Ser. No. 422,331, Dec. 6, 1973, abandoned. This application Dec. 17, 1975, Ser. No. 641,684

Claims priority, application Italy, Dec. 14, 1972, 70909/72

Int. Cl.[2] B41J *5/08*

U.S. Cl. 197—98 **2 Claims**



1. An office machine keyboard comprising a continuous layer of a first vulcanizable elastic material having a predetermined colour, a plurality of keys comprising an array of individually depressible reliefs formed in said layer, each relief including a top fingering surface raised above and parallel to the remainder of said keyboard layer and a curvilinear zone of said first elastic material surrounding said top surface of each said relief and having a smaller thickness than said top surface or the remainder of the layer, said zone sloping downwardly and then laterally away from said top surface toward said remainder of said layer to resiliently elastically connect said depressible relief to said remainder of said layer, said reliefs being depressible without distention of said connecting zone, and a set of characters, each one of a second vulcanizable elastic material, each character being positioned on the top fingering surface of one of said corresponding reliefs and being vulcanized to said first elastic material, whereby said characters are intimately connected to said reliefs.

4,039,069

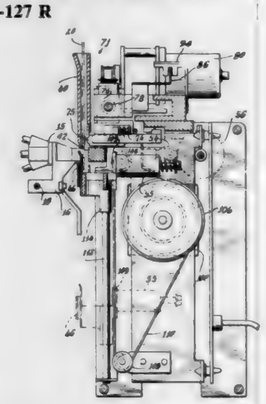
MAGNETIC STRIPE PASSBOOK AND SCANNER FOR DOCUMENT PRINTING APPARATUS

Okun Kwan, Trumbull, and Nicholas V. Zaccagnino, Jr., Stamford, both of Conn., assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 493,400, July 31, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,365

Int. Cl.[2] B41J *13/22*

U.S. Cl. 197—127 R **3 Claims**



1. In a bank passbook printing system having a document printing station for performing print operations upon a bank passbook in accordance with predetermined information contained on a readable and recordable information-bearing stripe positioned on the cover thereof parallel to the centerfold thereof and parallel to an unbound edge thereof, the improvement comprising:

a. transducer means mounted for scanning the information-bearing stripe;

b. document positioning means for receiving and positioning the bank passbook relative to the transducer means;

c. means for clamping the passbook in the document positioning means;

d. a platen adapted to support a section of an open bank passbook, the platen being positioned adjacent to the transducing means;

e. means for acutating the platen to clamp and flatten the cover of the bank passbook adjacent the stripe for smoothing and straightening the stripe;

f. carriage means, for resiliently mounting the transducer means, adapted to move the transducer means relative to and to bear against the information-bearing stripe for reading therefrom, the platen actuating means being released after the stripe is read to withdraw the platen;

g. means for jointly moving the document positioning means and the clamping means in a first direction to position a predetermined line of the passbook adjacent to the platen after the information-bearing stripe has been read;

h. the platen actuating means being energized after the passbook is at the predetermined line;

i. means for printing data along the predetermined line while the platen clamps and flattens the passbook cover after which the platen actuating means and platen are released;

j. the moving means causing the document positioning means and the clamping means to jointly move in a second direction, opposite the first, to a position in registry with said transducer means for recording updated information on the magnetic stripe while the platen actuating means and the platen again support the passbook; and

k. the means for clamping the bank passbook in the document positioning means being released, as are the platen actuating means and the platen, after the updated data is recorded on the stripe which allows removal of the passbook from the printing system.

4,039,070

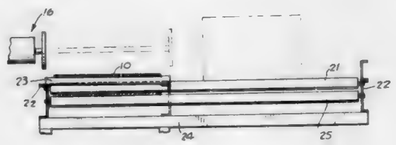
DIVERTING CONVEYOR SYSTEM

Franklin L. Harrison, Hagerstown, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed June 8, 1976, Ser. No. 693,764

Int. Cl.[2] B65G *47/52*

U.S. Cl. 198—370 **11 Claims**



1. A conveyor system comprising

an endless belt,

means for driving said belt,

at least one transfer station along the length of the belt,

a plurality of longitudinally spaced rotatably mounted rollers beneath the belt at said transfer station,

means for supporting said belt above said rollers at said transfer station,

and means for driving said rollers,

the width of said rollers being greater than the width of the belt,

and means for moving articles on said belt transversely at said transfer station from said belt onto said rollers at said transfer station.

4,039,071

APPARATUS FOR DIVIDING A CONTINUOUS STREAM OF ARTICLES INTO BATCHES WHICH MAY BE PLACED IN CONTAINERS

William Robert Garton, and Peter Alec Clarke, both of London, England, assignors to Molins Limited, England

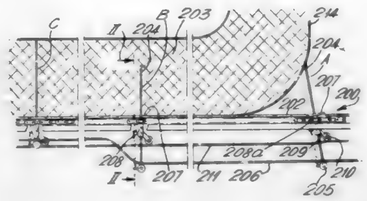
Continuation of Ser. No. 380,219, July 18, 1973. This application June 16, 1975, Ser. No. 586,862

Claims priority, application United Kingdom, July 21, 1972, 34123/72

Int. Cl.[2] B65G *47/26*

U.S. Cl. 198—425 **19 Claims**

1. Apparatus for separating a leading end portion of a stream of rod-like articles, said stream consisting of a stack of said articles moving transverse to their lengths, comprising means to feed said stream of articles along a first path, said feed means including an endless conveyor comprising a pair of chains supporting a plurality of slats defining a flat surface on which said stream of articles may be supported, spaced slats of said conveyor being provided with extensions on the surface opposed to said flat surface, said extensions being pivotally connected to said chains and having slots formed therein which extend through the respective slats; separating means comprising divider plates associated with said endless conveyor to be projected into said stream; guide means for guiding movement of said divider plates along a second path which converges on said first path, said divider plates being in sliding engagement with said slots formed in said spaced slats and their respective extensions, so that said pivotally connected extensions form part of said guide means and allow some angular movement of



said divider plates relative to said second path; and inclination adjusting means for inclining said divider plates relative to said second path whereby as said paths converge each divider plate is inserted into said stream while inclined to said second path and for changing the inclination of the divider plate so that it is substantially normal to said first and second paths after said paths have converged.

4,039,072

APPARATUS AND METHOD FOR CONVEYING MOLDED BRIQUETTES FROM A PRESS TO BED PLATES VIA AN INCLINED CONVEYANCE TRACK

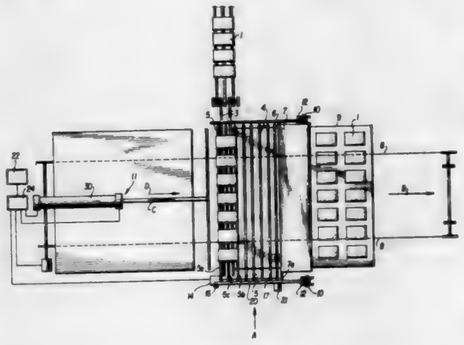
Werner Keller, and Karl Schafer, both of Ibbenburen, Germany, assignors to C. Keller & Co., Laggenbeck, Germany

Filed Aug. 20, 1975, Ser. No. 606,111

Claims priority, application Germany, Aug. 21, 1974, 2440035

Int. Cl.[2] B65G *47/00*

U.S. Cl. 198—429 **7 Claims**



1. An apparatus for conveying briquettes which have been formed in a press to bed plates, the apparatus comprising:

a first conveyor for carrying said briquettes; a second main conveyor under said first conveyor disposed at right angles thereto, said first conveyor comprising a plurality of parallel longitudinal spaced conveying means with at least one interval therebetween;

a substantially coplanar conveyance track provided with pivot means proximate its forward end and adapted to be inclined relative to said second conveyor, said conveyance track comprising a frame which supports a plurality of substantially coplanar roller means, a removal plate and vertical moving means provided therefor, said frame including said pivot means, said removal plate being provided with hinge means in its after part which connects it to said frame, said roller means being capable of being vertically raised in said interval to lift said briquettes from

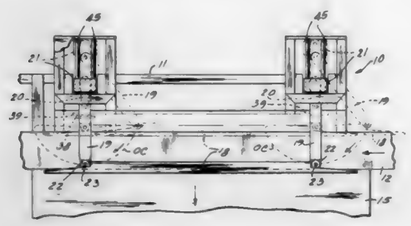
said first conveyor, the inclination of said conveyance track relative to said second conveyor being such whereby briquettes may be moved down the incline of said conveyance track from said first conveyor to said second conveyor.

4,039,073

PUSH-ON DEVICE

Homer W. Ohlhaver, Box 308, Walhalla, Mich. 49458

Filed Apr. 7, 1976, Ser. No. 674,646
Int. Cl.[2] B65G *47/52*
U.S. Cl. 198—430 **16 Claims**



1. A device for pushing onto a take-away conveyor or the like a succession of row groups of articles by displaying the articles laterally in one direction from a delivery conveyor on which the articles are continuously advanced seriatim, comprising:

a supporting structure carrying said delivery conveyor;

a horizontal push bar of a length to engage an entire row group of the articles;

substantially horizontal driving arms pivotally attached to adjacent respective opposite ends of the bar and extending rectilinearly from the bar in the opposite lateral direction relative to the delivery conveyor;

respective guide block means attached to and movable with that end portion of each of the arms which is remote from the bar;

rectilinear guide track means for each of said arms attached to said supporting structure adjacent to said remote ends of the arms and spaced from said delivery conveyor and extending on parallel axes transverse to said delivery conveyor;

said guide block means being supported on and running along said guide track means and guiding said arms reciprocatingly for controlling movement of said bar transversely relative to said delivery conveyor; and

operating means connected to said arms for effecting cyclical oscillation and reciprocation of the arms the motion of said arms occuring substantially in a horizontal plane;

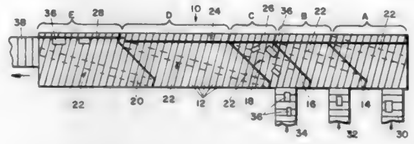
said arms as oscillated and reciprocated by said operating means and guided by said guide block and track means moving the bar in an orbital cycle to meet and engage an advancing row group of articles carried by the delivery conveyor and then advancing with the row group while applying a push laterally of the conveyor in said one direction across the line of travel of the articles until the engaged row group is pushed from the conveyor, and the bar then returning to meet and engage a succeeding row group of articles to repeat the cycle.

4,039,074

UNSCRAMBLER FOR RANDOMLY ARRANGED PACKAGES

Wesley R. Maxted, Grand Rapids, Mich., assignor to Rapistan, Incorporated, Grand Rapids, Mich.

Filed Nov. 5, 1975, Ser. No. 628,957
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—456 **8 Claims**



1. An unscrambler having a receiving end and a discharge end for arranging in tandem articles received in random orientation and spacing, comprising:

spaced, parallel, longitudinally extending side members;

a plurality of rollers extending between said side members, said rollers being coplanar and canted at a small angle relative to said side members so that the axes of said rollers converge towards one of said side members, said rollers lengthwise of said members being divided into a plurality of interfaced groups the interface between said groups being along a split line, said line being at an angle with respect to said side members;

means for driving said roller groups, said driving means driving each group of rollers at a different speed, the speed of the roller groups increasing progressively from the receiving end to the discharge end of the conveyor; and

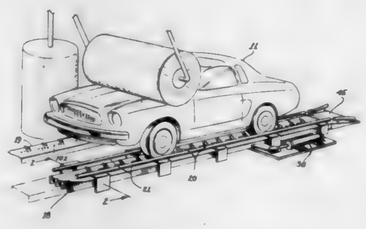
a guard rail mounted parallel to one of said side members so that articles conveyed by said roller groups are urged into contact with said guard rail while they are in transit over the unscrambler, said guard rail including an abrasive strip secured to the surface contacted by said articles whereby the coefficient of friction of said surface is increased.

4,039,075

METHOD AND APPARATUS FOR LINEARLY CONVEYING WHEELED VEHICLES

James Harrel Gray, 3411 East Gold Dust Ave., Phoenix, Ariz. 85028

Filed May 9, 1975, Ser. No. 576,169
Int. Cl.[2] B65G *25/04*
U.S. Cl. 198—746 **16 Claims**



1. A method for longitudinally advancing a vehicle through a predetermined distance, said vehicle being carried by at least a first pair and a second pair of independently rotatable wheels, said method comprising the steps of:

supporting one wheel in said first pair of independently rotatable wheels on a movable elongated plated while supporting the other wheel in said first pair of independently rotatable wheels on a stationary surface;

longitudinally reciprocating said plate between a forward position and a rearward position, the length of said reciprocation being substantially less than said predetermined length;

blocking the one wheel in said first pair of wheels to prevent both rotation of the one wheel and relative longitudinal movement between the one wheel and said plate as said plate moves toward its forward position;

maintaining the forward advancement of the one wheel in said first pair of wheels while permitting the one wheel to both rotate and move longitudinally relative to said plate as said plate moves toward its rearward position; and

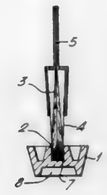
repeating the foregoing steps to incrementally advance said vehicle through said predetermined distance.

4,039,076

PACKAGING AND DISPLAY ARRANGEMENT FOR CHEMICALS

Jean-Jacques Desaules, Les Brenets, Switzerland, assignor to Fabrique d'Horlogerie Chs. Tissot et Fils S.A., Le Locle, Switzerland

Filed Feb. 26, 1976, Ser. No. 659,055
Int. Cl.[2] B65D *81/32*
U.S. Cl. 206—219 **5 Claims**



1. A packaging and display arrangement for chemicals which must be stored in isolation from one another but which are mixed together immediately prior to use, said packaging and display arrangement comprising, in combination:

a mixing and applying spatula;

a base member having a retaining channel and a mixing trough therein;

a sealed container comprising a flattened tube of flexible plastic film;

said flattened tube having an intermediate portion disposed in said retaining channel;

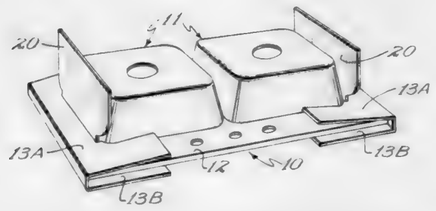
said spatula being removably disposed in said retaining channel and having a body configuration for pressing said intermediate portion of said flattened tube against said retaining channel to effectively divide said flattened tube into two compartments for holding said chemicals in isolation from one another.

4,039,077

RESTRAINING PAD FOR SINK PACKAGES

John F. Sorenson, Minneapolis, Minn., assignor to Hoerner Waldorf Corporation

Filed Aug. 2, 1976, Ser. No. 710,448
Int. Cl.[2] B65D *5/50, 75/04, 81/14*
U.S. Cl. 206—320 **1 Claim**



1. A package for storing and shipping a sink having at least one recessed well and a planar flange which is relatively thin in cross section, said package comprising:

a sink;

a pair of die cut sink restraining pads, one each of said pads positioned at the respective ends of said sink and partially folded to engage the flange of said sink;

each of said pads being folded into a generally U-shaped configuration with parallel sides and a narrow connecting section;

each side in each of said pads having formed therein an area which is defined by line cuts and a hinge line, said areas being moved downwardly into said wells of said sink and outwardly to lie in close relationship to the exterior perimeter of the well;

said sink and said pads located within a rectangular outer carton, the respective edges and surfaces of said pads preventing contact between said sink and said carton.

4,039,078

FASTENER ATTACHMENT STOCK

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 347,678, April 4, 1973, abandoned. This application July 10, 1975, Ser. No. 594,736
Int. Cl.[2] B65D *85/24*; B23P *11/02*
U.S. Cl. 206—343 **8 Claims**

1. Fastener stock comprising

two continuous and elongated plastic side members that are cross coupled by a plurality of cross links;

said stock being proportioned to be fed as a unit to a position where individual fasteners are separated therefrom within a machine;

one of said side members being proportioned so that each separated fastener includes a bar formed from a portion of the side member and is configured for feeding through the bore of a hollow needle having a longitudinal slot for passage of the associated cross link; and

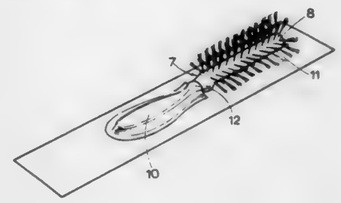
each cross link being foldable towards the associated end bar that is feedable through said hollow needle.

4,039,079

DISPLAY PACKS FOR BRUSHES

Malcolm Laughton, Birmingham, England, assignor to H. Goodman & Sons, Inc., Kearny, N.J.

Filed Jan. 7, 1976, Ser. No. 647,137
Claims priority, application United Kingdom, Jan. 11, 1975, 1218/75
Int. Cl.[2] B65D *73/00*
U.S. Cl. 206—461 **16 Claims**



1. A display pack comprising a stiff backing sheet bearing a brush having a handle and having a bristle portion including a shank from which bristles project, and a cover element having a portion defining an open-sided cavity and having flanges, and cooperating securing means on the backing sheet separate and distinct from said cove element, the cove element being mounted by its flanges on the backing sheet with its open side directed across the main part of the backing sheet and receiving said handle, the brush being made captive on the backing

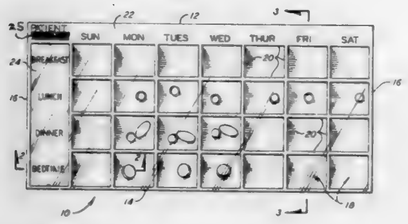
sheet by the cover element together with the cooperating securing means, and the bristles being exposed from the pack so that they can be felt.

4,039,080

DOSAGE INDICATING PILL TRAY

Joseph Anthony Cappuccilli, 404 Oak St., Syracuse, N.Y. 13203

Filed Mar. 23, 1976, Ser. No. 669,644
Int. Cl.² G09F 9/00; B65D 1/36; B85D 85/56
U.S. Cl. 206—534 **2 Claims**



1. A tray for holding prescribed dosages of pills, or the like, in compartments indicating the day and time such dosages are to be taken, said tray comprising:

a. a unitary base portion rectangular in plan view and having:

i. a first, rectangular, planar surface extending across said base portion from one side edge to the other and adjacent the top edge thereof;

ii. a second, rectangular, planar surface extending from the lower edge of said first planar surface to the lower edge of said base portion and adjacent one side edge thereof; and

iii. a rectangular array of individual compartments extending between said lower edges of said first planar surface and said base portion, and between the interior side edge of said second planar surface and the opposite side edge of said base portion;

b. said individual compartments each being of equal size, rectangular in plan view, arranged in seven columns and a plurality of rows;

c. said first planar surface bearing indicia adjacent said columns, labeling each with one of the days of the week;

d. said second planar surface being indicia adjacent said rows labeling each with a general time of day;

e. said individual compartments being formed of two planar, parallel side surfaces and a continuous bottom surface extending between said side walls and between upper and lower edges, said bottom surface being curved about a constant radius between said upper and lower edges;

f. said side and bottom surfaces of adjacent compartments being separated by wall means each having upper surfaces lying in a substantially common plane with said first and second planar surfaces; and

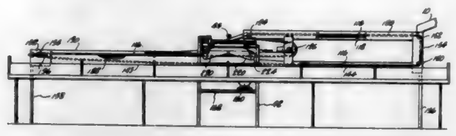
g. a flat cover attached to said base portion for hinged movement between a covering position, wherein one surface thereof lies in said common plane, and an uncovering position, allowing access to said compartments.

4,039,081

METHOD AND APPARATUS FOR SIZING AND DISTRIBUTING PRODUCE

Vernon J. Brandt, Reedley, Calif., assignor to Brandt Manufacturing Company, Inc., Reedley, Calif.

Continuation of Ser. No. 330,628, Feb. 8, 1973, Pat. No. 3,802,557. This application Apr. 9, 1974, Ser. No. 459,362
The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.
Int. Cl.² B07C 5/06
U.S. Cl. 209—73 **2 Claims**



1. A device for separating and distributing produce of dissimilar size, comprising

sizing means for receiving produce of dissimilar size from above and distributing that produce downwardly in a plurality of paths according to size;

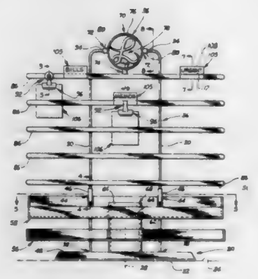
a single continuous transport means for transporting sized produce in two transport directions from said sizing means for subsequent distribution from said transport means and for transporting unsized produce to said sizing means, said transport means comprising a continuous conveyor belt defining at least three paths, a first path for transporting produce to said sizing means and distributing said produce downwardly into said sizing means, a second path below said sizing means for receiving sized produce from said sizing means and transporting same in the one direction and a third path below said sizing means for receiving sized produce from said sizing means and transporting same in the other direction.

4,039,082

MULTIPLE PAPER ITEM HOLDER

George Ladinsky, c/o P.O. Box 18992, Dockweiler Station, Los Angeles, Calif. 90007

Filed June 9, 1975, Ser. No. 585,341
Int. Cl.² A47F 7/00
U.S. Cl. 211—45 **9 Claims**



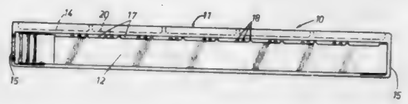
1. A multiple-paper-item holder comprising: a substantially non-tippable base member adapted to be supported by an underlying supporting structure; upstanding supporting framework means provided at the bottom with base-engaging means for attaching engagement with respect to said base member whereby to be firmly supported thereby, said supporting framework means comprising a pair of substantially rigid, upstanding rod-shaped members of substantially similr configuration but longitudinally spaced apart for longitudinal symmetricals spacing on each side of a central portion of said base member so as to extend upwardly therefrom on each side of a vertical centerline of said central portion of said base member; a plurality of substantially laterally directed, vertically spaced, transverse supporting arms for use in selectively mounting at desired locations with respect thereto any desired number of paper items; at least one controllably removably mountable clamp means including a controllably operable paper-item-engaging-and-disengaging clamp portion and a transverse supporting-arm-engaging mounting portion cooperable for controllably selectively placeable mounting engagement and effective attachment with respect to any selected portion of any of said transversely directed supporting arms for temporarily supporting and positioning a paper item in said clamp portion in depending relationship therebelow; said transverse supporting-arm-engaging mounting portion of each of said clamp means being of a magnetically mountable type comprising a magnetic mounting and attaching portion and wherein said transverse supporting arms have corresponding magnetic surface portions for magnetic attracting engagement therebetween whereby any of said clamp mans may be magentically mounted and supported in any selected location with respect to any portion of said magnetic surfaces of said transverse supporting arms; said pair of upstanding rod-shaped members of said supporting framework means being provided at successive upwardly spaced locations with a series of similarly displaced stepped portions whereby to cause each succeeding upwardly adjacent portion of the pir of rod-shaped members to lie in a progressively similarly displaced but substantially parallel, upwardly directed plane and wherein the depending relationsyip of paper items supported by said clamp means engaged and mounted with respect to each transverse supporting arm is such as to cause the depending lower portion of such a supported paper item to be positioned behind the next lower adjacent, transversely directed supported arm by reason of said sequential series of progressively displaced stepped portions of said pair of upwardly directed rod-shaped members of said supporting framework means to which each of said vertically displaced, transversely directed supporting arms is correspondingly attached, respectively.

4,039,083

TIE HANGER

Günter Leifheit; Johannes Liebscher, and Rainer Friedrich, all of Nassau (Lahn), Germany, assignors to Leifheit International Gunter Leifheit GmbH, Nassau (Lahn), Germany

Filed Feb. 5, 1975, Ser. No. 547,372
Claims priority, application Germany, Feb. 7, 1974, 2405756
Int. Cl.² A47F 5/08
U.S. Cl. 211—96 **10 Claims**



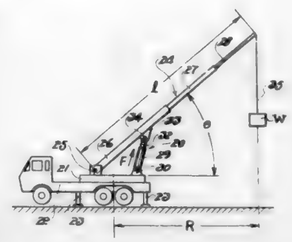
3. A tie hanger mountable on a supporting surface and comprising a housing having a back wall adapted to be mounted on said supporting surface, an upper wall, two end walls, and two lower wall portions extending substantially parallel to said upper wall downwardly spaced therefrom, said walls defining therebetween an opening; a plurality of arms each having two spaced ends and a length sufficient to permit a plurality of adjacent ties to be hung from said arms, each of said arms being pivotally mounted in said housing by one end of said arm and being pivotable through said opening between an access position in which the other end of said arm is remote from said housing and a storage position in which the other end is supported by said housing, said arms each having a length and a height corresponding substantially to the length and the height of said opening; and means for pivotally mounting said one end of each of said arms in said housing.

4,039,084

SAFETY-GUARD FOR A CRANE

Shinitsu Shinohara, Takamatsu; Hisanori Uchino, Tokyo, and Hiroyuki Yamaji, Kagawa, all of Japan, assignors to Tadano Ironworks Co., Ltd., Takamatsu, Japan

Filed June 26, 1972, Ser. No. 266,355
Claims priority, application Japan, July 6, 1971, 46-49241; Sept. 13, 1971, 46-83664[U]
Int. Cl.² B66C 13/48
U.S. Cl. 212—39 MS **6 Claims**



1. In a crane having a base, a boom pivotally mounted on the base so that the lift angle thereof may be varied, and at least one hydraulic cylinder unit connected to the base and the boom for varying the lift angle of the boom, the hydraulic cylinder unit comprising a cylinder, a piston slidably inserted in the cylinder in a fluid-tight manner, and piston rod connected to the piston at one end thereof and projected outwardly from the cylinder and having a hollow end, a safety guard comprising:

a. support means secured to the piston rod within said hollow end thereof for supporting stress-detecting means,

b. stress-detecting means for detecting stress in the axial direction of the cylinder unit by the moment applied to the boom by the weight of the boom and a load carried by the boom, the stress-detecting means including at least one strain-detecting gauge fixedly mounted within said piston rod on said support means, the stress-detecting means providing an electrical output signal corresponding to the stress in response to strain of said support means detected by the gauge,

c. safety-limit signal generating means for generating an electrical signal which corresponds to a predetermined maximum allowable moment applied to the boom, and

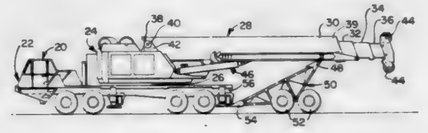
d. safety means for receiving the electrical output signal from the stress-detecting means and the electrical signal from the safety-limit signal generating means and for determining a relationship therebetween.

4,039,085

CRANE WITH A PIVOTED BOOM AND A FLOAT VALVE THEREFOR

Lynn W. Livengood, Chattanooga, Tenn., assignor to Koehring Company, Milwaukee, Wis.

Filed June 10, 1976, Ser. No. 694,832
Int. Cl.² B66G 23/62
U.S. Cl. 212—46 R **13 Claims**



1. In a crane having carrier means, boom means, hydraulic cylinder means for controlling elevation of the boom means, and load-holding check valve means for the hydraulic cylinder means to prevent accidental loss of actuating pressure, inten-

tionally operable means for allowing the boom means to float during transportation of the crane between job sites comprising:

float valve means between the check valve means and the hydraulic cylinder means having actuating fluid channels extending between the check valve means and the hydraulic cylinder means, a cross-over channel means extending between the actuating fluid channels, and flow control means having a first condition operable to prevent fluid communication between the actuating fluid channels and a second condition operable to permit fluid communication between the actuating fluid channels; and

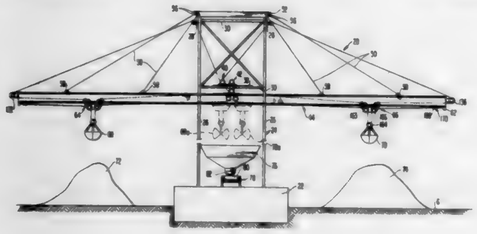
means for causing the flow control means to assume the first condition during normal load lifting operations of said crane and being intentionally operable for causing the flow control means to assume the second condition to facilitate crane transporting operations.

4,039,086

LOAD BALANCE, DOUBLE BUCKET CABLE STAY CRANE WITH LOAD SENSING MEANS

Louis F. Ray, P.O. Box 14702, Baton Rouge, La. 50808

Filed July 14, 1976, Ser. No. 705,181
Int. Cl.[2] B66C *23/00, 13/16*
U.S. Cl. 212—47 **9 Claims**



1. A balanced double load gantry crane comprising:

a base,

a tower mounted on said base and extending substantially vertically upwards therefrom,

a gantry mounted to said tower above said base and having portions extending horizontally outward from opposite sides of said tower in cantilever fashion,

trolleys mounted on respective sides of said tower for movement horizontally along said gantry,

a load carrying member for each trolley,

a trolley lift assembly including a first drive means and vertically movable hoist cable means operatively connecting said load carrying members and said trolleys respectively for suspending said load carrying members from said trolleys and for raising and lowering said movable hoist cable means and said load carrying members,

a trolley travel assembly including a second drive means and travel cable means coupling said trolleys to said second drive means for moving said trolleys simultaneously along said gantry in opposite directions at the same speed and at the same relative distance from said tower,

means for measuring the load imparted by the load carrying members on said crane through said trolleys,

comparator means for comparing said loads,

a power source for said drive means, and

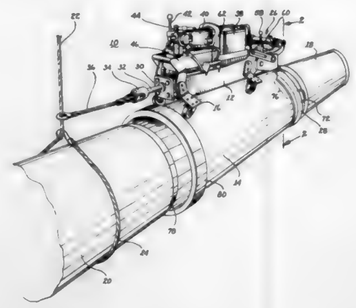
means responsive to said comparator means for controlling operation of said at least first drive means to prevent lifting of said loads unless said loads are substantially equal.

4,039,087

PIPE LAYING APPARATUS

Robert M. Sandvick, Sr., 11436 S. 51st St., Phoenix, Ariz. 85040

Filed Nov. 17, 1976, Ser. No. 742,588
Int. Cl.[2] B63P *19/04*
U.S. Cl. 214—1 PA **10 Claims**



1. In a pipe laying apparatus for temporary attachment to a horizontally oriented section or pipe for inhibiting relative longitudinal movement between said apparatus and said pipe, the combination comprising:

a. an elongated frame, having a longitudinal axis, positionable on the top surface of said pipe section with the longitudinal axis of said frame generally parallel to the longitudinal axis of said pipe section;

b. pipe encircling means having a pair of substantially coplanar arms for at least partially surrounding the outer circumference of said pipe section;

c. securing means for pivotably securing said pipe encircling means to said frame about an axis substantially perpendicular to the longitudinal axis of said frame;

d. tilting means for applying a longitudinal force to said frame for tilting the plane of said pipe encircling means relative to the vertical axis of said pipe section to force said pipe encircling means into engagement with the outer circumference of said pipe section;

e. locking means coupled to each of said pair of arms for locking said pair of arms in a partially surrounding portion with respect to said pipe section; whereby said pair or arms of said pipe encircling means wedge against the outer surface of said pipe section and prevent relative longitudinal movement between said apparatus and said pipe section.

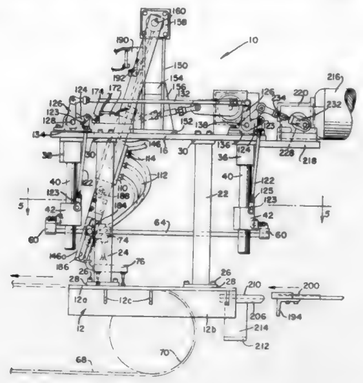
4,039,088

TRANSFER APPARATUS

William E. Marynissen, Old Greenwich, Conn., assignor to Bic Pen Corporation, Milford, Conn.

Filed Dec. 2, 1975, Ser. No. 637,048
Int. Cl.[2] B65G *57/04*
U.S. Cl. 214—1 BT **13 Claims**

1. A transporter apparatus for transporting a plurality of articles picked-up at a first location to a second location removed therefrom and at which the articles are deposited at different spacing comprising in combinations, frame means, carriage means, first means supporting said carriage means on said frame means for movement of said carriage means limited to movement in mutually opposite directions between a pair of spaced limit positions, transfer means at least equal in number to the number of articles transported movable between said locations, the movement of said transfer means between said locations including movement in a direction substantially perpendicular to the direction of movement of said carriage means, second means supporting each said transfer means on said carriage means, prime mover means having an output, first movement producing means connecting said output to said carriage means for moving said carriage means between said pair of spaced limit positions, second movement producing means connecting said output to said second supporting means for moving each said transfer means between said locations,



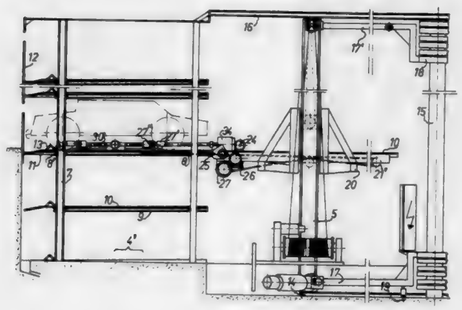
and each of said first and second movement producing means including an intermittently engageable uni-directional drive coupling whereby said carriage means and each said transfer means undergo movement both concurrently and individually.

4,039,089

RADIAL VEHICLE PARKING APPARATUS WITH A PLURALITY PARKING MACHINES

Uwe Kochanneck, 81, Neuer Graben, Dortmund, Germany

Continuation of Ser. No. 450,712, April 29, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,383
Int. Cl.[2] E04H *6/06*
U.S. Cl. 214—16.1 A **6 Claims**



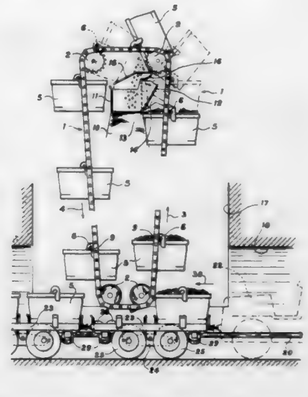
1. An automatic high garage, comprising upright support means forming a plurality of vertically superposed parking levels; a plurality of pairs of parking tracks forming at each of said levels an annulus of parking spaces, the parking tracks of each pair having inner end portions and also having outer end portions facing outwardly of the respective annulus and said tracks sloping in direction towards said end portions; limit means at said end portions for preventing vehicles from moving beyond the latter; and parking means within the space defined by said annuli for parking vehicles on and retrieving them from the respective parking spaces, said parking means comprising a circular rail in said space, a central upright column, a plurality of parking machines travelling along said rail and guided by said column, each of said parking machines comprising a load table unit having a base frame and a pair of transfer tracks carried by the same and adapted to support a vehicle, each of said parking machines comprises a retrival unit for transferring vehicles between respective parking and transfer tracks, said transfer tracks extending substantially radially of said annulus and having outer ends adapted to be aligned but forming a gap with said inner end portions of respective pairs of said parking tracks for transfer of a vehicle between the respective aligned parking tracks and transfer tracks, intermediate rollers mounted to be raised into and lowered out of the respective gap, and means for raising and lowering said rollers.

4,039,090

MUCK-EVACUATING SYSTEM IN TUNNELING OPERATION

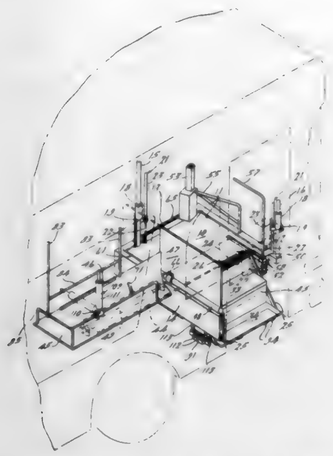
Bernard Desourdy, 545 deNormandie Street, Longueuil, Quebec, Canada

Division of Ser. No. 616,824, Sept. 25, 1975. This application Nov. 16, 1976, Ser. No. 742,256
Int. Cl.[2] B65G *67/02*
U.S. Cl. 214—40 **10 Claims**



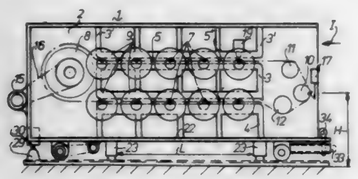
1. A muck-evacuating system in tunneling operation for use in a tunnel having a shaft opening at ground level, said system including a train of wagons adapted to travel in the tunnel between the tunnel face and the shaft and a plurality of receptacles removably carried by said wagons and a receptacle elevator located within said shaft and upwardly extending from said tunnel to ground level and adapted to automatically pick up the filled receptacles one by one off the train of wagons, raise said receptacles through said shaft, automatically trip the receptacles over to discharge the muck therefrom at ground level, then lower the empty receptacles and deposit the same back onto the wagons, each of said receptacles having a pair of hook members on opposite sides thereof, said receptacle elevator including a pair of separate and laterally spaced-endless conveyor bands, each conveyor band having two longer runs longitudinally extending upwardly through said shaft and forming an elevating conveyor run and a lowering conveyor run respectively in co-operation with, and separate from, the two longer runs of the other endless conveyor band, hooking members secured to said endless conveyor bands in spaced-apart relationship along the latter and in transverse register with the hooking members of the other conveyor band, and adapted to pivotally engage with hook members on opposite sides of a loaded receptacle on a wagon to raise said loaded receptacle off the wagon, a material collecting chute extending transversely between said conveyor runs at the upper end of said shaft and a receptacle tripper device mounted at the upper end of the elevating conveyor runs adjacent the chute, positioned in the path of the receptacles, to tile the latter one by one over for emptying thereof into the chute, whereby said receptacles are emptied, the lowering conveyor runs lowering the emptied receptacles and depositing the same back onto a wagon.

4,039,091
ELEVATOR TYPE BUS BOARDER
Donald F. Adamski, Danville, and Sol L. Morrison, Sierra Madre, both of Calif., assignors to MB Associates, San Ramon, Calif.
Filed Mar. 25, 1976, Ser. No. 670,161
Int. Cl.[2] B60P *1/48*
U.S. Cl. 214—77 R **15 Claims**



1. An elevator platform for a bus, including a reinforced frame providing an outwardly presenting U-shaped well at the bus entrance, a platform for raising and lowering movement within said well, guide means between said platform and frame, rams connected between said frame and platform for moving the platform upwardly and downwardly while guided by said guide means, a pair of spaced links pivoted at each side near the front of the platform, step plates pivoted between said links to form steps to the platform at said entrance, a torsion bar pivoted to the front portion of said platform and secured to the ends of the top links of the pairs, and cam means positioning said links when the platform is moved to different positions.

4,039,092
BOBBIN PACKAGE STORAGE BOX
Hugo Schär, Dattlikon, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland
Filed Apr. 7, 1976, Ser. No. 674,656
Claims priority, application Switzerland, Apr. 16, 1975, 4828/75
Int. Cl.[2] D01H *13/26*; B60P *1/38*
U.S. Cl. 214—83.36 **10 Claims**



1. A bobbin package storage box capable of traveling upon at least one rail, comprising means defining a storage box, an endless chain provided for the storage box, means for driving the endless chain to revolve in a substantially vertical plane, a bobbin transfer point provided at a region of the path of travel of the endless chain and associated with a winding machine, bolts carried by the endless chain for receiving and supporting full textile bobbin packages, and means for selectively adjusting the position of the bolts at the bobbin transfer point according to the specific position of such bobbin transfer point while the remainder of the bolts are maintained in a predetermined position corresponding to an idling position of the endless chain.

4,039,093
BOOM ARM SUPPORT LOCK
Floyd Albert Schmitz, Jr., and Wayne Gerald Smith, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.
Filed Aug. 30, 1976, Ser. No. 718,940
Int. Cl.[2] B66C *23/00*
U.S. Cl. 214—130 R **1 Claim**

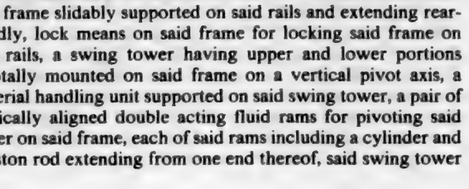


1. A boom arm safety lock comprising a boom arm pivotally mounted for up and down pivotal movement and extending in a direction away from the pivot axis thereof, a fluid cylinder assembly pivotally mounted on a pivot axis below the first-mentioned said pivot axis and having a cylinder and an extendable rod, said cylinder assembly being pivotally connected with said boom arm for inducing the up and down pivotal movement of said boom arm in response to respective extension and contraction of said cylinder assembly, a lock bar pivotally mounted at one end on said boom arm for pivotal movement in a vertical plane beneath said boom arm to positions parallel with and forming an angle with said boom arm for then upwardly supporting said boom arm, a V-shaped, downwardly open clevis disposed at the other end of said lock bar and being of a size to span said rod and abut said cylinder and thereby be in the position of retaining said cylinder assembly extended for supporting said boom arm and secure sand lock bar in the supporting position to thereby retain said boom arm pivoted upwardly irrespective of the supporting force of said cylinder assembly, said lock bar other end having a pin opening therein and within the confines of said clevis and axially aligned with the length of said lock bar, a retaining pin slidably mounted on the underside of said boom arm and being located thereon to align longitudinally with and be partly received in said pin opening when said lock bar is pivoted parallel to said boom arm for releasably securing said other end of said lock bar to said boom arm, and a spring operative on said pin for urging said pin into said clevis and said pin opening the shape of the pin and the pin opening being the same for the pin opening to receive the pin.

4,039,094
AERIAL LIFT PLATFORM WITH EXTENDABLE WHEELS
John Landis Grove, Greencastle, Pa., assignor to Fulton Industries, Inc., McConnellsburg, Pa.
Filed Dec. 23, 1975, Ser. No. 643,871
Int. Cl.[2] E02F *3/70*
U.S. Cl. 214—132 **4 Claims**

1. The method of providing stabilization of a vehicle, said vehicle comprising a chassis, front and rear axles supporting said chassis, and wheels on said front and rear axles for supporting said vehicle, and wherein said vehicle further comprises a turret rotatably mounted on said chassis and means for rotating said turret about a vertical axis, a boom pivotally secured to said turret on a horizontal axis and means for vertically pivoting said boom, said boom being telescopic and means for telescopically extending and retracting said boom, said boom having a workman-supporting platform at the end thereof remote from said turret, said method comprising:

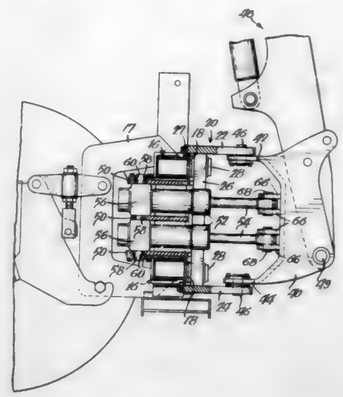
a. providing extensible supports for said axles,
b. providing motor means for extending and retracting said axles,
c. positioning said turret so that said boom extends over a first axle,
d. pivoting said boom downwardly by operation of said boom pivoting means to engage the outer end of said boom with the ground and continuing operation of said boom pivoting means to thereby elevate said first axle,
e. operating the axle extending and retracting motor means of said first axle to extend said first axle,
f. pivoting said boom upwardly by operation of said boom



pivoting means to raise the boom outer end above the ground and to simultaneously lower the wheels of said first axle into engagement with the ground,
g. rotating said turret to a position in which said boom extends over the second axle,
h. pivoting said boom downwardly by operation of said boom pivoting means to engage the outer end of said boom with ground and continuing operation of said boom pivoting means to thereby elevate said second axle,
i. operating the axle extending and retracting motor means of said second axle to extend said second axle, and
j. pivoting said boom upwardly by operation of said boom pivoting means to raise the boom outer end above the ground and to simultaneously lower the wheels of said second axle into engagement with the ground,
k. whereby to provide a base of increased width at both said first and second axles of said vehicle without the use of additional equipment for elevating a part of the vehicle to permit axle extension, so as to provide improved stabilization of said vehicle for all positions of said extendable and pivotable boom and of said rotatable turret.

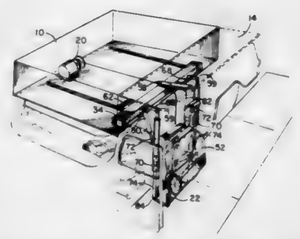
4,039,095
SWING MECHANISM FOR BACKHOE
Elton B. Long, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.
Continuation-in-part of Ser. No. 556,588, March 10, 1975, abandoned. This application Feb. 18, 1976, Ser. No. 659,170
Int. Cl.[2] E02F *3/32*
U.S. Cl. 214—138 D **3 Claims**

1. An earthworking implement including a vehicle having transversely spaced rear wheels, a pair of horizontally extending vertically spaced elongated slide rails fixed to said vehicle and located directly rearwardly of said rear wheels with the ends of said rails located behind said rear wheels, a side shiftable frame slidably supported on said rails and extending rearwardly, lock means on said frame for locking said frame on said rails, a swing tower having upper and lower portions pivotally mounted on said frame on a vertical pivot axis, a material handling unit supported on said swing tower, a pair of vertically aligned double acting fluid rams for pivoting said tower on said frame, each of said rams including a cylinder and a piston rod extending from one end thereof, said swing tower having first and second pins supported thereon and respectively spaced from said pivot axis with free ends of said piston rods respectively pivoted directly on the respective pins, said frame having a portion extending forwardly between said rails with said cylinders being located between said rails and supported on a common vertical pivot on a forward end of said portion so that opposite ends of said cylinders are located



between said wheels so that said vertical pivot axis and said first and second pins are located in close proximity to said slide rails to position the center of gravity of said material handling unit close to said rear wheels, and means for simultaneously supplying fluid to both of said cylinders so that both cylinders act to pivot said tower during a major portion of the swing arc of said tower.

4,039,096
WHEELCHAIR STORAGE APPARATUS
David E. McAllister, R.F.D. 2, Harrison, Maine 04040
Filed June 28, 1976, Ser. No. 700,205
Int. Cl.[2] B60R *9/00*
U.S. Cl. 214—450 **4 Claims**



1. An apparatus for storage of a wheelchair on top of a motor vehicle comprising:

a ramp member upon which said wheelchair is loaded;
at least one beam member affixed to said ramp member;
a casing, having an opening, mounted on the top of said vehicle;
a frame member affixed to the floor of said casing;
a frame pivotal member pivotally attached at one end to said frame member;
a frame raising member pivotally attached at one end to the other end of said frame pivotal member;
a frame lever member affixed perpendicularly to said frame raising member;
an upper beam attachment member affixed to the other end of said frame raising member for the pivotal attachment of said beam member; and

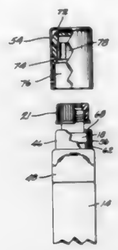
means for rotating said frame pivotal member and frame raising member in order to raise said ramp and beam member into said casing and to lower said ramp and beam member to ground level upon reversing the direction of rotation.

4,039,097

GLASS CONTAINER AND ADAPTER RING

Theodore Paul Venti, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.

Division of Ser. No. 600,289, July 31, 1975, Pat. No. 3,994,709. This application June 9, 1976, Ser. No. 694,332
Int. Cl.[2] B65D *23/08*
U.S. Cl. 215—12 R **6 Claims**



1. A glass container comprising:
a bottle having a body and a neck with a bead generally adjacent said neck;
a resilient adapter ring having a plurality of spaced, inwardly projecting ribs engaging said bead, each said rib being narrow relative to the circumference of said adapter ring;
a decorative overlay including a cylindrical sleeve portion, said cylindrical sleeve portion fitting over and snugly engaging said resilient adapter ring;
said bead defining an inwardly projecting under surface;
each of said ribs on said resilient adapter ring including an inwardly projecting hook generally at the bottom thereof, said inwardly projecting hook extending inwardly underneath said under surface of said bead whereby inadvertent removal of said resilient adapter ring from said glass container is prevented;
each of said inwardly projecting hook including a beveled bottom surface to facilitate sliding said hook portions over said bead when said adapter ring is fitted over said bead; and
each of said hooks including a flat, generally horizontal upper retaining surface engaging said under surface of said bead.

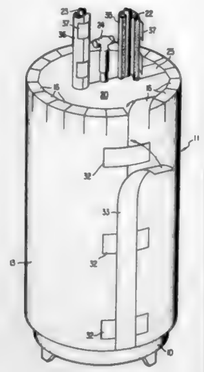
4,039,098

THERMAL INSULATION JACKET FOR WATER HEATERS

Kenneth Morris Stilts, P.O. Box 17087, Nashville, Tenn. 37217

Filed Jan. 5, 1976, Ser. No. 646,646
Int. Cl.[2] B65D *25/20*
U.S. Cl. 220—63 R **5 Claims**

1. A thermal insulating jacket for application to both the top and longitudinal periphery of a home hot water heater which has pipes extending from the top surface thereof, said jacket comprising:
a substantially flat, one-piece disc having top and bottom surfaces and composed of a continuous layer of fiberglass of a constant thickness wherein a sheet material backing is adhered to the top surface, a slit extending entirely through the disc from the periphery of the disc past the center of the disc and terminating before again reaching the periphery of the disc, said slit having abutting parallel sides wherein the pipes project through the slit and are engaged by the sides of the slit, the bottom surface of said disc projecting beyond the periphery of the hot water heater a distance substantially equal to the thickness of the disc;
a rectangular wrapper for application around the longitudinal periphery of the hot water heater, said wrapper having an upper edge joined by side edges, said wrapper being made of a continuous layer of fiberglass of constant thickness, equal to the thickness of the fiberglass layer of the disc, wherein the fiberglass is adhered to a backing sheet and wherein the wrapper is readily foldable and also wraps in a single layer around the longitudinal periphery of the tank so that the projecting bottom surface of the



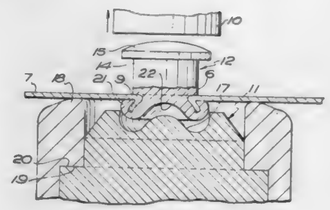
disc overlies the upper edge of the wrapper and the side edges of the wrapper meet;
a plurality of tabs extending from the upper edge of the wrapper a distance greater than the thickness of the disc, and an adhesive on the tabs so that when the tabs are folded over the disc, the tabs adhere to the disc retaining the upper edge of the wrapper in engagement with the disc, and
strips of tape for closing and sealing the slit in the disc and for holding the opposite edges of the wrapper together to thereby seal the wrapper where the side edges meet.

4,039,099

SECURING OF RIVETS TO PORTABLE ARTICLES

Charles W. Boxall, Norwich, England, assignor to National Can Corporation, Chicago, Ill.

Filed Feb. 11, 1976, Ser. No. 657,191
Int. Cl.[2] B65D *25/32*
U.S. Cl. 220—91 **1 Claim**



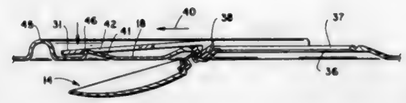
1. A portable article having a pair of metal rivets each of which is permenently secured to a respective flat wall portion of the article, each of said rivets including a solid shank portion engaging an outer surface of said flat wall portion and an enlarged head on an outer end of said shank spaced from said flat wall portion to receive a carrying handle, said shank having a reduced tubular end portion extending from an end opposite said enlarged head with said flat wall portion having an opening receiving said tubular end portion said flat wall portion having an inwardly directed rim integral therewith and surrounding said opening with said rim defining an acute included angle in cross section with said flat wall portion so that said rim extends away from said opening, said solid shank portion having a concave surface in cross section at said opposite end adapted to engage a tool for deforming said tubular end portion, said tubular end portion being permanently deformed completely around said rim and being contiguous to both opposed surfaces thereof, said tubular end portion engaging an inner surface of said flat wall portion to permanently secure said rivet to said flat wall portion.

4,039,100

CONTAINER HAVING NON-REMOVABLE OPENING MEMBER WITH ATTACHED OPENING LEVER

Robert A. Wells, 4450 Harris Trail NW., Atlanta, Ga. 30327

Filed July 28, 1976, Ser. No. 709,439
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 **8 Claims**



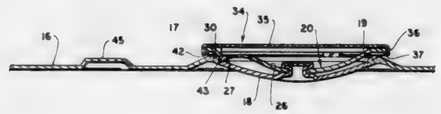
1. Easy opening wall apparatus for a container, comprising:
a wall having an outer side and an inner side;
an openable member smaller than said wall and defined in said wall by a selectably separable region of. weakness completely surrounding said openable member;
a separate opening tab member secured to the outer side of said openable member and overhanging at least a sufficient portion of said separable region to engage said outer side of said wall and prevent said opening tab member and said attached openable member from freely entering the container through said wall upon separation of said separable region,
said opening tab member having a first portion which is manually movable outwardly away from said outer side to move a second portion of the opening tab member inwardly to contact said wall in the vicinity of said separable region and fracture said separable region; and
means operative to retain said openable member on said wall when said separable region has become separated.

4,039,101

CLEAN COVER FOR EASY-OPEN CONTAINER TAB

Robert A. Wells, 4450 Harris Trail NW., Atlanta, Ga. 30327

Filed Jan. 18, 1977, Ser. No. 760,380
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—269 **10 Claims**



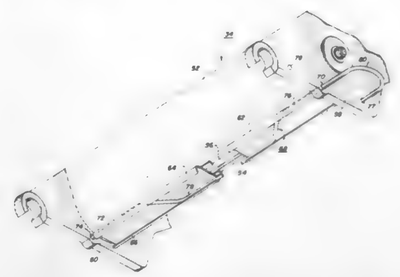
1. An easy opening end member for a container, comprising:
a panel having an openable member defined therein by a selectably separable region;
an opening tab member secured to said openable member and having means which overlies at least a portion of said separable region; and
means disposed on said opening tab member and covering substantially all of said opening tab member, so that said opening tab member as well as the portions of said panel beneath said opening tab member are protected from exposure to foreign matter.

4,039,102

DEVELOPER DOOR WITH USE COUNTER ON DOOR

Stanley D. Klett, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1976, Ser. No. 670,517
Int. Cl.[2] B67D *5/22*
U.S. Cl. 222—38 **2 Claims**



1. An improved developer for developing an electrostatic latent image on a photoreceptor, the developer having a housing for containing developing material, the housing having a bottom and a first side and an opposite second side both of which sides extend below the bottom, means for applying the developing material to the photoreceptor, and a discharge opening formed in the bottom of the housing for emptying the developing material when it is desired to change the latter, wherein the improvement comprises:
a. a dump door having means forming first and second channels thereon, the channels being parallel to and facing each other and generally perpendicular to the first and second sides of the developer housing,
b. means for pivotally supporting the door for movement toward and away from the discharge opening to close and open the latter, the pivotally supporting means including:
a unitary actuator rod having a first portion slidably retained in the first channel and a second portion slidably retained in the second channel, and a first opening formed in the first side of the developer housing through which one end of the actuator rod extends to pivotally support one end of the dump door, and
c. means including a loop on the one end of the actuator rod, and a second opening formed in the first side of the developer housing into which the tip of the loop extends for retaining the dump door in a closed position, whereby the loop can be pulled to cause the rod to slide within the channels to remove the tip from the second opening and thus allow the door to be moved away from the discharge opening.

4,039,103

PRESSURIZED DISPENSING CONTAINERS

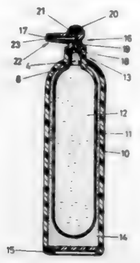
Hubert Juillet, 25 rue Roger-Salengro, 68100 Mulhouse, France

Filed Dec. 18, 1974, Ser. No. 533,820
Int. Cl.[2] B65D *35/28*
U.S. Cl. 222—95 **5 Claims**

1. A container for dispensing pasty, powdery, semi-liquid and similar products, comprising:
a. a rigid hollow outer body, including an end wall, and a generally cylindrical, relatively non-crushable sidewall open at its outer end, said end wall having outlet means integrally formed thereon and which includes a valve housing;
b. a deformable hollow inner body disposed within said rigid hollow outer body, said inner body being formed in a single integral piece of synthetic plastic material with said end wall of said outer body in surrounding relation to said outlet means, said sidewall of said outer body also being formed of said single integral piece of synthetic plastic

material and being substantially thicker than said inner body whereby it is relatively non-crushable with respect to said inner body;

c. valve means received within said valve housing for controlling flow from said hollow inner body; and



d. capsule means sealing the outer end of said cylindrical sidewall of said outer body,

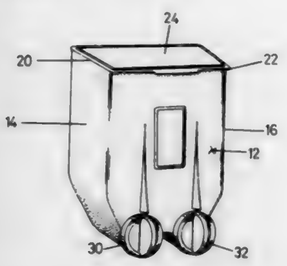
e. the inner body containing a product to be dispensed, and the space between said inner body and said outer body containing a gas under pressure tending to propel the product through the outlet.

4,039,104

WALL MOUNTED MULTIPLE-UNIT DISPENSER WITH ROTARY DISCHARGE ASSISTANTS

John Anthony Mijares, Jr., Miami Lakes; Ross J. Petrie, Fort Lauderdale; John Anthony Mijares, Sr., Miami Lakes, and Charles S. Alvarez, Hialeah, all of Fla., assignors to Anthony J. Mijares, Jr., Miami Lakes, Fla.

Filed May 17, 1976, Ser. No. 687,249
Int. Cl.[2] B67D *5/60, 5/32*
U.S. Cl. 222—144.5 **7 Claims**



1. In a multiple-unit dispenser including,

at least two side-by-side containers having upper and lower ends, said containers having a pair of mouths at said upper ends for filling of said containers with liquids and a pair of openings respectively at said lower ends discharging said liquids; and valve means for said openings for opening and closing the same;

the improvement wherein:

said containers are both parts of a single, integral housing;

said valve means comprises a pair of rotary valves rotatable in said housing at said openings for opening and closing the same; and

said dispenser includes a one-piece lid means removably mounted on both of said mouths for normally closing the same; and

wall mounting bracket means for mounting said housing on a wall;

said bracket means having an upper portion including a U-shaped, upper spring finger for grasping said housing;

said bracket means having a lower portion including a lower finger for grasping said housing; and

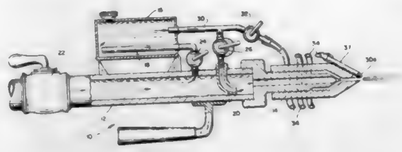
said lid means having a downwardly extending projection engageable with said upper spring finger for preventing release thereof without removal of said lid means from said mouths, and means for retaining said lid means laterally of said housing.

4,039,105

FERTILIZER DISPENSER

See Fong Chan, 47-09 Newtown Road, Astoria, N.Y. 11103

Filed Jan. 23, 1976, Ser. No. 651,638
Int. Cl.[2] B05B *7/30*
U.S. Cl. 222—193 **1 Claim**



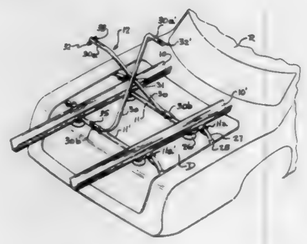
1. A liquid-solid mixture dispenser system comprising a flow line having an outlet end and adjustment control means thereof, a container for storing material, an inflow tube and an outflow connecting said flow line and said container, said inflow tube extending substantially farther into said container than said outflow tube, said outflow tube extending substantially farther into said flow line than said inflow tube, a second outflow tube being in communication with said container having an end opening juxtaposed to the outlet end of said flow line, said second outflow tube including an expansion coil mounted on said flow line near the outlet end thereof, whereby said expansion coil permits said second outflow tube and the outlet end of said flow line to remain in position during the control adjustment at the outlet end of the flow line.

4,039,106

AUTOMOBILE BICYCLE CARRIER

Thomas L. Graber, Madison, Wis., assignor to Joseph V. Graber, Middleton, Wis.

Continuation-in-part of Ser. No. 569,211, April 18, 1975, abandoned. This application June 10, 1976, Ser. No. 694,530
Int. Cl.[2] B60P *3/06*
U.S. Cl. 224—29 R **6 Claims**



1. In an automobile bicycle carrier for supporting at least two bicycles including first and second channels each adapted to receive the front and rear wheels of a bicycle, front and rear cross-frame members extending crosswise of the channels and detachably secured thereto to mount the channels in laterally spaced relatively parallel relation, means for mounting the cross-frame members on a vehicle, and support means attached to the cross-frame members intermediate said pair of channels and extending upwardly therefrom for engaging a portion of the frame of a bicycle in each of said channels, the improvement wherein said support means includes first and second

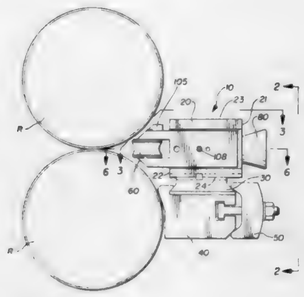
elongated members each having an integral lower end portion curved to extend laterally therefrom and provide a lateral mounting foot and an integral upper end portion curved to extend laterally therefrom and provide a lateral bicycle mounting arm, means detachably securing the lateral mounting foot on the first elongated member to the front cross-frame member with said first elongated member extending upwardly and rearwardly from the front cross-frame member generally parallel to an upright plane intermediate the channels and with the lateral bicycle mounting arm thereon extending to one side of said upright plane into overlying relation to said first channel, means detachably securing the lateral mounting foot on the second elongated member to the rear cross-frame member with said second elongated member extending upwardly and forwardly from the rear cross-frame member generally parallel to said upright plane and with the lateral bicycle support arm thereon extending to the other side of said generally upright plane into overlying relation to said second channel, said first and second elongated members crossing each other at a location intermediate the upper and lower ends thereof and such that the lateral bicycle support arm on the first elongated member is spaced rearwardly a substantial distance from the lateral bicycle support arm on the second elongated member, means detachably interconnecting the first and second elongated members at the location of the crossing, and clamp means on each of the lateral bicycle support arms for detachably engaging a portion of the frame on a bicycle resting in the channel below the respective arm.

4,039,107

ROLLER ENTRY GUIDE HAVING IMPROVED GUIDE INSERT AND ROLLER ADJUSTMENT MEANS

Robert E. Boley, Main and Canal Sts., Brinkhaven, Ohio 43006

Filed Nov. 12, 1975, Ser. No. 630,982
Int. Cl.[2] G03B *1/56*
U.S. Cl. 226—91 **9 Claims**



1. A roller entry guide, comprising;

A. a housing having

1. an intake end and a discharge end and
2. a through central bore communicating said intake and discharge ends;

B. a pair of guide rolls

1. externally mounted on said housing adjacent said discharge end,
2. and spaced from the center line of said through central bore of said housing;

C. a first guide insert

1. secured to said housing within said through central bore thereof adjacent said discharge end,
2. with one end thereof partially projecting beyond said discharge end in close proximity with said guide rolls,
3. having a through central passageway disposed coaxially with said through central bore of said housing;

D. a second guide insert

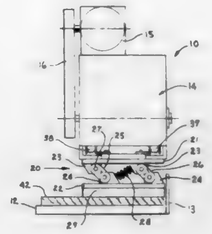
1. secured to said housing within said through central bore thereof,
2. with one end thereof in abuttment with the non-projecting end of said first guide insert and
3. the remaining end thereof projecting beyond the intake end of said housing and
4. having a through central passageway in communication with said passageway of said first guide insert.

4,039,108

FEEDING AND HOLD DOWN MECHANISM FOR A SANDING AND SHAPING MACHINE

Norman Hahn, and Raymond G. Martin, both of East Earl, Pa., assignors to Conestoga Wood Products, Inc., East Earl, Pa.

Filed Apr. 27, 1976, Ser. No. 680,713
Int. Cl.[2] B65H *17/34*
U.S. Cl. 226—171 **8 Claims**



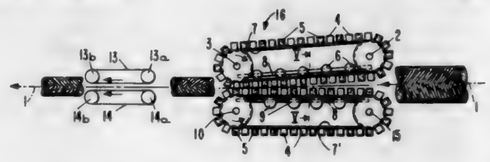
1. A feeding and hold down mechanism comprising, in combination, a work surface, drive means, a plurality of feeding and hold down members individually connected to said drive means for motion in a substantially continuous loop over said work surface to feed and hold a work piece against the work surface as the work piece is conveyed along the work surface, wherein the feeding and hold down members are comprised of a pair of parallel spaced apart plate members disposed one above the other, means to pivotally interconnect said plate members so that the lower of the two plates yields vertically in parallel relation to the other plate, means to continuously urge said plate members apart, and resilient pad means fixed to said lower plate for engaging a work piece whereby said feeding and hold down mechanism imparts a vertical and horizontal component of force to the work piece as it travels with respect to the work surface.

4,039,109

APPARATUS FOR PULLING A LINE

Herbert M. Rhodes, P.O. Box 8, Belle Chasse, La. 70037

Filed July 23, 1975, Ser. No. 598,281
Int. Cl.[2] B65H *17/34*
U.S. Cl. 226—172 **19 Claims**



1. Apparatus for pulling a line comprising:

a first endless belt having a longitudinal axis;

a second endless belt having a longitudinal axis and positioned adjacent and substantially coextensive with said first endless belt, with said first endless belt longitudinal axis and said second endless belt longitudinal axis defining a plane and with the facing portions of said first and second endless belts defining a first converging space having an outlet adjacent the narrower end thereof;

a plurality of first slat members positioned on said first endless belt transverse said first endless belt longitudinal axis;

a plurality of second slat members positioned on said second endless belt transverse said second endless belt longitudinal axis, with each second slat member opposite one of said first slat members and forming with its oppositely positioned first slat member a pair of cooperating slat members;

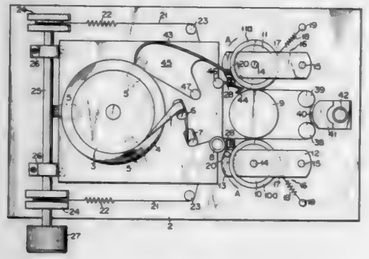
means for moving said first endless belt in a first endless path and said second endless belt in a second endless path with the facing portions of said first and second endless belts moving at substantially equal velocities toward the narrower end of the converging space to pull a line through the converging space to the outlet thereof; at least some of said pairs of cooperating slat members include one slat having a first hardness and another slat having a second hardness different from said first hardness to thereby crimp the line as it moves through the converging space to the outlet thereof.

4,039,110

TAPE HIGH-SPEED TRAVELLING DEVICE

Hiroyuki Tsukamoto, Kawasaki, and Morio Akino, Fujisawa, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 12, 1975, Ser. No. 576,808
Claims priority, application Japan, May 21, 1974, 49-56130
Int. Cl.² B65H *17/22*
U.S. Cl. 226—177 **4 Claims**



1. A tape high-speed travelling device comprising: a substrate on which a reel wound with a tape is mounted,

a capstan rotatably provided on said substrate,

a pinch roller having an outer peripheral portion formed of elastic material and rotatably provided to face said capstan,

guide means for guiding said tape from said reel between said capstan and said pinch roller,

moving means for moving said pinch roller toward said capstan so as to allow it to elastically press said capstan through the tape, and

regulating means for stopping the movement of said moving means of said pinch roller toward said capstan at a predetermined point and to a prescribed extent so as to thereby limit the contact pressure between said pinch roller and said capstan and thereby prevent the occurrence of a forced vibration of said pinch roller,

wherein said moving means includes a pinch roller support mechanism rotatably supporting said pinch roller at one end and rockable with respect to said substrate by being pivotally supported at the other end, and a pulling member for pulling said one end of said support mechanism toward said capstan,

wherein said regulating means includes a stop provided on said substrate and regulating the movement of said pinch roller by abutting against said one end of said support mechanism,

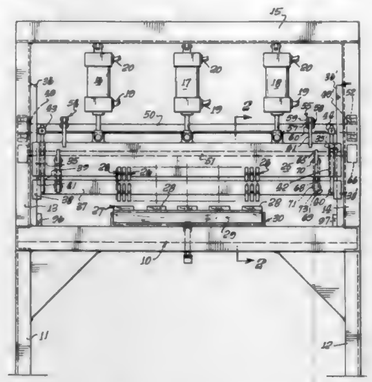
wherein said stop includes a supporting plate having an extended portion abutting against said support mechanism and a slot, and an adjustment screw fitted by screw engagement into said substrate through said slot to fix said supporting plate.

4,039,111

PALLET NAILING DEVICE

Irney Lee Rogers, 16638 Holton, Valinda, Calif. 91744

Filed Aug. 2, 1976, Ser. No. 710,407
Int. Cl.² B27F *7/02*
U.S. Cl. 227—30 **10 Claims**



1. An automatic nailing machine for nailing deck boards to stringers to fabricate pallets of the type utilizing hydraulic pressure to drive a plurality of hammer pins, said device comprising:

a frame;

hydraulic drive means connected to said frame;

a hammer pin support bar carried by said frame, vertically moveable in the frame and driven by the hydraulic drive means;

a nail feed and support member carried by said frame, vertically moveable in the frame, mounted below said hammer pin support bar and attached thereto by at least two lifting members, which members connect said hammer pin support bar to said nail feed and support member, said lifting members having stop means which permit the initial movement of the hammer pin support bar without the movement of the nail feed and support member but further upward movement of the hammer pin support bar causes the nail feed and support member to be lifted by said lifting members so that the nail feed and support member is moved upwardly when the hammer pin support bar is moved to its uppermost position, moves downwardly with said hammer pin support bar when said hammer pin support bar begins its downward travel and remains stationary as said hammer pin support bar continues its downward movement;

a plurality of hammer pins mounted on said hammer pin support bar;

a plurality of nail holding devices mounted on said nail feed and support member and positioned to cooperate with said hammer pins whereby each of said hammer pins contact a nail held in said nail holding device and drives it downwardly;

a first horizontal alignment bar mounted on said frame and having at least two arms rigidly affixed at one end to said first bar and pivotally linked at their other end to said hammer pin support bar; and

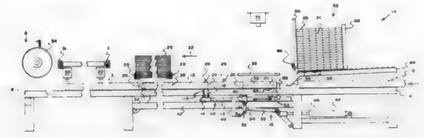
a second horizontal alignment bar mounted on said frame and having at least two arms rigidly affixed at one end to said second bar and pivotally linked at their other end to said nail feed and support bar.

4,039,112

APPARATUS FOR AUTOMATICALLY CONSTRUCTING FRAME STRUCTURES

Bethel F. Schultz, Rte. 1, Box 47-D, Harrisburg, Oreg. 97446

Filed June 1, 1976, Ser. No. 691,711
Int. Cl.² B27F *7/02*
U.S. Cl. 227—40 **10 Claims**



1. An apparatus for constructing a building wall, said wall having a frame comprising a pair of elongate parallel plate members and a plurality of parallel elongate studs disposed at predetermined regularly spaced intervals transversely between said plate members, said apparatus comprising:

a. elongate support means for supporting said plate members in horizontally disposed positions spaced from and parallel to one another and extending along the length of said support means;

b. fastening means located at a predetermined fastening station along the longitudinal sides of said support means for fastening studs to said plate members;

c. stud-placement means disposed in predetermined relation to said support means for placing studs one-at-a-time upon said support means at said fastening station such that said studs extend transversely between said plate members for fastening thereto by said fastening means; and

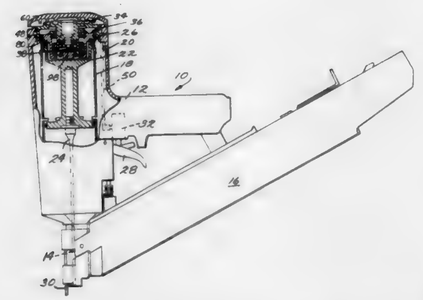
d. drive means attached to said support means for reciprocating forwardly and rearwardly along the length of said support means and engaging a stud after it has been fastened to said plate members so as to push against said stud and thereby move said stud and plate members longitudinally of said support means through a distance corresponding to one of said predetermined regular stud intervals.

4,039,113

PNEUMATICALLY OPERATED FASTENER DRIVING DEVICE WITH IMPROVED MAIN VALVE ASSEMBLY

Robert E. Males, Cranston, R.I., assignor to Textron, Inc., Providence, R.I.

Filed Apr. 16, 1976, Ser. No. 677,783
Int. Cl.² B25C *1/04*
U.S. Cl. 227—130 **10 Claims**



1. A pneumatically operated fastener driving device comprising a housing defining a fastener drive track, fastener magazine means for feeding successive fasteners laterally into said drive track, a fastener driving element slidably mounted in said drive track for movement through an operative cycle including a drive stroke during which a fastener within said drive track is engaged and moved longitudinally outwardly of the drive track into a workpiece and a return stroke and pneumatic means for effecting the operation of successive cycles of said fastener driving element, said pneumatic means including a drive piston connected with said fastener driving element, a cylinder within which said piston is reciprocably mounted, an air pressure reservoir communicating exteriorly with one end of said cylinder, means defining a discharge outlet port and pilot pressure operated main valve means for communicating the reservoir pressure with the interior of said one end of said cylinder to move the piston in a direction to effect the drive stroke of the fastener driving element and for communicating the one end of said cylinder with said outlet port for permitting the piston to move in a direction to effect the return stroke of the fastener driving element, the improvement in combination therewith which comprises said main valve means including

an inlet valve structure having a pilot pressure responsive surface area,

means mounting said inlet valve structure for movement between a closed position with respect to said one end of said cylinder and an open position communicating the air pressure reservoir therewith in response to the establishment of different pilot pressure conditions in communication with said pilot pressure responsive surface area,

an outlet valve structure movable between a closed position with respect to said one cylinder end and said outlet port and an open position with respect to said one cylinder end and said outlet port and an open position with respect to said one cylinder end and said outlet port, and

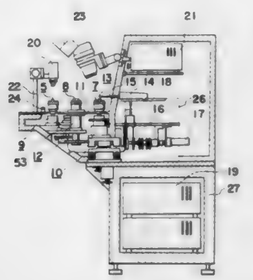
means operatively associated with said outlet valve structure for effecting (1) a movement of said outlet valve structure from the open position thereof to the closed position thereof simultaneously with a movement of said inlet valve structure from the closed position thereof to the open position thereof and (2) a movement of said outlet valve structure from the closed position thereof to the open position thereof sequentially following a movement of said inlet valve structure from the open position thereof to the closed position thereof.

4,039,114

WIRE-BONDING EQUIPMENT

Takekazu Yoshida, Fujiidera; Yoshiaki Makizawa, and Tamotsu Tanaka, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 13, 1976, Ser. No. 658,014
Claims priority, application Japan, Feb. 18, 1975, 50-20509
Int. Cl.² H01L *21/607*; B23K *21/02*
U.S. Cl. 228—1 R **14 Claims**



1. In equipment for bonding of wires to selected portions of successive elements, wire-bonding equipment comprising:

jig alignment and mounting support means fixedly mounted on said equipment and having an upper surface portion with alignment elements thereon for mounting of a jig on said support means in a required alignment with respect to said equipment;

at least one jig having a main body portion with a lowr surface portion having alignment elements corresponding

to and removably engagable with said alignment elements on said mounting support means, a head portion having an upper surface portion on which an element to be wired can be fixedly held, said head portion being movable with respect to said main body portion only upon application of external pressure to said head portion, normally unactuated holding means normally holding said head portion stationary with respect to said main body portion and actuable for releasing said head portion for permitting movement thereof only upon application of said external pressure;

positioning table means spaced from said jig alignment and mounting support means and having an upper surface portion with further alignment elements identical in size and configuration to said firstmentioned alignment elements for mounting thereon of a jig carrying an element to be wired in same said alignment with respect to said equipment as when said jig is on said jig alignment and mounting support means, said positioning table means being movable in requisite directions to bring successive portions of an element mounted thereon to a wire supply point;

a wire-bonder unit adjacent said positioning table means and repeatedly actuable for supplying wire to said wire support point and bonding said wire to a portion of an element to be wired which is brought to said wire supply point;

externally actuable control means coupled to said wire-bonder unit and said positioning table means for effecting synchronized actuation of said wire-bonder unit and said positioning table means; and

externally actuable transport means operatively associated with said mounting support means and said positioning table means for removing said jig from and placing said jig onto said mounting support means and said positioning table means and for transporting said jig between said support means and said positioning means while maintaining said jig generally in said alignment with respect to said equipment.

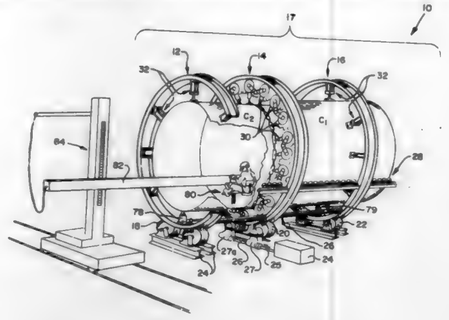
4,039,115

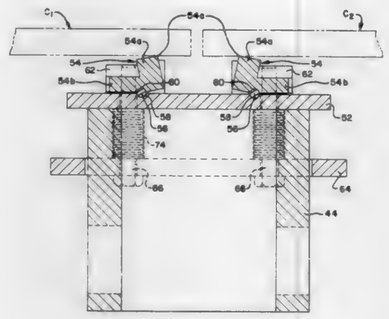
APPARATUS FOR OBTAINING ABUTTING CONTACT OF HOLLOW TANK COURSES TO BE CIRCUMFERENTIALLY WELDED

Robert W. Randolph, St. Charles, and Steven L. Jantzen, St. Louis, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed June 1, 1976, Ser. No. 691,246
Int. Cl.[2] B23K *37/04*
U.S. Cl. 228—44.5 **16 Claims**

1. Apparatus for clamping and supporting a pair of hollow tank sections in end-to-end abutting relationship during welding comprising, a supporting ring, a plurality of circumferentially spaced jacks mounted on said ring and extendible radially with respect to said ring to clamp and support the opposed ends of a pair of tank sections in end-to-end relationship, a gripping jaw extending from one side of the extendible end of at least one of said jacks and engagable with one of said tank sections, spring means biasing said jaw to an extended position relatively to said extendible end of said one of said jack, and means interconnecting said jaw with said extendible end of said one of said jacks whereby said jaw is moved transversely of said extendible end against the bias of said spring means to force the opposed end of said one tank section toward the





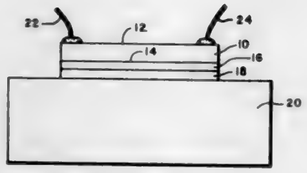
opposed end of the other of said tank sections when said jaw is forced against said tank section on extension of said jacks.

4,039,116

PHOTODETECTOR-TO-SUBSTRATE BONDS

John H. Chaffin, III, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 633,531, Nov. 19, 1975, Pat. No. 3,996,548. This application July 23, 1976, Ser. No. 708,501
Int. Cl.[2] H01G *9/20*
U.S. Cl. 228—123 **6 Claims**



1. A method of bonding a photodetector to an electrically conductive substrate, the method comprising:

sputter depositing an electrically insulating layer on a surface of the photodetector, the electrically insulating layer being a stable, electrically insulating oxide which is wettable by indium; and

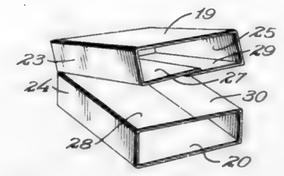
bonding the electrically insulating layer to the electrical conductive substrate with an indium containing solder.

4,039,117

CARTON DIVIDER

William G. Sieffert, Joliet, Ill., assignor to Hoerner Waldorf Corporation, St. Paul, Minn.

Filed Aug. 12, 1976, Ser. No. 713,655
Int. Cl.[2] B65D *5/48*
U.S. Cl. 229—15 **2 Claims**



1. A blank adapted to be erected into a two-cell partition with a double thickness center and rectangular cells, said blank made from flat foldable sheet-like material, said blank comprising:

a substantially rectangular sheet of said material;

said sheet being defined along its top and bottom edges by horizontal edges and along a first lateral edge by a vertical edge;

said blank being divided into top and bottom edges by a horizontally extending combined line cut and fold line extending between the lateral edges of said blank;

the lateral edge opposite said first lateral edge being divided into two parallel portions, a first portion being above said horizontal fold line and being spaced outwardly from second of said edges opposite a said first lateral edge;

a pair of vertically oriented hinge lines extending from said top to said bottom edges and defiing therebetween outer wall panels; said outer wall panels being separated along said horizontal line by a line cut;

a second pair of vertical fold lines spaced outwardly from said first pair of vertically oriented fold lines and defining four minor wall panels, one each on either lateral side of said outer wall panel and similarly separated from top to bottom by a line cut along said horizontal line, one of said minor wall panels disposed above said horizontal line being of greater width than the minor wall panel disposed immediately below said horizntal line;

a first pair of inner partition members defined by said first lateral edge and a first of said second pair of fold lines, said first pair of inner partition members having uniform width and separated by a portion of said horizontal line having at least a portion thereof formed as a scored hinge line.

4,039,118

CONTAINER WITH DISPENSING MEANS

Teru Kawaoka, 3253 Lowe St., College Park, Ga. 30337

Filed July 22, 1976, Ser. No. 707,886
Int. Cl.[2] B65D *5/72;* **B65G** *3/12;* **A01K** *5/02*
U.S. Cl. 229—17 B **8 Claims**

8. A container for packaging and dispensing granular, dry pet food comprising:

four side walls, each joined along its lateral edges to adjacent side walls, and a bottom wall joined at the edges thereof with the lower most edges of said side walls;

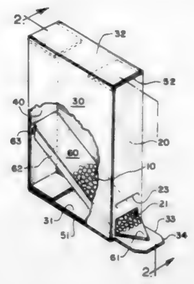
one of said side walls having an orifice with a vertical dimension sufficiently small to impede the free flow of said pet food therethrough, said orifice being located on said one wall adjacent said bottom wall;

a moveable partition disposed within said container and extending across substantially the entire cross-sectional area thereof, said partition being inclined with a free lower portion thereof adjacent to said orifice to direct said pet food toward and through said orifice in response to gravity and movement of said free lower portion;

manually controllable means affixed to the lower portion of said partition and extending through said orifice for vibrating said free lower portion of said partition to dispense controlled amounts of said pet food from said container;

a panel attached to said bottom wall at the edge adjacent said one wall, said panel adapted to fold upwardly from an open position to a closed position to cover said orifice and said vibrating means; and

means for securing said panel to said one wall in the closed position.

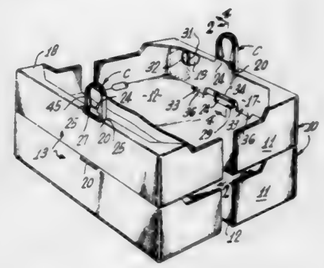


4,039,119

TRAY FOR BERRY BASKETS, WITH CLIPS AND COVER SHEET

Walton B. Crane, Sherman Oaks, Calif., assignor to A & E Plastik Pak Co., Inc., City of Industry, Calif.

Continuation-in-part of Ser. No. 675,802, April 12, 1976, abandoned, which is a continuation of Ser. No. 576,721, May 12, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,463
Int. Cl.[2] B65D *5/22, 25/22*
U.S. Cl. 229—34 HW **5 Claims**



1. The combination of a paperboard container structure having bottom, side and end walls, and a molded plastic resilient coupling clip, comprising:

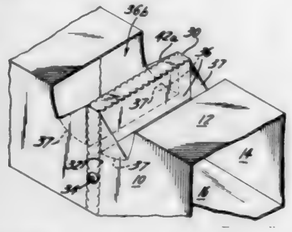
a container end structure having generally vertical inner and outer end walls spaced by a predetermined distance, and a top end wall joining the upper edges of said end walls, said top end wall formed with a longitudinally elongated, centrally located entrance slot having end edges, and

a molded plastics coupling clip comprised of a vertically disposed frame of generally rectangular outline and generally planar opposite sides receivable downwardly with a relatively close fit into said container end structure through said slot,

resiliently inwardly bendable legs normally depending substantially vertically from the lower corners of said frame, the lower extremities of said legs having toes projecting oppositely from one another to a normal spacing distance exceeding the length of said slot, said legs being resiliently bendable toward one another on said frame to a con-

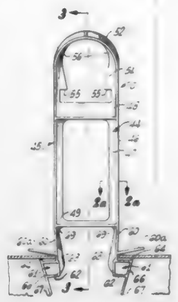
tracted position permitting entrance of said toes into said slot,
and said toes underlying said top end wall beyond opposite ends of said slot upon resilient expansion of said contracted legs following entrance through said slot.

4,039,120
DIVISIBLE CARTON AND BLANK THEREFOR
Milton W. Herzog, Valley Stream, N.Y., assignor to H. Goodman & Sons, Inc., Kearny, N.J.
Filed Mar. 26, 1976, Ser. No. 670,624
Int. Cl.² B65D *5/54*
U.S. Cl. 206—606 **4 Claims**



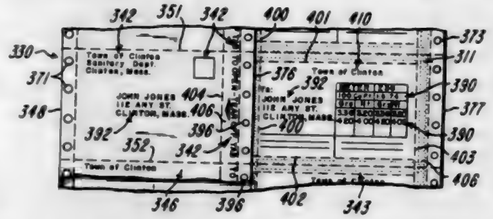
1. A carton blank, including first and second pairs of elongated panels adjoining one another along parallel margins constituting opposite pairs of panels when the carton is erected, end closure flaps at the opposite ends of the panels for forming carton closures when the blank is erected, said panels and said flaps being divided from each other by score lines, said panels including a tear strip, the tear strip extending across all of said elongated panels spaced from the opposite ends thereof, said tear strip being defined by a pair of discontinuous rows of punctures, and first and second carton-divider areas included in the same one of said panels and disposed respectively at opposite sides of the tear strip, the ends of each carton-divider area being defined by the score lines along the panel containing such carton-divider area, the pair of panels adjoining said one of said panels including a pair of divider flaps extending from the ends of each said carton-divider area, said carton-divider areas and said divider flaps being demarked from their respective panels by lines of weakening including spaced-apart parallel hinge means for said carton-divider areas and respective hinge means for said divider flaps formed at an acute angle to said panel-dividing score lines, said lines of weakening and said hinge means being formed for adapting said carton-divider areas to be erected transverse to the carton and spaced apart at opposite sides of the tear strip for acting when erected as a U-shaped carton-stiffening structure, the width of each carton-divider area measured along its elongated panel being less than about half the width of each of the elongated panels containing its divider flaps and the distance from each carton-divider area to the closet end flap being a major part of the distance between that end flap and the tear strip for providing a substantial length of carton wall for containing articles when the carton is erected, and the carton-divider areas when erected and when the tear strip is removed constituting article-retaining barriers opposite the respective end closures formed by said closure flaps.

4,039,121
CLIP FOR USE WITH BERRY BASKET TRAYS IN STACKS AND COVER SHEET
Walton B. Crane, Sherman Oaks, Calif., assignor to A & E Plastik Pak Co., Inc., City of Industry, Calif.
Continuation-in-part of Ser. No. 675,981, April 12, 1976, abandoned, which is a continuation of Ser. No. 576,807, May 12, 1975, abandoned. This application Dec. 1, 1976, Ser. No. 746,464
Int. Cl.² B65D *5/46, 25/22*
U.S. Cl. 229—52 A **10 Claims**



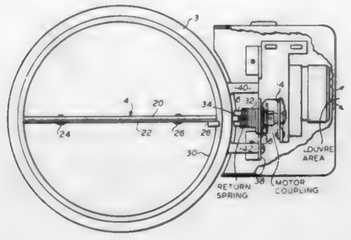
1. A clip composed of a resilient plastics material, and comprising:
a vertically disposed frame of generally rectangular outline, and of substantially equal outside width dimensions at its upper and lower extremities,
resiliently inwardly bendable rails depending from the lower corners of said frame, and
toes turned outwardly, in opposite directions from one another, from the lower extremities of said rails.

4,039,122
CONTINUOUS BUSINESS FORM OR THE LIKE ADAPTED FOR SUBSEQUENT PROCESSING INTO ORIGINAL INDICIA BEARING LOTTERY TICKETS, ENVELOPES OR THE LIKE
Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778
Division of Ser. No. 433,464, Jan. 15, 1974, Pat. No. 3,956,049. This application Oct. 3, 1975, Ser. No. 619,511
Int. Cl.² B65D *27/10*
U.S. Cl. 229—69 **16 Claims**



1. As a new article of manufacture, a continuous series of interconnected blanks having at least one double ply portion in side-by-side juxtaposition with a single ply portion and suited for subsequent processing into individual envelopes, lottery tickets or like articles each containing original directly applied indicia, comprising an endless web initially having an uneven number of continuous, connected single-ply panels spanning the width thereof, said panels including at least one pair of adjacent, non-abutting panels and an interconnecting intermediate discardable panel connecting said non-abutting panels together, with the outermost of said nonabutting panels forming edge-adjacent panels of said endless web, a foldline defined on said discardable panel between the edges thereof to extend longitudinally of said web continuously for essentially the entire length of said web, said double ply portion being defined by one edge-adjacent panel in overlying relationship with an adjoining intermediate discardable panel and in side-by-side juxtaposition with an adjacent, non-abutting panel which defines said single ply portion; and an adhesive on that surface of the edge-adjacent panel of said double ply portion which is presented toward and overlies the intermediate discardable panel of said double ply portion, said adhesive being non-adherent to the surface of said intermediate, discardable panel.

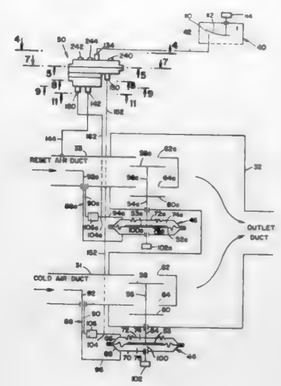
4,039,123
AUTOMATIC STACK DAMPER
Seymour Frankel, Commack, N.Y., assignor to Flair Manufacturing Corporation, Hauppauge, N.Y.
Filed Aug. 19, 1975, Ser. No. 605,948
Int. Cl.² F23N *3/00;* **F23J** *11/00*
U.S. Cl. 236—1 G **10 Claims**



1. In a system comprising a heat stack, a damper having a vane in said heat stack, actuating means for opening and closing said damper, said actuating means electrically connected to and responsive to a first thermostat in an electrical circuit containing a heating means for generating heat, the by-products from which pass through said stack, the improvement wherein said actuating means comprises an electric motor spring biasedly connected to said vane, said electric motor in an On position having current passing therethrough and holding said vane, against the action of said spring, in a closed position, and means responsive to the closing of said thermostat for deactivating said motor, said means responsive to the closing of said thermostat comprising a coil in the electrical circuit containing said thermostat which is energized upon closure of said thermostat which throws a first relay switch in a second circuit containing a second coil, which coil is energized upon completion of the second circuit containing said first relay switch, said second coil connected to a normally closed relay which is opened upon energization of said second coil, said second relay being in the electrical circuit of said electric motor, whereby when said second relay is open, the circuit of said motor is broken and the output shaft of said electric motor rotates.

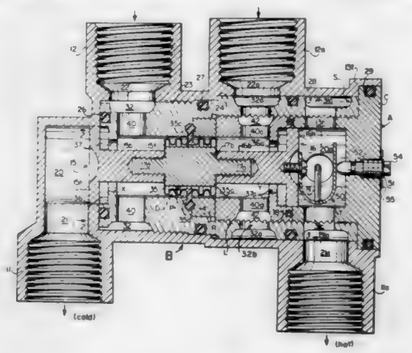
4,039,124
DUAL DUCT VARIABLE VOLUME AIR CONDITIONING SYSTEM
LeRoy Ginn; LeRoyce Ginn, both of San Leandro, and Dalny Travaglio, Kensington, all of Calif., assignors to Universal Pneumatic Controls, Inc., San Leandro, Calif.
Division of Ser. No. 438,591, Feb. 1, 1974, Pat. No. 3,934,795. This application Oct. 20, 1975, Ser. No. 623,726
Int. Cl.² F24F *3/00*
U.S. Cl. 236—1 B **7 Claims**

1. A control for a variable volume conditioned air distribution system of the kind having a first, cold duct for supplying cold air to a room or other space, a second, hot duct for supplying hot air to a room or other space and first and second pneumatically powered actuators for the respective first and second ducts for positioning a movable member in the duct to regulate the volume flow out of the duct, said control comprising,
first variable flow orifice means for controlling the position of the movable member in the cold duct in response to changes in room temperature,
second variable flow orifice means for controlling the position of the movable member in the hot duct in response to changes in room temperature,
reversing means for reversing the response of the second orifice means with respect to the response of the first orifice means, and



adjustable means for regulating the flow through the first and second orifice means and adjustable to cause conditioned air to be supplied from only one of the ducts at a time without mi ing with air from the other duct, said adjustment means including a first set point adjustment member for changing the set point for cold duct operation and a second, separate set point adjustment member which can be independently set with respect to said first adjustment member for changing the set point for hot duct operation and to provide a small overlap required to maintain minimum ventilation requirements.

4,039,125
PRESSURE BALANCING VALVE WITH THERMAL OVERRIDE
Irlin H. Botnick, 3155 Kersdale, Pepper Pike, Ohio 44124
Filed Apr. 5, 1976, Ser. No. 673,443
Int. Cl.² G05D *23/00, 11/16*
U.S. Cl. 236—12 A **9 Claims**



1. A valving device to be included in hot and cold water

supply passages for maintaining a hot and cold water flow ratio established at a point of use, despite subsequent variations in the relative hot and cold water supply pressure; comprising a body providing

a central valving bore,

an inlet and outlet for hot water opening to one half of the bore length at axially spaced locations,

an inlet and outlet for cold water opening to the other half of the bore length and similarly spaced axially, and a respective similarly located circumferential inward lip or flange restriction between each inlet and outlet providing a fixed flow resistance therebetween;

flexible means at bore mid-length isolating the two halves of the bore into hot and cold water valving chambers; the said inlets opening radially to said bore at axial locations between said flexible means and a respective said restriction; a valving shuttle axially shiftable in the valving bore extending through and secured to said flexible means and

providing a respective bore valving member in each chamber and cooperating with a respective bore formation located in the bore between the respective restriction and outlet to form a valved flow area varied by axial shifting of the valve member under change of a differential in inlet hydrostatic pressures applied to the flexible means until nulling of total forces of pressure on the flexible means and dynamic flow pressures and hydrostatic pressures on the valving members, with each valving flow area decreased as the other is increased by axial shift of said valving shuttle;

a thermally expansible element supported on the hot water valving member on the outlet side of the respective valving chamber,

said expansible element extending toward an adjacent end wall of the body; and

a stop element supported by said body and projecting into the discharge region for said hot water valving member, and engageable by and to serve as a reaction abutment for the expanded thermally expansible element to exert force shifting the hot water valving member toward a closed position.

4,039,126

THERMOSTATIC REGULATING MEANS FOR AN AIR-CONDITIONING PLANT

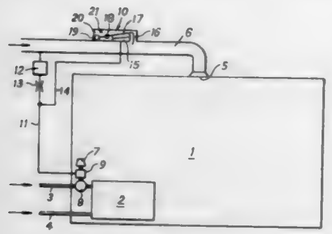
Volker Spies, Augustenborg; Christian Dyhr-Mikkelsen Poul, Sonderborg, and Knud Vagn Valbjørn, Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Apr. 30, 1976, Ser. No. 682,179

Claims priority, application Germany, May 6, 1975, 2520109

Int. Cl.[2] F24F *11/04*

U.S. Cl. 236—42 **4 Claims**



1. A thermostatic regulator assembly comprising a housing, a first valve unit connected to said housing having a first valve seat and a first closure member, first spring means biasing said closure member away from said first valve seat, fluid pressure operated motor means in said housing, said motor means including a servo shaft, a second valve unit having a casing attached to said first closure member and a second closure member attached to said servo shaft, means defining passage means from the exterior of said assembly housing to the interior of said second valve unit casing, said passage means having a second valve seat cooperable with said second closure member, second spring means in said casing biasing said second closure member away from said second valve seat, said second spring means being stiffer than said first spring means so that increasing temperatures cause said first and second valve units to close sequentially with said first valve unit being the first to close.

4,039,127

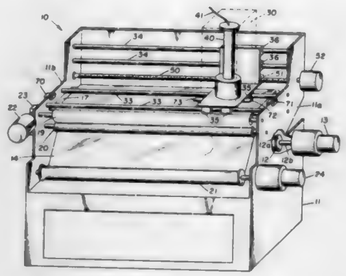
CONTINUOUS PLOTTER

Donald F. Huffhines, Richardson; J. S. Jones, Valley View, and Clarence G. Smith, Irving, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,510

Int. Cl.[2] G01D *15/24*

U.S. Cl. 346—110 R **9 Claims**



1. Apparatus for plotting information comprising:

a base structure;

means for mounting a supply reel of recording medium on said base structure;

means for mounting a takeup reel on said base structure;

an exposure surface positioned on said base structure so that recording medium passing from said supply reel to said takeup reel will lie substantially flat on said exposure surface;

means adapted to advance said recording medium across said exposure surface;

a carriage movably mounted on said base structure and adapted to move back and forth across said exposure surface;

a means carried by said carriage and adapted to receive information from an information source and to project said information onto said exposure surface; and

means to drive said carriage back and forth across said exposure surface at a controlled rate, said drive means comprising:

a lead screw extending along the length of said exposure surface;

means on said carriage in cooperation with said lead screw; and

motor means coupled to said lead screw for rotating said lead screw to move said carriage, said motor means comprising:

a stepping motor which rotates an exact increment each time said motor receives a pulse of a frequency signal; and

control circuitry means for supplying a precise frequency signal of desired value to said stepping motor for driving said motor at a desired speed, said control circuitry means including:

means for gradually increasing said precise frequency signal from 0 to a maximum value upon receiving a start signal to accelerate said motor to said desired speed; and

means for gradually decreasing said precise frequency signal from said maximum value to 0 upon receiving a stop signal to decelerate said motor from said desired speed to a stopped position.

4,039,128

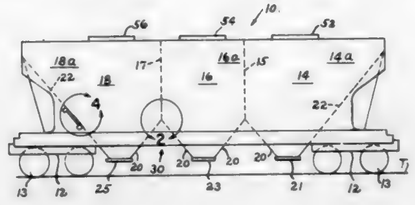
VIBRATOR BRACKET ASSEMBLY FOR HOPPERS AND RAILWAY CARS

Paul E. Hicks, Jr., Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,931

Int. Cl.[2] F16M *13/02*; B65G *67/24*; F16M *1/00*

U.S. Cl. 248—14 **26 Claims**



1. A vibrator bracket assembly for mounting hopper vibrator equipment comprising:

at least two spaced support members adapted to extend parallel to and integrally engage a structural portion of a hopper having a hopper planar surface; said spaced support members each having a longitudinal axis; a vibrator mounting bracket extending between said support members and having first and second planar surfaces, said planar surfaces being parallel to the longitudinal axis of said spaced support members and adapted to receive a vibrator suitable for facilitating loading and/or unloading of the hopper by applying vibrational forces to the hopper; whereby reciprocating vibrational forces applied to the vibrator mounting bracket are transmitted through said spaced support members and are applied to said hopper structural portion essentially entirely as shear loads in the plane of said hopper planar surface.

4,039,129

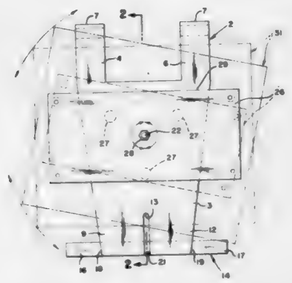
BRACKET FOR SMOKE AND FUME EJECTOR FAN

James E. Berkeland, 3329 Nesta Drive, San Jose, Calif. 95118, and Ralph H. Donnelly, 425 Hershner Drive, Los Gatos, Calif. 95030

Filed Mar. 25, 1976, Ser. No. 670,274

Int. Cl.[2] F16M *11/04*; H01H *3/16*

U.S. Cl. 248—14 **5 Claims**



1. A bracket assembly for a smoke ejector fan, comprising:

a. a base plate;

b. a fan mounting plate rotatably mounted on the base plate;

c. means interposed between the base plate and fan-mounting plate tending to retain the mounting plate in an adjusted position against a force tending to effect rotation thereof;

d. said base plate being provided with a pair of bifurcated extensions at each of two opposite ends defining a slot therebetween, one of said pairs of bifurcated extensions terminating in spaced hooks for suspending the bracket assembly from a door or ladder; and

e. a bar fixed to said base plate and extending across the other pair of said bifurcated extensions and the associated slot and providing lateral portions extending on opposite sides of said bifurcated extensions.

4,039,130

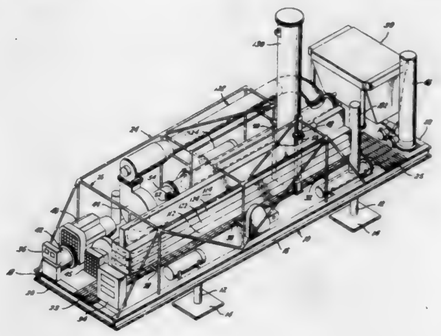
MOBILE REFINERY

Jim Smith Hogan, Houston, Tex., assignor to Val Verde Corporation, Houston, Tex.

Division of Ser. No. 467,081, May 6, 1974, Pat. No. 3,953,298. This application Oct. 20, 1975, Ser. No. 623,745

Int. Cl.[2] H02B *5/00*; F04B *35/04*

U.S. Cl. 248—19 **1 Claim**



1. Portable skid construction, comprising:

a plurality of parallel elongate beams,

a first bridge truss mounted vertically on each of said beams, and

first means for connecting said elongate beams together to form a base and for distributing force applied to said base and said first bridge trusses through said elongate beams, said first means forming a horizontal truss with said elongate beams;

said first means includes

a plurality of parallel cross beams of substantially the same vertical thickness as said parallel elongate beams, said cross beams being connected with and substantially perpendicular to the ends of said elongate beams, and

a grid of interconnected metal members including first members substantially parallel to said cross beams and connected at their ends to said elongate beams and second members substantially parallel to said elongate beams and connected at their ends to said cross beams;

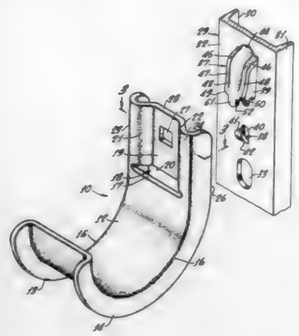
a second bridge truss mounted vertically on each of said second members;

first substantially horizontal cross-members connecting said first bridge trusses together and connecting said second bridge trusses to said first bridge trusses;

second substantially horizontal cross-members disposed below said first substantially horizontal cross-members and connecting one of said first bridge trusses to one of said second bridge trusses; and

equipment elements mounted on said second substantially horizontal cross-members.

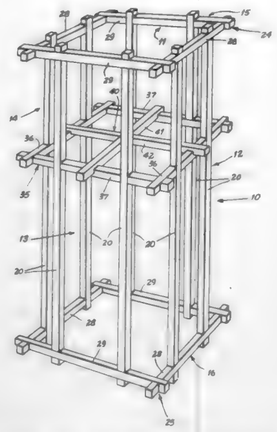
4,039,131
CURVED BRACKET
Frederick Perrault, 2644 W. 225th St., Torrance, Calif. 90505, and Raymond E. Perrault, 2404 Colt Road, Rancho Palos Verdes, Calif. 90274
Filed Mar. 3, 1976, Ser. No. 663,511
Int. Cl.[2] F16L *3/08*
U.S. Cl. 248—73 **16 Claims**



1. A bracket comprising a member having
an arcuate first portion having
a first wall,
and a flange extending from either side edge of said first wall,
and a second portion having
a second wall,
and two ribs positioned one on either side of said second wall,
said ribs having arcuate crests, said second wall being recessed inwardly from said crests, said first wall extending away from said second wall and providing a supporting surface which is concave upwardly, said supporting surface being substantially flat transversely thereof,
said first wall having an upper edge facing toward said second portion,
said second wall having a lower edge displaced laterally from said upper edge of said first wall and spaced therefrom longitudinally of said member thereby to define a slot,
said lower edge of said second wall facing toward said first portion,
said second wall above said lower edge thereof including means for engaging an attaching means for securing said member to a supporting structure.

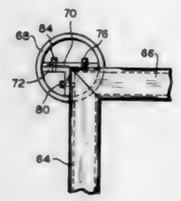
4,039,132
PLANT SUPPORT STRUCTURE
Peter R. Fournier, 29 N. Gore (Rear), St. Louis, Mo. 63119
Filed Jan. 5, 1976, Ser. No. 646,494
Int. Cl.[2] A47G *23/02*
U.S. Cl. 248—150 **7 Claims**

1. A support structure for a plant or the like comprising vertical members defining the sides of the structure, said vertical members being elongated and rigid and having at least three recesses therein spaced along their length, the recesses at opposite ends of each of said vertical members facing in a direction opposite to the recesses of said vertical member between those at its ends, a first set of horizontal members located near one end of said support, a second set of horizontal members located near the other end of said support, and a third set of horizontal members located between said first and second set, each set having horizontal members associated with each side of the support structure, and a horizontal member of each set having recesses therein which interlock with recesses in a horizontal member associated with an adjacent side, each vertical member interlocking with a horizontal member in each set, the recesses in said horizontal members in said first and second sets which interlock with said vertical members



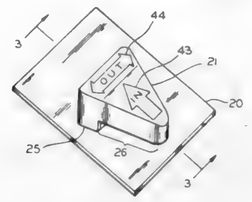
facing opposite to those of said third set, whereby said horizontal and vertical members are secured in interlocking engagement.

4,039,133
CORNER STRUCTURE FOR A LOAD SUPPORTING FRAME
Henry P. Streicher, 2347 Underhill Road, Toledo, Ohio 43615
Continuation-in-part of Ser. No. 471,852, May 21, 1974, abandoned. This application Aug. 21, 1975, Ser. No. 606,515
Int. Cl.[2] F16M *11/20*
U.S. Cl. 248—188.8 **4 Claims**



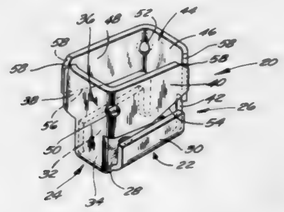
1. A corner structure for a load supporting frame, comprising:
an upright tubular leg having a single slot extending longitudinally from the upper end of said tubular leg;
a pair of horizontal side members each having a mitered end portion, said mitered end portions being attached in end abutting relationship at a predetermined angle, said mitered end portions of said side members extending through said slot; and
a pair of wedge members cooperating to define said predetermined angle, one of said wedge members being planar and being attached to said mitered end portion of one of said side members and having a pair of longitudinal edges engaging the inner wall of said tubular leg and wherein the other wedge member is an angle wedge member for defining said predetermined angle and is attached to said mitered end portion of the other one of said side members with a pair of longitudinal edges engaging the inner wall of said tubular leg wherein said wedge members securely hold said side members in paid slot.

4,039,134
MESSAGE HOLDER
Wilbert W. Redmer, 71 NE. 11th Way, Deerfield Beach, Fla. 33441
Filed Apr. 30, 1976, Ser. No. 681,815
Int. Cl.[2] F16M *13/00*
U.S. Cl. 248—205 A **10 Claims**



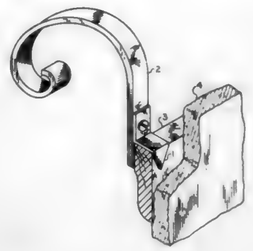
1. A message holder comprising a mounting plate, a housing having at least one edge, a cavity in the housing, said cavity facing said mounting plate which thereby terminates said cavity, at least one said edge of said housing being mounted on said plate, a paper receiving recess between said plate and said housing at a point other than said one edge, said cavity having tapered internal contours, with a large end of said taper near said one edge of said housing and a small end near said paper receiving recess, a coiled conical spring biased ball detent mounted in said cavity, said conical coiled spring having contours which somewhat generally follow the tapered contours of the cavity, and permit limited lateral play and movement of the ball detent, said spring bias urging said ball toward the small end of said taper, the tension of said spring, the size and shape of said internal contours, and the diameter of said ball being such that said ball moves back and lifts when a paper is inserted into said cavity and moves forward and jams into the small end of said tapered cavity to seize said paper if an attempt is made to pull said paper directly from the recess and moves laterally within said cavity to free said paper responsive to sideward movement of the paper.

4,039,135
COUPLING DEVICE
Peter Schenk, West Islip, N.Y., assignor to Dzus Fastener Co., Inc., West Islip, N.Y.
Filed Jan. 19, 1976, Ser. No. 650,294
Int. Cl.[2] H02G *3/10, 3/08;* F16B *2/24*
U.S. Cl. 248—214 **12 Claims**



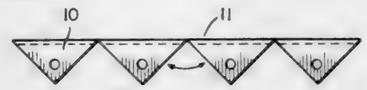
1. A one-piece coupling device for mounting an article to a support comprising; a base adapted to be mounted to a support independent of a separate fastener element, at least one depending leg terminating in a locking flange extending from the base and integrally formed therewith, each flange having a first configuration permitting it to be inserted through an aperture in an article to be coupled with a support, and each flange adapted to be shifted to a second configuration to engage with the surface of the article surrounding the opening and opposite the surface adjacent the support to thereby mount the article to the support independent of a separate fastener element.

4,039,136
WALL MOUNTABLE AND MOLDING MOUNTABLE BRACKET
Damon H. DeHart, 6 Veterans Lane, Stoneham, Mass. 02180
Continuation-in-part of Ser. No. 524,548, Nov. 18, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 625,530
Int. Cl.[2] E04G *3/00*
U.S. Cl. 248—215 **3 Claims**



1. A wall bracket arrangement comprising:
an elongated bracket means having two end portions, said bracket means having a loop at one end portion for suspending an article therefrom said loop being outwarding displaced from the other end portion, said other end portion comprising a depending straight section to abut a wall, said depending straight section having at least one hole to receive a conventional fastener therethrough and stop means to limit a retainer collar means;
detachable thin bodied tang means comprising an outboard depending tang element adapted for insertion between a extending from said tang portion towards said straight section wall and a wall molding, a horizontal middle portion a third portion extending from the end of said middle portion opposite said tang to space said tang element from the depending straight section of said bracket means; and a third portion extending from the end of said middle portion opposite said tang
retainer collar means to affix tang means to the depending straight section of said bracket means, said retainer collar means being slidably attachable to said straight section of said bracket means and being adapted to hold said depending straight section and said third portion of said tang means in engagement while abutting said stop means.

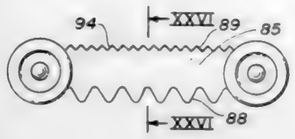
4,039,137
BEND OR BREAK SHELF SUPPORT
Edward J. Smith, 11 Bisset Drive, West Milford, N.J. 07480
Continuation-in-part of Ser. No. 685,397, May 11, 1976. This application Sept. 7, 1976, Ser. No. 721,155
Int. Cl.[2] A47F *5/00;* E06B *7/28*
U.S. Cl. 248—248 **7 Claims**



1. A shelf-support system of modular construction comprising a plurality of serially connected bracket members, said bracket members comprising substantially planar structures having an L-shaped cross-section, said bracket members further comprising a longer, plate-like vertical support member, said vertical support member integral at the top horizontal edge thereof with a horizontally extending longitudinally extending shelf-support member, said shelf-support member tapered toward its outer end to define a substantially triangular shape, and a flexible, severable connector portion located intermediate said bracket members and integral with the vertical edges of said vertical members whereby each of said brack-

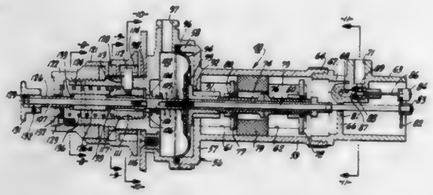
ets is detachably attached in flexible fashion to form a longitudinally extended support structure, and said system is adapted to bend to a 90-degree angle with respect to itself to provide support to a shelf member at the junction of two walls by the flexure of said connector between said segments, and said system is selectively severable to a desired longitudinal extension by the fracture of said connector portion.

4,039,138
SAW TOOTH HANGER
Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.
Division of Ser. No. 489,051, July 16, 1974, Pat. No. 3,911,516. This application July 23, 1975, Ser. No. 598,255
Int. Cl.² A47G *1/16*
U.S. Cl. 248—497 **7 Claims**



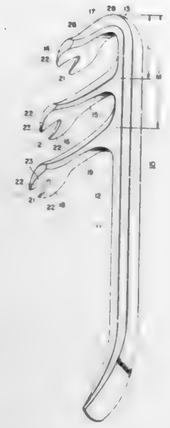
1. A push pin picture mount adapted to be mounted by means of pins to the back of a picture and to engage a wall fastening device for holding the picture to a wall, said picture mount comprising an elongated support member having first and second opposite sides joined by first and second opposite edges, a projection on each end of said member extending from said first side, a pin having a first end embedded in said member at each end and a sharpened and extending from the respective projection in a direction away from said first side, whereby said sharpened ends may be inserted in a picture with said projections holding said member spaced from the frame of said picture, the ends of said projections away from said member defining a first plane, the portion of said first side adjacent said first edge lying in a second plane at an acute angle to said first plane, with the distance between said first and second planes increasing away from said first edge, said first edge having a sawtooth shape, with transverse lines across said first edge being at a determined acute angle with respect to said first plane.

4,039,139
VENTILATOR AND METHOD
Forrest M. Bird, 212 NW. Cerritors, Palm Springs, Calif. 92262
Division of Ser. No. 499,554, Aug. 22, 1974, Pat. No. 3,915,164. This application June 30, 1975, Ser. No. 591,708
Int. Cl.² F16K *15/18*
U.S. Cl. 251—65 **3 Claims**



1. In a servo controller for use in a ventilator having an inhalation phase and an exhalation phase in its operative cycle, a housing having an inlet and an outlet and a flow passage establishing communication between the inlet and the outlet, control valve means disposed within the housing and movable between open and closed positions to control the flow of gas from the inlet to the outlet of the housing, a master shaft mounted in the housing and coupled to the control valve means, magnetic means mounted within the housing for applying force to the master shaft, said magnetic means including first and second magnetic elements which are adjustable to apply varying amounts to force to the master shaft in opposite directions, and a compound knob arrangement mounted on one end of said housing and coupled to said magnetic elements to thereby vary the forces applied to the magnetic elements to the master shaft.

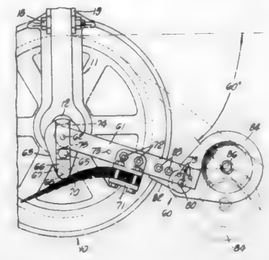
4,039,140
NAIL EXTRACTOR
Barron Pulliam, Chatsworth, Ga., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed June 14, 1976, Ser. No. 696,137
Int. Cl.² B66F *15/00*
U.S. Cl. 254—25 **1 Claim**



1. A nail extractor for the purpose of removing an embedded nail substantially along the straight axis of the nail, comprising
a bar formed with a generally straight section joined to a convex curved section that serves as a fulcrum section which fulcrum section is joined to
a first shank section terminating in a first claw of a size to grip a nail,
a second shank section joined to the straight section of the bar at a first distance from the fulcrum section of the bar, and
a third shank section joined to the straight section of the bar at a second distance from the fulcrum section, said second distance being greater than said first distance,
said second and third shank sections each terminating in a claw of similar shape to the first said claw, with
said claws each extending in the same general direction from the axis of the bar, and with said second shank section longer than said first shank section and shorter than said third shank section,
said second and said third shank sections each extending along a substantially straight line from said bar, with
each said claw formed with a V-shaped recess in which a nail may be gripped.

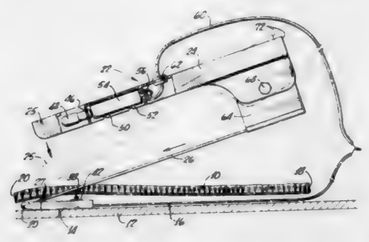
4,039,141
GROUNDING ACCESSORY FOR A BUNDLE CONDUCTOR STRINGING BLOCK
Keith E. Lindsey, 110 El Nido, Pasadena, Calif. 91101
Filed Aug. 11, 1975, Ser. No. 603,631
Int. Cl.² B65H *59/22*
U.S. Cl. 254—134.3 PA **23 Claims**

1. That improvement in a bundle conductor stringing block of the type having a main frame rotatably supporting a set of grooved sheaves in side-by-side relation for rotation about a common axis which comprises: a conductive grounding accessory for maintaining positive electrical contact with each of a plurality of bundle conductors supported by said sheaves, said accessory comprising a U-shaped bracket movably supported on said main frame astride said sheaves with the bight portion thereof positioned adjacent the periphery of said sheaves, a plurality of brackets each pivotally mounted on said bight portion and supporting a grooved roller on the outer ends



thereof each aligned with the groove of a respective one of said sheaves, first spring means resiliently biasing said brackets toward an adjacent one of said sheaves, and second spring means for biasing said U-shaped bracket and said rollers in a direction to hold said rollers in pressure contact with a respective one of bundle conductors while being pulled through said stringing block despite variation in the sag of individual ones of said bundle conductors.

4,039,142
ELECTRIC LEAD INSERTION DEVICE
William Vernon Smith, 12928 Newhope St., Garden Grove, Calif. 92645
Filed Feb. 23, 1977, Ser. No. 771,232
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 R **11 Claims**



1. In a device for inserting and feeding a lead or the like under a carpet or the like, the combination comprising:
A member having a recurved nose portion for feeding under a carpet and clamp means on said member for securing one end of a lead thereto; and
a tool having a pointed probe for inserting through the carpet, the point of the probe being adapted for engaging the recurved nose portion of said member, said tool having a handle portion secured to said pointed probe for grasping said handle and displacing said member under the carpet a distance determined by the length of said probe.

4,039,143
ORGANIC HYDROCARBON SOLVENT-BASED GREEN TIRE LUBRICANT AND PROCESS
Edgar D. Brown, Jr., Schenectady, and Richard M. Ronda, Mechanicville, both of N.Y., assignors to General Electric Company, Waterford, N.Y.
Filed Jan. 6, 1975, Ser. No. 538,784
Int. Cl.² C10M *1/10, 3/02, 5/02, 7/04*
U.S. Cl. 252—28 **51 Claims**

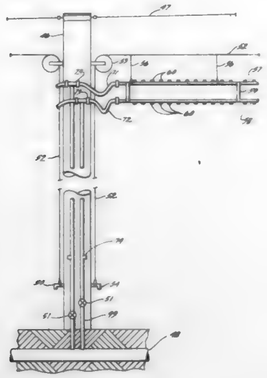
1. A composition for reducing the friction between an expanding fluid pressure core and the internal surface of a green tire during vulcanization, said composition comprising:
a. from 5 to 15% of a poly(diorganosiloxane) fluid having a viscosity in the range of 40,000 to 100,000 cps. at 25° C.;
b. from 5 to 15% of a high molecular weight alkylene oxide polyol, the total of (a) a (b) combined being from 10 to 30% by weight;
c. from 16.7 to 50% of a particulate solid for providing air bleed channels between the expanding pressure core and the green tire;
d. from 0.05 to 10% of a thickening agent;
e. from 0.05 to 5% of a suspending agent;
f. from 0.005 to 1% of an unsaturated fatty acid,
and the balance comprising a liquid, volatile organic hydrocarbon carrier medium, and wherein the ratio of combined amounts of (a) and (b) to (c), by weight, is at least 0.6:1.

16. A process for reducing friction in the bag molding of green tires which comprises applying between the surface of an expanding fluid pressure core and the internal surface of a green tire during vulcanization a composition comprising:
a. from 5 to 15% of a poly(diorganosiloxane) fluid having a viscosity in the range of 40,000 to 100,000 cps. at 25° C.;
b. from 5 to 15% of a high molecular weight alkylene oxide polyol, the total of (a) and (b) combined beng from 10 to 30% by weight;
c. from 16.7 to 50% of a particulate solid for providing air bleed channels between the expanding pressure core and the green tire;
d. from 0.05 to 10% of a thickening agent;
e. from 0.05 to 5% of a suspending agent;
f. from 0.005 to 1% of an unsaturated fatty aicd,
and the balance comprising a liquid, volatile organic hydrocarbon carrier medium, and wherein the ratio of combined amounts of (a) and (b) to (c), by weight, is at least 0.6:1.

4,039,144
ENVIRONMENTAL CONTROL METHOD AND APPARATUS
Thomas R. Mee, Altadena, Calif., assignor to Mee Industries, Inc., San Gabriel, Calif.
Continuation-in-part of Ser. No. 230,680, March 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 103,170, Dec. 31, 1970, Pat. No. 3,788,542. This application Nov. 28, 1973, Ser. No. 419,895
Int. Cl.² A01G *15/00*
U.S. Cl. 239—2 R **18 Claims**

1. A method for protecting an agricultural area from frost damage comprising:
generating a fog of water droplets substantially continuously along an updrift boundary of the area and at a sufficient elevation above ground level that the temperature with water vapor is higher than the original temperature of air nearer ground level; and
spraying a substantially continuous curtain of relatively warm water droplets into relatively cool air along an updrift boundary of the area to be protected, said water droplets being sufficiently large that a portion falls to ground level and sufficiently small that a major portion of

the water has come into equilibrium with the surrounding air before reaching ground level, said relatively warm



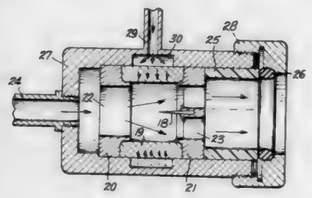
droplets being sprayed at an elevation below the elevation of fog generation.

4,039,145

ELECTROSTATIC POWDERING NOZZLE

Noel Felici, and Elie Gartner, both of Grenoble, France, assignors to Air-Industrie, Courbevoie, France

Filed July 28, 1975, Ser. No. 599,781
Claims priority, application France, Sept. 6, 1974, 74.30686
Int. Cl.[2] B05B *5/02*
U.S. Cl. 239—15 **3 Claims**



1. In a powder-ionizing nozzle for the electrostatic spraying of powder particles using a high voltage not greater than 10 kilovolts, said nozzle comprising a central electrode surrounded by a counter-electrode radially spaced therefrom, the improvement according to which said counter-electrode is made of an electrically conductive material permeable to gas and said nozzle comprises means for blowing a stream of auxiliary gas radially through said counter-electrode toward said central electrode.

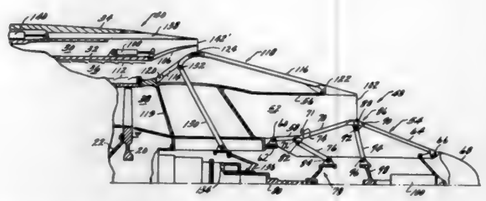
4,039,146

VARIABLE CYCLE PLUG NOZZLE AND FLAP AND METHOD OF OPERATING SAME

Conrad D. Wagenknecht, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 1, 1975, Ser. No. 636,550
Int. Cl.[2] B64C *15/02;* **B64D** *33/04*
U.S. Cl. 239—265.25 **14 Claims**

1. A propulsion nozzle comprising:
a shroud partially defining an outer flow duct;
an articulated plug mounted within said shroud to partially define an inner flow duct; and
a variable position valve means mounted intermediate said shroud and said plug and cooperating therewith to partially define said inner and said outer ducts, said valve being positionable to form a variable throat, as desired, either in cooperation with said plug for said inner duct, or in cooperation with said shroud for said outer duct, or both and



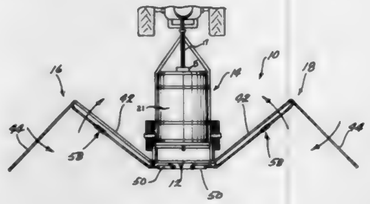
wherein said shroud is translatable to a position downstream of said valve means to partially define, in cooperation with said plug, a flow expansion portion of said nozzle.

4,039,147

SPRAYING APPARATUS

Richard C. Hugg, Westside, Iowa 51467

Filed Feb. 2, 1976, Ser. No. 654,562
Int. Cl.[2] B05B *1/20;* **A01G** *25/09*
U.S. Cl. 239—167 **12 Claims**



1. Spraying apparatus for spraying a liquid, comprising:
a frame;
a first elongated member;
means for pivotally connecting one end of said first elongated member to said frame along a substantially vertical axis;
a second elongated member;
means for pivotally connecting one end of said second elongated member to the other end of said first elongated member along a substantially vertical axis;
spraying means attached to said first and second members for spraying a fluid;
actuating means attached to said frame and to said first and second members for moving said first and second members between an extended and a retracted position, in said extended position for spraying said first and second members extending in a direction substantially transverse to the normal direction of travel of the spraying apparatus; and, in said retracted position, the first and second members being folded together and being each substantially in line with the direction of movement of the spraying apparatus, for transportation from place to place; said actuating means including a strut means pivotally connected to said frame and to said second member;
said actuating means further comprises means connected to said strut means for biasing said second member to said extended position in one position of said actuating means, and biasing said second member to said retracted position in another position of said actuating means; and
said strut means comprising a first portion pivotally attached at one end thereof to said second member, an abutment member rigidly attached to said first portion, a second portion pivotally attached at one end thereof to said

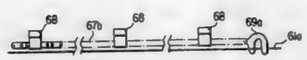
frame, an abutment portion disposed on said second portion, said biasing means comprising a coil compression spring disposed around said first portion and in abutment with said abutment member and said abutment portion, one of said first and second portions being reciprocally connected to the other of said first and second portions and means for limiting the amount of relative reciprocal movement between the first and second portions comprising:
a rod connected to said first portion at one end thereof and slideably connected to the second portion at the other end thereof.

4,039,148

CONVEYING DEVICE FOR LONG ARTICLES WITHIN HEAT TREATMENT FURNACES

Masamitu Tamura; Katsumi Maeda; Nobuhiko Harada, and Sigeharu Nakamura, all of Shimonoseki, Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Jan. 14, 1976, Ser. No. 649,150
Claims priority, application Japan, Jan. 14, 1975, 50-7550
Int. Cl.[2] F27B *9/20*
U.S. Cl. 214—21 **13 Claims**



1. A conveying device for use within a heat treatment furnace for especially conveying long articles to be heat treated, which has at least one product carrier being capable of supporting said long articles, and a drive means for driving said product carrier, wherein the improvement comprises:
said drive means comprises at least one linear conveying element driven by a drive mechanism and disposed within said heat treatment furnace so as to be disposed upon the floor surface of said furnace; and
at least the foremost one of said carriers disposed along the longitudinal direction of said conveying element comprises one or more product supports and an engaging means for engaging said conveying element, said product supports being of a length substantially shorter than that of said articles and being fixedly supported upon the upper surface of said conveying element such that substantially the entire portion of each of said product supports is disposed above and separated from said floor surface of said furnace so as to improve the heating and cooling efficiency of said articles.

4,039,149

LUMP BREAKER APPARATUS FOR REACTOR TANK

Leslie Bill Gajdos, Lakewood, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed June 9, 1976, Ser. No. 694,329
Int. Cl.[2] B02C *23/36*
U.S. Cl. 241—46.11 **17 Claims**

1. A lump breaking apparatus for use on a slurry from a reactor tank; said apparatus having a housing; said housing having an upper portion and a lower portion; said upper portion having end portions and a centrally disposed inlet opening communicating with a chamber in the interior of said upper portion; said lower portion having a compartment with a discharge opening for the discharging of slurry therefrom; apertures at the respective said end portions communicating said chamber with said compartment of said lower portion; bearing means mounted in the respective end portions; a drive shaft extending centrally through said upper portion and journaled respectively in said bearing means; drive means connected to said shaft for rotating said shaft; a plurality of axially spaced stator members mounted in said upper portion; means interconnecting said stator members with said housing of said upper portion to prevent said stator members from rotating; a plurality of axially spaced rotor members mounted on said drive shaft for rotation therewith; each of said rotor members being located between a pair of stator members to provide an



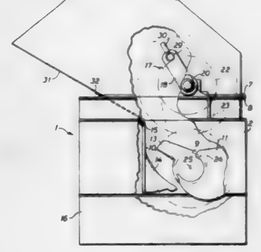
alternating array of said stator and said rotor members; and said stator members cooperative with said rotor members to reduce the particle size to a predetermined size.

4,039,150

APPARATUS FOR HANDLING WASTE PRODUCTS

Torsten Ivarsson, Oskarshamn, Sweden, assignor to Investmentbolaget Elajo AB, Oskarshamn, Sweden

Filed Apr. 7, 1976, Ser. No. 674,420
Claims priority, application Sweden, Apr. 10, 1975, 7504115
Int. Cl.[2] B02C *13/06, 13/286*
U.S. Cl. 241—154 **5 Claims**



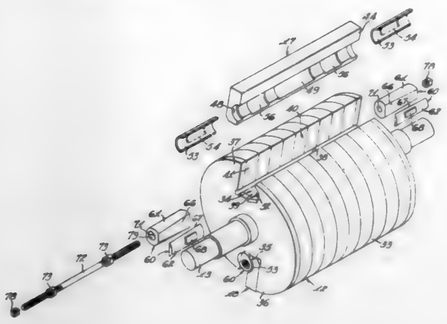
1. An apparatus for processing waste products, comprising comminuting means built into a housing, said comminuting means comprising a motor-driven drum having essentially radially projecting teeth arranged on said drum and an anvil for cooperation with said teeth for comminuting the waste products;
a downwardly sloping supply duct for the waste products opening in the housing above the drum;
feeding means rotatably arranged at the discharge end of the duct on an essentially horizontal shaft extending perpendicularly to the longitudinal axis of said duct, said feeding means having essentially the same width as the discharge end of the duct, said feeding means consisting of an essentially U-shaped clamp the legs of which are rotatably arranged of said shaft in such a way that the portion bridging the legs of the clamp extends in parallel to said shaft;
means for rotation of said feeding means; and
carrier means comprising pins or pegs being disposed on said portion of said feeding means and projecting radially outwards.

4,039,151

IMPELLER LOCKING MEANS FOR IMPACT CRUSHER ROTOR

Major Coxhill; Jerome R. Unger, and Keith B. Lowe, all of Appleton, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Sept. 7, 1976, Ser. No. 721,173
Int. Cl.[2] B02C *13/06*
U.S. Cl. 241—191 **5 Claims**



1. An impeller rotor for an impact crusher having an elongated central body portion having an axis of rotation and provided with at least one axially extending peripheral slot having a leading wall surface extending the length of the rotor in which an impeller bar is arranged with a portion of the leading impeller face within the slot and a portion thereof extending outward of the slot;

an elongated semi-cylindrical cavity formed in the face of the leading wall of the slot;

an elongated semi-cylindrical cavity formed in the leading impeller face within the slot, said semi-cylindrical cavities cooperating to define a single elongated cylindrical cavity;

a two-piece wedge lock disposed within the cylindrical cavity to lock the impeller within the slot; said wedge lock including a first portion having a semi-cylindrical outer surface having a radius centered at a first location and a flat surface formed at an angle to said semi-cylindrical surface;

a second portion having a semi-cylindrical outer surface having a radius equal to the radius of said first portion but centered at a location which is different than the location of the center of the radius of said first portion; said second portion also having a flat surface formed at an angle to said semi-cylindrical surface, said flat surfaces of said first and second portions being complementary; and

means to prevent axial and rotational movement of said second portion relative to said first portion within said cavity;

whereby positive wedging of the impeller within the slot is effected and rotation of the wedge lock within the cavity is effectively prevented due to the radii of the two pieces being centered at different locations.

4,039,152

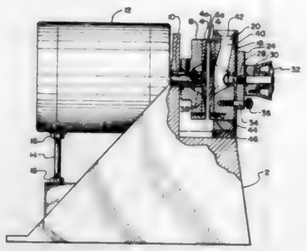
GRINDING MILL

Rex Peterson, 709 S. University, Provo, Utah 84601

Filed Nov. 28, 1975, Ser. No. 635,591
Int. Cl.[2] B02C *7/06, 7/14*
U.S. Cl. 241—245 **19 Claims**

1. A grinding mill for grinding grains and the like comprising

a pair of substantially coaxially disposed discs, each having a cutting face arranged in adjacent and opposing relationship with the cutting face of the other disc, each of said cutting faces including a plurality of circumferentially spaced cutting teeth defining channels therebetween, said teeth and channels extending from near the peripheries of the discs inwardly at an angle to the radii of the discs to effect an outwardly operating scissor action between the teeth of opposing cutting faces as one disc is rotated relative to the other, every other of said cutting teeth extending inwardly a greater distance than the remaining teeth,



said discs being formed to define a central cavity between the discs to receive material to be ground,

means for introducing material to be ground into said cavity, and

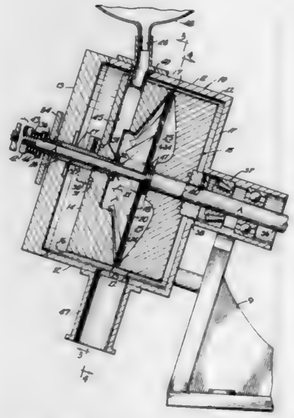
means for rotating one of said discs relative to the other to thereby cut material introduced into the cavity and force the cut material outwardly through the channels in the cutting faces.

4,039,153

GRINDING MILL

Douglas L. Hoffman, W. 3507 LaCrosse, Spokane, Wash. 99205

Filed Apr. 26, 1976, Ser. No. 680,490
Int. Cl.[2] B02C *7/14*
U.S. Cl. 241—248 **10 Claims**



1. In a grinding mill:

a housing having opposed end walls spaced from one another along an axis;

a hollow shaft non-rotatably mounted to one end wall and centered along said axis said hollow shaft having an inner end located within said housing, said hollow shaft being mounted to said one end wall for axial movement relative to the housing along said axis;

adjustment means operatively connected to said hollow shaft and said one end wall for selectively positioning the axial location of said hollow shaft relative to the housing along said axis;

a coaxial elongated shaft rotatably journalled about said axis within said hollow shaft and at the remaining end wall of said housing;

means mounted to said elongated shaft for preventing movement of the elongated shaft relative to the housing along said axis;

non-rotatable grinding means attached to said hollow shaft at a location within said housing;

rotatable grinding means attached to said elongated shaft at a location within said housing;

said non-rotatable and rotatable grinding means having opposed complementary grinding surfaces formed thereon, the grinding surfaces being centered coaxially about said axis; and

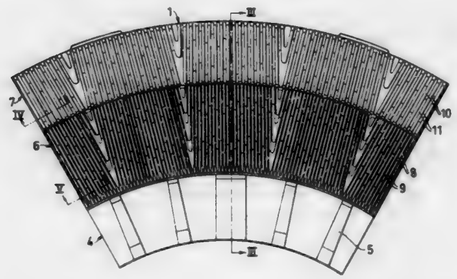
means for imparting rotational movement to said elongated shaft about said axis.

4,039,154

REFINING ELEMENT

Per Viking Peterson, Sundsvall, Sweden, assignor to SCA Development Aktiebolag, Sundsvall, Sweden

Filed Mar. 3, 1976, Ser. No. 663,539
Claims priority, application Sweden, Mar. 12, 1975, 7502787
Int. Cl.[2] B02C *7/08, 7/12*
U.S. Cl. 241—261.3 **6 Claims**



1. A refining element for the refining of fibrous materials comprising a first refining zone and a second refining zone disposed in a direction of flow of said fibrous material through said refining element, an inner feed zone for feeding said fibrous material to said first refining zone and said second refining zone, respectively, both said first refining zone and said second refining zone including grooves and ridges thereon, the ratio of the width of said grooves to the width of said ridges in said first refining zone being greater than the ratio of the width of said grooves to the width of said ridges in said second refining zone, the width of said grooves in said first refining zone being greater than the width of said ridges in said first refining zone, the width of said grooves in said second refining zone being less than the width of said ridges in said second refining zone, the number of ridges in said first refining zone being greater than the number of ridges in said second refining zone, and the width of the grooves in said first refining zone being greater than the width of said grooves in said second refining zone.

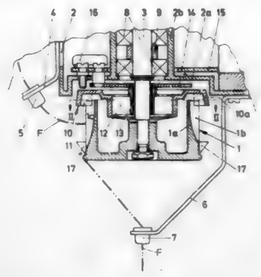
4,039,155

THREAD STORING AND FEEDING DEVICE

Kurt Arne Gunnar Jacobsson, Ulricehamn, Sweden, assignor to AB IRO, Ulricehamn, Sweden

Filed Mar. 4, 1976, Ser. No. 663,755
Claims priority, application Germany, Mar. 7, 1975, 2510048
Int. Cl.[2] B65H *51/20*
U.S. Cl. 242—47.12 **6 Claims**

1. In a thread storing and feeding device for textile machines, comprising a storage drum to which the thread can be tangentially fed to form a thread supply and from which it can be withdrawn particularly overend, and a disc movable with respect to the drum for displacing the thread supply axially along the drum, the disc having a thread engaging surface which extends transversely with respect to the exterior drum surface and which engages the thread storage for pushing it axially along the drum, the improvement wherein the storage drum has a closed circumferential wall provide with a plurality



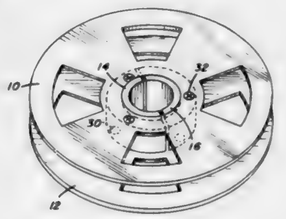
of longitudinally extending, circumferentially spaced grooves formed in the exterior surface thereof, and the movable disc having an edge section overlapping the upper edge of the drum and being provided with a plurality of webs or teeth which extend inwardly into the longitudinal grooves, the lower surfaces of said teeth defining said thread engaging surface.

4,039,156

REEL

Raymond A. Abraham, San Diego, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Filed Sept. 5, 1975, Ser. No. 610,726
Int. Cl.[2] B65H *75/22*
U.S. Cl. 242—71.8 **1 Claim**



1. A reel comprising:

first and second flange assemblies, each of which flange assemblies comprise a flange member and a core element rigidly and immovably affixed thereto;

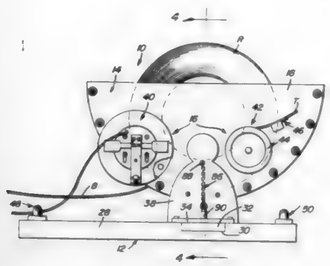
first means for detachably attaching said core element of said second flange assembly to said flange member of said first flange assembly;

second means for detachably attaching said core element of said first flange assembly to said flange member of said second flange assembly; and

said first and second attaching means attach said core elements to said flange assemblies such that said core elements form a space therebetween extending along the entire length of said core elements,

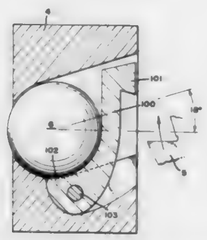
whereby when a web is wrapped around said core elements of said reel and said first and second attaching means are detached, said first and second flange assemblies collapse radially prior to axial movement whereupon said flange assemblies may be separated.

4,039,157
METAL BAND USE FACILITATING ASSEMBLY
Pedro R. Arriola, Jr., 2440 Ave. "B, Port Arthur, Tex. 77640
Filed July 12, 1976, Ser. No. 704,913
Int. Cl.[2] B21C *47/16*
U.S. Cl. 242—78.7 **11 Claims**



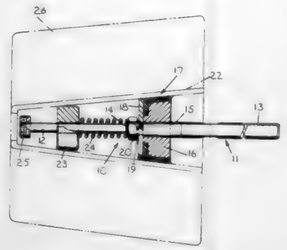
1. A metal band use facilitating assembly, comprising, in combination:
- a. frame means for cooperatively supporting the assembly;
- b. receptacle means supported on the frame means for receiving individually rolls of banding material of various widths and diameters; and
- c. band rewinder means supported on the frame means for winding banding material into rolls which are smaller and more manageable than a roll disposed in the receptacle means.

4,039,158
BALL ACTUATED INERTIA DEVICE
Per Olaf Weman, Haslah, Germany, assignor to Sigmatex, A.G., Basel, Switzerland
Filed Mar. 17, 1975, Ser. No. 559,297
Int. Cl.[2] A62B *35/00;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **4 Claims**



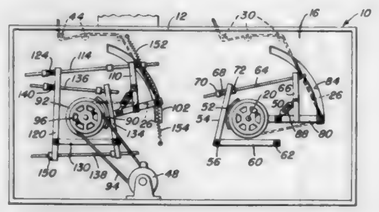
1. A belt winder for a safety belt for vehicles with quick-action locking means, comprising a housing having a winding shaft, a locking mechanism arranged between the housing and the winding shaft, a mounting support having the shape of a ring and including a pair of adjusting cylinders, each of the cylinders having formed therein a pocket open at one side, each said pocket having a bottom and being formed at an angle to the axes of said cylinders, means on said ring for selectively mounting each said cylinder for rotation to maintain a portion of the bottom of each said pocket below the open end of each said pocket when said cylinders are in a horizontal plane, means mounting said ring for selective rotation on said housing about an axis perpendicular to the longitudinal axis of the adjusting cylinders to maintain said adjusting cylinders in a horizontal plane, and said locking mechanism comprising **(1)** a locking wheel mounted on said shaft and having a plurality of ratchet teeth, **(2)** a ball inert mass mounted in the pocket of each of said cylinders and moving within the pocket when the vehicle accelerates in at least one of three directions in space and **(3)** a tipping member mounted in each said pocket and having a first portion thereof curved to conform to the shape of the ball and a second portion adapted to engage said teeth, said tipping being independent of the ball but moved in response to ball movement in the pocket to bring said second portion into engagement with said teeth to lock the winder shaft.

4,039,159
CONE HOLDER ASSEMBLY
Ralph R. Champagne, Woonsocket, R.I., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Apr. 16, 1976, Ser. No. 677,519
Int. Cl.[2] B65H *49/02;* **D03J** *5/08*
U.S. Cl. 242—130.1 **1 Claim**



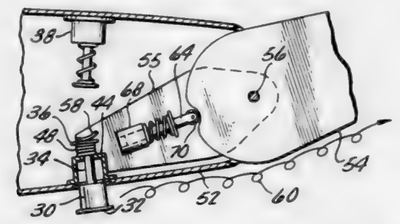
1. A cone holder for supporting a yarn package on textile machines which comprises:
- a. an elongated spindle member;
- b. a cone support means fixed on said spindle intermediate the ends thereof;
- c. means defining a resilient cap member carried on said support means which includes:
  - i. means forming a plurality of integral deformable circumferential projections for holding a yarn package cone on said spindle member and selectively releasing the same therefrom; and
- d. stabilizing means slidably mounted on said spindle in operative association with said support means for maintaining the cone in a centralized position on said spindle while being held by said circumferential projections which include:
  - i. a centering collar and a biasing means interposed between said cone support means and centering collar for urging the latter to a position for engaging an inner surface of a cone spaced from that portion of the surface engaged by said circumferential projections.

4,039,160
FILM TRANSPORT SYSTEM
John Burton Hendrick, 709 NW. 19 Ave., Gainesville, Fla. 32601
Filed Apr. 20, 1976, Ser. No. 678,605
Int. Cl.[2] B65H *25/04, 25/22;* **G03B** *1/18*
U.S. Cl. 242—189 **8 Claims**



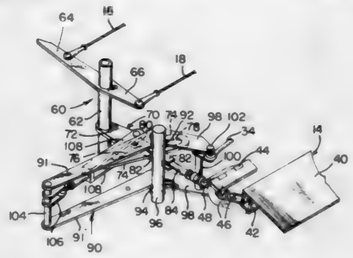
1. A film transport system for use in conjunction with a projection system including motor driven film moving means, said transport system comprising a feed reel and a take-up reel, a first elongated feed reel shaft, means rotatably mounting said shaft, said feed reel being fixed to said shaft for rotation of the reel and shaft in response to the drawing of film therefrom by the film moving means of the projector, a friction wheel fixed to said shaft for rotation therewith, a first brakeshoe, a first pivotally mounted linkage assembly mounting and constantly biasing said shoe into drag producing engagement with said wheel, said linkage assembly including a first elongated arm urging said linkage assembly in first direction to engage said shoe with said wheel, a first film guide mounted on said arm and adapted to have film entrained thereabout in a manner whereby excess tension in the film will tend to urge said arm in a second direction opposite to said first direction toward relaxation of the shoe engagement with the wheel, a second rotatably mounted elongated shaft, said take-up reel being fixed to said second shaft for rotation therewith, a second friction wheel fixed to the second shaft for rotation therewith, drive means engaged with said second shaft for a driving thereof independently of the film moving means of the projector system, a second brakeshoe, a second pivotally mounted linkage assembly mounting said second brakeshoe, spring means biasing said second brakeshoe out of engagement with said second friction wheel, said second linkage assembly including an elongated second arm, a second film guide mounted on said second arm and adapted to have the film entrained thereabout in a manner whereby any pressure developed by the film against the second film guide will urge said second arm, and the remainder of the linkage assembly, against the biasing force of said spring means for retention of the second brakeshoe in constant engagement with the second friction wheel as film moves about said second film guide, said reels and associated friction wheels being vertically orientated and respectively mounted on horizontal shafts, said first elongated arm, associated with the feed reel, being pivotally mounted, adjacent the first shaft, and projecting radially outward therefrom for pivotal movement in a vertical plane, said first film guide being mounted on the outer end of said first arm, a generally vertically directed link pivoted to said first arm between the first shaft and the first film guide thereon, and projecting upwardly therefrom, a second vertically extending link positioned to the opposite side of said first shaft from said first link and pivotally mounted at a point below said first shaft for selective movement toward and away from said first shaft, said first brakeshoe being mounted on said second link in alignment with the first friction wheel for engagement therewith, and a third link pivotally interconnecting the upper ends of the first link and the second link for a movement of the second link, and brakeshoe thereon, in conjunction with a movement of the first link which in turn moves with said first arm.

4,039,161
HIDDEN VORTEX GENERATORS
Andrew B. Bauer, Orange, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.
Filed Oct. 16, 1975, Ser. No. 622,893
Int. Cl.[2] B64C *3/58, 9/34*
U.S. Cl. 244—213 **7 Claims**



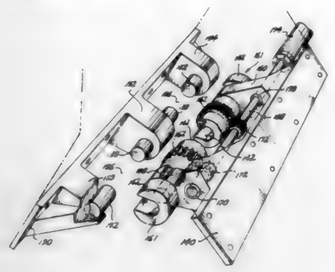
1. A control surface for generating force due to a medium flowing thereover having a leading portion with opposite side surfaces and a trailing portion movable with respect thereto, the improvement comprising:
- movable means for generating vortexes in the flowing medium adjacent the trailing portion, said movable means comprising a plurality of blades of airfoil cross section projecting into the flowing medium, said blades having chord lines inclined relative to the flowing medium to generate vortexes therefrom;
- means to extend and retract said movable means for generating vortexes from at least one of the oposite side surfaces of the leading portion as the trailing portion moves with respect to the leading portion through pre-determined positions;
- a pivot which connects the leading portion to the trailing portion; and
- force responsive means to releasably connect said means to extend and retract said movable means to the trailing portion for rotation about said pivot when counter force preventing said rotation is below a predetermined level.

4,039,162
SPOILER CONTROL SYSTEM
John T. Calhoun, 10396 Rainier Ave. South, Seattle, Wash. 98178, and Sherman E. Hall, 20816-18th Place South, Seattle, Wash. 98188
Filed Feb. 5, 1976, Ser. No. 655,620
Int. Cl.[2] B64C *9/04, 13/32*
U.S. Cl. 244—213 **10 Claims**



1. In a control system for aircraft wing spoilers wherein said aircraft includes wings provided with flaps and also includes manual cockpit controls which are operatively connected to said spoilers and flaps, and wherein said spoilers are hingedly mounted in said wings forward of the wing flaps and are the sole means of aircraft roll control, the improvements comprising:
- a. actuating mechanism for deploying said wing spoilers either up into active position from a neutral position to become an active spoiler for aircraft roll control, or downward from the neutral position into an inactive position to become an inactive spoiler for providing a centering moment to the aircraft cockpit controls,
- b. a first means connected to said actuating mechanism for moving one of the spoilers downwardly into the inactive position a lesser amount than the others of the spoilers is moved up into the active position, said first means including a differential portion and a shifting connection to said actuating mechanism for altering the amount of downward movement of the inactive spoiler according to the position of the wing flaps, and
- c. second means interconnecting said wing flaps and the differential portion of said first means such that as the wing flaps are extended from their retracted position to full down position the amount of downward movement of the inactive spoiler is increased from minimum to maximum to thereby increase the amount of centering moment in accordance with the amount of decentering moment on the active spoiler and to also thereby impart balanced forces for proper feel to the aircraft cockpit controls.

4,039,163
AIRCRAFT CARGO RAMP
Thomas H. Shorey, Freeland, Wash., assignor to The Boeing Company, Seattle, Wash.
Filed Apr. 5, 1976, Ser. No. 673,917
Int. Cl.[2] B64D *9/00*
U.S. Cl. 244—137 R **23 Claims**



5. An aircraft cargo ramp stowable within the cargo compartment of an aircraft and deployable between the cargo opening of said aircraft and the surface of the ground comprising:

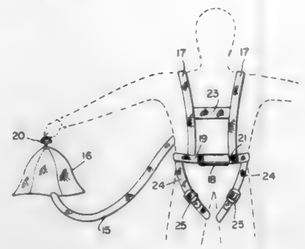
first, second and third cargo ramp sections, each of said cargo ramp sections having an upper surface, a lower surface, first and second end surfaces, and oppositely disposed side surfaces;

first and second hinge means, said first hinge means for pivotably connecting said first end surface of said second cargo ramp section to said second end surface of said first cargo ramp section, said first hinge means mounted along said lower surfaces of said first and second cargo ramp sections, said second hinge means for pivotably connecting said first end surface of said third cargo ramp section to said second end surface of said second cargo ramp section, said second hinge means mounted along said upper surfaces of said second and third cargo ramp sections, said first and second cargo ramp sections being substantially aligned with one another when said cargo ramp is stowed in said cargo compartment with said third cargo ramp section being rotated about said second hinge means to place said upper surface of said third cargo ramp section in juxtaposition with said upper surface of said second cargo ramp section;

first and second actuation means, for deploying said cargo ramp from the stowed position to a position in which said first, second and third cargo ramp sections are substantially aligned with one another and extend between the lower surface region of said cargo opening and said surface of the ground, said first actuation means for swinging said second and third cargo ramp sections about said first hinge means with said upper surfaces of said second and third cargo ramp sections in juxtaposition with one another, said second actuation for swinging said second and third cargo ramp sections about said second hinge means to substantially align said second and third cargo ramp sections with one another, said second actuation means being operable when said first actuator has positioned the center of mass of said third cargo ramp section outwardly from said second hinge means, said first actuation means further being operable to swing said aligned second and third cargo ramp sections about said first hinge means to bring said first cargo ramp section into substantial alignment with said aligned second and third cargo ramp sections; and

means for attaching said first end surface of said first cargo ramp section adjacent to the sill region of said cargo opening when said cargo ramp is deployed from said aircraft cargo opening to said surface of the ground.

4,039,164
PARACHUTE WITH MAIN CHUTE RELEASE DEPENDANT UPON PILOT CHUTE DEPLOYMENT
William Ross Booth, 2500 N. Woodland, Deland, Fla. 32720
Filed May 6, 1976, Ser. No. 683,798
Int. Cl.[2] B64D *17/40*
U.S. Cl. 244—148 **3 Claims**



1. In the art of parachutes comprising pilot and main chutes and means for releasing said chutes, the improvement wherein there is added locking means locking said main chute in place, said locking means being unlocked by the deployment of the pilot chute, said locking means comprising

a. a pack attached to the back of a user and enclosing said main chute, said pack comprising flaps which have respectively, grommets and a core thereon, said core going through said grommets when said flaps are enclosing said main chute;

b. said pilot chute is attached to said main chute by a bridle cord; and

c. said bridle cord going through a hole in said core when said flaps are enclosing said main chute, whereby said main chute is locked in place; wherein there are also container means attached to the front of the user of the parachute, said pilot chute being small and fitable into said container means whereby it is also deployable with one hand.

4,039,165
DERIVED RATE CIRCUIT FOR AIRCRAFT
Henry E. Hofferber, Phoenix, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.
Filed June 4, 1976, Ser. No. 693,246
Int. Cl.[2] G05D *1/10*
U.S. Cl. 244—177 **10 Claims**

1. A rate deriving circuit for use in aircraft having an a.c. power supply providing an a.c. power signal subject to undesired disturbance components and an attitude displacement sensor, said rate deriving circuit and said attitude displacement sensor receiving excitation from said a.c. power signal, said attitude sensor providing an a.c. signal in accordance with attitude displacements of said aircraft, said rate deriving circuit comprising an attitude displacement signal path and a power supply reference path, said attitude displacement signal path comprising:

first band pass filter means responsive to said a.c. attitude displacement signal and tuned to the frequency of said a.c. power signal for filtering said a.c. attitude displacement signal, thereby providing a filtered attitude displacement signal,

first demodulator means coupled to said first band pass filter means for demodulating said filtered attitude displacement signal thereby providing a demodulated filtered attitude displacement signal and

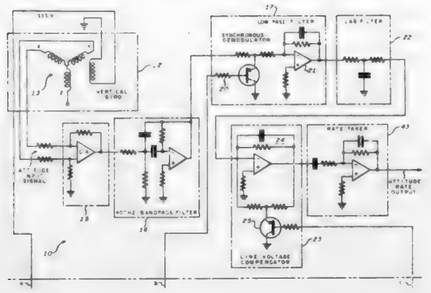
line voltage compensator means coupled to said first demodulator means and to said power supply reference path for compensating said demodulated filtered attitude displacement signal with respect to said disturbance components,

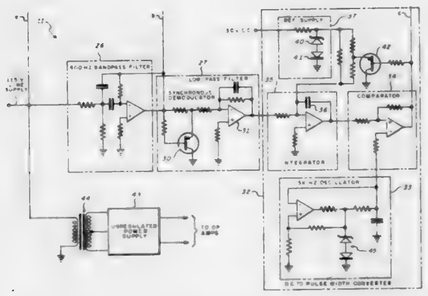
thereby providing a compensated attitude displacement signal,

said power supply reference path comprising

second band pass filter means responsive to said a.c. power signal and tuned to the frequency thereof for filtering said a.c. power signal, thereby providing a filtered a.c. power signal and

second demodulator means coupled to said second bandpass filter means for demodulating said filtered a.c. power





signal, thereby providing a reference signal in accordance with said a.c. power signal,

said line voltage compensator means being responsive to said reference signal for providing said compensated attitude displacement signal, and

derivative circuit means responsive to said compensated attitude displacement signal for providing a substantially disturbance free signal proportional to the rate of change of said attitude displacement signal.

4,039,166
STAMPED METAL FENCE POST CAP
Robert J. Elgin, Penn Township, Westmoreland County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.
Filed Nov. 26, 1975, Ser. No. 635,496
Int. Cl.[2] E04H *17/14*
U.S. Cl. 256—65 **7 Claims**

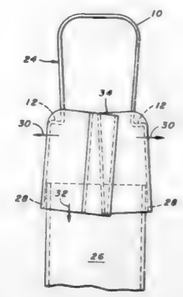
1. A cap for attaching a rail to the top of a fence post, said cap being formed from an integral, one-piece, flat, springy blank, said blank having a narrow rectangular body portion, wider ledge portions extending from the ends thereof, wall portions extending from the ends of said ledge portions, and mating joint segments extending from said wall portions, said cap comprising:

a rail receiving loop formed by bending said narrow rectangular body portion so that said ledge portions are brought substantially together;

a pair of ledges formed by outwardly bending said ledge portions of said blank;

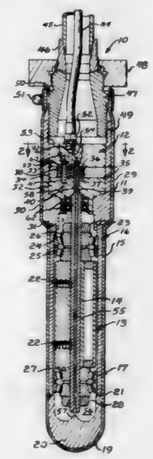
post-receiving means depending from said ledges formed from said wall portions; and

interlocking side joints in said post-receiving means, said side joints formed from said mating joint segments and interlocking as said cap is thrust onto said fence post, said



loop having a spring action tending to push said wall portions together for frictionally clamping said cap to said post.

4,039,167
HYDRAULIC VIBRATOR
William L. Zinga, Saratoga, Calif., and Raymond C. Thompson, Lisle, Ill., assignors to Zinga Industries Inc., Bellwood, Ill.
Filed Aug. 2, 1976, Ser. No. 711,092
Int. Cl.[2] B01F *11/00*
U.S. Cl. 259—1 R **16 Claims**



1. In a fluid-operated vibrator having an outer housing, a fluid-operated motor provided with a drive shaft, an eccentric on said shaft, bearing means for rotatably mounting the shaft in said housing, means for delivering pressurized fluid to said motor for rotating the motor, and exhausting means for exhausting the spent fluid, the improvement comprising:

duct means in said shaft for bypassing a portion of the pressurized fluid delivered to said motor into said housing to lubricate said bearing means; and

return for delivering said lubricating portion of the fluid from the bearing means to said exhausting means.

4,039,168

SCREW EXTRUDER FOR THE PRODUCTION OF AN EXPANDED DRY FEED FOR FOODSTUFF

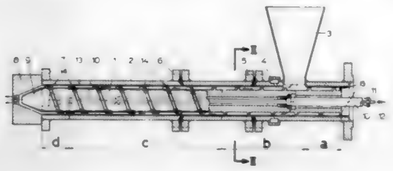
Josephus Antonius Marie Caris, Putten, and Johannes Antonius de Goede, Arnhem, both of Netherlands, assignors to Trouw & Co. N.V., Putten and Machinefabriek Lalesse, B. V. Arnheim, both of, Netherlands

Filed Jan. 3, 1975, Ser. No. 538,418

Claims priority, application Netherlands, Jan. 8, 1974, 7400221

Int. Cl.² B01F *7/08*

U.S. Cl. 259—9 **2 Claims**



1. A screw extruder for the production of an expanded dry feed or foodstuff, comprising: a stationary casing having an inner wall defining an axially extending bore; a screw mounted for rotation within said casing; the latter and said screw defining a push zone, a filling and transport zone, a compression zone and a final zone; said casing have a lateral filler opening at the beginning of said transport zone, and further having an outlet at one end thereof; said screw includes an end portion near said outlet, said end portion having the shape of a cone, said bore in the casing having an end portion surrounding said end portion of the screw and also having the shape of a cone, said casing and said screw extending in said push zone beyond said filler opening over a distance equal to at least one pitch length of said screw in a direction opposite to said outlet; said screw being sealed with respect to said casing at the end of said push zone; said filler opening being positioned at a distance of said compression zone which is at least equal to one pitch length of said screw; said casing having spaced-apart internal grooves extending in the longitudinal direction, said grooves having in cross-section the shape of a rectangular trapezium including a radially extending rectangular edge and a bevelled edge, said rectangular edge being the front edge and said bevelled edge being the rear edge when seen in the direction of rotation of said screw.

4,039,169

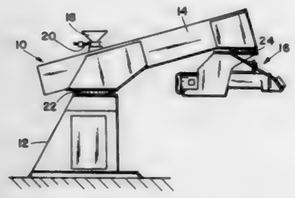
CONTINUOUS SAND MULLER

Gordon Bartholomew, Muscatine, Iowa, assignor to Carver Foundry Products, Progress Park, Iowa

Filed Feb. 2, 1976, Ser. No. 654,338

Int. Cl.² B01F *7/04, 7/08*

U.S. Cl. 259—10 **8 Claims**



1. A continuous muller including a sand conveyor and a mixing head rotatably mounted to said sand conveyor for mixing foundry sand and binder additives for core and mold production, said mixing head comprising:

a support frame having a pair of parallel, spaced side plates and a support plate extending transversely between said side plates;

a first and a second preblending means, each of said preblending means including an elongated cylindrical tube secured to said frame and having a sand inlet aperture adjacent the forward end of said tube and a sand outlet adjacent the rear end of said tube, a high-speed, high-intensity premixing auger means rotatably mounted within said tube for blending and continuously conveying a sand and additive mixture from the forward inlet to the rear outlet, and a binder additive inlet intersecting said tube at an angle with respect to the tube longitudinal center line and at a point adjacent to and downstream from said sand inlet aperture, said cylindrical tubes of said preblending assemblies being positioned in the same horizontal plane;

means for securing said preblending tubes to said frame including a heat plate positioned in front of said preblending tubes and a plurality of tie rods extending through said head plate and said support plate;

a primary mixing means positioned below and extending parallel with said first and second preblending means, said primary mixing means including a primary elongated cylindrical tube secured to said frame having an inlet aperture at the rear thereof and positioned below said outlets of said preblending means, an outlet aperture adjacent the forward end thereof, a premix outlet tube connecting said preblending means outlets with said primary tube inlet, and high-speed, high-intensity, primary auger means rotatably mounted within said primary tube for thoroughly combining said preblended mixtures and continuously conveying said combined mixture to said primary tube outlet;

means for securing said primary tube to said frame including a primary head plate positioned in front of said primary tube and a plurality of tie rods extending through said primary head plate and said support plate thereby securing said primary tube to said frame;

a single, high-speed, drive means supported on said frame for rotating said preblending auger means and said primary auger means;

a resin additive supply means connected to one of said binder inlets for supplying a metered quantity of resin; and

a catalyst additive supply means connected to the other of said binder inlets for supplying a metered quantity of catalyst.

4,039,170

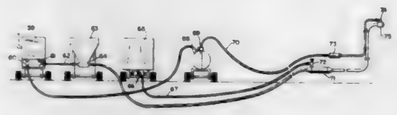
SYSTEM OF CONTINUOUS DUSTLESS MIXING AND AERATING AND A METHOD COMBINING MATERIALS

Charles E. Cornwell, 7104 Marlan Drive, and Mark Plunguian, 6912 Columbia Drive, both of Alexandria, Va. 22307

Filed Sept. 8, 1975, Ser. No. 610,990

Int. Cl.² B28C *5/06*

U.S. Cl. 259—147 **3 Claims**



1. A continuous process for the production of cementitious compositions comprising the steps of simultaneously supplying separate flows of water and a blend of dry cement and aggregate to a common junction where the flows are intermixed into a common flow upon coming in contact; moving the common flow through a path containing a series of angularly disposed baffles causing a turbulence and uniform mixing of the combined flows; further comprising adding a flow of preformed foam to the flow of mixed cementitious composition and conveying the final combined flows to a discharge nozzle.

4,039,171

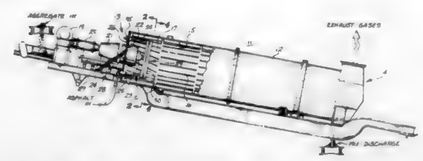
DRUM DRYER/MIXER

Herbert Neil Shearer, Renton, Wash., assignor to Boeing Construction Equipment Company, Tukwila, Wash.

Filed June 24, 1976, Ser. No. 699,425

Int. Cl.² B28C *5/46;* G01B *5/04*

U.S. Cl. 259—158 **7 Claims**



1. A mixer for the preparation of a bituminous paving composition or the like comprising:

a rotatable drum having an inlet end for the reception of aggregate and a discharge end;

burner means and cooperating blower means for producing and directing radiant energy and a stream of heated gases into the interior of said drum;

said burner means producing an open flame and being substantially aligned with the central axis of said drum and positioned to direct the radiant energy of its open flame into the interior of said drum; heat dispersing means disposed within said drum downstream from said burner means and extending across a portion of the interior cross-section of said drum;

means for introducing aggregate into said drum at substantially the inlet end thereof;

means for discharging a bituminous binder onto the aggregate within said drum;

lifting flight means disposed along the inner wall of said drum for lifting and tumbling said aggregate and said binder through said stream of heated gases within the volume of said drum downstream from said dispersing means;

said lifting flight means beginning substantially at the position of said dispersing means and extending toward the discharge end of said drum.

4,039,172

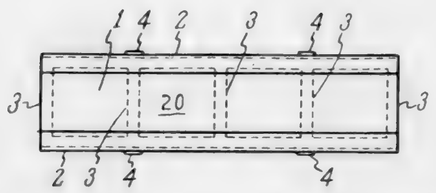
OUTLET TROUGH FOR A MOLTEN PRODUCT

Tsuyoshi Yoshida, Bizen, Japan, assignor to Koa Taika Kogyo Kabushiki Kaisha, Japan

Filed Oct. 6, 1976, Ser. No. 730,016

Int. Cl.² C21B *7/14*

U.S. Cl. 266—196 **3 Claims**



1. An outlet trough for a molten product, which comprises a body having a long, narrow depression in the top surface thereof permitting said molten product to run through, said body being supported by angle bars at the bottom corners thereof, said angle bars at opposite bottom corners being connected by flat bars provided at intervals, said body being a mass coalesced under the influence of physical force.

4,039,173

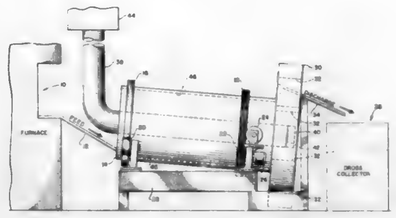
ALUMINUM DROSS RECOVERY METHOD

Pandelis N. Papafingos, and Richard T. Lance, both of Riverside, Calif., assignors to Alumax Mill Products, Inc., Riverside, Calif.

Division of Ser. No. 625,286, Oct. 23, 1975. This application Oct. 8, 1976, Ser. No. 731,071

Int. Cl.² C22B *21/00*

U.S. Cl. 266—201 **3 Claims**



1. A system for recovering dross values comprising, in combination:

means for feeding dross directly from a melting furnace to one end of cooling means without significant cooling enroute such that the dross reaches the cooling means at a temperature of more than about 1000° F.;

means for cooling the dross to less than 400° F. in less than 3 minutes comprising a portable cylinder having an internal cylindrical cooling surface, means to chill said surface, means to rotate said cylindrical surface;

the cooling means being so constructed and configured and being so operated when in use as to receive the hot dross at one end of the cylindrical cooling surface, lift the dross by rotation of the cylinder with the dross in contact with said surface, tumble the dross onto said cooling surface and convey the dross to the other end of the cylinder all simultaneously, the dross arriving at the other end of the cylinder at a temperature of no more than about 400° F. within less than about 3 minutes from the time the dross was first received on the cooled cylindrical surface;

means for removing particles which are smaller than openings in a 24 mesh Tyler screen while the dross is being cooled; and

means for removing the cooled dross from the other end of the cylinder at a temperature of no more than 400° F., said dross containing substantially all of the originally contained metallic constituent integrally retained in said dross as the metal.

4,039,174

RELINE TOWER FOR A METALLURGICAL FURNACE

Clifford A. Poff, Pittsburgh, Pa.; William J. Hively, Salem, and Kenneth J. Novacich, Poland, both of Ohio, assignors to Fordees Corporation, Leetonia, Ohio

Filed Mar. 31, 1976, Ser. No. 672,518

Int. Cl.² C21C *5/44*

U.S. Cl. 266—281 **28 Claims**

1. An apparatus for facilitating the relining of a metallurgical furnace having a bottom opening spaced above a floor, said furnace being supported for pivotal movement about a horizontal axis by a furnace drive, said apparatus including the combination of:

rails extending along said floor,

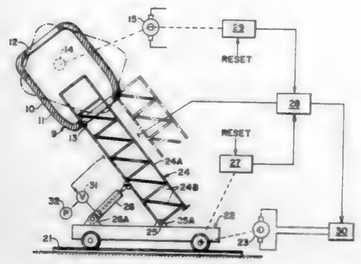
a wheeled car adapted to move along said rails while spaced vertically below the bottom opening in said metallurgical furnace,

a drive for moving said wheeled car along said rails,

an elongated tower having an extended height to project into said metallurgical furnace by passing through the

bottom opening thereof while the tower is supported by said wheeled car,

hinge means for pivoting a selected length of said tower about a horizontal axis lying below the bottom opening in the furnace in a manner to vertically displace the upper end of the tower,



drive means for pivoting the selected length of the tower about the horizontal axis of said hinge means for displacing the upper end of the tower from an elevation lying below the bottom opening in the metallurgical furnace to a vertically-extended position whereby the tower extends into the furnace, and

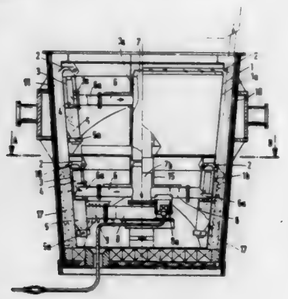
means for controlling said drive means.

4,039,175

PROCESS AND APPARATUS FOR REMOVING DUST PARTICLES DISPOSED BETWEEN THE LINING OF A CASTING LADLE AND A TEMPLATE

Karl Dieter Beckers, Neunkirchen-Seelscheid, Germany, assignor to Martin & Pagenstecher GmbH, Cologne-Mulheim, Germany

Filed Dec. 1, 1976, Ser. No. 746,575
Claims priority, application Germany, Jan. 20, 1976, 2601947
Int. Cl.[2] F27D *1/16*
U.S. Cl. 266—281 **19 Claims**



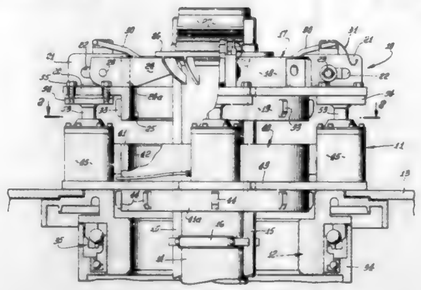
1. A device for removing dust particles disposed during slinging the lining of a reactor said reactor having spaced from the inner wall a generally vertical template, and a suction conduit having an inlet and outlet inside said template, said inlet being in fluid communication with particles disposed near the upper edge of said template, said suction conduit including filtrating means for filtering out entrained particles from air sucked therethrough, the filtering means including means for collecting filtered particles, the outlet end of said suction conduit including means for sucking air therethrough.

4,039,176

MARINE RISER SPIDER SHOCK ABSORBER APPARATUS

Martin B. Jansen, Jr., Houston, Tex., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed Aug. 4, 1975, Ser. No. 601,306
Int. Cl.[2] F16F *9/18*
U.S. Cl. 267—125 **17 Claims**



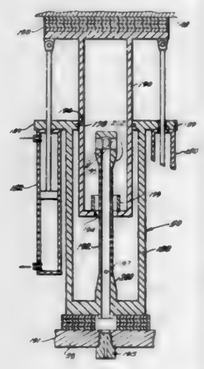
1. Shock absorber apparatus for supporting a tubular string to be lowered through the apparatus, comprising a shock absorber body adapted to be supported by a rotary rig table, a spider above said body and adapted to be engaged by the tubular string to support the same, cylinders connected to one of said body and spider and adapted to contain a fluid, pistons in said cylinders, extension rods rigidly connected to the other of said body and spider, a seat slidable laterally in each piston, said extension rods engaging said seats to support said spider for lateral translation relative to said shock absorber body, and means for restricting flow of fluid from said cylinders upon engagement of said tubular string with said spider and relative displacement of said pistons in said cylinders to reduce the decelerating force imparted by the tubular string to said spider.

4,039,177

HEAVE COMPENSATION APPARATUS FOR A MARINE MINING VESSEL

Abraham Person, Los Alamitos, and Vance E. Bolding, Redondo Beach, both of Calif., assignors to Global Marine Inc., Los Angeles, Calif.

Division of Ser. No. 479,093, June 13, 1974, Pat. No. 3,943,868. This application Dec. 22, 1975, Ser. No. 643,555
Int. Cl.[2] F16F *9/342*
U.S. Cl. 267—126 **2 Claims**



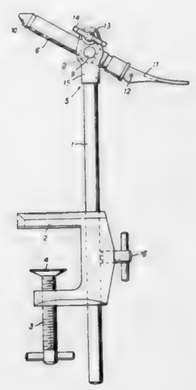
1. A hydraulic load supporting ram including first and second cylindrical members, one sliding inside the other, the outer ends of the cylindrical members being closed to form a fully enclosed space that varies in volume as the two members move relative to each other, a tube extending into the volume from the outer end of the outer one of the cylindrical members toward the end of the inner member, the tube being rigidly secured at one end to said one cylindrical member and providing a fluid passage connecting the enclosed space to the exterior of the ram, whereby fluid may move into and out of the variable volume defined by the two cylindrical members through the tube, the inner end of the inner cylinder having an end wall transverse to the tube to divide the interior space into two regions, the inner wall having an opening through which the tube extends, the tube having radial openings adjacent the inner end, and means movable with the inner one of said cylindrical members and forming a cylindrical surface concentric with the tube for covering said radial openings with relative movement between the two members to the maximum extension of the ram.

4,039,178

FLY TYING DEVICE

Kenneth Frank Odames, Crow Mill, Countesthorpe Road, South Wigston, Leicester, England

Filed Aug. 18, 1976, Ser. No. 715,497
Claims priority, application United Kingdom, Aug. 29, 1975, 35676/75
Int. Cl.[2] B25B *1/22*
U.S. Cl. 269—75 **3 Claims**



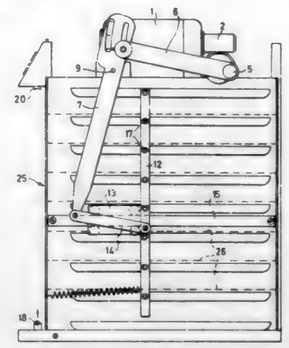
1. A fly-tying device comprising a stand, a U-shaped bracket provided on said stand and having two side portions, fastening means spanning said side portions, a tube receivable between said side portions, jaws means mounted with respect to said tube for gripping a hook, means for operating said jaw to cause said jaw to grip a hook and a swivel joint mounting said tube between the side portions of the bracket, said swivel joint comprising a part-spherical collar integral with the tube and means defining a circular collar-receiving opening formed in the side portions of the bracket in which said collar is mounted.

4,039,179

DEVICE FOR COLLATING SHEETS

Robert Dezoppy, 96, Rue Triolet, Angleur, Belgium

Continuation-in-part of Ser. No. 464,191, April 25, 1974, abandoned. This application Oct. 24, 1975, Ser. No. 625,774
Claims priority, application Luxembourg, Apr. 25, 1973, 67495
Int. Cl.[2] B65H *39/05*
U.S. Cl. 270—58 **6 Claims**



1. A device for collating sheets, comprising:

a. a series of racks arranged substantially parallel to each other one above another, to receive respective patches of sheets each rack having a front entrance for allowing sheets to be projected out of the respective racks;

b. a plurality of pushers which are to rest on the respective batches, the pushers frictionally engaging the uppermost sheets and pushing said uppermost sheets into a projecting position only during movement of the pushers in one direction relative to the racks, wherein the projected upper most sheets are the pushers running freely on the uppermost sheets during relative movement in the opposite direction;

c. drive means for reciprocating the pushers simultaneously and in synchronism; and

d. control means for automatically stopping the drive means when sheets project from the racks ready for manual collection and starting the drive means when the projecting sheets have been collected, the control means including a light emitter which directs a light beam past the series of racks, and a photo-sensitive cell in the path of the light beam beyond the series of racks whereby the beam is interrupted when a sheet projects from any of the racks.

4,039,180

SHEET FEEDING APPARATUS

Lester H. Stocker, Phillipsburg, N.J., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Oct. 14, 1976, Ser. No. 732,255
Int. Cl.[2] B65H *3/06, 7/02*
U.S. Cl. 271—10 **16 Claims**

1. An apparatus for sequentially feeding sheets, such as paper sheets from a stack, said apparatus comprising:

a feed tray, said feed tray positioned at an angle above the horizontal;

means for holding a stack of sheets on said feed tray, each sheet of said stack being held on end; and

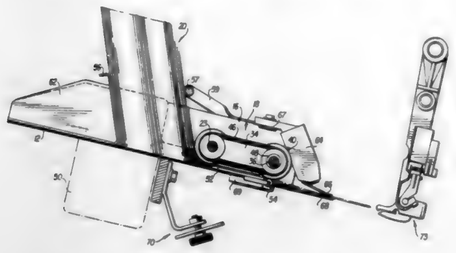
separator means over the lower end of said tray, said separator means comprising,

a first drive shaft, said first drive shaft extending over and across said feed tray,

a first pair of separator rollers mounted on said firsrt drive shaft to be driven by said first drive shaft,

a support frame, extending from said first drive shaft toward the lower end of said feed tray, said support

frame being supported for free rotation on said first drive shaft,
a second drive shaft, supported by said support frame,
a second pair of separator rollers mounted on said second drive shaft to be driven in a forward direction,
means for driving said second drive shaft and said second pair of separator rollers from said first drive shaft, such that said second pair of separator rollers will rotate



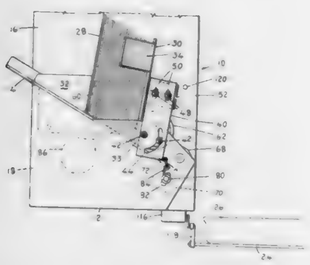
simultaneously with and at substantially the same speed as, said first pair of separator rollers,
drive means for driving said first drive shaft, and
sheet abutment means between said first pair of separator rollers and said feed tray, said sheet abutment means acting to prevent double feeding of sheets passing between said abutment means and said first pair of separator rollers.

4,039,181

AUTOMATIC COUPON DISPENSING APPARATUS

Richard Wayne Prewer, Toronto, Canada, assignor to Egg Sales Promotion Inc., Markham, Canada

Filed Nov. 10, 1975, Ser. No. 630,279
Claims priority, application Canada, Dec. 6, 1974, 215550
Int. Cl.² B65H *5/06*
U.S. Cl. 271—10 **8 Claims**



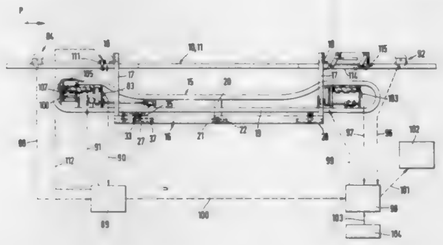
1. Apparatus for automatically dispensing coupons into containers being carried on an adjacent conveyor comprising:
a. a body having a horizontally inclined surface directed forwardly downward towards the containers on the conveyor;
b. holding means adapted to receive a deck of coupons resting on end on the inclined surface, the holding means including:
i. a coupon support member secured to the body having an upper portion and a lower portion spaced above the inclined surface in a position forwardly adjacent the coupons with a window in the lower portion adjacent the inclined surface, at least the upper portion of the coupon support member being horizontally, vertically and pivotally adjustable on the body relative to the inclined surface to enable the apparatus to be adjusted to feed coupons of different thickness, flexibility and resiliency, and
ii. a weight slidably positioned on the inclined surface rearwardly from the coupons, whereby the force of gravity on the weight continuously urges the deck of coupons forwardly against the coupon support member;
c. a rotatable drive wheel mounted on the body above the inclined surface forwardly adjacent the coupons to project slightly rearwardly through the window in the coupon support member to contact the adjacent coupon to frictionally engage it during rotation of the wheel to dispense it by downwardly displacing it along the inclined surface;
d. drive means adapted to periodically rotate the drive wheel; and
e. switch means adapted to synchronize operation of the drive means and conveyor to dispense a coupon into each passing container.

4,039,182

APPARATUS FOR TRANSFERRING PIECE GOODS, ESPECIALLY PRINTED PRODUCTS, ARRIVING IN SUCCESSION FROM A FIRST INDIVIDUAL CONVEYOR TO A SECOND INDIVIDUAL CONVEYOR

Walter Reist, Hinwil, and Hans-Ulrich Stauber, Grut, both of Switzerland, assignors to Ferag AG, Hinwil, Switzerland

Filed Jan. 5, 1977, Ser. No. 757,086
Claims priority, application Switzerland, Jan. 16, 1976, 475/76
Int. Cl.² B65H *29/04*
U.S. Cl. 271—64 **25 Claims**



1. An apparatus for transferring piece goods, especially printed products, arriving in succession from a first individual conveyor to a second individual conveyor, comprising, in combination:
a first individual conveyor movable along a first conveying path;
a second individual conveyor movable along a second conveying path;
a first group of tandemly arranged controlled grippers provided for the first individual conveyor, each of said grippers of the first group serving to engage one of the piece goods;
a second group of tandemly arranged controlled grippers provided for the second individual conveyor, each of said grippers of the second group serving to engage one of the piece goods;
a third revolving individual conveyor arranged between said first and second individual conveyors;
controlled entrainment members provided for the third revolving individual conveyor, each of said entrainment members serving to engage one of the piece goods;
said third individual conveyor having a conveying-active run including oppositely situated end regions;
means for introducing said conveying-active run of said third individual conveyor at its end regions into the respective conveying paths of the first and second individual conveyors to define overlapping zones between said end regions and said first and second individual conveyors;
drive means provided for the third individual conveyor;

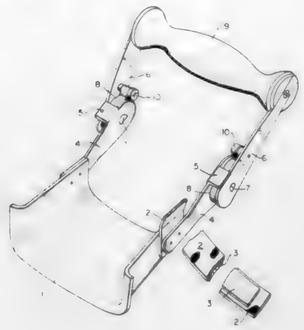
means for controlling said drive means by means of at least one of said first and second individual conveyors;
means for controlling the entrainment members at the overlapping zones of the end regions of the conveying-active run of the third individual conveyor to operate in opposed relation to the grippers of the first individual conveyor and the grippers of the second individual conveyor.

4,039,183

WRIST EXERCISE AND STRENGTHENING DEVICE

Hiroshi Sakurada, Toyonaka, Japan, assignor to Ritshyo Kogyo Kabushiki Kaisha, Japan

Filed Apr. 21, 1976, Ser. No. 679,081
Int. Cl.² A63B *21/00, 21/18*
U.S. Cl. 272—67 **6 Claims**



1. A device for exercising and strengthening the human wrist which comprises a concave, elongated trough adapted to fit on the human forearm immediately above the wrist, two spaced projecting members projecting from the ends of the respective sides of the trough parallel to the longitudinal axis of the trough and terminating in junctures with two rotatably mounted extending members which project generally in the same direction as said spaced, projecting members, said junctures being at a distance from said trough such that they coincide in position with the wrist of the user when the user's hand engages a common grip means and the trough is fitted on the forearm above the wrist, said extending members themselves terminating in said common grip means which is mounted at the ends thereof remote from said projecting members and transverse to said longitudinal axis of the trough, said extending members being biased away from a linear relationship with said projecting members by spring means disposed at the respective junctures of said extending and projecting members, and strap means attached to said elongated trough for securing the forearm therein.

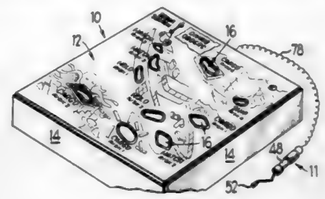
4,039,184

SKILL-TYPE GAME

Jeffrey D. Breslow, Highland Park; Alan A. Hicks, Chicago, and Harry Disko, South Barrington, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 26, 1976, Ser. No. 652,429
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 E **13 Claims**

1. A game device, comprising: a game board including an elevated plate having a plurality of spaced individual openings each of which has exposed electrically conductive edges, a turntable mounted below said plate, means mounting said turntable in spaced generally parallel relation to said plate for rotation relative thereto, drive means including an electric motor for rotating the turntable, a plurality of playing objects supportable on the turntable and each sized to be retrieved through at least one of said openings, a playing piece in the form of an electrically conductive member for insertion through said openings and having means for retrieval of the objects from said turntable, and electric circuit means completed by electrical contact between said playing piece and said



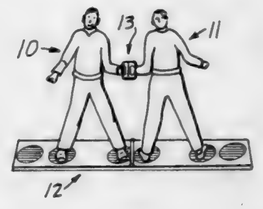
electrically conductive edges for actuating said drive means to rotate said turntable, whereby the objects and the turntable are repositioned relative to the openings.

4,039,185

INDIAN-WRESTLING DEVICE

Robert V. Rhodes, 1185 Hillcrest Ave., Pasadena, Calif. 91106

Filed Sept. 5, 1975, Ser. No. 610,649
Int. Cl.² A63F *9/00*; **A63B** *67/00*
U.S. Cl. 273—1 R **5 Claims**



1. A device for indian wrestling between two contestants comprising:
a body having a central plane and comprising two rigid blocks which abut at said central plane, and fastening means joining the two blocks in abutment, said fastening means comprising means which hold the two blocks immobile and unbendable relative to each other; and
a pair of parallel handle means located at opposite sides of said central plane, each block containing one of said handle means, and each handle means extending parallel to the central plane and being adapted to be grasped by a hand of a respective one of the contestants.

4,039,186

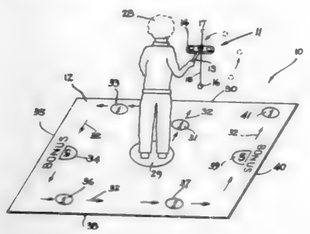
GAME APPARATUS

Paul R. Anderson, 23701 Surf Cove, Laguna Niguel, Calif. 92677

Filed Mar. 11, 1976, Ser. No. 665,929
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 R **9 Claims**

1. A game apparatus, which comprises:
a tee-shaped body having a crossmember connected to a handle adapted to be held in the hand of a player, the crossmember further having at least one aperture extending therethrough,
flexible means for connecting the handle to said crossmember, the flexible means being adapted to provide bending movement to said crossmember with respect to said handle,
a cord having one end secured to the central portion of said crossmember,
a ball secured to the other end of the cord and adapted to be cast into the air, and
a game sheet for standing and walking thereon having an upper surface, the upper surface being imprinted with a

starting area, intermediate standing areas and a finishing area, the object of the game being the requirement for



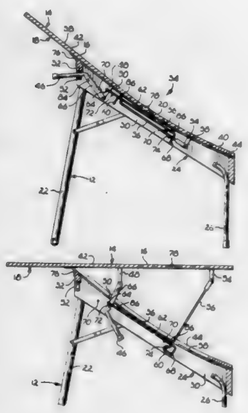
casting the ball into the air and threading it through the aperture so as to afford the player an opportunity to move from the starting area to the finishing area.

4,039,187

GAME TABLE

Donald D. Shea, 1016 Leavenworth, Manhattan, Kans. 66502

Filed Mar. 17, 1975, Ser. No. 559,129
Int. Cl.[2] A63B *39/00*
U.S. Cl. 273—30 **10 Claims**



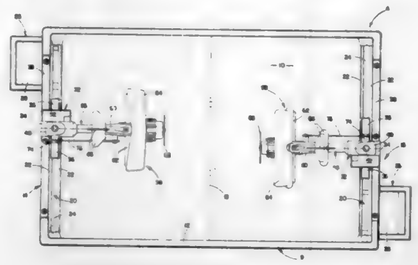
1. A game table comprising:
a support and
a tabletop secured to said support,
said tabletop being in a fixed disposition relative to said support and defining an inverted prism having a lowermost apex at the center of the tabletop spaced substantially below the periphery of the latter to present a plurality of discrete, generally triangular, upwardly facing, steeply inclined playing surfaces sloping upwardly and outwardly from said center to the periphery of the tabletop when the latter is in its normal game-playing disposition, each of said playing surfaces also being configured to present a shallow, elongate, open-ended trough-like depression having a rectilinear longitudinal axis and extending across the respective surface transversely of the inclined slipe thereof;
said playing surfaces being smooth and rigid to define a rebound zone for a ball when the latter is caused to strike said playing surfaces.

4,039,188

TOY AIRCRAFT ACTION SKILL GAME

Adolph E Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Frierdich, Canoga Park, all of Calif., assignors to A. E. Goldfarb and Erwin Benkoe, both of Northridge, Calif.

Filed Sept. 15, 1975, Ser. No. 613,354
Int. Cl.[2] A63F *9/02*
U.S. Cl. 273—101 **14 Claims**



1. An action skill game comprising
a. a game board,
b. means defining a pair of opposed opponent player ends at each of the opposite ends of said game board,
c. carrier means operatively mounted at each of the player ends,
d. a simulated three-dimensional aircraft operatively mounted on each of said carrier means and being transversely shiftable and pivotal in a plane normal to said game board,
e. a projectile shooting mechanism operatively associated with each said carrier means for issuing a projectile toward the opponent player's simulated aircraft,
f. a pair of spaced apart target elements on each said simulated aircraft, and
g. target effect means associated with each said simulated aircraft and causing said simulated aircraft to depict a projectile struck aircraft only when both spaced apart target elements on an aircraft have been struck by projectiles issued from the shooting mechanism of the opponent player,
said target effect means including means to permit the front end of the simulated aircraft to pivot downwardly toward the game board when both the target elements have been struck by projectiles.

4,039,189

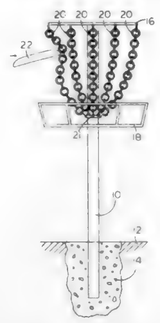
FLYING DISC ENTRAPMENT DEVICE

Edward E. Headrick, and Kenneth A. Headrick, both of 4900 Crown Ave., La Canada, Calif. 91011

Filed Apr. 19, 1976, Ser. No. 678,125
Int. Cl.[2] A63B *67/06*
U.S. Cl. 273—105 R **3 Claims**

1. An entrapment assembly for use in a flying disc game for arresting and trapping flying discs thrown against the assembly, said assembly including an upright post; an entrapment means mounted on the post for arresting and traping flying discs thrown thereagainst, said entrapment means including an upwardly opening basket for receiving and retaining flying discs thrown against said entrapment means said port being

directly connected to said basket, and a plurality of chains mounted on said post above said basket and extending into the



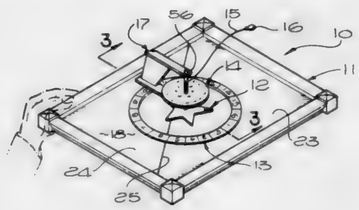
open top of the basket for absorbing the kinetic energy of the disc and causing the disc to be deposited in the basket.

4,039,190

GAME TOY UTILIZING A SPINNING TOP

John Kachaylo, 5555 Hollywood Blvd., Apt. 221, Los Angeles, Calif. 90028

Filed Nov. 7, 1975, Ser. No. 629,713
Int. Cl.[2] A63F *9/16*
U.S. Cl. 273—109 **12 Claims**



1. A game toy comprising:
a board having an upwardly facing surface;
a top which is adapted to spin on said board and is movable laterally to different positions as it spins; and
a shiftable part supported on said surface and containing an opening through which said top extends into spinning engagement with said surface in a relation moving said part to different positions on said surface in response to lateral movements of said top.

4,039,191

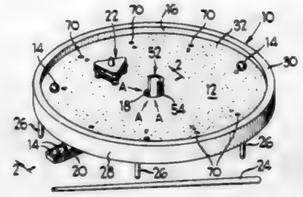
POOL TYPE GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.

Continuation of Ser. No. 542,310, Jan. 20, 1975, abandoned. This application Mar. 19, 1976, Ser. No. 668,801
Int. Cl.[2] A63F *7/00*
U.S. Cl. 273—125 R **8 Claims**

1. A pool type game apparatus, comprising: a base structure having a playing surface over which balls or the like may be propelled, bumper rail means substantially surrounding the playing surface, at least one ball receiving pocket disposed at a selected position in the playing surface, a ball propelling device for propelling balls over said playing surface away from the propelling device into contact with other balls or the rail means in an attempt to propel a ball into said pocket, and upright blocking means pivotally mounted to said base structure through said pocket for selective movement about the periphery of said pocket for blocking only a part of the pocket so that the angle of approach of a ball to be received in the pocket can be selectively changed.

8. A pool type game apparatus, comprising: a base structure having a playing surface over which balls or the like may be propelled, bumper rail means substantially surrounding the playing surface, at least one ball receiving pocket disposed at a selected position in the playing surface, a mobile bumper device positionable on and selectively movable bodily in any direction over the playing surface for placement at any desired position thereon, said mobile bumper device being polygonal



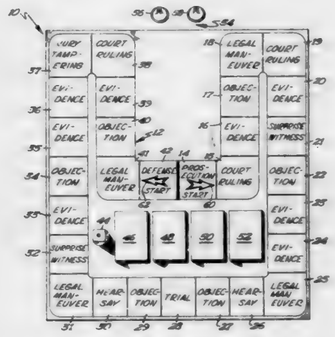
in configuration so as to present plural straight side bumper surfaces for directing a ball which is propelled thereagainst, away therefrom at an angle defined by said bumper surfaces, a plurality of upright members at the corners of the polygon with resilient means wrapped about and spanning the upright members for deflecting a ball which is propelled thereagainst, and a ball propelling device for propelling balls over said playing surface away from the propelling device into contact with other balls, the rail means, or said mobile bumper device in an attempt to propel a ball into said pocket.

4,039,192

COMBINED CARD AND BOARD GAME APPARATUS

David L. Magiera, Bloomington, Minn., assignor to Wicks & Nemer, P.A., Minneapolis, Minn.

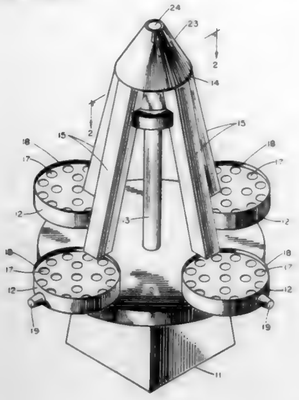
Filed May 29, 1975, Ser. No. 581,947
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 AT **8 Claims**



1. Combined card and board game apparatus comprising, in combination: first means for indicating game points; second means for detrimentally counteracting the first means during play thereof; a game board having locations arranged thereon forming a path of progression, the locations including reward/penalty locations, locations associated with the first means, and locations associated with the second means; game markers for movement around the locations on the board; and chance taking apparatus for determining movement of the game markers around the locations on the board during the first portion of play allowing collection of the first means and of the second means by the players as the game markers land on the locations for use during the second portion of play

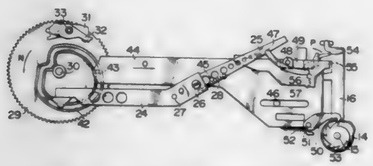
allowing the use of the first means and the second means to determine the winning player.

4,039,193
GAME AND APPARATUS THEREFOR
Margaret Anne Slater, and William Clarence Slater, both of 2724 Harvie Road, Richmond, Va. 23223
Filed Aug. 10, 1976, Ser. No. 713,247
Int. Cl.[2] A63F *5/04*
U.S. Cl. 273—138 R **8 Claims**



1. A game apparatus comprising horizontally disposed support means on which there is rotatably mounted a plurality of identically constructed platforms equally spaced about a generally circular locus, each of said platforms containing on the upper face thereof a multitude of depressions and associated indicia to facilitate visual differentiation amongst said depressions, and an encircling retaining wall projecting above said upper face, a distributor means positioned above the center of said circular locus containing a plurality of guide channels, each communicating with a depending chute whose lower end terminates above an associated platform, vertically disposed support means to maintain said distributor means and chutes in the aforesaid proper positions, and a conical hollow chamber which rests atop and encloses said distributor means, the apex of said chamber being truncated and upwardly directed.

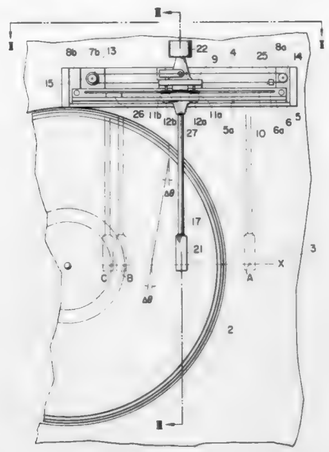
4,039,194
AUTOMATIC RECORD PLAYER
Takamichi Nakagawa, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Mar. 24, 1975, Ser. No. 561,348
Claims priority, application Japan, Mar. 29, 1974, 49-36304; Dec. 6, 1974, 49-140914
Int. Cl.[2] G11B *17/16*
U.S. Cl. 274—10 R **6 Claims**



1. An automatic record player comprising:
a pickup arm;
a turntable;
a motor for driving said turntable;
a switch for energizing said motor;
an automatic record-playing mechanism which automatically brings said pickup arm to a position from which record-playing starts and returns said pickup arm to its home position upon completion of record-playing and optionally a record changer mechanism which automatically operates to place a plurality of records one by one onto said turntable every time each record-playing is completed;
a drive member adapted to be driven by said turntable to reciprocate for operating said record-playing mechanism and said record changer mechanism;
a repeating mechanism including a cam adapted to be set to several positions each corresponding to the number of times a single record is to be played and/or the number of records desired to be played sequentially, a repeating knob for setting said cam to one of said several positions and indicating said number corresponding to the position of said cam as set, a ratchet wheel turning in unison with said cam and having teeth arranged in corresponding relation with positions of said cam, and a connecting pawl mounted on said drive member and adapted to engage with one of the teeth of said ratchet wheel to turn the ratchet wheel towards its original position, at which said cam is at the "0" position, by one tooth pitch for each reciprocation of said drive member;
a starting mechanism including a starting lever, means cooperated with said starting lever for establishing the driving connection between said turntable and said drive member, means cooperated with said starting lever for turning said cam from a position at which said number is 0 to a position at which said number is 1, a start-setting member in response to said cam to be set to a first position when said cam is set to the 0 position or to a second position when said cam is set to positions other than 0, and a switching lever in response to said start-setting member for turning on said switch when said start-setting member is set to said second position and turning off said switch when said start-setting member is set to said first position;
means for releasing the driving connection between said turntable and said drive member when each one reciprocation of said drive member is completed;
means in response to said pickup arm for establishing the driving connection betweeen said turntable and said drive member each time said pickup arm is brought to a position at which one cycle of record-playing is completed;
said automatic record-playing mechanism including a pickup arm displacing member mounted on said drive member and adapted to engage with said pickup arm in a course of each reciprocation of said drive member only when said start-setting member is at said second position for displacing said pickup arm from its home position to its record-playing starting position and means mounted on said drive member and adapted to engage with said pickup arm in another course of each reciprocation of said drive member for returning said pickup arm to its home position.

4,039,195
PICKUP ARM DRIVING DEVICE IN LINEAR TRACKING PICKUP APPARATUS
Motoi Iyeta, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed July 21, 1975, Ser. No. 597,904
Claims priority, application Japan, July 25, 1974, 49-85321; July 25, 1974, 49-91093; Aug. 8, 1974, 49-91382; July 26, 1974, 49-88991
Int. Cl.[2] G11B *3/12*
U.S. Cl. 274—23 A **18 Claims**

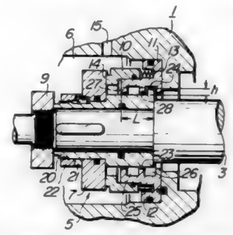
1. A pickup arm driving device in a linear tracking pickup apparatus with a pickup arm traceable on a disc, comprising:
support means including a movable supporting mechanism for supporting the pickup arm for vertical as well as horizontal movements and permitting the pickup arm to make linear travel radially of a disc in a horizontal direction;
a motor designed so that its rotation speed and direction of rotation are determined by the value and the polarity of the voltage applied;
a motive power transmitting means for converting the rotation force of said motor to a linear movement force and transmitting the latter force to said movable supporting mechanism;
an offset angle detector for detecting a horizontal offset angle of the pickup arm;
an offset signal generating circuit associated with said offset angle detector for generating an offset signal having a variable value and polarity corresponding to the variable magnitude and direction of the offset angle detected;
an amplifier for receiving, as an input thereof, said offset signal and for driving said motor, by the output of this amplifier, to rotate in a direction corresponding to the direction of movement of said movable supporting mechanism in which the offset angle decreases;



a signal groove end detecting circuit for detecting the face that the pickup arm has arrived at the end position of the signal-carrying groove of the disc by detecting when the said value of said offset signal exceeds a predetermined level of magnitude for generating a groove end detection signal;
a finished position detecting means for detecting the arrival of the whole pickup arm into a required range of distance from the center of the disc to produce a finish position detection signal, and
means coupling said position detecting means to said signal groove end detecting circuit for preventing generation of a signal groove end detection signal in the absence of a said finish position detection signal from said position detecting means.

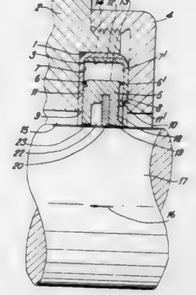
4,039,196
MECHANICAL SEAL
Hiroshi Inouye, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan
Filed May 25, 1976, Ser. No. 689,815
Claims priority, application Japan, May 28, 1975, 50-62905
Int. Cl.[2] F16J *15/34*
U.S. Cl. 277—11 **5 Claims**

1. In a mechanical seal including a shaft sleeve fitted over a rotating shaft for rotation therewith, a rotating seal element secured to said shaft sleeve, a retainer fitted in a seal box provided around said rotating shaft, a stationary seal element held by said retainer, and spring means for urging one of said seal elements against the other so as to maintain sliding seal-face contact between said seal elements, the improvement comprising at least one protuberance formed on the outer surface of said shaft sleeve, a plurality of axially spaced, circumferential grooves formed on the inner surface of said retainer to receive said protuberance of said shaft sleeve movably therein, and a plurality of axial grooves staggered in phase and also formed on the inner surface of said retainer to assist in introducing said protuberence selectively into one of said circumferential grooves, so that the mechanical seal can be easily installed in,



and removed from, said seal box by the engagement of said protuberance of said shaft sleeve with said grooves and also by the fitting of said shaft sleeve over said rotating shaft and removal therefrom.

4,039,197
SEALING RING
Herbert Schmidt, Frankfurt-Unterliederbach, and Rolf Weiler, Frankfurt-Sindlingen, both of Germany, assignors to ITT Industries, Inc., New York, N.Y.
Filed Sept. 2, 1975, Ser. No. 609,200
Claims priority, application Germany, Sept. 4, 1974, 2442338
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—24 **3 Claims**



1. A sealing ring assembly for sealing a shaft, comprising:
a radially and axially displaceable shaft within a shaft housing having a passage bore therein for receiving said shaft therein and having an annular recessed bore on one end thereof which is concentric with said passage bore;
a sealing-ring housing mounted within said recessed bore, said sealing-ring housing having first and second axially spaced and radially extending annular flanges the inside diameters of which are substantially equal to the diameter of said passage bore;
a slide ring concentrically mounted about said shaft for movement therewith and between said flanges, the inside diameter of said slide ring being substantially equal to the outside diameter of said shaft to provide and essentially zero clearance seal therebetween and wherein the outside diameter of said slide ring is substantially less than the inside diameter of said recessed bore to accomodate said radial displacement of said shaft within said shaft housing;
said slide ring comprising a substantially rigid material having a low coefficient of friction and said sliding ring terminating at its radially inner edge in two axially spaced legs which form a closed chamber therebetween and which

opens towards said shaft for receiving a sealing compound therein;

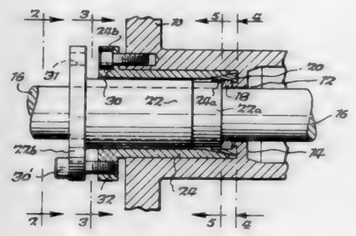
a scraper ring fixedly mounted to said slide ring and concentrically mounted about said shaft in essentially zero clearance sliding relationship therewith, said scraper ring being mounted immediately adjacent at least one of said legs and cooperating therewith to scrape said shaft upon axial displacement of said shaft, thereby to remove extraneous materials present on said shaft.

4,039,198

PACKING GLAND

Howard F. Stanton, Williamsville, N.Y., assignor to J & A Keller Machine Co., Inc., Tonawanda, N.Y.

Filed June 1, 1976, Ser. No. 691,469
Int. Cl.[2] F16J *15/18*
U.S. Cl. 277—118 **3 Claims**



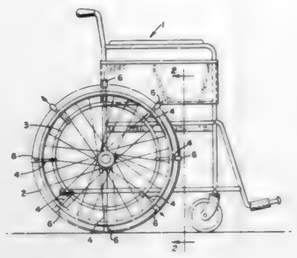
1. In combination, a housing associated with a pressurized fluid, and defining a passage having a longitudinal axis therethrough, a shaft means having a longitudinal axis and being disposed in said passage in a co-axial manner for movement therein, packing gland means disposed in said passage intermediate to said housing and said shaft means in a manner sealing against flow of said fluid between said housing and said shaft means, said packing gland means comprising sealing ring means disposed intermediate to said shaft means and said housing, means for selectively applying pressure on said sealing ring means in an axial direction with respect to said shaft, said means comprising a sleeve means mounted about said shaft means and being axially engagable against said sealing ring means in a manner so as to exert a predetermined amount of pressure thereon, and means for selectively applying pressure on said sealing ring in a direction transverse to said shaft, said latter means including a segmented ring means encompassing said sealing ring means and sleeve means for selectively urging said segmented ring into a predetermined degree of engagement with said sealing ring means so that the latter is urged against said shaft means in a direction transverse thereto, said latter sleeve means being disposed about said shaft means and being movable therealong to engage said segmented ring means in a camming manner so as to selectively urge the latter into engagement with said sealing ring means wherein said sleeve means for engaging said segmented ring means and the latter means have a wedge type of engagement with respect to one another so that upon axial movement of said sleeve means said segmented ring means undergoes radial movement with respect to said sealing ring means and said shaft means and at least certain of the the segments of said segmented ring means include openings in the sidewalls thereof with pin means, fixed with respect to said housing, being received in said openings so as to prevent relative rotation of said segments with respect to said sleeve means engaged therewith.

4,039,199

WHEEL CHAIR PUSH ROD APPARATUS

James D. Quinby, 81 Cedar Drive East, Briarcliff Manor, N.Y. 10510

Filed Mar. 23, 1976, Ser. No. 669,481
Int. Cl.[2] B62M *3/04*
U.S. Cl. 280—242 WC **11 Claims**



1. On a wheel chair having a first rear wheel and a first push rim located on one side of said wheel chair and a second rear wheel and a second push rim located on the other side of said wheel chair, a push rod system used by the occupant of said wheel chair to propel said wheel chair, said push rod system comprising:

a first plurality of push rods equally spaced around said first push rim;

a second plurality of push rods equally spaced around said second push rim, said second plurality of push rods being equal in number to said first plurality of push rods;

a first cam located on said one side of said wheel chair and secured to said wheel chair;

a second cam located on said other side of said wheel chair and secured to said wheel chair;

separate cam followers operatively associated with each of said first and second plurality of push rods, each of said separate cam followers operatively associated with said first plurality of push rods being guided by said first cam and each of said separate cam followers associated with said second plurality of cam followers being guided by said second cam, said first and second cams being so designed that each of said first plurality of push rods extends in a direction away from said first push rim when in its uppermost position and retracts in a direction toward said first push rim when in its lowermost position and said second cam being so designed that each of said second plurality of push rods extends in a direction away from said second push rim when in its uppermost position and retracts in a direction toward said push rim when in its lowermost position.

4,039,200

REAR WHEEL SUSPENSION SYSTEM FOR A MOTORCYCLE

James C. McGonegle, 6242 Crestview Place, Apt. No. 1, Cincinnati, Ohio 45230

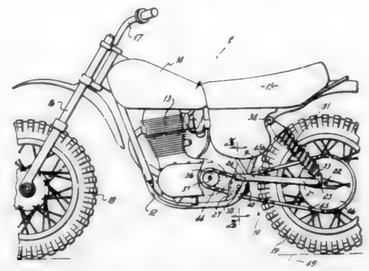
Filed Mar. 29, 1976, Ser. No. 671,096
Int. Cl.[2] B62K *25/02*
U.S. Cl. 280—284 **5 Claims**

1. A rear wheel suspension system for a motorcycle, said suspension system comprising

at least one swing arm rotatably mounting said motorcycle's rear wheel at one end, said swing arm being pivotally connected to said motorcycle's main frame at the other end,

a power transfer sprocket mounted to said motorcycle's main frame and a rear wheel drive sprocket mounted to said rear wheel, and

a rear wheel drive chain drivingly connecting said two sprockets, the pivot axis of said swing arm being located in the tension run of said rear wheel chain when said drive



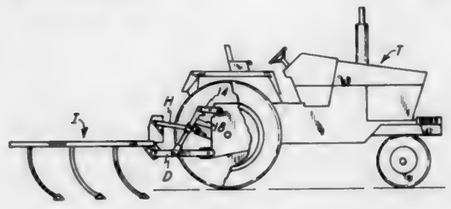
chain is viewed from a line of sight normal to the plane of said rear wheel drive chain.

4,039,201

TRACTOR IMPLEMENT LIFT HEIGHT AMPLIFIER

Thomas Woodford Huitema, Racine, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed Sept. 7, 1976, Ser. No. 720,891
Int. Cl.[2] A01B *59/043*
U.S. Cl. 280—461 A **10 Claims**



1. A tractor implement lift height amplifier comprising a tractor, a lift arm and a draft arm both pivotally mounted on said tractor for up and down movement relative to said tractor and extending therefrom and with said draft arm being pivotally mounted at an elevation lower than that of said lift arm and being arranged to have an implement connected therewith for draft-connecting and lifting the implement relative to said tractor, at least one lift link pivotally connected at its opposite ends respectively on both said arms at locations on said arms spaced from the pivot axis of said arms to thereby form an angle with said lift arm and being arranged to transmit the upward pivotal movement of said lift arm to said draft arm for lifting the implement, and one of said lift arm and said lift link having a portion thereof extending toward the other and into the confines of said angle therebetween and with the extending end of said portion and said other of said lift arm and said lift link having mutually abutting surfaces disposed on a common path of upward movement of said lift link to have said surfaces abut each other and thereby limit the minimum size of said angle and restrict further relative pivotal action between said lift arm and said lift link.

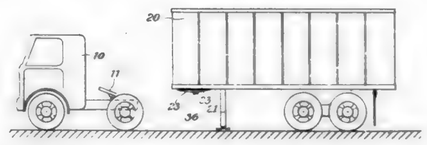
4,039,202

TRAILER PIN LATCH PLATES

Rudy A. Bamettler, South San Francisco, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Dec. 29, 1975, Ser. No. 644,604
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—507 **2 Claims**

1. a pair of hinged plates mounted to the underside of a trailer or semi-trailer by pivot means, said plates shaped so as to surround the tractor attachment pin of said trailer when



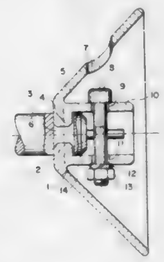
pivoted to a first position, and said plates shaped so as to clear the tractor attachment pin when pivoted to a second position.

4,039,203

CONICAL GUIDE FOR A COUPLING PIN ON AN AGRICULTURAL IMPLEMENT

Dieter Kunze, Siegburg, and Wilhelm von Allworden, Lohmar, both of Germany, assignors to Jean Waltersheid GmbH, Lohmar, Germany

Filed June 14, 1976, Ser. No. 695,426
Claims priority, application Germany, Mar. 24, 1976, 2612426
Int. Cl.[2] B60D *1/00*
U.S. Cl. 280—515 **5 Claims**



1. A conical guide for mounting on a coupling pin of an implement or the like which can be coupled to a three-point connection of a tractor, and comprising a semi-conical member having a portion along its longitudinal axis to enclose at least partially a coupling pin and tapering inwardly toward the enclosing portion, means attached to said semi-conical member and having a correspondingly shaped enclosing portion thereon for clamping said member to the coupling pin, said semi-conical member and said clamping means each having a radial projection within their respective enclosing portions receiving within a notch in the circumferential surface of said pin to secure the conical guide against axial displacement when mounted upon the coupling pin.

4,039,204

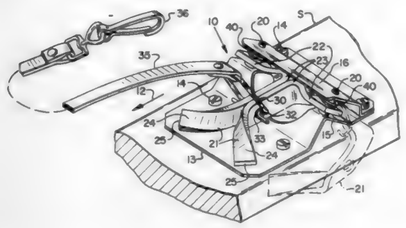
SKI STOP WITH STRAP RELEASE

Max Frey, 3940 SW. Altadena Ave., Portland, Oreg. 97201

Filed Mar. 4, 1976, Ser. No. 663,862
Int. Cl.[2] A63C *7/10*
U.S. Cl. 280—605 **6 Claims**

1. A ski stop comprising a base plate adapted for mounting on the top surface of a ski, a pair of pivot pins on said base plate inclined in longitudinal planes toward one end of the ski, a pair of claws pivotally mounted on the respective pivot pins, spring means arranged to swing angular free end portions of said claws around the opposite edges and underneath said ski, and release means normaly holding said claws in retracted positions on top of the ski spaced inwardly from said edges, said release means being detachable from said ski stop to release said claws for said swinging movements by said spring means, said release means comprising a strap having one end adapted for connection with a ski boot on said ski, and a release mem-

ber on the other end of said strap engagable with said claws, said claws having intermediate portions in juxtaposition to



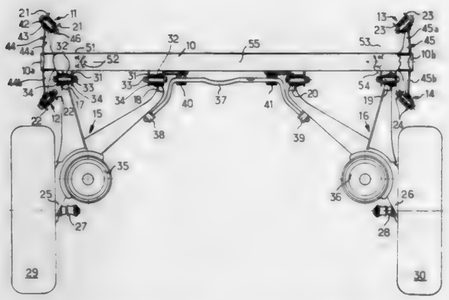
each other in said retracted positions, and said release member comprising a spring clip clamping opposite sides of said juxtaposed portions.

4,039,205

REAR-END SUSPENSION FOR AN AUTOMOTIVE VEHICLE

Emile Lucien Castanier, Conflans-St-Honorine, France, assignor to Chrysler France, Paris, France

Filed Dec. 8, 1975, Ser. No. 638,672
Claims priority, application France, Dec. 31, 1974, 74.43493
Int. Cl.[2] B60G *9/00*
U.S. Cl. 280—721 **8 Claims**



1. Rear-end suspension for an automotive vehicle having a frame, comprising a rigid cross-member having an axis extending transversely of the vehicle, resilient bearing means on the vehicle frame, two wheel arms pivoted to and extending rearwardly from the cross-member, and each carrying distant from said cross-member a spindle on which a wheel is mounted, and shock-absorbing and suspension means being provided between the said arms and the vehicle frame, wherein said resilient bearing means includes for mounting said cross-member at each of its ends two directional resilient bearing assemblies each having a directional axis and arranged respectively forwardly and rearwardly of the cross-member, allowing very slight movements about the directonal axis of each bearing assembly, said axes of said bearing assemblies mutually intersecting substantially on the axis of the cross-member.

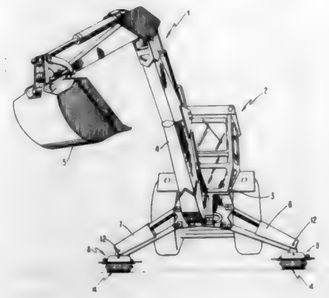
4,039,206

ATTACHMENT FOR GROUND-ENGAGING PADS OF STABILIZERS

Harold Nault, 48 Beau St., Norwalk, Conn. 06880

Continuation-in-part of Ser. No. 553,328, Feb. 26, 1975, Pat. No. 3,976,306. This application Dec. 10, 1975, Ser. No. 639,367
Int. Cl.[2] B60S *9/00*
U.S. Cl. 280—763 **2 Claims**

1. An attachment for ground engaging pads of stabilizer arms of a material-handling apparatus, comprising in combination, a ground-engaging plate having a preselected cross sectional area and an opening, said ground-engaging plate has a pair of brackets projecting therefrom and being adapted to be pivotally connected to the free end of a stabilizer arm, said pair of brackets has a pair of aligned holes adapted to receive a first pin which forms part of the pivotal connection between the free end of the stabilizer arm and the ground-engaging plate, an attachment having at least a pair of supporting members, a pair of angles, a plurality of parallel rubber plates disposed between said supporting members, bolt means holding said supporting members and rubber plates together, a projecting portion adapted to extend through said opening when said attachment is assembled with said ground-engaging plate, and having an



elongated inverted U-shaped bar the ends of which are secured to one of said supporting members of said attachment, said bar is secured to one supporting member and said projecting portion secured to another supporting member, the area between said elongated bar and said attachment being slightly larger than the cross-sectional area of said ground-engaging plate so that said plate can be disposed therebetween when said attachment is assembled with said ground-engaging plate, and retaining means adapted to be operatively and removably mounted on said projecting portion for maintaining said attachment in operative position on said plate, the ground-engaging characteristics of the ground-engaging pad being substantially different when said attachment is operatively mounted thereon.

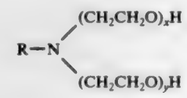
4,039,207

RECORDING SHEET

Akio Ishizuka, Fujimiya, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

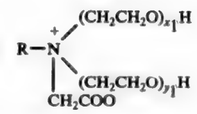
Filed Dec. 9, 1974, Ser. No. 531,123
Claims priority, application Japan, Dec. 7, 1973, 48-139235
Int. Cl.[2] B32B *5/16*; B41M *5/22*
U.S. Cl. 282—27.5 **5 Claims**

1. A recording sheet comprising a support having thereon a microcapsule layer containing a color former said sheet not containing a color developer wherein at least one of said support or said microcapsule layer contains a desensitizing agent, said agent being a liquid which is substantially nonvolatile at ordinary temperature selected from the group of compounds consisting of the compounds represented by the general formula (I)



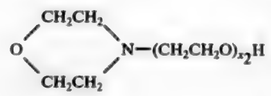
(I)

wherein R is a hydrocarbon group containing 12 to 18 carbon atoms, and x and y are integers, and $x + y$ is about 10 to 20; the compounds represented by general formula (II)



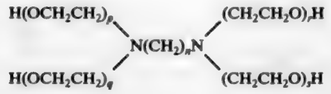
(II)

wherein R is a hydrocarbon group containing 12 to 18 carbon atoms, and x_1 and y_1 are integers and $x_1 + y_1$ is about 10 to 30; the compounds represented by general formula (III)



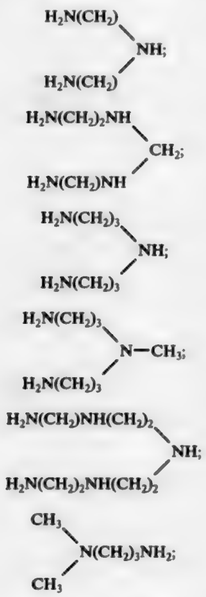
(III)

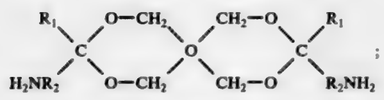
wherein x_2 is an integer of from about 10 to 30; the compounds represented by general formula (IV)



(IV)

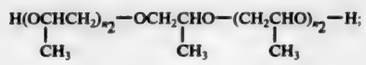
wherein n is an integer of from 2 to 6, and $p,q,r,$ and s are integers and $p + q + r + s$ is about 10 to 60;





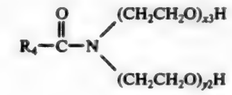
(V)

wherein R_1 is a hydrogen atom or an alkyl group, and R_2 and R_3 are straight chain or branched chain alkylene groups containing 1 to 6 carbon atoms; the compounds represented by general formula (VI)



(VI)

wherein n_2 is an integer of from about 1 to 30; the compounds represented by general formula (VII)



(VII)

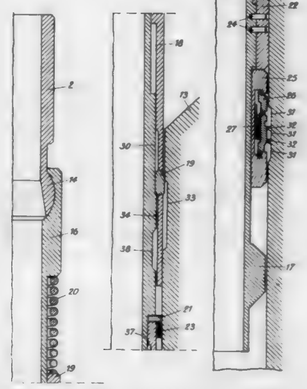
wherein R_4 is a hydrocarbon having 12 to 18 carbon atoms, and x_3 and y_2 are integers and $x_3 + y_2$ is about 50; glycols; dimers or trimers of unsaturated fatty acids; polyamide resins having molecular weights of from about 3,000 to 10,000, and said agent being present in an amount of about 30 mg/m^2 to 100 mg/m^2 of the support.

4,039,208

DEVICE FOR LOCKING AND UNLOCKING TWO CONCENTRIC PIPES

Jacques M. Pernet, Cazeres sur Garonne, France, and Donald F. Taylor, Dallas, Tex., assignors to Subsea Equipment Associates Limited, Hamilton, Bermuda

Filed June 17, 1975, Ser. No. 587,744
Claims priority, application France, June 17, 1974, 74.20869
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—3 **11 Claims**



1. A device for locking and unlocking two concentric pipes comprising:

a first and second locking means on one of said pipes and slidable longitudinally relative thereto;

at least two stop means for said first and second locking means on the second of said pipes;

means for urging said first locking means towards one of said stop means on introduction of said one pipe into said second pipe by relative movement in a first longitudinal direction;

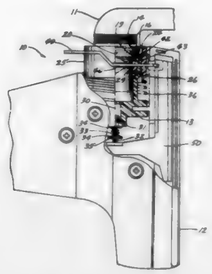
means for urging said second locking means towards the other of said stop means on movement of said one pipe relative to said second pipe in a longitudinal direction opposite to said first direction; and

means for displacing radially said first and second locking means after movement in the first longitudinal direction.

4,039,209
COUPLER ASSEMBLY HAVING SEGMENTAL LOCKING RING

John D. Goodlaxson, Colfax, and Frank E. Ross, Newton, both of Iowa, assignors to The Maytag Company, Newton, Iowa

Filed Mar. 29, 1976, Ser. No. 671,059
Int. Cl.[2] F16L *37/12*
U.S. Cl. 285—8 9 Claims



1. A coupler assembly for connecting a fluid conduit to a faucet having a recess adjacent an outlet end, the combination comprising: a coupler body having an inlet end for receiving the outlet end of said faucet, said coupler body further including a plurality of circumferentiallyextending angularly-spaced slots located generally at said inlet end and defining openings extending through the wall of said coupler body; means for locking said inlet end to said faucet including a retaining ring encircling the inlet end of said coupler body and further including a plurality of interconnected elongated locking members disposed generally between said retaining ring and said inlet end of said coupler body, said means for locking still further including deformable means having a substantially reduced cross-section as compared to said locking members and connecting adjacent locking members to form a unitary annular ring, said deformable means having a total length between connected locking members exceeding the arcuate distance therebetween and being disposed at least partially in a different plane than said locking members, said elongated locking members each having a portion extending through one of the openings in said coupler body for engagement with said recess in said faucet and being cooperable with said slots and with said retaining ring to axially lock said coupler body to said faucet; and spring means for axially biasing said retaining ring toward an operative position for maintaining said elongated locking members in locking engagement with said faucet.

4,039,210
COUPLING ADAPTER FOR PLASTIC PIPE

Roy F. Wood, and Ralph A. Wynne, both of Dallas, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 28, 1976, Ser. No. 700,437
Int. Cl.[2] F16L *17/04*
U.S. Cl. 285—112 7 Claims

1. A plastic pipe adapted for coupling with a clamp-type coupling, said adapted pipe comprising:

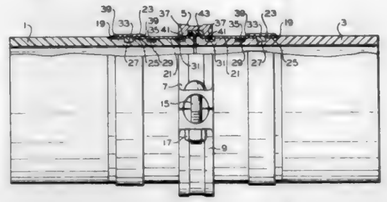
a. said pipe recessed circumferentially on its outside surface near its coupling end suitably to retain a sleeve within the recess and further indented within said recessed area with three circumferential grooves;

b. a split locking ring inserted in a first groove furthest removed from the coupling end of pipe, said locking ring of dimensions substantially to fill said first groove;

c. a gasket ring of resilient material inserted in and substantially filling a second groove;

d. a first metal sleeve of substantially the same outer circumference as said locking ring, said first sleeve inserted in said recess and extending from abuttment with said locking ring toward the end of the recess furthest removed from the coupling end of the pipe;

e. a second metal sleeve of substantially the same outer circumference as said locking ring,, said second sleeve inserted in said recess and extending from abuttment with said locking ring toward the end of the recess nearest the coupling end of the pipe, said second sleeve encasing the gasket ring in the second groove and indented to fit into a



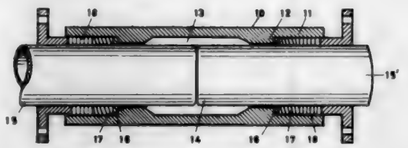
third groove retaining the grooved configuration, said third groove nearest to the coupling end of the pipe and spaced from this end to receive a coupling device; and

f. a third metal sleeve of inner circumference sufficient slidably to engage the outer circumference of said first and second metal sleeves, said third sleeve fixed into position encasing the locking ring and overlapping the first and second sleeves.

4,039,211
COUPLER FOR LIQUID AND GASEOUS FLUID PIPING

Ronald Albert Daspit, 2401 Delille St., Chalmette, La. 70043

Filed July 11, 1973, Ser. No. 378,182
Int. Cl.[2] F16L *27/00*
U.S. Cl. 285—184 3 Claims

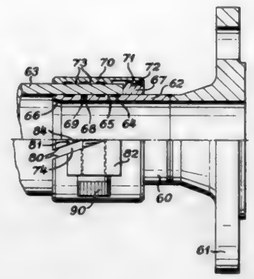


1. In a coupler for liquid and gaseous fluid ducts, comprising a cylinder open at both ends, and having inner and outer walls, said cylinder being provided on said inner wall axially inwardly from the ends with inner backup projection means for reception of corresponding ends of pipe lengths; packing means in each of the cylinder ends backing against the projection means of the cylinder; alignable rings provided with an end perpendicular to the longitudinal axis of the cylinder and bearing against the packing means; the other end of the alignable rings being planar and lying at an angle to said longitudinal axis, alignable caps provided with a perpendicular peripheral projection and an inner longitudinal projection, with an inclined plane end corresponding and operative with the inclined end of the alignable rings, and throughbolt means for the assembly securing the alignable caps in adjusted position to deform the packing means into sealing engagement with the cylinder and pipe lengths.

4,039,212
HOSE END FITTINGS

Roland Skarud, Wirsbo, Sweden, assignor to Wirsbo Bruks Aktiebolag, Wirsbo, Sweden

Filed Aug. 15, 1975, Ser. No. 605,162
Claims priority, application United Kingdom, Apr. 28, 1975, 17572/75
Int. Cl.[2] F16L *33/00*
U.S. Cl. 285—253 5 Claims



1. A tube end fitting comprising:

a body having an axially extending, annular nipple adapted for insertion into a tube;

a substantially cylindrical axially extending ring fitted over said nipple; said ring having axially opposite ends; said ring being split only through one side of said ring such that said ring has only a single split therein; said split extending completely axially along said ring and through its said ends; said ring having an interior with an inner diameter; said nipple having an exterior with an outer diameter; said ring inner diameter being greater than said nipple outer diameter and said ring interior being spaced from said nipple exterior;

cooperating engaging means on said ring and on said body and being normally in continuous engagement with said ring clamped and unclamped; said engaging means of said body comprising an annular retainer passing around and seating on and outside said nipple; a first group of ribs on the exterior of said retainer and positioned axially along said retainer to define grooves for receiving other ribs; said engaging means of said ring comprising a second group of ribs projecting radially inwardly of said ring and being of radial height and spacing so as to mate with and engage said first group of ribs, thereby to engage said ring and said body; said engaging means of said ring being spaced away from one said end of said ring, so that between said nipple and said ring, starting at said one end of said ring and moving away therefrom toward said engaging means of said ring, there is defined between said ring and said nipple an annular cavity that is adapted to accommodate a tube end;

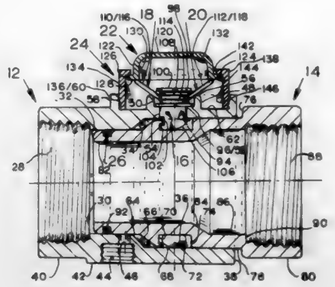
clamp means carried by said ring for clamping said split thereof together, to effect a clamping action of said ring about a tube disposed around said nipple wherein said clamp means acts upon said ring to take up the resultant play between the components of siad engaging means and to retain said ring upon said body;

said nipple exterior being contoured with a third plurality of outwardly projecting ribs, all having respective axial boundaries, and said ring interior being contoured with a fourth plurality of radially inwardly projecting ribs also all having respective axial boundaries; each said radially outwardly projecting rib being radially aligned with and having the same axial boundaries as a respective one of said radially inwardly projecting ribs, such that cooperation of said radially aligned ribs enhances the clamping and securing of a tube between said nipple and said ring.

4,039,213
COUPLINGS

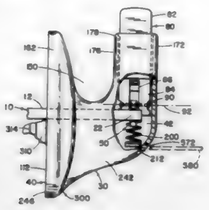
Tom Walters, 2102 Mason Blvd., Point Pleasant, W. Va. 25550

Filed Mar. 8, 1976, Ser. No. 665,109
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—317 19 Claims



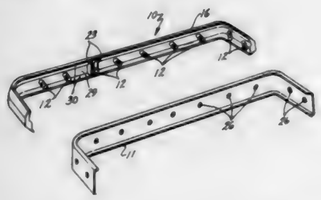
1. In combination with a pair of axially overlapping conduit members with O-ring seal element at the seal area between the members and a safety drain opening on the outer member, where said conduit members are adapted to be rotatable relative to each other about a common axis, a coupling assembly with conduit and the like attachment ends comprising a lock pin element slidably positioned radially within a square opening within a standing fulcrum ring configuration recessed within a boss upon the outer conduit member where said lock pin protrudes radially inward through said opening to subsequently engagingly interlock an axially outward annular hook upon the inner member, facing the threaded conduit attachment end of said member, which is formed by an annular groove axially positioned to face said threaded end wherein said hook and said groove form the interlocking configuration that projects radially outward from the inner member, a pair of coil/cantilever springs, with centrally positioned coils having outward extending arms for the subsequent cantilever unit uncouple action, guided by their centrally positioned coils yoked to said lock pin while said spring arms extend radially outward over said fulcrum ring of said boss where said spring arms outer ends are guided and limited by an outwardly crowned operating cap, having a flange ring extending outward at the inner face of said cap that is positioned and radially slidably maintained within a retaining sleeve which is secured to said boss where said operating cap flange upon contacting said spring coil arms compressingly deform same at said securement whereupon said spring arms reacting forces normally maintain said operating cap to its radially outward limits against said retaining sleeve and in operating position as well as said reacting forces normally maintaining said lock pin to its radially inward limits due to the spring coils being yoked to said pin, whereupon the insertion of the inner conduit member into the outer conduit member wedges said lock pin radially outward momentarily after which the interlocking configurations of said pin and said inner member are engaged, providing a coupled position of the conduit members, whereupon uncoupling the conduit members is accomplished when said lock pin's interlock with said inner member is disengaged by further insertion of said inner member into said outer member by said operating cap being pushed radially inward in push button fashion so said spring coil arms are forced across said fulcrum ring exerting cantilever reaction force upon the coil centers of said springs yoked to said pin, lifting said pin radially outward out of lock position to permit the withdrawal of said inner member at uncoupling the assembly.

4,039,214
DOOR OPENER
John M. Arends, 5023 S. 131st St., Omaha, Nebr. 68137
Filed Sept. 17, 1975, Ser. No. 614,221
Int. Cl.[2] E05C *21/02*
U.S. Cl. 292—336.3 **9 Claims**



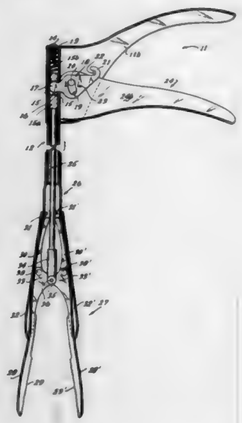
1. A door opener for control of an elongated door for control of an elongated door latch spindle which extends horizontally and is mounted to rotate about a horizontal axis, said opener comprising: a body having a cavity, said body having a plunger opening extending from its exterior to said cavity, a plunger slidably mounted in said plunger opening, said plunger having an inner portion, means operably correlating said inner end of said plunger and said spingle in a manner whereby inward movement of said plunger is not applying torque to said spindle, said body having a rearward side, said body having a spindle opening in its rearward side extending from the exterior to said cavity, said body having a rearward side surface having rearwardmost portions in a vertical plane for engaging a door, said spindle being of a type having a portion which has a non-round periphery in cross-section, said correlating means comprising a wrench in said cavity, said wrench having an opening for receiving said spindle portion, the walls of said wrench opening gripping said spindle when said wrench is caused to rotate in a vertical plane, means pivotally connecting said inner portion of said plunger to said wrench in a manner whereby inward movement of said plunger causes said wrench to rotate in a vertical plane.

4,039,215
AUTO MOLDING WITH INTEGRALLY MOLDED CONNECTOR
James W. Minhinnick, Grand Rapids, Mich., assignor to U.S. Industries, Inc., New York, N.Y.
Filed May 17, 1976, Ser. No. 686,702
Int. Cl.[2] B60R *19/06*
U.S. Cl. 293—71 R **8 Claims**



1. An automobile molding comprising:
an elongated molded plastic strip having an outer surface for facing away from an automobile and an inner surface for facing toward an automobile; and
at least one elongated molded plastic connector extending outward from said inner surface to an outward extremity spaced away from said inner surface for coupling said automobile molding to the automobile, said connector having a longitudinal central core opening extending from said extremity inwardly into said connector towards said inner surface of said strip, generally along the longitudinal axis of said connector, and a transverse slot extending along at least one side of said connector transverse to its longitudinal axis and defining an oppening from the exterior of said connector into said central core opening, said transverse slot including an inner edge wall located towards said inner surface of said strip and an outer edge wall spaced from said inner edge wall in a direction away from said inner surface of said strip, said outer edge wall of said transverse slot being a canted wall, said canted wall canting outward with respect to said inner surface of said strip as said canted wall extends from the exterior of said connector into said central core opening, thereby facilitating removal of a single piece mold portion, for forming said central core opening and said transverse slot, from said central core opening and said transverse slot and facilitating engagement of said connector to the automobile.

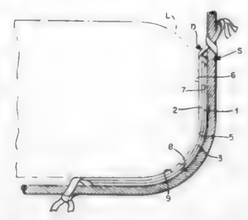
4,039,216
MANUAL GRASPING DEVICE
Imre Soos, 12124 Cedar Ave., Hawthorne, Calif. 90250
Continuation-in-part of Ser. No. 530,931, Dec. 9, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,139
Int. Cl.[2] A47F *13/06*; B25J *1/00*
U.S. Cl. 294—19 R **2 Claims**



1. An implement for grasping articles comprising an elongated member, operating handle means at one end of the member, means having grasping jaws at the other end of the member, the operating handle means including a lever and means connecting the lever to the grasping jaw means, said connecting means including a stem whereby reciprocating movement of the stem causes the jaw means to grasp, the grasping jaw means including flexible jaws integral with the member and including link means having pivotal connection to the member, the stem having connection to the link means at a position which is spaced from the connection of the link means to the member whereby reciprocation of the stem actuates the link means to engage the jaws causing the jaw means to grasp.

4,039,217
CLUTCH PADS
John G. Bryant, 15 Ridgewood Road, Radnor, Pa. 19087
Continuation-in-part of Ser. No. 886,706, Dec. 19, 1969, abandoned. This application Dec. 6, 1971, Ser. No. 204,932
Int. Cl.[2] B66C *1/12*
U.S. Cl. 294—74 **19 Claims**

4. In combination, a sling to be disposed around the underside of a load and at least one clutch pad interposed between the load and the sling and maintaining the load and the sling spaced from and out of direct contact with one another and the pad having a plurality of members capable of sliding motion relative to each other and thereby providing for relative sliding motion between the load and the sling while spaced from one another and one of said members being in contact with the load and constructed to be capable of moving with the load when



the load moves, said relative sliding motion between the sling and the load while spaced from one another providing that the movement of the load does not cut or abraid at least the sling material.

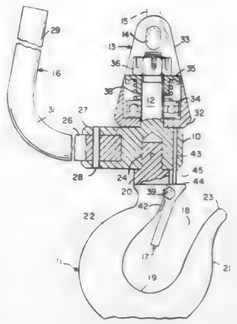
4,039,218
CLUTCH PADS
John G. Bryant, 15 Ridgewood Road, Radnor, Pa. 19087
Filed Oct. 5, 1972, Ser. No. 295,206
Int. Cl.[2] B66C *1/12*
U.S. Cl. 294—74 **16 Claims**



15. A sleeve-type clutch pad to be mounted on a sling in engagement with a load to be lifted by the sling, the pad permitting relative sliding motion between the load and sling, the pad comprising:
an outer sleeve including ply means connected together and arranged in generally annular form, the ply means being adapted to be placed in contact with the load to be lifted;
an inner sleeve disposed inside the outer sleeve and including ply means connected together and arranged in generally annular form for receiving and engaging the sling; and
slide permitting means on the surfaces of the inner and outer sleeves which face one another and operative when the sling and load are in lifting condition to permit relative sliding motion between the inner and outer sleeve and thereby provide for relative sliding motion between the load and the sling without the load and sling being in direct contact.

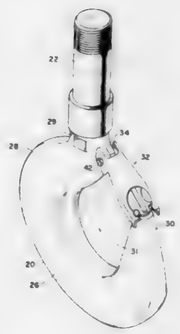
4,039,219
AUTOMATIC SAFETY LATCH LIFT HOOK UNIT
Michael Bugman, Ilion, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.
Filed June 23, 1976, Ser. No. 698,881
Int. Cl.[2] B66C *1/36*
U.S. Cl. 294—82 R **11 Claims**

1. A safety latch lift hook having a load receiving throat, a latch pivotable across the throat to open and closed positions, a spring biasing the latch to its closed position, plunger means having cooperation with the latch in response to unloading of the hook to pivot the latch against the bias of the spring to open position and to restrain the latch in the open position against the bias of the spring, and means intergral with the lift hook and responsive to loading of the hook to release the



restraint of the plunger means from the latch so as to allow the latch to pivot under the spring bias to closed position.

4,039,220
LATCH FOR HOISTING HOOK
Bobby G. Stoops, Tulsa, Okla., assignor to Don R. Hinderliter, Inc., Tulsa, Okla.
Filed May 4, 1976, Ser. No. 683,233
Int. Cl.[2] B66C *1/36*
U.S. Cl. 294—82 R **5 Claims**



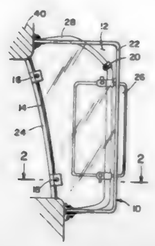
1. A latching mechanism for a hook of the type having a C-shaped body portion with a stem at one end of the body portion and a tip at an opposite end of said body portion spaced from said stem to form a mouth, a longitudinally extending latch pivotally connected at one end to said stem for pivotal movement towards and away from said body portion about a pivot axis perpendicular to and spaced from the central axis of said stem, said tip having a recess means therein terminating in a stop means, said latch being provided with a projection means adjacent an end opposite from said one end, whereby, when said latch is pivoted about said pivot axis away from said body portion said projection means will pass into said recess means until said projection means engages said stop means, engagement of said projection means with said stop means constituting a closed position of said latch with respect to said hook, and a rotatable locking means rotatably mounted at said opposite end of said latch for rotation about an axis substantially at right angles to said latch, said locking means being selectively disposable over and selectively engagable with the upper end of said tip for retaining said latch in said closed position with respect to said hook.

4,039,221

SAFETY WIND DEFLECTOR

Clarence Eady, 4223 Albert St., Burnaby, British Columbia, Canada (V5C 2E7)

Filed Jan. 27, 1976, Ser. No. 652,789
Int. Cl.[2] B60R *1/06, 1/12;* B60J *1/20*
U.S. Cl. 296—84 B 1 Claim



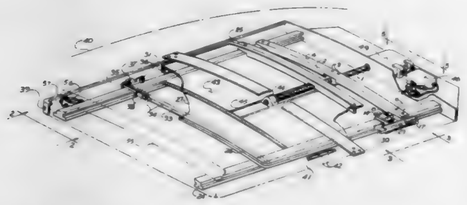
1. An automotive vehicle safety wind deflector comprising in combination an openable and closeable vehicle side window means, vent window means in front of said side window, mirror means adjacent said side window, said mirror means being secured to the side of said vehicle, transparent wind deflector means extending upwardly from the bottom to the top of said side window means and outwardly from said side window means, side wind deflector means being positioned in between said side window means and said vent window means, werein said wind deflector means is secured to said mirror means, said deflector means mounted in front or in back of said mirror means.

4,039,222

VEHICLE SUN ROOF

Ernest Wolf, St. Louis, and John L. Cain, St. Charles, both of Mo., assignors to Sky-Top Sunroofs, Ltd., Clayton, Mo.

Filed Oct. 20, 1975, Ser. No. 623,919
Int. Cl.[2] B60J *7/04*
U.S. Cl. 296—137 E 9 Claims



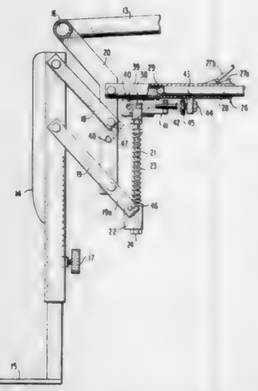
1. A sliding roof arrangement for a vehicle having an opening in the roof thereof comprising:
a housing,
said housing containing guide rails longitudinally positioned along the outer edges of the opening in the housing,
cam stops attached outwardly of said guide rails to said housing, and
a cover movable
on cover support means slidably attached to said guide rails and capable of effecting a closed and an open position of said cover in said roof opening;
cams slidably attached to said cover support means as a cover support means-cam combination,
an operating mechanism for moving said cover, said operating mechanism applied from the rear of the housing to the cover through
a movable cross member separated from and rearward of the cover and attached to the support means-cam combination,
said cover support means-cam combination capable of sliding relative to each other by permitting forward motion to the said cover support means after the cam stop contacts the cam,
said cover support means-cam combination hingably attached to the rear of the cover;
said cams containing frontal notches capable of engaging projecting tabs attached to the rear and underside of said cover,
said cams, upon contacting said cam stops, being capable of disengaging the projecting tabs from said frontal notches,
thus allowing said support means to hingably lift said cover to seal the roof opening.

4,039,223

CHAIR HAVING A TILTABLE BACK-REST AND TWO PIVOTAL LEG SUPPORTS

Nils Lars Ove Kristensson, Stockholm, Sweden, assignor to Landstingens Inkopscentral Lic, Ekonomisk Forening, Solna, Sweden

Filed Oct. 15, 1975, Ser. No. 622,650
Claims priority, application Sweden, Oct. 15, 1974, 7412981
Int. Cl.[2] A47C *1/02*
U.S. Cl. 297—90 3 Claims



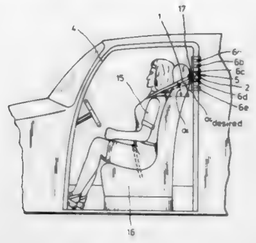
1. In a chair having a frame and provided with a resiliently tiltable back-rest frame, a seat frame and two separate leg supporting means arranged at the front end of the seat frame so as to support the legs of a person sitting in the chair, each leg supporting means including an adjustable foot rest and being capable to be swung about a pivot center on the frame at the front end of the seat frame from a substantially vertical position in which the foot rest is in a lower position adjacent the floor or ground to support the respective foot of the person, to a substantially horizontal leg supporting position, each of the supporting means in its vertical position being carried by a parallelogram linkage system movable in a longitudinal vertical plane and including a lower and an upper pivot point on the leg supporting means, a lower and an upper pivot point on a carrier arm located behind the leg supporting means and having an upper end pivotally mounted to the frame at the front end of the seat, an upper link arm connecting the two upper pivot points and a second lower link arm connecting the two lower pivot points, the parallelogram linkage being operative in response to swinging of the carrier arm forwards from its initial position to move the leg supporting means away from its pivot center on the frame to increase the distance between the foot rest and the pivot center, said movement of the parallelogram linkage being controlled by a connecting rod or link having its lower pivot point on the lower parallelogram link and its other pivot point on a telescopic connecting rod connecting the carrier member with a lever arm secured to the back-rest and extending below its pivot axis, said connecting rod or link having a substantially vertical position when the leg supporting means is vertical; the improvement comprising a guide member secured to one part of said telescopic connecting member and guiding said upper pivot of the connecting rod or link along a path substantially coinciding with a circular arc having its center at the lower pivot of the connecting rod at its connection with the lower parallelogram link.

4,039,224

SAFETY BELT POSITIONING APPARATUS

Andreas Bauer; Erwin Blüggel, both of Fallersleben, and Heinz Henning, Wolfsburg, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Germany

Filed May 17, 1976, Ser. No. 687,350
Claims priority, application United Kingdom, May 21, 1975, 2522415
Int. Cl.[2] A62B *35/00*
U.S. Cl. 297—389 13 Claims



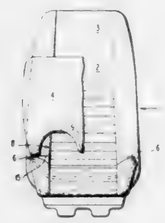
1. Apparatus for automatically positioning a vehicle safety belt, comprising:
a track mounted to said vehicle;
a carriage, movably arranged on said track;
retaining means, pivotably mounted on said carriage, for holding an end of said safety belt;
means for automatically moving said carriage in said track between a passenger release position and a plurality of passenger restraining positions;
and means, responsive to rotation of said retaining means by said safety belt, for locking said carriage in a selected one of said restraining positions upon attainment of a selected angle between said belt and a horizontal line.

4,039,225

SHELL-SHAPED CHILDREN'S SEAT FOR VEHICLES

Johann Tomforde, Magstadt, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 22, 1972, Ser. No. 291,184
Claims priority, application United Kingdom, Sept. 22, 1971, 2147248
Int. Cl.[2] B60R *21/10*
U.S. Cl. 297—390 6 Claims



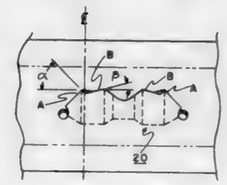
1. A children's seat for vehicles comprising:
a seating surface,
backrest means interconnected with headrest means in a transitional area located therebetween and a distance above said seating surface,
impact cushion means for protecting a child positioned in said seat while also permitting relative freedom of movement in use, said impact cushion means resting in use on associated edge portions of said seat within the area of said seating surface,
interconnecting means interconnecting said impact cushion means to said transitional area so that convenient boarding and leaving of the seat is provided for,
a safety belt adjustable in its length for abutment at the upper thighs, especially of small children, between abutment surfaces of said impact cushion means and said edge portions,
said impact cushion means extending above said seating surface at a distance substantially equal to the distance above said seating surface of said transitional area whereby the protection of a child's head and upper body in instances of sudden forward movement is provided for.

4,039,226

RETENTION ELEMENT FOR WHEEL COVERS

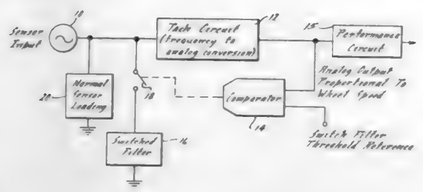
Thomas Frederick Brinson, Lake Park, Ga., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,820
Int. Cl.[2] B60B *7/06*
U.S. Cl. 301—37 B 5 Claims



1. A wheel cover for engagement with an automotive wheel rim and having an annular axially extending flange of a diameter slightly less than the inner diameter of said wheel rim:
a plurality of retention elements regularly spaced about the circumference of and integrally formed with the flange near the free end thereof and extending radially and axially outwardly from said flange;
each retention element including at least one offcentered generally V-shaped edge cutout portion forming a pair of retention teeth wherein said cutout portion is generally triangular with the apex of the triangle being spaced apart from the midpoint between said pair of retention teeth, thereby to form a pair of retention teeth comprising a sharp projecting tooth and a strong projecting tooth with each pair of said teeth lying along a common circle and wherein the projecting edges of said teeth extend substantially equally radially outwardly and reside substantially in a plane parallel to the plane of said wheel cover and said teeth being resiliently flexible in the axial direction; and,
wherein said sharp tooth bitingly engages and penetrates said wheel rim to resist relative rotation between said wheel cover and said wheel rim, and wherein said strong tooth engages said wheel rim to resist axial movement of said wheel cover.

4,039,227
SKID CONTROL SYSTEM HAVING A SWITCHED LOW SPEED NOISE FILTER
Gerald Michael Sivulka, Ann Arbor, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.
Filed Apr. 16, 1976, Ser. No. 677,824
Int. Cl.[2] B60T 8/08
U.S. Cl. 303—97 14 Claims



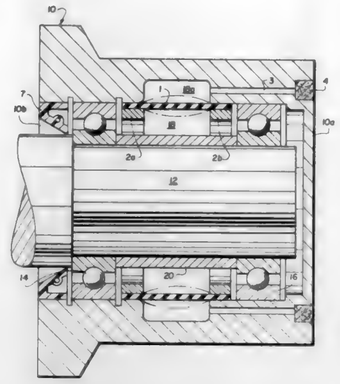
1. In a vehicle equipped with a skid control system having at least one wheel speed sensor operatively associated with one of the wheels of said vehicle to produce an output signal whose frequency is proportional to the rotational speed of said one wheel, and wheel speed signal processing means adapted to receive said sensor output signal and provide a signal at its output proportional to the frequency of said sensor signal; switched filter means for excluding from said signal processing means sensor output signals above a predetermined frequency whenever the output signal from said signal processing means does not exceed a predetermined threshold value.

4,039,228
TILTING PAD BEARING
John Repose, Trenton, N.J., and Ulysses Niatas, Yardley, Pa., assignors to Delaval Turbine, Inc., Trenton, N.J.
Filed May 7, 1976, Ser. No. 684,406
Int. Cl.[2] F16C 17/03
U.S. Cl. 308—73 6 Claims



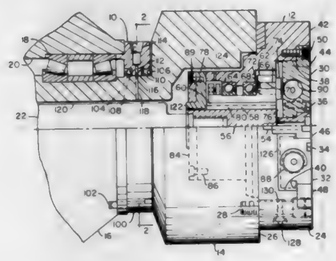
1. A bearing for a rotatable shaft comprising an annular housing defining a bore, a plurality of arcuate bearing shoes being spaced within the housing bore to define a cylindrical opening for axially receiving the shaft, said shoes being disposed in a free floating posture;
stop means being provided for maintaining said shoes in a generally operationally disposition in the absence of the shaft; and
pivot means for generally supporting each said shoe in the axial, radial and circumferential directions while providing for the universal movement thereof about a fixed point when a rotatable shaft is operationally mounted within the bearing.

4,039,229
ROLLER BEARING CONSTRUCTION
Karlheinz Ohlberg, Oberhausen, Germany, assignor to Gutehoffnungshutte Sterkrade Aktiengesellschaft, Germany
Filed Aug. 4, 1976, Ser. No. 711,646
Claims priority, application Germany, Aug. 6, 1975, 7524907
Int. Cl.[2] F16C 33/78
U.S. Cl. 308—187.1 7 Claims



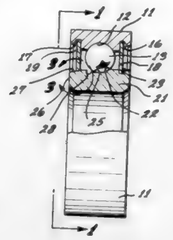
1. A housing for friction and antifriction bearings, comprising wall means defining a lubrication cavity in said housing, at least one impermeable elastic wall extending over said lubrication cavity and having an exterior wall side, and vent means connected into said housing to said exterior wall side to expose said exterior wall side to outside pressure so as to permit flexing of said impermeable elastic wall by changes of pressure in said lubrication cavity.

4,039,230
STRUCTURE FOR AND METHOD OF LUBRICATING A ROTATING FACING HEAD
Walter W. Wawrzyniak, 39230 Gary, Mount Clemens, Mich. 48043
Continuation-in-part of Ser. No. 641,937, Dec. 18, 1975, Pat. No. 4,004,332. This application Nov. 24, 1976, Ser. No. 744,726
Int. Cl.[2] F16C 33/66
U.S. Cl. 308—122 10 Claims



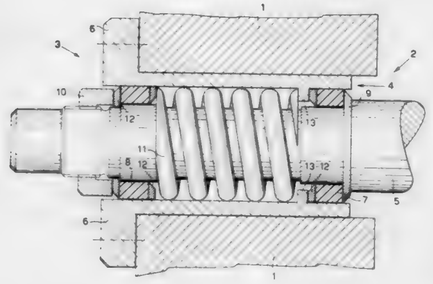
1. Structure for lubricating a rotation facing head while the facing head is rotating, comprising a stationary frame, a spindle rotatably mounted in the frame for carrying the facing head during rotation thereof, a lubricating member secured to the stationary frame and engaged with the rotatable spindle including means for passing lubricating fluid through the lubricating member, and means for passing lubricating fluid from the lubricating member radially through the spindle to the facing head while the spindle is rotating.

4,039,231
BALL BEARING ASSEMBLY
Edward Di Loreto, Downey, Calif., assignor to Yale Engineering Company, Downey, Calif.
Filed Mar. 12, 1976, Ser. No. 666,443
Int. Cl.[2] F16C 33/58
U.S. Cl. 308—189 R 6 Claims



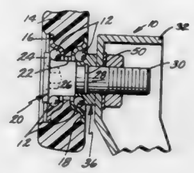
1. A ball bearing assembly comprising:
an outer race ring and an inner race ring having opposing ball race surfaces;
balls disposed within said raceway surfaces supporting said rings in a radially spaced relation;
one of said race rings having a substantially cylindrical surface extending axially from one side of said respective race surface and tangent thereto,
said one of said race rings having a conical surface disposed between said cylindrical surface and the respective axial end of said one race ring;
said conical surface having a diameter of such a size at its inner end to cause an interference between said conical surface and said balls;
said one race ring having a circumferential groove formed between said cylindrical surface and said conical surface.

4,039,232
SHAFT AND BUSHING ASSEMBLY
Costantino Vinciguerra, Florence, Italy, assignor to Nuovo Pignone, S.p.A., Florence, Italy
Filed Jan. 9, 1976, Ser. No. 647,783
Claims priority, application Italy, Jan. 10, 1975, 19162/75
Int. Cl.[2] F16C 1/24
U.S. Cl. 308—36.1 2 Claims



1. The combination of a shaft and a dustproof bushing assembly adapted to support said shaft for rotation about its axis and to prevent longitudinal movement thereof which comprises, a bushing support cylinder, an annular shoulder projecting from the bore of said bushing support cylinder near its inner end, a collar fixed to said shaft and contained within the bushing support cylinder between the inner end thereof and said annular shoulder, a first annular bearing of an elastically deformable material supported by said cylinder and mounted on said shaft between said collar and said annular shoulder, a longitudinally adjustable stop nut mounted on said shaft adjacent its outer end, a helical spring surrounding said shaft and having its inner end bearing against said annular shoulder, a second annular bearing of an elastically deformable material supported by said cylinder and mounted on said shaft between said stop nut and the outer end of said helical spring so that the spring causes said second annular bearing to be compressed against the stop nut and causes the said first annular bearing to be compressed between said collar and said annular shoulder, the tension of said spring being adjusted by said stop nut so as to exert a pressure on said elastically deformable annular bearings in excess of the yield load thereof.

4,039,233
CONNECTION APPARATUS FOR MULTIPIECE BEARING RACE
Devere W. Schmidt, Comstock Park, Mich., assignor to C. L. Frost & Son, Inc., Grand Rapids, Mich.
Filed Mar. 29, 1976, Ser. No. 671,721
Int. Cl.[2] F16C 13/00
U.S. Cl. 308—195 25 Claims

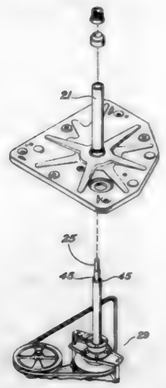


1. A multipiece race assembly for receiving a bearing member comprising a first means having an axis therethrough for forming a portion of the race assembly; second means received by at least a portion of said first means in axial alignment with said first means for forming another portion of the race assembly; at least one of said means forming at least a portion of a raceway for a bearing member; and retainer means received on one of said means and located between said first and second means for retaining said second means on said first means; said retainer means including means for allowing slight axial movement between said first and second means to allow independent axial adjustment of said first and second means without stressing said retainer means.

4,039,234
WASHING MACHINE BEARING
William F. Kelly, 307 Bellevue Drive, and Bobby G. Thompson, 1411 N. Main, both of Cleburne, Tex. 76031
Filed May 19, 1976, Ser. No. 688,109
Int. Cl.[2] F16C 33/20
U.S. Cl. 308—238 9 Claims

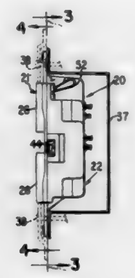
1. A bearing adapted to be coupled between a stationary stand tube of a washing machine and a spin tube located in said stand tube and which extends beyond the upper end of the stand tube, said spin tube being spaced inward from the inside surface of said stand tube defining an annular space between said stand tube and said spin tube in the vicinity of the upper end of said stand tube, said bearing comprising:
an annular member having an upper end and a lower end with a central cylindrical aperture formed therethrough for receiving the spin tube,
said central cylindrical aperture defining an inner cylindrical surface for engaging the outer surface of said spin tube,
said inner cylindrical surface being the closest surface to the central axis of said annular member,
the outer surface of said annular member being conical in shape at its upper end and which flares outward to an outer cylindrical surface at its lower end,

an annular slot formed in said annular member between said inner and outer cylindrical surfaces and which extends



upward from said lower end for receiving the upper end of said stand tube.

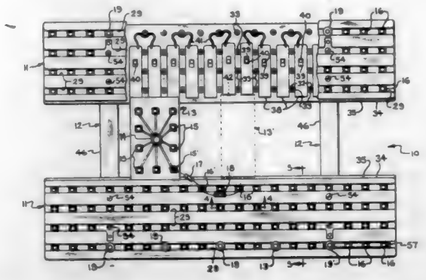
4,039,235
ELECTRICAL RECEPTACLE
Ronald N. Thibeault, Buena Park, Calif., assignor to Sola Basic Industries, Inc., Milwaukee, Wis.
Filed Jan. 23, 1976, Ser. No. 651,857
Int. Cl.² H01R 3/06, 11/20, 13/66
U.S. Cl. 339—14 R **8 Claims**



1. An electrical receptacle having a body with electrical receptor means therein, said body having nonconductive upper and lower portions, said lower portion having mounting strap means integral therewith and extending longitudinally therefrom and the upper portion having apertures corresponding to said receptor means and through which connector blade means can be removably inserted, there being a cavity between said upper portion and lower portion for receiving a grounding strip, and grounding strip means in said cavity, said grounding strip having aperture means for receiving grounding blade means of said connector blade means, said strip having an extension from said cavity to the exterior of said upper and lower portion for receiving a ground connection, and having a portion under said mounting strap means which can be contactable by a receptacle mounting screw.

4,039,236
MODULAR BREADBOARD
Kent L. Schepler, 1103 Oak St., Apt. D, Canon City, Colo. 81212
Filed Apr. 16, 1976, Ser. No. 677,564
Int. Cl.² H01R 29/00
U.S. Cl. 339—17 N **8 Claims**

1. A modular breadboard assembly on which electrical circuits are constructed comprising, in combination, a pair of panel assemblies each having an edge, support means rigidly mounting said panel assemblies with said edges extending parallel and spaced apart to define a first pair of edges, at least one module means for mounting thereon at least one preselected component for an electrical circuit, said module means having a second pair of edges spaced apart further than said first pair of edges, means for releasably attaching each said module means between said panel assemblies including grooves in the edges of one of said first and second pairs of



edges, said grooves having a spacing for receiving the other of said first and second edges whereby said module means is positionable between said panel assemblies and spring means in at least one of said grooves for biasing said module means towards one of said panel assemblies, and a plurality of terminal means mounted on each of said panel assemblies for releasably receiving and electrically contacting wires for constructing electrical circuits.

4,039,237
ELECTRICAL POWER CONDUCTOR APPARATUS FOR EARTH BORING
Roy H. Cullen, Houston, and Jimmie R. Aker, League City, both of Tex., assignors to Roy H. Cullen
Continuation-in-part of Ser. No. 554,753, March 3, 1975, abandoned, which is a division of Ser. No. 448,975, March 7, 1974, Pat. No. 3,886,241. This application Jan. 15, 1976, Ser. No. 649,246
Int. Cl.² H01R 13/54
U.S. Cl. 339—91 R **27 Claims**



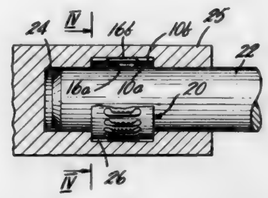
1. An electrical power conductor unit apparatus adapted for use in the bore of a tubing joint formed drilling string to transmit electrical power to an electrical motor mounted in the drilling string, including:

an elongated electrical conductor for extending in the bore of a drilling string to a desired operating location and having a lower end and an upper end;

a lower connector plug means mounted on said lower end of said electrical conductor for electrically connecting with a connector plug disposed in the bore of the drilling string below said electrical conductor; and

an upper connector plug means mounted on said upper end of said electrical conductor for electrically connecting with a connector plug disposed in the bore of the drilling string above said electrical conductor, said upper connector plug means having means for releasably securing said upper connector plug means with the drilling string to support said electrical conductor in the bore of the drilling string and releasable in response to predetermined engagement with a fishing tool for enabling removal of said electrical conductor from the bore of the drilling string with the fishing tool.

4,039,238
LOUVERED CONNECTORS AND CONTACT ELEMENTS THEREOF
Glenn W. Johnson, Jr., Summit, and Paul F. Lindlau, East Orange, both of N.J., assignors to Amerace Corporation, New York, N.Y.
Continuation of Ser. No. 503,783, Sept. 6, 1974, abandoned. This application May 5, 1976, Ser. No. 683,527
Int. Cl.² H01R 13/12, 13/20
U.S. Cl. 339—95 R **53 Claims**



1. An electrical contact comprising an elongate electrically conductive strip member having first and second longitudinally spaced transverse openings extending through opposed first and second surfaces thereof, said strip member defining a continuous longitudinally and laterally extending expanse between respectively adjacent transverse boundaries of said openings, said strip member expanse being displaced angularly outwardly of said openings about a transverse axis situated longitudinally closer to one of said adjacent boundaries than the other thereof.

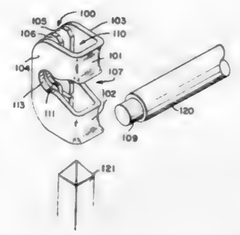
4,039,239
WIRE SLOT CLIP
Robert Franklin Cobaugh, Elizabethtown, and James Edward Lynch, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed Mar. 24, 1976, Ser. No. 669,772
Int. Cl.² H01R 11/20
U.S. Cl. 339—97 R **5 Claims**

1. A clip means for connecting an insulated wire to a terminal post and comprising:

a generally channel-shaped conductive body having a bottom wall and first and second side walls attached at first edges thereof to opposite edges of said bottom wall and perpendicular thereto;

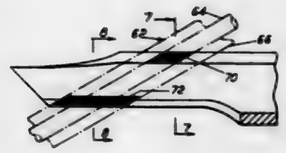
a first slot means extending transversely across said bottom wall and into the said first and second side walls, with the portion of said slot means extending into said side walls narrowing to a width less than the outside diameter of said insulated wire;

first and second extensions attached to second edges of said first and second side walls, respectively, and folded back towards the bottom wall within the channel-shaped conductive body and terminating a given distance from said bottom wall;



second and third slot means formed in said first and second extensions and aligned with a portion of the first slot means extending into said first and second side walls with a portion thereof having a width less than the diameter of said wire.

4,039,240
ELECTRICAL CONNECTOR AND CONTACTS THEREFOR
Carl W. Peterson, Santa Ana, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Division of Ser. No. 527,600, Nov. 27, 1974, Pat. No. 3,955,873, which is a continuation-in-part of Ser. No. 510,382, Sept. 30, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 641,095
Int. Cl.² H01R 13/38
U.S. Cl. 339—99 R **7 Claims**



1. A terminal device connected to an electrical conductor having a core covered by insulation, said terminal device comprising:

a base portion having a generally tubular section at one end thereof, said tubular section having a front end adjacent to said base portion and an opposite rear end;

a first slot extending longitudinally through said tubular section from said front end to said rear end defining a pair of resilient arcuate side walls;

the edges of said side walls defined by said slot being uniformly spaced from each other adjacent to said front end, said edges diverging outwardly to said rear end portion an entrance for said conductor;

the distance between said uniformly spaced edges being less than the cross-section of said core;

a second slot in said tubular section on the side thereof opposite to said first slot and extending from said rear end toward but short of said front end, the edges of said tubular section defined by said second slot being uniformly spaced from each other, the distance between said second-mentioned edges being less than the cross-section of said conductor but greater than the cross-section of said core; and

said conductor being forcibly inserted into said slots at an

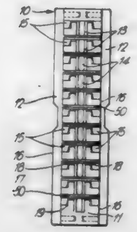
acute angle with respect to the longitudinal axis of said tubular section, the said first-mentioned edges severing said insulation and penetrating said core at a forward region of the conductor and said second-mentioned edges penetrating said insulation at a second region of said conductor immediately behind said forward region providing strain relief for said conductor, the portion of said conductor behind said second region thereof extending generally parallel to said axis.

4,039,241

MULTIPLE CONTACT CONNECTORS

Kenneth Roy Perry, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 2, 1976, Ser. No. 737,904
Int. Cl.² H05K *1/12*
U.S. Cl. 339—176 M **7 Claims**



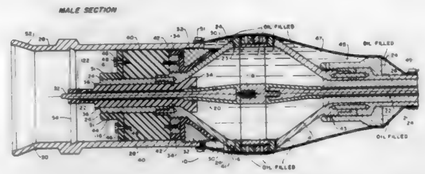
1. A multiple contact connector, comprising:
an elongate connector body of electrically insulating material and including a longitudinally extending central portion having a top surface and side surfaces;
a plurality of central recesses in said central portion, said central recesses spaced along said central portion and extending down from said top surface;
a slot extending from the base of each central recess through to a base surface of said body;
a plurality of further recesses spaced along said central portion, a further recess of each side of each central recess, each further recess extending downward from said top surface and inward from the related side surface;
a plurality of transverse slots extending across said top surface, each slot interconnecting a central recess and the further recesses on each side of the central recess to form a common side surface to the central recess and associated further recesses;
each of said further recesses including an inner corner spaced from the related transverse slot and a web extending across said inner corner to provide an undercut formation, and an inclined upper surface on said web, said inclined surface sloping downward toward the related further recess;
a plurality of contacts in said body, a contact in each of at least some of said central recesses, each said contact comprising; a stem portion having two opposed contact legs, said legs extending into a central recess and including lower ends positioned adjacent to the slot extending from the central recess to said base surface; a top portion including a central section extending laterally normal to said stem portion, an intermediate section at each end of said central portion and extending substantially normal thereto and an end section extending from each intermediate section and extending substantially normal thereto and in a direction away from said central section, said central section positioned in the transverse slot associated with said central recess, said intermediate and end sections positioned in the further recesses on either side of said central recess, the junction between each intermediate section and the associated end section forming a corner positioned under said web extending across said inner corner of each further recess, at least one end section extending from a further recess to form a terminal.

4,039,242

COAXIAL WET CONNECTOR

Jeffrey V. Wilson, and Ronald L. Brackett, both of Camarillo, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 23, 1976, Ser. No. 716,870
Int. Cl.² H01R *17/18*
U.S. Cl. 339—177 E **20 Claims**



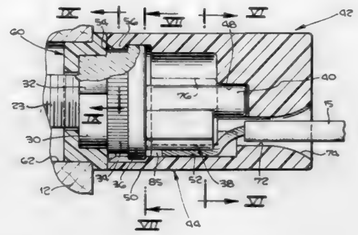
1. An electrical coaxial wet connector, including a male and a female section for mating which produces a nearly perfect impedance match while maintaining a coaxial mode of signal propagation, comprising:
a. a female housing having a central opening therein and a longitudinal axis;
b. a female inner conductor disposed within said female housing along the longitudinal axis thereof;
c. a female outer conductor disposed within said female housing concentric with said inner conductor, said female outer conductor projecting outwards from said female inner conductor such that an interconnection space is formed within said female outer conductor, said female outer conductor having a termination end;
d. female dielectric means disposed between said linear and outer female conductors for providing electrical insulation therebetween;
e. a male housing having a central opening therein and a longitudinal axis, said male housing interfitting in abutting relationship with said female housing with said female housing being partially surrounded by said male housing after mating;
f. a male inner conductor disposed within said male housing along the longitudinal axis thereof, said male inner conductor having a termination end;
g. a male outer conductor disposed within said male housing concentric with said inner conductor, said male inner conductor projecting outwards from said male outer conductor, said male outer conductor adapted to receive said female outer conductor in electrical connection therewith;
h. male dielectric means disposed between said inner and outer male conductors for providing electrical insulation and a water-tight seal therebetween;
i. male facing means disposed concentric with said male outer conductor between said male outer conductor and said male housing, said male facing means forming a water-tight seal therebetween;
j. female facing lip means disposed concentric with said female outer conductor between said female outer conductor and said female housing, said female facing means forming a water-tight seal therebetween, said female facing lip means being adapted to receive said male facing means in abutting relationship thereto with a water-tight seal being formed therebetween after mating;
k. shuttle piston means disposed within said interconnection space for receiving said male inner conductor and electrically interconnecting said male and female inner conductors, said piston means abutting said female outer conductor and being movable with respect thereto, said piston means having a front side for receiving said male inner conductor and a back side for engaging said female inner conductor;
seal means disposed between said shuttle piston means and said female outer conductor adjacent said termination end for providing a water-tight seal between said shuttle piston means and said female outer conductor before mating and between said male inner conductor and said female outer conductor after mating.

4,039,243

ELECTRICAL CONNECTOR

Paul D. Johnson, Cupertino, Calif., assignor to James B. Lansing Sound, Inc., Los Angeles, Calif.

Filed Sept. 7, 1976, Ser. No. 720,568
Int. Cl.² H01R *9/10*
U.S. Cl. 339—274 **13 Claims**



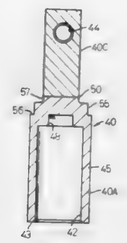
1. An electrical connector comprising:
an elongated conductive binding post having a central vertical axis and a cam including a surface disposed spirally relative to the axis,
and a cap rotatably mounted on the upper portion of the post and having formed therein a conductor-receiving bore eccentric to said axis, the cap including means for forcing a conductor into contact with the cam when the cap is rotated relative to the post.

4,039,244

BIMETALLIC ELECTRICAL CONNECTOR AND METHOD FOR MAKING THE SAME

Richard B. Leachy, Brookfield, Wis., assignor to Coatings Inc., Milwaukee, Wis.

Filed Apr. 9, 1976, Ser. No. 675,644
Int. Cl.² H01R *11/08*
U.S. Cl. 339—275 T **9 Claims**



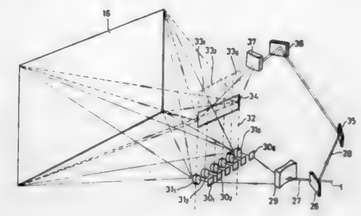
1. In a one-piece bimetallic electrical connector comprising two portions of dissimilar metals joined together in a solid state bond, electrical connecting means on each portion of said connector, said electrical connecting means on one portion comprising a wire receiving opening extending inwardly from one end of said connector for a predetermined distance to a predetermined point, an interior tool engaging means for tooling purposes provided on said one portion of said connector in said wire receiving opening and an exterior boss for tooling purposes provided on said one portion of said connector.

4,039,245

METHOD FOR PREPARING A HOLOGRAM

Akio Yano, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 485,628, July 3, 1974, abandoned, which is a continuation of Ser. No. 418,935, Nov. 26, 1973, abandoned, which is a continuation of Ser. No. 134,729, April 16, 1971, abandoned. This application Oct. 28, 1975, Ser. No. 626,348
Int. Cl.² G03H *1/30*
U.S. Cl. 350—3.5 **9 Claims**



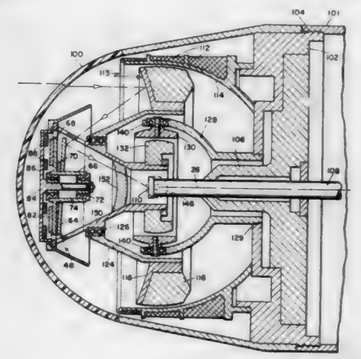
1. A method of producing a hologram, comprising:
arranging a plurality of two-dimensional pictures in a predetermined pattern,
illuminating each of the two-dimensional pictures with a coherent light beam,
projecting light emerging from each of said two-dimensional pictures toward a screen so as to form overlapping images of the two-dimensional pictures on the screen,
dispersing the light on the screen in a first direction parallel to the screen and redirecting the light on the screen along predetermined courses in a second direction orthogonal to the first direction so as to separate the light on the screen from the different pictures,
directing the light from the different pictures from the screen onto a holographic recording medium so that light emerging from each of the two-dimensional pictures strikes a separate portion of the medium, and
directing a reference beam toward the medium so as to produce interference with the light from the screen.

4,039,246

OPTICAL SCANNING APPARATUS WITH TWO MIRRORS ROTATABLE ABOUT A COMMON AXIS

Allan Alfred Voigt, Anaheim, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Jan. 22, 1976, Ser. No. 651,495
Int. Cl.² G02B *27/17*; G01J *1/20*; H01J *3/14*; F41G *7/12*
U.S. Cl. 350—7 **10 Claims**



1. Scanning apparatus for use in a scanning optical system comprising:
beam director means for directing incident rays of radiation

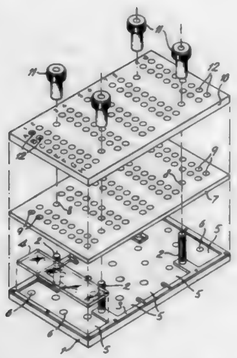
from a radiation source to produce a first scanning pattern,
first rotation means for rotating said beam director means about a spin axis,
a first part of said first rotation means associated with said beam director means and rotating therewith,
a second part of said first rotation means non-rotatably mounted adjacent said first part of said first rotation means, whereby said second part of said first rotation means may be directly coupled to a drive power supply,
gimbal mounting means for mounting said beam director means and said first rotation means first and second parts,
primary beam director means for receiving radiation rays from a radiation source and diverting same to said beam director means,
said beam director means mounted for rotation about said spin axis and canted out of perpendicularity with respect thereto to generate a second scanning pattern,
second rotation means independent of said first rotation means for rotating said primary beam director means.

4,039,247

DEVICE FOR USE IN TESTING OF FLUID SAMPLES ON MICROSCOPE SLIDES

Michael John Patrick Lawman, Bagshot, and Ian Scott Cale, Woking, both of England, assignors to National Research Development Corporation, London, England

Filed Dec. 12, 1975, Ser. No. 640,212
Claims priority, application United Kingdom, Dec. 17, 1974, 54438/74
Int. Cl.² G02B *21/34*; G01N *1/10*
U.S. Cl. 350—95 **7 Claims**



1. A device for use in a test procedure in which a plurality of discrete fluid samples is disposed on a microscope slide comprising:
a slide support for supporting a plurality of slides and having a plurality of inspection holes therethrough;
a flexible gasket provided with a plurality of apertures therethrough for contacting said slides on said support to define a plurality of sample wells;
means for clamping said gasket to said support to apply pressure to said gasket so as to seal said gasket apertures against said slide in a fluid tight relation including a plate for overlaying said gasket for contact therewith, said plate having a plurality of apertures for registration with the gasket apertures, a plurality of studs carried by said support and extending through stud apertures in said gasket and plate, and fastener means for engaging said studs to clamp said gasket and slide between said plate and support.

4,039,248

SHEATHED FIBER LIGHT CONDUCTOR

Hermann Franke, Korschenbroich-Pesch; Willi Kückes, Wegberg, and Wolfgang Märtin, Monchen-Gladbach, all of Germany, assignors to AEG-Telefunken Kabelwerke AG Rheydt, Monchen-Gladbach, Germany

Filed Sept. 19, 1975, Ser. No. 614,952
Claims priority, application Germany, Sept. 20, 1974, 2445532
Int. Cl.² G02B *5/14, 5/16*
U.S. Cl. 350—96 B **16 Claims**



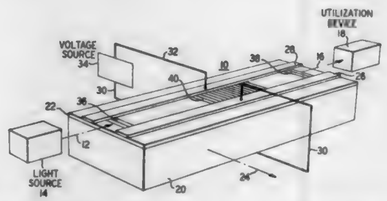
1. In a light conducting unit for a light conducting cable, the unit including a fiber light conductor and a sheath enclosing and supporting the conductor, the improvement wherein said sheath is a hollow tubular sheath and said conductor is shaped in a manner such that its longitudinal axis follows a substantially uniform undulating path along the length of said tube and said conductor contacts the inner wall of the sheath only at spaced intervals and is out of contact with the inner wall in regions between such intervals for permitting said conductor to yield in an elastically resilient manner due to mechanical stresses.

4,039,249

INTEGRATED OPTICAL DEVICES INCLUDING TUNABLE FIXED GRATING

Ivan Paul Kaminow, New Shrewsbury, and Herwig Werner Kogelnik, Fair Haven, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 28, 1973, Ser. No. 345,715
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 WG **4 Claims**



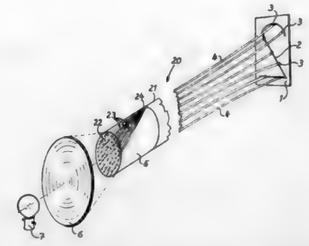
1. In combination, a substrate, a thin longitudinally extending planar dielectric film on said substrate, said film being characterized by a higher index of refraction than that of said substrate and being adapted to guide along the longitudinal extent thereof an incident optical beam that is directed at or near one end of said film, means for establishing a fixed diffraction grating in said film in the path of said guided beam, and means for controlling the propagation constant of said film thereby to vary the effective spacing of said grating, wherein said controlling means comprises two spaced-apart longitudinally extending electrodes on said guiding film for applying a variable electric field through said film in the vicinity of said fixed grating.

4,039,250

DEVICE FOR SIGNAL TRANSMISSION BY MEANS OF OPTICAL CONDUCTORS

Waldemar Gaertner, Wenden, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 8, 1976, Ser. No. 664,875
Claims priority, application Germany, Apr. 24, 1975, 2518241
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 B **10 Claims**



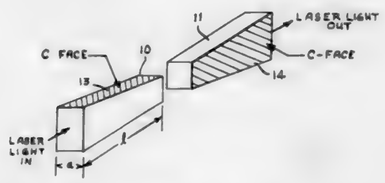
1. In a device for the transmission of light by means of optical conductors between a first and second location and particularly useful in both an apparatus for the representation of symbols on a display surface and an optical display apparatus for railroad and street traffic control, said device including a source of illumination, a display surface, and a plurality of conductor bundles with each bundle being composed of a plurality of individual optical conductors, said conductors being positioned with a light input end being disposed adjacent the source of illumination and a light output end being disposed adjacent the display surface, said bundles being gathered together into a strand of conductors at one of said input and said output ends, the improvement comprising light mixing means for obtaining substantially uniform distribution of the intensity of light leaving the strand of conductors, said light mixing means having a first and second end and being disposed with the first end at the bundles and with the second end at one end of the strand, said light mixing means comprising a plurality of individual light conducting elements, said conducting elements at a point spaced from said first end being spread into a substantial layer of elements of a thickness of one element, said layer being spirally wound around a common main axis extending parallel to the optical conductors so that the conducting elements of the light mixing means are uniformly distributed across an area of the second end of said means.

4,039,251

TAPERED CRYSTAL MODULATOR FOR LASERS

Louis B. Allen, Jr., Florissant, and James R. Teague, St. Charles, both of Mo., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,517
Int. Cl.² G02F *1/28*
U.S. Cl. 350—157 **4 Claims**



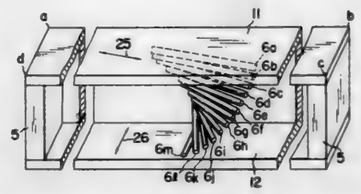
1. For use in a modulator for laser applications a crystal configuration comprising first and second tapered crystals having the same index of refraction arranged in light-transmitting relationship with the respective optic axes of said crystals being effectively optically perpendicular to each other and to the optical axis determined by the coaxial alignment of one of each of the principal axes of said crystals, said crystals having the same length along said optical axis, each of said first and second tapered crystals having first and second ends, said first ends having a substantially larger cross section than said second ends, a laser beam enters said first ends of said first tapered crystal and exits said first ends of said second tapered crystal.

4,039,252

FIELD-EFFECT LIQUID CRYSTAL-TYPE DISPLAY DEVICE

Fumio Mizuno; Fumio Takeuchi, both of Ibaragi, and Shunsuke Kobayashi, Wako, all of Japan, assignors to Energy Systems, Ltd., Iruma, Japan

Continuation-in-part of Ser. No. 422,870, Dec. 7, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,565
Claims priority, application Japan, Dec. 13, 1972, 47-124954
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **1 Claim**



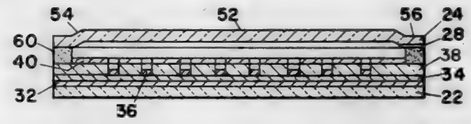
1. A liquid crystal type display device comprising a pair of transparent members provided with transparent electrodes, respectively, and a liquid crystal of a field-effect type loaded in the space formed by the transparent members, said transparent members being disposed in such a manner that the angle formed by the alignment treatment directions of the transparent members is changed by five degrees from ninety degrees, whereby the homogeneity of the display is significantly improved from that obtained when the twist angle is less than five degrees or more than 10°, from 90°.

4,039,253

OPTICAL DISPLAY HAVING DISHED COVER PLATE

Anil K. Jain, Eagleville, Pa., assignor to ICI United States Inc., Wilmington, Del.

Filed Apr. 20, 1976, Ser. No. 678,629
Int. Cl.² G02F *1/36*
U.S. Cl. 350—160 R **12 Claims**



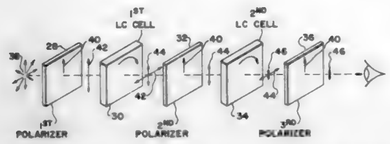
1. A sealed optical cell containing an aqueous medium and comprising an essentially inflexible base plate and an essentially inflexible dished cover plate, at least one of which is transparent, joined together and forming opposed walls of said cell, said cover plate including a central portion spaced from said base plate and a sloping peripheral portion extending outwardly from said central portion toward the base plate, the outer part of said peripheral portion being adjacent to said base plate and disposed at an acute angle thereto.

4,039,254

ELECTRO-OPTIC WELDING LENS ASSEMBLY USING MULTIPLE LIQUID CRYSTAL LIGHT SHUTTERS AND POLARIZERS

Thomas B. Harsch, Stow, Ohio, assignor to Mack Gordon, Cleveland, Ohio

Filed May 27, 1976, Ser. No. 690,554
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **5 Claims**



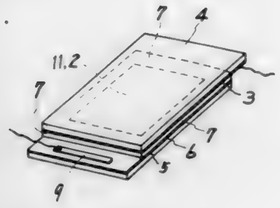
1. In a welding helmet, a protective welding lens assembly comprising at least two liquid crystal light shutters and at least three polarizers arranged alternately in tandem to achieve a maximum light transmission through the lens assembly of about 0.01%.

4,039,255

COLOR DISPLAY DEVICE WITH DYE AND SYNTHETIC OIL SOLUTION

Akio Yamashita, 2-86, 2 chome, Seiwadai, Kawanishi, Japan

Continuation of Ser. No. 507,194, Sept. 18, 1974, abandoned. This application May 24, 1976, Ser. No. 689,047
Claims priority, application Japan, Sept. 21, 1973, 48-107142; Mar. 6, 1974, 49-26498; May 7, 1974, 49-51010; May 7, 1974, 49-51011; May 7, 1974, 49-51012; May 7, 1974, 49-51013
Int. Cl.² G02F *1/25*
U.S. Cl. 350—160 R **11 Claims**



1. A color display device comprising

1. a container having a pair of electrodes with a specified gap in between, at least one of the electrodes being transparent for passing light therethrough,
2. a liquid contained between said gap of the electrodes so that an electric field is applied thereto when a voltage is applied across the electrodes,

wherein said liquid is a solution of an oil and at least

3. one dye selected from the group consisting of:

nitroso dyes, nitro dyes, azo dyes, stilbene dyes, diphenylmethane dyes, triarylmethane dyes, xanthen dyes, acridine dyes, quinoline dyes, methine dyes, polymethine dyes, thiazole dyes, indamine dyes, indophenol dyes, azine dyes, oxyazine dyes, thiazine dyes, sulfide dyes, aminoketone dyes, oxyketone dyes, anthraquinone dyes, indigoid dyes, and phthalocyanine dyes,

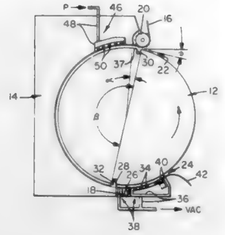
wherein said oil is a synthetic oil.

4,039,256

INTERMITTENT FILM TRANSPORT REGISTRATION STABILIZATION DEVICE

Lawrence R. Teeple, Jr., Palo Alto; Andrew K. Magyary, San Mateo, and Kenneth N. Severs, San Carlos, all of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed May 24, 1976, Ser. No. 689,633
Int. Cl.² G03B *1/00*
U.S. Cl. 352—184 **10 Claims**



1. A film transport for intermittently moving a film past an exposure gate at relatively high pull-down rates commensurate with television systems, the transport including a stator, a rotatable rotor concentric within the stator to define a film passage therebetween, film supply/guide means for supplying and retrieving the film, and means for recording on the film via the exposure gate, comprising the combination of;

a single sprocket disposed to introduce the film from the film supply/guide means to the film passage between the stator and rotor at a selected shallow inlet angle;

said rotor including selected gaps formed in the circumference thereof for gradually forming therein film loops which reach their full size of an exposure frame length upon arriving at the exposure gate;

means for expelling the film loops in their full size condition shortly after their passing the exposure gate;

said means for expelling including expulsion pin means located at the expulsion point of the film loops for preventing back forces upon the film in the exposure gate in response to expulsion of the full size loops; and

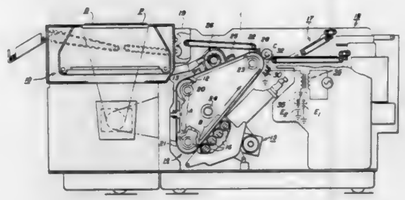
vacuum means cooperating with the means for expelling the film loops to stabilize the film in the exposure gate during the recording process.

4,039,257

PRETRANSFER COROTRON SWITCHING

Douglas P. Connolly, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 25, 1974, Ser. No. 491,895
Int. Cl.² G03G *15/16*
U.S. Cl. 355—3 R **2 Claims**



1. In an electrostatic reproduction machine having a moving photoconductive surface, a corona discharge device adapted to apply a uniform charge of a predetermined polarity to the surface, means for exposing the charged surface in image-wise configuration for forming an electrostatic image and back-

ground areas, a developing means positioned at a development zone for depositing toner on said surface to develop the moving electrostatic image on said surface, and a transfer means to transfer the toner to a receiving member, the combination comprising:

an A.C. corona discharge device positioned between said developing and transfer means for applying corona on said photoconductive surface,

said discharge device operating to enhance the transfer of toner associated with photoconductive surface potentials to one side of a transition potential and to suppress the transfer of toner associated with photoconductor potentials to the other side of said transition potential, and

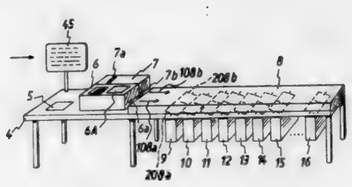
means for varying the output of said A.C. corona discharge device between first and second active charge deposition modes, in response to a command from the operator of the machine whereby said discharge device operates to enhance and suppress transfer of toner about first and second transition potentials.

4,039,258

METHOD AND APPARATUS FOR MAKING REPRODUCTIONS OF PHOTOGRAHIC COPY NEGATIVES OR THE LIKE

Friedrich Hujer, Grunwald, and Wolfgang Zahn, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 23, 1976, Ser. No. 669,500
Claims priority, application Germany, Mar. 27, 1975, 2513873
Int. Cl.² G03B *27/78, 27/32*
U.S. Cl. 355—27 **26 Claims**



1. A method of making reproductions of frames on relatively short film strips each of which includes at least one frame and a carrier connected with the frame and adapted to store encoded information and which strips are to be confined in evelopes bearing information denoting the type, size and number of reproductions to be made, the order number and customer identification, comprising the steps of

a. encoding on each carrier information including identification of the film frame and the number and nature of reproductions to be made;

b. encoding on each carrier at least some information which is borne by the respective envelope, including information identifying the customer and/or the order number;

c. grouping the film strips and the respective envelopes in accordance with the type of film strips and/or the nature of reproductions to be made;

d. making reproductions of frames on each of the thus obtained groups of film strips independently of other group or groups, including imaging the frames of film strips in the respective group onto a web of photosensitive material;

e. developing the photosensitive material;

f. subdividing the web into discrete prints; and

g. introducing the thus obtained prints and the corresponding film strips into the respective envelopes.

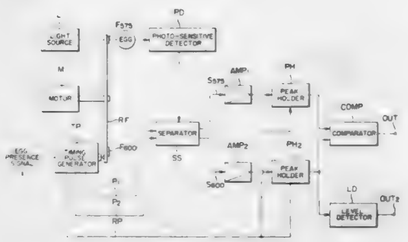
6. In an apparatus for making reproductions of frames on relatively short film strips each of which includes at least one frame and a carrier connected with the frame and adapted to store encoded information and which strips are to be confined in envelopes bearing information denoting the type, size and number of reproductions to be made, the order number and customer identification, a combination comprising applicator means for encoding on each carrier information including identification of the film frame, the number and nature of reproductions to be made, the order number and customer identification; means for grouping the film strips and the respective envelopes according to the type of film strips and/or the nature of desired reproductions; copying means for making reproductions of frames on each of the thus obtained groups of film strips independently of other group or groups, including means for imaging the frames of film strips in the respective group onto a web of photosensitive material which is thereupon developed; and means for subdividing the web into discrete reproductions.

4,039,259

EGG INSPECTING APPARATUS

Hisatoshi Saito, Yokohama, and Kuniyoshi Kimura, Iwakura, both of Japan, assignors to Kewpie Kabushiki Kaisha, Japan

Filed Nov. 14, 1975, Ser. No. 632,063
Claims priority, application Japan, Nov. 18, 1974, 49-132579; Sept. 19, 1975, 50-113415; Sept. 19, 1975, 50-113416
Int. Cl.² G01N *33/08*
U.S. Cl. 356—53 **2 Claims**



1. An egg inspecting apparatus which comprises:

light emitting means having a light source for projecting through an egg to be inspected a first light having a wavelength which is appreciably absorbed by a content of said egg and a second light having a wavelength which is not appreciably absorbed by said content of the egg;

photo-sensitive means comprising an electric charge storing element for receiving said first and second lights transmitted through said egg to produce first and second detection signals, respectively;

signal processing means for processing said first and second signals to produce an output signal when the level of said first detection signal is less than a first predetermined value with respect to the level of said second detection signal, and to produce an output signal when the level of said second detection signal is smaller than a second predetermined value;

said light emitting means further comprising a rotating filter plate provided with a first filter for passing said first light and a second filter for passing said second light thereby to alternately project said first and second lights through said egg to be inspected to said photo-sensitive means;

said signal processing means comprising:

a synchronization type separator connected to said photo-sensitive means for separately applying said first and second detection signals with the aid of timing pulses produced in synchronization with the rotation of said rotating filter plate respectively to first and second peak holders connected to said separator, said first peak holder storing a peak value of said first detection signal applied thereto, said second peak holder storing a peak value if said second detection signal applied thereto;

a comparator connected to said first and second peak holders for comparing outputs produced respectively

by said first and second peak holders thereby to produce an output signal when the level of the output of said first peak holder is less than a first predetermined value with respect to the level of the output of said second peak holder; and

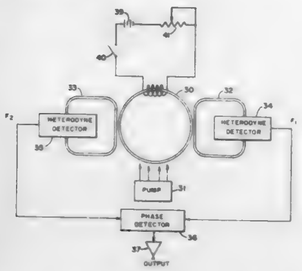
a level detector connected to said second peak holder for receiving the output of said second peak holder, said level detector producing an output signal when the level of the output of said second peak holder is less than a second predetermined value.

4,039,260

ROTATIONAL MOTION TRANSDUCER

Charles M. Redman, 2020 Huntington Drive, Las Cruces, N. Mex. 88001

Filed Mar. 22, 1976, Ser. No. 669,359
Int. Cl.[2] H01S *3/10*
U.S. Cl. 356—106 LR 3 Claims



1. A rotational motion transducer including a closed-loop, optical waveguide laser, and means for detecting frequency and phase differences for opposite directions of rotation of radiation in said laser; said means for detecting including a pair of heterodyne detectors, a phase detector having inputs fed by said heterodyne detectors, and means for coupling a portion of the radiation in said laser to said heterodyne detectors; said means for coupling being comprised of two different portions, said portions being coupled to opposite places on the loop of said laser, said portions being further connected to respective ones of said detectors.

4,039,261

DISPOSABLE TOOTHBRUSH

James L. Evans, 24400 Border Hill, Novi, Mich. 48050

Filed Oct. 14, 1975, Ser. No. 621,640
Int. Cl.[2] A46B *11/02*
U.S. Cl. 401—132 1 Claim



1. A toothbrush and paste dispensing device comprising:

a handle having an oval shaped cross section and an opening at one end;

a plastic brush head having an oval shaped cross section with one end sized to be slidably received in a tight fit in said handle opening, the outer walls of said brush head defining a sealed paste-holding cavity, said brush head having an outer wall with a plurality of aligned apertures;

a plurality of integrally formed, conically shaped hollow bristles molded in and extending from said outer wall of said brush head and communicating with said paste-holding cavity via said apertures, each of said hollow bristles having a plurality of longitudinal slits for providing an enlarged central opening and a plurality of side wall openings in each bristle to provide a plurality of passageways through which toothpaste may be emitted and to provide an increased number of cleaning edges;

a predetermined quantity of toothpaste in said cavity; and

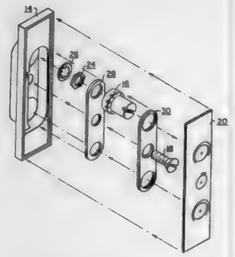
a single sealing film in said cavity covering, all of said apertures and between said toothpaste and the interior of said bristles, the side walls of said brush head being fabricated from a flexible plastic material such that, upon manual squeezing pressure applied to said brush head side walls, the paste therewithin will exert a pressure against said sealing film to puncture the same, squeezing said paste through said hollow bristle passageways to the top ends and side walls of said bristles for application by the user.

4,039,262

CLAMP HOLDS MEMBERS IN ROTATABLY ADJUSTED POSITION

William D. Allardice, Jr., Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 589,102, June 23, 1975, Pat. No. 3,995,201.
This application June 30, 1976, Ser. No. 701,396
Int. Cl.[2] F16D *1/12*
U.S. Cl. 403—110 13 Claims



1. Rotatable apparatus which is lockable at a desired angular position, comprising:

a. a base,

b. a rotatable member disposed upon said base which is generally rotatable in a plane parallel to said base, said rotatable member being rotatable to a generally predetermined angular position while said base remains generally stationary, said rotatable member having a flange;

c. a locking member disposed proximate to said base and said rotatable member, said locking member being translationally movable to engage said flange when said rotatable member is at said predetermined angular position to lock it thereat; and

d. driving means for moving said locking member.

4,039,263

CONNECTOR JOINT

Otto Bässler, Bahnhofstr. 29, 7504 Weingarten, Germany

Filed May 4, 1976, Ser. No. 683,023
Claims priority, application Germany, May 7, 1975, 2520510
Int. Cl.[2] F16D *3/00*
U.S. Cl. 403—218 8 Claims

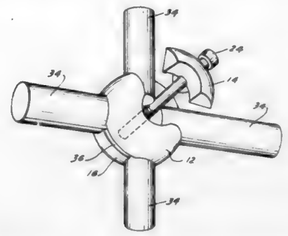
1. A three-dimensional assembly comprising:

a plurality of elongated rods having rod ends;

a joint having

a pair of generally identical outer parts each having an outer face formed with three outer recesses, and

an annular inner part having a pair of inner faces each formed with three inner recesses and each snugly interfittable with a respective outer face with each of said inner recesses aligned with and forming with a respective one of said outer recesses a respective bore generally coaxial with another of said bores and forming therewith a bore pair lying on a respective axis generally perpendicular to the axes of the other bore pairs,



each of said bores opening axially oppositely to the other bore of the respective pair and being shaped to receive a respective rod end; and

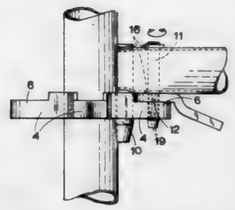
means for securing together said parts and thereby clamping said ends in said bores therebetween.

4,039,264

SCAFFOLDING

Frederick George Sharp, West Bromwich, England, assignor to C. Bryant & Son Limited, West Midlands, England

Filed Apr. 26, 1976, Ser. No. 679,928
Claims priority, application United Kingdom, Apr. 26, 1975, 17403/75; July 22, 1975, 30536/75
Int. Cl.[2] F16B *2/18*
U.S. Cl. 403—246 20 Claims



1. Scaffolding including an upright member having a socket, and a cross member having a dependent spigot adapted to be inserted in said socket, a cam mounted for rotation relative to said cross member and a retaining member which is acted upon by said cam and is movable relative to said spigot by rotation of said cam to jam said spigot in said socket and thereby secure said cross member to said upright member.

4,039,265

DITCH-SHAPING ROLL AND ATTACHMENT FOR A ROAD VEHICLE

Hartley P. Dermond, S. Venice, Fla., assignor to William H. Clark, Sharon, Pa., a part interest

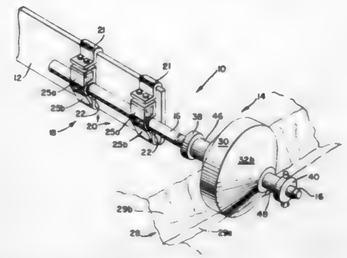
Filed Dec. 9, 1975, Ser. No. 639,114
Int. Cl.[2] E01C *19/26*
U.S. Cl. 404—127 6 Claims

1. A device for simultaneously forming, shaping and compacting both the sidewalls and the base of a ditch comprising:

a roll member which includes a pair of spaced, opposed, sidewall shaping surfaces, said shaping surfaces being adapted to shape and compress the opposed sidewalls of the ditch, said shaping surfaces being joined to form another shaping surface adapted to shape and compress the base surface of the ditch;

a shaft rotably supporting said roll member adjacent to one end portion of said shaft; and

attachment means disposed adjacent the other end portion of said shaft for removably securing said shaft and said roll member to a road vehicle which is able to cause said roll member to traverse the ditch, said attachment means including a clamping member fixedly disposed on said shaft, arcuate engagement surfaces on said clamping member for holding engagement with the road vehicle, and means for securing said clamping member to the road vehicle.

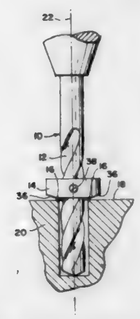


4,039,266

COMBINATION STOP COLLAR AND CUTTING TOOL

John W. O'Connell, 18 Northgate Road, Carmel, N.Y. 10512

Filed July 19, 1976, Ser. No. 706,230
Int. Cl.[2] B23B *51/00*
U.S. Cl. 408—202 4 Claims



1. In a combination with a longitudinal cutting tool formed with at least one groove, a stop collar received on said cutting tool, said stop collar having a stop surface, and yieldably resilient means for operatively connecting, and longitudinally adjusting said stop collar on said cutting tool so as not to damage the groove thereof, said collar having a longitudinal axis and being formed with a longitudinal slot perpendicular to said axis, and wherein said yieldably resilient means comprise:

a threaded screw passable through said longitudinal slot;

a lock nut attachable to said threaded screw;

a compression spring surrounding said screw and disposed within said slot; and

a pair of washers disposed at opposite ends of said spring, whereby the cutting depth of said tool is limited upon said stop face engaging with a stop surface of a work piece.

4,039,267

METHOD AND APPARATUS FOR STARTING A BLOWER

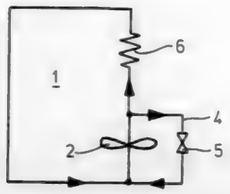
Jurgen Baer, Magenwil; Hans-Dieter Sommer, Oberrohrdorf, and Ernst Toplak, Windisch, all of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 26, 1975, Ser. No. 635,349

Claims priority, application Switzerland, Dec. 18, 1974, 16880/74

Int. Cl.² F01D *19/00*

U.S. Cl. 415—1 **5 Claims**



1. In the method for starting a blower installed within a pressure system such as the circulating cooling system of a turbogenerator, said blower being constituted by a single-stage radial fan having a pressure coefficient greater than 1 and which includes a defined region of flow interruption along its pressure-volume characteristic curve, and wherein the resistance of the pressure system is varied during the starting operation by means of a starting duct provided with a throttling element, the improvement which resides in the step of closing said throttling element at any desired blower speed ranging from 10 to 100% of its rated speed when the point of intersection between the pressure system characteristic, modified on the basis of the open throttling element, and the blower characteristic has been reached whereupon the desired point of operation conforming to the blower characteristic and the system characteristic will regulate itself automatically.

4,039,268

ARRANGEMENT FOR ENDWISE CLAMPING A FIRST GAS TURBINE ROTOR MEMBER TO ANOTHER MEMBER OF A GAS TURBINE ROTOR

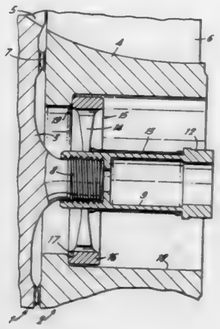
John Lee Cotton, Kongsberg, Norway, assignor to A/S Kongsberg Vapenfabrik, Kongsberg, Norway

Filed Feb. 18, 1976, Ser. No. 659,003

Claims priority, application Norway, Feb. 20, 1975, 750570

Int. Cl.² F01D *5/06*

U.S. Cl. 416—183 **6 Claims**



1. In a multi-part gas turbine rotor comprising a first gas turbine rotor member having a hub with a central bore; another rotor member, annular engagement areas between said rotor members and lying in a radial plane between said rotor members; and means for endwise clamping and maintaining said rotor members in firm, torque-transmitting engagement with each other over said annular engagement areas, said first rotor member central bore having a first shoulder facing away from said second rotor member, said second rotor member having connecting means projecting from an end face into said central bore and beyond said first shoulder, said second connecting means having a shoulder facing said second rotor member and said first shoulder, said connecting means including resilient means engaging both said shoulders, and securing means securely holding the two rotor members in assembled relation with said resilient means clamped between said shoulders, the improvement in which said resilient means includes a rim engaging said first shoulder and having an annular row of inwardly projecting lever portions, said lever portions having respective inner ends engaging said second shoulder.

4,039,269

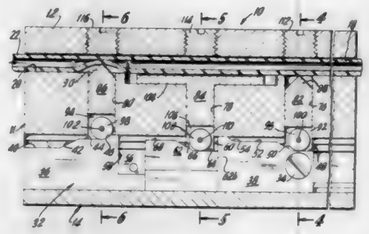
FLEXIBLE TUBE PUMP HAVING LINEAR CAM ACTUATION OF DISTRIBUTOR MEANS

Norman C. Pickering, North Haven, N.Y., assignor to The Lynkeus Corporation, East Hampton, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,181

Int. Cl.² F04B *43/12, 45/06, 7/00*

U.S. Cl. 417—475 **5 Claims**



1. A peristaltic-type metering pump comprising:

a. a housing;

b. elongated tubing means supported in said housing, said tubing means including an inlet end adapted to be connected to a source of fluid to be pumped and an outlet end;

c. an inlet plunger, an extruder plunger and an outlet plunger arranged serially in said housing in opposition to and along the length of said tubing means in said housing, said inlet, extruder, and outlet plungers being further arranged to be displaced and to thereby apply compressive forces to said tubing means;

d. a linear actuator;

e. primary cam means slidably mounted in said housing and responsive to said linear actuator for displacing said inlet and said outlet plungers in a predetermined timed relationship with respect to each other to thereby apply said forces to said tubing means, said primary cam means being comprised of first and second axially spaced apart sections; and

f. secondary cam means located between said first and second sections responsive to the movement of said first cam means for displacing said extruder plunger in a predetermined time relationship with respect to the displacement of said inlet and outlet plungers, said secondary cam means being slidably mounted on said primary cam means and arranged to be displaced in one axial direction by a portion of one of said primary cam means sections and to be displaced in the opposite axial direction by the other of said primary cam means sections.

4,039,270

FLUID SUCTION AND DISCHARGE APPARATUS

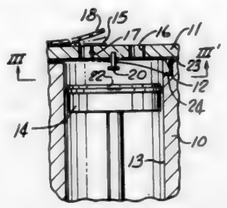
Masaharu Hiraga, Isesaki, Japan, assignor to Sankyo Electric Industries, Ltd., Japan

Filed Feb. 13, 1975, Ser. No. 549,795

Claims priority, application Japan, Feb. 14, 1974, 49-17172[U]; Feb. 14, 1974, 49-17173[U]

Int. Cl.² F04B *39/10, 21/02*

U.S. Cl. 417—569 **6 Claims**



1. A fluid suction and discharge apparatus comprising

a cylinder block provided with at least one cylinder,

a valve plate secured to said cylinder block to close one end of said cylinder and having an inlet port and an outlet port,

a piston slidably close-fitted into said cylinder,

a discharge reed valve disposed on an outer surface of said valve plate to close said outlet port thereof,

a suction reed valve which is secured at one end thereof and extends along the inner surface of said valve plate over said inlet port and terminates free at the other end thereof,

stopper means for restraining said suction reed valve from over-bending, which stopper means is positioned under the inner surface of said suction reed valve within the bore of said cylinder between the secured end thereof and the region thereof facing said inlet port,

said suction reed valve having a slit at a position between the secured end thereof and the region thereof facing said inlet port, said stopper means being a pin which is secured on the inner surface of said valve plate and which has a small radius portion extending through said slit of said suction reed valve and a head portion thereof having a greater radius than said slit, whereby said suction reed value may be suppressed from over-bending.

4,039,271

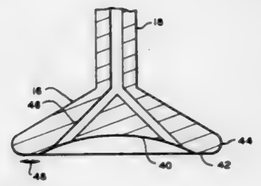
CONTOURED ASSIST PLUG FOR THERMOFORMING ORIENTED ARTICLES

Jimmie E. Hudson, Bartlesville, Okla., and Calvin D. Dockery, Bacton, England, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 539,041, Jan. 7, 1975, Pat. No. 3,966,860, which is a continuation-in-part of Ser. No. 75,801, Sept. 24, 1969, abandoned. This application Apr. 19, 1976, Ser. No. 678,286

Int. Cl.² B29C *17/04*

U.S. Cl. 425—529 **5 Claims**



1. Apparatus for forming open end articles comprising in combination:

sheet heating means operable to heat sheet to orientation temperature;

mold cavity means;

means advancing said sheet through said heating means and into position over said mold cavity means;

a plug assist having a concave leading surface with a flat annular face around the periphery thereof, said face terminating in a peripheral edge having a radius of curvature within the range of 1/64 to ¼-inch, said mold cavity means having an inner diameter greater than the outer diameter of said plug assist such that a space greater than the thickness of said sheet exists between said periphery of said plug and the side walls of said mold cavity;

means moving said plug so that said flat annular face contacts the thus heated sheet thereby stretching said sheet into said mold cavity whereby said flat annular face controls an amount of slippage of said sheet over said flat annular face; and

means creating a pressure differential between two sides of said sheet.

4,039,272

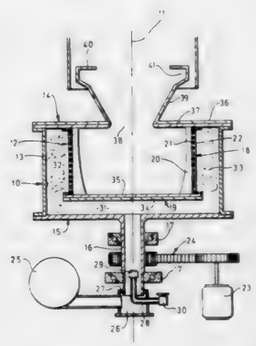
APPARATUS AND METHOD FOR CARRYING OUT REACTIONS IN A FLUIDIZED BED

Douglas Ernest Elliott, Sutton Coldfield, England, assignor to Stona-Platt Fluid fire Limited, West midlands, London, England.

Filed Sept. 26, 1975, Ser. No. 616,948

Int. Cl.² F23D *19/02*

U.S. Cl. 431—7 **18 Claims**



1. Apparatus comprising a rotatable drum having a circumferentially extending wall which is permeable to gases, feed means for mixing a gaseous fuel and a gaseous oxidant and for feeding the mixture through the wall into the drum, a bed of particles which, at least when the apparatus in use, is supported on an internal face of the peripheral wall and is fluidised, whereby the fuel is burned in the bed, and receiving means for receiving and for retaining during a period of sue of the apparatus particles which are carried from the bed by gases leaving the bed.

4,039,273

PHOTOFLASH LAMP PROVIDING AFTER-FLASH SHORTING

Paul T. Coté, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

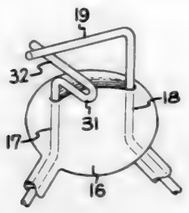
Filed Apr. 24, 1975, Ser. No. 571,264

Int. Cl.² F21K *5/02*

U.S. Cl. 431—95 R **15 Claims**

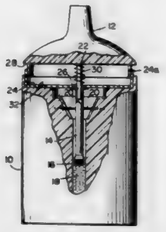
1. A shorting type of photoflash lamp comprising a bulb, first and second inlead wires extending into said bulb, and combustible material within said bulb which is capable of producing light and heat when the lamp is flashed, wherein the improvement comprises an arrangement in which said first

inlead wire extends laterally above and spaced from said second inlead wire and is of a size and material to deform from



heat of the lamp when it flashes and descend by gravity into contact with said other inlead wire and provide a short-circuit between said inlead wires after the lamp is flashed.

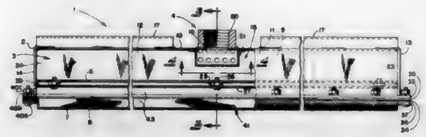
4,039,274
ELECTRIC SAFETY LIGHTER
Mildred Nordlinger, New York, N.Y., assignor to Westminster Industries, Inc., New York, N.Y.
Filed Feb. 10, 1976, Ser. No. 656,835
Int. Cl.² F23O 7/00
U.S. Cl. 431—128 **2 Claims**



1. A lighter comprising a chassis, a reservoir for lighter fluid within said chassis, a rod having a wick at one end, support means comprising a slidable disc mounted transverse to said rod for axial sliding movement with respect to said rod for suspending said rod within said chassis with the wick normally separated from the reservoir, spring means operationally associated with said support means such that upon actuation of said spring means the wick end of the rod comes in contact with the reservoir and absorbs lighter fluid from said reservoir, said spring means being secured between a fixed position on said rod and said disc, said disc engaging said chassis such that compression of said spring moves said wick from a position separate from the reservoir to a position in contact with said reservoir, and striker means for igniting said wick upon withdrawal of said rod from said chassis.

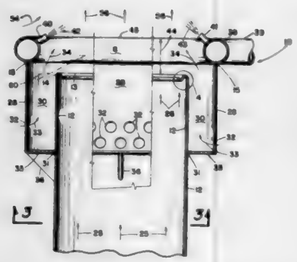
4,039,275
INFRARED ENERGY GENERATOR WITH ORIFICE PLATE
Charles A. McGettrick, 19447 Westover, Rocky River, Ohio 44114
Filed Feb. 23, 1976, Ser. No. 660,430
Int. Cl.² F23D 13/14
U.S. Cl. 431—329 **19 Claims**

1. An infrared energy generator, comprising:
a housing,
a plenum in said housing,
input means for coupling to said plenum a combustible fuel input at a pressure greater than relative ambient pressure outside said housing,
output means for directing fuel out from said plenum for combustion thereof,
radiating means exposed to the products of such combustion for radiating infrared energy in response to such products, said radiating means also being exposed to the ambient environment to radiate such infrared energy thereto,
means for impeding fuel flow through said plenum from said input means to said output means to maintain a fuel back pressure in at least a portion of said plenum exposed to said input means normally larger than normal pressure of the ambient environment to which such radiating means is exposed, said means for impeding flow including opening means of a size relative to the magnitude of such back pressure for passing fuel to said output means at a sufficient flow velocity that impedes back flashing and a sufficient fuel quantity to maintain combustion at said radiating means, said means for impeding comprising a substantially solid member in said plenum dividing the latter into first and second portions, the former being more proxi-



mate said input means than the latter, said opening means producing at least one controlled fuel flow stream therethrough, and said opening means, such back pressure, and the flow velocity of said at least one fuel flow stream being cooperably interrelated to maintain combustion at said radiating means and to prevent back flashing thus avoiding backfire, and
baffle means in said housing facing said second portion of said plenum for forming a boundary thereof, said baffle means being positioned between said opening means and said radiating means to block said at least one fuel flow stream from flowing directly from the former to the latter thereby deflecting said at least one fuel flow stream and spreading the same, whereby the fuel supplied for combustion at said radiating means is substantially uniformly distributed thereat.

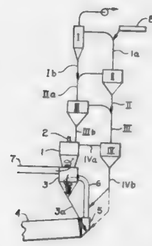
4,039,276
NOISE AND SMOKE RETARDANT FLARE
Robert D. Reed, and Robert E. Schwartz, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.
Filed Mar. 11, 1976, Ser. No. 665,863
Int. Cl.² F23D 13/20
U.S. Cl. 431—202 **9 Claims**



1. A noise and smoke retardant flare for the combustion of waste fuel gases comprising:
a. a flare stack;
b. a shroud surrounding the discharge end of said stack, said shroud extending a selected distance beyond the discharge end of said stack, an annular plate closing off the annular space between said stack and said shroud, at the base of said shroud;

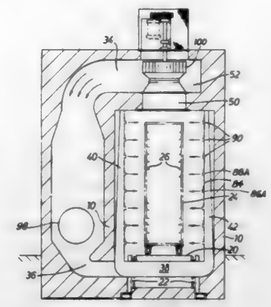
c. a plurality of openings through the wall of said shroud near its base for the entry of primary combustion air; and
d. means to ignite said waste gas as it is discharged from said stack;
whereby a wind-protected combustion zone just beyond the discharge end of said stack is provided for the mixing of primary combustion air with said gas, and for its ignition and burning; and including
a steam manifold supported at the discharge end of said shroud;
a plurality of steam nozzles sealably inserted into the inside surface of said manifold and circumferentially spaced;
whereby said nozzles are at a level substantially at, or below the discharge end of said manifold.

4,039,277
APPARATUS FOR CALCINING POWDER MATERIALS
Toshihiro Kobayashi, Tokyo, and Yoshifumi Nitta, Yokohama, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan
Filed Oct. 30, 1975, Ser. No. 627,289
Claims priority, application Japan, Nov. 7, 1974, 49-128406
Int. Cl.² F27B 7/02, 15/00
U.S. Cl. 432—106 **1 Claim**



1. An apparatus for calcining powder materials comprising a calcining furnace provided with inlet means for supplying the furnace with raw materials to be calcined, a plurality of preheater cyclones for feeding preheated raw materials to said inlet means, said furnace having a burner, a rotary kiln having an inlet for raw materials, said furnace having a connection for conducting combustion air to the furnace, a separator in said connection and positioned at the bottom of the furnace, conduit means for conducting high temperature exhaust gas from the kiln to the furnace through the separator, a conduit connecting the separator and the inlet of the kiln, a cyclone connected with the furnace for separating calcined materials from combustion gases and conducting the last named materials to said conduit means, said materials being suspended in the exhaust gases in the conduit means and being further heated and calcined and conducted to said separator where they are separated from said exhaust gases and conducted through said conduit to said kiln whereby the preheated materials are fed into the furnace and partly calcined therein, the partially calcined materials are conducted to the last named cyclone wherein the materials are separated from gases, the separated calcined materials are suspended in the kiln exhaust gases in said conduit means so that uncalcined portions are calcined, the completely calcined materials being separated from the kiln exhaust gases in said separator and fed into said kiln through said conduit, and a raw material conduit for directly supplying the kiln inlet with at least a portion of the materials separated in said last named cyclone.

4,039,278
BAKERY OVEN
Andrew Denholm, 2 Pearce Avenue, Edinburgh, EH12 8SW, Scotland
Filed Mar. 13, 1975, Ser. No. 557,986
Claims priority, application United Kingdom, Mar. 18, 1974, 11956/74
Int. Cl.² F27B 9/00
U.S. Cl. 432—144 **8 Claims**

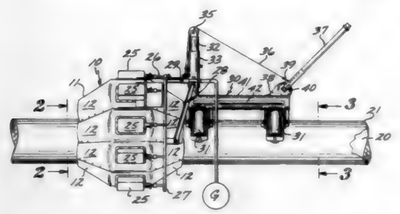


1. A bakery oven which comprises a chamber defined by a pair of generally vertical walls, a roof, and a floor which define an entry aperture at or near one end and an exit at or near the other end, at least one of the walls having means which define a plurality of hot air supply orifices, the orifices being arranged in horizontally-spaced and vertically-spaced groups and each group of orifices includes a plurality of orifices vertically or horizontally-spaced from one another, wherein said orifices are horizontal slots formed by upper and lower louver members each louver member having a horizontal plate or flange extending into the chamber wherein inflowing air is guided in operation of the oven to travel substantially horizontally, and a selected one of the louver members of each pair of upper and lower louver members is slidable towards and away from the other louver member to allow adjustment of the width of the slot defined thereby, air supply ducts in at least one of said walls, comprising a first duct, an intermediate duct connected with said first duct, a heat exchanger positioned within said intermediate duct having an outlet, said exchanger outlet connected to a second duct whereby hot air is conveyed from the heat exchanger to the hot air supply orifices, said air supply ducts further comprise an under-floor duct and a vertical duct which includes two air duct branches, said under-floor duct being disposed under the floor and connecting with said vertical duct, one said air duct branch extending upwardly in one of said walls and the other said air duct branch extending upwardly in the other of said walls.

4,039,279
ANNULAR HEATER
George Roman Horeczko, 2545 Pabolo Ave., San Pedro, Calif. 90732
Filed Sept. 10, 1975, Ser. No. 611,992
Int. Cl.² F24J 3/00
U.S. Cl. 432—225 **7 Claims**

1. Apparatus for applying heat circumferentially to a cylindrical object, comprising:
an annular heating chamber adapted to surround a peripheral section of said object;
a plurality of burners disposed around the periphery of said chamber for communicating heat to the interior thereof;
support platform means mounted for longitudinal translation along said object; and

adjustable connecting means attached to said support platform means and said annular heating chamber for adjustably positioning said chamber relative said object.



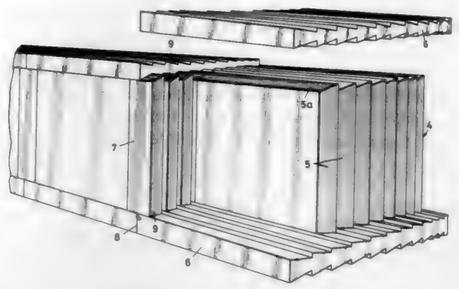
4,039,280

LININGS FOR HIGH TEMPERATURE OVENS

Sigismund Kienow, Clausthal-Zellerfeld, and Erich Sundermann, Braunschweig, both of Germany, assignors to Pyro-Zytan GmbH & Co., Braunschweig, Germany

Filed July 17, 1975, Ser. No. 596,587
Claims priority, application Germany, July 22, 1974, 2435146
Int. Cl.² F27B *3/14*
U.S. Cl. 432—248 **10 Claims**

1. A lining for the walls of a high temperature furnace and the like, comprising a plurality of adjacently disposed and superimposed layers of blocks of a refractory material, each of said blocks being formed by an assembly of a plurality of relatively thin plate elements arranged in spaced face-to-face parallel relationship to each other and to the associated adjacent walls of the furnace and stacked in relative alignment with the like plates in the adjacently disposed blocks, said blocks being separated by end members extending perpendicularly to the plane of the plates within said blocks, the faces of each of said end members having slots, each of the slots receiving at least a portion of the edges of a corresponding contiguous one of said plate elements therein to maintain each said plate element spaced from the adjacent plate elements in said block and provide a firm interconnecting bond therebetween.



4,039,281

METHOD FOR THE PREPARATION OF LEATHER AND FUR SKINS

Hans Dieter Graf, Eurasburg, Germany, assignor to Dr. Th. Boehme KG., Chem. Fabrik, Geretsried, Germany

Filed July 15, 1976, Ser. No. 705,630
Claims priority, application Germany, July 19, 1975, 2532391; July 19, 1975, 2532393; Feb. 18, 1976, 2606420
Int. Cl.² C14C *1/08, 3/26*
U.S. Cl. 8—94.14 **11 Claims**

1. Method for the preparation of leather and fur skins comprising adjusting water content to 50–80 weight percent for leather or 30–80 weight percent for skins and subject them to reaction with chemicals for tanning in a water immiscible organic solvent.

4,039,282

DURABLE-PRESS FINISHING OF CELLULOSE-CONTAINING TEXTILES WITH ALUMINUM CHLORHYDROXIDE-HYDROGEN PEROXIDE CATALYST SYSTEM

Russell M. H. Kullman, Metairie, and Robert M. Reinhardt, New Orleans, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 19, 1976, Ser. No. 706,979
Int. Cl.² D06M *13/34*; B01J *23/08, 27/06*
U.S. Cl. 8—184 **6 Claims**

1. In a process for imparting durable-press properties to cellulosic textiles, said process of the type wherein the textile is impregnated with an aqueous formulation containing a formaldehyde-amide adduct crosslinking agent and aluminum chlorhydroxide catalyst, and is dried and cured, the improvement characterized by:

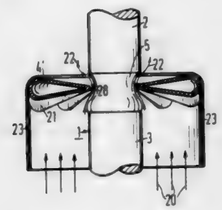
adding hydrogen peroxide to the formulation to provide a more efficient, activated catalyst system that promotes the finishing reaction through synergistic interaction of the aluminum chlorhydroxide and hydrogen peroxide.

4,039,283

APPARATUS FOR PRODUCING A CONTROLLED RADIAL PATH OF RESISTANCE IN A SEMICONDUCTOR MONOCRYSTALLINE ROD

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 460,539, April 12, 1974, Pat. No. 3,976,536.
This application Aug. 22, 1975, Ser. No. 606,854
Claims priority, application Germany, Apr. 18, 1973, 2319700
Int. Cl.² B01J *17/10*
U.S. Cl. 23—273 SP **2 Claims**



1. An apparatus for controlling the radial path of resistance within a semiconductor crystalline rod subjected to a crucible-free zone melt treatment, comprising:

a housing having a hollow melt zone chamber therein;

means within said chamber for vertically supporting a semiconductor crystalline rod by the rod ends;

an annular inductively heating single turn flat coil having a coil slot filled with an inert material, said flat coil having a plurality of guide vanes attached to a surface thereof, said coil being positioned within said chamber to encompass an axial portion of a semiconductor rod; and

at least one mobile gas supply line comprised of a quartz tube having a nozzle in the region of said heating coil, said gas supply line nozzle being positioned to face the surface of said coil having the guide vanes attached thereto, said gas line having means for controlling the temperature of a stream of gas flowing therein and having means for controlling the flow speed of a stream of gas therein.

4,039,284

CYANURIC ACID COMPOUND COLORIMETRIC INDICATOR AND METHOD FOR USE

Thomas P. Mancini, Lincoln Park, N.J., assignor to Coastal Industries, Inc., Carlstadt, N.J.

Filed Aug. 12, 1976, Ser. No. 713,991
Int. Cl.² G01N *33/18, 21/20*
U.S. Cl. 23—230 B **17 Claims**

16. A method for colorimetric determination of the concentration of cyanuric acid compounds in aqueous solution comprising the steps of:

a. obtaining a sample of said solution;

b. adding to said sample a formulation comprising an aqueous solution of:

1. a thymolsulfonphthalein compound which, in aqueous solution with monoethanolamine, exhibits characteristic color shades which are dependent upon the concentration of cyanuric acid compound in said aqueous solution;

2. monoethanolamine; and

3. a stabilizer which is a condensation product of disulfonic acid derivatives with a compound selected from the class consisting of stilbene, stilbyle and their derivatives; and

c. mixing said sample and said formulation and observing the resultant characteristic color shade of the mixed sample and formulation.

4,039,285

SINGLE SAMPLE METHOD FOR DETERMINATION OF LIPOPROTEIN CONCENTRATIONS IN BLOOD

John William Teipel, Belle Meade, N.J., assignor to Ortho Diagnostics, Inc., Raritan, N.J.

Filed Oct. 10, 1975, Ser. No. 621,339
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **20 Claims**



1. A single-sample method for determining the concentrations of low density lipoprotein (LDL), very low density lipoprotein (VLDL) and chylomicrons (CHYLO) in blood which comprises:

a. mixing the serum of said blood with an ionic-strength-sensitive agent for forming an insoluble complex with substantially all of said LDL, said VLDL, and said CHYLO, comprising a sulfated polysaccharide and the salt of a divalent cation whereby turbidity is produced in said mixture;

b. measuring the tubidity of said mixture;

c. increasing the ionic strength of the mixture formed in step

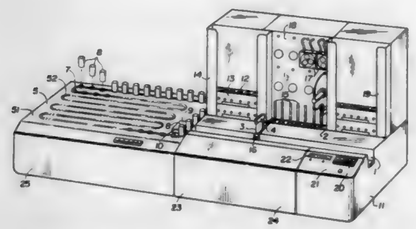
a) to a value whereby the LDL complex dissolves, so that the remaining turbidity of said mixture is due primarily to the insoluble complexes of VLDL snd CHYLO;
d. measuring said remaining turbidity of said mixture;
e. increasing the ionic strength of the mixture formed in step c) to a value whereby VLDL complex dissolves, so that the final turbidity of said mixture is due primarily to the insoluble complex of CHYLO;
f. measuring said final turbidity of said mixture;
g. and utilizing said turbidities to determine the concentration of LDL, VLDL, and chylomicrons.

4,039,286

AUTOMATIC CHEMICAL ANALYSIS APPARATUS

Walter Keller, Rodenbach II; Hubert Koukol, Bad Nauheim; Werner Ptaschek, and Dieter Wendt, both of Bruchkobel, all of Germany, assignors to W. C. Heraeus GmbH, Hanau am Main, Germany

Filed July 16, 1976, Ser. No. 705,916
Int. Cl.² G01N *33/16, 21/24, 1/14*
U.S. Cl. 23—230 R **15 Claims**



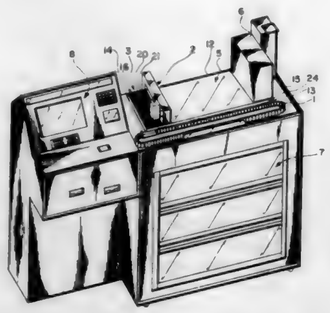
14. Method to automatically carry out analysis operations, repetitively, on different test samples, comprising the steps of;
moving a main sample receptacle (8) along a main transport path (1);
moving a plurality of test and treatment containers (12) in a test and treatment path (2);
Transferring a sample of the material to be analyzed from the main sample receptacle (8) to one of the test and treatment containers (12) at a predetermined instant of time;
and controlling the movement of the test and treatment containers, in discrete steps, past a plurality of analysis, treatment and sensing stations (15), wherein the movement steps are all equal and correspond to at least the longest one of the analysis, treatment or sensing steps at said stations (12),
and inhibiting movement of a further sample receptacle (8) to appear along said main transport path until, at least, one of said movement steps of the treatment containers (12) in the treatment transport path (2) from one analysis, treatment or sensing station (15) to the next has occured, so that the stepping time of movement of all said test and treatment containers (12) will be equal.
so that only one sample receptacle will be in the main transport path (1), and allocation of analysis, treatment and test steps with the material taken from any one of the sample receptacles will be unambiguous and determined by a time slot, or timing window, which progresses, in steps, with the stepping movement of the test and treatment container (12) along said test and treatment path (2).

4,039,287

REACTION CONVEYOR ASSEMBLY IN AN AUTOMATIC CHEMICAL TESTING APPARATUS

John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed Sept. 21, 1976, Ser. No. 725,237
Claims priority, application United Kingdom, Mar. 17, 1976, 10685/76
Int. Cl.² G01N *1/10, 33/16*
U.S. Cl. 23—253 R **19 Claims**



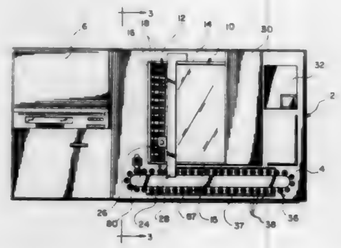
1. In a chemical testing apparatus having a dispensing means for dispensing sample aliquots to reaction containers, means for supply reagents to reaction containers and a readout station for aspirating reaction container contents and analyzing the contents, conveyor means comprising: an endless loop conveyor having a path of travel including a first longitudinal upper path, a second longitudinal lower path, first and second apexes adjacent opposite ends of the upper path and higher than the upper path, substantially straight line portions connecting the apexes to the upper path and contours connecting the apexes to the lower path, said conveyor comprising sections each extending transversely and defining a row, said sections supporting reaction containers which are disposed uprightly in the upper path and inverted during travel in the lower path; said section each having locations such that corresponding locations of reaction containers in adjacent sections define columns; link means secured between adjacent sections, and drive means engaging at least one said section for directly driving said conveyor.

4,039,288

AUTOMATIC CHEMICAL TESTING APPARATUS INCORPORATING IMPROVED CONVEYOR SYSTEM

John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

Filed Sept. 21, 1976, Ser. No. 725,269
Claims priority, application United Kingdom, Mar. 17, 1976, 10685/76
Int. Cl.² G01N *1/10, 33/16*
U.S. Cl. 23—253 R **18 Claims**



1. In a chemical testing apparatus including reaction means

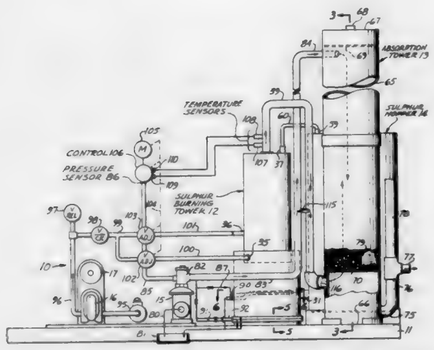
having a plurality of sections defining rows and each containing a plurality of reaction containers therein, said rows extending in a transverse direction and being mounted for movement in a longitudinal direction in a forward path from a beginning thereof at which aliquots of samples are dispensed into reaction containers in a first section through the forward path to readout means at which reacted contents of reaction containers are analyzed, an aspiration station transversely displaced from said reaction means and in longitudinal registration with said first section, sample source means including a plurality of sample holders, each sample holder for moving a sample, sample indexing means for indexing said sample holders to successive positions in said sample source means, means mounting said sample source means such that one position thereof is at said aspiration station, drive means for driving said sample indexing means, and control means coupled to said drive means for indexing said sample holders in synchronism with indexing of said sections in said reaction means.

4,039,289

SULPHUR-BURNING AND GASEOUS PRODUCTS ABSORPTION SYSTEM AND COMPONENTS THEREFOR

Dwight D. Collins, Covina, and Darrell R. Harmon, Lemoore, both of Calif., assignors to Chemsoil Corporation, Bakersfield, Calif.

Continuation of Ser. No. 113,289, Feb. 8, 1971, abandoned. This application Oct. 15, 1975, Ser. No. 622,662
Int. Cl.² C01B *17/54*
U.S. Cl. 23—262 **10 Claims**



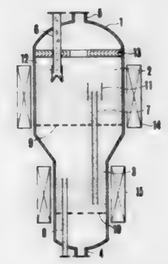
1. A sulphur-burning system including: a sulphur-burning tower having a bottom wall, a sidewall, and a dimension of height, with a level at which sulphur is to be burned, there being a primary air inlet into said tower at a first elevation above said surface and a secondary air inlet at a second elevation above said first elevation, air supply means for supplying air to said air inlets, a temperature sensor in said tower above said second elevation, valve means disposed between said air supply means and each of said air inlets, valve control means responsive to said temperature sensor and adapted to control the said valve means and thereby to control air flow into said inlets, whereby to maintain a substantially constant temperature at said temperature sensor; an absorption tower for the absorption of gases produced from the aforesaid sulphur-burning tower comprising a tank having a fluid-tight sidewall and bottom, a gas entry port at a first elevation, a water entry port at a second higher elevation, and between them a randomly packed column of lengths of tubing, the surfaces of said tubings being formed of material which is not wetted by water or by water containing the gases absorbed in the tank, and an outlet below the said gas entry port; a conduit supplying gas from the sulphur-burning tower to the gas entry port; a conduit supplying water to the water entry port; a lateral connection between said gas supplying conduit and said water supplying conduit whereby gas from the sulphur-burning tower entering the absorption tower is precooled by water flowing through the lateral connection into said gas supplying conduit; a peripheral skirt disposed inside the sulphur-burning tower between the said two elevations and space from the inside wall of the tower so as to leave a closed-at-its-top annular region therebetween, the primary air inlet discharging into the said annular region, the sulphur-burning tower including a peripheral sidewall member and a bottom member which adjoin one another with a leakage passage formed therebetween; an alignment flange formed on one of said last-named members to make a telescopic fit with the other of said members; and cooling means for cooling the said leakage passage in order to solidify previously molten sulphur and thereby form a seal therein, said cooling means comprising a coolant conduit extending peripherally around both of said last-named members adjacent to said leakage passage; and ebullition prevention means beneath the surface of the sulphur adapted to cool the region just below the surface of the sulphur to the extent required to prevent violent ebullition and expansive bubbling of the surface of the sulphur.

4,039,290

SPENT ACTIVATED CARBON REGENERATOR

Satoshi Inada, Ichigayadai; Mituo Amano, Hino, and Tadashi Onuma, Ohyaguchikami, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Continuation-in-part of Ser. No. 472,097, May 22, 1974, abandoned, which is a continuation-in-part of Ser. No. 359,535, May 11, 1973, abandoned. This application June 14, 1976, Ser. No. 695,406
Claims priority, application Japan, May 15, 1972, 47-47177; Feb. 28, 1974, 49-22833
Int. Cl.² B01D *15/06*; B01J *8/26, 37/12*; B05B *1/26*
U.S. Cl. 23—284 **6 Claims**



1. A spent activated carbon regenerator comprising:
a closed generally cylindrical column;
upper and lower perforated gas dispersing plates mounted within said column to provide an upper drying fluidized bed and a lower reactivating fluidized bed;
a gas inlet provided at the bottom of said column for continuous admission of an oxidative regenerative gas upwardly through said column;
a gas outlet provided at the top end of said column for discharging exhaust gases;
a feed pipe for introducing a spent activated carbon onto the upper fluidized bed;
an overflow pipe extending through the upper gas dispersing plate to provide a passage for transferring devolatilized carbon particles from the upper bed to the lower bed;
means for discharging reactivated carbon particles from said lower bed;
means for distributing the spent activated carbon particles onto said upper fluidized bed, said distributor means having a generally cylindrical portion with a number of openings spaced around its circumference and a conically shaped bottom wall with openings in staggered positions relative to said openings in said cylindrical portion;
a cylindrical hood mounted around and spaced from the

upper end of said overflow pipe and positioned so that the upper end of said overflow pipe terminates intermediate the upper and lower ends of said cylindrical hood; and

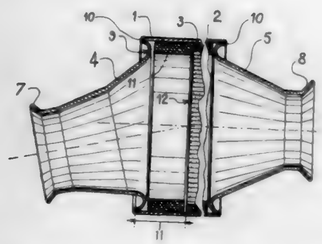
a strainer mounted within said column interposed between said gas outlet and said upper fluidized bed and having a plurality of louver plates, said louver plates being slanted relative to the longitudinal axis of said column to remove carbon fines from the exhaust gas stream.

4,039,291

INTERNAL COMBUSTION ENGINE CATALYTIC ANTI-POLLUTION REACTOR

Jean René Hergoualc'h, and Michel Fornet, Boulogne-Billancourt, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Mar. 25, 1975, Ser. No. 561,904
Claims priority, application France, Mar. 27, 1974, 74.10454
Int. Cl.² B01J *8/02, 35/04;* F01N *3/15*
U.S. Cl. 23—288 FC **5 Claims**



1. An anti-pollution catalytic reactor for the exhaust gases of internal combustion engines comprising, in combination, a metal sleeve of circular cross-sectional shape having an axis, oppositely disposed annular end edges and an interior, a catalytic element having ends disposed within said sleeve interior with said ends in axially spaced relationship with the respective annular end edge of said sleeve, a pair of frustoconically shaped neck members each having a circumferentially extending rounded marginal portion on one end terminating in an annular end edge, said rounded marginal portion extending within the sleeve interior and spaced from said sleeve and having the other end arranged to be connected to an associated exhaust piping system, the annular end edge of each of said neck members being secured in tangential edge-to-edge relationship to one of the annular end edges of said metal sleeve in axially spaced relationship with the adjacent end of said catalytic element, an annular resilient means for dampening vibrations comprising an annulus formed by a connecting portion of said sleeve extending between the annular end edge of said neck member and the end of said catalytic element whereby the annular end edge of said metal sleeve secured to the annular end edge of said neck members in tangential edge-to-edge relationship provides a stiffer portion than said sleeve connecting portion, and the sleeve portion surrounding the catalytic element provides a stiffer portion than said sleeve connecting portion, whereby said rounded marginal portions and said annular resilient means dampen vibrations imposed on said reactor.

4,039,292

CATALYTIC CONVERTER FOR OVEN FUMES

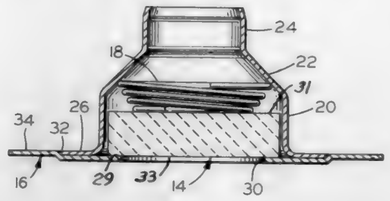
Ralph E. Morini, and Martin D. Turgeon, both of Southington, Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Mar. 26, 1976, Ser. No. 670,675
Int. Cl.² B01J *1/00, 35/04;* F24C *1/00;* F01N *3/15*
U.S. Cl. 23—288 FC **6 Claims**

1. A catalytic oxidatin unit for use with ovens and the like comprising:

a. a metallic housing including a tubular body portion, a front wall extending across one end of said body portion and having an aperture therein smaller than the cross section of said body portion to provide a first peripheral shoulder, a conduit portion of lesser cross sectional area than the cross section of said body portion and spaced from the opposite end thereof, and a shoulder portion extending between said opposite end of said body portion and said conduit portion to provide a second peripheral shoulder spaced from said first peripheral shoulder;

b. a block of cellular ceramic material having an oxidation catalyst on the walls of the cells thereof seated within said body portion of said housing, said block having oppositely disposed inner and outer surfaces extending transversely of said body portion of said housing, said outer surface being larger than said aperture in said front wall and



seated against said first peripheral shoulder and said inner surface being spaced from said second peripheral shoulder; and

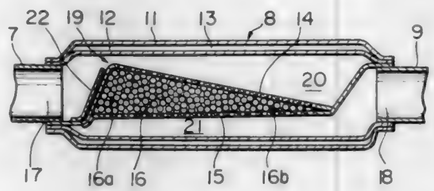
c. resiliently compressible means having one end disposed against said inner surface of said block and the other end disposed against said second shoulder to bias said outer surface of said block against said first shoulder to cover said aperture with said block and maintain said block in firm contact with said first shoulder during impacts and thermal expansion and contraction, said compressible means being pervious to passage of gases therethrough, whereby gases entering the unit through the exposed portion of said outer surface of said block may exit through substantially the entire transverse dimension of said inner surface of said block.

4,039,293

CATALYTIC CONVERTER FOR AN INTERNAL COMBUSTION ENGINE

Toshio Tanahashi, Toyota, and Hitoshi Hasegawa, Nagoya, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 9, 1976, Ser. No. 703,816
Claims priority, application Japan, June 15, 1976, 51-77054
Int. Cl.² B01J *8/02;* F01N *3/15, 3/14*
U.S. Cl. 23—288 F **6 Claims**



1. A catalytic converter for treating a mixture of exhaust gas and air for purifying the unburned HC and CO components in the exhaust gas from an internal combustion engine, comprising:

an elongated casing defining a chamber and having on its one end an exhaust gas inlet and on its other end an exhaust gas outlet;

a pair of spaced upper and lower perforated plates extending from said exhaust gas inlet to said exhaust gas outlet and dividing said chamber into an upper portion connected only to said exhaust gas inlet, a lower portion connected only to said exhaust gas outlet and a middle portion for holding catalyzer between said upper and said lower perforated plates, the cross-sectional area of said middle portion decreasing towards said exhaust gas outlet; and

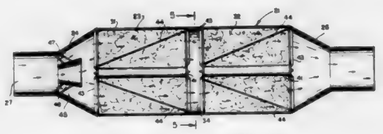
means in said upper portion for mixing the said mixture of exhaust gas and air, said means comprising a gas flow-restricting means on the upstream side of the exhaust gas for forming an unburned components burning chamber is said upper portion downstream of said restricting means.

4,039,294

FILTER FOR INTERNAL COMBUSTION EXHAUST GASES

Edward A. Mayer; John T. Brandenburg; John M. Crone, Jr., and Charles A. Ropes, Jr., all of Texaco Inc. P.O. Box 509, Beacon, N.Y. 12508

Filed May 21, 1975, Ser. No. 579,513
Int. Cl.² B01J *8/02;* F01N *3/15*
U.S. Cl. 23—288 FB **4 Claims**



1. A catalytic filter for cleaning a high temperature exhaust gas stream discharged from an internal combustion engine as a result of the combustion of a hydrocarbon fuel and air mixture, which catalytic filter includes an elongated closed casing having opposed end walls,

inlet and outlet means disposed at the respective opposed end walls, and casing side walls which define a longitudinal gas passage therethrough communicating the respective inlet and outlet means,

a plurality of discrete gas permeable catalytic beds disposed in longitudinally spaced relationship within said longitudinal passage to contact said stream of hot exhaust gas which passes therethrough, each of said discrete gas permeable catalyst beds including;

a central core member having opposed core ends, and end panels carried on the respective core ends,

said end panels including an outer ring adapted to be slidably inserted within said casing, and radially positioned fins extending between a core end and the outer ring adjacent thereto,

support tension members extending between, and fixed to, an outer ring and the opposite core end, and

a catalytic material disposed intermediate said respective end panels and surrounding said support tension members and supported by the latter,

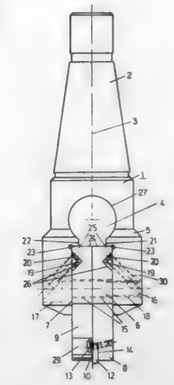
said support tension members including a plurality of discrete elements, spaced equidistant apart about said outer ring and said core end respectively, to define a conical pattern.

4,039,295

GROOVE CUTTER

Erwin Hochmuth, Haydnstrasse 31, 7032 Sindelfingen, Germany

Filed Apr. 12, 1976, Ser. No. 675,878
Claims priority, application United Kingdom, Apr. 12, 1975, 2516110
Int. Cl.² B26D *1/12;* B23B *51/00*
U.S. Cl. 29—105 A **8 Claims**



1. In combination with a cutting tool, especially for forming grooves; a holder habing a shank at one end and a tool head at the other end, a diametral axial slot extending into the holder from the head end and terminating in shoulders facing the open end of the slot, a pair of blade holders in the form of plates having opposed interengaging faces and extending axially into said slot and having inner ends engaging respective ones of said shoulders and having outer ends protruding axially from the tool head, a clamp screw extending diametrally through the tool head and said plates and operable for drawing the two sides of the tool head forming the slot toward one another to clamp the said plates therebetween, a transverse groove in the outwardly facing side of each plate within the axial range of the tool head and each having a surface which inclines downwardly in the inward direction of the respective plate, and other screws threaded angularly into said head and at the inner ends engaging said surfaces to clamp the plates against said shoulders, laterally elongated apertures provided in each of said plates, said clamping screws extending through said apertures, each said plate being adapted for supporting a cutting element on the radially outer side of the axially outer end, said plates overlapping when viewed in a direction perpendicular to the planes thereof.

4,039,296

CLEARANCE CONTROL THROUGH A NI-GRAPHITE/NICR-BASE ALLOY POWDER MIXTURE

Moses A. Levinstein, Cincinnati, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 12, 1975, Ser. No. 640,326
Int. Cl.² B22F *3/00*
U.S. Cl. 428—553 **8 Claims**

1. A seal member including:

a base portion; and

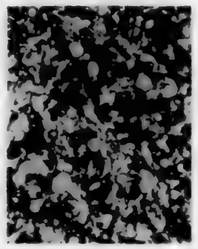
an abradable coating portion which is the fusion and interaction product of a mixture comprising, by weight:

i. greater than about 20% to less than about 40% of a nickel-graphite powder consisting essentially of a core of graphite and a shell of nickel, the nickel comprising, by weight, greater than about 50% and less than about 70% the nickel-graphite powder; and

ii. the balance a nickel-chromium base alloy powder;

the coating portion secured with the base portion and com-

prising a dispersion of nickel-coated graphite particles, and a plurality of blocky particles of a nickel-chromium alloy bound primarily with platelets of nickel,



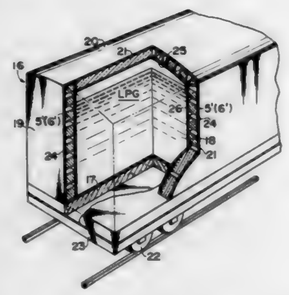
the coating portion having a density of about 3.7 – 4.2 grams per cubic centimeter.

4,039,297

HEAT INSULATING PARTICLES

Yasuo Takenaka, Hino, Japan, assignor to Japanese National Railways, Tokyo, Japan

Continuation-in-part of Ser. No. 318,654, Dec. 26, 1972, abandoned. This application Apr. 11, 1975, Ser. No. 567,103
Claims priority, application Japan, Dec. 25, 1971, 46-105197
Int. Cl.² B22F *3/10*; B32B *5/16*; B22F *7/00*
U.S. Cl. 428—566 **5 Claims**



1. A heat insulating, structurally stable body comprising a plurality of smooth heat insulating particles, each having a hollow center grain having an outside diameter of about 0.1 to about 1.2 mm, a wall thickness of about 3 to 200 μ, and a heat conductivity of less than about 1×10^4 microwatts/cm°K, said hollow center grains further being of material selected from the group consisting of silica, alumina, glass, and a synthetic resin and coated thereon at a thickness of about 0.1 μ to about 1.2 μ with a metallic material selected from the group consisting of aluminum, copper, gold, silver, stainless steel and titanium and having a reflected heat radiation emittance value of greater than about 0.02 to 300° K, the metallic surfaces of said particles being bonded together by sintering in regularly arranged point contact relationships at their contacting surface at a temperature of about ½ the melting point of said coating.

4,039,298

ALUMINUM BRAZED COMPOSITE

William H. Anthony; James M. Popplewell, both of Guilford, and Andrew J. Brock, Cheshire, all of Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed July 29, 1976, Ser. No. 709,870
Int. Cl.² B32B *15/00*
U.S. Cl. 428—558 **6 Claims**

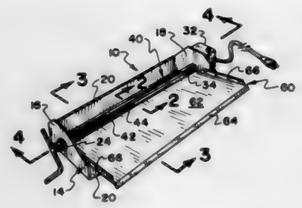
1. A brazed aluminum composite having improved resistance to intergranular corrosion comprising a substantially magnesium free aluminum alloy core material consisting essentially of from 1 to 1.5% manganese, from 0.1 to 0.4% chromium, from 0.1 to 0.4% copper, from 0.01 to 0.6% silicon, from 0.01 to 0.7% iron, balance essentially aluminum, wherein the microstructure is characterized by a solid solution containing manganese, copper and chromium, an alpha phase particulate dispersion uniformly dispersed throughout the matrix containing manganese and iron, and particles of $MnAl_6$ uniformly dispersed throughout the matrix, clad with a brazing alloy consisting essentially of from 0.05 to 0.2% bismuth, from 4 to 14% silicon and the balance essentially aluminum, wherein said composite provides galvanic protection against intergranular corrosion and wherein said cladding cathodically protects the core over a temperature range from ambient to 70° C.

4,039,299

MANUFACTURE OF PAPER FIRE LOGS

Clyde L. Porter, No. 5 Main St., Box 147, Franklin, Idaho 83237, and Richard C. Porter, 1623 Halsey, Idaho Falls, Idaho 83401

Filed Oct. 20, 1975, Ser. No. 624,012
Int. Cl.² C10L *5/22*; F01B *29/00*
U.S. Cl. 44—2 **6 Claims**



1. An apparatus for making paper fire logs comprising:
an open top tank in which a liquid is placed;
an axially slotted shaft removably bridging between opposed walls of the tank;
means removably and rotatably supporting the slotted shaft in said bridging position;
platform means disposed to one side of the slotted shaft and spanning toward the slotted shaft along which paper is linearly displaced to and thereafter wound upon the slotted shaft;
means for rotating the slotted shaft while in said bridging position;
whereby paper the leading edge of which is received at the slot of the shaft is linearly displaced along the platform means, into the liquid and wound upon the shaft.

4,039,300

GASOLINE FUEL COMPOSITION AND METHOD OF USING

Frank J. Chloupek, South Holland, and Tai S. Chao, Homewood, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed June 3, 1974, Ser. No. 475,373
Int. Cl.² C10L *1/22*
U.S. Cl. 44—58 **22 Claims**

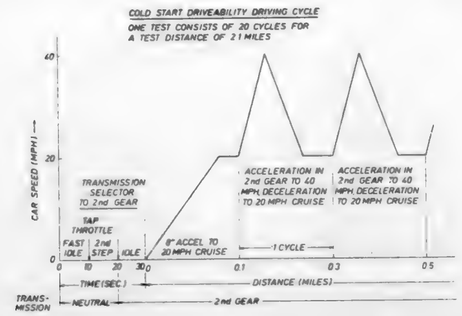
1. A composition of matter for fueling an internal combustion engine equipped with at least one carburetor which comprises a major amount of hydrocarbons boiling in the gasoline boiling range, a minor amount of at least one detergent comprising at last one surface active compound effective to inhibit solid contaminants in said fuel composition from adhering to said carburetor and a minor amount of mineral oil of lubricating viscosity comprising at least about 50% by weight of aromatic hydrocarbons having an average molecular weight in the range from about 300 to about 700, said detergent and oil both being present in said composition in amounts sufficient to inhibit formation of deposits on said carburetor.

4,039,301

GASOLINE COMPOSITION

John L. Laity, Edwardsville, Ill., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 495,735, Aug. 8, 1974, abandoned. This application Apr. 4, 1975, Ser. No. 565,299
Int. Cl.² C10L *1/20*
U.S. Cl. 44—62 **7 Claims**



1. A gasoline composition comprising gasoline and from about 0.5 to about 100 parts by weight of a driveability-enhancing fluorine-containing polymer ester of monocarboxylic acid per million parts of gasoline, wherein said polymer possesses (1) a critical surface tension of less than 17 dynes/centimeter at 25° C, (2) a high contact angle of at least 40° to toluene at 22° C, (3) a minimum solubility in gasoline of at least about 5 parts by weight per million, and (4) a fluorine content in the range of from 20 to about 65% by weight of flourine. centimeter at 25° C, (2) a high contact angle of at least 40° to toluene at 22° C, (3) a minimum solubility in gasoline of at least about 5 parts by weight per million, and (4) a fluorine content in the range of from 20 to about 65% by weight of fluorine.

4,039,302

PROCESS AND CATALYST FOR SYNTHESIZING LOW BOILING (C1 TO C3) ALIPHATIC HYDROCARBONS FROM CARBON MONOXIDE AND HYDROGEN

Surjit Singh Khera, Upper Arlington, Ohio, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Jan. 5, 1976, Ser. No. 646,566
Int. Cl.² C10J *3/00*; B01J *21/00*; C07C *1/04*
U.S. Cl. 48—197 R **10 Claims**

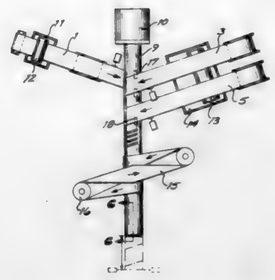
5. A process for the synthesis of C_1 to C_3 aliphatic hydrocarbons comprising:
a. contacting hydrogen and carbon monoxide in a volume ratio of about 45:55 to about 60:40 at a temperature of about 350° C. and a pressure of about 200 to about 10,000 p.s.i.g. at a space velocity of about 200 to about 6000 with a catalyst consisting essentially of an interspersed mixture of cobalt oxide, aluminum oxide, zinc oxide and molybdenum oxide, which mixture by elemental analysis contains less than about 0.5 weight percent of alkali metal, said catalyst consisting essentially of about 0.2 to about 2.0 weight percent of cobalt oxide, about 55 to about 95 weight percent of aluminum oxide, about 5 to about 15 weight percent of zinc oxide and about 2 to about 20 weight percent of molybdenum oxide; and
b. recovering the C_1 to C_3 aliphatic hydrocarbon product of said synthesis.

4,039,303

METHOD OF MAKING TUBULAR ABRASIVE CLOTH

Kaneko Yasushi, 1-36, 3 chome, Kamikizaki, Urawashi, Saitamaken, and Tanaka Seisaburo, 5-7, 6 chome, Uematsucho, Yaoshi, Osaka, both of Japan

Division of Ser. No. 450,095, March 11, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,505
Int. Cl.² B24D *11/02*
U.S. Cl. 51—297 **1 Claim**

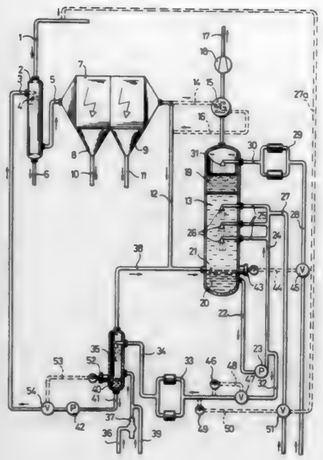


1. A method of making a tubular abrasive member that comprises the steps of:
a. providing first, second and third endless belts of a pliable sheet material, said third belt having an inner surface and an abrasive covered outer surface;
b. rotating an elongate rigid member having a circular transverse cross section;
c. sequentially applying oil to said first belt;
d. sequentially winding said first belt after said oil is applied thereto onto said rotating mandrel at a first oblique angle to form a first spiral thereon in which the edges of said first belt do not overlap;
e. applying a bonding agent to said second belt;
f. sequentially winding said second belt onto said first spiral at a second oblique angle opposite to said first oblique angle for said bonding agent to contact said first spiral and define a second spiral thereon in which the edges of said second belt do not overlap;
g. applying a bonding agent to said inner surface of said third belt;
h. sequentially winding said third belt onto said second spiral at substantially said second oblique angle for said bonding agent on said inner surface contacting said second spiral to define a third spiral thereon in which the longitudinal edges of said third spiral are in abutting contact;
i. sensing the position of one of the longitudinal edges of said third belt as the latter is wound onto said second spiral;
j. cutting a longitudinal segment from said third belt in response to said sensing that said third belt when defining said third sprial will be of uniform thickness and the adjacent edges of said third defining said third spiral will be in abutting contact;
k. applying radially directed pressure to said third spiral as said mandrel rotates to force said bonding agents into pressure contact with the adjacent surfaces of said first and second spirals and said second and third spirals;
l. moving said first, second, and third spirals as a unit longitudinally on said mandrel; and
m. cutting said tubular member in desired leagths from said mandrel but cutting edges that move outwardly from the interior of said mandrel.

4,039,304
METHOD OF REMOVING SO_2 AND/OR OTHER ACID COMPONENTS FROM WASTE GASES

Horst Bechthold, Erftstadt-Friesheim, and Paul Bottger, Bensberg-Refrath, both of Germany, assignors to Walther & Cie Aktiengesellschaft, Cologne-Delbruck, Germany

Filed June 30, 1975, Ser. No. 591,624
Claims priority, application Germany, June 28, 1974, 2431130; Apr. 25, 1975, 2518386
Int. Cl.² B01D *53/14*; B03C *1/00*; C01B *17/00*
U.S. Cl. 55—10 14 Claims



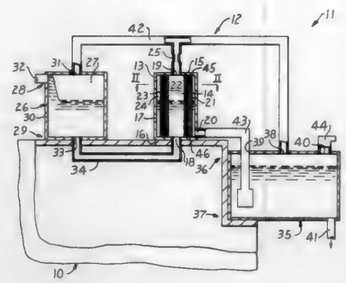
1. A continuous process for removing pollutants from waste gases which pollutants are present in the gas in the form of acid components, the said process comprising

1. introducing the waste gas into an evaporator tower where the gas is mixed with an aqueous solution of a salt of said acid component;
2. heat-vaporizing the resulting mixture in said evaporator so as to form salt crystals from said salt solution and withdrawing said salt crystals from the gas substantially without said pollutants and solids from the gas;
3. passing the gas through a separation device to remove the formed crystals together with solids initially present in the gas prior to passing the gas to an absorption tower;
4. then passing the now substantially dry gas including residual salt crystals to said absorption tower, introducing an alkaline absorbent into the tower, the absorbent being a liquid or forming a liquid in the tower and being adapted to form salts with said acid component of the gas in the form of an aqueous concentrated solution of the salt and to dissolve residual salt crystals present in said gas and introducing fresh water to the extent necessary to form and maintain the liquid absorbent and aqueous salt solution;
5. continuously circulating the formed salt solution out of and into the absorption tower;
6. while continuously withdrawing a controlled amount of said salt solution and recycling said amount into the evaporator tower for said gas-solids separation step and
7. discharging the pollutant-free gas from the absorption tower.

4,039,305
APPARATUS FOR REMOVING GAS FROM A LIQUID SYSTEM

Richard E. Livesay, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 17, 1976, Ser. No. 742,964
Int. Cl.² B01D *19/00*
U.S. Cl. 55—159 8 Claims



1. Apparatus for removing entrained relatively lighter gas from a liquid in a liquid system, comprising:

a liquid flow path having spaced predetermined inlet and outlet means for conducting liquid through the apparatus;

filter means disposed in said flow path between said inlet and outlet means for passing liquid through said filter means and resisting the passage of gas therethrough for separating the gas from the liquid;

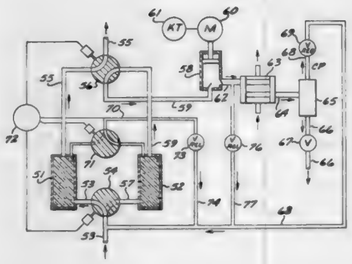
vent means disposed upstream of said filter means and at an elevationally higher point in said flow path than said inlet means for separating the relatively lighter gas from said liquid flow path; and

means associated with the lower end of said filter means and the lower end of a reservoir of said liquid system for passing liquid from said filter means into the lower end of said reservoir.

4,039,306
ADSORBER APPARATUS

John C. Taylor, 16 Cinnamon Lane, Portuguese Bend, Calif. 90274

Continuation-in-part of Ser. No. 320,208, Jan. 2, 1973, Pat. No. 3,876,397. This application Oct. 7, 1974, Ser. No. 512,510
Int. Cl.² B01D *53/04*
U.S. Cl. 55—163 7 Claims



1. Apparatus for removing vapors from a mixture of vapor and air, comprising:

gas-receiving means for conducting said mixture;

first and second adsorption means adapted to receive said mixture from said gas-receiving means for adsorbing and removing said vapors therefrom;

condensation means for condensing said vapors including a compressor and a condenser connected to said condenser at the input thereof and having means for condensing said gas by conducting away heat;

separation means connected to said condensation means for receiving the output thereof and separating the respective liquid and gas constituents thereof;

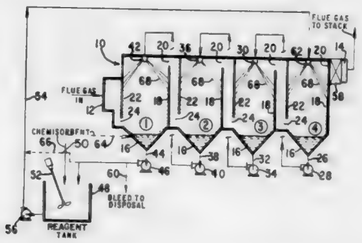
switching means connected to the input and output of said first and second adsorption means for alternatively connecting a selected one of said outputs to the input of said condensation means while concurrently connecting the input of the other one to said gas-receiving means and closing the input of said selected one of said first and second adsorption means and including an electrical pressure responsive switch operatively connected to the selected one of said first and second adsorption means, first valve means connected to said switch for venting the output of the selected one of said first and second adsorption means and for conducting the output of the other one to the input of said compressor when said switch registers a pressure below a predetermined pressure in said selected one of said adsorption means, and second valve means connected to said switch for concurrently connecting the input of the selected one of said adsorption means to said gas-receiving means; and

connection means connected to said separation means for conducting the gas constituent thereof to said gas-receiving means.

4,039,307
COUNTERCURRENT FLOW HORIZONTAL SPRAY ABSORBER

Frank Samuel Bondor, New Canaan, Conn., assignor to Envirotech Corporation, Menlo Park, Calif.

Filed Feb. 13, 1976, Ser. No. 657,736
Int. Cl.² B01D *47/00*
U.S. Cl. 55—228 16 Claims



1. A horizontal gas scrubbing apparatus in which enhanced gas-liquid contacting efficiency is achieved comprising:

a. a horizontally extending gas-liquid contacting vessel;

b. means for passing gas to be treated into the vessel at one end thereof;

c. means for withdrawing terated gas from said vessel at the opposite end thereof;

d. first vertically extending baffle means positioned at spaced-apart intervals within said vessel, so as to form a series of compartments positioned side-by-side across the length of said vessel, said first baffle means adapted, together with said vessel, to permit the flow of gas upward in each compartment, and from the uppermost portion of each compartment into the next downstream compartment within said vessel;

e. second vertically extending baffle means positioned at spaced-apart intervals within said vessel for co-action with said first baffle means to form a downwardly extending passage for the gas entering the upper portion of each said downstream compartment, said second baffle means being adapted to permit the flow of gas downward from the upper portion of said passage to exit from said passage into the body of each said downstream compartments at the bottommost portion thereof, so that gas passing across the length of said horizontally-extending vessel will pass into each compartment at the bottom thereof and pass out of each said compartment at the top, thus providing for an upward flow of gas through each compartment as said gas passes through said vessel;

f. liquid spray means positioned at the upper portion of each compartment for spraying scrubbing liquid in a generally downward direction in each said compartment;

g. liquid collection means disposed at the bottom of each compartment to collect liquid which has been sprayed into each said compartment, each said liquid collection means not being in direct liquid flow communication with any other said liquid collection means;

h. pumping means for passing scrubbing liquid to the liquid spray means at the furthermost downstream compartment within said vessel;

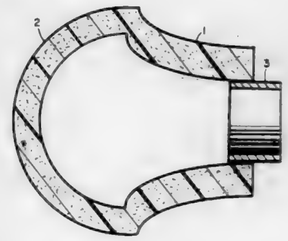
i. pumping means for passing scrubbing liquid that collects in said liquid collection means of each said compartment to the spray means for the next preceding upstream compartment; and

j. means for withdrawing scrubbing liquid from the furthermost upstream compartment within said vessel, whereby all of the gas to be treated flows in countercurrent passage with all of the scrubbing liquid, with vertical countercurrent gas-liquid flow being achieved in each compartment and with generally horizontal countercurrent gas-liquid flow across the length of the contacting vessel, thus enhancing the overall efficiency of the desired gas-liquid contact within the vessel.

4,039,308
AIR FILTER

Edward Paul Schiff, 18823 Martha St., Tarzana, Calif. 91356

Continuation-in-part of Ser. No. 508,037, Sept. 23, 1974, abandoned. This application Sept. 10, 1975, Ser. No. 612,191
Int. Cl.² B01D *39/00*
U.S. Cl. 55—505 5 Claims



1. An apparatus for an air input of an internal combustion engine, comprising:

porous air straightener of rigid foam, said air straightener having an input and an output end, said output end being smaller in diameter than said input end, said air straightener further having an interior surface which is a cylinder of revolution of a continuous curve defining a convex cylinder, said cylinder of revolution having a cross-sectional area which continuously decreases from said input end to said output end; and

porous air cleaner of rigid foam closing the input end of said porous air straightener, said air cleaner further being of substantially hemispherical shape and an integral part with said air straightener;

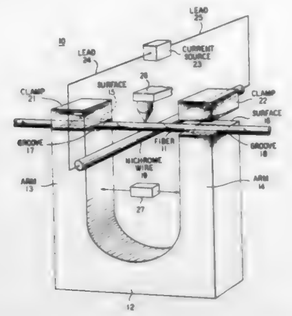
whereby the air flowing through said air cleaner and said air straightener is straightened before entering said air input.

4,039,309

METHOD AND APPARATUS FOR BREAKING OPTICAL FIBERS

Andres Albanese, Matawan, and Louis Maggi, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 709,307
Int. Cl.[2] C03B 33/06
U.S. Cl. 65—2 9 Claims



1. A method of breaking an optical fiber comprising the steps of:

a. clamping the optical fiber at two spaced-apart peripheral areas on opposite sides of the intended break;

b. heating the optical fiber in the area of the intended break to at least the annealing temperature of the fiber and in a manner to cause a thermal gradient to be produced within said fiber along the line of the intended break;

c. scoring the optical fiber on the line of the intended break; and

d. applying a force along the longitudinal axis of the optical fiber at each said two spaced-apart peripheral areas in a manner to cause the fiber to break.

5. Apparatus for breaking an optical fiber comprising:

means for clamping the optical fiber at two spaced-apart peripheral areas on opposite sides of a line of intended break;

means in contact with a portion of the peripheral surface of the optical fiber for heating the optical fiber along the line of intended break to at least the annealing temperature of the optical fiber and in a manner to cause a thermal gradient to be produced within said fiber along said line of intended break;

means for scoring the optical fiber along a portion of line of intended break; and

means for applying a force along the longitudinal axis of the optical fiber in a manner to break the fiber.

4,039,310

PROCESS OF STRENGTHENING GLASS BOTTLES AND THE LIKE

Nelson Eugene Sipe, Denver, and Noble Ida, Boulder, both of Colo., assignors to Duraglass Research & Development Corporation, Boulder, Colo.

Filed Jan. 12, 1976, Ser. No. 648,329
Int. Cl.[2] C03C 17/28; C03B 39/00
U.S. Cl. 65—25 R 18 Claims

1. A method of strengthening glass against failure under tension, comprising

a. heating the glass to a temperature between approximately 700° F. and the decomposition temperature of a given fatty acid,

b. applying said given fatty acid to the surface of the glass, and

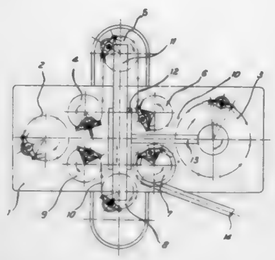
c. slowly cooling the glass said fatty acid being substantially non reacted with any other chemical in regard to the carboxyl group and being cemisorbed on the surface of the glass for strengthening the microcrack structure on said surface.

4,039,311

AUTOMATIC CONTINUOUS PROCESS MACHINE FOR THE MANUFACTURE OF GLASS OBJECTS

Gérard Bardet, Paris, France, assignor to Automatisme et Technique, Arcueil, France

Filed June 24, 1976, Ser. No. 699,307
Claims priority, application France, June 26, 1975, 75.20172
Int. Cl.[2] C03B 9/40
U.S. Cl. 65—163 4 Claims



1. A machine for the manufacture of glass objects comprising at least two operational rotary drums of which one is a blanking drum used to make a blank and the other is a finishing drum used to finish the product, and including transport means for transporting carriers for glass objects between the drums, characterized in that the machine comprises, between the blanking drum and the finishing drum, a sliding beam supporting at each end a transfer drum which is interposed in and constitutes part of the path of the transport means, whereby sliding the beam along its own axis in one direction or the other varies the length of the path between the blanking drum and the finishing drum.

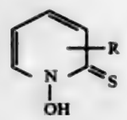
4,039,312

BACTERIOSTATIC, FUNGISTATIC AND ALGICIDAL COMPOSITIONS, PARTICULARLY FOR SUBMARINE PAINTS

Marcel Joseph Gastoa Patru, 60 Sainte-Eusoy, Froissy, France

Continuation-in-part of Ser. No. 372,608, June 22, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,129
Claims priority, application France, July 4, 1972, 72.24127
Int. Cl.[2] A01N 11/00
U.S. Cl. 71—67 3 Claims

1. A composition having bacteriostatic, fungistatic and algicidal properties comprising a zinc salt of a N-hydroxypyridinethione having the formula



in which R is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy and halogenated lower alkyl, and a fluorinated compound selected from the group consisting of potassium fluoborate and sodium fluosilicate, wherein the zinc salt and the fluorinated compound are present in a weight ratio of 1:2 to 1:10.

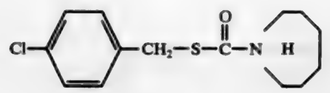
4,039,313

HERBICIDAL METHODS USING 4-CHLOROBENZYL-N,N-HEXAMETHYLENETHIOLCARBAMATE

Masahiro Aya; Masao Miyamoto, and Nobuo Fukazawa, all of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 296,745, Oct. 11, 1972, abandoned. This application June 24, 1974, Ser. No. 482,174
Claims priority, application Japan, Oct. 18, 1971, 46-81698
Int. Cl.[2] A01N 9/22
U.S. Cl. 71—88 5 Claims

1. Method of combating undesired vegetation in paddy field rice, which method comprises applying to the weeds or a weed habitat the compound of the formula



(I)

alone or in admixture with a diluent or carrier.

4,039,314

HERBICIDAL COMPOSITIONS AND METHODS EMPLOYING N-α-CHLOROACETYL-N-(1,3-DIOXAN-2-YLMETHYL)-2,6-DIMETHYLANILINE

Sidney B. Richter, Chicago, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Division of Ser. No. 492,128, July 26, 1974, Pat. No. 3,946,043. This application Jan. 5, 1976, Ser. No. 646,457
The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.
Int. Cl.[2] A01N 9/00
U.S. Cl. 71—88 2 Claims

1. A herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, the compound N-α-chloroacetyl-N-(1,3-dioxan- 2-ylmethyl)-2,6-dimethylaniline.

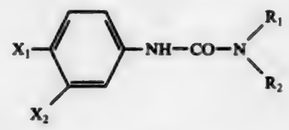
4,039,315

N-(DIFLUOROCHLOROMETHYLMERCAPTOPHENYL-)UREAS AS HERBICIDES

Erich Klauke, Odenthal; Engelbert Kühle, Bergisch-Gladbach, and Ludwig Ese, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 356,261, May 1, 1973, Pat. No. 3,931,312. This application Aug. 22, 1975, Ser. No. 606,982
Claims priority, application Germany, Jan. 24, 1970, 2003143
Int. Cl.[2] A01N 9/12
U.S. Cl. 71—98 19 Claims

1. Herbicidal composition comprising a herbicidally effective amount of an N-arylurea compound of the formula



in which

X_1 and X_2 are difluorochloromethylmercapto, chlorine or hydrogen with the proviso that one and onely one of X_1 and X_2 is difluorochloromethylmercapto;

R_1 is hydrogen or alkyl of from 1 to 4 carbon atoms; and

R_2 is alkyl of from 1 to 4 carbon atoms and an inert herbicidally acceptable carrier.

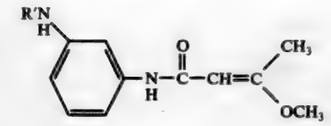
4,039,316

3-METHOXY CROTONANILIDES AS HERBICIDES

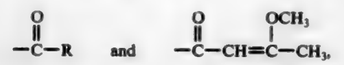
Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel-UCLAF, Paris, France

Filed Sept. 24, 1975, Ser. No. 616,416
Claims priority, application France, Oct. 3, 1974, 74.33321
Int. Cl.[2] A01N 9/20; C07C 103/56
U.S. Cl. 71—118 11 Claims

1. A compound of the formula



wherein R′ is selected from the group consisting of



and R is alkyl of 1 to 6 carbon atoms.

4,039,317

PROCESS FOR THE PREPARATION OF SILVER POWDER

Franco Montino, Casale Monferrato (Alessandria), and Luigi Colombo, Arona (Novara), both of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed Oct. 20, 1975, Ser. No. 623,912
Claims priority, application Italy, Oct. 22, 1974, 28641/74
Int. Cl.[2] C22B 11/04
U.S. Cl. 75—.5 A 8 Claims

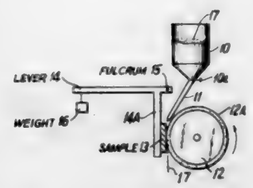
1. A process for preparing silver powders with a controlled apparent density, wherein an aqueous silver oxide suspension is treated with hydrogen in an autoclave, characterized in that the aqueous silver oxide suspension is additioned with one or more alkali metal, alkaline earth metal or silver sulphides and-/or with one or more silver salts soluble or made soluble by complexing with ammonia.

4,039,318

METALIFEROUS FLAME SPRAY MATERIAL FOR PRODUCING MACHINABLE COATINGS

Mahesh S. Patel, Albertson, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed July 19, 1976, Ser. No. 706,136
Int. Cl.[2] B05D 1/08
U.S. Cl. 75—0.5 R 23 Claims



1. A metaliferous flame spray material comprising a plurality of ingredients physically combined together with each other.

said plurality of ingredients comprising by weight about 3% to 15% aluminum, about 2% to 15% refractory metal silicide, and the balance essentially a metal selected from the group consisting of nickel-base, cobalt-base, iron-base and copper-base metals,

said metaliferous material when sprayed onto a metal substrate to provide a bonded layer thereof being character-

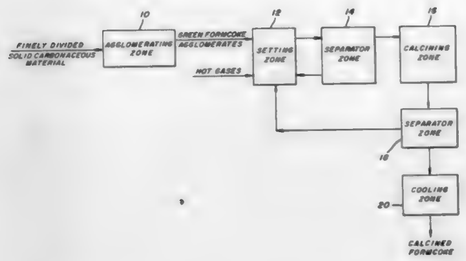
ized by improved machinability improved bonding strength and improved resistance to wear.

4,039,319

METHOD OF CALCINING GREEN COKE AGGLOMERATES

Norman Schapiro, Sudbury Township, Middlesex County, Mass., and Ronald W. Shoenberger, Monroeville Borough, Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Sept. 4, 1975, Ser. No. 610,210
Int. Cl.[2] C21B *5/00*
U.S. Cl. 75—42 **27 Claims**



1. In a process of producing a solid agglomerated fuel product suitable for use in an ore reduction furnace comprising (1) agglomerating discrete solid carbonaceous particles to form green coke agglomerates; (2) setting said green agglomerates to enable the shape to be maintained in subsequent handling during carbonization; (3) carbonizing the set agglomerates by heating, the improvement wherein the setting step is accomplished by (1) forming a substantially uniformly mixed stationary bed of the green coke agglomerates and separator particles such separator particles having a minimum particle size of about ¼ inch and having a size and being present in sufficient quantities to allow heating gases to pass through the mixture and to prevent the green agglomerates from sticking together while maintaining the mixture as a stationary bed; and (2) maintaining the mixture as a stationary bed during the setting step while passing heating gases through the bed.

4,039,320

REDUCING MATERIAL FOR STEEL MAKING

Masazi Uemura, Ando, Japan, assignor to Aikoh Co., Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Filed Mar. 17, 1976, Ser. No. 667,617
Claims priority, application Japan, Mar. 25, 1975, 50-36381
Int. Cl.[2] C21C *7/02*
U.S. Cl. 75—58 **4 Claims**

1. A reducing material for steel making, consisting essentially of 20–50% aluminum and 40–80% lime , said substances being uniformly mixed together and molded into a desired size such that the aluminum is substantially protected from exposure to the atmosphere.

4,039,321

METHOD FOR PRODUCING A GRAIN-ORIENTED ELECTRICAL STEEL BY AN OXYGEN-BLOWN CONVERTOR

Hisashi Matsunaga; Yosinobu Horii, and Masaya Higasiguchi, all of Himeji, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 474,161, May 29, 1974, abandoned. This application Dec. 30, 1975, Ser. No. 645,354
Claims priority, application Japan, May 31, 1973, 48-61194
Int. Cl.[2] C21C *7/06*
U.S. Cl. 75—60 **5 Claims**

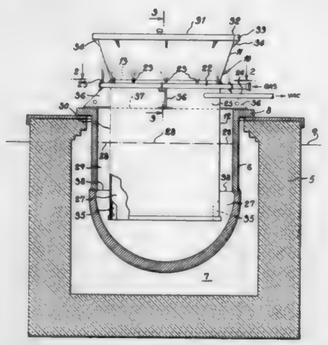
1. In a method for preparing grain-oriented electrical refined in strip of the type wherein molten pig iron is refined in a pure oxygen top-blown convertor to produce blown-off molten steel which is then subjected to conventional casting, rolling, and annealing and heating treatments, the improvement which comprises prior to said refining step, contacting, with stirring, the molten pig iron with an oxidizing slag of iron oxide powder having a bulk density between 0.3 and 1.0 in an amount from 15 to 25 kg per ton of pig iron to adjust the carbon content of the pig iron to not less than 4.0 percent and the manganese content to from about 0.10 to 0.35 percent, separating molten oxidizing slag from the pig iron, and then transferring the thus treated pig iron to said refining and casting steps, whereby the blown-off molten steel has not more than 0.065 percent manganese, not less than 0.030 percent carbon, and not more than 1000 ppm oxygen.

4,039,322

METHOD FOR THE CONCENTRATION OF ALKALINE BISMUTHIDE IN A MATERIAL ALSO CONTAINING MOLTEN LEAD

Carl Richard DiMartini, Piscataway, and William Lafayette Scott, Lebanon, both of N.J., assignors to Asarco Incorporated, New York, N.Y.

Filed Apr. 2, 1976, Ser. No. 673,179
Int. Cl.[2] C22B *7/00*
U.S. Cl. 75—63 **17 Claims**



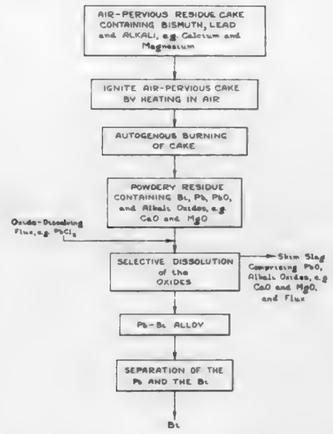
1. A method for the concentration of alkaline bismuthide in a material comprising solid alkaline bismuthide particles and molten lead which comprises supplying the material comprising the solid alkaline bismuthide particles and molten lead onto a heat-resistant screen of substantial mechanical strength, the screen having openings of such size as to enable the retention thereon of a pervious residue cake comprising the alkaline bismuthide, subjecting the material on the screen to the influence of a partial vacuum equivalent to at least 15 inches Hg drawn from the opposite side of the screen from the material thereon comprising the alkaline bismuthide and lead, drawing the molten lead through pore channels of the residue cake comprising the alkaline bismuthide and through the screen openings under the influence of the partial vacuum without any significant physical compression of the residue cake thereby substantially minimizing blockage of the pore channels in the residue cake due to collapse and constriction of the pore channel walls, and separating the resulting air-pervious residue cake from the screen.

4,039,323

PROCESS FOR THE RECOVERY OF BISMUTH

Carl Richard DiMartini, Piscataway, and William Lafayette Scott, Lebanon, both of N.J., assignors to Asarco Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 673,179, April 2, 1976. This application June 30, 1976, Ser. No. 701,260
Int. Cl.[2] C22B *37/00*
U.S. Cl. 75—70 **8 Claims**



1. A process for the recovery of bismuth from an alkaline bismuthide -and lead-containing material which comprises heating a free oxygen-containing gas-permeable mass of the alkaline bismuthide -and lead-containing material in the presence of a free oxygen-containing gas to at least the ignition temperature of said gas-permeable mass to ignite said permeable mass, burning said permeable solid mass to oxidize the alkali and a portion of the lead to the substantial exclusion of the bismuth and form a particulate residue comprising elemental bismuth, elemental lead, lead oxide and alkali oxide, selectively dissolving the alkali oxide in a flux, the flux and alkali oxide dissolved therein being readily separable from a resulting, molten lead-bismuth alloy, and separating the flux with alkali oxide dissolved therein from the molten lead-bismuth alloy.

4,039,324

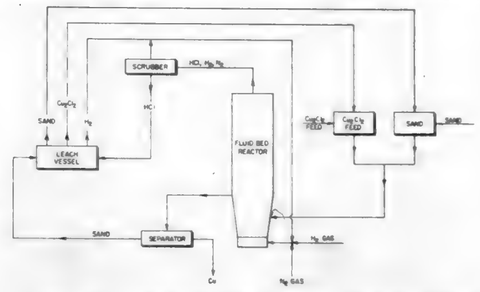
FLUIDIZED HYDROGEN REDUCTION PROCESS FOR THE RECOVERY OF COPPER

Frank M. Stephens, Jr., Lakewood, and James C. Blair, Wheat Ridge, both of Colo., assignors to Cyprus Metallurgical Processes Corporation, Los Angeles, Calif.

Filed Nov. 14, 1975, Ser. No. 631,832
Int. Cl.[2] C22B *15/00*
U.S. Cl. 75—72 **17 Claims**

1. In a process for recovering elemental copper and copper-bearing materials selected from the group consisting of copper oxides and copper salts by means of reducing the copper-bearing materials with hydrogen in a fluidized bed reactor, the improvement comprising:

performing the reduction in the presence of sufficient chemically inert, relatively smooth, generally spherical particles in order to restrain sintering of the reduced copper.



4,039,325

VACUUM SMELTING PROCESS FOR PRODUCING FERROMOLYBDENUM

Donald O. Buker, Denver, Colo., assignor to Amax Inc., New York, N.Y.

Continuation-in-part of Ser. No. 508,848, Sept. 24, 1974, Pat. No. 3,966,459. This application Feb. 27, 1976, Ser. No. 661,978
Int. Cl.[2] C22B *34/00, 9/14*
U.S. Cl. 75—84 **20 Claims**

1. A process for preparing a ferromolybdenum alloy which comprises the steps of forming a substantially uniform mixture composed of a finely-particulated molybdenite concentrate containing at least about 60% of molybdenum disulfide and a finely-particulated iron bearing material selected from the group consisting essentially of metallic iron, iron oxide and mixtures thereof, agglomerating said mixture into a plurality of shape-retaining pellets, heating said pellets to an elevated temperature above about 1800° F in a nonoxidizing atmosphere for a period of time sufficient to effect a dissociation of substantially all of the molybdenum disulfide therein while under a pressure of less than about 10 Torr forming metallic molybdenum, continuously withdrawing the gaseous sulfur and other volatile contaminating constituents in said pellets, continuing the heating of said pellets to effect an alloying of said metallic molybdenum with the iron constituent to produce a ferromolybdenum alloy, and thereafter cooling and extracting the substantially dense sintered ferromolybdenum alloy pellets.

4,039,326

ANTISCORIFIC POWDER FOR THE CASTING OF STEELS INTO INGOT MOLDS

Augusto Moschini, Piombino (Leghorn), Italy, assignor to Acciaierie di Piombino S.p.A., Italy

Filed Mar. 19, 1976, Ser. No. 668,407
Claims priority, application Italy, Apr. 17, 1975, 12575/75
Int. Cl.[2] C22B *9/10*
U.S. Cl. 75—257 **2 Claims**

1. An antiscorific powder composition for addition after the casting of liquid wild steels into an ingot mold, essentially consisting of the following weight % composition:

SiO_2: 0.5 to 2.0%
CaF_2: 40.0 to 60.0%
Na_2Co_3: 5.0 to 20.0%
Borax: 2.0 to 12.0%
Wood Flour: 20.0 to 30.0%

4,039,327

STEPWISE PROCESS FOR RECOVERING PRECIOUS METALS FROM SOLUTION

George Dietz, Jr., Watertown, Conn.; Robert M. Skomoroski, Paterson, N.J., and Robert G. Zobbi, Southbury, Conn., assignors to American Chemical & Refining Company Inc., Waterbury, Conn.

Filed Aug. 2, 1976, Ser. No. 710,807
Int. Cl.[2] C22B *11/08*
U.S. Cl. 75—108 12 Claims

1. A method for recovering precious metal values from aqueous cyandie solution comprising:

a. adding to an aqueous alkaline solution containing cyanide ions and precious metal ions a first material comprising a water-soluble compound containing at least one aldehyde group and reactive in alkaline aqueous solution with free cyanide ions;
b. then adding to the solution a second material which is selected from the class consisting of materials which release hydrogen peroxide or oxygen in alkaline aqueous solution;
c. thereafter heating the solution at a temperature of at least about 85° C for at least about one-half hour to facilitate reaction of said cyanide ions to other chemical species;
d. then adding to the solution a third material comprising a reducing agent to reduce the precious metal ions to elemental metal particles;
e. maintaining the solution at a temperature of at least about 85° C for an additional period of time after adding said third material;
f. allowing the solution to cool and said elemental metal particles to precipitate; and
g. separating the supernatant solution from said precipitated metal particles.

4,039,328

STEEL

Jury Donatovich Novomeisky, ulitsa Nakhimova 86, kv. 48, Tomsk; Mikhail Mikhailovich Eger, ulitsa Oktyabrskaya, 151, kv. 1, and Nikolai Petrovich Kravtsov, ulitsa Kalinina, 16, kv. 70, both of Altaisky krai, Rubtsovsk, all of U.S.S.R.

Filed Aug. 11, 1975, Ser. No. 603,255
Int. Cl.[2] C22C *38/26, 38/32, 38/38*
U.S. Cl. 75—126 B 1 Claim

1. A high strength steel capable of being hardened at temperatures of 1080° C. and less, said steel consisting essentially of in, weight percent:

manganese,	9 – 25
silicon,	0.3 – 1.2
chromium,	0.8 – 4
niobium,	0.06 – 0.25
boron,	0.001 – 0.01,

the weight percentage of impurities being limited to: sulphur, up to 0.05, phosphorus, up to 0.1 and iron, the balance.

4,039,329

DENTAL POWDER COMPOSITE AND AMALGAM

William V. Youdelis, 1935 W. Grand Boulevard, Windsor, Ontario, Canada

Continuation-in-part of Ser. No. 551,572, Feb. 20, 1975, abandoned. This application June 13, 1975, Ser. No. 586,822
Int. Cl.[2] C22C *5/06*
U.S. Cl. 75—169 26 Claims

1. A dental powder composite adapted to be combined with mercury to form dental amalgam comprising:

a. about 70% to about 99.5% by weight of an amalgamatable alloy in powder form of about 75% by weight silver and about 25% by weight tin, said alloy having up to about 8% by weight of the silver-tin alloy replaced with up to about 6% by weight of copper and up to about 2% by weight of zinc, and
b. about 0.5% to less than 30% by weight of unalloyed indium powder.

4,039,330

NICKEL-CHROMIUM-COBALT ALLOYS

Stuart Walter Ker Shaw, Sutton Coldfield, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 241,443, April 5, 1972, abandoned. This application Dec. 24, 1974, Ser. No. 536,173
Claims priority, application United Kingdom, Apr. 7, 1971, 08978/71
Int. Cl.[2] C22C *19/05*
U.S. Cl. 75—171 8 Claims

1. A nickel-base alloy adapted for use at elevated temperature and characterized by high stress-rupture strength and good corrosion resistance in sulphur- and chloride-containing environments while concomitantly exhibiting extended resistance to embrittlement for long periods upon prolonged exposure to temperatures at least as high as 870° C., said alloy consisting of about 21% to 24% chromium, about 5% to 25% cobalt, from 1% to 5% tungsten, up to 3.5% molybdenum, the tungsten and molybdenum being correlated such that the %W + 0.5 (% Mo) is not greater than about 5%, about 1.7% to 5% titanium and about 1% to 4% aluminum, the sum of the titanium and aluminum being about 4% to 6.5% with the ratio therebetween being from 0.75:1 to 4:1, from 0.02% to 0.25% carbon, from 0.5% to 3% tantalum, about 0.3% to 2% niobium, 0.005% to 1% zirconium and up to 2% hafnium, the value of %Zr + 0.5 (% Hf) being from about 0.01% to 1%, about 0.001% to 0.05% boron, up to about 0.2% in total of yttrium and/or lanthanum, and the balance being essentially nickel in an amount of at least 30%.

4,039,331

CARRIER BEAD COATING COMPOSITIONS

Lieng-Huang Lee, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 24, 1976, Ser. No. 669,773
Int. Cl.[2] G03G *9/10*; B32B *9/04*
U.S. Cl. 96—1 SD 12 Claims

1. A carrier particle for electrostatographic developer mixtures comprising a core having an average diameter of from between about 30 microns and about 1,000 microns surrounded by a thin outer layer, said outer layer comprising a copolymer of vinyl pyridine and organosilicon wherein said organosilicon is selected from the group consisting of organosilanes, silanols and siloxanes having from 1 to 3 hydrolyzable groups and an organic group attached directly to a silicon atom containing an unsaturated carbon-to-carbon linkage.

4,039,332

STABILIZATION OF PHOTOSENSITIVE RECORDING MATERIAL

Hendrik Emmanuel Kokelenberg, Wilrijk; Rafaël Pierre Samijn, Hoboken; Jozef Willy Van den Houte, Berchem, and Robert Joseph Pollet, Vremde, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Continuation of Ser. No. 507,446, Sept. 19, 1974, abandoned. This application Sept. 3, 1976, Ser. No. 720,450
Claims priority, application United Kingdom, Sept. 20, 1973, 44200/73
Int. Cl.[2] G03C *5/24, 1/48*
U.S. Cl. 96—48 R 13 Claims

1. A recording process including image stabilization comprising the steps of:

1. image-wise exposing to active electromagnetic radiation of a recording material containing in a recording layer a dye precursor compound and at least one photosensitive organic polyhalogen compound capable of producing photoradicals and a dyestuff with said dye precursor compound when exposed with ultraviolet radiation and/or visible light, and
2. heating the photoexposed recording material at a temperature above 60° C while said recording layer is in contact with an adjacent layer containing a molar excess of at least one stabilizing substance selected from the group consisting of (1) triphenylamine, (2) a phenylselenide compound, and 3) an α,β-ethylenically unsaturated compound having the structural formula:

$$X-(CH=CH-)_nY$$

wherein

X represents cyano, a cyanomethyl group, an acyl group, an acyloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbomoyl group or an aryl group,

Y represents hydrogen or a group represented by X, and n is 1 or 2,

whereby the nondecomposed polyhalogen compound is transformed by reaction with such stabilizing substance into a non-photosensitive substance.

4,039,333

PHOTOGRAPHIC MATERIALS HAVING IMPROVED ANTI-HALATION LAYERS

Yukio Shinagawa; Yasumasa Yamaguchi, and Shuichi Shindo, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 14, 1976, Ser. No. 676,785
Claims priority, application Japan, Apr. 14, 1975, 50-44951
Int. Cl.[2] G03C *1/84*
U.S. Cl. 96—84 R 8 Claims

1. A phographic material having an anti-halation layer comprising at least one aqueous alkali solution swellable binder and at least one aqueous alkali solution soluble binder, said aqueous alkali solution swellable binder being a terpolymer comprising about 10 to about 25% by weight of an alkyl acrylate unit where said alkyl group contains from 1 to 4 carbon atoms, 52 to 65% by weight of an alkyl methacrylate unit where said alkyl group contains from 1 to 4 carbon atoms, and about 18 to about 30% by weight of an acid monomer selected from acrylic, methacrylic or itaconic acid; and said aqueous alkali solution soluble binder having a molecular weight of from about 10,000 to about 200,000.

4,039,334

THERMALLY DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Shinpei Ikenque; Takao Masuda, and Yuzo Iwata, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 17, 1975, Ser. No. 632,885
Claims priority, application Japan, Nov. 15, 1974, 49-131827
Int. Cl.[2] G03C *1/02*
U.S. Cl. 96—114.1 15 Claims

1. In a thermally developable light-sensitive material comprising a support having thereon at least one layer containing at least (a) an organic silver salt, (b) a light-sensitive silver halide or a component capable of forming a light-sensitive silver halide and (c) a reducing agent, the improvement wherein at least one layer provided on the support comprises (d) at least one member selected from the group consisting of rosin of an acid value of more than about 100, one or more diterpene acids selected from the group consisting of abietic acid, pimaric acid, neoabietic acid, levopimaric acid, iso-d-pimaric acid, podocarpic acid, agathenedicarboxylic acid, rubenic acid, dihydroabeitic acid, tetrahydroabietic acid and dehydroabietic acid or a mixture thereof, in an amount sufficient to decrease heat fogging and to improve the storability of the light-sensitive material which is in the range of about 0.001 mol to about 10 mol per mol of said organic silver salt (a).

4,039,335

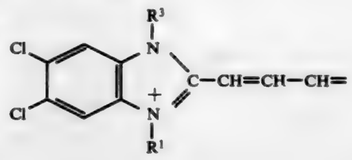
PHOTOGRAPHIC SILVER HALIDE EMULSIONS

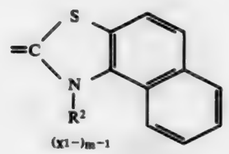
Masanao Hinata; Haruo Takei; Akira Sato; Atsuo Iwamoto, and Jun Hayashi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 29, 1976, Ser. No. 737,130
Claims priority, application Japan, Oct. 29, 1975, 50-130014
Int. Cl.[2] G03C *1/14*
U.S. Cl. 96—124 6 Claims

1. A silver halide photograhic emulsion spectrally sensitized with a combination of sensitizing dyes consisting essentially of at least one sensitizing dye represented by the following general formula [I] and at least one sensitizing dye represented by the following general formula [II] in supersensitizing amounts:

General formula [I] [I]





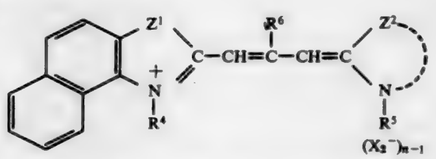
wherein

R^1 and R^2 each is an alkyl group,

R^3 is an alkyl group, X_1 is an acidic anion,

m is 1 or 2, and m is 1 when the dye forms an intramolecular salt (betaine-like structure).

General formula [II] [II]



wherein Z^1 is a sulfur atom or a selenium atom, Z^2 is an atomic group necessary to form a benzothiazole ring, a benzoselenazole ring, a naphtho[1,2-d]thiazole ring or a naphtho[1,2-d]selenazole ring, R^4 and R^5 each is an alkyl group, R^6 is an alkyl group, a phenyl group, aralkyl group, a furyl group or a thienyl group, X_2 is an acidic anion, n is 1 or 2, and n is 1 when the dye forms an intramolecular salt (betaine-like structure).

4,039,336

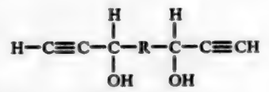
DIACETYLENIC ALCOHOL CORROSION INHIBITORS

Daniel S. Sullivan, 3rd, Houston, Tex.; Charles E. Strubelt, Tamare, Venezuela, and Kenneth W. Becker, Houston, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 3, 1975, Ser. No. 637,302
Int. Cl.[2] C09D *5/08*
U.S. Cl. 106—14 6 Claims

1. A relatively non-corrosion composition of matter comprising water and a quantity of nonoxidizing acid sufficient to form an aqueous acid ordinarily corrosive to ferrous metals,

wherein the corrosive tendency of said aqueous acid to ferrous metals is substantially diminished by the presence of about 0.005 to 2.0 vol. % of an α, Ω-diacetylenic diol having the structural formula:



where R is an aliphatic, alicyclic or aromatic residue containing from 1 to 12 carbon atoms.

4,039,337

RELEASE COATING FOR GLASS MANUFACTURE

Richard E. Brown; Archie L. Bickling, Jr., both of Boulder; Virgil R. Friebel, Longmont, and Kent G. Roller, Boulder, all of Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Continuation-in-part of Ser. No. 517,262, Oct. 23, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,605

Int. Cl.² B28B *7/36*

U.S. Cl. 106—38.28 **6 Claims**

1. A release and lubricating composition capable of rendering release and lubricating characteristics in excess of twenty hours during glassware manufacture at temperatures in excess of 1600° F., said composition consisting essentially of an aqueous dispersion of a mixture of boron nitride and graphite as solid lubricants, said solid lubricants being present in an amount between about 5 and 70 weight percent of the aqueous dispersion, the weight ratio of said graphite to boron nitride being between a range of about 1:2 to about 5:1, a water-soluble silicate binder, said binder being present in an amount between about 10 and 40 weight percent, a setting agent for said silicate binder, said setting agent being present in an amount between about 0.05 and about 15 weight percent, and a water-soluble phosphate, said phosphate being present in an amount between about 1 and about 25 weight percent.

4,039,338

ACCELERATED SINTERING FOR A GREEN CERAMIC SHEET

William R. Swiss, Bloomfield, N.J., and Wayne S. Young, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,113

Int. Cl.² C04B *33/26*

U.S. Cl. 106—46 **4 Claims**

1. A solvent-free flexible ceramic dried green sheet dispersion comprising:
   a. a plurality of ceramic particles having an average particle size represented by point (40) on the graph of FIG. 8 with 95% of said particles falling within 2 microns of said point,
   b. in combination with a glassy frit material, and
   c. a pyrolytically decomposable polymeric organic binder dispersed with said plurality of ceramic particles and said glassy frit material and occupying the interstices therebetween.

4,039,339

METHOD OF PREPARING GLAZES

Thomas H. Elmer, and Richard E. Tischer, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 492,442, July 29, 1974, abandoned. This application Nov. 26, 1975, Ser. No. 635,417

Int. Cl.² C03C *3/08, 17/22*

U.S. Cl. 106—54 **8 Claims**

1. A method for making an essentially alkali metal-free, high purity borosilicate glass having a coefficient of thermal expansion (R.T. to 300° C.) less than about 20×10^{-7}/° C., a flow point when present in particulate form between about 1000° ∝ 1250° C., and the ability to withstand thermal cycling to 1300° C. and higher without substantial devitrification, which comprises the steps of:

1 a. impregnating porous, essentially alkali metal-free, high purity silica material having a porosity of at least 25% and pore diameter ranging between about 15–250A. with an essentially alkali metal-free, boron-containing liquid;

1 b. consolidating said impregnated porous material by heating to about 1000°1250° C. to yield a high purity, non-porous borosilicate glass containing at least about 1%, but not more than about 20% by weight, B_2O_3, and wherein the total alkali metal oxide does not exceed about 0.03% by weight.

4,039,340

HIGH STRENGTH AND HEAT RESISTANT REFRACTORY COMPOSITIONS

Gerald Q. Weaver, Princeton, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 582,781, June 2, 1975, abandoned. This application Sept. 18, 1975, Ser. No. 614,701

Int. Cl.² C04B *35/58*

U.S. Cl. 106—55 **9 Claims**

1. A heat resistant high strength refractory composite produced by sintering a mixture consisting essentially of from 80 to 98.5% by weight of silicon nitride, 1 to 15% by weight of yttrium oxide, and 0.5 to 10% weight of thorium oxide, with the total oxide present not exceeding about 20%.

4,039,341

PRODUCTION OF CARBON ARTICLES

George Anthony Cooper, Brussels, Belgium; Rayner Michael Mayer, Pretoria, South Africa, and William Watt, Farnborough, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 115,873, Feb. 16, 1971, abandoned. This application Aug. 16, 1973, Ser. No. 389,027

Claims priority, application United Kingdom, Feb. 23, 1970, 8532/70; Aug. 17, 1970, 39541/70

Int. Cl.² C01B *31/02;* C04B *35/52*

U.S. Cl. 106—56 **12 Claims**

1. A process for producing a carbon-fiber-reinforced carbon body, which comprises: first producing a composite body having a matrix of carbonizable cured resin in which fibers that are made from synthetic organic fibers by subjecting such fibers to a first heat treatment up to a first temperature in an oxidizing atmosphere while substantially preventing the fibers from shrinking longitudinally during that heat treatment, are incorporated, and then subjecting the said composite body to carbonizing heat treatment up to a second, higher temperature in the absence of oxygen to convert the resin of the matrix into carbonaceous material and carbonize the fibers that are incorporated in said matrix.

4,039,342

FIREBRICKS

Wilhelm Reerink, Essen-Bredeney; Kurt-Guenther Beck; Heinrich Echterhoff, both of Essen; Johannes Müller, Bad Niederbreisig; Kurt Degen, Burg Brohl, and Gerd Nashan, Oberhausen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Division of Ser. No. 367,974, June 7, 1973, abandoned, which is a division of Ser. No. 247,003, April 24, 1972, abandoned, which is a division of Ser. No. 82,607, Oct. 21, 1970, abandoned. This application Aug. 26, 1974, Ser. No. 500,667

Claims priority, application Germany, Apr. 21, 1970, 2019072

Int. Cl.² C04B *35/04*

U.S. Cl. 106—58 **5 Claims**

1. In a coke oven, a wall comprising firebricks which contain approximately 94 percent MgO, approximately 2 to 3 percent CaO, approximately 1 to 2 percent SiO_2, approximately 0.5 to 1.0 percent Al_2O_3 and approximately 0.9 percent Fe_2O_3.

4,039,343

IMPROVED PERFORMANCE DIRECT BONDED BASIC REFRACTORY BRICK AND METHOD OF MANUFACTURE

Joseph L. Stein, Allegheny County, Pa., and Walter S. Treffner, Anne Arundel County, Md., assignors to General Refractories Company, Bala Cynwyd, Pa.

Continuation of Ser. No. 453,394, March 24, 1974, abandoned. This application Dec. 29, 1975, Ser. No. 645,261

Int. Cl.² C04B *35/04, 35/12*

U.S. Cl. 106—59 **22 Claims**

1. A high fired direct bonded basic magnesite-chrome refractory shape characterized by the presence of chromium enriched spinel structures distributed in the matrix which bond the individual periclase crystals made by the steps of:
   a. forming a mixture of (1) from about 40% to about 75% by weight periclase containing at least about 94% MgO, (2) from about 25% to about 60% by weight chrome ore and (3) from about 0.5% to about 10% by weight chromic oxide powder;
   b. pressing the mixture into a refractory shape; and
   c. firing the refractory shape to a temperature of at least 1700° C.

4,039,344

ALUMINA-CHROME REFRACTORY COMPOSITION

Yasuo Nishikawa, Okayama; Takeo Okamura, and Katsuhei Minami, both of Bizen, all of Japan, assignors to Kyushu Refractories Co., Ltd., Japan

Filed Feb. 23, 1976, Ser. No. 660,407

Claims priority, application Japan, Mar. 6, 1975, 50–27806

Int. Cl.² C04B *35/42, 35/44*

U.S. Cl. 106—66 **2 Claims**

1. An alumina-chrome refractory composition consisting essentially of:

30–60 weight % of an alumina-silica material containing 50–95 weight % of alumina and consisting of particles in which the major portion is coarser than 0.1 mm in size, said alumina-silica material being at least one of the materials selected from the group consisting of synthetic mullite, sillimanite, cyanite, andalusite, diaspore, bauxite and other alumina shales

70–40 weight % of a chrome material containing 15–65 weight % of chromium oxide and wherein the major portion consists of particles finer than 1 mm in size, said chrome material being at least one member selected from the group consisting of chrome ore, chrome-magnesia clinker and chrome-magnesia brick scrap.

4,039,345

SHRINKAGE-COMPENSATING PORTLAND CEMENT CONCRETE AND MORTAR COMPOSITIONS

Gale L. Emig, Midland; Ronald H. Cooper, Clare, and R. Douglas Eash, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 475,377, June 3, 1974, abandoned. This application July 17, 1975, Ser. No. 596,701

Int. Cl.² C04B *7/35*

U.S. Cl. 106—90 **12 Claims**

1. Improved shrinkage compensating portland cement concrete and mortar compositions containing essentially an admixture of an expansive portland cement, mineral aggregate, from about 5 to about 25 percent based on the weight of said cement of a styrene-butadiene-1,3 copolymer having a styrene to butadiene weight ratio, of about 30:70 to 70:30, water in amount of from about 25 to about 65 percent based on the weight of said cement; and based on the weight of said copolymer, (a) from about 2 to about 10 percent of non-ionic surfactant, (b) from about 0.75 to 7.5 percent of anionic surfactant, at least about 15 percent of which is a sodium alkyl sulfate in which the alkyl group contains 9 to 17 carbon atoms, and (c) from about 0.1 to 5 percent of a polyorganosiloxane foam depressant based on the weight of active polyorganosiloxane, the sum of (a) and (b) not exceeding about 11 percent by weight of said copolymer and the weight ratio of (a) to (b) being within the range of about 0.7:1 to 10:1; and reinforcement to provide restraint against expansion.

4,039,346

CONVERSION OF CRUDE COPPER PHTHALOCYANINES INTO PIGMENTS

Joachim Kranz, Ludwigshafen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 5, 1976, Ser. No. 655,459

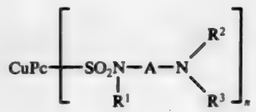
Claims priority, application Germany, Feb. 18, 1975, 2506832

Int. Cl.² C08K *5/34*

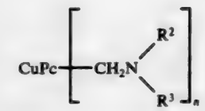
U.S. Cl. 106—288 Q **10 Claims**

1. In a process for converting crude copper phthalocynines into a pigmentary form by sulfuric acid treatment of finely particled copper phthalocyanines, which have crystallized irregularly and are heavily agglomerated, and which have a primary particle size of less than 0.1 μ and are obtained by grinding crude copper phthalocyanines in a ball mill in th absence of grinding aids, the improvement wherein the ground material is introduced into sulfuric acid of from 50 to 75% strength by weight in the presence of from 0.5 to 7% by weight, based on the crude copper phthalocyanine, of one or more basic copper phthalocyanines of the formula

(I)



(II)

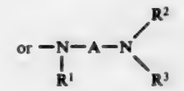


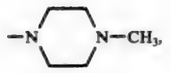
or mixtures thereof, where CuPc is an n-valent copper phthalocyanine radical, R^1 is hydrogen alkyl of 1 to 4 carbon atoms, A is saturated, linear or branched alkylene of 2 to 6 carbon atoms, R^2 is alkyl of 1 to 20 carbon atoms, alkoxyalkyl of a total of 3 to 12 carbon atoms or cycloakyl of 6 to 8 carbon atoms, R^3 is hydrogen, alkyl of 1 to 4 carbon atoms or cycloalkyl of 6 to 8 carbon atoms or the group





is a saturated heterocyclic 5-membered, 6-membered or 7-membered ring or a saturated 6-membered heterocyclic ring which may additionally contain an oxygen, sulfur or nitrogen atom as a ring member,





and *n* is from 1 to 6, and the mixture is kept at from room temperature to 100° C until the pigment has acquired optimum tinctorial strength, and the pigment is then separated from the sulfuric acid and isolated.

4,039,347

METHOD OF PREPARING ZINC ORTHOTITANATE PIGMENT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Daniel W. Gates, Huntsville, Ala.; Yoshiro Harada, Skokie, Ill.; William R. Logan, Wheaton, Ill., and John E. Gilligan, Prospect Heights, Ill.

Filed June 17, 1976, Ser. No. 696,989
Int. Cl.² C09C *1/36, 1/04*
U.S. Cl. 106—292 **5 Claims**

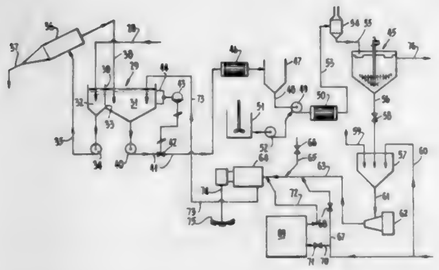
1. The method of preparing zinc orthotitanate in the form of very fine particles which comprises forming a mixture of precipitated oxalates of zinc and titanium having a zinc-to-titanium molar ratio of 1.92:1 to 1.98:1, heating said mixture first at a temperature of 400° to 600° C and then at a temperature of 900° to 1200° C.

4,039,348

TREATMENT OF RAW SUGAR JUICE

Richard James Hunwick, Wollstonecraft, Australia, assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed Apr. 14, 1975, Ser. No. 567,522
Claims priority, application Australia, Apr. 17, 1974, 7275/74
Int. Cl.² C13D *3/00, 3/16*
U.S. Cl. 127—9 **6 Claims**



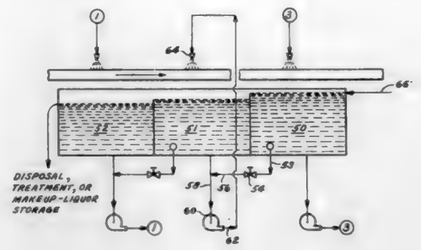
1. A method of processing sugar cane including the steps of subjecting the sugar cane to cutting, shredding and milling operations to produce raw sugar juice and bagasse, subjecting the raw sugar juice and bagasse to a first separation step to remove large fractions of bagasse from the raw sugar juice, subjecting the separated raw sugar juice to a cyclone separation step comprising a degritting process to produce a sugar juice substantially free of fine grits, clarifying the raw degritted sugar juice to produce sugar liquor and clarifier mud, the clarifier mud from said clarifying process being subsequently processed in one, or more, solid bowl centrifuges to produce relatively clear sugar juice for recycling through the clarification process, with the sugar liquor from the clarifying process being subsequently subjected to evaporation and crystallization processes to produce raw sugar.

4,039,349

METHOD AND APPARATUS FOR MULTI-STAGE RINSING

Daniel Kwasnoski, Hellertown, and Vernon B. Mancke, Bethlehem, both of Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Feb. 17, 1976, Ser. No. 658,787
Int. Cl.² A47L *25/00*
U.S. Cl. 134—10 **5 Claims**



1. An improved method of rinsing workpieces wherein said workpieces are subjected to a multiplicity of spray rinsing operations in a spray rinse system and rinse liquor from a preceding rinse operation is transferred to a succeeding spray rinse operation, the improvement comprising:

combining rinse liquor from a preceding spray rinse operation with a minor proportion of rinse liquor from the next succeeding spray rinse operation and spraying the mixture onto a workpiece being conveyed through the spray rinsing system at a location from which the used spray rinse liquor will flow into said next succeeding spray rinse operation.

2. In a continuous multi-stage rinsing apparatus comprising a multiplicity of discrete rinsing stations each of which stations comprises a collecting tank, a pump means, a liquid conduit means connecting said collecting tank to said pump means, spray head means disposed above said collecting tank, pipe means connecting said spray head means to said pump means, a liquid inlet means and a liquid outlet means connecting said collecting tank to adjacent collecting tanks, the improvement comprising:

a liquid flow directing means disposed within at least one of said collecting tanks so constructed and arranged that liquid entering said collecting tank from a preceding collecting tank is deflected toward said liquid conduit means prior to combining of said liquid from said preceding collecting tank with liquid from the said collecting tank.

4,039,350

INDUSTRIAL CLEANING SYSTEM

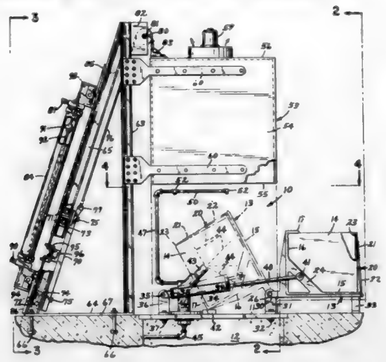
Harry S. Bucy, Sioux Falls, and John F. Finger, Beresford, both of S. Dak., assignors to Sioux Steam Cleaner Corporation, Beresford, S. Dak.

Filed Mar. 4, 1976, Ser. No. 663,674
Int. Cl.² B08B *9/00*
U.S. Cl. 134—22 R **9 Claims**

1. The method of cleaning an open top container without immersing it in a body of liquid which comprises the steps of:

1. positioning the container in a holding frame;
2. pivoting the frame and container to substantially invert the container into a washing space;
3. enclosing the washing space to confine fluids to discharge therein;

4. discharging a succession of cleaning fluids upwardly and into and downwardly onto the container; and



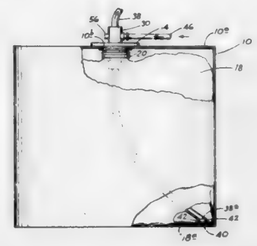
5. drying the container by heat before returning it to its normal position.

4,039,351

CONTAINER WASHER ATTACHMENT

Calvin J. Butler, Rte. 2, Box 100, Bend, Oreg. 97701

Filed Sept. 22, 1975, Ser. No. 615,832
Int. Cl.² B08B *3/02, 9/08*
U.S. Cl. 134—102 **1 Claim**



1. A removable washer attachment for use in washing containers comprising:

insert means for extending through a formed opening in a wall of a container in fluid tight sealing engagement therewith, said insert means including a first portion for extending exteriorally of the container, a second portion for depending interiorally of the container and a threaded segment, said threaded segment disposed between said portions and arranged to permit coupling of said insert means to a threaded formed opening in a container, said insert means additionally including a bore extending substantially axially therethrough for receiving a suction tube;

sealing means for producing a substantially fluid tight seal about a suction tube in said bore to prevent discharge of fluid from said bore into the atmosphere;

means for admitting a washing fluid into said bore under pressure including an inlet opening formed in an outer side wall of said first portion

spraying means communicating with said bore arranged adjacent to an end of said interiorally disposed second portion, said spraying means including a plurality of arcuately shaped notches arranged to direct washing fluid over an arc for dispersal into the container for washing same, said notches being formed on a segment of said second portion which has a cross-sectional area less than the remainder of said second portion so that said notches will not become fouled against an opening in a container during insertion and withdrawal of said insert means; and

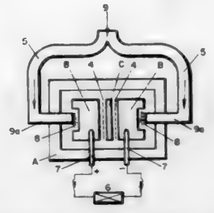
an air inlet valve communicating with said bore disposed on said first portion for permitting passage of air therefrom to said bore for subsequent displacement outwardly through said notches as material is withdrawn from a container through said suction tube.

4,039,352

HIGH EFFICIENCY THERMOELECTRIC GENERATOR FOR THE DIRECT CONVERSION OF HEAT INTO ELECTRICAL ENERGY

Matei Marinescu, Bucharest, Romania, assignor to Institutul de Cercetaro Energetice Industriale si Proictari Utilaje Energetice, Bucharest, Romania

Continuation-in-part of Ser. No. 179,727, Sept. 13, 1971, abandoned. This application Dec. 10, 1973, Ser. No. 423,475
Int. Cl.² H01V *1/30*
U.S. Cl. 136—205 **6 Claims**



1. In a thermoelectric generator unit for converting heat directly from a single heat source into electrical energy, at least one active cell spaced from the heat source and comprising two identical metallic terminal supports having sandwiched therebetween, in intimate contact over their entire surface with each other and with the supports, first, second and third successive thin films, each of the films having a thickness of a few microns, the first and third ones of the films being metals that respectively have different work functions θ_1 and θ_3, the second film being of semiconductor material having a concentration of holes of the order of 10^{18}n/cm³ and of electrons of the order of 10^{8}n/cm³ at 20° C, and means including a single heat source completely surrounding the cell for uniformly heating the cell to a temperature $T \leqq T_c$, where

$$Tc = \frac{\alpha(\sigma_1 - \sigma_3)}{k\ln\frac{(P_2')}{(P_2'')}},$$

k is Boltsman's constant, (P_2') $T = T_c$ is the concentration of holes in the second film adjacent its junction with the first film, (P_2'') $T = T_c$ is the concentration of holes in the second film adjacent its junction with the third film,

$$\alpha = \frac{Pm - nm}{(P_2 - n_2)^2} \leqq 1,$$

P_m and n_m are respectively the concentrations of holes the concentrations of holes and electrons in the bulk of the semiconductor material.

4,039,353

POST-TREATMENT OF CONVERSION-COATED METAL SURFACES

Leonard Kulick, Ferndale, and John K. Howell, Jr., Rochester, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation of Ser. No. 518,002, Oct. 25, 1974. This application Nov. 13, 1975, Ser. No. 631,787
Int. Cl.² C23F *7/10*
U.S. Cl. 148—6.15 R **18 Claims**

1. In a method of post-treating a phosphate or chromate conversion coated metal surface without the use of chromium chemicals, the improvement comprising contacting said sur-

face with an aqueous solution comprising at least 0.1 g/1 of a melamine-formaldehyde resin and at least 0.01 g/1 of least a vegetable tannin wherein the weight ratio of resin:tannin is at least 1:1.

4,039,354

METHOD OF MAKING BELLEVILLE SPRINGS

Michael A. Schober, Palatine, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Division of Ser. No. 500,212, Aug. 23, 1974, Pat. No. 3,964,737.
This application Mar. 22, 1976, Ser. No. 669,063
Int. Cl.² C21D *1/48;* F16F *1/34*
U.S. Cl. 148—16.5 **10 Claims**

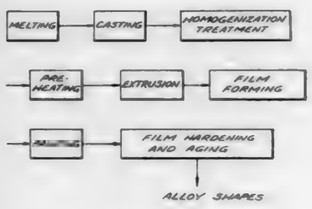
1. A process of forming an improved Belleville spring including the steps of blanking the spring shape from a low carbon steel having a carbon content of 0.2 to 0.4% carbon, forming the spring from the blank, heating the spring to a temperature in the range of 1500° to 2000° F. for a time interval of from 15 minutes to 4 hours in an atmosphere having a carbon potential of 0.60 to 1.20% carbon, and quenching the treated spring in an oil bath at a temperature in the range of 250° to 350° F. to yield a spring having a surface carbon content of 0.70 to 1.00% carbon.

4,039,355

ALUMINUM ALLOY SHAPES

Toshiro Takahashi; Toshihiro Nagano; Kenji Wada, all of Shizuoka, and Masaru Kikuchi, Fuji, all of Japan, assignors to Riken Light Metal Industries Company, Ltd., Japan

Filed Feb. 18, 1975, Ser. No. 550,223
Claims priority, application Japan, Mar. 29, 1974, 49-35421
Int. Cl.² C22C *21/08*
U.S. Cl. 148—31.5 **2 Claims**



1. An aluminum alloy shape formed of an aluminum alloy consisting essentially of 0.65 to 0.75% by weight of magnesium, 0.5 to 0.6% by weight of silicon, 0.15 to 0.25% by weight of iron, less than 0.05% by weight of impurities selected from the group consisting of zinc, manganese, chromium, copper, and titanium, and the balance aluminum, said aluminum shape having thereon an anodized oxide film and being coated over its surface with a water-soluble paint which has been hardened at a temperature below 200° C., and having been subjected to an aging treatment at a temperature below 200° C. for 20 to 50 minutes to deposit Mg_2Si to obtain a 0.2% proof stress larger than 11 kg/mm², an ultimate tensile strength larger than 20 kg/mm² and an elongation more than 8%.

4,039,356

GALLING RESISTANT AUSTENITIC STAINLESS STEEL

William J. Schumacher, and Harry Tanczyn, both of Baltimore, Md., assignor to Armco Steel Corporation, Cincinnati, Ohio

Division of Ser. No. 360,402, May 14, 1973, Pat. No. 3,912,503.
This application Feb. 24, 1975, Ser. No. 552,357
Int. Cl.² C22B *35/00;* C22C *38/40*
U.S. Cl. 148—31.5 **4 Claims**

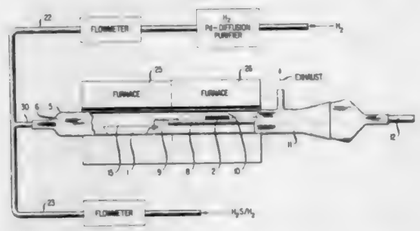
1. An annealed, austenitic stainless steel wrought product formed from a stainless steel exhibiting no galling at stress of 63 ksi when rotated against itself in the form of button and block specimens in accordance with the test method described herein, said steel consisting essentially of, in weight percent, from about 12% to about 19% chromium, from about 4% to about 12% nickel, from about 7% to about 13% manganese, from about 3% to about 5% silicon, from about 0.01% to about 0.12% carbon, from about 0.03% to about 0.3% nitrogen, about 0.75% maximum molybdenum, about 0.75% maximum copper, about 0.09% maximum phosphorus, about 0.05% maximum sulfur, and remainder essentially iron, said product having a low shear strength oxide film containing silicon formed in air at ordinary temperatures, the nickel content being varied directly in proportion to the silicon content in such manner as to assure an austenitic structure.

4,039,357

ETCHING OF III-V SEMICONDUCTOR MATERIALS WITH H_2S IN THE PREPARATION OF HETERODIODES TO FACILITATE THE DEPOSITION OF CADMIUM SULFIDE

Klaus Jürgen Bachmann, Piscataway; Manfred Hermann Bettini, Red Bank; Ernest Buehler, Chatham; Joseph Leo Shay, Marlboro, and Sigurd Wagner, Holmdel, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 27, 1976, Ser. No. 718,386
Int. Cl.² H01L *21/205, 21/302, 31/06*
U.S. Cl. 148—175 **10 Claims**



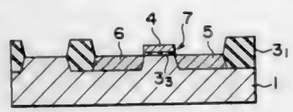
1. A hydrogen gas transport process for depositing a n-type cadmium sulfide layer on a p-type semiconductor material comprising the steps of passing a stream of hydrogen gas over a heated substrate of said p-type semiconductor material wherein heated cadmium sulfide is placed in the flow of said hydrogen gas upstream from said heated substrate characterized in that a sufficient quantity of hydrogen sulfide gas above the quantity of H_2S present from any reaction of said cadmium sulfide with said stream of hydrogen gas is introduced to etch said p-type semiconductor material which is chosen from the group consisting essentially of gallium arsenide and indium phosphide and depositing n-type CdS on the etched semiconductor material.

4,039,358

METHOD OF MANUFACTURING AN INSULATED GATE TYPE FIELD EFFECT SEMICONDUCTOR DEVICE

Motohiro Kitajima, and Yoshihiko Nakagawa, both of Aizu Wakamatsu, Japan, assignors to Toko Incorporated, Tokyo, Japan

Filed Sept. 8, 1976, Ser. No. 721,211
Claims priority, application Japan, Sept. 8, 1975, 50-108758
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **3 Claims**



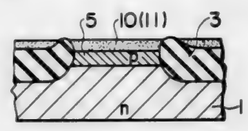
1. A method of manufacturing an insulated gate type field effect semiconductor device, which includes the steps of providing a silicon nitride film on the surface of a silicon substrate, selectively removing said silicon nitride film so as to define an exposed inactive area or areas and a non-exposed active area or areas in which at least the source, gate and drain of said semiconductor device are formed, forming an oxide film on the surface of said exposed inactive area or areas, and forming the gate comprising an oxide film in contact with the surface of said substrate and an overlying polycrystalline silicon or metal film and diffused source and drain, characterized by inclusion of the step of removing the surface portion of the substrate which includes defect in said active area or areas, after said step of removing said silicon nitride film is performed and before the step of forming the oxide film for said gate is carried out.

4,039,359

METHOD OF MANUFACTURING A FLATTENED SEMICONDUCTOR DEVICE

Nobuyuki Nakamoto, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 12, 1976, Ser. No. 731,340
Claims priority, application Japan, Oct. 11, 1975, 50-121833
Int. Cl.² H01L *21/225*
U.S. Cl. 148—188 **11 Claims**



1. A method of manufacturing a semiconductor device, comprising the steps of:

a. preparing a substrate which has an uneven surface,
b. applying onto the surface of said substrate a solution capable of being converted into a film by a heat-treatment, so that the film will cover concave parts of the substrate surface, said film exhibiting an etching rate to the same extent as that of an underlying layer,
c. converting said solution into said film by said heat-treatment, and
d. etching at least a part of said film and at least a part of said underlying layer.

4,039,360

GELLED MONOMETHYLHYDRAZINE THIXOTROPIC FUEL

Barry D. Allan, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Continuation-in-part of Ser. No. 518,489, Jan. 3, 1966, Pat. No. 3,857,743. This application Sept. 9, 1971, Ser. No. 179,217
Int. Cl.² C06B *47/08*
U.S. Cl. 149—36 **3 Claims**

1. A composition consisting of monomethylhydrazine present in an amount of about 36 to about 40 weight percent, hydroxyalkyl cellulose present in an amount of about 1 to about 3 weight percent, metallic fuel particles, and dimethylurea present in an amount of about 0.05 to about 0.03 weight percent to form a gelled fuel.

4,039,361

DRY BLASTING AGENTS

Bhairab Nath Ray, and Dhirendra Nath Bhattacharyya, both of Bihar, India, assignors to Indian Explosives Limited of I.C.I. House, Calcutta, India

Continuation of Ser. No. 442,365, Feb. 14, 1974, abandoned.
This application Dec. 16, 1975, Ser. No. 641,183
Int. Cl.² C06B *33/14*
U.S. Cl. 149—41 **7 Claims**

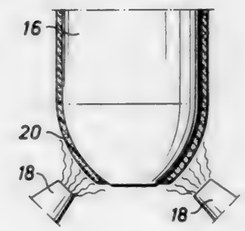
1. A sensitised dry blasting composition comprising a mixture (1) nitrate which acts as an oxidiser selected from ammonium nitrate, a mixture of alkali or alkaline earth metal nitrates and mixtures thereof; (2) a fuel and (3) a sensitiser selected from the group of metal nitrates, metal perchlorates, metal chlorates and metal organic derivatives and mixtures thereof wherein the metal of such metal nitrates, metal perchlorates, metal chlorates and metal organic derivatives is selected from the group consisting of iron, cobalt, nickel, chromium, lead and copper.

4,039,362

PACKING MATERIAL THAT CAN BE SHAPED UNDER THE EFFECT OF HEAT

Georg E. Ernstsson, Staffanstorp; Birger N. Nilsson, Arlov; Herwig Pupp, Lund, and Olof S. Stark, Rydegard, all of Sweden, assignors to AB Ziristor, Lund, Sweden

Filed June 14, 1974, Ser. No. 479,568
Claims priority, application Sweden, June 19, 1973, 7308581
Int. Cl.² B29C *27/24;* B29D *7/24, 27/00*
U.S. Cl. 156—69 **1 Claim**



1. Method of making a packing container from a sheet of packing material consisting essentially of a composite web consisting of (a) a sheet of extruded foamed thermoplastic material having a cellular structure with closed, thin-walled, normally spherical cells and (b) coverings of homogeneous plastic material laminated to the opposite sides of said sheet, which method comprises the steps of

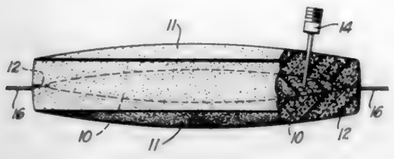
stretching the composite web so that the cells of the sheet of foamed cellular material are rendered elongated or lenticular in shape and situated in parallel planes;
folding said stretched web, and joining the ends of said web together to form a tubular composite web member and placing said member about the cylindrical part of a profiled container mandrel having a cup-shaped end;
heating said member to a temperature at which said elongated or lenticular cells endeavor to resume spherical form and thereby effect shrinking of said composite web member about and in accurate contact with the profiled mandrel to form a cup-shaped article;
stabilizing the resulting shrunken cup-shaped article by cooling it while in contact with the mandrel; and
thereafter separating the stabilized article from the mandrel and adding a bottom member to the stabilized article.

4,039,363

METHOD OF MAKING FLOATING SEAT CUSHION

James H. Robertson, P.O. Box 9551, North Hollywood, Calif. 91609

Filed Sept. 13, 1976, Ser. No. 723,038
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—145 4 Claims



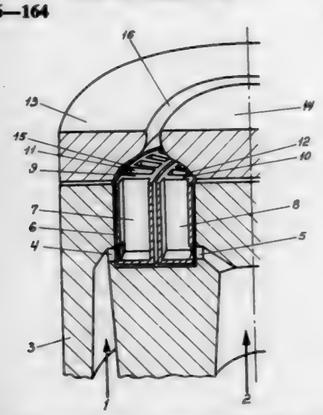
1. A method of forming a floating seat cushion comprising forming a substantially thick center core of open cell foam material, placing on opposite sides of said center core an outer layer of closed cell foam material having a substantially greater length and width than said center core, applying adhesive material between the peripheral portions of said outer layers which extend outwardly beyond the periphery of said center core, pressing said outer layers and center core together to temporarily deflate said center core substantially completely to a flat configuration in order to bring the outwardly extending portions of said outer layers together to adhere said portions into engagement with each other and completely enclose said center core, and re-inflating said center core back to its normal thickness except as restrained by said outer layers, to form said cushion into a convex configuration on the top and bottom of said cushion, said center core remaining inflated thereafter to maintain said cushion permanently in said convex configuration.

4,039,364

METHOD FOR PRODUCING A LAMINATED HIGH STRENGTH SHEET

Ole-Bendt Rasmussen, 14 Anemonevej, 2820 Gentofte, Denmark

Filed July 1, 1975, Ser. No. 592,273
Claims priority, application United Kingdom July 5, 1974, 29807/74, Dec. 11, 1974, 53644/74, Feb. 12, 1975 5971/75, 5972/75
Int. Cl.[2] B29D *7/24*
U.S. Cl. 156—164 24 Claims



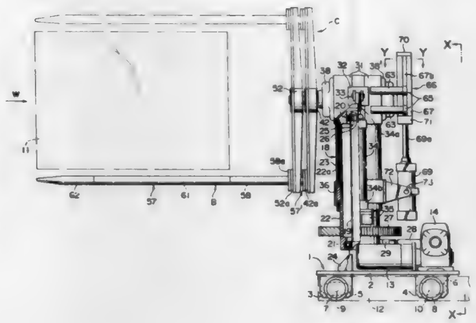
1. Method for producing a laminated high strength sheet comprising the steps of attenuating while extruding each of at least two layers of at least a blend of two or more polymers containing not more than about 85% of any one of such polymer and at least about 15% of one or more different polymer, the polymers in said blend being sufficiently incompatible as to form upon extrusion of the blend a microscopically visible grain and impart upon solidification a pronounced direction of splittability, before or after solidification of said layers uniting the layers into a common sheet with the grain direction of adjacent layers herein extending in criss-crossing relationship while forming a generally weak bond between said layers, solidifying if not already solid and finally biaxially orienting the solid laminated sheet thus obtained in at least two separate steps each of which is essentially unidirectional with the directions crossing one another at a temperature sufficiently low for maintaining a significant splittability in each layer.

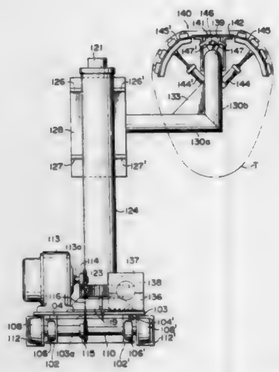
4,039,365

TIRE COMPONENT TRANSFERRING APPARATUS

Yutaka Takasuga, Higashimurayama; Seiichiro Nishimura, Shakujii, and Takao Urayama, Higashimurayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 17, 1975, Ser. No. 641,578
Claims priority, application Japan, Dec. 25, 1974, 49-3687; Apr. 2, 1975, 50-40561
Int. Cl.[2] B29H *17/20, 17/37*
U.S. Cl. 156—405 15 Claims





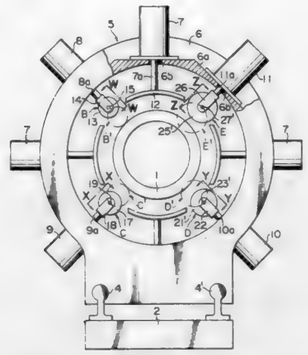
1. A tire component transferring apparatus comprising:
a truck movable toward and away from a collapsible building drum;
drive means mounted on said truck to move said truck toward and away from said building drum;
an upstanding post assembly mounted on said truck;
a pair of tire component supporting rods mounted on said upstanding post assembly to be revolvable around a portion of the circumferential outer surface of said building drum, said tire component supporting rods being insertable through a gap formed between a tire component and said building drum held in a collapsed state and then revolved upward to support said tire componenet for removing said tire component from said tire building drum while being revolved downward for releasing therefrom and mounting said tire component on said building drum held in the collapsed state; and
revolving means mounted on said upstanding post assembly to revolve said tire component supporting rods around said portion of the circumferential surface of said building drum in opposite directions.

4,039,366

APPARATUS FOR BUILDING GREEN TIRES

Toshinori Yabe, Kodaira, Japan, assignor to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 23, 1975, Ser. No. 625,157
Claims priority, application Japan, Oct. 25, 1974, 49-123179
Int. Cl.[2] B29H *17/18, 17/37*
U.S. Cl. 156—405 3 Claims



1. An apparatus for building green tires, comprising:
a tire building drum rotatably mounted on a housing and driven for rotation by a motor accommodated in said housing; a ring-shaped frame movable toward and away from an operating position where said ring-shaped frame surrounds the circumference of said tire building drum;
tire component holding means including a plurality of tire component holders radially movably mounted on said ring-shaped frame at uniform space from each other for releasably holding a breaker-tread assembly during a green tire producing stage and a green tire after said green tire producing stage; and
stitching means including a plurality of rotatable stitching rollers mounted on said ring-shaped frame in alternate relation with said tire component holders and movable toward and away from said tire building drum for stitching said breaker-tread assembly into tight contact with said carcass on said tire building drum while said ring-shaped frame is in said operation position.

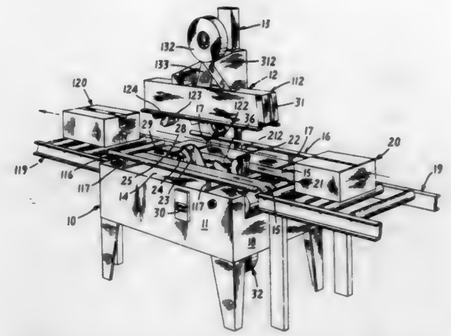
4,039,367

TAPE APPLYING MECHANISMS OF CARTON SEALING MACHINES

Saul Warshaw, Hawley, Pa.; Winton Loveland, Fort Salonga, and Horst J. Hanemann, Manhasset, both of N.Y., assignors to The Loveshaw Corporation, Deer Park, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,718
Int. Cl.[2] B65C *1/06*
U.S. Cl. 156—486 5 Claims

1. Tape applying mechanism of carton sealing machines for feeding lengths of pressure sensitive tape each having an uncoated back side and an adhesively coated face bearing pressure sensitive cement and to apply the latter of each tape length to end panels of an advancing carton and lap it over the opposed longitudinal edges of folded-in side flaps of such carton, comprising
1. means to guide the tape along a path extending toward and for lap of its uncoated back side against the outer surface of a wipe-on applicator cylindrical roller that is supported for movement toward and away from a carton travel path with the adhesively coated face exposed outward away from this roller for lapping its adhesively coated face against the leading end panel of an advancing carton and then longitudinally along either the top or bottom wall of this advancing carton,
2. swingable mounting means supporting said wipe-on roller for swing of the latter to effect such movement of it,
3. a guide plate secured to and floatingly mounted upon said swingable roller mounting means for simultaneous and like swing with said roller and having a guide face arranged along the rear side of the tape guide path when the uncoated back side of the tape travels therealong with its adhesive face facing away from said guide face at a near location preceding said applicator roller and with this plate face having a substantially medial longitudinal projecting rib flanked by substantially flat side surfaces to



stiffen-bow the adhesively coated tape face outward with flanking side edge zones of the back side of the tape gliding over said flat surfaces, the tape approach path at said face of the guide plate being at least relatively close to parallelism with a plane that is substantially tangential to the cylindrical surface of the applicator roller, and
4. means providing a very small sliding contact tip end bearing lightly against each of the pair of side zones of the tape adhesive side face with light biasing thereagainst to snug the side edge zones back against said side flat surfaces of said guide plate so as to maintain such stiffening bowing of said tape substantially until its back side laps against said cylindrical roller for substantially flop-free guidance of the tape to said applicator roller cylindrical surface and so that the latter smooths out the tape to substantially flat disposition by the lap thereagainst for substantially flat application to opposed carton surfaces against which this roller is rolled.

4,039,368

APPARATUS FOR SPLICING TOGETHER THE ENDS OF A PAIR OF STRIPS OF FILM OR TAPE

Rudolph Martin Hanke, Monheim, Germany, assignor to Hama Hamaphot K.G., Hanke & Thomas, Monheim, Germany

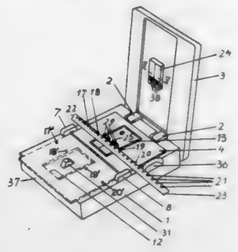
Continuation-in-part of Ser. No. 513,591, Oct. 10, 1974. This application July 15, 1976, Ser. No. 705,412
Int. Cl.[2] B31F *5/00*
U.S. Cl. 156—506 5 Claims

1. A film or tape splicer and cooperant splicing tab for splicing together the ends of a pair of to-be-joined strips comprising:
a base,
a flap for holding the strips in end-to-end adjacency,
means allowing swinging of the flap relative to the base between a rearward position of holding the strips in a face-up first position and a forward position of holding the strips in a face-down second position,

a three-part splicing tabe including first and second release limbs and hinged together first and second half portions of an adhesively-coated tab, the first and second release links being peelable from the respective first and second half portions,

first guide means for holding the splicing tab in position relative to the flap and the strips held thereby and facilitating the peeling of the first release limb away from the first half portion of the tab for the adhering of the first half portion of the tab on the exposed adjacent ends of the faces of the strips with the flap in rearward position,

second guide means for facilitating the peeling of the second



release limb away from the second half portion of the tab for adhering of the second half portion of the tab on the exposed adjacent ends of the backs of the strips with the flap in forward position,

a lid mounted on the base for pivotal movements between opened-non-cutting and closed-cutting positions,

a cutter carrried by the lid, and

a counter-member carried by the base and providing a counter-surface for cooperation with the cutter in the closed cutting position of the lid, the flap having an opening therethrough the counter-member being constituted by an anvil positoned on the base member for accommodation within the opening in the first position of the flap.

4,039,369

METHOD AND DEVICE FOR THE UNIFORM AND EVEN SPRAYING OF SURFACES IN A NON-CONTINUOUS PRODUCTION SYSTEM

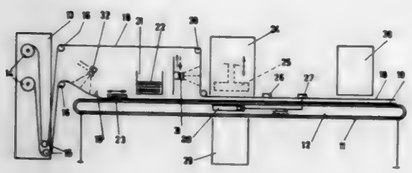
Arnoldus Josef Versteege, Boulevard Paulus Loot 77, Zandvoort, Netherlands

Filed June 15, 1976, Ser. No. 696,375

Claims priority, application Netherlands, June 26, 1975, 7507646

Int. Cl.² B32B *31/04*; B65C *11/04*

U.S. Cl. 156—551 **11 Claims**



1. A device for gluing plastic foil webs and equivalent material for forming laminates, which comprises supply spools for at least two webs, a conveyor belt for conveying said webs in spaced opposition to each other, a driving mechanism for intermittently moving said conveyor belt whereby during each said intermittent movement said conveyor belt is accelerated in a first phase, is moved with uniform motion in a second phase and is decelerated in a third phase, means for feeding reinforcing material between the two webs, at least one spray head for spraying glue on the surfaces of said webs to be glued, and means for applying substantially the same quantity of the glue in each of said three phases whereby the thickness of the glue coating is substantially uniform.

4,039,370

OPTICALLY MONITORING THE UNDERCUTTING OF A LAYER BEING ETCHED

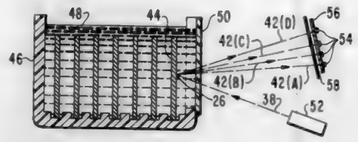
Hans Peter Kleinknecht, Bergdietikon, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed June 21, 1976, Ser. No. 698,481

Claims priority, application United Kingdom, June 23, 1976, 26614/76

Int. Cl.² H01L *21/306*

U.S. Cl. 156—626 **16 Claims**



1. A method of optically monitoring the undercutting of a layer of material being selectively etched beneath a pattern of masking material disposed thereon in an etchant comprising the steps of:

forming on a layer of the material being etched a diffraction grating pattern including spaced strips of masking material having a strip width W;

exposing said diffracion grating pattern, while positioned in said etchant, to a beam of monochromatic light, whereby said diffraction grating pattern and the layer of material therebeneath function as a relief pattern, diffracting said beam of monochromatic light into a diffraction spectrum including diffracted beams of various orders; and

monitoring certain of said diffracted beams to determine when a sharp decrease in the intensity thereof occurs, said sharp decrease indicating an undercutting equal to a distance of W/2.

4,039,371

ETCHANT FOR POLYIMIDES

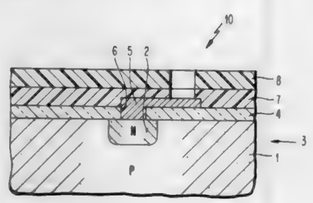
Friedrich Brunner, Sindelfingen; Peter Frasch, Boeblingen, and Friedrich Schwerdt, Burgwedel, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,709

Claims priority, application Germany, Sept. 18, 1975, 2541624

Int. Cl.² B29C *17/08*

U.S. Cl. 156—668 **3 Claims**



1. A process of etching a polyimide based polymer comprising contacting said polymer with an aqueous solution of a polyalkylammonium hydroxide and an organic acid selected from the group consisting of acetic acid, tartaric acid and oxalic acid.

4,039,372

BLEACH PLANT FILTRATE RECOVERY

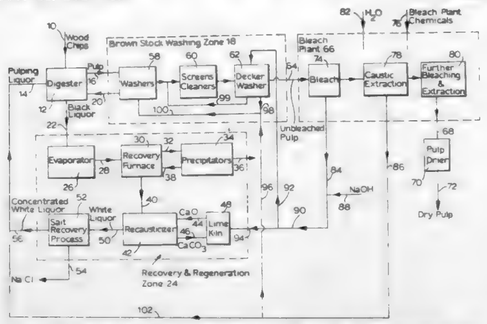
Douglas W. Reeve, Orton, Canada; Gordon Rowlandson, Appleton, Wis., and W. Howard Rapson, Scarborough, Canada, assignors to Erco Envirotech Ltd., Islington, Canada

Filed Mar. 9, 1976, Ser. No. 665,240

Claims priority, application United Kingdom, Mar. 11, 1975, 10016/75

Int. Cl.² D21C *3/26, 11/04*

U.S. Cl. 162—19 **13 Claims**



1. In a pulp mill system having a pulping and recovery and regeneration cycle and a bleaching and purification operation including the steps of

digesting raw cellulosic fibrous material in a pulping liquor,

washing the digested cellulosic fibrous material substantially free from spent pulping liquor,

forming an aqueous spent liquor containing spent pulping liquor and spent wash water from said washing step,

subjecting said aqueous spent liquor to furnacing to form a smelt,

subjecting said washed digested cellulosic fibrous material to said bleaching and purification operation using bleaching chemicals including chlorine atoms and sodium hydroxide extraction solutions,

washing said bleach and purified pulp substantially free from residual bleaching and purification chemicals,

recovering a washed, bleached and purified pulp from said bleaching and purification operation,

separating from said bleaching and purification operation an acid aqueous filtrate and an alkaline aqueous filtrate, said latter filtrates in combination including all the aqueous material introduced to said bleaching and purification operation less any water present in said washed, bleached and purified pulp,

introducing said latter filtrates to said pulping and recovery and regeneration cycle, whereby said smelt contains sodium chloride,

regenerating pulping liquor from the components of said smelt,

recycling said regenerated pulping liquor as at least part of said pulping liquor in said digestion step, and

separating solid sodium chloride from said pulping and recovery and regeneration cycle subsequent to said furnacing step and prior to said recycling step,

the improvement wherein said introduction of said filtrates to said pulping and recovery and regeneration cycle is carried out by:

neutralizing part only of said acid filtrate with fresh aqueous sodium hydroxide solution for use as wash water,

using said neutralized filtrate as wash water for washing said digested cellulosic fibrous material in the portion of said washing step immediately prior to passage of washed pulp to said bleaching and purification operation, and

using part only of said alkaline filtrate as wash water for washing said digested cellulosic fibrous material prior to said washing with said neutralized filtrate in the remainder of said washing step, whereby said washing step is carried out wholly by said neutralized filtrate and said part of said alkaline filtrate.

4,039,373

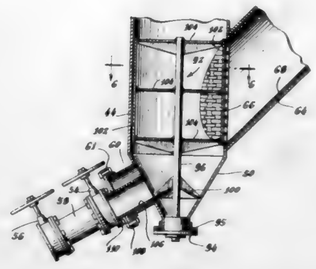
STATIC DISCHARGE DEVICE AND METHOD FOR FIBER DISCHARGE FROM A PRESSURIZED DIGESTER

Johan L. Michelsen, Minnetonka, Minn., assignor to American Defibrator, Inc., Minneapolis, Minn.

Filed Dec. 31, 1975, Ser. No. 645,673

Int. Cl.² D21C *7/08*

U.S. Cl. 162—52 **12 Claims**



1. In a discharge device for discharging fibrous material from a continuous pressurized system by the cold blow method utilizing the system pressure to blow the fibrous material to a blow tank through a blow valve orifice, the improvement of a static discharger eliminating discharge device moving parts while minimizing plugging of blow valves comprising:

a. a vertical casing having connection means for connection to the pressurized system for receiving a stream of fibrous material therefrom;

b. a pair of valve means for opening and closing a cylinder forming a hollow chamber positioned therebetween;

c. the valve means and hollow chamber forming a scrap collector assembly means connected to the bottom of the casing, whereby nonbuoyant foreign bodies in the stream will sink and collect in the chamber between the valves wherefrom they may be removed by appropriate valving operations without interrupting the flow of fibrous material through the discharge conduit means;

d. a discharge conduit for connection to the blow valve means extending from the casing at a location above the scrap collector assembly means for discharge of fibrous material therefrom;

e. a grid plate covering the intersection between said discharge conduit means and said vertical casing, having openings therein to prevent passage of objects that would clog the blow valve;

f. fluid conduit means connected to said vertical casing at a location above the intersection of said discharge conduit means for introducing flooding liquid into said casing and to maintain a liquid suspension of fibrous pulp material at a predetermined level therein.

10. An improved method for discharging fibrous material from a continuous pressurized system utilizing the system pressure to blow the fibrous material to a blow tank through a blow valve orifice comprising:

passing a stream of fibrous material from the system to a vertical casing,

introducing a flooding liquid into the casing to maintain a liquid suspension of fibrous material at a predetermined level therein,

passing the liquid suspension of fibrous material through an apertured grid plate and into a conduit means connected to said casing at a location above a scrap collector to screen out objects of a predetermined size, while permitting nonbuoyant foreign object impurities in the stream to sink to the scrap collector positioned beneath the casing,

causing screened fibrous material to pass through the con-

duit means to the blow valve, said grid plate preventing passage of objects that would clog the blow valve,

periodically isolating the scrap collector from the casing and removing the foreign bodies therein.

4,039,374

BLEACHING OF CELLULOSIC PULP FIBERS WITH CHLORINE DIOXIDE IN THE PRESENCE OF A VANADIUM COMPOUND

Howard Deutsch, Forsyth, Ga., and John D. Shoemaker, Jr., Trenton, N.J., assignors to Union Camp Corporation, Wayne, N.J.

Filed Aug. 29, 1975, Ser. No. 609,039
Int. Cl.[2] D21C *9/14*
U.S. Cl. 162—79 **8 Claims**

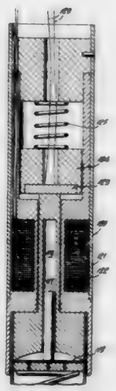
1. A process for the delignification and bleaching of cellulosic pulp fibers which comprises; the step of mixing said pulp fibers with chlorine dioxide in the presence of a vanadium compound containing vanadium in the +4 or +5 oxidation state so as to provide a final pH in the mixture of less than about 3.0 whereby brightness reversion of resultant bleached and delignified pulp fibers is inhibited after consumption of chlorine dioxide.

4,039,375

DETECTION OF FUEL ROD LEAKAGE

Dan C. Worlton, deceased, late of Richland, Wash. (by June S. Worlton, administratrix), and Dan L. Robinson, Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Division of Ser. No. 422,383, Dec. 6, 1973, Pat. No. 3,969,187, which is a continuation-in-part of Ser. No. 251,936, May 10, 1972, abandoned. This application June 20, 1975, Ser. No. 588,858
Int. Cl.[2] G21C *17/00*
U.S. Cl. 176—19 LD **5 Claims**



1. A system for the detection of leakage of fission product gases from a fuel rod comprising in combination:

a. a hollow longitudinal body containing nuclear fuel for producing fission product gases;

b. a lower end cap attached to and sealing the lower end of said body;

c. an upper end cap assembly attached to and sealing the upper end of said body, said assembly comprising:

i. end cap means extending longitudinally upward from said upper end and having a concave lower surface facing said fuel and including a first cavity extending upward from said lower surface and terminating in said end cap means above said upper end of said body,

ii. resilient, flexible means operably disposed in said hollow body below and in contact at its edges with said concave lower surface to form a second cavity between said concave lower surface and one side of said flexible means into which said resilient, flexible means can flex, and sealing at least said second cavity from the portion of said hollow body located below said flexible means, said flexible means being flat in its undistorted position, and

iii. rigid means operably in contact with the inner surface of said hollow body adjacent to said resilient, flexible means on the side thereof opposite said second cavity, said rigid means having at least one bleed hole which allows any gases developed in said hollow body to contact said flexible means, and

iv. contact means having at least a portion thereof normally located in said first and second cavities with one end in contact with said resilient, flexible means, said contact means being freely movable in said first cavity and inducing vibrations in said flexible means when said contact means is raised into said first cavity and thereafter dropped into contact with said flexible means whereby the frequency of said vibrations is a function of pressure applied to the opposite side of said resilient, flexible means, and

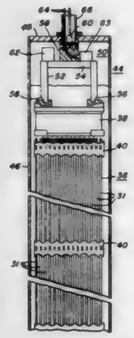
v. energizable means for raising said contact means into said first cavity spaced longitudinally from said flexible means and for permitting said contact means to drop freely from said first cavity into contact with said resilient, flexible means.

4,039,376

METHOD AND APPARATUS FOR INSPECTION OF NUCLEAR FUEL RODS

William J. Wachter, 3157 Bel Air Drive, Pittsburgh, Pa. 15227

Filed June 24, 1974, Ser. No. 481,961
Int. Cl.[2] G21C *17/06*
U.S. Cl. 176—19 LD **8 Claims**



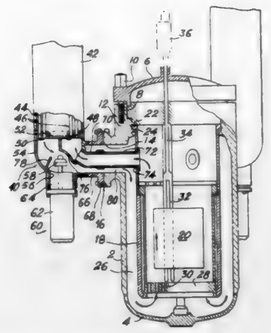
5. Apparatus for detecting defective nuclear fuel rods immersed in a liquid, said fuel rods containing fuel pellets and a fluid, said apparatus comprising means for effecting a change in the relative pressures of the liquid around the fuel rods and of said fluid such that the pressure of the fluid is higher than that of the liquid, means for detecting vibration of the fuel rods induced by emission of material from a rod into the liquid external means for further vibrating said fuel rods, and means for detecting emission of additional material expelled from said fuel rods due to said further vibrating.

4,039,377

NUCLEAR BOILER

Jean-Louis Andrieu, Paris; Yves Bonnet, Versailles, and Michel Viaud, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 18, 1975, Ser. No. 559,542
Claims priority, application France, Mar. 20, 1974, 74.09517; Aug. 22, 1974, 74.28862
Int. Cl.[2] G21C *19/28*
U.S. Cl. 176—65 **7 Claims**



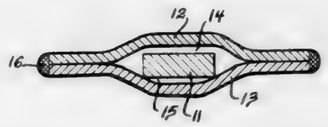
1. A nuclear boiler, comprising a vertical pressure vessel which is provided with a closed bottom and a closure head at the top, a reactor core in the vessel, a heat exchanger through which liquid can be circulated to cool said reactor core, a pump for circulating said liquid located external of the pressure vessel and below the closure head, a flange located on the outer surface of the pressure vessel and in the upper portion thereof above the reactor core for providing a junction and a supporting surface therein to which the heat exchanger is connected, a nozzle in the flange for proving access to the interior of the pressure vessel, the heat exchanger further being located entirely above said nozzle and the input thereto being located below the closure head, first liquid conducting means for connecting the outlet of the reactor core with the inlet of the heat exchanger through said nozzle, second liquid conducting means for connecting the outlet of the heat exchanger with the inlet of the pump, and third liquid conducting means for connecting the outlet of the pump with the inlet of the reactor core.

4,039,378

PU-ZR ALLOY HIGH-TEMPERATURE ACTIVATION-MEASUREMENT FOIL

Franklin D. McCuaig, Westmont, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Division of Ser. No. 451,615, March 15, 1974. This application Oct. 26, 1976, Ser. No. 735,566
Int. Cl.[2] G21C *3/02*; G01T *3/00*
U.S. Cl. 176—70 **4 Claims**



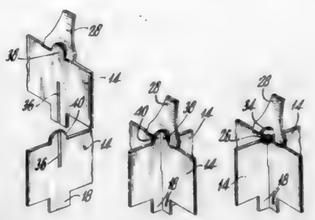
1. A high-temperature activation-measurement foil comprising: a fuel alloy foil core sandwiched and sealed between two cladding material jackets, wherein said fuel alloy foil is from about 7 to about 4 weight percent zirconium, balance plutonium, and said fuel alloy foil core is from 0.005 to 0.0005 inch thick.

4,039,379

MIXING VANE GRID SPACER

John F. Patterson, and Kirk P. Galbraith, both of Richland, Wash., assignors to Exxon Nuclear Company, Inc., Bellevue, Wash.

Filed Feb. 28, 1975, Ser. No. 554,000
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—76 **11 Claims**



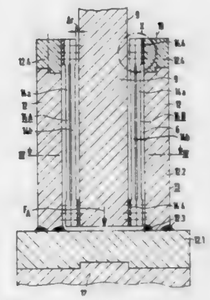
1. A grid spacer for a nuclear fuel reactor comprising intersecting spring retaining strips forming a plurality of fuel element receiving openings and having mixing vanes at selected ones of the intersections of said strips, said vanes being angularly disposed relative to said strips and overlying predetermined ones of said openings at said intersections, wherein the improvement comprises a plurality of said vanes each having a substantially unobstructed opening located in the bottom end thereof above said intersections for substantially minimizing the coolant flow separation on the downstream side of said vanes.

4,039,380

NUCLEAR REACTOR PRESSURE VESSEL INSTALLATION

Elmar Harand, Hochstadt, and Eberhard Michel, Nurnberg, both of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed June 26, 1975, Ser. No. 590,677
Claims priority, application Germany, July 3, 1974, 2432011
Int. Cl.[2] G21C *13/04, 9/00*
U.S. Cl. 176—87 **8 Claims**



1. A nuclear reactor pressure vessel installation comprising a vertical pressure vessel which is subjected axially and radially to thermal expansion forces when heated, the vessel having an upper portion and means for holding the upper portion against upward motion, the vessel having a lower portion and a second means for holding the lower portion against downward motion, axial expansion of the vessel placing it under axial stress, said second means being formed by a plurality of leaf springs positioned substantially vertically and having top and bottom

ends, the bottom ends being fastened to the lower portion of the vessel, and means for supporting the springs' top ends so that the vessel is suspended by the springs with the springs carrying said axial stress in tension, the springs being free for cantilever motion permitting radial expansion of the vessel, the vessel's aforesaid lower portion being formed as a circumferential skirt depending from the vessel, the skirt having a bottom end to which the spring's bottom ends are fastened, said skirt having radially inner and outer sides and the springs forming sets of inner and outer springs respectively positioned on the skirt's inner and outer sides.

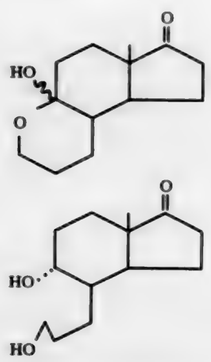
4,039,381

COMPOSITION OF MATTER AND PROCESS

John C. Knight, and Merle G. Wovcha, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 17, 1975, Ser. No. 632,635
Int. Cl.² C07B *29/00*
U.S. Cl. 195—51 S **24 Claims**

17. A process for preparing a fermentation beer containing compounds of the formulae



which comprises cultivating *Mycobacterium fortuitum* NRRL B-8129 in an aqueous medium under aerobic conditions in the presence of a steroid with or without a 17-alkyl side chain containing from 2 to 10 carbon atoms, inclusive.

4,039,382

IMMOBILIZED RIBONUCLEASE AND ALKALINE PHOSPHATASE

Minh-Nguy Thang, Bagneux, and Annie Guissani born Trachtenberg, Fresnes, both of France, assignors to Choay S. A., Paris, France

Filed Apr. 19, 1976, Ser. No. 678,459
Claims priority, application France, Apr. 23, 1975, 75.12667
Int. Cl.² C07G *7/02*; C12B *1/00*
U.S. Cl. 195—28 N **16 Claims**

1. An insoluble solid matrix carrying simultaneously more than one different enzymatic function, consisting essentially of:

an activated solid insoluble matrix support, non-denaturing for the enzymes to be attached thereto;

a nuclease, selected from the group consisting of ribonucleases A, T_1, T_2 and U_2; and

an alkaline phosphatase,

said nuclease and said alkaline phosphatase being irreversibly bound to said matrix support, wherein the enzyme-bound matrix has no non-neutralized free activated groups thereon.

13. Process for obtaining polymers A_nU_{OH}, A_nC_{OH}, A_nG_{OH} and/or oligonucleotides U, C, A or G, of predetermined lengths, said process comprising:

fractionating a polyribonucleotide by incubation with the insoluble solid matrix carrying simultaneously more than one different enzymatic function in accordance with claim **1.**

4,039,383

PROCESS FOR PRODUCING MALTOPENTAOSE

Thomas John Pankratz, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 9, 1976, Ser. No. 675,649
Int. Cl.² C12D *13/02*
U.S. Cl. 195—31 R **12 Claims**

1. A process for producing maltopentaose comprising the steps of:

a. dissolving amylose in a first organic solvent capable of dissociating and dissolving said amylose to form a first solution;

b. mixing said first solution with an aqueous acid solution capable of partially hydrolyzing said dissociated amylose to form a second solution;

c. heating said second solution to partially hydrolyze said dissociated amylose into lower molecular weight segments;

d. mixing said second solution containing said partially hydrolyzed amylose with a second organic solvent capable of stripping the first organic solvent from the hydrolyzed amylose to form a third solution, and allowing a precipitate to form in said third solution;

e. collecting, washing and drying said precipitate to form water-soluble amylose;

f. mixing amylase obtained from *Bacillus licheniformis* and said soluble amylose in a buffered aqueous solution to form a fourth solution;

g. incubating said fourth solution for a time sufficient to obtain a fifth solution containing a high percentage of maltopentaose;

h. deactivating the amylase in said fifth solution; and

i. fractionating said fifth solution to obtain a sixth solution rich in maltopentaose.

12. A process for producing maltopentaose comprising the steps of:

a. dissolving amylose in dimethyl sulfoxide to form a first solution;

b. mixing said first solution with an aqueous solution of sulfuric acid to dissociate said amylose and form a second solution;

c. heating said second solution to hydrolyze said dissociated amylose into lower molecular weight segments;

d. mixing said second solution with a second organic solvent containing materials selected from the group consisting of acetone, methanol and mixtures thereof to form a third solution and allowing a precipitate containing maltopentaose to form in said third solution;

e. collecting, washing and drying said precipitate to form soluble amylose;

f. mixing amylase obtained from *Bacillus licheniformis* and said soluble amylose in a buffered aqueous solution to form a fourth solution;

g. incubating said fourth solution at an elevated temperature for a time sufficient to obtain a fifth solution containing a high percentage of maltopentaose;

h. deactivating the amylase in said fifth solution;

i. fractionating said fifth solution on a separation column to obtain a sixth solution rich in maltopentaose; and

j. drying said sixth solution to obtain a solid maltopentaose containing product.

4,039,384

CREATININE AMIDOHYDROLASE AND CREATINE AMIDINOHYDROLASE AND PROCESS FOR PRODUCING THEM

Masaru Suzuki, Kashiwa, and Narimasa Saito, Noda, both of Japan, assignors to Noda Institute for Scientific Research, Noda, Japan

Filed Mar. 24, 1976, Ser. No. 669,757
Claims priority, application Japan, Apr. 5, 1975, 50-40792; Apr. 5, 1975, 50-40793
Int. Cl.² C12D *13/10*; C07G *7/02*; C12K *1/00*
U.S. Cl. 195—62 **16 Claims**

1. Creatinine amidohydrolase of which K_m value (Michaelis constant) for creatinine is 3.45×10^{-2} moe (37° C, pH 6.5), K_m value for creatine is 4.35×10^{-2} mole (37° C, pH 6.5), stable pH range is 7.0 – 9.5, optimum pH is 6.5, action temperature range is 40° – 70° C, optimum action temperature is 65° C, and molecular weight is about 150,000.

4,039,385

CARDIAC GLYCOSIDE ENZYME CONJUGATES

Edwin F. Ullman, Atherton, and Kenneth E. Rubenstein, Menlo Park, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 481,022, June 20, 1974, abandoned, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Jan. 19, 1976, Ser. No. 649,942
Claims priority, application United Kingdom, May 15, 1972, 22778/72; Canada, May 10, 1972, 141803; France, May 12, 1972, 72.17130; Switzerland, May 12, 1972, 7097/70; Sweden, May 8, 1972, 6049/72; Germany, May 12, 1972, 2223385
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 **13 Claims**

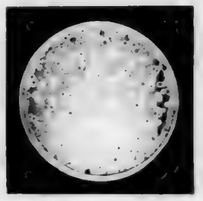
1. A conjugate of a cardiac glycoside or aglycone from digitalis to an enzyme wherein both of said cardiac glycoside or aglycone are derived from digitalis and are bonded at other than the active site of said enzyme, wherein said enzyme retains a substantial proportion of the activity of said enzyme prior to conjugation.

4,039,386

METHOD FOR DETERMINING THE VIABLE BACTERIA COUNT OF FOOD AND A MEDIUM FOR ACCOMPLISHING THE METHOD

Katsuhiro Ogasa; Seiichi Shimamura, both of Yokohama, and Hiroshi Miyagawa, Kamakura, all of Japan, assignors to Morinaga Milk Industry Co., Ltd., Tokyo, Japan

Filed Apr. 2, 1976, Ser. No. 673,294
Int. Cl.² C12K *1/10*
U.S. Cl. 195—100 **2 Claims**



1. A method for the quantitive determination of the viable bacteria count of food which is contaminated with spreading-colony forming bacteria by incubating said food in a liquified agar medium and subsequently counting the bacteria colonies, wherein the spreading of the bacteria colonies during incubation is inhibited by incubating said food in a liquified agar medium which contains from 0.005 to 0.1 grams of 2,3,5-triphenyl tetrazolium chloride per liter of said liquified agar medium.

2. A powdered agar medium for the quantitive determination fo the viable bacterial count of food which is contaiminated with spreading colony forming bacteria which comprises a nitrogen source, a carbon source, a phosphorous source, an ash source and an amount of 2,3,5-triphenyl tetrazolium chloride sufficient to yield a concentration of from 0.005 to 0.1 gram per liter when the agar medium is dissolved in water to inhibit colony spreading.

4,039,387

MEDIUM AND METHOD FOR DISTINGUISHING *NEISSERIA GONORRHOEAE* AND *NEISSERIA MENINGITIDIS*

Lynn B. Simpson, Corning, and Milton M. Takeguchi, Painted Post, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed July 1, 1976, Ser. No. 701,891
Int. Cl.² C12K *1/10, 1/06*
U.S. Cl. 195—100 **10 Claims**

1. A microbial growth medium specific to gonococci and meningococci bacteria, the medium having incorporated therein 8-anilino-1-naphthalene-sulfonic acid or a salt thereof in a quantity sufficient to permit the growth of meningococci bacteria and inhibit the growth of gonococci bacteria, the amount of 8-anilino-1-naphthalene-sulfonic acid or a salt thereof being at least about 0.08 mg./ml. of medium.

5. A method for the definitive identification of *Neisseria gonorrhoeae* in a specimen, the method comprising the steps of:

A. incubating one portion of the specimen with a microbial growth medium specific to gonococci and meningococci bacteria; and

B. incubating another portion of the specimen with a microbial growth medium specific to gonococci and meningococci bacteria and containing 8-anilino-1-naphthalene-sulfonic acid, or a salt thereof, in an amount sufficient to permit the growth of meningococci bacteria and inhibit the growth of gonococci bacteria.

4,039,388

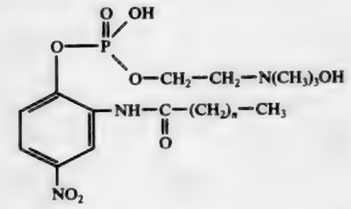
DIAGNOSTIC TEST FOR NIEMANN-PICK DISEASE

Andrew E. Gal, Vienna, Va., and Roscoe O. Brady, Bethesda, Md., assignors to The United States of America as represented by the Government, Washington, D.C.

Filed June 4, 1976, Ser. No. 692,913
Int. Cl.² G01N *31/14*
U.S. Cl. 195—103.5 R **11 Claims**

1. A chromogenic method for determining the sphingomyelinase activity in an extract of human cells or tissues for use in the diagnostic testing for Niemann-Pick disease, comprising the steps of:

a. forming an aqueous incubation mixture of said extract and a sphingomyelinase-specific chromogenic artificial substrate consisting of a 2-alkanoylamino-4-nitrophenyl phosphorylcholinehydroxide having the formula



wherein *n* is an integer from 10 to 18, inclusive;

b. incubating said mixture for a determinate time period, whereby sphingomyelinase-catalyzed hydrolysis of said substrate into the corresponding 2-alkanoylamino-4-nitro-

phenol and phosphorylcholine takes place in an amount proportional to the sphingomelinase activity in said extract;

c. alkalinizing said mixture so as to convert all of said 2-alkanoylamino-4-nitrophenol formed in step (b) into the alkali salt thereof, said alkali salt imparting to said mixture a bright yellow color whose intensity is proportional to the amount of said substrate that has been hydrolyzed;

d. precipitating and removing from said mixture the entire protein content in said mixture, thereby leaving a clear supernatant solution having the color developed in step (c);

e. measuring said protein content which was removed from said mixture in step (d); and

f. measuring the optical density of said clear supernatant solution to thereby quantitatively determine the amount of said substrate that has been hydrolyzed;

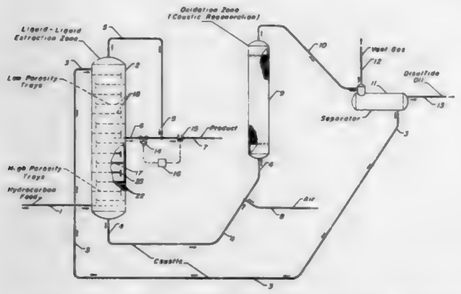
whereby the sphingomyelinase activity in said extract may be determined as the number of nanomoles of said substrate that has been hydrolyzed per hour of said incubation time period per milligram of protein as measured in step (e).

4,039,389

LIQUID-LIQUID EXTRACTION APPARATUS

William J. Christman, Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Nov. 3, 1975, Ser. No. 627,989
Int. Cl.² B01D *11/04*; C10G *19/08*
U.S. Cl. 196—14.52 **1 Claim**



1. An extraction column for the countercurrent contacting of an upward flowing hydrocarbon feed stream, which passes through extracting trays, and a downward flowing aqueous stream, which passes through downcomer means, comprising:

a. a vertically orientated outer vessel having an enclosed internal volume in the shape of a right-angle cylinder;

b. a first plurality of vertically spaced apart extraction trays horizontally traversing the internal volume in an upper portion of the outer vessel and having contacting areas designed for maximum extraction efficiency at a first rate of upward hydrocarbon flow, each of said plurality of said extraction trays having a chordal downcomer means operatively associated therewith, and each of said first plurality of extraction trays having a first number of uniform perforations of a preselected cross-sectional area distributed across the contacting area of said tray;

c. a second plurality of vertically spaced apart extraction trays horizontally traversing the internal volume below the first plurality of extraction trays and having contacting areas designed for maximum extraction efficiency at a second and greater rate of upward hydrocarbon flow, each of said second plurality of extraction trays having a chordal downcomer means operatively associated therewith, and each of said second plurality of extraction trays having a second number of uniform perforations of said preselected cross-sectional area distributed across the contacting area of said tray, said second number of uniform perforations being greater than said first number of uniform perforations;

d. an inlet means for the aqueous stream operatively communicating with the internal volume at the point above the first plurality of extraction trays;

e. an inlet means for the hydrocarbon feed stream operatively communicating with the internal volume at a point below the second plurality of extraction trays;

f. an outlet means for a liquid extract stream operatively communicating with the internal volume at a point below the second plurality of extraction trays;

g. an outlet means for a first raffinate stream operatively communicating with the internal volume at a point above the first plurality of extraction trays; and,

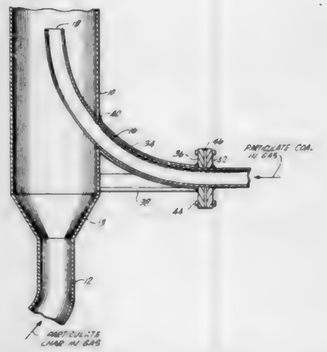
h. an outlet means for a second raffinate stream mounted in operative relation to remove upward rising hydrocarbons from the internal volume at a point between the first plurality of extraction trays and the second plurality of extraction trays.

4,039,390

FEED SYSTEM FOR PYROLYSIS REACTORS

Forrest E. Logan, Claremont, Calif., assignor to Occidental Petroleum Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 396,752, Sept. 13, 1973, abandoned. This application May 5, 1976, Ser. No. 683,301
Int. Cl.² C10B *49/22*
U.S. Cl. 201—12 **65 Claims**



1. In a pyrolysis system including a pyrolysis reactor and a system which transports a flow of hot particulate material suspended in a gaseous carrier of the reactor, an improved system for feeding particulate carbonaceous material into the pyrolysis reactor which comprises:

a. at least one circularly arcuate feed tube means, a portion which is extendible through an opening in a side wall of the reactor for providing a discharge end positioned in the reactor;

b. means for coupling an end opposed to the discharge end of the feed tube means to a source of particulate carbonaceous material suspended in a non-deleteriously reactive carrier gas for injection into the reactor;

c. at least one circularly arcuate support sleeve extending outwardly from the external wall of the pyrolysis reactor about an opening therein, said support sleeve receiving said circularly arcuate feed tube means in close slidable relation and preventing rotation of the feed tube means relative to the internal walls of the reactor to cause discharge of carbonaceous material from the feed tube means cocurrent to the flow of hot particulate material within the reactor; and

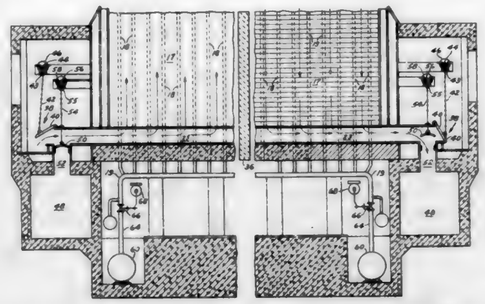
d. means on the support sleeve to control the extension of the feed tube means into the reactor; said feed tube means at least being circularly arcuate from the point of said means on the support sleeve for controlling the extension into the reactor to the discharge end of said feed tube means in the reactor.

4,039,391

COKE OVEN BATTERY AND METHOD FOR OPERATION ON A SLOW-DOWN BASIS

Wayne C. Gensler, Allentown, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 19, 1976, Ser. No. 687,778
Int. Cl.² C10B *57/00, 21/10*
U.S. Cl. 201—36 **6 Claims**



1. In a horizontal regenerative coke oven battery including a plurality of parallel heating walls and a coking chamber between each pair of said heating walls, the improvement comprising:

a. a plurality of independent regenerator means operably connected to a plurality of groups of said heating walls, one regenerator means for each group of heating walls, each said independent regenerator means having end partitions extending across the width of said battery and from the base to the top of said regenerator means to restrict combustion air and waste gas flowing therein to only said independent regenerator means and only said group of heating walls operably connected thereto;

b. a separate reversal means for each independent regenerator means and its operably connected group of heating walls for independent reversal of each group of heating walls during a reversal period; and

c. timing means for said separate reversal means for providing a neutral time in each reversal period wherein flow of gas, combustion air, and waste gas through a group of heating walls can be substantially stopped, while full flow of gas, combustion air, and waste gas can simultaneously take place in the remainder of said groups of heating walls.

4. A method of operating at a reduced coking rate a regenerative coke oven battery wherein the direction of flow of gases comprising air, fuel gas, and waste gas through heating walls is reversed at the end of a predetermined reversal period comprising:

a. providing said battery as a plurality of separate groups of heating walls;

b. stopping substantially all flow of said gases in a first of said groups of heating walls for a predetermined portion of a reversal period;

c. simultaneously providing full flow of said gases in the remainder of said groups of heating walls;

d. at the end of said predetermined portion of a reversal period stopping substantially all flow of said gases in a different group of heating walls; and

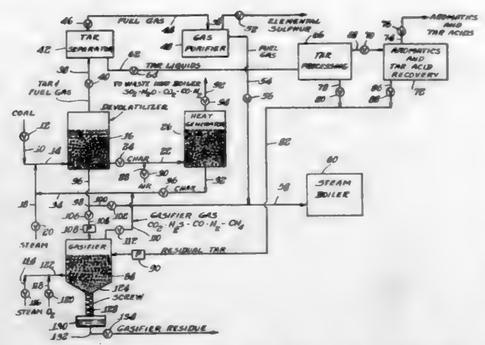
e. simultaneously providing full flow of said gases in the remainder of said groups of heating walls.

4,039,392

PROCESS AND APPARATUS FOR PRODUCING CHAR AND CO-PRODUCTS FROM COAL AND THE LIKE

Alamjit D. Singh, P.O. Box 1679, Chicago, Ill. 60690

Continuation of Ser. No. 403,423, Oct. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 175,932, Aug. 30, 1971, abandoned. This application May 27, 1975, Ser. No. 580,561
Int. Cl.² C10B *1/04*
U.S. Cl. 202—93 **8 Claims**



1. Apparatus for producing char from coal comprising a chamber forming a devolatilizer, means for introducing coal into the devolatilizer, means to produce a char in the devolatilizer, a chamber forming a heat generator, means for transmitting char from the devolatilizer to the heat generator, means for burning char in the heat generator at a controlled rate to thereby determine the temperature of the char, means for transmitting char at said controlled temperature from the heat generator into the coal introducing means, for transmission with the coal to the devolatilizer, said devolatilizer and heat generator forming a char interchange system, a gasifier, means for transmitting char from said interchange system to the gasifier, means for transmitting char from the gasifier, means for extracting volatiles including fuel gas from the devolatilizer, processing means for extracting sulphur from the fuel gas, and means for mixing at least a portion of the processed fuel gas with the char from the gasifier to provide a reduced sulphur combustion product for transmission to a station for use.

4,039,393

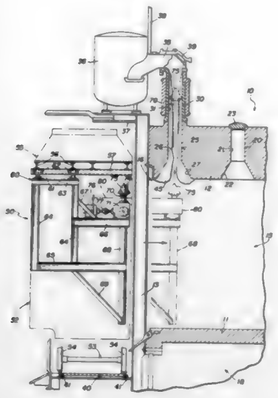
APPARATUS FOR CLEANING COKE OVEN ASCENSION PIPE

Robert C. Rankin, Munster, Ind., assignor to Interlake, Inc., Oak Brook, Ill.

Filed July 21, 1976, Ser. No. 707,369
Int. Cl.² C10B *43/06*; B08B *1/00*
U.S. Cl. 202—241 **14 Claims**

1. Apparatus for cleaning the exhaust port and the ascension pipe of a coke oven chamber, said apparatus comprising an elongated shaft, support means for supporting said shaft and positioning it in the coke oven chamber beneath the associated exhaust port substantially coaxially therewith and with the associated ascension pipe, a cleaning head carried by said shaft at the upper end thereof and having a maximum outer diameter only slightly less than the inner diameter of the associated exhaust port and ascension pipe, and drive means carried by said support means and coupled to said shaft for effecting reciprocating movement thereof between a retracted position wherein said cleaning head is disposed beneath the associated exhaust port and a fully extended position wherein said clean-

ing head is disposed within the ascension pipe adjacent to the upper end thereof, thereby to effect loosening and removal of



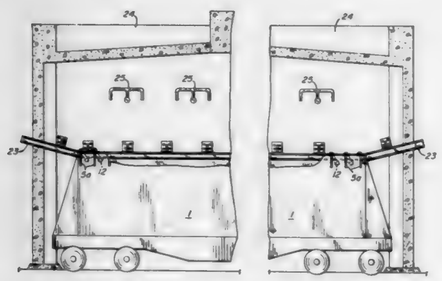
material deposited on the inner surfaces of the associated exhaust port and ascension pipe.

4,039,394

SLATTED TOP QUENCH CAR

Donald L. Friend, Allison Park, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 8, 1976, Ser. No. 664,774
Int. Cl.² C10B *39/08, 39/14, 45/00*
U.S. Cl. 202—262 **25 Claims**



1. A covered quench car for receiving incandescent coke from a coke oven and transporting it to a quenching site for quenching comprising

a. a quench car including walls for containing coke and an open top, and

b. means for closing said open to top comprising:

i. a plurality of slats having substantially parallel edges transversing the top of said quench car, said slats having sufficient width to permit the opposing edges thereof to cooperate to form a closure which prevents the emission of fumes into the atmosphere above said car; and

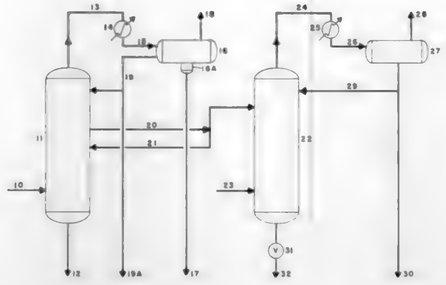
ii. means for opening at least some of said slats to permit coke to pass into said quench car from above and to close said slats after coke is received in said car.

4,039,395

PURIFICATION OF ACETIC ACID

Roy T. Eby, Texas City, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 11, 1975, Ser. No. 603,825
Int. Cl.² C07C *53/08;* **B01D** *3/34*
U.S. Cl. 203—38 **10 Claims**



1. A process for the removal and recovery of iodine-containing components and the drying of acetic acid which consists of

a. introducing a stream of acetic acid containing water, methyl iodide and hydrogen iodide into a first distillation zone intermediate the ends thereof,

b. removing as an overhead fraction from said first distillation zone the major proportion of the methyl iodide and a portion of the water,

c. removing from the bottom of said first distillation zone the major proportion of the hydrogen iodide,

d. withdrawing a stream from the middle section of said first distillation zone and introducing at least a portion of said stream into the upper section of a second distillation zone,

e. introducing a stream of methanol into the lower section of said second distillation zone,

f. removing overhead from said second distillation zone a stream containing the remainder of the water and methyl iodide present together with any methyl acetate generated by the addition of excess methanol into said zone, condensing said stream, returning a portion thereof as reflux to said second distillation zone and removing the remaining portion thereof from said secnd distillation zone, and

g. removing at or near the bottom of said second distillation zone a product acetic acid essentially dry and substantially free of hydrogen iodide and methyl iodide.

4,039,396

METHOD FOR MANUFACTURING A SEAMLESS CYLINDRICAL SCREEN GAUZE

Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

Filed Dec. 5, 1975, Ser. No. 638,062
Claims priority, application Netherlands, Dec. 24, 1974, 7416890
Int. Cl.² C25D *1/02, 1/08*
U.S. Cl. 204—11 **6 Claims**

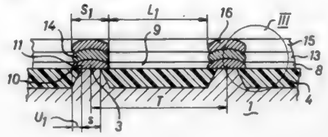
1. A method of manufacturing a seamless cylindrical metalized screen gauze from fibres comprising the steps of supporting upon a cylindrical surface a plurality of disordered fibres to define a fleece, temporarily adhering the fibres to the surface, precipitating metal upon the fibres by a glavanoplastic process while the fibres are adhered to the surface to embed the fibres in metal, eliminating the adherence of the fibres to the cylindrical surface, and removing the metal reinforced cylindrical gauze from the supporting cylindrical surface to provide a thin cylindrical screen.

4,039,397

PROCESS FOR PRODUCING SCREEN MATERIAL

Martin Klemm, Wiler near Utzenstorf, Switzerland, assignor to Fritz Buser AG Maschinenfabrik, Switzerland

Filed Apr. 28, 1976, Ser. No. 681,284
Claims priority, application Switzerland, May 2, 1975, 5645/75
Int. Cl.² C25D *1/08, 5/02*
U.S. Cl. 204—11 **8 Claims**



1. A process for the production of screen material by means of electrodeposition of metal on a smooth surfaced matrix having conductive and non-conductive areas on said surface, said process comprising the steps of:

depositing a first partial layer of said metal on said conductive areas of said matrix to a depth substantially less than the desired screen material thickness; then

coating the exposed surfaces, including the top and sides, of said first partial layer of said metal with an electrically insulating material;

stripping said insulating material from the top surface of said first partial layer; and then

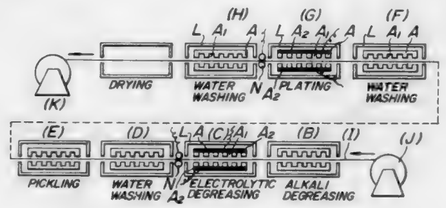
depositing a second partial layer of said metal on that portion of said first partial layer exposed by said stripping step.

4,039,398

METHOD AND APPARATUS FOR ELECTROLYTIC TREATMENT

Kiyoto Furuya, Yokohama, Japan, assignor to Daiichi Denshi Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 605,024
The portion of the term of this patent subsequent to Mar. 29, 1994, has been disclaimed.
Int. Cl.² C25D *5/02, 5/04, 17/00*
U.S. Cl. 204—15 **21 Claims**



1. An electrolytic treating method comprising steps of feeding a material in succession through a series of units for electrolytic processes and other processes in connection therewith, said units being provided with through passages for said material and passages for treating liquids and the units for said electrolytic processes being further provided with electrodes for causing electric current to flow through said treating liquid between said material and electrodes; causing treating liquids to flow through said respective passages for said treating liquids of said units; restricting the flow to a plurality of discrete small volume straight line paths transverse the direction of travel of said material and in a direction perpendicular thereto and causing electric current to flow between said material and electrodes in the direction of travel of said material while the treating liquids flow transverse the same thereby continuously effecting said series of processes on said material.

8. A method as set forth in claim **1** wherein only one surface of said material is treated so as to minimize the volume of treating fluid required completely to effect treatment.

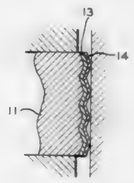
9. An electrolytic treating apparatus for effecting in succession electrolytic processes and other processes in connection therewith, said apparatus comprising a series of treating units respectively for said electrolytic processes and other processes in connection therewith, said treating units being arranged in row in the order of the processes, said treating units, each consisting of identical first and second unit halves seated one upon the other, said unit halves comprising first means defining a through passage for feeding said material and second means defining at least one insulating passage for flowing a treating liquid onto surfaces of said material transferred through said through passage, said insulating passage being formed as a plurality of discrete chambers disposed relative to said through passage to direct treating fluids in a straight line path transverse the flowing material and perpendicular to the direct of travel thereof, and said units for said electrolytic processes being further provided with electrodes for causing electric current to flow between the electrodes and the material.

4,039,399

METHOD OF MAKING A BEARING SURFACE

William Patrick Wallace, Hagerstown, and Anthony George Angilella, Richmond, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Division of Ser. No. 123,316, March 11, 1971, Pat. No. 3,770,286. This application May 29, 1973, Ser. No. 364,983
Int. Cl.² C25D *7/04*
U.S. Cl. 204—25 **7 Claims**



1. A method of forming a bearing surface which comprises the steps of: (a) electrodepositing on a metallic substrate a first layer of chromium having a Vicker's hardness in excess of 775; (b) electrodepositing a second layer of microcracked chromium having a Vicker's hardness in excess of 775 on said first layer; and (c) etching the outer surface of said second layer to provide said surface finely porous and friable.

4,039,400

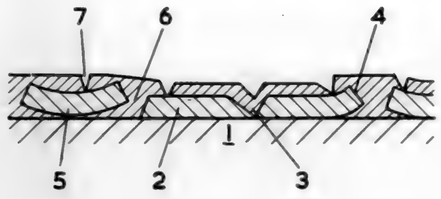
METHOD OF FORMING ELECTRODES

Peter Charles Steele Hayfield, Bickenhill, England, assignor to Marston Excelsior Limited, Staffordshire, United Kingdom

Filed Oct. 29, 1975, Ser. No. 627,007
Claims priority, application United Kingdom, Oct. 29, 1974, 46710/74; Feb. 14, 1975, 6393/75
Int. Cl.² C25D *5/00;* **C25B** *11/08, 11/10*
U.S. Cl. 204—38 R **20 Claims**

1. A method of manufacturing an electrode suitable for use in electrolytic processes which comprises the steps of inserting into a solution containing cations of titanium a body having at least its surface selected from the group consisting essentially of a film-forming metal, nickel, or lead, connecting the body as an anode and depositing on the surface a layer of an oxide of titanium, removing the body from the solution and heating the layer to a temperature greater than 100° C but less than 800° C, reinserting the body in a solution containing cations of titanium, connecting the body as an anode and depositing a further

layer of an oxide of titanium on the surface and applying to the surface an electrically conductive electrolyte-resistant and



electrolysis product resistant layer containing a metal of the platinum group or an oxide of a metal of the platinum group.

4,039,401

ALUMINUM PRODUCTION METHOD WITH ELECTRODES FOR ALUMINUM REDUCTION CELLS

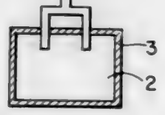
Koichi Yamada; Tadanori Hashimoto, and Kazuo Horinouchi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 511,521, Oct. 3, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 658,032

Claims priority, application Japan, Oct. 5, 1973, 48-112589

Int. Cl.² C25C *3/06, 7/02, 3/12*

U.S. Cl. 204—67 **7 Claims**



1. A method for producing aluminum by molten salt electrolysis of aluminum oxide which comprises electrolyzing aluminum oxide dissolved in a molten salt containing aluminum sodium fluoride as the main component by passing a direct current through an anode to a cathode disposed in said molten salt, wherein at least a portion of said anode and said cathode that is brought into contact with said molten salt is made or covered with a composition containing at least about 50% by weight of electronic conductive oxide ceramics having chemical resistance to the molten salt, said oxide ceramics being selected from spinel structure oxides having the general formula $XYY'O_4$ (wherein X is a divalent or tetravalent metal, Y and Y' may be either the same or different and are trivalent or divalent metals, O is oxygen atom, provided that when X is a divalent metal, Y and Y' are selected from trivalent metals but the spinel structure oxides are excluded in which both Y and Y' are trivalent iron, Fe(III), and when X is tetravalent metal, Y and Y' are selected from divalent metals), perovskite structure oxides having the general formula RMO_3 (wherein R is a monovalent, divalent or trivalent metal, M is a pentavalent, tetravalent or trivalent metal, O is oxygen atom, provided that when R is a monovalent metal, M is selected from pentavalent metals, when R is divalent metal, M is selected from tetravalent metals, and when R is a trivalent metal, M is selected from trivalent metals), or a mixture thereof.

4,039,402

METHOD FOR THE OPERATION OF A FLUIDIZED BED ELECTROCHEMICAL REACTOR AT A SUBSTANTIALLY CONSTANT CURRENT DENSITY

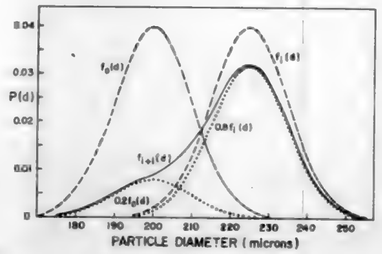
Rodney L. LeRoy, Pointe Claire, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed Feb. 27, 1976, Ser. No. 662,224

Claims priority, application Canada, Nov. 28, 1975, 240695

Int. Cl.² C25C *1/00, 1/12, 7/08, 11/02*

U.S. Cl. 204—105 R **6 Claims**



1. A method for the operation of a fluidized bed electrowinning electrode made of fine particles at an approximately constant current density for a prolonged period of time, comprising the steps of:

a. electrowinning for a number of periods of predetermined duration;

b. withdrawing from the fluidized bed during each period, a weight of particles equal to the electrowon weight plus some fraction of the bed weight; and

c. adding to the fluidized bed, during each period, a predetermined weight of the starting bed particles enough to maintain the total surface area of the fluidized bed electrode approximately constant, such predetermined weight being determined substantially by the formula:

$$W_{in} + 1 = W_o\left[1 - \frac{W_i(1 - X_f)}{W_i + G}\ \frac{S_i}{S_o}\right],$$

wherein:

W_o = original electrode weight,

S_o = original total surface area of the electrode,

W_i = electrode weight at a predetermined time in the preceding period,

G = electrowon weight,

S_i = total surface area of the electrode at such predetermined time in the preceding period, and

X_f = fraction of the weight W_i of the electrode withdrawn in addition to the electrowon weight at such predetermined time in the period.

4,039,403

ELECTROWINNING METALS

David John Astley, Selly Oak; John Roger Bawden Gilbert; Ian Robert Scholes, both of Sutton Coldfield; Jan Stephan Jacobi, Wolverhampton, and Garth Royston Brookes, Walsall, all of England, assignors to Imperial Metal Industries (Kynoch) Limited, Birmingham and IMI Refinery Holdings Limited, both of, England

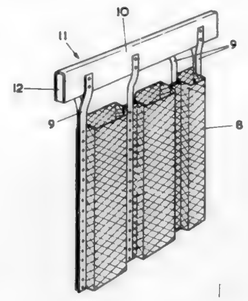
Filed Feb. 26, 1976, Ser. No. 661,786

Claims priority, application United Kingdom, Mar. 5, 1975, 9107/75

Int. Cl.² C25B *1/00;* **C25C** *7/02*

U.S. Cl. 204—105 R **18 Claims**

1. A method of electrowinning a metal from an aqueous solution containing ions of the metal which includes the steps of inserting an anode and a cathode into the solution, connecting the anode positively with respect to the cathode, and passing an electrical current through the anode and cathode, characterised in that the anode is a foraminate container containing particulate material comprising electrically conducting,



non-polarising compounds of a metal and a non-metallic element, there being provided means to supply the current to the particulate material.

4,039,404

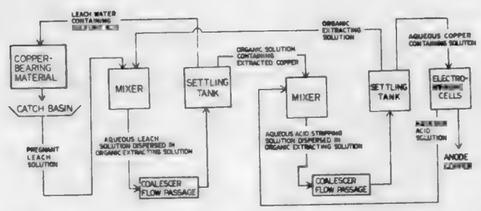
CYCLIC PROCESS USING A.C. FOR SELECTIVE RECOVERY OF METALS FROM MATERIALS CONTAINING SAME

Kenneth Julian Richards, Salt Lake City, and Don Richard Clark, Centerville, both of Utah, assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 578,523, May 19, 1975, abandoned. This application May 10, 1976, Ser. No. 684,950

Int. Cl.² C25C *1/12;* **C22B** *3/00, 60/02, 23/04*

U.S. Cl. 204—106 **17 Claims**



1. A cyclic process for selectively recovering metals from a material containing other metallic values in addition to the selected metal, comprising (a) leaching said material with an aqueous leach solution; (b) recovering a pregnant, aqueous, leach solution containing the selected metal and other metallic contaminants dissolved therein; (c) intimately mixing the recovered aqueous leach solution with an organic medium containing an exchange reagent, which is capable of selectively extracting the selected metal from the aqueous solution, thereby producing a dispersion comprising an aqueous portion containing said other metallic and exchanged ions, and an organic portion containing the exchange reagent and the selected metal values; (d) passing the dispersion from step (c) through a flow way having a plurality of spaced, parallel, elongate electrodes disposed therein so that the flow of dispersion in the flow way is distributed uniformly about the elongate electrodes; (e) subjecting the flow of dispersion in step (d) to an A.C. electric field by applying an A.C. potential to the elongate electrodes in the flow way, said field being sufficient to electrically coalesce the aqueous phase of the dispersion as it flows through said flow way; (f) feeding the electrically treated dispersion from step (e) to a gravity settling tank wherein the coalesced aqueous phase is separated from the organic phase; (g) recycling the aqueoue phase as leach solution for further leaching of said material; (h) intimately mixing the organic phase from step (f) with an aqueous stripping solution which is capable of stripping the selected metal ions from the organic phase, thereby producing a second dispersion comprising an aqueous portion containing the selected metal and an organic portion containing the exchange reagent; (i) passing the dispersion from step (h) through a second flow way having a plurality of spaced, parallel elongate electrodes disposed therein so that the flow of dispersion in said second flow way is distributed uniformly about the elongate electrodes; (j) subjecting the flow of dispersion in step (i) to an A.C. electric field by applying an A.C. potential to the electrodes in said second flow way, said field being sufficient to electrically coalesce the aqueous phase of the dispersion as it flows through second flow way; (k) feeding the electrically treated dispersion from step (j) to a gravity settling tank wherein the coolesced, aqueous phase which contains the selected metal values is separated from the organic phase which contains the exchange reagent; (l) recycling the organic phase from step (k) as the organic medium containing an exchange reagent to be mixed with further leach solution in step (c); and (m) recovering the selected metal values from the aqueous phase obtained in step (k).

4,039,405

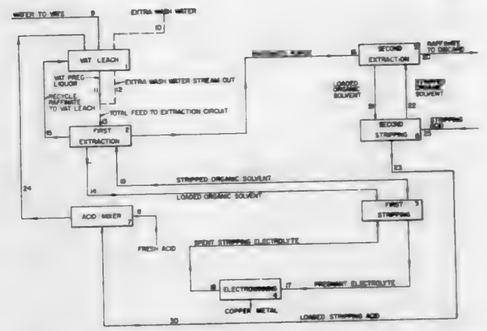
LEACHING COPPER ORES AND SOLVENT EXTRACTION OF THE COPPER-BEARING SOLUTIONS

Soon Y. Wong, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed May 14, 1976, Ser. No. 686,441

Int. Cl.² C25C *1/12*

U.S. Cl. 204—106 **11 Claims**



1. A process for the recovery of copper values from copper-bearing ores comprising:

a. leaching the ore with mineral acid in the presence of water to produce a pregnant liquor stream containing dissolved copper values, and washing the leached ore residue with an internal recycle stream from step (c) in addition to other wash waters,

b. passing additional water through the leach vessel containing spent ore residues, said ore being disposed from the recovery system and said water being subsequently combined with the pregnant liquor stream from step (a) to form a resultant stream which is then passed through

c. at least one first extraction stage containing an extraction agent for removal of copper values, said extraction stage producing a loaded organic extraction stream and an aqueous raffinate stream containing metal values not extracted from resultant stream of step (b) and separating said raffinate stream into a first internal stream of aqueous raffinate and a second internal stream of aqueous raffinate,

d. passing the first internal raffinate recycle stream back to step (a) leach system, and

e. passing the second internal stream to a second extraction having at least one extraction stage containing a second extracting agent where the copper values are extracted in the presence of a low pH extracting agent, said extraction stage producing a loaded organic stream and a disposal stream, while

f. the loaded organic stream from step (e) is stripped in at least one stripping stage in the presence of sufficient strip-

ping acid containing aqueous stripping agent, resulting in a stripped organic stream and a loaded stripping acid stream

g. recycling the stripped organic stream from step (f) to the extraction stage of step (e) while

h. the loaded stripping acid stream of step (f), containing recovered copper values is passed to the process described in step (a), while

i. the loaded organic stream produced in step (c) is passed through at least one stripping stage wherein a stripped organic stream and a pregnant electrolyte stream is produced, subsequently

j. recycling the stripped organic stream to the resultant stream extraction of step (c), while

k. passing the pregnant electrolyte to a copper recovery process from which exits a spent electrolyte stream which is recycled to step (i) as a stripping agent, while

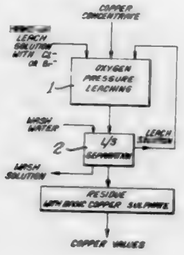
l. recovering the copper values as metal from step (k).

4,039,406

RECOVERING COPPER FROM CONCENTRATES WITH INSOLUBLE SULFATE FORMING LEACH

Robert W. Stanley, Kirkland, and Kohur Nagaraja Subramanian, Mississauga, both of Canada, assignors to Noranda Mines Limited, Canada

Continuation of Ser. No. 491,870, July 25, 1974, abandoned. This application May 7, 1976, Ser. No. 684,374
Claims priority, application Canada, Aug. 10, 1973, 179995
Int. Cl.² C25C *1/12*
U.S. Cl. 204—108 **18 Claims**



1. A hydrometallurgical method of recovering copper values from copper sulphide concentrates which comprises:

a. forming an aqueous leach solution containing chloride or bromide ions therein and a total amount of acid such that the molar ratio of H^+/Cu is between 0 and about 0.65/1;

b. dispersing copper sulphide concentrates in said leach solution to form a slurry;

c. adjusting the amount of chloride or bromide ions in the slurry such that the molar ratio of Cl^-/Cu or Br^-/Cu is greater than about 0.08/1;

d. carrying out the leaching operation at a temperature between about 115° C and about 160° C and under an oxygen pressure above 100 psig, while agitating the slurry;

e. separating resulting leach residue containing the copper values essentially in the form of basic copper sulphate from the leach solution; and

f. recovering the copper values from the leach residue.

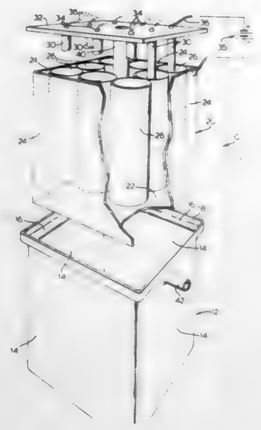
17. Method according to claim 1 wherein initially no acid is present in the slurry.

4,039,407

METHOD FOR ELECTROLYTIC SILVER RECOVERY

Richard F. Kelleher, Guelph, Canada, assignor to Electrolyte Services Limited, Guelph, Canada

Division of Ser. No. 542,548, Jan. 20, 1975, Pat. No. 4,000,056, which is a continuation-in-part of Ser. No. 402,210, Oct. 1, 1973, abandoned. This application Dec. 4, 1975, Ser. No. 637,512
Int. Cl.² C25C *1/20*
U.S. Cl. 204—109 **7 Claims**



1. A method of recovering dissolved silver from an electrolyte, said method comprising the steps:

a. providing in an open-topped container a liquid-permeable, electrically conductive reticulum having substantially vertical walls, with a least one open-ended, electrically conductive, reticulated, substantially vertically oriented sleeve portion therewithin, said sleeve portion being in electrical communication with the reticulum,

b. providing a substantially vertical electrode centrally within but spaced from said sleeve portion,

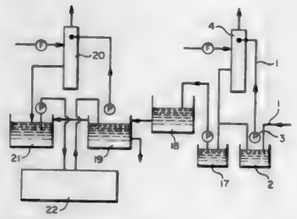
c. simultaneously passing said electrolyte into said container near the bottom thereof and out of the container near the top thereof, and applying a voltage differential between said reticulum and said electrode to cause the electrode to become anodic with respect to the reticulum, thereby to plate silver on the sleeve portion and on the reticulum.

4,039,408

METHOD OF ELECTROLYTICALLY RECOVERING ZINC

Tatsuo Takesue, Shimonoseki, Japan, assignor to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,127
Claims priority, application Japan, July 7, 1975, 50-83260
Int. Cl.² C25C *1/16*
U.S. Cl. 204—119 **4 Claims**



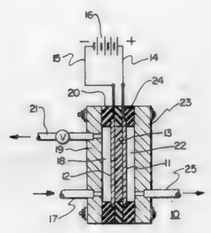
1. In a method of electrolytically recovering zinc wherein a circulating zinc electrolyte solution is cooled, the improvement comprising precooling a zinc sulfate solution resulting from the leaching of zinc ore and adding the same to said circulating electrolyte at a first temperature relatively close to a second temperature suitable for electrolysis of said zinc, while, at the same time, removing impurities existing in said solution by causing the impurities to precipitate in gel form during said cooling, and then further cooling the resulting mixture of circulating electrolyte and said zinc sulfate solution to said second temperature while, at the same time, removing impurities in said circulating electrolyte precipitated in gel form during said further cooling.

4,039,409

METHOD FOR GAS GENERATION UTILIZING PLATINUM METAL ELECTROCATALYST CONTAINING 5 TO 60% RUTHENIUM

Anthony B. LaConti, Lynnfield, and Anthony R. Fragala, N. Andover, both of Mass., assignors to General Electric Company, Wilmington, Mass.

Filed Dec. 4, 1975, Ser. No. 637,519
Int. Cl.² C25B *1/10*
U.S. Cl. 204—129 **3 Claims**



1. In a method for electrolytically generating oxygen, the steps comprising,

a. providing a catalytic cathode,

b. providing a catalytic oxygen evolving anode,

c. positioning a ion exchange membrane between and in electrical contact with the cathode and the anode,

d. providing a direct current potential between the cathode and the anode, supplying water to one of the electrodes to be acted on electrochemically to evolve oxygen at the anode,

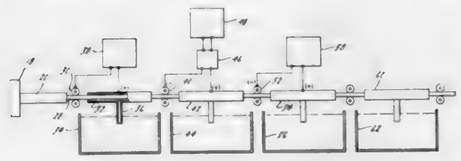
e. the improvement comprising the step of providing a catalyst at the oxygen evolving electrode, consisting of a platinum-ruthenium alloy comprising reduced oxides of platinum and ruthenium and containing from 5 to 60 weight percent of ruthenium.

4,039,410

ELECTROCLEANING PROCESS

Charles Davidoff, Port Washington, N.Y., assignor to Bundy Corporation, Detroit, Mich.

Filed June 7, 1976, Ser. No. 694,070
Int. Cl.² C25F *1/00, 5/00*
U.S. Cl. 204—141.5 **18 Claims**



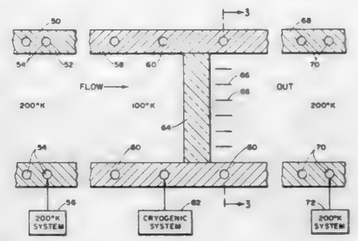
1. A process for electrocleaning articles comprised of a copper surface stratum to remove embedded contaminating carbon particles in the surface thereof which comprises the steps of contacting the article with an aqueous alkaline solution containing an alkaline complexing agent of a type which provides for a solubilizing of copper and forms aqueous alkaline solution soluble copper complexes to maintain the solubilized copper in solution, cathodically electrifying the article for a period of time sufficient to effect a solubilization of a portion of the copper surface by forming solution soluble copper complexes in a magnitude sufficient to undercut and release the embedded carbon particles in the surface stratum, and thereafter extracting the article from said solution and rinsing said article to remove the residual solution thereon.

4,039,411

ISOTOPE SEPARATION USING VIBRATIONALLY EXCITED MOLECULES

Jaime A. Woodroffe, and James C. Keck, both of Andover, Mass., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed June 30, 1975, Ser. No. 591,706
Int. Cl.² B01J *1/10*; B01K *1/00*
U.S. Cl. 204—157.1 R **62 Claims**



1. A method for separating molecules by the isotope type of a component therein, said components occurring in a plurality of isotope types, the method comprising the steps of:

establishing a flow of said molecules with a carrier medium having particles of a distinct chemical type;

selectively photoexciting into an elevated vibrational state molecules having components of a first isotope type;

colliding the vibrationally excited molecules with the particles of said carrier medium to enhance the diffusivity of said excited molecules as a result of collision; and

segregating the molecules with enhanced diffusivity from the flow of said molecules with said carrier medium.

26. The method of claim 1 wherein said segregating step includes the step of collecting the molecules having the enhanced diffusivity on a surface.

4,039,412

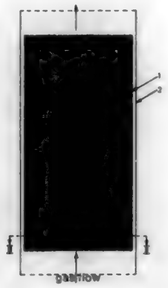
PROCESS AND STRUCTURE FOR FIXATION OF ATMOSPHERIC NITROGEN

Robert Dickson Hill, P.O. Box 5484, Montecito, Calif. 93108

Continuation-in-part of Ser. No. 518,762, Oct. 29, 1974, abandoned. This application July 25, 1975, Ser. No. 598,931
Int. Cl.² B01J *1/10*; B01K *1/00*
U.S. Cl. 204—157.1 H **12 Claims**

1. A process for fixing nitrogen and oxygen, as in air, to obtain oxides of nitrogen, employing heat generated by spent nuclear reactor rods, the said process relying on an assembly of spent reactor rods arranged in a closely spaced manner so as to confine the heat generated in the rods by the nuclear reactions still occurring in the rods even though the said rods have been removed from the reactor in which they were originally activated, the said process further employing a mixture of nitrogen and oxygen which is forced to flow through said assembly of spent reactor rods at such a rate as to achieve a substantial heating and consequent temperature rise of the mixture, the

said heating and temperature rise producing oxides of nitrogen which are in thermodynamic equilibrium with the constituents



and which in the final stage of the process are separated from the mixture.

4,039,413

METHOD OF BONDING A POLYPEPTIDE TO A MACROMOLECULAR POLYMERIC CARRIER BY IRRADIATION WITH LIGHT

Dieter Kraemer, Mainz; Klaus Lehmann, Rossdorf, Darmstadt, and Hermann Plainer, Darmstadt, all of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Dec. 19, 1973, Ser. No. 426,317
Claims priority, application Germany, Dec. 23, 1972, 2263289
Int. Cl.² C08L *1/00, 3/00*
U.S. Cl. 204—159.12 **9 Claims**

1. A method for bonding a polypeptide to a macromolecular carrier which comprises irradiating an aqueous solution of a polypeptide, in the absence of oxygen and in the presence of a macromolecular carrier compound having a molecular weight of at least 1000, with ultraviolet light in the presence or absence of a photosensitizer, or with visible light in the presence of a photosensitizer and of an organic peroxide, wherein said macromolecular carrier compound is (a) a non-cross-linked water-soluble compound, (b) a cross-linked compound swellable in water to at least twice its dry volume, or (c) a cross-linked or non-cross-linked compound non-swellable in water or swellable to less than twice its dry volume and comprises latex particles having a diameter of at most 1 micron, said macromolecular carrier compound further being a polymer which is

A. a polymer of at least one monomer selected from the group consisting of acrylic acid, methacrylic acid, the amides of these acids, the water-soluble salts of these acids, the hydroxy alkyl esters of these acids, the dialkyl aminoalkyl esters of these acids, and the water-soluble salts and quaternization products of the dialkyl aminoalkyl esters of these acids,

B. a copolymer of at least one monomer of (A) with at least one vinyl or vinylidene monomer readily undergoing a photochemical reaction and having a vinyl or vinylidene group bound to an alkenyl, alkylphenyl, pyrrolidonyl, or imidazolinyl group, or bound to an ester group or a substituted amido group wherein an alkenyl, alkylphenyl, pyrrolidonyl, or imidazolinyl group is present in the alcohol portion of said ester group or in the substituent on said amido group, or

C. a polymer of (A) or (B) which additionally comprises a water-insoluble vinyl or vinylidene monomer different from those readily undergoing a photochemical reaction mentioned in (B) above.

4,039,414

ULTRAVIOLET CURING OF ELECTROCOATING COMPOSITIONS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed June 19, 1974, Ser. No. 480,738
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 **5 Claims**

1. In a process for electrocoating a paint film onto a cathode substrate disposed within an aqueous electrocoating bath, the electrocoating composition being dispersed in water and comprising an ethylenically unsaturated polymer containing ethylenically unsaturated groups selected from acrylyl, acrylamide, and allyl, said polymer having amine groups thereon being neutralized with a proton donating solubilizing salt or acid for dispersing said polymer within water, and electrocoating said polymer onto the cathode substrate to form a film thereon, the improvement comprising:

reacting at least about 2% by weight of an ultraviolet sensitizer with said polymer to attach the ultraviolet sensitizer to the polymer structure, said ultraviolet sensitizer being reacted onto the polymer structure prior to the step of neutralizing the amine groups on the polymer and prior to dispersing the polymer into the electrocoating water bath;

electrocoating said polymer containing the ultraviolet sensitizer connected to the polymer structure onto the cathode substrate wherein the ultraviolet sensitizer remains tied to the polymer structure while electrocoating a polymeric film onto the cathode substrate; and

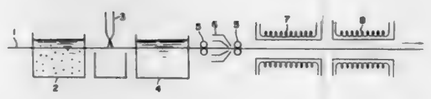
exposing the polymer film to ultraviolet energy to activate the ultraviolet sensitizer connected to the polymer structure and cross-link the ethylenic unsaturation in the polymer structure to provide a cured paint film on the cathode substrate.

4,039,415

PROCESS FOR PREPARING INSULATION WIRE

Kyoichi Shibayama; Fumihiko Sato, and Takashi Takahama, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 5, 1975, Ser. No. 584,115
Claims priority, application Japan, June 5, 1974, 49-64307; Oct. 23, 1974, 49-122709
Int. Cl.² C25D *13/06, 13/16*
U.S. Cl. 204—181 **5 Claims**



1. A process for preparing an insulation wire which comprises:

dipping a wire into a water dispersion synthetic resin varnish and forming a resin layer on the wire by electrodeposition;

treating said wire having the electrodeposited resin layer in hot water or steam to comelt colloidal particles of said resin in the electrodeposited resin layer;

removing water from said resin layer;

exposing said resin layer to a vapor of a film-forming auxiliary agent to impregnate the film-forming auxiliary agent into said resin layer; and

heating said resin layer to cure it.

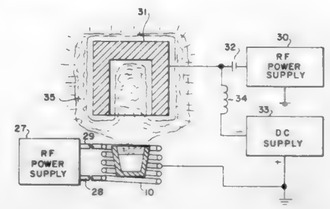
4,039,416

GASLESS ION PLATING

Gerald W. White, 5835 Elm Lawn St., Dallas, Tex. 75228

Filed Apr. 21, 1975, Ser. No. 569,679
Int. Cl.² C23C *15/00, 13/12*
U.S. Cl. 204—192 N **15 Claims**

7. A process for plating a substrate supported within a chamber with a plating material comprising the steps of: evacuating said chamber; vaporizing said plating material in the evacuated chamber; developing a direct current negative bias on said substrate; forming and maintaining an ionized plasma from the vaporized plating material in the absence of any inert gas inputted to said chamber; and applying a radio frequency field within said chamber to ion plate said material from said plasma onto said substrate.



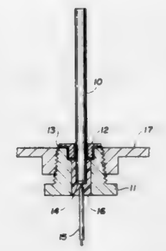
9. Apparatus for plating a conductive substrate with a plating material, including: a chamber adapted to hold said substrate and said plating material; means for evacuating said chamber; means for vaporizing said plating material in the evacuated chamber; means for applying radio frequency power to the vaporized plating material to form and maintain an ionized plasma therefrom in the absence of any inert gas inputted to said chamber; a radio frequency bias source means connected to said substrate; and means for applying a direct current negative bias to said substrate.

4,039,417

ELECTRODE ASSEMBLY FOR USE IN CATHODIC PROTECTION

Yoshinori Sasaki; Isao Yokoyama; Motohiko Makino; Syun Awaji, all of Nikaho, and Kaneo Hosoya, Honjyo, all of Japan, assignors to TDK Electronics Company, Limited, Tokyo, Japan

Filed Dec. 5, 1975, Ser. No. 638,277
Claims priority, application Japan, Feb. 18, 1975, 50-22212[U]
Int. Cl.² C23F *13/00*
U.S. Cl. 204—196 **5 Claims**



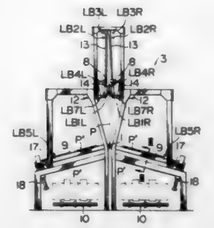
1. An electrode assembly for the cathodic protection of a glass-lined metallic vessel comprising a ferrite electrode, a ring of a material selected from the group consisting of alumina and forsterite supporting said electrode, and an iron bushing adapted to be mounted in a wall of said vessel, said ring being mounted in said bushing.

4,039,418

ELECTRODEPOSITED METAL PLATE PEELING OFF MACHINE

Kozi Kawakami, Gifu, and Makoto Iseri, Takehara, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1976, Ser. No. 670,386
Claims priority, application Japan, Mar. 31, 1975, 50-39580
Int. Cl.² C25D *1/04, 1/20*
U.S. Cl. 204—198 **7 Claims**



1. In an apparatus for peeling off electrodeposited metal plates from cathode base plates, said apparatus including transfer means for intermittently moving a cathode plate composed of a base plate having an electrodeposited metal plate thereon along a processing line having a series of spaced work stations, means disposed at a first work station for loosening the electrodeposited metal plate from the base plate, stripping means for peeling the electrodeposited metal plate from the base plate, said stripping means being disposed at a second work station disposed downstream of said first work station, and receiving means associated with said stripping means for receiving thereon the metal plate which is peeled from the base plate when said cathode plate is disposed in said second working station, the improvement comprising:

sensing means associated with said receiving means for sensing the presence thereon of the peeled metal plate which has been stripped from a base plate;

discharge means for automatically removing a base plate from said transfer means, said discharge means being disposed at a third work station which is disposed downstream of said second work station; and

control means for selectively actuating said discharge means only to remove from said transfer means those base plates from which the stripping means has been unable to successfully peel off the metal plates, said control means including activating means for actuating said discharge means only after elapse of a preselected time interval following initiation of a stripping operation and only if said sensing means does not sense the presence of the peeled metal plate on said receiving means during said preselected time interval.

4,039,419

ANODE POSITIONING DEVICE

Kenneth E. Buse, Davenport, Iowa, assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed July 23, 1976, Ser. No. 708,289
Int. Cl.² C25D *17/00*; C25C *3/06, 3/12*
U.S. Cl. 204—225 **4 Claims**

1. In an electrolytic cell having at least one anode adapted to be positioned toward an electrolytic bath, an anode positioning device for precisely displacing individual anodes comprising:

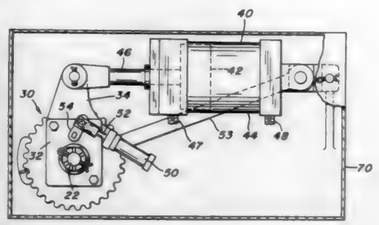
a jack screw having a stationary guide housing, an externally helically threaded shaft through said housing and a retainer threadably engaged onto said shaft and attached to the anode;

a ratchet having inner teeth adapted to engage a pawl and return a ratchet head mounted on a top portion of the jack

screw shaft, and an arm integral with and connected to the ratchet head, said arm extending perpendicularly from the ratchet head with respect to the shaft;

a fluid cylinder firmly anchored to said housing having a piston fitting inside a mating chamber in said cylinder and a piston rod extending from said piston and connected to said ratchet arm with said ratchet arm fully responsive to piston rod movement;

means for reciprocally driving the piston in the chamber in said cylinder; and



a detent device to hold said jack screw shaft in position while said ratchet arm and said piston rod connected thereto are stopped or in return stroke;

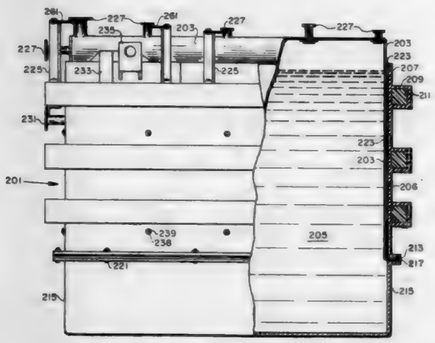
whereby each stroke of the piston and the attached piston rod displaces the ratchet arm a constant lateral distance, which rotates the ratchet head, and thus the jack screw shaft connected thereto, thereby displacing the retainer and the attached anode along the rotating shaft.

4,039,420

HALATE CELL TOP

Chester Ronald Nawrot, Depew, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 24, 1976, Ser. No. 669,949
Int. Cl.[2] C25B *9/00*
U.S. Cl. 204—242 **15 Claims**



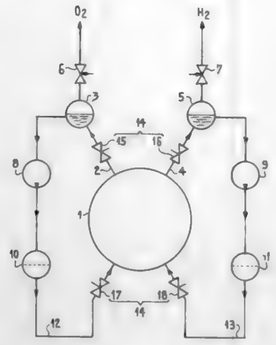
1. In an electrolytic cell for the manufacture of alkali metal halate, wherein said cell comprises a cell top joined to a cell bottom below the level of enclosed electrolyte, the improvement comprising providing a titanium interior surface of said cell top, said titanium surface being electrically insulated from said cell bottom which functions as the cathode of said cell.

4,039,421

APPARATUS FOR THE ELECTROLYSIS OF WATER WHICH OPERATES UNDER PRESSURE

Louis Mas, Buc, France, assignor to Societe de Recherches Techniques et Industrielles, Buc, France

Filed Jan. 27, 1976, Ser. No. 652,859
Claims priority, application France, Jan. 31, 1975, 75.03105
Int. Cl.[2] C25B *1/02, 9/00*
U.S. Cl. 204—266 **2 Claims**



1. An apparatus for the electrolysis of water which operates under pressure of the type comprising a stack of cells having a return circuit; a first output circuit connected to an oxygen separator and a second output circuit connected to a hydrogen separator and out of communication with said first output circuit; first and second means for regulating the pressure respectively connected to said oxygen separator and to said hydrogen separator; first and second means for circulating the electrolyte, respectively connected between said return circuit and said oxygen separator and between said input circuit and said hydrogen separator, said apparatus further comprising an isolating system which co-operates with said circulating and regulating means to prevent any migration of electrolyte once the apparatus has been shut down, said system comprising a set of valves with a first valve positioned in said first output circuit between said stack and said oxygen separator, a second valve positioned in said second output circuit between said stack and said hydrogen separator, at least a third valve positioned in said return circuit between said stack and said first and second means, for isulating the electrolyte, said system maintaining a pressure Po predetermined to enable said apparatus to start up again without the help of inert gas, said pressure Po being comprised between the atmospheric pressure and the rated operating pressure of said apparatus.

4,039,422

METAL RECOVERY UNIT

Elliot L. Packer, 1015 Prospect Ave., Plainfield, N.J. 07060

Filed Oct. 14, 1975, Ser. No. 622,228
Int. Cl.[2] C25C *1/20, 7/00, 7/02*
U.S. Cl. 204—272 **9 Claims**

1. A recovery unit for recovering metal from a solution containing metal ions, said unit comprising:

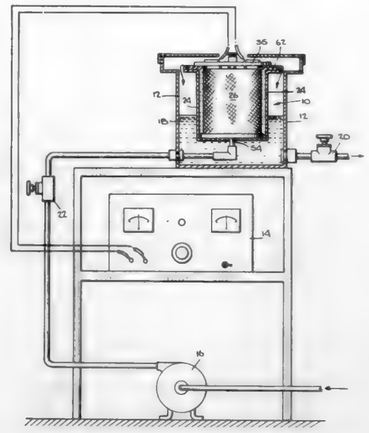
a container,

a first electrode within said container, and adapted to be connected and used as an anode, said first electrode including at least one perforated element,

a second electrode within said container and adapted to be connected and used as a cathode, said second electrode including a plurality of spaced apart highly perforated electrode elements providing a large cathode surface area,

said electrode elements all being disposed substantially parallel to each other to provide a plurality of parallel channels within said container,

said container having an inlet opening in communication with one end of each of said parallel channels and an outlet opening in communication with the other end of each of said parallel channels, said openings and said



channels having a relationship such that liquid flowing through said inlet opening to said outlet opening will branch out and flow through all of said channels in parallel.

4,039,423

PREPARATION OF PETROLEUM PITCH

Maurice Moyle, Oakville; Buenaventura B. Galvez, Islington; Eric C. Pease, Campbellville, and Alan Logan, Oakville, all of Canada, assignors to Gulf Oil Canada Limited, Toronto, Canada

Filed Mar. 10, 1975, Ser. No. 556,856
Int. Cl.[2] C10G *3/00*
U.S. Cl. 208—4 **4 Claims**

1. A process for the preparation of a petroleum pitch binder for the manufacture of carbon electrodes, consisting essentially of (1) subjecting a full range decant oil petroleum fraction, obtained as the clarified bottoms fraction of a catalytic gas oil cracking operation and having a boiling range at atmospheric pressure at least 95% of which is above 450° F (232° C), to a severe heat treatment in the absence of any free oxygen containing gas by rapidly raising the temperature of the fraction to the range from 775° to 975° F (413° to 524° C) under a pressure in the range from 15 to 30 atmospheres and maintaining the temperature in said range for a period of from 3 to 300 minutes until the proportion of benzene insoluble material in the fraction has risen to at least 5% by weight, (2) flashing the heat treated fraction at a lower pressure in the range from less than atmospheric to 4 atmospheres to separate volatilized material from a heat treated liquid fraction having a resultant softening point in the range from 150° to 250° F (66° to 121° C) and (3) subjecting the said liquid fraction to an oxy-activated condensation by maintaining it at a temperature in the range from 400° to 500° F (204° to 260° C) under a pressure in the range from atmospheric to 4 atmospheres, simultaneously with air being introduced into said fraction, for a period of from 3 to 10 hours with air flow between substantially 100 to 500 liters per hour per kilogram of material being treated until said liquid fraction has a softening point in the range from 175° to 275° F (79° to 135° C).

4,039,424

PROCESS FOR PRODUCING FLUID FUEL FROM COAL

Richard W. Hyde, Winchester; Stephen A. Reber, Waltham; August H. Schutte, Lexington, and Ravindra M. Nadkarni, Arlington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Mar. 29, 1976, Ser. No. 671,174
Int. Cl.[2] C10G *1/06*
U.S. Cl. 208—8 **34 Claims**

1. A process for producing fluid hydrocarbon fuel from coal, comprising the steps of

a. forming a slurry of finely divided, moisture-free coal and a hydrogen-donor solvent;

b. heating said slurry to an elevated temperature up to about 850° F;

c. charging the heated slurry into a drum wherein said coal is further contacted with said hydrogen-donor solvent to raise the temperature of the mass in the drum to between about 650° F. and 800° F;

d. maintaining the pressure within said drum at an elevated pressure no greater than about 150 psig while extracting hydrocarbons from said coal;

e. during said extracting, adding hydrocarbon vapor at an elevated temperature up to about 900° F thereby to agitate said mass within said drum and to further heat it;

f. depressurizing said drum to flash off the hydrocarbons while providing the latent heat of vaporization required for the volatilization of said hydrocarbons;

g. withdrawing fluid hydrocarbon products from said drum;

h. fractionating said fluid hydrocarbons withdrawn from said drum to form at least three cuts comprising a light cut hydrocarbon product, a medium cut hydrocarbon product having a boiling range of 450° F to 750° F and a heavy cut hydrocarbon product;

i. adding to said drum a hydrocarbon fraction at a temperature sufficient to heat the contents of said drum to about 850° F to 900° F in a quantity, for a time and at a pressure sufficient to crack at least a portion of the hydrocarbons extracted from said coal and remaining in said drum and to coke the residual solids in said drum thereby to produce additional fluid hydrocarbon products;

j. removing said additional fluid hydrocarbon products from said drum and adding them to said fluid hydrocarbons of step (g);

k. decoking said drum to remove the coked residue therefrom.

4,039,425

METHOD FOR PREPARING A COAL SLURRY SUBSTANTIALLY DEPLETED IN MINERAL-RICH PARTICLES

Richard C. Neavel, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 22, 1975, Ser. No. 643,583
Int. Cl.[2] C10G *1/04;* B03B *5/66*
U.S. Cl. 208—8 **12 Claims**

1. A process for preparing a slurry composed of a carrier liquid and coal or similar carbonaceous solids substantially depleted in mineral-rich particles for delivery to any desired place of use which comprises:

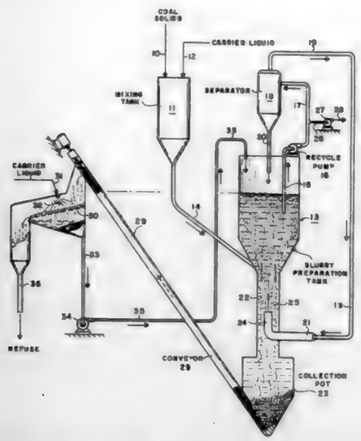
a. introducing said carbonaceous solids and said carrier liquid into a slurry preparation zone, said slurry preparation zone communicating with an elutriation zone extending downward from the bottom of said slurry preparation zone;

b. passing a stream of slurry from said slurry preparation zone to a liquid-solids separator;

c. returning a concentrated slurry stream from said separator to said slurry preparation zone;

d. passing a substantially clarified liquid stream from said separator to said elutriation zone in such a manner as to form an upward directed current of predetermined velocity in said elutriation zone, whereby mineral-rich and

other particles in said slurry preparation zone and said elutriation zone having a settling velocity greater than said predetermined velocity pass downward through said elutriation zone; and



e. passing a slurry stream deficient in mineral-rich particles from said slurry preparation zone to said place of use.

4,039,426

PROCESS FOR PRODUCING FLUID FUEL FROM COAL

August H. Schutte, Lexington, Mass., assignor to Arthur D. Little, Inc., Cambridge, Mass.

Filed Feb. 2, 1976, Ser. No. 654,521

Int. Cl.² C10G *1/06*

U.S. Cl. 208—8 **26 Claims**

1. A process for producing fluid hydrocarbon fuels from coal, comprising the steps of

a. contacting within a drum, moisture-free, preheated coal in particulate form with a hydrogen-donor solvent at a temperature ranging between about 700° and 900° F under a pressure sufficient to maintain essentially all of said solvent in said drum in a liquid state thereby to contact and heat the coal to a temperature between about 650° and 800° F and to extract a substantial portion of the soluble hydrocarbon fractions from said coal;

b. decreasing the pressure in said drum and providing the latent heat required to volatilize said solvent while withdrawing the light ends of the extract formed in step (a);

c. introducing into said drum a hydrocarbon fraction at an elevated temperature sufficient to heat the contents of said drum to about 850°–900° F in a quantity, for a time at a pressure sufficient to crack at least a portion of the remaining hydrocarbon fractions extracted from said coal and to coke the residual solids in said drum thereby to produce a fluid hydrocarbon product;

d. removing said fluid hydrocarbon product from said drum; and

e. decoking said drum to remove the coked residue therefrom.

4,039,427

PROCESS FOR RETORTING OIL SHALE

Thomas E. Ban, South Euclid, Ohio, assignor to McDowell-Wellman Engineering Company, Cleveland, Ohio

Filed Dec. 29, 1975, Ser. No. 644,927

Int. Cl.² C10G *1/02*

U.S. Cl. 208—11 R **5 Claims**

1. A continuous process for the recovery of oil from oil-bearing material and for employing oil-depleted material formed in the process and having uncombusted remaining carbon and hydrocarbons as a combustible heat source, comprising the steps of charging the oil-bearing material on a traveling grate to form a burden, passing a heated reducing atmosphere through the burden of oil-bearing material to raise the temperature of the oil-bearing material to at least about 800° F., to thereby educe oil from the oil-bearing material, and to thereby provide a bed of oil-depleted, combustible material, separating oil from the reducing atmosphere, discharging the oil-depleted material from the traveling grate, combusting remaining carbon and hydrocarbons in said oil-depleted material to raise the temperature of the bed to above about 1000° F., and passing said reducing atmosphere through the oil-depleted and combusted bed of material to raise the temperature of the reducing atmosphere, said combusted oil-depleted material being layered onto the oil-bearing material on the traveling grate and the reducing atmosphere being passed first through the combusted, oil-depleted material, and then through the oil-bearing material.

4,039,428

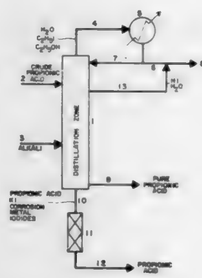
PURIFICATION OF PROPIONIC ACID

YuWen Wei, Houston, Tex., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1976, Ser. No. 646,291

Int. Cl.² B01D *3/32*; C07C *51/44*

U.S. Cl. 203—37 **10 Claims**



1. A method for purifying a crude propionic acid stream containing water and iodine either as I^-, free iodine, ethyl iodide or all of these as contaminants which comprises:

1. introducing said stream into the upper section of a distillation zone,
2. introducing an alkaline compound selected from the group consisting of alkaline compounds of the alkali metals and the alkaline earth metals into the lower third of said distillation zone;
3. removing overhead from said distillation zone a stream containing the major portion of the water present along with substantially all of the ethyl iodide;
4. removing as a liquid sidestream from the upper section of said distillation zone all of the hydrogen iodide together with the remaining portion of water;
5. withdrawing as a vapor near the bottom of said distillation zone the product propionic acid stream containing less than 20 ppb of iodine;
6. removing a bottoms stream from said distillation zone containing propionic acid, said alkaline compound and metal corrosion products; and
7. passing said bottoms stream through a cation exchange resin and recovering the effluent from said exchange free of said alkaline compound and said metal corrosion products.

4,039,429

PROCESS FOR HYDROCARBON CONVERSION

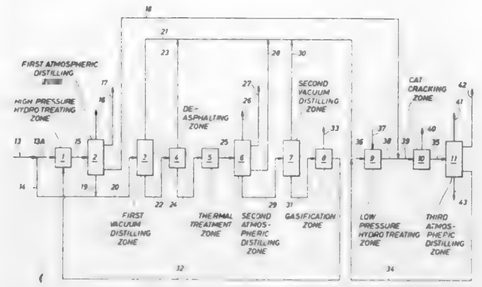
Jakob van Klinken, and Peter Ladeur, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed June 17, 1976, Ser. No. 697,183

Claims priority, application Netherlands, June 23, 1975, 7507484

Int. Cl.² C10G *37/04, 37/06*

U.S. Cl. 208—50 **11 Claims**



1. A process for the production of light hydrocarbon distillates from a hydrocarbon oil residue obtained by atmospheric distillation which comprises:

a. fractionating said residue by vacuum distillation into a vacuum distillate and a vacuum residue;

b. deasphalting said vacuum residue in a deasphalting zone by contact with a low boiling hydrocarbon sorbent to obtain a deasphalted oil and asphalt;

c. catalytically cracking said vacuum distillate and said deasphalted oil in a catalytic cracking zone to obtain a catalytically cracked product;

d. fractionating said catalytically cracked product by fractionation distillation at essentially atmospheric pressure to obtain at least one light hydrocarbon distillate product, an intermediate boiling fraction and a residue;

e. hydrotreating said intermediate boiling fraction in a low pressure hydrotreating zone and recycling at least part of said intermediate fraction to said catalytic cracking zone;

f. thermally heating at least one of said asphalt and said residue in thermal treatment zone comprising either a thermal cracking zone or a coking zone to obtain a thermal treatment product;

g. fractionating said thermal product by fractionation distillation into at least one light distillate product, a thermal intermediate fraction and a thermal residue;

h. hydrotreating said thermal intermediate fraction in a low pressure hydrotreating zone and recycling at least part of this hydrotreated product as feed to the catalytic cracking zone;

i. gasifying the thermal residual fraction in a gasification zone and catalytically reacting said gasified product with steam to produce hydrogen;

j. feeding said hydrogen to a high pressure catalytic hydrotreating zone together with at least part of the atmospheric distillation residue feed prior to step (a) or to at least part of the vacuum residue feed to step (b); then

k. passing said hydrogen exiting said high pressure hydrotreating zone as feed to a low pressure catalytic hydrotreating zone together with a feed selected from the vacuum distillate product of step (a) and at least part of the asphalt product of step (b); and then

1. passing said hydrogen exiting step (k) to at least one low pressure catalytic hydrotreating zone selected from steps (e) and (h).

4,039,430

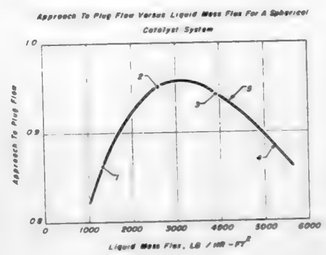
OPTIMUM LIQUID MASS FLUX FOR TWO PHASE FLOW THROUGH A FIXED BED OF CATALYST

Robert H. Jensen, Clarendon Hills, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 644,990

Int. Cl.² C10G *13/02, 23/02*

U.S. Cl. 208—108 **3 Claims**



1. A catalytic process for processing a fluid stream composed of liquid and gas by contacting said liquid and gas at a uniform rate of flow with a bed of fixed spherical catalyst, said contacting producing a chemical interaction of said liquid and gas, the improvement which comprises approaching perfect liquid distribution in said bed by means of selecting a liquid mass flux in the range of about 2000 to about 4000 lb/hr-ft².

4,039,431

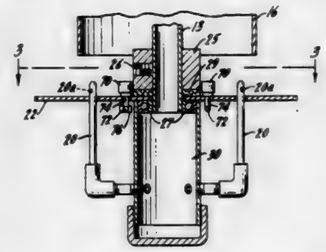
PARTICULATE MATERIAL DISTRIBUTOR AND METHOD INVOLVING USE OF SAME

Lloyd A. Baillie, Homewood, Ill., assignor to Atlantic Richfield Company, Philadelphia, Pa.

Filed Oct. 23, 1975, Ser. No. 625,353

Int. Cl.² B01J *8/02*; B65G *65/32*; C10G *13/00*

U.S. Cl. 208—146 **15 Claims**



1. Apparatus for distributing particulate material over a zone comprising:

a supply hopper, having inlet means and outlet means, for holding particulate material;

a deflection plate located adjacent to the end of said outlet means away from said supply hopper to deflect the direction of at least a portion of said particulate material flowing through said outlet means; and

at least one rotatable conduit in fluid communication with at least one source of gaseous media, said conduit being situated such that at least a portion of said gaseous media from said conduit flows in the space between the end of said outlet means away from said supply hopper and said deflection plate to thereby cause at least a portion of said particulate material to be propelled in substantially the same direction as said flow.

4,039,432

UPGRADING METAL-CONTAMINATED PETROLEUM OILS CONTAINING VANADIUM AND/OR NICKEL

Manfred J. Michlmayr, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 3, 1976, Ser. No. 663,416
Int. Cl.[2] C10G *17/00, 29/04*
U.S. Cl. 208—252 **10 Claims**

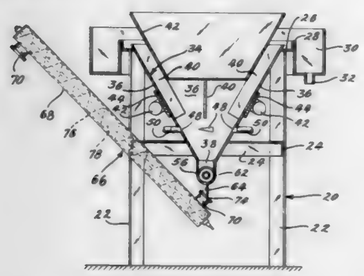
1. A process for upgrading a metal-contaminated petroleum oil having, in parts by weight, a content of said contaminant, calculated as metal in parts by weight, of at least 10 parts per million parts of the oil, said metal being selected from the group consisting of vanadium and nickel and mixtures thereof, which comprises reducing said metal content by contacting said oil in the liquid phase with an aqueous solution of at least one extraction agent selected from the group consisting of ferric salts soluble in acidified water and stannic chloride, said solution having a concentration of said agents in the range from about 0.1 to 5 molar and a pH at least sufficiently acidic to inhibit precipitating said agent, said contacting being at a temperature in the range from about 0° C to 250° C and at a pressure sufficient to maintain said solution in the liquid phase; and recovering the resulting oil having a reduced content of said metals.

4,039,433

PROCESS AND APPARATUS FOR RECOVERING METAL FROM SOIL

Francis C. Peterson, St. Louis City, Mo., assignor to C. Hager & Sons Hinge Manufacturing Company, St. Louis, Mo.

Filed Jan. 12, 1976, Ser. No. 648,127
Int. Cl.[2] B03B *5/66*
U.S. Cl. 209—3 **15 Claims**



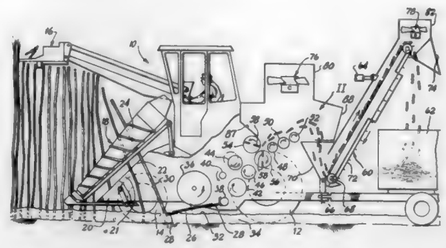
1. A process for recovering metal from soil, said process comprising: shredding the metal-bearing soil to reduce it to fragments of generally small size; depositing the fragmentized metal-bearing soil into a swirling volume of water having a stream of water directed directly upwardly through the swirl from the bottom of the swirling volume, the swirling volume possessing sufficient turbulence to dislodge the soil from the metal; allowing the soil to form a suspension which rises to the top of the swirling volume; allowing the metal to gravitate to the bottom of the tank through the rising stream of water, so that the metal is cleansed; withdrawing the metal from the vicinity of the bottom of the tank by elevating it to an elevation at least about as high as the top surface of the volume of water and then discharging the metal; and allowing the suspension to overflow away from the swirling volume.

4,039,434

SUGAR CANE HARVESTER CANE CONVEYOR ROLLER

Kenneth W. Croucher, North Bundaberg, Australia, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Jan. 8, 1976, Ser. No. 647,546
Claims priority, application United Kingdom, Jan. 17, 1975, 02052/75
Int. Cl.[2] B07B *9/00*
U.S. Cl. 209—28 **3 Claims**



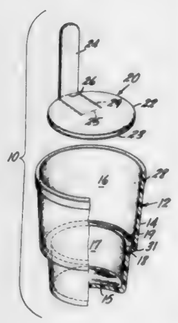
1. A sugar cane harvester including a frame, cane gathering means mounted on the forward portion of the frame, wall members mounted on the frame to form the sides of a channel and guide cane along the channel, a plurality of rollers rotatably mounted on the frame and extending from one wall member to the other wall member to form a bottom to said channel, drive means to rotate the rollers about axes which are generally perpendicular to said walls to convey cane along the channel, at least one of said plurality of rollers including an outer periphery of mesh material which will allow the passage of air and will convey cane along said channel, and an extractor fan mounted on the frame above at least some of the rollers for pulling air up through the roller with an outer periphery of mesh material, through cane that is being conveyed along the channel and for forcing air and entrained trash from the cane out of the harvester.

4,039,435

UNITARY COMPARTMENTALIZED CONTAINER

Sydney Paul Narva, 367 Echo Valley Lane, Newtown Square, Pa. 19073

Filed Dec. 11, 1975, Ser. No. 639,765
Int. Cl.[2] B65D *77/20*
U.S. Cl. 206—217 **12 Claims**



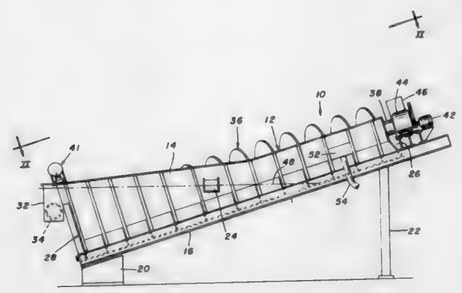
1. A container assembly for hermetically storing a product dosage comprising: a container having a sidewall and a bottom wall connected to said sidewall thereby closing one end of the container, said container sidewall having around its interior a radially inwardly extending sidewall portion defining an annular surface which divides said container into upper and lower compartments; and a closure member insertable into said container defining therewith a container assembly and dimensioned to overlie and directly contact the sidewall annular surface when said closure member is in a predetermined position thereby closing said lower compartment while leaving open said upper compartment so that a product dosage can be stored within said lower compartment during use of the container assembly, said closure member having an annular lip depending from its underside coacting with means on said sidewall portion defining an annular groove dimensioned to receive therein said annular lip for hermetically sealing said lower compartment when said closure member is in said predetermined position, said annular lip being solid throughout and having a width slightly wider than that of said annular groove and being composed of compressible material so that said lip compresses inwardly and engages with said groove with a snapfit when said closure member is in said predetermined position, and manually graspable means attached to the top side of said closure member for effecting manual removal thereof from said container to enable access to the product dosage within said lower compartment.

4,039,436

SPIRAL CLASSIFIER HAVING PRIMARY AND SECONDARY COARSE SOLIDS FRACTION DISCHARGE

Richard R. Maki, Hibbing, Minn., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 2, 1976, Ser. No. 646,138
Int. Cl.[2] B03B *5/52*
U.S. Cl. 209—464 **7 Claims**



1. Spiral classifier apparatus for the classification of solids particles in a liquid - solids mixuture comprising:

a. longitudinally extending side walls and a bottom inclined upwardly from end to end forming an elongated tank;

b. inlet means for supplying a mixture of liquid and solids particles to the interior of said tank forming a pool therein;

c. a primary coars solids discharge at the elevated end of said tank and a fine solids discharge at the other end thereof, the level of said fine solids discharge defining the level of said pool;

d. a raking mechanism operative in said tank for inducing movement of the coarse solids fraction toward said coarse solids discharge; and

e. means froming an opening in one of said side walls adjacent said raking mechansim and intermediate said inlet and said primary coarse solids discharge and disposed above the level of said pool to define a secondary coarse solids discharge for the removal of part of the coarse solids fraction ahead of said primary coarse solids fraction

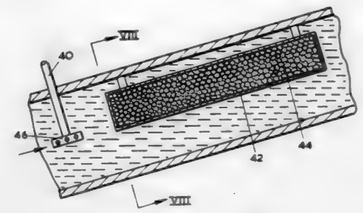
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4,039,437

TREATMENT OF SEWAGE

Kenneth Cecil Smith, Roydon, and Michael Ernest Garrett, Woking, both of England, assignors to BOC Limited, London, England

Claims priority, application United Kingdom, Apr. 8, 1974 15375/74
Filed May 8, 1975, Ser. No. 575,969
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—9 **11 Claims**



1. In a method of treating sewage flowing through a sewer, wherein an oxygenating gas is injected under pressure into the sewage and is dissolved therein the improvement comprising, contacting the thus oxygenated sewage without obstructing flow of solids along the bottom of the sewer with a stationary matrix means generally supported from the top of the sewer and above the bottom of the sewer extending generally longitudinally in the sewer a significant distance and constructed to permit flow of sewage therethrough for providing an extended area for growth of micro-organisms effective to reduce the Biochemical Oxygen Demand of the sewage, the matrix extending across a region inside the sewer, whereby said matrix is colonized along distinct longitudinally disposed portions with colonies of micro-organisms capable of assimilating at least carbonaceous compounds, wherein the matrix is a bed of solid material within a container having passages in its walls for the flow of liquid therethrough.

9. A sewer with matrix means generally supported from the top of the sewer and extending downwardly therefrom and extending generally longitudinally in the sewer a significant distance and constructed to permit flow of sewage therethrough for providing an increased surface area for growth of micro-organisms, which matrix means extend across a region inside the sewer, said matrix means not projecting generally below a central longitudinal axis of the sewer, said matrix means being selected from the group consisting of, (1) a bed of solid material within a container having passages in its walls for the flow of liquid therethrough, (2) a plurality of spaced-apart pieces of sheet material which have passages for the flow of liquid therethrough, and (3) a plurality of longitudinally extending members comprising radially disposed fins on the inner wall of the sewer.

4,039,438

BIOLOGICAL DENITRIFICATION OF WATER

Donald R. Anderson, 3062 Blume Drive, Los Alamitos, Calif. 90720

Filed Oct. 15, 1975, Ser. No. 622,528
Int. Cl.[2] C02C *5/10*
U.S. Cl. 210—11 **11 Claims**

1. The process for the anaerobic biological denitrification of water which comprises:

contacting water containing from 10 to about 200 ppm nitrogen as nitrate and quantities of organic material less than about 10 ppm., insufficient to support its biological denitrification, with a quantity of a cellulosic substrate sufficient to support said biological denitrification in the presence of a culture of anaerobic soil bacteria in an active growth phase; and

maintaining the water during the contacting substantially free of oxygen, under anaerobic conditions, and at a temperature from 50° to about 120° F. and for a sufficient

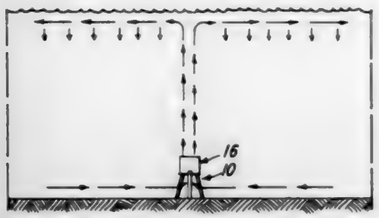
period of time from a few minutes to to about 24 hours to effect the biological denitrification of the water.

4,039,439

METHOD FOR DESTRATIFYING BODIES OF WATER

John W. Clark, 205 Hoagland, Las Cruces, Dona Ana, N. Mex. 88001

Continuation-in-part of Ser. No. 282,930, Aug. 23, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 511,007
Int. Cl.[2] C02B *1/00*; C02C *5/12*
U.S. Cl. 210—14 3 Claims



1. A method for destratifying and mixing large bodies of water for increasing natural surface aeration, improving the habitant for acquatic life, removing and/or preventing formation of ice, and improving the general quality of the water for domestic and industrial use, comprising the steps of:

a. emplacing electrolytic-gas generating means adjacent the lower reaches of a large body of water in which the water thereat is normally hydrogen-saturated;

b. electrolytically generating hydrogen gas bubbles as a lifting vehicle beneath the surface of the water at the lower reaches; and

c. maintaining the hydrogen bubble size range from 100 to 600 microns in diameter so that the bubble size is not so small as to adhere to particulate matter and cause turbulence in the lower reaches of the body of water and of a size large enough to lift on the hydrogen-saturated water and lift it to the surface of the body of water and substantially spread thereover to expose the hydrogen-saturated water to natural aeration at the surface by maintaining the oxygen-depleted water in substantial contact with the atmosphere.

4,039,440

REVERSE OSMOSIS MEMBRANE

John E. Cadotte, Minneapolis, Minn., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Continuation-in-part of Ser. No. 287,592, Sept. 19, 1972, abandoned. This application Jan. 16, 1975, Ser. No. 541,477
Int. Cl.[2] B01D *31/00, 13/00*
U.S. Cl. 210—23 H 5 Claims

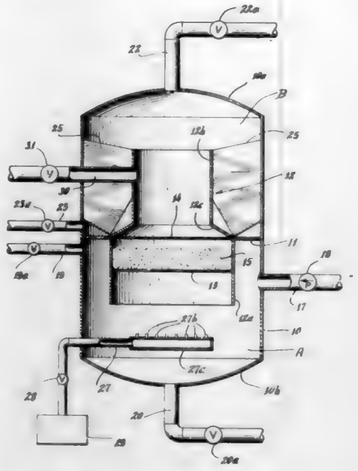
1. A process for the preparation of a reverse osmosis membrane consisting of the steps of (1) coating a porous support with a film of polyethyleneimine; (2) contacting the product of step (1) with a solution of a polyfunctional cross-linking reagent in a non-polar organic solvent, said cross-linking reagent consisting of isophthaloyl chloride; and (3) heat curing the product of step (2) at a temperature of about 90° to 130° C for a period of about 5 to 30 minutes.

4,039,441

COALESCING METHOD AND APPARATUS

Richard H. G. Fett, Poughkeepsie, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed Apr. 8, 1974, Ser. No. 458,695
Int. Cl.[2] B01D *17/04*
U.S. Cl. 210—23 R 6 Claims



1. In a coalescing apparatus comprising a housing, means dividing the interior of the housing into upper and lower chambers, said dividing means including a pair of vertically spaced screen elements and a coalescing bed of granular material loosely retained between said elements, said bed and screen elements forming a generally vertical flow path between said chambers, the lower chamber having an inlet for a mixture of relatively light and heavy liquids and also having an upper outlet for light liquid and a bottom outlet, baffle means located in the lower chamber between said upper outlet and said vertical flow path, the upper chamber having an upper outlet for light liquid and a lower outlet, a duct leading to said lower chamber and having an outlet positioned to deliver gas to the coalescing bed from substantially below said bed, and a compressed gas source associated with the duct for delivering compressed gas intermittently thereto.

4,039,442

ION-EXCHANGE PROCESS FOR DESALTING WATER AND SUBSEQUENT REGENERATION OF THE ION EXCHANGERS

Vaclav Kadlec, Klanovice, and Pavel Huebner, Prague, both of Czechoslovakia, assignors to CKD DUKLA, narodni podnik, Prague, Czechoslovakia

Continuation of Ser. No. 534,438, Dec. 19, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,375
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—32 2 Claims

1. In a method for the desalting of a solution by means of ion exchangers followed by the regeneration of the exhausted ion exchangers after the desalting is completed, comprising contacting the solution with a first strong cation exchanger in the form of a monovalent cation selected from the group consisting of sodium and ammonium and by a first strong anion exchanger selected from the group consisting of a hydroxide and a bicarbonate to replace the salts in the solution by a first basic compound and to exhaust the first cation exchanger and the first anion exchanger, and thereafter contacting the solution with a second weak cation exchanger having a pk value greater than 2 in the form of a free acid to replace the cation of the first compound with a hydrogen ion of the second cation exchanger and to exhaust the second cation exchanger, the improvement

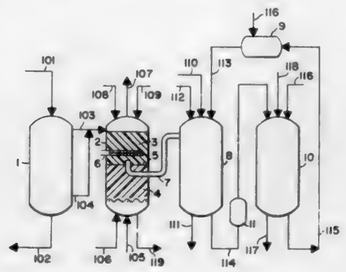
which comprises the further steps of contacting the exhausted second cation exchanger with deionized water having a temperature greater than 30° C to produce a second basic compound and to directly regenerate the second cation exchanger, and thereafter contacting the exhausted first anion exchanger with the second basic compound to directly regenerate the first anion exchanger.

4,039,443

CONDENSATE PURIFICATION PROCESS

Sentaroo Tahara, Tokyo; Toshiteru Murata, Kawashi; Seiki Shimaya, Tokyo, all of Japan, and George J. Crits, Havertown, Pa., assignors to Crane Co., New York, N.Y.

Continuation of Ser. No. 641,935, Dec. 18, 1975, abandoned. This application June 8, 1976, Ser. No. 693,841
Claims priority, application Japan, Dec. 18, 1974, 49-145178
Int. Cl.[2] B01D *15/06*; C02B *1/70*
U.S. Cl. 210—32 10 Claims



1. In a water purification process involving flow of water through a demineralizer containing mixed anion exchange resin granules and cation exchange resin granules, the steps of separating the resins into two beds, one of which contains anion exchange resin granules entraining a minor amount of cation exchange resin granules and the other of which contains the major part of the cation exchange resin granules, regenerating the first-mentioned bed with alkali, and following the regeneration with alkali, recirculating an aqueous solution of hydrazine through said first-mentioned bed to effect displacement of alkali metal from the entrained cation exchange resin granules.

4,039,444

WATER PURIFICATION DEVICE

Barbara H. Bory, Fort Lee, and Alan B. Kessler, Ramsey, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,375
Int. Cl.[2] B01D *15/00*
U.S. Cl. 210—36 15 Claims

1. A device for removing certain impurities from water comprising:

a. a closed container, wherein at least one functional surface of said container is a porous to water, high strength paper wherein said paper has a thickness of about 0.001 to 0.005 inches, a porosity of at least 100 cfm/ft^2, a dry machine direction strength of at least 2,000 grams/linear inch, a dry cross direction strength of at least 800 grams/linear inch, a wet machine direction strength of at least 450 grams/linear inch, and a wet cross direction strength of at least 175 grams/linear inch;

b. an amount, sufficient to treat said water of granular activated carbon contained in said container; and

c. an ingredient that will inhibit the migration of fine particles of said carbon through said paper when said device is immersed in water, wherein said ingredient is compatible to the particle size distribution of said carbon and is dispersed therein, in an amount sufficient to inhibit the migration of fine particles of said carbon through said porous paper when said device is immersed in water and wherein said ingredient will not normally adversely affect the palatability of said water;

wherein said ingredient is selected from the group consisting of:

i. a pregelatinized, pH modified epichlorohydrin crosslinked tapioca starch having a gross swelling power of about 16 measured after 30 minutes, a pH of about 6, and a predominant mesh size of about 20 to 100 mesh,

ii. a pH modified, epichlorohydrin crosslinked corn starch having a gross swelling power of about 13 measured after 45 minutes, a pH of about 6, and a predominant mesh size of about 12 to 100 mesh,

iii. a substantially pure aluminum lanolate soap in the form of free flowing particles having a predominant mesh size of about 40 mesh, and

iv. combinations thereof.

4,039,445

MATRIX OF ALGAE AND METHOD OF MAKING SAME AND METHOD OF OBTAINING URANIUM FROM SEA WATER BY SAID MATRIX

Erich-Alexander Heide; Maximilian Wald; Manfred Paschke, and Klaus Wagener, all of Julich, Germany, assignors to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung, Julich, Germany

Continuation of Ser. No. 504,493, Sept. 9, 1974, abandoned. This application Apr. 6, 1976, Ser. No. 674,109
Claims priority, application Germany, Sept. 8, 1973, 2345430; Aug. 30, 1974, 2441479
Int. Cl.[2] B01D *15/00*
U.S. Cl. 210—38 C 3 Claims

1. A method of preparing a matrix comprising in combination mutants for single cell green algae to be cultivated compatible with uranium and suitable for extracting uranium dissolved in sea water, which includes the steps of: introducing the algae into a sterilized nutrient solution adjusted to an acidity of ph 6, and formed of 3.8 grams sea salt, 0.03 grams of NH_4NO_3 as well as 5ml earth extracts in 100 ml water, introducing in steps into the thus obtained solution uranium in the form of uranylnitrate until the quantity of uranium has been enriched to 250mg/l, subjecting the algae to X-ray radiation at a dose of approximately 50 kR, pouring the algae onto agar plates formed by employing a solution of 3.8 grams sea salt and 0.03 grams of NH_4NO_3 and 5ml earth extracts in 100 ml water, inoculating the thus forming colonies individually and further cultivating the same in a nutrient solution formed by the solution of 3.8 grams sea salt and 0.03 grams NH_4NO_3 and 5ml earth extracts in 100 ml water.

4,039,446

HEAVY METAL-BINDING AGENT PROCESS

Kouichi Ban; Yasumiti Namba; Yukihiro Sekine, and Masaaki Matsuda, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Division of Ser. No. 373,419, June 25, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,446
Claims priority, application Japan, June 28, 1972, 47-65207
Int. Cl.[2] B01D *15/00*
U.S. Cl. 210—38 B 4 Claims

1. A method for removing heavy metals present in a solution or gas comprising contacting the heavy metal-containing solution or gas with a heavy metal-binding agent consisting essentially of the reaction product of at least 0.01% by weight of carbon disulfide with a resin selected from the group consisting of a urea resin, a thiourea resin, a melamine resin, an aniline resin, a urethane resin, and a resin obtained by reacting an amino compound with a halogen containing resin selected from the group consisting of polyvinyl chloride, polyvinylidene chloride, polyvinyl bromide, polyvinylidene bromide, 1-chloro-1-bromoethylene polymer, 1-chloro-1-fluoroethylene polymer, chlorinated polyethylene, chlorinated polypropylene and a

copolymer of vinyl chloride, vinylidene chloride, vinyl bromide, vinylidene bromide, 1-chloro-1-bromoethylene or 1-chloro-1-fluoroethylene with acrylonitrile, vinyl acetate, acrylic acid, methacrylic acid, methyl methacrylate, methyl acrylate, ethyl acrylate or butyl acrylate.

4,039,447

WASTE WATER TREATMENT METHOD AND APPARATUS

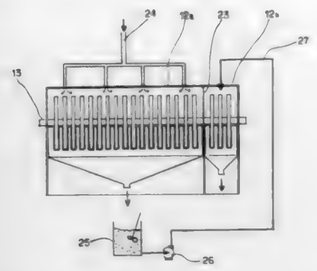
Mitugi Miura, Osakasi; Hisao Matubayasi, Tokyoto, and Syojiro Iwai, Osakafu, all of Japan, assignors to Miura Engineering International Company Ltd., Osaka, Japan

Filed Nov. 14, 1975, Ser. No. 632,074

Claims priority, application Japan, Nov. 15, 1974, 49-132366; Dec. 26, 1974, 50-681; Mar. 8, 1975, 50-28316; Sept. 10, 1975, 50-110348

Int. Cl.[2] **C02B** *1/20;* **B01D** *35/06*

U.S. Cl. 210—42 S **9 Claims**



1. A waste water treatment method, utilizing magnetic powder, which comprises the steps of:

continuously feeding waste water, to which has been added magnetic powder and which has been subjected to a flocculation treatment, into the large chamber of a tank having a large chamber separated from a small chamber by a partition, the tank having a plurality of rotating rotary magnetic discs arranged therein on a single shaft of rotation extending through both chambers thereof, some of said discs being in said large chamber and a smaller number of said discs being in said small chamber;

collecting the co-flocs of magnetic powder and suspended solids from the waste water on said magnetic discs in the large chamber, as they rotate;

removing the co-flocs from the magnetic discs in the large chamber and continuously discharging the resultant water therefrom;

agitating the removed co-flocs in a separate chamber to destroy the co-flocs;

feeding the deflocculated magnetic powder and suspended solids to the small chamber of said tank; and

separating the magnetic powder from the suspended solids by collecting the magnetic powder on said magnetic discs and removing the magnetic powder therefrom.

4. A waste water treatment apparatus, comprising:

a tank divided by a partition into a large chamber, for receiving the waste water which has had magnetic powder added thereto and has been subjected to a flocculation treatment, and a small chamber for separating magnetic powder from suspended solids;

a rotary shaft extending through both chambers of said tank;

a plurality of rotary magnetic discs connected to said shaft, a number of said magnetic discs being disposed in said large chamber and a smaller number being disposed in said small chamber;

scraper means disposed in close adjacency to each said rotary magnetic disc for scraping off material which has been deposited on the magnetic discs, such material being magnetic powder co-flocculated with suspended solids from the waste water on the discs in said large chamber and magnetic powder alone on the discs in said small chamber;

means for rotating said shaft carrying said rotary magnetic discs;

smashing tank means for destroying the co-flocs of magnetic powder and suspended solids by agitation;

means for directing the co-flocs scraped off by said scraper means adjacent said rotary discs in said large chamber into said smashing tank means; and

means for directing the deflocculated magnetic powder and suspended solids from said smashing tank means into said small chamber of said tank.

4,039,448

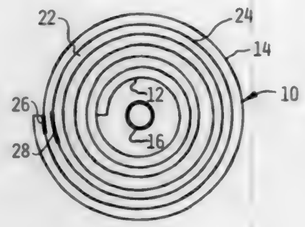
FILTER WITH AN OPEN-CELL ELASTOMERIC FOAM

Kenji Etani, W. Meadow Road, West Townsend, Mass. 01474

Continuation-in-part of Ser. No. 518,077, Oct. 25, 1974, Pat. No. 3,947,362, which is a continuation-in-part of Ser. No. 419,042, Nov. 26, 1973, abandoned. This application Feb. 4, 1976, Ser. No. 655,128

Int. Cl.[2] **B01D** *29/06*

U.S. Cl. 210—42 R **2 Claims**



1. A filter for water, said filter comprising:

a. a cylindrical body having, coaxially, an inner hollow surface and an outer peripheral surface;

b. a pair of opposed end plates sealing the ends of said body; and

c. an axial fitting that substantially is spaced from the hollow surface and that connects said end plates;

d. said body being composed of an elastomeric foam characterized by open cells which range from 10 to 400 pores per linear inch; e. said cylindrical body being composed of spiral convolutions including two outer convolutions of a sheet of said elastomeric foam;

f. at least said two outer convolutions being bonded to each other by a line of cement extending substantially from one end of said body to the other;

g. said end plates being bonded to the ends of said body by cement;

h. said elastomeric foam being composed of a material that is selected from the class consisting of urethane polymers and vinyl polymers and has a **25** percent indication load deflection value in the range of 1 to 200 pounds-force per 50 square inches.

4,039,449

FLOC BARRIER

Alfonse Joseph Soriente, Gillette, N.J., assignor to Ecodyne Corporation, Lincolnshire, Ill.

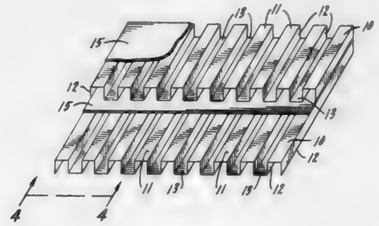
Filed May 20, 1976, Ser. No. 688,213

Int. Cl.[2] **B01D** *21/10*

U.S. Cl. 210—522 **8 Claims**

1. Apparatus for separating settlable solids from liquids comprising a self-supporting module in the shape of a parallelogram consisting essentially of a plurality of rows of parallel, vertical tubes tilted in the same direction toward one end of said parallelogram, each row of parallel tubes being defined by a square-tooth member extending across the width of said parallelogram, each square-tooth member having a series of first segments spaced across the width of said parallelogram in the same plane, a pair of second segments extending lengthwise of said parallelogram from the opposite ends of each of said first segments, a series of third segments, spaced across the width of said parallelogram in the same plane, the plane of said first segments being parallel to the plane of said third segments, said second segments also being connected to opposite ends of said third segments in such a manner that each of said first and third segments and the second segments connected to the opposite ends of each first and third segment define three sides of each said tubes, said square-tooth members being bonded to and separated by a pluarality of flat parallel sheets tilted toward said one end and extending across the width of said parallelogram, said tilted sheets defining the fourth side of each said tubes, a pair of flat side sheets extending lengthwise of said parallelogram at its opposite sides, and each of said side sheets being bonded to the oposite edges of said square-tooth members and said tilted sheets at said opposite sides of said parallelogram.

8. Apparatus for separating settlable solids from liquids comprising a self-supporting module in the shape of a parallelogram consisting essentially of a plurality of rows of parallel, vertical tubes tilted at an angle of about 60° in the same direction toward one end of said parallelogram, each row of parallel tubes being defined by a square-tooth member extending across the width of said parallelogram, each square-tooth member having a series of first segments spaced across the width of said



parallelogram in the same plane, a pair of second segments extending lengthwise of said parallelogram from the opposite ends of each of said first segments, a series of third segments, spaced across the width of said parallelogram in the same plane, the plane of said first segments being parallel to the plane of said third segments, said second segments also being connected to opposite ends of said third segments in such a manner that each of said first and third segments and the second segments connected to the opposite ends of each first and third segment define three sides of each said tubes, said first and third segments being essentially perpendicular to said second segments so that said tubes are essentially rectangular, said square-tooth members being bonded to and separated by a plurality of flat parallel sheets tilted toward said one end and extending across the width of said parallelogram, said tilted sheets defining the fourth side of each said tubes, a pair of flat side sheets extending lengthwise of said parallelogram at its opposite sides, said side sheets being at least twice as thick as said tilted flat sheets and comprising two overlapping layers of material having the same thickness bonded to each other, each of said overlapping layers comprising a plurality of segments of material connected by bonded joints at their edges, the segments in each of said overlapping layers have different lengths so that said joints will be staggered along the length of said parallelogram, and each of said side sheets being bonded to the opposite edges of said square-tooth members and said tilted sheets at said opposite sides of said parallelogram.

4,039,450

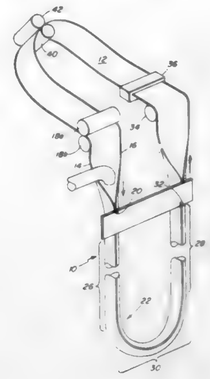
CONTINUOUS TUBULAR FILTER AND METHOD OF USING THE SAME

Judson G. Brown, 11 Arcadia Road, Andover, Mass. 01810

Filed Apr. 8, 1976, Ser. No. 674,818

Int. Cl.[2] **B01D** *33/00*

U.S. Cl. 210—77 **14 Claims**



1. A method for filtration by hydrostatic pressure and gravity which includes:

a. forming a filter belt into an integral tube by sealing continuously the edges of the belt;

b. moving the tube along a substantially U-shaped path, the path comprising a feed side, a bottom portion, and a discharge side;

c. introducing a feed stream into the tube;

d. increasing the hydrostatic pressure in the feed side from the upper to the lower portion of the feed side;

e. forming a cake on the inner walls of the tube and causing said cake formation substantially solely by the hydrostatic pressure;

f. forming a liquid core within the cake, and extending said liquid core along the length of the feed side;

g. opening the tube downstream of the discharge end to form the belt; and

h. removing the cake formed.

11. A filter apparatus which comprises:

a. a filter belt;

b. means to form the belt into an integral tubular filter;

c. means to suspend the tube such that it forms a substantially U-shaped configuration, the tube including a substantially vertical feed side, a bottom portion, and a discharge side;

d. means to introduce a feed stream into the feed side of the tube and to fill the feed side of the tube with the feed stream;

e. means to control the belt speed to form a cake on the inner walls of the tube and a liquid core within the cake;

f. means to open the tube disposed downstream of the discharge side to convert the tube back into the filter belt;

g. means to remove cake formed in the tube and remaining on the belt, said means spaced apart from the means to open the tube; and,

h. means to move the belt along the U-shaped configuration.

4,039,451

EVAPORATION OF TREATED WASTE WATER

Alvin Jack Smith, 228 Cordova Drive, Santa Barbara, Calif. 93110

Filed Aug. 18, 1975, Ser. No. 605,594

Int. Cl.[2] **B01D** *23/16*

U.S. Cl. 210—170 **6 Claims**

1. In a system for evaporating waste water,

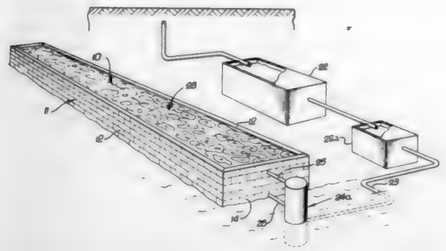
a. a generally horizontally elongated evaporation bed com-

prising multiple layers, the top layer exposed to the atmosphere,

b. said layers including an upper layer of rock pieces and a lower sand layer,

c. there being piping extending in the upper rock layer and containing perforations to relatively slowly deliver waste water into that rock layer for percolation into the sand layer and ultimate evaporation therefrom,

d. there being a lower rock layer under the sand layer to receive drainage of excess water therefrom, and means to



recirculate drainage of water in the lower rock layer for return to the upper rock layer, said last named means including a sump in communication with said lower rock layer to receive water drainage therefrom, and a pump taking suction from the sump and having its outlet in supply communication with said piping, and

e. a septic tank, and a conduit communicating between said tank and said pump to deliver tank contents to the sump for delivery by the pump to said piping in the upper rock layer.

4,039,452

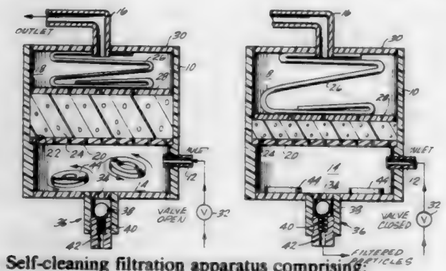
SELF-CLEANING FILTER

John J. Fernandez, 1620 S. Myrtle Ave., Monrovia, Calif. 91016

Filed Nov. 15, 1976, Ser. No. 741,511

Int. Cl.² B01D *29/38*

U.S. Cl. 210—106 **21 Claims**



1. Self-cleaning filtration apparatus comprising:

a filter housing having spaced apart inlet and outlet openings;

a compressible filter element in the housing between the inlet and outlet openings;

means for introducing an unfiltered fluid under pressure into the housing through the inlet opening so that the fluid flows through the filter element and filtered fluid flows through the outlet opening;

spring-biasing means in the housing for applying variable pressure to the compressible filter element;

the spring-biasing means being responsive to fluid pressure established in the filter housing to reduce pressure on the filter element to enable the filter element to maintain a relatively uncompressed normal condition during passage of the filtered fluid through it;

the spring-biasing means being responsive to reduction of fluid pressure in the housing to apply pressure to the filter element to compress it and thereby squeeze filtered matter from the filter element.

4,039,453

AQUARIUM FILTER TANK PUMP WITH BYPASS

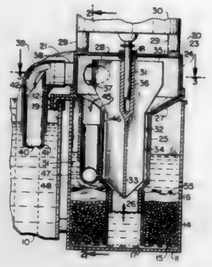
Tibor Horvath, Brooklyn, N.Y., assignor to Aquology Corporation, Newark, N.J.

Filed July 19, 1976, Ser. No. 706,804

The portion of the term of this patent subsequent to July 10, 1990, has been disclaimed.

Int. Cl.² E04H *3/16*

U.S. Cl. 210—169 **8 Claims**



1. A pump for an aquarium filter tank, said filter tank containing water and having filter material in said filter tank, means supporting said filter material, and a suction outlet drawing water from below said filter material, said pump comprising, in combination, a housing having a large upper portion containing a cylindrical cavity disposed at least partly above the top of said filter tank, a tangential outlet from said cylindrical cavity extending out over the top of said filter tank, a small lower portion with an inlet at the bottom thereof connected to said suction outlet, and a transition between said upper and lower portions, a motor mounted above said casing and having a shaft extending into said casing, an impeller in said housing mounted on said shaft, said impeller having a larger upper portion within said cylindrical cavity of said upper portion of said housing and a smaller lower portion extending downward within the lower portion of said housing below the level of water in said filter tank, said smaller lower portion of said impeller priming said upper portion of said housing by raising water into said cavity where efficient pumping action takes place, flow constricting control means associated with said outlet tube, said casing containing a bypass opening, and a bypass tube extending from said bypass opening into said filter tank above said filter material so that restriction of flow through said outlet tube by said control means causes flow from said bypass tube back into said filter tank.

4,039,454

FLUID SEPARATION DEVICE FOR LOW TEMPERATURE ENVIRONMENTS

Henry Francis Miller, San Jose, and Michael George Hoard, Sunnyvale, both of Calif., assignors to Lockheed Aircraft Corporation, Burbank, Calif.

Filed June 29, 1976, Ser. No. 700,831

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 S **5 Claims**

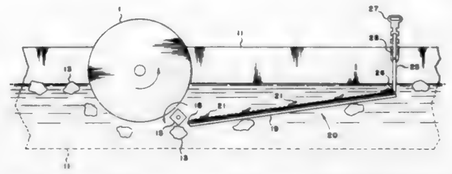
1. A device for separating oil from water and pieces of floating ice comprising

spaced side support members, adapted to extend beneath a water surface, constituting a channel area,

rotational oil pickup means journalled between said side supports,

a perforate through-put barrier, adapted to be submerged in operation, having an inclined under surface and forward and rearward edges, said forward edge secured between said side supports adjacent said pickup means and positioned to be able to receive submerged pieces of ice against its under surface,

a containment backstop hingedly attached to the rearward edge of said barrier and extending between said side supports, thus to form between said pickup device and said



side members a containment ponding area for accumulated oil,

and a rotatable tumbler bar journalled between said side members and positioned generally between the forward edge of said barrier and the lower periphery of said pickup means.

4,039,455

RETAINING DEVICE FOR AN APPARATUS HAVING FLAT SEMI-PERMEABLE MEMBRANES

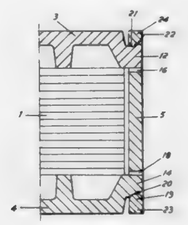
Robert Bardin, Vienne, and Michel Cronenberger, Rhone, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed May 15, 1975, Ser. No. 577,839

Claims priority, application France, May 16, 1974, 74.17001; Apr. 1, 1975, 75.10102

Int. Cl.² B01D *13/00*

U.S. Cl. 210—321 A **21 Claims**



1. Fluid treatment apparatus comprising:

a lower plate,

a stack of membranes and spacers arranged on said lower plate parallel thereto,

at least two side-plates connected to said lower plate, effective to permit movement of said side plates with respect to said lower plate,

an upper plate adjacent said stack, and

co-operating locking means on said upper plate and said side plates which lock said upper plates to said side plates and which compress said stack against the lower plate whereby the membranes and spacers forming said stack are compressed together a predetermined compressed thickness against the lower plate.

19. A method of making fluid treatment apparatus comprising forming a stack of membranes and spacers, positioning this stack on a lower plate to which are connected at least two side plates having cut-outs adjacent their upper edge, placing an upper plate on the stack, the upper plate having projections adapted to co-operate with the cut-outs of the side-plates, clamping the thus formed assembly thus causing the stack to be compressed and then engaging the cut-outs on the projections of the upper plates, relaxing the clamping force and releasing the thus formed assembly whereby the membranes and spacers forming said stack are compressed together a predetermined compressed thickness against the lower plate.

4,039,456

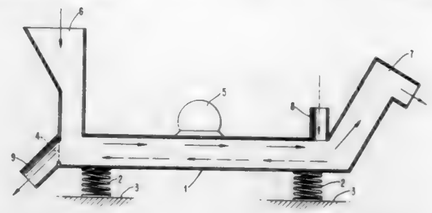
COUNTER CURRENT FLOW VIBRO-ACOUSTICAL EXTRACTION APPARATUS

Stoycho Mitrev Stoev; Marin Dimitrov Mitrushev; Grozdan Todorov Boshilov, and Maria Georgieva Radeva, all of Sofia, Bulgaria, assignors to Vish Minno-Geoloshki Institute-Nis, Sofia, Bulgaria

Filed Apr. 28, 1975, Ser. No. 572,342

Int. Cl.² B01D *33/00, 35/20*

U.S. Cl. 210—388 **4 Claims**



1. Apparatus for separating liquid and solid phases of a suspension, comprising in combination, an enclosure forming a working cell defining a flow path having a first lateral end and a second lateral end, a stationary support, spring means mounting such cell on said stationary support for vibratory movement, a vibrator mounted on the cell to vibrate it, two laterally displaced feeding openings at the top of the cell for feeding, respectively, solid particulate material to said first lateral end of said flow path and liquid material to said second lateral end of said flow path, two laterally spaced discharge outlets on the cell for discharging, respectively, a solid material component of the fed material from said second lateral end of said flow path and a liquid material component of the fed material from said first lateral end of said flow path and a screen mounted vertically inside the cell across the liquid discharge opening and fully covering said liquid discharge opening and secured to said cell so as the vibrate jointly therewith; said vibrator effecting a countercurrent flow within said working cell between said solid and liquid material components.

4. Apparatus for separating liquid and solid phases of suspension, comprising in combination,

an enclosure forming a working cell and having a front wall, a back wall, a pair of oppositely disposed side walls, a top wall and a bottom wall;

a stationary support;

spring means mounting said cell on said stationary support;

a vibrator secured to the bottom wall of said working cell and adapted to vibrate said cell;

a partition extending from said front wall to said back wall and from said top wall to a position adjacent but spaced from the bottom wall of the cell so as to divide said working cell into two serially disposed chambers which are in communication with each other;

a first chamber having a first feed opening in said top wall for charging said first chamber with liquid and solid material; the second chamber defining a flow path with an upper end and a lower end, having a second feed opening in said upper end of said flow path for charging said second chamber with liquid material;

said second chamber having a first discharge opening for discharging liquid material from said lower end of said flow path;

a horizontal screen mounted in said second chamber at said lower end of said flow path fully covering said first discharge opening; and

said second chamber having a second discharge opening at said upper end of said flow path for discharging solid material, whereby countercurrent flow is effected be-

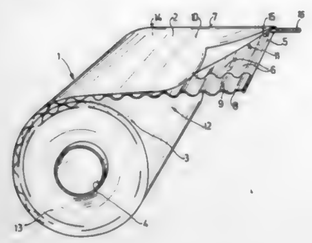
tween said solid material and said liquid material in said second chamber.

4,039,457

COILED FILTER ELEMENT FOR FILTERING OF LIQUIDS

Hans Schacht, Stuttgart, and Fritz Cub, Schwabach, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation of Ser. No. 438,035, Jan. 30, 1974, abandoned. This application Jan. 13, 1976, Ser. No. 648,716
Claims priority, application Germany, Feb. 2, 1973, 2305128
Int. Cl.² B01D *27/06, 29/06, 29/10*
U.S. Cl. 210—493 R **7 Claims**



1. A filter element for filtering of liquids, particularly contaminant-containing liquids, comprising a unitary strip of filter material formed with a fold so as to have two closely adjacent strip portions consisting of one piece and having aligned longitudinally extending free edges between which liquid to be filtered enters and longitudinally extending unitary second edges transversely spaced from the respective free edges and in the region of which filtered liquid passes through said filter material, said strip portions due to said folding being unitary along said second edges only, and said strip being coiled so that each of said strip portions forms a plurality of convolutions which alternate with the convolutions of the other strip portion, the convolutions of said strip portions defining two spirally intercalated internal filter chambers one of which is open in the region of said free edges and closed in the region of said second edges due to said strip portions being folded and therefore unitary along said second edges; means for closing the other of said intercalated internal filter chambers along said free edges of said strip portions, so that said intercalated internal filter chambers are open and closed along opposite edges of said strip portions, respectively; and liquid-permeable foraminous contaminant-entrapping uncoated multi-fiber thread means for permitting passage of incoming liquid through the foramina of said means while entrapping contaminants contained in the liquid, said means being provided within the fold of said strip portions in the region of said unitary second edges so as to prevent the liquid flowing through the formania from forcing contaminant particles through said filter material.

4,039,458

APPARATUS FOR SEPARATION BY DECANTATION

Paul Maisonneuve, Communay, and Paul Rouyer, Lyon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 7, 1975, Ser. No. 629,964
Claims priority, application France, Nov. 8, 1974, 74.37051
Int. Cl.² B01D *19/00*
U.S. Cl. 210—513 **13 Claims**

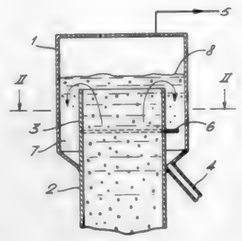
1. Apparatus for the separation of a heterogeneous mixture, including a continuous liquid phase of higher density than the other phase of the mixture, said apparatus comprising:

a. a jacket;

b. weir extending upwardly into said jacket and defining, between the jacket and the weir, a space forming a decantation zone, said weir having an upper rim;

c. at least one outlet for the liquid in the jacket connected to the space at a location below the upper rim of the weir;

d. at least one outlet for the other phase in said jacket at a location above the upper rim of said weir; and



e. at least one obstacle located in the decantation zone above the liquid outlet effective to ensure that the vertical component of the local speed of overflow is uniform over the length of the rim of the weir.

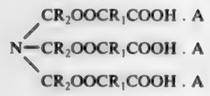
4,039,459

COMPOSITION AND METHOD FOR DRILLING A RESERVOIR CONTAINING A HIGH TEMPERATURE AQUEOUS LIQUID

Paul W. Fischer, Whittier, and Horst E. Zilch, Yorba Linda, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed June 30, 1976, Ser. No. 701,366
Int. Cl.² C09K *7/02, 7/08;* **C02B** *5/06*
U.S. Cl. 252—8.5 C **12 Claims**

1. A gas-containing aqueous drilling fluid comprising about 99.5 to about 90 volume percent of a gas and from about 0.5 to about 10 volume percent of a clay-free aqueous dispersion containing (1) about 327 to about 347 pounds per barrel water, (2) about 10 to about 2 pounds per barrel lignite, (3) about 2.5 to about 0.5 pounds per barrel alkali metal or ammonium salt of a homopolymer of acrylic acid or a copolymer containing at least about 90 percent by weight acrylic acid and up to about 10 percent by weight acrylonitrile, methyl acrylate, ethyl acrylate or 2-methyl propanoic acid, which homopolymers and copolymers have an average molecular weight of 5,000 to 50,000, (4) about 1.0 to about 0.05 pounds per barrel of a polyamine salt having the formula:



where R_1 is a bivalent hydrocarbyl radical containing about 8 to about 44 carbon atoms, R_2 is an alkylene containing about 1 to about 4 carbon atoms and A is ammonia or a water-soluble amine containing about 1 to 15 carbon atoms, and (5) about 0.087 to about 0.0007 pound per barrel of a scale inhibitor comprising a water-soluble organic compound selected from the group consisting of: (i)
unsubstituted saturated dicarboxylic acids having about 2 to about 10 carbon atoms, (ii) dimethylsuccinate, (iii) thiourea, (iv) hexamethylenetetramine and (v) the amide reaction products of unsubstituted saturated aliphatic polycarboxylic acids containing about 2 to about 10 carbon atoms, tartaric acid, or dimethylsuccinate with saturated aliphatic primary and secondary amines having from about 2 to about 8 carbon atoms, their hydroxylated derivatives selected from the group consisting of monoethanolamine, diethanolamine and aminoethanolamine or saturated nitrogen-containing heterocyclic compounds selected from the group consisting of piperidine, pyrrolidine, piperazine, morpholine and 2,6-dimethylmorpholine.

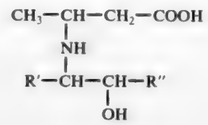
4,039,460

HYDROXYALKYL-AMINOBUTYRIC ACID LUBRICANTS FOR THE COLD-WORKING OF ALUMINUM

Karlheinz Koch, Haan, Germany, assignor to Henkel & Cie G.m.b.H., Dusseldorf, Germany

Filed Nov. 6, 1974, Ser. No. 521,245
Claims priority, application Germany, Nov. 10, 1973, 2356322
Int. Cl.² C07C *101/30*
U.S. Cl. 252—49.3 **13 Claims**

1. A hydroxyalkyl-aminobutyric acid for use in aqueous lubricant preparations in the cold-working of aluminum and aluminum alloys having the formula



wherein R′ and R″ are members selected from the group consisting of hydrogen and alkyl having from 1 to 20 carbon atoms with the proviso that the sum of carbon atoms in both R′ and R″ is from 6 to 20 and only one of R′ and R″ can be hydrogen, and mixtures of said hydroxyalkyl-aminobutyric acids.

7. An aqueous preparation for use as a lubricant in the cold-working of aluminum and aluminum alloys consisting essentially of water containing from 0.1 to 10% by weight of at least one hydroxyalkyl-aminobutyric acid having the formula

wherein R′ and R″ are members selected from the group consisting of hydrogen and alkyl having from 1 to 20 carbon atoms with the proviso that the sum of carbon atoms in both R′ and R″ is from 6 to 20 and only one of R′ and R″ can be hydrogen, and mixtures of said hydroxyalkyl-aminobutyric acids.

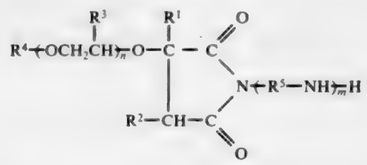
4,039,461

POLYALKYLENE GLYCOL POLYALKYLENE POLYAMINE SUCCINIMIDE DISPERSANTS FOR LUBRICANT FLUIDS

Tad L. Hankins, Fullerton, Calif., and Ting-I Wang, Cherry Hill, N.J., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Division of Ser. No. 368,678, June 11, 1973, Pat. No. 3,897,454, and a continuation-in-part of Ser. No. 765,959, Oct. 8, 1968, abandoned. This application Apr. 28, 1975, Ser. No. 572,026
Int. Cl.² C10M *1/32*
U.S. Cl. 252—51.5 A **11 Claims**

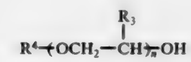
1. A homogeneous lubricating composition comprising a major amount of a base fluid comprising polypropylene glycol diether polymer of lubricating viscosity and a minor amount sufficient to improve the dispersant properties of said lubricating compositions of at least one compound having the following structure:



wherein each R^1 and R^2 is independently selected from the group consisting of hydrogen and monovalent hydrocarbonaceous radicals containing less than about 10 carbon atoms, each R^3 and R^4 is independently selected from the group consisting of hydrogen and alkyl containing from 1 to about 10 carbon atoms, each R^5 is independently selected from the group consisting of divalent hydrocarbonaceous radicals containing from 1 to about 3 carbon atoms, n is a positive integer in the range from about 1 to about 100 and m is a positive integer from about 1 to about 10.

6. A homogeneous lubricating composition comprising a major amount of a base fluid comprising polypropylene glycol diether polymer of lubricating viscosity and a minor amount sufficient to improve the dispersant properties of said lubricating composition of a dispersant composition prepared by a method which comprises:

1. contacting a polyalkylene glycol polymer with a maleic compound in an amount of from about 0.1 mole to about 3 moles of glycol polymer per mole of maleic compound at conditions sufficient to etherify at least a portion of said maleic compound at the carbon-carbon double bond, said polyalkylene glycol polymer being selected from the group consisting of

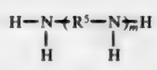


and mixtures thereof, wherein each R^3 and R^4 is independently selected from the group consisting of hydrogen and alkyl containing from 1 to about 10 carbon atoms and n is a positive integer from 1 to about 100, said maleic compound being selected from the group consisting of



and mixtures thereof, wherein R^1 and R^2 are independently selected from the group consisting of hydrogen and monovalent hydrocarbonaceous radicals containing less than about 10 carbon atoms; and

2. contacting said etherified product with a polyalkylene polyamine in an amount from about 0.1 mole to about 3 mole of polyamine per mole of maleic compound contacted in step (1) at conditions sufficient to react at least a portion of said etherified product with said polyamine to form said dispersant composition, said polyalkylene polyamine being selected from the group consisting of



and mixtures thereof, wherein each R^5 is independently selected from the group consisting of divalent hydrocarbonaceous radicals containing from 1 to about 3 carbon atoms, and m is a positive integer from 1 to about 10.

4,039,462

SYNTHETIC POLYESTER-BASED LUBRICANTS POSSESSING A WIDE RANGE OF DESIRABLE PHYSICAL CHARACTERISTICS INCLUDING SOLUBILITY IN MINERAL OIL

Frederic C. McCoy, Beacon, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 570,285, April 21, 1975. This application Dec. 3, 1975, Ser. No. 637,426

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **15 Claims**

1. Synthetic polyester-based lubricant products prepared by the reaction of three classes of reactants in the presence of esterification catalyst and inert solvent capable of forming binary azeotropes with the water formed at the reaction temperatures, by:

A. Forming a reaction mixture of

a. alkoxylated primary alkylmonoamine reactant containing 4 to 30 carbon atoms and an average of 2 to 50 alkoxy groups,

b. monobasic alkanoic acid reactant containing from 1 to 30 carbon atoms,

c. dibasic alkanoic acids containing from 2 to 12 carbon atoms, said reactants being present in the proportions, that for each mole of (a) present, from 1.85 to 0.05 moles of (b) and from 0.5 to 0.95 moles of (c) as well as:

d. a catalytic quantity of esterification catalyst, and

e. a substantial quantity of said inert solvent capable of forming binary azeotropes with the water formed at the reaction temperatures.

B. Heating said reaction mixture to reflux temperatures for a time sufficient to prepare said lubricant products and removing the water of reaction formed as said inert solvent-water binary azeotrope.

4,039,463

ELECTROSTATOGRAPHIC DEVELOPERS COMPRISING A CARRIER BEAD COATED WITH A COPOLYMER OF N-VINYLCARBAZOLE AND TRIALKOXYVINYLSILANE AND/OR TRIACETOXYVINYLSILANE

Pierre Richard De Roo, Schoten; Walter Frans De Winter, 's-Gravenwezel; Jan Jozef Priem, Mortsel, and Yvan Karel Gilliams, Berchem, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 16, 1975, Ser. No. 568,400

Claims priority, application United Kingdom, Apr. 30, 1974, 18884/74

Int. Cl.² G03G *9/10*

U.S. Cl. 252—62.1 P **8 Claims**

1. Carrier beads consisting essentially of a glass core or iron-containing metal core enveloped with a coating of a copolymer of N-vinylcarbazole, trialkoxyvinylsilane and/or triacetoxyvinylsilane and optionally at least one monomer of the group consisting of C_1–C_4 alkyl acrylate or methacrylate and styrene, said copolymer comprising at least 50% by weight of said N-vinylcarbazole units and from 0.5 to 10% by weight of said trialkoxyvinylsilane and/or triacetoxyvinylsilane units.

4,039,464

DETERGENT BUILDERS AND COMPOSITIONS CONTAINING THE SAME

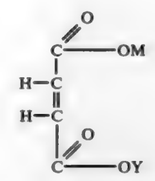
John A. Patterson, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Jan. 28, 1974, Ser. No. 437,252

Int. Cl.² C11D *3/20, 7/26*

U.S. Cl. 252—89 R **3 Claims**

1. A detergent builder of the formula:



wherein M is an alkali metal cation or ammonium; and Y is $(CH_2)_nCOOM$, wherein *n* ranges from 1–6 and M is as before defined.

4,039,465

CONSTANT BOILING ADMIXTURES

William Milton Hutchinson, deceased, late of Bartlesville, Okla., and by Florence M. Hutchinson, executrix, Claremore, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 602,353, Aug. 6, 1975, Pat. No. 4,024,086. This application May 27, 1976, Ser. No. 690,807

Int. Cl.² C11D *7/50, 7/30;* C23G *5/02*

U.S. Cl. 252—171 **2 Claims**

1. A substantially constant boiling admixture which at substantially atmospheric pressure is characterized as about 55.6 weight percent (A) 1,1-difluoro-1,2-dichloroethane and (B) about 44.4 weight percent acetone.

4,039,466

HYDROEXTRACTING COMPOSITION FOR WET AND FINELY PULVERIZED ORES

Kaneo Matsuda, Kyoto, and Noboru Fujimura, Shiga, both of Japan, assignors to Sanyo Chemical Industries, Ltd., Kyoto, Japan

Filed Mar. 19, 1975, Ser. No. 559,779

Claims priority, application Japan, Mar. 20, 1974, 49-31713

Int. Cl.² C09K *3/00*

U.S. Cl. 252—194 **13 Claims**

1. A hydroextracting composition for wet and finely pulverized ores which comprises (A) a nonionic compound having a polyoxyalkylene group in the molecule and a cloud point of not more than 35° C. and (B) an anionic compound having a hydrophobic polyoxyalkylene group and at least one anionic group selected from the class consisting of sulfonic, sulfate, phosphate, thiophosphate, borate and carboxylic groups in the molecule, wherein the weight ratio of the nonionic compound (A) to the anionic compound (B) is 40 – 95 : 60 – 5.

4,039,467

VISIBLY OPAQUE INFRARED TRANSMITTING OPTICAL FILTER CONTAINING A COMBINATION OF COPPER AND VANADYL PHTHALOCYANINE SULFONAMIDES

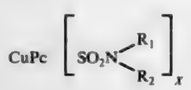
Robert Jerome Tucker, Hackettstown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 16, 1975, Ser. No. 587,506

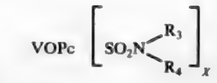
Int. Cl.² F21V *9/06*

U.S. Cl. 252—300 **5 Claims**

1. An optical filter which is substantially opaque to visible light but which is transparent to light in the near infrared region comprising a plastic substrate having substantially uniformly dispersed therein, a copper phthalocyanine sulfonamide compound having the formula:



wherein Pc is the phthalocyanine moiety, R_1 and R_2 are alkyl groups containing from 1 to 4 carbon atoms or R_1 is hydrogen and R_2 is an alkyl group containing from 4 to 20 carbon atoms; X is a number from 1 to 4, provided that not more than 1 sulfonamide group is present on any single phenyl ring of the phthalocyanine moiety; a vanadyl phthalocyanine sulfonamide compound having the formula:



wherein Pc is the phthalocyanine moiety and R_3 and R_4 are alkyl groups containing from 1 to 4 carbon atoms or R_3 is hydrogen and R_4 is an alkyl group containing from 4 to 20 carbon atoms and X is a number from 1 to 4, provided that not more than one sulfonamide group is present on any single phenyl ring of the phthalocyanine moiety; and an auxiliary organic dye compound capable of absorbing visible light but which does not absorb in the near said copper phthalocyanine sulfonamide compound being present in the substrate in a weight percent concentration such that said concentration multiplied by the thickness of the substrate in mils is a constant falling within the range of from about 0.02 to about 6.13 and said vanadyl phthalocyanine sulfonamide compound being present in the substrate in a weight percent concentration such that said concentration multiplied by the thickness of the substrate in mils is a constant falling within the range of from about 0.01 to 0.3.

4,039,468

PROCESS FOR THE TREATMENT OF ORGANIC WASTES

Lucien A. Humblet, Mol; Louis Salomon, Balen, and Hubert R. Eschrich, Geel, all of Belgium, assignors to Societe Europeenne pour le Traitement Chimique des Combustibles Irradies (Eurochemic), Mol, Belgium

Filed Sept. 12, 1975, Ser. No. 612,987

Claims priority, application Belgium, Sept. 12, 1974, 148437

Int. Cl.² G21F *9/06*

U.S. Cl. 252—301.1 W **13 Claims**

1. A process for treating organic wastes produced when extracting radioactive metals with a solvent consisting essentially of a phosphoric acid ester or a phosphoric acid ester and an organic diluent comprising:

a. adding concentrated phosphoric acid to the solvent in an amount such that the metallic contaminants and organic degradation products are contained in a phosphoric acid ester phase and the phosphoric acid ester is separated from any organic diluent present and said phase is at least 4M phosphoric acid;

b. heating the phosphoric acid ester phase at a temperature of about 175° C or higher to decompose said phosphoric acid ester and to convert said phase into a concentrated phosphoric acid phase containing said metallic contaminants and organic compounds consisting essentially of hydrocarbons; and

c. converting the concentrated phosphoric acid phase into solid inorganic phosphates comprising the inorganic contaminants by reaction on aluminum oxide at a temperature above 150° C.

4,039,469

PROCESS FOR THE PREPARATION OF AQUEOUS ANTIFOAM COMPOSITIONS

William J. Raleigh, Watervliet, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed June 20, 1975, Ser. No. 588,771

Int. Cl.² B01D *19/04*

U.S. Cl. 252—358 **16 Claims**

1. A method of preparing an emulsified antifoam composition, which comprises:

i. dissolving an emulsifying agent selected from the group consisting of polyoxyethylene sorbitan monostearate, sorbitan monostearate, polyoxyethylene stearate, and mixtures thereof in water;

ii. separately, dissolving a thickening agent in water;

iii. uniformly dispersing a diorganopolysiloxane antifoam agent in the mixture of step (i);

iv. milling the uniform dispersion of step (iii) until homogeneous and incapable of separating into two layers; and

v. mixing the milled homogeneous dispersion of step (iv) with the thickened water produced in step (ii).

4,039,470

PRESERVATIVE COATING FOR FRUITS AND VEGETABLES

Arthur F. Kalmar, Riverside, Calif., assignor to FMC Corporation, Philadelphia, Pa.

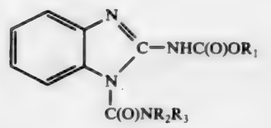
Division of Ser. No. 564,145, April 1, 1975. This application Sept. 24, 1976, Ser. No. 726,241

Int. Cl.² C09K *3/00*

U.S. Cl. 252—382 **5 Claims**

1. A composition for applying a protective adhering film to the surface of fruits and vegetables comprising a volatile petroleum solvent solution having dissolved therein a waxy film forming material and an alkyl aryl sulfonic acid solution of a fungicidal benzimidazole selected from the class consisting of:

I.



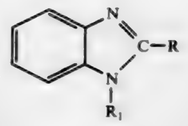
wherein

R_1 is methyl, ethyl, isopropyl or sec-butyl;

R_2 is hydrogen, alkyl of 1 to 6 carbon atoms or alkenyl of 3 to 6 carbon atoms and

R_3 is alkyl of 1 to 12 carbon atoms,

II.



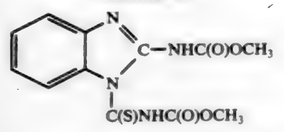
wherein

R is a five-membered heterocyclic ring containing nitrogen and sulfur and

R_1 is hydrogen, lower alkyl of 1 to 5 carbon atoms or lower alkenyl of 3 to 6 carbon atoms and

III.

-continued



4,039,471

PROCESS FOR REJUVENATING AUTOMOBILE EMISSION CONTROL CATALYSTS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Dec. 15, 1975, Ser. No. 640,645
Int. Cl.[2] B01J *23/96, 23/94*
U.S. Cl. 252—412 16 Claims

1. A process for the rejuvenation of an automobile exhaust gas conversion catalyst comprising a Group VIII metal dispersed on a refractory oxide support, said catalyst having been previously utilized for the conversion of air pollutants in lead-containing and phosphorus-containing auto exhaust gases with resultant deposition thereon of deactivating solids comprising inorganic compounds of lead and phosphorus, which process comprises:

a. contacting said catalyst with an aqueous ammonium and-/or acetate salt solution of at least 0.1 M concentration at a temperature between about 20° C and the boiling point of said salt solution for at least about 10 minutes, said ammonium and/or acetate salt being selected from the class consisting of ammonium chloride, ammonium nitrate, ammonium sulfate, ammonium acetate, ammonium tartrate, ammonium citrate, ammonium carbonate, sodium acetate, potassium acetate, calcium acetate and magnesium acetate;

b. contacting the catalyst from step (a) with a reducing gas for at least about 10 minutes at a temperature between about 200° and 800° C, said reducing gas comprising H_2 and/or CO as its essential active component; and

c. contacting the reduced catalyst from step (b) with an aqueous ammonium and/or acetate salt solution as defined in step (a) and recovering therefrom said catalyst with at least some of said lead and phosphorus deactivating solids removed and in a substantially more active condition.

7. A process for the rejuvenation of an automobile exhaust gas conversion catalyst comprising a Group VIII metal dispersed on a refractory oxide support, said catalyst having been previously utilized for the conversion of air polutants in auto exhaust gases containing lead and phosphorus compounds with resultant deposition thereon of deactivating solids comprising inorganic compounds of lead and phosphorus, which process comprises:

a. contacting said catalyst with a reducing gas for at least about 10 minutes at a temperature between about 200° and about 800° C, said reducing gas comprising H_2 and/or CO as its essential active component;

b. contacting the reduced catalyst from step (a) with an aqueous ammonium and/or acetate salt solution of at least about 0.1 M concentration at a temperature betwen about 20° C and the boiling point of said salt solution for at least about 10 minutes, said ammonium and/or acetate salt being selected from the class consisting of ammonium chloride, ammonium nitrate, ammonium sulfate, ammonium acetate, ammonium citrate, ammonium carbonate, sodium acetate, potassium acetate, calcium acetate and magnesium acetate, thereby removing at least some of said deactivating solids from said catalyst; and

c. recovering said catalyst in a substantially more active condition.

13. A process for the rejuvenation of an automobile exhaust gas conversion catalyst comprising a Group VIII metal dispersed on a refractory oxide support, said catalyst having been previously utilized for the conversion of air pollutants in auto exhaust gases containing vaporized metallic constituents with resultant deposition thereon of deactivaing solids comprising lead and one or more metallic components selected from the class consisting of Ba, Fe, Ca, Zn, and compounds thereof, which process comprises:

a. contacting said catalyst with an aqueous ammonium and-/or acetate salt solution of at least 0.1 M concentration at a temperature between about 20° C and the boiling point of said salt solution for at least about 10 minutes, said ammonium and/or acetate salt being selected from the class consisting of ammonium chloride, ammonium nitrate, ammonium sulfate, ammonium acetate, ammonium tartrate, ammonium citrate, ammonium carbonate, sodium acetate, potassium acetate, calcium acetate, and magnesium acetate;

b. contacting the catalyst from step (a) with a reducing gas for at least about 10 minutes at a temperature between about 200° and 800° C, said reducing gas comprising H_2 and/or CO as its essential active component; and

c. contacting the reduced catalyst from step (b) with an aqueous ammonium and/or acetate salt solution as defined in step (a) and recovering therefrom said catalyst with at least some of said deactivating solids removed and in a substantially more active condition.

15. A process for the rejuvenation of an automobile exhaust gas conversion catalyst comprising a Group VIII metal dispersed on a refractory oxide support, said catalyst having been previously utilized for the conversion of air pollutants in auto exhaust gases containing vaporized metallic constituents with resultant deposition thereon of deactivating solids comprising lead and one or more metallic constituents selected from the class consisting of Ba, Fe, Ca, Zn, and compounds thereof, which process comprises:

a. contacting said catalyst with a reducing gas for at least about 10 minutes at a temperature between about 200° and about 800° C, said reducing gas comprising H_2 and/or CO as its essential active component;

b. contacting the reduced catalyst from step (a) with an aqueous ammonium and/or acetate salt solution of at least about 0.1 M concentration at a temperature between about 20° C and the boiling point of said salt solution for at least about 10 minutes, said ammonium and/or acetate salt being selected from the class consisting of ammonium chloride, ammonium nitrate, ammonium sulfate, ammonium acetate, ammonium citrate, ammonium carbonate, sodium acetate, potassium acetate, calcium acetate, and magnesium acetate, thereby removing at least some of said deactivating solids from said catalyst; and

c. recovering said catalyst in a substantially more active condition.

4,039,472

INCREASING THE PARTICLE SIZE OF AS FORMED POLYETHYLENE OR ETHYLENE COPOLYMER

Glen R. Hoff, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Nov. 14, 1975, Ser. No. 631,954
Int. Cl.[2] C08F *4/66, 4/68*
U.S. Cl. 252—429 C 10 Claims

1. A catalyst for polymerizing ethylene or ethylene containing a small amount of polymerizable C_3 to C_8 olefin comprising:

a. a solid catalyst component made between above about ambient to about 150° C. from (1) a lower alkyl, magnesium dialkoxide, (2) a transition metal compound which is at least one lower alkyl, titanium (IV) or vanadium (V) alkoxide, alkoxychloride or chloride, (3) a lower alkyl, alkylaluminum compound which is a trialkylaluminum, a dialkylaluminum chloride or an alkylaluminum dichloride, and (4) hydrogen chloride, using a mol ratio, said alkylaluminum compound to said transition metal compound, between about two-tenths and ten and a mol ratio, hydrogen chloride to said alkylaluminum compound, of greater than one, said component containing as a percentage of the support weight between one-tenth and 15 weight percent of the transition metal calculated as the metal; and

b. a promoter which is a trialkylaluminum, a dialkylaluminum hydride, or a dialkylaluminum chloride wherein said component is made either (i) by reacting said magnesium dialkoxide with said transition metal compound, reacting the product thereof with said alkylaluminum compound and thereafter treating with said hydrogen chloride, or (ii) by together reacting said magnesium dialkoxide, said transition metal compound and said alkylaluminum compound and thereafter treating the product thereof with said hydrogen chloride.

4,039,473

ACTIVE CARBON BY POTASSIUM ION EXCHANGE AND LEACHING OF CARBONACEOUS MATERIAL

Harry Neil Scott Schafer, Sydney, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Mar. 18, 1976, Ser. No. 668,004
Claims priority, application Australia, Mar. 18, 1975, 0943/75
Int. Cl.[2] C01B *31/16, 31/12, 31/10*
U.S. Cl. 252—425 10 Claims

1. A process for producing an active carbon from carbonaceous material selected from the group consisting of brown coal and lignite comprising the sequential steps of:

a. forming a potassium carbonaceous material by contacting the carbonaceous material with an aqueous solution of at least one ionizable potassium compound,

b. pyrolysing the potassium-carbonaceous material to form a char, and

c. leaching the char so obtained to remove the potassium cations therefrom.

2. A process as defined in claim 1, wherein

a. the aqueous solution contains one or more compounds selected from the group consisting of potassium hydroxide, potassium chloride and potassium acetate, and

b. the pH of the aqueous solution is maintained at a value of about 8.3.

4,039,474

SILICA-ALUMINA CATALYSTS

Gerald R. Feistel, Justice, and George N. Pessimisis, Berwyn, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Oct. 20, 1975, Ser. No. 623,825
Int. Cl.[2] B01J *21/08, 29/00*
U.S. Cl. 252—451 3 Claims

1. In a process where porous microspherical silica-alumina particles useful in catalysis are prepared by initially adding a mineral acid to a body of aqueous sodium silicate starting material initially to precipitate silica in hydrous form, followed by addition of an aluminate salt to precipitate hydrous alumina on the silica, after which the product is filtered, purified and dried: the improvement characterized by said body of aqueous sodium silicate starting material, before acid is added, being treated with Na_2O so that the alkali, expressed as Na_2O in the starting material, is substantially in excess of that required to form water glass and in an amount sufficient to produce pores of an appreciably larger diameter compared to pore size distribution when the body of sodium silicate is in water glass proportion without excess alkali.

4,039,475

STABLE, PUMPABLE, AQUEOUS SUSPENSIONS OF ORGANIC PEROXIDES

Hendrik Harm Jannes Oosterwijk, Diepenveen, and Reinder Torenbeek, Twello, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

Filed Mar. 15, 1976, Ser. No. 666,993
Claims priority, application Netherlands, Mar. 14, 1975, 7503051; July 2, 1975, 7507859
Int. Cl.[2] C08F *4/32, 4/34*
U.S. Cl. 252—431 R 8 Claims

1. A pumpable, aqueous suspension comprising at least about 20 weight % of an organic peroxide, which is solid at about 20° C, at least about 0.2 weight % of a nonionic emulsifier having a maximum HLB-value of 12.5 and an emulsifier selected from the group consisting of nonionic emulsifiers having a minimum HLB-value of 12.5, and anionic emulsifiers, said nonionic emulsifier of minimum HLB-value of 12.5 present in an amount of at least about 0.2 weight %, and said anionic emulsifier present in an amount of at least about 0.01 weight %.

7. A composition as in claim 1 wherein the anionic emulsifier is sodium-dodecylbenzene sulphonate.

4,039,476

OXIDATIVE DEHYDROGENATION CATALYSTS

Brent J. Bertus; Donald C. Tabler, and Marvin M. Johnson, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 381,552, July 23, 1973, Pat. No. 3,894,056. This application May 30, 1975, Ser. No. 582,571
Int. Cl.[2] B01J *27/14*
U.S. Cl. 252—437 21 Claims

1. A composition consisting essentially of molybdenum, cobalt, phosphorus, and oxygen, with an atom ratio of phosphorus to molybdenum in the range of about 1.4:1 to about 4:1 and an atom ratio of cobalt to molybdenum in the range of about 1.5:1 to about 3:1.

4,039,477

CATALYSTS FOR THE HYDROTREATMENT OF HYDROCARBONS AND THEIR UTILIZATION

Philippe Engelhard; Georges Szabo, and Joseph Edouard Weisang, all of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed July 22, 1975, Ser. No. 597,987
Claims priority, application France, July 30, 1974, 74.26490
Int. Cl.[2] C10G *35/08;* B01J *27/06*
U.S. Cl. 252—441 36 Claims

1. A catalyst for the hydrotreatment of hydrocarbons comprising a refractory mineral oxide carrier, a halogen element present in combined form, and containing metals in a free or combined state on said carrier as follows:

a. From 0.02 to 2% of at least one metal from the platinum group;

b. From 0.02 to 2% of tin; and

c. From 0.01 to 5% of scandium;

said percentages, determined relative to the respective elemental form, being based upon the total catalyst weight.

4,039,478

FLUE GAS DESULFURIZATION SORBENT

Neville L. Cull, Baker, and Warren M. Smith, Baton Rouge, both of La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 315,590, Dec. 15, 1972, abandoned. This application Jan. 10, 1975, Ser. No. 540,225
Int. Cl.[2] B01J *29/06, 23/08*
U.S. Cl. 252—455 R 19 Claims

1. A process for preparing alumina base catalysts and sorbents which comprises:

a. forming on particles of porous alumina a liquid surface

coating containing a hydrolyzable organic compound which forms a refractory oxide on hydrolysis;
b. hydrolyzing and calcining said hydrolyzable organic compound to said refractory oxide, thereby forming a coating of said oxide on said alumina base;
c. impregnating said coated alumina base with a solution of a decomposable compound of a desired active metal selected from the group consisting of iron and copper; and
d. converting said compound to the oxide of the desired active metal.

6. A process according to claim **1** in which said hydrolyzable organic compound is a silicon compound.

4,039,479

METHOD OF CATALYST MANUFACTURE

Stanley A. Gembicki, Western Springs, and Richard W. Arbesman, Wheeling, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sept. 10, 1976, Ser. No. 722,933
Int. Cl.[2] B01J *29/06*
U.S. Cl. 252—455 Z **12 Claims**

1. A method of preparing a catalytic composite which comprises subjecting a zeolite of the mordenite crystal structure and containing less than about 5 wt. % sodium as Na_2O, to an aqueous ammoniacal treatment at a pH of at least about 9.5, and calcining the thus treated zeolite in intimate admixture with a refractory inorganic oxide or gel and a metal salt convertible to said oxide at calcination conditions, said salt being in sufficient concentration to provide from about 5 to about 20 wt. % of the refractory inorganic oxide content of said catalytic composite.

4. The method of claim **1** further characterized in that said refractory inorganic oxide is an alumina and said metal salt is an aluminum salt of a strong acid.

4,039,480

HOLLOW CERAMIC BALLS AS AUTOMOTIVE CATALYSTS SUPPORTS

David R. Watson, Benton; Val G. Carithers, Little Rock, and Harold L. Drown, Benton, all of Ark., assignors to Reynolds Metals Company, Richmond, Va.

Filed Mar. 21, 1975, Ser. No. 560,720
Int. Cl.[2] B01J *29/06, 35/00*
U.S. Cl. 252—455 R **19 Claims**

1. A method of producing hollow ceramic balls of spherical shape having a smooth and dustfree surface and a crush strength of at least 10 pounds, comprising:
A. producing dried spherical pellets of largely combustible material, comprising the following steps:
1. forming a slurry comprising a clay, a combustible binder, and water,
2. admixing a particulate combustible filler material with said slurry to form an extrusion mass, the weight of said filler material being at least five times the weight of said clay,
3. extruding said mass,
4. pelletizing the product from step 3 with input of high packing energy to form wet, compacted spherical pellets, and
5. drying said pellets to obtain said dried spherical pellets of largely combustible material;
B. boiling said dried spherical pellets in a liquid selected from the group consisting of water, a solution of triethanolamine, and an alum solution;
C. draining and cooling said pellets:
D. coating said pellets, as cores, with a ceramic-forming powder to obtain a homogeneous deposit of substantially uniform thickness, said coating operation being conducted with gentle tumbling action, and continuing said tumbling of the coated pellets to form wet-appearing but non-sticking balls;
E. slowly drying said wet-appearing but non-sticking balls to prevent surface cracking;
F. preheating said balls to volatilize said cores, then firing the balls to form hollow ceramic balls at sintering temperatures sufficient to form a smooth and dust-free surface and sufficient for substantially eliminating pores of a diameter up to three-tenths micron in their fired ceramic walls; and
G. cooling and recovering said hollow ceramic balls.

4. The method of claim **1** wherein said ceramic-forming powder is a mullite mix and said hollow ceramic balls have a bulk density below 50 pounds per cubic foot.

4,039,481

CATALYST CARRIER AND METHOD OF MANUFACTURING SAME

Sadahiro Kimura; Kiyoshi Uchida, and Hiroyuki Akizuki, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 16, 1975, Ser. No. 568,550
Claims priority, application Japan, Apr. 20, 1974, 49-044660
Int. Cl.[2] B01J *21/04, 23/22, 23/24, 23/74*
U.S. Cl. 252—464 **11 Claims**

1. A method of increasing the effective life of a catalyst carrier consisting mainly of alumina, which method comprises the step of introducing into only a surface layer of said carrier a compound which promotes the transformation of alumina only in the surface layer into α-alumina and then heat-treating said carrier at a temperature to produce said transformation.

4,039,482

METHOD OF COATING AND IMPREGNATING CATALYST SUPPORT MEMBERS

William A. Hoyer, Evanston, and Lowell W. Johnson, Fox Lake, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Division of Ser. No. 516,525, Oct. 21, 1974, Pat. No. 3,948,213.
This application Sept. 25, 1975, Ser. No. 616,750
Int. Cl.[2] B01J *21/04, 23/40, 35/04*
U.S. Cl. 252—466 PT **6 Claims**

1. In the coating of catalytic support members, each of said members comprising a porous, rigid, skeletal structure having passageways and surface pores therein, the improved method for effecting a more rapid and uniform coating operation thereof, which comprises the steps of:
a. placing the member(s) in a pressure tight chamber;
b. exerting a vacuum on the member(s) to remove entrapped air from said surface pores;
c. while having said member(s) in a degassed condition, effecting the filling of the chamber with a desired coating fluid comprising a liquid coating material containing a refractory inorganic oxide;
d. maintaining a short period of superatmospheric pressure on the thusly filled chamber to insure the coating of said pores;
e. subsequently removing the encompassing fluid;
f. providing the blowing of pressurized air over the surfaces of the thusly coated member(s) to remove excess fluid and to preclude any undesired passageway blockages; and then
g. effecting removal of the resulting coated member(s) from said chamber.

4,039,483

METHOD OF PRODUCING AN ION EXCHANGER BY REACTING UNSATURATED VULCANIZED OR POWDERED RUBBERS WITH IODINE ISOCYANATE AND THEN INTRODUCING ION EXCHANGE GROUPS BY FURTHER REACTION

Toshio Honda, Akigawa; Koichi Iwami, Kunitachi; Shoji Tanaka, Akigawa; Yukio Fukuura, Kodaira; Shoson Shibata, Tokyo; Yoshikatsu Suzuki, and Itsuo Tanuma, both of Higashi-Murayama, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 29, 1975, Ser. No. 644,681
Claims priority, application Japan, Dec. 28, 1974, 49-3820
Int. Cl.[2] C08C *19/22*
U.S. Cl. 260—2.1 R **20 Claims**

1. A method of producing an ion exchanger comprising
a. reacting a substance containing carbon-to-carbon unsaturated double bonds selected from the group consisting of vulcanized rubbers, powdered rubbers from latex and foam rubber with a solution of iodine isocyanate in an organic solvent wherein the amount of iodine isocyanate is not more than one equivalent per equivalent of the double bond in the substance; and then
b. reacting the resulting isocyanate group added to said substance with a compound having the following formula

$$(X)_nR(Y)_m \text{ or } XY$$

wherein X represents an addition active group to the isocyanate group, Y represents an ion-exchanging group or a chelating group, R represents an organic radical having any valence of from 2 to 6 and a molecular weight of 20 to 1000, and n and m are selected from integers of 1 to 5, respectively, provided that a sum of n and m is equal to the valence of R, to introduce the ion-exchanging group having ion-exchanging properties into said substance.

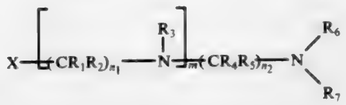
4,039,484

PROCESS FOR THE PRODUCTION OF ANION-EXCHANGEABLE NONHOLLOW NOVOLAK FILAMENTS

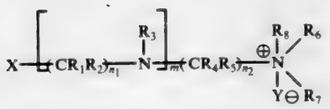
Koichiro Ohtomo, Takatsuki, and Taro Murata, Settsu, both of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

Continuation of Ser. No. 343,793, June 21, 1973, abandoned.
This application Nov. 12, 1975, Ser. No. 631,236
Claims priority, application Japan, May 24, 1972, 47-51893; Apr. 3, 1972, 47-33282; Apr. 1, 1972, 47-33042
Int. Cl.[2] C08G *5/18*
U.S. Cl. 260—2.1 C **13 Claims**

1. A process for producing an anion-exchangeable nonhollow novolak filament which comprises curing an uncured melt-spun nonhollow novolak filament using an aldehyde as a curing reagent in the presence of a catalyst selected from the group consisting of an acidic catalyst and a basic catalyst and thereafter treating the resulting cured nonhollow filament with an amination agent selected from the compounds of the formulae



and



wherein X is a member selected from the class consisting of halogen, sulfuric acid ester residue and epoxy group; R_1, R_2, R_3, R_4 and R_5 are each a member selected from the class consisting of hydrogen and the C_1–C_4 alkyl groups; R_6 and R_7 are each a member selected from the class consisting of hydrogen, the C_1–C_4 alkyl groups and the group of the formula $X(CR_1R_2)_{n_3}$, where X, R_1 and R_2 are as above defined, and n_3 is an integer from 1 to 6; R_8 is a member selected from the class consisting of the C_1–C_4 alkyl groups, methylol and ethylol groups; Y is a member of the class consisting of hydroxyl and halogens; n_1 and n_2 are each an integer from 1 to 6; and m is an integer from 0 to 3.

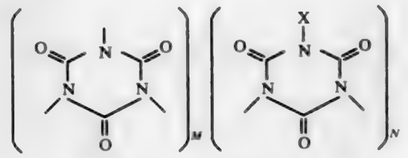
4,039,485

ION EXCHANGE OF METALS FROM AQUEOUS SOLUTIONS USING COMPOSITIONS OF SYNTHETIC RESINS REACTED WITH POLYISOCYANURATE SALTS

Perry A. Argabright, Larkspur, Colo.; Larry M. Echelberger, Robinson, Ill., and Brian L. Phillips, Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Division of Ser. No. 412,057, Nov. 2, 1973, Pat. No. 3,920,545.
This application July 7, 1975, Ser. No. 593,397
Int. Cl.[2] C08F *18/24*; C22B *3/00*
U.S. Cl. 260—2.2 R **10 Claims**

1. A water-insoluble product by process obtained by reacting about 1 to about 50 moles of a polyisocyanurate salt having the structure:



$$(-R-)_{2M+N+1}\ (-A)_{M+2}$$

wherein
R = divalent radial
X = an alkali metal, alkaline earth metal, or hydrogen, quaternary ammonium mono-, di-, tri-, or tetra-lower alkyl-substituted ammonium and unsubstituted ammonium, or a combination thereof,
A = a monovalent group selected from the following: isocyanate, urethane ($NHCO_2R'$), urea, amino
R' = monovalent radical
M = average number of trisubstituted isocyanurate rings
N = average number of isocyanuric acid and/or isocyanurate salt groups
2M+N+1 = average of divalent R groups
M+2 = average number of A groups with at least one halogen equivalent on a synthetic resin selected from the group consisting of haloalkylated polystyrene, polyepihalohydrin, haloalkylated polyphenyl ether, and halogenated polypropylene.

4,039,486

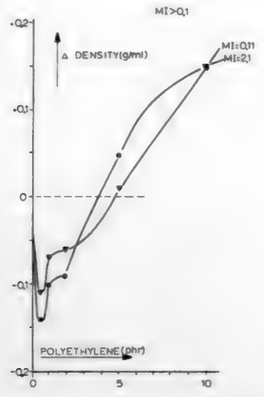
FOAMABLE VINYL-CHLORIDE POLYMERS AND RIGID FOAM STRUCTURES MADE THEREOF

Johannes M.A.A. van der Mark, Bunnik, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 709,533, July 28, 1976. This application Nov. 24, 1976, Ser. No. 744,829
Claims priority, application Netherlands, Nov. 29, 1975, 7513958
Int. Cl.[2] C08J *9/10*
U.S. Cl. 260—2.5 HA **9 Claims**

1. A foamable vinyl chloride polymer composition, comprising:
polyvinyl chloride or a vinyl chloride copolymer containing at least 70% by weight of vinyl chloride;

from 0.1 to 2% by weight of a chemical blowing agent;
from 1 to 5% by weight of a plasticizer, and from 0.5 to 4% by weight of a high density, high molecular weight poly-



ethylene having a melt index more than 0.1 and less than 2.1 dg/min as defined in ASTM D-1238, all percentages being calculated on the quantity of vinyl chloride polymer.

4,039,487

CELLULAR ISOCYANURATE POLYMER

Richard A. Kolakowski, Northford; Harold E. Reymore, Jr., Wallingford, both of Conn., and Adnan A. R. Sayigh, North Haven, Conn. (by Anne B. Sayigh, conservatrix), assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 19, 1976, Ser. No. 650,453
Int. Cl.² C08G *18/42*
U.S. Cl. 260—2.5 AW **11 Claims**

1. In a polymer in which the major recurring polymer unit is isocyanurate which polymer comprises the reaction product obtained by bringing together a polymethylene poly(-phenylisocyanate), a trimerization catalyst and a minor amount of a polyol the improvement which comprises employing as the polyol component from about 0.05 hydroxyl equivalent to about 0.20 hydroxyl equivalent per equivalent of said polymethylene poly(phenylisocyanate) of a polyol having a hydroxyl equivalent weight from about 150 to about 500 provided the polyol is present in a weight from about 10 to about 30 parts per equivalent of said isocyanate, and said polyol is obtained by the reaction of:

a. about 0.1 molar to about 0.7 molar excess of a polyethyleneglycol having a hydroxyl equivalent weight from about 75 to about 225 over the stoichiometric amount required for reaction with b. an aromatic polycarboxylic compound containing from two to three carboxylic groups.

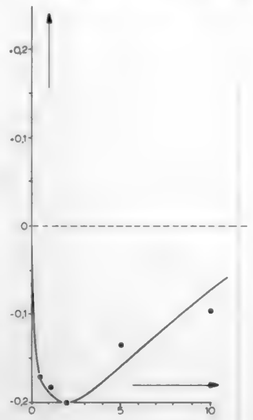
4,039,488

FOAMABLE VINYL-CHLORIDE POLYMERS AND HARD FOAM STRUCTURES MADE THEREOF

Johannes M.A.A. vanderMark, Bunnik, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed July 28, 1976, Ser. No. 709,533
Claims priority, application Netherlands, July 29, 1975, 7509004
Int. Cl.² C08J *9/10*
U.S. Cl. 260—2.5 HA **10 Claims**

1. A foamable vinyl chloride polymer composition, comprising: poly vinyl chloride or a vinyl chloride copolymer containing up to 30% by weight of at least one comonomer and at least 70% by weight of vinyl chloride,
from 0.1 to 2% by weight of a chemical blowing agent,
from 0 to 5% by weight of a plasticizer, and
from 0.5 to 8% by weight of a high molecular weight poly-



ethylene having a melt index of at most 0.1 as defined in ASTM-D 1238, all percentages being calculated on the quantity of vinyl chloride polymer.

4,039,489

OIL AND FAT ABSORBING POLYMERS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and Harold E. Marsh, Jr., La Canada, Calif.

Continuation-in-part of Ser. No. 228,229, Feb. 22, 1972, abandoned. This application Apr. 7, 1976, Ser. No. 674,700
Int. Cl.² C08G *18/82*
U.S. Cl. 260—2.5 AD **15 Claims**

1. A method of absorbing an oil selected from a hydrocarbon oil and a fatty acid oil comprising the steps of:

forming a lightly cross-linked highly swellable, solid, network polymer having an amount of cross-linking such that the polymer will exhibit an absorption characteristic by weight in said oil of at least 900 weight percent of said oil absorbed based on dry weight of the gel fraction of polymer formed by reacting a difunctional hydroxyl-terminated liquid prepolymer having a molecular weight of 1,000 to 6,000, a difunctional isocyanate curing agent in an amount less than that required to react with available hydroxyl groups so as not to form a fully cross-linked polymer, and an at least trifunctional hydroxyl-substituted cross-linking agent in a minimum amount necessary to form a solid, highly swellable polymeric product having a mean chain length between cross-linking sites of at least 4,000 chain atoms and said absorption characteristic;

extracting the soluble portion from the cross-linked portion of said polymer product; and

adding said cross-linked polymer portion to said oil and swelling said portion and absorbing said oil therein in an amount of at least 10 times the weight of said cross-linked portion.

4,039,490

HIGH RESILIENCE FOAM

Bernard Kanner, West Nyack, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,805
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 AH **19 Claims**

1. A process for producing high resilience polyether urethane foam, said process comprising foaming and reacting a mixture comprising:

a. an organic polyether polyol having an average primary hydroxyl content of at least 35 mole percent and an average hydroxyl functionality from 2.1 to about 5;

b. an organic polyisocyanate, said organic polyether polyol and said polyisocyanate being present in the mixture in a major amount and in a relative amount required to produce the urethane;

c. a blowing agent in a minor amount sufficient to foam the reaction mixture;

d. a catalytic amount of a tertiary amine catalyst for the production of the urethane; and

e. a tertiary alcohol-modified siloxane surfactant in an amount sufficient to stabilize the foam against voids and shrinkage, said siloxane consisting essentially of (1) monofunctional end-blocking siloxy units, the respective silicon atoms of which have two alkyl radicals bonded thereto, the third silicon-bonded organic group being a tertiary alcohol radical, or an alkyl radical (2) an average of from about 1 to 6 moles of dialkylsiloxy units for every two moles of said monofunctional siloxy units, and (3) from zero up to an average of about 6 moles, for every two moles of said monofunctional siloxy units, of difunctional monoalkylsiloxy units in which the second organic group bonded to silicon is a tertiary alcohol radical; provided an average of at least about 0.5 moles of said tertiary alcohol groups are present in said tertiary alcohol-modified siloxane for every two moles of said monofunctional siloxy units, and wherein the silicon bonded alkyl radicals have from 1 to 4 carbon atoms and the silicon-bonded tertiary alcohol radicals have the formula



wherein R_1 is a bivalent hydrocarbon selected from the class consisting of alkylene radicals having from 2 to 8 carbon atoms and alkenylene radicals having from 2 to 8 carbon atoms, and R^2 is an alkyl radical having from 1 to 4 carbon atoms.

4,039,491

NOVEL COPOLYMER AND PROCESS FOR PRODUCING SAME

Hiroharu Ikeda, Machida; Shuichi Matsumoto; Hiroji Enyo, both of Yokohama; Noboru Oshima, and Koei Komatsu, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed June 2, 1975, Ser. No. 583,177
Claims priority, application Japan, May 17, 1975, 50-56769
Int. Cl.² C08F *253/00, 255/06, 257/02, 279/02*
U.S. Cl. 260—4 R **31 Claims**

1. A copolymer obtained by reacting

a. at least one norbornene compound having at least one polar group or polar group containing substitutent, wherein said polar group is selected from the group consisting of ester, nitrile, amino, halogen, imino and carboxylic anhydride with

b. at least one unsaturated polymer having carbon-to-carbon double bonds in the presence of a metathesis catalyst.

4,039,492

SYNTHETIC FIBER WATER BASE SURFACE COATING COMPOSITION

Willis D. Hamilton, Santa Ana, Calif., assignor to Hamilton Materials, Orange, Calif.

Filed Nov. 26, 1975, Ser. No. 635,345
Int. Cl.² C08L *5/00, 89/00*
U.S. Cl. 260—8 **13 Claims**

1. A composition for blending with water to form a surface coating composition which comprises from 1 to about 15 weight percent of a water-dispersible binder, from 40 to about 95 weight percent of a finely subdivided particulate filler and from 0.5 to about 20 weight percent of a fibrous filler consisting of a water-dispersible, linear, high molecular weight polyolefin having a surface area between about 1.0 and 100 square meters per gram, a fiber diameter from about 20 to 400 microns and length from about 0.05 to 10 millimeters.

4,039,493

MELAMINE-FORMALDEHYDE CONDENSATES AND MIXTURES THEREOF

Manfred Schön, Dudenhofen; Helmut Dürr, Frankfurt am Main; Dieter Plath, Wiesbaden; Karlfried Keller, Bergen-Enkheim, and Walter Michel, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed June 25, 1975, Ser. No. 590,215
Claims priority, application Germany, June 27, 1974, 2430899
Int. Cl.² C08K *5/05;* **C08L** *61/20, 91/00*
U.S. Cl. 260—21 **10 Claims**

1. Process for the production of a solution of reactive hard-enable melamine-formaldehyde condensate, wherein a mixture of melamine and formaldehyde, in a molar ratio of about 1 : 2.0 to about 1 : 4.5 respectively, with about 3 to about 20 mols per mol of melamine of at least one alcohol having 1, 2 or 3 C atoms, which mixture contains water in an amount no greater than about 25% by weight, is heated in the presence of a condensation-catalyzing proportion of acid at from about 40 to about 120° C, for 1 to 10 hours to effect condensation; the resulting mixture is neutralized and the alcohol together with water is distilled from the neutralized mixture until the residue reaches a solids content of at least 85% by weight; 0.5 to 10 mols of at least one alcohol having from 3 to 18 C atoms are thereafter added to the distillation residue, per original mol of melamine; and vaporizable material is again distilled off until the residue of the vaporization reaches a solids content of 65 to 80 percent by weight as well as a water content below 2% by weight.

4,039,494

FUNGUS RESISTANT PROTECTIVE COATINGS

Richard W. Drisko, Oxnard, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 26, 1976, Ser. No. 661,472
Int. Cl.² C09D *3/64, 5/14*
U.S. Cl. 260—22 A **13 Claims**

1. A non-volatile composition for an air curable protective paint to control fungal and microbial growth on structures comprising:

a. 30 to 70% by weight of a high tin content first reaction product, formed by the reaction of tributyltin oxide with the carboxyl groups of free fatty acids, that will not air cure to form a hard film;

b. said first reaction product being combined with 70 to 30% by weight of a phthalic alkyd polymer having a resin acid value less than 20 to form a homogeneous blend which cures in air to form a hard film;

c. the quantity of tributyltin oxide in the first reaction product being sufficient to react with all the carboxyl groups of said free fatty acids so that no free carboxyl groups remain present in said first reaction product;

d. said composition providing an alkyd protective coating polymer having an internal biocidal material incorporated into the polymer as a chemically-bound component, said biocidal material being released at a controlled rate by hydrolysis thus retarding fungal and microbial growths on structures to which the coating is applied.

3. A tin containing alkyd resin for formulating air curable protective paint to control fungal and microbial growth on structures, comprising the composition formed by:

reacting a phthalic alkyd polymer having a resin acid value less than 20 with an equivalent amount of tri-N-butyltin oxide in boiling benezene (approximately 80° C) so that no

free carboxyl groups are present; said resin acid value being calculated such that the quantity of tri-N-butyltin oxide used reacts with all the free carboxyl groups and there is no excess tin compound remaining;

4,039,495

WATER-DISPERSED COATING COMPOSITION OF SHORT OIL ALKYD RESIN AND TRIS(HYDROXYMETHYL)NITROMETHANE

Jerry Hoyt Hunsucker, Terre Haute, Ind., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed July 30, 1976, Ser. No. 710,079
Int. Cl.[2] C09D *3/64, 5/02;* **C08L** *35/02, 33/14*
U.S. Cl. 260—22 R **7 Claims**

1. A water-dispersed coating composition consisting essentially of a short oil alkyd resin and tris (hydroxy-methyl)nitromethane in a concentration of 20% to about 55% by weight of the resin.

4,039,496

LOW FORMALDEHYDE FULLY ETHERIFIED METHYLOLATED MELAMINE WITH UREA-FORMALDEHYDE-GLYOXAL AS TEXTILE RESIN

David Trimble Hermann, Belle Mead, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 9, 1974, Ser. No. 504,407
Int. Cl.[2] C08L *61/30;* **D06M** *15/58*
U.S. Cl. 260—29.4 R **6 Claims**

1. A process for preparing a water-soluble textile finishing composition comprising

reacting relative amounts of about 1.0 mole of melamine and from about 9.5 to 11.5 moles of formaldehyde at a pH of about 6.0 to 6.5 and a temperature of about 60° C. to 75° C., while

concentrating under vacuum to form a reaction mixture of substantially fully methylolated melamine and formaldehyde,

recovering from about 30 to 35% by weight of the reaction mixture as distillate over a period of about 2½ to 3 hours,

etherifying the reaction mixture by reacting it in highly acidified alcohol at slighly elevated temperatures to obtain a mixture of substantially fully alkoxymethylated melamine resin and formaldehyde,

reacting the mixture of substantially fully alkoxymethylated melamine and formaldehyde with from about 1.65 to 3.3 moles of urea per mole of melamine and from about 0.1 to 0.5 mole of glyoxal per mole of urea at a pH of about 6.0 to 6.5 and a temperature of 60° to 75° C. under vacuum over a period of about 1 to 2 hours to recover an amount of distillate which ranges from about 15 to 20% based on the total weight of the reaction mixture,

reacting the mixture at a temperature of about 60° C. to 75° C. under atmospheric pressure for a period of about 2 to 3 hours to achieve a free formaldehyde content from about 0.75 to 3.5% and a solids content of from about 65% to 75% by weight of the mixture,

cooling the reaction mixture to ambient temperatures,

adding an acid-binding agent to make the mixture moderately alkaline, and

diluting the mixture with water to obtain suitable free formaldehyde and solids content.

4,039,497

POLYTETRAFLUOROETHYLENE BASED COATING COMPOSITIONS

Maurice Troussier, Pierre-Benite, and Huynh Van Lang, Lyon, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 21, 1975, Ser. No. 624,402
Claims priority, application France, Oct. 29, 1974, 74.36075
Int. Cl.[2] C08L *27/18*
U.S. Cl. 260—29.6 F **5 Claims**

1. A coating composition comprising:
a. polytetrafluoroethylene in the dispersed form;
b. polyvinylidene fluoride in the dispersed form;
c. lithia; and
d. an aqueous medium.

4,039,498

PROCESS FOR PREPARING AQUEOUS SOLUTIONS OF ACRYLAMIDE POLYMERS

Frans Maurice Joseph Defoor, Strombeek-Bever, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Apr. 4, 1975, Ser. No. 565,125
Claims priority, application South Africa, Apr. 4, 1974, 74/2169
Int. Cl.[2] C08L *33/26*
U.S. Cl. 260—29.6 HN **12 Claims**

1. A process for preparing an aqueous solution of an acrylamide polymer by initiating the polymerization of an aqueous solution of acrylamide based monomer in the presence of a free radical catalyst and an amine reducing agent, the improvement which comprises carrying out the polymerization in the presence of a peroxide-type catalyst which is used in an amount of between about 0.05 and 5%, based on the weight of said monomer, and adjusting the pH of the solution to a value between about 3 and 6 by adding an acid about 10 to 20 minutes after the start of the polymerization to obtain an aqueous solution of an acrylamide polymer having an average molecular weight of from 800,000 to 2,000,000 and having a viscosity of between about 2,000 and 8,000 centipoises at 25° C.

4,039,499

PRODUCT

Edward F. Steigelmann; Robert D. Hughes, both of Park Forest, Ill., and Joseph Gabor, Whiting, Ind., assignors to Standard Oil Company, Chicago, Ill.

Division of Ser. No. 419,091, Nov. 26, 1973, Pat. No. 3,940,469.
This application June 25, 1975, Ser. No. 590,072
Int. Cl.[2] C08L *77/06*
U.S. Cl. 260—29.6 NR **15 Claims**

1. A composition consisting essentially of hydrophilic polymer and di(lower alkyl) sulfoxide solvent, said polymer consisting essentially of film-forming N-alkoxyalkyl nylon and sufficient water-soluble polyvinyl alcohol to enhance the hydrophilic properties of the nylon, said composition having a sufficient amount of water to inhibit degradation of the polymer at elevated temperatures suitable for extrusion of the composition.

4,039,500

PROCESS FOR CONTROLLING MOLECULAR WEIGHT DISTRIBUTION OF LATEX POLYMERS

David Robinson Bassett, Charleston, and Kenneth Look Hoy, St. Albans, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,597
Int. Cl.[2] C08L *25/14*
U.S. Cl. 260—29.6 R **11 Claims**

1. A process for controlling the particle morphology and molecular weight distribution of emulsion polymerized latex polymers, said process comprising introducing at least one primary polymerizable ethylenically unsaturated monomers feed composition containing from 0 to 5 weight percent of a chain transfer agent and from 0 to 5 weight percent of at least one crosslinking agent from at least one primary feed source to a polymerization zone, said primary polymerizable ethylenically unsaturated monomers feed composition continually varying in compositional content by the simultaneous addition thereto during its introduction to the polymerization zone, from at least one secondary feed source, of at least one secondary polymerizable ethylenically unsaturated monomers feed composition containing from 0 to 5 weight percent of a chain transfer agent and from 0 to 5 weight percent of at least one crosslinking agent so as to continually change the compositional content of the primary polymerizable ethylenically unsaturated monomers feed composition in said primary feed source during the addition thereto of said secondary polymerizable ethylenically unsaturated monomers feed composition, and simultaneously polymerizing the primary polymerizable ethylenically unsaturated monomers feed composition introduced to the polymerization zone whereby emulsion polymerized latex polymer of broadened molecular weight distribution is produced; with the proviso that there be a positive amount of said chain transfer agent in at least one of said feed compositions during at least a portion of the polymerization period.

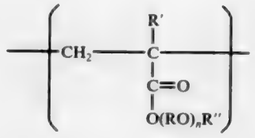
4,039,501

PLASTICIZED HYDROPHILIC POLYMERS

Thomas E. Babcock, Mercer; Karel Kliment, Princeton, and Richard F. Stockel, Somerville, all of N.J., assignors to National Patent Development Corporation, New York, N.Y.

Filed May 30, 1975, Ser. No. 582,333
Int. Cl.[2] C08K *5/06, 5/15, 5/16, 5/20*
U.S. Cl. 260—30.4 R **24 Claims**

1. A plasticized polymer composition comprising (1) a solid, water-insoluble, water-swellable hydrophilic polymer having the recurring unit



wherein R is a divalent aliphatic hydrocarbon radical of 2 to 8 carbon atoms, R′ is hydrogen or alkyl of 1 to 4 carbon atoms, R″ is hydrogen or alkyl of 1 to 12 carbon atoms, and *n* is an integer of at least 1; and (2) as the plasticizer therefor, an aminoalcohol composed of carbon, hydrogen, amino nitrogen, and oxygen atoms, said aminoalcohol having a boiling point at 760 mm of Hg greater than 165° C., a vapor pressure of less than 5 mm of Hg under standard conditions, from 1 to 3 hydroxy groups, and from 1 to 3 amino groups, the plasticizer being present in an amount of 1 to 100 weight percent of the weight of the polymer.

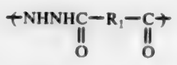
4,039,502

POLYHYDRAZIDE SPINNING SOLUTIONS

John David Hartzler, Kinston, N.C., and Paul Winthrop Morgan, West Chester, Pa., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.

Filed Jan. 2, 1976, Ser. No. 646,356
Int. Cl.[2] C08K *3/24*
U.S. Cl. 260—30.8 R **8 Claims**

1. A novel optically anisotrapic spinning solution comprising at least 5% by weight of a (co)polyhydrazide consisting essentially of repeating units of the formula



I.

wherein the divalent radical R_1 in each repeating structural unit may be the same or different and is selected from the group of aromatic, carbocyclic and aliphatic radicals of from 1 to 12 carbon atoms; 2,5-pyridinediyl radicals or a chemical bond in a solvent selected from the group of concentrated sulfuric acid (at least 99.5% but not greater than 102%) or a mixture thereof with fluorosulfonic acid.

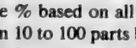
4,039,503

SILICONE RUBBER COMPOSITIONS

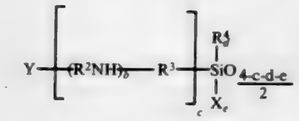
Kunio Itoh, Annaka, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1976, Ser. No. 658,124
Claims priority, application Japan, Feb. 19, 1975, 50-20473
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **12 Claims**

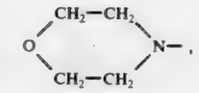
1. A silicone rubber composition consisting essentially of
a. 100 parts by weight of a diorganopolysiloxane gum represented by the average unit formula



where R^1 is a substituted or unsubstituted monovalent hydrocarbon group and a has a value from 1.98 inclusive to 2.05 inclusive,
b. from 20 to 250 parts by weight of an inorganic filler,
c. from 1 to 20 parts by weight of an organopolysiloxane composed of from 20 to 60 mole % $C_6H_5SiO_{1.5}$ units, from zero to 20 mole % $CH_2=CHSiO_{1.5}$ units, from 15 to 30 mole % $(CH_3)(CH_2=CH)SiO$ units and 20 to 50 mole % $(CH_3)_2SiO$ units, the total of the $C_6H_5SiO_{1.5}$ and $CH_2=CHSiO_{1.5}$ units being equivalent to from 20 to 60 mole % based on all siloxane units,
d. from 10 to 100 parts by weight of polyester fiber having a softening point of 200° C or higher, and composed of filaments from 0.5 to 5 mm in length,
e. from 0.5 to 10 parts by weight of an organic silicon compound represented by the formula



where R^2 and R^3 each are the same or different divalent hydrocarbon groups, R^4 is a substituted or unsubstituted monovalent hydrocarbon group, X is a hydroxy or hydrolyzable group, Y is a group selected from the class consisting of H_2N-, NC—, $HO.CO.CH_2.NH-$, $NH_2.CO.NH-$,



C_6H_5-NH- and HS—, *b* has a value of 0 or 1, *c* has a value greater than 0 but not exceeding 1, and *d* and *e* each have a value from 0 inclusive to 3 inclusive, with the proviso that $(c+d+e)$ is equal to a value greater than 0 but not exceeding 4, and
f. from 0.1 to 10 parts by weight of an organic peroxide.

4,039,504

MERCAPTOSILOXANE ELASTOMER AND METHOD OF PREPARATION

Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1976, Ser. No. 663,328
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **3 Claims**

1. A composition curable to an elastomer comprising a material prepared by mixing

A. a vinyl containing polydiorganosiloxane having a viscosity of at least 0.3 Pa.s at 25° C. and consisting essentially of a combination of two triorganosiloxy units selected from the group consisting of trimethylsiloxy units, dimethylvinylsiloxy units and methylphenylvinylsiloxy units, from 70 to 85 mol percent dimethylsiloxane units and from 15 to 30 mol percent methylvinylsiloxane units, where the total number of dimethylsiloxane units and methylvinylsiloxane units equal 100 mol percent,

B. a mercaptoorganopolysiloxane consisting essentially of a combination of two trimethylsiloxy units, at least 92 mol percent dimethylsiloxane units and at least two (mercaptoalkyl)methylsiloxane units per molecule up to 8 mol percent (mercaptoalkyl)methylsiloxane units, where the total number of dimethylsiloxane units and (mercaptoalkyl)methylsiloxane B units is 100 mol percent, the mercaptoalkyl groups having from 1 to 4 inclusive carbon atoms, said mercaptoorganopolysiloxane having a molecular weight of at least 1,000, (A) and (B) being combined in a weight ratio sufficient enough to provide a molar ratio of moles of —SH group in (B) per mole of vinyl radical in (A) of 1:1 to 10:1,

C. an organic peroxide in an amount of from 1.4 to 5.5 parts by weight based on 100 parts by weight of (A) and (B) combined, and

D. a filler in an amount of from 0 to 100 parts by weight per 100 parts by weight of (A) and (B) combined.

4,039,505

SILOXANE ELASTOMERS CONTAINING SULFUR AND METHOD OF PREPARATION

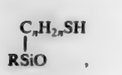
Gary R. Homan, and Chi-Long Lee, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Filed Mar. 3, 1976, Ser. No. 663,327
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—37 SB **5 Claims**

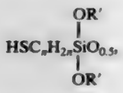
1. A composition curable to an elastomer comprising a material prepared by mixing

A. a polymethylvinylsiloxane consisting essentially of methylvinylsiloxane units, having linear or cyclic structures or mixtures thereof, said linear structures having hydroxyl endblocking or trimethylsiloxy endblocking, having an average of at least three siloxane units per molecule and a molecular weight sufficient to provide a viscosity of less than 0.05 Pa·s at 25° C.,

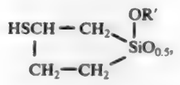
B. a mercaptoorganopolysiloxane consisting essentially of a combination of units selected from dimethylsiloxane units, trimethylsiloxane units, units of the formula



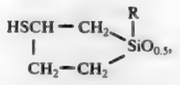
units of the formula



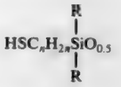
units of the formula



units of the formula



units of the formula



wherein R is a monovalent radical selected from the group consisting of alkyl radicals of from 1 to 3 carbon atoms inclusive and phenyl radicals, R′ is methyl or ethyl and *n* has a value of from 1 to 4 inclusive, there being in said mercaptoorganopolysiloxane an average of at least two sulfur containing siloxane units per molecule and no more than 8 mol percent —SH containing siloxane units based on the total number of siloxane units in the mercaptoorganopolysiloxane, the molecular weight of the mercaptoorganopolysiloxane being at least 2000,

A. and (B) being combined in a weight ratio sufficient enough to provide a molar ratio of moles of —SH group in

B. per mole of vinyl radical in (A) of 1:1 to 10:1,

C. an organic peroxide in an amount of from 1.4 to 5.5 parts by weight based on 100 parts by weight of (A) and (B) combined, and

D. a filler in an amount of from 0 to 100 parts by weight per 100 parts by weight of (A) and (B) combined.

4,039,506

COVULCANIZATION OF CONJUGATED DIENE-CONTAINING BUTYL WITH HALOBUTYL AND BUTYL RUBBER

Albert M. Gessler, 448 Orchard St., Cranford, N.J. 07016, and Francis P. Baldwin, 19 Winchester Road, Summit, N.J. 07901, assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 393,349, Aug. 31, 1973, abandoned. This application Mar. 28, 1975, Ser. No. 562,828
Int. Cl.[2] C08K *3/04*
U.S. Cl. 260—42.35 **15 Claims**

1. An inner tube which comprises 95 curable blend of from 5 to 95weight percent (wt. %) conjugated diene-containing butyl rubber and from 95 to 5 wt. % of a rubber selected from the group consisting of butyl or halogenated butyl rubber, carbon black, oil, and a vulcanization system.

4,039,507

INCORPORATION OF FINELY DIVIDED FUNCTIONAL SOLIDS INTO OLEFIN

William P. Paige, and John A. Barber, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 5, 1975, Ser. No. 610,588
Int. Cl.[2] C08K *9/10*
U.S. Cl. 260—42.46 **7 Claims**

1. A concentrate comprising from about 10 to about 120 weight parts of a finely divided functional solid selected from group consisting of pigments, dyes and combinations thereof and as a carrier, 100 weight parts of an ethylene/butene-1 copolymer having (1) from about 8 to about 15 weight percent based on the copolymer of copolymerized butene-1, (2) a melt flow viscosity as determined by ASTM D-1238-65-T (condition E) in the range from about 0.1 to about 10 decigrams per minute and (3) an absolute density in the range from about 0.941 to about 0.959 grams per cc.

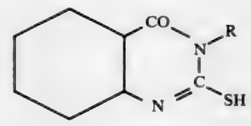
4,039,508

POLYMERIC COMPOSITION CONTAINING MERCAPTOQUINAZOLONE ANTIOXIDANT

Kewal Singh Dhami, Shrewsbury, Mass., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sept. 22, 1976, Ser. No. 725,365
Int. Cl.[2] C08K *5/34*; C07D *239/95*
U.S. Cl. 260—45.8 N **5 Claims**

1. A polymeric composition containing as an antioxidant therefor an effective amount of a mercaptoquinazolone of the formula



in which R is allyl or methallyl.

4,039,509

NON-OPAQUE FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,166, Dec. 28, 1973, Pat. No. 3,919,167. This application Oct. 29, 1975, Ser. No. 626,934
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.[2] C08L *69/00*
U.S. Cl. 260—45.8 R **12 Claims**

1. A non-opaque flame retardant aromatic polymer composition comprising in admixture an aromatic carbonate polymer and from 0.001 to about 2.0 parts per hundred parts of the aromatic carbonate polymer of an additive selected from the group consisting of the metal salts of substituted and unsubstituted sulfonic acids of heterocyclic compounds, and mixtures thereof, wherein said metal salts thereof are selected from the group consisting of alkali metals and alkaline earth metals, and mixtures of the metal salts, and wherein said substituent on the metal salt of the substituted sulfonic acids of heterocyclic compounds is selected from the group consisting of an electron withdrawing radical and mixtures of electron withdrawing radicals; and wherein said heterocyclic compound is selected from the group consisting of five and six membered heterocyclic nuclei containing a hetero atom selected from the group consisting of nitrogen, oxygen and sulfur; said aromatic carbonate polymer and additive having a refractive index in the range of 1.54 to 1.65.

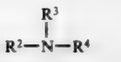
4,039,510

REMOVAL OF CATALYST FROM POLYPHENYLENE OXIDE REACTION MIXTURES WITH NITROGENOUS SALTS OF NITRILOTRIACETIC ACID

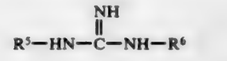
Glenn Dale Cooper, Delmar, and Daniel Edwin Floryan, Glenmont, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Dec. 8, 1975, Ser. No. 638,804
Int. Cl.[2] C08G *65/44, 65/46*
U.S. Cl. 260—47 ET **10 Claims**

1. In a process for forming a polyphenylene oxide by an oxidative coupling reaction in the presence of a complex copper-amine catalyst comprising passing an oxygen-containing gas through an organic reaction solution of a phenol and said catalyst, the improvement which comprises separating the polyphenylene oxide from said organic reaction solution by contacting said reaction solution with a solution of from 1:1 to 20:1 moles per mole of copper of a nitrogenous salt of nitrilotriacetic acid that is formed from nitrilotriacetic acid and an amine of the formula:



wherein R^2, R^3 and R^4 are independently selected from the group consisting of hydrogen, alkyl of 1–20 carbon atoms, cycloalkyl of 3–6 carbon atoms and alkenyl of 1–20 carbon atoms with the proviso that no more than any two of R^2, R^3 and R^4 may be hydrogen; or a compound of the formula:



wherein R^5 and R^6 are independently selected from the group consisting of alkyl of 1–20 carbon atoms, aryl, alkaryl wherein the alkyl moiety has from 1–10 carbon atoms and aralkyl wherein the alkyl moiety has from 1–10 carbon atoms; to form a mixed organic reaction solution which contains a small aqueous phase from the water formed in the polymerization reaction, and thereafter, adding to said mixed organic reaction solution an antisolvent for the polyphenylene oxide that causes said polyphenylene oxide to precipitate.

4,039,511

PROCESS FOR THE MANUFACTURE OF POLYETHERS FROM BISPHENATES AND SULFONYL HALIDES

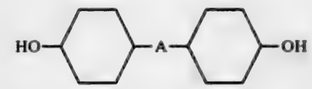
Harald Wulff, Limburgerhof, and Gerd Blinne, Freinsheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 14, 1975, Ser. No. 622,102
Claims priority, application Germany, Oct. 25, 1974, P2450789
Int. Cl.[2] C08G *65/40*
U.S. Cl. 260—49 **3 Claims**

1. A process for the manufacture of polyethers, wherein one mole of a bisphenolate of the formula



where Me is an alkali metal or an ammonium, phosphonium or sulphonium cation and —O—Ar—O— is an anion of a bisphenol selected from the group consisting of resorcinol, pyrocatechol, hydroquinone, 4,4-dihydroxydiphenyl and



where A is $-CH_2-$, $-C(CH_3)_2-$, —O—, —S—, —CO— or

—SO_2— is reacted, in a first stage, with $1 + x$, ($x = 0$ to 1) moles of an aromatic sulfonyl halide of the formula Ar′—SO_2—X where X is chlorine or bromine and Ar′ is an aromatic radical, at temperatures of from −50° C to +150° C with the elimination of halide MeX, whereupon, in a second stage, polycondensation is carried out at temperatures of from 150° to 350° C with x (X = 0 to 1) mole of bisphenolate to form polyethers with elimination of sulfonate $MeSO_3Ar'$.

4,039,512

POLYMERS OF BENZENE PHOSPHORUS OXYDICHLORIDE, 4,4′-THIODIPHENOL AND $POCl_3$

Ki Soo Kim, Irvington, and Siegfried Altscher, Monsey, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 15, 1975, Ser. No. 613,145
Int. Cl.² C08G *33/10, 33/18*
U.S. Cl. 260—61 **8 Claims**

1. A resinous polymer of benzene phosphorus oxydichloride, 4,4′-thiodiphenol and $POCl_3$.

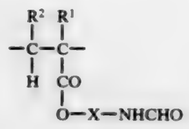
4,039,513

POLYMERS CONTAINING FORMAMIDE GROUPS

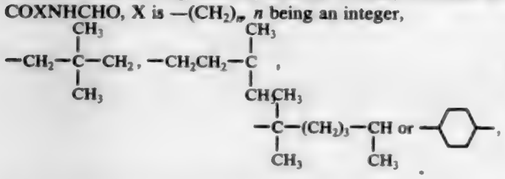
Herbert Naarmann, Wattenheim, and Heinz Pohlemann, Limburgerhof, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Feb. 9, 1976, Ser. No. 656,310
Claims priority, application Germany, Feb. 20, 1975, 2507189
Int. Cl.² C08G *2/00, 6/00, 10/02, 236/00*
U.S. Cl. 260—67 UA **6 Claims**

1. A polymer which contains structural units of the formula



where R^1 is H or CH_3, R^2 is H, COOR, COOM, CONHR or COXNHCHO, X is $—(CH_2)_m—$ n being an integer,



M is a metal cation or ammonium cation and R is H, alkyl, cycloalkyl or aryl.

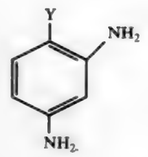
4,039,514

POLYURETHANES CURED WITH DERIVATIVES OF 2,4-DIAMINO-BENZAMIDE

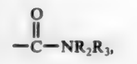
Norman Martin van Gulick, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 289,460, Sept. 15, 1972. This application July 22, 1975, Ser. No. 598,128
Int. Cl.² C08G *18/32, 18/72*
U.S. Cl. 260—75 NH **6 Claims**

1. In a process of preparing a polyurethane/polyurea composition by curing a prepolymer comprising the reaction product of a glycol having a molecular weight of about 500–5000 and an organic diisocyanate the improvement which consists essentially of curing said prepolymer with a curing agent having the general formula:



in which Y is either



and wherein R_2 and R_3 are each selected from the group consisting of H, C_1-C_8 alkyl which may contain OH or ether groups, and C_6-C_{12} aryl, and wherein R_2 and R_3 may form a 5- or 6-membered ring which may contain one oxygen atom, one nitrogen atom, or one oxygen atom and one nitrogen atom.

4,039,515

CONTINUOUS MANUFACTURE OF LINEAR POLYESTERS

Joerg Rebhan, and Hans Georg Matthies, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Oct. 6, 1975, Ser. No. 619,812
Claims priority, application Germany, Oct. 16, 1974, 2449162
Int. Cl.² C08G *63/16*
U.S. Cl. 260—75 M **9 Claims**

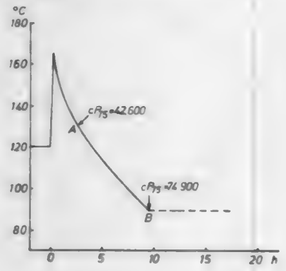
1. In a process for the manufacture of linear high molecular weight polyesters by direct esterification of terephthalic acid with excess glycols in a medium comprising terephthalic acid glycol esters or their oligomers, under superatmospheric pressure at temperatures above 200° C, followed by polycondensation in the presence of catalysts at from 260° to 290° C, the improvement comprising: (a) feeding to the esterifiction a mixture which contains terephthalic acid and glycols in the molar ratio of 1:1.15 to 1:1.5, and (b) continuously distilling from the reaction mixture, during the esterification, from 20 to 30% by weight of the excess of glycol over the molar ratio terephthalic acid: glycol = 1:1.

4,039,516

PROCESS FOR THE PRODUCTION OF SOLUBLE HIGH MOLECULAR WEIGHT POLYURETHANES WHICH ARE FREE FROM ISOCYANATE GROUPS

Georg Niederdellmann, Dormagen; Henning Klussmann, Rommerskirchen, and Horst Conrad, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 7, 1976, Ser. No. 674,355
Claims priority, application Germany, Apr. 10, 1975, 2515766
Int. Cl.² C08G *18/08*
U.S. Cl. 260—75 NE **9 Claims**



1. A process for the production of high molecular weight

polyurethanes which are free from NCO-groups and soluble in organic solvents comprising reacting a dihydroxy compound having an average molecular weight of from about 500 to 5000, and optionally another compound having two isocyanate-reactive groups and a molecular weight in the range of from about 32 to 400, and an organic diisocyanate, the equivalent ratio between NCO-groups to isocyanate-reactive groups being from about 0.92 to 1.0, in the presence of an inert solvent, wherein

a. the total quantity of diisocyanate is added at a temperature of from about 100° to 150° C to the dihydroxy compond dissolved in from about 0 to 50% of the total quantity of inert solvent used as reaction medium and optionally in admixture with the other isocyanate-reactive compound, so that a starting temperature of from about 20° to 60° C above the specific reaction temperature in the range of about 100° – 160° C is achieved from the heat of reaction;

b. the reaction is carried out at this starting temperature until the reaction mixture reaches a viscosity of from about 7000 to 20,000 cP; after which

c. the remaining about 100 to 50% of the quantity of inert solvent at a temperature of from about 0° to 110° C is added either in stages or continuously over a period of from about 0.5 to 6 hours in such a way that the viscosity of the reaction mixture remains substantially constant, the reaction mixture being cooled at the same time;

d. the reaction mixture is optionally stirred at the specific reaction temperature in the range of about 100° – 160° C until no further reaction takes place and the maximum viscosity has been reached; and finally

e. when there is no sign of any further increase in viscosity, the resulting reaction solution containing from about 30 to 70%, by weight, of polyurethane is cooled to a temperature of from about 80° to 100° C. and

f. the polyurethane solid is recovered from the solution in known manner by removing the solvent.

4,039,517

HYDROPHILIC AND THERMOREACTIVE URETHANE COMPOSITIONS WITH IMPROVED PROPERTIES

Tamotu Hamamura, Joyo; Sumio Goto, Uji, and Kazuhiko Ishihara, Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed May 29, 1975, Ser. No. 582,003
Claims priority, application Japan, May 29, 1974, 49-61223; May 29, 1974, 49-61224; June 11, 1974, 49-66926
Int. Cl.² C08G *18/06*
U.S. Cl. 260—77.5 TB **15 Claims**

1. A hydrophilic and thermoreactive urethane composition prepared by forming a low-molecular-weight, substantially gel-free urethane prepolymer containing free isocyanate groups by reacting a member selected from the group consisting of (a) (1) a compound containing at least 2 hydroxyl groups, containing an oxyethylene chain, and having a molecular weight of about 200 to 20,000 or (2) an admixture of a compound containing at least 2 hydroxyl groups, not containing an oxyethylene chain, and having a molecular weight of about 200 to 20,000 and a compound containing at least 2 hydroxyl groups, containing an oxyethylene chain and having a molecular weight of about 200 to 20,000; and (b) an excess of a polyisocyanate, whereby said prepolymer has an oxyethylene chain content of 10 to 40% by weight, and reacting said prepolymer or a solution thereof in an inert solvent with up to 3 times the equivalent of the free isocyanate groups in said prepolymer of an aqueous solution of a bisulfate salt of a concentration of at least 15% by weight thereby to block the free isocyanate groups with the bisulfite and render the urethane prepolymer hydrophilic.

4,039,518

PRODUCTION OF P-PHENYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,330
Int. Cl.² C08F *28/00*
U.S. Cl. 260—79.1 **10 Claims**

1. A method for producing polymers comprising:

a. forming a composition by contacting at least one p-dihalobenzene, at least one alkali metal sulfide, at least one organic amide, and at least one lithium salt selected from the group consisting of lithium carbonate and lithium borates, and

b. maintaining at least a portion of said composition at polymerization conditions to produce a polymer.

4,039,519

BROAD SPECTRUM ANTIBIOTICS AND METHOD

Pierre Nivieré, Montlouis; Gérard Orillard, Vanves, and Jean Blum, Courbevoie, all of France, assignors to Chimie & Biologie, Colombes, France

Filed Apr. 14, 1975, Ser. No. 567,751
Int. Cl.² C07C *103/52;* A61K *37/00*
U.S. Cl. 260—112.5 R **2 Claims**

1. The compound trioxytetracycline methyl cholistine trichlorohydrate and its salts.

4,039,520

GELATIN HARDENING PROCESS

Teiji Habu; Hisashi Yamaguchi; Tsuneo Wada; Takashi Sasaki; Hiroki Ishii; Takayoshi Omura, and Hiroyuki Inokuma, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Filed Mar. 11, 1974, Ser. No. 450,227
Claims priority, application Japan, Mar. 12, 1973, 48-27949; Mar. 19, 1973, 48-30952
Int. Cl.² C09H *7/00*
U.S. Cl. 260—117 **7 Claims**

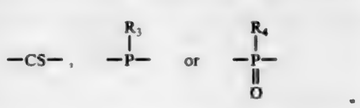
1. A process for hardening gelatin which comprises reacting photographic gelatin with a compound selected from the group consisting of formulae (I) or (II) which are as follows:

$$[A — B —(NHCO)_{m-1} — X]_{n-1} — Z — Y — NH(CONH)_{m-1} — B —A \quad (I)$$

wherein A is CH_2=CH—, CH_2=C(R_1)—, CH_2(R_2)—CH_2— or CH_2(R_1)—CH(R_2)— (where R_1 and R_2 are halogen atoms); B is —CO— or —SO_2—; m is 1 or 2; X is oxygen, sulfur, —NH—, —NHCO— or —$NHSO_2$—; n is an integer of 2 or more; Y is —CO— or —SO_2—; and Z is an n-valent aliphatic, aromatic or heterocyclic group, and when Z is an n-valent aromatic or heterocyclic group, Y is —CO—, and when Z is an n-valent aromatic, heterocyclic or aliphatic group, Y is —SO_2—; As, Bs and Xs may individually be the same or different, or

$$[A' — SO_2 — (NHCO)_{m'} —Y]_{N'} —Z' \quad (II)$$

wherein A′ is CH_2=CH—, CH_2=C(R_1)—, CH_2(R_1)—CH_2— or CH_2(R_1)—CH_2(R_2)— (where R_1 and R_2 are halogen atoms); m' is 1 or 2; n' is an integer of 2 or more; Z′ is an n-valent aliphatic, alicyclic, aromatic or heterocyclic group, —CO—,

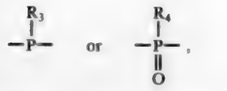


in which R_3 and R_4 individually represent a substituted or unsubstituted alkyl, aryl, alkoxy, aryloxy, alkylamino or arylamino group or —Y— (CONH)$_{n'}$$SO_2$—A′, and when m' is 1, Z is an n-valent aromatic or heterocyclic group, and when

m' is 2, Z is an n-valent aromatic, heterocyclic, aliphatic or alicyclic group,



and Y represents —NH—when *m'* is 1 or when Z' is —CO—, —CS—,



or Y represents —NH—, oxygen or sulfur when *m'* is 2.

4,039,521

AROMATIC DIAZONIUM BIS(FLUORINATED ALKYLSULFONYL) METHIDES

George H. Smith, Maplewood, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 23, 1973, Ser. No. 353,297
Int. Cl.[2] C07C *113/04;* B01J *31/02;* G03C *1/52*
U.S. Cl. 260—141 **6 Claims**

1. A light-sensitive diazonium salt compound the cation of which is a stable, aromatic, light-sensitive nucleus and the anion of which is a bis(fluorinated alkylsulfonyl) methide, the alkyl portion of the alkylsulfonyl being substantially fluorinated.

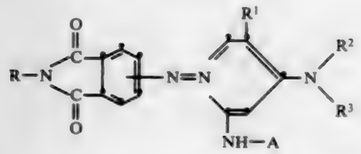
4,039,522

PHTHALIMIDYL-AZO-M-ACYLAMIDO-N-SUBSTITUTED ANILINE COMPOUNDS AND POLYESTER FIBERS DYED THEREWITH

Max A. Weaver, and Jean C. Fleischer, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

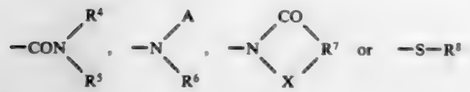
Continuation of Ser. No. 438,813, Feb. 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 376,046, July 2, 1973, abandoned. This application Oct. 28, 1975, Ser. No. 626,519
Int. Cl.[2] C09B *29/06, 29/08;* D06P *1/18, 3/54*
U.S. Cl. 260—152 **2 Claims**

1. A compound having the formula



wherein

R and R^2 are the same or different and each is alkyl containing one to eight carbon atoms; cyclohexyl; cyclohexyl substituted with lower alkyl; arylmethyl; arylethyl; cyclohexylmethyl; 2-cyanoethyl or a group having the formula —Z—R^9 in which Z is ethylene, propylene, trimethylene or tetramethylene and R^9 is lower alkoxy, aryloxy, lower alkanoyloxy, lower alkoxycarbonyl, lower alkoxycarbonyloxy, aroyloxy or



wherein

R^4 individually is hydrogen, lower alkyl or aryl;

R^5 individually is hydrogen or lower alkyl;

R^4 and R^5 taken together are $—(CH_2)_5—$ or $—CH_2CH_2OCH_2CH_2—$;

R^6 is hydrogen, lower alkyl, aryl, or cyclohexyl;

R^7 is ethylene, propylene, trimethylene, o-cyclohexylene, or o-arylene;

X is $—CH_2—$, —CO—, or $—SO_2—$; and

R^8 is aryl, benzyl, cyclohexyl, 1,2,4-triazol-3-yl, or 2-benzothiazolyl;

A is lower alkanoyl; lower alkanoyl substituted with chlorine, bromine, aryl, cyano, lower alkoxy, benzyloxy, lower alkylthio, aryloxy or lower alkylsulfonyl; lower alkoxycarbonyl; or aroyl;

R^1 is hydrogen or methyl, one of R^1 and R^3 being hydrogen;

R^3 is hydrogen, lower alkyl, arylmethyl, arylethyl, allyl, aryl, or a group having the formula —Z—R^{10} in which Z is ethylene, propylene, trimethylene, or tetramethylene and R^{10} is lower alkoxy, aryloxy, lower alkanoyloxy, lower alkoxycarbonyl, or lower alkoxycarbonyloxy.

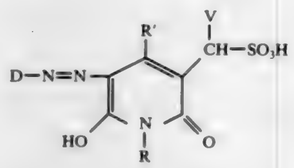
4,039,523

3-SULFOALKYL-6-HYDROXY-PYRID-(2)-ONE-CONTAINING AZO DYESTUFFS

Gert Hegar, Schonenbuch, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 209,350, Dec. 17, 1971, abandoned. This application Dec. 24, 1974, Ser. No. 536,130
Claims priority, application Switzerland, Dec. 22, 1970, 19063/70; Feb. 9, 1971, 1873/71; Dec. 2, 1971, 17614/71
Int. Cl.[2] C09B *29/36, 62/08, 62/24, 62/50*
U.S. Cl. 260—153 **6 Claims**

1. An azo dyestuff of the formula



in which

D is benzene or naphthalene, unsubstituted or substituted by sulfonic acid, carboxy, hydroxy, chloro, bromo, $NH_2—$, lower alkylamino, lower alkyl, lower alkoxy, lower alkylsulfonyl, trifluoromethyl, cyano, cyclohexyloxycarbonyl, sulfonic acid-N-lower alkylamide, sulfonic acid-N-lower alkoxyloweralkylamide, acetylamino, phenylazo, sulfophenylazo, sulfonaphthylazo, β-sulfatoethylsulfonyl, aminosulfonyloxy or a fibre-reactive radical capable of reacting with the hydroxyl groups of cellulose or the amino groups of polyamides and bound via an amino group; or is thiazole, quinoline, benzthiazole, 6-methylbenzthiazole, 1,3,5-thiadiazole or benzisothiazole;

R is hydrogen, lower akyl, lower chloroalkyl, lower hydroxyalkyl, acetylamino-lower alkyl, phenyl-lower alkyl, phenyl, chlorophenyl, lower alkoxyphenyl, acetaminophenyl or amino-lower alkyl, in which the amino group is unsubstituted or substituted by a fibre-reactive radical capable of reacting with the hydroxyl groups of cellulose or the amino groups of polyamides;

R' is hydrogen, lower alkyl, phenyl-lower alkyl, phenyl, chlorophenyl or lower alkoxy-phenyl; and

V is hydrogen, lower alkyl or phenyl, unsubstituted or substituted by chloro, nitro, cyano, $mNH_2—$ or a fibre-reactive radical capable of reacting with the hydroxyl groups of cellulose or the amino groups of polyamides and bound via an amino group; and the heavy metal complex compound thereof selected from the group consisting of iron, manganese, nickel, copper, cobalt and chromium.

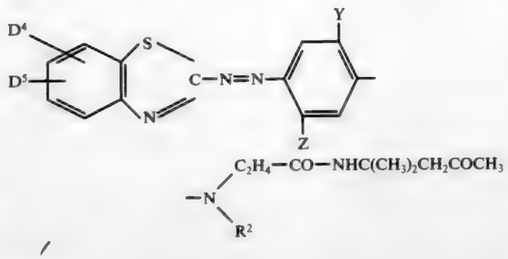
4,039,524

KETO-AMIDO CONTAINING PHENYLAZO BENZOTHIAZOLE DYESTUFFS

Lester N. Stanley, Delmar, and Russell E. Farris, Elnora, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 319,034, Dec. 27, 1972, Pat. No. 3,931,145. This application June 17, 1975, Ser. No. 587,694
Int. Cl.[2] C09B *29/08, 29/26;* D06P *1/18*
U.S. Cl. 260—158 **6 Claims**

1. A dyestuff of the formula:



wherein

D^4 is hydrogen, chlorine, bromine, fluorine, cyano, thiocyano, nitro, lower alkyl, lower alkylsulfonyl, trifluoromethyl, lower alkoxy, lower alkanoyl, benzoyl, lower alkoxycarbonyl, or carbamyl or sulfamyl optionally substituted by N-mono- or N,N-di-lower alkyl;

D^5 is hydrogen, chlorine, bromine, fluorine, lower alkoxy, lower alkyl, or nitro;

Z is hydrogen, halogen, lower alkyl or NHX and X is So_2–R, SO_2OR, COR or COOR with R being hydrogen, phenyl or lower alkyl;

Y is hydrogen, lower alkyl or lower alkoxy;

R^2 is $—C_2H_4—CO—NHC(CH_3)_2CH_2COCH_3$, hydrogen, lower alkyl, lower alkenyl, lower alkynyl; or lower alkyl, lower alkenyl or lower alkynyl substituted with chlorine, bromine, fluorine, hydroxy, cyano, thiocyano, lower alkoxy, hydroxyethoxy, lower alkoxycarbonyl, lower alkanoyloxy, benzoyloxy, unsubstituted carbamyl, N-monolower alkylcarbamyl, or N,N-di-lower alkylcarbamyl.

4,039,525

AQUEOUS PHENOLIC RESOLE DISPERSION CONTAINING CERTAIN HYDROXYALKYLATED GUMS AS INTERFACIAL AGENTS

Neil Justin McCarthy, Jr., Warren Township, Middlesex County, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 23, 1975, Ser. No. 616,025
Int. Cl.[2] C08L *5/00*
U.S. Cl. 260—17.2 **14 Claims**

1. An aqueous dispersion containing dispersed particles of a phenolic resole in water, and, in an amount sufficient to stabilize said dispersion, said amount being within the range of from about 0.5 to about 3 parts by weight of phenol employed to produce said resole, of at least one interfacial agent, said interfacial agent being the reaction product of (a) guar gum, locust bean gum, stractan gum, or mixture thereof, with (b) ethylene oxide, propylene oxide, or mixture thereof, the proportion of said (b) component to said (a) component being such that said interfacial permits a phase inversion to a resole-in-water dispersion to occur when producing said aqueous dispersion, wherein said resole has a weight average molecular weight within the range of from about 400 to about 3000, as determined by the method of Moore, "Journal of Polymer Science, Part A", Volume 2, page 835, 1964.

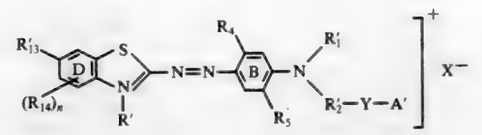
4,039,526

CATIONIC DYESTUFFS CONTAINING QUATERNIZED BENZTHIAZOLE AND P-SUBSTITUTED AMINO AZO PHENYL MOIETIES

Hans-Peter Kühlthau, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

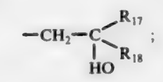
Filed Aug. 21, 1975, Ser. No. 606,584
Claims priority, application Germany, Aug. 21, 1974, 2440021
Int. Cl.[2] C09B *43/00, 27/00*
U.S. Cl. 260—158 **13 Claims**

1. Dyestuff of the formula



wherein

R' represents C_1-C_6-alkyl; C_2-C_7-alkenyl; benzyl; phenethyl; benzyl or phenylethyl substituted by halogen, hydroxyl, cyano, C_1-C_3-alkylcarbonyloxy, C_1-C_4-alkoxycarbonyl, hydroxycarbonyl or aminocarbonyl; or

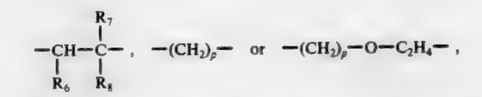


R_{17} denotes hydrogen or methyl;

R_{18} denotes methyl, ethyl, chloromethyl, C_1-C_4-alkoxymethyl, allyloxymethyl, phenoxymethyl or phenyl;

R'_1 represents C_1-C_6-alkyl; C_1-C_6-alkyl substituted by halogen, hydroxyl, C_1-C_4-alkoxy, cyano, C_1-C_3-alkylcarbonyloxy, hydroxycarbonyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkoxycarbonyloxy, aminocarbonyl, C_1-C_4-alkylsulphonylamino or C_1-C_4-alkylsulphonyl-C_1-C_4-alkylamino; C_2-C_7-alkenyl; cyclopentyl; cyclohexyl; benzyl; β-phenylethyl; or cyclopentyl, cyclohexyl, benzyl or β-phenylethyl substituted by C_1-C_6-alkyl;

R'_2 represents



R_6 denotes hydrogen, methyl, ethyl, C_1-C_4-alkoxymethyl, allyloxymethyl, phenyl or phenoxymethyl;

R_7 denotes hydrogen, methyl, ethyl, C_1-C_4-alkoxymethyl, allyloxymethyl, phenyl, phenoxymethyl or -Y-A';

R_8 denotes hydrogen or methyl;

p denotes the numbers from 1 to 6;

R_4 represents hydrogen; halogen; C_1-C_6-alkyl; C_1-C_6-alkyl substituted by halogen, C_1-C_4-alkoxy, benzyloxy, β-phenylethyloxy, or benzyloxy or β-phenylethyloxy which are substituted by C_1-C_6-alkyl in the phenyl ring; cyano; phenoxy; naphthyloxy; phenoxy or naphthyloxy substituted by C_1-C_6-alkyl or halogen; C_1-C_4-alkylcarbonylamino; C_1-C_4-alkylsulphonylamino; phenylcarbonylamino; phenylsulphonylamino; C_1-C_4-alkylcarbonyloxy or phenylcarbonyloxy; or, together with B, a naphthalene or tetrahydronaphthalene ring;

R_5 represents hydrogen; C_1-C_6-alkyl; C_1-C_4-alkoxy; benzyloxy; β-phenylethyloxy; benzyloxy or β-phenylethyloxy substituted by C_1-C_6-alkyl in the phenyl ring; phenoxy; naphthyloxy; phenoxy or naphthyloxy substituted by C_1-C_6-alkyl or halogen; C_1-C_4-alkylcarbonylamino; C_1-C_4-alkyl-sulphonylamino; phenylcarbonylamino; phenyl-sulphonylamino; C_1-C_4-alkylcarbonyloxy; or phenylcarbonyloxy; or, together with B, a naphthalene or tetrahydronaphthalene ring;

R'_{13} represents hydrogen; C_1-C_6-alkyl; C_1-C_4-alkoxy; cyclopentyl; cyclohexyl; benzyl; β-phenylethyl; cyclopentyl, cyclohexyl, benzyl or β-phenylethyl substituted by C_1-C_6-alkyl; phenoxy; naphthyloxy; phenoxy or naphthyloxy substituted by C_1-C_6-alkyl or halogen; benzyloxy; C_1-C_4-alkylcarbonylamino; C_1-C_4-alkyl-sulphonylamino; phenylcarbonylamino; or phenylsulphonylamino; or a benzene or tetrahydrobenzene fused to the 4,5 or 5,6-position of D;

R_{14} represents C_1-C_6-alkyl; C_1-C_4-alkoxy; phenoxy; benzyloxy; benzyl; trifluoromethyl; halogen; C_1-C_4-alkylcarbonylamino; C_1-C_4-alkylsulphonylamino, phenylcarbonylamino; or phenylsulphonylamino; or when n is 1, represents a benzene or tetrahydrobenzene ring fused to the 6,7-position of D;

n represents the numbers, 0, 1, 2 or 3;

A' represents a benzene,naphthalene or tetrahydronaphthalene ring; or a benzene, naphthalene ring substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, halogen, phenyl, cyclohexyl, C_1-C_4-alkoxycarbonyl, benzyl, C_1-C_4-alkylsulphonyl or phenylsulphonyl, in which the cyclic substituents are unsubstituted or substituted by halogen, C_1-C_4-alkyl or C_1-C_4-alkoxy;

X represents an anion; and

Y represents -CO- or -O-CO-O.

4,039,527

UNSYMMETRICAL AZONITRILES

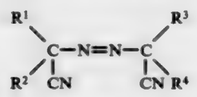
Joji Nagaoka, Tokyo; Kazuhiko Yamashita, Wako; Nobuaki Minamii; Tsutomu Miyagawa, both of Kawagoe, and Masahiko Sugano, Sakato, all of Japan, assignors to Wako Pure Chemical Industries, Ltd., Osaka, Japan

Filed Oct. 10, 1974, Ser. No. 513,846

Int. Cl.[2] C07C *107/02*

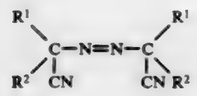
U.S. Cl. 260—192 **7 Claims**

1. An unsymmetrical azonitrile of the formula

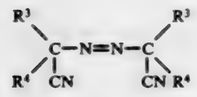


wherein R^1, R^2, R^3 and R^4 are independently straight- or branched-chain alkyl having 1 to 7 carbon atoms or alkoxy substituted straight- or branched-chain alkyl having 2 to 11 carbon atoms provided that R^1 is different than R^3 when R^2 is the same as R^4 and R^1 is different than R^4 when R^2 is the same as R^3.

6. A composition containing an unsymmetrical azonitrile as claimed in claim 1 and symmetrical azonitriles of the formulas



and



wherein R^1, R^2, R^3 and R^4 are independently straight- or branched-chain alkyl having 1 to 7 carbon atoms or alkoxy substituted straight- or branched-chain alkyl having 2 to 11 carbon atoms.

4,039,528

SULPHONIC ACID-, HYDROXY-SUBSTITUTED PHENYL AZO-NAPHTHYL AZO-N-ARYL AMINO DYES

Denis Robert Annesley Ridyard, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

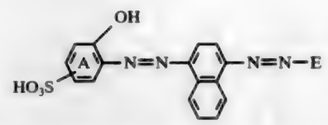
Continuation of Ser. No. 433,538, Jan. 15, 1974, abandoned, which is a continuation of Ser. No. 53,633, July 9, 1970, abandoned. This application Dec. 5, 1975, Ser. No. 638,279

Claims priority, application United Kingdom, July 17, 1969, 36096/69

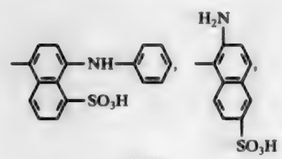
Int. Cl.[2] C09B *31/04*

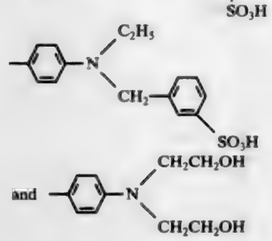
U.S. Cl. 260—190 **1 Claim**

1. A disazo dyestuff of the formula

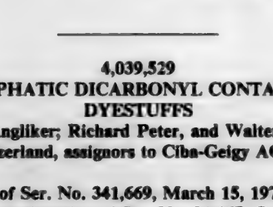


wherein the sulphonic acid group in ring A is in meta or para position relative to the hydroxy group and E represents a member selected from the group consisting of





and



4,039,529

CYCLOALIPHATIC DICARBONYL CONTAINING AZO DYESTUFFS

Hans-Joerg Angliker; Richard Peter, and Walter Jenny, all of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

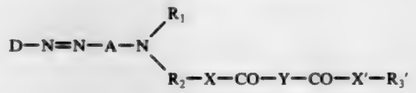
Continuation of Ser. No. 341,669, March 15, 1973, abandoned, which is a continuation of Ser. No. 84,467, Oct. 27, 1970, abandoned. This application Sept. 26, 1975, Ser. No. 617,224

Claims priority, application Switzerland, Nov. 3, 1969, 16350/69

Int. Cl.[2] C09B *29/08, 29/26, 43/00*

U.S. Cl. 260—207.1 **7 Claims**

1. An azo dyestuff compound of the formula



wherein

D is phenyl or phenyl substituted by chloro, nitro, cyano, methylsulfonyl, aminosulfonyl, phenoxy, methoxy, trifluoromethyl, carbomethoxy, bromo, methyl or N-chloro, N,N,N-trimethylaminoacetyl;

A is para-phenylene which is unsubstituted or substituted by C_1-C_2-alkoxy, C_1-C_2-alkyl, phenoxy, phenylthio, benzyl,

phenyl, cyclohexyloxy, chloro, bromo, C_1-C_{12}-hydrocarbylcarbonylamino, C_1-C_{14}--hydrocarbyloxycarbonylamino, C_1-C_{15}-hydrocarbylaminocarbonylamino, formylamino, trifluoromethyl, C_1-C_{12}-hydrocarbylcarbonyl (methyl) amino, C_1-C_6-alkylsulfonylamino or halogenated C_1-C_3-hydrocarbylcarbonylamino;

X and X' independently represent —O—, —S— or —NH—;

R_1 is C_1-C_4-alkyl that is unsubstituted or substituted by cyano, C_1-C_4-alkoxy, C_1-C_{10}-hydrocarbylcarbonyloxy, C_1-C_{10}-hydrocarbyloxycarbonyl, C_1-C_{10}-hydrocarbylaminocarbonyloxy, phenyl, ' methoxyphenylcarbonyloxy, hydroxy, or a group of the formula —X—CO—Y—CO—X'—R'_3;

R_2 is C_1-C_4-alkylene, or ethyleneoxyethylene;

R'_3 is alkyl of 1 to 8 carbon atoms; and the group —CO—Y—CO— represent endomethylenetetrahydrophthalyl, hexahydrophthalyl or tetrahydrophthalyl.

4,039,530

THIOAMIDES

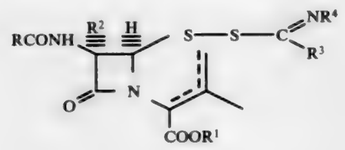
Ronald G. Micetich, and Robert B. Morin, both of Edmonton, Canada, assignors to Connlab Holdings Limited, Willowdale, Canada

Filed June 23, 1975, Ser. No. 589,560

Int. Cl.[2] C07D *205/08*

U.S. Cl. 260—239 A **14 Claims**

1. The novel azetidinone imidoyldisulfides of the formula:



wherein R is loweralkyl, phenyl, benzyl, 4-amino 1-carboxy-1-butyl, phenoxyloweralkyl, phenylthioloweralkyl, alpha-hydroxybenzyl, alpha-carboxybenzyl, alpha-sulfobenzyl, alpha-aminobenzyl and protective derivatives thereof selected from the group consisting of N-benzyloxycarbonyl, N-trichloroethyoxycarbonyl and N-methoxymethyl carbonyl, and R^5O—, R^5S—, or R^5R^6N—

wherein R^5 and R^6 may be the same or different and each is selected from the group consisting of lower alkyl, phenyl, phenylloweralkyl and when R is R^5R^6N—, R^5 and R^6 can also be hydrogen.

R^1 is hydrogen or a cleavable radical selected from the group consisting of loweralkoxymethyl, lower alkylthiomethyl, loweralkyl, 2,2,2-trichloroethyl, benzyl, nitrobenzyl, methoxybenzyl and halobenzyl, benzhydryl, and trialkylsilyl;

R^2 is hydrogen or methoxy;

R^3 is selected from the group consisting of lower alkyl, phenyl, and phenylloweralkyl R^50—, R^5S—, R^5R^6N—, and $R^5R^6NR^7N$— where R^5 and R^6 may be the same or different and each is selected from the group consisting of lower alkyl, phenyl, phenylloweralkyl and, where R is R^5R^6N— R^5 and R^6 can also be hydrogen and, where R is $R^5R^6NR^7N$— R^7 is the same as R^5 and R^6 where R^5 and R^6 are as defined above as including hydrogen;

R^4 is selected from the group consisting of loweralkyl, phenyl, phenylloweralkyl and hydrogen.

4,039,531

4-STILBENYL-1,2,3-TRIAZOLES, PROCESS FOR PREPARING THEM AND THEIR USE AS OPTICAL BRIGHTENERS

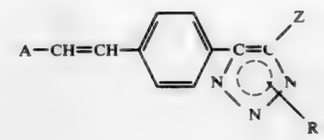
Dieter Günther; Rüdiger Erckel, both of Kelkheim, Taunus; Erich Schinzel, Hofheim, Taunus, and Günter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 12, 1975, Ser. No. 612,701

Int. Cl.[2] C07D *249/06*

U.S. Cl. 542—462 **4 Claims**

1. A compound of the formula (I)



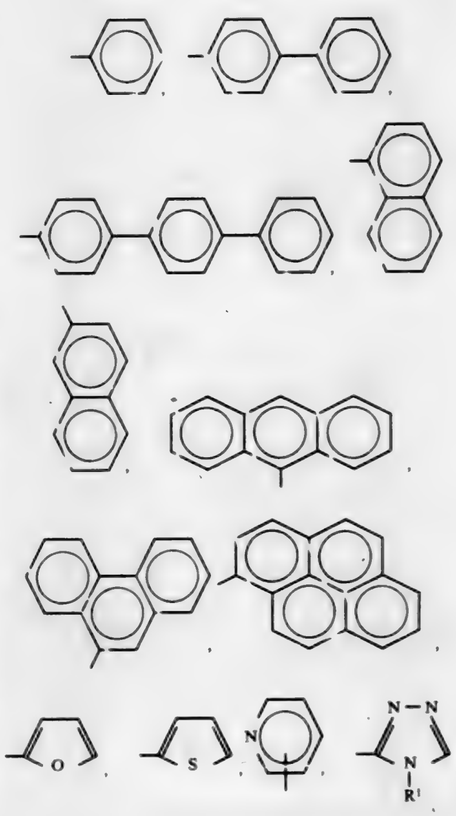
(I)

wherein

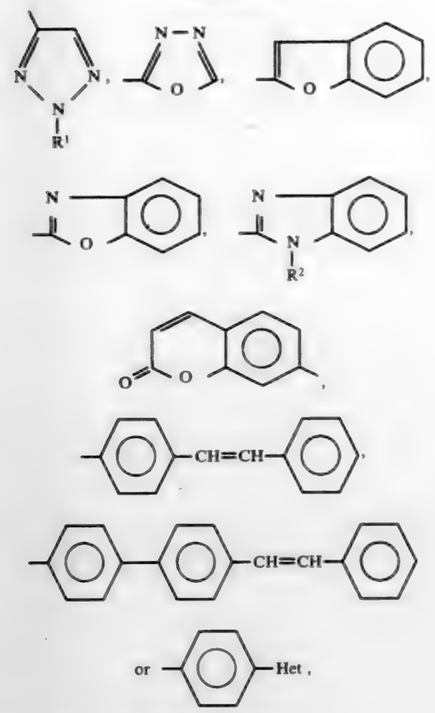
R is hydrogen, methyl or ethyl, R being other than hydrogen when 2 is cyano,

Z is cyano, carbalkoxy, carbonamido or imidazolyl,

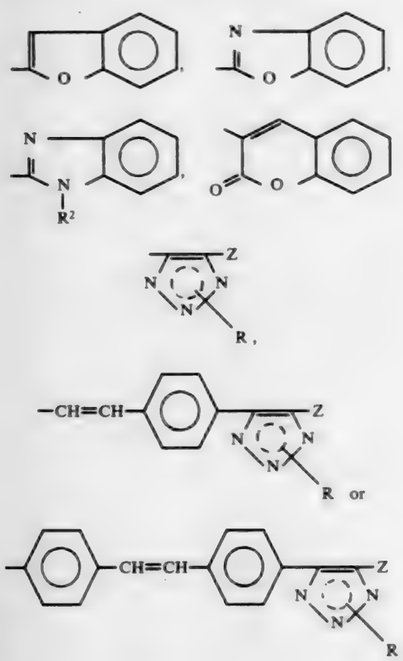
A is a group of the formula



-continued



wherein Het has the following meaning:



and

R^1 is hydrogen, lower alkyl or phenyl,

and

R^2 is hydrogen or lower alkyl.

4,039,532

4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

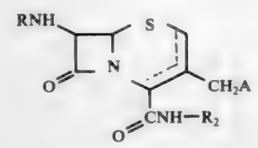
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 508,634, Sept. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,292

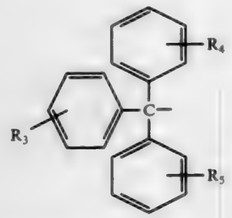
Int. Cl.^{2} C07D *501/18*

U.S. Cl. 544—17 **11 Claims**

1. A compound selected from the group consisting of



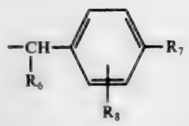
wherein R is selected from the group consisting of 2,2,2-trichloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl, benzyloxycarbonyl and



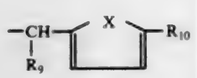
wherein R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and phenyl;

A is selected from the group consisting of hydrogen and acetoxy and

R_2 is selected from the group consisting of



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having 2 to 4 carbon atoms and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,039,533

4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

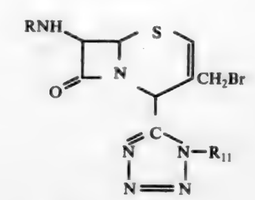
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 508,634, Sept. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,304

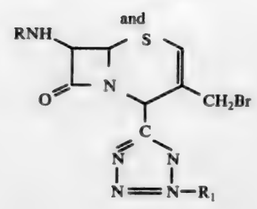
Int. Cl.^{2} C07D *501/18*

U.S. Cl. 544—17 **4 Claims**

1. A compound selected from the group consisting of



and

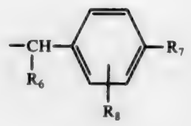


wherein

R is selected from the group consisting of 2,2,2-trichloroethoxycarbonyl, 2,2,2-tribromoethoxycarbonyl and benzyloxycarbonyl.

R_1 is selected from the group consisting of hydrogen, alkanoyloxy-methyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl;

and R_{11} is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms, and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,039,534

4-THIO SUBSTITUTED-Δ^2-CEPHALOSPORIN INTERMEDIATES

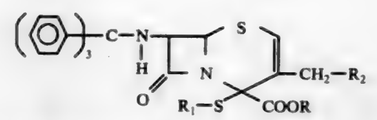
William A. Slusarchyk, Belle Mead, and Christopher M. Cimarusti, Hamilton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 17, 1975, Ser. No. 632,618

Int. Cl.^{2} C07D *501/18*

U.S. Cl. 544—17 **4 Claims**

1. A compound of the formula:



wherein R is lower alkyl, 2,2,2-trichloroethyl, p-methoxybenzyl, p-nitrobenzyl, or diphenylmethyl; R_1 is lower alkyl or phenyl; and R_2 is hydrogen or acetoxy.

4,039,535

7-[α-(GUANYL-1-UREIDO)PHENYLACETAMIDO]-3-SUBSTITUTED CEPHALOSPORIN ANTIBIOTICS

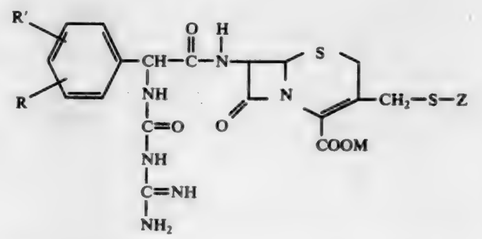
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 423,027, Dec. 10, 1973, abandoned. This application Mar. 4, 1976, Ser. No. 663,885

Int. Cl.^{2} C07D *501/36*

U.S. Cl. 544—26 **7 Claims**

1. The compound of the formula



wherein

R and R' are independently hydrogen, hydroxy, methyl or chloro;

Z is selected from the group consisting of

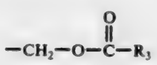


wherein

R_1 and R_2 are C_1–C_4 lower alkyl or phenyl, and

Y is O or S; and

M is hydrogen, a pharmaceutically acceptable cation or an acyloxymethyl group of the formula



wherein

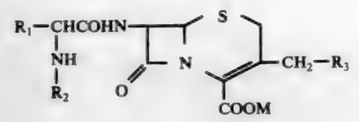
R_3 is C_1–C_4 alkyl, phenyl or benzyl.

4,039,536
7-(α-SUBSTITUTED GLYCINAMIDO)-3-SUBSTITUTED METHYL-3-CEPHEM-4-CARBOXYLIC ACIDS AND THEIR DERIVATIVES

Tadayoshi Takano, Hirakata, and Susumu Horibe, Takatsuki, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Mar. 28, 1975, Ser. No. 563,116
Claims priority, application Japan, Apr. 9, 1974, 49-40577; Mar. 28, 1974, 49-36080; Apr. 10, 1974, 49-41130; Apr. 11, 1974, 49-41515; Apr. 11, 1974, 49-41516; Apr. 15, 1974, 49-42568
Int. Cl.[2] C07D *501/36*
U.S. Cl. 544—26 C **22 Claims**

1. Compounds of the formula:



wherein

R_1 is hydrogen, lower alkyl, phenyl or thienyl;

R_2 is phenyl(lower)alkanoyl, phenoxy(lower)alkanoyl or phenylthio(lower)alkanoyl, in which the phenyl moiety may be substituted with one or two halogen atoms, a nitro, carboxy, sulfo, lower alkyl, lower alkoxy, halo(lower)alkyl or phenoxycarbonyl radical;

R_3 is a heterocyclic-thio group selected from thiadiazolylthio, oxadiazolylthio, trizolylthio, tetrazolylthio and benzimidazolylthio, in which the heterocyclic moiety may be substituted with lower alkyl, amino(lower)alkyl, in which the amino moiety may have lower alkoxycarbonyl or sulfo(lower)alkyl group, provided that R_1 is hydrogen, lower alkyl or thienyl when R_2 is phenoxy(lower)alkanoyl, in which the phenyl moiety has no substituent and R_3 is lower alkyl substituted; and

M is hydrogen or a nontoxic, pharmaceutically acceptable cation; and

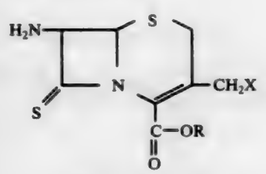
their lower alkyl, lower alkanoyloxy(lower)alkyl, and phenyl(lower)alkyl esters, wherein the phenyl moiety of the phenyl(lower)alkyl esters may be substituted with lower alkoxy.

4,039,537
THIO-β-LACTAM CEPHALOSPORINS

Christopher M. Cimarusti, Hamilton, N.J.; Paul Wojtkowski, Wilmington, Del., and Joseph E. Dolfini, Cincinnati, Ohio, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 659,864, Feb. 20, 1976, which is a division of Ser. No. 551,222, Feb. 19, 1975, Pat. No. 3,971,780. This application Oct. 22, 1976, Ser. No. 734,792
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—30 **3 Claims**

1. A compound of the formula



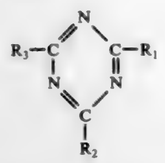
wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, trihaloethyl, alkali metal or alkaline earth metal and X is hydrogen, hydroxy or lower alkanoyloxy.

4,039,538
PREPARATION OF TRIS-(HALOPHENOXY)-SYM.-TRIAZINES

Herbert Klinkenberg, Troisdorf; Egon Petersen, Neukirchen, and Werner Schmidt, St. Augustin, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Germany

Filed Nov. 13, 1974, Ser. No. 523,282
Claims priority, application Germany, Nov. 14, 1973, 2356730; Nov. 14, 1973, 2356771
Int. Cl.[2] C07D *251/34*
U.S. Cl. 544—219 **11 Claims**

1. In the process for the preparation of tris-(halophenoxy)-1,3,5-triazine of formula I



I

wherein

R_1, R_2, and R_3 is each a phenoxy substituent having 0–2 alkyl groups, and 0–2 halo alkyl groups, and has 1–5 halogen atoms

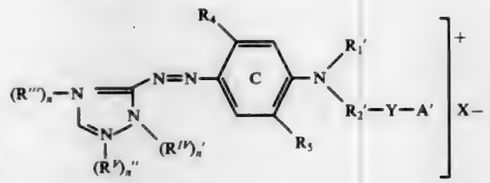
which comprises contacting cyanuric acid chloride with alkali phenolate of the formulae R_1Me, R_2Me, and R_3Me, wherein Me is alkali metal, and wherein said formulae can be identical or different, the improvement which comprises conducting said contacting in the presence of alkylene diol monoalkyl ether as solvent at a temperature of 60–180° C and for a time sufficient for production of said trizine.

4,039,539
1,2,4-TRIAZOLE-AZO-ANILINE CATIONIC DYESTUFFS

Hans-Peter Kühlthau, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 23, 1975, Ser. No. 598,272
Claims priority, application Germany, Aug. 3, 1974, 2437549
Int. Cl.[2] C09B *29/08, 29/26;* **D06P** *1/08, 1/10*
U.S. Cl. 260—157 **10 Claims**

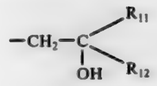
1. Cationic dyestuff of the formula



in which

R''', R^{IV} and R^{V} independently of one another represent C_1-C_6-alkyl, C_2-C_7-alkenyl, benzyl, cyclohexyl, phenylethyl, or any of these five radicals substituted by fluoro, chloro, bromo, hydroxyl, cyano, C_1-C_4-alkylcarbonyloxy, C_1-C_4-alkoxycarbonyl, hydroxycarbonyl, or aminocarbonyl;

R^{III}, R^{IV}, and R^{V} also represent the radical



wherein

R_{11} denotes hydrogen or methyl and

R_{12} denotes methyl, ethyl, fluoro, chloro, bromo, C_1-C_4-alkoxy, C_2-C_4-alkenyloxymethyl, C_2-C_4-alkenyloxyphenyl, phenoxymethyl, or phenoxyphenyl;

R_1, represents hydrogen, C_1-C_6-alkyl, C_2-C_7-alkenyl, cyclopentyl, cyclohexyl, benzyl, β-phenylethyl, C_1-C_6-alkylcyclopentyl, C_1-C_6-alkylcyclohexyl, C_1-C_6-alkylbenzyl, C_1-C_6-alkyl-β-phenylethyl, or C_1-C_6-alkyl substituted by fluoro, chloro, bromo, hydroxyl, C_1-C_4-alkoxy, cyano, acetoxy, hydroxycarbonyl, C_1-C_4-alkoxycarbonyl, C_1-C_4-alkoxycarbonyloxy, aminocarbonyl, C_1-C_4-alkylsulphonylamino or C_1-C_4-alkylsulphonyl-C_1-C_4-alkylamino;

R_2' represents C_1-C_6-alkylene or C_1-C_6-alkylene interrupted by oxygen, said alkylene being either unsubstituted or substituted by C_1-C_4-alkoxy, C_2-C_4-alkenyloxy, phenyl or phenoxy;

R_4 represents hydrogen, fluoro, chloro, bromo, C_1-C_6-alkyl, fluoro, C_1-C_6-alkyl, chloro-C_1-C_6-alkyl, bromo-C_1-C_6-alkyl, C_1-C_4-alkoxy, benzyl, β-phenylethoxy, C_1-C_4-alkylcarbonylamino or C_1-C_4-alkylsulphonylamino, phenylcarbonylamino or phenylsulphonylamino, C_1-C_4-alkylcarbonyloxy or phenylcarbonyloxy, or benzyl or β-phenylethoxy, substituted in the phenyl ring by C_1-C_6-alkyl, cyano, phenoxy or naphthyloxy, C_1-C_6-alkylphenoxy, C_1-C_6-alkylnaphthyloxy, fluorophenoxy, chlorophenoxy, bromophenoxy, fluoronaphthyloxy, chloronaphthyloxy, or bromonaphthyloxy;

R_4, when together toget her with ring C also represents a naphthalene ring or a tetralin ring;

R_5 represents hydrogen, C_1-C_6-alkyl, C_1-C_4-alkoxy, benzyloxy, β-phenylethoxy, C_1-C_6-alkylbenzyloxy, C_1-C_6-alkyl-β-phenylethoxy, phenoxy, naphthyloxy, C_1-C_6-alkylphenoxy, C_1-C_6-alkylnaphthyloxy, fluorophenoxy, chlorophenoxy, bromophenoxy, fluoronaphthyloxy, chloronaphthyloxy, bromonaphthyloxy, C_1-C_4-alkylcarbonylamino, C_1-C_4-alkylsulphonylamino, phenylcarbonylamino, phenylsulphonylamino, C_1-C_4-alkylcarbonyloxy or phenylcarbonyloxy;

R_5 when taken together with ring C also represents a naphthalene ring or a tetralin ring;

A′ represents phenyl, naphthyl or tetrahydronaphthyl, or any of said radicals substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, fluoro, chloro, bromo, phenyl, cyclohexyl, C_1-C_4-alkoxycarbonyl, benzyl, C_1-C_4-alkylsulphonyl or phenylsulphonyl, wherein the ring structures are unsubstituted or are substituted by fluoro, chloro, bromo, C_1-C_4-alkyl or C_1-C_4-alkoxy;

Y denotes —CO— or —O—CO—O—;

n, n', and n'' independently of each other are 0 or 1 with the proviso that $n+n'+n''$ is 2; and

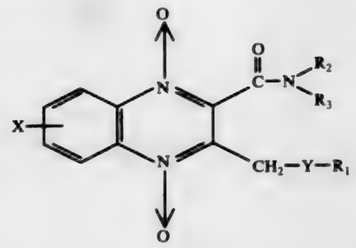
X^- denotes an anion.

4,039,540
3-SUBSTITUTED QUINOXALINE-2-CARBOXAMIDE-1,4-DIOXIDES

John P. Dirlam, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 467,718, May 7, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,219
Int. Cl.[2] C07D *241/52, 403/12, 401/12*
U.S. Cl. 260—250 QN **10 Claims**

1. A compound selected from the group consisting of



wherein X is a 6- or 7-position substituent selected from the group consisting of hydrogen, halogen, lower alkoxy, trifluoromethyl, methyl, lower alkyl sulfide, lower alkyl sulfoxide and lower alkyl sulfone; Y is S, SO or SO_2; R_1 is selected from the group consisting of carbamyl(lower alkyl), carbo(lower alkoxy)lower alkyl and mono-substituted alkyl having from 2 to 4 carbon atoms in the alkyl group wherein the substituent is selected from the group consisting of hydroxy, lower alkoxy, amino, mono(lower alkyl)amino, di(lower alkyl)amino, mono(lower alkyl)carbamyl, di(lower alkyl)carbamyl, halogen, mercapto, sulfo, lower alkyl sulfide, lower alkyl sulfoxide, lower alkyl sulfone, acetoxy, pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino, N-(lower alkyl)piperazino, N-hydroxy(lower alkyl)piperazino, N-(lower alkanoyl)-piperazino and N-carbo(lower alkoxy)piperazino; R_2, when taken separately, is hydrogen or lower alkyl; R_3, when taken separately, is hydrogen, lower alkyl or mono-substituted lower alkyl wherein the substituent is phenyl, amino, mono(lower alkyl)amino, di(lower alkyl)amino, pyrrolidino, piperidino, morpholino, N-(lower alkyl)piperazino, N-hydroxy(lower alkyl)piperazino, N-(lower alkanoyl)piperazino, N-carbo(lower alkoxy)piperazino, pyrrolo, piperazino, imidazolidino, hydroxy, lower alkoxy, thio(lower alkyl), carboxy, carbo(lower alkoxy), carbamyl, mono(lower alkyl)carbamyl, di(lower alkyl)carbamyl, lower alkanoyloxy or lower alkanoylamino and R_2 and R_3, when taken together with the nitrogen atom to which they are attached, form a member selected from the group consisting of pyrrolo, pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino, N-(lower alkyl)piperazino, N-hydroxy(lower alkyl)piperazino, N-(lower alkanoyl)piperazino and N-carbo(lower alkoxy)piperazino and the pharmaceutically acceptable acid addition salts of those compounds wherein at least one of R_1 and R_3 is substituted lower alkyl wherein the substituent is a basic group.

4,039,541
MONOCYCLIC AROMATIC CLATHRATES OF 13-OXATETRACYCLO[8.2.1^{2,9}.0^{3,8}]TRIDEC-5-ENE-1,5,6,10-TETRACARBONITRILE

Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 637,500, Dec. 4, 1975, Pat. No. 3,998,853. This application July 22, 1976, Ser. No. 707,725
Int. Cl.[2] C07D *237/08, 307/93*
U.S. Cl. 260—250 A **29 Claims**

1. A clathrate of 13-oxatetracyclo[8.2.1^{2,9}.0^{3,8}]tridec-5-ene-1,5,6,10-tetracarbonitrile and a monocyclic unsubstituted aromatic compound.

20. A method of preparation of 13-oxatetracyclo[8.2.1^{2,9}.0^{3,8}]-tridec-5-ene-1,5,6,10-tetracarbonitrile which comprises the steps of:

a. reacting cyclobutene-1,2-dicarbonitrile with furan at effective reaction temperatures, pressures, and mole ratios, thereby producing 9-oxatricyclo[4.2.1^{2,5}.0]non-3-ene-1,6-dicarbonitrile, and

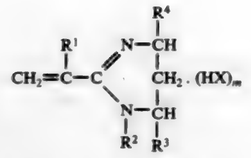
b. reacting said 9-oxatricyclo[4.2.1^{2,5}.0]-non-3-ene-1,6-dicarbonitrile with 1,3-butadiene-2,3-dicarbonitrile at effective reaction temperatures, pressures, and mole ratios, thereby producing said 13-oxatetracyclo[8.2.1^{2,9}.0^{3,8}]tridec-5-ene-1,5,6,10-tetracarbonitrile.

4,039,542
UNSATURATED PYRIMIDINE

Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Bacci, Newington, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 467,331, May 6, 1974, Pat. No. 4,006,247. This application July 16, 1976, Ser. No. 706,084
Int. Cl.[2] C07D *239/20*
U.S. Cl. 260—251 R **4 Claims**

1. A compound having the formula



wherein *m* is 0 or 1, X is an ion of a salt forming acid, R^1 is hydrogen, methyl or phenyl and R^2, R^3 and R^4 are, individually, hydrogen, alkyl (C_1–C_4), aryl (C_6–C_{10}), aralkyl, (C_7–C_{11}) or alkaryl (C_7–C_{11}).

4,039,543

BENZYLPYRIMIDINES

Ivan Kompis, Oberwil; Gerald Rey-Bellet, Basel, and Guido Zanetti, Fullinsdorf, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

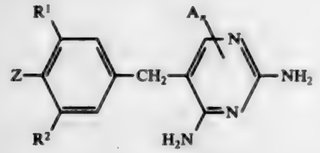
Filed Dec. 19, 1975, Ser. No. 642,303

Claims priority, application Switzerland, Dec. 24, 1974, 17287/74; Oct. 27, 1975, 13883/75

Int. Cl.² C07D *239/48*

U.S. Cl. 260—256.4 N **21 Claims**

1. A compound of the formula



wherein R^1 and R^2 each, independently, is amino, pyrrolo, pyrrolidino, piperidino, C_{1-3}-alkyl-substituted pyrrolo, C_{1-3}-alkyl-substituted pyrrolidino, C_{1-3}-alkyl-substituted piperidino, $-NHR^3$, $-N(R^3)_2$, $-NHR^4$, $-N(R^3)(R^4)$, $-NR^3COOR^3$, $-NHCOOR^3$, $-NHCONHR^3$, $-NHCONH_2$ or $-N(NO)R^3$ wherein R^3 is C_{1-4}-alkyl or C_{2-4}-alkenyl, R^4 is formyl, acetyl, propionyl, butyryl, ethoxyacetyl or mesyl; Z is hydrogen, chlorine, bromine, pyrrolo, pyrrolidino, piperidino or morpholino or R^3, OR^3 or $-N(R^3)_2$; A is an oxygen atom bonded to one of the cyclic nitrogen atoms; and *n* is 0 or 1,

or a pharmaceutically acceptable acid addition salt thereof.

4,039,544

AZAPURINONES

Barbara Joyce Broughton, Croydon; Bryan John Large, Ilkley; Stuart Malcolm Marshall, Stanford-Le-Hope; David Lord Pain, Upminster, and Kenneth Robert Harry Wooldridge, Brentwood, all of England, assignors to May & Baker Limited, England

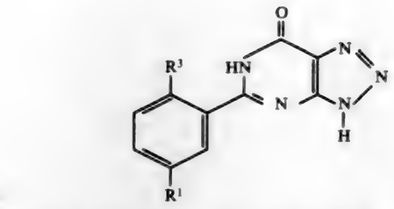
Continuation-in-part of Ser. No. 364,425, May 29, 1973, Pat. No. 3,987,160, which is a continuation of Ser. No. 207,986, Dec. 14, 1971, Pat. No. 3,819,631. This application Apr. 26, 1976, Ser. No. 680,444

Claims priority, application United Kingdom, Dec. 15, 1970, 59552/70; Dec. 15, 1970, 59556/70; Oct. 26, 1971, 49756/71; Nov. 17, 1971, 53457/71; Apr. 28, 1975, 17573/75; June 2, 1975, 23785/75

Int. Cl.² C07D *487/04*

U.S. Cl. 260—256.4 F **13 Claims**

1. An 8-azapurin-6-one of the formula:



wherein R^3 is straight- or branched-chain alkoxy of from 1 to 4 carbon atoms and R^1 is alkylthio of 1 to 6 carbon atoms, alkylsulphinyl of 1 to 6 carbon atoms, alkylsulphonyl of 1 to 6 carbon atoms, or alkoxycarbonyl of 2 to 7 carbon atoms, and pharmaceutically acceptable salts thereof.

4,039,545

PIGMENTARY IMIDO-PERINONES

Philippe Yves Edouard Gangneux, Bihorel, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

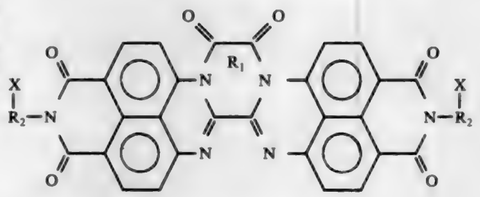
Continuation of Ser. No. 330,331, Feb. 7, 1973, abandoned. This application June 23, 1975, Ser. No. 589,222

Claims priority, application United Kingdom, Feb. 7, 1972, 03974/72

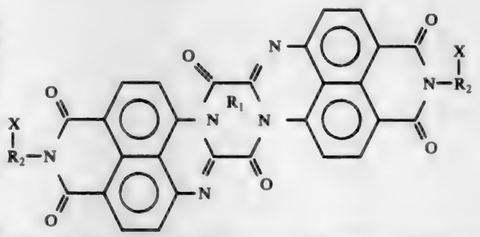
Int. Cl.² C07D *471/22*

U.S. Cl. 260—256.4 F **5 Claims**

1. A compound of the formulae, having a cis form



and having a corresponding trans form



wherein R_1 represents unsubstituted benzene 1,2,4,5-tetrayl, naphthalene 1,4,5,8-tetrayl or perylene 3,4,9,10-tetrayl, R_2 represents unsubstituted para-phenylene or linear alkylene having from 1 to 10 carbon atoms, and X represents amino or carboxy.

4,039,546

METHOD OF PREPARING N_1-(2'-FURANIDYL)-5-SUBSTITUTED URACILS

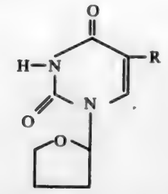
Solomon Aronovich Giller, ulitsa Pernavas, 10, kv. 76, Riga; Arvid Avgustovich Lazdinsh, ulitsa Mendeleeva, 1, kv. 31, Rizhsky raion, Olaine; Artur Karlovich Veinberg, ulitsa Ludzas, 2, Rizhsky raion, Jurmala, and Alexandr Borisovich Sidorov, ulitsa Marupes, 12-a, kv. 1, Riga, all of U.S.S.R.

Filed Apr. 28, 1975, Ser. No. 572,064

Int. Cl.² C07D *239/54*

U.S. Cl. 260—260 **3 Claims**

1. A method for preparing N_1-(2'-furanidyl)-5-substituted uracils having the general formula



where R is selected from the group consisting of hydrogen, halogens, and methyl which comprises the steps of reacting a 2,4-bis(trimethylsilyloxy)-5 R-substituted pyrimidine where R is as above, with a solution of 2,3-dihydrofuran in an organic chlorinated lower aliphatic hydrocarbon solvent which solution is being saturated with anhydrous hydrogen chloride, said reaction being conducted at a temperature below about 10° C, and the reaction product is then isolated by precipitation with an alkanol.

4,039,547

24-METHYL-14A-AZA-D-HOMO-CHOLEST-8(9)-ENES

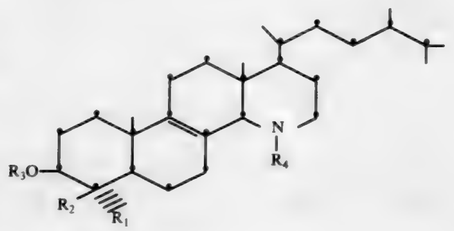
James W. Chamberlin, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 503,562, Sept. 6, 1974, abandoned. This application Feb. 4, 1976, Ser. No. 655,172

Int. Cl.² C07D *215/06, 215/08*

U.S. Cl. 260—287 AZ **8 Claims**

1. A compound of the formula



wherein:

R_1 and R_2 are both hydrogen or both methyl;

R_3 and R_4 independently are hydrogen or C_1–C_4 alkanoyl; and the pharmaceutically acceptable salts thereof.

4,039,548

SYNTHETIC EPOXIDE ENAMEL LIKE COATING COMPOUND

Laurence A. Malone, 2111 Jefferson Davis Highway, Arlington, Va. 22202

Filed Apr. 23, 1976, Ser. No. 679,729

Int. Cl.² C08J *3/06;* C08K *5/15;* C08L *63/02*

U.S. Cl. 260—29.2 EP **5 Claims**

1. A composition capable of hardening into an enamel coating without heating and comprising a mixture of:

A. A first component which comprises:
- 18.1–32.1% by weight of epichlorohydrin;
- 1.0–4.1% by weight of water;
- 2.1–6.1% by weight of ethanol;
- 2.1–8.1% by weight of butylcellusolve;
- 18.6–28.6% by weight of bisphenol-A; and
- 12.9–22.0% by weight of an epoxy resin having a viscosity of 100–160 poise and an epoxide equivalent of 185–192;

B. A second component which comprises:
- 18.1–32.1% by weight of epichlorohydrin;
- 1.0–4.1% by weight of water;
- 2.1–6.1% by weight of ethanol;
- 2.1–8.1% by weight of butycellusolve;
- 12.6–24.6% by weight of bisphenol-A;
- 12.9–22.0% by weight of a semi-solid epoxy resin having an epoxide equivalent of 230–280; and 1.0–4.0% by weight of an amine curing agent; and

C. A third component which comprises:
- 32.1–36.1% by weight of an epoxy resin having a viscosity of 100–160 poise and an epoxide equivalent of 185–192;
- 1.0–4.0% by weight of a semi-solid epoxy resin having an epoxide equivalent of 230–280;
- 42.9–56.9% by weight of calcium carbonate; and
- 1.0–3.0% by weight of titanium dioxide.

4,039,549

OLEFINIC DERIVATIVES OF AMINO ACIDS

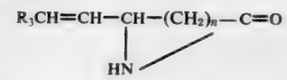
Brian Walter Metcalf, Strasbourg, and Michel Jung, Illkirch, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 559,544, March 18, 1975, Pat. No. 3,960,927. This application Mar. 8, 1976, Ser. No. 664,991

Int. Cl.² C07D *211/76, 207/26;* C07C *103/183, 103/28*

U.S. Cl. 260—293.86 **6 Claims**

1. A compound of the formula:



wherein n' is the integer 2 or 3; and R_3 is hydrogen, chlorine, bromine or iodine; or a pharmaceutically useful salt and individual optical isomers thereof.

4,039,550

LOWER-ALKYL (5-SUBSTITUTED-2-PYRIDYL)CARBAMODITHIOATES

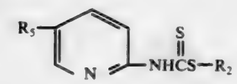
William B. Dickinson, Albany, and Marcia P. Vaupotic, Sand Lake, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed July 26, 1976, Ser. No. 708,903

Int. Cl.² C07D *213/52*

U.S. Cl. 260—294.8 E **4 Claims**

1. A compound having the formula:



where R_2 is lower-alkyl and R_5 is chloro.

4,039,551

1-[(HYDROXYAMINO)METHYL]-6-ARYL-4H-S-TRIAZOLO[4,3-a][1,4]BENZODIAZEPINES

Jackson B. Hester, Jr., Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

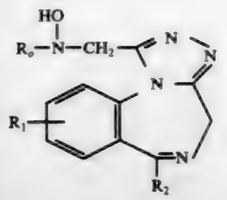
Division of Ser. No. 666,902, March 15, 1976. This application Aug. 12, 1976, Ser. No. 713,924

Int. Cl.² C07D *487/14*

U.S. Cl. 260—296 T **8 Claims**

1. A compound of the formula Va:

VA



wherein R_o is hydrogen or alkyl of 1 to 3 carbon atoms, inclusive; wherein R_1 is hydrogen, fluoro, chloro, bromo, nitro, trifluoromethyl, or alkylthio in which the alkyl moiety is of 1 to 3 carbon atoms, inclusive; and wherein R_2 is phenyl, o-chlorophenyl, o-fluorophenyl, 2,6-difluorophenyl or 2-pyridyl, or the pharmacologically acceptable acid addition salts thereof.

4,039,552

TWO PHASE PROCESS FOR THE PREPARATION OF AZOLE AND AZOLINE DISULFIDES

Stanley J. Brois, Wantage, Oxon, England, and Antonio Gutierrez, Hamilton Square, N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 5, 1975, Ser. No. 555,375

Int. Cl.² C07D *285/08, 285/12, 263/58, 235/28*

U.S. Cl. 260—302 SD **22 Claims**

1. A process of preparing a disulfide of a thiol-substituted azole or azoline comprising the step of halogen-induced oxidative coupling of a 2-mercapto azole or azoline with a hydrocarbon substituted thiol reactant in a two-phase liquid reaction medium comprising a non-polar organic solvent phase and an aqueous phase, said hydrocarbon substituent containing between 2 and 100 carbon atoms and said thiol reactant being soluble in said organic phase.

4,039,553

CERTAIN 2(2'-HYDROXYPHENYL)BENZOTHIAZOLO DERIVATIVES

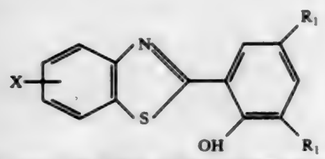
Richard F. Smith, Morristown, N.J., assignor to GAF Corporation, New York, N.Y.

Division of Ser. No. 444,988, Feb. 22, 1974, Pat. No. 3,972,875, which is a continuation of Ser. No. 818,386, April 22, 1969, abandoned, and Ser. No. 173,667, Aug. 20, 1971, abandoned. This application Feb. 10, 1976, Ser. No. 656,988

Int. Cl.² C07D *277/66*

U.S. Cl. 260—304 R **6 Claims**

1. A red fluorescing 2-(2'-hydroxyphenyl)benzothiazole derivative having the formula:



wherein R_1 or R_2 is N=CHR_3 and R_3 is selected from the group of alkyl having from 1 to 30 carbon atoms, alkoxy having from 1 to 4 carbon atoms or halo, and X and the other of R_1 and R_2 is hydrogen alkoxy of from 1 to 4 carbon atoms, SO_3H, halogen, alkyl as defined above, cycloalkyl of from 5 to 9 carbon atoms, nitrogen heterocyclic radical having 4 or 5 carbon atoms in an aromatically unsaturated 6-membered ring, phenyl, naphthyl or phenyl substituted by alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms or halogen.

4,039,554

MANUFACTURE OF 4-METHYLOXAZOLE

Horst Koenig, Ludwigshafen, and Walter Boell, Dannstadt-Schauernheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

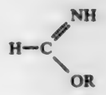
Filed Oct. 16, 1975, Ser. No. 623,039

Claims priority, application Germany, Oct. 31, 1974, 2451725

Int. Cl.² C07D *263/04*

U.S. Cl. 260—307 R **9 Claims**

1. A process for the manufacture of 4-methyloxazole which comprises the step of: reacting a formimido-ester of the formula



I

wherein R is alkyl of 1 to 12 carbon atoms, cycloalkyl of 5 to 8 carbon atoms, aralkyl of 7 to 12 carbon atoms or phenyl, with hydroxyacetone at temperatures of from −20° to +160° C.

4,039,555

BENZOFURAN DERIVATIVES, PROCESS FOR PREPARING THEM AND THEIR USE AS OPTICAL BRIGHTENERS

Wilfried Sahm, Kelkheim, Taunus; Erich Schinzel, Hofheim, Taunus, and Günter Rösch, Altenhain, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

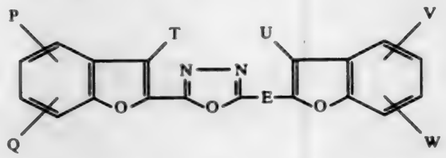
Continuation-in-part of Ser. No. 440,335, Feb. 7, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,928

Claims priority, application Switzerland, Feb. 9, 1973, 1881/73

Int. Cl.² C07D *271/10*

U.S. Cl. 260—307 G **7 Claims**

1. A compound of the formula



wherein E is p-phenylene, T and U are hydrogen or methyl; P, Q, V and W are hydrogen, chlorine, methyl or methoxy, or P and Q together or V and W together are a benzene ring annellated in the 4,5-position.

4,039,556

SUBSTITUTED CARBONYL COMPOUNDS

Harold Francis Hodson, Hayes, and John Frederick Batchelor, Beckenham, both of England, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 394,423, Sept. 5, 1973, Pat. No. 3,939,173. This application Nov. 24, 1975, Ser. No. 634,456

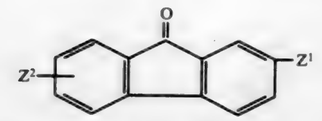
Claims priority, application United Kingdom, Sept. 6, 1972, 41431/72; Feb. 20, 1973, 8200/73

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D **11 Claims**

1. A tricycle compound of the general formula (I)

(I)



wherein one of Z^1 and Z^2 is a 5-(1-R)tetrazolyl or a 5-(2-R)tetrazolyl group in which R is hydrogen or alkyl having 1 to 6 carbon atoms, and the other is selected from the group consisting of carboxy, 5-(1-R)tetrazolyl and 5-(2-R)tetrazolyl as defined, provided that when Z^2 is 5-(1-R)tetrazolyl of 5-(2-R)tetrazolyl then Z^1 is carboxyl; and Z^2 is also selected from the group consisting of hydrogen, nitro, cyano, halogen, alkylsulphinyl, alkylsulphonyl, acyl, alkyl and alkoxy wherein the "alkyl" moiety of each of the acyl, alkyl, alkoxy, alkylsulphinyl and alkylsulphonyl groups has 1 to 6 carbon atoms; together with salts, and, when Z^1 or Z^2 is carboxy, alkyl esters having 1 to 6 carbons, unsubstituted amides and amides substituted by one or two alkyl groups each having 1 to 6 carbons of said compounds of formula (I).

4,039,557

CHROMENOPYRAZOLE COMPOUNDS

Robert Garner, Bury, England, and Jean Claude Petitpierre, Kaiseraugst, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Division of Ser. No. 500,200, Aug. 23, 1974, abandoned.

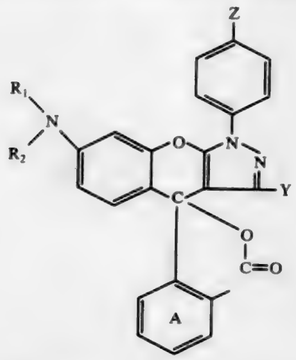
Filed Jan. 22, 1976, Ser. No. 651,380

Claims priority, application United Kingdom, Sept. 6, 1973, 41964/73

Int. Cl.² C07D *231/00*

U.S. Cl. 548—370 **6 Claims**

1. A chromenopyrazole compound of the formula



wherein

R_1 and R_2, independently of the other, represent hydrogen, alkyl of 1 to 12 carbon atoms, alkoxyalkyl of 2 to 8 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, benzyl or phenyl,

Y represents alkyl of 1 to 12 carbon atoms, alkoxy of 1 to 12 carbon atoms, phenyl or phenyl substituted by methyl, nitro, halogen, amino or an amino group mono- or disubstituted by alkyl of 1 to 12 carbon atoms, acyl of 2 to 12 carbon atoms or by benzyl, and

Z represents amino mono- or disubstituted by alkyl with 1 to 4 carbon atoms, or benzyl, and

the benzen ring A is unsubstituted or substituted by 1 to 4 carbon atoms.

4,039,558

AMINO-SUBSTITUTED TETRACYCLIC COMPOUNDS

Willem Jacob van der Burg, Heesch, and Robert Raymond Malvine Salsmans, Oss, both of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

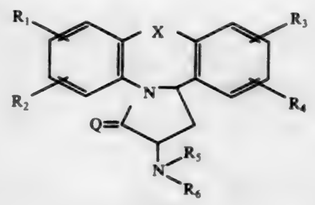
Filed Oct. 20, 1975, Ser. No. 624,197

Claims priority, application Netherlands, Oct. 28, 1974, 7414038

Int. Cl.² C07D *487/02, 498/02, 513/02*

U.S. Cl. 260—326.5 B **5 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, in which

X represents oxygen, sulfur, the group >NR_7 or the group —CR_8R_9—,

Q represents hydrogen (2H) or oxygen,

R_1, R_2, R_3, R_4 represent hydrogen, hydroxy, halogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, alkylthio having 1 to 6 carbon atoms or trifluoromethyl,

R_5, R_6 represent hydrogen, alkyl having 1 to 6 carbon atoms or phenylalkyl the alkyl group of which has 1 to 4 carbon atoms,

R_7 represents hydrogen or alkyl having 1 to 4 carbon atoms and

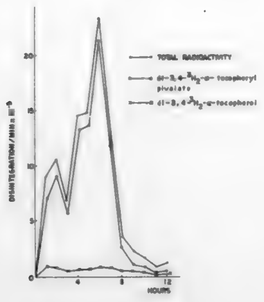
R_8, R_9 represent hydrogen or methyl.

4,039,559

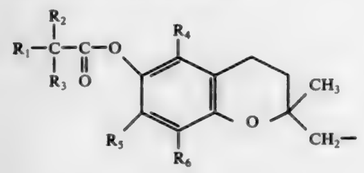
ALIPHATIC CARBOXYLIC ACID ESTERS OF VITAMIN E AND PROCESS FOR PREPARATION THEREOF

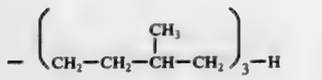
Tetsuya Nakamura, Tokyo, Japan, assignor to Eisai Co., Ltd., Tokyo, Japan

Filed July 16, 1975, Ser. No. 596,569
Claims priority, application Japan, July 18, 1974, 49-81692
Int. Cl.² C07D *311/72*
U.S. Cl. 260—345.5 **8 Claims**



1. A compound having the formula:





wherein R_1 is $CH_3—(CH_2)_n—$ in which n is 0 or an integer of 1 to 4, R_2 and R_3 are hydrogen or methyl with the proviso that at least one R_2 and R_3 is methyl, and R_4, R_5 and R_6, which can be the same or different, are hydrogen or methyl.

4,039,560

METHOD OF PRODUCING MODIFIED POLYETHYLENE WAX

Toru Tomoshige, Ohtake, Japan, assignor to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Aug. 15, 1972, Ser. No. 280,760
Claims priority, application Japan, Aug. 20, 1971, 46-62965
Int. Cl.² C07D *307/89, 307/60*
U.S. Cl. 260—346.3 **7 Claims**

1. A variation of a method of producing a modified waxy ethylene polymer comprising

A. polymerizing ethylene in an inert hydrocarbon solvent and in the presence of at least one member of the group consisting of hydrogen and an alpha olefin:

1. at a temperature of 120° to 250° C.;
2. at a pressure ranging from the vapor pressure of the solvent at the polymerization temperature to 100 Kg/cm^2; and
3. using a catalyst composed of an organoaluminum compound together with a halogen compound of at least one of the group consisting of titanium and vanadium, said halogen compound being supported on a carrier comprising a hydrocarbon-insoluble magnesium-containing compound; to form a waxy ethylene polymer having a viscosity average molecular weight of 500 to 30,000, as determined from measuring the inherent viscosity in a decalin solution at 135° C., and having a density of 0.900 to 0.975 g/cm^3,

B. reacting one of the group consisting of maleic, fumaric, citraconic, itaconic or himic acids, their anhydrides, or their esters, with the resulting waxy ethylene polymer in the presence of one of the group consisting of dialkyl peroxides, diacyl peroxides, and peroxy esters, present in an amount of from 0.01 to 20 parts by weight per 100 parts by weight of the polyethylene wax and at a temperature from the melting point of the waxy ethylene polymer to 250° C., to form a modified waxy ethylene polymer,

C. wherein the waxy ethylene polymer or modified waxy ethylene polymer is contacted with oxygen at a temperature of from its melting point to 200° C., so that the polymer being oxidized absorbs from 0.1 to 3% of its own weight of oxygen and so that its acid value is increased from 0.3 to 3.0.

4,039,561

PROCESS FOR PREPARING ETHYLENE OXIDE

Masashi Mitsuhata; Toshihiko Kumazawa, both of Yokohama, and Isamu Kiguchi, Zushi, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo, Osaka, Japan

Filed Sept. 3, 1974, Ser. No. 502,848
Claims priority, application Japan, Sept. 7, 1973, 48-100326
Int. Cl.² C07D *301/10*
U.S. Cl. 260—348.34 **6 Claims**

1. In a process for preparing ethylene oxide by the catalytic vapor phase oxidation of ethylene with molecular oxygen in the presence of a catalyst, the improvement which comprises using as catalyst a catalytic composition whose constituent metallic elements and atomic ratio are represented by the general formula

$$Ag_aX_cTl_dK_eCs_fO_g$$

wherein X represents at least one metallic element of the group consisting of tin and antimony, *a, d, e, f* and *g* are the number of atoms of silver, thallium, potassium, cesium and oxygen, respectively, and *c* is the sum of the number of atoms of at least one metallic element of the group consisting of tin and antimony; and when *a* is 100, *c* is a number from 0.001 to 0.15, *d* is a number from 0 (exclusive) to 0.1, *e* is a number from 0 to 0.1, *f* is a number from 0 to 0.1, with the proviso that the relationship $0 < d + e + f \leqq 0.3$ is satisfied, and *g* is a number determined by the valence requirements of the other elements present, said catalytic composition being supported on a carrier having a surface area of less than 1 square meter per gram, a particle size of 3/16 – 5/16 inch, a pore diameter of 10 – 300 microns and porosity of 20 – 45%.

4,039,562

PROCESS FOR PREPARING SULFOSUCCINATES

Michael Bloch, Schluechtern, Germany; Ronald Peter Inglis, Cockermouth, and Adolf Koebner, St. Bees, both of England, assignors to Rewo Chemische Werke G.m.b.H., Germany

Filed Feb. 17, 1976, Ser. No. 658,503
Claims priority, application Germany, Feb. 21, 1975, 2507520
Int. Cl.² C07C *143/90;* C11D *1/28*
U.S. Cl. 260—401 **22 Claims**

1. A process for preparing salts of mono-esters of sulfosuccinic acid in which:

A. an acid reactant, selected from the group consisting of maleic acid, fumaric acid and maleic anhydride and mixtures thereof,

is reacted at a temperature of 60°–150° C

with an alcoholic reactant selected from the group consisting of fully saturated aliphatic alcohols containing in each molecule 6–18 carbon atoms, ethylenically unsaturated aliphatic alochols containing in each molecule 6–18 carbon atoms and 1–2 ethylenic linkages, alkoxylated aliphatic alcohols containing in each molecule a hydrocarbon radical containing 6–18 carbon atoms and selected from the group consisting of fully saturated hydrocarbon radicals and ethylenically unsaturated hydrocarbon radicals containing 1–2 ethylenic linkages, and said alkoxylated aliphatic alcohols containing in each molecule also 1–10 alkoxy radicals each of which is selected from the group consisting of oxyethylene radicals and oxypropylene radicals, acyl alkanolamides represented by the formula R.CONH.X.OH where R contains 6–18 carbon atoms and is selected from the group consisting of saturated hydrocarbon radicals, ethylenically unsaturated hydrocarbon radicals containing 1–2 ethylenic linkages, mono-hydroxy-substituted saturated hydrocarbon radicals and mono-hydroxy-substituted ethylenically unsaturated hydrocarbon radicals containing 1–2 ethylenic linkages, and where X is a hydrocarbon radical containing 1–4 carbon atoms, and mixtures thereof,

the amounts of said acid and alcoholic reactants being in the ratio of 0.8–1.2 gram molecules of said acid reactant to 1.0 gram molecule of said alcoholic reactant

so as to form a butenedioic acid half ester; and in which thereafter

B. said butenedioic acid half ester is reacted with a finely powdered crystalline sulfite reactant containing water of crystallisation

said crystalline sulfite reactant being selected from the group consisting of crystalline hydrated alkali metal sulfites, crystalline hydrated alkaline earth metal sulfites, and mixtures thereof,

the amounts of said butenedioic acid half ester and of said crystalline sulfite reactant being in the proportion of 0.8–1.2 gram molecules of said butenedioic acid half ester to 1.0 gram molecule of said crystalline sulfite reactant

the reaction being effected by mechanically mixing said butenedioic acid half ester with said crystalline sulfite reactant at a temperatureof 30°–100° C

so as form the salt of the mono-ester of sulfosuccinic acid.

4,039,563

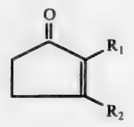
PROCESS FOR PREPARING CYCLOPENT-2-EN-1-ONE DERIVATIVES

Toshio Tanaka; Seizi Kurozumi; Takeshi Toru; Shuji Miura; Makiko Kobayashi, all of Hino, and Sachio Ishimoto, Tokyo, all of Japan, assignors to Teijin Limited, Osaka, Japan

Filed Apr. 28, 1975, Ser. No. 572,287
Claims priority, application Japan, May 2, 1974, 49-48717
Int. Cl.² C07C *49/46;* C07B *3/00*
U.S. Cl. 260—410.9 R **13 Claims**

1. A process for preparing cyclopent-2-en-1-one derivatives of the formula

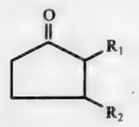
(I)



wherein R_1 is a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group, and R_2 is a hydrogen atom or a substituent which is not substantially brominated under the treating conditions,

which comprises treating, in a single step, a cyclopentanone derivative of the formula

(II)



wherein R_1 and R_2 are the same as defined above, with pyridinium hydrobromide perbromide in an inert organic solvent selected from the group consisting of acetic acid and propionic acid wherein the derivative of formula (I) is formed as a result of said single-step treatment.

4,039,564

PRODUCTION OF CARBOXYLIC ACIDS FROM UNSATURATED HYDROCARBONS IN THE PRESENCE OF HF AND A CUPROUS COMPOUND

Louis Schmerling, Riverside, and Joseph Levy, Northbrook, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 458,640, April 8, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,275
Int. Cl.² C07C *51/14*
U.S. Cl. 260—413 **10 Claims**

1. In a process for the production of a carboxylic acid which comprises reacting a monoolefinic or diolefinic hydrocarbon with water and carbon monoxide in contact with a hydrogen fluoride catalyst, the improvement which comprises effecting the reaction in the presence of a promoter amount of a cuprous compound selected from the group consisting of cuprous oxide, sulfate, chloride, iodide, fluoride and acetate. pressure of about 25 p.s.i. to about 85 p.s.i. at a pressure of about 25 p.s.i. to about 85 p.s.i.

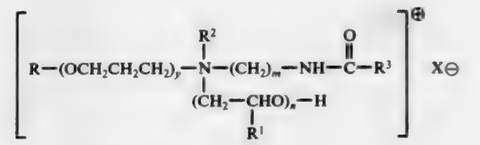
4,039,565

QUATERNIZED AMIDOAMINES

Peter E. Throckmorton; J. W. Sigan, both of Worthington, Ohio, and Robert B. McConnell, Janesville, Wis., assignors to Ashland Oil, Inc., Ashland, Ky.

Filed June 26, 1975, Ser. No. 590,514
Int. Cl.² C07C *141/06, 91/26, 103/38*
U.S. Cl. 260—459 A **4 Claims**

1. A compound having the formula:



wherein:

R and R^3 are each C_1–C_{22} alkyl

R^1 is methyl or hydrogen

R^2 is methyl or benzyl

X is a negatively charged ion *m* is 2 or 3

y is 0 or 1

n is 1–15

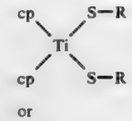
4,039,566

PROCESS FOR THE PREPARATION OF TITANIUM THIO-DERIVATIVES

Giuseppe Fachinetti, Fauglia, and Carlo Floriani, Pisa, both of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

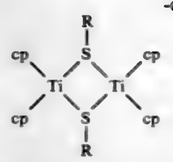
Filed Apr. 29, 1975, Ser. No. 572,649
Claims priority, application Italy, May 17, 1974, 22868/74
Int. Cl.² C07F *7/28*
U.S. Cl. 260—429.5 **4 Claims**

1. The process of preparing a thio-derivative of titanium represented by the formulae:



or

-continued

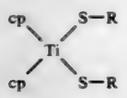


wherein cp represents a cyclopentadiene and R represents an alkyl, aryl or cycloalkyl radical, which comprises reacting a carbonyl derivative of titanium represented by the formula: $Ticp_2(CO)_2$, wherein cp has the meaning given above, with a disulfide represented by the formula: R_2S_2, wherein R has the meanings given above, in an inert atmosphere.

4. The process of preparing a thio-derivative of titanium represented by the formula:



wherein cp represents a cyclopentadiene and R represents an alkyl, aryl or cycloalkyl radical, wherein a carbonyl derivative of titanium represented by the formula: $Ticp_2(CO)_2$, wherein cp has the meaning given above, is reacted with a thio-derivative of titanium prepared as claimed in claim 1, and represented by the formula:



wherein cp and R have the meanings given above.

4,039,567

PROCESS FOR THE CONTINUOUS ESTERIFICATION OF CHLOROSILANES

Hans-Joachim Kötzsch, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, Baden, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed June 5, 1975, Ser. No. 584,271

Claims priority, application Germany, June 5, 1974, 2427085

Int. Cl.² C07F *7/04, 7/18*

U.S. Cl. 260—448.8 R **7 Claims**

1. In a process for the preparation of an alkoxysilane of the formula:

$$R_{4-n-m}Si(OR')_nCl_m$$

wherein

R is hydrogen or a saturated or unsaturated, chlorinated or unchlorinated alkyl radical of 1 to 12 carbon atoms;

R' is an alkyl radical of 1 to 11 carbon atoms which can contain a hetero atom in the chain;

m is 0 to 3;

n is 1 to 4;

n + *m* is equal to or less than 4;

by esterification of a chlorosilane of the formula:

$$R_{4-n}SiCl_n$$

wherein R and n have the previously assigned significance, with an alcohol, the improvement which comprises continuously charging liquid alcohol and liquid chlorosilane simultaneously from separate sources into a distillative reaction zone having a head portion and a sump portion, maintaining the head portion at a temperature sufficient for said esterification, continuously distilling off gaseous HCl formed during said esterification while maintaining the resultant reaction mixture in the sump at its boiling point and continuously separating liquid alkoxy silane from the sump.

4,039,568

PROCESS FOR DECOMPOSITION OF POLYURETHANE FOAM

Kazuyoshi Sakai, Kyoto; Shigeo Kobayashi, Ibaraki, and Takeshi Fujita, Muko, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Sept. 15, 1975, Ser. No. 613,584

Claims priority, application Japan, Sept. 14, 1974, 49-106224; Oct. 11, 1974, 49-117321; July 25, 1975, 50-91315; Aug. 2, 1975, 50-98260; Aug. 3, 1975, 50-98917

Int. Cl.² C087 *27/00, 85/00*

U.S. Cl. 260—453 P **20 Claims**

1. A process for decomposing a polyurethane resin foam produced from polyetherpolyol and polyisocyanate which comprises heating said polyurethane resin in the presence of:

1. an alcoholate alone, said alcoholate being produced by alcoholating a part of the OH groups of an alcohol, or a part of the OH groups of an alkylene oxide adduct of an alcohol, or amine, with an alkali metal;
2. said alcoholate and an alkali hydroxide; or
3. a combination of said alcoholate, or said alcoholate and alkali hydroxide, and a decomposition accelerator selected from the group consisting of:
   a. one or more selected from straight aliphatic amines, branched aliphatic amines, alicyclic amines, heterocyclic amines, and aromatic amines;
   b. one or more of those compounds produced by cyanoethylating said amines or by the partial addition an alkylene oxide to said amines; and
   c. one or more of amides and urea based compounds.

4,039,569

METHYL CHLOROFORMATE PROCESS

Fred S. Bell, III, Baltimore, Md.; Ronald D. Crozier, Bedford, N.Y., and Lawrence Evans Strow, Baltimore, Md., Malagasy Republic, assignors to Minerec Corporation, New York, N.Y.

Filed May 11, 1976, Ser. No. 685,436

Int. Cl.² C07C *68/02*

U.S. Cl. 260—463 **15 Claims**

1. In the process for the production of methyl chloroformate by reaction of phosgene and methyl alcohol, the improvements comprising:

carrying out said reaction in the liquid phase in the presence of a large circulating load of preformed methyl chloroformate, in the absence of catalytic materials and at a temperature constantly under 20° C.;

absorbing said phosgene in said preformed methyl chloroformate;

rapidly dispersing said methanol in a flowing stream of said preformed methyl chloroformate;

said circulating load and heat exchangers preventing undesired temperature rises.

4,039,570

PROCESS FOR THE PRODUCTION OF SUCCINYLOSUCCINIC DIESTER

Erich Greth, Visp, Switzerland, assignor to Lonza Ltd., Gampel, Switzerland

Filed May 7, 1975, Ser. No. 575,371

Claims priority, application Switzerland, May 7, 1974, 006166/74

Int. Cl.² C07C *69/95*

U.S. Cl. 260—468 K **11 Claims**

1. The process for this production of a succinylosuccinic acid diester which comprises reacting a γ-haloacetoacetic acid alkyl ester with a strong base (a), said reaction being conducted in an aqueous buffer solution of two inorganic slats or an inorganic salt and a strong inorganic base (b) at a pH of 8 to 10 in the presence of between 0.01 and 10 percent, based on the amount of said γ-haloacetoacetic acid alkyl ester, of a dispersing agent, said dispersing agent being selected from the group consisting of polyhydroxylethyl cellulose, an ammonium salt of a sulfate of an oxyethylated alkyl phenol, a sodium salt of a sulfate of an oxyethylated alkyl phenol, a fatty alcohol sulfate, an ethylene oxide propylene oxide copolymer, triethylbenzyl ammonium chloride, tetrabutyl ammonium iodide, dioctyldimethyl ammonium chloride, myristyldimethylbenzyl ammonium chloride tetraphenyl phosphonium chloride methoxymethyltriphenyl-phosphonium bromide, and said pH being kept constant, within said pH range, during said reaction by the addition of said strong inorganic base as meeded, said reaction being conducted at a temperature between -10° and 10° C., and said strong base (a) and said strong inorganic base (b) being the same or different and each having a dissociation constant in aqueous solution, of at least 1×10^{-3}.

4,039,571

ORGANIC DERIVATIVES

William Dawson, Camberley; Michael John Foulis, Bracknell; Norman James Albert Gutteridge, Owlsmoor, near Camberley, and Colin William Smith, Bracknell, all of England, assignors to Lilly Industries, Ltd., London, England

Filed Dec. 4, 1975, Ser. No. 637,782

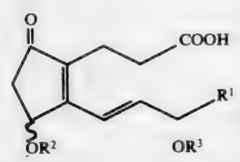
Claims priority, application United Kingdom, Dec. 9, 1974, 53220/74

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **7 Claims**

1. A compound of formula (II):

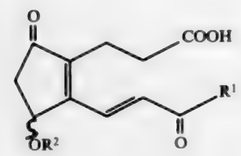
(II)



wherein R^1 is a C_{1-8} alkyl group optionally substituted by hydroxyl or COOH,and wherein R^2 and R^3 are individually hydrogen or a protecting group selected from the group consisting of acetyl, trimethylsilyl, p-chlorobenzoyl and tetrahydropyranyl; or a C_{1-4}alkyl ester thereof.

6. A compound of formula (III):

(III)



wherein

R^1 is a C_{1-8} alkyl groups, optionally substituted by hydroxyl or COOH, and

wherein

R^2 is hydrogen or a protecting group selected from the group consisting of acetyl, trimethylsilyl, p-chlorobenzoyl and tetrahydropyranyl; or a S_{1-3} alky ester thereof.

4,039,572

PROCESS FOR PREPARING DIESTERS OF CARBOXYLIC ACIDS BY CATALYTIC OXIDATIVE CARBONYLATION

Wataru Funakoshi; Takanori Urasaki, and Hiroshi Fujimoto, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Mar. 14, 1975, Ser. No. 558,555

Claims priority, application Japan, Mar. 19, 1974, 49-30559; Mar. 20, 1974, 49-30890; June 22, 1974, 49-70791; June 22, 1974, 49-70792

Int. Cl.² C07C *67/38*

U.S. Cl. 260—468 K **9 Claims**

1. In a process for preparing diesters of carboxylic acids by oxidative carbonylation of C_2–C_{20} olefins, C_1–C_{20} alkanols, and carbon monoxide in an atmosphere containing molecular oxygen, at a temperature of from room temperature to about 350° C and at a pressure of from atmospheric to about 300 atmospheres, in the presence of a carrier-supported catalyst, the catalyst consisting essentially of (1) a compound of platinum group metal and (2) a compound of a metal having an atomic number of not less than 22 which is a metal of Groups Ib, IIb, III, IV, V, VI, or VIIb of the Periodic Table, the improvement comprising using said catalyst wherein the catalyst is reduced so that at least a part of compound (2) is reduced to a metal and the ratio of compound (2) to compound (1) is from 0.0005:1 to 10:1 gram-atoms.

4,039,573

PROCESS FOR PREPARATION OF 1,4-BENZOHYDROQUINONE DERIVATIVES

Shizumasa Kijima; Isao Yamatsu, both of Tokyo; Kimio Hamamura, Kashiwa; Norio Minami, Kawasaki; Youji Yamagishi, and Yuichi Inai, both of Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

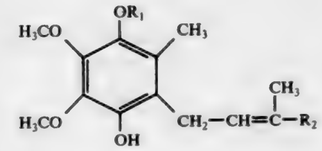
Filed Oct. 9, 1975, Ser. No. 621,084

Claims priority, application Japan, Oct. 11, 1974, 49-116184

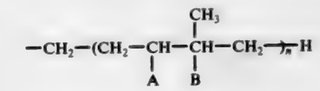
Int. Cl.² C07C *43/22, 69/16*

U.S. Cl. 260—479 R **4 Claims**

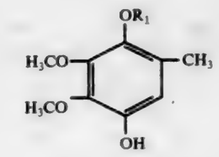
1. In a process for preparing a compound having the formula



wherein R_1 is hydrogen or acetyl, and R_2 has the formula



wherein *n* is zero or an integer from 1 to 11, A and B are hydrogen or together form a valence bond to form a double bond between the two carbon atoms to which A and B are attached, by reacting a first reactant having the formula



wherein R_1 is as defined above,

with a second reactant selected from the group consisting of

3-methylbutene-2-ol-1, 3-methylbutene-1-ol-3, geraniol, linalol, nerol, nerolidol, farnesol, phytol, geranyl geraniol, geranyl linalol, geranyl farnesol, geranyl nerolidol, farnecyl farnesol, farnecyl nerolido, geranyl gernylfarnesol, solanesol, decaprenol, isodecaprenol, undecaprenol, dodecanol, and halides, lower alkyl ethers and lower alkane carboxylic acid esters thereof, the improvement which comprises the steps of: placing in a reaction zone a catalyst composition consisting essentially of a catalyst component adsorbed in an adsorbent, said catalyst component being selected from the group consisting of formic acid, sulfuric acid, hydrochloric acid, phosphoric acid, p-toluenesulfonic acid, zinc chloride, aluminum chloride, boron trifluoride-ether complex and mixtures thereof, said adsorbent being selected from the group consisting of silicic acid, silica gel, clay, kaolin, magnesium silicate, activated charcoal, permutite, natural or synthetic zeolite, alumina, silica alumina and silica magnesia; and then adding said reactants to the reaction zone and contacting same with said catalyst composition therein whereby to effect the reaction.

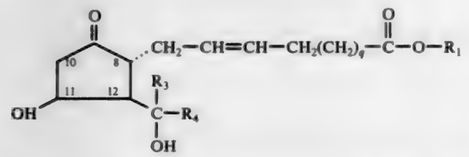
4,039,574

13-HYDROXY-15-DEOXY-PROSTAGLANDINS

Allan Wissner, Monsey, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed Sept. 25, 1975, Ser. No. 616,514
Int. Cl.² C07C *177/00*
U.S. Cl. 260—514 D **7 Claims**

1. An optically active compound of the formula:



which represents the absolute configuration of the naturally occuring mammalian prostaglandins, or a racemic compound of that formula and the mirror image thereof wherein R_1 is selected from the group consisting of hydrogen and C_1–C_6 alkyl; R_3 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; R_4 is selected from the group consisting of hydrogen and C_1–C_{10} alkyl; and q is an integer from 1 to 4 inclusive.

4,039,575

ALKANIMIDOYLTHIOUREAS

Guy D. Diana, Stephentown, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 418,087, Nov. 21, 1973, Pat. No. 3,984,467, which is a continuation-in-part of Ser. No. 15,875, March 2, 1970, Pat. No. 3,830,839, which is a continuation-in-part of Ser. No. 711,235, March 7, 1968, Pat. No. 3,629,455. This application Mar. 22, 1976, Ser. No. 669,229
Int. Cl.² C07C *157/05*; A61K *31/17*
U.S. Cl. 260—552 R **10 Claims**

1. A compound selected from the group consisting of 1-(4-chlorophenyl)-3-(4,4-dimethylpentanimidoyl)-2-thiourea, 1-(4-chlorophenyl)-3-(hexanimidoyl)-2-thiourea, 1-(4-chlorophenyl)-3-(heptanimidoyl)-2-thiourea, 1-(4-bromophenyl)-3-(heptanimidoyl)-2-thiourea, 1-(4-fluorophenyl)-3-(heptanimidoyl)-2-thiourea, 1-(4-iodophenyl)-3-(heptanimidoyl)-2-thiourea, 1-(3-chlorophenyl)-3-(heptanimidoyl)-2-thiourea, 1-(2,4-dibromophenyl)-3-(heptanimidoyl)-2-thiourea, 1-(2-chloro-4-methylphenyl)-3-(heptanimidoyl)-2-thiourea, 1-(4-chlorophenyl)-3-(octanimidoyl)-2-thiourea and 1-(4-chlorophenyl)-3-(nonanimidoyl)-2-thiourea, and acid-addition salts thereof.

8. A compound selected from the group consisting of 1-(4-methoxyphenyl)-3-(heptanimidoyl)-2-thiourea and 1-[4-(trifluoromethoxy)phenyl]-3-(heptanimidoyl)-2-thiourea, and acid-addition salts thereof.

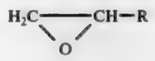
4,039,576

PROCESS FOR THE MANUFACTURE OF ALKOXYLATED N-METHYLOL UREAS

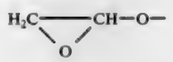
Jurg Merz, Therwil, and Luzius Schibler, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 344,669, March 26, 1973, Pat. No. 4,013,655. This application Nov. 26, 1975, Ser. No. 635,530
Claims priority, application Switzerland, Mar. 28, 1972, 4632/72
Int. Cl.² C07C *127/15, 127/17, 127/19*
U.S. Cl. 260—553 R **13 Claims**

1. A process for the manufacture of alkoxylated N-methylol compound, which comprises reacting, at a temperature of 10° to 160° C and a pressure of 1 to 20 atmospheres gauge, (a) a N-methylolated urea with at most 22 carbon atoms with (b) an alkylene oxide of the formula



wherein R denotes hydrogen, alkyl with 1 to 3 carbon atoms, phenyl or a



radical, in the presence of a catalytic amount of (c) at least one metal alcoholate of the formula

$$Me(O—X)_r(Q)_{n-r}$$

wherein Me denotes a n-valent transition metal of groups IVB, VB, and VIB of the periodic system, X denotes alkyl with 1 to 4 carbon atoms, halogenoalkyl with 2 to 4 carbon atoms, phenyl, benzyl or cycloalkyl with at most 12 ring carbon atoms, Q denotes halogen or alkoxy with 1 to 4 carbon atoms, r denotes 1 to n and n denotes 4, 5 or 6, or in the presence of said component (c) together with (d) at least one alkali metal hydroxide or one alkali metal alcoholate of an alkanol with 1 to 4 carbon atoms.

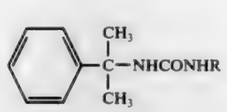
4,039,577

PROCESS FOR PREPARING PHENYLISOPROPYLUREA DERIVATIVES

Hidejiro Yokoo, Tokyo; Tetsuo Tsuruya, Yokohama; Shigehiro Chaen, Kawasaki, and Hiroshi Kubo, Yokohama, all of Japan, assignors to Showa Denko K.K., Japan

Filed July 1, 1975, Ser. No. 592,313
Claims priority, application Japan, July 3, 1974, 49-75441
Int. Cl.² C07C *127/17, 127/19*
U.S. Cl. 260—553 A **4 Claims**

1. A process for preparing phenylisopropylurea derivatives of the formula



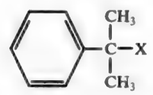
(I)

wherein R is a a phenyl group, a phenyl group substituted by at least one alkyl group containing 1 to 4 carbon atom, or a phenylalkyl group the alkyl group of which contains 1 to 3 carbon atoms

which comprises reacting, at a temperature of 10 ° to 80 ° C, a cumyl halide of the formula

(II)

-continued



wherein X is a chlorine or bromine atom, with a urea derivative of the formula

$$H_2NCONHR \qquad \text{(III)}$$

wherein R is the same as defined above, and the reaction being carried out in a solvent which consists of:

a at least one member selected from the group consisting of dimethylformamide, acetonitrile, diemthylsulfoxide, nitromethane, nitrobenzene, methylisobutyl ketone, methyl ethyl ketone and acetone; or

b. a mixture of a member (a) with at least one member selected from the group consisting of dioxane, tetrahydrofuran, cyclohexanone, chloroform, chlorobenzene, benzene, toluene, xylene and ether.

4,039,578

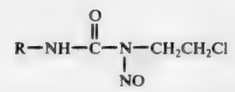
1-TETRAHYDROXYCYCLOPENTYL-3-NITROSO-3-(2-CHLOROETHYL)-UREA ANTITUMOR AGENTS

Tetsuo Suami, 3-5-8, Nakamachi, Musashino, Tokyo 180, Japan

Filed Mar. 8, 1976, Ser. No. 664,844
Int. Cl.² C07C *127/15, 133/06*; A61K *31/17, 31/175*
U.S. Cl. 260—553 R **12 Claims**

1. Antitumor agents having the formula

I



wherein R represents a 2', 3', 4', 5'-tetrahydroxycyclopentyl group.

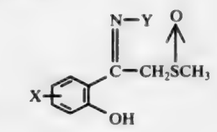
4,039,579

2-[1-IMINO-2-(METHYLSULFINYL)ETHYL]PHENOLS AND 3-[1-IMINO-2-(METHYLSULFINYL)ETHYL]-2-NAPHTHALENOLS

David T. Connor, Parsippany; Patricia A. Young, Madison, and Max von Strandtmann, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Dec. 8, 1976, Ser. No. 748,629
Int. Cl.² C07C *119/00*
U.S. Cl. 260—566 R **5 Claims**

1. A member selected from the group consisting of compounds of the formula:



I

wherein X is hydrogen, lower alkyl, halogen, lower alkoxy or hydroxy; Y is hydrogen, lower alkyl or cycloalkyl of 3 to 8 carbon atoms.

4,039,580

PROCESS FOR PREPARING DI(AMINOPHENYL)METHANES

Floro F. Frulla, Wallingford; Adnan A. R. Sayigh, North Haven; Henri Ulrich, Northford, and Peter J. Whitman, Hamden, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed July 24, 1975, Ser. No. 598,794
Int. Cl.² C07C *85/08*
U.S. Cl. 260—570 D **12 Claims**

1. A process for the preparation of a mixture of di(aminophenyl)methanes and oligomeric polymethylene polyphenyl polyamines wherein the diamine content is within the range of about 40 to 60 percent by weight and wherein at least 95 percent of the said oligomeric polyamines consists of a mixture of triamines and tetramines, which process comprises the steps of

a. reacting aniline and formaldehyde in a proportion within the range of 4 moles to 10 moles of aniline per mole of formaldehyde at a temperature of 20° C to 60° C and in the absence of catalyst to form a mixture of aminals;

b. separating water from said aminals;

c. contacting the aminals so obtained with at least about 1 percent by weight of a solid catalyst selected from the class consisting of diatomaceous earths, clays, and zeolites at a temperature of about 20° C to about 60° C until from 80 to 100 percent by weight of the aminals has been converted to benzylamines;

d. subjecting the benzylamines so obtained to distillation under reduced pressure at a temperature not greater than 150° C tp remove aniline until the aniline content of the undistilled fraction is within the range of about 3 to 22 percent by weight; and

e. contacting said undistilled fraction with at least about 1 percent by weight of a solid catalyst selected from the class consisting of diatomaceous earth, clays, and zeolites at a temperature of about 100° C to 190° C until conversion to methylene polyphenyl polyamines is complete.

4,039,581

PROCESS FOR THE PREPARATION OF DI(AMINO PHENYL)METHANES

Floro F. Frulla, Wallingford; Adnan A. R. Sayigh, North Haven; Henri Ulrich, Northford, and Peter J. Whitman, Hamden, all of Conn., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed June 27, 1975, Ser. No. 590,801
Int. Cl.² C07C *85/08*
U.S. Cl. 260—570 D **13 Claims**

1. A process for the preparation of a mixture of di(aminophenyl)methane and oligomeric polymethylene polyphenyl polyamines wherein the diamine content is of the order of 90 percent by weight and wherein the p,p'-isomer content of said diamine is of the order of 85 percent by weight which process comprises the steps of

a. reacting aniline and formaldehyde in a proportion within the range of 2 moles to 10 moles of aniline per mole of formaldehyde at a temperature of 10° C to 55° C and in the absence of acid catalyst to form a mixture of animals;

b. separating the water from said animals;

c. contacting said animals, free from water, with a solid catalyst selected from the class consisting of diatomaceous earth, clay, and zeolite at a temperature of 20°C to 55°C until the reaction mixture contains from about 80% to 100% by weight of the corresponding benzylamines;

d. thereafter adjusting the temperature of the reaction mixture to about 55° C to ° C until from about 75% to 90% by weight of said benzylamines have been converted to methylene polyphenyl polyamines; and

e. thereupon finally raising the temperature of the reaction mixture to 80° C to 100° C until conversion to methylene polyphenyl polyamines is complete.

4,039,582

METHOD OF PREPARING VANADIUM PENTOXIDE

Gakif Zakirovich Nasyrov, 12, prospekt Mauki, kv. 49, and Izabella Vladislayovna Ravdonikas, ulitsa III Internatsionala, 14, kv.58, both of, Leningrad, USSR

Continuation of Ser. No. 645,099, Dec. 29, 1975, abandoned, which is a continuation of Ser. No. 424,076, Dec. 12, 1973, abandoned. This application Aug. 23, 1976, Ser. No. 716,900

Int. Cl.[2] C01G *31/00*

U.S. Cl. 423—592 **6 Claims**

1. A method of preparing vanadium pentoxide comprising the steps of: processing a solution of sodium vanadate at a pH of from 4 to 6 with at least one substance selected from the group consisting of ammonium chloride and ammonium sulphate at a temperature of from 20° to 40° C to precipitate ammonium-sodium decavanadate, the substance being present in an amount not exceeding 0.84 gram, calculated as NH_4, per gram of vanadium pentoxide in the solution of sodium vanadate; dissolving the ammonium-sodium decavanadate in hot water to prepare a solution of the ammonium-sodium decavanadate with a concentration of from 70 to 100 grams/-liter of vanadium pentoxide; processing the obtained solution of ammonium-sodium decavanadate with a mineral acid to precipitate ammonium polyvanadate; and calcining the ammonium polyvanadate to prepare vanadium pentoxide.

4,039,583

PROCESS FOR PRODUCING METHACROLEIN

Masato Kawakami, Yokohama; Naoki Andoh, and Akira Iio, both of Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Dec. 2, 1975, Ser. No. 636,887

Claims priority, application Japan, Dec. 6, 1974, 49-139448

Int. Cl.[2] C07C *45/04, 5/00*

U.S. Cl. 260—604 R **14 Claims**

1. A process for producing methacrolein, or methacrolein and 1,3-butadiene, by the gas phase catalytic reaction of isobutene, or isobutene and n-butene, with molecular oxygen or a molecular oxygen-containing gas in the presence of a catalyst having a composition of the formula,

$$MO_{10}Bi_{0.1-8}Fe_{0.1-10}Co_{0.01-20}Sb_{0.01-5}O_n$$

wherein *n* is a number defined by the valences of the respective catalyst component elements said number being from 35 to 90, at a temperature of 350° to 550° C., characterized in that the catalyst is prepared by using, as the Sb component, a mixture of a trivalent Sb compound and a pentavalent Sb compound in an antimony atomic ratio of the former to the latter of 0.1/0.9 to 0.95/0.05, wherein the trivalent Sb compound is selected form the group consisting of diantimony trioxide, antimony trichloride, antimony tribromide, antimony (III) oxychloride and antimony (III) pentoxydichloride, and the pentavalent Sb compound is selected from the group consisting of diantimony pentoxide, antimony pentachloride and antimony (v) sulfide.

4,039,584

CATALYTIC CLEAVAGE OF ISOBUTYRALDEHYDE

Jurgen Falbe, Dinslaken; Hans Tummes, and Heinz-Dieter Hahn, both of Oberhausen-Sterkrade-Nord, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen-Holtea, Germany

Continuation of Ser. No. 864,153, Oct. 6, 1969, abandoned. This application Nov. 19, 1975, Ser. No. 633,334

Claims priority, application Germany, Apr. 3, 1969, 1917244

Int. Cl.[2] C07C *45/08*

U.S. Cl. 260—604 HF **12 Claims**

1. In a process of hydroformylating propylene with carbon monoxide and hydrogen to form a mixture of normal and isobutyraldehydes, the improvement comprising separating said isobutyraldehydes, converting the so separated isobutyraldehyde at a temperature in the range of 200° to 400° C and a pressure in the range of 0.1 to 20 atmospheres in the presence of rhodium as catalyst for the conversion to produce a gas mixture consisting predominately of propylene, carbon monoxide, and hydrogen, and returning propylene, carbon monoxide, and hydrogen of said gas mixture to the hydroformylating step.

4. In a process for the catalytic cleavage of isobutyraldehyde to form a gas consisting predominately of propylene, carbon monoxide and hydrogen, the improvement comprising reacting the isobutyraldehyde in the gaseous phase at a temperature in the range of 200° to 400° C and a pressure in the range of 0.1 to 20 atm. in the presence of rhodium as catalyst for the reaction.

4,039,585

HYDROFORMYLATION PROCESS

Edwin H. Homeier, Maywood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 8, 1975, Ser. No. 611,471

Int. Cl.[2] C07C *45/02, 45/08*

U.S. Cl. 260—604 HF **18 Claims**

1. A process for the preparation of a hydroformylation product consisting essentially of alcohols and aldehydes which comprises hydroformylation of a monoolefinic alkene possessing from 3 to 30 carbon atoms with its double bond disposed in the alpha position with carbon monoxide and hydrogen at a temperature of about 15° to about 300° C. and a pressure of from about 1 atmosphere to about 500 atmospheres in the presence of a catalyst system consisting essentially of a Group IB metal phthalocyanine compound and recovering the resultant hydroformylation products.

4,039,586

OXIDATION OF THIOLS TO DISULFIDES

Baruch S. Shasha, Peoria; William M. Doane, Morton, and Edward I. Stout, Peoria, all of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Aug. 30, 1973, Ser. No. 393,253

Int. Cl.[2] C07C *148/00*

U.S. Cl. 260—608 **10 Claims**

1. A method of preparing disulfide compounds by the oxidative coupling of organic thiols which comprises reacting a xanthide with an organic thiol, at least one of which is in solution in a suitable solvent, in the presence of an amount of a tertiary amine sufficient to initiate to reaction, said xanthide and organic thiol being present in a 1:2 molar ratio, respectively.

4,039,587

METHOD OF PREPARING POLYNUCLEAR, HALOGENATED, AROMATIC BENZYL ETHERS

Egon Norbert Petersen, Neunkirchen-Seelscheid, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Division of Ser. No. 541,669, Jan. 16, 1975, abandoned. This application Sept. 4, 1975, Ser. No. 610,478

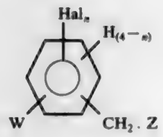
Claims priority, application Germany, Feb. 2, 1974, 2404999

Int. Cl.[2] C07C *41/04*

U.S. Cl. 260—612 R **12 Claims**

1. A process for preparing a benzyl ether of the formula:

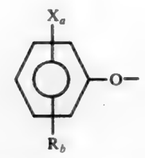
I



wherein W is a chlorine or bromine atom, a methyl radical or a radical $—CH_2$. Z and is disposed in the ortho, meta or para

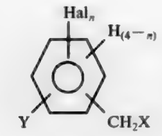
bromine, *n* is 0 to 4 and Z is a phenoxy radical of the general formula:

II



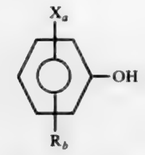
wherein X is chlorine or bromine, R is hydrogen, an alkyl radical of 1 to 4 carbon atoms, *a* is 2 to 5 and *b* is (5-a) which consists essentially of contacting a benzyl halide of the formula:

III



wherein Hal, *n*, X have the previously assigned significance, Y is CH_2X or a methyl radical, said Y being disposed in the ortho, meta or para position with respect to the radical $—CH_2X$, at an elevated temperature in the presence of a reaction medium of a monoalkyl ether of glycols selected from the group consisting of 1,4-butanediol, 2,3-butylene glycol, propylene glycol or ethylene glycol where the alkyl group has 1 to 4 carbon atoms, an alkali or alkaline earth metal phenolate of a halogen phenol having the formula:

IV



wherein X, R, *a* and *b* have the previously assigned significance and thereafter separating the resultant aromatic polynuclear halogenated benzyl ether.

4,039,588

HERBICIDAL 4-NITRO-DIPHENYL ETHERS

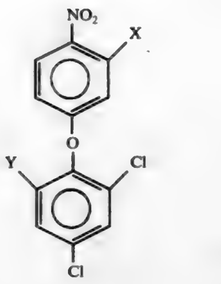
Harold F. Wilson, Jenkintown, and Marvin H. Fleischfresser, Warrington, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 828,732, May 28, 1969, abandoned. This application Apr. 27, 1970, Ser. No. 32,412

Int. Cl. C07c *43/28*

U.S. Cl. 260—613 R **4 Claims**

1. A compound of the formula



wherein

Y is a hydrogen atom or a halogen atom, and

X is a (C_1–C_6) alkoxy group, an alkoxyalkoxy group, wherein each alkyl moiety has 1 to 4 carbon atoms, a halogen atom, a trifluoromethyl group, or a hydroxy group.

4,039,589

α-SUBSTITUTED BENZHYDROL DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

Edit Töth; József Törley; Szabolcs Széberenyi; Éva Pálosi; László Szporny; Sándor Görög, and Csilla Mészáros, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

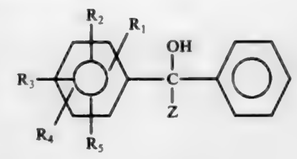
Filed Aug. 8, 1974, Ser. No. 495,847

Claims priority, application Hungary, Aug. 15, 1973, RI 521

Int. Cl.[2] C07C *31/16*

U.S. Cl. 260—618 B **4 Claims**

1. A compound of the formula:



wherein

Z is ethyl,

R_1, and R_2 and R_3, are hydrogen,

R_4 is hydrogen, lower alkyl, lower alkenyl, trihalomethyl, cyclopentyl, benzyl or phenyl, and

R_5 is lower alkyl or provided that where R_1, R_2, R_3 and R_4 each is hydrogen, R_5 is not methyl attached to the 4-position of the benzene ring, or a pharmaceutically acceptable acid addition or quaternary ammonium salt of the compound of said formula.

4,039,590

PROCESS FOR THE SYNTHESIS OF METHYL-TERT-BUTYL ETHER FROM METHANOL AND ISOBUTYLENE IN THE PRESENCE OF BUTADIENE

Francesco Ancillotti, San Donato Milanese; Ermanno Pescarollo, Milan, and Marcello Massi Mauri, San Donato Milanese, all of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Filed May 21, 1975, Ser. No. 579,662

Claims priority, application Italy, May 21, 1974, 23010/74

Int. Cl.[2] C07C *41/06, 41/10*

U.S. Cl. 260—614 A **2 Claims**

1. In a process of synthesizing methyl tert-butyl ether by reacting methanol with isobutylene in the presence of butadiene, wherein the improvement comprises feeding a stream of methanol and C-4 hydrocarbons containing butadiene as a

major constituent and isobutylene to a reactor containing a catalyst consisting of an acid ion-exchange resin in the temperature range of from 60° to 120° C and at a space velocity (LHSV) in the range of from 5 to 35, and correlating said space velocity (LHSV) and temperature so that they correspond to the formula: LHSV = ½ t – 25, wherein t is the temperature in degrees C, whereby said methanol and isobutylene are caused to react to form methyl tert-butyl ether, and then separating said methyl tert-butyl ether from the reaction mixture by distillation.

4,039,591

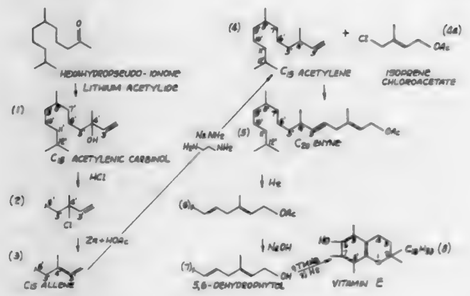
SYNTHESIS OF DEHYDROPHYTOL AND VITAMIN E

Ralph E. Close, Jacksonville, Fla., and William Oroshnik, Plainfield, N.J., assignors to SCM Corporation, New York, N.Y.

Division of Ser. No. 560,550, March 20, 1975. This application Oct. 16, 1975, Ser. No. 622,974

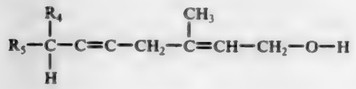
Int. Cl.[2] C07C *29/00*

U.S. Cl. 260—618 R **9 Claims**



1. A process for the synthesis of a compound having the general formula:

(1)



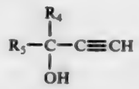
R_4 being methyl and R_5 being alkyl, alkenyl, alkadienyl, alkatrienyl, phenyl, or aralkyl, from a ketone having the configuration:



comprising the steps of:

a. reacting said ketone with a metal acetylide to produce an acetylenic carbinol having the formula:

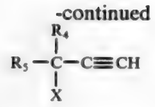
(2)



b. reacting said acetylenic carbinol with a reagent capable of replacing the hydroxyl group with a halogen to produce a propargylic halide having the formula:

(3)

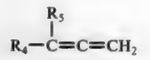
-continued



X being a halogen;

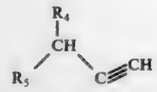
c. hydrogenatively dehalogenating the propargylic halide to form the corresponding allene having the formula:

(4)



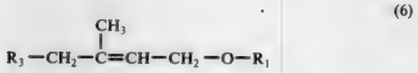
d. isomerizing the allene in the presence of a strong base to an acetylene having the formula:

(5)



e. coupling the acetylene of formula (5) in a coupling reaction with a compound having the general formula:

(6)



wherein R_1 is COR_2, R_2 being lower alkyl, phenyl or aralkyl, R_3 being a halogen; and

f. hydrogenating the reaction product of step (e) and then saponifying the same to produce a compound of the formula (1).

4,039,592

PROCESS FOR PREPARING BUTANEDIOL

William E. Smith, Schenectady, and R. John Gerhart, Averill Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Division of Ser. No. 439,275, Feb. 4, 1974, Pat. No. 3,965,152. This application May 18, 1976, Ser. No. 687,469

Int. Cl.[2] C07C *29/00*

U.S. Cl. 260—635 R **1 Claim**

1. An improved process for the production of butanediol which comprises:

a. reacting propylene and a mixture of methyl acetate, water, acetic acid and methanol with oxygen in the vapor phase in the presence of a catalyst comprising a Group VIII noble metal, or its salts, or its oxides or mixtures thereof at a temperature of from about 100° C to about 200° C to form allyl acetate;

b. converting the allyl acetate under hydroformylation-hydrogenation conditions to a mixture comprising the monoacetate esters of 1,4-butanediol, 2-methyl-1,3-propanediol and 1,2-butanediol and their respective diol and diacetate disproportionation products;

c. de-esterifying the mixture of the acetate esters of the butanediols so produced under methanolysis conditions to produce the corresponding butanediols and methyl acetate;

d. hydrolyzing the methyl acetate to produce a mixture of acetic acid; methanol, water and methyl acetate; and

e. recycling the mixture produced in step (d) to step (a).

4,039,593

PREPARATION OF HYDROXY-TERMINATED CONJUGATED DIENE POLYMERS

Conrad W. Kamienski, and Robert C. Morrison, both of Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Continuation-in-part of Ser. No. 481,554, June 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 361,467, May 18, 1973, Pat. No. 3,954,894. This application Sept. 30, 1976, Ser. No. 728,233

Int. Cl.[2] C07C *29/00, 43/14, 33/06, 33/10*

U.S. Cl. 260—635 E **22 Claims**

1. In a process for preparing hydroxy-terminated conjugated diene polymers and copolymers wherein the polymerization or copolymerization is carried out in the presence of at least one organopolylithium initiator, and wherein said polymers or copolymers having terminal polymer or copolymer C-Li bonds are capped with a lower alkylene epoxide capping agent, the improvement which consists in carrying out said capping reaction in the presence of a small proportion of a tertiary amine characterized by its having from 2 to 4 nitrogen atoms separated from each other by a saturated aliphatic hydrocarbon group containing from 2 to 8 carbon atoms or by a cycloaliphatic hydrocarbon group having from 4 to 8 carbon atoms.

4,039,594

ALKENOL PRODUCTION

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

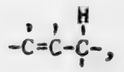
Division of Ser. No. 484,261, June 28, 1974, Pat. No. 3,960,973. This application Jan. 23, 1976, Ser. No. 651,864

Int. Cl.[2] C07C *29/00*

U.S. Cl. 260—638 R **7 Claims**

1. A process for the production of alkenols and cycloalkenols which comprises reacting:

(a) at least one alkene or cycloalkene having at least one allylic hydrogen having the basic structure



and having from 3 to 20 carbon atoms per molecule with

(b) formaldehyde in the presence of

(c) a catalyst selected from the group consisting of alkali metal and alkaline earth metal bisulfites

under reaction conditions including an elevated temperature and pressure sufficient to produce alkenols and cycloalkenols.

4,039,595

COPOLYMERS OF ETHYLENE AND HEXAFLUOROPROPENE

Daniel Ashton Dimmig, King of Prussia, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed June 16, 1975, Ser. No. 587,947

Int. Cl.[2] C08F *14/28*

U.S. Cl. 260—653.1 R **10 Claims**

1. A highly viscous oil having little tendency to flow at ambient temperature and characterized by having low to intermediate molecular weight consisting essentially of copolymerized units of 85 mol percent to 50 mol percent ethylene and 15 mol percent to 50 mol percent hexafluoropropene, the copolymer being soluble in liquid perfluoroalkanes and liquid perfluorochloroalkanes.

4. A process for preparing the copolymers of claim **1** which comprises copolymerizing ethylene and hexafluoropropene at a temperature in the range of between 20° C. and 80° C. at autogenous pressure in liquid phase reaction medium comprised of a liquid perfluoroalkane or a liquid perfluorochloroalkane, or a mixture of one or more of said perhaloalkanes with water, in the presence of a peroxide having a 10 hour half-life temperature between 0° and 50° C. and which provides free radicals.

4,039,596

CATALYST OF CHLORINATION AND COMBINED CHLORINATION/FLUORINATION BASED ON COPPER/CALCIUM/FLUORIDE

Wim J. M. Pieters, Morristown, and Emery J. Carlson, Chatham, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed May 6, 1976, Ser. No. 683,995

Int. Cl.[2] C07C *17/15*

U.S. Cl. 260—653.7 **4 Claims**

1. Process of chlorination of organic compounds which contain a CH group susceptible to attack by chlorine, by use of HCl and elemental oxygen, wherein material to be chlorinated is passed in vapor phase, together with HCl and elemental oxygen, in contact with a catalyst as defined below at temperatures in the range 200° C. to 550° C., which catalyst consists essentially of a calcium fluoride matrix and a thermally stable phase containing copper ion, calcium ion, and alkali metal or ammonium ion in combination with fluoride ion, which phase is herein referred to as the A phase; said catalyst having Debye-Scherrer X-ray diffraction pattern including lines characteristic of calcium fluoride and lines, characteristic of the A phase, having the following Bragg spacings in Angstrom units and the following relative intensities (I/I_1):

Bragg spacings	Relative intensities
4.68	100
2.87	70
2.34	50
2.03	55

said catalyst being thermally stable to at least 600° C. upon heating for 24 hours.

4,039,597

CARBON DIOXIDE REMOVAL FROM CHLORINATED HYDROCARBON PRODUCTION SYSTEM

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Continuation-in-part of Ser. No. 547,377, Feb. 6, 1975, abandoned. This application Aug. 6, 1975, Ser. No. 602,388

Int. Cl.[2] C07C *19/00, 21/00, 17/02, 17/10*

U.S. Cl. 260—654 A **10 Claims**

1. In a process for producing chlorinated hydrocarbons from a hydrocarbon feed in a chlorinated hydrocarbon production zone wherein an effluent is withdrawn containing chlorohydrocarbon, unreacted hydrocarbon and carbon dioxide, the improvement comprising:

recovering from the effluent a gaseous stream comprising unreacted hydrocarbon, carbon dioxide and minor amounts of chlorinated hydrocarbons;

contacting the gaseous stream with a carbon dioxide absorption solution to absorb carbon dioxide from the gaseous stream;

stripping the absorption solution, containing absorbed carbon dioxide to remove chlorinated hydrocarbon therefrom to maintain the absorption solution essentially free of chlorinated hydrocarbon for introduction into a carbon dioxide stripper;

introducing stripped absorption solution into a carbon dioxide stripper to strip carbon dioxide therefrom;

recycling the absorption solution to said contacting with the gaseous stream; and

introducing gas recovered from the carbon dioxide absorption and chlorinated hydrocarbon stripping into the chlorinated hydrocarbon production zone.

4,039,598

PRODUCTION OF TETRABROMOBUTADIENE BY CATALYTIC OXYBROMINATION OF BUTANE

Anthony K. Uriarte, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 23, 1976, Ser. No. 716,420
Int. Cl.² C07C *21/20*
U.S. Cl. 260—655 **10 Claims**

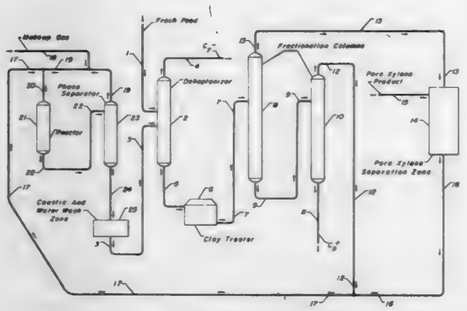
1. The process for the production of 1,1,4,4-tetrabromobutadiene comprising continuously oxybrominting butane with free oxygen and bromine in the presence of a cupric bromide catalyst stabiized with a member of the group consisting of a potassium or ammonium halide on a high surface area support comprising a member of the group consisting of activated alumina, and silica by feeding the oxygen, bromine and butane, in gaseous phase, at controlled rates and temperatures into a reactor maintained under conditions of pressure and temperature to form 1,1,4,4-tetrabromobutadiene and selectively condensing an effluent of the reaction medium thereby to recover the 1,1,4,4-tetrabromobutadiene.

4,039,599

XYLENE ISOMERIZATION PROCESS

Steve A. Gewartowski, Mount Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 26, 1976, Ser. No. 717,979
Int. Cl.² C07C *15/08*
U.S. Cl. 260—668 A **4 Claims**



1. A process for the production of paraxylene which comprises the steps of:

a. passing an aromatic-rich feed stream into a first fractionation column operated under conditions effective to cause the separation of all hydrocarbons fed to the first fractionation column into a first overhead product stream comprising hydrocarbons having less than eight carbon atoms per molecule and a first bottoms stream comprising hydrocarbons having eight or more carbon atoms per molecule;

b. passing the first bottoms stream into a second fractionation column which is operated at conditions effective to cause the separation of the first bottoms stream into a second overhead product stream comprising orthoxylene, metaxylene, paraxylene and ethylbenzene and a second bottoms stream comprising orthoxylene, metaxylene, paraxylene and hydrocarbons having more than eight carbon atoms per molecule;

c. passing the second overhead product stream into a paraxylene separation zone operated at conditions effective to cause the formation of a relatively pure paraxylene product stream and a paraxylene separation zone effluent stream having a lower paraxylene concentration than said second overhead product stream;

d. passing the second bottoms stream into a third fractionation column operated at conditions effective to separate the second bottoms stream into a third overhead product stream comprising hydrocarbons having more than eight carbon atoms per molecule, orthoxylene and paraxylene and a third bottoms stream comprising hydrocarbon having more than eight carbon atoms per molecule;

e. admixing the third overhead product stream with the paraxylene separation zone effluent stream and effecting thereby the formation of a hydrocarbon charge stream;

f. admixing a hydrogen stream with the hydrocarbon charge stream and passing the hydrocarbon charge stream through a catalytic xylene isomerization zone as a vapor while the xylene isomerization zone is maintained at conditions effective to cause the conversion of orthoxylene and metxylene into paraxylene and effecting thereby the formation of an isomerization zone effluent stream;

g. effecting a partial condensation of the isomerization zone effluent stream and pasing the isomerization zone effluent stream into a vapor-liquid separation zone which is operated at conditions effective to result in the separation of the isomerization zone effluent stream into the hydrogen stream and an isomerate stream; and,

h. passing the isomerate stream into the first fractionation column.

4,039,600

CONVERSION OF SYNTHESIS GAS TO AROMATIC HYDROCARBONS

Clarence D. Chang, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed July 2, 1975, Ser. No. 592,565
Int. Cl.² B07C *15/00*
U.S. Cl. 260—668 R **8 Claims**

1. A process of converting carbon monoxide to gasoline boiling range aromatic hydrocarbons comprising:

A. reacting carbon monoxide and hydrogen at about 450° to 750° F in contact with a methanol synthesis catalyst to produce a product comprising methanol and carbon monoxide;

B. reacting said methanol and said carbon monoxide at about 300° to 800° F in contact with a carbonylation catalyst to produce a product comprising methanol and acetic acid; and

C. converting said methanol and said acetic acid at about 500° to 1200° F in contact with an aromatizing catalyst comprising a zeolite having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12 to produce a product comprising normally liquid hydrocarbons the major portion of which are a conjunct mixture of C_6 and C_{10} mono-cyclic aromatics.

4,039,601

PROCESS AND APPARATUS FOR CONTINUOUS CATALYST ACTIVATION

Frederick J. Soderquist, Essexville; Theodore T. Wazbinski, Bay City, and Nathan Waldman, Midland, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 22, 1976, Ser. No. 698,667
Int. Cl.² C07C *15/00*
U.S. Cl. 260—669 R **4 Claims**

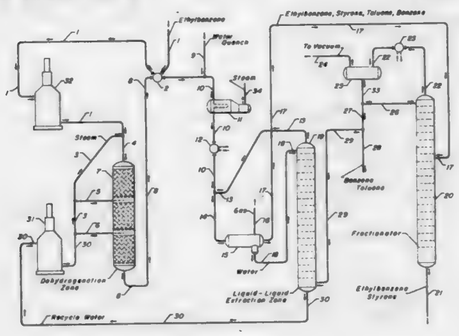
1. In the method of activating a bed of self-regenerative dehydrogenation catalyst during the dehydrogenation of an alkyl aromatic hydrocarbon having from 1 to 2 six membered rings and from 1 to 2 alkyl groups of 2–3 carbon atoms to the corresponding alkenyl aromatic hydrocarbon by passing a mixture of process steam and said alkyl aromatic hydrocarbon over said catalyst at about 600° to about 700° C wherein the method of activating comprises periodically interrupting the feed of alkyl aromatic hydrocarbon and continuing the feed of process steam at said temperature for about 7–30 minutes to provide a catalyst activation cycle and then resuming the feed of said alkyl aromatic hydrocarbon for dehydrogenation thereof under high severity reaction conditions, the improvement wherein a plurality of minor portions of said catalyst bed are individually and successively activated in a portionwise activating process by applying to a first minor portion of catalyst bed a separate stream of activating steam in a flow sufficient to exclude substantially all of the alkylaromatic hydrocarbon feed to that first minor portion only, maintaining the stream of activating steam to said first minor portion in that manner for about 7–30 minutes, then discontinuing the stream of activating steam to said first minor portion of catalyst bed, thereby allowing the resumption of alkylaromatic hydrocarbon feed thereto, subsequently applying a separate stream of activating steam to a second minor portion of the catalyst bed in the same fashion and repeating the above portionwise activating process until each minor portion of the catalyst bed has been so activated at least once in **24** hours.

4,039,602

ETHYLBENZENE DEHYDROGENATION PROCESS

Kenneth D. Uitti, Bensenville, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,987
Int. Cl.² C07C *15/00, 15/10*
U.S. Cl. 260—669 R **3 Claims**



1. A process for the dehydrogenation of ethylbenzene which comprises in cooperative combination the steps of:

a. admixing a feed stream comprising ethylbenzene with steam and contacting the resulting mixture with a heterogeneous fixed bed dehydrogenation catalyst within a reaction zone maintained at dehydrogenation conditions and effecting the formation of an effluent stream comprisng styrene, ethylbenzene and steam;

b. cooling the effluent stream and effecting partial condensation of said stream;

c. effecting a further cooling of said effluent stream by admixture of said effluent stream with a liquid hydrocarbon stream comprising benzene, styrene and dissolved water;

d. passing said admixed effluent stream into a phase separation zone and effecting the formation of a hydrocarbonaceous phase comprising styrene, benzene, toluene and ethylbenzene and an aqueous phase comprising styrene;

e. passing at least a portion of said aqueous phase into a liquid-liquid extraction zone and contacting said aqueous phase with a solvent stream comprising benzene to effect a transfer of substantially all the styrene contained in the aqueous phase into said solvent stream to form an extract stream comprising benzene, styrene and dissolved water;

f. fractionating at least a portion of said extract stream comprising benzene, styrene and dissolved water to produce said solvent stream comprising benzene; and,

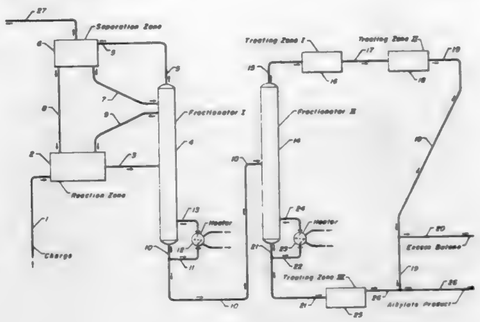
g. admixing at least a portion of said extract stream as the liquid hydrocarbon stream of step (c) with said effluent stream.

4,039,603

VAPOR PRESSURE-ADJUSTED MOTOR FUEL ALKYLATE OF REDUCED FLUORIDE CONTENT

Michael Z. Mikulicz, Palatine, and Vance P. Burton, Arlington Heights, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 12, 1976, Ser. No. 657,675
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.42 **8 Claims**



1. In a process wherein an isoparaffin and olefin hydrocarbon feed stream, containing normal paraffins, is reacted in an alkylation reaction zone, in admixture with a hydrogen fluoride catalyst, resulting in a reaction zone effluent containing (1) motor fuel alkylate, (2) unreacted isopraffin, propane and normal butane, (3) hydrogen fluoride catalyst, and (4) organic fluoride compounds, the method of recovering said motor fuel alkylate having a predetermined vapor pressure, and substantially free from said fluoride compounds and said catalyst which comprises the integrated steps of:

a. separating said alkylate, unreacted isoparaffin, propane, normal butane, hydrogen fluoride and organic fluoride compounds in a first fractionation zone, at a temperature of about 100° F to about 475° F and a pressure of about 125 psig to about 350 psig. to decompose organic fluorides, and to separate (i) unrelated isoparaffin concentrate containing hydrogen fluoride and propane from, (ii) a first motor fuel alkylate stream of reduced organic fluoride content, and containing hydrogen fluoride and normal butane;

b. separating said first alkylate stream, in a second fractionation zone, at a temperature of about 90° F to about 475° F and a pressure of about 120 psig to about 170 psig to decompose additional organic fluorides, and to separate (i) normal butane concentrate containing organic fluorides from hydrogen fluoride (ii) a second motor fuel alkylate stream substantially free from organic fluorides and containing hydrogen fluoride;

c. treating said normal butane concentrate in a first treatment zone having disposed therein a bed of particulate refractory metal oxide comprising bauxite or aluminum at conditions to decompose organic fluorides;

d. said normal butane concentrate from step (c) in a second treatment zone having disposed therei an alkali metal hydroxide at conditions selected to remove hydrogen fluoride and to produce a substantially fluoride-free normal butane;

e. treating said second alkylate stream in a third treatment zone having diposed therein an alkali metal hydroxide at conditions selected to remove hydrogen fluoride and to produce a third motor fuel alkylate stream substantially fluoride-free; and,

f. admixing at least a portion of said fluoride-free normal butane with said third alkylate stream to adjust its vapor pressure said predetermined vapor pressure.

4,039,604

HYDROCARBON ISOMERIZATION WITH INCREASED TEMPERATURE AND LOWERED HYDROGEN/HYDROCARBON RATIO

John W. Myers, and James W. Garner, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 18, 1975, Ser. No. 605,710
Int. Cl.[2] C07C 5/30
U.S. Cl. 260—683.68 9 Claims

1. In an isomerization process wherein a hydrocarbon feed is contacted with a chloride- or bromide-activated alumina or platinum-alumina catalyst in the presence of hydrogen at a mole ratio of said hydrogen to said hydrocarbon within the range of 0.25:1 to 10:1 at a temperature below 400° F (204° C) and an isomerized product recovered, the improvement comprising: after said process has been carried out for at least 1 month increasing the temperature 50°–200° F. (58°–111° C.) and decreasing said ratio of hydrogen to hydrocarbon at least 20 percent, said decrease in said ratio of hydrogen to hydrocarbon thereby enhancing the production of the desired isomer.

4,039,605

ORGANOSILICON CONTAINING RESIN COMPOSITION AND PROCESS FOR ITS PREPARATION

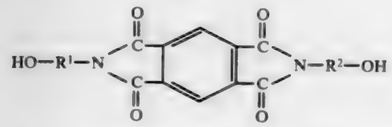
Götz Koerner; Václav Kropác, both of Essen, and Hans-Jürgen Putzke, Gelsenkirchen-Resse, all of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

Filed Nov. 11, 1974, Ser. No. 522,621
Claims priority, application Switzerland, Nov. 12, 1973, 15879/73
Int. Cl.[2] C08L 67/00, 83/10; C08G 73/10, 77/26
U.S. Cl. 260—824 R 22 Claims

1. A resin composition which is the cocondensation product of

a. a polysiloxane having ≡SiOR groups, wherein R is lower alkyl and wherein hydrocarbon groups are linked to the silicon of said groups, at least some of said hydrocarbon groups being phenyl having a hydrocarbon to silicon ratio of about 0.9 to 1.67, and

b. an organic ≡COH group containing component which at least partially consists of a diimido compound of the formula



wherein R^1 and R^2 symbolize alkylene of 2 – 4 carbon atoms.

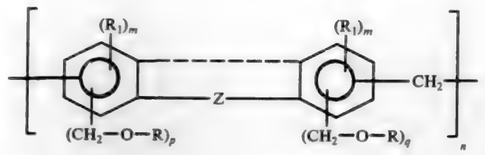
4,039,606

UNSATURATED RESIN BLENDS

Harry A. Smith, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1976, Ser. No. 662,391
Int. Cl.[2] C08L 67/06, 45/00
U.S. Cl. 260—829 9 Claims

1. A composition of matter comprising (1) a mixture of (a) from about 5 to about 90 percent by weight of a diaryl compound-formaldehyde copolymer resin having pendent unsaturated groups with the repeating units:



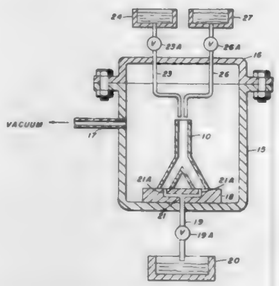
wherein R is an aliphatic acyl group derived from saturated acids having 2–6 carbons, olefinically unsaturated acids having 3–20 carbons, or an omega-carboxy-aliphatic acyl group derived from unsaturated dicarboxylic acids having 4–12 carbons or mixtures thereof, R_1 is independently hydrogen, an alkyl group of 1–10 carbon atoms, or halogen, Z is selected from oxygen or sulfur, the group represented by Z taken with the dotted line represents dibenzofuran and dibenzothiophene moieties, or mixtures thereof, n is a whole number sufficient to give a weight average molecular weight greater than about 500, m is 0-2, and p and q have an average value of 0 to 1 with the proviso that the total number of p and q groups are sufficient to give greater than one unsaturated group per resin molecule, and (b) from about 95 to about 10 percent by weight of an unsaturated polyester resin, and (2) a polymerizable ethylenically unsaturated liquid monomer, wherein (1) is present in an amount from about 20 to 75 weight percent based on the combined weights of (1) and (2).

4,039,607

METHOD FOR PRECISION CASTING OF CLAD OPTICAL COMPONENTS

Glen Elwood Miller, Redondo, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 10, 1976, Ser. No. 684,575
Int. Cl.[2] B29D 11/00
U.S. Cl. 264—1 8 Claims



1. A method for precision casting of clad optical components for use with a light-conducting optical fiber, said method including the steps of:

selecting a hollow shell having an internal surface defining a desired barrier configuration to reflect electromagnetic wave energy,

filling the shell with a liquid barrier material to completely wet the internal surface of the shell with the liquid barrier material,

forming a liquid cladding of barrier material upon the internal surface of said shell by incomplete draining of the barrier material from the shell,

thereafter curing the liquid cladding of barrier material remaining upon the internal surface of the shell to form a desired optical barrier,

thereafter casting a core of fiber optic material having an index of refraction greater than the index of refraction of the cured barrier material, and

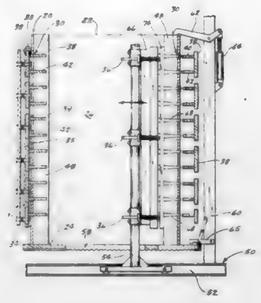
thereafter forming optical entrance and exit surfaces on the cast core for adjoining with the end of at least one optical fiber.

4,039,608

METHOD AND MEANS FOR CREATING PERFORATED CONCRETE CASING

Gottlieb W. Grosch, Silver Creek, Nebr. 68663

Division of Ser. No. 532,763, Dec. 24, 1975, Pat. No. 3,957,409.
This application Sept. 24, 1975, Ser. No. 616,434
Int. Cl.[2] B28B 1/48
U.S. Cl. 264—156 4 Claims



1. The method of forming a perforated concrete casing, comprising the steps of:

providing a hollow cylindrical canister having a plurality of spaced apart rows of elongated and horizontally disposed openings formed therein,

positioning movable plates in each of said openings so that said plates extend inwardly into said canister,

machine positioning a layer of stiff concrete adjacent the inner surface of said canister to form a cylindrical mass so that a cylindrical concrete casing member is created which has the plurality of plates embedded therein.

removing the plates from the concrete so that a plurality of depressions are created in the concrete which do not extend completely through the casing,

providing a wedge means comprising a plurality of horizontally disposed and vertically spaced wedge members,

forcing the wedge members outwardly through the stiff concrete from the interior of the cylindrical casing so that the wedge members register with the said depressions to reshape said depressions and so that the outer ends of said wedge members move into said openings in said canister,

and removing the wedge members from said concrete so that perforations are formed in the casing.

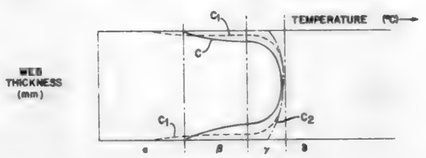
4,039,609

METHOD FOR THE MANUFACTURE OF THIN-WALLED SHAPED ARTICLES OF THERMOPLASTIC MATERIAL

Alfons W. Thiel, Mainz, and Hans Hell, Wiesbaden, both of Germany, assignors to Bellaplast GmbH, Wiesbaden, Germany

Continuation-in-part of Ser. No. 408,083, Oct. 19, 1973, abandoned. This application Aug. 24, 1976, Ser. No. 717,221
Claims priority, application Germany, Oct. 25, 1972, 2252219; Dec. 19, 1972, 2262093; June 4, 1973, 2328368; Sept. 6, 1973, 2344866
Int. Cl.[2] B29D 7/04
U.S. Cl. 264—210 R 29 Claims

1. A method of manufacturing thin-walled synthetic plastic articles which comprises the sequential steps of (2) extruding a continuous web of hot thermoplastic material at a relatively high temperature in the upper limits of the range wherein said material is in substantially fluid but extrudable plastic condition, (2) substantially immediately rapidly precooling the opposite surfaces of said web to form along said surfaces thin supportive layers having a temperature in the range wherein said material is substantially solid and not elastically deformable while the hotter core material between said layers remains in substantially fluid condition, (3) allowing said layers to be



partially reheated by heat conducted from the core whereby the temperature at said layers is such that the material is said layers achieves an elastically deformable condition, and (4) then thermally forming said web to an article of desired shape.

4,039,610

METHOD OF MAKING AN ORIENTAL DIMENSIONALLY STABLE ARTICLE FROM A HIGH SOFTENING AROMATIC POLYMER OR COPOLYMER

Burnett H. Johnson, and Don J. Henderson, both of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 359,836, May 14, 1973, Pat. No. 3,939,116.
This application Aug. 28, 1975, Ser. No. 608,608
Int. Cl.[2] B29B 3/00; B29C 17/00, 25/00; B29D 7/20
U.S. Cl. 264—237 6 Claims

1. A method of obtaining a dimensionally stable oriented shaped article formed from a high softening temperature aromatic-containing polymer or copolymer having a Tg greater than 200° C, a thermal co-efficient of expansion (a) of from $+1.6 \times$ to -3.0×10^{-5} deg. $^{-1}$ and for PPA a birefringence value of from 0.05 to 0.2 and wherein said article has been elongated at least 25% more than its non-oriented value in one direction which comprises in combination the steps of:

a. heating a shaped article of said high softening temperature aromatic-containing polymer of a temperature from 20° C below to 5° C above its Tg,

b. drawing said article at a rate of 10 to 10,000 percent per minute in at least one direction at said temperature until an elongation of at least 25% over that of the original dimension is obtained,

c. quenching the as drawn said article by any convenient means.

4,039,611

METHOD FOR TREATING RESIDUES, LEFT OVER AFTER THE GAS RELEASE, OF PEST CONTROL AGENTS THAT CONTAIN EARTH METAL PHOSPHIDES AND/OR ALKALINE EARTH METAL PHOSPHIDES

Werner Schoom, Bergen-Enkheim, Germany, assignor to Deutsche Gesellschaft fur Schadlingbekampfung, Frankfurt am Main, Germany

Continuation of Ser. No. 331,890, Feb. 12, 1973, abandoned.
This application Mar. 14, 1975, Ser. No. 558,275
Claims priority, application Germany, Feb. 11, 1972, 2206494
Int. Cl.[2] C01B 25/00; C01G 1/00
U.S. Cl. 423—1 4 Claims



1. A method of treating the residual remainder of a pest control agent after same has been used the agent containing as

an active ingredient a metal phosphide which generates hydrogen phosphide as a toxic gas upon contact with water comprising adding a water-soluble oxidizing agent to a container of water to provide an oxidizing water solution having a pH of below 7, the water being present in an amount sufficient to decompose any remaining unreacted metal phosphide that may be present in the residue, and the oxidizing agent being present in an amount sufficient to oxidize any hydrogen phosphide gas generated by said residue, said oxidizing agent being selected from the group consisting of a mixture of calcium hypochlorite and citric acid, chromic acid, a mixture of sodium perborate and citric acid, a mixture of potassium percarbonate and citric acid and a mixture of sodium percarbonate with manganates, and thereafter adding the pest control agent residue remaining after use to the oxidizing solution and permitting the residue to remain in said oxidizing solution until any unreacted metal phosphide present in the residue has been converted to a completely harmless state.

4,039,612

PROCESS FOR EXTRACTING COBALT, COPPER OR ZINC VALUES USING A 1-ALKYL SUBSTITUTED BENZIMIDAZOLE

Raymond Price, and Peter Smith, both of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Filed June 1, 1976, Ser. No. 691,296
Claims priority, application United Kingdom, June 9, 1975, 24626/75
Int. Cl.[2] C01G *3/00*; C07F *1/08*; C01G *9/00, 51/00*
U.S. Cl. 423—24 **6 Claims**

1. A process for extracting a metal selected from the group consisting of cobalt, copper and zinc from aqueous solutions of salts thereof which comprises contacting said aqueous solutions in the presence of a halogen or psuedo-halogen anion with a solution in a water-immiscible organic solvent of a benzimidazole having an alkyl group in position 1 and optionally having an alkyl, methoxy or chloro group substituent in position 5 or 6, the alkyl group or groups in said benzimidazole containing a total of at least 7 and not more than 25 carbon atoms.

6. A process as claimed in claim 1 wherein the metal is recovered as an aqueous solution of metal halide by extracting the metal-loaded water-immiscible organic solvent with water substantially free from halide ion.

4,039,613

PROCESS FOR PRODUCTION OF HYDROGEN AND SULFUR FROM HYDROGEN SULFIDE AS RAW MATERIAL

Yoshihide Kotera, Kawasaki; Naoyuki Todo, Tachikawa, and Kenzo Fukuda, Niiza, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Division of Ser. No. 517,656, Oct. 24, 1974, Pat. No. 3,962,409. This application Mar. 9, 1976, Ser. No. 665,231
Claims priority, application Japan, Oct. 29, 1973, 48-120727
Int. Cl.[2] C01B *17/04*
U.S. Cl. 423—571 **6 Claims**

1. In a process for the production of hydrogen and sulfur from hydrogen sulfide, the improvement which comprises:

1. bringing hydrogen sulfide into contact with tungsten sulfide at a temperature of from 450° to 800° C thereby giving rise to a gaseous mixture consisting of hydrogen sulfide, hydrogen and sulfur,
2. cooling the said gaseous mixture thereby condensing the sulfur component of the said mixture and separating and obtaining elementary sulfur,
3. circulating back to the step (1) above the gaseous mixture remaining after removal of sulfur,
4. subjecting the circulated gaseous mixture to the steps (2) and (3) above continuously and recurrently for thereby forming a gaseous mixture having an increased hydrogen content and,
5. separating the hydrogen component from the gaseous mixture having an increased hydrogen content.

4,039,614

METHOD OF PREPARING VANADIUM PENTOXIDE FROM METALLURGICAL SLAGS CONTAINING VANADIUM

Nikolai Petrovich Slotvinsky-Sidak, Ambulatorny pereulok, 17, kv. 54, Moscow, and Naum Volfovich Grinberg, ulitsa Otakara Yarosha, 53, kv. 69, Kharkov, both of U.S.S.R.

Continuation of Ser. No. 571,597, April 25, 1975, abandoned, which is a continuation of Ser. No. 379,982, July 17, 1973, abandoned. This application Feb. 23, 1976, Ser. No. 660,392
Claims priority, application U.S.S.R., July 17, 1972, 1810744
Int. Cl.[2] C01G *31/00*
U.S. Cl. 423—65 **2 Claims**

1. A method for extracting vanadium pentoxide from metallurgical slags containing vanadium comprising: disintegrating a metallurgical slag containing vanadium and having a ratio of V_2O_5/CaO greater than 0.05 to form particles of a size of less than 0.1 mm; roasting the slag particles in an oxidizing medium; processing the roasted particles with a solution of phosphoric acid having a concentration of H_3PO_4 within the range of from 5 to 20 percent by weight and a liquid to solid ratio by weight of 2–10:1 at a temperature of from 50°–100° C for a period of from 30 to 120 minutes to transfer vanadium as vanadium pentoxide into solution; separating the vanadium pentoxide in solution from a solid residue; and recovering the vanadium pentoxide from the solution.

4,039,615

PRODUCTION OF ALUMINUM SULFATE

Yasuie Mikami; Ippo Takei; Kazuo Soma, all of Tokyo, and Yasuo Morimoto, Takatsuki; all of Japan, assignors to Nittetsu Mining Company, Limited, Tokyo, Japan

Continuation of Ser. No. 416,293, Nov. 15, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,923
Int. Cl.[2] C01F *7/74*; B01D *9/02*
U.S. Cl. 423—128 **4 Claims**



4. A process for the production of hexagonal plate crystals of chemically pure aluminum sulfate which comprises:

a. cooling at a rate of less than 8° C/hour a hot, chemically impure saturated solution of aluminum sulfate, acidified with sulfuric acid, which contains 50–85 g/l of Al_2O_3, wherein the weight ratio of SO_3 to Al_2O_3 in the saturated solution is in the range of 4:1 to 10:1 to precipitate crystals of aluminum sulfate, and wherein said solution contains iron sulfate in an amount such that the iron sulfate is not precipitated with the aluminum;
b. heating the resultant slurry containing the precipitated aluminum sulfate crystals to a temperature below the minimum temperature at which all the precipitated aluminum sulfate will dissolve into the solution, and maintaining said slurry at said temperature for at least one hour to dissolve only a portion of the crystals in the solution;
c. Cooling the slurry to cause the aluminum sulfate crystals to grow;

d. recovering hexagonal plate aluminum sulfate crystals to be used as seed crystals for subsequent processing;
adding 5% of said seed crystals to additional amounts of said hot impure saturated solution of aluminum sulfate to form a slurry;
adjusting the sulfuric acid concentration in said slurry to from 43–50 wt.%;
heating the slurry to a temperature at which essentially pure hexagonal plate aluminum sulfate crystals begin to grow;
maintaining the slurry at this temperature for less than three hours;
cooling said slurry at a rate not exceeding less than 8° C/hour to cause said hexagonal plate aluminum sulfate crystals to grow; and
recovering hexagonal plate aluminum sulfate crystals.

4,039,616

PROCESS FOR THE MANUFACTURE OF STABILIZED, HARDENABLE CALCIUM SULPHATE BY REACTING CRUDE PHOSPHATE WITH SULPHURIC ACID

Kurt Scheel, Hamburg, and Franz Wirsching, Iphofen, both of Germany, assignors to Gebr. Knauf Westdeutsche Gipswerke, Germany

Filed June 2, 1975, Ser. No. 582,775
Claims priority, application Germany, June 5, 1974, 2427122
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—166 **10 Claims**

1. In a process for the manufacture of calcium sulphate hemi-hydrate, wherein crude phosphate is reacted with sulfuric acid to produce crude calcium sulphate hemi-hydrate, and wherein the crude calcium sulphate hemi-hydrate is washed with an aqueous medium to remove impurities therefrom, the improvement, which comprises:

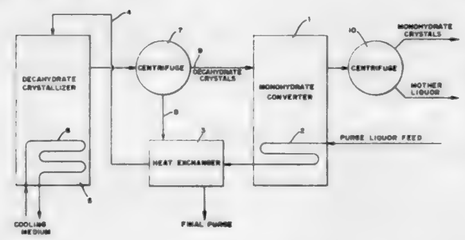
washing the crude calcium sulphate hemi-hydrate with an aqueous solution of condensed and complex aluminum fluorides of the general formulae $MeAlF_4$, Me_2AlF_5, $Me_5Al_3F_{14}$ and $AlF_3 \cdot nH_2O$, in which Me represents an alkali metal, ammonium or thallium-I ion and n is a number between 1 and 9.

4,039,617

RECOVERY OF SODA VALUES AND HEAT FROM SODIUM CARBONATE CRYSTALLIZER PURGE LIQUORS

Vincent H. S. Kuo, Liverpool, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed June 17, 1975, Ser. No. 587,583
Int. Cl.[2] C01D *7/00*
U.S. Cl. 423—186 **11 Claims**



8. The method of recovering soda values and water in the form of sodium carbonate solution from the sodium carbonate purge liquor from the process for making sodium carbonate monohydrate crystals by crystallization from a sodium carbonate solution, which comprises:

a. cooling the purge liquor to temperature below about 32° C. to effect crystallization of sodium carbonate decahydrate crystals therefrom;
b. separating the sodium carbonate decahydrate crystals from the liquor;
c. heating the separated sodium carbonate decahydrate crystals to temperature above about 36° C., but below about 108° C. to convert the sodium carbonate decahydrate crystals into a slurry of sodium carbonate monohydrate crystals in sodium carbonate solution; and
d. separately recovering the sodium carbonate monohydrate crystals and the sodium carbonate solution.

4,039,618

TREATMENT OF SODIUM CARBONATE CRYSTALLIZER MOTHER LIQUORS

Alan B. Gancy, and Rustom P. Poncha, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed June 17, 1975, Ser. No. 587,584
Int. Cl.[2] C01D *7/00*
U.S. Cl. 423—206 T **9 Claims**

1. The method for treating aqueous carbonate process crystallizer mother liquor from the process for making sodium carbonate precursor crystals by evaporative crystallization which comprises:

a. digesting said mother liquor at elevated temperature, for time sufficient to reduce soluble silicates, in the presence as treating agent of activated insolubles which have been obtained by calcining of crushed trona, dissolution of the crushed trona in a aqueous medium to obtain a solution comprising sodium carbonate and insolubles, separating the insolubles from the solution and activating the separated insolubles by calcining at temperature of 300° to below 600° C., and
b. separating the insolubles from the digested mother liquor.

4,039,619

PROCESS FOR THE SELECTIVE REMOVAL OF HYDROGEN SULFIDE FROM HOT COAL GASIFICATION GASES

Peter Steiner, Edison, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Continuation-in-part of Ser. No. 432,277, Jan. 10, 1974, abandoned. This application Nov. 4, 1975, Ser. No. 628,635
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—230 **10 Claims**

1. A process for the selective removal of hydrogen sulfide from hot coal gasification effluent gases containing same, comprising contacting a hydrogen sulfide-containing coal gasification effluent gas in a reaction zone containing a solid nickel acceptor at a temperature range between about 1000° F and about 1450° F whereby said nickel acceptor is at least partially sulfided; withdrawing the sulfided nickel acceptor from the reaction zone to a regenerating zone; and subjecting the sulfided nickel acceptor to a source of oxygen at a temperature which is approximately the same as that in the reaction zone, said temperature being from about 1000° F to about 1450° F, thereby forming sulfur dioxide and a regenerated nickel acceptor.

4,039,620

ENDOTHERMAL CARBON DIOXIDE ABSORPTION

Loyal G. Netteland, East Aurora, and Clifford E. Heintz, Buffalo, both of N.Y., assignors to A-T-O Inc., Willoughby, Ohio

Division of Ser. No. 464,738, April 29, 1974, Pat. No. 3,906,945. This application Apr. 25, 1975, Ser. No. 571,721
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—230 **9 Claims**

1. The method of removing carbon dioxide from a gas stream containing moisture, at least in part according to the reaction

$$LiOH + CO_2 \underset{}{\overset{H_2O}{\rightleftharpoons}} LiHCO_3$$

comprising the steps of passing the gas stream directly through lithuim hydroxide and immediately thereafter through a molecular sieve.

4,039,621

POWER GENERATION WHEREIN SULFUR AND NITROGEN OXIDES ARE REMOVED

Ralph Costantini, Los Angeles, Calif., assignor to Ralph M. Parsons Company, Pasadena, Calif.

Filed Mar. 25, 1974, Ser. No. 454,124
Int. Cl.[2] B01J *8/00*; C01B *21/00, 17/00*
U.S. Cl. 423—239 **6 Claims**

1. Improved process for the generation of power through the extraction of heat generated from the combustion of sulfur bearing carbonaceous fuels which comprises:

a. combusting the sulfur bearing carbonaceous fuels in the combustion zone of the boiler maintained at a temperature from about 2000° to about 3000° of a power generator in a deficiency of air to form a reducing flue gas stream of corresponding high temperature comprising carbon dioxide, carbon monoxide, hydrogen, sulfur dioxide, the oxides of nitrogen and water, the hydrogen and carbon monoxide content of the formed high temperature reducing flue gas stream being at least from about 30 to about 60% in excess of the stoichiometric amount required to reduce the formed sulfur dioxide to hydrogen sulfide;

b. cooling the high temperature reducing flue gas stream in said boiler to a temperature of from about 300° to 800° F, to extract heat values therefrom and thermally reduce a portion of the oxides of nitrogen to a nitrogen compound selected from the group consisting of nitrogen, ammonia and mixtures thereof, and a portion of the sulfur dioxide to a mixture of hydrogen sulfide and carbonyl sulfide;

c. catalytically converting by reduction residual sulfur dioxide to hydrogen sulfide, the oxides of nitrogen to a nitrogen compound selected from the group consisting of nitrogen ammonia and mixtures thereof and hydrolyzing at least part of the carbonyl sulfide to hydrogen sulfide by passing the cooled reducing flue gas stream through a catalytic conversion zone in the presence of a catalyst capable of converting the sulfur dioxide to hydrogen sulfide, the oxides of nitrogen to nitrogen and ammonia and hydrolyzing carbonyl sulfide to hydrogen sulfide; and

d. extracting the formed hydrogen sulfide from the flue gas stream and venting the flue gas stream to the atmosphere.

4,039,622

CATALYTIC PROCESS FOR NO_X REDUCTION UNDER LEAN CONDITIONS

Lawrence L. Murrell, Elizabeth, and Samuel J. Tauster, Englishtown, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 520,490, Nov. 4, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 616,752
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 **10 Claims**

1. A process for effecting the selective reduction of NO_x in lean effluent waste streams containing NO_x, CO, O_2, H_2, CO_2 and water, wherein the concentration of CO is at least equivalent to the concentration of NO_x present in the waste stream, a lean effluent waste stream being defined as one in which the concentration of oxygen is in excess over the concentration of reductants to a level as high as 8%, i.e., about 800% excess oxygen, over the total of reductants present, said reductants being selected from the group comprising CO and H_2 so that when such a waste stream is reacted to completion, the residuum is oxidizing in character, said process comprising the steps of contacting said lean exhaust stream in a reaction zone with an iridium catalyst, said contacting occurring at a temperature between 300° to 750° C thereby effecting the selective reduction by CO of the oxides of nitrogen to molecular nitrogen.

4,039,623

CATALYTIC OXIDATION OF C2-C4 HALOGENATED HYDROCARBONS

Jerome M. Lavanish, Akron, and Edward J. Sare, Clinton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 16, 1976, Ser. No. 714,889
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—240 **15 Claims**

1. A method for treating a C_2–C_4 halogenated hydrocarbon containing gas stream, said halogenated hydrocarbon being selected from the group consisting of chlorinated and brominated hydrocarbons, which comprises contacting the gas stream with an oxidizing amount of oxygen-containing gas in the presence of hydrated nickel oxide catalyst at temperatures within the range of from 20° C. to 500° C., for a time sufficient to reduce said halogenated hydrocarbon content of the gas stream, said temperature being such as to inhibit water induced loss of catalyst activity.

4,039,624

METHOD OF PRODUCING PHOSPHORIC ACID FROM HIGH IRON AND ALUMINUM CONTENT PHOSPHATE ROCKS USING NITRIC ACID

Robert Oliver Hill, Johannesburg, South Africa, assignor to National Process Industries (Proprietary) Limited, Johannesburg, South Africa

Filed July 17, 1975, Ser. No. 596,777
Claims priority, application South Africa, July 30, 1974, 74/4842; Jan. 9, 1975, 75/0162
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—319 **5 Claims**

1. A method of solubilizing phosphate values in a phosphate rock which contains metal values selected from iron and aluminum substantially in the form of one or more of the oxides Fe_2O_3, Fe_3O_4 and Al_2O_3, hydrated oxides, hydroxides, sulfides or carbonates and in an amount greater than 3 percent by weight calculated as R_2O_3, wherein R is Al plus Fe, which comprises

a. if the iron and alumina are not in oxide form, or iron is present as Fe_3O_4 in an amount greater than 10 percent, converting them by oxidative calcination at a temperature of 700° C. to 1100° C. to R_2O_3 oxide form and

b. attacking the rock with a nitric acid leach solution of weight concentration of HNO_3 of 53 to 65 percent and in an amount in excess of that necessary to convert all the calcium in the rock to calcium nitrate and at a temperature of 40° C. to 75° C. for a time up to 2 hours to produce a phosphate rich leach solution containing at least 90 percent of the P_2O_5 values of the rock and no more than 10 parts by weight of Fe and Al in solution calculated as R_2O_3 per 100 parts by weight P_2O_5 in solution.

4,039,625

BENEFICIATION OF OLIVINE FOUNDRY SAND BY DIFFERENTIAL ATTRITION GRINDING

Edward G. Davis, Tuscaloosa, Ala., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Dec. 10, 1976, Ser. No. 749,583
Int. Cl.[2] C01B *33/22*
U.S. Cl. 423—326 **10 Claims**

1. A process for the recovery of olivine sand from olivine-containing rock which comprises:

subjecting said rock to wet differential attrition grinding at an intensity and for a time sufficient to round individual olivine sand grains and to finely comminute the non-olivine gangue minerals contained in said rock;

separating said olivine sand grains from the finely comminuted non-olivine gangue minerals, and

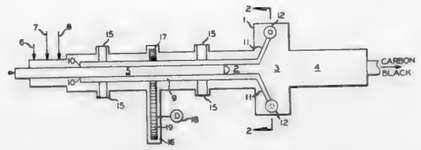
recovering an olivine sand product suitable for use as a foundry sand.

4,039,626

CARBON BLACK PROCESS

Paul H. Johnson, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 406,385, Oct. 15, 1973, Pat. No. 3,918,914, which is a continuation-in-part of Ser. No. 253,027, May 15, 1972, abandoned, which is a division of Ser. No. 830,611, June 5, 1969, Pat. No. 3,681,031. This application July 28, 1975, Ser. No. 599,752
Int. Cl.[2] C09C *1/50*
U.S. Cl. 423—456 **4 Claims**



1. A process for producing carbon black comprising

a. introducing a hydrocarbon feed axially into a reactor which comprises a plurality of nozzles for the tangential discharge of hot combustion gases, said nozzles being arranged for rotation around the reactor axis,

b. introducing hot combustion gases through said nozzles tangentially into said reactor,

c. rotating said nozzles around said axis at a rotational velocity such as to impart a discharge velocity and a rotational velocity to said hot combustion gases and to establish said hot combustion gases in a helical flow relationship to the axially flowing hydrocarbon feed,

d. contacting said hydrocarbon feed with said hot combustion gases under carbon black-forming conditions to form carbon black, the structure of said carbon black being controlled by the rotational velocity imparted to said hot combustion gases, and

e. recovering carbon black-contacting smoke from said reactor.

4,039,627

HEAT-CURABLE PULVERULENT COATING AGENT OF A MIXTURE OF A COPOLYMER CONTAINING GLYCIDYL GROUPS AND AN ADDUCT OF ALIPHATIC DICARBOXYLIC ACID AND 2,4,6-TRIS-(N',N'',N'''-DIMETHYLAMINOMETHYL)-PHENOL

Themistoklis Katsimbas, Hamburg, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Feb. 19, 1975, Ser. No. 551,126
Claims priority, application Switzerland, Feb. 22, 1974, 2515/74
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—836 **13 Claims**

1. Pulverulent coating agent of a mixture of

A. a copolymer which contains glycidyl groups and which is a copolymer of several ethylenically unsaturated compounds and has a relatively low molecular weight,

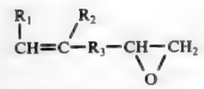
B. at least one aliphatic dicarboxylic acid, in an amount corresponding to 0.8 – 1.1 acid groups per epoxy group of the copolymer and

C. a curing accelerator in th form of an organic base, and optionally

D. a flow control agent, in an amount of at least 0.05 percent by weight of the mixture, which is a polymer of molecular weight ($\bar{M}_n$) at least 1,000 and has a glass transition temperature which is at least 50° C lower than the glass transition temperature of the copolymer (A) characterised in that the component

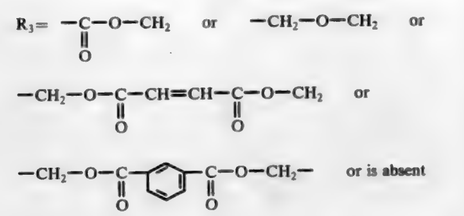
A. consists of 80 to 96 percent by weight of copolymers, containing epoxide groups and hydroxyl groups, which have Durran softening points of about 90° – 120° C and are soluble in organic solvents, of

a. 6 to 24 percent by weight of ethylenically unsaturated epoxide monomers with 6 – 12 carbon atoms, of the general formula



wherein

R_1 and R_2 = H or $-CH_3$



b. 4 – 20 percent by weight of hydroxyalkyl esters of acrylic acid or methacrylic acid, wherein the hydroxyalkyl ester group is saturated and contains 2 – 4 C atoms,

c. 10 – 80 percent by weight of acrylic acid esters or methacrylic acid esters of aliphatic saturated monoalcohols with 1 – 8 carbon atoms and

d. 10 – 60 percent by weight of styrene or vinyltoluene; and

B. consists of 4 – 20 percent by weight of an adduct of a saturated straight-chain aliphatic dicarboxylic acid of the formula $HOOC-(CH_2)_n—COOH$, wherein *n* is a whole number from 4 to 11, and 2,4,6-tris(N',N'',N'''-dimethylaminomethyl)-phenol, and these components of the adduct can be present in a weight ratio of 97 : 3 to 99:1; optionally together with other customary additives.

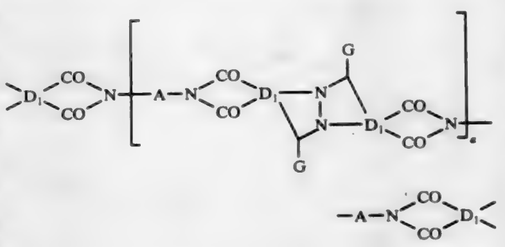
4,039,628

HEAT-STABLE POLYIMIDE RESINS

Michel Bargain, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

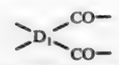
Division of Ser. No. 228,233, Feb. 22, 1972, Pat. No. 3,998,787. This application May 17, 1976, Ser. No. 687,225
Claims priority, application France, Feb. 24, 1971, 71.06288
Int. Cl.[2] C08L *77/06*; C08G *69/26*
U.S. Cl. 260—857 UN **18 Claims**

1. A heat-stable cured resin which consists essentially of three-dimensional recurring units of the general formula:

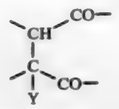


in which, in any particular recurring unit

a is zero or an integer from 1 to 5;



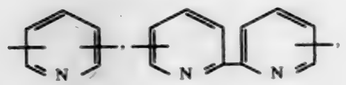
denotes a radical of the general formula:

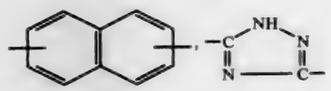


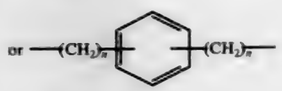
in which Y represents H, CH_3 or Cl;

G denotes a monovalent carbocyclic aromatic radical; and

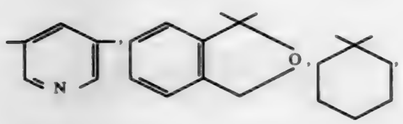
A denotes an alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or one of the radicals of the formula:

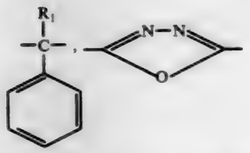


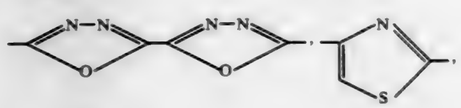


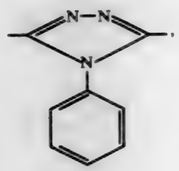


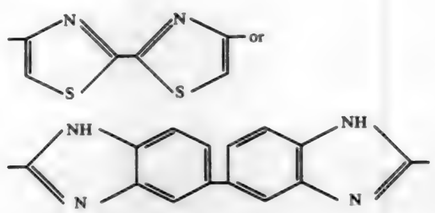
wherein *n* represents an integer from 1 to 3, or a divalent radical having 12 to 30 carbon atoms consisting of phenylene or cyclohexylene radicals linked to one another by a simple valency bond or by —O— or —S—, and alkylene group with 1 to 3 carbon atoms, —CO—, —SO_2—, —NR_1—, —N=N—, —CONH—, —COO—, —P(O)R_1—, —CONH—X—NHCO—,











wherein R_1 represents a hydrogen atom, an alkyl radical with 1 to 4 carbon atoms, a phenyl radical or a cyclohexyl radical and X represents an alkylene radical with less than 13 carbon atoms,

such that there are, on average, at least 4.4 and at most about 20 >D_1< radicals per



radical which is modified by the addition, before curing of the resin, of a polymerisable monomer other than an imide, containing at least one vinyl, maleic, allyl or acrylic —CH=C < group, in an amount from 5% to 50% by weight based on the weight of the reactants.

4,039,629

BLOCK COPOLYMER BLENDS

Glenn R. Himes, Houston, Tex., and Luis Enrique Mendoza, Cerritos, Calif., assignors to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 617,122, Sept. 28, 1975. This application Feb. 11, 1977, Ser. No. 767,932

Int. Cl.² C08L *53/00*

U.S. Cl. 260—876 B **8 Claims**

1. An unvulcanized block copolymer composition suitable for the manufacture of shoe heels comprising:

a. 65 to 90 parts by weight of a first block copolymer having an average total molecular weight between about 170,000 and 210,000 and a monoalkenyl arene block mol. wt. between about 20,000 and 30,000; and

b. 35 to 10 parts by weight of a second block copolymer having an average total molecular weight between about 70,000 and 90,000 and a monoalkenyl arene block mol. wt. between about 5,000 and 15,000; both of said block copolymers having at least two monoalkenyl arene polymer blocks and at least one conjugated diene polymer block and both of said block copolymers not having been hydrogenated.

4,039,630

ELASTOMER

Shuichi Kanagawa, Osaka, and Kazuyoshi Kagaya, Ibaragi, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

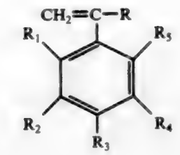
Filed Nov. 20, 1975, Ser. No. 633,986

Claims priority, application Japan, Nov. 22, 1974, 49-134745

Int. Cl.² C08F *255/06, 279/00, 291/02*

U.S. Cl. 260—878 R **11 Claims**

1. A modified elastomer having a phenolic hydroxyl group on the side chain, characterized in that the elastomer is obtained by graft-copolymerizing an elastomer, prepared by copolymerizing ethylene with at least one α-olefin represented by the general formula R'-CH=CH_2, wherein R' is an alkyl group, and at least one non-conjugated diene or polyene, with at least one phenolic monomer represented by the general formula (A),



wherein R is a lower alkyl group or a hydrogen atom; and R_1 to R_5 are individually an alkyl group, a hydrogen atom or a hydroxyl group, one of said R_1 to R_5 being a hydroxyl group, and wherein the said hydroxyl group may have been protected by an alkyl or acyl group or an alkalimetal.

4,039,631

RADIATION CROSS-LINKABLE COMPOSITIONS OF COPOLYMERS OF ETHYLENE AND A HALOGENATED MONOMER

Arthur B. Robertson, Succasunna, and Robert J. Schaffhauser, Brookside, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 327,907, Jan. 20, 1973, Pat. No. 3,947,525. This application Aug. 5, 1975, Ser. No. 602,048

The portion of the term of this patent subsequent to Mar. 30, 1993, has been disclaimed.

Int. Cl.² C08F *2/46, 259/08*

U.S. Cl. 260—878 R **13 Claims**

1. A radiation cross-linkable composition comprising an admixture of a copolymer of ethylene and a halogenated monomer selected from the group consisting of chlorotrifluoroethylene, tetrafluoroethylene and mixtures thereof and an effective amount of a radiation cross-linking agent selected from the group consisting of diallyl isophthalate, diallyl terephthalate, and mixtures thereof.

4,039,632

PREPARATION OF BLOCK COPOLYMERS

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 709,194, Jan. 16, 1958, Pat. No. 3,970,719. This application Apr. 30, 1976, Ser. No. 681,978

Int. Cl.² C08F *297/08*

U.S. Cl. 260—878 B **4 Claims**

1. A block copolymer comprising first and second adjacent polymer blocks, each of which is formed from one alpha-olefin having the formula:

$CH_2 = CHR$

wherein R is selected from the group consisting of hydrogen and linear alkyl radicals containing 1 to 6 carbon atoms, said polymer blocks being non-identical with respect to the alpha-olefins forming said blocks.

4,039,633

COUPLING OF ALKALI METAL-TERMINATED POLYMERS

Robert P. Zelinski, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 19, 1976, Ser. No. 678,097

Int. Cl.² C08F *8/04, 8/18, 8/00*

U.S. Cl. 260—879 **13 Claims**

1. A process for the production of a polymer comprising reacting a living alkali metal-terminated polymer having the formula M—Z wherein M represents an alkali metal and Z is selected from a group consisting of polymer chains of one or more alkadienes having 4–12 carbon atoms and copolymer chains of one or more alkadienes having 4–12 carbon atoms and one or more monovinylarenes of 8–18 carbon atoms, having the vinyl radical attached to an arene ring carbon atom, with a coupling agent having the formula

$A(COX)_nR_{6-n}$

wherein A is a benzene ring, the radicals X, which can be the same or different, are halogen, *n* is 2, 3 or 4, the radicals R which can be the same or different, are hydrogen or hydrocarbyl radicals of 1–6 carbon atoms, the total number of carbon atoms in all radicals R being between 0 and about 10.

4,039,634

SHAPED ARTICLES MADE FROM A MIXTURE OF POLYVINYLIDENE FLUORIDE AND A COPOLYMER OF METHYL METHACRYLATE AND A COMONOMER CONTAINING A QUATERNARY AMMONIUM GROUP

Paul Couchoud, Dardilly, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Apr. 14, 1975, Ser. No. 567,873

Claims priority, application France, Apr. 16, 1974, 74.13449

Int. Cl.² C08L *27/12, 39/04*

U.S. Cl. 260—895 **8 Claims**

1. Shaped articles based on poly(vinylidene fluoride) possessing good dyeing affinity for acid and metal-containing dyestuffs, comprising a mixture of a vinylidene fluoride homopolymer (A) and a copolymer (B) containing 80 to 95% by weight of methyl methacrylate and 5 to 20% by weight of a compound which contains a quaternary ammonium group and is copolymerisable with methyl methacrylate.

4,039,635

SOIL FUNGICIDAL PHOSPHOROTHIOATE

Toshiro Kato, Ibaragi; Mitsuru Sasaki, Nishinomiya; Tadashi Ooishi, Takarazuka, and Kunio Mukai, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

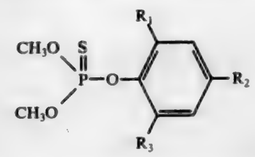
Continuation-in-part of Ser. No. 540,546, Jan. 13, 1975, abandoned. This application Dec. 22, 1975, Ser. No. 642,716

Claims priority, application Japan, Jan. 29, 1975, 50-12789

Int. Cl.² C07F *9/165;* A01N *9/36*

U.S. Cl. 260—954 **9 Claims**

1. A phosphorothioate of the formula,



(I)

wherein R_1 is a chlorine or bromine atom, R_2 is methyl or ethyl group and R_3 is a chlorine or bromine atom or nitro group.

2. A soil fungicidal composition including an inert carrier and, as an active ingredient, a fungicidally effective amount of a phosphorothioate of the formula given and defined in claim 1.

4,039,636

MAGNESIUM DIALKYL PHOSPHATES AND THEIR PREPARATION

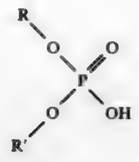
Kenneth G. Claus, Lake Jackson, Tex., and Jack A. Rogers, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed June 28, 1973, Ser. No. 374,458

Int. Cl.² C07F *9/11*

U.S. Cl. 260—963 **4 Claims**

1. A process for making a magnesium salt of a dialkyl acid phosphate of the formula



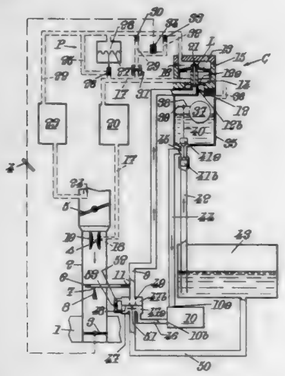
wherein R is an alkyl radical of about 1–6 carbon atoms, R′ is an alkyl radical of about 10–20 carbon atoms, and R and R′ together contain about 12–24 carbon atoms, which process comprises reacting magnesium in the form of its oxide, hydroxide, or carbonate with a molar excess of said dialkyl acid phosphate in an inert nonpolar organic solvent at about 100°–190° C. for 1–90 minutes in the presence of about 2–6 moles of water per mole of magnesium.

4,039,637

FUEL SUPPLY SYSTEMS FOR HEAT GENERATORS

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, France

Filed Mar. 12, 1976, Ser. No. 666,428
Claims priority, application France, Mar. 20, 1975, 75.08772
Int. Cl.² F02M *69/02*
U.S. Cl. 261—36 A **10 Claims**



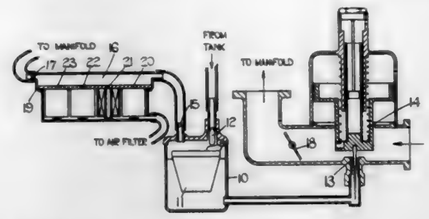
1. A fuel supply system for a heat generator, comprising: an air inlet tube for the generator; at least one fuel spray tube disposed in said air inlet tube; a fuel pump having a delivery greater than the fuel consumption rate of the generator, said pump having an intake and a delivery duct; a fuel line connected to said pump delivery duct and having a fuel feed connection to said spray tube; a variable-opening throttle element disposed in said fuel line downstream of said fuel feed connection; a constant-level chamber connected to said fuel line downstream of said throttle element for receiving excess fuel circulated by said pump, said chamber being connected to the intake of said pump; and control means to control said throttle element in dependence on the air flow through said inlet tube, said control means comprising a moving element forming a movable wall of a chamber subjected to a negative pressure produced by the air flow through a portion of said inlet tube and connecting means between said moving element and said throttle element; said fuel supply system being characterised by: a fuel reservoir; a bypass circuit connecting said pump delivery duct to said fuel reservoir; and calibrated valve means disposed in said bypass circuit upstream of said spray tube feed connection, said valve means closing said bypass circuit at high rates of fuel consumption and opening said bypass circuit in response to a predetermined low rate of fuel consumption so that the fuel in said constant-level chamber is renewed when the rate of generator fuel consumption is low.

4,039,638

FUEL SUPPLY SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

William Frank Hill, Stafford, England, assignor to Lucas Electrical Limited, Birmingham, England

Filed Feb. 12, 1976, Ser. No. 657,659
Claims priority, application United Kingdom, Feb. 22, 1975, 7551/75
Int. Cl.² F02M *7/06*
U.S. Cl. 261—72 R **2 Claims**



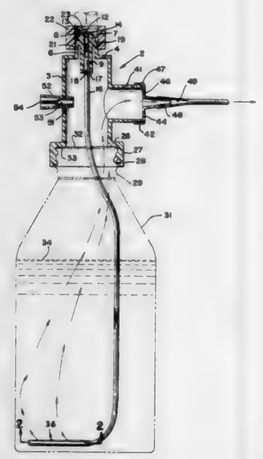
1. A fuel supply system for an internal combustion engine comprising a carburettor including a float chamber in which the level of fuel is controlled to determine the rate of fuel flow through an orifice into the air intake of the engine, and means controlling the air pressure in an air space in said float chamber to vary the rate of fuel flow through said orifice, said control means including a read only memory programmed to provide an n-bit digital output signal varying in accordance with one or more input signals corresponding to one or more engine operating parameters, and a plurality of valves respectively controlling a plurality of orifices of different sizes in parallel in a passage connecting the air space in the float chamber to the engine air inlet, said air space being also connected to the intake manifold downstream of the throttle valve via an orifice, said valves being controlled by respective bits of the digital output.

4,039,639

LIQUID ENTRAINING SYSTEM OF THE HUMIDIFIER AND NEBULIZER TYPE

Richard L. Kankel, San Jose, Calif., and William G. Brown, Troutdale, Oreg., assignors to Richard L. Kankel, San Jose, Calif.

Filed Apr. 10, 1975, Ser. No. 566,882
Int. Cl.² B01F *3/04*
U.S. Cl. 261—121 R **2 Claims**



1. An oxygen humidifier device for use in conjunction with a conventional irrigating container having a threaded neck portion and on which the oxygen humidifier device may be threadably mounted for administering inhalation therapy to a patient, comprising:

a. an elongated, generally cylindrical hollow shell having a vertically extending longitudinal axis, said shell including at its lower end a first threaded gland adapted to be sealingly secured by threaded engagement to the threaded neck of the container so that the hollow interior of the shell communicates with the interior of the container;

b. connector means on the upper end of the hollow shell including a second threaded gland rotatably mounted on an upwardly extending generally cylindrical bulbous extension of said shell, said extension having an upper convex sealing surface adapted to engage a source of oxygen and said gland being adapted to sealingly attach the source of oxygen to said shell;

c. a restricted passageway through said bulbous extension communicating the interior of the hollow shell with the exterior thereof and adapted for connecting said source of oxygen to the interior of said shell;

d. an oxygen diffuser adapted to be immersed in liquid contained in said container when said hollow shell is sealingly secured to the threaded neck of the container;

e. a downwardly projecting cylindrical extension integral with and extending generally axially through said bulbous extension, said downwardly projecting extension having a bore which is an extension of said restricted passage, the lower end of said bore having an increased diameter portion defining an integral interior shoulder;

f. flexible tube means connected at one end to said diffuser, the other end being inserted into said bore to engage said interior shoulder, said tube means connecting said diffuser to said restricted passageway so as to convey oxygen under pressure to said diffuser;

g. means including a chamfered portion within said bore to secure said flexible tube means;

h. an outlet nipple in said shell for discharging humidified oxygen to the patient upon demand thereby, said outlet nipple comprising a laterally directed, generally cylindrical opening intermediate the upper and lower ends of said shell;

i. cap means mounted on said outlet nipple, said cap means including a centrally disposed conical nipple adapted to receive an oxygen delivery tube; and

j. pressure relief valve means on the shell operative to relieve the internal pressure of said humidified oxygen within the shell when such pressure exceeds a predetermined value, said relief valve comprising a generally tubular housing and flap valve means constituting two layers of flexible material secured in said housing and joined along their longitudinal edges to permit the escape of humidified oxygen to produce an audible alarm in the event excessive pressure occurs in said humidifier device, said pressure relief valve being located in the wall of said shell generally intermedite the ends thereof and opposite said outlet nipple.

4,039,640

MOLDABLE COMPOSITIONS COMPRISING POLYVINYL NITRATE

Louis J. Leneveu, Pont de Buis, France, assignor to Societe Nationale des Poudres et Explosifs, France

Division of Ser. No. 491,619, July 24, 1974, abandoned. This application Aug. 5, 1976, Ser. No. 711,717
Claims priority, application France, Aug. 9, 1973, 73.29186; Dec. 4, 1973, 73.43246
Int. Cl.² C06B *21/00*
U.S. Cl. 264—3 B **7 Claims**

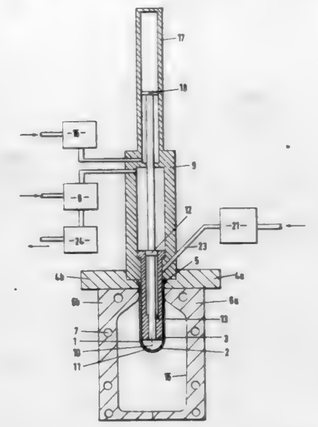
1. A method of making a combustible article, which comprises mixing (i) polyvinyl nitrate, (ii) at least one material selected from the group consisting of nitrocellulose and polyvinyl acetate, and (iii) 2-nitrodiphenylamine, in an organic solvent, forming fibers, stretching the fibers, forming granules, heating the granules to a temperature between their softening temperature and their decomposition temperature, and moulding the granules so formed to produce the combustible article.

4,039,641

PLASTICS CONTAINER MANUFACTURE

Thomas Robert Stephen Collins, Letchworth, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Nov. 28, 1975, Ser. No. 636,295
Claims priority, application United Kingdom, Dec. 3, 1974, 52230/74
Int. Cl.² B29C *17/07*
U.S. Cl. 264—28 **4 Claims**



1. A process for the production of a heat set biaxially oriented polyethylene terephthalate bottle filled with a liquid comprising

i. providing a polyethylene terephthalate parison having one closed end, preheated to a temperature at which it can be oriented, supported on a mandrel,

ii. gripping the parison at its open end in a split mould the walls of which are heated to a temperature in the range 130° to 220° C,

iii. stretching the parison axially by means of a plunger located in the mandrel and expanding the parison radially to contact the mould walls by means of a gas under pressure whereby the parison is transformed into a biaxially oriented bottle conforming to the mould configuration,

iv. maintaining the bottle in contact with the walls of the mould by means of said gas under pressure while said polyethylene terephthalate crystallises,

v. cooling the crystallised bottle by displacing the pressurising gas, while maintaining the pressure, with a cooling liquid,

vi. removing the bottle containing the liquid from the mould.

4,039,642

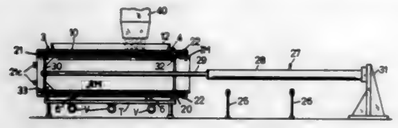
METHOD OF MAKING CONCRETE PIPE

Harry Steiro, P.O. Box H, Woodruff, Wis. 54568

Division of Ser. No. 429,562, Jan. 2, 1974, abandoned, which is a continuation of Ser. No. 616,502, Sept. 24, 1975. This application Sept. 22, 1975, Ser. No. 615,802
Int. Cl.² B28B *1/08*
U.S. Cl. 264—71 **1 Claim**

1. The method of making concrete pipe in the horizontal position from no-slump concrete, said method comprising the steps of horizontally positioning and securing an outer mold on a table, securing end rings having openings therein near opposite ends of said outer mold, axially shifting a horizontally positioned cylindrical inner mold in a horizontal direction so as to insert said inner mold into said outer mold and through said

openings in said end rings and in concentric relationship therewith, maintaining said inner and outer molds in said concentric relationship, dumping no-slump concrete through a longitudinal opening in the upper side of said outer mold and thereby filling the annular chamber between said molds, vibrating said table to effect vibration of said molds during said filling to thereby compactly place said no-slump concrete therebetween in the form of a wet pipe, then immediately axially withdrawing said inner mold in a generally horizontal direction from



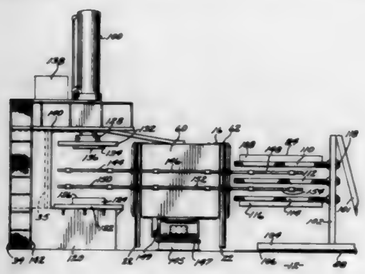
said outer mold and from said openings in said end rings, then immediately detaching said outer mold from said table, then immediately raising said outer mold and said wet pipe therein to a vertical position, then immedately setting the lower end of said wet pipe on one of its end rings and releasing said one end ring from said outer mold, and then immediately vertically stripping said outer mold from said wet pipe, axially sliding said outer mold from said wet pipe along the entire length thereof leaving said pipe on said end ring.

4,039,643

METHOD FOR FORMING PLASTIC SHEETS

Donald E. Dean, San Pedro, and John Alesi, Jr., Topanga, both of Calif., assignors to Formex Manufacturing, Inc., Venice, Calif.

Filed Sept. 23, 1974, Ser. No. 508,706
Int. Cl.[2] B29C *17/04;* B29F *5/00*
U.S. Cl. 264—92 **4 Claims**



1. The method of vacuum forming a substantially complete, hollow enclosure by means of two mold halves, said method comprising:

a. supporting thermoplastic sheets in upper and lower vertically spaced-apart frameworks, defined by cross arms peripherally disposed about an open space to receive said sheets and slidably moveable toward and from said open space, and vertically moving said frameworks into a transporting, vertically spaced-apart position;

b. simultaneously moving said frameworks in said transporting, spaced-apart position to a heating station and interposing said sheets between vertically spaced-apart heating elements whereby heating elements are located above and beneath each of said sheets to concurrently heat both sides of both sheets to forming temperatures;

c. simultaneously moving said frameworks to a molding station between a lower stationary mold half and a vertically spaced-apart, upper mold half carried on a movable platen;

d. lowering the lowermost framework to place its supported thermoplastic sheet onto said lower mold half;

e. lowering the upper platen into vertical proximity to the uppermost frame and applying a vacuum to said upper mold half to draw the thermoplastic sheet carried therein into contour-conforming contact with the face of said uppermost mold half.

f. applying a vacuum to the lower mold half to draw the lower thermoplastic sheet into contour-conforming contact with the face of the lower mold half;

g. continuing to lower said upper platen and said upper framework concurrently therewith until said upper and lower framework are vertically closed and said mold halves engage about their peripheral regions to compress and fuse said sheets together in a seam along the edges of a cavity defined therein;

h. raising said upper platen and raising said upper and lower frameworks to separate said formed enclosure from said lower mold half;

i. moving said upper and lower frameworks to a product eject station; and

j. releasing the edges of said thermoplastic sheets from the clamping means of said frameworks to permit ejection of the formed hollow enclosure therefrom; and

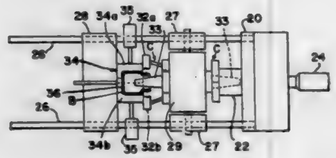
k. laterally outwardly expanding said open space by slidably moving the cross arms of the frameworks to permit said formed enclosure to pass therethrough.

4,039,644

METHOD FOR BLOW MOLDING AND EJECTING HOLLOW ARTICLES

Robert W. Saumsiegle, Needham, and Iestin L. Harry, Billerica, both of Mass., assignors to Continental Can Company, Inc., Chicago, Ill.

Division of Ser. No. 312,257, Dec. 5, 1972, Pat. No. 3,941,539.
This application Sept. 23, 1975, Ser. No. 616,007
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—97 **6 Claims**



1. A method of molding hollow articles comprising the steps of

positioning a core and partible neck mold sections in mold forming relationship with a blank mold,

forming a blank on the core, the blank including a neck portion formed in the neck mold sections and a body portion formed in the blank mold,

inserting the body portion of the blank, on the core, in a partible blow mold with the neck mold sections, containing the neck portion, in abutting relationship with the blow mold,

expanding the body portion of the blank in the blow mold to form an article while the core is maintained in the blow mold,

separating the core axially from the article while the blow mold is maintained closed about the article,

moving the neck mold sections longitudinally and divergently outward with respect to the core to separate the neck mold sections from the neck portion as the core is separated from the article and at the same time thereby retaining said neck mold sections adjacent said blow mold for movement of the neck mold sections transversely of the blow mold during initial separation of the core from the article,

opening the blow mold after the core and neck mold sections have been separated from the article, and

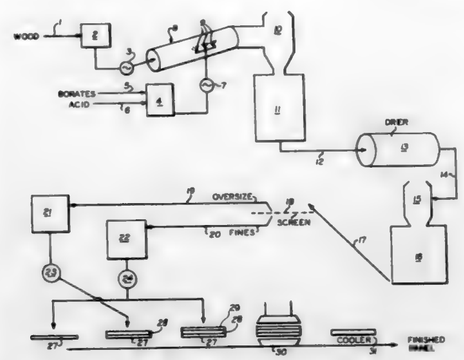
removing the article from the blow mold.

4,039,645

PROCESS FOR THE MANUFACTURE OF FIRE RETARDANT PARTICLEBOARD

Robert P. Coyle, Clovis, Calif., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 486,686, July 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 356,578, May 2, 1973, abandoned. This application Oct. 9, 1975, Ser. No. 620,957
Int. Cl.[2] B29J *5/00*
U.S. Cl. 264—118 **3 Claims**



1. A process for manufacturing fire resistant particleboard, comprising the steps of:

a. spraying wood chips having a moisture content of 125–150% of the weight of the dry wood chips, with an aqueous solution of a borate and sulfuric acid heated to a temperature of about 150°–225° F., said aqueous solution having a pH of about 4.0–6.0;

b. storing said sprayed wood chips for a stand time of approximately 10–20 minutes to permit said chips to become thoroughly impregnated and saturated with said aqueous solution;

c. drying said impregnated wood chips;

d. applying a urea-formaldehdye adhesive to said impregnated wood chips in an amount in the range of about 2% to 12% by weight based on the dry weight of the wood chips; and

e. consolidating the wood chips under heat and pressure to form the fire-resistant wood particleboard.

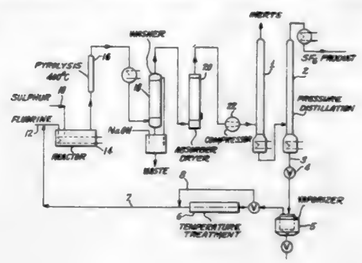
4,039,646

PROCESS FOR PREPARING SULPHUR HEXAFLUORIDE

Joachim Massonne, Hannover, and Wilfried Becher, Heilbronn-Neckargartach, both of Germany, assignors to Kali-Chemie Aktiengesellschaft, Hanover, Germany

Filed Feb. 14, 1975, Ser. No. 550,159
Claims priority, application Germany, Feb. 16, 1974, 2407492
Int. Cl.[2] C01B *17/45*
U.S. Cl. 423—469 **11 Claims**

1. In a process for the production of sulphur hexafluoride SF_6 including the steps of reacting fluorine and molten sulphur, whereby a mixture of SF_6 together with higher- and lower-boiling by-products is produced, removing said lower-boiling by-products from said mixture, and separating a portion of said SF_6 from said higher-boiling by-products, whereby a residue of said SF_6 containing a minor portion of higher-boiling by-products results, the improvement comprising the step of treating said residue in the presence of 1 part elementary fluorine for each 0.1 to 2 parts residue at a temperature between about 450° and 800° C for a period of time between about 0.1 and 25 seconds, whereby a SF_6 product containing a substantially



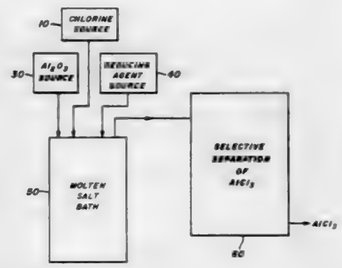
reduced concentrations of toxic and difficultly separable by-products is produced.

4,039,647

PRODUCTION OF ALUMINUM CHLORIDE

David A. Wohleber, Lower Burrell, and C. Norman Cochran, Oakmont, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 24, 1975, Ser. No. 644,416
Int. Cl.[2] C01F *7/60, 7/58, 7/56*
U.S. Cl. 423—495 **11 Claims**



1. In an improved method of producing $AlCl_3$ by contacting alumina and a reducing agent with a source of chlorine in a molten bath comprisng $AlCl_3$ and metal halide to form $AlCl_3$ and by recovering the $AlCl_3$ by vaporization from the bath, the improvement which comprises, adding a source of metal selected from the group consisting of iron, chromium, copper, europium and cerium to the molten bath to increase the rate of formation of said aluminum chloride by catalytic action of said metal.

4,039,648

PRODUCTION OF ALUMINUM CHLORIDE

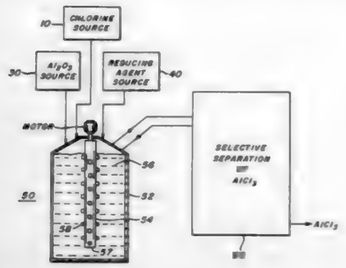
Warren E. Haupin; John A. Remper, both of Lower Burrell, and M. Benjamin Dell, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 12, 1975, Ser. No. 639,995
Int. Cl.[2] C01F *7/58, 7/60, 7/56*
U.S. Cl. 423—496 **10 Claims**

1. A method of producing $AlCl_3$ comprising:

a. contacting alumina which has been extracted from its ore and which has a surface area in the range of 0.5 to 110 m^2/g and a carbonaceous reducing agent with a source of Cl_2 in a molten bath containing at least 30% by weight $AlCl_3$ with the balance consisting essentially of at least one metal halide, said bath being at a temperature in the range of 150° to 1000° C, said method being capable of exothermically converting substantially 100% of said Cl_2 to $AlCl_3$;

b. maintaining said carbonaceous reducing agent in said bath in an amount in the range of 0.05 to 0.5 lbs/lb of molten bath, further maintaining said alumina in said bath in an amount in the range of 0.05 to 0.5 lbs/lb of molten bath;



c. adding the alumina, reducing agent and Cl_2 to said bath in stoichiometric amounts for purposes of said contacting thereby maintaining the reducing agent and the alumina in said ranges; and

d. recovering $AlCl_3$ by vaporization from the bath.

4,039,649

PROCESS FOR REMOVING SULFUR FROM WASTE WATERS CONTAINING SULFURIC ACID

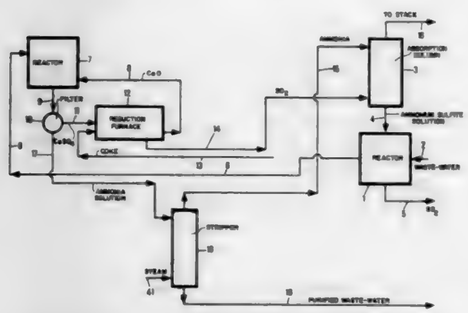
Jacques Alagy, Lyon; Christian Busson, Rueil Malmaison, and Maurice Cessou, Communay, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 11, 1975, Ser. No. 603,621

Claims priority, application France, Aug. 14, 1974, 74.28500; Mar. 6, 1975, 75.07330

Int. Cl.² C01B *17/50, 17/96;* **C01C** *1/02;* **B01D** *5/00*

U.S. Cl. 423—540 **15 Claims**



1. A process for producing sulfur dioxide, from waste water containing sulfuric acid, which comprises the following steps: (a) reacting the waste water with an aqueous solution of ammonium sulfite and separating of the formed sulfur dioxide from the resulting solution, (b) reacting calcium oxide with the solution obtained in step (a) in order to precipitate the sulfate ions in the form of calcium sulfate and to form an aqueous solution of ammonia, (c) vaporizing ammonia from the aqueous solution, (d) reducing the calcium sulfate by means of carbon so as to form calcium oxide and a sulfur dioxide containing gas, (e) contacting the ammonia from step (c) with the sulfur dioxide-containing gas and with water, so as to form an aqueous solution of ammonium sulfite, (f) feeding back at least a portion of said aqueous solution to step (a), and (g) feeding back to step (b) at least a portion of the calcium oxide obtained in step (d).

4,039,650

SULFUR DIOXIDE REDUCTION

William D. Daley, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed May 10, 1976, Ser. No. 684,529

Int. Cl.² C01B *17/04*

U.S. Cl. 423—569 **16 Claims**

1. A continuous process for the reduction of sulfur dioxide in a sulfur dioxide-containing gas stream with a gaseous reducing agent selected from the group consisting of carbon monoxide, hydrogen, normally gaseous hydrocarbons of 1 to 4 carbon atoms, and mixtures thereof, which comprises the steps of:

a. admixing said sulfur dioxide-containing gas stream with a portion comprising of from about 10 to about 95 percent of the total stream of gaseous reducing agent fed to the process, and passing of from about 60 to 100 percent of the resultant mixed gas stream through a first reaction chamber containing catalytic material, wherein said mixed gas stream is heated to a temperature of from about 850° to about 2400° F. and wherein a portion of the sulfur dioxide is reduced to form a gas stream comprising sulfur dioxide, hydrogen sulfide, and sulfur, and by-passing the remaining portion of the resultant mixed gas stream around the first reaction chamber;

b. admixing said gas stream comprising sulfur dioxide, hydrogen sulfide, and sulfur obtained from said first reaction chamber with (i) the remaining portion of the total stream of gaseous reducing agent fed to the process and, (ii) from 0 to about 40 percent of the mixed gas stream obtained in step (a), above, then passing from about 10 to about 80 percent of the resultant mixed gas stream comprising reducing agent, sulfur dioxide, hydrogen sulfide, and sulfur through a second reaction chamber containing catalytic material, and passing the remaining portion of said mixed gas stream comprising reducing agent, sulfur dioxide, hydrogen sulfide, and sulfur through a third reaction chamber containing catalytic material in parallel with the gas stream being passed through said second reaction chamber, to produce in said second and third reaction chambers a product gas stream comprising hydrogen sulfide, sulfur dioxide, and sulfur, wherein in said third reaction chamber heat is absorbed from the gas stream to reduce the temperature of the product gas stream from said third reaction chamber to from about 500° to about 1000° F.;

c. periodically reversing the flow in said first and third reaction chambers, thereby subjecting said first and third reaction chambers to periodically alternating heat absorbing and desorbing cycles while maintaining during the alternating cycles the gas flow through the catalyst bed in said second reaction chamber in the same direction; and

d. maintaining the temperature of the gas stream entering said second and third reaction chambers within the range of from about 800° to about 1800° F. by varying the proportion of said mixed gas stream obtained in step (a), above, which is by-passed around the first reaction chamber during the alternating heat absorbing cycles of the first and third chambers so as to maintain the gas inlet temperature of said second and third reaction chamber within the above-stated range.

4,039,651

PROCESS FOR CLOSED-CYCLE THERMOCHEMICAL PRODUCTION OF HYDROGEN AND OXYGEN FROM WATER

Karl-Friedrich Knoche, Aachen; Johannes Schubert, Wurselen, and Roland Schulze-Bentrop, Bonn, all of Germany, assignors to Rheinische Braunkohlenwerke AG, Cologne, Germany

Filed May 20, 1975, Ser. No. 579,219

Claims priority, application Germany, May 20, 1974, 2424380

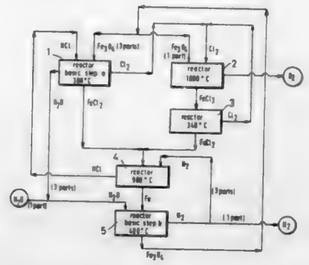
Int. Cl.² C01B *13/02*

U.S. Cl. 423—579 **2 Claims**

1. In the process for the production of hydrogen and oxygen from water by means of a thermochemical closed-cycle multi-step process conducted at temperatures of between about 130° – 1100° C utilizing at least one member selected from the group consisting of iron oxides, iron chlorides, chlorine and hydrogen chloride as an auxiliary compound, the improvement which comprises employing the steps of:

a. reacting water with a member selected from the group consisting of iron and iron (II) oxide at a temperature between 300°–1000° C. in one process step thereby forming hydrogen and a member selected from the group consisting of iron (II, III) oxide and iron (II) oxide, separating and recovering the thus obtained reaction products;

b. reacting at least part of the iron oxide formed in step (a) with hydrogen chloride at a temperature of between about 130° – 830° C. in a subsequent process step thereby forming a member selected from the group consisting of iron (II) chloride and iron (III) chloride, separating and recovering the thus obtained reaction products;



c. re-forming the starting material selected from the group consisting of iron and iron (II) oxide for process step (a) by converting at least one of said iron chlorides obtained in step (b) to said iron or iron (II) oxide in at least two additional process steps one of the steps being the reaction of a compound selected from the group consisting of iron (II) oxide, iron (II, III) oxide and water with chlorine at a temperature of between about 450 °– 1050° C, whereby iron (III) chloride or hydrogen chloride and oxygen are formed, and the second step being the reaction of iron (II) chloride with hydrogen or water, whereby hydrogen chloride is obtained, employing in any further reaction as reactant at least one member selected from the group consisting of iron oxides, iron (III) chloride, chlorine and water, and recycling the so obtained iron or iron (II) oxide into process step (a);

d. separating and recovering at least part of said hydrogen formed in step (a) and oxygen as end products.

4,039,652

COLUMN METHOD OF IMMUNOASSAY EMPLOYING AN IMMOBILIZED BINDING PARTNER

Ernest Clarence Adams; Joe William Davis, and John Menley Yoder, all of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Oct. 11, 1973, Ser. No. 405,316

Int. Cl.² G01N *33/00, 33/16;* **G21H** *5/02*

U.S. Cl. 424—1 **33 Claims**

1. A method for the quantitative determination of a specific binding substance which method comprises the steps of:

a. contacting a matrix contained in a column with a predetermined quantity of a liquid sample containing said substance to be determined and with a predetermined quantity of a reference sample containing a labeled form of said substance to be determined or a specific binding partner thereto, said matrix being porous and insoluble with respect to said liquid sample and said reference sample and having specific binding partners to said substance to be determined immobilized therewith;

b. contacting said matrix with a liquid capable of eluting from said matrix substantially all of the labeling component originating from the reference sample and not bound to the specific binding partners immobilized with said matrix a predetermined period of time after step (a); and

c. determining the relative amount of said labeled component which is retained in said column, which relative amount is a function of the amount of said substance to be determined in said liquid sample.

4,039,653

LONG-ACTING ARTICLES FOR ORAL DELIVERY AND PROCESS

George F. DeFoney, Philadelphia; Donald S. Mayes, Sunbury, both of Pa., and Henry S. Brenman, Cinnaminson, N.J., assignors to DeFoney, Brenman, Mayes & Baron, Cinnaminson, N.J.

Division of Ser. No. 435,940, Jan. 23, 1974, Pat. No. 3,911,199. This application July 21, 1975, Ser. No. 597,696

Int. Cl.² A61K *9/22, 9/24, 9/50, 9/52*

U.S. Cl. 424—19 **1 Claim**

1. A tablet for releasing a relatively uniform quantity of a medication or odor-masking material into the oral cavity of a human being or other animal over a prolonged period of time, said tablet comprising:

a. An elongated body;

b. Said body having at least one face having a concave curvature and adapted to fit comfortably along the upper surface of the gums at the side of the mouth;

c. Said tablet having a surface layer encompassing said tablet comprising principally pharmaceutically acceptable shellac having medicament or essential oil admixed therein to provide substantially immediate release of medicament or odor-masking material into the oral cavity; and

d. Said tablet having an inner core comprising principally a material selected from the group consisting of ethylcellulose, carboxymethylcellulose, methylcellulose and hydroxypropylcellulose having medicament or essential oil admixed therein for providing substantially more prolonged release of medicament or odor-masking material into the oral cavity.

4,039,654

PROSTANOIC ACID DERIVATIVES

Edward Raymond Halstead Walker, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

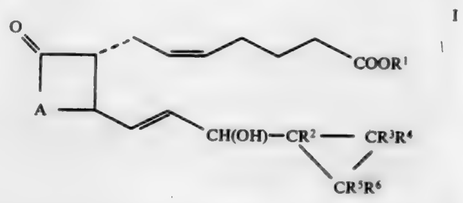
Filed July 22, 1975, Ser. No. 598,168

Claims priority, application United Kingdom, Aug. 8, 1974, 34995/74

Int. Cl.² C07C *177/00*

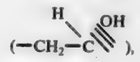
U.S. Cl. 424—305 **6 Claims**

1. A prostanoic acid derivative of the formula:



I

wherein R^1 is hydrogen or C_{1-10} alkyl, R^2 is C_{2-7} alkyl, R^3, R^5 and R^6 which may be the same or different are each hydrogen or methyl, and A is α-hydroxy-ethylene



of which the methylene is bonded to the carbon of the ring keto group, and, for those compounds wherein R^1 is hydrogen, the pharmaceutically or veterinarily acceptable base addition salts thereof.

4,039,655

COMPOSITIONS CONTAINING ORGANO GERMANIUM COMPOUNDS USEFUL IN THE PREVENTION OF CARIES

Gerrit J. M. van der Kerk, Emmalaan 11; Antje Kaars Sijpesteijn, Hogendorpstraat 16, both of Utrecht, and Eric J. Bulten, Julianalaan 149, Bilthoven, all of Netherlands

Continuation of Ser. No. 389,335, Aug. 17, 1973, abandoned. This application June 5, 1975, Ser. No. 584,117

Claims priority, application Netherlands, Aug. 21, 1972, 9211389

Int. Cl.[2] A61K *7/18*

U.S. Cl. 424—52 **22 Claims**

1. A composition of matter useful in caries prevention comprising an oral hygiene agent, selected from fluoride treatments, powders, pastes or tablets, and an organo germanium compound which is effective to retard the growth of *Streptococcus mutans* and is selected from the group consisting of

R_3GeX and $(R_3Ge)_2Y$

wherein

R is an aliphatic or cycloaliphatic hydrocarbon group,

X is a carboxylate group, a sulphonate group, a hydroxyl group or a halogen, and

Y is oxygen, sulphur or sulphate, the concentration of said compound in said oral hygiene agent being sufficient to retard the growth of *Streptococcus mutans* in the oral cavity.

4,039,656

PRODUCTION OF ATTENUATED VIRUSES

Otto-Christian Straub, Tuebingen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 313,245, Dec. 8, 1972, abandoned. This application Jan. 29, 1975, Ser. No. 544,886

Claims priority, application Germany, Dec. 10, 1971, 2161344

Int. Cl.[2] A61K *39/12, 39/42, 39/18, 39/00*

U.S. Cl. 424—85 **3 Claims**

1. A pharmaceutical composition containing as an active ingredient attenuated IPV virus which causes no immunological cross-reaction with unattenuated IPV virus and which stimulates the natural defense mechanism of cattle with a detectable non-specific induction of interferon and which is suitable for the prophylaxis and treatment of respiratory and genital tract infections in cattle, in admixture with a pharmaceutically acceptable diluent, wherein said active ingredient is contained in an amount equivalent to 10^4 to 10^8 CiD_{50} units/ml of virus.

4,039,657

SEPARATING ANTIGEN FROM RESIDUAL COMMON SENSITIZING PROTEIN

William J. McAleer, Ambler, and Edward H. Wasmuth, Telford, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 588,270, June 19, 1975, abandoned. This application Apr. 12, 1976, Ser. No. 676,265

Int. Cl.[2] A61K *39/12, 39/20, 39/00*

U.S. Cl. 424—89 **9 Claims**

1. A process for separating biological immunizing antigen having a particle size of from about 10 nm to about 10 μm from serum derived residual common sensitizing protein components which comprises agitating the biological antigen containing residual common sensitizing protein in phosphate buffered saline having a pH of from about 6.8 to about 7.6 at a temperature of from about 0° C to about 10° C. for from about 48 to about 96 hours.

4,039,658

FIBRINOLYTIC SUBSTANCES

John Burnham King, Sandown Lodge, Glebe Road, Rondebosch, Cape, South Africa

Division of Ser. No. 347,254, April 2, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,006

Claims priority, application South Africa, Apr. 5, 1972, 72/2311

Int. Cl.[2] C07C *7/026;* A61K *37/48*

U.S. Cl. 424—94 **13 Claims**

1. In a form more concentrated and purified than its natural occurrence a fibrinolytic substance derived from mammalian bile having in addition to its fibrinolytic activity the following characteristics:

i. it occurs in mammalian bile and can be recovered therefrom, after removal of interfering bile acids if present, by precipitation with ammonium sulphate and further purification by exclusion chromatography on cross-linked polydextran suitable for the separation of proteins in the molecular weight range from 5,000 to 50,000,

ii. it has the property of dissolving fibrin but does not activate plasminogen, trypsinogen and chymotrypsinogen,

iii. it is non-dialysable,

iv. it is a protein,

v. at pH 7.4 it behaves as an anion,

vi. it will inhibit platelet aggregation by collagen.

4,039,659

METHOD FOR TREATING HYPERCHOLESTEROLEMIA WITH LEVORIN

Harry W. Gordon, Bronx, N.Y., and Carl P. Schaffner, Trenton, N.J., assignors to Schmid Laboratories, Inc., Little Falls, N.J.

Division of Ser. No. 177,512, Sept. 2, 1971, Pat. No. 3,855,409, and a continuation of Ser. No. 221,062, Jan. 26, 1972, Pat. No. 3,966,910, and a continuation of Ser. No. 24,797, April 1, 1970, abandoned, Pat. No. 3,855,409, which is a continuation of Ser. No. 627,313, March 31, 1967, Pat. No. 3,627,879. This application Nov. 6, 1974, Ser. No. 521,289

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—115 **3 Claims**

1. A process for treating hypercholesterolemia in a large mammal afflicted with hypercholesterolemia which comprises orally administering an effective dose for treating hypercholesterolemia of Levorin to said mammal.

4,039,660

ANTIBIOTIC Y-G19Z D3 AND THE PRODUCTION THEREOF

Takashi Osono, Tokyo; Shunichi Watanabe, Omiya; Takeshi Saito, Tokyo; Hiroshi Gushima, Ageo; Keisuke Murakami, Wako; Isao Takahashi, Tokyo; Hiroshi Yamaguchi, Omiya; Toshio Sasaki, Tokyo, and Yoshihiko Oka, Kawagoe, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Sept. 16, 1975, Ser. No. 613,738

Claims priority, application Japan, Sept. 24, 1974, 49-109753

Int. Cl.[2] A61K *35/74*

U.S. Cl. 424—117 **3 Claims**

1. The antibiotic Y-G19Z D3, a compound of 7-methoxy cephalosporin group, or pharmaceutically acceptable salts thereof, which in its most purified state

a. is a white amorphous powder of amphoteric nature

b. has melting point of 160°–170° C (decomposition)

c. is easily soluble in water

d. is difficultly soluble in methanol and ethanol

e. is almost insoluble in other organic solvents

f. has an elemental composition (percent) (as sodium salt) C: 31.8 H: 3.8 N: 7.1 S: 16.5 Na: 7 ± 0.7

g. has the following value in high voltage paper electrophoresis on Whatman No. 1 paper in 10% acetic acid at pH 2.2:

The distance moved at 42 V/cm during 1 hour −5.2 cm

h. give α-aminoadipic acid by acidic hydrolysis

i. in 1/100 M phosphate buffer solution at pH 6.4 has characteristic ultraviolet absorption spectrum as shown FIG. 1 of the drawing:

λ_{max} 272 mμ ($E_{1cm}^{1\%}$ 176), 243 mμ (shoulder)

j. in KBr tablet has a chracteristic infrared absorption spectrum as shown in FIG. 2 of the drawing

k. in heavy water has a chracteristic nuclear magnetic resonance spectrum as follows:

β value (ppm): 1.80 (4H, multiplet), 2.43 (2H, multiplet) 3.35 – 3.82 (2H, quartet, J=18Hz), 3.47 (3H, singlet), 3.82 (1H, multiplet) 4.01 (2H, singlet), 5.13 (1H, singlet)

l. has the following Rf values in thin layer chromatography using microcrystalline cellulose systems indicated as below

Solvent system (volume ratio)	Rf value
Acetonitrile : H_2O (5 : 2)	0.35
n-Butanol : Acetic acid : H_2O (6 : 1.5 : 2.5)	0.16
n-Butanol : Acetic acid : H_2O (4 : 1 : 2)	0.19

4,039,661

ANTIBIOTIC METHOD OF TREATING BENIGN PROSTATIC HYPERTROPHY WITH SCH-16656

Harry W. Gordon, Bronx County, N.Y., assignor to Schmid Laboratories, Inc., Little Falls, N.J.

Continuation-in-part of Ser. No. 584,607, June 6, 1975, abandoned, which is a continuation of Ser. No. 414,968, Nov. 23, 1973, Pat. No. 3,920,813, which is a continuation of Ser. No. 313,568, Dec. 8, 1972, Pat. No. 3,843,785, which is a continuation of Ser. No. 194,052, Oct. 29, 1971, Pat. No. 3,721,734, which is a division of Ser. No. 70,509, Sept. 8, 1970, Pat. No. 3,714,347, which is a continuation-in-part of Ser. No. 544,712, April 25, 1966, abandoned, which is a continuation of Ser. No. 623,847, March 17, 1967, Pat. No. 3,584,118. This application Nov. 4, 1975, Ser. No. 628,790

Int. Cl.[2] A61K *35/00*

U.S. Cl. 424—119 **3 Claims**

1. A process for treating benign prostatic hypertrophy in a mammal afflicted with benign prostatic hypertrophy which comprises orally administering to said mammal an effective amount for treating benign prostatic hypertrophy of antibiotic SCH-16656.

4,039,662

OPHTHALMIC SOLUTION

Gerald Hecht, and Charles D. Shively, both of Fort Worth, Tex., assignors to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Dec. 4, 1975, Ser. No. 637,608

Int. Cl.[2] A61K *31/70, 31/715*

U.S. Cl. 424—180 **8 Claims**

1. An ophthalmic solution useful as an artificial tear comprising an aqueous solution of a polysaccharide selected from the group consisting of dextran and arabinogalactan, benzalkonium chloride, and water, said polysaccharide being present at a level of from about 0.001 to about 5 percent by weight and said benzalkonium chloride being present at a level of from about 0.001 to about 0.1 percent by weight.

4,039,663

DAUNOMYCINS, PROCESS FOR THEIR USES AND INTERMEDIATES

Federico Arcamone; Aurelio Di Marco, and Sergio Penco, all of Milan, Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

Filed Mar. 19, 1975, Ser. No. 560,105

Int. Cl.[2] A61K *31/71;* C07H *11/00*

U.S. Cl. 424—180 **9 Claims**

1. A mixture of the α- and β-anomers of 4'epidaunomycin wherein the α-anomer comprises about 70% by weight and the β-anomer comprises about 30% by weight.

8. A method of inhibiting the growth of a tumor selected from the group consisting of Moloney Sarcoma Virus, Sacroma 180 Ascites and gross transplantable leukemia which comprises administering to a host afflicted with said tumor an amount of the mixture of claim **1** sufficient to inhibit the growth of said tumor, together with an inert, pharmaceutically acceptable carrier.

4,039,664

TOPICAL GRISEOFULVIN COMPOSITION AND METHOD

Richard B. Stoughton, Rancho Santa Fe; Richard L. Harris, Dana Point, and Frank J. Dea, Newport Beach, all of Calif., assignors to Nelson Research & Development Company, Irvine, Calif.

Filed Apr. 11, 1975, Ser. No. 567,392

Int. Cl.[2] A01N *9/28;* A61K *31/71*

U.S. Cl. 424—180 **13 Claims**

1. A composition useful in the topical treatment of fungal infections of the skin and nails comprising an effective anti-fungal amount of griseofulvin, together with a vehicle system comprising a mixture of 2-pyrrolidone and N-methyl-2-pyrrolidone in a ratio ranging between about 1:4 and about 4:1, said composition containing at least about 10% by weight of said vehicle system.

4,039,665

METHOD FOR THE ERADICATION OF VENOUS BLEMISHES

William T. Foley, New York, N.Y., assignor to William T. Foley Foundation, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 579,197, May 20, 1975, abandoned. This application Sept. 2, 1976, Ser. No. 719,695

Int. Cl.[2] A61K *31/725*

U.S. Cl. 424—183 **6 Claims**

1. The method of treating venous blemishes such as venous spiders, sun-bursts, telangiectases, venous plexi, and groups of dilated venules which comprises partially removing the blood from the venules of the afflicted area by gravity, then injecting air into a selected venule within the area to clear the blood completely from the venules of the afflicted area, and then injecting a sclerosing solution into said selected venule to fill the cleared venules of the area, said sclerosing solution comprising at least 20% sodium chloride in water with heparin added.

4,039,666

ANTICONVULSANT PHENYLSILANES

Michael L. Chandler; Robert H. Krahnke, and Robert R. LeVier, all of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

Continuation of Ser. No. 640,987, Dec. 15, 1977, abandoned. This application Sept. 27, 1976, Ser. No. 727,091

Int. Cl.[2] A61K *31/695*

U.S. Cl. 424—184 **13 Claims**

1. A process for the treatment of a warm-blooded animal to induce an anticonvulsant effect, comprising administering to said animal a phenylsilane, the phenylsilane selected from the group consisting of ϕR_2SiX, ϕ_2RSIX, $\phi RSiX_2$, ϕSiX_3, and ϕ_3SiX in which R is an alkyl or alkenyl group and X is a hydroxy group or a radical which hydrolyzes in vivo to form the hydroxyl group, said silane being administered in an amount effective to suppress convulsions in the animal.

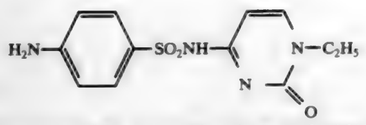
4,039,667

ANTIBACTERIAL COMPOSITIONS

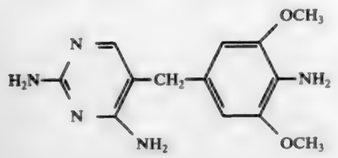
Erika Bohni, and Marc Montavon, both of Basel, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 529,179, Dec. 3, 1974, Pat. No. 3,996,357.
This application Apr. 13, 1976, Ser. No. 676,581
Int. Cl.[2] A61K *31/625*
U.S. Cl. 424—229 **3 Claims**

1. An antibacterial composition comprising the sulfonamide of the formula



or a pharmaceutically acceptable salt thereof with a strong base and the sulfonamide potentiator of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein the weight ratio of sulfonamide to sulfonamide potentiator is in the range of from 1:1 to 40:1.

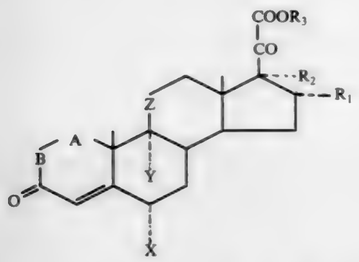
4,039,668

CORTICOID-CONTAINING INHALANTS

Peter Fuchs; Erich Gerhards; Heinz Matthes; Hans Wendt, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

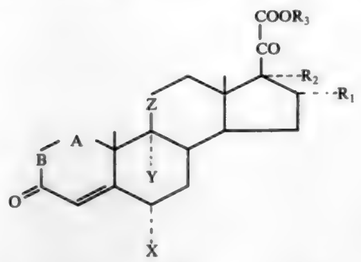
Continuation of Ser. No. 481,830, June 21, 1974, abandoned.
This application Aug. 16, 1976, Ser. No. 714,668
Claims priority, application Germany, June 23, 1973, 2332663
Int. Cl.[2] A61K *31/58*
U.S. Cl. 424—241 **10 Claims**

1. A corticoid-containing inhalant comprising, in admixture with a pharmaceutically acceptable carrier adapted for inhalation, an effective amount of at least one controlled of the formula



wherein —B—A— is $—CH_2—CH_2—$, —CH=CH— or —CCl=CH—; X is a hydrogen atom, a fluorine atom, or methyl; Y is a hydrogen atom, a fluorine atom or a chlorine atom; Z is methylene, hydroxymethylene, fluoromethylene, a chloromethylene, or carbonyl; R_1 is a hydrogen atom or methyl and R_3 is a hydrogen atom, or R_1 and R_2 collectively are isopropylidenedioxy; and R_3 is hydrocarbon of 1–12 carbon atoms.

7. A method for the treatment of an allergic disease of the respiratory passage, which comprises administering to the patient by inhalation an effective amount of at least one compounds of the formula



wherein —B—A— is $—CH_2—CH_2—$, —CH=CH— or CCl=CH—; X is a hydrogen atom, a fluorine atom, or methyl; Y is a hydrogen atom, a fluorine atom or a chlorine atom; Z is methylene, hydroxymethylene, fluoromethylene, a chloromethylene, or carbonyl; R_1 is a hydrogen atom or methyl and R_3 is a hydrogen atom, or R_1 and R_2 collectively are isopropylidenedioxy; and R_3 is hydrocarbon of 1–12 carbon atoms.

4,039,669

COMPOSITION FOR TOPICAL APPLICATION AND USE THEREOF

Arthur L. Beyler, North Greenbush, and Richard A. Ferrari, Bethlehem, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Aug. 1, 1975, Ser. No. 601,192
Int. Cl.[2] A61K *31/56*
U.S. Cl. 424—243 **6 Claims**

1. A composition for topical treatment of dermatological conditions associated with androgenic stimulatory influences which comprises an anti-androgenically effective amount of 17α-R-andros-4-en-17β-ol-3-one or a pharmaceutically acceptable ester thereof, where R is n-propyl or n-butyl, in a pharmaceutical formulation suitable for topical application.

4. A method of treating dermatological conditions associated with androgenic stimulatory influences which comprises applying to the affected skin area a composition according to claim **1.**

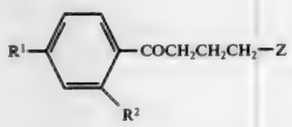
4,039,670

BUTYROPHENONE COMPOUNDS AS PSYCHOTROPICS

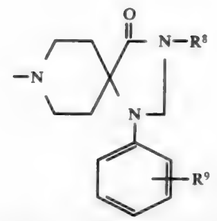
Kikuo Sasajima, Toyonaka; Keiichi Ono, Nishinomiya; Masaru Nakao, Toyonaka, and Hisao Yamamoto, Higashinada, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Apr. 17, 1975, Ser. No. 568,819
Claims priority, application Japan, Apr. 18, 1974, 49-44181
Int. Cl.[2] C07D *487/10;* **A01N** *9/22*
U.S. Cl. 424—267 **7 Claims**

1. A compound of the formula:



wherein R^1 is a halogen atom, R^2 is a lower alkyl group and Z is a group of the formula:



wherein R^8 is a hydrogen atom or a lower alkyl group and R^9 is a hydrogen atom, a halogen atom, a lower alkyl group or a lower alkoxy group, or a pharmaceutically acceptable acid addition salt thereof.

7. A neuroleptic and analgesic composition comprising an effective neuroleptic and analgesic amount of the compound of claim **1** or a pharmaceutically acceptable acid addition salt thereof, and at least one pharmaceutically acceptable diluent or carrier.

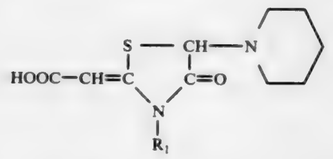
4,039,671

METHOD FOR PRODUCING DIURESIS BY ADMINISTERING CERTAIN THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg (Brsg), all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 553,715, Feb. 27, 1975, Pat. No. 3,971,794.
This application Mar. 18, 1976, Ser. No. 668,158
Claims priority, application Germany, Mar. 25, 1974, 2414345
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 **6 Claims**

1. A method for producing diuresis in a mammal which comprises the administration of a compound of the formula:



wherein R_1 is lower alkyl containing 1 to 4 carbon atoms in an effective amount to cause diuresis.

4,039,672

N-(1′-ALLYPYRROLIDINYL 2′-METHYL) 2-METHOXY 4,5-AZIMIDO BENZAMIDE AND ITS PHARMACEUTICALLY ACCEPTABLE SALTS

Gerard Bulteau, Paris; Jacques Acher, Itteville; Claude Colignon, Saint Remy-les-Chevreuses, and Jean-Claude Monier, Lardy, all of France, assignors to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France, Paris, France

Filed Mar. 3, 1975, Ser. No. 554,612
Claims priority, application Germany, Jan. 11, 1975, 2500919; France, Jan. 31, 1975, 75.3005
Int. Cl.[2] C07D *249/18;* **A61K** *31/41*
U.S. Cl. 424—269 **5 Claims**

1. A compound selected from the class consisting of N-(1′-allylpyrrolidinyl-2′-methyl)-2-methoxy-4,5-azimidobenzamide, pharmaceutically acceptable acid addition salts thereof and pharmaceutically acceptable quaternary ammonium salts thereof.

4. A method of protecting a mammal against emesis which comprises administering to said mammal an anti-emesis effective amount of a compound of claim **1.**

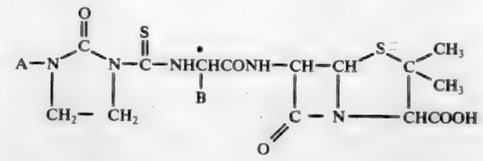
4,039,673

PENICILLINS AND CEPHALOSPORINS AND THEIR PRODUCTION

Hans-Bodo König; Karl Georg Metzger, and Wilfried Schröck, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Division of Ser. No. 518,178, Oct. 25, 1974, Pat. No. 3,966,709.
This application Dec. 22, 1975, Ser. No. 643,550
Claims priority, application Germany, Oct. 30, 1973, 2354219
Int. Cl.[2] A61K *31/43*
U.S. Cl. 424—271 **12 Claims**

8. The method of combatting bacterial infections in humans and other animals which comprises administering to said human or other animal an antibacterially effective amount of a compound selected from the group consisting of a 2-oxoimidazolidine of the formula:



and the pharmaceutically acceptable salts thereof wherein the carbon atom designated C* constitutes a center of chirality;

A is hydrogen or alkyl of 1 to 4 carbon atoms; and

B is phenyl, methylphenyl, chlorophenyl, hydroxyphenyl or cyclohexa-1,4-dien-1-yl.

4,039,674

3-(3-METHYL-2-OCTYL)-1-[4-(1-HOMOPIPERIDINE)-BUTYRYLOXY]-6,6,9-TRIMETHYL-7,8,9,10-TETRAHYDRO-6H-DIBENZO [b,d]PYRAN HYDROCHLORIDE AS AN ANTICONVULSANT AGENT

Nicholas Peter Plotnikoff, Lake Bluff, and Harold Elmer Zaugg, Lake Forest, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 15, 1976, Ser. No. 677,099
Int. Cl.[2] A61K *31/35*
U.S. Cl. 424—283 **2 Claims**

1. A method of preventing and/or controlling convulsions in a mammalian patient comprising administering a therapeutically effective dosage to a patient in need of such treatment orally of 3-(3-methyl-2-octyl)-[4-(1-homopiperidine)butyryloxy]-6,6,9- trimethyl-7,8,9,10-tetrahydro-6H-dibenzo[b,d]pyran hydrochloride.

4,039,675

α,α-DIALKYL-SUBSTITUTED 3-PYRIDINEMETHANOLS AS FUNGICIDAL AGENTS

Eriks V. Krumkalns, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 289,530, Sept. 15, 1972, abandoned, which is a continuation-in-part of Ser. No. 14,223, Feb. 25, 1970, abandoned, which is a continuation-in-part of Ser. No. 609,000, Jan. 13, 1967, abandoned. This application Apr. 16, 1973, Ser. No. 351,675
Int. Cl.[2] A01N *9/22;* **C07D** *213/02*
U.S. Cl. 424—263 **4 Claims**

1. A method for controlling plant pathogenic fungi which comprises applying to the locus of the fungi a fungicidally-effective amount of α,α-bis(n-pentyl)-3-pyridinemethanol.

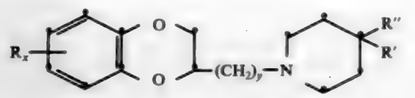
4,039,676

2-PIPERIDINOALKYL-1,4-BENZODIOXANS

Charles Ferdinand Huebner, Chatham, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed June 23, 1975, Ser. No. 589,118
Int. Cl.[2] C07D *405/06*
U.S. Cl. 424—267 **5 Claims**

1. A compound corresponding to the formula



wherein R is hydrogen, methyl, ethyl, methoxy, ethoxy, methylmercapto, ethylmercapto, fluoro, chloro or trifluoromethyl, *x* is the integer 1 or 2, *y* is the integer 2 or 3, R″ is hydroxy or alkanoyloxy with 2 to 12 carbon atoms, and R′ is 2-, 3-, or 4-pyridyl; or a therapeutically acceptable acid addition salt thereof.

4. A neuroleptic or analgetic pharmaceutical composition comprising a neuroleptically or analgetically effective amount of a compound claimed in claim **1**, together with a pharmaceutical excipient.

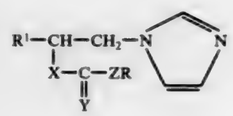
4,039,677

NOVEL 1-PHENETHYLIMIDAZOLES

Keith A. M. Walker, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 1, 1976, Ser. No. 662,784
Int. Cl.[2] A61K *31/415*; C07D *233/60*
U.S. Cl. 424—273 **37 Claims**

1. A compound selected from those represented by the formula



wherein

R is alkyl of 1 to 12 carbon atoms, phenylalkenyl, cycloalkyl, cycloalkyl lower alkyl, phenylalkyl, or phenyl, said phenyl, phenylalkyl, and phenylalkenyl each being independently optionally substituted with at least one substituent on the phenyl moiety selected from the group consisting of halo, lower alkyl, and trifluoromethyl;

R[1] is phenyl optionally substituted with at least one substituent chosen from the group consisting of halo, lower-alkyl and trifluoromethyl; and

X, Y and Z are independently sulfur or oxygen and the antimicrobial acid addition salts thereof or a composition containing same as active ingredient.

4,039,678

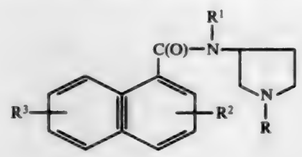
N-(SUBSTITUTED-3-PYRROLIDINYL)-1-NAPHTHALENE CARBOXAMIDES

Albert Duncan Cale, Jr., Mechanicsville, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Division of Ser. No. 536,514, Dec. 26, 1974, Pat. No. 4,002,757.
This application May 5, 1976, Ser. No. 683,603
Int. Cl.[2] A61K *33/40*
U.S. Cl. 424—274 **12 Claims**

1. A therapeutic composition suitable for control of emesis comprising

1. an effective anti-emetic amount of between 1.0 and 100 mg. of an anti-emetic compound having the formula:



wherein;

R is lower cycloalkyl,

R[1] is selected from the group consisting of hydrogen, lower-alkyl, phenyl or substituted phenyl wherein the substituents are selected from halogen atoms of atomic weight less than 80, nitro, lower-alkyl, lower-alkoxy, trifluoromethyl and amino,

R[2] is selected from the group consisting of hydrogen, lower-alkyl, halogen of atomic weight less than 80, lower-alkoxy, amino or nitro,

R[3] is selected from the group consisting of hydrogen, lower-alkyl, lower-alkoxy, halogen atom of atomic weight less than 80, amino or nitro, and

pharmaceutically acceptable salts thereof, and

2. a pharmaceutically acceptable carrier therefor.

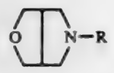
4,039,679

TREATMENT OF INCREASED BODY TEMPERATURE WITH SUBSTITUTED HEXAHYDRO-1H-FURO(3,4-C)PYRROLE COMPOUNDS

Alfred D. Miller, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

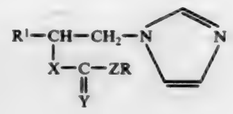
Continuation-in-part of Ser. No. 566,418, April 9, 1975, Pat. No. 3,975,532, which is a division of Ser. No. 370,010, June 14, 1973, Pat. No. 3,910,950. This application Mar. 9, 1976, Ser. No. 665,302
Int. Cl.[2] A61K *31/40*
U.S. Cl. 424—274 **10 Claims**

1. A method for the treatment of an animal suffering from an elevated body temperature comprising administering to said animal a therapeutically effective amount for antipyritic effect of a compound of the formula



wherein R is phenyl; benzoyl; thenoyl; naphthoyl; phenylacetyl; mono-, di- or tri-halogen substituted benzoyl where the halogen substitution is on the phenyl ring; mono-, di- or tri-halogen substituted phenylacetyl where the halogen substitution is on the phenyl ring; phenylalkyl where the alkyl group contains from 1 to 4 carbon atoms; mono-, di- or tri-halogen substituted phenylalkyl where the alkyl group contains from 1 to 4 carbon atoms and the halogen is substituted on the phenyl ring and the pharmacologically acceptable acid addition salt thereof.

36. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to the host object containing, or subject to attack by, fungi, bacteria or protozoa, a fungicidally, bactericidally or protozoicidally effective amount of a compound represented by the formula



wherein

R is alkyl of 1 to 12 carbon atoms, phenylalkenyl, cycloalkyl, cycloalkyl lower alkyl, phenylalkyl, or phenyl, said phenyl, phenylalkyl, and phenylalkenyl each being independently optionally substituted with at least one substitu-

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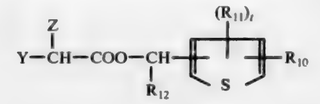
4,039,680

INSECTICIDAL SUBSTITUTED ACETATE COMPOUNDS

Keimei Fujimoto, Kobe; Nobuo Ohno, Toyonaka; Yoshitoshi Okuno, Toyonaka; Toshio Mizutani, Toyonaka; Isao Ohno, Minoo; Masachika Hirano, Toyonaka; Nobushige Itaya, Ikeda, and Takashi Matsuo, Amagasaki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

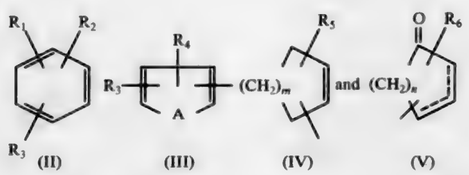
Division of Ser. No. 378,301, July 11, 1973, Pat. No. 3,996,244.
This application July 16, 1975, Ser. No. 596,335
Claims priority, application Japan, July 11, 1972, 47-69805
Int. Cl.[2] A01N *9/00*
U.S. Cl. 424—275 **5 Claims**

1. A substituted acetate compound of the formula



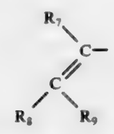
(I)

wherein Y is selected from the group consisting of the formulae:



(II) (III) (IV) (V)

in which R_1 and R_2 are individually hydrogen, halogen, cyano, nitro, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxyalkyl. halogen-substituted lower alkyl, halogen-substituted lower alkenyl, halogen-substituted lower alkynyl, lower alkylthio, lower alkylsulfoxyl, C_2-C_4 alkanoyl, C_2 alkanoyloxy, lower alkoxycarbonyl, lower alkenyloxycarbonyl, lower alkynyloxcarbonyl, methylenedioxy, tetramethylene or trimethylene group; R_3 and R_4 are individually hydrogen, halogen, cyano, nitro, lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, lower alkoxyalkyl, halogen-substituted lower aikyl, halogen-substituted lower alkenyl, halogen-substituted lower alkynyl, lower alkylthio, lower alkylsulfoxyl, C_2-C_4 alkanoyl, lower alkoxycarbonyl, lower alkenyloxycarbonyl or lower alkynyloxycarbonyl group; A represents an oxygen atom or a sulfur atom; R_5 represents hydrogen, halogen, cyano, nitro or lower alkyl group; m is an integer of from 1 to 3; R_6 represents hydrogen, halogen, cyano, nitro or lower alkyl group; n is an integer of from 1 to 3, and the dotted line in the formula (V) represents a double bond present at a position conjugated or non-conjugated with the ketone (C=O), or Y represents a substituted ethylene group of the formula (VI)



(VI)

in which R_7, R_8 and R_9 constitutes a plane together with the double bond at β-γ position of the ester group, and are individually hydrogen, lower alkyl, lower alkenyl, lower alkynyl or halogen, Z represents a straight or branched lower alkyl, lower alkenyl, lower alkynyl, lower alkoxy, cyano, halogen-substituted lower alkyl, halogen-substituted lower alkenyl group or an alicyclic group having 3 to 7 carbon atoms; in which R_{10} represents an allyl, propargyl, benzyl, thenyl. furylmethyl, phenoxy or phenylthio group; R_{11} represents hydrogen, methyl, trifluoromethyl or halogen R_{10} and R_{11} may, when they are bonded to each other at terminals, form a trimethylene or tetramethylene group; R_{12} represents hydrogen, ethynyl or cyano; *t* is an integer of from 1 to 2.

3. An insecticidal and miticidal composition comprising an insecticidally and miticidally effective amount of at least one substituted acetate compound as defined in claim **1** and an inert carrier.

4,039,681

ZINC METHIONINE COMPLEX FOR ACNE TREATMENT

Mahmoud M. Abdel-Monem, St. Paul, Minn., assignor to Zinpro Corporation, Chaska, Minn.

Continuation-in-part of Ser. No. 390,080, Aug. 20, 1973, Pat. No. 3,941,818. This application Feb. 23, 1976, Ser. No. 660,661
The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.
Int. Cl.[2] A61K *31/315*
U.S. Cl. 424—289 **10 Claims**

1. A composition for treating acne comprising a pharmaceutically acceptable carrier and a small but pharmaceutically effective acne alleviating amount of a 1:1 zinc methionine complexed salt of the formula:

$$[CH_3SCH_2CH_2CH(NH_2)COO.Zn^{++}]_wX$$

wherein X is a non-toxic anion which has no inhibiting effect on the therapeutic effectiveness of said 1:1 zinc methionine complex, and W is an integer equal to the anionic charge of X.

4,039,682

METHOD AND COMPOSITION FOR RELIEF OF BACK PAIN

Robert K. Ausman, Long Grove, and Ivan J. Stern, Morton Grove, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Mar. 29, 1976, Ser. No. 671,470
Int. Cl.[2] A61K *31/195*
U.S. Cl. 424—319 **16 Claims**

1. The method of relieving back pain and related symptoms which comprises injecting into an intervertebral disk of the back a formulation which comprises an effective dosage in aqueous solution of cysteine, said formulation being free of proteolytic enzymes and having a generally neutral pH.

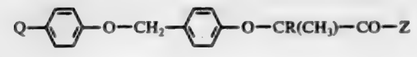
4,039,683

PHENOXYPROPIONIC ACID DERIVATIVES AND PHARMACEUTICAL PREPARATIONS CONTAINING SAME

Erich Schacht; Gunter Lauterbach; Werner Mehrhof; Herbert Nowak, and Zdenek Simane, all of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschrankter Haftung, Darmstadt, Germany

Division of Ser. No. 497,300, Aug. 14, 1974, Pat. No. 3,968,143.
This application Dec. 24, 1975, Ser. No. 644,033
Claims priority, application Germany, Aug. 21, 1973, 2342118
Int. Cl.[2] A61K *31/165*; C07C *103/75*
U.S. Cl. 424—324 **6 Claims**

1. A phenoxypropionic acid derivative of the formula



wherein Q is H or halogen, R is H or CH_3, and Z is $NHCH_2CH_2OH$.

5. A pharmaceutical composition comprising a cholesterol and triglyceride blood-level-lowering amount per unit dosage of a compound of claim **1** in admixture with a pharmaceutically acceptable carrier.

4,039,684

METHOD FOR TREATMENT OF *CANINE SEBORRHEA*

Robert N. Berkman, Cranford, and Jesse W. Houdeshell, Scotch Plains, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Mar. 25, 1976, Ser. No. 670,337
Int. Cl.[2] A61K *31/165*
U.S. Cl. 424—324 **5 Claims**

1. A method of treating *Canine seborrhea* comprising the step of orally administering to a dog afflicted therewith an effective amount of a compound selected from the class consisting of 4-nitro-3-trifluoromethylisobutyranilide and 4'-nitro-3'trifluoromethyl 2-hydroxyisobutyranilide.

4,039,685

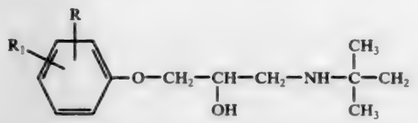
1-PHENOXY-2-HYDROXY-3-TERT.-BUTYLAMINO PROPANE ANTIARRHYTHMIC COMPOUNDS

Herbert Köppe, Ingleheimam Rhein; Albrecht Engelhardt, Mainz, and Karl Zeile, Ingelheimam Rhein, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheimam Rhein, Germany

Continuation-in-part of Ser. No. 53,015, July 7, 1970, abandoned, which is a continuation-in-part of Ser. No. 700,376, Jan. 25, 1968, Pat. No. 3,541,130. This application Apr. 25, 1975, Ser. No. 571,790

Claims priority, application Germany, Feb. 6, 1967, 91070; June 15, 1967, 93025; June 15, 1967, 27645/67
Int. Cl.[2] A61K *31/135*; C07C *93/06*
U.S. Cl. 424—330 **6 Claims**

1. A compound selected from the group consisting of racemates of 1-phenoxy-2-hydroxy-3-tert.-butylamino propanes of the formula



where R is alkynyloxy of 2 to 4 carbon atoms, R_1 is selected from the group consisting of hydrogen, halogen and alkoxy of 1 to 4 carbon atoms, their optically active isomers and their non-toxic, pharmaceutically acceptable acid addition salts of said racemates and said optically active isomers.

5. A method of inducing antiarrhythmic acitivity in warm-blooded animals comprising administering to warm-blooded animals an antiarrhythmically effective amount of a compound of claim **1**.

4,039,686

MANGE CURE

Patricia Deeter, 103 Woodlawn Place, Marion, Ill. 62959

Filed May 10, 1976, Ser. No. 684,545
Int. Cl.[2] A61K *31/02*
U.S. Cl. 424—350 **4 Claims**

1. A method for treating mange by applying an effective amount of methylene chloride to the affected areas of the patient.

4,039,687

ANIMAL FOOD

Hendrik Frans Weyn, Le Chesnay, France, assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 502,524, Sept. 3, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 665,071

Claims priority, application France, Sept. 7, 1973, 73.32380
Int. Cl.[2] A23C *9/12*; A23L *1/30*
U.S. Cl. 426—62 **2 Claims**

1. An animal food containing synthetic protein comprising the following ingredients:

	% by Weight
Candida lipolytica yeast	32.1
Beef tallow	7.0
Steamed bone meal	1.0
Lactic acid (85%)	1.4
Whey (27% solids)	31.0
Molasses	3.0
Wheat germ	7.85
Rolled oats	7.0
Dried brewers'yeast	5.0
Nutritional supplements and flavoring	4.65.

4,039,688

CENTERFILLED FOOD BAR

James Roger Hayward, McHenry; William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 2, 1976, Ser. No. 654,370
Int. Cl.[2] A23J *3/00*; A23G *3/00*; A23C *19/12*
U.S. Cl. 426—92 **13 Claims**

1. A high protein flavored food product comprising: an outer shell; and an inner filling; said outer shell comprising marshmallow supplemented with a high protein ingredient having reduced water binding capability and being selected from the group consisting of heat treated protein, fat coated protein and combinations thereof, said high protein ingredient having a protein content of at least 30% by weight, said protein supplemented marshmallow having a density between 111–119 oz. per gallon, said marshmallow being below 2% by weight in reducing sugars; said inner filling comprising an intermediate moisture food product having a moisture content between 15 and 45% by weight, and a water activity coefficient below 0.85.

4,039,689

SOFT DRY PET FOOD PRODUCT AND PROCESS

David P. Bone, Palatine, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 3, 1976, Ser. No. 654,931
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—99 **32 Claims**

1. A soft, dry pet food containing up to 15 percent moisture comprising:

a. about 20 percent to about 40 percent of a starch-derived polysaccharide having a dextrose equivalent of 6–35;
b. about 3 percent to about 12 percent of polyhydric plasticizing agent having humectant capabilities;
c. about 0.01 percent to about 0.2 percent of a mold inhibitor;
d. from a trace to about 18 percent of a meat and bone meal;
e. 0 to about 5 percent of a calcium phosphorus source;
f. 0 to about 5 percent of an emulsifying agent; and
g. from a trace to about 40 percent of a vegetable protein source.

all percentages being based on the total weight of the pet food.

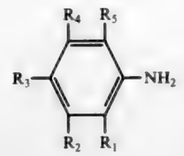
4,039,690

CONTROL OF NITROSAMINE FORMATION IN NITRITE CURED MEAT BY USE OF AROMATIC PRIMARY AMINES

Kekhusroo R. Bharucha; Leon J. Rubin, both of Toronto, and Charles K. Cross, Rexdale, all of Canada, assignors to Canada Packers Limited, Toronto, Canada

Filed Oct. 2, 1975, Ser. No. 619,067
Int. Cl.[2] A23B *4/02*; A23L *1/31*
U.S. Cl. 426—266 **20 Claims**

1. A meat treating composition comprising a solution or dispersion of an aromatic primary amine in a nitrite-containing meat curing solution, said aromatic primary amine having the formula:



I

wherein

R_1, R_2, R_3, R_4 and R_5 are each selected from:

a. hydrogen,
b. hydrocarbon of one to eighteen carbon atoms,
c. $—OR_6$ where R_6 is hydrogen or hydrocarbon as defined above,

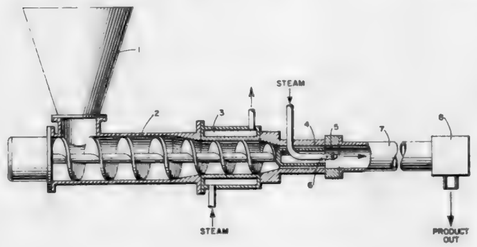
or two adjacent members R_1, R_2, R_3, R_4 and R_5 are cyclized to form the group $(CH_2)_n$ where n is 3 to 5, and said aromatic primary amine being effective to reduce the nitrosamine content of nitrite cured meat treated by said composition when cooked at frying temperature.

4,039,691

PROTEIN TEXTURIZATION BY EXTRUSION WITH INTERNAL STEAM INJECTION

William M. Hildebolt, Mickleton, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,614
Int. Cl.[2] A23J *1/00*
U.S. Cl. 426—511 **13 Claims**



1. A method for producing texturized protein in the form of irregularly shaped pieces of puffy, randomly texturized protein, said method comprising:

a. mixing dry untextured protein material and water to form a dough, said dough containing from about 40 up to about 60% solids;
b. advancing said dough to a tubular shaped extrusion die at a temperature below that at which texturization takes place,
c. continuously extruding said dough in the form of a hollow tubular shell of protein material at a temperature below that at which texturization occurs;
d. passing said extruded tubular shell into a confined treating zone while simultaneously injecting a heated gaseous stream into the interior of said shell, said gaseous stream blowing said shell into discrete pieces of irregularly shaped protein material and randomly texturizing said protein material, and said gaseous stream further propelling said discrete pieces of protein through said confined zone and further texturizing said protein material, said gaseous stream being at a pressure sufficient to perform said blowing said shell into discrete pieces of irregularly shaped protein material and randomly texturizing said protein material, and being at a temperature sufficient to further texturize said protein pieces as they are propelled through said confined zone;
e. passing said texturized protein pieces through means for maintaining back pressure disposed at the discharge end of said confined treating zone; and
f. recovering said texturized protein pieces.

4,039,692

INTERMEDIATE-MOISTURE ANIMAL FOOD PROCESS

Edward Einar Clausen, Armonk, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed Nov. 1, 1974, Ser. No. 519,903
Int. Cl.[2] A23K *1/10*; A23B *4/14*
U.S. Cl. 426—532 **13 Claims**

1. A process for preparing a shelf-stable intermediate-moisture animal food product comprising forming a mixture comprised of uncooked proteinaceous meaty material, an edible antimicrobial agent or agents, and sufficient water soluble solutes to impart bacteriostasis to said mixture, the moisture content of said mixture being between 15 to 60% by weight, the A_w of said mixture being below about 0.92, forming said mixture into a desired shape, and deep fat frying said mixture in fat at a temperature of from 250° F to 350° F for a period of time sufficient to raise the product to a temperature in excess of 140° F.

4,039,693

PROCESS FOR PREPARING FLAVORED ICE DRINK

Donald James Adams, Rushden, England; Horst Kieninger, Hamburg, Germany; John Richard Ravenhill, Stevenage, England; Dieter Ries, and Karin Schmeling, both of Hamburg, Germany, assignors to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Filed May 30, 1975, Ser. No. 582,435

Claims priority, application United Kingdom, May 31, 1974, 24273/74; May 31, 1974, 24274/74; Oct. 3, 1974, 42984/74; Oct. 3, 1974, 42985/74
Int. Cl.[2] A23G *9/00*
U.S. Cl. 426—565 **9 Claims**

1. In a process for preparing a cold flavored drink by adding an aqueous liquid to a frozen flavored concentrate, the improvement which comprises utilizing as the frozen flavored concentrate an ice confection having an overrun in the range 165% to 250%, containing, by weight, not more than 1% emulsified fat, less than 0.5% protein, from 25% to 40% of sugar and from 0.04% to 0.07% of a stabilizer.

4,039,694

PROCESS FOR PRODUCING A PROTEIN-BASED FOOD

Claude Giddey, and Willy Rufer, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Continuation-in-part of Ser. No. 576,421, May 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 277,589, Aug. 2, 1972, abandoned. This application Aug. 2, 1976, Ser. No. 711,087

Claims priority, application Switzerland, Aug. 3, 1971, 11362/71
Int. Cl.[2] A23J *3/00*
U.S. Cl. 426—574 **7 Claims**

1. A process for producing a protein-based food product comprising the steps of:

a. forming a homogeneous mixture consisting essentially of

an aqueous suspension of at least one isolated vegetable protein and of at least one other ingredient, selected from carbohydrates and lipides, and adjusting the amounts of the ingredients of said mixture to, respectively, from 15 percent to 30 percent by weight of isolated vegetable protein, at most 15 percent by weight of carbohydrate and at most 20 percent by weight of lipide, the total amount of carbohydrate and lipide being between 5 percent and 35 percent, and from 35 to 80 percent by weight of water, and the pH of the mixture to a value between 5.7 and 6.4, so as to form a homogeneous heat gelable mass,

b. heating said mass to a temperature in the range from 60° C to 160° C, for a period of time sufficient to coagulate the isolated vegetable protein, so as to transform the mass into a homogeneous gel and,

c. reducing the water content of the thus obtained homogeneous gel to between 15 percent and 35 percent by weight, such that the ratio of the water content of the final product to the water content of the starting mixture is between about 1:4.1 to about 1:2.7, the water content being reduced at a sufficient rate to provoke the formation of cracks in said gel so as to confer to the final product an appearance and texture analogous to the fibrous texture of dried meat.

4,039,695

COMPACTED GRATED CHEESE

John D. Johnson, Evanston, Ill., assignor to Kraftco Corporation, Glenview, Ill.

Filed Oct. 28, 1975, Ser. No. 625,929
Int. Cl.² A23C *19/14;* A01J *27/00*
U.S. Cl. 426—582 **8 Claims**

1. A method for treating hard grating cheese consisting essentially of comminuting a hard grating cheese to provide grated cheese particles, less than about 10 percent of said cheese particles having a size greater than about 2 mm and at least about 70 percent of the particles have a size less than about 1 mm and said grated cheese particles having a length to width ratio of less than about 3:1, said cheese particles having a moisture content in the range of from about 30 to about 34 percent by weight and a fat content, dry basis, of from about 30 to about 42 percent by weight and subjecting said grated cheese particles to pressure by placing said grated cheese particles in a die and compressing said grated cheese at a pressure of from about 30 to about 500 psig to form a cheese compact which can be easily crumbled by hand to provide a grated cheese product.

4,039,696

SOY LIPID-PROTEIN CONCENTRATE

Robert P. Marquardt, Danville, Calif.; Grant H. Hartman, Jr., and Kenneth C. Goodnight, Jr., both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Apr. 2, 1976, Ser. No. 673,165
Int. Cl.² A23C *11/00*
U.S. Cl. 426—598 **28 Claims**

1. A process for preparing a soybean lipid-protein concentrate for food use which comprises blanching whole soybeans by heating in dilute aqueous alkali near the boiling point for a period sufficient to inactivate lipoxygenase activity, grinding blanched soybeans in water to form a comminuted soybean slurry homogenizing said slurry to afford a homogenized suspension having a maximum suspended particle dimension of 100μ, and fractionating resulting suspension by centrifugation into a light liquid stream constituting a primary concentrate and a viscous sludge wherein the centrifugation conditions including G force, percent solids in feed suspension, and feed rate are selected so that resulting sludge contains from 20% to 60% by weight of the carbohydrate contained in said raw soybeans said primary concentrate constituting desired soybean lipid-protein concentrate suitable for food use.

4,039,697

PROCESS FOR FORMING A FILM COMPOSED OF PLASTIC-COATED INORGANIC POWDER PARTICLES

Kazuo Isawa; Masatsugu Maejima, both of Tokyo, and Hideo Nagasaka, Hitachi, all of Japan, assignors to The Fujikura Cable Works, Ltd., Tokyo, Japan

Filed Aug. 21, 1974, Ser. No. 499,157
Claims priority, application Japan, Aug. 27, 1973, 48-95924
Int. Cl.² C25D *13/20;* B05D *1/06*
U.S. Cl. 427—27 **11 Claims**

1. A process of forming a uniform film at least 200 μ thick on a substrate which comprises surface-treating an inorganic substance having a particle size range from 0.1 to 500 microns with a surface-treating agent to render its surface compatible with plastics, said surface-treating agent being selected from the group consisting of stearic acid, palmitic acid, gamma-methacryloxypropyltrimethoxy silane, gammaglycidoxy-propyltrimethoxy saline, and beta-ethyltrimethoxy silane, coating each surface-treated particles with plastic in an amount equal to 1 to 15% by weight of the particle, drying the coated particles, applying said dried coated particles to the substrate, and heating and fixing the layer thus provided on the substrate surface at a temperature between the melting point and the volatilizing point of the plastic.

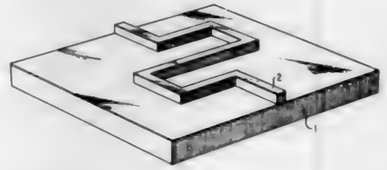
7. The process according to claim **1** wherein the application of the plastic-coated inorganic particles to the substrate is conducted by fluidized bed coating.

4,039,698

METHOD FOR MAKING PATTERNED PLATINUM METALLIZATION

David Bruce Fraser, and Alfred Urquhart MacRae, both of Berkeley Heights, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 23, 1976, Ser. No. 651,641
Int. Cl.² H05K *1/00*
U.S. Cl. 427—34 **10 Claims**



1. A method for making a patterned layer of platinum metal on a substrate comprising the steps of depositing on said substrate a first layer, depositing on said first layer and a second layer of a resist material, patterning said second layer by selectively removing portions of said resist material and thereby exposing portions of said first layer, patterning said first layer by physically removing the exposed portions of said first layer, and removing the remaining portions of said second layer CHARACTERIZED IN THAT (1) said first layer is platinum oxide and (2) after removing the exposed portions of said first layer the remaining portions of said first layer are heat reduced to platinum metal.

4,039,699

METHOD FOR MAKING PHOSPHORS

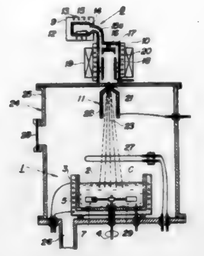
Kiyoshi Morimoto; Yukihiko Utamura, both of Mobara, and Toshinori Takagi, Nagaokakyo, all of Japan, assignors to Futaba Denshi Kogyo K.K., Japan

Division of Ser. No. 552,607, Feb. 24, 1975, Pat. No. 3,967,125.
This application Feb. 27, 1976, Ser. No. 661,860
Claims priority, application Japan, Feb. 22, 1974, 49-20457
Int. Cl.² B05D *3/06*
U.S. Cl. 427—38 **2 Claims**

1. A method of preparing a phosphor by injection of activator ions, which become luminescent centers, into crystals of a base material of said phosphor disposed within a container, comprising the steps of:

generating activator ions;

accelerating said activator ions by giving kinetic energy thereto;



irradiating and injecting said accelerated activator ions onto the surface of and into said base material; and

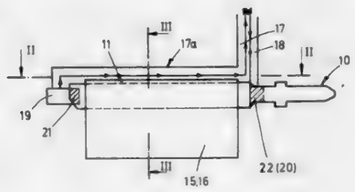
agitating said base material during irradiation and injection thereinto of said activator ions such that the surface and bottom portions of said base material are circulated and mixed, and thereby interchanged whereby said actuator ions are uniformly injected throughout said base material.

4,039,700

HARD METAL COATING PROCESS FOR METAL OBJECTS

Oskar Sohmer, Stuttgart; Heinz Autenrieth, Korntal, and Kuno Kirner, Gerlingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Apr. 23, 1974, Ser. No. 463,255
Claims priority, application Germany, May 9, 1973, 2323242
Int. Cl.² B05D *3/02, 3/14, 1/34, 1/36*
U.S. Cl. 427—46 **12 Claims**



1. A process for the production of a wear-resistant hard metal layer on a steel saw blade, consisting essentially of the steps of:

depositing a powdered binder metal **(13)** and granules of hard metal **(14)**, in the absence of fluxing medium, edgewise on a steel blade to be coated, thereafter heating the steel blade in a protective gas atmosphere in the continued absence of fluxing medium by causing high-frequency electric current to flow in a circuit of which said blade forms a part of the current path and which contains a linear return conductor disposed parallel to the edge of the blade to be coated and having one end thereof connected to an end of the blade, so as to provide an induction loop together with said blade in which current is returned from said blade on a path facing the portion of said blade on which said binder metal and said granules are deposited, whereby said current is concentrated in said portion of said blade, until the binder metal melts, and then interrupting the flow of said high-frequency current, whereby hard metal granules are brazed onto said blade along its edge.

4,039,701

METHOD OF METALLIZING A SCREEN HAVING A LUMINESCENT LAYER

Harm Gerrit Benthem, and Cornelis van Straten, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 293,118, Sept. 28, 1972, abandoned.
This application July 21, 1975, Ser. No. 597,425
Claims priority, application Netherlands, Oct. 2, 1971, 7113565
Int. Cl.² B05D *5/06*
U.S. Cl. 427—69 **2 Claims**

1. A method of metallizing a screen having a luminescent layer, comprising the steps of providing on said luminescent layer a film that can be fired, roughening parts of said film extending beyond said luminescent layer by blasting with a fine granular material, then metallizing by vapour deposition said film and firing said film so as to remove substantially said film.

4,039,702

METHOD FOR SETTLING A GLASS SUSPENSION USING PREFERENTIAL POLAR ADSORBTION

Raymond DiBugnara, Huntington Beach, and Richard Allison, Los Angeles, both of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed Jan. 13, 1975, Ser. No. 540,410
Int. Cl.² B05D *5/12*
U.S. Cl. 427—93 **11 Claims**



1. A method for forming a glass film on an object comprising:

covering said object with a dielectric fluid containing a suspension of glass particles, said dielectric fluid being combined with a preferentially adsorbed substance, said particles being covered by an adsorbed layer of said preferentially adsorbed substance;

disposing said suspended glass particles onto said object;

removing said article with substantially all of said disposed glass particles thereon from said dielectric fluid; and

heating said article and said disposed glass to the flow point temperature of said glass of said suspended particles until said glass particles disposed on said object are substantially fused together to form an integral glass film wherein said preferentially adsorbed substance is an aqueous solution selected from the group consisting of hydrogen peroxide, and hydrogen chloride.

4,039,703

METHOD FOR PRODUCING A TUBULAR MULTI-LAYERED POROUS BARRIER

Eiji Kamijo; Tatsuya Nishimoto, and Masaaki Honda, all of Itami, Japan, assignors to Sumitomo Electric Industries, Ltd., Itami, Japan

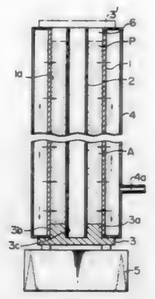
Filed Oct. 30, 1974, Ser. No. 519,215
Claims priority, application Japan, Nov. 13, 1973, 48-126749; Nov. 13, 1973, 48-126752; Nov. 13, 1973, 48-126753; May 14, 1974, 49-54123
Int. Cl.² B05D *7/22;* B22F *3/06;* B01D *13/04*
U.S. Cl. 427—183 **12 Claims**

1. A method for producing a tubular multi-layered porous barrier comprising the steps:

depositing a fine powder selected from the group consisting of a metal, a ceramic or an organic synthetic resin onto the inner surface of a sintered tubular porous support member in a layer of uniform thickness, thereby forming a fine powdered layer, said fine powder deposition step including the steps of:

supplying said fine powder into said porous support member,

spreading said fine powder around the inner surface of said porous support member into a layer of uniform thickness, and



compressing said fine powder layer against said inner surface of said porous support member by centrifugal force while rotating said porous support member, thereby adhering said layer to said support member; and

static pressure compression-forming said powder layer against said support member by applying pressure against said fine powder layer radially and outwardly.

4,039,704

METHOD FOR APPLYING A SEALANT TO CAN ENDS

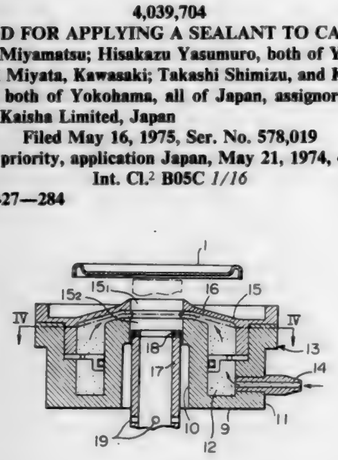
Yasunori Miyamatsu; Hisakazu Yasumuro, both of Yokohama; Kenichi Miyata, Kawasaki; Takashi Shimizu, and Kikuo Matsuoka, both of Yokohama, all of Japan, assignors to Toyo Seikan Kaisha Limited, Japan

Filed May 16, 1975, Ser. No. 578,019

Claims priority, application Japan, May 21, 1974, 49-56103

Int. Cl.² B05C *1/16*

U.S. Cl. 427—284 **4 Claims**



1. A method for applying a sealant to the inside surface of opening portions of a can end having a curled portion for seaming in order to reinforce it and to prevent leakage of the contents of the can, said method comprising the steps of providing an apparatus comprising a vertically movable plunger which has a stamping die fitted to its top so that it faces the inside surface of the opening portions of the can end held at a predetermined position, a chamber surrounding the plunger for accommodating the sealant, a cover for the chamber, a central hole formed in each of the chamber and cover so as to permit the vertical movement of the stamping die and plunger therethrough, and a slit formed between the chamber and the cover so as to surround the die at the upper part of the central holes; extruding a suitable amount of the sealant from the slit to the central holes, lifting the plunger so as to cause the stamping die to push off the extruded sealant, removing the excessive sealant adhering to the periphery of the stamping die by means of the inside wall of the central hole at the cover, and bringing the stamping die into contact with the inside surface of the opening portions of the can end to apply the sealant on the stamping die to the inside surface of the opening portions, with the inside of the plunger at its lower part being brought into communication with the outer atmosphere during the application of the sealant.

4,039,705

ANAEROBIC PRESSURE SENSITIVE ADHESIVE STOCKS

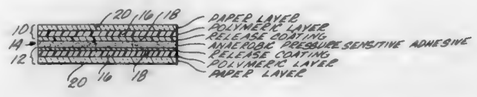
Maurice Douek, Los Angeles; Gustav A. Schmidt, South Pasadena, both of Calif.; Bernard M. Malofsky, Bloomfield, and Martin Hauser, West Hartford, both of Conn., assignors to Avery International Corporation, San Marino, Calif. and Loctite Corporation, Newington, Conn., a part interest to each

Continuation-in-part of Ser. No. 512,940, Oct. 7, 1974, Pat. No. 3,993,815. This application Sept. 13, 1976, Ser. No. 722,872

The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.² B32B *27/26, 27/30*

U.S. Cl. 428—40 **50 Claims**



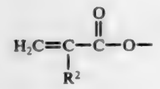
1. An anaerobic pressure sensitive adhesive stock comprising:

a. a first release coating on a self-supporting release liner;

b. a transferable and curable pressure sensitive adhesive layer having one surface in contact with said first release coating, said pressure sensitive adhesive layer comprising:

i. from about 9 to about 95 percent by weight of the layer of a thermoplastic resin system containing at least one thermoplastic polymer selected from the group consisting of vinyl homopolymers, vinyl copolymers, polyurethanes, polyesters, polyamides, acrylic polymers, natural elastomers, and synthetic elastomers;

ii. from about 4 to about 40 percent by weight of the layer of a first anaerobic resin system, containing at least one curable anaerobic resin having a viscosity from about 5 to about 1000 cps at 25° C and a vinyl equivalent number from about 80 to about 2000 and from 0 to about 80 percent by weight of the layer of a second anaerobic resin system containing at least one of a curable anaerobic resin having a viscosity greater than 1000 cps at 25° C, at least one anaerobic resin in the first and second anaerobic resin system containing at least two polymerizable acrylic ester groups, each individually having the formula:



wherein R^2 is a radical selected from the group consisting of hydrogen, halogen and a lower alkyl containing from 1 to about 4 carbon atoms, the said anaerobic resins being present in an amount of from about 4 to about 90 percent by weight of the layer;

iii. from about 0.1 to about 10 percent by weight of the layer of a peroxy initiator to initiate cure of the contained anaerobic resins upon the substantial exclusion of oxygen; and

iv. from 0 to about 10 percent by weight of the layer of an organonitrogen compound as a latent accelerator in the cure of the contained anaerobic resins, and

said pressure sensitive adhesive layer providing a static shear strength of at least 10 minutes at a 250 gram load per 0.25 square inch, a 180° peel valve of at least about 2 pounds; a Polyken tack of at least about 700 gram and a loop tack of at least about 1.5 lbs. per in^2 prior to cure of said anaerobic resin system; and

c. a second release coating on a self-supporting release liner in contact with the opposed surface of said transferable pressure sensitive adhesive layer, the bond of the first release coating to the transferable pressure sensitive adhesive layer being less than the cohesive strength of said pressure sensitive adhesive layer and exceeding the bond of said second release coating for said pressure sensitive adhesive layer to permit the pressure sensitive adhesive layer to be preferentially separated from said second release coating for application and bonding to a substrate prior to separation of the pressure sensitive adhesive layer from said first release coating without cohesive failure of said pressure sensitive adhesive layer.

4,039,706

LAMINATED BITUMINOUS ROOFING MEMBRANE

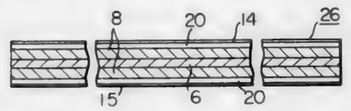
Eiichi Tajima; Kaname Yamamoto, and Takayoshi Imai, all of Tokyo, Japan, assignors to Tajima Roofing Co., Ltd., Tokyo, Japan

Division of Ser. No. 331,602, Feb. 12, 1973, abandoned. This application May 8, 1975, Ser. No. 575,540

Claims priority, application Japan, Feb. 19, 1972, 47-016906

Int. Cl.² B32B *3/00, 11/00;* **E04F** *13/02*

U.S. Cl. 428—40 **17 Claims**



1. A self-adhesive, multi-layer, laminated, bituminous roofing membrane, comprising a flexible base sheet having superposed on the entirety of at least one surface thereof a first coating layer of uniform thickness applied in direct face-to-face, mutually adhering contact therewith, said first coating layer consisting essentially of a substantially solid, waterproofing roofing bitumen; a second coating layer of uniform thickness superposed on said first layer and having its inner surface in direct, face-to-face, mutually cohering contact with the outer surface of said first coating layer, said second coating layer being of lesser thickness than said first coating layer and consisting essentially of a compound bitumen, said compound bitumen consisting essentially of roofing bitumen containing from about 5 to 95 percent by weight of substance selected from the group consisting of rubber, thermoplastic resin and mixtures thereof, said compound bitumen being of high tackiness at ambient temperature and being self-adhesive to the second coating layer of another like roofing membrane; and a flexible release sheet having a release substance in direct face-to-face releasably adhering contact with the entire outer surface of said second coating layer, said release sheet being an exposed outer layer of said roofing membrane, said second layer having been adhered in a molten state to said first surface coating layer.

4,039,707

ARTICLE COMPRISING A SILICONE PRESSURE-SENSITIVE ADHESIVE AND A RELEASABLE ANTI-STICK LAYER AND PROCESS OF USING SAME

William J. O'Malley, Ballston Lake, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 364,246, May 29, 1973, abandoned. This application May 22, 1975, Ser. No. 579,898

Int. Cl.² B32B *13/04;* **C09J** *7/02*

U.S. Cl. 428—40 **27 Claims**

1. An article comprising a unitary coherent backing, an organopolysiloxane pressure-sensitive adhesive layer on at least one side of said backing, and a releasable anti-stick layer comprising a cured reactive terminal group containing dimethylpolysiloxane fluid-coated sheet on the organopolysiloxane pressure-sensitive adhesive, said adhesive comprising the intercondensation product of a mixture containing an organopolysiloxane resinand at least one alkylaryl polysiloxane gum.

4,039,708

COMBINATION BOARD

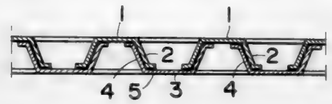
Kikuji Okada, 3-11, 5-chome, Asagayakita, Suginami, Tokyo, Japan

Filed Dec. 27, 1974, Ser. No. 536,866

Claims priority, application Japan, Dec. 28, 1973, 48-144656

Int. Cl.² B65D *5/50;* **B32B** *3/12, 3/28*

U.S. Cl. 428—73 **11 Claims**



1. A combination board comprising an upper board having a plurality of openings therein with downwardly slanted spacer fins extending from said openings and a lower board having a plurality of openings therein with upwardly slanted, matching spacer fins extending from said openings, said fins of the two boards being arranged alternately and joined together back to back to provide an integral structure of repeating trapezoidal shapes in the longitudinal cross section with the openings in said boards being in an alternate arrangement, and said upper or lower boards being constituted of a material selected from the group consisting of cardboard and corrugated board and said combination board is provided with a wax coating for moisture-proof applications.

4,039,709

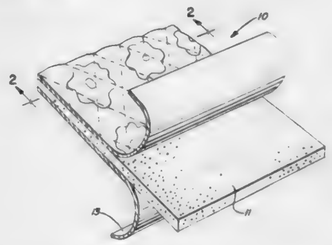
INSULATED WALLPAPER

Arnold H. Newman, Beverly Hills, Calif., assignor to West Coast Quilting Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 455,308, March 27, 1974, abandoned. This application June 4, 1975, Ser. No. 583,673

Int. Cl.² B32B *3/26, 5/18, 7/08, 7/14*

U.S. Cl. 428—159 **7 Claims**



1. an insulating, quilted multilayer wallpaper web which comprises a fire-retardant facing sheet which is a non-woven fabric web containing inherently fire-retardant fibers which do not sustain combustion but which give off a flame-dousing gas when ignited, an intermediate synthetic resin foam insulating layer of microporous structure substantially coextensive with said facing sheet and having one side contiguous to the back side of said facing sheet; and a backing sheet substantially coextensive with said insulating layer and contiguous to the other side of said insulating layer; said facing sheet and said backing sheet being relatively thinner than said insulating layer

and being secured to said insulating layer by intermittent bonding to form a quilted unitary web.

4,039,710

NOVEL RESINOUS MATERIAL

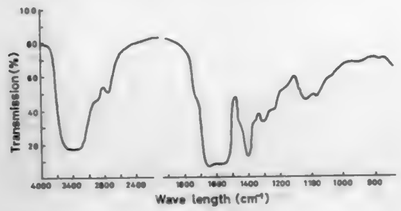
Yasuo Fujimoto, Yokohama; Keizo Tatsukawa, Machida; Koichi Nagaoka, Nishinomiya; Masayuki Nagumo, Tokyo, and Kiichi Nagai, Nagoya, all of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Japan

Division of Ser. No. 292,783, Sept. 27, 1972, Pat. No. 3,945,952. This application Feb. 28, 1975, Ser. No. 553,931

Claims priority, application Japan, Oct. 1, 1971, 46-76254; Jan. 10, 1972, 47-4654

Int. Cl.[2] **B05D** *3/02;* **B32B** *27/38*

U.S. Cl. 428—253 **27 Claims**



1. A method for improving the touch and feel properties of textiles including natural, artificial and synthetic fabrics, knitted goods, thread, yarn, fiber and unwoven cloth comprising:

forming a treating solution of

1. an emulsion containing 0.5 - 20% non-volatile materials obtained by mixing
   - i. a solution containing an epoxy compound and 1 - 20% weight of a surfactant based on said epoxy compound, and
   - ii. an aqueous solution of a water-soluble salt of polyglutamic acid; and
2. 0.1–100% weight of a catalyst based on said epoxy compound in said solution,

impregnating the textile with said treating solution and thereafter heating said textile at 70°–170° C.

4,039,711

NON-WOVEN FABRICS

Nicholas S. Newman, West Newton, Mass., assignor to The Kendall Company, Boston, Mass.

Continuation-in-part of Ser. No. 150,593, June 7, 1971, abandoned. This application May 21, 1973, Ser. No. 362,450

Int. Cl.[2] **B32B** *27/00*

U.S. Cl. 428—286 **4 Claims**

1. A thin nonwoven laminate of high resistance to elongation which comprises:

a spun-bonded web of entangled and interlaced synthetic polymeric continuous filaments, said spun-bonded web being a lightly bonded network of filaments weighing not over 30 grams per square yard and being not more than 10 mils in thickness; and,

a fleece of textile-length staple fibers consisting of thermoplastic and non-thermoplastic fibers being disposed on each face of said spun-bonded web, substantially all of the filaments of said spun-bonded web being bonded to and in bonding contact with said thermoplastic fibers of said fleece.

4,039,712

PROCESS FOR PRODUCING A SOLVENT FOR USE IN MICROCAPSULE FOR PRESSURE-SENSITIVE COPYING PAPER

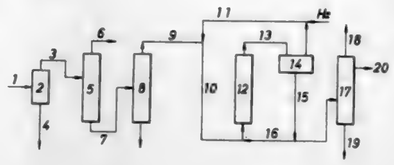
Atsushi Sato, Yokohama, Japan, assignor to Nippon Petrochemicals Company Ltd., Tokyo, Japan

Filed Feb. 24, 1972, Ser. No. 228,957

Claims priority, application Japan, Mar. 2, 1971, 46-10543

Int. Cl.[2] **B41M** *5/16*

U.S. Cl. 428—307 **4 Claims**



1. A pressure-sensitive copying material which comprises a paper sheet coated with microcapsules containing a dye precursor and a solvent for said dye precursor produced by hydrogenating a hydrocarbon mixture having a boiling range of 290° - 400° C., which is obtained as a by-product in the decomposition of a hydrocarbon oil and is rich in polycyclic aromatic hydrocarbon compounds, at a temperature within the range of 100° - 400° C. a pressure of 15–100 kg/cm^2 and a ratio of hydrogen to hydrocarbon mixture of 100–1,0000 m^{3}H$_2$/Kl in the presence of a hydrogenating catalyst capable of catalyzing nuclear hydrogenation so as to hydrogenate the aromatic rings of the compounds which contain at least three aromatic rings and are principal components of said polycyclic aromatic hydrocarbon compounds, leaving at least two aromatic rings therein intact.

4,039,713

FLUOROCARBON PRIMER HAVING IMPROVED SCRATCH RESISTANCE

Eustathios Vassiliou, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed July 31, 1975, Ser. No. 600,576

Int. Cl.[2] **B32B** *19/00;* **C08L** *27/18;* **B32B** *27/00*

U.S. Cl. 428—324 **23 Claims**

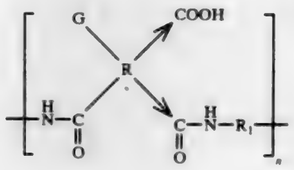
1. A coating composition comprising

a. about 10%–90%, by weight of the total of (a) and (b) solids, of a polymer of monoethylenically unsaturated hydrocarbon monomers completely substituted with fluorine atoms or a combination of fluorine atoms and chlorine atoms, the polymer having a number average molecular weight of at least 20,000;

b. about 10%–90%, by weight of the total of (a) and (b) solids, or a binder which comprises

1. about 5–95% by weight of the total of (1) and (2) solids, of an alkali metal silicate having an alkali metal oxide mol content within the range of from a trace amount to about 20% of the total number of mols alkali metal oxide and silicon dioxide; and

about 5–95%, by weight of the total of (1) and (2) solids, of a salt of polyamide acid represented by the structure



where

G is hydrogen or a carboxyl group;

→ denotes isomerism;

R is a tetravalent organic radical containing at least two carbon atoms, no more than two carbonyl groups of each polyamide acid unit being attached to any one carbon atom of said tetravalent radical;

R_1 is a divalent radical containing at least two carbon atoms, the amide groups of adjacent polyamide acid units each being attached to separate atoms of said divalent radical; and

n is a number large enough to give the polyamide acid an inherent viscosity of at least 0.1, measured as a 0.5% solution in N,N -dimethylacetamide at 30° C., neutralized with a stoichiometric amount of a tertiary amine;

c. about 10–90%, by weight of the polyamide acid amine salt, of N-methyl pyrrolidone, dimethylformamide, dimethylacetamide, dimethylsulfoxide, cresylic acid, sulfolane or formamide;

d. about 0.2–20%, by weight of the total of (a), (b), (c) and (d) solids, of mica particles. mica particles coated with pigment, or metal flake; and

e. a liquid carrier.

12. An article bearing a primer coat of the composition of claim **1**, topcoated with a fused fluoropolymer enamel.

4,039,714

PRETREATMENT OF PLASTIC MATERIALS FOR METAL PLATING

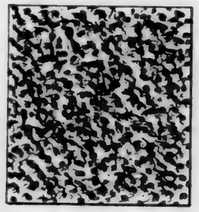
Jiri Roubal, and Joachim Korpiun, both of Geislingen, Steige, Germany, assignors to Dr. -Ing. Max Schloetter, Geislingen, Steige, Germany

Continuation of Ser. No. 256,768, May 25, 1972, abandoned. This application June 11, 1974, Ser. No. 478,276

Claims priority, application Germany, May 28, 1971, 2126781

Int. Cl. B05d *3/04*

U.S. Cl. 428—336 **37 Claims**



1. In a process for metal plating a natural or synthetic resinous material, including the steps of:

a. conditioning the surface of the natural or synthetic resinous material;

b. activating the conditioned surface by providing a noble metal thereon; and

c. depositing a metal coating upon the activated surface from an electroless plating bath, wherein the improvement comprises said conditioning step consisting essentially of exposing the natural or synthetic resinous material to the action of a gaseous sulfur trioxide-containing atmosphere containing between about 1 mg/l and 100%, by volume, of sulfur trioxide for a period of time between about 0.5 seconds and 20 minutes sufficient to condition the surface of the material without substantially physically affecting the material.

4,039,715

TEXTILE TREATING COMPOSITION AND TEXTILE YARN TREATED THEREWITH

Bobby C. Carver, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

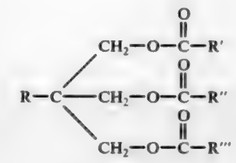
Division of Ser. No. 392,726, Aug. 29, 1973, Pat. No. 3,907,689. This application June 2, 1975, Ser. No. 583,337

Int. Cl.[2] **D02G** *3/00;* **D06M** *13/32*

U.S. Cl. 428—375 **16 Claims**

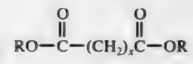
1. Textile yarn comprising a partially oriented thermoplastic fiber having on the surface thereof a textile treating composition which comprises a blend containing:

a. a major amount of an alkylidyne trimethanol ester having the formula

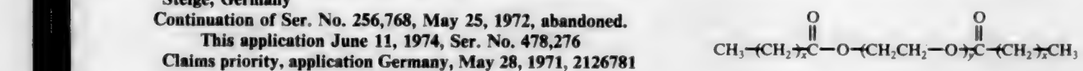


wherein R is H or an alkyl radical having 1 to 12 carbon atoms and R′, R″, and R‴ are selected from the class consisting of saturated alkyl radicals and alkenyl radicals containing from 4 to 14 carbon atoms per radical; and

b. a minor effective amount of at least one member selected from the group consisting of a diester of a dicarboxylic acid having the structure

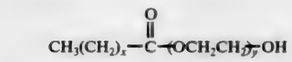


wherein *x* is 2 to 22 and R is an alkyl radical containing 2 to 22 carbon atoms and an ethoxylated ester of the formula



wherein *x* is 4 to 22 and *y* is 1 to 40; (*a*) being present in an amount of about 10 to 40 weight percent of said composition and (*b*) being present in an amount of about 1 to 15 weight percent of said composition; and

c. about 10 to 30 weight percent of an ethoxylated fatty acid wax which has a melting point greater than 100° F. and having the formula



wherein *x* is 10 to 22 and *y* is 5 to 200; and

d. about 10 to 20 weight percent of at least one processing aid selected from the group consisting of

1. an alkali metal salt of a phosphoric acid mono or diester of an ethylene oxide adduct of at least one member selected from the group consisting of a C_8 to C_{18} linear alkyl alcohol which contains 2 to 25 moles of ethylene oxide; and
2. an alkali metal salt of sulfated fatty alcohols containing 12 to 22 carbon atoms; and

e. about 25 to 45 weight percent of at least one blending agent of the group consisting of

1. an ethoxylated alcohol having the formula

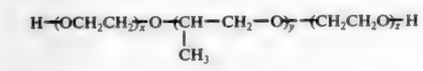
$$CH_3(CH_2)_x(OCH_2CH_2)_n—OH$$

wherein *x* is from 8 to 22 and *n* is 1 to 20;

2. an ethoxylated castor oil ether containing from about 5

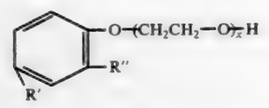
to about 200 moles of etylene oxide per mole of castor oil;

3. an ethoxylated polyoxypropylene having the formula



wherein x is 1 to 15, y is 1 to 50, and z is 1 to 15;

4. an ethoxylated aromatic phenol ether having the formula



wherein R′ and R″ are aryl, alkyl aryl, and x is 1 to 25; and

5. an aliphatic saturated or unsaturated unsubstituted alcohol containing 10 to 30 carbon atoms.

4,039,716

RESIN COATED GLASS FIBERS AND METHOD OF PRODUCING SAME THROUGH USE OF AN AQUEOUS SILANE-CONTAINING SIZING COMPOSITION WHEREBY HYDROLYSIS AND POLYMERIZATION OF THE SILANE IS INHIBITED

Carl A. Johnson, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sept. 20, 1974, Ser. No. 507,642
Int. Cl.² B32B *1/08, 1/10, 17/04;* **C03C** *25/02*
U.S. Cl. 428—378 **5 Claims**

1. Glass fibers coated with the dried residue of an aqueous dispersion comprising the following solids in percent by weight:

Materials	% By Weight
Emulsion prepolymer [solids] stabilized by an adduct or adducts of polyoxypropylene and polyoxyethylene	33 - 66
Emulsion [solids] of an oil stabilized by an ethoxylated fatty amine	3 - 10
Polyethylene glycol fatty radical adduct	10 - 35
Nonionic trialkoxysilane	5 - 25
Cationic trialkoxysilane	1 - 15

said nonionic trialkoxysilane having been (1) added directly to said emulsion prepolymer stabilized by an adduct or adducts of polyoxypropylene and polyoxyethylene and (2) overcoated with said emulsion of an oil stabilized by an ethoxylated fatty amine to effect locking up of said nonionic trialkoxysilane in the surfactant layer of said emulsion prepolymer.

4,039,717

METHOD FOR REDUCING THE ADHERENCE OF CRUDE OIL TO SUCKER RODS

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 416,721, Nov. 16, 1973, abandoned. This application Sept. 17, 1975, Ser. No. 614,093
Int. Cl.² B32B *15/08*
U.S. Cl. 428—389 **4 Claims**

1. A method for reducing the adherence of viscous crude oil to sucker rods in oil wells wherein the high-viscosity of the crude limits production by reducing the speed of sucker rod descent during each stroke comprising coating the sucker rods with a film of polyacrylamide cross-linked in the presence of water with a salt of polyvalent metal, whereby the film tends to reduce failing of the sucker rods and increase the speed of descent during each stroke of the sucker rods.

4,039,718

HOLLOW GLASS FILAMENTS SEALED AT BOTH ENDS THEIR PRODUCTION AND THEIR USE AS MATRIX REINFORCING MATERIALS

John Kallenborn, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 19, 1975, Ser. No. 642,527
Int. Cl.² B32B *3/18, 17/04;* **C03B** *23/10, 23/12, 37/00*
U.S. Cl. 428—398 **2 Claims**

1. An article of manufacture comprising a strand of finite length formed of a consolidated bundle of glass filaments, each of the filaments in said bundle having an external diameter of 0.0003 to 0.003 inch (0.0076 to 0.076 millimeter) and having 10 to 65 percent of its volume hollow, said glass filaments in the strand being of lengths of 1/16 to 4 inches (1.58 to 101.6 millimeters) and wherein each of the filaments in the said consolidated bundle forming said strand are sealed at each of their ends.

2. An article of manufacture comprising a strand formed of a consolidated bundle of glass filaments, each of the filaments in said consolidated bundle forming said strand having an external diameter of 0.0003 to 0.03 inch (0.0076 to 0.076 millimeter) and each filament having 10 to 65 percent of its volume hollow and wherein each of the filaments in the bundle forming said glass strand is sealed at each end thereof thereby providing a glass barrier between the hollow interior of the filaments in the bundle forming said strand and the environment.

4,039,719

LAMINATED SAFETY GLASS

Tadashi Matsuda, Takatsuki, and Kunia Yanagisawa, Hirokata, both of Japan, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 264,218, June 19, 1972, abandoned, which is a continuation of Ser. No. 786,731, Dec. 24, 1968, abandoned. This application June 26, 1975, Ser. No. 590,780
Claims priority, application Japan, Dec. 29, 1967, 43-85245
Int. Cl.² B32B *27/40*
U.S. Cl. 428—424 **5 Claims**

1. A transparent laminated safety glass comprising a laminated assembly of two sheets of glass between which is sandwiched an interlayer of a polyurethane elastomer which bonds together said glass sheets, said interlayer having a thickness of between 0.2 and 5mm. and consisting essentially of a polymeric elastomeric polyurethane that is obtained by curing (a) an isocyanate terminated prepolymer, which is the reaction product of poly(ethylene propylene adipate) glycol having —OH groups at both ends and a molecular weight of about 2000 and toluene diisocyanate with (b) 4,4′-methylene-bis(2-chloroaniline) curing agent, the mole ratio of prepolymer to curing agent being from 4:3.

4,039,720

LAMINATED WINDSHIELD WITH IMPROVED INNERLAYER

Joseph Cherenko, Valencia, and Charles W. Lewis, Pittsburgh, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 3, 1976, Ser. No. 682,538
Int. Cl.² B32B *27/40;* **C08G** *18/06;* **B29C** *19/02;* **B05D** *3/06*
U.S. Cl. 428—425 **23 Claims**

1. A method for making a safety glass laminate comprising the steps of:

a. preparing a transparent film of a thermoplastic urethane polymer, essentially free of ethylenic unsaturation, which comprises a photoinitiator in an amount effective to initiate cross-linking of said film;

b. laminating said film to a transparent ply of a material selected from the group consisting of glass and rigid transparent plastics; and

c. irradiating the exposed surface of the film with actinic radiation to effect crosslinking of the exposed surface thereby improving its resistance to abrasion in the preence of organic solvents.

9. A transparent polymer film for use as an innerlayer in a bilayer safety glass laminate which consisting essentially of a thermoplastic urethane polymer, essentially free of ethylenic unsaturation, and an effective amount of photoinitiator which upon actinic radiation is capable of initiating crosslinking of said film especially at an exposed surface thereof.

14. A safety glass laminate comprising:

a. a first ply of a material selected from the group consisting of glass and rigid transparent plastics; and

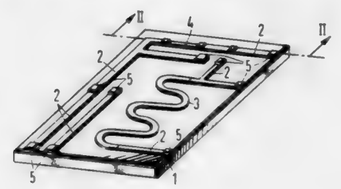
b. a transparent second ply, bonded to said first ply, of a thermoplastic urethane polymer essentially free of ethylenic unsaturation and an effective amount of photoinitiator wherein the exposed surface of said thermoplastic polymer is crosslinked actinic radiation.

4,039,721

THICK-LAYER CONDUCTOR PATH PASTES

Artur Weitze, and Peter Leskovar, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 9, 1975, Ser. No. 611,793
Claims priority, application Germany, Sept. 18, 1974, 2444639
Int. Cl.² B32B *17/06;* **H01B** *1/02*
U.S. Cl. 428—426 **8 Claims**



1. A conductive path associated with predetermined locations of a preformed vitreous substrate surface, said path comprising a sintered uniform mixture initially comprised on a 100 weight percent total mixture basis of:

a. from about 3 to 28 weight percent of silver particles

b. from about 30 to 61 weight percent of aluminum particles,

c. from about 24 to 44 weight percent of fritted glass, said path having been produced by heating such initial mixture deposited on such locations to a temperature ranging from about 850° to 1050° C for a time of from about 0.2 to 1 hours.

4. A paste composition adapted for forming thick layer conductor paths comprising in uniform admixture on a 100 weight percent total composition basis:

A. from about 72 to 78 weight percent of a powder mixture which comprises on a 100 weight percent total mixture basis:

1. from about 3 to 28 weight percent of particles silver

2. from about 30 to 61 weight percent of aluminum particles, and

3. from about 24 to 44 weight percent of fritted glass, and

B. from about 22 to 28 weight percent of an organic carrier liquid.

7. A process for forming a conductor path upon a preformed vitreous substrate surface comprising the steps of:

A. depositing on such surface in predetermined locations a paste composition of claim **4**,

B. drying the resulting such deposits at a temperature ranging from about 20° to 120° C for a time from about 0.2 to 2 hours, and

C. heating the so dried deposits and at least the adjacent portions of such surface associated therewith to a temperature ranging from about 850° to 1050° C for a time of from about 0.2 to 1 hours.

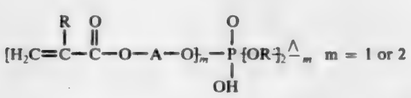
4,039,722

PLURAL COATED ARTICLE AND PROCESS FOR MAKING SAME

Ray A. Dickie, Birmingham, and Joseph C. Cassatta, Taylor, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 500,832, Aug. 26, 1974, Pat. No. 3,987,127, which is a continuation-in-part of Ser. No. 431,632, Jan. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,654, Jan. 8, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,017
Int. Cl.² C08L *31/02;* **C08F** *8/00;* **B05D** *3/06*
U.S. Cl. 428—461 **17 Claims**

1. An article of manufacture comprising a substrate and an adherent coating of radiation polymerized paint on the surface thereof, said paint, on a non-polymerizable solvent, pigment, initiator and particulate filler-free basis, consisting essentially of the in situ formed polymerization product of a film-forming solution of: (1) between about 90 and about 10 parts of a thermoplastic vinyl polymer free of olefinic unsaturation, having a number average molecular weight ranging from about 2,000 to about 250,000 and being prepared from at least about 85 weight percent of monofunctional vinyl monomers; (2) between about 10 and about 90 parts of vinyl monomer solvent for said polymer, up to 90 weight percent of said solvent being selected from the group consisting of divinyl monomers, trivinyl monomers, tetravinyl monomers and mixtures thereof; and (3) between and about 0.05 and about 1.0 parts per 100 parts of the total of said thermoplastic vinyl polymer and said vinyl solvent monomers of a mono- or diester of phosphoric acid bearing one or more sites of vinyl unsaturation and having the formula:



where:

R = H, Cl, CH_3

A = C_nH_{2n}, $2 \leqq n \leqq 6$

R′ = H, C_1 to C_4 alkyl or C_1 to C_4 chloro- or bromoalkyl.

4,039,723

PENTAERYTHRITOL ESTERS OF MERCAPTO ACIDS PLUS LONG CHAIN FATTY ACIDS

Joseph Donald Moyer, Silver Spring, and David Edward Kramm, Laurel, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 16, 1975, Ser. No. 623,216
Int. Cl.² C08L *81/02, 91/00;* **C08F** *2/46*
U.S. Cl. 428—521 **3 Claims**

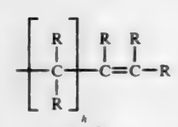
1. A curable composition useful for obtaining a solid polythioether having improved slip properties comprising:

A. a polyene component of the formula:

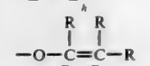
$[A]\text{-}(X)_m$

wherein m is an integer of at least 2, wherein X is a member selected from the group consisting of:

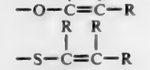
(a)



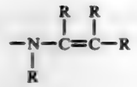
(b)

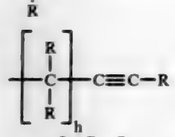


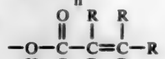
(c)

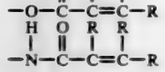


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(d) 

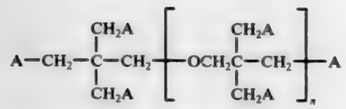
(e) 

(f) 

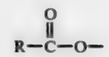
(g) 

where *h* is an integer from 1 to 9; R is a radical selected from the group consisting of hydrogen, fluorine, chlorine, furyl, thienyl, pyridyl, phenyl and substituted phenyl, benzyl and substituted benzyl, alkyl and substituted alkyl, alkoxy and substituted alkoxy, cycloalkyl and substituted cycloalkyl; said substituents on said substituted members selected from the group consisting of nitro, chloro, fluoro, acetoxy, acetamide, phenyl, benzyl, alkyl, alkoxy and cycloalkyl; said alkyl and alkoxy having from one to nine carbon atoms and said cycloalkyl having from three to eight carbon atoms; wherein [A] is free of reactive carbon-to-carbon unsaturation; free of highly watersensitive members; and is a polyvalent chemically compatible member of the group consisting of carbonate, carboxylate, carbonyl, ether, silane, silicate, phosphonate, phosphite, phosphate, alkyl and substituted alkyl, cycloalkyl and substituted cycloalkyl, aryl and substituted aryl, urethane and substituted urethane, urea and substituted urea, amine and substituted amine, amide and substituted amide, hydroxyl, heterocyclic carbon containing radical, and mixtures thereof; said substituents on said members being defined above, said component having a molecular weight in the range from about 64 to 20,000; and a viscosity in the range of essentially 0 to 20 million centipoises at 70° C; and,

B. pentaerythritol ester component of the formula:



wherein *n* is 0 to 2, and at least 1 and not more than $2n + 2$ of the A groups are ester radicals of the structure



wherein R is a straight chain or branched, saturated or unsaturated hydrocarbon radical containing 11 to 19 carbon atoms, and at least 2 and not more than $2n + 3$ of the A groups are ester radicals of the structure



wherein *m* is 0 to 1.

4,039,724

POLY(PHENOL/DIENE) RESIN AND RUBBER ADHESIVE COMPOSITIONS TACKIFIED THEREWITH

Ramsis Gobran, Roseville, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 408,584, Oct. 23, 1973, Pat. No. 3,944,523. This application Aug. 15, 1975, Ser. No. 604,927

Int. Cl.² B32B *27/08*; C08L *9/00*

U.S. Cl. 428—525 **4 Claims**

1. A tacky adhesive composition comprising (1) 5 to 200 parts by weight poly(phenol/diene) resin having alternately repeating diene and phenol units, a glass transition temperature in the range 100° – 200° C and a number average molecular weight in the range 600 – 5000 produced by adding, in an inert atmosphere and in the presence of a Friedel-Crafts catalyst, 1 mole of non-conjugated diene with 1 – 1.75 mole of a phenolic compound having at least two ring carbon atoms susceptible of alkylation, at a temperature in the range of 20° – 130° C, maintaining the reactants at a temperature of about 130° C until the reaction is complete, and isolating the poly(phenol/diene) resin and (2) blended together with said resin about 100 parts by weight rubber selected from the group consisting of polychloroprene, chlorinated ethylene-propylene and poly(ethylene/-propylene).

4,039,725

PLASTICIZED SULFUR AS AN ADHESIVE AND LAMINATED CONDUIT MADE THEREFROM

William G. Toland, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 518,435, Oct. 29, 1974, abandoned. This application Oct. 24, 1975, Ser. No. 625,397

Int. Cl.² B32B *21/04, 9/04*

U.S. Cl. 428—537 **7 Claims**

1. In a paper or paper-like product comprising layers laminated together by a plasticized sulfur adhesive, the improvement which comprises preparing the plasticized sulfur adhesive by heating to a temperature between 160° C and 220° C to obtain a molten, low viscosity adhesive.

4,039,726

ALTERING THE APPEARANCE OF CORUNDUM CRYSTALS

Ronald Ray Carr, Merrillville, and Stephen Dale Nisevich, Munster, both of Ind., assignors to Astrid Corporation, Limited, Hong Kong

Continuation of Ser. No. 467,937, May 8, 1974, Pat. No. 3,950,596, which is a continuation of Ser. No. 210,140, Dec. 20, 1970, abandoned. This application Mar. 8, 1976, Ser. No. 664,431

The portion of the term of this patent subsequent to Apr. 13, 1993, has been disclaimed.

Int. Cl.² B32B *9/04, 35/00*; B05D *5/06*

U.S. Cl. 428—539 **4 Claims**

1. A corundum crystal initially having a non-uniform color and a surface altered by contact with a powder consisting essentially of alumina and at least one metal oxide colorant at an elevated temperature within the range of 1600° C to a temperature below the fusion temperature of the said powder, said metal oxide colorant imparting to the surface of the crystal a uniform color appearance without effecting asterism of said crystal.

3. A corundum crystal initially having a first color appearance and a surface altered by contact with a powder consisting essentially of alumina and of metal oxide colorant at an elevated temperature within the range of 1600° C to a temperature below the fusion temperature of the said powder, said metal oxide colorant consisting essentially of an oxide of titanium and at least one further metal oxide, said further metal oxide colorant imparting to the surface of the crystal a second color appearance different from the first color appearance.

4,039,727

1,3-DITHIOLO(4,5-B)PYRAZIN-2-YLIDENE-PROPANEDINITRILE 4-OXIDE

Craig E. Mixan; Christian T. Goralski, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 649,175, Jan. 15, 1976. This application Nov. 10, 1976, Ser. No. 740,631

Int. Cl.² B27K *3/34*

U.S. Cl. 428—541 **1 Claim**

1. Wood impregnated with about 2 to about 5 weight percent of 1,3-dithiolo (4,5-b) pyrazin-2-ylidenepropanedinitrile 4-oxide.

4,039,728

AUTOMATIC DEVICE FOR OPENING AND CLOSING THE COMBURENT INLET AND OUTLET PORTS OF A FUEL CELL

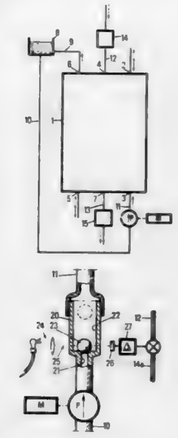
Jacques Cheron, Maisons Lafitte, France, assignor to Institut Francais du Petrole, France

Filed Sept. 19, 1975, Ser. No. 614,940

Claims priority, application France, Aug. 10, 1974, 74.34192

Int. Cl.² H01M *8/04*

U.S. Cl. 429—22 **26 Claims**



1. An automatic control device in combination with a fuel cell, said fuel cell comprising a first inlet port and a first outlet port connected to an electrolyte feeding circuit including a pump for effecting electrolyte circulation in said fuel cell, and a second inlet port and a second outlet port for respectively introducing and discharging comburent to and from the fuel cell, independently of said electrolyte feeding circuit, and said device comprising obturation means for closing and opening said second inlet and second outlet ports for the comburent and control means connected to said obturation means, said control means being adapted to actuate said obturation means in response to a parameter which is a function of the circulation of electrolyte through the fuel cell whereby said second inlet port and said second outlet port are open during flow of electrolyte through said fuel cell and are closed during absence of flow of said electrolyte through said fuel cell.

4,039,729

RECHARGEABLE GALVANIC CELL WITH ZINC ELECTRODE AND AUXILIARY STRUCTURE

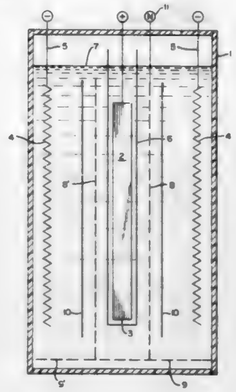
Gábor Benczúr-Ürmössy, Stuttgart; Klaus von Benda, Kemnat, and Friedrich Haschka, Stuttgart, all of Germany, assignors to Deutsche Automobilgesellschaft mBh, Firma, Germany

Filed May 7, 1975, Ser. No. 575,268

Claims priority, application Germany, May 9, 1974, 2422577

Int. Cl.² H01M *6/04*

U.S. Cl. 429—206 **44 Claims**



1. A rechargeable galvanic cell comprising a housing containing at least one negative zinc electrode, said zinc electrode including zinc deposited on a current collector, at least one positive metal oxide or oxygen electrode, an alkaline electrolyte, at least one electrically conductive foraminous auxiliary structure exhibiting low hydrogen overvoltage for cathodic hydrogen evolution at least one microporous separator for separating said auxiliary structure from at least one of said electrodes, and current lead means for conductively connecting said auxiliary structure to said at least one zinc electrode to effect afterdischarge of said at least one zinc electrode, said current lead means being disconnected from said zinc electrode during charging and discharging in the normal operation of said cell and said current lead means being connected with said auxiliary structure and said at least one zinc electrode after normal discharge occuring during normal operation of said cell to effect afterdischage of said zinc electrode whereby said auxiliary structure serves as an auxiliary electrode to effect afterdischarging of the zinc electrode connected thereto by said current lead means and as a dendrite barrier to prevent short-circuiting between the negative and positive electrodes during normal operation of said cell said auxiliary structure also being arranged between each positive electrode and each negative electrode so that said auxiliary structure is in close, but electrically insulated, relationship with the positive electrode, while an interspace is provided as an electrolyte chamber between the auxiliary structure and the current collector of the negative zinc electrode, whereby zinc deposition takes place in said interspace during the charging of the cell and, during discharging, the oxidation products of the negative electrode are completely dissolved and whereby the zinc of the at least one zinc electrode is completely dissolved during afterdischarge so that a fully renewed zinc deposition may be built upon the current collector during charging of said cell.

42. A rechargeable galvanic cell comprising a housing containing at least one negative zinc electrode, said zinc electrode comprising zinc deposited on a current collector, an alkaline electrolyte, at least one electrically conductive auxiliary structure exhibiting low hydrogen overvoltage for cathodic hydrogen evolution, means conductively connecting said auxiliary structure to said at least one negative zinc electrode to effect after discharge of said zinc electrode and at least one microporous separator for separating said auxiliary structure from at

least one of said electrodes; said auxiliary structure acting as an auxiliary electrode to effect afterdischarging of the zinc electrode when connected thereto by said means and when said means is not connected with said zinc electrode, said auxiliary structure serving as a dendrite barrier to prevent short-circuiting between the negative and positive electrodes during normal opertion of said cell said auxiliary structure being arranged between a positive electrode and a negative electrode in close, but electrically insulated, relationship with the positive electrode and said means including circuit means external of said electrolyte for connecting said auxiliary structure to said negative electrode during the afterdischarging.

4,039,730

STORAGE BATTERY ELECTRODE TUBES AND METHOD OF FILLING

Jurgen Brinkmann, and Josef Sucher, both of Hagen, Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Feb. 9, 1976, Ser. No. 656,186
Claims priority, application Germany, Mar. 7, 1975, 2509948
Int. Cl.² H01M *4/60*
U.S. Cl. 429—212 **17 Claims**

1. A mass-filled tubular electrode for a lead storage battery comprising:

active mass formed of a mixture of lead oxide, sulfuric acid and water, and including fibers of electrolyte-resistant material, the fibers being more densely concentrated toward the outer periphery of the tubular electrode than toward the interior.

6. A method of filling the lead core-containing tube electrodes of lead storage batteries by introduction under pressure of paste-like active mass formed of a mixture of lead oxide, sulfuric acid and water, the method being characterized in that

the active mass additionally has previously had added to it a quantity of fibers of electrolyte-resistant material, and

the pressure applied and viscosity of the mixture is such as to cause at least a part of said fibers to penetrate into and be trapped within the pores of the tube walls during escape of a liquid mass component through the tube wall to at least partly occlude the pores.

4,039,731

PHOTODEGRADABLE POLYOLEFINS CONTAINING NITROHALOALKANES

Bernard Freedman, Berkeley, and Martin J. Diamond, Oakland, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Division of Ser. No. 603,080, Aug. 8, 1975, Pat. No. 3,968,096, which is a division of Ser. No. 543,706, Jan. 23, 1975, Pat. No. 3,929,723. This application Apr. 21, 1976, Ser. No. 679,130
Int. Cl.² C08J *3/20*
U.S. Cl. 526—6 **2 Claims**

1. A photodegradable composition comprising a polyolefin and about from 0.1 to 10%, based on the weight of polyolefin, of an additive of the structure

$$O_2N-(CH_bX_a)_c-R$$

wherein:

X is chlorine, bromine, or iodine

R is hydrogen, chlorine, bromine, iodine, or an alkyl radical containing 1 to 6 carbon atoms

a is 1 or 2

b is 2—*a*

c is 1 or 2.

4,039,732

AFTERCHLORINATED VINYL CHLORIDE POLYMERS

Löwhardt A. A. Schoen, Geleen; Wilhelmus G. M. Bruls, Geulle, and Wilhelmus A. M. Debets, Schinnen, all of Netherlands, assignors to Stamicarbon B. V., Geleen, Netherlands

Filed Apr. 16, 1976, Ser. No. 677,784
Claims priority, application Netherlands, Apr. 18, 1975, 7504616
Int. Cl.² C08F *8/22*
U.S. Cl. 526—43 **18 Claims**

1. A process for the dry chlorination of powdery vinyl chloride polymers with gaseous chlorine comprising the steps:

1. introducing chlorine into a reaction vessel containing the vinyl chloride polymer powder and maintaining the polymer in a chlorine atmosphere in the absence of radical-forming initiators, radical-forming initiating radiation or both at temperatures of at most about 50° C. for at least 30 minutes;
2. raising the temperature of the reaction to a temperature of at least 70° C., but below the agglomeration temperature of the vinyl chloride polymer, such that thermal radical-formation occurs and chlorination of the vinyl chloride polymer occurs to the required chlorine content thereby producing chlorinated vinyl chloride polymer powder;

the relationship between the time required for the two steps is such that the reaction time of the first step is selected to be such that, in the second step, in the temperature range at which thermal radical-formation occurs, no thermal degradation and subsequent product discoloration occurs thereby producing a chlorinated vinyl chloride polymer powder having a chlorine content in excess of the starting vinyl chloride polymer.

4,039,733

NOVEL PETROLEUM RESIN FORMED BY A CATALYST SYSTEM CONTAINING (A) ORGANOALUMINUM COMPOUND AND (B) ALKYL HALIDE OR HYDROGEN HALIDE AS COCATALYST

Ken-ichi Kudo; Yoshihiko Kitagawa, and Hideyuki Kuribayashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 21, 1975, Ser. No. 570,071
Claims priority, application Japan, Apr. 23, 1974, 49-46152
Int. Cl.² C08F *4/52, 2/00, 10/00, 136/20*
U.S. Cl. 526—185 **16 Claims**

1. A process for manufacturing a petroleum resin, characterized by copolymerizing a monomer composition comprising (1) a mixture of 20 to 80 parts by weight of a so-called spent C_4- or C_5-fraction obtained by removing most of the dienic constituents from a fraction mainly of four or five carbon atoms formed in petroleum cracking and 80 to 20 parts by weight of styrene and/or a styrene derivative, and (2) 0.5 to 10 parts by weight of divinylbenzene for 100 parts by weight of the monomeric constituents contained in said mixture (1), with a catalyst system comprising an organoaluminum compound represented by the general formula AlR_nX_{3-n} (wherein R is an alkyl group having 1 to 4 carbon atoms, X is a halogen atom, and *n* is a positive number from 1 to 2) as main catalyst and an alkyl halide or a hydrogen halide as co-catalyst in a hydrocarbon solvent at a temperature of 0° to 60° C.

4,039,734

PRODUCTION OF RANDOM OR HOMOGENEOUS COPOLYMERS

Brian Norman Hendy, Welwyn, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 519,167, Oct. 29, 1974, abandoned, which is a continuation of Ser. No. 425,280, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 347,567, April 3, 1973, which is a continuation-in-part of Ser. No. 183,638, Sept. 24, 1971, abandoned, Ser. No. 62,799, Aug. 11, 1970, abandoned, and Ser. No. 871,962, Oct. 28, 1969, abandoned, said Ser. No. 183,638, is a continuation-in-part of Ser. No. 871,962, and Ser. No. 100,432, Dec. 21, 1970, abandoned, which is a continuation of Ser. No. 755,793, Aug. 28, 1968, abandoned, said Ser. No. 871,962, and Ser. No. 755,793, each is a continuation-in-part of Ser. No. 623,229, March 15, 1967, abandoned, said Ser. No. 62,799, is a continuation-in-part of Ser. No. 765,426, Oct. 7, 1968, abandoned, and Ser. No. 756,014, Aug. 28, 1968, abandoned, each is a continuation-in-part of Ser. No. 622,268, March 10, 1967, abandoned. This application June 24, 1975, Ser. No. 589,689
Claims priority, application United Kingdom, Mar. 24, 1966, 13070/66; Mar. 24, 1966, 13072/66; Mar. 10, 1970, 11389/70; Mar. 24, 1966, 13069/66; Sept. 20, 1967, 42898/67; Sept. 20, 1967, 42900/67; Italy, Mar. 27, 1970, 22623/70
Int. Cl.² C08F *218/14;* C08G *81/00;* C08F *200/00, 220/42*
U.S. Cl. 526—258 **43 Claims**

1. A homogeneous melt-extrudable or injectionmouldable copolymer having a reduced viscosity of at least 0.5 but not more than 3 (as measured on a solution of 0.5 g of the copolymer in 100 cm^3 of dimethyl formamide at 25° C), consisting of 50 to 98 mole % of units of acrylonitrile, 2 to 50 mole % of units of at least one conjugated aromatic olefine which has the formula

$$CH_2{:}CR.Ar$$

wherein R is hydrogen or methyl and Ar is an aromatic residue having up to 3 rings or is coumarone or indene, and 0 to 10 mole % of units of other ethylenically unsaturated copolymerizable monomers, the molar ratio of acrylonitrile to conjugated aromatic olefine having about the same value for substantially all the copolymer molecules and the units of conjugated aromatic olefine being randomly distributed in the copolymer molecules, the copolymer being the product of a copolymerization reaction under free-radical polymerization conditions in which the conjugated aromatic olefine is fed to the reaction mixture throughout the polymerization at a rate dependent on the rate of production of heat in the formation of the copolymer.

4,039,735

HOMOPOLYMERS AND COPOLYMERS OF TETRACHLOROETHOXYETHYL ESTERS AND METHOD FOR THEIR PREPARATION

František Hrabák, and Karel Bochal, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 427,224, Dec. 21, 1973. This application June 13, 1975, Ser. No. 586,654
Claims priority, application Czechoslovakia, Dec. 28, 1972, 9028/72; Dec. 28, 1972, 9029/72
Int. Cl.² C08F *18/00, 22/00, 120/00, 220/00*
U.S. Cl. 526—292 **21 Claims**

1. Solid homopolymers of tetrachloroethoxyethyl esters having the general formula

wherein X is a substituent selected from the group consisting of a hydrogen atom and CH_3 radical.

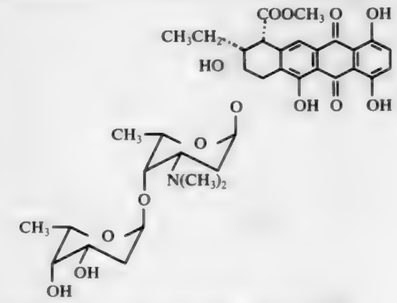
4,039,736

ANTIBIOTIC COMPOUNDS MARCELLOMYCIN AND MUSETTAMYCIN

Donald E. Nettleton, Jr., Jordan; James A. Bush, Fayetteville; William T. Bradner, Manlius, and Richard H. Schreiber, Canastota, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,480
Int. Cl.² C07H *15/24*
U.S. Cl. 536—17 **4 Claims**

1. The antibiotic compound selected from the group consisting of musettamycin having the structural formula



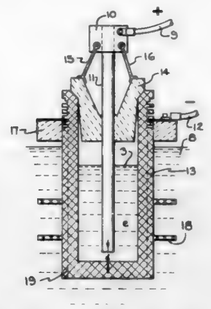
or the pharmaceutically acceptable salts thereof.

4,039,737

ELECTRIC IMMERSION HEATING APPARATUS AND METHODS OF CONSTRUCTING AND UTILIZING SAME

Eugene L. Kemper, 38520 Delta Drive, Mount Clemens, Mich. 48043

Filed Feb. 13, 1976, Ser. No. 658,139
Int. Cl.[2] H05B *7/08*
U.S. Cl. 13—18 **13 Claims**



1. An electric immersion heating apparatus, comprising:
first means for holding at least temporarily therein a first predetermined material;
second means operatively associated with said first means and disposed at least partially within at least a portion of said first predetermined material;
third means electrically connected to said second means for selectively causing a predetermined electrical current to flow through at least a portion of said first predetermined material to control the thermal condition of said first predetermined material;
fourth means for holding at least temporarily therein a second predetermined material whose thermal condition is to be controlled;
said first means being disposed at least partially within at least a portion of said second predetermined material for controlling the thermal condition of said second predetermined material by the use of non-gaseous heat transfer media;
said second means being substantially inert to said first predetermined material; and
said first means being substantially inert to said first predetermined material and being substantially inert to said second predetermined material.

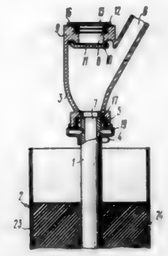
4,039,738

DEVICE FOR CHARGING AN ELECTRIC ARC FURNACE THROUGH ITS INNER ELECTRODE PIPE AND PERMITTING CONNECTION OF ADDITIONAL LENGTHS OF PIPES THERETO

Mikhail Davydovich Beskin, ulitsa Kolomenskaya, 7, kv. 7; Anatoly Timofeevich Pevtsov, Zanevsky prospekt, 43, kv. 36; Lev Grigorievich Nakhamkis, Zanevsky prospekt, 32, kv. 176; Yakov Efimovich Morgovsky, Krasnoputilovskaya ulitsa, 19, kv. 37, and Natalya Genrikhovna Bat, ulitsa Bolshaya Porokhovskaya, 44, korpus 3, kv. 56, all of Leningrad, U.S.S.R.

Filed Sept. 22, 1975, Ser. No. 615,192
Int. Cl.[2] H05B *7/14*
U.S. Cl. 13—33 **6 Claims**

1. A device for charging an electric arc furnace through an inner electrode pipe of the furnace, said device comprising a casing including a side pipe for charging the inner electrode pipe, said casing having upper and lower portions and being provided with first and second coaxial holes, one in said bottom portion of said casing and the other hole in said upper portion of said casing; closing means comprising a valve inside said casing in said upper portion for closing said other hole during charging and being displaceable to a position in which said hole is opened, a length of pipe to be coupled to said inner electrode pipe to lengthen the same, said length of pipe having upper and lower ends and being insertable into said other hole in the upper portion of the casing to be joined at its lower end to said inner electrode pipe, and a screw cap on the upper end



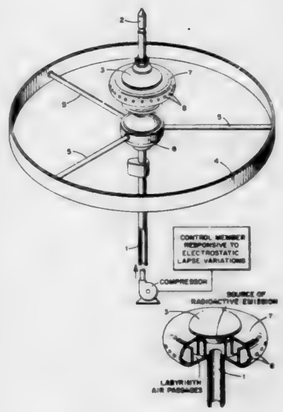
of said length of pipe to prevent the leakage of furnace gases during the joining of said pipes and being capable of moving along the axis of said length of pipe.

4,039,739

RADIOACTIVE LIGHTNING CONDUCTOR WITH IONIZED-GAS CURRENT

Benedetto Luigi Donelli, Via Pergolesi, 26, 20124 Milan, Italy

Filed Aug. 8, 1975, Ser. No. 602,924
Claims priority, application Italy, Sept. 13, 1974, 27264/74
Int. Cl.[2] H02G *13/00;* **H05F** *3/06*
U.S. Cl. 174—4 C **8 Claims**



1. A radioactive lightning conductor comprising a rod, an insulator body surrounding said rod, a container supported by said body having openings therein, a source of radioactive emissions positioned within said container but sealed against the direct outlet of radioactive emission and means to introduce a gas source to the interior of the container to cause gas flow from the interior of the container to the outside thereof through said openings.

4,039,740

CRYOGENIC POWER CABLE

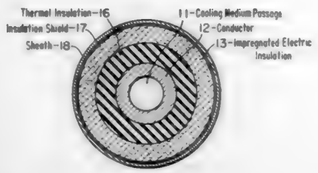
Zensuke Iwata, Yokohama, Japan, assignor to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed June 18, 1975, Ser. No. 587,860

Claims priority, application Japan, June 19, 1974, 49-70035; Nov. 22, 1974, 49-134610; Apr. 3, 1975, 50-40654

Int. Cl.[2] H01B *12/00*

U.S. Cl. 174—15 S **13 Claims**



1. A cryogenic power cable comprising

1. an electrical conductor having a cryogenic cooling medium passage therethrough,
2. a layer of thermal insulating material surrounding the conductor, and
3. an electric insulation layer surrounding the layer of thermal insulating material, the electric insulating layer comprising insulating paper or plastic film which has impregnated therein an insulating liquid and the electric insulating layer being cooled with a cryogenic cooling medium to a temperature in the range of from −40° C to −100° C.

4,039,741

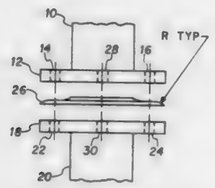
GASKET APPARATUS

Charlie C. Havens, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 18, 1976, Ser. No. 659,173

Int. Cl.[2] H05K *9/00*

U.S. Cl. 174—35 GC **2 Claims**



1. Corrugated gasket apparatus including at least one circumferentially continuous curved portion having a radius of curvature (R) related to thickness (C) of the gasket material, modulus of elasticity (E) of the material and yield stress (S) of the material according to the formula:

$$R = \frac{CE}{S}$$

wherein:

R = minimum radius of curvature in inches for complete straightening without exceeding the elastic limit of the gasket material;

C = ½ X thickness of material in inches;

E = modulus of elasticity of material in lbs/in²/inch; and

S = maximum fiber stress or yield stress in lbs/in².

4,039,742

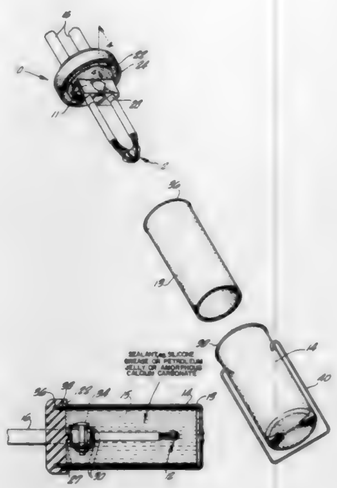
WATERPROOF CABLE SPLICE ENCLOSURE KIT

Bert A. Smith, Northridge, Calif., assignor to Preformed Line Products Company, Cleveland, Ohio

Filed Nov. 22, 1974, Ser. No. 526,222

Int. Cl.[2] H02G *15/08;* **H01R** *5/12*

U.S. Cl. 174—87 **3 Claims**



1. A kit for enclosing and protecting a splice between a plurality of cables comprising:

a cap having apertures therein for receiving and passing said cables therethrough, said cap being provided with a channel having a first and second groove on the inner side thereof, said first groove enabling retention of a sleeve means;

means for splicing said cables together;

a vial having a body of sealant material positioned therein, said vial having one open end and adapted to accept said cap for closure; and,

sleeve means insertable into said vial, said sleeve means capable of forming a protective enclosure about said cables and said splicing means when said sleeve means is inserted into the sealant material in said vial.

4,039,743

STRANDED WIRE WITH ADHESIVE COATED CONE

Hubertus Johannes Josephus Gommans, Venlo, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

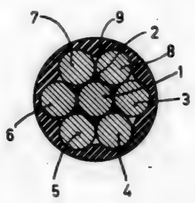
Filed June 6, 1975, Ser. No. 584,331

Claims priority, application Netherlands, June 27, 1974, 7408651

Int. Cl.[2] H01B *11/02*

U.S. Cl. 174—114 R **1 Claim**

1. A stranded wire comprising a wire core, a plurality of individual wire strands twisted around the wire core, a sheath formed of a plastic synthetic material extruded around the wire strands twisted around the wire core, and a thin coating of adhesive material continuously along the length of the wire core having a thickness insufficient to fill interstices between said individual wire strands and adhering individual wire strands to the wire core, wherein the individual wire strands are adhered to the wire core only at local areas and not continuously along the length of the wire core.



4,039,744

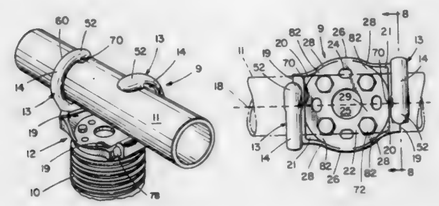
ELECTRICAL BUS SUPPORT

James J. Seaquist, Birmingham, Ala., assignor to Square D Company, Park Ridge, Ill.

Filed Apr. 26, 1976, Ser. No. 680,007

Int. Cl.[2] H01B *17/40, 17/16*

U.S. Cl. 174—169 **11 Claims**



1. A bus support for a cylindrical electrical bus comprising a three-part casting including a base adapted to be secured to an insulating support structure and two spaced end portions assembled on respective opposite ends of the base so as to extend upwardly from the base, the end portions having respective substantially circular openings therethrough which are axially aligned with each other for slidably receiving and retaining the bus, and connecting means connecting the end portions to the base, including outwardly directed, horizontally aligned flanges at the opposite ends of the base, respectively, and complementary grooves in respective base portions of the end portions receiving the flanges, respectively.

4,039,745

SPLICES FOR HIGH PRESSURE PIPE-TYPE CABLES

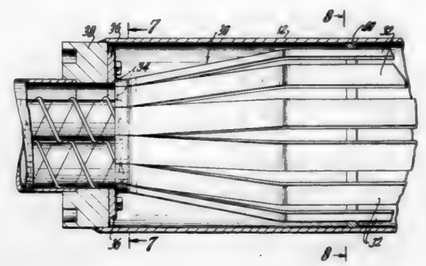
Richard C. Waldron, Mountain Lakes, N.J., assignor to The Okonite Company, Ramsey, N.J.

Filed Jan. 16, 1976, Ser. No. 649,600

Int. Cl.[2] H02G *15/24*

U.S. Cl. 174—21 R **3 Claims**

1. In combination, an electrical cable splice support including an outer casing and an inner cage member generally coaxially disposed within said outer casing and comprising a generally cylindrical member tapered toward the axial ends thereof, said outer casing being at least partially filled with a fluid coolant and said cage being formed with openings for directing the free flow of the fluid coolant throughout the space defined by said casing.



4,039,746

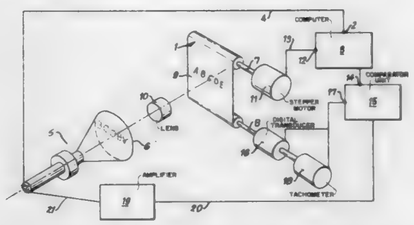
RECORD MEMBER ADVANCE SYSTEM

George Clive Ashmead Talbot, London, England, assignor to Linotype-Paul Limited, London, England

Filed June 13, 1975, Ser. No. 586,798

Int. Cl.[2] G11B *15/54;* **H04L** *15/34*

U.S. Cl. 178—15 **4 Claims**



1. Character recording system comprising: drive means;

a first spool arranged to be driven by the drive means; a second spool; a record member comprising a web of material on said second spool and having one end fixed to the first spool, said record member being adapted to record characters thereon;

means arranged to pass a comman signal to the drive means for advancing the web a predetermined amount;

first transducer means connected to said second spool and arranged to provide an output representative of the angular position of said second spool;

second transducer means connected to said second spool and arranged to provide an output representative of the velocity of said second spool;

comparator means;

means arranged to apply said output of said first and second transducer means to said comparator means, said comparator means being arranged to compare said command signal with the output of said first and second transducer means and arranged to provide an output representative of difference therebetween;

means arranged to provide a display of the characters to be transferred to said web;

deflection means arranged to vary the position of said display; and

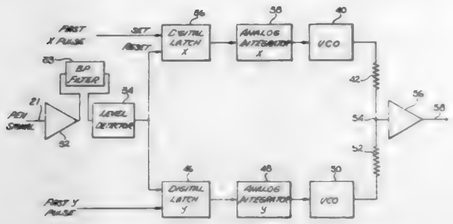
means arranged to apply said difference output as a control signal to said deflection means whereby the position of said display f characters is varied in dependence on the instantaneous position of said record member.

4,039,747

APPARATUS FOR CONVERTING THE POSITION OF A MANUALLY OPERATED INSTRUMENT INTO AN ELECTRICAL SIGNAL

Alex M. Muller, Palos Verdes, Calif., assignor to Telautograph Corporation, Los Angeles, Calif.

Filed Feb. 5, 1976, Ser. No. 655,430
Int. Cl.² G08C *21/00*
U.S. Cl. 178—19 **12 Claims**



1. Apparatus for converting the position of a sensor into an electrical signal comprising:

a plurality of spaced-apart conductors;

means for providing discrete voltage pulses to each of the said conductors sequentially to generate a time-varying electrostatic field;

sensor means for sensing the varying electrostatic field generated by said conductors and for generating an output signal therefrom;

means coupled to said sensor means and said means for providing voltage pulses for receiving said output signal from said sensor means and at least one of said voltage pulses and for generating therefrom an analog signal representative of the position of said sensor means relative to said plurality of conductors, including;

a detecting circuit coupled to said sensor means for providing an output when the output signal amplitude of said sensor means exceeds a predetermined level,

means for generating a pulse signal having a duration representative of the time interval between a voltage pulse provided to a particular one of said spaced-apart conductors and the output signal from said detecting circuit, said time interval corresponding to the position of said sensor means relative to said spaced-apar' conductors, and

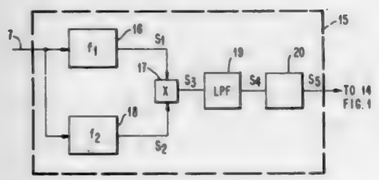
means for integrating said pulse signal.

4,039,748

METHOD AND DEVICE FOR SYNCHRONIZING THE RECEIVER CLOCK IN A DATA TRANSMISSION SYSTEM

Francois Gabriel Caron, Cagnes-sur-Mer; Andre Eugene Desblache, Nice; Dominique Noel Godard, Le Rouret, and Francis Paul Maddens, Cagnes-sur-Mer, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 8, 1976, Ser. No. 674,787
Claims priority, application France, Apr. 25, 1975, 75.1402
Int. Cl.² H04L *7/02*
U.S. Cl. 178—69.1 **8 Claims**



1. A synchronization method for adjusting the phase of a phase-locked oscillator which provides clocking signals to a data receiving device of a digital data synchronous transmission system to define to the receiving device, the sampling times of the signal of said system, said method characterized in that it includes the steps of:

filtering a digital representation of the received signal to derive therefrom a first signal exhibiting a phase ϕ_1 and a frequency $f_1 = f_c - \frac{1}{4}T$, with f_c being the signal carrier frequency of said system and $1/T$ the signaling rate,

also filtering said digital representation of the received signal to derive therefrom a second signal exhibiting a phase ϕ_2 and a frequency $f_2 = f_c + \frac{1}{4}T$,

combining said first and said second signals to generate an error signal indicative of the phase differential $\phi_2 - \phi_1$, and

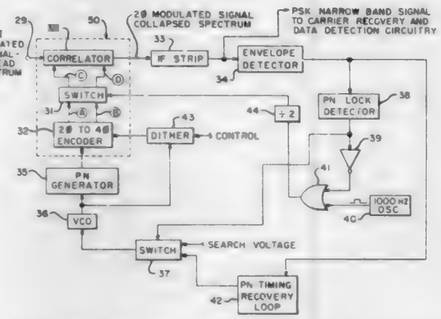
applying said error signal to the phase-locked oscillator to adjust the phase of the clock signal provided by said oscillator in a direction tending to render said error signal equal to zero.

4,039,749

SPREAD SPECTRUM DEMODULATOR

Robert S. Gordy, Largo, and David E. Sanders, St. Petersburg, both of Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Sept. 8, 1975, Ser. No. 611,366
Int. Cl.² H04L *27/22*
U.S. Cl. 178—69.1 **12 Claims**



1. A demodulator for collapsing the spectrum of a received signal which is a spread spectrum phase shift keyed modulated carrier signal comprising:

generator means for generating a local carrier signal corresponding to the spread spectrum signal portion of said received signal;

correlator means for correlating the generated local carrier signal with the received signal so as to collapse the spread spectrum signal portion of said received signal; and

reversing means interposed between said generator means and said correlator means for changing the correlation relationship of components of the signal from said generated local carrier signal with the spread spectrum signal portion of said received signal.

4,039,750

AUDIO FREQUENCY PHASE MODULATOR IN HEARING TEST SYSTEM

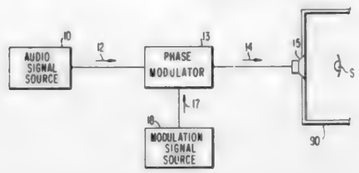
Robert E. Hull, 2002 Woody Drive, Billings, Mont. 59102

Filed July 12, 1974, Ser. No. 488,050
Int. Cl.² H04R *29/00*
U.S. Cl. 179—1 N **1 Claim**

1. In combination, a sound-absorbing enclosure, and a device for reducing or eliminating standing waves produced in response to an audio signal directed to a subject located in the sound-absorbing enclosure, said device comprising, acoustical transducer means, having an input for receiving an audio input signal, for generating an acoustical output responsive to the input signal thereto, an apparatus for producing an electrical audio signal,

a phase modulation means for receiving said audio signal and modulating the same so as to produce an output signal of varying phase and of constant amplitude in reference to said audio signal, and

means for connecting said modulated output signal to the input of said acoustical transducer means to reduce the standing waves associated with the acoustical output



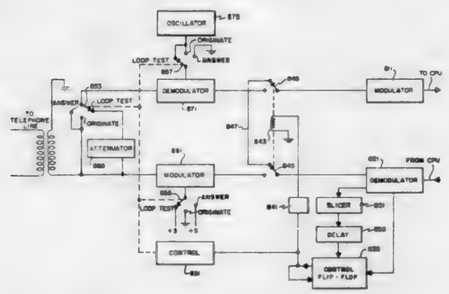
signal generated by said acoustical transducer means, said audio signal producing apparatus comprising speaker means and said phase modulating means comprising a rotating drum, and a microphone mounted on said drum for rotation therewith, said speaker means comprising at least two speakers mounted in a wall of a housing and connected so as to differ in phase by 180° and said rotating drum being mounted within said housing.

4,039,751

METHOD AND APPARATUS FOR CLOSED LOOP TESTING OF FIRST AND SECOND MODULATORS AND DEMODULATORS

Robert A. Couturier, Stamford; Steven J. Davis, Ridgefield, and G. Howard Robbins, New Canaan, all of Conn., assignors to General Datacomm Industries, Inc., Wilton, Conn.

Continuation-in-part of Ser. No. 554,773, March 3, 1975, Pat. No. 3,952,163, which is a division of Ser. No. 246,589, April 24, 1972, Pat. No. 3,869,577. This application Mar. 22, 1976, Ser. No. 668,990
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.² H04B *3/46*
U.S. Cl. 179—15 BF **16 Claims**



1. In a communication terminal comprising:

a first modulator with an input terminal for receiving a signal and an output terminal to which is supplied a modulated signal representative of said signal at its input terminal;

a first demodulator with an input terminal for receiving a modulated signal and an output terminal to which is supplied a signal demodulated from said modulated signal;

a second modulator having an input termianl for receiving a signal and an output terminal to which is supplied a modulated signal representative of said signal at its input terminal, said input terminal being connected to the output terminal of the first demodulator; and

a second demodulator with an input terminal for receiving a modulated signal and an output terminal to which is supplied a signal demodulated from said modulated signal, said output terminal being connected to the input terminal of the first modulator;

a method of closed loop testing the operation of said modulators and demodulators from the modulated signal side of the first modulator and first demodulator comprising:

sensing a first signal supplied to the first demodulator and producing in response thereto a test initiate signal;

connecting the output of the second modulator to the input of the second demodulator in response to said test initiate signal;

connecting the output terminal of the first demodulator and the input terminal of the first modulator while disconnecting the first modulator and the first demodulator from the second demodulator and second modulator, said connecting and disconnecting occurring in response to an additional test initiate signal; and

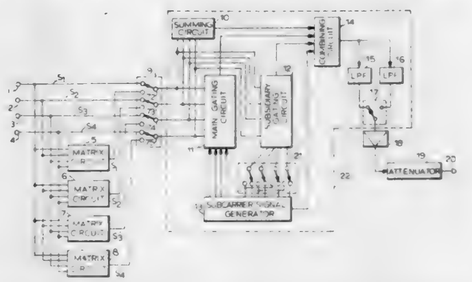
sensing at least one additional signal supplied to the first demodulator and in response thereto restoring the terminal to normal operation.

4,039,752

FM FOUR CHANNEL STEREO SIGNAL GENERATOR

Masashi Kanno, Katano; Sukeichi Miki, Ikoma; Tsuneo Takezaki, Neyagawa, and Syuichi Ninomiya, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 19, 1975, Ser. No. 615,088
Int. Cl.² H04H *5/00*; H04J *3/02*
U.S. Cl. 179—15 BT **3 Claims**



1. An FM four channel stereo signal generator comprising:

a first, a second, a third and a fourth audio input terminal to which four stereophonically related audio signals S_1, S_2, S_3 and S_4 are applied, respectively;

a first, a second, a third and a fourth matrixing circuit, each having an output terminal and four input terminals connected to said four audio input terminals, for producing matrixed audio signals $S_1' = (aS_1 + bS_2 + bS_3 + cS_4)$, $S_2' = (bS_1 + aS_2 + cS_3 + bS_4)$, $S_3' = (cS_1 + bS_2 + bS_3 + aS_4)$ and $S_4' = (bS_1 + cS_2 + aS_3 + bS_4)$, respectively, where a, b and c are coefficients and are in the relation $2b = a + c$; and

a four channel stereo signal modulation means operatively connected to said four matrixing circuits and including (i) a subcarrier signal generator for producing gating signals of four time sequential pulses having a duty ratio $\frac{1}{4}$ and a fundamental frequency $\omega = 2\pi \times 38 \times 10^3$ rad/sec, and (ii) a gating circuit operatively connected to said four matrixing circuits for gating said four matrixed audio signals with the aid of said gating signals so as to produce a main channel signal $(S_1' + S_2' + S_3' + S_4')$, a first subsidiary channel signal signal $(S_1' + S_2' - S_3' - S_4')\sin\omega t$, a second subsidiary channel signal $(S_1' - S_2' - S_3' + S_4')\cos\omega t$ and a third subsidiary channel signal $(S_1' - S_2' + S_3' - S_4')\sin 2\omega t$, thereby $(S_1' - S_2' + S_3' - S_4')$ being zero under said condition $2b = a + c$.

4,039,753

SINGING SUPPRESSOR DEVICE

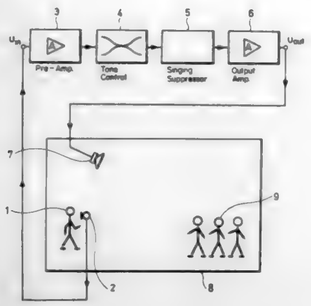
Geza Balogh, Budapest; Emil Sesztak, Maglod, and Karoly Szabados, Budapest, all of Hungary, assignors to Elektroakusztikai Gyar, Budapest, Hungary

Filed May 2, 1975, Ser. No. 573,989

Claims priority, application Hungary, June 5, 1974, EE 2241/74

Int. Cl.[2] H04R 3/04

U.S. Cl. 179—1 FS **8 Claims**



1. A singing suppressor device (**5**) for preventing singing and self-oscillation that arises owing to acoustic feedback in an electroacoustic chain (**2** to **7**) that includes at least one source (**1**) of audio-frequency signal, at least one sound sensing device (**2**), at least one amplifier (**3, 6**) connected to the latter, and at least one sound transducer (**7**) fed by said amplifier for emitting the audio-frequency signal; the device comprising, in combination, at least one delay unit (**51**) in said electroacoustic chain between an audio-frequency input (U_{in}) and an audio-frequency output (U_{out}) of the device, said delay unit having a delay time dependent on the frequency of a signal applied to at least one electrical control input of said delay unit, that determines the delay time; at least one control generator (**53**) at least indirectly coupled to said control input, for generating an electrical signal that varies in time, and consisting of components of a frequency less than that of the lower limit of the transmitting band of said electroacoustic chain; the coupling between said control generator and said control input of the delay unit being through a serially connected modulator (**54**); and at least one auxiliary generator (**52**) coupled to an input of said modulator; wherein at least one of said control generator and of said auxiliary generator is in the form of a signal converter (**55**) that shapes and transforms the audio-frequency signal, said converter having an input coupled to said source of audio-frequency signal at said audio-frequency input; whereby the singing and the self-oscillation are successfully eliminated in said electroacoustic chain, with the absence of any distortion, dissonance and the like being introduced in the audio-frequency signal.

4,039,754

SPEECH ANALYZER

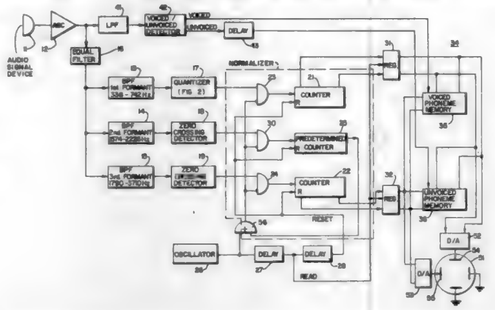
Donald C. Lokerson, New Carrollton, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 9, 1975, Ser. No. 566,494

Int. Cl.[2] G10L 1/00

U.S. Cl. 179—1 SA **28 Claims**

1. Apparatus for quantizing a speech waveform and/or a waveform that is a replica of an audio signal, such as a telephone ring, a knock or a siren, comprising means for establishing N signal level bands, where N is an interger more than two, adjacent ones of said bands having common boundaries, each of said boundaries being a predetermined percentage of the peak level of a complete cycle of the waveform, means responsive to the established bands for deriving a bilevel signal having a first level while the speech signal has an amplitude lying



in even numbered ones of said bands and a second level while the speech signal has an amplitude lying in odd numbered ones of said bands.

4,039,755

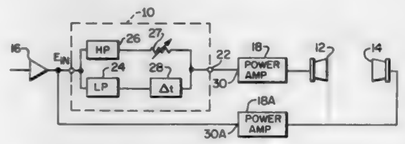
AUDITORIUM SIMULATOR ECONOMIZES ON DELAY LINE BANDWIDTH

Robert A. Berkovitz, Lexington, Mass., assignor to Teledyne, Inc., Los Angeles, Calif.

Filed July 26, 1976, Ser. No. 708,576

Int. Cl.[2] H04R 3/00

U.S. Cl. 179—1 G **22 Claims**



22. For use with an acoustic signal reproduction system having within an enclosed listening space at least two spatially separated speaker means for reproducing acoustic waves from corresponding electrical signals, apparatus for providing output electrical signals to drive one of said speaker means so that when the other of said speaker means is simultaneously driven by other electrical signals, said speaker means produce acoustic waves which tend to simulate the ambience of a space larger than the actual enclosed listening space, the input electrical signals for said apparatus being derived from said other signals; said apparatus comprising, in combination:

means for separating each of said input electrical signals into first and second components so that said first component includes primarily relatively low audio frequencies, and said second component includes primarily relatively high audio frequencies,

means for delaying for a predetermined period of time said first component with respect to said component so as to provide a time-delayed signal; and

means for combining said time-delayed signal with said second component to provide a combined signal as said output electrical signal of said apparatus.

4,039,756

ARTIFICIAL LARYNX WITH SEMI-AUTOMATIC INFLECTION CONTROL

Richard Burtschi, East Lansing, Mich., assignor to Missouri Province Educational Institute, St. Louis, Mo.

Filed Nov. 17, 1976, Ser. No. 742,432

Int. Cl.[2] A61F 1/20

U.S. Cl. 179—1 AL **20 Claims**

18. An artificial layrnx comprising pulse-generating means coupled to a power supply for normally generating electrical

pulses at a predetermined basic frequency generally in the normal range of fundamental frequencies for a human voice, said pulse generating means having an input normally responsive to the receipt of a reference signal for effecting the generation of said pulses at said predetermined basic frequency but further responsive to a frequency control signal whose value increases and decreases with time for increasing and decreasing the rate of generation of said electrical pulses to frequencies higher and lower than said predetermined basic frequency at a rate proportional to the rate of change of the value of said frequency control signal, transducer means coupled to said



pulse generating means and responsive to the frequency of generation of said electrical pulses for producing sound waves in a person's speech cavitites which can be articulated for speach purposes, the frequency of generation of said pulses being directly related to the pitch of the sound produced, circuit means for establishing the rate at which the value of said frequency control signal automatically increases and decreases, and manually-operated switching means for selecting the direction in which the value of said frequency control signal automatically increases or decreases at said established rate.

4,039,757

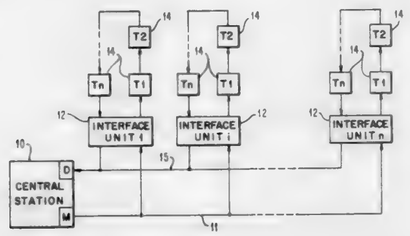
DIGITAL DATA COMMUNICATION NETWORK AND CONTROL SYSTEM THEREFOR

John B. Frisone, Raleigh, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 541,541, Jan. 16, 1975, abandoned. This application May 19, 1976, Ser. No. 687,729

Int. Cl.[2] H04Q 5/00

U.S. Cl. 179—15 AL **13 Claims**



1. A communications network for providing bidirectional data communication between a central control station and a plurality of remote terminal stations comprising:

input and output means at said central station;

a first outbound communication channel connected to said central station output means for receiving and conveying digital data signals therefrom;

a second inbound communications channel connected to said central station input means for conveying digital data signals thereto;

a plurality of remote interface units each comprising;

an input means connected to the said first communication channel and an output means connected to said second communication channel;

a plurality of terminal means each having data signal inputs and outputs connected in series;

first control means for connecting the interface input means to the input of the first of the series connected terminals;

second control means for connecting the interface output means to the output of the last terminal of the series connected terminals;

said first control means responsive to a first unique control signal for, establishing a data path between the output of the last series connected terminal and the said second channel via said second control means and providing line control signals in synchronism with the signals on the said first outbound communication channel to the input of the first series connected terminal for enabling said serially connected terminals in serial sequence to transmit digital data signals directly with substantially no delay to the central station via any intervening terminals, said second control means, said output means and said second communications channel, and said first control means responsive to a second unique control signal for, disestablishing the data path between the output of the last series connected terminal and the second communications channel, and removing the line control signals from the input to the first series connected terminal.

4,039,758

LINE IDENTIFYING SYSTEM OF COMMON CONTROL TYPE AUTOMATIC EXCHANGE

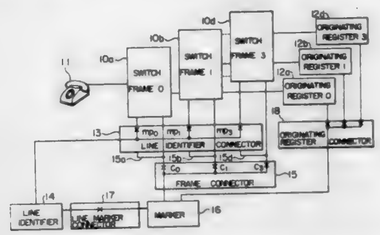
Hirotoshi Shirasu, and Hirotaka Usuda, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 471,600, May 20, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,904

Claims priority, application Japan, May 22, 1973, 48-56269

Int. Cl.[2] H04Q 3/72

U.S. Cl. 179—18 FH **8 Claims**



1. In an automatic telephone exchange of the common control type, including

a plurality of switch frames each of which is connectible with a plurality of subscriber's line circuits;

a line identifier, controllably connectible to each of said switch frames, for identifying the respective line circuits which are connected with said switch frames; and

a common control, coupled to said line identifier and any one of said switch frames, for controlling the completion of a path from a subscriber's line circuit through said any one of said switch frames in accordance with information representative of the position of a subscriber's line circuit on said any one switch frame received from said line identifier;

the improvement wherein said system further includes

a line identifier connector, coupled to each of said switch frames, said line identifier, and said common control, for selectively controlling the connection of individual ones

of said switch frames to said line identifier, said line identifier connector comprising, in combination:

a first plurality of means, each corresponding to one of said switch frames, responsive to a request for service from a subscriber's line circuit, for establishing a connection between a line circuit which is associated with a corresponding switch frame, with which the subscriber's line circuit requesting service is connected, and said line identifier, whereby said line identifier identifies the calling line requesting service, and

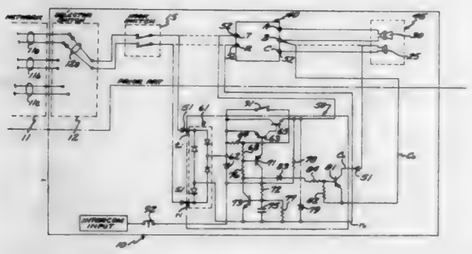
a second plurality of means, each corresponding to a respective one of said first means, responsive to the receipt of calling line identification information by said common control from said line identifier, for preventing said corresponding one of said first plurality of means from establishing a connection between the subscriber's line circuit associated with said corresponding switch frame and said line identifier until said common control has completed said path from said requesting subscriber's line circuit through said corresponding switch frame.

4,039,759

LINE SECURITY DEVICE

James H. Taylor, 409 Redondo Ave., Long Beach, Calif. 90814

Filed June 13, 1975, Ser. No. 586,614
Int. Cl.[2] H04M *1/70*
U.S. Cl. 179—38 **4 Claims**



1. A line security device adapted for connecting across the line communicating with a telephone instrument of the type that includes a receiver connected across said line, comprising:

level sensing means connected to one side of said line for producing an output signal when said line is excited by an electrical potential above a predetermined level;

latching means connected to receive said output signal for switching into a conductive state upon receipt thereof;

transistor switching means connected in circuit between said receiver and the one side of said line and controlled by said latching means to be rendered conductive after said latching means is conducting; and

remote connecting means connected to said switching means and said level sensing means for selectively rendering said switching means conductive.

4,039,760

CORDLESS TELEPHONE SYSTEM

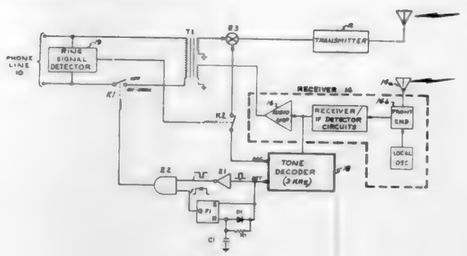
L. Duane Gregory, Colton, and Douglas G. Talley, Los Angeles, both of Calif., assignors to Teletronics United Inc., Riverside, Calif.

Filed Mar. 11, 1974, Ser. No. 450,061
Int. Cl.[2] H04Q *7/04*
U.S. Cl. 179—41 A **4 Claims**

1. A cordless telephone system providing for connection from a cordless telephone to a subscriber's telephone line, said telephone system comprising:

cordless telephone apparatus including radiant energy, duplex transmission and receiving communication means providing for simultaneous two-way communication between a base station connected to said telephone line and said cordless telephone;

system control means comprising electronic means for electronically controlling said communication means including means at saicd cordless telephone for producing logic tones of first and second time durations for transmission of logic signals between said cordless telephone and said base station in response to telephone actuating and deactuating condition, respectively;



BASE STATION

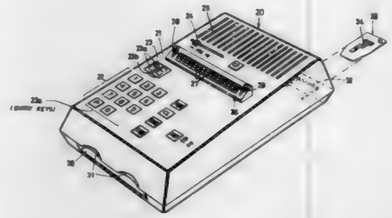
said system control means further including electronic detector means at said base station for electronically detecting said logic tones to produce first and second detection signals, respectively, and means responsive to said first detection signal to latch the telephone line and responsive to said second detection signal to unlatch the telephone line to initiate and terminate, respectively, duplex transmission and reception between said telephone line and said cordless telephone.

4,039,761

ELECTRONIC APPARATUS FOR THE PERMANENT STORAGE AND AUTOMATIC DIALING OF TELEPHONE NUMBERS

Jean-Daniel Nicoud, Lausanne, and Jean-Marie Rouiller, Couvet, both of Switzerland, assignors to Stoppani S.A., Etablissements pour la mecanique de precision et l'electromecanique, Bern, Switzerland

Filed May 19, 1975, Ser. No. 579,079
Claims priority, application Switzerland, May 20, 1974, 6907/74
Int. Cl.[2] H04M *1/45*
U.S. Cl. 179—90 B **27 Claims**



1. An electronic apparatus for the permanent storage and automatic dialing of telephone numbers, intended to be jointly connected with a telephone set, said apparatus comprising:

a. a memory circuit having a plurality of tracks, each including a plurality of storage sections for storing digital data representing all the different figures capable of being included in telephone numbers;

b. preparation and storage control means for entering digital data into said storage sections of a track of the memory circuit;

c. means for sequentially reading digital data stored in said storage sections in the order in which the sections follow one another on a track;

d. dialing and transmission means co-operating with said reading means for dialing the numbers represented by digital data successively read by said reading means from said storage sections and for transmitting the so read telephone numbers; and

e. a command keyboard provided with members, the keying of which permits the selection of a track, a display being connected to said command keyboard for identifying the thus selected track, said command keyboard having means for selectively actuating one of said preparation and storage control means and sequential reading means wherein:

f. said memory circuit also comprises, in each storage section, means for storing digital data representing an indication other than said figures capable of being included in telephone numbers, said other indication being a pause order; and

g. said command keyboard further comprises:

1. pause order storage means cooperating with said preparation and storage control means for storing, in a storage section of a selected track, digital data which represents a pause order;

2. rapid advance command means for actuating said sequential reading means to successively read all the digital data stored in a selected track, until said reading means detects the data representing a pause order, in less than one second and without actuating said dialing means transmitting digits of telephone numbers;

3. dialing command means for commanding the new dialing of a telephone number, including the pretransmission of an impulse for restoring, and then reclaiming, a telephone line, said sequential reading means cooperating with said dialing command means to stop the data reading and transmission of the corresponding telephone numbers upon detection of said pause order; and

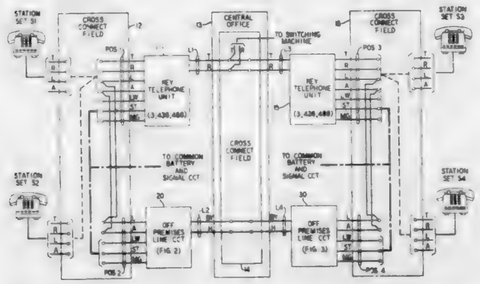
4. dialing continuation means cooperating with said sequential reading means for commanding the continuation of the dialing of a telephone number corresponding to previously unread data read by said sequential reading means subsequent to detection of said pause order.

4,039,762

KEY TELEPHONE OFF-PREMISES LINE CIRCUIT

Albert Edward Donkin, Oakhurst; David Frederick Jones, Middletown, and Henry Alfons Lanty, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 28, 1975, Ser. No. 608,502
Int. Cl.[2] H04M *1/72*
U.S. Cl. 179—99 **12 Claims**



1. In a telephone system where lamp signals are provided to a telephone station indicative of busy and hold conditions with respect to an associated telephone line under control of a line circuit interposed between said telephone station and a central switching machine, wherein said line circuit provides said lamp signals over an "L" lead between said line circuit and said station and wherein said line circuit obtains active and inactive status signals over an "A" lead between said line circuit and said station, each said line circuit arranged to place an associated telephone line in the hold condition, the improvement comprising

means for locating two telephone stations and two line circuits at locations remote from each other, each said telephone station associated with a different one of said line circuits and each said line circuit associated with the same telephone line,

said locating means including a first auxiliary circuit associated with one of said line circuits and a second auxiliary circuit associated with the other of said line circuits, said auxiliary circuits interconnected by a signaling connection and each auxiliary circuit comprising

means for monitoring said associated "A" and "L" leads to detect the busy and hold status conditions of said associated station,

means for communicating to the other of said auxiliary circuits over said signaling connection signals representative of any said detected busy and hold status conditions,

means responsive to a communicated hold status signal over said signaling connection from the other of said auxiliary circuits for providing a hold lamp signal indication to said associated station, and

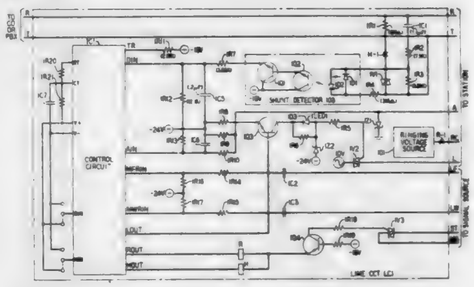
means responsive to a communicated busy status signal over said signaling connection from the other of said auxiliary circuits for providing a busy lamp signal indication to said associated station.

4,039,763

KEY TELEPHONE COMMUNICATION PATH INTERFACE

Ronald Joseph Angner, Freehold, and James Volney Lacy, Red Bank, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1976, Ser. No. 709,421
Int. Cl.[2] H04M *1/72*
U.S. Cl. 179—99 **9 Claims**



1. A line circuit for use in controlling communication services between a telephone switching machine and a telephone station, said switching machine performing a pre-ring test, an impedance test and a line status verification test, said line circuit adapted for continuous connection in parallel across the communication conduction pair between said switching machine and said telephone station and adapted for A-lead control from said station, said line circuit including

means for detecting both transient signals and ringing signals on said conduction pair, said transient signals being generated by the on-hook to off-hook or off-hook to on-hook transition of said station, and said ringing signals being applied to said communication conduction pair from said switching machine,

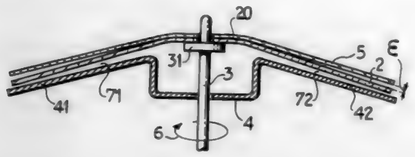
said transient signal detecting means comprising linear and nonlinear circuit elements, said linear circuit element including a capacitor and resistor series circuit across said communication pair and said nonlinear circuit element including a light emitting diode pair and a varistor parallel circuit across said resistor portion of said linear circuit element.

4,039,764

METHOD FOR PROTECTING A FLEXIBLE RECORD DISC AND DISC SO PROTECTED

Claude Bricot; Bernard Carre; Jean Claude Lehureau, and Claude Puech, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed June 17, 1975, Ser. No. 588,157
Claims priority, application France, June 21, 1974, 74.21661
Int. Cl.[2] G11B *7/24, 23/00, 7/00*
U.S. Cl. 179—100.41 L **4 Claims**



1. A method for protecting an optically readable flexible record disc having a face comprising an engraved ring shaped zone wherein signals are engraved in the form of impressions along a track and a central flat zone, said method consisting in placing, close to said face, a flexible protective disc and in sticking the central flat zone of said record disc and the part of said flexible protective disc which face said central flat zone.

4,039,765

HEADSET WITH ADJUSTABLE MICROPHONE SUPPORT

Thomas H. Tichy, Mount Prospect, and Raymond W. Collins, Schaumburg, both of Ill., assignors to Shure Brothers, Inc., Evanston, Ill.

Filed Oct. 26, 1976, Ser. No. 735,622
Int. Cl.[2] H04M *1/05*
U.S. Cl. 179—156 A **6 Claims**



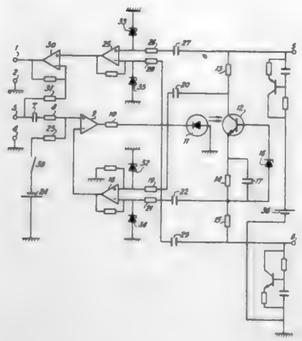
1. A communications headset comprising:
a resilient headband adapted to be worn over the head,
a substantially rigid microphone boom having a sound pick-up at one end thereof, and adjustable mounting means attached to said headband for securely supporting said sound pick-up in a position selected by the wearer, said adjustable mounting means comprising, in combination,
first and second hemispherical members having substantially equal curvatures together forming the ball of a ball-and-socket joint, at least one of said hemispherical members being recessed to form a passageway for slidably receiving said boom,
first and second bearing members having opposing surfaces forming the socket of said ball-and-socket joint,
and means for applying an adjustable clamping force to said bearing members to place said ball and said boom under variable compression.

4,039,766

ELECTRIC TWO-TO-FOUR WIRE CONVERSION CIRCUIT FOR USE IN TELEPHONE SYSTEMS

Jean A. Picandet, Paris, France, assignor to Jeumont-Schneider, Puteaux, France

Filed Mar. 17, 1976, Ser. No. 667,838
Claims priority, application France, Mar. 20, 1975, 75.08696
Int. Cl.[2] H04B *1/58*
U.S. Cl. 179—170 NC **17 Claims**



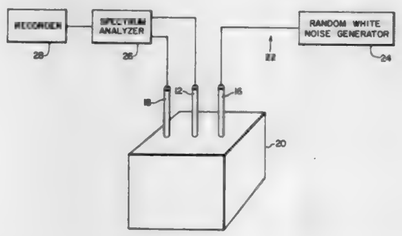
5. In an electronic two-to-four-wire conversion circuit for use in telephone systems and having receiving and transmitting circuits on the four-wire side thereof connected to the two-wire side thereof, the improvement comprising, in said receiving circuit:
a first differential amplifying means for receiving a signal in said receiving circuit having a constant gain feedback loop,
said feedback loop comprising a opto-electronic coupling means receiving the output of said first differential amplifying means for coupling said output to the two-wire side.

4,039,767

ACOUSTIC EMISSION TRANSDUCER CALIBRATION

Walter C. Leschek, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 14, 1975, Ser. No. 595,982
Int. Cl.[2] H04R *29/00*
U.S. Cl. 179—175.1 A **7 Claims**



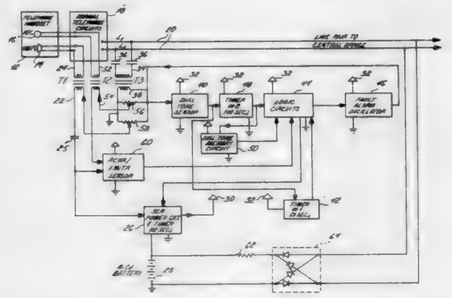
1. A method of calibrating an acoustic emission transducer to operate within a predetermined range of frequencies in a given application comprising:
determining the absolute receiving sensitivity of a standard transducer at selected frequencies within said range of frequencies;
placing said standard transducer and said acoustic emission transducer in acoustical communication with a surface of a bounded acoustic medium presenting a substantially equivalent acoustic loading to the medium on which the acoustic emission transducer is to be used in its given application, said bounded acoustic medium comprising a block, each dimension of said block being at least approximately equal to a thickness of said acoustic medium on which said acoustic emission transducer is to be used in its given application;
transmitting acoustic random white noise into said acoustic medium to establish a reverberant, diffuse sound field;
obtaining the output response of said primary transducer and said acoustic emission transducer to the reverberant, diffuse sound field at selected frequencies within said range of frequencies; and
comparing said acoustic emission transducer output response with said standard transducer output response at said selected frequencies to determine the receiving sensitivity of said acoustic emission transducer.

4,039,768

PAY TELEPHONE STATION MONITOR SYSTEM

James B. O'Maley, 2741 NE. 36th St., Lighthouse Point, Fla. 33064

Filed May 26, 1976, Ser. No. 690,286
Int. Cl.[2] H04M *1/24*
U.S. Cl. 179—175.2 C **27 Claims**



1. In a pay telephone station coupled to a central office through telephone lines, a fault alarm system comprising:
detection circuit means connected at the pay telephone station for producing alarm signals upon the detection of malfunctions of the pay station equipment;
monitor circuit means connected at the central office for receiving said alarm signals and producing output signals upon predetermined occurrences of said alarm signals; and
a handset removable from a cradle to cause a dial tone to appear onto the line, and wherein said detection circuit means further comprises:
timing means for timing the time interval from handset removal to the onset of dial tone and producing an alarm signal when the interval is greater than a predetermined amount.

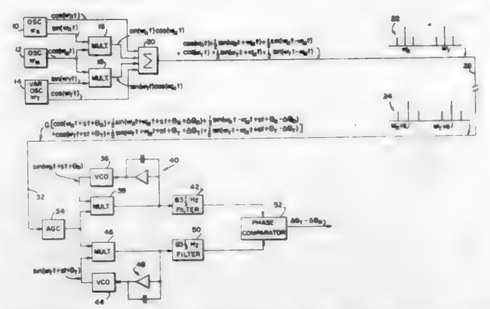
4,039,769

INSTRUMENT AND METHOD FOR MEASURING ENVELOPE DELAY IN A TRANSMISSION CHANNEL

Frank R. Bradley, Bronx, N.Y., assignor to Bradley Telcom Corporation, Leonia, N.J.

Filed Apr. 22, 1976, Ser. No. 679,350
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.3 R **72 Claims**

1. Apparatus for deriving a signal from which the envelope delay characteristic of a transmission channel can be determined comprising means for applying at the send end of the channel a signal consisting of both reference and test carrier frequencies, each modulated by the same modulating signal, the test carrier frequency being variable through that portion of the channel voiceband which is of interest; and means at the receive end of the channel for processing the simultaneously received reference and test carrier frequencies, together with their sidebands, said processing means including first means for tracking said reference carrier frequency and for deriving a signal whose frequency is the same as that of said modulating signal and whose phase is proportional to the derivative of the channel phase-shift at the reference carrier frequency, second means for tracking the variable test carrier frequency and for deriving a signal whose frequency is the same as that of said modulating signal and whose phase is proportional to the derivative of the channel phase-shift at the test carrier frequency, and means for determining the difference between the phases of the two derived signals.

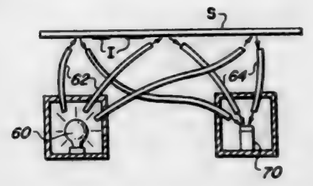


4,039,770

INTERFACE SYSTEM TO CONTROL FLASH LAMP

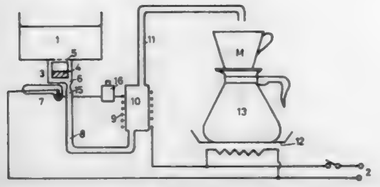
Richard C. Johnson, Pasedena, Calif., and Ihor Kulbida, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed June 11, 1975, Ser. No. 585,946
Int. Cl.[2] G03G *15/20*
U.S. Cl. 219—216 **1 Claim**



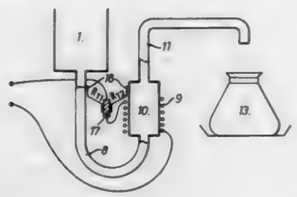
1. An improved interface system for controlling energy to a flash lamp in response to toner image density on copy sheets comprising:
means for advancing copy sheets bearing toner images along a predetermined path,
flash lamp means positioned in the path for processing said copy sheets,
area coverage sensing means for sensing the density of the toner images on said copy sheets advanced and producing spatially concentrated optical signals thereof and converting the optical signals into electrical signals proportional thereof,
said area coverage sensing means including first fiber optic means for transmitting illumination to a predetermined location in the copy sheet path and second fiber optic means for receiving illumination reflected from said copy sheets and transmitting reflected illumination to a remote location,
first circuit means for receiving and conditioning said electrical signals,
variable energy storage means including at least one chargeable capacitor for driving said flash lamp means, and
second circuit means coupled to said energy storage means for receiving the conditioned signals and controlling the input to said energy storage means for driving said flash lamp means in response to the density of toner images on said copy sheets.

4,039,771
COFFEE MAKER
Flemming Thorsoe, Sonderborg; Niels Lervad Andersen, and John Christensen, both of Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark
Division of Ser. No. 691,972, June 2, 1974, which is a continuation of Ser. No. 409,697, Oct. 25, 1973, abandoned. This application Dec. 10, 1976, Ser. No. 749,212
Claims priority, application Denmark, Nov. 8, 1972, 5516/72
Int. Cl.² F24H *1/00*; H05B *1/00*
U.S. Cl. 219—328 **1 Claim**



1. A coffee maker assembly comprising a heat exchanger having a cold water inlet pipe and a hot water outlet pipe, electrical heating means for and in close proximity to said heat exchanger, a power supply circuit connected to said electrical heating means, a PTC resistor in said circuit and being thermally connected to said cold water inlet pipe and to the downstream end of said heat exchanger, one end of said heat exchanger and one of said pipes forming an outwardly open annularly shaped well, said resistor being annularly shaped and disposed in said well.

4,039,772
COFFEE MAKER
Flemming Thorsoe, Sonderborg; Niels Lervad Andersen, and John Christensen, both of Nordborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark
Continuation of Ser. No. 409,697, Oct. 25, 1973, abandoned. This application June 2, 1976, Ser. No. 691,972
Claims priority, application Denmark, Nov. 8, 1972, 5516/72
Int. Cl.² F24H *1/00*; H05B *1/00*
U.S. Cl. 219—328 **2 Claims**

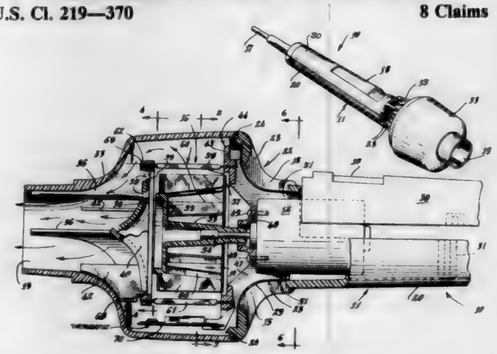


1. A coffee maker assembly comprising a one pass heat exchanger defining a chamber and having a cold water inlet pipe and a hot water outlet pipe, said inlet and outlet pipes being fluidly connected only through said chamber, electrical heating means for and in close proximity to said heat exchanger, a power supply circuit connected to said electrical heating means, a PTC resistor in said circuit and having two separate and separated thermally conductive connections connected respectively to the upstream and downstream ends of said heat exchanger.

4,039,773
ELECTRONIC CHARGING CONTROL DEVICE FOR ELECTRIC STORAGE HEATERS
Poul Christian Carlos Iversen, Nordborg, Denmark, assignor to Danfoss A/S, Nordborg, Denmark
Filed Oct. 6, 1975, Ser. No. 619,617
Claims priority, application Germany, Oct. 25, 1974, 2450688
Int. Cl.² H05B *1/02*
U.S. Cl. 219—364 **5 Claims**

1. An electronic charging control device for electric storage heaters comprising an electronic integrator, means for charging said integrator to a predetermined value during a first period, means for discharging said integrator during a second period, outdoor temperature sensing means moderating the operation of said discharging means at a rate inversely proportional to sensed outdoor temperatures, time controlled switching means for respectively connecting said charging and discharging means to said integrator during said periods, charge sensing means operative during said second period for sensing the absence of a charge on said integrator, heat control means responsive to said charge sensing means for generating a signal to actuate a heater power supply in response to the presence of a charge on said integrator and time controlled synchronizing means responsive to said charge sensing means for rapidly discharging any remaining charge on said integrator at the end of said second period.

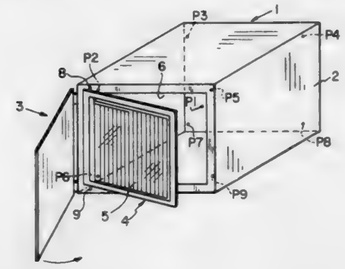
4,039,774
PORTABLE HAIR DRYER
Joseph Kata, Meriden, and Richard Ihasz, Milford, both of Conn., assignors to Sperry Rand Corporation, Bridgeport, Conn.
Filed June 4, 1975, Ser. No. 583,619
Int. Cl.² H05B *1/00*; F24H *3/04*; A45D *20/10*
U.S. Cl. 219—370 **8 Claims**



1. A portable electric hair dryer comprising,
a. an elongated casing of circular transverse cross-section and including a handle portion and an enlarged casing portion spaced from said handle, said enlarged portion positioned between air intake vents and an air discharge orifice formed in the walls of said casing;
b. means in said casing for establishing a heated airstream between said air intake vents and said air discharge orifice;
c. said airstream establishing means including a motor in said handle arranged adjacent said air intake vents and a fan driven by said motor for rotation within said enlarged casing portion and an elongated heater assembly having a central longitudinal axis and positioned in said enlarged casing portion in the path of said airstream between said fan and said discharge orifice;
d. said motor and fan having a common central longitudinal axis within said casting;
e. support means for said airstream establishing means comprising a support member of generally circular configuration secured to said enlarged casing portion between said air intake vents and said air discharge orifice, said support member having a central axis coincident with said common central longitudinal axis;

f. means formed on said support member and said heater assembly for supporting said heater assembly to said support member whereby said central longitudinal axis of the heater assembly is coincident with the axis of the support member and said common central longitudinal axis;
g. said support member having a bearing portion located centrally thereof and having a central axis coincident with said common central longitudinal axis ;
h. said bearing portion having means thereon for securing the motor and fan in coaxial relationship with said heater assembly; and
i. said support member having a central opening to permit flow of air therethrough from said air intake vents in the direction of said common central longitudinal axis through said heater assembly to said air discharge orifice and outwardly of said casting upon operation of the fan.

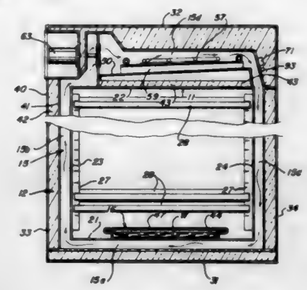
4,039,775
UNIFORM TEMPERATURE INCUBATOR
John R. Andra, Pittsburgh, Pa., assignor to Fisher Scientific Company, Pittsburgh, Pa.
Filed Oct. 1, 1975, Ser. No. 618,498
Int. Cl.² F27D *11/02*
U.S. Cl. 219—385 **10 Claims**



1. An incubator having substantial temperature uniformity comprising:
A. a housing having a plurality of walls defining an incubator chamber and having an opening for obtaining access to the chamber;
B. heating means for heating the chamber;
C. a door for sealing the opening in the housing;
D. a glass light in the door for observing the interior of the chamber; and
E. an electric heating element applied to a surface of the glass light, the heating element comprising at least one pair of bus bars, one located along each opposite edge of the glass light and having a plurality of conductors connected between the bus bars, the conductors being substantially parallel to each other and spaced over substantially the entire area of the glass.

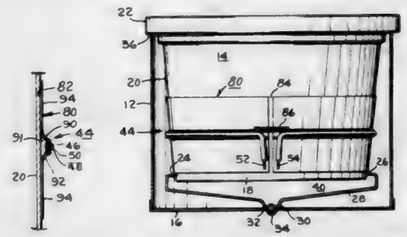
4,039,776
CLOSED PASSAGE HEAT HOLDING APPARATUS
Ronald R. Roderick, Evergreen, Colo., assignor to National Equipment Corporation, Denver, Colo.
Filed Sept. 19, 1975, Ser. No. 614,879
Int. Cl.² A21B *1/22*; F27D *11/02*
U.S. Cl. 219—401 **9 Claims**

1. In holding apparatus for holding food and the like at desirable heat and moisture levels, the combination comprising:
a. compartment means including an inner heat-holding compartment having walls made of imperforate heat-conductive material for confining a relatively still volume of air about a food and the like,
b. heating means for said volume of air including an outer jacket arranged about said compartment means defining a closed passage arranged along at least two pairs of perpendicular axes and about a major portion of the external surface of said volume of air, said outer jacket having thermally insulated walls arranged entirely about the closed passage, a temperature-controlled heating element in said closed passage automatically adjusted in response to the temperature in said compartment in a selected temperature range, and a pressure source for recirculating heated air in said closed passage for maintaining a controlled flow of temperature-controlled, heated, recirculating air about said volume of air,



and provide substantially uniform heating of the volume of air and thereby the food and the like therein by conduction and convection, and
c. moisture supply means in open communication with said heated volume of air for introducing controlled quantities of moisture into said heated, confined volume of air.

4,039,777
HEATING APPARATUS FOR GLASS OR CERAMIC COOKING VESSEL
Fred E. Baker, Asheboro, N.C., assignor to General Electric Company, Bridgeport, Conn.
Filed June 23, 1976, Ser. No. 698,962
Int. Cl.² F27D *11/02*
U.S. Cl. 219—439 **10 Claims**



1. In an electric cooking utensil including a vessel formed of glass or ceramic material having an outer surface, improved electric heating apparatus comprising:
an electric heating element and electric lead means for applying electric current to said heating element,
a single metallic support strap shaped to provide a
first support portion of heat conducting material supporting said heating element in intimate good heat exchange contact on the outer surface therewith so as to conduct heat therefrom, and a
second support portion of heat conducting material intermediate said first support portion and the outer surface of the vessel supporting said first support portion and said heating element in fixed position spaced from the outer surface of the vessel to provide a dead air space and prevent direct conduction of heat thereto,

said second support portion being in intimate heat exchange contact with both said first support portion and a substantial portion of the outer surface of the vessel, whereby heat is conducted from said heating element to the vessel over an extended portion of its outer surface so as to promote substantially uniform heating of the vessel.

4,039,778

ELECTRIC CARTRIDGE HEATER WITH A MULTIPLE THERMOCOUPLE ASSEMBLY

David E. Williams, Hemet, Calif., assignor to Rama Corporation, San Jacinto, Calif.

Filed July 1, 1976, Ser. No. 701,526
Int. Cl.[2] H05B *3/40*
U.S. Cl. 219—544 **18 Claims**



1. An elongate cartridge heater and thermocouple unit comprising an elongate normally cylindrical outer tubular metal sheath with open ends, an elongate normally cylindrical inner tubular metal tube with open ends concentric with and extending freely through the sheath in spaced parallel relationship therewith and defining an annulus, a plurality of axially aligned pairs of normally cylindrical thermocouple cables and spacer rods fixed to the exterior of the tube in circumferential spaced parallel relationship therewith and extending longitudinally through the annulus in interfering engagement with the sheath, plugs at and closing the ends of the tube and the sheath, an elongate resistance element substantially concentric with and extending longitudinally through the tube in spaced parallel relationship therewith and between the plugs, elongate conductor terminals at the ends of the element and each extending axially outwardly through and from a related plug and a filler of particulate dielectric material compacted in the tube about the element and in the annulus between the pairs of cables and rods, sheath, tube and plugs, the cables having outer end portions with thermocouple conductors accessible at free outer ends thereof extending axially through and from the plug at a related end of the annulus and having inner ends with thermocouple junctions, said cables being of different longitudinal extent and positioned with their junctions in contact with the sheath at spaced points longitudinally thereof, said rods being of different longitudinal extent and each having an inner end in close proximity with the junction of its related cable and an outer end terminating in close proximity with a related end of the annulus, said sheath being a strong substantially rigid supporting part, said tube being a relatively weak yieldable part orienting the cables and rods in the sheath.

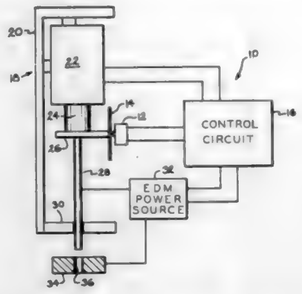
4,039,779

APPARATUS FOR COMPENSATING FOR ELECTRODE WEAR IN AN ELECTRICAL DISCHARGE MACHINE

Gary F. Rupert, Ann Arbor, Mich., assignor to Raycon Corporation, Ann Arbor, Mich.

Filed Dec. 11, 1975, Ser. No. 639,851
Int. Cl.[2] B23P *1/04*
U.S. Cl. 219—69 G **3 Claims**

1. In electrical discharge machining apparatus having an electrode and means for moving the electrode toward and away from a workpiece for the purpose of machining the workpiece, an electronic sensing device operatively associated with said electrode moving means and operable to detect incremental movements of said electrode toward and away from said workpiece and to transmit electrical signals representing said incremental movements, and control circuit means connected to said electrode moving means and to said sensor means operable to terminate the supply of working current to said electrode after said electrode has travelled toward the workpiece a preselected distance, said control circuit means further operable to provide for the movement of said electrode away from said workpiece after said electrode has travelled toward the workpiece said preselected distance and terminate



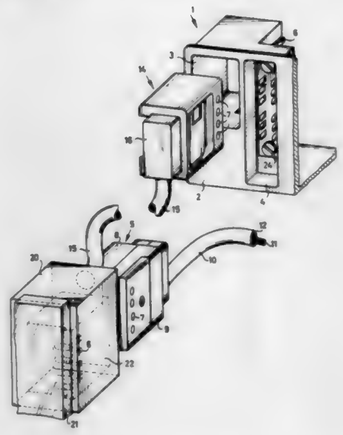
movement of said electrode away from said workpiece after it has travelled a predetermined distance less than said preselected distance.

4,039,780

ELECTRIC TAXIMETER MOUNTING AND DEMOUNTING ARRANGEMENT

Heinz Kelch, Buchenberg, and Eduard Schuh, Villingen-Schwenningen, both of Germany, assignors to Kienzle Apparate GmbH, Villingen-Schwenningen, Germany

Filed May 22, 1975, Ser. No. 579,817
Claims priority, application Germany, June 1, 1974, 2426733
Int. Cl.[2] G07B *13/00*
U.S. Cl. 235—30 R **6 Claims**



1. In a transmitting arrangement for supplying electrical pulses to a taximeter by way of a flexible rotary mechanical drive shaft adapted to be driven by a drive component of the vehicle carrying the taximeter, a combination comprising a taximeter housing formed with a first socket of predetermined contour, and having first electrical contact means; an auxiliary housing mounted on the vehicle at a spacing remote from said taximeter housing and being provided with first auxiliary electrical contact means, said auxiliary housing having a second socket of substantially the same contour as said first socket; means for converting the mechanical rotary motion of the drive component into said electrical pulses, said converting means comprising an electromechanical transducer having a transducer plug-in portion of predetermined configuration which is complementary to the contour of said second socket

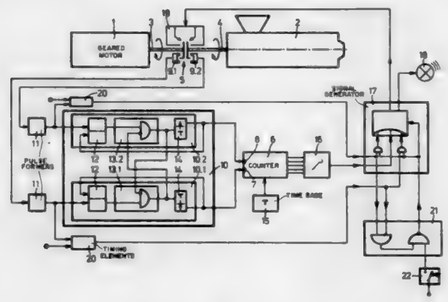
for reception therein, said transducer plug-in portion having second auxiliary electrical contact means which registers in direct electrical contact with said first auxiliary electrical contact means when said transducer plug-in portion is fully received in said second socket, and a transducer extension portion projecting away from said auxiliary housing in direction opposite to the direction of insertion of said transducer plug-in portion into said second socket, said transducer extension portion being connected to said drive shaft at a location outwardly adjacent said second socket; and means for connecting said auxiliary housing with said taximeter housing, comprising an electrical connector having a connector plug-in portion of substantially the same configuration as the predetermined configuration of said transducer plug-in portion so that said connector plug-in portion is receivable in said first socket, said connector plug-in portion being provided with second electrical contact means which registers in direct electrical contact with said first electrical contact means when said connector plug-in portion is fully received in said first socket, and a connector extension portion projecting away from said taximeter housing in direction opposite to the direction of insertion of said connector plug-in portion into said first socket, and said connecting means further comprising a flexible electrical cable having one end region connected to said connector extension portion at a location outwardly adjacent said first socket and another end region connected to said auxiliary housing so as to complete an electro-mechanical connection.

4,039,781

CIRCUIT ARRANGEMENT FOR PROTECTIVE COUPLINGS

Dieter Kolb, Stuttgart, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed May 11, 1976, Ser. No. 685,143
Claims priority, application Germany, May 31, 1975, 2524178
Int. Cl.[2] G06M *3/08, 3/02*
U.S. Cl. 235—92 EV **11 Claims**



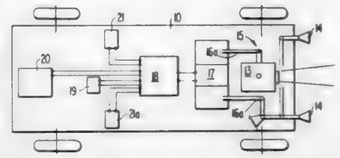
1. A circuit arrangement for protecting an overload coupling having a first driving part and a second driven part between a driving machine element and a driven, rotating machine element, the circuit arrangement comprising a forward-backward counter followed by a decoding stage and being coupled to a two-channel decoupling circuit which is connected to respective rotational speed, pulse generator elements which are coupled respectively to said driving part and said driven part and are responsive to rotation thereof said forward-backward counter having a reset input; a time base stage having its output connected to said reset input; a counting result output of said counter being coupled to said decoding stage which responds to a predetermined mined minimum counting result; and a signal generator coupled to said decoding stage and responsive to its output.

4,039,782

INSTALLATION FOR CONTROLLING A MEASURING BEAM AND/OR A LIGHT BEAM IN MOTOR VEHICLES

Manfred H. Burckhardt, Waiblingen, and Jurgen Paul, Stuttgart, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 17, 1975, Ser. No. 623,451
Claims priority, application Germany, Oct. 25, 1974, 2450777
Int. Cl.[2] G01S *9/04*; G06F *15/20*
U.S. Cl. 235—150.2 **16 Claims**



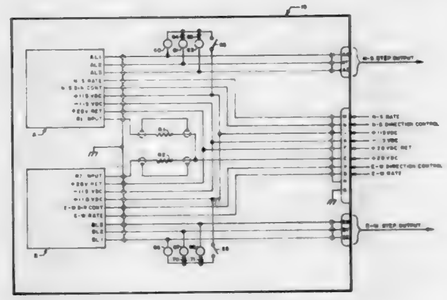
1. An installation for controlling a beam in motor vehicles which comprises at least one beam transmitter-receiver means for transmitting a beam from the vehicle which serves for detecting objects located in front of the vehicle in its own lane, wherein the improvement comprises measuring means at the motor vehicle which determine at least the vehicle velocity and the transverse vehicle acceleration, computer means responsive to the measured values from said measuring means for producing control signals for controlling the beam transmitter-receiver means in dependence on the measured values.

4,039,783

SOLID STATE STEP TRANSMITTER

Leon Bardin Crocker, Virginia Beach, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,665
Int. Cl.[2] G06F *15/20*
U.S. Cl. 235—150.3 **4 Claims**



1. A Solid State Step Transmitter which converts two single-phase digital data pulse trains into two three-phase digital electrical signals representing distance traveled comprising:

a pair of channels, each including: a single-phase digital data pulse train rate signal; and a two-state directional control signal;

voltage regulating means which develop the voltages operating the SSST; and

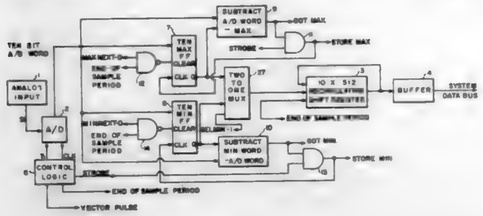
a pair of solid state three-phase square wave generators each receiving said rate and control signals from one channel and each outputting three individual square-waves displaced by 120° with respect to each other and representative of distance traveled.

4,039,784

DIGITAL MINIMUM/MAXIMUM VECTOR CRT DISPLAY

William T. Quarton, and Peter R. Lowe, both of Englewood, Colo., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Jan. 30, 1976, Ser. No. 653,725
Int. Cl.[2] G06F *15/20*; G01R *19/30*
U.S. Cl. 235—151 **12 Claims**



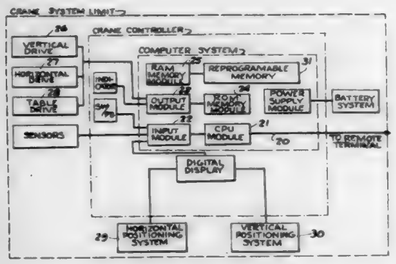
1. The method of providing a faithful digital representation of the amplitude variations of an analog signal comprising deriving in each of successive sampling periods two digital words representative, respectively, of minimum and maximum values of said signal during such sampling period, determining which of said values is most relevant to faithful representation of said signal, storing said most relevant value and discarding the other of said when only one of the said values represent a new maximum and a new minimum value, and storing both of said values in the order derived when both represent new minimum and maximum values and, hence, are relevant values, storing in said sampling period the first value derived in storing the other value in the next successive sampling period, and reading out said stored values in the order in which they were stored.

4,039,785

COMPUTER CONTROLLED ARTICLE HANDLING SYSTEM

Erich T. Ziemann, Madison, Wis., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Jan. 23, 1976, Ser. No. 651,965
Int. Cl.[2] B25J *9/00, 5/04*; B65G *61/00*; B66F *9/24*
U.S. Cl. 235—151 **12 Claims**



1. In an article handling system including means for moving articles from one position to another, the combination comprising

computer means for controlling a plurality of functions of said article handling means including

unalterable memory devices for controlling some of said functions,

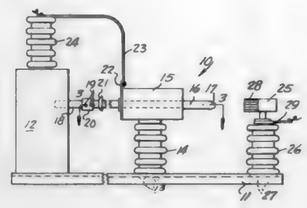
and manually operable mechanical selectively programmable memory devices for controlling other of said functions.

4,039,786

ARROW SWITCH

Roger Severin, 27 Buena Place, Red Bank, N.J. 07701, and Emil H. Lovenberg, 28 Edgemere Drive, Matawan, N.J. 07747

Filed Nov. 26, 1975, Ser. No. 635,748
Int. Cl.[2] H01H *1/38*
U.S. Cl. 200—163 **1 Claim**



1. A fast acting switch comprising a base having activating means disposed thereon, a driving rod extending outwardly from, while coupled to said activating means, said driving rod being made of an insulating material, a connecting bar remote from said activating means and attached to the extremity of said driving rod, a contact arm fastened to said connecting bar and oriented with said driving rod and connecting bar to provide a substantially axially aligned continuum of these three last named elements when said activating means is either energized or deenergized, guide means overlying a portion of said contact arm, lug means fastened to said contact arm and disposed between said connecting bar and said guide means, plate means disposed on said guide means nearest said lug means and insulated from said contact arm and having cable means leading away therefrom to a circuit, load break means lying along the same axis as said contact arm and fashioned to receive the extremity of said contact arm remote from said connecting bar, said load break means and said connecting bar oriented so as to be on opposite sides of said guide means, said load break means having cable means leading away therefrom to the same circuit, whereby when the circuit is to be deenergized, said activating means has said lug means remote from said plate means and said load break means remote from said contact arm, and when the circuit is to be energized said activating means has said lug means tangent to said plate means and said load break means overlying and connected to the extremity of said contact arm, to provide electrical continuity.

4,039,787

DISTRIBUTOR FOR INTERNAL COMBUSTION ENGINE CONTAINING APPARATUS FOR SUPPRESSING NOISE

Osamu Hori, and Teruo Yamanaka, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 10, 1975, Ser. No. 566,936
Claims priority, application Japan, Apr. 20, 1974, 49-44734
Int. Cl.[2] H01H *19/00*
U.S. Cl. 200—19 R **7 Claims**

1. A distributor for an internal combustion engine, containing an apparatus for suppressing noise, comprising:

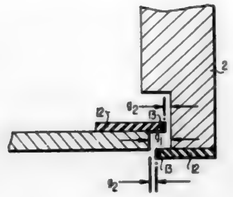
a distributor rotor which is located in the distributor and rotates at the same pace as a distributor driving shaft driven by the internal combustion engine,

a plurality of segments of a dielectric member attached with a predetermined pitch along the surface of the outer periphery of said rotor,

a segment of a metallic auxiliary electrode attached to the outer periphery surface of each of said dielectric member segments,

a plurality of stationary terminals which are located in the distributor and arranged along a circular locus defined by the rotating distributor rotor,

the portions of the surface of the outer periphery of said distributor rotor, between said spaced segments, and one side of each of said terminals defining a first discharging gap therebetween,



the surfaces of the metallic auxiliary electrode elements and one side of each of the stationary terminals defining a second discharging gap therebetween as the rotor reaches the position of each terminal, and

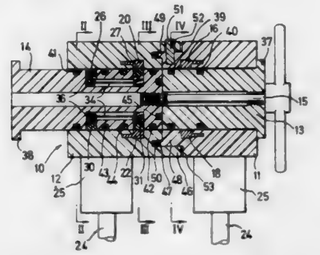
said second discharging gap is shorter than said first discharging gap.

4,039,788

ELECTRICAL CONNECTOR AND SWITCH APPARATUSES

Peter Newman, Roslin, 23 Springfield Road Bishopbriggs, Glasgow, Scotland

Filed Feb. 9, 1976, Ser. No. 656,125
Int. Cl.[2] H01R *33/28*
U.S. Cl. 200—51.13 **24 Claims**



1. An electrical connector and switch apparatus comprising:

first and second operating members including means whereby the operating members are adapted to be disconnectably connected together in end-to-end relationship;

first and second tubular housings including means whereby the housings are adapted to be disconnectably connected together in end-to-end relationship;

the two operating members and two housings, when respectively connected together, being adapted for the two operating members to be capable of relative switching movement as a single unit in the two housings;

at least said first operating member and at least said second housing each having an electrical contact such that, when the two operating members and the two housings are respectively connected together, electrical connection can be selectively made and broken between said contacts by relative switching movement of the two operating members in the two housings;

the two operating members and the two housings being adapted for said first and second operating members respectively to occupy said first and second housings when the two operating members and the two housings are respectively disconnected;

sealing means to seal the apparatus against fluid or other matter from the environment of the apparatus reaching any of the contacts both when the operating members and housings are respectively connected together and when they are disconnected;

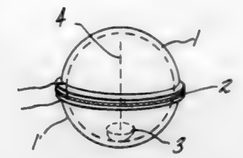
and means to make an external electrical connection to the electrical contact of said second housing.

4,039,789

THEFT PROTECTION SENSOR SWITCH

Takeshi Hase, Osaka, Japan, assignor to Daiko Electronics Co., Ltd., Osaka, Japan

Filed Sept. 8, 1975, Ser. No. 611,447
Int. Cl.[2] H01H *35/14*
U.S. Cl. 200—61.52 **9 Claims**



1. A movement-sensitive switch comprising electrically conductive top and bottom hollow members joined together along the periphery thereof with insulation disposed thereinbetween, said top and bottom members joined together so as to form a hollow, dry chamber; and a conductive balance weight having an arcuous bottom secand an electrically conductive balance weight having an arcuous bottom section and an integral top section, said top section being fixed to an upwardly-extending electrically conductive pin, said balance weight and said pin disposed in said chamber and arranged and configured therein such that (i) said arcuous bottom section is engaged with only said bottom member of said chamber in a stable equilibrium position, and said pin member extends upwardly into the hollow interior of said top member of said chamber a predetermined distance; and (ii) when said chamber is moved, said pin is caused to engage said top member thereby electrically joining said bottom members and said top member together until said balance weight moves back into said equilibrium position.

4,039,790

INERTIA SWITCH HAVING RECIPROCATING MASS

Frank Treckman, 31306 Schoenherr, Apt. 2, Warren, Mich. 48093

Filed Mar. 29, 1976, Ser. No. 671,073
Int. Cl.[2] H01H *35/14*
U.S. Cl. 200—61.53 **15 Claims**

1. Inertial switch apparatus comprising:

a housing;

an energizable circuit;

an inertial mass mounted for movement in said housing in opposite directions from a normal position along a given linear path;

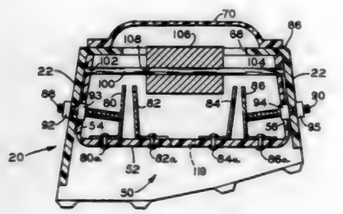
a first conductive spring blade mounted in said housing and having a portion extending transversely in said path and resiliently deformable by movement of said mass in one direction away from said normal position;

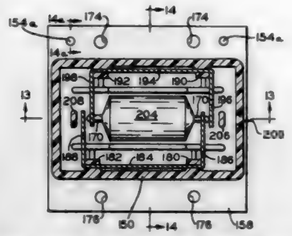
a second conductive spring blade mounted in said housing and having a portion extending transversely in said path and resiliently deformable by movement of said mass in a second direction away from said normal position;

a third conductive blade mounted in said housing and having a portion extending transversely of said path, said third blade portion being normally spaced from said first blade portion and being engageable in circuit-completing relation therewith when said first blade portion is resiliently deformed by said mass;

a fourth conductive blade mounted in said housing and having a portion extending transversely of said path, said

fourth blade portion being normally spaced from said second blade portion and being engageable in circuit-completing relation therewith when said second blade portion is resiliently deformed by said mass;





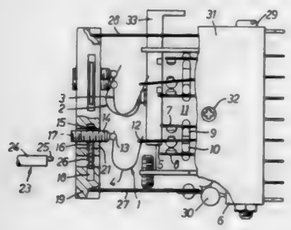
said first and third blades being coupled in said circuit to energize the same when engaged and said second and fourth blades being coupled in said circuit to energize the same when engaged, said first and third, and second and fourth blade portions being respectively spaced when said mass is in said normal position.

4,039,791

ELECTRIC SNAP SWITCH

Holger Nicolaisen; Finn Schnoor Andersen, both of Nordborg, and Jens Peter Jensen, Augustenborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Oct. 9, 1975, Ser. No. 620,870
Claims priority, application Germany, Oct. 28, 1974, 2451107
Int. Cl.[2] H01H *13/36*
U.S. Cl. 200—67 D **2 Claims**



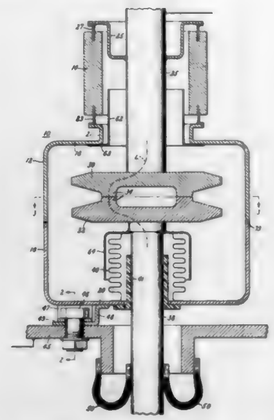
1. An electric snap switch assembly comprising a carrier unit having first and second parts at least one leaf spring mounted in said first carrier part, said second carrier part being spaced from the free end of said leaf spring, a movable bearing mounted on said second carrier part in spaced relation to and in the same plane as said leaf spring, an omega spring mounted between said bearing and said leaf spring, and bearing control means for moving said bearing a first direction towards said spring and in a second direction transversely of said first direction, said bearing control means including a slot and a movable plate in said second carrier part with said plate having a locus normal to said leaf spring, said bearing control means including a screw rotatably mounted in said plate, said bearing being at one end of said screw, cam means for adjustably moving said plate, said cam means including a shaft rotatably mounted in said second carrier part and an elongated slot in said plate, said cam means including a pin which engages said plate slot and is eccentrically mounted on said pin.

4,039,792

COMPACT HIGH-CURRENT VACUUM CIRCUIT INTERRUPTER COMPRISING A METAL HOUSING THAT IS ELECTRICALLY CONNECTED TO ONE CONTACT OF THE INTERRUPTER

Donald Wayne Crouch, Newtown Square; Donald Reah Kurtz, West Chester, and Joseph Carl Sofianek, Broomall, all of Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Dec. 19, 1975, Ser. No. 642,222
Int. Cl.[2] H01H *33/66*
U.S. Cl. 200—144 B **8 Claims**



1. A vacuum circuit interrupter having a current interrupting rating exceeding 20,000 amperes r.m.s. with any factor of asymmetry up to 1.3, comprising:

a. a pair of disc-shaped contacts relatively movable into and out of engagement with each other, with circuit interruption being effected by moving said contacts out of engagement with each other to establish a gap therebetween,

b. a movable conductive contact rod fixed to a first one of said contacts generally centrally of said first contact,

c. a generally stationary contact rod fixed to a second one of said contacts generally centrally of said second contact,

d. a highly evacuated envelope comprising:

d_1. a metal housing electrically connected to said first contact and having a generally cylindrical metal portion surrounding said contacts and a pair of generally radially-extending metal end flanges at opposite ends of said cylindrical portion, and

d_2. a tubular insulator fixed to one of said end flanges and surrounding said stationary contact rod in radially-spaced relationship, the space between the cylindrical portion of said metal housing and said second contact beins so small that during the interruption of rated currents above 20,000 amperes r.m.s., 25% or more of the arcing current frequently will flow between said housing and said second contact and bypass said first contact,

e. a flexible metal bellows located for the most part within said metal housing, providing a seal between the other of said end flanges and said movable contact rod, and allowing axial movement of said movable contact rod with respect to said metal housing,

f. means located at the outer end of said insulator for supporting said stationary contact rod on said insulator,

g. an electric bus located adjacent said other end flange,

h. means located outside said evacuated envelope for providing an electrical connection between said bus and said other end flange that is capable during interruption of carrying without damage at least one-half of the rated interrupting current of said interrupter, through which connection arcing current between said metal housing and said second contact flows, said connection forming a bypass around said bellows for said arcing current between the metal housing and said second contact, the impedance of said bypass being sufficiently low to limit any arcing current through said bellows to a value low enough to prevent damage to said bellows by said arcing current,

means providing an electrical connection between said bus and said movable contact rod through which current between said contacts flows via a path extending through rod movable contact rod,

and arc-revolving means associated with said second contact for causing any arc developed between the outer periphery of said second contact and said cylindrical metal housing portion to revolve about said second contact.

4,039,793

PRODUCTION OF MONOCHLORO- AND ARYL SUBSTITUTED SATURATED COMPOUNDS

Herman S. Bloch, Skokie, and Louis Schmerling, Riverside, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 507,086, Sept. 18, 1974, abandoned. This application Aug. 25, 1975, Ser. No. 607,311
Int. Cl.[2] C07C *25/14, 25/18, 17/32*
U.S. Cl. 260—651 R **11 Claims**

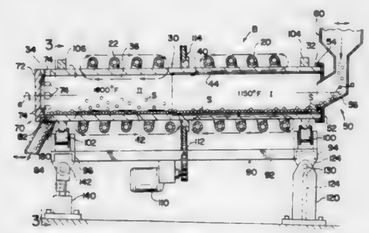
1. A process for producing monochloro- and aryl-substituted saturated compounds which comprises condensing an alkyl aromatic hydrocarbon containing from 1 to about 10 carbon atoms in the alkyl substituent with a monochloromonoolefin possessing up to 14 carbon atoms and having the chlorine atom attached to one of the doubly-bonded carbon atoms in the presence of a free radical-generating catalyst at a temperature at least as high as the decomposition temperature of the free radical catalyst and a pressure of from about 1 atmosphere to about 100 atmospheres and recovering the resultant monochloro- and aryl-substituted saturated compound.

4,039,794

APPARATUS AND METHOD FOR HEATING FERROMAGNETIC ABRASIVE SHOT

Robert J. Kasper, Seven Hills, Ohio, assignor to Park-Ohio Industries, Inc., Cleveland, Ohio

Filed Jan. 14, 1976, Ser. No. 648,960
Int. Cl.[2] H05B *5/02*
U.S. Cl. 219—10.49 **15 Claims**



1. An apparatus for heating ferromagnetic shot to a selected temperature substantially above the Curie Point temperature of the metal forming said shot, said apparatus comprising: an elongated, generally cylindrical retort having a central axis and a central passage; said retort being divided into first and second axially spaced heating zones and each of said zones being surrounded by first and second generally cylindrical surface portions, respectively of said central passage, said first surface being formed from a magnetically permeable material having a Curie Point temperature, first inductor means for inductively heating said retort adjacent said first heating zone to a first average temperature below said Curie Point temperatures of said shot and of said retort; second inductor means for inductively heating said retort adjacent said second heating zone to a second average temperature substantially above said Curie Point temperatures of said shot and said retort; means for conveying said shot successively through said first zone and then through said second heating zone whereby said shot is first heated by said first surface to a temperature below the Curie Point temperature thereof in said first heating zone and is then heated substantially by induction heating to said selected temperature in said second heating zone; and means for rotating said retort about said central axis.

8. A method of heating ferromagnetic shot to a selected temperature substantially above the Curie Point temperature of the metal forming said shot, said method comprising the steps of:

a. passing said shot axially through a central passage of an elongated retort having first and second heating zones;

b. inductively heating said retort adjacent said first zone by flux concentrated primarily in said retort; and,

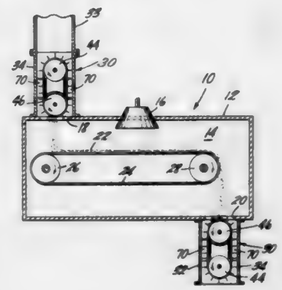
c. inductively heating said shot adjacent said second zone by flux extending through said retort and into said central passage.

4,039,795

APPARATUS FOR TRANSPORTING MATERIALS FOR TREATMENT OF SAID MATERIALS IN A MICROWAVE UNIT

Tibor S. Laszlo, and Osvalds F. Licis, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 506,042, Sept. 16, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,520
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 A **14 Claims**



1. In apparatus for treating particulate material and the like by subjecting it to microwave energy and including

a casing enclosing a space defining a microwave cavity,

a microwave power source exciting microwave energy within said casing, and

means for conveying material to and from said cavity through openings in said casing, the improvement in which said conveying means comprises

a plurality of separate belts,

means for supporting said endless belts for travel in straight parallel travel courses communicating with said openings and passing through said casing, and

an enclosure extending outwardly from each said casing opening, said enclosure comprising a corresponding plurality of separate elongated tunnels associated one with each of said belts and in which said belts travel during the straight course travel thereof, the tunnels being characterized by having waveguide characteristics and predetermined cross-sectional dimensions and length such as to

effect attenuation of microwave energy therein to a level below 10mw/cm² at the tunnel ends remote from said casing openings,

said enclosure comprising two opposed, parallel spaced walls, the straight run courses of said belts extending between said walls, there further being partitions extending between said walls at the sides of each belt to define with said opposed walls an assembly of separate tunnels of rectangular cross-section and each associated with one of said belts, said assembly being connected to said casing,

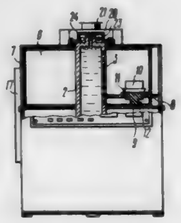
said belts traversing horizontally disposed straight travel courses with said belts being of substantially U-shaped cross-section having a base and side walls upstanding from said base and passing through said tunnels in close spaced adjacency to the tunnel structure.

4,039,796

MICROWAVE OVEN HAVING IMPROVED CONVEYING MEANS

Jury Veniaminovich Leibin, ulitsa Raevskogo, 3, kv. 36, Leningrad; Samuil Veniaminovich Nekrutman, Lomonosovsky prospekt, 19, kv. 264, Moscow; Alexandr Nikolaevich Vyshelessky, Petrovsko-Razumovsky proezd, 7, kv. 28, Moscow; Iosif Alexandrovich Rogov, ulitsa Vostrukhina, 7, kv. 80, Moscow; Lazar Iosifovich Kishinevsky, prospekt 50-letia Oktyabrya, 81, kv. 32, and Anatoly Pavlovich Pidenko, prospekt 50-letia Oktyabrya, 81, kv. 31, both of Saratov, all of U.S.S.R.

Continuation of Ser. No. 484,221, June 28, 1974, abandoned.
This application Jan. 22, 1976, Ser. No. 651,397
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 A **3 Claims**



1. A microwave frequency turntable-type continuous oven having a loading section and shielded cooking sections, comprising: a chamber shaped as a body of revolution with holes, and a loading-unloading opening; a rotor installed inside said chamber in coaxial relationship therewith; a shaft of said rotor carrying radially and equidistantly spaced blades corresponding to the shape of the housing of said chamber through which they move, and dividing said chamber into compartments; shelves of dielectric material positioned between the upper and lower edges of said blades perpendicular to the axis of said shaft, which together form a disk whose outer shape corresponds to the shape of the housing of said chamber; seals positioned on said blades to prevent dissipation of the microwave-frequency energy; a slot-type electromagnetic exciter so positioned in relation to said chamber that in the course of operation it communicates with some of said isolated compartments forming the working portion of said chamber, while said holes in the chamber coincide with the slots in said slot-type exciter.

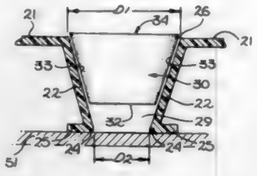
4,039,797

BOTTOMLESS MICROWAVE BAKING UTENSIL

Dolores Olsen, 1992 Burleson Ave., Thousand Oaks, Calif. 91360

Filed Feb. 13, 1976, Ser. No. 657,881
Int. Cl.² H05B 9/06
U.S. Cl. 219—10.55 E **10 Claims**

1. A cooking utensil for use in combination with a microwave heating apparatus, comprising an upper surface member having at least one aperture therein, said aperture being defined by a tapering, narrowing wall and forming a cavity wherein the width of said aperture at said upper surface member is larger than the width of said aperture at the lower end of



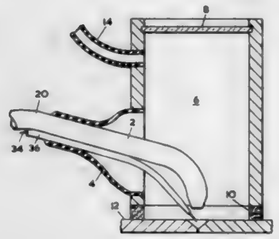
said tapering, narrowing wall, said tapering, narrowing wall capable of receiving and supporting a baking cup disposed therein such that the bottom of said baking cup is unsupported.

4,039,798

UNDERWATER WELDING

David John Lythall, Hertford, and Eric Martin Wilson, Weston-Super-Mare, both of England, assignors to BOC International Limited, London, United Kingdom

Filed June 10, 1975, Ser. No. 585,661
Claims priority, application United Kingdom, June 10, 1974, 25596/74
Int. Cl.² B23K 9/00
U.S. Cl. 219—72 **6 Claims**



1. A process for deep water gas shielded arc welding including the steps of positioning a welding chamber adjacent to an underwater workpiece to be welded; injecting a pressurized gas into said chamber at sufficient pressure to displace the water from the interior of said chamber and to maintain said displacement in response to variations in outside pressure to expose part of the surface of the workpiece to said gas; introducing a non-consumable electrode welding torch of the constricted arc type into the gas-filled space in said chamber and supplying gas to said torch at a pressure significantly greater than the pressure of the gas within said chamber.

4,039,799

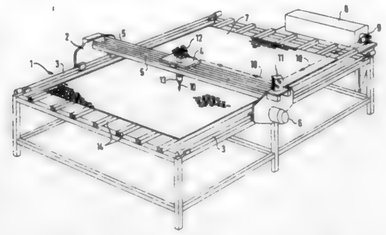
DEVICE FOR CUTTING SHEET MATERIAL

Gunter Stumpf, 7421 Mehrstetten, Kr., Munsingen, Germany

Continuation of Ser. No. 472,207, May 21, 1974, abandoned.
This application Aug. 11, 1975, Ser. No. 603,862
Claims priority, application Germany, May 22, 1973, 193110
Int. Cl.² B23K 26/00
U.S. Cl. 219—121 L **7 Claims**

1. A device for cutting sheet material comprising means for producing a thermal cutting beam, plate-like supporting means for supporting said sheet material in a position in which said thermal cutting beam can cut the sheet material, said plate-like support means having perforations, a plurality of supports, each of said supports including screw means for individual vertical adjustment and an upper conical portion, a cowl seated on each conical portion and having a projection at its upper

end insertable in a respective one of perforations in said plate-like supporting means, said plate-like supporting means and



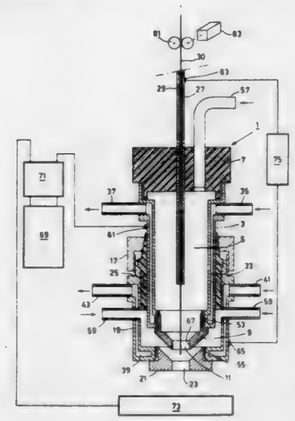
said cowls being removable from said conical portion so as to permit rigid sheet material to be supported directly on the conical portions at the apices thereof.

4,039,800

METHOD OF AND DEVICE FOR ARC WELDING

Wilhelmus Gerardus Essers, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 19, 1975, Ser. No. 559,820
Claims priority, application Netherlands, Mar. 27, 1974, 7404120
Int. Cl.² B23K 9/00
U.S. Cl. 219—121 P **10 Claims**



1. A method of plasma -MIG welding, which comprises establishing a plasma arc between a first non-consumable electrode and a workpiece, feeding a consumable electrode through said plasma arc toward said workpiece, and establishing a MIG-arc between said consumable electrode and an auxiliary non-consumable electrode electrically insulated from said workpiece.

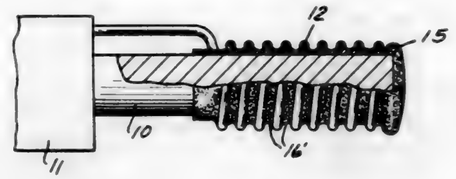
4,039,801

METHOD FOR CONNECTING A FINE WIRE TO A CONNECTING PIN

Otto Foerster, Graefelfing, and Erich Vojta, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 429,561, Jan. 2, 1974, abandoned. This application June 27, 1975, Ser. No. 591,038
Claims priority, application Germany, Jan. 10, 1973, 2301094
Int. Cl.² B23K 9/00
U.S. Cl. 219—137 R **2 Claims**

1. A method of forming a welded connection between a fine wire having a layer of insulation and a connecting pin comprising the steps of applying a layer of solder on the pin, then wrapping the wire around the pin with at least three turns of the wire extending around the pin, applying a welding arc to weld a portion of the wrapped wire to the pin with a weld bead adjacent to the end of the pin, said welding arc burning the insulation layer from the wire in the area of the turns and also



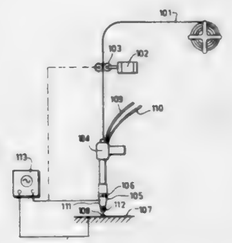
melting the layer of solder which then solidifies to hold the wrapped wire on the pin in at least one place spaced from the weld bead to prevent shifting of the unwelded portion of the wire on the pin and prevent breaking of the wire at the weld bead.

4,039,802

METHOD OF AUTOMATIC OR SEMI-AUTOMATIC WELDING WITH GASES

Tamotsu Kotani, Akashi, Japan, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Continuation of Ser. No. 586,152, June 12, 1975, abandoned.
This application Dec. 1, 1976, Ser. No. 746,232
Int. Cl.² B23K 5/00
U.S. Cl. 219—137 R **4 Claims**



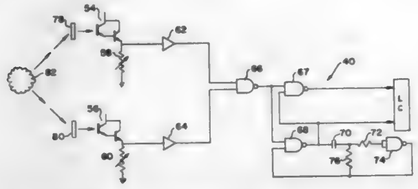
1. A method of welding a work part by use of a gas flame, comprising the steps of: supplying a combustion-supporting gas and a combustible gas, respectively, for mixture; projecting said mixture in the form of a ring to form a ring-shaped flamed; feeding an electrically conductive fillet wire from a source of fillet wire through said ring-shaped gas flame to a position spaced from said work part; heating said fillet wire and said work part by said flame such that the end of said fillet wire spaced from said work part is heated to a molten state to melt onto said work part; applying a voltage between said work part and said fillet wire; and further heating said fillet wire independently of said gas flame by passing a short-circuit current through said fillet wire, said short-circuit current flowing through said molten fillet wire and said work part when said molten wire drops into electrical circuit contact between said work part and said fillet wire.

4,039,803

ELECTRO-OPTIC WELDING HELMET LENS ASSEMBLY

Thomas B. Harsch, Stow, Ohio, assignor to Mack Gordon, Cleveland, Ohio

Filed Apr. 8, 1976, Ser. No. 674,903
Int. Cl.[2] B23K *9/32*
U.S. Cl. 219—147 **5 Claims**



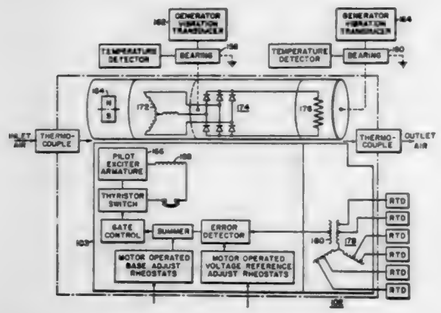
1. In a welding helmet of the type employing a liquid crystal light shutter as a lens assembly, the combination of first means exposed to light emitted from a welding arc for producing a first electrical signal in response only to visible light from said arc, second means exposed to light emitted from a welding arc for producing a second electrical signal only in response to infrared wave energy from said arc, and circuitry coupled to said first and second means and operable only when both said first and second electrical signals are produced for increasing the opacity of the liquid crystal light shutter.

4,039,804

SYSTEM AND METHOD FOR MONITORING INDUSTRIAL GAS TURBINE OPERATING PARAMETERS AND FOR PROVIDING GAS TURBINE POWER PLANT CONTROL SYSTEM INPUTS REPRESENTATIVE THEREOF

Terry J. Reed, Latrobe, and Robert A. Yannone, Aldan, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 234,491, March 14, 1972. This application Oct. 4, 1973, Ser. No. 403,595
Int. Cl.[2] F01D *17/00*
U.S. Cl. 235—151.21 **2 Claims**



1. A machine implemented method for operating industrial gas turbine apparatus including a gas turbine having compressor, combustion and turbine elements, a fuel system for supplying fuel to the combustion element, and a process sensor for monitoring a selected process parameter of gas turbine operation by generating a signal representative thereof utilizable for scheduling fuel flow from said fuel system to said combustion element and means for storing signals of the type generated by said sensor, the steps of said method comprising

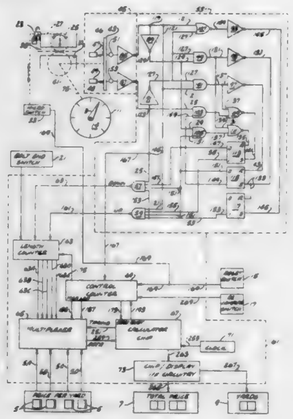
a. generating a signal representative of the value of said parameter at a time when said value is known,
b. comparing the actual value of the signal generated at said time to the known value of said parameters,
c. storing the difference between the known value of said parameters and the actual value of the signal generated,
d. determining, from said stored difference value, a calibration value for said process sensor,
e. utilizing said calibration value in correctively adjusting the value of successive parameter generated signals representative of the value of said parameter, and
f. scheduling fuel flow from said fuel system to said combustion element at least in part as a function of said adjusted signal values.

4,039,805

APPARATUS FOR CALCULATING THE PRICE OF MEASURED LENGTHS OF MATERIAL

John A. Newell, St. Louis County, Mo., assignor to The Measuregraph Company, St. Louis, Mo.

Filed Mar. 27, 1975, Ser. No. 562,764
Int. Cl.[2] G06F *15/20;* **G01B** *3/12*
U.S. Cl. 235—151.32 **1 Claim**



1. Apparatus for calculating the price of a measured length of material comprising:

means for sensing movement in either of two directions of a material having a length to be measured and a price per unit length, the sensing means including a light source, a pair of detectors responsive to the presence or absence of light and a disk responsive to the movement of material in either direction and having first and second optically encoded bands respectively interposed along optical paths from the light source to the detectors alternately to block and transmit light from said source to said respective detectors in a phased sequence which is a function of the direction of movement of the material, said optically encoded bands comprising concentric rings of alternating opaque and light-transmitting zones with the positions of the zones in the first band being shifted with respect to the positions of the zones in the second band whereby as the disk is rotated by the movement of the material the sequence of transmission and interruption of light by the first band relative to that of the second band differs in phase as a function of the direction of movement of the material, and first and second roll means for the insertion therebetween of said material whose length is to be measured and to which the disk is coupled whereby the direction of rotation of the roll means as a material moves therebetween in either direction determines the direction of rotation of the disk;

means into which the unit price of the material is entered and from which a binary value related thereto may be derived;

logic means responsive to the sensing means for determining the direction of material movement and for providing a first signal representative of the distance of the material moves in a forward direction and a second signal representative of the distance the material moves in a reverse direction;

means responsive to the first and second signals and to the binary value derived from the unit price to provide an output signal representing the total price of the measured length of material, said signal responsive means including a length counter whose contents are incremented in response to the first signal and decremented in response to the second signal whereby the contents of the length counter represent the binary value of the total measured length of material and means responsive to the end of a bolt of material passing through the roll means to provide an indication thereof, said bolt end responsive means further including switch means for incrementing the contents of the length counter an amount equal to an offset between the roll means and a predetermined reference point at which said material is initially aligned; and

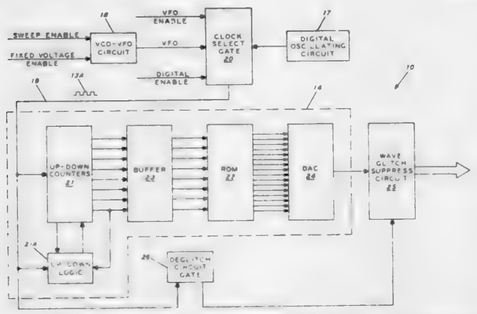
display means responsive to the output signal for indicating the total price of a measured length of material.

4,039,806

SYNTHESIZER FOR TESTING ELEMENTS OF A GEOPHYSICAL DATA ACQUISITION SYSTEM

Oke A. Fredriksson, and Elmer L. Thomas, both of Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 1, 1975, Ser. No. 618,550
Int. Cl.[2] H03K *13/02*
U.S. Cl. 235—152 **3 Claims**



1. A synthesizer used in testing elements of a geophysical data acquisition system using a generated synthesized sinusoid of frequency f_o where f_o is in a range of 1 to 500 Hz, comprising:

means for producing a pulse train having a rate equal to Cf_o where C is a constant;

counter means operative in response to said pulse train for producing a series of addresses;

storage means connected to said counter means, having storage locations operative in response to said addresses to produce a series of binary code words, each indicative of a digital amplitude of said sinusoid as a function of time;

digital-to-analog conversion (DAC) means connected to said storage means and having an output conductor path, for producing discrete analog amplitude values of said sinusoid thereat corresponding to said binary code words accessed from said storage means; and

glitch suppression means connected to said conductor path of said DAC means operative to hold said discrete analog amplitude values at individual true values at least during a selected time interval measured by a change in operating state of said conductor path whereby unwanted glitches produced by change in operational state of at least said DAC means are suppressed;

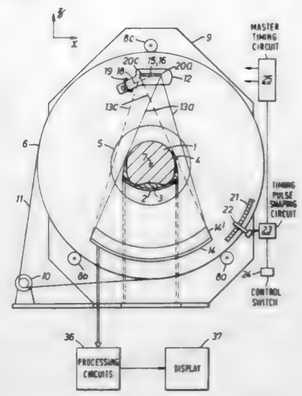
said suppression circuit including a one-shot enabled by said Cf_o pulse train, and switch circuit means responsive to said enabled one-shot to selectively disable and then enable said conductor path from said DAC means during said selected time interval.

4,039,807

ELECTRON BEAM DEFLECTION ARRANGEMENTS HAVING PRESHAPING OF THE BEAM

Eric William Bull, Sunbury-on-Thames, England, assignor to EMI Limited, Middlesex, England

Filed July 7, 1976, Ser. No. 703,238
Claims priority, application United Kingdom, July 11, 1975, 29182/75
Int. Cl.[2] A61B *6/02;* **G03B** *41/16*
U.S. Cl. 250—360 **12 Claims**



1. An X-ray tube including a source of a ribbon-like beam of electrons, being relatively narrow in a first direction perpendicular to the direction of travel of the beam and relatively wide in a second direction orthogonal to the first direction and direction of travel, a target extended in the first direction and having a surface inclined to the second direction to project x-rays substantially about a chosen direction, which may be the second direction, in response to electrons incident thereon, means for deflecting the beam of electrons to scan the region of incidence of the beam along the target in the first direction and correction means for changing the shape of the beam of electrons in dependence on said deflection so that the region of incidence of the deflected beams remains a linear region substantially parallel to the region of incidence of the undeflected beam.

4,039,808

SOLID STATE IONIZATION CHAMBER OF SILICON PN-JUNCTION TYPE

Ryuichi Tanaka, Maebashi; Satoshi Tajima, Takasaki; Akira Usami, Nagoya, and Mitsutaka Yokoyama, Fuchu, all of Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,778
Claims priority, application Japan, Nov. 30, 1974, 49-137544
Int. Cl.[2] G01T *1/24*
U.S. Cl. 250—370 **11 Claims**



1. A solid state ionization chamber of silicon PN-junction type for detecting gamma-ray and X-ray radiations, comprising an N/P-type silicon solar cell, said N/P type solar cell being doped with copper for establishing a reduction rate of lifetime of minority carriers in response to gamma-ray and

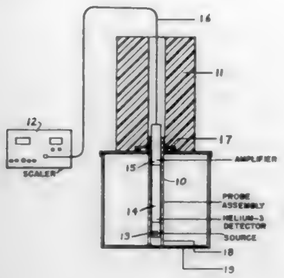
X-ray radiation to improve radiation resistance; and a heavy metal foil positioned adjacent said solar cell for compensating for directional dependence of said solar cell to incident direction of radiation.

4,039,809

LOWER-ENERGY NEUTRON SOURCES FOR INCREASING THE SENSITIVITY OF NUCLEAR GAGES FOR MEASURING THE WATER CONTENT OF BULK MATERIALS

Sylvia M. Bailey, 6908 Strathmore St., Chevy Chase, Md. 20015

Filed Sept. 2, 1975, Ser. No. 609,629
Int. Cl.[2] G01T *3/00*; G21G *4/02*
U.S. Cl. 250—390 **9 Claims**



1. A gage for measuring the water content or hydrogenous content of plastic concrete or materials of similar characteristics comprising

means for holding a predetermined amount of plastic concrete or materials of similar characteristics of which the water content is to be measured,

a nuclear source located adjacent said holding means,

detector means for detecting low energy neutrons located adjacent said holding means,

means to register output from said detector means connected electrically to said detector means,

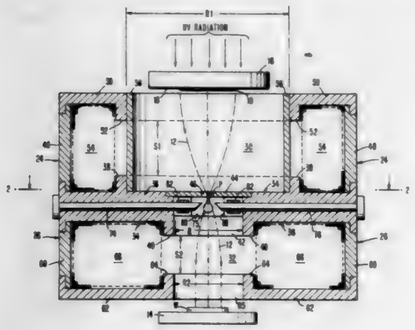
said nuclear source being a radioactive neutron source of intermediate fast neutron energy in the range from 1.0 to 2.5 Mev with an average of about 1.5 Mev.

4,039,810

ELECTRON PROJECTION MICROFABRICATION SYSTEM

Marcus Barry Heritage, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,438
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—396 ML **7 Claims**



1. In a microfabrication system wherein an electron beam defining a pattern image is projected from a masked photocathode to a sensitized workpiece, the improvement comprising:

a lens structure defining a first region through which the electron beam passes, said lens structure including:

means for producing an electrostatic field in said first region to accelerate the electrons in said beam, and

means for producing a magnetic field in said first region to focus said beam at a crossover point in a plane located intermediate the photocathode and the workpiece,

said lens structure being arranged so that said first region is spaced from the workpiece;

means defining a second region intermediate said first region and the workpiece through which the beam passes from said crossover point to the workpiece; and

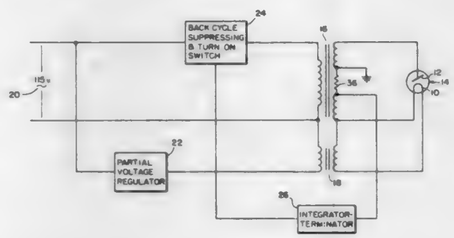
a shielding structure between said first and second regions for effectively isolating said second region from the electrostatic field in said first region without interrupting the beam path between said regions.

4,039,811

METHOD OF OPERATING AND POWER SUPPLY FOR X-RAY TUBES

Frieder H. Ennslin, and Richard J. Buck, both of Rochester, N.Y., assignors to Sybron Corporation, Rochester, N.Y.

Continuation-in-part of Ser. No. 560,446, March 21, 1975, abandoned, which is a continuation of Ser. No. 390,929, Aug. 23, 1973, abandoned. This application Nov. 25, 1975, Ser. No. 635,068
Int. Cl.[2] H05G *1/30*
U.S. Cl. 250—409 **13 Claims**



1. Method of operating an X-ray tube of the kind that is energized from a conventional alternating current power source through a load responsive high voltage transformer comprising the steps of: varying the plate current in response to changes in the voltage of the source, thereby the chaning the electrical load of the transformer to a degree that the output voltage of said transformer remains substantially constant independent of changes in the voltage across its input.

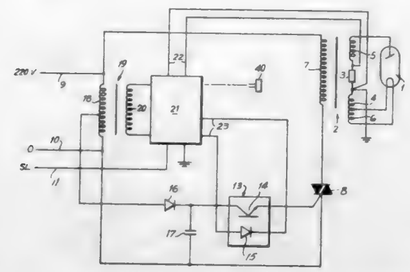
4,039,812

X-RAY DIAGNOSTIC APPARATUS

Ulrich Grassmé, Nurnberg, and Eickhardt Söder, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 482,840, June 5, 1974, abandoned. This application Nov. 11, 1975, Ser. No. 631,154
Claims priority, application Germany, June 28, 1973, 2333004
Int. Cl.[2] A61B *6/00*; H05G *1/30*
U.S. Cl. 250—413 **9 Claims**

4. In an X-ray diagnostic apparatus having an adjustable mAs-relay for determining the exposure time for an X-ray exposure; an X-ray tube having variable X-ray tube voltage and current in conformance with fluctuations of a voltage supply; control means for controlling said mAs-product in dependence upon said voltage supply for maintaining constant an X-ray dosage, said X-ray dosage being predetermined through preset values for said mAs-product and the X-ray tube voltage; said mAs-relay including an integrator having an integrator input circuit for receiving an input voltage which is a function of the X-ray tube current of said X-ray tube, and having an integrator output circuit for supplying an integrator output voltage which is a measure of the integral of the X-ray tube current, and including a plural-voltage-responsive element having a first input connected with said integrator output circuit for receiving said integrator output voltage which is a measure of the integral of the X-ray tube current, having a second input, and having an exposure-controlling output circuit for controlling the time duration of the X-ray exposure; said control means including an input for receiving a supply-voltage-responsive signal corresponding to the actual value of the voltage supply and having an output for supplying an



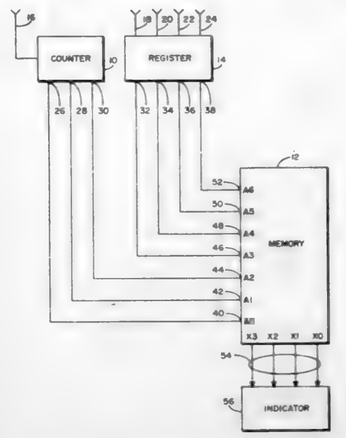
output control voltage which is a measure of the required mAs-product for the supply-voltage-responsive signal received at it input, the plural-voltage-responsive element having its second input connected to the output of said control means and being responsive to the output control voltage from said control means to vary the peak value of the integrator output voltage at its first input which is required to actuate said plural-voltage-responsive element to terminate an X-ray exposure, such required peak value of the integrator output voltage being increased for decreasing values of the supply voltage as represented by said supply-voltage-responsive signal, and decreasing with an increasing supply voltage as represented by said supply-voltage-responsive signal, so as to maintain substantially a constant X-ray dosage independent of fluctuations in the voltage supply.

4,039,814

REAL TIME PROGRAMMABLE DIGITAL REGISTER ANALYSER

Gilles Saint-Hilaire, 1743, rue Michel, Ste-Julie, Quebec, Canada (J0L 2C0), and Jean-Marc Guay, 735 Marie Victorin, Boucherville, Quebec, Canada

Filed June 18, 1976, Ser. No. 697,559
Int. Cl.[2] H03K *5/18*; G08B *29/00*
U.S. Cl. 235—153 A **17 Claims**



output signals from said counter means and said certain logic signals for generating an address utilized by said memory means for accessing said predetermined code words.

4,039,813

APPARATUS AND METHOD FOR DIAGNOSING DIGITAL DATA DEVICES

Glen Roy Kregness, Hopkins, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

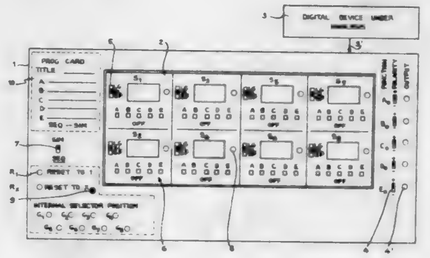
Filed Apr. 7, 1976, Ser. No. 674,712
Int. Cl.[2] G06F *11/04*; H03K *5/18*
U.S. Cl. 235—153 AC **16 Claims**

1. In a digital data processing device, apparatus for diagnosing functional hardware errors in certain logic signals produced therein, comprising:

a. counter means for counting a predetermined test step sequence and producing binary output signals indicative of such steps;

b. memory means for storing predetermined code words indicative of diagnostic data at addressable storage locations therein; and

c. address generating means coupled to receive said binary



1. An apparatus for analyzing output signals of digital devices, comprising a plurality of comparison registers for evaluating the digital output signals, each comparison register including means for decoding the output signals under analysis; program setting switching means for generating a function signal through at least one output channel provided in each comparison register when said output signals and the decoded value of said register are in a predetermined relationship; and logic circuit means for selectively controlling operation of said plurality of comparison registers, whereby the function signal is issued by the comparison register through said channel in accordance with a predetermined program set by the switching means and under the control of the logic circuit means, the function signal being representative of said predetermined relationship between the output signals from the digital device under analysis and said decoded value of the comparison register.

4,039,815

ELECTRO-OPTICAL CORRELATOR

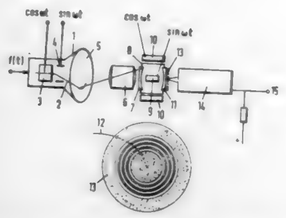
Ronald Jan Geluk, Nootdorp, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Netherlands

Filed Oct. 20, 1975, Ser. No. 623,946

Claims priority, application Netherlands, Oct. 28, 1974, 7414060

Int. Cl.² G06G *7/19, 7/78*

U.S. Cl. 235—181 **8 Claims**



1. A system for electro-optically correlating two signals, characterized by: means for forming a running representation of the amplitude variation of one of said signals, and comprised of a cathode ray tube having a phosphorescent screen, said cathode ray tube including deflection plates controlled to produce a light track on said phosphorescent screen, each point of said track having a brightness corresponding to the instantaneous amplitude of said one of said signals; at least one masking means having a geometric configuration representing the amplitude variation of the other of said signals; an image intensifier tube, said image intensifier tube having deflection coils energized so that a dot travelling on said phosphorescent screen of said cathode ray tube is reproduced as a stationary dot on an anode of said image intensifier tube; and means for observing the running representation through said masking means and for integrating the observed signal.

4,039,816

ARRANGEMENT FOR TRANSMITTING LIGHT ENERGY

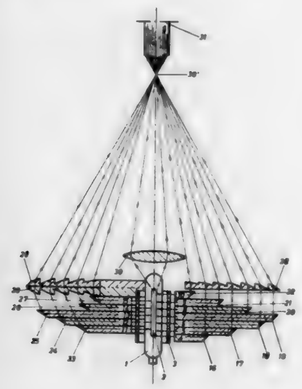
Richard Gareis, 9 Ziegetsdorfer Str., Regensburg, Germany (8400)

Filed Oct. 6, 1975, Ser. No. 619,872

Claims priority, application Germany, Oct. 8, 1974, 2447832; Nov. 14, 1974, 37945[U]

Int. Cl.² F21P *5/02;* **F21V** *7/12*

U.S. Cl. 240—1 EL **15 Claims**



1. In an arrangement for transmitting the light energy radiated by a light source

having an elongated light-producing means, and comprising a stack of light-conducting bodies having walls running in parallel to a common plane, said walls extending sidewards from said light source and having reflecting surfaces at their respective ends remote from said light source, the improvement wherein,

said bodies are arranged around said light source, and said means is substantially perpendicular to said plane, whereby each one of said bodies collects only a portion of the light produced by said means and transmits the collected light to its reflecting surface, thereby allowing said bodies to substantially fully collect the light produced by said means.

4,039,817

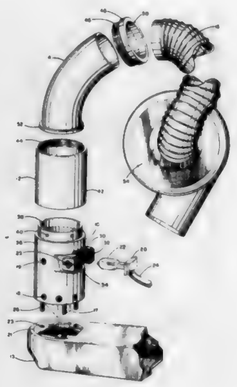
MICROSCOPE LAMP ASSEMBLY

Robert W. Williams, 3201 S. Maryland Parkway, Las Vegas, Nev. 89109

Filed Nov. 20, 1975, Ser. No. 633,608

Int. Cl.² F21V *33/00*

U.S. Cl. 240—2 MA **7 Claims**



1. In an operation microscope the improvement comprising a high intensity illumination lamp assembly comprising:

a. a high intensity lamp secured in a lamp housing member;

b. a lamp base member on which said lamp is mounted, and an electrical supply cord for said lamp;

c. a lamp housing member having a cavity for receiving said lamp, a plurality of orifices communicating between the cavity and exterior thereof, an opening through which said lamp extends and means for mounting said lamp;

d. a fan for drawing air through said housing member orifices and cavity for cooling said lamp; and

e. a conduit extending between said housing member and said fan comprising an angled pipe member and a flexible hose, said pipe secured to said base member and said hose extending between said pipe and said fan.

4,039,818

REMOTELY POSITIONABLE MIRROR ON AN ELONGATE ARM

Ronald Price Hickman, Waltham Abbey, England, assignor to Inventec International Limited, Point Robert, Guernsey (Channel Is.)

Continuation of Ser. No. 507,383, Sept. 19, 1974, abandoned. This application Feb. 24, 1976, Ser. No. 661,001

Claims priority, application United Kingdom, Sept. 19, 1973, 43997/73; May 24, 1974, 23364/74

Int. Cl.² F21V *33/00;* **G02B** *5/08*

U.S. Cl. 240—2.18 **25 Claims**

1. A portable, remotely positionable mirror construction comprising:

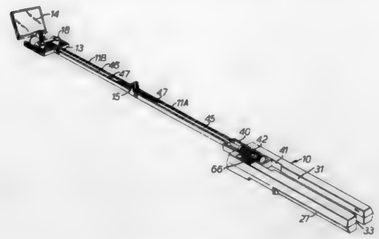
an elongate arm which can be supported from one end by a single hand;

a mirror;

an angleable connection connecting said mirror to the other end of said arm for rotation of said mirror with respect to said arm about two axes at right angles to one another;

a control element adjacent said one end of said arm for controlling the angular orientation of said mirror with respect to said arm, said element being operable by the same hand which supports said arm while said arm is being supported by said hand alone;

a unitary transmission means extending along the elongate arm and linking said element to said connection for transmitting control movements of said control element to said mirror so that movement of the control element with respect to said arm in a linear direction controls movement of the mirror about one of said axes, and movement of the control element in a rotational direction with respect to said arm controls movement of the mirror about the other of said axes.



8. A mirror as defined in claim **1**, further comprisng:

an electric circuit including a first receptor adjacent said mirror for receiving an electrically energizable light emitting element, a second receptor adjacent the other end of said arm for receiving an electric power source, and an electric current conductor between said receptors.

4,039,819

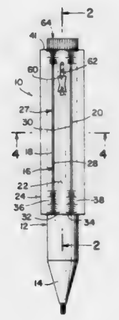
COMBINED WRITING INSTRUMENT AND SLIDE RULE

Michael Vorrasi, Box 7080, Hollywood, Fla. 33021

Filed Oct. 29, 1975, Ser. No. 626,830

Int. Cl.² B43K *29/10*

U.S. Cl. 240—6.46 **1 Claim**



1. A combined writing and illuminated computing instrument adapted to receive a battery means; said instrument comprising a first elongated translucent generally tubular member; a writing means carried at one end of said first member; an elongated ridge projecting radially of said first member and being directed along substantially the entire length of said first member; first numerical scale means formed on said ridge; a generally tubular second translucent member having a longitudinally directed elongated slot and having second numerical scale means formed along said slot; said seond member being slideably received about said first member with said slot slideably receiving said ridge for enabling relative longitudinal manipulation of said first and second scales; the interior of said first tubular member comprising an elongated cavity for receiving said battery means, a lamp means mounted in said cavity proximate the other end of said first member for illuminating said first and second scales and for enabling some of the light from said lamp means to be directed out said other end; variable iris means carried on said other end of said first member for adjusting the amount of light directed out of said other end; and means carried by said first member for electrically interconnecting said battery means and said lamp means in an electrical circuit; said electrically interconnecting means including a switch means mounted on said ridge.

4,039,820

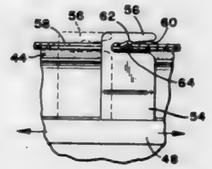
WATERTIGHT LAMP FIXTURE

Vincent Materese, Dayton, Ohio, assignor to Dayton Manufacturing Company, Dayton, Ohio

Filed Sept. 5, 1975, Ser. No. 610,558

Int. Cl.² F21V *31/00*

U.S. Cl. 240—26 **10 Claims**



10. In a water-tight lamp fixture including a trough-like body having opposite longitudinally extending side walls, end walls extending between said side walls and defining with said side walls said trough-like body, said side and end walls having free edges extending about an open mouth of said body, lighting means disposed within said body and a light transmitting cover received over said free edges of said walls, and improved latching and sealing means comprising:

a. a resilient sponge rubber seal attached to said cover and engaging said free edges of said walls,

b. a plurality of hinges mounted along one of said longitudinally extending side walls and connecting said cover to said one wall for pivoting movement of said cover about an axis parallel to but spaced outwardly from the free edge of said one longitudinally extending side wall,

c. an elongated bar mounted for sliding movement longitudinally of the other of said longitudinally extending side walls,

d. a plurality of hooks attached to said bar and having sloping faces disposed outwardly of the free edge of said other of said longitudinally extending side walls,

e. a plurality of slots formed in said cover and receiving said plurality of hooks,

f. said sloping faces of said hooks having grooves therein engageable with beads formed on portions of said cover adjacent said slots therein,

g. tool engaging portions projecting outwardly from said bar, and

h. a fulcrum fixed with respect to said body and projecting outwardly therefrom to serve as a fulcrum for a tool engaging one of said tool engaging portions projecting from said bar.

4,039,821

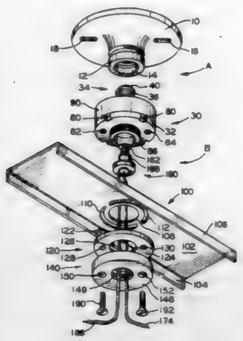
SELF-CONTAINED FLUORESCENT LAMP FIXTURE

Albert A. Greene, Cleveland, and Emanuel A. Capadona, Garfield Heights, both of Ohio, assignors to Conserve-A-Watt Corporation, North Canton, Ohio

Continuation-in-part of Ser. No. 500,252, Aug. 26, 1974, abandoned. This application Dec. 2, 1974, Ser. No. 528,627

Int. Cl.[2] H05B *33/02*

U.S. Cl. 240—51.11 R **19 Claims**



1. In a self-contained fluroescent lamp fixture of the type adapted for installation in a conventional incandescent lamp socket wherein there is included a socket adaptor having an outermost end and an outer side wall receivable in said socket and a fixture body cover communicating with said socket adaptor adapted to receive and support a fluorescent light tube and its operative components in an operative electrical association with said socket adaptor by a pair of conventional lead wires wherein at least said fixture body cover and socket adaptor are rotatable relative to each other about the longitudinal axis of said socket adaptor in a plane generally normal thereto, the improvement comprising:

a separate electrical pivot member generally longitudinally slidably received in the end of said socket adaptor adjacent said fixture body cover and receiving said lead wires therein for maintaining continuous electrical contact of said lead wires between said socket adaptor and the fluorescent light tube and operative components disposed in said fixture body cover to eliminate binding and entanglement of said wires as said fixture body cover and socket adaptor are rotated relative to each other, said pivot member including a first contact for making continuous electrical contact for one of said lead wires with said socket adaptor outermost end and a second contact for making continuous electrical contact for the other of said lead wires with said socket adaptor outer side wall.

4,039,822

CIRCULAR RECESSED LIGHTING FIXTURE

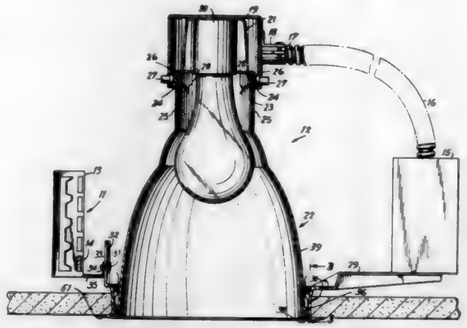
Kingsley Chan, Rutherford, and Neil Russo, Jersey City, both of N.J., assignors to Lightolier Incorporated, Jersey City, N.J.

Filed May 5, 1976, Ser. No. 683,257

Int. Cl.[2] F21S *5/00*

U.S. Cl. 240—73 BC **7 Claims**

1. A flush mounted ceiling light fixture comprising, in combination, a frame adapted to be mounted above a ceiling, a cylindrical bezel depending from said frame and having a downwardly open circular mouth portion, a plurality of hardened metal spring members having first ends fixed to said frame at mutually angularly spaced positions surrounding said mouth, said spring members inluding free end portions extending inwardly and overlying said mouth portion, said spring members including inwardly facing cutting lip portions adjacent said free ends, said lip portions being inclined to the horizontal and defining segments of helices having substantially the same pitch angle and direction of inclination, said lip portions being spaced equally from the axis of said bezel and being disposed in generally coplanar alignment, a reflector member formed of substantially softer material than said lip portions, said reflector member being circular in transverse section, the diameter of external portions of said reflector being coordinated with the spacing of said lip portions to provide a snug frictional interfit of said lips and external portions, whereby a reflector supported between said lips may be demounted by relative rotation of said reflector and bezel in the direction of inclination of said lip portions.



4,039,823

METHOD FOR PROCESSING WORK PIECES, FOR TRANSMITTING AND PROCESSING INFORMATION BY MEANS OF LASER EMISSION AND APPARATUS FOR PERFORMANCE OF THE METHOD

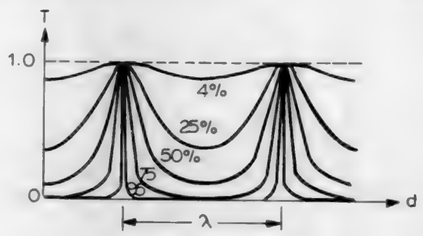
Alexandre Jovanovic, 33, route du centre, 1723 Marly, and Jurg Steffen, Dorf, 3655 Sigriswil, both of Switzerland

Filed Feb. 25, 1975, Ser. No. 552,998

Claims priority, application Switzerland, Feb. 26, 1974, 2682/74

Int. Cl.[2] H04B *9/00*

U.S. Cl. 250—199 **13 Claims**



1. A modulator for use in a laser resonator, wherein the modulator is used to produce mode-locking, spiking and output modulation, said modulator comprising: crystalline vibrating means having eigen-frequencies including a fundamental eigen-frequency f_o, which is equal to the mean frequency of spiking and a mechanical resonator quality equal to $f_o/\Delta f_s$ wherein Δf_s is the bandwidth of spiking.

4,039,824

FOCUS DETECTING PHOTOELECTRIC DEVICE

Yasuhiro Nanba, Sennan, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

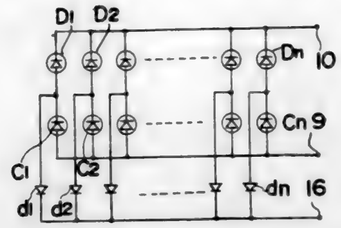
Filed July 8, 1975, Ser. No. 594,075

Claims priority, application Japan, Aug. 8, 1974, 49-91295; Sept. 18, 1974, 49-107537

Int. Cl.[2] G01J *1/20*

U.S. Cl. 250—201 **6 Claims**

1. A focus control system for detecting a focused condition of an optical image, comprising: an objective lens assembly through which the optical image is projected, and a focus detecting photoelectric device, the path of the optical image from the objective lens to the focus detecting photoelectric device being unobstructed, said device having: a first terminal, a second terminal; and a plurality of groups of photodiodes, each of said photodiodes having an anode and a cathode, the anode of a first photodiode of said each group being connected to said first terminal, and the anode of a second photodiode of said each group being connected to the cathode of said first photodiode of the same group and the cathode of said second photodiode of each group being connected to said second



terminal, the photoelectric characteristics of the photodiode in each group being substantially equal to each other, each of said photodiodes having a light receiving surface positioned to receive the light carrying the image from said objective lens assembly, said photodiodes being positioned with said light receiving surfaces thereof located in the same plane which plane is the plane on which the optical image is projected and the light receiving surfaces of said first and second photodiodes in each group being adjacent to each other, whereby the current output between said first and second terminals is at its minimum when the amplitude of spatial frequency of the light on said plane is at its maximum.

4,039,825

POSITION INDICATING SYSTEM

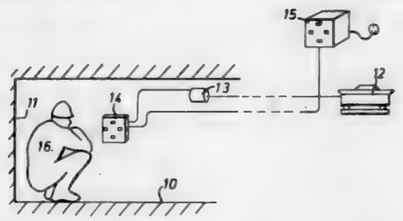
Keith Gilbert Doyle, Bromley, England, assignor to Zed Instruments Limited, England

Filed Dec. 11, 1975, Ser. No. 639,777

Claims priority, application United Kingdom, Dec. 16, 1974, 54262/74

Int. Cl.[2] G01J *1/20*; H01J *39/12*

U.S. Cl. 250—203 R **18 Claims**



1. Apparatus for indicating the position of a light beam relative to a target, comprising a system of optical elements, a linear array of photoelectric elements adapted to produce a video output signal and an electronic circuit arrangement for processing the video output signal of said array of photoelectric elements, wherein: the system of optical elements includes diffusing for producing a virtual source of said beam and imaging means adapted to produce a narrow, generally band-like image of the virtual source on said array, and the said circuit arrangement includes means for sampling the video output of said array; and an integrator device for measuring the total intensity of illumination of a given peak in the video output and for finding the exact pulse centre in the next successive pulse.

4,039,826

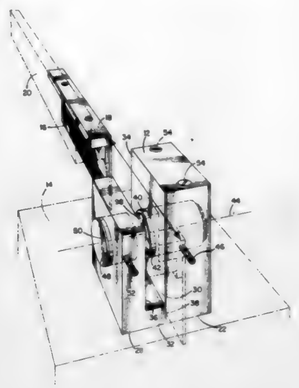
MAGNETIC HEAD LOCATING SYSTEM FOR DISK STORAGE SYSTEM

Sidney A. Wingate, Concord, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Mar. 26, 1976, Ser. No. 671,006

Int. Cl.[2] H01J *3/14*

U.S. Cl. 250—237 G **10 Claims**



1. In a system with a first member moving in a linear path with respect to a second member, an encoder system for locating the relative position between the members, comprising:

a scale having an encoder pattern thereupon;

means for mounting the scale;

means for illuminating the encoder pattern;

a cylindrical housing within which the illuminating means is mounted;

means for detecting illumination;

a second cylindrical housing within which the detecting means is mounted;

means for positioning the illuminating means such that the illuminating means is rotatable about and movable longitudinally along the cylindrical axis of the illuminating means housing for alignment thereof;

the means for mounting the encoder scale and the means for positioning the illuminating means being operative to position the encoder scale and the illuminating means so that the relative movement therebetween corresponds with the relative movement between the two members; and

means for positioning the detector means such that the detector means is rotatable about and movable longitudinally along the cylindrical axis of the detecting means for alignment thereof and such that light from the illuminating means which passes through the encoder pattern impinges upon the detecting means.

4,039,827

METHOD FOR MARKING INTRAOCULAR LENSES

Edward Z. Zdrok, Webster, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed Aug. 26, 1976, Ser. No. 717,819

Int. Cl.[2] G06K *7/10*

U.S. Cl. 250—271 **10 Claims**

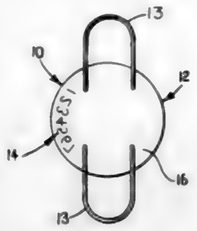
1. The method for marking lenses comprising the steps of:

preparing a mask of coding characters for disposition over one surface of a lens to be marked, said mask comprising opaques forming the configurations of said coding characters;

disposing said mask intermediately of said lens and a source of particular wavelengths of radiant energy preselected

for effecting a refractive index change in the material of said lens by exposure;

exposing portions of said lens around said opaques of said mask to said radiant energy for a period of time sufficient to alter the refractive index of said lens material in said



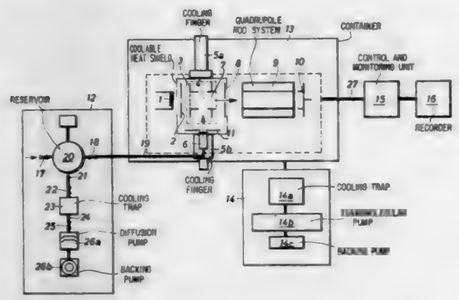
portions around said opaques substantially without affect upon remaining portions protected by said opaques whereby the resulting differential of refractive index in said lens produces a detectable facsimilie of said coding characters.

4,039,828

QUADRUPOLE MASS SPECTROMETER

Jochen Pokar, Julich, and Horst Pütter, Aachen, both of Germany, assignors to URANIT Uran-Isotopentrennungs-GmbH, Julich, Germany

Filed Dec. 13, 1974, Ser. No. 532,364
Claims priority, application Germany, Dec. 13, 1973, 2361955
Int. Cl.[2] H01J *37/08*
U.S. Cl. 250—288 **8 Claims**



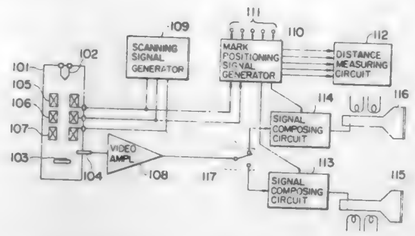
1. In a quadrupole mass spectrometer enclosed by a high vacuum container and including an ionization chamber enclosing an ionization region in which gas molecules are ionized, an ion source located outside of the ionization chamber and separated from the ionization region, a molecular beam radiator passing through the container and having an output opening for supplying the gas to be ionized in the ionization region and to be analyzed, and a cryopump arranged for receiving the molecular beam exiting from the output opening and serving as a radiation trap, the improvement wherein said output opening of said radiator and said cryopump are disposed at the periphery of said ionization chamber and said cryopump is located in line with the molecular beam exiting from said output opening, and said spectrometer further comprises a second cryopump enclosing said molecular beam radiator, a cathode, and a coolable heat shield between said cathode and said ionization chamber and kept at a low temperature level by connecting it with said cryopumps.

4,039,829

STEREOSCOPIC MEASURING APPARATUS

Yasuo Kato, Kodaira; Masahide Okumura, Tokyo, and Hideo Todokoro, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 14, 1976, Ser. No. 686,298
Claims priority, application Japan, May 19, 1975, 50-58592
Int. Cl.[2] G01N *23/00*; **G21K** *7/00*; **H04N** *9/54, 9/60*
U.S. Cl. 250—306 **5 Claims**



1. Stereoscopic measuring apparatus, comprising:

means to irradiate a surface of a sample with an energized beam converged to be fine,

means to cause said beam to scan the sample surface,

means to detect secondary information of said sample as obtained by the irradiation with said beam,

means to display an image of said sample by making an output signal of the detection means a video signal,

means to change-over an incident angle of said beam on said sample surface,

means to superpose and display marks at two positions on each of the two sample images obtained by the change-over of said incident angle of said beam, said two positions corresponding to two arbitrary points on said sample surface, and

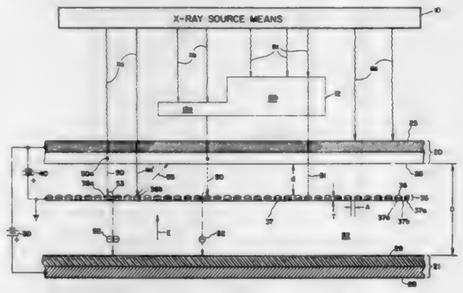
means to calculate a distance between said two points on said sample surface on the basis of positioning signals of said marks.

4,039,830

ELECTROSTATIC X-RAY IMAGE RECORDING DEVICE WITH MESH-BASE PHOTOCATHODE PHOTOELECTRON DISCRIMINATOR MEANS

Kei-Hsiung Yang, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,254
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—315 R **12 Claims**



1. A device for the electrostatic recording of images produced responsive to differential absorption of X-rays by an object, comprising:

a first electrode emitting light photons responsive to quanta of X-rays impinging thereupon;

a second electrode spaced from said first electrode to form a gap therebetween, said second electrode including a layer of an insulating material on a surface thereof facing said first electride;

a gas filling gap between said first and second electrode;

means for generating an electric field in the gap between said first and second electrodes; and

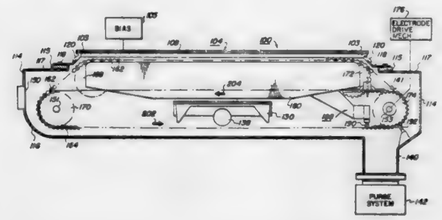
means positioned in said gap and spaced from said first and second electrodes for emitting primary slow and fast electrons respectively responsive to impingement thereon of said light photons and at least a portion of said X-rays and for discriminating between said fast and slow electrons to allow said slow electrons to be accelerated across said gap by said electric field for deposition upon said insulating layer and to substantially prevent said fast electrons from entering the gap between said discriminator means and said second electrode.

4,039,831

TWO COLOR XERORADIOGRAPHY DEVELOPMENT

Ernest H. Lehmann, Arcadia, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 15, 1975, Ser. No. 622,790
Int. Cl.[2] G03G *13/00, 15/00*
U.S. Cl. 250—315 A **6 Claims**



1. A xeroradiographic imaging method comprising the steps of providing an electrophotographically photoconductive member, uniformly charging said photoconductive member, exposing said member to a pattern of penetrating radiation to form a charge pattern thereon, developing said charge pattern with a first colored toner employing a far spaced electrode so that the charge pattern is developed substantially field-wise, and then developing the charge pattern with a colored toner of a contrasting color employing a closely spaced electrode so that the charge pattern is developed substantially in accordance with the charge residing on the photoconductive member.

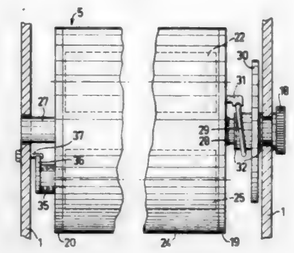
4,039,832

APPARATUS FOR THERMOGRAPHIC DUPLICATION OF INFORMATION COMPRISING A CURVE OR CAM MEMBER FOR AXIAL MOVEMENT OF DYE CARRIER

Sven Bertil Kvarnegård, Enebyberg, Sweden, assignor to AB Carl Lamm, Stockholm, Sweden

Filed Sept. 1, 1976, Ser. No. 719,399
Claims priority, application Sweden, Sept. 3, 1975, 7509771
Int. Cl.[2] B41M *5/18, 19/08*
U.S. Cl. 250—318 **6 Claims**

1. An apparatus for duplicating information from a master (M) provided with information, such as text lines or the like, comprising a drum rotatable in a stand, to which drum the master (M) with information thereon is applied, and the master (M) during rotation of the drum is exposed to directed heat radiation from one or more heat radiators and supplied to a dye-carrier rotating synchronously with the drum, which carrier comprises a dye-carrying web, the dye of which adheres to the master (M) agreement with the information applied thereon, whereafter unprepared copy receiving sheets are contacted with the master (M) and thereafter removed therefrom, characterized in that the dye-carrier is mounted non-rotatably in the stand, that it comprises a curve member changing in the direction of the drive axle, along which curve member a curve follower member runs at an angular speed in relation to the curve member equal to an entire division of the angular speed of the dye-carrier in order during one revolution



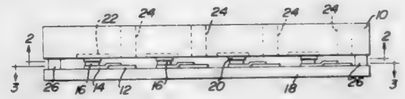
of the dye-carrier to move the same on the drive axle from one position to another one, and a rotation locking device is provided to advance the dye-carrying web in co-operation with the stand upon rotation of the dye-carrier.

4,039,833

HIGH DENSITY INFRARED DETECTOR ARRAY

Richard D. Thom, Santa Barbara, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1976, Ser. No. 715,038
Int. Cl.[2] G01J *1/00*; **H01L** *27/14*
U.S. Cl. 250—332 **10 Claims**



1. A device for processing infrared radiation information, comprising, in combination:

an array of infrared detector elements, each of said elements producing an output signal at a solderable terminal formed thereon; and

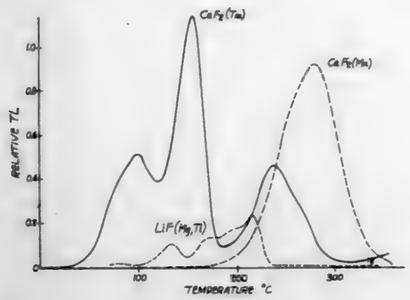
a chip stacked upon said array and having a multiplicity of circuits formed thereon, each of said circuits having a solderable terminal formed thereon in registration with corresponding ones of said element terminals for electrically and mechanically bonding thereto and for receiving the respective output signals therefrom, said circuits being distributed suitably for the formation of a plurality of window areas, each of said window areas being transparent to infrared radiation and formed in registration with corresponding ones of said detector elements for permitting the transmission of the radiation through said chip to said array.

4,039,834

THERMOLUMINESCENT CaF_2(TM) AND METHOD FOR ITS USE

Arthur C. Lucas, Chagrin Falls; Robert H. Moss, Cleveland Heights, and Barbara M. Kapsar, Parma, all of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Filed Jan. 9, 1975, Ser. No. 539,654
Int. Cl.² G01T *1/11*
U.S. Cl. 250—337 **8 Claims**



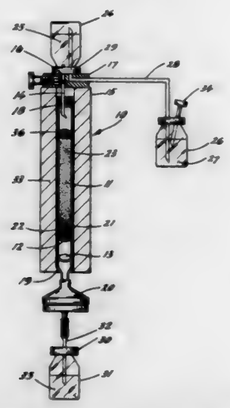
1. A radiation dosimeter comprising a phosphor consisting essentially of calcium fluoride activated with thulium present in the range from about 0.1 mole percent to about 0.5 mole percent.

4,039,835

RELOADABLE RADIOACTIVE GENERATOR SYSTEM

Lelio G. Colombetti, 3300 N. Lake Shore Drive, Apt. No. 14D, Chicago, Ill. 60657

Filed Mar. 12, 1976, Ser. No. 666,186
Int. Cl.² G21G *4/08*
U.S. Cl. 250—432 PD **10 Claims**



1. A generator system that can be reloaded with an elutable radioactive material which can be used for nuclear medicine and which comprises:

an elongated column having a chromatographic bed of alumina therein and sealed at the top and bottom thereof;

transfer means arranged at the top and bottom of the column for communication with separate containers;

a first container having a predetermined amount of elutable radioactive material therein and adapted for attachment to the transfer means arranged at the top of the column;

a second container having a rinsing solution therein; and

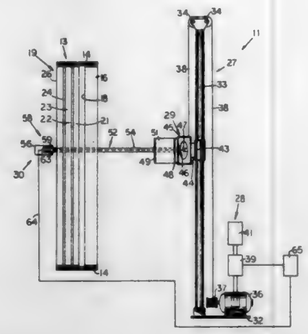
conduit means connecting the first and second containers whereby the elutable radioactive material and rinsing solution will be transferred to the column when the first container is attached to the transfer means at the top of the column and an evacuated container is attached to the transfer means at the bottom of the column.

4,039,836

METHOD AND APPARATUS FOR BODY X-RAYING

Alexander F. Shaw, IV, 46 Gunning Point Road, Falmouth, Mass. 02540

Filed Mar. 8, 1976, Ser. No. 664,724
Int. Cl.² G03B *41/16*
U.S. Cl. 250—445 R **12 Claims**



1. An apparatus for X-raying, a bucky for full body X-raying having a grid and a film cassette disposed in parallel therein, the patient being disposed in front of the bucky near to the side of the bucky adjacent the grid, said apparatus for X-raying comprising:

elongated means for supporting, the patient being disposed between the bucky and said means for supporting, the patient and the bucky being disposed parallel to said means for support;

source means for providing X-rays, said source means being attached to said means for supporting perpendicular thereto and slidable along the length thereof, said source means being directed toward the patient whereby X-rays are made to pass through the patient into the bucky;

motor means attached to said means for supporting and to said source means, said motor means operable upon actuation to move said source means along the length of said means for supporting; and

feedback means for detecting opaqueness of the body of the patient to X-rays, said feedback means being coupled to said motor means, said feedback means operating said motor means to move said source means along the length of said means for supporting at a rate inversely proportional to the opaqueness of the body of the patient to the X-rays.

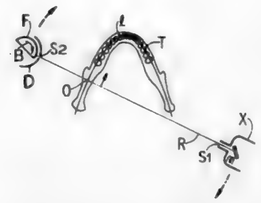
4,039,837

METHOD OF MAKING TOMOGRAM AND APPARATUS

Sadayasu Ohta, Kyoto; Akio Yada, Uji, and Keizo Inoue, Kyoto, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed July 2, 1976, Ser. No. 702,299
Claims priority, application Japan, Feb. 25, 1976, 51-20455
Int. Cl.² A61B *6/02*
U.S. Cl. 250—445 T **11 Claims**

1. A method of making a tomogram comprising a) moving one shaft supporting an X-ray tube and an X-ray film along a desired curve to thereby move a long and narrow X-ray beam projected from said X-ray tube on said film while the beam is transversing said curve, b) adjusting an angle of intersection of said X-ray beam with said curve by turning said shaft around the axis thereof and maintaining said angle of intersection at a predetermined angle while said X-ray beam is being moved, and c) moving the surface of said X-ray film relatively with respect to said X-ray beam incident upon the film surface to thereby cause the X-ray beam to scan the film surface and bringing the velocity of movement of the film surface into



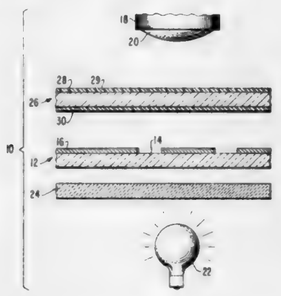
sychronism with the velocity of movement of said shaft along said curve, and d) controlling said movement of the shaft along a desired curve, of rotation of the shaft around the axis thereof, and the velocity of said movement of the X-ray film surface respectively by digital signals.

4,039,838

HIGH RESOLUTION FLUORESCENT SCREEN AND METHODS OF MAKING AND USING THE SAME

James John DiPiazza, Burlington County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,877
Int. Cl.² G01J *1/58*; G01N *21/38*
U.S. Cl. 250—483 **10 Claims**



1. A high resolution fluorescent screen for testing photomasks comprising:

a. a substrate having two sides, said substrate being transparent to visible light;

b. means comprising an organic dye in a binder applied to one surface of said substrate, said means emitting visible light when exposed to ultraviolet light; and

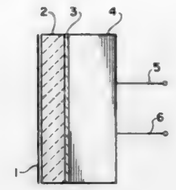
c. a filter on one side of said substrate for blocking ultraviolet light which has passed through said photomask while passing visible light, whereby visible light is emitted by said screen in locations corresponding to locations where ultraviolet light has passed through said photomask.

4,039,839

THORIUM TETRABROMIDE SCINTILLATORS AND RADIATION DETECTION AND MEASUREMENT THEREWITH

Roger Carlier, Breuillet Port-Sud; Michel Hussonois, Gif-sur-Yvette; Michel Genet, Orsay, and Jean-Claude Krupa, Bures-sur-Yvette, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 21, 1976, Ser. No. 698,262
Claims priority, application France, June 25, 1975, 75.19961
Int. Cl.² G01J *1/58*
U.S. Cl. 250—483 **14 Claims**



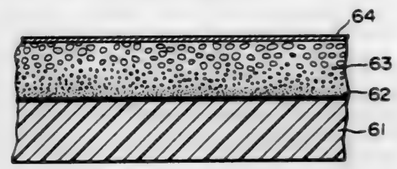
1. A fluorescent and radioluminescent material having a characteristic blue emission in the region from 3400 A to 4800 A due to excitation by electromagnetic radiation in the range comprising ultraviolet light, X and gamma rays and to particle radiation including alpha and beta rays and protons, neutrons and heavy ions, said material essentially consisting of thorium tetrabromide, $ThBr_4$.

4,039,840

INTENSIFYING SCREENS

Keiji Shimiya, Hiratsuka, and Norio Miura, Isehara, both of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

Filed July 29, 1975, Ser. No. 600,096
Claims priority, application Japan, Jan. 6, 1975, 50-134
Int. Cl.² G01J *1/58*
U.S. Cl. 250—486 **12 Claims**



1. A radiographic intensifying screen comprising a support having applied thereon a fluorescent layer containing fluorescent substance grains dispersed therein and having a grain size distribution of said fluorescent substance grains such that the grain size becomes smaller gradually from one surface of the fluorescent layer on the side utilizing the enitted light from the fluorescent substance to the other surface thereof on the support side.

4,039,841

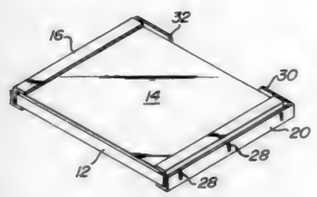
X-RAY GRID ADAPTOR

Kenneth C. Leighley, East Setauket, N.Y., assignor to Spectronics Corporation, Westbury, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,323
Int. Cl.² H01J *35/16*
U.S. Cl. 250—508 **9 Claims**

1. An X-ry grid adaptor comprising an X-ray grid, top rails fixedly connected to opposite side edges of said grid, discrete bottom rails, means for connecting a discrete bottom rail to each top rail, each bottom rail having a flange generally paral-

lel to and spaced from said grid, said flanges and said grid defining a cassette channel entry at a third edge of said grid, said flanges extending toward each other, means for adjusting the distance between the plane of said flanges and the plane of



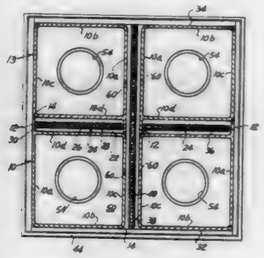
a major face of said grid, and means defining a limit stop along at least a portion of a fourth edge of said grid and generally perpendicular thereto whereby an X-ray film cassette may be introduced into the channel to thereby form a grid cassette and then removed from the adaptor for processing the film.

4,039,842

FUEL STORAGE RACK

Leslie Mollon, Southfield, Mich., assignor to Brooks & Perkins, Incorporated, Southfield, Mich.

Filed Jan. 8, 1976, Ser. No. 647,577
Int. Cl.[2] G21F *5/00*
U.S. Cl. 250—518 **18 Claims**



1. A storage rack for storing elongated radioactive nuclear fuel elements in upright shielded position comprising a plurality of elongated metal containers having longitudinally extended openings therethrough for receiving fuel elements, support means mounting said containers in parallel vertical relationship with at least some of said containers comprising pairs of adjacent spaced apart containers, the containers of each of said pairs including a longitudinally extending flange integral with one of said containers and extending laterally therefrom into close proximity and having the free edge thereof bonded to the other container to define with the adjacent side walls of the pair of containers a partially enclosed vertically extending space, and a separate flat neutron absorbing panel received in said space in position to intercept neutrons emitted from one container in a direction to enter the other container of said pair.

4,039,843

COMPLEMENTARY MASK IMAGE DIGITIZER METHOD AND APPARATUS

John Peter Glish, Jr., 10132 Brookside Ave., Bloomington, Minn. 55431

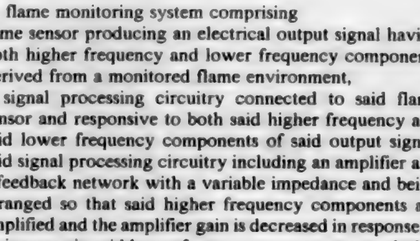
Filed Dec. 16, 1975, Ser. No. 641,261
Int. Cl.[2] G02B *27/38;* **H01J** *39/12*
U.S. Cl. 250—550 **8 Claims**

1. A method of sampling an image such as a photographic print, transparency or object produced image consisting in:

a. Selecting complementary masks each having an appropriate transform domain response determined by specific image properties and desired sampling function response, wherein one mask has an intensity distribution of positive components required in sampling aperture and is elswhere opaque, and the other mask has an intensity distribution corresponding to negative components required in sampling aperture and is elswhere opaque,

b. Projecting mask patterns onto image sample point or projecting image sample point through said masks,

c. Separately measuring illumination of combined mask/image sample point response as effected by each of said complementary masks.



d. Combining complementary measurements to produce optimized spatial image sample as determined at each image sample point (x_n, y_m) by the desired sampling response

$$c \int\int i(x,y)\, q(x - x_n, y - y_m)\, dx\, dy$$

where c is a constant determined by ambient conditions, $i(x,y)$ represents image intensity variations and $q(x - x_n, y - y_m)$ represents positive and negative variations of the sample aperture produced by complementary masks, and

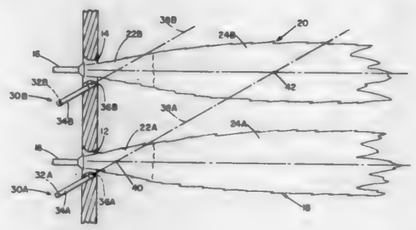
e. Indexing over image sample points and repeating steps (b) through (d)to produce optimized samples of entire image.

4,039,844

FLAME MONITORING SYSTEM

Malcolm F. MacDonald, Chelmsford, Mass., assignor to Electronics Corporation of America, Cambridge, Mass.

Filed Mar. 20, 1975, Ser. No. 560,569
Int. Cl.[2] G01N *21/58*
U.S. Cl. 250—554 **24 Claims**



1. A flame monitoring system comprising

a flame sensor producing an electrical output signal having both higher frequency and lower frequency components derived from a monitored flame environment,

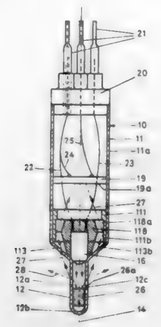
and signal processing circuitry connected to said flame sensor and responsive to both said higher frequency and said lower frequency components of said output signal, said signal processing circuitry including an amplifier and a feedback network with a variable impedance and being arranged so that said higher frequency components are amplified and the amplifier gain is decreased in response to an increase in said lower frequency components such that the resulting output of said signal processing circuitry provides discrimination between the flame monitored by said sensor and other conditions in the supervised environment.

4,039,845

OPTICAL-ELECTRICAL LIQUID PROBES

Jürg Oberhänsli, Kuttigen; Erwin Stalder, Erlinsbach; Willy Bulgheroni, Aarau, and Josef Penasa, Triengen, all of Switzerland, assignors to Hectronic AG, Buchs, Switzerland

Filed July 21, 1976, Ser. No. 707,245
Claims priority, application Switzerland, July 25, 1975, 9491/75
Int. Cl.[2] G01K *21/26*
U.S. Cl. 250—577 **23 Claims**



1. An optical-electrical liquid probe comprising a light emitter, a light receiver in the form of a photo-electric transducer, a body which is translucent to light rays and having at least one surface which can be exposed to a liquid, said light emitter being arranged to emit light rays, so that they strike, from within the body, the said surface which can be exposed to liquid, and are refracted, in the absence of liquid at the said surface, in the direction of the light receiver, wherein said translucent body is in the form of a hollow body defining an internal space, and said body comprises a widened hollow upper part, a narrowed hollow part having a circumferential wall, and a shoulder part located between the said parts, the narrowed lower part has a closed end remote from the shoulder part and is arranged to be externally exposed to liquid, the light emitter is located in the said internal space of the hollow body such that the light rays emitted by the light emitter pass outwards through the outer surface of the circumferential wall of the narrowed lower part at an acute angle and in such predetermined directions that, in the case of the absence of liquid from the vicinity of the narrowed lower part, the light rays pass through the shoulder part of the hollow body into the widened upper part, but in the presence of liquid the light rays do not reach the shoulder part, the light receiver is located in the interior of the widened upper part, and means are provided to prevent access, to the light receiver, of light rays which enter through the shoulder part from directions other than predetermined directions.

4,039,846

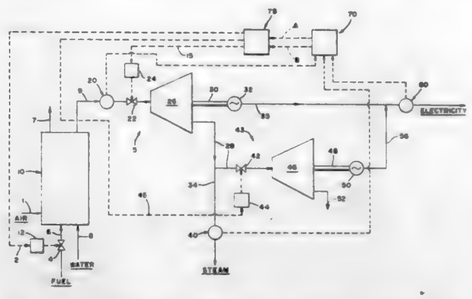
CONTROL OF A STEAM-HEATING POWER PLANT

James R. Vance, Maplewood, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Aug. 18, 1975, Ser. No. 605,497
Int. Cl.[2] H02P *9/04;* **F02C** *7/02;* **F01D** *15/10*
U.S. Cl. 290—4 R **2 Claims**

1. A control system for an apparatus adapted for producing steam and electricity to meet demands for same, said apparatus including (1) steam generator means for producing high pressure steam in response to a fuel load signal, (2) first turbine means for producing electricity from said high pressure steam, said first turbine means being adapted to exhaust intermediate pressure steam having a pressure between the high pressure steam and that pressure corresponding to condensing conditions, (3) second turbine means for producing electricity from a portion of said intermediate pressure steam and (4) means for withdrawal of the remaining intermediate pressure steam to supply said steam demand, said first and second turbine means being adapted to supply electricity to a common power network, each turbine means having means for setting the turbine load level in response to a load command signal, said control system comprising:

a. means for sensing steam and electricity demand-variables,



b. means for comparing said sensed demand-variables with the electricity and steam outputs of said first and second turbine means, respectively, and producing adjusted load command signals for each turbine means,

c. means for producing an adjusted fuel-load signal for said steam generator means in response to said adjusted load command signals, and

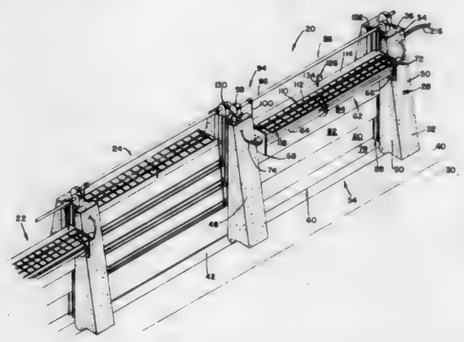
d. means for transmitting said turbine load command signals to said first and second turbine means, respectively, and said adjusted fuel-load signal to said steam generator means for coordinated adjustment of said steam generator means and said first and second turbine means.

4,039,847

TIDEWATER POWER PLANT

Richard E. Diggs, S. 12A Road, P.O. Box 776, Carthage, Mo. 64836

Filed Oct. 20, 1975, Ser. No. 624,226
Int. Cl.[2] F03B *13/12*
U.S. Cl. 290—42 **11 Claims**

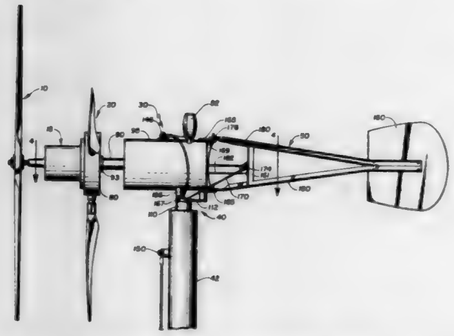


1. A device for converting tidal current into electrical power comprising:

an upright supporting structure located in a body of water subject to tides, said supporting structure having a structure top, one side presented inland and another side presented seaward so that horizontal water movement asso-

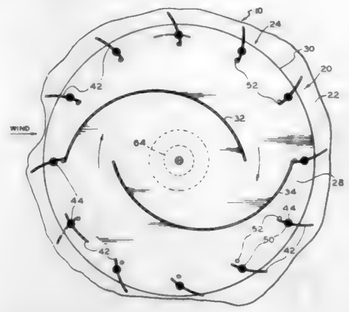
ciated with said tides causes water to move past said supporting structure;
a turbine wheel having a turbine top and a turbine bottom and mounted on said supporting structure so that water moving past said supporting structure flows over said turbine top to cause rotation thereof, said turbine wheel being mounted on said supporting structure to be vertically movable thereon between a first position located a predetermined distance below said structure top and a second position located adjacent said structure top;
a turbine wheel moving means connected to said supporting structure for vertically moving said turbine wheel in a manner such that said turbine wheel is moved between said first and second positions during said tides so that said turbine moves vertically in cooperation with changes in water level during said tides;
power generating means connected to said turbine wheel for converting turbine wheel rotation into electric power; and
power withdrawing means connected to said power generating means for withdrawing electric power therefrom.

4,039,848
WIND OPERATED GENERATOR
William R. Winderl, 124 1st N., Glasgow, Mont. 59230
Filed Nov. 10, 1975, Ser. No. 630,094
Int. Cl.² F02N *11/04*
U.S. Cl. 290—55 **11 Claims**



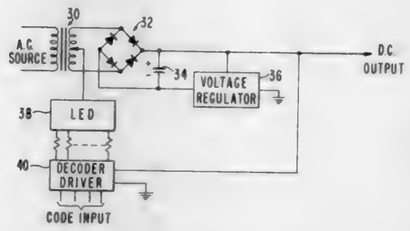
1. A wind operated generator comprising, a pair of propellors each having blades with respectively opposite pitch and mounted respectively on a pair of concentric shafts, one of said propellors having a pair of blades thereon and the other of said propellors has three blades thereon such that all blades of said propellors will never be in alignment, an electric generator disposed between and spacing the propellors from each other and mounted on said shafts, said generator including a field part and a winding part with said parts being coupled respectively to said shafts and said propellors for rotation relative to one another, a positive drive structure including a housing mounted on a turntable and mounting and journaling said pair of concentric shafts, said positive drive structure including a tie shaft journaled in the housing, first coupling means coupling said one of said shafts to said tie shaft and having a predetermined speed ratio, a second coupling means coupling other of said shaft to said tie shaft and having the same predetermined speed ratio with means for reversing the direction of rotation such that said tie shaft rotates in the same direction and at the same speed to cause equal and counterrotation of the propellors at all times; one of said propellors having a governor mechanism associated therewith so as to govern rotation of the shaft associated therewith and through said tie shaft the rotation of the other propellor mounted on the other of the concentric shafts, and means in the housing of said positive drive structure and cooperating with the slip ring on one of said shafts for coupling the winding part of said generator through said turntable.

4,039,849
WIND POWERED GENERATING SYSTEMS
Milton H. Mater, and Robert E. Torley, both of Corvallis, Oreg., assignors to Milton H. Mater, Corvallis, Oreg.
Filed Mar. 31, 1975, Ser. No. 563,597
Int. Cl.² F03D *9/00*
U.S. Cl. 290—55 **9 Claims**



1. In a wind actuated power generator,
generally circular rotor means,
a plurality of inner blades mounted on the rotor means inwardly from the periphery of thr rotor means responsive to wind flow for turning the rotor means in a predetermined direction,
and a plurality of turbine blades mounted near the periphery of the rotor means and responsive to wind flow for turning the rotor means in said direction and deflecting wind flow to the inner blades.

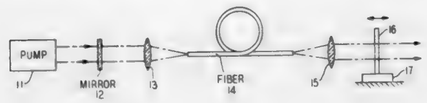
4,039,850
VOLTAGE CONVERTER
Arthur J. Winter, Encino, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.
Filed May 17, 1976, Ser. No. 687,429
Int. Cl.² G08B *5/36*
U.S. Cl. 307—11 **8 Claims**



1. A voltage converter circuit for generating a regulated direct current voltage from an alternating current voltage source and supplying the regulated voltage to a load-utilizing regulated and unregulated voltage whereby regulated current is minimized, comprising:
a. an alternating current voltage source;
b. transformer means having a primary winding with two input terminals, a secondary winding with two input terminals;
c. means connecting said alternating current voltage source to said two transformer input terminals;
d. a full-wave rectification bridge having two input terminals for receiving alternating current voltage and two output terminals for producing rectified alternating current voltage, a first output terminal of said bridge being more positive than said second bridge output terminal;

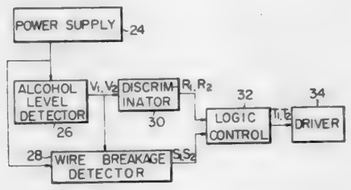
e. voltage regulator means interconnecting said second bridge terminal and a common circuit terminal and interconnected with said first bridge terminal whereby voltage across said common circuit terminal and said first bridge terminal is regulated;
f. load means having a common circuit terminal, input terminal means for receiving input voltage, and a load output voltage; and,
g. means interconnecting said first bridge output terminal to said load input terminal means, and means interconnecting said load output terminal to said converter whereby said voltage regulator means is by-passed.

4,039,851
TIME DISPERSION TUNED RAMAN OSCILLATOR
Ravinder Kumar Jain, Matawan; Chinlon Lin, Middletown, and Rogers Hall Stolen, Rumson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Jan. 4, 1977, Ser. No. 756,558
Int. Cl.² H03F *7/00*
U.S. Cl. 307—88.3 **7 Claims**



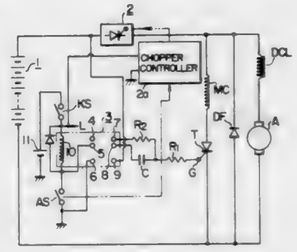
1. A Raman oscillator comprising
an optical fiber having a substantial Raman gain bandwidth and a frequency-dependent optical group velocity,
repetitively pulsed laser means for transmitting pump pulses of radiation through said fiber, and
means for selectively resonating in said fiber a pulse of Rama-scattered radiation of wavelength within a tuning range such that substantially the same path is taken through said resonating means by all Raman-scattered radiation within said turning range, which selective resonating process is controlled by adjustment of the time relationship between a feedback pulse of Raman-scattered radiation and a pump pulse.

4,039,852
EXHALATION INSPECTING APPARATUS
Keiichi Miyamoto, and Naohiko Inoue, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed June 5, 1975, Ser. No. 584,049
Claims priority, application Japan, June 18, 1974, 49-70287[U]
Int. Cl.² H01H *35/00*; H02H *3/00*
U.S. Cl. 307—326 **19 Claims**



1. An exhalation inspecting apparatus comprising power supply means, an alcohol level detecting circuit connected to the power supply means by a first set of wires and operative to produce a first output voltage indicative of an alcohol concentration of air exhaled by a subject and a second output voltage indicative of the volume of the subject's exhaled air, a discriminating circuit connected to said alcohol level detecting circuit by a second set of wires and operative to produce a first output signal if said first output voltage is indicative of an alcohol concentration lower than a predetermined allowable limit and said second output voltage is indicative of a volume of exhaled air larger than a predetermined minimum limit and a second output signal if said first output voltage is indicative of an alcohol concentration higher than said allowable limit and/or said second output voltage is indicative of a volume of exhaled air smaller than said minimum limit, a wire breakage detecting circuit responsive to breakage of any one of said wires and operative to produce a first output signal in the absence of breakage in said wires and a second output signal in response to breakage of at least one of said wires, and a control circuit responsive to the signals from said discriminating circuit and said wire breakage detecting circuit for producing a first output signal in the presence of both of the first output signals from the discriminating circuit and the wire breakage detecting circuit and a second output signal in the presence of at least one of the second output signals from the discriminating circuit and the wire breakage detecting circuit.

4,039,853
MAGNETIZING DEVICE FOR PERMANENT MAGNET MOTOR FOR ELECTRIC VEHICLE
Osamu Koizumi; Shigeki Saito, and Shotaro Naito, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan
Filed Sept. 29, 1975, Ser. No. 617,731
Claims priority, application Japan, Sept. 30, 1974, 49-111536
Int. Cl.² H01F *13/00, 27/42*
U.S. Cl. 307—101 **3 Claims**

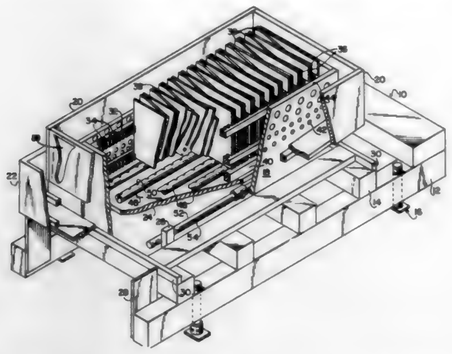


1. In an electric vehicle equipped with a main dc power source, a permanent magnet motor, and a chopper controlling the current supplied from said main dc power source to said permanent magnet motor, a magnetizing device comprising a magnetizing coil wound around the permanent magnet of said permanent magnet motor, and means for supplying magnetizing current to said magnetizing coil in response to a specific step in a series of predetermined steps required for the operation of the electric vehicle.

4,039,854
LIQUID RHEOSTAT SYSTEM
Richard Louis Elliott, Jr.; William John Borkowski, and Thomas Warren Pfister, all of Baltimore, Md., assignors to Maryland Shipbuilding & Drydock Company, Baltimore, Md.
Filed Apr. 16, 1976, Ser. No. 677,717
Int. Cl.² H01C *1/082*
U.S. Cl. 307—118 **15 Claims**

1. A method for dissipating an electric load in testing of generators and the like, including, in a liquid rheostat system the steps of: converting electrical energy output from the generators into thermal energy in a liquid rheostat by passing the electric current via pre-shaped electrode plates having increased area relative to depth of electrolyte through liquid constituting an electrolyte in the liquid rheostat, and dissipat-

ing the so-derived thermal energy comprising through a self adjustable weir system controlling flow and composition of the



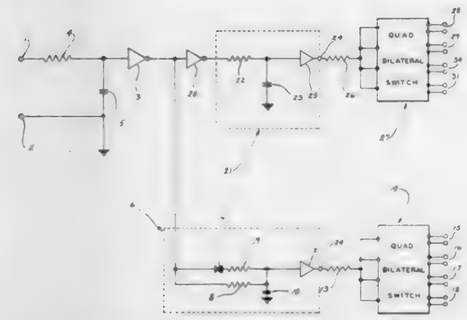
electrolyte through which the electric current is passed with the resultant conversion to thermal energy.

4,039,855

SOLID STATE RELAY

John E. Callan, Milwaukee, and Harold J. Pollnow, Jr., Dousman, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Mar. 3, 1976, Ser. No. 663,523
Int. Cl.[2] H03K *17/60, 5/13*
U.S. Cl. 307—203 **5 Claims**



1. In a logic circuit for emulating the function of a relay, the combination comprising:

a pseudo coil terminal;

a time delay circuit having an input connected to said pseudo coil terminal, said time delay circuit being operable to generate a delayed logic signal at its output which is responsive to the logic state of said pseudo coil terminal;

a pair of pseudo contact terminals;

a solid state bilateral switch having a control terminal connected to the output of said time delay circuit and a pair of outputs connected to said pair of pseudo contact terminals, said bilateral switch being responsive to the logic signal generated by said time delay circuit to either open said pseudo contact terminals to block the flow of current therethrough or close said pseudo contact terminals to allow current flow in either direction therethrough;

a second time delay circuit having an input coupled to said pseudo coil terminal, said second time delay circuit being operable to generate a delayed logic signal at its output which is responsive to the logic state of said pseudo coil terminal;

inverter means connected in series with said second time delay circuit and being operable to generate a logic signal at its output which is the inversion of a logic signal applied to its input;

a second pair of pseudo contact terminals;

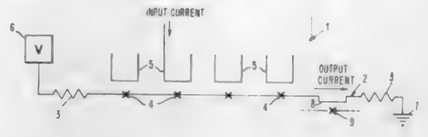
a second solid state bilateral switch having a control terminal coupled to the output of said second time delay circuit and a pair of outputs connected to said second pair of pseudo contact terminals, said second bilateral switch being responsive to the logic signal at the output of said second time delay circuit to either open said second pair of pseudo contact terminals to block the flow of current therethrough or close said second pair of pseudo contact terminals to allow current to flow in either direction therethrough.

4,039,856

DISTRIBUTED JOSEPHSON JUNCTION LOGIC CIRCUIT

Eugene Stewart Schlig, Somers, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,868
Int. Cl.[2] H03K *19/195*
U.S. Cl. 307—212 **34 Claims**



1. A Josephson tunneling logic circuit comprising:

a conductive line disposed in insulating spaced relationship with a groundplane of given characteristic impedance,

a plurality of devices capable of carrying Josephson current disposed along said line,

a resistive termination disposed at each end of said conductive line, the resistance of said terminations being sufficient to permit a change in current flow when at least one of said devices switches,

at least a single control line electrically coupled to each of said devices for switching said devices,

means for applying a constant voltage connected to said conductive line, and,

at least another device capable of carrying Josephson current and at least one portion of said conductive line disposed in electromagnetically coupled relationship with said at least another device.

4,039,857

DYNAMIC BIASING OF ISOLATION BOAT INCLUDING DIFFUSED RESISTORS

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 463,606, April 24, 1974. This application Apr. 10, 1975, Ser. No. 566,707
Int. Cl.[2] H03K *19/12*
U.S. Cl. 307—213 **7 Claims**

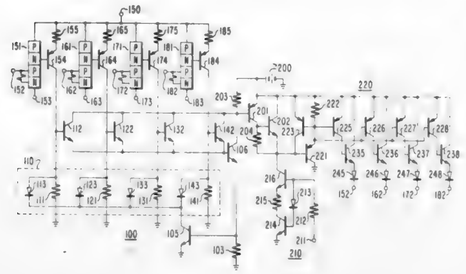
1. Apparatus comprising:

first and second regions being of opposite types of semiconductor material and having a semiconductor junction therebetween, said first region being provided with an ohmic contact, said second region being disposed as an island in said first region and being provided with first and second ohmic contacts at different points therein defining the ends of a resistive path through said second region;

means exhibiting a source impedance relatively small compared to the resistance of said resistive path, for continually applying a potential to the first ohmic contact of said second region;

means exhibiting a source impedance relatively large compared to the resistance of said resistive path, for selectively applying a first current to the second ohmic contact of said second region;

means for selectively diverting a portion of said first current to the ohmic contact of said first region to cause conduction between said first region and said second region along



at least a portion of said semiconductor junction therebetween, the portion of said semi-conductor junction that is conductive being related to the portion of said first current that is diverted; and

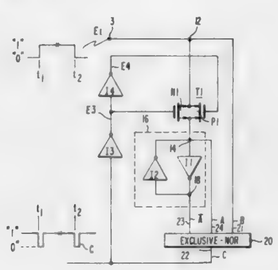
means for utilizing the resulting potential appearing between the first and second ohmic contacts of said second region.

4,039,858

TRANSITION DETECTOR

Roger Green Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,866
Int. Cl.[2] H03K *5/153*
U.S. Cl. 307—231 **9 Claims**



1. The combination comprising:

an input terminal;

means for applying an input signal to said input terminal whose transitions are to be detected;

comparing means having at least two inputs and one output and of the type which produces at its output a first binary value when the signals applied at its inputs have the same binary value and which produces a signal at its output having a second binary value when the signals applied at its inputs have different binary values;

sampling means having an input and an output;

means for coupling said input terminal to the input of said sampling means and to one of the inputs of said comparing means;

bistable storage means for statically storing binary data connected to the output of said sampling means for receiving and storing sampled signals and connected to another one of said at least two inputs of said comparing means for applying thereto its stored signal; and

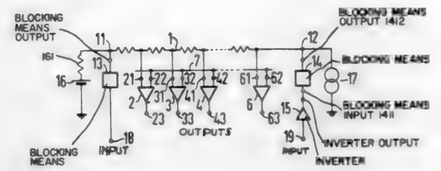
means connected between the output of said comparing means and said sampling means for enabling said sampling means when the signal at the output of said comparing means is at one of said first and second binary values and for disabling said sampling means when the signal at the output of said comparing means is at the other one of said first and second binary values.

4,039,859

PHASE COMPARATOR AND PROCESS FOR THE OPERATION THEREOF

Karlheinrich Horninger, Eglharting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,644
Claims priority, application Germany, Feb. 10, 1975, 2505479
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—232 **12 Claims**



1. A phase comparator comprising:

at least two signal comparison inputs for receiving respective signals to be compared;

a resistance line including a series of resistors;

an additional resistor connected to one end of said resistance line for receiving a constant voltage;

at least one voltage amplitude comparator having one input connected to said resistance line, another input connected to a reference voltage, and an output;

a first dc voltage blocking means connecting said one end of said resistance line to one of said signal comparison inputs;

an inverter connected to the other signal comparison input;

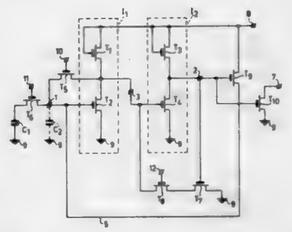
a second dc voltage blocking means connecting said inverter to the other end of said resistance line.

4,039,860

AMPLIFIER ARRANGEMENT FOR DETECTING LOGIC SIGNALS FROM A CAPACITANCE SOURCE

Cornelis Willem Lambrechtse, and Roelof Herman Willem Salters, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,255
Claims priority, application Netherlands, Feb. 28, 1975, 7502375
Int. Cl.[2] H03K *5/153, 5/18, 3/353;* **G11C** *11/24*
U.S. Cl. 307—362 **6 Claims**



1. An amplifier arrangement including insulated-gate field effect transistors for detecting logic signals from a capacitance source comprising: a supply source of a constant voltage, at least one inverting amplifier stage defining a reference voltage at its output, a first switching circuit to connect, when activated during a first phase, the output of said one amplifier stage to the input thereof, a selection control circuit operable to

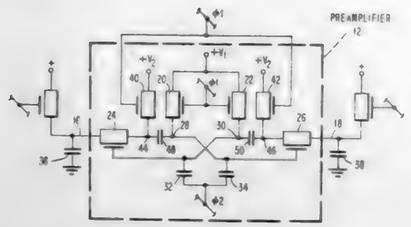
connect, when activated during a subsequent second phase, the input of said one amplifier stage to the capacitance source, and a charge restoration circuit including a second switching circuit controlled by the output of said amplifier stage and connected between one terminal of the supply source and the input of said one amplifier stage.

4,039,861

CROSS-COUPLED CHARGE TRANSFER SENSE AMPLIFIER CIRCUITS

Lawrence Griffith Heller, Brewster, and Dominic Patrick Spampinato, Ozone Park, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,677
Int. Cl.[2] H03K *5/20, 5/18;* **G11C** *11/40;* **H03K** *3/353*
U.S. Cl. 307—355 **10 Claims**



1. A preamplifier for signal detection comprising

first and second charge-transfer actuable devices each having first and second current carrying electrodes and a control electrode, said first current carrying electrodes of said first and second actuable devices being coupled respectively to first and second sources of input signals to be detected,

means for coupling said second electrode of said first actuable device to said control electrode of said second actuable device at a first node,

means for coupling said second electrode of said second actuable device to said control electrode of said first actuable device at a second node,

a first capacitor connected to said second electrode of said second actuable device at said second node and to said control electrode of said first actuable device,

a second capacitor connected to said second electrode of said first actuable device at said first node and to said control electrode of said second actuable device,

means for applying a precharge voltage at a first time period onto said first and second nodes causing said first and second charge-transfer actuable devices to turn on whereby said input signal electrodes charge up to predetermined values,

said input signals to be detected from said first and second sources being applied to said first current carrying electrodes of said first and second charge-transfer actuable devices after said precharge voltage time period for relatively decreasing the signal on one of said first current carrying electrode and producing a relative increase of the signal on said control electrode of said one of said first and second charge-transfer actuable devices,

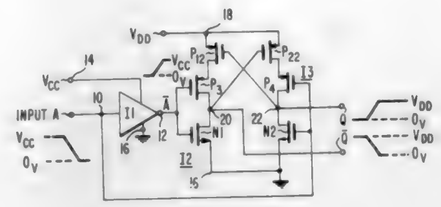
and means for applying a ramp through said first and second capacitors to said second current carrying electrodes of said first and second charge-transfer actuable devices for causing said one of said first and second charge-transfer actuable devices to turn on relatively greater than the other and transfer relatively more charge from one of said first and second nodes to said input signal applying means wherein said relative amount of transferred charge is potentially greater in magnitude than charge obtained from said applied input signals thereby providing charge gain and voltage gain.

4,039,862

LEVEL SHIFT CIRCUIT

Andrew Gordon Francis Dingwall, Somerville, N.J., and Bruce David Rosenthal, Mountain View, Calif., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 19, 1976, Ser. No. 649,972
Int. Cl.[2] H03K *17/60, 17/04, 3/286, 3/353*
U.S. Cl. 307—247 R **1 Claim**



1. A level shift circuit comprising:

first and second power terminals for the application thereto of first and second voltages, respectively;

first and second transistors of one conductivity type and third, fourth, fifth and sixth transistors of second conductivity type; each transistor having a conduction path and a control electrode;

first and second output terminals;

means connecting the conduction paths of said first and second transistors between said first power terminal and said first and second output terminals; respectively

means connecting the conduction paths of said third and fourth transistors in series between said second power terminal and said first output terminal;

means connecting the conduction paths of said fifth and sixth transistors in series between said second power terminal and said second output terminal;

an imput terminal for the application thereto of input signals which vary in amplitude between a first value equal to that of said first voltage and a second value intermediate said first and second voltages;

a third terminal for the application thereto of an operating voltage intermediate said first and second voltages;

an inverter having an input and an output and two power terminals; said inverter being connected at its input to said input terminal, at one of its power terminals to said third power terminal, and at its other power terminal to said first power terminal whereby the signal at said inverter output varies in amplitude between the voltages at said first and third power terminals;

means connecting the control electrodes of said first and third transistors to said input terminal for increasing the impedance of the conduction path of said third transistor when said first transistor is being turned on;

means connecting the control electrodes of said second and fifth transistors to said inverter output for increasing the impedance of the conduction path of said fifth transistor when said second transistor is being turned on;

means connecting the control electrode of said fourth transistor to said second output terminal; and

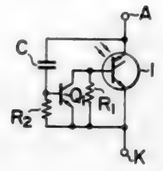
means connecting the control electrode of said sixth transistor to said first output terminal.

4,039,863

LIGHT ACTIVATED SEMICONDUCTOR SWITCH DEVICE

Ichiro Ohhinata, Yokohama; Shinzi Okuhara, Fujisawa, and Michio Tokunaga, Zushi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed June 26, 1975, Ser. No. 590,562
Claims priority, application Japan, July 19, 1974, 49-82186
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 A **22 Claims**



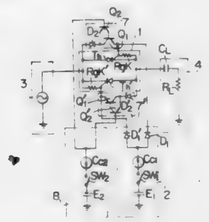
1. A light activated semiconductor switch device comprising a light activated PNPN switch having an anode, a cathode, an anode gate and a cathode gate, an impedance element, a switching means having two terminals in addition to a control terminal for controlling the on-off operation thereof due to a control current supplied thereto and a capacitive element, said impedance element and said two terminals of said switching means being connected in parallel between the cathode gate and the cathode of said light activated PNPN switch, and said control terminal of said switching means being connected through said capacitive element to one of said anode and anode gate of said light activated PNPN switch so as to be turned on by the control current supplied to said control terminal from a current source which is connected to the anode of said light activated PNPN switch.

4,039,864

SEMICONDUCTOR BIDIRECTIONAL SWITCH CIRCUIT

Michio Tokunaga, Zushi; Ichiro Ohhinata, Yokohama, and Shinzi Okuhara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 27, 1976, Ser. No. 690,587
Claims priority, application Japan, May 30, 1975, 50-64248; July 31, 1975, 50-93812
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 T **15 Claims**



1. A semiconductor bidirectional switch circuit for passing an AC signal comprising:

a bidirectional switch including a first and a second thyristor connected in antiparallel relationship;

a first bypass circuit including at least one transistor for bypassing therethrough a part of a main current of said first thyristor from an anode of said first thyristor to a cathode-gate of the same;

a second bypass circuit including at least one transistor for bypassing therethrough a part of a main current of said second thyristor from an anode of said second thyristor to a cathode-gate of the same;

a first driver circuit including a first voltage source, for supplying a current to the cathode-gate of each of said first and second thyristors;

a second driver circuit including a second voltage source, for extracting a current from a base of the transistor of each of said first and second bypass circuits; and

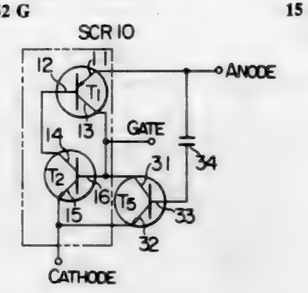
the absolute value of each of the respective voltages of said first and second voltage sources being under any load conditions smaller than the absolute value of the maximum voltage of the AC signal.

4,039,865

SEMICONDUCTOR SWITCH

Ichiro Ohhinata, Yokohama; Shinzi Okuhara, Fujisawa, and Michio Tokunaga, Zushi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 15, 1975, Ser. No. 596,094
Claims priority, application Japan, July 19, 1974, 49-82168
Int. Cl.[2] H03K *17/72*
U.S. Cl. 307—252 G **15 Claims**



1. A semiconductor switch comprising a PNPN switch having an equivalently four-layer structure of *p, n, p* and *n* regions and three PN junctions;

a transistor;

two impedance elements and a capacitive element, wherein said transistor is connected in parallel with one of said impedance elements;

the thus formed parallel circuit being so connected as to shunt one of said three PN junctions which is located at one extreme end terminal in dependence upon the time rate of change of voltage across said one extreme end terminal and an other extreme end terminal of said PNPN switch;

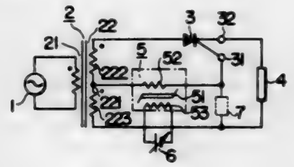
said capacitive element being connected between the base of said transistor and the other end terminal of said PNPN switch, and the other impedance element being connected between the base and the emitter of said transistor.

4,039,866

THYRISTOR CONTROL APPARATUS

Katsu Komuro; Seiya Shima, and Sadao Hokari, all of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 4, 1976, Ser. No. 663,864
Claims priority, application Japan, Mar. 7, 1975, 50-27185
Int. Cl.[2] H03K *17/68, 17/72*
U.S. Cl. 307—252 N **7 Claims**



1. A thyristor control apparatus comprising a transformer including a primary circuit and at least one secondary circuit, said primary circuit including a primary winding of said trans-

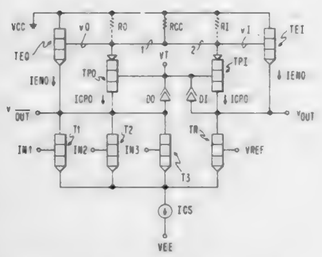
former to be connected to an AC power supply, said secondary circuit including a secondary winding of said transformer, a thyristor having a gate terminal to control the conduction thereof, a load connected across said secondary winding through said thyristor, and magnetic phase shifter means for effecting phase control of said thyristor, said magnetic phase shifter means including at least a saturable magnetic core, an AC winding and a control winding, said AC winding being connected between said gate terminal of said thyristor and an intermediate tap provided at a given point of said secondary winding.

4,039,867

CURRENT SWITCH CIRCUIT HAVING AN ACTIVE LOAD

Richard Jay Blumberg, Poughkeepsie, and Jack Arthur Dorler, Wappingers Falls, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 24, 1976, Ser. No. 699,740
Int. Cl.[2] H03K *17/60, 17/04*
U.S. Cl. 307—255 **25 Claims**



1. In a current switch circuit which includes:

at least one input switch transistor and a reference switch transistor connected between first and second reference potentials;

a first current source connected between the emitters of said switch transistors and said second reference potential;

the base of said reference transistor connected to an input reference potential and the base of said at least one input transistor connected to a source of an input signal;

the improvement comprising:

a second current source connected between said first reference potential and the collector of either said reference switch transistor, or said at least one input switch transistor, the current from said second current source being less than the current in said first current source and tending to flow in the same direction between said reference potentials;

means, connected between said first reference potential and the collector of the switch transistor to which said second current source is connected, for supplying supplementary current to said first current source when the switch transistor to which said second current source is connected is conductive; and

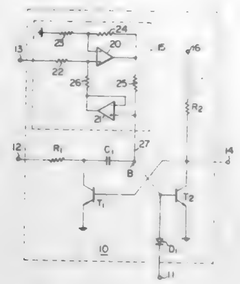
means, connected to said second current source, for diverting said current from said second current source when the switch transistor to which said second current source is connected is non-conductive.

4,039,868

CIRCUIT FOR GENERATING PULSES WITH DURATION PROPORTIONAL TO QUOTIENT OF TWO INPUT VOLTAGES

Shigeo Aono, Tokyo; Hiromichi Nakamura, and Hiroshige Ozawa, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed June 25, 1975, Ser. No. 590,084
Claims priority, application Japan, June 26, 1974, 49-73107
Int. Cl.[2] H03K *5/04, 3/10;* **G06G** *7/16*
U.S. Cl. 307—273 **2 Claims**



1. A circuit for generating pulses having a duration proportional to the quotient of two input voltages, the circuit comprising:

a source of supply voltage;

a monostable multivibrator circuit configuration having cross-coupled first and second transistors, the base of each respective one of said transistors being coupled to the collector of the other respective one of said transistors, a timing capacitor connected between the collector of said first transistor and the base of said second transistor and a trigger input connected to said base of said second transistor, and said collector of said second transistor being coupled to said source of supply voltage via a first resistor;

a constant current source including first and second differential amplifiers, each having its one input connected to the output thereof and the output of the first differential amplifier being connected to the other input of the second amplifier, the other input of the first amplifier being connected to the output of said second amplifier, and the other input of the second amplifier being connected to a junction between said capacitor and said base of said second transistor of the monostable multivibrator configuration to saturate said second transistor in the absence of a trigger signal applied to said trigger input;

a first input terminal biased at a first control voltage to serve as a dividend and connected via a second resistor to a junction between said capacitor and said collector of said first transistor for charging said capacitor whenever said second transistor is in its saturated state; and

a second input terminal biased at a second control voltage to serve as a divisor for the dividend and connected to the other input of said first differential amplifier of said constant current source to control rate of variation of current discharged from said capacitor in proportion to the second voltage whenever said first transistor is in its saturated state subsequent to occurrence of a trigger signal;

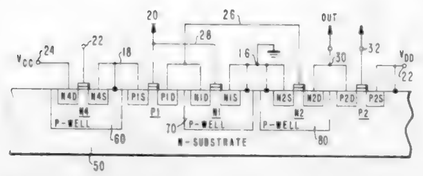
whereby the pulses produced at the collector of the second transistor have a duration proportional to the quotient of the control voltages.

4,039,869

PROTECTION CIRCUIT

Michael Barnett Goldman, Belle Mead, and Stanley Joseph Niemiec, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,093
Int. Cl.[2] H01L *29/78;* **H03K** *17/60, 17/30, 3/353*
U.S. Cl. 307—304 **11 Claims**



1. An integrated circuit comprising:

a substrate of first conductivity type;

first and second regions of second conductivity type in physical contact with said substrate and forming junctions therewith;

first and second points for the application thereto of first and second, different voltages, respectively;

means directly connecting said first point to said first region and to said substrate; and

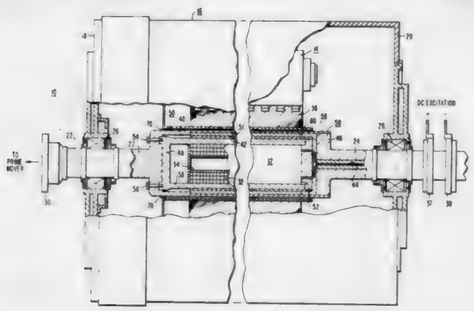
a control means responsive to said first voltage for coupling said second voltage to said second region only when said first voltage is present; said control means having a conduction path connected between said second point and said second region, and having a control electrode connected to said first point.

4,039,870

INTEGRATED ANNULAR SUPPORTING STRUCTURE AND DAMPER SHIELD FOR SUPERCONDUCTING ROTOR ASSEMBLY OF DYNAMOELECTRIC MACHINE

Charles C. Sterrett, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 17, 1975, Ser. No. 596,793
Int. Cl.[2] H02K *9/19*
U.S. Cl. 310—52 **9 Claims**



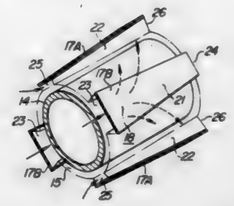
1. In a dynamoelectric machine having a rotor member disposed on a shaft for rotation within an annular stator member, said rotor member having a field assembly including a superconductive winding disposed thereon, the combination with said rotor member of a composite tubular structure for supporting said field assembly for rotation within said stator member, said composite structure comprising a pair of elongated hollow metal cylinders disposed one within another, there being an innermost cylinder and an outermost cylinder, the innermost one of said cylinders defining a chamber within which said field assembly is disposed, and at least one of said cylinders being secured to said shaft for concurrent rotation therewith, said cylinders being bonded together substantially uniformly across substantially their entire interface, said bond being produced by a coordinated high energy impact of said cylinders one against another, said impact being of sufficient magnitude to produce a metallurgically welded union therebetween, said outermost cylinder being formed of a non-ferromagnetic metal having sufficient mechanical strength to provide stable support for said field assembly during rotation and said innermost cylinder being formed of a non-ferromagnetic metal having sufficient electrical conductivity and radial thickness to attenuate extraneous electrical and magnetic fields to a level which does not interfere with the superconductive operation of said field winding.

4,039,871

COOLING DEVICE FOR USE IN A LOW INERTIA ELECTRIC MOTOR

Seizi Yamashita, and Kazuo Onishi, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 14, 1975, Ser. No. 621,768
Claims priority, application Japan, Oct. 16, 1974, 49-118171
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—59 **11 Claims**



1. A cooling device for use in a low inertia electric motor, comprising:

an armature extending in the axial direction and rotatively supported;

means for supporting magnetic pole pieces which are radially spaced a minute distance from the outer circumferential surface of said armature, said magnetic pole pieces being placed at an equal spacing to each other around the aforesaid outer circumferential surface of said armature; and

a plurality of main passages for the cooling air formed in the spaces between adjoining magnetic pieces and in the vicinity of the circumferential surface of the armature, at least half of said main passages having cross sectional areas which are gradually varied in the axial directions of said passages.

4,039,872

GUIDE VANE ASSEMBLY FOR REVERSE FLOW COOLED DYNAMOELECTRIC MACHINE

Anthony F. Armor; James B. Archibald, both of Schenectady, and William L. Darby, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed June 1, 1976, Ser. No. 691,363
Int. Cl.[2] H02K *9/06*
U.S. Cl. 310—62 **9 Claims**

1. A reverse flow dynamoelectric machine comprising

a. a stator assembly including a core having axially spaced radial cooling passages disposed therein;

b. a rotor disposed within the interior of said stator and defining therewith a circumferential gas gap;

c. a fan and guide vane assembly including:

c_1. at least one fan comprising a plurality of radial fan blades attached to said rotor and adapted to circulate cooling gas axially outwardly from said gas gap to a cooling means and therefrom to said stator and said gas gap;

c_2. at least one guide vane assembly disposed inboard of

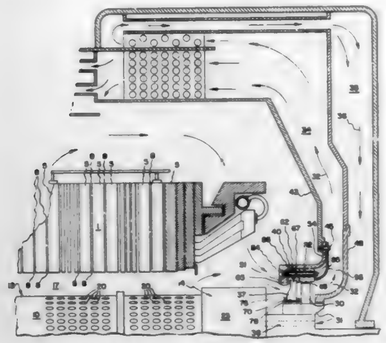
said fan and upstream thereof for directing cooling gas toward said fan with optimum efficiency and including:

c_{2a}. an outer guide vane support ring in fixed but removable relation to said stator assembly,

c_{2b}. a plurality of airfoil sectioned guide vanes depending inwardly from said outer guide vane support ring; and

c_{2c}. an inner guide vane support ring affixed to the inwardly depending ends of said guide vanes;

c_3. said guide vane assembly being fabricated from nonmagnetic material incapable of supporting electrical currents and surrounding a portion of said rotor;



c_4. at least one removable annular fan rub ring affixed to said stator assembly surrounding the exterior of each said fan and in close proximity thereto sufficient to minimize gas flow leakage between said fan and said rub ring;

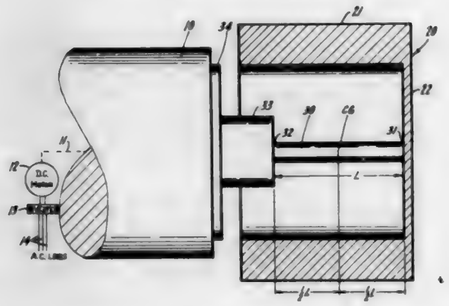
d. an annular flow guide ring affixed to said stator assembly downstream of the last fan affixed to said rotor and providing a portion of a smooth channel for providing a smooth gas flow downstream of said guide vane and said fan assembly.

4,039,873

VIBRATION-FREE DRIVE FOR PRINTING PRESSES

Valentin Gensheimer, Muhlheim, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG., Germany

Filed Apr. 12, 1976, Ser. No. 676,384
Claims priority, application Germany, Apr. 15, 1975, 2516462
Int. Cl.[2] H02K *7/02*
U.S. Cl. 310—74 **3 Claims**



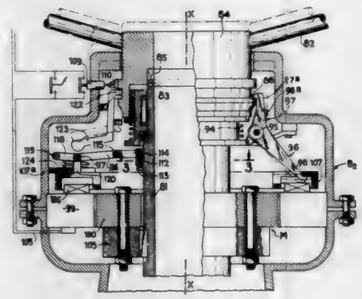
1. In a drive system for a printing press having cylinders and intended for powering from an a.c. supply line, the combination comprising a d.c. drive motor mechanically coupled to the cylinders to form a system of rotational elements, an inverter interposed between the supply line and the motor, and a flywheel assembly connected to one of the rotational elements, the flywheel assembly including a cup-shaped flywheel having a cylindrical portion and an end wall, a torsionally resilient rod axially centered in the flywheel, the rod being connected rigidly at its first end to the end wall and coaxially connected at its second end to the associated rotational element, the rod and flywheel together being so proportioned as to form a resonant oscillating system having fundamental resonance at the frequency of the supply line, the axial length of the rod being approximately equal to the axial length of the flywheel so that the rod is substantially totally self-contained within the flywheel.

4,039,874

MOTOR-DRIVEN CONTROL DEVICE WITH AUTOMATIC BRAKE

Jean Georges Sutter, Villers-les-Nancy, France, assignor to Pont-A-Mousson S.A., Pont-a-Mousson, France

Division of Ser. No. 370,261, June 15, 1973, Pat. No. 3,946,984.
This application Dec. 23, 1975, Ser. No. 643,654
Claims priority, application France, June 19, 1972, 72.22078; Nov. 8, 1972, 72.39455; Apr. 25, 1973, 73.14916
Int. Cl.[2] H02K *7/10*
U.S. Cl. 310—77 **8 Claims**



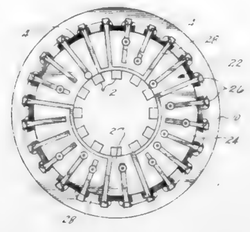
1. A control device for actuating a closure member of a valve, comprising an actuating rod having an axis of rotation for connection to the closure member, a frame for association with the valve, an electric motor having a stator secured to said frame, a rotor coaxial with and connected to rotate with the actuating rod, means for braking the actuating rod and means for automatically applying said braking means when the motor is put out of action and automatically releasing said braking means when the motor is brought into action, said automatic applying means and releasing means for the braking means comprising a magnetic core integral with the stator of the motor and a magnetic armature disposed with respect to said core in such a manner as to be attracted by the core and to shift the braking means between their applying and releasing positions when current is supplied to the stator in opposite to elastically yieldable means for returning the braking means to the applying position, and wherein the automatic applying and releasing means for the braking means comprise at least one linkage which comprises a pair of links, a common pivotal connection pivoting ends of said links together, the other end of one link being pivoted to a fixed pin, the other end of the other link being pivoted to the braking means, and said linkage having in a mean position a radial orientation with respect to the rod.

4,039,875

METHOD AND APPARATUS FOR INTERCONNECTING STATOR COILS

Anthony P. Morreale, Whittier, Calif., assignor to Computer Devices Corporation, Santa Fe Springs, Calif.

Filed Nov. 7, 1975, Ser. No. 629,715
Int. Cl.[2] H02K *3/00*
U.S. Cl. 310—194 **2 Claims**



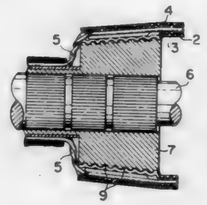
1. In a motor stator having a cylindrical core of magnetic material defining a plurality of radial poles on which are wound coils of conductive wire, apparatus for connecting external electrical leads to the coils comprising: an annular printed circuit board having a plurality of integral radial projections around the outer periphery, the projections supporting a portion of the printed circuit to form a plurality of electrical terminals, there being two terminals for each coil, adhesive means holding the circuit board against the coils adjacent one end of the core and coaxial with the core, the two wire ends of each coil being wrapped around said projections and electrically connected to the associated terminals, the wire ends anchoring the board against the coils, and a plurality of external electrical leads connected to selected ones of said terminals, the printed circuit board electrically interconnecting the external leads and the coils.

4,039,876

IMPROVED SUPPORTING ARRANGEMENT FOR HOLLOW CYLINDRICAL ARMATURE WINDING

Keita Takasaka, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Sept. 5, 1975, Ser. No. 610,784
Claims priority, application Japan, Sept. 13, 1974, 49-105039
Int. Cl.[2] H02K *1/22*
U.S. Cl. 310—266 **9 Claims**



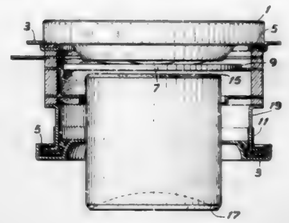
1. A cylindrical armature comprising an armature winding cylindrically arranged, and a rotor ring fixed on a shaft, said armature winding having at least an inner cylindrical insulating layer formed by winding filament member at least on the inner peripheral surface of said armature winding, said armature winding having an end fixed on the outer peripheral surface of said rotor ring, said rotor ring having a plurality of knurled grooves in the surface thereof through which surface said armature winding is coupled with the rotor ring, said knurled grooves being cut at substantially the same angle as the angle at which said filament member of said inner cylindrical insulating layer is wound, whereby a reinforcing layer is formed integrally with said inner cylindrical insulating layer within said knurled grooves.

4,039,877

IMAGE INTENSIFIER WITH FIBER OPTIC FACEPLATES SEALED WITH INDIUM-BISMUTH ALLOY

Jack D. Wimmer, Roanoke, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Division of Ser. No. 594,376, July 9, 1975, Pat. No. 4,005,920.
This application June 24, 1976, Ser. No. 699,405
Int. Cl.[2] H01J *31/50, 39/02*
U.S. Cl. 313—95 **2 Claims**



1. An image intensifier tube comprising:

an open-ended tube body;

a microchannel plate electron multiplier within said tube body;

a fiber optic faceplate containing a layer of phosphor material sealed to one end of said tube body by means of an alloy of indium and bismuth; and

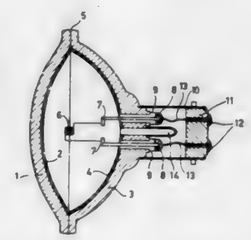
a fiber optic faceplate having a layer of photocathode material sealed to another end of said tube body by means of an alloy of indium and bismuth.

4,039,878

ELECTRIC REFLECTOR LAMP

Leonard Cornelis Hendrik Eijkelenboom, and Jan Antoon Henri Kesseler, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1976, Ser. No. 729,952
Claims priority, application Netherlands, Oct. 13, 1975, 7511983
Int. Cl.[2] H01K *1/32*
U.S. Cl. 313—113 **6 Claims**



1. An electric reflector lamp comprising **(1)** an ellipse-like curved total reflector, **(2)** a hyperbola-like curved, light-pervious, thermal radiation-reflecting reflector and **(3)** a light source in which the foci of the ellipse-like curved reflector coincide with those of the hyperbola-like curved reflector, the reflectors face each other with their concave sides, and the light source surrounds the coinciding foci situated within the space enclosed by the reflectors, characterized in that the ellipse-like curved reflector has an eccentricity c/a, of 0.5 to 0.99 and that the ellipse-like curved reflector and the hyperbola-like curved

reflector satisfy the relationship $a_h = f \times c^2/a_e$, in which formula a_h is half the distance between the branches of the hyperbola, a_e is half the length of the long axis of the ellipse and c is half the focal distance of both the hyperbola and the ellipse according to which the reflectors are curved and f has a value between the limit values 0.84 and 1.14 if $c/a_e = 0.5$, while f is between limit values nearer to 1.00 according as c/a_e increases so that f is between 0.998 and 1.002 if $c/a_e = 0.99$.

4,039,879

ELECTRIC TUNGSTEN/BROMINE CYCLE LAMP AND METHOD OF MANUFACTURING SAID LAMP

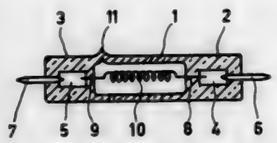
Germain Remi T'jampens, and Henricus Franciscus Johannes Giller, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 6, 1976, Ser. No. 729,928

Claims priority, application Netherlands, Oct. 7, 1975, 7511741

Int. Cl.² H01J *9/38;* **H01K** *1/50*

U.S. Cl. 313—174 **2 Claims**



1. An electric tungsten/bromine cycle lamp in which a tungsten filament is positioned in a light-pervious lamp vessel which contains an inert gas, bromine, hydrogen and phosphorus, characterized in that the envelope contains 2,2-diamino-4,4,6,6-tetrabromo-2,2,4,4,6,6-hexahydrotriazaphosphine, 2-amino-2,4,4,6,6-pentabromo-2,2,4,4,6,6-hexahydrotriazaphosphine, mixtures thereof or thermal decomposition products thereof.

4,039,880

METHOD OF OPERATING A SELF-STABILIZING DISCHARGE LAMP

Louis Benjamin Beijer; Mijndert Koedam; Jacobus Marinus Maria Claassens, and Johannes Adrianus Josephus Maria Van Vliet, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,068

Claims priority, application Netherlands, Jan. 17, 1975, 7500551

Int. Cl.² A47B *63/00, 67/00*

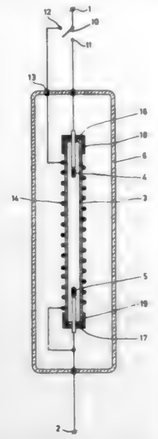
U.S. Cl. 313—183 **5 Claims**

1. A method for efficiently producing light which comprises:

providing a discharge lamp having a discharge tube, a pair of electrodes and a filling which mainly comprises sodium and xenon and wherein in the operating condition of said lamp the pressure of the xenon is less than 600 Torr and the ratio between the pressure of the sodium and the pressure of the xenon is less than or equal to 0.05 and at least a part of said sodium is non-volatilized during operation of said lamp;

providing means disposed about the outer surface of said discharge tube for heating the interior of said discharge tubes;

controlling the temperature in said discharge tube at the coolest spot therein to between 500° C and 675° C before initiation of the discharge and then initiating and continuing a discharge in said discharge tube without any ballast.



4,039,881

PLASMA DISPLAY SCREEN FOR DISPLAYING A MATRIX OF LUMINOUS POINTS

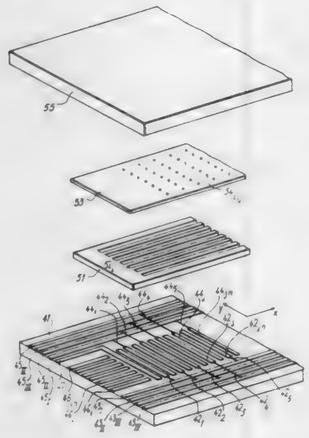
Emile F. Le Coquil, rue des Cordiers; Hubert Prigent, Batiment N 401, Kerhuel, both of Lannion, France (22300), and Guy Gerard, 1, Cite du Colombier, Perros-Guirec, France (22700)

Filed June 10, 1975, Ser. No. 585,499

Claims priority, application France, June 10, 1974, 74.19971

Int. Cl.² H01J *61/06*

U.S. Cl. 313—217 **2 Claims**



1. A display screen for displaying a matrix of luminous points, comprising:

a transparent front plate;

a first intermediate insulating plate formed with a matrix of holes arranged in N lines by M columns;

a second intermediate insulating plate having N slots each aligned with a respective line of holes in said first intermediate plate;

a back insulating plate supporting on its inner surface a plurality of electrodes;

said plurality of electrodes including M parallel sweeping electrodes each parallel to a respective column of holes and spaced apart by a distance equal to the distance between said columns of holes;

said plurality further including M parallel display electrodes arranged parallel to and alternating with said sweeping electrodes;

each display electrode cooperating with a respective column of holes;

a set of sweeping bus bars connected to said M sweeping electrodes in a cyclic order;

a set of display bus bars connected to said M display electrodes in a cyclic order;

a fly-back cathode parallel to and adjacent the first sweeping electrodes;

a set of N fly-back anodes respectively communicating with said N slots in a said second intermediate plate and arranged adjacent said fly-back cathode on side of said cathode remote from said sweeping electrodes; and

an ionizable gas atmosphere under low pressure filling the spaces defined by said slots and said holes.

4,039,882

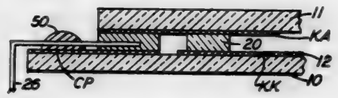
EDGE TERMINATIONS FOR GAS DISCHARGE DISPLAY PANEL

George A. Kupsky, and Douglas L. Santchi, both of State College, Pa., assignors to Panel Technology, Inc., Lewistown, Pa.

Filed Dec. 19, 1975, Ser. No. 642,512

Int. Cl.² H01J *61/04, 61/30, 61/36*

U.S. Cl. 313—217 **9 Claims**



7. In a gas discharge panel comprising a pair of glass plates joined in spaced apart relation by a seal to form (1) a thin gas discharge chamber and (2) at least one nip between said glass plates along an edge of the panel, printed display electrodes on said plates, printed circuit terminal electrical conductor elements on said plates electrically connected through said seal to said electrodes, and solid metal conductive pins inserted in the nip between said plates and in alignment with said printed circuit terminal electrical conductor elements, the improvements comprising in combination

1. bridging conductor means bridging the space inbetween said substrate and immersing the end of said pins therein, respectively, and

2. means commonly securing said pins to a surface of one of said plates so as to relieve strain on said bridging conductor means from forces applied to said pins.

4,039,883

SOLDERED JOINT

Cornelis Jan Damsteeg, Leende, and Tjepke Hendrick Ekkelboom, Eindhoven, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

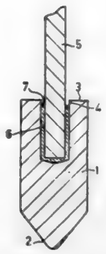
Division of Ser. No. 373,943, June 27, 1973, Pat. No. 3,923,470. This application Aug. 18, 1975, Ser. No. 605,517

Claims priority, application Netherlands, July 4, 1972, 7209332

Int. Cl.² H01J *61/06*

U.S. Cl. 313—218 **8 Claims**

1. An electrode for use in high-pressure gas discharge lamp, said electrode consisting mainly of at least one metal selected from the group consisting of tungsten and tantalum and secured by soldered joint means to a current supply conductor consisting mainly of at least one metal selected from the group consisting of tungsten, molybdenum and tantalum, said



soldered joint means comprising titanium and having at least an external surface layer consisting of titanium nitride.

4,039,884

DISCHARGE LAMP FOR THE DISACTIVATION OF MICRO-ORGANISMS

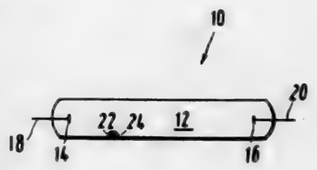
Jürgen F. Schäfer, Niedermittlau, Germany, assignor to Original Hanau Quarzlampen, Hanau, Germany

Filed July 21, 1976, Ser. No. 707,407

Claims priority, application Germany, Aug. 11, 1975, 2535816; May 7, 1976, 2620251

Int. Cl.² H01J *61/12*

U.S. Cl. 313—225 **10 Claims**



1. In a metal halide discharge lamp for the disactivation of micro organisms with an emitted radiation suitable for disactivation, the improvement comprising: said metal halide discharge lamp **(10)** contains antimony **(24)** as a metal and iodine **(22)** as a halogen.

4,039,885

ELECTRIC INCANDESCENT LAMP

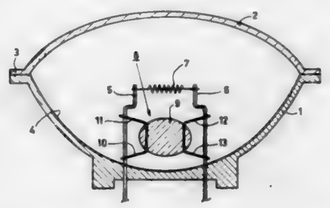
Johannes Leonardus Andreas Maria van Boekhold, and Wilhelmus Cornelius Kessels, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1976, Ser. No. 659,417

Claims priority, application Germany, Feb. 22, 1975, 7505552[U]

Int. Cl.² H01J *1/90, 19/48;* **H01K** *1/18*

U.S. Cl. 313—275 **2 Claims**



1. An electric incandescent lamp comprising a hermetically sealed envelope which is constructed of pressed glass, at least two current conductors, a filament stretched between said

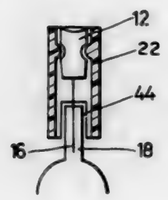
current conductors, a bridge for stabilizing the relative physical positions of said current conductors, which includes first and second support members, each member having first, second, and third axial sections, an electrically insulating body engaging each of said second axial sections to prevent relative movement therebetween, each first and third axial section of each support being disposed in oblique relation to said second axial section in each support, each of said first and third axial sections of each of said supports diverging away from said body and fixedly engaging said current conductors at axially spaced points thereof.

4,039,886

CONTACT PIN INSULATION OF INFRARED BRIGHT RADIATORS

Joachim Scherzer, Bruchkobel, Germany, assignor to Original Hanau Quarzlampen, Hanau am Main, Germany

Filed Aug. 26, 1976, Ser. No. 717,823
Claims priority, application Germany, Sept. 4, 1975, 2539459
Int. Cl.² H01K *5/02, 1/46;* **H05B** *3/40;* **H01J** *5/50*
U.S. Cl. 313—318 **9 Claims**



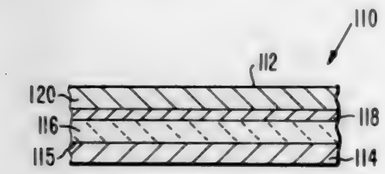
1. In an infrared bright radiator having insulating sleeve members surrounding contact pin members at respective pinched ends of the radiator and wherein each sleeve member comprises a hollow cylinder having at least an even outer circumferential surface and being provided with two diametrically slits at the end facing away from the free end of the associated contact pin member, the improvement wherein each insulating sleeve member is formed of plastic material and wherein the surface of one of the contact of one of the contact pin or sleeve members facing the other is provided with a radial projection and the surface of the other contact pin or sleeve member facing that projection is provided with an annular recess receiving the projection an axially limiting movement of the contact pin and sleeve members with respect to each other.

4,039,887

ELECTRON EMITTER INCLUDING POROUS ANTIMONY

Arthur Frederick McDonie, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed June 4, 1975, Ser. No. 583,745
Int. Cl.² H01J *1/14, 19/06*
U.S. Cl. 313—346 R **5 Claims**



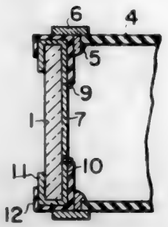
1. An electron emissive electrode comprising:
a. a base support member;
b. a solid layer of antimony disposed on said support member, said solid layer being less than about 1000 Angstroms thick and including the reaction products of antimony with at least one alkali metal; and
c. a porous layer of antimony disposed on said solid layer, said porous layer being about 4 microns thick and including the reaction products of antimony with at least one alkali metal.

4,039,888

IMAGE PICK-UP TUBE HAVING A PLURALITY OF ELECTRODES ON THE FACE-PLATE

Mikio Ashikawa, and Iwao Takemoto, both of Tokyo, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1973, Ser. No. 328,391
Claims priority, application Japan, Jan. 31, 1972, 47-10582
Int. Cl. H01j *31/26*
U.S. Cl. 313—365 **13 Claims**



1. An image pick-up tube comprising
a. a vacuum envelope made of an electrically insulating material,
b. a transparent and optically flat face-plate made of electrically insulating material, said face-plate being associated with said vacuum envelope so as to define a vacuum side and a non vacuum side on opposite sides of said face plate,
c. a plurality of electrodes formed on the inner surface of said face-plate and electrically insulated from each other,
d. a plurality of conductive members bridging the face plate by extending between two different planes from the vacuum side of the face-plate in a first plane, through the vacuum envelope, around the outer peripheral edge of the face-plate to the non-vacuum side of the face-plate in a second plane, and thus having portions on both the vacuum side and non-Vacuum side of said face-plate, said the face-plate, at least one of said plurality of conductive between said plurality of electrodes and the outer surface of the face plate, at least one of said plurality of conductive members being in the form of a thin film,
e. an annular sealing means made of a low-melting-point metal interposed between said vacuum envelope and said face-plate on the inside of the pick-up tube, and a ring of an electrically conductive material associated with the external end portion of said vacuum envelope and in electrical contact with the annular sealing means, and
f. an insulating thin film associated with at least one portion of said thin-film conductive member and serving to seal hermetically said vacuum envelope and said face-plate together with the thin-film conductive member.

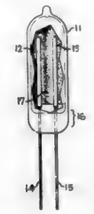
4,039,889

BLUE-WHITE GLOW LAMP

Egon Vicai, Gates Mills, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,302
Int. Cl.² H01J *61/16, 61/44*
U.S. Cl. 313—487 **6 Claims**

1. A negative discharge glow lamp comprising:
a light translucent envelope;
at least two electrodes positioned approximately parallel to each other inside said envelope;
an atmosphere inside said envelope consisting essentially of 1–15% xenon, balance neon, at a pressure of from 6.6×10^3 to 1.5×10^4 pascals absolute; and
a phosphor coating on the interior of said envelope comprising a mixture of manganese-activated zinc silicate and calcium tungstate phosphors;



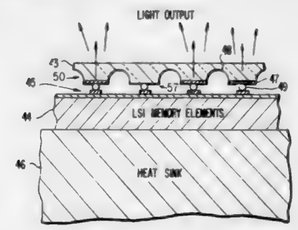
said lamp characterized by a firing voltage of 80–125 volts d.c., a maintaining voltage of 40–70 volts d.c., and a light output having coordinates within a radius of 0.04 of point (0.29; 0.38) on the CIE chromaticity diagram.

4,039,890

INTEGRATED SEMICONDUCTOR LIGHT-EMITTING DISPLAY ARRAY

Paul T. Bailey, Creve Coeur; M. George Craford, St. Louis, both of Mo.; Alexander G. Findlay, Cupertino, and Robert K. Underwood, San Jose, both of Calif., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 498,142, Aug. 16, 1974, abandoned.
This application Oct. 16, 1975, Ser. No. 622,936
The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.² H05B *33/02*
U.S. Cl. 313—500 **8 Claims**



1. A composite integrated circuit LED display array of sandwich configuration comprising:
a planar monolithic light-transmissive single crystal of GaP having a plurality of LED devices integrally formed on the back surface of said crystal in an X-Y array, said LED devices being optically isolated, the optical isolation being effected by a deeply etched grid on the back surface of said crystal;
a monolithic integrated circuit array of memory circuit elements corresponding to respective ones of said LED devices said integrated circuit being integrally joined to said light-transmissive crystal at the back side thereof, said memory circuits being selectively addressabie to cause energization of the respective LED devices to emit light at the back surface of said crystal, the light being transmitted through said crystal for being observed at the front surface of said crystal.

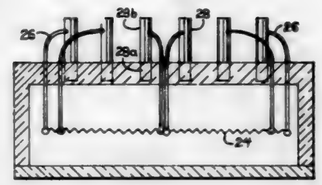
4,039,891

INCANDESCENT DISPLAY LAMP

Philip A. Schneider, Ringwood, N.J., assignor to Refac Technology Development Corporation, New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,370
Int. Cl.² H01K *1/22, 1/40, 1/42*
U.S. Cl. 313—522 **4 Claims**

1. A glass incandescent display lamp comprising:
a glass container and a glass faceplate forming a sealed glass envelope enclosing an evacuated space, said glass envelope having a bottom wall;
a plurality of electrically-conductive filament posts having first and second ends, said filament posts extending through said glass bottom wall with said first ends terminating in said evacuated space and said second ends terminating outside of said glass envelope;
a set of incandescent filaments selectively secured to the first ends of said filament posts for the passage of current and for producing a display;



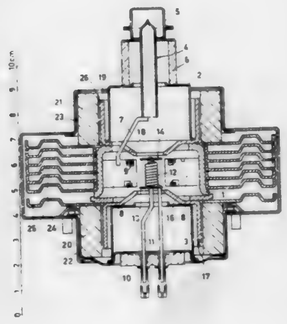
a plurality of conductor pins for connecting said incandescent filaments to an external source of power, said conductor pins each having one end embedded in and terminating in the bottom wall of said glass envelope and the other end of said pin extending to the exterior of said glass envelope; and
the second ends of said filament posts being connected to a portion of said conductor pins extending outside of said glass envelope.

4,039,892

RESONANT CAVITY MAGNETRON HAVING A MAGNET SYSTEM AND MAGNETRON DESTINED FOR SUCH A COMBINATION

Franciscus Napoleon Adrianus Kerstens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,310
Claims priority, application Netherlands, Mar. 13, 1975, 7502972
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.71 **2 Claims**



1. A resonant cavity magnetron comprising an anode housing defining a central axis and two opposite openings around said axis, cathode and anode members arranged within said housing, single-piece soft magnetic shells each including a poleshoe projecting through one opening into said housing, and a poleplate member extending parallel to said axis outside said housing, an intermediate portion between said poleshoe and said poleplate member being hermetically connected to said housing, radially magnetized permanent magnets surrounding respectively, said poleplate members, cathode filament connections extending along said axis through one pole-

plate member, and coupling-out lead extending through the other poleplate member, and a tubular partition arranged within each poleplate member, each partition being hermetically connected at one end thereof to said intermediate portion of the assigned soft magnetic part and at the other end thereof being closed by an insulating member for sealing said filament connection or coupling-out lead from the vacuum space within said anode housing and said poleplate members.

4,039,893

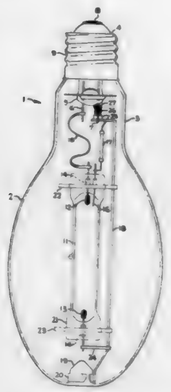
DISCHARGE LAMP HAVING DISCONNECT EFFECTIVE UPON JACKET FAILURE

Eugene K. Corbley, Cleveland Hts., Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1976, Ser. No. 669,289

Int. Cl.[2] H01J *7/14, 13/46, 17/34;* **H01K** *1/62*

U.S. Cl. 315—73 **3 Claims**



1. A jacketed electric lamp comprising: a sealed vitreous outer envelope having a neck end to which a base is attached and a dome end;

current inleads connected to said base and sealed into said envelope through the neck end;

an inner arc tube of material which transmits ultraviolet radiation supported within said outer envelope by a mount frame;

said arc tube having electrodes and inleads thereto sealed into its ends and containing an ionizable medium productive of radiation including ultraviolet which is normally intercepted at the outer envelope;

and means connecting the electrodes of the arc tube to said current inleads and including a disconnect feature, said means comprising a side-rod forming part of said frame and having a sliding coupling to one of said current inleads, said coupling being maintained in engagement by the restraint provided to said side-rod by said outer envelope, but moving out of engagement under press of gravity upon shattering of said outer envelope whereby to disable said arc tube.

4,039,894

ANTENNA LAMP

Homer E. Gardner, III, 3212 Fairway Drive, Montgomery, Ala. 36111

Filed Feb. 4, 1976, Ser. No. 655,316

Int. Cl.[2] H01K *7/00*

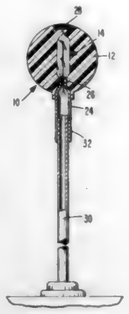
U.S. Cl. 315—76 **14 Claims**

1. An antenna lamp responsive to energy radiated from a radio transmitter antenna to produce visible light as a visual indication of radio transmission, comprising:

a gaseous discharge lamp bulb having electrical lead wire means;

a metallic tube secured at one end to said lead wire means; and

encapsulating means encasing said lamp bulb and said one end of said metallic tube, the opposite end of said tube



extending from said encapsulating means and being adapted to mount said lamp bulb on an antenna so that energy radiated from said antenna will produce illumination in said lamp bulb to produce light for the duration of such radiation.

4,039,895

DEVICE FOR STARTING AND FEEDING A DISCHARGE LAMP

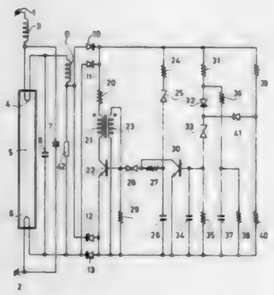
Hubertus Mathias Jozef Chermin; Meerten Luursema; Jaap Rozenboom, and Herman Adrianus Godefridus Smulders, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 11, 1976, Ser. No. 657,064

Claims priority, application Netherlands, Feb. 21, 1975, 7502005

Int. Cl.[2] H05B *41/232*

U.S. Cl. 315—101 **11 Claims**



1. A device for starting and operating an electric discharge lamp provided with two electrodes comprising, two input terminals for connection to an AC voltage source whose frequency is less than 100Hz, means connecting a series circuit comprising at least a stabilizing inductor and the lamp across said two input terminals, means including a second inductor for interconnecting the two lamp electrodes by means of a starter comprising a branch circuit including a first semiconductor switching element, means connecting, in parallel with the branch which includes said semiconductor switching element, a control circuit for the first semiconductor switching element, said control circuit comprising at least a first capacitor, an auxiliary transistor shunting at least the first capacitor, a second control circuit comprising a first resistor and a second capacitor connected in series and in parallel to the branch including the first semiconductor switching element, means connecting the base of the auxiliary transistor via a voltage -

sensitive threshold element to the junction of the first resistor and the second capacitor, and means connecting the lamp electrodes to a third capacitor.

4,039,896

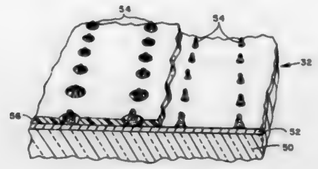
CATHODE RAY STORAGE TUBE HAVING A TARGET DIELECTRIC PROVIDED WITH PARTICULATE SEGMENTS OF COLLECTOR ELECTRODE EXTENDING THERETHROUGH

Gerald E. McTeague, Portland, and Kenneth R. Stinger, Hillsboro, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 645,961, Jan. 2, 1976, which is a division of Ser. No. 356,029, April 30, 1973, Pat. No. 3,956,662. This application Oct. 12, 1976, Ser. No. 731,166

Int. Cl.[2] H01J *29/50*

U.S. Cl. 315—135 T **10 Claims**



9. A cathode ray tube comprising:

a faceplate having a conductive coating on an inside surface thereof;

dielectric layer means on said conductive coating, said dielectric layer means having a pattern of openings therein;

conductive segments in the form of particulate material in said openings having inner ends connected to said conductive coating and outer ends extending outwardly from an outer surface of said dielectric layer means, said conductive segments providing collector electrode means;

means for directing a high velocity electron beam onto said dielectric layer means for establishing a charge pattern therein; and

means for directing low velocity electrons onto said dielectric layer mean with said low velocity electrons being attracted to said charge pattern whereby secondary electrons are emitted therefrom and collected by said collector electrode means.

4,039,897

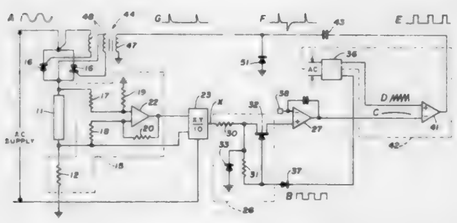
SYSTEM FOR CONTROLLING POWER APPLIED TO A GAS DISCHARGE LAMP

James E. Dragoset, 2006 Woodmont Drive, SE., Decatur, Ala. 35601

Filed Mar. 8, 1976, Ser. No. 664,965

Int. Cl.[2] H05B *37/00, 39/00, 41/14*

U.S. Cl. 315—205 **10 Claims**



1. A system for controlling power dissipated in a gas discharge lamp powered by an AC supply, comprising

a. a semi-conductor adapted to be rendered conductive by an actuating pulse, said semi-conductor and said lamp being connected in series across the AC power supply,

b. a measuring network connected to the lamp for measuring voltage across and current through the lamp in a given half cycle of the AC power supply and for providing output signals proportional to said voltage and current,

c. means connected to the measuring network for multiplying said output signals and providing a multiplied signal,

d. means connected to the multiplying means for integrating said multiplied signal and providing an integrated output signal, and

e. means synchronized with the AC power supply and connected to the integrating means for actuating the semiconductor to adjust the time interval in a subsequent half cycle during which the lamp is allowed to conduct, said adjustment being made in response to power dissipated in the lamp in said given half cycle.

4,039,898

ELECTRONIC FLASH APPARATUS

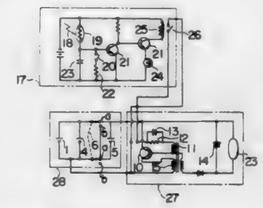
Hiroshi Iwata, Osaka, and Satoru Misaki, Toyonaka, both of Japan, assignors to West Electric Company, Ltd., Osaka, Japan

Division of Ser. No. 405,174, Oct. 10, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,651

Claims priority, application Japan, Oct. 13, 1972, 47-102934; Oct. 20, 1972, 47-105391; Oct. 20, 1972, 47-105393; Oct. 20, 1972, 47-105443

Int. Cl.[2] H05B *37/00;* **H02J** *7/00*

U.S. Cl. 315—241 P **6 Claims**



1. A photographic flash apparatus comprising: a power supply means including a plurality of rechargeable secondary cells for supplying a large discharging current to a load, a primary cell, connectable to said plurality of secondary cells, havig a small self-discharging factor and a terminal voltage higher than a final charge voltage of said secondary cells, and a first switching means for connecting said primary cell to said plurality of secondary cells; a DC-DC converter circuit including an oscillating transistor having base, emitter and collector terminals, an oscillation transformer connected to said oscillating transistor and a second switching means connected to said oscillating transistor; said power supply means being connected to an input of said DC-DC converter circuit; a primary discharging capacitor connected to an output of said DC-DC converter circuit; and a flashing discharge lamp connected in parallel with said primary discharging capacitor; said first switching means serving to connect said primary cell and said plurality of secondary cells in parallel before said DC-DC converter circuit is operated in order to charge said plurality of secondary cells with said primary cell while connecting said plurality of secondary cells in series during the operation of said DC-DC converter circuit in order to rapidly charge said primary discharging capacitor.

4,039,899

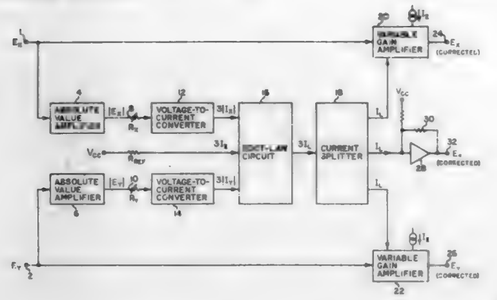
GEOMETRY AND FOCUS CORRECTION CIRCUIT

Carl Robert Battjes, Portland; Harvey Leon Golladay, Beaverton; Michael Lawrence Rieger, Tigard; Binoy Anthony Rosario, Aloha, and Kenneth George Schlotzhauer, Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 3, 1976, Ser. No. 682,242

Int. Cl.[2] H01J *29/56*

U.S. Cl. 315—371 **14 Claims**



1. A geometry and focus correction circuit for a cathode-ray tube having a focus electrode and a magnetic deflection system for deflecting an electron beam across a display target in response to vertical and horizontal deflection signals, comprising:

first and second input terminals for receiving said vertical and horizontal deflection signals, respectively;

reference generator means for providing an electrical quantity proportional to the axial length of said cathode-ray tube between said deflection system and said display target;

correction generator means responsive to said vertical and horizontal deflection signals and said reference quantity for generating a correction signal proportional to the length of said electron beam between said deflection system and said display target regardless of the angle of deflection thereof; and

variable-gain amplifier means coupled to said input terminals for providing corrected vertical and horizontal deflection outputs, said deflection amplifier means being responsive to said electrical quantity and said correction signal for establishing the gain factor thereof wherein said gain factor is equal to the cosine of said deflection angle.

4,039,900

PLUG IN REGULATING POWER SUPPLY

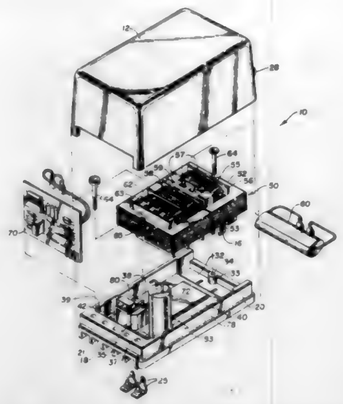
Donald W. Roback, New Brighton; Wilbur J. Hampel, Wayzata; Luther T. Prince, Minneapolis, and Dean L. Huppert, Edina, all of Minn., assignors to Ault, Inc., Minneapolis, Minn.

Filed Mar. 18, 1976, Ser. No. 668,069

Int. Cl.[2] H05K *7/20*

U.S. Cl. 361—388 **12 Claims**

1. A plug in voltage regulating power supply comprising, a transformer having an input and output winding with a pair of plug in terminals connected to the input winding, an electronic voltage regulator connected to the output winding of the transformer and energized thereby adapted to produce a regulated output voltage, said voltage regulator having at least one electronic element generating significant heat, a thermoplastic enclosure mounting said transformer and said voltage regulator and enclosing the same with said plug in terminals of said transformer extending therethrough; and a heat sink mounting said heat generating electronic element apart from said transformer and said voltage regulator and positioned within the thermoplastic enclosure and against one surface thereof to



distribute the heat generated by said electronic element throughout said surface of said enclosure.

4,039,901

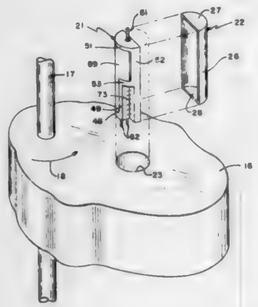
ENCAPSULATED PLURAL ELECTRICAL COMPONENT ASSEMBLY FOR USE IN TRANSMITTERS AND THE LIKE

Alan J. Adler, Palo Alto, Calif., assignor to Acurex Corporation, Mountain View, Calif.

Filed Apr. 25, 1975, Ser. No. 571,616

Int. Cl.[2] H02B *1/00;* **H05K** *5/00*

U.S. Cl. 361—422 **15 Claims**



1. In an electrical device: a rigid housing defining first and second cavities, a discrete component mounted in the first cavity, a hybrid circuit mounted in the second cavity, said hybrid circuit consisting of a substrate and a plurality of interconnected circuit elements mounted on the substrate, connector means mounted on the housing and extending between the cavities, said connector means being connected directly between the discrete component and the hybrid circuit, with no intermediate leads or additional packaging encasing the hybrid circuit, and additional connector means mounted on the housing and extending from one of the cavities to the exterior of the housing for connection to an element outside the housing.

4,039,902

ELECTRONIC AUTOMATION SYSTEM

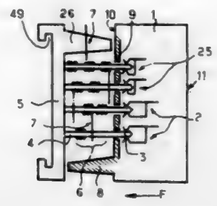
Guy Lacan, Carrieres sur Seine, and André Vergez, Villennes sur Seine, both of France, assignors to La Telemecanique Electrique, France

Filed Mar. 27, 1974, Ser. No. 455,490

Claims priority, application France, Mar. 29, 1973, 73.11413

Int. Cl.[2] A05K *1/04*

U.S. Cl. 361—395 **8 Claims**



1. An electrical and electronic automation system comprising in combination:

i. an insulating support having first and second faces;

i'. a carrier structure, cooperating groove and rail means on said support and carrier structure for removably attaching said insulating support to said carrier structure;

ii. a plurality of parallel electrically-conductive pins each having two ends, each pin mounted at one end on the second face of said support and being free only at its other end, said pins being arranged in lines and columns on the support, each pin including a first zone including its free end, and a second zone adjacent to the support and shaped to receive at least one electric lead thereon;

iii. a plurality of functional module circuits each contained in a modular casing including a bounding wall having therein a plurality of openings arranged in lines and columns and corresponding in position to said pins;

iv. a plurality of resilient contacts mount in said casing spaced from said bounding wall and arranged in lines and columns and corresponding in number and position to the openings in said wall, said contacts being directly connected to electrical circuits of the modules and receiving the free ends of said pins in said first zone thereof;

v. limiting means serving to restrict the extent to which the pins may enter the modular casing, and

vi. electrical leads secured on said pins at said second zone for connecting selected pins to each other to connect said module circuits to each other and to other external circuits.

4,039,903

REMOTE CONTROLLED MECHANICAL RELEASE OR LOCK-IN ELECTRICAL PATH BETWEEN BATTERY AND A LOAD

Carl D. Russell, 1502 S. Boulder 24D, Tulsa, Okla. 74119

Filed Feb. 18, 1975, Ser. No. 550,823

Int. Cl.[2] H01H *9/00, 47/00*

U.S. Cl. 361—187 **7 Claims**

1. In a vehicular key operated electrical system normally connecting a vehicular electrical load to the vehicular battery via an electrical current path wherein the key has at least an "on" and an "off" position,

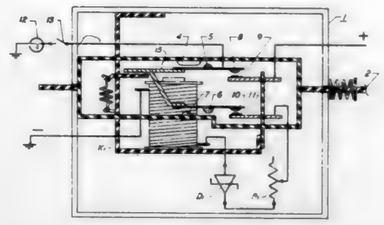
switching apparatus for opening and closing said path in response to pre-determined conditions including key position and battery voltage level comprising, in combination:

first actuator means in said path for opening said path and for closing said path;

a circuit comprising magnetic voltage sensing means and second actuator means for opening and closing said circuit;

mechanical means movable in response to key position to actuate said first actuator mans and said second actuator means; said mechanical means mechanically locking the first-mentioned actuator means closing said path when the key is in the "on" position;

said mechanical means actuating said second actuator means when the key is moved from "on" to "off" to magnetically



maintain said first actuator means actuated via said magnetic voltage sensing means; and,

said voltage sensing means relieving said magnetic maintaining when the battery voltage drops to said pre-determined voltage level.

4,039,904

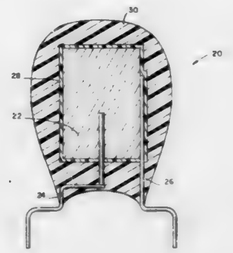
INTERMEDIATE PRECOAT LAYER OF RESIN MATERIAL FOR STABILIZING ENCAPSULATED ELECTRIC DEVICES

Gerhart P. Klein, Manchester; Milton Kallianidis, Brockton, both of Mass.; Paul J. Christiansen, Greencastle, and Dennis R. Henderson, Indianapolis, both of Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Jan. 2, 1976, Ser. No. 646,406

Int. Cl.[2] H01G *9/00, 9/16;* **H01L** *23/28*

U.S. Cl. 361—433 **11 Claims**



1. An electrically insulative intermediate precoat layer adapted for use between a surface of an electrical component means and a protective coating, the intermediate precoat layer including a resin material selected from acrylic resin, styrene resin, cellulose acetate resin, polyvinyl chloride resin, epoxy "B stage" resin, and mixtures thereof.

4,039,905

ELECTRICAL DEVICE OF THE ELECTROLYTIC TYPE HAVING MEANS FOR CONFINING MOBILE ELECTROLYTE AND METHOD OF MAKING SAME

Godfrey R. Pearce, and William J. Breeden, both of Glasgow, Ky., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

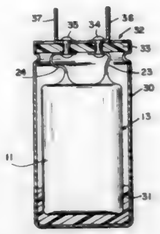
Filed July 1, 1974, Ser. No. 484,654

Int. Cl.[2] H01G *9/00*

U.S. Cl. 361—433 **10 Claims**

1. An electrical device of the electrolytic type comprising an electrical body, mobile electrolyte contacting the electrical

body, and a continuous coating of electrical insulating polymer containing material at least radiation semi-cured over the electrical body to confine mobile electrolyte contiguous to the body.



4,039,906

VARIABLE CAPACITOR

Chander M. Wahi, and Robert J. Baumler, both of Waseca, Minn., assignors to E. F. Johnson Company, Minneapolis, Minn.

Filed July 24, 1975, Ser. No. 598,558
Int. Cl.[2] H01G *5/06*
U.S. Cl. 361—293 **7 Claims**



1. A variable capacitor comprising in combination:
an axial unitary conductive rotor including a shaft portion at one axial end and a radially extending capacitance forming portion at the other axial end, said capacitance forming portion having a flat surface extending normally to the longitudinal axis of said shaft adjacent said shaft portion;
a stator comprised of material exhibiting dielectric characteristics, said stator having a flat major surface and an aperture extending therethrough to the other surface thereof to rotatably receive the shaft of said rotor, said stator further having a recess in the major surface thereof opposite to the stator flat major surface and opposite to the capacitance forming portion of said rotor, said recess extending laterally thereacross for less than one-half of the dimension of the other major surfaces of said stator receiving a capacitance forming electrode; and
first and second terminals conductively connected to the shaft of said rotor and said capacitance forming electrode respectively.

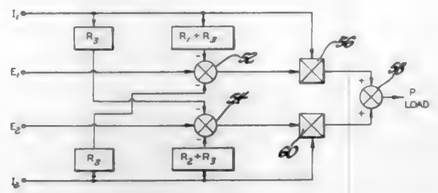
4,039,907

THRUST CONTROL CIRCUIT

Arthur H. Marsh, Arvada, and Prabodh Chandra Gupta, Aurora, both of Colo., assignors to Otis Elevator Company, New York, N.Y.

Continuation of Ser. No. 389,767, Aug. 20, 1973, abandoned.
This application July 10, 1975, Ser. No. 594,827
Int. Cl.[2] H02K *41/00*
U.S. Cl. 318—135 **8 Claims**

1. A motor control circuit comprising: an alternating current motor; a source of voltage supplying current and delivering power to said motor; and an electrical monitoring means connected with said motor for developing a control signal proportional to the power delivered to said motor less the stator copper losses of said motor, said electrical monitoring means sensing both the voltage applied to and the current supplied to said motor and using both the sensed voltage and the sensed current to develop said control signal wherein said motor is a three phase linear induction motor and said electrical monitoring means includes first means simulating the sum of the stator resistances of the first and the third of the three stator phase windings of said motor, second means simulating the sum of the stator resistances of the second and the third of said three stator phase windings; and third means simulating the stator resistance of the third of said three stator phase windings.

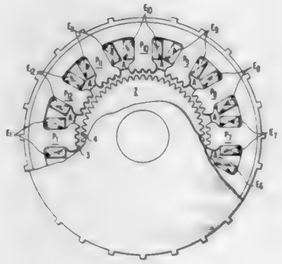


4,039,908

SYNCHRONOUS MOTOR HAVING A VARIABLE RELUCTANCE

Claude R. Maeder, Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Apr. 10, 1975, Ser. No. 566,843
Claims priority, application France, May 22, 1974, 74.18161
Int. Cl.[2] H02K *19/06*
U.S. Cl. 318—166 **7 Claims**



1. In a synchronous motor having a variable reluctance and supplied with three-phase electric current, said motor comprising a stator having a polar face provided with radial teeth and a non-magnetic rotor which is coaxially disposed with respect to the stator and which is externally provided with radial teeth, the improvement wherein:
a. the stator is provided with $3n$ pairs of poles (P) where n is a positive integer, each of said poles (P) bearing at least one inductive winding (E) and the inductive windings of all the poles (P) being identical;
b. the inductive windings (E) are arranged in groups of six in which each of said inductive windings (E) is connected to a diode (D) to form a group (G) of diode (D) - inductive winding (E) elements;
c. each diode (D) is such that two diodes (D) connected respectively to two inductive windings (E) provided on two adjacent poles (P) permit the passage of oppositely directed electric currents;
d. three pairs (H) of groups (G) of elements are formed by disposing in parallel two groups (**G1–G2, G3–G4, G5–G6**) of elements which are selected in such a way that the inductive windings which are thus assembled are provided on poles (P) separated by two other poles (P); and

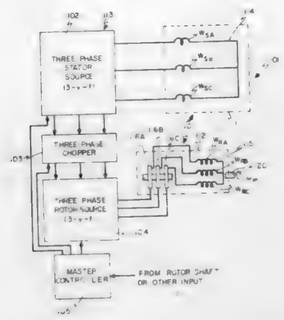
e. the excited poles (P) are always grouped in threes the middle one of which produces an oppositely directed magnetic flow to the two adjacent poles (P), whereby the rotating magnetic fields produced by inductive windings (E) are closed through adjacent poles (P) and only half of the inductive windings (E) are supplied with current at any given instant.

4,039,909

VARIABLE SPEED ELECTRONIC MOTOR AND THE LIKE

Richard H. Baker, Bedford, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 10, 1975, Ser. No. 548,493
Int. Cl.[2] H02P *7/36*
U.S. Cl. 318—197 **31 Claims**



1. Electric apparatus having two sets of polyphase coils magnetically coupled and adapted to move relative to one another; a first variable voltage, variable freuency, polyphase source connected to energize one set of the polyphase coils; a second variable voltage, variable frequency, polyphase source connected to energize the other set of the polyphase coils; means to vry the voltge and the freuency of the first polyphase source over a wide range of voltages and freuencies; means to vary the voltage and the frequency of the second polyphase source over a wide range of voltages and frequencies; and means to control the time phasing of the output of the second polyphase source relative to the first polyphase source; relative movement between the two sets of polyphase coils being between zero and some maximum value; each phase of the first polyphase source comprising a primay stage having an input and an output and including DC primary supply voltage means, first bilateral switch means and second bilateral switch means, the first bilateral switch means and the second bilateral switch means being operable to connect the DC primay supply voltage means between the input and the output of the primary stage such that the input and the output of the primary stage are at equal potential or the output is positive with respect to the input or the utput is negative with respect to the input.

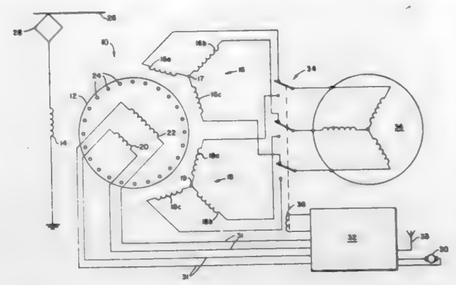
4,039,910

DYNAMOELECTRIC MACHINE

Keith M. Chirgwin, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Division of Ser. No. 396,043, Sept. 10, 1973, Pat. No. 3,930,175.
This application Dec. 5, 1975, Ser. No. 637,993
Int. Cl.[2] H02M *5/32*
U.S. Cl. 318—213 **7 Claims**

1. A drive system for an electric vehicle comprising:
means for supplying high voltage, alternating current to said vehicle from a stationary source;
a dynamoelectric machine on said vehicle including a primary stator winding defining a plurality of primary stator poles connected to receive said high voltage, alternating current, and including a multiphase secondary winding;
a rotor on said machine including exciting winding means defining each of a first plurality of rotor poles and a second plurality of rotor poles greater in number than said first plurality of rotor poles;
a multiphase vehicle drive motor responsive to multiphase alternating current input power for driving the vehicle at speeds directly related to the magnitude and the frequencey of said electrical input power;
means for supplying exciting current to said exciting winding means to selectively excite said first and second plurality of rotor poles, said rotor being operated in response to the excitation of said plurality of rotor poles at a synchronous speed related to the frequency of said high voltage alternating current and to the number of said plurality of primary stator poles, said multiphase secondary winding being magnetically coupled to said exciting winding means and supplying said drive motor with multiphase alternating current input power at a first frequency in response to the excitation of said first plurality of rotor poles to thereby accelerate said drive motor toward a first speed, said multiphase secondary winding supplying said drive motor with multiphase alternating current input power at a second frequency higher than said first frequency in response to the excitation of said second plurality of rotor poles to thereby accelerate said drive motor toward a second speed higher than said first speed.

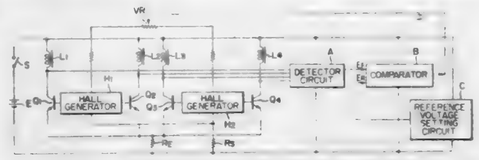


4,039,911

DC MOTOR CONTROLLED BY HALL GENERATOR

Kinji Tanikoshi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed June 20, 1975, Ser. No. 588,697
Claims priority, application Japan, June 24, 1974, 49-72121
Int. Cl.[2] H02K *29/00*
U.S. Cl. 318—254 **18 Claims**



1. A DC motor controlled by a Hall generator comprising:
a rotor having magnetic poles of opposite polarities thereon;
a stator including flux-producing windings positioned in torque-producing relation to said rotor;
Hall generators disposed within said motor in flux-sensing relation to said magnetic poles so as to generate rotor position signals;
driving means having terminals coupled in series to respective ones of said windings for applying exciting currents to said windings in response to the position signals from said Hall generators; and
control circuit means coupled to said driving means for

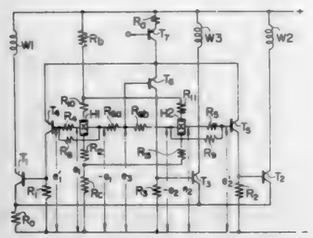
detecting a voltage corresponding to a respective terminal voltage of said driving means and to maintain the terminal voltage substantially constant.

4,039,912

THREE-PHASE BRUSHLESS DC MOTOR USING TWO HALL EFFECT DEVICES

Kinzo Wada, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed Oct. 20, 1975, Ser. No. 624,186
Claims priority, application Japan, Oct. 30, 1974, 49-125033; Nov. 22, 1974, 49-134607
Int. Cl.² H02K *29/00*
U.S. Cl. 318—254 **9 Claims**



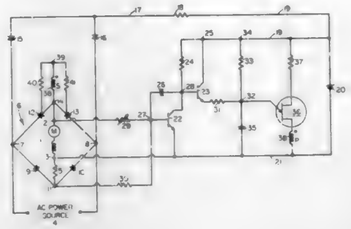
1. A three-phase brushless DC motor comprising a permanent magnet rotor; three stator windings mutually displaced electrically by 120°; first and second Hall effect devices associated with the stator windings and electrically displaced from each other by a predetermined amount, said Hall effect devices having a pair of first and second Hall voltage electrodes and a pair of control current electrodes, the stator windings having their one ends connectable in use in common to a first terminal of a DC voltage source; first, second and third power transistors each having emitter, base and collector electrodes and a collector-emitter path, the other end of each of the stator windings being connectable in use to a second terminal of the DC voltage source via the collector-emitter path of a corresponding one of the power transistors; first, second and third switching transistors of opposite conductivity type to said power transistors, each having base, emitter and collector electrodes, the first, second and third switching transistors having their emitter electrodes connectable in use in common to the first terminal of the DC voltage source; the base electrodes of the first and second switching transistors being connected to at least one of the first and second Hall voltage electrodes of the first and second Hall effect devices respectively, and the base electrode of the third switching transistor being connected at least one of the second voltage electrodes of the first and second Hall effect devices; a voltage dividing network in at least one of the connections between said base electrodes of the first, second and third switching transistors and the Hall voltage electrodes, the base electrodes of the first, second and third power transistors being connected to the collector electrodes of the first, second and third switching transistors respectively, one of the control current electrodes of the Hall effect devices being connectable in use to the first terminal of said DC voltage source and the other control current electrode of the Hall effect device being connectable in use to the second terminal of said DC voltage source, the electrical displacement between the first and second Hall effect devices and the voltage divisions of the voltage dividing network being such that the first, second and third switching transistors successively turn on at equal intervals.

4,039,913

UNIVERSAL ELECTRIC MOTOR SPEED CONTROL

John Cardwell Clegg, Provo, Utah, assignor to Battelle Development Corporation, Columbus, Ohio

Filed Feb. 26, 1976, Ser. No. 661,541
Int. Cl.² H02P *5/16*
U.S. Cl. 318—345 C **26 Claims**



1. A motor speed control system for a universaltype electric motor comprising:

a. a power modulator circuit having a pair of input terminals adapted to be connected to a source of alternating current and a pair of output terminals adapted to be connected to a universal-type motor, said circuit including gating means adapted to control the power supplied to the motor;

b. means, adapted to be connected in series between the motor and one of said output terminals and adapted to provide a voltage which is directly proportional to the instantaneous motor terminal current;

c. means, connected to means (b) at said output terminal, adapted to provide a sensing current which is directly proportional to the voltage across means (b), and thus to the instantaneous motor terminal current;

d. means, adapted to be connected to the motor and adapted to provide a sensing current which is directly proportional to the instantaneous motor terminal voltage;

e. summing means, connected to means (c) and (d), adapted to algebraically sum the instantaneous values of the two sensing currents;

f. integrator means, connected to means (e), adapted to average the sum of instantaneous values provided by means (e); and,

g. feedback means, connected between integrator means (f) and said gating means and adapted to generate a signal for operating the gating means, said signal having a phase determined by the output of the integrator means, whereby the output of the integrator means controls the phase of the gating means and thereby controls the power supplied to the motor.

4,039,914

DYNAMIC BRAKING IN CONTROLLED CURRENT MOTOR DRIVE SYSTEMS

Robert L. Steigerwald, Scotia, and Edward P. Cornell, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,143
Int. Cl.² H02P *3/12*
U.S. Cl. 318—375 **9 Claims**

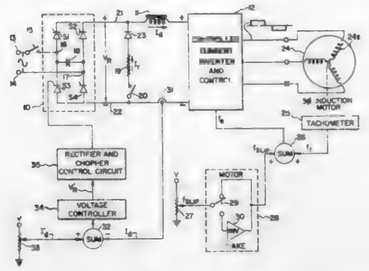
1. A motor control circuit for a controlled current motor drive system comprising

a current source power converter comprising combined full wave contolled rectifier and chopper means and also controlled current inverter means coupled in cascade with a direct-current reactor therebetween,

said combined controlled rectifier and chopper means having a pair of rectifier output terminals directly between which is connected in series a braking resistor and dynamic braking switch, and

control means for operating said current source power converter to produce variable amplitude and frequency rectangular wave output current to be supplied to a motor winding,

said control means under dynamic braking mode conditions further being operative to close said braking switch and



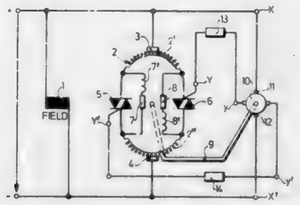
operate said combined controlled rectifier and chopper means as a chopper circuit to generate variable width voltage pulses between said rectifier output terminals and across said braking resistor and thus control the direct current magnitude fed to said controlled current inverter means during dynamic braking.

4,039,915

D-C COMMUTATOR-TYPE DYNAMO ELECTRIC MACHINE WITH ELECTRONIC CONTROL

Wolfgang Kofink, Schanbacher Strasse 8, 7301 Aichwald-Lobenrot, Germany

Filed Apr. 29, 1975, Ser. No. 572,869
Claims priority, application Germany, May 2, 1974, 2421180
Int. Cl.² H02P *7/06*
U.S. Cl. 318—439 **10 Claims**



1. Direct-current, dynamo electric machine having

an armature winding **(2)**;

a commutator/and brushes **(3, 4)** connecting the terminals of the machine to the commutator;

electrically controlled switch means **(5, 6)** connected in series circuit with the armature winding **(2)** and separating the winding **(2)** into winding portions **(2', 2")**;

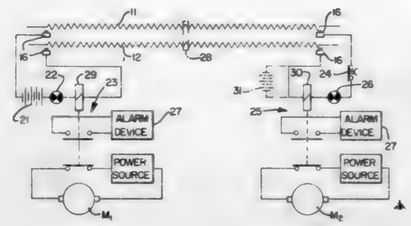
and a pulse source **(10, 10')** synchronized with rotation of the machine, connected to and controlling conduction of the controlled switch means and providing pulses to said switch means to selectively connect together the armature winding portions **(2', 2")** into a complete winding **(2)**.

4,039,916

DEVICE FOR PRECLUDING A COLLISION BETWEEN A MOBILE OBJECT AND A FIXED OR MOBILE OBSTACLE

Gabriel Selam, 161, Boulevard Edouard Vaillant, 93 Aubervilliers, France

Continuation-in-part of Ser. No. 405,108, Oct. 10, 1973, abandoned. This application Apr. 18, 1975, Ser. No. 569,266
Claims priority, application France, Oct. 10, 1972, 72.35816
Int. Cl.² G08D *1/00*
U.S. Cl. 318—587 **9 Claims**



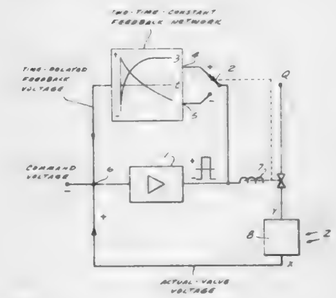
1. A device for precluding a collision between a mobile object moving in a predetermined path and a second object in the same path, the mobile object including a motor, a source of power for said motor, and a means for interrupting the supply of power from said source to said motor, the device comprising a fixed tape disposed along the path and a sensor carried by the mobile object, said fixed tape comprising a track which has a band having a predetermined resistivity, the sensor comprising a series circuit having a source of voltage, a limit switch comprising the means for interrupting the supply of power, and a wiping means for electrically contacting the band so as to connect said band in series in said circuit, said limit switch interrupting said supply of power from said source to said motor when the resistance presented in said series circuit by said band is reduced to a predetermined value.

4,039,917

ON-OFF SERVOCONTROLLER GENERATING A PULSE-DURATION-MODULATED ERROR-COMPENSATING SIGNAL

Bernhard Bach, and Ernst Picmaus, both of Frankenthal, Pfalz, Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed Apr. 12, 1974, Ser. No. 460,457
Claims priority, application Germany, Apr. 13, 1973, 2318696
Int. Cl.² G05B *11/28*
U.S. Cl. 318—599 **10 Claims**



1. A servosystem, comprising in combination, an energy-storing controlled system having an output variable which is to be maintained at a predetermined value; energy-varying means

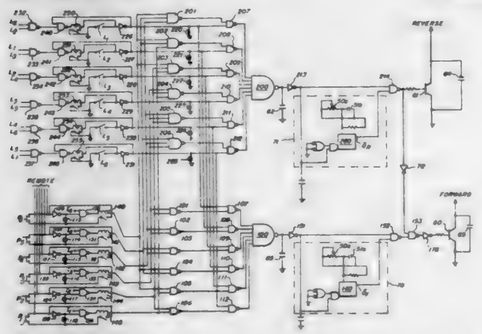
operative for effecting a change in the energy stored by said energy-storing controlled system; an on-off control unit operative in the on mode thereof for causing said energy-varying means to effect a change in the energy stored by said controlled system and operative in the off mode thereof for preventing said energy-varying means from effecting such change; error-indicating means operative for generating an error signal indicative of the deviation of said output variable from said predetermined value; and pulse-duration-modulating means connected to said error-indicating means for receiving said error signal and operative for alternately turning said control unit on and off by applying to said on-off control unit an error-signal-dependent pulse-duration-modulated actuating signal whose dependence upon said error signal is such that increases in the deviation indicated by said error signal result in superproportional increases in the ratio of the on-time to the off-time of said pulse-duration-modulated actuating signal, wherein said pulse-duration-modulating means comprises a servoamplifier having an input connected to said error-indicating means for receiving said error signal and having an output connected to said control unit for applying to the latter said actuating signal, and a feedback network connecting the output of said servoamplifier to the input thereof for feeding back said actuating signal to said input of said servoamplifier, and switchover means operative in dependence upon said actuating signal for changing the conductance of said feedback network in a sense counteracting the effect of said error signal upon said actuating signal.

4,039,918

CONTROL FOR ROTATABLE STORAGE UNIT

Karl C. H. Cheng, Albert Lea, Minn., assignor to Litton Business Systems, Inc., Beverly Hills, Calif.

Filed Aug. 4, 1975, Ser. No. 601,353
Int. Cl.² G05B *19/28*
U.S. Cl. 318—602 **10 Claims**



1. In a rotatable storage unit comprising a plurality of stations, and including means to drivingly rotate the unit from a first orientation wherein a first station is positioned at a preselected point to a second orientation wherein a second station is positioned at said preselected point, the improvement comprising:

a. station selector means for creating an electrical signal corresponding to a station selected by an operator;

b. circuit means for receiving said station selector signal as an input and providing an output signal to the driving means to cause said unit to rotate from said first station to said second station, said circuit means including:

forward movement gating means;

reverse movement gating means;

logic circuit means for determining the shortest rotational distance between said first and second stations and providing an electrical signal representative of that determination to said forward and reverse gating means;

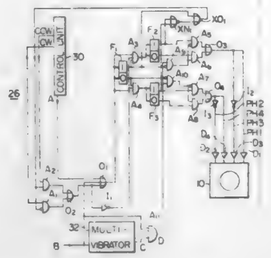
timing circuit means for selectably adjusting the precise stopping point of said second station when said unit is rotated into said second orientation.

4,039,919

MULTI-PHASE MOTOR CONTROLLER

Masayuki Suzaki, and Shigeyuki Araki, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed June 4, 1975, Ser. No. 583,945
Claims priority, application Japan, June 6, 1974, 49-63448
Int. Cl.² H02K *37/00*
U.S. Cl. 318—696 **15 Claims**



1. In a method of driving a multi-phase motor, the motor having excitation means to sequentially excite the motor phases to drive the motor and a pulse generator operatively connected with the motor shaft to generate a pulse representing a predetermined magnitude of angular displacement of the motor shaft whereby the pulse duration decreases as the motor shaft speed increases, the improvement of steps to control the excitation means to limit the motor shaft speed to a predetermined value, comprising:

a. sensing the duration of the pulse; and

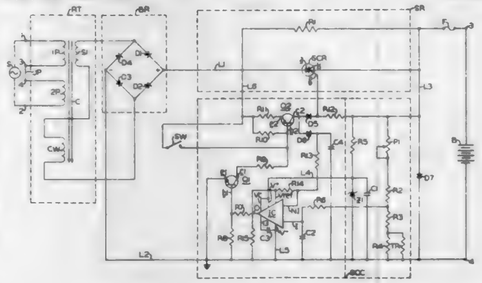
b. controlling the excitation means to excite the motor phases in such a manner as to reduce the accelerating force on the motor shaft when the pulse duration is below a predetermined duration for a time duration equal to the difference between the pulse duration and the predetermined duration so that the motor shaft speed is substantially limited to the predetermined motor shaft speed value.

4,039,920

CYCLING TYPE OF ELECTRONIC BATTERY CHARGER

Ralph Popp, Pittsburgh, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Continuation of Ser. No. 411,371, Oct. 31, 1973, abandoned.
This application Feb. 10, 1975, Ser. No. 548,422
Int. Cl.² H02J *7/04*
U.S. Cl. 320—22 **9 Claims**



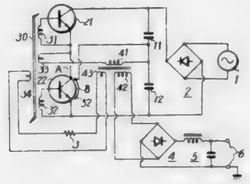
1. A cycling type of electronically controlled battery charger comprising, reactive transformer means connected to a source of alternating current, said reactive transformer including an adjustable core block member for varying the magnetic coupling between the windings, rectifier means connected to said reactive transformer means, regulator means connected to said rectifier means, sensor and control means connected to said regulator means for sensing the value of the battery voltage and for causing said regulator means to assume a high charging rate when the battery voltage falls below a first predetermined value which is slightly less than the average load plus the circuit losses and for causing said regulator means to assume a low charging rate when the battery voltage rises above a second predetermined value which is greater than the average load plus the circuit losses, and said sensor and control means including hysteresis means for requiring the battery voltage to be raised to said second predetermined value before said regulator means assumes said low charging rate thereby causing a battery to be worked to prevent sulphation and to avoid the need of providing a periodic equalizing charge.

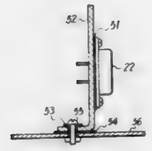
4,039,921

INVERTER RADIATION SUPPRESSION

Tadao Yoshida; Tadao Suzuki, and Shigeaki Wachi, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 1, 1976, Ser. No. 691,826
Claims priority, application Japan, June 11, 1975, 50-70651; June 11, 1975, 50-70652
Int. Cl.² H02M *3/335*
U.S. Cl. 363—22 **10 Claims**





1. In a transistor inverter including at least a pair of switching transistors, a transformer having primary and secondary windings, a DC voltage source having a pair of output terminals and a voltage reference terminal, and a rectifying circuit connected to the secondary winding of said transformer, said transistor inverter further comprising:

a. insulation means for mounting one of said switching transistors on a chassis which comprises at least a first insulating layer, a conductive layer and a second insulating layer interposed between a transistor case and said chassis;

b. means for electrically connecting said conductive layer to the voltage reference terminal of said DC voltage source.

4,039,922

METHOD OF CONVERTING PHASE AND FREQUENCY USING A DYNAMO-ELECTRIC MACHINE

Keith M. Chirgwin, Palos Verdes Estates, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

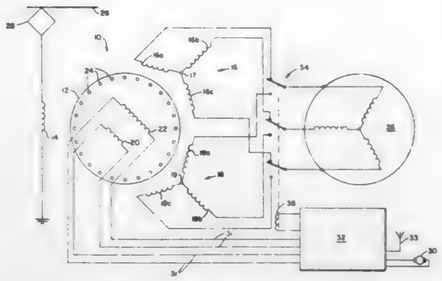
Division of Ser. No. 396,043, Sept. 10, 1973, Pat. No. 3,930,175.
This application Dec. 5, 1975, Ser. No. 638,218
Int. Cl.² H02M *5/32*
U.S. Cl. 363—9 **9 Claims**

1. A method of converting single phase electrical energy from one form to another form using a dynamoelectric machine, comprising the steps of:

a. applying the single phase electrical energy to the dynamoelectric machine to operate the machine as a synchronous motor presenting a high power factor load to the single phase electrical energy;

b. transforming the single phase electrical energy from one value of voltage to another value in the dynamoelectric machine;

c. converting the single phase electrical energy from single phase to polyphase electrical energy in the dynamoelectric machine; and



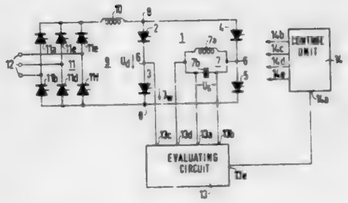
d. selectively operating the dynamoelectric machine with two different pole configurations to change the frequency of the polyphase electrical energy from one value to another value in the dynamoelectric machine.

4,039,923

METHOD AND APPARATUS FOR OPERATING A LOAD CONTROLLED INVERTER

Lovro Vukasovic, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 8, 1976, Ser. No. 721,381
Claims priority, application Germany, Sept. 18, 1975, 2541661
Int. Cl.² H02M *7/00*
U.S. Cl. 363—79 **12 Claims**



1. A method for operating a self commutating inverter having thyristors, in which the thyristors are fired prior to every zero crossing of the load voltage at a firing instant taking their protection time and the commuting time of the inverter into consideration, such as to determine the commutating and protection time without delay comprising:

a. developing a first measured voltage which is in phase with and proportional to the load voltage;

developing a second measured voltage which is phase shifted 90° relative to the load voltage and which is proportional to the product of the load voltage and the angular frequency ω of the load voltage;

c. developing a third measured voltage proportional to the inverter output current;

d. obtaining a derived voltage by adding the second and third measured voltages;

e. determining the firing instant by intersection point of said first measured voltage with said derived voltage;

f. establishing the peak value of the second measured voltage to be equal to $\omega \cdot U_{10} \cdot t_s$ where U_{10} is the peak value of the first measured voltage and t_s the protection time; and

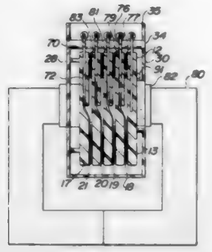
g. establishing the peak value of the third measured voltage to be equal to $(\omega \cdot U_{10} \cdot t_k)/I_W(t_z)$, where t_k is the commutating time and $I_W(t_z)$ the instantaneous value of the inverter output current I_W at the firing instant t_z.

4,039,924

HIGH VOLTAGE WINDING ASSEMBLY WITH IMPROVED REGULATION

Edgar F. Scales; Eugene K. Von Fange, both of Chesapeake, and Robert F. Wood, Portsmouth, all of Va., assignors to General Electric Company, Portsmouth, Va.

Filed Dec. 29, 1975, Ser. No. 644,979
Int. Cl.[2] H02M *7/10;* **H01F** *35/00*
U.S. Cl. 363—65 **8 Claims**



1. A transformer for providing rectangular shaped high voltage pulses to the cathode ray tube of a television receiver in response to input voltage pulses being applied to said transformer, said transformer comprising:

a magnetic core,

a primary winding mounted on said core and responsive to said input voltage pulses,

coil form means mounted on said core and including a plurality of partition members forming a plurality of slots,

a plurality of relatively tall and narrow washer-shaped high voltage windings, each being wound in one of said slots,

means interconnecting said high voltage windings in series-aiding relationship,

the height and width of each high voltage winding being selected to control predominantly the capacitance of said winding,

the width of each partition member of said coil form means being selected to adjust the spacing between adjacent high voltage windings to thereby control substantially only the leakage inductance between adjacent windings,

said height, width and spacing being chosen such that the tuning of said high voltage windings occasioned by the combined effect of said capacitance and leakage inductance shapes said high voltage pulses to be substantially rectangular.

4,039,925

PHASE SUBSTITUTION OF SPARE CONVERTER FOR A FAILED ONE OF PARALLEL PHASE STAGGERED CONVERTERS

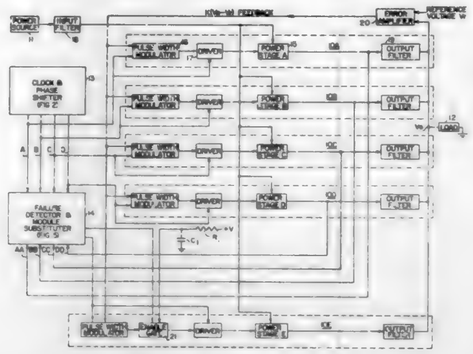
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of W. T. McLyman, Lakewood, and Gene W. Wester, Pasadena, both of Calif.

Filed June 10, 1976, Ser. No. 694,855
Int. Cl.[2] H02M *7/00*
U.S. Cl. 363—70 **11 Claims**

1. In a system for delivering power to a load from a source through a plurality of active converter modules connected in parallel and controlled to operate in staggered phase by separate phase control signals applied to respective active converter modules, apparatus for detecting the failure of any one of said converter modules and for substituting a parallel-connected spare converter module in the phase position of the failed module, comprising

means for separately sensing the power output of each of said active phase staggered converter modules to produce separate signals indicative of the respective active modules operating to deliver power to said load, and

a plurality of gating means, one for each active converter module, for coupling said separate phase control signals to said space converter module, each gating means associated with a separate active converter module being disabled by the operating indication signal of the associated module to transmit the phase control signal of the associated module, whereby failure of an active converter module enables its phase control signal to be applied to said spare converter module.

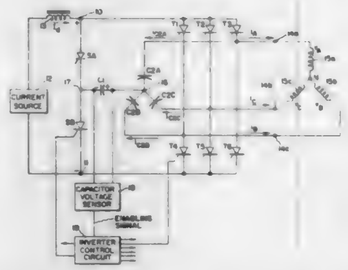


4,039,926

CURRENT FED INVERTER WITH COMMUTATION INDEPENDENT OF LOAD INDUCTANCE

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 21, 1976, Ser. No. 698,000
Int. Cl.[2] H02M *7/515*
U.S. Cl. 363—138 **7 Claims**



4. A current fed three phase bridge inverter for energization by a current source comprising

a plurality of pairs of alternately conductive main thyristors and a single pair of alternately conductive auxiliary thyristors each coupled between a pair of direct current input terminals, said pairs of main thyristors respectively having an output terminal between the thyristors in each pair,

wye-connected capacitors and a three phase inductive load connected in parallel between said output terminals, said wye-connected capacitors having a midpoint and a capacitance value selected to resonate with said load at a desired frequency,

a commutation capacitor connected directly between the junction of said auxiliary thyristors and the midpoint of said wye-connected capacitors,

capacitor voltage sensor means for sensing the voltage across said commutating capacitor and producing a control circuit enabling signal when the commutating capacitor voltage rises to a magnitude of either polarity sufficient to assure commutation, and

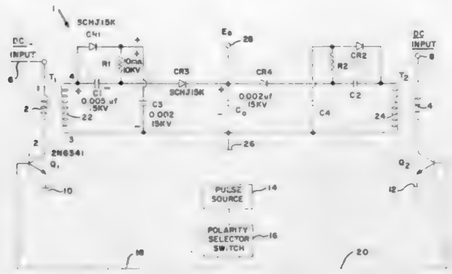
control circuit means responsive to said enabling signal for rendering conductive said main thyristors in a prescribed sequence and for rendering conductive said auxiliary thyristors alternately to initiate commutation of a selected thyristor, to thereby generate rectangular wave currents at said output terminals applied to the load and wye-connected capacitors.

4,039,927

ELECTROSTATIC POWER SUPPLY

George Gilman Richards, Jr., Middletown, and John Gilbert Berger, Elizabethtown, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 12, 1976, Ser. No. 648,225
Int. Cl.[2] H02M *3/315*
U.S. Cl. 323—17 **2 Claims**



1. An electrostatic power supply for supplying an output pulse of selected polarity and peak voltage throughout duration of said pulse, comprising:

transformer means having first and second transformer primaries connected to a D.C. input, each said primary being coupled to reference potential through a normally non-conductive transistor switch,

a pulse source and a polarity selector switch in series with a base of each said transistor switch to supply a pulse selectively to one said transistor switch and render a selected one said primary conductive,

said transformer means having first and second transformer secondaries connected to a common load forming capacitor,

each secondary including a rectifier and a load supplying capacitor in series with said load forming capacitor,

a corresponding one said secondary having a current induced therein upon conduction of said selected one primary, and

means in each said secondary coupled to a corresponding said load supplying capacitor for applying peak secondary voltage thereto whereby said load supplying capacitor remains fully charged and whereby peak energy of said secondary passes through said load supplying capacitor to replace energy drain from said load forming capacitor.

4,039,928

ELECTRICAL OPERATING CIRCUIT HAVING SEMICONDUCTOR DEVICE JUNCTION TEMPERATURE MONITORING

Russell Noftsker, Woodland Hills, and James Kirk Mathews, Van Nuys, both of Calif., assignors to Pertron Controls Corporation, Van Nuys, Calif.

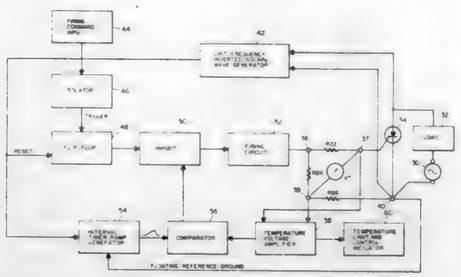
Filed July 19, 1976, Ser. No. 706,608
Int. Cl.[2] G05D *23/24;* **H05B** *1/02*
U.S. Cl. 323—19 **48 Claims**

14. The method of determining the junction temperature of a semiconductor switch device of the type which conducts current between its first and second main terminals in a series currentconducting path, including an electrical source and a load, responsive to the control terminal thereof being forward biased relative to said first main terminal in a circuit including:

first bias means for applying an forward bias voltage through a first resistor means to said control terminal; and

second and third resistor means connected between said bias means and said first terminal; and

a source of current and an electrical load connected in series circuit connected across said main terminals of said semiconductor switch device, comprising the steps of:



interrupting said first bias means and substituting therefor a second bias means for applying a reverse bias voltage; and

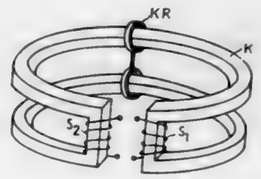
measuring the voltage between said control terminal and a circuit juncture between said second and third resistor means.

4,039,929

INDUCTIVE TRANSDUCER FOR RECTILINEAR OR ROTATIONAL DISPLACEMENT

Albert Weckenmann, Oberasbach-Altenberg, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Division of Ser. No. 491,180, July 23, 1974, Pat. No. 4,013,986.
This application Mar. 12, 1976, Ser. No. 666,323
Claims priority, application Germany, Oct. 22, 1973, 2352851
Int. Cl.[2] H01F *21/04*
U.S. Cl. 323—75 L **20 Claims**



1. A transducer for converting a mechanical displacement into an electrical output magnitude in accordance with a predetermined function of the displacement of a body, comprising:

an elongated ferromagnetic core having two elongated members joined at both ends thereof by respective transverse core portions and elsewhere separated by an elongated gap free of intermediate ferromagnetic members;

first and second coil means, respectively wound on the two transverse end portions of said core;

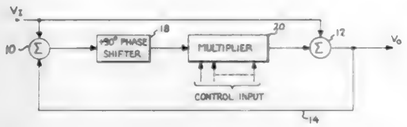
short-circuiting ring means comprising short-cicuits respectively encircling individually each of said two elongated members at substantially the same distance from each end portion of said core, mechanically constituted as a single unit and displaceably mounted for movement in the direction of elongation of said members relative to said core with a conductive part of said ring means always passing completely through said gap and thereby completing said short-circuits, whereby the displacement of said ring means relative to said core varies the inductance of said second coil means in the sense opposite to the concurrent variation of the inductance of the first coil means.

4,039,930

REMOTELY CONTROLLED PHASE SHIFTING CIRCUIT

Stephen J. Lukas, Waynesboro, Va., assignor to General Electric Company, Salem, Va.

Filed Aug. 12, 1976, Ser. No. 713,889
Int. Cl.[2] G05F *1/68*; H03K *1/12*
U.S. Cl. 323—108 **14 Claims**



1. A circuit for shifting the phase of an input voltage to provide an output voltage of substantially the same magnitude but having a phase differing from that of the input voltage by the amount of the phase shift, said circuit comprising:

a. first and second summation means for receiving input signals and for providing output signals, the output of said second summation means constituting said output voltage;

b. means for applying the input voltage as an input signal to both said first and said second summation means;

c. means for applying the output signal of said second summation means as a second input signal to said first summation means;

d. circuit means responsive to the output signal of said first summation means to provide a second input to said second summation means said circuit means combining with said first and second summation means to provide a transfer function equal in magnitude to K/TS wherein,

K = a control variable

T = time constant of the circuit means

S = Laplace transformer operator; and,

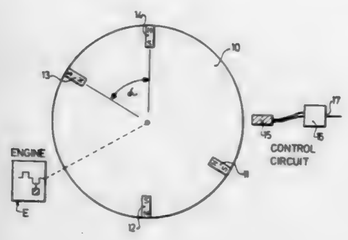
e. means connected to said circuit means for selectively controlling the value of said control variable K.

4,039,931

SYSTEM TO SENSE A MARKER ON A ROTATING BODY

Hartmut Schweizer, Korntal-Munchingen, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed July 6, 1976, Ser. No. 702,958
Claims priority, application Germany, July 15, 1975, 2531517
Int. Cl.[2] F02P *17/00*
U.S. Cl. 324—16 T **12 Claims**



1. System to sense a marker on a rotating body **(10)** comprising

a permanent magnet **(11–14)** located on the rotatng body and forming said marker;

an inductive transducer **(15)** fixedly located with respect to the rotating body and having a voltage induced therein upon rotation of the body;

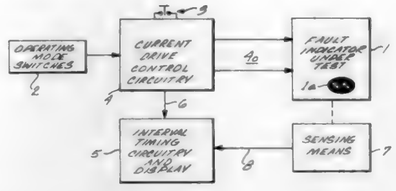
and an amplitude control circuit **(16)** connected to the transducer **(15)** and including a feedback network to normalize the amplitude of the output from said control circuit **(16)** to an essentially constant value independent of speed of the rotating body.

4,039,932

FAULT INDICATOR TESTING APPARATUS

William H. Duckworth, San Diego, Calif., assignor to San Diego Gas & Electric Co., San Diego, Calif.

Filed Feb. 26, 1976, Ser. No. 661,711
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—28 R **6 Claims**



1. Apparatus for testing the reaction time of a fault indicator which has surge-current detection means and settable fault indicating means, with the surge-current detection means being adapted to set the fault indicating means when a conductor connected to the fault indicator has flowing through it for a time lasting longer than said reaction time a surge current having a magnitude exceeding a threshold value, the testing apparatus comprising:

switching means for actuating a pulse testing operation;

current-drive circuit means having an actuation input coupled to the switching means and having a current-drive output for connection to the conductor to supply thereto during the pulse testing operation a test surge current having a magnitude exceeding the threshold value;

interval-timing circuit means having a first circuit input for receiving a timing-initiation signal, a second circuit input for receiving a timing-completion signal, a circuit output, and means for producing on said circuit output an elapsed-time signal representative of the length of time elapsing between sequentially received timing-initiation and timing-completion signals;

timer-control means for controlling the interval-timing circuit means so that the elapsed-time signal represents the reaction time of the fault indicator, the timer-control means including circuit means for supplying the timing-initiation signal to said first circuit input substantially simultaneously with the start of the test surge current, and further including sensing means responsive to the fault indicating means of the fault indicator for supplying the timing-completion signal to said second circuit input; and

test result display means responsive to the elapsed-time signal for visually indicating the reaction time to the fault indicator.

4,039,933

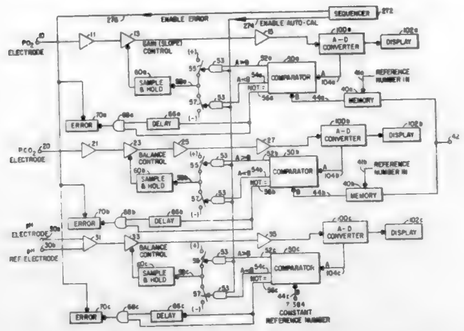
CONTINUOUS CALIBRATION SYSTEM AND METHOD FOR ANALYTICAL INSTRUMENTS

Byron L. Moran, Bedford, Mass., assignor to Instrumentation Laboratory, Inc., Lexington, Mass.

Filed Mar. 25, 1976, Ser. No. 670,184
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29 **13 Claims**

1. In an analytical instrument for measuring constituents of a fluid comprising at least one sensor means, first circuitry for producing a signal representative of the constituent sensed by said sensor and including an analog-to-digital converter to allow display of said signal in digital form, the improvement for providing continuous calibration of the instrument by means of a second circuitry comprising a comparator circuit for continuously comparing the output signal of said analog-to-digital converter to a reference signal when calibrating the instruments and for producing an output signal representative

of the difference as a result of said comparing, and a sample-and-hold circuit for receiving the output signal of said comparator circuit and for producing in turn a compensatory voltage coupled to said first circuitry.

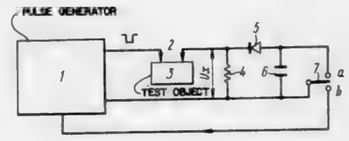


4,039,934

METHOD OF AND APPARATUS FOR MEASURING IONIC ELECTRIC CONDUCTANCE OF OBJECTS

Fedor Ivanovich Ostashko, p/o Kulinichi, o/kh"Ukrainka" ulitsa Olkhovskaya, 5, kv. 6, and Igor Nikolaevich Mirny, p/o Kulinichi, o/kh"Ukrainka" ulitsa Olkhovskaya, 13, kv. 15, both of Kharkov, U.S.S.R.

Filed Dec. 7, 1973, Ser. No. 422,922
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—30 R **5 Claims**



1. A method of measuring ionic electric conductance of biological objects by establishing electric current flow in a predetermined zone of the object being tested, particularly measuring the electrical conductance of the cervical secretion of cows for the purpose pf pregnancy diagnosis, comprising the step of passing in the course of measurement through a predetermined zone of the object being tested such a current and during such a relatively short time interval that the total amount of electricity passing through the object being tested during the measurement period should not exceed about $1.35.10^{-3}$C with a corresponding permissible error of the measurement being of $\pm 2.5\%$, wherein electric current is passed through sampled secretion in the course of the measurement for a time not exceeding 0.25 sec.

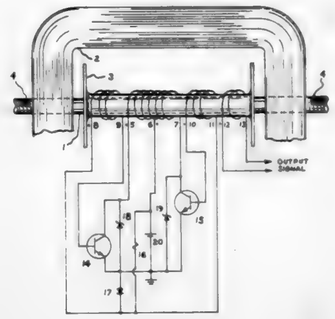
4,039,935

VARIABLE FREQUENCY STRESS TRANSDUCER

John Thomas Richard Wilson, 736 Lynnhaven Lane, La Canada, Calif. 91011

Filed Jan. 8, 1976, Ser. No. 647,514
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 ST **4 Claims**

1. A variable frequency stress transducer for measuring mechanical stress comprising a magnetic member in which the magnetic characteristics are varied by the applied mechanical stress, a means for applying a mechanical force to said member to cause mechanical stress in said member, a flux path means for magnetic flux to flow through said member thence through a magnetic yoke external to said member and returning to said member, multiple winding means inductively linking said yoke and member, a magnetic multivibrator utilizing said winding means in which the frequency of oscillation is determined principally by the time required to drive magnetic flux reciprocally through said flux path between one polarity near-maximum flux-level and the opposite polarity near-maximum flux-level, and output stress signal winding means linking said flux path for deriving an induced output stress signal from said multivibrator.

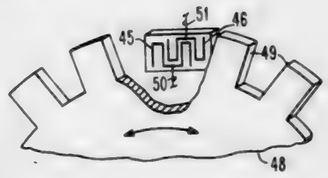


4,039,936

INTERLEAVED MAGNETORESISTIVE DISPLACEMENT TRANSDUCERS

Alan Lytton Jones; Joseph Paul Pawletko, both of Endwell, and Jerry Wesley Raider, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,824
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 D **4 Claims**



1. Transducer apparatus for detecting displacement comprising:

a member of magnetic material formed with at least one pole face having a pair of parallel edges;

means for producing a magnetic flux field at said pole face;

transducer means on said magnetic flux means movable transversely with respect to said edges and in a plane parallel to said pole face, said transducer means including a plurality of transducers, each transducer having first and second interconnected sections of magnetoresistive material in a common plane parallel with said pole face and each said section of a transducer having a longitudinal axis parallel with said edges and spaced from the other section a distance equal to that between said edges, and each pair of sections having disposed therebetween a section from at least one other transducer; and

means for detecting changes in resistance of said sections of said transducers as a function of the movement of said transducer means along a plane parallel with said pole face.

4,039,937

ACOUSTIC TEST APPARATUS FOR ELECTRICAL NETWORKS INCLUDING MULTI-PHASE POWER SYSTEMS

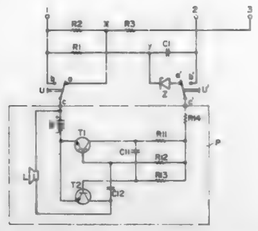
Heinz Laass, Pfungstadt-Hahn, Germany, assignor to Taco-Tafel GmbH & Co., KG, Esslingen, Germany

Filed May 17, 1976, Ser. No. 687,156

Claims priority, application Germany, June 4, 1975, 2524681; Jan. 16, 1976, 2601475

Int. Cl.² G01R *19/14, 31/02*

U.S. Cl. 324—51 **30 Claims**



1. Multi-phase power system audio output test apparatus, particularly for use with three-phase systems, comprising

at least three test input terminals **(1, 2, 3);**

a tone generator oscillator circuit **(P; T1, T2, C11, C12, R11-R13;** L) having a local power source (B) and an audio reproducer (L);

a phase-shifting circuit **(R1, C1; R5, R6, C2; R9, C3; R21, C4)** connected across a first combination **(1, 2)** of any two of the test input terminals, and connected across one of the phases **(1, 2);**

circuit means **(R2, *x*, R3; N; R22, *x*, R23)** connected to a second one of the phases and deriving a separate phase signal; and voltage sensing means (Z, G, R7, G'-F) having one terminal connected to said phase-shifting circuit and a second terminal being controlled by the separate phase signal, the phase-shifting circuit providing a phase-shifted output to the voltage sensing means to cause the said voltage sensing means to have a predetermined output level when the phase sequence is in a first sequence **(1-2-3)** and to have another output level when the phase sequence differs from said first sequence **(1-3-2),**

the output of the voltage sensing means being coupled to the tone generator oscillator circuit (P) to cause oscillation thereof at a predetermined frequency to generate a tone of predetermined pitch for reproduction by the reproducer (L) when the phase sequence has a predetermined one of said phase sequences, absence of reproduction of said tone due to oscillation at another frequency, or at other frequencies, or a non-oscillation of the oscillator circuit (P) being an indication of another predetermined phase sequence or circuit condition.

4,039,938

METHOD AND APPARATUS FOR DETECTING FAULTS IN BURIED INSULATED CONDUCTORS

John Barry Link, Liberty, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 8, 1976, Ser. No. 721,455

Int. Cl.² G01R *31/08*

U.S. Cl. 324—52 **13 Claims**



1. In a system for locating conductor-to-earth leakage paths through the insulation of buried conductors wherein said system comprises first means for producing a signal for application between a conductor of a buried insulated conductor and the medium in which it is buried, and second means for sensing said signal at discrete locations along the path of said conductor, for deriving a reference signal from said sensed signal and for phase comparing at least a portion of said sensed signal with said reference signal, an improvement in said system characterized in that,

said signal produced by said first means comprises an alternating wave which is started at substantially the same phase angle at least once each time said second means is sensing said signal, and

said second means comprises means for full-wave rectifying at least a portion of said sensed signal, means for dividing said rectified sensed signal by two with said dividing starting anew each time said sensed signal is started to thereby produce a reference signal and means for phase comparing said reference signal and at least a portion of said sensed signal.

4,039,939

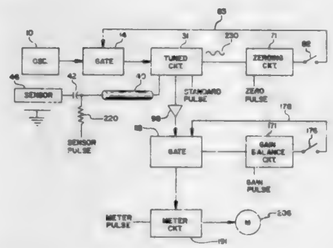
MOISTURE MEASURING APPARATUS

Delmer W. Wagner, 392 Pine Grove Road, Rogue River, Oreg. 97537

Filed July 6, 1976, Ser. No. 702,874

Int. Cl.² G01R *27/26*

U.S. Cl. 324—57 Q **12 Claims**



1. Moisture measuring apparatus comprising:

a tuned circuit and a source of energy for supplying said tuned circuit,

a moisture sensor for mounting at a location where moisture is to be measured and connected means for coupling said sensor to said tuned circuit,

meter means for ascertaining the degree of loading of said tuned circuit by said sensor,

and means for alternately coupling and decoupling said sensor with respect to said connection means and for determining the drive to said tuned circuit from said source of energy when said sensor is decoupled from said connection means.

4,039,940

CAPACITANCE SENSOR

Walter J. Butler, Scotia, and Charles W. Eichelberger, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 30, 1976, Ser. No. 710,177

Int. Cl.² G01R *27/26*

U.S. Cl. 324—60 C **13 Claims**

1. A capacitance sensor for measuring the magnitude of an unknown capacitance and providing a digital output comprising:

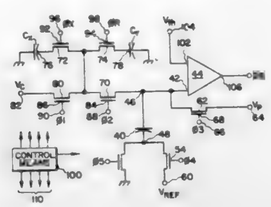
primary charge storage means;

sensor means connected to said primary charge storage means providing an output signal when the level of charge in said primary charge storage means equals or exceeds a preselected level;

secondary charge storage means selectively connected to said primary charge storage means for transferring a plurality of charge packets to said primary charge storage means during a first measurement period until said preselected level is reached;

means for selectively connecting said unknown capacitance to said primary charge storage means during a second measurement period so that the magnitude of the charge packets in a second plurality of charge packets is proportional to the magnitude of said unknown capacitance, and for sequentially transferring said second plurality of charge packets to said primary charge storage location during said second measurement period until said preselected level is again reached;

digital counting means responsive to said output signal for counting the number of charge transfers required to reach said preselected level during said first and second periods.



4,039,941

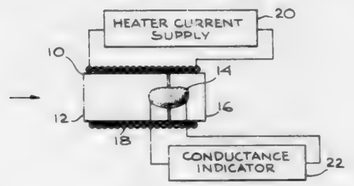
GAS SENSOR

Stanley R. Morrison, Los Altos, Calif., assignor to Stanford Research Institute, Menlo Park, Calif.

Filed May 9, 1975, Ser. No. 575,949

Int. Cl.² G01N *27/00*

U.S. Cl. 324—71 SN **6 Claims**



1. A gas detector comprising:

a semiconductor support which is substantially nonreactive to a gas to be detected,

a surface additive means which is a catalyst deposited solely on said semiconductor support surface and in pores in said surface, for exchanging electrons with said semiconductor in the presence of said gas to be detected to change the conductivity of said semiconductor, and

means for detecting the change in conductivity of said semiconductor support.

4,039,942

SYSTEM FOR SENSING ELECTRICAL POTENTIAL PARTICULARLY IN PLANTS

David Glaser, c/o E. H. Rainer, 3400 Virginia Road, Cleveland, Ohio 44122

Filed Aug. 5, 1975, Ser. No. 602,113

Int. Cl.² G01R *31/02*

U.S. Cl. 324—72 **6 Claims**

1. A plant voltage sensing system for sensing electrical potentials in the leaves of a plant comprising two conductive sensors capacitively coupled to opposite surfaces of a

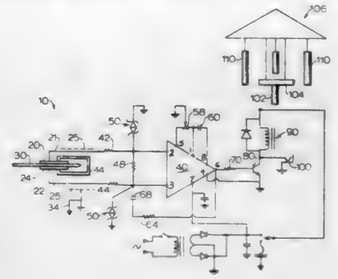
plant leaf whose electrical potential is to be sensed, a differential operational amplifier having high input impedance and having an

output and two inputs, each input being connected through a

resistive path to one of said sensors,

a resistive path connected across the two inputs of said amplifier, the output of said amplifier being coupled through a resistor and

capacitor to one input of said amplifier, both inputs of said amplifier also being connected through a Zener diode



arrangement to ground,

means connected to the output of said amplifier to receive current flow

therefrom in response to potential changes in said

leaf and sensed by said sensors,

a utilization device for responding to said currentflow and providing

a useful representation thereof, and said utilization device comprising

bell chimes that ring in response to said current changes whereby the changes in the plant potential of the plant causes said bell chimes to generate sound.

4,039,943

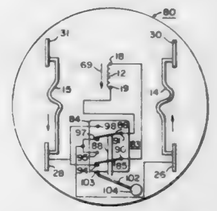
POSITION SENSITIVE ANTI-TAMPER WATTHOUR METER

Hunter P. Tapscott, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 3, 1976, Ser. No. 663,336

Int. Cl.² G01R *11/24;* **H02B** *9/00*

U.S. Cl. 324—110 **7 Claims**



1. A watthour meter having a metering movement rotatable in response to the flow of electrical energy in a pair of line conductors, said watthour meter comprising;

a first pair of terminal blades for mounting said meter and electrically connecting said meter across the pair of line conductors;

a second pair of terminal blades for mounting said meter and electrically connecting said meter in series with said line conductors;

a pair of current windings connected between separate

blades in each of said first and said second pairs of terminal blades;

a voltage winding having first and second terminal ends; and

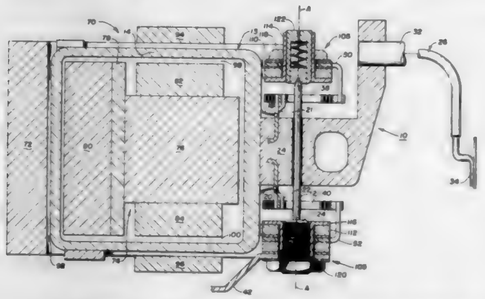
a gravity actuated switch means connecting said first and said second terminal ends of said voltage winding to one and the other of said first pair of terminal blades when said watthour meter is in an upright operating position and reversing the connection of said first and said second terminal ends across said one and said other of said pair of terminal blades when said watthour meter is in an inverted position whereby said metering movement is rotated in the same direction when said meter is mounted in either of said upright or said inverted mounted positions.

4,039,944

MOVING COIL ELECTRICAL INSTRUMENT

Charles Edward Clift, Montevideo, Minn., assignor to Montevideo Technology, Inc., Montevideo, Minn.

Filed Apr. 8, 1976, Ser. No. 675,121
Int. Cl.² G01R 1/20
U.S. Cl. 324—150 **12 Claims**



1. A moving coil electrical meter mechanism which comprises:

a substantially rectangular coil;

a magnetic structure surrounding first, second, and third sides of the coil and defining first, second, and third magnetic flux filled air gaps wherein

the first and third sides of the coil are opposing sides of the rectangle and are located in the first and third air gaps, respectively, said first and third air gaps having therein oppositely-directed magnetic fields which are substantially perpendicular to said first and third coil sides, and

the second side of the coil, lying between the first and third sides, is located in the second air gap, said air gap having therein a magnetic field which is substantially perpendicular to said second coil side and orthogonal to the fields in the first and third air gaps, said magnetic field in said second air gap further having a direction such that the force exerted on the side of the coil located in the second air gap is in the same direction as the forces exerted on the sides of the coil located in the first and third air gaps, said magnetic structure comprising

first, second, and third permanent magnets each having a different orientation, and

a core assembly of magnetically permeable materials magnetically connected to said first, second, and third permanent magnets to form first, second, and third magnetic circuits, said first, second, and third magnetic circuits providing magnetic flux for the first, second, and third air gaps, respectively;

means mounting the coil for rotational motion within said magnetic structure about an axis parallel to the second side of the coil; and

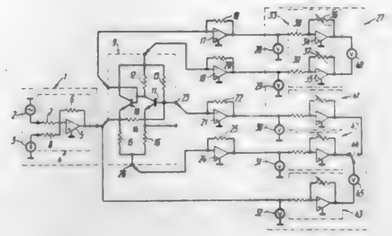
indicator means responsive to coil movement.

4,039,945

DEVICE FOR MEASURING AND CHECKING PARAMETERS OF ELECTRIC CIRCUIT ELEMENTS

Stanislav Vasilievich Ugolnikov, ulitsa Narodnogo Opolchenia, 45, kv. 61; Stanislav Petrovich Kosach, ulitsa Masterovaya, 11, kv. 19; Vladimir Davydovich Kaplun, ulitsa Kutuzova, 1, kv. 30, all of Moscow; Valentin Ivanovich Zhitnik, prospekt Lenina, 44, kv. 26, and Anatoly Yakovlevich Bulgakov, ulitsa Sverdlova, 31, kv. 4, both of Zaporozhie, all of U.S.S.R.

Filed July 21, 1975, Ser. No. 597,889
Int. Cl.² G01R 31/22, 27/00
U.S. Cl. 324—158 R **7 Claims**



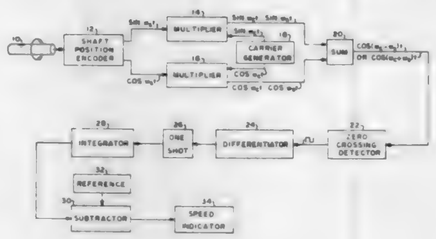
1. A device for measuring and checking the parameters of at least one element of an electric circuit having at least three elements forming a closed loop, said device comprising: a testing signal source having an output for connection to a first lead of a first element being checked; a first operational amplifier with a calibrated element in its feedback circuit and having an input for connection to a second lead of said first element being checked, a common condcutor of the first operational amplifier being connected to a common conductor of said testing signal source; a first group of auxiliary operational amplifiers whose number is equal to the number of the remaining additional leads of said first element being checked, the input of each said auxiliary operational amplifier being intended for connection to the respective additional lead of said first element being checked; at least one auxiliary operational amplifier of a second group, having an input for connection to a first lead of at least one second element of said electric circuit, the second element having a second lead connected to said first lead of said first element being checked; a data processing means having inputs connected respectively to the outputs of all of said operational amplifiers and to the output of said testing signal source.

4,039,946

TACHOMETER

Frank J. Nola, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 18, 1976, Ser. No. 667,928
Int. Cl.² G01P 3/52
U.S. Cl. 324—165 **5 Claims**



1. a tachometer for measuring shaft speed comprising:

transducer means responsive to the angular position of a shaft as rotated through an angle from a reference position for providing a signal representative of the sine of the angle, SIN $w_s t$, and a signal representative of the cosine of this angle, COS $w_s t$;

signal generating means for providing a signal proportional to the sine of the angle of a carrier frequency, SIN$w_c t$, and a signal proportional to the cosine of the angle of said carrier frequency, COS $w_c t$;

first multiplication means responsive to said transducer means and said signal generating means for providing as a product SIN $w_s t$ SIN $w_c t$, and second multiplication means responsive to said transducer means and said signal generating means for providing a product COS $w_s t$ COS $w_c t$;

summing means responsive to the outputs of said first and second multiplication means for providing as an output a signal proportional to COS$(w_c - w_s)$t and, alternately, COS$(w_c + w_s)$t;

pulse means responsive to the output of said summing means for providing as an output fixed-height, fixed width pulses of the frequency of the output of said summing means;

integration means responsive to the output of said pulse means for providing a DC output proportional to shaft speed; and

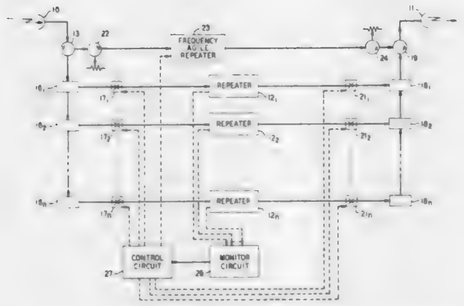
indication means responsive to said integration means for indicating shaft speed.

4,039,947

PROTECTION SWITCHING SYSTEM FOR MICROWAVE RADIO

Hotze Miedema, Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 29, 1976, Ser. No. 700,833
Int. Cl.² H04B 1/60
U.S. Cl. 325—2 **8 Claims**



1. An improved microwave protection switching system of the type that includes:

a receiving antenna;

a transmitting antenna;

a plurality of channel-separating networks connected to said receiving antenna;

a plurality of channel-combining networks connected to said transmitting antenna; and

a corresponding plurality of microwave repeaters respectively interconnecting said channel separating and channel-combining networks, each of said repeaters being tuned to a uniquely assigned pair of transmitting and receiving frequencies, wherein the improvement comprises:

a corresponding plurality of remotely operable input and output shutters respectively associated with the input and output circuits of said microwave repeaters;

a frequency-agile-repeater remotely tunable to any of said pairs of frequencies;

means for connecting said frequency-agile-repeater to said receiving and transmitting antennas;

first means for monitoring the performance of each of said microwave repeaters and for generating a first alarm signal when any one of said repeaters fails or becomes marginal; and

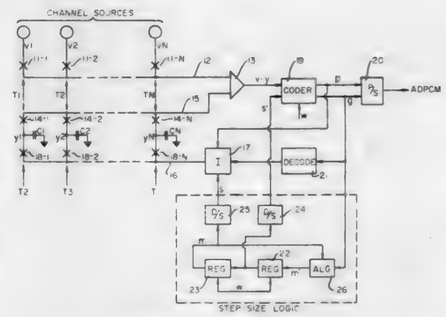
means, responsive to said first alarm signal, for closing the input and output shutters associated with the failed repeater and for simultaneously re-tuning said frequency-agile-repeater to the transmitting and receiving frequencies of said failed repeater, whereby the microwave signal normally repeatered by the failed repeater is repeatered by said frequency-agile-repeater.

4,039,948

MULTI-CHANNEL DIFFERENTIAL PULSE CODE MODULATION SYSTEM

Frank S. Boxall, 380 Eleanor Drive, Woodside, Calif. 94062

Filed June 19, 1974, Ser. No. 480,640
Int. Cl.² H03K 13/22
U.S. Cl. 325—38 B **13 Claims**



1. An n channel differential pulse code modulation system for converting input frames of time division multiplexed signal samples to corresponding output frames of digital words, each input frame containing one signal sample for each of n channels, wherein n is any positive integer other than one, said system comprising means for storing frames of approximating signals, each approximating signal being a quantized approximation to a corresponding signal sample of the preceding input frame, means connected to receive said input frames of time division multiplexed signal samples and said frames of approximating signals and form frames of difference signals, one difference signal for each channel, a single pulse code modulation encoding means connected to receive said frames of difference signals, means for generating and applying to said pulse code modulation encoding means frames of step size control signals, the step size control signal for each channel being determined by its step size control signal in the preceding frame and the number of steps encoded for that channel in the preceding frame, said pulse code modulation encoding means serving to generate output frames of digital words responsive to said frames of step size control signals and said frames of difference signals, each digital word representing the polarity and adapted number of steps of the quantized difference between the signal sample for the (j)th channel of the present frame and the signal approximating the signal of the (j)th channel in the preceding frame, and means responsive to said frames of step size control signals and said frames of digital words for incrementing said means for storing frames of approximating signals, said incrementing means serving to increment the approximating signal of a preceding channel during the time allotted to generating the digital word for the (j)th channel of the present frame.

4,039,949

PULSE CODE MODULATION WITH DYNAMIC RANGE LIMITING

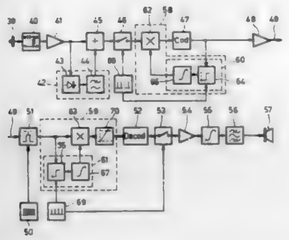
Ludwig Desire Johan Eggermont, and Karel Riemens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,390

Claims priority, application Netherlands, Sept. 10, 1974, 7411988

Int. Cl.[2] H03K *13/22*

U.S. Cl. 325—38 B **5 Claims**



4. A pulse code modulation receiver comprising terminal means for receiving a synamically compressed pulse code modulation signal, a dynamic control signal generator connected to said terminal means and producing dynamic control signals, a multiplier connected to said dynamic control signal generator and to said terminal means for providing a further signal, a decoder connected to said multiplier for decoding said further signal, and an amplitude limiting device connected in the circuit formed by the said dynamic control signal generator, multiplier and decoder and limiting all of the signals passing through said circuit formed by the dynamic control generator, multiplier and decoder.

4,039,950

PULSE CODE TRANSMITTER AND RECEIVER DESIGNED TO PRODUCE UNIFORM TRANSFER CHARACTERISTICS IN THE FACE OF COMPONENT VARIATIONS

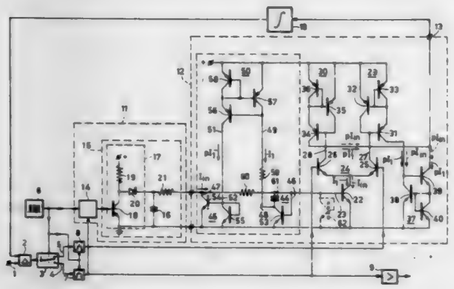
Johannes Wilhelmus Glasbergen, Hilversum, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,576

Claims priority, application Netherlands, Feb. 14, 1975, 7501724

Int. Cl.[2] H04B *1/00*

U.S. Cl. 325—38 B **11 Claims**



1. An arrangement for the transmission of information signals by pulse code modulation comprising a receiver; and a transmitter, the transmitter comprising an input terminal for receving said information signals to be transmitted, a comparison circuit having a first input connected to said input terminal, a quantizing device connected to an output of said comparison circuit, a pulse generator connected to an output of said quantizing device and providing output pulses to said receiver, a dynamic control circuit connected to an output of said pulse generator and providing a dynamic control signal, a modulator having an input receiving said dynamic control signal, a decoder connected to an output of said modulator and having an output connected in a feedback path to the second input of said comparison circuit, a difference amplifier in said modulator, a first controlled current source in said modulator providing current to said difference amplifier, said pulse generator being coupled to first and second inputs of said difference amplifier and alternately providing pulse signals thereto, a second controlled current source circuit in said modulator having a control input connected to a first output of said difference amplifier and an output connected to the output of said modulator, a third controlled current source circuit in said modulator substantially identical to said second controlled current source and having a control input connected to a second output of said difference amplifier, a precision polarity reversing circuit in said modulator connecting an output of said third controlled current source to said modulator output, a fourth controlled current source in said modulator having a control input connected to the input of said modulator, a fifth controlled current source in said modulator having an output connected to the input of said modulator and to a control input of the first controlled current source, and a sixth controlled current source in said modulator having a control input connected to an output of said fouth controlled current source and having an output connected in a feedback path to a control input of the fifth controlled current source.

4,039,951

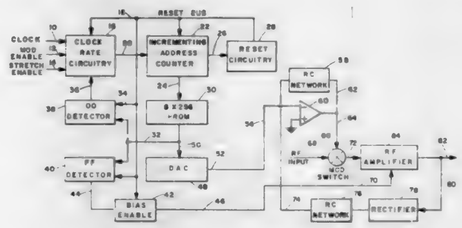
METHOD AND APPARATUS FOR DIGITALLY CONTROLLING AN AMPLITUDE MODULATED PULSE ENVELOPE ON AN RF SIGNAL

Robert L. Bruce; Neil A. Gaughan, and Allan E. Ripingill, all of San Diego, Calif., assignors to Cubic Industrial Corporation, San Diego, Calif.

Filed Mar. 21, 1975, Ser. No. 560,338

Int. Cl.[2] H04B *1/00*

U.S. Cl. 325—38 R **6 Claims**



1. A circuit for digitally controlling the shape of an amplitude modulated pulse envelope on an RF signal comprising:

read only memory means for storing digital values for increments of a given shaped amplitude waveform,

clocking means including an incrementing address counter for accessing said read only memory in response to given clock pulses and clocking out the digital values at a given clock rate,

means for converting said digital values incrementally into an analog waveform having the given shape,

means for amplitude modulating an RF signal with the analog waveform,

detector means responsive to a last sequence output of a series from the read only memory for providing a detector signal,

clock rate means for decreasing the clock rate,

and enable means responsive to the coincidence of an enable signal and the detector signal for enabling the clock rate means to decrease the clock rate of the clocking means in sequence with an output detector signal from the detector, thereby elongating the center shape of the pulse.

4,039,952

DIGITAL FREQUENCY SHIFT-KEYED TRANSMITTER

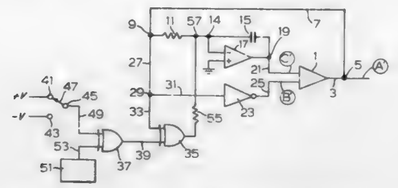
Christopher R. Huntley, Burnaby, Canada, assignor to GTE Lenkurt Electric (Canada) Ltd., Burnaby, Canada

Filed Apr. 10, 1975, Ser. No. 566,876

Claims priority, application Canada, May 9, 1974, 199594

Int. Cl.[2] H04B *1/04*

U.S. Cl. 325—163 **2 Claims**



1. A frequency shift-keyed transmitter comprising:

comparing means having a first input, a second input and an output;

inverting means having an input connected to the output of said comparing means and an output connected to the first input of the comparing means;

a first resistor having one end connected to the output of said comparing means;

an operational amplifier having one input connected to the other end of said first resistor, and the other input connected to a bias potential, and an output connected to the second input of said comparing means;

a capacitor having one end connected to said one input of the operational amplifier and the other end thereof connected to the output of said operational amplifier;

a source of binary data signals;

a second resistor having one end connected to said one input of the operational amplifier; and

gating means connected between said data source and the other end of said second resistor.

4,039,953

AUTOMATIC AERIAL ATTENUATOR

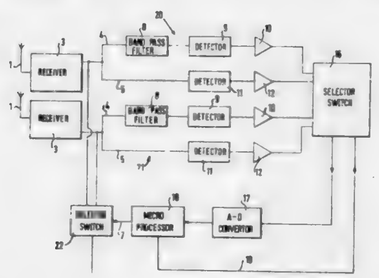
Peter Edward Chadwick, London, England, assignor to Decca Limited, London, England

Filed Nov. 6, 1975, Ser. No. 629,571

Claims priority, application United Kingdom, Nov. 7, 1974, 48171/74

Int. Cl.[2] H04B *1/06*

U.S. Cl. 325—304 **3 Claims**



1. A transmission system receiver including:

an aerial;

an attenuator having an input and an output, the input being connected to the aerial;

a receiver having an input and an output, the receiver input being connected to the output of the attenuator;

a micro-processor having at least one input and having an output connected to the attenuator;

a first signal path extending between the output of the receiver and an input of the micro-processor and including means for measuring the signal power of the input signals of the receiver and means for obtaining a first digital indication of the measured signal power and for feeding the digital indication to the micro-processor; and,

a second signal path extending between the output of the receiver and an input of the micro-processor and including a base band filter for filtering the output of the receiver, means for measuring the signal power of the filtered signal and means for obtaining a second digital indication of the measured filtered signal power; the micro-processor being arranged to obtain an indication of the SINAD ratio (as hereinbefore defined) from the first and second digital indications and to compare the indications of the SINAD ratio with a reference to obtain a control signal for controlling the attenuation of the attenuator.

4,039,954

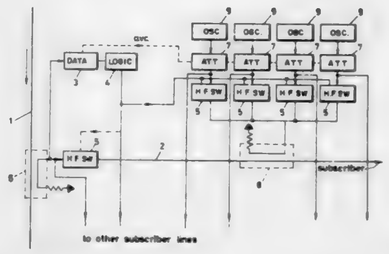
SIGNAL DISTRIBUTION DEVICE FOR A CABLE TELEVISION

Pieter den Toonder, Dordrecht, Netherlands, assignor to Oak Holland B.V., Emmen, Netherlands

Filed May 27, 1975, Ser. No. 581,139

Int. Cl.[2] H04B *1/06*

U.S. Cl. 325—308 **9 Claims**



1. A signal distribution means for use with a cable television network having a supply line in which a plurality of TV programs are transmitted in frequency multiplex to a plurality of subscriber drop lines, said means including a data receiver connected to the supply line, a logic control unit connected to said data receiver, a plurality of high frequency switches controlled by said logic control unit, and a jamming oscillator connected to each high frequency switch, said high frequency switches responding to control signals from said data receiver and logic control unit to provide jamming signals from designated oscillators to said subscriber drop lines to prevent clear reception of designated TV programs.

4,039,955

RECEIVER FOR THE RECEPTION OF SIGNALS TRANSMITTED BY DELTA MODULATION

Ludwig Désiré Johan Eggermont, and Anton Hendrik Wevers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,573

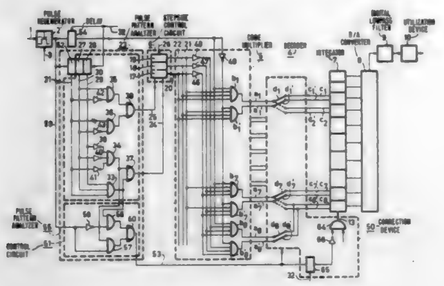
Claims priority, application Netherlands, May 2, 1975, 7501341

Int. Cl.[2] H03K *13/22*

U.S. Cl. 325—321 **12 Claims**

1. A delta modulation receiver comprising means for receiving a pulse pattern of a pulse pattern group Q_K constituted by

an information pulse I_K at an instant t_k and a preceding information pulse I_{K-1} at an instant t_{k-1} and an information pulse I_{K+1} subsequent to the pulse I_K at an instant t_{k+1}, a pulse pattern analyzer means for distinguishing different pulse patterns of the pulse group Q_K from said receiving means and for providing correction signals and control signals corresponding to said different pulse patterns of said pulse group Q_K, a stepsize



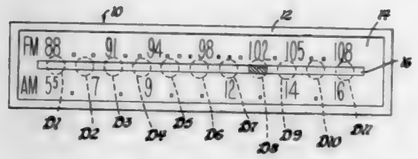
control circuit means responsive to the control signals from said pulse pattern analyzer means and to the received pulse patterns for multiplying the received pulse patterns by different discrete weighting factors corresponding to said control signals, and correction circuit means and connected to said responsive to said correction signals from said pulse stepsize control circuit means pattern analyzer means for modifying the multiplication of said received pulse patterns.

4,039,956

ELECTRONIC INDICATOR

Ronald W. Shimanek, and Mark A. Franklin, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 5, 1975, Ser. No. 610,538
Int. Cl.[2] H03J 3/14; H04B 1/16
U.S. Cl. 325—455 **3 Claims**



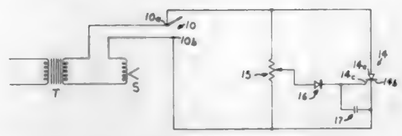
1. An electronic indicator circuit comprising a plurality of parallel connected light emitting diodes, a variable DC voltage source, a source of regulated DC voltage, voltage divider means connecting each of said diodes to said regulated source and establishing a reference voltage at one terminal of each of said diodes, transistor means connected in circuit with respective ones of said diodes and responsive to the voltage established at said terminal and to said variable DC voltage source for continuously varying the current through each of said diodes over a range from a minimum to a maximum level in sequence as said variable DC voltage source is varied over a predetermined voltage range whereby each diode is successively activated and previously energized diodes remain activated.

4,039,957

SIGNAL ACTIVATED EMERGENCY ALARM DEVICE

Marvin E. Jennings, decreased, late of Topeka, Kans., by (Dorothy Jennings, administratrix), assignor to Universal Industries, Inc., Topeka, Kans.

Continuation of Ser. No. 389,693, Aug. 20, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 664,814
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—466 **7 Claims**



1. In combination with a radio receiver having an audio output system including a speaker, wherein said receiver when tuned to an emergency broadcast will receive a carrier wave heavily modulated with a sustained audio signal, a signal activated alarm circuit comprising:

a silicon controlled rectifier having anode and cathode connections between which current flow is normally interrupted, and also having a gate responsive to applied excitation for closing the cathode-anode circuit to establish electrical continuity between said connections;

circuit means coupling said connections in series with said speaker, and including a two position switch connected in said audio output system and having a first position permitting normal operation of said speaker and a second position rendering said speaker responsive to operation of said rectifier; and

control means connected with said audio output system for receiving signals present in said system when said switch is in its second position, said control means including signal responsive means operably associated with said gate for delivering excitation to the gate derived from said signals present in said system, and a capacitor coupled between said gate and said cathode,

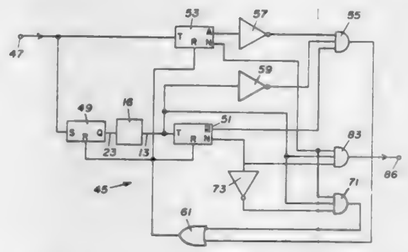
said control means delivering excitation to said gate sufficient to close said cathode-anode circuit and operate said speaker only in response to said sustained audio signal in said audio output system of at least a predetermined duration which was present as heavy modulation on the received carrier wave of said emergency broadcast.

4,039,958

CIRCUITS FOR DECODING PULSE SIGNALS

Paul C. Krueger, Wharton, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 682,882, May 3, 1976. This application Jan. 3, 1977, Ser. No. 756,519
Int. Cl.[2] H03K 13/00, 5/20
U.S. Cl. 328—119 **10 Claims**



1. A decoding circuit comprising:

gated pulse oscillator circuit means responsive to a voltage input to generate a pulse train starting with a first pulse having a given width determined by the electrical characteristics of the oscillator circuit means;

an input terminal for receiving a signal pulse train for comparison with said generated pulse train;

a flip-flop having a SET input, a RESET input, and an output; said SET input being connected to said input terminal, and said output being connected to the input of said oscillator circuit means;

two similar binary counters each including a pulse input, a RESET input, a counting output, and means for producing a logical "1" at its output at the first negative excursion of the pulse train, the pulse input of one of said counters being connected to the output of said oscillator circuit means; and the pulse input of the other counter being connected to said input terminal;

an electronic gate having three inputs and one output; two of said gate inputs being connected, respectively, in opposite phase to the outputs of said counters; said gate output being connected to the three RESET inputs of said flip-flop and said two counters; and

means connecting said oscillator circuit means output to the third input of said gate;

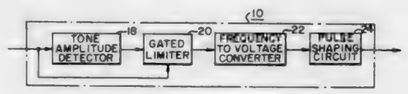
whereby said gate can be activated only by different counter outputs; produced by signal and generated first pulses of unequal width.

4,039,959

TWO-TONE DECODER HAVING HIGH NOISE IMMUNITY

Tamas I. Pattantyus-Abraham, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 31, 1975, Ser. No. 600,557
Int. Cl.[2] H03K 9/06, 13/24
U.S. Cl. 328—133 **8 Claims**



1. A decoder for receiving a two-tone input signal having first and second frequencies representative of binary coded intelligence and converting said intelligence into a correspondingly coded binary output signal, said decoder comprising:

limiting means for producing a squarewave signal responsive to the input signal, said squarewave signal having a constant peak-to-peak amplitude and first and second frequencies which are the same as the first and second frequencies of the input signal tones;

integrating circuit means receiving said squarewave signal and producing an integrated signal responsive to the integral of each cycle of the squarewave signal at said first and second frequencies;

offsetting circuit means for offsetting the average value references axes of the squarewave signal and of the integrated signal with respect to each other by a predetermined amount such that said integrated signal is less positive than said squarewave signal for different portions of each complete cycle of said squarewave signal when the signals change between said first and second frequencies;

means for comparing the amplitudes of the integrated signal relative to the amplitudes of the squarewave signal during each cycle thereof, said comparing means producing a rectangular pulse signal having a substantially constant amplitude between first and second levels produced when said integrated signal is more and less positive, respectively, than said squarewave signal, said rectangular pulse signal having the same two repetition rates as the squarewave signal at said first and second frequencies;

low pass filter means for filtering the rectangular pulse signal to produce a filtered signal having varying amplitudes responsive to changes in the average values of the rectangular pulse signal when occurring at the two repetition rates; and

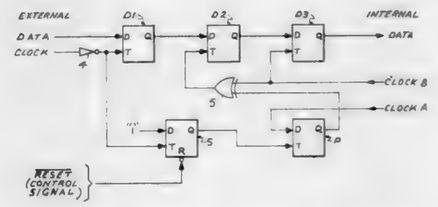
pulse shaping means for producing a binary output signal having first and second voltage levels responsive to the filtered signal varying amplitudes occurring with changes between the two repetition rates of said rectangular pulse signal.

4,039,960

AUTOMATIC PHASING CIRCUIT TO TRANSFER DIGITAL DATA FROM AN EXTERNAL INTERFACE CIRCUIT TO AN INTERNAL INTERFACE CIRCUIT

James Monroe Clark, Cedar Grove, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed June 29, 1976, Ser. No. 700,932
Int. Cl.[2] H03B 3/04; H03K 5/18, 19/08
U.S. Cl. 328—155 **6 Claims**



1. An automatic phasing circuit interconnected between an external interface circuit and an internal interface circuit to transfer digital data from said external interface circuit to said internal interface circuit with no bit errors and no violation of bit count integrity, said digital data in said external interface circuit being related to an external clock having a given frequency and a given phase and said digital data in said internal interface circuit being related to an internal clock having a frequency equal to said given frequency and a phase that is different than said given phase, said phasing circuit comprising:

a data input from said external interface circuit;

a first clock input for said external clock;

a data output to said internal interface circuit;

at least a second clock input for said internal clock;

at least first and second D-type flip flops, said first flip flop having its D input coupled to said data input and its Q output coupled to the D input of said second flip flop and said second flip flop having its Q output coupled to said data output; and

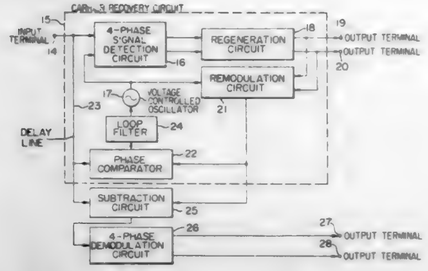
logic circuitry having a first input coupled to a seclected one of said first clock input and said data input, a second input coupled to said second clock input and an output coupled to the clock input of said first flip flop to select one of said internal clock and an inverted version of said internal clock as the clock for said first flip flop to provide said digital data transfer with no bit errors and no violation of bit count integrity.

4,039,961

DEMODULATOR FOR COMBINED DIGITAL AMPLITUDE AND PHASE KEYED MODULATION SIGNALS

Hideki Ishio; Seizo Seki, both of Yokosuka, and Kazuhiro Miyauchi, Tokyo, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo, Japan

Filed Sept. 8, 1975, Ser. No. 611,545
Claims priority, application Japan, Sept. 12, 1974, 49-105607; May 28, 1975, 50-63031
Int. Cl.[2] H03D *3/00, 5/00;* **H04L** *27/22*
U.S. Cl. 329—50 **7 Claims**



1. A digital carrier signal demodulation circuit comprising

A. a carrier recovery circuit comprising

a. a four-phase signal detection circuit means for detecting a received input signal with a reference carrier,

b. a regeneration circuit responsive to the detected received input signal for regenerating base band pulses of a first path signal in said received input signal,

c. remodulation circuit means for remodulating said reference carrier with said regenerated base band pulses, thereby regenerating said first path signal,

d. a phase comparator means for comparing the phase of said first path signal with that of the received input signal, and

e. a voltage-controlled oscillator means for providing said reference carrier phase locked to the output from said phase comparator; and

B. a demodulation circuit means for regenerating base band pulses of a second path signal from said first path signal and said received input signal.

4,039,962

SYSTEM FOR AMPLIFYING LASER BEAMS

John Leonard Hughes, 34 Nungara Place, Aranda, Australian Capital Territory, Australia

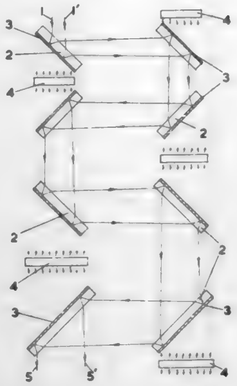
Continuation-in-part of Ser. No. 493,570, Aug. 1, 1974. This application May 14, 1976, Ser. No. 686,473
Int. Cl.[2] H01S *3/00*
U.S. Cl. 330—4.3 **8 Claims**

1. A uni-directional laser amplifier system utilizing a diverged, high quality beam composed of either a single, unstructured pulse, or a train of such pulses, amplified to a very high power level over a long, folded amplification path, emerging via a large, elliptical cross-section aperture, the system consisting of:

a. two, well spaced rows of amplifying segments of elliptical and progressively increasing cross-sectional area each segment possessing two optically polished, flat end surfaces with the front surface of each segment being anti-reflection coated and its rear surface having either a mirror deposited on it which reflects the laser beam 100%, or having the mirror attached to it and/or separated from the rear surface of the segment by at least half the length of the laser pulse to be amplified so that no pulse overlap occurs in the amplifying medium;

b. Each segment orientated at an angle of approximately 45° to the length of its row and at an angle of about 90° to the segment which follows in the same row so that any pair of segments in the row with their front faces facing each other will reflect the diverged beam traversing the amplifier through a total angle of about 180° the beam traversing each segment twice during this process so that it emerges travelling approximately parallel to its path of incident but in the opposite direction and displaced by at least its own diameter in such a manner that it can traverse all remaining segments of the amplifier system;

c. Optical excitation sources positioned along each row of segments, matching their respective parameters in both



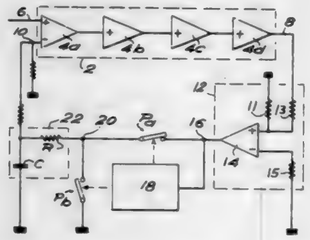
size and power and separated from each other along a row of segments by a pair of segments which turn the beam through the 180° angle, excitation radiation from each output surface of the source except those facing input and output segments, traverse both segments in such a manner that one end of each segment is excited before the other due to the fact that the excitation sources and the segments are orientated with respect to each other by an angle of approximately 45°.

4,039,963

STABILIZER FOR THE BASE LEVEL OF AN AMPLIFIER

Henri Georges Guillon, Orsay, and Kamal Labib Henein, Evry, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 1, 1976, Ser. No. 662,541
Claims priority, application France, Mar. 4, 1975, 75.06747
Int. Cl.[2] H03F *1/02*
U.S. Cl. 330—9 **5 Claims**



1. A device for stabilizing the base level of an amplifier having a number of amplifying stages connected in succession, wherein said device comprises, in series between the output of the final amplifying stage and the input of one of the preceding amplifying stages, an amplification assembly whose output is coupled with the input of an integrating circuit by means of a first controlled switch, the output of said integrating circuit being coupled with said input of one of the preceding amplifying stages in a manner such as to be subtracted from the input

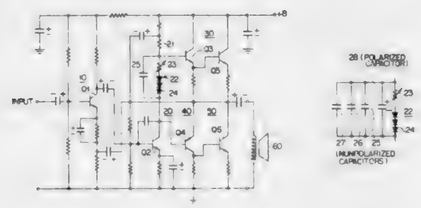
signal of said amplifier and further comprises a second switch which is connected between the input of said integrating circuit and ground and a logical detection circuit provided with one input and two outputs, said input being connected to the output of said amplification assembly, a first of said two outputs being connected to the controlled input of the first switch and the second of said two outputs being connected to the control input of the second switch, said logical circuit including means for applying a switch-opening signal to said first output and a switch-closing signal to the second output when the signal applied to its input is a pulse having a rate of potential variation exceeding a predetermined variation rate, regardless of the polarity of variation, and means for applying a switch-closing signal to the first output and a switch-opening signal to the second output when the signal applied to the input of said circuit produces potential variations not exceeding said predetermined variation rate or a steady potential.

4,039,964

AUDIO FREQUENCY TRANSISTOR AMPLIFIER

Kazuo Ishii, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 20, 1976, Ser. No. 678,550
Int. Cl.[2] H03F *3/18, 3/183*
U.S. Cl. 330—13 **9 Claims**



1. A transistor amplifier for amplifying audio frequency signals comprising:

a complementary push-pull output amplifier circuit including a pair of complementary transistors which may be coupled to a load;

a driver amplifier circuit including a load resistor for developing an output signal to drive alternately said pair of complementary transistors,

a bias circuit coupled in series to said load resistor and having at least one nonlinear semiconductor passive circuit element for providing a predetermined DC potential difference between input electrodes of said pair of complementary transistors, said nonlinear semiconductor passive circuit element generating undesirable harmonics of said audio frequency signals whereby the audio fidelity of said transistor amplifier is reduced; and,

a plurality of capacitors having successively smaller values of capacitance, each coupled in parallel to one another and to said nonlinear seimconductor passive circuit element in said bias circuit for short circuiting successively higher frequency harmonics generated by said nonlinear semiconductor passive circuit element thereby enhancing the fidelity of said transistor amplifier.

4,039,965

AUDIO FREQUENCY TRANSISTOR AMPLIFIER

Kazuo Ishii, Tokyo, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

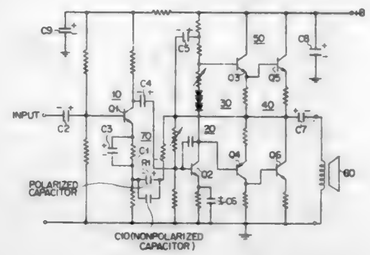
Filed Apr. 20, 1976, Ser. No. 678,554
Int. Cl.[2] H03F *3/18, 3/183*
U.S. Cl. 330—13 **10 Claims**

1. A transistor amplifier for amplifying audio frequency signals comprising:

an output amplifier circuit to be coupled to a load,

a preceding stage amplifier circuit coupled to the input of said output amplifier circuit,

a negative feedback circuit including a DC blocking electrolytic capacitor having input and output terminals coupled between said output amplifier circuit and said preceding stage amplifier circuit, said electrolytic capacitor generating undesirable harmonics of said audio frequency signals



whereby the audio fidelity of said transistor amplifier is reduced; and,

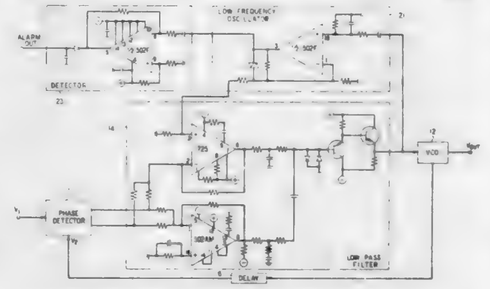
a first nonpolarized capacitor connected directly between said input and output terminals in parallel with said electrolytic capacitor for short circuiting said undesirable harmonics and enhancing the fidelity of said transistor amplifier.

4,039,966

PHASE-LOCK LOOP CIRCUIT

Mitchell Allen Skinner, Seabrook, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1976, Ser. No. 673,130
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—4 **2 Claims**



1. A phase-lock loop circuit which comprises:

a voltage-controlled oscillator having at least one output and a control input;

a phase-comparison circuit having first and second inputs and a pair of complementary outputs, an incoming signal being applied to said first input and said at least one output of said voltage-controlled oscillator being applied to said second input; and

an active, low-pass filter interconnecting the complementary outputs of said phase-comparison circuit and the control input of said voltage-controlled oscillator to limit the bandwidth of said phase-lock loop, said filter comprising:

a first operational amplifier having inverting and non-inverting inputs and an output;

a second operational amplifier having inverting and non-inverting inputs and an output, the inverting inputs of said first and second amplifiers being connected to the complementary outputs of said phase detector;

a first amplifier having an output connected to the input of said voltage-controlled oscillator and an input con-

nected to the outputs of said first and second operational amplifiers; and

first and second filter sections respectively interposed between the outputs of said first and second operational amplifiers and the input of said first amplifier, said phase-lock loop further comprising:

a low-frequency oscillator for modulating said voltage-controlled oscillator so that the frequency of the output signal therefrom sweeps through the frequency of said incoming signal whereupon said circuit achieves lock, said low-frequency oscillator including a third operational amplifier having a non-inverting input connected to the control input of said voltage-controlled oscillator, the inverting input and the output thereof being connected to the non-inverting input of said first operational amplifier.

4,039,967

PHASE-LOCKED LOOP HAVING A SLIGHT PHASE OFFSET ERROR

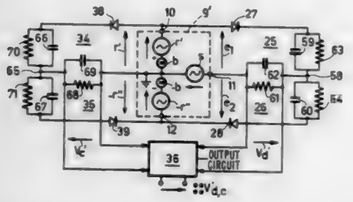
Engel Roza, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 12, 1976, Ser. No. 657,558

Claims priority, application Netherlands, Feb. 18, 1975, 7501871

Int. Cl.[2] H03B *3/04*

U.S. Cl. 331—11 **1 Claim**



1. A phase-locked loop comprising

a voltage-controlled reference circuit having a natural frequency;

a phase comparator for producing an output voltage in response to a difference in phase between an input signal and a reference signal derived from said reference circuit;

a loop filter connected to said phase comparator for applying said output voltage to said reference circuit for controlling said natural frequency;

said phase comparator including an input circuit for combining said reference signal with said input signal to form a first composite signal and for combining said reference signal in the opposite phase with said input signal to form a second composite signal;

first and second diode peak detectors connected in a balanced manner and producing first and second detection currents respectively in response to said first and said second composite signals respectively;

said first and second diode peak detectors jointly producing a detection voltage porportional to the difference between said first and said second detection current;

third and fourth diode peak detectors connected ir a balanced manner and producing third and fourth detection currents respectively in response to said reference signal and said reference signal in the opposite phase, respectively;

said third and fourth diode peak detectors jointly producing a compensation voltage proportional to the difference between said third and said fourth proportional to the difference between said third and said fourth detection current; and

said phase comparator also including an output circuit for differentially combining said detection voltage with said compensation voltage so as to produce said phase comparator output voltage substantially freee from offset voltages.

4,039,968

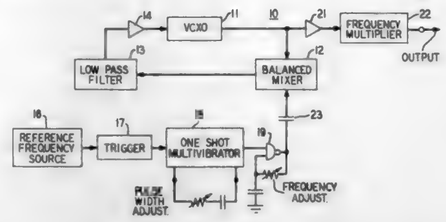
SYNCHRONIZING CIRCUIT

MacLellan Emshwiller, Andover, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1976, Ser. No. 685,340

Int. Cl.[2] H03B *3/08*

U.S. Cl. 331—19 **2 Claims**



1. Apparatus for synchronizing an oscillator with a reference signal of known frequency, which comprises:

a voltage-controlled oscillator having a free-running output frequency which is close to a desired output frequency;

a trigger circuit, connected to said reference signal source, for generating a square wave signal in phase-synchronism with said reference signal;

a one-shot multivibrator, connected to and triggered by said trigger circuit, for generating a train of pulses in phase-synchronism with said square wave signal, said pulse train having a predetermined duty cycle;

a burst oscillator periodically enabled by the pulse train from said one-shot multivibrator, said burst oscillator having a predetermined output frequency and a comb-like frequency spectrum comprising discrete harmonics of said reference signal;

means, operatively associated with said generating means, for altering the envelope of said comb-like frequency spectrum such that the particular reference frequency harmonic contained therein which has the same frequency as the desired output frequency has a non-zero amplitude, said envelope altering means comprising:

means for adjusting the duty cycle of the pulse train from said one-shot multivibrator; and

means for adjusting the output frequency of said burst oscillator, said apparatus further comprising:

means, connected to said voltage-controlled oscillator and to said burst oscillator for causing said free-running frequency to coincide with the frequency of said particular reference frequency harmonic.

4,039,969

QUARTZ THERMOMETER

Jean-Claude Martin, Neuchatel, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Jan. 2, 1976, Ser. No. 646,048

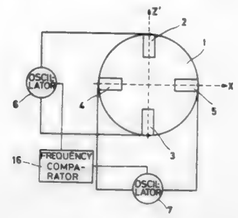
Claims priority, application Switzerland, Jan. 9, 1975, 211/75

Int. Cl.[2] H03B *25/00, 5/32*

U.S. Cl. 331—40 **8 Claims**

1. A quartz crystal thermometer comprising a single quartz element having at least a first and a second pair of electrodes and vibrating simultaneously in two different modes which are not mechanically coupled with each other and which correspond to two different frequencies of vibration, each of said first and second pairs of electrodes being arranged for providing high piezoelectric coupling with one corresponding mode of the said two modes of vibration and for providing no piezoelectric coupling with the other mode, one of the said two

frequencies of vibration being a standard frequency and the other being dependent on the temperature of the quartz crystal, the thermometer further comprising a first and a second oscillator circuit respectively connected to the said first and



second pairs of electrodes, and a frequency comparison device for comparing the oscillation frequencies of the first and second oscillator circuits and providing an output which is a measure of the detected temperature.

4,039,970

SOLID STATE LASER DEVICE WITH LIGHT FILTER

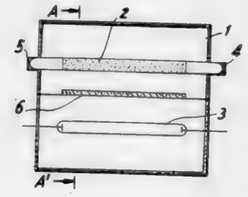
Ken-ichi Shiroki; Katsumi Mori; Yasuhiko Kuwano, and Seiichi Saito, all of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Continuation of Ser. No. 452,523, March 19, 1974, abandoned. This application Nov. 12, 1975, Ser. No. 631,218

Claims priority, application Japan, Mar. 23, 1973, 48-33787

Int. Cl.[2] H01S *3/092*

U.S. Cl. 331—94.5 F **6 Claims**



1. An improved laser device comprising a solid state laser element consisting of a yttrium aluminate crystal having a pumping band defined by predetermined lower and upper wavelengths, a source of pumping light, and a light filter means for intercepting and removing pumping light components having wavelengths below about 5,000A at least some of which are above the lower wavelength limit of the pumping band, the filter means being disposed between the laser element and the light source, whereby the removal of higher frequency components of the pumping light results in a lower oscillation threshhold and increased laser output.

4,039,971

FAST DISCHARGE, HIGH POWER, ELECTRIC DISCHARGE PUMPED GAS LASER

Charles P. Wang, Rancho Palos Verdes, and Owen L. Gibb, Redondo Beach, both of Calif., assignors to The Aerospace Corporation, El Segundo, Calif.

Filed May 4, 1976, Ser. No. 682,929

Int. Cl.[2] H01S *3/097*

U.S. Cl. 331—94.5 PE **6 Claims**

1. Apparatus for imparting a high-energy, high pulse rate, electric discharge into a body of gas for producing laser action, comprising:

a pair of substantially planar charging conductor plates, each of said pair of plates having one edge thereof conductively connected to an elongated electrode, the electrode of one plate positioned in confronting spaced apart relation with respect to the electrode of the other plate and defining a discharge gap therebetween,

an elongated sealed chamber forming a laser cavity about the discharge gap;

grounded conductor plate means lying in close parallel relation with at least one side of each of said first pair of plates;

sheet dielectric means interposed between the grounded plate means and said first pair of plates whereby to form a pair of plate condensors;

a sealed housing formed about said plate condensor and

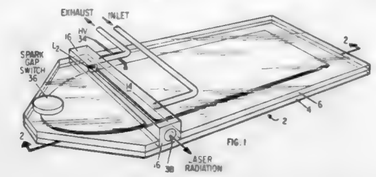


FIG. 1

having interior walls for pressuring the grounded plate and the first pair of plates against the sheet dielectric;

means for evacuating sealed housing whereby to create an internal-external pressure differential uniformly urging the interior walls against the plate condensors;

means for charging the plate condensor;

means for discharging one plate condensor whereby to induce the discharge of the other plate condensor across the gap between the electrodes; and,

a gaseous medium within the laser cavity absorbing the energy of the discharge across the electrode gap whereby to produce laser action.

4,039,972

CRYSTAL CONTROLLED LOGIC GATE CLOCK PULSE GENERATOR

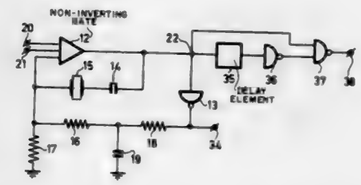
Rudy Dirk Anthonie Scholten, and Antonius Gerardus Visser, both of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,369

Claims priority, application Netherlands, Feb. 21, 1975, 7502054

Int. Cl.[2] H03B *5/36*

U.S. Cl. 331—108 D **7 Claims**



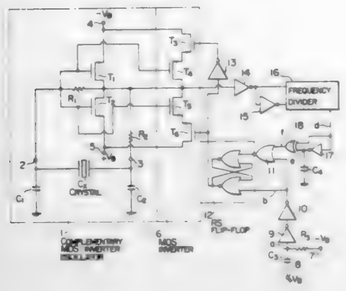
1. A device for the self-triggered generation of a series of cyclically recurring clock pulses, comprising a non-inverting logic gate, a piezoelectric oscillator element having one lead connected to an input and the other lead coupled to the output of the non-inverting gate, and a feedback loop connected between the output and the input of said non-inverting gate, said loop including a series combination of an inverting gate, an integrating network and means for setting the switching voltage of said non-inverting gate.

4,039,973

INITIATION CIRCUIT IN A CRYSTAL-CONTROLLED OSCILLATOR

Osamu Yamashiro, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 15, 1976, Ser. No. 677,065
Claims priority, application Japan, Apr. 21, 1975, 50-47547
Int. Cl.² H03B *5/36*
U.S. Cl. 331—116 R **5 Claims**



1. In an oscillation circuit having a metal-insulator semiconductor (MIS) inverter connected with a crystal in a feed-back circuit, an oscillation initiating circuit comprising:

another MIS inverter disconnected from the former MIS inverter during nomal oscillation; and

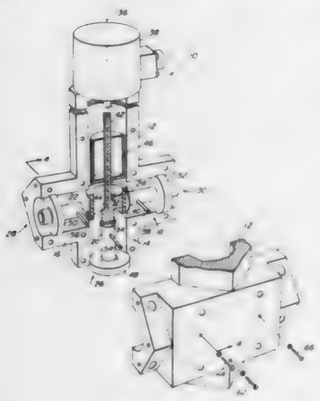
means for connecting said another MIS inverter in parallel with the former MIS inverter at the time of initiating oscillation.

4,039,974

COAXIAL RADIO FREQUENCY SWITCH HAVING INTEGRAL FILTER

Neill V. Clark, Sunnyvale, and Homer G. Holzgrafe, Santa Barbara, both of Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Sept. 4, 1975, Ser. No. 610,367
Int. Cl.² H01P *1/12*
U.S. Cl. 333—7 R **5 Claims**



1. A coaxial transmission line switch comprising:

a. a housing for such switch;

b. an input coaxial transmission line;

c. a plurality of output coaxial transmission lines, such housing providing outer conductors for the input coaxial transmission line and the plurality of output coaxial transmission lines;

d. a radio frequency filter, comprising:

a plurality of radio frequency stubs having first ends thereof connected to center conductors of the input coaxial transmission line and the plurality of output coaxial transmission lines;

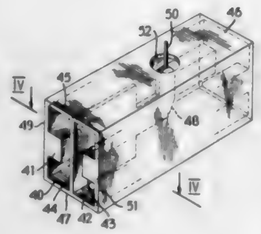
and a rotatable coupling element, disposed in the housing, reactively coupled between the input coaxial transmission line and a selected one of a plurality of output coaxial transmission lines, such filter being formed integrally with the switch to filter signals fed to the input coaxial transmission line and coupled to the selected one of the plurality of output coaxial transmission lines.

4,039,975

E PLANE FOLDED HYBRID WITH COAXIAL DIFFERENCE PORT

Thomas R. Debski, Bethpage, N.Y., assignor to Sedco Systems, Incorporated, Melville, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,386
Int. Cl.² H01P *5/20*
U.S. Cl. 333—11 **6 Claims**



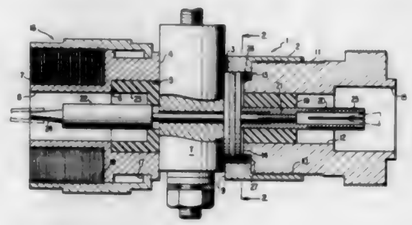
1. An E-plane folded hybrid comprising a double ridge waveguide, a first end of said waveguide forming an input port, an H-plane bifurcation extending partially into said waveguide from a second end, said bifurcation forming first and second single ridge waveguide colinear ports, each having an internal cross-section corresponding to half the cross-section of said double ridge waveguide, a coaxial difference port formed in the E-plane wall of said waveguide and having an outer conductor connected to said waveguide wall and an inner conductor connected to said bifurcation.

4,039,976

COAXIAL CURRENT PROBE

Rudolph J. Prochazka, Springfield, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,738
Int. Cl.² H01P *5/02, 5/08;* **G01R** *21/12, 29/08*
U.S. Cl. 333—24 R **8 Claims**



1. A coupling probe for coaxial conductors including

a. a coupling body having

b. coupling means for coupling with a coaxial conductor,

c. a bore in said coupling body,

d. a central conductor in said bore,

e. an annular conductor surrounding said central conductor and spaced therefrom to form

f. a chamber,

g. a passive load member positioned in said chamber and in communication between said central and annular conductors,

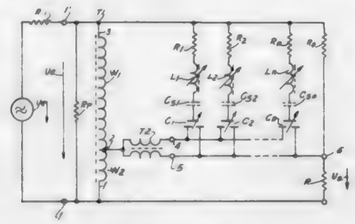
h. and transformer means surrounding and spaced from said central conductor and in communication with said annular conductor.

4,039,977

ADJUSTABLE COMPENSATING CIRCUIT HAVING DIFFERENTIAL CAPACITOR IN EACH TUNABLE STAGE

Hans-Joachim Schmidt, Nurnberg, Germany, assignor to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH, Nuremberg, Germany

Filed July 19, 1976, Ser. No. 706,838
Claims priority, application Germany, July 26, 1975, 2533553
Int. Cl.² H03H *7/16*
U.S. Cl. 333—28 R **9 Claims**



1. A compensating circuit, comprising, in combination, input terminals for connection to a signal source; an output impedance; input transformer means connecting the input terminals to the output impedance for applying to the latter a voltage derived from the signal applied to the input terminals; a plurality of tunable circuit stages each operable for introducing an accentuation or deaccentuation into a respective portion of the frequency response curve of the compensating circuit, each tunable stage including a differential capacitor having a rotor terminal, a first stator terminal and a second stator terminal, each tunable stage furthermore including a resistor and an inductor connected in series with each other and to the rotor terminal of the differential capacitor of the stage; differential transformer means comprised of first and second winding means respectively connected to the first and second stator terminals and connected to the output impedance for applying thereto a supplemental voltage derived from the voltage induced across the differential transformer means and dependent upon the settings of the differential capacitor.

4,039,978

LOGIC CONTROLLED CHARGE TRANSFER DEVICE TRANSVERSAL FILTER EMPLOYING SIMPLE WEIGHTING

Lawrence Griffith Heller, Brewster, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

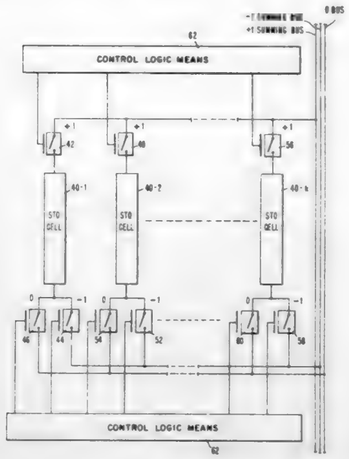
Filed Apr. 12, 1976, Ser. No. 676,037
Int. Cl.² H03H *7/28;* **G11C** *11/40;* **H03K** *25/02;* **H03H** *7/14*
U.S. Cl. 333—70 T **7 Claims**

1. A transversal filter comprising;

a time sampled analog input signal including pluralities of sampled signal values,

a charge redistribution means responsive to said sampled signal values in each of said input signal pluralities for dividing said sampled signal values into a separate sequence of n electrical charge packets of decreasing selected discrete fractional amounts for each one of said plurality of said sampled signal values,

weighting means connected to said charge redistribution dividing means for applying positive or negative weighting values to selected ones of said fractional signal amounts in each of said sequences,



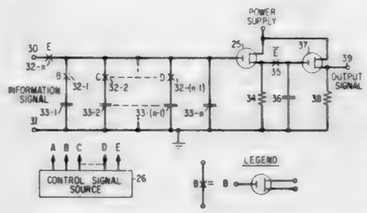
and means connected to said weighting means for combining said weighted fractional signal amounts to produce an output signal which is representative of the said input signal modified by a filter transfer function.

4,039,979

REDUCTION OF ALIASING DISTORTION IN SAMPLED SIGNALS

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 18, 1975, Ser. No. 588,012
Int. Cl.² H03H *7/14, 7/10, 7/28;* **H03K** *17/00*
U.S. Cl. 333—70 A **16 Claims**



1. The method of generating, at rate *f*, pulse amplitude modulation (PAM) samples corresponding to a continuous wave signal and reducing aliasing distortion, said signal having a highest frequency of interest not exceeding *f*/2, comprising the steps of:

sampling said signal *nf* times per second where *n* is an integer greater than 1, and

combining the *n* most recently taken samples *f* times per second to produce by each of such sample combinations one of the PAM samples.

4,039,980

VOLTAGE-CONTROLLED FILTER

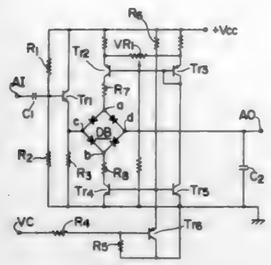
Yasuo Nagahama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed July 29, 1975, Ser. No. 600,086

Claims priority, application Japan, July 30, 1974, 49-87710; July 30, 1974, 49-87711

Int. Cl.[2] H03H *7/04, 13/00*

U.S. Cl. 333—70 R **3 Claims**



1. A voltage controlled filter comprising:

a variable current circuit for supplying current of a value which is determined in proportion to the exponential function of a control voltage;

an equivalent impedance circuit including diodes connected in the form of a bridge in a forward direction from one terminal of a first pair of opposing terminals to another terminal and providing an equivalent impedance determined by the value of said current flowing through said diode at a second pair of opposing terminals, a signal to be filtered being applied to one terminal of said second pair of opposing terminals; and

a capacitor element connected to another terminal of said second pair of opposing terminals whereby the filtering frequency region is variably controlled in response to the magnitude of said control voltage.

4,039,981

VARIABLE IMPEDANCE CIRCUIT

Shin-ichi Ohashi, Toyokawa, and Akihiro Asada, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 1, 1976, Ser. No. 672,676

Claims priority, application Japan, Apr. 4, 1975, 50-40334

Int. Cl.[2] H03J *3/20;* **H03H** *5/12, 11/00*

U.S. Cl. 334—14 **10 Claims**

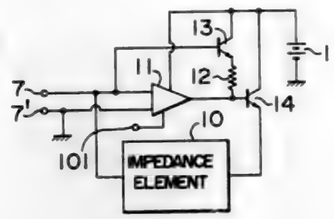
1. A variable impedance circuit with an impedance variable in response to a control signal comprising:

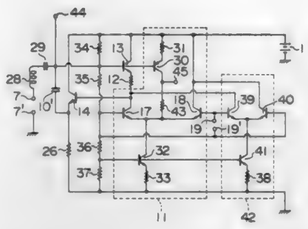
an amplifier circuit for delivering an output current signal having a magnitude proportional to a voltage of an input signal irrespectively of a magnitude of a load, said amplifier circuit having mutual conductance between input and output terminals thereof controlled by said control signal;

means for adding a signal voltage developing across the load due to the output current signal of said amplifier circuit to said input signal voltage; and

an impedance element connected between an output terminal of said adder means and the input terminal of said amplifier circuit,

whereby an impedance as viewed from the input side to





which said input signal is applied is controlled by said control signal.

4,039,982

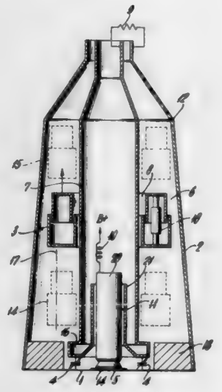
COAXIAL CAVITY RADIO FREQUENCY TUNING CIRCUIT HAVING A TOROIDAL-SHAPED ELECTRODE TO EFFECT TUNING

James O. Weldon, Dallas, Tex., assignor to Continental Electronics Manufacturing Company, Dallas, Tex.

Continuation of Ser. No. 519,963, Nov. 1, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,236

Int. Cl.[2] H03J *3/00*

U.S. Cl. 334—45 **11 Claims**



1. A tunable coaxial cavity structure comprising an outer electrode providing a casing and being tapered substantially throughout its length an inner electrode arranged coaxially within said tapered portion; a toroid shaped electrode arranged coaxially about said inner electrode and defining a first annular space, with said inner electrode, to provide capacitive coupling between the toroid shaped electrode and said inner electrode, said toroid shaped electrode defining, with said outer electrode, a second annular space to provide capacitive coupling between the toroid shaped electrode and said outer electrode, said toroid shaped electrode being electrically insulated from said inner and outer electrodes, said toroid shaped electrode being axially movable with respect to said inner and outer electrodes to adjust the resonant frequency of said cavity structure by providing adjustment of the effective inductance of said inner electrode with respect to one end of said inner electrode and adjustment of said capacitive coupling between said outer electrode and said toroid shaped electrode, means applying high frequency signals to said one end of said inner electrode, and a load connected to the other end of said inner electrode.

4,039,983

HIGH-SPEED HIGH-CURRENT CIRCUIT INTERRUPTER HAVING ELECTRODYNAMICALLY OPERATED ARCING CONTACTS

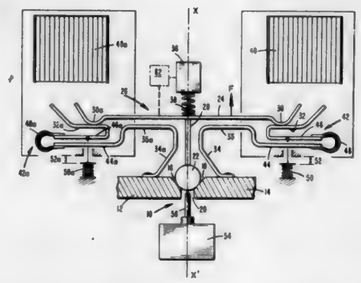
Claude Terracol, Eybens, and Pierre Schueller, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Aug. 16, 1976, Ser. No. 714,665

Claims priority, application France, Aug. 26, 1975, 75.26466; Jan. 26, 1976, 76.02086; Jan. 26, 1976, 76.02085

Int. Cl.[2] H01H *77/10*

U.S. Cl. 335—16 **4 Claims**



1. A high-current circuit interrupter comprising:

an electrical main circuit;

an electrical auxiliary circuit connected in parallel with said main circuit and having a higher electric resistance than said main circuit;

separable main contact means inserted in said main circuit and having a movable main contact member;

separable arcing contact means inserted in said auxiliary circuit and having a movable arcing contact member in driving connection with said movable main contact member;

elastic means urging said movable contact members resiliently towards the closed-circuit position thereof;

impetus means having a trigger member adapted to mechanically operate said movable main contact member strikingly at the appearance of a short-circuit current flowing through said circuit interrupter to separate said main contact means against the action of said elastic means and transfer said current to said auxiliary circuit;

said auxiliary circuit comprising first electrodynamic means, said first electrodynamic means tending to keep said arcing contact means in the closed-circuit position thereof under the action of said current; and

second electrodynamic means urging said arcing contact means towards the open-circuit position thereof under the action of said current;

said first and second electrodynamic means being adapted to cause said arcing contacts to remain in the closed-circuit position thereof a short lapse of time after the transfer of said current to said auxiliary circuit and to sequentially separate, thereby to draw an arc therebetween.

4,039,984

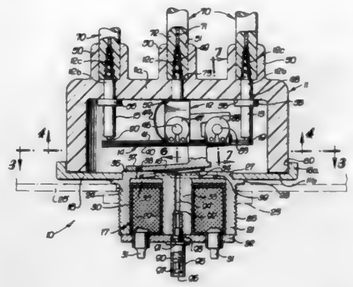
PRESSURIZED RELAY ASSEMBLY

Victor E. DeLucia, Santa Monica, and Philip B. Nosser, Los Olivos, both of Calif., assignors to Torr Laboratories, Inc., Van Nuys, Calif.

Filed Mar. 11, 1976, Ser. No. 665,903

Int. Cl.[2] H01H *1/66*

U.S. Cl. 335—151 **20 Claims**



1. A relay comprising a housing of electrical insulating synthetic resin material, terminals in said housing extending through the housing to the exterior thereof, at least one of said terminals providing a contact within said housing, a contact arm within said housing connected to another of said terminals, electromagnetic operating means for engaging said contact arm with said terminal contact and for disengaging said contact arm from said terminal contact, bonding means on and between said housing and each terminal to secure said terminals to said housing and to provide a leakproof seal between said terminals and housing, and means for admitting a gas into said housing.

4,039,985

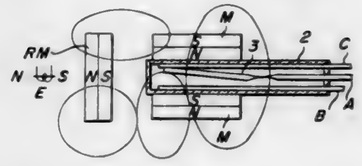
MAGNETIC REED SWITCH

B. Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309, and Charlie Dwain Mariner, 2846 Greenway Blvd., Falls Church, Va. 22042

Continuation-in-part of Ser. No. 611,156, Sept. 8, 1975, Pat. No. 4,038,620, which is a continuation-in-part of Ser. No. 533,233, Dec. 16, 1975, abandoned, which is a division of Ser. No. 404,612, Oct. 9, 1973, Pat. No. 3,866,007. This application Jan. 9, 1976, Ser. No. 647,774

Int. Cl.[2] H01H *1/66*

U.S. Cl. 335—153 **31 Claims**



1. A reed switch comprising

a. a first reed of conductive magnetic material

b. a second reed of conductive non-magnetic material mounted in cooperating spaced relation to said first reed

c. a cooperating pair of magnetic operators mounted in spaced relation to said first and second reeds

d. said reeds being positioned between said pair of operators, and

e. a third operator cooperating with said pair of operators to influence one or the other of said operators to shift said

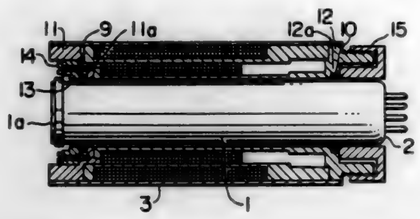
first reed into a first mode or a second mode and latch said first reed in said mode.

4,039,986

IMAGE PICKUP DEVICE

Mitsuru Nakazawa, and Toru Takigawa, both of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 24, 1976, Ser. No. 661,024
Claims priority, application Japan, Apr. 8, 1975, 50-47738[U]
Int. Cl.[2] H01F *1/00*
U.S. Cl. 335—212 **3 Claims**



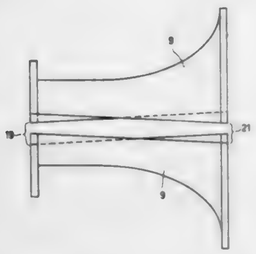
1. An image pickup device comprising an image pickup tube, a coil assembly disposed around said image pickup tube, elastic members disposed on the inner circumferential surface of said coil assembly in the proximity of an extremity at the side of a face plate of said image pickup tube and an extremity at the side of a stem thereof for coaxially fixing said image pickup tube and coil assembly, and means provided at least at one of said elastic members to move in the axial direction of said device for compressing and deforming said elastic members, wherein said elastic members comprise an O ring of elasticity.

4,039,987

COLOR TELEVISION DISPLAY DEVICE

Tjitte Talsma, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1977, Ser. No. 758,477
Claims priority, application Netherlands, Jan. 16, 1976, 7600424
Int. Cl.[2] H01F *5/00*
U.S. Cl. 335—213 **2 Claims**



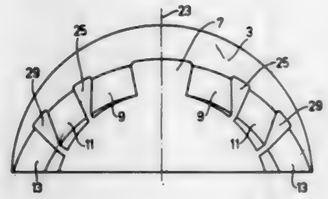
1. A colour television deflection device for a display tube of the shadow-mask type which comprises a rearmost cylindrical portion which accommodates a device for generating three electron beams which extend in a common horizontal plane, and a foremost flared portion, said deflection device being adapted to be coaxially arranged about the tube near the transition between the two portions, said deflection device comprising two diametrically arranged saddle-shaped line deflection coil means for the deflection of the electron beams in the horizontal direction and which are separated from each other by a left gap and a right gap, the axes of the two gaps between the line deflection coils intersect the horizontal symmetry plane of the display tube, the axis of one of the gaps extending above this symmetry plane near its rearmost end and below this symmetry near its foremost end, the axis of the other gap extending below the symmetry plane near its rearmost end and above this plane near its foremost end.

4,039,988

DEFLECTION COIL HAVING SECTIONS WITH MINIMUM WINDING DENSITY PORTIONS AND SPACES

Martin Clemens van der Heijde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 381,681, July 23, 1973, abandoned, which is a division of Ser. No. 198,833, Nov. 15, 1971. This application May 6, 1976, Ser. No. 683,722
Int. Cl.[2] H01F *5/00*
U.S. Cl. 335—213 **3 Claims**



1. A saddle shaped television deflection coil for a cathode ray display tube, said coil comprising a first coil section comprising longitudinally extending winding elements forming a portion of a tubular coil assembly, a first portion of said winding elements being formed with a given winding density and a second end portion of said elements being formed with a lesser winding density; a second coil section having longitudinally extending elements arranged in adjacent relationship with the elements of said first section and having a first end portion of a given winding density and a second end portion being formed with a lesser winding density than said first end portion of said second section, said portions of lesser winding density being arranged at the same end of said coil assembly and being spaced apart at the portion of lesser density and said portion of said given winding density being arranged at the same end of said coil and being contiguous with each other; and means for generating a selected magnetic field upon current being applied to said sections comprising said sections having a selected number of turns.

4,039,989

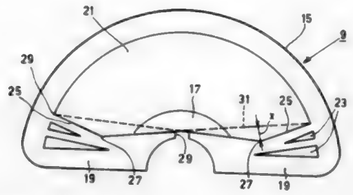
DEFLECTION SYSTEM FOR A COLOR TELEVISION DISPLAY TUBE

Franciscus Cornelis Maria Antonius Staal, and Nicolaas Gerrit Vink, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 11, 1977, Ser. No. 758,478
Claims priority, application Netherlands, Jan. 23, 1976, 7600687
Int. Cl.[2] H01F *5/00*
U.S. Cl. 335—213 **2 Claims**

1. A deflection system for a colour television display tube of the shadow mask type having a rear cylindrical part in which a device is accommodated for generating three electron beams extending in a common horizontal plane, and a front flaring part, which deflection system can be arranged coaxially around the tube near the transition between the two parts, said deflection system comprising two diametrically arranged saddleshaped line deflection coil means for deflection of the electron beams in the horizontal direction, each coil comprising

two active parts situated on either side of a window, the boundary between each of the active parts and the window



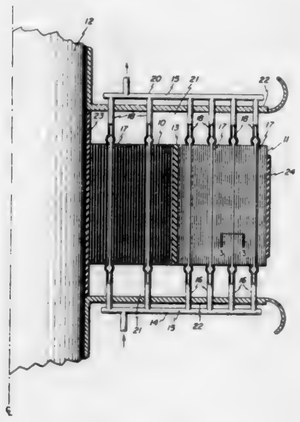
having at least one bend in such manner that the window is widened at the area of the bends.

4,039,990

SHEET-WOUND, HIGH-VOLTAGE COILS

Sanborn F. Philp, Pittsfield, Mass., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,459
Int. Cl.[2] H01F *27/08*
U.S. Cl. 336—60 **10 Claims**



1. An electrical coil comprising:
a conductive sheet;
an insulating sheet overlaying said conductive sheet;
a magnetic core, said conductive sheet overlaid by said insulating sheet being wound continuously in a plurality of turns about said core such that consecutive turns of conductive sheet and insulating sheet are in substantially continuous contact over their facing areas, the wound turns forming a structure having voids therein of small thickness relative to thickness of said insulating sheet;
means surrounding said coil with an environment of gas at high pressure such that said voids are filled with said gas; and a sealed cooling duct situated between two consecutive turns of said coil, said duct being connected to a supply of circulating coolant fluid.

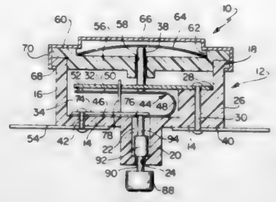
4,039,991

THERMOSTATIC SWITCH WITH RESET MECHANISM

Henry C. Bucheister, Cranston, R.I., assignor to Elmwood Sensors, Inc., Cranston, R.I.

Filed Dec. 18, 1975, Ser. No. 642,062
Int. Cl.[2] H01H *37/70, 37/74*
U.S. Cl. 337—348 **7 Claims**

1. A thermostatic switch, comprising a housing having a cavity formed therein, a temperature responsive bimetallic disc located in said housing and being responsive to a predetermined temperature for exerting a flexing action, a first contact member located in said cavity and being electrically interconnected to a first terminal external to said housing, a second contact member located in said cavity adjacent to said first contact membr and being electrically interconnected to a second terminal external to said housing, said second contact member being spring mounted and movable between a switch-closed position in which it makes electrical contact with said first contact member and a switch open position, spaced from said first contact member and normally spring biased toward the switch-closed position, a first actuating member located in said housing and being responsive to flexing movement of said disc for moving said second contact member from said switch-closed position to said switch open position, locking means for



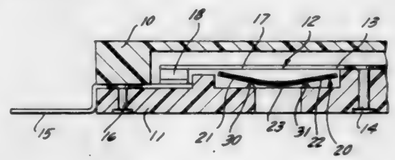
locking said second contact member in the switch open position said locking means being releasable from engagement with said second contact member, wherein said second contact member is free to return to the normally closed position by spring action thereof, when both the locking means is released and said actuating member is in the switch-closed position, said locking means mounted on a flexible support normally positioned in a locking position, and a release actuating member engageable with said locking member and operable externally of said housing to flex said flexible support member to the release position, said release actuating member not independently operable to move said second contact member into its switch closed position.

4,039,992

NON-CREEP THERMOSTAT CONSTRUCTION

Omar R. Givler, North Canton, Ohio, assignor to Portage Electric Products, Inc., North Canton, Ohio

Filed Feb. 19, 1976, Ser. No. 659,500
Int. Cl.[2] H01H *37/54*
U.S. Cl. 337—365 **4 Claims**



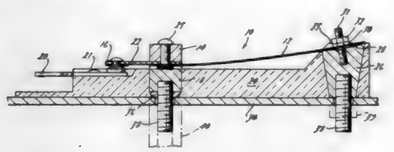
1. In a thermostatic element having a case, a first contact, a second contact including a flexible arm and a contact member to contact said first contact, said flexible arm being movable so as to place said contact member in a first position abutting said first contact and in a second position away from said first contact, movement of said flexible arm being controlled by a bimetal strip having a formed, dished, snap-over portion, the improvement which comprises a pair of knife edges, placed opposite said flexible arm, to provide the sole support for said bimetal strip.

4,039,993

OVER TEMPERATURE LIMIT SWITCH

Maxwell A. Kerr, Jackson, Mich., assignor to Mechanical Products, Jackson, Mich.

Filed June 4, 1976, Ser. No. 693,218
Int. Cl.[2] H01H 37/54, 37/66
U.S. Cl. 337—366 24 Claims



1. A temperature limit switch for interrupting an electrical current comprising:

contact means electrically connected to an external source of electrical current and operative to interrupt said electrical current when opened and conduct said electrical current when closed;

temperature dependent spring means connected to said contact means for exerting a bias force tending to open said contact means as the temperature of said spring means exceeds a first predetermined temperature; and

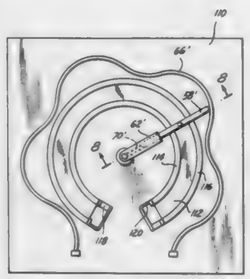
magnetic means electrically isolated from said electrical current for preventing said spring means from opening said contact means until the temperature of said magnetic means exceeds a second predetermined temperature greater than said first predetermined temperature, said magnetic means including a non-permanent magnet having associated therewith a transition temperature substantially equivalent to said second predetermined temperature such that above said second predetermined temperature the magnetic force of said magnetic means is less than the force of said spring means.

4,039,994

VARIABLE OUTPUT FUNCTION POTENTIOMETER

Frank L. Ward, Kensington, N.H., assignor to Clarostat Mfg. Co., Inc., Dover, N.H.

Filed May 6, 1976, Ser. No. 684,062
Int. Cl.[2] H01C 10/04
U.S. Cl. 338—89 4 Claims



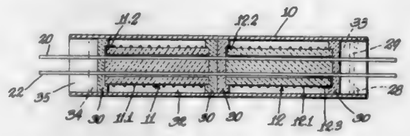
1. A potentiometer having a plurality of outputs, each of which provides a voltage value which is intermediate between two predetermined bias voltages including in combination a nonelectrical conducting substrate, a thin layer of high resistance material disposed on said substrate, first and second spaced layers of low resistance material disposed on said high resistance material, first and second low resistance ends of said first layer of low resistance material, second and third low resistance ends of said second layer of low resistance material, a first low resistance element having an end in contact with said high resistance material beneath said first low resistance end, a first conductor electrically connecting the remaining end of said first low resistance element with said high resistance material beneath said third low resistance end, a second low resistance element having an end in contact with said high resistance material beneath said fourth low resistance end, a second conductor electrically connecting the remaining end of said second low resistance element with said high resistance material beneath said fourth low resistance end, output means mounted on said substrate, wiper means of said output means in contact with said high resistance material and movable thereon through a path, first and second termination means respectively connected to said first and second conductors and means for taking an output voltage between one of said termination means and said output means.

4,039,995

ELECTRIC HEATING ELEMENTS

Frank T. Walton, Oakmont, and Walter J. Dzaack, Glenshaw, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 4, 1976, Ser. No. 682,955
Int. Cl.[2] H01C 7/22
U.S. Cl. 338—295 12 Claims



1. An electric resistance heating element, comprising:

a pair of elongated dielectric bodies, each having at least three openings extending longitudinally therethrough in simularly radially spaced, parallel relation,

three metallic terminal pins fitting into the openings in said dielectric bodies and at least certain pins maintaining said bodies in longitudinally aligned relation,

a resistance conductor on the surface of each of said bodies, each conductor having longitudinally spaced terminals, one of the terminals of each resistance conductor being electrically connected to one pin, the opposite terminal of one resistance conductor being electrically connected to a second pin, and the opposite terminal of the other resistance conductor being electrically connected to the third pin,

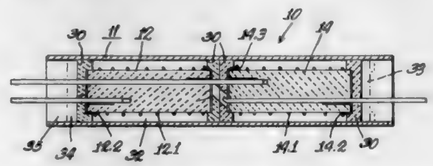
whereby said one pin serves as a common electrical connection for the resistance conductors on both dielectric bodies, and the second and the third pins serve as separate electrical connections to respective conductors.

4,039,996

ELECTRIC HEATING ELEMENTS

Joseph P. Handerhan, Pittsburgh, Pa., assignor to Emerson Electric Co., St. Louis, Mo.

Filed May 4, 1976, Ser. No. 682,956
Int. Cl.[2] H01C 7/22
U.S. Cl. 338—295 6 Claims



1. An electric resistance heating element, comprising:

a pair of elongated dielectric bodies, one having three openings extending longitudinally therein, and the other having two openings extending longitudinally therein,

three metallic terminal pins fitting into respective openings /the opening/ of said one body, and one of said pins fitting within an opening of said other body to maintain the bodies in longitudinally aligned relation,

a resistor coil wound on the surface of each of said bodies, each coil having opposed terminals at opposite ends of its respective body and extending into different body openings,

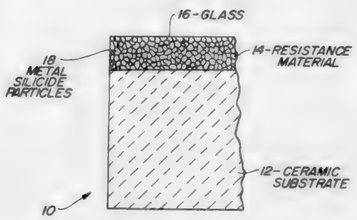
one of said terminal pins being electrically connected to a terminal of each coil, a second terminal pin being electrically connected to the opposite terminal of one coil, and a third terminal pin being electrically connected to the opposite terminal of the other coil.

4,039,997

RESISTANCE MATERIAL AND RESISTOR MADE THEREFROM

Cornelius Y. D. Huang, Bala Cynwyd, and Kenneth M. Merz, Gladwyne, both of Pa., assignors to TRW Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 409,712, Oct. 25, 1973, abandoned. This application Apr. 2, 1976, Ser. No. 673,303
Int. Cl.[2] H01C 8/00; B32B 17/06; H01B 1/04
U.S. Cl. 338—308 4 Claims



1. An electrical resistor comprising a ceramic body containing on the surface thereof a coating of vitreous enamel resistor composition consisting essentially, of a borosilicate glass and, about 75% to 10% by weight of finely divided particles of a metal silicide selected from the group consisting of tungsten disilicide, molybdenum disilicide, vanadium disilicide, titanium disilicide, zirconium disilicide, chromium disilicide and tantalum disilicide, mixed with its fired reaction products with said borosilicate glass, said composition beting heated at a temperature sufficient to provide said reaction products.

3. The method of making an electrical resistor of the type wherein a vitreous enamel resistor composition is applied to a substrate comprising:

preparing a vitreous enamel resistor composition consisting essentially of a borosilicate glass frit and about 75 to 10% by weight of finely divided conductive particles of a metal silicide selected from the group consisting of tungsten disilicide, molybdenum disilicide, vanadium disilicide, titanium disilicide, zirconium disilicide, chronium disilicide and tantalum disilicide;

applying a uniform thickness of the composition to an insulating refractory substrate;

firing the coated substrate at a temperature of about 970° to 1150° C at which the glass frit becomes molten and below the melting temperature of the conductive particles in a non-oxidizing atmosphere;

cooling the resistor to form a glass matrix having the conductive particles dispersed therein; and

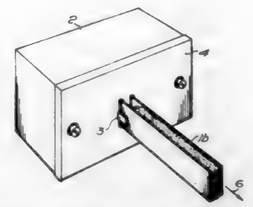
connecting terminations to the vitreous enamel resistor composition.

4,039,998

ULTRASONIC TRANSMITTER OR RECEIVER

Yeshwant Sadashiw Sunthankar, Washington, England, assignor to Sunderland Polytechnic, Sunderland, England

Filed Apr. 29, 1975, Ser. No. 572,766
Claims priority, application United Kingdom, Apr. 29, 1974, 18662/74
Int. Cl.[2] G01S 9/66; H04R 1/20, 17/10
U.S. Cl. 340—1 R 5 Claims



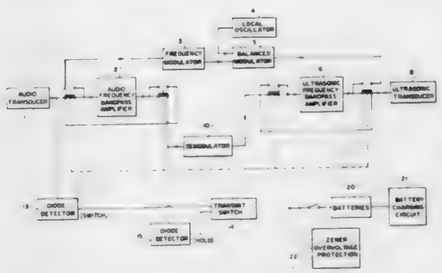
1. A directional ultrasonic vibrator operative in a medium comprising: two resonant reeds disposed in a parallel relationship, at least one ultrasonic transducer secured to each reed and adapted for producing bending vibrations in each reed along its longitudinal axis, one of said transducers adapted to be responsive to bending vibrations in one of said reeds, both of said reeds drivable as a pulse emitter and said one of said reeds responsive as a receptor, an acoustic absorber placed between said reeds, a holder supporting said reeds at one end thereof, means in said holder for vibrating said transducers in antiphase with each other, said bending vibrations being of a wavelength matched to the ultrasonic wavelength in said medium, the length of each said reed being matched to a plurality of half said wavelength.

4,039,999

COMMUNICATION SYSTEM

John Weston, 100 Elizabeth Ave., Apartment 307, St. John's, Newfoundland, Canada (A1B 1S1)

Filed Feb. 17, 1976, Ser. No. 658,629
Int. Cl.[2] H04B 11/00
U.S. Cl. 340—5 T 3 Claims



1. An ultrasonic transmitter and receiver unit having a transmit mode and a receive mode and switching means for changing from one mode to the other, said unit comprising an audio transducer for converting audio signals into audio frequency electrical signals or audio frequency electrical signals into audio signals, characterized in that in the transmit mode the audio transducer is connected to the input of an audio frequency band-pass amplifier, said audio band-pass amplifier having an output connected to an input of a first modulator which produces at its output angle modulated radio frequency signals of predetermined center frequency, said radio frequency signals being fed to one input of a balanced modulator having a second input to which is fed a fixed frequency radio frequency signal from a local oscillator, said center frequency

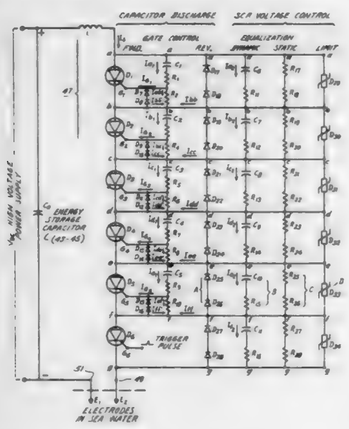
and said fixed frequency differing in frequency by an amount such that said balanced modulator produces at its output ultrasonic frequency signals which are angle modulated in accordance with said audio signals, said ultrasonic frequency signals being fed via an ultrasonic frequency band-pass amplifier to an ultrasonic transducer, and characterized in that in the receive mode said ultrasonic transducer is connected via said ultrasonic frequency band-pass amplifier to a demodulator deriving audio frequency signals corresponding to audio modulations of ultrasonic signals received by the ultrasonic transducer, the audio frequency signals from the demodulator being fed via said audio band-pass amplifier to said audio transducer, said switching means normally maintaining said unit in the receive mode but changing it to the transmit mode in the presence of an output from said audio transducer if there is, at the same time, no output from the demodulator, said unit being mounted in a water-proof container, a resilient strap being attached to said container so that the unit may be strapped to a diver's head, wherein the audio transducer is a bone conduction type of transducer and is on one side of the resilient strap so as to lie in use against the forehead of a diver using it while the ultrasonic transducer is on another side of the strap so as to readily transmit ultrasonic vibrations to water surrounding the diver, and wherein said unit has an on-off switch mounted in the resilient strap so that when the strap is stretched upon being put around a diver's head, the on-off switch is moved to the "on" position from a normally "off" position.

4,040,000

SOLID STATE HIGH ENERGY ELECTRICAL SWITCH FOR UNDER-SEA-WATER ELECTRIC DISCHARGE SEISMIC GENERATOR

Ramesh Chandra Dwivedi, Houston, Tex., assignor to Teledyne Exploration Company, Houston, Tex.

Filed Aug. 23, 1976, Ser. No. 716,462
Int. Cl.[2] G01V *1/06, 1/38*
U.S. Cl. 340—12 SD **4 Claims**



1. A seismic generator apparatus including a source of direct current,

a capacitor means connected to said source to be charged thereby, and

a capacitor discharge circuit connected to said capacitor means including in series in any order:

an electrical switch, and

an electrode system for under-sea-water conduction,

said apparatus being capable of producing a high intensity acoustic pulse at said electrode system when said capacitor means is discharged through said electrode system, said pulse being sufficient for subbottom seismic surveying,

said apparatus being further characterized by:

said switch including an inductor means in series with a mesh,

said mesh including a plurality of cross connected parallel branches for capacitor means discharge and for voltage control,

the capacitor means discharge group of branches comprising:

a string of a plurality of SCRs connected isotactically in series,

a string of a plurality of series connected resistance and capacitor circuits, i.e. RC circuits, connected isotactically in series with each other and each paralleling one of the SCRs, except for one of the SCRs, forming an SCR gate control sub-branch circuit,

an intermediate point of each resistance of said RC circuits being connected to the gate of the SCR in parallel with the RC circuit, and

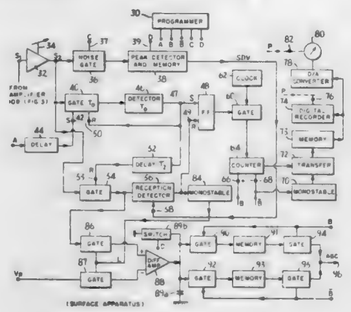
said one SCR being the one in said string of SCRs whose cathode is nearest the negative side of said source of direct current.

4,040,001

ACOUSTIC WELL LOGGING WITH THRESHOLD ADJUSTMENT

Bernard Vivet, Buc; Jean-Claude Trouiller, Chaville, and Henri Gruel, Paris, all of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 325,168, Jan. 19, 1973, abandoned. This application Dec. 2, 1974, Ser. No. 528,693
Claims priority, application France, Jan. 19, 1972, 72.01736
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—15.5 TN **3 Claims**



1. An acoustic well-logging method for investigating earth formations traversed by a borehole, comprising the steps of:

a. generating a composite electric signal which is a function of time and which comprises (i) a signal received during a first time interval which precedes the time of transmission of an acoustic pulse into said formation at a first location and which is longer than the time interval between said transmission time and an expected time of reception of said acoustic pulse at a second location after propagation in said formations and (ii) a reception signal received during a second time interval representative of said expected reception time of said acoustic pulse, said composite electric signal inherently including long-period noise in addition to the above;

b. measuring the maximum amplitude of the noise within said first time interval;

c. adjusting said composite electric signal so that a selected portion of said reception signal is maintained substantially at a predetermined amplitude exceeding the maximum measured amplitude of the noise;

d. generating a threshold signal and adjusting it so that its amplitude barely exceeds said maximum measured amplitude of the noise; and

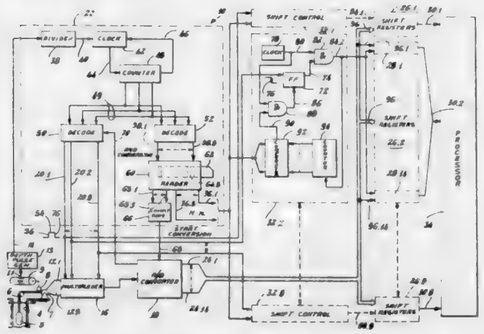
e. making a measurement corresponding to the time difference between (i) a time having a known relation to said time of transmission and (ii) the portion of said reception signal which earliest exceeds said threshold, said measurement therefore accurately representing the time required for passage of said acoustic pulse through said formations from said first location to said second location.

4,040,002

WELL DEPTH MATCHER UTILIZING PROGRAMMABLE SHIFTING OF WELL LOGGING DATA

Yves Henri Durand, Meudon-Bellevue, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 384,228, July 31, 1973. This application Apr. 25, 1975, Ser. No. 571,497
Claims priority, application France, Aug. 3, 1972, 72.27987
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—18 DC **50 Claims**



18. A method for depth shifting well logging signals from different well sensors located in spaced relationship on a borehole investigating device moved through a borehole with well depth pulses being produced to indicate incremental borehole advance made by the investigating device comprising the steps of

forming groups of digital data words individually representative of the well logging signals substantially in synchronization with the well depth pulses;

reading a machine readable record in synchronization with the well depth pulses to identify shift control words individually associated with a digital data word in a group; and

advancing the digital data words along shift registers under individual control of a shift control word to produce a desired well depth shift of the digital data words.

4,040,003

DOWNHOLE SEISMIC SOURCE

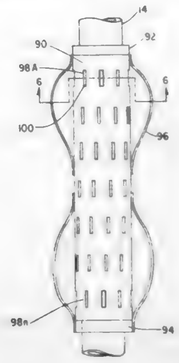
Pierre A. Beynet; John B. Farr, and Newell Pottorf, all of Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 511,141, Oct. 2, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,262
Int. Cl.[2] G01V *1/40*
U.S. Cl. 340—18 LD **5 Claims**

1. A downhole seismic source for use when drilling a borehole in the earth using a rotating drill string through which a drilling fluid is circulated, which comprises:

a section of drill string having at least one slot in the wall thereof;

a sleeve rotatably surrounding said section, said sleeve having a plurality of spaced-apart slots arranged to align with said slot of said section during rotation of said sleeve with respect to said section;



means to prevent rotation of said sleeve during the rotation of said section of drill string.

4,040,004

COLOR CODED VEHICLE GUIDANCE SYSTEM

Harold L. Walpole, Redondo Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sept. 7, 1976, Ser. No. 720,844
Int. Cl.[2] G08G *5/00*
U.S. Cl. 340—26 **10 Claims**



2. A vehicle guidance system comprising:

means for projecting a beam of light along which a vehicle is guided,

means for pulse coding at least a cross-sectional portion of said beam over its projected length whereby a pulse coded signal is encountered by said vehicle following said beam on any departure into the pulse coded portion thereof, said pulse coded signal including periodic pulses having a pulse duration in each period varying continuously according to the degree of departure by said vehicle into the pulse coded portion of said beam, and

means for color coding by the substitution of one color for another at periodic intervals at least a cross-sectional portion of said beam over its projected length whereby said beam may be distinguished by the operator of said vehicle from other lights in the area of said means for projecting.

4,040,005

COMPOSITE SITUATION ANALYZER AND INSTRUMENT FLIGHT SYSTEM

William W. Melvin, 8434 Greenstone Drive, Dallas, Tex. 75231

Continuation-in-part of Ser. No. 536,948, Dec. 23, 1974, Pat. No. 3,970,829. This application Nov. 12, 1975, Ser. No. 631,294
Int. Cl.[2] G08G *5/02*
U.S. Cl. 340—27 AT **15 Claims**

1. An aircraft control system display comprising:

an aircraft reference indicator,

a horizon reference indicator,

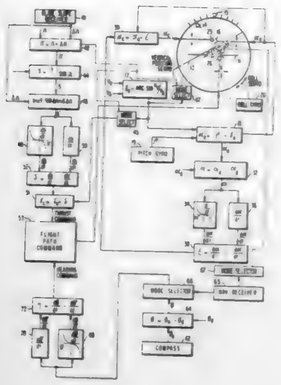
means for producing a relative displacement of said aircraft and horizon reference indicators as a function of flight path angle of the aircraft,

an angle of attack indicator,

means for producing a displacement of said angle of attack indicator with respect to said aircraft reference indicator

as a function of the difference between the pitch and the flight path angle of the aircraft,

means for selectively generating a runway reference indicator below said horizon reference indicator, and



means for producing a relative displacement of said aircraft and horizon reference indicators proportional to the ground path angle of the aircraft.

4,040,006

JACKNIFE WARNING SYSTEM

Robert W. Kimmel, 121 Swann Road, Clearwater, Fla. 33516

Filed Sept. 10, 1975, Ser. No. 612,093

Int. Cl.[2] B60Q *1/12*

U.S. Cl. 340—52 R **3 Claims**



1. A warning system of the type used with a towed vehicle and a towing vehicle to determine the relative orientation thereof, said warning system comprising: base means mounted on the towed vehicle, sensing means attached to said base means and extending outwardly therefrom in communicating disposition relative to the towing vehicle, said sensing means comprising at least two elongated arms, each arm formed from an electrically conductive material, each of said two arms electrically connected in parallel to one another, and disposed and configured to extend laterally outwardly from said base means, each of said arms comprising a plurality of arm portions interconnected to one another in telescoping relation so as to be adjustable outwardly along a longitudinal axis of each arm in substantially opposite directions, each of said arm members disposed to extend outwardly from said base into engagement with a conductive portion of the towing vehicle, when the towed and towing vehicles are in a predetermined spaced relation to one another, whereby relative movement of the towed and the towing vehicle toward one another beyond the point of engagement of one of said arm members and a connective portion of the towing vehicle is regulated; said base means comprising a plate element formed from insulating material and securely attached to the towed vehicle, adjusting means disposed in movable, interconnecting relation between each of said two arms, whereby each of said two arms is adjustably positioned relative to said plate element, said plate element disposed to define an insulated barrier between each of said arms and the towed vehicle; indicator means mounted on the towing vehicle in communicating position relative to an operator thereof, electrical circuit means defined at least in part by a power source, each of said arms, a switch, said indicating means and an electrically conductive portion of the towing vehicle, whereby said electric circuit means is completed upon engagement between the conductive portion of the towing vehicle and one of said arm members.

4,040,007

APPARATUS FOR WARNING THAT A KEY-OPERATED DEVICE IN A VEHICLE IS INOPERATIVE

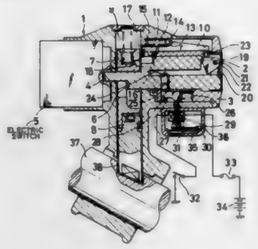
Shigenobu Kuroki, Miyazaki, Japan, assignor to Kabushiki Kaisha Honda Rokku, Japan

Filed Feb. 3, 1976, Ser. No. 654,730

Claims priority, application Japan, Feb. 20, 1975, 50-20336; Apr. 14, 1975, 50-44349

Int. Cl.[2] B60R *25/02*

U.S. Cl. 340—52 D **8 Claims**



1. An apparatus for warning that a key-operated device in a vehicle is inoperative where said vehicle has a door and normally open switch means adapted to be closed when said door is opened, said apparatus comprising:

a. a warning buzzer having a vibratory member for emitting a warning when said door is open and said key-operated device is inoperative, said vibratory member being actuable upon closing of said switch means; and

b. a control pin interposed between said vibratory member and said key-operated device, said control pin being movable in response to movement of said key-operated device, and said control pin being arranged to move from a first position when said key-operated device is operative and in which said control pin mechanically restrains said vibratory member from vibrating to a second position when said key-operated device is inoperative and in which said vibratory member is free of restraint by said control pin.

4,040,008

AUTOMOBILE TIRE THEFT ALARM

Pedro Sanabria, 133 Centennial Ave., Roosevelt, N.Y. 11575

Filed Mar. 5, 1976, Ser. No. 664,096

Int. Cl.[2] B60R *25/10*

U.S. Cl. 340—65 **10 Claims**

1. An alarm actuating device for indicating the removal of part of a motor vehicle comprising:

a. a mounting plate;

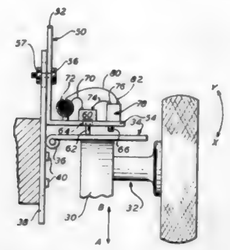
b. a control plate swingably mounted on said mounting plate for swinging movement between a first predetermined position and a second predetermined position;

c. a mounting bracket having a first leg adjustably positionable on said mounting plate and a second leg positionable along with said first leg in relation to said control plate;

d. electrical switch means carried by said mounting bracket and having a pair of contacts adapted to be selectively opened and closed; and

e. a switch contact actuating member disposed for coaction with said pair of contacts of said switch means to either maintain same spaced apart or permit same to close;

f. said switch contact actuating member further being disposed for co-operation with said control plate in said first predetermined position of said control plate to maintain



said pair of contacts spaced apart, and in second predetermined position of said control plate to permit said pair of contacts to close to indicate the removal of part of a motor vehicle.

4,040,009

PATTERN RECOGNITION SYSTEM

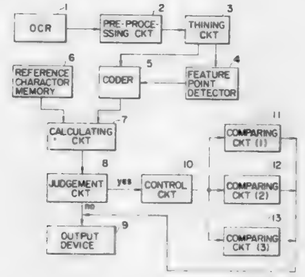
Shozo Kadota; Yoshiji Fujimoto, both of Hachioji, and Masao Yamamoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 12, 1976, Ser. No. 675,972

Claims priority, application Japan, Apr. 11, 1975, 50-43187

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 AQ **16 Claims**



1. In a pattern recognition system including converting means for converting an optical input pattern into electrical signals corresponding to the characteristics of the pattern and comparing means for comparing said electrical signals to the stored electrical signals corresponding to each of a plurality of reference patterns so as to select a probable reference pattern which corresponds to the input pattern at least to a predetermined degree, a confusing pattern selection circuit for selecting one of a plurality of probable reference patterns selected by said comparing means when more than one reference pattern corresponds to said input pattern by more than said predetermined degree, comprising

feature comparator means for comparing at least one designated distinguishing portion of said input pattern to the corresponding portion of each probable reference pattern by a prescribed method of recognition including a plurality of individual feature comparators each operating in accordance with a respectively different prescribed method of recognition; and

control means responsive to stored information identifying the distinguishing portion and prescribed method of recognition of a given confusing pattern for applying the electrical signals corresponding to said input pattern and each probable reference pattern to at least one of said feature comparators selected by said control means in accordance with said stored information.

4,040,010

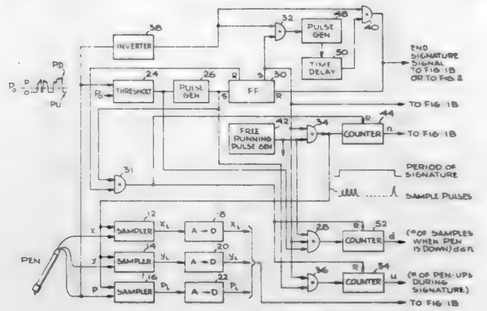
IDENTIFICATION BY HANDWRITING VERIFICATION

Hewitt D. Crane, Portola Valley; Daniel E. Wolf, and John S. Ostrem, both of Menlo Park, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Nov. 6, 1975, Ser. No. 629,290

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 SY **42 Claims**



1. A method of detecting whether a specimen signature is authentic or a forgery comprising

writing a plurality of sample signatures,

deriving from each sample a plurality of different sample parameter representative signals,

deriving from the plurality of different sample parameter representative signals of all samples an average value signal for each parameter, each said average value signal representing the average value of corresponding sample parameter representative signals derived from all of said sample signatures,

writing a specimen signature,

deriving from said specimen signature a plurality of specimen parameter representative signals representing parameters corresponding to those derived from the sample signatures,

combining each of said specimen parameter representative signals with an average value signal derived from corresponding sample signature parameters to provide a plurality of variance signals, and

comparing said plurality of variance signals with reference means to determine whether said specimen signature is authentic or a forgery.

4,040,011

IDENTIFICATION BASED ON HANDWRITING SAMPLES

Hewitt D. Crane, Portola Valley, and Earle D. Jones, Menlo Park, both of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Aug. 20, 1976, Ser. No. 716,270

Int. Cl.[2] G06K *9/00*

U.S. Cl. 340—146.3 SY **9 Claims**

1. In a system wherein a memory stores a plurality of sets of data, each set having been derived from a handwritten template signature and which data set uniquely characterizes that signature, and a set of data derived from a handwritten specimen signature is to be compared with one or more of said template signature data sets to determine whether

the specimen signature was written by one of the persons who wrote the template signatures, a method comprising:

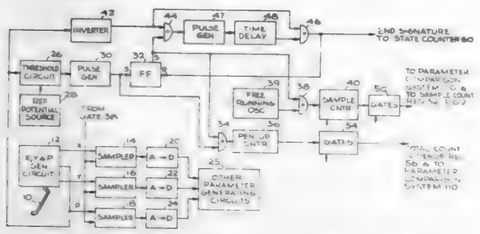
selecting some of the data from said specimen signature data set,

establishing a range of acceptable values about the values of said data,

deriving from said memory those template signature data

sets wherein the data which corresponds to said selected data has a value which falls within said range of acceptable values,

comparing each said derived template data set with said



specimen signature data set for determining which template data set provides the optimum comparison result with said specimen signature data set, and

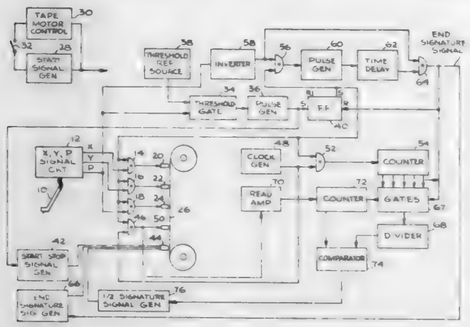
indicating which of the template data sets provides said optimum comparison result.

4,040,012

HANDWRITING VERIFICATION SYSTEM

Hewitt David Crane, Portola Valley; Daniel Errol Wolf, Menlo Park, and Samuel Lindenberg, Pacific Palisades, all of Calif., assignors to Stanford Research Institute, Menlo Park, Calif.

Filed Apr. 28, 1976, Ser. No. 681,118
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 SY **21 Claims**



1. A method of comparing a template signal train with a specimen signal train to determine substantial identicality comprising, for successive equal portions of each signal train,

simulating successive incremental displacements of a portion of a specimen signal train relative to a template signal train while deriving a correlation value from said specimen and template wavetrains for each incremental displacement, determining the largest of said derived correlation value, to provide a first correlation value,

simulating successive incremental velocity changes between said portions of said specimen signal train relative to said template signal train, while deriving a correlation value from said specimen and signal wavetrains for each incremental velocity change,

determining the largest of said first correlation value and the correlation values derived for said incremental velocity changes to provide a maximum correlation value,

combining the maximum correlation value for each portion of said signal trains to provide an average maximum correlation value, and

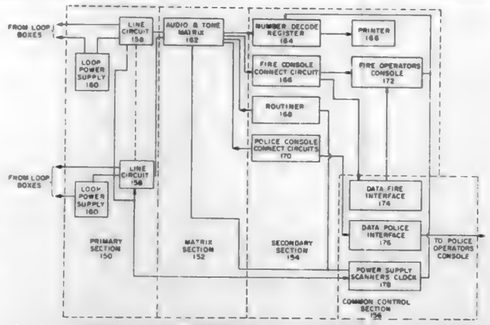
comparing said average maximum correlation value with a reference value for providing an output indicating substantial identicality if said reference value is exceeded and non-identicality if not exceeded.

4,040,013

CITIZENS ALARM SYSTEM

Tom Walter Carlson, Paterson, N.J., assignor to North American Philips Corporation, New York, N.Y.

Continuation of Ser. No. 340,769, March 13, 1973. This application Jan. 9, 1975, Ser. No. 539,783
Int. Cl.[2] G08B *25/00*; H04Q *9/00*; H04M *11/06*
U.S. Cl. 340—164 R **7 Claims**



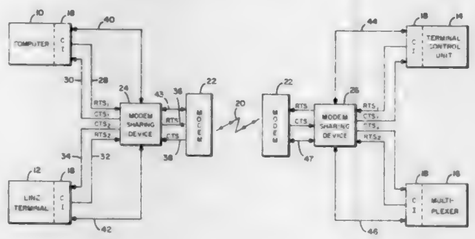
1. A method for establishing communication between at least one of a plurality of alarm stations coupled together and to a central station with a plurality of cable loops, said method comprising transmitting from said alarm station to said central station a signal indicative that one of said alarm stations has been activated, receiving said signal at said central station, and coupling the loop of said activated alarm station to a free one of a plurality of operator stations at said central station regardless of any groupings of said cable loops.

4,040,014

MODEM SHARING DEVICE

Arvin George Gehrking, New Brighton, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,954
Int. Cl.[2] H04B *1/38*
U.S. Cl. 340—147 LP **5 Claims**



1. In a communications system of the type including a plurality of line terminals for transmitting and receiving data to and from modem units, said line terminals and modems operating in response to Request-to-Send and Clear-to-Send commands, apparatus for sharing a single modem unit between plural line terminals comprising:

a. a plurality of flip-flops individually associated with each of said line terminals;

b. timing means responsive to a Request-to-Send signal from said line terminals for setting only one of said plurality of flip-flops at a time;

c. means connecting the outputs of a given one of said plurality of flip-flops to the inputs of the remaining flip-flops such that so long as said given one of said plurality of flip-flops is set, the remaining flip-flops are prevented from being set;

d. means connected to the outputs of said plurality of flip-flops for transmitting said Request-to-Send signal to said single modem; and

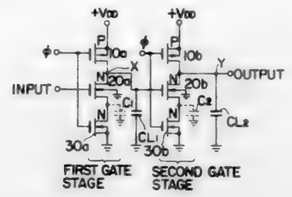
e. means connected to said plurality of flip-flops for transmitting a Clear-to-Send signal from said single modem to only that line terminal associated with the set one of said plurality of flip-flops.

4,040,015

COMPLEMENTARY MOS LOGIC CIRCUIT

Hideki Fukuda, Mitaka, Japan, assignor to Hitachi, Ltd., Japan

Division of Ser. No. 511,277, Oct. 2, 1974. This application June 22, 1976, Ser. No. 698,517
Claims priority, application United Kingdom, Apr. 16, 1974, 16641/74
Int. Cl.[2] G11C *11/40*
U.S. Cl. 340—173 R **2 Claims**



1. A read-only memory comprising

a first gate stage matrix formed of *m* columns of first gate stages and *n* rows of logic input lines,

each first gate stage having a pair of clock controlled driving MOS transistors connected in series with a first logic block made up of at least one MOS transistor which has its gate electrode corresponding to a logic input terminal for said first logic block connected to a respective one of said logic input lines, between first and second sources of reference potential, said first logic block having a logic output terminal connected to one of the MOS transistors therein,

a second gate stage matrix formed of *p* columns of second gate stages and *m* rows of logic input lines,

each second gate stage having a pair of clock controlled driving MOS transistors connected in series with a second logic block made up of at least one MOS transistor which has its gate electrode corresponding to a logic input terminal for said second logic block connected to a respective one of the logic input lines of said *m* rows of logic input lines, between said second and first sources of reference potential, said second logic block having a logic output terminal connected to one of the MOS transistors therein, the gate electrode of an MOS transistor of said second logic block being connected to the logic output terminal of a respective first logic block in said first gate stage matrix.

a third gate stage matrix formed of *q* columns of third gate stages and *p* rows of logic input lines,

each third gate stage having a pair of clock controlled driving MOS transistors connected in series with a third logic block made up of at least one MOS transistor which has its gate electrode corresponding to a logic input terminal for said third logic block connected to a respective one of the logic input lines of said *p* rows of logic input lines, between said first and second sources of reference potential, said third logic block having a logic output terminal connected to one of the MOS transistors therein, the gate electrode of an MOS transistor of said third logic block being connected to the logic output terminal of a respective second logic block in said second gate stage matrix,

a first clock line, connected to the clock controlled driving transistors in said first and third gate stage matrices, for supplying a first clock signal thereto, and

a second clock line, connected to the clock controlled driving transistors in said second gate stage matrix, for supplying a second clock signal, which is the inverse of said first clock signal, thereto, and

wherein

the conductivity type of the at least one MOS transistor making up said second logic block is opposite the conductivity type of the at least one MOS transistor making up said first and third logic blocks,

the driving MOS transistors and the first logic blocks in each first gate stage are arranged so that one of the driving MOS transistors therein is rendered conductive during first repeated intervals of said first clock signal for rendering the output potential of said first gate stage equal to said first reference potential irrespective of the state of said first logic block and the other of the driving MOS transistors therein conductive during second repeated intervals, alternating with said first repeating intervals of said first clock signal, for enabling the output potential of each first gate stage to change to a potential equal to the second reference potential depending on the state of said first logic block,

the driving MOS transistors and the second logic block in each second gate stage are arranged so that one of the driving MOS transistors therein is rendered conductive during said first repeated intervals for rendering the output potential of each second gate stage equal to said second reference potential, the output potential of each second gate stage being enabled to change to a potential equal to said first reference potential depending on the state of the second logic block thereof, and

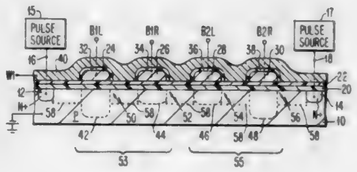
the driving MOS transistors and the third logic block in each third gate stage are arranged so that one of the driving MOS transistors therein is rendered conductive during said first repeated intervals for rendering the output potential of each third gate stage equal to said first reference potential, the output potential of each third gate stage being enabled to change to a potential equal to said second reference potential depending on the state of said third logic block.

4,040,016

TWIN NODES CAPACITANCE MEMORY

Hsing-San Lee, Williston, and Norbert George Vogl, Jr., Colchester, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,196
Int. Cl.[2] G11C *11/24, 11/40*
U.S. Cl. 340—173 CA **17 Claims**



1. A capacitance memory comprising,

a semiconductor substrate,

a dielectric medium disposed on said substrate,

first and second conductive means disposed on said dielectric medium defining first and second storage nodes at first and second given regions on the surface of said substrate,

means for applying complementary data signals to said first and second storage nodes,

a source of reference potential disposed on the surface of said substrate at a third given region of said substrate,

means for selectively coupling said source of reference potential to said first and second given regions, and

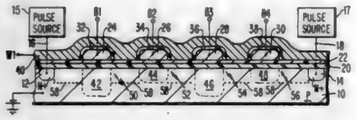
means coupled to said first and second storage nodes for differentially sensing said complementary date signals.

4,040,017

INJECTED CHARGE CAPACITOR MEMORY

Hsing-San Lee, Williston, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1976, Ser. No. 672,198
Int. Cl.² H04N 3/14; H01L 27/14
U.S. Cl. 340—173 R **11 Claims**



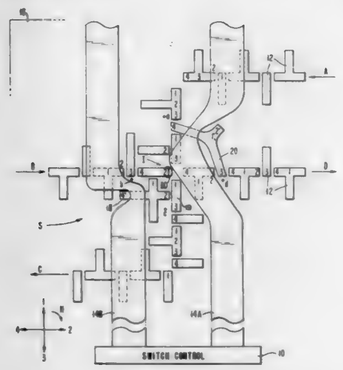
1. A capacitance memory comprising,
a semiconductor substrate,
a dielectric medium disposed on said substrate,
conductive means disposed on said dielectric medium defining a storage node at a given region on the surface of said substrate,
means for applying data signals to said conductive means,
a source of reference potential having selectable first and second potential levels disposed at the surface of said substrate a given distance from said given region, and
means for selectively coupling said source of reference potential at predetermined time intervals to said given region, said source of reference potential being alternately at said first and second levels during each of said predetermined intervals.

4,040,018

LADDER FOR INFORMATION PROCESSING

Hsu Chang, Yorktown Heights, N.Y.; Tien Chi Chen, San Jose, and Chin Tung, Saratoga, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 7, 1975, Ser. No. 556,378
Int. Cl.² G11C 11/14
U.S. Cl. 340—174 TF **23 Claims**



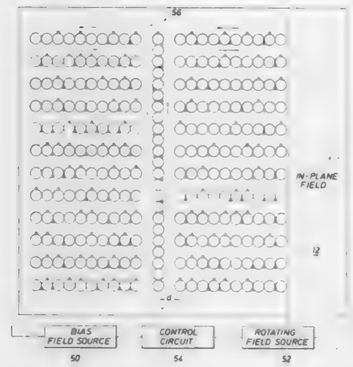
1. A data handling apparatus for moving data which can be moved in a medium in response to the application of a cycle of drive fields thereto, comprising:
a plurality of first loops in which data streams can propagate in response to the application of drive fields,
at least one I/O loop including write means for producing data and read means for reading data in said I/O loop,
means for interconnecting said I/O loop to one of said first loops so that data will move from said one of said first loops to said I/O loop during application of said drive fields,
means for separating said I/O loop and said first loop interconnected to it to prevent data from moving to said I/O loop from said interconnected first loop during application of said drive fields,
first means for interconnecting said first loops so that data streams in the interconnected first loops will cross one another and will move one loop to an interconnected loop in response to the application of said drive fields, said first means being separate from said I/O loop and having means for interconnecting said first loops without having data flow through said I/O loop,
second means for separating said interconnected first loops to prevent the data streams in said separated loops from moving from one separated loop to the other separated loop during application of said drive fields.

4,040,019

ION IMPLANTED MAGNETIC BUBBLE MEMORY DEVICE HAVING MAJOR AND MINOR ROWS

David Carl Bullock, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 23, 1974, Ser. No. 499,823
Int. Cl.² G11C 11/14
U.S. Cl. 340—174 TF **9 Claims**



1. A magnetic bubble domain memory comprising:
a substrate,
a body of magnetic material capable of supporting magnetic bubble domains disposed on said substrate,
the upper surface portion of said domain-supporting magnetic body having a pattern formed therein defined by regions of two different types,
the first of said regions being of the same character as the remainder of said domain-supporting magnetic body,
the second of said regions being ion-implanted regions the edges of which adjacent to said first regions form rails to which magnetic bubble domains in the remainder of said domain-supporting magnetic body adhere and along which the magnetic bubble domains may be propagated,
one of said first and second regions forming a major row of contiguous regions in the upper surface portion of said domain-supporting magnetic body, said major row having adjacent regions contacting each other and terminating at its opposite ends in respective end regions,
said one of said first and second regions also forming a plurality of minor rows of contiguous regions in the upper surface portion of said domain-supporting magnetic body, each of said minor rows having adjacent regions contacting each other and terminating at its opposite ends in respective end regions,
said major row being arranged in spaced relationship to said plurality of minor rows and in alignment with the end regions of each of the respective minor rows for transfer of bubble domains between the major row and each of the minor rows, and
means operably coupled to said domain-supporting magnetic

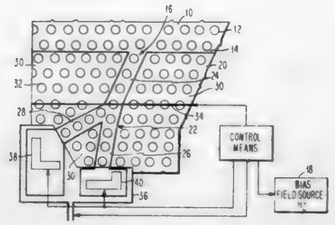
body for controllably positioning and moving magnetic bubble domains with respect to said major and minor rows.

4,040,020

BUBBLE LATTICE DEVICE

David Malcolm Hannon, Palo Alto, and Hung Liang Hu, Sunnyvale, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 5, 1975, Ser. No. 638,203
Int. Cl.² G11C 11/14
U.S. Cl. 340—174 TF **14 Claims**



1. A device adapted for use with a bubble lattice system in an external bias field between 0 and 0.2 ($4\pi M_s$) comprising
a first channel associated with a bubble lattice, said channel having an end,
a second channel having a first end and a second end, said first end connected to said first channel end wherein a bubble having an S=0 state leaving said first channel moves into said second channel,
a third channel being aligned at an angle with said first channel, said third channel having a first end and a second end, said third channel first end connected to said first channel end wherein a bubble having an S=1 state leaving said channel moves into said third channel, and
a self biasing field around said first channel and being substantially balanced around the region where said first channel joins said second channel first end and said third channel first end.

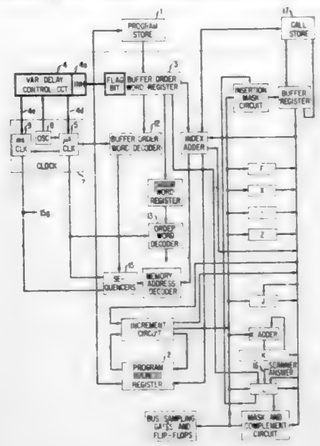
4,040,021

CIRCUIT FOR INCREASING THE APPARENT OCCUPANCY OF A PROCESSOR

Ronald Holmes Birchall, Wheaton; Frank Vincent Pellettiere, Schaumberg, and William John Skeens, Woodridge, all of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 30, 1975, Ser. No. 627,186
Int. Cl.² G06F 1/04
U.S. Cl. 364—200 **12 Claims**

1. In a stored-program controlled processor having first clock means for controlling the execution of instructions from a program stored in the memory unit of said processor and a second clock for furnishing indications of real-time, an arrangement for increasing the apparent occupancy of said processor comprising
means for receiving both overhead and work-load sensitive instructions from said memory unit,
means responsive to the appearance of a work-load sensitive instruction in said receiving means for selectively inhibiting said instruction execution controlling clock means for predetermined intervals of time, and
means operative during said selective inhibiting for allowing said real-time clock to function normally, whereby the time taken by the processor to complete the processing of all of said overhead and work-load sensitive instruction is increased by an amount disproportionately determined by



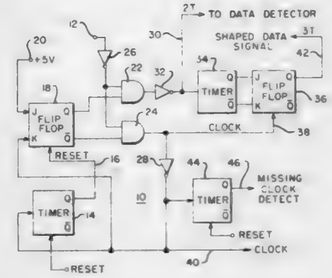
the number of said work load sensitive instructions actually registered in said receiving means.

4,040,022

MISSING CLOCK DETECTION CIRCUIT

Tomio Takii, Yokohoma, Japan, assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 7, 1976, Ser. No. 647,221
Claims priority, application Japan, Feb. 21, 1975, 50-21807
Int. Cl.² G06F 1/00; G11B 5/02
U.S. Cl. 364—900 **23 Claims**



1. In a data processing system wherein data bits and clock bits are serially and alternately encoded, a missing clock pulse detector comprising:
input means for receiving said data bits and said clock bits;
first means coupled to said input means for establishing a first time period of greater duration than the interval between succeeding clock and data bits and of less duration than the interval between said succeeding clock bits having a data bit interposed therebetween;
second means coupled to said input means for establishing a second time period of greater duration than the interval between said succeeding clock bits and of less duration than the interval between the first of said succeeding clock bits and the data bit adjacent to the second of said succeeding clock bits;
means including said second means for detecting the occurrence of a missing clock bit; and
means responsive to the detection of a missing clock bit for decoding the next bit following the missing clock bit as either a data bit or a clock bit depending upon whether

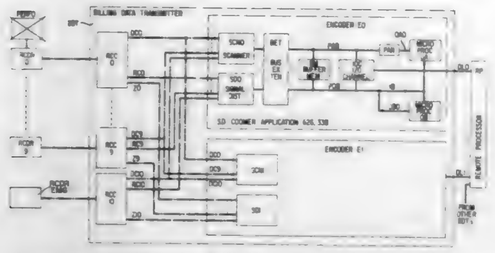
said next bit is detected within said first or said second time period.

4,040,023

RECORDER TRANSFER ARRANGEMENT MAINTAINING BILLING DATA CONTINUITY

Robert Bartlett Curtis, and Nelson Andrew Riedel, both of Columbus, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 22, 1975, Ser. No. 643,140
Int. Cl.[2] G06F *3/08, 7/04;* **G05B** *11/16*
U.S. Cl. 364—900 **13 Claims**



1. For use with a plurality of recorders generating message accounting information in a telecommunication system, the combination comprising

first and second data processing units each independently operative to receive each generation of information from each of said recorders and to check the validity of the information received thereat,

said first processing unit having means for controlling system responses to said recorders including means for buffering the information received from said recorders and means for transmitting said buffered information to a remote processor,

said second processing unit including means for providing a check indication if information received from said recorders is valid,

said first processing unit including means responsive to receipt of invalid information from one of said recorders and to said chekc indication for corresponding information received by the second processing unit for selectively transferring control of said one recorder to said second processing unit, and means for generating a relinquish message and for controlling said transmission means to transmit said relinquish message to the remote processor, and

said second processing unit including means responsive to said transfer of control for generating an acceptance message, means for buffering said acceptance message, and means for transmitting said buffered acceptance message to the remote processor after a predetermined time interval, wherein said second processing unit controls said last named buffering means for buffering and transmitting to the remote processor information received from said one recorder subsequent to said transfer of control.

4,040,024

EDITING SYSTEM FOR A RANDOM ACCESS MEMORY

Alan Barnett Cowe, and John Francis de Raismes, both of Denville, N.J., assignors to Teleram Communications Corporation, Mamaroneck, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,001
Int. Cl.[2] G06F *7/06;* **G11C** *9/04*
U.S. Cl. 364—900 **9 Claims**

1. Apparatus for editing the character contents of a random access data storage memory having a predetermined number of character locations from an alphanumeric and control keyboard, said random access data storage memory operating in conjunction with CRT display means for visually displaying data characters stored in said memory, and memory address counter means for identifying each character location within said memory, comprising:

means for selecting a character from said displayed data upon which to perform an editing operation;

clock means for incrementing said memory address counter means;

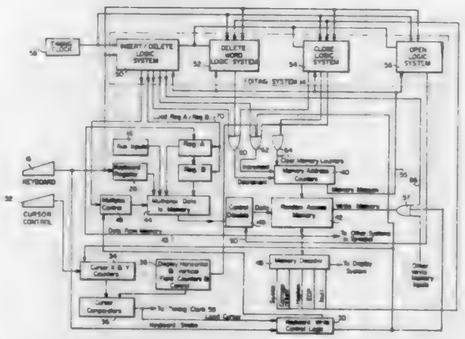
means for signaling coincidence between said selected character and a predetermined character location within said memory as defined by said memory address counter means;

means responsive to an insert command signal from said keyboard for generating an insert flag signal;

a first storage register;

means responsive to said insert flag signal for transferring the character contents at said predetermined character location in memory to said first storage register;

keyboard write control means for inserting a character presented from said keyboard into said predetermined character location in said memory;



a second storage register;

logic means responsive to said insert flag signal for reorganizing the character contents within said memory following said predetermined character location, said logic means comprising; first signal means for incrementing said memory address counter means one character location, second signal means for transferring the contents of said first storage register into said second storage register, third signal means for transferring the character contents in said memory at the incremented character location identified by said memory address counter means into said first storage register; fourth signal means for transferring the character contents from said second storage register to said incremented character location in said memory and means for repeatedly recycling said first, second, third and fourth signal means respectively; and

memory maximum signal means for disabling said logic means when said memory address counter means reaches a predetermined maximum character location in memory.

4,040,025

LOGIC STATE ANALYZER

Justin S. Morrill, Jr., Cascade; William A. Farnbach, and Charles T. Small, both of Colorado Springs, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 31, 1976, Ser. No. 672,226
Int. Cl.[2] G06F *3/14, 3/02*
U.S. Cl. 364—900 **25 Claims**

1. An apparatus for use in the analysis of a digital device, by storing electrical representations of monitored device signals in response to the occurrence of preselected conditions, the apparatus comprising:

threshold circuitry for providing a threshold signal;

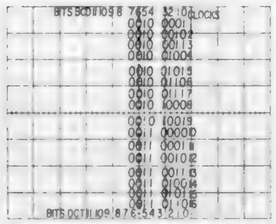
input means coupled to the threshold circuitry for monitoring a plurality of device signals within said digital device and for providing a plurality of buffered device signals in response to said device signals and said threshold signal;

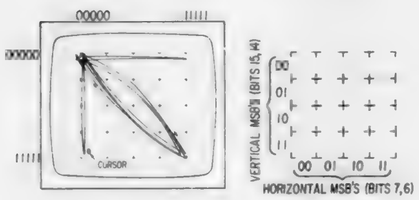
timing generator means coupled to the input means for providing at least one timing signal in response to at least one of said buffered device signals which has been preselected as representing a clock cycle of said device signals;

first storage means coupled to said input means and said timing generator means for storing electrical representations of said buffered device signals in response to at least one of said timing signals;

trigger word means having a plurality of switches for producing a plurality of trigger word signals in response to the setting of said switches;

pattern recognition means coupled to the first storage means, the trigger word means and the timing generator means





for producing a first plurality of control signals in response to the electrical representations of said buffered device signals, said plurality of trigger word signals and at least one of said timing signals; and

trigger generator means having settable delay means and coupled to the pattern recognition means for providing a trigger signal in response to the setting of the settable delay means and said first plurality of control signals;

memory control means for providing a memory input control signal in response to said timing signals and said trigger signal; and

first memory means coupled to the first storage means and to the trigger generator means for storing electrical representations of said buffered device signals in response to said memory input control signal.

4,040,026

CHANNEL FOR EXCHANGING INFORMATION BETWEEN A COMPUTER AND RAPID PERIPHERAL UNITS

Francois Gernelle, 18 Avenue du Bois, 92290-Chatenay Malabry, France

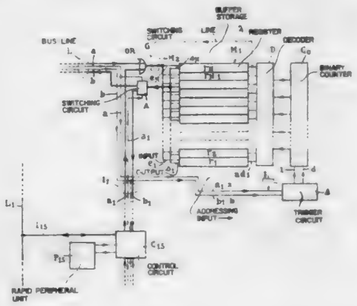
Continuation of Ser. No. 468,298, May 8, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,793
Int. Cl.[2] G06F *9/18*
U.S. Cl. 364—900 **6 Claims**

1. A channel for exchanging information in the form of blocks of at least one word, between a computer performing operations under the control of a programme and at least one rapid peripheral unit accessible through at least one control circuit means for extracting the information blocks from at least one peripheral unit, in response to readout orders delivered thereto, and for recording the information blocks in at least one peripheral unit, in response to write-in orders delivered thereto, the computer including specialized registers and being operatively arranged to deliver the readout orders and the write-in orders to at least one control circuit means, said channel comprising, in combination:

at least one buffer memory consisting of a stack of N independent registers referenced by serial numbers assuming all values from 1 to N, each one of said independent registers including a write-in input and a readout output, and being operative to store an information word, so as to become a full register, and to read out such information word so as to become an empty register;

a logic OR circuit including an output connected to said write-in inputs of all said registers of said buffer memory and including at least two inputs, the first one being connected to said computer and the second one to said at least one rapid peripheral unit via said at least one control circuit means;

a switching circuit including an input connected to the readout outputs of all the registers of a same buffer memory, first and second outputs connected respectively to said computer and to said at least one rapid peripheral unit via said at least one control circuit means, and first and second switching terminals to be activated by a signal of rectangular shape having a leading edge and a trailing edge for connecting, throughout duration of the signal of rectangular shape, said input of said switching circuit to



said first output and second output of said switching circuit, respectively;

addressing means including, for each memory, a trigger circuit having two inputs and two outputs, these two outputs being connected to a counter containing a next lower integer preceding immediately the serial number of that empty registe having a lowest serial number, said counter being connected to a decoder having outputs each connected to one of the registers of said memory, each decoder output when energized opening access to that register of said buffer memory to which it is connected;

said trigger circuit including means for producing, upon occurrence of the leading edge of one of the signals of rectangular shape at its second input, a single incrementation signal delivered to its second output for up counting one unit in said counter, and means for producing, upon occurrence of the trailing edge of one of the signals of rectangular shape at its first input, a single decrementation signal delivered to its first output for down counting one unit in said counter;

said control circuit means including means for delivering in response to one of said readout orders transmitted from said computer and concerning one word of information, one of the signals of rectangular shape to the second input of said trigger circuit in order to store, in said empty register having the lowest serial number, the word transmitted through the second input of said logic OR circuit, said control circuit means further having means for deliv-

ering simultaneously to the first input of said trigger circuit and to the second switching terminal of said switching circuit, in response to a write-in order transmitted from said computer and concerning one word, one of the signals of rectangular shape to permit the storage, in said at least one peripheral unit, of the information word contained in a full register having a next lower serial number preceding immediately the serial number of said empty register having the lowest serial number.

4,040,027

DIGITAL DATA TRANSFER SYSTEM HAVING DELAYED INFORMATION READOUT FROM A FIRST MEMORY INTO A SECOND MEMORY

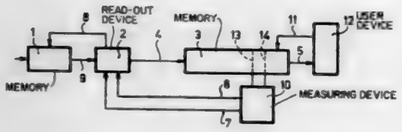
Lambertus Gerardus van Es, Apeldoorn; Hendrik Arie van Essen, and Nicolaas Cornelis de Troye, both of Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 21, 1976, Ser. No. 678,869

Claims priority, application Netherlands, Apr. 25, 1975, 7504901

Int. Cl.[2] G06F *13/00;* **G11C** *9/00*

U.S. Cl. 364—900 **8 Claims**



1. A data transfer system comprising:

data input means for supplying digital data, said data input means including a first memory and having a data output;

read-out means, connected to said data output of said data input means, for sequentially reading out data from said first memory under control of a first read command signal, said read-out means haivng an output;

intermediate storage means connected to said output of said read-out means, for temporarily storing the read-out data;

measuring means, connected to said intermediate storage means, for determining the extend of filling of said intermediate storage means with said data, and including means for producing first and second alarm signals upon detection of certain predetermined conditions in said intermediate storage means,

said first alarm signal being produced upon detection of said intermediate storage means reaching a predetermined first degree of filling,

and said second alarm signal being produced upon detection of said second memory reaching a predetermined second degree of filling; and

said measuring means further including blocking means, including a delay unit, responsive to said first alarm signal for blocking said first read command signal after a predetermined first delay produced by said delay unit.

4,040,028

DATA PROCESSING SYSTEM COMPRISING INPUT/OUTPUT PROCESSORS

Mira Pauker, Bievres; Jean Gobert, Gentilly; Denis Pottier, Antony, and Louis Quere, Sceaux, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 28, 1975, Ser. No. 581,708

Claims priority, application France, May 28, 1974, 74.18468

Int. Cl.[2] G06F *3/02, 9/18*

U.S. Cl. 364—900 **5 Claims**

1. A data processing system comprising

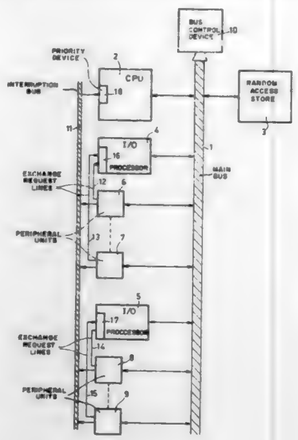
a central processor unit;

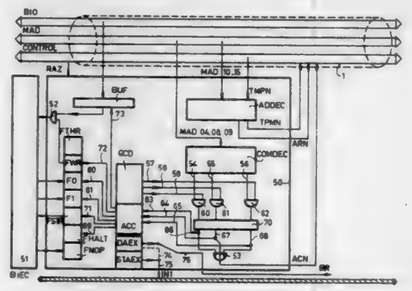
a random-access store unit; connected to said central processor;

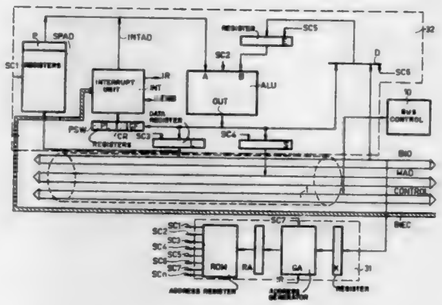
a group of peripheral units for conveying address information, control information and data;

an I/0 unit for processing input/output commands and for controlling the exchange of data to one of peripheral units of said group of peripheral units;

a bus for connecting said processor unit and each of said other units in parallel, said processor and said I/0 unit each having a relative priority in the system;







request means in said central processor unit and in said I/0 unit for generating a request signal in order to gain control of the bus;

selection means in said bus for selecting the unit having the highest priority which has generated a request signal;

means in said central processor unit for successively initiating the I/0 unit for processing the input/output commands, and ones of said peripheral units which will be

requested to perform a task by the program currently being executed in the central processor unit;

means for requesting an exchange in each peripheral unit, and for generating an exchange request signal for the said unit for processing the input/output commands, said request signal being transmitted over a special line;

detecting means in said I/0 unit for processing input/output commands for detecting the exchange request signals originating from one of said peripheral units for generating a request to gain control over the bus, after detection of the presence of at least one of said request signals;

I/0 processing means in said I/0 unit for connecting, via the bus, said peripheral unit to the random-access store for executing and controlling a data transfer between said peripheral unit and said central processing unit;

interruption request means in each peripheral unit which, after completion of an information transfer from or to said peripheral unit, generate an interruption signal in order to signal the central unit that the transfer has been completed;

an interruption bus along which said peripheral units and said central processor unit are connected in parallel, each peripheral unit and the central processor unit having a relative priority within the system, each unit being capable of dispatching, independent of any other activity occurring on the bus, an interruption request signal to the central unit so as to interrupt the completion of the current program in the central unit, the task of the unit having the highest priority and having submitted an interruption request signal then being performed first; and

means for addressing said peripheral units and said random access store unit and which, after the said processing unit has gained control over the bus, successively addresses, in the case of a data exchange between the central store and said peripheral units, said peripheral unit and subsequently the central store via the common address lines of the bus, all data being taken into account in the case of the transfer of data from said peripheral unit to the central unit, as of the instant at which said peripheral unit dispatches a receive signal to said one I/0 unit processing the input/output commands, while in the case of a transfer of data from the central store to said peripheral unit, said data are taken into account as of the instant at which the central store dispatches a receive signal to the unit processing the input/output commands, the data exchange between the store and said peripheral unit being performed in a multiplex mode.

4,040,029

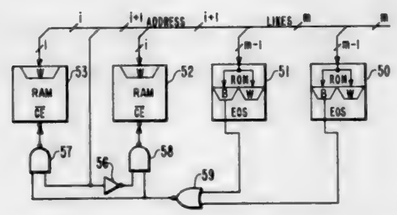
MEMORY SYSTEM WITH REDUCED BLOCK DECODING

Alexander Wilson Young, High Bridge, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,576

Int. Cl.[2] G06F *13/00;* **G11C** *7/00*

U.S. Cl. 364—900 **3 Claims**



1. In a memory system comprising a plurality of memory module means for storing blocks of data, each memory module means including word address decoding means for selecting a word stored in said memory module means and enabling means for reading out from said memory modules means the word selected by said word address decoding means, the improvement comprising:

a separate block address decoding means included in each one of said plurality less one of said memory module means for producing an output signal to the enabling means of its associated memory module means;

means responsive to the output signals from said block address decoding means for producing a select signal when none of said plurality less one of said memory module means is enabled; and

means for coupling said select signal to the enabling means of said one of said memory module means to enable said one of the memory module means when none of said plurality less one of said memory module means when none of said plurality less one of said memory module means is enabled.

4,040,030

COMPUTER INSTRUCTION CONTROL APPARATUS AND METHOD

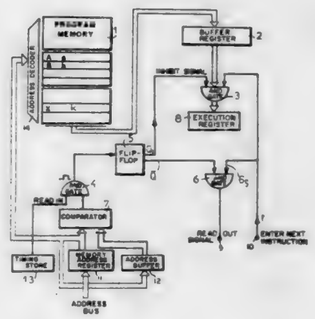
Jean-Claude Marcel Cassonnet, Conflans-Ste-Honorine, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 12, 1974, Ser. No. 460,467

Claims priority, application France, Apr. 13, 1973, 73.13502

Int. Cl.[2] G06F *9/00*

U.S. Cl. 364—200 **8 Claims**



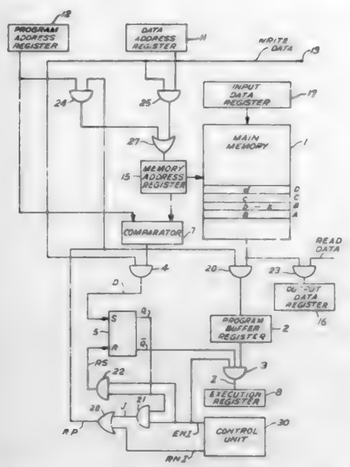
4. In a data processing system including an addressable program instruction memory, a buffer register connected to said addressable program instruction memory for storing at least a portion of an instruction read from one address of the program memory, an execution register for storing the contents of said buffer register, the improvement comprising means connected between an output of the buffer register and an input of the execution register for loading the contents of the buffer register into the execution register in response to an address of the instruction which has been read into the buffer register differing from the address of a next instruction which is to be written into the addressable program instruction memory and for preventing the contents of the buffer register from being loaded into the execution register in response to the address of the instruction which has been read into the buffer register being the same as the address of the next instruction which is to be written into the addressable program instruction memory.

4,040,031

COMPUTER INSTRUCTION CONTROL APPARATUS AND METHOD

Jean-Claude Marcel Cassonnet, Conflans-Ste-Hororine, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Continuation-in-part of Ser. No. 460,467, April 12, 1974. This application Jan. 14, 1975, Ser. No. 540,820
Claims priority, application France, Apr. 13, 1973, 73.13502
Int. Cl.² G06F *9/00*
U.S. Cl. 364—200 **5 Claims**



1. In a data processing system including an addressable memory for memorizing program instructions or data, a memory address register connected to said addressable memory for storing the address of an instruction program or data to be read from or written into the addressable memory, a buffer register connected to said addressable memory for storing at least a portion of the instruction or for storing the data read at one address of the addressable memory, an execution register for storing the contents of said buffer register, the improvement comprising means connected between an output of the buffer register and an input of the execution register for loading the contents of the buffer register into the execution register in response to an address of the instruction which has been read into the buffer register differing from the address of a next instruction which is to be written into the addressable memory and for preventing the contents of the buffer register from being loaded into the execution register in response to the address of the instruction which has been read into the buffer register being the same as the address of the next instruction which is to be written into the addressable memory.

4,040,032

PERIPHERAL DEVICE CONTROLLER FOR A DATA PROCESSING SYSTEM

Philip Michael Kreiker, Framingham, Mass., assignor to Data General Corporation, Westboro, Mass.

Filed Feb. 27, 1976, Ser. No. 662,179
Int. Cl.² G06F *3/04, 15/20, 9/14*
U.S. Cl. 364—200 **4 Claims**

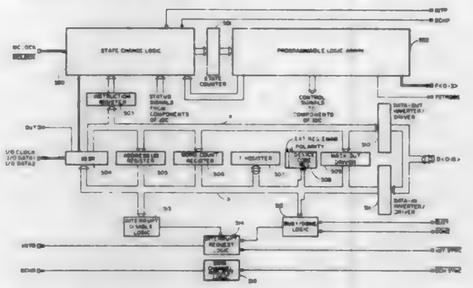
1. In data processing system including (a) a CPU, (b) a main memory interfacing with said CPU, (c) I/O means, including an I/O bus having a plurality of peripheral device transceivers displaced along said bus and each of said transceivers being directly connected to said bus, for directly connecting between said CPU and a like plurality of peripheral devices, and (d) a clock source for providing timing pulses to said system, device controller means contained within said I/O means for transmitting and receiving signals between (i) each of said plurality of peripheral devices and (ii) both each respective one of said plurality of transceivers and said CPU, said device controller means comprising a like plurality of individual device controllers, each respective one of said controllers comprising:

shift register means for serially receiving an input group of said signals from said respective one of said transceivers and for serially transmitting an output group of said signals to said respective one of said transceivers;

first bus means for parallel conducting representations of certain of said input group of signals from said shift register means to at least the respective peripheral device;

second bus means for parallel conducting representations of certain of said output group of signals from at least said respective peripheral device to at least said shift register means;

other register means connected between said first bus means and said second bus means for (1) parallel receiving representations of said input group of signals from said first bus means, (2) temporarily storing said representations, and (3) parallel transmitting representations of said output group of signals to said second bus means;



instruction register means connected from said first bus means for storing an instruction derived from said representations of certain of said input group of signals;

programmable logic array means, having stored therein information representative of logic states of said respective one of said controllers, for controlling said respective one of said device controllers to operate in one of said logic states;

state change logic means, responsive to at least (1) said one of said logic states from said programmable logic array means and (2) said instruction from said instruction register means, for selecting another of said logic states as the next successive one of said logic states after termination of said one of said states; and

bypass means connected from said second bus means and from a respective one of said devices for conducting other of said signals relating to requests by said one of said plurality of peripheral devices and by said CPU for certain operations of said main memory directly between said respective one of said controllers and said CPU in a conductive path that does not include said respective one of said transceivers.

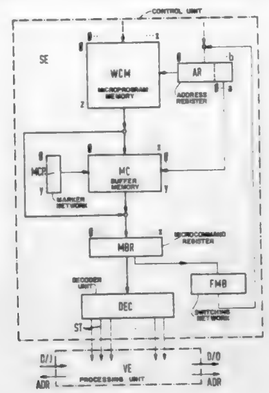
4,040,033

MICROPROGRAMMABLE DATA PROCESSOR WITH A MICROPROGRAM BUFFER MEMORY

Waldemar Strutynski, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 18, 1976, Ser. No. 668,060
Claims priority, application Germany, Mar. 20, 1975, 2512270
Int. Cl.² G06F *9/16*
U.S. Cl. 364—200 **3 Claims**

1. In a microprogrammable data processor having a writable control memory with an access time which is greater than the machine cycle, and a control unit for deriving control signals from microcommands stored in said writable control memory comprising: an address register connected to selection inputs of said writable control memory for addressing the same; a microcommand register connected in parallel for selective operation to the information outputs of said writable control memory and to outputs of a buffer memory having inputs connected to the outputs of said writable control memory and an access time which is considerably less than that of said writable control memory and including a plurality of cells each capable of storing a microcommand, a decoder connected to said register for deriving control signals for the processor from a microcommand in said microcommand register; a switching network



connected between said microcommand register and said address register for forming the address of the following microcommand; addressing inputs of said buffer memory connected to said address register and said cells of said buffer memory selected by low-value bits of an entry in said address register; and a marker network connected to said buffer memory, said marker network responsive to the low-value bits of the entry in said address register to mark an entry in a corresponding storage position of said buffer memory so that the next of said microcommands to be operated is selected from said marked cell and loaded into said microcommand register.

4,040,034

DATA SECURITY SYSTEM EMPLOYING AUTOMATIC TIME STAMPING MECHANISM

Laszlo Antal Belady, Yorktown Heights, and Carlo John Evangelisti, Jefferson Valley, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 4, 1975, Ser. No. 637,492
Int. Cl.² G06F *1/04*
U.S. Cl. 364—200 **8 Claims**

1. A data security system for detecting security violations for programs and data within a data processing system, comprising:

a memory containing a plurality of storage sections;

time stamp storage means including a plurality of storage elements each of which is associated with a respective storage section of said memory;

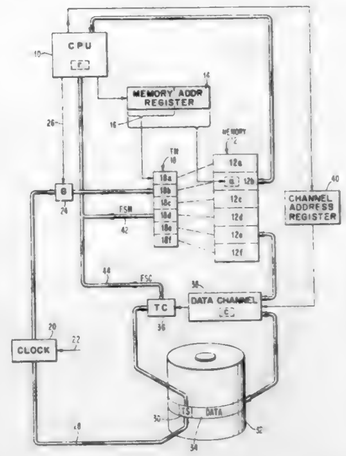
addressing means for locating both the memory storage section being read or written into as well as locating its associated time stamp storage element;

a continuously running clock providing a code indicating the time of day and date;

instruction register means for indicating the presence of system instructions for reading data from or writing data into said memory storage sections thus activating said addressing means; and

time stamp gating means, responsive to a data read or write instruction in said instruction register means, for entering the current time code from said clock into the addressed time stamp storage element associated with the data memory section being read from or written into;

time stamp retrieval means, for retrieving the time clock code from the time stamp storage elements selected by said addressing means, the retrieved time code having been stored in said addressed time stamp storage mans as



a result of an access thereto which immediately preceded the current access;

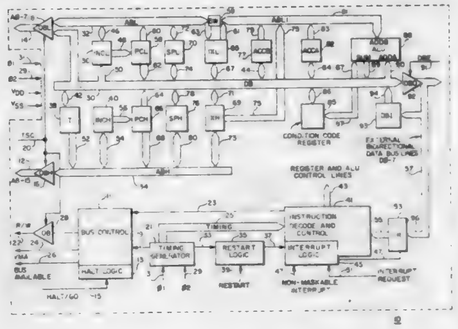
whereby the system indicates the time when the last read or write of data to each memory section occurred.

4,040,035

MICROPROCESSOR HAVING INDEX REGISTER COUPLED TO SERIAL-COUPLED ADDRESS BUS SECTIONS AND TO DATA BUS

Thomas H. Bennett; Earl F. Carlow, both of Scottsdale; Anthony E. Kouvoussis, Phoenix, all of Ariz.; Rodney H. Orgill; Charles Peddle, both of Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 519,150, Oct. 30, 1974. This application Sept. 18, 1975, Ser. No. 614,453
Int. Cl.² G06F *9/20*
U.S. Cl. 364—200 **4 Claims**



1. A microprocessor unit including a first address bus having a plurality of conductors, a data bus, a register coupled between said address bus and said data bus, and control means for effectig transfers of digital information in said microprocessor unit, said microprocessor unit also including means comprising:

a second address bus having a plurality of conductors;

bus switching means responsive to said control means coupled between said first and second address buses for controllably electrically coupling said conductors of said first

address bus to respective ones of said conductors of said second address bus;

index register means coupled to said data bus, said first address bus, and said second address bus for storing digital information to be utilized in an indexed addressing mode of operation;

first means responsive to said control means coupling said first address bus means to said index register means for controllably loading said index register means from said first address bus;

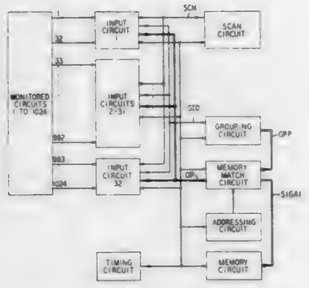
second means responsive to said control means coupling said index register means to said second address bus for controllably transferring information representative of contents of said index register means to said second address bus.

4,040,036

INPUT GROUPING ARRANGEMENT FOR DATA GATHERING

Sidney Dean Hester, Pickerington, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 26, 1976, Ser. No. 690,099
Int. Cl.[2] G06F *13/00*
U.S. Cl. 364—900 **19 Claims**



1. A system for gathering data pertaining to the statuses of a plurality of inputs, wherein from the start of input scanning the inputs are scanned one input at a time in a prescribed sequence, wherein an output common to all inputs detects input status data on successively scanned inputs, wherein input status data detected by the common output is stored in memory having addressable memory locations to which detected input status data is steered for storage according to generated memory location addresses, and wherein the improvement comprises an input grouping arrangement comprising

A. means for providing a succession of scan signals corresponding to the scanning of successive inputs,

B. means selectively settable to define groups of inputs with each group containing one or more successively scanned inputs,

C. means controlled jointly by the providing means and by the defining means to supply a succession of group signals corresponding to a succession of scanned groups,

D. and means controlled by the supplying means to generate a succession of different memory location addresses corresponding to the succession of group signals and to generate each such address during the scanning of each input of the corresponding group.

4,040,037

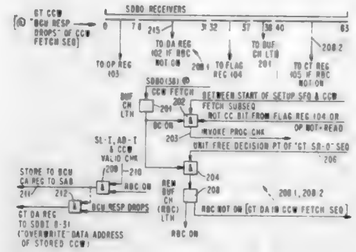
BUFFER CHAINING

Francis D. Lawlor, Hyde Park, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1976, Ser. No. 691,953
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—200 **24 Claims**

1. A method of transferring plural data blocks of unspecified length, supplied consecutively at an input-output interface, into storage facilities accessible to central processing facilities of a data processing system, comprising:

transferring one said data block into a series of successive address locations of said storage facility, starting at a pre-designated initial address and concluding at a final address associated with receipt of a concluding indication at said interface; and without interruption,



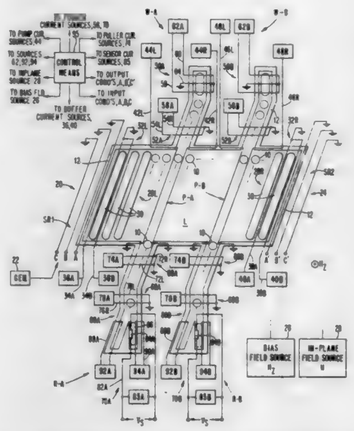
conditionally transferring a successive data block into another series of addresses in said storage facility starting at an initial address determined by applying a predetermined mathematical increment to a representation of said final address.

4,040,038

COLUMN ACCESSING OF ELEMENTS IN CONFINED ARRAYS

Laurence L. Rosier, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 2, 1974, Ser. No. 429,601
Int. Cl.[2] G11C *19/08*
U.S. Cl. 340—174 TF **54 Claims**



1. A method for extracting interactive elements from a confined two-dimensional lattice array of said elements which are spaced such that interactions exist between said elements in said array, wherein said method comprises

moving said elements in a first direction in said lattice array, and

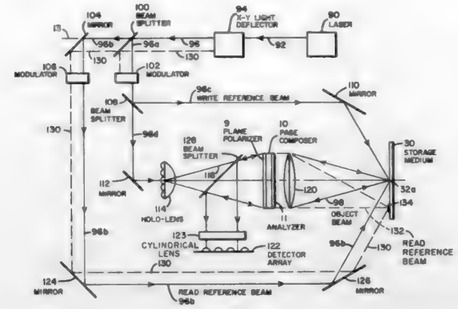
removing elements from said lattice array in a direction substantially transverse to said first direction.

4,040,039

SINGLE WALL DOMAIN LATRIX FOR OPTICAL DATA PROCESSING SYSTEM

Marlin M. Hanson, Cologne, and Ernest J. Torok, St. Paul, both of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 11, 1975, Ser. No. 603,891
Int. Cl.[2] G11C *11/02*
U.S. Cl. 340—174 YC **3 Claims**



1. In a page composer comprising a planar layer of magnetizable material in which single wall domains or bubbles may be sustained and moved about, D parallel conductive digit lines that are oriented parallel to the plane of said layer, W parallel conductive word lines that are oriented parallel to the plane of said layer and perpendicular to said parallel digit lines for forming DW memory areas, each memory area having four quadrants defined by the associated ones of said intersecting digit and word lines, and an opaque shield that is only oriented in the second, third and fourth quadrants of each of said DW memory areas for optically shielding a bubble except when in said first quadrant, the method of selectively moving the D bubbles that are associated with a selected one of said W word lines between said four quadrants, comprising:

selectively coupling a digit line half-select write current signal of a first or second and opposite polarity to said D digit lines;

selectively coupling a word line half-select write current signal of a first or second and opposite polarity to said selected one of said W word lines;

each of said digit line half-select write current signal and said word line half-select write current signal being individually of insufficient amplitude for substantially affecting the position of the bubble in the individually affected ones of D memory areas along the selected one of said W word lines, but collectively of sufficient amplitude for transferring said bubble between said first and said third quadrants in the collectively affected ones of said D memory areas;

selectively coupling a word line full-select store current signal of a first polarity to said selected one of said W word lines, said word line full-select store current signal being individually of sufficient amplitude for transferring the bubbles in the D memory areas along said one selected word line from a write 1 first quadrant and from a write 0 third quadrant to a store 1 second quadrant and to a store 0 third quadrant, respectively;

selectively coupling a word line full-select read current signal of the opposite second polarity as said word line full-select store current signal to said selected one of said W word lines, said word line full-select read current signal being of individually sufficient amplitude for transferring the bubbles in the D memory areas long said one selected word line from a store 1 second quadrant and from a store 0 third quadrant to a read 1 first quadrant and to a read 0 fourth quadrant, respectively; and,

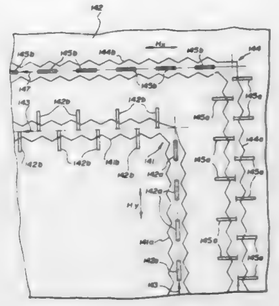
selectively coupling a word line full-select restore current signal of the same first polarity as said word line full-select store current signal to said selected one of said W word lines, said word line full-select store current signal being individually of sufficient amplitude for transferring the bubbles in the D memory areas along said one selected word line from a read 1 first quadrant and from a read 0 fourth quadrant to a store 1 second quadrant and a store 0 third quadrant, respectively.

4,040,040

CHANNEL BAR BUBBLE PROPAGATE CIRCUIT

Edward Della Torre, Toronto, and Witold Kinsner, Hamilton, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 29, 1976, Ser. No. 671,069
Int. Cl.[2] G11C *11/14, 19/00*
U.S. Cl. 340—174 TF **13 Claims**



1. A bubble domain propagate circuit for moving bubbles within a bubble supporting material comprising:

channel means formed in the bubble supporting material, for defining the bubble path, said channel means having periodically spaced stable bubble positions O separated by barrier positions X, and

magnetic means having a series of well defined poles P_1 and P_2 located over said channel means between the stable bubble positions O and near the barrier positions X to form a repeated pattern O, X, P_1, O, X, P_2, said poles P_1 and P_2 being periodically magnetized to opposite polarities by a first alternating transverse magnetic field to propagate a bubble along the channel means by producing forces on the bubble to move a bubble from a stable position across an adjacent barrier position.

4,040,041

TWIN-CAPACITIVE SHAFT ANGLE ENCODER WITH ANALOG OUTPUT SIGNAL

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Ronald J. Hruby, Campbell, and Robert L. Wilson, Santa Clara, both of Calif.

Filed Oct. 24, 1975, Ser. No. 625,781
Int. Cl.[2] G08C *19/00*
U.S. Cl. 340—200 **9 Claims**

7. Shaft encoder apparatus comprising:

first and second varible capacitors connected in tandem with a rotatable shaft, each of said variable capacitors having a capacitance that varies linearly with a change in the angular position of said shaft, the sum of the capacitances of said variable capacitors being constant over the complete range of rotation of said shaft;

first and second regulated d-c voltage supplies each having a positive and a negative output, said negative output of said first supply and said positive output of said second supply being grounded;

a terminal, each variable capacitor including a fixed plate

and a movable plate, said movable plates being connected to said terminal;

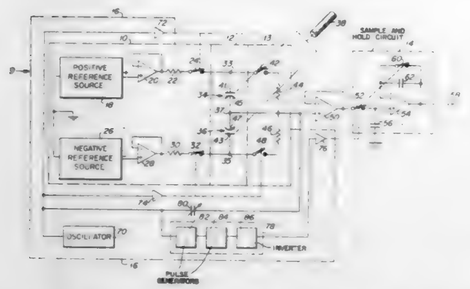
a first switch connected between said first supply positive output and said fixed plate of said first variable capacitor;

a second switch connected between said second supply negative output and said fixed plate of said second variable capacitor;

first and second resistors;

a third switch connected in series with said first resistor between said fixed plate of said first variable capacitor and said terminal;

a fourth switch connected in series with said second resistor between said fixed plate of said second variable capacitor and said terminal;



means for periodically opening and closing said first and second switches in synchronism;

means for periodically opening and closing said third and fourth switches in synchronism, said first and second switches being closed when said third and fourth switches are open, said first and second switches being closed long enough for each of said capacitors to fully charge to the level of its respective d-c voltage supply, said third and fourth switches being closed long enough for each of said capacitors to be fully discharged; and

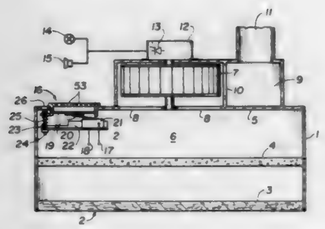
means coupled to said terminal for periodically sampling and holding the voltage appearing at said terminal, said voltage being a function of the angular orientation of said rotatable shaft.

4,040,042

EXHAUST APPARATUS AND MONITORING CIRCUIT THEREFOR

Horst Mayer, Wagenbergstrasse 33, Neheim-Huesten 2, Germany (5760)

Filed July 13, 1976, Ser. No. 704,947
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—239 F **14 Claims**



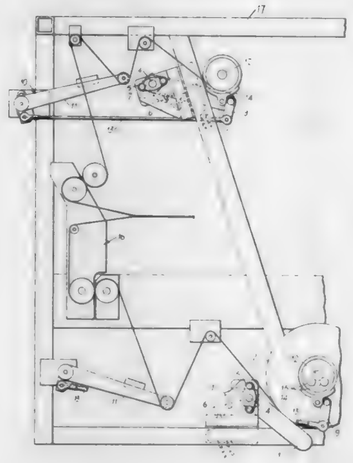
1. Exhaust apparatus comprising a housing, fan means operatively arranged in said housing, filter means opertively arranged in said housing to provide a space between the filter means and the fan means, motor means operatively connected to drive said fan means, an aperture in said housing to connect said space to the atmosphere, membrane switch means located in said aperture and responsive to predetermined pressure changes in said space, power consumption sensing means opertively connected to said fan drive motor means, alarm means, and electric circuit means operatively interconnecting said alarm means, said membrane switch means, and said consumption sensing means with a source of power to activate said alarm means in response to predetermined operating conditions of said exhaust apparatus.

4,040,043

FILM SENSING APPARATUS

Arthur Stanford, Richmond, Va., assignor to AMF Incorporated, White Plains, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,795
Int. Cl.[2] G08B *21/00*
U.S. Cl. 340—259 **2 Claims**



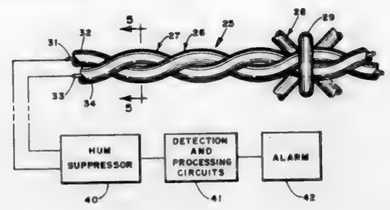
1. A film sensing apparatus for indicating the presence of a predefined amount of film remaining on a film supply reel, said reel being adapted to continuously dispense film from a freely moving film roll spindle for controlled movement of said spindle supported at each end upwardly and downwardly, including: supply sensing means disposed in proximity to said reel, responsive to a predefined quantity of film on said reel, said supply sensing means being defined by a sensing arm in contact with said film roll responsive to upward and downward movement of said spindle; brake means for engaging said film roll spindle in the absence of a designated film tension; and film tension sensing means disposed in proximity to said film being drawn from said film supply reel for governing movement between said brake means and said film spindle, said film tension sensing means moving angularly with respect to said film being drawn from said film supply reel in response to the tension of the film, said brake means movement in an upward direction being responsive to movement of said film tension sensing means in a downard direction, causing said film spindle to de-accelerate responsive to decreased tension and said tension sensing means to reverse its angular movement to urge said brake downward for disengagement from said spindle, permitting said spindle to travel upwardly and downwardly in an oscillatory manner.

4,040,044

DUAL LINE ELECTRET TRANSDUCER

Marvin D. Laymon, Milpitas, and G. Kirby Miller, Saratoga, both of Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed Aug. 30, 1976, Ser. No. 718,845
Int. Cl.[2] G08B *13/07*
U.S. Cl. 340—261 **3 Claims**



1. A system for detecting mechanical disturbances in a medium comprising

a pair of coextensive contiguous lines twisted in a longitudinal direction and in physical contact with said medium whereby disturbances in said medium are directly coupled to said lines, each of said lines comprising an elongated conductor and a dielectric jacket enclosing said conductor, at least one of said jackets constituting an electret whereby a disturbance in said medium changes the spacing between said one of said jackets and the conductor enclosed by the other jacket to produce an electrical signal across said conductors, and

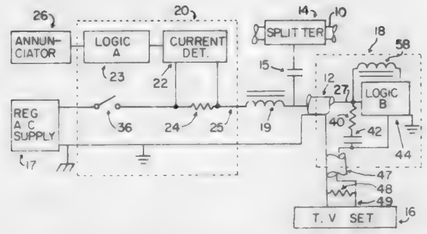
utilization apparatus connected to said conductors and responsive to said signal.

4,040,045

METHOD AND APPARATUS FOR CREATING AND DETECTING ALARM CONDITION USING A MASTER ANTENNA TELEVISION SYSTEM

Richard C. Osborne, 505 Nottingham, Richardson, Tex. 75080, and Richard L. Bickel, 9257 Meadowglen, Dallas, Tex. 75238

Filed May 27, 1975, Ser. No. 580,611
Int. Cl.[2] G08B *13/22*
U.S. Cl. 340—280 **13 Claims**



1. An alarm system for detecting disturbance of a television set connected by a tap to a trunk line of a MATV system and providing an alarm indication comprising:

a source of voltage of different character than television signals;

means connecting said source to said trunk line;

a resistor connected to provide a desired resistance to the flow of current of said different character between a conductor connecting the TV set to the tap and a point of common potential;

local audible alarm means located at a not readily accessible location in the vicinity of but external to the TV set;

detector means responsive to a change in the resistance between said conductor and said point of common potential for causing current of said different character to flow in said trunk line from said voltage source and pass through said local audible alarm means to sound an audible alarm;

central alarm means positioned at a central control location remote from said television set location for providing an alarm indication during an alarm condition on said trunk line; and

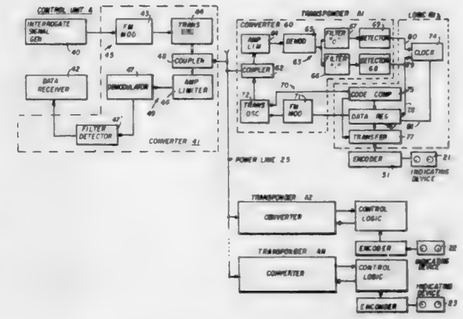
current detecting means coupled to said connecting means for sensing a change in the level of current of different character flowing through said connecting means caused by current flowing through said local audible alarm means, said current detecting means applying a signal defining an alarm condition to cause said central alarm means to provide said alarm indication responsive to a change in current level being sensed.

4,040,046

REMOTE DATA READOUT SYSTEM FOR TRANSMITTING DIGITAL DATA OVER EXISTING ELECTRICAL POWER LINES

George Long; Dennis J. Martell, both of Naperville, and James E. Batz, Northbrook, all of Ill., assignors to Northern Illinois Gas Company, Aurora, Ill.

Continuation of Ser. No. 444,249, Feb. 20, 1974, which is a continuation-in-part of Ser. No. 208,318, Dec. 15, 1971, abandoned. This application June 13, 1975, Ser. No. 586,997
Int. Cl.[2] H04M *11/04*
U.S. Cl. 340—310 CP **6 Claims**



1. In a system which employs AC electrical power lines for effecting selective readout of information registered on a plurality of register means, each of which is associated with a different one of a plurality of utility devices located within an electrically wired building complex having electrical power distribution conductors which are connected over a power distribution box and a service main for said complex to said power lines and which extend to a plurality of locations within said complex and supply power to standard electrical receptacles connected to said electrical power distribution conductors, certain ones of said electrical receptacles being located in the vicinity of the utility devices, each of said utility devices having plug means for connecting the utility device to one of the electrical receptacles for supplying power to the utility devices, while permitting convenient relocation of the utility devices, the improvement comprising an individual data transponder means for each of said register means for each utility device, each data transponder means including transmitter means operable when enabled to generate data signals which represent the information provided by an associated register means, and a power cord having an electrical plug adapted to be plugged into one of said electrical receptacles to connect said data transponder means to said power distribution conductors in said building complex to enable said data signals to be conducted over said power cord to said power distribution conductors, and a control transponder means coupled to the

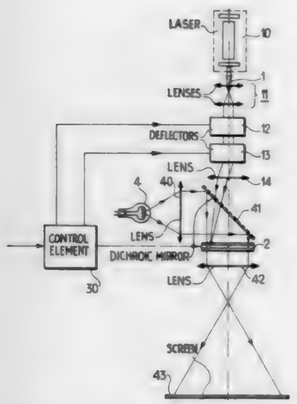
power distribution conductors for said building complex, including means responsive to interrogate signals provided by an interrogate means located externally of said building complex to provide enabling signals for transmission over the electrical power distribution conductors in said building complex to said transmitter means, and receiver means in said control transponder means including means for receiving said data signals which are transmitted over said building complex power distribution conductors by each of the plurality of data transmitters and means for transmitting the information to said interrogate means over a communication link which effectively bypasses said power distribution box and said service main.

4,040,047

ERASABLE THERMO-OPTIC STORAGE DISPLAY OF A TRANSMITTED IMAGE

Michel Hareng; Serge Le Berre, and Erich Spitz, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed June 10, 1975, Ser. No. 585,715
Claims priority, application France, June 14, 1974, 74.20715
Int. Cl.[2] G06F *3/14*
U.S. Cl. 340—324 R **14 Claims**



1. A method of successively inscribing, storing and erasing in a film at least one image transmitted under the form of a video-signal voltage, said method comprising:

an inscription step during which each point of said film corresponding to a point of said image is successively submitted to a temporary heating from a first to a second temperature and consecutively cooled from said second to said first temperature; said first and second temperature being substantially identical in every said point; said video-signal voltage being simultaneously applied to the whole of said points for spatially modulating an optical characteristic of said film;

a storing step, during which said film being maintained at said first temperature, a null voltage is applied to the whole of said points;

an erasure step, during which said film being maintained at said first temperature, a constant erasure voltage is simultaneously applied to the whole of said points.

4,040,048

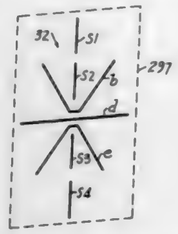
DISPLAY OF MATHEMATICAL EQUATIONS

Ming T. Lien, 5603 Lodi St., San Diego, Calif. 92117

Filed Mar. 10, 1975, Ser. No. 557,131
Int. Cl.[2] G09F *9/32*
U.S. Cl. 340—336 **8 Claims**

1. In apparatus for displaying a mathematical equation, the improvement comprising in combination:

means for displaying mathematical signs, including a first straight segment electrode for displaying a minus sign, a pair of essentially V-shaped second and third segment electrodes having apices located adjacent a midportion of said first segment electrode and being essentially symmetrically disposed relative to said first segment electrode for displaying a multiplication sign, a pair of fourth and fifth segment electrodes extending at an angle to, and being essentially symmetrically disposed relative to said first segment electrode, said fourth segment electrode being located essentially midway between the legs, and spaced from the apex, of said V-shaped second electrode, and said fifth segment electrode being located essentially midway between the legs, and spaced from the apex, of said V-shaped third electrode, a pair of sixth and seventh segment electrodes aligned with said fourth and fifth segment electrodes and essentially symmetrically disposed relative to said first segment electrode, said sixth segment electrode being located between said fourth segment electrode and the apex of said V-shaped second electrode, and said seventh segment electrode being located between said fifth segment electrode and the apex of said V-shaped third electrode, a further electrode spaced from and common to said first, second, third, fourth, fifth, sixth and seventh segment electrodes, and an electrically excitable, optically active medium between said common electrode and said segment electrodes; and



means connected to said displaying means for selectively energizing said means for displaying mathematical signs, said energizing means including means connected to said common electrode and to said segment electrodes for selectively energizing said common electrode and said first segment electrode for a display of a minus sign by said optically active medium, for selectively energizing said common electrode and said second and third segment electrodes for a display of a multiplication sign by said optically active medium, for selectively energizing said common electrode and at least said first, sixth and seventh segment electrodes for a display of a plus sign by said optically active medium, and for selectively energizing said common electrode and at least said fourth and fifth segment electrodes for a display of a division sign by said optically active medium.

4,040,049

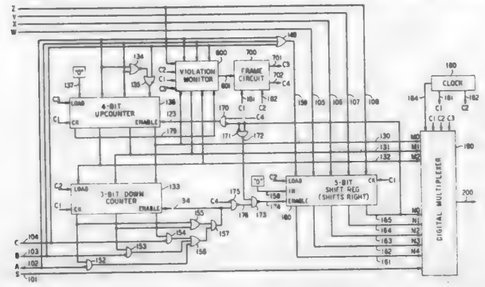
TANDEM BLOCK DIGITAL PROCESSOR FOR USE WITH NONUNIFORMLY ENCODED DIGITAL DATA

David Gavin Messerschmitt, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 9, 1975, Ser. No. 621,130
Int. Cl.[2] H03K *13/24*
U.S. Cl. 340—347 DD **12 Claims**

1. In a digital communication system, apparatus for processing a first block of digital characters, each character in said first block having segment bits and mantissa bits, said segment bits corresponding to a value, said processor apparatus including means responsive to a maximum segment value for developing a second block of digital characters, each character in said second block having at least one fewer bit than a corresponding character in said first block and CHARACTERIZED IN THAT said processor apparatus further comprises:

means responsive to a predetermined character in said first block for determining said maximum segment value, said maximum value being equal to the additive sum of the value of a first function of said segment bits of said predetermined character plus the value of a second function of a predetermined bit pattern in said mantissa bits of said predetermined character whereby each character in said second block is developable in response to a difference between said maximum segment value and a value of the segment bits of a character in said first block

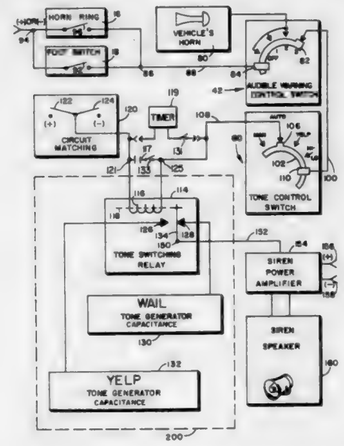


4,040,050

EMERGENCY VEHICLE AUDIBLE WARNING SYSTEM

Ewing D. Nunn, Jr., 2900 Madison, Apartment B-32, Fullerton, Calif. 92631

Continuation-in-part of Ser. No. 216,002, Jan. 7, 1972, Pat. No. 3,868,684. This application Feb. 18, 1975, Ser. No. 550,417
Int. Cl.[2] G08B *3/00*
U.S. Cl. 340—384 E **10 Claims**



1. An improved audible warning system in combination with an emergency vehicle comprising:

a tone generating circuit for generating a signal to provide a first siren sound from a low to high pitch at a prescribed frequency between the low and high pitch in the form of a wail tone;

a siren speaker operatively connected to said tone generating circuit;

a suitable power supply for operating the system;

capacitance means within said tone generating circuit to effectuate the prescribed frequency between the high and low pitch;

switch means connected to said capacitance means to eliminate at least a portion of said capacitance in said tone generating circuit to create a tone signal between the high and low pitch at a greater frequency than the prescribed frequency of the first tone in the form of a yelp tone when said switch means is actuated by the horn switch of an automobile; and,

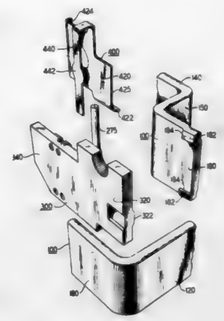
timing means for maintaining the switch means in operative position to create the greater frequency between the high and low pitch for a prescribed period of time.

4,040,051

ELECTROMAGNETICALLY OPERATED AUDIBLE SIGNAL GENERATOR

Robert Joseph O'Connor, Greenfield, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 4, 1976, Ser. No. 738,970
Int. Cl.[2] G10K *9/12*
U.S. Cl. 340—397 **10 Claims**



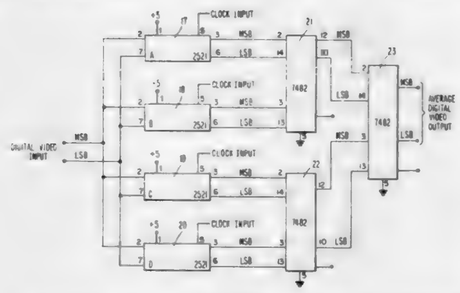
1. An electromagnetically operated audible signal generator comprising a coil, a pole piece, an armature movably mounted with respect to the pole piece so that one end of the armature approaches the pole piece upon energization of the coil, characterized in that the pole piece has a pair of spaced protrusions that extend toward the one end of the armature, a cantilever spring member is supported on the pole piece so as to extend between the spaced protrusions, and the one end of the armature has a protrusion that extends toward the pole piece and is located so as to engage the portion of the spring member in between the spaced protrusions of the pole piece.

4,040,052

DIGITAL VIDEO SIGNAL PROCESSING CIRCUIT

David L. Stanislaw, Hatfield, Pa., assignor to Aradar Corporation, Horsham, Pa.

Filed June 29, 1976, Ser. No. 700,894
Int. Cl.[2] G01S *7/44*
U.S. Cl. 343—5 VQ **2 Claims**



1. A digital radar video averaging circuit for processing input periodic two-bit digital signals, each period comprising *n* two-bit signals, said circuit comprising:

a. Four dual n-bit shift registers, each dual shift register having a most significant bit input terminal, a least signifi-

cant bit input terminal, a most significant bit output terminal, a least significant bit output terminal, and a clock input terminal, the said two-bit digital signals being applied simultaneously to the four dual shift registers through parallel connections of the least significant bit and most significant bit input terminals;

b. Clock means to enable the four dual shift registers to sequentially store successive periods of the input signals such that a first period of *n* two-bit signals is stored in a first shift register, the second period of n two-bit signals is stored in a second shift register, the third period of n two-bit signals is stored in a third shift register and the fourth period of n two-bit signals is stored in a fourth shift register;

c. Clock means to shift the four dual shift registers simultaneously after the fourth shift register has been filled;

d. First addition and division means to sum and divide by two the outputs of said first and second dual shift registers;

e. Second addition and division means to sum and divide by two the outputs of said third and fourth dual shift registers;

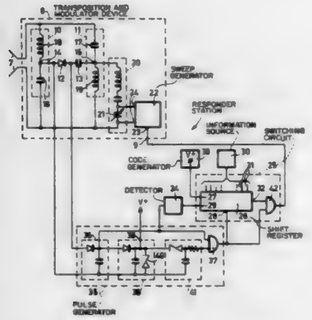
f. Third addition and division means to sum and divide by two the output of the first and second addition and division means, to produce an averaged two-bit digital output signal.

4,040,053

TRANSPONDER SYSTEM FOR THE TRANSFER OF SIGNALLING INFORMATION FOR RAIL-BOUNDED VEHICLES

Kjell Olow Ingemar Olsson, Jarfalla, Sweden, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 18, 1975, Ser. No. 605,528
Claims priority, application Sweden, Aug. 16, 1974, 7410476
Int. Cl.[2] G01S *9/56*
U.S. Cl. 343—6.5 R **3 Claims**



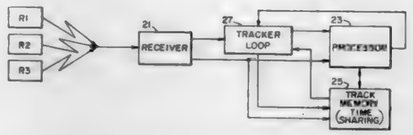
1. A transponder system for the transfer of signalling information for rail-bounded vehicles comprising an interrogator station and a passive responder station activated by the energy of a signal received from said interrogator station, said interrogator station being provided with a pulse generator for the continuous transmission of a pulsed interrogation signal with a given carrier frequency, said responder station being provided with a frequency transposition device for the transposition of received pulses with the given carrier frequency to a harmonic of this frequency, with a modulator coupled with the transposition device, and an information source coupled to the modulator for the modulation of the frequency transposed pulses in accordance with the information to be transmitted to the interrogation station whereby the interrogator station is provided with a detector for the detection of received frequency transposed pulses, said information source being coupled via a switching circuit to the modulator, the responder station being provided with a code generator coupled via the switching circuit to the modulator for the transmission of a continuous sequency of predetermined modulated reply pulses in response to received interrogation pulses, the interrogation station being provided with a decoder connected to the detector for the identification of an uninterrupted sequence of a predetermined number of said modulated reply pulses, whereby the decoder is coupled with the pulse generator for the insertion of a predetermined starting signal in the interrogation signal after the detection of the predetermined number of modulated reply pulses, and the responder station being provided with a start signal detector coupled to the switching circuit for the transmission of a reply pulse sequence modulated in accordance with the information to be transmitted in response to the detection of a starting signal.

4,040,054

TRACKING OF RADAR SIGNALS

Kelly C. Overman, Pikesville, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 27, 1975, Ser. No. 608,305
Int. Cl.[2] G01S *9/02*
U.S. Cl. 343—7 A **17 Claims**



1. Apparatus for tracking a plurality of radar threats each threat including a train of pulses, the said apparatus including:

means for processing said threats to determine the frequency, pulse repetition interval, and predicted times of arrival parameters of each of said threats;

means for separately storing the frequency, pulse repetition interval, predicted time of arrival for each of said threats; and

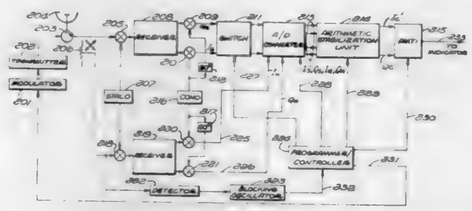
time multiplexing means connected to said storing means and sequentially responsive to the parameters of each of said threats for correcting the parameters to set each of said threats in tracked condition.

4,040,055

DIGITAL COMPENSATOR FOR TRANSMITTER INSTABILITY

Thomas H. Donahue, and David E. Hammers, both of Los Angeles, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 15, 1974, Ser. No. 488,726
Int. Cl.[2] G01S *9/42*
U.S. Cl. 343—7.7 **6 Claims**



1. A digital MTI radar system including means for transmitting pulses of radio frequency energy comprising:

a first receiver responsive to echo signals resulting from said transmitted pulses, said first receiver including first and second phase detectors for providing I_r and Q_r signals, where I_r is the in-phase received signal component and Q_r is the quadrature received signal component;

means for providing samples of said radio frequency energy;

a second receiver responsive to said samples of radio frequency energy, said second receiver including first and second phase detectors for providing I_m and Q_m signals, where I_m is the in-phase transmitted signal component and Q_m is the quadrature signal component;

digital conversion means responsive to said first and second receiver outputs to digitize said I_r, Q_r, I_m and Q_m signals;

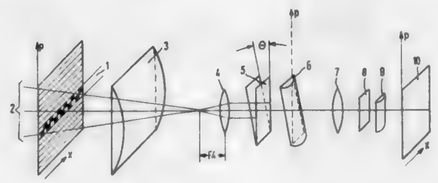
and compensating means responsive to said digital conversion means for generating compensated phase detector signals I_c and Q_c, said compensating means including digital arithmetic computing means for solving the equations $I_c = I_r I_m + Q_r Q_m$ and $Q_c = I_r Q_m - Q_r I_m$.

4,040,056

METHOD FOR ABERRATION-FREE OPTICAL RECORDING OF HIGHLY RESOLVED SONAR OR RADAR MAPS

Dietlind Pekau, Krailling, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 342,303, March 12, 1973, abandoned. This application June 3, 1975, Ser. No. 583,460
Claims priority, application Germany, Mar. 30, 1972, 2215508
Int. Cl.[2] G01S *7/04, 9/02;* G02B *27/00*
U.S. Cl. 343—17 **3 Claims**



1. A method for coherently optically reconstructing one-dimensional holograms for sonar or radar maps, comprising the steps of illuminating a one-dimensional holgram with a coherent beam to produce holographic transmission along an optical axis, and transposing a reconstruction plane by an angle into the image plane which is perpendicular to the optical axis so that the image distance and the image enlargement are independent of distance.

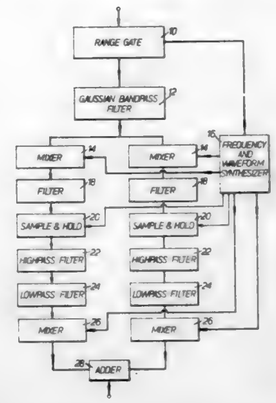
4,040,057

CLUTTER FILTER FOR PULSE DOPPLER RADAR

Malcolm Geoffrey Cross, Colchester, and John Howard Dawson, Chelmsford, both of England, assignors to The Marconi Company Limited, England

Filed Nov. 3, 1975, Ser. No. 628,544
Claims priority, application United Kingdom, May 14, 1975, 20242/75
Int. Cl.[2] G01S *7/28*
U.S. Cl. 343—17.1 PF **5 Claims**

1. A clutter filter for a Pulse Doppler Radar in which the p.r.f. of the transmitted pulse is changed during the time taken to scan across a given target, the filter including a bandpass filter operative to receive signals derived from echo pulses and serving to reduce the frequency spectrum of the signals, frequency changing means for reducing the frequency of the output signals of the bandpass filter such that the resultant signals have a frequency less than the lowest p.r.f. of the radar for all targets travelling at less than a predetermined velocity, a sample-and-hold circuit arranged to sample the output of the frequency changing means at times related to the prevailing p.r.f. of the Radar and filter means for smoothing abrupt signals transition in the output signals of the sample-and-hold



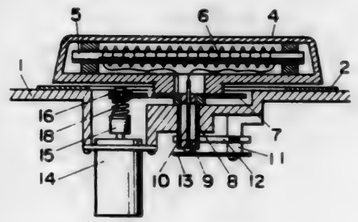
circuit and for attenuating frequency components resulting from undesired stationary and slow moving objects.

4,040,058

DIRECTION FINDER

Kenzo Mori, Tokyo; Fumio Kakuchi, Chofu, and Kimio Fujii, Tokyo, all of Japan, assignors to Taiyo Musen Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1975, Ser. No. 555,301
Claims priority, application Japan, Mar. 28, 1974, 49-34463[U]
Int. Cl.[2] G01S *5/02*
U.S. Cl. 343—113 PT **2 Claims**



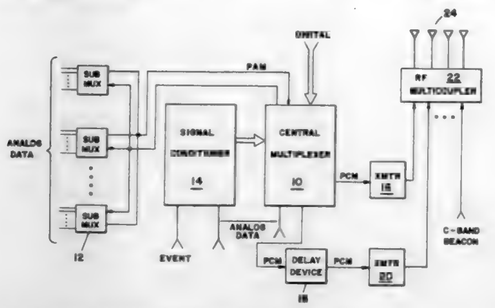
1. In an automatic direction finder which comprises a combined handle and index rotatably pivoted at the center of a direction dial provided above a case, a loop antenna means contained within said index, a gear of a sufficiently large diameter fixed to said index, a direct current servomotor provided on the inside surface of said case so that an automatically controlled output of said antenna means obtained from the output of said antenna means may be given to it and a pinion connected with said direct current servomotor and meshed with said gear of the large diameter, said automatic direction finder characterized by that a frictional power transmitting means composed of said pinion, a spring, a seat plate, and a relay shaft is provided between said direct current servomotor and said gear of the large diameter, whereby said automatic direction finder can be manually operated.

4,040,059

MISSILE BODY TELEMETRY SYSTEM

Robert W. Simons, Santa Clara, and Martin G. Troop, Sunnyvale, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 30, 1976, Ser. No. 718,488
Int. Cl.[2] H04J *3/00*
U.S. Cl. 343—203 **9 Claims**



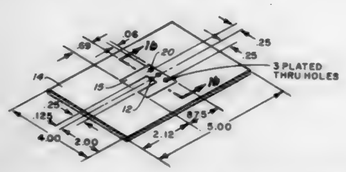
1. A missile telemetry system comprising:
a. means for converting analog data into a serial pulse amplitude modulated (PAM) data stream;
b. a central multiplexer to convert said PAM data, analog data, bi-level data and high frequency digital data into a pulse code modulated (PCM) non return to zero-level (NRZ-L) bit stream in the form of digital words, said high frequency digital and bi-level data being word-interlaced with said PAM and analog data, said central multiplexer also providing timing for elements of said telemetry system;
c. a solid state delay device to provide a delayed PCM bit stream from said PCM bit stream; and
d. means for transmitting both said PCM bit stream from said central multiplexer and said delayed PCM bit stream from said solid state delay device to a receiving station.

4,040,060

NOTCH FED MAGNETIC MICROSTRIP DIPOLE ANTENNA WITH SHORTING PINS

Cyril M. Kaloi, Thousand Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 10, 1976, Ser. No. 740,697
Int. Cl.[2] H01Q *1/38, 9/28*
U.S. Cl. 343—700 MS **13 Claims**



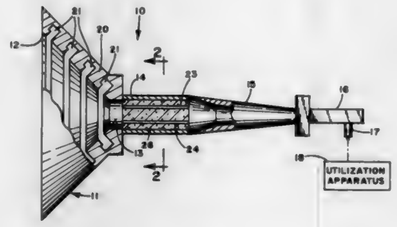
1. A notch fed magnetic microstrip dipole antenna having low physical profile and conformal arraying capability, comprising:
a. a thin ground plane conductor;
b. a thin rectangular radiating element having a notch extending into said element from one end thereof along the centerline of the element length, said element being spaced from said ground plane;
c. said radiating element being electrically separated from said ground plane by a dielectric substrate;
d. said radiating element being shorted to the ground plane at one end of the length thereof;
e. said radiating element having an optimum feed input located along the centerline of the length thereof at the inner end of said notch;
f. the length of said radiating element determining the resonant frequency of said antenna;
g. the antenna input impedance being variable to match most practical impedances as said feed point is moved along said centerline without affecting the antenna radiation pattern;
h. the antenna bandwidth being variable with the width of the radiating element and the spacing between said radiating element and said ground plane, the width of said notch being a factor as to the effective width of said element, said spacing between the radiating element and the grond plane having somewhat greater effect on the bandwidth than the element width.

4,040,061

BROADBAND CORRUGATED HORN ANTENNA

Craig G. Roberts, and Samuel Chung-Shu Kuo, both of Saratoga, Calif., assignors to GTE Sylvania Incorporated, Mountain View, Calif.

Filed June 1, 1976, Ser. No. 691,322
Int. Cl.[2] H01Q *13/02*
U.S. Cl. 343—786 **8 Claims**



1. An antenna system comprising
a corrugated horn antenna having an inner surface formed with broadband slots and having an aperture with a predetermined shape and a correspondingly shaped feed port,
waveguide means connected to said port, said waveguide means comprising
a ridged rectangular waveguide,
a tapered transition waveguide connected to said ridged waveguide, and
an intermediate waveguide connected between said transition waveguide and the feed port of said horn, said intermediate waveguide having the same cross-sectional shape as said feed port, and
hybrid mode suppressor means disposed within said intermediate waveguide whereby to suppress hybrid wave modes in said horn and correspondingly increase its operating bandwidth.

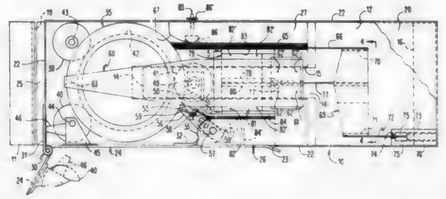
4,040,062

RECORDING INSTRUMENT

Richard H. Prewitt, Jr., 439 N. Broadway, Lexington, Ky. 40508, and Richard H. Prewitt, R.R. No. 3, Lexington, Ky. 40505

Filed Oct. 14, 1975, Ser. No. 622,229
Int. Cl.[2] G01D *9/00, 15/02, 15/16;* F16C *11/00*
U.S. Cl. 346—7 **35 Claims**

1. A recording instrument comprising first and second support means, marking means supported by said first support means, a target for recording motions in at least one of opposite senses by marks formed on said target due to movement of said marking means, said target being mounted on said second support means for movement relative thereto, said target having a groove in its periphery, target moving means adapted to engage said target to move said target intermittently in one direction in response to motions between said first and second support means, said target being removably mounted on said second support means, the improvement including:



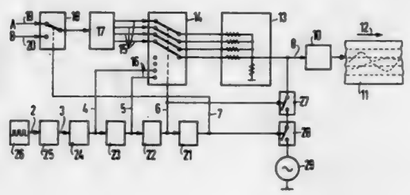
target support means supported by said second support means and engaging the bottom of said groove of said target to support said target.

4,040,063

RECORDING DEVICE FOR PLOTTING THE CURVE OF AT LEAST ONE MEASURED QUANTITY

Kurt Karl Henrik Alexander Berglund, Solna, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 15, 1975, Ser. No. 596,084
Claims priority, application Germany, July 19, 1974, 2434963
Int. Cl.[2] G01D *9/34*
U.S. Cl. 346—23 **8 Claims**



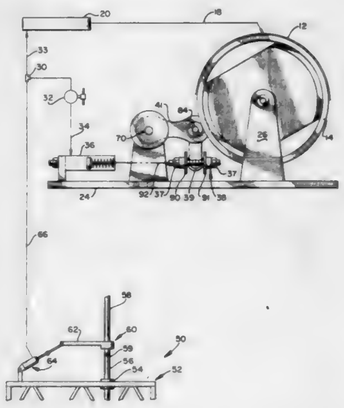
1. In a recording device for plotting the curve of at least one measured quantity produced by an electrical signal, including a recorder; a recording carrier adapted to have indicia plotted thereon by said recorder; and means for producing relative movement between said recorder and recording carrier in two approximately perpendicular directions, the improvement comprising: a generator for a reference line signal; at least one generator for a measured quantity signal; a time multiplexer for alternately periodically connected a control input of said recording device to said reference line signal generator and to said measured quantity signal generator in successive recording positions of the recording carrier relative to the recorder with respect to a given direction of relative movement, said recorder comprising an ink jet operable to record indicia on the recording carrier over a range of transverse positions successively offset in a transverse direction transverse to said given direction of relative movement and the successive recorded indicia being displaced in said transverse direction in accordance with the successive instantaneous input signal magnitudes supplied to the control input of said recording device, said reference line signal generator being operable in each cycle of operation thereof for sequentially generating a set of different discrete reference signal magnitudes representing respective different discrete reference levels and corresponding to successively greater displacements of the indicia in said transverse direction, and means controlling said reference line signal generator to sequentially generate the successive discrete reference signal magnitudes in each of a succession of cycles of operation thereof, and controlling said time multiplexer to alternately supply successive ones of the discrete reference signal magnitudes occurring during a given cycle and successive instantaneous values of the measured quantity signal to said control input of said recording device whereby indicia are recorded on the recording carrier alternately according to successive different discrete reference signal magnitudes and according to successive instantaneous values of the measured quantity signal so that a plurality of sets of reference line indicia are plotted in a sequence of first nonadjacent recording positions along the recording carrier in said given direction of relative movement and successive measured quantity indicia are plotted on said recording carrier in a sequence of second nonadjacent recording positions interleaved with respect to said given direction relative to said first nonadjacent recording positions, thus to define a plurality of parallel reference lines which are recognizable along the extent of plot of the measured quantity indicia supplied by said measured quantity signal generator.

4,040,064

FLUID PRESSURE ACTUATED RECORDER

Harry Boucher, P.O. Box 1849, Odessa, Tex. 79760

Filed Sept. 13, 1976, Ser. No. 722,640
Int. Cl.[2] G01D *9/02*
U.S. Cl. 346—72 **12 Claims**



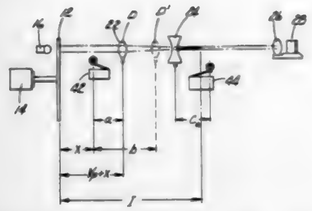
1. Recorder apparatus comprising a cylindrical chart means, means mounting said cylindrical chart means for rotation in only one direction about the central axis thereof; a scribe means positioned to place indicia on said chart means upon occurrence of relative movement between said chart and said scribe means;
a first pressure responsive means connected to move said scribe means in one plane along said chart to form indicia related to a curve, with the length of the curve being proportional to the magnitude of pressure effected upon said pressure responsive means;
a second pressure responsive means, including a fluid motor, connected to move said chart means one increment of travel in another direction respective to said scribe means, with the increment of travel being constant for each succeeding pressure signal received by the first pressure responsive means so that the chart is advanced one increment for each cycle of the scribe; and, means connecting said first and second pressure responsive means to a pressure signal in such a manner that said scribe moves across said chart to record the magnitude of pressure and thereafter said chart advances one increment of movement so that each measurement of pressure is distinct from the other.

4,040,065

PHOTOCOMPOSER OPTICAL SYSTEM WITH A NEGATIVE COLLIMATING LENS

Thomas Allan Booth, Flanders, N.J., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Jan. 14, 1976, Ser. No. 649,073
Int. Cl.[2] B41B *15/08*
U.S. Cl. 354—5 **3 Claims**



1. A photocomposition machine wherein the optical system is foreshortened to reduce the amount of open interior space required for image projection, comprising:

an illuminated font source;

primary focusing lens means for producing a selected variable size aerial image;

a negative collimating lens positioned in optical alignment with said primary focusing lens means to allow the converging beam of the primary lens means to pass through the negative lens with the lenses positioned apart a distance equal to the difference between the image conjugate length of the primary lens and the absolute focal length of the collimator lens such that the rays of the primary lens are collimated; and

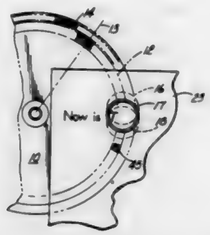
a decollimating means in optical alignment with said negative lens to refocus the font image projection.

4,040,066

AUTOMATIC BASE LINE CORRECTION FOR P/T (PHOTOCOMPOSING MACHINE)

Henry L. Brill, Flushing, N.Y., and Jacob H. Moody, Scotch Plains, N.J., assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Filed July 24, 1975, Ser. No. 598,786
Int. Cl.[2] G03B *15/00*
U.S. Cl. 354—10 **2 Claims**



1. The method of coordinating a rotating disc bearing projectionable characters, and a changeable set of point size selection lenses, to produce projected copy on one predetermined base line position, comprising essentially these steps:

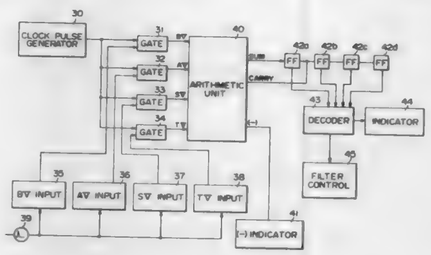
1. providing a character font on said disc with a timing mark track means wherein each character has a dedicated track mark located in angular relationship to said character for detecting the arrival of said character at a specified rotary position by placing a mark sensing device adjacent the face of the disc along an arcuate path an angular amount removed from the lens substantially equivalent to the angular relationship of the mark to its character;
2. placing a changeable lens in an optical projection position;
3. placing a timing track sensor in said arcuate path at a position, which would cause a flash signal before the character related to the mark has arrived at the optical projection of the lenses;
4. sensing the timing mark for one character and projecting that character prior to its arrival at the optical projection position and continuing the projection as the disc moves the character until the image thereof arrives in proper base line position, and counting units of time from the first projection of the mark until the mark arrives at the proper position;
5. recording that count in memory, and repeating the procedure (1) - (5) for each lens; and 6. in composition, thereafter, counting marks on the track until the mark for an indicated character is located, pulsing a single indicating arrival of the dedicated mark, counting the units of time until the mark arrives at the proper position for the particular lens in use, and then firing a flash circuit.

4,040,067

PHOTOGRAPHIC CAMERA WITH AUTOMATICALLY CONTROLLED FILTER

Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., Minami-ashigara, both of, Japan

Filed Sept. 17, 1975, Ser. No. 614,020
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—23 D **8 Claims**



1. A photographic camera with a taking lens having an optical axis comprising a diaphragm the aperture size of which is variable provided on the optical axis of the taking lens, means manually operable to select the aperture size of the diaphragm, a shutter mechanism the exposure time of which is variable provided on the optical axis of the taking lens, means manually operable to select the exposure time of the shutter mechanism, a filter the transmittivity of which is variable provided on the optical axis of the taking lens, means for varying the transmittivity of the filter, a film sensitivity setting means provided in the camera to be set at a position which is indicative of the sensitivity of the film loaded in the camera, and a scene brightness measuring means provided in the camera for measuring the brightness of the scene to be photographed by the camera wherein the improvement comprising,

a scene brightness input means connected with said scene brightness measuring means for creating pulses the number of which corresponds to the scene brightness measured thereby,

an aperture size input means connected with said manually operable aperture size selecting means for creating pulses the number of which corresponds to the aperture size selected thereby,

an exposure time input means connected with said manually operable exposure time selecting means for creating pulses the number of which corresponds to the exposure time selected thereby,

a film sensitivity input means connected with said film sensitivity setting means for creating pulses the number of which corresponds to the sensitivity of the film set thereby,

an arithmetic unit connected with all said input means to receive said pulses and conduct calculation of said pulses for generating an output indicative of the desirable transmittivity of the filter,

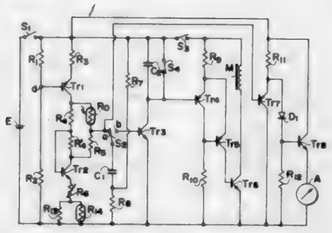
and means for transmitting the output of the arithmetic unit to said means for varying the transmittivity of the filter to control the transmittivity of the filter in accordance with the output of the arithmetic unit.

4,040,068

EXPOSURE TIME CONTROL DEVICE FOR AN ELECTRIC SHUTTER IN A SINGLE REFLEX CAMERA WITH THROUGH THE LENS MEASURING SYSTEM

Yasuhiro Nanba, Toyokawa, and Masayoshi Sahara, Sakai, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 315,211, Dec. 14, 1972, Pat. No. 3,931,628, which is a continuation of Ser. No. 131,151, April 5, 1971, abandoned. This application June 13, 1975, Ser. No. 586,704
Claims priority, application Japan, Apr. 6, 1970, 45-28599
Int. Cl.[2] G03B *7/08*
U.S. Cl. 354—24 **11 Claims**



1. In an electric shutter control device for a single lens reflex camera having a light receptive element for receiving light through an objective lens of the camera, a light detecting circuit having said light receptive elements for generating an output voltage proportinal to the logarithm of the light intensity incident on said light receptive element, means for storing said output voltage during operation of the shutter, a first transistor for detecting the voltage stored by said means for storing and for generating a current output, said current output being proportional to the antilogarithm of said stored voltage, means for integrating said current output, and means responsive to said integrated current for initiating closing of the shutter after a time interval determined by said integrated current, the improvement wherein

said light detecting circuit further has an output resistance serially connected with said light receptive element and a resistance shunting said serially connected light receptive element and said output resistor, said output voltage being generated at the junction point of said output resistance and said light receptive element, and

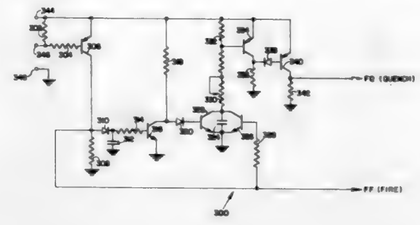
a second transistor having substantially the same electric and temperature characteristics as said first transistor and further having a collector connected to one terminal of the parallel combination of said shunting resistance and said serially connected light receptive element and said output resistance, and a base connected to said shunting resistance to be biased thereby, and a third transistor for supplying constant current to the collector of said second transistor whereby said second transistor compensates for variations in said integrated current due to changes in temperature.

4,040,069

FIXED TIME DELAY CIRCUIT FOR QUENCH STROBE

William R. Pope, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 8, 1976, Ser. No. 674,937
Int. Cl.[2] G03B *7/14, 7/16*
U.S. Cl. 354—27 **17 Claims**



1. A photographic camera apparatus comprising:

a housing;

means for mounting an objective lens on said housing;

means associated with said housing for receiving a source of electrical energy;

a source of artificial illumination;

means within said housing for defining a film exposure plane;

a blade assembly mounted and arranged within said housing for displacement from an initial closed arrangement wherein said blade assembly precludes scene light from impinging on said exposure plane to a second arrangement wherein said blade assembly defines a maximum aperture through which scene light is permitted to impinge on said exposure plane and then to a final closed arrangement wherein said blade assembly again precludes scene light from impinging on said exposure plane, such a displacement of said blade assembly serving to define an exposure interval during which scene light is incident upon said film exposure plane;

scene light detecting means energizable by the source of electrical energy for providing an output signal in correspondence to the amount of scene light detected subsequent to the commencement of an exposure interval;

means, at least in part, energizable by the source of electrical energy, for initiating the displacement of said blade assembly from its said initial closed arrangement towards its said second arrangement thereby commencing said exposure interval and for initiating the energization of the source of artificial illumination to effect the firing thereof subsequent to the initiating of the exposure interval, and then responsive to said output signal of said scene light detecting means reaching a first predetermined value, for effecting the displacement of said blade assembly into its said final closed arrangement; and

circuit means energizable by the source of electrical energy and responsive to said output signal of said scene light detecting means reaching its said first predetermined value of initiating the deenergization of the source of artificial illumination to effect the termination of the firing thereof, said circuit means including a first timing capacitor, first switch means for establishing a first effective electrical short across said timing capacitor prior to the initiation of the energization of the source of artificial illumination and responsive to the initiation of the energization of the source of artificial illumination for removing said first electrical short across said timing capacitor, second switch means for establishing a second effective electrical short across said timing capacitor substantially simultaneously with the removal of said first electrical short and responsive to said output signal of said scene light detecting means reaching said first predetermined value for removing said second effective electrical short across said timing capacitor so as to permit said timing capacitor to commence charging and means responsive to

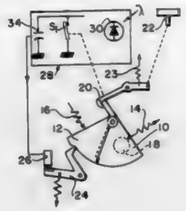
the charge on said timing capacitor reaching a predetermined value for initiating the deenergization of the source of artificial illumination whereby the deenergization of the source of artificial illumination occurs a predetermined time period after said output signal of said scene light detecting means reaches its said first predetermined value.

4,040,070

OPTIMIZED FLASH EXPOSURE

William Thomas Hochreiter, and Guilford Edwin Kindig, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,514
Int. Cl.² G03B *7/08, 15/04*
U.S. Cl. 354—59 **2 Claims**



1. In a camera having means for mounting a flashunit, a focus control movable between a plurality of positions each indicative of a different distance from a photographic subject and exposure time control apparatus having a photosensor exposed to scene illumination passing along an optical axis of said photosensor, the improvement comprising:

first and second light attenuating means mounted for movement into and out of the optical path of said photosensor;

means for biasing said first and second attenuating means toward said optical path;

means for locating said first attenuating means in said optical path and for holding said second attenuating means out of said optical path;

means, responsive to mounting of a flashunit on said camera, for moving said first attenuating means out of said optical path and for releasing said second attenuating means to move into said optical path; and

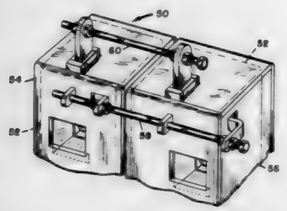
means, coupled with said focus control, for limiting the extent of movement of said second attenuating means into said optical path in relation to the position of said focus control.

4,040,071

METHOD AND APPARATUS FOR MAKING STEREOSCOPIC PICTURES

Bruce Shane, 9039 Sligo Creek Parkway No. 1711, Silver Spring, Md. 20901

Filed Mar. 20, 1975, Ser. No. 560,132
Int. Cl.² G03B *35/08*
U.S. Cl. 354—113 **9 Claims**



4. Apparatus for producing sterophotographs adapted for use in standard Viewmaster 3-D reel mounts comprising two fixed-focus cameras of the 110 type;

holder means for mounting the cameras at a predetermined interaxial spacing, the cameras being mounted such that, when in use, the longitudinal axes of their respective film planes are disposed substantially parallel to each other, essentially vertical with respect to a horizontal reference plane and horizontally spaced apart a distance substantially equivalent to said predetermined interaxial spacing;

release means for simultaneously actuating the two cameras; and

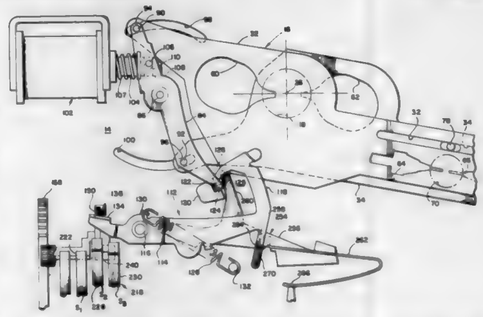
advance means for simultaneously advancing the film in each of the two cameras.

4,040,072

SHUTTER LATCH ARRANGEMENT RELEASABLE THROUGH SHUTTER BLADE ACTUATION AND RESETTABLE THROUGH FILM ADVANCEMENT

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 13, 1976, Ser. No. 648,725
Int. Cl.² G03B *1/18, 9/08*
U.S. Cl. 354—173 **27 Claims**



1. A photographic camera having means for mounting photographic film material at a given focal plane, said camera comprising:

a blade mechanism;

means for mounting said blade mechanism for displacement between at least one blocking arrangement precluding transmission of scene light to the focal plane and an unblocking arrangement defining at least one aperture value structured for transmission of scene light to the focal plane;

drive means actuable for displacing said blade mechanism between its said arrangements;

latch means for initially retaining said blade mechanism in one of its said arrangements; and

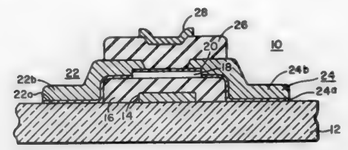
means at least in part electrically energizable for actuating said drive means to effect the displacement of said blade mechanism from its said arrangement wherein it is retainable by said latch means to another of its said arrangements and then back to its said arrangement wherein it is retainable by said latch means to define an exposure cycle of said blade mechanism, said latch means being structured to be displaced responsive to a predetermined displacement of said blade mechanism resulting from actuation of said drive means to effect its release of said blade mechanism, to facilitate the movement of said blade mechanism under the influence of said drive means to define said exposure cycle, said actuating means including manually actuable means for initially actuating said drive means together with means responsive to said latch means releasing said blade member for maintaining the actuation of said drive means throughout the remainder of the exposure cycle subsequent to the manual deactuation of said manually actuable means.

4,040,073

THIN FILM TRANSISTOR AND DISPLAY PANEL USING THE TRANSISTOR

Fang-Chen Luo, Turtle Creek, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 609,139, Aug. 29, 1975, abandoned. This application Aug. 20, 1976, Ser. No. 716,046
Int. Cl.² H01L *27/12*
U.S. Cl. 357—4 **13 Claims**



1. A thin film transistor disposed upon an insulating substrating comprising.

a. a first conductive gate disposed on the substrate;

b. a first insulating layer atop the first conductive gate, which the first conductive gate extends beyond the first insulating layer;

c. a semiconductive layer disposed on the first insulating layer overlaying at least a portion of the first conductive gate with sufficient indium incorporated in the semiconductive layer to stabilize the device;

d. source and drain conductive contacts overlapping opposed sides of the semiconductive layer, which source and drain conductive contacts comprise a layer of indium with a layer of copper thereon;

e. a second insulating layer disposed on the semiconductive layer and on a portion of the source and drain contacts; and

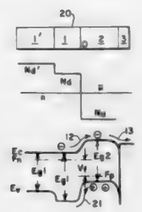
f. a second conductive gate disposed atop the second insulating layer above the semiconductive layer, the second conductive gate being electrically connectable to the first gate.

4,040,074

SEMICONDUCTOR COLD ELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 669,237, March 22, 1976, which is a division of Ser. No. 451,754, March 24, 1974, Pat. No. 3,972,060. This application Sept. 20, 1976, Ser. No. 724,759
Int. Cl.² H01L *29/161, 27/14*
U.S. Cl. 357—16 **3 Claims**



1. A cold emission semiconductor device comprising a first layer of GaAlP, and of several hundred Angstroms thickness and of n-type conductivity; a second layer of GaAlP of p-type conductivity and of a thickness less than the diffusion length of electrons, and whose effective forbidden band gap is smaller than that of said first layer, said first and said second layers being intimately in contact with each other through epitaxial growth and which substantial lattice match to form a heterojunction, said second layer having a surface opposite said heterojunction with zero or negative electron affinity for emission of electrons, a first electrode connectable to said first layer, and a second electrode connectable to said second layer with the distance between said second electrode and said heterojunction being more than the diffusion length of electrons, and means for applying a potential to said electrodes to bias said heterojunction and cause said first layer to generate electrons which are subsequently injected into said second layer and without substantially any recombination emitted from said surface of said second layer;

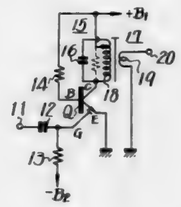
wherein further comprising a third layer disposed adjacent said first layer, said third layer being GaP and of n-type conductivity.

4,040,075

FREQUENCY CONVERTER

Hideo Nakamura, Komae; Mitsuo Ohsawa, Fujisawa, and Osamu Hamada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1975, Ser. No. 571,784
Claims priority, application Japan, May 9, 1974, 49-51569
Int. Cl.² H01L *29/78*
U.S. Cl. 357—23 **9 Claims**



1. A frequency converter comprising:

a semiconductor device having a first semiconductor region of one conductivity type,

a second semiconductor region of the opposite conductivity type adjacent said first region with a first semiconductor junction therebetween,

a third semiconductor region of the same conductivity type of said first region adjacent said second region with a second semiconductor junction therebetween, first, second and third terminals coupled to said first, second and third regions, respectively;

a fourth terminal connected to said semiconductor device comprising a gate electrode formed over said first semiconductor region only at a position which is spaced from the said first terminal, and an insulating layer separating said fourth terminal from said first region, the vertical thickness of said first region between said insulating layer and first junction being less than a diffusion length of minority carriers therein,

said semiconductor device having an emitter grounded current amplification (hfe) variation in response to changes in voltage between said first and fourth terminals, said variation exhibiting a minimum value at a first voltage between said first and fourth terminals and an increasing value for voltages higher and lower than said first voltage to form an amplification characteristic curve with substantially symmetrical increasing portions on either side of said minimum value;

input signal means for applying a time varying signal at a first frequency to said fourth terminal,

means for applying a predetermined bias to said fourth terminal to establish said first voltage between said first and fourth terminals;

additional bias means connected to said second terminal for biasing said device into a conducting condition,

means connected to said fourth terminal and input signal means for causing said time varying signal to increase and

decrease about said predetermined bias at said fourth terminal to shift the amplification characteristic curve to said increasing portions on either side of said minimum value;

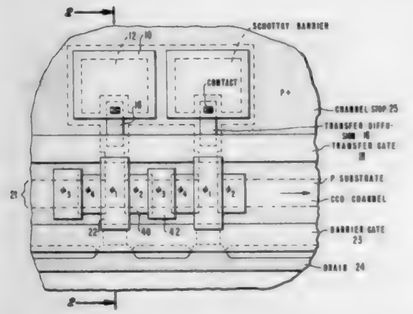
and means connected to said third terminal for deriving an output at a frequency which is at least twice the value of the frequency of said time varying signal.

4,040,076

CHARGE TRANSFER SKIMMING AND RESET CIRCUIT

Walter Frank Kosonocky, Skillman, and Elliott Samuel Kohn, East Windsor, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 28, 1976, Ser. No. 709,410
Int. Cl.[2] H01L *29/78, 27/14, 31/00;* H01J *39/12*
U.S. Cl. 357—24 **6 Claims**



1. In a radiation sensing array including a semiconductor substrate, in combination:

a radiation sensor responsive to radiation for storing a charge signal;

a gate electrode insulated from said substrate and located adjacent to said sensor;

a charge storage location;

means, including means for applying a voltage at a first level to said gate electrode, for conducting that portion of the charge signal stored in said sensor which exceeds a given level, via a conduction path in the substrate adjacent to said gate electrode, to said charge storage location;

a drain region; and

means, including means for applying a voltage at a second level to said gate electrode, for conducting that portion which exceeds a second given level of the remainder of said charge signal stored in said sensor to said drain region via the same conduction path in said substrate through which the portion exceeding said given level of said charge was conducted, and for resetting said radiation sensor to a reference level dependent on said second level in the process.

4,040,077

TIME-INDEPENDENT CCD CHARGE AMPLIFIER

Wallace Edward Tchon, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Aug. 18, 1976, Ser. No. 715,271
Int. Cl.[2] H01L *29/78;* G11C *19/28;* H01L *29/04*
U.S. Cl. 357—24 **9 Claims**

1. A time-independent charge-coupled device charge amplifier comprising

a substrate of a given type of semiconductor material,

a layer of silicon dioxide overlying said substrate,

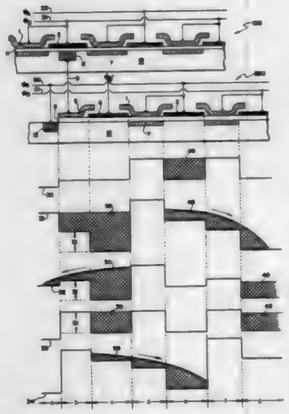
a plurality of first electrode pairs overlying a first portion of said silicon dioxide layer, each of said first electrode pairs comprising a charge transfer electrode and a charge storage electrode, said plurality of first electrode pairs being arranged to form a first charge-coupled device,

a plurality of clock drivers, a first one of said clock drivers being connected to alternate ones of said first electrode pairs and a second one of said clock drivers being connected to the remaining ones of said first electrode pairs,

a first conduction region in said substrate underlying the charge storage electrode of one of said first electrode pairs, said first conduction region comprising semiconductor material of an opposite conductivity type from that of said substrate,

a plurality of second electrode pairs overlying a second portion of said silicon dioxide layer, each of said second electrode pairs comprising a charge transfer electrode and a charge storage electrode, said plurality of said second electrode pairs being arranged so as to form a second charge-coupled device, said first one of said clock drivers being connected to alternate ones of said second electrode pairs and said second one of said clock drivers being connected to all but one of the remaining ones of said second electrode pairs,

a second conduction region in said substrate and located adjacent to the charge transfer electrode of said one of said second electrode pairs, said second conduction region



comprising semiconductor material of an opposite conductivity type from that of said substrate, said second conduction region being connected to said first one of said clock drivers,

means for electrically connecting said first conduction region with said charge transfer electrode of said one of said second electrode pairs, and

means for electrically connecting said charge storage electrode of said one of said second electrode pairs with said second one of said clock drivers through an offset circuit comprising

an additional electrode on a third portion of said silicon dioxide layer,

a third conduction region in said substrate and located beneath said additional electrode, said third conduction region comprising semiconductor material of an opposite conductivity type from that of said substrate,

means for electrically connecting said additional electrode to said second one of said clock drivers, and

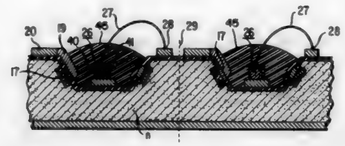
means for electrically connecting said third conduction region to said charge storage electrode of said one of said second electrode pairs.

4,040,078

OPTO-ISOLATORS AND METHOD OF MANUFACTURE

Wallace Henry Eckton, Jr., and Phillip Edward Fraley, both of Reading, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 11, 1976, Ser. No. 685,396
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **28 Claims**



1. An opto-isolator comprising:

a silicon body of one conductivity type with a recess having side walls and a bottom surface formed in the top surface of the body;

means formed in said side walls for detection of light;

a light-emitting element comprising a III-V semiconductor material with one surface of said element bonded to a first metal pad on the bottom of the recess so that the light emitted therefrom can be detected by said means; and

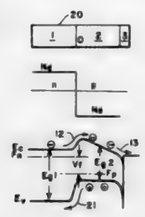
means for making electrical contact to said surface of the element comprising metallization extending from the metal pad and terminating on the top surface of said silicon body outside of said recess.

4,040,079

SEMICONDUCTOR COLD ELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 669,237, March 22, 1976, which is a division of Ser. No. 451,754, March 18, 1974, Pat. No. 3,972,060. This application Sept. 20, 1976, Ser. No. 724,760
Int. Cl.[2] H01L *29/161, 27/14*
U.S. Cl. 357—30 **3 Claims**



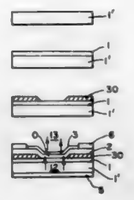
1. A cold emission semiconductor device comprising a first layer of GaAlP, and of several hundred Angstroms thickness and of n-type conductivity; a second layer of GaAlP of p-type conductivity and of a thickness less than the diffusion length of electrons, and whose effective forbidden band gap is smaller than that of said first layer, said first and said second layers being intimately in contact with each other through epitaxial growth and with substantial lattice match to form a heterojunction, said second layer having a surface opposite said heterojunction with zero or negative electron affinity for emission of electrons, a first electrode connectable to said first layer, and a second electrode connectable to said second layer with the distance between said second electrode and said heterojunction being more than the diffusion length of electrons, and means for applying a potential to said electrodes to bias said heterojunction and cause said first layer to generate electrons which are subsequently injected into said second layer and without substantially any recombination emitted from said surface of said second layer, wherein said second layer has a graded forbidden band gap.

4,040,080

SEMICONDUCTOR COLD ELECTRON EMISSION DEVICE

Katsuo Hara; Minoru Hagino, and Tokuzo Sukegawa, all of Hamamatsu, Japan, assignors to Hamamatsu Terebi Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 669,237, March 22, 1976, which is a division of Ser. No. 451,754, March 24, 1974, Pat. No. 3,972,060. This application Sept. 20, 1976, Ser. No. 724,761
Int. Cl.[2] H01L *29/161, 27/14*
U.S. Cl. 357—30 **6 Claims**



1. A cold emission semiconductor device comprising a first layer of GaAlP, and of several hundred Angstroms thickness and of n-type conductivity; a second layer of GaAlP of p-type conductivity and of a thickness less than the diffusion length of electrons, and whose effective forbidden band gap is smaller than that of said first layer, said first and said second layers being intimately in contact with each other through epitaxial growth and with substantial lattice match to form a heterojunction, said second layer having a surface opposite said heterojunction with zero or negative electron affinity for emission of electrons, a first electrode connectable to said first layer, and a second electrode connectable to said second layer with the distance between said second electrode and said heterojunction being more than the diffusion length of electrons, and means for applying a potential to said electrodes to bias said heterojunction and cause said first layer to generate electrons which are subsequently injected into said second layer and without substantially any recombination emitted from said surface of said second layer,

wherein an insulating or high resistance layer is provided at selected portions toward either side of said junction to enable concentration of electron flow to areas of said junction not effectively convered by said insulating or high resistance layer.

4,040,081

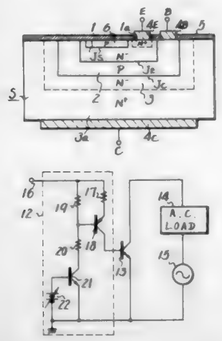
ALTERNATING CURRENT CONTROL CIRCUITS

Takeshi Ninomiya; Masaaki Sakai, and Kiyosuke Suzuki, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1975, Ser. No. 567,275
Claims priority, application Japan, Apr. 16, 1974, 49-42952
Int. Cl.[2] H01L *29/72*
U.S. Cl. 357—34 **6 Claims**

1. A control circuit for varying the impedance of the current supply line from an AC source to an AC load which includes a bidirectional continuously variable impedance semiconductor device connected in said current supply line, said semiconductor device comprising a first semiconductor region of one conductivity type, a second semiconductor region of the opposite conductivity type adjacent said first region with a first semiconductor junction therebetween, a third semiconductor region of the same type as said first region adjacent said second region with a second semiconductor junction therebetween, said first region having a first potential barrier formed therein having energy higher than that of the minority carriers injected from the second region to the first region at a position

facing said first junction and spaced from the same by a distance smaller than the diffusion distance of the minority carriers, said third region having a second potential barrier formed therein and having an energy higher than minority carriers injected from the second region to the third region at a position facing said second junction and spaced from the same by a distance smaller than the diffusion distance of the minority carriers, said first and third regions of the semiconductor device each having a first portion with an impurity concentration of substantially the same order of magnitude respectively



adjacent the first and second semiconductor junctions, first, second and third terminals coupled to said first, second and third regions, respectively, said first and third terminals connecting the semiconductor device in the supply line, means for causing a DC base current to flow through said second terminal of said semiconductor device, and means for selectively adjusting the magnitude of the DC base current continuously to vary the amplitude of the alternating current flowing through said semiconductor device whereby said alternating current has a substantially continuous waveform free of undesirable discontinuities.

4,040,082

STORAGE ARRANGEMENT COMPRISING TWO COMPLEMENTARY FIELD-EFFECT TRANSISTORS

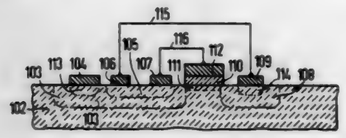
Karl Goser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 6, 1975, Ser. No. 629,394

Claims priority, application Germany, Nov. 11, 1974, 2453421; Nov. 11, 1974, 2453319; Nov. 11, 1974, 2453395; Nov. 11, 1974, 2453376

Int. Cl.² H01L *27/02*

U.S. Cl. 357—42 **20 Claims**



1. In a storage arrangement comprising a first and a second field-effect transistor, at least one of which is a junction field-effect transistor, which transistors are complementary to one another and connected in series, said transistors being disposed on a common semiconductor member and having source, drain and gate areas, the source area of the first transistor being connected to the gate area of the second transistor, the gate area of the first transistor being connected to the drain area of the second transistor, and the drain area of the first transistor being connected to the source area of the second transistor, the combination of said transistors being disposed on a semiconductor member having a substrate of a first conductivity type, and a first doped area of a second conductivity type, which extends to the surface of the semiconductor member, and is, at least in part, there covered with a metal connection terminal, and which doped area operatively surrounds a channel area of the first conductivity type, which likewise extends to the surface of the semiconductor member, and is there provided with the source and drain terminals of said junction field-effect transistor, said semiconductor member having a second doped area of the second conductivity type which extends to the surface of said semiconductor member and is provided with a metal terminal thereat, a channel zone being located between said first and second doped areas, an insulating layer disposed on the surface of the semiconductor member, which extends at least over said channel zone between said first and second doped areas, a metal gate electrode disposed on said insulating layer, said first and second doped areas, said channel zone and said metal gate electrode forming said other transistor, one of said terminals of the junction field-effect transistor being conductively connected to said metal terminal of the second doped area of said other transistor, and the other of said terminal of the junction field-effect transistor being conductively connected to said metal gate electrode.

4,040,083

ALUMINUM OXIDE LAYER BONDING POLYMER RESIN LAYER TO SEMICONDUCTOR DEVICE

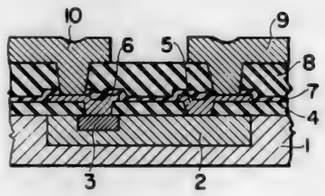
Atsushi Saiki, Musashimurayama; Seiki Harada, and Yoichi Oba, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 22, 1974, Ser. No. 526,407

Claims priority, application Japan, Apr. 15, 1974, 49-41011

Int. Cl.² H01L *23/30, 23/50*

U.S. Cl. 357—54 **44 Claims**



1. A semiconductor device comprising:
- a semiconductor body having at least one semiconductor element therein;
- an insulating layer disposed on the surface of said body;
- a first anhydrous aluminum oxide layer having a thickness of between about 10 and about 2000 A and disposed on the surface of said insulating layer; and
- a first polymer resin layer disposed on the surface of said oxide layer.

4,040,084

SEMICONDUCTOR DEVICE HAVING HIGH BLOCKING VOLTAGE WITH PERIPHERAL CIRCULAR GROOVE

Tomoyuki Tanaka; Masahiro Okamura; Takuzo Ogawa, and Yutaka Misawa, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

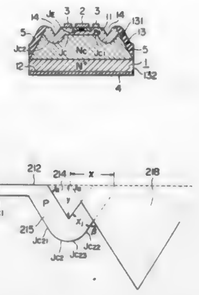
Filed Sept. 5, 1975, Ser. No. 610,786

Claims priority, application Japan, Sept. 18, 1974, 49-106714

Int. Cl.² H01L *29/06, 29/72, 29/34*

U.S. Cl. 357—55 **15 Claims**

1. A semiconductor device having a high blocking voltage, comprising:
- a semiconductor substrate consisting of a pair of principal surfaces located opposite to each other, a side surface connecting said pair of principal surfaces with each other, at least one PN junction formed between said pair of principal surfaces and a first circular groove cut in the peripheral portion of one of said principal surfaces in which the high impurity concentration region on one side of the PN junction is exposed, said first circular groove tapering off toward the other principal surface of said semiconductor substrate, said PN junction being formed along said one of said principal surfaces and the surface of said circular groove, and the outer edge of said PN junction appearing in said side surface intersecting said side surface in such a manner that the angle therebetween is greater in the region on the high impurity concentration side of said PN junction than in the region on the low impurity concentration side of said PN junction;
- an insulator covering at last the part of said side surface near the exposed edge of said PN junction; and
- at least a pair of electrodes in ohmic contact with said principal surfaces.



4,040,085

POWER SEMICONDUCTOR ASSEMBLY AND THE METHOD AND APPARATUS FOR ASSEMBLY THEREOF

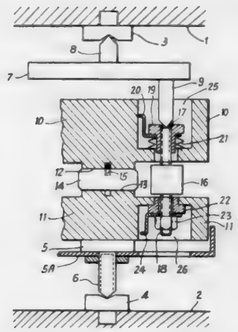
Robert Jouanny, Montreuil-sous-Bois, France, assignor to Jeumont-Schneider, France

Filed Sept. 25, 1975, Ser. No. 616,635

Claims priority, application France, Oct. 1, 1974, 74.33035

Int. Cl.² H01L *23/42*

U.S. Cl. 357—79 **2 Claims**



1. Process for the clamping of a power semi-conductor housing mounted between two radiators, characterized by:
- placing the said housing between its upper radiator and its lower radiator, the contact surfaces having been previously machined;
- applying to the radiators, by means of a dial press, clamping forces which are about 25% greater than the clamping force E desired on the housing, via two swivel plates so as to transmit only pressing forces perpendicular to each contact surface and in such a manner that one of the plates exerts its pressing force directly on the clamping parts of the radiators, these parts being distributed around the housing along three equidistant axes;
- without changing the adjustment of the press, each of the three clamping parts is clamped successively with a clamping force equal to about 1% of E and the equality of the three corresponding forces is checked by means of the dial of the press;
- finally, the action of the press is eliminated.

2. A power semiconductor assembly made with the process according to claim 1.

4,040,086

METHOD OF GENERATING CHROMATICITY POINT-DEPENDENT SWITCHING INFORMATION FROM CODED COLOR VIDEO SIGNALS

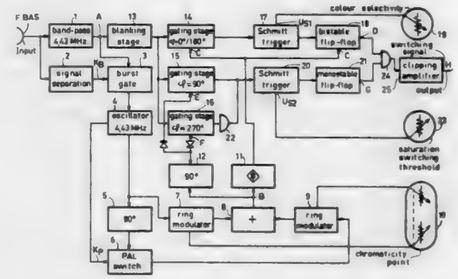
Hans Wellhausen, Hamburg, and Reinhard Friedmann, Pinneberg, both of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,416

Claims priority, application Germany, Mar. 22, 1974, 2413869

Int. Cl.² H04N *5/22*

U.S. Cl. 358—22 **10 Claims**



1. A method of generating chromaticity point-dependent switching information from coded color video signals. said method comprising generating a color carrier wave using an oscillator, synchronizing said oscillator using color synchronization signals derived from the coded color video signals, filtering the chrominance signal component present as a modulated color carrier wave from the coded color video signal, phase-adjusting the generated signal to supply a phase-adjustable color carrier wave, applying the filtered signal and the phase adjusted signal to at least one switching stage in a threshold circuit having an adjustable threshold value, and passing and blocking the chrominance signal component by said switching stage whereby the chrome commutation signal is provided at the output of the threshold circuit.

4,040,087

ELECTRONIC MOTION COMPENSATION FOR THE PYROELECTRIC VIDICON

John T. Hall, Woodbridge, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

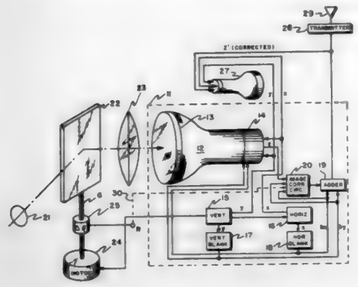
Filed Mar. 2, 1976, Ser. No. 663,033

Int. Cl.² H04N *3/16*

U.S. Cl. 358—113 **4 Claims**

1. An image correction circuit for a pyroelectric vidicon wherein a small area image is mechanically scanned over the much larger surface area of a sensing surface of the vidicon target comprising:
- a first signal commutator coupled to the video output of said vidicon means to sequentially channel the video output signal to a plurality of output terminals; and

a first tapped delay line having a like plurality of large equal delay taps connected to said output terminals, so as to



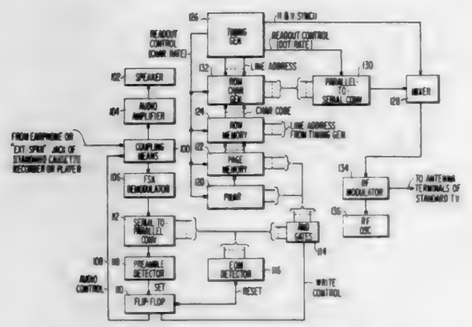
provide periodically decreasing delay for each frame of said video signal.

4,040,088

ADAPTOR FOR INTER-RELATING AN EXTERNAL AUDIO INPUT DEVICE WITH A STANDARD TELEVISION RECEIVER, AND AN AUDIO RECORDING FOR USE THEREWITH

William James Hannan, Palm Beach, Fla., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 432,175, Jan. 10, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,285
Int. Cl.² G06F *3/14*
U.S. Cl. 358—127 **13 Claims**



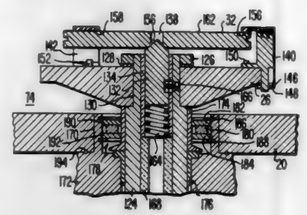
1. A recording medium having recorded thereon on the same portion of a single channel thereof both binary coded video information and analog audio information in a predetermined form which permits said video information and said audio information to be separated on playback of said recording medium, said predetermined from comprising a first carrier at a given audio frequency phase-shift-keyed with said binary-coded video information so that a first binary value is manifested by said first carrier having a given phase and a second binary value is manifested by said first carrier having a phase of substantially 180° with respect to said given phase, and said predetermined form further comprising a second carrier at said given audio frequency having a phase which is substantially in quadrature with said given phase, said second carrier being amplitude-modulated by said analog audio information.

4,040,089

DISC MASTER POSITIONING APPARATUS FOR A RECORDING SYSTEM

Joseph Guarracini, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,417
Claims priority, application United Kingdom, June 14, 1976, 24562/76; June 17, 1976, 24562/76
Int. Cl.² G11B *3/62;* H04N *5/76*
U.S. Cl. 358—128 **4 Claims**



1. In a system for recording signals by directing a beam of energy toward a disc master supported by a turntable rotatably mounted within a recording chamber; said beam of energy having characteristics representative of signals to be recorded; said disc master having a surface responsive to said beam of energy; an apparatus for positioning a disc master on a turntable comprising:

a centering spindle;

said turntable having a central opening in which said centering spindle is snugly received for reciprocal motion along the axis of rotation of said turntable;

a portion of said centering spindle protruding beyond a surface of said turntable facing said disc master;

said protruding portion of said centering spindle having a tapering portion for engagement with walls defining said central aperture of said disc master in order to center said disc master with respect to said axis of rotation of said turntable;

a plurality of axial locating members;

each of said axial locating members having a disc master-engaging end;

means for mounting each of said axial locating members to the peripheral portion of said turntable for movement between a first location and a second location;

said axial locating members in said first locations disposing said disc master-engaging ends in a recording plane in which same beam of energy is focussed;

said axial locating members in said second locations placing said disc master-engaging ends outside the path of travel of a disc master, to-and-from a position of centered engagement with said centering spindle, to permit, respectively, installation and removal of said disc master; and

means located in said turntable central opening for biasing said centering spindle in a direction that causes said tapering portion of said centering spindle, in engagement with said wall of said central aperture of said disc master, to bias said disc master against said disc master-engaging ends of said axial locating members, when said axial locating members are occupying said first locations in order to locate said energy-responsive surface of said disc master in alignment with said recording plane defined by said disc master-engaging ends of said axial locating members.

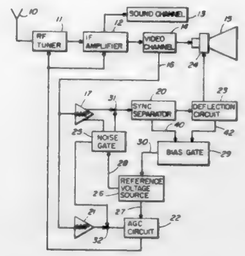
4,040,090

BIAS GATE FOR NOISE SUPPRESSION CIRCUIT

William P. Haynes, Bedford, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed May 7, 1976, Ser. No. 684,210
Int. Cl.² H04N *5/08, 5/21*
U.S. Cl. 358—155 **6 Claims**

1. In a television receiver having a gain controlled signal receiver for providing a composite video signal, an automatic gain control circuit for providing a gain control signal to the signal receiver related to the variation of the amplitude of the synchronizing pulses in the composite video signal from a first predetermined reference level so that the tips of the synchronizing pulses are maintained at the first predetermined reference level, a noise suppression circuit for detecting and suppressing amplitudes in the composite video signal which exceed a second predetermined reference level equal to or greater than the first predetermined reference level during intervals of the signal other than the intervals of the synchronizing pulses, a synchronizing pulse separator for separating the synchronizing pulses from the composite video signal, and



a deflection circuit which provides flyback pulses, a bias gate circuit comprising:

a. means for detecting the simultaneous occurrence of synchronizing pulses from the synchronizing pulse separator and the flyback pulses from the deflection circuit to produce an output signal whose duration is representative of the simultaneous occurrence thereof, and

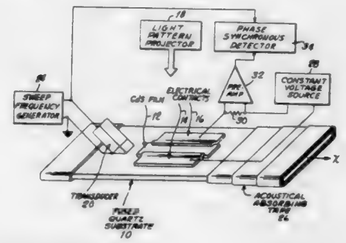
b. means responsive to the signal representative of the simultaneous occurrence for establishing a third predetermined reference level greater than the second predetermined reference level for the noise suppression circuit to increase the noise detection level during synchronizing pulse intervals so that only strong noise pulses generated during synchronizing pulse intervals are suppressed.

4,040,091

DIRECT ELECTRONIC FOURIER TRANSFORMS OF OPTICAL IMAGES

Philipp G. Kornreich, North Syracuse, and Stephen T. Kowel, Syracuse, both of N.Y., assignors to Research Corporation, New York, N.Y.

Continuation of Ser. No. 319,680, Dec. 29, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 493,990
Int. Cl.² H04N *3/14;* H01V *7/00*
U.S. Cl. 358—213 **32 Claims**



1. A device for generating an electrical signal representation of an optical image comprising:

a medium having an electrical property which varies as a function of an optical image incident on the medium and as a function of time and space varying strain disturbances in the medium;

means for causing the incidence of an optical image on the medium;

means for causing in the medium a plurality of different time and space varying strain disturbances whose spatial wavelengths are selected substantially independently of any natural vibrating modes of the medium; and

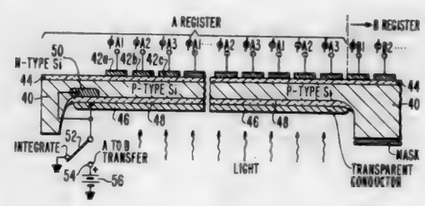
means for measuring said electrical property of the medium at a plurality of said different strain disturbances in the medium to derive a plurality of electrical signals, each signal representing an aspect of the entire optical image rather than of a point of the image.

4,040,092

SMEAR REDUCTION IN CCD IMAGERS

James Edward Carnes, North Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1976, Ser. No. 711,448
Int. Cl.² H04N *5/30*
U.S. Cl. 358—213 **2 Claims**



1. A method of operating a charge coupled imager of the type including an imaging area having a semiconductor substrate and columns and rows of electrodes adjacent to one surface of the substrate, means during successive integration times during which an image is projected onto the opposite surface of said substrate for maintaining certain of the electrodes at a potential to form potential wells in the substrate and other of the electrodes at a potential to form potential barriers in the substrate between adjacent potential wells, and which also includes means operative during a transfer time upon the completion of each integration time for applying multiple phase voltages to said electrodes for transferring a field of charge signals which have accumulated in said potential wells out of said imaging area, comprising the steps of:

creating a depletion region at said opposite surface of said substrate during each transfer time for at least a substantial portion of the duration of each transfer time and of a depth sufficient to retain within said depletion region at least a substantial portion of the charge signals induced by the projected image during each transfer time, but of insufficient depth to prevent the transfer of said field of charge signals out of said imaging area;

draining away said retained charge signals; and

removing said depletion region during each integration time for the duration of said integration time.

4,040,093

SYSTEM FOR CODING INFORMATION CHANGE PICTURE ELEMENTS IN FACSIMILE SIGNAL

Yukio Nakagome, Yokohama; Hiroichi Teramura, Tokyo; Yasuhiro Yamasaki, Machida, and Yasushi Wakahara, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Sept. 8, 1975, Ser. No. 611,269
Claims priority, application Japan, Sept. 9, 1974, 49-103004
Int. Cl.² H04N *1/40, 7/12*
U.S. Cl. 358—261 **6 Claims**

1. A system for coding information change picture elements in a facsimile signal, comprising:

input terminal means for receiving the facsimile signal;
first encoder means connected to said input terminal means for encoding the absolute address of each information change picture element, having a state different from that of an immediately preceding picture element on each scanning line, in the facsimile signal in such a manner that a distance between the information change picture element and a reference information change picture element selected from information change picture elements of at least an immediately preceding scanning line is encoded by a minimum number of bits of each code word in the order of occurrence of all the information change picture elements;

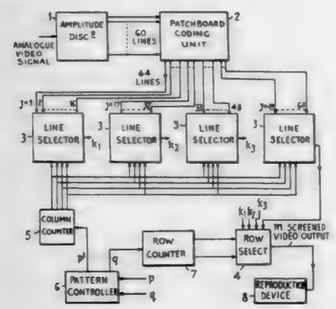


detector means connected to said input terminal means for generating a detection output signal when no information change picture element is included in an instant scanning line of the facsimile signal;
second encoder means connected to said input terminal means and said detector means for encoding the run length of the scanning line of the facsimile signal in response to said detection output signal; and
output means connected to said first encoder means and said second encoder means for obtaining a coded output pulse train from outputs of said first encoder means and said second encoder means.

4,040,094
ELECTRONIC SCREENING

Robert Charles Everett; Paul Anthony Beaufort Radcliffe; Alfred Henry Robinson, and Janusz Andrew Veltze, all of London, England, assignors to International Publishing Corporation Ltd., London, England

Division of Ser. No. 440,733, Feb. 8, 1974, Pat. No. 3,916,096. This application Aug. 13, 1975, Ser. No. 604,130
Claims priority, application United Kingdom, Feb. 13, 1973, 3016096/73
Int. Cl.² H06N *1/40*
U.S. Cl. 358—283 **9 Claims**

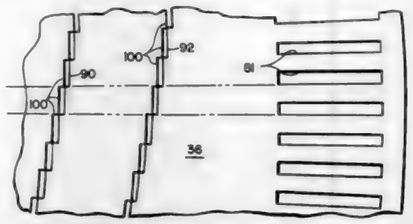


1. Apparatus for electronic screening of a graphic image to be reproduced by printing wherein means are provided for determining the density of said graphic image repetitively by means of digital sampling of the density during the generation of each dot which will form a part of the half-tone image when reproduced, and means for modifying the dot according to changes in the density during generation of the dot.

4,040,095
APPARATUS AND METHOD FOR FACSIMILE SCANNING

Jack S. Abrams, Northbrook, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Oct. 14, 1975, Ser. No. 621,902
Int. Cl.² H04N *1/04*
U.S. Cl. 358—285 **16 Claims**

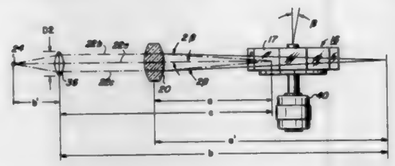


10. An apparatus for scanning a document by optically dividing the document into a large number of small discrete areas comprising:
means defining a fixed linear slit;
a scanning disc defining a spirally-shaped aperture, said disc being positioned adjacent said slit, defining means so that the intersection of said scanning spiral and said slit defines an exposure aperture;
means for rotatably driving said scanning disc so as to cause said scanning aperture to move across the document along a predetermined path as determined by the orientation of said elongated slit and said scanning spiral, said scanning spiral being formed by a continuous path of contiguous arcuate segments, each of said segments having a common center and forming a small portion of the total scanning spiral.

4,040,096
FLYING SPOT SCANNER WITH RUNOUT CORRECTION

Gary K. Starkweather, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 309,874, Nov. 27, 1972, abandoned. This application Oct. 28, 1975, Ser. No. 626,167
Int. Cl.² H04N *5/76, 1/04*
U.S. Cl. 358—302 **20 Claims**

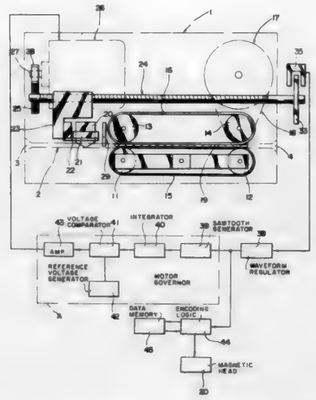


1. A flying spot scanning system comprising:
means for generating a beam of high intensity light,
a medium,
optical means for imaging said beam to a spot at the surface of said medium at a predetermined distance from said optical means,
a multifaceted polygon located in the path of said imaged beam between said beam generating means and said medium and having reflective facets for reflecting the beam incident to it onto said medium,
means for rotating said polygon such that the reflected light is scanned in successive traces across said medium, and
said optical means including a positive cylindrical lens positioned in the optical path of the beam between said polygon and said medium at a location such that runout errors are substantially corrected at said medium, the plane of no power of said cylindrical lens being oriented in the direction of the scan.

4,040,097
MAGNETIC CARD-READER WITH MOVABLE MAGNETIC HEAD

Mamoru Mizuno, Tokyo, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed Dec. 18, 1975, Ser. No. 641,990
Claims priority, application Japan, Jan. 20, 1975, 50-9184; Jan. 22, 1975, 50-9592; Jan. 22, 1975, 50-9593
Int. Cl.² G11B *25/04*; G06K *7/08*; G11B *21/02*
U.S. Cl. 360—2 **22 Claims**

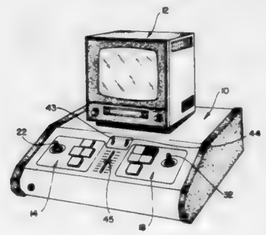


1. A magnetic card-reader with a movable magnetic head comprising head driving means to move a magnetic head along a card path, card moving means to carry to a specified position a magnetic card introduced in the card path, speed detection means adjacent the head driving means to detect moving speed of the magnetic head, data area control means for controlling starting of head magnetic operations, positioning means to position the magnetic head, and a means connected to the mounting means to hold the magnetic head in vertical position.

4,040,098
EDITING SYSTEM FOR CONTROLLING THE TRANSFER OF SELECTED VIDEO INFORMATION FROM A VIDEO SOURCE TO A VIDEO TAPE RECORDER

Gary H. Beeson, and William D. Skinner, both of Newport Beach, Calif., assignors to Convergence Corporation, Irvine, Calif.

Filed Mar. 15, 1976, Ser. No. 666,784
Int. Cl.² H04N *5/785*
U.S. Cl. 360—14 **12 Claims**

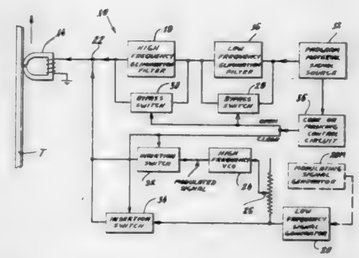


1. An edit control system for transferring selected video information from a video source to a record video tape recorder, said record video tape recorder including a supply reel, a take-up reel, drive means for causing video tape to be transported between the supply reel and the take-up reel in either direction, first means for supplying drive signals to said drive means, said edit control system including: second means for supplyng drive signals to said drive means in the video tape recorder; circuit means for selectively connecting said first and second drive signal supplying means to said drive means in the video tape recorder; first manually controlled switching means connected to said drive means in the video tape recorder and to said circuit means for stopping the video tape and for causing said first drive signal supplying means in the video tape recorder to be disconnected from the drive means in the video tape recorder and for causing said second drive signal supplying means to be connected to the drive means in the video tape recorder; and control circuit means including manually-controllable potentiometer means connected to said second drive signal supplying means for causing the drive means in the video tape recorder to drive the video tape in the video tape recorder under manual control in either direction from a still-frame position at a rate determined by the setting of the potentiometer means.

4,040,099
METHOD AND APPARATUS FOR PREPARING RECORDED PROGRAM MATERIAL TO RENDER DETECTABLE UNAUTHORIZED MAGNETIC TAPE DUPLICATIONS, AND METHOD AND APPARATUS FOR DETECTING SUCH DUPLICATIONS

Emory G. Cook, Wilton, Conn., assignor to Cook Laboratories, Inc., Norwalk, Conn.

Filed July 30, 1975, Ser. No. 600,454
Int. Cl.² G11B *5/02, 5/86*
U.S. Cl. 360—29 **39 Claims**



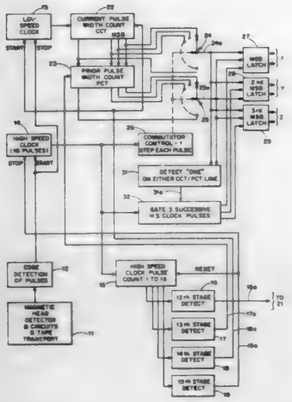
1. A method for preparing recorded program material which does not interfere with normal playback of the material but which renders detectable any unauthorized copies of the material which are made by conventional magnetic tape recording equipment introducing a phase shift between low and high frequency signals, said method comprising:
eliminating a low frequency band of signals from the program material signal;
generating and inserting a predetermined low frequency signal is said low frequency band;
eliminating a high frequency band of signals from the program material signal;
generating a predetermined high frequency signal in the high frequency band;
modulating the predetermined high frequency signal with said low frequency signal;
inserting the modulated high frequency signal in the high frequency band; and
recording the program material with the inserted high and low frequency signals;
whereby copying of the recorded material onto magnetic tape will produce on the tape detectable phase shifts between the inserted low frequency signal, and a low frequency signal obtained by demodulating the high frequency signal.

4,040,100

DIGITAL VIDEO TAPE FRAME CODE READOUT SYSTEM

Steven S. Chan, Holden, Mass., assignor to Adams-Smith Incorporated, Boxborough, Mass.

Filed Sept. 25, 1975, Ser. No. 616,589
Int. Cl.[2] G11B *5/02, 5/44*
U.S. Cl. 360—43 **15 Claims**



1. A system for detecting the successive binary bits of a binary number recorded on a moving tape comprising:

a bit detector;

means for moving the tape relative to the detector whereby the detector produces electrical pulses representing detecting bits;

means for producing clock pulses,

means responsive to said detected bit pulses and said clock pulses for producing a binary number, CCT, repesentative of the time duration of the current pulse and a binary number, PCT, representative of the time duration of the pulse prior to the current pulse;

means for comparing the N most significant bits of CCT with the corresponding N most significant binary bits of PCT producing comparison signals;

means responsive to said comparison signals for producing binary output signals from the system as follows:

the same binary output signal that represents the prior pulse when the ratio of the larger to CCT and PCT of the smaller is less than a pedetermined values R, or

a binary ONE when the ratio of PCT to CCT is greater than R, or

a binary ZERO when the ratio of CCT to PCT is greater than R.

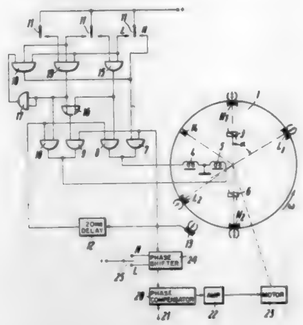
4,040,101

SYSTEM FOR EXTENDING THE PLAYING TIME OF VIDEO CASSETTES

Rainer Zoellner, Fuerth, and Guenter Munkert, Seukendorf, both of Germany, assignors to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth, Germany

Filed Aug. 27, 1975, Ser. No. 608,101
Claims priority, application Germany, Oct. 17, 1974, 2449423
Int. Cl.[2] G11B *15/44*
U.S. Cl. 360—64 **9 Claims**

1. In a video tape record/playback machine of the type including a tape transport, a tape transport drive, a rotating head drum, means for rotating said head drum, a first pair of video heads mounted on said head drum and displaced from each other by 180°, and a transformer having a rotating winding mounted to said head drum and a stationary winding; the improvement comprising: a second pair of video heads mounted to said head drum and displaced from each other by an angle slightly different from 180° and control means to interconnect said first pair of video heads and said rotating



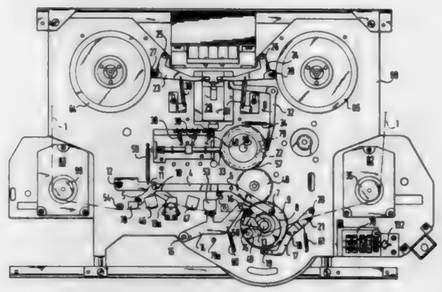
winding when said tape transport drive is operated at a normal speed and to interconnect at least one of the video heads of said second pair and said rotating winding when said tape transport drive is operated at a lower, extended play speed.

4,040,102

MAGNETIC TAPE DEVICE

Helmut Plener, Munich; Heinz Piotrowski, Olching; Otto Arweiler, Germering, and Herbert Drexler, Neuesting, all of Germany, assignors to Uher Werke Munchen GmbH & Co., Munich, Germany

Filed Nov. 4, 1975, Ser. No. 628,746
Claims priority, application Japan, Sept. 26, 1975, 50-116287
Int. Cl.[2] G11B *15/43, 15/24;* **B65M** *17/22, 59/38*
U.S. Cl. 360—71 **16 Claims**



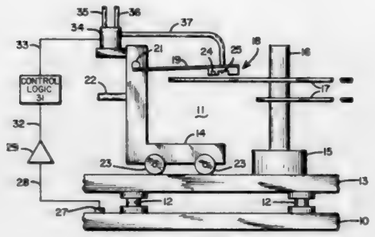
1. An improved magnetic tape device comprising two tape spool supporting means, motors for driving the spool supporting means, brake means for braking each spool supporting means, magnetic heads for recording, reproducing and erasing information on the tape, a capstan for said tape, first guide means for guiding the tape around the capstan in the approximate shape of an Ω-configuration, and second guide means for guiding the tape past the magnetic heads, a drive motor for driving the capstan, manually operable switches for setting the mode of operation of the device, wherein the improvement comprises a first control member, a control motor for moving the first control member between two operating positions, said two operating positions comprising a first operating position in which the tape can be stopped and rapidly wound forward or in reverse by the motors for driving the spool supporting means and in which the tape can be moved rectilinearly past the magnetic heads and capstan without contact therewith and a second operating position in which the tape is guided by the first and second guide means and lies against the magnetic heads for recording or reproducing and is engaged with the capstan in the approximate shape of an Ω-configuration, wherein said first control member comprises a control disc, said capstan extending through said control disc at the center thereof, and said control disc being rotatable about said capstan between the two operating positions, wherein said first guide means is mounted on said disc for movement with said disc between said first operating position and said second operating position.

4,040,103

SHOCK FORCE COMPENSATING SYSTEM

Robert A. White, Bloomington, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,588
Int. Cl.[2] G11B *21/20, 5/60*
U.S. Cl. 360—75 **9 Claims**



1. A shock force compensating system for flying magnetic heads comprising:

a stationary base subject to shock forces,

a shock absorbing means on said stationary base for delaying shock forces several milliseconds,

a chassis mounted on said shock absorbing means,

a rotatable magnetic storage device mounted on said chassis,

a flying head mounted on said chassis opposite said rotatable magnetic storage device for movement relative to said magnetic storage device,

an accelerometer mounted on said stationary base for sensing shock forces and for immediately generating a signal indicative of the magnitude of said shock force,

control means connected to said accelerometer for generating a control signal indicative of the magnitude of said shock force, and

transducer means responsive to said control signal for moving said flying head relative to said magnetic storage device in anticipation of said shock force being transmitted to said chassis.

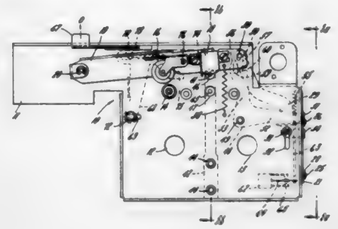
4,040,104

TAPE CASSETTE APPARATUS WITH PLURAL INTERMEDIATE POSITIONS

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed Mar. 18, 1976, Ser. No. 667,950
Claims priority, application France, Mar. 21, 1975, 75.08963
Int. Cl.[2] G11B *15/00*
U.S. Cl. 360—96 **13 Claims**

1. In an apparatus for the recording and playback of sound from a magnetic tape in a cassette, said apparatus having a fixed frame member, electro-mechanical reel and tape drive components mounted on said frame member including a tape drive capstan and reel spindles, said capstan being located to penetrate a cassette upon the insertion thereof into a playing position in said apparatus, a pressure roller for cooperating with said capstan for transporting said tape, a head for transducing signals onto and from the magnetic tape, and a movable support upon which said pressure roller and said head are mounted, said movable support being movably mounted on said frame for movement between an operative position, wherein with the cassette in said playing position, said pressure roller and said head are in their operative positions with the pressure roller pinching the tape against the capstan and the head engaged with the tape, and a retracted position, wherein said pressure roller and said head are in their retracted positions clear of the cassette and disengaged from the tape, the improvement comprising: means responsive to the movement of a cassette into said playing position for automatically moving said movable support from said retracted position toward said operating position, latch means carried by the frame member and interposed to arrest and maintain said movable support in a stable intermmediate position wherein the pressure roller is spaced from the drive capstan sufficient to allow movement of the tape therebetween and said head is spaced from the operative position, and means for releasing said latch means and for selectively moving said movable support from said stable intermediate position into and from said operative position and from said intermediate position into said retracted position.



4,040,105

MAGNETIC DISK DRIVE UNIT WITH FLEXIBLE SKIRT

Norman Edward Slindee, Austin, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,944
Int. Cl.[2] G11B *5/016, 23/02;* **H05F** *3/00*
U.S. Cl. 360—99 **4 Claims**



1. In a disk drive machine for operating on a disk-jacket assembly in which the jacket encloses the disk and is made of a material with high electrical resistivity so that the jacket may accumulate a high electrostatic charge on it, said jacket having a central opening through it and having an elongate slot in one of its thicknesses, said disk drive machine comprising:

a frame having a vertical recess in it into which the disk-jacket assembly may be dropped,

a rotatable hub carried by said frame and adapted to have an engagement with the disk of said disk-jacket assembly

through the central opening of the jacket for driving the disk,

a transducer of substantially electrically insulating material adapted to extend through the elongate slot of said disk-jacket assembly so as to have a data transferring relationship with respect to the disk, and

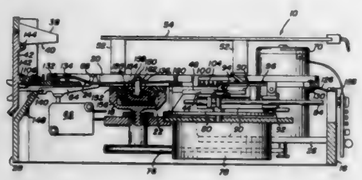
a skirt fixed at the upper end of said recess and depending downwardly into said recess and being of such flexible, flimsy thin sheet material so that the skirt is attracted to and thus moves into contact with an adjacent outer surface of the disk-jacket assembly positioned in said recess due to the electrostatic charge on the jacket, said skirt being made at least partially of electrically conducting material so that the electrostatic charge on the jacket may flow through the electrically conducting material of the skirt to said frame for dissipating the electrostatic charge on the jacket to the frame.

4,040,106

FLEXIBLE MAGNETIC DISC DRIVE APPARATUS

Harold C. Medley, Los Gatos, Calif., assignor to Shugart Associates, Inc., Sunnyvale, Calif.

Filed June 4, 1976, Ser. No. 692,886
Int. Cl.[2] G11B *5/016, 19/04*
U.S. Cl. 360—99 **21 Claims**



1. A flexible magnetic disc drive apparatus for recording or reproducing data on a flexible magnetic disc comprising:

a housing including a front plate;

a drive spindle rotatably mounted to said housing for rotatably driving the disc;

an elongated frame including opposed first and second ends, and means forming a stop, said frame being disposed over said spindle;

a latch hingedly mounted to said first end and coupled to said front plate such that said latch is movable between a closed and an open position;

pivot means for pivotally mounting said second end to said housing;

a spindle-clamping assembly;

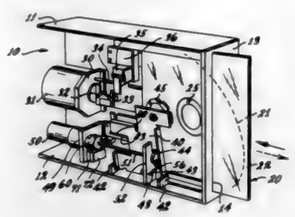
an elongated member formed of a resilient material and mounted to said frame proximate said first end such that its distal end is adapted to be engaged by said means forming a stop when said latch is moved to said open position, said member serving to carry said spindle-clamping assembly and to bias same towards said spindle, whereby when the disc is supported on said spindle and said latch is in said closed position, said member biases said spindle-clamping assembly against said spindle so as to clamp the disc therebetween, and whereby when said latch is opened and said frame is pivoted away from said spindle, said means forming a stop engages said member such that continued pivoting of said frame moves said spindle-clamping assembly out of clamping relationship with said spindle so as to allow the disc to be removed from said spindle.

4,040,107

DISK POSITIONING AND EJECTION DEVICE IN A DISK DRIVE

Philip Stuart Bryer, Tarzana, Calif., assignor to PerSci, Inc., Marina Del Rey, Calif.

Filed Apr. 21, 1976, Ser. No. 678,995
Int. Cl.[2] G11B *17/04*
U.S. Cl. 360—99 **13 Claims**



1. In a disk drive having a rotatable spindle for coupling to a disk to be inserted into the drive and in particular direction, a positioning and ejection mechanism mounted in a support comprising:

a hub member;

a carrier for the hub member and mounted for pivoting to assume a protracted and a retracted position, the hub member being mounted for freely rotating on the carrier;

an ejection device mounted in said support for reciprocating motion in said particular direction and opposite thereto;

a control motor;

a first cam assembly rotatably connected to the motor and establishing a three-phase cam cycle, the first assembly having means so that in a first phase of the cycle the cam assembly is coupled to the carrier to push the carrier from the retracted to the protracted position, in a second phase of the cycle the cam assembly is coupled to the carrier to move the carrier from the protracted to the retracted position, in the third phase of the cycle the cam assembly operates the ejection device for causing ejection of a disk;

a second cam assembly coupled to the motor;

a first switching device cooperating with the second cam assembly and connected to the motor for stopping the motor in a position between the first and the second phases and the second and third phases, respectively; and

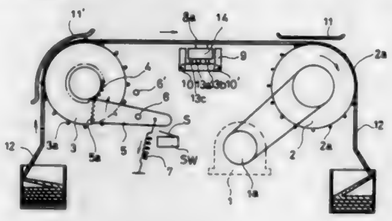
a second switching device for starting the motor from either of said stopping positions.

4,040,108

MAGNETIC SHEET READER

Kazuhiko Nakata, Shimosuwamachi-yashiro, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Filed July 28, 1975, Ser. No. 599,490
Claims priority, application Japan, July 31, 1974, 49-87652; June 30, 1975, 50-80622
Int. Cl.[2] G06K *7/08*
U.S. Cl. 360—101 **23 Claims**



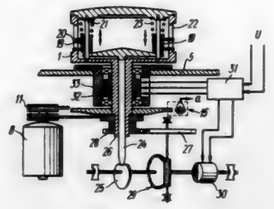
1. Magnetic sheet reader apparatus comprising intermittent driving means connected to a sheet for intermittently driving a magnetic sheet, tensioning means connected to the sheet for tensioning the magnetic sheet, magnetic head means mounted between the driving means and the tensioning means for communicating between the head means and the sheet, and moving means connected to the head means for moving the head means in a direction parallel to a plane of the sheet.

4,040,109

TAPE TRANSPORT SYSTEM OF VIDEO TAPE RECORDER WITH LONGITUDINAL RECORDING

Igor Alexeevich Kryltsov, Semenovskaya naberezhnaya, 3/1, korpus 5, kv. 102, Moscow, U.S.S.R.

Filed Aug. 18, 1975, Ser. No. 605,676
Int. Cl.[2] G11B *5/52, 21/04, 21/18*
U.S. Cl. 360—107 **12 Claims**



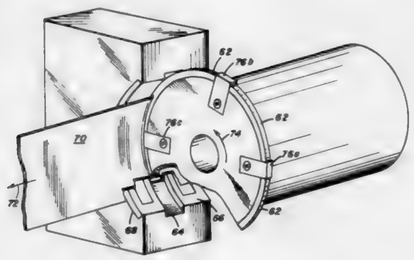
1. A magnetic tape scanning system for a video tape recorder providing scanning in the longitudinal direction of a moving magnetic tape, with the tape being wrapped about the periphery of a guide drum perpendicular to the drum axis comprising: a rotatably mounted drum of generally hollow construction having a shaft and having at least one slot in the periphery thereof disposed with its axis generally parallel to the axis of said drum, a magnetic head assembly in each of said slots with each of same mounted in said drum for reciprocating movement in the slot direction, guide means on said drum supporting and guiding said magnetic head assemblies to provide said reciprocating movement within said slot, drive means for rotating said drum and for reciprocating said magnetic head assembly, whereby the recording of video tape information is improved.

4,040,110

VIDEO HEAD ASSEMBLY HAVING DISCRETE ARCURATE CERAMIC PIECES ON ROTOR BETWEEN HEADS

John F. Bagby, Encinitas, Calif., assignor to Spin Physics, Inc., San Diego, Calif.

Filed Sept. 12, 1975, Ser. No. 612,601
Int. Cl.[2] G11B *5/22, 5/52, 15/60*
U.S. Cl. 360—107 **2 Claims**



1. A head wheel assembly for use in a transverse scan video recorder, comprising:

a. a head wheel having a plurality of substantially identical magnetic heads arcuately spaced evenly about the periphery of said head wheel;

b. means for rotating said wheel;

c. said magnetic heads mounted to and extending slightly from the periphery of said head wheel, said magnetic heads having transducer gap-defining parts comprised of ferrite material;

d. ceramic material mounted to said head wheel and defining said head wheel periphery, said ceramic material comprising a plurality of discrete arcuate pieces respectively disposed on said head wheel and separated by said magnetic heads;

e. a vacuum guide having a generally circular concave surface, a cylindrical groove in said surface, and at least one conduit through said guide for communicating vacuum to said concave surface;

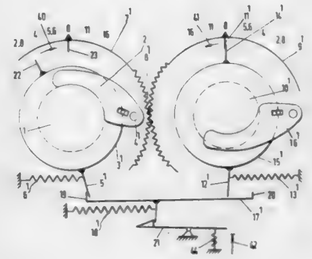
f. means for supporting said head wheel and said guide so that the periphery of said wheel aligns with the the groove of said guide, the gap-defining parts of said magnetic heads, during wheel rotation, extending slightly into said groove.

4,040,111

CAMERA AUTOMATIC EXPOSURE CONTROL APPARATUS

Fritz Lindner, and Werner Hahn, both of Dresden, Germany, assignors to VEB Pentacon Dresden, Dresden, Germany

Filed June 16, 1975, Ser. No. 587,035
Claims priority, application Germany, July 5, 1974, 179713
Int. Cl.[2] G03B *7/00*
U.S. Cl. 354—49 **5 Claims**



5. An apparatus for automatic exposure control in a single lens reflex camera including

an exposure shutter;

a shutter release element;

an objective lens;

a first light regulating means (**3**[1] and **2** or **28**) controlling light admission through said objective lens;

a toothed preselection element (**7**[1], **27**) controlling said first light regulating means;

a photo-electric receiver for controlling the exposure;

an optical device associated with said photo-electric receiver;

means for directing light from the objective lens through the said optical device to the photo-electric receiver;

a second light regulating means (**15**[1], **16**[1] or **24**) controlling light passing from said optical device to the photo-electric receiver;

a first abutment (**23, 36**) movable by said preselection element to its preselected position;

a second abutment (**22, 37**) on said first light regulating means movable into engagement with said first abutment on release of the shutter release element;

operating means for driving the second light controlling means in its light restricting direction when the preselection element is moved to its selected position, said operating means including teeth engaging the teeth on the preselection element;

means (**61**) for driving said first regulating means in the light restricting direction on release of the shutter release element; and

driving means (**20, 12**[1] or **33, 32**) for driving the second light

regulating means in the direction opposite to that of the first light regulating means and to an equal degree after release of the shutter release element.

4,040,112

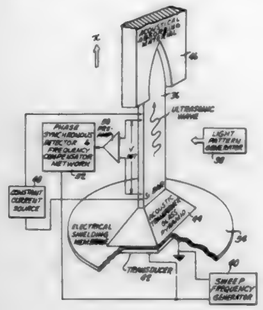
DIRECT ELECTRONIC FOURIER TRANSFORMS OF OPTICAL IMAGES

Philipp G. Kornreich, North Syracuse, and Stephen T. Kowel, Liverpool, both of N.Y., assignors to Research Corporation, New York, N.Y.

Division of Ser. No. 493,990, Aug. 1, 1974, which is a continuation of Ser. No. 319,680, Dec. 29, 1972, abandoned. This application May 7, 1976, Ser. No. 684,002

Int. Cl.[2] H04N *3/14;* **H01V** *7/00*

U.S. Cl. 358—213 **17 Claims**



1. A device for generating an electrical signal representation of an optical image comprising:

a medium of a material selected from the group consisting of degenerate semiconductors and metals and having an electrical property which varies as a function of an optical image formed at the medium and as a function of strain disturbances in the medium;

means for forming an optical image at the medium;

means for causing in the medium a plurality of different strain disturbances having spatial wavelengths selected substantially independently of any natural vibrating modes of the medium; and

means for measuring said electrical property of the medium at a plurality of said different strain disturbances in the medium to derive a plurality of electrical signals, each signal representing an aspect of the entire optical image rather than at a point of the image, said measuring means including means for establishing a constant current across a portion of the medium and means for detecting the potential difference across at least a part of said portion of the medium at a plurality of said different strain disturbances in the medium.

4,040,113

MAGNETORESISTIVE MAGNETIC HEAD

Frederik Willem Gorter, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,948

Claims priority, application Netherlands, Apr. 15, 1975, 7504438

Int. Cl.[2] G11B *5/30*

U.S. Cl. 360—113 **4 Claims**

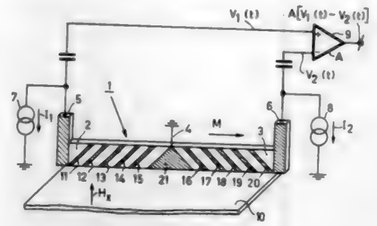
1. A magnetic head for detecting information representing magnetic fields on a selected track of a magnetic recording medium, which head comprises an elongate magneto resistive sensing element, said element having:

a. an edge adapted for cooperation, in parallel relationship, with a selected track of a recording medium;

an axis of easy magnetisation parallel to said edge;

c. A first end-contact, a middle-contact and a second end-contact, for connecting the element to an electrical circuit for detecting resistance variations, which middle-contact devides the element in two substantially equal parts, each having a length which substantially corresponds with half the width of a selected track;

d. one equipotential strip, which is provided between the



first end-contact and the middle-contact, at an acute-angle between 30° and 60° with the axis of easy-magnetisation;

e. one equipotential strip, which is provided between the middle-contact and the second end-contact, at an obtuse-angle with the axis of easy magnetisation, which obtuse-angle is substantially the supplement of said acute-angle.

4,040,114

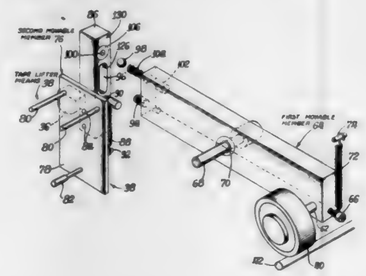
MAGNETIC TAPE REPRODUCING APPARATUS WITH MANUALLY OVERRIDEABLE CONNECTION BETWEEN TAPE LIFTER AND PRESSURE ROLLER

John P. Jenkins, Towanda, Ill., assignor to International Tapetronics Corporation, Bloomington, Ill.

Filed Apr. 19, 1976, Ser. No. 678,307

Int. Cl.[2] G11B *15/60, 27/02*

U.S. Cl. 360—130 **8 Claims**



1. In reproducing apparatus for a magnetic tape having a housing, tape drive means for moving the tape past a reproducing head and between a capstan and pressure roller, a tape lifter movable between a lowered tape-free position enabling the tape to engage the head for play mode operation and a lifted position engaging and lifting the tape from the head for fast mode operation, and control means selectively activatable to place said apparatus in play and fast modes in which said tape drive means moves said tape at play and fast speeds respectively, the improvement comprising:

the pressure roller being carried on a first movable member for movement toward and away from said capstan;

the tape lifter being carried on a second movable member for movement between its said lowered and lifted positions;

first biasing means urging said first movable member in a direction to move said pressure roller away from said capstan;

second biasing means urging said second movable member in a direction to move said tape lifter toward its said lifted position;

means for supporting said first movable member to move said pressure roller between a tape-driving position pressing the tape into frictional driving engagement with the capstan and a non-tape-driving position spaced from the capstan;

means for supporting said second movable member to move said tape lifter between its said lowered and lifted positions and a manually manipulated grip on said second movable member enabling an operator to grasp said grip and move said tape lifter selectively through a range between said lowered and lifted positions against the urgence of said second biasing means;

means including mechanical connecting means between said first and second movable members for moving said tape lifter to its said lowered and lifted positions simultaneously with movement of said first movable member to move said pressure roller respectively to its said tape-driving and non-tape-driving positions;

said mechanical connecting means including a lost motion connection between said first and second movable members enabling manual override movement of said second movable member and tape lifter relative to and independent of said first movable member, between said lowered and lifted positions, when said first movable member is moved to place said pressure roller in its said non-tape-driving position;

whereby tape proximity to the head can be adjusted manually within the limits of said lost motion connection, to provide selected audio output level, while editing and scanning the tape in fast mode operation.

4,040,115

SEMI-CONDUCTOR REGULATORS, PARTICULARLY FOR MOTOR VEHICLE GENERATORS

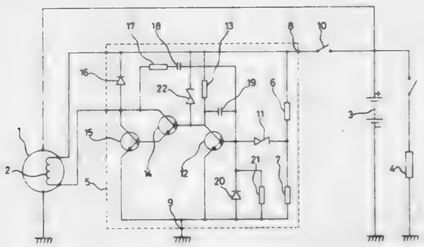
Michel Gerard Gruson, Paris, France, assignor to Ducellier et Cie., Paris, France

Filed Nov. 19, 1975, Ser. No. 633,296

Claims priority, application France, Dec. 27, 1974, 74.42949

Int. Cl.[2] H02H *9/04*

U.S. Cl. 361—18 **4 Claims**



1. An improvement to semi-conductor regulators, particularly for motor vehicle generators, the regulators comprising an output stage constituted by a Darlington pair and protection by a Zener diode, characterised in that the Zener diode is connected directly between the base of the input transistor of the Darlington pair and the supply terminal of the regulator, the said diode has a conduction threshold of value equal to at least five times the nominal value of voltage of the installation, such that the dynamic value of its inverse resistance is sufficiently high to ensure the protection of the Darlington pair against transient over-voltages.

4,040,116

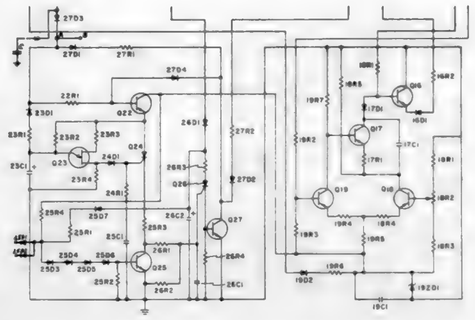
POWER SUPPLY EMPLOYING A SHORT CIRCUIT DETECTOR

Donald Charles Sheldon, Glen Ellyn, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Dec. 4, 1975, Ser. No. 637,829

Int. Cl.[2] H02H *7/127*

U.S. Cl. 361—18 **3 Claims**



1. A power supply having an input buss for supplying current to a plurality of loads, a plurality of individual power converting and controlling circuits, each such circuit interfacing between said input buss and a separate one of said loads, each said individual circuit comprising means for rectifying the voltage from said input buss, means in each individual circuit for limiting the current which may be drawn by that circuit from to a predetermined reduced to level the common buss, means in each circuit responsive to a drop in potential below a predetermined voltage level for causing said circuit to enter an open circuit condition for the supply of power to its load, means disposed externally of each circuit and responsive to anyone of said circuits entering an open circuit condition for causing the remaining circuits on said buss to enter an open circuit condition relative to their respective loads, and timing means operative automatically for restoring said circuits from the open circuit condition to again supply power to the loads.

4,040,117

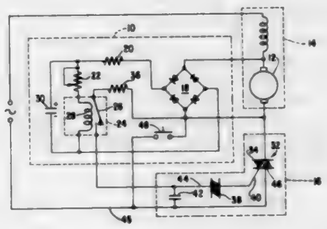
FAST OPERATING OVERLOAD SWITCHING CIRCUIT FOR UNIVERSAL MOTORS

John Martin Houser, Pickens, S.C., assignor to The Singer Company, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,582

Int. Cl.[2] H02H *7/085*

U.S. Cl. 361—33 **7 Claims**



1. Fast operating overload protection circuitry for a universal motor comprising:

a. controllable gating means in the power line to said motor for switching off the power to said motor in response to the removal of an electrical gating signal,

b. voltage detecting means coupled to sense the voltage level across the armature of said motor and for interrupting an

electrical gating signal to said gating means when the voltage across said armature falls below the predetermined threshold level,

c. the gating means includes a triac, and

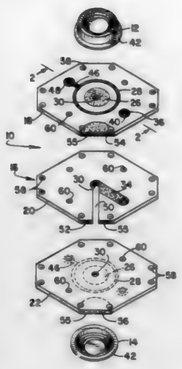
d. the detecting means includes rectifying means coupled to rectify the voltage across said armature.

4,040,118

PRESSURE SENSITIVE TRANSDUCER

Samuel Andrew Johnston, Fontana, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed June 18, 1975, Ser. No. 587,807
Int. Cl.[2] H01G 7/00
U.S. Cl. 361—283 **16 Claims**



1. A variable capacitance pressure responsive transducer comprising:

a substrate assembly of electrically insulating material having first and second spaced apart surfaces having substantially coextensive peripheral boundaries and a fixed capacitor plate within the boundary of said first surface to form a first electrode;

a metal diaphragm hermetically secured to the first surface of said substrate assembly in surrounding relation to said fixed capacitor plate and spaced from said first surface boundary to form a second electrode and a chamber containing said fixed capacitor plate;

and a fluid passageway in said substrate in communication with said chamber and longitudinally extending substantially parallel to said first and second surfaces to a point external to said chamber to provide fluid communication between said chamber and said point.

4,040,119

PROGRAMMER FOR MAGNETIC LATCHING RELAYS

Joseph A. Dalpee, New Carrollton, Md.; Fred W. Bernard, Alexandria, Va., and Richard G. Reynolds, Bowie, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 19, 1976, Ser. No. 706,409
Int. Cl.[2] H01H 47/32
U.S. Cl. 361—191 **3 Claims**

1. A programmer for selectively controlling magnetic latching relays, which comprises:

a first monostable multivibrator for receiving an activating signal;

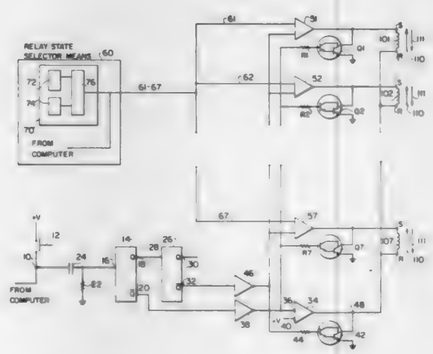
a second monostable multivibrator coupled to the output of said first monostable multivibrator;

relay state-selector means for providing control signals to select the position of the relays;

a first AND-driver device for generating an actuating voltage for each relay, said first AND-driver device having a first input coupled to a high-level signal, a second input coupled to the output of said first monostable multivibrator so that said first AND-driver device second input is energized with a high-level signal only during the occurrence of the quasi-stable state of said first monostable multivibrator, and an output coupled to the reset terminal of each relay coil;

first output-driving means for providing a sustaining current for each relay, said first output-driving means having a control input coupled to the output of said second monostable multivibrator and having output terminals connected between the circuit ground and said reset terminal of each relay coil;

a plurality of AND-driver devices for generating actuating voltages, one associated with each relay coil, each of said plurality of AND-driver devices having a frist input coupled to said relay state-selector means for receiving a control signal, a second input coupled to the output of said monostable multivibrator so that the second input of each of said plurality of AND-driver devices is energized with a high-level signal only during the occurrence of the quasi-stable state of said second monostable multivibrator, and an output coupled to the set terminal of the associated relay coil; and



a plurality of output-driving means for providing sustaining currents, one associated with each relay coil, each of said plurality of output-driving means having a control input coupled to the output of said first monostable multivibrator and having output terminals connected between the circuit ground and the set terminal of the associated relay coil,

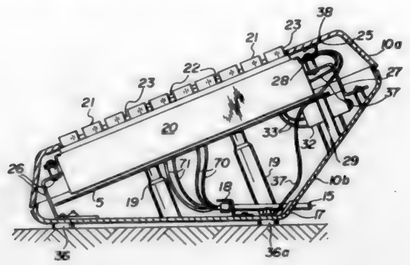
said first AND-driver device producing an actuating voltage establishing current through said relay coils in a first direction only during the occurrence of the quasi-stable state of said first monostable multivibrator, said plurality of output-driving devices being in a conducting state for supplying a sustaining current through said relay coils in said first direction only during the occurrence of the quasi-stable state of said first multivibrator, said plurality of AND-driver devices producing an actuating voltage establishing current through said associated relay coils in a second direction only upon the joint occurrence of said control signals from said relay state-selector means and of the quasi-stable state of said second monostable multivibrator, said first output-driving means being in a conducting state and supplying a sustaining curtent in said second direction only during the occurrence of the quasi-stable state of said second monostable multivibrator.

4,040,120

ELECTROSTATIC PROTECTION FOR A TELECOMMUNICATIONS TERMINAL APPARATUS

Youssef Alfred Geadah, and Frank Joseph Vallo, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed June 29, 1976, Ser. No. 700,957
Int. Cl.[2] H05F 3/02
U.S. Cl. 361—220 **9 Claims**



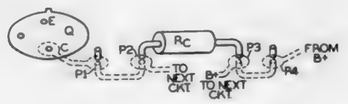
1. In a telecommunications terminal apparatus including a housing having an aperture defined by a peripheral wall, and in the housing at least one manually actuatable control protruding into the aperture, a power supply for connection to a source of energizing current related to earth, and electronic circuitry having power and control terminals connected to the power supply and the actuatable control respectively, the electronic circuitry being susceptible to being damaged by static electric discharge from a user; an electrical circuit for reduding exposure of the electronic circuitry to said static electric discharge, the electrical circuit comprising an electrically conductive material located in close proximity to the actuatable control and the aperture, and a conductive path connected between the conductive material and one of the power terminals, whereby static electric discharge which would typically flow along a potentially damaging path through the actuatable control and the electronic circuitry, is conducted around the electronic circuitry via the conductive material and the conductive path.

4,040,121

FAIL-SAFE PRINTED CIRCUIT BOARD CONNECTION

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 27, 1975, Ser. No. 581,223
Int. Cl.[2] H05K 5/00
U.S. Cl. 361—409 **6 Claims**



1. On a printed circuit board, a fail-safe circuit connection arrangement comprising:

a. a first and a second terminal pad for interconnecting two circuit elements, at least one of which has external lead wire connections,

b. a first solder joint connection between one external lead wire of said one element and said first terminal pad,

c. a second solder joint connection between said second terminal pad and said one external lead wire at another point along that lead more distant from said one element,

d. a circuit connection between said second terminal pad and the other circuit element for adding any resistance in said first solder joint only to said second element to maintain unchanged the established parameter values of said one element circuit path, and

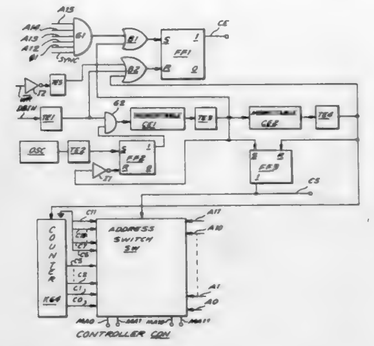
e. a circuit connection from said first terminal pad to another circuit stage for transferring an output signal between said one element and said other stage exclusive of any resistance in said first solder joint.

4,040,122

METHOD AND APPARATUS FOR REFRESHING A DYNAMIC MEMORY BY SEQUENTIAL TRANSPARENT READINGS

Leslie J. Bodin, Stonybrook, N.Y., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 7, 1976, Ser. No. 674,391
Int. Cl.[2] G11C 7/00; G06F 13/00
U.S. Cl. 364—900 **6 Claims**



1. In a data processing system comprising a dynamic memory unit connected to a central processing unit, the central processing unit periodically, during major system cycles, emitting a group of memory address signals and a fetch signal for requesting the contents of a memory cell of the dynamic memory unit, and the dynamic memory unit comprising a plurality of memory cells arrayed in a matrix of row sets and column sets wherein each memory cell must be periodically refreshed and wherein a set of memory cells is refreshed when a read signal and the group of memory address signals of at least one of the memory cells of the set are coincidentally received by the dynamic memory unit and the dynamic memory unit emits the contents of a memory cell for transmission to the central processing unit only when a read signal, a transfer-allow signal, and the group of memory address signals of the memory cell are coincidentally received by the dynamic memory unit, the improvement comprising: converting means connected to the central processing unit for converting the fetch signal to a first read signal and to a transfer-allow signal; means for transmitting both the read and transfer-allow signals and the group of memory address signals received with the fetch signal to the dynamic memory unit whereby the contents of the memory cell designated by said group of memory address signals are emitted by the dynamic memory unit for transfer to the central processing unit; memory address signals generating means for sequentially generating groups of memory address signals; supplemental read signal generating means for generating a given period of time after the conversion of the fetch signal to said first read signal but before the end of the major systems cycle during which the fetch signal was generated, a second read signal, and means for transmitting said second read signal and a group of memory address signals generated by said memory address signals generating means but no transfer-allow signal to the dynamic memory unit whereby the set of memory cells containing the memory cell designated by the group of memory address signals generated by said memory address signals generating means is refreshed but the contents of none of the memory cells of said group are emitted by the dynamic memory unit.

DESIGN PATENTS

GRANTED AUGUST 2, 1977

ERRATA

For CLASS	See PATENT NO.
024–003	245,287

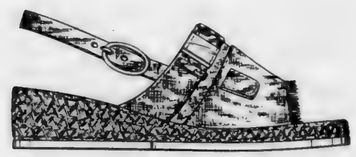
DESIGNS

AUGUST 2, 1977

245,206
KNEE PROTECTOR
Clement A. Magnan, 600 18th Ave. North, Apartment 204W, Minneapolis, Minn. 55411
Filed Aug. 11, 1975, Ser. No. 603,690
Term of patent 14 years
Int. Cl. D2—*02, 99*
U.S. Cl. D2—27



245,207
SHOE
Lyle J. Cohn, Lyndhurst, Ohio, assignor to International Seaway Trading Corporation, Cleveland, Ohio
Filed July 28, 1975, Ser. No. 599,401
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—293



245,208
SHOE
Lyle J. Cohn, Lyndhurst, Ohio, assignor to International Seaway Trading Corporation, Cleveland, Ohio
Filed July 28, 1975, Ser. No. 599,771
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—293



245,209
SHOE
Harvey Gerdy, Beachwood, Ohio, assignor to International Seaway Trading Corporation, Cleveland, Ohio
Filed Nov. 28, 1975, Ser. No. 635,756
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—293



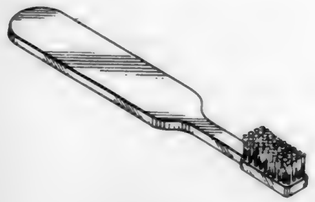
245,210
SHOE
Harvey Gerdy, Beachwood, Ohio, assignor to International Seaway Trading Corporation, Cleveland, Ohio
Filed Nov. 28, 1975, Ser. No. 635,810
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—293



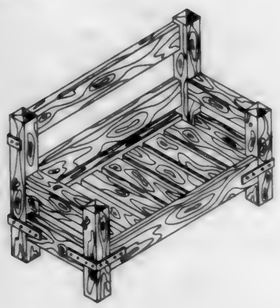
245,211
SPORT SHOE
Morris L. Krome, 722 E. Pratt St., Baltimore, Md. 21202
Filed Sept. 22, 1975, Ser. No. 615,524
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



245,212
TOOTHBRUSH
Kenneth John Pridmore Akester, 47 Portland place, London W.1, England
Filed Oct. 9, 1975, Ser. No. 621,143
Term of patent 14 years
Int. Cl. D4—*02*
U.S. Cl. D4—25



245,213
SETTEE
Horace A. Hade, 6303 Valley Drive, R.R. No. 2, Grabill, Ind. 46741
Filed Feb. 27, 1976, Ser. No. 661,941
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—60



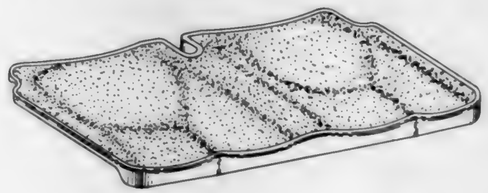
245,214
WALL MOUNTED COMBINED RACK FOR TENNIS RACKETS AND TENNIS BALL CANS
Billy W. Allen, 3320 Augusta, Rockwall, Tex. 75087
Filed June 21, 1976, Ser. No. 698,179
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—125



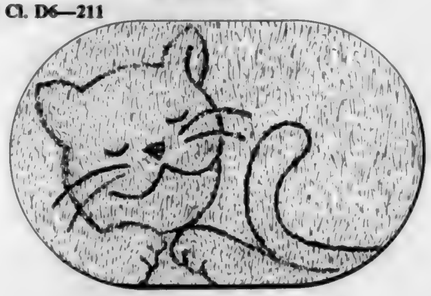
245,215
TABLE HAVING AN ADJUSTABLE TOP
Ellen M. Silvay, 25A Josham Lane, Lake Hiawatha, N.J. 07034
Filed Sept. 10, 1975, Ser. No. 607,121
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—179



245,216
SKI LIFT SEAT
William A. Akers, Knoxville, Tenn., assignor to Plastics Industries, Inc., Athens, Tenn.
Filed Feb. 25, 1976, Ser. No. 661,029
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—197



245,217
RUG
Arthur T. Farhood, Brooklyn, N.Y., assignor to Lysander Tufted Products, Ltd., New York, N.Y.
Filed June 18, 1976, Ser. No. 697,407
Term of patent 14 years
Int. Cl. D6—*11*
U.S. Cl. D6—211



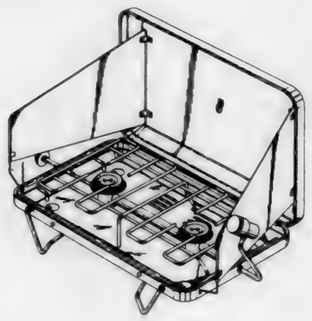
245,218
DINNER PLATE OR SIMILAR ARTICLE
George B. Jensen, Syracuse, N.Y., assignor to Syracuse China Corporation, Syracuse, N.Y.
Filed June 25, 1975, Ser. No. 590,143
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—35



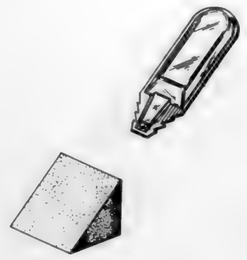
245,219
POPCORN POPPER
Louis J. Christen, Jr., St. Louis, Mo., assignor to Christen Incorporated, St. Louis, Mo.
Filed Mar. 11, 1976, Ser. No. 665,965
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—95



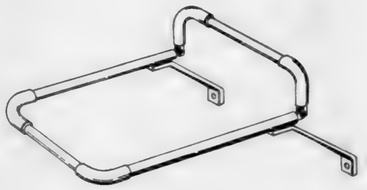
245,220
PORTABLE COOKING STOVE
Ming Kong Chan, 58 Pau Chung St., Tokwawan, Kowloon, Hong Kong
Filed June 11, 1975, Ser. No. 585,918
Claims priority, application United Kingdom, Feb. 21, 1975, 969973/75
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—110



245,221
DISPOSABLE APPLICATOR WITH LIQUID SUPPLY
Earl Hoyt, 127 E. Crescent Ave., Ramsey, N.J. 07446
Filed Mar. 22, 1976, Ser. No. 669,003
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



245,222
ARTICULATED BAG HOLDER
Frank M. Harding, 1303 Brush Hill Circle, Naperville, Ill. 60540
Filed Oct. 20, 1975, Ser. No. 623,953
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—193



245,223
WALLPLATE-EDGE CLUSTERS
Leonard Fine, Brooklyn, N.Y., assignor to General Electric Company
Filed Sept. 16, 1975, Ser. No. 613,825
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—350



245,224
STRAP GROUND ANCHOR
William G. Bowers, 3138 Lower Roswell Road, Marietta, Ga. 30062
Filed June 27, 1975, Ser. No. 591,149
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—388



245,225
MOIST TOWEL DISPENSER
Gerard E. Lyons, Burlington, Canada, assignor to Plax Canada Limited, Toronto, Canada
Filed Nov. 25, 1975, Ser. No. 635,266
Claims priority, application Canada, Aug. 19, 1975, 1908752
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60

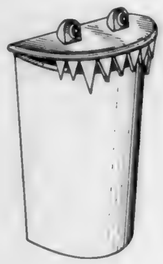
245,226
BOTTLE
John Dermot Magowan, Johannesburg, South Africa, assignor to Nicholas Laboratories (Proprietary) Limited
Filed Aug. 1, 1975, Ser. No. 601,573
Claims priority, application South Africa, Feb. 5, 1975, 75/212
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—149



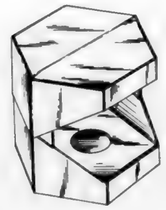
245,227
BOTTLE
Dennis F. Shine, Huntington Beach, Calif., and Gunther W. Torau, Buffalo Grove, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Division of Ser. No. 404,075, Oct. 5, 1973. This application June 16, 1975, Ser. No. 587,521
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—169



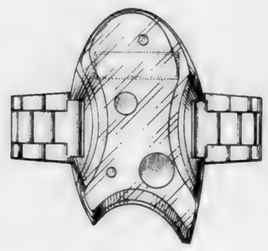
245,228
STORAGE CONTAINER
Thomas A. Gilson, and Matthew W. Gilson, both of 777 Michigan Ave., Wilmette, Ill. 60091
Filed Oct. 17, 1975, Ser. No. 623,428
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—230



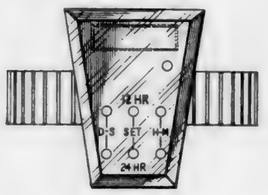
245,229
DISPLAY CARTON
Wallace E. Hanson, Hampden, Mass., assignor to Champion International Corporation, Stamford, Conn.
Filed Mar. 1, 1976, Ser. No. 662,378
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



245,230
WRIST WATCH
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed Nov. 20, 1975, Ser. No. 633,660
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32



245,231
WRIST WATCH
Carl J. Kleiner, 2302 Beach, Cisco, Tex. 76437
Filed Nov. 20, 1975, Ser. No. 633,701
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—32



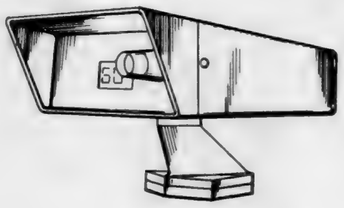
245,232
TIMER
François Quirin, Courbevoie, France, assignor to Adams S.A., Annemasse, France
Filed Mar. 2, 1976, Ser. No. 663,055
Claims priority, application Switzerland, Sept. 9, 1975, 61600/75
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



245,233
DOWSING ROD
Samuel E. Wolfe, 13451 Ector, La Puente, Calif. 91746
Filed Apr. 13, 1976, Ser. No. 676,418
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—46



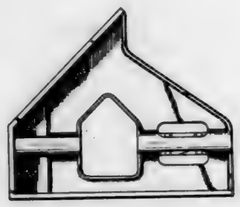
245,234
TEMPERATURE READOUT HOUSING
James E. Rieth, 2315 Okemos Drive SE., Grand Rapids, Mich. 49506
Filed Dec. 31, 1975, Ser. No. 645,709
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—57



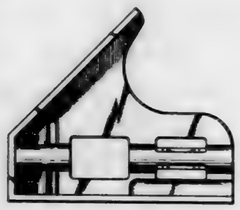
245,235
COMBINED SQUARE AND PROTRACTOR
Dan Hurwitz, Dallas, Tex., assignor to On-Line Data, Inc., Dallas, Tex.
Filed Dec. 29, 1975, Ser. No. 644,432
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



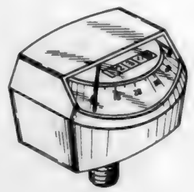
245,236
HANDLE FOR A COMBINATION SQUARE
Richard H. Russell, Farmington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Mar. 12, 1976, Ser. No. 666,227
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



245,237
HANDLE FOR A COMBINATION SQUARE
Richard H. Russell, Farmington, Conn., assignor to The Stanley Works, New Britain, Conn.
Filed Mar. 12, 1976, Ser. No. 666,709
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—62



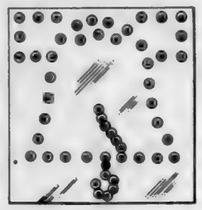
245,238
SPEEDOMETER
Howard J. Rasmussen, Fox River Grove, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Jan. 15, 1976, Ser. No. 649,534
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98



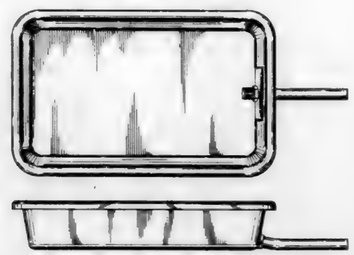
245,239
JEWELRY FINDING
John Clyde Miller, 9001 Industrial Road, Las Vegas, Nev. 89118
Continuation of Ser. No. 483,966, June 28, 1974, abandoned. This application May 12, 1976, Ser. No. 686,239
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—79



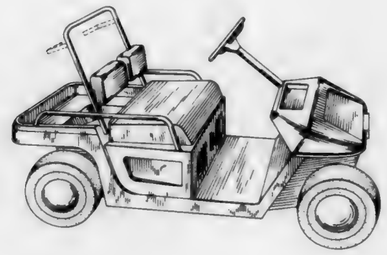
245,240
PLAQUE
John P. Sut, 2461 Huntington St., Lake Station, Ind. 46405
Filed Feb. 2, 1976, Ser. No. 654,528
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—132



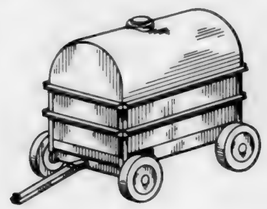
245,241
HYDROPONIC GARDENING TRAY
John E. Robinson, 11514 Orchard Road, Kansas City, Mo. 64134
Filed June 25, 1976, Ser. No. 699,900
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



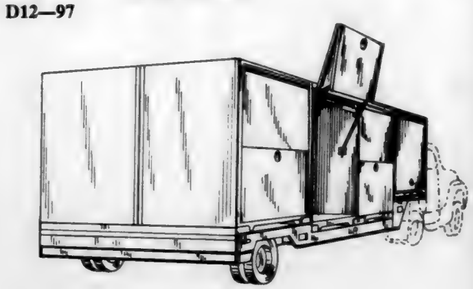
245,242
GOLF CAR
Ronald M. Stolley, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed Jan. 29, 1976, Ser. No. 653,548
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—16



245,243
TANK TRAILER
Donald R. Kerr, and Marvin D. Kerr, both of 220 S. Burlington St., Hastings, Nebr. 68901
Division of Ser. No. 650,171, Jan. 19, 1976. This application Aug. 16, 1976, Ser. No. 714,753
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—95



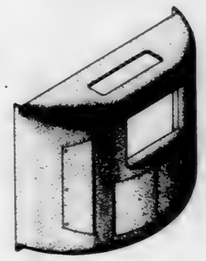
245,244
TRAILER
Leland D. Arnot, Jr., 310 Norton St., Boulder, Colo. 80303; Ray C. Imel, Jr., 2260 Meadow Ave., Boulder, Colo. 80302, and Donald E. Imel, 1935 Table Mesa Drive, Boulder, Colo. 80303
Filed Dec. 8, 1975, Ser. No. 638,905
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—97



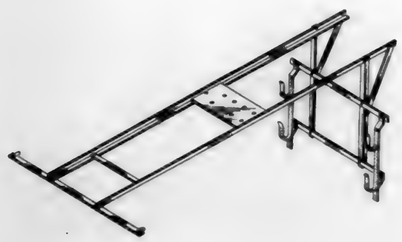
245,245
BRAKE STIRRUP
Rene Lauzier, Ruy, France, assignor to Angenieux-CLB S.A., Saint-Etienne, France
Filed Apr. 23, 1976, Ser. No. 679,865
Claims priority, application France, Nov. 21, 1975, 75.2142
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—179



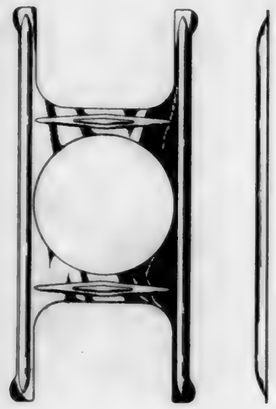
245,246
AIR DEFLECTOR FOR TRAILERS
Robert W. Crowe, 4942 Encinita Blvd., Temple City, Calif. 91780, and Joseph M. FitzGerald, 9331 Mikinda Ave., La Habra, Calif. 90631
Filed Dec. 15, 1976, Ser. No. 750,771
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—181



245,247
VEHICLE-MOUNTABLE RACK FOR HOLDING ACCESSORIES AND THE LIKE
Joseph C. Russell, 4286 Florence St., and Gerard A. Russell, 3418 Travis St., both of Simi Valley, Calif. 93063
Filed Oct. 10, 1975, Ser. No. 621,375
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—157



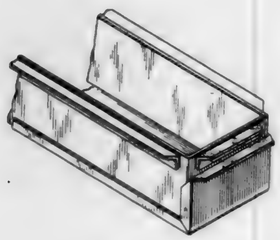
245,248
SPEAKER SUPPORT TRUSS
William E. Brown, Jr., 809 N. Madison, Dallas, Tex. 75208
Filed Aug. 22, 1975, Ser. No. 607,030
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—37



245,249
COFFEE BREWER
Calvin C. Preble, Long Beach, Calif., assignor to Farmer Bros. Co
Filed Oct. 1, 1975, Ser. No. 618,711
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—113



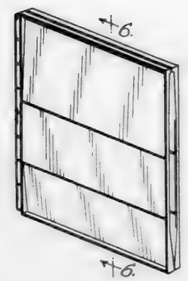
245,250
BEAM MOLD FOR CASTING CONCRETE TEST SPECIMENS
Edward R. Hamilton, Austin, Tex., assignor to Rainhart Co., Austin, Tex.
Filed Mar. 22, 1976, Ser. No. 668,753
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—136



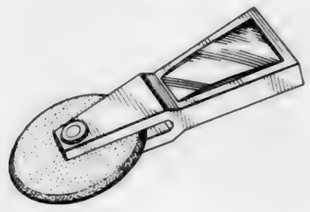
245,251
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,780
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



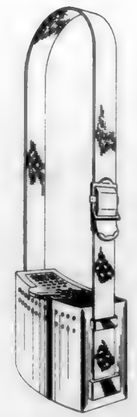
245,252
BOOK FOR TELEPHONE INDEX CARDS OR THE LIKE
James Patrick Sullivan, Tustin, and Dale D. Smith, Irvine, both of Calif., assignors to Acme Visible Records, Inc.
Filed Jan. 19, 1976, Ser. No. 650,199
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26



245,253
COMBINED ERASER AND MAGNIFIER
Seymour Moskowitz, 36 Brandon St., Lexington, Mass. 02173
Filed Aug. 4, 1975, Ser. No. 601,619
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—53

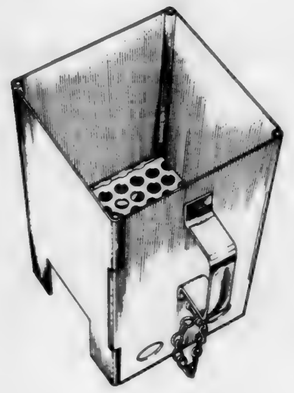


245,254
BAIT CONTAINER
Andrew O. Lightfoot, 2848 Bonnywood, Dallas, Tex. 75233
Filed Sept. 2, 1975, Ser. No. 609,202
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13

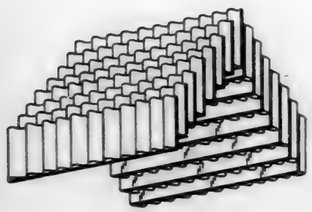


245,255
VENT COVER
William V. Porter, c/o The Porter Company, 1620 S. Seguin, New Braunfels, Tex. 78130
Filed Feb. 25, 1976, Ser. No. 661,397
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41

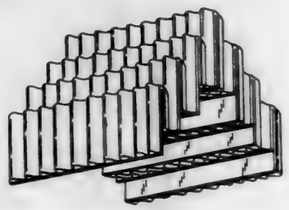
245,256
COLLAPSIBLE CHARCOAL LIGHTER
C. Arthur Heidelbach, 12 Simpson St., Geneva, Ill. 60134
Filed Apr. 21, 1975, Ser. No. 569,820
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—90.1



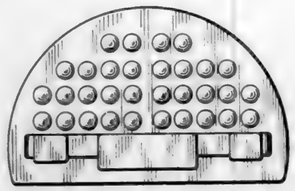
245,257
FIRE STARTER
Robert S. Taylor, 1583 DeSoto Way, Livermore, Calif. 94550
Filed June 25, 1976, Ser. No. 700,411
Term of patent 14 years
Int. Cl. D23—*5*
U.S. Cl. D23—90.1

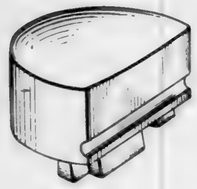


245,258
FIRE STARTER
Robert S. Taylor, 1583 DeSoto Way, Livermore, Calif. 94550
Filed July 26, 1976, Ser. No. 708,654
Term of patent 14 years
Int. Cl. D23—*05*
U.S. Cl. D23—90.1



245,259
TIBIAL PROSTHESIS
George Shen, Warsaw, Ind., assignor to Zimmer U.S.A. Inc.
Filed Jan. 29, 1976, Ser. No. 653,340
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33

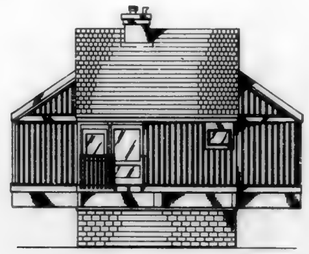




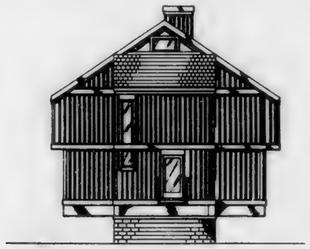
245,260
BUILDING
Victor J. Cassano, Sr., Kettering, Ohio, assignor to Cassano's Inc., Dayton, Ohio
Filed Nov. 18, 1974, Ser. No. 524,439
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—9



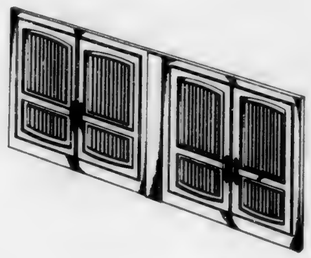
245,261
SINGLE STORY PEDESTAL HOME
Bertram Zusman, 570 Madera Ave., Youngstown, Ohio 44504
Filed Apr. 7, 1976, Ser. No. 674,493
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17



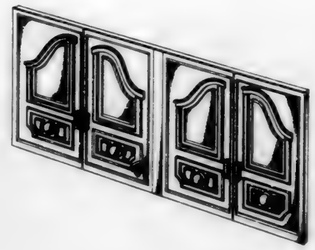
245,262
TWO STORY PEDESTAL HOME
Bertram Zusman, 570 Madera Ave., Youngstown, Ohio 44504
Filed Apr. 7, 1976, Ser. No. 674,494
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17



245,263
GARAGE DOOR
Conrad Andresen, 5180 N. Wishon Ave., Fresno, Calif. 93705
Filed Aug. 8, 1975, Ser. No. 602,965
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



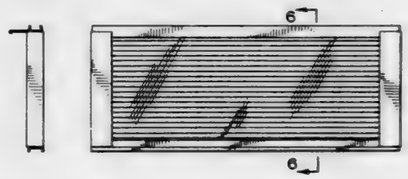
245,264
GARAGE DOOR
Conrad L. Andresen, 5180 N. Wishon Ave., Fresno, Calif. 93705
Filed Aug. 8, 1975, Ser. No. 603,217
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48



245,265
GARAGE DOOR
Conrad L. Andresen, 5180 N. Wishon Ave., Fresno, Calif. 93705
Filed Nov. 24, 1975, Ser. No. 634,938
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—48

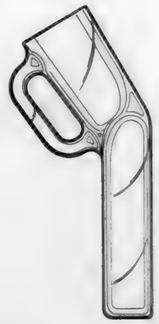


245,266
DOOR PANEL
Paul Gorse, 133 Queen St. East, Mississauga, Canada (L5G 1N1)
Filed May 20, 1976, Ser. No. 688,413
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—49

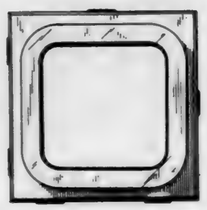


245,267
MALE URINAL
Seymour Gruber, 109 Chestnut Road, Manhasset, N.Y. 11030
Filed June 10, 1976, Ser. No. 694,663
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—57





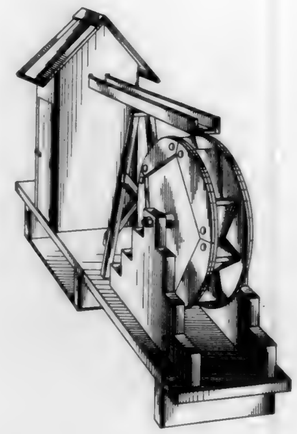
245,268
TRANSLUCENT INTER-LOCKING PANEL MEMBER FOR CEILINGS OR THE LIKE
Edward J. Maresca, Fort Launderdale, Fla., assignor to Cal-Mar Industries, Inc.
Filed Sept. 8, 1975, Ser. No. 611,085
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—89



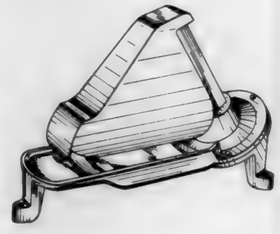
245,269
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed June 16, 1976, Ser. No. 696,692
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



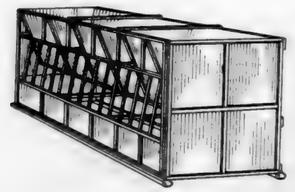
245,270
AQUARIUM WATER MILL
John F. Williams, and Catherine R. Williams, both of 2001 Hermosa Drive, Artesia, N. Mex. 88210
Filed June 1, 1976, Ser. No. 691,383
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—12



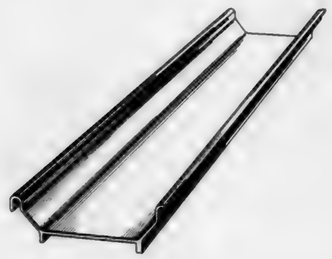
245,271
COMBINED PASTURE PUMP AND WATERING TROUGH
Fian Pitzner, Kalkhuttenweg 7, 2420 Eutin, Germany
Filed Apr. 15, 1976, Ser. No. 677,227
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



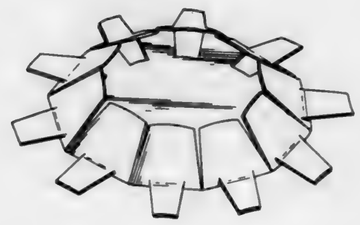
245,272
LIVESTOCK ROUGHAGE FEEDER
Kenneth D. Einsel, and Ronald A. Alexander, both of Hastings, Nebr., assignors to Hastings Equity Grain Bin Mfg. Co., Hastings, Nebr.
Filed Oct. 20, 1976, Ser. No. 734,043
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



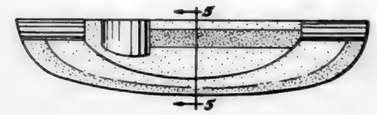
245,273
SKI TRACK MEMBER
Sven Gunnar Pettersson, Falun, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden
Filed Oct. 2, 1975, Ser. No. 619,045
Claims priority, application Sweden, Apr. 2, 1975, 669/75
Term of patent 14 years
Int. Cl. D21—*03;* D25—*01*
U.S. Cl. D34—5 E



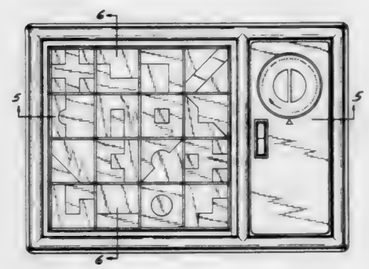
245,274
GOLF PUTTING CUP
William E. Jarrett, 1726 Stanwood St., Philadelphia, Pa. 19152
Filed Nov. 5, 1975, Ser. No. 629,048
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 NN



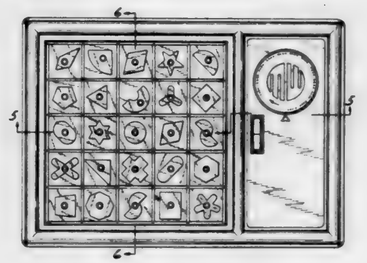
245,275
PUTTER HEAD
Jack C. Denhart, 1915 Rockford Road, Indianapolis, Ind. 46229
Filed Dec. 3, 1972, Ser. No. 637,163
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



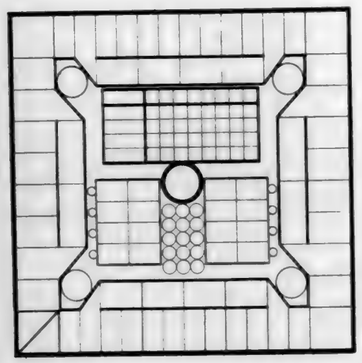
245,276
ACTION GAME BOARD
Gale D. Jenkins, Excelsior, Minn., assignor to Leisure Dynamics, Inc., Minneapolis, Minn.
Filed Jan. 19, 1976, Ser. No. 650,504
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



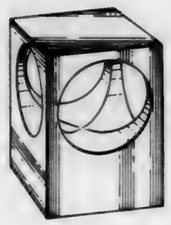
245,277
GAME BOARD
Gale D. Jenkins, Excelsior, Minn., assignor to Leisure Dynamics, Inc., Minneapolis, Minn.
Filed Feb. 12, 1976, Ser. No. 657,441
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



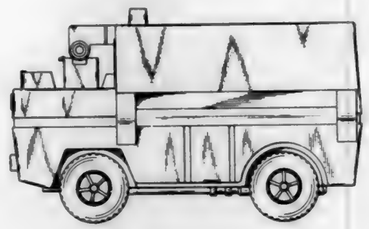
245,278
GAME BOARD
Richard Thomas Martin, Jr., 7225 Fair Oaks Drive, No. 1412, Dallas, Tex. 75231, and David Michael Engert, 2201 Chartres St., New Orleans, La. 70117
Filed Feb. 17, 1976, Ser. No. 658,765
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



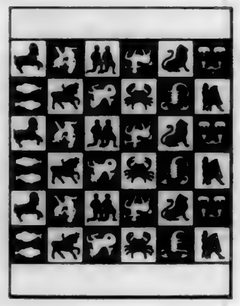
245,279
ROOK CHESS PIECE
Robert R. Hollendonner, 1830 R St. NW., Apt. 44, Washington, D.C. 20009
Continuation-in-part of Ser. No. 301,098, Oct. 26, 1972, abandoned. This application Oct. 5, 1976, Ser. No. 729,912
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CH



245,280
TOY RESCUE TRUCK
Richard S. Chesler, East Brunswick, N.J., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 29, 1975, Ser. No. 644,429
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



245,281
GAME BOARD
Marion F. Lantaff, 7401 Syls Drive, Evansville, Ind. 47712
Filed Feb. 25, 1976, Ser. No. 661,385
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



245,282
HAND-HELD SPOTLIGHT
John Baxter Brinkmann, New York, N.Y., assignor to Q-Beam Corporation
Filed July 17, 1975, Ser. No. 596,801
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D48—20 K



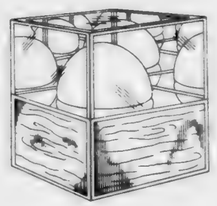
245,283
COMBINED RADIO AND LAMP
Esther M. Phillips, 1336 Straight Path, Wyandanch, L.I., N.Y. 11798
Filed Mar. 29, 1976, Ser. No. 671,609
Term of patent 14 years
Int. Cl. D26—*05;* D14—*03*
U.S. Cl. D48—20 D



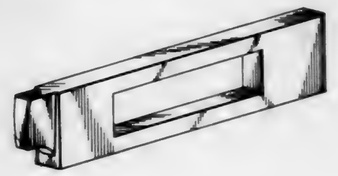
245,284
COMBINED CLOCK AND LAMP
Esther M. Phillips, 1336 Straight Path, Wyandanch, L.I., N.Y. 11798
Filed Mar. 29, 1976, Ser. No. 671,608
Term of patent 14 years
Int. Cl. D26—*05;* D10—*01*
U.S. Cl. D48—20 D



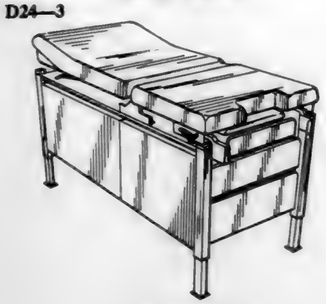
245,285
LAMP
James Eric Whitesel, 5313 Grand Ave., Western Springs, Ill. 60558
Filed June 25, 1976, Ser. No. 699,870
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



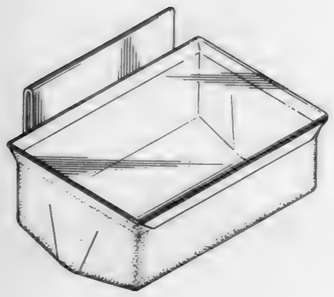
245,286
PRINT WHEEL HAMMER
Alfred G. Osterlund, Los Gatos, and Mario G. Plaza, Fremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Aug. 22, 1975, Ser. No. 606,992
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D64—11 R



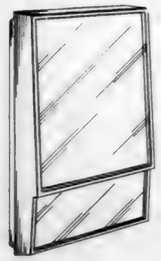
245,287
EXAMINATION TABLE
Frank M. Damico, Hull; Richard A. Koprowski, and Warren J. Peterson, both of Stevens Point, all of Wis., assignors to Joerns Furniture Company, a Division of American Seating Company, Stevens Point, Wis.
Filed Sept. 2, 1975, Ser. No. 609,173
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—3



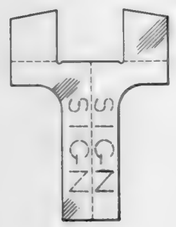
245,288
DISPENSER FOR SCREWS, BOLTS AND THE LIKE
Charles L. Roark, 12934 Barto Drive, Granada Hills, Calif. 91344, and Carl B. Bridges, 3254 Montrose Ave., La Crescenta, Calif. 91214
Filed July 7, 1975, Ser. No. 593,308
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



245,289
ILLUMINATED SIGN
Donald H. Niehaus, Crestview Hills, Ky.; Nick J. Schwab, Cincinnati, Ohio, and Patrick J. Seggerson, Fort Mitchell, Ky., assignors to American Sign and Advertising Services, Inc., Florence, Ky.
Filed Apr. 7, 1976, Ser. No. 674,608
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



245,290
SELF-ADHERENT SHELF SIGN BLANK
Ted I. Kingsford, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.
Filed June 30, 1976, Ser. No. 701,380
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF AUGUST, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick Company: *See—*
Thomas, Richard E., 4,038,761, Cl. 35-9.00G.
A & E Plastik Pak Co., Inc.: *See—*
Crane, Walton B., 4,039,119, Cl. 229-34.0HW.
Crane, Walton B., 4,039,121, Cl. 229-52.00A.
A. H. Robins Company, Incorporated: *See—*
Cale, Albert Duncan, Jr., 4,039,678, Cl. 424-274.000.
A. J. Filipeli Co., Inc.: *See—*
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A/S Kongsberg Vapenfabrik: *See—*
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A-T-O Inc.: *See—*
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AB Bofors: *See—*
Tidstrom, Bror Erling, 4,038,906, Cl. 89-46.000.
AB Carl Lamm: *See—*
Kvarnegard, Sven Bertil, 4,039,832, Cl. 250-318.000.
AB IRO: *See—*
Jacobsson, Kurt Arne Gunnar, 4,039,155, Cl. 242-47.120.
AB Ziristor: *See—*
Ernstsson, Georg E.; Nilsson, Birger N.; Pupp, Herwig; and Stark, Olof S., 4,039,362, Cl. 156-69.000.
Abbott Laboratories: *See—*
Plotnikoff, Nicholas Peter; and Zaugg, Harold Elmer, 4,039,674, Cl. 424-283.000.
Abdel-Monem, Mahmoud M., to Zinpro Corporation. Zinc methionine complex for acne treatment. 4,039,681, Cl. 424-289.000.
Abia, Abia Sunday: *See—*
Eronini, Iheanyichukwu E.; and Abia, Abia Sunday, 4,038,996, Cl. 132-9.000.
Abraham, Raymond A., to Spin Physics, Inc. Reel. 4,039,156, Cl. 242-71.800.
Abrams, Jack S., to Teletype Corporation. Apparatus and method for facsimile scanning. 4,040,095, Cl. 358-285.000.
Abrams, Ned H. Concrete storage tank and method of making same. 4,038,795, Cl. 52-169.700.
Acciaierie di Piombino S.p.A.: *See—*
Moschini, Augusto, 4,039,326, Cl. 75-257.000.
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Hicks, Paul E., Jr., 4,039,128, Cl. 248-14.000.
Randolph, Robert W.; and Jantzen, Steven L., 4,039,115, Cl. 228-44.500.
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Bulteau, Gerard; Acher, Jacques; Collignon, Claude; and Monier, Jean-Claude, 4,039,672, Cl. 424-269.000.
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Acurex Corporation: *See—*
Adler, Alan J., 4,039,901, Cl. 361-422.000.
Adachi, Tsutomu: *See—*
Yamada, Norio; Matsumoto, Masao; Adachi, Tsutomu; Imai, Hirozo; and Kubo, Masao, 4,038,749, Cl. 30-43.920.
Adams, Donald James; Kieninger, Horst; Ravenhill, John Richard; Ries, Dieter; and Schmeling, Karin, to Thomas J. Lipton, Inc. Process for preparing flavored ice drink. 4,039,693, Cl. 426-565.000.
Adams, Ernest Clarence; Davis, Joe William; and Yoder, John Menley, to Miles Laboratories, Inc. Column method of immunoassay employing an immobilized binding partner. 4,039,652, Cl. 424-1.000.
Adams-Smith Incorporated: *See—*
Chan, Steven S., 4,040,100, Cl. 360-43.000.
Adamski, Donald F.; and Morrison, Sol L., to MB Associates. Elevator type bus boarder. 4,039,091, Cl. 214-77.00R.
Addressograph Multigraph Corporation: *See—*
Booth, Thomas Allan, 4,040,065, Cl. 354-5.000.
Brill, Henry L.; and Moody, Jacob H., 4,040,066, Cl. 354-10.000.
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Franke, Hermann; Kuckes, Willi; and Martin, Wolfgang, 4,039,248, Cl. 350-96.00B.
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Wang, Charles P.; and Gibb, Owen L., 4,039,971, Cl. 331-94.5PE.
Aetna-Standard Engineering Company: *See—*
Jones, Russell E., 4,038,854, Cl. 72-209.000.
Scheib, William R., 4,038,855, Cl. 72-238.000.
Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Carlier, Roger; Hussonois, Michel; Genet, Michel; and Krupa, Jean-Claude, 4,039,839, Cl. 250-483.000.
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Kotera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, 4,039,613, Cl. 423-571.000.
AGFA-Gevaert, A.G.: *See—*
Hujer, Friedrich; and Zahn, Wolfgang, 4,039,258, Cl. 355-27.000.
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De Roo, Pierre Richard; De Winter, Walter Frans; Priem, Jan Jozef; and Gilliams, Yvan Karel, 4,039,463, Cl. 252-62.10P.
Kokelenberg, Hendrik Emmanuel; Samijn, Rafael Pierre; Van den Houte, Jozef Willy; and Pollet, Robert Joseph, 4,039,332, Cl. 96-48.00R.
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Aikman, Leslie N. Tobacco smoke filter unit. 4,038,994, Cl. 131-187.000.
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Gaudel, Gerard; and Krafft, Robert, 4,038,831, Cl. 62-3.000.
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Aisin Seiki Kabushiki Kaisha: *See—*
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Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 4,038,888, Cl. 74-765.000.
Okamoto, Toshiaki; Kato, Yoshihisa; and Ban, Masashi, 4,038,824, Cl. 60-591.000.
Akazawa, Haruo: *See—*
Terase, Tsuneo; Onishi, Ryuzo; and Akazawa, Haruo, 4,038,722, Cl. 17-48.000.
Aker, Jimmie R.: *See—*
Cullen, Roy H.; and Aker, Jimmie R., 4,039,237, Cl. 339-91.00R.
Akino, Morio: *See—*
Tsukamoto, Hiroyuki; and Akino, Morio, 4,039,110, Cl. 226-177.000.
Akizuki, Hiroyuki: *See—*
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,039,481, Cl. 252-464.000.
Akzona Incorporated: *See—*
Oosterwijk, Hendrik Harm Jannes; and Torenbeek, Reinder, 4,039,475, Cl. 252-431.00R.
van der Burg, Willem Jacob; and Salsmans, Robert Raymond Malvine, 4,039,558, Cl. 260-326.50B.
Alagy, Jacques; Busson, Christian; and Cessou, Maurice, to Institut Francais du Petrole. Process for removing sulfur from waste waters containing sulfuric acid. 4,039,649, Cl. 423-540.000.
Albanese, Andres; and Maggi, Louis, to Bell Telephone Laboratories, Incorporated. Method and apparatus for breaking optical fibers. 4,039,309, Cl. 65-2.000.
Albright, Alto O. Mat cutting device. 4,038,751, Cl. 30-293.000.
Alcon Laboratories, Inc.: *See—*
Hecht, Gerald; and Shively, Charles D., 4,039,662, Cl. 424-180.000.
Alesi, John, Jr.: *See—*
Dean, Donald E.; and Alesi, John, Jr., 4,039,643, Cl. 264-92.000.
Allan, Barry D., to United States of America, Army. Gelled monomethylhydrazine thixotropic fuel. 4,039,360, Cl. 149-36.000.
Allardice, William D., Jr., to Westinghouse Electric Corporation. Clamp holds members in rotatably adjusted position. 4,039,262, Cl. 403-110.000.
Allen-Bradley Company: *See—*
Callan, John E.; and Pollnow, Harold J., Jr., 4,039,855, Cl. 307-203.000.
Allen, Louis B., Jr.; and Teague, James R., to United States of America, Air Force. Tapered crystal modulator for lasers. 4,039,251, Cl. 350-157.000.
Allied Chemical Corporation: *See—*
Daley, William D., 4,039,650, Cl. 423-569.000.
Gancy, Alan B.; and Poncha, Rustom P., 4,039,618, Cl. 423-206.00T.
Kuo, Vincent H. S., 4,039,617, Cl. 423-186.000.
Pieters, Wim J. M.; and Carlson, Emery J., 4,039,596, Cl. 260-653.700.
Robertson, Arthur B.; and Schaffhauser, Robert J., 4,039,631, Cl. 260-878.00R.
Vance, James R., 4,039,846, Cl. 290-4.00R.

Allis-Chalmers Corporation: *See—*
Coxhill, Major; Unger, Jerome R.; and Lowe, Keith B., 4,039,151, Cl. 241-191.000.
Goldman, Holliday L., 4,038,734, Cl. 29-157.10R.

Allison, Richard: *See—*
DiBugnara, Raymond; and Allison, Richard, 4,039,702, Cl. 427-93.000.

Alpha Press Company: *See—*
Weiss, Adolf F., 4,038,907, Cl. 91-20.000.

Alphin, John G.: *See—*
Patten, Frank C.; and Alphin, John G., 4,038,808, Cl. 56-27.500.

Altenschulte, Ray A.: *See—*
Chestnut, Benjamin F.; and Altenschulte, Ray A., 4,038,884, Cl. 74-568.00T.

Altscher, Siegfried: *See—*
Kim, Ki Soo; and Altscher, Siegfried, 4,039,512, Cl. 260-61.000.

Alumax Mill Products, Inc.: *See—*
Papafingos, Pandelis N.; and Lance, Richard T., 4,039.173, Cl. 266-201.000.

Aluminum Company of America: *See—*
Buse, Kenneth E., 4,039,419, Cl. 204-225.000.
Haupin, Warren E.; Remper, John A.; and Dell, M. Benjamin, 4,039,648, Cl. 423-496.000.
Wohleber, David A.; and Cochran, C. Norman, 4,039,647, Cl. 423-495.000.

Alvarez, Charles S.: *See—*
Mijares, John Anthony, Jr.; Petrie, Ross J.; Mijares, John Anthony, Sr.; and Alvarez, Charles S., 4,039,104, Cl. 222-144.500.

Amano, Mituo: *See—*
Inada, Satoshi; Amano, Mituo; and Onuma, Tadashi, 4,039,290, Cl. 23-284.000.

Amax Inc.: *See—*
Buker, Donald O., 4,039,325, Cl. 75-84.000.

Amerace Corporation: *See—*
Johnson, Glenn W., Jr.; and Lindlau, Paul F., 4,039,238, Cl. 339-95.00R.

American Can Company: *See—*
Pavleszek, John, 4,038,859, Cl. 72-347.000.

American Chain & Cable Company, Inc.: *See—*
Harrison, Franklin L., 4,039,070, Cl. 198-370.000.
Ziemann, Erich T., 4,039,785, Cl. 235-151.000.

American Chemical & Refining Company Inc.: *See—*
Dietz, George, Jr.; Skomoroski, Robert M.; and Zobbi, Robert G., 4,039,327, Cl. 75-108.000.

American Cyanamid Company: *See—*
Hermann, David Trimble, 4,039,496, Cl. 260-29.40R.
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,039,542, Cl. 260-251.00R.
Tucker, Robert Jerome, 4,039,467, Cl. 252-300.000.
Wissner, Allan, 4,039,574, Cl. 260-514.00D.

American Defibrator, Inc.: *See—*
Michelsen, Johan L., 4,039,373, Cl. 162-52.000.

American Optical Corporation: *See—*
Zdrok, Edward Z.; and Deeg, Emil W., 4,039,827, Cl. 250-271.000.

American Sunroof Manufacturing Company: *See—*
Kneusels, Max B.; Federmann, Dieter; and Hattass, Rainer, 4,038,910, Cl. 98-2.140.

AMF Incorporated: *See—*
Stanford, Arthur, 4,040,043, Cl. 340-259.000.

AMP Incorporated: *See—*
Cobaugh, Robert Franklin; and Lynch, James Edward, 4,039,239, Cl. 339-97.00R.
Richards, George Gilman, Jr.; and Berger, John Gilbert, 4,039,927, Cl. 323-17.000.

Ampex Corporation: *See—*
Teeple, Lawrence R., Jr.; Magyary, Andrew K.; and Severs, Kenneth N., 4,039,256, Cl. 352-184.000.

Amway Corporation: *See—*
Venti, Theodore Paul, 4,039,097, Cl. 215-12.00R.

Ancillotti, Francesco; Pescarollo, Ermanno; and Mauri, Marcello Massi, to Snam Progetti S.p.A. Process for the synthesis of methyl-tert-butyl ether from methanol and isobutylene in the presence of butadiene. 4,039,590, Cl. 260-614.00A.

Andersen, Finn Schnoor: *See—*
Nicolaisen, Holger; Andersen, Finn Schnoor; and Jensen, Jens Peter, 4,039,791, Cl. 200-67.00D.

Andersen, Niels Lervad: *See—*
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, 4,039,771, Cl. 219-328.000.
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, 4,039,772, Cl. 219-328.000.

Anderson, Donald R. Biological denitrification of water. 4,039,438, Cl. 210-11.000.

Anderson, Paul R. Game apparatus. 4,039,186, Cl. 273-1.00R.

Andiano, Jose: *See—*
Arnould. Jean; McNaught, James B.; and Andiano, Jose, 4,038,809, Cl. 56-124.000.

Andoh, Naoki: *See—*
Kawakami, Masato; Andoh, Naoki; and Iio, Akira, 4,039,583, Cl. 260-604.00R.

Andra, John R., to Fisher Scientific Company. Uniform temperature incubator. 4,039,775, Cl. 219-385.000.

Andrews, Arthur William; Heber, Eric Lewis; Michelmore, John Roger; and Nicholls, John, to British Hovercraft Corporation Limited. Transducer assembly and method of manufacturing same. 4,038,867, Cl. 73-88.50R.

Andrieu, Jean-Louis; Bonnet, Yves; and Viaud, Michel, to Commissariat a l'Energie Atomique. Nuclear boiler. 4,039,377, Cl. 176-65.000.

Angilella, Anthony George: *See—*
Wallace, William Patrick; and Angilella, Anthony George, 4,039,399, Cl. 204-25.000.

Angliker, Hans-Joerg; Peter, Richard; and Jenny, Walter, to Ciba-Geigy AG. Cycloaliphatic dicarbonyl containing azo dyestuffs. 4,039,529, Cl. 260-207.100.

Angner, Ronald Joseph; and Lacy, James Volney, to Bell Telephone Laboratories, Incorporated. Key telephone communication path interface. 4,039,763, Cl. 179-99.000.

Anselrode, Lodewijk, to Stork Brabant B.V. Method for manufacturing a seamless cylindrical screen gauze. 4,039,396, Cl. 204-11.000.

Ansin, Joseph L.; and Harris, Stephen C., to Joan Fabrics Corporation. Apparatus for continuously drawing and texturing core and effect yarns. 4,038,811, Cl. 57-34.00B.

Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., to Swiss Aluminium Ltd. Aluminum brazed composite. 4,039,298, Cl. 428-558.000.

Aono, Shigeo; Nakamura, Hiromichi; and Ozawa, Hiroshige, to Nissan Motor Co., Ltd. Circuit for generating pulses with duration proportional to quotient of two input voltages. 4,039,868, Cl. 307-273.000.

Aqulogy Corporation: *See—*
Horvath, Tibor, 4,039,453, Cl. 210-169.000.

Aradar Corporation: *See—*
Stanislaw, David L., 4,040,052, Cl. 343-5.0VQ.

Araki, Shigeyuki: *See—*
Suzaki, Masayuki; and Araki, Shigeyuki, 4,039,919, Cl. 318-696.000.

Arbesman, Richard W.: *See—*
Gembicki, Stanley A.; and Arbesman, Richard W., 4,039,479, Cl. 252-455.00Z.

Arcamone, Federico; Di Marco, Aurelio; and Penco, Sergio, to Societa' Farmaceutici Italia S.p.A. Daunomycins, process for their uses and intermediates. 4,039,663, Cl. 424-180.000.

Archibald, James B.: *See—*
Armor, Anthony F.; Archibald, James B.; and Darby, William L., 4,039,872, Cl. 310-62.000.

ARCO Medical Products Company: *See—*
Walters, Robert A., 4,038,991, Cl. 128-419.0PG.

Arends, John M. Door opener. 4,039,214, Cl. 292-336.300.

Argabright, Perry A.; Echelberger, Larry M.; and Phillips, Brian L., to Marathon Oil Company. Ion exchange of metals from aqueous solutions using compositions of synthetic resins reacted with polyisocyanurate salts. 4,039,485, Cl. 260-2.20R.

Arguto, Inc.: *See—*
Mellor, Harrison Clay; and Peacock, Lawrence A., 4,038,863, Cl. 73-9.000.

Armor, Anthony F.; Archibald, James B.; and Darby, William L., to General Electric Company. Guide vane assembly for reverse flow cooled dynamoelectric machine. 4,039,872, Cl. 310-62.000.

Armstrong, John Richard: *See—*
Dyer, Hugh Edric Trenchard; and Armstrong, John Richard, 4,038,759, Cl. 34-99.000.

Armstrong, Maclay M., to Northwest Orthodontics, Inc. Orthodontic appliance guard. 4,038,754, Cl. 32-14.00D.

Arnieri, Charles. Air conditioning for automobiles. 4,038,835, Cl. 62-244.000.

Arnold, John W.: *See—*
Williams, Millard M.; and Arnold, John W., 4,038,810, Cl. 56-220.000.

Arnould, Jean; McNaught, James B.; and Andiano, Jose, to Massey-Ferguson Services N.V. Crop gathering apparatus for grain crop harvesters. 4,038,809, Cl. 56-124.000.

Arriola, Pedro R., Jr. Metal band use facilitating assembly. 4,039,157, Cl. 242-78.700.

Arthur D. Little, Inc.: *See—*
Hyde, Richard W.; Reber, Stephen A.; Schutte, August H.; and Nadkarni, Ravindra M., 4,039,424, Cl. 208-8.000.
Schutte, August H., 4,039,426, Cl. 208-8.000.

Arweiler, Otto: *See—*
Plener, Helmut; Piotrowski, Heinz; Arweiler, Otto; and Drexler, Herbert, 4,040,102, Cl. 360-71.000.

Asada, Akihiro: *See—*
Ohashi, Shin-ichi; and Asada, Akihiro, 4,039,981, Cl. 334-14.000.

Asarco Incorporated: *See—*
DiMartini, Carl Richard; and Scott, William Lafayette, 4,039,322, Cl. 75-63.000.
DiMartini, Carl Richard; and Scott, William Lafayette, 4,039,323, Cl. 75-70.000.

Asea Aktiebolag: *See—*
Larsson, Hans Gunnar, 4,038,849, Cl. 72-60.000.

Ashikawa, Mikio; and Takemoto, Iwao, to Hitachi, Ltd. Image pick-up tube having a plurality of electrodes on the face-plate. 4,039,888, Cl. 313-365.000.

Ashland Oil, Inc.: *See—*
Throckmorton, Peter E.; Sigan, J. W.; and McConnell, Robert B., 4,039,565, Cl. 260-459.00A.

Astley, David John; Gilbert, John Roger Bawden; Scholes, Ian Robert; Jacobi, Jan Stephan; and Brookes, Garth Royston, to Imperial Metal Industries (Kynoch) Limited; and IMI Refinery Holdings Limited. Electrowinning metals. 4,039,403, Cl. 204-105.00R.

Astrid Corporation, Limited: *See—*
Carr, Ronald Ray; and Nisevich, Stephen Dale, 4,039,726, Cl. 428-539.000.

Atkinson, John W. Window greenhouse. 4,038,791, Cl. 52-36.000.

Atlantic Richfield Company: *See—*
Baillie, Lloyd A., 4,039,431, Cl. 208-146.000.
Chloupek, Frank J.; and Chao, Tai S., 4,039,300, Cl. 44-58.000.
Hankins, Tad L.; and Wang, Ting-I, 4,039,461, Cl. 252-51.50A.

Attwood Corporation: *See—*
Dekker, Donald Allen, 4,038,735, Cl. 29-159.00B.

Ault, Inc.: *See—*
Roback, Donald W.; Hampel, Wilbur J.; Prince, Luther T.; and Huppert, Dean L., 4,039,900, Cl. 361-388.000.

Ausman, Robert K.; and Stern, Ivan J., to Baxter Travenol Laboratories, Inc. Method and composition for relief of back pain. 4,039,682, Cl. 424-319.000.

Autenrieth, Heinz: *See—*
Sohmer, Oskar; Autenrieth, Heinz; and Kirner, Kuno, 4,039,700, Cl. 427-46.000.

Automatisme et Technique: *See—*
Bardet, Gerard, 4,039,311, Cl. 65-163.000.

Automobiles Peugeot: *See—*
Hergoualc'h, Jean Rene; and Fornet, Michel, 4,039,291, Cl. 23-288.0FC.
Pruvot, Francois C.; Maistrelli, Roger; and Bauchet, Pierre, 4,039,061, Cl. 192-4.00A.

Automotive Products Company Limited: *See—*
Farrow, Robert Michael, 4,039,041, Cl. 180-104.000.

Avco Corporation: *See—*
Williams, Millard M.; and Arnold, John W., 4,038,810, Cl. 56-220.000.

Avery International Corporation: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,039,705, Cl. 428-40.000.

Awaji, Syun: *See—*
Sasaki, Yoshinori; Yokoyama, Isao; Makino, Motohiko; Awaji, Syun; and Hosoya, Kaneo, 4,039,417, Cl. 204-196.000.

Axelsson, Bengt Borje: *See—*
Axgarde, Gunnar Albert; Axelsson, Bengt Borje; and Klingwall, Alf, 4,038,789, Cl. 52-20.000.

Axgarde, Gunnar Albert; Axelsson, Bengt Borje; and Klingwall, Alf, to Parca-Norrahammar AB. Adjustable manhole frame assembly. 4,038,789, Cl. 52-20.000.

Aya, Masahiro; Miyamoto, Masao; and Fukazawa, Nobuo, to Bayer Aktiengesellschaft. Herbicidal methods using 4-chlorobenzyl-N,N-hexamethylenethiolcarbamate. 4,039,313, Cl. 71-88.000.

B. F. Goodrich Company, The: *See—*
Gajdos, Leslie Bill, 4,039,149, Cl. 241-46.110.

Babcock, Thomas E.; Kliment, Karel; and Stockel, Richard F., to National Patent Development Corporation. Plasticized hydrophilic polymers. 4,039,501, Cl. 260-30.40R.

Baccei, Louis J.: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,039,542, Cl. 260-251.00R.

Bach, Bernhard: and Picmaus, Ernst, to Klein, Schanzlin & Becker Aktiengesellschaft. On-off servocontroller generating a pulse-duration-modulated error-compensating signal. 4,039,917, Cl. 318-599.000.

Bachiochi, Jeffrey L.: *See—*
Murray, Jeffrey J.; Bachiochi, Jeffrey L.; and Milliard, Norman L., 4,038,897, Cl. 84-1.160.

Bachmann, Klaus Jurgen; Bettini, Manfred Hermann; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, to Bell Telephone Laboratories, Incorporated. Etching of III-V semiconductor materials with H_2S in the preparation of heterodiodes to facilitate the deposition of cadmium sulfide. 4,039,357, Cl. 148-175.000.

Backstein, Gunter, to Rheinmetall G.m.b.H. Submergible detonating device. 4,038,901, Cl. 89-1.00B.

Baer, Jurgen; Sommer, Hans-Dieter; and Toplak, Ernst, to BBC Brown Boveri & Company Limited. Method and apparatus for starting a blower. 4,039,267, Cl. 415-1.000.

Bagby, John F., to Spin Physics, Inc. Video head assembly having discrete arcurate ceramic pieces on rotor between heads. 4,040,110, Cl. 360-107.000.

Bailey, Paul T.; Craford, M. George; Findlay, Alexander G.; and Underwood, Robert K., to Monsanto Company. Integrated semiconductor light-emitting display array. 4,039,890, Cl. 313-500.000.

Bailey, Sylvia M. Lower-energy neutron sources for increasing the sensitivity of nuclear gages for measuring the water content of bulk materials. 4,039,809, Cl. 250-390.000.

Baillie, Lloyd A., to Atlantic Richfield Company. Particulate material distributor and method involving use of same. 4,039,431, Cl. 208-146.000.

Bajorek, Jay E.; and Newman, Albert L., to Questor Corporation. Tubular spindle cover. 4,038,802, Cl. 52-731.000.

Baker, Fred E., to General Electric Company. Heating apparatus for glass or ceramic cooking vessel. 4,039,777, Cl. 219-439.000.

Baker Oil Tools, Inc.: *See—*
Crowe, Talmadge L., 4,039,031, Cl. 166-317.000.

Baker, Richard H., to Massachusetts Institute of Technology. Variable speed electronic motor and the like. 4,039,909, Cl. 318-197.000.

Baldin, Pierre; Brocco, Albert; and Winstel, Jean-Paul, to Societe Nationale Elf Aquitaine (Production). Device for the insertion of samples into a chromatography column. 4,038,874, Cl. 73-422.0GC.

Baldwin, Francis P.: *See—*
Gessler, Albert M.; and Baldwin, Francis P., 4,039,506, Cl. 260-42.350.

Ball Brothers Research Corporation: *See—*
Brown, Richard E.; Bickling, Archie L., Jr.; Friebel, Virgil R.; and Roller, Kent G., 4,039,337, Cl. 106-38.280.

Balogh, Geza; Sesztak, Emil; and Szabados, Karoly, to Elektroakusztikai Gyar. Singing suppressor device. 4,039,753, Cl. 179-1.0FS.

Bamettler, Rudy A., to Raymond Lee Organization, Inc., The, a part interest. Trailer pin latch plates. 4,039,202, Cl. 280-507.000.

Ban, Kouichi; Namba, Yasumiti; Sekine, Yukihiro; and Matsuda, Masaaki, to Sumitomo Chemical Company, Limited. Heavy metal-binding agent process. 4,039,446, Cl. 210-38.00B.

Ban, Masashi: *See—*
Okamoto, Toshiaki; Kato, Yoshihisa; and Ban, Masashi, 4,038,824, Cl. 60-591.000.

Ban, Thomas E., to McDowell-Wellman Engineering Company. Process for retorting oil shale. 4,039,427, Cl. 208-11.00R.

Bang, Friedrich C.: *See—*
Rothman, Bernard; Fiks, Julien G.; and Bang, Friedrich C., 4,038,806, Cl. 53-32.000.

Bar Productions (Bromsgrove) Limited: *See—*
Spears, Peter John; and Showell, Richard Grahame Dugard, 4,039,040, Cl. 180-96.000.

Barasch, Stephen; and Fedder, Richard C., to Burroughs Corporation. Electrostatic imaging apparatus. 4,038,916, Cl. 101-1.000.

Barber-Colman Company: *See—*
Townsend, Franklin L., 4,038,729, Cl. 28-206.000.

Barber, John A.: *See—*
Paige, William P.; and Barber, John A., 4,039,507, Cl. 260-42.460.

Barden, Kenneth L.: *See—*
Sankey, Edwin W.; Barden, Kenneth L.; and Ruch, Paul, 4,038,765, Cl. 37-116.000.

Bardet, Gerard, to Automatisme et Technique. Automatic continuous process machine for the manufacture of glass objects. 4,039,311, Cl. 65-163.000.

Bardin, Robert; and Cronenberger, Michel, to Rhone-Poulenc Industries. Retaining device for an apparatus having flat semi-permeable membranes. 4,039,455, Cl. 210-321.00A.

Bargain, Michel, to Rhone-Poulenc S.A. Heat-stable polyimide resins. 4,039,628, Cl. 260-857.0UN.

Barkhuus, Per W. Furnace for incinerating refuse. 4,038,930, Cl. 110-8.00A.

Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,039,532, Cl. 544-17.000.

Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,039,533, Cl. 544-17.000.

Bartholomew, Gordon, to Carver Foundry Products. Continuous sand muller. 4,039,169, Cl. 259-10.000.

Baruffaldi Frizioni S.p.A.: *See—*
Zaninelli, Ettore, 4,038,891, Cl. 82-36.00A.

BASF Aktiengesellschaft: *See—*
Koenig, Horst; and Boell, Walter, 4,039,554, Cl. 260-307.00R.
Kranz, Joachim, 4,039,346, Cl. 106-288.00Q.
Naarmann, Herbert; and Pohlemann, Heinz, 4,039,513, Cl. 260-67.0UA.
Rebhan, Joerg; and Matthies, Hans Georg, 4,039,515, Cl. 260-75.00M.
Wulff, Harald; and Blinne, Gerd, 4,039,511, Cl. 260-49.000.

Bassett, David Robinson; and Hoy, Kenneth Look, to Union Carbide Corporation. Process for controlling molecular weight distribution of latex polymers. 4,039,500, Cl. 260-29.60R.

Bassler, Otto. Connector joint. 4,039,263, Cl. 403-218.000.

Bastenhof, Dirk; and Devaux, Alain, to Societe d'Etudes de Machines Thermiques. Pneumatic method and device for diesel engine braking and restarting in the reverse direction. 4,038,825, Cl. 60-631.000.

Bat, Natalya Genrikhovna: *See—*
Beskin, Mikhail Davydovich; Pevtsov, Anatoly Timofeevich; Nakhamkis, Lev Grigorievich; Morgovsky, Yakov Efimovich; and Bat, Natalya Genrikhovna, 4,039,738, Cl. 13-33.000.

Batchelor, John Frederick: *See—*
Hodson, Harold Francis; and Batchelor, John Frederick, 4,039,556, Cl. 260-308.00D.

Battelle Development Corporation: *See—*
Clegg, John Cardwell, 4,039,913, Cl. 318-345.00C.
Khera, Surjit Singh, 4,039,302, Cl. 48-197.00R.

Battelle Memorial Institute: *See—*
Giddey, Claude; and Rufer, Willy, 4,039,694, Cl. 426-574.000.

Battjes, Carl Robert; Golladay, Harvey Leon; Rieger, Michael Lawrence; Rosario, Binoy Anthony; and Schlotzhauer, Kenneth George, to Tektronix, Inc. Geometry and focus correction circuit. 4,039,899, Cl. 315-371.000.

Batz, James E.: *See—*
Long, George; Martell, Dennis J.; and Batz, James E., 4,040,046, Cl. 340-310.0CP.

Bauchet, Pierre: *See—*
Pruvot, Francois C.; Maistrelli, Roger; and Bauchet, Pierre, 4,039,061, Cl. 192-4.00A.

Bauer, Andreas; Bluggel, Erwin; and Henning, Heinz, to Volkswagenwerk Aktiengesellschaft. Safety belt positioning apparatus. 4,039,224, Cl. 297-389.000.

Bauer, Andrew B., to McDonnell Douglas Corporation. Hidden vortex generators. 4,039,161, Cl. 244-213.000.

Baumgartner, Max; Bucher, Anton; and Utzinger, Diethelm, to Mettler Instrumente AG. Weighing apparatus of the electromagnetic load compensation type including filter means. 4,039,036, Cl. 177-212.000.

Baumler, Robert J.: *See—*
Wahi, Chander M.; and Baumler, Robert J., 4,039,906, Cl. 361-293.000.

Baxter Travenol Laboratories, Inc.: *See—*
Ausman, Robert K.; and Stern, Ivan J., 4,039,682, Cl. 424-319.000.

Mittleman, Herbert; and Ruschke, Ricky Robert, 4,038,983, Cl. 128-214.00C.

Bayer Aktiengesellschaft: *See—*
Aya, Masahiro; Miyamoto, Masao; and Fukazawa, Nobuo, 4,039,313, Cl. 71-88.000.
Klauke, Erich; Kuhle, Engelbert; and Eue, Ludwig, 4,039,315, Cl. 71-98.000.
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,039,673, Cl. 424-271.000.
Kuhlthau, Hans-Peter, 4,039,526, Cl. 260-158.000.
Kuhlthau, Hans-Peter, 4,039,539, Cl. 260-157.000.
Niederdellmann, Georg; Klussmann, Henning; and Conrad, Horst, 4,039,516, Cl. 260-75.0NE.
Straub, Otto-Christian, 4,039,656, Cl. 424-85.000.

Bayer, Franz; and Scheurecker, Werner, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Driven roller assembly for supporting, conveying, bending, straightening or deforming a continuously cast strand. 4,038,856, Cl. 72-238.000.

Baylor, John M.: *See—*
Schuck, Paul R.; and Baylor, John M., 4,038,828, Cl. 61-72.600.

BBC Brown Boveri & Company Limited: *See—*
Baer, Jurgen; Sommer, Hans-Dieter; and Toplak, Ernst, 4,039,267, Cl. 415-1.000.
Schuler, Roland, 4,038,741, Cl. 29-596.000.

Beardsley, Paul G.; and Patzlaff, Albert W., to Blueberry Equipment, Inc. Apparatus for packaging and the like. 4,038,807, Cl. 53-282.000.

Beatrice Foods Co.: *See—*
Dian, Walter, 4,038,878, Cl. 74-217.00B.
Lutgen, Harold Michael; and Rezac, Terrence E., 4,038,832, Cl. 62-45.000.

Becher, Wilfried: *See—*
Massonne, Joachim; and Becher, Wilfried, 4,039,646, Cl. 423-469.000.

Bechthold, Horst; and Bottger, Paul, to Walther & Cie Aktiengesellschaft. Method of removing SO_2 and/or other acid components from waste gases. 4,039,304, Cl. 55-10.000.

Beck, Kurt-Guenther: *See—*
Reerink, Wilhelm; Beck, Kurt-Guenther; Echterhoff, Heinrich; Muller, Johannes; Degen, Kurt; and Nashan, Gerd, 4,039,342, Cl. 106-58.000.

Becker, Kenneth W.: *See—*
Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., 4,039,336, Cl. 106-14.000.

Beckers, Karl Dieter, to Martin & Pagenstecher GmbH. Process and apparatus for removing dust particles disposed between the lining of a casting ladle and a template. 4,039,175, Cl. 266-281.000.

Beermann, Paul; Grosse-Benne, Wilhelm; Guntermann, Hans; and Wirtz, Johann-Hugo, to Hagenuk & Co GmbH. Igniter for fuses and the like. 4,038,924, Cl. 102-70.00S.

Beeson, Gary H.; and Skinner, William D., to Convergence Corporation. Editing system for controlling the transfer of selected video information from a video source to a video tape recorder. 4,040,098, Cl. 360-14.000.

Beijer, Louis Benjamin; Koedam, Mijndert; Claassens, Jacobus Marinus Maria; and Van Vliet, Johannes Adrianus Josephus Maria, to U.S. Philips Corporation. Method of operating a self-stabilizing discharge lamp. 4,039,880, Cl. 313-183.000.

Belady, Laszlo Antal; and Evangelisti, Carlo John, to International Business Machines Corporation. Data security system employing automatic time stamping mechanism. 4,040,034, Cl. 364-200.000.

Bell, Fred S., III; Crozier, Ronald D.; and Strow, Lawrence Evans, to Minerec Corporation. Methyl chloroformate process. 4,039,569, Cl. 260-463.000.

Bell & Howell Company: *See—*
Stocker, Lester H., 4,039,180, Cl. 271-10.000.

Bell Telephone Laboratories, Incorporated: *See—*
Albanese, Andres; and Maggi, Louis, 4,039,309, Cl. 65-2.000.
Angner, Ronald Joseph; and Lacy, James Volney, 4,039,763, Cl. 179-99.000.
Bachmann, Klaus Jurgen; Bettini, Manfred Hermann; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,039,357, Cl. 148-175.000.
Birchall, Ronald Holmes; Pellettiere, Frank Vincent; and Skeens, William John, 4,040,021, Cl. 364-200.000.
Carbrey, Robert Lawrence, 4,039,979, Cl. 333-70.00A.
Curtis, Robert Bartlett; and Riedel, Nelson Andrew, 4,040,023, Cl. 364-900.000.
Donkin, Albert Edward; Jones, David Frederick; and Lanty, Henry Alfons, 4,039,762, Cl. 179-99.000.
Eckton, Wallace Henry, Jr.; and Fraley, Phillip Edward, 4,040,078, Cl. 357-30.000.
Emshwiller, MacLellan, 4,039,968, Cl. 331-19.000.
Fraser, David Bruce; and MacRae, Alfred Urquhart, 4,039,698, Cl. 427-34.000.
Hester, Sidney Dean, 4,040,036, Cl. 364-900.000.
Jain, Ravinder Kumar; Lin, Chinlon; and Stolen, Rogers Hall, 4,039,851, Cl. 307-88.300.
Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, 4,039,249, Cl. 350-96.0WG.
Link, John Barry, 4,039,938, Cl. 324-52.000.
Messerschmitt, David Gavin, 4,040,049, Cl. 340-347.0DD.
Miedema, Hotze, 4,039,947, Cl. 325-2.000.
O'Connor, Robert Joseph, 4,040,051, Cl. 340-397.000.
Skinner, Mitchell Allen, 4,039,966, Cl. 331-4.000.

Bellaplast GmbH: *See—*
Thiel, Alfons W.; and Hell, Hans, 4,039,609, Cl. 264-210.00R.

Benczur-Urmossy, Gabor; von Benda, Klaus; and Haschka, Friedrich, to Deutsche Automobilgesellschaft mBh, Firma. Rechargeable galvanic cell with zinc electrode and auxiliary structure. 4,039,729, Cl. 429-206.000.

Bendix Corporation, The: *See—*
Dodge, Harley J., 4,038,822, Cl. 60-554.000.

Bendix Westinghouse Limited: *See—*
Taig, Alistair Gordon, 4,038,998, Cl. 137-101.000.

Benkoe, Erwin: *See—*
Goldfarb, Adolph E; Benkoe, Erwin; Everitt, Delmar K; Chesley, Ronald F.; and Frierdich, Richard D., 4,039,188, Cl. 273-101.000.

Bennett, Bruce A., to Creative Innovations. Motorcycle lock. 4,038,847, Cl. 70-233.000.

Bennett, John F. Handle for tools and sporting equipment. 4,038,719, Cl. 16-110.00R.

Bennett, John P.: *See—*
Morris, John McLean; Bennett, John P.; and Kercso, Josef E., 4,038,978, Cl. 128-130.000.

Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., to Motorola, Inc. Microprocessor having index register coupled to serial-coupled address bus sections and to data bus. 4,040,035, Cl. 364-200.000.

Benthem, Harm Gerrit; and van Straten, Cornelis, to U.S. Philips Corporation. Method of metallizing a screen having a luminescent layer. 4,039,701, Cl. 427-69.000.

Berger, John Gilbert: *See—*
Richards, George Gilman, Jr.; and Berger, John Gilbert, 4,039,927, Cl. 323-17.000.

Bergische Stahl-Industrie: *See—*
Otto, Alfred, 4,039,051, Cl. 188-58.000.

Berglund, Kurt Karl Henrik Alexander, to Siemens Aktiengesellschaft. Recording device for plotting the curve of at least one measured quantity. 4,040,063, Cl. 346-23.000.

Bergwerksverband GmbH: *See—*
Reerink, Wilhelm; Beck, Kurt-Guenther; Echterhoff, Heinrich; Muller, Johannes; Degen, Kurt; and Nashan, Gerd, 4,039,342, Cl. 106-58.000.

Berkeland, James E.; and Donnelly, Ralph H. Bracket for smoke and fume ejector fan. 4,039,129, Cl. 248-14.000.

Berkman, Robert N.; and Houdeshell, Jesse W., to Schering Corporation. Method for treatment of canine seborrhea. 4,039,684, Cl. 424-324.000.

Berkovitz, Robert A., to Teledyne, Inc. Auditorium simulator economizes on delay line bandwidth. 4,039,755, Cl. 179-1.00G.

Bernard, Fred W.: *See—*
Dalpee, Joseph A.; Bernard, Fred W.; and Reynolds, Richard G., 4,040,119, Cl. 361-191.000.

Bernstein, Benjamin T.: *See—*
Kosrow, Robert Leslie; Smith, Robert Emmet; Talsma, Robert Clarence; and Bernstein, Benjamin T., 4,038,931, Cl. 112-272.000.

Bertus, Brent J.; Tabler, Donald C.; and Johnson, Marvin M., to Phillips Petroleum Company. Oxidative dehydrogenation catalysts. 4,039,476, Cl. 252-437.000.

Beskin, Mikhail Davydovich; Pevtsov, Anatoly Timofeevich; Nakhamkis, Lev Grigorievich; Morgovsky, Yakov Efimovich; and Bat, Natalya Genrikhovna. Device for charging an electric arc furnace through its inner electrode pipe and permitting connection of additional lengths of pipes thereto. 4,039,738, Cl. 13-33.000.

Bethlehem Steel Corporation: *See—*
Gensler, Wayne C., 4,039,391, Cl. 201-36.000.
Kwasnoski, Daniel; and Mancke, Vernon B., 4,039,349, Cl. 134-10.000.

Bettini, Manfred Hermann: *See—*
Bachmann, Klaus Jurgen; Bettini, Manfred Hermann; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,039,357, Cl. 148-175.000.

Beyler, Arthur L.; and Ferrari, Richard A., to Sterling Drug Inc. Composition for topical application and use thereof. 4,039,669, Cl. 424-243.000.

Beynet, Pierre A.; Farr, John B.; and Pottorf, Newell, to Standard Oil Company (Indiana). Downhole seismic source. 4,040,003, Cl. 340-18.0LD.

Bezborodko, Joseph A. I. B. Concave, mirrored solar collector. 4,038,971, Cl. 126-271.000.

Bharucha, Kekhusroo R.; Rubin, Leon J.; and Cross, Charles K., to Canada Packers Limited. Control of nitrosamine formation in nitrite cured meat by use of aromatic primary amines. 4,039,690, Cl. 426-266.000.

Bhattacharyya, Dhirendra Nath: *See—*
Ray, Bhairab Nath; and Bhattacharyya, Dhirendra Nath, 4,039,361, Cl. 149-41.000.

Bianchi, Albert A., to RB Products Corporation. Abrasive glove. 4,038,787, Cl. 51-391.000.

Bic Pen Corporation: *See—*
Marynissen, William E., 4,039,088, Cl. 214-1.0BT.

Bickel, Richard L.: *See—*
Osborne, Richard C.; and Bickel, Richard L., 4,040,045, Cl. 340-280.000.

Bickling, Archie L., Jr.: *See—*
Brown, Richard E.; Bickling, Archie L., Jr.; Friebel, Virgil R.; and Roller, Kent G., 4,039,337, Cl. 106-38.280.

Big Three Industries, Inc. (Tempil Div.): *See—*
Kimmel, Elias, 4,038,873, Cl. 73-358.000.

Birchall, Ronald Holmes; Pellettiere, Frank Vincent; and Skeens, William John, to Bell Telephone Laboratories, Incorporated. Circuit for increasing the apparent occupancy of a processor. 4,040,021, Cl. 364-200.000.

Bird, Forrest M. Ventilator and method. 4,039,139, Cl. 251-65.000.

Birdseye, Harvey E.: *See—*
Cooper, John C.; Birdseye, Harvey E.; and Donnelly, Russell J., 4,038,864, Cl. 73-23.000.

Black, Jerimiah B. Fluid current motor. 4,038,821, Cl. 60-398.000.

Blackwood, William A. Rotary internal combustion engine. 4,038,948, Cl. 123-43.00C.

Blair, James C.: *See—*
Stephens, Frank M., Jr.; and Blair, James C., 4,039,324, Cl. 75-72.000.

Blaw-Knox Foundry & Mill Machinery, Inc.: *See—*
Eibe, Werner W.; and Farrell, Wilfred T., 4,038,857, Cl. 72-244.000.

Blinne, Gerd: *See—*
Wulff, Harald; and Blinne, Gerd, 4,039,511, Cl. 260-49.000.

Bloch, Herman S.; and Schmerling, Louis, to UOP Inc. Production of monochloro- and aryl substituted saturated compounds. 4,039,793, Cl. 260-651.00R.

Bloch, Michael; Inglis, Ronald Peter; and Koebner, Adolf, to Rewo Chemische Werke G.m.b.H. Process for preparing sulfosuccinates. 4,039,562, Cl. 260-401.000.

Blueberry Equipment, Inc.: *See—*
Beardsley, Paul G.; and Patzlaff, Albert W., 4,038,807, Cl. 53-282.000.

Bluggel, Erwin: *See—*
Bauer, Andreas; Bluggel, Erwin; and Henning, Heinz, 4,039,224, Cl. 297-389.000.

Blum, Jean: *See—*
Niviere, Pierre; Orillard, Gerard; and Blum, Jean, 4,039,519, Cl. 260-112.50R.

Blumberg, Richard Jay; and Dorler, Jack Arthur, to International Business Machines Corporation. Current switch circuit having an active load. 4,039,867, Cl. 307-255.000.

BOC International Limited: *See—*
Lythall, David John; and Wilson, Eric Martin, 4,039,798, Cl. 219-72.000.

BOC Limited: *See—*
Smith, Kenneth Cecil; and Garrett, Michael Ernest, 4,039,437, Cl. 210-9.000.

Bochal, Karel: *See—*
Hrabak, Frantisek; and Bochal, Karel, 4,039,735, Cl. 526-292.000.

Bochumer Eisenhutte Heintzmann & Company: *See—*
Moebus, Dieter; Mennekes, Werner; and Podjadtke, Rudi, 4,038,829, Cl. 61-84.000.

Bodin, Leslie J., to Burroughs Corporation. Method and apparatus for refreshing a dynamic memory by sequential transparent readings. 4,040,122, Cl. 364-900.000.

Boehringer Ingelheim GmbH: *See—*
Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, 4,039,685, Cl. 424-330.000.

Boeing Company, The: *See—*
Miller, Glen Elwood, 4,039,607, Cl. 264-1.000.
Shorey, Thomas H., 4,039,163, Cl. 244-137.00R.
Wagner, David Lee, 4,039,034, Cl. 173-137.000.

Boeing Construction Equipment Company: *See—*
Shearer, Herbert Neil, 4,039,171, Cl. 259-158.000.

Boell, Walter: *See—*
Koenig, Horst; and Boell, Walter, 4,039,554, Cl. 260-307.00R.

Bohni, Erika; and Montavon, Marc, to Hoffmann-La Roche Inc. Antibacterial compositions. 4,039,667, Cl. 424-229.000.

Bokros, Jack C., to General Atomic Company. Prosthetic devices having a region of controlled porosity. 4,038,703, Cl. 3-1.500.

Bolding, Vance E.: *See—*
Person, Abraham; and Bolding, Vance E., 4,039,177, Cl. 267-126.000.

Boley, Robert E. Roller entry guide having improved guide insert and roller adjustment means. 4,039,107, Cl. 226-91.000.

Bondor, Frank Samuel, to Envirotech Corporation. Countercurrent flow horizontal spray absorber. 4,039,307, Cl. 55-228.000.

Bone, Arnold R., to Dennison Manufacturing Company. Fastener attachment stock. 4,039,078, Cl. 206-343.000.

Bone, David P., to Quaker Oats Company, The. Soft dry pet food product and process. 4,039,689, Cl. 426-99.000.

Bonnet, Yves: *See—*
Andrieu, Jean-Louis; Bonnet, Yves; and Viaud, Michel, 4,039,377, Cl. 176-65.000.

Booth, Thomas Allan, to Addressograph Multigraph Corporation. Photocomposer optical system with a negative collimating lens. 4,040,065, Cl. 354-5.000.

Booth, William Ross. Parachute with main chute release dependant upon pilot chute deployment. 4,039,164, Cl. 244-148.000.

Borg-Warner Corporation: *See—*
Schober, Michael A., 4,039,354, Cl. 148-16.500.

Borkowski, William John: *See—*
Elliott, Richard Louis, Jr.; Borkowski, William John; and Pfister, Thomas Warren, 4,039,854, Cl. 307-118.000.

Bory, Barbara H.; and Kessler, Alan B., to Lever Brothers Company. Water purification device. 4,039,444, Cl. 210-36.000.

Boshilov, Grozdan Todorov: *See—*
Stoev, Stoycho Mitrev; Mitrushev, Marin Dimitrov; Boshilov, Grozdan Todorov; and Radeva, Maria Georgieva, 4,039,456, Cl. 210-388.000.

Botnick, Irlin H. Pressure balancing valve with thermal override. 4,039,125, Cl. 236-12.00A.

Bott, John A. License plate frame assembly. 4,038,770, Cl. 40-209.000.

Bottger, Paul: *See—*
Bechthold, Horst; and Bottger, Paul, 4,039,304, Cl. 55-10.000.

Boucher, Harry. Fluid pressure actuated recorder. 4,040,064, Cl. 346-72.000.

Bowling, George W.; Conlisk, Peter J.; and Lenzen, Kenneth H., to Monsanto Company. Damping system. 4,039,050, Cl. 188-1.00B.

Boxall, Charles W., to National Can Corporation. Securing of rivets to portable articles. 4,039,099, Cl. 220-91.000.

Boxall, Frank S. Multi-channel differential pulse code modulation system. 4,039,948, Cl. 325-38.00B.

Brackett, Ronald L.: *See—*
Wilson, Jeffrey V.; and Brackett, Ronald L., 4,039,242, Cl. 339-177.00E.

Bradley, Frank R., to Bradley Telcom Corporation. Instrument and method for measuring envelope delay in a transmission channel. 4,039,769, Cl. 179-175.30R.

Bradley Telcom Corporation: *See—*
Bradley, Frank R., 4,039,769, Cl. 179-175.30R.

Bradner, William T.: *See—*
Nettleton, Donald E., Jr.; Bush, James A.; Bradner, William T.; and Schreiber, Richard H., 4,039,736, Cl. 536-17.000.

Brady, Roscoe O.: *See—*
Gal, Andrew E.; and Brady, Roscoe O., 4,039,388, Cl. 195-103.50R.

Brandenburg, John T.: *See—*
Mayer, Edward A.; Brandenburg, John T.; Crone, John M., Jr.; and Ropes, Charles A., Jr., 4,039,294, Cl. 23-288.0FB.

Brandt Manufacturing Company, Inc.: *See—*
Brandt, Vernon J., 4,039,081, Cl. 209-73.000.

Brandt, Vernon J., to Brandt Manufacturing Company, Inc. Method and apparatus for sizing and distributing produce. 4,039,081, Cl. 209-73.000.

Brassert, Walter L.: *See—*
Heitmann, Arnold M.; Brassert, Walter L.; and Chouinard, Donald B., 4,038,815, Cl. 60-39.080.

Breeden, William J.: *See—*
Pearce, Godfrey R.; and Breeden, William J., 4,039,905, Cl. 361-433.000.

Brenman, Henry S.: *See—*
DeFoney, George F.; Mayes, Donald S.; and Brenman, Henry S., 4,039,653, Cl. 424-19.000.

Breslow, Jeffrey D.; Hicks, Alan A.; and Disko, Harry, to Marvin Glass & Associates. Skill-type game. 4,039,184, Cl. 273-1.00E.

Breslow, Jeffrey D., to Marvin Glass & Associates. Pool type game apparatus. 4,039,191, Cl. 273-125.00R.

Bretone, John, Jr. Method of replacing plumbing. 4,038,737, Cl. 29-401.00F.

Bricot, Claude; Carre, Bernard; Lehureau, Jean Claude; and Puech, Claude, to Thomson-Brandt. Method for protecting a flexible record disc and disc so protected. 4,039,764, Cl. 179-100.41L.

Bridgestone Tire Company Limited: *See—*
Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, 4,039,483, Cl. 260-2.10R.
Takasuga, Yutaka; Nishimura, Seiichiro; and Urayama, Takao, 4,039,365, Cl. 156-405.000.
Yabe, Toshinori, 4,039,366, Cl. 156-405.000.

Bright, James A., to General Motors Corporation. Clothes washer spin delay mechanism. 4,038,841, Cl. 68-12.00R.

Brill, Henry L.; and Moody, Jacob H., to Addressograph-Multigraph Corporation. Automatic base line correction for p/t (photocomposing machine). 4,040,066, Cl. 354-10.000.

Brinkmann, Jurgen; and Sucher, Josef, to Varta Batterie Aktiengesellschaft. Storage battery electrode tubes and method of filling. 4,039,730, Cl. 429-212.000.

Brinson, Thomas Frederick, to International Telephone and Telegraph Corporation. Retention element for wheel covers. 4,039,226, Cl. 301-37.00B.

Bristol-Myers Company: *See—*
Nettleton, Donald E., Jr.; Bush, James A.; Bradner, William T.; and Schreiber, Richard H., 4,039,736, Cl. 536-17.000.

British Hovercraft Corporation Limited: *See—*
Andrews, Arthur William; Heber, Eric Lewis; Michelmore, John Roger; and Nicholls, John, 4,038,867, Cl. 73-88.50R.

Brocco, Albert: *See—*
Baldin, Pierre; Brocco, Albert; and Winstel, Jean-Paul, 4,038,874, Cl. 73-422.0GC.

Brock, Andrew J.: *See—*
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,039,298, Cl. 428-558.000.

Brois, Stanley J.; and Gutierrez, Antonio, to Exxon Research and Engineering Company. Two phase process for the preparation of azole and azoline disulfides. 4,039,552, Cl. 260-302.0SD.

Bromley, Meryl L. Opener for a coin package. 4,038,746, Cl. 30-2.000.

Brookes, Garth Royston: *See—*
Astley, David John; Gilbert, John Roger Bawden; Scholes, Ian Robert; Jacobi, Jan Stephan; and Brookes, Garth Royston, 4,039,403, Cl. 204-105.00R.

Brooks & Perkins, Incorporated: *See—*
Mollon, Leslie, 4,039,842, Cl. 250-518.000.

Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, to May & Baker Limited. Azapurinones. 4,039,544, Cl. 260-256.40F.

Brown, Edgar D., Jr.; and Ronda, Richard M., to General Electric Company. Organic hydrocarbon solvent-based green tire lubricant and process. 4,039,143, Cl. 252-28.000.

Brown, Judson G. Continuous tubular filter and method of using the same. 4,039,450, Cl. 210-77.000.

Brown, Phillip John: *See—*
Coleman, Kenneth John; Brown, Phillip John; and Watkins, Howard John Stephen, 4,039,007, Cl. 139-7.00F.

Brown, Richard E.; Bickling, Archie L., Jr.; Friebel, Virgil R.; and Roller, Kent G., to Ball Brothers Research Corporation. Release coating for glass manufacture. 4,039,337, Cl. 106-38.280.

Brown, William G.: *See—*
Kankel, Richard L.; and Brown, William G., 4,039,639, Cl. 261-121.00R.

Brown & Williamson Tobacco Corporation: *See—*
Geiss, Vernon L.; Gregory, Charles F.; Newton, Richard P.; and Gravely, Lawrence E., 4,038,993, Cl. 131-141.000.

Broyan, Fred K. Gas compressor valve. 4,039,002, Cl. 137-516.170.

Bruce, Robert L.; Gaughan, Neil A.; and Ripingill, Allan E., to Cubic Industrial Corporation. Method and apparatus for digitally controlling an amplitude modulated pulse envelope on an RF signal. 4,039,951, Cl. 325-38.00R.

Bruls, Wilhelmus G. M.: *See—*
Schoen, Lowhardt A. A.; Bruls, Wilhelmus G. M.; and Debets, Wilhelmus A. M., 4,039,732, Cl. 526-43.000.

Brunner, Friedrich; Frasch, Peter; and Schwerdt, Friedrich, to International Business Machines Corporation. Etchant for polyimides. 4,039,371, Cl. 156-668.000.

Bruno, Edward C., to Polycraft Corporation. Water container device for plants. 4,038,780, Cl. 47-63.000.

Bryant, John G. Clutch pads. 4,039,217, Cl. 294-74.000.

Bryant, John G. Clutch pads. 4,039,218, Cl. 294-74.000.

Bryer, Philip Stuart, to PerSci, Inc. Disk positioning and ejection device in a disk drive. 4,040,107, Cl. 360-99.000.

Bucheister, Henry C., to Elmwood Sensors, Inc. Thermostatic switch with reset mechanism. 4,039,991, Cl. 337-348.000.

Bucher, Anton: *See—*
Baumgartner, Max; Bucher, Anton; and Utzinger, Diethelm, 4,039,036, Cl. 177-212.000.

Buck, Richard J.: *See—*
Ennslin, Frieder H.; and Buck, Richard J., 4,039,811, Cl. 250-409.000.

Bucy, Harry S.; and Finger, John F., to Sioux Steam Cleaner Corporation. Industrial cleaning system. 4,039,350, Cl. 134-22.00R.

Buehler, Ernest: *See—*
Bachmann, Klaus Jurgen; Bettini, Manfred Hermann; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,039,357, Cl. 148-175.000.

Bugman, Michael, to Chicago Pneumatic Tool Company. Automatic safety latch lift hook unit. 4,039,219, Cl. 294-82.00R.

Buker, Donald O., to Amax Inc. Vacuum smelting process for producing ferromolybdenum. 4,039,325, Cl. 75-84.000.

Bulgakov, Anatoly Yakovlevich: *See—*
Ugolnikov, Stanislav Vasilievich; Kosach, Stanislav Petrovich; Kaplun, Vladimir Davydovich; Zhitnik, Valentin Ivanovich; and Bulgakov, Anatoly Yakovlevich, 4,039,945, Cl. 324-158.00R.

Bulgheroni, Willy: *See—*
Oberhansli, Jurg; Stalder, Erwin; Bulgheroni, Willy; and Penasa, Josef, 4,039,845, Cl. 250-577.000.

Bull, Eric William, to EMI Limited. Electron beam deflection arrangements having preshaping of the beam. 4,039,807, Cl. 250-360.000.

Bullard Company, The: *See—*
Grinage, Claude M., 4,038,740, Cl. 29-568.000.

Bullock, David Carl, to Texas Instruments Incorporated. Ion implanted magnetic bubble memory device having major and minor rows. 4,040,019, Cl. 340-174.0TF.

Bulteau, Gerard; Acher, Jacques; Collignon, Claude; and Monier, Jean-Claude, to Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France. N-(1'-Allypyrrolidinyl 2'-methyl) 2-methoxy 4,5-azimido benzamide and its pharmaceutically acceptable salts. 4,039,672, Cl. 424-269.000.

Bulten, Eric J.: *See—*
van der Kerk, Gerrit J. M.; Sijpesteijn, Antje Kaars; and Bulten, Eric J., 4,039,655, Cl. 424-52.000.

Bundy Corporation: *See—*
Davidoff, Charles, 4,039,410, Cl. 204-141.500.

Bunker Ramo Corporation: *See—*
Johnston, Samuel Andrew, 4,040,118, Cl. 361-283.000.
Kwan, Okun; and Zaccagnino, Nicholas V., Jr., 4,039,069, Cl. 197-127.00R.
Nijman, John P., 4,038,745, Cl. 29-749.000.

Burckhardt, Manfred H.; and Paul, Jurgen, to Daimler-Benz Aktiengesellschaft. Installation for controlling a measuring beam and/or a light beam in motor vehicles. 4,039,782, Cl. 235-150.200.

Burke, George K.; LeFevre, Robert J.; Thomas, Robert E.; Turner, James W.; and Krohn, Peter L., to Burron Medical Products, Inc. Electrically controlled intravenous infusion set. 4,038,982, Cl. 128-214.00E.

Burkhardt, Joseph A.; Loth, William D.; and Pattison, Martin O., to Exxon Production Research Company. Apparatus for anchoring an offshore structure. 4,039,025, Cl. 166-.500.

Burn, William H., to Pocket Socks Corporation, The. Sock with integrally knit pocket and method. 4,038,699, Cl. 2-239.000.

Burron Medical Products, Inc.: *See—*
Burke, George K.; LeFevre, Robert J.; Thomas, Robert E.; Turner, James W.; and Krohn, Peter L., 4,038,982, Cl. 128-214.00E.
LeFevre, Robert J.; and Thomas, Robert E., 4,038,981, Cl. 128-214.00E.

Burroughs Corporation: *See—*
Barasch, Stephen; and Fedder, Richard C., 4,038,916, Cl. 101-1.000.
Bodin, Leslie J., 4,040,122, Cl. 364-900.000.

Burroughs Wellcome Co.: *See—*
Hodson, Harold Francis; and Batchelor, John Frederick, 4,039,556, Cl. 260-308.00D.

Burton, Vance P.: *See—*
Mikulicz, Michael Z.; and Burton, Vance P., 4,039,603, Cl. 260-683.420.

Burtschi, Richard, to Missouri Province Educational Institute. Artificial larynx with semi-automatic inflection control. 4,039,756, Cl. 179-1.0AL.

Busch, Gunter. Device for connecting parts on walls and ceilings. 4,038,801, Cl. 52-698.000.

Buse, Kenneth E., to Aluminum Company of America. Anode positioning device. 4,039,419, Cl. 204-225.000.

Bush, James A.: *See—*
Nettleton, Donald E., Jr.; Bush, James A.; Bradner, William T.; and Schreiber, Richard H., 4,039,736, Cl. 536-17.000.

Busson, Christian: *See—*
Alagy, Jacques; Busson, Christian; and Cessou, Maurice, 4,039,649, Cl. 423-540.000.

Butler, Calvin J. Container washer attachment. 4,039,351, Cl. 134-102.000.

Butler, Walter J.; and Eichelberger, Charles W., to General Electric Company. Capacitance sensor. 4,039,940, Cl. 324-60.00C.

C. Bryant & Son Limited: *See—*
Sharp, Frederick George, 4,039,264, Cl. 403-246.000.

C. E. S., Inc.: *See—*
Cook, William H., 4,039,012, Cl. 145-29.00R.

C. Hager & Sons Hinge Manufacturing Company: *See—*
Peterson, Francis C., 4,039,433, Cl. 209-3.000.

C. Keller & Co.: *See—*
Keller, Werner; and Schafer, Karl, 4,039,072, Cl. 198-429.000.

C. L. Frost & Son, Inc.: *See—*
Schmidt, Devere W., 4,039,233, Cl. 308-195.000.

Cadotte, John E., to United States of America, Interior. Reverse osmosis membrane. 4,039,440, Cl. 210-23.00H.

Caie, Ian Scott: *See—*
Lawman, Michael John Patrick; and Caie, Ian Scott, 4,039,247, Cl. 350-95.000.

Cain, John L.: *See—*
Wolf, Ernest; and Cain, John L., 4,039,222, Cl. 296-137.00E.

Cale, Albert Duncan, Jr., to A. H. Robins Company, Incorporated. N-(substituted-3-pyrrolidinyl)-1-naphthalene carboxamides. 4,039,678, Cl. 424-274.000.

Calhoun, John T.; and Hall, Sherman E. Spoiler control system. 4,039,162, Cl. 244-213.000.

Callan, John E.; and Pollnow, Harold J., Jr., to Allen-Bradley Company. Solid state relay. 4,039,855, Cl. 307-203.000.

Campbell, Kenneth Strong: *See—*
Clement, Carl Jennings; Campbell, Kenneth Strong; and Walker, James Terrell, 4,038,895, Cl. 84-1.010.

Campbell, Robert W., to Phillips Petroleum Company. Production of p-phenylene sulfide polymers. 4,039,518, Cl. 260-79.100.

Campbell Soup Company: *See—*
Hildebolt, William M., 4,039,691, Cl. 426-511.000.

Canada Packers Limited: *See—*
Bharucha, Kekhusroo R.; Rubin, Leon J.; and Cross, Charles K., 4,039,690, Cl. 426-266.000.

Canadian Patents and Development Limited: *See—*
Heggie, William S., 4,038,868, Cl. 73-119.00A.
Romero-Sierra, Cesar Aurelio; and Tanner, Joseph A., 4,038,989, Cl. 128-335.000.
Torre, Edward Della; and Kinsner, Witold, 4,040,040, Cl. 340-174.0TF.

Canon Kabushiki Kaisha: *See—*
Seki, Mitsuaki; and Hanagata, Takayoshi, 4,039,065, Cl. 197-1.00R.
Tanikoshi, Kinji, 4,039,911, Cl. 318-254.000.
Yano, Akio, 4,039,245, Cl. 350-3.500.

Canon Seiki Kabushiki Kaisha: *See—*
Tanikoshi, Kinji, 4,039,911, Cl. 318-254.000.

Cantrell, Robert L., Jr.: *See—*
Williams, Roy G.; and Cantrell, Robert L., Jr., 4,039,060, Cl. 192-134.000.

Capadona, Emanuel A.: *See—*
Greene, Albert A.; and Capadona, Emanuel A., 4,039,821, Cl. 240-51.11R.

Cappuccilli, Joseph Anthony. Dosage indicating pill tray. 4,039,080, Cl. 206-534.000.

Carbrey, Robert Lawrence, to Bell Telephone Laboratories, Incorporated. Reduction of aliasing distortion in sampled signals. 4,039,979, Cl. 333-70.00A.

Caris, Josephus Antonius Marie; and de Goede, Johannes Antonius, to Trouw & Co. N.V.; and Machinefabriek Lalesse. Screw extruder for the production of an expanded dry feed for foodstuff. 4,039,168, Cl. 259-9.000.

Carithers, Val G.: *See—*
Watson, David R.; Carithers, Val G.; and Drown, Harold L., 4,039,480, Cl. 252-455.00R.

Carlier, Roger; Hussonois, Michel; Genet, Michel; and Krupa, Jean-Claude, to Agence Nationale de Valorisation de la Recherche (ANVAR). Thorium tetrabromide scintillators and radiation detection and measurement therewith. 4,039,839, Cl. 250-483.000.

Carlow, Earl F.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,040,035, Cl. 364-200.000.

Carlson, Emery J.: *See—*
Pieters, Wim J. M.; and Carlson, Emery J., 4,039,596, Cl. 260-653.700.

Carlson, Richard E. Pick proof money box. 4,038,844, Cl. 70-86.000.

Carlson, Tom Walter, to North American Philips Corporation. Citizens alarm system. 4,040,013, Cl. 340-164.00R.

Carnes, James Edward, to RCA Corporation. Smear reduction in CCD imagers. 4,040,092, Cl. 358-213.000.

Caron, Francois Gabriel; Desblache, Andre Eugene; Godard, Dominique Noel; and Maddens, Francis Paul, to International Business Machines Corporation. Method and device for synchronizing the receiver clock in a data transmission system. 4,039,748, Cl. 178-69.100.

Carpets International Limited: *See—*
Coleman, Kenneth John; Brown, Phillip John; and Watkins, Howard John Stephen, 4,039,007, Cl. 139-7.00F.

Carr, Ronald Ray; and Nisevich, Stephen Dale, to Astrid Corporation, Limited. Altering the appearance of corundum crystals. 4,039,726, Cl. 428-539.000.

Carratala, Carmen Sophia: *See—*
Crespo, Osmundo; and Carratala, Carmen Sophia, 4,038,914, Cl. 99-279.000.

Carre, Bernard: *See—*
Bricot, Claude; Carre, Bernard; Lehureau, Jean Claude; and Puech, Claude, 4,039,764, Cl. 179-100.41L.

Carre, Christian; and Rebours, Albert, to Air-Industrie. Flow divider for a powdery material. 4,039,062, Cl. 193-31.00R.

Carver, Bobby C., to Eastman Kodak Company. Textile treating composition and textile yarn treated therewith. 4,039,715, Cl. 428-375.000.

Carver Foundry Products: *See—*
Bartholomew, Gordon, 4,039,169, Cl. 259-10.000.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,039,067, Cl. 197-49.000.

Cass, Earl T. Flush controller. 4,038,707, Cl. 4-67.00R.

Cassatta, Joseph C.: *See—*
Dickie, Ray A.; and Cassatta, Joseph C., 4,039,722, Cl. 428-461.000.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Schon, Manfred; Durr, Helmut; Plath, Dieter; Keller, Karlfried; and Michel, Walter, 4,039,493, Cl. 260-21.000.

Cassera, James A.: *See—*
Perrine, Paul M.; Janes, Vincent C.; and Cassera, James A., 4,038,708, Cl. 4-67.00A.

Cassidy, Raymond T.: *See—*
Wilson, Robert B.; and Cassidy, Raymond T., 4,038,768, Cl. 40-106.100.

Cassonnet, Jean-Claude Marcel, to Compagnie Honeywell Bull (Societe Anonyme). Computer instruction control apparatus and method. 4,040,030, Cl. 364-200.000.

Cassonnet, Jean-Claude Marcel, to Compagnie Honeywell Bull (Societe Anonyme). Computer instruction control apparatus and method. 4,040,031, Cl. 364-200.000.

Castanier, Emile Lucien, to Chrysler France. Rear-end suspension for an automotive vehicle. 4,039,205, Cl. 280-721.000.

Castelletti, Robert; and Spector, George. Fishing lure. 4,038,773, Cl. 43-26.200.

Castello, Leo J. Method of collar fabrication. 4,038,840, Cl. 66-170.000.

Caterina, Fred J.: *See—*
Lindow, Carl E.; Joseph, Craig L.; Caterina, Fred J.; and Howard, Harlan N., 4,038,889, Cl. 74-866.000.

Caterpillar Tractor Co.: *See—*
Livesay, Richard E., 4,039,305, Cl. 55-159.000.

Centralnt Osrodek Techniki Medycznej: *See—*
Ober, Jan; and Piatek, Zygmunt, 4,038,706, Cl. 3-12.300.

Centre Electronique Horloger S.A.: *See—*
Martin, Jean-Claude, 4,039,969, Cl. 331-40.000.

Centre Technique des Industries Mecaniques: *See—*
Flambard, Christian; and Lambert, Alain, 4,038,865, Cl. 73-67.700.

Ceskoslovenska akademie ved: *See—*
Hrabak, Frantisek; and Bochal, Karel, 4,039,735, Cl. 526-292.000.

Cessou, Maurice: *See—*
Alagy, Jacques; Busson, Christian; and Cessou, Maurice, 4,039,649, Cl. 423-540.000.

Chadwick, Peter Edward, to Decca Limited. Automatic aerial attenuator. 4,039,953, Cl. 325-304.000.

Chaen, Shigehiro: *See—*
Yokoo, Hidejiro; Tsuruya, Tetsuo; Chaen, Shigehiro; and Kubo, Hiroshi, 4,039,577, Cl. 260-553.00A.

Chaffin, John H., III, to Honeywell Inc. Photodetector-to-substrate bonds. 4,039,116, Cl. 228-123.000.

Chamberlin, James W., to Eli Lilly and Company. 24-Methyl-14a-aza-D-homo-cholest-8(9)-enes. 4,039,547, Cl. 260-287.0AZ.

Champagne, Ralph R., to Rockwell International Corporation. Cone holder assembly. 4,039,159, Cl. 242-130.100.

Champion International Corporation: *See—*
Coyle, Robert P., 4,039,645, Cl. 264-118.000.

Chan, Kingsley; and Russo, Neil, to Lightolier Incorporated. Circular recessed lighting fixture. 4,039,822, Cl. 240-73.0BC.

Chan, See Fong. Fertilizer dispenser. 4,039,105, Cl. 222-193.000.

Chan, Steven S., to Adams-Smith Incorporated. Digital video tape frame code readout system. 4,040,100, Cl. 360-43.000.

Chandler, Michael L.; Krahnke, Robert H.; and LeVier, Robert R., to Dow Corning Corporation. Anticonvulsant phenylsilanes. 4,039,666, Cl. 424-184.000.

Chang, Clarence D., to Mobil Oil Corporation. Conversion of synthesis gas to aromatic hydrocarbons. 4,039,600, Cl. 260-668.00R.

Chang, Hsu; Chen, Tien Chi; and Tung, Chin, to International Business Machines Corporation. Ladder for information processing. 4,040,018, Cl. 340-174.0TF.

Chao, Tai S.: *See—*
Chloupek, Frank J.; and Chao, Tai S., 4,039,300, Cl. 44-58.000.

Chasin, David; Russo, Vincent, Jr.; and Foglio, Sam. Flexible flag advertising sign. 4,038,767, Cl. 40-125.00H.

Cheek, Robert L., to McCartney, Carl Lane. Drop check valve. 4,039,003, Cl. 137-516.290.

Chemsoil Corporation: *See—*
Collins, Dwight D.; and Harmon, Darrell R., 4,039,289, Cl. 23-262.000.

Chen, Tien Chi: *See—*
Chang, Hsu; Chen, Tien Chi; and Tung, Chin, 4,040,018, Cl. 340-174.0TF.

Cheng, Karl C. H., to Litton Business Systems, Inc. Control for rotatable storage unit. 4,039,918, Cl. 318-602.000.

Cherbourg, Robert: *See—*
Reilhac, Andre Jean; and Cherbourg, Robert, 4,038,718, Cl. 16-110.00R.

Cherenko, Joseph; and Lewis, Charles W., to PPG Industries, Inc. Laminated windshield with improved innerlayer. 4,039,720, Cl. 428-425.000.

Chermin, Hubertus Mathias Jozef; Luursema, Meerten; Rozenboom, Jaap; and Smulders, Herman Adrianus Godefridus, to U.S. Philips Corporation. Device for starting and feeding a discharge lamp. 4,039,895, Cl. 315-101.000.

Cheron, Jacques, to Institut Francais du Petrole. Automatic device for opening and closing the comburent inlet and outlet ports of a fuel cell. 4,039,728, Cl. 429-22.000.

Chesley, Ronald F.: *See—*
Goldfarb, Adolph E; Benkoe, Erwin; Everitt, Delmar K; Chesley, Ronald F.; and Frierdich, Richard D., 4,039,188, Cl. 273-101.000.

Chestnut, Benjamin F.; and Altenschulte, Ray A., to P. R. Mallory & Co., Inc. Timing mechanism having in line intermittent drive means. 4,038,884, Cl. 74-568.00T.

Chevron Research Company: *See—*
Fredriksson, Oke A.; and Thomas, Elmer L., 4,039,806, Cl. 235-152.000.
Michlmayr, Manfred J., 4,039,432, Cl. 208-252.000.
Toland, William G., 4,039,725, Cl. 428-537.000.

Cheype, Jean Marie; Courant, Patrick; and Kurzweil, Karel, to Compagnie Honeywell Bull (Societe Anonyme). Methods of manufacturing carrier supports for integrated chips and mounting of integrated circuit chips to a substrate. 4,038,744, Cl. 29-630.00A.

Chicago Pneumatic Tool Company: *See—*
Bugman, Michael, 4,039,219, Cl. 294-82.00R.

Chimie & Biologie: *See—*
Niviere, Pierre; Orillard, Gerard; and Blum, Jean, 4,039,519, Cl. 260-112.50R.

Chirgwin, Keith M., to Garrett Corporation, The. Dynamoelectric machine. 4,039,910, Cl. 318-213.000.

Chirgwin, Keith M., to Garrett Corporation, The. Method of converting phase and frequency using a dynamo-electric machine. 4,039,922, Cl. 363-9.000.

Chiulli, Robert D., to Medico Developments, Inc. Device for repairing arteries. 4,038,985, Cl. 128-304.000.

Chloupek, Frank J.; and Chao, Tai S., to Atlantic Richfield Company. Gasoline fuel composition and method of using. 4,039,300, Cl. 44-58.000.

Choay S. A.: *See—*
Thang, Minh-Nguy; and Guissani born Trachtenberg, Annie, 4,039,382, Cl. 195-28.00N.

Chouinard, Donald B.: *See—*
Heitmann, Arnold M.; Brassert, Walter L.; and Chouinard, Donald B., 4,038,815, Cl. 60-39.080.

Christensen, John: *See—*
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, 4,039,771, Cl. 219-328.000.
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, 4,039,772, Cl. 219-328.000.

Christiansen, Paul J.: *See—*
Klein, Gerhart P.; Kallianidis, Milton; Christiansen, Paul J.; and Henderson, Dennis R., 4,039,904, Cl. 361-433.000.

Christman, William J., to UOP Inc. Liquid-liquid extraction apparatus. 4,039,389, Cl. 196-14.520.

Chrysler France: *See—*
Castanier, Emile Lucien, 4,039,205, Cl. 280-721.000.

Churchman, Ronald K.; and Yonker, John H., to Otis Engineering Corporation. Circumferential centralizer. 4,039,027, Cl. 166-153.000.

Ciba-Geigy AG: *See—*
Angliker, Hans-Joerg; Peter, Richard; and Jenny, Walter, 4,039,529, Cl. 260-207.100.
Garner, Robert; and Petitpierre, Jean Claude, 4,039,557, Cl. 548-370.000.
Hegar, Gert, 4,039,523, Cl. 260-153.000.

Ciba-Geigy Corporation: *See—*
Huebner, Charles Ferdinand, 4,039,676, Cl. 424-267.000.
Merz, Jurg; and Schibler, Luzius, 4,039,576, Cl. 260-553.00R.

Cicero, Jim: *See—*
McFall, Jim; Cicero, Jim; and Phillips, Tom, 4,038,701, Cl. 3-1.000.

Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., to E. R. Squibb & Sons, Inc. Thio-β-lactam cephalosporins. 4,039,537, Cl. 544-30.000.

Cimarusti, Christopher M.: *See—*
Slusarchyk, William A.; and Cimarusti, Christopher M., 4,039,534, Cl. 544-17.000.

Citizen Watch Co., Ltd.: *See—*
Niida, Yutaka, 4,038,814, Cl. 58-23.00R.

CKD DUKLA, narodni podnik: *See—*
Kadlec, Vaclav; and Huebner, Pavel, 4,039,442, Cl. 210-32.000.

Claassens, Jacobus Marinus Maria: *See—*
Beijer, Louis Benjamin; Koedam, Mijndert; Claassens, Jacobus Marinus Maria; and Van Vliet, Johannes Adrianus Josephus Maria, 4,039,880, Cl. 313-183.000.

Claessens, Willem Maria August. Sliding roof. 4,038,788, Cl. 52-2.000.

Clark, Don Richard: *See—*
Richards, Kenneth Julian; and Clark, Don Richard, 4,039,404, Cl. 204-106.000.

Clark, James Monroe, to International Telephone and Telegraph Corporation. Automatic phasing circuit to transfer digital data from an external interface circuit to an internal interface circuit. 4,039,960, Cl. 328-155.000.

Clark, John W. Method for destratifying bodies of water. 4,039,439, Cl. 210-14.000.

Clark, Neill V.; and Holzgrafe, Homer G., to Raytheon Company. Coaxial radio frequency switch having integral filter. 4,039,974, Cl. 333-7.00R.

Clark, William H.: *See—*
Dermond, Hartley P., 4,039,265, Cl. 404-127.000.

Clarke, Peter Alec: *See—*
Garton, William Robert; and Clarke, Peter Alec, 4,039,071, Cl. 198-425.000.

Clarostat Mfg. Co., Inc.: *See—*
Ward, Frank L., 4,039,994, Cl. 338-89.000.

Claus, Kenneth G.; and Rogers, Jack A., to Dow Chemical Company, The. Magnesium dialkyl phosphates and their preparation. 4,039,636, Cl. 260-963.000.

Clausen, Edward Einar, to General Foods Corporation. Intermediate-moisture animal food process. 4,039,692, Cl. 426-532.000.

Clegg, John Cardwell, to Battelle Development Corporation. Universal electric motor speed control. 4,039,913, Cl. 318-345.00C.

Clement, Carl Jennings; Campbell, Kenneth Strong; and Walker, James Terrell, to Clement Laboratories. Breath pressure actuated electronic musical instrument. 4,038,895, Cl. 84-1.010.

Clement Laboratories: *See—*
Clement, Carl Jennings; Campbell, Kenneth Strong; and Walker, James Terrell, 4,038,895, Cl. 84-1.010.

Clemson University: *See—*
Patten, Frank C.; and Alphin, John G., 4,038,808, Cl. 56-27.500.

Clifford, Gary John. Flow diversion means. 4,039,005, Cl. 137-609.000.

Clift, Charles Edward, to Montevideo Technology, Inc. Moving coil electrical instrument. 4,039,944, Cl. 324-150.000.

Close, Ralph E.; and Oroshnik, William, to SCM Corporation. Synthesis of dehydrophytol and Vitamin E. 4,039,591, Cl. 260-618.00R.

Coal Industry (Patents) Limited: *See—*
Monks, Harry, 4,039,057, Cl. 192-.02R.

Coastal Industries, Inc.: *See—*
Mancini, Thomas P., 4,039,284, Cl. 23-230.00B.

Coatings Inc.: *See—*
Leachy, Richard B., 4,039,244, Cl. 339-275.00T.

Coats & Clark, Inc.: *See—*
Einhorn, Ruediger, 4,039,138, Cl. 248-497.000.

Coats Company, Inc., The: *See—*
Cunningham, Charles L., 4,039,016, Cl. 157-1.280.

Cobaugh, Robert Franklin; and Lynch, James Edward, to AMP Incorporated. Wire slot clip. 4,039,239, Cl. 339-97.00R.

Cobb, Raymond L., to Phillips Petroleum Company. Monocyclic aromatic clathrates of 13-oxatetracyclo[8.2.1^{2,9}.0.0^{3,8}]tridec-5-ene-1,5,6,10-tetracarbonitrile. 4,039,541, Cl. 260-250.00A.

Cochran, C. Norman: *See—*
Wohleber, David A.; and Cochran, C. Norman, 4,039,647, Cl. 423-495.000.

Coffey, Theodore W.: *See—*
Hardy, Frank M.; and Coffey, Theodore W., 4,038,976, Cl. 128-2.05P.

Coggins Industries, Inc.: *See—*
Tessner, Roy Lynnard, 4,038,962, Cl. 125-21.000.

Cole, William T.; Pavone, Joseph P.; and Scanlon, John J., to Remington Arms Company, Inc. Expendable case ammunition. 4,038,923, Cl. 102-43.00R.

Coleman, Kenneth John; Brown, Phillip John; and Watkins, Howard John Stephen, to Carpets International Limited. Carpet weaving looms. 4,039,007, Cl. 139-7.00F.

Colgate-Palmolive Company: *See—*
Weyn, Hendrik Frans, 4,039,687, Cl. 426-62.000.

Collignon, Claude: *See—*
Bulteau, Gerard; Acher, Jacques; Collignon, Claude; and Monier, Jean-Claude, 4,039,672, Cl. 424-269.000.

Collins, Dwight D.; and Harmon, Darrell R., to Chemsoil Corporation. Sulphur-burning and gaseous products absorption system and components therefor. 4,039,289, Cl. 23-262.000.

Collins, Raymond W.: *See—*
Tichy, Thomas H.; and Collins, Raymond W., 4,039,765, Cl. 179-156.00A.

Collins, Thomas Robert Stephen, to Imperial Chemical Industries Limited. Plastics container manufacture. 4,039,641, Cl. 264-28.000.

Coloma, Antonio. Toggle bolt setting tool. 4,038,851, Cl. 72-114.000.

Colombetti, Lelio G. Reloadable radioactive generator system. 4,039,835, Cl. 250-432.0PD.

Colombo, Luigi: *See—*
Montino, Franco; and Colombo, Luigi, 4,039,317, Cl. 75-.50A.

Columbian Rope Company: *See—*
Thomson, George, 4,038,934, Cl. 114-298.000.

Commercial Resins Company: *See—*
Hart, Robert J., 4,038,942, Cl. 118-305.000.

Commissariat a l'Energie Atomique: *See—*
Andrieu, Jean-Louis; Bonnet, Yves; and Viaud, Michel, 4,039,377, Cl. 176-65.000.
Guillon, Henri Georges; and Henein, Kamal Labib, 4,039,963, Cl. 330-9.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Schafer, Harry Neil Scott, 4,039,473, Cl. 252-425.000.

Compagnie Francaise de Raffinage: *See—*
Engelhard, Philippe; Szabo, Georges; and Weisang, Joseph Edouard, 4,039,477, Cl. 252-441.000.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Cassonnet, Jean-Claude Marcel, 4,040,030, Cl. 364-200.000.
Cassonnet, Jean-Claude Marcel, 4,040,031, Cl. 364-200.000.
Cheype, Jean Marie; Courant, Patrick; and Kurzweil, Karel, 4,038,744, Cl. 29-630.00A.

Computer Devices Corporation: *See—*
Morreale, Anthony P., 4,039,875, Cl. 310-194.000.

Conestoga Wood Products, Inc.: *See—*
Hahn, Norman; and Martin, Raymond G., 4,039,108, Cl. 226-171.000.

Conlisk, Peter J.: *See—*
Bowling, George W.; Conlisk, Peter J.; and Lenzen, Kenneth H., 4,039,050, Cl. 188-1.00B.

Connlab Holdings Limited: *See—*
Micetich, Ronald G.; and Morin, Robert B., 4,039,530, Cl. 260-239.00A.

Connolly, Douglas P., to Xerox Corporation. Pretransfer corotron switching. 4,039,257, Cl. 355-3.00R.

Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, to Warner-Lambert Company. 2-[1-Imino-2-(methylsulfinyl)ethyl]-phenols and 3-[1-imino-2-(methylsulfinyl)ethyl]-2-naphthalenols. 4,039,579, Cl. 260-566.00R.

Conrad, Horst: *See—*
Niederdellmann, Georg; Klussmann, Henning; and Conrad, Horst, 4,039,516, Cl. 260-75.0NE.

Conrad, Winthrop B., to Teleflex Incorporated. Motion transmitting remote control assembly. 4,038,881, Cl. 74-501.00P.

Conserve-A-Watt Corporation: *See—*
Greene, Albert A.; and Capadona, Emanuel A., 4,039,821, Cl. 240-51.11R.

Continental Can Company, Inc.: *See—*
Saumsiegle, Robert W.; and Harry, Ieuan L., 4,039,644, Cl. 264-97.000.

Continental Electronics Manufacturing Company: *See—*
Weldon, James O., 4,039,982, Cl. 334-45.000.

Continental Gummi-Werke Aktiengesellschaft: *See—*
Pakur, Henryk; and Tiemann, Reinhard, 4,039,015, Cl. 152-362.00R.

Continental Oil Company: *See—*
Wong, Soon Y., 4,039,405, Cl. 204-106.000.

Convergence Corporation: *See—*
Beeson, Gary H.; and Skinner, William D., 4,040,098, Cl. 360-14.000.

Cook, Emory G., to Cook Laboratories, Inc. Method and apparatus for preparing recorded program material to render detectable unauthorized magnetic tape duplications, and method and apparatus for detecting such duplications. 4,040,099, Cl. 360-29.000.

Cook Laboratories, Inc.: *See—*
Cook, Emory G., 4,040,099, Cl. 360-29.000.

Cook, William H., to C. E. S., Inc. Non-rebound hammer. 4,039,012, Cl. 145-29.00R.

Cooper, George Anthony; Mayer, Rayner Michael; and Watt, William, to National Research Development Corporation. Production of carbon articles. 4,039,341, Cl. 106-56.000.

Cooper, Glenn Dale; and Floryan, Daniel Edwin, to General Electric Company. Removal of catalyst from polyphenylene oxide reaction mixtures with nitrogenous salts of nitrilotriacetic acid. 4,039,510, Cl. 260-47.0ET.

Cooper, John C.; Birdseye, Harvey E.; and Donnelly, Russell J., to State Board of Higher Education for and on Behalf of the University of Oregon. Hydrocarbon measurement. 4,038,864, Cl. 73-23.000.

Cooper, Robin D. G., to Eli Lilly and Company. 7-[α-(guanyl-1-ureido)phenylacetamido]-3-substituted cephalosporin antibiotics. 4,039,535, Cl. 544-26.000.

Cooper, Ronald H.: *See—*
Emig, Gale L.; Cooper, Ronald H.; and Eash, R. Douglas, 4,039,345, Cl. 106-90.000.

Corbley, Eugene K., to General Electric Company. Discharge lamp having disconnect effective upon jacket failure. 4,039,893, Cl. 315-73.000.

Cornell, Edward P.: *See—*
Steigerwald, Robert L.; and Cornell, Edward P., 4,039,914, Cl. 318-375.000.

Corning Glass Works: *See—*
Elmer, Thomas H.; and Tischer, Richard E., 4,039,339, Cl. 106-54.000.
Simpson, Lynn B.; and Takeguchi, Milton M., 4,039,387, Cl. 195-100.000.

Cornwell, Charles E.; and Plunguian, Mark. System of continuous dustless mixing and aerating and a method combining materials. 4,039,170, Cl. 259-147.000.

Costantini, Ralph, to Ralph M. Parsons Company. Power generation wherein sulfur and nitrogen oxides are removed. 4,039,621, Cl. 423-239.000.

Cote, Paul T., to General Electric Company. Photoflash lamp providing after-flash shorting. 4,039,273, Cl. 431-95.00R.

Cotton, John Lee, to A/S Kongsberg Vapenfabrik. Arrangement for endwise clamping a first gas turbine rotor member to another member of a gas turbine rotor. 4,039,268, Cl. 416-183.000.

Couchoud, Paul, to Rhone-Poulenc-Textile. Shaped articles made from a mixture of polyvinylidene fluoride and a copolymer of methyl methacrylate and a comonomer containing a quaternary ammonium group. 4,039,634, Cl. 260-895.000.

Courant, Patrick: *See—*
Cheype, Jean Marie; Courant, Patrick; and Kurzweil, Karel, 4,038,744, Cl. 29-630.00A.

Courbot, Pierre: *See—*
Meyer, Yves; and Courbot, Pierre, 4,039,055, Cl. 188-79.5GC.

Courtney, James, to Lacheen, Jerome H. Pulley belt and its inherent installation device. 4,038,879, Cl. 74-231.00J.

Couturier, Robert A.; Davis, Steven J.; and Robbins, G. Howard, to General Datacomm Industries, Inc. Method and apparatus for closed loop testing of first and second modulators and demodulators. 4,039,751, Cl. 179-15.0BF.

Cowe, Alan Barnett; and de Raismes, John Francis, to Teleram Communications Corporation. Editing system for a random access memory. 4,040,024, Cl. 364-900.000.

Coxhill, Major; Unger, Jerome R.; and Lowe, Keith B., to Allis-Chalmers Corporation. Impeller locking means for impact crusher rotor. 4,039,151, Cl. 241-191.000.

Coyle, Robert P., to Champion International Corporation. Process for the manufacture of fire retardant particleboard. 4,039,645, Cl. 264-118.000.

Cozzini, Artemio S. Honing mechanism. 4,038,782, Cl. 51-5.00D.

Craford, M. George: *See—*
Bailey, Paul T.; Craford, M. George; Findlay, Alexander G.; and Underwood, Robert K., 4,039,890, Cl. 313-500.000.

Crane Co.: *See—*
Tahara, Sentaroo; Murata, Toshiteru; Shimaya, Seiki; and Crits, George J., 4,039,443, Cl. 210-32.000.

Crane, Hewitt D.; Wolf, Daniel E.; and Ostrem, John S., to Stanford Research Institute. Identification by handwriting verification. 4,040,010, Cl. 340-146.3SY.

Crane, Hewitt D.; and Jones, Earle D., to Stanford Research Institute. Identification based on handwriting samples. 4,040,011, Cl. 340-146.3SY.

Crane, Hewitt David; Wolf, Daniel Errol; and Lindenberg, Samuel, to Stanford Research Institute. Handwriting verification system. 4,040,012, Cl. 340-146.3SY.

Crane, Walton B., to A & E Plastik Pak Co., Inc. Tray for berry baskets, with clips and cover sheet. 4,039,119, Cl. 229-34.0HW.

Crane, Walton B., to A & E Plastik Pak Co., Inc. Clip for use with berry basket trays in stacks and cover sheet. 4,039,121, Cl. 229-52.00A.

Creative Innovations: *See—*
Bennett, Bruce A., 4,038,847, Cl. 70-233.000.

Crespo, Osmundo; and Carratala, Carmen Sophia. Device for use in separating coffee brewers which are in two screw-threaded portions. 4,038,914, Cl. 99-279.000.

Crits, George J.: *See—*
Tahara, Sentaroo; Murata, Toshiteru; Shimaya, Seiki; and Crits, George J., 4,039,443, Cl. 210-32.000.

Crocker, Leon Bardin, to United States of America, Navy. Solid state step transmitter. 4,039,783, Cl. 235-150.300.

Crone, John M., Jr.: *See—*
Mayer, Edward A.; Brandenburg, John T.; Crone, John M., Jr.; and Ropes, Charles A., Jr., 4,039,294, Cl. 23-288.0FB.

Cronenberger, Michel: *See—*
Bardin, Robert; and Cronenberger, Michel, 4,039,455, Cl. 210-321.00A.

Cross, Charles K.: *See—*
Bharucha, Kekhusroo R.; Rubin, Leon J.; and Cross, Charles K., 4,039,690, Cl. 426-266.000.

Cross, Malcolm Geoffrey; and Dawson, John Howard, to Marconi Company Limited, The. Clutter filter for Pulse Doppler Radar. 4,040,057, Cl. 343-17.1PF.

Crouch, Donald Wayne; Kurtz, Donald Reah; and Sofianek, Joseph Carl, to General Electric Company. Compact high-current vacuum circuit interrupter comprising a metal housing that is electrically connected to one contact of the interrupter. 4,039,792, Cl. 200-144.00B.

Croucher, Kenneth W., to Massey-Ferguson Services N.V. Sugar cane harvester cane conveyor roller. 4,039,434, Cl. 209-28.000.

Crowe, Talmadge L., to Baker Oil Tools, Inc. Well control valve apparatus. 4,039,031, Cl. 166-317.000.

Crowley, Norman R.; and Fuchs, Gilbert N., to Evana Tool & Engineering Inc. Screen positioning and squeegee drive means for screen printer. 4,038,920, Cl. 101-123.000.

Crozier, Ronald D.: *See—*
Bell, Fred S., III; Crozier, Ronald D.; and Strow, Lawrence Evans, 4,039,569, Cl. 260-463.000.

Cub, Fritz: *See—*
Schacht, Hans; and Cub, Fritz, 4,039,457, Cl. 210-493.00R.

Cubic Industrial Corporation: *See—*
Bruce, Robert L.; Gaughan, Neil A.; and Ripingill, Allan E., 4,039,951, Cl. 325-38.00R.

Cull, Neville L.; and Smith, Warren M., to Exxon Research and Engineering Company. Flue gas desulfurization sorbent. 4,039,478, Cl. 252-455.00R.

Cullen, Roy H.; and Aker, Jimmie R., to Cullen, Roy H. Electrical power conductor apparatus for earth boring. 4,039,237, Cl. 339-91.00R.

Cummins Engine Company, Inc.: *See—*
Perr, Julius P.; Smith, Edward D.; and Wilson, Harry L., 4,038,956, Cl. 123-139.0AF.

Cunningham, Charles L., to Coats Company, Inc., The. Tire servicing apparatus. 4,039,016, Cl. 157-1.280.

Curchack, Herbert D., to United States of America, Army. Simulator for setback followed by drag. 4,038,869, Cl. 73-167.000.

Curtis, Robert Bartlett; and Riedel, Nelson Andrew, to Bell Telephone Laboratories, Incorporated. Recorder transfer arrangement maintaining billing data continuity. 4,040,023, Cl. 364-900.000.

Cyprus Metallurgical Processes Corporation: *See—*
Stephens, Frank M., Jr.; and Blair, James C., 4,039,324, Cl. 75-72.000.

Dahlron Corporation: *See—*
Olofsson, Sigfrid M., 4,038,961, Cl. 124-69.000.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See—*
Hamamura, Tamotu; Goto, Sumio; and Ishihara, Kazuhiko, 4,039,517, Cl. 260-77.5TB.
Sakai, Kazuyoshi; Kobayashi, Shigeo; and Fujita, Takeshi, 4,039,568, Cl. 260-453.00P.

Dai Nippon Toryo Co., Ltd.: *See—*
Shimiya, Keiji; and Miura, Norio, 4,039,840, Cl. 250-486.000.

Daiichi Denshi Kogyo Kabushiki Kaisha: *See—*
Furuya, Kiyoto, 4,039,398, Cl. 204-15.000.

Daiko Electronics Co., Ltd.: *See—*
Hase, Takeshi, 4,039,789, Cl. 200-61.520.

Daimler-Benz Aktiengesellschaft: *See—*
Burckhardt, Manfred H.; and Paul, Jurgen, 4,039,782, Cl. 235-150.200.
Tomforde, Johann, 4,039,225, Cl. 297-390.000.

Daley, Richard John, Jr. Adjustable grills for use as doors, windows, gates or the like. 4,038,800, Cl. 52-507.000.

Daley, Richard John, Jr. Security devices for mounting CB radio, tape player, stereo or the like in motor vehicles. 4,038,843, Cl. 70-58.000.

Daley, William D., to Allied Chemical Corporation. Sulfur dioxide reduction. 4,039,650, Cl. 423-569.000.

Dalmau, Jose M[illegible]
Lombardi, Victor J.; and Dalmau, Jose M[illegible] 4,038,838, Cl. 66-147.000

Dalpee, Joseph A.; Bernard, Fred W.; and Reynolds, Richard G., to United States of America, Navy. Programmer for magnetic latching relays. 4,040,119, Cl. 361-191.000.

Damsteeg, Cornelis Jan; and Ekkelboom, Tjepke Hendrick, to U.S. Philips Corporation. Soldered joint. 4,039,883, Cl. 313-218.000.

Dana Corporation: *See—*
Wallace, William Patrick; and Angilella, Anthony George, 4,039,399, Cl. 204-25.000.

Danfoss A/S: *See—*
Iversen, Poul Christian Carlos, 4,039,773, Cl. 219-364.000.
Nicolaisen, Holger; Andersen, Finn Schnoor; and Jensen, Jens Peter, 4,039,791, Cl. 200-67.00D.
Spies, Volker; Poul, Christian Dyhr-Mikkelsen; and Valbjorn, Knud Vagn, 4,039,126, Cl. 236-42.000.
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, 4,039,771, Cl. 219-328.000.
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, 4,039,772, Cl. 219-328.000.

Darby, William L.: *See—*
Armor, Anthony F.; Archibald, James B.; and Darby, William L., 4,039,872, Cl. 310-62.000.

D'Ascoli, John; Rappa, Benny F.; and Sculley, Thomas M. Solar water heater. 4,038,970, Cl. 126-271.000.

Daspit, Ronald Albert. Coupler for liquid and gaseous fluid piping. 4,039,211, Cl. 285-184.000.

Data General Corporation: *See—*
Kreiker, Philip Michael, 4,040,032, Cl. 364-200.000.

Davidoff, Charles, to Bundy Corporation. Electrocleaning process. 4,039,410, Cl. 204-141.500.

Davis, Chester A.: *See—*
Edelberg, Norman L.; and Davis, Chester A., 4,038,995, Cl. 132-7.000.

Davis, Edward G., to United States of America, Interior. Beneficiation of olivine foundry sand by differential attrition grinding. 4,039,625, Cl. 423-326.000.

Davis, Joe William: *See—*
Adams, Ernest Clarence; Davis, Joe William; and Yoder, John Menley, 4,039,652, Cl. 424-1.000.

Davis, Steven J.: *See—*
Couturier, Robert A.; Davis, Steven J.; and Robbins, G. Howard, 4,039,751, Cl. 179-15.0BF.

Dawson, John Howard: *See—*
Cross, Malcolm Geoffrey; and Dawson, John Howard, 4,040,057, Cl. 343-17.1PF.

Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, to Lilly Industries, Ltd. Organic derivatives. 4,039,571, Cl. 260-468.00D.

Dayton Manufacturing Company: *See—*
Materese, Vincent, 4,039,820, Cl. 240-26.000.

De Laval Separator Company, The: *See—*
Fett, Richard H. G., 4,039,441, Cl. 210-23.00R.

Dea, Frank J.: *See—*
Stoughton, Richard B.; Harris, Richard L.; and Dea, Frank J., 4,039,664, Cl. 424-180.000.

Dean, Donald E.; and Alesi, John, Jr., to Formex Manufacturing, Inc. Method for forming plastic sheets. 4,039,643, Cl. 264-92.000.

Debets, Wilhelmus A. M.: *See—*
Schoen, Lowhardt A. A.; Bruls, Wilhelmus G. M.; and Debets, Wilhelmus A. M., 4,039,732, Cl. 526-43.000.
Debski, Thomas R., to Sedco Systems, Incorporated. E plane folded hybrid with coaxial difference port. 4,039,975, Cl. 333-11.000.
Decca Limited: *See—*
Chadwick, Peter Edward, 4,039,953, Cl. 325-304.000.
Deeg, Emil W.: *See—*
Zdrok, Edward Z.; and Deeg, Emil W., 4,039,827, Cl. 250-271.000.
Deere & Company: *See—*
Wittren, Richard Arthur, 4,038,886, Cl. 74-793.000.
Deeter, Patricia. Mange cure. 4,039,686, Cl. 424-350.000.
DeFoney, Brenman, Mayes & Baron: *See—*
DeFoney, George F.; Mayes, Donald S.; and Brenman, Henry S., 4,039,653, Cl. 424-19.000.
DeFoney, George F.; Mayes, Donald S.; and Brenman, Henry S., to DeFoney, Brenman, Mayes & Baron. Long-acting articles for oral delivery and process. 4,039,653, Cl. 424-19.000.
Defoor, Frans Maurice Joseph, to Labofina S.A. Process for preparing aqueous solutions of acrylamide polymers. 4,039,498, Cl. 260-29.6HN.
Degen, Kurt: *See—*
Reerink, Wilhelm; Beck, Kurt-Guenther; Echterhoff, Heinrich; Muller, Johannes; Degen, Kurt; and Nashan, Gerd, 4,039,342, Cl. 106-58.000.
Degen, Norbert, to Maschinenfabrik Augsburg-Nurnberg AG. Lateral magnetic truck wheel positioning assembly. 4,038,928, Cl. 104-242.000.
de Gennes, Gerard, to Societe Anonyme Francaise du Ferodo. Diaphragm clutch assembly. 4,039,059, Cl. 192-89.00B.
de Goede, Johannes Antonius: *See—*
Caris, Josephus Antonius Marie; and de Goede, Johannes Antonius, 4,039,168, Cl. 259-9.000.
DeHart, Damon H. Wall mountable and molding mountable bracket. 4,039,136, Cl. 248-215.000.
Dekker, Donald Allen, to Attwood Corporation. Method of fabricating steering wheel. 4,038,735, Cl. 29-159.00B.
Delaval Turbine, Inc.: *See—*
Repose, John; and Niatas, Ulysses, 4,039,228, Cl. 308-73.000.
DeLigt, John, to Westvaco Corporation. Thin belt embossing method and apparatus. 4,038,917, Cl. 101-23.000.
Dell, M. Benjamin: *See—*
Haupin, Warren E.; Remper, John A.; and Dell, M. Benjamin, 4,039,648, Cl. 423-496.000.
DeLucia, Victor E.; and Nosser, Philip B., to Torr Laboratories, Inc. Pressurized relay assembly. 4,039,984, Cl. 335-151.000.
De Maria, Carmine. Awning window construction. 4,039,018, Cl. 160-89.000.
Denholm, Andrew. Bakery oven. 4,039,278, Cl. 432-144.000.
Dennison Manufacturing Company: *See—*
Bone, Arnold R., 4,039,078, Cl. 206-343.000.
den Toonder, Pieter, to Oak Holland B.V. Signal distribution device for a cable television. 4,039,954, Cl. 325-308.000.
de Raismes, John Francis: *See—*
Cowe, Alan Barnett; and de Raismes, John Francis, 4,040,024, Cl. 364-900.000.
Dermond, Hartley P., to Clark, William H., a part interest. Ditch-shaping roll and attachment for a road vehicle. 4,039,265, Cl. 404-127.000.
De Roo, Pierre Richard; De Winter, Walter Frans; Priem, Jan Jozef; and Gilliams, Yvan Karel, to AGFA-GEVAERT N.V. Electrostatographic developers comprising a carrier bead coated with a copolymer of N-vinylcarbazole and trialkoxyvinylsilane and/or triacetoxyvinylsilane. 4,039,463, Cl. 252-62.10P.
Desaules, Jean-Jacques, to Fabrique d'Horlogerie Cms. Tissot et Fils S.A. Packaging and display arrangement for chemicals. 4,039,076, Cl. 206-219.000.
Desblache, Andre Eugene: *See—*
Caron, Francois Gabriel; Desblache, Andre Eugene; Godard, Dominique Noel; and Maddens, Francis Paul, 4,039,748, Cl. 178-69.100.
Desourdy, Bernard. Muck-evacuating system in tunneling operation. 4,039,090, Cl. 214-40.000.
de Troye, Nicolaas Cornelis: *See—*
van Es, Lambertus Gerardus; van Essen, Hendrik Arie; and de Troye, Nicolaas Cornelis, 4,040,027, Cl. 364-900.000.
Deutsch, Howard; and Shoemaker, John D., Jr., to Union Camp Corporation. Bleaching of cellulosic pulp fibers with chlorine dioxide in the presence of a vanadium compound. 4,039,374, Cl. 162-79.000.
Deutsche Automobilgesellschaft mBh, Firma: *See—*
Benczur-Urmossy, Gabor; von Benda, Klaus; and Haschka, Friedrich, 4,039,729, Cl. 429-206.000.
Deutsche Gesellschaft fur Schadlingbekampfung: *See—*
Schoom, Werner, 4,039,611, Cl. 423-1.000.
Devaux, Alain: *See—*
Bastenhof, Dirk; and Devaux, Alain, 4,038,825, Cl. 60-631.000.
De Winter, Walter Frans: *See—*
De Roo, Pierre Richard; De Winter, Walter Frans; Priem, Jan Jozef; and Gilliams, Yvan Karel, 4,039,463, Cl. 252-62.10P.
Dezoppy, Robert. Device for collating sheets. 4,039,179, Cl. 270-58.000.
DeZuba, James M., to DeZuba, Rose M. Ceramic die and method of using same. 4,038,858, Cl. 72-274.000.
DeZuba, Rose M.: *See—*
DeZuba, James M., 4,038,858, Cl. 72-274.000.
Dhami, Kewal Singh, to International Telephone and Telegraph Corporation. Polymeric composition containing mercaptoquinazolone antioxidant. 4,039,508, Cl. 260-45.80N.
Diamond, Martin J.: *See—*
Freedman, Bernard; and Diamond, Martin J., 4,039,731, Cl. 526-6.000.
Dian, Walter, to Beatrice Foods Co. Bicycle derailler. 4,038,878, Cl. 74-217.00B.
Diana, Guy D., to Sterling Drug Inc. Alkanimidoylthioureas. 4,039,575, Cl. 260-552.00R.
DiBugnara, Raymond; and Allison, Richard, to TRW Inc. Method for settling a glass suspension using preferential polar adsorbtion. 4,039,702, Cl. 427-93.000.
Dickie, Ray A.; and Cassatta, Joseph C., to Ford Motor Company. Plural coated article and process for making same. 4,039,722, Cl. 428-461.000.
Dickinson, William B.; and Vaupotic, Marcia P., to Sterling Drug Inc. Lower-alkyl (5-substituted-2-pyridyl)carbamodithioates. 4,039,550, Cl. 260-294.80E.
Diesel Kiki Co.: *See—*
Susuki, Yasuhide, 4,038,958, Cl. 123-140.00R.
Diesner, Ferdinand, to Patax Trust Reg. Method of and a machine for manufacturing at least one nap fabric strip. 4,039,008, Cl. 139-21.000.
Dietz, George, Jr.; Skomoroski, Robert M.; and Zobbi, Robert G., to American Chemical & Refining Company Inc. Stepwise process for recovering precious metals from solution. 4,039,327, Cl. 75-108.000.
Diggs, Richard E. Tidewater power plant. 4,039,847, Cl. 290-42.000.
Di Loreto, Edward, to Yale Engineering Company. Ball bearing assembly. 4,039,231, Cl. 308-189.00R.
Di Marco, Aurelio: *See—*
Arcamone, Federico; Di Marco, Aurelio; and Penco, Sergio, 4,039,663, Cl. 424-180.000.
DiMartini, Carl Richard; and Scott, William Lafayette, to Asarco Incorporated. Method for the concentration of alkaline bismuthide in a material also containing molten lead. 4,039,322, Cl. 75-63.000.
DiMartini, Carl Richard; and Scott, William Lafayette, to Asarco Incorporated. Process for the recovery of bismuth. 4,039,323, Cl. 75-70.000.
Dimmig, Daniel Ashton, to Pennwalt Corporation. Copolymers of ethylene and hexafluoropropene. 4,039,595, Cl. 260-653.10R.
Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, to RCA Corporation. Level shift circuit. 4,039,862, Cl. 307-247.00R.
Dingwall, Gloria L. Heating system using outside air. 4,038,963, Cl. 126-85.00B.
DiPiazza, James John, to RCA Corporation. High resolution fluorescent screen and methods of making and using the same. 4,039,838, Cl. 250-483.000.
Dirlam, John P., to Pfizer Inc. 3-Substituted quinoxaline-2-carboxamide-1,4-dioxides. 4,039,540, Cl. 260-250.0QN.
Disk Brake Drum Company: *See—*
Murphy, John H.; and Treantos, Joseph, 4,039,052, Cl. 188-76.000.
Disko, Harry: *See—*
Breslow, Jeffrey D.; Hicks, Alan A.; and Disko, Harry, 4,039,184, Cl. 273-1.00E.
D'Luhy, Emil A., to Moore Business Forms, Inc. Stubless multi-ply assembly. 4,039,046, Cl. 282-22.00R.
Doane, William M.: *See—*
Shasha, Baruch S.; Doane, William M.; and Stout, Edward I., 4,039,586, Cl. 260-608.000.
Dockery, Calvin D.: *See—*
Hudson, Jimmie E.; and Dockery, Calvin D., 4,039.271, Cl. 425-529.000.
Dr. -Ing. Max Schloetter: *See—*
Roubal, Jiri; and Korpiun, Joachim, 4,039,714, Cl. 428-336.000.
Dr. Th. Boehme KG., Chem. Fabrik: *See—*
Graf, Hans Dieter, 4,039,281, Cl. 8-94.140.
Dodge, Harley J., to Bendix Corporation, The. Fastener means for connecting a cylindrical body to a hub means. 4,038,822, Cl. 60-554.000.
Doi, Kazuyoshi: *See—*
Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, 4,038,992, Cl. 131-10.700.
Dolfini, Joseph E.: *See—*
Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 4,039,537, Cl. 544-30.000.
Don R. Hinderliter, Inc.: *See—*
Stoops, Bobby G., 4,039,220, Cl. 294-82.00R.
Donahue, Thomas H.; and Hammers, David E., to International Telephone and Telegraph Corporation. Digital compensator for transmitter instability. 4,040,055, Cl. 343-7.700.
Donelli, Benedetto Luigi. Radioactive lightning conductor with ionized-gas current. 4,039,739, Cl. 174-4.00C.
Donkin, Albert Edward; Jones, David Frederick; and Lanty, Henry Alfons, to Bell Telephone Laboratories, Incorporated. Key telephone off-premises line circuit. 4,039,762, Cl. 179-99.000.
Donnelly, Ralph H.: *See—*
Berkeland, James E.; and Donnelly, Ralph H., 4,039,129, Cl. 248-14.000.
Donnelly, Russell J.: *See—*
Cooper, John C.; Birdseye, Harvey E.; and Donnelly, Russell J., 4,038,864, Cl. 73-23.000.
Dorler, Jack Arthur: *See—*
Blumberg, Richard Jay; and Dorler, Jack Arthur, 4,039,867, Cl. 307-255.000.
Dorr-Oliver Incorporated: *See—*
Hunwick, Richard James, 4,039,348, Cl. 127-9.000.
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, to Avery International Corporation; and Loctite Corporation, a part interest to each. Anaerobic pressure sensitive adhesive stocks. 4,039,705, Cl. 428-40.000.
Dow Chemical Company, The: *See—*
Claus, Kenneth G.; and Rogers, Jack A., 4,039,636, Cl. 260-963.000.
Emig, Gale L.; Cooper, Ronald H.; and Eash, R. Douglas, 4,039,345, Cl. 106-90.000.
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,039,727, Cl. 428-541.000.
Paige, William P.; and Barber, John A., 4,039,507, Cl. 260-42.460.
Smith, Harry A., 4,039,606, Cl. 260-829.000.
Soderquist, Frederick J.; Wazbinski, Theodore T.; and Waldman, Nathan, 4,039,601, Cl. 260-669.00R.
Dow Corning Corporation: *See—*
Chandler, Michael L.; Krahnke, Robert H.; and LeVier, Robert R., 4,039,666, Cl. 424-184.000.
Homan, Gary R.; and Lee, Chi-Long, 4,039,504, Cl. 260-37.0SB.
Homan, Gary R.; and Lee, Chi-Long, 4,039,505, Cl. 260-37.0SB.
Downing, Richard C.: *See—*
Kloenne, Ernest F.; and Downing, Richard C., 4,038,877, Cl. 74-125.000.
Downs Surgical Limited: *See—*
Ring, Peter Alexander, 4,038,704, Cl. 3-1.910.
Doyle, Keith Gilbert, to Zed Instruments Limited. Position indicating system. 4,039,825, Cl. 250-203.00R.
Dragoset, James E. System for controlling power applied to a gas discharge lamp. 4,039,897, Cl. 315-205.000.
Drew, George F. Parabolic solar concentrator employing flat plate collector. 4,038,964, Cl. 126-270.000.
Drew, Julius. Chain carriage system. 4,038,932, Cl. 112-121.120.
Drexler, Herbert: *See—*
Plener, Helmut; Piotrowski, Heinz; Arweiler, Otto; and Drexler, Herbert, 4,040,102, Cl. 360-71.000.
Drisko, Richard W., to United States of America, Navy. Fungus resistant protective coatings. 4,039,494, Cl. 260-22.00A.
Drown, Harold L.: *See—*
Watson, David R.; Carithers, Val G.; and Drown, Harold L., 4,039,480, Cl. 252-455.00R.
Ducellier et Cie.: *See—*
Gruson, Michel Gerard, 4,040,115, Cl. 361-18.000.
Duckworth, William H., to San Diego Gas & Electric Co. Fault indicator testing apparatus. 4,039,932, Cl. 324-28.00R.
Duke, Alvan E.: *See—*
Holladay, James F.; Starnes, R. Emory, Jr.; and Duke, Alvan E., 4,038,805, Cl. 53-21.0FW.
DuPont, Achiel M., Jr.; Moody, J. Burnett; and Newlon, Roger L., to United States of America, Army. Compressible fluid recoil system. 4,038,905, Cl. 89-43.00R.
Du Pont de Nemours, E. I., and Company: *See—*
Hartzler, John David; and Morgan, Paul Winthrop, 4,039,502, Cl. 260-30.80R.
Pankratz, Thomas John, 4,039,383, Cl. 195-31.00R.
van Gulick, Norman Martin, 4,039,514, Cl. 260-75.0NH.
Vassiliou, Eustathios, 4,039,713, Cl. 428-324.000.
Duraglass Research & Development Corporation: *See—*
Sipe, Nelson Eugene; and Ida, Noble, 4,039,310, Cl. 65-25.00R.
Durand, Yves Henri, to Schlumberger Technology Corporation. Well depth matcher utilizing programmable shifting of well logging data. 4,040,002, Cl. 340-18.0DC.
DuRocher, Gideon A.; and Miller, Ellsworth S., to Essex International, Inc. Terminating and splicing electrical conductors. 4,038,743, Cl. 29-628.000.
Durr, Helmut: *See—*
Schon, Manfred; Durr, Helmut; Plath, Dieter; Keller, Karlfried; and Michel, Walter, 4,039,493, Cl. 260-21.000.
Dwivedi, Ramesh Chandra, to Teledyne Exploration Company. Solid state high energy electrical switch for under-sea-water electric discharge seismic generator. 4,040,000, Cl. 340-12.0SD.
Dyer, Hugh Edric Trenchard; and Armstrong, John Richard, to Firth Cleveland Limited. Hairdryer. 4,038,759, Cl. 34-99.000.
Dynamics Research Corporation: *See—*
Wingate, Sidney A., 4,039,826, Cl. 250-237.00G.
Dynamit Nobel Aktiengesellschaft: *See—*
Haage, Karl; Thelen, Helmut; and Uedelhoven, Heinz, 4,038,804, Cl. 52-746.000.
Klinkenberg, Herbert; Petersen, Egon; and Schmidt, Werner, 4,039,538, Cl. 544-219.000.
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,039,567, Cl. 260-448.80R.
Petersen, Egon Norbert, 4,039,587, Cl. 260-612.00R.
Dzaack, Walter J.: *See—*
Walton, Frank T.; and Dzaack, Walter J., 4,039,995, Cl. 338-295.000.
Dzus Fastener Co., Inc.: *See—*
Schenk, Peter, 4,039,135, Cl. 248-214.000.
E. F. Johnson Company: *See—*
Wahi, Chander M.; and Baumler, Robert J., 4,039,906, Cl. 361-293.000.
E. R. Squibb & Sons, Inc.: *See—*
Cimarusti, Christopher M.; Wojtkowski, Paul; and Dolfini, Joseph E., 4,039,537, Cl. 544-30.000.
Slusarchyk, William A.; and Cimarusti, Christopher M., 4,039,534, Cl. 544-17.000.
Eady, Clarence. Safety wind deflector. 4,039,221, Cl. 296-84.00B.
Earley, Sa Lomie C. Hair spray exhaust system. 4,038,913, Cl. 98-115.00R.
Eash, R. Douglas: *See—*
Emig, Gale L.; Cooper, Ronald H.; and Eash, R. Douglas, 4,039,345, Cl. 106-90.000.
Eastman Kodak Company: *See—*
Carver, Bobby C., 4,039,715, Cl. 428-375.000.
Hochreiter, William Thomas; and Kindig, Guilford Edwin, 4,040,070, Cl. 354-59.000.
Weaver, Max A.; and Fleischer, Jean C., 4,039,522, Cl. 260-152.000.
Eby, Roy T., to Monsanto Company. Purification of acetic acid. 4,039,395, Cl. 203-38.000.
Echelberger, Larry M.: *See—*
Argabright, Perry A.; Echelberger, Larry M.; and Phillips, Brian L., 4,039,485, Cl. 260-2.20R.
Echterhoff, Heinrich: *See—*
Reerink, Wilhelm; Beck, Kurt-Guenther; Echterhoff, Heinrich; Muller, Johannes; Degen, Kurt; and Nashan, Gerd, 4,039,342, Cl. 106-58.000.
Eckel, Alan, to Eckel Industries, Inc. Wall panel assembly. 4,038,796, Cl. 52-221.000.
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Eckel, Alan, 4,038,796, Cl. 52-221.000.
Eckton, Wallace Henry, Jr.; and Fraley, Phillip Edward, to Bell Telephone Laboratories, Incorporated. Opto-isolators and method of manufacture. 4,040,078, Cl. 357-30.000.
Ecodyne Corporation: *See—*
Soriente, Alfonse Joseph, 4,039,449, Cl. 210-522.000.
Edelberg, Norman L.; and Davis, Chester A., to Helene Curtis Industries, Inc. Hair treating composition containing a mink oil fatty acid quaternary ammonium salt. 4,038,995, Cl. 132-7.000.
Edmonds, James T., Jr., to Phillips Petroleum Company. Preparation of block copolymers. 4,039,632, Cl. 260-878.00B.
Edwards, Harrison F., to Liquidometer Corporation. Liquid level gauge. 4,038,871, Cl. 73-304.00C.
Edwards, Richard C.; and Wilson, Richard L., to Holosonics, Inc. Acoustical sparker probe apparatus. 4,039,042, Cl. 181-106.000.
Eger, Mikhail Mikhailovich: *See—*
Novomeisky, Jury Donatovich; Eger, Mikhail Mikhailovich; and Kravtsov, Nikolai Petrovich, 4,039,328, Cl. 75-126.00B.
Egg Sales Promotion Inc.: *See—*
Prewer, Richard Wayne, 4,039,181, Cl. 271-10.000.
Eggermont, Ludwig Desire Johan; and Riemens, Karel, to U.S. Philips Corporation. Pulse code modulation with dynamic range limiting. 4,039,949, Cl. 325-38.00B.
Eggermont, Ludwig Desire Johan; and Wevers, Anton Hendrik, to U.S. Philips Corporation. Receiver for the reception of signals transmitted by delta modulation. 4,039,955, Cl. 325-321.000.
Eibe, Werner W.; and Farrell, Wilfred T., to Blaw-Knox Foundry & Mill Machinery, Inc. Hydraulic mill stand. 4,038,857, Cl. 72-244.000.
Eichelberger, Charles W.: *See—*
Butler, Walter J.; and Eichelberger, Charles W., 4,039,940, Cl. 324-60.00C.
Eijkelenboom, Leonard Cornelis Hendrik; and Kesseler, Jan Antoon Henri, to U.S. Philips Corporation. Electric reflector lamp. 4,039,878, Cl. 313-113.000.
Einhorn, Ruediger, to Coats & Clark, Inc. Saw tooth hanger. 4,039,138, Cl. 248-497.000.
Eisai Co., Ltd.: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, 4,039,573, Cl. 260-479.00R.
Nakamura, Tetsuya, 4,039,559, Cl. 260-345.500.
Ekkelboom, Tjepke Hendrick: *See—*
Damsteeg, Cornelis Jan; and Ekkelboom, Tjepke Hendrick, 4,039,883, Cl. 313-218.000.
Electro Medical Systems, Inc.: *See—*
Sittner, Weldon Rex, 4,038,984, Cl. 128-303.140.
Electrolyte Services Limited: *See—*
Kelleher, Richard F., 4,039,407, Cl. 204-109.000.
Electronic Music Laboratories, Inc.: *See—*
Murray, Jeffrey J.; Bachiochi, Jeffrey L.; and Milliard, Norman L., 4,038,897, Cl. 84-1.160.
Electronics Corporation of America: *See—*
MacDonald, Malcolm F., 4,039,844, Cl. 250-554.000.
Elektroakusztikai Gyar: *See—*
Balogh, Geza; Sesztak, Emil; and Szabados, Karoly, 4,039,753, Cl. 179-1.0FS.
Elgin, Robert J., to United States Steel Corporation. Stamped metal fence post cap. 4,039,166, Cl. 256-65.000.
Eli Lilly and Company: *See—*
Chamberlin, James W., 4,039,547, Cl. 260-287.0AZ.
Cooper, Robin D. G., 4,039,535, Cl. 544-26.000.
Krumkalns, Eriks V., 4,039,675, Cl. 424-263.000.
Elixir Industries: *See—*
Hart, Arthur C., 4,038,911, Cl. 98-2.140.
Elliott, Douglas Ernest, to Stone-Platt Fluidfire Limited. Apparatus and method for carrying out reactions in a fluidized bed. 4,039,272, Cl. 431-7.000.
Elliott, Richard Louis, Jr.; Borkowski, William John; and Pfister, Thomas Warren, to Maryland Shipbuilding & Drydock Company. Liquid rheostat system. 4,039,854, Cl. 307-118.000.
Elmer, Thomas H.; and Tischer, Richard E., to Corning Glass Works. Method of preparing glazes. 4,039,339, Cl. 106-54.000.
Elmwood Sensors, Inc.: *See—*
Bucheister, Henry C., 4,039,991, Cl. 337-348.000.
Emerson Electric Co.: *See—*
Handerhan, Joseph P., 4,039,996, Cl. 338-295.000.

Walton, Frank T.; and Dzaack, Walter J., 4,039,995, Cl. 338-295.000.

EMI Limited: *See—*
Bull, Eric William, 4,039,807, Cl. 250-360.000.

Emig, Gale L.; Cooper, Ronald H.; and Eash, R. Douglas, to Dow Chemical Company, The. Shrinkage-compensating portland cement concrete and mortar compositions. 4,039,345, Cl. 106-90.000.

Emshwiller, MacLellan, to Bell Telephone Laboratories, Incorporated. Synchronizing circuit. 4,039,968, Cl. 331-19.000.

Energy Systems, Ltd.: *See—*
Mizuno, Fumio; Takeuchi, Fumio; and Kobayashi, Shunsuke, 4,039,252, Cl. 350-160.0LC.

Engelhard, Philippe; Szabo, Georges; and Weisang, Joseph Edouard, to Compagnie Francaise de Raffinage. Catalysts for the hydrotreatment of hydrocarbons and their utilization. 4,039,477, Cl. 252-441.000.

Engelhardt, Albrecht: *See—*
Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, 4,039,685, Cl. 424-330.000.

Ennslin, Frieder H.; and Buck, Richard J., to Sybron Corporation. Method of operating and power supply for X-ray tubes. 4,039,811, Cl. 250-409.000.

Envirotech Corporation: *See—*
Bondor, Frank Samuel, 4,039,307, Cl. 55-228.000.

Enyo, Hiroji: *See—*
Ikeda, Hiroharu; Matsumoto, Shuichi; Enyo, Hiroji; Oshima, Noboru; and Komatsu, Koei, 4,039,491, Cl. 260-4.00R.

Erckel, Rudiger: *See—*
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,039,531, Cl. 542-462.000.

Erco Envirotech Ltd.: *See—*
Reeve, Douglas W.; Rowlandson, Gordon; and Rapson, W. Howard, 4,039,372, Cl. 162-19.000.

Ernstsson, Georg E.; Nilsson, Birger N.; Pupp, Herwig; and Stark, Olof S., to AB Ziristor. Packing material that can be shaped under the effect of heat. 4,039,362, Cl. 156-69.000.

Eronini, Iheanyichukwu E.; and Abia, Abia Sunday. Hair braider. 4,038,996, Cl. 132-9.000.

Eschrich, Hubert R.: *See—*
Humblet, Lucien A.; Salomon, Louis; and Eschrich, Hubert R., 4,039,468, Cl. 252-301.10W.

Essers, Wilhelmus Gerardus, to U.S. Philips Corporation. Method of and device for arc welding. 4,039,800, Cl. 219-121.00P.

Essex Cryogenics Industries, Inc.: *See—*
Williams, Roy G.; and Cantrell, Robert L., Jr., 4,039,060, Cl. 192-134.000.

Essex International, Inc.: *See—*
DuRocher, Gideon A.; and Miller, Ellsworth S., 4,038,743, Cl. 29-628.000.

Etani, Kenji. Filter with an open-cell elastomeric foam. 4,039,448, Cl. 210-42.00R.

Eue, Ludwig: *See—*
Klauke, Erich; Kuhle, Engelbert; and Eue, Ludwig, 4,039,315, Cl. 71-98.000.

Eutectic Corporation: *See—*
Patel, Mahesh S., 4,039,318, Cl. 75-0.50R.

Evana Tool & Engineering Inc.: *See—*
Crowley, Norman R.; and Fuchs, Gilbert N., 4,038,920, Cl. 101-123.000.

Evangelisti, Carlo John: *See—*
Belady, Laszlo Antal; and Evangelisti, Carlo John, 4,040,034, Cl. 364-200.000.

Evans, David Arthur, to Strachan & Henshaw Limited. Positioning means. 4,038,927, Cl. 104-162.000.

Evans, James L. Disposable toothbrush. 4,039,261, Cl. 401-132.000.

Everett, Robert Charles; Radcliffe, Paul Anthony Beaufort; Robinson, Alfred Henry; and Veltze, Janusz Andrew, to International Publishing Corporation Ltd. Electronic screening. 4,040,094, Cl. 358-283.000.

Everitt, Delmar K: *See—*
Goldfarb, Adolph E; Benkoe, Erwin; Everitt, Delmar K; Chesley, Ronald F.; and Frierdich, Richard D., 4,039,188, Cl. 273-101.000.

Ex-Cell-O Corporation: *See—*
Kauffman, Ivan L., 4,038,908, Cl. 93-36.300.

Exxon Nuclear Company, Inc.: *See—*
Patterson, John F.; and Galbraith, Kirk P., 4,039,379, Cl. 176-76.000.
Worlton, Dan C., deceased; and Robinson, Dan L., 4,039,375, Cl. 176-19.0LD.

Exxon Production Research Company: *See—*
Burkhardt, Joseph A.; Loth, William D.; and Pattison, Martin O., 4,039,025, Cl. 166-.500.

Exxon Research and Engineering Company: *See—*
Brois, Stanley J.; and Gutierrez, Antonio, 4,039,552, Cl. 260-302.0SD.
Cull, Neville L.; and Smith, Warren M., 4,039,478, Cl. 252-455.00R.
Gessler, Albert M.; and Baldwin, Francis P., 4,039,506, Cl. 260-42.350.
Johnson, Burnett H.; and Henderson, Don J., 4,039,610, Cl. 264-237.000.
Murrell, Lawrence L.; and Tauster, Samuel J., 4,039,622, Cl. 423-239.000.
Neavel, Richard C., 4,039,425, Cl. 208-8.000.
Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., 4,039,336, Cl. 106-14.000.

Fabrique d'Horlogerie Cms. Tissot et Fils S.A.: *See—*
Desaules, Jean-Jacques, 4,039,076, Cl. 206-219.000.

Fachinetti, Giuseppe; and Floriani, Carlo, to Snam Progetti S.p.A. Process for the preparation of titanium thio-derivatives. 4,039,566, Cl. 260-429.500.

Fairchild Camera and Instrument Corporation: *See—*
Winter, Arthur J., 4,039,850, Cl. 307-11.000.

Falbe, Jurgen; Tummes, Hans; and Hahn, Heinz-Dieter, to Ruhrchemie Aktiengesellschaft. Catalytic cleavage of isobutyraldehyde. 4,039,584, Cl. 260-604.0HF.

Falk Corporation, The: *See—*
Trzebiatowski, Peter M., 4,039,058, Cl. 192-45.000.

Farnbach, William A.: *See—*
Morrill, Justin S., Jr.; Farnbach, William A.; and Small, Charles T., 4,040,025, Cl. 364-900.000.

Farr, John B.: *See—*
Beynet, Pierre A.; Farr, John B.; and Pottorf, Newell, 4,040,003, Cl. 340-18.0LD.

Farrell, Wilfred T.: *See—*
Eibe, Werner W.; and Farrell, Wilfred T., 4,038,857, Cl. 72-244.000.

Farris, Russell E.: *See—*
Stanley, Lester N.; and Farris, Russell E., 4,039,524, Cl. 260-158.000.

Farris, Victor W. Rotary-radial internal combustion engine. 4,038,949, Cl. 123-44.00D.

Farrow, Robert Michael, to Automotive Products Company Limited. Fluid pressure braking systems for vehicles. 4,039,041, Cl. 180-104.000.

Faulkner, Alfred H. Electronic organ with multi-pitch note generators. 4,038,896, Cl. 84-1.010.

Fedder, Richard C.: *See—*
Barasch, Stephen; and Fedder, Richard C., 4,038,916, Cl. 101-1.000.

Federmann, Dieter: *See—*
Kneusels, Max B.; Federmann, Dieter; and Hattass, Rainer, 4,038,910, Cl. 98-2.140.

Fehrer, Ernst. Needling machine for manufacturing endless fibrous webs. 4,038,728, Cl. 28-110.000.

Feistel, Gerald R.; and Pessimisis, George N., to Nalco Chemical Company. Silica-alumina catalysts. 4,039,474, Cl. 252-451.000.

Felici, Noel; and Gartner, Elie, to Air-Industrie. Electrostatic powdering nozzle. 4,039,145, Cl. 239-15.000.

Felix, Ernst, to Zellweger, Ltd. Method of and an arrangement for standardizing comber slivers. 4,038,723, Cl. 19-215.000.

Felstet, Rickerd M. Excavator bucket ripper tool. 4,038,766, Cl. 37-141.00T.

Fenwick, James R.: *See—*
United States of America, National Aeronautics and Space Administration; Fenwick, James R.; and Karigan, George H., 4,039,000, Cl. 137-207.000.

Ferag AG: *See—*
Reist, Walter, 4,038,893, Cl. 83-154.000.
Reist, Walter; and Stauber, Hans-Ulrich, 4,039,182, Cl. 271-64.000.

Fernandez, John J. Self-cleaning filter. 4,039,452, Cl. 210-106.000.

Ferrari, Richard A.: *See—*
Beyler, Arthur L.; and Ferrari, Richard A., 4,039,669, Cl. 424-243.000.

Fett, Richard H. G., to De Laval Separator Company, The. Coalescing method and apparatus. 4,039,441, Cl. 210-23.00R.

Fichtel & Sachs A.G.: *See—*
Keller, Dieter, 4,038,882, Cl. 74-331.000.

Fiks, Julien G.: *See—*
Rothman, Bernard; Fiks, Julien G.; and Bang, Friedrich C., 4,038,806, Cl. 53-32.000.

Filipeli, James Michael, to A. J. Filipeli Co., Inc. Rocket toy. 4,038,776, Cl. 46-76.00A.

Findlay, Alexander G.: *See—*
Bailey, Paul T.; Craford, M. George; Findlay, Alexander G.; and Underwood, Robert K., 4,039,890, Cl. 313-500.000.

Finger, John F.: *See—*
Bucy, Harry S.; and Finger, John F., 4,039,350, Cl. 134-22.00R.

Firth Cleveland Limited: *See—*
Dyer, Hugh Edric Trenchard; and Armstrong, John Richard, 4,038,759, Cl. 34-99.000.

Fischer, Paul W.; and Zilch, Horst E., to Union Oil Company of California. Composition and method for drilling a reservoir containing a high temperature aqueous liquid. 4,039,459, Cl. 252-8.50C.

Fischmeister, Hellmut; Lampe, Vaino; and Olsson, Leif, to Uddeholms Aktiebolag. Method and means for the production of bar stock from metal powder. 4,038,738, Cl. 29-420.500.

Fisher Scientific Company: *See—*
Andra, John R., 4,039,775, Cl. 219-385.000.

Flair Manufacturing Corporation: *See—*
Frankel, Seymour, 4,039,123, Cl. 236-1.00G.

Flambard, Christian; and Lambert, Alain, to Centre Technique des Industries Mecaniques. Device for non-destructive measurement of a surface layer of a material. 4,038,865, Cl. 73-67.700.

Fleischer, Jean C.: *See—*
Weaver, Max A.; and Fleischer, Jean C., 4,039,522, Cl. 260-152.000.

Fleischfresser, Marvin H.: *See—*
Wilson, Harold F.; and Fleischfresser, Marvin H., 4,039,588, Cl. 260-613.00R.

Floriani, Carlo: *See—*
Fachinetti, Giuseppe; and Floriani, Carlo, 4,039,566, Cl. 260-429.500.

Floryan, Daniel Edwin: *See—*
Cooper, Glenn Dale; and Floryan, Daniel Edwin, 4,039,510, Cl. 260-47.0ET.

FMC Corporation: *See—*
Kalmar, Arthur F., 4,039,470, Cl. 252-382.000.

Lindow, Carl E.; Joseph, Craig L.; Caterina, Fred J.; and Howard, Harlan N., 4,038,889, Cl. 74-866.000.

Fodor, Imre. Air humidifiers. 4,038,980, Cl. 128-193.000.

Foerster, Otto; and Vojta, Erich, to Siemens Aktiengesellschaft. Method for connecting a fine wire to a connecting pin. 4,039,801, Cl. 219-137.00R.

Foessl, John K. Detachable refrigeration system for containers. 4,038,833, Cl. 62-223.000.

Foglio, Sam: *See—*
Chasin, David; Russo, Vincent, Jr.; and Foglio, Sam, 4,038,767, Cl. 40-125.00H.

Foley, William T., to William T. Foley Foundation, Inc. Method for the eradication of venous blemishes. 4,039,665, Cl. 424-183.000.

Fong, Calvin C., to Lockheed Aircraft Corporation. Sandblasting with pellets of material capable of sublimation. 4,038,786, Cl. 51-320.000.

Ford Motor Company: *See—*
Dickie, Ray A.; and Cassatta, Joseph C., 4,039,722, Cl. 428-461.000.

Fordees Corporation: *See—*
Poff, Clifford A.; Hively, William J.; and Novacich, Kenneth J., 4,039,174, Cl. 266-281.000.

Formex Manufacturing, Inc.: *See—*
Dean, Donald E.; and Alesi, John, Jr., 4,039,643, Cl. 264-92.000.

Fornet, Michel: *See—*
Hergoualc'h, Jean Rene; and Fornet, Michel, 4,039,291, Cl. 23-288.0FC.

Foster Wheeler Energy Corporation: *See—*
Steiner, Peter, 4,039,619, Cl. 423-230.000.

Foulis, Michael John: *See—*
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 4,039,571, Cl. 260-468.00D.

Fournier, Peter R. Plant support structure. 4,039,132, Cl. 248-150.000.

Fragala, Anthony R.: *See—*
LaConti, Anthony B.; and Fragala, Anthony R., 4,039,409, Cl. 204-129.000.

Fraley, Phillip Edward: *See—*
Eckton, Wallace Henry, Jr.; and Fraley, Phillip Edward, 4,040,078, Cl. 357-30.000.

Franke, Hermann; Kuckes, Willi; and Martin, Wolfgang, to AEG-Telefunken Kabelwerke AG Rheydt. Sheathed fiber light conductor. 4,039,248, Cl. 350-96.00B.

Franke, Walter, to Motoren-Forschungs GmbH KG. Multi-cylinder internal combustion engine. 4,038,954, Cl. 123-75.0CC.

Frankel, Seymour, to Flair Manufacturing Corporation. Automatic stack damper. 4,039,123, Cl. 236-1.00G.

Franklin, Mark A.: *See—*
Shimanek, Ronald W.; and Franklin, Mark A., 4,039.956, Cl. 325-455.000.

Frasch, Peter: *See—*
Brunner, Friedrich; Frasch, Peter; and Schwerdt, Friedrich, 4,039,371, Cl. 156-668.000.

Fraser, David Bruce; and MacRae, Alfred Urquhart, to Bell Telephone Laboratories, Incorporated. Method for making patterned platinum metallization. 4,039,698, Cl. 427-34.000.

Fredriksson, Oke A.; and Thomas, Elmer L., to Chevron Research Company. Synthesizer for testing elements of a geophysical data acquisition system. 4,039,806, Cl. 235-152.000.

Freedman, Bernard; and Diamond, Martin J., to United States of America, Agriculture. Photodegradable polyolefins containing nitrohaloalkanes. 4,039,731, Cl. 526-6.000.

Frey, Max. Ski stop with strap release. 4,039,204, Cl. 280-605.000.

Friebel, Virgil R.: *See—*
Brown, Richard E.; Bickling, Archie L., Jr.; Friebel, Virgil R.; and Roller, Kent G., 4,039,337, Cl. 106-38.280.

Friedmann, Reinhard: *See—*
Wellhausen, Hans; and Friedmann, Reinhard, 4,040,086, Cl. 358-22.000.

Friedrich, Rainer: *See—*
Leifheit, Gunter; Liebscher, Johannes; and Friedrich, Rainer, 4,039,083, Cl. 211-96.000.

Friend, Donald L., to United States Steel Corporation. Slatted top quench car. 4,039,394, Cl. 202-262.000.

Frierdich, Richard D.: *See—*
Goldfarb, Adolph E; Benkoe, Erwin; Everitt, Delmar K; Chesley, Ronald F.; and Frierdich, Richard D., 4,039,188, Cl. 273-101.000.

Frigitemp Corporation: *See—*
Shanks, Gerald R., 4,038,799, Cl. 52-241.000.

Frisone, John B., to International Business Machines Corporation. Digital data communication network and control system therefor. 4,039,757, Cl. 179-15.0AL.

Fritz Buser AG Maschinenfabrik: *See—*
Klemm, Martin, 4,039,397, Cl. 204-11.000.

Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., to Upjohn Company, The. Process for preparing di(aminophenyl)methanes. 4,039,580, Cl. 260-570.00D.

Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., to Upjohn Company, The. Process for the preparation of di(amino phenyl)methanes. 4,039,581, Cl. 260-570.00D.

Fuchs, Gilbert N.: *See—*
Crowley, Norman R.; and Fuchs, Gilbert N., 4,038,920, Cl. 101-123.000.

Fuchs, Peter; Gerhards, Erich; Matthes, Heinz; Wendt, Hans; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Corticoid-containing inhalants. 4,039,668, Cl. 424-241.000.

Fuji Kikai Seizo Kabushiki Kaisha: *See—*
Sakagami, Mamoru, 4,038,850, Cl. 72-85.000.

Fuji Photo Film Co., Ltd.: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,039,335, Cl. 96-124.000.
Ikenque, Shinpei; Masuda, Takao; and Iwata, Yuzo, 4,039,334, Cl. 96-114.100.
Ishizuka, Akio, 4,039,207, Cl. 282-27.500.
Kondo, Toshihiro, 4,040,067, Cl. 354-23.00D.
Shinagawa, Yukio; Yamaguchi, Yasumasa; and Shindo, Shuichi, 4,039,333, Cl. 96-84.00R.

Fujii, Kimio: *See—*
Mori, Kenzo; Kakuchi, Fumio; and Fujii, Kimio, 4,040,058, Cl. 343-113.0PT.

Fujikura Cable Works, Ltd., The: *See—*
Isawa, Kazuo; Maejima, Masatsugu; and Nagasaka, Hideo, 4,039,697, Cl. 427-27.000.

Fujimoto, Hiroshi: *See—*
Funakoshi, Wataru; Urasaki, Takanori; and Fujimoto, Hiroshi, 4,039,572, Cl. 260-468.00K.

Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, to Sumitomo Chemical Company, Limited. Insecticidal substituted acetate compounds. 4,039,680, Cl. 424-275.000.

Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, to Kyowa Hakko Kogyo Co., Ltd. Novel resinous material. 4,039,710, Cl. 428-253.000.

Fujimoto, Yoshiji: *See—*
Kadota, Shozo; Fujimoto, Yoshiji; and Yamamoto, Masao, 4,040,009, Cl. 340-146.3AQ.

Fujimura, Noboru: *See—*
Matsuda, Kaneo; and Fujimura, Noboru, 4,039,466, Cl. 252-194.000.

Fujisawa Pharmaceutical Co., Ltd.: *See—*
Takano, Tadayoshi; and Horibe, Susumu, 4,039,536, Cl. 544-26.00C.

Fujita, Takeshi: *See—*
Sakai, Kazuyoshi; Kobayashi, Shigeo; and Fujita, Takeshi, 4,039,568, Cl. 260-453.00P.

Fukazawa, Nobuo: *See—*
Aya, Masahiro; Miyamoto, Masao; and Fukazawa, Nobuo, 4,039,313, Cl. 71-88.000.

Fukuda, Hideki, to Hitachi, Ltd. Complementary MOS logic circuit. 4,040,015, Cl. 340-173.00R.

Fukuda, Kenzo: *See—*
Kotera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, 4,039,613, Cl. 423-571.000.

Fukuura, Yukio: *See—*
Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, 4,039,483, Cl. 260-2.10R.

Fulop, Laszlo. Garbage can cover spring closure. 4,038,720, Cl. 16-145.000.

Fulton Industries, Inc.: *See—*
Grove, John Landis, 4,039,094, Cl. 214-132.000.

Funahashi, Takaji. Hand stamp. 4,038,918, Cl. 101-111.000.

Funakoshi, Wataru; Urasaki, Takanori; and Fujimoto, Hiroshi, to Teijin Limited. Process for preparing diesters of carboxylic acids by catalytic oxidative carbonylation. 4,039,572, Cl. 260-468.00K.

Furukawa Electric Co., Ltd., The: *See—*
Iwata, Zensuke, 4,039,740, Cl. 174-15.00S.

Furuya, Kiyoto, to Daiichi Denshi Kogyo Kabushiki Kaisha. Method and apparatus for electrolytic treatment. 4,039,398, Cl. 204-15.000.

Futaba Denshi Kogyo K.K.: *See—*
Morimoto, Kiyoshi; Utamura, Yukihiko; and Takagi, Toshinori, 4,039,699, Cl. 427-38.000.

Gabor, Joseph: *See—*
Steigelmann, Edward F.; Hughes, Robert D.; and Gabor, Joseph, 4,039,499, Cl. 260-29.6NR.

Gaertner, Waldemar, to Siemens Aktiengesellschaft. Device for signal transmission by means of optical conductors. 4,039,250, Cl. 350-96.00B.

GAF Corporation: *See—*
Smith, Richard F., 4,039,553, Cl. 260-304.00R.
Stanley, Lester N.; and Farris, Russell E., 4,039,524, Cl. 260-158.000.

Gajdos, Leslie Bill, to B. F. Goodrich Company, The. Lump breaker apparatus for reactor tank. 4,039,149, Cl. 241-46.110.

Gal, Andrew E.; and Brady, Roscoe O., to United States of America, Government. Diagnostic test for Niemann-Pick disease. 4,039,388, Cl. 195-103.50R.

Galbraith, Kirk P.: *See—*
Patterson, John F.; and Galbraith, Kirk P., 4,039,379, Cl. 176-76.000.

Gall, James W., to Phillips Petroleum Company. Retreatment of wells to reduce water production. 4,039,029, Cl. 166-294.000.

Galvez, Buenaventura B.: *See—*
Moyle, Maurice; Galvez, Buenaventura B.; Pease, Eric C.; and Logan, Alan, 4,039,423, Cl. 208-4.000.

Gambit Enterprises: *See—*
Schwartz, Seymour S., 4,038,777, Cl. 46-87.000.

Gancy, Alan B.; and Poncha, Rustom P., to Allied Chemical Corporation. Treatment of sodium carbonate crystallizer mother liquors. 4,039,618, Cl. 423-206.00T.

Gangneux, Philippe Yves Edouard, to Produits Chimiques Ugine Kuhlmann. Pigmentary imido-perinones. 4,039,545, Cl. 260-256.40F.

Gardner, Homer E., III. Antenna lamp. 4,039,894, Cl. 315-76.000.

Gareis, Richard. Arrangement for transmitting light energy. 4,039,816, Cl. 240-1.0EL.

Garner, James W.: *See—*
Myers, John W.; and Garner, James W., 4,039,604, Cl. 260-683.680.

Garner, Robert; and Petitpierre, Jean Claude, to Ciba-Geigy AG. Chromenopyrazole compounds. 4,039,557, Cl. 548-370.000.

Garrett Corporation, The: *See—*
Chirgwin, Keith M., 4,039,910, Cl. 318-213.000.
Chirgwin, Keith M., 4,039,922, Cl. 363-9.000.

Garrett, Michael Ernest: *See—*
Smith, Kenneth Cecil; and Garrett, Michael Ernest, 4,039,437, Cl. 210-9.000.

Garrison, Harold Keith, to Hesston Corporation. Drive train and transmission for forage harvester. 4,038,880, Cl. 74-242.10R.

Gartner, Elie: *See—*
Felici, Noel; and Gartner, Elie, 4,039,145, Cl. 239-15.000.

Garton, William Robert; and Clarke, Peter Alec, to Molins Limited. Apparatus for dividing a continuous stream of articles into batches which may be placed in containers. 4,039,071, Cl. 198-425.000.

Gates, Daniel W.: *See—*
United States of America, National Aeronautics and Space Administration; Gates, Daniel W.; Harada, Yoshiro; Logan, William R.; and Gilligan, John E., 4,039,347, Cl. 106-292.000.

Gaudel, Gerard; and Krafft, Robert, to Air Industrie. Thermoelectric installations. 4,038,831, Cl. 62-3.000.

Gaughan, Neil A.: *See—*
Bruce, Robert L.; Gaughan, Neil A.; and Ripingill, Allan E., 4,039,951, Cl. 325-38.00R.

Geadah, Youssef Alfred; and Vallo, Frank Joseph, to Northern Telecom Limited. Electrostatic protection for a telecommunications terminal apparatus. 4,040,120, Cl. 361-220.000.

Gebr. Knauf Westdeutsche Gipswerke: *See—*
Scheel, Kurt; and Wirsching, Franz, 4,039,616, Cl. 423-166.000.

Gehap Gesellschaft fur Handel und Patentverwertung mbH & Co. KG: *See—*
Schweikart, Horst, 4,038,951, Cl. 123-102.000.

Gehrking, Arvin George, to Sperry Rand Corporation. Modem sharing device. 4,040,014, Cl. 340-147.0LP.

Geiss, Vernon L.; Gregory, Charles F.; Newton, Richard P.; and Gravely, Lawrence E., to Brown & Williamson Tobacco Corporation. Process for reduction of nicotine content of tobacco by microbial treatment. 4,038,993, Cl. 131-141.000.

Geluk, Ronald Jan, to N. V. Optische Industrie "De Oude Delft" Electro-optical correlator. 4,039,815, Cl. 235-181.000.

Gembicki, Stanley A.; and Arbesman, Richard W., to UOP Inc. Method of catalyst manufacture. 4,039,479, Cl. 252-455.00Z.

General Atomic Company: *See—*
Bokros, Jack C., 4,038,703, Cl. 3-1.500.

General Datacomm Industries, Inc.: *See—*
Couturier, Robert A.; Davis, Steven J.; and Robbins, G. Howard, 4,039,751, Cl. 179-15.0BF.

General Dynamics Corporation: *See—*
Voigt, Allan Alfred, 4,039,246, Cl. 350-7.000.

General Electric Company: *See—*
Armor, Anthony F.; Archibald, James B.; and Darby, William L., 4,039,872, Cl. 310-62.000.
Baker, Fred E., 4,039,777, Cl. 219-439.000.
Brown, Edgar D., Jr.; and Ronda, Richard M., 4,039,143, Cl. 252-28.000.
Butler, Walter J.; and Eichelberger, Charles W., 4,039,940, Cl. 324-60.00C.
Cooper, Glenn Dale; and Floryan, Daniel Edwin, 4,039,510, Cl. 260-47.0ET.
Corbley, Eugene K., 4,039,893, Cl. 315-73.000.
Cote, Paul T., 4,039,273, Cl. 431-95.00R.
Crouch, Donald Wayne; Kurtz, Donald Reah; and Sofianek, Joseph Carl, 4,039,792, Cl. 200-144.00B.
Kernander, Warren N.; and Schultz, William J., 4,038,938, Cl. 116-129.00N.
LaConti, Anthony B.; and Fragala, Anthony R., 4,039,409, Cl. 204-129.000.
Levinstein, Moses A., 4,039,296, Cl. 428-553.000.
Lukas, Stephen J., 4,039,930, Cl. 323-108.000.
Mark, Victor, 4,039,509, Cl. 260-45.80R.
O'Malley, William J., 4,039,707, Cl. 428-40.000.
Philp, Sanborn F., 4,039,990, Cl. 336-60.000.
Raleigh, William J., 4,039,469, Cl. 252-358.000.
Scales, Edgar F.; Von Fange, Eugene K.; and Wood, Robert F., 4,039,924, Cl. 363-65.000.
Smith, William E.; and Gerhart, R. John, 4,039,592, Cl. 260-635.00R.
Snow, Barton H.; and Sargisson, Donald F., 4,038,817, Cl. 60-204.000.
Steigerwald, Robert L.; and Cornell, Edward P., 4,039,914, Cl. 318-375.000.
Steigerwald, Robert L., 4,039,926, Cl. 363-138.000.
Vicai, Egon, 4,039,889, Cl. 313-487.000.
Wagenknecht, Conrad D., 4,039,146, Cl. 239-265.250.
Yang, Kei-Hsiung, 4,039,830, Cl. 250-315.00R.

General Foods Corporation: *See—*
Clausen, Edward Einar, 4,039,692, Cl. 426-532.000.

General Motors Corporation: *See—*
Bright, James A., 4,038,841, Cl. 68-12.00R.
Shimanek, Ronald W.; and Franklin, Mark A., 4,039,956, Cl. 325-455.000.

General Refractories Company: *See—*
Stein, Joseph L.; and Treffner, Walter S., 4,039,343, Cl. 106-59.000.

Genet, Michel: *See—*
Carlier, Roger; Hussonois, Michel; Genet, Michel; and Krupa, Jean-Claude, 4,039,839, Cl. 250-483.000.

Gensheimer, Valentin, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Vibration-free drive for printing presses. 4,039,873, Cl. 310-74.000.

Gensler, Wayne C., to Bethlehem Steel Corporation. Coke oven battery and method for operation on a slow-down basis. 4,039,391, Cl. 201-36.000.

Gerard, Guy: *See—*
Le Coquil, Emile F.; Prigent, Hubert; and Gerard, Guy, 4,039,881, Cl. 313-217.000.

Gerard, Jean-Louis: *See—*
Meyer, Yves; Le Marchand, Claude; and Gerard, Jean-Louis, 4,039,053, Cl. 188-73.300.

Gerhards, Erich: *See—*
Fuchs, Peter; Gerhards, Erich; Matthes, Heinz; Wendt, Hans; and Wiechert, Rudolf, 4,039,668, Cl. 424-241.000.

Gerhart, R. John: *See—*
Smith, William E.; and Gerhart, R. John, 4,039,592, Cl. 260-635.00R.

Gerin, Merlin: *See—*
Terracol, Claude; and Schueller, Pierre, 4,039,983, Cl. 335-16.000.

Gernelle, Francois. Channel for exchanging information between a computer and rapid peripheral units. 4,040,026, Cl. 364-900.000.

Gessler, Albert M.; and Baldwin, Francis P., to Exxon Research and Engineering Company. Covulcanization of conjugated diene-containing butyl with halobutyl and butyl rubber. 4,039,506, Cl. 260-42.350.

Gewartowski, Steve A., to UOP Inc. Xylene isomerization process. 4,039,599, Cl. 260-668.00A.

Gibb, Owen L.: *See—*
Wang, Charles P.; and Gibb, Owen L., 4,039,971, Cl. 331-94.5PE.

Giddey, Claude; and Rufer, Willy, to Battelle Memorial Institute. Process for producing a protein-based food. 4,039,694, Cl. 426-574.000.

Gierse, Heinz. Device for the application of meltable or liquid colors. 4,038,940, Cl. 118-5.000.

Gilbert, John Roger Bawden: *See—*
Astley, David John; Gilbert, John Roger Bawden; Scholes, Ian Robert; Jacobi, Jan Stephan; and Brookes, Garth Royston, 4,039,403, Cl. 204-105.00R.

Giller, Henricus Franciscus Johannes: *See—*
T'jampens, Germain Remi; and Giller, Henricus Franciscus Johannes, 4,039,879, Cl. 313-174.000.

Giller, Solomon Aronovich; Lazdinsh, Arvid Avgustovich; Veinberg, Artur Karlovich; and Sidorov, Alexandr Borisovich. Method of preparing N_1-(2'-furanidyl)-5-substituted uracils. 4,039,546, Cl. 260-260.000.

Gilliams, Yvan Karel: *See—*
De Roo, Pierre Richard; De Winter, Walter Frans; Priem, Jan Jozef; and Gilliams, Yvan Karel, 4,039,463, Cl. 252-62.10P.

Gilligan, John E.: *See—*
United States of America, National Aeronautics and Space Administration; Gates, Daniel W.; Harada, Yoshiro; Logan, William R.; and Gilligan, John E., 4,039,347, Cl. 106-292.000.

Ginn, LeRoy; Ginn, LeRoyce; and Travaglio, Dalny, to Universal Pneumatic Controls, Inc. Dual duct variable volume air conditioning system. 4,039,124, Cl. 236-1.00B.

Ginn, LeRoyce: *See—*
Ginn, LeRoy; Ginn, LeRoyce; and Travaglio, Dalny, 4,039,124, Cl. 236-1.00B.

Giorza, Virgilio; and Giovanetti, Piero, to Ing. C. Olivetti & C., S.p.A. Keyboard of elastic material for office machines. 4,039,068, Cl. 197-98.000.

Giovanetti, Piero: *See—*
Giorza, Virgilio; and Giovanetti, Piero, 4,039,068, Cl. 197-98.000.

Girault, Pierre: *See—*
Perronnet, Jacques; and Girault, Pierre, 4,039,316, Cl. 71-118.000.

Girling Limited: *See—*
Rath, Heinrich Bernhard, 4,039,054, Cl. 188-73.400.

Givler, Omar R., to Portage Electric Products, Inc. Non-creep thermostat construction. 4,039,992, Cl. 337-365.000.

Glasbergen, Johannes Wilhelmus, to U.S. Philips Corporation. Pulse code transmitter and receiver designed to produce uniform transfer characteristics in the face of component variations. 4,039,950, Cl. 325-38.00B.

Glaser, David. System for sensing electrical potential particularly in plants. 4,039,942, Cl. 324-72.000.

Gleason Works, The: *See—*
Hunkeler, Ernst J., 4,038,732, Cl. 29-105.00A.

Glish, John Peter, Jr. Complementary mask image digitizer method and apparatus. 4,039,843, Cl. 250-550.000.

Global Marine Inc.: *See—*
Person, Abraham; and Bolding, Vance E., 4,039,177, Cl. 267-126.000.

Gobert, Jean: *See—*
Pauker, Mira; Gobert, Jean; Pottier, Denis; and Quere, Louis, 4,040,028, Cl. 364-900.000.

Gobran, Ramsis, to Minnesota Mining and Manufacturing Company. Poly(phenol/diene) resin and rubber adhesive compositions tackified therewith. 4,039,724, Cl. 428-525.000.

Godard, Dominique Noel: *See—*
Caron, Francois Gabriel; Desblache, Andre Eugene; Godard, Dominique Noel; and Maddens, Francis Paul, 4,039,748, Cl. 178-69.100.

Godfrey, Charles S.; Moore, E. T., Jr.; and Mumma, Douglas M., to Physics International Company. Oil and gas well stimulation. 4,039,030, Cl. 166-299.000.

Goldfarb, A. E.: *See—*
Goldfarb, Adolph E; Benkoe, Erwin; Everitt, Delmar K; Chesley, Ronald F.; and Frierdich, Richard D., 4,039,188, Cl. 273-101.000.

Goldfarb, Adolph E; Benkoe, Erwin; Everitt, Delmar K; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, A. E.; and Benkoe, Erwin. Toy aircraft action skill game. 4,039,188, Cl. 273-101.000.

Goldman, Holliday L., to Allis-Chalmers Corporation. Method of manufacturing a butterfly valve. 4,038,734, Cl. 29-157.10R.

Goldman, Michael Barnett; and Niemiec, Stanley Joseph, to RCA Corporation. Protection circuit. 4,039,869, Cl. 307-304.000.

Golembeck, Gerald A.; and Marx, Ralph J., to United States Bedding Company, The. Spring assemblies and prefabricated sub-assemblies for manufacture thereof. 4,038,711, Cl. 5-263.000.

Golladay, Harvey Leon: *See—*
Battjes, Carl Robert; Golladay, Harvey Leon; Rieger, Michael Lawrence; Rosario, Binoy Anthony; and Schlotzhauer, Kenneth George, 4,039,899, Cl. 315-371.000.

Gommans, Hubertus Johannes Josephus, to U.S. Philips Corporation. Stranded wire with adhesive coated cone. 4,039,743, Cl. 174-114.00R.

Goodlaxson, John D.; and Ross, Frank E., to Maytag Company, The. Coupler assembly having segmental locking ring. 4,039,209, Cl. 285-8.000.

Goodnight, Kenneth C., Jr.: *See—*
Marquardt, Robert F.; Hartman, Grant H., Jr.; and Goodnight, Kenneth C., Jr., 4,039,696, Cl. 426-598.000.

Goralski, Christian T.: *See—*
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,039,727, Cl. 428-541.000.

Gordon, Harry W.; and Schaffner, Carl P., to Schmid Laboratories, Inc. Method for treating hypercholesterolemia with levorin. 4,039,659, Cl. 424-115.000.

Gordon, Harry W., to Schmid Laboratories, Inc. Antibiotic method of treating benign prostatic hypertrophy with SCH-16656. 4,039,661, Cl. 424-119.000.

Gordon, Mack: *See—*
Harsch, Thomas B., 4,039,254, Cl. 350-160.0LC.

Gordy, Robert S.; and Sanders, David E., to NCR Corporation. Spread spectrum demodulator. 4,039,749, Cl. 178-69.100.

Gorog, Sandor: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,039,589, Cl. 260-618.00B.

Gorter, Frederik Willem, to U.S. Philips Corporation. Magnetoresistive magnetic head. 4,040,113, Cl. 360-113.000.

Goser, Karl, to Siemens Aktiengesellschaft. Storage arrangement comprising two complementary field-effect transistors. 4,040,082, Cl. 357-42.000.

Goto, Sumio: *See—*
Hamamura, Tamotu; Goto, Sumio; and Ishihara, Kazuhiko, 4,039,517, Cl. 260-77.5TB.

Gottfried, Max, to Jobst Institute Inc. Inflatable anti-shock and splinting trousers. 4,039,039, Cl. 128-87.00R.

Graber, Joseph V.: *See—*
Graber, Thomas L., 4,039,106, Cl. 224-29.00R.

Graber, Thomas L., to Graber, Joseph V. Automobile bicycle carrier. 4,039,106, Cl. 224-29.00R.

Graf, Hans Dieter, to Dr. Th. Boehme KG., Chem. Fabrik. Method for the preparation of leather and fur skins. 4,039,281, Cl. 8-94.140.

Graham, Richard W., to Airolite Company, The. Jamb seal. 4,038,781, Cl. 49-91.000.

Grassme, Ulrich; and Soder, Eickhardt, to Siemens Aktiengesellschaft. X-ray diagnostic apparatus. 4,039,812, Cl. 250-413.000.

Gravely, Lawrence E.: *See—*
Geiss, Vernon L.; Gregory, Charles F.; Newton, Richard P.; and Gravely, Lawrence E., 4,038,993, Cl. 131-141.000.

Gray, James Harrel. Method and apparatus for linearly conveying wheeled vehicles. 4,039,075, Cl. 198-746.000.

Greathouse, Chester K., to Hamilton Caster & Mfg. Company, The. Caster mounting structure. 4,038,717, Cl. 16-29.000.

Greene, Albert A.; and Capadona, Emanuel A., to Conserve-A-Watt Corporation. Self-contained fluorescent lamp fixture. 4,039,821, Cl. 240-51.11R.

Gregory, Charles F.: *See—*
Geiss, Vernon L.; Gregory, Charles F.; Newton, Richard P.; and Gravely, Lawrence E., 4,038,993, Cl. 131-141.000.

Gregory, L. Duane; and Talley, Douglas G., to Teletronics United Inc. Cordless telephone system. 4,039,760, Cl. 179-41.00A.

Greth, Erich, to Lonza Ltd. Process for the production of succinylosuccinic diester. 4,039,570, Cl. 260-468.00K.

Grinage, Claude M., to Bullard Company, The. Vertical lathe with automatic tool change facility. 4,038,740, Cl. 29-568.000.

Grinberg, Naum Volfovich: *See—*
Slotvinsky-Sidak, Nikolai Petrovich; and Grinberg, Naum Volfovich, 4,039,614, Cl. 423-65.000.

Grivna, Howard W., to Acrometal Products, Inc. Method and apparatus for cross grain abrading to produce a rough-sawn effect. 4,038,784, Cl. 51-139.000.

Grosch, Gottlieb W. Method and means for creating perforated concrete casing. 4,039,608, Cl. 264-156.000.

Grosse-Benne, Wilhelm: *See—*
Beermann, Paul; Grosse-Benne, Wilhelm; Guntermann, Hans; and Wirtz, Johann-Hugo, 4,038,924, Cl. 102-70.00S.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Fuel supply systems for heat generators. 4,039,637, Cl. 261-36.00A.

Grove, John Landis, to Fulton Industries, Inc. Aerial lift platform with extendable wheels. 4,039,094, Cl. 214-132.000.

Gruel, Henri: *See—*
Vivet, Bernard; Trouiller, Jean-Claude; and Gruel, Henri, 4,040,001, Cl. 340-15.5TN.

GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
Zoellner, Rainer; and Munkert, Guenter, 4,040,101, Cl. 360-64.000.

Grundy, Reed H., to Westinghouse Air Brake Company. Fail-safe printed circuit board connection. 4,040,121, Cl. 361-409.000.

Gruson, Michel Gerard, to Ducellier et Cie. Semi-conductor regulators, particularly for motor vehicle generators. 4,040,115, Cl. 361-18.000.

GTE Laboratories Incorporated: *See—*
Haynes, William P., 4,040,090, Cl. 358-155.000.
Kadkade, Prakash G., 4,038,778, Cl. 47-58.000.

GTE Lenkurt Electric (Canada) Ltd.: *See—*
Huntley, Christopher R., 4,039,952, Cl. 325-163.000.

GTE Sylvania Incorporated: *See—*
Laymon, Marvin D.; and Miller, G. Kirby, 4,040,044, Cl. 340-261.000.
Roberts, Craig G.; and Kuo, Samuel Chung-Shu, 4,040,061, Cl. 343-786.000.

Guarracini, Joseph, to RCA Corporation. Disc master positioning apparatus for a recording system. 4,040,089, Cl. 358-128.000.

Guay, Jean-Marc: *See—*
Saint-Hilaire, Gilles; and Guay, Jean-Marc, 4,039,814, Cl. 235-153.00A.

Guell, Jose Maria Dalmau, to Jumberca, S.A. Needle selection mechanism for knitting machines. 4,038,837, Cl. 66-50.00R.

Guell, Jose Maria Dalmau, to Jumberca, S.A. Take-up apparatus. 4,038,839, Cl. 66-151.000.

Guillon, Henri Georges; and Henein, Kamal Labib, to Commissariat a l'Energie Atomique. Stabilizer for the base level of an amplifier. 4,039,963, Cl. 330-9.000.

Guissani born Trachtenberg, Annie: *See—*
Thang, Minh-Nguy; and Guissani born Trachtenberg, Annie, 4,039,382, Cl. 195-28.00N.

Gulf Oil Canada Limited: *See—*
Moyle, Maurice; Galvez, Buenaventura B.; Pease, Eric C.; and Logan, Alan, 4,039,423, Cl. 208-4.000.

Guntermann, Hans: *See—*
Beermann, Paul; Grosse-Benne, Wilhelm; Guntermann, Hans; and Wirtz, Johann-Hugo, 4,038,924, Cl. 102-70.00S.

Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, to Hoechst Aktiengesellschaft. 4-Stilbenyl-1,2,3-triazoles, process for preparing them and their use as optical brighteners. 4,039,531, Cl. 542-462.000.

Gupta, Prabodh Chandra: *See—*
Marsh, Arthur H.; and Gupta, Prabodh Chandra, 4,039,907, Cl. 318-135.000.

Gushima, Hiroshi: *See—*
Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, 4,039,660, Cl. 424-117.000.

Gutehoffnungshutte Sterkrade Aktiengesellschaft: *See—*
Ohlberg, Karlheinz, 4,039,229, Cl. 308-187.100.

Gutierrez, Antonio: *See—*
Brois, Stanley J.; and Gutierrez, Antonio, 4,039,552, Cl. 260-302.0SD.

Gutteridge, Norman James Albert: *See—*
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 4,039,571, Cl. 260-468.00D.

Gyory, Kalman. Safety helmets for motorcyclists or the like. 4,038,700, Cl. 2-413.000.

H. Goodman & Sons, Inc.: *See—*
Herzog, Milton W., 4,039,120, Cl. 206-606.000.
Laughton, Malcolm, 4,039,079, Cl. 206-461.000.

Haage, Karl; Thelen, Helmut; and Uedelhoven, Heinz, to Dynamit Nobel Aktiengesellschaft. Mounting element for roofing having loosely laid synthetic resin films. 4,038,804, Cl. 52-746.000.

Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, to Konishiroku Photo Industry Co., Ltd. Gelatin hardening process. 4,039,520, Cl. 260-117.000.

Hagenuk & Co GmbH: *See—*
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Harrison, Henry; and Konars, Clement R., 4,038,921, Cl. 101-232.000.
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Greathouse, Chester K., 4,038,717, Cl. 16-29.000.
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Roback, Donald W.; Hampel, Wilbur J.; Prince, Luther T.; and Huppert, Dean L., 4,039,900, Cl. 361-388.000.
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Handerhan, Joseph P., to Emerson Electric Co. Electric heating elements. 4,039,996, Cl. 338-295.000.
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Hannan, William James, to RCA Corporation. Adaptor for inter-relating an external audio input device with a standard television receiver, and an audio recording for use therewith. 4,040,088, Cl. 358-127.000.
Hannon, David Malcolm; and Hu, Hung Liang, to International Business Machines Corporation. Bubble lattice device. 4,040,020, Cl. 340-174.0TF.
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Swan, Jack C., Jr., 4,038,762, Cl. 36-89.000.
Hanson, Marlin M.; and Torok, Ernest J., to Sperry Rand Corporation. Single wall domain latrix for optical data processing system. 4,040,039, Cl. 340-174.0YC.
Hanson, Raymond A. Shearing excavator. 4,038,764, Cl. 37-110.000.
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Collins, Dwight D.; and Harmon, Darrell R., 4,039,289, Cl. 23-262.000.
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Harrison, Franklin L., to American Chain & Cable Company, Inc. Diverting conveyor system. 4,039,070, Cl. 198-370.000.
Harrison, Henry; and Konars, Clement R., to Halm Instrument Co., Inc. Means to connect printing presses in tandem. 4,038,921, Cl. 101-232.000.
Harrison, Henry, to Halm Instrument Co., Inc. Solar heat collector tank. 4,038,966, Cl. 126-271.000.
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Harsch, Thomas B., to Gordon, Mack. Electro-optic welding lens assembly using multiple liquid crystal light shutters and polarizers. 4,039,254, Cl. 350-160.0LC.
Harsch, Thomas B., to Mack Gordon. Electro-optic welding helmet lens assembly. 4,039,803, Cl. 219-147.000.
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Lucas, Arthur C.; Moss, Robert H.; and Kapsar, Barbara M., 4,039,834, Cl. 250-337.000.
Hart, Arthur C., to Elixir Industries. Multi-directional vent. 4,038,911, Cl. 98-2.140.
Hart, Robert J., to Commercial Resins Company. System for spraying a powder circumferentially around a pipe. 4,038,942, Cl. 118-305.000.
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Hartman, Grant H., Jr.: *See—*
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Hartzler, John David; and Morgan, Paul Winthrop, to Du Pont de Nemours, E. I., and Company. Polyhydrazide spinning solutions. 4,039,502, Cl. 260-30.80R.
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Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, 4,039,021, Cl. 160-202.000.
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Benczur-Urmossy, Gabor; von Benda, Klaus; and Haschka, Friedrich, 4,039,729, Cl. 429-206.000.
Hase, Takeshi, to Daiko Electronics Co., Ltd. Theft protection sensor switch. 4,039,789, Cl. 200-61.520.
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Haupin, Warren E.; Remper, John A.; and Dell, M. Benjamin, to Aluminum Company of America. Production of aluminum chloride. 4,039,648, Cl. 423-496.000.
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Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,039,705, Cl. 428-40.000.
Havens, Charlie C., to Rockwell International Corporation. Gasket apparatus. 4,039,741, Cl. 174-35.0GC.
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Hayashida, Yoshihiro, to Tokico Ltd. Hydraulic pressure control valve. 4,038,999, Cl. 137-116.300.
Hayfield, Peter Charles Steele, to Marston Excelsior Limited. Method of forming electrodes. 4,039,400, Cl. 204-38.00R.
Haynes, William P., to GTE Laboratories Incorporated. Bias gate for noise suppression circuit. 4,040,090, Cl. 358-155.000.
Hayward, James Roger; Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. Centerfilled food bar. 4,039,688, Cl. 426-92.000.
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Headrick, Edward E.; and Headrick, Kenneth A., 4,039,189, Cl. 273-105.00R.
Heap, Sydney Allan; and Naarding, Willem Jacobus, to International Institute for Cotton. Spinning of twistless yarns by wet drafting. 4,038,813, Cl. 57-153.000.
Heber, Eric Lewis: *See—*
Andrews, Arthur William; Heber, Eric Lewis; Michelmore, John Roger; and Nicholls, John, 4,038,867, Cl. 73-88.50R.
Hecht, Gerald; and Shively, Charles D., to Alcon Laboratories, Inc. Ophthalmic solution. 4,039,662, Cl. 424-180.000.
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Oberhansli, Jurg; Stalder, Erwin; Bulgheroni, Willy; and Penasa, Josef, 4,039,845, Cl. 250-577.000.
Hegar, Gert, to Ciba-Geigy AG. 3-Sulfoalkyl-6-hydroxy-pyrid-(2)-one-containing azo dyestuffs. 4,039,523, Cl. 260-153.000.
Heggie, William S., to Canadian Patents and Development Limited. Transducer for measuring injection pressures of diesel engines. 4,038,868, Cl. 73-119.00A.
Heide, Erich-Alexander; Wald, Maximilian; Paschke, Manfred; and Wagener, Klaus, to Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung. Matrix of algae and method of making same and method of obtaining uranium from sea water by said matrix. 4,039,445, Cl. 210-38.00C.
Heil, Oskar. Low frequency electro-acoustic transducer with interconnected diaphragms interleaved with fixed diaphragms. 4,039,044, Cl. 181-144.000.
Heim Universal Corporation: *See—*
McCloskey, Albert R., 4,038,733, Cl. 29-149.50B.
Heimbach, Ludolf: *See—*
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Netteland, Loyal G.; and Heintz, Clifford E., 4,039,620, Cl. 423-230.000.
Heitmann, Arnold M.; Brassert, Walter L.; and Chouinard, Donald B., to Northern Research and Engineering Corporation. Gas turbine. 4,038,815, Cl. 60-39.080.
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Edelberg, Norman L.; and Davis, Chester A., 4,038,995, Cl. 132-7.000.
Hell, Hans: *See—*
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Heller, Lawrence Griffith; and Spampinato, Dominic Patrick, to International Business Machines Corporation. Cross-coupled charge transfer sense amplifier circuits. 4,039,861, Cl. 307-355.000.
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Klein, Gerhart P.; Kallianidis, Milton; Christiansen, Paul J.; and Henderson, Dennis R., 4,039,904, Cl. 361-433.000.
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Hendrick, John Burton. Film transport system. 4,039,160, Cl. 242-189.000.
Hendy, Brian Norman, to Imperial Chemical Industries Limited. Production of random or homogeneous copolymers. 4,039,734, Cl. 526-258.000.
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Henkel & Cie G.m.b.H.: *See—*
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Henning, Heinz: *See—*
Bauer, Andreas; Bluggel, Erwin; and Henning, Heinz, 4,039,224, Cl. 297-389.000.
Hergoualc'h, Jean Rene; and Fornet, Michel, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Internal combustion engine catalytic anti-pollution reactor. 4,039,291, Cl. 23-288.0FC.
Heritage, Marcus Barry, to International Business Machines Corporation. Electron projection microfabrication system. 4,039,810, Cl. 250-396.0ML.
Hermann, David Trimble, to American Cyanamid Company. Low formaldehyde fully etherified methylolated melamine with urea-formaldehyde-glyoxal as textile resin. 4,039,496, Cl. 260-29.40R.
Hermann, Wilhelm; and Horster, Horst, to U.S. Philips Corporation. Evacuated thermal insulating glazing unit with an infrared reflecting coating. 4,038,797, Cl. 52-306.000.
Hernandez, Joseph L. Intra-oral wire bending pliers. 4,038,755, Cl. 32-66.000.
Herrmann, Manfred: *See—*
Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, 4,039,671, Cl. 424-267.000.
Herzog, Milton W., to H. Goodman & Sons, Inc. Divisible carton and blank therefor. 4,039,120, Cl. 206-606.000.
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Garrison, Harold Keith, 4,038,880, Cl. 74-242.10R.
Hester, Jackson B., Jr., to Upjohn Company, The. 1-[(Hydroxyamino)-methyl]-6-aryl-4H-s-triazolo[4,3-a][1,4]benzodiazepines. 4,039,551, Cl. 260-296.00T.
Hester, Sidney Dean, to Bell Telephone Laboratories, Incorporated. Input grouping arrangement for data gathering. 4,040,036, Cl. 364-900.000.
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Morrill, Justin S., Jr.; Farnbach, William A.; and Small, Charles T., 4,040,025, Cl. 364-900.000.
Hickman, Ronald Price, to Inventec International Limited. Remotely positionable mirror on an elongate arm. 4,039,818, Cl. 240-2.180.
Hicks, Alan A.: *See—*
Breslow, Jeffrey D.; Hicks, Alan A.; and Disko, Harry, 4,039,184, Cl. 273-1.00E.
Hicks Associates, Inc.: *See—*
Hicks, Edward H.; and Lenhart, Charlene, 4,038,757, Cl. 33-247.000.
Hicks, Edward H.; and Lenhart, Charlene, to Hicks Associates, Inc. External adjustment knob for telescopic sights. 4,038,757, Cl. 33-247.000.
Hicks, Paul E., Jr., to ACF Industries, Incorporated. Vibrator bracket assembly for hoppers and railway cars. 4,039,128, Cl. 248-14.000.
Higasiguchi, Masaya: *See—*
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Hildebolt, William M., to Campbell Soup Company. Protein texturization by extrusion with internal steam injection. 4,039,691, Cl. 426-511.000.
Hill, Edward D. Forming integrated roller from core, telescoping sleeve and filler adhesive. 4,038,731, Cl. 29-132.000.
Hill, Robert Dickson. Process and structure for fixation of atmospheric nitrogen. 4,039,412, Cl. 204-157.10H.
Hill, Robert Oliver, to National Process Industries (Proprietary) Limited. Method of producing phosphoric acid from high iron and aluminum content phosphate rocks using nitric acid. 4,039,624, Cl. 423-319.000.
Hill, William Frank, to Lucas Electrical Limited. Fuel supply system for an internal combustion engine. 4,039,638, Cl. 261-72.00R.
Himes, Glenn R.; and Mendoza, Luis Enrique, to Shell Oil Company. Block copolymer blends. 4,039,629, Cl. 260-876.00B.
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, to Fuji Photo Film Co., Ltd. Photographic silver halide emulsions. 4,039,335, Cl. 96-124.000.
Hiraga, Masaharu, to Sankyo Electric Industries, Ltd. Fluid suction and discharge apparatus. 4,039,270, Cl. 417-569.000.
Hirano, Masachika: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.
Hirosawa, Koichiro: *See—*
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Hitachi Chemical Company, Ltd.: *See—*
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Hosho, Yukio; and Moriya, Hisanori, 4,038,957, Cl. 123-139.0AW.
Ichiryu, Ken; Shigeta, Masayuki; Masuda, Toyotsugu; and Kinoshita, Haruo, 4,038,848, Cl. 72-8.000.
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Kadota, Shozo; Fujimoto, Yoshiji; and Yamamoto, Masao, 4,040,009, Cl. 340-146.3AQ.
Kanamaru, Hisanobu; and Ohuchi, Yasushi, 4,038,860, Cl. 72-358.000.
Kato, Yasuo; Okumura, Masahide; and Todokoro, Hideo, 4,039,829, Cl. 250-306.000.
Koizumi, Osamu; Saito, Shigeki; and Naito, Shotaro, 4,039,853, Cl. 307-101.000.
Komuro, Katsu; Shima, Seiya; and Hokari, Sadao, 4,039,866, Cl. 307-252.00N.
Nakamoto, Nobuyuki, 4,039,359, Cl. 148-188.000.
Nakazawa, Mitsuru; and Takigawa, Toru, 4,039,986, Cl. 335-212.000.
Ohashi, Shin-ichi; and Asada, Akihiro, 4,039,981, Cl. 334-14.000.
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,039,863, Cl. 307-252.00A.
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Saiki, Atsushi; Harada, Seiki; and Oba, Yoichi, 4,040,083, Cl. 357-54.000.
Shirasu, Hirotoshi; and Usuda, Hirotaka, 4,039,758, Cl. 179-18.0FH.
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Tanaka, Tomoyuki; Okamura, Masahiro; Ogawa, Takuzo; and Misawa, Yutaka, 4,040,084, Cl. 357-55.000.
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Hoard, Michael George: *See—*
Miller, Henry Francis; and Hoard, Michael George, 4,039,454, Cl. 210-242.00S.
Hochmuth, Erwin. Groove cutter. 4,039,295, Cl. 29-105.00A.
Hochreiter, William Thomas; and Kindig, Guilford Edwin, to Eastman Kodak Company. Optimized flash exposure. 4,040,070, Cl. 354-59.000.
Hodson, Harold Francis; and Batchelor, John Frederick, to Burroughs Wellcome Co. Substituted carbonyl compounds. 4,039,556, Cl. 260-308.00D.
Hoechst Aktiengesellschaft: *See—*
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,039,531, Cl. 542-462.000.
Katsimbas, Themistoklis, 4,039,627, Cl. 260-836.000.
Sahm, Wilfried; Schinzel, Erich; and Rosch, Gunter, 4,039,555, Cl. 260-307.00G.

Hoerner Waldorf Corporation: *See—*
Sieffert, William G., 4,039,117, Cl. 229-15.000.
Sorenson, John F., 4,039,077, Cl. 206-320.000.

Hoff, Glen R., to Standard Oil Company (Indiana). Increasing the particle size of as formed polyethylene or ethylene copolymer. 4,039,472, Cl. 252-429.00C.

Hofferber, Henry E., to Sperry Rand Corporation. Derived rate circuit for aircraft. 4,039,165, Cl. 244-177.000.

Hoffman, Douglas L. Grinding mill. 4,039,153, Cl. 241-248.000.

Hoffmann-La Roche Inc.: *See—*
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Kompis, Ivan; Rey-Bellet, Gerald; and Zanetti, Guido, 4,039,543, Cl. 260-256.40N.

Hogan, Jim Smith, to Val Verde Corporation. Mobile refinery. 4,039,130, Cl. 248-19.000.

Hoger, Rudolf. Device for lowering objects and persons by ropes. 4,039,045, Cl. 182-5.000.

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Komuro, Katsu; Shima, Seiya; and Hokari, Sadao, 4,039,866, Cl. 307-252.00N.

Holberry, Charles Thomas, to Redman Fisher Engineering Limited. Trolley conveyor system with magnetically actuated reading means. 4,038,926, Cl. 104-88.000.

Holladay, James F.; Starnes, R. Emory, Jr.; and Duke, Alvan E., to Southwire Company. Method and apparatus for coiling and packaging electrical cable. 4,038,805, Cl. 53-21.0FW.

Holosonics, Inc.: *See—*
Edwards, Richard C.; and Wilson, Richard L., 4,039,042, Cl. 181-106.000.

Holzgrafe, Homer G.: *See—*
Clark, Neill V.; and Holzgrafe, Homer G., 4,039,974, Cl. 333-7.00R.

Holzgruber, Wolfgang; and Schneidhofer, Adolf, to Vereinigte Edelstahlwerk AG. Process for producing elongated ingots of steel. 4,039,022, Cl. 164-52.000.

Homan, Gary R.; and Lee, Chi-Long, to Dow Corning Corporation. Mercaptosiloxane elastomer and method of preparation. 4,039,504, Cl. 260-37.0SB.

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Homeier, Edwin H., to UOP Inc. Hydroformylation process. 4,039,585, Cl. 260-604.0HF.

Honda, Masaaki: *See—*
Kamijo, Eiji; Nishimoto, Tatsuya; and Honda, Masaaki, 4,039,703, Cl. 427-183.000.

Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, to Bridgestone Tire Company Limited. Method of producing an ion exchanger by reacting unsaturated vulcanized or powdered rubbers with iodine isocyanate and then introducing ion exchange groups by further reaction. 4,039,483, Cl. 260-2.10R.

Honeywell Inc.: *See—*
Chaffin, John H., III, 4,039,116, Cl. 228-123.000.
Quarton, William T.; and Lowe, Peter R., 4,039,784, Cl. 235-151.000.
Rotier, Donald Jack, 4,038,870, Cl. 73-181.000.

Honeywell Information Systems, Inc.: *See—*
Tchon, Wallace Edward, 4,040,077, Cl. 357-24.000.

Hooker Chemicals & Plastics Corporation: *See—*
Nawrot, Chester Ronald, 4,039,420, Cl. 204-242.000.

Hopper, Thomas P. Apparatus for insulating against conductive, convective, and radiant heat transmission. 4,039,019, Cl. 160-121.00R.

Horeczko, George Roman. Annular heater. 4,039,279, Cl. 432-225.000.

Hori, Osamu; and Yamanaka, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Distributor for internal combustion engine containing apparatus for suppressing noise. 4,039,787, Cl. 200-19.00R.

Horibe, Susumu: *See—*
Takano, Tadayoshi; and Horibe, Susumu, 4,039,536, Cl. 544-26.00C.

Horii, Yosinobu: *See—*
Matsunaga, Hisashi; Horii, Yosinobu; and Higasiguchi, Masaya, 4,039,321, Cl. 75-60.000.

Horinouchi, Kazuo: *See—*
Yamada, Koichi; Hashimoto, Tadanori; and Horinouchi, Kazuo, 4,039,401, Cl. 204-67.000.

Horky, Reginald P. Method of manufacturing jewelry components. 4,038,736, Cl. 29-160.600.

Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Phase comparator and process for the operation thereof. 4,039,859, Cl. 307-232.000.

Horster, Horst: *See—*
Hermann, Wilhelm; and Horster, Horst, 4,038,797, Cl. 52-306.000.

Horvath, Tibor, to Aquology Corporation. Aquarium filter tank pump with bypass. 4,039,453, Cl. 210-169.000.

Hosho, Yukio; and Moriya, Hisanori, to Hitachi, Ltd. Fuel control system for use in internal combustion engine. 4,038,957, Cl. 123-139.0AW.

Hosoya, Kaneo: *See—*
Sasaki, Yoshinori; Yokoyama, Isao; Makino, Motohiko; Awaji, Syun; and Hosoya, Kaneo, 4,039,417, Cl. 204-196.000.

Houdeshell, Jesse W.: *See—*
Berkman, Robert N.; and Houdeshell, Jesse W., 4,039,684, Cl. 424-324.000.

Houser, John Martin, to Singer Company, The. Fast operating overload switching circuit for universal motors. 4,040,117, Cl. 361-33.000.

Howard, Harlan N.: *See—*
Lindow, Carl E.; Joseph, Craig L.; Caterina, Fred J.; and Howard, Harlan N., 4,038,889, Cl. 74-866.000.

Howell, John K., Jr.: *See—*
Kulick, Leonard; and Howell, John K., Jr., 4,039,353, Cl. 148-6.15R.

Hoy, Kenneth Look: *See—*
Bassett, David Robinson; and Hoy, Kenneth Look, 4,039,500, Cl. 260-29.60R.

Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., to Universal Oil Products Company. Continuous system for providing a catalytic coating on support members. 4,038,939, Cl. 118-4.000.

Hoyer, William A.; and Johnson, Lowell W., to Universal Oil Products Company. Method of coating and impregnating catalyst support members. 4,039,482, Cl. 252-466.0PT.

Hrabak, Frantisek; and Bochal, Karel, to Ceskoslovenska akademie ved. Homopolymers and copolymers of tetrachloroethoxyethyl esters and method for their preparation. 4,039,735, Cl. 526-292.000.

Hruby, Ronald J.: *See—*
United States of America, National Aeronautics and Space Administration; Hruby, Ronald J.; and Wilson, Robert L., 4,040,041, Cl. 340-200.000.

Hu, Hung Liang: *See—*
Hannon, David Malcolm; and Hu, Hung Liang, 4,040,020, Cl. 340-174.0TF.

Huang, Cornelius Y. D.; and Merz, Kenneth M., to TRW Inc. Resistance material and resistor made therefrom. 4,039,997, Cl. 338-308.000.

Hudson, Jimmie E.; and Dockery, Calvin D., to Phillips Petroleum Company. Contoured assist plug for thermoforming oriented articles. 4,039,271, Cl. 425-529.000.

Huebner, Charles Ferdinand, to Ciba-Geigy Corporation. 2-Piperidinoalkyl-1,4-benzodioxans. 4,039,676, Cl. 424-267.000.

Huebner, Pavel: *See—*
Kadlec, Vaclav; and Huebner, Pavel, 4,039,442, Cl. 210-32.000.

Huffhines, Donald F.; Jones, J. S.; and Smith, Clarence G., to Mobil Oil Corporation. Continuous plotter. 4,039,127, Cl. 346-110.00R.

Hugg, Richard C. Spraying apparatus. 4,039,147, Cl. 239-167.000.

Hughes, John Leonard. System for amplifying laser beams. 4,039,962, Cl. 330-4.300.

Hughes, Robert D.: *See—*
Steigelmann, Edward F.; Hughes, Robert D.; and Gabor, Joseph, 4,039,499, Cl. 260-29.6NR.

Huitema, Thomas Woodford, to J. I. Case Company. Tractor implement lift height amplifier. 4,039,201, Cl. 280-461.00A.

Hujer, Friedrich; and Zahn, Wolfgang, to AGFA-Gevaert, A.G. Method and apparatus for making reproductions of photograhic copy negatives or the like. 4,039,258, Cl. 355-27.000.

Hull, Robert E. Audio frequency phase modulator in hearing test system. 4,039,750, Cl. 179-1.00N.

Humblet, Lucien A.; Salomon, Louis; and Eschrich, Hubert R., to Societe Europeenne pour le Traitement Chimique des Combustibles Irradies (Eurochemic). Process for the treatment of organic wastes. 4,039,468, Cl. 252-301.10W.

Hunkeler, Ernst J., to Gleason Works, The. Versatile cutting tool for gear manufacture. 4,038,732, Cl. 29-105.00A.

Hunsucker, Jerry Hoyt, to IMC Chemical Group, Inc. Water-dispersed coating composition of short oil alkyd resin and tris(hydroxymethyl)-nitromethane. 4,039,495, Cl. 260-22.00R.

Huntley, Christopher R., to GTE Lenkurt Electric (Canada) Ltd. Digital frequency shift-keyed transmitter. 4,039,952, Cl. 325-163.000.

Hunwick, Richard James, to Dorr-Oliver Incorporated. Treatment of raw sugar juice. 4,039,348, Cl. 127-9.000.

Huppert, Dean L.: *See—*
Roback, Donald W.; Hampel, Wilbur J.; Prince, Luther T.; and Huppert, Dean L., 4,039,900, Cl. 361-388.000.

Hussonois, Michel: *See—*
Carlier, Roger; Hussonois, Michel; Genet, Michel; and Krupa, Jean-Claude, 4,039,839, Cl. 250-483.000.

Hutchinson, Florence M., executrix: *See—*
Hutchinson, William Milton, deceased; and Hutchinson, Florence M., executrix, 4,039,465, Cl. 252-171.000.

Hutchinson, William Milton, deceased; and by Hutchinson, Florence M., executrix, to Phillips Petroleum Company. Constant boiling admixtures. 4,039,465, Cl. 252-171.000.

Hutchison, Marion Edward. Orbital trench forming apparatus. 4,038,763, Cl. 37-80.00R.

Hycel, Inc.: *See—*
Moran, John J., 4,039,287, Cl. 23-253.00R.
Moran, John J., 4,039,288, Cl. 23-253.00R.

Hyde, Richard W.; Reber, Stephen A.; Schutte, August H.; and Nadkarni, Ravindra M., to Arthur D. Little, Inc. Process for producing fluid fuel from coal. 4,039,424, Cl. 208-8.000.

Ichiryu, Ken; Shigeta, Masayuki; Masuda, Toyotsugu; and Kinoshita, Haruo, to Hitachi, Ltd. Method and apparatus for controlling eccentricity of rolls in rolling mill. 4,038,848, Cl. 72-8.000.

ICI United States Inc.: *See—*
Jain, Anil K., 4,039,253, Cl. 350-160.00R.
Miller, Alfred D., 4,039,679, Cl. 424-274.000.

Ida, Noble: *See—*
Sipe, Nelson Eugene; and Ida, Noble, 4,039,310, Cl. 65-25.00R.

Ihasz, Richard: *See—*
Kata, Joseph; and Ihasz, Richard, 4,039,774, Cl. 219-370.000.

Iio, Akira: *See—*
Kawakami, Masato; Andoh, Naoki; and Iio, Akira, 4,039,583, Cl. 260-604.00R.

Ikeda, Hiroharu; Matsumoto, Shuichi; Enyo, Hiroji; Oshima, Noboru; and Komatsu, Koei, to Japan Synthetic Rubber Co., Ltd. Novel copolymer and process for producing same. 4,039,491, Cl. 260-4.00R.

Ikenque, Shinpei; Masuda, Takao; and Iwata, Yuzo, to Fuji Photo Film Co., Ltd. Thermally developable light-sensitive material. 4,039,334, Cl. 96-114.100.

Imai, Hirozo: *See—*
Yamada, Norio; Matsumoto, Masao; Adachi, Tsutomu; Imai, Hirozo; and Kubo, Masao, 4,038,749, Cl. 30-43.920.

Imai, Takayoshi: *See—*
Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, 4,039,706, Cl. 428-40.000.

IMC Chemical Group, Inc.: *See—*
Hunsucker, Jerry Hoyt, 4,039,495, Cl. 260-22.00R.

IMI Refinery Holdings Limited: *See—*
Astley, David John; Gilbert, John Roger Bawden; Scholes, Ian Robert; Jacobi, Jan Stephan; and Brookes, Garth Royston, 4,039,403, Cl. 204-105.00R.

Imperial Chemical Industries Limited: *See—*
Collins, Thomas Robert Stephen, 4,039,641, Cl. 264-28.000.
Hendy, Brian Norman, 4,039,734, Cl. 526-258.000.
Price, Raymond; and Smith, Peter, 4,039,612, Cl. 423-24.000.
Ridyard, Denis Robert Annesley, 4,039,528, Cl. 260-190.000.
Walker, Edward Raymond Halstead, 4,039,654, Cl. 424-305.000.

Imperial Metal Industries (Kynoch) Limited: *See—*
Astley, David John; Gilbert, John Roger Bawden; Scholes, Ian Robert; Jacobi, Jan Stephan; and Brookes, Garth Royston, 4,039,403, Cl. 204-105.00R.

Inada, Satoshi; Amano, Mituo; and Onuma, Tadashi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Spent activated carbon regenerator. 4,039,290, Cl. 23-284.000.

Inai, Yuichi: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, 4,039,573, Cl. 260-479.00R.

Indian Explosives Limited of I.C.I. House: *See—*
Ray, Bhairab Nath; and Bhattacharyya, Dhirendra Nath, 4,039,361, Cl. 149-41.000.

Ing. C. Olivetti & C., S.p.A.: *See—*
Giorza, Virgilio; and Giovanetti, Piero, 4,039,068, Cl. 197-98.000.

Inglis, Ronald Peter: *See—*
Bloch, Michael; Inglis, Ronald Peter; and Koebner, Adolf, 4,039,562, Cl. 260-401.000.

Inokuma, Hiroyuki: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 4,039,520, Cl. 260-117.000.

Inoue, Keizo: *See—*
Ohta, Sadayasu; Yada, Akio; and Inoue, Keizo, 4,039,837, Cl. 250-445.00T.

Inoue, Mitsuhiro; Maeda, Yo; Suzuki, Satoshi; Ohashi, Shozo; and Nakamura, Yoshiharu, to Hitachi Chemical Company, Ltd.; and Hitachi, Ltd. Carbon filament wound cylinder and method of producing the same. 4,039,006, Cl. 138-129.000.

Inoue, Naohiko: *See—*
Miyamoto, Keiichi; and Inoue, Naohiko, 4,039,852, Cl. 307-326.000.

Inouye, Hiroshi, to Hitachi, Ltd. Mechanical seal. 4,039,196, Cl. 277-11.000.

Institut Francais du Petrole: *See—*
Alagy, Jacques; Busson, Christian; and Cessou, Maurice, 4,039,649, Cl. 423-540.000.
Cheron, Jacques, 4,039,728, Cl. 429-22.000.

Institutul de Cercetaro Energetice Industriale si Proictari Utilaje Energetice: *See—*
Marinescu, Matei, 4,039,352, Cl. 136-205.000.

Instrumentation Laboratory, Inc.: *See—*
Moran, Byron L., 4,039,933, Cl. 324-29.000.

Interlake, Inc.: *See—*
Rankin, Robert C., 4,039,393, Cl. 202-241.000.

International Business Machines Corporation: *See—*
Belady, Laszlo Antal; and Evangelisti, Carlo John, 4,040,034, Cl. 364-200.000.
Blumberg, Richard Jay; and Dorler, Jack Arthur, 4,039,867, Cl. 307-255.000.
Brunner, Friedrich; Frasch, Peter; and Schwerdt, Friedrich, 4,039,371, Cl. 156-668.000.
Caron, Francois Gabriel; Desblache, Andre Eugene; Godard, Dominique Noel; and Maddens, Francis Paul, 4,039,748, Cl. 178-69.100.
Chang, Hsu; Chen, Tien Chi; and Tung, Chin, 4,040,018, Cl. 340-174.0TF.
Frisone, John B., 4,039,757, Cl. 179-15.0AL.
Hannon, David Malcolm; and Hu, Hung Liang, 4,040,020, Cl. 340-174.0TF.
Heller, Lawrence Griffith; and Spampinato, Dominic Patrick, 4,039,861, Cl. 307-355.000.
Heller, Lawrence Griffith, 4,039,978, Cl. 333-70.00T.
Heritage, Marcus Barry, 4,039,810, Cl. 250-396.0ML.
Jones, Alan Lytton; Pawletko, Joseph Paul; and Raider, Jerry Wesley, 4,039,936, Cl. 324-34.00D.
Lawlor, Francis D., 4,040,037, Cl. 364-200.000.
Lee, Hsing-San; and Vogl, Norbert George, Jr., 4,040,016, Cl. 340-173.0CA.
Lee, Hsing-San, 4,040,017, Cl. 340-173.00R.
Rosier, Laurence L., 4,040,038, Cl. 340-174.0TF.
Schlig, Eugene Stewart, 4,039,856, Cl. 307-212.000.
Slindee, Norman Edward, 4,040,105, Cl. 360-99.000.
Swiss, William R.; and Young, Wayne S., 4,039,338, Cl. 106-46.000.

International Institute for Cotton: *See—*
Heap, Sydney Allan; and Naarding, Willem Jacobus, 4,038,813, Cl. 57-153.000.

International Nickel Company, Inc., The: *See—*
Shaw, Stuart Walter Ker, 4,039,330, Cl. 75-171.000.

International Publishing Corporation Ltd.: *See—*
Everett, Robert Charles; Radcliffe, Paul Anthony Beaufort; Robinson, Alfred Henry; and Veltze, Janusz Andrew, 4,040,094, Cl. 358-283.000.

International Tapetronics Corporation: *See—*
Jenkins, John P., 4,040,114, Cl. 360-130.000.

International Telephone and Telegraph Corporation: *See—*
Brinson, Thomas Frederick, 4,039,226, Cl. 301-37.00B.
Clark, James Monroe, 4,039,960, Cl. 328-155.000.
Dhami, Kewal Singh, 4,039,508, Cl. 260-45.80N.
Donahue, Thomas H.; and Hammers, David E., 4,040,055, Cl. 343-7.700.
Peterson, Carl W., 4,039,240, Cl. 339-99.00R.
Sheldon, Donald Charles, 4,040,116, Cl. 361-18.000.
Wimmer, Jack D., 4,039,877, Cl. 313-95.000.

Inventec International Limited: *See—*
Hickman, Ronald Price, 4,039,818, Cl. 240-2.180.

Investmentbolaget Elajo AB: *See—*
Ivarsson, Torsten, 4,039,150, Cl. 241-154.000.

Isawa, Kazuo; Maejima, Masatsugu; and Nagasaka, Hideo, to Fujikura Cable Works, Ltd., The. Process for forming a film composed of plastic-coated inorganic powder particles. 4,039,697, Cl. 427-27.000.

Iseri, Makoto: *See—*
Kawakami, Kozi; and Iseri, Makoto, 4,039,418, Cl. 204-198.000.

Ishihara, Kazuhiko: *See—*
Hamamura, Tamotu; Goto, Sumio; and Ishihara, Kazuhiko, 4,039,517, Cl. 260-77.5TB.

Ishii, Hiroki: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 4,039,520, Cl. 260-117.000.

Ishii, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Audio frequency transistor amplifier. 4,039,964, Cl. 330-13.000.

Ishii, Kazuo, to Tokyo Shibaura Electric Co., Ltd. Audio frequency transistor amplifier. 4,039,965, Cl. 330-13.000.

Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
Kobayashi, Toshihiro; and Nitta, Yoshifumi, 4,039,277, Cl. 432-106.000.

Ishimoto, Sachio: *See—*
Tanaka, Toshio; Kurozumi, Seizi; Toru, Takeshi; Miura, Shuji; Kobayashi, Makiko; and Ishimoto, Sachio, 4,039,563, Cl. 260-410.90R.

Ishio, Hideki; Seki, Seizo; and Miyauchi, Kazuhiro, to Nippon Telegraph and Telephone Public Corporation. Demodulator for combined digital amplitude and phase keyed modulation signals. 4,039,961, Cl. 329-50.000.

Ishizuka, Akio, to Fuji Photo Film Co., Ltd. Recording sheet. 4,039,207, Cl. 282-27.500.

Itaya, Nobushige: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.

Itoh, Kunio, to Shin-Etsu Chemical Co., Ltd. Silicone rubber compositions. 4,039,503, Cl. 260-37.0SB.

ITT Industries, Inc.: *See—*
Schmidt, Herbert; and Weiler, Rolf, 4,039,197, Cl. 277-24.000.

Ivarsson, Torsten, to Investmentbolaget Elajo AB. Apparatus for handling waste products. 4,039,150, Cl. 241-154.000.

Iversen, Poul Christian Carlos, to Danfoss A/S. Electronic charging control device for electric storage heaters. 4,039,773, Cl. 219-364.000.

Iwai, Syojiro: *See—*
Miura, Mitugi; Matubayasi, Hisao; and Iwai, Syojiro, 4,039,447, Cl. 210-42.00S.

Iwami, Koichi: *See—*
Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, 4,039,483, Cl. 260-2.10R.

Iwamoto, Atsuo: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,039,335, Cl. 96-124.000.

Iwata, Hiroshi; and Misaki, Satoru, to West Electric Company, Ltd. Electronic flash apparatus. 4,039,898, Cl. 315-241.00P.

Iwata, Yuzo: *See—*
Ikenque, Shinpei; Masuda, Takao; and Iwata, Yuzo, 4,039,334, Cl. 96-114.100.

Iwata, Zensuke, to Furukawa Electric Co., Ltd., The. Cryogenic power cable. 4,039,740, Cl. 174-15.00S.

Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Pickup arm driving device in linear tracking pickup apparatus. 4,039,195, Cl. 274-23.00A.

J & A Keller Machine Co., Inc.: *See—*
Stanton, Howard F., 4,039,198, Cl. 277-118.000.

J. B. Foote Foundry Co., The: *See—*
Jones, Ronald N., 4,038,883, Cl. 74-337.500.

J. Bobst & Fils, S.A.: *See—*
Preisig, Roland, 4,038,909, Cl. 93-93.00M.

J. I. Case Company: *See—*
Huitema, Thomas Woodford, 4,039,201, Cl. 280-461.00A.
Long, Elton B., 4,039,095, Cl. 214-138.00D.
Schmitz, Floyd Albert, Jr.; and Smith, Wayne Gerald, 4,039,093, Cl. 214-130.00R.
Schuck, Paul R.; and Baylor, John M., 4,038,828, Cl. 61-72.600.
Tucek, Frank J., 4,039,010, Cl. 144-34.00R.

Jacobi, Jan Stephan: *See—*
Astley, David John; Gilbert, John Roger Bawden; Scholes, Ian Robert; Jacobi, Jan Stephan; and Brookes, Garth Royston, 4,039,403, Cl. 204-105.00R.

Jacobson, Abraham. Cord locking device for blinds or the like. 4,039,020, Cl. 160-178.00C.

Jacobsson, Kurt Arne Gunnar, to AB IRO. Thread storing and feeding device. 4,039,155, Cl. 242-47.120.

Jain, Anil K., to ICI United States Inc. Optical display having dished cover plate. 4,039,253, Cl. 350-160.00R.

Jain, Ravinder Kumar; Lin, Chinlon; and Stolen, Rogers Hall, to Bell Telephone Laboratories, Incorporated. Time dispersion tuned Raman oscillator. 4,039,851, Cl. 307-88.300.

James B. Lansing Sound, Inc.: *See—*
Johnson, Paul D., 4,039,243, Cl. 339-274.000.

Janes, Vincent C.: *See—*
Perrine, Paul M.; Janes, Vincent C.; and Cassera, James A., 4,038,708, Cl. 4-67.00A.

Jansen, Martin B., Jr., to Vetco Offshore Industries, Inc. Marine riser spider shock absorber apparatus. 4,039,176, Cl. 267-125.000.

Jantzen, Steven L.: *See—*
Randolph, Robert W.; and Jantzen, Steven L., 4,039,115, Cl. 228-44.500.

Japan Atomic Energy Research Institute: *See—*
Tanaka, Ryuichi; Tajima, Satoshi; Usami, Akira; and Yokoyama, Mitsutaka, 4,039,808, Cl. 250-370.000.

Japan Synthetic Rubber Co., Ltd.: *See—*
Ikeda, Hiroharu; Matsumoto, Shuichi; Enyo, Hiroji; Oshima, Noboru; and Komatsu, Koei, 4,039,491, Cl. 260-4.00R.
Kawakami, Masato; Andoh, Naoki; and Iio, Akira, 4,039,583, Cl. 260-604.00R.

Japan Tobacco & Salt Public Corporation, The: *See—*
Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, 4,038,992, Cl. 131-10.700.

Japanese National Railways: *See—*
Takenaka, Yasuo, 4,039,297, Cl. 428-566.000.

Jarvis Products Corporation: *See—*
Kendzior, Leo J., 4,038,721, Cl. 17-23.000.

Jean Waltersheid GmbH: *See—*
Kunze, Dieter; and von Allworden, Wilhelm, 4,039,203, Cl. 280-515.000.

Jenkins, John P., to International Tapetronics Corporation. Magnetic tape reproducing apparatus with manually overrideable connection between tape lifter and pressure roller. 4,040,114, Cl. 360-130.000.

Jennings, Dorothy, administratrix: *See—*
Jennings, Marvin E., deceased, 4,039,957, Cl. 325-466.000.

Jennings, Marvin E., deceased (by Jennings, Dorothy, administratrix), to Universal Industries, Inc. Signal activated emergency alarm device. 4,039,957, Cl. 325-466.000.

Jenny, Walter: *See—*
Angliker, Hans-Joerg; Peter, Richard; and Jenny, Walter, 4,039,529, Cl. 260-207.100.

Jensen, Jens Peter: *See—*
Nicolaisen, Holger; Andersen, Finn Schnoor; and Jensen, Jens Peter, 4,039,791, Cl. 200-67.00D.

Jensen, Robert H., to UOP Inc. Optimum liquid mass flux for two phase flow through a fixed bed of catalyst. 4,039,430, Cl. 208-108.000.

Jeromin, Lothar S.: *See—*
Nelson, Alan C.; and Jeromin, Lothar S., 4,038,943, Cl. 118-647.000.

Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Woodroffe, Jaime A.; and Keck, James C., 4,039,411, Cl. 204-157.10R.

Jeumont-Schneider: *See—*
Jouanny, Robert, 4,040,085, Cl. 357-79.000.
Picandet, Jean A., 4,039,766, Cl. 179-170.0NC.

Joan Fabrics Corporation: *See—*
Ansin, Joseph L.; and Harris, Stephen C., 4,038,811, Cl. 57-34.00B.

Jobst Institute Inc.: *See—*
Gottfried, Max, 4,039,039, Cl. 128-87.00R.

John Zink Company: *See—*
Reed, Robert D.; and Schwartz, Robert E., 4,039,276, Cl. 431-202.000.

Johnsen, Edward L. Continuous business form or the like adapted for subsequent processing into original indicia bearing lottery tickets, envelopes or the like. 4,039,122, Cl. 229-69.000.

Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Shutter latch arrangement releasable through shutter blade actuation and resettable through film advancement. 4,040,072, Cl. 354-173.000.

Johnson, Burnett H.; and Henderson, Don J., to Exxon Research and Engineering Company. Method of making an oriental dimensionally stable article from a high softening aromatic polymer or copolymer. 4,039,610, Cl. 264-237.000.

Johnson, Carl A., to Owens-Corning Fiberglas Corporation. Resin coated glass fibers and method of producing same through use of an aqueous silane-containing sizing composition whereby hydrolysis and polymerization of the silane is inhibited. 4,039,716, Cl. 428-378.000.

Johnson, Glenn W., Jr.; and Lindlau, Paul F., to Amerace Corporation. Louvered connectors and contact elements thereof. 4,039,238, Cl. 339-95.00R.

Johnson, John D., to Kraftco Corporation. Compacted grated cheese. 4,039,695, Cl. 426-582.000.

Johnson, John F. Electronic probe for sensing and reproducing the sound of mechanical movement. 4,038,866, Cl. 73-71.200.

Johnson, Lowell W.: *See—*
Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., 4,038,939, Cl. 118-4.000.
Hoyer, William A.; and Johnson, Lowell W., 4,039,482, Cl. 252-466.0PT.

Johnson, Marvin M.: *See—*
Bertus, Brent J.; Tabler, Donald C.; and Johnson, Marvin M., 4,039,476, Cl. 252-437.000.

Johnson, Paul D., to James B. Lansing Sound, Inc. Electrical connector. 4,039,243, Cl. 339-274.000.

Johnson, Paul H., to Phillips Petroleum Company. Carbon black process. 4,039,626, Cl. 423-456.000.

Johnson, Richard C.; and Kulbida, Ihor, to Xerox Corporation. Interface system to control flash lamp. 4,039,770, Cl. 219-216.000.

Johnston, Samuel Andrew, to Bunker Ramo Corporation. Pressure sensitive transducer. 4,040,118, Cl. 361-283.000.

Jonda, Wolfgang, to Messerschmitt-Bolkow-Blohm GmbH. Connecting element for a part of fiber-reinforced plastic. 4,038,885, Cl. 74-581.000.

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Jones, David Frederick: *See—*
Donkin, Albert Edward; Jones, David Frederick; and Lanty, Henry Alfons, 4,039,762, Cl. 179-99.000.

Jones, Earle D.: *See—*
Crane, Hewitt D.; and Jones, Earle D., 4,040,011, Cl. 340-146.3SY.

Jones, J. S.: *See—*
Huffhines, Donald F.; Jones, J. S.; and Smith, Clarence G., 4,039,127, Cl. 346-110.00R.

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Jones, Russell E., to Aetna-Standard Engineering Company. Plug changer for plug mill. 4,038,854, Cl. 72-209.000.

Jones, William C.: *See—*
Owens, Lester J.; and Jones, William C., 4,038,705, Cl. 3-2.000.

Joseph, Craig L.: *See—*
Lindow, Carl E.; Joseph, Craig L.; Caterina, Fred J.; and Howard, Harlan N., 4,038,889, Cl. 74-866.000.

Jouanny, Robert, to Jeumont-Schneider. Power semiconductor assembly and the method and apparatus for assembly thereof. 4,040,085, Cl. 357-79.000.

Jovanovic, Alexandre; and Steffen, Jurg. Method for processing work pieces, for transmitting and processing information by means of laser emission and apparatus for performance of the method. 4,039,823, Cl. 250-199.000.

Joy Manufacturing Company: *See—*
Morrison, Ward D., 4,039,032, Cl. 173-43.000.

Juillet, Hubert. Pressurized dispensing containers. 4,039,103, Cl. 222-95.000.

Jumberca, S.A.: *See—*
Guell, Jose Maria Dalmau, 4,038,837, Cl. 66-50.00R.
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Lombardi, Victor J.; and Dalmau, Jose M^a., 4,038,838, Cl. 66-147.000.

Jung, Michel: *See—*
Metcalf, Brian Walter; and Jung, Michel, 4,039,549, Cl. 260-293.860.

Kabelschlepp Gesellschaft mit beschrankter Haftung: *See—*
Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, 4,039,021, Cl. 160-202.000.

Kabushiki Kaisha Honda Rokku: *See—*
Kuroki, Shigenobu, 4,040,007, Cl. 340-52.00D.

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Yamashita, Hisateru, 4,038,862, Cl. 72-421.000.

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Ohta, Sadayasu; Yada, Akio; and Inoue, Keizo, 4,039,837, Cl. 250-445.00T.

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Mizuno, Mamoru, 4,040,097, Cl. 360-2.000.
Nakata, Kazuhiko, 4,040,108, Cl. 360-101.000.

Kachaylo, John. Game toy utilizing a spinning top. 4,039,190, Cl. 273-109.000.

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Kadlec, Vaclav; and Huebner, Pavel, to CKD DUKLA, narodni podnik. Ion-exchange process for desalting water and subsequent regeneration of the ion exchangers. 4,039,442, Cl. 210-32.000.

Kadota, Shozo; Fujimoto, Yoshiji; and Yamamoto, Masao, to Hitachi, Ltd. Pattern recognition system. 4,040,009, Cl. 340-146.3AQ.

Kagaya, Kazuyoshi: *See—*
Kanagawa, Shuichi; and Kagaya, Kazuyoshi, 4,039,630, Cl. 260-878.00R.

Kakuchi, Fumio: *See—*
Mori, Kenzo; Kakuchi, Fumio; and Fujii, Kimio, 4,040,058, Cl. 343-113.0PT.

Kali-Chemie Aktiengesellschaft: *See—*
Massonne, Joachim; and Becher, Wilfried, 4,039,646, Cl. 423-469.000.

Kallenborn, John, to PPG Industries, Inc. Hollow glass filaments sealed at both ends their production and their use as matrix reinforcing materials. 4,039,718, Cl. 428-398.000.

Kallianidis, Milton: *See—*
Klein, Gerhart P.; Kallianidis, Milton; Christiansen, Paul J.; and Henderson, Dennis R., 4,039,904, Cl. 361-433.000.

Kalmar, Arthur F., to FMC Corporation. Preservative coating for fruits and vegetables. 4,039,470, Cl. 252-382.000.

Kaloi, Cyril M., to United States of America, Navy. Notch fed magnetic microstrip dipole antenna with shorting pins. 4,040,060, Cl. 343-700.0MS.

Kamienski, Conrad W.; and Morrison, Robert C., to Lithium Corporation of America. Preparation of hydroxy-terminated conjugated diene polymers. 4,039,593, Cl. 260-635.00E.

Kamijo, Eiji; Nishimoto, Tatsuya; and Honda, Masaaki, to Sumitomo Electric Industries, Ltd. Method for producing a tubular multi-layered porous barrier. 4,039,703, Cl. 427-183.000.

Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, to Bell Telephone Laboratories, Incorporated. Integrated optical devices including tunable fixed grating. 4,039,249, Cl. 350-96.0WG.

Kanagawa, Shuichi; and Kagaya, Kazuyoshi, to Sumitomo Chemical Company, Limited. Elastomer. 4,039,630, Cl. 260-878.00R.

Kanamaru, Hisanobu; and Ohuchi, Yasushi, to Hitachi, Ltd. Plastic molding process for metal. 4,038,860, Cl. 72-358.000.

Kanebo, Ltd.: *See—*
Ohtomo, Koichiro; and Murata, Taro, 4,039,484, Cl. 260-2.10C.

Kankel, Richard L.; and Brown, William G., to Kankel, Richard L. Liquid entraining system of the humidifier and nebulizer type. 4,039,639, Cl. 261-121.00R.

Kanner, Bernard, to Union Carbide Corporation. High resilience foam. 4,039,490, Cl. 260-2.5AH.

Kanno, Masashi; Miki, Sukeichi; Takezaki, Tsuneo; and Ninomiya, Syuichi, to Matsushita Electric Industrial Co., Ltd. FM four channel stereo signal generator. 4,039,752, Cl. 179-15.0BT.

Kaplun, Vladimir Davydovich: *See—*
Ugolnikov, Stanislav Vasilievich; Kosach, Stanislav Petrovich; Kaplun, Vladimir Davydovich; Zhitnik, Valentin Ivanovich; and Bulgakov, Anatoly Yakovlevich, 4,039,945, Cl. 324-158.00R.

Kapsar, Barbara M.: *See—*
Lucas, Arthur C.; Moss, Robert H.; and Kapsar, Barbara M., 4,039,834, Cl. 250-337.000.

Karigan, George H.: *See—*
United States of America, National Aeronautics and Space Administration; Fenwick, James R.; and Karigan, George H., 4,039,000, Cl. 137-207.000.

Kashio, Toshio, to Casio Computer Co., Ltd. Character printing device. 4,039,067, Cl. 197-49.000.

Kasper, Robert J., to Park-Ohio Industries, Inc. Apparatus and method for heating ferromagnetic abrasive shot. 4,039,794, Cl. 219-10.490.

Kata, Joseph; and Ihasz, Richard, to Sperry Rand Corporation. Portable hair dryer. 4,039,774, Cl. 219-370.000.

Kato, Toshiro; Sasaki, Mitsuru; Ooishi, Tadashi; and Mujai, Kunio, to Sumitomo Chemical Company, Limited. Soil fungicidal phosphorothioate. 4,039,635, Cl. 260-954.000.

Kato, Yasuo; Okumura, Masahide; and Todokoro, Hideo, to Hitachi, Ltd. Stereoscopic measuring apparatus. 4,039,829, Cl. 250-306.000.

Kato, Yoshihisa: *See—*
Okamoto, Toshiaki; Kato, Yoshihisa; and Ban, Masashi, 4,038,824, Cl. 60-591.000.

Katsimbas, Themistoklis, to Hoechst Aktiengesellschaft. Heat-curable pulverulent coating agent of a mixture of a copolymer containing glycidyl groups and an adduct of aliphatic dicarboxylic acid and 2,4,6-tris-(N',N'',N'''-dimethylaminomethyl)-phenol. 4,039,627, Cl. 260-836.000.

Kauffman, Ivan L., to Ex-Cell-O Corporation. Floating sealing pressure means for carton ends. 4,038,908, Cl. 93-36.300.

Kawakami, Kozi; and Iseri, Makoto, to Mitsui Mining & Smelting Co., Ltd. Electrodeposited metal plate peeling off machine. 4,039,418, Cl. 204-198.000.

Kawakami, Masato; Andoh, Naoki; and Iio, Akira, to Japan Synthetic Rubber Co., Ltd. Process for producing methacrolein. 4,039,583, Cl. 260-604.00R.

Kawaoka, Teru. Container with dispensing means. 4,039,118, Cl. 229-17.00B.

Keck, James C.: *See—*
Woodroffe, Jaime A.; and Keck, James C., 4,039,411, Cl. 204-157.10R.

Keefe, Jack D., to Monarch Marking Systems, Inc. Fastener and method of using same. 4,038,725, Cl. 24-150.0FP.

Kelch, Heinz; and Schuh, Eduard, to Kienzle Apparate GmbH. Electric taximeter mounting and demounting arrangement. 4,039,780, Cl. 235-30.00R.

Kelleher, Richard F., to Electrolyte Services Limited. Method for electrolytic silver recovery. 4,039,407, Cl. 204-109.000.

Keller, Dieter, to Fichtel & Sachs A.G. Variable ratio gear transmission. 4,038,882, Cl. 74-331.000.

Keller, Karlfried: *See—*
Schon, Manfred; Durr, Helmut; Plath, Dieter; Keller, Karlfried; and Michel, Walter, 4,039,493, Cl. 260-21.000.

Keller, Walter; Koukol, Hubert; Ptaschek, Werner; and Wendt, Dieter, to W. C. Heraeus GmbH. Automatic chemical analysis apparatus. 4,039,286, Cl. 23-230.00R.

Keller, Werner; and Schafer, Karl, to C. Keller & Co. Apparatus and method for conveying molded briquettes from a press to bed plates via an inclined conveyance track. 4,039,072, Cl. 198-429.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Apparatus for producing a controlled radial path of resistance in a semiconductor monocrystalline rod. 4,039,283, Cl. 23-273.0SP.

Kelly, William F.; and Thompson, Bobby G. Washing machine bearing. 4,039,234, Cl. 308-238.000.

Kelsey-Hayes Company: *See—*
Sivulka, Gerald Michael, 4,039,227, Cl. 303-97.000.

Kemper, Eugene L. Electric immersion heating apparatus and methods of constructing and utilizing same. 4,039,737, Cl. 13-18.000.

Kendall Company, The: *See—*
Newman, Nicholas S., 4,039,711, Cl. 428-286.000.

Kendzior, Leo J., to Jarvis Products Corporation. Reciprocating blade saw. 4,038,721, Cl. 17-23.000.

Kennecott Copper Corporation: *See—*
Richards, Kenneth Julian; and Clark, Don Richard, 4,039,404, Cl. 204-106.000.

Kercso, Josef E.: *See—*
Morris, John McLean; Bennett, John P.; and Kercso, Josef E., 4,038,978, Cl. 128-130.000.

Kernander, Warren N.; and Schultz, William J., to General Electric Company. Bistable clamping mechanism for an indicating needle of an instrument. 4,038,938, Cl. 116-129.00N.

Kernforschungsanlage Julich, Gesellschaft mit beschrankter Haftung: *See—*
Heide, Erich-Alexander; Wald, Maximilian; Paschke, Manfred; and Wagener, Klaus, 4,039,445, Cl. 210-38.00C.

Kerr, Maxwell A., to Mechanical Products. Over temperature limit switch. 4,039,993, Cl. 337-366.000.

Kerstens, Franciscus Napoleon Adrianus, to U.S. Philips Corporation. Resonant cavity magnetron having a magnet system and magnetron destined for such a combination. 4,039,892, Cl. 315-39.710.

Kerwit, Malcolm, to Kerwit Medical Products, Inc. Dual hydraulic hospital bed. 4,038,709, Cl. 5-68.000.

Kerwit Medical Products, Inc.: *See—*
Kerwit, Malcolm, 4,038,709, Cl. 5-68.000.

Kesseler, Jan Antoon Henri: *See—*
Eijkelenboom, Leonard Cornelis Hendrik; and Kesseler, Jan Antoon Henri, 4,039,878, Cl. 313-113.000.

Kessels, Wilhelmus Cornelius: *See—*
van Boekhold, Johannes Leonardus Andreas Maria; and Kessels, Wilhelmus Cornelius, 4,039,885, Cl. 313-275.000.

Kessler, Alan B.: *See—*
Bory, Barbara H.; and Kessler, Alan B., 4,039,444, Cl. 210-36.000.

Kessler, Jane R. Condition change indicator. 4,038,936, Cl. 116-114.500.

Kewpie Kabushiki Kaisha: *See—*
Saito, Hisatoshi; and Kimura, Kuniyoshi, 4,039,259, Cl. 356-53.000.

Keyser, William L.: *See—*
Hayward, James Roger; Keyser, William L.; and Zielinski, Walter J., 4,039,688, Cl. 426-92.000.

Khera, Surjit Singh, to Battelle Development Corporation. Process and catalyst for synthesizing low boiling (C1 to C3) aliphatic hydrocarbons from carbon monoxide and hydrogen. 4,039,302, Cl. 48-197.00R.

Kieninger, Horst: *See—*
Adams, Donald James; Kieninger, Horst; Ravenhill, John Richard; Ries, Dieter; and Schmeling, Karin, 4,039,693, Cl. 426-565.000.

Kienow, Sigismund; and Sundermann, Erich, to Pyro-Zytan GmbH & Co. Linings for high temperature ovens. 4,039,280, Cl. 432-248.000.

Kienzle Apparate GmbH: *See—*
Kelch, Heinz; and Schuh, Eduard, 4,039,780, Cl. 235-30.00R.

Kiguchi, Isamu: *See—*
Mitsuhata, Masashi; Kumazawa, Toshihiko; and Kiguchi, Isamu, 4,039,561, Cl. 260-348.340.

Kijima, Shizumasa; Yamatsu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, to Eisai Co., Ltd. Process for preparation of 1,4-benzohydroquinone derivatives. 4,039,573, Cl. 260-479.00R.

Kikuchi, Masaru: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Wada, Kenji; and Kikuchi, Masaru, 4,039,355, Cl. 148-31.500.

Kim, Ki Soo; and Altscher, Siegfried, to Stauffer Chemical Company. Polymers of benzene phosphorus oxydichloride, 4,4'-thiodiphenol and $POCl_3$. 4,039,512, Cl. 260–61.000.

Kimball, John K.; and Plunk, Troy E., to United States of America, Army. Method of making styrofoam slotted plane-array antenna. 4,038,742, Cl. 29-600.000.

Kimmel, Elias, to Big Three Industries, Inc. (Tempil Div.). Temperature monitor and indicator. 4,038,873, Cl. 73-358.000.

Kimmel, Robert W. Jacknife warning system. 4,040,006, Cl. 340-52.00R.

Kimura, Kuniyoshi: *See—*
Saito, Hisatoshi; and Kimura, Kuniyoshi, 4,039,259, Cl. 356-53.000.

Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalyst carrier and method of manufacturing same. 4,039,481, Cl. 252-464.000.

Kindig, Guilford Edwin: *See—*
Hochreiter, William Thomas; and Kindig, Guilford Edwin, 4,040,070, Cl. 354-59.000.

King, John Burnham. Fibrinolytic substances. 4,039,658, Cl. 424-94.000.

Kinoshita, Haruo: *See—*
Ichiryu, Ken; Shigeta, Masayuki; Masuda, Toyotsugu; and Kinoshita, Haruo, 4,038,848, Cl. 72-8.000.

Kinsner, Witold: *See—*
Torre, Edward Della; and Kinsner, Witold, 4,040,040, Cl. 340-174.0TF.

Kirby, Roy S. Adjustable work support. 4,039,064, Cl. 193-42.000.

Kirner, Kuno: *See—*
Sohmer, Oskar; Autenrieth, Heinz; and Kirner, Kuno, 4,039,700, Cl. 427-46.000.

Kishinevsky, Lazar Iosifovich: *See—*
Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; Vyshelessky, Alexandr Nikolaevich; Rogov, Iosif Alexandrovich; Kishinevsky, Lazar Iosifovich; and Pidenko, Anatoly Pavlovich, 4,039,796, Cl. 219-10.55A.

Kitagawa, Yoshihiko: *See—*
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,039,733, Cl. 526-185.000.

Kitajima, Motohiro; and Nakagawa, Yoshihiko, to Toko Incorporated. Method of manufacturing an insulated gate type field effect semiconductor device. 4,039,358, Cl. 148-187.000.

Klann, Paul. Electronic combination lock. 4,038,846, Cl. 70-220.000.

Klauke, Erich; Kuhle, Engelbert; and Eue, Ludwig, to Bayer Aktiengesellschaft. N-(Difluorochloromethylmercaptophenyl)ureas as herbicides. 4,039,315, Cl. 71-98.000.

Klein, Gerhart P.; Kallianidis, Milton; Christiansen, Paul J.; and Henderson, Dennis R., to P. R. Mallory & Co., Inc. Intermediate precoat layer of resin material for stabilizing encapsulated electric devices. 4,039,904, Cl. 361-433.000.

Klein, Paul E., to Modcom, Inc. Orthodontic apparatus including unitary dispenser and dispensed articles. 4,038,753, Cl. 32-14.00E.

Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Bach, Bernhard; and Picmaus, Ernst, 4,039,917, Cl. 318-599.000.

Kleinknecht, Hans Peter, to RCA Corporation. Optically monitoring the undercutting of a layer being etched. 4,039,370, Cl. 156-626.000.

Klemm, Martin, to Fritz Buser AG Maschinenfabrik. Process for producing screen material. 4,039,397, Cl. 204-11.000.

Klett, Stanley D., to Xerox Corporation. Developer door with use counter on door. 4,039,102, Cl. 222-38.000.

Kliment, Karel: *See—*
Babcock, Thomas E.; Kliment, Karel; and Stockel, Richard F., 4,039,501, Cl. 260-30.40R.

Klingwall, Alf: *See—*
Axgarde, Gunnar Albert; Axelsson, Bengt Borje; and Klingwall, Alf, 4,038,789, Cl. 52-20.000.

Klinkenberg, Herbert; Petersen, Egon; and Schmidt, Werner, to Dynamit Nobel Aktiengesellschaft. Preparation of tris-(halophenoxy)-sym.-triazines. 4,039,538, Cl. 544-219.000.

Kloenne, Ernest F.; and Downing, Richard C., to P. R. Mallory & Co., Inc. Timing mechanism. 4,038,877, Cl. 74-125.000.

Klussmann, Henning: *See—*
Niederdellmann, Georg; Klussmann, Henning; and Conrad, Horst, 4,039,516, Cl. 260-75.0NE.

Kneusels, Max B.; Federmann, Dieter; and Hattass, Rainer, to American Sunroof Manufacturing Company. Sliding roof for automobile roofs. 4,038,910, Cl. 98-2.140.

Knibbe, Jan C.; and McPhee, Willard J., to Springfield Tool and Die, Inc. Piercing apparatus. 4,038,894, Cl. 83-411.00R.

Kniepkamp, Alberto; and Moore, Douglas, to Norlin Music, Inc. System for producing chorus effect. 4,038,898, Cl. 84-1.240.

Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Composition of matter and process. 4,039,381, Cl. 195-51.00S.

Knight, Robert K., to Union Oil Company of California. Mobility control of aqueous fluids in porous media. 4,039,028, Cl. 166-246.000.

Knoche, Karl-Friedrich; Schubert, Johannes; and Schulze-Bentrop, Roland, to Rheinische Braunkohlenwerke AG. Process for closed-cycle thermochemical production of hydrogen and oxygen from water. 4,039,651, Cl. 423-579.000.

Knudson, Gary A. Run-out apparatus and method for roll-formed panels. 4,039,063, Cl. 193-35.00R.

Koa Taika Kogyo Kabushiki Kaisha: *See—*
Yoshida, Tsuyoshi, 4,039,172, Cl. 266-196.000.

Kobayashi, Makiko: *See—*
Tanaka, Toshio; Kurozumi, Seizi; Toru, Takeshi; Miura, Shuji; Kobayashi, Makiko; and Ishimoto, Sachio, 4,039,563, Cl. 260-410.90R.

Kobayashi, Shigeo: *See—*
Sakai, Kazuyoshi; Kobayashi, Shigeo; and Fujita, Takeshi, 4,039,568, Cl. 260-453.00P.

Kobayashi, Shunsuke: *See—*
Mizuno, Fumio; Takeuchi, Fumio; and Kobayashi, Shunsuke, 4,039,252, Cl. 350-160.0LC.

Kobayashi, Toshihiro; and Nitta, Yoshifumi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Apparatus for calcining powder materials. 4,039,277, Cl. 432-106.000.

Kobayashi, Tsuneo: *See—*
Yoshikawa, Eiji; and Kobayashi, Tsuneo, 4,038,819, Cl. 60-307.000.

Kobe Steel Ltd.: *See—*
Tamura, Masamitu; Maeda, Katsumi; Harada, Nobuhiko; and Nakamura, Sigeharu, 4,039,148, Cl. 214-21.000.

Koch, Karlheinz, to Henkel & Cie G.m.b.H. Hydroxyalkylaminobutyric acid lubricants for the cold-working of aluminum. 4,039,460, Cl. 252-49.300.

Kochanneck, Uwe. Radial vehicle parking apparatus with a plurality parking machines. 4,039,089, Cl. 214-16.10A.

Koebner, Adolf: *See—*
Bloch, Michael; Inglis, Ronald Peter; and Koebner, Adolf, 4,039,562, Cl. 260-401.000.

Koedam, Mijndert: *See—*
Beijer, Louis Benjamin; Koedam, Mijndert; Claassens, Jacobus Marinus Maria; and Van Vliet, Johannes Adrianus Josephus Maria, 4,039,880, Cl. 313-183.000.

Koehring Company: *See—*
Livengood, Lynn W., 4,039,085, Cl. 212-46.00R.

Koenig, Horst; and Boell, Walter, to BASF Aktiengesellschaft. Manufacture of 4-methyloxazole. 4,039,554, Cl. 260-307.00R.

Koerner, Gotz; Kropac, Vaclav; and Patzke, Hans-Jurgen, to Th. Goldschmidt AG. Organosilicon containing resin composition and process for its preparation. 4,039,605, Cl. 260-824.00R.

Kofink, Wolfgang. D-C commutator-type dynamo electric machine with electronic control. 4,039,915, Cl. 318-439.000.

Kogelnik, Herwig Werner: *See—*
Kaminow, Ivan Paul; and Kogelnik, Herwig Werner, 4,039,249, Cl. 350-96.0WG.

Kohn, Elliott Samuel: *See—*
Kosonocky, Walter Frank; and Kohn, Elliott Samuel, 4,040,076, Cl. 357-24.000.

Kohshoh Limited: *See—*
Takabayashi, Teruo, 4,038,726, Cl. 24-198.000.

Koizumi, Osamu; Saito, Shigeki; and Naito, Shotaro, to Hitachi, Ltd. Magnetizing device for permanent magnet motor for electric vehicle. 4,039,853, Cl. 307-101.000.

Kokelenberg, Hendrik Emmanuel; Samijn, Rafael Pierre; Van den Houte, Jozef Willy; and Pollet, Robert Joseph, to AGFA-GEVAERT N.V. Stabilization of photosensitive recording material. 4,039,332, Cl. 96-48.00R.

Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamasaki, Yasuhiro; and Wakahara, Yasushi, 4,040,093, Cl. 358-261.000.

Kolakowski, Richard A.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., to Upjohn Company, The. Cellular isocyanurate polymer. 4,039,487, Cl. 260-2.5AW.

Kolb, Dieter, to Werner & Pfleiderer. Circuit arrangement for protective couplings. 4,039,781, Cl. 235-92.0EV.

Komatsu, Koei: *See—*
Ikeda, Hiroharu; Matsumoto, Shuichi; Enyo, Hiroji; Oshima, Noboru; and Komatsu, Koei, 4,039,491, Cl. 260-4.00R.

Komiya, Osamu, to Olympus Optical Co., Ltd. Forceps device for endoscope. 4,038,987, Cl. 128-321.000.

Kompis, Ivan; Rey-Bellet, Gerald; and Zanetti, Guido, to Hoffmann-La Roche Inc. Benzylpyrimidines. 4,039,543, Cl. 260-256.40N.

Komuro, Katsu; Shima, Seiya; and Hokari, Sadao, to Hitachi, Ltd. Thyristor control apparatus. 4,039,866, Cl. 307-252.00N.

Konars, Clement R.: *See—*
Harrison, Henry; and Konars, Clement R., 4,038,921, Cl. 101-232.000.

Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Photographic camera with automatically controlled filter. 4,040,067, Cl. 354-23.00D.

Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, to Bayer Aktiengesellschaft. Penicillins and cephalosporins and their production. 4,039,673, Cl. 424-271.000.

Konishiroku Photo Industry Co., Ltd.: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 4,039,520, Cl. 260-117.000.

Konomi, Toshiaki; Nurita, Joji; and Tanazawa, Yasushi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Intake manifold of the internal combustion engine. 4,038,950, Cl. 123-52.00M.

Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, to Boehringer Ingelheim GmbH. 1-Phenoxy-2-hydroxy-3-tert.-butylamino propane antiarrhythmic compounds. 4,039,685, Cl. 424-330.000.

Kornreich, Philipp G.; and Kowel, Stephen T., to Research Corporation. Direct electronic fourier transforms of optical images. 4,040,091, Cl. 358-213.000.

Kornreich, Philipp G.; and Kowel, Stephen T., to Research Corporation. Direct electronic Fourier transforms of optical images. 4,040,112, Cl. 358-213.000.

Korpiun, Joachim: *See—*
Roubal, Jiri; and Korpiun, Joachim, 4,039,714, Cl. 428-336.000.

Kosach, Stanislav Petrovich: *See—*
Ugolnikov, Stanislav Vasilievich; Kosach, Stanislav Petrovich; Kaplun, Vladimir Davydovich; Zhitnik, Valentin Ivanovich; and Bulgakov, Anatoly Yakovlevich, 4,039,945, Cl. 324-158.00R.

Kosonocky, Walter Frank; and Kohn, Elliott Samuel, to RCA Corporation. Charge transfer skimming and reset circuit. 4,040,076, Cl. 357-24.000.

Kosrow, Robert Leslie; Smith, Robert Emmet; Talsma, Robert Clarence; and Bernstein, Benjamin T., to Union Special Corporation. Fabric panel discontinuity sensor. 4,038,931, Cl. 112-272.000.

Kotani, Tamotsu, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of automatic or semi-automatic welding with gases. 4,039,802, Cl. 219-137.00R.

Kotera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, to Agency of Industrial Science & Technology. Process for production of hydrogen and sulfur from hydrogen sulfide as raw material. 4,039,613, Cl. 423-571.000.

Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the continuous esterification of chlorosilanes. 4,039,567, Cl. 260-448.80R.

Koukol, Hubert: *See—*
Keller, Walter; Koukol, Hubert; Ptaschek, Werner; and Wendt, Dieter, 4,039,286, Cl. 23-230.00R.

Kouvoussis, Anthony E.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,040,035, Cl. 364-200.000.

Kowel, Stephen T.: *See—*
Kornreich, Philipp G.; and Kowel, Stephen T., 4,040,091, Cl. 358-213.000.
Kornreich, Philipp G.; and Kowel, Stephen T., 4,040,112, Cl. 358-213.000.

Kraemer, Dieter; Lehmann, Klaus; and Plainer, Hermann, to Rohm GmbH. Method of bonding a polypeptide to a macromolecular polymeric carrier by irradiation with light. 4,039,413, Cl. 204-159.120.

Krafft, Robert: *See—*
Gaudel, Gerard; and Krafft, Robert, 4,038,831, Cl. 62-3.000.

Kraftco Corporation: *See—*
Johnson, John D., 4,039,695, Cl. 426-582.000.

Kraftwerk Union Aktiengesellschaft: *See—*
Harand, Elmar; and Michel, Eberhard, 4,039,380, Cl. 176-87.000.

Krahnke, Robert H.: *See—*
Chandler, Michael L.; Krahnke, Robert H.; and LeVier, Robert R., 4,039,666, Cl. 424-184.000.

Kramm, David Edward: *See—*
Moyer, Joseph Donald; and Kramm, David Edward, 4,039,723, Cl. 428-521.000.

Kranz, Joachim, to BASF Aktiengesellschaft. Conversion of crude copper phthalocyanines into pigments. 4,039,346, Cl. 106-288.00Q.

Kravtsov, Nikolai Petrovich: *See—*
Novomeisky, Jury Donatovich; Eger, Mikhail Mikhailovich; and Kravtsov, Nikolai Petrovich, 4,039,328, Cl. 75-126.00B.

Kregness, Glen Roy, to Sperry Rand Corporation. Apparatus and method for diagnosing digital data devices. 4,039,813, Cl. 235-153.0AC.

Kreiker, Philip Michael, to Data General Corporation. Peripheral device controller for a data processing system. 4,040,032, Cl. 364-200.000.

Krenzer, John: *See—*
Richter, Sidney B.; and Krenzer, John, 4,039,314, Cl. 71-88.000.

Kristensson, Nils Lars Ove, to Landstingens Inkopscentral Lic, Ekonomisk Forening. Chair having a tiltable back-rest and two pivotal leg supports. 4,039,223, Cl. 297-90.000.

Krohn, Peter L.: *See—*
Burke, George K.; LeFevre, Robert J.; Thomas, Robert E.; Turner, James W.; and Krohn, Peter L., 4,038,982, Cl. 128-214.00E.

Kropac, Vaclav: *See—*
Koerner, Gotz; Kropac, Vaclav; and Patzke, Hans-Jurgen, 4,039,605, Cl. 260-824.00R.

Krueger, Paul C., to United States of America, Army. Circuits for decoding pulse signals. 4,039,958, Cl. 328-119.000.

Krumkalns, Eriks V., to Eli Lilly and Company. α,α-Dialkyl-substituted 3-pyridinemethanols as fungicidal agents. 4,039,675, Cl. 424-263.000.

Krupa, Jean-Claude: *See—*
Carlier, Roger; Hussonois, Michel; Genet, Michel; and Krupa, Jean-Claude, 4,039,839, Cl. 250-483.000.

Kryltsov, Igor Alexeevich. Tape transport system of video tape recorder with longitudinal recording. 4,040,109, Cl. 360-107.000.

Kubo, Hiroshi: *See—*
Yokoo, Hidejiro; Tsuruya, Tetsuo; Chaen, Shigehiro; and Kubo, Hiroshi, 4,039,577, Cl. 260-553.00A.

Kubo, Masao: *See—*
Yamada, Norio; Matsumoto, Masao; Adachi, Tsutomu; Imai, Hirozo; and Kubo, Masao, 4,038,749, Cl. 30-43.920.

Kuckes, Willi: *See—*
Franke, Hermann; Kuckes, Willi; and Martin, Wolfgang, 4,039,248, Cl. 350-96.00B.

Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, to Sumitomo Chemical Company, Limited. Novel petroleum resin formed by a catalyst system containing (a) organoaluminum compound and (b) alkyl halide or hydrogen halide as cocatalyst. 4,039,733, Cl. 526-185.000.

Kudo, Tsutomu: *See—*
Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, 4,038,992, Cl. 131-10.700.

Kuechler, Irvin R., to Vent-Cair, Inc. Combination forced-flow and convective-flow grease-hood system and method having a low-level entry portion over a protruding cooking appliance. 4,038,912, Cl. 126-299.00D.

Kuhle, Engelbert: *See—*
Klauke, Erich; Kuhle, Engelbert; and Eue, Ludwig, 4,039,315, Cl. 71-98.000.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Cationic dyestuffs containing quaternized benzthiazole and p-substituted amino azo phenyl moieties. 4,039.526, Cl. 260-158.000.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. 1,2,4-Triazole-azoaniline cationic dyestuffs. 4,039,539, Cl. 260-157.000.

Kulbida, Ihor: *See—*
Johnson, Richard C.; and Kulbida, Ihor, 4,039,770, Cl. 219-216.000.

Kulick, Leonard; and Howell, John K., Jr., to Oxy Metal Industries Corporation. Post-treatment of conversion-coated metal surfaces. 4,039,353, Cl. 148-6.15R.

Kullman, Russell M. H.; and Reinhardt, Robert M., to United States of America, Agriculture. Durable-press finishing of cellulose-containing textiles with aluminum chlorhydroxide-hydrogen peroxide catalyst system. 4,039,282, Cl. 8-184.000.

Kumazawa, Toshihiko: *See—*
Mitsuhata, Masashi; Kumazawa, Toshihiko; and Kiguchi, Isamu, 4,039,561, Cl. 260-348.340.

Kunze, Dieter; and von Allworden, Wilhelm, to Jean Waltersheid GmbH. Conical guide for a coupling pin on an agricultural implement. 4,039,203, Cl. 280-515.000.

Kuo, Samuel Chung-Shu: *See—*
Roberts, Craig G.; and Kuo, Samuel Chung-Shu, 4,040,061, Cl. 343-786.000.

Kuo, Vincent H. S., to Allied Chemical Corporation. Recovery of soda values and heat from sodium carbonate crystallizer purge liquors. 4,039,617, Cl. 423-186.000.

Kupsky, George A.; and Santchi, Douglas L., to Panel Technology, Inc. Edge terminations for gas discharge display panel. 4,039,882, Cl. 313-217.000.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Inada, Satoshi; Amano, Mituo; and Onuma, Tadashi, 4,039,290, Cl. 23-284.000.

Kuribayashi, Hideyuki: *See—*
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,039,733, Cl. 526-185.000.

Kuroki, Shigenobu, to Kabushiki Kaisha Honda Rokku. Apparatus for warning that a key-operated device in a vehicle is inoperative. 4,040,007, Cl. 340-52.00D.

Kurozumi, Seizi: *See—*
Tanaka, Toshio; Kurozumi, Seizi; Toru, Takeshi; Miura, Shuji; Kobayashi, Makiko; and Ishimoto, Sachio, 4,039,563, Cl. 260-410.90R.

Kurtz, Donald Reah: *See—*
Crouch, Donald Wayne; Kurtz, Donald Reah; and Sofianek, Joseph Carl, 4,039,792, Cl. 200-144.00B.

Kurzweil, Karel: *See—*
Cheype, Jean Marie; Courant, Patrick; and Kurzweil, Karel, 4,038,744, Cl. 29-630.00A.

Kuwano, Yasuhiko: *See—*
Shiroki, Ken-ichi; Mori, Katsumi; Kuwano, Yasuhiko; and Saito, Seiichi, 4,039,970, Cl. 331-94.50F.

Kuwertz, Erich, to Pfalzstahlbau GmbH. Coupling arrangement for towing conveyor. 4,038,925, Cl. 104-88.000.

Kvarnegard, Sven Bertil, to AB Carl Lamm. Apparatus for thermographic duplication of information comprising a curve or cam member for axial movement of dye carrier. 4,039,832, Cl. 250-318.000.

Kwan, Okun; and Zaccagnino, Nicholas V., Jr., to Bunker Ramo Corporation. Magnetic stripe passbook and scanner for document printing apparatus. 4,039,069, Cl. 197-127.00R.

Kwasnoski, Daniel; and Mancke, Vernon B., to Bethlehem Steel Corporation. Method and apparatus for multi-stage rinsing. 4,039,349, Cl. 134-10.000.

Kyowa Hakko Kogyo Co., Ltd.: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 4,039,710, Cl. 428-253.000.

Kyushu Refractories Co., Ltd.: *See—*
Nishikawa, Yasuo; Okamura, Takeo; and Minami, Katsuhei, 4,039,344, Cl. 106-66.000.

La Telemecanique Electrique: *See—*
Lacan, Guy; and Vergez, Andre, 4,039,902, Cl. 361-395.000.

Laass, Heinz, to Taco-Tafel GmbH & Co., KG. Acoustic test apparatus for electrical networks including multi-phase power systems. 4,039,937, Cl. 324-51.000.

Labofina S.A.: *See—*
Defoor, Frans Maurice Joseph, 4,039,498, Cl. 260-29.6HN.

Lacan, Guy; and Vergez, Andre, to La Telemecanique Electrique. Electronic automation system. 4,039,902, Cl. 361-395.000.

Lacheen, Jerome H.: *See—*
Courtney, James, 4,038,879, Cl. 74-231.00J.

LaConti, Anthony B.; and Fragala, Anthony R., to General Electric Company. Method for gas generation utilizing platinum metal electrocatalyst containing 5 to 60% ruthenium. 4,039,409, Cl. 204-129.000.

Lacy, James Volney: *See—*
Angner, Ronald Joseph; and Lacy, James Volney, 4,039,763, Cl. 179-99.000.

Ladeur, Peter: *See—*
van Klinken, Jakob; and Ladeur, Peter, 4,039.429, Cl. 208-50.000.

Ladinsky, George. Multiple paper item holder. 4,039,082, Cl. 211-45.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Kotani, Tamotsu, 4,039,802, Cl. 219-137.00R.

Laity, John L., to Shell Oil Company. Gasoline composition. 4,039,301, Cl. 44-62.000.

Lambert, Alain: *See—*
Flambard, Christian; and Lambert, Alain, 4,038,865, Cl. 73-67.700.

Lambrechtse, Cornelis Willem; and Salters, Roelof Herman Willem, to U.S. Philips Corporation. Amplifier arrangement for detecting logic signals from a capacitance source. 4,039,860, Cl. 307-362.000.

Lampe, Vaino: *See—*
Fischmeister, Hellmut; Lampe, Vaino; and Olsson, Leif, 4,038,738, Cl. 29-420.500.

Lamson & Sessions Co., The: *See—*
Werner, Adalbert, 4,038,714, Cl. 10-86.00A.

Lance, Richard T.: *See—*
Papafingos, Pandelis N.; and Lance, Richard T., 4,039,173, Cl. 266-201.000.

Landstingens Inkopscentral Lic, Ekonomisk Forening: *See—*
Kristensson, Nils Lars Ove, 4,039,223, Cl. 297-90.000.

Lanty, Henry Alfons: *See—*
Donkin, Albert Edward; Jones, David Frederick; and Lanty, Henry Alfons, 4,039,762, Cl. 179-99.000.

Large, Bryan John: *See—*
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 4,039,544, Cl. 260-256.40F.

Larson, Clayton E.; and Records, Earl T., to White Metal Rolling & Stamping Corporation. Ladders incorporating retractable ground spikes. 4,039,047, Cl. 182-111.000.

Larsson, Hans Gunnar, to Asea Aktiebolag. High pressure press. 4,038,849, Cl. 72-60.000.

Laszlo, Tibor S.; and Licis, Osvalds F., to Philip Morris Incorporated. Apparatus for transporting materials for treatment of said materials in a microwave unit. 4,039,795, Cl. 219-10.55A.

Laughton, Malcolm, to H. Goodman & Sons, Inc. Display packs for brushes. 4,039,079, Cl. 206-461.000.

Lauterbach, Gunter: *See—*
Schacht, Erich; Lauterbach, Gunter; Mehrhof, Werner; Nowak, Herbert; and Simane, Zdenek, 4,039,683, Cl. 424-324.000.

Lavanish, Jerome M.; and Sare, Edward J., to PPG Industries, Inc. Catalytic oxidation of C2-C4 halogenated hydrocarbons. 4,039,623, Cl. 423-240.000.

Lawlor, Francis D., to International Business Machines Corporation. Buffer chaining. 4,040,037, Cl. 364-200.000.

Lawman, Michael John Patrick; and Caie, Ian Scott, to National Research Development Corporation. Device for use in testing of fluid samples on microscope slides. 4,039,247, Cl. 350-95.000.

Laymon, Marvin D.; and Miller, G. Kirby, to GTE Sylvania Incorporated. Dual line electret transducer. 4,040,044, Cl. 340-261.000.

Lazdinsh, Arvid Avgustovich: *See—*
Giller, Solomon Aronovich; Lazdinsh, Arvid Avgustovich; Veinberg, Artur Karlovich; and Sidorov, Alexandr Borisovich, 4,039,546, Cl. 260-260.000.

Leachy, Richard B., to Coatings Inc. Bimetallic electrical connector and method for making the same. 4,039,244, Cl. 339-275.00T.

Lear, Ronald. Scroll-forming device. 4,038,852, Cl. 72-147.000.

Lear Siegler, Inc.: *See—*
Tersch, Richard W., 4,038,730, Cl. 29-95.100.

Le Berre, Serge: *See—*
Hareng, Michel; Le Berre, Serge; and Spitz, Erich, 4,040,047, Cl. 340-324.00R.

Le Coquil, Emile F.; Prigent, Hubert; and Gerard, Guy. Plasma display screen for displaying a matrix of luminous points. 4,039,881, Cl. 313-217.000.

Lee, Chi-Long: *See—*
Homan, Gary R.; and Lee, Chi-Long, 4,039,504, Cl. 260-37.0SB.
Homan, Gary R.; and Lee, Chi-Long, 4,039,505, Cl. 260-37.0SB.

Lee, Hsing-San; and Vogl, Norbert George, Jr., to International Business Machines Corporation. Twin nodes capacitance memory. 4,040,016, Cl. 340-173.0CA.

Lee, Hsing-San, to International Business Machines Corporation. Injected charge capacitor memory. 4,040,017, Cl. 340-173.00R.

Lee, Lieng-Huang, to Xerox Corporation. Carrier bead coating compositions. 4,039,331, Cl. 96-1.0SD.

LeFevre, Robert J.; and Thomas, Robert E., to Burron Medical Products, Inc. Electronically controlled intravenous infusion set. 4,038,981, Cl. 128-214.00E.

LeFevre, Robert J.: *See—*
Burke, George K.; LeFevre, Robert J.; Thomas, Robert E.; Turner, James W.; and Krohn, Peter L., 4,038,982, Cl. 128-214.00E.

Lehmann, Ernest H., to Xerox Corporation. Two color xeroradiography development. 4,039,831, Cl. 250-315.00A.

Lehmann, Klaus: *See—*
Kraemer, Dieter; Lehmann, Klaus; and Plainer, Hermann, 4,039,413, Cl. 204-159.120.

Lehureau, Jean Claude: *See—*
Bricot, Claude; Carre, Bernard; Lehureau, Jean Claude; and Puech, Claude, 4,039,764, Cl. 179-100.41L.

Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; Vyshelessky, Alexandr Nikolaevich; Rogov, Iosif Alexandrovich; Kishinevsky, Lazar Iosifovich; and Pidenko, Anatoly Pavlovich. Microwave oven having improved conveying means. 4,039,796, Cl. 219-10.55A.

Leifheit, Gunter; Liebscher, Johannes; and Friedrich, Rainer, to Leifheit International Gunter Leifheit GmbH. Tie hanger. 4,039,083, Cl. 211-96.000.

Leifheit International Gunter Leifheit GmbH: *See—*
Leifheit, Gunter; Liebscher, Johannes; and Friedrich, Rainer, 4,039,083, Cl. 211-96.000.

Leighley, Kenneth C., to Spectronics Corporation. X-ray grid adaptor. 4,039,841, Cl. 250-508.000.

Le Marchand, Claude: *See—*
Meyer, Yves; Le Marchand, Claude; and Gerard, Jean-Louis, 4,039,053, Cl. 188-73.300.

Leneveu, Louis J., to Societe Nationale des Poudres et Explosifs. Moldable compositions comprising polyvinyl nitrate. 4,039,640, Cl. 264-3.00B.

Lenhart, Charlene: *See—*
Hicks, Edward H.; and Lenhart, Charlene, 4,038,757, Cl. 33-247.000.

Lenzen, Kenneth H.: *See—*
Bowling, George W.; Conlisk, Peter J.; and Lenzen, Kenneth H., 4,039,050, Cl. 188-1.00B.

LeRoy, Rodney L., to Noranda Mines Limited. Method for the operation of a fluidized bed electrochemical reactor at a substantially constant current density. 4,039,402, Cl. 204-105.00R.

Leschek, Walter C., to Westinghouse Electric Corporation. Acoustic emission transducer calibration. 4,039,767, Cl. 179-175.10A.

Leskovar, Peter: *See—*
Weitze, Artur; and Leskovar, Peter, 4,039,721, Cl. 428-426.000.

Lester, Dozier, Jr. Frog feeding apparatus. 4,038,947, Cl. 119-51.00R.

Leuthesser, Edward G.: *See—*
Leuthesser, Lance E.; and Leuthesser, Edward G., 4,038,946, Cl. 119-5.000.

Leuthesser, Lance E.; and Leuthesser, Edward G. Fish farm and water conditioning apparatus. 4,038,946, Cl. 119-5.000.

Lever Brothers Company: *See—*
Bory, Barbara H.; and Kessler, Alan B., 4,039,444, Cl. 210-36.000.

LeVier, Robert R.: *See—*
Chandler, Michael L.; Krahnke, Robert H.; and LeVier, Robert R., 4,039,666, Cl. 424-184.000.

Levinstein, Moses A., to General Electric Company. Clearance control through a Ni-graphite/NiCr-base alloy powder mixture. 4,039,296, Cl. 428-553.000.

Levitt, Sylvia. Sheet-and-bib combination. 4,038,697, Cl. 2-49.00A.

Levy, Joseph: *See—*
Schmerling, Louis; and Levy, Joseph, 4,039,564, Cl. 260-413.000.

Lewis, Charles W.: *See—*
Cherenko, Joseph; and Lewis, Charles W., 4,039,720, Cl. 428-425.000.

Licis, Osvalds F.: *See—*
Laszlo, Tibor S.; and Licis, Osvalds F., 4,039,795, Cl. 219-10.55A.

Liebscher, Johannes: *See—*
Leifheit, Gunter; Liebscher, Johannes; and Friedrich, Rainer, 4,039,083, Cl. 211-96.000.

Lien, Ming T. Display of mathematical equations. 4,040,048, Cl. 340-336.000.

Lightolier Incorporated: *See—*
Chan, Kingsley; and Russo, Neil, 4,039,822, Cl. 240-73.0BC.

Lilly Industries, Ltd.: *See—*
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 4,039,571, Cl. 260-468.00D.

'Lin, Chinlon: *See—*
Jain, Ravinder Kumar; Lin, Chinlon; and Stolen, Rogers Hall, 4,039,851, Cl. 307-88.300.

Lindblom, Karl Thore, to Ostbergs Fabriks AB. Hydraulic control system for a tree felling unit. 4,039,009, Cl. 144-34.00E.

Lindenberg, Samuel: *See—*
Crane, Hewitt David; Wolf, Daniel Errol; and Lindenberg, Samuel, 4,040,012, Cl. 340-146.3SY.

Lindlau, Paul F.: *See—*
Johnson, Glenn W., Jr.; and Lindlau, Paul F., 4,039,238, Cl. 339-95.00R.

Lindner, Fritz; and Hahn, Werner, to VEB Pentacon Dresden. Camera automatic exposure control apparatus. 4,040,111, Cl. 354-49.000.

Lindow, Carl E.; Joseph, Craig L.; Caterina, Fred J.; and Howard, Harlan N., to FMC Corporation. Electronic transmission controller. 4,038,889, Cl. 74-866.000.

Lindsey, Keith E. Grounding accessory for a bundle conductor stringing block. 4,039,141, Cl. 254-134.3PA.

Link, John Barry, to Bell Telephone Laboratories, Incorporated. Method and apparatus for detecting faults in buried insulated conductors. 4,039,938, Cl. 324-52.000.

Linotype-Paul Limited: *See—*
Talbot, George Clive Ashmead, 4,039,746, Cl. 178-15.000.

Liquidometer Corporation: *See—*
Edwards, Harrison F., 4,038,871, Cl. 73-304.00C.

List, Heinz. Heat exchanger. 4,039,024, Cl. 165-92.000.

Lithium Corporation of America: *See—*
Kamienski, Conrad W.; and Morrison, Robert C., 4,039,593, Cl. 260-635.00E.

Litt, Sanford. Scarifying tool for pipe ends. 4,038,715, Cl. 15-106.000.

Litton Business Systems, Inc.: *See—*
Cheng, Karl C. H., 4,039,918, Cl. 318-602.000.

Livengood, Lynn W., to Koehring Company. Crane with a pivoted boom and a float valve therefor. 4,039,085, Cl. 212-46.00R.

Livesay, Richard E., to Caterpillar Tractor Co. Apparatus for removing gas from a liquid system. 4,039,305, Cl. 55-159.000.

Lockheed Aircraft Corporation: *See—*
Fong, Calvin C., 4,038,786, Cl. 51-320.000.
Miller, Henry Francis; and Hoard, Michael George, 4,039,454, Cl. 210-242.00S.

Loctite Corporation: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,039,705, Cl. 428-40.000.

Logan, Alan: *See—*
Moyle, Maurice; Galvez, Buenaventura B.; Pease, Eric C.; and Logan, Alan, 4,039,423, Cl. 208-4.000.

Logan, Forrest E., to Occidental Petroleum Corporation. Feed system for pyrolysis reactors. 4,039,390, Cl. 201-12.000.

Logan, William R.: *See—*
United States of America, National Aeronautics and Space Administration; Gates, Daniel W.; Harada, Yoshiro; Logan, William R.; and Gilligan, John E., 4,039,347, Cl. 106-292.000.

Lokerson, Donald C., to United States of America, National Aeronautics and Space Administration. Speech analyzer. 4,039,754, Cl. 179-1.0SA.

Lombardi, Victor J.; and Dalmau, Jose M^a, to Jumberca, S.A., a part interest. Knitting machines and methods for knitting fabrics having terry loops on both sides thereof. 4,038,838, Cl. 66-147.000.

Long, Elton B., to J. I. Case Company. Swing mechanism for backhoe. 4,039,095, Cl. 214-138.00D.

Long, George; Martell, Dennis J.; and Batz, James E., to Northern Illinois Gas Company. Remote data readout system for transmitting digital data over existing electrical power lines. 4,040,046, Cl. 340-310.0CP.

Lonza Ltd.: *See—*
Greth, Erich, 4,039,570, Cl. 260-468.00K.

Loos, Kurt: *See—*
Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, 4,039,021, Cl. 160-202.000.

Lopez, Alvaro G., to United States of America, Navy. Explosive closure valve. 4,038,900, Cl. 89-1.00B.

Loth, William D.: *See—*
Burkhardt, Joseph A.; Loth, William D.; and Pattison, Martin O., 4,039,025, Cl. 166-.500.

Lotte, Andre M., to Societe Alsacienne de Constructions Mecaniques de Mulhouse. Doctor blade holders for screen process printing machines. 4,038,919, Cl. 101-120.000.

Loveland, Winton: *See—*
Warshaw, Saul; Loveland, Winton; and Hanemann, Horst J., 4,039,367, Cl. 156-486.000.

Lovenberg, Emil H.: *See—*
Severin, Roger; and Lovenberg, Emil H., 4,039,786, Cl. 200-163.000.

Loveshaw Corporation, The: *See—*
Warshaw, Saul; Loveland, Winton; and Hanemann, Horst J., 4,039,367, Cl. 156-486.000.

Lowe, Keith B.: *See—*
Coxhill, Major; Unger, Jerome R.; and Lowe, Keith B., 4,039,151, Cl. 241-191.000.

Lowe, Peter R.: *See—*
Quarton, William T.; and Lowe, Peter R., 4,039,784, Cl. 235-151.000.

Lucas, Arthur C.; Moss, Robert H.; and Kapsar, Barbara M., to Harshaw Chemical Company, The. Thermoluminescent CaF_2 (Tm) and method for its use. 4,039,834, Cl. 250-337.000.

Lucas Electrical Limited: *See—*
Hill, William Frank, 4,039,638, Cl. 261-72.00R.

Ludwig, James E. Arrow holder. 4,038,960, Cl. 124-41.00A.

Lukas, Stephen J., to General Electric Company. Remotely controlled phase shifting circuit. 4,039,930, Cl. 323-108.000.

Lummus Company, The: *See—*
Tsao, Utah, 4,039,597, Cl. 260-654.00A.

Luo, Fang-Chen, to Westinghouse Electric Corporation. Thin film transistor and display panel using the transistor. 4,040,073, Cl. 357-4.000.

Lutgen, Harold Michael; and Rezac, Terrence E., to Beatrice Foods Co. Liquefied gas container of large capacity. 4,038,832, Cl. 62-45.000.

Luthy, Ronald K., to West American Rubber Co. Backflow valve mounting and sealing device. 4,039,004, Cl. 137-527.000.

Luursema, Meerten: *See—*
Chermin, Hubertus Mathias Jozef; Luursema, Meerten; Rozenboom, Jaap; and Smulders, Herman Adrianus Godefridus, 4,039,895, Cl. 315-101.000.

Lynch, James Edward: *See—*
Cobaugh, Robert Franklin; and Lynch, James Edward, 4,039,239, Cl. 339-97.00R.

Lynkeus Corporation, The: *See—*
Pickering, Norman C., 4,039,269, Cl. 417-475.000.

Lyon, Floyd A., to Halm Instrument Co., Inc. Evacuated solar heat collector. 4,038,965, Cl. 126-271.000.

Lythall, David John; and Wilson, Eric Martin, to BOC International Limited. Underwater welding. 4,039,798, Cl. 219-72.000.

MacDonald, Malcolm F., to Electronics Corporation of America. Flame monitoring system. 4,039,844, Cl. 250-554.000.

Machinefabriek Lalesse: *See—*
Caris, Josephus Antonius Marie; and de Goede, Johannes Antonius, 4,039,168, Cl. 259-9.000.

Mack Gordon: *See—*
Harsch, Thomas B., 4,039,803, Cl. 219-147.000.

MacMillan, Roderic A. Musical instrument tuning apparatus. 4,038,899, Cl. 84-454.000.

MacRae, Alfred Urquhart: *See—*
Fraser, David Bruce; and MacRae, Alfred Urquhart, 4,039,698, Cl. 427-34.000.

Maddens, Francis Paul: *See—*
Caron, Francois Gabriel; Desblache, Andre Eugene; Godard, Dominique Noel; and Maddens, Francis Paul, 4,039,748, Cl. 178-69.100.

Maeda, Katsumi: *See—*
Tamura, Masamitu; Maeda, Katsumi; Harada, Nobuhiko; and Nakamura, Sigeharu, 4,039,148, Cl. 214-21.000.

Maeda, Kazuo: *See—*
Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, 4,038,992, Cl. 131-10.700.

Maeda, Yo: *See—*
Inoue, Mitsuhiro; Maeda, Yo; Suzuki, Satoshi; Ohashi, Shozo; and Nakamura, Yoshiharu, 4,039,006, Cl. 138-129.000.

Maeder, Claude R., to Pont-A-Mousson S.A. Synchronous motor having a variable reluctance. 4,039,908, Cl. 318-166.000.

Maejima, Masatsugu: *See—*
Isawa, Kazuo; Maejima, Masatsugu; and Nagasaka, Hideo, 4,039,697, Cl. 427-27.000.

Maggi, Louis: *See—*
Albanese, Andres; and Maggi, Louis, 4,039,309, Cl. 65-2.000.

Magiera, David L., to Wicks & Nemer, P.A. Combined card and board game apparatus. 4,039,192, Cl. 273-134.0AT.

Magyary, Andrew K.: *See—*
Teeple, Lawrence R., Jr.; Magyary, Andrew K.; and Severs, Kenneth N., 4,039,256, Cl. 352-184.000.

Mahler, Dan E. Dermatome. 4,038,986, Cl. 128-305.500.

Maisonneuve, Paul; and Rouyer, Paul, to Rhone-Poulenc Industries. Apparatus for separation by decantation. 4,039,458, Cl. 210-513.000.

Maistrelli, Roger: *See—*
Pruvot, Francois C.; Maistrelli, Roger; and Bauchet, Pierre, 4,039,061, Cl. 192-4.00A.

Makas, Stanley: *See—*
McGuire, Winston B.; and Makas, Stanley, 4,038,792, Cl. 52-105.000.

Maki, Richard R., to United States Steel Corporation. Spiral classifier having primary and secondary coarse solids fraction discharge. 4,039,436, Cl. 209-464.000.

Makino, Motohiko: *See—*
Sasaki, Yoshinori; Yokoyama, Isao; Makino, Motohiko; Awaji, Syun; and Hosoya, Kaneo, 4,039,417, Cl. 204-196.000.

Makizawa, Yoshiaki: *See—*
Yoshida, Takekazu; Makizawa, Yoshiaki; and Tanaka, Tamotsu, 4,039,114, Cl. 228-1.00R.

Males, Robert E., to Textron, Inc. Pneumatically operated fastener driving device with improved main valve assembly. 4,039,113, Cl. 227-130.000.

Malofsky, Bernard M.: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,039,705, Cl. 428-40.000.

Malone, Laurence A. Synthetic epoxide enamel like coating compound. 4,039,548, Cl. 260-29.2EP.

Mancini, Thomas P., to Coastal Industries, Inc. Cyanuric acid compound colorimetric indicator and method for use. 4,039,284, Cl. 23-230.00B.

Mancke, Vernon B.: *See—*
Kwasnoski, Daniel; and Mancke, Vernon B., 4,039,349, Cl. 134-10.000.

Mann, Arnold; Heimbach, Ludolf; and Schlick, Horst, to VDO Adolf Schindling AG. Apparatus for controlling the traveling speed of a motor vehicle. 4,039,043, Cl. 180-108.000.

Marathon Oil Company: *See—*
Argabright, Perry A.; Echelberger, Larry M.; and Phillips, Brian L., 4,039,485, Cl. 260-2.20R.

Marconi Company Limited, The: *See—*
Cross, Malcolm Geoffrey; and Dawson, John Howard, 4,040,057, Cl. 343-17.1PF.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Device for retaining a chain of stitches in a sewing machine. 4,038,933, Cl. 112-288.000.

Margiloff, Henry. Traffic signaling attachment device for bicycles. 4,038,935, Cl. 116-35.00R.

Mariner, Charlie Dwain: *See—*
Shlesinger, B. Edward, Jr.; and Mariner, Charlie Dwain, 4,039,985, Cl. 335-153.000.

Marinescu, Matei, to Institutul de Cercetaro Energetice Industriale si Proictari Utilaje Energetice. High efficiency thermoelectric generator for the direct conversion of heat into electrical energy. 4,039,352, Cl. 136-205.000.

Marion Power Shovel Company, Inc.: *See—*
Sankey, Edwin W.; Barden, Kenneth L.; and Ruch, Paul, 4,038,765, Cl. 37-116.000.

Mark, Victor, to General Electric Company. Non-opaque flame retardant polycarbonate composition. 4,039,509, Cl. 260-45.80R.

Marquardt, Robert F.; Hartman, Grant H., Jr.; and Goodnight, Kenneth C., Jr., to Mead Johnson & Company. Soy lipid-protein concentrate. 4,039,696, Cl. 426-598.000.

Marsh, Arthur H.; and Gupta, Prabodh Chandra, to Otis Elevator Company. Thrust control circuit. 4,039,907, Cl. 318-135.000.

Marsh, Harold E., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; and Marsh, Harold E., Jr., 4,039,489, Cl. 260-2.5AD.

Marshall, Stuart Malcolm: *See—*
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 4,039,544, Cl. 260-256.40F.

Marston Excelsior Limited: *See—*
Hayfield, Peter Charles Steele, 4,039,400, Cl. 204-38.00R.

Martell, Dennis J.: *See—*
Long, George; Martell, Dennis J.; and Batz, James E., 4,040,046, Cl. 340-310.0CP.

Martin, Jean-Claude, to Centre Electronique Horloger S.A. Quartz thermometer. 4,039,969, Cl. 331-40.000.

Martin & Pagenstecher GmbH: *See—*
Beckers, Karl Dieter, 4,039,175, Cl. 266-281.000.

Martin, Raymond G.: *See—*
Hahn, Norman; and Martin, Raymond G., 4,039,108, Cl. 226-171.000.

Martin, Wolfgang: *See—*
Franke, Hermann; Kuckes, Willi; and Martin, Wolfgang, 4,039,248, Cl. 350-96.00B.

Marvin Glass & Associates: *See—*
Breslow, Jeffrey D.; Hicks, Alan A.; and Disko, Harry, 4,039,184, Cl. 273-1.00E.
Breslow, Jeffrey D., 4,039,191, Cl. 273-125.00R.

Marx, Ralph J.: *See—*
Golembeck, Gerald A.; and Marx, Ralph J., 4,038,711, Cl. 5-263.000.

Maryland Shipbuilding & Drydock Company: *See—*
Elliott, Richard Louis, Jr.; Borkowski, William John; and Pfister, Thomas Warren, 4,039,854, Cl. 307-118.000.

Marynissen, William E., to Bic Pen Corporation. Transfer apparatus. 4,039,088, Cl. 214-1.0BT.

Mas, Louis, to Societe de Recherches Techniques et Industrielles. Apparatus for the electrolysis of water which operates under pressure. 4,039,421, Cl. 204-266.000.

Maschinenfabrik Augsburg-Nurnberg AG: *See—*
Degen, Norbert, 4,038,928, Cl. 104-242.000.

Massachusetts Institute of Technology: *See—*
Baker, Richard H., 4,039,909, Cl. 318-197.000.

Massey-Ferguson Services N.V.: *See—*
Arnould, Jean; McNaught, James B.; and Andiano, Jose, 4,038,809, Cl. 56-124.000.
Croucher, Kenneth W., 4,039,434, Cl. 209-28.000.

Massonne, Joachim; and Becher, Wilfried, to Kali-Chemie Aktiengesellschaft. Process for preparing sulphur hexafluoride. 4,039,646, Cl. 423-469.000.

Masuda, Takao: *See—*
Ikenque, Shinpei; Masuda, Takao; and Iwata, Yuzo, 4,039,334, Cl. 96-114.100.

Masuda, Toyotsugu: *See—*
Ichiryu, Ken; Shigeta, Masayuki; Masuda, Toyotsugu; and Kinoshita, Haruo, 4,038,848, Cl. 72-8.000.

Mater, Milton H.; and Torley, Robert E., to Mater, Milton H. Wind powered generating systems. 4,039,849, Cl. 290-55.000.

Materese, Vincent, to Dayton Manufacturing Company. Watertight lamp fixture. 4,039,820, Cl. 240-26.000.

Mathews, James Kirk: *See—*
Noftsker, Russell; and Mathews, James Kirk, 4,039,928, Cl. 323-19.000.

Matsuda, Kaneo; and Fujimura, Noboru, to Sanyo Chemical Industries, Ltd. Hydroextracting composition for wet and finely pulverized ores. 4,039,466, Cl. 252-194.000.

Matsuda, Masaaki: *See—*
Ban, Kouichi; Namba, Yasumiti; Sekine, Yukihiro; and Matsuda, Masaaki, 4,039,446, Cl. 210-38.00B.

Matsuda, Tadashi; and Yanagisawa, Kunia, to PPG Industries, Inc. Laminated safety glass. 4,039,719, Cl. 428-424.000.

Matsumoto, Masao: *See—*
Yamada, Norio; Matsumoto, Masao; Adachi, Tsutomu; Imai, Hirozo; and Kubo, Masao, 4,038,749, Cl. 30-43.920.

Matsumoto, Shuichi: *See—*
Ikeda, Hiroharu; Matsumoto, Shuichi; Enyo, Hiroji; Oshima, Noboru; and Komatsu, Koei, 4,039,491, Cl. 260-4.00R.

Matsunaga, Hisashi; Horii, Yosinobu; and Higasiguchi, Masaya, to Nippon Steel Corporation. Method for producing a grain-oriented electrical steel by an oxygen-blown convertor. 4,039,321, Cl. 75-60.000.

Matsuo, Koichi: *See—*
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 4,038,887, Cl. 74-769.000.
Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 4,038,888, Cl. 74-765.000.

Matsuo, Takashi: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.

Matsuoka, Kikuo: *See—*
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,039,704, Cl. 427-284.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Kanno, Masashi; Miki, Sukeichi; Takezaki, Tsuneo; and Ninomiya, Syuichi, 4,039,752, Cl. 179-15.0BT.
Nakagawa, Takamichi, 4,039,194, Cl. 274-10.00R.
Yoshida, Takekazu; Makizawa, Yoshiaki; and Tanaka, Tamotsu, 4,039,114, Cl. 228-1.00R.

Matsushita Electric Works Ltd.: *See—*
Yamada, Norio; Matsumoto, Masao; Adachi, Tsutomu; Imai, Hirozo; and Kubo, Masao, 4,038,749, Cl. 30-43.920.

Matthes, Heinz: *See—*
Fuchs, Peter; Gerhards, Erich; Matthes, Heinz; Wendt, Hans; and Wiechert, Rudolf, 4,039,668, Cl. 424-241.000.

Matthies, Hans Georg: *See—*
Rebhan, Joerg; and Matthies, Hans Georg, 4,039,515, Cl. 260-75.00M.

Matubayasi, Hisao: *See—*
Miura, Mitugi; Matubayasi, Hisao; and Iwai, Syojiro, 4,039,447, Cl. 210-42.00S.

Matyas, Honthegyi: *See—*
Mihaly, Nemeth; and Matyas, Honthegyi, 4,038,772, Cl. 43-17.000.

Mauri, Marcello Massi: *See—*
Ancillotti, Francesco; Pescarollo, Ermanno; and Mauri, Marcello Massi, 4,039,590, Cl. 260-614.00A.

Maxted, Wesley R., to Rapistan, Incorporated. Unscrambler for randomly arranged packages. 4,039,074, Cl. 198-456.000.

May & Baker Limited: *See—*
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 4,039,544, Cl. 260-256.40F.

Mayer, Edward A.; Brandenburg, John T.; Crone, John M., Jr.; and Ropes, Charles A., Jr. Filter for internal combustion exhaust gases. 4,039,294, Cl. 23-288.0FB.

Mayer, Horst. Exhaust apparatus and monitoring circuit therefor. 4,040,042, Cl. 340-239.00F.

Mayer, Rayner Michael: *See—*
Cooper, George Anthony; Mayer, Rayner Michael; and Watt, William, 4,039,341, Cl. 106-56.000.

Mayes, Donald S.: *See—*
DeFoney, George F.; Mayes, Donald S.; and Brenman, Henry S., 4,039,653, Cl. 424-19.000.

Maytag Company, The: *See—*
Goodlaxson, John D.; and Ross, Frank E., 4,039,209, Cl. 285-8.000.

MB Associates: *See—*
Adamski, Donald F.; and Morrison, Sol L., 4,039,091, Cl. 214-77.00R.

McAleer, William J.; and Wasmuth, Edward H., to Merck & Co., Inc. Separating antigen from residual common sensitizing protein. 4,039,657, Cl. 424-89.000.

McAllister, David E. Wheelchair storage apparatus. 4,039,096, Cl. 214-450.000.

McArthur, Dennis P., to Union Oil Company of California. Process for rejuvenating automobile emission control catalysts. 4,039,471, Cl. 252-412.000.

McCarthy, Neil Justin, Jr., to Union Carbide Corporation. Aqueous phenolic resole dispersion containing certain hydroxyalkylated gums as interfacial agents. 4,039,525, Cl. 260-17.200.

McCartney, Carl Lane: *See—*
Cheek, Robert L., 4,039,003, Cl. 137-516.290.

McClaine, Andrew W., to United States of America, Navy. Method and apparatus for heat transfer, using metal hydrides. 4,039,023, Cl. 165-2.000.

McCloskey, Albert R., to Heim Universal Corporation. Method of manufacturing a self-aligning bearing with a deformable inner member. 4,038,733, Cl. 29-149.50B.

McConnell, Robert B.: *See—*
Throckmorton, Peter E.; Sigan, J. W.; and McConnell, Robert B., 4,039,565, Cl. 260-459.00A.

McCosker, Doris C. Sanitary face mask. 4,038,979, Cl. 128-141.00R.

McCoy, Frederic C., to Texaco Inc. Synthetic polyester-based lubricants possessing a wide range of desirable physical characteristics including solubility in mineral oil. 4,039,462, Cl. 252-51.50A.

McCuaig, Franklin D., to United States of America, Energy Research and Development Administration. Pu-ZR Alloy high-temperature activation-measurement foil. 4,039,378, Cl. 176-70.000.

McDonie, Arthur Frederick, to RCA Corporation. Electron emitter including porous antimony. 4,039,887, Cl. 313-346.00R.

McDonnell Douglas Corporation: *See—*
Bauer, Andrew B., 4,039,161, Cl. 244-213.000.
Walpole, Harold L., 4,040,004, Cl. 340-26.000.

McDowell-Wellman Engineering Company: *See—*
Ban, Thomas E., 4,039,427, Cl. 208-11.00R.

McFall, Jim; Cicero, Jim; and Phillips, Tom. Above the knee prosthesis donning device. 4,038,701, Cl. 3-1.000.

McGettrick, Charles A. Infrared energy generator with orifice plate. 4,039,275, Cl. 431-329.000.

McGinniss, Vincent D., to SCM Corporation. Ultraviolet curing of electrocoating compositions. 4,039,414, Cl. 204-181.000.

McGonegle, James C. Rear wheel suspension system for a motorcycle. 4,039,200, Cl. 280-284.000.

McGregor, Harold R. Apparatus for feeding tags. 4,038,922, Cl. 101-232.000.

McGuire, Winston B.; and Makas, Stanley, to W. B. McGuire Co., Inc. Wear protector for truck dock door seal. 4,038,792, Cl. 52-105.000.

McLyman, W. T.: *See—*
United States of America, National Aeronautics and Space Administration; McLyman, W. T.; and Wester, Gene W., 4,039,925, Cl. 363-70.000.

McNaught, James B.: *See—*
Arnould, Jean; McNaught, James B.; and Andiano, Jose, 4,038,809, Cl. 56-124.000.

McPhee, Willard J.: *See—*
Knibbe, Jan C.; and McPhee, Willard J., 4,038,894, Cl. 83-411.00R.

McTeague, Gerald E.; and Stinger, Kenneth R., to Tektronix, Inc. Cathode ray storage tube having a target dielectric provided with particulate segments of collector electrode extending therethrough. 4,039,896, Cl. 315-135.00T.

Mead Johnson & Company: *See—*
Marquardt, Robert F.; Hartman, Grant H., Jr.; and Goodnight, Kenneth C., Jr., 4,039,696, Cl. 426-598.000.

Measuregraph Company, The: *See—*
Newell, John A., 4,039,805, Cl. 235-151.320.

Mechanical Products: *See—*
Kerr, Maxwell A., 4,039,993, Cl. 337-366.000.

Medico Developments, Inc.: *See—*
Chiulli, Robert D., 4,038,985, Cl. 128-304.000.

Medley, Harold C., to Shugart Associates, Inc. Flexible magnetic disc drive apparatus. 4,040,106, Cl. 360-99.000.

Medtronic, Inc.: *See—*
Thompson, David L., 4,038,990, Cl. 128-419.0PG.

Mee Industries, Inc.: *See—*
Mee, Thomas R., 4,039,144, Cl. 239-2.00R.

Mee, Thomas R., to Mee Industries, Inc. Environmental control method and apparatus. 4,039,144, Cl. 239-2.00R.

Mehrhof, Werner: *See—*
Schacht, Erich; Lauterbach, Gunter; Mehrhof, Werner; Nowak, Herbert; and Simane, Zdenek, 4,039,683, Cl. 424-324.000.

Mellor, Harrison Clay; and Peacock, Lawrence A., to Arguto, Inc. Machine for testing and comparing bearings and bearing materials. 4,038,863, Cl. 73-9.000.

Melvin, William W. Composite situation analyzer and instrument flight system. 4,040,005, Cl. 340-27.0AT.

Mendoza, Luis Enrique: *See—*
Himes, Glenn R.; and Mendoza, Luis Enrique, 4,039,629, Cl. 260-876.00B.

Mennekes, Werner: *See—*
Moebus, Dieter; Mennekes, Werner; and Podjadtke, Rudi, 4,038,829, Cl. 61-84.000.

Merck & Co., Inc.: *See—*
McAleer, William J.; and Wasmuth, Edward H., 4,039,657, Cl. 424-89.000.

Merck Patent Gesellschaft mit beschrankter Haftung: *See—*
Schacht, Erich; Lauterbach, Gunter; Mehrhof, Werner; Nowak, Herbert; and Simane, Zdenek, 4,039,683, Cl. 424-324.000.

Merrell Toraude et Compagnie: *See—*
Metcalf, Brian Walter; and Jung, Michel, 4,039,549, Cl. 260-293.860.

Merz, Jurg; and Schibler, Luzius, to Ciba-Geigy Corporation. Process for the manufacture of alkoxylated N-methylol ureas. 4,039,576, Cl. 260-553.00R.

Merz, Kenneth M.: *See—*
Huang, Cornelius Y. D.; and Merz, Kenneth M., 4,039,997, Cl. 338-308.000.

Messerschmitt-Bolkow-Blohm GmbH: *See—*
Jonda, Wolfgang, 4,038,885, Cl. 74-581.000.

Messerschmitt, David Gavin, to Bell Telephone Laboratories, Incorporated. Tandem block digital processor for use with nonuniformly encoded digital data. 4,040,049, Cl. 340-347.0DD.

Meszaros, Csilla: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,039,589, Cl. 260-618.00B.

Metcalf, Brian Walter; and Jung, Michel, to Merrell Toraude et Compagnie. Olefinic derivatives of amino acids. 4,039,549, Cl. 260-293.860.

Mettler Instrumente AG: *See—*
Baumgartner, Max; Bucher, Anton; and Utzinger, Diethelm, 4,039,036, Cl. 177-212.000.

Metzger, Karl Georg: *See—*
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,039,673, Cl. 424-271.000.

Meyer, Yves; Le Marchand, Claude; and Gerard, Jean-Louis, to Societe Anonyme D.B.A. Protecting device for the cylindrical sliding surfaces of a disc brake. 4,039,053, Cl. 188-73.300.

Meyer, Yves; and Courbot, Pierre, to Societe Anonyme D.B.A. Automatic slack adjuster for drum brakes. 4,039,055, Cl. 188-79.5GC.

Micetich, Ronald G.; and Morin, Robert B., to Connlab Holdings Limited. Thioamides. 4,039,530, Cl. 260-239.00A.

Michel, Eberhard: *See—*
Harand, Elmar; and Michel, Eberhard, 4,039,380, Cl. 176-87.000.

Michel, Walter: *See—*
Schon, Manfred; Durr, Helmut; Plath, Dieter; Keller, Karlfried; and Michel, Walter, 4,039,493, Cl. 260-21.000.

Michelmore, John Roger: *See—*
Andrews, Arthur William; Heber, Eric Lewis; Michelmore, John Roger; and Nicholls, John, 4,038,867, Cl. 73-88.50R.

Michelsen, Johan L., to American Defibrator, Inc. Static discharge device and method for fiber discharge from a pressurized digester. 4,039,373, Cl. 162-52.000.

Michlmayr, Manfred J., to Chevron Research Company. Upgrading metal-contaminated petroleum oils containing vanadium and/or nickel. 4,039,432, Cl. 208-252.000.

Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Protection switching system for microwave radio. 4,039,947, Cl. 325-2.000.

Mihaly, Nemeth; and Matyas, Honthegyi. Fishing rod with an improved bite detector arrangement. 4,038,772, Cl. 43-17.000.

Mijares, Anthony J., Jr.: *See—*
Mijares, John Anthony, Jr.; Petrie, Ross J.; Mijares, John Anthony, Sr.; and Alvarez, Charles S., 4,039,104, Cl. 222-144.500.

Mijares, John Anthony, Jr.; Petrie, Ross J.; Mijares, John Anthony, Sr.; and Alvarez, Charles S., to Mijares, Anthony J., Jr. Wall mounted multiple-unit dispenser with rotary discharge assistants. 4,039,104, Cl. 222-144.500.

Mijares, John Anthony, Sr.: *See—*
Mijares, John Anthony, Jr.; Petrie, Ross J.; Mijares, John Anthony, Sr.; and Alvarez, Charles S., 4,039,104, Cl. 222-144.500.

Mikami, Yasuie; Takei, Ippo; Soma, Kazuo; and Morimoto, Yasuo, to Nittetsu Mining Company, Limited. Production of aluminum sulfate. 4,039,615, Cl. 423-128.000.

Miki, Sukeichi: *See—*
Kanno, Masashi; Miki, Sukeichi; Takezaki, Tsuneo; and Ninomiya, Syuichi, 4,039,752, Cl. 179-15.0BT.

Mikulicz, Michael Z.; and Burton, Vance P., to UOP Inc. Vapor pressure-adjusted motor fuel alkylate of reduced fluoride content. 4,039,603, Cl. 260-683.420.

Miles Laboratories, Inc.: *See—*
Adams, Ernest Clarence; Davis, Joe William; and Yoder, John Menley, 4,039,652, Cl. 424-1.000.

Miller, Alfred D., to ICI United States Inc. Treatment of increased body temperature with substituted hexahydro-1H-furo(3,4-c)pyrrole compounds. 4,039,679, Cl. 424-274.000.

Miller, Craig Salvatore. Mattress construction. 4,038,712, Cl. 5-371.000.

Miller, Ellsworth S.: *See—*
DuRocher, Gideon A.; and Miller, Ellsworth S., 4,038,743, Cl. 29-628.000.

Miller, G. Kirby: *See—*
Laymon, Marvin D.; and Miller, G. Kirby, 4,040,044, Cl. 340-261.000.

Miller, Glen Elwood, to Boeing Company, The. Method for precision casting of clad optical components. 4,039,607, Cl. 264-1.000.

Miller, Henry Francis; and Hoard, Michael George, to Lockheed Aircraft Corporation. Fluid separation device for low temperature environments. 4,039,454, Cl. 210-242.00S.

Miller, Leland D. Load safety device for revolvers. 4,038,771, Cl. 42-1.0LP.

Miller, Russell A. Grain dryer. 4,038,758, Cl. 34-48.000.

Milliard, Norman L.: *See—*
Murray, Jeffrey J.; Bachiochi, Jeffrey L.; and Milliard, Norman L., 4,038,897, Cl. 84-1.160.

Minami, Katsuhei: *See—*
Nishikawa, Yasuo; Okamura, Takeo; and Minami, Katsuhei, 4,039,344, Cl. 106-66.000.

Minami, Norio: *See—*
Kijima, Shizumasa; Yamatsu, Isao; Hamamura, Kimio; Minami, Norio; Yamagishi, Youji; and Inai, Yuichi, 4,039,573, Cl. 260-479.00R.

Minamii, Nobuaki: *See—*
Nagaoka, Joji; Yamashita, Kazuhiko; Minamii, Nobuaki; Miyagawa, Tsutomu; and Sugano, Masahiko, 4,039,527, Cl. 260-192.000.

Minerec Corporation: *See—*
Bell, Fred S., III; Crozier, Ronald D.; and Strow, Lawrence Evans, 4,039,569, Cl. 260-463.000.

Minhinnick, James W., to U.S. Industries, Inc. Auto molding with integrally molded connector. 4,039,215, Cl. 293-71.00R.

Minnesota Mining and Manufacturing Company: *See—*
Gobran, Ramsis, 4,039,724, Cl. 428-525.000.
Smith, George H., 4,039,521, Cl. 260-141.000.

Minolta Camera Kabushiki Kaisha: *See—*
Nanba, Yasuhiro, 4,039,824, Cl. 250-201.000.
Nanba, Yasuhiro; and Sahara, Masayoshi, 4,040,068, Cl. 354-24.000.

Mirny, Igor Nikolaevich: *See—*
Ostashko, Fedor Ivanovich; and Mirny, Igor Nikolaevich, 4,039,934, Cl. 324-30.00R.

Misaki, Satoru: *See—*
Iwata, Hiroshi; and Misaki, Satoru, 4,039,898, Cl. 315-241.00P.

Misawa, Yutaka: *See—*
Tanaka, Tomoyuki; Okamura, Masahiro; Ogawa, Takuzo; and Misawa, Yutaka, 4,040,084, Cl. 357-55.000.

Misiak, Carl W. Fishing plug. 4,038,774, Cl. 43-42.090.

Missouri Province Educational Institute: *See—*
Burtschi, Richard, 4,039,756, Cl. 179-1.0AL.

Mitrushev, Marin Dimitrov: *See—*
Stoev, Stoycho Mitrev; Mitrushev, Marin Dimitrov; Boshilov, Grozdan Todorov; and Radeva, Maria Georgieva, 4,039,456, Cl. 210-388.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Shibayama, Kyoichi; Sato, Fumihiko; and Takahama, Takashi, 4,039,415, Cl. 204-181.000.

Mitsuhata, Masashi; Kumazawa, Toshihiko; and Kiguchi, Isamu, to Nippon Shokubai Kagaku Kogyo. Process for preparing ethylene oxide. 4,039,561, Cl. 260-348.340.

Mitsui Mining & Smelting Co., Ltd.: *See—*
Kawakami, Kozi; and Iseri, Makoto, 4,039,418, Cl. 204-198.000.
Takesue, Tatsuo, 4,039,408, Cl. 204-119.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Tomoshige, Toru, 4,039,560, Cl. 260-346.300.

Mittleman, Herbert; and Ruschke, Ricky Robert, to Baxter Travenol Laboratories, Inc. Fluid infusion pump. 4,038,983, Cl. 128-214.00C.

Miura Engineering International Company Ltd.: *See—*
Miura, Mitugi; Matubayasi, Hisao; and Iwai, Syojiro, 4,039,447, Cl 210-42.00S.

Miura, Mitugi; Matubayasi, Hisao; and Iwai, Syojiro, to Miura Engineering International Company Ltd. Waste water treatment method and apparatus. 4,039,447, Cl. 210-42.00S.

Miura, Norio: *See—*
Shimiya, Keiji; and Miura, Norio, 4,039,840, Cl. 250-486.000.

Miura, Shuji: *See—*
Tanaka, Toshio; Kurozumi, Seizi; Toru, Takeshi; Miura, Shuji; Kobayashi, Makiko; and Ishimoto, Sachio, 4,039,563, Cl. 260-410.90R.

Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, to Dow Chemical Company, The. 1,3-Dithiolo(4,5-b)pyrazin-2-ylidene-propanedinitrile 4-oxide. 4,039,727, Cl. 428-541.000.

Miyagawa, Hiroshi: *See—*
Ogasa, Katsuhiro; Shimamura, Seiichi; and Miyagawa, Hiroshi, 4,039,386, Cl. 195-100.000.

Miyagawa, Tsutomu: *See—*
Nagaoka, Joji; Yamashita, Kazuhiko; Minamii, Nobuaki; Miyagawa, Tsutomu; and Sugano, Masahiko, 4,039,527, Cl. 260-192.000.

Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, to Toyo Seikan Kaisha Limited. Method for applying a sealant to can ends. 4,039,704, Cl. 427-284.000.

Miyamoto, Keiichi; and Inoue, Naohiko, to Nissan Motor Co., Ltd. Exhalation inspecting apparatus. 4,039,852, Cl. 307-326.000.

Miyamoto, Masao: *See—*
Aya, Masahiro; Miyamoto, Masao; and Fukazawa, Nobuo, 4,039,313, Cl. 71-88.000.

Miyata, Kenichi: *See—*
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,039,704, Cl. 427-284.000.

Miyauchi, Kazuhiro: *See—*
Ishio, Hideki; Seki, Seizo; and Miyauchi, Kazuhiro, 4,039,961, Cl. 329-50.000.

Mizuno, Fumio; Takeuchi, Fumio; and Kobayashi, Shunsuke, to Energy Systems, Ltd. Field-effect liquid crystal-type display device. 4,039,252, Cl. 350-160.0LC.

Mizuno, Mamoru, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Magnetic card-reader with movable magnetic head. 4,040,097, Cl. 360-2.000.

Mizutani, Hiroshi, to Nippon Dyeing Machine Mfg. Co., Ltd. Apparatus of continuously treating wide knitted fabric. 4,038,842, Cl. 68-177.000.

Mizutani, Toshio: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.

Mobil Oil Corporation: *See—*
Chang, Clarence D., 4,039,600, Cl. 260-668.00R.
Huffhines, Donald F.; Jones, J. S.; and Smith, Clarence G., 4,039,127, Cl. 346-110.00R.

Modcom, Inc.: *See—*
Klein, Paul E., 4,038,753, Cl. 32-14.00E.

Moe, Kjell. Medicine dispenser and method. 4,038,937, Cl. 116-121.000.

Moebus, Dieter; Mennekes, Werner; and Podjadtke, Rudi, to Bochumer Eisenhutte Heintzmann & Company. Method of and apparatus for lining a tunnel. 4,038,829, Cl. 61-84.000.

Molins Limited: *See—*
Garton, William Robert; and Clarke, Peter Alec, 4,039,071, Cl. 198-425.000.

Mollart Engineering Company, Limited, The: *See—*
Nohejl, Antonin, 4,038,739, Cl. 29-568.000.

Mollon, Leslie, to Brooks & Perkins, Incorporated. Fuel storage rack. 4,039,842, Cl. 250-518.000.

Monarch Marking Systems, Inc.: *See—*
Keefe, Jack D., 4,038,725, Cl. 24-150.0FP.

Monck, Charles S. P.: *See—*
Monck, John M.; and Monck, Charles S. P., 4,038,760, Cl. 34-109.000.

Monck, John M.; and Monck, Charles S. P. Crop drying apparatus. 4,038,760, Cl. 34-109.000.

Monier, Jean-Claude: *See—*
Bulteau, Gerard; Acher, Jacques; Collignon, Claude; and Monier, Jean-Claude, 4,039,672, Cl. 424-269.000.

Monks, Harry, to Coal Industry (Patents) Limited. Electric motor with fluid operated clutch. 4,039,057, Cl. 192-.02R.

Monsanto Company: *See—*
Bailey, Paul T.; Craford, M. George; Findlay, Alexander G.; and Underwood, Robert K., 4,039,890, Cl. 313-500.000.
Bowling, George W.; Conlisk, Peter J.; and Lenzen, Kenneth H., 4,039,050, Cl. 188-1.00B.
Eby, Roy T., 4,039,395, Cl. 203-38.000.
Uriarte, Anthony K., 4,039,598, Cl. 260-655.000.
Wei, YuWen, 4,039,428, Cl. 203-37.000.

Montavon, Marc: *See—*
Bohni, Erika; and Montavon, Marc, 4,039,667, Cl. 424-229.000.

Montedison Fibre S.p.A.: *See—*
Montino, Franco; and Colombo, Luigi, 4,039,317, Cl. 75-.50A.

Montevideo Technology, Inc.: *See—*
Clift, Charles Edward, 4,039,944, Cl. 324-150.000.

Montino, Franco; and Colombo, Luigi, to Montedison Fibre S.p.A. Process for the preparation of silver powder. 4,039,317, Cl. 75-.50A.

Moody, J. Burnett: *See—*
DuPont, Achiel M., Jr.; Moody, J. Burnett; and Newlon, Roger L., 4,038,905, Cl. 89-43.00R.

Moody, Jacob H.: *See—*
Brill, Henry L.; and Moody, Jacob H., 4,040,066, Cl. 354-10.000.

Moore Business Forms, Inc.: *See—*
D'Luhy, Emil A., 4,039,046, Cl. 282-22.00R.

Moore, Douglas: *See—*
Kniepkamp, Alberto; and Moore, Douglas, 4,038,898, Cl. 84-1.240.

Moore, E. T., Jr.: *See—*
Godfrey, Charles S.; Moore, E. T., Jr.; and Mumma, Douglas M., 4,039,030, Cl. 166-299.000.

Moore, Mary A. System for monitoring the weight of a patient. 4,038,973, Cl. 128-1.00B.

Moran, Byron L., to Instrumentation Laboratory, Inc. Continuous calibration system and method for analytical instruments. 4,039,933, Cl. 324-29.000.

Moran, John J., to Hycel, Inc. Reaction conveyor assembly in an automatic chemical testing apparatus. 4,039,287, Cl. 23-253.00R.

Moran, John J., to Hycel, Inc. Automatic chemical testing apparatus incorporating improved conveyor system. 4,039,288, Cl. 23-253.00R.

Moran, Joseph F., Jr. Scissors with handle formed from sinusoidal blank. 4,038,750, Cl. 30-254.000.

Morgan, Paul Winthrop: *See—*
Hartzler, John David; and Morgan, Paul Winthrop, 4,039,502, Cl. 260-30.80R.

Morgovsky, Yakov Efimovich: *See—*
Beskin, Mikhail Davydovich; Pevtsov, Anatoly Timofeevich; Nakhamkis, Lev Grigorievich; Morgovsky, Yakov Efimovich; and Bat, Natalya Genrikhovna, 4,039,738, Cl. 13-33.000.

Mori, Katsumi: *See—*
Shiroki, Ken-ichi; Mori, Katsumi; Kuwano, Yasuhiko; and Saito, Seiichi, 4,039,970, Cl. 331-94.50F.

Mori, Kenzo; Kakuchi, Fumio; and Fujii, Kimio, to Taiyo Musen Co., Ltd. Direction finder. 4,040,058, Cl. 343-113.0PT.

Morimoto, Kiyoshi; Utamura, Yukihiko; and Takagi, Toshinori, to Futaba Denshi Kogyo K.K. Method for making phosphors. 4,039,699, Cl. 427-38.000.

Morimoto, Yasuo: *See—*
Mikami, Yasuie; Takei, Ippo; Soma, Kazuo; and Morimoto, Yasuo, 4,039.615, Cl. 423-128.000.

Morin, Robert B.: *See—*
Micetich, Ronald G.; and Morin, Robert B., 4,039,530, Cl. 260-239.00A.

Morinaga Milk Industry Co., Ltd.: *See—*
Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, 4,038,992, Cl. 131-10.700.
Ogasa, Katsuhiro; Shimamura, Seiichi; and Miyagawa, Hiroshi, 4,039,386, Cl. 195-100.000.

Morini, Ralph E.; and Turgeon, Martin D., to Stanley Works, The. Catalytic converter for oven fumes. 4,039,292, Cl. 23-288.0FC.

Moritz, Werner; Loos, Kurt; and Haschek, Friedrich, to Kabelschlepp Gesellschaft mit beschrankter Haftung. Protective cover for guiding paths of machine tools. 4,039,021, Cl. 160-202.000.

Moriya, Hisanori: *See—*
Hosho, Yukio; and Moriya, Hisanori, 4,038,957, Cl. 123-139.0AW.

Morreale, Anthony P., to Computer Devices Corporation. Method and apparatus for interconnecting stator coils. 4,039,875, Cl. 310-194.000.

Morrill, Justin S., Jr.; Farnbach, William A.; and Small, Charles T., to Hewlett-Packard Company. Logic state analyzer. 4,040,025, Cl. 364-900.000.

Morris, Harold D., to Systron Donner Corporation. Acceleration error compensated attitude sensing and control apparatus and method. 4,038,876, Cl. 73-432.00R.

Morris, John McLean; Bennett, John P.; and Kercso, Josef E., to Morris, John McLean. Intrauterine device. 4,038,978, Cl. 128-130.000.

Morrison, Robert C.: *See—*
Kamienski, Conrad W.; and Morrison, Robert C., 4,039,593, Cl. 260-635.00E.

Morrison, Sol L.: *See—*
Adamski, Donald F.; and Morrison, Sol L., 4,039,091, Cl. 214-77.00R.

Morrison, Stanley R., to Stanford Research Institute. Gas sensor. 4,039,941, Cl. 324-71.0SN.

Morrison, Ward D., to Joy Manufacturing Company. Hose training means. 4,039,032, Cl. 173-43.000.

Moschini, Augusto, to Acciaierie di Piombino S.p.A. Antiscorific powder for the casting of steels into ingot molds. 4,039,326, Cl. 75-257.000.

Moss, Robert H.: *See—*
Lucas, Arthur C.; Moss, Robert H.; and Kapsar, Barbara M., 4,039,834, Cl. 250-337.000.

Mostert, Jacob Johan, to Reverse Injection Company (Proprietary) Limited. Method of bleeding a hydraulic system and means therefor. 4,038,823, Cl. 60-584.000.

Motoren-Forschungs GmbH KG: *See—*
Franke, Walter, 4,038,954, Cl. 123-75.0CC.

Motorola, Inc.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,040,035, Cl. 364-200.000.

Moyer, Joseph Donald; and Kramm, David Edward, to W. R. Grace & Co. Pentaerythritol esters of mercapto acids plus long chain fatty acids. 4,039,723, Cl. 428-521.000.

Moyle, Maurice; Galvez, Buenaventura B.; Pease, Eric C.; and Logan, Alan, to Gulf Oil Canada Limited. Preparation of petroleum pitch. 4,039,423, Cl. 208-4.000.

Mujai, Kunio: *See—*
Kato, Toshiro; Sasaki, Mitsuru; Ooishi, Tadashi; and Mujai, Kunio, 4,039,635, Cl. 260-954.000.

Muller, Alex M., to Telautograph Corporation. Apparatus for converting the position of a manually operated instrument into an electrical signal. 4,039,747, Cl. 178-19.000.

Muller, Johannes: *See—*
Reerink, Wilhelm; Beck, Kurt-Guenther; Echterhoff, Heinrich; Muller, Johannes; Degen, Kurt; and Nashan, Gerd, 4,039,342, Cl. 106-58.000.

Mumma, Douglas M.: *See—*
Godfrey, Charles S.; Moore, E. T., Jr.; and Mumma, Douglas M., 4,039,030, Cl. 166-299.000.

Munkert, Guenter: *See—*
Zoellner, Rainer; and Munkert, Guenter, 4,040,101, Cl. 360-64.000.

Murakami, Keisuke: *See—*
Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, 4,039,660, Cl. 424-117.000.

Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, to Aisin Seiki Kabushiki Kaisha. Speed change gear. 4,038,887, Cl. 74-769.000.

Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, to Aisin Seiki Kabushiki Kaisha. Speed change gear system. 4,038,888, Cl. 74-765.000.

Murata, Taro: *See—*
Ohtomo, Koichiro; and Murata, Taro, 4,039,484, Cl. 260-2.10C.

Murata, Toshiteru: *See—*
Tahara, Sentaroo; Murata, Toshiteru; Shimaya, Seiki; and Crits, George J., 4,039,443, Cl. 210-32.000.

Murphy, John H.; and Treantos, Joseph, to Disk Brake Drum Company. Brake with inner and outer swivel-mounted shoes. 4,039,052, Cl. 188-76.000.

Murray, Jeffrey J.; Bachiochi, Jeffrey L.; and Milliard, Norman L., to Electronic Music Laboratories, Inc. Electronic music system and stringed instrument input device therefor. 4,038,897, Cl. 84-1.160.

Murrell, Lawrence L.; and Tauster, Samuel J., to Exxon Research and Engineering Company. Catalytic process for NO_X reduction under lean conditions. 4,039,622, Cl. 423-239.000.

Myers, John W.; and Garner, James W., to Phillips Petroleum Company. Hydrocarbon isomerization with increased temperature and lowered hydrogen/hydrocarbon ratio. 4,039,604, Cl. 260-683.680.

N. V. Optische Industrie "De Oude Delft": *See—*
Geluk, Ronald Jan, 4,039,815, Cl. 235-181.000.

Naarding, Willem Jacobus: *See—*
Heap, Sydney Allan; and Naarding, Willem Jacobus, 4,038,813, Cl. 57-153.000.

Naarmann, Herbert; and Pohlemann, Heinz, to BASF Aktiengesellschaft. Polymers containing formamide groups. 4,039,513, Cl. 260-67.0UA.

Nadkarni, Ravindra M.: *See—*
Hyde, Richard W.; Reber, Stephen A.; Schutte, August H.; and Nadkarni, Ravindra M., 4,039,424, Cl. 208-8.000.

Nagahama, Yasuo, to Nippon Gakki Seizo Kabushiki Kaisha. Voltage-controlled filter. 4,039,980, Cl. 333-70.00R.

Nagai, Kiichi: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 4,039,710, Cl. 428-253.000.

Nagano, Tetsuro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine. 4,038,952, Cl. 123-32.00K.

Nagano, Toshihiro: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Wada, Kenji; and Kikuchi, Masaru, 4,039,355, Cl. 148-31.500.

Nagaoka, Joji; Yamashita, Kazuhiko; Minamii, Nobuaki; Miyagawa, Tsutomu; and Sugano, Masahiko, to Wako Pure Chemical Industries, Ltd. Unsymmetrical azonitriles. 4,039,527, Cl. 260-192.000.

Nagaoka, Koichi: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 4,039,710, Cl. 428-253.000.

Nagasaka, Hideo: *See—*
Isawa, Kazuo; Maejima, Masatsugu; and Nagasaka, Hideo, 4,039,697, Cl. 427-27.000.

Nagumo, Masayuki: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 4,039,710, Cl. 428-253.000.

Naito, Shotaro: *See—*
Koizumi, Osamu; Saito, Shigeki; and Naito, Shotaro, 4,039,853, Cl. 307-101.000.

Nakagawa, Takamichi, to Matsushita Electric Industrial Co., Ltd. Automatic record player. 4,039,194, Cl. 274-10.00R.

Nakagawa, Yoshihiko: *See—*
Kitajima, Motohiro; and Nakagawa, Yoshihiko, 4,039,358, Cl. 148-187.000.

Nakagome, Yukio; Teramura, Hiroichi; Yamasaki, Yasuhiro; and Wakahara, Yasushi, to Kokusai Denshin Denwa Kabushiki Kaisha. System for coding information change picture elements in facsimile signal. 4,040,093, Cl. 358-261.000.

Nakamoto, Nobuyuki, to Hitachi, Ltd. Method of manufacturing a flattened semiconductor device. 4,039,359, Cl. 148-188.000.

Nakamura, Hideo; Ohsawa, Mitsuo; and Hamada, Osamu, to Sony Corporation. Frequency converter. 4,040,075, Cl. 357-23.000.

Nakamura, Hiromichi: *See—*
Aono, Shigeo; Nakamura, Hiromichi; and Ozawa, Hiroshige, 4,039,868, Cl. 307-273.000.

Nakamura, Sigeharu: *See—*
Tamura, Masamitu; Maeda, Katsumi; Harada, Nobuhiko; and Nakamura, Sigeharu, 4,039,148, Cl. 214-21.000.

Nakamura, Tetsuya, to Eisai Co., Ltd. Aliphatic carboxylic acid esters of Vitamin E and process for preparation thereof. 4,039,559, Cl. 260-345.500.

Nakamura, Yoshiharu: *See—*
Inoue, Mitsuhiro; Maeda, Yo; Suzuki, Satoshi; Ohashi, Shozo; and Nakamura, Yoshiharu, 4,039,006, Cl. 138-129.000.

Nakao, Masaru: *See—*
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; and Yamamoto, Hisao, 4,039,670, Cl. 424-267.000.

Nakata, Kazuhiko, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Magnetic sheet reader. 4,040,108, Cl. 360-101.000.

Nakazawa, Mitsuru; and Takigawa, Toru, to Hitachi, Ltd. Image pickup device. 4,039,986, Cl. 335-212.000.

Nakhamkis, Lev Grigorievich: *See—*
Beskin, Mikhail Davydovich; Pevtsov, Anatoly Timofeevich; Nakhamkis, Lev Grigorievich; Morgovsky, Yakov Efimovich; and Bat, Natalya Genrikhovna, 4,039,738, Cl. 13-33.000.

Nalco Chemical Company: *See—*
Feistel, Gerald R.; and Pessimisis, George N., 4,039,474, Cl. 252-451.000.

Namba, Yasumiti: *See—*
Ban, Kouichi; Namba, Yasumiti; Sekine, Yukihiro; and Matsuda, Masaaki, 4,039,446, Cl. 210-38.00B.

Nanba, Yasuhiro, to Minolta Camera Kabushiki Kaisha. Focus detecting photoelectric device. 4,039,824, Cl. 250-201.000.

Nanba, Yasuhiro; and Sahara, Masayoshi, to Minolta Camera Kabushiki Kaisha. Exposure time control device for an electric shutter in a single reflex camera with through the lens measuring system. 4,040,068, Cl. 354-24.000.

Narva, Sydney Paul. Unitary compartmentalized container. 4,039,435, Cl. 206-217.000.

Nashan, Gerd: *See—*
Reerink, Wilhelm; Beck, Kurt-Guenther; Echterhoff, Heinrich; Muller, Johannes; Degen, Kurt; and Nashan, Gerd, 4,039,342, Cl. 106-58.000.

Nasyrov, Gakif Zakirovich; and Ravdonikas, Izabella Vladislayovna. Method of preparing vanadium pentoxide. 4,039,582, Cl. 423-592.000.

National Blank Book Company, Inc.: *See—*
Wilson, Robert B.; and Cassidy, Raymond T., 4,038,768, Cl. 40-106.100.

National Can Corporation: *See—*
Boxall, Charles W., 4,039,099, Cl. 220-91.000.

National Equipment Corporation: *See—*
Roderick, Ronald R., 4,039,776, Cl. 219-401.000.

National Patent Development Corporation: *See—*
Babcock, Thomas E.; Kliment, Karel; and Stockel, Richard F., 4,039,501, Cl. 260-30.40R.

National Process Industries (Proprietary) Limited: *See—*
Hill, Robert Oliver, 4,039,624, Cl. 423-319.000.

National Research Development Corporation: *See—*
Cooper, George Anthony; Mayer, Rayner Michael; and Watt, William, 4,039,341, Cl. 106-56.000.
Lawman, Michael John Patrick; and Caie, Ian Scott, 4,039,247, Cl. 350-95.000.

Nault, Harold. Attachment for ground-engaging pads of stabilizers. 4,039,206, Cl. 280-763.000.

Nawrot, Chester Ronald, to Hooker Chemicals & Plastics Corporation. Halate cell top. 4,039,420, Cl. 204-242.000.

NCR Corporation: *See—*
Gordy, Robert S.; and Sanders, David E., 4,039,749, Cl. 178-69.100.
Takii, Tomio, 4,040,022, Cl. 364-900.000.

Neavel, Richard C., to Exxon Research and Engineering Company. Method for preparing a coal slurry substantially depleted in mineral-rich particles. 4,039,425, Cl. 208-8.000.

Nekrutman, Samuil Veniaminovich: *See—*
Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; Vyshelessky, Alexandr Nikolaevich; Rogov, Iosif Alexandrovich; Kishinevsky, Lazar Iosifovich; and Pidenko, Anatoly Pavlovich, 4,039,796, Cl. 219-10.55A.

Nelson, Alan C.; and Jeromin, Lothar S., to Xerox Corporation. Signal amplification by charging and illuminating a partially developed latent electrostatic image. 4,038,943, Cl. 118-647.000.

Nelson Research & Development Company: *See—*
Stoughton, Richard B.; Harris, Richard L.; and Dea, Frank J., 4,039,664, Cl. 424-180.000.

Netteland, Loyal G.; and Heintz, Clifford E., to A-T-O Inc. Endothermal carbon dioxide absorption. 4,039,620, Cl. 423-230.000.

Nettleton, Donald E., Jr.; Bush, James A.; Bradner, William T.; and Schreiber, Richard H., to Bristol-Myers Company. Antibiotic compounds marcellomycin and musettamycin. 4,039,736, Cl. 536-17.000.

Newell, John A., to Measuregraph Company, The. Apparatus for calculating the price of measured lengths of material. 4,039,805, Cl. 235-151.320.

Newlon, Roger L.: *See—*
DuPont, Achiel M., Jr.; Moody, J. Burnett; and Newlon, Roger L., 4,038,905, Cl. 89-43.00R.

Newman, Albert L.: *See—*
Bajorek, Jay E.; and Newman, Albert L., 4,038,802, Cl. 52-731.000.

Newman, Arnold H., to West Coast Quilting Company. Insulated wallpaper. 4,039,709, Cl. 428-159.000.

Newman, Nicholas S., to Kendall Company, The. Non-woven fabrics. 4,039,711, Cl. 428-286.000.

Newman, Peter. Electrical connector and switch apparatuses. 4,039,788, Cl. 200-51.130.

Newton, Richard P.: *See—*
Geiss, Vernon L.; Gregory, Charles F.; Newton, Richard P.; and Gravely, Lawrence E., 4,038,993, Cl. 131-141.000.

Niatas, Ulysses: *See—*
Repose, John; and Niatas, Ulysses, 4,039,228, Cl. 308-73.000.

Nichiro Gyogyo Kaisha Ltd.: *See—*
Terase, Tsuneo; Onishi, Ryuzo; and Akazawa, Haruo, 4,038,722, Cl. 17-48.000.

Nicholis, John: *See—*
Andrews, Arthur William; Heber, Eric Lewis; Michelmore, John Roger; and Nicholis, John, 4,038,867, Cl. 73-88.50R.

Nicolaisen, Holger; Andersen, Finn Schnoor; and Jensen, Jens Peter, to Danfoss A/S. Electric snap switch. 4,039,791, Cl. 200-67.00D.

Nicoud, Jean-Daniel; and Rouiller, Jean-Marie, to Stoppani S.A., Etablissements pour la mecanique de precision et l'electro-mecanique. Electronic apparatus for the permanent storage and automatic dialing of telephone numbers. 4,039,761, Cl. 179-90.00B.

Niederdellmann, Georg; Klussmann, Henning; and Conrad, Horst, to Bayer Aktiengesellschaft. Process for the production of soluble high molecular weight polyurethanes which are free from isocyanate groups. 4,039,516, Cl. 260-75.0NE.

Niemiec, Stanley Joseph: *See—*
Goldman, Michael Barnett; and Niemiec, Stanley Joseph, 4,039,869, Cl. 307-304.000.

Niida, Yutaka, to Citizen Watch Co., Ltd. Wristwatch structure. 4,038,814, Cl. 58-23.00R.

Nijman, John P., to Bunker Ramo Corporation. Field termination tool having a removable connector mounting mechanism and an insertion control mechanism. 4,038,745, Cl. 29-749.000.

Nilsson, Birger N.: *See—*
Ernstsson, Georg E.; Nilsson, Birger N.; Pupp, Herwig; and Stark, Olof S., 4,039,362, Cl. 156-69.000.

Ninomiya, Syuichi: *See—*
Kanno, Masashi; Miki, Sukeichi; Takezaki, Tsuneo; and Ninomiya, Syuichi, 4,039,752, Cl. 179-15.0BT.

Ninomiya, Takeshi; Sakai, Masaaki; and Suzuki, Kiyosuke, to Sony Corporation. Alternating current control circuits. 4,040,081, Cl. 357-34.000.

Nippon Dyeing Machine Mfg. Co., Ltd.: *See—*
Mizutani, Hiroshi, 4,038,842, Cl. 68-177.000.

Nippon Electric Company, Ltd.: *See—*
Shiroki, Ken-ichi; Mori, Katsumi; Kuwano, Yasuhiko; and Saito, Seiichi, 4,039,970, Cl. 331-94.50F.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Iyeta, Motoi, 4,039,195, Cl. 274-23.00A.
Nagahama, Yasuo, 4,039,980, Cl. 333-70.00R.

Nippon Petrochemicals Company Ltd.: *See—*
Sato, Atsushi, 4,039,712, Cl. 428-307.000.

Nippon Sanso K.K.: *See—*
Terase, Tsuneo; Onishi, Ryuzo; and Akazawa, Haruo, 4,038,722, Cl. 17-48.000.

Nippon Shokubai Kagaku Kogyo: *See—*
Mitsuhata, Masashi; Kumazawa, Toshihiko; and Kiguchi, Isamu, 4,039,561, Cl. 260-348.340.

Nippon Steel Corporation: *See—*
Matsunaga, Hisashi; Horii, Yosinobu; and Higasiguchi, Masaya, 4,039,321, Cl. 75-60.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Ishio, Hideki; Seki, Seizo; and Miyauchi, Kazuhiro, 4,039,961, Cl. 329-50.000.

Nisevich, Stephen Dale: *See—*
Carr, Ronald Ray; and Nisevich, Stephen Dale, 4,039,726, Cl. 428-539.000.

Nishikawa, Yasuo; Okamura, Takeo; and Minami, Katsuhei, to Kyushu Refractories Co., Ltd. Alumina-chrome refractory composition. 4,039,344, Cl. 106-66.000.

Nishimoto, Tatsuya: *See—*
Kamijo, Eiji; Nishimoto, Tatsuya; and Honda, Masaaki, 4,039,703, Cl. 427-183.000.

Nishimura, Seiichiro: *See—*
Takasuga, Yutaka; Nishimura, Seiichiro; and Urayama, Takao, 4,039,365, Cl. 156-405.000.

Nissan Motor Co., Ltd.: *See—*
Aono, Shigeo; Nakamura, Hiromichi; and Ozawa, Hiroshige, 4,039,868, Cl. 307-273.000.
Miyamoto, Keiichi; and Inoue, Naohiko, 4,039,852, Cl. 307-326.000.

Nitta, Yoshifumi: *See—*
Kobayashi, Toshihiro; and Nitta, Yoshifumi, 4,039,277, Cl. 432-106.000.

Nittetsu Mining Company, Limited: *See—*
Mikami, Yasuie; Takei, Ippo; Soma, Kazuo; and Morimoto, Yasuo, 4,039,615, Cl. 423-128.000.

Niviere, Pierre; Orillard, Gerard; and Blum, Jean, to Chimie & Biologie. Broad spectrum antibiotics and method. 4,039,519, Cl. 260-112.50R.

Noda Institute for Scientific Research: *See—*
Suzuki, Masaru; and Saito, Narimasa, 4,039,384, Cl. 195-62.000.

Noftsker, Russell; and Mathews, James Kirk, to Pertron Controls Corporation. Electrical operating circuit having semiconductor device junction temperature monitoring. 4,039,928, Cl. 323-19.000.

Noguchi, Katsuichi: *See—*
Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, 4,038,992, Cl. 131-10.700.

Nohejl, Antonin, to Mollart Engineering Company, Limited, The. Machine tools having interchangeable tool carrying units. 4,038,739, Cl. 29-568.000.

Nola, Frank J., to United States of America, National Aeronautics and Space Administration. Tachometer. 4,039,946, Cl. 324-165.000.

Noranda Mines Limited: *See—*
LeRoy, Rodney L., 4,039,402, Cl. 204-105.00R.
Stanley, Robert W.; and Subramanian, Kohur Nagaraja, 4,039,406, Cl. 204-108.000.

Nordlinger, Mildred, to Westminster Industries, Inc. Electric safety lighter. 4,039,274, Cl. 431-128.000.

Norlin Music, Inc.: *See—*
Kniepkamp, Alberto; and Moore, Douglas, 4,038,898, Cl. 84-1.240.

North American Philips Corporation: *See—*
Carlson, Tom Walter, 4,040,013, Cl. 340-164.00R.

Northern Illinois Gas Company: *See—*
Long, George; Martell, Dennis J.; and Batz, James E., 4,040,046, Cl. 340-310.0CP.

Northern Research and Engineering Corporation: *See—*
Heitmann, Arnold M.; Brassert, Walter L.; and Chouinard, Donald B., 4,038,815, Cl. 60-39.080.

Northern Telecom Limited: *See—*
Geadah, Youssef Alfred; and Vallo, Frank Joseph, 4,040,120, Cl. 361-220.000.
Perry, Kenneth Roy, 4,039,241, Cl. 339-176.00M.

Northwest Hardwoods, Inc.: *See—*
Sword, Irvin E., 4,039,011, Cl. 144-218.000.

Northwest Orthodontics, Inc.: *See—*
Armstrong, Maclay M., 4,038,754, Cl. 32-14.00D.

Norton Company: *See—*
Weaver, Gerald Q., 4,039,340, Cl. 106-55.000.

Nosser, Philip B.: *See—*
DeLucia, Victor E.; and Nosser, Philip B., 4,039,984, Cl. 335-151.000.

Novacich, Kenneth J.: *See—*
Poff, Clifford A.; Hively, William J.; and Novacich, Kenneth J., 4,039,174, Cl. 266-281.000.

Novomeisky, Jury Donatovich; Eger, Mikhail Mikhailovich; and Kravtsov, Nikolai Petrovich. Steel. 4,039,328, Cl. 75-126.00B.

Nowak, Herbert: *See—*
Schacht, Erich; Lauterbach, Gunter; Mehrhof, Werner; Nowak, Herbert; and Simane, Zdenek, 4,039,683, Cl. 424-324.000.

Nunn, Ewing D., Jr. Emergency vehicle audible warning system. 4,040,050, Cl. 340-384.00E.

Nuovo Pignone, S.p.A.: *See—*
Vinciguerra, Costantino, 4,039,232, Cl. 308-36.100.

Nurita, Joji: *See—*
Konomi, Toshiaki; Nurita, Joji; and Tanazawa, Yasushi, 4,038,950, Cl. 123-52.00M.

Oak Holland B.V.: *See—*
den Toonder, Pieter, 4,039,954, Cl. 325-308.000.

Oba, Yoichi: *See—*
Saiki, Atsushi; Harada, Seiki; and Oba, Yoichi, 4,040,083, Cl. 357-54.000.

Ober, Jan; and Piatek, Zygmunt, to Centralnt Osrodek Techniki Medycznej. Artificial elbow mechanism. 4,038,706, Cl. 3-12.300.

Oberhansli, Jurg; Stalder, Erwin; Bulgheroni, Willy; and Penasa, Josef, to Hectronic AG. Optical-electrical liquid probes. 4,039,845, Cl. 250-577.000.

Occidental Petroleum Corporation: *See—*
Logan, Forrest E., 4,039,390, Cl. 201-12.000.

O'Connell, John W. Combination stop collar and cutting tool. 4,039,266, Cl. 408-202.000.

O'Connor, Michael Niall Desmond: *See—*
Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., 4,039,542, Cl. 260-251.00R.

O'Connor, Robert Joseph, to Bell Telephone Laboratories, Incorporated. Electromagnetically operated audible signal generator. 4,040,051, Cl. 340-397.000.

Odames, Kenneth Frank. Fly tying device. 4,039,178, Cl. 269-75.000.

Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, to Japan Tobacco & Salt Public Corporation, The; and Morinaga Milk Industry Co., Ltd. Granular composition for tobacco filter. 4,038,992, Cl. 131-10.700.

Ogasa, Katsuhiro; Shimamura, Seiichi; and Miyagawa, Hiroshi, to Morinaga Milk Industry Co., Ltd. Method for determining the viable bacteria count of food and a medium for accomplishing the method. 4,039,386, Cl. 195-100.000.

Ogawa, Takuzo: *See—*
Tanaka, Tomoyuki; Okamura, Masahiro; Ogawa, Takuzo; and Misawa, Yutaka, 4,040,084, Cl. 357-55.000.

Ohara, Kazuo: *See—*
Murakami, Noboru; Hirosawa, Koichiro; Ohara, Kazuo; and Matsuo, Koichi, 4,038,887, Cl. 74-769.000.
Murakami, Noboru; Matsuo, Koichi; Hirosawa, Koichiro; and Ohara, Kazuo, 4,038,888, Cl. 74-765.000.

Ohashi, Shin-ichi; and Asada, Akihiro, to Hitachi, Ltd. Variable impedance circuit. 4,039,981, Cl. 334-14.000.

Ohashi, Shozo: *See—*
Inoue, Mitsuhiro; Maeda, Yo; Suzuki, Satoshi; Ohashi, Shozo; and Nakamura, Yoshiharu, 4,039,006, Cl. 138-129.000.

Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, to Hitachi, Ltd. Light activated semiconductor switch device. 4,039,863, Cl. 307-252.00A.

Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, to Hitachi, Ltd. Semiconductor switch. 4,039,865, Cl. 307-252.00G.

Ohhinata, Ichiro: *See—*
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,039,864, Cl. 307-252.00T.

Ohlberg, Karlheinz, to Gutehoffnungshutte Sterkrade Aktiengesellschaft. Roller bearing construction. 4,039,229, Cl. 308-187.100.

Ohlhaver, Homer W. Push-on device. 4,039,073, Cl. 198-430.000.

Ohno, Isao: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.

Ohno, Nobuo: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.

Ohsawa, Mitsuo: *See—*
Nakamura, Hideo; Ohsawa, Mitsuo; and Hamada, Osamu, 4,040,075, Cl. 357-23.000.

Ohta, Sadayasu; Yada, Akio; and Inoue, Keizo, to Kabushiki Kaisha Morita Seisakusho. Method of making tomogram and apparatus. 4,039,837, Cl. 250-445.00T.

Ohtomo, Koichiro; and Murata, Taro, to Kanebo, Ltd. Process for the production of anion-exchangeable nonhollow novolak filaments. 4,039,484, Cl. 260-2.10C.

Ohuchi, Yasushi: *See—*
Kanamaru, Hisanobu; and Ohuchi, Yasushi, 4,038,860, Cl. 72-358.000.

Oka, Yoshihiko: *See—*
Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, 4,039,660, Cl. 424-117.000.

Okada, Kikuji. Combination board. 4,039,708, Cl. 428-73.000.

Okada, Takeshi, to Olympus Optical Co., Ltd. Endoscope equipped with a film cassette. 4,038,977, Cl. 128-6.000.

Okamoto, Toshiaki; Kato, Yoshihisa; and Ban, Masashi, to Aisin Seiki Kabushiki Kaisha. Flow control apparatus of master cylinder. 4,038,824, Cl. 60-591.000.

Okamura, Masahiro: *See—*
Tanaka, Tomoyuki; Okamura, Masahiro; Ogawa, Takuzo; and Misawa, Yutaka, 4,040,084, Cl. 357-55.000.

Okamura, Takeo: *See—*
Nishikawa, Yasuo; Okamura, Takeo; and Minami, Katsuhei, 4,039,344, Cl. 106-66.000.

Okonite Company, The: *See—*
Spear, Robert Allen; and Strandberg, Kenneth Roger, 4,038,872, Cl. 73-362.0AR.
Waldron, Richard C., 4,039,745, Cl. 174-21.00R.

Okuhara, Shinzi: *See—*
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,039,863, Cl. 307-252.00A.
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,039,865, Cl. 307-252.00G.
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, 4,039,864, Cl. 307-252.00T.

Okumura, Masahide: *See—*
Kato, Yasuo; Okumura, Masahide; and Todokoro, Hideo, 4,039,829, Cl. 250-306.000.

Okuno, Yoshitoshi: *See—*
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.

O'Link, Maurice H., to Stearns Manufacturing Company. Personal flotation device. 4,038,713, Cl. 9-345.000.

Olofsson, Sigfrid M., to Dahltron Corporation. Pneumatic rifle and hand gun. 4,038,961, Cl. 124-69.000.

Olsen, Dolores. Bottomless microwave baking utensil. 4,039,797, Cl. 219-10.55E.

Olsson, Kjell Olow Ingemar, to U.S. Philips Corporation. Transponder system for the transfer of signalling information for rail-bounded vehicles. 4,040,053, Cl. 343-6.50R.

Olsson, Leif: *See—*
Fischmeister, Hellmut; Lampe, Vaino; and Olsson, Leif, 4,038,738, Cl. 29-420.500.

Olympus Optical Co., Ltd.: *See—*
Komiya, Osamu, 4,038,987, Cl. 128-321.000.
Okada, Takeshi, 4,038,977, Cl. 128-6.000.

O'Maley, James B. Pay telephone station monitor system. 4,039,768, Cl. 179-175.20C.

O'Malley, William J., to General Electric Company. Article comprising a silicone pressure-sensitive adhesive and a releasable anti-stick layer and process of using same. 4,039,707, Cl. 428-40.000.

Omura, Takayoshi: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 4,039,520, Cl. 260-117.000.

Onishi, Kazuo: *See—*
Yamashita, Seizi; and Onishi, Kazuo, 4,039,871, Cl. 310-59.000.

Onishi, Ryuzo: *See—*
Terase, Tsuneo; Onishi, Ryuzo; and Akazawa, Haruo, 4,038,722, Cl. 17-48.000.

Ono, Joji: *See—*
Ogasa, Katsuhiro; Ono, Joji; Kudo, Tsutomu; Doi, Kazuyoshi; Noguchi, Katsuichi; and Maeda, Kazuo, 4,038,992, Cl. 131-10.700.

Ono, Keiichi: *See—*
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; and Yamamoto, Hisao, 4,039,670, Cl. 424-267.000.

Onuma, Tadashi: *See—*
Inada, Satoshi; Amano, Mituo; and Onuma, Tadashi, 4,039,290, Cl. 23-284.000.

Ooishi, Tadashi: *See—*
Kato, Toshiro; Sasaki, Mitsuru; Ooishi, Tadashi; and Mujai, Kunio, 4,039,635, Cl. 260-954.000.

Oosterwijk, Hendrik Harm Jannes; and Torenbeek, Reinder, to Akzona Incorporated. Stable, pumpable, aqueous suspensions of organic peroxides. 4,039,475, Cl. 252-431.00R.

Orgill, Rodney H.: *See—*
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,040,035, Cl. 364-200.000.

Original Hanau Quarzlampen: *See—*
Schafer, Jurgen F., 4,039,884, Cl. 313-225.000.
Scherzer, Joachim, 4,039,886, Cl. 313-318.000.

Orillard, Gerard: *See—*
Niviere, Pierre; Orillard, Gerard; and Blum, Jean, 4,039,519, Cl. 260-112.50R.

Oroshnik, William: *See—*
Close, Ralph E.; and Oroshnik, William, 4,039,591, Cl. 260-618.00R.

Orrison, William W. Solar energy collector apparatus. 4,038,972, Cl. 126-271.000.

Ortho Diagnostics, Inc.: *See—*
Teipel, John William, 4,039,285, Cl. 23-230.00B.

Osborne, Richard C.; and Bickel, Richard L. Method and apparatus for creating and detecting alarm condition using a master antenna television system. 4,040,045, Cl. 340-280.000.

Oshima, Noboru: *See—*
Ikeda, Hiroharu; Matsumoto, Shuichi; Enyo, Hiroji; Oshima, Noboru; and Komatsu, Koei, 4,039,491, Cl. 260-4.00R.

Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, to Yamanouchi Pharmaceutical Co., Ltd. Antibiotic Y-G19Z D3 and the production thereof. 4,039,660, Cl. 424-117.000.

Ostashko, Fedor Ivanovich; and Mirny, Igor Nikolaevich. Method of and apparatus for measuring ionic electric conductance of objects. 4,039,934, Cl. 324-30.00R.

Ostbergs Fabriks AB: *See—*
Lindblom, Karl Thore, 4,039,009, Cl. 144-34.00E.

Ostrem, John S.: *See—*
Crane, Hewitt D.; Wolf, Daniel E.; and Ostrem, John S., 4,040,010, Cl. 340-146.3SY.

Otis Elevator Company: *See—*
Marsh, Arthur H.; and Gupta, Prabodh Chandra, 4,039,907, Cl. 318-135.000.

Otis Engineering Corporation: *See—*
Churchman, Ronald K.; and Yonker, John H., 4,039,027, Cl. 166-153.000.
Yonker, John H., 4,039,026, Cl. 166-117.500.

Otto, Alfred, to Bergische Stahl-Industrie. Disc brake construction, especially for rail vehicles. 4,039,051, Cl. 188-58.000.

Overman, Kelly C., to Westinghouse Electric Corporation. Tracking of radar signals. 4,040,054, Cl. 343-7.00A.

Owens-Corning Fiberglas Corporation: *See—*
Johnson, Carl A., 4,039,716, Cl. 428-378.000.

Owens-Illinois, Inc.: *See—*
Scott, John E., 4,038,785, Cl. 51-145.00R.

Owens, Lester J.; and Jones, William C., to United States of America, National Aeronautics and Space Administration. Rotational joint assembly for the prosthetic leg. 4,038,705, Cl. 3-2.000.

Oxy Metal Industries Corporation: *See—*
Kulick, Leonard; and Howell, John K., Jr., 4,039,353, Cl. 148-6.15R.

Oy Tampella AB: *See—*
Salmi, Pekka M., 4,039,033, Cl. 173-105.000.

Ozawa, Hiroshige: *See—*
Aono, Shigeo; Nakamura, Hiromichi; and Ozawa, Hiroshige, 4,039,868, Cl. 307-273.000.

P. R. Mallory & Co., Inc.: *See—*
Chestnut, Benjamin F.; and Altenschulte, Ray A., 4,038,884, Cl. 74-568.00T.
Klein, Gerhart P.; Kallianidis, Milton; Christiansen, Paul J.; and Henderson, Dennis R., 4,039,904, Cl. 361-433.000.
Kloenne, Ernest F.; and Downing, Richard C., 4,038,877, Cl. 74-125.000.
Pearce, Godfrey R.; and Breeden, William J., 4,039,905, Cl. 361-433.000.

Packer, Elliot L. Metal recovery unit. 4,039,422, Cl. 204-272.000.

Paige, William P.; and Barber, John A., to Dow Chemical Company, The. Incorporation of finely divided functional solids into olefin. 4,039,507, Cl. 260-42.460.

Pain, David Lord: *See—*
Broughton, Barbara Joyce; Large, Bryan John; Marshall, Stuart Malcolm; Pain, David Lord; and Wooldridge, Kenneth Robert Harry, 4,039,544, Cl. 260-256.40F.

Paisley, John C. Partition structure. 4,038,790, Cl. 52-36.000.

Pakur, Henryk; and Tiemann, Reinhard, to Continental Gummi-Werke Aktiengesellschaft. Bead core for pneumatic tires. 4,039,015, Cl. 152-362.00R.

Palosi, Eva: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,039,589, Cl. 260-618.00B.

Panel Technology, Inc.: *See—*
Kupsky, George A.; and Santchi, Douglas L., 4,039,882, Cl. 313-217.000.

Pankratz, Thomas John, to Du Pont de Nemours, E. I., and Company. Process for producing maltopentaose. 4,039,383, Cl. 195-31.00R.

Panzer, Hans Peter; O'Connor, Michael Niall Desmond; and Baccei, Louis J., to American Cyanamid Company. Unsaturated pyrimidine. 4,039,542, Cl. 260-251.00R.

Papafingos, Pandelis N.; and Lance, Richard T., to Alumax Mill Products, Inc. Aluminum dross recovery method. 4,039,173, Cl. 266-201.000.

Parca-Norrahammar AB: *See—*
Axgarde, Gunnar Albert; Axelsson, Bengt Borje; and Klingwall, Alf, 4,038,789, Cl. 52-20.000.

Parizek, Jaro. Scarf retainer and pendant. 4,038,724, Cl. 24-49.00S.

Park-Ohio Industries, Inc.: *See—*
Kasper, Robert J., 4,039,794, Cl. 219-10.490.

Paschke, Manfred: *See—*
Heide, Erich-Alexander; Wald, Maximilian; Paschke, Manfred; and Wagener, Klaus, 4,039,445, Cl. 210-38.00C.

Patax Trust Reg.: *See—*
Diesner, Ferdinand, 4,039,008, Cl. 139-21.000.

Patel, Mahesh S., to Eutectic Corporation. Metaliferous flame spray material for producing machinable coatings. 4,039,318, Cl. 75-0.50R.

Patru, Marcel Joseph Gaston. Bacteriostatic, fungistatic and algicidal compositions, particularly for submarine paints. 4,039,312, Cl. 71-67.000.

Pattantyus-Abraham, Tamas I., to Westinghouse Electric Corporation. Two-tone decoder having high noise immunity. 4,039,959, Cl. 328-133.000.

Patten, Frank C.; and Alphin, John G., to Clemson University. Tobacco harvester. 4,038,808, Cl. 56-27.500.

Patterson, John A., to Texaco Inc. Detergent builders and compositions containing the same. 4,039,464, Cl. 252-89.00R.

Patterson, John F.; and Galbraith, Kirk P., to Exxon Nuclear Company, Inc. Mixing vane grid spacer. 4,039,379, Cl. 176-76.000.

Pattison, Martin O.: *See*—
Burkhardt, Joseph A.; Loth, William D.; and Pattison, Martin O., 4,039,025, Cl. 166-.500.

Patzke, Hans-Jurgen: *See*—
Koerner, Gotz; Kropac, Vaclav; and Patzke, Hans-Jurgen, 4,039,605, Cl. 260-824.00R.

Patzlaff, Albert W.: *See*—
Beardsley, Paul G.; and Patzlaff, Albert W., 4,038,807, Cl. 53-282.000.

Pauker, Mira; Gobert, Jean; Pottier, Denis; and Quere, Louis, to U.S. Philips Corporation. Data processing system comprising input/output processors. 4,040,028, Cl. 364-900.000.

Paul, Jurgen: *See*—
Burckhardt, Manfred H.; and Paul, Jurgen, 4,039,782, Cl. 235-150.200.

Paulmier, Claude, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Automatic choke systems for carburetors. 4,038,955, Cl. 123-119.00F.

Pavleszek, John, to American Can Company. Metal forming die. 4,038,859, Cl. 72-347.000.

Pavone, Joseph P.: *See*—
Cole, William T.; Pavone, Joseph P.; and Scanlon, John J., 4,038,923, Cl. 102-43.00R.

Pawletko, Joseph Paul: *See*—
Jones, Alan Lytton; Pawletko, Joseph Paul; and Raider, Jerry Wesley, 4,039,936, Cl. 324-34.00D.

Peacock, Lawrence A.: *See*—
Mellor, Harrison Clay; and Peacock, Lawrence A., 4,038,863, Cl. 73-9.000.

Pearce, Godfrey R.; and Breeden, William J., to P. R. Mallory & Co., Inc. Electrical device of the electrolytic type having means for confining mobile electrolyte and method of making same. 4,039,905, Cl. 361-433.000.

Pease, Eric C.: *See*—
Moyle, Maurice; Galvez, Buenaventura B.; Pease, Eric C.; and Logan, Alan, 4,039,423, Cl. 208-4.000.

Peddle, Charles: *See*—
Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,040,035, Cl. 364-200.000.

Pekau, Dietlind, to Siemens Aktiengesellschaft. Method for aberration-free optical recording of highly resolved sonar or radar maps. 4,040,056, Cl. 343-17.000.

Pellettiere, Frank Vincent: *See*—
Birchall, Ronald Holmes; Pellettiere, Frank Vincent; and Skeens, William John, 4,040,021, Cl. 364-200.000.

Penasa, Josef: *See*—
Oberhansli, Jurg; Stalder, Erwin; Bulgheroni, Willy; and Penasa, Josef, 4,039,845, Cl. 250-577.000.

Penco, Sergio: *See*—
Arcamone, Federico; Di Marco, Aurelio; and Penco, Sergio, 4,039,663, Cl. 424-180.000.

Pennwalt Corporation: *See*—
Dimmig, Daniel Ashton, 4,039,595, Cl. 260-653.10R.

Perisse, Pierre. Surgical apparatus. 4,038,988, Cl. 128-326.000.

Pernet, Jacques M.; and Taylor, Donald F., to Subsea Equipment Associates Limited. Device for locking and unlocking two concentric pipes. 4,039,208, Cl. 285-3.000.

Perr, Julius P.; Smith, Edward D.; and Wilson, Harry L., to Cummins Engine Company, Inc. Fluid pressure regulator. 4,038,956, Cl. 123-139.0AF.

Perrault, Frederick; and Perrault, Raymond E. Curved bracket. 4,039,131, Cl. 248-73.000.

Perrault, Raymond E.: *See*—
Perrault, Frederick; and Perrault, Raymond E., 4,039,131, Cl. 248-73.000.

Perrine, Paul M.; Janes, Vincent C.; and Cassera, James A. Commode water conservation apparatus. 4,038,708, Cl. 4-67.00A.

Perronnet, Jacques; and Girault, Pierre, to Roussel-UCLAF. 3-Methoxy crotonanilides as herbicides. 4,039,316, Cl. 71-118.000.

Perry, Kenneth Roy, to Northern Telecom Limited. Multiple contact connectors. 4,039,241, Cl. 339-176.00M.

PerSci, Inc.: *See*—
Bryer, Philip Stuart, 4,040,107, Cl. 360-99.000.

Person, Abraham; and Bolding, Vance E., to Global Marine Inc. Heave compensation apparatus for a marine mining vessel. 4,039,177, Cl. 267-126.000.

Pertron Controls Corporation: *See*—
Noftsker, Russell; and Mathews, James Kirk, 4,039,928, Cl. 323-19.000.

Pescarollo, Ermanno: *See*—
Ancillotti, Francesco; Pescarollo, Ermanno; and Mauri, Marcello Massi, 4,039,590, Cl. 260-614.00A.

Pessimisis, George N.: *See*—
Feistel, Gerald R.; and Pessimisis, George N., 4,039,474, Cl. 252-451.000.

Peter, Richard: *See*—
Angliker, Hans-Joerg; Peter, Richard; and Jenny, Walter, 4,039,529, Cl. 260-207.100.

Petersen, Egon: *See*—
Klinkenberg, Herbert; Petersen, Egon; and Schmidt, Werner, 4,039,538, Cl. 544-219.000.

Petersen, Egon Norbert, to Dynamit Nobel Aktiengesellschaft. Method of preparing polynuclear, halogenated, aromatic benzyl ethers. 4,039,587, Cl. 260-612.00R.

Peterson, Carl W., to International Telephone and Telegraph Corporation. Electrical connector and contacts therefor. 4,039,240, Cl. 339-99.00R.

Peterson, Francis C., to C. Hager & Sons Hinge Manufacturing Company. Process and apparatus for recovering metal from soil. 4,039,433, Cl. 209-3.000.

Peterson, Per Viking, to SCA Development Aktiebolag. Refining element. 4,039,154, Cl. 241-261.300.

Peterson, Rex. Grinding mill. 4,039,152, Cl. 241-245.000.

Petitpierre, Jean Claude: *See*—
Garner, Robert; and Petitpierre, Jean Claude, 4,039,557, Cl. 548-370.000.

Petrie, Ross J.: *See*—
Mijares, John Anthony, Jr.; Petrie, Ross J.; Mijares, John Anthony, Sr.; and Alvarez, Charles S., 4,039,104, Cl. 222-144.500.

Pevtsov, Anatoly Timofeevich: *See*—
Beskin, Mikhail Davydovich; Pevtsov, Anatoly Timofeevich; Nakhamkis, Lev Grigorievich; Morgovsky, Yakov Efimovich; and Bat, Natalya Genrikhovna, 4,039,738, Cl. 13-33.000.

Pews, R. Garth: *See*—
Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,039,727, Cl. 428-541.000.

Pfalzstahlbau GmbH.: *See*—
Kuwertz, Erich, 4,038,925, Cl. 104-88.000.

Pfister, Thomas Warren: *See*—
Elliott, Richard Louis, Jr.; Borkowski, William John; and Pfister, Thomas Warren, 4,039,854, Cl. 307-118.000.

Pfizer Inc.: *See*—
Barth, Wayne E., 4,039,532, Cl. 544-17.000.
Barth, Wayne E., 4,039,533, Cl. 544-17.000.
Dirlam, John P., 4,039,540, Cl. 260-250.0QN.

Phelps, Robert Edward; Spill, Robin; and Print, Barry Edward. Dental alloys. 4,038,752, Cl. 32-2.000.

Philip Morris Incorporated: *See*—
Laszlo, Tibor S.; and Licis, Osvalds F., 4,039,795, Cl. 219-10.55A.

Phillips, Brian L.: *See*—
Argabright, Perry A.; Echelberger, Larry M.; and Phillips, Brian L., 4,039,485, Cl. 260-2.20R.

Phillips Petroleum Company: *See*—
Bertus, Brent J.; Tabler, Donald C.; and Johnson, Marvin M., 4,039,476, Cl. 252-437.000.
Campbell, Robert W., 4,039,518, Cl. 260-79.100.
Cobb, Raymond L., 4,039,541, Cl. 260-250.00A.
Edmonds, James T., Jr., 4,039,632, Cl. 260-878.00B.
Gall, James W., 4,039,029, Cl. 166-294.000.
Hudson, Jimmie E.; and Dockery, Calvin D., 4,039,271, Cl. 425-529.000.
Hutchinson, William Milton, deceased; and Hutchinson, Florence M., executrix, 4,039,465, Cl. 252-171.000.
Johnson, Paul H., 4,039,626, Cl. 423-456.000.
Myers, John W.; and Garner, James W., 4,039,604, Cl. 260-683.680.
Stapp, Paul R., 4,039,594, Cl. 260-638.00R.
Wood, Roy F.; and Wynne, Ralph A., 4,039,210, Cl. 285-112.000.
Zelinski, Robert P., 4,039,633, Cl. 260-879.000.

Phillips, Tom: *See*—
McFall, Jim; Cicero, Jim; and Phillips, Tom, 4,038,701, Cl. 3-1.000.

Philp, Sanborn F., to General Electric Company. Sheet-wound, high-voltage coils. 4,039,990, Cl. 336-60.000.

Physics International Company: *See*—
Godfrey, Charles S.; Moore, E. T., Jr.; and Mumma, Douglas M., 4,039,030, Cl. 166-299.000.

Piatek, Zygmunt: *See*—
Ober, Jan; and Piatek, Zygmunt, 4,038,706, Cl. 3-12.300.

Picandet, Jean A., to Jeumont-Schneider. Electric two-to-four wire conversion circuit for use in telephone systems. 4,039,766, Cl. 179-170.0NC.

Pickering, Norman C., to Lynkeus Corporation, The. Flexible tube pump having linear cam actuation of distributor means. 4,039,269, Cl. 417-475.000.

Picmaus, Ernst: *See*—
Bach, Bernhard; and Picmaus, Ernst, 4,039,917, Cl. 318-599.000.

Pidenko, Anatoly Pavlovich: *See*—
Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; Vyshelessky, Alexandr Nikolaevich; Rogov, Iosif Alexandrovich; Kishinevsky, Lazar Iosifovich; and Pidenko, Anatoly Pavlovich, 4,039,796, Cl. 219-10.55A.

Pielkenrood, Simon, to Pielkenrood-Vinitex B. V. Apparatus for producing a germ-free air flow in the vicinity of an operating table. 4,038,974, Cl. 128-1.00R.

Pielkenrood-Vinitex B. V.: *See*—
Pielkenrood, Simon, 4,038,974, Cl. 128-1.00R.

Pieters, Wim J. M.; and Carlson, Emery J., to Allied Chemical Corporation. Catalyst of chlorination and combined chlorination/fluorination based on copper/calcium/fluoride. 4,039,596, Cl. 260-653.700.

Piotrowski, Heinz: *See*—
Plener, Helmut; Piotrowski, Heinz; Arweiler, Otto; and Drexler, Herbert, 4,040,102, Cl. 360-71.000.

Pitney-Bowes, Inc.: *See*—
Swaniger, James R., 4,038,941, Cl. 118-243.000.

Plainer, Hermann: *See*—
Kraemer, Dieter; Lehmann, Klaus; and Plainer, Hermann, 4,039,413, Cl. 204-159.120.

Plath, Dieter: *See*—
Schon, Manfred; Durr, Helmut; Plath, Dieter; Keller, Karlfried; and Michel, Walter, 4,039,493, Cl. 260-21.000.

Plener, Helmut; Piotrowski, Heinz; Arweiler, Otto; and Drexler, Herbert, to Uher Werke Munchen GmbH & Co. Magnetic tape device. 4,040,102, Cl. 360-71.000.

Plotnikoff, Nicholas Peter; and Zaugg, Harold Elmer, to Abbott Laboratories. 3-(3-Methyl-2-octyl)-1-[4-(1-homopiperidine)butyryloxy]-6,6,9-trimethyl-7,8,9,10-tetrahydro-6H-dibenzo [b,d]pyran hydrochloride as an anticonvulsant agent. 4,039,674, Cl. 424-283.000.

Plunguian, Mark: *See*—
Cornwell, Charles E.; and Plunguian, Mark, 4,039,170, Cl. 259-147.000.

Plunk, Troy E.: *See*—
Kimball, John K.; and Plunk, Troy E., 4,038,742, Cl. 29-600.000.

Pocket Socks Corporation, The: *See*—
Burn, William H., 4,038,699, Cl. 2-239.000.

Podjadtke, Rudi: *See*—
Moebus, Dieter; Mennekes, Werner; and Podjadtke, Rudi, 4,038,829, Cl. 61-84.000.

Poff, Clifford A.; Hively, William J.; and Novacich, Kenneth J., to Fordees Corporation. Reline tower for a metallurgical furnace. 4,039,174, Cl. 266-281.000.

Pohlemann, Heinz: *See*—
Naarmann, Herbert; and Pohlemann, Heinz, 4,039,513, Cl. 260-67.0UA.

Pokar, Jochen; and Putter, Horst, to URANIT Uran-Isotopentrennungs-GmbH. Quadrupole mass spectrometer. 4,039,828, Cl. 250-288.000.

Polaroid Corporation: *See*—
Johnson, Bruce K.; and Whiteside, George D., 4,040,072, Cl. 354-173.000.
Pope, William R., 4,040,069, Cl. 354-27.000.

Pollet, Robert Joseph: *See*—
Kokelenberg, Hendrik Emmanuel; Samijn, Rafael Pierre; Van den Houte, Jozef Willy; and Pollet, Robert Joseph, 4,039,332, Cl. 96-48.00R.

Pollnow, Harold J., Jr.: *See*—
Callan, John E.; and Pollnow, Harold J., Jr., 4,039,855, Cl. 307-203.000.

Polsfuss, Marvin F. Swingable yielding paint roller. 4,038,716, Cl. 15-230.110.

Polycraft Corporation: *See*—
Bruno, Edward C., 4,038,780, Cl. 47-63.000.

Poncha, Rustom P.: *See*—
Gancy, Alan B.; and Poncha, Rustom P., 4,039,618, Cl. 423-206.00T.

Pont-A-Mousson S.A.: *See*—
Maeder, Claude R., 4,039,908, Cl. 318-166.000.
Sutter, Jean Georges, 4,039,874, Cl. 310-77.000.

Pope, William R., to Polaroid Corporation. Fixed time delay circuit for quench strobe. 4,040,069, Cl. 354-27.000.

Popeil Brothers, Inc.: *See*—
Popeil, Samuel J., 4,038,892, Cl. 83-4.000.

Popeil, Samuel J., to Popeil Brothers, Inc. Food slicer with indexing turret. 4,038,892, Cl. 83-4.000.

Popp, Ralph, to Westinghouse Air Brake Company. Cycling type of electronic battery charger. 4,039,920, Cl. 320-22.000.

Popplewell, James M.: *See*—
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,039,298, Cl. 428-558.000.

Portage Electric Products, Inc.: *See*—
Givler, Omar R., 4,039,992, Cl. 337-365.000.

Porter, Clyde L.; and Porter, Richard C. Manufacture of paper fire logs. 4,039,299, Cl. 44-2.000.

Porter, Richard C.: *See*—
Porter, Clyde L.; and Porter, Richard C., 4,039,299, Cl. 44-2.000.

Pottier, Denis: *See*—
Pauker, Mira; Gobert, Jean; Pottier, Denis; and Quere, Louis, 4,040,028, Cl. 364-900.000.

Pottorf, Newell: *See*—
Beynet, Pierre A.; Farr, John B.; and Pottorf, Newell, 4,040,003, Cl. 340-18.0LD.

Poul, Christian Dyhr-Mikkelsen: *See*—
Spies, Volker; Poul, Christian Dyhr-Mikkelsen; and Valbjorn, Knud Vagn, 4,039,126, Cl. 236-42.000.

PPG Industries, Inc.: *See*—
Cherenko, Joseph; and Lewis, Charles W., 4,039,720, Cl. 428-425.000.
Kallenborn, John, 4,039,718, Cl. 428-398.000.
Lavanish, Jerome M.; and Sare, Edward J., 4,039,623, Cl. 423-240.000.
Matsuda, Tadashi; and Yanagisawa, Kunia, 4,039,719, Cl. 428-424.000.

Preformed Line Products Company: *See*—
Smith, Bert A., 4,039,742, Cl. 174-87.000.

Preisig, Roland, to J. Bobst & Fils, S.A. Method and apparatus for counting a plurality of folded box blanks in a stream of box blanks and separating the counted blanks as a batch. 4,038,909, Cl. 93-93.00M.

Prewer, Richard Wayne, to Egg Sales Promotion Inc. Automatic coupon dispensing apparatus. 4,039,181, Cl. 271-10.000.

Prewitt, Richard H.: *See*—
Prewitt, Richard H., Jr.; and Prewitt, Richard H., 4,040,062, Cl. 346-7.000.

Prewitt, Richard H., Jr.; and Prewitt, Richard H. Recording instrument. 4,040,062, Cl. 346-7.000.

Price, Raymond; and Smith, Peter, to Imperial Chemical Industries Limited. Process for extracting cobalt, copper or zinc values using a 1-alkyl substituted benzimidazole. 4,039,612, Cl. 423-24.000.

Priem, Jan Jozef: *See*—
De Roo, Pierre Richard; De Winter, Walter Frans; Priem, Jan Jozef; and Gilliams, Yvan Karel, 4,039,463, Cl. 252-62.10P.

Prigent, Hubert: *See*—
Le Coquil, Emile F.; Prigent, Hubert; and Gerard, Guy, 4,039,881, Cl. 313-217.000.

Prince, Luther T.: *See*—
Roback, Donald W.; Hampel, Wilbur J.; Prince, Luther T.; and Huppert, Dean L., 4,039,900, Cl. 361-388.000.

Print, Barry Edward: *See*—
Phelps, Robert Edward; Spill, Robin; and Print, Barry Edward, 4,038,752, Cl. 32-2.000.

Prochazka, Rudolph J., to United States of America, Army. Coaxial current probe. 4,039,976, Cl. 333-24.00R.

Produits Chimiques Ugine Kuhlmann: *See*—
Gangneux, Philippe Yves Edouard, 4,039,545, Cl. 260-256.40F.
Troussier, Maurice; and Van Lang, Huynh, 4,039,497, Cl. 260-29.60F.

Pruvot, Francois C.; Maistrelli, Roger; and Bauchet, Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Automatically controlling the transmission ratios of an automotive vehicle engine for decreasing the vehicle speed. 4,039,061, Cl. 192-4.00A.

Pryke, John Fordham Speaight, to Pynford Limited. Pile. 4,038,827, Cl. 61-53.620.

Ptaschek, Werner: *See*—
Keller, Walter; Koukol, Hubert; Ptaschek, Werner; and Wendt, Dieter, 4,039,286, Cl. 23-230.00R.

Puech, Claude: *See*—
Bricot, Claude; Carre, Bernard; Lehureau, Jean Claude; and Puech, Claude, 4,039,764, Cl. 179-100.41L.

Pulliam, Barron, to Raymond Lee Organization, Inc., The, a part interest. Nail extractor. 4,039,140, Cl. 254-25.000.

Pupp, Herwig: *See*—
Ernstsson, Georg E.; Nilsson, Birger N.; Pupp, Herwig; and Stark, Olof S., 4,039,362, Cl. 156-69.000.

Putter, Horst: *See*—
Pokar, Jochen; and Putter, Horst, 4,039,828, Cl. 250-288.000.

Pynford Limited: *See*—
Pryke, John Fordham Speaight, 4,038,827, Cl. 61-53.620.

Pyro-Zytan GmbH & Co.: *See*—
Kienow, Sigismund; and Sundermann, Erich, 4,039,280, Cl. 432-248.000.

Quaker Oats Company, The: *See*—
Bone, David P., 4,039,689, Cl. 426-99.000.
Hayward, James Roger; Keyser, William L.; and Zielinski, Walter J., 4,039,688, Cl. 426-92.000.

Quarton, William T.; and Lowe, Peter R., to Honeywell Inc. Digital minimum/maximum vector CRT display. 4,039,784, Cl. 235-151.000.

Quere, Louis: *See*—
Pauker, Mira; Gobert, Jean; Pottier, Denis; and Quere, Louis, 4,040,028, Cl. 364-900.000.

Questor Corporation: *See*—
Bajorek, Jay E.; and Newman, Albert L., 4,038,802, Cl. 52-731.000.

Quigley, William D., to Sweda International, Inc. Forgery-resistant impact printing with matrix printer. 4,039,066, Cl. 197-1.00R.

Quinby, James D. Wheel chair push rod apparatus. 4,039,199, Cl. 280-242.0WC.

Radcliffe, Paul Anthony Beaufort: *See*—
Everett, Robert Charles; Radcliffe, Paul Anthony Beaufort; Robinson, Alfred Henry; and Veltze, Janusz Andrew, 4,040,094, Cl. 358-283.000.

Radeva, Maria Georgieva: *See*—
Stoev, Stoycho Mitrev; Mitrushev, Marin Dimitrov; Boshilov, Grozdan Todorov; and Radeva, Maria Georgieva, 4,039,456, Cl. 210-388.000.

Raider, Jerry Wesley: *See*—
Jones, Alan Lytton; Pawletko, Joseph Paul; and Raider, Jerry Wesley, 4,039,936, Cl. 324-34.00D.

Raleigh, William J., to General Electric Company. Process for the preparation of aqueous antifoam compositions. 4,039,469, Cl. 252-358.000.

Ralph M. Parsons Company: *See*—
Costantini, Ralph, 4,039,621, Cl. 423-239.000.

Rama Corporation: *See*—
Williams, David E., 4,039,778, Cl. 219-544.000.

Randolph, Robert W.; and Jantzen, Steven L., to ACF Industries, Incorporated. Apparatus for obtaining abutting contact of hollow tank courses to be circumferentially welded. 4,039,115, Cl. 228-44.500.

Rankin, Robert C., to Interlake, Inc. Apparatus for cleaning coke oven ascension pipe. 4,039,393, Cl. 202-241.000.

Rapistan, Incorporated: *See*—
Maxted, Wesley R., 4,039,074, Cl. 198-456.000.

Rappa, Benny F.: *See—*
D'Ascoli, John; Rappa, Benny F.; and Sculley, Thomas M., 4,038,970, Cl. 126-271.000.

Rapson, W. Howard: *See—*
Reeve, Douglas W.; Rowlandson, Gordon; and Rapson, W. Howard, 4,039,372, Cl. 162-19.000.

Rasmussen, Ole-Bendt. Method for producing a laminated high strength sheet. 4,039,364, Cl. 156-164.000.

Rath, Heinrich Bernhard, to Girling Limited. Disc brakes for vehicles. 4,039,054, Cl. 188-73.400.

Ravdonikas, Izabella Vladislayovna: *See—*
Nasyrov, Gakif Zakirovich; and Ravdonikas, Izabella Vladislayovna, 4,039,582, Cl. 423-592.000.

Ravenhill, John Richard: *See—*
Adams, Donald James; Kieninger, Horst; Ravenhill, John Richard; Ries, Dieter; and Schmeling, Karin, 4,039,693, Cl. 426-565.000.

Ray, Bhairab Nath; and Bhattacharyya, Dhirendra Nath, to Indian Explosives Limited of I.C.I. House. Dry blasting agents. 4,039,361, Cl. 149-41.000.

Ray, Louis F. Load balance, double bucket cable stay crane with load sensing means. 4,039,086, Cl. 212-47.000.

Raycon Corporation: *See—*
Rupert, Gary F., 4,039,779, Cl. 219-69.00G.

Raymond Lee Organization, Inc., The: *See—*
Bamettler, Rudy A., 4,039,202, Cl. 280-507.000.
Pulliam, Barron, 4,039,140, Cl. 254-25.000.
Wilhelm, Bartel, 4,039,038, Cl. 180-70.00R.

Raytheon Company: *See—*
Clark, Neill V.; and Holzgrafe, Homer G., 4,039,974, Cl. 333-7.00R.

RB Products Corporation: *See—*
Bianchi, Albert A., 4,038,787, Cl. 51-391.000.

RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 4,039,857, Cl. 307-213.000.
Carnes, James Edward, 4,040,092, Cl. 358-213.000.
Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, 4,039,862, Cl. 307-247.00R.
DiPiazza, James John, 4,039,838, Cl. 250-483.000.
Goldman, Michael Barnett; and Niemiec, Stanley Joseph, 4,039,869, Cl. 307-304.000.
Guarracini, Joseph, 4,040,089, Cl. 358-128.000.
Hannan, William James, 4,040,088, Cl. 358-127.000.
Kleinknecht, Hans Peter, 4,039,370, Cl. 156-626.000.
Kosonocky, Walter Frank; and Kohn, Elliott Samuel, 4,040,076, Cl. 357-24.000.
McDonie, Arthur Frederick, 4,039,887, Cl. 313-346.00R.
Stewart, Roger Green, 4,039,858, Cl. 307-231.000.
Young, Alexander Wilson, 4,040,029, Cl. 364-900.000.

Reber, Stephen A.: *See—*
Hyde, Richard W.; Reber, Stephen A.; Schutte, August H.; and Nadkarni, Ravindra M., 4,039,424, Cl. 208-8.000.

Rebhan, Joerg; and Matthies, Hans Georg, to BASF Aktiengesellschaft. Continuous manufacture of linear polyesters. 4,039,515, Cl. 260-75.00M.

Rebours, Albert: *See—*
Carre, Christian; and Rebours, Albert, 4,039,062, Cl. 193-31.00R.

Records, Earl T.: *See—*
Larson, Clayton E.; and Records, Earl T., 4,039,047, Cl. 182-111.000.

Redman, Charles M. Rotational motion transducer. 4,039,260, Cl. 356-106.0LR.

Redman Fisher Engineering Limited: *See—*
Holberry, Charles Thomas, 4,038,926, Cl. 104-88.000.

Redmer, Wilbert W. Message holder. 4,039,134, Cl. 248-205.00A.

Reed, Robert D.; and Schwartz, Robert E., to John Zink Company. Noise and smoke retardant flare. 4,039,276, Cl. 431-202.000.

Reed, Terry J.; and Yannone, Robert A., to Westinghouse Electric Corporation. System and method for monitoring industrial gas turbine operating parameters and for providing gas turbine power plant control system inputs representative thereof. 4,039,804, Cl. 235-151.210.

Reerink, Wilhelm; Beck, Kurt-Guenther; Echterhoff, Heinrich; Muller, Johannes; Degen, Kurt; and Nashan, Gerd, to Bergwerksverband GmbH. Firebricks. 4,039,342, Cl. 106-58.000.

Reeve, Douglas W.; Rowlandson, Gordon; and Rapson, W. Howard, to Erco Envirotech Ltd. Bleach plant filtrate recovery. 4,039,372, Cl. 162-19.000.

Refac Technology Development Corporation: *See—*
Schneider, Philip A., 4,039,891, Cl. 313-522.000.

Regie Nationale des Usines Renault: *See—*
Hergoualc'h, Jean Rene; and Fornet, Michel, 4,039,291, Cl. 23-288.0FC.
Pruvot, Francois C.; Maistrelli, Roger; and Bauchet, Pierre, 4,039,061, Cl. 192-4.00A.

Regie Nationale des Usines Renault et Automobiles Peugeot: *See—*
Reilhac, Andre Jean; and Cherbourg, Robert, 4,038,718, Cl. 16-110.00R.

Reilhac, Andre Jean; and Cherbourg, Robert, to Regie Nationale des Usines Renault et Automobiles Peugeot. Door handles, notably for vehicles. 4,038,718, Cl. 16-110.00R.

Reinhardt, Robert M.: *See—*
Kullman, Russell M. H.; and Reinhardt, Robert M., 4,039,282, Cl. 8-184.000.

Reist, Walter, to Ferag AG. Apparatus for cutting continuously arriving flat structures. 4,038,893, Cl. 83-154.000.

Reist, Walter; and Stauber, Hans-Ulrich, to Ferag AG. Apparatus for transferring piece goods, especially printed products, arriving in succession from a first individual conveyor to a second individual conveyor. 4,039,182, Cl. 271-64.000.

Remington Arms Company, Inc.: *See—*
Cole, William T.; Pavone, Joseph P.; and Scanlon, John J., 4,038,923, Cl. 102-43.00R.

Remper, John A.: *See—*
Haupin, Warren E.; Remper, John A.; and Dell, M. Benjamin, 4,039,648, Cl. 423-496.000.

Repose, John; and Niatas, Ulysses, to Delaval Turbine, Inc. Tilting pad bearing. 4,039,228, Cl. 308-73.000.

Research Corporation: *See—*
Kornreich, Philipp G.; and Kowel, Stephen T., 4,040,091, Cl. 358-213.000.
Kornreich, Philipp G.; and Kowel, Stephen T., 4,040,112, Cl. 358-213.000.

Reverse Injection Company (Proprietary) Limited: *See—*
Mostert, Jacob Johan, 4,038,823, Cl. 60-584.000.

Rewo Chemische Werke G.m.b.H.: *See—*
Bloch, Michael; Inglis, Ronald Peter; and Koebner, Adolf, 4,039,562, Cl. 260-401.000.

Rey-Bellet, Gerald: *See—*
Kompis, Ivan; Rey-Bellet, Gerald; and Zanetti, Guido, 4,039,543, Cl. 260-256.40N.

Reymore, Harold E., Jr.: *See—*
Kolakowski, Richard A.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., 4,039,487, Cl. 260-2.5AW.

Reynolds Metals Company: *See—*
Watson, David R.; Carithers, Val G.; and Drown, Harold L., 4,039,480, Cl. 252-455.00R.

Reynolds, Richard G.: *See—*
Dalpee, Joseph A.; Bernard, Fred W.; and Reynolds, Richard G., 4,040,119, Cl. 361-191.000.

Rezac, Terrence E.: *See—*
Lutgen, Harold Michael; and Rezac, Terrence E., 4,038,832, Cl. 62-45.000.

Rheinische Braunkohlenwerke AG: *See—*
Knoche, Karl-Friedrich; Schubert, Johannes; and Schulze-Bentrop, Roland, 4,039,651, Cl. 423-579.000.

Rheinmetall G.m.b.H.: *See—*
Backstein, Gunter, 4,038,901, Cl. 89-1.00B.

Rhodes, Herbert M. Apparatus for pulling a line. 4,039,109, Cl. 226-172.000.

Rhodes, Robert V. Indian-wrestling device. 4,039,185, Cl. 273-1.00R.

Rhone-Poulenc Industries: *See—*
Bardin, Robert; and Cronenberger, Michel, 4,039,455, Cl. 210-321.00A.
Maisonneuve, Paul; and Rouyer, Paul, 4,039,458, Cl. 210-513.000.

Rhone-Poulenc S.A.: *See—*
Bargain, Michel, 4,039,628, Cl. 260-857.0UN.

Rhone-Poulenc-Textile: *See—*
Couchoud, Paul, 4,039,634, Cl. 260-895.000.

Richards, George Gilman, Jr.; and Berger, John Gilbert, to AMP Incorporated. Electrostatic power supply. 4,039,927, Cl. 323-17.000.

Richards, Kenneth Julian; and Clark, Don Richard, to Kennecott Copper Corporation. Cyclic process using A.C. for selective recovery of metals from materials containing same. 4,039,404, Cl. 204-106.000.

Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,039,589, Cl. 260-618.00B.

Richter, Sidney B.; and Krenzer, John, to Velsicol Chemical Corporation. Herbicidal compositions and methods employing N-α-chloroacetyl-N-(1,3-dioxan-2-ylmethyl)-2,6-dimethylaniline. 4,039,314, Cl. 71-88.000.

Ricoh Co., Ltd.: *See—*
Suzaki, Masayuki; and Araki, Shigeyuki, 4,039,919, Cl. 318-696.000.

Ridyard, Denis Robert Annesley, to Imperial Chemical Industries Limited. Sulphonic acid-, hydroxy-substituted phenyl azo-naphthyl azo-N-aryl amino dyes. 4,039,528, Cl. 260-190.000.

Riedel, Nelson Andrew: *See—*
Curtis, Robert Bartlett; and Riedel, Nelson Andrew, 4,040,023, Cl. 364-900.000.

Rieger, Michael Lawrence: *See—*
Battjes, Carl Robert; Golladay, Harvey Leon; Rieger, Michael Lawrence; Rosario, Binoy Anthony; and Schlotzhauer, Kenneth George, 4,039,899, Cl. 315-371.000.

Riemens, Karel: *See—*
Eggermont, Ludwig Desire Johan; and Riemens, Karel, 4,039,949, Cl. 325-38.00B.

Ries, Dieter: *See—*
Adams, Donald James; Kieninger, Horst; Ravenhill, John Richard; Ries, Dieter; and Schmeling, Karin, 4,039,693, Cl. 426-565.000.

Rieter Machine Works, Ltd.: *See—*
Schar, Hugo, 4,039,092, Cl. 214-83.360.

Riken Light Metal Industries Company, Ltd.: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Wada, Kenji; and Kikuchi, Masaru, 4,039,355, Cl. 148-31.500.

Ring, Peter Alexander, to Downs Surgical Limited. Elbow prosthesis. 4,038,704, Cl. 3-1.910.

Ripingill, Allan E.: *See—*
Bruce, Robert L.; Gaughan, Neil A.; and Ripingill, Allan E., 4,039,951, Cl. 325-38.00R.

Ritshyo Kogyo Kabushiki Kaisha: *See—*
Sakurada, Hiroshi, 4,039,183, Cl. 272-67.000.

Roback, Donald W.; Hampel, Wilbur J.; Prince, Luther T.; and Huppert, Dean L., to Ault, Inc. Plug in regulating power supply. 4,039,900, Cl. 361-388.000.

Robbins, F. Peter. Openable and closeable self-tightening clip. 4,038,727, Cl. 24-248.00C.

Robbins, G. Howard: *See—*
Couturier, Robert A.; Davis, Steven J.; and Robbins, G. Howard, 4,039,751, Cl. 179-15.0BF.

Robert Bosch G.m.b.H.: *See—*
Schacht, Hans; and Cub, Fritz, 4,039,457, Cl. 210-493.00R.
Schweizer, Hartmut, 4,039,931, Cl. 324-16.00T.
Sohmer, Oskar; Autenrieth, Heinz; and Kirner, Kuno, 4,039,700, Cl. 427-46.000.
Weckenmann, Albert, 4,039,929, Cl. 323-75.00L.

Roberts, Craig G.; and Kuo, Samuel Chung-Shu, to GTE Sylvania Incorporated. Broadband corrugated horn antenna. 4,040,061, Cl. 343-786.000.

Roberts, David B., Jr.; and Wells, Joseph L. Educational and multifunction hydroponics garden container. 4,038,779, Cl. 47-62.000.

Roberts, Richard Whitside. Ice skating arena. 4,038,834, Cl. 62-235.000.

Robertson, Arthur B.; and Schaffhauser, Robert J., to Allied Chemical Corporation. Radiation cross-linkable compositions of copolymers of ethylene and a halogenated monomer. 4,039,631, Cl. 260-878.00R.

Robertson, James H. Method of making floating seat cushion. 4,039,363, Cl. 156-145.000.

Robinson, Alfred Henry: *See—*
Everett, Robert Charles; Radcliffe, Paul Anthony Beaufort; Robinson, Alfred Henry; and Veltze, Janusz Andrew, 4,040,094, Cl. 358-283.000.

Robinson, Dan L.: *See—*
Worlton, Dan C., deceased; and Robinson, Dan L., 4,039,375, Cl. 176-19.0LD.

Roca, Juan Armengol. Wall structure. 4,038,793, Cl. 52-125.000.

Rocha, John G., to United States of America, Army. Cartridge feed, positioning and ejection control system. 4,038,904, Cl. 89-33.0MC.

Rockwell International Corporation: *See—*
Champagne, Ralph R., 4,039,159, Cl. 242-130.100.
Havens, Charlie C., 4,039,741, Cl. 174-35.0GC.

Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,038,933, Cl. 112-288.000.

Roderick, Ronald R., to National Equipment Corporation. Closed passage heat holding apparatus. 4,039,776, Cl. 219-401.000.

Rogers, Irney Lee. Pallet nailing device. 4,039,111, Cl. 227-30.000.

Rogers, Jack A.: *See—*
Claus, Kenneth G.; and Rogers, Jack A., 4,039,636, Cl. 260-963.000.

Rogov, Iosif Alexandrovich: *See—*
Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; Vyshelessky, Alexandr Nikolaevich; Rogov, Iosif Alexandrovich; Kishinevsky, Lazar Iosifovich; and Pidenko, Anatoly Pavlovich, 4,039,796, Cl. 219-10.55A.

Rohm GmbH: *See—*
Kraemer, Dieter; Lehmann, Klaus; and Plainer, Hermann, 4,039,413, Cl. 204-159.120.

Rohm and Haas Company: *See—*
Wilson, Harold F.; and Fleischfresser, Marvin H., 4,039,588, Cl. 260-613.00R.

Roland Offsetmaschinenfabrik Faber & Schleicher AG.: *See—*
Gensheimer, Valentin, 4,039,873, Cl. 310-74.000.

Roller, Kent G.: *See—*
Brown, Richard E.; Bickling, Archie L., Jr.; Friebel, Virgil R.; and Roller, Kent G., 4,039,337, Cl. 106-38.280.

Rolls-Royce (1971) Limited: *See—*
Snell, Leonard Stanley, 4,038,818, Cl. 60-226.00R.

Romero-Sierra, Cesar Aurelio; and Tanner, Joseph A., to Canadian Patents and Development Limited. Surgical skin closure. 4,038,989, Cl. 128-335.000.

Ronda, Richard M.: *See—*
Brown, Edgar D., Jr.; and Ronda, Richard M., 4,039,143, Cl. 252-28.000.

Ropes, Charles A., Jr.: *See—*
Mayer, Edward A.; Brandenburg, John T.; Crone, John M., Jr.; and Ropes, Charles A., Jr., 4,039,294, Cl. 23-288.0FB.

Rosario, Binoy Anthony: *See—*
Battjes, Carl Robert; Golladay, Harvey Leon; Rieger, Michael Lawrence; Rosario, Binoy Anthony; and Schlotzhauer, Kenneth George, 4,039,899, Cl. 315-371.000.

Rosch, Gunter: *See—*
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,039,531, Cl. 542-462.000.
Sahm, Wilfried; Schinzel, Erich; and Rosch, Gunter, 4,039,555, Cl. 260-307.00G.

Rose, Billy L. Portable, foldable evaporative cooler. 4,038,836, Cl. 62-316.000.

Rosenthal, Bruce David: *See—*
Dingwall, Andrew Gordon Francis; and Rosenthal, Bruce David, 4,039,862, Cl. 307-247.00R.

Rosenthal, Leon. Method and apparatus for generating optic lenses. 4,038,783, Cl. 51-33.00W.

Rosier, Laurence L., to International Business Machines Corporation. Column accessing of elements in confined arrays. 4,040,038, Cl. 340-174.0TF.

Ross, Frank E.: *See—*
Goodlaxson, John D.; and Ross, Frank E., 4,039,209, Cl. 285-8.000.

Rothman, Bernard; Fiks, Julien G.; and Bang, Friedrich C., to Wastermann, Werner F. Coin packaging machine. 4,038,806, Cl. 53-32.000.

Rotier, Donald Jack, to Honeywell Inc. Air movement measuring apparatus. 4,038,870, Cl. 73-181.000.

Roubal, Jiri; and Korpiun, Joachim, to Dr. -Ing. Max Schloetter. Pretreatment of plastic materials for metal plating. 4,039,714, Cl. 428-336.000.

Rouiller, Jean-Marie: *See—*
Nicoud, Jean-Daniel; and Rouiller, Jean-Marie, 4,039,761, Cl. 179-90.00B.

Roussel-UCLAF: *See—*
Perronnet, Jacques; and Girault, Pierre, 4,039,316, Cl. 71-118.000.

Rouyer, Paul: *See—*
Maisonneuve, Paul; and Rouyer, Paul, 4,039,458, Cl. 210-513.000.

Rovell, Alfred. Air screen for food warming table. 4,038,968, Cl. 126-261.000.

Rowlandson, Gordon: *See—*
Reeve, Douglas W.; Rowlandson, Gordon; and Rapson, W. Howard, 4,039,372, Cl. 162-19.000.

Roza, Engel, to U.S. Philips Corporation. Phase-locked loop having a slight phase offset error. 4,039,967, Cl. 331-11.000.

Rozenboom, Jaap: *See—*
Chermin, Hubertus Mathias Jozef; Luursema, Meerten; Rozenboom, Jaap; and Smulders, Herman Adrianus Godefridus, 4,039,895, Cl. 315-101.000.

Rubenstein, Kenneth E.: *See—*
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,039,385, Cl. 195-63.000.

Rubin, Leon J.: *See—*
Bharucha, Kekhusroo R.; Rubin, Leon J.; and Cross, Charles K., 4,039,690, Cl. 426-266.000.

Ruch, Paul: *See—*
Sankey, Edwin W.; Barden, Kenneth L.; and Ruch, Paul, 4,038,765, Cl. 37-116.000.

Rufer, Willy: *See—*
Giddey, Claude; and Rufer, Willy, 4,039,694, Cl. 426-574.000.

Ruhrchemie Aktiengesellschaft: *See—*
Falbe, Jurgen; Tummes, Hans; and Hahn, Heinz-Dieter, 4,039,584, Cl. 260-604.0HF.

Rupert, Gary F., to Raycon Corporation. Apparatus for compensating for electrode wear in an electrical discharge machine. 4,039,779, Cl. 219-69.00G.

Ruschke, Ricky Robert: *See—*
Mittleman, Herbert; and Ruschke, Ricky Robert, 4,038,983, Cl. 128-214.00C.

Rusco Industries, Inc.: *See—*
Tambascio, Nickolas A., 4,038,710, Cl. 5-200.00R.

Russell, Carl D. Remote controlled mechanical release or lock-in electrical path between battery and a load. 4,039,903, Cl. 361-187.000.

Russo, Neil: *See—*
Chan, Kingsley; and Russo, Neil, 4,039,822, Cl. 240-73.0BC.

Russo, Vincent, Jr.: *See—*
Chasin, David; Russo, Vincent, Jr.; and Foglio, Sam, 4,038,767, Cl. 40-125.00H.

Sachs, Melvin H., to U-Forms International, Inc. Composite permanent block-form for reinforced concrete construction and method of making same. 4,038,798, Cl. 52-309.700.

Safholm, Alwyn K. Apparatus for lubricating or cleaning sheathed cables. 4,039,048, Cl. 184-15.00R.

Sahara, Masayoshi: *See—*
Nanba, Yasuhiro; and Sahara, Masayoshi, 4,040,068, Cl. 354-24.000.

Sahm, Wilfried; Schinzel, Erich; and Rosch, Gunter, to Hoechst Aktiengesellschaft. Benzofuran derivatives, process for preparing them and their use as optical brighteners. 4,039,555, Cl. 260-307.00G.

Saiki, Atsushi; Harada, Seiki; and Oba, Yoichi, to Hitachi, Ltd. Aluminum oxide layer bonding polymer resin layer to semiconductor device. 4,040,083, Cl. 357-54.000.

Sain, Bernard S., to Sea-Land Service, Inc. Portable meat railer shipping assembly. 4,038,929, Cl. 105-367.000.

Saint-Hilaire, Gilles; and Guay, Jean-Marc. Real time programmable digital register analyser. 4,039,814, Cl. 235-153.00A.

Saito, Hisatoshi; and Kimura, Kuniyoshi, to Kewpie Kabushiki Kaisha. Egg inspecting apparatus. 4,039,259, Cl. 356-53.000.

Saito, Narimasa: *See—*
Suzuki, Masaru; and Saito, Narimasa, 4,039,384, Cl. 195-62.000.

Saito, Seiichi: *See—*
Shiroki, Ken-ichi; Mori, Katsumi; Kuwano, Yasuhiko; and Saito, Seiichi, 4,039,970, Cl. 331-94.50F.

Saito, Shigeki: *See—*
Koizumi, Osamu; Saito, Shigeki; and Naito, Shotaro, 4,039,853, Cl. 307-101.000.

Saito, Shoji. Apparatus for peeling a flesh of vegetables to form a tape-like flesh. 4,038,915, Cl. 99-594.000.

Saito, Takeshi: *See—*
Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, 4,039,660, Cl. 424-117.000.

Sakagami, Mamoru, to Fuji Kikai Seizo Kabushiki Kaisha. Method of and apparatus for producing baseball bats. 4,038,850, Cl. 72-85.000.

Sakai, Kazuyoshi; Kobayashi, Shigeo; and Fujita, Takeshi, to Dai-Ichi Kogyo Seiyaku Co., Ltd. Process for decomposition of polyurethane foam. 4,039,568, Cl. 260-453.00P.

Sakai, Masaaki: *See—*
Ninomiya, Takeshi; Sakai, Masaaki; and Suzuki, Kiyosuke, 4,040,081, Cl. 357-34.000.

Sakurada, Hiroshi, to Ritshyo Kogyo Kabushiki Kaisha. Wrist exercise and strengthening device. 4,039,183, Cl. 272-67.000.

Salmi, Pekka M., to Oy Tampella AB. Hydraulic rock drill. 4,039,033, Cl. 173-105.000.

Salomon, Louis: *See—*
Humblet, Lucien A.; Salomon, Louis; and Eschrich, Hubert R., 4,039,468, Cl. 252-301.10W.

Salsmans, Robert Raymond Malvine: *See—*
van der Burg, Willem Jacob; and Salsmans, Robert Raymond Malvine, 4,039,558, Cl. 260-326.50B.

Salters, Roelof Herman Willem: *See—*
Lambrechtse, Cornelis Willem; and Salters, Roelof Herman Willem, 4,039,860, Cl. 307-362.000.

Samijn, Rafael Pierre: *See—*
Kokelenberg, Hendrik Emmanuel; Samijn, Rafael Pierre; Van den Houte, Jozef Willy; and Pollet, Robert Joseph, 4,039,332, Cl. 96-48.00R.

San Diego Gas & Electric Co.: *See—*
Duckworth, William H., 4,039,932, Cl. 324-28.00R.

Sanabria, Pedro. Automobile tire theft alarm. 4,040,008, Cl. 340-65.000.

Sanders, David E.: *See—*
Gordy, Robert S.; and Sanders, David E., 4,039,749, Cl. 178-69.100.

Sandvick, Robert M., Sr. Pipe laying apparatus. 4,039,087, Cl. 214-1.0PA.

Sankey, Edwin W.; Barden, Kenneth L.; and Ruch, Paul, to Marion Power Shovel Company, Inc. Boom support structure for walking dragline excavator. 4,038,765, Cl. 37-116.000.

Sankyo Electric Industries, Ltd.: *See—*
Hiraga, Masaharu, 4,039,270, Cl. 417-569.000.

Santchi, Douglas L.: *See—*
Kupsky, George A.; and Santchi, Douglas L., 4,039,882, Cl. 313-217.000.

Sanyo Chemical Industries, Ltd.: *See—*
Matsuda, Kaneo; and Fujimura, Noboru, 4,039,466, Cl. 252-194.000.

Sare, Edward J.: *See—*
Lavanish, Jerome M.; and Sare, Edward J., 4,039,623, Cl. 423-240.000.

Sargisson, Donald F.: *See—*
Snow, Barton H.; and Sargisson, Donald F., 4,038,817, Cl. 60-204.000.

Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; and Yamamoto, Hisao, to Sumitomo Chemical Co., Ltd. Butyrophenone compounds as psychotropics. 4,039,670, Cl. 424-267.000.

Sasaki, Mitsuru: *See—*
Kato, Toshiro; Sasaki, Mitsuru; Ooishi, Tadashi; and Mujai, Kunio, 4,039,635, Cl. 260-954.000.

Sasaki, Takashi: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 4,039,520, Cl. 260-117.000.

Sasaki, Toshio: *See—*
Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, 4,039,660, Cl. 424-117.000.

Sasaki, Yoshinori; Yokoyama, Isao; Makino, Motohiko; Awaji, Syun; and Hosoya, Kaneo, to TDK Electronics Company, Limited. Electrode assembly for use in cathodic protection. 4,039,417, Cl. 204-196.000.

Sato, Akira: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,039,335, Cl. 96-124.000.

Sato, Atsushi, to Nippon Petrochemicals Company Ltd. Process for producing a solvent for use in microcapsule for pressure-sensitive copying paper. 4,039,712, Cl. 428-307.000.

Sato, Fumihiko: *See—*
Shibayama, Kyoichi; Sato, Fumihiko; and Takahama, Takashi, 4,039,415, Cl. 204-181.000.

Sato, Yasuta, to Takara Co, Ltd. Doll body with magnet and pole pieces and detachable appendages. 4,038,775, Cl. 46-22.000.

Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, to Warner-Lambert Company. Method for producing diuresis by administering certain thiazolidinone acetic acid derivatives. 4,039,671, Cl. 424-267.000.

Saumsiegle, Robert W.; and Harry, Ieuan L., to Continental Can Company, Inc. Method for blow molding and ejecting hollow articles. 4,039,644, Cl. 264-97.000.

Sawyer, Philip Nicholas. Electrochemical and chemical methods for production of non-thrombogenic metal heart valves. 4,038,702, Cl. 3-1.500.

Sayigh, Adnan A. R.: *See—*
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,039,580, Cl. 260-570.00D.
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,039,581, Cl. 260-570.00D.
Kolakowski, Richard A.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., 4,039,487, Cl. 260-2.5AW.

SCA Development Aktiebolag: *See—*
Peterson, Per Viking, 4,039,154, Cl. 241-261.300.

Scales, Edgar F.; Von Fange, Eugene K.; and Wood, Robert F., to General Electric Company. High voltage winding assembly with improved regulation. 4,039,924, Cl. 363-65.000.

Scanlon, John J.: *See—*
Cole, William T.; Pavone, Joseph P.; and Scanlon, John J., 4,038,923, Cl. 102-43.00R.

Schacht, Erich; Lauterbach, Gunter; Mehrhof, Werner; Nowak, Herbert; and Simane, Zdenek, to Merck Patent Gesellschaft mit beschrankter Haftung. Phenoxypropionic acid derivatives and pharmaceutical preparations containing same. 4,039,683, Cl. 424-324.000.

Schacht, Hans; and Cub, Fritz, to Robert Bosch G.m.b.H. Coiled filter element for filtering of liquids. 4,039,457, Cl. 210-493.00R.

Schafer, Harry Neil Scott, to Commonwealth Scientific and Industrial Research Organization. Active carbon by potassium ion exchange and leaching of carbonaceous material. 4,039,473, Cl. 252-425.000.

Schafer, Jurgen F., to Original Hanau Quarzlampen. Discharge lamp for the disactivation of micro-organisms. 4,039,884, Cl. 313-225.000.

Schafer, Karl: *See—*
Keller, Werner; and Schafer, Karl, 4,039,072, Cl. 198-429.000.

Schaffhauser, Robert J.: *See—*
Robertson, Arthur B.; and Schaffhauser, Robert J., 4,039,631, Cl. 260-878.00R.

Schaffner, Carl P.: *See—*
Gordon, Harry W.; and Schaffner, Carl P., 4,039,659, Cl. 424-115.000.

Schapiro, Norman; and Shoenberger, Ronald W., to United States Steel Corporation. Method of calcining green coke agglomerates. 4,039,319, Cl. 75-42.000.

Schar, Hugo, to Rieter Machine Works, Ltd. Bobbin package storage box. 4,039,092, Cl. 214-83.360.

Scheel, Kurt; and Wirsching, Franz, to Gebr. Knauf Westdeutsche Gipswerke. Process for the manufacture of stabilized, hardenable calcium sulphate by reacting crude phosphate with sulphuric acid. 4,039,616, Cl. 423-166.000.

Scheib, William R., to Aetna-Standard Engineering Company. Stretch reducing mill. 4,038,855, Cl. 72-238.000.

Schenk, Peter, to Dzus Fastener Co., Inc. Coupling device. 4,039,135, Cl. 248-214.000.

Schepler, Kent L. Modular breadboard. 4,039,236, Cl. 339-17.00N.

Schering Aktiengesellschaft: *See—*
Fuchs, Peter; Gerhards, Erich; Matthes, Heinz; Wendt, Hans; and Wiechert, Rudolf, 4,039,668, Cl. 424-241.000.

Schering Corporation: *See—*
Berkman, Robert N.; and Houdeshell, Jesse W., 4,039,684, Cl. 424-324.000.

Scherr, Norman J., Jr.: *See—*
Smith, David L.; and Scherr, Norman J., Jr., 4,038,756, Cl. 33-172.00E.

Scherzer, Joachim, to Original Hanau Quarzlampen. Contact pin insulation of infrared bright radiators. 4,039,886, Cl. 313-318.000.

Scheurecker, Werner: *See—*
Bayer, Franz; and Scheurecker, Werner, 4,038,856, Cl. 72-238.000.

Schibler, Luzius: *See—*
Merz, Jurg; and Schibler, Luzius, 4,039,576, Cl. 260-553.00R.

Schiff, Edward Paul. Air filter. 4,039,308, Cl. 55-505.000.

Schinzel, Erich: *See—*
Gunther, Dieter; Erckel, Rudiger; Schinzel, Erich; and Rosch, Gunter, 4,039,531, Cl. 542-462.000.
Sahm, Wilfried; Schinzel, Erich; and Rosch, Gunter, 4,039,555, Cl. 260-307.00G.

Schlick, Horst: *See—*
Mann, Arnold; Heimbach, Ludolf; and Schlick, Horst, 4,039,043, Cl. 180-108.000.

Schlig, Eugene Stewart, to International Business Machines Corporation. Distributed Josephson junction logic circuit. 4,039,856, Cl. 307-212.000.

Schlotzhauer, Kenneth George: *See—*
Battjes, Carl Robert; Golladay, Harvey Leon; Rieger, Michael Lawrence; Rosario, Binoy Anthony; and Schlotzhauer, Kenneth George, 4,039,899, Cl. 315-371.000.

Schlumberger Technology Corporation: *See—*
Durand, Yves Henri, 4,040,002, Cl. 340-18.0DC.
Vivet, Bernard; Trouiller, Jean-Claude; and Gruel, Henri, 4,040,001, Cl. 340-15.5TN.

Schmeling, Karin: *See—*
Adams, Donald James; Kieninger, Horst; Ravenhill, John Richard; Ries, Dieter; and Schmeling, Karin, 4,039,693, Cl. 426-565.000.

Schmerling, Louis; and Levy, Joseph, to UOP Inc. Production of carboxylic acids from unsaturated hydrocarbons in the presence of HF and A cuprous compound. 4,039,564, Cl. 260-413.000.

Schmerling, Louis: *See—*
Bloch, Herman S.; and Schmerling, Louis, 4,039,793, Cl. 260-651.00R.

Schmid Laboratories, Inc.: *See—*
Gordon, Harry W.; and Schaffner, Carl P., 4,039,659, Cl. 424-115.000.
Gordon, Harry W., 4,039,661, Cl. 424-119.000.

Schmidt, Devere W., to C. L. Frost & Son, Inc. Connection apparatus for multipiece bearing race. 4,039,233, Cl. 308-195.000.

Schmidt, Gustav A.: *See—*
Douek, Maurice; Schmidt, Gustav A.; Malofsky, Bernard M.; and Hauser, Martin, 4,039,705, Cl. 428-40.000.

Schmidt, Hans-Joachim, to Tekade Felten & Guilleaume Fernmeldeanlagen GmbH. Adjustable compensating circuit having differential capacitor in each tunable stage. 4,039,977, Cl. 333-28.00R.

Schmidt, Herbert; and Weiler, Rolf, to ITT Industries, Inc. Sealing ring. 4,039,197, Cl. 277-24.000.

Schmidt, Werner: *See—*
Klinkenberg, Herbert; Petersen, Egon; and Schmidt, Werner, 4,039,538, Cl. 544-219.000.

Schmitz, Floyd Albert, Jr.; and Smith, Wayne Gerald, to J. I. Case Company. Boom arm support lock. 4,039,093, Cl. 214-130.00R.

Schneider, Horst: *See—*
Hartkopf, Heinz; and Schneider, Horst, 4,038,861, Cl. 72-416.000.

Schneider, Philip A., to Refac Technology Development Corporation. Incandescent display lamp. 4,039,891, Cl. 313-522.000.

Schneidhofer, Adolf: *See—*
Holzgruber, Wolfgang; and Schneidhofer, Adolf, 4,039,022, Cl. 164-52.000.

Schober, Michael A., to Borg-Warner Corporation. Method of making Belleville springs. 4,039,354, Cl. 148-16.500.

Schoeller, Siegmund. Method for straightening joists. 4,038,803, Cl. 52-741.000.

Schoen, Lowhardt A. A.; Bruls, Wilhelmus G. M.; and Debets, Wilhelmus A. M., to Stamicarbon B. V. Afterchlorinated vinyl chloride polymers. 4,039,732, Cl. 526-43.000.

Schoenenberger, Richard J.: *See—*
Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., 4,038,939, Cl. 118-4.000.

Scholes, Ian Robert: *See—*
Astley, David John; Gilbert, John Roger Bawden; Scholes, Ian Robert; Jacobi, Jan Stephan; and Brookes, Garth Royston, 4,039,403, Cl. 204-105.00R.

Scholten, Rudy Dirk Anthonie; and Visser, Antonius Gerardus, to U.S. Philips Corporation. Crystal controlled logic gate clock pulse generator. 4,039,972, Cl. 331-108.00D.

Schon, Manfred; Durr, Helmut; Plath, Dieter; Keller, Karlfried; and Michel, Walter, to Cassella Farbwerke Mainkur Aktiengesellschaft. Melamine-formaldehyde condensates and mixtures thereof. 4,039,493, Cl. 260-21.000.

Schoom, Werner, to Deutsche Gesellschaft fur Schadlingbekampfung. Method for treating residues, left over after the gas release, of pest control agents that contain earth metal phosphides and/or alkaline earth metal phosphides. 4,039,611, Cl. 423-1.000.

Schreiber, Richard H.: *See—*
Nettleton, Donald E., Jr.; Bush, James A.; Bradner, William T.; and Schreiber, Richard H., 4,039,736, Cl. 536-17.000.

Schrock, Wilfried: *See—*
Konig, Hans-Bodo; Metzger, Karl Georg; and Schrock, Wilfried, 4,039,673, Cl. 424-271.000.

Schubert, Johannes: *See—*
Knoche, Karl-Friedrich; Schubert, Johannes; and Schulze-Bentrop, Roland, 4,039,651, Cl. 423-579.000.

Schuck, Paul R.; and Baylor, John M., to J. I. Case Company. Vertical lift and control for plows. 4,038,828, Cl. 61-72.600.

Schueller, Pierre: *See—*
Terracol, Claude; and Schueller, Pierre, 4,039,983, Cl. 335-16.000.

Schuh, Eduard: *See—*
Kelch, Heinz; and Schuh, Eduard, 4,039,780, Cl. 235-30.00R.

Schuler, Roland, to BBC Brown Boveri & Company Limited. Method of making electrical coils for dynamo-electric machines having band-formed insulation material. 4,038,741, Cl. 29-596.000.

Schultz, Bethel F. Apparatus for automatically constructing frame structures. 4,039,112, Cl. 227-40.000.

Schultz, William J.: *See—*
Kernander, Warren N.; and Schultz, William J., 4,038,938, Cl. 116-129.00N.

Schulze-Bentrop, Roland: *See—*
Knoche, Karl-Friedrich; Schubert, Johannes; and Schulze-Bentrop, Roland, 4,039,651, Cl. 423-579.000.

Schumacher, William J.; and Tanczyn, Harry. Galling resistant austenitic stainless steel. 4,039,356, Cl. 148-31.500.

Schutte, August H., to Arthur D. Little, Inc. Process for producing fluid fuel from coal. 4,039,426, Cl. 208-8.000.

Schutte, August H.: *See—*
Hyde, Richard W.; Reber, Stephen A.; Schutte, August H.; and Nadkarni, Ravindra M., 4,039,424, Cl. 208-8.000.

Schwartz, Robert E.: *See—*
Reed, Robert D.; and Schwartz, Robert E., 4,039,276, Cl. 431-202.000.

Schwartz, Seymour S., to Gambit Enterprises. Airborne, hovering, decorative object, toy or the like. 4,038,777, Cl. 46-87.000.

Schwarze, Rigobert. Tube bending machine. 4,038,853, Cl. 72-157.000.

Schweikart, Horst, to Gehap Gesellschaft fur Handel und Patentverwertung mbH & Co. KG. Device for limiting the speed of internal-combustion engine. 4,038,951, Cl. 123-102.000.

Schweizer, Hartmut, to Robert Bosch G.m.b.H. System to sense a marker on a rotating body. 4,039,931, Cl. 324-16.00T.

Schwerdt, Friedrich: *See—*
Brunner, Friedrich; Frasch, Peter; and Schwerdt, Friedrich, 4,039,371, Cl. 156-668.000.

SCM Corporation: *See—*
Close, Ralph E.; and Oroshnik, William, 4,039,591, Cl. 260-618.00R.
McGinniss, Vincent D., 4,039,414, Cl. 204-181.000.

Scott, John E., to Owens-Illinois, Inc. Method and apparatus for transferring and operating on articles. 4,038,785, Cl. 51-145.00R.

Scott, William Lafayette: *See—*
DiMartini, Carl Richard; and Scott, William Lafayette, 4,039,322, Cl. 75-63.000.
DiMartini, Carl Richard; and Scott, William Lafayette, 4,039,323, Cl. 75-70.000.

Sculley, Thomas M.: *See—*
D'Ascoli, John; Rappa, Benny F.; and Sculley, Thomas M., 4,038,970, Cl. 126-271.000.

Sea-Land Service, Inc.: *See—*
Sain, Bernard S., 4,038,929, Cl. 105-367.000.

Seaquist, James J., to Square D Company. Electrical bus support. 4,039,744, Cl. 174-169.000.

Sedco Systems, Incorporated: *See—*
Debski, Thomas R., 4,039,975, Cl. 333-11.000.

Seisaburo, Tanaka: *See—*
Yasushi, Kaneko; and Seisaburo, Tanaka, 4,039,303, Cl. 51-297.000.

Seki, Mitsuaki; and Hanagata, Takayoshi, to Canon Kabushiki Kaisha. Thermal printer. 4,039,065, Cl. 197-1.00R.

Seki, Seizo: *See—*
Ishio, Hideki; Seki, Seizo; and Miyauchi, Kazuhiro, 4,039,961, Cl. 329-50.000.

Sekine, Yukihiro: *See—*
Ban, Kouichi; Namba, Yasumiti; Sekine, Yukihiro; and Matsuda, Masaaki, 4,039,446, Cl. 210-38.00B.

Selam, Gabriel. Device for precluding a collision between a mobile object and a fixed or mobile obstacle. 4,039,916, Cl. 318-587.000.

Sellars, James H. Automatic car wash apparatus and side brush assembly for washing cars of varying widths. 4,039,014, Cl. 15-53.0AB.

Sesztak, Emil: *See—*
Balogh, Geza; Sesztak, Emil; and Szabados, Karoly, 4,039,753, Cl. 179-1.0FS.

Setka, Jaroslav: *See—*
Vrana, Jiri; and Setka, Jaroslav, 4,038,975, Cl. 128-2.10Z.

Severin, Roger; and Lovenberg, Emil H. Arrow switch. 4,039,786, Cl. 200-163.000.

Severs, Kenneth N.: *See—*
Teeple, Lawrence R., Jr.; Magyary, Andrew K.; and Severs, Kenneth N., 4,039,256, Cl. 352-184.000.

Shane, Bruce. Method and apparatus for making stereoscopic pictures. 4,040,071, Cl. 354-113.000.

Shanks, Gerald R., to Frigitemp Corporation. Joiner bulkhead method and apparatus. 4,038,799, Cl. 52-241.000.

Sharp, Frederick George, to C. Bryant & Son Limited. Scaffolding. 4,039,264, Cl. 403-246.000.

Shasha, Baruch S.; Doane, William M.; and Stout, Edward I., to United States of America, Agriculture. Oxidation of thiols to disulfides. 4,039,586, Cl. 260-608.000.

Shaw, Alexander F., IV. Method and apparatus for body X-raying. 4,039,836, Cl. 250-445.00R.

Shaw, John S. Solar energy system utilizing buoyancy as a conversion force. 4,038,826, Cl. 60-641.000.

Shaw, Stuart Walter Ker, to International Nickel Company, Inc., The. Nickel-chromium-cobalt alloys. 4,039,330, Cl. 75-171.000.

Shay, Joseph Leo: *See—*
Bachmann, Klaus Jurgen; Bettini, Manfred Hermann; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,039,357, Cl. 148-175.000.

Shea, Donald D. Game table. 4,039,187, Cl. 273-30.000.

Shearer, Herbert Neil, to Boeing Construction Equipment Company. Drum dryer/mixer. 4,039,171, Cl. 259-158.000.

Sheldon, Donald Charles, to International Telephone and Telegraph Corporation. Power supply employing a short circuit detector. 4,040,116, Cl. 361-18.000.

Shell Oil Company: *See—*
Himes, Glenn R.; and Mendoza, Luis Enrique, 4,039,629, Cl. 260-876.00B.
Laity, John L., 4,039,301, Cl. 44-62.000.
Titus, Paul E., 4,039,717, Cl. 428-389.000.
van Klinken, Jakob; and Ladeur, Peter, 4,039,429, Cl. 208-50.000.

Shibata, Shoson: *See—*
Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, 4,039,483, Cl. 260-2.10R.

Shibayama, Kyoichi; Sato, Fumihiko; and Takahama, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Process for preparing insulation wire. 4,039,415, Cl. 204-181.000.

Shigeta, Masayuki: *See—*
Ichiryu, Ken; Shigeta, Masayuki; Masuda, Toyotsugu; and Kinoshita, Haruo, 4,038,848, Cl. 72-8.000.

Shima, Seiya: *See—*
Komuro, Katsu; Shima, Seiya; and Hokari, Sadao, 4,039,866, Cl. 307-252.00N.

Shimamura, Seiichi: *See—*
Ogasa, Katsuhiro; Shimamura, Seiichi; and Miyagawa, Hiroshi, 4,039,386, Cl. 195-100.000.

Shimanek, Ronald W.; and Franklin, Mark A., to General Motors Corporation. Electronic indicator. 4,039,956, Cl. 325-455.000.

Shimaya, Seiki: *See—*
Tahara, Sentaroo; Murata, Toshiteru; Shimaya, Seiki; and Crits, George J., 4,039,443, Cl. 210-32.000.

Shimiya, Keiji; and Miura, Norio, to Dai Nippon Toryo Co., Ltd. Intensifying screens. 4,039,840, Cl. 250-486.000.

Shimizu, Takashi: *See—*
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,039,704, Cl. 427-284.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Itoh, Kunio, 4,039,503, Cl. 260-37.0SB.

Shinagawa, Yukio; Yamaguchi, Yasumasa; and Shindo, Shuichi, to Fuji Photo Film Co., Ltd. Photographic materials having improved antihalation layers. 4,039,333, Cl. 96-84.00R.

Shindo, Shuichi: *See—*
Shinagawa, Yukio; Yamaguchi, Yasumasa; and Shindo, Shuichi, 4,039,333, Cl. 96-84.00R.

Shinohara, Shinitsu; Uchino, Hisanori; and Yamaji, Hiroyuki, to Tadano Ironworks Co., Ltd. Safety-guard for a crane. 4,039,084, Cl. 212-39.0MS.

Shirasu, Hirotoshi; and Usuda, Hirotaka, to Hitachi, Ltd. Line identifying system of common control type automatic exchange. 4,039,758, Cl. 179-18.0FH.

Shiroki, Ken-ichi; Mori, Katsumi; Kuwano, Yasuhiko; and Saito, Seii-

chi, to Nippon Electric Company, Ltd. Solid state laser device with light filter. 4,039,970, Cl. 331-94.50F.

Shively, Charles D.: *See—*
Hecht, Gerald; and Shively, Charles D., 4,039,662, Cl. 424-180.000.

Shlesinger, B. Edward, Jr.; and Mariner, Charlie Dwain. Magnetic reed switch. 4,039,985, Cl. 335-153.000.

Shoemaker, John D., Jr.: *See—*
Deutsch, Howard; and Shoemaker, John D., Jr., 4,039,374, Cl. 162-79.000.

Shoenberger, Ronald W.: *See—*
Schapiro, Norman; and Shoenberger, Ronald W., 4,039,319, Cl. 75-42.000.

Shorey, Thomas H., to Boeing Company, The. Aircraft cargo ramp. 4,039,163, Cl. 244-137.00R.

Showa Denko K.K.: *See—*
Yokoo, Hidejiro; Tsuruya, Tetsuo; Chaen, Shigehiro; and Kubo, Hiroshi, 4,039,577, Cl. 260-553.00A.

Showell, Richard Grahame Dugard: *See—*
Spears, Peter John; and Showell, Richard Grahame Dugard, 4,039,040, Cl. 180-96.000.

Shugart Associates, Inc.: *See—*
Medley, Harold C., 4,040,106, Cl. 360-99.000.

Shure Brothers, Inc.: *See—*
Tichy, Thomas H.; and Collins, Raymond W., 4,039,765, Cl. 179-156.00A.

Sidorov, Alexandr Borisovich: *See—*
Giller, Solomon Aronovich; Lazdinsh, Arvid Avgustovich; Veinberg, Artur Karlovich; and Sidorov, Alexandr Borisovich, 4,039,546, Cl. 260-260.000.

Sieffert, William G., to Hoerner Waldorf Corporation. Carton divider. 4,039,117, Cl. 229-15.000.

Siemens Aktiengesellschaft: *See—*
Berglund, Kurt Karl Henrik Alexander, 4,040,063, Cl. 346-23.000.
Foerster, Otto; and Vojta, Erich, 4,039,801, Cl. 219-137.00R.
Gaertner, Waldemar, 4,039,250, Cl. 350-96.00B.
Goser, Karl, 4,040,082, Cl. 357-42.000.
Grassme, Ulrich; and Soder, Eickhardt, 4,039,812, Cl. 250-413.000.
Horninger, Karlheinrich, 4,039,859, Cl. 307-232.000.
Keller, Wolfgang, 4,039,283, Cl. 23-273.0SP.
Pekau, Dietlind, 4,040,056, Cl. 343-17.000.
Strutynski, Waldemar, 4,040,033, Cl. 364-200.000.
Vukasovic, Lovro, 4,039,923, Cl. 363-79.000.
Weitze, Artur; and Leskovar, Peter, 4,039,721, Cl. 428-426.000.

Sigan, J. W.: *See—*
Throckmorton, Peter E.; Sigan, J. W.; and McConnell, Robert B., 4,039,565, Cl. 260-459.00A.

Sigmatex, A.G.: *See—*
Weman, Per Olaf, 4,039,158, Cl. 242-107.40A.

Sijpesteijn, Antje Kaars: *See—*
van der Kerk, Gerrit J. M.; Sijpesteijn, Antje Kaars; and Bulten, Eric J., 4,039,655, Cl. 424-52.000.

Simane, Zdenek: *See—*
Schacht, Erich; Lauterbach, Gunter; Mehrhof, Werner; Nowak, Herbert; and Simane, Zdenek, 4,039,683, Cl. 424-324.000.

Simons, Robert W.; and Troop, Martin G., to United States of America, Navy. Missile body telemetry system. 4,040,059, Cl. 343-203.000.

Simpson, Lynn B.; and Takeguchi, Milton M., to Corning Glass Works. Medium and method for distinguishing *Neisseria gonorrhoeae* and *Neisseria meningitidis*. 4,039,387, Cl. 195-100.000.

Singer Company, The: *See—*
Houser, John Martin, 4,040,117, Cl. 361-33.000.

Singh, Alamjit D. Process and apparatus for producing char and co-products from coal and the like. 4,039,392, Cl. 202-93.000.

Sintokogio, Ltd.: *See—*
Terase, Tsuneo; Onishi, Ryuzo; and Akazawa, Haruo, 4,038,722, Cl. 17-48.000.

Sioux Steam Cleaner Corporation: *See—*
Bucy, Harry S.; and Finger, John F., 4,039,350, Cl. 134-22.00R.

Sipe, Nelson Eugene; and Ida, Noble, to Duraglass Research & Development Corporation. Process of strengthening glass bottles and the like. 4,039,310, Cl. 65-25.00R.

Sittner, Weldon Rex, to Electro Medical Systems, Inc. Method and apparatus for high frequency electric surgery. 4,038,984, Cl. 128-303.140.

Sivulka, Gerald Michael, to Kelsey-Hayes Company. Skid control system having a switched low speed noise filter. 4,039,227, Cl. 303-97.000.

Skarud, Roland, to Wirsbo Bruks Aktiebolag. Hose end fittings. 4,039,212, Cl. 285-253.000.

Skeens, William John: *See—*
Birchall, Ronald Holmes; Pellettiere, Frank Vincent; and Skeens, William John, 4,040,021, Cl. 364-200.000.

Skinner, Mitchell Allen, to Bell Telephone Laboratories, Incorporated. Phase-lock loop circuit. 4,039,966, Cl. 331-4.000.

Skinner, William D.: *See—*
Beeson, Gary H.; and Skinner, William D., 4,040,098, Cl. 360-14.000.

Skomoroski, Robert M.: *See—*
Dietz, George, Jr.; Skomoroski, Robert M.; and Zobbi, Robert G., 4,039,327, Cl. 75-108.000.

Sky-Top Sunroofs, Ltd.: *See—*
Wolf, Ernest; and Cain, John L., 4,039,222, Cl. 296-137.00E.

Slater, Margaret Anne; and Slater, William Clarence. Game and apparatus therefor. 4,039,193, Cl. 273-138.00R.

Slater, William Clarence: *See—*
Slater, Margaret Anne; and Slater, William Clarence, 4,039,193, Cl. 273-138.00R.

Slindee, Norman Edward, to International Business Machines Corporation. Magnetic disk drive unit with flexible skirt. 4,040,105, Cl. 360-99.000.

Slotvinsky-Sidak, Nikolai Petrovich; and Grinberg, Naum Volfovich. Method of preparing vanadium pentoxide from metallurgical slags containing vanadium. 4,039,614, Cl. 423-65.000.

Slusarchyk, William A.; and Cimarusti, Christopher M., to E. R. Squibb & Sons, Inc. 4-Thio substituted-Δ^2-cephalosporin intermediates. 4,039,534, Cl. 544-17.000.

Small, Charles T.: *See—*
Morrill, Justin S., Jr.; Farnbach, William A.; and Small, Charles T., 4,040,025, Cl. 364-900.000.

Smith, Alvin Jack. Evaporation of treated waste water. 4,039,451, Cl. 210-170.000.

Smith, Bert A., to Preformed Line Products Company. Waterproof cable splice enclosure kit. 4,039,742, Cl. 174-87.000.

Smith, Clarence G.: *See—*
Huffhines, Donald F.; Jones, J. S.; and Smith, Clarence G., 4,039,127, Cl. 346-110.00R.

Smith, Colin William: *See—*
Dawson, William; Foulis, Michael John; Gutteridge, Norman James Albert; and Smith, Colin William, 4,039,571, Cl. 260-468.00D.

Smith, David L.; and Scherr, Norman J., Jr., to Valeron Corporation, The. Electronic column gage. 4,038,756, Cl. 33-172.00E.

Smith, Edward D.: *See—*
Perr, Julius P.; Smith, Edward D.; and Wilson, Harry L., 4,038,956, Cl. 123-139.0AF.

Smith, Edward J. Bend or break shelf support. 4,039,137, Cl. 248-248.000.

Smith, George H., to Minnesota Mining and Manufacturing Company. Aromatic diazonium bis(fluorinated alkylsulfonyl) methides. 4,039,521, Cl. 260-141.000.

Smith, Harry A., to Dow Chemical Company, The. Unsaturated resin blends. 4,039,606, Cl. 260-829.000.

Smith, John Robert. Tent support pole with detachable strut and rib means. 4,038,997, Cl. 135-15.0PQ.

Smith, Kenneth Cecil; and Garrett, Michael Ernest, to BOC Limited. Treatment of sewage. 4,039,437, Cl. 210-9.000.

Smith, Leroy. One-piece rainsuit and face mask. 4,038,698, Cl. 2-79.000.

Smith, Peter: *See—*
Price, Raymond; and Smith, Peter, 4,039,612, Cl. 423-24.000.

Smith, Philip D. Solar energy collector. 4,038,969, Cl. 126-270.000.

Smith, Richard F., to GAF Corporation. Certain 2(2'-hydroxyphenyl)-benzothiazolo derivatives. 4,039,553, Cl. 260-304.00R.

Smith, Robert Emmet: *See—*
Kosrow, Robert Leslie; Smith, Robert Emmet; Talsma, Robert Clarence; and Bernstein, Benjamin T., 4,038,931, Cl. 112-272.000.

Smith, Warren M.: *See—*
Cull, Neville L.; and Smith, Warren M., 4,039,478, Cl. 252-455.00R.

Smith, Wayne Gerald: *See—*
Schmitz, Floyd Albert, Jr.; and Smith, Wayne Gerald, 4,039,093, Cl. 214-130.00R.

Smith, William E.; and Gerhart, R. John, to General Electric Company. Process for preparing butanediol. 4,039,592, Cl. 260-635.00R.

Smith, William Vernon. Electric lead insertion device. 4,039,142, Cl. 254-134.30R.

Smulders, Herman Adrianus Godefridus: *See—*
Chermin, Hubertus Mathias Jozef; Luursema, Meerten; Rozenboom, Jaap; and Smulders, Herman Adrianus Godefridus, 4,039,895, Cl. 315-101.000.

Snam Progetti S.p.A.: *See—*
Ancillotti, Francesco; Pescarollo, Ermanno; and Mauri, Marcello Massi, 4,039,590, Cl. 260-614.00A.
Fachinetti, Giuseppe; and Floriani, Carlo, 4,039,566, Cl. 260-429.500.

Snell, Leonard Stanley, to Rolls-Royce (1971) Limited. Gas turbine power plant having series-parallel valve arrangement. 4,038,818, Cl. 60-226.00R.

Snow, Barton H.; and Sargisson, Donald F., to General Electric Company. Fuel jettison system. 4,038,817, Cl. 60-204.000.

Societa' Farmaceutici Italia S.p.A.: *See—*
Arcamone, Federico; Di Marco, Aurelio; and Penco, Sergio, 4,039,663, Cl. 424-180.000.

Societe Alsacienne de Constructions Mecaniques de Mulhouse: *See—*
Lotte, Andre M., 4,038,919, Cl. 101-120.000.

Societe Anonyme Automobiles Citroen: *See—*
Grosseau, Albert, 4,039,637, Cl. 261-36.00A.

Societe Anonyme D.B.A.: *See—*
Meyer, Yves; Le Marchand, Claude; and Gerard, Jean-Louis, 4,039,053, Cl. 188-73.300.
Meyer, Yves; and Courbot, Pierre, 4,039,055, Cl. 188-79.5GC.

Societe Anonyme Francaise du Ferodo: *See—*
de Gennes, Gerard, 4,039,059, Cl. 192-89.00B.

Societe de Recherches Techniques et Industrielles: *See—*
Mas, Louis, 4,039,421, Cl. 204-266.000.

Societe d'Etudes de Machines Thermiques: *See—*
Bastenhof, Dirk; and Devaux, Alain, 4,038,825, Cl. 60-631.000.

Societe d'Etudes Scientifiques et Industrielles de l'Ile-de-France: *See—*
Bulteau, Gerard; Acher, Jacques; Collignon, Claude; and Monier, Jean-Claude, 4,039,672, Cl. 424-269.000.

Societe Europeenne pour le Traitement Chimique des Combustibles Irradies (Eurochemic): *See—*
Humblet, Lucien A.; Salomon, Louis; and Eschrich, Hubert R., 4,039,468, Cl. 252-301.10W.

Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
Paulmier, Claude, 4,038,955, Cl. 123-119.00F.

Societe Nationale des Poudres et Explosifs: *See—*
Leneveu, Louis J., 4,039,640, Cl. 264-3.00B.

Societe Nationale Elf Aquitaine (Production): *See—*
Baldin, Pierre; Brocco, Albert; and Winstel, Jean-Paul, 4,038,874, Cl. 73-422.0GC.

Soder, Eickhardt: *See—*
Grassme, Ulrich; and Soder, Eickhardt, 4,039,812, Cl. 250-413.000.

Soderquist, Frederick J.; Wazbinski, Theodore T.; and Waldman, Nathan, to Dow Chemical Company, The. Process and apparatus for continuous catalyst activation. 4,039,601, Cl. 260-669.00R.

Sofianek, Joseph Carl: *See—*
Crouch, Donald Wayne; Kurtz, Donald Reah; and Sofianek, Joseph Carl, 4,039,792, Cl. 200-144.00B.

Sohmer, Oskar; Autenrieth, Heinz; and Kirner, Kuno, to Robert Bosch G.m.b.H. Hard metal coating process for metal objects. 4,039,700, Cl. 427-46.000.

Sola Basic Industries, Inc.: *See—*
Thibeault, Ronald N., 4,039,235, Cl. 339-14.00R.

Soma, Kazuo: *See—*
Mikami, Yasuie; Takei, Ippo; Soma, Kazuo; and Morimoto, Yasuo, 4,039,615, Cl. 423-128.000.

Sommer, Hans-Dieter: *See—*
Baer, Jurgen; Sommer, Hans-Dieter; and Toplak, Ernst, 4,039,267, Cl. 415-1.000.

Sony Corporation: *See—*
Nakamura, Hideo; Ohsawa, Mitsuo; and Hamada, Osamu, 4,040,075, Cl. 357-23.000.
Ninomiya, Takeshi; Sakai, Masaaki; and Suzuki, Kiyosuke, 4,040,081, Cl. 357-34.000.
Yoshida, Tadao; Suzuki, Tadao; and Wachi, Shigeaki, 4,039,921, Cl. 363-22.000.

Soos, Imre. Manual grasping device. 4,039,216, Cl. 294-19.00R.

Sorenson, John F., to Hoerner Waldorf Corporation. Restraining pad for sink packages. 4,039,077, Cl. 206-320.000.

Soriente, Alfonse Joseph, to Ecodyne Corporation. Floc barrier. 4,039,449, Cl. 210-522.000.

Southwire Company: *See—*
Holladay, James F.; Starnes, R. Emory, Jr.; and Duke, Alvan E., 4,038,805, Cl. 53-21.0FW.

Spampinato, Dominic Patrick: *See—*
Heller, Lawrence Griffith; and Spampinato, Dominic Patrick, 4,039,861, Cl. 307-355.000.

Spear, Robert Allen; and Strandberg, Kenneth Roger, to Okonite Company, The. Temperature measurement system for cables. 4,038,872, Cl. 73-362.0AR.

Spears, Peter John; and Showell, Richard Grahame Dugard, to Bar Productions (Bromsgrove) Limited. Storage assemblies. 4,039,040, Cl. 180-96.000.

Spector, George: *See—*
Castelletti, Robert; and Spector, George, 4,038,773, Cl. 43-26.200.

Spectronics Corporation: *See—*
Leighley, Kenneth C., 4,039,841, Cl. 250-508.000.

Sperry Rand Corporation: *See—*
Gehrking, Arvin George, 4,040,014, Cl. 340-147.0LP.
Hanson, Marlin M.; and Torok, Ernest J., 4,040,039, Cl. 340-174.0YC.
Hofferber, Henry E., 4,039,165, Cl. 244-177.000.
Kata, Joseph; and Ihasz, Richard, 4,039,774, Cl. 219-370.000.
Kregness, Glen Roy, 4,039,813, Cl. 235-153.0AC.
White, Robert A., 4,040,103, Cl. 360-75.000.

Spies, Volker; Poul, Christian Dyhr-Mikkelsen; and Valbjorn, Knud Vagn, to Danfoss A/S. Thermostatic regulating means for an air-conditioning plant. 4,039,126, Cl. 236-42.000.

Spill, Robin: *See—*
Phelps, Robert Edward; Spill, Robin; and Print, Barry Edward, 4,038,752, Cl. 32-2.000.

Spin Physics, Inc.: *See—*
Abraham, Raymond A., 4,039,156, Cl. 242-71.800.
Bagby, John F., 4,040,110, Cl. 360-107.000.

Spitz, Erich: *See—*
Hareng, Michel; Le Berre, Serge; and Spitz, Erich, 4,040,047, Cl. 340-324.00R.

Springfield Tool and Die, Inc.: *See—*
Knibbe, Jan C.; and McPhee, Willard J., 4,038,894, Cl. 83-411.00R.

Square D Company: *See—*
Seaquist, James J., 4,039,744, Cl. 174-169.000.

Staal, Franciscus Cornelis Maria Antonius; and Vink, Nicolaas Gerrit, to U.S. Philips Corporation. Deflection system for a color television display tube. 4,039,989, Cl. 335-213.000.

Staar, S.A.: *See—*
Staar, Theophiel Clement Jozef Lodewijk, 4,040,104, Cl. 360-96.000.

Staar, Theophiel Clement Jozef Lodewijk, to Staar, S.A. Tape cassette apparatus with plural intermediate positions. 4,040,104, Cl. 360-96.000.

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Open-end spinning machine having spinning units with removal opening for impurities. 4,038,812, Cl. 57-56.000.

Stahlecker, Hans: *See—*
Stahlecker, Fritz, 4,038,812, Cl. 57-56.000.

Stalder, Erwin: *See—*
Oberhansli, Jurg; Stalder, Erwin; Bulgheroni, Willy; and Penasa, Josef, 4,039,845, Cl. 250-577.000.

Stamicarbon B. V.: *See—*
Schoen, Lowhardt A. A.; Bruls, Wilhelmus G. M.; and Debets, Wilhelmus A. M., 4,039,732, Cl. 526-43.000.

Stamicarbon B.V.: *See—*
van der Mark, Johannes M.A.A., 4,039,486, Cl. 260-2.5HA.
vanderMark, Johannes M.A.A., 4,039,488, Cl. 260-2.5HA.

Standard Oil Company: *See—*
Steigelmann, Edward F.; Hughes, Robert D.; and Gabor, Joseph, 4,039,499, Cl. 260-29.6NR.

Standard Oil Company (Indiana): *See—*
Beynet, Pierre A.; Farr, John B.; and Pottorf, Newell, 4,040,003, Cl. 340-18.0LD.
Hoff, Glen R., 4,039,472, Cl. 252-429.00C.

Stanford, Arthur, to AMF Incorporated. Film sensing apparatus. 4,040,043, Cl. 340-259.000.

Stanford Research Institute: *See—*
Crane, Hewitt D.; Wolf, Daniel E.; and Ostrem, John S., 4,040,010, Cl. 340-146.3SY.
Crane, Hewitt D.; and Jones, Earle D., 4,040,011, Cl. 340-146.3SY.
Crane, Hewitt David; Wolf, Daniel Errol; and Lindenberg, Samuel, 4,040,012, Cl. 340-146.3SY.
Morrison, Stanley R., 4,039,941, Cl. 324-71.0SN.

Stanislaw, David L., to Aradar Corporation. Digital video signal processing circuit. 4,040,052, Cl. 343-5.0VQ.

Stanley, Lester N.; and Farris, Russell E., to GAF Corporation. Ketoamido containing phenylazo benzothiazole dyestuffs. 4,039,524, Cl. 260-158.000.

Stanley, Robert W.; and Subramanian, Kohur Nagaraja, to Noranda Mines Limited. Recovering copper from concentrates with insoluble sulfate forming leach. 4,039,406, Cl. 204-108.000.

Stanley Works, The: *See—*
Morini, Ralph E.; and Turgeon, Martin D., 4,039,292, Cl. 23-288.0FC.
Stoutenberg, Carl C., 4,039,013, Cl. 145-53.000.

Stanton, Howard F., to J & A Keller Machine Co., Inc. Packing gland. 4,039,198, Cl. 277-118.000.

Stapp, Paul R., to Phillips Petroleum Company. Alkenol production. 4,039,594, Cl. 260-638.00R.

Stark, Olof S.: *See—*
Ernstsson, Georg E.; Nilsson, Birger N.; Pupp, Herwig; and Stark, Olof S., 4,039,362, Cl. 156-69.000.

Starkweather, Gary K., to Xerox Corporation. Flying spot scanner with runout correction. 4,040,096, Cl. 358-302.000.

Starnes, R. Emory, Jr.: *See—*
Holladay, James F.; Starnes, R. Emory, Jr.; and Duke, Alvan E., 4,038,805, Cl. 53-21.0FW.

State Board of Higher Education for and on Behalf of the University of Oregon: *See—*
Cooper, John C.; Birdseye, Harvey E.; and Donnelly, Russell J., 4,038,864, Cl. 73-23.000.

Stauber, Hans-Ulrich: *See—*
Reist, Walter; and Stauber, Hans-Ulrich, 4,039,182, Cl. 271-64.000.

Stauffer Chemical Company: *See—*
Kim, Ki Soo; and Altscher, Siegfried, 4,039,512, Cl. 260-61.000.

Stearns Manufacturing Company: *See—*
O'Link, Maurice H., 4,038,713, Cl. 9-345.000.

Steffen, Jurg: *See—*
Jovanovic, Alexandre; and Steffen, Jurg, 4,039,823, Cl. 250-199.000.

Steigelmann, Edward F.; Hughes, Robert D.; and Gabor, Joseph, to Standard Oil Company. Product. 4,039,499, Cl. 260-29.6NR.

Steigerwald, Robert L.; and Cornell, Edward P., to General Electric Company. Dynamic braking in controlled current motor drive systems. 4,039,914, Cl. 318-375.000.

Steigerwald, Robert L., to General Electric Company. Current fed inverter with commutation independent of load inductance. 4,039,926, Cl. 363-138.000.

Stein, Joseph L.; and Treffner, Walter S., to General Refractories Company. Improved performance direct bonded basic refractory brick and method of manufacture. 4,039,343, Cl. 106-59.000.

Steiner, Peter, to Foster Wheeler Energy Corporation. Process for the selective removal of hydrogen sulfide from hot coal gasification gases. 4,039,619, Cl. 423-230.000.

Steiro, Harry. Method of making concrete pipe. 4,039,642, Cl. 264-71.000.

Stephens, Frank M., Jr.; and Blair, James C., to Cyprus Metallurgical Processes Corporation. Fluidized hydrogen reduction process for the recovery of copper. 4,039,324, Cl. 75-72.000.

Sterling Drug Inc.: *See—*
Beyler, Arthur L.; and Ferrari, Richard A., 4,039,669, Cl. 424-243.000.
Diana, Guy D., 4,039,575, Cl. 260-552.00R.
Dickinson, William B.; and Vaupotic, Marcia P., 4,039,550, Cl. 260-294.80E.

Stern, Ivan J.: *See—*
Ausman, Robert K.; and Stern, Ivan J., 4,039,682, Cl. 424-319.000.

Sterrett, Charles C., to Westinghouse Electric Corporation. Integrated annular supporting structure and damper shield for superconducting rotor assembly of dynamoelectric machine. 4,039,870, Cl. 310-52.000.

Stewart, Roger Green, to RCA Corporation. Transition detector. 4,039,858, Cl. 307-231.000.

Stilts, Kenneth Morris. Thermal insulation jacket for water heaters. 4,039,098, Cl. 220-63.00R.

Stinger, Kenneth R.: *See—*
McTeague, Gerald E.; and Stinger, Kenneth R., 4,039,896, Cl. 315-135.00T.

Stockel, Richard F.: *See—*
Babcock, Thomas E.; Kliment, Karel; and Stockel, Richard F., 4,039,501, Cl. 260-30.40R.

Stocker, Lester H., to Bell & Howell Company. Sheet feeding apparatus. 4,039,180, Cl. 271-10.000.

Stoev, Stoycho Mitrev; Mitrushev, Marin Dimitrov; Boshilov, Grozdan Todorov; and Radeva, Maria Georgieva, to Vish Minno-Geoloshki Institute-Nis. Counter current flow vibro-acoustical extraction apparatus. 4,039,456, Cl. 210-388.000.

Stolen, Rogers Hall: *See—*
Jain, Ravinder Kumar; Lin, Chinlon; and Stolen, Rogers Hall, 4,039,851, Cl. 307-88.300.

Stone-Platt Fluidfire Limited: *See—*
Elliott, Douglas Ernest, 4,039,272, Cl. 431-7.000.

Stoops, Bobby G., to Don R. Hinderliter, Inc. Latch for hoisting hook. 4,039,220, Cl. 294-82.00R.

Stoppani S.A., Etablissements pour la mecanique de precision et l'electro-mecanique: *See—*
Nicoud, Jean-Daniel; and Rouiller, Jean-Marie, 4,039,761, Cl. 179-90.00B.

Stork Brabant B.V.: *See—*
Anselrode, Lodewijk, 4,039,396, Cl. 204-11.000.

Stoughton, Richard B.; Harris, Richard L.; and Dea, Frank J., to Nelson Research & Development Company. Topical griseofulvin composition and method. 4,039,664, Cl. 424-180.000.

Stout, Brian: *See—*
Stout, Harry E.; and Stout, Brian, 4,038,967, Cl. 126-271.000.

Stout, Edward I.: *See—*
Shasha, Baruch S.; Doane, William M.; and Stout, Edward I., 4,039,586, Cl. 260-608.000.

Stout, Harry E.; and Stout, Brian. Solar heating system and components thereof. 4,038,967, Cl. 126-271.000.

Stoutenberg, Carl C., to Stanley Works, The. Hand tool with helical drive. 4,039,013, Cl. 145-53.000.

Strachan & Henshaw Limited: *See—*
Evans, David Arthur, 4,038,927, Cl. 104-162.000.

Strandberg, Kenneth Roger: *See—*
Spear, Robert Allen; and Strandberg, Kenneth Roger, 4,038,872, Cl. 73-362.0AR.

Straub, Otto-Christian, to Bayer Aktiengesellschaft. Production of attenuated viruses. 4,039,656, Cl. 424-85.000.

Streicher, Henry P. Corner structure for a load supporting frame. 4,039,133, Cl. 248-188.800.

Strow, Lawrence Evans: *See—*
Bell, Fred S., III; Crozier, Ronald D.; and Strow, Lawrence Evans, 4,039,569, Cl. 260-463.000.

Strubelt, Charles E.: *See—*
Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., 4,039,336, Cl. 106-14.000.

Strutynski, Waldemar, to Siemens Aktiengesellschaft. Microprogrammable data processor with a microprogram buffer memory. 4,040,033, Cl. 364-200.000.

Stumpf, Gunter. Device for cutting sheet material. 4,039,799, Cl. 219-121.00L.

Suami, Tetsuo. 1-Tetrahydroxycyclopentyl-3-nitroso-3-(2-chloroethyl)-urea antitumor agents. 4,039,578, Cl. 260-553.00R.

Subramanian, Kohur Nagaraja: *See—*
Stanley, Robert W.; and Subramanian, Kohur Nagaraja, 4,039,406, Cl. 204-108.000.

Subsea Equipment Associates Limited: *See—*
Pernet, Jacques M.; and Taylor, Donald F., 4,039,208, Cl. 285-3.000.

Sucher, Josef: *See—*
Brinkmann, Jurgen; and Sucher, Josef, 4,039,730, Cl. 429-212.000.

Sugano, Masahiko: *See—*
Nagaoka, Joji; Yamashita, Kazuhiko; Minamii, Nobuaki; Miyagawa, Tsutomu; and Sugano, Masahiko, 4,039,527, Cl. 260-192.000.

Sukegawa, Tokuzo: *See—*
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,040,074, Cl. 357-16.000.
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,040,079, Cl. 357-30.000.
Hara, Katsuo; Hagino, Minoru; and Sukegawa, Tokuzo, 4,040,080, Cl. 357-30.000.

Sullivan, Daniel S., 3rd; Strubelt, Charles E.; and Becker, Kenneth W., to Exxon Research and Engineering Company. Diacetylenic alcohol corrosion inhibitors. 4,039,336, Cl. 106-14.000.

Sumitomo Chemical Company, Limited: *See—*
Ban, Kouichi; Namba, Yasumiti; Sekine, Yukihiro; and Matsuda, Masaaki, 4,039,446, Cl. 210-38.00B.
Fujimoto, Keimei; Ohno, Nobuo; Okuno, Yoshitoshi; Mizutani, Toshio; Ohno, Isao; Hirano, Masachika; Itaya, Nobushige; and Matsuo, Takashi, 4,039,680, Cl. 424-275.000.
Kanagawa, Shuichi; and Kagaya, Kazuyoshi, 4,039,630, Cl. 260-878.00R.
Kato, Toshiro; Sasaki, Mitsuru; Ooishi, Tadashi; and Mujai, Kunio, 4,039,635, Cl. 260-954.000.
Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,039,733, Cl. 526-185.000.
Sasajima, Kikuo; Ono, Keiichi; Nakao, Masaru; and Yamamoto, Hisao, 4,039,670, Cl. 424-267.000.
Yamada, Koichi; Hashimoto, Tadanori; and Horinouchi, Kazuo, 4,039,401, Cl. 204-67.000.

Sumitomo Electric Industries, Ltd.: *See—*
Kamijo, Eiji; Nishimoto, Tatsuya; and Honda, Masaaki, 4,039,703, Cl. 427-183.000.

Sumitomo Metal Industries, Ltd.: *See—*
Uemura, Masazi, 4,039,320, Cl. 75-58.000.

Sumner, Maurice N. Modular geometric offshore structures system. 4,038,830, Cl. 61-89.000.

Sunderland Polytechnic: *See—*
Sunthankar, Yeshwant Sadashiw, 4,039,998, Cl. 340-1.00R.

Sundermann, Erich: *See—*
Kienow, Sigismund; and Sundermann, Erich, 4,039,280, Cl. 432-248.000.

Sunthankar, Yeshwant Sadashiw, to Sunderland Polytechnic. Ultrasonic transmitter or receiver. 4,039,998, Cl. 340-1.00R.

Susuki, Yasuhide, to Diesel Kiki Co. Fuel injection pump governor. 4,038,958, Cl. 123-140.00R.

Sutter, Jean Georges, to Pont-A-Mousson S.A. Motor-driven control device with automatic brake. 4,039,874, Cl. 310-77.000.

Suzaki, Masayuki; and Araki, Shigeyuki, to Ricoh Co., Ltd. Multi-phase motor controller. 4,039,919, Cl. 318-696.000.

Suzuki, Kiyosuke: *See—*
Ninomiya, Takeshi; Sakai, Masaaki; and Suzuki, Kiyosuke, 4,040,081, Cl. 357-34.000.

Suzuki, Masaru; and Saito, Narimasa, to Noda Institute for Scientific Research. Creatinine amidohydrolase and creatine amidinohydrolase and process for producing them. 4,039,384, Cl. 195-62.000.

Suzuki, Satoshi: *See—*
Inoue, Mitsuhiro; Maeda, Yo; Suzuki, Satoshi; Ohashi, Shozo; and Nakamura, Yoshiharu, 4,039,006, Cl. 138-129.000.

Suzuki, Tadao: *See—*
Yoshida, Tadao; Suzuki, Tadao; and Wachi, Shigeaki, 4,039,921, Cl. 363-22.000.

Suzuki, Yoshikatsu: *See—*
Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, 4,039,483, Cl. 260-2.10R.

Swan, Jack C., Jr., to Hanson Industries Inc. Viscous, flowable, pressure-compensating fitting materials and their use, including their use in boots. 4,038,762, Cl. 36-89.000.

Swaniger, James R., to Pitney-Bowes, Inc. Envelope flap moistener. 4,038,941, Cl. 118-243.000.

Sweda International, Inc.: *See—*
Quigley, William D., 4,039,066, Cl. 197-1.00R.

Swiss Aluminium Ltd.: *See—*
Anthony, William H.; Popplewell, James M.; and Brock, Andrew J., 4,039,298, Cl. 428-558.000.

Swiss, William R.; and Young, Wayne S., to International Business Machines Corporation. Accelerated sintering for a green ceramic sheet. 4,039,338, Cl. 106-46.000.

Sword, Irvin E., to Northwest Hardwoods, Inc. Chipper saw. 4,039,011, Cl. 144-218.000.

Sybron Corporation: *See—*
Ennslin, Frieder H.; and Buck, Richard J., 4,039,811, Cl. 250-409.000.

Syntex (U.S.A.) Inc.: *See—*
Walker, Keith A. M., 4,039,677, Cl. 424-273.000.

Systron Donner Corporation: *See—*
Morris, Harold D., 4,038,876, Cl. 73-432.00R.

Syva Company: *See—*
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,039,385, Cl. 195-63.000.

Szabados, Karoly: *See—*
Balogh, Geza; Sesztak, Emil; and Szabados, Karoly, 4,039,753, Cl. 179-1.0FS.

Szabo, Georges: *See—*
Engelhard, Philippe; Szabo, Georges; and Weisang, Joseph Eduard, 4,039,477, Cl. 252-441.000.

Szeberenyi, Szabolcs: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,039,589, Cl. 260-618.00B.

Szlakman, Nathan. Automobile security apparatus. 4,038,845, Cl. 70-211.000.

Szporny, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,039,589, Cl. 260-618.00B.

Tabler, Donald C.: *See—*
Bertus, Brent J.; Tabler, Donald C.; and Johnson, Marvin M., 4,039,476, Cl. 252-437.000.

Taborsky, Jiri. Breeding tank. 4,038,945, Cl. 119-3.000.

Taco-Tafel GmbH & Co., KG: *See—*
Laass, Heinz, 4,039,937, Cl. 324-51.000.

Tadano Ironworks Co., Ltd.: *See—*
Shinohara, Shinitsu; Uchino, Hisanori; and Yamaji, Hiroyuki, 4,039,084, Cl. 212-39.0MS.

Tahara, Sentaroo; Murata, Toshiteru; Shimaya, Seiki; and Crits, George J., to Crane Co. Condensate purification process. 4,039,443, Cl. 210-32.000.

Taig, Alistair Gordon, to Bendix Westinghouse Limited. Fluid flow divider. 4,038,998, Cl. 137-101.000.

Taihei Shiryo Kaisha, Ltd.: *See—*
Terase, Tsuneo; Onishi, Ryuzo; and Akazawa, Haruo, 4,038,722, Cl. 17-48.000.

Taiyo Musen Co., Ltd.: *See—*
Mori, Kenzo; Kakuchi, Fumio; and Fujii, Kimio, 4,040,058, Cl. 343-113.0PT.

Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi; to Tajima Roofing Co., Ltd. Laminated bituminous roofing membrane. 4,039,706, Cl. 428-40.000.

Tajima Roofing Co., Ltd.: *See—*
Tajima, Eiichi; Yamamoto, Kaname; and Imai, Takayoshi, 4,039,706, Cl. 428-40.000.

Tajima, Satoshi: *See—*
Tanaka, Ryuichi; Tajima, Satoshi; Usami, Akira; and Yokoyama, Mitsutaka, 4,039,808, Cl. 250-370.000.

Takabayashi, Teruo, to Kohshoh Limited. Plastic adjuster for a belt. 4,038,726, Cl. 24-198.000.

Takagi, Toshinori: *See—*
Morimoto, Kiyoshi; Utamura, Yukihiko; and Takagi, Toshinori, 4,039,699, Cl. 427-38.000.

Takahama, Takashi: *See—*
Shibayama, Kyoichi; Sato, Fumihiko; and Takahama, Takashi, 4,039,415, Cl. 204-181.000.

Takahashi, Isao: *See—*
Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, 4,039,660, Cl. 424-117.000.

Takahashi, Toshiro; Nagano, Toshihiro; Wada, Kenji; and Kikuchi, Masaru, to Riken Light Metal Industries Company, Ltd. Aluminum alloy shapes. 4,039,355, Cl. 148-31.500.

Takano, Tadayoshi; and Horibe, Susumu, to Fujisawa Pharmaceutical Co., Ltd. 7-(α-substituted glycinamido)-3-substituted methyl-3-cephem-4-carboxylic acids and their derivatives. 4,039,536, Cl. 544-26.00C.

Takara Co, Ltd.: *See—*
Sato, Yasuta, 4,038,775, Cl. 46-22.000.

Takasaka, Keita, to Hitachi, Ltd. Improved supporting arrangement for hollow cylindrical armature winding. 4,039,876, Cl. 310-266.000.

Takasuga, Yutaka; Nishimura, Seiichiro; and Urayama, Takao, to Bridgestone Tire Company Limited. Tire component transferring apparatus. 4,039,365, Cl. 156-405.000.

Takeguchi, Milton M.: *See—*
Simpson, Lynn B.; and Takeguchi, Milton M., 4,039,387, Cl. 195-100.000.

Takei, Haruo: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; Iwamoto, Atsuo; and Hayashi, Jun, 4,039,335, Cl. 96-124.000.

Takei, Ippo: *See—*
Mikami, Yasuie; Takei, Ippo; Soma, Kazuo; and Morimoto, Yasuo, 4,039,615, Cl. 423-128.000.

Takemoto, Iwao: *See—*
Ashikawa, Mikio; and Takemoto, Iwao, 4,039,888, Cl. 313-365.000.

Takenaka, Yasuo, to Japanese National Railways. Heat insulating particles. 4,039,297, Cl. 428-566.000.

Takesue, Tatsuo, to Mitsui Mining & Smelting Co., Ltd. Method of electrolytically recovering zinc. 4,039,408, Cl. 204-119.000.

Takeuchi, Fumio: *See—*
Mizuno, Fumio; Takeuchi, Fumio; and Kobayashi, Shunsuke, 4,039,252, Cl. 350-160.0LC.

Takezaki, Tsuneo: *See—*
Kanno, Masashi; Miki, Sukeichi; Takezaki, Tsuneo; and Ninomiya, Syuichi, 4,039,752, Cl. 179-15.0BT.

Takigawa, Toru: *See—*
Nakazawa, Mitsuru; and Takigawa, Toru, 4,039,986, Cl. 335-212.000.

Takii, Tomio, to NCR Corporation. Missing clock detection circuit. 4,040,022, Cl. 364-900.000.

Takizawa, Masaaki; and Hiyoshi, Tsutomu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine with a subsidiary combustion chamber. 4,038,959, Cl. 123-191.00S.

Takizawa, Masao: *See—*
Yoneda, Kennzi; Yuminaka, Takeo; and Takizawa, Masao, 4,039,049, Cl. 187-29.00R.

Talbot, George Clive Ashmead, to Linotype-Paul Limited. Record member advance system. 4,039,746, Cl. 178-15.000.

Talley, Douglas G.: *See—*
Gregory, L. Duane; and Talley, Douglas G., 4,039,760, Cl. 179-41.00A.

Talsma, Robert Clarence: *See—*
Kosrow, Robert Leslie; Smith, Robert Emmet; Talsma, Robert Clarence; and Bernstein, Benjamin T., 4,038,931, Cl. 112-272.000.

Talsma, Tjitte, to U.S. Philips Corporation. Color television display device. 4,039,987, Cl. 335-213.000.

Tambascio, Nickolas A., to Rusco Industries, Inc. Cross rail and support for bed frames. 4,038,710, Cl. 5-200.00R.

Tamura, Masamitu; Maeda, Katsumi; Harada, Nobuhiko; and Nakamura, Sigeharu, to Kobe Steel Ltd. Conveying device for long articles within heat treatment furnaces. 4,039,148, Cl. 214-21.000.

Tanahashi, Toshio; and Hasegawa, Hitoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Catalytic converter for an internal combustion engine. 4,039,293, Cl. 23-288.00F.

Tanaka, Ryuichi; Tajima, Satoshi; Usami, Akira; and Yokoyama, Mitsutaka, to Japan Atomic Energy Research Institute. Solid state ionization chamber of silicon PN-junction type. 4,039,808, Cl. 250-370.000.

Tanaka, Shoji: *See—*
Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, 4,039,483, Cl. 260-2.10R.

Tanaka, Tamotsu: *See—*
Yoshida, Takekazu; Makizawa, Yoshiaki; and Tanaka, Tamotsu, 4,039,114, Cl. 228-1.00R.

Tanaka, Tomoyuki; Okamura, Masahiro; Ogawa, Takuzo; and Misawa, Yutaka, to Hitachi, Ltd. Semiconductor device having high blocking voltage with peripheral circular groove. 4,040,084, Cl. 357-55.000.

Tanaka, Toshio; Kurozumi, Seizi; Toru, Takeshi; Miura, Shuji; Kobayashi, Makiko; and Ishimoto, Sachio, to Teijin Limited. Process for preparing cyclopent-2-en-1-one derivatives. 4,039,563, Cl. 260-410.90R.

Tanazawa, Yasushi: *See—*
Konomi, Toshiaki; Nurita, Joji; and Tanazawa, Yasushi, 4,038,950, Cl. 123-52.00M.

Tanczyn, Harry: *See—*
Schumacher, William J.; and Tanczyn, Harry, 4,039,356, Cl. 148-31.500.

Tanikoshi, Kinji, to Canon Kabushiki Kaisha; and Canon Seiki Kabushiki Kaisha. DC motor controlled by hall generator. 4,039,911, Cl. 318-254.000.

Tanner, Joseph A.: *See—*
Romero-Sierra, Cesar Aurelio; and Tanner, Joseph A., 4,038,989, Cl. 128-335.000.

Tanuma, Itsuo: *See—*
Honda, Toshio; Iwami, Koichi; Tanaka, Shoji; Fukuura, Yukio; Shibata, Shoson; Suzuki, Yoshikatsu; and Tanuma, Itsuo, 4,039,483, Cl. 260-2.10R.

Tapscott, Hunter P., to Westinghouse Electric Corporation. Position sensitive anti-tamper watthour meter. 4,039,943, Cl. 324-110.000.

Tarnoff, Sherwin S., to Air Balance, Inc. Heat radiation closure. 4,039,017, Cl. 160-1.000.

Tatsukawa, Keizo: *See—*
Fujimoto, Yasuo; Tatsukawa, Keizo; Nagaoka, Koichi; Nagumo, Masayuki; and Nagai, Kiichi, 4,039,710, Cl. 428-253.000.

Tauster, Samuel J.: *See—*
Murrell, Lawrence L.; and Tauster, Samuel J., 4,039,622, Cl. 423-239.000.

Taylor, Donald F.: *See—*
Pernet, Jacques M.; and Taylor, Donald F., 4,039,208, Cl. 285-3.000.

Taylor, James H. Line security device. 4,039,759, Cl. 179-38.000.

Taylor, John C. Adsorber apparatus. 4,039,306, Cl. 55-163.000.

Tchon, Wallace Edward, to Honeywell Information Systems, Inc. Time-independent CCD charge amplifier. 4,040,077, Cl. 357-24.000.

TDK Electronics Company, Limited: *See—*
Sasaki, Yoshinori; Yokoyama, Isao; Makino, Motohiko; Awaji, Syun; and Hosoya, Kaneo, 4,039,417, Cl. 204-196.000.

Teague, James R.: *See—*
Allen, Louis B., Jr.; and Teague, James R., 4,039,251, Cl. 350-157.000.

Teeple, Lawrence R., Jr.; Magyary, Andrew K.; and Severs, Kenneth N., to Ampex Corporation. Intermittent film transport registration stabilization device. 4,039,256, Cl. 352-184.000.

Teijin Limited: *See—*
Funakoshi, Wataru; Urasaki, Takanori; and Fujimoto, Hiroshi, 4,039,572, Cl. 260-468.00K.
Tanaka, Toshio; Kurozumi, Seizi; Toru, Takeshi; Miura, Shuji; Kobayashi, Makiko; and Ishimoto, Sachio, 4,039,563, Cl. 260-410.90R.

Teipel, John William, to Ortho Diagnostics, Inc. Single sample method for determination of lipoprotein concentrations in blood. 4,039,285, Cl. 23-230.00B.

Tekade Felten & Guilleaume Fernmeldeanlagen GmbH: *See—*
Schmidt, Hans-Joachim, 4,039,977, Cl. 333-28.00R.

Tektronix, Inc.: *See—*
Battjes, Carl Robert; Golladay, Harvey Leon; Rieger, Michael Lawrence; Rosario, Binoy Anthony; and Schlotzhauer, Kenneth George, 4,039,899, Cl. 315-371.000.
McTeague, Gerald E.; and Stinger, Kenneth R., 4,039,896, Cl. 315-135.00T.

Telautograph Corporation: *See—*
Muller, Alex M., 4,039,747, Cl. 178-19.000.

Teledyne Exploration Company: *See—*
Dwivedi, Ramesh Chandra, 4,040,000, Cl. 340-12.0SD.

Teledyne, Inc.: *See—*
Berkovitz, Robert A., 4,039,755, Cl. 179-1.00G.

Teleflex Incorporated: *See—*
Conrad, Winthrop B., 4,038,881, Cl. 74-501.00P.

Teleram Communications Corporation: *See—*
Cowe, Alan Barnett; and de Raismes, John Francis, 4,040,024, Cl. 364-900.000.

Teletronics United Inc.: *See—*
Gregory, L. Duane; and Talley, Douglas G., 4,039,760, Cl. 179-41.00A.

Teletype Corporation: *See—*
Abrams, Jack S., 4,040,095, Cl. 358-285.000.

Teramura, Hiroichi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamasaki, Yasuhiro; and Wakahara, Yasushi, 4,040,093, Cl. 358-261.000.

Terase, Tsuneo; Onishi, Ryuzo; and Akazawa, Haruo, to Nichiro Gyogyo Kaisha Ltd.; Taihei Shiryo Kaisha, Ltd.; Nippon Sanso K.K.; and Sintokogio, Ltd. Method for processing euphausia superba. 4,038,722, Cl. 17-48.000.

Terracol, Claude; and Schueller, Pierre, to Gerin, Merlin. High-speed high-current circuit interrupter having electrodynamically operated arcing contacts. 4,039,983, Cl. 335-16.000.

Terraillon: *See—*
Terraillon, Paul, 4,039,035, Cl. 177-186.000.
Terraillon, Paul, to Terraillon. Weighing balance. 4,039,035, Cl. 177-186.000.
Tersch, Richard W., to Lear Siegler, Inc. Pot broach rings. 4,038,730, Cl. 29-95.100.
Tessner, Roy Lynnard, to Coggins Industries, Inc. Automatic power controller for a wire saw. 4,038,962, Cl. 125-21.000.
Texaco Inc.: *See—*
McCoy, Frederic C., 4,039,462, Cl. 252-51.50A.
Patterson, John A., 4,039,464, Cl. 252-89.00R.
Texas Instruments Incorporated: *See—*
Bullock, David Carl, 4,040,019, Cl. 340-174.0TF.
Textron, Inc.: *See—*
Males, Robert E., 4,039,113, Cl. 227-130.000.
Th. Goldschmidt AG: *See—*
Koerner, Gotz; Kropac, Vaclav; and Patzke, Hans-Jurgen, 4,039,605, Cl. 260-824.00R.
Th. Kieserling & Albrecht: *See—*
Hartkopf, Heinz; and Schneider, Horst, 4,038,861, Cl. 72-416.000.
Thang, Minh-Nguy; and Guissani born Trachtenberg, Annie, to Choay S. A. Immobilized ribonuclease and alkaline phosphatase. 4,039,382, Cl. 195-28.00N.
Thelen, Helmut: *See—*
Haage, Karl; Thelen, Helmut; and Uedelhoven, Heinz, 4,038,804, Cl. 52-746.000.
Thibeault, Ronald N., to Sola Basic Industries, Inc. Electrical receptacle. 4,039,235, Cl. 339-14.00R.
Thiel, Alfons W.; and Hell, Hans, to Bellaplast GmbH. Method for the manufacture of thin-walled shaped articles of thermoplastic material. 4,039,609, Cl. 264-210.00R.
Thom, Richard D., to United States of America, Navy. High density infrared detector array. 4,039,833, Cl. 250-332.000.
Thomas, Elmer L.: *See—*
Fredriksson, Oke A.; and Thomas, Elmer L., 4,039,806, Cl. 235-152.000.
Thomas J. Lipton, Inc.: *See—*
Adams, Donald James; Kieninger, Horst; Ravenhill, John Richard; Ries, Dieter; and Schmeling, Karin, 4,039,693, Cl. 426-565.000.
Thomas, Richard E., to A. B. Dick Company. Element and method for teaching with liquid crystals. 4,038,761, Cl. 35-9.00G.
Thomas, Robert E.: *See—*
Burke, George K.; LeFevre, Robert J.; Thomas, Robert E.; Turner, James W.; and Krohn, Peter L., 4,038,982, Cl. 128-214.00E.
LeFevre, Robert J.; and Thomas, Robert E., 4,038,981, Cl. 128-214.00E.
Thompson, Bobby G.: *See—*
Kelly, William F.; and Thompson, Bobby G., 4,039,234, Cl. 308-238.000.
Thompson, David L., to Medtronic, Inc. Cautery protection circuit for a heart pacemaker. 4,038,990, Cl. 128-419.0PG.
Thompson, Raymond C.: *See—*
Zinga, William L.; and Thompson, Raymond C., 4,039,167, Cl. 259-1.00R.
Thomson-Brandt: *See—*
Bricot, Claude; Carre, Bernard; Lehureau, Jean Claude; and Puech, Claude, 4,039,764, Cl. 179-100.41L.
Thomson-CSF: *See—*
Hareng, Michel; Le Berre, Serge; and Spitz, Erich, 4,040,047, Cl. 340-324.00R.
Thomson, George, to Columbian Rope Company. Anchor having releasable flukes. 4,038,934, Cl. 114-298.000.
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, to Danfoss A/S. Coffee maker. 4,039,771, Cl. 219-328.000.
Thorsoe, Flemming; Andersen, Niels Lervad; and Christensen, John, to Danfoss A/S. Coffee maker. 4,039,772, Cl. 219-328.000.
Throckmorton, Peter E.; Sigan, J. W.; and McConnell, Robert B., to Ashland Oil, Inc. Quaternized amidoamines. 4,039,565, Cl. 260-459.00A.
Tichy, Thomas H.; and Collins, Raymond W., to Shure Brothers, Inc. Headset with adjustable microphone support. 4,039,765, Cl. 179-156.00A.
Tidstrom, Bror Erling, to AB Bofors. Method of and device for achieving a rapid transfer in a tank of a round from a magazine to the ramming position at the firearm of the tank. 4,038,906, Cl. 89-46.000.
Tiemann, Reinhard: *See—*
Pakur, Henryk; and Tiemann, Reinhard, 4,039,015, Cl. 152-362.00R.
Tischer, Richard E.: *See—*
Elmer, Thomas H.; and Tischer, Richard E., 4,039,339, Cl. 106-54.000.
Titus, Paul E., to Shell Oil Company. Method for reducing the adherence of crude oil to sucker rods. 4,039,717, Cl. 428-389.000.
T'jampens, Germain Remi; and Giller, Henricus Franciscus Johannes, to U.S. Philips Corporation. Electric tungsten/bromine cycle lamp and method of manufacturing said lamp. 4,039,879, Cl. 313-174.000.
Todo, Naoyuki: *See—*
Kotera, Yoshihide; Todo, Naoyuki; and Fukuda, Kenzo, 4,039,613, Cl. 423-571.000.
Todokoro, Hideo: *See—*
Kato, Yasuo; Okumura, Masahide; and Todokoro, Hideo, 4,039,829, Cl. 250-306.000.
Tokico Ltd.: *See—*
Hayashida, Yoshihiro, 4,038,999, Cl. 137-116.300.
Toko Incorporated: *See—*
Kitajima, Motohiro; and Nakagawa, Yoshihiko, 4,039,358, Cl. 148-187.000.
Tokunaga, Michio; Ohhinata, Ichiro; and Okuhara, Shinzi, to Hitachi, Ltd. Semiconductor bidirectional switch circuit. 4,039,864, Cl. 307-252.00T.
Tokunaga, Michio: *See—*
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,039,863, Cl. 307-252.00A.
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,039,865, Cl. 307-252.00G.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ishii, Kazuo, 4,039,964, Cl. 330-13.000.
Ishii, Kazuo, 4,039,965, Cl. 330-13.000.
Tsukamoto, Hiroyuki; and Akino, Morio, 4,039,110, Cl. 226-177.000.
Toland, William G., to Chevron Research Company. Plasticized sulfur as an adhesive and laminated conduit made therefrom. 4,039,725, Cl. 428-537.000.
Tomforde, Johann, to Daimler-Benz Aktiengesellschaft. Shell-shaped children's seat for vehicles. 4,039,225, Cl. 297-390.000.
Tomoshige, Toru, to Mitsui Petrochemical Industries, Ltd. Method of producing modified polyethylene wax. 4,039,560, Cl. 260-346.300.
Toplak, Ernst: *See—*
Baer, Jurgen; Sommer, Hans-Dieter; and Toplak, Ernst, 4,039,267, Cl. 415-1.000.
Torenbeek, Reinder: *See—*
Oosterwijk, Hendrik Harm Jannes; and Torenbeek, Reinder, 4,039,475, Cl. 252-431.00R.
Torley, Jozsef: *See—*
Toth, Edit; Torley, Jozsef; Szeberenyi, Szabolcs; Palosi, Eva; Szporny, Laszlo; Gorog, Sandor; and Meszaros, Csilla, 4,039,589, Cl. 260-618.00B.
Torley, Robert E.: *See—*
Mater, Milton H.; and Torley, Robert E., 4,039,849, Cl. 290-55.000.
Torok, Ernest J.: *See—*
Hanson, Marlin M.; and Torok, Ernest J., 4,040,039, Cl. 340-174.0YC.
Torr Laboratories, Inc.: *See—*
DeLucia, Victor E.; and Nosser, Philip B., 4,039,984, Cl. 335-151.000.
Torre, Edward Della; and Kinsner, Witold, to Canadian Patents and Development Limited. Channel bar bubble propagate circuit. 4,040,040, Cl. 340-174.0TF.
Toru, Takeshi: *See—*
Tanaka, Toshio; Kurozumi, Seizi; Toru, Takeshi; Miura, Shuji; Kobayashi, Makiko; and Ishimoto, Sachio, 4,039,563, Cl. 260-410.90R.
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Townsend Engineering Company: *See—*
Townsend, Ray T., 4,038,953, Cl. 123-44.00E.
Townsend, Franklin L., to Barber-Colman Company. Heddle selecting and positioning apparatus. 4,038,729, Cl. 28-206.000.
Townsend, Ray T., to Townsend Engineering Company. Rotary internal combustion engine having rotary valve means for fuel and air introduction. 4,038,953, Cl. 123-44.00E.
Toyo Seikan Kaisha Limited: *See—*
Miyamatsu, Yasunori; Yasumuro, Hisakazu; Miyata, Kenichi; Shimizu, Takashi; and Matsuoka, Kikuo, 4,039,704, Cl. 427-284.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Hori, Osamu; and Yamanaka, Teruo, 4,039,787, Cl. 200-19.00R.
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,039,481, Cl. 252-464.000.
Konomi, Toshiaki; Nurita, Joji; and Tanazawa, Yasushi, 4,038,950, Cl. 123-52.00M.
Nagano, Tetsuro, 4,038,952, Cl. 123-32.00K.
Takizawa, Masaaki; and Hiyoshi, Tsutomu, 4,038,959, Cl. 123-191.00S.
Tanahashi, Toshio; and Hasegawa, Hitoshi, 4,039,293, Cl. 23-288.00F.
Yoshikawa, Eiji; and Kobayashi, Tsuneo, 4,038,819, Cl. 60-307.000.
Travaglio, Dalny: *See—*
Ginn, LeRoy; Ginn, LeRoyce; and Travaglio, Dalny, 4,039,124, Cl. 236-1.00B.
Treantos, Joseph: *See—*
Murphy, John H.; and Treantos, Joseph, 4,039,052, Cl. 188-76.000.
Treckman, Frank. Inertia switch having reciprocating mass. 4,039,790, Cl. 200-61.530.
Treffner, Walter S.: *See—*
Stein, Joseph L.; and Treffner, Walter S., 4,039,343, Cl. 106-59.000.
Troop, Martin G.: *See—*
Simons, Robert W.; and Troop, Martin G., 4,040,059, Cl. 343-203.000.
Trouiller, Jean-Claude: *See—*
Vivet, Bernard; Trouiller, Jean-Claude; and Gruel, Henri, 4,040,001, Cl. 340-15.5TN.
Troussier, Maurice; and Van Lang, Huynh, to Produits Chimiques Ugine Kuhlmann. Polytetrafluoroethylene based coating compositions. 4,039,497, Cl. 260-29.60F.
Trouw & Co. N.V.: *See—*
Caris, Josephus Antonius Marie; and de Goede, Johannes Antonius, 4,039,168, Cl. 259-9.000.

TRW Inc.: *See—*
DiBugnara, Raymond; and Allison, Richard, 4,039,702, Cl. 427-93.000.
Huang, Cornelius Y. D.; and Merz, Kenneth M., 4,039,997, Cl. 338-308.000.
Trzebiatowski, Peter M., to Falk Corporation, The. One-way clutch and backstop incorporating the same. 4,039,058, Cl. 192-45.000.
Tsao, Utah, to Lummus Company, The. Carbon dioxide removal from chlorinated hydrocarbon production system. 4,039,597, Cl. 260-654.00A.
Tsukamoto, Hiroyuki; and Akino, Morio, to Tokyo Shibaura Electric Co., Ltd. Tape high-speed travelling device. 4,039,110, Cl. 226-177.000.
Tsukamoto, Magohei, to Yamaha, Hatsudoki Kabushiki Kaisha. Two-cycle engine wave interference muffler means. 4,038,820, Cl. 60-314.000.
Tsuruya, Tetsuo: *See—*
Yokoo, Hidejiro; Tsuruya, Tetsuo; Chaen, Shigehiro; and Kubo, Hiroshi, 4,039,577, Cl. 260-553.00A.
Tucci, Frank J. Artificial bedding material for animals. 4,038,944, Cl. 119-1.000.
Tucek, Frank J., to J. I. Case Company. Hydraulic circuit for tree harvesting implement. 4,039,010, Cl. 144-34.00R.
Tucker, Robert Jerome, to American Cyanamid Company. Visibly opaque infrared transmitting optical filter containing a combination of copper and vanadyl phthalocyanine sulfonamides. 4,039,467, Cl. 252-300.000.
Tummes, Hans: *See—*
Falbe, Jurgen; Tummes, Hans; and Hahn, Heinz-Dieter, 4,039,584, Cl. 260-604.0HF.
Tung, Chin: *See—*
Chang, Hsu; Chen, Tien Chi; and Tung, Chin, 4,040,018, Cl. 340-174.0TF.
Turgeon, Martin D.: *See—*
Morini, Ralph E.; and Turgeon, Martin D., 4,039,292, Cl. 23-288.0FC.
Turner, James W.: *See—*
Burke, George K.; LeFevre, Robert J.; Thomas, Robert E.; Turner, James W.; and Krohn, Peter L., 4,038,982, Cl. 128-214.00E.
Tyler, Tracy B. Rotary dry shaver with tiltable shear plates. 4,038,748, Cl. 30-43.600.
U-Forms International, Inc.: *See—*
Sachs, Melvin H., 4,038,798, Cl. 52-309.700.
Uchida, Kiyoshi: *See—*
Kimura, Sadahiro; Uchida, Kiyoshi; and Akizuki, Hiroyuki, 4,039,481, Cl. 252-464.000.
Uchino, Hisanori: *See—*
Shinohara, Shinitsu; Uchino, Hisanori; and Yamaji, Hiroyuki, 4,039,084, Cl. 212-39.0MS.
Uddeholms Aktiebolag: *See—*
Fischmeister, Hellmut; Lampe, Vaino; and Olsson, Leif, 4,038,738, Cl. 29-420.500.
Uedelhoven, Heinz: *See—*
Haage, Karl; Thelen, Helmut; and Uedelhoven, Heinz, 4,038,804, Cl. 52-746.000.
Uemura, Masazi, to Aikoh Co., Ltd.; and Sumitomo Metal Industries, Ltd. Reducing material for steel making. 4,039,320, Cl. 75-58.000.
Ugolnikov, Stanislav Vasilievich; Kosach, Stanislav Petrovich; Kaplun, Vladimir Davydovich; Zhitnik, Valentin Ivanovich; and Bulgakov, Anatoly Yakovlevich. Device for measuring and checking parameters of electric circuit elements. 4,039,945, Cl. 324-158.00R.
Uher Werke Munchen GmbH & Co.: *See—*
Plener, Helmut; Piotrowski, Heinz; Arweiler, Otto; and Drexler, Herbert, 4,040,102, Cl. 360-71.000.
Uitti, Kenneth D., to Universal Oil Products Company. Ethylbenzene Dehydrogenation process. 4,039,602, Cl. 260-669.00R.
Ullman, Edwin F.; and Rubenstein, Kenneth E., to Syva Company. Cardiac glycoside enzyme conjugates. 4,039,385, Cl. 195-63.000.
Ulrich, Henri: *See—*
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,039,580, Cl. 260-570.00D.
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,039,581, Cl. 260-570.00D.
Underwood, Robert K.: *See—*
Bailey, Paul T.; Craford, M. George; Findlay, Alexander G.; and Underwood, Robert K., 4,039,890, Cl. 313-500.000.
Unger, Jerome R.: *See—*
Coxhill, Major; Unger, Jerome R.; and Lowe, Keith B., 4,039,151, Cl. 241-191.000.
Union Camp Corporation: *See—*
Deutsch, Howard; and Shoemaker, John D., Jr., 4,039,374, Cl. 162-79.000.
Union Carbide Corporation: *See—*
Bassett, David Robinson; and Hoy, Kenneth Look, 4,039,500, Cl. 260-29.60R.
Kanner, Bernard, 4,039,490, Cl. 260-2.5AH.
McCarthy, Neil Justin, Jr., 4,039,525, Cl. 260-17.200.
Union Oil Company of California: *See—*
Fischer, Paul W.; and Zilch, Horst E., 4,039,459, Cl. 252-8.50C.
Knight, Robert K., 4,039,028, Cl. 166-246.000.
McArthur, Dennis P., 4,039,471, Cl. 252-412.000.
Union Special Corporation: *See—*
Kosrow, Robert Leslie; Smith, Robert Emmet; Talsma, Robert Clarence; and Bernstein, Benjamin T., 4,038,931, Cl. 112-272.000.
United States Bedding Company, The: *See—*
Golembeck, Gerald A.; and Marx, Ralph J., 4,038,711, Cl. 5-263.000.
U.S. Industries, Inc.: *See—*
Minhinnick, James W., 4,039,215, Cl. 293-71.00R.
Winget, James L., 4,038,890, Cl. 82-5.000.
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Agriculture: *See—*
Freedman, Bernard; and Diamond, Martin J., 4,039,731, Cl. 526-6.000.
Kullman, Russell M. H.; and Reinhardt, Robert M., 4,039,282, Cl. 8-184.000.
Shasha, Baruch S.; Doane, William M.; and Stout, Edward I., 4,039,586, Cl. 260-608.000.
Walkotten, William J., 4,038,875, Cl. 73-425.000.
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Allen, Louis B., Jr.; and Teague, James R., 4,039,251, Cl. 350-157.000.
Army: *See—*
Allan, Barry D., 4,039,360, Cl. 149-36.000.
Curchack, Herbert D., 4,038,869, Cl. 73-167.000.
DuPont, Achiel M., Jr.; Moody, J. Burnett; and Newlon, Roger L., 4,038,905, Cl. 89-43.00R.
Hall, John T., 4,040,087, Cl. 358-113.000.
Kimball, John K.; and Plunk, Troy E., 4,038,742, Cl. 29-600.000.
Krueger, Paul C., 4,039,958, Cl. 328-119.000.
Prochazka, Rudolph J., 4,039,976, Cl. 333-24.00R.
Rocha, John G., 4,038,904, Cl. 89-33.0MC.
Wohlford, William P., 4,038,903, Cl. 89-8.000.
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McCuaig, Franklin D., 4,039,378, Cl. 176-70.000.
Government: *See—*
Gal, Andrew E.; and Brady, Roscoe O., 4,039,388, Cl. 195-103.50R.
Interior: *See—*
Cadotte, John E., 4,039,440, Cl. 210-23.00H.
Davis, Edward G., 4,039,625, Cl. 423-326.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Fenwick, James R.; and Karigan, George H. Accumulator. 4,039,000, Cl. 137-207.000.
Gates, Daniel W.; Harada, Yoshiro; Logan, William R.; and Gilligan, John E. Method of preparing zinc orthotitanate pigment. 4,039,347, Cl. 106-292.000.
Hruby, Ronald J.; and Wilson, Robert L. Twin-capacitive shaft angle encoder with analog output signal. 4,040,041, Cl. 340-200.000.
Marsh, Harold E., Jr. Oil and fat absorbing polymers. 4,039,489, Cl. 260-2.5AD.
McLyman, W. T.; and Wester, Gene W. Phase substitution of spare converter for a failed one of parallel phase staggered converters. 4,039,925, Cl. 363-70.000.
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Lokerson, Donald C., 4,039,754, Cl. 179-1.0SA.
Nola, Frank J., 4,039,946, Cl. 324-165.000.
Owens, Lester J.; and Jones, William C., 4,038,705, Cl. 3-2.000.
Navy: *See—*
Crocker, Leon Bardin, 4,039,783, Cl. 235-150.300.
Dalpee, Joseph A.; Bernard, Fred W.; and Reynolds, Richard G., 4,040,119, Cl. 361-191.000.
Drisko, Richard W., 4,039,494, Cl. 260-22.00A.
Kaloi, Cyril M., 4,040,060, Cl. 343-700.0MS.
Lopez, Alvaro G., 4,038,900, Cl. 89-1.00B.
McClaine, Andrew W., 4,039,023, Cl. 165-2.000.
Simons, Robert W.; and Troop, Martin G., 4,040,059, Cl. 343-203.000.
Thom, Richard D., 4,039,833, Cl. 250-332.000.
Wilson, Jeffrey V.; and Brackett, Ronald L., 4,039,242, Cl. 339-177.00E.
U.S. Philips Corporation: *See—*
Beijer, Louis Benjamin; Koedam, Mijndert; Claassens, Jacobus Marinus Maria; and Van Vliet, Johannes Adrianus Josephus Maria, 4,039,880, Cl. 313-183.000.
Benthem, Harm Gerrit; and van Straten, Cornelis, 4,039,701, Cl. 427-69.000.
Chermin, Hubertus Mathias Jozef; Luursema, Meerten; Rozenboom, Jaap; and Smulders, Herman Adrianus Godefridus, 4,039,895, Cl. 315-101.000.
Damsteeg, Cornelis Jan; and Ekkelboom, Tjepke Hendrick, 4,039,883, Cl. 313-218.000.
Eggermont, Ludwig Desire Johan; and Riemens, Karel, 4,039,949, Cl. 325-38.00B.
Eggermont, Ludwig Desire Johan; and Wevers, Anton Hendrik, 4,039,955, Cl. 325-321.000.
Eijkelenboom, Leonard Cornelis Hendrik; and Kesseler, Jan Antoon Henri, 4,039,878, Cl. 313-113.000.
Essers, Wilhelmus Gerardus, 4,039,800, Cl. 219-121.00P.
Glasbergen, Johannes Wilhelmus, 4,039,950, Cl. 325-38.00B.
Gommans, Hubertus Johannes Josephus, 4,039,743, Cl. 174-114.00R.
Gorter, Frederik Willem, 4,040,113, Cl. 360-113.000.
Hermann, Wilhelm; and Horster, Horst, 4,038,797, Cl. 52-306.000.
Kerstens, Franciscus Napoleon Adrianus, 4,039,892, Cl. 315-39.710.
Lambrechtse, Cornelis Willem; and Salters, Roelof Herman Willem, 4,039,860, Cl. 307-362.000.
Olsson, Kjell Olow Ingemar, 4,040,053, Cl. 343-6.50R.

Pauker, Mira; Gobert, Jean; Pottier, Denis; and Quere, Louis, 4,040,028, Cl. 364-900.000.
Roza, Engel, 4,039,967, Cl. 331-11.000.
Scholten, Rudy Dirk Anthonie; and Visser, Antonius Gerardus, 4,039,972, Cl. 331-108.00D.
Staal, Franciscus Cornelis Maria Antonius; and Vink, Nicolaas Gerrit, 4,039,989, Cl. 335-213.000.
Talsma, Tjitte, 4,039,987, Cl. 335-213.000.
T'jampens, Germain Remi; and Giller, Henricus Franciscus Johannes, 4,039,879, Cl. 313-174.000.
van Boekhold, Johannes Leonardus Andreas Maria; and Kessels, Wilhelmus Cornelius, 4,039,885, Cl. 313-275.000.
van der Heijde, Martin Clemens, 4,039,988, Cl. 335-213.000.
van Es, Lambertus Gerardus; van Essen, Hendrik Arie; and de Troye, Nicolaas Cornelis, 4,040,027, Cl. 364-900.000.
Wellhausen, Hans; and Friedmann, Reinhard, 4,040,086, Cl. 358-22.000.

United States Steel Corporation: *See—*
Elgin, Robert J., 4,039,166, Cl. 256-65.000.
Friend, Donald L., 4,039,394, Cl. 202-262.000.
Maki, Richard R., 4,039,436, Cl. 209-464.000.
Schapiro, Norman; and Shoenberger, Ronald W., 4,039,319, Cl. 75-42.000.

Universal Industries, Inc.: *See—*
Jennings, Marvin E., deceased, 4,039,957, Cl. 325-466.000.

Universal Oil Products Company: *See—*
Hoyer, William A.; Johnson, Lowell W.; and Schoenenberger, Richard J., 4,038,939, Cl. 118-4.000.
Hoyer, William A.; and Johnson, Lowell W., 4,039,482, Cl. 252-466.0PT.
Uitti, Kenneth D., 4,039,602, Cl. 260-669.00R.

Universal Pneumatic Controls, Inc.: *See—*
Ginn, LeRoy; Ginn, LeRoyce; and Travaglio, Dalny, 4,039,124, Cl. 236-1.00B.

UOP Inc.: *See—*
Bloch, Herman S.; and Schmerling, Louis, 4,039,793, Cl. 260-651.00R.
Christman, William J., 4,039,389, Cl. 196-14.520.
Gembicki, Stanley A.; and Arbesman, Richard W., 4,039,479, Cl. 252-455.00Z.
Gewartowski, Steve A., 4,039,599, Cl. 260-668.00A.
Homeier, Edwin H., 4,039,585, Cl. 260-604.0HF.
Jensen, Robert H., 4,039,430, Cl. 208-108.000.
Mikulicz, Michael Z.; and Burton, Vance P., 4,039,603, Cl. 260-683.420.
Schmerling, Louis; and Levy, Joseph, 4,039,564, Cl. 260-413.000.

Upjohn Company, The: *See—*
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,039,580, Cl. 260-570.00D.
Frulla, Floro F.; Sayigh, Adnan A. R.; Ulrich, Henri; and Whitman, Peter J., 4,039,581, Cl. 260-570.00D.
Hester, Jackson B., Jr., 4,039,551, Cl. 260-296.00T.
Knight, John C.; and Wovcha, Merle G., 4,039,381, Cl. 195-51.00S.
Kolakowski, Richard A.; Reymore, Harold E., Jr.; and Sayigh, Adnan A. R., 4,039,487, Cl. 260-2.5AW.

Upton, Douglas J. Electric razor having an oscillating cutting head. 4,038,747, Cl. 30-34.200.

URANIT Uran-Isotopentrennungs-GmbH: *See—*
Pokar, Jochen; and Putter, Horst, 4,039,828, Cl. 250-288.000.

Urasaki, Takanori: *See—*
Funakoshi, Wataru; Urasaki, Takanori; and Fujimoto, Hiroshi, 4,039,572, Cl. 260-468.00K.

Urayama, Takao: *See—*
Takasuga, Yutaka; Nishimura, Seiichiro; and Urayama, Takao, 4,039,365, Cl. 156-405.000.

Uriarte, Anthony K., to Monsanto Company. Production of tetrabromobutadiene by catalytic oxybromination of butane. 4,039,598, Cl. 260-655.000.

Usami, Akira: *See—*
Tanaka, Ryuichi; Tajima, Satoshi; Usami, Akira; and Yokoyama, Mitsutaka, 4,039,808, Cl. 250-370.000.

Usuda, Hirotaka: *See—*
Shirasu, Hirotoshi; and Usuda, Hirotaka, 4,039,758, Cl. 179-18.0FH.

Utamura, Yukihiko: *See—*
Morimoto, Kiyoshi; Utamura, Yukihiko; and Takagi, Toshinori, 4,039,699, Cl. 427-38.000.

Utzinger, Diethelm: *See—*
Baumgartner, Max; Bucher, Anton; and Utzinger, Diethelm, 4,039,036, Cl. 177-212.000.

Vahlensieck, Hans-Joachim: *See—*
Kotzsch, Hans-Joachim; and Vahlensieck, Hans-Joachim, 4,039,567, Cl. 260-448.80R.

Val Verde Corporation: *See—*
Hogan, Jim Smith, 4,039,130, Cl. 248-19.000.

Valbjorn, Knud Vagn: *See—*
Spies, Volker; Poul, Christian Dyhr-Mikkelsen; and Valbjorn, Knud Vagn, 4,039,126, Cl. 236-42.000.

Valeron Corporation, The: *See—*
Smith, David L.; and Scherr, Norman J., Jr., 4,038,756, Cl. 33-172.00E.

Vallo, Frank Joseph: *See—*
Geadah, Youssef Alfred; and Vallo, Frank Joseph, 4,040,120, Cl. 361-220.000.

van Boekhold, Johannes Leonardus Andreas Maria; and Kessels, Wilhelmus Cornelius, to U.S. Philips Corporation. Electric incandescent lamp. 4,039,885, Cl. 313-275.000.

Vance, James R., to Allied Chemical Corporation. Control of a steam-heating power plant. 4,039,846, Cl. 290-4.00R.

Van den Houte, Jozef Willy: *See—*
Kokelenberg, Hendrik Emmanuel; Samijn, Rafael Pierre; Van den Houte, Jozef Willy; and Pollet, Robert Joseph, 4,039,332, Cl. 96-48.00R.

van der Burg, Willem Jacob; and Salsmans, Robert Raymond Malvine, to Akzona Incorporated. Amino-substituted tetracyclic compounds. 4,039,558, Cl. 260-326.50B.

van der Heijde, Martin Clemens, to U.S. Philips Corporation. Deflection coil having sections with minimum winding density portions and spaces. 4,039,988, Cl. 335-213.000.

van der Kerk, Gerrit J. M.; Sijpesteijn, Antje Kaars; and Bulten, Eric J. Compositions containing organo germanium compounds useful in the prevention of caries. 4,039,655, Cl. 424-52.000.

van der Mark, Johannes M.A.A., to Stamicarbon B.V. Foamable vinyl-chloride polymers and rigid foam structures made thereof. 4,039,486, Cl. 260-2.5HA.

vanderMark, Johannes M.A.A., to Stamicarbon B.V. Foamable vinyl-chloride polymers and hard foam structures made thereof. 4,039,488, Cl. 260-2.5HA.

van Es, Lambertus Gerardus; van Essen, Hendrik Arie; and de Troye, Nicolaas Cornelis, to U.S. Philips Corporation. Digital data transfer system having delayed information readout from a first memory into a second memory. 4,040,027, Cl. 364-900.000.

van Essen, Hendrik Arie: *See—*
van Es, Lambertus Gerardus; van Essen, Hendrik Arie; and de Troye, Nicolaas Cornelis, 4,040,027, Cl. 364-900.000.

van Gulick, Norman Martin, to Du Pont de Nemours, E. I., and Company. Polyurethanes cured with derivatives of 2,4-diamino-benzamide. 4,039,514, Cl. 260-75.0NH.

van Klinken, Jakob; and Ladeur, Peter, to Shell Oil Company. Process for hydrocarbon conversion. 4,039,429, Cl. 208-50.000.

Van Lang, Huynh: *See—*
Troussier, Maurice; and Van Lang, Huynh, 4,039,497, Cl. 260-29.60F.

van Straten, Cornelis: *See—*
Benthem, Harm Gerrit; and van Straten, Cornelis, 4,039,701, Cl. 427-69.000.

Van Vliet, Johannes Adrianus Josephus Maria: *See—*
Beijer, Louis Benjamin; Koedam, Mijndert; Claassens, Jacobus Marinus Maria; and Van Vliet, Johannes Adrianus Josephus Maria, 4,039,880, Cl. 313-183.000.

Varta Batterie Aktiengesellschaft: *See—*
Brinkmann, Jurgen; and Sucher, Josef, 4,039,730, Cl. 429-212.000.

Vassiliou, Eustathios, to Du Pont de Nemours, E. I., and Company. Fluorocarbon primer having improved scratch resistance. 4,039,713, Cl. 428-324.000.

Vaupotic, Marcia P.: *See—*
Dickinson, William B.; and Vaupotic, Marcia P., 4,039,550, Cl. 260-294.80E.

VDO Adolf Schindling AG: *See—*
Mann, Arnold; Heimbach, Ludolf; and Schlick, Horst, 4,039,043, Cl. 180-108.000.

VEB Pentacon Dresden: *See—*
Lindner, Fritz; and Hahn, Werner, 4,040,111, Cl. 354-49.000.

Veinberg, Artur Karlovich: *See—*
Giller, Solomon Aronovich; Lazdinsh, Arvid Avgustovich; Veinberg, Artur Karlovich; and Sidorov, Alexandr Borisovich, 4,039,546, Cl. 260-260.000.

Velsicol Chemical Corporation: *See—*
Richter, Sidney B.; and Krenzer, John, 4,039,314, Cl. 71-88.000.

Veltze, Janusz Andrew: *See—*
Everett, Robert Charles; Radcliffe, Paul Anthony Beaufort; Robinson, Alfred Henry; and Veltze, Janusz Andrew, 4,040,094, Cl. 358-283.000.

Vent-Cair, Inc.: *See—*
Kuechler, Irvin R., 4,038,912, Cl. 126-299.00D.

Venti, Theodore Paul, to Amway Corporation. Glass container and adapter ring. 4,039,097, Cl. 215-12.00R.

Vereinigte Edelstahlwerk AG: *See—*
Holzgruber, Wolfgang; and Schneidhofer, Adolf, 4,039,022, Cl. 164-52.000.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Bayer, Franz; and Scheurecker, Werner, 4,038,856, Cl. 72-238.000.

Vergez, Andre: *See—*
Lacan, Guy; and Vergez, Andre, 4,039,902, Cl. 361-395.000.

Versteege, Arnoldus Josef. Method and device for the uniform and even spraying of surfaces in a non-continuous production system. 4,039,369, Cl. 156-551.000.

Vetco Offshore Industries, Inc.: *See—*
Jansen, Martin B., Jr., 4,039,176, Cl. 267-125.000.

Viaud, Michel: *See—*
Andrieu, Jean-Louis; Bonnet, Yves; and Viaud, Michel, 4,039,377, Cl. 176-65.000.

Vicai, Egon, to General Electric Company. Blue-white glow lamp. 4,039,889, Cl. 313-487.000.

Victor Company of Japan, Limited: *See—*
Wada, Kinzo, 4,039,912, Cl. 318-254.000.

Vin, Jean-Pierre. Vehicle drive train. 4,039,037, Cl. 180-24.110.

Vinciguerra, Costantino, to Nuovo Pignone, S.p.A. Shaft and bushing assembly. 4,039,232, Cl. 308-36.100.

Vink, Nicolaas Gerrit: *See—*
Staal, Franciscus Cornelis Maria Antonius; and Vink, Nicolaas Gerrit, 4,039,989, Cl. 335-213.000.

Vish Minno-Geoloshki Institute-Nis: *See—*
Stoev, Stoycho Mitrev; Mitrushev, Marin Dimitrov; Boshilov, Grozdan Todorov; and Radeva, Maria Georgieva, 4,039,456, Cl. 210-388.000.

Visser, Antonius Gerardus: *See—*
Scholten, Rudy Dirk Anthonie; and Visser, Antonius Gerardus, 4,039,972, Cl. 331-108.00D.

Vivet, Bernard; Trouiller, Jean-Claude; and Gruel, Henri, to Schlumberger Technology Corporation. Acoustic well logging with threshold adjustment. 4,040,001, Cl. 340-15.5TN.

Vogl, Norbert George, Jr.: *See—*
Lee, Hsing-San; and Vogl, Norbert George, Jr., 4,040,016, Cl. 340-173.0CA.

Voigt, Allan Alfred, to General Dynamics Corporation. Optical scanning apparatus with two mirrors rotatable about a common axis. 4,039,246, Cl. 350-7.000.

Vojta, Erich: *See—*
Foerster, Otto; and Vojta, Erich, 4,039,801, Cl. 219-137.00R.

Volkswagenwerk Aktiengesellschaft: *See—*
Bauer, Andreas; Bluggel, Erwin; and Henning, Heinz, 4,039,224, Cl. 297-389.000.

Vollmer, Karl-Otto: *See—*
Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, 4,039,671, Cl. 424-267.000.

von Allworden, Wilhelm: *See—*
Kunze, Dieter; and von Allworden, Wilhelm, 4,039,203, Cl. 280-515.000.

von Benda, Klaus: *See—*
Benczur-Urmossy, Gabor; von Benda, Klaus; and Haschka, Friedrich, 4,039,729, Cl. 429-206.000.

Von Fange, Eugene K.: *See—*
Scales, Edgar F.; Von Fange, Eugene K.; and Wood, Robert F., 4,039,924, Cl. 363-65.000.

von Strandtmann, Max: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,039,579, Cl. 260-566.00R.

Vorrasi, Michael. Combined writing instrument and slide rule. 4,039,819, Cl. 240-6.460.

Vrana, Jiri; and Setka, Jaroslav, to Vyvojova a provozni zakladna vyzkumnych ustavu. Method of and apparatus for the detector of neoplasms and other morphologic changes in mucous membrane samples. 4,038,975, Cl. 128-2.10Z.

Vukasovic, Lovro, to Siemens Aktiengesellschaft. Method and apparatus for operating a load controlled inverter. 4,039,923, Cl. 363-79.000.

Vyshelessky, Alexandr Nikolaevich: *See—*
Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; Vyshelessky, Alexandr Nikolaevich; Rogov, Iosif Alexandrovich; Kishinevsky, Lazar Iosifovich; and Pidenko, Anatoly Pavlovich, 4,039,796, Cl. 219-10.55A.

Vyvojova a provozni zakladna vyzkumnych ustavu: *See—*
Vrana, Jiri; and Setka, Jaroslav, 4,038,975, Cl. 128-2.10Z.

W. B. McGuire Co., Inc.: *See—*
McGuire, Winston B.; and Makas, Stanley, 4,038,792, Cl. 52-105.000.

W. C. Heraeus GmbH: *See—*
Keller, Walter; Koukol, Hubert; Ptaschek, Werner; and Wendt, Dieter, 4,039,286, Cl. 23-230.00R.

W. R. Grace & Co.: *See—*
Moyer, Joseph Donald; and Kramm, David Edward, 4,039,723, Cl. 428-521.000.

Wachi, Shigeaki: *See—*
Yoshida, Tadao; Suzuki, Tadao; and Wachi, Shigeaki, 4,039,921, Cl. 363-22.000.

Wachter, William J. Method and apparatus for inspection of nuclear fuel rods. 4,039,376, Cl. 176-19.0LD.

Wada, Kenji: *See—*
Takahashi, Toshiro; Nagano, Toshihiro; Wada, Kenji; and Kikuchi, Masaru, 4,039,355, Cl. 148-31.500.

Wada, Kinzo, to Victor Company of Japan, Limited. Three-phase brushless DC motor using two hall effect devices. 4,039,912, Cl. 318-254.000.

Wada, Tsuneo: *See—*
Habu, Teiji; Yamaguchi, Hisashi; Wada, Tsuneo; Sasaki, Takashi; Ishii, Hiroki; Omura, Takayoshi; and Inokuma, Hiroyuki, 4,039,520, Cl. 260-117.000.

Wagener, Klaus: *See—*
Heide, Erich-Alexander; Wald, Maximilian; Paschke, Manfred; and Wagener, Klaus, 4,039,445, Cl. 210-38.00C.

Wagenknecht, Conrad D., to General Electric Company. Variable cycle plug nozzle and flap and method of operating same. 4,039,146, Cl. 239-265.250.

Wagner, David Lee, to Boeing Company, The. Pneumatic impact gun. 4,039,034, Cl. 173-137.000.

Wagner, Delmer W. Moisture measuring apparatus. 4,039,939, Cl. 324-57.00Q.

Wagner, Sigurd: *See—*
Bachmann, Klaus Jurgen; Bettini, Manfred Hermann; Buehler, Ernest; Shay, Joseph Leo; and Wagner, Sigurd, 4,039,357, Cl. 148-175.000.

Wahi, Chander M.; and Baumler, Robert J., to E. F. Johnson Company. Variable capacitor. 4,039,906, Cl. 361-293.000.

Wakahara, Yasushi: *See—*
Nakagome, Yukio; Teramura, Hiroichi; Yamasaki, Yasuhiro; and Wakahara, Yasushi, 4,040,093, Cl. 358-261.000.

Wako Pure Chemical Industries, Ltd.: *See—*
Nagaoka, Joji; Yamashita, Kazuhiko; Minamii, Nobuaki; Miyagawa, Tsutomu; and Sugano, Masahiko, 4,039,527, Cl. 260-192.000.

Wald, Maximilian: *See—*
Heide, Erich-Alexander; Wald, Maximilian; Paschke, Manfred; and Wagener, Klaus, 4,039,445, Cl. 210-38.00C.

Waldman, Nathan: *See—*
Soderquist, Frederick J.; Wazbinski, Theodore T.; and Waldman, Nathan, 4,039,601, Cl. 260-669.00R.

Waldron, Richard C., to Okonite Company, The. Splices for high pressure pipe-type cables. 4,039,745, Cl. 174-21.00R.

Walker, Edward Raymond Halstead, to Imperial Chemical Industries Limited. Prostanoic acid derivatives. 4,039,654, Cl. 424-305.000.

Walker, James Terrell: *See—*
Clement, Carl Jennings; Campbell, Kenneth Strong; and Walker, James Terrell, 4,038,895, Cl. 84-1.010.

Walker, Keith A. M., to Syntex (U.S.A.) Inc. Novel 1-phenethylimidazoles. 4,039,677, Cl. 424-273.000.

Walkotten, William J., to United States of America, Agriculture. Cryogenic sediment sampler. 4,038,875, Cl. 73-425.000.

Wallace, William Patrick; and Angilella, Anthony George, to Dana Corporation. Method of making a bearing surface. 4,039,399, Cl. 204-25.000.

Walpole, Harold L., to McDonnell Douglas Corporation. Color coded vehicle guidance system. 4,040,004, Cl. 340-26.000.

Walters, Robert A., to ARCO Medical Products Company. Cardiac pacer with rate limiting means. 4,038,991, Cl. 128-419.0PG.

Walters, Tom. Couplings. 4,039,213, Cl. 285-317.000.

Walther & Cie Aktiengesellschaft: *See—*
Bechthold, Horst; and Bottger, Paul, 4,039,304, Cl. 55-10.000.

Walton, Frank T.; and Dzaack, Walter J., to Emerson Electric Co. Electric heating elements. 4,039,995, Cl. 338-295.000.

Wang, Charles P.; and Gibb, Owen L., to Aerospace Corporation, The. Fast discharge, high power, electric discharge pumped gas laser. 4,039,971, Cl. 331-94.5PE.

Wang, Ting-I: *See—*
Hankins, Tad L.; and Wang, Ting-I, 4,039,461, Cl. 252-51.50A.

Ward, Frank L., to Clarostat Mfg. Co., Inc. Variable output function potentiometer. 4,039,994, Cl. 338-89.000.

Warner-Lambert Company: *See—*
Connor, David T.; Young, Patricia A.; and von Strandtmann, Max, 4,039,579, Cl. 260-566.00R.
Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, 4,039,671, Cl. 424-267.000.

Warner & Swasey Company, The: *See—*
Young, Warren C., 4,038,794, Cl. 52-127.000.

Warshaw, Saul; Loveland, Winton; and Hanemann, Horst J., to Loveshaw Corporation, The. Tape applying mechanisms of carton sealing machines. 4,039,367, Cl. 156-486.000.

Wasmuth, Edward H.: *See—*
McAleer, William J.; and Wasmuth, Edward H., 4,039,657, Cl. 424-89.000.

Wastermann, Werner F.: *See—*
Rothman, Bernard; Fiks, Julien G.; and Bang, Friedrich C., 4,038,806, Cl. 53-32.000.

Watanabe, Shunichi: *See—*
Osono, Takashi; Watanabe, Shunichi; Saito, Takeshi; Gushima, Hiroshi; Murakami, Keisuke; Takahashi, Isao; Yamaguchi, Hiroshi; Sasaki, Toshio; and Oka, Yoshihiko, 4,039,660, Cl. 424-117.000.

Watkins, Howard John Stephen: *See—*
Coleman, Kenneth John; Brown, Phillip John; and Watkins, Howard John Stephen, 4,039,007, Cl. 139-7.00F.

Watson, David R.; Carithers, Val G.; and Drown, Harold L., to Reynolds Metals Company. Hollow ceramic balls as automotive catalysts supports. 4,039,480, Cl. 252-455.00R.

Watt, William: *See—*
Cooper, George Anthony; Mayer, Rayner Michael; and Watt, William, 4,039,341, Cl. 106-56.000.

Wawrzyniak, Walter W. Structure for and method of lubricating a rotating facing head. 4,039,230, Cl. 308-122.000.

Wazbinski, Theodore T.: *See—*
Soderquist, Frederick J.; Wazbinski, Theodore T.; and Waldman, Nathan, 4,039,601, Cl. 260-669.00R.

Weaver, Gerald Q., to Norton Company. High strength and heat resistant refractory compositions. 4,039,340, Cl. 106-55.000.

Weaver, Max A.; and Fleischer, Jean C., to Eastman Kodak Company. Phthalimidyl-azo-m-acylamido-n-substituted aniline compounds and polyester fibers dyed therewith. 4,039,522, Cl. 260-152.000.

Weckenmann, Albert, to Robert Bosch G.m.b.H. Inductive transducer for rectilinear or rotational displacement. 4,039,929, Cl. 323-75.00L.

Wei, YuWen, to Monsanto Company. Purification of propionic acid. 4,039,428, Cl. 203-37.000.

Weiler, Rolf: *See—*
Schmidt, Herbert; and Weiler, Rolf, 4,039,197, Cl. 277-24.000.

Weisang, Joseph Edouard: *See—*
Engelhard, Philippe; Szabo, Georges; and Weisang, Joseph Edouard, 4,039,477, Cl. 252-441.000.

Weiss, Adolf F., to Alpha Press Company. Stroke limiting mechanism with fail-safe feature. 4,038,907, Cl. 91-20.000.

Weitze, Artur; and Leskovar, Peter, to Siemens Aktiengesellschaft. Thick-layer conductor path pastes. 4,039,721, Cl. 428-426.000.

Weldon, James O., to Continental Electronics Manufacturing Company. Coaxial cavity radio frequency tuning circuit having a toroidal-shaped electrode to effect tuning. 4,039,982, Cl. 334-45.000.

Weldy, Keith E. Water storage refill system. 4,039,001, Cl. 137-389.000.
Wellhausen, Hans; and Friedmann, Reinhard, to U.S. Philips Corporation. Method of generating chromaticity point-dependent switching information from coded color video signals. 4,040,086, Cl. 358-22.000.
Wells, Joseph L.: *See—*
Roberts, David B., Jr.; and Wells, Joseph L., 4,038,779, Cl. 47-62.000.
Wells, Robert A. Container having non-removable opening member with attached opening lever. 4,039,100, Cl. 220-269.000.
Wells, Robert A. Clean cover for easy-open container tab. 4,039,101, Cl. 220-269.000.
Welsh, Robert B. Artillery weapon. 4,038,902, Cl. 89-1.807.
Weman, Per Olaf, to Sigmatex, A.G. Ball actuated inertia device. 4,039,158, Cl. 242-107.40A.
Wendt, Dieter: *See—*
Keller, Walter; Koukol, Hubert; Ptaschek, Werner; and Wendt, Dieter, 4,039,286, Cl. 23-230.00R.
Wendt, Hans: *See—*
Fuchs, Peter; Gerhards, Erich; Matthes, Heinz; Wendt, Hans; and Wiechert, Rudolf, 4,039,668, Cl. 424-241.000.
Werner, Adalbert, to Lamson & Sessions Co., The. Method of making locknuts. 4,038,714, Cl. 10-86.00A.
Werner & Pfleiderer: *See—*
Kolb, Dieter, 4,039,781, Cl. 235-92.0EV.
Werner, William A. Portable sign holder. 4,038,769, Cl. 40-125.00H.
West American Rubber Co.: *See—*
Luthy, Ronald K., 4,039,004, Cl. 137-527.000.
West Coast Quilting Company: *See—*
Newman, Arnold H., 4,039,709, Cl. 428-159.000.
West Electric Company, Ltd.: *See—*
Iwata, Hiroshi; and Misaki, Satoru, 4,039,898, Cl. 315-241.00P.
Wester, Gene W.: *See—*
United States of America, National Aeronautics and Space Administration; McLyman, W. T.; and Wester, Gene W., 4,039,925, Cl. 363-70.000.
Westinghouse Air Brake Company: *See—*
Grundy, Reed H., 4,040,121, Cl. 361-409.000.
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B 262,599	3,925,323	Dec. 9, 1975	B 309,860	3,922,485	Nov. 25, 1975
B 264,257	3,928,665	Dec. 23, 1975	B 310,149	3,924,705	Dec. 9, 1975
B 264,833	3,923,566	Dec. 2, 1975	B 310,271	3,923,689	Dec. 2, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 310,740	3,985,686	Oct. 12, 1976
B 265,727	3,914,479	Oct. 21, 1975	B 311,313	3,925,142	Dec. 9, 1975
B 265,862	3,915,915	Oct. 28, 1975	B 311,317	3,918,975	Nov. 11, 1975
B 266,195	3,923,599	Dec. 2, 1975	B 311,413	3,925,515	Dec. 9, 1975
B 269,673	3,914,377	Oct. 21, 1975	B 311,910	3,924,357	Dec. 9, 1975
B 270,089	3,923,875	Dec. 2, 1975	B 311,977	3,925,233	Dec. 9,1975
B 271,104	3,925,400	Dec. 9, 1975	B 312,139	3,925,530	Dec. 9, 1975
B 274,945	3,924,992	Dec. 9, 1975	B 312,477	3,923,714	Dec. 2, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,098	3,925,045	Dec. 9, 1975
B 276,271	3,916,028	Oct. 28, 1975	B 313,531	3,925,548	Dec. 9, 1975
B 276,560	3,916,030	Oct. 28, 1975	B 313,594	3,924,626	Dec. 9, 1975
B 276,993	3,948,823	Apr. 6, 1976	B 313,900	3,915,932	Oct. 28, 1975
B 277,449	3,924,048	Dec. 2, 1975	B 314,049	3,920,588	Nov. 18, 1975
B 278,491	3,921,170	Nov. 18, 1975	B 314,255	3,923,764	Dec. 2, 1975
B 278,991	3,914,469	Oct. 21, 1975	B 314,271	3,921,845	Nov. 25, 1975
B 279,583	3,923,749	Dec. 2, 1975	B 314,489	3,925,016	Dec. 9, 1975
B 280,015	3,925,378	Dec. 9, 1975	B 314,800	3,930,087	Dec. 30, 1975
B 280,395	3,919,604	Nov. 11, 1975	B 314,977	3,923,459	Dec. 2, 1975
B 281,341	3,920,643	Nov. 18, 1975	B 315,363	3,920,673	Nov. 18, 1975
B 281,943	3,924,013	Dec. 2, 1975	B 315,397	3,923,963	Dec. 2, 1975
B 282,081	3,913,483	Oct. 21, 1975	B 315,731	3,914,108	Oct. 21, 1975
B 282,252	3,924,997	Dec. 9, 1975	B 316,014	3,920,861	Nov. 18, 1975
B 282,390	3,924,576	Dec. 9,1975	B 316,239	3,913,546	Oct. 21, 1975
B 282,819	3,982,932	Sep. 28, 1976	B 316,422	4,016,206	Apr. 19, 1977
B 283,124	3,923,512	Dec. 2, 1975	B 316,917	3,925,494	Dec. ,9, 1975
B 283,300	3,925,011	Dec. 9, 1975	B 317,080	3,925,324	Dec. 9, 1975
B 284,297	3,913,722	Oct. 21, 1975	B 317,347	3,923,552	Dec. 2, 1975
B 284,427	3,952,812	Apr. 27, 1976	B 317,624	3,925,167	Dec. 9, 1975
B 285,200	3,923,680	Dec. 2, 1975	B 318,122	4,026,905	May 31, 1977
B 285,796	3,914,303	Oct. 21, 1975	B 318,195	3,915,699	Oct. 28, 1975
B 286,499	3,914,129	Oct. 21, 1975	B 318,618	3,915,365	Oct. 28, 1975
B 286,614	3,924,696	Dec. 9, 1975	B 318,640	3,925,186	Dec. 9, 1975
B 286,913	3,928,696	Dec. 23, 1975	B 318,745	3,916,571	Nov. 4, 1975
B 287,164	3,914,139	Oct. 21, 1975	B 319,226	3,925,082	Dec. 9, 1975
B 287,270	3,924,825	Dec. 9, 1975	B 319,339	3,916,056	Oct. 28, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 319,402	3,919,568	Nov. 11, 1975
B 319,414	3,928,666	Dec. 23, 1975
B 320,261	3,924,033	Dec. 2, 1975
B 320,452	3,925,083	Dec. 9, 1975
B 320,603	3,915,571	Oct. 28, 1975
B 321,018	3,921,623	Nov. 25, 1975
B 321,101	3,917,163	Nov. 4, 1975
B 321,938	3,923,889	Dec. 2, 1975
B 322,182	3,925,390	Dec. 9, 1975
B 322,239	3,920,973	Nov. 18, 1975
B 322,564	3,914,373	Oct. 21, 1975
B 322,621	3,920,863	Nov. 18,1975
B 322,777	3,924,382	Dec. 9, 1975
B 323,127	3,923,967	Dec. 2, 1975
B 323,191	3,914,566	Oct. 21, 1975
B 323,203	3,916,165	Oct. 28, 1975
B 323,568	3,920,536	Nov. 18, 1975
B 323,666	3,924,568	Dec. 9, 1975
B 324,495	3,928,664	Dec. 23, 1975
B 324,503	3,928,524	Dec. 23, 1975
B 324,505	3,925,294	Dec. 9, 1975
B 324,739	3,924,990	Dec. 9, 1975
B 324,879	3,923,538	Dec. 2, 1975
B 325,102	3,924,355	Dec. 9, 1975
B 325,261	3,921,304	Nov. 25,1975
B 326,514	3,925,080	Dec. 9, 1975
B 327,109	3,925,350	Dec. 9, 1975
B 327,363	3,923,504	Dec. 2, 1975
B 327,612	3,925,620	Dec. 9, 1975
B 327,674	3,918,540	Nov. 11, 1975
B 327,899	3,925,674	Dec. 9, 1975
B 328,164	3,914,703	Oct. 21, 1975
B 328,200	3,916,031	Oct. 28, 1975
B 328,205	3,914,106	Oct. 21, 1975
B 328,210	3,914,275	Oct. 21, 1975
B 328,391	4,039,888	Aug. 2, 1977
B 328,870	3,916,486	Nov. 4, 1975
B 329,115	3,924,727	Dec. 9, 1975
B 329,476	3,920,562	Nov. 18, 1975
B 329,612	3,925,128	Dec. 9, 1975
B 329,787	3,920,688	Nov. 18, 1975
B 329,816	3,923,947	Dec. 2, 1975
B 330,536	3,925,452	Dec. 9, 1975
B 330,828	3,913,589	Oct. 21, 1975
B 331,417	3,914,157	Oct. 21, 1975
B 331,557	3,916,577	Nov. 4, 1975
B 331,895	3,916,403	Oct. 28, 1975
B 332,527	3,924,017	Dec. 2, 1975
B 332,811	3,924,359	Dec. 9, 1975
B 333,876	3,921,208	Nov. 18, 1975
B 333,928	3,927,172	Dec. 16, 1975
B 334,251	3,924,719	Dec. 9, 1975
B 334,868	3,919,469	Nov. 11, 1975
B 334,985	3,923,912	Dec. 2, 1975
B 335,670	3,928,686	Dec. 23, 1975
B 335,741	3,925,615	Dec. 9, 1975
B 335,773	3,920,953	Nov. 18, 1975
B 336,129	3,923,606	Dec. 2, 1975
B 336,243	3,925,422	Dec. 9, 1975
B 336,345	3,925,179	Dec. 9, 1975
B 336,652	3,914,211	Oct. 21, 1975
B 336,902	3,918,897	Nov. 11, 1975
B 336,946	3,919,425	Nov. 11, 1975
B 336,978	3,923,968	Dec. 2, 1975
B 337,235	3,919,386	Nov. 11, 1975
B 337,409	3,925,258	Dec. 9, 1975
B 337,442	3,913,658	Oct. 21, 1975
B 337,703	3,914,690	Oct. 21, 1975
B 337,787	3,923,506	Dec. 2, 1975
B 339,059	3,924,822	Dec. 9, 1975
B 339,218	3,925,121	Dec. 9, 1975
B 339,699	3,933,527	Jan. 20, 1976
B 339,838	3,930,221	Dec. 30, 1975
B 340,212	3,922,645	Nov. 25, 1975
B 340,833	3,925,208	Dec. 9, 1975
B 341,579	3,913,363	Oct. 21, 1975
B 342,084	3,928,694	Dec. 23, 1975
B 342,423	3,925,334	Dec. 9, 1975
B 342,886	3,923,507	Dec. 2, 1975
B 343,136	3,919,453	Nov. 11, 1975
B 343,240	3,925,693	Dec. 9, 1975
B 343,506	3,916,021	Oct. 28, 1975
B 343,577	3,921,165	Nov. 18, 1975
B 344,203	3,928,719	Dec. 23, 1975
B 344,479	3,924,042	Dec. 2, 1975
B 345,060	3,916,018	Oct. 28, 1975
B 345,384	3,916,146	Oct. 28, 1975
B 345,390	3,940,343	Feb. 24, 1976
B 345,422	3,914,392	Oct. 21, 1975
B 345,527	3,927,365	Dec. 16, 1975
B 345,567	3,913,985	Oct. 21, 1975
B 346,044	3,988,405	Oct. 26, 1976
B 346,145	3,913,293	Oct. 21, 1975
B 346,210	3,916,142	Oct. 28, 1975
B 346,350	3,915,824	Oct. 28, 1975
B 346,487	3,927,406	Dec. 16, 1975
B 346,585	3,913,820	Oct. 21, 1975
B 346,613	3,923,545	Dec. 2, 1975
B 346,901	3,915,583	Oct. 28, 1975
B 348,083	3,923,774	Dec. 2, 1975
B 348,383	3,923,452	Dec. 2, 1975
B 348,495	3,914,654	Oct. 21, 1975
B 348,558	3,914,109	Oct. 21, 1975
B 349,141	3,915,363	Oct. 28, 1975
B 349,177	3,914,033	Oct. 21, 1975
B 349,231	3,915,831	Oct. 28, 1975
B 349,321	3,916,103	Oct. 28, 1975
B 349,948	3,914,557	Oct. 21, 1975
B 350,025	3,927,415	Dec. 16, 1975
B 350,143	3,924,419	Dec. 9, 1975
B 350,219	3,917,802	Nov. 4, 1975
B 350,245	3,914,331	Oct. 21, 1975
B 350,523	3,924,726	Dec. 9, 1975
B 350,589	3,927,419	Dec. 16, 1975
B 350,708	3,923,871	Dec. 2, 1975
B 350,843	3,915,461	Oct. 28, 1975
B 351,055	3,914,074	Oct. 21, 1975
B 351,218	3,914,186	Oct. 21, 1975
B 351,222	3,921,179	Nov. 18, 1975
B 351,348	3,923,563	Dec. 2, 1975
B 351,421	3,914,733	Oct. 21, 1975
B 351,493	3,914,758	Oct. 21, 1975
B 351,535	3,915,239	Oct. 28, 1975
B 351,665	3,919,701	Nov. 11, 1975
B 351,672	3,914,000	Oct. 21, 1975
B 351,735	3,913,385	Oct. 21, 1975
B 351,863	3,914,700	Oct. 21, 1975
B 351,883	3,924,657	Dec. 9, 1975
B 351,926	3,914,133	Oct. 21, 1975
B 351,939	3,913,480	Oct. 21, 1975
B 352,445	3,928,746	Dec. 23, 1975
B 352,934	3,913,692	Oct. 21, 1975
B 352,950	3,922,590	Nov. 25, 1975
B 352,965	3,921,926	Nov. 25, 1975
B 353,317	3,916,446	Nov. 4, 1975
B 353,387	3,924,404	Dec. 9, 1975
B 353,546	3,913,273	Oct. 21, 1975
B 354,008	3,925,081	Dec. 9, 1975
B 354,098	3,925,547	Dec. 9, 1975
B 354,145	3,927,279	Dec. 16, 1975
B 354,296	3,914,580	Oct. 21, 1975
B 354,510	3,928,658	Dec. 23, 1975
B 354,889	3,913,204	Oct. 21, 1975
B 354,979	3,914,251	Oct. 21, 1975
B 355,095	3,925,656	Dec. 9, 1975
B 355,269	3,914,561	Oct. 21, 1975
B 355,510	3,913,704	Oct. 21, 1975
B 355,595	3,925,649	Dec. 9, 1975
B 355,876	3,925,685	Dec. 9, 1975
B 356,032	3,928,636	Dec. 23, 1975
B 356,253	3,925,025	Dec. 9, 1975
B 356,602	3,927,393	Dec. 16, 1975
B 356,724	3,924,586	Dec. 9, 1975
B 357,039	3,924,406	Dec. 9, 1975
B 357,057	3,913,738	Oct. 21, 1975
B 357,131	3,924,453	Dec. 9, 1975
B 357,402	3,914,180	Oct. 21, 1975
B 357,682	3,924,973	Dec. 9, 1975
B 357,803	3,919,470	Nov. 11,1975
B 358,174	3,924,958	Dec. 9, 1975
B 358,244	3,913,411	Oct. 21, 1975
B 358,311	3,923,561	Dec. 2, 1975
B 358,939	3,924,713	Dec. 9, 1975
B 359,174	3,914,117	Oct. 21, 1975
B 359,187	3,924,525	Dec. 9, 1975
B 359,540	3,915,235	Oct. 28, 1975
B 359,740	3,936,212	Feb. 3, 1976
B 359,791	3,929,430	Dec. 30, 1975
B 359,825	3,921,344	Nov. 25, 1975
B 359,946	3,914,132	Oct. 21, 1975
B 359,947	3,914,653	Oct. 21, 1975
B 360,208	3,923,750	Dec. 2, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 360,296	3,916,720	Nov. 4, 1975
B 360,719	3,915,715	Oct. 28, 1975
B 360,910	3,925,696	Dec. 9, 1975
B 361,265	3,923,569	Dec. 2, 1975
B 361,347	3,914,642	Oct. 21, 1975
B 361,443	3,927,405	Dec. 16, 1975
B 361,569	3,914,554	Oct. 21, 1975
B 361,604	3,922,702	Nov. 25, 1975
B 361,734	3,915,764	Oct. 28, 1975
B 361,743	4,035,255	July 12, 1977
B 361,744	4,035,254	July 12, 1977
B 362,589	3,914,012	Oct. 21, 1975
B 363,205	3,923,744	Dec. 2, 1975
B 363,337	3,928,639	Dec. 23, 1975
B 363,457	3,922,595	Nov. 25, 1975
B 363,674	3,929,716	Dec. 30, 1975
B 363,892	3,913,395	Oct. 21, 1975
B 363,962	3,921,826	Nov. 25, 1975
B 364,022	3,913,499	Oct. 21, 1975
B 364,163	3,916,092	Oct. 28, 1975
B 364,241	3,916,668	Nov. 4, 1975
B 364,334	3,924,670	Dec. 9, 1975
B 364,528	3,919,510	Nov. 11, 1975
B 364,786	3,921,673	Nov. 25, 1975
B 364,910	3,925,335	Dec. 9, 1975
B 365,371	3,988,181	Oct. 26, 1976
B 365,490	3,918,527	Nov. 11, 1975
B 365,834	3,914,702	Oct. 21, 1975
B 365,841	3,925,628	Dec. 9, 1975
B 365,855	3,917,258	Nov. 4, 1975
B 366,287	3,924,946	Dec. 9, 1975
B 366,402	3,928,053	Dec. 23, 1975
B 366,589	3,914,719	Oct. 21, 1975
B 367,021	3,914,752	Oct. 21, 1975
B 367,040	3,924,775	Dec. 9, 1975
B 367,661	3,914,158	Oct. 21, 1975
B 367,739	3,923,648	Dec. 2, 1975
B 367,812	3,924,789	Dec. 9, 1975
B 368,081	3,924,691	Dec. 9, 1975
B 368,387	3,924,923	Dec. 9, 1975
B 368,392	3,913,812	Oct. 21, 1975
B 368,397	3,914,677	Oct. 21, 1975
B 368,862	3,925,549	Dec. 9, 1975
B 369,563	3,924,449	Dec. 9, 1975
B 369,607	3,923,786	Dec. 2, 1975
B 369,997	3,913,533	Oct. 21, 1975
B 370,453	3,964,101	Jun. 15, 1976
B 370,706	3,925,242	Dec. 9, 1975
B 371,073	3,930,135	Dec. 30, 1975
B 371,085	3,923,783	Dec. 2, 1975
B 371,787	3,921,217	Nov. 18, 1975
B 371,805	3,914,433	Oct. 21, 1975
B 371,836	3,923,541	Dec. 2, 1975
B 372,823	3,924,660	Dec. 9, 1975
B 373,051	3,914,162	Oct. 21, 1975
B 373,297	3,924,436	Dec. 9, 1975
B 373,326	3,920,433	Nov. 18, 1975
B 373,428	3,915,511	Oct. 28, 1975
B 375,220	3,920,417	Nov. 18, 1975
B 375,652	3,921,303	Nov. 25, 1975
B 376,504	3,914,570	Oct. 21, 1975
B 376,654	3,922,513	Nov. 25, 1975
B 376,742	3,924,392	Dec. 9, 1975
B 376,799	3,913,955	Oct. 21, 1975
B 377,172	3,918,255	Nov. 11, 1975
B 377,683	3,924,433	Dec. 9, 1975
B 377,833	3,913,884	Oct. 21, 1975
B 377,869	3,917,002	Nov. 4, 1975
B 378,621	3,923,840	Dec. 2, 1975
B 379,038	3,923,994	Dec. 2, 1975
B 379,172	3,914,379	Oct. 21, 1975
B 379,282	3,913,462	Oct. 21, 1975
B 379,955	3,913,157	Oct. 21, 1975
B 380,014	3,921,915	Nov. 25, 1975
B 380,141	3,925,161	Dec. 9, 1975
B 380,310	3,921,048	Nov. 18, 1975
B 380,312	3,913,953	Oct. 21, 1975
B 380,338	3,924,873	Dec. 9, 1975
B 380,446	3,923,836	Dec. 2, 1975
B 380,900	3,913,307	Oct. 21, 1975
B 380,926	3,925,095	Dec. 9, 1975
B 381,074	3,919,583	Nov. 11, 1975
B 381,632	3,914,732	Oct. 21, 1975
B 381,847	3,921,152	Nov. 18, 1975
B 382,018	3,929,742	Dec. 30, 1975
B 382,021	3,913,212	Oct. 21, 1975
B 382,261	3,914,991	Oct. 28, 1975
B 382,290	3,924,717	Dec. 9, 1975
B 382,783	3,919,527	Nov. 11, 1975
B 382,798	3,924,435	Dec. 9, 1975
B 382,840	3,922,007	Nov. 25, 1975
B 383,465	3,927,412	Dec. 16, 1975
B 383,581	3,925,318	Dec. 9, 1975
B 383,852	3,914,246	Oct. 21, 1975
B 384,499	3,925,135	Dec. 9, 1975
B 384,658	3,913,452	Oct. 21, 1975
B 384,773	3,915,416	Oct. 28, 1975
B 385,210	3,913,406	Oct. 21, 1975
B 386,403	3,924,895	Dec. 9, 1975
B 386,592	3,925,305	Dec. 9, 1975
B 387,039	3,924,510	Dec. 9, 1975
B 387,331	3,913,701	Oct. 21, 1975
B 387,363	3,927,378	Dec. 16, 1975
B 387,687	3,918,151	Nov. 11, 1975
B 387,761	3,914,245	Oct. 21, 1975
B 387,790	3,925,380	Dec. 9, 1975
B 387,818	3,918,935	Nov. 11, 1975
B 388,580	3,923,712	Dec. 2, 1975
B 389,070	3,914,171	Oct. 21, 1975
B 389,295	3,914,631	Oct. 21, 1975
B 389,327	3,924,504	Dec. 9, 1975
B 389,639	3,914,626	Oct. 21, 1975
B 389,726	3,921,010	Nov. 18, 1975
B 389,807	3,922,623	Nov. 25, 1975
B 389,932	3,913,268	Oct. 21, 1975
B 389,933	3,913,267	Oct. 21, 1975
B 390,679	3,913,668	Oct. 21, 1975
B 390,732	3,913,878	Oct. 21, 1975
B 390,738	4,035,343	July 12, 1977
B 391,184	3,914,214	Oct. 21, 1975
B 391,210	3,914,220	Oct. 21, 1975
B 391,437	3,915,416	Oct. 28, 1975
B 391,509	3,925,175	Dec. 9, 1975
B 391,675	3,916,017	Oct. 28, 1975
B 392,154	3,923,809	Dec. 2, 1975
B 392,242	3,926,636	Dec. 16, 1975
B 392,696	3,916,175	Oct. 28, 1975
B 392,732	3,914,903	Oct. 21, 1975
B 392,753	3,916,341	Oct. 28, 1975
B 392,894	3,914,763	Oct. 21, 1975
B 393,163	3,914,535	Oct. 21, 1975
B 393,347	3,985,800	Oct. 12, 1976
B 393,970	3,914,638	Oct. 21, 1975
B 394,088	3,914,740	Oct. 21, 1975
B 394,188	3,924,591	Dec. 9, 1975
B 394,300	3,914,159	Oct. 21, 1975
B 394,712	3,916,306	Oct. 28, 1975
B 395,478	3,922,577	Nov. 25, 1975
B 395,496	3,919,435	Nov. 11, 1975
B 395,671	3,920,418	Nov. 18, 1975
B 395,889	3,913,190	Oct. 21, 1975
B 396,025	3,913,869	Oct. 21, 1975
B 396,551	3,921,929	Nov. 25, 1975
B 397,027	3,923,736	Dec. 2, 1975
B 397,527	3,913,488	Oct. 21, 1975
B 397,990	3,914,848	Oct. 28, 1975
B 398,262	3,913,481	Oct. 21, 1975
B 398,551	3,924,924	Dec. 9, 1975
B 398,597	3,913,743	Oct. 21, 1975
B 398,625	3,920,996	Nov. 18, 1975
B 399,292	3,914,810	Oct. 28, 1975
B 399,304	3,919,567	Nov. 11, 1975
B 399,349	3,925,694	Dec. 9, 1975
B 399,766	3,915,667	Oct. 28, 1975
B 400,080	3,925,163	Dec. 9, 1975
B 400,293	3,923,719	Dec. 2, 1975
B 400,310	3,915,507	Oct. 28, 1975
B 401,133	3,924,443	Dec. 9, 1975
B 401,992	3,924,898	Dec. 9, 1975
B 402,065	3,925,413	Dec. 9, 1975
B 402,555	3,914,688	Oct. 21, 1975
B 403,140	3,913,486	Oct. 21, 1975
B 403,355	3,913,352	Oct. 21, 1975
B 403,990	3,914,684	Oct. 21, 1975
B 403,996	3,916,016	Oct. 28, 1975
B 404,290	3,924,918	Dec. 9, 1975
B 404,437	3,915,200	Oct. 28, 1975
B 405,136	3,915,565	Oct. 28, 1975
B 405,137	3,915,566	Oct. 28, 1975
B 405,160	3,924,821	Dec. 9, 1975
B 405,248	3,926,294	Dec. 16, 1975
B 405,305	3,922,111	Nov. 25, 1975

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JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 405,360	3,913,403	Oct. 21, 1975	B 422,949	3,921,873	Nov. 25, 1975
B 405,495	3,924,577	Dec. 9, 1975	B 424,415	3,919,458	Nov. 11, 1975
B 405,938	3,920,109	Nov. 18, 1975	B 424,462	3,920,522	Nov. 18, 1975
B 406,065	3,914,199	Oct. 21, 1975	B 424,572	3,924,979	Dec. 9, 1975
B 406,357	3,924,529	Dec. 9, 1975	B 424,748	3,924,395	Dec. 9, 1975
B 406,800	3,952,708	Apr. 27, 1976	B 425,035	3,914,025	Oct. 21, 1975
B 407,357	3,924,614	Dec. 9, 1975	B 425,345	3,922,015	Nov. 25, 1975
B 407,728	3,925,240	Dec. 9, 1975	B 425,470	3,923,796	Dec. 2, 1975
B 407,736	3,924,463	Dec. 9, 1975	B 425,539	3,916,742	Nov. 4, 1975
B 408,380	3,984,172	Oct. 5, 1976	B 425,541	3,914,051	Oct. 21, 1975
B 408,487	3,924,046	Dec. 2, 1975	B 425,572	3,923,822	Dec. 2, 1975
B 408,749	3,914,116	Oct. 21, 1975	B 425,770	3,989,817	Nov. 2, 1976
B 409,026	3,925,497	Dec. 9, 1975	B 427,631	3,921,433	Nov. 25, 1975
B 409,220	3,915,648	Oct. 28, 1975	B 428,177	3,914,624	Oct. 21, 1975
B 409,251	3,922,620	Nov. 25, 1975	B 428,795	3,921,056	Nov. 18, 1975
B 409,657	3,927,362	Dec. 16, 1975	B 429,442	3,923,485	Dec. 2, 1975
B 409,816	3,921,317	Nov. 25, 1975	B 430,106	3,918,941	Nov. 11, 1975
B 410,062	3,923,855	Dec. 2, 1975	B 430,140	3,922,084	Nov. 25, 1975
B 410,168	3,914,717	Oct. 21, 1975	B 430,149	4,037,175	July 19, 1977
B 411,145	3,914,168	Oct. 21, 1975	B 430,385	4,001,104	Jan. 4, 1977
B 411,356	3,919,649	Nov. 11, 1975	B 430,798	3,918,204	Nov. 11, 1975
B 411,483	3,925,196	Dec. 9, 1975	B 430,944	3,922,096	Nov. 25, 1975
B 411,633	3,914,741	Oct. 21, 1975	B 432,373	3,919,670	Nov. 11, 1975
B 412,516	3,927,417	Dec. 16, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 412,619	3,925,292	Dec. 9, 1975	B 435,343	3,919,244	Nov. 11, 1975
B 412,867	3,924,587	Dec. 9, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 413,006	3,914,850	Oct. 28, 1975	B 437,172	3,913,251	Oct. 21, 1975
B 413,546	3,924,314	Dec. 9, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 414,288	3,925,537	Dec. 9, 1975	B 437,450	3,922,479	Nov. 25, 1975
B 415,113	3,915,717	Oct. 28, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 415,124	3,915,944	Oct. 28, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 415,845	3,925,076	Dec. 9, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 415,847	3,914,208	Oct. 21, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 415,957	3,925,635	Dec. 9, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 415,977	3,927,359	Dec. 16, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 416,598	3,923,473	Dec. 2, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 416,710	3,923,746	Dec. 2, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 416,832	3,924,975	Dec. 9, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 416,933	3,924,968	Dec. 9, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975	B 444,614	3,927,996	Dec. 23, 1975
B 418,121	3,925,023	Dec. 9, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 418,153	3,925,251	Dec. 9, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 418,302	3,913,252	Oct. 21, 1975	B 447,417	4,024,727	May 24, 1977
B 419,327	3,921,197	Nov. 18, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 419,481	3,924,970	Dec. 9, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 420,016	3,914,572	Oct. 21, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 420,148	3,927,414	Dec. 16, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 420,568	3,925,069	Dec. 9, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 421,026	3,914,785	Oct. 21, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 421,362	3,924,817	Dec. 9, 1975	B 456,346	3,914,531	Oct. 21, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 459,425	3,928,773	Dec. 23, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 422,399	3,928,656	Dec. 23, 1975	B 467,684	3,915,119	Oct. 28, 1975
B 422,467	3,924,804	Dec. 9, 1975	B 468,198	3,925,340	Dec. 9, 1975

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 2ND DAY OF AUGUST, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O. G. 687.

Bell Telephone Laboratories, Incorporated: *See*—
Krumreich, Charles Louis, T961,003, Cl. 339-176.00M.

Brown, Francis Barton; and Wilson, Phillip M., to Kohe, Inc. Oil well completion with high submergence jet pump. T961,006, 8-2-77, Cl. 417-196.000.

Deffenbaugh, Edmund Frank. Camera electromagnetic shutter release. T961,005, 8-2-77, Cl. 354-238.000.

Hall, Alan V.; and Woodard, Ollie C., to International Business Machines Corporation. Electron current regulator for an electron discharge device. T961,002, 8-2-77, Cl. 315-107.000.

Hendy, Brian Norman, to Imperial Chemical Industries Limited. Oriented polyolefin film treated with quaternary ammonium salts. T961,008, 8-2-77, Cl. 427-401.000.

Hendy, Brian Norman, to Imperial Chemical Industries Limited. Oriented polyolefin film treated with amine sulphates. T961,009, 8-2-77, Cl. 427-401.000.

Heuer-Leonedas S.A.: *See*—
Prinz, Francois, T961,001, Cl. 58-39.500.

Horton, William Howard. Film speed sensing device. T961,004, 8-2-77, Cl. 354-21.000.

Imperial Chemical Industries Limited: *See*—
Hendy, Brian Norman, T961,008, Cl. 427-401.000.
Hendy, Brian Norman, T961,009, Cl. 427-401.000.
Jukes, Alan William; and Packham, Michael John, T961,007, Cl. 427-54.000.

International Business Machines Corporation: *See*—
Hall, Alan V.; and Woodard, Ollie C., T961,002, Cl. 315-107.000.

Jukes, Alan William; and Packham, Michael John, to Imperial Chemical Industries Limited. Production of electrically conductive paths on an insulating substrate. T961,007, 8-2-77, Cl. 427-54.000.

Kohe, Inc.: *See*—
Brown, Francis Barton; and Wilson, Phillip M., T961,006, Cl. 417-196.000.

Krumreich, Charles Louis, to Bell Telephone Laboratories, Incorporated. Female connector. T961,003, 8-2-77, Cl. 339-176.00M.

Packham, Michael John: *See*—
Jukes, Alan William; and Packham, Michael John, T961,007, Cl. 427-54.000.

Prinz, Francois, to Heuer-Leonedas S.A. Electronic watch-chronograph. T961,001, 8-2-77, Cl. 58-39.500.

Wilson, Phillip M.: *See*—
Brown, Francis Barton; and Wilson, Phillip M., T961,006, Cl. 417-196.000.

Woodard, Ollie C.: *See*—
Hall, Alan V.; and Woodard, Ollie C., T961,002, Cl. 315-107.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 2ND DAY OF AUGUST, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Baron, Seymour, to Hexcel Corporation. Production of N-alkylated amines. Re. 29,339, Cl. 260-585.00B.

Bilbro, James E.; and Johnson, Ben C., Jr., to Thermon Manufacturing Company. Pipe heat transfer assembly and method of making same. Re. 29,332, Cl. 165-164.000.

Burroughs Corporation: *See*—
Gates, Robert R.; and Seeley, Dunham B., Re. 29,335, Cl. 156-541.000.

Cipriani, Gioacchino: *See*—
Perrotti, Emilio; and Cipriani, Gioacchino, Re. 29,338, Cl. 260-463.000.

Gates, Robert R.; and Seeley, Dunham B., to Burroughs Corporation. Apparatus for automatically attaching a patch to a commercial document. Re. 29,335, Cl. 156-541.000.

Hayashi, Ikuya: *See*—
Matsunami, Koichi; and Hayashi, Ikuya, Re. 29,340, Cl. 428-216.000.

Hexcel Corporation: *See*—
Baron, Seymour, Re. 29,339, Cl. 260-585.00B.

Johnson, Ben C., Jr.: *See*—
Bilbro, James E.; and Johnson, Ben C., Jr., Re. 29,332, Cl. 165-164.000.

Kabushiki Kaisha Seisan Nihon Sha: *See*—
Naito, Kakuji, Re. 29,331, Cl. 138-118.000.

Kabushiki Kaisha Suwa Seikosha: *See*—
Yasukawa, Hideaki; and Naito, Okito, Re. 29,327, Cl. 58-23.00R.

Kemper, Yves Jean, to Vadetec S.A. Transmission device. Re. 29,328, Cl. 74-190.000.

Lim, Mahn-Jick, to Western Electric Company, Inc. Method of etching a surface of a substrate comprising $LiTaO_3$ and chemically similar materials. Re. 29,336, Cl. 156-626.000.

Massey-Ferguson Services N.V.: *See*—
Pensa, Carlo, Re. 29,333, Cl. 417-216.000.

Matsunami, Koichi; and Hayashi, Ikuya, to Toyo Boseki Kabushiki Kaisha. Composite film. Re. 29,340, Cl. 428-216.000.

Miller, Robert C.: *See*—
Ryan, Frederick M.; and Miller, Robert C., Re. 29,334, Cl. 149-18.000.

Naito, Kakuji, to Kabushiki Kaisha Seisan Nihon Sha. Method and structure for reclosable containers. Re. 29,331, Cl. 138-118.000.

Naito, Okito: *See*—
Yasukawa, Hideaki; and Naito, Okito, Re. 29,327, Cl. 58-23.00R.

Pensa, Carlo, to Massey-Ferguson Services N.V. Hydraulic apparatus for regulating the flow of one or more pumps. Re. 29,333, Cl. 417-216.000.

Perrotti, Emilio; and Cipriani, Gioacchino, to Snam Progetti S.p.A. Process for the preparation of esters of carbonic acid. Re. 29,338, Cl. 260-463.000.

Peters, Sherman M.; and Smith, Lawrence M. Locking apparatus. Re. 29,341, Cl. 307-129.000.

Rosan Enterprises: *See*—
Stewart, Buster D., Re. 29,330, Cl. 137-551.000.

Ryan, Frederick M.; and Miller, Robert C., to Westinghouse Electric Corporation. Phosphor combination and method, particularly adapted for use with explosives, for providing a distinctive information label. Re. 29,334, Cl. 149-18.000.

Seeley, Dunham B.: *See*—
Gates, Robert R.; and Seeley, Dunham B., Re. 29,335, Cl. 156-541.000.

Smith, Lawrence M.: *See*—
Peters, Sherman M.; and Smith, Lawrence M., Re. 29,341, Cl. 307-129.000.

Snam Progetti S.p.A.: *See*—
Perrotti, Emilio; and Cipriani, Gioacchino, Re. 29,338, Cl. 260-463.000.

Sperry Rand Limited: *See*—
Walters, Ronald Bernard, Re. 29,329, Cl. 91-444.000.

Stewart, Buster D., to Rosan Enterprises. Leak detector valve assembly. Re. 29,330, Cl. 137-551.000.

Thermon Manufacturing Company: *See*—
Bilbro, James E.; and Johnson, Ben C., Jr., Re. 29,332, Cl. 165-164.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Matsunami, Koichi; and Hayashi, Ikuya, Re. 29,340, Cl. 428-216.000.

Vadetec S.A.: *See*—
Kemper, Yves Jean, Re. 29,328, Cl. 74-190.000.

Walters, Ronald Bernard, to Sperry Rand Limited. Hydraulic systems. Re. 29,329, Cl. 91-444.000.

Ward, Benjamin F., to Westvaco Corporation. Dicarboxylic acid soaps. Re. 29,337, Cl. 252-108.000.

Western Electric Company, Inc.: *See*—
Lim, Mahn-Jick, Re. 29,336, Cl. 156-626.000.

Westinghouse Electric Corporation: *See*—
Ryan, Frederick M.; and Miller, Robert C., Re. 29,334, Cl. 149-18.000.

Westvaco Corporation: *See*—
Ward, Benjamin F., Re. 29,337, Cl. 252-108.000.

Yasukawa, Hideaki; and Naito, Okito, to Kabushiki Kaisha Suwa Seikosha. Method and apparatus for correcting time in an electronic wristwatch. Re. 29,327, Cl. 58-23.00R.

LIST OF PLANT PATENTEES

Duffett, William E.: *See—*
Niklas, Edmund R.; Meek, Jack M.; and Duffett, William E., 4,087, Cl. 76.000.

Jackson & Perkins Co.: *See—*
Permenter, Ethel J., 4,086, Cl. 15.000.
Warriner, William A., 4,089, Cl. 27.000.

Kyle, Thomas B., to Spring Hill Nurseries Co. Rose plant. 4,088, 8-2-77, Cl. 5.000.

Meek, Jack M.: *See—*
Niklas, Edmund R.; Meek, Jack M.; and Duffett, William E., 4,087, Cl. 76.000.

Niklas, Edmund R.; Meek, Jack M.; and Duffett, William E., to Niklas, Edmund R. Chrysanthemum plant. 4,087, 8-2-77, Cl. 76.000.

Permenter, Ethel J., to Jackson & Perkins Co. Rose plant. 4,086, 8-2-77, Cl. 15.000.

Spring Hill Nurseries Co.: *See—*
Kyle, Thomas B., 4,088, Cl. 5.000.

Warriner, William A., to Jackson & Perkins Co. Rose plant. 4,089, 8-2-77, Cl. 27.000.

LIST OF DESIGN PATENTEES

Acme Visible Records, Inc.: *See—*
Sullivan, James Patrick; and Smith, Dale D., 245,252, Cl. D19-26.000.

Adams S.A.: *See—*
Quirin, Francois, 245,232, Cl. D10-40.000.

Akers, William A., to Plastics Industries, Inc. Ski lift seat. 245,216, 8-2-77, Cl. D6-197.000.

Akester, Kenneth John Pridmore. Toothbrush. 245,212, 8-2-77, Cl. D4-25.000.

Alexander, Ronald A.: *See—*
Einsel, Kenneth D.; and Alexander, Ronald A., 245,272, Cl. D30-15.000.

Allen, Billy W. Wall mounted combined rack for tennis rackets and tennis ball cans. 245,214, 8-2-77, Cl. D6-125.000.

American Sign and Advertising Services, Inc.: *See—*
Niehaus, Donald H.; Schwab, Nick J.; and Seggerson, Patrick J., 245,289, Cl. D96-12.00R.

Andresen, Conrad. Garage door. 245,263, 8-2-77, Cl. D25-48.000.

Andresen, Conrad L. Garage door. 245,264, 8-2-77, Cl. D25-48.000.

Andresen, Conrad L. Garage door. 245,265, 8-2-77, Cl. D25-48.000.

Angenieux-CLB S.A.: *See—*
Lauzier, Rene, 245,245, Cl. D12-179.000.

Arnot, Leland D., Jr.; Imel, Ray C., Jr.; and Imel, Donald E. Trailer. 245,244, 8-2-77, Cl. D12-97.000.

Baxter Travenol Laboratories, Inc.: *See—*
Shine, Dennis F.; and Torau, Gunther W., 245,227, Cl. D9-169.000.

Bowers, William G. Strap ground anchor. 245,224, 8-2-77, Cl. D8-388.000.

Bridges, Carl B.: *See—*
Roark, Charles L.; and Bridges, Carl B., 245,288, Cl. D87-1.00R.

Brinkmann, John Baxter, to Q-Beam Corporation. Hand-held spotlight. 245,282, 8-2-77, Cl. D48-20.00K.

Brown, William E., Jr. Speaker support truss. 245,248, 8-2-77, Cl. D14-37.000.

Cal-Mar Industries, Inc.: *See—*
Maresca, Edward J., 245,268, Cl. D25-89.000.

Cassano, Victor J., Sr., to Cassano's Inc. Building. 245,260, 8-2-77, Cl. D25-9.000.

Cassano's Inc.: *See—*
Cassano, Victor J., Sr., 245,260, Cl. D25-9.000.

Champion International Corporation: *See—*
Hanson, Wallace E., 245,229, Cl. D9-224.000.

Chan, Ming Kong. Portable cooking stove. 245,220, 8-2-77, Cl. D7-110.000.

Chesler, Richard S., to Quaker Oats Company, The. Toy rescue truck. 245,280, 8-2-77, Cl. D34-15.0AJ.

Christen Incorporated: *See—*
Christen, Louis J., Jr., 245,219, Cl. D7-95.000.

Christen, Louis J., Jr., to Christen Incorporated. Popcorn popper. 245,219, 8-2-77, Cl. D7-95.000.

Christian Dior, S.A.R.L.: *See—*
Zimmermann, Hilde, 245,251, Cl. D16-65.000.

Cohn, Lyle J., to International Seaway Trading Corporation. Shoe. 245,207, 8-2-77, Cl. D2-293.000.

Cohn, Lyle J., to International Seaway Trading Corporation. Shoe. 245,208, 8-2-77, Cl. D2-293.000.

Crowe, Robert W.; and FitzGerald, Joseph M. Air deflector for trailers. 245,246, 8-2-77, Cl. D12-181.000.

Damico, Frank M.; Koprowski, Richard A.; and Peterson, Warren J., to Joerns Furniture Company, a Division of American Seating Company. Examination table. 245,287, 8-2-77, Cl. D24-3.000.

Denhart, Jack C. Putter head. 245,275, 8-2-77, Cl. D34-5.0GH.

Einsel, Kenneth D.; and Alexander, Ronald A., to Hastings Equity Grain Bin Mfg. Co. Livestock roughage feeder. 245,272, 8-2-77, Cl. D30-15.000.

Engert, David Michael: *See—*
Martin, Richard Thomas, Jr.; and Engert, David Michael, 245,278, Cl. D34-5.0SS.

Farhood, Arthur T., to Lysander Tufted Products, Ltd. Rug. 245,217, 8-2-77, Cl. D6-211.000.

Farmer Bros. Co: *See—*
Preble, Calvin C., 245,249, Cl. D15-113.000.

Fine, Leonard, to General Electric Company. Wallplate-edge clusters. 245,223, 8-2-77, Cl. D8-350.000.

FitzGerald, Joseph M.: *See—*
Crowe, Robert W.; and FitzGerald, Joseph M., 245,246, Cl. D12-181.000.

General Electric Company: *See—*
Fine, Leonard, 245,223, Cl. D8-350.000.

Gerdy, Harvey, to International Seaway Trading Corporation. Shoe. 245,209, 8-2-77, Cl. D2-293.000.

Gerdy, Harvey, to International Seaway Trading Corporation. Shoe. 245,210, 8-2-77, Cl. D2-293.000.

Gilson, Matthew W.: *See—*
Gilson, Thomas A.; and Gilson, Matthew W., 245,228, Cl. D9-230.000.

Gilson, Thomas A.; and Gilson, Matthew W. Storage container. 245,228, 8-2-77, Cl. D9-230.000.

Gorse, Paul. Door panel. 245,266, 8-2-77, Cl. D25-49.000.

Granges Essem Aktiebolag: *See—*
Pettersson, Sven Gunnar, 245,273, Cl. D34-5.00E.

Gruber, Seymour. Male urinal. 245,267, 8-2-77, Cl. D24-57.000.

Hade, Horace A. Settee. 245,213, 8-2-77, Cl. D6-60.000.

Hamilton, Edward R., to Rainhart Co. Beam mold for casting concrete test specimens. 245,250, 8-2-77, Cl. D15-136.000.

Hanson, Wallace E., to Champion International Corporation. Display carton. 245,229, 8-2-77, Cl. D9-224.000.

Harding, Frank M. Articulated bag holder. 245,222, 8-2-77, Cl. D7-193.000.

Hastings Equity Grain Bin Mfg. Co.: *See—*
Einsel, Kenneth D.; and Alexander, Ronald A., 245,272, Cl. D30-15.000.

Heidelbach, C. Arthur. Collapsible charcoal lighter. 245,256, 8-2-77, Cl. D23-90.100.

Hollendonner, Robert R. Rook chess piece. 245,279, 8-2-77, Cl. D34-5.0CH.

Hoyt, Earl. Disposable applicator with liquid supply. 245,221, 8-2-77, Cl. D7-178.000.

Hurwitz, Dan, to On-Line Data, Inc. Combined square and protractor. 245,235, 8-2-77, Cl. D10-62.000.

Imel, Donald E.: *See—*
Arnot, Leland D., Jr.; Imel, Ray C., Jr.; and Imel, Donald E., 245,244, Cl. D12-97.000.

Imel, Ray C., Jr.: *See—*
Arnot, Leland D., Jr.; Imel, Ray C., Jr.; and Imel, Donald E., 245,244, Cl. D12-97.000.

International Seaway Trading Corporation: *See—*
Cohn, Lyle J., 245,207, Cl. D2-293.000.
Cohn, Lyle J., 245,208, Cl. D2-293.000.
Gerdy, Harvey, 245,209, Cl. D2-293.000.
Gerdy, Harvey, 245,210, Cl. D2-293.000.

Jarrett, William E. Golf putting cup. 245,274, 8-2-77, Cl. D34-5.0NN.

Jenkins, Gale D., to Leisure Dynamics, Inc. Action game board. 245,276, 8-2-77, Cl. D34-5.0SS.

Jenkins, Gale D., to Leisure Dynamics, Inc. Game board. 245,277, 8-2-77, Cl. D34-5.0SS.

Jensen, George B., to Syracuse China Corporation. Dinner plate or similar article. 245,218, 8-2-77, Cl. D7-35.000.

Joerns Furniture Company, a Division of American Seating Company: *See—*
Damico, Frank M.; Koprowski, Richard A.; and Peterson, Warren J., 245,287, Cl. D24-3.000.

Kerr, Donald R.; and Kerr, Marvin D. Tank trailer. 245,243, 8-2-77, Cl. D12-95.000.

Kerr, Marvin D.: *See—*
Kerr, Donald R.; and Kerr, Marvin D., 245,243, Cl. D12-95.000.

Kingsford, Ted I., to Plough, Inc. Self-adherent shelf sign blank. 245,290, 8-2-77, Cl. D96-12.00R.

Kleiner, Carl J. Wrist watch. 245,230, 8-2-77, Cl. D10-32.000.

Kleiner, Carl J. Wrist watch. 245,231, 8-2-77, Cl. D10-32.000.

Koprowski, Richard A.: *See—*
Damico, Frank M.; Koprowski, Richard A.; and Peterson, Warren J., 245,287, Cl. D24-3.000.

Krome, Morris L. Sport shoe. 245,211, 8-2-77, Cl. D2-310.000.

Lantaff, Marion F. Game board. 245,281, 8-2-77, Cl. D34-5.0SS.

Lauzier, Rene, to Angenieux-CLB S.A. Brake stirrup. 245,245, 8-2-77, Cl. D12-179.000.

Leisure Dynamics, Inc.: *See—*
Jenkins, Gale D., 245,276, Cl. D34-5.0SS.
Jenkins, Gale D., 245,277, Cl. D34-5.0SS.

Lightfoot, Andrew O. Bait container. 245,254, 8-2-77, Cl. D22-13.000.

Lyons, Gerard E., to Plax Canada Limited. Moist towel dispenser. 245,225, 8-2-77, Cl. D9-60.000.

Lysander Tufted Products, Ltd.: *See—*
Farhood, Arthur T., 245,217, Cl. D6-211.000.

Magnan, Clement A. Knee protector. 245,206, 8-2-77, Cl. D2-27.000.

Magowan, John Dermot, to Nicholas Laboratories (Proprietary) Limited. Bottle. 245,226, 8-9-77, Cl. D9-149.000.

Maresca, Edward J., to Cal-Mar Industries, Inc. Translucent inter-locking panel member for ceilings or the like. 245,268, 8-2-77, Cl. D25-89.000.

Martin, Richard Thomas, Jr.; and Engert, David Michael. Game board. 245,278, 8-2-77, Cl. D34-5.0SS.

Miller, John Clyde. Jewelry finding. 245,239, 8-2-77, Cl. D11-79.000.

Moskowitz, Seymour. Combined eraser and magnifier. 245,253, 8-2-77, Cl. D19-53.000.

Nicholas Laboratories (Proprietary) Limited: *See—*
Magowan, John Dermot, 245,226, Cl. D9-149.000.

Niehaus, Donald H.; Schwab, Nick J.; and Seggerson, Patrick J., to American Sign and Advertising Services, Inc. Illuminated sign. 245,289, 8-2-77, Cl. D96-12.00R.

On-Line Data, Inc.: *See—*
Hurwitz, Dan, 245,235, Cl. D10-62.000.

Osterlund, Alfred G.; and Plaza, Mario G., to Xerox Corporation. Print wheel hammer. 245,286, 8-2-77, Cl. D64-11.00R.

Outboard Marine Corporation: *See—*
Stolley, Ronald M., 245,242, Cl. D12-16.000.

Peterson, Warren J.: *See—*
Damico, Frank M.; Koprowski, Richard A.; and Peterson, Warren J., 245,287, Cl. D24-3.000.

Pettersson, Sven Gunnar, to Granges Essem Aktiebolag. Ski track member. 245,273, 8-2-77, Cl. D34-5.00E.

Phillips, Esther M. Combined radio and lamp. 245,283, 8-2-77, Cl. D48-20.00D.

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Plastics Industries, Inc.: *See—*
Akers, William A., 245,216, Cl. D6-197.000.

Plax Canada Limited: *See—*
Lyons, Gerard E., 245,225, Cl. D9-60.000.

Plaza, Mario G.: *See—*
Osterlund, Alfred G.; and Plaza, Mario G., 245,286, Cl. D64-11.00R.

Plough, Inc.: *See—*
Kingsford, Ted I., 245,290, Cl. D96-12.00R.

Porter, William V. Vent cover. 245,255, 8-2-77, Cl. D23-41.000.

Preble, Calvin C., to Farmer Bros. Co. Coffee brewer. 245,249, 8-2-77, Cl. D15-113.000.

Q-Beam Corporation: *See—*
Brinkmann, John Baxter, 245,282, Cl. D48-20.00K.

Quaker Oats Company, The: *See—*
Chesler, Richard S., 245,280, Cl. D34-15.0AJ.

Quirin, Francois, to Adams S.A. Timer. 245,232, 8-2-77, Cl. D10-40.000.

Rainhart Co.: *See—*
Hamilton, Edward R., 245,250, Cl. D15-136.000.

Rasmussen, Howard J., to Stewart-Warner Corporation. Speedometer. 245,238, 8-2-77, Cl. D10-98.000.

Rieth, James E. Temperature readout housing. 245,234, 8-2-77, Cl. D10-57.000.

Roark, Charles L.; and Bridges, Carl B. Dispenser for screws, bolts and the like. 245,288, 8-2-77, Cl. D87-1.00R.

Robinson, John E. Hydroponic gardening tray. 245,241, 8-2-77, Cl. D11-155.000.

Russell, Gerard A.: *See—*
Russell, Joseph C.; and Russell, Gerard A., 245,247, Cl. D12-157.000.

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Schwab, Nick J.: *See—*
Niehaus, Donald H.; Schwab, Nick J.; and Seggerson, Patrick J., 245,289, Cl. D96-12.00R.

Seggerson, Patrick J.: *See—*
Niehaus, Donald H.; Schwab, Nick J.; and Seggerson, Patrick J., 245,289, Cl. D96-12.00R.

Shen, George, to Zimmer U.S.A. Inc. Tibial prosthesis. 245,259, 8-2-77, Cl. D24-33.000.

Shine, Dennis F.; and Torau, Gunther W., to Baxter Travenol Laboratories, Inc. Bottle. 245,227, 8-2-77, Cl. D9-169.000.

Silvay, Ellen M. Table having an adjustable top. 245,215, 8-2-77, Cl. D6-179.000.

Smith, Dale D.: *See—*
Sullivan, James Patrick; and Smith, Dale D., 245,252, Cl. D19-26.000.

Stanley Works, The: *See—*
Russell, Richard H., 245,236, Cl. D10-62.000.
Russell, Richard H., 245,237, Cl. D10-62.000.

Stewart-Warner Corporation: *See—*
Rasmussen, Howard J., 245,238, Cl. D10-98.000.

Stolley, Ronald M., to Outboard Marine Corporation. Golf car. 245,242, 8-2-77, Cl. D12-16.000.

Sullivan, James Patrick; and Smith, Dale D., to Acme Visible Records, Inc. Book for telephone index cards or the like. 245,252, 8-2-77, Cl. D19-26.000.

Sut, John P. Plaque. 245,240, 8-2-77, Cl. D11-132.000.

Syracuse China Corporation: *See—*
Jensen, George B., 245,218, Cl. D7-35.000.

Taylor, Robert S. Fire starter. 245,257, 8-2-77, Cl. D23-90.100.

Taylor, Robert S. Fire starter. 245,258, 8-2-77, Cl. D23-90.100.

Torau, Gunther W.: *See—*
Shine, Dennis F.; and Torau, Gunther W., 245,227, Cl. D9-169.000.

Whitesel, James Eric. Lamp. 245,285, 8-2-77, Cl. D48-20.00R.

Williams, Catherine R.: *See—*
Williams, John F.; and Williams, Catherine R., 245,270, Cl. D30-12.000.

Williams, John F.; and Williams, Catherine R. Aquarium water mill. 245,270, 8-2-77, Cl. D30-12.000.

Wolfe, Samuel E. Dowsing rod. 245,233, 8-2-77, Cl. D10-46.000.

Xerox Corporation: *See—*
Osterlund, Alfred G.; and Plaza, Mario G., 245,286, Cl. D64-11.00R.

Yoshinaga Prince Co., Ltd.: *See—*
Yoshinaga, Sadao, 245,269, Cl. D27-42.000.

Yoshinaga, Sadao, to Yoshinaga Prince Co., Ltd. Cigarette lighter. 245,269, 8-2-77, Cl. D27-42.000.

Zimmer U.S.A. Inc.: *See—*
Shen, George, 245,259, Cl. D24-33.000.

Zimmermann, Hilde, to Christian Dior, S.A.R.L. Eyeglass frame. 245,251, 8-2-77, Cl. D16-65.000.

Zusman, Bertram. Single story pedestal home. 245,261, 8-2-77, Cl. D25-17.000.

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CLASSIFICATION OF PATENTS

ISSUED AUGUST 2, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

49 A 4,038,697
79 4,038,698
239 4,038,699
413 4,038,700

CLASS 3

1 4,038,701
1.5 4,038,702
4,038,703
1.91 4,038,704
2 4,038,705
12.3 4,038,706

CLASS 4

67 A 4,038,708
67 R 4,038,707

CLASS 5

68 4,038,709
200 R 4,038,710
263 4,038,711
371 4,038,712

CLASS 8

94.14 4,039,281
184 4,039,282

CLASS 9

345 4,038,713

CLASS 10

86 A 4,038,714

CLASS 13

18 4,039,737
33 4,039,738

CLASS 15

53 AB 4,039,014
106 4,038,715
230.11 4,038,716

CLASS 16

29 4,038,717
110 R 4,038,718
4,038,719
145 4,038,720

CLASS 17

23 4,038,721
48 4,038,722

CLASS 19

215 4,038,723

CLASS 23

230 B 4,039,284
4,039,285
230 R 4,039,286
253 R 4,039,287
4,039,288
262 4,039,289
273 SP 4,039,283
284 4,039,290
288 F 4,039,293
288 FB 4,039,294
288 FC 4,039,291
4,039,292

CLASS 24

49 S 4,038,724
150 FP 4,038,725
198 4,038,726
248 C 4,038,727

CLASS 28

110 4,038,728
206 4,038,729

CLASS 29

95.1 4,038,730
105 A 4,038,732
4,039,295
132 4,038,731
149.5 B 4,038,733
157.1 R 4,038,734
159 B 4,038,735
160.6 4,038,736
401 F 4,038,737
420.5 4,038,738
568 4,038,739
4,038,740
596 4,038,741
600 4,038,742
628 4,038,743
630 A 4,038,744
749 4,038,745

CLASS 30

2 4,038,746
34.2 4,038,747
43.6 4,038,748
43.92 4,038,749
254 4,038,750
293 4,038,751

CLASS 32

2 4,038,752
14 D 4,038,754
14 E 4,038,753
66 4,038,755

CLASS 33

172 E 4,038,756
247 4,038,757

CLASS 34

48 4,038,758
99 4,038,759
109 4,038,760

CLASS 35

9 G 4,038,761

CLASS 36

89 4,038,762

CLASS 37

80 R 4,038,763
110 4,038,764
116 4,038,765
141 T 4,038,766

CLASS 40

106.1 4,038,768
125 H 4,038,767
4,038,769
209 4,038,770

CLASS 42

1 LP 4,038,771

CLASS 43

17 4,038,772
26.2 4,038,773
42.09 4,038,774

CLASS 44

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58 4,039,300
62 4,039,301

CLASS 46

22 4,038,775
76 A 4,038,776
87 4,038,777

CLASS 47

58 4,038,778
62 4,038,779
63 4,038,780

CLASS 48

197 R 4,039,302

CLASS 49

91 4,038,781

CLASS 51

5 D 4,038,782
33 W 4,038,783
139 4,038,784
145 R 4,038,785
297 4,039,303
320 4,038,786
391 4,038,787

CLASS 52

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20 4,038,789
36 4,038,790
4,038,791
105 4,038,792
125 4,038,793
127 4,038,794
169.7 4,038,795
221 4,038,796
241 4,038,799
306 4,038,797
309.7 4,038,798
507 4,038,800
698 4,038,801
731 4,038,802
741 4,038,803
746 4,038,804

CLASS 53

21 FW 4,038,805
32 4,038,806
282 4,038,807

CLASS 55

10 4,039,304
159 4,039,305
163 4,039,306
228 4,039,307
505 4,039,308

CLASS 56

27.5 4,038,808
124 4,038,809
220 4,038,810

CLASS 57

34 B 4,038,811
56 4,038,812
153 4,038,813

CLASS 58

23 R Re.29,327
4,038,814

CLASS 60

39.08 4,038,815
39.17 4,038,816
204 4,038,817
226 R 4,038,818
307 4,038,819
314 4,038,820
398 4,038,821
554 4,038,822
584 4,038,823
591 4,038,824
631 4,038,825
641 4,038,826

CLASS 61

53.62 4,038,827
72.6 4,038,828
84 4,038,829
89 4,038,830

CLASS 62

3 4,038,831
45 4,038,832
223 4,038,833
235 4,038,834
244 4,038,835
316 4,038,836

CLASS 65

2 4,039,309
25 R 4,039,310
163 4,039,311

CLASS 66

50 R 4,038,837
147 4,038,838
151 4,038,839
170 4,038,840

CLASS 68

12 R 4,038,841
177 4,038,842

CLASS 70

58 4,038,843
86 4,038,844
211 4,038,845
220 4,038,846
233 4,038,847

CLASS 71

67 4,039,312
88 4,039,313
4,039,314
98 4,039,315
118 4,039,316

CLASS 72

8 4,038,848
60 4,038,849
85 4,038,850
114 4,038,851
147 4,038,852
157 4,038,853
209 4,038,854
238 4,038,855
4,038,856
244 4,038,857
274 4,038,858
347 4,038,859
358 4,038,860
416 4,038,861
421 4,038,862

CLASS 73

9 4,038,863
23 4,038,864
67.7 4,038,865
71.2 4,038,866
88.5 R 4,038,867
119 A 4,038,868
167 4,038,869
181 4,038,870
304 C 4,038,871
358 4,038,873
362 AR 4,038,872
422 GC 4,038,874
425 4,038,875
432 R 4,038,876

CLASS 74

125 4,038,877
190 Re.29,328
217 B 4,038,878
231 J 4,038,879
242.1 R 4,038,880
331 4,038,882
337.5 4,038,883
501 P 4,038,881
568 T 4,038,884
581 4,038,885
765 4,038,888
769 4,038,887
793 4,038,886
866 4,038,889

CLASS 75

0.5 R 4,039,318
.5 A 4,039,317
42 4,039,319
58 4,039,320
60 4,039,321
63 4,039,322
70 4,039,323
72 4,039,324
84 4,039,325
108 4,039,327
126 B 4,039,328
169 4,039,329
171 4,039,330
257 4,039,326

CLASS 82

5 4,038,890
36 A 4,038,891

CLASS 83

4 4,038,892
154 4,038,893
411 R 4,038,894

CLASS 84

1.01 4,038,895
4,038,896
1.16 4,038,897
1.24 4,038,898
454 4,038,899

CLASS 89

1 B 4,038,900
4,038,901
1.807 4,038,902
8 4,038,903
33 MC 4,038,904
43 R 4,038,905
46 4,038,906

CLASS 91

20 4,038,907
444 Re.29,329

CLASS 93

36.3 4,038,908
93 M 4,038,909

CLASS 96

1 SD 4,039,331
48 R 4,039,332
84 R 4,039,333
114.1 4,039,334
124 4,039,335

CLASS 98

2.14 4,038,910
4,038,911
115 R 4,038,913

CLASS 99

279 4,038,914
594 4,038,915

CLASS 101

1 4,038,916
23 4,038,917
111 4,038,918
120 4,038,919
123 4,038,920
232 4,038,921
4,038,922

CLASS 102

43 R 4,038,923
70 S 4,038,924

CLASS 104

88 4,038,925
4,038,926
162 4,038,927
242 4,038,928

CLASS 105

367 4,038,929

CLASS 106

14 4,039,336
38.28 4,039,337
46 4,039,338
54 4,039,339
55 4,039,340
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58 4,039,342
59 4,039,343
66 4,039,344
90 4,039,345
288 Q 4,039,346
292 4,039,347

CLASS 110

8 A 4,038,930

CLASS 112

121.12 4,038,932
272 4,038,931
288 4,038,933

CLASS 114

298 4,038,934

CLASS 116

35 R 4,038,935
114.5 4,038,936
121 4,038,937
129 N 4,038,938

CLASS 118

4 4,038,939
5 4,038,940
243 4,038,941
305 4,038,942
647 4,038,943

CLASS 119

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3 4,038,945
5 4,038,946
51 R 4,038,947

CLASS 123

32 K 4,038,952
43 C 4,038,948
44 D 4,038,949
44 E 4,038,953
52 M 4,038,950
75 CC 4,038,954
102 4,038,951
119 F 4,038,955
139 AF 4,038,956
139 AW 4,038,957
140 R 4,038,958
191 S 4,038,959

CLASS 124

41 A 4,038,960
69 4,038,961

CLASS 125

21 4,038,962

CLASS 126

85 B 4,038,963
261 4,038,968
270 4,038,964
4,038,969
271 4,038,965
4,038,966
4,038,967
4,038,970
4,038,971
4,038,972
299 D 4,038,912

CLASS 127

9 4,039,348

CLASS 128

1 B 4,038,973
1 R 4,038,974
2.05 P 4,038,976
2.1 Z 4,038,975
6 4,038,977
87 R 4,039,039
130 4,038,978
141 R 4,038,979
193 4,038,980
214 C 4,038,983
214 E 4,038,981
4,038,982
303.14 4,038,984
304 4,038,985
305.5 4,038,986
321 4,038,987
326 4,038,988
335 4,038,989
419 PG 4,038,990
4,038,991

CLASS 131

10.7 4,038,992
141 4,038,993
187 4,038,994

CLASS 132

7 4,038,995
9 4,038,996

CLASS 134

10 4,039,349
22 R 4,039,350
102 4,039,351

CLASS 135

15 PQ 4,038,997

CLASS 136

205 4,039,352

CLASS 137

101 4,038,998
116.3 4,038,999
207 4,039,000
389 4,039,001
516.17 4,039,002
516.29 4,039,003
527 4,039,004
551 Re.29,330
609 4,039,005

CLASS 138

118 Re.29,331
129 4,039,006

CLASS 139

7 F 4,039,007
21 4,039,008

CLASS 144

34 E 4,039,009
34 R 4,039,010
218 4,039,011

CLASS 145

29 R 4,039,012
53 4,039,013

CLASS 148

6.15 R 4,039,353
16.5 4,039,354
31.5 4,039,355
4,039,356
175 4,039,357
187 4,039,358
188 4,039,359

CLASS 149

18 Re.29,334
36 4,039,360
41 4,039,361

CLASS 152

362 R 4,039,015

CLASS 156

69 4,039,362
145 4,039,363
164 4,039,364
405 4,039,365
4,039,366
486 4,039,367
506 4,039,368
541 Re.29,335
551 4,039,369
626 Re.29,336
4,039,370
668 4,039,371

CLASS 157

1.28 4,039,016

CLASS 160

1 4,039,017
89 4,039,018
121 R 4,039,019
178 C 4,039,020
202 4,039,021

CLASS 162

19 4,039,372
52 4,039,373
79 4,039,374

CLASS 164

52 4,039,022

CLASS 165

2 4,039,023
92 4,039,024
164 Re.29,332

CLASS 166

.5 4,039,025
117.5 4,039,026
153 4,039,027
246 4,039,028
294 4,039,029
299 4,039,030
317 4,039,031

CLASS 173

43 4,039,032
105 4,039,033
137 4,039,034

CLASS 174

4 C 4,039,739
15 S 4,039,740
21 R 4,039,745
35 GC 4,039,741
87 4,039,742
114 R 4,039,743
169 4,039,744

CLASS 176

19 LD 4,039,375
4,039,376
65 4,039,377
70 4,039,378
76 4,039,379
[illegible] 4,039,380

CLASS 177

186 4,039,035
212 4,039,036

CLASS 178

15 4,039,746
19 4,039,747
69.1 4,039,748
4,039,749

CLASS 179

1 AL 4,039,756
1 FS 4,039,753
1 G 4,039,755
1 N 4,039,750
1 SA 4,039,754
15 AL 4,039,757
15 BF 4,039,751
15 BT 4,039,752
18 FH 4,039,758
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41 A 4,039,760
90 B 4,039,761
99 4,039,762
4,039,763
100.41 L 4,039,764
156 A 4,039,765
170 NC 4,039,766
175.1 A 4,039,767
175.2 C 4,039,768
175.3 R 4,039,769

CLASS 180

24.11 4,039,037
70 R 4,039,038
96 4,039,040
104 4,039,041
108 4,039,043

CLASS 181

106 4,039,042
144 4,039,044

CLASS 182

5 4,039,045
111 4,039,047

CLASS 184

15 R 4,039,048

CLASS 187

29 R 4,039,049

CLASS 188

1 B 4,039,050
50 4,039,051
73.3 4,039,053
73.4 4,039,054
76 4,039,052
79.5 GC 4,039,055
325 4,039,056

CLASS 192

4 A 4,039,061
45 4,039,058
89 B 4,039,059
.02 R 4,039,057
134 4,039,060

CLASS 193

31 R 4,039,062
35 R 4,039,063
42 4,039,064

CLASS 195

28 N 4,039,382
31 R 4,039,383
51 S 4,039,381
62 4,039,384
63 4,039,385
100 4,039,386
4,039,387
103.5 R 4,039,388

CLASS 196

14.52 4,039,389

CLASS 197

1 R 4,039,065
4,039,066
49 4,039,067
98 4,039,068
127 R 4,039,069

CLASS 198

370 4,039,070
425 4,039,071
429 4,039,072
430 4,039,073
456 4,039,074
746 4,039,075

CLASS 200

19 R 4,039,787
51.13 4,039,788
61.52 4,039,789
61.53 4,039,790
67 D 4,039,791
144 B 4,039,792
163 4,039,786

CLASS 201

12 4,039,390
36 4,039,391

CLASS 202

93 4,039,392
241 4,039,393
262 4,039,394

CLASS 203

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15 4,039,398
25 4,039,399
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119 4,039,408
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141.5 4,039,410
157.1 H 4,039,412
157.1 R 4,039,411
159.12 4,039,413
181 4,039,414
4,039,415
192 N 4,039,416
196 4,039,417
198 4,039,418
225 4,039,419
242 4,039,420
266 4,039,421
272 4,039,422

CLASS 206

217 4,039,435
219 4,039,076
320 4,039,077
343 4,039,078
461 4,039,079
534 4,039,080
606 4,039,120

CLASS 208

4 4,039,423
8 4,039,424
4,039,425
4,039,426
11 R 4,039,427
50 4,039,429
108 4,039,430
146 4,039,431
252 4,039,432

CLASS 209

3 4,039,433
28 4,039,434
73 4,039,081
464 4,039,436

CLASS 210

9 4,039,437
11 4,039,438
14 4,039,439
23 H 4,039,440
23 R 4,039,441
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36 4,039,444
38 B 4,039,446
38 C 4,039,445
42 R 4,039,448
42 S 4,039,447
77 4,039,450
106 4,039,452
169 4,039,453
170 4,039,451
242 S 4,039,454
321 A 4,039,455
[illegible] 4,039,456
493 R 4,039,457
513 4,039,458
522 4,039,449

CLASS 211

45 4,039,082
96 4,039,083

CLASS 212

39 MS 4,039,084
46 R 4,039,085
47 4,039,086

CLASS 214

1 BT 4,039,088
1 PA 4,039,087
16.1 A 4,039,089
21 4,039,148
40 4,039,090
77 R 4,039,091
83.16 4,039,092
130 R 4,039,093
132 4,039,094
138 D 4,039,095
450 4,039,096

CLASS 215

12 R 4,039,097

CLASS 219

10.49 4,039,794
10.55 A 4,039,795
4,039,796
10.55 E 4,039,797
69 G 4,039,779
72 4,039,798
121 L 4,039,799
121 P 4,039,800
137 R 4,039,801
4,039,802
147 4,039,803
216 4,039,770
328 4,039,771
4,039,772
364 4,039,773
370 4,039,774
385 4,039,775
401 4,039,776
439 4,039,777
544 4,039,778

CLASS 220

63 R 4,039,098
91 4,039,099
269 4,039,100
4,039,101

CLASS 222

38 4,039,102
95 4,039,103
144.5 4,039,104
193 4,039,105

CLASS 224

29 R 4,039,106

CLASS 226

91 4,039,107
171 4,039,108
172 4,039,109
177 4,039,110

CLASS 227

30 4,039,111
40 4,039,112
130 4,039,113

CLASS 228

1 R 4,039,114
44.5 4,039,115
123 4,039,116

CLASS 229

15 4,039,117
17 B 4,039,118
34 HW 4,039,119
52 A 4,039,121
69 4,039,122

CLASS 235

30 R 4,039,780
92 EV 4,039,781
150.2 4,039,782
150.3 4,039,783
151 4,039,784
4,039,785
151.21 4,039,804
151.32 4,039,805
152 4,039,806
153 A 4,039,814
153 AC 4,039,813
181 4,039,815

CLASS 236

1 B 4,039,124
1 G 4,039,123
12 A 4,039,125
42 4,039,126

CLASS 239

2 R 4,039,144
15 4,039,145
167 4,039,147
265.25 4,039,146

CLASS 240

1 EL 4,039,816
2 MA 4,039,817
2.18 4,039,818
6.46 4,039,819
26 4,039,820
51.11 R 4,039,821
73 BC 4,039,822

CLASS 241

46.11 4,039,149
154 4,039,150
191 4,039,151
245 4,039,152
248 4,039,153
261.3 4,039,154

CLASS 242

47.12 4,039,155
71.8 4,039,156
78.7 4,039,157
107.4 A 4,039,158
130.1 4,039,159
189 4,039,160

CLASS 244

137 R 4,039,163
148 4,039,164
177 4,039,165
213 4,039,161
4,039,162

CLASS 248

14 4,039,128
4,039,129
19 4,039,130
73 4,039,131
150 4,039,132
188.8 4,039,133
205 A 4,039,134
214 4,039,135
215 4,039,136
248 4,039,137
497 4,039,138

CLASS 250

199 4,039,823
201 4,039,824
203 R 4,039,825
237 G 4,039,826
271 4,039,827
288 4,039,828
306 4,039,829
315 A 4,039,831
315 R 4,039,830
318 4,039,832
332 4,039,833
337 4,039,834
360 4,039,807
370 4,039,808
390 4,039,809
396 ML 4,039,810
409 4,039,811
413 4,039,812
432 PD 4,039,835
445 R 4,039,836
445 T 4,039,837
483 4,039,838
4,039,839
486 4,039,840
508 4,039,841
518 4,039,842
550 4,039,843
554 4,039,844
577 4,039,845

CLASS 251

65 4,039,139

CLASS 252

8.5 C 4,039,459
[illegible] 4,039,143
49.3 4,039,460
51.5 A 4,039,461
4,039,462
62.1 P 4,039,463
89 R 4,039,464
108 Re.29,337
171 4,039,465
194 4,039,466
300 4,039,467
301.1 W 4,039,468
358 4,039,469
382 4,039,470
412 4,039,471
425 4,039,473
429 C 4,039,472
431 R 4,039,475
437 4,039,476
441 4,039,477
451 4,039,474
455 R 4,039,478
4,039,480
455 Z 4,039,479
464 4,039,481
466 PT 4,039,482

CLASS 254

25 4,039,140
134.3 PA 4,039,141
134.3 R 4,039,142

CLASS 256

65 4,039,166

CLASS 259

1 R 4,039,167
9 4,039,168
10 4,039,169
147 4,039,170
158 4,039,171

CLASS 260

2.1 C 4,039,484
2.1 R 4,039,483
2.2 R 4,039,485
2.5 AD 4,039,489
2.5 AH 4,039,490
2.5 AW 4,039,487
2.5 HA 4,039,486
4,039,488
4 R 4,039,491
8 4,039,492
17.2 4,039,525
21 4,039,493
22 A 4,039,494
22 R 4,039,495
29.2 EP 4,039,548
29.4 R 4,039,496
29.6 F 4,039,497
29.6 HN 4,039,498
29.6 NR 4,039,499
29.6 R 4,039,500
30.4 R 4,039,501
30.8 R 4,039,502
37 SB 4,039,503
4,039,504
4,039,505
42.35 4,039,506
42.46 4,039,507
45.8 N 4,039,508
45.8 R 4,039,509
47 ET 4,039,510
49 4,039,511
61 4,039,512
67 UA 4,039,513
75 M 4,039,515
75 NE 4,039,516
75 NH 4,039,514
77.5 TB 4,039,517
79.1 4,039,518
112.5 R 4,039,519
117 4,039,520
141 4,039,521
152 4,039,522
153 4,039,523
157 4,039,539
158 4,039,524
4,039,526
190 4,039,528
192 4,039,527
207.1 4,039,529
239 A 4,039,530
250 A 4,039,541
250 QN 4,039,540
251 R 4,039,542
256.4 F 4,039,544
4,039,545
256.4 N 4,039,543
260 4,039,546
287 AZ 4,039,547
293.86 4,039,549
294.8 E 4,039,550
296 T 4,039,551
302 SD 4,039,552
304 R 4,039,553
307 G 4,039,555
307 R 4,039,554
308 D 4,039,556
326.5 B 4,039,558
345.5 4,039,559
346.3 4,039,560
348.34 4,039,561
401 4,039,562
410.9 R 4,039,563
413 4,039,564
429.5 4,039,566
448.8 R 4,039,567
453 P 4,039,568
459 A 4,039,565
463 Re.29,338
4,039,569
468 D 4,039,571
468 K 4,039,570
4,039,572
479 R 4,039,573
514 D 4,039,574
552 R 4,039,575
553 A 4,039,577
553 R 4,039,576
4,039,578
566 R 4,039,579
570 D 4,039,580
4,039,581
585 B Re.29,339
604 HF 4,039,584
4,039,585
604 R 4,039,583
608 4,039,586
612 R 4,039,587
613 R 4,039,588
614 A 4,039,590
618 B 4,039,589
618 R 4,039,591
635 E 4,039,593
635 R 4,039,592
638 R 4,039,594
651 R 4,039,793
653.1 R 4,039,595
653.7 4,039,596
654 A 4,039,597
655 4,039,598
668 A 4,039,599
668 R 4,039,600
669 R 4,039,601
4,039,602
683.42 4,039,603
683.68 4,039,604
824 R 4,039,605
829 4,039,606
836 4,039,627
857 UN 4,039,628
876 B 4,039,629
878 B 4,039,632
878 R 4,039,630
4,039,631

879 4,039,633
895 4,039,634
954 4,039,635
963 4,039,636

CLASS 261

36 A 4,039,637
72 R 4,039,638
121 R 4,039,639

CLASS 264

1 4,039,607
3 B 4,039,640
28 4,039,641
71 4,039,642
92 4,039,643
97 4,039,644
118 4,039,645
156 4,039,608
210 R 4,039,609
237 4,039,610

CLASS 266

196 4,039,172
201 4,039,173
281 4,039,174
4,039,175

CLASS 267

125 4,039,176
126 4,039,177

CLASS 269

75 4,039,178

CLASS 270

58 4,039,179
4,039,180
10 4,039,181
64 4,039,182

CLASS 272

67 4,039,183

CLASS 273

1 E 4,039,184
1 R 4,039,185
4,039,186
30 4,039,187
101 4,039,188
105 R 4,039,189
109 4,039,190
125 R 4,039,191
134 AT 4,039,192
138 R 4,039,193

CLASS 274

10 R 4,039,194
23 A 4,039,195

CLASS 277

11 4,039,196
24 4,039,197
118 4,039,198

CLASS 280

242 WC 4,039,199
284 4,039,200
461 A 4,039,201
507 4,039,202
515 4,039,203
605 4,039,204
721 4,039,205
763 4,039,206

CLASS 282

22 R 4,039,046
27.5 4,039,207

CLASS 285

3 4,039,208
8 4,039,209
112 4,039,210
184 4,039,211
253 4,039,212
317 4,039,213

CLASS 290

4 R 4,039,846
42 4,039,847
55 4,039,848
4,039,849

CLASS 292

336.3 4,039,214

CLASS 293

71 R 4,039,215

CLASS 294

19 R 4,039,216
74 4,039,217
4,039,218
82 R 4,039,219
4,039,220

CLASS 296

84 B 4,039,221
137 E 4,039,222

CLASS 297

90 4,039,223
389 4,039,224
390 4,039,225

CLASS 301

37 B 4,039,226

CLASS 303

97 4,039,227

CLASS 307

11 4,039,850
88.3 4,039,851
101 4,039,853
118 4,039,854
129 Re.29,341
203 4,039,855
212 4,039,856
213 4,039,857
231 4,039,858
232 4,039,859
247 R 4,039,862
252 A 4,039,863
252 G 4,039,865
252 N 4,039,866
252 T 4,039,864
255 4,039,867
273 4,039,868
304 4,039,869
326 4,039,852
355 4,039,861
362 4,039,860

CLASS 308

36.1 4,039,232
73 4,039,228
122 4,039,230
187.1 4,039,229
189 R 4,039,231
195 4,039,233
238 4,039,234

CLASS 310

52 4,039,870
59 4,039,871
62 4,039,872
74 4,039,873
77 4,039,874
194 4,039,875
266 4,039,876

CLASS 313

95 4,039,877
113 4,039,878
174 4,039,879
183 4,039,880
217 4,039,881
4,039,882
218 4,039,883
225 4,039,884
275 4,039,885
318 4,039,886
346 R 4,039,887
365 4,039,888
487 4,039,889
500 4,039,890
522 4,039,891

CLASS 315

39.71 4,039,892
73 4,039,893
76 4,039,894
101 4,039,895
135 T 4,039,896
205 4,039,897
241 P 4,039,898
371 4,039,899

CLASS 318

135 4,039,907
166 4,039,908
197 4,039,909
213 4,039,910
254 4,039,911
4,039,912
345 C 4,039,913
375 4,039,914
439 4,039,915
587 4,039,916
599 4,039,917
602 4,039,918
696 4,039,919

CLASS 320

22 4,039,920

CLASS 323

17 4,039,927
19 4,039,928
75 L 4,039,929
108 4,039,930

CLASS 324

16 T 4,039,931
28 R 4,039,932
29 4,039,933
30 R 4,039,934
34 D 4,039,936
34 ST 4,039,935
51 4,039,937
52 4,039,938
57 Q 4,039,939
60 C 4,039,940
71 SN 4,039,941
72 4,039,942
110 4,039,943
150 4,039,944
158 R 4,039,945
165 4,039,946

CLASS 325

2 4,039,947
38 B 4,039,948
4,039,949
4,039,950
38 R 4,039,951
163 4,039,952
304 4,039,953
308 4,039,954
321 4,039,955
455 4,039,956
466 4,039,957

CLASS 328

119 4,039,958
133 4,039,959
155 4,039,960

CLASS 329

50 4,039,961

CLASS 330

4.3 4,039,962
9 4,039,963
13 4,039,964
4,039,965

CLASS 331

4 4,039,966
11 4,039,967
19 4,039,968
40 4,039,969
94.5 F 4,039,970
94.5 PE 4,039,971
108 D 4,039,972
116 R 4,039,973

CLASS 333

7 R 4,039,974
11 4,039,975
24 R 4,039,976
28 R 4,039,977
70 A 4,039,979
70 R 4,039,980
70 T 4,039,978

CLASS 334

14 4,039,981
45 4,039,982

CLASS 335

16 4,039,983
151 4,039,984
153 4,039,985
212 4,039,986
213 4,039,987
4,039,988
4,039,989

CLASS 336

60 4,039,990

CLASS 337

348 4,039,991
365 4,039,992
366 4,039,993

CLASS 338

89 4,039,994
295 4,039,995
4,039,996
308 4,039,997

CLASS 339

14 R 4,039,235
17 N 4,039,236
91 R 4,039,237
95 R 4,039,238
97 R 4,039,239
99 R 4,039,240
176 M 4,039,241
177 E 4,039,242
274 4,039,243
275 T 4,039,244

CLASS 340

1 R 4,039,998
5 T 4,039,999
12 SD 4,040,000
15.5 TN 4,040,001
18 DC 4,040,002
18 LD 4,040,003
26 4,040,004

CLASS 360

27 AT 4,040,005
52 D 4,040,007
52 R 4,040,006
65 4,040,008
146.3 AQ 4,040,009
146.3 SY 4,040,010
4,040,011
4,040,012
147 LP 4,040,014
164 R 4,040,013
173 CA 4,040,016
173 R 4,040,015
4,040,017
174 TF 4,040,018
4,040,019
4,040,020
4,040,038
4,040,040
174 YC 4,040,039
200 4,040,041
239 F 4,040,042
259 4,040,043
261 4,040,044
280 4,040,045
310 CP 4,040,046
324 R 4,040,047
336 4,040,048
347 DD 4,040,049
384 E 4,040,050
397 4,040,051

CLASS 343

5 VQ 4,040,052
6.5 R 4,040,053
7 A 4,040,054
7.7 4,040,055
17 4,040,056
17.1 PF 4,040,057
113 PT 4,040,058
203 4,040,059
700 MS 4,040,060
786 4,040,061

CLASS 346

7 4,040,062
23 4,040,063
72 4,040,064
110 R 4,039,127

CLASS 350

3.5 4,039,245
7 4,039,246
95 4,039,247
96 B 4,039,248
4,039,250
96 WG 4,039,249
157 4,039,251
160 LC 4,039,252
4,039,254
160 R 4,039,253
4,039,255

CLASS 352

184 4,039,256

CLASS 354

5 4,040,065
10 4,040,066
23 D 4,040,067
24 4,040,068
27 4,040,069
49 4,040,111
59 4,040,070
113 4,040,071
173 4,040,072

CLASS 355

3 R 4,039,257
27 4,039,258

CLASS 356

53 4,039,259
106 LR 4,039,260

CLASS 357

4 4,040,073
16 4,040,074
23 4,040,075
24 4,040,076
4,040,077
4,040,078
30 4,040,079
4,040,080
34 4,040,081
42 4,040,082
54 4,040,083
55 4,040,084
79 4,040,085

CLASS 358

22 4,040,086
113 4,040,087
127 4,040,088
128 4,040,089
155 4,040,090
213 4,040,091
4,040,092
4,040,112
261 4,040,093
283 4,040,094
285 4,040,095
302 4,040,096

CLASS 360

2 4,040,097
14 4,040,098
29 4,040,099
43 4,040,100
64 4,040,101
71 4,040,102
75 4,040,103
96 4,040,104
99 4,040,105
4,040,106
4,040,107
101 4,040,108
107 4,040,109
4,040,110
113 4,040,113
130 4,040,114

CLASS 361

18 4,040,115
4,040,116
33 4,040,117
187 4,039,903
191 4,040,119
220 4,040,120
283 4,040,118
293 4,039,906
388 4,039,900
395 4,039,902
409 4,040,121
422 4,039,901
433 4,039,904
4,039,905

CLASS 363

9 4,039,922
22 4,039,921
65 4,039,924
70 4,039,925
79 4,039,923
138 4,039,926

CLASS 364

200 4,040,021
4,040,030
4,040,031
4,040,032
4,040,033
4,040,034
4,040,035
4,040,037
900 4,040,022
4,040,023
4,040,024
4,040,025
4,040,026
4,040,027
4,040,028
4,040,029
4,040,036
4,040,122

CLASS 401

132 4,039,261

CLASS 403

110 4,039,262
218 4,039,263
246 4,039,264

CLASS 404

127 4,039,265

CLASS 408

202 4,039,266

CLASS 415

1 4,039,267

CLASS 416

183 4,039,268

CLASS 417

216 Re.29,333
475 4,039,269
569 4,039,270

CLASS 423

1 4,039,611
4,039,612
4,039,614
4,039,615
4,039,616
4,039,617
4,039,618
230 4,039,619
4,039,620
239 4,039,621
4,039,622
240 4,039,623
319 4,039,624
326 4,039,625
456 4,039,626
469 4,039,646
495 4,039,647
496 4,039,648
540 4,039,649
569 4,039,650
571 4,039,613
579 4,039,651
592 4,039,582

CLASS 424

1 4,039,652
19 4,039,653
52 4,039,655
85 4,039,656
89 4,039,657
94 4,039,658
4,039,659
117 4,039,660
119 4,039,661
180 4,039,662
4,039,663
4,039,664
183 4,039,665
184 4,039,666
229 4,039,667
241 4,039,668
243 4,039,669
263 4,039,675
267 4,039,670
4,039,671
4,039,676
269 4,039,672
271 4,039,673
273 4,039,677
274 4,039,678
4,039,679
275 4,039,680
283 4,039,674
289 4,039,681
305 4,039,654
319 4,039,682
324 4,039,683
4,039,684
330 4,039,685
350 4,039,686

CLASS 425

529 4,039,271

CLASS 426

62 4,039,687
92 4,039,688
99 4,039,689
266 4,039,690
511 4,039,691
532 4,039,692
565 4,039,693
574 4,039,694
582 4,039,695
598 4,039,696

CLASS 427

27 4,039,697
34 4,039,698
38 4,039,699
46 4,039,700
69 4,039,701
93 4,039,702
183 4,039,703
284 4,039,704

CLASS 428

40 4,039,705
4,039,706
4,039,707
73 4,039,708
159 4,039,709
216 Re.29,340
253 4,039,710
286 4,039,711
307 4,039,712
324 4,039,713
336 4,039,714
375 4,039,715
378 4,039,716
389 4,039,717
398 4,039,718
424 4,039,719
425 4,039,720
426 4,039,721
461 4,039,722
521 4,039,723
525 4,039,724
537 4,039,725
539 4,039,726
541 4,039,727
553 4,039,296
558 4,039,298
566 4,039,297

CLASS 429

22 4,039,728
206 4,039,729
212 4,039,730

CLASS 431

7 4,039,272
95 R 4,039,273
128 4,039,274
202 4,039,276
329 4,039,275

CLASS 432

106 4,039,277
144 4,039,278
225 4,039,279
248 4,039,280

CLASS 526

6 4,039,731
43 4,039,732
185 4,039,733
258 4,039,734
292 4,039,735

CLASS 536

17 4,039,736

CLASS 542

462 4,039,531

CLASS 544

17 4,039,532
4,039,533
4,039,534
26 4,039,535
26 C 4,039,536
30 4,039,537
219 4,039,538

CLASS 548

370 4,039,557

CLASSIFICATION OF DESIGNS

D2—	27	245,206		178	245,221		62	245,235	D15—	113	245,249		17	245,261		5 NN	245,274
	293	245,207		193	245,222			245,236		136	245,250			245,262		5 SS	245,276
		245,208	D8—	350	245,223			245,237	D16—	65	245,251		48	245,263			245,277
		245,209		388	245,224		98	245,238	D19—	26	245,252			245,264			245,278
		245,210	D9—	60	245,225	D11—	79	245,239		53	245,253			245,265			245,281
	310	245,211		149	245,226		132	245,240	D22—	13	245,254		49	245,266		15 AJ	245,280
D4—	25	245,212		169	245,227		155	245,241	D23—	41	245,255		89	245,268	D48—	20 D	245,283
D6—	50	245,213		224	245,229	D12—	16	245,242		90.1	245,256	D27—	42	245,269			245,284
	125	245,214		230	245,228		95	245,243			245,257	D30—	12	245,270		20 K	245,282
	179	245,215	D10—	32	245,230		97	245,244			245,258		13	245,271		20 R	245,285
	197	245,216			245,231		157	245,247	D24—	3	245,287		15	245,272	D64—	11 R	245,286
	211	245,217		40	245,232		179	245,245		33	245,259	D34—	5 CH	245,279	D87—	1 R	245,288
D7—	35	245,218		46	245,233		181	245,246		57	245,267		5 E	245,273	D96—	12 R	245,289
	95	245,219		57	245,234	D14—	37	245,248	D25—	9	245,260		5 GH	245,275			245,290
	110	245,220															

CLASSIFICATION OF PLANTS

P.—	5	4,088	15	4,086	27	4,089	76	4,087			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

58—	39.5	T961,001	339—	176 M	T961,003		238	T961,005						
315—	107	T961,002	354—	21	T961,004	417—	196	T961,006	427—	54	T961,007	401	T961,008	T961,009

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
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Arkansas	5	Massachusetts	25	South Carolina	45
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Canal Zone	7	Minnesota	27	Tennessee	47
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

6 :	T961,006	18 :	T961,003	36 :	T961,002		T961,004		T961,005

U. S. GOVERNMENT PRINTING OFFICE : O - 1977

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PATENT AND TRADEMARK OFFICE NOTICES

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,245,280, Re. S.N. 775,252, Filed Mar. 7, 1977, Cl. 74/462, INTEGRAL GEAR, George M. Mooney, Owner of Record: *Inventor,* Attorney or Agent: Richard O. Bartz, Ex. Gp.: 345

3,642,829, Re. S.N. 808,358, Filed June 20, 1977, Cl. 260/346.8, CONTINUOUS PROCESS FOR THE PREPARATION OF MALEIC ANHYDRIDE FROM AN AQUEOUS SOLUTION OF MALEIC ACID BY DISTILLATION, Ernest Weyens, Owner of Record: *UCB Societe Anonyme, Saint-Gilles-lez-Brussels, Belgium,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 121

3,711,166, Re. S.N. 808,410, Filed June 20, 1977, Cl. 308/3, MEANS FOR CONTROLLING THE COEFFICIENT OF FRICTION BETWEEN BEARING SURFACES, Andrew J. Wayson, Owner of Record: *Litton Industrial Products, Inc., Hingham, Mass.,* Attorney or Agent: Joseph R. Spalla, et al., Ex. Gp.: 316

3,751,399, Re. S.N. 806,991, Filed June 16, 1977, Cl. 260/47 UA, POLYACRYLATE RESIN COMPOSITIONS, Henry L. Lee, Jr., et al., Owner of Record: *Lee Pharmaceuticals, South El Monte, Calif.,* Attorney or Agent: Edward S. Irons, et al., Ex. Gp.: 143

3,891,233, Re. S.N. 808,489, Filed June 21, 1977, Cl. 277/32, INFLATOR SEAL, William H. Damon, Owner of Record: *Allied Chemical Corporation, New York, N.Y.,* Attorney or Agent: Patrick L. Henry, et al., Ex. Gp.: 243

3,904,671, Re. S.N. 808,280, Filed June 20, 1977, Cl. 260/473 R, ESTERS OF 3-(HYDROXY OR HYDROXYMETHYL)-4-HYDROXYPHENYL AMINOMETHYL KETONES, Hiroaki Minatoya, et al., Owner of Record: *Sterling Drug Inc., New York, N.Y.,* Attorney or Agent: B. Woodrow Wyatt, et al., Ex. Gp.: 127

3,990,926, Re. S.N. 808,331, Filed June 20, 1977, Cl. 156/3, METHOD FOR THE PRODUCTION OF MATERIAL FOR PRINTED CIRCUITS, Jiri K. Konicek, Owner of Record: *Perstorp AB, Perstorp, Sweden,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 161

PATENT NOTICES

Certificates of Correction for the Week of Aug. 9, 1977

Re. 29,023	3,998,147	4,015,925	4,021,399
Re. 29,145	3,998,606	4,015,991	4,021,443
D. 244,470	4,000,133	4,016,189	4,021,586
3,749,800	4,000,172	4,016,332	4,021,605
3,752,773	4,001,333	4,016,353	4,021,832
3,804,880	4,001,371	4,016,401	4,021,849
3,852,465	4,001,408	4,016,404	4,021,996
3,862,142	4,001,606	4,016,421	4,022,037
3,865,807	4,002,535	4,016,529	4,022,511
3,880,182	4,003,296	4,016,643	4,022,553
3,907,932	4,003,613	4,016,732	4,022,674
3,919,287	4,003,894	4,016,771	4,022,735
3,928,347	4,004,226	4,017,277	4,022,856
3,932,736	4,004,916	4,017,362	4,022,900
3,935,735	4,005,028	4,017,378	4,022,987
3,936,414	4,005,358	4,017,410	4,023,068
3,951,946	4,005,683	4,017,480	4,023,165
3,953,432	4,005,828	4,017,557	4,023,203
3,958,211	4,006,089	4,017,947	4,023,515
3,959,379	4,008,512	4,018,129	4,023,630
3,960,954	4,008,961	4,018,159	4,024,044
3,966,914	4,009,362	4,018,167	4,024,077
3,966,935	4,009,627	4,018,688	4,024,173
3,967,761	4,011,558	4,018,690	4,024,174
3,969,146	4,011,962	4,019,114	4,024,311
3,981,736	4,012,311	4,019,205	4,024,340
3,984,667	4,012,404	4,019,241	4,024,364
3,985,874	4,012,635	4,019,743	4,024,369
3,986,940	4,012,975	4,019,781	4,024,377
3,988,092	4,013,130	4,019,862	4,024,463
3,988,904	4,013,178	4,019,885	4,024,491
3,989,893	4,013,551	4,019,931	4,024,671
3,991,916	4,013,662	4,020,163	4,024,761
3,992,551	4,013,973	4,020,279	4,025,090
3,992,643	4,014,087	4,020,695	4,025,252
3,993,174	4,014,141	4,020,697	4,025,722
3,993,733	4,014,665	4,020,711	4,025,855
3,995,300	4,015,350	4,020,812	4,026,202
3,996,851	4,015,509	4,020,937	4,026,757
3,997,501	4,015,525	4,021,095	
3,997,526	4,015,669	4,021,152	
3,997,818	4,015,902	4,021,387	

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

AUGUST 9, 1977

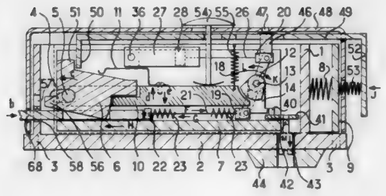
Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,342

BUCKLE FOR RETARDED AUTOMATIC UNLOCKING OF SAFETY BELTS AND HARNESSES OF PARACHUTING EQUIPMENT AND OF VEHICLES

Guy Barbe, Marseille, France, assignor to Etudes et Fabrications Aeronautiques, Paris, France

Original No. 3,952,381, dated Apr. 27, 1976, Ser. No. 507,874, Sept. 20, 1974. Application for reissue June 17, 1976, Ser. No. 697,012
Claims priority, application France, Sept. 21, 1973, 73.34955
Int. Cl.[2] B64D *17/38*
U.S. Cl. 24—230 A
16 Claims



1. A buckle for retarded automatic unlocking the shackle of safety belts and harnesses, said buckle comprising:

a casing for receiving the shackle;

a frame means slideably mounted with respect to said casing and including a frame means return spring connected to said casing for biasing said frame means to an initial position;

a shaft mounted through said frame means;

a bolt rotatably mounted on said shaft for releasably engaging and locking the shackle;

an automatic unlocking control rotatably mounted on said shaft and engaging said bolt for disengaging said bolt from the shackle for unlocking the shackle from said bolt;

an auxiliary locking means including a movable meand supported by said frame means and releasably engaging and locking said automatic unlocking control so as to block rotation of said control to prevent unlocking the shackle from said bolt;

at least one drive spring, connected to said movable means, compressed by the shackle when the shackle is inserted into said casing and biasing said movable means for movement out of engagement with said automatic unlocking control for unlocking said automatic unlocking control

said auxiliary locking means further including a movable latch means withdrawably abutting said movable means for securing said movable means against the biasing of said drive spring and a brake means connected to said movable means for retarding rapid acceleration of said movable means under the urging of said drive spring when said movable latch means is withdrawn from abutting said movable means;

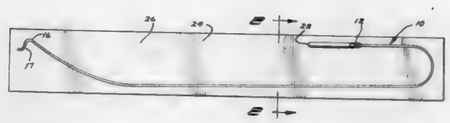
whereby said automatic unlocking control is slowly unlocked under the action of a traction force exerted by the shackle on said bolt, which traction force is sufficient to slideably move said frame means against the bias of said frame means return spring, said frame means return spring returning said frame means to its initial position as soon as the traction force of the shackle on said bolt substantially diminishes.

Re. 29,343

METHOD FOR FORMING AND STERILIZING CATHETERS

Kurt Amplatz, 10 Evergreen Road, St. Paul, Minn. 55110

Original No. 3,839,841, dated Oct. 8, 1974, Ser. No. 271,586, July 13, 1972. Application for reissue Feb. 20, 1976, Ser. No. 659,646
Int. Cl.[2] B65B *55/18*
U.S. Cl. 53—21 FC
6 Claims



5. A method of preparing and preserving in readiness for use a catheter for use within the human body, said catheter comprising an elongated strip of thermoplastic material having a temperature above which it is free forming and below which it tends to retain its shape, the method including the steps of:

1. preparing a forming board having a groove of shape to support a catheter in a predetermined desired configuration;

2. supporting a catheter in said predetermined desired configuration;

3. heating the catheter at least to the free form temperature of the catheter materials;

4. reducing the temperature of the catheter to substantially below the free form temperature;

5. supporting the catheter in said groove of said forming board to constitute a forming board catheter unit;

6. encompassing the forming board-elongated catheter unit in a hermetically sealed envelope;

7. sterilizing the interior of the envelope and the contents thereof; and

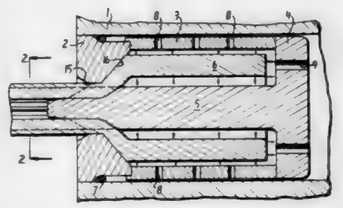
8. retaining the catheter in the forming board and in the envelope until it is ready to be used.

Re. 29,344

METHOD AND APPARATUS FOR MANUFACTURING TUBES OR TUBULAR BODIES WITH INNER WALLS HAVING CROSS SECTIONS OF IRREGULAR SHAPES

Yoshihiro Yamaguchi, Ashiya; Tomiharu Matsushita, Nishinomiya; Masataka Noguchi, Kobe; Junichi Nakagawa, Hatano, and Hakumi Hasegawa, Akashi, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Original No. 3,808,860, dated May 7, 1974, Ser. No. 281,041, Aug. 16, 1972. Application for reissue May 7, 1976, Ser. No. 684,234
Claims priority, application Japan, Aug. 18, 1971, 46-63129
Int. Cl.[2] B21C *25/08, 23/04*
U.S. Cl. 72—60
3 Claims



1. A method of manufacturing tubes or tubular bodies with

inner walls having cross-sections of irregular shapes by means of hydrostatic extrusion, comprising the steps of:

placing a tubular billet having a pre-shaped, tapered tip portion against a die in a pressure chamber with a mandrel positioned in an axially extending hole of said billet, said mandrel having a conical tip portion and a grooved portion, said conical tip portion of said mandrel being so shaped as to be similar to a corresponding, conically shaped inlet hole of said [die] *billet;*

introducing a pressure medium under pressure into said chamber so as to advance said mandrel toward the inner end surface of said billet, such that the conically shaped tip portion and the grooved portion of the mandrel may provide complete sealing between the inner surface of said billet and the tip portion of said mandrel and between the outer surface of said billet and the inner wall of the inlet opening of said die; and

raising the pressure of the pressure medium to a required value thereby effecting the extrusion of said tubes or tubular bodies.

Re. 29,345

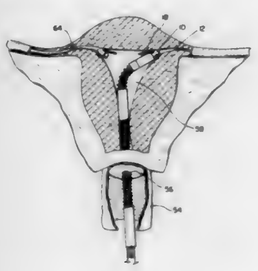
METHOD AND APPARATUS FOR NON-SURGICAL, REVERSIBLE STERILIZATION OF FEMALES

Robert A. Erb, Valley Forge, Pa., assignor to The Franklin Institute, Philadelphia, Pa.

Original No. 3,805,767, dated Apr. 23, 1974, Ser. No. 335,816, Feb. 26, 1973. Application for reissue Apr. 22, 1976, Ser. No. 679,185

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **29 Claims**



10. Apparatus for forming an oviduct block comprising: a tubular means having a length sufficient to extend from the vagina area of a female to the uterine end of the oviduct and having a diameter sufficiently small to pass longitudinally through the cervix of said female; said tubular means having first and second terminal ends; said first terminal end having means to engage and connect a tip member thereto, said tubular means including means therein for adjustably displacing said first terminal end laterally relative to said second terminal end to position said first terminal end adjacent the uterine end of said oviduct to cause the tip member to at least temporarily block said uterine end; said tubular means further including fluid passage means for transmission of a plastic material from a point adjacent to the second terminal end into said oviduct beyond said tip member at first terminal end of said tubular means, and means to dispense a sufficient amount of said material to fill a predetermined length of the oviduct and to flow into engagement with the tip member at the uterine end of said oviduct, to form a block having an enlarged end portion exposed in the uterine end of the oviduct.

28. The method of forming non-surgically removable oviduct block in a female, comprising the steps of:

a. introducing an injecting means through the cervical os into the uterine cavity of said female;

b. positioning the injecting means adjacent the uterine end of the oviduct and providing a seal with the uterine wall in the marginal area circumscribing the interior of the oviduct limiting the flow into the uterine cavity of material dispensed by the injecting means;

c. injecting from said injecting means into the interior of said oviduct beyond said seal a plastic material which will flow into engagement with said seal, said plastic material being injected into said oviduct in an amount sufficient to block the passage of ovum through said oviduct to the uterine cavity; and

d. allowing said plastic material to solidify in said oviduct and provide an oviduct block at least partially formed by said solidified plastic material, whereby the block can be gripped by mechanical means to remove the oviduct block non-surgically.

Re. 29,346

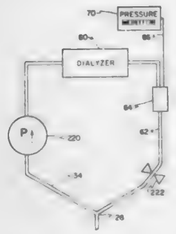
SINGLE NEEDLE DIALYSIS

Klaus F. Kopp, Kirchseeon, Germany, assignor to Vital Assists, Inc., Salt Lake City, Utah

Original No. 3,756,234, dated Sept. 4, 1973, Ser. No. 149,905, June 4, 1971. Application for reissue Sept. 3, 1975, Ser. No. 610,043

Int. Cl.[2] A61M *5/00, 1/03*

U.S. Cl. 128—214 R **4 Claims**



3. A method of dialyzing the blood of a patient with a single cannulation in a system including a pump and a hemodialyzer connected together in a series configuration, and a single hollow cannula having a bifurcated conduit connected thereto to provide an arterial branch and a venous branch, coupled respectively to opposed ends of the series connected pump and hemodialyzer, wherein the interconnected conduit, pump and hemodialyzer define a closed system connected to the single hollow cannula, comprising the steps of:

cannulating the blood vessel of a patient with the single cannula through which blood is withdrawn from and returned to the patient through said system in alternate phases of successive cycles of operation;

pumping blood from the patient to the hemodialyzer through the arterial branch, while preventing the return of blood to the patient through the venous branch;

sensing pressure in the closed system;

automatically occluding blood flow through the arterial branch to stop the withdrawal of blood from the patient in response to the sensing of a predetermined first pressure level in the closed system, while permitting the return of blood to the patient through the venous branch; and, alternately,

automatically occluding blood flow through the venous branch to stop the return flow of blood to the patient in response to the sensing of a predetermined second pressure level in the closed system, while permitting blood withdrawal from the patient through the arterial branch, so that blood is alternately withdrawn and returned to the patient in alternate phases of each successive cycle of operation of the system in response to the sensing of the predetermined first and second pressure levels.

Re. 29,347

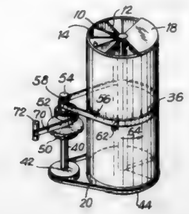
MEASURING AND DISPENSING APPARATUS

Louis T. Friedman, 2 Leonard St., Farmingdale, N.Y. 11735

Original No. 3,893,592, dated July 8, 1975, Ser. No. 410,420, Oct. 29, 1973. Application for reissue Mar. 12, 1976, Ser. No. 666,457

Int. Cl.[2] B67D *5/30*

U.S. Cl. 222—14 **19 Claims**



1. Apparatus comprising a source of flowable material, passage means having a sequence of parallel passages adapted for being fed by said source, said passages having inlets and outlets, first blocking means displaceable to obturate selected of said inlets whereby to prevent feeding of the associated passages from said source while the remainder of said inlets are open so that the corresponding passages can be fed from said source, second blocking means to obturate selected of said outlets constituting less than all of the same but including at least those of said outlets associated with the passages whose inlets are not obturated by said first blocking means, and drive means for the concomitant driving of said first and second blocking means to displace the same relative to said sequence of passages whereby said material can flow into selected passages and out of selected passages but is prevented from flowing from said source directly through any of the passages; said drive means including control means displaceable through distances corresponding to selectable numbers of said passages, storage means to store energy corresponding to the displacement of said control means, coupling means effective on release of said control means and responsive to said storage means to drive the first and second blocking means across said inlets and outlets to release material from the selected number of passages and to permit the recharging of the passages from said source, and scale means cooperatively related to said control means whereby displacement of said control means can be related to selectable amounts of said material, said control means including a drive mechanism, means for manually displacing said drive mechanism, a shaft driven by said drive mechanism, and a spring loading said shaft to return the same to a normal position of rest.

Re. 29,348

SPARE TIRE EXTRACTION DEVICE

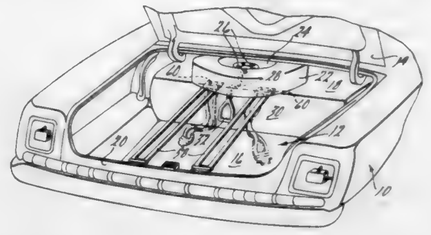
John A. Bott, 931 Lakeshore Drive, Grosse Pointe Shores, Mich. 48236

Original No. 3,940,041, dated Feb. 24, 1976, Ser. No. 360,094, May 14, 1973. Application for reissue Sept. 23, 1976, Ser. No. 725,987

Int. Cl.[2] B62D *43/00*

U.S. Cl. 224—42.12 **3 Claims**

1. In combination, an [automobile body] *automotive vehicle* having a longitudinal axis and an interior storage area, a [raised] *generally upstanding* wall along an access side of said storage area, said wall extending generally perpendicular to said axis and transversely of said [automobile body] *vehicle*, a spare tire assembly including a tire and wheel, means in said storage area supporting said assembly in a substantially horizontal attitude and substantially parallel to said axis, said wheel having a plurality of [bolt] holes *formed* therein, said [bolt] holes being defined by a plurality of axes arranged generally parallel to said wall, and a flexible strap having a length equal to at least the radial distance between said [bolt] holes and the outer periphery of said assembly and having a handle at one end thereof and a fastening element at its opposite end, said fastening element extending generally parallel to said wall *and extending axially through* and [engaged with one of said bolt holes] *cooperative with one of the holes for securing said opposite end of said strap to said assembly,* said strap having a main body portion arranged substantially parallel to said [automobile body] *vehicle* axis and extending radially of said assembly along the underside thereof from said one [bolt] hole to a



position where said handle may be conveniently grasped by a person reaching [over said wall] into said storage area, whereupon said strap may be pulled *in a direction causing said fastening element to move* toward said wall by the said person [to] *and thereby* cause said assembly to be biased [rearwardly and upwardly of said storage area, whereby the rearwardly facing portion of said assembly is moved upwardly and rearwardly so that said assembly passes up and over said wall] *longitudinally of the vehicle and out of said storage area.*

Re. 29,349

ORGANIC THERMOTROPIC NEMATIC COMPOUNDS

Elwood L. Strebel, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing, St. Paul, Minn.

Original No. 3,829,491, dated Aug. 13, 1974, Ser. No. 363,429, May 24, 1973. Continuation-in-part of Ser. No. 817,143, April 17, 1969, abandoned. Application for reissue Sept. 2, 1975, Ser. No. 609,515

Int. Cl.[2] C07D *119/00*

U.S. Cl. 260—566 F **8 Claims**

1. N-(p-methoxybenzylidene)-p-n-butyl aniline.

Re. 29,350

PROCESS FOR CHLORINATING ETHYLENE POLYMERS

Lowhardt A. A. Schoen, Spaubeek, Netherlands, assignor to Stamicarbon, B.V., Geleen, Netherlands

Original No. 3,935,181, dated Jan. 27, 1976, Ser. No. 500,942, Aug. 27, 1974. Application for reissue June 8, 1976, Ser. No. 693,953

Int. Cl.[2] C08F *27/03*

U.S. Cl. 526—45 **15 Claims**

1. Process for chlorinating a solid, finely divided ethylene polymer to produce statistical or hybridical chloropolyethylene, said process comprising

a. mixing said polymer with 10 to 100% by weight of water, based on the weight of ethylene polymer, and

b. chlorinating the polymer with gaseous chlorine at a temperature which is below the ethylene polymer decomposition temperature and above the crystalline melting point of the ethylene polymer during [at least about 70%] *a part* of the chlorination period and at a pressure such that the boiling point of water at said pressure is at least equal to the said chlorination temperature while maintaining the amount of water in the ethylene polymer at a level of at least 10% by weight, based on the weight of starting ethylene polymer, until the chlorination has proceeded to a polymer chlorine content of at least 15% by weight and

maintaining the water substantially uniformly distributed in the polymer.

Re. 29,351

VIDEO-DISPLAY-PROCESSOR

Yoram Zukerman; Moshe Ben-Porath, and Benjamin Sabbah, all of Haifa, Israel, assignors to Elscint Ltd., Haifa, Israel

Original No. 3,794,762, dated Feb. 26, 1974, Ser. No. 266,128, June 26, 1972. Application for reissue Jan. 27, 1975, Ser. No. 544,516

Int. Cl.[2] H04N *3/04, 5/76*

U.S. Cl. 358—81 **22 Claims**

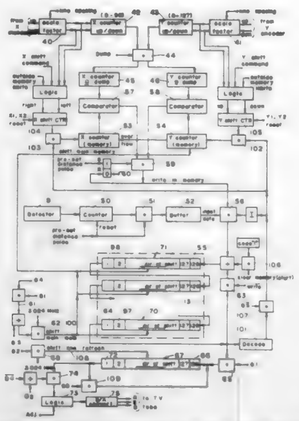
21. A video-display-processor for producing an on-line display comprising:

a. a CRT having a screen and a modulatable beam that scans the screen in a raster;

b. a memory having a plurality of registers;

c. means to sequentially read-out the contents of the registers, non-destructively, in synchronism with the scan of the screen, for modulating the beam in accordance with the contents of the registers; and

d. detector means responsive to radiation stimuli emitted by a



radiation field for storing data in the memory during the time the contents of the registers are being sequentially read-out.

PLANT PATENTS

GRANTED AUGUST 9, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,090

DISTINCT VARIETY OF PHILODENDRON PLANT

Robert H. McColley, P.O. Box 17126, Orlando, Fla. 32810

Filed Oct. 4, 1976, Ser. No. 729,583

Int. Cl.[2] A01H *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of Philodendron plant substantially as herein disclosed, characterized as to novelty by its superior growth, resistance to shot-gun fungus and bacterial soft rot, glossy bronze red and green color contrasts in immature and mature leaves, the hastate shape of the leaves, the glossy bronze red color of the sheath covering with its tendency to curl back and hang on to the stem for long periods of time.

PATENTS

GRANTED AUGUST 9, 1977

ERRATA

For CLASS	See PATENT NO.
248–493	4,040,149
432–124	4,040,203
052–664	4,040,231
052–720	4,040,232
062–037	4,040,259
429–014	4,040,435
209–166	4,040,519
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028–271	4,040,782
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542–400	4,041,027
544–012	4,041,028
544–025	4,041,029
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548–375	4,041,046
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343–005 R	4,041,341
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364–200	4,041,461
364–200	4,041,462
364–900	4,041,463
364–200	4,041,464
364–900	4,041,465
364–900	4,041,466
364–900	4,041,467
364–900	4,041,468
364–900	4,041,469
364–900	4,041,470
364–200	4,041,471
364–900	4,041,472
364–900	4,041,473
337–295	4,041,525

PATENTS

GRANTED AUGUST 9, 1977

NOTE—A cross reference listing of applications published under the second Trial Voluntary Protest Program is located in the back of this Issue. These entries will be in numerical order by document publication number.

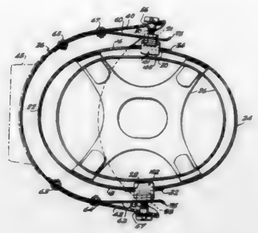
GENERAL AND MECHANICAL

4,040,123

DETACHABLE CONNECTION FOR PIVOTALLY MOUNTING A FACE SHIELD TO A HEAD PROTECTOR

Garland S. Williams, 5790 Devonshire Blvd., Miami, Fla. 33155

Filed May 27, 1976, Ser. No. 690,393
Int. Cl.[2] A61F 9/06
U.S. Cl. 2—10 **5 Claims**



1. In combination, (a) a rigid head protective helmet, (b) a face shield, and (c) a connector means for pivotally and removably connecting and orienting the face shield onto the head protective helmet,

A. said helmet being of the type having a crown and a downwardly extending skirt with a front, rear and opposing size zones, and said side zones terminating at a rim at a level above the ears of a wearer's head, said helmet having an elongate opening in each side zone in confronting relation and adjacent the rim,

B. said face shield having an inner surface and an outer surface and including a front face with a central window means and a rearwardly extending left and right side face each terminating at a generally vertical edge and each side face having a hole of predetermined size adjacent the edge and with their centers defining a line above the central window means,

C. said connector means comprising:

a. a first and a second elongate leaf spring each having a first end zone and a second end zone,

said first end zone of said first spring being secured to the inner surface of said face shield and said second end zones normally diverging from the adjacent inner surface of the right side face and being of a length to extend beyond the line through the centers of the holes in said side faces, and said second end zone terminating at a terminal end, and said terminal end being accessible at said edge of said right side face, and said second end zone having a hole of a predetermined size smaller than the predetermined size of said hole in said right side face,

said first end zone of said second leaf spring being secured to the inner surface of said face shield and said second end zone normally diverging from the adjacent inner surface of said left side face and being of a length to extend beyond the line through the centers of the holes in said side faces and said second end zone terminating at a terminal end, and said terminal end being accessible at said edge of said left side face, and said second end zone having a hole of a predetermined size smaller than the predetermined size of said hole in said left side face,

said holes in said second end zones being aligned with one another and normally within the space comprising a projection of the holes in the side faces of the shield and said second end zones normally converging toward one another;

said first and second leaf springs being yieldable to a compressive force to move their respective terminal ends toward the inner surface of the right and left side faces respectively of the shield with the holes in each of the second end zones remaining at all times substantially in said projection during relative movement of the leaf springs toward the adjacent inner surface of the face shield,

b. a first and a second pivot pin each having a headed inner end and a shank terminating at a threaded outer end, and each pin being of a diameter less than that of the holes in said side faces of said shield,

c. a key means on each pivot pin to constrain the shield to pivotal movement only with respect to the hat while connected thereto, each of said key means comprising a first leg having an inner surface and an outer surface with a hole receiving one of said pivot means and with the inner surface of said first leg in abutting engagement with the adjacent headed inner end; and a second leg extending inwardly from said inner surface to a terminal end, said terminal end of said key means of said first pivot pin being sized and normally extending into the opening in the right side face in a keyed condition, and said terminal end of said key means on said second pivot pin being sized and normally extending into the opening in the left side face in a keyed connection,

d. means journaling said leaf springs on the shanks of said pivot pins comprising, the shank of said first pivot pin extending through the hole of said first elongate leaf spring and the shank of said second pivot pin extending through the hole of said second elongate leaf spring, said leaf springs normally urging said terminal ends of said second legs into keyed relation in said openings of said helmet, and

e. a first keeper exteriorly of said face shield and in abutting engagement with the other surface of said face shield about said hole in the right side face and including an inner sleeve length of a diameter less than that of the hole in said right side face of said shield and having a threaded axial recess in threaded engagement on the threaded end of the first pivot pin, and a first coil spring having an inner end and an outer end about the shank of said first pivot pin and a first pair of washers on the shank of said first pivot pin comprising an inner washer and an outer washer, said inner washer being captivated between the leaf spring and the inner surface of the first leg of the associated key means and said outer washer being captivated between said inner end of said coil spring and said leaf spring, and

f. a second keeper exteriorly of said face shield and in abutting engagement with the outer surface of said face shield about said hole in the left side face and including an inner sleeve length of a diameter less than that of the hole in said left side face of said shield and having a threaded axial recess in threaded engagement on the threaded end of the second pivot pin, a second coil spring having an inner end and an outer end about the shank of said second pivot pin and a second pair of washers on the shank of said second pivot pin comprising an inner washer and an outer washer, said inner washer being captivated between the leaf spring and the inner surface of the first leg of the associated key means and said outer washer being captivated between said inner end of said coil spring and said leaf spring.

4,040,124
HOSPITAL GOWN HAVING FITTING MEANS
Richard L. Zoephel, Lake Villa, Ill., assignor to The Kendall Company, Boston, Mass.
Division of Ser. No. 473,017, May 24, 1974, Pat. No. 3,921,221.
This application Sept. 15, 1975, Ser. No. 612,422
The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—51 2 Claims



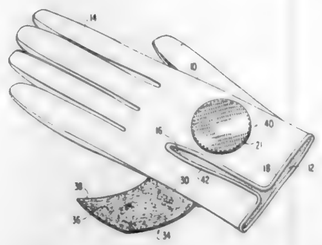
1. A hospital gown comprising, a garment having a front, a back, and first and second margins defining an opening for placement of the garment on a wearer, a belt having first and second ends and having a sufficient length to encircle the garment, and a cohesive-adhesive material on both of said belt ends for releasably attaching the belt ends together with said belt passing around the garment margins to close the garment about the wearer, at least one of said belt ends having cohesive-adhesive material on both of its opposed sides, said garment including a region of cohesive-adhesive material on the outside of the gown and located to releasably attach at least one of said belt ends to the gown when said belt closes the garment.

4,040,125
CONVERTIBLE SHIRT COLLAR
Sidney D. Blue, 605 Park Ave., New York, N.Y. 10021
Filed May 20, 1976, Ser. No. 688,391
Int. Cl.[2] A41B *3/04*
U.S. Cl. 2—139 6 Claims



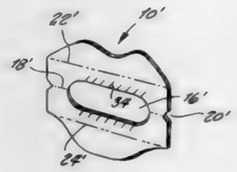
1. A collar for attachment to the neck opening of a shirt body of the type having front body panels with central overlapping vertical edges, the collar including a first outer cape portion and a neckband portion and a second cape portion and neckband portion on the underside of the collar, a multi-ply interlining disposed and secured between the outer and under cape and neckband portions, a first pair of upper slots through one ply of the lining extending laterally outwardly from spaced points at the back of the collar along a line demarking the collar cape from the neckband, the outer ends of the first pair of slots being spaced from the ends of the collar, a second pair of slots through the same ply of the collar interlining extending outwardly similarly spaced from points at the back of the collar, said second pair of slots extending laterally of the collar and curving downwardly across the neckband terminating short of the bottom of the neckband and at a lateral distance beyond the outer ends of the first pair of slots.

4,040,126
GOLF GLOVE
Leonard Cecil, 5644 Bent Branch Road, Bethesda, Md. 20016
Filed Nov. 9, 1976, Ser. No. 740,140
Int. Cl.[2] A41D *19/00*
U.S. Cl. 2—161 A 7 Claims



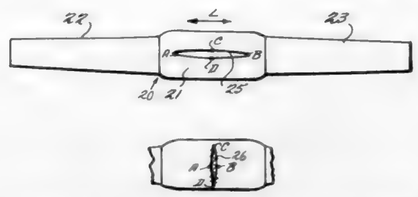
1. In a sports glove to facilitate the gripping of a golf club for example, a glove body including interconnected palm, finger and back portions, said back portion at least being comprised of substantially inelastic and non-resilient material such as leather and having a longitudinal opening extending forwardly from the rear edge of the back portion, the improvement comprising: a one piece integrally formed stretch fastener element attached to said glove body on one side of said opening and being in and of itself elastically extensible and stretchable across said opening, and a complementary fastener element fixed on said back portion on the other side of said opening and adapted to be engaged with said stretch fastener element with the latter elastically tensioned across said opening.

4,040,127
LIP PROTECTOR
Simon Slovitt, and Miriam Slovitt, both of 5901 NW. 61st Ave., Tamarac, Fla. 33319
Filed May 24, 1976, Ser. No. 689,357
Int. Cl.[2] A42B *1/00*
U.S. Cl. 2—174 9 Claims



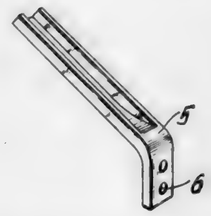
1. A lip protector comprising a
one-piece member of flexible material folded into a substantially V-shaped configuration including
a pair of legs adapted to be inserted in the mouth of the user, said legs including an opening therethrough,
a plurality of tabs bent from the material about said opening, said tabs adapted to be inserted between adjacent lateral surfaces of the teeth of each individual jaw of the user; and
a laterally extending flange connected to each leg adapted to cover the lips of the user when the legs are inserted in the mouth.

4,040,128
ONE-PIECE PANTYHOSE CONSTRUCTION
Walter H. Imboden, Burlington, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.
Filed Apr. 5, 1976, Ser. No. 673,997
Int. Cl.[2] A41B *9/04*
U.S. Cl. 2—409 25 Claims



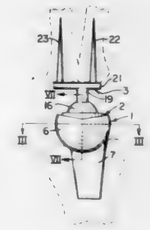
1. A method of making pantyhose or the like comprising the steps of
a. forming an integral elongated tube of knit fabric, a waist slit being formed in said tube in the middle portion thereof, said slit extending in the dimension of elongation of said tube,
b. forming a crotch slit in the middle portion of said tube in the area thereof generally opposite said waist slit, said crotch slit generally extending in the dimension of elongation of said tube, and said crotch slit having two terminating end points,
c. moving said crotch slit terminating end points toward each other so that the orientation of said crotch slit is changed from one generally extending in the dimension of elongation of said tube to one having a different orientation, said crotch slit assuming a translocated position,
d. closing said tube in the area of said crotch slit while said crotch slit is in said translocated position, so that no slit remains in said tube middle portion generally opposite said waist slit, and
e. providing a waistband or the like in said waist slit.

4,040,129
SURGICAL IMPLANT AND ALLOY FOR USE IN MAKING AN IMPLANT
Samuel G. Steinemann, St-Sulpice, and Stephan M. Perren, Davos, both of Switzerland, assignors to Institut Dr. Ing. Reinhard Straumann AG, Switzerland
Continuation-in-part of Ser. No. 382,194, July 24, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,269, July 13, 1971, abandoned. This application Feb. 24, 1975, Ser. No. 552,216
Claims priority, application Switzerland, July 15, 1970, 10721/70
Int. Cl.[2] A61F *1/24;* A61B *17/18;* C22C *14/00, 11/00*
U.S. Cl. 3—1.9 18 Claims



1. Implant for bone, joint or dental surgery consisting essentially of a worked and heat-treated alloy composition having full tissue compatibility and a tensile strength of not less than about 100 kg/mm² and fatigue strength of at least about 40 kg/mm², said alloy composition consisting essentially of:
i. a first component constituting about 3% to about 30% by weight of said alloy composition, said first component consisting essentially of not less than one member selected from the group consisting of niobium, tantalum, chromium, molybdenum, aluminum; and the balance
ii. a second component of said alloy composition consisting essentially of not less than one member selected from the group consisting of titanium and zirconium;
wherein the sum of the weights of chromium, molybdenum, and aluminum in said alloy composition amounts to at least 20% by weight of said alloy composition, and the weight of zirconium therein amounts to not more than 75% by weight of said alloy composition; said alloy composition being free from copper, cobalt, nickel, vanadium and tin, apart from the usual impurities.

4,040,130
WRIST JOINT PROSTHESIS
George R. Laure, Kalamazoo, Mich., assignor to Laure Prosthetics, Inc., Portage, Mich.
Filed Oct. 12, 1976, Ser. No. 731,795
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 9 Claims

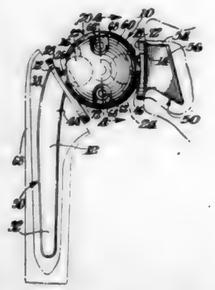


1. An endoprosthetic joint for a wrist comprising:
means defining a first, or wrist, member including a socket and having also a prong projecting therefrom, an intermediate member related to the socket of said first member for pivotal motion with respect thereto in only a first plane and a second, or finger, member related to said intermediate member for pivotal motion with respect thereto in only a second plane, said first being at a substantially right angle with respect to said second plane and means associated with said finger member for connecting same to finger bones.

4,040,131
TRISPHERICAL PROSTHETIC SHOULDER DEVICE
Anthony G. Gristina, Winston-Salem, N.C., assignor to Howmedica, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 681,805, April 29, 1976, Pat. No. 4,003,095. This application Jan. 7, 1977, Ser. No. 757,559
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 6 Claims

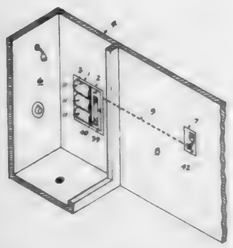
1. A trispherical prosthetic shoulder device comprising a relatively small ball-headed humeral component of a biocompatible metal, a humeral stem on the ball-headed humeral component for affixing it to the intermedullary canal of the humerus, a humeral flange separating the ball-headed component from the stem, a ball-headed scapular component of a biocompatible metal, a scapular stem on the scapular component for attaching it to the scapular region of the shoulder, a scapular flange separating the scapular ball from the scapular stem, a spheroidal ball-capturing member having a pair of spherical sockets disposed substantially 180° from each other, the ball-capturing member comprising a pair of biocompatible cutout plastic hemispheres sharing the sockets between them, clamping means joining the hemispheres together whereby the ball heads are rotatably trapped in the sockets to provide a substantially stable shoulder prosthesis with a substantially

wide range of movement, and the clamping means comprising a pair of metal shells substantially surrounding and enclosing



the hemispheres and fastening means joining the metal shells together.

4,040,132
BACKSCRUBBER
George Braun, 471 Lakeshire Drive, Daly City, Calif. 94015
Filed Feb. 20, 1976, Ser. No. 659,980
Int. Cl.[2] A47K *3/22, 7/00*
U.S. Cl. 4—158 **8 Claims**

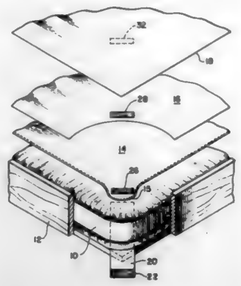


1. In a remotely driven backscrubber device for a bath enclosure, the combination with
- a casing open inwardly of the enclosure,
- at least one cylindrical scrubber rotatably mounted in said casing and partially projecting into said enclosure,
- a closed compartment adjacent said casing,
- transmission means in said compartment,
- and means to drivingly connect said transmission means to said scrubber for transmitting rotation to said scrubber, of
- a motor case mounted remotely from said casing and said closed compartment and entirely outside of said enclosure,
- an electric motor drive in said case,
- an insulated drive line extended from said electric motor drive into said closed compartment,
- insulated means in said closed compartment to couple said drive line to said transmission means to transmit rotation from said remote motor drive to said scrubber

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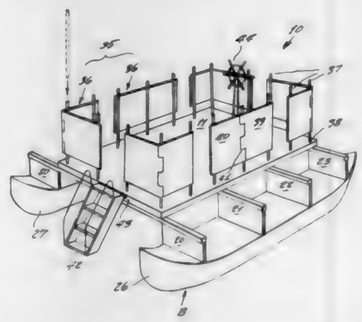
4,040,133
BEDDING ATTACHMENT SYSTEM
Murvin Bruce Gilreath, 4047 Mistral Drive, Huntington Beach, Calif. 92649
Filed June 28, 1976, Ser. No. 700,287
Int. Cl.[2] A47G *9/04*
U.S. Cl. 5—320 **3 Claims**

1. A bedding attachment system for a waterbed comprising:
- a mattress substantially filled with liquid;
- a frame having a bottom wall and side walls supporting and surrounding said mattress;
- a separate bedding attachment strap for each corner of the mattress, each strap having one end portion captured between the bottom wall of the frame and the mattress by the weight of the mattress, each of the strap end portions beneath the mattress extending diagonally approximately toward the opposite corner of the mattress, the length of the strap portion beneath the mattress being long enough such that the weight of the mattress will retain the strap in



position and yet short enough that one person can position the strap by grasping the corner of the mattress and pulling it back from the frame, the other end of said strap extending upwardly between the mattress edge and the surrounding frame; and
- bedding attachment means formed on said strap other end for releasable attachment to bedding to be placed on the mattress.

4,040,134
PONTOON BOAT
Alvin Downing, 3939 N. Dayton Lake View Road, New Carlisle, Ohio 45344
Filed Sept. 27, 1976, Ser. No. 727,178
Int. Cl.[2] B63B *7/00*
U.S. Cl. 9—2 F **2 Claims**



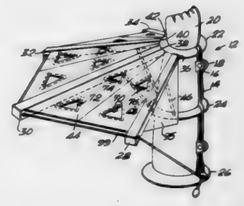
1. A pontoon boat, comprising in combination, a rectangular main frame having a deck thereupon, said main frame including a pair of longitudinally telescopic tubes and a plurality of four transverse telescoping tubes, said transverse telescoping tubes being sidewardly extendible beyond a side edge of said main frame, outward extended sections of said transverse telescoping tubes each being secured to a mounting frame, said mounting frame being secured to two pontoons, each of which is made of a standard canoe, and said pontoons consisting of said canoes being filled with a suitable light weight and cellular flotation material, said canoes being covered so as to be watertight and serving as a strong decking, each said outward section of said transverse telescoping tubes being hingedly pivotable, so that said pontoons are pivotable between a position along each side of said main frame and a position upon said deck; a strengthener being insertable into each of said transverse telescoping tubes for bridging said hinge, in order to rigidly lock said outward section thereof to a remainder of said transverse telescoping tube; a pair of wheel assemblies pivotally attached to an underside of said main frame for being upwardly retracted out of the way, or in a downwardly extended position for travel upon a highway, said wheel assemblies in downward extended position being secured by braces; said pontoon boat including a forwardly telescoping tongue for attachment to a towing vehicle, said pontoon boat including a forwardly pivotable ladder secured by a hinge to a forward edge of said deck; and a removeable rail around a periphery of said deck being comprised of a plurality of railing sections spaced apart end to end, each one of said railing sections being comprised of three vertical posts and a pair of panels, both of which are supported pivotally by hinge means from a center of said posts.

4,040,135
EMERGENCY LOCATOR SYSTEM FOR LOCATING AND RETRIEVING SUNKEN VESSELS
Ruben Robert Arnold, 21641 Zamora Lane, Huntington Beach, Calif. 92646
Filed Nov. 20, 1975, Ser. No. 633,922
Int. Cl.[2] B63B *21/52*
U.S. Cl. 9—9 **12 Claims**



1. An Emergency Locator System for locating and retrieving sunken vessels and locating vessels in distress comprising in combination;
- a base adapted to be mounted on an external surface of a vessel in spaced apart relationship thereto to permit air and water to flow between a base lower surface and the vessel external surface on which the base is mounted, said base further comprising a hydrostatic pressure sensing float holding and release means, having a pressure sensing flexible diaphragm member mounted on the base lower surface for actuating a float holding and release trigger means, said trigger means adapted to fixedly hold a buoyant marker float means releasably mounted on said base until said base having said float means mounted thereon becomes immersed in a fluid having a pressure greater than a pre-selected pressure below which the said diaphragm will not actuate the said trigger means, said preselected pressure being substantially greater than atmospheric pressures, whereupon said diaphragm actuates said float holding and release trigger means and the float means is released from said base and rises to the water surface, said base having one or more U-shaped grapple cables fixedly connected to a top surface of said base and being adapted further for being fixedly attached at cable ends to the vessel surface;
- said buoyant marker float means adapted for releasably mounting on said base in spaced apart relationship for permitting air and water to circulate between base side and top surfaces and a float under side, said underside being adjacent to said base side and top surfaces when said float means is mounted on said base, said float means having a plurality of base float holding trigger means engaging shoulders for engaging said trigger means in releasably locked position when said float means is mounted on said base; and
- a locator line connecting said float means to said base for maintaining float to base connection when the float means is released from the base and rises to the water surface and for guiding a diver and a retrieving grapple hook means connected to a retrieval cable to the grapple cables for hooking a grapple hook means to said grapple cables.

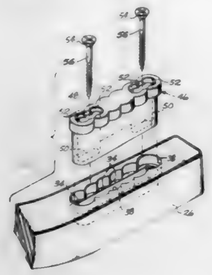
4,040,136
WING TO SWIM
Onofre S. Garcia, 77 Prospect St., Newark, N.J. 07105
Division of Ser. No. 500,921, Aug. 27, 1974, Pat. No. 3,913,516, which is a continuation-in-part of Ser. No. 409,277, Oct. 24, 1973, abandoned. This application May 9, 1975, Ser. No. 576,046
Int. Cl.[2] A63B *31/00*
U.S. Cl. 9—302 **1 Claim**



1. A device for attachment to a member to be manipulated in water to cause forces of propulsion, said device comprising:
- a sleeve having a first end zone and a second end zone and being characterized by a longitudinal centerline,
- a plurality of equi-spaced struts each of a common length and each having a first end and a second end,
- pivot means connecting the first end of each strut to the first end zone,
- said struts being swingable from a first position of general alignment of said struts with said sleeve and a second position of said struts extending radially outwardly and rearwardly toward said second end zone;
- stop means to limit swinging movement of the second end of each of said struts toward said first end zone,
- said stop means defining said second position,
- said second position being such that each of said struts is oriented at a substantially common angle of divergence with respect to the centerline of said sleeve and with the second ends being in a substantially common transverse plane with respect to the sleeve centerline and said second ends defining a curved line in said plane of a substantially common radius from said centerline;
- a flexible canopy connected to each of said struts and spanning the space between said struts and said sleeve; and
- said sleeve being of an axial length greater than the distance between the first end zone and said transverse plane;
- means to connect said sleeve to a member;
- said curved line defines a sector of a circle;
- said sleeve is of flexible material; and
- the device includes tie means to hold the struts in said first position when not in use, said tie means including a draw string connected to said second end zone and to said second end of each strut whereby the second end of each

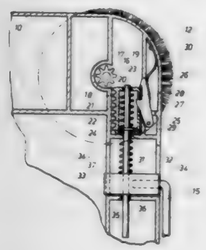
strut may be pulled toward and secured to the second end zone by said drawn string;
a glove portion on said first end zone and opening into said sleeve; and
said sleeve including circumferential reinforcing zones at spaced locations along the length of said sleeve.

4,040,137
BINDING FOR WATER SKI
William H. Fetherston, Bellevue, and Maurice N. Theriault, Renton, both of Wash., assignors to Composite Structures Corporation, Kent, Wash.
Continuation of Ser. No. 578,732, May 19, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,992
Int. Cl.[2] A63C *15/06*
U.S. Cl. 9—310 AA **8 Claims**



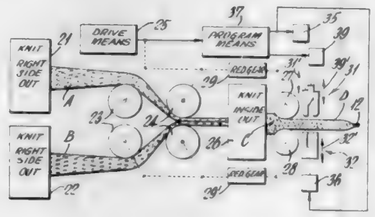
1. A water ski binding for a heel of a person's foot, said binding having an essentially U-shaped hold down member for a resilient heel boot and having longitudinally extending elongate slots on each leg of the U-shaped member for mounting with longitudinal adjustment to the ski, the new combination comprising: means for filling each of the longitudinally extending elongated slots on each leg of the U-shaped hold down member comprising an insert having means for mounting the hold down member to the water ski through holes in the inserts.

4,040,138
DRIVE FOR USE IN A SWEEPING DEVICE
Johannes Liebscher, Nassau, Lahn, Germany, assignor to Leifheit International Gunter Leifheit GmbH, Nassau, Lahn, Germany
Filed Jan. 13, 1975, Ser. No. 540,822
Claims priority, application Germany, Jan. 15, 1974, 2401685
Int. Cl.[2] A47L *11/32*
U.S. Cl. 15—42 **18 Claims**



1. In a sweeping device of the character described, a combination comprising a housing having a front region; at least one corner-sweeping brush mounted in said front region for rotation about an axis; means for rotating said brush about said axis, including a rotating element connected to said brush, and a tranalation element formed with a chamber and mounted in said housing for translation between a retracted position and an extended position, and operative for engaging said rotating element and for rotating the latter during said translation; means for actuating said rotating means at least when said front region reaches an obstruction on a surface being swept so that said brush rotates, whereby dirt is removed from the vicinity of said obstruction, said actuation means including an elongated thrust rod mounted in said housing for displacement in a direction coinciding with the translation of said translation element and extending through said chamber, said thrust rod being formed with a projection accommodated in said chamber, and a spring in said chamber surrounding said thrust rod and abutting against said projection and said translation element and urging the latter away from the former longitudinally of said thrust rod and toward said rotating element.

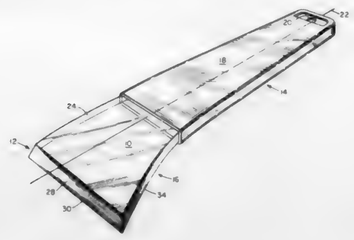
4,040,139
SCOURING PAD OR THE LIKE
George B. Botvin, Cumberland, R.I., assignor to ACS Industries, Inc., Woonsocket, R.I.
Continuation-in-part of Ser. No. 553,509, Feb. 27, 1975. This application June 25, 1975, Ser. No. 590,102
Int. Cl.[2] A47L *17/08*; D04B *21/16*
U.S. Cl. 15—209 B **15 Claims**



2. A scouring pad comprising an axially extending length of loosely knitted pliant outer tubular scouring material, said length being in inside-out orientation, an axially extending length of loosely knitted pliant inner tubular stuffing material within said outer tubular material in face-out orientation and extending to substantially the axial ends of said outer tubular material, said outer material being secured at its ends on compressed generally transverse alignments, thereby retaining closure of both ends of the outer tubular length, in substantial grain-matching relation with the adjacent surface of said inner tubular material.

4,040,140
ICE SCRAPER
Evan Leon Hopkins, Emporia, Kans., and Donald W. Cartner, Kansas City, Mo., assignors to Hopkins Manufacturing Corporation, Emporia, Kans.
Filed May 17, 1976, Ser. No. 687,073
Int. Cl.[2] B60S *1/04*; A47L *17/06*
U.S. Cl. 15—236 R **6 Claims**

1. A scraper for removing ice from a smooth surface, said scraper being adapted to be held in the hand of a user and comprising a one piece body having top and bottom surfaces, said body defining:
a scraping blade at one end thereof comprising
a deflecting surface extending obliquely from said top surface toward said bottom surface, and
a scraping edge;
a handle section remote from said one end located at the extremity of the body of said scraper, said handle section having a longitudinal axis; and
an intermediate section curved to define
a concave portion of said bottom surface extending between said blade and handle section below said axis and
a convex portion of said top surface extending between said blade and said handle section and projecting below said axis;
the transverse dimensions of said body, perpendicular to said axis, being greatest at said blade section and being continuously less toward the end remote therefrom;
said scraper being operable during scraping to permit force to be applied longitudinally of a surface to be scraped with the hand of the user remaining substantially spaced from the surface to be scraped,
with ice thrown by the deflecting action of said deflecting surface and said convex portion of said top surface being substantially deflected away from said hand of said user, and
with said deflecting surface being oblique relative to said surface to be scraper;



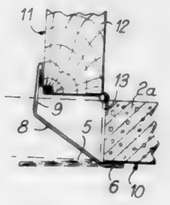
said handle section, on lateral edges thereof, providing a generally wedge shaped handle configuration operable to progressively resist pushing force imposed on said handle section and directed toward said scraping blade;
said convex portion of said top surface being progressively more steeply inclined away from said longitudinal axis of said handle section and operable to provide the greatest resistance to movement of ice over the top surface of said scraper adjacent said scraping blade;
said handle section being grippable on the underside thereof adjacent a free end of said handle section; and
said intermediate section, or said convex portion of said top surface being substantially free of obstructions to the removal of ice therefrom.

4,040,141
WINDSHIELD WIPER INSTALLATION
Alvan D. O'Steen, 1813 S. Dixie, West Palm Beach, Fla. 33401
Continuation-in-part of Ser. No. 513,573, Oct. 10, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,701
Int. Cl.[2] B60S *1/04*
U.S. Cl. 15—250.19 **3 Claims**



1. In combination with a vehicle having a windshield including an arcuate, convex outer surface and a lower horizontal margin, a windshield wiper shaft adjacent the margin and a windshield wiper assembly for wiping an arcuate sector of the upper convex surface bordered by a portion of the lower horizontal margin, said windshield wiper assembly including:
a support arm with a first end zone and a second end zone and said arm being normally disposed below the horizontal margin of the windshield at an "at rest" parked position,
means to mount the second end zone to said shaft for cyclical movement of said arm through an arc over a portion of said convex outer surface adjacent said lower horizontal margin;
an elongate wiper blade holder portion having a first end, a second end and an intermediate length with a mid-zone, and means mounting the mid-zone to the first end zone of said support arm for movement therewith from said normal "at rest" parked position below the horizontal margin and cyclically through said arc;
said assembly including a resilient blade portion extending longitudinally of said elongate blade holder portion and projecting toward said horizontal margin and convex outer surface,
means holding said blade portion to said holder portion and including means normally spring urging the resilient blade outwardly of the holder portion and toward wiping engagement with the convex outer surface,
a blade parking means on the vehicle and means to fix the blade parking means below the horizontal margin and said parking means including structure projecting laterally toward the elongate blade holder portion on said support arm when said arm is at the at rest position,
said blade parking means comprising a first and a second cam block element in spaced relation with respect to one another and each including a cam track extending vertically and diverging angularly from said convex outer surface adjacent the horizontal margin of the windshield and having a portion comprising a support portion when said wiper blade is in the at rest position,
said elongate blade holder portion having a first and a second cam follower surface each adjacent said first and second ends respectively and each engaging respectively said first and second cam block element at said support portions when at the at rest position and said cam follower surfaces being adapted to progressively bias the elongate wiper blade holder portion and the resilient wiper blade out of engagement with the vehicle upon movement below the horizontal margin of the windshield to the at rest position, whereby movement of the at rest position of the windshield wiper assembly results in the resilient wiper blade being spring urged into engagement with the outer convex windshield surface portion, said follower surfaces each comprising outwardly projecting portions and
said cam tracks each including said cam surface and side guide surfaces sized to receive said projecting portions of the cam follower surfaces therebetween to constrain the same to movement to the at rest position and to maintain the assembly against lateral forces.

4,040,142
SAFETY DEVICE MORE PARTICULARLY FOR RABBET OF DOOR
Marceau Ippolito, Lot 55, Rue des Tiamas, Abidjan, Ivory Coast
Filed July 7, 1975, Ser. No. 593,315
Claims priority, application France, Aug. 13, 1974, 74.27992
Int. Cl.[2] E05D *11/00*
U.S. Cl. 16—137 **6 Claims**



1. In combination with a door or the like, mounted by a hinge to a supporting casing, a safety device for covering the

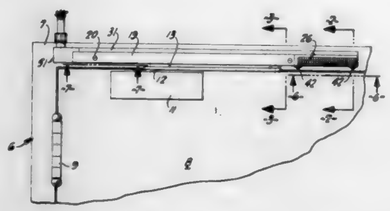
gap between the door and casing, comprising a bellows having four parallel panels, the opposing outer panels of which being attached respectively, to the door and the casing on the side opposite the hinge, inner panels of which being articulatingly connected therewith and with each other in a manner so that when the door is closed said panels automatically fold over each other and flat over the door itself, the inner panel associated with the outer side panel attached to said door being narrower in width than the other inner panel, and said other inner panel folds over said smaller panel when said door is closed.

4,040,143

RELEASABLE DOOR HOLD-OPEN DEVICE

Thomas R. Lasier; William G. Rodseth, and Raymond H. Schnarr, all of Princeton, Ill., assignors to Schlage Lock Company, San Francisco, Calif.

Filed Aug. 6, 1976, Ser. No. 712,237
Int. Cl.[2] E05F *15/20*
U.S. Cl. 16—48 J **7 Claims**



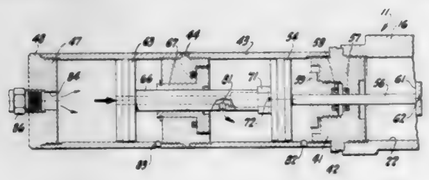
1. A releasable door hold-open device comprising an elongated channel defining an internal guide, a door connector, a traveller on said door connector adapted to travel in a predetermined path in said guide, holding means on said channel movable between a first position in engagement with said traveller and a second position out of engagement with said traveller, a solenoid adapted when energized to hold said holding means in said first position, means for mounting said solenoid at one end of said elongated channel, an electric smoke detector, means for mounting said detector at the other end of said elongated channel, at least one electrical conductor connected to said detector and to said solenoid, and means for disposing said conductor along said channel at one side of but out of said path.

4,040,144

DOOR ASSISTER

Thomas R. Lasier, and Raymond H. Schnarr, both of Princeton, Ill., assignors to Schlage Lock Company, San Francisco, Calif.

Filed May 24, 1976, Ser. No. 689,103
Int. Cl.[2] E05F *3/00*
U.S. Cl. 16—66 **7 Claims**



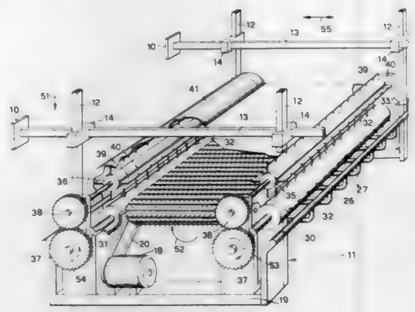
1. A door assister for a door closer having a cylinder with a piston movable in a predetermined direction therein against a resistance for door opening movement comprising a cylindrical shell, means for securing said shell to one end of said cylinder as a continutation thereof, a booster plunger movable in said shell in said predetermined direction and adapted to abut said piston, means cooperating with said shell for defining a booster compartment partially bounded by said booster plunger, a main plunger movable in said shell in said predetermined direction and adapted to abut said booster plunger, means cooperating with said shell for defining a main compartment partially bounded by said main plunger, and means for supplying said booster compartment and said main compartment with fluid under pressure insufficient to move said piston against all of said resistance.

4,040,145

MACHINE FOR LOOSENING AND REMOVING TEXTILE FIBERS FROM FIBER BALES

Angelo Marzoli, Bergamo, Italy, assignor to F. lli Marzoli & C. S.p.A., Palazzolo Sull'Oglio, Italy

Filed May 18, 1976, Ser. No. 687,601
Claims priority, application Italy, May 21, 1975, 23584/75
Int. Cl.[2] D01G *7/06*
U.S. Cl. 19—81 **8 Claims**



1. An apparatus for loosening and removing textile fibres from bales, said apparatus comprising a framing adapted to contain at least one fibre bale, a carriage supported from said framing with means for vertical and horizontal translation movement for movement relative to said bale, a driven carding cloth mounted on said carriage, said cloth having upper and lower traveling laps and lateral edges, bars on said carriage extending below said carding cloth, said bale having a top surface engaged by said bars when the carriage is lowered, said carding cloth having an active surface for contacting said top surface of the bale and removing fibres therefrom when the carriage is lowered and the bars engage the bale, said bars extending substantially parallel to said active surface of the carding cloth and arranged crosswise relative to the direction of travel of the laps of the carding cloth, conveying cylinder means on said carriage on each side of the carding cloth for removing fibres from said bale and bringing the fibres onto the upper lap of the carding cloth upon horizontal movement of the carriage, motor means for driving said conveying cylinder means in rotation for bringing the fibers removed from said bale onto the upper lap of the carding cloth, each said conveying cylinder means including a conveying cylinder with metal spikes projecting between said bars; and means for removing fibre from said carding cloth.

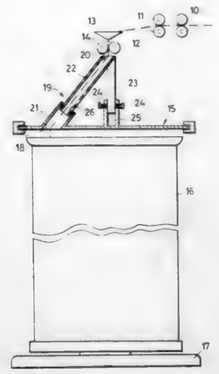
4,040,146

DEVICE FOR DISTRIBUTING TEXTILE FIBER SLIVERS INSIDE COLLECTION BOXES IN SPINNING PREPARATION MACHINES

Angelo Marzoli, Bergamo, Italy, assignor to F. lli Marzoli & C. S.p.A., Palazzolo Sull'Oglippo, Italy

Filed Feb. 23, 1976, Ser. No. 660,314
Claims priority, application Italy, Feb. 27, 1975, 20727/75
Int. Cl.[2] B65H *54/80*
U.S. Cl. 19—159 R **4 Claims**

1. Device for distributing textile fiber slivers inside collection boxes in spinning preparation machines, in particular at the outlet of drawing frames, comprising a plate rotating above a collection box, an eccentric outlet on said plate, a duct fixed to said plate, said duct having a substantially axial inlet and an eccentric outlet, and guide calenders, said eccentric outlet being connected by said duct to said axial inlet facing said guide calenders for the sliver leaving the machine, said duct comprising two tubular portions, one portion being partially inserted in the other, one portion defining the duct inlet, said tubular portions forming an annular passage external to the



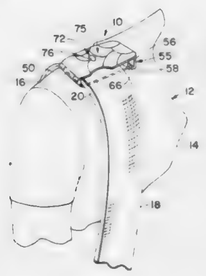
portion defining the duct inlet, said annular passage being formed between said tubular duct portions and communicating with the atmosphere at one end and with the eccentric outlet of the duct at the other end; an axial rod fixable to said plate and having a free end, means for adjusting the spacing of the free end of the axial rod from said plate, the inlet portion of the duct being supported at said inlet by said axial rod fixable to said plate, the height of said inlet portion being adjustable by said adjusting means.

4,040,147

SHOULDER STRAP RETAINER

Marguerite King, Trevecca Towers 11 Apt. 1431, 84 Lester Ave., Nashville, Tenn. 37210

Filed July 19, 1976, Ser. No. 706,176
Int. Cl.[2] A44B *9/00*
U.S. Cl. 24—86 A **5 Claims**



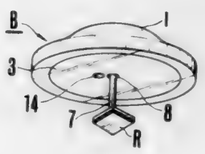
1. A shoulder strap retainer comprises:
a. a base having a fixed end and free end adapted to be positioned on the exterior shoulder portion of a garment;
b. securing means attached to the undersurface of said base for removably securing said base to the exterior shoulder portion of the garment, said securing means includes a pin pivotally mounted at one end thereof, with the other end having a point for piercing the garment and releasably held in place relative to said base;
c. a flexible cover having a free end and a fixed end attached to said fixed end of said base for movement between open and closed positions and extending in a common overlapping plane for defining a pocket to contain the shoulder strap;
d. locking means for retaining said flexible cover releasably secured to the free end of said base to retain the strap in the pocket, said locking means integrally formed with said flexible cover and having a downwardly projecting arm terminating in an inwardly projecting catch designed to slightly overhang the free end of said base to retain said flexible cover in the closed position of the retainer;
e. releasing means for disengagement of said catch from the free end of said base so that said strap is positionable into or out of the pocket, said releasing means including fulcrum means laterally displaced from said free end of said base and vertically extending above said base by a distance such that a manually applied downwardly extending force against said cover between said fixed end and said fulcrum means causes a deflection of said cover therebetween and an angular outward displacement of said catch for disengagement with said free end of said base so that release thereof is obtained, and
f. means for pivotably securing said fixed end of said base and said cover together, such that said cover may be opened into non-overlapping relation with said base to permit the strap to be placed in position on said base.

4,040,148

BUTTON FOR CLOTHES

Noriyoshi Fukumoto, No. 942 Shimoishihara, Chohu, Tokyo, Japan

Filed Sept. 10, 1975, Ser. No. 611,946
Int. Cl.[2] A44B *1/38*
U.S. Cl. 24—108 **6 Claims**



1. A button for clothes comprising in combination: a button body and a reverse button as a set; said reverse button having an integrally formed needle member and an arrowhead portion formed protrudely at the tip of the needle member; said button body formed by an ornament member having an inside cavity with a bottom opening and a base plate; said base plate having an axial hole for insertion of the needle member and being formed in the center of the base plate as a through hole; said base plate having a concave surface formed on its upper surface to place an engaging disc member on the concave surface; said engaging member formed of a thin plate material having resiliency including a ring portion to be retained by the base plate at the lower edge of the ornament member and an engaging means for engaging the needle member inserted in the axial hole of the base plate; said engaging means being formed of a pair of pawl pieces extending toward the center from the right and left symmetrical positions of the ring portion; said pawl pieces being opposed to each other at their tip portions to form a circular hole by semi-circular notched portions of the tip portions; said needle member inserted into the axial hole of the base plate; said engaging means being such that the diameter of the axial hole of the base plate is sufficient to allow the insertion of the arrowhead portion of the needle member of the reverse button; said circular hole formed by said semicircular notched portions of said two pawl pieces of the engaging member being made to coincide with the axial hole of the base plate; said circular hole being made to have a slightly smaller diameter as compared with that of the axial hole of the base plate; said circular hole diameter being sufficient to effect meshing engagement at the reverse side of the arrowhead

portion of the needle member; said base plate being formed with a through hole and being provided with a detaching means for removing the reverse button engaged on the button body, and said detaching means being such that the through hole being formed at a position where one of the pawl pieces of the engaging member is located and also a position closer to the tip of said pawl piece.

4,040,149

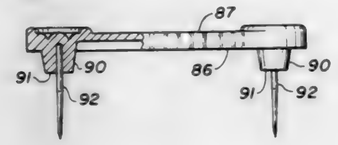
MOUNTING EYE

Ruediger Einhorn, Katonah, N.Y., assignor to Coats & Clark, Inc., Stamford, Conn.

Division of Ser. No. 489,051, July 16, 1974, Pat. No. 3,911,516. This application July 22, 1975, Ser. No. 598,065

Int. Cl.[2] A44B *9/00, 21/00;* **F46G** *11/00*

U.S. Cl. 248—493 **6 Claims**



1. In a hanger for mounting a picture to a wall wherein the hanger is adapted to be mounted to the back of a picture frame to suspend the same from a wall; the improvement wherein said hanger comprises a picture wire of suitable length having spaced ends and a pair of push pin members each having a base portion and a wire end receiving loop portion extending from said base portion, said base portion having a flat surface, whereby said loop portion extends in a plane at an acute angle to the plane of said flat surface and a pin having an end completely embedded in said base portion and a sharpened end extending through said flat surface at an acute angle to the plane of said flat surface, said pin extending substantially normal to the plane of said loop portion.

4,040,150

SLIDE FASTENER HAVING DISCRETE COUPLING ELEMENTS

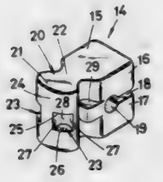
Takeo Fukuroi, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Mar. 18, 1976, Ser. No. 668,042

Claims priority, application Japan, Mar. 27, 1975, 50-41734[U]

Int. Cl.[2] A44B *19/06*

U.S. Cl. 24—205.13 R **3 Claims**



1. In a slide fastener of the type including a pair of stringer tapes, and a series of uniformly spaced fastener elements carried on each of said stringer tapes, each of the fastener elements having generally rectangular body which has a coupling end portion and a pair of parallel spaced apart legs extending rearwardly therefrom to hold a longitudinal edge portion of said stringer tapes therebetween, said coupling end portion projecting beyond the longitudinal edge at right angles to the axis of the slide fastener, and having a rounded head and a neck integral therewith, said head and said neck being complementary in shape to each other, said neck portion being defined by a pair of recesses disposed symmetrically with respect to the axis of said body, the improvement wherein said head portion has a pair of openings formed in the rounded front end face thereof, each of said openings being defined by a pair of parallel spaced apart, opposed upper and lower flat walls and a pair of vertical walls extending therebetween, said vertical walls extending at an angle to each other, and said neck portion including a pair of lugs at sides thereof adjacent said legs, said lugs being complementary in shape to said openings and so disposed as to snugly fit in the corresponding openings of adjacent fastener elements of the companion stringer tape when the fastener elements on said tapes are coupled together, said lugs having flat surfaces that engage respective upper and lower flat walls of said openings to limit relative tilting displacement of coupled adjacent fastener elements when said tapes are flexed.

4,040,151

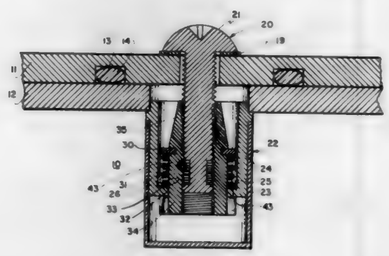
PARTIAL TURN PANEL FASTENER

Collen Kieth Brimm, 2981 Ditch Road, Simi Valley, Calif. 93063

Filed Feb. 19, 1976, Ser. No. 659,585

Int. Cl.[2] A44B *17/00;* **F16B** *19/00*

U.S. Cl. 24—221 K **4 Claims**



1. Partial turn fastening means adapted to hold a first and second apertured members together, comprising;

a receptical positioned on one side of said second member over the aperture therein; and

a retaining assembly including key portions extending through the aperture in the first member into engagement with the receptical in said second member;

said receptical including a slot and a region for holding the key portion of said retaining assembly through said slot upon partial turn of said key portion;

said retaining assembly including a screw with its head on the exposed side of said first member and a sleeve having threads mated with said screw, said sleeve including said key portion; and

spring means engaging said receptical and said sleeve for partially ejecting said sleeve when said key member is not in an engagement with said receptical; and

said screw, sleeve and receptical constituting the fastening pressure applying elements of said fastening means without spring elements therebetween.

4,040,152

SADDLE FOR U-BOLT CLAMP

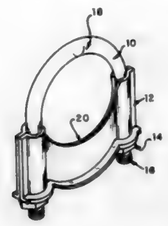
Carl Gilgallon, 24407 Tamarack Circle, Southfield, Mich. 48075

Filed Jan. 7, 1977, Ser. No. 757,501

Int. Cl.[2] B65D *63/00;* **F16L** *33/10*

U.S. Cl. 24—277 **8 Claims**

1. A saddle for a U-bolt clamp comprising two thicknesses of sheet metal secured together in face-to-face relation by spot welding, said saddle having a central flat web provided with upright parallel tubular portions adjacent the laterally opposite ends thereof for slideably receiving the threaded legs of a U-bolt, the upper edge of said web between said tubular portions being of generally semicircular shape to encircle approximately one-half of the circular periphery of a pair of telescopically engaged tube sections, the lower edge of said web being



defined by a pair of flanges turned outwardly in opposite directions from the plane of said web and extending throughout the width of said web between said bolt-receiving portions, said sections being spot welded together at least along a line adjacent the lower edge of said web.

4,040,154

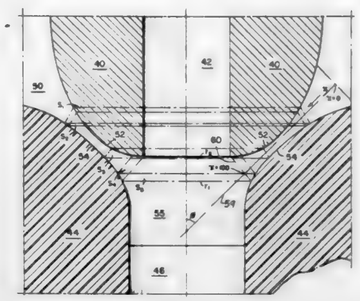
JET TEXTURING PROCESS AND APPARATUS

Myrne Rodney Riley, Fayetteville, N.C., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 533,600, Dec. 17, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,307

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—273 **14 Claims**



1. A jet nozzle for texturing thermoplastic yarn, comprising:

a fluid chamber;

a needle element positioned in said fluid chamber, said needle element having an axial yarn passage therethrough;

a throat element positioned downstream of said needle element, said throat element having an axial yarn passage aligned with the axial passage of said needle element;

The respective adjacent surfaces of said needle element and said throat element defining between them a flow passage communicating with said fluid chamber and converging toward said yarn passage of said throat element for flow of fluid therethrough to a yarn impingement zone;

said flow passage further characterized in that, on a succession of hypothetical frusto-conical sections taken along said flow passage in the direction of flow in such fashion that the surface of each of said sections is perpendicular to the direction of flow through said flow passage, the projections of the respective flow areas thereon become initially successively smaller and then successively larger so that the magnitudes of said successive areas pass through a minimum without undergoing any mathematical discontinuity, whereby a fluid passing through the flow passaage areas is accelerated to a velocity in excess of Mach 1 prior to impingement upon yarn in the yarn impingement zone and impinges upon the yarn in the yarn impingement zone at a velocity in excess of Mach 1 and at an angle causing texturing of the yarn.

4,040,153

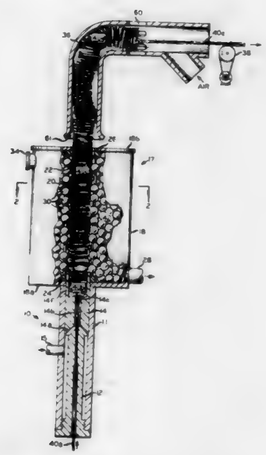
METHOD AND APPARATUS FOR RESTRAINING A YARN WAD

Charles S. Hatcher, Greenville, and Gary S. Atchley, Pauline, both of S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 8, 1976, Ser. No. 674,806

Int. Cl.[2] D02G *1/20, 1/16, 1/12*

U.S. Cl. 28—221 **12 Claims**



1. Apparatus comprising:

a first cylinder having first and second annular members and an inner wall;

a second cylinder having inner and outer walls, said second cylinder being positioned inside, adjacent to and coaxially aligned with said first cylinder, said second cylinder having a plurality of troughs communicating the inner and outer surfaces thereof; and

a plurality of balls of sufficient size to be retained within the space defined by the inner wall and the first and second annular members of said first cylinder and the inner wall of said second cylinder but of sufficient size to permit the surfaces of a portion of the balls to extend beyond the inner surface of said second cylinder.

4,040,155

APPARATUS FOR CRIMPING SYNTHETIC THERMOPLASTIC FIBERS

James K. Hughes, Bartlesville, Okla., and Wayne K. Erickson, Greenville, S.C., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 319,136, Dec. 29, 1972, Pat. No. 3,911,539. This application Aug. 26, 1975, Ser. No. 607,972

Int. Cl.[2] D02C *1/12*

U.S. Cl. 28—248 **7 Claims**

1. Apparatus for crimping synthetic thermoplastic fibers in the presence of steam, comprising, in combination:

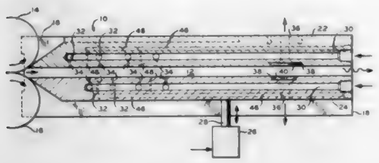
a compaction chamber having an upstream end and a downstream end;

means for continuously feeding said fibers into said upstream end of said chamber into contact with a mass of crimped fibers held compacted therein and cause said introduced fibers to form crimps therein as they contact said mass, and for advancing said fibers substantially unformily and

successively through a defined first region of low but increasing steam pressure, a defined second region of relatively high and substantially constant steam pressure, and a defined third region of decreasing steam pressure, of said chamber;

first conduit means for introducing steam into and transverely across said chamber at a first location adjacent but downstream from said upstream end of said chamber, with said first region being defined at its upstream end by said upstream end of said chamber and at its downstream end by said first location of steam introduction;

second conduit means for introducing additiona steam into and transversely across said chamber at a second location spaced apart from the downstream from said first location,



with said first and second locations of stream introduction establishing and defining therebetween and second region of said chamber, and with said third region of said chamber being defined at ist upstream end by said second location of steam introduction;

wherein said first location is the most upstream location for introducing steam into said chamber, said second location is the most downstream location for introducing steam into said chamber, and both of said first and second locations are located in the upstream one-half of said chamber;

means for obtaining a measurement of the steam pressure in said second region; and

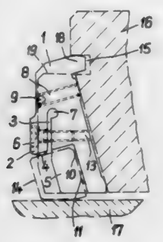
flow control means for controlling the flow rate of steam through said conduit means responsive to said pressure measurment and thereby maintaining said substantially constant steam pressure in said second region.

4,040,156

ADJUSTING DEVICE FOR MILLING CUTTERS

Hans Tack, Heiligenhaus, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter, Essen, Germany

Filed Apr. 16, 1976, Ser. No. 677,852
Claims priority, application Germany, Apr. 17, 1975, 2516944
Int. Cl.² B26D *1/00*
U.S. Cl. 29—96 **4 Claims**



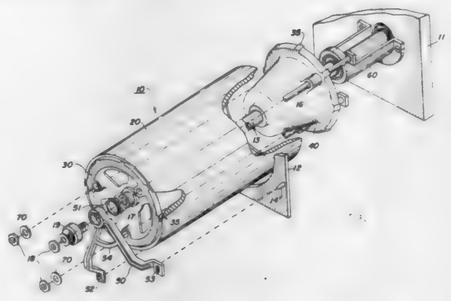
1. In a blade holder component secured to a revolving milling cutter body and having wall means defining a recess for receiving a cutting blade and supporting the cutting blade inserted in the recess; an adjusting device having a resiliently deformable tongue forming an integral part of the blade holder component and being in engagement with the cutting blade; a set screw connected to the resiliently deformable tongue for changing the position of the latter to adjust the orientation of the cutting blade in the recess; the improvement wherein said resiliently deformable tongue is defined by a single slot extending into the blade holder component from the zone of the blade-receiving recess, said tongue having a root and a free terminal portion, said free terminal portion including a support area for engaging the cutting blade received in said recess; said set screw passing through said tongue and traversing said single slot, said set screw having a head engaging, with a shoulder, said tongue; said set screw having an end portion threadedly engaged in said blade holder component adjacent said tongue.

4,040,157

DRUM SUPPORT APPARATUS

Alan L. Shanly, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 8, 1976, Ser. No. 647,486
Int. Cl.² B21B *31/08*
U.S. Cl. 29—123 **10 Claims**



1. In a drum support apparatus including a shaft, outboard and inboard endbells releasably connected by tierods and adapted to be placed on the shaft for supporting a drum thereon; the improvement comprising:

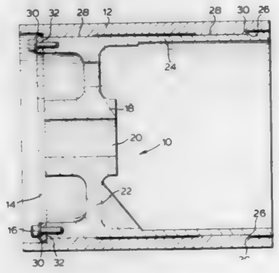
non-penetrating means on the surface of said outboard and inboard endbells immediately adjacent the inner surface of said drum for reducing the contact area where interface fit between the endbells and the drum occurs to thereby diminish drum run-out.

4,040,158

STEEL MILL ROLLS

Frederick George Payne, Dundas, Canada, assignor to Canron Limited, Montreal, Canada

Filed May 17, 1976, Ser. No. 686,717
Int. Cl.² B21B *31/08*
U.S. Cl. 29—123 **5 Claims**



1. A roll construction comprising:

a core member adapted for mounting upon a shaft;

an outer shell member; and

a retaining member;

the core member having an outer surface of uniform radius extending from and including one end and being provided at the other end with a radially-outwardly-extending shoulder;

the outer shell member being an axial sliding fit on the said core member outer surface and having respective radially-inwardly-extending shoulders adjacent its ends and equally spaced therefrom, each shell member shoulder being engageable with the said core shoulder upon mounting of the shell member on the core member for positioning and retaining the former axially on the latter, the length of the shell member between the said inwardly-extending shoulders being equal to the length of the said core member outer surface whereby the said core member one end and the adjacent shell member shoulder register axially with one another; and

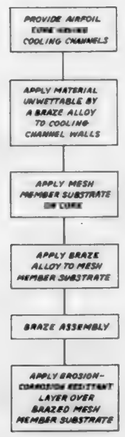
the retaining member comprising a flat ring mounted to the core member said one end and engageable with the axially registering shell member shoulder not engaged by the core member shoulder for retention of the shell member on the core member.

4,040,159

METHOD OF MANUFACTURE OF COOLED AIRFOIL-SHAPED BUCKET

Kenneth A. Darrow, Sprakers; Paul H. Kydd, Scotia, and John W. Daly, Quaker Street, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Oct. 29, 1975, Ser. No. 626,633
Int. Cl.² B23P *15/04*
U.S. Cl. 29—156.8 H **5 Claims**



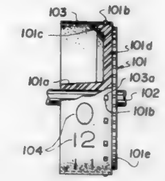
1. A method of forming an airfoil-shaped body which comprises providing an airfoil core having cooling channels recessed into the surface thereof, applying material unwettable by a braze alloy to the surfaces of the cooling channel walls, applying a calendered multilayer flexible mesh member substrate on the core, affixing the mesh member substrate to the core, applying braze alloy to the mesh member substrate, brazing the assembly thereby filling completely the mesh member pores and bonding further the mesh member substrate to the core, and applying an erosion-corrosion resistant layer over the brazed mesh member substrate completing the airfoil-shaped body.

4,040,160

METHOD OF MANUFACTURING SYMBOL INDICATION DRUM

Takashi Funaki, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Division of Ser. No. 585,772, June 11, 1975, which is a continuation of Ser. No. 410,336, Oct. 29, 1973, abandoned. This application July 22, 1976, Ser. No. 707,505
Claims priority, application Japan, Nov. 4, 1972, 47-127312[U]
Int. Cl.² B21D *53/26*; B21K *1/28, 1/42*
U.S. Cl. 29—159 R **14 Claims**



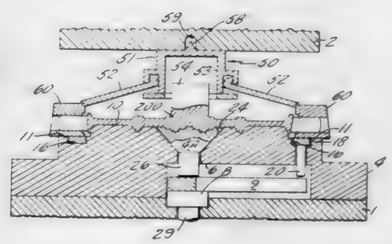
1. The method of manufacturing a rotatable symbol indication drum having indicia extending around its external periphery comprising the steps of forming a drum body including an axially elongated hub, an annular web extending radially from said hub, and a cylindrical rim extending axially from the outer end of said web concentric with said hub; preparing a relatively elongated indicia-carrying belt, having a length substantially equal to the external circumference of said cylindrical rim of said drum body, by providing a series of inked indicia thereon in correctly positioned longitudinal and lateral relation to each other and centered, laterally of said belt, at the same predetermined distance from a reference lateral edge of said belt; forming a series of perforations in said belt in adjacent spaced relation to said reference lateral edge at equal longitudinal spacings from each other and at equal lateral spacings from said reference lateral edge; forming a series of projections on said cylindrical rim of said drum body at equal circumferential spacings from each other equal to the longitudinal spacings of said perforations and at equal lateral spacings from a reference lateral edge of said rim; winding said belt circumferentially around said rim of said drum body by engaging said projections in said perforations; and securing said belt on said drum body; said perforations serving as symbol position ascertaining marks while said projections serve for correctly positioning the symbols around said rim of said drum body.

4,040,161

APPARATUS AND METHOD FOR REMOVING A PLURALITY OF BLADE DIES

George W. Kelch, Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 25, 1975, Ser. No. 635,188
Int. Cl.² B21D *45/00*; B22D *17/00*
U.S. Cl. 29—239 **10 Claims**



1. A rim blade die removal tool comprising a central hub

having a plurality of arms extending radially therefrom, means pivotally connecting one end of each of said arms to said central hub, the outer ends of said arms being contoured, each end of each arm being contoured for engaging an inner surface of one die of a plurality of rim blade dies and moving them radially outwardly when the central hub is moved axially.

4,040,162

METHOD OF PRODUCING COMPOSITE EXTRUDED ALUMINUM PRODUCTS FROM ALUMINUM SWARF

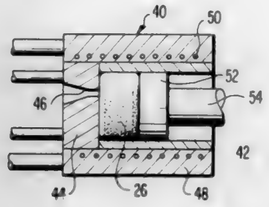
Mitsuyuki Isogai, Okazaki; Kouiti Tikusa, Nagoya, and Yoshiko Nakamura, Anzo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Division of Ser. No. 506,809, Sept. 17, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,168

Claims priority, application Japan, Sept. 17, 1973, 48-104737

Int. Cl.[2] B22F *3/24*

U.S. Cl. 29—420.5 **3 Claims**



1. A method of extruding composite products having a core and an external sheath comprising heating a die plate, pressure plate and an extrusion container at a constant temperature, compressing aluminum swarf into a billet having a bulk specific gravity of 1.4 to 2.1 preheating a billet of cast aluminum and said billet of compressed aluminum swarf to a temperature higher than the temperature of said die plate, pressure plate and extrusion container, placing said billet of cast aluminum in said container adjacent said die plate and placing said billet of compressed aluminum swarf between said billet of cast aluminum and said pressure plate, and forcing said billets through an extrusion orifice in said die plate to form an elongated extrusion having a core of said aluminum swarf and a covering of said cast aluminum.

4,040,163

METHOD FOR MAKING A CONTAINER OF COMPOSITE MATERIAL

Walter Tronsberg, Munich, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Germany

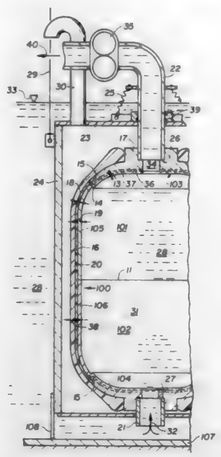
Filed June 30, 1975, Ser. No. 591,945

Claims priority, application Germany, July 5, 1974, 2432378; Nov. 5, 1974, 2452311

Int. Cl.[2] B21D *39/00*; B23P *17/00*; C23F *1/02*

U.S. Cl. 29—423 **14 Claims**

1. A method for producing a container made of composite material including a fibrous component and a bonding filler component, comprising the steps of manufacturing a hollow, dimensionally precise core having the shape of said container and including access openings, applying said composite material to said core, then permitting said composite material to set, and then chemically removing said core by enclosing said container and core in a protective housing in a sealed manner, connecting, also in a sealed manner, a closed loop removal agent circulating circuit to said access openings, immersing said protective housing with said container sealed therein into a removal agent bath which forms part of said closed loop circuit, and circulating a removal agent in said circuit until said



core or portions thereof have been removed through said access openings from the inside of said container.

4,040,164

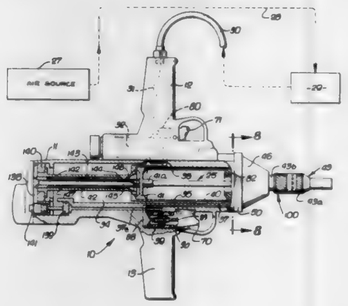
FASTENER DRIVING GUN

Franklin S. Briles, 1301 Dolphin, Corona Del Mar, Calif. 92625

Continuation-in-part of Ser. No. 552,334, Feb. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 379,106, July 13, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 666,447

Int. Cl.[2] B25C *1/04*

U.S. Cl. 29—432 **17 Claims**



15. The method of operating a gun for driving a fastener forwardly in a work bore to seat a fastener therein, the gun including

a. a gun body containing a bore and a piston movable forwardly in the bore,

b. a striker carried by the gun to be driven forwardly by the piston for seating the fastener, a barrel receiving the striker and having telescopically interconnected sections which are relatively adjustable to control the barrel length, and

c. control means carried by the body including a first trigger operable to control passage of gas at a first pressure level to said bore to drive the piston and striker forwardly and a second trigger operable to control passage of gas at a higher pressure level to be controllably fed to said bore to drive the piston and striker forwardly, said method including

d. positioning the gun with the striker in alignment with the fastener partially inserted in the work bore, and with the tip of the barrel engaging the work,

e. operating the first trigger to effect partial seating of the fastener in the bore, and operating both triggers to effect complete seating of the fastener in the bore

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4,040,165

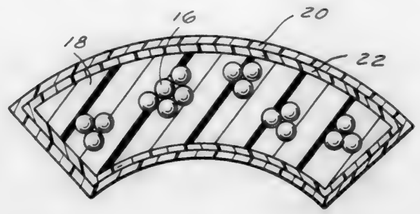
METHOD OF MAKING SYNTATIC MODULES

James D. Miessler, Westfield, and Arne I. Johnson, Springfield, both of Mass., assignors to Albany International Corporation, Albany, N.Y.

Filed Oct. 22, 1976, Ser. No. 734,954

Int. Cl.[2] B23P *3/00, 25/00*

U.S. Cl. 29—458 **12 Claims**



1. The method of providing a pipe member with syntatic modules as floatation devices comprising the steps of:

a. forming a hollow preform mold having surfaces defining a cavity of desired configuration and forming a casting mold having surfaces defining a cavity of similar cross section including an arcuately convex surface for forming one surface of said modules with an arcuately concave surface thereof;

b. forming a woven roving of predetermined size to provide a skin;

c. forming a layer of spacing material of predetermined size and containing a plurality of voids therein;

d. attaching the roving to the spacer material to form a laminate thereof;

e. forming the laminate to the inside walls of the preform mold;

f. filling the preform mold with a plurality of hollow balls;

g. pouring a thin layer of resin into the preform mold to connect the balls and form the composite;

h. removing the composite from the preform mold and placing end sections of spacing material thereon before placing it into the casting mold;

i. adding a syntatic foam resin into the casting mold interior so as to fill all spaces between the balls and all voids in the spacer material;

j. curing said syntatic foam resin and removing said mold parts so as to produce a module;

k. repeating steps *b* through *j* to produce additional like modules; and

l. assembling said module segments around said pipe with the concave surfaces of said modules adjacent said pipe.

2. The method of making syntatic modules comprising the steps of:

a. forming a hollow preform mold having surfaces defining a cavity of desired configuration and forming a hollow casting mold having surfaces defining a cavity of the desired module configuration;

b. forming a woven roving of predetermined size to form a skin;

c. forming a layer of spacer material containing a plurality of voids and being of predetermined size;

d. attaching the roving to the spacer material to form a laminate thereof;

e. forming the laminate to the perform mold;

f. filling the preform mold with a plurality of hollow balls;

g. pouring a thin layer of resin into the preform mold to connect the balls and form a composite;

h. removing the composite from the preform mold and attaching spacer material sections to the ends and placing into the casting mold;

i. adding a syntatic foam resin into the casting mold interior so as to fill all spaces between the balls and all voids in the spacer material; and

j. curing said syntatic foam resin and removing said mold parts so as to produce said modules.

4,040,166

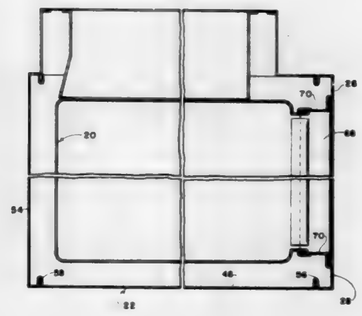
METHOD OF CONSTRUCTION OF INSULATED CABINET

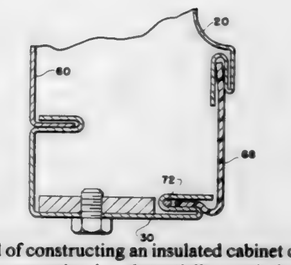
Paul H. Morphy, Prairie Village, Kans., assignor to Hobart Corporation, Troy, Ohio

Filed Aug. 4, 1976, Ser. No. 711,442

Int. Cl.[2] B23P *3/00, 19/04*

U.S. Cl. 29—460 **8 Claims**





1. A method of constructing an insulated cabinet comprising:

rigidly interconnecting in substantially precisely positioned relationship to each other a plurality of structural components to form a substantially rigid main structural frame,

loosely attaching additional components to said main frame in non-rigid relationship to each other and said main frame by mechanical connections permitting limited relative movement between said additional components and said main frame,

said main frame and loosely interconnected additional components defining an outer shell in which the components thereof are capable of relative limited movement,

positioning an inner shell within said outer shell in spaced relationship thereto thereby defining an insulating cavity therebetween,

squaring said outer shell to position said main frame and loosely connected additional components in their desired final relationship to each other,

while maintaining said main frame and said loosely connected additional components in said desired relationship to each other, substantially filling said insulating cavity with a hardenable insulating material, and

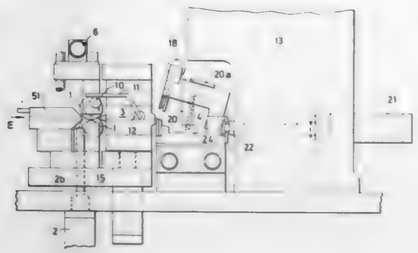
allowing said insulating material to harden in said cavity and fix said main frame and additional components in said desired relationship to each other and with said inner shell positioned in spaced relationship to said outer shell.

4,040,167

METHOD OF AND A MACHINE FOR SEPARATING AND FITTING INSULATED CONDUCTORS OF MULTI-CONDUCTOR RIBBON CABLES TO CONNECTORS IN HOUSINGS

Michael John Jepson, Stapleford, and Bernard Kilbourne, Breaston, both of England, assignors to The Breedon Press Limited, Long Eaton, United Kingdom

Filed Dec. 29, 1975, Ser. No. 644,587
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—564.4 **8 Claims**



1. A machine for fitting insulated conductors of an enlongated, multi-conductor ribbon, electric cable with contacts comprising:

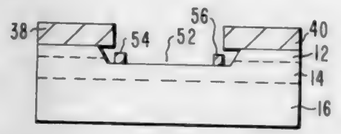
a. separator means for severing the individually insulated conductors at the leading end of said cable;
b. guide means for guiding said cable lengthwise to said separator means;
c. spreading means for transversely spreading the severed conductors;
d. stripping means adapted to receive the spread conductors for baring the leading ends of the same;
e. moving means for withdrawing said cable from said separator means and for locating the leading ends of the spread conductors in said stripping means while holding the conductors stationary;
f. feeding means for feeding a housing containing a plurality of contacts to a position wherein said contacts are adjacent respetive ones of the leading ends of the conductors bared by said stripping means;
g. engaging means for engaging the adjacent contacts with the bared leading ends of said conductors respectively.

4,040,168

FABRICATION METHOD FOR A DUAL GATE FIELD-EFFECT TRANSISTOR

Ho-Chung Huang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,517
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **1 Claim**



1. In a method for making a dual gate field effect transistor comprising the steps of:

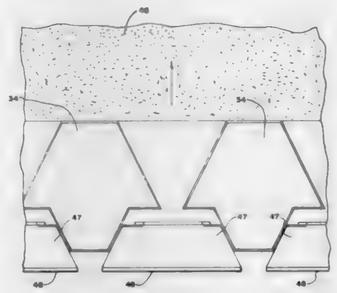
disposing a layer of a conductor adjacent a surface of an N+ layer of a semiconductor substrate;
forming an aperture in the conductor;
forming an aperture in the N+ layer congruent with the aperture in the conductor;
forming a blind aperture in an N layer adjacent the N+ layer congruent with the aperture in the N+ layer;
enlarging the aperture formed in the N+ and N layers whereby the conductor is cantilevered over the apertures in the N+ and N layers;
forming two disjoined contacts from said conductor separated by the apertures; and
disposing a Schottky metal adjacent a principal flat surface of the blind aperture in the N layer via the aperture defined by the conductor;
the improvement comprising the steps of:
disposing a layer of photoresist over the exposed surfaces of the disjoined contacts, the metal and the N+ and N layers;
removing a portion of the photoresist to expose a central region of the Schottky metal located transversely between the disjoined contacts whereby each end region of the metal is located adjacent one of said disjoined contacts and remains covered with a continuously extending portion of said photoresist;
removing the central region of the metal using said photoresist as a mask whereby two laterally spaced Schottky metal gates are formed; and
removing the photoresist remaining.

4,040,169

METHOD OF FABRICATING AN ARRAY OF SEMICONDUCTOR DEVICES

Ralph E. Rose, San Jose, Calif., assignor to Watkins-Johnson Co., Palo Alto and Signetics Corporation, Sunnyvale, both of, Calif.

Division of Ser. No. 447,981, March 4, 1974, Pat. No. 3,930,295. This application Dec. 29, 1975, Ser. No. 644,515
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—577 **6 Claims**



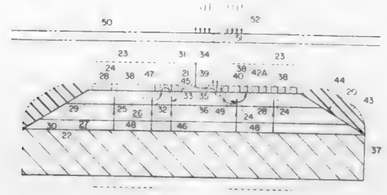
1. In a method of fabricating an array of semiconductor devices on a substrate utilizing an alignment tool having a body with a plurality of spaced apart recesses with outwardly diverging side walls extending to one surface thereof, the steps of: forming a plurality of individual semiconductor devices having bonding pads on one side thereof and inclined side walls diverging toward the bonding pads, placing the individual semiconductor devices in the recesses in the alignment tool with the inclined walls of the semiconductor devices engaging the outwardly diverging walls of the recesses and the bonding pads protruding beyond the surface of the tool, forming a metallized layer on one surface of the substrate, positioning the surfaces of the alignment tool and the substrate in confronting relationship with the bonding pads aligned with predetermined portions of the metallized layer, heating the metallized layer to a predetermined temperature, and pressing the alignment tool and substrate together to bring the bonding pads into contact with the metallized layer and thereby effect bonding of the semiconductor devices to the substrate.

4,040,170

INTEGRATED GATE ASSISTED TURN-OFF, AMPLIFYING GATE THYRISTOR, AND A METHOD FOR MAKING THE SAME

Earl S. Schlegel, Pittsburgh, and Derrick J. Page, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 581,255, May 27, 1975. This application Aug. 24, 1976, Ser. No. 717,079
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—577 **5 Claims**



1. A method of making an integrated amplifying gate thyristor with gate assist turn-off capability comprising the steps of:

A. providing in a semiconductor body having first and second opposed major surfaces impurities to form in the body a main thyristor of four impurity regions of alternate type conductivity disposed alternately through the body between the major surfaces with a PN junction between each region, with one intermediate region adjoining the first major surface, the two impurity regions adjoining the first and second major surfaces being cathode-emitter and anode-emitter regions, respectively, the two intermediate impurity regions adjoining the cathode-emitter and anode-emitter regions being cathode-base and anode-base regions, respectively, and the cathode-base region adjoining the first major surface adjacent the cathode-emitter region;
B. providing in the semiconductor body an impurity to form in the body a pilot thyristor of said cathode-base, anode-base and anode-emitter regions of the main thyristor and at least one additional impurity region adjacent to and spaced from the cathode-emitter region of the main thyristor of conductivity-type to form a PN junction with said cathode-base region and a separate cathode-emitter region for the pilot thyristor;
C. providing in the semiconductor body an impurity to form in the body a diode of said cathode-base region of the thyristors and at least one additional impurity region being a cathode region adjacent to and spaced from the cathode-emitter regions of the main and pilot thyristors;
D. selectively masking against a radiation means portions of the first major surface of the semiconductor body adjoining the main and pilot thyristor, while leaving exposed portions of the first major surface adjoining the diode;
E. selectively irradiating the diode in the semiconductor body with said radiation means through said masking to reduce the current gain of the common cathode-base region at the diode to less than the ratio of I_{FB}/I_g, where I_{FB} is the forward anode current triggering the diode to function as a thyristor in the low impedance conducting state, and I_g is a specified gate assist turn-off current to turn-off the main thyristor;
F. positioning cathode and anode electrodes on said first and second major surfaces, respectively, to make ohmic contact with the cathode-emitter region of the main thyristor and the common anode-emittor region of the main and pilot thyristors;
G. positioning a gate electrode on said first major surface to make ohmic contact with the common cathode-base region adjacent to and spaced from the cathode-emitter region of the pilot thyristor and the cathode region of the diode; and
H. positioning a floating electrode on said first major surface adjacent to and spaced from the gate electrode to make ohmic contact with the common cathode-base region between the thyristors and the cathode-emitter region of the pilot thyristor.

4,040,171

DEEP DIODE ZENERS

Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 568,920, April 17, 1975, Pat. No. 3,988,757, which is a continuation of Ser. No. 411,013, Oct. 30, 1973, abandoned. This application Apr. 22, 1976, Ser. No. 679,206
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—577 **32 Claims**



1. A method for making a deep diode zener comprising the process steps of

a. selecting a body of semiconductor material having two opposed major surfaces which are, respectively, the top and bottom surfaces thereof, a selected level of resistivity, a selected first type conductivity, a preferred planar crystal structure orientation for at least one of the major surfaces which is one selected from the group consisting of (100), (110) and (111) and a vertical axis substantially aligned with a first crystal axis of the material of the body;
b. disposing an array of metal on the major surface having a preferred planar crystal structure orientation, the metal comprising at least one material suitable for imparting to a portion of the material of the body a predetermined level of resistivity and a predetermined second type conductivity;
c. heating the body and the metal array to an elevated temperature sufficient to form an array of melt of metal-rich semiconductor material on the major surface of the body;
d. establishing a temperature gradient in the body substantially parallel with the vertical axis of the body and the first crystal axis, the major surface having the array of metals being at the lower temperature;
e. migrating the array of metal-rich semiconductor material through the body from the major surface along the temperature gradient in the direction of the higher temperature to form a plurality of regions of recrystallized semiconductor material of the body having a selected second type conductivity and solid solubility of the metal of the array distributed substantially uniformly throughout the region, the level of concentration of the metal being determined by the temperature of migration, the type and the composition of the metal, and the semiconductor material migrated therethrough;
f. affixing a first ohmic electrical contact to one the regions of recrystallized semiconductor material of the body, and
g. affixing a second ohmic electrical contact to a selective portion of the original material of the body, the first and second contact arrangement being such as to cause the processed body to function as a zener diode when voltage is applied across the processed body between the two ohmic electrical contacts.

4,040,172

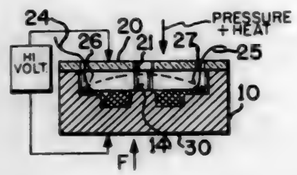
METHOD OF MANUFACTURING INTEGRAL TRANSDUCER ASSEMBLIES EMPLOYING BUILT-IN PRESSURE LIMITING

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Alpine, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Division of Ser. No. 573,624, May 1, 1975. This application Aug. 2, 1976, Ser. No. 710,570

Int. Cl.² H01C *17/02*

U.S. Cl. 29—580 **6 Claims**



1. A method for fabricating a semiconductor transducer, comprising the steps of:

a. forming a first depression on a first surface in a semiconductor wafer, said depression as formed being of a predetermined depth and having a plurality of "finger-like" projections extending from the periphery,

b. diffusing a serpentine piezoresistor within said depression and having a resistance line width approximately equal to said predetermined depth,

c. metallizing the surface of said depression to form a series of terminal areas extending into said projections,

d. covering said depression with a glass sheet,

e. bonding leads to said terminal areas within said projections.

4,040,173

FORMERS FOR COILS

Ian Leitch McDougall, Aldridge, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed Oct. 14, 1975, Ser. No. 622,158

Claims priority, application United Kingdom, Oct. 15, 1974, 44599/74

Int. Cl.² H01L *39/08*

U.S. Cl. 29—599 **7 Claims**

1. A method of manufacturing a superconductive magnet which comprises the steps of winding onto a former a wire containing the components of a superconductive intermetallic compound, and heating the assembly to a temperature such that the components of the compound react to form the intermetallic compound, characterised in that the former is of metal having a melting point greater than the temperature at which the reaction is carried out, and has on all portions of its surface contacted by the wire a coating of a refractory material non-reactive with the metal and non-reactive with the wire.

4,040,174

METHOD OF MANUFACTURING MAGNETIC HEADS

Naotsune Tsuda, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

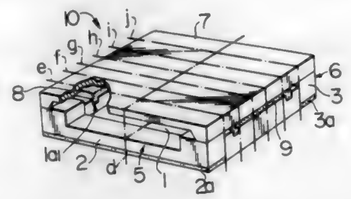
Filed July 8, 1976, Ser. No. 703,508

Claims priority, application Japan, July 31, 1975, 50-93768

Int. Cl.² G11B *5/42*

U.S. Cl. 29—603 **5 Claims**

1. A method of manufacturing magnetic heads comprising the steps of providing a pair of core block pieces each having a gap defining surface, cutting one of the core block pieces through the gap defining surface to provide a pair of fragment pieces, applying a thin film of a thickness corresponding to a desired gap length on the surface of the fragment pieces which is opposite to the gap defining surface to thereby provide a pair of offset block pieces, disposing the offset block pieces in juxtaposition with the remainder of said one core block piece, disposing the other core block piece on top of said one core block piece and the offset block pieces so that their gap defining surfaces are located opposite to each other, causing a gap forming material to melt and permeate into clearances which



are formed between the pair of core block pieces as a result of the presence of the thin film, solidifying the gap forming material to provide a core block in which a gap is formed between the both core block pieces, and cutting and slicing the core block to size, thereby producing a plurality of magnetic cores.

4,040,175

METHOD OF MAKING A MINIATURE PLUG-IN FUSE WITH FRAGILE FUSE LINK

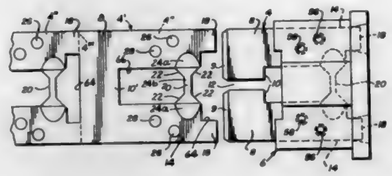
Harold L. Williamson, Northbrook, and Avinash P. Aryamane, Mount Prospect, both of Ill., assignors to Littelfuse, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 432,980, Jan. 14, 1974, Pat. No. 3,909,767, and a continuation-in-part of Ser. No. 610,978, Feb. 8, 1975, Pat. No. 3,962,782. This application June 8, 1976, Ser. No. 693,936

The portion of the term of this patent subsequent to June 15, 1993, has been disclaimed.

Int. Cl.² H01H *69/02*

U.S. Cl. 29—623 **16 Claims**



1. A method of making a plug-in fuse assembly comprising a plug-in element including a pair of terminals to be received by pressure clip terminals or the like, current carrying extensions extending from the inner end portions of the pair of terminals and a fuse-forming link interconnecting the current carrying extensions, said method comprising the step of providing a blank of fuse metal which is blanked to form a pair of spaced juxtaposed parallel terminals which are interconnected by a rigid web, current carrying longitudinal extensions of said terminals and a relatively weak fuse-forming link portion interconnecting said current carrying extensions, anchoring between said current carrying extensions a body of insulating material forming a rigid interconnection between said current carrying extensions, with the pair of terminals interconnected by the web on the outside of the body of insulating material, and blanking the exposed web of fuse metal interconnecting the terminals.

4,040,176

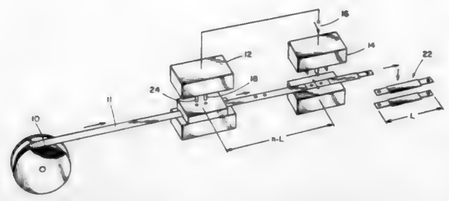
METHOD FOR MANUFACTURING INSULATED GROUNDING STRAPS

Robert C. Ferris, Chicago, Ill., assignor to Christiana Industries Corporation, Chicago, Ill.

Filed June 11, 1976, Ser. No. 695,116

Int. Cl.² H01B *13/06*

U.S. Cl. 29—624 **2 Claims**



1. A method of making an insulated grounding strap of a selected length having stripped and punched ends comprising the steps of:

a. feeding a continuous length of flexible conductor having an insulating covering from a supply reel,

b. punching two holes in said conductor, one on either side of a trailing point on said conductor which is said selected length behind a leading point on said conductor, each trailing point serving as the leading point for subsequent lengths of said conductor,

c. severing said conductor at each of said points, and

d. stripping a desired length of insulation form the severed ends.

4,040,177

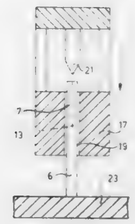
METHOD OF MANUFACTURING AN ELECTRICAL CONTACT

Alfred Beeler, Horgen, Switzerland, and Wilhelmus Marinus Cornelius van der Mijden, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 553,532, Feb. 27, 1975, abandoned. This application May 25, 1976, Ser. No. 689,946

Int. Cl.² H01R *9/04*

U.S. Cl. 29—630 C **5 Claims**



1. A method of manufacturing an electrical contact member from a bar of electrically conductive material, which comprises splitting the bar longitudinally over a portion of its length from one end into two parts, and plastically deforming the two parts to form contact tongues by bending such parts so that they diverge in opposite directions from the longitudinal dimension of the bar, flattening each part to provide respective flat surfaces, and bending such flattened parts so that they extend in spaced relation to each other approximately parallel to the longitudinal dimension of the bar with such flat surfaces oppositely disposed.

4,040,178

APPARATUS FOR ASSEMBLING A FLEXIBLE SLEEVE TO A LEAD

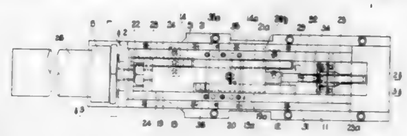
Robert Amphlett, Stoke-on-Trent, England, assignor to Rist's Wires & Cables Limited, Birmingham, England

Filed Dec. 24, 1975, Ser. No. 644,315

Claims priority, application United Kingdom, Jan. 16, 1975, 1865/75

Int. Cl.² H01B *13/22*

U.S. Cl. 29—745 **10 Claims**



1. Apparatus for assembling a flexible sleeve to a rod-like component comprising a frame which, in use, is fixed, a sleeve carrier supported by the frame and movable linearly relative thereto between a rest position and an advanced position, first and second releasable latch means for restraining said sleeve carrier in said rest position and advanced positions respectively, a mandrel supported by said frame, and movable linearly relative to said frame in the same direction as said sleeve carrier, between a rest position and an advanced position, means for moving said mandrel, first latch release mean for releasing said sleeve carrier at a point in the movement of the mandrel wherein the mandrel has engaged in a sleeve carried by the sleeve carrier, means whereby after release of the sleeve carrier the sleeve carrier is moved with the mandrel to engage the sleeve, containing the mandrel, over the end region of a rod like component, second latch release means for releasing said sleeve carrier for return movement from its advanced position at a point during the return movement of the mandrel from its advanced position towards its rest position wherein the mandrel has been withdrawn from the sleeve, and sleeve carrier return means for returning the sleeve carrier to its rest position.

4,040,179

APPARATUS FOR MATING FIRST AND SECOND PORTIONS OF AN ELECTRICAL CONNECTOR

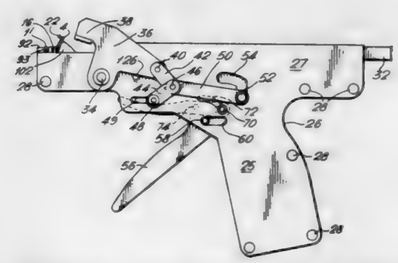
Miguel Ruiz Sanchez, Barcelona, Spain, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 11, 1977, Ser. No. 758,374

Claims priority, application United Kingdom, Jan. 13, 1976, 01121/76; Apr. 7, 1976, 14018/76

Int. Cl.² H01R *43/04*

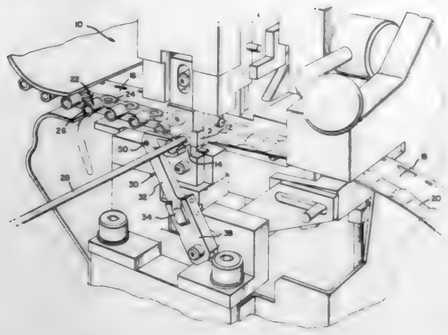
U.S. Cl. 29—749 **15 Claims**



1. Apparatus for mating first and second portions of an electrical connector to connect a terminal therein to a wire placed between the portions, the apparatus comprising a support for the first portion, a jaw, means for moving the jaw from a raised portion remote from the support, towards the support, to move the second portion into mating relationship with the first portion, means for displacing the support from a first position remote from the jaw to a second position in register

with the jaw when the jaw is in its raised position, and means for positioning the second portion with respect to the jaw prior to the support reaching its second position, to enable the jaw to move the second portion into mating relationship with the first portion.

4,040,180
WIRE CONE ASSEMBLY
Leon Richard Brown, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed June 15, 1976, Ser. No. 696,258
Int. Cl.[2] H01R *43/04*
U.S. Cl. 29—753 **5 Claims**



1. A wire cone assembly for use on a crimping press of the type having a crimping station and crimping dies for crimping a wire barrel terminal about an electrical wire and means for moving the crimped terminal laterally from the station, said wire cone assembly comprising:

a. an elongated arm with its lower end attached to a rotatable mounting block on the crimping press and having a laterally projecting member on its upper end;

b. an L-shaped lever having a first section positioned parallel to the laterally projecting member and a second section positioned at a right angle to the first section and extending across the free end of the laterally projecting member, said second section having a partially conical passage therethrough opening out in front of the crimping station and further having a slot on an upwardly facing surface extending for the length of the section and intersecting the passage so that a multi-strand wire may be laid into the passage through the slot for subsequent insertion into a wire barrel which may be positioned in the crimping station, said first section being pivotally attached at its free end to the laterally projecting member,

so that as the moving means on the crimping press move a crimped terminal from the crimping station, the wire lying in the passage with one end in the crimped terminal causes said lever to rotate downwardly so that the slot faces sideways permitting the wire to leave the passage therethrough.

4,040,181
LOCKING BLADE KNIFE
Lawrence P. Johnson, Boulder, Colo., assignor to Western Cutlery Co., Boulder, Colo.
Filed Sept. 7, 1976, Ser. No. 720,773
Int. Cl.[2] B26B *1/02*
U.S. Cl. 30—161 **9 Claims**

1. A locking blade knife comprising:

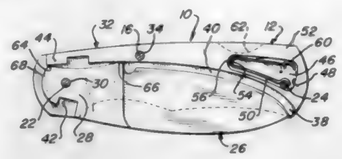
a handle including a pair of side scales arranged in spaced parallelism to provide between them an elongate narrow channel to receive a knife blade and a locking rocker arm, and secured in fixed relation by a center pin and a pair of end pins;

a knife blade having an apertured tang pivotally mounted on the end pin at the forward portion of the handle to provide for swinging of the blade between extended operating position and retracted position in this channel;

the back of the tang being formed with a key notch to receive a locking key for positively retaining the blade in extended position;

a locking rocker arm arranged in the channel and extending along the back of the handle throughout the major portion of the length of the handle and pivotally mounted intermediate its ends on the center pin for rocking movement in the handle;

the forward end of the rocker arm being formed with an inwardly facing key to engage the key notch when the blade is in extended position and lock the blade against retraction;

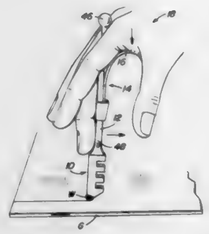


the aft portion of the rocker arm being formed with an aperture of predetermined size and shape throughout the thickness of the arm and so located that the aft end pin passes through it to serve as a fixed abutment anchorages;

the rocker arm being dimensioned in thickness to fit in sliding relation with the side scales to produce between the scales and the periphery of the aperture a totally enclosed pocket;

and a spring located in the pocket and engaging the anchorage and the arm to yieldingly urge the aft end of the arm in a direction outwardly of the back of the handle to force the key into locking engagement with the notch.

4,040,182
HOLDER FOR GLASS CUTTER
Dennis R. O'Dell, 2924 Downey St., Independence, Mo. 64056
Filed June 7, 1976, Ser. No. 693,486
Int. Cl.[2] B26B *25/00*; C03B *33/10*
U.S. Cl. 30—164.95 **8 Claims**

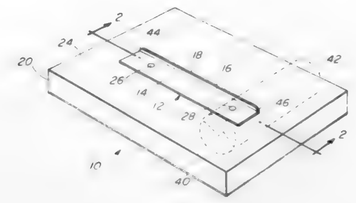


1. A holder for a glass cutter, comprising, in combination:

a. palm contacting means for steadying a glass cutter; and

b. attachment means for retaining the palm contacting means on a handle of the glass cutter, the palm contacting means being a bent member including a curved portion arranged for contacting the palm of an operator's hand. and a connecting portion having a substantially U-shape including a back section and a pair of spaced, substantially parallel, coextending legs depending from the back section, and the attachment means including a sleeve of rectangular cross section.

4,040,183
COIN ROLL OPENER
Robert X. Cassier, 115 Mount Auburn St., Cambridge, Mass. 02138
Continuation-in-part of Ser. No. 660,727, March 17, 1976, abandoned. This application Feb. 25, 1977, Ser. No. 771,952
Int. Cl.[2] B26B *27/00*
U.S. Cl. 30—296 R **10 Claims**



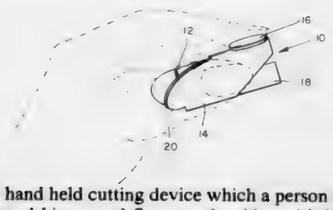
1. A device for opening a plurality of coins packaged in a paper wrapper defining a roll, said device comprising:

a. a thin body having a pair of relatively long parallel sides and a pair of relatively short parallel sides, a margin of one of said long sides bent upwardly to form a substantially L-shaped structure constituting a wide base and a narrow flange having a dulled edge, a longitudinal axis of said flange being disposed in parallel relationship to a longitudinal axis of said base, the width of said base is larger than the height of said flange, the length of said flange is at least as long as the circumference of the roll of coins, the height of said flange being sufficiently high to allow said flange to cut only through the paper wrapper when the roll of coins is rolled on said flange in a direction that is along the longitudinal axis of said flange;

b. a platform, said body mounted on an upper face of said platform; and

c. gripping means on a lower face of said platform for preventing movement of said platform when the roll of coins is rolled along said flange.

4,040,184
CUTTING INSTRUMENT
Tafari Hightower, 765 Rand Ave., Oakland, Calif. 94610
Filed Nov. 3, 1975, Ser. No. 627,961
Int. Cl.[2] B26B *27/00*
U.S. Cl. 30—298 **5 Claims**



1. A hand held cutting device which a person holds with his thumb and his second finger and guides with his first finger, comprising:

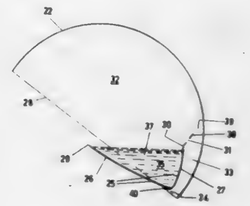
a. a rectangular razor blade of a certain size;

b. a first sidewall and a second sidewall, each of said sidewalls being substantially parallel to each other and substantially the same size as the size of said razor blade and having a top edge, a front edge, a back edge and a bottom edge, said bottom edges, said front edges and said top edges of said first and second sidewalls being joined together to form a casing in which to insert said razor blade with a corner portion of said sidewalls adjacent to said bottom edges and said front edges being removed in order to expose a portion of the cutting surface of said razor blade;

c. a first tab and a second tab coupled to said back edges of said first and second sidewalls, respectively, and adapted so that a person can hold said casing between his thumb and his second finger said tabs being bent downwardly and away from each other at an acute angle from said top edges; and

d. an elliptical plate coupled to said top edges of said adjoining sidewalls directly over the forwardmost part of said razor blade and disposed perpendicularly thereto and adapted to accommodate the first finger of the person so that a person can guide said cutting device with his first finger.

4,040,185
LADLE FOR SERVING SOUP
Jacob Jacobi, Simon van Capelweg 10, Noorden, Netherlands
Continuation-in-part of Ser. No. 557,823, March 12, 1975, abandoned. This application Feb. 19, 1976, Ser. No. 659,271
Claims priority, application Netherlands, Mar. 29, 1974, 7404355
Int. Cl.[2] A47J *43/28*
U.S. Cl. 30—326 **3 Claims**



1. A ladle for serving soup, comprising a substantially hemispherical bowl which has a circular edge and is provided with a handle, wherein the improvement comprises an inner boat-shaped receptacle which has a generally V-shaped cross-section, formed by two sides of the boat-shaped receptacle which meet at the bottom of the receptacle, which sides converge at both ends of the receptacle, and have edges which also converge at both ends of the receptacle, said receptacle being supported by the bowl in a generally inverted position relative to the bowl, with one side of the boat-shaped receptacle generally conforming to and slightly spaced from the inner surface of the bowl at one side of the bowl, the space between said side of the boat-shaped receptacle and the inner surface of the bowl forming a pouring passage extending from an inlet slot between the edge of such receptacle and the inner surface of the bowl to a discharge slot between the edge of the bowl and the bottom of such receptacle.

4,040,186
ORTHODONTIC PLIER-TYPE TOOL
Gerald J. Kalvelage, 7035 Rosemary, Dearborn Heights, Mich. 48128
Filed Oct. 1, 1973, Ser. No. 402,394
Int. Cl.[2] A61C *7/00*
U.S. Cl. 32—66 **1 Claim**

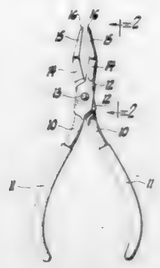
1. A plier-type tool for orthodontists for manipulating O-ring type elastic ligatures comprising:

a. a pair of plier members, each having a handle portion and a jaw portion;

b. said plier members being retained in a pivotal relationship by a pivot pin;

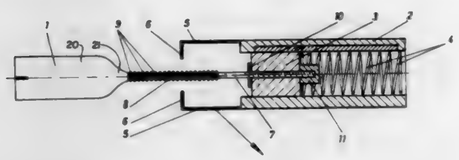
c. said plier members being movable between an open position and a closed position by manipulation of the handle portions of the plier members;

d. each of said jaw portions including a pivot portion, an intermediate portion and an outer end portion;
e. each of said outer end portions comprising a beak member having an inner face, with each of said beak members having a transverse groove formed along the inner face thereof, whereby an elastic ligature may be positioned lengthwise in said grooves and grasped between said beak members for manipulating said elastic ligature when the jaw portions are moved to the closed position;
f. each of said beak members having an identical pointed outer end configuration adjacent the transverse groove formed thereon and forming one-half of a total pointed tip formed by the beak members when in the closed position, whichwhen in the closed position facilitates the sliding



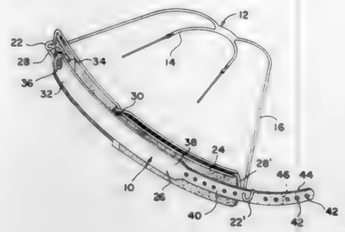
thereon of an elastic ligature for expanding the same preparatory to grasping the ligature by the beak members for manipulation and placement of the same in an operative position in a patient's mouth;
g. each of said grooves in said beak members having a concave transverse configuration that extends perpendicular to the longitudinal axis of each beak member and which coact together to form a transversely closed circular groove when the jaw portions are moved to the closed position to completely surround said ligature;
h. each of said beak members being disposed at an acute angle from a plane passing through the longitudinal axes of the handle portions; and,
i. said acute angle being an acute angle in a range up to and including 90°.

4,040,187
ORTHODONTIC ELASTIC INSERTER TOOL AND METHOD
Pedro Garcia Cardena, Avda. de Jose Antonio No. 54, Madrid, Spain
Filed Jan. 15, 1976, Ser. No. 649,456
Claims priority, application Spain, Feb. 13, 1975, 209927
Int. Cl.² A61C *7/00*
U.S. Cl. 32—66 **11 Claims**



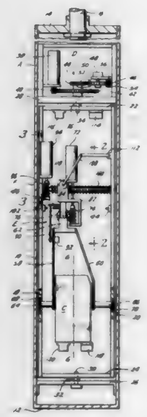
1. Orthodontic elastic inserter apparatus comprising:
a hollow sleeve having an opening;
piston means mounted and slidable within said sleeve, said piston means adapted to support storage means;
storage means attached at one end to said piston means and passing longitudinally through said opening, said storage means adapted to pass through said elastic rings;
a body attached to the other end of said storage means and having a tapered surface adjacent said storage means, said surface adapted to receive said elastic rings annularly, and
flexible clamp means, mounted to said sleeve and proximate said storage means, for engaging a selected one of said elastic rings on said storage means, whereby said selected elastic ring expands by movement of said tapered surface through said selected ring.

4,040,188
ORTHODONTIC NECK BAND INCLUDING SAFETY STRAP
Jacob J. Masel, 3021 Darnell St., Philadelphia, Pa. 19154
Filed Dec. 11, 1975, Ser. No. 639,757
Int. Cl.² A61C *7/00*
U.S. Cl. 32—14 D **15 Claims**



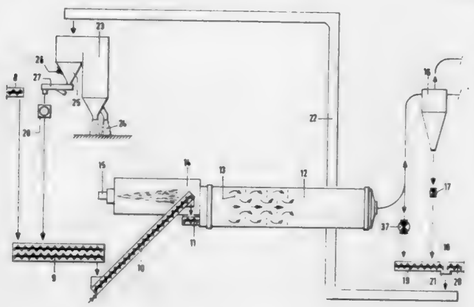
1. In an orthodontic device, the combination of
a face bow, said face bow comprising attaching terminals;
a resilient band attached to the face bow at at least one terminal,
said resilient band tensioning the face bow; and
a non-extensible band overlying the resilient band,
the non-extensible band being connected to the face bow to prevent movement of the face bow in a direction tending to extend the band.

4,040,189
METHOD AND APPARATUS FOR LEVELING AN INSTRUMENT IN A WELL BORE
Lucien J. B. LaCoste, Austin, Tex., assignor to La Coste and Romberg, Inc., Austin, Tex.
Filed Sept. 22, 1976, Ser. No. 725,543
Int. Cl.² F21B *47/022*
U.S. Cl. 33—304 **16 Claims**



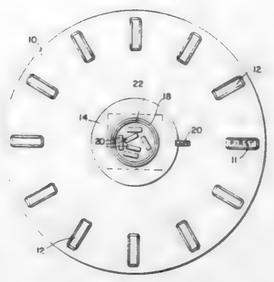
1. A device for leveling an instrument comprising:
a housing having a dimension which is substantially longer than the housing dimensions normal to said long dimension,
a frame,
means for rotating said frame about a rotation axis substantially parallel to said long housing dimension,
an instrument having a reference axis which is to be positioned approximately vertical for good instrument performance,
means for tilting said instrument relative to said frame about two tilt axes substantially normal to said rotation axis and at an angle to each other,
one of said tilt means having a long range of tilt,
the other of said tilt means having a shorter range of tilt,
said instrument being mounted in said tilt means to align its reference axis parallel to said rotation axis when said long range tilt means is near one end of its range and when the short range tilt means is near the center of its range,
means for indicating the amount of tilt of said long range tilt means relative to said frame, and
leveling indicating means in fixed relation to said instrument to indicate when said instrument reference axis is vertical.

4,040,190
METHOD AND APPARATUS FOR DRYING MANURE OR MUD OR THE LIKE
Adriaan van den Broek, Zeist, Netherlands, assignor to W. van den Broek's Machinefabriek B.V., Driebergen, Netherlands
Filed Jan. 26, 1976, Ser. No. 652,416
Claims priority, application Netherlands, Nov. 11, 1975, 7513187
Int. Cl.² F26B *7/00*
U.S. Cl. 34—11 **5 Claims**



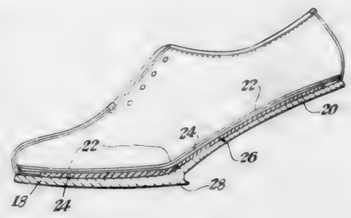
1. A process for drying a product, such as manure or mud and particularly sewerage mud, including the steps of passing said product to be dried through a preparation device to produce a prepared product suitable for introduction into a thermal drying device, thereafter passing said prepared product through a thermal drying device to produce a granular dried end product, and recycling at least a portion of said granular dried end product by returning and mixing said portion of said granular dried end product with said product being processed at a position in said process in advance of said thermal drying device, wherein the improvement in said drying process is comprised of the step of:
controlling the grain size of said granular dried end product by varying the grain size of the recycled portion of said granular dried end product through mechanical crushing of said recycled portion to a selected known grain size, and prior to drying, mixing the crushed recycled portion with said prepared product in a predetermined known amount.

4,040,191
EDUCATIONAL GAME
Eugene A. Quarrie, 7 Laurel Hill Place, Armonk, N.Y. 10504
Filed Oct. 1, 1975, Ser. No. 618,330
Int. Cl.² G09B *1/14*; A63F *9/00*
U.S. Cl. 35—1 **4 Claims**



1. An educational game comprising a substantially planar support surface defining a substantially centrally located aperture, shaft means adapted to communicate with said aperture, said support surface adapted to rotate its own axis about said shaft means, platform means integral with said shaft means and disposed at one distal end thereof, a plurality of slotted channels disposed substantially equidistant from each other on a surface of said support surface, sleeve means open at at least one end thereof and disposed on said platform means, a hollow walled housing open at at least one end thereof and adapted to receive and concentrically engage said sleeve means, and a plurality of clip means containing printed matter thereon dispersed in said sleeve means, each of said clip means for selective clipped affixment to said platform means.

4,040,192
ATHLETIC TRAINING SHOE
Jose Miguel Perez, 7975 NW. 17th Terrace, Miami, Fla. 33155
Filed June 7, 1976, Ser. No. 694,025
Int. Cl.² A43B *23/00, 5/00*
U.S. Cl. 36—108 **4 Claims**



1. An improved athletic training shoe having an upper portion secured to a lower portion wherein the improvement comprising:
said lower portion being of unitary, one-piece construction and includes three distinct lower portion segments, a first segment having an end and a rearward extending surface for supporting the toes and the ball of the foot of a wearer, a second segment connected to said first segment and extending rearward for supporting a portion of the foot immediately behind the ball of the foot, and a third segment connected to the second segment and extending rearward to support the arch of the foot and the heel of the foot, said second segment adapted to position the first segment at an obtuse angle to said second segment and said third segment to prevent the third segment from

contacting a horizontal plane at the same time as said first segment contacts said horizontal plane.

4,040,193

DISPLAY DEVICE

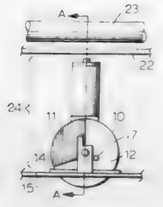
Isamu Matsuda, Yao, and Taizo Ono, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed June 9, 1976, Ser. No. 694,488

Claims priority, application Japan, June 10, 1975, 50-78777[U]; June 10, 1975, 50-78778[U]; July 11, 1975, 50-97100[U]; Sept. 23, 1975, 50-130345[U]

Int. Cl.² G09F *7/00*

U.S. Cl. 40—28 C **5 Claims**



1. In a display device of the type having a display element with a surface including different colored areas, which display element is rotatably mounted opposite an opening of a front panel, and including means for controlling the rotational position of said display element to selectively expose a specified colored area through the opening of the front panel, the movement comprising:

the surface portion of said display element having a non-transparent area, a transparent area having a color different from the color of said non-transparent area, and a light passing portion which is positioned inside the front panel when said transparent area is exposed through the opening of the front panel, said light passing portion being optically connected to said transparent area and said nontransparent area having a size for completely covering said opening in the front panel when said non-transparent area is exposed to said opening; and

a light source positioned behind said display element,

whereby the light from the light source is scattered to the otuside of the front panel through the display element when the transparent area is exposed through the opening.

4,040,194

CHANGEABLE MESSAGE SIGN CONSTRUCTION

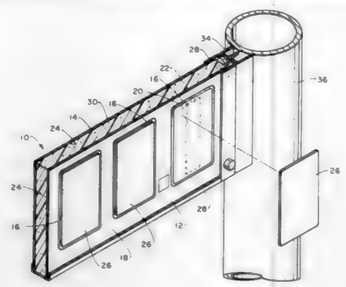
Hugh V. Penton, 850 Winthrop Road, San Marino, Calif. 91108; Gerald P. Dunphy, 1232 Laster Ave., Anaheim, Calif. 92803, and Clayton O. Stevens, 12626 Ocaso Ave., La Mirada, Calif. 90638

Filed July 28, 1976, Ser. No. 709,286

Int. Cl.² G09F *7/04*

U.S. Cl. 40—142 A **16 Claims**

1. In a changeable message sign construction, the combination of: generally horizontally spaced and generally vertically extending first and second face sheets, at least said first face sheet being formed of a magnetic force transmitting sheet metal and having a horizontally recessed message pocket debossed in an exterior face thereof; a magnet operably mounted on an interior face of said first face sheet positioned magnetically effective through said first face sheet within the confines of said message pocket and transmitting magnetic forces exteriorly through said pocket; a message plate formed at least partially of a magnetically attractable material selectively removably positioned at least partially recessed within said message pocket of said first face sheet retained against at



least generally horizontal displacement therefrom by said magnetic forces of said magnet.

4,040,195

PAGE TURNER APPARATUS

James P. Claypool, Minneapolis, and Gerrit Hoogenraad, Minnesota Lake, both of Minn., assignors to Donald C. Delich, Minneapolis, Minn., a part interest

Filed Apr. 15, 1976, Ser. No. 677,279

Int. Cl.² B41J *11/38*

U.S. Cl. 40—341 **13 Claims**

1. Page turner apparatus comprising a base for supporting a book in an open condition, a slide member for engaging and successively turning pages in the book; first means for mounting the slide member for translating movement on the base the slide member including a plurality of longitudinally extending, generally parallel finger portions for having a page extended between each adjacent pair of finger portions; said finger portions having first end portions; and second means joined to said first end portions of said finger portions for retaining the finger portions generally parallel and to simultaneously translate all of the finger portions as the slide member is moved to turn a page.

4,040,196

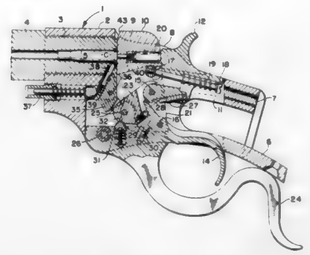
RIFLE

Jessop Smith, Gates Mills, and Thomas Robert Kocis, Streetsboro, both of Ohio, assignors to Triple-S Development Co., Inc., Wickliffe, Ohio

Filed May 17, 1976, Ser. No. 687,007

Int. Cl.² F41C *11/04, 15/08*

U.S. Cl. 42—23 **7 Claims**



1. A receiver for a single-shot rifle having a rifle barrel secured to said receiver and having a lever-activated falling block action; said action comprising a breech-block movable downwardly from a wedged firing position wherein a firing pin carried thereby is aligned with a cartridge in the rifle barrel to a cartridge loading position; a hammer and a trigger each pivotally connected to said block whereby, in said firing position of said breech-block, pulling of the trigger releases said hammer to strike said firing pin; a lever pivotally connected to said receiver and to one end of a link which has its other end pivotally connected to said block to form a toggle linkage to move said block downwardly from and upwardly to said wedged firing position responsive to swinging of said lever in opposite directions; said receiver having a slot from which said action including said firing pin, said hammer, said trigger, said link, and said lever is bodily removable upon removal of the lever-receiver pivot; said link having a spring-biased plunger engaging said trigger at a point radially spaced from the trigger-block pivot to yieldably engage an end of said trigger with a radial shoulder on said hammer.

4,040,197

AUTOMATIC FISHING POLE HOLDER

Daniel T. Robbins, Burbank, Calif., assignor to Danny Joel Robbins and Stanley M. Brown, both of Newhall, Calif.

Filed Dec. 29, 1975, Ser. No. 644,377

Int. Cl.² A01K *97/10*

U.S. Cl. 43—15 **7 Claims**

1. A fishing rod holder and triggering device comprising:

a frame;

cradle support means rotatably attached to said frame for supporting a fishing rod, said cradle means comprising:

a flat plate;

means rotatably attaching said plate to said frame;

a pair of flanges extending outward from opposite edges of said plate;

cradling means in each flange for cradling a fishing rod;

biasing means for rotatably biasing said cradle support means;

trigger latching means for latching said cradle means in a biased position, said trigger latching means comprising;

a counterweighted plate secured to said frame beneath said cradle means;

a tang extending outward from said counterweighted plate;

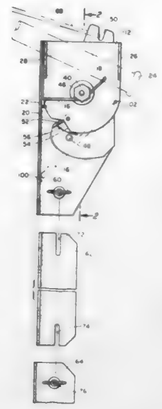
a detent in the edge of said cradle means being engage and latched by the tang;

mounting means for pivotally mounting said trigger latching means at a point spaced from its center of gravity;

limiting means for limiting the rotational movement of said center of gravity so that said trigger latching means will automatically latch said cradle means after a predetermined amount of rotation, said limiting means comprising;

an arcuate slot in said counterweighted plate;

bearing means on said rotatably attaching means between the cradle means and frame;



said bearing means passing through said arcuate slot for guiding said counterweighted plate; and

slot means on said trigger latching means for engaging a fishing line whereby a pull on said fishing line trips said trigger latching means, releasing said cradle means causing a sudden jerk on said fishing line.

4,040,198

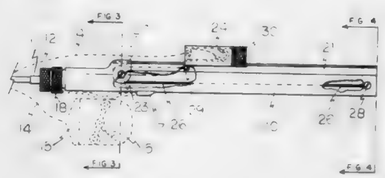
BAIT CASTING DEVICE

Phillip M. Skibo, 1353 Thomas St., Green Bay, Wis. 54303

Filed May 3, 1976, Ser. No. 682,613

Int. Cl.² A01K *91/02*

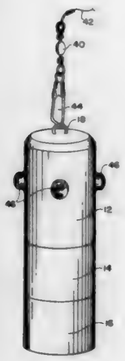
U.S. Cl. 43—19 **3 Claims**



1. In a bait casting device including a handle adapted to support a rod from a forward end thereof and adapted to support a reel for forward feeding of a fishing line therefrom and for retraction of the fishing line, said handle member including a pair of elongated side wall members together defining a hollow generally tubular structure having a central longitudinal axis, a pair of elongated track members on an upper side of said handle and having a first pair of portions in parallel vertical planes on opposite sides of a central vertical plane through said longitudinal axis and having a second pair of portions in a horizontal plane transverse to said central vertical plane and projecting in opposite directions from said central vertical plane, a bait carrier mounted on said track members for longitudinal slidable movement therealong and including inwardly extending flanges for cooperation with said second pair of portions of said track members to retain said carrier on said track members during slidable movement therealong, means for securing said pair of side wall members of said handle together and for securing said track members thereto including fastening means extending transversely between said

side wall members of said handle and through forward end portions of said track members, a pulley journalled on said fastening means for rotation about a horizontal axis in a plane transverse to said central vertical plane, and flexible band means secured at one end to said bait carrier and at an opposite end to the rearward end of said handle, said flexible band means being entrained on said pulley and having an upper portion extending between said first pair of portions of said track members and between said pulley and said bait carrier and having a lower portion extending rearwardly within said handle between said pulley and said rearward end of said handle.

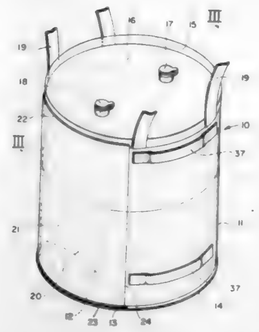
4,040,199
FISHING LINE SINKER ASSEMBLY
George M. Raptis, 17876 Vicino Way, Pacific Palisades, Calif. 90272
Filed Mar. 15, 1976, Ser. No. 666,622
Int. Cl.[2] A01K *95/00*
U.S. Cl. 43—43.14 **3 Claims**



1. A sinker assembly for a fishing line including: a first member of substantial weight, means mounted on the first member for receiving the fishing line, at least one further member of substantial weight removably coupled to the first member, the first and second members having a generally cylindrical configuration; and a threaded stud fitted into one of the members to be received in a threaded hole in the other of the members for removably intercoupling the first and second members in which at least one of the members has protuberance means formed on the surface thereof to prevent the assembly from rolling.

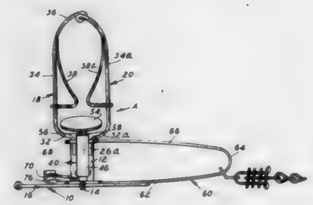
4,040,200
PORTABLE CONTAINER FOR FISH, LIVE BAIT, AND THE LIKE
Shuzo Tomita, 122-1 Tomonaka, Kyowa, Obu, Aichi, Japan
Filed Mar. 18, 1976, Ser. No. 667,999
Claims priority, application Japan, Mar. 20, 1975, 50-38069[U]; Mar. 20, 1975, 50-38070[U]
Int. Cl.[2] A01K *97/04*
U.S. Cl. 43—57 **12 Claims**

1. Apparatus for the transport of fish, bait or the like comprising a container having a body, a portion of which is formed with a contiguous double wall and having a bottom plate, a cover plate sealed therewith, the lower edge of the inner one of said double walls of said body being separate from the bottom plate, the upper edge of the outer one of said double wall being separate from the cover plate, said wall members being flexible



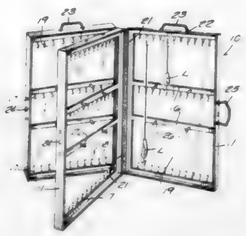
relative to each other to form a closable pocket allowing access to the interior of said container.

4,040,201
MULTIDIRECTIONAL ANIMAL TRAP
Kenneth R. Swanson, Rte. No. 1, Waverly, Minn. 55390
Filed May 4, 1976, Ser. No. 683,170
Int. Cl.[2] A01M *23/26*
U.S. Cl. 43—90 **1 Claim**



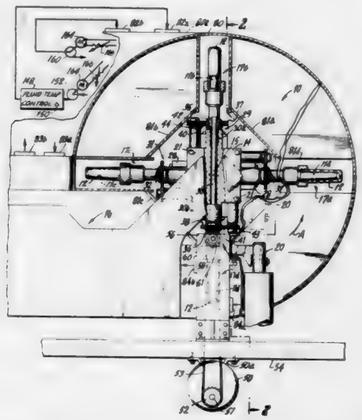
1. A multidirectional animal trap comprising:
a. a base including a circular ring having
b. spokes connected at the outer ends to the base ring and at the inner ends to
c. an elongated cylindrical hub mounted axially of said ring on said base,
d. at least three jaws pivotally mounted at the lower ends thereof in spaced slots formed in said hub and extending radially outwardly of the hub,
e. a spring carried by said hub and in engagement with said jaws to normally hold the same together in closed clamping relation including a lower leg connected at the outer end of said base and terminating at its inner end in
f. a bight which terminates in
g. an upper leg overlying said lower leg with
h. a ring formed on the outer free end of said upper leg through which said jaws extend and which urges said jaws into closed clamping condition,
i. a pressure plate,
j. means pivotally mounting said plate on said base,
k. means for releasably holding said jaws in open separated condition against the action of said spring includig a bar pivotally mounted on said base for clamping engagement with one of said jaws with
l. means for releasable engagement with
m. the edge of an opening formed in said means mounting said pressure plate so that pressure applied to said plate causes disengagement of said engagement means of said bar from said opening whereby said jaws are caused to pivot to closed clamping relationship.

4,040,202
FISHING TACKLE STORAGE CASE
Richard M. Wille, 15355 Kata Drive, Brookfield, Wis. 53005
Filed June 14, 1976, Ser. No. 696,043
Int. Cl.[2] A01K *97/06*
U.S. Cl. 43—57.5 A **8 Claims**



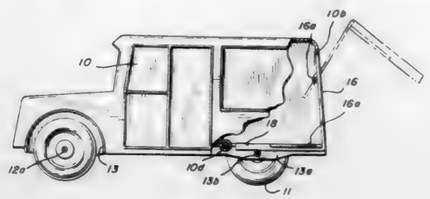
1. A case for the storage of fishing lures and the like comprising:
a. an outer frame member;
b. first attachment means mounting helical tension springs to the interior of said outer frame member, said first attachment means comprising a threaded stud for each spring having a pitch diameter approximately equal to the diameter of the spring;
c. second attachment means on the interior of said frame member opposite said first attachment means; and,
d. said tension springs each being demountably threaded by one of its ends to one of said threaded studs such that the opposite end of the spring is free, the first coil of the opposite end being opened to provide attachment for one end of a lure, whereby the other end of the lure may be attached to said second attachment means and held against displacement by spring tension.

4,040,203
ROTATING CORE RODS
John Jerome Farrell, Greenbrook, N.J., assignor to Consupak, Inc., Morristown, N.J.
Filed May 10, 1976, Ser. No. 684,668
Int. Cl.[2] F27B *9/14*
U.S. Cl. 432—124 **10 Claims**



1. An apparatus for parison temperature distribution comprising, an indexing head being horizontally rotatable, a block mounted to said indexing head so as to be rotatable about an axis transverse to the axis of rotation of the head, a first plurality of cores rotatably mounted to said block, and a second plurality of core rods being rotatably mounted to said block, said pluralities of core rods being angularly disposed to each other, each of said core rods having a surface to support a parison, a chamber with temperature control means for conditioning parisons, with said pluralities extending into said chamber, and means to rotate said pluralities of core rods in the chamber.

4,040,204
VEHICLE BANK WITH CLOSURE RETAINED BY VEHICLE MECHANISM PORTION
Armand S. Zucker, Skokie, Ill., assignor to Callen Manufacturing Corporation, Melrose Park, Ill.
Filed June 1, 1976, Ser. No. 691,452
Int. Cl.[2] A63H *33/30*
U.S. Cl. 46—2 **7 Claims**



1. A miniature bank comprising a functional toy vehicle having a functional toy vehicle mechanism enabling conventional use of said vehicle, said vehicle having also a coin compartment, a closure for the latter which opens to permit the removal of coins, and a unit of the vehicle mechanism serving as a bar to the opening of said closure, said unit being independent of said closure and shiftable to release the closure.

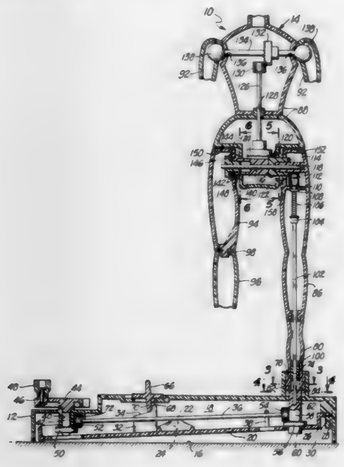
4,040,205
SPINNING BALANCE TOY
Peter Taylor, Decatur, Ill., assignor to David V. Munnis, Champaign, Ill.
Filed Feb. 27, 1976, Ser. No. 661,957
Int. Cl.[2] A63H *1/32*
U.S. Cl. 46—51 **4 Claims**



1. A spinning balance toy comprising a portable frame member adapted for manual rotation in a vertical plane about a horizontal axis, an opening in said frame having an axis which is coaxial to said axis of rotation of said frame, said frame opening thereby adapting said frame to be manually supported vertically by a member inserted into said frame opening, at least one pointed balance member, positioned fixedly to said frame, said pointed balance member being located on said frame at a point removed from said axis of rotation of said frame and having a terminus which, when said frame is supported in a vertical plane, extends upwardly and is truncated at

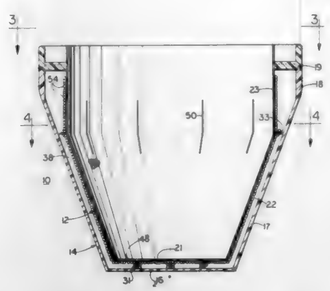
its end to define a horizontal surface, at least one target element, said target element having a bottom surface of larger cross-sectional area than that of said horizontal terminus of said pointed balance member and being adapted for removable slideable engagement with and for support by gravity upon said horizontal terminus of said pointed balance member, and a safety retaining means attached to said target element, said safety retaining means comprising a separate flexible line attached at one end to the upper surface of said target element and removeably attached at the other end to said frame.

4,040,206
BASE AND ROTATABLY MOUNTED DOLL WITH RELATIVELY MOVABLE PART
Osamu Kimura, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Sept. 2, 1975, Ser. No. 609,204
Claims priority, application Japan, Sept. 4, 1974, 49-106378[U]
Int. Cl.² A63H *13/02*
U.S. Cl. 46—138 **9 Claims**



1. In the combination of a base, a doll which is articulated for relative movement of at least some parts thereof having a leg supported on said base and a rod extending from said base through said leg for use in transmitting motion to at least one relatively movable articulated part of said doll, the improvement which comprises:
- said rod being a shaft and being rotatably mounted in said leg,
- cooperating mounting means on said base and on said leg for holding said leg so that said doll can either be rotated as a unit relative to said base about an axis or so that said leg is held in a fixed position relative to said base,
- adjustment means for controlling the operation of said mounting means so that said doll can either be given said rotation as a unit about an axis or so that said leg is held in said fixed position,
- drive means for rotating said shaft located on said base,
- coupling means for transmitting rotation from said drive means connecting said drive means to said shaft so that during the operation of said drive means said shaft is rotated, and
- friction clutch means connecting said shaft with said doll for causing enough friction between said shaft and said doll to cause said doll to rotate as a unit when said adjustment means are used to control said mounting means so that said doll can be given said rotation as a unit,
- said friction clutch means permitting said shaft to transmit motion to said articulated part of said doll when said adjustment means are used to control said mounting means so that said leg is held in a fixed position.

4,040,207
SELF-FERTILIZING POT
William R. Lancaster, 1157 Petersburg Road, Burlington, Ky. 41005
Filed Sept. 23, 1976, Ser. No. 725,778
Int. Cl.² A01G *27/00*
U.S. Cl. 47—80 **6 Claims**



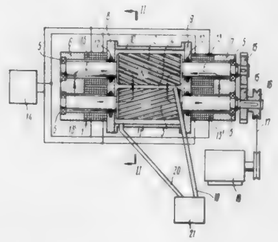
1. A self-fertilizing pot which comprises an outer cup-shaped member, an inner cup-shaped member, means for attaching the cup-shaped members together with a space therebetween, timed release encapsulated plant food mounted on one of the cup-shaped members inside the space, and means for introducing water into the space to cause release of the plant food, there being opening means in the inner cup-shaped member to permit the water and plant food to enter the inner cup-shaped member to water and fertilize contents of the inner cup-shaped member, the inner cup-shaped member including a bottom plate, an annular wall extending upwardly from the inner member bottom plate, an annular trough bottom plate extending outwardly from an upper portion of the inner member annular wall, and an annular upright outer trough wall carried by the trough bottom plate, the outer cup-shaped member including a bottom plate and an annular wall extending upwardly from the outer member bottom plate, the means for attaching the cup-shaped members together including interacting detent means on the upright outer trough wall and the outer member annular wall.

4,040,208
PLANT HOLDER AND ANCHOR FOR ORCHID PLANTS AND THE LIKE
Fred England, 307 SW. Hardin Lane, Palm Bay, Fla. 32905
Filed Oct. 8, 1975, Ser. No. 620,547
Int. Cl.² A01G *9/02*
U.S. Cl. 47—67 **4 Claims**

1. In combination:
- a flower pot having a cavity therein defined by a bottom, a side wall and a top opening communicating with said cavity, said cavity and said opening adapted to receive a plant to be carried by said pot, said pot having opposing peripheral holes in said side wall at the interface between said side wall and said bottom;
- a generally U-shaped wire member having two arms with an outwardly turned hook at the extremity of each said arm, each hook engaging said pot through one of said peripheral holes;
- a bend along each of said arms of said U-shaped wire member between the periphery of said top opening and said bottom for biasing the corresponding arm against the inside of said side wall of said pot; and
- a bridging portion of said U-shaped wire member between said two arms thereof, said two arms having a dimension so as to allow said bridging portion to extend above said top opening when said wire member is installed in said pot, whereby said plant therein.may be anchored to said bridging portion.

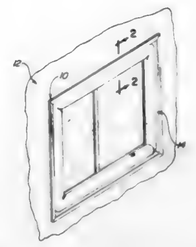


4,040,209
DEVICE FOR THE TREATMENT OF SHEET MATERIALS
Boris Nikolaevich Shikhirev, Novo-Alexeevskaya ulitsa, 1, kv. 146; Evgeny Arkadievich Matrosov, 2 Filevskaya ulitsa, 10/13, korpus 1, kv. 64, and Ilya Abramovich Deresh, Krasnokholmskaya Naberezhnaya, 1/15, kv. 343, all of Moscow, U.S.S.R.
Filed Nov. 6, 1975, Ser. No. 629,631
Claims priority, application U.S.S.R., Nov. 15, 1974, 2077025
Int. Cl.² B24B *7/12*
U.S. Cl. 51—80 A **4 Claims**



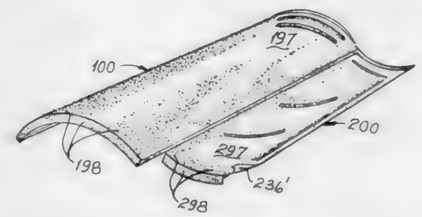
1. A device for treating sheet materials by a ferromagnetic abrasive powder comprising: a pair of cylindrical rolls of a magneto-conducting material adapted to rotate in opposite directions and arranged with a gap therebetween to enable the sheet being treated to pass between said rolls; said rolls having grooves formed on their external surfaces; means for feeding said abrasive powder into the gap between said rolls; means for inducing a magnetic field in the gap between the rolls so as to form a treating zone or area including a magnetic circuit located at least on one side of the ends of both said rolls so that the magnetic lines of the magnetic field pass along the axes of rotation of the rolls and cross the gap between them, so that said magnetic circuit and said rolls form a magnetic system wherein one roll constitutes one poll of the magnetic system and the second roll of said pair of rolls constitutes the other poll of the same system; the particles of said abrasive powder being retained in the zone of treatment by the action of the magnetic field of said system; a drive for rotating said rolls at substantially equal speed; and means for feeding the sheet material being treated into said gap between the rolls.

4,040,210
LOW COST STORM WINDOW
Edgel T. Land, 1733 S. Urban Way, Lakewood, Colo. 80228
Filed June 1, 1976, Ser. No. 691,463
Int. Cl.² E06B *7/16*
U.S. Cl. 52—2 **12 Claims**



1. A storm window adapted for mounting in the window frame of a house interiorly of the existing window closure, comprising:
- a general planar marginal framework of sealed flexible tubing having a planform corresponding in size and shape to the size and shape of the window frame and provided with at least one inflation port to supply air under pressure to its interior to yieldingly enlarge its periphery and cause it to grip opposing areas of the window frame and retain it in predetermined position;
- and closure means of thin flexible material extending across the framework at each side thereof and connected to it to form a hollow panel having a thickness substantially corresponding to the diameter of the tubing with substantially planar faces, and cooperating with the framework to define and enclose at least one substantially sealed dead air space to serve as insulation between the inner and outer walls of the panel;
- the closure means being substantially transparent to facilitate vision and light transmission through the panel.

4,040,211
MULTI PORTION TILE HAVING A CURLED INTERLOCK
John G. Wotherspoon, Anaheim, Calif., assignor to Martin E. Gerry, Santa Ana, Calif., a part interest
Continuation-in-part of Ser. No. 626,332, Oct. 28, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,491
Claims priority, application Australia, Mar. 10, 1975, 0843/75
Int. Cl.² E04D *1/06, 1/08*
U.S. Cl. 52—100 **27 Claims**



1. A tile having arc-shaped portions, each of the portions being generally describable by an imaginary cylinder sliced by an imaginary plane parallel to a central axis coaxial with the walls of the cylinder, comprising in combination:
- a first of said portions having convex and concave oppositely disposed surfaces;
- a second of said portions, integral with the first of said portions, having concave and convex oppositely disposed

surfaces, the convex surface of the first portion and the concave surface of the second portion forming an outer surface of the tile, said second portion having a curled portion only at the approximate intersection of a first imaginary line describing one edge of the second portion to said axis with a second imaginary line perpendicular to said first imaginary line;

particulate matter disposed over said outer surface; and

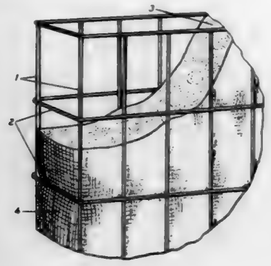
a coating material binding said particulate matter to said outer surface.

4,040,212

LATTICED WIRE STRUCTURE WITH A SOUND-ABSORBING MATERIAL

Per Staffan Göransson, Falkenberg, Sweden, assignor to Kommanditbolaget Pemac Invention AB & Co., Sweden

Filed Mar. 25, 1975, Ser. No. 561,715
Int. Cl.[2] E04B *1/82*
U.S. Cl. 52—145 **4 Claims**



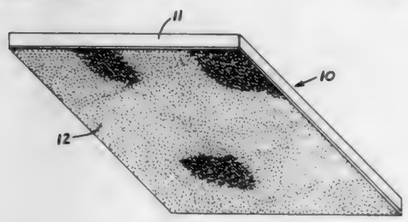
1. A sound absorbing rectangular parallelepiped structure having 12 edges and being comprised of a wire lattice having sound absorbing material housed therein, said lattice having longitudinal wires and transverse wires which cross over each other at a plurality of locations, the longitudinal and transverse wires being fixedly interconnected to each other at at least a majority of said plurality of locations causing the structure to be inherently stable, a wire being located at each of said edges of the structure and the spacing between adjacent wires in at least one direction of said lattice being the same as the thickness of the structure.

4,040,213

UNITARY STRUCTURAL PANEL FOR CEILING AND WALL INSTALLATIONS

Raymond W. Capaul, Rte. 3, Wildwood Drive, Aurora, Ill. 60544

Filed Aug. 22, 1975, Ser. No. 606,963
Int. Cl.[2] E04B *1/86, 1/94*
U.S. Cl. 52—145 **38 Claims**



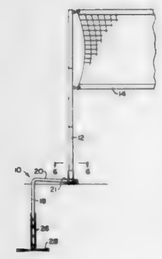
1. A unitary structural acoustical panel for ceiling or wall installations which has large area dimensions, a dimensional stability and structural strength to be edge supported as a unit without sagging or warping, a high impact resistance, a high fire rating and easy washability, comprising in combination a relatively thick fabricated panel, which of itself may be subject to sagging or warping or impact damage or fire damage or soil damage, and a relatively thin and flexible laminated facing for said fabricated panel including a thin and flexible metallic film, a thin and flexible glass fiber scrim and a thin and flexible synthetic plastic film adhesively secured together with the scrim between and bonded to the metallic film and the synthetic plastic film and with the metallic film bonded to the synthetic plastic film within the openings in the scrim, said relatively thin and flexible laminated facing being adhesively secured to said fabricated panel, which of itself may be subject to sagging or warping or fire damage or impact fire damage or soil damage, with the metallic film thereof bonded to a face of the fabricated panel and with the synthetic plastic film thereof exposed to provide, in combination, the unitary structural acoustical panel which has large area dimensions, a dimensional stability and structural strength to be edge supported as a unit without sagging or warping, a high impact resistance, a high fire rating and easy washability.

4,040,214

ADJUSTABLE GROUND SUPPORT FOR VOLLEYBALL POLES AND THE LIKE

Norman V. Frye, R.R. 4, Davenport, Iowa 52804

Filed Oct. 29, 1976, Ser. No. 736,779
Int. Cl.[2] E02D *5/74;* A45F *3/44*
U.S. Cl. 52—157 **10 Claims**



1. A support for poles and the like of the type including an inverted L-shaped structure having a depending part adapted to penetrate the ground and a lateral part adapted to overlie the ground and an upwardly directed pole-receiving means carried by the lateral part in spaced relation to the depending part, characterized in that a one-piece inverted L-shaped member of uniform non-circular section has a lateral leg constituting the aforesaid lateral part and a depending leg constituting one of two elements of the depending part, the other element of the depending part being a vertical tubular element of uniform non-circular section matching that of the depending leg and vertically telescopically and adjustably receiving said leg, means is provided for securing the tubular element and depending leg in any of several selected positions of vertical adjustment whereby to vary the extent to which the depending part penetrates the ground, and the pole-receiving means has a lateral opening therein of non-circular section and receiving the aforesaid lateral part.

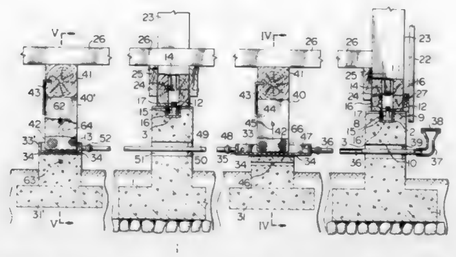
4,040,215

DECAY-RESISTING CONSTRUCTION OF LOWER STRUCTURE FOR WOODEN BUILDINGS

Yasutaro Totsuka, Tokyo, Japan, assignor to Totsuka Komuten Co., Ltd., Tokyo, Japan

Filed May 20, 1976, Ser. No. 688,345
Claims priority, application Japan, May 26, 1975, 50-61939; June 23, 1975, 50-75633; June 4, 1975, 50-74836
Int. Cl.[2] E04B *1/92;* A01M *1/24*
U.S. Cl. 52—168 **8 Claims**

1. In a building construction having a continuous footing and a plurality of post-type footings, each of said footings having a top face, and a wooden lower structure erected on the footings, the improvement wherein the top faces of the footings are provided with an upwardly opening groove therein, an upwardly opening tray positioned within the respective grooves accommodating therein a wood preserving and insecticidal liquid, said tray being formed by walls which are impervious to said liquid to prevent same from permeating into the footings, a plurality of pipes interconnecting the trays which are



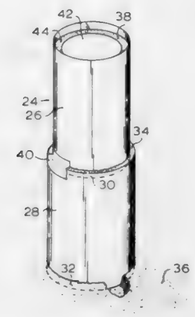
mounted on the different footings to permit transfer of said liquid between said trays, and suction material affixed to at least a portion of said lower structure, at least a part of said suction material being positioned within the trays and being in contact with the liquid therein, whereby said suction material sucks up the liquid in said trays and transfers same to said lower structure so that the liquid can permeate the lower structure to protect same.

4,040,216

PILLARS, WALLS AND BUILDINGS

Aristid V. Grosse, Haverford, Pa., assignor to A & T Development Corporation, Philadelphia, Pa.

Filed May 19, 1975, Ser. No. 578,931
Int. Cl.[2] E04B *1/00;* E02D *27/00*
U.S. Cl. 52—169.13 **10 Claims**



1. A structural member comprising at least one substantially smooth, linear tube, each tube comprising a material having sufficient tensile strength to retain a column of soil in pillar-like configuration, the tubular configuration having a waisted cross-section, each tube positioned substantially upright having an upper end and a lower end, a minor portion of each tube extending downward into the soil immediately surrounding the lower end of each tube, and a column of soil retained within each tube.

4,040,217

APPARATUS FOR ERECTING A MAST

Jean Cloup, Latresne, France

Continuation of Ser. No. 441,347, Feb. 11, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,262
Claims priority, application France, Feb. 22, 1973, 73.06354
Int. Cl.[2] E04H *12/18, 12/34*
U.S. Cl. 52—115 **9 Claims**



1. An apparatus for raising a vertical mast having an upper portion and a base, said apparatus comprising:

guy lines attached to the upper portion of said mast points of attachment thereon for balancing said mast, pulleys fixed to the earth for securing the guy lines to balance the mast, first means operatively connected to said guy lines for increasing the tension in said guy lines, second means operatively connected to the base of the mast for applying an upwardly directed force to the base of the mast derived from the tension in the lines that is capable of overcoming the weight of the mast and the downwardly directed force on the mast created by said tension at said points of attachment, said mast being raised upon the increase of tension in the lines by said tension increasing means so that said second means creates an upwardly directed force on said base that overcomes the weight of the mast and the downwardly directed force on said mast at said points of attachment due to said tension in said lines.

4,040,218

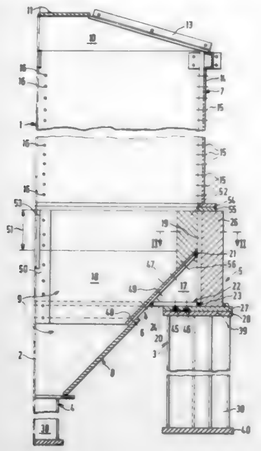
VESSEL WITH AN UPRIGHT SHELL

Karl-Heinz Stanelle, Rosenstrasse 4, Guglingen 2, Germany (7129)

Filed Dec. 17, 1976, Ser. No. 751,745
Claims priority, application Germany, June 18, 1976, 2627290
Int. Cl.[2] E04H *7/22;* B67D *5/06*
U.S. Cl. 52—194 **15 Claims**

1. A vessel, particularly a silo, comprising an upright shell having a generally circular outline and including a first part and a second part disposed below and supporting said first part, said second part having a collar including several arcuate sections extending circumferentially of said shell and abutting against each other in planes including the axis of said shell; means for securing the neighboring sections of said collar to each other, including an upright profiled bearing member for each of said planes, each of said bearing members having a relatively wide inner portion overlying the respective sections of said collar from without and a narrower outer portion, and means for fastening said inner portion to the respective sec-

tions, said fastening means forming two rows and said outer portion of each bearing member being disposed between the



respective rows of fastening means; and ground-contacting support means for said bearing members.

4,040,219

PROFILE ARRANGEMENT FOR WINDOW FRAMES OR DOORFRAMES

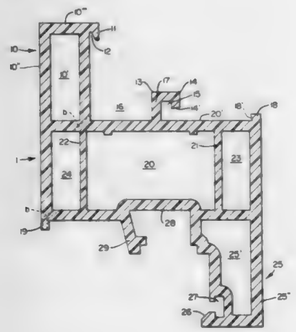
Wolfgang Budich, Troisdorf-Eschmar, Germany, assignor to Dynamit Nobel Aktiengesellschaft, Germany

Filed Nov. 3, 1975, Ser. No. 628,370

Claims priority, application Germany, Nov. 2, 1974, 2452087; Nov. 2, 1974, 2452089

Int. Cl.[2] E06B *7/14, 3/58*

U.S. Cl. 52—209 **67 Claims**



1. A frame arrangement, especially for doorframe and window frame construction comprising:

a profile member of hollow cross-sectional configuration formed by a plurality of interconnected side walls which surround and enclose a hollow space,

at least one outwardly projecting tongue means disposed on at least one side wall of the profile member at the center thereof for receiving at least one of a glass molding means and a sealing means, said tongue means includes a first portion extending outwardly from the side wall of said profile member, a second portion extending outwardly from said first portion substantially parallel to the side wall of said profile member and spaced therefrom, and a third portion extending from a second wall portion toward the side wall of said profile member, said third portion terminating in a free end spaced from the side wall of said profile member, said first, said second and said third portions defining a groove therebetween for receiving at least one of the glass molding means and the sealing means,

said profile member includes a projecting portion extending from the side wall on which said tongue means is disposed, said projecting portion being of hollow cross-sectional configuration formed by a plurality of interconnected side walls which surround and enclose a hollow space, said projecting portion being spaced from said tongue means and defining a channel between said first portion of said tongue means and a side wall of said projecting portion,

a cam means arranged on an extension of a side wall of said projecting portion, said cam means being directed toward the side wall of said profile member on which said tongue means is disposed and defining a groove means for accommodating a sealing element,

a recess means provided on the side wall of said profile member on which said tongue means is disposed, said recess means beind disposed in alignment with said groove defined by said tongue means, and at least a pair of web means disposed in the hollow space enclosed by the side walls of said profile member, said web means being spaced from each other and the side walls of the profile member such that the profile member includes a main chamber and lateral chambers disposed on each side of said main chamber, one of said lateral chambers accommodating the mounting of additional fittings, the other of said lateral chambers draining fluid from said channel.

4,040,220

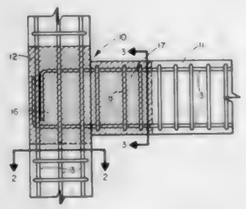
CONCRETE JOINTS

Charles H. Henager, Kennewick, Wash., assignor to Battelle Development Corporation, Columbus, Ohio

Filed July 25, 1973, Ser. No. 382,519

Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—259 **6 Claims**



4. In a joint of beam and column-type members of the type comprising essentially concrete and intersecting elongate members of reinforcing steel or the like, confined with supporting members in the form of reinforcing hoops, stirrup-ties, supplementary crossties, or the like in a joint region, to provide sufficient strength and ductility in the joint to withstand satisfactorily a predetermined amount of reversed flexure the improvement of a joint possessing greater stiffness than the aforesaid joint through comprising in the joint region

a concrete mix with fibers having a modulus of elasticity of at least about 20 million psi substantially uniformly distributed therein with an average spacing between fibers of up to about 0.3 inch and in a quantity sufficient to provide at least a predetermined flexural strength, and

such intersecting elongate members and a number of said supporting members in the joint region less than are required to provide said sufficient strength and ductility with concrete not containing any such fibers, the quantity of said fibers in the joint region having less weight and volume than the omitted supporting members.

4,040,221

LOAD-BEARING CONCRETE MEMBERS PROVIDED WITH MOISTURE AND DAMP PROOF

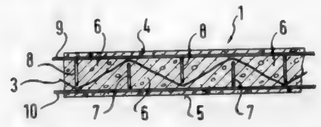
Francoise Vermeulen-Amelot, 69, Avenue du Manoir, and Thierry F. Vermeulen, 17, avenue du Belier, both of Waterloo, Belgium

Filed Mar. 8, 1976, Ser. No. 665,158

Claims priority, application Germany, Mar. 7, 1975, 2510061

Int. Cl.[2] E04B *1/64;* **E04C** *2/32*

U.S. Cl. 52—265 **12 Claims**



1. A load-bearing concrete member, such as a beam, slab, shell, panel, wall, or like member, comprising

a single unitary piece of concrete having a pair of faces, a pair of lateral edge walls, and a pair of end walls,

reinforcing rods of steel embedded in said single piece of concrete, and

a moisture and damp proof, insulating, synthetic plastic foil sheet embedded in said single unitary piece of concrete and extending substantially over the entire area of said piece defined by said walls,

said foiled sheet being disposed in a corrugated pattern so as to extend to and fro from near one said face to near the other said face through substantially the entire thickness of the statically effective cross section of the concrete piece and so as to divide the concrete piece into roughly prismatic load-bearing elements each extending from one said end wall to the other of the concrete piece.

4,040,222

CAVITY WALL AND METHOD USING ADJUSTABLE SPACING DEVICES

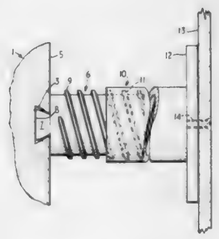
Alan Sidney Cull, Cammeray, Australia, assignor to Civic & Civic PTY Limited, Sydney, Australia

Filed May 18, 1976, Ser. No. 687,607

Claims priority, application Australia, May 20, 1975, 1666/75

Int. Cl.[2] E04B *2/30*

U.S. Cl. 52—365 **8 Claims**



6. A cavity wall comprising:

a. a load-bearing masonry wall which is subdivided into a plurality of masonry units provided with slots, said slots being located on one side of said masonry wall;

b. a plurality of spacing devices rigidly held in said slots, each of said spacing devices comprising a threaded rod, an elastically deformable tongue on one end of the respective rod, and a cap in the region of the other end of the respective rod in threaded engagement therewith, said tongues being received in the respective slots under compression so as to be rigidly secured therein, and said caps having fixing surfaces which are spaced from said masonry wall and are aligned in a predetermined plane; and

c. a skin connected with said fixing surfaces and defining a gap with said masonry wall, each of said rods having an exposed threaded portion in the region of said masonry wall so that moisture which penetrates said masonry wall and flows along said rods is caused to drip into said gap.

4,040,223

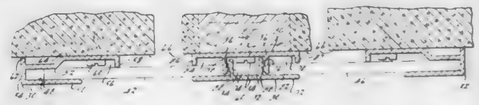
PANEL FRAMING DEVICE AND METHOD

David U. Hillstrom, Novi, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed June 1, 1976, Ser. No. 691,849

Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—483 **6 Claims**



1. A panel framing device for attachment to a structure and for holding and displaying at least two panel members, said panel framing device comprising

a plurality of exterior framing sections forming a perimeter frame, each of said framing sections comprising an elongated channel for engaging and retaining a first edge of one of said panel members, recess means positioned adjacent said channel such that said recess means is covered by a panel member inserted in said channel, and projecting means adjacent said recess means for supporting and positioning said panel member in said channel a predetermined distance from the surface of said structure on which said panel framing device is attached,

at least one interior framing means positioned on said structure inwardly of said exterior framing sections, each of said interior framing means comprising a base member and a cover member, said base member havng a pair of outwardly extending spaced apart flange members having inwardly facing toothed portions thereon and a pair of outwardly extending projecting members for supporting said panel members, said pair of flange members forming a recess therebetween, said cover member having inwardly facing toothed flange members for mating and engaging with said first pair of flange members on said base member, said cover member covering said last-mentioned recess when installed in mating engagement with said base member,

said cover member and said base member forming a pair of elongated channels in said interior framing means for securely retaining a second edge of said panel members, said cover member adapted to securely mate with said base member and rest against one surface of said panel members,

said pair of outwardly extending projecting members on said base member being substantially the same height as said projecting means on said exterior framing sections, said pair of projecting members and said projecting means positioning said panel members substantially parallel to the plane of said surface of said structure, and

fastening means disposed in said recess means in said exterior framing sections and in said recess formed in said base member in said interior framing means for securing said panel framing device to said surface of said structure.

4,040,224

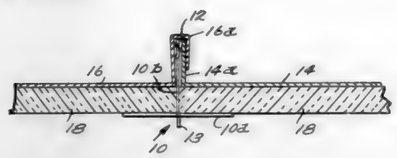
ROOF INSULATION SUPPORT MEANS

Frank D. Harris, Homosassa Springs, Fla., assignor to Ralph D. Harris, Margarita, CanalZone

Division of Ser. No. 508,712, Sept. 23, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,985

Int. Cl.² E04C *1/24*

U.S. Cl. 52—509 **4 Claims**



1. An insulated roofing assembly comprising

a. a plurality of sheet metal roofing panels forming a roof, each of said panels having a bottom generally flat surface, and each panel being joined to an adjacent panel at a joint, each joint including a portion of each roofing panel forming the joint extending upwardly away from and generally orthogonal to said bottom panel surfaces, each said upwardly extending portions being smooth-walled,

b. a plurality of generally flat insulation panels disposed in generally abutting engagement with said roofing panel bottom surfaces, said insulation panels each having a bottom surface generally parallel to the bottom roofing panels surface, and

c. means for readily removably retaining said insulation panels in engagement with said roofing panels so that said insulation panels may be readily assembled into engagement with said roofing panels and disassembled from engagement therewith, said means including a plurality of retaining members, each of said members comprising (i) a tongue portion inserted between the upstanding panel portions forming a joint between adjacent roofing panels, (ii) means formed on said tongue portion to provide sufficient withdrawal resistance of said tongue portion from said joint so that insulation panels may be supported by said retaining member while still allowing said tongue portion to be readily removable from said joint without damage to said joint or said tongue portion, (iii) a lip portion connected to said tongue portion and providing a support for an insulation panel by a utting the bottom surface thereof to hold said panel in engagement with a roofing panel bottom surface, and (iv) a withdrawal tab extending downwardly from said lip portion for aiding withdrawal of said tongue portion from a roofing panel joint in which it is disposed.

4,040,225

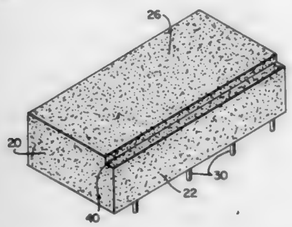
BUILDING BLOCK AND WALL CONSTRUCTION

Salvatore William Bretone, 34-41 85th St., Jackson Heights, N.Y. 11372

Filed Oct. 18, 1976, Ser. No. 733,388

Int. Cl.² E04C *1/10*; E04B *5/04*

U.S. Cl. 52—585 **9 Claims**



1. A wall construction composed of a multiplicity of rectangular building blocks bound together by cement mortar in an arrangement of staggered rows with each building block comprising; four minor side surfaces and two major surfaces, said two major surfaces being on opposite sides of one another with their longer dimensions disposed in a horizontal direction, a plurality of pins extending from one of said major surfaces and arranged in two equal rows each having an even number of pins with each row of pins aligned with the longer dimension in a plane perpendicular to the plane of said major surface and each row extending from said major surface, a distance unequal to the extending distance of the other row of pins, a recessed channel located along the opposite major surface in a corresponding relation with said longer extending row of pins such that the row of longer extending pins from each block extend into the recessed channel of the adjacent lower row of block for forming a reinforced structure with the channel of each row serving as a guide for the emplacement of each adjacent upper row of blocks to assure a true grade.

4,040,226

BUILDING BLOCK WITH WAVE-SHAPED UPPER AND LOWER SUPPORT SURFACES

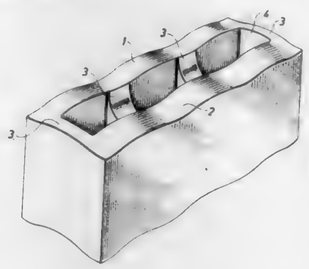
Sven Evert Fernaeus, Frejavagen 80, 191 46 Sollentuna, and Erik Anselm Jonsson, Box 3411, Yckelsbo, 820 40 Jarvso, both of Sweden

Filed Aug. 18, 1975, Ser. No. 605,314

Claims priority, application Sweden, Aug. 23, 1974, 7410741; Sept. 3, 1974, 7411139

Int. Cl.² E04C *1/10*

U.S. Cl. 52—594 **3 Claims**



1. A building block adapted to be arranged in substantially horizontal layers stacked upon each other, comprising:

substantially rectangular upper and lower support surfaces in parallel relative to each other over the whole of the upper and lower support surfaces, each of said upper and lower support surfaces having a continuous substantially sinusoidal wave-shaped profile in the length and width directions thereof at the same time, said length and width directions being substantially perpendicular relative to each other,

said continuous substantially sinusoidal wave-shaped profiles in both said length and width directions respectively extending over the complete surfaces of said upper and lower support surfaces, and said substantially sinusoidal wave-shaped profiles for the upper and lower support surfaces all having the same amplitude and periodicity and a constant wave profile over the whole of said upper and lower support surfaces such that the profiles of sectional surfaces through said block in either of said two directions is always substantially the same at all points in a respective direction.

4,040,227

METHODS OF MANUFACTURING BUILDING SECTIONS

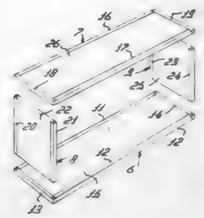
Cornelis van der Lely, Bruschenrain 7, Zug, and Hendricus Jacobus Cornelis Nieuwenhoven, Hirssattelweg, 6340 Baar, both of Switzerland

Continuation of Ser. No. 403,316, Oct. 3, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,402

Claims priority, application Netherlands, Oct. 3, 1972, 7213328

Int. Cl.² E04B *1/35*

U.S. Cl. 52—745 **5 Claims**



1. A method of manufacturing a box-shaped space-enlosing prefabricated building section having dimensions compatible with and size for being transported on highways by transport vehicles, the method comprising the steps of performing the functions of:

making a floor panel, a wall panel and a top panel, said floor panel and said top panel each being provided with a framework of metal beams about its periphery;

providing metal beams at opposite vertical edges of said wall panel;

accurately incorporating permanently and immovably in the framework of said floor panel and also on the framework of said top panel a pair of spaced-apart extensions proximate the corners of each;

defining and accurately incorporating on the top end of said metal beams of said wall panel a pair of recesses corresponding to said pair of extensions incorporated in said top panel and defining and accurately incorporating on the bottom end of said metal beams of said wall panel a pair of further recesses corresponding to said pair of extensions incorporated in said floor panel, said extensions and said recesses being so shaped that when received together for accurately positioning the relative positions of said panels in the assembled section each individual extension and corresponding recess combination form a set which cooperate to restrict relative movement of said panels in which they are incorporated in all horizontal directions;

casting a concrete slab within said floor panel framework, providing filling materials between said beams said wall panel;

placing said bottom pair of recesses of said wall panel on said floor panel extensions and said top panel extensions in said top edge recesses whereby said panels are accurately positioned; and

rigidly fastening said panels by welding the framework of said floor panel and said top panel to said metal beams of said wall panel.

4,040,228

MOUNTING MEANS

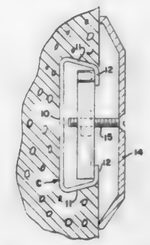
Leroy F. Skubic, La Porte, Ind., assignor to The Paltior Corporation, Michigan City, Ind.

Filed Feb. 12, 1976, Ser. No. 657,681

Int. Cl.² E04B *1/38*; E06B *1/16*; F16B *1/00*

U.S. Cl. 52—710 **5 Claims**

1. A mounting means for a plate such as a threshold having screw receiving apertures in accurately predetermined position comprising an upwardly opening mounting channel member having a web and side flanges extending at an angle to the web, an inturned margin extending along each flange, a downwardly opening channel shaped spanner bar of slightly greater length than the distance between the flanges of said mounting channel member, said channel shaped spanner bar having parallel flanges and being free of obstructions and of uniform dimensions between its flanges, said spanner bar having a screw receiving slot centrally of said web thereof and of a length to span the free edges of the inturned margins of the mounting channel opening, and a nut having parallel enlongated edges slidably and non-rotatably received in the downwardly opening channel of said spanner bar to prevent relative rotation between said nut and said spanner bar channel while permitting relative sliding between said spanner bar and said nut, and a bindingly fitting screw extending through an aperture in said plate and through said slot in said spanner bar and threaded into said nut, said screw being secureable through said plate such as a threshold to be secured to said mounting channel, whereby the assembled threshold plate and spannar



bar and nut and screw with the spanner bar in axial alignment with the channel opening of the channel mounting member can be positioned so the nut and spanner bar lie below the inturned margins so the first turning of the screw will cause the ends of the spanner bar to underlie the inturned margins of the mounting member as the spanner bar may slide on the nut whereby the ends of the spanner bar engage the flanges of said mounting channel member with a camming action so each end of the spanner bar may engage the adjacent flange of the mounting channel member and underlie the adjacent inturned margin of the channel member and further rotation of the screw positively rotates the screw relative to the nut and spanner bar and the nut and spanner bar are thereby moved along the screw and the arrangement clamps the plate such as a threshold when the ends of the spanner bar abut the undersurface of the inturned margins and the plate is secured in the accurately adjusted desired predetermined position to the support by the reaction of the spanner bar, screw, and nut with the mounting channel member.

4,040,229

METHOD OF MAKING A PACKAGE CONSTRUCTION FOR BASEBALL TYPE PLAYING COMPONENTS

James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429, and Joseph V. Tassone, 2425 Rawnsdale Road, Kettering, Ohio 45440

Division of Ser. No. 481,776, June 21, 1974, Pat. No. 3,952,477, which is a continuation-in-part of Ser. No. 326,805, Jan. 26, 1973, Pat. No. 3,830,362, and a continuation-in-part of Ser. No. 320,206, Jan. 2, 1973, Pat. No. 3,819,038. This application Feb. 17, 1976, Ser. No. 658,102

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.² B65B *5/04*

U.S. Cl. 53—29 **10 Claims**

1. A method of making of making a package construction comprising the steps of providing a tubular baseball and softball tee member having a chamber therein of a size to accommodate an entire bat of a conventional baseball or softball ballbat configuration and having a transition portion adapted

to be engaged by the conventional transition portion of said bat, providing a bat of a generally conventional baseball or softball ballbat configuration for hitting a ball off of said tee



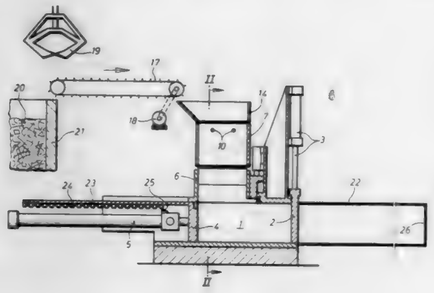
member, and telescopically disposing the entire said bat into said chamber of said tee member to provide a self-contained package construction thereof.

4,040,230

METHOD FOR FILLING CONTAINERS WITH COMPRESSED BLOCKS OF GARBAGE

Kurt Pessel, and Eberhard Stodt, both of Dusseldorf, Germany, assignors to Lindemann Maschinenfabrik GmbH, Dusseldorf, Germany

Filed Apr. 30, 1976, Ser. No. 682,160
Claims priority, application Germany, May 9, 1975, 2520573
Int. Cl.² B65B *63/02, 1/32*
U.S. Cl. 53—24 **7 Claims**



1. A method of compacting heterogeneous garbage into blocks and inserting a plurality of the compacted blocks into a container having a closable opening and having a filling space of predetermined length and a predetermined permissible load capacity, said method comprising:

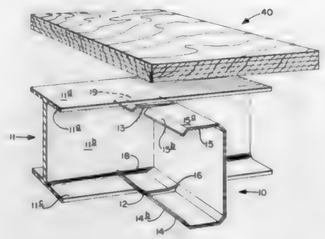
a. feeding a first quantity of garbage into a box;
b. weighing the first quantity of garbage feed into the box;
c. discharging the first quantity of garbage from the box into a compacting chamber;
d. compacting said first quantity of garbage in said compacting chamber based on the weight of the garbage into a first block of predetermined density, whereby the length of said first block is dependent on the weight characteristic of the garbage making up the block;
e. determining the length of said first block based on the length required to establish the predetermined density;
f. inserting said first block through said opening into the container;
g. repeating steps a) through e) with further quantities of heterogeneous garbage to form additional blocks of the same said predetermined density as said first block which further blocks are inserted into said container;
h. discontinuing the insertion of further compacted blocks into said container when the total length of all inserted blocks is sufficient for substantially filling the predetermined length of said container so that the closable opening can be inserted into the container without interference.

4,040,231

FRAMING SYSTEM

Joseph N. Laborde, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 346,289, March 30, 1973, abandoned, which is a division of Ser. No. 173,029, Aug. 19, 1971, abandoned. This application July 22, 1974, Ser. No. 490,272
Int. Cl.² E04B *2/78*
U.S. Cl. 52—664 **5 Claims**



1. A framing system for a building or structure, comprising: a plurality of special structural connections; each of said special structural connections comprising, a special channel member and a special receiving structural member joined thereto; said special channel member having a pair of vertical legs extending substantially the length thereof and each joined to the base of the channel by an inclined corner wall, each of said channel member legs having leg portions formed on one end thereof by opposing cuts extending through said channel member vertical legs and said inclined walls, said cuts extending the height of said channel member vertical legs; said leg portions being bent toward each other; said special receiving structural member having a pair of legs extending substantially the length thereof, said structural member legs being spaced apart and having an opening therebetween, said opening being of a size sufficiently large for receiving said bent toward each other leg portions but sufficiently small for rejecting said channel member legs; said bendable leg portions of said special channel member being inserted in said opening between said legs of said special structural member in a tight frictional relationship without distortion in said structural receiving member; and, the external surfaces of said vertical legs of said special channel member being substantially flush with the external surfaces of said legs of said special structural receiving member, thereby providing a substantially flat surface for receiving a decking or sheathing member.

4,040,232

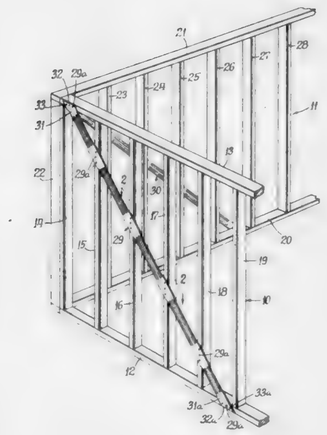
BUILDING BRACE

Kenneth T. Snow, 1303 N. Cross St., Wheaton, Ill. 60187, and Kenneth T. Snow, Jr., 317 Shagbark Court, Schaumburg, Ill. 60172

Continuation-in-part of Ser. No. 449,324, March 8, 1974, abandoned. This application Jan. 9, 1975, Ser. No. 539,701
Int. Cl.² E04C *3/32, 3/18*
U.S. Cl. 52—720 **1 Claim**

1. An elongated, relatively thin steel brace having both substantial compressive and tensile strengths for use in a building having a basic wall composed of vertically disposed spaced apart wood studs joined by a horizontal wooden bottom plate and a horizontal wooden top plate and capable of being carried

and handled by a person without substantial bending, and with the brace intended for attachment to the basic wall in a diagonal manner from the top plate, across a plurality of the vertical studs to the bottom plate without requiring notching of the top and bottom plates or the intermediately disposed vertical studs, said elongated brace comprising relatively flat portions at each end thereof with a plurality of holes therethrough to permit nailing of the flat end portions to the spaced apart top and bottom plates without any wood notching, said brace having a plurality of first portions disposed in spaced apart relationship longitudinally of said brace and between the flat ends for disposition of said first portions between the vertically disposed studs, stiffening ribs in each of said first portions, said ribs disposed generally longitudinally of the brace and projecting in one direction from the plane of said brace for disposition inwardly between the studs leaving the outside thereof generally flat and lying in the same plane as the outer plane surface of the studs, said ribs projecting a distance from the plane of said brace sufficient to substantially prevent compressive bending of said first portions, and said brace having other intermediate portions extending between the ends of said first portions for abutting each of the studs which the brace crosses, said intermediate portions being equal in number to the number of studs intended to be crossed by said brace, said intermediate portions being shaped in transverse cross section to render said intermediate portions in cooperation with said first portions and said flat end portions sufficiently stiff to permit carrying of said brace by a person without substantial bending and further to enable said intermediate portions to engage said studs in a substantially flat condition when said brace is secured to said basic wall with the ribs of said first portions extending inwardly of a plane including the outer edges of said basic wall, said portions having a plurality of nail holes provided therein, said intermediate portions of the brace shaped with extremely shallow stiffening ribs at the longitudinal side edges of said intermediate portions, said shallow stiffening ribs projecting in the same direction as said ribs of said first portions, said intermediate portions of said brace being curvilinear in cross section about the longitudinal axis of said brace to thereby define the extremely shallow side edge stiffening ribs.

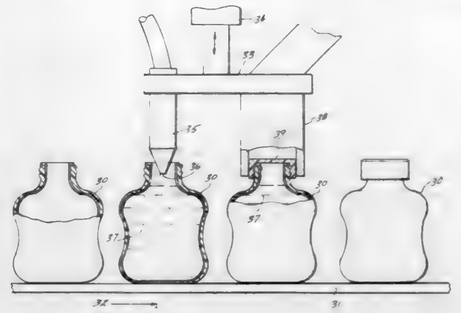


4,040,233

METHOD OF OBTAINING A FILLED, FLUID BARRIER RESISTANT PLASTIC CONTAINER

Emery I. Valyi, 5200 Sycamore Ave., Riverdale, N.Y. 10471

Continuation-in-part of Ser. No. 538,894, Jan. 6, 1975, Pat. No. 3,955,697, which is a continuation-in-part of Ser. No. 309,346, Nov. 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 71,734, Sept. 14, 1970, Pat. No. 3,717,544, and Ser. No. 100,050, Dec. 21, 1971, Pat. No. 3,719,735. This application Mar. 17, 1975, Ser. No. 558,787
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² B29C *17/07;* **B65B** *55/06, 55/14*
U.S. Cl. 53—21 R **10 Claims**



1. A method for obtaining a filled, fluid barrier resistant plastic container wherein said container is exposed to a temperature in excess of 175° F. while retaining the barrier resistant characteristics thereof which comprises: preparing a seamless, multilayered, hollow plastic container having an open molded neck and having an outer pressure molded first portion of a thermoplastic material resistant to temperatures in excess of 175° F., an inner second portion of a thermoplastic material resistant to temperatures in excess of 175° F., and a third portion fluid barrier layer of a thermoplastic material between said first and second layers and co-extensive therewith throughout the extent thereof, said barrier layer having a lower temperature resistance than said first and second layers so that said container has the property that when exposed to an elevated temperature in excess of 175° F. but below the temperature resistance of said first and second positions said barrier layer softens or melts, but reforms in place upon cooling to retain its barrier resistant characteristics; filling said container through said open neck; exposing said container to an elevated temperature in excess of 175° F. but below the temperature resistance of said first and second portions followed be cooling the container to ambient temperature to utilize said property of the container and provide a filled, barrier resistant container.

4,040,234

METHOD AND DEVICE FOR RACKING AND SEALING CONTAINERS

Douglas P. Stockdale, Anaheim; Richard Mencarini, Hungtington Beach; Carlton D. Deaton, Garden Grove, and Ralph M. Owen, Laguna Hills, all of Calif., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

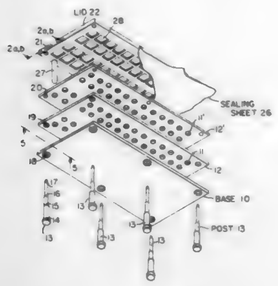
Filed Jan. 14, 1976, Ser. No. 649,079
Int. Cl.² B67B *5/00;* **B01L** *9/06*
U.S. Cl. 53—38 **22 Claims**

1. Rack for holding and sealing a plurality of containers having orifices, the rack comprising in combination:

a. mounting means for supporting and indexing a plurality of containers in predetermined substantially horizontally spaced relationship;
b. a lid opposite the mounting means at least one rigid sur-

face of which is broken with apertures, each aperture capable of receiving at least one of the orifices;

c. a flexible sheet for sealing the container orifices, said sheet disposed between the mounting means and the lid apertures; and



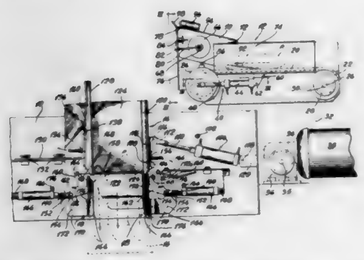
d. a spacing means for spacing the lid and mounting means at a distance predetermined to permit the orifices to penetrate the apertures without abutting the lid, and for removably fixing the sealing sheet between the lid apertures and the mounting means.

4,040,235

APPARATUS FOR HANDLING LIQUID FILLED FLEXIBLE POUCHES

Adam Chlipalski, 55th Avenue, Lachine, Quebec, Canada

Filed July 19, 1976, Ser. No. 706,604
Int. Cl.[2] B65B *57/20, 43/34*
U.S. Cl. 53—59 R **15 Claims**



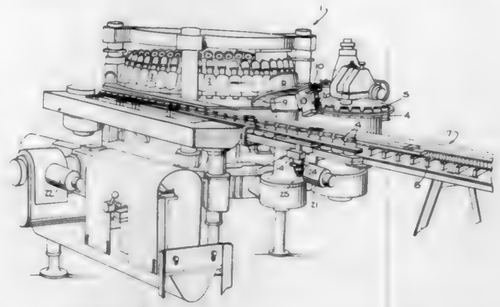
1. An apparatus for supplying a plurality of liquid filled flexible pouches into an outer flexible bag, the apparatus including means for advancing and feeding the plurality of flexible pouches one by one; a flexible pouch receiving cradle assembly having at least one support wall and a retractable bottom wall; means pivoting the cradle assembly between a first position whereby said support wall is inclined from the vertical below the angle of rest of said flexible pouches and adapted to receive a plurality of pouches fed from the advancing means stacked in side-by-side relation in the cradle assembly and a second position wherein said support wall is above the angle of rest of said pouches, means adapted to retract said bottom wall when the cradle assembly is in said second position, means below and adjacent said bottom wall when said cradle is in said second position for opening and locating an outer flexible bag for receiving the pouches as the pouches are dropped simultaneously from the cradle assembly, the advancing and feeding means including a conveyor belt supported by at least two conveyor belt support structures; a clutch arrangement operatively connected to one of the belt support structures and a source of power operatively connected to another of the support structures, the clutch arrangement adapted to move its respective support structure between a first position wherein the at least two support structures permit movement of the conveyor belt and a second position wherein movement of the conveyor belt is prevented, the support structure connected to the source of power being in motion before the clutch arrangement is advanced into the first position whereby immediate delivery of pouches by means of the conveyor belt is obtained upon actuation of the clutch arrangement to the first position.

4,040,236

MEANS FOR COMPENSATING CONTAINER FEED TRIP FOR SPEED CHANGES

Harold L. Siler, Jr., Rockbridge, and Cecil P. Roberts, Carroll, both of Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed Jan. 21, 1976, Ser. No. 651,060
Int. Cl.[2] B65B *57/02, 57/08*
U.S. Cl. 53—67 **10 Claims**



1. In a sealing machine for sealing containers with closure caps and including a sealing means with a container feed means and a closure cap feed means and having a container sensing device on the container feed means coupled to a cap stop device positioned on the closure feed means for controlling it, an improved synchronizing means for said feed comprising the combination of:

a movable mounting for one of said devices;

said one device being mounted on said movable mounting;

a first control device for adjusting the operating speed of said sealing machine;

a second control device operatively coupled to said movable mounting for adjusting the position of the said one device positioned thereon; and

means coupling said first control device to said second control device for moving said second control device in response to movement of said first control device whereby said one device is moved in accordance with adjustments of the machine speed under the control of said first control device.

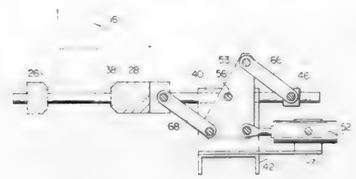
4,040,237

SEALING JAW MECHANISM FOR PACKAGE MAKING MACHINE

Edward F. O'Brien, Northhampton, Mass., assignor to Package Machinery Company, East Longmeadow, Mass.

Filed June 18, 1976, Ser. No. 697,626
Int. Cl.[2] B65B *9/10*
U.S. Cl. 53—180 M **13 Claims**

1. In a package making machine, the combination of front and rear sealing jaws and a mechanism for moving said jaws relative to one another between open and closed conditions, said mechanism comprising a base, a slide supported for sliding movement relative to said base along a given axis, means fixing said front jaw to said slide for movement therewith, means slidably supporting said rear jaw for sliding movement relative to said slide along said given axis, said slide extending along said given axis from said front jaw toward and beyond said rear jaw to a point behind said rear jaw, two crank arms fixed relative to one another and supported for pivotal movement in unison about a crank axis generally perpendicular to said given axis and located behind said rear jaw, a first connecting link connected between one of said crank arms and said slide with its point of connection to said slide being located behind said rear jaw, and a second connecting link connected between the other of said crank arms and said supporting means for said rear jaw, the point at which said first connecting link is connected to said one crank arm and the point at which said second connecting link is connected to said other crank arm being located generally on opposite sides of said crank axis so that upon rotation of said crank arms about said crank axis said two jaws are slidably moved in opposite directions along said given axis.

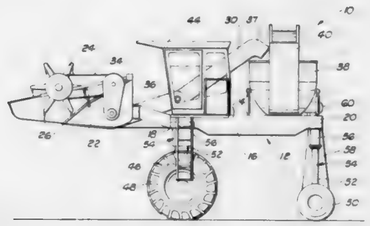


4,040,238

ROW CROP ROGUE VEHICLE

Fred L. Hill, 516 S. Ash, McPherson, Kans. 67460

Filed Jan. 14, 1976, Ser. No. 648,933
Int. Cl.[2] A01D *23/00*
U.S. Cl. 56—167 **2 Claims**



1. A row crop rogue vehicle for removing seed heads from weeds or the like which are taller than cultivated crops in a field, the vehicle comprising:

a vehicle frame having a top portion, bottom portion, front portion, and rear portion;

a front pair of hydraulic cylinders and a rear pair of hydraulic cylinders, said cylinders having an upper portion and lower portion, the upper portion of said cylinders attached to the bottom of said frame;

a pair of front wheels and a pair of rear wheels, said wheels rotatably attached to the lower portion of said cylinders;

a cutting sickle attached to the front of said frame for cutting the seed heads;

a rotary reel attached to the front portion of said frame;

an auger attached to the front of said frame, said rotary reel feeding the cut seed heads to said auger;

an endless chain driven ribbed conveyor mounted on the top portion of said frame and disposed adjacent said auger for receiving the cut seed heads from said auger;

a storage hopper mounted on the top portion of said frame and positioned at the rear portion of said frame for receiving and storing the cut seed heads from said conveyor;

a vehicle motor mounted on the top portion of said frame, said motor attached to and driving said wheels, said conveyor, said cutting sickle, said rotary reel, and said auger by a mechanical linkage;

a hydraulic drive motor mounted on the top of said frame and driven by said vehicle motor and connected to said hydraulic cylinders for raising and lowering said cylinders thereby raising and lowering said vehicle frame above the cultivated crops; and

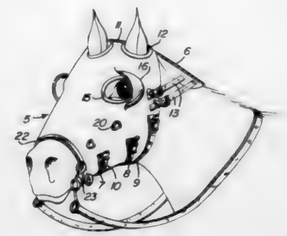
steering means mounted on the top portion of said frame and attached to said wheels for guiding said wheels between the rows of the cultivated crops.

4,040,239

PROTECTIVE HEADGEAR FOR HORSES

Kenneth W. Powell, Sweetwater, Tex., assignor to Charles G. Powell, Sweetwater, Tex., a part interest

Filed Apr. 6, 1976, Ser. No. 674,663
Int. Cl.[2] B68C *5/00*
U.S. Cl. 54—80 **8 Claims**



1. Protective headgear for horses comprising: means for substantially covering the complete head of a horse except for the ears, eyes, mouth and nose portions, including; a face mask of configuration to substantially conform to the head of a horse, the face mask as viewed from the side having a slightly convexly curved upper edge, a narrow lower edge and side edges converging from the top to the bottom edge, a pair of spaced openings near the top edge and spaced on each side thereof to receive the ears of the horse, a pair of farther apart spaced eye openings, one at each side of the face mask to accommodate the eyes of the horse, eye blinder cups secured to the outer edge of the eye openings, a protective flap member for the poll and neck of the horse hinged to the face mask at its upper rear edge, both the face mask and the protective flap member being lined with a soft protective padding, means for securing the face mask beneath the jaw of the horse, and further means for adjustably securing the side edges of the protective flap member to the rear side edges of the face mask.

4,040,240

METHOD AND APPARATUS FOR DOUBLING AND TWISTING A YARN BY A TWO-STEP CHANGEOVER SYSTEM

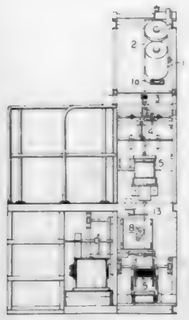
Kotaro Fujioka, Nagoya; Osami Tsuchihashi, Okazaki; Tetsuhiko Endo, Kyoto, and Masakazu Hirota, Shiga, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Aug. 12, 1976, Ser. No. 713,851
Claims priority, application Japan, Oct. 8, 1975, 50-120578
Int. Cl.[2] D01H *1/08*
U.S. Cl. 57—34 CP **21 Claims**

1. A method for doubling and twisting a material yarn by a two-step changeover system by means of a pot twisting and winding device, wherein said material yarn is fed into said pot by way of a traverse tube being reciprocally displaced upwardly and downwardly along an axial center of said pot during a first step operation so that a yarn package of a primary twisted yarn created from said material yarn is formed upon an inside cylindrical wall of said pot, upon completion of forming said yarn package of said primary twisted yarn, a second step operation starts in which said primary twisted yarn is unwound from said yarn package so as to double with said material yarn supplied through said traverse tube while eliminating the primary twists imparted thereto, and said doubled yarn is twisted

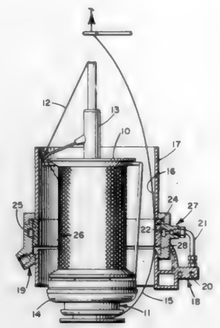
simultaneously to said doubling operation; and, during the second step operation, upon completion of unwinding of said primary twisted yarn from said yarn package formed in said pot, said second step operation is stopped and said first step operation is commenced again, said first step operation and second step operation being alternately carried out, and changeover from the first step to the second step being controlled such that a bottom end of said traverse tube in said pot is at a position defined by $D_2 \geqq L_2$ wherein D_2 represents an innermost diameter of said yarn package formed in said pot by said first step operation while L_2 represents a distance between said bottom end of said traverse tube and an upper terminal of an aperture formed from a bottom inside surface of said pot.

9. An apparatus for doubling and twisting a material yarn by a two-step changeover system comprising a pot twisting and winding device provided with a traverse tube disposed therein



in a condition capable of traversing upwardly and downwardly along an axial center thereof, said pot being provided with an aperture formed from a bottom inside surface thereof, a mechanism for feeding a material yarn into said pot by way of said traverse tube, a mechanism for taking up a doubled and twisted yarn composed of said material yarn and a yarn unwound from a yarn package of primary twised yarn, formed on an inside cylindrical wall by a first step operation, from said operature of said pot during a second step operation, means for traversing said traverse tube along said axial center of said pot during said first step operation, and means for controlling the position of a bottom end of said traverse tube during said second step operation in a condition satisfying a relation $D_2 \geqq L_2$, where D_2 represents an innermost diameter of said yarn package formed in said pot by said first step operation, and L_2 represents a distance between said bottom end of said transverse tube and an upper terminal of said aperture.

feeding means for supplying liquid to said chamber and at least one porous seepage septum which is present as an inner sliding



surface for the balloon, said chamber being feedable with liquid under adjustable pressure.

4,040,241

DEVICE FOR DISTRIBUTING SOFTENING LIQUID ON THE YARN DURING THE TWISTING PROCESS

Claudio Speranzin, Pordenone, Italy, assignor to Officine Savio, S.p.A., Udine, Italy

Filed Dec. 12, 1975, Ser. No. 640,155

Claims priority, application Italy, Dec. 12, 1974, 83450/74

Int. Cl.[2] D01H *13/30, 7/86*

U.S. Cl. 57—35 **15 Claims**

1. A device for distributing softening liquid to a yarn, when the yarn is being balloon twisted and has emerged from a spindle or core of the spindle including a container for the balloon, at least one chamber integrally fixed to an external portion of the container wherein the balloon slides, at least one

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4,040,242

TWIST TUBE FOR FALSE-TWISTING DEVICES

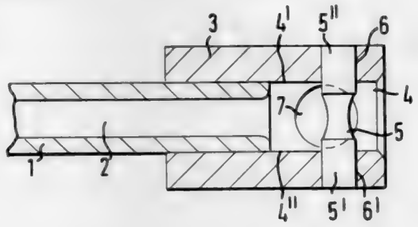
Josef Raschle, Butschwil, Switzerland, assignor to Heberlein Maschinenfabrik AG, Switzerland

Filed Nov. 29, 1976, Ser. No. 745,577

Claims priority, application Switzerland, Dec. 11, 1975, 16091/75

Int. Cl.[2] D02G *1/06*

U.S. Cl. 57—77.3 **3 Claims**



1. A twist tube for a false-twist device for texturing textile yarns, comprising a main tubular portion, a diametrally enlarged tubular portion constituting a comparatively short extension of one end of said main tubular portion, said enlarged tubular portion providing a widened continuation of the passage through said main tubular portion and having a bore extending from said one end to the extremity of said twist-tube, said bore being uniformly oblong in cross-section with major and minor axes perpendicular to one another and with parallel sides perpendicular to the minor axis of said cross-section, said enlarged tubular portion being formed on opposite sides with spaces for receiving respectively the ends of a thread-guide pin and opening into said parallel sides of said bore, and a cylindrical thread guide pin having its ends fitted and fixed in said spaces with the axis of said pin perpendicular to the major axis of said bore, said major and minor axes being substantially longer than the diameter of the passage through said main tubular portion and being dimensioned and disposed to facilitate the threading of yarn passing through the twist-tube and wound once round said pin.

4,040,243

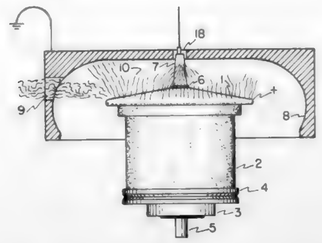
ELECTRODES FOR ELECTROSTATIC FIBER COLLECTING AND SPINNING APPARATUS

Heber W. Weller, Jr., Metairie, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed July 19, 1976, Ser. No. 706,978

Int. Cl.[2] D01H *1/12*

U.S. Cl. 57—58.89 **9 Claims**



1. In a yarn spinning apparatus of the type comprising a stationary electrode, a rotatable electrode spaced from the stationary electrode and means connected to said electrodes for establishing and maintaining an electrical field between them, and said stationary electrode having an opening axially aligned with the rotatable electrode through which the formed yarn is withdrawn, the improvement characterized by:

a. a stationary electrode which
   1. substantially encloses the rotatable electrode by extending, in a direction parallel to the axis, at least to the plane of the greatest diameter of the rotatable electrode,
   2. has a surface opposing the rotatable electrode which is round in all planes perpendicular to the axis of the rotatable electrode, and
   3. is positioned so that its axis is coincident with the axis of the rotatable electrode, and

b. the two electrodes being a corresponding size and shape so that the space between their opposing surfaces increases in a direction radial from their common axis.

4,040,244

APPARATUS FOR FALSE-TWIST TEXTURING OF TEXTILE YARNS

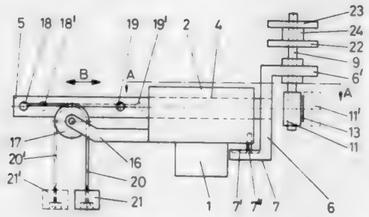
Josef Raschle, Butschwil, Switzerland, assignor to Heberlein Maschinenfabrik AG, Switzerland

Filed Aug. 2, 1976, Ser. No. 710,418

Claims priority, application Switzerland, Aug. 19, 1975, 10793/75

Int. Cl.[2] D02G *1/04*

U.S. Cl. 57—77.45 **6 Claims**



1. In apparatus for the false-twist texturing of textile yarns, a driving belt mounted to travel along a predetermined path during the operation of the machine, a fixed holder element formed with a guide passage, a rod guided in said passage so as to be slidable in opposite axial directions therethrough, said passage and rod being positioned so that one end of said rod is presented towards said belt, a support member fixed to said end of said rod and formed with two axially parallel bores extending therethrough in a plane to which said rod is perpendicular, two shafts respectively extending through and being rotatably mounted in said bores, driving rolls respectively mounted on said shafts in positions so to be driven by said belt when said rod is pulled in a direction to force said rolls against said belt, two rotation elements respectively mounted on said shafts for imparting rotation to means for false-twisting textile yarns, and means for imparting a constant, adjustable force to said rod to maintain a corresponding constant pressure between said rolls and said belt.

4,040,245

ELECTRONIC WATCH

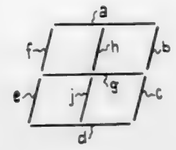
Fernand Chetelat, Cortaillod, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Apr. 2, 1976, Ser. No. 672,971

Claims priority, application Switzerland, Apr. 25, 1975, 5362/75

Int. Cl.[2] G04B *19/00, 19/24*

U.S. Cl. 58—4 A **5 Claims**



1. An electronic watch having an alpha-numeric display comprising, in addition to counter-dividers adapted to indicate seconds, minutes, hours and date, at least one counter adapted to provide a display in the form of letters of the alphabet, and several encoding means, associated with the said at least one counter, each of the encoding means, being adapted to a particular language and being selectively actuatable by means of a control terminal.

4,040,246

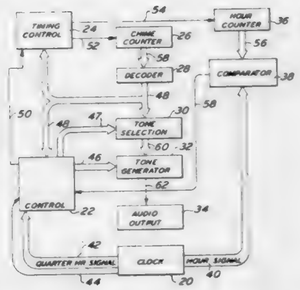
TIMEPIECE WITH ELECTRONIC CHIME GENERATOR

Egon Gorsky, 306 W. Dudley Ave., Westfield, N.J. 07090, and Morse Minknow, 1055 Grand Concourse, Bronx, N.Y. 10452

Filed June 19, 1975, Ser. No. 588,443

Int. Cl.[2] G04C *3/00;* **G04B** *21/08;* **G08B** *3/00*

U.S. Cl. 58—23 R **14 Claims**



1. An electronic tone generator system for generating sequences of tones in accordance with the time of day, said system including a timepiece having output means for providing a coded signal representative of the time, means responsive to said output means for generating a sequence of electronic tones each time said means responsive is activated, said means responsive being activated each quarter hour, said tones being converted to a sound which is an audible representation of the time said chime generator generating a first sequence of tones

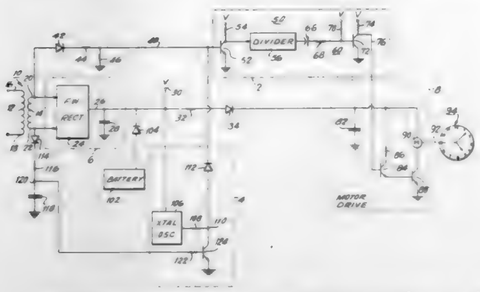
at the first quarter hour, a second sequence of tones at the second quarter hour, a third sequence of tones at the third quarter hour and a fourth sequence of tones at the hour, said generator further generating a chime of a different tone than the previous tones at the hour for each hour of the day past 12 o'clock.

4,040,247

CLOCK DRIVE APPARATUS

Arthur W. Haydon, Middlebury, Conn., assignor to Tri-Tech, Inc., Waterbury, Conn.

Filed Dec. 2, 1975, Ser. No. 637,026
Int. Cl.² G04C *3/00, 13/04;* H02M *7/00*
U.S. Cl. 58—23 R **22 Claims**



1. Apparatus for driving a time indicator device from an AC power source, comprising voltage supply means including a rectifier circuit for receiving a voltage from said AC power source to produce a DC energizing voltage and a capacitor coupled to the output of said rectifier circuit for storing and maintaining said DC energizing voltage thereacross immediately following an AC power source failure; oscillator means normally energized by said DC energizing voltage to produce periodic timing pulses; an auxiliary DC source; means responsive to said failure of said AC power source for supplying the voltage produced by said auxiliary DC source to energize said oscillator means, and utilization means for receiving said periodic timing pulses and for providing an indication of time.

4,040,248

ALARM ELECTRIC WATCH

Claude Laesser, La Chaux-de-Fonds, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Oct. 2, 1975, Ser. No. 618,824
Claims priority, application Switzerland, Oct. 11, 1974, 13687/74
Int. Cl.² G04C *21/28, 21/34*
U.S. Cl. 58—38 R **5 Claims**



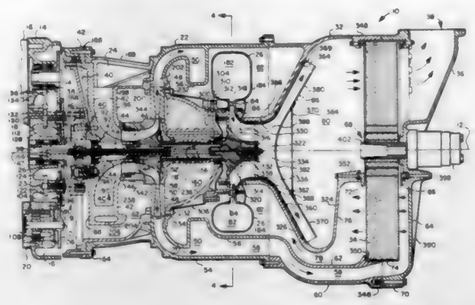
1. An alarm electric watch having an electro-optical display for the time and an alarm mechanism, said watch having a selecting device for the time at which the alarm is released, said time-selecting device comprising a manually displaceable element movable carried by a support element of said watch, one of said elements having an electrically conducting zone, a plurality of electrically conducting members associated with the electronic circuit of the watch carried by the other of said elements such that upon movement of said displaceable element a different combination of said conducting members makes contact with said conducting zone at each position of said displaceable element, each of said combinations of conducting members determining the time at which said alarm is released.

4,040,249

SINGLE SHAFT GAS TURBINE ENGINE WITH AXIALLY MOUNTED DISK REGENERATOR

Glenn W. Kahle, Waterloo, and Sydney A. Olsen, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed June 24, 1975, Ser. No. 589,679
Int. Cl.² F02C *7/10*
U.S. Cl. 60—39.51 H **16 Claims**



1. In a single shaft gas turbine engine having a single stage compressor disposed for rotation about a central axis and discharging high pressure gases, having a single stage radial flow turbine disposed axially forward of the compressor for rotation about the central axis which discharges exhaust gases in an axially forward direction and which is coupled to drive the compressor, and having a disk regenerator disposed axially forward of the radial flow turbine for rotation about a regenerator axis which is parallel to the central axis, the regenerator being coupled to pass high pressure gases from the compressor through one portion thereof which is below the regenerator axis in an axially rearward direction and being coupled to pass exhaust gases from the turbine through a second portion thereof which is above the regenerator axis in an axially forward direction, the improvement comprising a plenum disposed about the circumference of the engine between the single stage compressor and the single stage radial flow turbine and being connected to receive all of the high pressure gases from the compressor and carry the high pressure gases to a single first high pressure duct, a single first high pressure duct coupled to carry all of the high pressure gases from the plenum axially forward to the one portion of the regenerator on the axially forward side thereof, the first high pressure duct being disposed adjacent an outer periphery of the engine below the central axis and extending past an outer periphery of the regenerator below the regenerator axis.

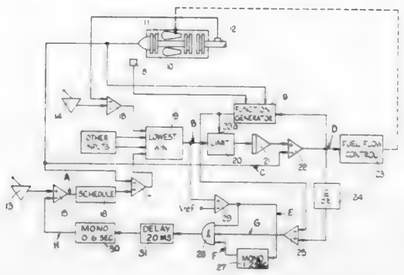
4,040,250

ELECTRONIC FUEL CONTROL FOR A GAS TURBINE ENGINE

Arthur Frank Saunders, West Midlands, and Graham John Hindmarsh, Birmingham, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed July 22, 1975, Ser. No. 598,048
Claims priority, application United Kingdom, July 24, 1974, 32637/74
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.28 R **7 Claims**

1. An electronic fuel control for a gas turbine engine, comprising: means for generating an engine speed error signal, limiter means sensitive to engine operating conditions to limit said speed error signal, an integrator for integrating said error signal, a first difference amplifier for comparing the output signal of the integrator with an engine actual speed signal to produce a fuel error signal, and a fuel flow control actuated by said fuel error signal controlling fuel flow to the engine, surge detection means comprising means for producing a signal



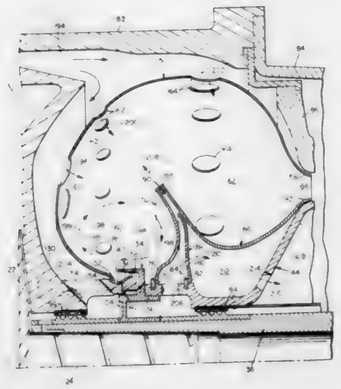
corresponding to the rate of change of the output of the difference amplifier, and a comparator means connected to produce a surge indication signal when said rate of change signal exceeds a predetermined level for a predetermined period.

4,040,251

GAS TURBINE COMBUSTION CHAMBER ARRANGEMENT

Arnold M. Heitmann, Swampscott; Walter L. Brassert, Belmont, and Donald N. Chouinard, Peabody, all of Mass., assignors to Northern Research and Engineering Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 583,793, June 4, 1975, which is a continuation of Ser. No. 346,651, March 30, 1973, abandoned.
This application Jan. 16, 1976, Ser. No. 649,816
Int. Cl.² F02C *3/08, 7/18, 7/22, 7/30*
U.S. Cl. 60—39.36 **25 Claims**



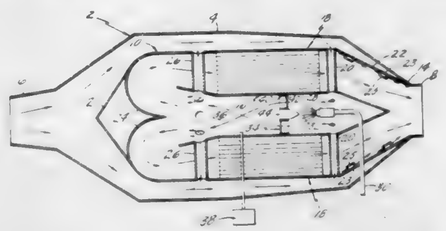
1. A gas turbine comprising:
a rotatable unit mounted for rotation about a system axis, said rotatable unit including a compression component and an expansion component,
a combustion chamber disposed between said compression and expansion components, said gas turbine having a gas flow path serially through said compression component, said combustion chamber, and said expansion component,
said combustion chamber being of toroidal configuration and having two distinct annular zones, a primary zone and a dilution zone, structure in said combustion chamber having a radially extending imperforate dished surface, first ports in said combustion chamber for injecting discharge air from said compression component into said primary zone toward said dished surface, said dished surface deflecting injected compressor discharge air in a radially inward direction and setting up a toroidal recirculation pattern of generally circular cross-sectional configuration in said primary zone, said toroidal recirculation pattern including an annular flow component adjacent the inner periphery of said primary zone that is generally coaxial with said system axis and is moving toward said compression component,
fuel injecting structure at the inner periphery of said primary zone including a stationary fuel supply source and slinger structure mounted for rotation about said system axis and spaced from the discharge end of said supply source, said slinger structure having a generally cylindrical radially inwardly facing fuel distribution surface that is disposed coaxially with said system axis and that has a closed end and an open end, said open end being closer to said compression component than said open end, said fuel distribution surface receiving fuel from said supply source for distribution and flow in a thin annular sheet across said generally cylindrical surface and discharge from the open end of said surface in a radially outward direction in a thin radial sheet of minute droplets across said annular flow component in a direction generally normal thereto and towards the center of said toroidal recirculation pattern, the radial flow of fuel droplets interacting with said toroidal recirculation pattern for achieving intimate mixing of fuel and air, and resulting efficient combustion within said primary zone, the resulting product flowing from said primary zone into said dilution zone, and second ports in said combustion chamber for injecting discharge air from said compression component into said dilution zone, the injection of compressor discharge air into said dilution zone diluting the products of combustion from said primary zone prior to flow to said expansion component.

4,040,252

CATALYTIC PREMIXING COMBUSTOR

Stanley A. Mosier, North Palm Beach, and Robert M. Pierce, Tequesta, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jan. 30, 1976, Ser. No. 653,811
Int. Cl.² F02C *7/22*
U.S. Cl. 60—39.36 **8 Claims**



1. A combustion device for a power plant including in combination a burner can, said burner can including a central tubular section, an annular section located therearound, said central tubular section having an open end and a closed end, means for directing air around said burner can, first tubular means connecting the exterior of said burner can to the interior of said central tubular section adjacent its closed end to direct air thereto, opening means connecting the exterior of said burner can to the interior of said central tubular section adjacent its open end to direct air thereto, means connecting the open end of said central tubular section to the adjacent end of said annular section, transition duct means connects the other end of said annular section to an outlet, said central tubular section including a combustion chamber, means for injecting fuel into the interior of said central tubular section adjacent its closed end, means for igniting the fuel-air mixture formed in

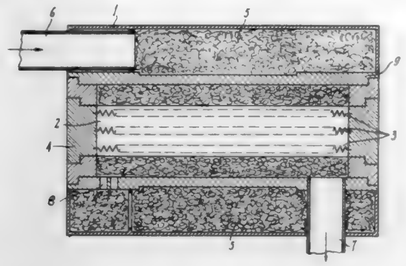
said combustion chamber, said annular section including a catalytic reaction device.

4,040,253

APPARATUS FOR TREATING EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Paul Dhugues, 40 rue du Capitaine Portales, Beausejour, and Francois Zanca, 5, rue Canizares, both of Casablanca, Morocco

Filed Oct. 21, 1971, Ser. No. 191,257
Claims priority, application France, Nov. 20, 1970, 70.41681
Int. Cl.² F01N *3/14*
U.S. Cl. 60—303 **4 Claims**



1. Apparatus for treating exhaust gas of internal combustion engines to eliminate therefrom its toxic constituents, especially carbon monoxide, comprising an outer shell of substantially cylindrical configuration; an inner substantially cylindrical enclosure having a peripheral wall of a material of high conductive capacity arranged spaced from and substantially coaxial with said outer shell in the latter; inlet means for feeding only exhaust gas from an internal combustion engine into said outer shell; passage means providing communication between the interior of the outer shell and the interior of said enclosure; means for heating the interior of said enclosure to a temperature so as to transform the toxic components of the exhaust gas fed thereinto into nontoxic components and to simultaneously preheat the exhaust gas in said outer shell through the heat conductive peripheral wall of said enclosure; means filling at least the space between said outer shell and said enclosure for providing a tortuous path for the exhaust gas passing therethrough; and outlet means communicating with the interior of said enclosure for discharging the treated exhaust gas therefrom.

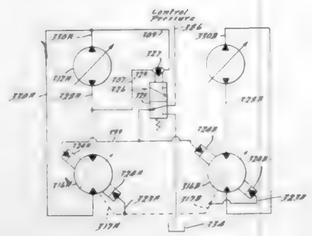
4,040,254

HYDROSTATIC TRANSMISSION WITH AUTOMATIC DISPLACEMENT SHIFTER

Kenneth K. Knapp, Battle Creek, and William E. Koch, Marshall, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Mar. 25, 1976, Ser. No. 670,333
Int. Cl.² B62D *11/04*
U.S. Cl. 60—420 **4 Claims**

1. A hydrostatic transmission system comprising:
a. a fluid reservoir;
b. first and second variable displacement pump means;
c. first and second variable displacement motor means each including displacement control means operable to vary the displacement of said motors between a maximum displacement and a minimum displacement;
d. first fluid conduit means interconnecting said first pump means with said first motor means, second fluid conduit means interconnecting said second pump means with said second motor means, and third fluid conduit means interconnecting said reservoir with said first and second pump means;
e. means associated solely with said first fluid conduit means to sense the magnitude of the load imposed on said first motor means; and
f. motor displacement shifting means for each motor means to:
1. bias said motor displacement control means to the minimum displacement position; and



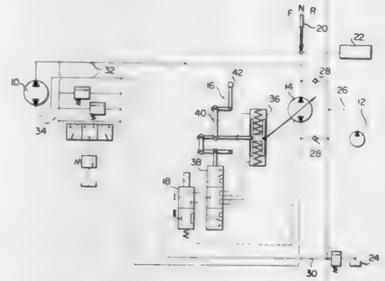
2. shift, upon sensing the application of a load on said first motor means in excess of a predetermined value, both of said motor displacement control means toward the mximum displacement position.

4,040,255

CONTROL SYSTEM FOR A HYDRAULICALLY ACTUATED DEVICE SUCH AS THE VIBRATOR MOTOR OF A SELF-PROPELLED VIBRATORY COMPACTOR

Hideo Hara, Kawasaki, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed July 29, 1976, Ser. No. 709,643
Claims priority, application Japan, July 29, 1975, 50-104123[U]
Int. Cl.² F16H *39/46*
U.S. Cl. 60—445 **4 Claims**



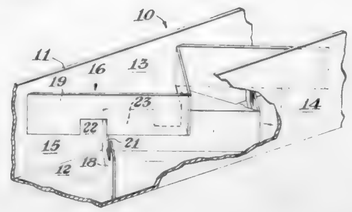
1. In a vibratory compactor having a vibrator driven by a hydraulic motor, a control system comprising in combination:
first pump means;
second pump means of the variable displacement type for supplying pressurized hydraulic fluid to said motor;
servo control means receiving pressurized hydraulic fluid from said first pump means and adapted to adjustably vary the per-cycle displacement of said second pump means, said servo control means including an actuator which is adapted to be neutralized automatically upon termination of the supply of pressurizd hydraulic fluid from said first pump means to said servo control means, with the result that said second pump means is prevented from supplying pressurized hydraulic fluid to said motor;
selector valve means for the on-off control of communication between said first pump means and said servo control means; and
valve operating means for operating said selector valve means so as to block communication between said first pump means and said servo control means when the travelling speed of the vibratory compactor becomes less than a predetermined value;
whereby said vibrator is automatically set out of operation when the travelling speed of the vibratory compactor becomes less than the predetermined value.

4,040,256

FLUME MIXER

Earl E. Bosche, Alvin; Jay M. Havlik, and James C. Kyle, both of Lake Jackson, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed July 14, 1976, Ser. No. 705,310
Int. Cl.² B01F *5/00*
U.S. Cl. 61—15 **8 Claims**



1. A flume mixer, the flume mixer comprising a flume having a bottom, flume side walls affixed to said bottom, the side walls and the bottom defining a liquid-flow channel having a longitudinal axis extending generally parallel to the side walls and bottom, a first mixing element disposed within the flume, the first mixing element comprising at least a bottom baffle and a top baffle, the top baffle and the bottom baffle being of generally elongate configuration, the bottom baffle extending between the side walls and being affixed thereto, the bottom baffle being angularly disposed within the channel, relative to the longitudinal axis of the channel and a plane perpendicular to the longitudinal axis of the channel, a second or upper baffle being generally similarly disposed in the channel above the bottom baffle and affixed to the side walls of the flume with the further limitation that the upper baffle is angularly disposed relative to the lower baffle and vertically projected centers of the upper baffle and the lower baffle are generally adjacent, the upper and lower baffles each being asymmetric about their centers in a projection of the baffles on a cross-section of the flume channel along the axis and that the upper baffle and the lower baffle in such a projection have major areas on opposite sides of a plane containing the longitudinal axis of the channel and extending generally parallel to the side walls to form a first mixing cell, at least a second mixing cell disposed adjacent the first mixing cell, the second mixing cell being of generally like construction to the first mixing cell, the first and second mixing cells having a generally mirror image configuration about a plane normal to the longitudinal axis of the channel and disposed between the first and second mixing cells.

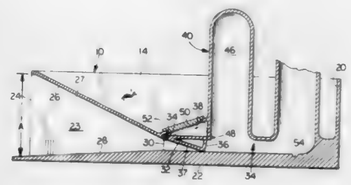
4,040,257

WAVE-PUMP APPARATUS

Ottie H. Andrews, 3129 Olinda Lane, Anaheim, Calif. 92804

Filed June 23, 1975, Ser. No. 589,052
Int. Cl.² E02B *9/08*
U.S. Cl. 61—20 **1 Claim**

1. A wave-pump apparatus for installation along the shoreline of coastal waterways, wherein the waves generated therein are received into said apparatus which comprises:
a housing;
a funnel-like, mouth portion formed as an integral part of the forward end of said housing to receive said waves directly therein, said mouth portion having:
a pair of inwardly converging side walls;
a bottom wall converging inwardly and upwardly providing an angular displacement substantially equal to the angle of said shore-line;
a top wall inclined downwardly and inwardly, whereby each of said walls defines a forward, enlarged opening and a rearward, reduced opening;
a throat portion contiguously formed aft of said mouth portion, whereby water is funneled from said mouth portion into said throat portion;
a valve means disposed at the junction of said mouth portion and said throat portion, whereby the force of the entering wave of water causes said valve to open, wherein said valve means comprises:
a flap-gate valve having converging side walls forming an apex end hingedly attached at the junction of said mouth portion and said throat portion and terminating at the junction of said mouth portion and said throat portion and terminating at the opposite end thereof with an accuately formed base wall disposed in a substantially vertical plan relative to the flow of water, whereby said base wall receives the direct force of the back pressure of the water intrapped within said throat portion;
a hinge disposed along the upper, longitudinal edge formed by said apex of said flap-gate valve and secured to the upper portion of said reduced opening of said mouth portion, whereby said gate valve hangs in a normally closed position;
a recess arranged to receive said flap-valve gate therein when said flap-valve is in an open mode of operation;



an access cover removably positioned as part of said recess, whereby access to said flap-valve is obtainable therethrough;
a bell housing defining a pressure chamber positioned adjacent and rearwardly of said flap-valve gate, said bell housing having a depending lower lip defining a portion of said recess thereby allowing said flap-valve gate to assume a substantially horizontal plan equal to that of said lower lip, wherein an uninterrupted flow of water is permitted into said throat portion, wherein said pressure chamber communicates with said throat portion, whereby the pressure built up therein provides additional means to force said water from said water tower into said conduit, and wherein said pressure chamber also provides means for absorbing back pressure developed within said apparatus;
a water tower positioned at the terminating end of said throat portion and disposed vertically thereto, said tower communicating with said throat portion, whereby water captured within said throat is forced upwardly into said tower;
a discharge conduit connected to the opposite end of said water tower, whereby the flow of water is transported to a predetermined point; and
a transverse, recessed channel disposed directly under said water tower and extending laterally outwardly from said throat portion, thereby allowing water to exit therethrough under pressure and wash foreign matter caught within said throat.

4,040,258

METHOD OF CONSOLIDATING PARTICLES

Perry A. Argabright, Larkspur, and C. Travis Presley, Littleton, both of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Aug. 16, 1974, Ser. No. 498,017

The portion of the term of this patent subsequent to Dec. 3, 1991, has been disclaimed.

Int. Cl.[2] E02D *3/12*

U.S. Cl. 61—36 C **6 Claims**

1. A process for increasing the strength and stability of a permeable mass comprising initially unconsolidated particles which process comprises:

a. preparing an aqueous solution containing a water-soluble salt of a polyisocyanuric acid in a concentration from about 0.5 to about 50% by weight and a water-soluble polymer in a concentration from about 1.0 to about 10.0% by weight selected from the group consisting of polyvinyl alcohol, hydroxyethyl cellulose, and mixtures thereof,

b. adjusting the pH of said aqueous solution as desired for a given application, said pH always being in excess of 7,

c. applying said aqueous solution to said unconsolidated particles and maintaining contact between said unconsolidated particles and said aqueous solution for a time sufficient to permit gelatin and the formation of a consolidated matrix containing said particles.

4,040,259

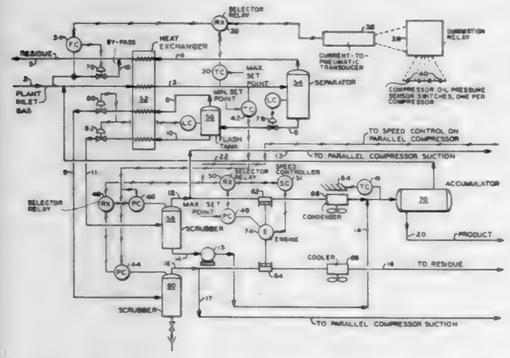
RECOVERY OF NATURAL GAS LIQUIDS BY PARTIAL CONDENSATION

Carl W. Zahn, and Hadwen A. Clayton, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 315,535, Dec. 15, 1972, Pat. No. 3,901,673. This application May 22, 1975, Ser. No. 579,993

Int. Cl.[2] F25J *3/00*; F25B *41/00*; F04B *41/06*

U.S. Cl. 62—37 **3 Claims**



1. An apparatus for controlling the bypass of inlet gas around a compressor system said system comprising a plurality of compressors in parallel operations, said apparatus comprising:

1. means for sensing the compressor operating status of each compressor;

2. means for producing a signal when indicated that a compressor is operating;

3. a relay means for transmitting a plurality of said signals to a pneumatic transducer;

4. said pneumatic transducer producing a signal in response to the summation of signals from the relay means;

5. means for transmitting said transducer signal to a flow controlling means for modifying the transducer signal to apportion the inlet gas to be by-passed around said compressor system in an inverse proportion to said summation of signals compared to the total number of compressors in system; and

6. means responsive to said modified signal for bypassing said inversely proportioned inlet gas away from said compressor system.

4,040,260

PILE WITH DOWNWARDLY EXTENDING ELONGATED ELEMENTS

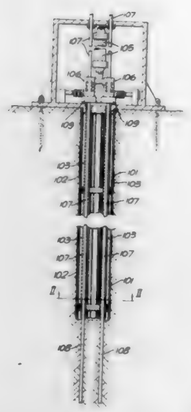
David Speaight Pryke, Brent Pelham, England, assignor to Pynford Limited, London, England

Filed Mar. 26, 1976, Ser. No. 671,023

Claims priority, application United Kingdom, Mar. 26, 1975, 12761/75; July 7, 1975, 28575/75

Int. Cl.[2] E02D *5/34*

U.S. Cl. 61—53.62 **11 Claims**



1. A method of forming a pile comprising an elongated columnar body adapted to carry a structural load at its upper end, and a plurality of elongated elements, each of the elongated elements being of smaller cross-sectional area than said body, said elements being connected at their upper ends to said pile body, the method comrpising the steps of:

a. forming a hole in the ground approximating the size and shape of the columnar body of the pile,

b. lowering an array of guide tubes into the hole, the guide tubes being slightly larger in cross-sectional area than the elongated elements,

c. inserting elongated elements into the guide tubes,

d. applying forces to the elongated elements to drive the bottom ends thereof downwardly into the ground through the bottom of the hole,

e. lifting the array of guide tubes out of the hole, and

f. grouting the hole to form a solid pile body which is reinforced by the upper ends of the elongated elements contained therein.

4,040,261

VIBRATORY PLOW

Paul R. Schuck, Daven Port, and John M. Baylor, Bettendorf, both of Iowa, assignors to J.I. Case Company, Racine, Wis.

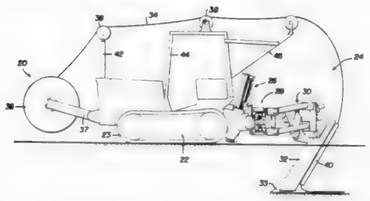
Filed Jan. 12, 1976, Ser. No. 648,348

Int. Cl.[2] E02F *5/02*; F16L *1/00*

U.S. Cl. 61—72.6 **14 Claims**

1. A vibratory plow, including a vehicle, a frame assembly operably supported on said vehicle and a generally vertical blade supported on said frame assembly, the improvement comprising:

a U-shaped yoke pivotally supported at opposite ends on said frame assembly having a free center portion, a vibrator supported on said yoke center portion generally in the plane of said blade and said yoke center portion pivotally connected to said blade by a link, said yoke transmitting the vibrations generated by said vibrator to said blade and vibrating said blade in an orbital motion.



4,040,262

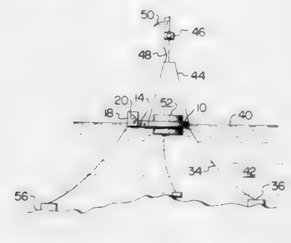
ICE ANCHOR

Preston E. Chaney, and George W. Morgan, both of Dallas, Tex., assignors to Suntech, Inc., Wayne, Pa.

Filed Sept. 8, 1976, Ser. No. 721,250

Int. Cl.[2] E02B *1/00*; B63B *21/30*

U.S. Cl. 61—86 **4 Claims**



1. Apparatus for forming an ice anchor in offshore areas covered by ice at some time during the year comprising: a banded high tensile strength material located adjacent the surface of the water and laterally enclosing a section of water in such offshore areas; buoyant float means attached to the banded material and positioned to maintain such material adjacent the water surface; attachment means connected with the banded material and located at least partially above the water surface; and means for maintaining the banded material in position relative to a selected position on the floor of the body of water.

4,040,263

ARRANGEMENT IN OR RELATING TO DRAINAGE

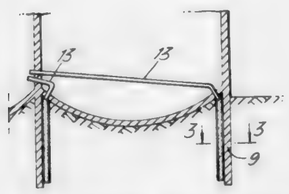
Ove Eide, and Carl F. Clausen, both of Oslo, Norway, assignors to A/S Hoyer-Ellefsen, Oslo, Norway

Filed Oct. 9, 1974, Ser. No. 513,285

Claims priority, application United Kingdom, Oct. 11, 1973, 47568/73

Int. Cl.[2] E02D *21/00*

U.S. Cl. 61—86 **2 Claims**



1. In a fully positioned marine gravity-type structure surrounded by the sea so as to be subject to cyclic loads from environmental forces and resting firmly on the seabed at a predetermined ultimate depth and orientation and at a location where the seabed material is of substantially uniform grain size distribution, continuously available means for counteracting liquefaction in the supporting soil beneath the structure at any desired time by relieving excess pore water pressure arising at any time from cyclic shearload in the supporting soil, said means comprising one or more permeable wells penetrating said supporting soil, a water-tight open-topped tower extending from the seabed to above the water surface, means communicating said wells with the lower portion of said tower, and continuously available means for selectively maintaining the water level inside said tower at a lower level than the water surface so as to maintain a lower hydrostatic pressure inside said wells than outside, and hence relieve excess pore water pressure occuring at any time in the supporting soil about said wells.

4,040,264

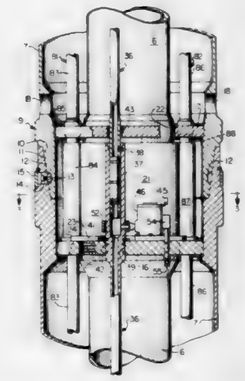
CONTROLLED BUOYANCY UNDERWATER RISER SYSTEM

Claude R. Neilon, Houston, Tex., assignor to Armco Steel Corporation, Middletown, Ohio

Filed Nov. 28, 1975, Ser. No. 635,843

Int. Cl.[2] E21B *7/12*

U.S. Cl. 61—86 **15 Claims**



1. In an underwater well riser system to be run between a floating vessel and an underwater well installation, the combination of

a primary riser comprising a plurality of lengths of riser pipe;

pipe of substantially larger diameter than said riser pipe;

a plurality of connector assemblies each adapted to interconnect two adjacent lengths of said riser pipe and to secure the upper end of one of said lengths of jacekt pipe to the upper end of the corresponding one of said lengths of riser pipe with said length of jacket pipe spaced outwardly from said one length of riser pipe and depending from the connector assembly,

there being an annular space between said one length of riser pipe and said one length of jacket pipe,

there being at least one opening communicating between said annular space and the water external to said jacket pipe in a location spaced from the top of said one length of jacket pipe;

a pressure fluid supply line comprising a plurality of lengths of pressure fluid supply pipe of a diameter such as to be accommodated in said annular space and of a length such that said connector assemblies can interconnect adjacent lengths of said pressure fluid supply pipe; and

a plurality of pressure differential valves each mounted on a different one of said connector assemblies, each of said pressure differential valves comprising

an inlet connectable to said pressure fluid supply line,

an outlet connectable to said annular space below the one of said connector assemblies on which the valve is mounted, and

valve operating means responsive to the difference between the water pressure in the location occupied by the valve and the fluid pressure at said outlet;

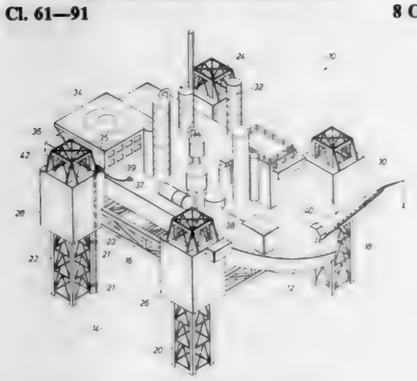
supply of pressure fluid in one direction via said pressure fluid supply line in the assembled riser system, when the system is submerged, causing water in said annular spaces to be forced out through said at least one opening of each annular space, whereby said spaces are rendered buoyant to a degree determined by operation of said pressure differential valves.

4,040,265

MOBILE OFFSHORE PLATFORM

Lance W. Hellerman, and Richard S. Hollyer, both of Houston, Tex., assignors to Marine Engineering Systems, Inc., Houston, Tex.

Filed Feb. 6, 1976, Ser. No. 655,682
Int. Cl.[2] E02B *17/04;* B63C *1/00*
U.S. Cl. 61—91 **8 Claims**



1. An offshore platform structure comprising:

a negatively buoyant one-piece platform defining a substantially horizontal support surface for accepting a vessel thereon;

a plurality of support legs on said platform being supported by the sea bottom below the surface of the water for stably supporting said platform, said legs being spaced to define a passage between said legs;

a plurality of jacking mechanisms secured to said platform and adapted to engage said legs for raising and lowering said platform with respect to said legs to position said platform above water level or below water level;

heave absorbing means disposed substantially across the passage between said legs, said heave absorbing means comprising a fender of pliable material providing a flexible surface extending above said support surface for engagement with the bottom of the vessel to dampen vertical motion thereof during docking and means for moving said fender between a first position wherein said fender is raised above the surface of the support surface to a second position wherein said fender is below the surface of the support surface; and

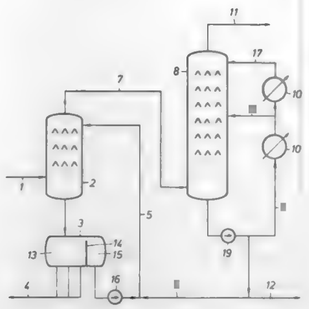
a substantially flat-bottomed work barge to be floated over said platform through said passage and to be supported without attachment on said platform at a raised position above water level.

4,040,266

MULTISTAGE COOLING OF CRUDE HYDROCARBON GASES

Horst Frank, Baierbrunn, and Hans Peter Langebach, Pullach, both of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Aug. 19, 1976, Ser. No. 715,674
Claims priority, application Germany, Aug. 23, 1975, 2538611
Int. Cl.[2] F28C *1/00*
U.S. Cl. 62—121 **7 Claims**



1. A process for cooling a crude gas containing a mixture of hydrocarbons having divergent boiling points, comprising the steps of

a. cooling said crude gas in a first stage in direct heat exchange with water to scrub out thus-condensed hydrocarbons and solids, said cooling being conducted substantially adiabatically by vaporization of the water, the resultant cooled crude gas being cooled to above the ambient temperature of the gas; and

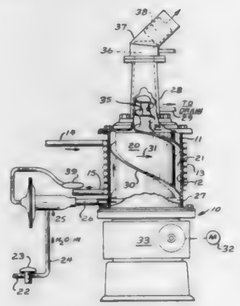
b. further cooling resultant cooled gas from said first stage in a second stage to about ambient temperature, said further cooling being provided by an external refrigerant.

4,040,267

ICE MAKER WITH THERMOSTATIC WATER CONTROL

Donald F. Swanson, St. Paul, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed June 21, 1976, Ser. No. 698,471
Int. Cl.[2] F25C *5/02*
U.S. Cl. 62—180 **16 Claims**



1. In an ice maker comprising a feeezing surface member; a refrigerating means for refrigerating said freezing surface member to a subfreezing temperature having a low pressure side including an evaporator in heat exchange contact with said freezing surface member and a gaseous refrigerant suction line connecting said evaporator to a compressor, a high pressure side including said compressor, a condenser, a refrigerant line connecting said compressor and condenser, and a liquid refrigerant line connecting said evaporator to said condenser, and a thermostatic expansion valve connected in said liquid line and separating said high and low pressure sides of said refrigerating means; and harvesting means for removing said ice from said freezing surface member; the improvement comprising a variable flow water supply means for supplying water to said freezing surface member, said variable flow means comprising a thermostatic water valve means having a control portion responsive to temperature conditions of one of said high and low pressure sides of said refrigerating means for regulating the volumetric water supply to said freezing surface member proportionate to the capacity of said refrigerating means to form ice on said freezing surface member.

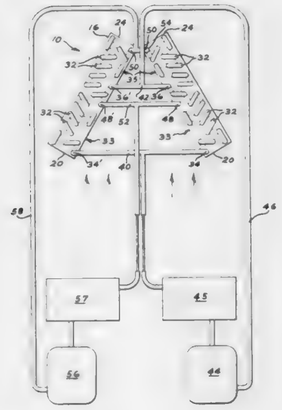
14. In an ice maker for continuous production of ice including an upright cylindrical ice freezing surface; a refrigerating means for said surface including an evaporator in heat exchange contact with said surface, a compressor, a condenser, a liquid refrigerant line connecting said evaporator to said condenser, a gaseous refrigerant suction line connecting said evaporator to said compressor, and a thermostatic expansion valve connected in said liquid line and responsive to the temperature of said suction line; and a rotatable harvest auger for removing ice from said ice freezing surface; the improvement comprising a variable flow water supply means for supplying water to said cylindrical freezing surface in excess of the amount required for the ice formed including a thermostatic water valve having a control portion responsive to the temperature of said suction line for regulating the volumetric water supply to said cylindrical freezing surface in inverse ratio to the temperature of said suction line.

4,040,268

MULTI-CIRCUITED A-COIL HEAT EXCHANGER

Webster L. Howard, Tyler, Tex., assignor to General Electric Company, Louisville, Ky.

Filed July 15, 1976, Ser. No. 705,621
Int. Cl.[2] F25B *7/00;* F25D *17/06;* F25B *39/02, 1/10*
U.S. Cl. 62—335 **8 Claims**



1. In a heat exchanger arranged in the path of a flow of air including a pair of slab heat exchangers having leading and trailing ends, said trailing ends being substantially parallel and spaced from each other to define an opening therebetween to allow movement of air therethrough, said slab heat exchangers converging toward said leading end so that substantially all of the air moving through said opening contacts and flows through both of said heat exchangers, each of said slab heat exchangers having a pair of end plates, a plurality of substantially rectangular sheet metal fins disposed in spaced parallel relation between said end plates, wherein the improvement comprises:

a plurality of straight tube runs extending through aligned holes in said fins and said end plates,

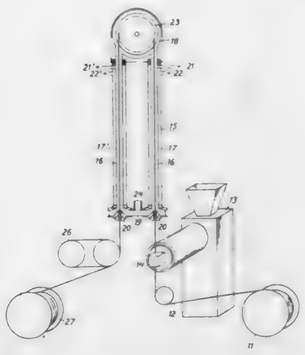
a plurality of return bends associated with each of said slab heat exchangers being located outwardly of said end plates connecting selected groups of adjacent straight tube runs so as to provide a first sinuous circuit in each of said slabs arranged so that one end of said first circuit is adjacent the trailing ends thereof and a second sinuous circuit arranged substantially between the first circuit and the leading ends of each of said slab heat exchangers being arranged so that substantially all of said first circuit in each heat exchanger is downstream in said air flow relative to their respective second circuit.

4,040,269

APPARATUS FOR CONTINUOUSLY COOLING WIRE SHAPED OBJECTS

Sven Sigurd Nordblad, Spanga, and Karl-Erik Svensson, Hagersten, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Nov. 13, 1975, Ser. No. 631,530
Claims priority, application Sweden, Dec. 2, 1974, 7415044
Int. Cl.[2] F25D *17/02*
U.S. Cl. 62—374 **9 Claims**



1. Apparatus for continuously cooling a wire-shaped object comprising a vertically extending first pipe, means for guiding the object coaxially through said first pipe, liquid feeding means for feeding liquid coolant onto the inner surface of the wall of said first pipe, said feeding means being near the top of said first pipe whereby the coolant can flow down the inner wall of said first pipe, a plurality of openings in the wall of said first pipe, a second pipe coaxially surrounding said first pipe, means for sealing the ends of said second pipe to said first pipe to provide a manifold, gas feeding means connected to said second pipe for feeding a gas under pressure to the manifold whereby jets of the gas can pass through the openings in said first pipe to vaporize and propel the coolant to form a mist around the object.

4,040,270

COUPLING ADAPTED TO CONNECT RADIALLY OFFSET SHAFTS

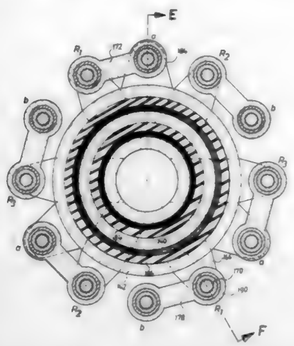
Ilie Chivari, Berliner Strasse 1, 4680 Wanne-Eickel, Germany

Filed May 8, 1975, Ser. No. 575,815
Claims priority, application Germany, June 29, 1974, 2431383; Mar. 22, 1975, 2512829
Int. Cl.[2] F16D *3/54*
U.S. Cl. 64—19 **38 Claims**

1. In a rotary coupling comprising a first main coupling member defining a first axis, a second main coupling member defining a second axis, intermediate coupling member means, and connecting means interconnecting the intermediate coupling member means and said main coupling members to per-

mit said second axis to be radially offset with respect to said first axis, the improvement comprising:

said intermediate coupling member means comprising two intermediate coupling members rotatable relative to each other about a third axis;



said connecting means comprising links connecting each of intermediate coupling members with each of said main coupling members.

4,040,271

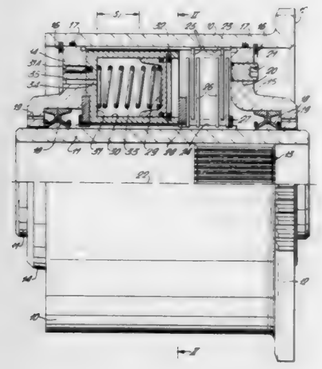
VISCOUS SHEAR COUPLINGS

Anthony P. R. Rolt, Stratford-on-Avon; Frederick J. Walker, Banbury, and Oswald Webb, Coventry, all of England, assignors to Harry Ferguson Limited, Moreton-in-March and GKN Transmissions Limited, Birmingham, both of, England

Filed Oct. 22, 1975, Ser. No. 624,980

Int. Cl.[2] F16D *3/80*; F16H *1/44*; F16D *19/00, 31/00*

U.S. Cl. 64—26 **11 Claims**



1. A control coupling comprising mutually spaced and mutually interleaved plate elements arranged for rotation about a common axis within an enclosure containing a viscous liquid in contact with adjacent surfaces of said plate elements, alternate ones of said plate elements constituting a first set of plate elements for driving connection with a first rotatable member, remaining ones of said plate elements constituting a second set of plate elements for driving connection with a second rotatable member, the plates of at least one set being free to move in directions parallel to said common axis, the enclosure including movable means movable independently of said plates for varying the volume of the enclosure and resiliently yieldable means provided to urge said movable means towards a limit position in which said volume has a minimum value, the strength of the resiliently yieldable means being chosen according to a desired torque transmitting characteristic for the coupling, and the quantity of viscous liquid within the enclosure being such that at an ambient temperature of 25° C and with the coupling at rest the viscous liquid occupies a volume in the range of 85 % to 100 % of said minimum value.

4,040,272

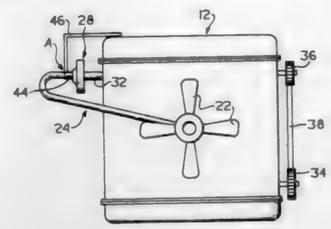
FLEXIBLE DRIVE FOR ROTATING A FAN

Keith A. Boyd, Marshall, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 26, 1976, Ser. No. 652,259

Int. Cl.[2] F16D *3/00*

U.S. Cl. 64—26 **12 Claims**



1. An accessory drive for rotating a fan used to cool a prime mover of a vehicle, the prime mover having an output shaft adapted for rotation, the drive comprising:

A. an elongated flexible shaft terminating at a pair of ends;

B. a declutchable device having

1. an input element,
2. an output element, and
3. means to transmit torque between the input element and the output element in response to rotation of one of the elements and to restrict such torque transmission during rotation of one of the elements, said torque transmitting means comprising said input element and said output element cooperating to define a shear space, a viscous fluid being contained within said shear space to transmit torque by viscous shear stress;

C. first means for securing one of the elements to the output shaft for corresponding rotational movement;

D. second means for securing one end of the flexible shaft to the fan for corresponding rotational movement; and

E. third means securing the other end of the flexible shaft to the other element for corresponding rotational movement.

4,040,273

METHOD AND A CIRCULAR KNITTING MACHINE FOR MANUFACTURING STOCKINGS AND LIKE ARTICLES HAVING A JACQUARD PATTERN OVER RIBBED KNITWORK MADE OF PLAIN AND PURL STITCHES

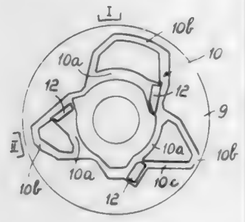
Aldo Bonazzi, Via Gherardo Vaiarini, 2, Brescia, Italy

Filed Jan. 26, 1976, Ser. No. 652,588

Claims priority, application Italy, Jan. 31, 1975, 19852/75

Int. Cl.[2] D04B *9/06*

U.S. Cl. 66—19 **1 Claim**



1. A circular knitting machine for manufacturing stockings and like articles having a jacquard pattern over ribbed knitwork made of plain and purl stitches, comprising at least two different thread feeds, e.g. of different colors, a needle dial and a needle cylinder rotating in timed relationship and having needles movable thereon, the needles of the needle dial being one half in number as the needles of the needle cylinder, means for reciprocating said needle dial and needle cylinder, means for independently selecting the needles of the needle dial and of the needle cylinder to knit at a corresponding thread feed, means for simultaneously and selectively controlling at least part of the needles of said needle dial and the corresponding underlying needles of the needle cylinder for transferring the loops from said part of the dial needles to the corresponding underlying cylinder needles, wherein said needles of the needle dial have butts of at least two different heights and are grouped in at least two groups each comprising the dial needles having a same butt height, and wherein said means for selecting the needles of the needle dial comprise a stationary disc located over the needle dial and provided with cams defining a path for the butts of the needles of the needle dial, said cams comprising fixed cams defining an inner continuous groove portion for the butts and outer groove portions at each feed area departing from said inner groove portion and returning therein to cause the dial needles to radially project for taking up the thread at the corresponding thread feed and an additional outer groove portion at a point between two feeds at a non-knitting area for causing selected dial needles to outwardly project for trasferring loops to corresponding cylinder needles, and a vertically movable cam at each zone of departure of said outer groove portions from said inner groove portion, said movable cams being movable between a position external to said groove portions and a position fully internal thereto and the movable cam provided at the departure of said additional outer groove portion being further movable into at least one position intermediate between the position external to said groove portions and the position completely internal thereto to cause dial needle selection for loop transfer according to the butt height of the dial needles.

4,040,274

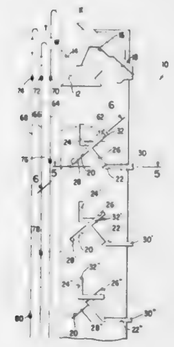
KNIT, TUCK AND WELT CAMS FOR CIRCULAR KNITTING MACHINES

John Christopoulos, Charlotte, N.C., assignor to The Singer Company, New York, N.Y.

Filed June 14, 1976, Ser. No. 696,090

Int. Cl.[2] D04B *15/32*

U.S. Cl. 66—57 **5 Claims**



1. In a cam section block, a first straight slot (**20**) and a first two legged angular slot (**26**) with the straight slot (**20**) and one leg of the angular slot (**26**) in alignment, a second straight slot (**22′, 20″**), a second two legged angular slot (**26′, 24″**)a first two legged angular cam member (**32**) in the first angular slot (**26**), a first flat plate like cam member (**29**) in the first straight slot (**20**) for acting in conjunction with one leg of the first angular cam member (**32**) to raise predetermined needles moving relative to the cam section to a latch clear position, a second two legged angular cam member (**32′, 32″**) in the second angular slot (**26′, 24″**), and a second flat plate like cam member (**30′, 28″**) in the second straight slot (**22′, 20″**) for acting in conjunction with one leg of the second angular cam member (**32′, 32″**), the second angular slot and second flat slot being disposed to cause the cams therein to control the position of other predetermined needles moving relative to the cam section in a manner different from the cam members in the said first slots (**20, 26**).

4,040,275

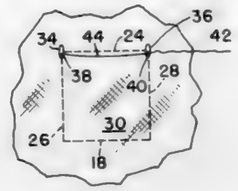
KNIT-IN POCKET AND METHOD

Leo J. Castello, 3702 Burnett Lane, Huntingdon Valley, Pa. 19006

Filed Apr. 11, 1974, Ser. No. 460,064

Int. Cl.[2] D04B *1/24*

U.S. Cl. 66—64 **6 Claims**



1. The method of automatically knitting a pocket intermediate the top and bottom margins of a knitted garment having a panel area of single layer thickness, said pocket area having edges including a top, a bottom, a right side and a left side, including the steps of

knitting from a yarn a first portion of the panel area of single layer, ribbed knitted fabric from one said margin to a first height defined by an edge of the pocket area;

knitting from the yarn a second portion of the panel area of single layer rib knit fabric from the first height to a second height defined by the top edge of the pocket area and simultaneously knitting the pocket area of tubular jersey knit, comprising a front pocket panel and a rear pocket panel;

joining the front and rear pocket panels to the second portion of the panel area at the top, bottom and sides thereof, said top comprising a top coursewise yarn thread;

knitting from the yarn a third portion of the panel area of single layer rib knit fabric from the second height to a third height defined by the second said margin;

knitting a long knitted yarn loop at the intersections of the pocket area top edge with each pocket panel side edge to expose a portion of the top coursewise yarn thread within the loop, cutting the top coursewise yarn thread at each loop and removing only that portion of the thread defined between the loops to separate the pocket top edge from the panel area.

4,040,276

SINKLER CAM SEGMENT

Ralph A. Koegel, Brookfield, Wis., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

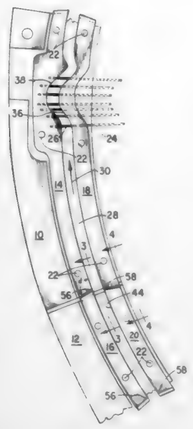
Filed July 16, 1975, Ser. No. 596,470

Int. Cl.[2] D04B *15/06*

U.S. Cl. 66—107 **5 Claims**

1. For use in a knitting machine having a circular cam ring extending about an axis center line, a removable cam segment for said sinker cam ring, said cam segment having a sinker-actuating cam surface formed thereon facing said axis center line, generated by elements parallel to said axis center line, and said segment having corners at the intersection of the ends

thereof and said cam surface and which corners are along lines which are at a generally oblique angle to said axis center line



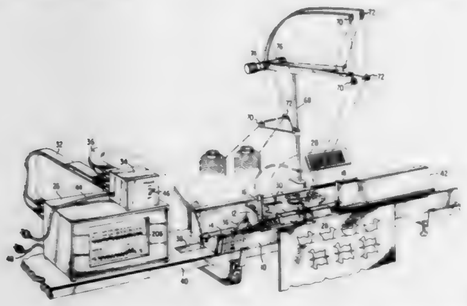
and complementary to adjacent corners in joints with said cam ring.

4,040,277

AUTOMATED HOME KNITTING MACHINE WITH PROGRAM CARD READER

William Kahan, New York, N.Y.; Fredrick Alexander Rupinski, Lyndhurst, N.J.; John Francis Wagner, Garden City, N.Y., and Thomas Richard Peer, Glenwood, N.J., assignors to The Singer Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,173
Int. Cl.[2] D04B *15/66*
U.S. Cl. 66—154 A **25 Claims**



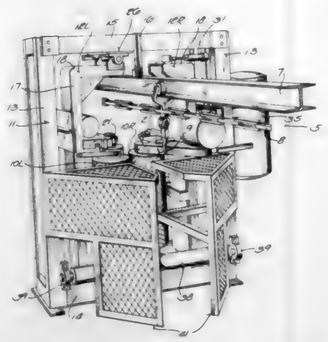
1. In a programmable knitting machine, the combination comprising a relatively movable program card and card reader, the reader including electronic means which detects the edge of the card, and other electronic detecting means enabled in response to operation of the first mentioned means and disposed in the reader to read a portion of the card beyond the edge when the edge is detected.

4,040,278

METHOD OF AND APPARATUS FOR REMOVING BRINE FROM HIDES

John E. Zimmerman, and Richard M. Reis, Sr., both of Janesville, Wis., assignors to Northern Conveyor & Manufacturing Corporation, Janesville, Wis.

Filed Dec. 17, 1976, Ser. No. 751,732
Int. Cl.[2] C14B *1/06*
U.S. Cl. 69—42 **13 Claims**



1. The method of removing brine from wet brine-soaked hides, which comprises:

A. hanging the hides on hooks of an elevated conveyor;

B. by means of the conveyor, advancing the hides along a substantially horizontal path towards and through a pair of substantially vertically oriented pressure loaded power-driven wringer rolls with the part of each hide that is engaged by its respective conveyor hook moving in a path just slightly higher than the upper end of the wringer rolls; and

C. lifting the trailing portion of each hide as it is about to be clamped between the wringer rolls, to an elevation sufficiently above the lower end of the wringer rolls to assure that all but the very small part of the hide that spans the distance between the upper end of the wringer rolls and the path of the conveyor hooks will be subjected to the wringing action of the rolls.

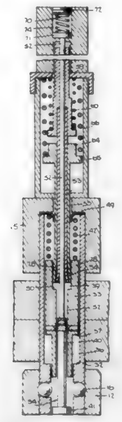
4,040,279

SECURITY LOCK AND KEY

John A. Signorelli, 2150 E. 29th St., Brooklyn, N.Y. 11229, and Paul Z. Haus, Jr., 787 Hartwell St., Teaneck, N.J. 07666

Filed Oct. 4, 1976, Ser. No. 728,943
Int. Cl.[2] E05B *67/36*
U.S. Cl. 70—34 **23 Claims**

1. A lock having a generally cylindrical body with an axial bore and spring loaded plunger means movable within the bore for holding extensible locking members in extended position, said plunger means including a first part retractible by use of expanding key means and a second part biased to follow said first plunger part upon retraction thereof, so that said second part must be restrained against motion to release the locking members.

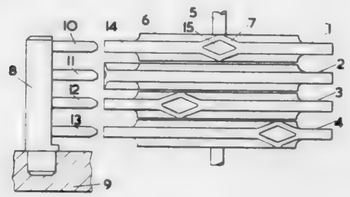


4,040,280

ANTI-MANIPULATION DEVICE FOR PERMUTATION LOCKS

James Main, 10, Queen Elizabeth Crescent, Accrington, Lancashire; Leslie Robert Moss, 30, Baird Gardens, Dulwich Wood Park, London, S.E. 19, and Ralph Perryman, 138, Stafford Road, Caterham, Surrey, all of England

Filed Dec. 16, 1975, Ser. No. 641,246
Claims priority, application United Kingdom, Dec. 17, 1974, 54519/74
Int. Cl.[2] E05B *15/14*
U.S. Cl. 70—333 R **4 Claims**



1. A permutation lock having a wheel pack comprising a plurality of rotatable permutation discs each of which has a peripheral portion and a radially extending recess in the peripheral portion thereof, a bolt, and a fence which moves with the bolt and which engages in the recesses of said discs when the bolt is in a retracted position, wherein the construction of the wheel pack is such that the total thickness, in a direction parallel to the axis of rotation of the permutation discs, of the material of each permutation disc is substantially constant along any cylindrical locus concentric with the said axis and passing through the recess.

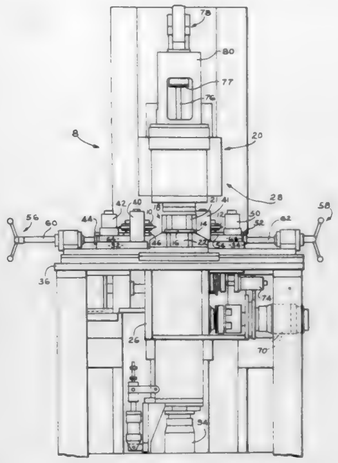
4,040,281

PULLEY SPLITTING MACHINE-CONTROL SYSTEM

Bengt E. Meyer, Chardon, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 679,261, April 22, 1976, abandoned. This application Nov. 15, 1976, Ser. No. 741,915
Int. Cl.[2] B21B *37/00*; B21D *22/14*
U.S. Cl. 72—10 **13 Claims**

1. An apparatus for manufacturing split pulleys comprising a spindle for rotatably supporting a blank to be split, first motor means connected with said spindle for effecting rotation of said spindle and a blank supported therein, a first rotatable tool disposed adjacent said spindle and having an axis of rotation parallel to the axis of rotation of said spindle, said first tool being movable relative to said spindle for effecting engagement of said first tool with the peripheral edge of a blank supported by said spindle, second motor means for effecting rotation of said first tool, a second rotatable tool disposed adjacent said spindle and having an axis of rotation parallel to the axis of rotation of said spindle, said second tool being movable relative to said spindle for effecting engagement of said second tool with the peripheral edge of a blank supported by said spindle, third motor means for effecting rotation of said second



tool, first sensing means for establishing a first signal indicative of the speed of rotation of said first tool, second sensing means for establishing a second signal indicative of the speed of rotation of said second tool, and control means responsive to said first and second signals for controlling the energization of said first motor means to control the speed of said spindle, said control means controlling the speed of said spindle to match the peripheral speed of a blank supported by said spindle with the peripheral speed of the first tool during initial engagement of said first tool with the rotating blank, said control means further controlling the speed of said spindle to match the peripheral speed of a blank supported by said spindle with the peripheral speed of the second tool during initial engagement of said second tool with the rotating blank.

4,040,282

IRONING RING HAVING IMPROVED LUBRICATING CHARACTERISTICS

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Nov. 24, 1975, Ser. No. 634,518
Int. Cl.[2] B21D *22/28*
U.S. Cl. 72—41 **4 Claims**

1. Improved ironing ring which facilitates ironing of flat rolled steel blackplate container stock in which ironing operation the sidewall of a unitary cup-shaped article is elongated and thinned by passage of the cup-shaped article, while mounted on an ironing mandrel, through an ironing ring concentrically mounted with respect to the ironing mandrel with the central axis of the ironing ring coincident with the longitudinal axis of the ironing mandrel,

such ironing ring having a circular interior configuration in a cross-sectional plane which is perpendicular to the central axis of the ironing ring and longitudinal axis of the ironing mandrel during an ironing operation, such longitu-

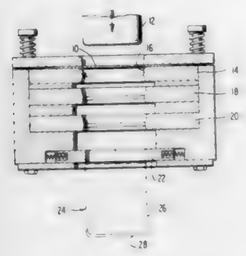
dinal axis being coincident with the direction of movement of the ironing mandrel,

the ironing ring defining a plurality of surface areas along its interior surface confronting the cylindrical exterior surface of the ironing mandrel mounted cup-shaped article,

such interior surface areas of the ironing ring being symmetrical with respect to the central axis and comprising an entry portion, a dwell portion, and an exit portion confronted in that order during a working stroke of the ironing mandrel,

the entry portion of the ironing ring defining a truncated coincal configuration with its largest diameter in the direction of approach of the ironing mandrel on its working stroke, such entry portion interior surface having an angled relationship with such central axis of about 5° to about 15° at the intersection of such entry portion with a radial plane extending from the central axis of the ironing ring,

the dwell portion of the ironing ring having a substantially cylindrical configuration, such interior surface area of the dwell portion extending longitudinally between the entry portion and the exit portion of the ironing ring,



the exit portion of the ironing ring having a truncated conical configuration with its smallest diameter in the direction of approach of the ironing mandrel on its working stroke,

such exit portion of the ironing ring having an internal surface having an angled relationship with the central axis of less than 5° to prevent binding of sheet metal as the ironing mandrel is driven through the ironing ring, such angled relationship existing at the intersection of such exit portion with a radial plane extending from the central axis of the ironing ring,

such interior surface area of the entry portion of the ironing ring presenting fine-line indentations which act to hold surface lubricant during the working stroke of an ironing operation, such fine-line indentations extending over the surface area of the entry portion contacted by the cup-shaped article during the working stroke and extending toward the dwell portion of the ironing ring, and

such fine-line indentations presenting a center line average of surface irregularities between about 20 and about 50 micro inches.

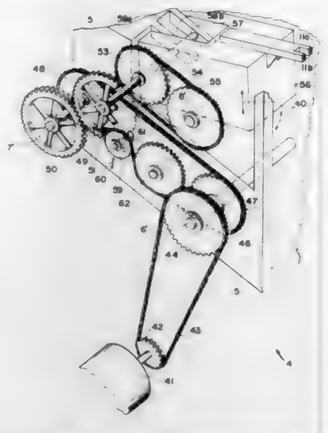
4,040,283

BENDING ROLLS MACHINE

Patsy Suriano, Suriano's Welding Service, 1219 Kennedy Blvd., Manville, N.J. 08835

Filed Nov. 2, 1976, Ser. No. 738,026
Int. Cl.[2] B21D *5/08*
U.S. Cl. 72—175 **5 Claims**

1. A bending rolls device comprising in combination: support structure having forward and rearward faces; spaced-apart first and second bending rolls and first and second shafts thereof each mounting fixedly its respective one of the first and second bending rolls, at forward ends of the respective first and second shafts respectively, and first and second gears each mounted fixedly on its respective one of the first and second shafts, the first and second shafts extending through the support structure with the first and second bending rolls located on the forward face and with the first and second gears located on the rearward face of the support structure, the support structure having a through-slot space formed therein extending through the support structure between the forward and rearward faces, with the length of the through-slot extending transversely to an imaginary line extending linearly between the first and second bending rolls; a third bending roll, a third gear, and a third shaft fixedly mounting the third bending roll on the forward face and the third gear on the rearward face, and the third shaft extending through said through-slot mounted movable transversely to the longitudinal axis of the third shaft along the length of the through-slot; a pivot member



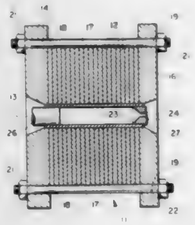
and pivot-point drive shaft pivotably mounting the pivot member thereon at a proximal end of the pivot member, the third shaft being mounted within a distal end of the pivot member, and a fourth gear mounted on the pivot-point drive shaft, and a linking chain mounted on and between and transmitable of driving force from one to the other of the fourth gear and the third gear; upon pivoting of the pivot member to and fro, the third shaft being movable to and fro along the length of the through-slot and movable of the third bending roll to and from a contacting state of contact with each of the first and second bending rolls; lever means for intermittently positioning the distal end in alternate to and fro positions; and drive means for driving the fourth gear and the first and second gears.

4,040,284

PRESSURE VESSELS

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,492
Int. Cl.[2] B21C *27/00*; B23P *11/00*
U.S. Cl. 72—272 **14 Claims**



1. A pressure vessel, comprising:

a plurality of like, flexible, metallic, generally annular elements, each having, in an unstressed condition, a dished configuration including a concave surface facing away from a radial plane passing through the generally annular element along the inner periphery thereof, the generally annular elements forming an in-line array, extending in an axial direction, with the radial planes of the generally annular elements extending in parallel;

means, effective to apply a compressive force to the array of generally annular elements in the axial direction, for clamping the generally annular elements together so as to maintain the generally annular elements in a flattened, substantially parallel-extending configuration, while prestressing the individual, generally annular elements forming the configuration; and

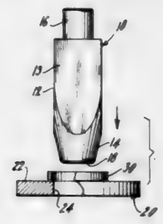
means for closing the axially opposite ends of the array of generally annular elements.

4,040,285

METHOD AND APPARATUS FOR MAKING JEWELRY BANDS

Abraham Winzelberg, Flushing, N.Y., assignor to Frank Ellman Co., Inc., New York, N.Y.

Filed June 29, 1976, Ser. No. 700,907
Int. Cl.[2] B21D *11/02*
U.S. Cl. 72—370 **2 Claims**



1. A method of forming a blank band into a jewelry band having a different predetermined size and shape by employing an apparatus including a male member with a tapered front portion merging into a rear portion of said predetermined size and shape, and a planar female member having an aperture of said predetermined size and shape adapted to receive said male member, said method comprising the steps of:

positioning said blank for sliding movement on said male member;

forcing said male member and said female member into relative movement, so that said blank is moved along the front portion and onto the rear portion of said male member, thereby forming said blank substantially to said predetermined size and shape, and

compressing said formed blank against the sides of said male member rear portion to produce a band of said predetermined size and shape.

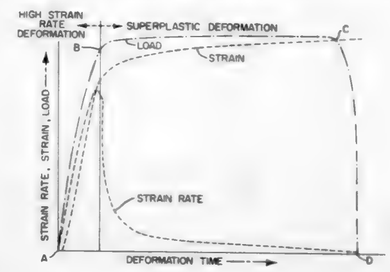
4,040,286

HIGH-PRECISION, FINE-DETAIL FORGING PROCESS

Philip Herbert Abramowitz, Beaver, and Robert Wayne Balliett, Beaver Falls, both of Pa., assignors to St. Joe Minerals Corporation, New York, N.Y.

Filed Oct. 9, 1975, Ser. No. 621,248
Int. Cl.[2] B21D *31/00*
U.S. Cl. 72—377 **3 Claims**

1. A process for forming high-precision, fine-detail forging from a superplastic workpiece characterized by utilizing high strain rate forming to impart the bulk of the total deformation



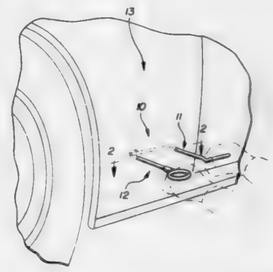
required and superplastic relatively low strain rate forming to impart detail and approach final tolerances in the product.

4,040,287

PULLING TOOL AND METHOD

Gerald P. Wivinis, 3325-B Beacon St., North Chicago, Ill. 60064

Filed May 13, 1976, Ser. No. 686,049
Int. Cl.[2] B21D *1/12*
U.S. Cl. 72—479 **6 Claims**



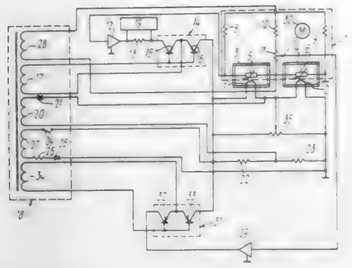
1. A pulling tool comprising, in combination: a first pulling member having a pair of legs which are formed generally L-shaped, and a second pulling member of an extended length having hook means formed on one end thereof which is adapted to releasably hookingly engage with one of said legs of said first pulling member and coupling means on the other end thereof for permitting said second pulling member to be pulled; one of said legs of said first pulling member being inserted through a first aperture formed in an object and said first pulling member being manipulated such that said one of said legs is disposed to extend generally parallel with said object; said hook means on said second pulling member being inserted through a second aperture which is formed in the object in a spaced and laterally variable position relative to the first aperture and being releasably hookingly engaged with said one of said legs, said first pulling member at the juncture of said pair of legs being formed with an offset radius so as to provide a recessed cavity into which the edge of the object about said first aperture extends to prevent the formation of a dimple on the object when a pulling force is exerted on the pulling tool, whereby a pulling force exerted on at least said second pulling member is translated to the object by the cooperative action of said first and second pulling members.

4,040,288

DIFFERENTIAL MICROCALORIMETER

Grigory Vladimirovich Kotelnikov, Puschino, Mikroraion "G", 10, kv. 56, and Gennady Petrovich Krylov, Puschino, Mikroraion AB, 9, kv. 50, both of Moskovskaya oblast, Serpukhovsky raion, U.S.S.R.

Filed Mar. 5, 1976, Ser. No. 664,267
Int. Cl.² G01N *25/00*
U.S. Cl. 73—15 B **8 Claims**



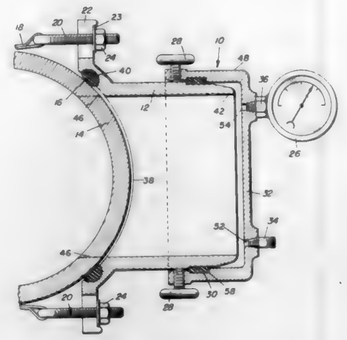
1. A differential microcalorimeter comprising: a first heating element having first and second terminals; a second heating element having first and second terminals, said first terminals of said heating elements being connected to each other; first and second thermosensitive elements; a working cell accommodating said first thermosensitive element and said first heating element; a reference cell accommodating said second heating element and said second thermosensitive element; a temperature measuring circuit incorporating said first and second thermosensitive elements, said temperature measuring circuit comprising resistors and said thermosensitive elements and arranged to form first and second measuring bridge circuits, said first bridge circuit comprising two parallel branches connected to each other to define a signal voltage input diagonal, each parallel branch including a resistor connected to one of said thermosensitive elements at a junction point, the two junction points of said two parallel branches defining a measuring diagonal of said first bridge, and said second bridge having a signal voltage input diagonal and a measuring diagonal; means for measuring the power of the thermal process under study having an input and an output; means for programmed heating of the cells having an input and an output; a first phase-sensitive switch having an input, an output and a control input; a second phase-sensitive switch having an input, an output and a control input, said input of said device for measuring the power of the thermal process under study being connected to the measuring diagonal of said first bridge circuit of said temperature measuring circuit, said input of said device for programmed heating of the cells being connected to said measuring diagonal of said second bridge circuit of said temperature measuring circuit, said output of said means for measuring the power of the thermal process under study being connected to said input of said first phase-sensitive switch; said output of said means for programmed heating being connected to said input of said second phase-sensitive switch, said outputs of said first and second phase-sensitive switches being connected to said heating elements; a variable resistor for adjusting the baseline having a first, movable terminal connected to said first terminals of said heating elements and two second terminals connected to said second terminals of said heating elements; an a-c voltage source having a plurality of outputs a first of which is connected to said control input of said first phase-sensitive switch, a second of said outputs of said a-c voltage source is connected to said control input of said second phase-sensitive switch, a third of said outputs of said a-c voltage cource comprising a unidirectional pulse output which consists of two terminals the first of which is connected to said first terminals of said heating elements and said second terminal is connected, via elements of a unidirectional pulse splitting circuit, to said second terminals of said heating elements.

4,040,289

METHOD AND ARRANGEMENT FOR AIR TESTING OF SEWER LATERAL CONNECTIONS

Joseph H. Clark, 4015 Woodley Road, Ellicott City, Md. 21043, and Leslie W. Grove, Jr., P.O. Box 609, Frederick, Md. 21701

Continuation of Ser. No. 304,602, Nov. 8, 1972, abandoned. This application Apr. 10, 1974, Ser. No. 459,838
Int. Cl.² G01M *3/28*
U.S. Cl. 73—46 **1 Claim**



1. Apparatus for testing the seal formed between a primary sewer main and a secondary sewer connector upon assembly of said secondary sewer connector to said primary sewer main prior to tapping into said primary sewer main, said secondary sewer connector consisting of a substantially cylindrical housing mating at one end with the outer surface of said primary sewer main and being sealed thereto, said secondary sewer connector having a peripheral groove adjacent to, but spaced apart from the inside edge of the wall of said substantially cylindrical housing, said seal consisting of a flexible rubber ring set in said groove in said wall of said substantially cylindrical housing, said flexible rubber ring interfacing with said outer surface of said primary sewer main and securely sealed to said outer surface by at least one removably attached clamping strap with toggle connectors at each end, said clamping strap encompassing said primary sewer main opposite said secondary sewer connector, each end of said clamping strap terminating in a welded loop into each of which is fitted the eye of said toggle connector, each said toggle connector being removably engaged and connected at the upper end of said toggle connector into open end of horizontal lug yokes attached to two sides of said secondary sewer connector, with a nut on each said toggle connector in order to tighten said clamping strap around said primary sewer main and thereby compress said flexible rubber ring to establish said seal, said substantially cylindrical housing being open at the end opposite of said seal with the primary sewer main to receive said apparatus for testing said seal, said apparatus for testing said seal formed between said primary sewer main and said secondary sewer connector comprising:

a cylindrical housing cap, said cap being open at one end to receive said open end of said secondary sewer connector, and closed at its opposite end, said closed end having spaced inlet and outlet ports disposed therein;

a plurality of screw knobs oppositely mounted on said cylindrical housing cap and engageable with said secondary sewer connector for fixedly securing said cylindrical housing cap to said secondary sewer connector to form an enclosed chamber defined by said cylindrical housing cap, said secondary sewer connector, and that portion of said primary sewer main connected to said secondary sewer connector, said cylindrical housing cap having an annular slot in the inner wall thereof;

a flexible rubber sealing annular gasket disposed between said cylindrical housing cap and said secondary sewer connector, and fixedly held within said annular slot disposed in said inner wall of said cylindrical housing cap, said annular gasket being held in said annular slot for contact against an outer wall of said secondary sewer connector;

means for introducing a gas under pressure into said enclosed chamber through said inlet port;

a pressure gauge for measuring the pressure in said enclosed chamber; and a valve for removing said pressure in the enclosed chamber through said outlet port.

4,040,290

VIBRATION AMPLITUDE TRANSDUCER

Peter Leendert Holster; Adam Ooms, both of Eindhoven, and Marinus Johannes Gerardus van den Hoogen, Venlo, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,096
Claims priority, application Netherlands, Oct. 30, 1974, 7414155
Int. Cl.² G01H *1/00*; G01P *15/02*
U.S. Cl. 73—71 **6 Claims**

1. A transducer for measuring the amplitude of vibration of a vibrating member, comprising a duct having an outflow aperture, means for providing a flow of compressed air to said duct, means for sensing the outflowing quantity of air, an obstructing element, and means for mounting said duct and said element for relative motion transverse to the direction of air flow through said aperture in response to the amplitude of vibration of a vibrating member, said element being arranged opposite said aperture so as to obstruct air flow therethrough at least partially when said element and aperture are in a central position of said relative movement,

wherein said obstructing element comprises means for preventing negative pressure due to air flow along a side of the element.

4,040,291

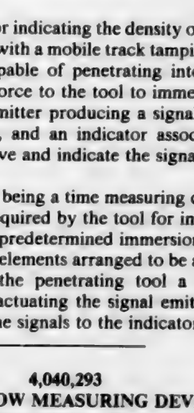
HARDNESS TESTER

Bernard John Ince, Carlingford, Australia, assignor to Girlock Limited of Belmore, Australia

Filed Feb. 10, 1976, Ser. No. 656,944
Claims priority, application Australia, Feb. 21, 1975, 0684/75
Int. Cl.² G01N *3/42*
U.S. Cl. 73—81 **8 Claims**

5. A penetrator member for measuring surface hardness of an object comprising:

marker means having a hardened end for making an impression in said object when said end is pressed there against; hole means defining an aperture in said end of said marker means;



passage means for placing said hole means in communication with a pressure source.

4,040,292

METHOD AND APPARATUS FOR INDICATING THE DENSITY OF BALLAST

Josef Theurer, Vienna, Austria, and Waldemar Friedrich Thöle, Johannesburg, South Africa, assignors to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Dec. 24, 1975, Ser. No. 644,325
Claims priority, application Austria, Jan. 28, 1975, 617/75
Int. Cl.² G01N *3/40, 33/24*
U.S. Cl. 73—84 **11 Claims**

1. In an apparatus for indicating the density of track supporting ballast, combined with a mobile track tamping machine and comprising a tool capable of penetrating into the ballast, a drive for applying a force to the tool to immerse the same in the ballast, a signal emitter producing a signal indicating the density of the ballast, and an indicator associated with the signal emitter to receive and indicate the signal: the improvement of

1. the signal emitter being a time measuring device for measuring the time required by the tool for immersion in the ballast through a predetermined immersion stroke and
2. spaced switching elements arranged to be actuated by the displacement of the penetrating tool a predetermined distance and for actuating the signal emitter to transmit corresponding time signals to the indicator.

4,040,293

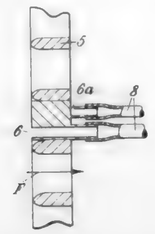
FLUID FLOW MEASURING DEVICE

Alexander Connor Wilson, Marlow, England, assignor to Airflow Developments Limited, High Wycombe, England

Filed Dec. 22, 1975, Ser. No. 643,619
Int. Cl.² G01F *1/36*
U.S. Cl. 73—211 **3 Claims**

1. A fluid- flow measuring device comprising a tubular

member; a diaphragm in said tubular member and having a multiplicity of closely spaced fluid flow holes, said holes having bellmouthed entrances merging into parallel cylindrical sections: fluid pressure sensing tubes opening at the upstream and downstream faces of said diaphragm with the opening of



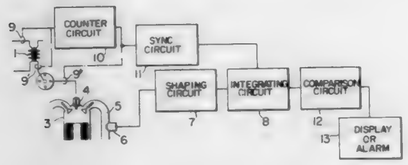
the upstream pressure sensing tube facing the direction of fluid flow, the opening of the downstream pressure sensing tube facing laterally and at least partly downstream relative to the fluid flow, the pressure sensing tubes being connectable to a differential pressure indicating or recording instrument from which a fluid measurement can be derived.

4,040,294

APPARATUS FOR DETECTING MISFIRE IN MULTICYLINDER INTERNAL COMBUSTION ENGINE

Yasumasa Matsuda, Hitachi; Ichiro Kimura, Mito; Akio Sagawa, and Tsutomu Hiramatsu, both of Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 29, 1976, Ser. No. 727,852
Claims priority, application Japan, Oct. 3, 1975, 50-118833
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.3 **24 Claims**



1. An apparatus for detecting misfire in a multicylinder internal combustion engine, comprising:

a sound pick-up transducer for converting the exhaust sound in the exhaust passage of said engine into an electric signal;

means for integrating the output of said sound pick-up transducer with a predetermined integration period in synchronism with the rotation of said engine; and

means for comparing the output signal of said integrating means with a reference signal and for delivering an output when the level of the output of said integrating means is lower than that of said reference signal.

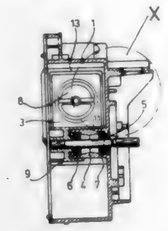
4,040,295

AIR INTAKE FLOWMETER FOR INTERNAL COMBUSTION ENGINES

Peter Romann, Stuttgart, Germany, assignor to Robert Bosch GmbH, Sutttgart, Germany

Filed Oct. 13, 1976, Ser. No. 732,126
Claims priority, application Germany, Oct. 21, 1975, 2547005
Int. Cl.² G01F *1/28*
U.S. Cl. 73—228 **2 Claims**

1. In a flowmeter for measuring the air intake flow in an internal combustion engine, including a cast housing, a rectangular flow channel provided therein and a transversely extending baffle plate mounted on a pivotal shaft, the improvement comprising that the baffle plate is substantially trapezoidal-shaped having longer and shorter oppositely disposed parallel



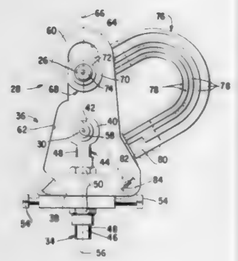
edge portions, the longer of said edge portions lying adjacent said pivotal shaft.

4,040,296

GAS METER TEMPERATURE COMPENSATING TANGENTS

Robert Ritson Douglas, Philadelphia, Pa., assignor to The Singer Company, New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,542
Int. Cl.² G01F *3/22, 15/04*
U.S. Cl. 73—281 **3 Claims**



1. A temperature compensating tangent device for a gas meter comprising:

a. a tangent block,

b. a tangent arm having a longitudinal axis connected to the tangent block,

c. a crank shaft connected to the tangent arm,

d. a guideway formed in the tangent block in substantial alignment with the axis of the tangent arm,

e. a guide roller directly connected in and shiftable along the length of the guideway,

f. a tangent wrist affixed to the guide roller,

g. a bi-metal member asymmetrically connected between the tangent block and the guide roller, with the tangent block connection being pivotal,

h. the bi-metal member including a plurality of substantially "U" shaped nested bi-metal strips of varying thickness to expand or contract responsive to temperature changes of the gas flowing through the meter, and

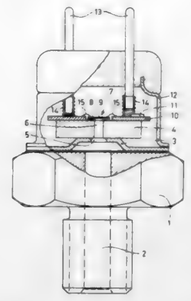
i. the bi-metal member to cause the guide roller to continuously move along the guideway to increase or decrease the distance between the tangent wrist and the crank shaft continuously to adjust the position of the tangent wrist relative to the crank shaft.

4,040,297

PRESSURE TRANSDUCER

Mathijs Antonius Karsmakers, and Gerardus Henricus Johannus Somers, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,286
Claims priority, application Netherlands, Dec. 2, 1974, 7415668
Int. Cl.² G01L *9/06*
U.S. Cl. 73—398 AR **2 Claims**



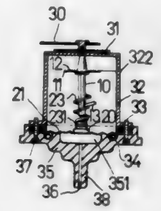
1. A pressure transducer for measuring pressure in a fluid, comprising an insulating holder having a bore therethrough; said bore having a supply end and a measuring end; means for mounting the insulating holder for communicating between said supply end of the bore and a fluid to be measured, comprising a mounting frame assembly having a through bore communicating with said supply end, and a sealing cap hermetically fastened to said frame and having electrical connections passing therethrough; and a pressure sensitive element bonded to the insulating holder and enclosing said measuring end of the bore, said element comprising a semiconductor material formed as a diaphragm having a thickened edge; wherein said insulating holder consists of a hard glass, and wherein said pressure sensitive element is bonded to the holder by thermocompression bonds to an aluminum ring between the holder and the pressure sensitive element.

4,040,298

GEARLESS PRESSURE OR TEMPERATURE GAUGE

Char-Shin Lee, and Hsug-Fang Wang, both of No. 361 Sec. 1 Wanshou Road, Kueishan Hsiang, Taoyuan Hsien, China /Taiwan

Filed Apr. 8, 1976, Ser. No. 674,891
Int. Cl.² G01L *7/08;* G01K *5/32*
U.S. Cl. 73—406 **7 Claims**



1. A gearless pressure gauge comprising:

a. a housing having a sealed chamber;

b. a diaphragm flexing in response to a change in pressure in said chamber;

c. a cylindrical seat carrying a driving helix mounted thereon and fixed to said diaphragm;

d. a rotary shaft with a transverse pin fixed thereon, said shaft adapted to rotate in accordance with the reciprocation of the driving helix due to diaphragm movement under pressure, with said pin being forced to rotate said shaft under the influence of a caming action with said driving helix;

e. a spiral spring providing a restoring force making the rotary shaft rotate to its initial position upon relaxing of said diaphragm; and

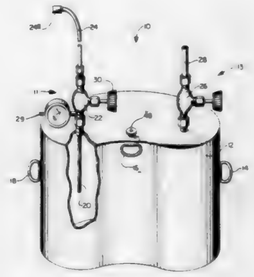
f. indicating means connected to said rotary shaft and influenced by the rotation of said rotary shaft for causing a readout proportional to the pressure in said chamber.

4,040,299

AIR SAMPLING APPARATUS

Louis J. Snyder, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 13, 1974, Ser. No. 523,342
Int. Cl.² G01N *1/24*
U.S. Cl. 73—421.5 R **6 Claims**



1. A personal, portable apparatus worn by an operator for the continuous collection, without operator attention, of a time-weighted gas sample for subsequent analysis which comprises:

a. an enclosed gas reservoir capable of withstanding a pressure differential of about **30** inches mercury;

b. an openable and closeable gas flow means communicating with said gas reservoir for allowing gas to flow from the exterior of said reservoir to the interior of said reservoir at a constant rate when there exists a sufficient gas pressure differential between the exterior and interior of said reservoir so that the passing gas achieves a linear velocity in the throat of said gas flow means equal to the velocity of sound in said passing gas, said reservoir and said gas flow means being sized such that a sample can be obtained over a period up to about 24 hours; and

c. means for attaching the apparatus to the operator.

4,040,300

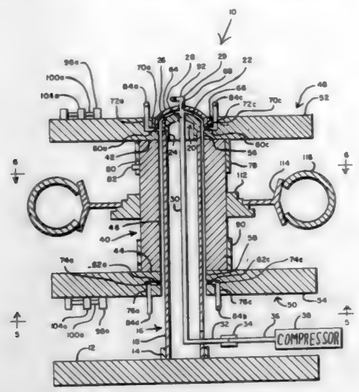
PNEUMATIC WHEEL BALANCING APPARATUS

Donald J. Negard, 129 Cedar Lake Road, North, Minneapolis, Minn. 55405

Filed Feb. 17, 1976, Ser. No. 658,389
Int. Cl.² G01M *1/12, 1/20*
U.S. Cl. 73—459 **12 Claims**

1. Wheel balancing apparatus comprising an upright post, a rounded bearing member at the upper end of said post providing a discharge port, means supplying air to said discharge port, a bearing body having a bore encircling a longitudinal portion of said post, the diameter of said bore being slightly larger than that of the portion of said post it encircles whereby tilting of said bearing body changes the clearance between said bearing body and post and said changing clearance causes a change in air pressure between said bearing body and post, means on said bearing body for supporting a vehicle wheel to be balanced, and a balancing mechanism including a domed bearing cap overlying said bearing member, said balancing mechanism being attached to said bearing body and said bal-

ancing mechanism further including means responsive to said air pressure change for sensing when said bearing body has



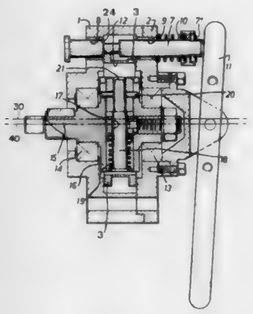
been tilted by an unbalanced wheel placed on said supporting means.

4,040,301

CONTROL DEVICE SENSITIVE TO SPEEDS IN EXCESS OF A PRE-DETERMINED ROTATION SPEED

Armand Rognon, 22 rue Geo-Lufbery, 02300 Chauny, France

Filed Mar. 10, 1976, Ser. No. 665,616
Claims priority, application France, Mar. 27, 1975, 75.09627
Int. Cl.[2] G05G *17/00*
U.S. Cl. 74—3 **2 Claims**



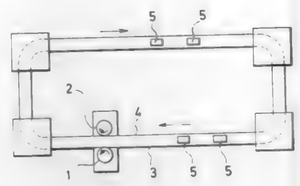
1. Control device sensitive to speeds exceeding a pre-determined rotation speed, comprising a mobile ring arranged for locking a driving organ, a means resiliently biasing said ring to its locking position, a sleeve freely rotating inside said ring at a speed linked to the speed to be controlled and provided with at least one weight, said sleeve being arranged in such manner as, under the action of the centrifugal force created by said predetermined rotation speed, to cause said ring to leave its locking position, characterized in that the sleeve is rotating around a fixed axis and that the weight is a peripheral fly-weight, biased to its rest position by a calibrated spring, and displaceably mounted within the sleeve in such manner as, under the action of said force, to engage with the inner surface of the ring to cause it to leave its locking position.

4,040,302

CHAIN DRIVE FOR A TRANSFER MACHINE

Tadamichi Katarao, Hiroshima, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Jan. 3, 1975, Ser. No. 538,267
Int. Cl.[2] F16H *19/06*
U.S. Cl. 74—37 **4 Claims**



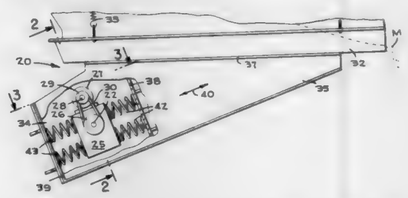
1. A chain drive for a transfer machine, operable to transfer work-carrying pallets horizontally between work stations, comprising, in combination, a pair of endless chains extending in spaced parallel relation along a substantially horizontal workpiece transfer path and having rectilinear sections interconnected by bends, said chains supporting work-carrying pallets; and a driving unit in driving engagement with said chains at a location on a rectilinear section of said transfer path intermediate bends thereof; said driving unit comprising at least one pair of toothed sprockets in the same horizontal plane and each engaged with a respective chain, the lengths of engagement of both chains with their associated sprockets being equal to each other and the sprockets having equal diameters and identical tooth pitches; and driving means conjointly rotating both sprockets of each pair at the same speed to drive the two chains at equal speeds.

4,040,303

TWO MASS VIBRATORY MATERIAL HANDLING APPARATUS AND METHODS OF MANUFACTURING AND FINE TUNING THE SAME

Shinobu Makino, Kamakura, Japan, assignor to FMC Corporation, San Jose, Calif.

Filed Sept. 5, 1975, Ser. No. 610,593
Int. Cl.[2] F16H *33/00*
U.S. Cl. 74—61 **4 Claims**



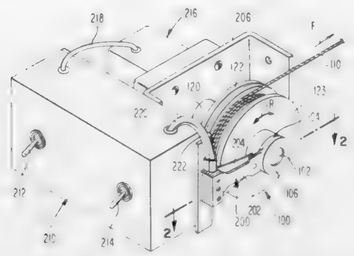
1. A two mass vibratory material handling apparatus comprising a first mass, a second mass, and a plurality of resilient elements that interconnect the first and second masses, said first mass including a vibration exciter of the rotary eccentric weight type with an adjustable drive for driving the vibration exciter, said drive including a fixed r.p.m. at full voltage motor with a drive shaft extending therefrom, a driven rotary eccentric weight shaft extending from the exciter, a pulley on the drive shaft of the fixed r.p.m. at full voltage motor, a pulley on the driven rotary eccentric weight shaft, and a drive belt trained about the pulleys, said adjustable drive including means for adjusting the drive ratio of the pulleys to enable the fixed r.p.m. at full voltage motor to drive the driven rotary eccentric weight shaft at a selected operating frequency, said second mass including a trough for supporting an object to be vibrated within the trough, said second mass together with the object to be vibrated being subject to variations in weight, said resilient elements providing the sole support for said first mass, said resilient elements having fixed spring rates that influence the natural frequency of vibration for the apparatus in predetermined directions from the vibration exciter to the object to be vibrated, said resilient elements interconnecting the first and second masses including a plurality of steel coil springs located between the vibration exciter and the second mass, said coil springs being aligned longitudinally in a direction parallel with a predetermined line of attack and having a length to mean diameter ratio greater than three.

4,040,304

CLUTCH MOTOR FOR USE IN RESETTABLE FIRE DAMPER

Francis J. McCabe, 239 Hastings Court, Doylestown, Pa. 18901

Filed Apr. 13, 1976, Ser. No. 676,413
Int. Cl.[2] F16D *43/25, 11/10*
U.S. Cl. 74—230.17 T **8 Claims**



1. In a cable-controlled smoke or fire protected system, the apparatus comprising:

a. a base;

b. a motor mounted on said base having at least one one drive shaft;

c. drive plate means mounted on said shaft for rotation therewith, said means comprising an outwardly directed pulley shaft coaxial with said drive shaft and a plurality of outwardly directed drive pins spaced radially apart around the axis of said drive shaft;

d. a pulley mounted for rotation on said pulley shaft, said pulley having a plurality of drive pin slots, at least one for each drive pin, spaced radially apart around the axis of said pulley at positions corresponding to the positions of said drive pins, said pulley having a peripheral portion adapted to receive and coil said cable therearound; and

e. a heat responsive means for moving said pulley between first and second positions along said pulley shaft, said drive pin slots engaging said drive pins in said first position for establishing a positive rotational engagement between said pulley and said drive plate means, whereby activation of said motor tends to coil said cable upon said pulley, said pulley being disengaged from said drive plate means and being rotationally controlled in said second position by said cable to activate said system at least in response to heat.

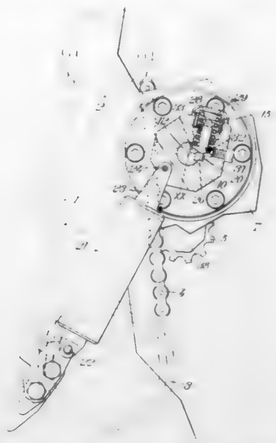
4,040,305

DEVICE FOR TENSIONING A CHAIN

Raymond Cadic, Cherbourg, France, assignor to Societe D'Exploitation Des Procedes Felix Amiot S.E.P.F.A., Paris, France

Filed July 12, 1976, Ser. No. 704,648
Claims priority, application France, July 18, 1975, 75.22580
Int. Cl.[2] F16H *7/10, 7/12*
U.S. Cl. 74—242.15 R **5 Claims**

1. Device for tensioning a chain used for transmitting torque from a first toothed sprocket to a second toothed sprocket, comprising a tensioning element adapted to bear in use against the run of chain to be tensioned, means for supporting and guiding this element in relation to the frame which carries the shafts of the two sprockets and for urging it constantly against the run to be tensioned, the said means comprising two structures and two springs, that is a first structure directly supported and guided by an element fixed to the frame and directly urged by a first spring and a second structure supporting and guiding the tensioning element, supported and guided by the first structure and urged in relation to the latter by a second spring in the same direction as that in which the first spring



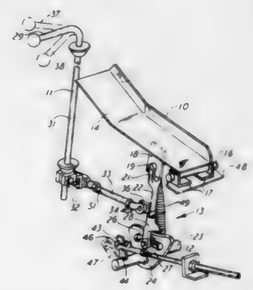
urges the first structure, the amplitude of possible movements of the second structure relative to the first being limited by mechanical abutments, and means being provided between the frame and the first structure for preventing relative displacements of this latter relative to the frame in the opposite direction to that corresponding to the application of the tensioning element against the run of the chain to be tensioned, wherein the two structures are pivotally mounted about the same fixed axis of the frame.

4,040,306

FORWARD AND REVERSE MECHANISM HAVING A SINGLE DIRECTION

Louis Theodore Jensen, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 12, 1976, Ser. No. 676,123
Int. Cl.[2] B60K *20/04;* **G05G** *11/00*
U.S. Cl. 74—334 **3 Claims**



1. A forward and reverse mechanism having a single direction foot pedal, comprising a pivotally-mounted foot pedal arranged to be operative in a single direction of movement, a member movable in two opposite directions in response to pivotal movement of said foot pedal, and forward and reverse mode mechanism operatively interconnected between said

foot pedal and said member for transmitting movement of said foot pedal to said member, said mechanism including a rotatably-mounted shaft operatively associated with said member for inducing the movement of said member in the two directions, said mechanism including an over-center shiftable assembly operatively interconnected between said foot pedal and said shaft and consisting of a plate and a link, with said plate being mounted on and rotatable with said shaft, and with said link being connected between said plate and said pedal, said plate having three detents in a row therein and respectively corresponding to forward and reverse and neutral modes of said mechanism and with said neutral mode being the centered position of said over-center shiftable assembly and with the other two of said detents being on opposite sides of said centered position, said link having an end disposed in said detents for selective engagement therewith for forward and reverse positions to effect movement of said member in the selected one of the two directions and in response to the single direction of movement of said pedal, and a shift member operatively associated with said over-center shiftable assembly for positioning same in relative neutral, forward, and reverse positions.

4,040,307

WORM GEAR TRANSMISSION

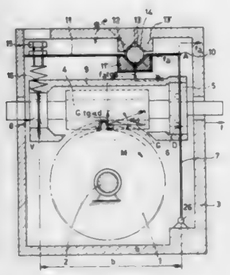
Marinus Pieter Koster, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, Briarcliff Manor, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,963

Claims priority, application Netherlands, May 15, 1975, 7505699

Int. Cl.² F16H *1/16*

U.S. Cl. 74—425 **7 Claims**



1. A worm gear transmission comprising a housing, a worm wheel journalled in the housing, two bearings, a pre-load spring, and a worm engaging the worm wheel, rotatably mounted between the bearings, a first of the two bearings being pivotably connected to the housing, and the second bearing being engaged by the pre-load spring arranged to exert a force on the second bearing which presses the worm toward the worm wheel, wherein the transmission comprises means for mounting the first bearing for displacement in the axial direction of the worm, a first member and a second member, means for connecting said second member to the housing rigidly at least in the axial direction of the worm, first coupling means for coupling said first member to said first bearing for displacement in the axial direction of the worm responsive to axial movement of said first bearing, second coupling means for coupling said first member to said second member such that displacement of said first member in said axial direction causes displacement of at least a portion of one of said members in a direction transverse to the worm axis, and means responsive to said transverse displacement for varying the pre-load force of said spring.

4,040,308

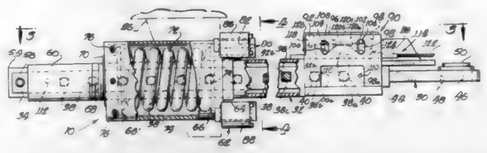
PULL ROD ASSEMBLY

Haim J. Kamner, Palatine, Ill., assignor to Goodman Equipment Corporation, Chicago, Ill.

Filed Jan. 23, 1976, Ser. No. 651,819

Int. Cl.² G05G *3/00*

U.S. Cl. 74—586 **10 Claims**



1. A pull rod assembly for use in transmitting reciprocating motion to a driven member from a drive means with said pull rod assembly being alternately subjected to axial forces tending to elongate said rod assembly and axial forces tending to foreshorten said pull rod assembly, said pull rod assembly including a first rod member having means generally adjacent one end thereof for connection to said drive member, a second rod member having means for connecting said second rod member to said driven member, said first and second rod members being disposed in telescoping relation and adapted for axial movement relative to each other, connecting means carried by one of said first and second rod members for interlocking relation with the other of said rod members, said connecting means including pawl means selectively operable to release said first and second rod members in a manner to facilitate axial movement of said rod members relative to each other in first axial directions to either extend or shorten the overall length of said pull rod assembly while preventing movement of said pull rod members in opposite axial directions, and control means operatively associated with said pawl means and adapted to effect selective interlocking of said rod members for unitary movement or to effect selective release of said rod members to facilitate extension or shortening of the overall length of said pull rod assembly.

4,040,309

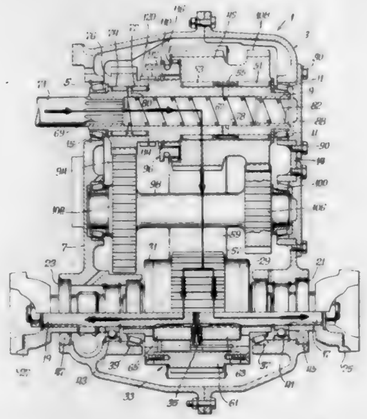
AUTOMATIC TWO-SPEED TRANSFER CASE

Gail E. Wood, and Robert D. Dickmeyer, both of Fort Wayne, Ind., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 17, 1976, Ser. No. 658,646

Int. Cl.² F16H *37/06, 37/00, 3/02, 37/08*

U.S. Cl. 74—665 T **8 Claims**



1. A transfer case assembly comprising a transfer case housing, two output shafts rotatably supported in said housing in a coaxial relation, an input shaft rotatably supported in said housing parallel to said output shafts, a two-way roller clutch disposed between said outer shafts with its two output hubs coupled to the adjacent ends of said two output shafts, a drive sprocket rotatably mounted on said input shaft, chain drive means for directly connecting said drive sprocket to the outer drive member of said two-way roller clutch, speed reduction gear means including a first drive gear rotatably mounted on said input shaft for reducing the speed and increasing the torque applied to said drive sprocket, and clutching means having two positions for selectively coupling in a non-rotational relation said first drive gear to said input shaft in one position and said drive sprocket directly to said input shaft in said second position.

4,040,310

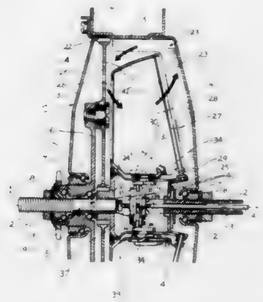
HYDRAULIC TORQUE CONVERTING WHEEL

Pierre Giroux, 3156 de Francheville Street, Trois-Rivieres, Canada

Filed Dec. 1, 1975, Ser. No. 636,619

Int. Cl.² F16H *47/08*

U.S. Cl. 74—688 **12 Claims**



1. A hydraulic torque converting wheel comprising a liquid-tight casing operatively containing a hydraulic torque converter liquid, a planetary gear system including a rotary input drive, a planet carrier, planet gears rotatably carried by the latter, a sun gear and a ring gear directly meshing with each of the planet gears independently of each other, said ring gear being secured to said casing, the rotary input drive being secured to the planet carrier for bodily rotation thereof, said planet gears having a greater diameter than that of said sun gear, fins rigidly secured to and inside the liquid-tight casing for bodily rotation with the latter, blades rotatably mounted inside said casing and radially projecting toward operative edgewise registry with the fins, a carrier for said blades rigidly secured to said sun gear for bodily rotation therewith and having said blades angularly adjustable thereon relative to said fins to vary the torque converting relationship with the latter, and a manually-operated remote control system connected to said blades and constructed and arranged to selectively angularly adjust the latter to any desired torque converting relationship of the blades relative to the fins, and to positively maintain said blades in angularly adjusted position despite the action of centrifugal force and/or fluid pressure exerted on said blades, said casing including a peripheral rim and cooperatively forming with the latter a hollow hub, a spindle rotatably carrying said hollow hub, and said liquid-tight casing having axially opposite annular sides centrifugally sealed around the spindle, and wherein said fins include each a main portion extending axially of said spindle and radially relative to the axis of rotation of said casing, shafts are carried by the blade carrier, and said blades are mounted on said shafts respectively and angularly adjustable around the axes defined by the latter for selective angular adjustment relative to said main portion of the fins.

11. A transmission for a bicycle and the like having a power-actuated wheel, comprising a liquid-tight casing forming a hub for said wheel and operatively containing a hydraulic torque converter liquid, a planetary gear system including a rotary input drive, a planet carrier, planet gears rotatably carried by the latter, a sun gear and a ring gear directly meshing with each of the planet gears independently of each other, said ring gear being secured to said casing, the rotary input drive being secured to the planet carrier for bodily rotation thereof, said planet gears having a greater diameter than that of said sun gear, fins rigidly secured to and inside the liquid-tight casing for bodily rotation with the latter, blades rotatable mounted inside said casing and radially projecting toward operative edgewise registry with the fins, a carrier for said blades rigidly secured to said sun gear for bodily rotation therewith and having said blades angularly adjustable thereon relative to said fins to vary the torque converting relationship with the latter, and a manually-operated remote control system connected to said blades and constructed and arranged to selectively adjust the latter to any desired torque converting relationship of the blades relative to the fins and to positively maintain said blades in angularly adjusted position despite the action of centrifugal force and/or fluid pressure exerted on said blades.

4,040,311

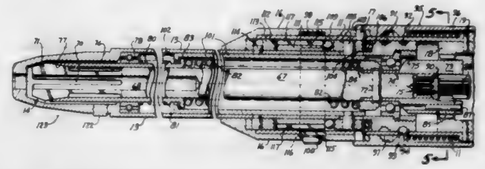
DENTAL HANDPIECE

Joe W. Page, Jr., Huntington Beach, and Paul H. Stahlhuth, Mission Viejo, both of Calif., assignors to Joe W. Page, Jr., Huntington Beach, Calif.

Continuation-in-part of Ser. No. 477,803, June 10, 1974, Pat. No. 3,942,392. This application Jan. 2, 1976, Ser. No. 646,069

Int. Cl.² F16H *3/44*

U.S. Cl. 74—750 R **15 Claims**



1. A dental handpiece comprising

a first housing barrel,

a second housing barrel movable axially in said first barrel between a first position and a second position,

a motor carried by one of said barrels,

a rotatable chuck carried by the other of said barrels,

a variable speed transmission mechanism intermediate said motor and said chuck,

means responsive to movement of said second barrel axially relative to said first barrel to adjust said transmission to transmit rotation to said chuck at one speed and responsive to movement of said second barrel to said second position to adjust said transmission to transmit rotation to said chuck at another speed, and

chuck control means responsive to relative rotation of said barrels in one direction to close said chuck and responsive to relative rotation of said barrels in the opposite direction to open said chuck.

4,040,312

PLANETARY REDUCTION DRIVE UNIT

Harold B. Tappan, and John Roy Corwin, both of Richmond, Ind., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 29, 1974, Ser. No. 518,667

Int. Cl.² F16H *1/28*

U.S. Cl. 74—801 **12 Claims**

1. A reduction drive unit of the type including a fluid motor including a rotating group operable to rotate a shaft means, a sun gear in engagement with said shaft means for rotation therewith, planetary gear reduction means in driven engagement with said sun gear, a fixed ring gear in engagement with said planetary gear reduction means, an output ring gear

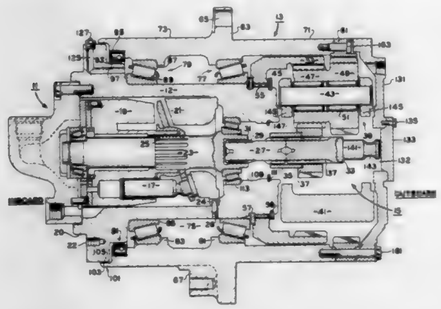
driven by said planetary gear reduction means and a rotating hub assembly mounted for rotation with said output ring gear wherein:

a. said rotating hub assembly includes a wheel mounting flange, a first hub portion extending from said wheel mounting flange to said output ring gear, and a second hub portion extending from said wheel mounting flange toward the inboard end of said unit, oppositely disposed from said first hub portion;

b. said fluid motor including a substantially non-rotatable motor housing surrounding said rotating group, said motor housing being disposed within said second hub portion and terminating, at its outboard end, in a support portion disposed about said shaft means;

c. said second hub portion defining a generally cylindrical internal surface and said motor housing defining generally cylindrical external surface, said external surface including first and second external portions and said internal surface including first and second internal portions, said second portions being disposed between said first portions and said inboard end;

d. bearing means including an inner race engaging said first external portion, an outer race engaging said first internal



portion and a plurality of bearing members in bearing engagement between said inner race and said outer race;

e. oil seal means including a deformable sealing member in sealing engagement with said second external portion and a seal housing seated in engagement with said second internal portion, said second external portion having a diameter sufficiently larger than that of said first external portion to permit removal of said motor housing from within said second hub portion and passage of at least a portion of said bearing means through said deformable sealing member;

f. said internal surface defined by said second hub portion and said external surface defined by said motor housing cooperating to define an annular chamber in communication with the space occupied by said planetary gear reduction means, said annular chamber terminating at said oil seal means;

g. said motor housing defining a passageway in fluid communication between said annular chamber and the exterior of said motor housing; and

h. a pressure relief valve disposed in said passageway and operable to relieve fluid pressure at a pressure substantially below the maximum rated pressure of said oil seal means.

4,040,313

PRECISION CIRCULAR SAW BLADE GRINDING MACHINE

William John Lustgraaf, 124 Glacier Drive, Lolo, Mont. 59847

Filed Dec. 29, 1975, Ser. No. 644,566

Int. Cl.[2] B23D *63/12*

U.S. Cl. 76—37 **21 Claims**

1. A circular saw blade sharpening apparatus, comprising:

an upright supportive framework;

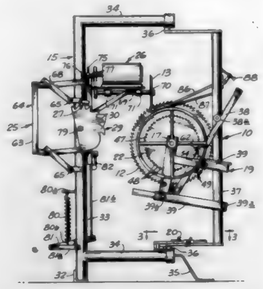
a circular saw blade receiving arbor on the framework;

a circular grinding disc;

drive means for rotating the grinding disc about its center axis;

disc mounting means for holding the disc in a prescribed angular orientation and for mounting the disc to the supportive framework for movement in the prescribed angular orientation so the disc may operatively engage a saw blade mounted on the arbor;

a sawtooth-shaped template on the supportive framework having a sawtooth configuration thereon similar to the configuration of a tooth on a saw blade to be sharpened;



a trace pin on the disc mounting means operatively engageable with the template so that movement of the trace pin over the template causes corresponding tracing movement of the grinding disc;

saw blade indexing means operatively associated with the arbor for enabling selective incremental rotation of a saw blade mounted on the arbor about an arbor axis in prescribed angular increments equal to correct spacing between adjacent teeth on the saw blade regardless of existing spacing of saw teeth about the blade periphery, and wherein the arbor is pivotable relative to the grinding disc about a pivot axis such that a saw blade on the arbor may be set with its planar side surfaces at a selected angle relative to the rotational axis of the disc.

4,040,314

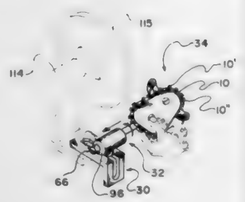
CHAIN SAW BLADE SHARPENING ACCESSORY

Joseph S. Geeck, 6355 Jefferson Highway, Harahan, La. 70123

Filed Sept. 15, 1975, Ser. No. 613,445

Int. Cl.[2] B23D *63/16;* **B24B** *3/36*

U.S. Cl. 76—78 R **13 Claims**



1. A grinder accessory for a bench grinder to adapt the bench grinder to sharpen blades attached to a chain comprising:

securement means for orienting, moving, and holding said chain in a semi-fixed relation to said grinder, and;

holding means for removably relocating said securement means to said grinder, said securement means includes a first shaft means including a first shaft for angularly and longitudinally orienting such blades to said grinder, said holding means includes rotation means for holding said first shaft means and permitting said first shaft to rotate about the axis of said first shaft and setting the longitudinal orientation of such blades, said longitudinal orientation providing the spacing between said rotation means and said wheel to place said blades opposite said grinder, and wherein said first shaft includes a locking dog pivotably mounted on said first shaft having a locked and unlocked position, and said rotation means includes a bushing, said bushing having means including an end surface of said bushing for holding said locking dog in said locked position of said locking dog.

4,040,315

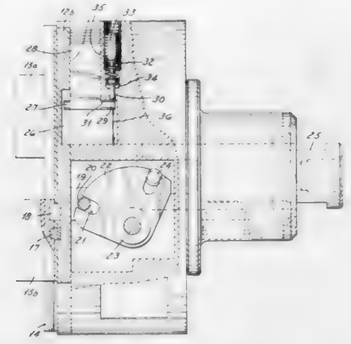
MACHINING CROSS-FEED HEAD COUNTERWEIGHT SYSTEM

Robert Aldred Bellingham, Southfield, Mich., assignor to The Valeron Corporation, Oak Park, Mich.

Filed May 24, 1976, Ser. No. 688,957

Int. Cl.[2] B23B *3/00, 3/04*

U.S. Cl. 82—2 E **7 Claims**



1. A machining cross-feed head comprising;

a rotary body,

parallel cross slide means on opposite sides of rotational center of said body, each with a tool block for mounting a cutting tool,

means for simultaneously feeding said tool blocks radially across said body,

individual counterweight means having a connection with each tool block cross slide operative to reduce the effective centrifugal force on said tool blocks through at least a portion of their travel

and stop means on said body rendering said counterweight means ineffective after a predetermined partial radially inward movement of said tool block has occurred.

4,040,316

LATHE BED

Herbert Gramespacher, and Armin Feisel, both of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Mar. 16, 1976, Ser. No. 667,353

Claims priority, application Switzerland, Mar. 27, 1975, 3950/75

Int. Cl.[2] B23B *17/00*

U.S. Cl. 82—32 **5 Claims**

1. A lathe bed comprising

a concrete supporting body having spaced apart wall portions integrally formed thereon;

a generally rectangular frame having two side members at opposite ends thereof, said frame including means extending between side members defining parallel track members for supporting and guiding a tool carrier,

said track members being fixedly connected to both of said end members,

said frame being torsionally flexible when apart from said support body; and

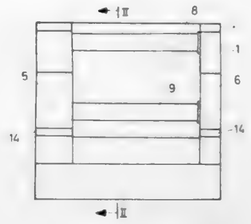
means for rigidly connecting said side members of said frame to said spaced apart wall portions of said body to render said frame substantially torsionally inflexible.

4. A lathe bed comprising

a concrete supporting body having first and second spaced-apart wall portions integrally formed thereon;

a generally rectangular frame having two ends, said frame including

an elongated box-like side member at one end of said ends, and



first and second parallel column guide members fixedly attached at one end to said side member and extending perpendicularly from said side member for supporting and guiding a tool carrier,

said frame being torsionally flexible when apart from said body; and

means for fixedly attaching said side member to said first one of said spaced-apart wall portions,

the other end of each of said column members being directly and fixedly attached to said second one of said wall portions on said body to render said frame substantially torsionally inflexible.

4,040,317

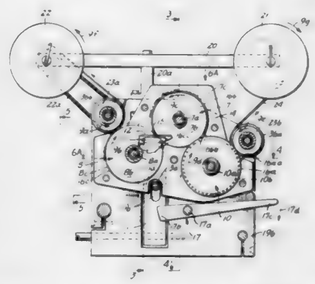
FILM TRIMMING DEVICE

Paul A. Kiejzik, Motion Technology Corp., Mount Pleasant Drive, Aston, Pa. 19014

Filed Sept. 21, 1976, Ser. No. 725,277

Int. Cl.[2] B26D *3/12*

U.S. Cl. 83—56 **12 Claims**



12. A method for trimming an edge margin from a tape, comprising drawing a tape between contacting radially outward circular circumscribing surfaces of opposing first and second rollers, positioning the tape being drawn therebetween, with a predetermined width of a margin thereof positioned beyond corresponding side faces of the first and second rollers, and as tape is being drawn therebetween, positioning a cutting edge directed in a counter-direction to the drawing-direction of the tape and gradually pressing the cutting edge against an outer side of the margin to be trimmed whereby the cutting

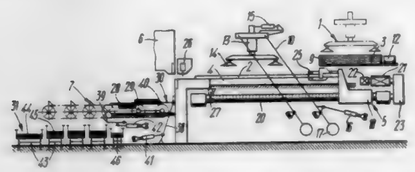
edge slices into and trims the predetermined width, the cutting edge being thereupon pressed against said corresponding side faces at a point of said drawing.

4,040,318

TRANSFER MACHINE FOR CUTTING ROLLED SHEET METAL

Boris Anatolievich Makeev, ulitsa Novgorodskaya, 6, kv. 29; Lev Mikhailovich Stepochkin, ulitsa Chernoglazovskaya, 11a, kv. 9; Garri Moiseevich Korot, ulitsa Timurovtsev, 25a, kv. 100; Vadim Ivanovich Batozsky, Moskovsky prospekt, 28, kv. 21; Alexandr Iosifovich Khodorov, Sadovy proezd, 1, kv. 89; Vitaly Ivanovich Zhuravlev, ulitsa Slinka, 14a, kv. 50, and Adolf Grigorievich Eremenko, ulitsa 3 Internatsionala, 17, kv. 24, all of Kharkov, U.S.S.R.

Filed May 14, 1976, Ser. No. 686,554
Int. Cl.² B26D *5/20*
U.S. Cl. 83—71 **4 Claims**



1. A transfer machine for cutting sheet metal comprising:

a. a frame with longitudinal members, said frame being composed of several sections located successively along the axis of said machine and designed for mounting respective units thereof;

b. a sheet-loading arrangement including a first receiving table for sheets fixedly mounted on said frame and located on said axis, and a four-member linkwork having a sheet grip, said linkwork being mounted on said frame via supports secured to said frame;

c. guillotine shears located on said axis downstream of said first receiving table as viewed in the direction of sheet movement;

d. a feed table located between said first receiving table and said shears, said linkwork being constructed so as to transfer a sheet from a stack onto said feed table in such a manner that the sheet remains parallel to the plane of said feed table during the transfer, and said feed table being mounted on said frame and being designed to feed a sheet from said first receiving table to said shears;

e. a first sensor for measuring the dimensions of a blank from the forward edge of a sheet, said first sensor being located near the cutting line of said shears;

f. a second sensor responsive to the passage of the rearward edge of a sheet and designed to measure the dimensions of a blank from the rearward edge of a sheet, said second sensor being located on said feed table;

g. a multisection storage arrangement positioned slightly below said longitudinal members;

h. an arrangement for sorting and stacking cut-off blanks and including a second receiving table for intermediate storage of like blanks located downstreams of said shears and upstream of said storage arrangement as viewed in the direction of sheet movement, a trolley designed to transport like blanks and adapted for movement along said axis on said longitudinal members, and a discharge mechanism on said trolley designed to discharge cut-off blanks into said storage arrangement; and

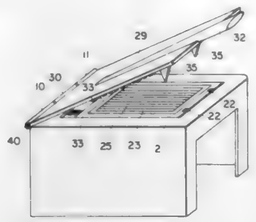
i. a system for programmed control of said machine.

4,040,319

CUTTER FOR CUTTING VEGETABLES AND FRUITS, THE CUTTER HAVING BLADES THAT ARE MOVABLE AT THE TIME OF CUTTING

Masayo Taniyama, 1347 Fuchu, Wakayama, Wakayamaken, Japan

Filed Oct. 15, 1975, Ser. No. 622,736
Int. Cl.² B26D *4/06, 5/22*
U.S. Cl. 83—425.3 **5 Claims**



1. A cutter, for cutting vegetables and fruits, comprising, in combination, a cutter body having an upper support surface formed with an elongated rectangular opening; inwardly extending rails on at least the opposite longer sides of said opening; an open rectangular support frame engageable with said rails and of a length less than that of said opening, for reciprocation along said rails; means biasing said support frame to engage one end of said opening; an open rectangular blade frame removably and conformingly seated in the opening of said support frame for reciprocation with said support frame; a plurality of cutting blades extending longitudinally across the opening of said blade frame in equispaced substantially parallel relation; a pressing cover hinged at one end to said cover body and having a free end, said cover having projections on its inner surface engageable through the spaces between said cutting blades; and cooperating cam means on the free end of said cover and on an end of said support frame interengageable upon swinging of said pressing cover toward said support surface to move said support and blade frames toward the opposite end of said rectangular opening in said support surface against the bias of said biasing means; whereby, when a fruit or vegetable to be cut is placed on said cutting blades with said cover open, and said cover is swung toward said support surface, the projections on said cover press the fruit or vegetable against and between said cutting blades, and said cutting blades are moved longitudinally to effect slicing of the fruit or vegetable.

4,040,320

PUNCHING MACHINES

Jean Cloup, 33360, Latresne, France

Filed Nov. 11, 1975, Ser. No. 631,158
Claims priority, application France, Dec. 26, 1974, 74.42895
Int. Cl.² B26D *5/02*
U.S. Cl. 83—527 **7 Claims**

1. A punching machine for use in punching holes in the sides of a shape comprising:

a frame;

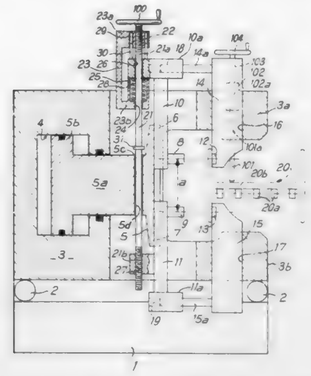
a press forming punch closing control means having a fixed portion integral with the frame of the machine and having a mobile platform;

two generally C-shaped assemblies including at least two arms carried by the frame juxtaposed and disposed symmetrically in relation to each other; each assembly comprising a first part which constitutes one arm of a C-shape assembly bearing a punching tool and which is mounted axially and slidably on said mobile platform of said press and a second part which constitutes the other arm of said C-shape assembly and which is mounted axially and slidably on the frame parallel to the sliding axis of the said first part;

connecting means provided to interconnect each of the said first parts to the corresponding second part;

means provided for controlling the forward movement of said punch tool;

means provided for regulating and maintaining said assemblies in a working position, with a predetermined spacing of said punch tools, said C-shape assemblies being guided within said machine in such a way that said C-shape assemblies can be displaced and moved further from each other; and



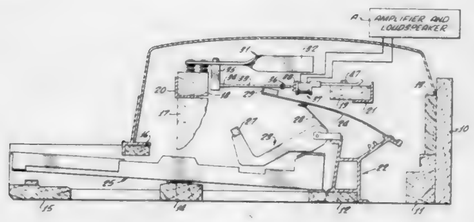
means for controlling and positioning said C-shape assemblies, firstly, in a working position in which the position of one of said punch tools is maintained at a predetermined distance from a guide plane coinciding with a guiding surface on the shape to be punched and in which the spacing of the tools is maintained at a predetermined value, and secondly in a position to rotate the shape to be punched such that each of said C-shape assemblies is displaced in relation to its working position in the sense of an increase in the distance separating said assemblies.

4,040,321

ELECTROMAGNETIC PICKUP AND METHOD FOR TINE-TYPE ELECTRIC PIANO, AND PIANO INCORPORATING SUCH PICKUP

Seth E. Lover, Garden Grove, Calif., assignor to CBS Inc., New York, N.Y.

Filed July 18, 1975, Ser. No. 597,084
Int. Cl.² G10H *3/00;* **H04M** *1/00*
U.S. Cl. 84—1.15 **43 Claims**



1. A tine-type electromechanical musical instrument, which comprises:

a. a tine or reed one end portion of which is fixed and the remaining portion of which is free to vibrate in a predetermined direction,

b. magnetic means including a protuberance to generate in the air in the region of said protuberance a magnetic field which is asymmetrical with respect to said protuberance, said means being such that the lines of force in said magnetic field loop back instead of following a substantially closed low reluctance magnetic circuit including a tine or reed,

said means causing said asymmetry of said magnetic field to be such that the magnetic field strength along a hypothetical straight line which extends through the air past said protuberance is relatively high adjacent one side of said protuberance and relatively low adjacent the other side thereof,

c. means to mount said magnetic means in such relationship to said tine that said hypothetical line is parallel to said predetermined direction of vibration, and also in such relationship to said tine that a part of said free tine portion is disposed in said magnetic field,

d. means to set said free tine portion into vibration in said predetermined direction, and

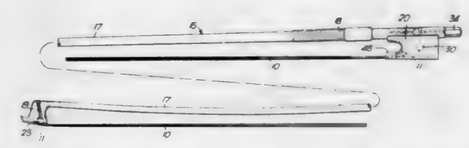
e. means associated with said magnetic means to generate an electrical signal in response to said vibration of said part in said field.

4,040,322

BOWS FOR MUSICAL INSTRUMENTS

Raymond Parkyns, and Terence H. Hubble, both of 39 Craddocks Avenue, Ashtead, Surrey, England

Filed Nov. 21, 1975, Ser. No. 634,092
Claims priority, application United Kingdom, Nov. 29, 1974, 51856/74
Int. Cl.² G10D *1/02, 3/00*
U.S. Cl. 84—282 **6 Claims**



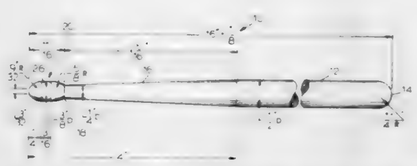
1. A self-contained unit for the re-stringing of a bow for a musical instrument, said unit comprising a hank of reorientated monofilaments each said monofilament containing at least a substantial proportion of polyvinyl chloride and having a diameter in the range of 0.15 to 0.40 m.m, the adjacent free ends of said monofilaments being bonded together and an enlargement at each end of said hank, said enlargement being formed by said bonded monofilaments.

4,040,323

SYNTHETIC MATERIAL DRUMSTICK

Gregory G. Kline, 1437 W. Philadelphia, York, Pa. 17404

Filed Feb. 10, 1976, Ser. No. 656,960
Int. Cl.² G10D *13/00*
U.S. Cl. 84—422 S **2 Claims**



1. A synthetic material drumstick formed from solid polyester resin reinforced with glass roving fibers, said drumstick having a butt end and a substantially straight cylindrical portion forming a handle extending forward from said butt end approximately three-fourths the length of said drumstick, the opposite end of the drumstick comprising a head end integrally extending forward from the end of the handle opposite the butt end thereof approximately one-fourth the length of said drumstick, said head end being substantially in the form of a straight elongated truncated conical section terminating in a neck integrally connected to a tip on the forward end of said head,

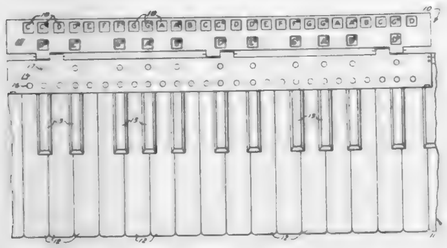
the neck of said truncated conical portion being substantially one-half the diameter of said handle, and said tip having an intermediate cylindrical portion substantially three-quarters the diameter of said handle and has a length approximately one-fourth that of said tip, the outer end of said tip being smoothly rounded and the portion of said tip between said intermediate cylindrical portion and said neck being tapered in a smoothly rounded shape.

4,040,324

CHORD INDICATOR FOR INSTRUMENTS HAVING ORGAN AND PIANO-TYPE KEYBOARDS

Harry Green, 11848 - 99 Ave., Surrey, British Columbia, Canada

Filed Apr. 12, 1976, Ser. No. 676,243
Int. Cl.[2] G09B *15/00*
U.S. Cl. 84—478 **4 Claims**



1. A chord teaching aid for instruments having a piano or organ-type keyboard adapted to be connected to a source of electric power, said aid including:

a. an indicator panel having a first row of lights adapted to be aligned with the keys of the instrument extending over two octaves,

b. the lights representing the black keys indicating the black keys as sharps,

c. a second row of electric lights on the indicator panel representing only the black keys indicating the black keys are flats,

d. lead means separately grounding each of the indicator lights representing white keys,

e. electrically operated relay switch means connectable to the power source adapted when in a deenergized condition for connecting all the indicator lights of the first row representing black keys to ground, and in an energized condition adapted to connect only the indicator lights of the second row indicating that the black keys are flats to ground,

f. a chord selector assembly operable remote from the indicator panel for connecting the indicator lights to the source of electric power, said assembly including:

i. a base plate having a row of base contact elements arranged thereon in equidistantly spaced relationship and equal in number to total number of the first row of indicator lights connecting each of the base contact elements to its associated indicator lights representing a white key and a lead connecting each contact element with its associated indicator light representing a black instrument key,

ii. a carriage mounted for slidable movement over the base plate longitudinally of the row of spaced contact elements thereon,

iii. a row of contact elements on the carriage connectable in circuit to the power source for slidably contacting the base contact elements, said carriage contact elements being equal in number to the total number of notes required to be played for the selected chord and being so spaced so that when a first carriage contact element is positioned over any base contact element which represents the chord root note, the remainder of the carriage contact elements contact the base contact elements which represent the total number of notes,

iv. a plurality of normally open chord selector switches mounted on the carriage for connecting selected carriage contact elements in circuit with one side of the power source, each switch representing one of the selected chords and being adapted when operated from the open to closed position to connect those carriage contact elements representing the notes of any chord selected to the source of electric power so as to energize the indicator lights associated with any of the base contact elements contacted by the carriage contact elements which are connected to the source of power,

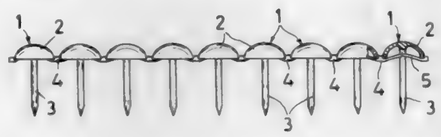
g. flat selector switch means in circuit between the relay switch and the power source for closing the relay switch circuit only when the black key notes of the chord selector are flats.

4,040,325

TACK-STRIP AS OBTAINED BY HEAD-CEMENTING

Umberto Monacelli, Via Parini 6, Monza (Milan), Italy

Filed June 28, 1976, Ser. No. 700,108
Claims priority, application Italy, June 26, 1975, 24811/75
Int. Cl.[2] F16B *15/08*
U.S. Cl. 85—17 **4 Claims**



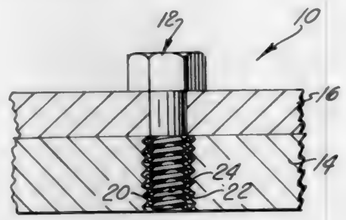
1. A flexible tack package comprising a consecutive array of tacks, each having a round head and an integral shank substantially smaller in diameter than the associated head, and means separably connecting only the heads of adjacent tacks to each other, characterized in that said connecting means comprises drops of a hot melt adhesive positioned between consecutive tack heads.

4,040,326

FASTENER ASSEMBLY

Arthur R. Breed, 12900 Lake Ave., Lakewood, Ohio 44107

Filed Mar. 3, 1975, Ser. No. 554,397
Int. Cl.[2] F16B *37/12, 39/28*
U.S. Cl. 85—32 CS **7 Claims**



1. An assembly comprising a generally helical internal thread convolution having leading and trailing flank surfaces extending between crest and root portions of said internal thread convolution, a generally helical external thread convolution at least partially disposed within said internal thread convolution and having leading and trailing flank surfaces extending between crest and root portions of said external thread convolution, said external thread convolution having a crest diameter which is less than the crest diameter of said internal thread convolution to provide a space between adjacent crests of said internal and external thread convolutions, a generally helical insert having a plurality of turns disposed between said internal and external thread convolutions and having a generally helical central axis extending through each of said turns, said insert having a generally polygonal cross sectional configuration in a radically extending plane with first and second pairs of side surfaces, said insert being resiliently twistable about said helical central axis from a first condition to a fully deflected condition under the influence of torsion forces applied to said insert by said internal and external thread convolutions, said internal thread convolution having a first flank surface disposed in abutting engagement with a first side surface of said first pair of side surfaces on said insert and a second flank surface spaced apart from said insert when said insert is in said first condition, said first flank surface of said internal thread convolution being spaced apart from said insert and said second flank surface of said internal thread convolution being disposed in abutting engagement with a first side surface of said second pair of side surfaces on said insert when said insert is in said fully deflected condition, said first side surfaces of said first and second pairs of side surfaces at least partially defining an included angle which is less than the included angle between said first and second flank surfaces of said internal thread convolution to provide space between one of said flank surfaces of said internal thread convolution and one of said first side surfaces of said first and second pairs of side surfaces when said insert is in said first condition and when said insert is in said fully deflected condition, said external thread convolution having a first flank surface disposed in abutting engagement with a second side surface of said first pair of side surfaces on said insert and a second flank surface spaced apart from said insert is in said first condition, said first flank surface of said external thread convolution being spaced apart from said insert and said second flank surface of said external thread convolution being disposed in abutting engagement with a second side surface of said second pair of side surfaces on said insert when said insert is in said fully deflected condition, said second side surfaces of said first and second pairs of side surfaces at least partially defining an included angle which is less than the included angle between said first and second flank surface of said external thread convolution to provide space between one of said flank surfaces of said external thread convolution and one of said second side surfaces of said first and second pairs of side surfaces when said insert is in said first condition and when said insert is in said fully deflected condition, said helical central axis of said insert being shiftable relative to said internal and external thread convolutions upon twising of said insert from the first condition to the fully deflected condition, said helical central axis of said insert being spaced further from said first flank surfaces of said internal and external thread convolutions when said insert is in said fully deflected condition than when said insert is in said first condition, said helical central axis of said insert being spaced further from said second flank surfaces of said internal and external thread convolutions when said insert is in said initial condition than when said insert is in said fully deflected condition.

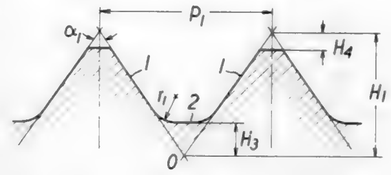
4,040,327

HIGH FATIGUE SCREW THREADS

Hideyuki Otaki, Mitaka, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sept. 19, 1975, Ser. No. 614,772
Claims priority, application Japan, Sept. 20, 1974, 49-108572
Int. Cl.[2] F16B *33/02*
U.S. Cl. 85—46 **1 Claim**

1. A substantially symmetric screw thread system including external threads each profiled to have a flank angle of (70 ± 2)° and a flat root located at (0.27 ± 0.02)H, from an intersecting point of two lines extended from opposing flanks of two adjacent threads and connected to said opposing flanks



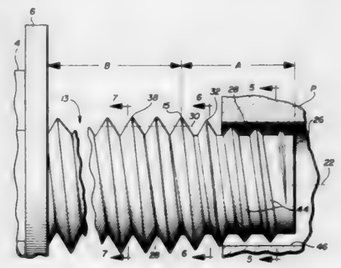
through arcs of a radius (0.15 ± 0.02)*p* where H is the depth and *p* is the pitch of the threads.

4,040,328

THREAD-FORMING FASTENER HAVING DUAL LOBULATION AND DIES FOR MAKING THE SAME

Herman G. Muenchinger, South Dartmouth, Mass., assignor to Research Engineering & Manufacturing, Inc., New Bedford, Mass.

Filed Mar. 10, 1976, Ser. No. 665,537
Int. Cl.[2] B21D *17/04;* **F16B** *25/00, 39/30*
U.S. Cl. 85—46 **8 Claims**



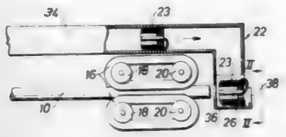
1. A thread-forming fastener having a work-entering section and a work-holding section, each section having more than one thread turn, a continuous roll thread on both said work-entering and work-holding sections, the thread formation on said work-entering section being tapered and having a pitch cross section in the form of a generally arcuate polygon with an odd number of arcuate sides merging gradually with intermediate thread-swaging lobes, the thread formation on said work-holding section also having a pitch cross section in the form of a generally arcuate polygon with an odd number of arcuate sides merging gradually with intermediate lobes, the number of sides and lobes in said holding section being respectively the same as the number of sides and lobes in said work-entering section, the radii of curvature of the sides in each section being substantially greater than the radii of curvature of the lobes in that section, and the lobulation in the holding section being substantially less than the lobulation in said work-entering section, said lobulation being defined as the maximum distance from the crest of the thread at an arcuate side to the circle that inscribes the crests of the thread at the adjacent lobes, the lobulation in said work-entering end being sufficient to provide a low torque thread-forming action in a workpiece, the lobulation in the holding section being a sufficient departure from a circular configuration to enhance in the holding section thread a locking action and an increase in the stripping torque when threaded into such workpiece, and a pilot thread section on said work-entering section intermediate the larger end of the tapered thread formation and the work-entering tip of the fastener for aligning the axis of the fastener with the axis of a hole in a workpiece when the pilot thread is inserted therein, said pilot thread section having a crest cross section of substantially uniform width throughout 360° and extending for at least approximately one thread turn.

4,040,329

METHOD AND ARRANGEMENT FOR CHARGING OF SHOTHOLES

Sten Herman Ljungberg, Stockholm, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed June 7, 1976, Ser. No. 694,100
Claims priority, application Sweden, June 9, 1975, 7506593
Int. Cl.[2] F42B *3/00*; F42D *1/08*
U.S. Cl. 86—20 C **5 Claims**



1. Apparatus for charging a shothole with explosive and a detonator, comprising

a stand,

an elongate, flexible charging tube mounted on said stand,

means operable for inserting said tube into a shothole,

a retainer mounted on said stand ahead of the front end of said tube,

roll of cord and a detonator assembly supported on said retainer coaxially of said tube, and with one end of said cord tied to said detonator,

said roll having an internal diameter larger than the external diameter of said tube, and said detonator being centered in the bore in said roll and being positioned in the path of the tube, whereby the detonator is propelled by the tube as the latter is introduced into the shothole, while at the same time the cord is unwound from said roll, and

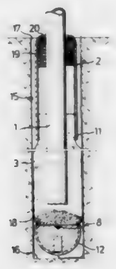
a guiding device on said retainer operative to compel said roll to rotate about its own axis as it is unwound.

4,040,330

METHOD OF CHARGING DRILL HOLES AND MEANS FOR CARRYING OUT THE METHOD

Nils Denny Matzén, Damastvagen 6a, S-16148, Bromma, Sweden

Filed Dec. 23, 1975, Ser. No. 643,813
Claims priority, application Sweden, Dec. 30, 1974, 7416357
Int. Cl.[2] F42D *1/08*
U.S. Cl. 86—20 C **4 Claims**



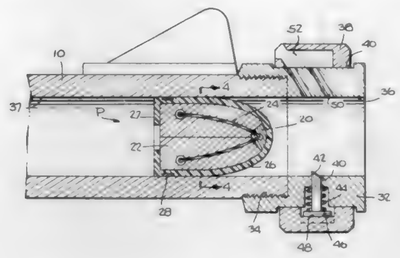
4. A method of charging a drill hole with explosives, comprising the steps of: preparing a sleeve open at both ends, preparing a thin-walled stocking of flexible material open at both ends, connecting one end of said stocking to one end of said sleeve and folding said stocking into a bellows around said sleeve from said one end towards said other end, folding said stocking over said bellows, closing said other end of said stocking after it has been drawn over said bellows and said other end of the sleeve, introducing a charging hose into the sleeve, introducing said charging hose, sleeve and stocking into said drill hole, and introducing explosives through said charging hose while the thin-walled stocking straightens out fold by fold from said bellows.

4,040,331

DUAL PURPOSE PROJECTILE AND WEAPON COMBINATION

Alan Litman, Pittsburgh, Pa., assignor to Smith & Wesson Chemical Company, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 485,360, July 3, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,052
Int. Cl.[2] F41C *21/18*
U.S. Cl. 89—14 C **16 Claims**



1. The combination of a dual purpose projectile and a weapon for firing the projectile comprising:

a body including a plurality of body segments, means securing said segments one to the other for movement between first and second configurations, said projectile body in said first configuration having a longitudinal axis with said segments being disposed in close juxtaposition one to the other about said axes and forming a substantially bullet-shaped projectile body having a predetermined diameter, said projectile body in said second configuration having a predetermined point with said segments being disposed radially from said point and forming a projectile body having a diameter larger than said predetermined diameter affording increased frontal area in a direction normal to the trajectory of the projectile when fired from the weapon, and means for releasably retaining said segments in said first configuration,

means carried by said weapon and cooperable with said projectile for selecting before firing said weapon one of said first and second projectile configurations whereby said projectile obtains either said first configuration or said second configuration after being fired from said weapon,

and means cooperable with said selecting means for venting said weapon only when said second projectile configuration is selected.

4,040,332

VARIABLE SPRING RATE EQUILIBRATORS

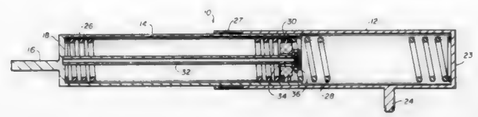
Robert O. Border, Bettendorf, Iowa, and Ronald H. Rudman, Chatsworth, Calif., assignors to The United States Government as represented by the Secretary of the Army, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,322
Int. Cl.[2] F41F *21/16*
U.S. Cl. 89—37 F **3 Claims**

1. An equilibrator assembly for a weapon system having a set of tipping parts pivotable in elevation relative to a fixed mount including an expandible housing pivoted between the tipping parts and the mount, and a plurality of coaxially aligned spring means in the housing cooperable to expand in response to the increased elevational position of the tipping parts to compensate substantially for the weight load demands of the tipping parts caused by variation in the location of the center of mass of the tipping parts throughout its range of elevation and depression.

a floating piston interposed between two of said spring means,

said housing having two sections with one section telescopically movable in the other section in response to elevation and depression of said tipping parts, and



an elongated stop member carried by said housing and engageable with said floating piston to prevent further expansion of one of said spring means when the tipping parts have reached a predetermined angle of elevation,

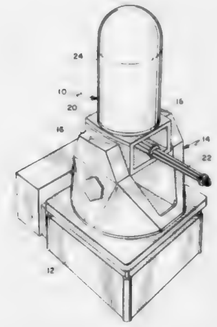
said stop member extending through a bore in the floating piston and having an enlarged head for preventing movement of said piston when the tipping parts reach a predetermined angle of elevation.

4,040,333

ISOGRID SHELL GUN MOUNT

Paul Slysh, San Diego, Calif., assignor to General Dynamics, Pomona, Calif.

Filed Oct. 18, 1976, Ser. No. 733,662
Int. Cl.[2] B64D *7/06*
U.S. Cl. 89—37.5 R **19 Claims**



1. High strength load bearing shell structure comprising:

means defining a substantially circular base;

alternate flat and curved wall panels arranged circumferentially around and extending upwardly from said base;

said panels defining wall means converging inward from said base to the top and secured to plate means extending substantially parallel to said base;

said adjacent panels being secured together along lines that run at an angle to said base; and

each of said panels having an outer skin structure and an inner isogrid structure.

4,040,334

MISSILE LAUNCHER FOR AIRCRAFT

Rollo G. Smethers, Jr., Atlanta, Ga., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed Apr. 20, 1976, Ser. No. 678,557
Int. Cl.[2] F41F *3/06*
U.S. Cl. 89—1.804 **10 Claims**

1. A missile launcher for aircraft comprising:

at least one tube mounted internally of said aircraft and adapted to contain a missile to be ejected therefrom, each said missile tube being sized internally to the transverse dimension of the aft end of said missile and adapted to be disposed in axial alignment with an opening in the forward end of said aircraft;

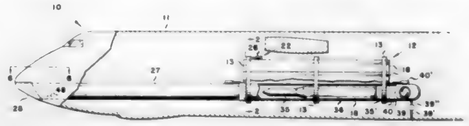
a removable and replaceable closure associated with said opening;

a chamber at the aft end of said missile tube, the interior of which is in communication with the end of the adjacent missile tube aft of said missile therein;

a source of fluid under pressure in excess of that in said each adjacent missile tube forwardly of said missile;

a conduit connecting said chamber with said fluid source; and

a valve associated with said conduit to control the passage of said fluid from said source into the adjacent chamber.

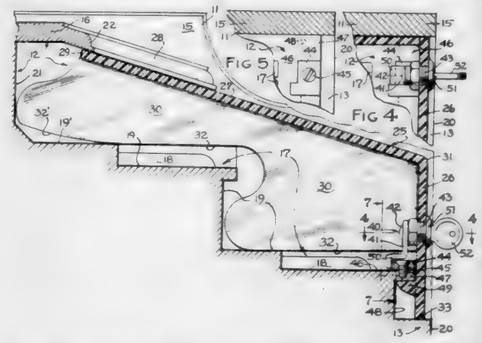


4,040,335

COVER AND LOCK FOR KEYBOARD OF AN ELECTRONIC ORGAN

Ray J. Oliver, 451 S. 1st St., San Jose, Calif. 95113, and Stanford M. Sammarcelli, 1357 Loyola Drive, Santa Clara, Calif. 95051

Filed Feb. 17, 1976, Ser. No. 658,179
Int. Cl.[2] G10C *3/02*
U.S. Cl. 84—183 **7 Claims**



1. For the keyboard of a musical instrument such as an electronic organ and the like having a plurality of groups of keys arranged in steps from its front to its back, a cover comprising in combination:

1. a keyboard compartment having a bottom, side walls and a top member at the back end of such keyboard compartment for confining the keyboard;
2. a sheet of rigid plastic material having side ends engaging the side walls of said keyboard compartment;
3. said plastic material having an upper portion disposed at an inclination substantially conforming to the steps of the groups of keys on said keyboard with its upper end engaged under the top member of the keyboard compartment;
4. said plastic material having a front portion formed integrally with said upper portion disposed vertically adjacent the front edge of the keyboard and having a lower edge adapted to rest upon the upper surface of the bottom of the keyboard compartment for supporting the cover over the keyboard;
5. a forwardly projecting ledge on the first step of said

keyboard engaging said vertically disposed front portion of the sheet of plastic material;

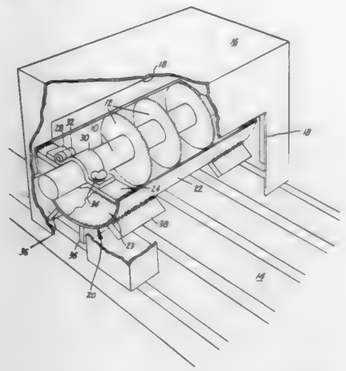
6. a detent formed on the back face of said front portion projecting below said forwardly projecting ledge for engaging the underside of the latter; and
7. a latch mechanism between the vertically disposed front portion of said sheet of plastic material and the upper surface of said forwardly projecting ledge for securing said cover to the keyboard;

4,040,336

CUTTING OR GRINDING TOOL PROTECTING GUARD

Terence John Lewis, Rugby; Raymond Brooks, Exhall, near Coventry, and John Selby, Coventry, all of England, assignors to The Torrington Company Limited, Coventry, England

Filed July 26, 1976, Ser. No. 676,525
Int. Cl.[2] B23Q *11/06*; B27G *19/02*
U.S. Cl. 90—11 R **4 Claims**



1. A protective guard for a cutting or grinding member of a machine tool, said guard comprising a sheet metal shield defining a trough of generally semi-cylindrical configuration, means for mounting said shield on a machine tool with said shield pivotally movable between a first, guard position wherein access to the cutting or grinding member is barred and a second, access position wherein said cutting or grinding member is exposed; and a plurality of circularly spaced, radial projections on said shield for pivoting said shield between said two positions responsive to workpiece advancing and retracting movements, said workpiece being held in a holder mounted for movement on said machine tool.

4,040,337

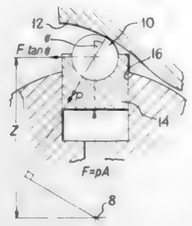
MULTI-LOBE CAM FOR HYDRAULIC PISTON-AND-CYLINDER MACHINES

Kenneth William Samuel Foster, Prestbury, England, assignor to Renold Limited, Manchester, England

Continuation-in-part of Ser. No. 412,074, Nov. 2, 1973, abandoned. This application May 28, 1975, Ser. No. 581,694
Int. Cl.[2] F01B *13/06*
U.S. Cl. 91—491 **15 Claims**

1. An hydraulic piston and cylinder machine having a given speed range, comprising a cylinder block defining a plurality of cylinders, a plurality of pistons slidably mounted in respective cylinders, piston follower elements associated with said pistons, means for supplying fluid to and for venting fluid from said cylinders, a multi-lobe cam to control the displacement of the pistons and piston follower elements in the cylinder block with respect to the progression of the cylinder block along the direction of the cam, and a drive shaft when the machine is operated as a motor,

the cam being shaped to provide a constant output torque at the motor drive shaft at an intermediate speed in said given speed range of the machine and so that all points of operation, in the cycle of events constituting each constant torque producing cycle of the machine, the mathematical output of the torque from the cam comprises two parts, the first part being a component of the torque to provide the torque dissipated in friction between the pistons and piston follower elements on the one hand and the



pistons and cylinders on the other hand in the motor while producing the output torque, and the second part being a component of the torque required from that part of the cam being its contribution at that instant to said constant torque output required at the motor drive shaft, and

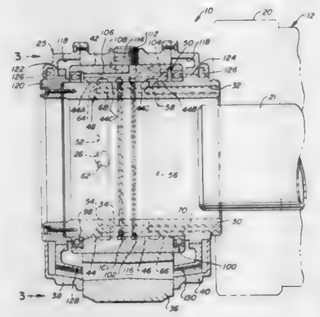
the sum of the velocities of all the pistons varies from point to point.

4,040,338

FLUID SUPPLY DISTRIBUTOR

John J. Wilson, Camden, and Donald M. Rhoades, Logansport, both of Ind., assignors to Logansport Machine Co., Inc., Logansport, Ind.

Filed June 14, 1976, Ser. No. 695,595
Int. Cl.[2] F01B *31/00*
U.S. Cl. 92—106 **16 Claims**



1. A fluid supply distributor for fluid communication between a stationary fluid source and a rotating hydraulic motor, said fluid supply distributor comprising:

a stationary housing including main port means;

shaft means adapted to be connected to the rotating hydraulic motor and including motor port means;

sleeve means in said housing interposed between said housing and said shaft means;

the exterior surface of said shaft means and the interior surface of said sleeve means defining sealing surfaces;

means mounting said shaft means for rotation within said sleeve means;

passage means intersecting said sealing surfaces and intercommunicating said main port means and said motor port means;

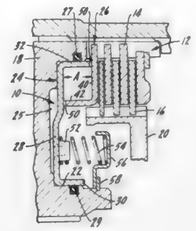
and release means for releasably retaining said sleeve means in a stationary position in said housing means and for permitting rotation of said sleeve means in response to seizure of said shaft means within said sleeve means.

4,040,339

AXIALLY ADJUSTABLE CLUTCH PISTONS

John Saxon Ivey, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Apr. 7, 1976, Ser. No. 674,343
Int. Cl.[2] F16J *1/10*
U.S. Cl. 92—129 **2 Claims**



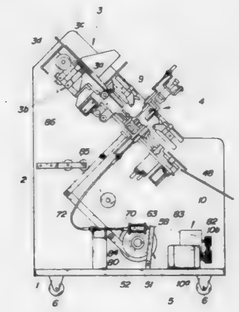
1. A piston assembly for use in a fluid actuator, wherein the assembly is mounted in a bore and moves in response to fluid pressure applied thereto, comprising a first annular sheet metal piston member having a portion thereof extending radially inward from an outer axially extending portion, a second annular piston member having a section thereof extending radially outward from an inner axially extending portion thereof, the respective axially extending portions of the other member when said assembly is subjected to fluid pressure whereby a relatively strong box-shaped construction is defined during operation of the piston and, the axially extending portions of said first and second piston members having ends thereof remote from the radially extending portions thereof and said ends have a series of scallops or serrations formed thereon wherein the length of the axially extending portions of said first and second piston members is controlled by a coining operation on said scalloped portions.

4,040,340

AUTOMATIC PASTE BOARD BOX FORMING MACHINE

Tomeo Iijima, 3-1363, Kamiaoki, Kawaguchi, Saitama, Japan

Filed June 9, 1976, Ser. No. 694,230
Claims priority, application Japan, June 9, 1975, 50-68628
Int. Cl.[2] B31B *3/26*
U.S. Cl. 93—49 R **8 Claims**



1. An automatic paste board box forming machine comprising a paste board box forming mechanism for bending and assembling a paste board, said paste board forming mechanism including a member for paste board box assembling, a paste board supplying mechanism for supplying paste boards to said forming mechanism and driving means for driving both mechanisms, wherein these mechanisms include:

a driving force generating mechanism for generating a driving force necessary for bending and assembling the paste board in said paste board box forming mechanism,

a hollow cable; a steel wire slidably inserted into said hollow cable, one end of said steel wire being connected to said driving force generating mechanism; the other end of said steel wire being connected to the paste board box assembling member, said paste board forming mechanism including an alarm;

a shock absorbing member interconnected between said one end of said steel wire and said driving force generating mechanism, said shock absorber being compressible to a predetermined length; and

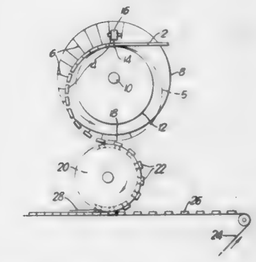
means detecting the compressed length of said shock absorbing member; for actuating said alarm upon said shock absorber being compressed to said predetermined length.

4,040,341

APPARATUS FOR MAKING COMPOSITE FILTERS

Desmond Walter Molins, London, and Norman Walter Jackson, Eastbourne, both of England, assignors to Molins Limited, England

Filed Nov. 5, 1975, Ser. No. 629,622
Claims priority, application United Kingdom, Nov. 8, 1974, 48399/74
Int. Cl.[2] A24C *5/50*
U.S. Cl. 93—77 FT **12 Claims**



1. Apparatus for producing composite filters comprising feed means for supplying a serial stream of contiguous first filter elements of predetermined length moving axially along a first path, means for moving said first filter elements received from said feed means transversely along arcuately spaced radial paths for axially separating said first filter elements, conveyor means for supporting a continuous wrapper web, means for feeding onto the web a stream of spaced second filter elements, means for transferring the axially separated first filter elements onto the wrapper web so that said first and second filler elements intercalate to form a stream of alternating filter elements, means for continuously wrapping the stream in the wrapper web to form a composite filter rod, and means for severing said rod at predetermined positions to produce composite filters or multiples thereof.

4,040,342

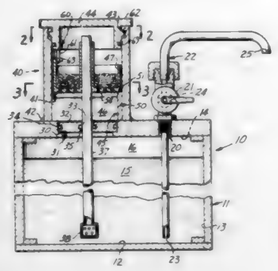
APPARATUS FOR GENERATION OF CARBON DIOXIDE GAS AND THE CARBONATION OF WATER

Robert Roy Austin, 2270 E. Orange Grove Blvd., Pasadena, Calif. 91104, and George Noblit Tyson, 4950 N. Live Oak Canyon Road, LaVerne, Calif. 91750

Filed Oct. 14, 1975, Ser. No. 622,141
Int. Cl.[2] A23F *1/00, 3/00*; B01J *7/02*
U.S. Cl. 99—323.1 **34 Claims**

1. Carbonating apparatus comprising: an absorber tank for holding liquid to be carbonated and for retaining the contents under pressure; an inlet port giving access to the inside of said absorber tank; a discharge tube exiting the absorber tank and having a flow passage from inside to outside of the absorber tank; a valve in said discharge tube selectively to permit or to

prevent flow of liquid therethrough; a generator chamber adapted to receive substances which, when mixed in aqueous solution, generate carbon dioxide; a removable closure giving access to the inside of said generator chamber; an injector conduit extending from a region in the generator chamber intended to contain gas into the absorber tank; first and second container means in said generator chamber for holding said substances; separator means for releasably holding the second



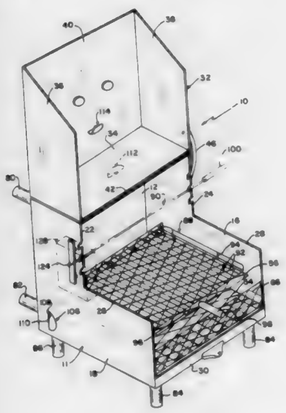
container means away from the first container means; actuator means for causing the substances in the two containers to be mixed; said separator means comprising a key and a groove, one of which is on the first container means and the other of which is on the second container means, and in which the actuator means comprises means carried by the closure, which actuator means is adapted to cause the key and groove to be aligned so that the second container means is enabled to move into the first container means and mix the substances.

4,040,343

CHARCOAL BROILER

Gerald B. De Lucchi, 2012 Greenwich St., San Francisco, Calif. 94123

Filed Dec. 30, 1974, Ser. No. 537,096
Int. Cl.[2] A47J *37/04*; F24C *1/16*
U.S. Cl. 99—421 H **5 Claims**



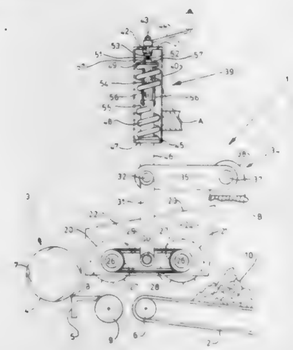
1. A charcoal broiler comprising the combination of a housing having a bottom floor, an open top, a pair of opposite side walls, a front wall having a lower corner, and a rear wall, all of said walls extending between the floor and the open top, a hood having a top wall, opposite side walls and a rear wall, hinge means for mounting a margin of the hood rear wall for pivotal movement about a transverse axis on an edge of the housing rear wall, said housing having a center of balance which is located within a vertical plane located between the front wall and rear wall of said housing, a handle mounted on the top wall of the hood, a perforate fuel-containing basket mounted within the housing, said basket extending in parallel relationship with the housing front wall, support means for supporting the broiler in a first orientation with the basket extending substantially vertical and in a second orientation with the basket extending substantially horizontal, said handle being positioned substantially on a mid-portion of the hood top wall and said axis of the hinge means being positioned substantially in a vertical plane which is horizontally offset from the center of balance of the hosuing when the housing is oriented in its first position whereby in such position a vertical lifting force applied to the handle by a user causes the hood to exert a vertical force on the housing at said hinge means to pivot the housing about said lower corner of the front wall which causes the plane of said center of balance to shift in a horizontal direction whereby it passes through the vertical plane encompassing the lower corner of the front wall for tilting the hosuing about said lower corner toward its second orientation, and with the housing in its second orientation a force applied against the handle which tends to pivot the hood away from the open top causes the hood to exert a force on the housing at said hinge means in a direction offset from said center of balance whereby the plane of said center of balance is shifted in a horizontal direction whereby it passes through the vertical plane encompassing the lower corner of the front wall for tilting the housing toward its first orientation.

4,040,344

FEED ROLLER MECHANISMS FOR FORAGE HARVESTERS

George Edgar Moore, and Alan Francis Morris, both of Ashburton, New Zealand, assignors to Dehye Harvesters Limited, Ashburton, New Zealand

Filed Nov. 25, 1975, Ser. No. 635,541
Claims priority, application New Zealand, Dec. 2, 1974, 176089
Int. Cl.[2] B30B *3/04*
U.S. Cl. 100—95 **9 Claims**



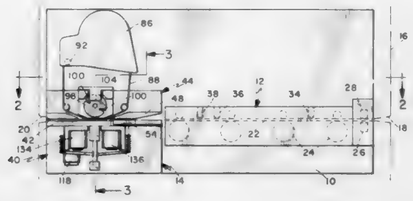
1. In a forage harvester having a frame, an inclined movable conveyor and cutting means positioned adjacent the upper end of the movable conveyor; a feed roller mechanism comprising a roller housing and at least one feed roller in said housing and having a longitudinal axis of rotation lying transverse to the movement of said conveyor, said roller housing being situated above the upper end of said conveyor and adjacent said cutting means, and being mounted within said harvester for limited vertical movement, an adjustable biasing means in the form of an elongate thruster arranged to allow the bias of said roller housing towards said conveyor to be adjusted, the elongate thruster being situated substantially centrally above said housing and mounted to the frame of the forage harvester, tie means linking said housing to said forage harvester to guide said limited vertical movement relative to said forage harvester substantially parallel to the longitudinal axis of the thruster, whereby forage material travelling up the conveyor and onto the cutting means will pass beneath said feed roller mechanism in a direction transverse to said longitudinal axis of rotation of said roller and be compressed by said roller, and said feed roller mechanism is prevented from rocking or tilting movement about an axis substantially transverse to the longitudinal axis of rotation of said roller such that the pressure applied by the roller is substantially uniform along its length, and said adjustable biasing means enables the bias on said feed roller mechanism to be varied and to be raised by said thruster to clear clogged material therefrom.

4,040,345

TICKET ADVANCE AND PRINTER MECHANISM

Ralph Delta Adams, Escondido, and Charles Junior Ingram, El Cajon, both of Calif., assignors to Cubic-Western Data, San Diego, Calif.

Filed Apr. 12, 1976, Ser. No. 675,946
Int. Cl.[2] B41J *1/44*
U.S. Cl. 101—66 **2 Claims**



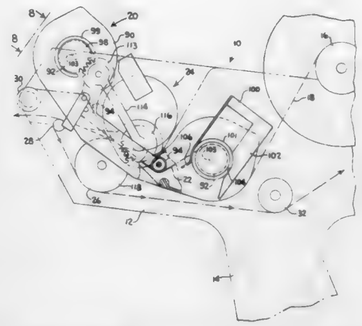
1. A ticket advance and printer mechanism, comprising:
an input stage having an entry portion for receiving a ticket;
a printer stage positioned to receive a ticket from said input stage;
said printer stage including an upper head unit and a lower platen unit having a flat ticket supporting platen;
said head unit having a guide flange parallel to and spaced from said platen and defining a ticket conducting channel therebetween;
stepper motor drive means on said printer stage for driving a ticket through said channel in sequential steps;
drive actuating means for selectively engaging and disengaging said drive means;
a rotatable print drum driven in sequential steps by said drive means, the print drum having a plurality of axially spaced character wheels, each with circumferentially spaced characters thereon;
said print drum having an axial shaft parallel to the platen and perpendicular to the path of the ticket through said channel, and being mounted in said head unit and protruding into said channel through said guide flange;
said drive means including a ticket engaging drive wheel on said shaft and fixed with the print drum;
said drive actuating means including an arm pivotally mounted on said platen unit, with a pinch roller rotataby mounted on one end of the arm, the platen having a slot through which said pinch roller protrudes opposite said drive wheel, and an actuator coupled to said arm for selectively moving said pinch roller into and out of driving engagement with said drive wheel;
a ticket engaging stop on said arm on the side of the pivot opposite said pinch roller, said stop protruding through said platen into the channel when the pinch roller is out of driving engagement with the drive wheel, and being retracted clear of the channel when the pinch roller is in the driving engagement position;
a plurality of print hammers mounted on the opposite side of the channel from the print drum, each hammer being aligned with one of said character wheels;
a printing ribbon extending between said print drum and hammers;
and hammer actuating means for actuating the hammers in a selected sequency while said drive means is disengaged.

4,040,346

LABEL PRINTING APPARATUS WITH TAPE CASSETTE

Alfreds Orlens, Old Greenwich, and David W. Hubbard, Stamford, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Feb. 5, 1976, Ser. No. 655,479
Int. Cl.[2] B41J *1/48*
U.S. Cl. 101—336 **5 Claims**



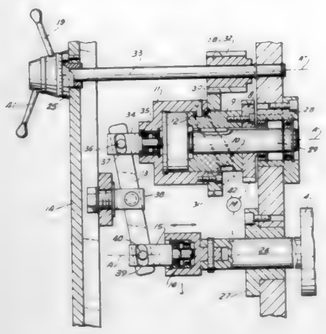
1. In a hand-held printing apparatus for printing a label with characters, said apparatus comprising a main frame and a printing member supported by the frame, said printing member having a series of character printing dies; an assembly for moving a ribbon-type printing medium in operative relation to the printing member; said label printing apparatus comprising:
A. a printing medium cartridge including
1. a cartridge housing having an open brige-like extension forming an opening for exposing a printing medium and for allowing the printing member to adaptably fit within said cartridge in order to contact said medium, said medium extending along said bridge-like extension in a mid-portion thereof, so that the printing members projects into said bridge-like extension to contact said medium disposed therein;
2. first spindle means mounted in said housing on which the medium may be wound;
3. second spindle means, also mounted in said housing, on which the medium may be wound, the medium being exposed when conducted between said first and second spindle means;
4. coupling means associated with at least one of said spindle means, said coupling means including a driven coupling gear accessible from the exterior of said housing;
B. mounting bracket means associated with the printing apparatus frame for embracing said cartridge housing to position the housing opening and the medium exposed therein in operative relation to the printing member; and
C. drive means connectible with said coupling means when said cartridge housing is embraced by said mounting bracket means for driving the spindle means with which said coupling means is associated to wind the medium thereon, said drive means comprising:
a. a first rotatably driven gear connected to one of said spindle means,
b. a second driven gear adapted to mesh with said coupling gear, and
c. belt means interconnecting said first and second driven gears.

4,040,347

INKING ARRANGEMENT FOR PRINTING MACHINE

Hans Johne, Radebeul; Arndt Jentzsch, Coswig; Gunter Schumann, Radebeul; Roland Reichenberger, Radebeul; Horst Kesselring, Radebeul, and Karl-Heinz Fischer, Coswig, all of Germany, assignors to Veb Polygraph Leipzig Kombinat Fur Polygraphische Maschinen Und Ausrustungen, Leipzig, Germany

Filed July 13, 1976, Ser. No. 704,916
Claims priority, application Germany, July 28, 1975, 187499
Int. Cl.[2] B41F *31/14*
U.S. Cl. 101—349 **10 Claims**



1. In a printing machine, the combination comprising:
- a rubbing roller having a roller axis and axially displaceable therealong;
- a cam rotatable about a cam axis generally parallel to said roller axis and formed with a continuous circumferential radially open cam groove crossing a plane perpendicular to said cam axis;
- a cam follower nonrotatable about said cam axis but displaceable parallel thereto and engaged axially nondisplaceably in said groove;
- cam and roller drive means for synchronously rotating said cam and roller respectively about said cam and roller axes and thereby reciprocating said follower parallel to said cam axis;
- coupling means connected between said follower and said rubbing roller for displacing same along said roller axis in synchronism with the displacement of said follower parallel to said cam axis; and
- means for angularly displacing said follower about said cam axis and for locking it in any of a plurality of angularly offset positions therearound.

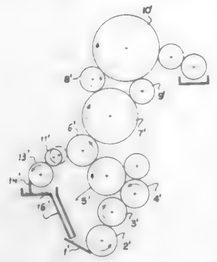
4,040,348

DUCTOR OR FILM-TRANSFERRING INKING MECHANISM, PARTICULARLY FOR OFFSET PRESSES

Peter Gertsch, Bern, and Alfons Wehrli, Liebefeld, both of Switzerland, assignors to Maschinenfabrik Wifag, Switzerland

Filed Apr. 8, 1976, Ser. No. 675,061
Claims priority, application Switzerland, May 5, 1975, 5713/75
Int. Cl.[2] B41L *27/16, 27/22*
U.S. Cl. 101—350 **2 Claims**

1. In a ductor or film-transferring inking mechanism for printing machines which include a plate cylinder having a printing form, an ink reservoir, a ductor roller mounted for rotation so as to dip into the ink of said ink reservoir, and at least one additional rotatable roller engageable during printing between the surfaces of said ductor roller and said plate cylinder, the improvement comprising a rotatable stripper roller, a stripper engaged with the surface of said stripper roller to strip ink therefrom as said stripper roller is rotated, ink return means located in a position to receive the stripped ink from said stripper roller, a rotatable take-off roller associated with one of said additional rollers of the inking mechanism and adapted to engage said one of said additional rollers to take up the periodically unused, no longer applicable ink from said additional



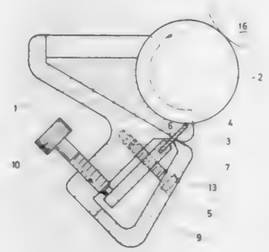
roller and is also engageable with said stripper roller to transfer the ink to the stripping roller, and means mounting said takeoff roller for oscillating movement toward and away from said distributor roller and said stripping roller.

4,040,349

INK FOUNTAIN ASSEMBLY FOR PRINTING PRESSES

Willi Jeschke, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Dec. 19, 1975, Ser. No. 642,485
Claims priority, application Germany, Dec. 19, 1974, 2460116
Int. Cl.[2] B41F *31/02*
U.S. Cl. 101—365 **10 Claims**



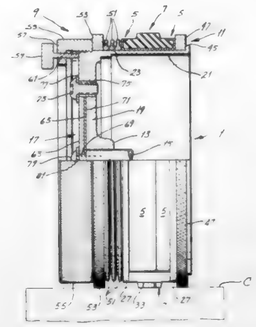
1. Ink fountain assembly for a printing press comprising an ink fountain, a fountain roller engageable in said ink fountain for transferring ink therefrom to a printing unit of a printing press, an elongated ink knife having a scraper edge on one side and having another side opposite and extending along the length of said scraper edge, said scraper edge being engageable with the peripheral surface of the fountain roller for scraping ink therefrom, said ink knife being divided into individual zones mutually spaced from one another along the length of said ink knife to allow the engagement of the scraper edge with the roller to be selectively adjusted by individual zones; means for holding said ink knife along a portion between said scraper edge and said opposite side in a fixed position relative to said roller; and means operatively engageable with said opposite side of said ink knife for adjusting the position of said scraper edge relative to said fountain roller zonewise.

4,040,350

ROTARY PRINTER

Roger A. Hopkins, Herrin, Ill., assignor to Diagraph-Bradley Industries, Inc., Herrin, Ill.

Filed July 1, 1976, Ser. No. 701,584
Int. Cl.[2] B41F *13/10*
U.S. Cl. 101—376 **10 Claims**



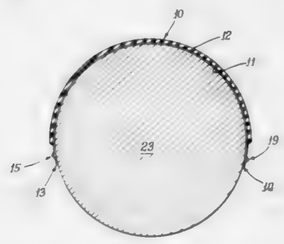
1. A rotary printer comprising a wheel having a generally cylindrical surface, type-holding ring means on the wheel, said ring means comprising a pair of relatively thin cylindrical ring members having a sliding fit on the wheel, said ring members being positioned side-by-side on the wheel, each of said ring members having a radially outwardly extending flange at the side thereof away from the other ring member, each of said flanges having a lip at its outer edge extending inwardly toward the other flange spaced radially outwardly from the respective ring member, said lips defining inwardly directed opposed annular grooves at opposite sides of the ring members, a series of type members on said ring members, each type member comprising a block of elastomeric material having an inside face engageable with the outside faces of said ring members and extending across said ring members with the ends of the block received in said grooves, with a raised type face extending outwardly from the block between said lips, abutment means extending radially outwardly from the wheel axially engageable by the flange of one of said ring members, and means on the wheel for clamping said ring members with the type members therebetween against said abutment means thereby to lock said ring members to the wheel and said type members to said ring members.

4,040,351

MAGNETICALLY HELD PRINTING MAT

Hans B. Faust, Mount Prospect, Ill., assignor to Weber Marking Systems, Inc., Arlington Heights, Ill.

Filed Oct. 12, 1976, Ser. No. 731,848
Int. Cl.[2] B41F *27/02*
U.S. Cl. 101—382 MV **3 Claims**



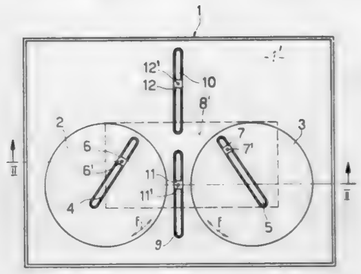
1. In a printing device of the type employing a magnetic cylinder comprising a generally rectangularly shaped flexographic printing mat of a flat plane sheet steel adapted to be wrapped around said cylinder and gripped thereto by the magnetic attraction of the cylinder, and the leading and trailing ends only of said flexographic printing mat being preformed with an inverted V-shape lying parallel to and closely adjacent each end thereof and leaving an intermediate flat portion on the mat whereby the resultant spaced apart parallel engagement lines at the ends of the flexographic printing mat created by the inverted V-shapes cause a more concentrated magnetic adherence of the ends of the mat to the magnetic cylinder over the intermediate flat portion of the mat thereby preventing unwarranted separation of the mat from the cylinder.

4,040,352

ADJUSTABLE WORK TABLE FOR SILK SCREEN PRINTER

Ezio Curti, Viale Regina Giovanna 38, Milan, Italy

Filed Jan. 30, 1976, Ser. No. 653,615
Int. Cl.[2] B41F *15/26, 17/00*
U.S. Cl. 101—407 BP **8 Claims**



1. A printing table for use with work having positioning openings in the under portion thereof comprising a flat table-forming body, means provided on said table body for stabilizing said work against accidental shifting during the printing process comprising said body having at least one aperture therein, a complementarily formed disc disposed in said at least one aperture for rotation about an axis perpendicular to the plane of said table-forming body, said disc having a top surface coplanar with said body, said disc having an upwardly opening groove, a carriage slideably disposed in said groove for adjustable movement reciprocally longitudinally thereof, a reference pin carried on said carriage and projecting upwardly of the plane of the top surface of said disc and said body for engagement within at least one of said openings in said printing work, and means for locking said carrigage in selected adjusted position within said groove.

4,040,353

PROCESS FOR COLORING SURFACES

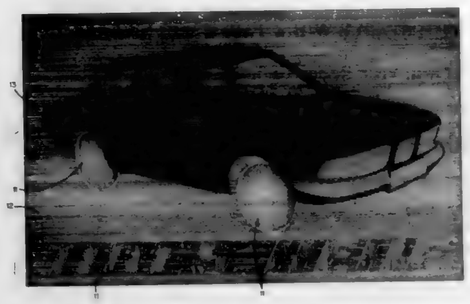
Michel Serge Lefebvre, Guise, France, assignor to OPI Metriservice, Societe Anonyme, France

Filed Oct. 28, 1975, Ser. No. 626,317
Claims priority, application France, Oct. 31, 1974, 74.36399
Int. Cl.[2] B41M *5/14*; G09F *19/14*
U.S. Cl. 101—426 **5 Claims**

1. A process for preparing a coloured surface having different visual impressions depending upon the distance from which it is viewed, said process comprising the steps of:
- colouring a first area of said surface by at least two colours in the following manner:
  - distributing distinct first unitary zones of a first color substantially uniformly over predetermined portions of said first area of said surface;
  - distributing distinct second unitary zones of a second colour substantially uniformly over predetermined portions of said first area of said surface, whereby the sum of the surface areas covered by said unitary zones of

said first colour bears a predetermined ratio relationship with respect to the sum of the surface areas covered by said unitary zones of said second colour, said unitary zones of each of said at least two colours being of such size that they are not visually distinguishable when viewed from beyond a predetermined distance at which said surface is clearly visible;

determining the resultant colour of said at least two colours in said first area, said resultant colour being the optical mixtures of said at least two colours in the ratio of surface areas covered by each colour in said first area; and



colouring a second area of said surface with said resultant colour, said first and second areas being juxtaposed;

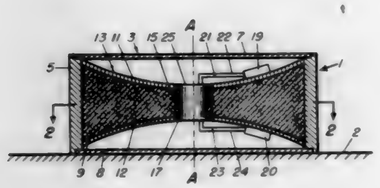
whereby when viewed from beyond said predetermined distance, said first and second areas are distinguishable while said surface is clearly visible, and when viewed from a point located at a distance equal to or less than said predetermined distance, said first area is perceived as having juxtaposed zones of said at least two colours and said second area is perceived as having said resultant colour.

4,040,354

GRAVITY-DEPLOYED DOUBLE-ENDED ANTI-TANK MINE

Allen E. Stern, Morristown, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 30, 1975, Ser. No. 627,174
Int. Cl.² F42B *21/00, 23/26, 1/02, 11/22*
U.S. Cl. 102—8 **7 Claims**



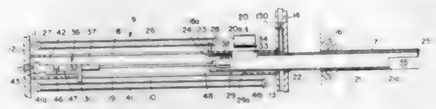
1. A high-explosive, anti-tank land mine comprising a hollow external connecting wall, two opposite, substantially-flat, circular, end walls attached to the ends of said hollow external connecting wall, said mine being adapted to be deployed from the air and come to rest by gravity on either end wall thereof; a charge of high explosive material fixed within said hollow external connecting wall, said charge having two concave end surfaces facing said end walls, each surface lined with a concave hardened metal plate thereby forming two oppositely directed double-ended plates; and fuze means disposed within said hollow external connecting wall for initiating said charge after said mine has come to rest on one of said end walls, to explosively project the upper metal plate.

4,040,355

EXCAVATION APPARATUS AND METHOD

Robert B. Hopler, Jr., Succasunna, N.J., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 9, 1975, Ser. No. 621,200
Int. Cl.² F42D *3/04*
U.S. Cl. 102—22 R **18 Claims**



4. Apparatus for loading and initiating delay type percussion initiatable explosive charges in bore holes, which comprises:

a tubular loading member having a passageway in a side wall thereof for receiving an explosive charge;

means for moving said tubular loading member into and out of a bore hole;

means for advancing said charge within said tubular loading member into emplacement within said bore hole;

means mounted to said advancing means for impacting said emplaced charge to initiate said charge; and

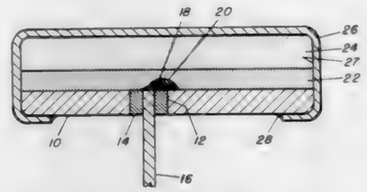
means responsive to actuation of said impacting means for actuating said moving means to retract said tubular loading member and said advancing means from said bore hole during the delay period of said initiated charge.

4,040,356

CONVERGING WAVE DETONATOR

Wallace E. Voreck, Jr., Sparta, and Everett W. Dalrymple, Randolph, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 6, 1976, Ser. No. 702,560
Int. Cl.² F42B *3/10*
U.S. Cl. 102—28 R **7 Claims**



1. A converging wave detonator which comprises:

means for housing said detonator therein and for reflecting an outwardly radially radiating detonation wave from the interior walls thereof;

lead-header means for hermetically sealing with said means for housing and for providing electrical connection therethrough;

means for igniting said detonator being centrally disposed on said lead-header means for sealing and enclosed within said means for housing;

a disc shaped lead azide primer charge member axially aligned with and operatively disposed on said means for igniting; and

a disc shaped secondary output charge member operatively disposed on said primer charge member;

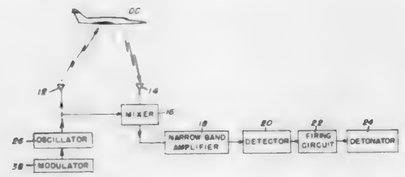
wherein, in initial detonation wave, centrally produced in said lead azide primer charge by said means for igniting, propagates radially outward from said lead azide primer charge until said detonation wave hits the interior walls of said means for housing generating a reflected shock wave which causes pressure within said means for housing to increase to a level which in turn causes annular initiation at the outer edges of said secondary output charge and the generation of a converging detonation wave in said secondary output charge which after colliding in the center of said secondary output charge produces an axial jet of explosion materials capable of initiating a high explosive acceptor made of material such as RDX.

4,040,357

AIR TARGET FUZE

William K. Saunders, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 4, 1959, Ser. No. 797,310
Int. Cl.² F42C *13/04*
U.S. Cl. 102—70.2 P **3 Claims**



1. An improved air target fuze for use on a missile, said fuze comprising in combination: an oscillator, a modulator connected to frequency modulate said oscillator with a modulating waveform chosen so that the carrier frequency of said oscillator is changed from its initial value at approximately a $t^{2/3}$ rate, where t represents time, until a predetermined frequency is reached, the wave then decreasing at a $-t^{2/3}$ rate until the carrier frequency returns to its initial value, the above cycle the repeating periodically, a sidewise looking transmitting antenna to which the frequency modulated output of said oscillator is fed, a sidewise looking receiving antenna for receiving a reflected wave from a target, a mixer to which the received wave and a portion of the transmitted wave are fed, a narrow band amplifier having a center frequency f_o to which the output of said mixer is fed, said modulating waveform further being chosen so that at the fuze-to-target cut-off distance beyond which the fuze is not to respond the difference frequency between the transmitted and received waves when the transmitted wave has a frequency corresponding to said predetermined point is substantially equal to the center frequency f_o of said amplifier, a detonator, and means connected to the output of said narrow band amplifier for functioning said detonator in response to the receipt of a signal from said amplifier.

4,040,358

HYDRAULIC DELAYED ARMING FUZE

George Webb, Richmond, Ind., assignor to Avco Corporation, Wilmington, Mass.

Filed Dec. 14, 1965, Ser. No. 513,804
Int. Cl.² F42C *15/22, 15/34*
U.S. Cl. 102—79 **7 Claims**

1. In a fuze of the type adapted to be installed in a missile, the combination of:

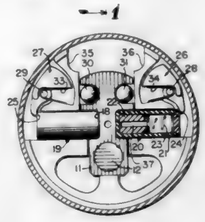
firing means,

a displaceable element having a normal disabling positional relationship with reference to the firing means but adapted to be displaced to an enabling positional relationship,

said displaceable element being formed with locking surfaces,

a plurality of locking means each comprising a partially fluid-filled hollow cylinder, a hydraulic piston, formed with a timing orifice and slidably mounted within the cylinder, and a spring for biasing the piston radially inwardly,

and a plurality of retainer weights for yieldably holding the cylinders in locking position and in engagement with said surfaces, said retainer weights being pivotally mounted and proportioned to exert increased retaining force on the cylinders as centrifugal force increases,



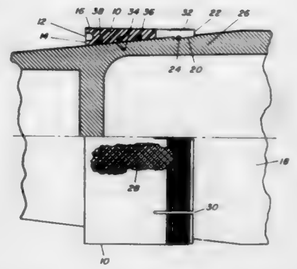
centrifugal force due to spin of the missile in flight moving the pistons radially outwardly against the force of the fluid until the thrust exerted by the cylinders overcomes the retaining thrust exerted by the retainers whereupon the cylinders are disengaged from the displaceable element to move to its enabling position with respect to the firing means.

4,040,359

DISCARDING FRANGIBLE ROTATING BAND

Raymond S. Blajda, Parsippany; Robert W. Kantenwein, Landing; Gerald E. Gaughan, Dover, all of N.J., and John F. Sikra, Feasterville, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 14, 1976, Ser. No. 686,610
Int. Cl.² F42B *13/16*
U.S. Cl. 102—93 **4 Claims**



1. A discarding frangible rotating band for use on a spin launched projectile from a rifled gun which comprises:

a projectile having a boattail end with an annular, circumferentially disposed, knurled surface thereon, an annular projectile retaining groove positioned circumjacent the periphery of said boattail end and adjacent to said knurled surface;

composite rotating band means, press fit on said knurled surface and into said annular projectile retaining groove, for maintaining structural integrity when subjected to compressive forces of launch in order to provide an obturating seal to forcibly expel said projectile from said gun, for transmitting spin forces imparted by said rifled gun to said projectile, and for fragmentizing when exposed to tensile shear conditions as soon as said band means exits from the muzzle of said gun, which includes:

a cylindrically shaped band member being made of a

mixture of an acetal copolymer resin and hollow glass beads, said band member having a front end which has an inwardly protruding retaining lip on the interior wall of said cylindrically shaped band member, a plurality of peripherally concentrically disposed band grooves located in the outer wall, a plurality of peripherally concentrically disposed band grooves located in the outer wall, a plurality of equally spaced longitudinal band slots disposed through said front end, a rear end having an annular obturator undercut groove therein, and a plurality of annular stress grooves rearwardly disposed in the interior wall of said cylindrically shaped band member; and

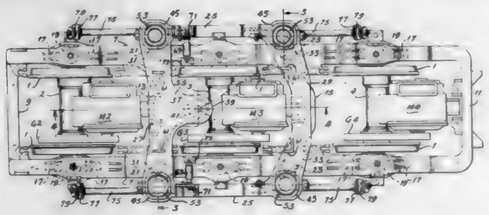
epoxy resin means for filling said stress grooves to enable said rotating band to maintain structural shape while being exposed to compressive forces in said gun during launch and for helping said rotating band to fragmentize when said rotating band emerges from the muzzle of said gun.

4,040,360

RAILWAY LOCOMOTIVE TRUCK

Keith L. Jackson, Granite City, Ill., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Feb. 17, 1976, Ser. No. 658,341
Int. Cl.[2] B61C *3/00*; B61F *3/06, 5/14, 5/16*
U.S. Cl. 105—136 **5 Claims**



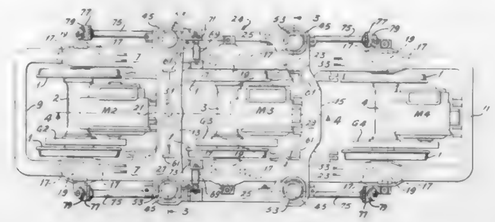
1. In a railway locomotive truck, three wheeled axles spaced apart longitudinally of the truck including first and second end axles and a middle axle therebetween, a rigid truck frame resiliently supported from said axles, said truck frame comprising longitudinally extending side members and first and second transversely extending transom members connecting said side members, respectively, intermediate said first end and said middle axles and said middle and said second end axles, traction motors respectively drivingly connected to each of said axles and having reaction connections to the frame, a bolster comprising longitudinally extending side members and transversely extending first and second end members connecting said side members, said side members being disposed transversely outboard of said truck frame side members and said bolster end members, respectively, overlying at least in part the respective intermediate truck frame transoms, said bolster and said truck frame being substantially free of structural elements in the region defined by said bolster end members and said truck frame side members whereby said bolster end members and the portions of said frame side members therebetween define an opening substantially commensurate with the space defined by said intermediate transom members and said frame side members, opposed horizontal bearing means on both of said bolster end members and said truck frame, said first intermediate truck frame transom and said first bolster end member having cooperating vertical axis swivel bearings centered transversely of the truck, said opposed bearings comprising pairs of transversely spaced upwardly and downwardly facing bearing surfaces on said frame side members and both of said bolster end members, a pair of upright body-support springs seated on each of said bolster end members in substantial transverse alignment with the respective pairs of opposed bearings whereby each of said bolster end members constitutes a beam loaded adjacent its ends and supported near its ends on said truck frame side members, and said bolster side members constitute vertically unloaded spacers and ties between said bolster end members, and a pair of longitudinally upwardly and outwardly inclined links connected at their lower ends to said bolster side members and arranged for connection to the locomotive body such that their axial projections intersect at track level.

4,040,361

RAILWAY LOCOMOTIVE TRUCK

Keith L. Jackson, Granite City, Ill., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed May 6, 1976, Ser. No. 683,923
Int. Cl.[2] B61F *3/06, 5/06, 5/16, 5/24*
U.S. Cl. 105—136 **6 Claims**



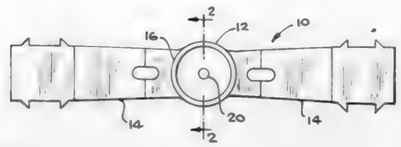
1. In a railway locomotive truck, three wheeled axles spaced apart longitudinally of the truck including first and second end axles and a middle axle therebetween, a rigid truck frame resiliently supported from said axles, said truck frame comprising longitudinally extending side members and first and second transversely extending transom members connecting said side members, respectively, intermediate said first end and said middle and said second end axles, traction motors respectively drivingly connected to each of said axles and having reaction connections to the frame, a bolster comprising longitudinally extending side members and transversely extending first and second end members connecting said side members, said side members being disposed transversely outboard of said truck frame side members and said bolster end members, respectively, overlying at least in part the respective intermediate truck frame transoms, said bolster and said truck frame being substantially free of structural elements in the region defined by said bolster end members and said truck frame side members, whereby said bolster end members and the portions of said frame side members provide an opening substantially commensurate with the space defined by said intermediate transom members and said frame side members, said first intermediate truck frame transom and said first bolster end member having co-operating vertical axis swivel bearings at their centers in vertical load supporting relation with each other and the truck frame and said second bolster end member having transversely spaced opposed horizontal sliding bearings in vertical load supporting relation with each other for providing a stable three-point support of said bolster on said truck frame, upright springs carried on the end portions of said bolster end members for supporting a locomotive body on the truck, and a pair of longitudinally upwardly and outwardly inclined links connected at their lower ends to said bolster side members and arranged for connection at their upper ends to the locomotive body, such that their axial projections intersect substantially at rail level whereby to transmit tractive forces from the truck to the locomotive body substantially at rail level, the upright springs on said first bolster end member being in substantial alignment transversely of the truck with the vertical axis of said swivel bearing and the upright springs on said other bolster end member being in substantial alignment transversely of the truck with said sliding bearings, whereby each of said bolster end members constitutes a beam loaded adjacent its ends and supported intermediate its ends on said truck frame, and said bolster side members constitute vertically unloaded spacers and ties between said bolster end members.

4,040,362

RAILWAY BOLSTER INTEGRAL WEAR LINER

Carl Emil Oppenheim, West Dundee, Ill., and James McKenna, Atlanta, Ga., assignors to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 517,680, Oct. 24, 1974, abandoned, which is a division of Ser. No. 406,678, Oct. 15, 1973, Pat. No. 3,894,676. This application Sept. 29, 1976, Ser. No. 727,778
Int. Cl.[2] B61F *5/16*; C22C *39/20, 39/26*; F16C *17/10*
U.S. Cl. 105—226 **5 Claims**



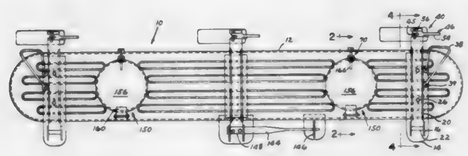
1. A railway car bolster including an upwardly opening bolster bowl comprising an upstanding flange, a wearable steel liner having top and bottom edges within said flange and defining a generally cylindrical metal receiving void between said upstanding flange and said liner, and a body of alloy weld metal disposed within said void and bonded to said flange and said liner, said body of weld metal having a greater hardness than said liner, extending substantially continuously between said top and bottom edges of said liner and forming a wear element for said flange.

4,040,363

COMBINATION HATCH COVERS

Howard J. Walk, and Dallas W. Rollins, both of St. Charles, Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 365,533, May 31, 1973, abandoned. This application June 8, 1976, Ser. No. 694,000
Int. Cl.[2] B61D *39/00*
U.S. Cl. 105—377 **31 Claims**



1. A combination hatch cover for railway car roofs comprising:

an elongated hatch cover made from a material selected from the group consisting of metallic and non-metallic material, having its longitudinal axis adapted to extend along the longitudinal axis of the railway car and adapted to close a longitudinally extending opening in the car roof;

at least one strap pivotally mounting said elongated cover for transverse movement between open and closed positions with respect to the opening in the roof;

said strap adapted to engage elongated cover latch means mounted upon said car for holding said elongated cover in closed position;

at least one opening provided in said elongated cover;

means pivotally mounting a small hatch cover on said elongated cover;

said small cover adapted to move between open and closed positions with respect to said opening in said elongated cover;

said small cover having a locking portion affixed thereto;

small cover latch means mounted upon said elongated cover comprising an overcenter locking lever including a locking handle and a locking ring and wherein said locking ring engages said locking portion adapted to hold said smaller cover in closed position;

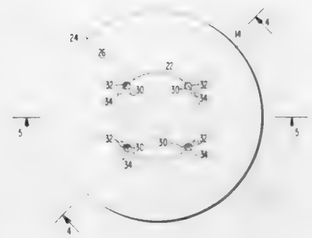
said small cover latch means being operable independently of said elongated cover latch means whereby said small cover may be opened and closed while said elongated cover is in closed position and whereby said elongated cover may be moved between open and closed positions with said small cover remaining closed during such movement.

4,040,364

TABLE APPARATUS INCLUDING A LOCKABLE, ROTATABLE TRAY

A. Perry Morgan, Jr., Constitution Hill, Princeton, N.J. 08540

Filed Mar. 29, 1976, Ser. No. 671,207
Int. Cl.[2] A47B *11/00*
U.S. Cl. 108—28 **11 Claims**



1. A table apparatus comprising:

a table top having a depression therein, said depression having a periphery including a plurality of cut-out sections located there-around;

a base support means for supporting said table top;

a rotatable tray means fitted in said depression, said rotatable tray means having a periphery including a plurality of cut-out sections there-around at least some of which line up across from corresponding cut-out sections in the periphery of said depression to form locking apertures therewith; and,

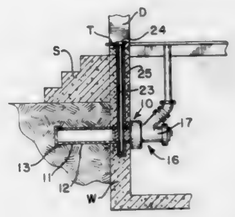
locking means fitted in said locking apertures for selectively locking said rotatable tray means relative to said table top.

4,040,365

UTILITY SYSTEM WALL SAFE

Robert F. Baxter, 2944 Lincoln St., Highland, Ind. 46322

Filed July 31, 1975, Ser. No. 600,647
Int. Cl.[2] E05G *1/04*
U.S. Cl. 109—50 **1 Claim**



1. A wall safe comprising a vault pipe section in a wall, removable closure means simulating a utility system section extending from one face of the wall, said closure means including a plug removably inserted in the vault pipe section, gasket means provided at the face of said wall for providing a seal, an eccentrically tapered locking pin disposed in and passing through said vault pipe section and said plug thereby to compress said gasket and maintain a seal at the face when said

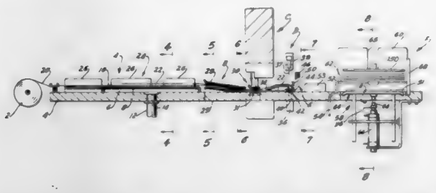
locking pin is in a locked position, said locking pin being of a length so as to be accessible for removal and insertion from and into said plug at an opening in said wall remote from said vault pipe section, said locking pin including a removable head pin for rotating said locking pin to release said gasket means out of sealing relationship with said wall.

4,040,366

AUTOMATIC HEMMING APPARATUS

Seymour Silverman, New York; Paul F. Costa, Flushing, and Charles Block, North Bellmore, all of N.Y., assignors to Silverman Machines, Inc., New York, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,561
Int. Cl.[2] D05B *33/02*
U.S. Cl. 112—121.29 **40 Claims**



1. In combination with a sewing machine having a stitching means for sewing one side of a plurality of pieces of material, each resting on a continuous band, to one side of said band as it is being moved from a supply through the stitching means, and then cutting said band into strips:

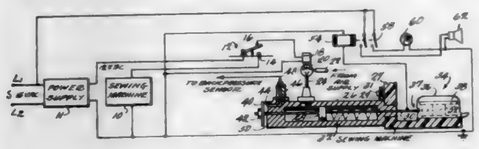
a. a support adapted to be positioned between said supply and said stitching means;
b. an elongated member adapted to support said band, said member being attached to said support and extending for at least a portion of the distance between said supply and said stitching means;
c. means for retaining said pieces of material in position on said band;
d. folder means for folding said one side of said pieces under said one side of said band, said folder means located upstream of and adjacent to the said stitching means;
e. separation means located downstream of said stitching means for vertically separating each of said pieces from said band at an unstitched portion of the pieces, respectively;
f. a cutting means located downstream of said separation means for cutting said band across its transverse axis into said strips when actuated; and
g. sensing means located between said cutting means and said separation means for sensing the passage of an end of each of said pieces which is vertically separated from said band and actuating said cutter in response thereto.

4,040,367

BOBBIN LOW DETECTOR

William B. Crawford, Greensboro, and Anthony T. Solomon, Reidsville, both of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.

Filed Sept. 3, 1975, Ser. No. 609,918
Int. Cl.[2] B65H *63/02*
U.S. Cl. 112—273 **13 Claims**



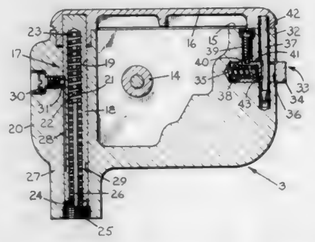
1. A bobbin thread low detector for use in a sewing machine which includes a bobbin spool having a central hub, said bobbin spool being mounted in a bobbin housing in which an opening has been provided, said detector comprising a probe slidably mounted within a probe housing, said probe housing being mounted on the sewing machine such that the probe is aligned with the opening in said bobbin housing, means for moving said probe within said probe housing into and out of said bobbin housing when said sewing machine is not operating, said moving means being mounted to said sewing machine and indicating means actuated by said probe for indicating the condition of said bobbin, said moving means includes adjusting means for adjusting the distance said probe is moved into said bobbin housing wherein said indicating means is actuated when said probe moves a predetermined distance.

4,040,368

CLOSURE COVER FOR AN OPENING PROVIDING ACCESS TO SEWING MACHINE MECHANISMS

Nerino Marforio, Via Soderini 35/A, Milan, Italy

Filed Aug. 20, 1976, Ser. No. 716,134
Claims priority, application Italy, Sept. 17, 1975, 22301/75
Int. Cl.[2] D05B *75/00*
U.S. Cl. 112—258 **5 Claims**



1. A device for selectively opening and closing the opening providing access to the thread control members for the lower hook in sewing machines of the type having cylindrical and U-shaped bases, said device comprising:

a. a closure cover **(16)** attached to the sewing machine base;
b. means **(33)** assembled in the base in operative association with such closure cover **(16)** for retaining and releasing the latter from a position of locking engagement with the opening **(15)** in the base; and
c. means **(17)** assembled in the base operatively connected to said closure cover for raising the latter to position clear of the opening in the base upon actuation of said releasing means.

4,040,369

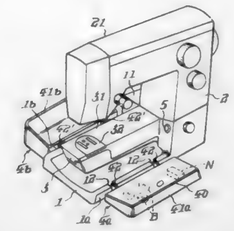
CONVERTIBLE-BED TYPE SEWING MACHINE HEAD

Yukio Kaito, Yamagata, Japan, assignor to Happy Sewing Machine Manufacturing Company, Yamagata, Japan

Filed Sept. 27, 1976, Ser. No. 726,817
Claims priority, application Japan, Nov. 17, 1975, 50-137252
Int. Cl.[2] D05B *75/00*
U.S. Cl. 112—258 **1 Claim**

1. A convertible-bed type sewing machine head comprising: a base plate; a vertical column upstanding from one end portion of said base plate; an elongate tubular bed extending substantially horizontally from a lower portion of said vertical column in overhanging relation to said base plate; a front auxiliary bed including a substantially rectangular hollow box-like body opening on one side thereof and pivotally secured to said base plate along the front edge thereof, by means of a pair of supporting legs formed on said box-like body, for swinging movement to and from an upright position in which the open side of said box-like body faces said tubular bed, said box-like body, as swung into said upright position, having a wide planar top portion formed to define a front auxiliary work-supporting table surface in substantially the same plane

as the top surface of said tubular bed, a narrow bottom portion provided with said pair of supporting legs and a pair of substantially sector-shaped opposite end walls diverging upwardly from said bottom portion to said top portion; and a rear auxiliary bed including a substantially rectangular hollow box-like body opening on one side thereof and pivotally secured to said base plate along the rear edge thereof, by means of a pair of supporting legs formed on the second-mentioned box-like body, for swing movement to and from an upright position in which the open side of the box-like body faces said tubular bed, said box-like body of said rear auxiliary bed, as



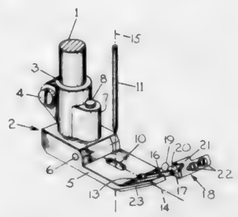
swung into said upright position, having a wide planar top portion formed to define a rear auxiliary work-supporting table surface in substantially the same plane as the top surface of said tubular bed, a narrow bottom portion provided with said pair of supporting legs, and a pair of substantially sector-shaped opposite end walls diverging upwardly from said bottom portion to said top portion: both said front and rear auxiliary beds further including a cover plate fitted to the open side of said box-like body to afford access to the interior thereof, and partitions and holding means, arranged in said box-like body to enable the latter to be used as a case for storing accessories and other articles.

4,040,370

STITCH CONTROL DEVICE FOR SEWING MACHINES

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Sept. 29, 1976, Ser. No. 727,886
Claims priority, application Italy, Oct. 2, 1975, 27872/75
Int. Cl.[2] D05B *65/00, 53/00*
U.S. Cl. 112—299 **7 Claims**



1. A chain stitch control device for straight sewing machines of the type having a sewing needle disposed in operative association with a needle aperture provided in the machine presser foot, said chain stitch control device comprising:

a. a sole **(5)** forming the lower portion of the presser foot;
b. means on one end of said sole for receiving a chain of stitches extending between the needle and a sewn workpiece;
c. means interconnecting the needle aperture and said receiving means for aligning the chain of stitches received by the latter with the axis of the sewing needle;
d. gripping means attached to said sole for temporarily holding the chain of stitches received by said receiving means; and
e. a cutting means fixed on said sole for severing the chain of stitches intermediate the gripping means a sewn workpiece to permit the sewing instrumentalities to incorporate the chain of stitches extending from the sewing needle into the seam formed in the next workpiece.

4,040,371

POLYSILOXANE COATED POLYESTER FIBERS BLENDED WITH OTHER FIBERS TO OBTAIN FIBROUS MASS HAVING MORE ACCEPTABLE FLAME RESISTANCE THAN A MASS OF UNBLENDED POLYSILOXANE COATED FIBERS

John LaMonte Cooper, West Grove, Pa., and James Alvis Newnam, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 29, 1976, Ser. No. 671,278
Int. Cl.[2] A47G *9/02, 9/08;* B32B *7/08, 27/02;* D04H *1/00*
U.S. Cl. 112—420 **9 Claims**

1. An intimate blend of staple fibers comprising by weight about 80 to 98% of polyester staple fibers having a cured polysiloxane coating and about 2 to 20% of organic staple fibers that maintain their physical integrity when exposed to the flame from a burning match.

8. A quilted composite comprising a blend according to claim **1.**

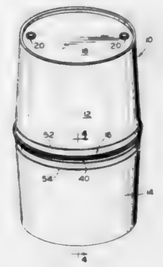
9. A fabric comprising a blend according to claim **1.**

4,040,372

METHOD FOR DETACHABLY SEALING TOGETHER THE SECTIONS OF A BARREL CONTAINER ASSEMBLY

Robert D. Flanders, Rte. 2, Box 666, No. 42, Wilsonville, Oreg. 97070

Division of Ser. No. 614,863, Sept. 19, 1975, Pat. No. 3,981,409, which is a continuation of Ser. No. 255,597, May 22, 1972, Pat. No. 3,940,008. This application Apr. 12, 1976, Ser. No. 675,940
Int. Cl.[2] B21D *51/20*
U.S. Cl. 113—120 L **3 Claims**



1. A method for detachably joining a pair of barrel half sections together to form a leak-proof barrel assembly for storing and shipment of fluids and other materials, said barrel sections having a pair of projecting flanges extending peripherally around the open ends of said barrel sections and having a respective pair of oppositely facing lips formed peripherally around the edges thereof, said method comprising:

a. inserting a resilient gasket member between said flange pair as a pair of said barrel sections are positioned with their respective open ends opposed to each other and separated by the thickness of said gasket member;
b. pressing said opposed barrel sections together to compress said interposed gasket member between said flange pair utilizing mechanical press means for applying compressive force to said barrel sections;
c. while said pressure is maintained, inserting a plurality of C-shaped clamp members over said flange pair at spaced locations around the periphery thereof, said clamp members having their respective ends bent inwardly toward each other so as to mate with a portion of said oppositely facing lips when inserted on said flanged pair,

d. releasing said pressure applied to said opposed barrel sections by said press means, whereby said gasket member expansively urges said barrel sections apart, such that said outermost extremities of said oppositely facing lips are moved to bear respectively against the mating inner surfaces of said plurality of clamp members thereby locking said flange pair against respective ends of said C-shaped clamp members.

4,040,373

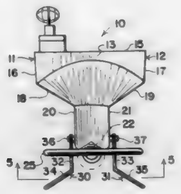
STEERING AND STABILIZATION APPARATUS FOR WATERCRAFT

Allen Jones, Jr., 5028 Lauderdale Ave., Virginia Beach, Va. 23455

Continuation-in-part of Ser. No. 579,896, May 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 566,353, April 9, 1975, Pat. No. 3,995,575, which is a continuation-in-part of Ser. No. 279,714, Aug. 10, 1972, Pat. No. 3,881,438. This application Feb. 26, 1976, Ser. No. 661,626

Int. Cl.[2] B63B *39/06*

U.S. Cl. 114—126 **13 Claims**



1. A watercraft, comprising;
a. an elongated hull;
b. a pair of elongated vane members having inner end regions near the hull and substantially planar outer end regions projecting away from the hull;
c. mounting means mounting the inner end regions on the hull for rotary movement about a common axis;
d. the substantially planar outer end regions extending in planes which obliquely intersect the common axis, to vanes being rotatably movable about the common axis to move such planes into and out of alignment with the flow-steam of water passing alongside the hull when the watercraft is moving forwardly to concurrently serve steering and heeling functions;
e. the vane members remaining substantially submerged while serving such steering and heeling functions.

4,040,374

AUTOMATIC PILOT FOR A SAILBOAT

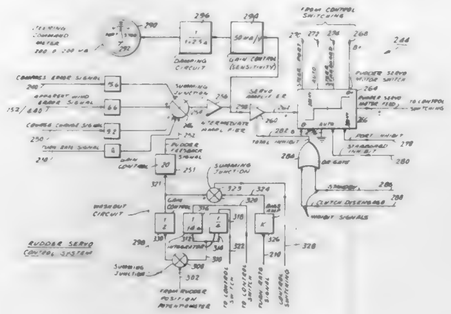
Leonard M. Greene, Chappaqua, N.Y., assignor to Safe Flight Instrument Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 452,265, March 18, 1974, abandoned, which is a continuation of Ser. No. 220,768, Jan. 26, 1972, abandoned. This application Dec. 2, 1975, Ser. No. 636,834

Int. Cl.[2] B63H *25/02;* **G05D** *1/00*

U.S. Cl. 114—144 C **6 Claims**

1. An automatic pilot for a sailboat having a rubber, a mast and sails supported from the mast, said automatic pilot comprising:
A. means to provide a first electric signal as a function of the angular position of the rudder,
B. power means to vary the angular position of the rudder,
C. means to provide a second electric signal as a function of the prevailing angle of the apparent wind relative to the fore and aft position of the sailboat,
D. means to provide a third electric signal as a function of a desired angle of apparent wind relative to the fore and aft position of the sailboat,
E. means responsive to means (C) and (D) to provide a fourth electric signal as a function of the prevailing difference between the second and third electric signals,
F. means to provide a fifth electric signal as a function of the prevailing heading of the sailboat,
G. means to provide a sixth electric signal as a function of a desired heading of the sailboat,
H. means responsive to means (F) and (G) to provide a seventh electric signal as a function of the prevailing difference between the fifth and sixth electric signals, and
I. a mode selecting means having at least four modes which are OFF, WIND, COMPASS and STANDBY, said mode selecting means being so structured that the selection of WIND mode must be made between a selection of OFF mode and of COMPASS mode and that the STANDBY mode is positioned between the OFF mode and the WIND mode, said selecting means including
i. means operable when the selecting means is in the



WIND mode for connecting the means providing the first and fourth signals to the power means in a control loop which governs the heading of the sailboat to secure and maintain the desired angle of apparent wind relative to the fore and aft position of the sailboat,
ii. means operable when the selecting means is in the COMPASS mode for connecting the means providing the first and seventh signals to the power means in a control loop which governs the heading of the sailboat to secure and maintain the sailboat in the desired heading,
iii. said selecting means in the OFF mode providing no connection between the first and fourth electric signals and the power meams and no connection between the first and seventh signals and the power means, and
iv. means operable when the selecting means is in the STANDBY mode for rendering the means generating the fifth, sixth and seventh electric signals operative.

4,040,375

BOAT STEERING SYSTEM

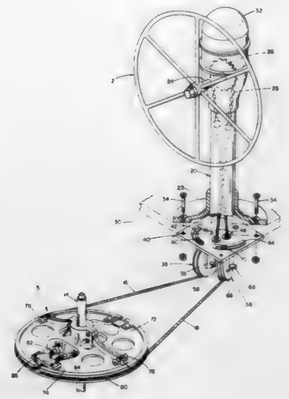
Frederick Joseph Atkins, West Roxbury, and Henry Rich Keene, Dedham, both of Mass., assignors to The Edson Corporation, New Bedford, Mass.

Continuation-in-part of Ser. No. 615,693, Sept. 22, 1975, abandoned. This application May 24, 1976, Ser. No. 689,371

Int. Cl.[2] B63H *25/10*

U.S. Cl. 114—160 **7 Claims**

1. In a boat steering system having
rudder post actuating means having portions extending radially outwardly from the axis of a rudder post
steering actuating means having portions extending radially outwardly from the axis of a steering shaft and
a pair of operating strands extending between said outwardly extending portions of said rudder post and steering actuating means
that improvement which consists of:
preassembled adjustable strand directing mechanism positioned between said rudder post actuating means and said steering actuating means for independently adjusting the direction of each of said operating strands, said mechanism comprising
an integral base plate defining a mounting plane and having a pair of spaced circular apertures of predetermined diameter for said operating strands, said apertures having spaced axes generally perpendicular to said mounting plane,
a pair of strand directing pulleys each having a peripheral strand supporting rim cooperating with one of said apertures for changing the direction of the strand passing therethrough, each said pulley being mounted for rotation in a plane perpendicular to said mounting plate plane



adjustable supporting means mounting each of said pulleys on said base plate for independent arcuate adjustment thereof in a plane parallel to said mounting plane while maintaining the rim of said pulley tangent to the axis of its cooperating base plate aperture
each said supporting means including
a link having a pulley rotatably mounted thereon, and
link mounting means permanently rotatably mounting said link on said base plate for arcuate movement about the axis of its cooperating base plate aperture and
locking means on said base plate and each said link for selectively securing each said link in arcuately adjusted position on said base plate.

4,040,376

COMPLETELY EXPENDABLE MINE ANCHOR LINE CUTTING TOOL

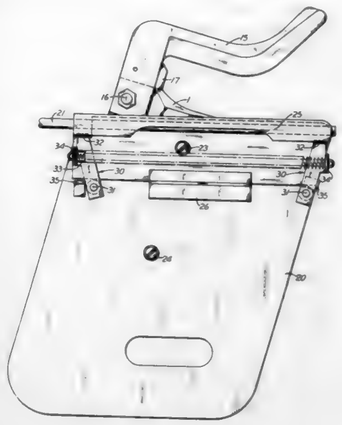
Joseph L. Giebel, Pittsburgh, Pa., assignor to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed July 6, 1976, Ser. No. 702,912

Int. Cl.[2] B63B *9/00*

U.S. Cl. 114—221 A **4 Claims**

1. A completely expendable mine anchor line cutting tool comprising a cutter body having front and rear ends, a cutter therein slidable lengthwise of said body, the body having a bore behind the cutter for receiving an explosive charge, means attached to said body for receiving and holding a mine anchor in front of said cutter, means adapted to be actuated by said line for firing an explosive charge in said bore to drive the cutter foward through the line, a stabilizing fin disposed at one side of the cutter body, a retaining member overlapping the front portion of the fin and shaped to hook over a sweep line, a shear screw extending through said retaining member and fin and into the cutter body to connect them together, and means carried by the fin for locking the retaining member on a sweep line, said screw being week enough to be sheared off by movement of said body rearwardly relative to the fin due to recoil



when the tool is fired, whereby all of said tool will separate from a sweep line supporting it.

4,040,377

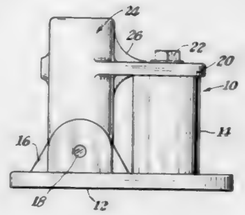
MOORING WHIP BASE

Robert H. Olsen, 106 SE. 10th St., Fort Lauderdale, Fla. 33316

Filed July 6, 1976, Ser. No. 702,468

Int. Cl.[2] B63B *21/08*

U.S. Cl. 114—230 **5 Claims**



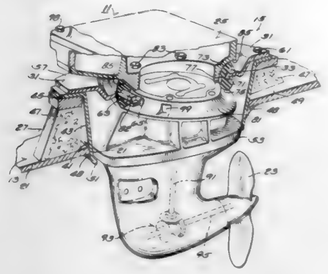
1. A mooring whip base for anchoring a mooring whip to a dock or the like comprising:
a base plate;
a housing for receiving one end of a mooring whip, said housing including a wall forming a hollow receptacle for receiving said mooring whip end;
means connected directly to said base plate and to said housing for pivoting said housing relative to said base plate said housing being pivotable about a horizontal axis entending through the housing;
a substantially planar lever arm connected to and protruding from the outside of said housing at a point intermediate the ends of the housing; and
a resilient means disposed between said lever arm and said base plate and connected to said base plate and said lever arm.

4,040,378

METHOD AND APPARATUS FOR INSTALLING A MARINE PROPULSION DEVICE

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Continuation-in-part of Ser. No. 482,468, June 24, 1974, Pat. No. 3,968,767. This application Nov. 17, 1975, Ser. No. 632,268
Int. Cl.[2] B63H *21/30*
U.S. Cl. 115—74 **13 Claims**



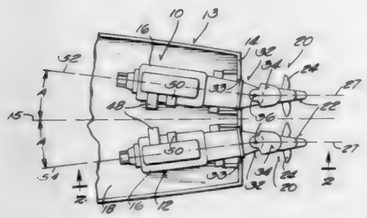
1. A boat hull including a bottom having thickness, said bottom having therein an aperture with a length through said bottom substantially equal to said thickness, a mounting collar having a sleeve portion which has a length substantially greater than the thickness of said boat hull bottom, which extends through said aperture, and which includes an upper end having a flange extending generally horizontally outwardly from said sleeve portion and in spaced relation above said boat hull bottom, means sealing said boat hull bottom to said sleeve portion of said collar, and rigidifying means extending between said boat hull bottom and said flange of said collar and comprising a circular series of angularly spaced, vertically extending members.

4,040,379

DUAL STERN DRIVE MOUNTING ARRANGEMENT

E. Douglas Betts, Gurnee, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 11, 1976, Ser. No. 685,298
Int. Cl.[2] B63H *5/08*
U.S. Cl. 115—37 **5 Claims**



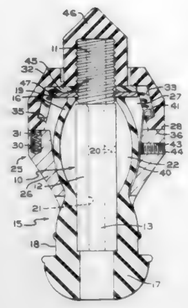
1. A boat comprising a boat hull having a centerline, and a pair of stern drive units supported by said boat hull and each including an engine, a shaft driven by said engine and having an axis of rotation extending at an angle to the boat centerline so that said axes converge in a rearward direction, a propulsion unit disposed rearwardly of said engine and including a propeller driven by said shaft, and means supporting said propulsion unit for steering movement relative to said boat hull, said propellers having rotary axis substantially parallel to each other and substantially parallel to the boat centerline when said propulsion units are in position for propelling said boat in a straight line.

4,040,380

LOW PRESSURE TIRE WARNING DEVICE

Nelson Claire Hess, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Mar. 2, 1977, Ser. No. 773,454
Int. Cl.[2] B60C *23/04*
U.S. Cl. 116—34 R **10 Claims**



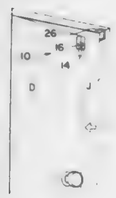
1. A low pressure tire valve assembly comprising a tire valve core unit, a cylindrical elastomeric member encompassing said valve core unit and having its lower portion secured to said valve core unit, said valve core unit having a threaded upper portion and a bore extending therethrough for communicating with a tire chamber, said cylindrical member having a lower plug portion for reception by a tire rim and to sealingly engage such a tire rim, a housing member encompassing the upper portion of said cylindrical member, an indicator cap mounted on said housing member, latching means operative to interconnect said housing member and said indicator cap, vent means interconnecting said bore and the surface areas between the outer peripheral surface of said tire valve core unit and the inner peripheral surface of said cylindrical member operative to distend said cylindrical member to position said latching means into operative position, valve cup means on said tire valve core unit retaining said cylindrical member and said housing member positioned on said valve assembly, means interconnecting said indicator cap and said valve cap means for relatively a predetermined distance, and spring means mounted on said housing member biasing said indicator cap outwardly for ejection from said housing member.

4,040,381

VISUAL BURGLAR ALARM

Gerard G. Keogh, Sr., and Gerard G. Keogh, Jr., both of 1101 Concordia Drive, Towson, Md. 21204

Filed Apr. 2, 1976, Ser. No. 672,845
Int. Cl.[2] G08B *13/08*
U.S. Cl. 116—86 **13 Claims**



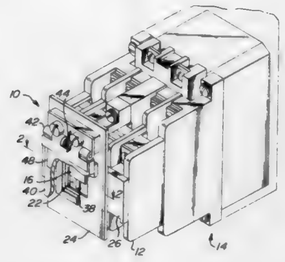
1. A burglar alarm for installation on a doorway having relative opening and closing motion between first and second parts of the doorway, comprising: a housing for upright installation of a first part of a doorway, a magnet, said housing having a bore therein, means intermediate said housing for retaining the magnet within the housing, said means intermediate of the housing forming a constriction of said bore within said housing, means for lifting the magnet comprising a shank affixed to the magnet; means locatable on said second part of a doorway for causing the magnet when lifted to adhere magnetically adjacent said second part of a doorway, to fall within the housing on said relative opening motion between first and second parts of a doorway and to remain in the fallen position upon doorway reclosure; and means for affording visual indication of the position of the magnet with respect to the housing.

4,040,382

INDICATOR FOR RELAY OR THE LIKE

Howard H. Sheppard, 7430 Sprague St., Philadelphia, Pa. 19119

Filed June 11, 1976, Ser. No. 695,286
Int. Cl.[2] G08B *5/34*
U.S. Cl. 116—124 L **18 Claims**



1. An electrical device such as a relay or the like having means for indicating a condition of the contacts therein, comprising:

a contact operator element movable inwardly with respect to a casing or housing or an electrical device when the electrical device is operated;

guide means for slideably mounting an indicating element, said indicating element being movable between a first and a second position within said guide means; and

means operable by said contact operator element for holding said indicating element in said first position, said holding means including mechanical stop means, movement of said contact operator element inwardly with respect to the electrical device casing causing disengagement of the indicating element by said holding means whereby said indicating element may move from said first position to said second position indicating operation of said electrical device.

4,040,383

FUSER ROLL LUBRICATOR-CLEANER

John D. Vandervort, Cottage Grove, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

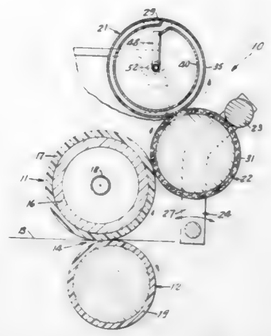
Filed Mar. 4, 1976, Ser. No. 663,682
Int. Cl.[2] B05C *11/00*
U.S. Cl. 118—60 **10 Claims**

1. A rotatable roll for dispensing liquid, comprising:

a first cylinder having an interior surface circumscribing a longitudinal axis of rotation and apertures therein defining an array substantially parallel to the axis of rotation;

a second cylinder mounted within said first cylinder and having outer and inner surfaces, the outer surface defining a narrow annular cavity with said interior surface, and the inner surface defining a reservoir for liquid and defining an air space above said reservoir; and

said second cylinder having a longitudinal opening defined in a preferred direction of rotation by extending, generally radially-directed flanges at leading and trailing longitudinal edges, said flange on the leading edge of the array extending inward for directing liquid from said reservoir into the cavity during rotation of the roll, said flange on the trailing edge of the opening extending outward and enclosing the cavity behind the apertures to define a second reservoir communicating with the apertures; and



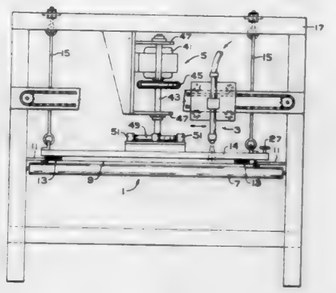
vent means communicating with said air space for venting air therefrom to equalize pressure within the roll with the ambient external pressure.

4,040,384

APPARATUS FOR SCRUBBING STAIN INTO SHEET OR BOARD MATERIAL

Elmer A. Lattner, Kirkwood, Mo., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 19, 1976, Ser. No. 659,391
Int. Cl.[2] B05C *11/02*
U.S. Cl. 118—120 **10 Claims**



1. An apparatus for scrubbing a stain into sheet and board material being conveyed through said apparatus, comprising:

A. a frame adapted to be positioned over a conveyor which conveys sheet or board material through said apparatus;

B. a structural member connected to said frame; the structural member having mounted thereto at least one strip brush arranged to contact the top surface of the material being conveyed through the apparatus, said strip brush extending substantially across the width of the material being conveyed;

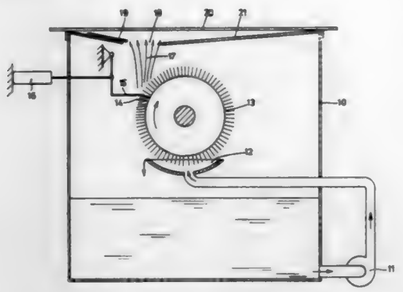
C. means mounted on said frame member and connected to said structural member for oscillating said structural member and said strip brush mounted thereon at varying frequency with various length strokes to scrub the stain into the surface of said sheet or board material.

4,040,385

APPARATUS FOR DEPOSITING FLUX-FLUID ONTO CONDUCTOR PLATES

Heinrich Tost, Nurnberg, Germany, assignor to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Fuerth, Germany

Filed Dec. 8, 1976, Ser. No. 748,641
Claims priority, application Germany, May 3, 1976, 7613874
Int. Cl.² B05B *1/28, 3/08*
U.S. Cl. 118—326 **7 Claims**



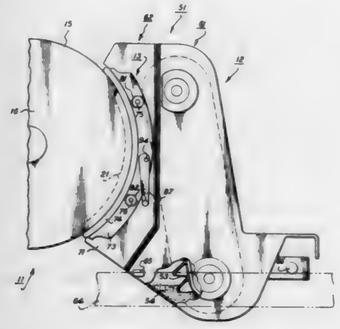
1. An apparatus for depositing flux-fluid onto a conductor plate including in combination: a housing containing a source of said flux-fluid; an open receptacle bath disposed within said housing and above said source; a horizontally disposed rotary brush having flexible bristles in functional association with said receptacle; conduit means including a pump device communicating said source and receptacle whereby said receptacle is charged and excess flux-fluid overflows the receptacle and is returned to the source; an adjustable stripping bar disposed in the path of said brush bristles; said housing including a cover member having an adjustable despensing slot in operative association with said brush and stripper bar; and said cover being inclined downwardly towards said slot; a guidance path for said conductor plate above said housing and in operative association with said slot; whereby upon rotation of said brush, the bristles are flexed and sprung by said stripper bar to effect a spray of said flux-fluid through said slot and onto said conductor plate and whereby flux-fluid spray intercepted by said cover is generally directed towards said slot.

4,040,386

RETRACTABLE EDGE SEALS FOR ELECTROSTATOGRAPHIC DEVELOPMENT SYSTEMS

Richard E. Smith, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 1, 1975, Ser. No. 573,636
Int. Cl.² G03G *15/08*
U.S. Cl. 118—653 **9 Claims**



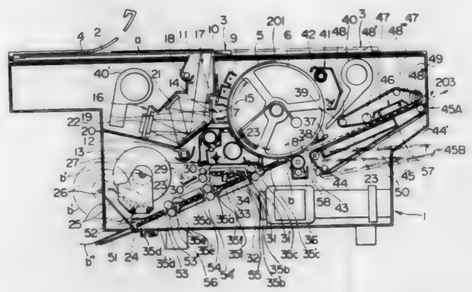
1. In a development system for developing latent electrostatic images carried by an imaging surface of an electrostatographic processor as said imaging surface moves through a development zone; said development system including a housing having a sump for storing a supply of developer, and means within said housing for circulating developer along a path running from said sump, through said development zone, and then back into said sump; the improvement comprising at least one retractable sealing means mounted on said housing for movement toward and away from said imaging surface independently of said housing; said sealing means being aligned with one edge of said development zone to selectively seal and unseal said development zone along said edge while said housing is maintained in a predetermined position, said sealing means comprising a support plate mounted on said housing for movement toward and away from said imaging surface, a resilient member secured to said support plate in facing relationship with said imaging surface and in alignment with said one edge of said development zone, and a manually controlled drive mechanism coupled to said support plate to enable an operator to selectively engage and disengage said resilient member with and from, respectively, said imaging surface, said drive mechanism including a shaft journalled for rotation in said housing, an eccentric mounted for rotation with said shaft, and a crank coupled to said shaft for rotating said eccentric; said eccentric extending through a slot in said support plate, whereby said support plate is cammed toward and away from said imaging surface in response to the rotation of said eccentric.

4,040,387

ELECTROSTATIC PHOTOGRAPHIC COPYING APPARATUS

Takaji Washio, Toyonaka; Koichi Sasaki, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Co. Ltd., Osaka, Japan

Division of Ser. No. 399,516, Sept. 21, 1973, Pat. No. 3,923,391.
This application Apr. 22, 1975, Ser. No. 570,428
Claims priority, application Japan, Sept. 24, 1972, 47-95460
Int. Cl.² G03G *15/09*
U.S. Cl. 118—658 **4 Claims**



1. An electrostatic latent image developing device comprising:

a developing chamber containing a magnetic developer;

a rotating magnetic brush means comprising a nonmagnetic, hollow, cylindrical, rotating sleeve provided within said developing chamber and a magnetic field forming stationary member disposed within said sleeve, said magnetic field forming stationary member having a magnet and a magnetic field shielding member made of a non-magnetized magnetic material, said magnet being disposed so that it forms a magnetic field sufficient for attracting and retaining a developer in an area extending in the rotating direction of the sleeve between a developer pumping position and a developing position, said magnetic field-shielding member being disposed so that it weakens the magnetic field to an extent, wherein the field is incapable of retaining the developer on the surface of the sleeve in at least part of an area extending in the rotating direction of said sleeve between the developing position and the developer pumping position, whereby said rotating magnetic brush means repeats a cycle of pumping the developer up onto the surface of said sleeve in the developer pumping position, transporting it to the developing position, developing an electrostatic latent image forming surface and then removing an excess of the developer from the surface of said sleeve with the rotation of the sleeve;

a toner supply chamber communicating with said developing chamber through a toner supply opening formed at the bottom of the chamber;

a toner supply means for supplying a toner powder from said toner supply chamber to said developing chamber;

said toner supply means including a toner supply roller having a plurality of grooves and cantilevered flexible members, said toner supply roller being disposed rotatably at the toner supply opening so that its top surface is situated in said toner supply chamber and its bottom surface in said developing chamber, said flexible members having free edges and being positioned at the toner supply opening so that free edges make elastic contact with the surface of said toner supply roller situated within the developing chamber, said toner supply roller and said flexible members cooperating to close the toner supply opening substantially and feeding the toner powder contained in the toner supply chamber to said developing chamber by rotation of the toner supply roller; and

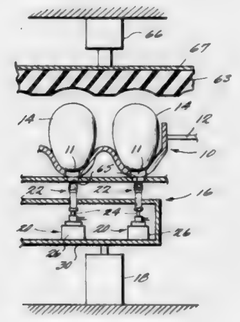
a toner supply cartridge capable of being rotatably mounted in said toner supply chamber, said cartridge comprising an elongated hollow receptacle having an enclosing side wall and end faces, said receptacle containing a supply of toner powder inside, said hollow receptacle having an opening extending in the side wall and sealed by an openable sealing member, said opening being of such a shape and size that when it is opened and positioned to face downwardly, the toner powder contained therein is uniformly discharged generally along the entire length of the hollow receptacle, and at least one of the end faces of said hollow receptacle being made of a transparent or semi-transparent material and having a mark indicating the position of said opening.

4,040,388

METHOD AND APPARATUS FOR AUTOMATIC EGG INJECTION

Gary E. Miller, Salt Lake City, Utah, assignor to Agrimatic Corporation, Cerritos, Calif.

Filed Feb. 27, 1976, Ser. No. 662,257
Int. Cl.² A01K *45/00*
U.S. Cl. 119—1 **12 Claims**



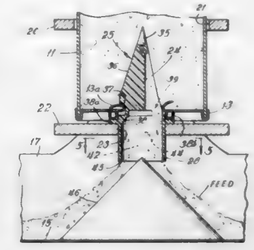
1. A method of injecting a fluid into an egg comprising: heat-sterilizing the exterior surface of a portion of the shell of the egg; driving a hollow needle having a squared-off end through the sterilized shell portion thereby forming a hole in the shell; injecting fluid through the needle into the egg; withdrawing the needle from the hole; sealing the hole by heat-coagulating a small portion of the egg albumin at the location of the hole; and heat-sterilizing the needle.

4,040,389

ANIMAL FEEDING DEVICE

James H. Walters, 1219 Carriage Place, Kalamazoo, Mich. 49008

Filed Sept. 12, 1975, Ser. No. 612,763
Int. Cl.² A01K *5/00*
U.S. Cl. 119—52 R **8 Claims**



1. An animal feeding device for non-liquid feed comprising tray means adapted to receive food and to make it accessible to an animal, container holding means spaced from said tray means, container perforating means having an upwardly projecting perforating portion tapering upwardly to a perforating point and a downwardly projecting discharge portion, said container perforating means being located in the center bottom portion of the container holding means and said perforating portion having channel means communicating from adjacent said perforating point essentially vertically downward to said discharge portion, whereby when a container having a bottom perforatable wall is inserted into said container holding means with the perforatable wall apposed to said perforating means and pushed down, the perforating means will perforate the perforatable wall and bring the channel means into said container, said channel means communicating directly with the portion of the container immediately adjacent said perforatable wall so that food from the bottom of said container can gravitate through said channel means into said discharge portion and out into said tray, and in which disposed beneath the discharge portion is a feed distributing means adapted to cause the food to move toward an accessible portion of the tray means.

4,040,390

ANIMAL GROOMING TOOL

James E. Rosenbaum, Box 400, Keller, Tex. 76248

Filed Jan. 12, 1976, Ser. No. 648,245
Int. Cl.² A01K *13/00*
U.S. Cl. 119—86 **9 Claims**

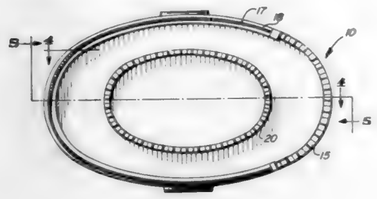
1. A multi-purpose grooming and shedding tool for animals including in combination:

a body member made of plastic material and having a support surface and a curved depending portion extending downwardly around the periphery of the support surface, said portion having first and second parts located thereon;

grooming teeth integrally formed with said body member of a first predetermined size on said first part of the curved depending portion of said body member;

a curved shedding blade comprising a hacksaw blade having teeth of a second smaller predetermined size on said second part of the curved depending portion of said member; and

an additional set of depending teeth attached to a further curved depending portion of said body member and space



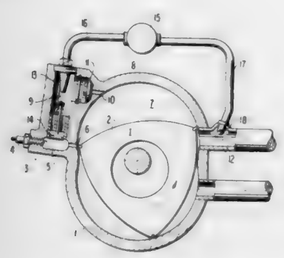
inwardly from the periphery thereof a predetermined distance.

4,040,391

ROTARY PISTON INTERNAL COMBUSTION ENGINE OF TROCHOIDAL CONSTRUCTION

Karl Zeilinger, Bergien-Hosslinswart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Oct. 22, 1975, Ser. No. 624,943
Claims priority, application Germany, Nov. 8, 1974, 2453047
Int. Cl.² F02B *53/10*
U.S. Cl. 123—8.09 **10 Claims**



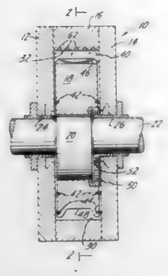
1. A rotary piston internal combustion engine which includes a casing means and a piston means rotating in the casing means, working space means formed by said casing means and said piston means, inlet and exhaust channel means for the working space means, means for supplying a quantity of fuel into the inlet channel means so as to form a lean fuel-air mixture therein, an ignition chamber means in communication with a working space means and including a spark plug and an inlet for a fuel-air mixture, and overflow channel means in communication with a working space means, characterized in that an intermediate chamber means is interposed between the overflow channel means and the ignition chamber means with the inlet for the fuel-air mixture communicating the intermediate chamber means with the ignition chamber means, an injection nozzle means communicating with the fuel supplying means is arranged in the intermediate chamber means for injecting a quantity of fuel into the intermediate chamber means so as to enrich the lean fuel-air mixture sucked-in out of the inlet channel means and conducted to the intermediate chamber means by the overflow channel means, and in that valve means for the control of the gas interchange between the intermediate chamber means and the ignition chamber means and between the intermediate chamber means and the overflow channel means are respectively arranged in the inlet for the fuel-air mixture and in the overflow channel means.

4,040,392

ROTARY ENGINE MODIFIED FOR LOW EMISSIONS

George H. Woodier, Ringwood, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed June 11, 1976, Ser. No. 695,046
Int. Cl.² F02B *53/00*
U.S. Cl. 123—8.45 **3 Claims**



1. A rotary combustion engine comprising:

a. an outer body having a peripheral wall and a pair of side walls defining an internal cavity and having an axis transverse to said side walls, the inner surface of said peripheral wall having a multi-lobe profile in which the lobes are joined by regions disposed relatively near to said axis;

b. an inner body of generally polygonal profile mounted for relative rotation within said outer body cavity, the apex portions of said inner body having sealing cooperation with said multi-lobe peripheral surface to define a plurality of working chambers which vary in volume in response to said relative rotation;

c. said outer body also having an intake port and an exhaust port for communication with said working chambers and disposed adjacent to and on opposite sides of one of said near-axis regions; and

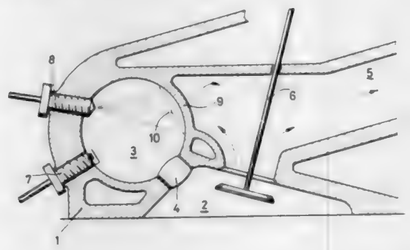
d. said outer body having a plurality of side-by-side circumferentially-extending grooves in its multi-lobe peripheral surface adjacent to a near-axis region at which combustion takes place, said grooves being positioned so that an apex portion of the inner body does not reach said grooves until the working chamber on it trailing side has closed to said intake port.

4,040,393

IGNITED INTERNAL COMBUSTION ENGINE OPERATED WITH CHARGE STRATIFICATION

Gerd Decker, Vorsfelde; Dieter Steinke, and Kurt Reichel, both of Wolfsburg, all of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Germany

Filed Feb. 28, 1975, Ser. No. 554,085
Claims priority, application Germany, Mar. 8, 1974, 2411080
Int. Cl.² F02M *31/00*
U.S. Cl. 123—30 A **5 Claims**



1. In a spark ignited internal combustion engine operated with charge stratification and including a cylinder head having a main combustion chamber, an auxiliary combustion chamber connected to the main combustion chamber through a connecting passage, fuel delivery means for supplying fuel to the auxiliary combustion chamber, ignition means for igniting a fuel-air mixture in the auxiliary combustion chamber, and an intake and an exhaust conduit communicating with the main combustion chamber; the improvement wherein:

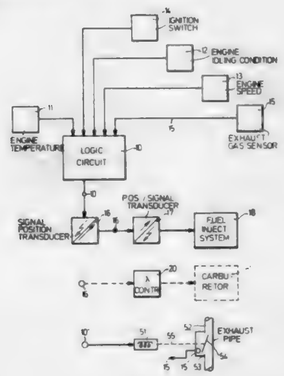
the auxiliary combustion chamber has at least one wall portion in heat exchange relationship with hot exhaust gases flowing through the exhaust conduit from the main combustion chamber of the internal combustion engine, the auxiliary combustion chamber being positioned in the immediate vicinity of the exhaust conduit in such a manner that the wall portion of the auxiliary combustion chamber in heat exchange relationship with hot exhaust gases flowing through the exhaust conduit from the main combustion chamber projects into the exhaust conduit, whereby hot exhaust gases flowing through the exhaust conduit flow externally around the wall portion of the auxiliary combustion chamber to heat the auxiliary combustion chamber and maintain the auxiliary combustion chamber at an elevated temperature so that fuel components of a fuel-air mixture in the auxiliary combustion chamber are rapidly evaporated.

4,040,394

APPARATUS REPETITIVELY CONTROLLING THE COMPOSITION OF EXHAUST EMISSIONS FROM INTERNAL COMBUSTION ENGINES, IN PREDETERMINED INTERVALS

Josef Wahl, Stuttgart; Peter Jurgen Schmidt, Schwieberdingen, and Richard Zechnall, Stuttgart, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Division of Ser. No. 396,477, Sept. 12, 1973, Pat. No. 3,919,983.
This application July 21, 1975, Ser. No. 597,561
Claims priority, application Germany, Sept. 14, 1972, 2245029
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **17 Claims**



1. Apparatus to control the composition of exhaust gases from an internal combustion engine subject to operating parameters including engine temperature, engine power, engine speed, and ignition switch operation,

said apparatus having an exhaust gas sensor **(15)**, a fuel-air mixture and balance means **(17, 18, 19, 20)** adjusting the relative proportion of fuel and air supplied to the engine; and means **(11, 12, 13, 14)** sensing at least one of said operating parameters;

said apparatus comprising

a first timing circuit **(23)** generating and operating time signal having a limited duration with respect to the operating time of the engine after starting of the engine and subsequent to the engine having been stopped;

a first logic circuit **(22)** connected to at least one of said operating parameters and having its output connected to and controlling said first timing circuit **(23)** to start a timing interval of said limited time duration upon energization by said logic circuit **(22)**;

a second timing circuit **(22, 40)**;

a second logic circuit **(29)** connecting the output of said first timing circuit **(23)** to the second timing circuit **(32, 40)**;

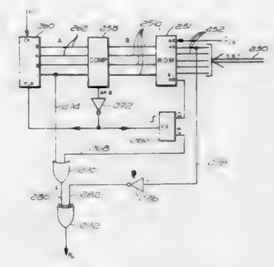
and gating means **(33)** enabled by the output of said second timing circuit connecting the output signal from the exhaust sensor **(15)** to said balance means **(17, 18, 19, 20)**.

4,040,395

ENGINE SELECTIVELY UTILIZING HYBRID THERMODYNAMIC COMBUSTION CYCLES

Mihai C. Demetrescu, 17761 Palmento Way, Irvine, Calif. 92715

Division of Ser. No. 413,070, Nov. 5, 1973, Pat. No. 3,996,915.
This application Mar. 21, 1975, Ser. No. 560,672
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 EA **6 Claims**



1. A method of operating a multiple cylinder, internal-combustion engine, comprising the steps of:

storing a plurality of output-torque code words;

providing a signal to indicate a desired level of output torque for said engine;

selecting at least a pair of said code words under control of said signal indicative of desired output torque;

developing at least said select pair of said code words to obtain specific combustion patterns for said engine, representative of actuation patterns to selectively burn fuel in the cylinders of said engine to provide different levels of output torque;

generating a series of actuating pulses coinciding to said combustion patterns; and

applying said actuating pulses to said engine to selectively actuate combustion events in each of said cylinders.

4,040,396

FUEL INJECTION VALVE FOR INTERNAL COMBUSTION ENGINE

Hitoshi Tomita, Saitama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1975, Ser. No. 563,002
Claims priority, application Japan, Mar. 29, 1974, 49-35081[U]
Int. Cl.² F02B *3/00;* **F02M** *39/00*
U.S. Cl. 123—32 JV **3 Claims**

1. In a fuel injection valve for an internal combustion engine including a valve body having a central bore sealably and slidably mounting a needle valve and formed with an oil pool adjacent a circular valve seat which is closed off by the tip end of the needle valve, the improvement comprising:

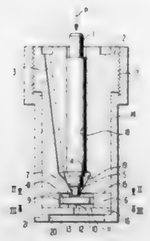
a planar passage member fixedly abutting and underlying the discharge end of the valve body, and

a planar nozzle member fixedly abutting and underlying said passage member and having a small diameter nozzle opening concentric with the valve seat and needle valve,

said planar passage member including on its upstream face, facing said valve body, a first central recess extending

radially beyond said circular valve seat and acting as a direct axial extension of the valve body central bore and including an axial end face for deflecting flow radially outwardly, and said planar passage member including circumferentially spaced through holes extending through said passage member parallel to its axis at positions radially outwards of said circular valve seat and being in fluid communication with said upstream face first central recess of said passage member,

and at least one of said planar members including a second central recess open to the downstream face of said passage member and overlying said nozzle opening and in fluid communication with said through holes by fluid passages extending tangentially from said second central recess to said through holes,



and wherein a plurality of radial passages corresponding to said tangential fluid passages and said through holes are provided within the upstream face of said planar passage member and extend radially outward from the first central recess therein to respective through holes, and said tangential passages lead from said through holes within said downstream face of said passage member to said second central recess whose diameter is in excess of the diameter of said opening within said nozzle member;

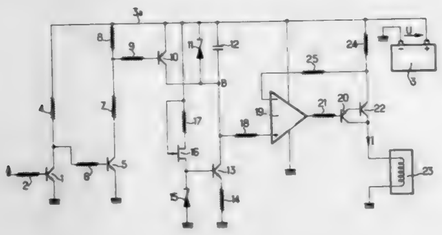
whereby, fuel entering said second central recess by way of said tangential fluid passage is subjected to a gyrating flow prior to immediate discharge through the central nozzle opening with improved atomization thereof.

4,040,397

CONTROL OF ELECTROMAGNETIC FUEL INJECTORS IN INTERNAL COMBUSTION ENGINES

Claude Leichle, Le Pecq, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Sept. 5, 1975, Ser. No. 610,775
Claims priority, application France, Sept. 9, 1974, 74.30510
Int. Cl.² F02B *3/00*
U.S. Cl. 123—32 AE **11 Claims**



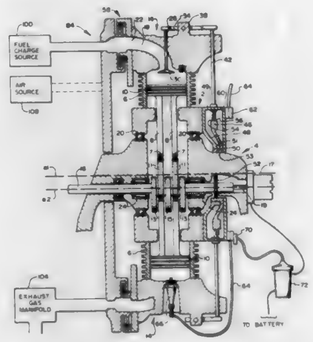
1. A control device for controlling the initiation operation of an electromagnetic fuel injector in an internal combustion engine having a storage battery, said fuel injector having a coil, comprising: voltage comparator means, first and second input terminals on said voltage comparator means, a resistor connected to said first input terminal, means for series connecting said resistor to said coil of said fuel injector, a capacitor connected to said second input terminal, electric current generator means for generating a constant electric current, means connecting said electric current generator means to said capacitor for causing said constant electric current to charge said capacitor, and limiting means connected to said capacitor for limiting the maximum charge of said capacitor to a predetermined fixed value, whereby the build-up time for said fuel injector coil is retained constant, regardless of changes in voltage supplied by said storage battery.

4,040,398

FOUR-CYCLE ROTARY ENGINE AND METHOD OF OPERATION THEREFOR

Roger Evan Billings, and Franklin Earl Lynch, both of Provo, Utah, assignors to Engine Research, Provo, Utah

Filed Dec. 8, 1975, Ser. No. 638,665
Int. Cl.² F02B *57/08*
U.S. Cl. 123—44 R **7 Claims**



1. A four-cycle rotary engine comprising

a cylinder unit rotatable about a first axis and having six cylinders radially arranged about the axis,

a piston system rotatable about a second axis which is offset from said first axis, said piston system including six pistons each disposed to reciprocate in a different one of the cylinders,

means for introducing fuel charges successively into alternate pairs of adjacent cylinders and for exhausting combustion products therefrom, and

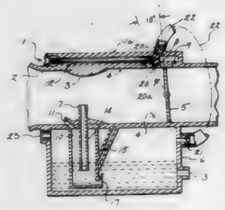
ignition means for successively firing fuel charges in alternate pairs of adjacent cylinders.

4,040,399

BACK DRAFT CARBURETOR FOR TWO CYCLE ENGINES

James R. Meininger, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed June 11, 1975, Ser. No. 585,864
Int. Cl.² F02M *5/08*
U.S. Cl. 123—65 R **14 Claims**



1. In a carburetor for a two stroke engine including a body,

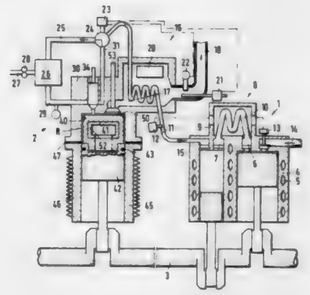
float bowl fuel chamber, a main fuel supply system including a main fuel nozzle and an idle fuel supply system including an idle fuel jet, each system communicating with a bottom portion of said float bowl, an air intake, a venturi, a throat section downstream of said venturi, and a throttle plate-type valve rotationally mounted in the throat; a back draft fuel economizing means comprising; means opening into the carburetor throat and responsive to the proximity of the throttle valve for creating a vacuum source, passage means for connecting said means for creating a vacuum with the air space above the fuel in said float bowl, and means for venting one of said passage means and float bowl to the atmosphere to limit the effect of said vacuum upon said float chamber, said means for creating a vacuum source comprising an orifice positioned substantially upstream of the throttle valve plate when said valve plate is positioned for idle and opening into the carburetor throat at a preselected point directly opposite a peripheral edge of the throttle valve plate when said throttle valve is sufficiently open to inactivate said idle fuel supply system and render the main fuel supply system fully operative and is further positioned to provide a selected minimum cruising RPM of the engine, said orifice and valve plate utilizing the venturi effect therebetween to create said vacuum.

4,040,400

INTERNAL COMBUSTION PROCESS AND ENGINE

Karl Kiener, 7081 Goldshofe, Ostalbkreis, Germany

Filed Sept. 2, 1975, Ser. No. 609,726
Int. Cl.² F22B *11/00*
U.S. Cl. 123—68 **25 Claims**



1. An internal combustion process wherein combustion-supporting air is compressed outisde of a working cylinder-piston and compressed air and a gaseous fuel are supplied separately in predetermined quantities to a burner nozzle and mixed therein and ignited and burnt without increasing the pressure in the cylinder-piston and wherein the energy of the combustion gases which expand without cooling is transmitted to the working piston and the exhaust gases are removed from the working cylinder, characterized in that the combustion-supporting air is compressed substantially isothermally then heated by the hot exhaust gases with some of the compressed hot air being diverted to preheat and carburet and compress the fuel with the remainder of the combustion-supporting air and the combustible gas evolved being burnt substantially stoichiometrically by self-ignition.

4,040,401

SPARK VACUUM ADVANCE CONTROL

Frederick J. Marsee, Clawson, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Nov. 5, 1974, Ser. No. 521,035
Int. Cl.² F02P *5/04*; F02M *25/06*
U.S. Cl. 123—117 A **14 Claims**

1. In an ignition spark advance system for use with spark ignited internal combustion engines comprising in combination

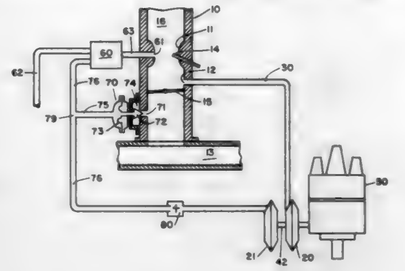
a. an ignition distributor having a spark advance mechanism operated by a first vacuum actuated spark advance means,

b. a carburetor having a spark advance port,

c. a vacuum line operably connecting said spark advance port with said first spark advance means,

d. a vacuum actuated exhaust gas recycle valve, and

e. an EGR vacuum amplifier having a vacuum line operatively connected to and adapted to modulate said exhaust



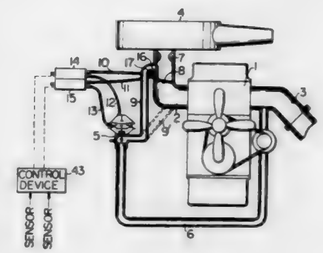
gas recycle valve in response to operating conditions of said engine, the improvement comprising a second vacuum actuated spark advance means, said second spark advance means being operatively connected to said EGR vacuum amplifier by said vacuum line and actuated by a vacuum signal from said EGR vacuum amplifier, said first and said second spark advance means cooperating in advancing the timing of said ignition spark advance system when said exhaust gas recycle valve is open.

4,040,402

EXHAUST GAS RE-CIRCULATION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira; Kiyoshi Kobashi, and Masaaki Tanaka, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 13, 1976, Ser. No. 658,109
Claims priority, application Japan, Oct. 11, 1975, 50-121799
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **9 Claims**



1. An exhaust gas re-circulation system for an internal combustion engine, comprising

an exhaust gas re-circulation pipeline extending between intake and exhaust systems of the internal combustion engine for re-introducing a part of the exhaust gas from the exhaust system into the intake system,

a single flow-control valve for regulating the flow of the re-introduced exhaust gas, which valve comprises: an orifice element arranged in a portion of the exhaust gas re-circulation pipeline to provide said portion with an orifice through which the exhaust gas flows from said exhaust system toward said intake system; a valve element movably placed over the orifice and having an axially extended valve stem; a first displaceable diaphragm mem-

ber connected to the valve stem for actuating movement of the valve element away from said orifice; a second displaceable diaphragm member axially spaced apart from the first diaphragm member and having means for limiting the movement of said valve element; a first closed pressure-control chamber defined between the first and second diaphragm members; a second closed pressure-control chamber arranged adjacent to, but separated from said first closed pressure-control chamber by said second diaphragm member, and; an atmospheric pressure chamber arranged adjacent to, but separated from said first closed pressure-control chamber by said first diaphragm member, and means for generating in first said first and then in said second pressure-control chambers, individual vacuum pressures changing in response to change in the opening position of a throttle valve of the intake system from the closed position thereof, said vacuum pressure generating means comprising a first vacuum pressure line extending from said first pressure-control chamber of the flow-control valve to a first vacuum port provided in said intake system, and a second vacuum pressure line extending from said second-pressure control chamber of the flow-control valve to a second vacuum port provided in said intake system, said first and second vacuum ports being located such that when said throttle valve is opened gradually from the closed position thereof, an edge of said throttle valve moves past said first and second vacuum ports in sequence, said separate vacuum pressures of said first and second pressure-control chambers causing sequential displacements of said first and second diaphragm members thereby moving said valve element away from said orifice in a two step-like manner.

4,040,403

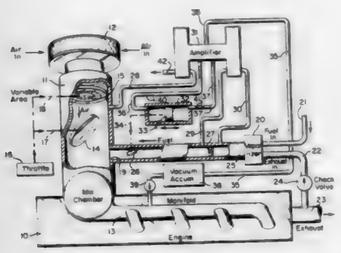
AIR-FUEL MIXTURE CONTROL SYSTEM

William Lester Rose, 2114 Rhonda Street, and Herbert Joe Johnson, 1250 Bluebell Street, both of Oxnard, Calif. 93030

Continuation-in-part of Ser. No. 444,361, Feb. 21, 1974, Pat. No. 3,931,801. This application Nov. 24, 1975, Ser. No. 634,625

Int. Cl.² F02M *17/18, 17/22*

U.S. Cl. 123—133 **12 Claims**



1. A method of vaporizing fuel and maintaining a desired ratio of air to fuel mixture in an internal combustion engine including the steps of:

a. holding the temperature of a liquid fuel and a diluent gas substantially constant prior to mixing:

b. mixing said diluent gas with said liquid fuel such that an excess of fuel is provided to super saturate the gas with fuel;

c. separating out fuel droplets from the super saturated gas by passing the mixture of diluent gas and liquid fuel through a change of momentum separator to provide gas saturated with vaporized fuel resulting in fuel vapor at the dew point;

d. passing the fuel vapor at dew point along a direction to mix with incoming air;

e. generating an air signal constituting a function of the air flow per unit time;

f. generating a fuel signal constituting a function of the fuel flow per unit time while in the vaporized state; and

g. controlling the fuel flow per unit time along said direction in accordance with a given relationship between the generated signals to thereby maintain a desired ratio of air-to-fuel mixture in said internal combustion engine.

4,040,404

FUEL TANK PRESSURE-VACUUM RELIEF VALVE

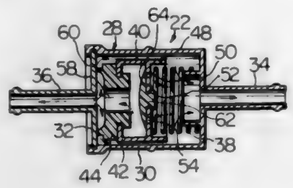
Katsuhiro Tagawa, Fussa, Japan, assignor to Nisson Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 442,336, Feb. 14, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,153

Claims priority, application Japan, Feb. 17, 1973, 48-20950

Int. Cl.² F02M *59/00*

U.S. Cl. 123—136 **3 Claims**



1. A pressure relief valve for a fuel tank of a motor vehicle equipped with an evaporative emission control system, said valve comprising:

a cylindrical hollow casing having end portions said end portions being closed and having an inlet and outlet at said both end portions, respectively, said inlet communicating with the fuel tank and said outlet communicating with the atmosphere;

a cylindrical movable valve element coaxially disposed within said cylindrical hollow casing and being in spaced relationship thereto and also in space relationship with said both end portions, said cylindrical movable valve element including a cylindrical wall portion and an annular partition wall portion which is integral with the inner surface of the cylindrical wall portion adjacent one end of said cylindrical movable valve element, the one end being adjacent to one hollow casing end portion having the outlet, the annular partition wall portion having at least one radially outward hole therethrough;

a compression spring interposed between the inner surface of the one hollow casing end portion having the outlet and the annular partition wall portion of said cylindrical movable valve element to bias said cylindrical movable valve element in the direction of another hollow casing end portion having the inlet;

an annular resilient valve member mounted at its central portion on the annular partition wall portion of said cylindrical movable valve element, said annular resilient valve member having at its peripheral portion a flexible flap portion which is located opposite said compression spring with respect to the annular partition wall portion, the flexible flap portion normally urgingly closing the hole of the annular partition wall portion and opening the hole to introduce atmospheric air therethrough from the outlet of said cylindrical hollow casing to the inlet of said cylindrical hollow casing when fuel vapor pressure in the fuel tank drops bellow zero gage pressure; and

a cylindrical resilient valve member securely mounted on the another end of said cylindrical movable valve element adjacent to the inlet of said cylindrical hollow casing, said cylindrical resilient valve member being formed with a central bore therethrough and an annular lip portion which is normally urged by said compression spring into sealingly contact with the inner surface of the another hollow casing end portion having the inlet, said cylindrical resilient movable valve member being moved to a position which unseats the lip portion from the inner surface so as to introduce fuel vapor from the fuel tank through the inlet of said cylindrical hollow casing and around said cylindrical movable valve element to the outlet of said cylindrical hollow casing when the fuel vapor pressure in the fuel tank exceeds a predetermined value.

4,040,405

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

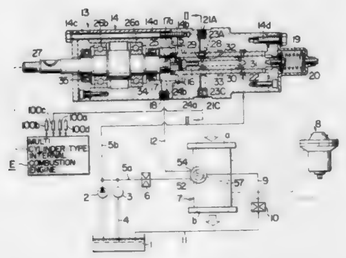
Eizi Tanaka, Anjo; Hiroshi Mochizuki; Tooru Kosuda, both of Okazaki; Seikou Abe, Nishio, and Michihiro Ohashi, Handa, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed June 8, 1976, Ser. No. 693,951

Claims priority, application Japan, June 10, 1975, 50-70292; July 4, 1975, 50-83049

Int. Cl.² F02M *69/00*

U.S. Cl. 123—139 BG **10 Claims**



1. A fuel injection system for a multi-cylinder type internal combustion engine comprising:

a. fuel delivery means for regulating the pressure of fuel at a predetermined level and delivering fuel as a first and a second flows;

b. fuel pressure control means for changing the pressure of the first fuel flow delivered from said fuel delivery means in response to the quantity of intake air inducted into the engine, said fuel pressure control means comprising

i. a housing having an intake air passage adapted to be connected to an intake pipe of the engine,

ii. a sensor valve disposed in said intake air passage, the rotating angle of said sensor valve being in proportion to the quantity of intake air passing through said intake air passage,

iii. a sensor valve shaft connected to said sensor valve for rotation in unison therewith, said sensor valve shaft having a cutout portion formed at a part thereof,

iv. a fuel metering cylindrical bearing, disposed in said housing, for supporting said sensor valve shaft and provided with a fine parallel slit which defines with said cutout portion of the sensor valve shaft a control orifice,

v. a fuel differential pressure regulating valve for maintaining the pressure across said control orifice substantially at a predetermined level,

vi. a first fuel passage for delivering the fuel from said fuel delivery means to said control orifice and said fuel differential pressure regulating valve,

vii. a second fuel passage for admitting to the exterior of the fuel pressure control means the fuel pressure at the upstream of said control orifice,

viii. compensation means disposed within said intake air passage in said housing in the proximity of said sensor valve for compensating the sectional area of said intake air passage, and

ix. pressure-activated means operatively coupled to said sensor valve for maintaining the differential pressure across said sensor valve at a predetermined level;

c. fuel metering means for metering and distributing the second fuel flow from said fuel delivery means in response to the controlled pressure of the fuel from the outlet of said fuel pressure control means, said fuel metering means comprising

i. a housing having a plurality of fuel intake ports equal in number to the cylinders of the engine,

ii. a rotor disposed in said housing and adapted to be operatively coupled to said engine for rotation in synchronism with the crankshaft of said engine, said rotor having a slit which, upon rotation of said rotor, intermittently and sequentially communicate with said fuel intake ports of said housing,

iii. a control shaft axially slidably fitted into said rotor, said control shaft being provided with an annular groove which normally communicates with said slit of said rotor with an opening area, said opening area varying in response to the axial displacement of said control shaft,

iv. a pressure chamber formed within said housing so that the controlled pressure of the fuel in said pressure chamber may be transmitted to said control shaft, said pressure chamber being in communication with said second fuel passage of said fuel pressure control means, and

v. a fuel passage for delivering the fuel of said second flow from said fuel delivery means to said annular groove of said control shaft; and

d. a plurality of fuel injection nozzles equal in number to the cylinders of said engine, said fuel injection nozzles respectively communicate with said fuel intake ports of said fuel metering means for injecting and delivering the metered fuel into said engine.

4,040,406

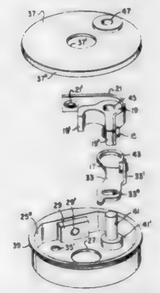
IGNITION BREAKER POINT ARRANGEMENT

John L. Baillargeon, Springfield, and Leonard W. Clifford, Wilbraham, both of Morocco, assignors to Eltra Corporation, Toledo, Ohio

Filed Jan. 6, 1975, Ser. No. 538,648

Int. Cl.² F02P *1/00;* **H01H** *19/62*

U.S. Cl. 123—146.5 A **2 Claims**



1. A breaker point assembly for a magneto ignition system comprising:

breaker box means for being mounted on an engine having a shaft rotatable in association with the operation of the engine and carrying a cam,

breaker point means mounted in said breaker box means for effecting ignition pulses in response to the rotational movement of the cam carried by the engine shaft,

said breaker box means including support means having a wall with an opening therethrough for receiving the engine shaft and cover means removably secured to said support means for enclosing the breaker point means,

said breaker point means including a breaker lever for movement about a pivot axis and having an arm carrying a

contact mounted on said support means and another arm for engaging the cam carried by the rotational engine shaft, and

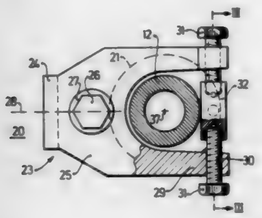
a pivot post constructed integrally with said support means, secured to the wall of said support means and providing an axis for the pivotal movement of said breaker lever, said cover means including a wall with an openings formed therein for receiving and holding the end of said pivot post upon being removably secured to said support means.

4,040,407

INTERNAL COMBUSTION ENGINE DISTRIBUTOR-BREAKER UNIT HOLDING AND ADJUSTMENT ARRANGEMENT

Joseph Heine, Vohrenbach, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 15, 1976, Ser. No. 666,587
Claims priority, application Germany, May 23, 1975, 2522829
Int. Cl.[2] F02P *5/04, 1/00*
U.S. Cl. 123—146.5 A **10 Claims**



1. Internal combustion engine distributor holding and adjusting arrangement, to secure a distributor **(10)** in adjusted position on the motor block **(20)** of the engine, having a housing **(11)**, a shaft **(12)** for insertion in the motor block **(20)** of the engine, means **(21, 23)** secured to the motor block **(20)** and engaging the distributor **(10)** to clamp the distributor to the motor block **(20)** including a releasable bolt **(26)** to tighten the distributor into frictional engagement with the block;

and a unitary boss concentric with said shaft **(12)** and formed with essentially parallel engagement surfaces to permit engagement therewith by a wrench located below the bottom of the housing **(11)** of the distributor and forming a thickened portion of said shaft **(12)** the engagement surfaces tapering slightly in the direction of the bottom of the housing **(11)** so that, upon application of rotary force to said engagement surfaces, a lifting force component will result to permit slight relative rotary movement between the shaft, and hence the distributor, and the motor block after said clamping means have clamped the distributor against the motor block to permit fine adjustment of ignition timing of the engine.

4,040,408

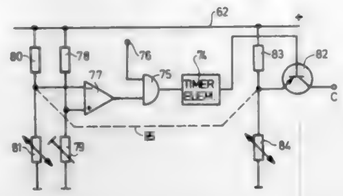
SYSTEM FOR REDUCING TOXIC COMPONENTS IN THE EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE

Bernd Kraus, Stuttgart, and Otto Glockler, Renningen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Aug. 5, 1975, Ser. No. 601,991
Claims priority, application Germany, Aug. 6, 1974, 2437713
Int. Cl.[2] F02B *3/00;* **F02M** *39/00*
U.S. Cl. 123—179 L **8 Claims**

1. In an apparatus for reducing the concentration of toxic components in the exhaust gas of an internal combustion engine, which engine includes a fuel supply system, a fuel metering system, and a control pressure circuit for controlling said fuel metering system, said control pressure circuit including an electromagnetic valve, said apparatus including a regulating device for cyclic actuation of said electromagnetic valve, and an oxygen sensor located in the exhaust system of the engine and electrically connected to said regulating device, the improvement comprising:

a timing circuit, connected to said regulating device, for supplying a time-dependent control signal to said regulator device, said timing circuit including:



i. a threshold switch for receiving input signals and for generating an output signal;

ii. a logic gate, one of whose inputs is connected to the output of said threshold switch; and

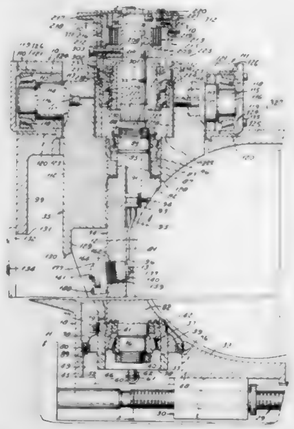
iii. a timer element, whose trigger input is connected to the output of said logic gate.

4,040,409

GRINDING WHEEL TRUING MECHANISM

Stanley John Walasewicz, Cavendish; Virgil William Erickson; Robert Adams Harrison, both of Springfield, and Royal Elwin Houghton, Ascutney, all of Vt., assignors to Bryant Grinder Corporation, Springfield, Vt.

Filed Dec. 19, 1975, Ser. No. 642,417
Int. Cl.[2] B24B *53/06*
U.S. Cl. 125—11 AS **4 Claims**



1. In a grinding wheel truing mechanism for dressing forms on the periphery of a grinding wheel, the combination comprising:

A. a support housing for mounting in a position adjacent a grinding wheel on which a form is to be imparted to the periphery of the grinding wheel;

B. a turn post carrier having one end pivotally mounted on said housing;

C. means for normally biasing the other end of said turn post carrier to an initial position;

D. a turn post rotatably mounted on said turn post carrier, said means for rotating said turn post includes:

1. a reversible power drive means mounted on said turn post carrier;

2. a drive system connecting said power drive means with said turn post for rotating the turn post; said drive system includes:

a. a driven drum rotatably mounted on said turn post carrier and connected to said turn post;

b. means connecting said reversible power drive means to said driven drum for driving the same in a selected direction of rotation;

E. a main diamond mounted on said turn post for dressing form on the periphery of a grinding wheel;

F. means for rotating said turn post and swinging said turn post carrier from said initial position for advancing said main diamond from an initial position through a dressing path for dressing a form on the periphery of a grinding wheel, and for retracting the main diamond to said initial position, said means for swinging said turn post carrier includes:

1. a cam means for swinging said turn post carrier from said initial position to a second position after a dressing action through a first arcuate path by the main diamond for allowing the main diamond to dress a second arcuate path so as to form a Gothic Arch form on the periphery of a grinding wheel, said cam means for swinging said turn post carrier includes:

a. a fixed cam mounted on said turn post carrier;

b. an eccentric cam roller follower rotatably mounted on said support housing;

c. means for rotating said eccentric cam roller follower from a first position when the main diamond is moved through said first arcuate path to a second position when said main diamond is moved through said second arcuate path, said means for rotating said eccentric cam roller follower includes:

i. a toggle member for rotating said eccentric cam roller follower between said first and second positions; and,

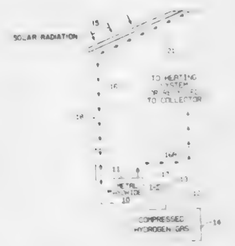
ii. a pair of stop members mounted on the driven drum for moving the toggle member for rotating said eccentric cam roller follower.

4,040,410

THERMAL ENERGY STORAGE SYSTEMS EMPLOYING METAL HYDRIDES

George G. Libowitz, Brookside, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 528,302, Nov. 29, 1974, abandoned. This application June 14, 1976, Ser. No. 695,678
Int. Cl.[2] F24J *3/02;* **C01B** *6/00*
U.S. Cl. 126—270 **19 Claims**



1. A reversible, closed thermal energy storage system for supplying heat to a living space comprising:

a. means for containing a material, said containing means exposed to an external source of heat, said material comprising at least one metal hydride capable of reversible dissociation into metal plus hydrogen gas and having a heat of formation of at least −5 kcal/mole, said external source of heat adapted to heat said material to a temperature sufficient to cause said dissociation of said material;

b. means for storing said hydrogen gas separate from said metal and apart from said living space;

c. means for communicating between said containing means and said storing means; and

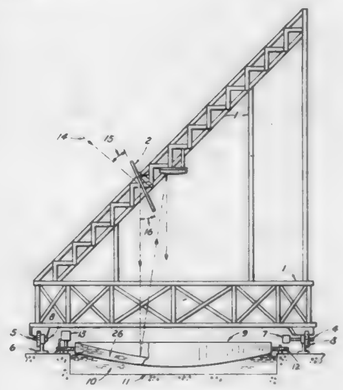
d. means for controllably recombining substantially all of said hydrogen gas with said metal in said containing means to regenerate substantially all of said metal hydride to produce heat, with additional means for transporting said produced heat to said living space.

4,040,411

APPARATUS FOR CONCENTRATION OF SOLAR RADIATION

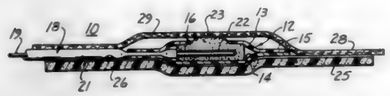
Rudolph Rust, 4562 Heil, Apt. 3, Huntington Beach, Calif. 92649

Filed Sept. 10, 1975, Ser. No. 612,106
Int. Cl.[2] F03G *7/02*
U.S. Cl. 126—271 **3 Claims**



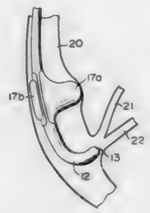
1. An apparatus for converting solar radiation into high temperature heat energy wherein the solar radiation is directed vertically downward by means forming reflecting planes onto the surface of a fluid body rotating at constant angular velocity about its vertical axis; said reflecting planes being located upon a rotating gantry centered on the axis of the rotating fluid such that the rays reflected from the fluid surface are directed to another reflecting means located on said gantry so as to concentrate said rays upon a radiation to enthalpy exchanger located near means forming the focal point of said other reflecting means and wherein the reflectivity of the fluid is increased by a covering or partial covering of reflective particulate floating material, said gantry including means to enable said gantry to follow the sun in azimuth and upon which are mounted pivoted reflecting planes including means to enable said pivoted reflecting planes to follow the suns radiation in elevation to maintain the angle of incidence of the suns rays upon said rotating fluid surface equal to the angle between said surface and the vertical, and wherein the means for rotating the fluid is a mechanism which includes means to form a vessel containing a volume of fluid and having support means for rotating said vessel means about its' vertical axis, a multiplicity of wheels pressed substantially uniformly against the circumference of said vessel means; one or more of said wheels being rotated by a constant speed motor thus causing said vessel to rotate at constant revolutions per minute wherein said vessel support means is a fluid in a stationary tank, said fluid having a sufficient depth and density to float the rotating vessel means with its contents.

4,040,412
BIOELECTRODES
Takuya R. Sato, 5130 Randall St., Culver City, Calif. 90230
Continuation-in-part of Ser. No. 495,957, Aug. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 228,827, Feb. 24, 1972, Pat. No. 3,834,373. This application Feb. 3, 1976, Ser. No. 655,030
Int. Cl.[2] A61B *5/04*
U.S. Cl. 128—2.06 E **72 Claims**



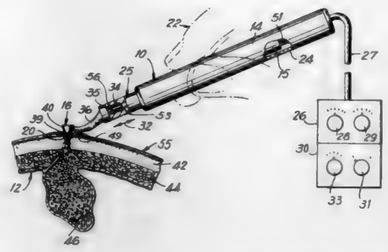
1. A bioelectrode applicable to a body part, comprising in combination:
a pouch having a solid bottom formed of a sheet of electrically insulating watertight material being solid throughout said bottom, and a top sealed to said bottom and having an aperture remote from said bottom, said pouch defining an enclosed interior wider than said aperture;
electric current conducting means including an electrode in said pouch spaced from said aperture and means for connecting said electrode to external electronic equipment; and
electrolyte-absorbing means in said pouch in contact with said electrode and exposed at said aperture, said electrolyte-absorbing means extending in said enclosed interior beyond the width of said aperture.

4,040,413
ENDOSCOPE
Susumu Ohshiro, Iwatsuki, Japan, assignor to Fuji Photo Optical Co. Ltd., Omiya, Japan
Filed July 14, 1975, Ser. No. 595,425
Claims priority, application Japan, July 18, 1974, 49-81739; July 18, 1974, 49-81740; July 18, 1974, 49-81741
Int. Cl.[2] A61B *1/06*
U.S. Cl. 128—6 **6 Claims**



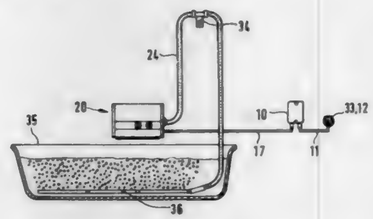
1. An endoscope for visual internal examination of body cavities comprising:
a light transmitting tube including a fiber optical light transmitting bundle having an image receiving end and an image output end, a sleeve extending around and along the light transmitting bundle concentrically therewith for enclosing the bundle for protection thereof and facilitating the insertion thereof into body cavities, and an image taking head connected with the image receiving side end of the sleeve having therein an optical system for focusing an image of the internal view of the body cavities on the image receiving end of the light transmitting bundle,
a plurality of inflatable balloons provided on the outer face of said sleeve so as to be inflated radially outwardly in different directions, said balloons being selectively and independently inflated,
said sleeve being flexible between said image taking head and said balloons,
a plurality of air ducts communicated with said balloons and extending along the sleeve on the internal surface thereof from the balloon to the output end of the sleeve, and
air supply source means connected with said plurality of air ducts for independently supplying air into said balloons to inflate said balloons independently of each other.

4,040,414
ULTRASONIC PERSONAL CARE INSTRUMENT AND METHOD
Leonard W. Suroff, Jericho, N.Y., assignor to Xygiene, Inc., Panama, Panama
Filed May 12, 1976, Ser. No. 685,518
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—24 A **79 Claims**



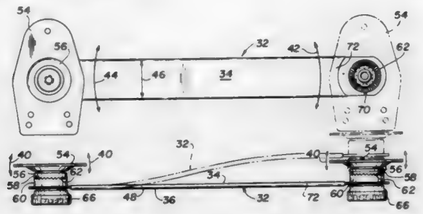
1. The method of removing a foreign deposit from the tissue of a human comprising the steps of:
A. positioning adjacent said foreign deposit to be removed a surface capable of supporting and transmitting ultrasonic vibrations,
B. supplying a fluid to the tissue adjacent said foreign deposit for engagement by said surface,
C. inducing vibrations in said surface at a frequency in the ultrasonic range,
D. moving said ultrasonically vibrating surface relative to said foreign deposit such that it substantially engages the tissue and applies a force thereto, whereby an extraction of said foreign deposit from its containment in said tissue is obtained, and
E. circumferentially applying a static force to the tissue in surrounding relation to said foreign deposit.

4,040,415
AIR BUBBLING MASSAGING APPARATUS
Ruth Kulisch, Schwalbenstrasse 5, D-2902 Rastede, Germany
Filed Dec. 19, 1975, Ser. No. 642,381
Claims priority, application Germany, Dec. 24, 1974, 2461475
Int. Cl.[2] A61H *9/00*
U.S. Cl. 128—66 **9 Claims**



1. In hydrotherapy apparatus including a housing within which there is positioned at least a blower means for supplying heated air to said blower and control means for said blower and heated air supply means, a hose communicating at one end thereof with said blower and at the other end thereof with means positionable within a bathtub so as to introduce the heated air thereinto, the improvement comprising in combination a second housing independent of and remote from the blower-containing housing, a step down electrical transformer having an output not greater than 24 volts positioned in said housing and having an input connected to a source of line current, and an elongated low voltage cable connecting the output of said transformer to said blower and heated air supply means and said control means therefor.

4,040,416
ORTHOPEDIC SPLINT
Leo Zentman, c/o Orthopedic Splints, Inc. 147 Albany Ave., Lindenhurst, N.Y. 11757
Filed July 23, 1976, Ser. No. 708,043
Int. Cl.[2] A61F *3/00*
U.S. Cl. 128—80 A **1 Claim**

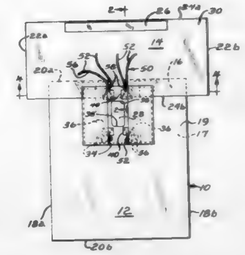


1. In an improved orthopedic splint comprising a pair of shoe-engaging plates for attachment to the shoes of a patient using said splint, spaced apart rotation axis-defining means for rotatably mounting each said shoe-engaging plate preparatory to urging each said shoe-engaging plate through a rotatable traverse about one said cooperating rotation axis incident to fixing said shoe-engaging plates in a selected angular relation to each other, and a flat, normally horizontally disposed planar connecting member of metallic leaf spring construction material flexible up and down from said horizontal plane and connected in spanning relation between said spaced apart rotation axis-defining means for allowing limited movement of said shoe-engaging plates and the patient's feet only in rocking movement relative to each other up and down from the horizontal plane as limited by the planar member, said rocking movement being permitted by the flexuring of said member up and down out of its normally horizontal plane while preventing any rotative movement about either of said rotation axes of said shoe-engaging plates to retain said plates and the patient's feet in their fixed selected angular relationship to each other so that the patient can partake of exercise movements in the up and down directions, but not rotatively during use of said orthopedic splint.

4,040,417
INTRAUTERINE DEVICE
Jaime A. Zipper, Santiago, Chile, assignor to G. D. Searle & Co., Chicago, Ill.
Division of Ser. No. 94,216, Dec. 1, 1970, Pat. No. 3,803,308, which is a continuation-in-part of Ser. No. 760,688, Sept. 18, 1968, Pat. No. 3,563,235. This application Dec. 12, 1973, Ser. No. 424,100
Int. Cl.[2] A61F *5/46*
U.S. Cl. 128—130 **3 Claims**

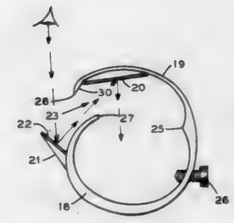
1. An intrauterine device adaptable to insertion in the uterine cavity and capable of being retained therein for a prolonged period of time, said device including a contraceptively effective amount of non-toxic copper or zinc compound.

4,040,418
SURGICAL DRAPE WITH RETAINING MEANS
Robert F. Collins, Barrington, Ill., assignor to The Kendall Company, Boston, Mass.
Filed Apr. 12, 1976, Ser. No. 676,029
Int. Cl.[2] A61B *19/06*
U.S. Cl. 128—132 D **13 Claims**



1. A surgical drape for use in association with auxiliary equipment, such as a tube or cord, comprising:
sheet means of a material resistant to passage of bacteria and having a fenestration for placement over a surgical site; and
tie means secured to the drape and spaced from a side of the fenestration for retaining said equipment at a fixed location on the drape.

4,040,419
SHIELDING HOLDER FOR A SYRINGE HAVING INDIRECT VIEWING MEANS
Abraham Goldman, 105-54 Avenue K, Brooklyn, New York, N.Y. 11236
Filed Feb. 2, 1976, Ser. No. 654,191
Int. Cl.[2] G21F *5/00*; A61N *5/00*
U.S. Cl. 128—215 **4 Claims**



1. A shielding holder for a syringe comprising a holder of high density material, said holder including an open ended arcuate lower portion adapted to receive a syringe therein and having a free lower leading edge, an upper portion integral with said free lower leading edge, said upper portion generally following the arcuate curvature of the arcuate lower portion and overlying the syringe receiving lower portion in upwardly spaced relation thereto, said upper portion extending past and terminating beyond said lower leading edge in an upper leading edge oriented generally parallel to said lower leading edge and in upwardly spaced relation thereto, said leading edges defining an opening therebetween, the orientation of said leading edges relative to each other precluding a direct passage of radiation from a lower portion received syringe through the edge defined opening, and mirror means for viewing a lower portion received syringe through the opening from the exterior of said holder, said mirror means comprising a first mirror positioned within said upper portion generally above said opening for a viewing thereof through said opening, said first mirror facing toward the lower portion, a second mirror and

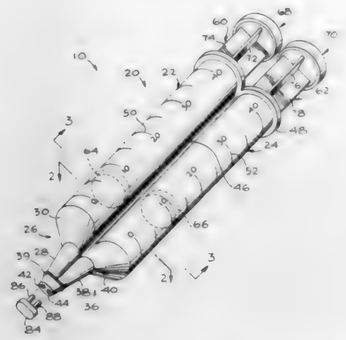
means mounting said second mirror on the exterior of said lower portion below said opening with said second mirror facing said first mirror through said opening for an indirect viewing of a lower portion received syringe by a user looking in said second mirror.

4,040,420

PACKAGING AND DISPENSING KIT

Spencer J. Speer, Ontario, Calif., assignor to General Dynamics, Pomona, Calif.

Filed Apr. 22, 1976, Ser. No. 679,426
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 M **18 Claims**



1. Apparatus for storing and dispensing a plurality of disparate inter-reactable fluids from separate storage locations, comprising:

a plurality of distinct, elongate chambers containing fluids, each chamber including a piston for forceably ejecting the fluid therefrom through a tapered nozzle;

needle means having a corresponding plurality of interior conduits for dispensing fluid from said nozzles;

lock means including a ridge projecting about an exterior surface of each tapered nozzle; and

releasable retaining means comprising a separable needle block having a fluid conduit with an interior groove for engaging a corresponding nozzle ridge and means for retaining associated needle means in sealing relationship with the chamber nozzles and the fluid conduits.

4,040,421

HYPODERMIC SYRINGE AND ATTACHED NEEDLE ASSEMBLY

H. Theodore Young, Union, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

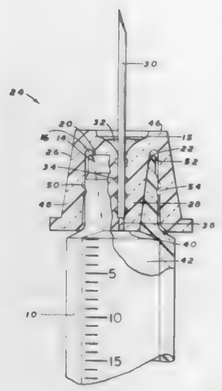
Continuation-in-part of Ser. No. 565,048, April 4, 1975, abandoned. This application July 6, 1976, Ser. No. 702,914
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 N **1 Claim**

1. A low-dose hypodermic syringe and attached needle assembly wherein:

the syringe includes a plastic tubular barrel having a distal end and a proximal end, a reduced boss having an exterior face extending from the distal end and defining an inner end wall, a piston in the barrel having a plunger rod extending from the proximal end of the barrel and the piston adapted to travel in the barrel into engagement with the barrel inner end wall in dispensing liquid from the syringe into the needle assembly;

the needle assembly includes a needle having a lumen and a pointed distal end and a proximal end and a plastic hub secured by cement to the needle at its proximal end, the hub including a radial flange and a tubular collar having one end integral with the flange and its other end extending towards the needle proximal end, the collar adapted to be manually gripped for attaching and removing the needle assembly from the barrel; and

a connection joint attaching the needle assembly to the hypodermic syringe for cooperating in permitting fluid to be conveyed through the lumen from the fluid chamber to the pointed end of the needle comprising a female conical opening in the reduced boss, a conical male extension on the proximal end of the said hub and being inserted in the female opening, the shape and dimensions of the male extension matching the female opening whereby when the said extension is inserted into the said opening a leak proof seal will be provided by the matching surfaces of the female opening and male extension and the proximal end of such extension will be flush with the inner end wall of the barrel, the proximal end of the lumen substantially



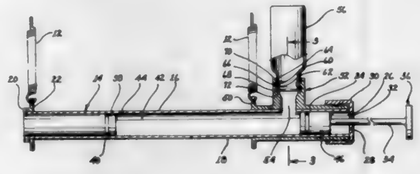
coincident with the proximal end of the extension so that there will be no residual volume of liquid beyond the measured volume of the barrel when the piston is extended fully into the barrel against the inner end wall; the collar having an annular radially inwardly extending bead for frictionally engaging with the outer surface of the reduced boss to provide a mechanical lock of the needle assembly on the syringe barrel, the collar having an inner face between the bead and flange providing an interference fit with the associated exterior surfaces of the reduced boss, the bead forming in time a corresponding depression in the boss outer surface thereby preventing the needle assembly from disassociation with the syringe barrel upon removal of a needle sheath and during the injection of the liquid in the barrel.

4,040,422

ANIMAL MEDICATION DISPENSER

Burt L. Kuhn, Phoenix, Ariz., assignor to AKDOV Animal Health Care Products, Inc., Tempe, Ariz.

Filed Mar. 17, 1976, Ser. No. 667,575
Int. Cl.[2] A61D *7/00*
U.S. Cl. 128—223 **5 Claims**



1. In combination, a drenching bit coupled to a bridle

adapted to be attached to the head of an animal for positively and completely injecting a metered amount of a substance into the oral cavity of the animal at a controlled rate, said bit comprising:

a. a straight hollow tubular member having a tubular cavity having a substantially uniform cross section, a first end located in a first end portion, and a second end, said tubular member being positionable within the oral cavity of the animal and having sufficient length for the first end portion to be located outside said oral cavity;

b. a dispensing aperture disposed at a location in said tubular member intermediate the first and second ends;

c. end means for sealing off the tubular cavity of said tubular member at a position immediately adjacent said aperture;

d. passageway means located in said first end portion of said tubular member communicating with the tubular cavity for introducing the substance into the tubular cavity of said tubular member; and

e. plunger means having a plunger head including a working face disposed within the tubular cavity, said plunger head having substantially the same cross section as said tubular cavity and being displaceable between a first position proximate to the first end of said tubular member and a second position proximate to said sealing end means for forcefully dispensing and completely evacuating the substance within the tubular cavity out through said dispensing aperture into the oral cavity of the animal as said plunger head is displaced from the first position to the second position;

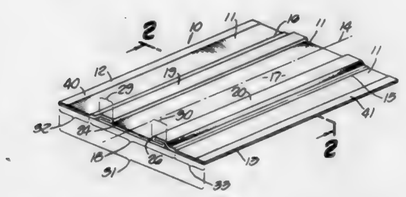
f. said passageway means being intermediate said dispensing aperture and said working face when said plunger head is in said first position.

4,040,423

URINE TRAP DIAPER

John Leslie Jones, Sr., 1070 Glen Oaks Blvd., Pasadena, Calif. 91105

Filed July 23, 1976, Ser. No. 706,761
Int. Cl.[2] A61F *13/16, 13/18*
U.S. Cl. 128—287 **12 Claims**



1. An infant diaper having a rectangular, coplanar multiple ply, marginally aligned fluid absorbent paper sheet pad area, said pad area having a pair of longitudinal diaper pad exterior margins oppositely disposed to each other, a central longitudinal diaper pad axis, and a diaper total pad width axis normal to said longitudinal diaper pad axis, wherein the improvement combination cmprises:

a fluid absorbent paper sheet pad area having each one of two longitudinal pad margins coincident with one longitudinal diaper pad margin, said pad area having the required thickness;

a pair of narrow pad pleats oppositely disposed in parrallel along the full longitudinal diaper axis length, each one of said pair of pad pleats formed on a first face of said paper pad area a spaced distance apart, said pair of pleats and the spaced pad area between said pleats together providing an excreta channel pad area, and the diaper total pad width axis value having the value of the second face width of said absorbent pad area excluding the side width values of the pair of narrow pleats;

a thin, flexible, fluid impermeable membrane disposed adjacently coextensive with the diaper total pad width value, said second face of said absorbent pad area opposite said pad first face, said membrane also forming each one of a pair of opposed longitudinal border seals disposed on said pair of longitudinal diaper pad margins, said seals securing said diaper pad margins.

4,040,424

SURGICAL PAD

James R. Hunt, Carencro, La., assignor to Will Ross, Inc., Milwaukee, Wis.

Filed May 14, 1976, Ser. No. 686,343
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—290 R **8 Claims**



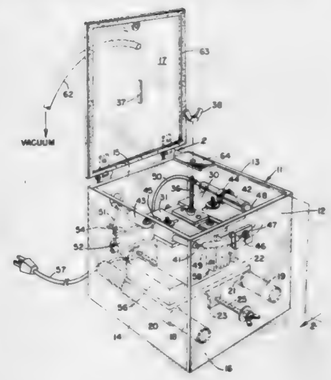
1. A surgical pad comprising a backing sheet, an absorbent pad secured to said sheet at substantially the midportion thereof, said sheet extending beyond said pad to form two end portions, and a pressure-sensitive, adhesive strip applied to one of said end portions in a T-shaped configuration, such that the horizontal portion of the T extends along the edge of said end portion and the vertical portion of the T extends between the end of said end portion and the end of said pad.

4,040,425

POULTRY BEAK REMOVER

John S. Goodling; Gayner R. McDaniel, both of Auburn, Ala., and Richard A. Steadham, Texas City, Tex., assignors to Auburn Research Foundation, Auburn, Ala.

Filed Jan. 6, 1976, Ser. No. 646,924
Int. Cl.[2] A61B *17/36*; A61N *3/00*
U.S. Cl. 128—303.14 **13 Claims**



1. A poultry beak remover for debeaking fowl, comprising: a housing having a beak receiving aperture therein of a size to receive the beak of a fowl, for insertion of the beak of a fowl into the housing; a pair of spaced apart electrodes supported in the housing in substantial alignment with the aperture and spaced therefrom a distance such that when the beak is inserted through the aperture, a portion thereof extends between the electrodes; and electrical circuit means connected with the electrodes for discharging a spark across the electrodes to burn

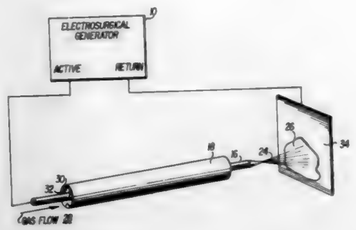
the beak of the fowl received therebetween and thus effect removal of a desired portion of the beak.

4,040,426

ELECTROSURGICAL METHOD AND APPARATUS FOR INITIATING AN ELECTRICAL DISCHARGE IN AN INERT GAS FLOW

Charles F. Morrison, Jr., Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Filed Jan. 16, 1976, Ser. No. 649,682
Int. Cl.² A61B 17/36
U.S. Cl. 128—303.17 **21 Claims**



1. Apparatus for establishing an electrical discharge to an object comprising

a support;

a source of electrical energy;

an active electrode connected to said source of electrical energy and being supported by said support and outwardly extending therefrom;

a source of inert gas;

gas flow directing means connected to said source of inert gas for directing the gas past said electrode to thereby facilitate the establishment of a primary electrical discharge in the gas disposed adjacent the end of the electrode and extending outwardly therefrom;

discharge initiating means disposed adjacent to said electrode for initiating said electrical discharge in said gas formed adjacent the end of the electrode, said discharge initiating means including said active electrode and a second electrode having a small gap therebetween, across which an auxiliary discharge initiates said primary electrical discharge;

said second electrode being electrically isolated from any source of biasing potential and being so disposed in the gas flow established by said gas flow directing means that said gas generates electrostatic charge on said second electrode, which is discharged through said gas to said active electrode to thereby establish said auxiliary electrical discharge; and

means for returning said electrical energy from said object to said source of electrical energy.

4,040,427

CATHETER SUPPORT ASSEMBLY

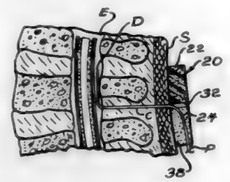
Alon P. Winnie, Wilmette, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 1, 1976, Ser. No. 672,590
Int. Cl.² A61M 25/02
U.S. Cl. 128—348 **4 Claims**

1. A catheter support assembly, comprising:

a catheter having a distal end for placement in a patient's body, and a proximal end portion extending outside the patient's body when the catheter is placed;

a support member of relatively soft and compressible foam material and having an inner surface for facing the patient's body, an outer surface facing away from the patient's body, and a slot extending between said inner and outer surfaces and extending between an outer edge of the support member toward a central portion of the support member, a pressure-sensitive adhesive on said inner surface, and a release sheet releasably covering said adhesive, said support member being secured to the patient's body by said adhesive with said proximal end portion of the



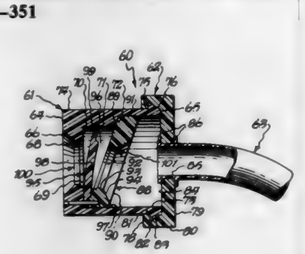
catheter located in said slot, said support member having a sufficient thickness between said inner and outer surfaces to cushion the patient's body and prevent kinking of the catheter when the patient reclines on the support member.

4,040,428

CONTROL VALVES FOR TRACHEOTOMY PATIENT OR LARYNGEAL PROSTHESIS

Earl W. Clifford, Getzville, N.Y., assignor to The Aro Corporation, Bryan, Ohio

Filed Aug. 30, 1976, Ser. No. 718,946
Int. Cl.² A61M 25/00; A61F 1/20; A61M 16/00
U.S. Cl. 128—351 **3 Claims**



1. A control valve for a tracheotomy patient provided with a tracheal fistula and adapted to require said patient to breathe normally through his mouth, but adapted to enable said patient to breathe heavily through said tracheal fistula, comprising:

a housing defining a chamber therewithin, said housing provided with a first control opening communicating said chamber with ambient atmosphere and provided with a second control opening adapted to communicate said chamber with said tracheal fistula, a marginal portion of said housing about each of said control openings defining a seat facing the other of said control openings; and

a flapper mounted on said housing in said chamber for movement between said control openings and having a flexible peripheral marginal portion, said flapper being adapted to move toward and sealingly assume the contour of the seat about said first control opening to close said first control opening when said patient normally exhales, said flapper also being adapted to move toward and sealingly assume the contour of the seat about said second control opening to close said second control opening when said patient normally inhales;

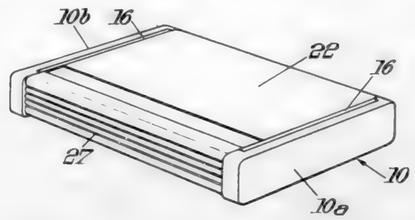
whereby said patient may be forced to breathe normally through his mouth but may breathe heavily through said tracheal fistula.

4,040,429

AUTOMATIC APPARATUS FOR MAKING ROLLED CIGARETTES

Jean R. Lacroix, 167 bis, Avenue Victor Hugo, 75116 - Paris, France

Filed Sept. 15, 1975, Ser. No. 613,540
Claims priority, application France, Nov. 4, 1974, 74.36611
Int. Cl.² A24C 1/10, 5/08
U.S. Cl. 131—51 **8 Claims**



1. A device for making rolled cigarettes comprising a housing containing a bearing plate and a bearing shaft, said plate extending in a plane substantially parallel to a base of said housing, an endless belt passing around said plate and said shaft whereby slack in said belt forms a groove between said plate and said shaft for receiving tobacco, means mounting at least one of said plate and said shaft for relative movement to open and substantially close said groove, said bearing plate having a major surface serving as a support for said belt in a manually accessible position whereby, when said groove is substantially closed, a piece of sheet material can be introduced into the groove and an operator can manually move the belt along said major surface relative to the plate and hence around said shaft to roll the tobacco within the sheet material.

4,040,430

METHOD AND APPARATUS FOR MAKING FILTER CIGARETTES

Desmond Walter Molins, London, England, assignor to Molins Limited, England

Filed May 18, 1976, Ser. No. 687,744
Claims priority, application United Kingdom, May 20, 1975, 21365/75; Aug. 22, 1975, 34888/75
Int. Cl.² A24C 5/58
U.S. Cl. 131—94 **17 Claims**



1. A method of making filter cigarettes comprising assembling tobacco sections moving in a direction transverse to their lengths along two separate paths, the tobacco sections on one path being parallel to and transversely displaced relative to the tobacco sections on the other path; assembling filter portions moving in a direction transverse to their lengths along two separate paths, the filter portions on one path being parallel to and transversely displaced relative to the filter portions on the other path; moving said tobacco sections said filter portions along portions of said separate paths which are partially common, so as to produce two rows of transversely-moving tobacco sections having axially adjacent filter portions, the filter portions being at the same ends of the tobacco sections in each row in relation to the direction of movement of the rows; and uniting the axially adjacent filter portions and tobacco sections whilst they are moving transverse to their lengths.

4,040,431

METHOD OF INCREASING THE FILLING CAPACITY OF SHREDDED TOBACCO TISSUE

James G. Ashworth; Eugene Glock; James G. Kelly, all of Richmond; James L. McLaughlin, Chester, and Owen T. Merwin, Richmond, all of Va., assignors to American Brands, Inc., New York, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,736
Int. Cl.² A24B 3/18
U.S. Cl. 131—140 P **6 Claims**

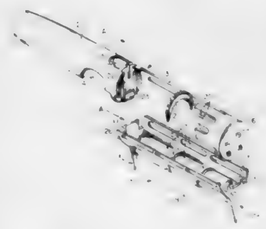
1. The process of increasing the filling capacity of shredded tobacco comprising the steps of first conditioning the tobacco so that its temperature is at least about 130° F. to 250° F. and its moisture content from about 15% to 35% promptly followed by drying the thus conditioned tobacco with a hot gas while the tobacco is in the form of a substantially thin laminar dispersion in the gas at a temperature such that the moisture content of the tobacco will be lowered within about 5 seconds to a moisture content of about 11% to 16%.

4,040,432

HAIR STYLING TOOL

Rocco J. Adinolfi, Burlington, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Apr. 1, 1976, Ser. No. 672,745
Int. Cl.² A45D 1/00
U.S. Cl. 132—9 **4 Claims**



1. Portable hair styling apparatus comprising:

a plurality of hair styling attachments, each of said attachments having a first detent member at a first end and a prong member at a second end;

an integrally molded tool having a handle portion and a working portion extending in opposite directions along an axis of said tool wherein said handle portion is generally cylindrical in shape and defines a hollow portion and further includes first and second gripping means disposed about its surface; and

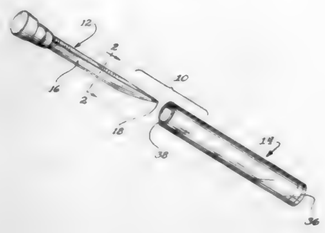
mating means including a latching means and a stop means integrally connected to said tool for interchangeably mounting said attachments to said tool, said latching means including a second movable detent member for mating with said first detent member of each of said attachments and further including an integrally molded tab portion positioned in said hollow portion of said handle portion proximate said first and second gripping means for moving said second detent member of said latching means in a general clockwise direction when pressed by the user of said tool and said stop means formed at an outer end of said working portion including an aperture means for receiving said prong member of each of said attachments.

4,040,433

TOOTHPICK AND CONTAINER ASSEMBLY

Robert G. Edison, 3032 University Ave., Highland Park, Ill. 60035

Filed Feb. 6, 1976, Ser. No. 655,917
Int. Cl.² A61C *15/00*
U.S. Cl. 132—89 **5 Claims**



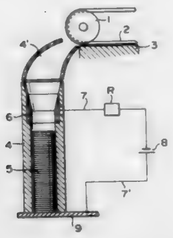
1. A reusable toothpick-and-container assembly comprising: elongated, tubularly-shaped and transparent container means for holding a liquid, said container means being closed at one end and having an open mouth at the other end which is adapted to be sealed so as to provide a fluid-tight container; and molded plastic toothpick means which includes an elongated blade-shaped portion having a V-shaped cross-section and terminating at one end in a tip for picking debris from between a user's teeth, and end cap means cooperatively associated with the other end of the blade-shaped portion for grasping by the user and adapted to sealingly cooperate with said open mouth to provide said seal, said toothpick adapted to be stored within said container and in contact with a liquid therein for cleansing said toothpick for reuse.

4,040,434

DEVICE FOR DETECTING STACK OF COINS FOR USE IN COINS-PACKAGING MACHINE

Kenkichi Watanabe, Kawasaki, and Kyoichi Ohsako, Tokyo, both of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed May 17, 1976, Ser. No. 687,224
Claims priority, application Japan, June 6, 1975, 50-68309
Int. Cl.² G07D *9/00*
U.S. Cl. 133—1 A **5 Claims**



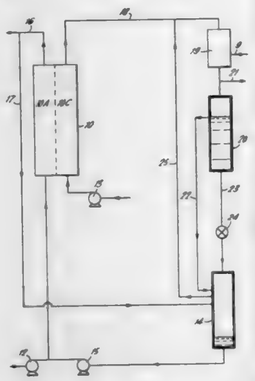
1. A device for detecting a stack of coins for use in a coin-packaging machine adapted to form a stack of a predetermined number of coins in which each coin be horizontally positioned in face to face relation with the next one and then to package said each stack with wrapping material, said device comprising a stacking cylinder of electrically insulating material adapted to receive coins supplied from the upper inlet to form a stack of a predetermined number of coins therewithin, a bottom plate of electrically conductive material adapted to be moved between open and closed positions for discharging said stack of coins through the lower open end of said stacking cylinder into the subsequent stage of the packaging machine while in the open position and for supporting said stack of coins formed within said stacking cylinder from the lower end thereof, an electrode of a ring-like shape which forms part of the inner surface of said stacking cylinder at a height of a little more distance than the height of said stack of coins from the lower end thereof, a relay and an electric power source electrically connected together in series relation between said electrode and said bottom plate, whereby, when at least one coin is incorrectly positioned in said stacking cylinder and the height of said stack increases to get contact with said electrode, electric current is caused to pass through said relay via said stack of coins so that said relay may be energized to produce an output for detection of said incorrect position of said stack of coins within said stacking cylinder.

4,040,435

FUEL CELLS AND METHODS OF OPERATING THEM

Eugene Robert Elzinga, Paris, France, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Oct. 28, 1975, Ser. No. 626,472
Claims priority, application United Kingdom, Nov. 18, 1974, 49763/74
Int. Cl.² H01M *8/04*
U.S. Cl. 429—14 **9 Claims**



1. A method of operating a fuel cell of the type which employs an electrolyte having a solvent and a solute dissolved therein so as to permit increase in electrolyte temperature during start-up of said cell and so as to avoid crystallization of said solute when electrolyte temperature is decreased during shut-down of said cell comprising: allowing the solvent in said electrolyte to evaporate during start-up of said cell, therey increasing the concentration of solute in said electrolyte, whereby said electrolyte can be heated to higher temperatures; condensing a predetermined portion of the evaporated solvent; maintaining the concentration of solute in said electrolyte below the solubility limit of said solute in said solvent; returning said condensed solvent to said electrolyte during shut-down of said cell whereby crystallization of said solute in said solvent is avoided.

4,040,436

MEANS AND METHOD OF IRRIGATION CONTROL

Dave L. Caldwell, 28890 Lilac Road, Sp. 110, Valley Center, Calif. 92082

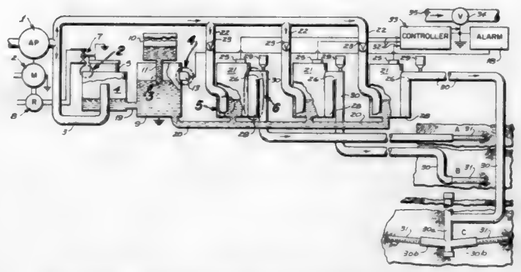
Filed Aug. 8, 1975, Ser. No. 603,081
Int. Cl.² A01G *25/00*
U.S. Cl. 137—1 **27 Claims**

1. A means for indicating soil moisture condition, comprising:

a. a sensor having a porous wall adapted when in moisture contact with soil to maintain a moisture content corresponding approximately to the moisture content of the soil;

b. a gas line connected to the sensor;

c. means for maintaining the gas in the gas line and sensor at a pressure to cause an increased seepage of gas through



the sensor wall as the water content of the sensor wall and soil is lowered;

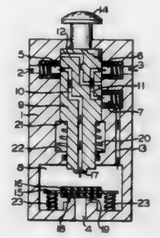
d. and means for measuring the seepage rate of the gas through the sensor to indicate the soil moisture condition.

4,040,437

AUTOMATIC FLUID PRESSURE CUT-OFF SAFETY DEVICE

Helmut Gottling, Oberweser, Germany, assignor to WABCO Westinghouse GmbH, Hannover, Germany

Filed May 25, 1976, Ser. No. 689,940
Claims priority, application Germany, June 4, 1975, 2524781
Int. Cl.² G05D *7/00*
U.S. Cl. 137—102 **8 Claims**



1. A fluid pressure cut-off safety device interposable in a fluid pressure supply pipe via which operating fluid at a predetermined operating pressure may be supplied to a fluid pressure operable device, said safety device comprising:

a. a casing having formed therein a fluid pressure supply port normally supplied with operating fluid at a certain predetermined pressure, a fluid pressure delivery port via which operating fluid pressure is deliverable to the fluid pressure operable device, an exhaust port open to atmosphere, and a fluid pressure operating chamber;

b. first valve means in said casing effective in one position for opening a fluid pressure supply communication between said supply port and said delivery port via said operating chamber and concurrently closing with a second valve means an exhaust communication between said delivery port and said exhaust port, or for alternatively closing with said second valve means said supply communication and concurrently opening said exhaust communication via said operating chamber;

c. said first valve means being operable to a different position in which both said supply and exhaust communications are concurrently closed;

d. said second valve means operable responsively to fluid in said operating chamber, at said certain pressure or greater, to a first position in which, and cooperatively with said first valve means in its said one position, said supply communication is open and said exhaust communication is concurrently closed;

e. said second valve means being operable, in response to a reduction of fluid pressure in said operating chamber to a pressure less than said certain pressure, to a second position in which, and cooperatively with said first valve means in its said one position, said supply communication is closed and said exhaust communication is concurrently open;

f. operating means carried by said first valve means and yieldable to manual force effecting concurrent operation of said first valve means and said second valve means to said different and said first positions, respectively, in which positions said first and said second valve means are cooperatively effective for closing both said supply and exhaust communications; and

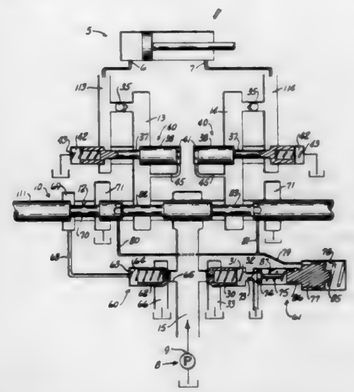
g. biasing means for restoring said first valve means to its said one position upon release of said manual force subsequently to restoration of fluid pressure in said operating chamber to said certain pressure or greater for retaining said second valve means in its said first position.

4,040,438

CONTROL VALVE WITH FLOW CONTROL MEANS

Raud A. Wilke, Brookfield, Wis., assignor to Koehring, Milwaukee, Wis.

Division of Ser. No. 462,038, April 18, 1974, Pat. No. 3,951,162, which is a continuation-in-part of Ser. No. 195,145, Nov. 3, 1971, abandoned. This application Jan. 30, 1976, Ser. No. 653,824
Int. Cl.² F15B *11/08*
U.S. Cl. 137—106 **5 Claims**



1. In combination:

A. a control valve having a valve element movable from a neutral position to an operating position at which it directs pressure fluid from a supply passage to one of a pair of service passages while directing exhaust fluid in the other service passage to a tank passage;

B. a flow control valve for said other service passage operable to prevent rise in pressure of exhaust fluid therein above a predetermined value;

C. a tank port which is connectible with said supply passage;

D. a valve mechanism having a valve member which can be opened by supply fluid pressure to communicate the supply passage with said tank port except at times when a venting passage for a chamber in which the valve member operates is closed;

E. and means controlling the effectiveness of said venting passage comprising

1. a pilot valve which can be opened under the action of supply fluid pressure thereon,

2. a spring to normally hold the pilot-valve in a position closing said venting passage,

3. a cylinder having a piston therein providing a seat for said spring,

4. a spring member acting upon the piston in a direction to yieldingly maintain the same in a position at which it

loads the pilot valve spring and thereby holds the pilot valve in position closing said venting passage,

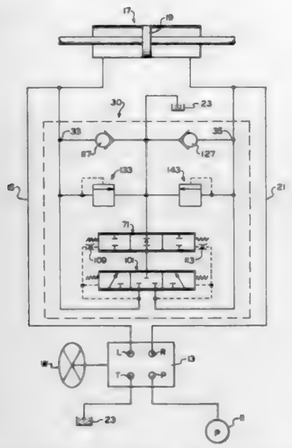
5. and means for moving the piston in the opposite direction to relax the pilot valve spring in consequence of pressure in said other service passage in excess of said predetermined value.

4,040,439

CUSHION VALVE ARRANGEMENT

Sohan Uppal, St. Louis Park, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 29, 1976, Ser. No. 671,480
Int. Cl.² F15B *15/18*
U.S. Cl. 137—115 **16 Claims**



1. A valve assembly adapted to be connected in parallel between first and second fluid conduits, the first fluid conduit communicating pressurized fluid to a fluid actuated device and the second fluid conduit communicating return fluid from the fluid actuated device, said valve assembly cushioning the rate of pressure rise of the pressurized fluid and comprising:

a. a valve body defining a first port for connection to the first fluid conduit, a second port for connection to the second fluid conduit, a spool bore in open communication with said first and second ports at first and second axially spaced-apart locations, and a cushion passage communicating with said first and second ports and with said spool bore at a third location disposed axially between said first and second locations;

b. a valve spool slidably disposed within said spool bore and having a central position therein, said valve spool defining an axial bore, first and second passage means communicating between said axial bore and said first and second ports, respectively, and third passage means communicating between said axial bore and said cushion passage when said valve spool is in said central position;

c. a valve piston slidably disposed within said axial bore and biased toward a neutral position blocking fluid communication between said axial bore and said third passage means when said first and second ports are subjected to less than a minimal pressure differential, said valve piston being movable to a second position, relative to said valve spool, permitting fluid from said first port to flow to said cushion passage, then to said second port when fluid pressure in said first port exceeds fluid pressure in said second port by at least said minimal pressure differential;

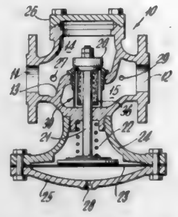
d. said valve spool, said valve body and said spool bore defining first and second dashpots and first and second orifices, said first orifice communicating between said first passage means and said first dashpot, said second orifice communicating between said second passage means and said second dashpot, an increase in fluid pressure in said first port causing an increase in pressure in said first dashpot, moving said valve spool in a direction to cause fluid to flow from said second dashpot to said second passage means, gradually reducing to zero the flow area defined by said third passage means and said cushion passage.

4,040,440

SILENCED VALVE CONSTRUCTION

Moustafa A. Zaki, Newburgh, N.Y., assignor to Spence Engineering Company, Walden, N.Y.

Filed June 18, 1975, Ser. No. 587,845
Int. Cl.² F16K *47/02*
U.S. Cl. 137—375 **19 Claims**



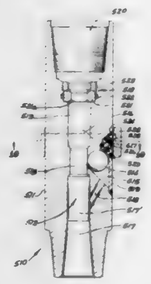
1. In a valve, a valve body having inlet and outlet ports, a circular valve seat carried by said body between said ports and having an inner wall defining the outer confines of an axially extending annular passage on the downstream side of said seat for accommodation of valve-controlled fluid flow from the inlet port to the outlet port of said valve, a valve stem guided for reciprocation on the axis of said passage, a valve member carried by said stem for coaction with said seat, and an elongate cylindrical sound-absorbent structure on the downstream side of said valve member and within and spaced from said inner wall of said passage, said sound-absorbent structure including a perforated outer wall surface in radially opposed spaced relation to said inner wall and defining with said inner wall said annular passage for fluid flow downstream from said valve member, the spacing of said perforated wall surface from said inner wall being such as to establish a flow area in said passage of at least maximum valve-open effective area.

4,040,441

CHECK VALVE ASSEMBLY

Cicero C. deceased, late of Houston, Tex.; by Joe Russell Brown, executor; by Ramey Lee Brown, executor, both of P.O. Box 19236, Houston, Tex. 77024

Division of Ser. No. 322,226, Jan. 9, 1973, Pat. No. 3,850,191.
This application Aug. 8, 1974, Ser. No. 495,901
Int. Cl.² F16K *15/04*
U.S. Cl. 137—519.5 **7 Claims**



1. A drill string assembly comprising a drill bit connected to the lower end of a string of drill pipe and check valve means connected in said drill pipe above said drill bit, said check valve means comprising:

a. a valve body having a longitudinal flowbore therethrough, said flowbore having a lower section, an intermediate section of restricted diameter and a cylindrical upper section of a diameter greater than said intermediate section;

b. seat means carried by said valve body adjacent said upper flowbore section;

c. recess means in said valve body communicating with said flowbore near the upper end of said intermediate section;

d. ball closure means normally carried in said recess means out of said flowbore but movable from said recess means into said upper flowbore section in response to upward flow of fluids through said check valve means above a predetermined rate to sealingly engage said seat means, blocking upward flow of fluids through said drill string assembly; and

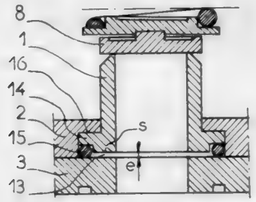
e. plug means projecting into said recess means engageable and operable externally of said valve body for engagement with said ball closure means to selectively prevent exit of said ball closure means from said recess means.

4,040,442

VALVE SEAT CONSTRUCTION FOR VALVES FOR CONTROLLING THE PRESSURE OF LIQUIDS

Philippe Alexandre, La Tronche, France, assignor to Societe Generale de Constructions Electriques et Mecaniques Alsthom, Paris Cedex, France

Filed Nov. 28, 1975, Ser. No. 636,143
Claims priority, application France, Dec. 19, 1974, 74.42072
Int. Cl.² F16K *15/02*
U.S. Cl. 137—543.17 **4 Claims**



1. An improvement in a valve for controlling the pressure of a liquid in a pipe, the valve having a seat and a shutter bearing, in closed position of the valve, on the seat, the improvement comprising a valve body connected to the pipe and having a recess slidably accommodating the seat, a seal member in said recess between the seat and the pipe, said valve body having a shoulder bounding said recess, the seat being urged against said shoulder, in a normal position, by the pressure of the liquid in the pipe such that a clearance space is formed in said recess between the seat and the pipe to permit slidable movement of the seat in said valve body under the effect of vibration of the shutter.

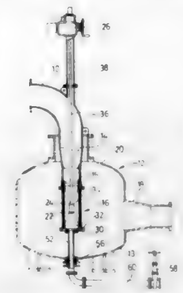
4,040,443

SLEEVE VALVE

Yoshitsugu Okada; Teruaki Nanao, and Toshio Sugino, all of Hirakata, Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed Feb. 13, 1976, Ser. No. 658,116
Claims priority, application Japan, May 27, 1975, 50-71896
Int. Cl.² F16K *11/07*
U.S. Cl. 137—546 **4 Claims**

1. A sleeve valve for connection to a reducing chamber comprising a valve body having a peripheral wall formed with a multiplicity of discharge ports extending therethrough, a lower end closed by a bottom cover attached thereto and an upper end secured to an upper wall of the reducing chamber, a valve cylinder gate having open upper and lower ends and slidably fitted in the valve body in contact with the inner surface of the body, the valve cylinder gate being coupled to means operable from outside for upwardly or downwardly driving the gate to control the number of the discharge ports in communication with a water compartment within the gate and



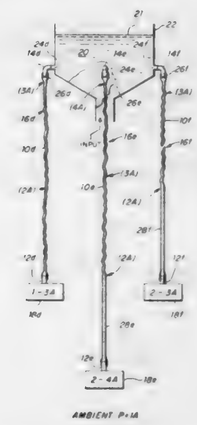
to thereby regulate the flow of water, and a drain tube means secured at its upper end to the bottom cover of the valve body and having a lower end extending through a bottom wall of the reducing chamber and communicating with the outside of the chamber.

4,040,444

AIR-PRECLUDING FLOW REGULATOR

John J. Nolan, Cambridge, Mass., assignor to Sala Magnetics, Inc., Cambridge, Mass.

Filed May 6, 1976, Ser. No. 683,660
Int. Cl.² F15D *1/14*; F16L *41/00*; F17D *1/00*
U.S. Cl. 137—561 A **4 Claims**



1. An air-precluding flow-regulating device, included in each satellite conduit associated with each orifice located at a higher elevation of a multi-orifice stream-splitter system which feeds a number of satellite devices at lower elevations, whose back pressure is subject to variatons between predetermined lower and upper limits, comprising: a section of normally collapsed, soft, resilient tube forming at least a part of the conduit sealingly connected with its respective said orifice and its respective said satellite, and having a length at least as long as the variation between said lower and upper limits of back pressure at the satellite device expressed in head, said tube being disposed to contain the ambient pressure level within its length.

4,040,445

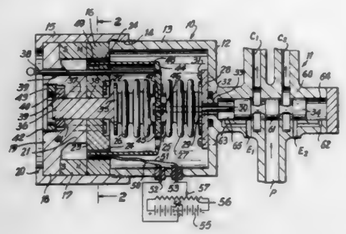
ELECTRICAL LINEAR FORCE MOTOR FOR SERVO CONTROLS, FLUID VALVES, AND THE LIKE

Joseph F. McCormick, Pawling, N.Y., assignor to Murray A. Ruben, Belmont, Mass.

Continuation of Ser. No. 458,714, April 8, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,493

Int. Cl.[2] F15B *13/044*; F16K *31/05*

U.S. Cl. 137—596.18 **11 Claims**



1. A two-way, linear proportional force motor unit for directly operating an hydraulic utilization device, comprising

a. a permanent magnet connected to magnetic pole pieces and defining an air gap containing a permanent magnetic flux,

b. an electrical winding in said air gap,

c. a mechanical coil support for said electrical winding,

d. a balanced, prestressed, double-acting resilient metallic bellows

e. said mechanical coil support being connected to said bellows at its effective midpoint from without said bellows whereby said electrical winding is external of said bellows,

f. said bellows being prestressed in an amount greater than the operating displacement of said mechanical oil support, whereby said bellows is unidirectionally stressed at all times under normal working conditions,

g. operator means projecting coaxially of the bellows within the confines of said bellows to an exterior point for connection to said utilization device and operatively associated with said mechanical coil support,

h. said bellows being sealed at one end and in sealed communication at its other end with said hydraulic utilization device, whereby said bellows serves to isolate said air gap from the fluid of said hydraulic utilization device independently of sliding-type seals.

4,040,446

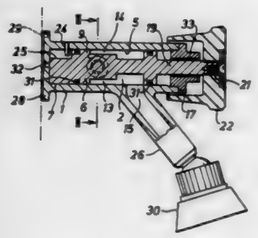
MIXER TAPS OR VALVES

Horace Watts, Pinner, England, assignor to H. & D. E. Watts, Pinner, England

Filed May 10, 1974, Ser. No. 468,656

Int. Cl.[2] F16K *11/07*

U.S. Cl. 137—625.17 **11 Claims**



1. A hot and cold water mixing and flow control valve, comprising means forming a housing having a valve chamber therein with a cylindrical bore of a specific diameter; inlet means in said housing means connectible to hot and cold water supplies and including a hot water inlet and a cold water inlet opening laterally into said bore; outlet means in said housing means for discharging said supplies to atmosphere, including an outlet opening into said valve chamber; valve means movable relative to said housing means comprising an actuating means and a generally cylindrical valve member, the valve member being disposed in said bore and movable angularly around said bore and axially along said bore by the actuating means, to control separately the temperature and the rate of flow of the discharge, and the actuating means being operable in two separate modes corresponding respectively to said angular and axial modes of movement of the valve member, and also being operable to a particular axial/angular closed position in which the valve is closed; sealing means between the valve means and the housing means effective to isolate the inlets with respect to each other and with respect to said outlet means; stop means on the valve means and on the housing means for limiting the angular and axial travel of the valve member; said valve member being movable from said particular closed position to the medial axial/angular coordinate open position thereof only by operation of the actuating means in its two modes of movement, and not being movable from said closed position without effecting immediate opening of the valve.

4,040,447

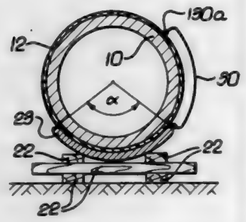
PROTECTION OF PIPE AGAINST DAMAGE TO INSULATION AND/OR CORROSION

Gordon N. Scott, 608 N. Cannon Drive, Beverly Hills, Calif. 90210

Filed July 23, 1975, Ser. No. 598,143

Int. Cl.[2] F16L *3/02*; C23F *13/00*

U.S. Cl. 138—106 **14 Claims**



1. In combination with a pipe having an insulative covering thereon,

a. a sacrificially corrodable mount extending in protective and supportive relation beneath the covered pipe, the mount and pipe having respective body portions of different metallic composition,

b. the mount defining a generally concave receptacle in which underside extent of the pipe and said covering thereon are received, in assembled relation thereto,

c. a means electrically interconnecting said portions of the pipe and mount so that electrolytic current tends to flow preferentially from the mount to the pipe.

14. A mount for use in combination with a metallic pipe having an insulative covering thereon, comprising

a. a body defining a generally concave receptacle in which the underside of said covering is receivable in protected and supported relation,

b. at least a portion of said body consisting essentially of magnesium, there being an extended mesh electrode in electrical contact with substantial lengthwise and widthwise extent of the body, the mesh electrically connected with the pipe.

4,040,448

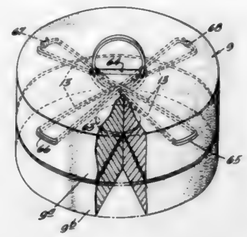
DISPENSER MEMBER FOR FILLING FLUID STORAGE CONTAINERS

William B. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Division of Ser. No. 511,821, Oct. 3, 1974, Pat. No. 3,946,758, which is a continuation-in-part of Ser. No. 214,872, Jan. 3, 1972, abandoned, and a continuation-in-part of Ser. No. 280,611, Aug. 14, 1972, abandoned. This application Oct. 16, 1975, Ser. No. 623,190

Int. Cl.[2] F15D *1/02*

U.S. Cl. 138—42 **3 Claims**



1. As an article of manufacture, a cylindrical body able to be passed through a fillpipe, said body made of material which is substantially unaffected by hydrocarbons, said body being porous and having a high void-volume relationship, and a retrorse cord arrangement fastened to said body, wherein said porous body is peripherally sliced parallel to its tp and bottom to form an upper and a lower body of essentially equal size joined at the center and said retrorse cord comprises a plurality of cords connected to a withdrawal device at the center of the face of said upper body and said cords extend through said upper body in an essentially equally spaced apart relationship and are attached to the outer peripheral wall of said upper body.

4,040,449

OIL-TIGHT LAY-IN DUCT

DeForest D. Butler, and Andy Mancik, both of Oxford, Ohio, assignors to Square D Company, Park Ridge, Ill.

Filed Feb. 15, 1974, Ser. No. 443,056

Int. Cl.[2] H02G *3/04, 3/06*

U.S. Cl. 138—92 **8 Claims**

1. A lay-in duct for electric current carrying wires and comprising:

a pair of like open top troughs connected together end to end in alignment with each other, and each having upper lateral marginal flanges at its top extending endwise of the troughs, and each of said marginal flanges having an upper face;

covers for the troughs, respectively;

said covers, in their closed position, having their adjacent ends spaced endwise of the troughs from each other and from said connected ends of the troughs, and each of said covers being of a width such that, in said closed position, its lateral margins overlap said lateral flanges of its associated trough;

means for fastening the covers in closed positions on the troughs, respectively;

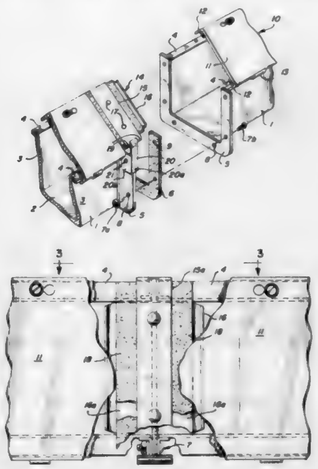
a joint sealing device comprising a rigid body extending endwise transversely of the troughs across the open tops thereof at their connected end portions, and hingedly connected at one of its ends to at least one of said troughs for swinging upwardly to an open position and downwardly to a closed position, selectively;

means on the other end of the body for detachably holding the body in closed position;

said body including a top plate which, in the closed position of the body, extends endwise transversely of the troughs and, has end portions in overlapping relation to both lateral flanges of both troughs at, and adjacent, their connected ends, and a base plate of less length, transversely of the troughs, than the top plate and which, in said closed position, lies within the troughs and extends transversely of the troughs with an end near to the inner lateral limit of the flanges at one side of the troughs and the opposite end near to the inner lateral limit of the flanges at the other side of the troughs;

said base plate being of greater width than the top plate and having lateral margins extending, in a direction endwise of the troughs, beyond the lateral limits of the top plate sufficient distances, respectively, to underlap adjacent end margins of said covers, respectively;

sealing means carried by the body and positioned to lie in sealing relation between said upper faces of the trough flanges and said respective overlapping end portions of the top plate, between under faces of said adjacent end



margins of the covers and upper faces of the underlapping lateral margins of the base plate for substantially the full length, in a direction transversely of the troughs, of said base plate, and directly between the faces of the lateral flanges of the troughs and the faces of those portions of said end margins of the covers overlapping said lateral flanges;

wherein the sealing means includes a single piece of resilient sealing material clamped between the plates and which overlies said base plate at its said lateral margins for their full length transversely of the troughs and endwise of the base plate beyond said end portions of the base plate at and between said lateral margins of the base plate so as to underlie said end margins of the top plate near its ends for the full width of the top plate; and

connecting means securely fasten the plates to each other in said clamping relation to the said piece of material.

4,040,450

PIPE SEALING APPARATUS

Geoffrey A. Boundy, Parafield Gardens, Australia, assignor to Glenys Irene Boundy, Parafield Gardens, Australia

Filed Oct. 20, 1975, Ser. No. 624,407

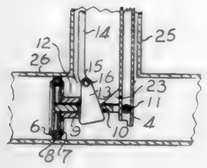
Claims priority, application Australia, Oct. 28, 1974, 9391/74

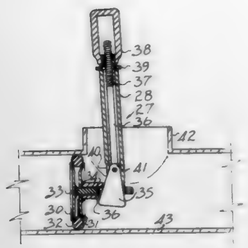
Int. Cl.[2] F16L *55/12*

U.S. Cl. 138—94 **7 Claims**

1. A drain pipe sealing device including a support arm, and a sealing head secured at an end of the support arm, the sealing head including a resilient sealing ring and coreactive members supported for relative movement one with respect to the other to cause outward peripheral sealing expansion of the resilient

sealing ring to a sealing position and to allow the resilient sealing ring to contract from the sealing position, the invention being characterized in that the sealing head is secured to the support arm by means including control means operable to move the sealing head to a first position in which the resilient sealing ring has its axis aligned substantially parallel with respect to the elongate direction of the support arm and to a second position in which the resilient sealing ring has its axis aligned transversely to the elongate direction of the support arm, said control means including a cam member operable to provide the relative movement between the co-reactive members to cause the outward peripheral sealing expansion of the resilient sealing ring.



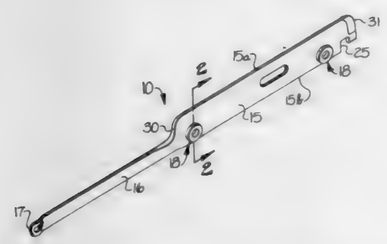


4,040,451

TRIAXIAL WEAVING MACHINE HAVING HEDDLES WITH WEFTWISE LATERAL PROJECTIONS

Wayne C. Trost, Rockford, and John B. Capps, Forreston, both of Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Aug. 23, 1976, Ser. No. 716,825
Int. Cl.² D03C *13/00*
U.S. Cl. 139—48 **9 Claims**



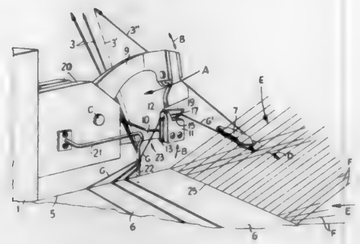
1. In a weaving machine for making triaxial fabric and having a plurality of elongate heddles arranged in weftwise rows for guiding respective warp strands, means for longitudinally moving said heddles for forming the warp strands guided thereby into warp sheds, means defining passageways for guiding said heddles during longitudinal movement, and means for moving said heddles and the warp strands guided thereby weftwise during weaving to shift heddles from one passageway to another and to move the warp strands from one weftwise location to another, each of said heddles having a body portion and an elongate reduced width frontal portion for engagement with a warp strand, the improvement in said heddles which comprises each of said heddles having means on said body portion thereof spaced from said frontal portion and for preventing entrance of more than one heddle into the same passageway.

4,040,452

DEVICE FOR HOLDING CUT WEFT THREADS TO BE FOLDED UP INTO THE SHED TO FORM A TUCKED SELVEDGE IN A FABRIC MADE BY A SHUTTLELESS LOOM HAVING A CONTINUOUS WEFT SUPPLY MECHANISM

Nicola Santucci, Schio (Vicenza), Italy, assignor to Nuovo Pignone S.p.A., Italy

Filed Aug. 1, 1975, Ser. No. 601,169
Claims priority, application Italy, Aug. 2, 1974, 25942/74
Int. Cl.² D03D *47/36*
U.S. Cl. 139—302 **2 Claims**



1. A device for retaining the cut weft thread to be folded up into the shed to form a tucked selvedge as the selvedge being formed on a shuttleless loom comprising in combination:

a weft cutting device coupled to the loom having upper and lower cutters,

a plate mounted on the lower cutter having a planar gripping surface for holding the weft thread in a taut condition after cutting and a cutting edge on said cutter located in the same plane with said surface,

a generally rectangular frame member open on one side and having a resiliently biased thread pressing member mounted to the free end of the frame and in engagement with the gripping surface, said other end being adjustably coupled to the plate and capable of adjustment in a direction perpendicular to the gripping surface to regulate the bias of the thread pressing member, and,

a holding member for positioning the weft threads to be folded into the shed to form a tucked selvedge comprising an elongated member coupled to the cutting device at one end and having an upper portion extending substantially parrallel to the selvedge and a lower portion extending downwardly therefrom to the other end in a place substantially perpendicular to the edge of the selvedge.

4,040,453

SHUTTLELESS LOOM OF THE SINGLE OR DOUBLE LAYER TYPE

Yves Juillard, and Victor Riner, both of Mulhouse, France, assignors to Societe Alsacienne de Constructions Mecaniques de Mulhouse, of Mulhouse Cedex, France

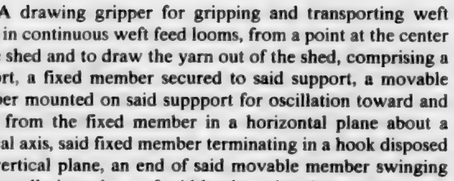
Filed Aug. 2, 1976, Ser. No. 710,703
Claims priority, application France, Aug. 4, 1975, 75.24220
Int. Cl.² D03D *47/18*
U.S. Cl. 139—446 **5 Claims**

1. A shuttleless loom, having

a slay, a planar read carried by said slay, horizontal, longitudinally-reciprocating, floating weft-inserting needles, each having an inner extremity and an outer extremity with said inner extremity resting against said reed and a lower sheet of warp threads, and with said outer extremity being movable along a predetermined path of travel,

a sliding shoe operatively connected to said outer extremity of each said needle,

a driving member having a portion adapted to support said sliding shoe and to reciprocate in said path of travel of said outer extremity of said needle,



an unbounded longitudinal sliding surface carried by said slay in coplanar, relationship with respect to said reed and extending close to said path of travel of said outer extremity of said needle.

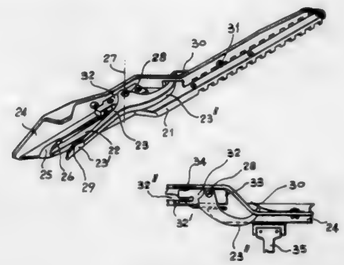
and elastic means resiliently applying said sliding shoe against said sliding surface.

4,040,454

DRAWING GRIPPER FOR GRIPPING AND TRANSPORTING WEFT YARNS IN CONTINUOUS WEFT FEED LOOMS

Graziano Genini, Stabio, Switzerland, assignor to Albatex A.G., Vaduz, Liechtenstein

Filed Sept. 23, 1975, Ser. No. 616,059
Claims priority, application Switzerland, Sept. 23, 1974, 12832/74; Sept. 11, 1975, 11805/75
Int. Cl.² D03D *47/22*
U.S. Cl. 139—448 **3 Claims**



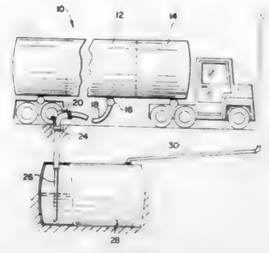
1. A drawing gripper for gripping and transporting weft yarns in continuous weft feed looms, from a point at the center of the shed and to draw the yarn out of the shed, comprising a support, a fixed member secured to said support, a movable member mounted on said suppport for oscillation toward and away from the fixed member in a horizontal plane about a vertical axis, said fixed member terminating in a hook disposed in a vertical plane, an end of said movable member swinging horizontally in and out of said hook, and spring means urging said end into said hook, said end of said movable member having an upper surface and the inside of said hook having a lower surface, said surfaces coacting releasably to grasp said yarn between them, said surfaces being conjugated helical surfaces of variable pitch that decrease both in distance from each other and in inclination to the horizontal in a direction toward the end of said movable member.

4,040,455

AUTOMATIC SHUT OFF FOR GRAVITY FILLING SYSTEM FOR LIQUID STORAGE TANKS

Leonard W. Swain, London, Canada, and Allen M. Bower, Painsville, Ohio, assignors to Emco Limited, London, Canada

Filed Feb. 24, 1976, Ser. No. 660,995
Int. Cl.² B67D *5/00*
U.S. Cl. 141—225 **7 Claims**



1. In a liquid loading system for the gravity loading of a liquid storage tank from a tank truck having at least one liquid shipping compartment, the improvement of;

a. a normally open substantially unrestricted liquid fill line in which a partial vacuum is drawn in response to the passage of liquid therethrough under the influence of gravity, said fill line opening from the shipping compartment and being connected to a liquid input passage of the liquid storage tank,

b. valve means in said line movable between an open position in which said line is open to permit the flow of liquid therethrough and a closed position in which said line is closed to interrupt the flow of liquid to the storage tank, said valve means being normally open and urged to said closed position,

c. pressure responsive latch means engaging said valve means and releasably locking said valve means in said normally open position,

d. vent passage means having a first end communicating with said pressure responsive latch means and a second end opening into said storage tank at a predetermined level below the upper end of the tank,

e. vacuum passage means communicating between said pressure responsive latch means and a vacuum source in said fill line whereby the flow of liquid through the fill line during the filling of the storage tank draws a vacuum in the vacuum passage at the vacuum source which is insufficient to activate said pressure responsive latch means to retain said valve means in the open position until the level of liquid in the storage tank rises to close said other end of said vent line whereupon the full vacuum is applied to the pressure responsive latch means thereby releasing the valve which moves to its normally closed position.

4,040,456

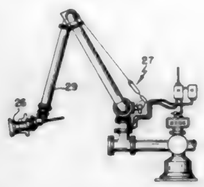
OPENABLE BOTTOM LOADING ADAPTER FOR TRANSPORT TANK

Joseph H. DeFrees, 505 Liberty St., Warren, Pa. 16365

Filed Jan. 28, 1976, Ser. No. 652,985
Int. Cl.² B67C *11/04*; B65B *39/00*
U.S. Cl. 141—349 **10 Claims**

1. A fabricated adapter valve for controlling flow of liquid to and from a transportation tank comprising, a hollow body portion, a coupling portion secured to one end of the body portion in liquid tight relation, said coupling portion being adapted for coupling to a compatible loading coupler of a loading island for liquids, a flange portion secured in liquid tight relation to the other end of said body portion adapted for coupling to a liquid flow conduit to the tank, said flange portion defining an exit opening for liquid, said coupling portion having a liquid inlet opening therein, valve means mounted in

said body portion intermediate said inlet and said exit openings for opening and closing said inlet opening and including biasing means automatically urging said valve means toward closed condition, a manually operable actuator mounted on said valve and accessible from exteriorly of said valve, said actuator including cam means pivotal in said body portion about a fixed point and coacting with said valve means for



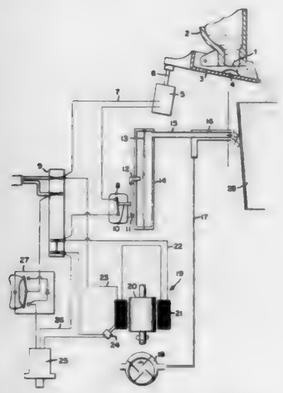
moving said valve means toward open position against the resistance of said biasing means, and means for selectively maintaining said valve means in open condition while permitting release of said actuator by an operator, the last mentioned maintaining means including a generally sinuous configuration on said cam means adapted for holding coaction with said valve means.

4,040,457

AUTOMATIC OPENING OF JUICE OUTFLOW CONDUIT IN RESPONSE TO DETECTION OF CONTAINER, WITHOUT PHYSICAL CONTACT

Karl Niese, Kronberg, and Eckhard Hundhausen, Westerland, both of Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 21, 1975, Ser. No. 624,206
Claims priority, application Germany, Oct. 22, 1974, 2450059
Int. Cl.[2] B65B *3/06*
U.S. Cl. 141—361 **14 Claims**



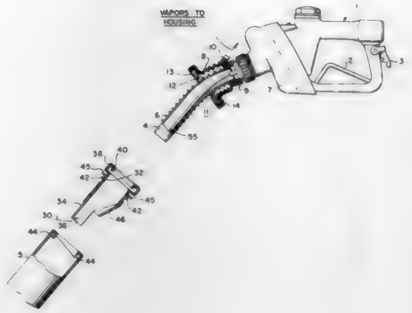
1. In a juice dispensing apparatus, particularly a household tabletop juicer or juice centrifuge, of the type having a jucie outflow conduit below the outlet of which a glass or other container is placed for filling the container with juice, in combination, first means for opening and closing the outlet of the juice outflow conduit in automatic response to the receipt of opening and closing command signals, respectively; and second means operative for detecting the presence of a container below the outlet of the juice outflow conduit without physically contacting the container and operative for generating an opening command signal in response to the detection of the placement of a container below the outlet of the juice outflow conduit and a closing command signal in response to the detection of the removal of a container from below the outlet of the juice outflow conduit, wherein the second means comprises a signal transmitter operative for transmitting a signal towards the location occupied by a properly positioned container and a signal receiver operative for detecting the presence of a properly positioned container by detecting the reflection of the transmitted signal back from the container.

4,040,458

GASOLINE TANK FILLPIPE ADAPTER

William B. Hansel, Media, Pa., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Filed May 6, 1975, Ser. No. 575,109
Int. Cl.[2] B65B *3/04*
U.S. Cl. 141—392 **10 Claims**



5. A combination for use in filling an automobile gasoline tank through a fillpipe, comprising: an automobile gasoline dispensing nozzle having a spout of standard diameter with a port therein for controlling the operation of the nozzle valve shutoff mechanism; a rigid cylindrical sleeve dimensioned to be mounted inside the gasoline tank fillpipe with the upper side of the rigid sleeve extending along a substantial portion of the length of a nozzle spout to prevent upward movement of a nozzle spout inserted in the adapter and to hold the spout with its axis approximately colinear with the fillpipe axis, means for mounting said rigid sleeve in the outer end of said fillpipe, and a sealing member supported by said sleeve for covering the controlling port of said nozzle when the spout thereof is being inserted in said sleeve and to leave said controlling port open when said nozzle is fully inserted in said fillpipe.

4,040,459

LOG HANDLING SYSTEM

Thomas P. Bush, Jr., Birmingham, Ala., and Samuel Edward Grant, Jacksonville, Fla., assignors to Bush Manufacturing Company, Trussville, Ala.

Division of Ser. No. 432,872, Jan. 14, 1974, Pat. No. 3,908,495, which is a division of Ser. No. 117,257, Sept. 2, 1971, Pat. No. 3,799,015. This application May 19, 1975, Ser. No. 578,472
Int. Cl.[2] B27B *1/00*
U.S. Cl. 144—312 **4 Claims**

1. In a method of processing logs, including the steps of:

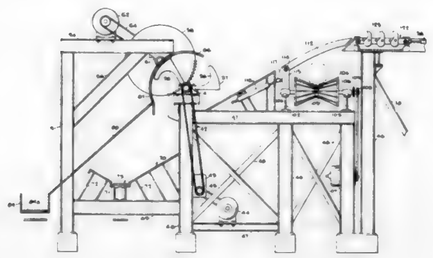
a. advancing a plurality of logs in a first predetermined direction along a path transverse to the longitudinal axis of said logs;

b. segregating said logs, during the advancing of the logs in the transverse path, according to size;

c. advancing first segregated ones of said logs in a second direction along a path parallel to the longitudinal axis of said logs;

d. advancing second ones of said segregated logs in said first predetermined direction;

e. severing said second ones of said segregated logs substantially simultaneously at a plurality of special locations after the same have been segregated and advanced after segregation; and



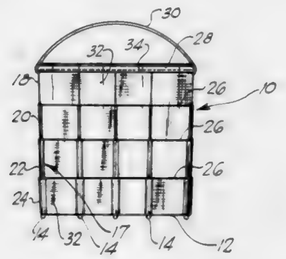
f. advancing said severed logs in said second predetermined direction.

4,040,460

COLLAPSIBLE BUCKET

Sidney Thornton, 323 South 11th Ave., Mount Vernon, N.Y. 10550

Filed Dec. 23, 1975, Ser. No. 643,786
Int. Cl.[2] A45C *7/00*
U.S. Cl. 150—48 **5 Claims**



1. A collapsible bucket, comprising:

a. a bottom rim;

b. a plurality of base support members affixed to said bottom rim;

c. a plurality of telescoping erecting members affixed to said bottom rim;

d. a plurality of support rings affixed to said telescoping erecting members;

e. a top rim affixed to the top of said telescoping erecting members;

f. a handle affixed to said top rim; and

g. a collapsible fabric member disposed over said top rim and secured thereto.

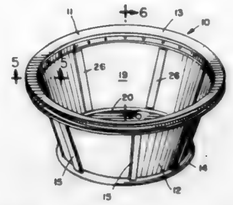
4,040,461

NESTABLE FRUIT HARVESTING CONTAINER

William S. Carson, 218 Escambia Drive, Winter Haven, Fla. 33880

Filed Aug. 9, 1976, Ser. No. 712,946
Int. Cl.[2] B65D *33/14*
U.S. Cl. 150—51 **10 Claims**

1. A nestable fruit harvesting container comprising a generally frusto-conical frame and a flexible bag supported within the frame, the frame comprising a top ring and a bottom ring and a plurality of brace strips which extend between the top and bottom rings and which are secured thereto at circumferentially spaced locations therearound, the diameter of the bottom ring being less than the diameter of the top ring and the brace strips extending outwardly and upwardly from the bottom ring toward the top ring, the outside of the bag engaging and being supported by the brace strips, and a reinforcing strip secured to the inside of the bag opposite each of the brace strips, whereby a plurality of containers can be nested within



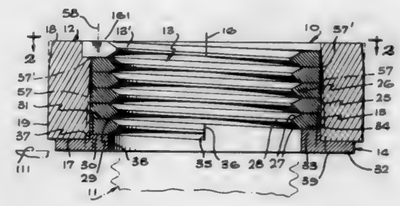
each other and the reinforcing strips of a container protect the bag of the container from chafing between the brace strips of the container and the brace strips of the next higher container.

4,040,462

FASTENERS HAVING THREADS FORMED OF ESSENTIALLY HELICAL COIL STRUCTURES

Mark Hattan, Balboa, Calif., assignor to William P. Green, Pasadena, Calif., a part interest

Continuation of Ser. No. 390,741, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 229,990, Feb. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 121,817, March 8, 1971, abandoned. This application Aug. 18, 1975, Ser. No. 605,456
Int. Cl.[2] F16B *39/38*
U.S. Cl. 151—14 CS **21 Claims**



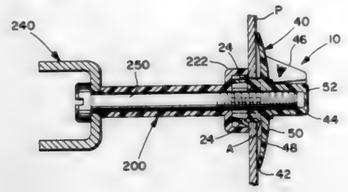
1. A high strength composite lock nut comprising an essentially tubular case, and a separately formed coil structure contained within said case and having a hardened radially inner portion in work hardened condition shaped to form a thread, said coil structure having a plurality of turns with radially outer portions bonded directly to a surrounding portion of said case and softer than said inner thread portion, said coil structure having, at a location offset axially from said bonded turns, a locking portion which is within the case but not bonded to the portion thereof which is located directly radially outwardly of said locking portion, said locking portion being shaped to project radially inwardly farther than said bonded turns and inwardly far enough to have a self-locking action with a coacting screw and to require deformation of the self-locking portion radially outwardly upon threaded engagement with the screw, said portion of the case which is located directly radially outwardly of said locking portion of the coil structure having an inner surface extending approximately directly axially and engaged by an approximately directly axially extending external surface of said locking portion in a relation blocking said radially outward deformation of said locking portion and requiring slight radially outward deformation of the case itself at the location of said locking portion upon threaded engagement of said locking portion with said screw, so that the strength of the case is added to that of the locking portion of the coil structure for maximizing said locking action, said locking portion being fixed at its opposite ends against even slight relative movement of said ends in a direction to circularly elongate and thus radially constrict the locking portion.

4,040,463

FASTENER

Stephen Petrus, Parma, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed July 12, 1974, Ser. No. 488,615
Int. Cl.[2] A47G *29/02*; F16D *39/28*
U.S. Cl. 151—41.75 **7 Claims**



1. A one-piece, molded fastener for sealing, self-retention in an apertured panel, said fastener comprising:

an axially extending shank having a cross-sectional shape closely conforming to the cross-sectional shape of said panel apertures, one end of said shank having a plurality of radially outwardly extending protuberances thereon, said one end of said shank having a plurality of radially and axially extending slots therein, the intersection of said slots being generally coaxial with the axis of said shank and defining an axially extending, fastener receiving cavity, said protuberances having an inclined, radially outer surface, said radially outer surface being radially inwardly inclined toward said one end, the inner surfaces of said shank axially coincident with said protuberances being radially outwardly inclined away from said one end, said radially outer surfaces and said inner surfaces meeting substantially at said one end whereby a member making axial sufficiently pressurized contact with said one end will cause said shank adjacent said one end to fold radially inwardly; and

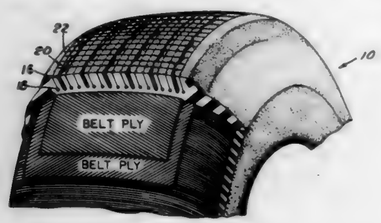
a semi-spherical, dished head attached to the other end of said shank, said head attached with its concave surface facing said one end of said shank, said dished head having a continuous, radially outer periphery defining a plane substantially normal to the axis of said shank, said defined plane being spaced from said protuberances by an axial distance less than the thickness of said aperture panel, said dished head having a continuous substantially convex surface opposite its concave surface.

4,040,464

PNEUMATIC TIRE AND METHOD OF MAKING SAME

Frank Oren Skidmore, 2513 Third St., Cuyahoga Falls, Ohio 44221

Filed Jan. 2, 1976, Ser. No. 645,992
Int. Cl.[2] B60C *9/22*
U.S. Cl. 152—361 R **8 Claims**



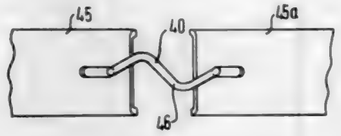
1. A pneumatic tire having a tread layer having a tread design, a carcass, a strip of siping material positioned in the tread layer over the full circumference thereof and at a depth about equal to the depth of the tread design and across a substantial width of the tread, which is characterized by the siping material including longitudinally extending cords which extend in longitudinal, substantially parallel relationship around the full circumference of the tire, said cords having great tensile strength, and being subject to minimum elongation within their designed tensile strength, said cords acting in conjunction with the tread layer to form a belt ply to reduce radial force variations in the tire under operating conditions, wherein the longitudinal cords have a tensile strength of between about 75 to about 150 pounds, and there are between about 8 to about 20 cords across the width of the tread.

4,040,465

WHEEL RIM ASSEMBLIES

William Eric Mitchell, Coventry, England, assignor to Dunlop Limited, London, England

Filed June 25, 1974, Ser. No. 483,023
Claims priority, application United Kingdom, June 30, 1973, 31287/73
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.[2] B60C *25/12*
U.S. Cl. 152—381.1 **3 Claims**



1. A method for securing a well cover band around the well of a well base rim comprising the steps of locating in position around the well, a well cover band split at one point of its circumference, attaching a link of deformable material to the ends of the band, locating a slotted tool in the gap between the ends of the band, rotating the tool to deform the link to produce a kink in the link and thereby reduce the effective length of the link to tension the band around the well, the tool being arranged to have limited angular movement between the ends of the band so as to provide a kink of predetermined dimensions.

2. A wheel rim assembly comprising a rim having a well disposed between tire bead seats, a well cover band arranged to extend circumferentially around the well so as to prevent a tire bead from entering the well, the well cover band defining in combination with the rim a circumferential groove adjacent one bead seat, the groove being arranged to receive an extended toe of the associated tire bead when a tire is mounted thereon to prevent axial inward displacement of the bead, the well cover band being provided with radially inwardly turned edges which are arranged to rest on circumferentially extending step portion formed one on each side of the well, the cover band being split at one side of its circumference, and a link of deformable material to connect the ends of the band, the link having sufficient rigidity to hold the ends of the band against circumferential displacement relative to one another after deformation of the link to secure and tension the band around the well.

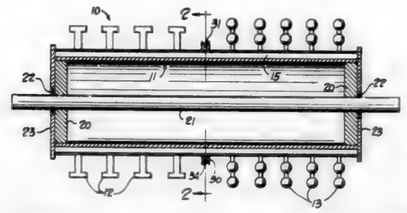
4,040,466

INVESTMENT SHELL MOLDING PROCESS

Robert A. Horton, Chesterland, and Timothy R. Bauer, Richmond Heights, both of Ohio, assignors to Precision Metalsmiths, Inc., Cleveland, Ohio

Filed Oct. 23, 1975, Ser. No. 625,137
Int. Cl.[2] B22C *09/02, 13/08*
U.S. Cl. 164—17 **2 Claims**

1. In a method of making a refractory shell mold, the improvement comprising the steps of preparing a pattern tree including a support member, patterns attached to said support member, and an outwardly projecting divider extending about the said support member, said divider having an outwardly opening, circumferential groove bounded by knife-like edges, wrapping a strand about said divider at the bottom of said



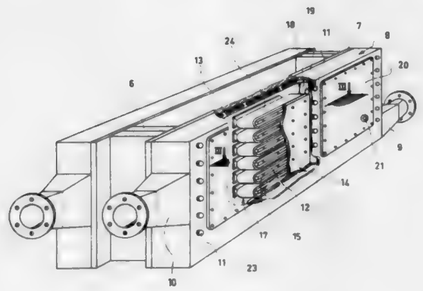
groove, applying refractory material to said tree to form a mold shell extending over said divider and embedding said strand, and thereafter unwrapping said strand to separate said shell into sections.

4,040,467

CONTINUOUS-CASTING SYSTEM WITH ELECTRO-MAGNETIC MIXING

Robert Alberny, and Louis Vedda, both of Metz, France, assignors to Institut des Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Sept. 15, 1976, Ser. No. 723,647
Claims priority, application France, Sept. 19, 1975, 75.28702
Int. Cl.[2] B22D *11/10*
U.S. Cl. 164—49 **10 Claims**



1. In a method of continuous casting wherein molten metal is poured into the top of a mold formed as an upright tube having at least one relatively long upright wall, the improvement comprising:

forming a plurality of independent magnetic fields of respective field-strength characteristics at a plurality of respective horizontally spaced locations along said long wall;

displacing each of said fields continuously vertically with a respctive speed characteristic; and

varying at least one of the characteristics of each of said fields relative to the corresponding characteristics of the other fields to vary the electromagnetic mixing effect in said metal along said long wall.

7. A continuous-casting apparatus comprising:

an upright tubular mold having a pair of long walls and a pair of short walls, whereby molten metal can be poured into the top of said mold and an ingot withdrawn from the bottom thereof continuously;

a hollow cooling box on each of said long walls;

means including respective inlets and outlets for passing a fluid coolant through said boxes thereby cooling said long walls;

a pluality of horizontally spaced groups of vertically spaced inductors in each of said boxes, each of said inductors being energizable to form a field having a respective strength characteristic and movable with a predetermined speed characteristic; and

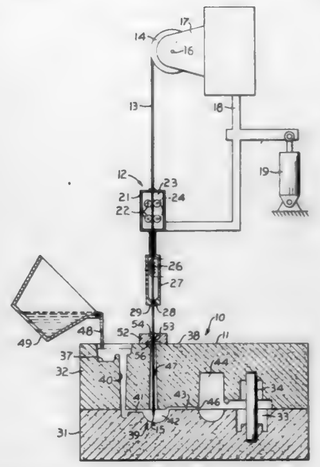
supply means for each of said groups for energizing the respective groups and varying at least one of the characteristics thereof relative to the corresponding characteristics of the other groups.

4,040,468

METHOD AND APPARATUS FOR INTRODUCING ADDITIVES INTO A CASTING MOLD

John R. Nieman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 488,756, July 15, 1974, Pat. No. 3,991,810.
This application Dec. 15, 1975, Ser. No. 640,513
Int. Cl.[2] B22D *1/00, 27/00*
U.S. Cl. 164—55 **3 Claims**



1. A method for introducing additives into a molten metal being poured into a casting cavity formed within a casting mold, comprising the steps of:

providing a passageway within the casting mold and having an upwardly extending portion and a flow path for directing molten metal into the casting cavity, said upwardly extending portion being connected to said flow path at its lower end;

positioning a wire feed mechanism above the casting mold;

lowering the wire feed mechanism relative to the casting mold to a position at which the wire feed mechanism is aligned with the upwardly extending portion of the passageway and guiding an end of the wire of additive material into the upwardly extending portion of the passageway to position said end within said portion;

feeding a flow of molten metal into and through the flow path;

feeding the wire of additive material downwardly from the wire feed mechanism into the upwardly extending portion of the passageway and into the molten metal for erodibly mixing with the molten metal prior to its entry into the casting cavity;

adjusting the feed rate of the wire to match the melting rate of the wire; and

stopping the feeding of the wire from the wire feed mechanism, and raising the wire feed mechanism relative to the casting mold to raise the end of the wire from the flow path and upwardly extending portion of the passageway at the completion of feeding the molten metal into the flow path.

2. An apparatus for introducing additives into a molten metal being poured into a casting mold comprising:

a casting mold having an internal casting cavity, and pas-

sageway means formed within the casting mold including an upwardly extending passageway and a flow path for directing molten metal into the casting cavity, said upwardly extending passageway being connected to said flow path at its lower end;

pouring means separate from the casting mold for holding and feeding a flow of molten metal through the flow path into the casting cavity;

means for holding a supply of wire of additive material remote from the casting mold;

a wire feed mechanism positioned above the casting mold and movable between a first position at which the wire feed mechanism is aligned with the upwardly extending passageway and an end of the wire is in position to be fed into the upwardly extending passageway and a second position at which the end of the wire is removed from the upwardly extending passageway, said wire feed mechanism including a plurality of drive rollers positioned above the upwardly extending passageway in at least the first position of the wire feed mechanism and a variable speed drive means drivingly connected to the drive rollers and which, when actuated, drives the drive rollers to feed the wire downwardly into the upwardly extending passageway and into the molten metal flowing through the flow path at a wire feed rate adjusted to match the melting rate of the wire;

a support on which the wire feed mechanism is mounted;

means connected to the support for moving the support and hence the wire feed mechanism relative to the casting mold between the first and second positions; and

a guide positioned outwardly of the casting mold and having a passage through which the wire passes, said passage being aligned with the upwardly extending passageway of the mold for guiding the wire into the upwardly extending passageway as the wire feed mechanism is moved to the first position.

4,040,469

CASTING OF MOLTEN METALS

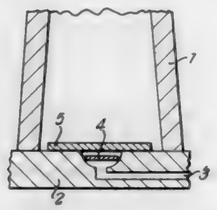
Pierre Roger Potier, La Celle Saint Cloud, France, and Tadamichi Sota, Kurashiki, Japan, assignors to Foseco International Limited, Birmingham, England

Filed June 14, 1976, Ser. No. 695,553

Claims priority, application United Kingdom, July 10, 1975, 29158/75

Int. Cl.² B22D *27/00*

U.S. Cl. 164—56 **6 Claims**



1. In a process for casting an ingot from a molten metal by bottom pouring molten metal into an ingot mould through a molten metal inlet located adjacent the bottom of said mould and wherein there is located in the ingot mould a bonded flux composition consisting essentially of at least one fluxing agent, the improvement which comprises locating in the ingot mould adjacent said inlet a bonded refractory composition consisting essentially of particulate refractory material and fibrous material, the bonded refractory composition being positioned in relation to the bonded flux composition so that molten metal first entering said mould contacts said bonded refractory composition before contacting said bonded flux composition thereby protecting the latter from the initial upsurge of molten metal when pouring commences.

4,040,470

METHOD OF CONTINUOUSLY CASTING STEEL

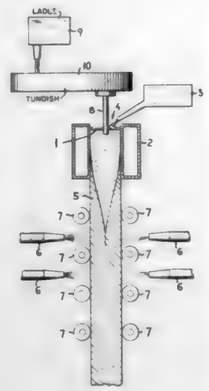
Thorwald Fastner, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Feb. 13, 1976, Ser. No. 657,727

Claims priority, application Austria, Mar. 5, 1975, 1685/75

Int. Cl.² B22D *11/10*

U.S. Cl. 164—58 **5 Claims**



1. In a method of continuously casting steel to form strands in continuous casting plants having at least one casting tube and a mould, the steel being cast into the mould through said at least one casting tube and the at least one casting tube reaching below a casting level formed in the mould wherein a casting powder is continuously supplied onto the casting level in the mould, the improvement comprising using a casting powder that contains at least one metal alloying component in metallic form to be taken up by the surface of the strand.

4,040,471

METHOD OF MAKING OR REPAIRING AND SECURING LUGS AND TRUNNION MEMBERS TO INGOT MOLDS

Walter A. McCray, Berea, and Charles L. Smith, Salem, both of Ohio, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed June 6, 1975, Ser. No. 584,298

Int. Cl.² B22D *19/10*; B23K *23/00*

U.S. Cl. 164—92 **8 Claims**

1. A method for making and securing a lug or trunnion member to an ingot mold which comprises:

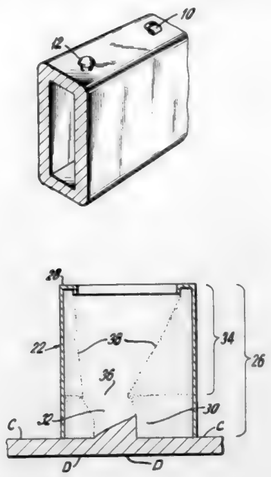
a. positioning the mold so that the area of the side of the ingot mold where the member is to be located, is substantially horizontal and uppermost;

b. forming a member casting space from a refractory material on the uppermost side of the ingot mold, said casting space having a size and shape corresponding to the shape of the member to be formed, and a bottom area of a size and shape corresponding to the base of the member where it is secured to the ingot mold and said bottom area being in registration with the base area of the side of the ingot mold where the member is to be secured, the upper most portion of the space being open and forming a top entrance to the casting space;

c. forming a casting material feeding chamber from refractory material, directly above and contiguous with the top entrance, said feeding chamber having a funnel shape, the smaller bottom opening being in registration and communicating with the entrance of the casting space entrance; the casting space and feeding chamber forming a single welding chamber closed on all sides except the top;

d. filling the welding chamber with an alumino thermic material in an amount effective to provide sufficient weld metal for forming the member; and

e. igniting said alumino thermic mixture; whereby molten metal is formed from the alumino thermic reaction, and feeds downwardly by gravitation through said feeding chamber and into the casting space to form, on cooling, the member.



4,040,472

CASTING MOULD ADVANCING PLANT

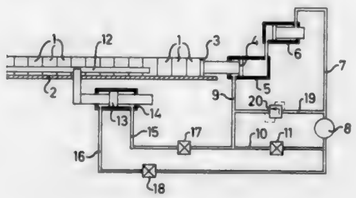
Henning Borge Lundsgart, Karlslunde, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark

Filed Sept. 17, 1976, Ser. No. 724,695

Claims priority, application Denmark, June 4, 1976, 2498/76

Int. Cl.² B22C *11/08, 19/04, 25/00*; B22D *33/04*

U.S. Cl. 164—154 **1 Claim**



1. A plant for stepwise advancing a casting mould comprising uniform mould parts which are closely piled together on a conveyor path having a preparatory section where the mould parts are successively added to the already existing casting mould by means of a hydraulically operated main piston, followed by pouring, solidification and cooling sections, of which at least the last-mentioned section includes a mould advancing device which during the advance steps is moved synchroneously with the main piston by means of at least one hydraulic unit fed with hydraulic liquid displaced by the main piston, wherein the hydraulic unit of the mould advancing device is a hydraulic cylinder with a piston, the effective area of which exceeds the effective displacement area of the main piston, said cylinder being connected to the main pump of the plant via a pipe including a differential pressure valve for supplying additional hydraulic liquid to the hydraulic cylinder when the pressure difference between the two sides of the main piston exceeds a preset value.

4,040,473

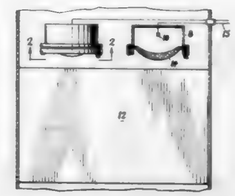
ANNULAR LENS CLEANER

Lewis Halsay Wheeler, Almond, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,164

Int. Cl.² F28D *17/00*

U.S. Cl. 165—5 **3 Claims**



1. A heat exchanger having a housing including inlet and outlet ports for a heating fluid and for a fluid to be heated, a heat absorbent matrix in said housing, means for alternately subjecting the matrix to the heating fluid and to the fluid to be heated, a detector of infrared rays being emitted by the matrix, a viewing lens confronting the matrix to focus the rays upon said detector, a source of clean air, an annular base member holding the viewing lens, an annular plenum chamber in said annular base, and an annular slot extending completely around said base member to exhaust clean air over the periphery of said lens.

4,040,474

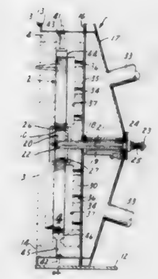
HIGH EFFICIENCY HEAT EXCHANGER WITH CERAMIC ROTOR

Paul D. Stroom, Minneapolis, and Carl J. Braunreiter, Maplewood, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 8, 1975, Ser. No. 638,831

Int. Cl.² F28D *19/00*

U.S. Cl. 165—9 **4 Claims**



1. A high effeciency, high temperature gas regenerative heat exchanger having:

a ceramic rotor formed of a plurality of parallel, axial gas flow passages and having a substantially cylindrical circumference;

a housing having front and rear partition members located near the front and back of said rotor for dividing the rotor into at least one high temperature and at least one low temperature duct;

a drive shaft assembly that is journaled in the housing for mounting said rotor, which assembly includes an outer portion and an inner portion that is rotatably disposed in said outer portion;

a pair of pressure plates having parallel surfaces, one of which plates is connected to the outer shaft portion and the other of which is connected to the inner shaft portion;

bias means for exerting oppositely directed forces on said shaft portions to urge said pressure plates toward one another to securely clamp said rotor between said parallel surfaces of said plates;

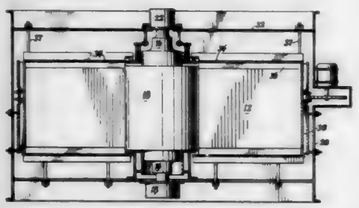
insulating means disposed on an inner portion of said housing to prevent heat transfer through the housing, said rotor and said housing being of such size that there is an annular channel between said housing and the outer circumference of said rotor, said channel being 1–10 times greater in width than the hydraulic diameter of the passages in said rotor and wherein said housing further includes means for directing sealing fluid at segments of the circumference of said rotor traversing between said partition members to provide curtain seals at such circumferential segments of said rotor.

4,040,475

AXIALLY MOVABLE SECTOR PLATE SUPPORT FOR ROTARY REGENERATIVE HEAT EXCHANGER

Richard Franklin Stockman, Friendship, and Roderick Jay Baker, Belmont, both of N.Y., assignors to The Air Preheater Company, Inc., Wellsville, N.Y.

Filed July 12, 1976, Ser. No. 704,705
Int. Cl.² F28D *19/00*
U.S. Cl. 165—9 **7 Claims**



1. Rotary regenerative heat exchange apparatus having a mass of heat absorbent material disposed for rotation concentrically about a vertical rotor post, a housing surrounding said rotor including end plates at opposite ends of the rotor having apertures that direct the flow of heating fluid and fluid to be heated through the rotor, bearing means supporting the rotor for rotation about its vertical axis, a guide bearing intermediate the upper end of the rotor post and the rotor housing adapted to preclude radial movement of the rotor post, a housing for the guide bearing supported by the rotor post and adapted to move axially with thermal expansion of the rotor, sector plates intermediate an end of the rotor and the end plates of the rotor housing adapted to separate the heating fluid from the fluid to be heated, post sealing means intermediate the radially inner end of the sector plates and the rotor post precluding the flow of fluid therebetween, and support means depending from the bearing housing adapted to simultaneously support the post sealing means and the inboard ends of the sector plates for independent radial and axial movement whereby the post sealing means and the sector plates may move freely in response to thermal variations of the rotor.

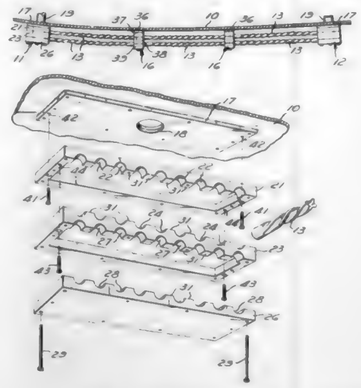
4,040,476

KEEL COOLER WITH SPIRAL FLUTED TUBES

Byron J. Telle, Louisville, and John R. Sudyk, Huntsburg, both of Ohio, assignors to The Johnson Rubber Company, Chagrin Falls, Ohio

Filed July 9, 1975, Ser. No. 594,289
Int. Cl.² F28F *9/04*
U.S. Cl. 165—76 **7 Claims**

1. An elongated marine heat exchanger system comprising a supporting hull having a curvature in the direction of the length of said system, a pair of spaced headers secured to said hull at the ends of said system, a substantially continuously helically fluted heat exchanger tube connected at each end to one of said headers for a flow of fluid between said headers, said tube being supported so that it is curved along its length to substantially match the curvature of said hull, said helical fluting of said tube permitting said tube to assume such curved condition with substantially less strain than a tube of similar



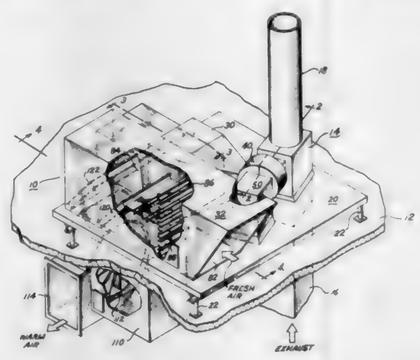
size and material without helical fluting and to transfer heat between the fluid circulated through such tube and the fluid surrounding such tube at a greater rate than a tube of similar size and material without helical fluting, said fluted tube providing cylindrical ends which are supported by said headers and intermediate cylindrical portions, and intermediate supports connected between said intermediate cylindrical portions and said hull to support said tube at locations between its ends.

4,040,477

HEAT RECOVERY APPARATUS

Thayne K. Garberick, 1510 Renfrew Drive, South Bend, Ind. 46614

Filed June 17, 1976, Ser. No. 697,237
Int. Cl.² F28D *15/00*
U.S. Cl. 165—103 **10 Claims**



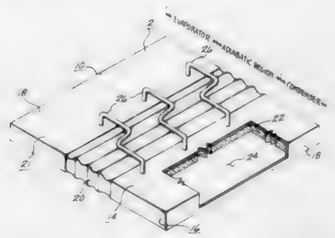
1. A heat recovery apparatus comprising an exhaust gas section having a passage therethrough for connection to a source of hot gases, a blower for forcing exhaust gases from said source through said passage, a fresh air section disposed in close proximity to said exhaust gas section and having a passage therethrough for fresh air, an outlet conduit connected to said latter passage for connection to space to be heated, a blower for forcing fresh air through said latter passage into the space to be heated, a plurality of heat pipe units, each of said heat pipe units contains a plurality of heat pipes extending from one section to the other with the evaporation ends disposed in the passage of said exhaust gas section and the condensation ends being disposed in the passage of said fresh air section, the ends of the heat pipe units in the passage of the exhaust gas section being arranged in a series flow relationship and the ends of the heat pipe units in the passage of the fresh air section being arranged in a parallel flow relationship.

4,040,478

EXTERNAL TUBE ARTERY FLEXIBLE HEAT PIPE

John T. Pogson, Seattle, and Donald A. Streck, Des Moines, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 402,655, Oct. 1, 1973, Pat. No. 3,913,665.
This application June 11, 1975, Ser. No. 586,120
Int. Cl.² F28D *15/00*
U.S. Cl. 165—105 **6 Claims**



1. A heat pipe containing a quantity of fluid and being an airtight enclosure composite structure comprising in combination:

a. first enclosure means defining a first space and a second space, said first space containing first internal conductor means for containing and transporting the fluid therethrough as a liquid, said second space being a passageway for containing and transporting the fluid therethrough as a vapor;

b. second enclosure means operatively connected to said first enclosure means and having a flexible passageway disposed adjacent to said second space of said first enclosure means so as to allow the fluid to move from said second space of said first enclosure means into said second enclosure means as a vapor;

c. third enclosure means comprising a third space and a fourth space operatively connected to said second enclosure means, said third space containing second internal conductor means for containing and transporting the fluid therethrough as a liquid, said fourth space being a passageway disposed adjacent to said second enclosure means so as to allow the fluid to move from said second enclosure means into said fourth space of said third enclosure means as a vapor; and,

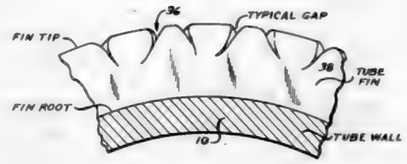
d. flexible external capillary conduit means operatively connected to said first enclosure means and to said third enclosure means, said flexible external capillary conduit means having its ends disposed adjacent to said first internal conductor means and said second internal conductor means so as to allow the fluid to move from said second internal conductor means to said first internal conductor means through said flexible external capillary conduit means, said flexible external capillary conduit means being a spring bias with respect to flexing said first enclosure means relative to said third enclosure means in one plane.

4,040,479

FINNED TUBING HAVING ENHANCED NUCLEATE BOILING SURFACE

Bonnie J. Campbell, Decatur, Ala., and Klaus R. Rieger, West Orange, N.J., assignors to UOP Inc., Des Plaines, Ill.

Filed Sept. 3, 1975, Ser. No. 610,039
Int. Cl.² F28F *13/18*
U.S. Cl. 165—133 **10 Claims**



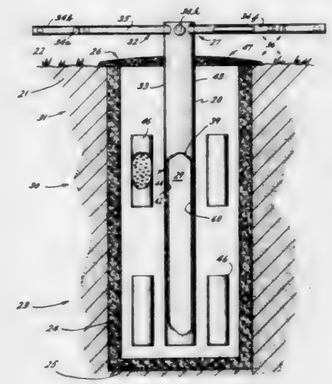
1. A heat exchanger tube comprising a tube wall having integral, radially extending fins formed in its outer surface, the tips of the fins including a plurality of fissure like transverse gaps around their peripheries, at least the majority of said gaps having a depth less than the height of the fin and a tapered width in the range from 0 to about 0.006 inches.

4,040,480

STORAGE OF RADIOACTIVE MATERIAL

Lawrence M. Richards, Monterey Park, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Apr. 15, 1976, Ser. No. 677,188
Int. Cl.² E21B *43/00*; F28D *15/00*; G21F *5/00*
U.S. Cl. 166—57 **4 Claims**



1. A system for storage of containers for radioactive material, said system consisting essentially of:

a. a lined subterranean well having a vertical axis extending up to a well head at about the earth's surface, there being at said well head, at least one access opening adapted to permit loading of containers into and out of the zone of said subterranean well;

b. a metal heat pipe comprising a vertically oriented heat absorption zone adapted to adsorb heat from said subterranean well, a heat dissipation zone adapted to dissipate heat to the atmosphere, a cavity extending into both the heat absorption zone and the heat dissipation zone, the walls of said heat pipe withstanding the pressure generated within said cavity by delays in heat dissipation from the heat dissipation zone, said cavity having a vapor space containing substantially only water vapor and water being the heat transfer fluid within said heat pipe, each wall of the cavity being an internal wall of said heat pipe;

c. at least one container of radioactive material in heat exchange relationship with said heat tube in the subterranean heat absorption zone;

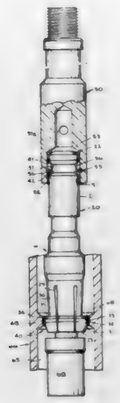
d. a closure means for the well head of the subterranean well, such closure means having a heavy weight adapted to decrease the likelihood of inadvertent or unscheduled opening of said access openings or shifting of such closure means.

4,040,481

ARRANGEMENT FOR POSITIONING A MEMBER IN A RECEIVING SECTION OF A SIDE POCKET MANDREL

Sidney G. Coussan, Lafayette, La., assignor to Production Specialties, Inc., Lafayette, La.

Filed May 17, 1976, Ser. No. 686,907
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—214 **5 Claims**



1. A latch for use with a running tool to position a member in a receiving section of a side pocket mandrel including:

a. a body having one end thereof threaded externally;

b. a threaded socket formed on the outer end of said body for engaging with the member to be positioned in the mandrel side pocket;

c. a sleeve having one end thereof configured for engagement with a running tool;

d. the other end of said sleeve having a bore therein, the innermost end of which is threaded whereby said sleeve may be threadedly engaged with said one end of said body;

e. said bore adjacent said other end of said sleeve having a plurality of longitudinally extending; circumferentially spaced slots to form a plurality of flexible portions on said other end of said sleeve; and

f. each of said flexible portions having a circumferentially extending enlargement adjacent the end thereof.

4,040,482

OPTIONAL FIRE AND RELEASE TOOL AND METHOD

Roy R. Vann, P.O. Box 38, Artesia, N. Mex. 88210

Filed June 28, 1976, Ser. No. 700,466
Int. Cl.[2] E21B *23/00, 43/119*
U.S. Cl. 166—255 **11 Claims**

5. In a well bore apparatus having a production string affixed to a packer device and extending downhole from the packer device to a perforating gun, with there being a releasable coupling member connecting the tubing together at a location between said gun and said packer, and with said gun having a firing head which is located within the interior of said tubing, the combination with said firing head and releasable coupling of a firing and releasing tool;

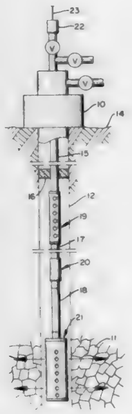
said firing and releasing tool having a main body, a plurality of circumferentially extending dogs, and a retractable member which is connected to and downwardly extends from said main body; means mounting said dogs to said main body in such a manner that said dogs can be retracted into said main body to thereby permit uphole movement of the tool;

a stop means positioned above said releasable coupling for engaging said dogs and arresting uphole movement of said tool;

said releasable coupling having a releasing member therein for engaging said dogs so that the dogs of the tool can engage and move the releasing member when the tool is moved uphole;

the distance measured from said releasable coupling to said gun head being shorter than the distance measured between said dogs and the lowermost end of said tool when the retractable member is extended, and being greater when the retractable member is retracted;

so that said tool can be run downhole and touch bottom, with the dogs being located at an elevation which is intermediate said stop means and said releasable coupling, whereupon the tool can then be picked up so that the dogs engage said stop means to thereby determine the distance from the bottom of the hole to the stop means;



and thereafter said tool can be run downhole to engage the firing head, or alternatively, the dogs can be retracted and the tool brought back to the surface of the ground.

9. The method of completing a well bore comprising the steps of:

locating a perforating gun downhole on the end of a tubing string and connecting the tubing string together with a releasable coupling device;

placing a stop means in spaced relationship above said releasable coupling device;

measuring the distance from said perforating gun to said stop means;

running a firing tool downhole within the tubing string and touching bottom above the gun;

lifting the firing tool uphole and engaging said stop means to measure the spaced distance between said bottom and said stop means;

comparing the last measurement to the first measurement;

firing the gun and subsequently releasing the releasable coupling member when the first and last measurements are equal to one another;

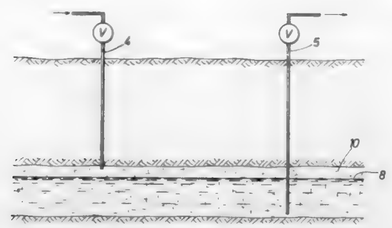
removing the firing tool from the tubing string when the first and last measurements are unequal.

4,040,483

RECOVERY OF OIL BY CIRCULATING HOT FLUID THROUGH A GAS-FILLED PORTION OF A NETWORK INTERCONNECTED FRACTURES

Jan Offeringa, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 571,463, April 25, 1975, abandoned, and Ser. No. 586,106, June 11, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,947
Claims priority, application United Kingdom, June 4, 1974, 24681/74; Mar. 14, 1975, 10730/75
Int. Cl.[2] E21B *43/25*
U.S. Cl. 166—272 **10 Claims**



1. In a process for producing oil from an extensively fractured reservoir in which oil is contained in matrix blocks of relatively low permeability which are surrounded by a network of interconnected fractures of relatively high permeability, the improvement comprising:

treating the reservoir by injecting or producing fluid to the extent necessary to form within the fracture network a substantially gas-filled gas layer overlying a substantially liquid-filled liquid layer;

injecting fluid which comprises or forms a hot fluid in a manner such that hot fluid flows into the gas layer, flows along the exposed faces of the matrix blocks, heats oil contained in the matrix blocks, and causes heated oil to be displaced into the fracture network;

producing an oil-containing liquid from within the liquid layer in the fracture network; and

correlating the rates and locations of the injections and productions of fluid so that the interface between the gas and liquid layers in the fracture network is kept at selected depths within the network of fractures.

4,040,484

GEL FORMATION BY POLYMER CROSSLINKING

James E. Hessert, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 6, 1975, Ser. No. 629,360
Int. Cl.[2] E21B *33/138*
U.S. Cl. 166—294 **10 Claims**

1. A composition capable of forming a gel for treating underground formations at a slow rate of gelling by crosslinking, said composition consisting essentially of gel forming amounts of:

a. water;

b. a water thickening amount of a water dispersible polymer selected from among the group consisting of substantially linear homopolymers and copolymers of acrylamide and methacrylamide, cellulose ethers, and heteropolysaccharides produced by fermentation of carbohydrates by bacteria of the genus Xanthomonas, said polymer capable of being crosslinked by polyvalent metal cations;

c. a polyvalent metal component chosen from the group consisting of hexavalent chromium compounds and heptavalent manganese compounds in a reducible oxidation state; and

d. a reducing agent selected from among the group consisting of $MnCl_2$, KI, $K_4Fe(CN)_6$ and $Mn(NO_3)_2$.

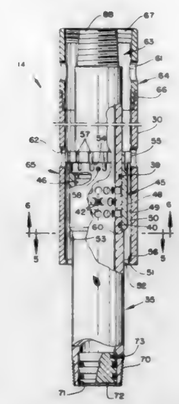
10. A method for at least partially plugging porous portions of an underground formation comprising injecting into said formation a composition of claim **1** and allowing said composition to produce a gel.

4,040,485

METHOD OF SIMULTANEOUSLY SETTING A PACKER DEVICE AND ACTUATING A VENT ASSEMBLY

Roy R. Vann, and Flint R. George, both of Artesia, N. Mex., assignors to Vann Tool Company, Inc., Artesia, N. Mex.

Division of Ser. No. 517,390, Oct. 23, 1974, Pat. No. 3,931,855, which is a continuation-in-part of Ser. No. 382,958, July 26, 1973, Pat. No. 3,871,448. This application Jan. 12, 1976, Ser. No. 648,470
Int. Cl.[2] E21B *33/129, 43/11*
U.S. Cl. 166—297 **14 Claims**



1. The method of completing a well bore comprising the steps of:

assembling a tool string comprised of a tubing string, a packer device, and a vent assembly; attaching the vent assembly in underlying relation respective to the packer device and attaching the packer device to one end of the tubing string;

connecting an extension from the packer mandrel to the vent assembly and moving the vent assembly from the closed to the opened position in response to said packer mandrel being moved from the unset to the set position;

running the tool string downhole into the borehole such that both the packer device and vent assembly are positioned at a location which is above a production formation associated with the well bore, with the tubing string extending from the well head down to the packer device;

setting the packer device while simultaneously actuating the vent assembly to the opened configuration so that flow can occur up the lower borehole annulus, into the vent assembly, into the tubing string, and out of the well head.

4,040,486

METHOD AND APPARATUS FOR AIR DEVELOPMENT AND REJUVENATION OF WATER WELLS

Joe D. Kirkland, Jr., Amarillo, Tex., assignor to Steve Taylor, Amarillo, Tex., a part interest

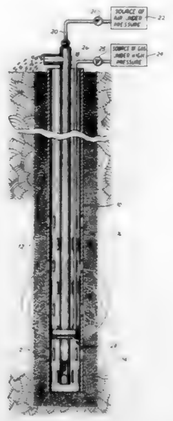
Filed May 10, 1976, Ser. No. 685,081
Int. Cl.[2] E21B *37/00, 43/00, 43/25*
U.S. Cl. 166—311 **25 Claims**

1. The method of developing a water well having an eduction tube comprising: periodically jetting slugs of high velocity air from within the well outward in all horizontal directions, and while jetting air also continuously producing enough water from the bottom of the well by the eduction tube to remove all silt and debris therefrom.

19. In a water well having

a. an eduction tube in

b. a well bore,
c. the improved structure comprising:
d. a jet ring adapted to surround the eduction tube within the well bore,



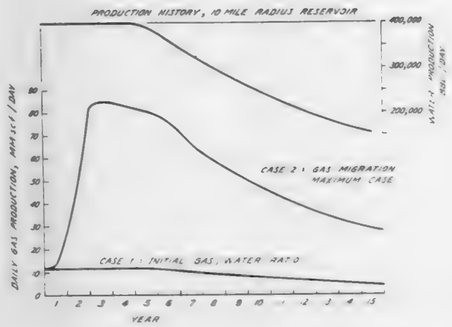
c. said jet ring forming means for jetting air at high velocity in all horizontal directions,
f. a source of high pressure air on the surface of the ground, and
g. a conduit from the source of air to the jet ring.

4,040,487

METHOD FOR INCREASING THE RECOVERY OF NATURAL GAS FROM A GEO-PRESSURED AQUIFER

Harold L. Cook, Jr.; Ernest C. Geer, both of Houston, Tex., and Donald L. Katz, Ann Arbor, Mich., assignors to Transco Energy Company, Houston, Tex.

Continuation-in-part of Ser. No. 589,240, June 23, 1975, abandoned. This application May 24, 1976, Ser. No. 689,621
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—314 **8 Claims**



1. A method of increasing the recovery of natural gas from a watered-out geo-pressured natural gas reservoir containing water, gas in solution in the water, a zone of free gas dispersed in the water, a free-gas phase, and which includes one or more wells completed in said zone in the

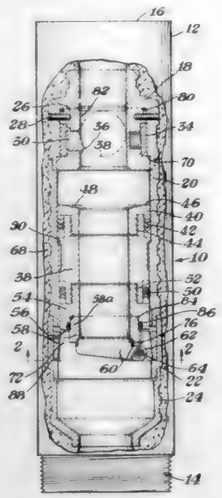
producing water from the wells under reservoir pressure, at a high enough rate of production to reduce the existing bottomhole pressure of the wells to effect the recovery of more than one form of natural gas from the reservoir by causing the natural gas to expand sufficiently so as to migrate more freely to the wells and be produced.

4,040,488

DIFFERENTIAL VALVE

Wayne F. Nelson, Wichita Falls, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Sept. 27, 1976, Ser. No. 727,074
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—317 **6 Claims**



1. Differential valve apparatus comprising within an elongated multisection inner casing having upper and lower ends, a dog retainer section, a piston section and a check valve and flow port section;

said casing having an axial bore extending therethrough, said bore having a larger diameter section intermediate of its ends,

said dog retainer section having an axial bore extending therethrough and fitting slidably within the upper part of said bore in said casing with an outwardly flanged part at its lower end which is being disposed in the larger diameter section of said casing bore, but is held in fixed position by shearable means, said dog retainer section having a retractable ball retaining means extending through its side walls and retained in place by circumferentially expandable detent means, said piston section having an axial bore extending therethrough, an upper end and a lower end, the upper end part of said piston section being of larger diameter than the remainder thereof, said upper end of said piston section being disposed in the larger diameter part of said casing bore, a pair of spaced apart seals, each seal extending around said piston section, said lower end of said piston section which is subject to pressure from below having an area less than the upper end of said section and having a wall seal containing counterbored part for sealing with a tubular walled part of said check valve and flow port section, said check valve and flow part section comprising a tubular outer part and a tubular walled inner part joined by wall sections surrounding axially disposed flow ports, said tubular walled inner part having a valve seat and check valve at its lower end, said check valve and flow port section being disposed for limited sliding movement within said casing.

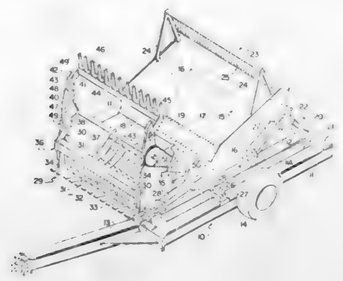
4,040,489

ROCK PICKER

Leslie Hulicsko, 1421-7th Avenue, Regina, Canada

Filed Jan. 30, 1976, Ser. No. 654,056
Claims priority, application Canada, June 4, 1975, 228661
Int. Cl.[2] A01B *43/00*
U.S. Cl. 171—63 **14 Claims**

1. A rock picker comprising in combination a supporting frame, a stone bucket in said frame, ground engaging wheels mounted on said frame, a prong assembly mounted within said frame, means mounting said prong assembly for raising and lowering same relative to the ground, a rotary rake assembly mounted in said frame above said prong assembly, and power means operatively connected to said rotary rake assembly for rotating same at varying speeds and in either direction, said rotary rake assembly cooperating with said prong assembly to move stones from said prong assembly into said stone bucket, said rotary rake comprising a cross shaft journalled for rotation in said frame above said prong assembly, at least two sets of



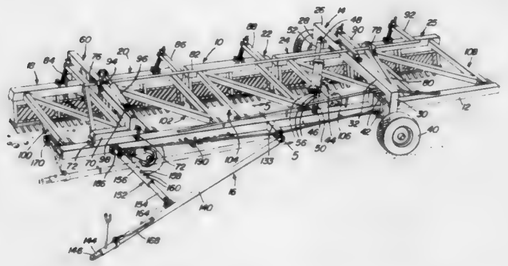
raking teeth mounted diametrically upon said shaft, means mounting said teeth upon said shaft, said last mentioned means including a pair of side flanges secured one to adjacent each end of said shaft, stop means on said side flanges adjacent each end thereof, a mounting member pivoted by one end thereof to adjacent each end of said side flanges, a cross bar extending between the other ends of the corresponding mounting members of said side flanges, and a plurality of stone picking teeth secured to and extending from said cross bar, and tension spring means extending between said mounting member and said side flanges normally urging said mounting member against said stop means.

4,040,490

ROCK WINDROWER

Raymond R. Anderson, Ray, N. Dak. 58849

Filed Mar. 8, 1976, Ser. No. 665,100
Int. Cl.[2] A01B *43/00*
U.S. Cl. 171—63 **9 Claims**



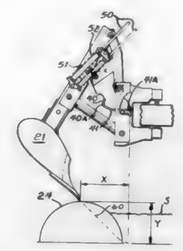
1. A windrower including an elongated main frame having front and rear ends, a rear transverse axle assembly, first support means supporting said axle assembly from said frame for adjustable angular displacement in a horizontal plane relative to said frame, front towing means supported from said frame for adjustable shifting transversely thereof operative in conjunction with adjustment of said axle assembly to establish an angularly adjustable towed relationship of said frame relative to the path of movement of said windrower as the latter is towed behind a towing vehicle to which towing means is attached, said frame including longitudinally extending transversely facing rake means.

4,040,491

AUTOMATIC RESET PLOW

William J. Dietrich, Congerville, Ill., assignor to DMI, Inc., Goodfield, Ill.

Filed Aug. 15, 1975, Ser. No. 605,160
Int. Cl.[2] A01B *61/04*
U.S. Cl. 172—269 **9 Claims**



1. An automatic reset plow comprising: a linkage assembly connected at a forward position to a draft member; a plow bottom carried by said linkage assembly; cam means comprising a cam member defining a cam surface having first and second portions and a cam follower engaging said first portion of said cam surface when said plow is in a normal plowing position and adapted to engage said second portion of said cam surface when said plow is raised from a normal plowing position; and resilient means connected between said cam means and said linkage assembly for urging said cam surface into engagement with said cam follower and for urging said plow bottom in the plowing position; whereby said cam member and cam follower remain engaged during raising and reset of said plow and the shape of said second portion of said cam surface controls the reset force on said plow.

4,040,492

MODULAR LEADS FRAME WITH NOISE ABATEMENT SYSTEM AND PILE FEEDER

Leonard L. Frederick, 15 Crestview Terrace, Whippany, N.J. 07981

Division of Ser. No. 359,782, May 14, 1973, Pat. No. 3,887,017, which is a continuation-in-part of Ser. No. 142,173, May 11, 1971, Pat. No. 3,747,689. This application Oct. 23, 1974, Ser. No. 517,153
Int. Cl.[2] E02D *7/06*
U.S. Cl. 173—1 **2 Claims**



1. A method of abating noise in a pile driving machine when operating to drive a pile, the machine including a boom, a leads

frame operatively associated therewith and a pile driving hammer, with the leads frame extending substantially the full length of the undriven pile, the method comprising the steps of:

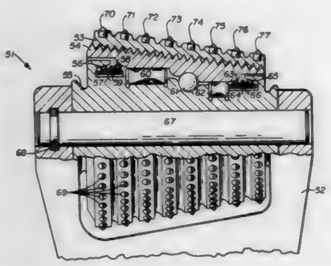
a. fixedly mounting a first set of noise abating means to the leads frame, along the full extent thereof;
b. mounting a second set of noise abating means to the leads frame in approximate location with the driving hammer for displacement along the leads frame with the driving hammer;
c. moving certain ones of the second set of noise abating means relative to other ones thereof to establish an overlapping relationship therebetween; and
d. moving the overlapped second set of noise abating means with the driving hammer throughout its driving range.

4,040,493

ROCK BORING CUTTER WITH THREAD-ON REPLACEABLE CUTTING ELEMENT

William Craig Saxman, Irving, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 13, 1976, Ser. No. 685,838
Int. Cl.[2] E21B *9/08*
U.S. Cl. 175—374 **2 Claims**



1. A cutter apparatus for earth boring, comprising:
a saddle having a pair of support arms;
a bearing shell mounted between said support arms;
an inner cutter shell mounted for rotation about said bearing shell, said inner cutter shell having a generally tapered conical exterior surface;
threads on said generally tapered conical exterior surface of said inner cutter shell;
an outer cutter shell mounted over said inner cutter shell, said outer cutter shell having an outer surface and a central passage, said central passage having a conical surface;
threads on said conical surface of said central passage that engage the threads on said generally tapered conical exterior surface of said inner cutter shell; and
a multiplicity of carbide inserts mounted in said outer surface of said outer cutter shell.

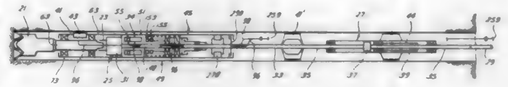
4,040,494

DRILL DIRECTOR

Jackson M. Kellner, Midland, Tex., assignor to Smith International, Inc., Midland, Tex.

Continuation-in-part of Ser. No. 584,736, June 9, 1975, which is a continuation of Ser. No. 505,450, Sept. 13, 1974, abandoned, which is a continuation of Ser. No. 419,106, Nov. 26, 1973, abandoned. This application Sept. 15, 1975, Ser. No. 613,060
Int. Cl.[2] E21B *7/04*
U.S. Cl. 175—45 **19 Claims**

1. Drilling apparatus comprising
an in-hole assembly adapted to be run in a hole being made, said in-hole assembly including,
an in-hole motor having a shaft rotated when the motor is actuated, said shaft being adapted to rotate a drill bit,
a deflection barrel rotatable about the shaft axis,
positioning means for turning the barrel to a desired azimuthal position relative to the axis of rotation of the motor shaft and holding it in that position, said positioning means including a single hydraulic line for actuation, and
said apparatus further comprising
command means for directing said positioning means through said single hydraulic line,



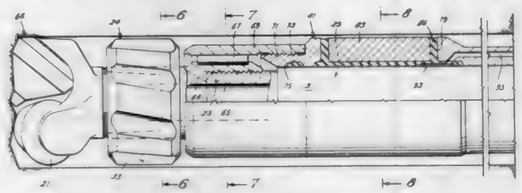
said deflection barrel including means extendable from the side thereof to engage one side of a hole being drilled and means to push the shaft laterally toward the opposite side of the hole,
said in-hole motor including a housing, said deflection barrel being connected to said housing and said positioning means turning said barrel along with said motor housing.

4,040,495

DRILLING APPARATUS

Jackson M. Kellner, Midland, and William R. Garrett, Houston, both of Tex., assignors to Smith International, Inc., Midland, Tex.

Filed Dec. 22, 1975, Ser. No. 643,254
Int. Cl.[2] E21B *7/08, 3/12*
U.S. Cl. 175—73 **25 Claims**



1. Earth boring apparatus comprising
a string of pipe,
an in-hole motor having a stator affixed to one end of said pipe string, and
a deflection means affixed to said pipe string,
said deflection means comprising a barrel disposed about said motor stator, one end of said barrel being connected to said one end of said pipe string, and means at an other portion of said barrel for engaging an outer peripheral portion of said motor shaft.

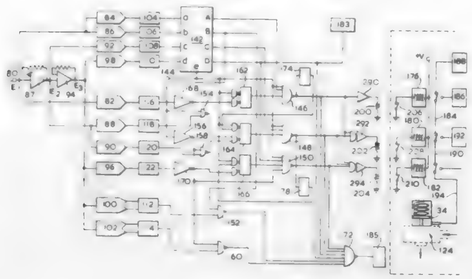
4,040,496

AUTOMATIC WEIGHING MACHINES

Thomas William Wilson, Bramhall, and Michael Johnston Topham, Sale, both of England, assignors to Tootal Limited, Manchester, England

Filed June 9, 1975, Ser. No. 584,842
Claims priority, application United Kingdom, June 18, 1974, 26862/74
Int. Cl.[2] G01G *13/04*
U.S. Cl. 177—105 **10 Claims**

1. An automatic weighing machine for weighing out a predetermined quantity of fluid material into a container, including a fluid material valve of the downward delivery type comprising a closure member having a plurality of selectable discrete positions corresponding to different predetermined flow rates through the valve, and a weighing control system which is adapted to control the valve so as to dispense an appropriate weight of fluid material into the container in accordance with a predetermined program, the control system comprising load cell means arranged to provide an electrical output dependent upon the weight of the container plus its contents, and a comparator for comparing the signal from said load cell means with a predetermined target weight to be achieved in accordance with the program to provide an electrical error signal instantaneously representative of the additional weight of fluid material to be dispensed and dynamic



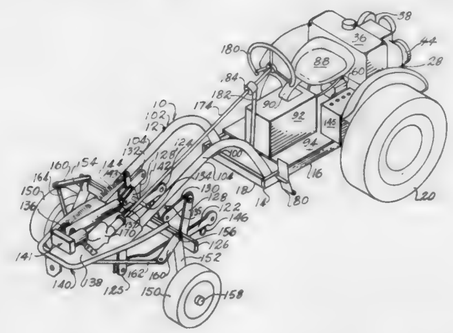
detector means responsive to both the magnitude of the instantaneous error and the rate of change of the error for initiating a change in the valve from a positive flow position to OFF in advance of the error reducing to zero.

4,040,497

TRACTOR

Harold D. Thomas, Cumming, Ga., assignor to Tri Tractor Manufacturing Co., Inc., Cummings, Ga.

Filed Aug. 11, 1975, Ser. No. 603,742
Int. Cl.[2] B60K *17/28*
U.S. Cl. 180—53 R **12 Claims**



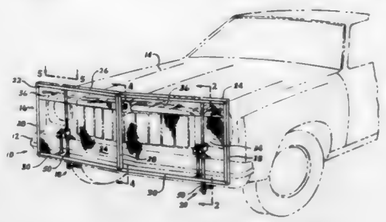
1. In a tractor, an elongated tractor frame, driving wheels mounted on the rear portion of said frame and front wheels steerably mounted on the forward portion of said frame, means for steering said front wheels, an engine mounted on the rear portion of said frame for driving said rear wheels, an operator's seat mounted on said frame positioned forwardly of said engine, an implement space defined by said frame behind said front steerable wheels and in front of said seat, and means for supporting an implement in said implement space comprising a pair of implement support arms each pivotally mounted at its forward end on said frame in front of said implement space and extending rearwardly toward said implement space for supporting an implement in said implement space a lever system for pivoting said implement support arms upwardly and downwardly about their forward ends comprising a pair of connecting arms each connected at one of its ends to an intermediate portion of one of said implement support arms, a control rod extending across the length of said frame and supported at its ends on said frame and including levers extending rearwardly therefrom and connected to said connecting rods, a pivoted shifting lever mounted on said control rod and arranged to pivot said levers about said control rod, and power operated means mounted on said frame and arranged to pivot said pivoted shifting lever, whereby the power operated means actuates the lever system to cause said implement support arms to pivot upwardly and downwardly about their forward ends and raise and lower the implement carried thereby.

4,040,498

INSECT SHIELD ASSEMBLY

James B. Johnson, and Jesse L. Henson, both of Urbana, Ohio, assignors to W. B. Marvin Mfg. Co., Urbana, Ohio

Filed Nov. 6, 1975, Ser. No. 629,376
Int. Cl.[2] B60K *11/02*
U.S. Cl. 180—68 P **6 Claims**



1. An insect shield assembly comprising:
a shield including a peripheral frame structure having an upper portion and a lower portion; and
means for removably mounting said shield on a vehicle, said means comprising:
a pair of mounting members, means for removably mounting said mounting members on the front of a vehicle, said mounting members when mounted on the front of the vehicle having generally vertically extending parts projecting above said
means for removably mounting them on a vehicle; and
a pair of brace means, one for each mounting member, each of said brace means comprising a first generally vertical brace member connected to said upper portion of said frame structure,
a second generally vertical brace member connected to said lower portion of said frame structure, said brace memers having adjacent, offset end portions, and
clamp means interconnecting said end portions, the lowermost ends of said first brace members being telescopically interengaged with said generally vertically extending parts for orienting said shield in a generally vertical position in front of the vehicle, said clamp means having surfaces engaging said mounting members to limit the length of interengagement of said first brace members and said generally vertically extending parts and to provide support for said shield, so that said shield and said brace means may be mounted on and removed from the vehicle as a single unit.

4,040,499

VEHICLE CONTROL ARMREST IN A VIBRATION ISOLATED CONTROL MODULE

Anthony M. Kestian, Berwyn, and Raymond J. Allori, Chicago, both of Ill., assignors to International Harvester Company, Chicago, Ill.

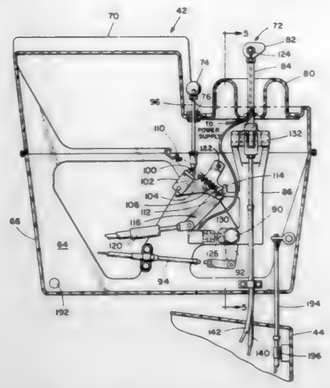
Division of Ser. No. 571,442, April 25, 1975, which is a continuation-in-part of Ser. No. 432,799, Jan. 11, 1974, abandoned. This application Dec. 10, 1975, Ser. No. 639,564
Int. Cl.[2] B60K *23/00*
U.S. Cl. 180—77 R **4 Claims**

1. An armrest control for use in a vehicle having controllable equipment, the armrest control comprising:
a podium carried in the vehicle, the podium having an inclined uppermost surface sloping from the rear of the podium toward the front of the podium, a pivot point

means appended to the rear uppermost surface of the podium,

a housing pivotally mounted to the uppermost surface of the podium, the housing containing a frame structure provided with a housing pivoting means that is accommodated by the pivot point means of the podium;

a push-pull shielded cable affixed at one end to the frame structure in said housing, passing out of the housing into the podium wherein the shielding of the cable is securely affixed to the podium, movement of the push-pull cable responsive to the pivotal movement of the housing;



a control stick pivotally mounted to the frame structure inside the housing displaceable in planes perpendicular as well as parallel to the axis of pivotal mounting of the housing;

a second push-pull cable (**94**) attached to the control stick communicating movement of the control stick in a plane perpendicular to the axis of pivotal mounting of the housing to the vehicle; and

first and second steering push-pull cables mounted to the control stick communicating movement of the control stick in a plane perpendicular to the axis of pivotal mounting of the housing to the vehicle.

4,040,500

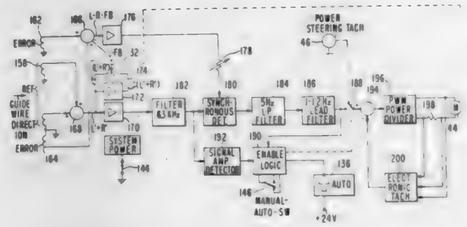
GUIDANCE SYSTEM FOR LIFT TRUCK

Thomas R. Blakeslee, Woodside, Calif., assignor to Logisticon, Inc., Sunnyvale, Calif.

Filed Nov. 6, 1975, Ser. No. 629,491

Int. Cl.² B62D *1/24*

U.S. Cl. 180—98 **6 Claims**



1. An improved, self-guided vehicle of the type which automatically follows an externally defined course and which has at least one ground engaging steering wheel, sensor means mounted on the vehicle for generating a sensor signal representative of both the lateral position of the vehicle with respect to the course and the direction of vehicle travel with respect to the course, steering motor means attached to the ground engaging steering wheel for steering the vehicle in response to a steering control signal to the steering motor means, and steering circuit means supplied with the sensor signal for generating a first steering control signal for the steering motor means to cause the steering motor means to automatically steer the vehicle along the external course, wherein the improvement comprises:

enabling logic means supplied with the sensor signal for producing an enabling output signal when the vehicle is being manually steered toward the external course and has crossed it, or passed within a predetermined distance of it, and thereafter is moving away from the external course, and

switching means supplied with the enabling output signal to supply the first steering control signal to the steering motor means only after the enabling output signal is generated, whereby the vehicle will become automatically guided along the external course only after it has been manually steered across or just up to the external course and is starting to move away from it.

4,040,501

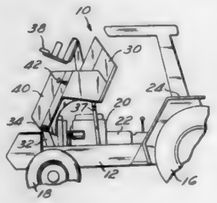
LIFT TRUCK

John W. Haswell, 44429 Harmony Lane, Belleville, Mich. 48111

Filed Apr. 26, 1976, Ser. No. 680,193

Int. Cl.² B62D *25/10*

U.S. Cl. 180—89.18 **2 Claims**



1. A fork lift truck having a chassis, a fork lift mounted at one end of said chassis in front of a pair of front wheels, an engine mounted on said chassis adjacent the rear end of the chassis, a drive train from said engine to said front wheels, a shroud covering said engine and said drive train, one edge of at least a portion of said shroud having apertures therein, said apertures receiving pins fixed to the chassis so that said portion of the shroud may be pivotally raised relative to remaining portions of said shroud to expose said engine and drive train, said portion of said shroud including a hatch covering the engine, one edge of said hatch having apertures therein, said apertures receiving said pins fixed to the chassis so that said hatch may be opened to expose only said engine.

4,040,502

HYDRAULIC POWER STEERING

Hiroshi Yoshida, Toyokawa; Hajime Kozuka; Toyoshi Sakano, both of Okazaki; Yoichiro Honda, Kasugai, and Shojiro Omuro, Nagoya, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Jukogyo Kabushiki Kaisha, both of, Japan

Filed July 23, 1975, Ser. No. 598,402

Claims priority, application Japan, July 24, 1974, 49-88848[U]

Int. Cl.² B62D *5/06*

U.S. Cl. 180—149 **7 Claims**

1. A hydraulic power steering system, comprising:

a drag link having first and second end portions disposed respectively on first and second side portions of a vehicle;

a steering shaft for the vehicle disposed on the first side portion and having an end portion adjacent the first end portion of the drag link;

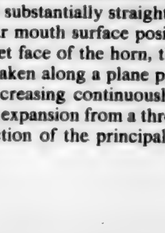
a steering gear box interposed between the end portion of the steering shaft and the first end portion of the drag link and mounted on the first side portion of the vehicle, the gear box having a pitman arm for displacing the drag link laterally of the vehicle to steer the vehicle if a steering input is applied to the steering shaft;

a changeover valve disposed on the first side portion and interposed between the end portion of the steering shaft and the gearbox;

control means for operating the changeover valve in accordance with the steering input;

an actuator disposed on the second side portion of the vehicle and having a power assist arm rotatable thereby to assist the pitman arm's displacing of the drag link; and

a pressure system controlled by the changeover valve for operating the actuator, which pressure system includes a pressure source, a pressure sink, and rotary passage means disposed on the first side portion and defining a first pressure passage to interconnect the pressure source and the pressure sink with ports of the changeover valve, and a second pressure passage to interconnect other ports of the



changeover valve with the actuator for operating the actuator and thereby the power assist arm and the drag link in response to the operating of the changeover valve,

the rotary passage means comprising a control housing, a rotor therein, means at the end portion of the steering shaft for thereby rotating the rotor in response to rotation of the steering shaft, and means in the rotor for slidably supporting the changeover valve for operation of the valve, independent of the rotating of the rotor, to control the actuator;

the pressure system also including pressure chambers in the control housing, at both ends of the rotor, the rotor having a passage therein, interconnecting the pressure chambers to equalize pressures in the chambers and thereby to facilitate the rotating of the rotor by the end portion of the steering shaft;

the actuator being remote from the gearbox, being disposed adjacent the second end portion of the drag link, and being mounted on the second side portion of the vehicle, independently of the gearbox.

4,040,503

HORN SPEAKER

Masanori Hino, Hirakata; Taro Eguchi, Osaka, and Chitoshi Shiraga, Yagumo, all of Japan, assignors to Onkyo Kabushiki Kaisha, Japan

Division of Ser. No. 432,879, Jan. 14, 1974, Pat. No. 3,972,385. This application May 10, 1976, Ser. No. 684,928

Claims priority, application Japan, Jan. 17, 1973, 48-8056; Jan. 17, 1973, 48-8057; Mar. 10, 1973, 48-28438; Mar. 19, 1973, 48-31574

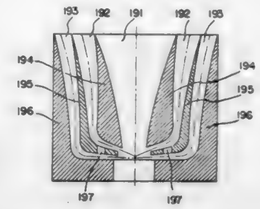
Int. Cl.² G10K *11/00*

U.S. Cl. 181—192 **1 Claim**

1. A horn speaker comprising a diaphragm, a side wall, and at least one interior sound partition, forming at least two passages for radiating sound waves emitted from the diaphragm, the horn speaker having a substantially straight principal horn axis and a generally planar mouth surface positioned substantially in parallel to the inlet face of the horn, the area of each sound passage in section taken along a plane perpendicular to the principal horn axis increasing continuously at a substantially constant rate of area expansion from a throat to the plane of the mouth in the direction of the principal horn axis, the horn speaker being characterized in that said at least one interior sound partion has inner and outer surfaces, at least said outer surface being curved along the principal horn axis to give substantially the relationship for each sound passage represented by the equation:

$$l = -f + \sqrt{(l_0 + f)^2 + y^2}$$

wherein l is the effective length of the sound passage for propagating sound waves from the diaphragm to a point at a distance of y from the intersection of the principal horn axis with the mouth plane, the point being positioned on at least one first straight directional line contained in the mouth plane and passing through the intersection, l o is the length of the principal horn axis and f is a virtual focal distance; and wherein:



the mouth surface is generally circular, and every diametrical direction of the plane of the mouth substantially coincides with the directional line;

said at least one interior sound partition, as seen in cross section parallel to the mouth plane, is annular in shape and coaxial with the principal horn axis, whereby said at least two sound passages defined by said at least one interior sound partition and the side wall, as seen in cross section parallel to the mouth plane, include a circular sound passage coaxial with the principal horn axis and at least one annular sound passage concentric with the circular sound passage; and

at least one of said at least one interior sound partition defines a plurality of circumferentially spaced bores, or passageways, through the sound partition.

4,040,504

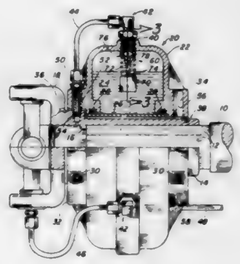
DRIVE SHAFT U-JOINT LUBRICATOR

Roy B. Smith, 3480 NE. 62, Washington Court House, Ohio 43160

Filed Nov. 26, 1975, Ser. No. 635,439

Int. Cl.² F01M *9/00*

U.S. Cl. 184—1 E **1 Claim**



1. A method of mounting lubricating apparatus on the drive shaft of a previously assembled commercial vehicle, said drive shaft having an end with longitudinally extending splines on the periphery, said splines extending only part of the length of the shaft, a yoke mounted on the shaft and having mating internal splines, said yoke comprising part of a universal joint; comprising in sequence,

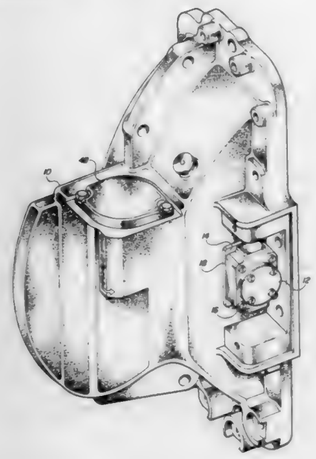
first disconnecting said universal joint and removing the yoke from the shaft,
second sliding an annular dynamically balanced lubricant reservoir over the shaft past the splines,
third reattaching the yoke and shaft in operable position with the splines again mating,
fourth rigidly attaching said reservoir to said shaft and yoke combination, and
fifth attaching conduits to said yoke and reservoir to conduit lubricant from said reservoir to said yoke,
providing means within said reservoir prior to its assembly on the shaft to force lubricant from said reservoir into said conduits upon rotation of said shaft.

4,040,505

LUBRICATION SYSTEM FOR EARTH MOVING EQUIPMENT

Thomas Anthony Beveridge, Rochester, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Oct. 29, 1975, Ser. No. 626,650
Int. Cl.[2] F01M *11/00*
U.S. Cl. 184—6.28 **1 Claim**



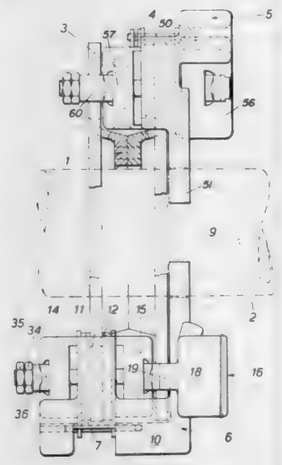
1. A lubrication system for earthmoving equipment of the type having a final drive enclosed in a closed housing which forms a lubricant sump and has lubricant lines interior thereof for directing lubricant to lubrication points, said closed housing having an access opening located on a side thereof above the level of the lubricant in said sump, said final drive including a lubricant pump drive gear means operable with said final drive and aligned with said access opening, comprising
removable access cover means for sealingly closing said access opening,
lubricant pump means assessmbled and secured to the exterior of said access cover means and adapted to be removed from said access cover means without removing said cover means from said access opening and being removable, with said cover,
filter means assembled in said access cover means so as to be removable from the exterior thereof without removing said cover means from said access opening and being removable with said cover,
lubricant line means comprising inlet line means, pump inlet line means, pump and filter interconnecting line means and discharge line means, said inlet line means depending downward from the interior of cover-means and terminating in an inlet screen means below the level of the lubricant in said sump, said pump inlet line means being assembled and secured to the interior of said cover means and connecting said inlet line means to the inlet port of said lubricant pump means, said interconnecting line means being secured to the interior of said cover means between the inlet of said filter means and the outlet port of said lubricant pump means, said discharge line means being assembled and secured to the interior of said cover means and connecting the outlet of said filter means to discharge coupling means whereby when said access cover means is assembled to said access opening said lubricant pump means is connected at its inlet to said lubricant sump, the inlet of said filter means being connected to the output of said lubricant pump means and the outlet of said filter means is connected through said discharge coupling means to said lubrication points, and
drive means for connecting said lubricant pump means to said lubricant pump drive gear means, whereby each time said drive means is operated said lubricant pump means withdraws lubricant from said lubricant sump and directs it through said lubricant lines means and said filter means to said lubrication points.

4,040,506

HYDRAULICALLY OPERATED DISC BRAKES FOR VEHICLES

Charles Newstead, Walsall, England, assignor to Girling Limited, Birmingham, England

Division of Ser. No. 559,591, March 18, 1975, Pat. No. 3,966,025, which is a continuation of Ser. No. 464,222, April 25, 1974, abandoned, which is a continuation of Ser. No. 170,254, Aug. 9, 1971, abandoned. This application Feb. 24, 1976, Ser. No. 660,973
Claims priority, application United Kingdom, Aug. 21, 1970, 40275/70
Int. Cl.[2] F16D *55/228*
U.S. Cl. 188—72.5 **7 Claims**



1. A disc brake assembly for a vehicle including a first axially fixed outboard rotatable disc, a second axially fixed inboard rotatable disc rotatable with and spaced axially from said first disc, in an inborad direction, each disc having an inner face, an outer face, a radially innermost peripheral edge from which said disc is driven, and a free radially outermost peripheral edge, said inner face of said first outboard disc facing said inner face of said second inboard disc and said outer face of each disc facing outwardly away from the other disc, a first pair of friction pads for engagement with said inner and said outer faces of said first outboard disc, a second pair of friction pads for engagement with said inner and said outer faces of said second inboard disc, first and second fluid-pressure operated actuators for applying said first and second pairs of friction pads to said inner and outer faces of each respective said first and second disc, said first and second actuators being both

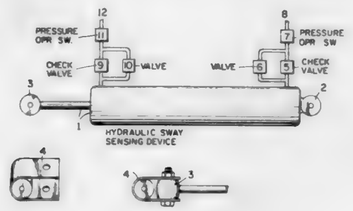
located adjacent to said outer face of said second inboard disc, a first pair of inner and outer axially movable pressure plates for urging said first pair of friction pads into engagement with said inner and outer faces of said first outboard disc, a second pair of inner and outer axially movable pressure plates associated with said second pair of friction pads, said second actuator comprising means for axially moving said second pair of inner and outer pressure plates and for urging said second pair of friction pads into engagement with said inner and outer faces of said second inboard disc and including an applying portion extending over said outermost peripheral edge of said inboard disc and wherein said first actuator comprises a pair of circumferentially spaced hydraulic cylinders, a piston working in each hydraulic cylinder, a co-axial tubular portion carried by each cylinder, extending over said outermost peripheral edge of second inboard disc, and acting on said inner pressure plate of said first pair to apply an adjacent friction pad to said inner face of said first disc, and a draw-bar guided through each tubular portion and through which said last mentioned piston acts on said outer pressure plate of said first pair to apply the other friction pad of said first pair to said outer face of said first disc, both said pressure plates of said first pair lying on a first common chord passing through the centers of pressure of said first pads, and including a first stationary member straddling the outermost peripheral edge of said first outboard disc and extending over said outermost peripheral edge of said inboard disc, said first stationary member having a gap in which said first pair of friction pads are located and are guided for movement towards and away from said first disc, and said stationary member also having circumferentially spaced openings through which said draw-bars of said first actuator are slidably guided, and a relatively stationary part adjacent to said outer face of said inboard disc, and to which said first stationary member is secured.

4,040,507

AUTOMATIC TRAILER SWAY SENSING AND BRAKE APPLYING SYSTEM

Herman A. Reise, 513B Portsmouth Drive, Lakewood, N.J. 08701

Filed Nov. 6, 1975, Ser. No. 629,603
Int. Cl.[2] B60T *7/20*
U.S. Cl. 188—112 **1 Claim**



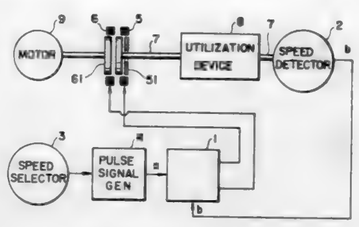
1. A sway control system for controlling brakes of a towed vehicle in response to the detection of a sway condition comprising:
a hydraulic unit having first and second ends mounted to coupling means between the towed vehicle and a towing vehicle, which hydraulic unit includes first and second fluid passages associated with said first and second ends of the unit each passage including a check valve shunted by a bypass restricted orifice and a pressure switch, and
an electric brake circuit for applying and releasing the brakes of the towed vehicle in response to said pressure switches being opened or closed, said hydraulic unit constituting a sway detection device for sensing the onset of a sway condition of a towed vehicle relative to a towing vehicle.

4,040,508

CONTROL CIRCUIT FOR CONTROLLING THE SHAFT SPEED OF A MOTOR HAVING CLUTCH AND BRAKE DEVICES

Masayoshi Sunada, and Kuniaki Kubokura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 13, 1976, Ser. No. 648,674
Claims priority, application Japan, Jan. 20, 1975, 50-7810
Int. Cl.[2] F16D *67/07*
U.S. Cl. 192—12 D **7 Claims**



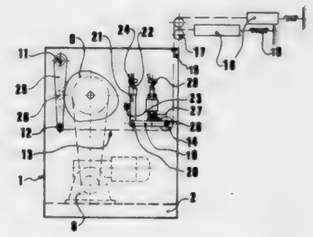
1. A control circuit for controlling the shaft speed of a motor having clutch and brake devices comprising:
a speed detector for detecting the actual rotating speed of said shaft and generating a first pulse signal having a period in inverse proportion to said actual rotating speed;
a speed selector for setting a desired-speed of said shaft;
a signal generator for generating a second pulse signal having a period in inverse proportion to the desired-speed from said speed selector;
first means for detecting the ratio of the period of the first signal to the period of the second signal; and
second means for actuating said brake device where said ratio is less than or equal to a predetermined value, for actuating said clutch device when said ratio exceeds said predetermined value.

4,040,509

AUTONOMOUS GROUP FOR MECHANICAL CONTROL OF MACHINES

Jean Leon Missioux, 55 Boulevard Gambetta, 95 Sannois, France

Filed Nov. 24, 1975, Ser. No. 634,628
Claims priority, application France, Dec. 4, 1974, 74.39588
Int. Cl.[2] F16D *71/00*; B65H *25/14, 25/32*
U.S. Cl. 192—150 **7 Claims**



1. Transmission group for mechanical control of machines comprising an independent assembly including at least one rotating shaft, at least two cams removably mounted on said shaft, a pivoted lever engaging each of said cams, a non-extensible flexible member connected to each of said levers and to the machine to be controlled outside of the group, said non-extensible flexible members transmitting the cyclical movement of said cams to the machines to be controlled, security means reacting to variations of tension in said non-extensible flexible members to stop the control group upon occurrence of

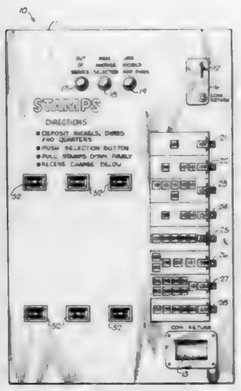
an excessible variation of tension in said non-extensible flexible members between said levers and the machines to be controlled, a housing for the independent transmission group, a driving motor in said housing rotating said shaft, a base for the transmission group, said housing including at least two walls removably mounted on said base and disposed opposite each other and two vertical spaced parallel plates within said walls and secured to said base, said two vertical walls supporting said shaft, said shaft extending across said base.

4,040,510

STAMP VENDING MACHINE

Walter A. Peters, Schaumburg; Curtis A. Hozian, Wheeling, and Richard W. Gusek, Chicago, all of Ill., assignors to Gard, Inc., Niles, Ill.

Filed June 17, 1976, Ser. No. 697,024
Int. Cl.[2] G07F *11/68*
U.S. Cl. 194—2 **11 Claims**



1. A vending machine useful for dispensing stamps from one or more rolls of strips of stamps during a transaction, which comprises:

a housing having a front panel with a number of holes;

money acceptor/rejector means having at least one output terminal to provide a voltage signal in response to a predetermined minimum value of money added to said acceptor/rejector means for a transaction;

a number of manually operated switches electrically coupled to said at least one output terminal of said acceptor/rejector means;

main control logic means mounted within said housing and being constructed to have a first set of outputs to provide selectively a voltage signal at one of said first set of outputs and to have additional sets of outputs to provide, by one or more of each additional set of outputs, binary information as voltage signals;

at least first and second stamp-dispensing mechanisms, as modules, mounted within said housing, each module including:

support means having a portion constructed to support a roll of a strip of stamps for free rotation of the roll about the axis of the roll;

an enclosure mounted on one margin of said support means and spaced from said portion of said support means that rotatively supports a roll of stamps, said enclosure being in alignment with one of said holes of said front panel and said enclosure having a slot for passage of a strip of stamps through said slot of said enclosure;

motor means mounted on said support means and including a motor and an output shaft;

stamp-feeding means mounted on said support means and including a feed wheel that is operatively connected to said output shaft of said motor means and is located between said enclosure and said portion of said supporting means that rotatively mounts a roll of the strip of stamps, said stamp-feeding means being constructed to move the strip of stamps by said feed wheel to and through said slot of said enclosure; and

module control logic means mounted on said support means, said module control logic means being constructed with one input and a set of inputs to be responsive to a signal provided to said one input and to signals, providing binary information, to said set of inputs from said main control logic means to initiate the operation of said motor and to stop the operation of said motor;

first set of electrical coupling means, each coupling means of said first set being connected to a different one of said first set of outputs of said main control logic means and to said one input of a different one only of said module control logic means of said modules; and

additional sets of coupling means, each set being connected to a different one of said additional sets of outputs of said main control logic means and to said set of inputs of said module control logic means of a different one of said modules,

said main control logic means including in its construction a printed circuit board having printed conducting lines comprising:

first sets of lines with the number of sets corresponding to the number of said modules and with the number of lines of each set corresponding to the number of lines required to provide binary information to said outputs of each of said additional sets of outputs to which said lines of each set are connected;

a first additional set of lines corresponding in number to the number of said manually operated switches, each line being connected to a different one of said manually operated switches; and

a second additional set of lines, each line being connected to a different one of said first additional set of lines and with said main control logic means being constructed to provide a voltage signal to one of said first set of outputs of said main control logic means based on a voltage signal provided to one of said lines of said second additional set of lines, and

said main control logic means further including in its construction:

first sets of spaced terminals mounted on said board, each set of terminals being connected to a different line of said first sets of lines; and

second sets of spaced terminals mounted on said board, each set of said second sets being connected to a different line of said first additional set of lines so that each terminal of said second sets of spaced terminals provides with a different one of said terminals of said first sets of terminals a pair of terminals connectable by a diode,

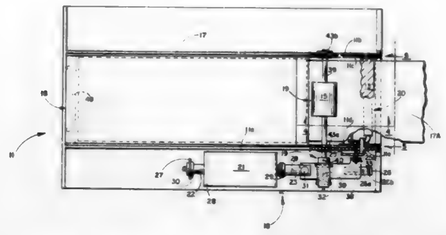
whereby the selective connection of pairs of terminals by diodes provides specific binary information as signals to one or more of said additional sets of outputs of said main control logic means when one of said manually operated switches is closed, so that at least one module is operated to dispense stamps in a number in accordance with the binary information provided to said set of inputs of said module control logic means of the module by said main control logic means.

4,040,511

PAPER MOVING MECHANISM

Herbert R. Beaven, Jr., Los Altos, and Daniel M. Roberts, Saratoga, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 5, 1975, Ser. No. 610,905
Int. Cl.[2] B41J *15/00*
U.S. Cl. 197—133 R **11 Claims**



1. Apparatus for selectively advancing paper past a printing station comprising:

a paper storing compartment having an access panel;

advance means mounted adjacent said paper storing compartment for advancing said paper past said printing station;

support means rotatably mounted on the frame of said apparatus for positioning a portion of said paper in contact with said printing station;

linkage means including controlled means coupled to said advance means and including means for engaging and moving said support means from said printing station, and for simultaneously moving said advance means to advance said portion of said paper a predetermined distance past said printing station,

said advance means including a shaft having a roller fixedly mounted thereon, said roller being in contact with said paper; and

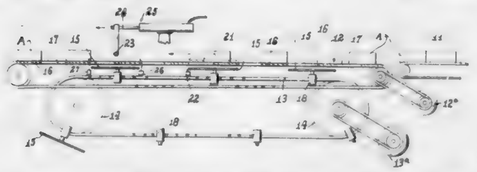
one way clutch means mounted to one end of said shaft and coupled to said linkage means, said one way clutch means ensuring rotation of said shaft in only one direction.

4,040,512

METHOD OF AND MEANS FOR INDEXING ARTICLES

Warren C. Ness, 6211 W. Touhy Ave., Chicago, Ill. 60648

Filed Jan. 12, 1976, Ser. No. 648,363
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—460 **13 Claims**



1. An apparatus for sequentially indexing a first article having at least a predetermined minimum overall spacing behind a second article on a conveyor wherein said overall spacing includes the spacing between said first and said second article and the length of said first article, said apparatus comprising:

a. sensing means for determining the position of said first article on said conveyor; and

b. positioning means responsive to said sensing means for:

1. lifting said first article from said conveyor if said sensing means indicates that said first article is mispositioned;

2. moving said first article if thusly lifted at a speed greater than the speed of said conveyor; and

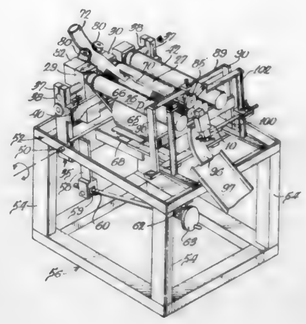
3. placing said first article on a surface at a position where it will lie a positive integral number of unit lengths behind said second article, said unit length being longer than the lengths of said first and second articles and no longer than said minimum overall spacing.

4,040,513

DISC ADVANCING AND METERING DEVICE

Leroy C. Walls, Valparaiso, Ind., assignor to Lewals, Inc., Chesterton, Ind.

Division of Ser. No. 308,145, Nov. 20, 1972, Pat. No. 3,886,892.
This application Dec. 16, 1974, Ser. No. 533,184
Int. Cl.[2] B65B *7/28*; B67B *3/08*
U.S. Cl. 198—530 **3 Claims**



1. A feeding mechanism for feeding a row of similar discs on edge in parallel relationship wherein each disc has a circular peripheral edge and a center of gravity displaced from the plane of the circular edge, comprising,

a. a pair of generally cylindrical support rollers rotatably mounted at one end in cantilever fashion in generally horizontal spaced side-by-side relationship with the space between the rollers less than the radius of the discs to provide a cradle for supporting the discs on edge,

b. means for rotating the rollers in the same angular direction so that adjacent surfaces of the rollers move in opposite directions to advance the discs along the rollers from said one end to the other,

c. means for advancing a row of discs to the cradle at said one end of the rollers,

d. holddown means disposed over the cradle to hold the discs against the rollers, and

e. the advancing means comprises a tubular guide extending toward said one end of the rollers, a pair of feed rollers disposed at opposite sides of the guide and having surfaces engaging opposite sides of the discs, and means for rotating the feed rollers in a direction to advance the discs along the guide.

4,040,514

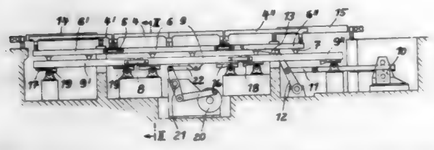
LIFTING BEAM COOLING AND CONVEYING BED

Klaus Peter Pielsticker, Dusseldorf; Friedel Mogendorf, Duisburg, and Karl Heinrich Sonnabend, Ratingen, all of Germany, assignors to Schloemann-Siemag-Aktiengesellschaft of Duesseldorf, Germany

Filed July 22, 1976, Ser. No. 707,484
Claims priority, application Germany, Aug. 1, 1975, 2534363
Int. Cl.[2] B65G *25/04*
U.S. Cl. 198—774 **4 Claims**

1. A lifting beam cooling and cross-conveying bed which comprises stationary support beams and movable support beams, the movable beams being divided into portions being articulated together, and a support arrangement for the movable beams which comprises transversely movable support members which are also divided into portions and articulated and on which the movable beams are supported, profiled tracks mounted on the undersides of the support members, and

rollers on which the tracks run, and wherein the profiles of the tracks are such that when the movable beams are driven in a conveying direction, the individual portions can be either



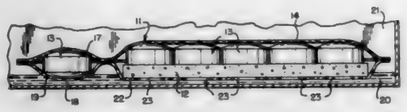
raised or lowered or maintained in a raised or lowered position, with the different portions being subjected to different vertical movement sequences.

4,040,515

CHEMICAL DISPENSING APPARATUS

Harold H. Hessel, Briarcliff Manor, and Francis S. Kiele, Pleasantville, both of N.Y., assignors to Stewart-Hall Chemical Co., Mount Vernon, N.Y.

Continuation-in-part of Ser. No. 108,774, Jan. 22, 1971, Pat. No. 3,754,871. This application Apr. 11, 1973, Ser. No. 350,192
The portion of the term of this patent subsequent to Aug. 28, 1990, has been disclaimed.
Int. Cl.[2] A23F *1/08;* **B65D** *81/74;* **B01D** *59/22*
U.S. Cl. 206—.5 **15 Claims**



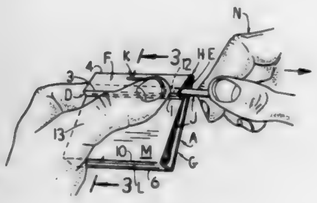
1. A chemical dispenser apparatus comprising a porous plastic capillary matrix exhibiting capillary action towards a fluid when a surface area of said matrix is contacted by said fluid, a dissolvable chemical composition resting on an upper surface of said matrix, and housing means comprising a fluid impermeable flexible plastic envelope above said matrix and said chemical composition, a peripheral edge portion of said envelope secured to the outer edges of said capillary matrix, and said chemical composition being held between said housing and the upper surface of said capillary matrix.

4,040,516

SAFETY MATCH PACKET

Anthony S. Cappello, 4017 Everett Ave., Oakland, Calif. 94602

Filed July 18, 1975, Ser. No. 597,399
Int. Cl.[2] A24F *27/12, 27/00*
U.S. Cl. 206—109 **1 Claim**



1. A safety match packet comprising:

a. a semi-flexible rectangular sheet folded upon itself to form an interconnected front and back cover to house a comb of safety matches and enclose the heads of the safety match comb;

b. said rectangular sheet having an additional length extending beyond said back cover to be folded into a safety match receiving pocket that is open at both ends in order to readily receive a match head and has an unobstructed length coextensive with the width of the rectangular sheet;

c. the pocket having an outer wall spaced from an inner wall of the pocket by a spacing wall whose plane extends substantially at right angles to the planes of said outer and inner walls of said pocket, the end of the inner pocket wall contacting the adjacent portion of the outer pocket wall to constitute a closure for the pocket that parallels the plane of said spacing wall and extending through the length of the pocket;

d. a safety match igniting strip secured to one of the inner surfaces of the pocket outer or innerwall and having a length substantially equal to the length of the pocket; and

e. a fastening member positioned substantially midway between the open ends of the pocket and extending through both the outer and inner walls of the pocket also through the base of the comb of safety matches and through said back cover for securing them together and for positively separating the pocket interior from the comb of safety matches, said fastening member not obstructing a clear passage along the pocket from one end of the pocket to the other open end;

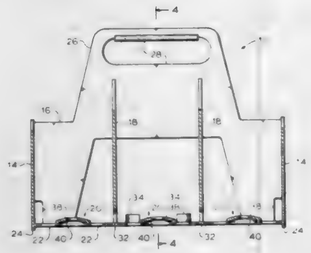
f. the lateral interior spacing between the outer and inner walls of the pocket being substantially the same throughout the length of the pocket to loosely receive the head and part of the shank of a safety match whether the match is inserted from either open end of the pocket, whereby lateral inward pressure is required to be applied against the outer wall of the pocket and against said back cover for forcing said outer pocket wall against the match head for forcing the latter against said match igniting strip so that an outward pull of the exposed shank of the match will cause the head to frictionally engage with the igniting strip to ignite the match head while it is still within the pocket so that the pocket will prevent any undue flaring of the match head material from striking the person using the match pocket and also from contacting with the comb of safety matches.

4,040,517

STACKING CASE

Thomas Evald Torokvei, Don Mills, Canada, assignor to Scepter Manufacturing Company Limited, Toronto, Canada

Filed Dec. 8, 1975, Ser. No. 638,358
Int. Cl.[2] B65D *1/24, 1/36, 85/54*
U.S. Cl. 206—144 **9 Claims**



1. A carton of generally rectangular shape in plan view for carrying a plurality of bottles comprising:

means for defining side and end walls;

a single wall constituting a vertically and longitudinally extending central dividing member having oppositely disposed surfaces, said single wall having a recess upwardly extending from its bottom edge for a predetermined distance, said recess forming an opening through said oppositely disposed surfaces;

partition walls cooperating with said single wall and said means for defining side and end walls to divide the carton into a plurality of cells for receiving bottles;

upright handle means connected to said single wall and located above said means for defining said side and end walls;

said recess of said single wall being proportioned to receive the handle means of a similar empty carton when in stacked relationship; and

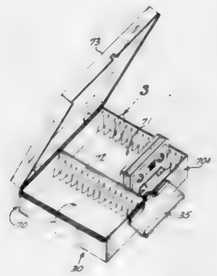
means coupled to said partition walls and said single wall for defining for each of said cells a bottom support for a bottle placed in said cell, said last named means being open in the region of said recess of said single wall.

4,040,518

STORAGE AND CARRYING CASE FOR COMPACT CASSETTES

Jesse Donald Carter, 741 Orizaba Ave., No. 3, Long Beach, Calif. 90804

Filed Apr. 22, 1976, Ser. No. 679,391
Int. Cl.[2] B65D *85/672, 1/34*
U.S. Cl. 206—387 **14 Claims**



1. A case for storing and carrying a plurality of magnetic tape cassettes of a type described as compact cassettes having two tape drive hub openings in the sides thereof and a cassette recorder coupling edge having a magnetic tape head engaging opening therein on said edge, said case comprising in combination:

a cassette tray for receiving and storing compact cassettes in transverse parallel position, having a bottom wall, left and right sidewalls and back and front walls joined together to form an open top rectangular shaped tray, said walls extending substantially equidistantly above the bottom wall a heighth less than that of a compact cassette, said tray having an inside width between the sidewalls slightly greater than a length of a compact cassette and having an inside length between front and back walls equal to a sum of a plurality of incremental distances, each increment being slightly greater than a maximum width of a compact cassette, said tray having a plurality of cassette positioning rib sets, a first member of each set being integral with a right tray wall inner surface and extending a relatively short distance outwardly therefrom and at a lower rib portion being integral with a tray bottom wall inner surface and extending a relatively short distance transversely along said bottom wall inner surface and a remaining second member of each rib set being similarly disposed along a tray left wall inner surface and bottom wall inner surface and being in parallel alignment with the right wall set member, said plurality of rib sets being disposed longitudinally from a first rib set adjacent a front tray wall inner surface to a last rib set adjacent a back tray wall inner surface, each of said rib sets having a distance between adjacent rib sets such that a compact cassette positioned between adjacent rib sets and a cassette recorder coupling edge resting on and in parallel alignment with the tray bottom wall inner surface nearly touches an adjacent compact cassette similarly positioned between adjacent rib sets, said cassettes being positioned in leafed arrangement, a top cover rearwardly hinged to the tray back wall having a cover top wall, left and right cover sidewalls, and front and back cover walls joined together to form an open bottom rectangular shaped tray covering having an opening substantially equivalent to a tray top opening, said cover walls being of at least sufficient depth, when the cover is closed, to enclose compact cassettes positioned transversely within the tray, and

a case latch means further comprising in combination;

a tray cover latch engaging throughhole in the cover front wall a relatively short distance above a tray cover front wall lower edge extending through the tray cover front wall, said throughhole having a latch positioning slot opening downwardly and out of the cover front wall lower edge, said throughhole further having latch hook retaining shoulders on each side of said slot,

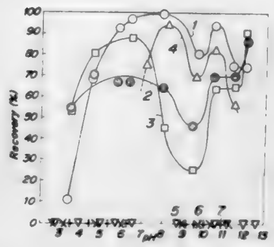
a latch member having a lower end mounted on a tray front wall inner surface, a throughhole engaging hook on a top end, a latch positioning member a relatively short distance below said hook, and a resilient shank intermediate said latch positioning member and the lower end, said latch positioning member extending forwardly across a tray front wall top edge and forward the tray front wall front surface a distance greater than a throughhole engaging hook length, said latch positioning member being inserted into the said slot when the cover is closed and said hook engaging said hook engaging shoulder, said forwardly extending latch positioning member further comprises a push button for disengaging the latch hook upon depressing the push button thereby disengaging the latch hook from the throughhole to permit opening the cover.

4,040,519

FROTH FLOTATION PROCESS FOR RECOVERING SHEELITE

Koji Fukazawa, Iwaki, Japan, assignor to Nittetsu Mining Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1975, Ser. No. 551,239
Claims priority, application Japan, Mar. 28, 1974, 49-33927; Mar. 28, 1974, 49-33928
Int. Cl.[2] B03D *1/14*
U.S. Cl. 209—166 **6 Claims**



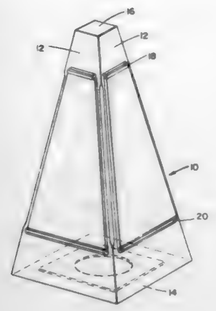
1. A process for recovering scheelite concentrate from scheelite ores which comprises in an alkaline treatment step, treating a low grade scheelite containing concentrate obtained from said ore by initial froth flotation and containing an objectionable amount of adsorbed collector added during said initial froth flotation, which amount of adsorbed collector interferes with further stages of scheelite concentration of froth flotation, with caustic soda as an alkaline substance in an amount sufficient to substantially remove said amount of objectionable adsorbed collector, in water to form a pulp and filtering the pulp to form a cake,

washing the cake with water, and repulping the cake and thereafter in a flotation step, adding 20–40 kg/t-ores in the repulped cake of quebracho as a depressant for sulfide minerals and silicate minerals to the repulped cake and conditioning the pulp for 3–5 minutes and then, following the conditioning step,

floating the conditioned pulp at a pH of 9.5–10.5 with addi-

tion of 30–150 g/t-ores in the conditioned pulp of a fatty acid collector and 50–160 g/t-ores of a frother and recovering a scheelite concentrate.

4,040,520
DISPLAY DEVICE
Jean Joaquin, 2 Niven Way, Larkspur, Calif. 94939
Filed Aug. 25, 1975, Ser. No. 607,565
Int. Cl.² A47F *3/10*
U.S. Cl. 211—13 **10 Claims**



1. A device for displaying and serving a multiplicity of relatively small articles which may be easily removed therefrom when selected for removal, said device comprising:

a support having a series of planar surfaces extending generally upwardly from a bottom surface;

retainer members fixed to each planar surface and spaced apart near upper and lower ends of each said surface for slidably receiving mounting boards in directions parallel to said planar surface, said retainer members including lip portions extending parallel to the associated planar surface; and

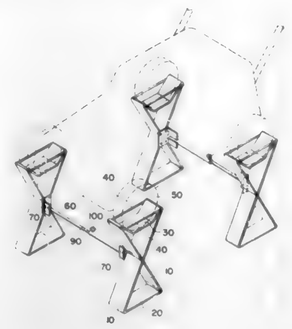
a said rigid mounting board removably held on each planar surface between said retainer members, said mounting board being adapted to manually removably receive the small articles, said retainer members retentatively engaging said boards against any movement having a component normal to the plane of the surface on which said board is disposed, each board disposed between said planar surface and the plane including the associated pair of lip portions.

4,040,521
ELEMENTS FOR SUPPORTING WHEELS ABOVE GROUND AND DEVICE FOR CONNECTING THE ELEMENTS
Richard L. Fitzpatrick, Baker, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Sept. 22, 1976, Ser. No. 725,643
Int. Cl.² A47F *7/04*
U.S. Cl. 211—24 **1 Claim**

1. A device for supporting two horizontally spaced vertical wheels at the same vertical level above ground, said device comprising:

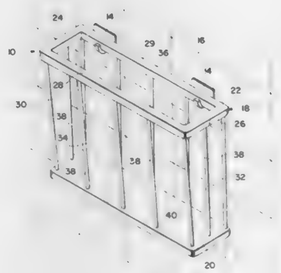
first and second like elements, each element having a central slot extending transversely inwardly from the center of one of the elongated sides of the centerline of the plate, the plates engaging each other with their slots so as to form a vertically elongated X when viewed from the side, a horizontal base plate connecting the bottom ends of the support plates together, and a concave plate connecting the top ends of the support plates together with the concave facing upwardly and disposed mainly below the top ends, said elements being spaced apart with the sides of the support plates and one element being aligned with the sides of the support plates of the other element;

like first and second vertical leaf hinges, each hinge being secured flat to the junction of the sides of the corresponding one of the two elements; and



an elongated horizontal telescopic member connecting the second leaves of the two hinges together, each end of the member being cut longitudinally and being secured flat to the corresponding second leaf.

4,040,522
MAGAZINE RACK
Warren J. Vickery, 7 Fox Run, Armonk, N.Y. 10504
Filed May 7, 1976, Ser. No. 684,309
Int. Cl.² A47G *29/00*
U.S. Cl. 211—88 **5 Claims**



1. A magazine rack for receiving magazines therein, which comprises:

a. an opened top frame;

b. a base;

c. a plurality of elongated elements;

d. means for joining each said elongated element to said base and said top frame, wherein said elongated elements are spaced apart from each other to create a plurality of upwardly extending walls having a plurality of elongated openings therethrough, said joining means including,

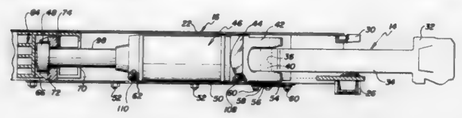
a bifurcated rubber ring member affixed to each end of said elongated element, each said end having an opening therein,

a first snap element disposed in each of a plurality of holes in an upper surface of said base, one of said snap elements received through a first bifurcated ring member into a first opening in each of said elongated elements, and

a second snap element disposed in each of a plurality of apertures in a lower surface of said top frame, one of said second snap elements received through a second bifurcated ring member into a second opening in each said of elongated elements; and

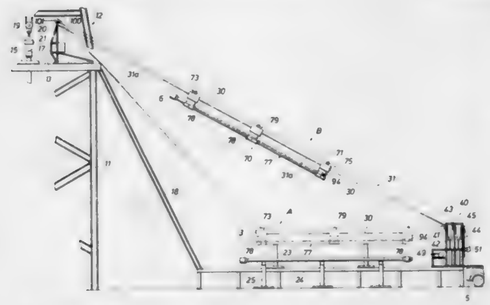
e. means for securing said rack to a vertical surface.

4,040,523
RAILWAY CAR CUSHIONING DEVICE
Ross G. Carle, and James R. Reinhardt, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.
Filed Mar. 3, 1976, Ser. No. 663,400
Int. Cl.² B61G *9/08*
U.S. Cl. 213—46 R **6 Claims**



1. A hydraulic-pneumatic cushioning unit comprising a cylinder having front and rear end portions, a piston mounted within the cylinder for reciprocal movement, a piston rod secured centrally to a face of the piston and extending through an opening in the rear end portion of the cylinder, said cylinder forming a high pressure chamber adjacent the front face of the piston and a low pressure chamber adjacent the rear face of the piston in which the piston rod is mounted, said high pressure and low pressure chambers having a mixture of gaseous and liquid fluid therein under a preload fluid pressure with the gaseous fluid in the high pressure chamber containing at least 5 percent of the total volume of the high pressure chamber, said piston having an opening therethrough at a position radially spaced from the longitudinal axis of the position rod, and normally closed valve means mounted within said piston opening to control fluid flow between the low pressure chamber and the high pressure chamber and having a relatively large buff flow passage and a restricted draft flow passage, said valve means when moving with the piston in buff travel from extended position remaining closed for at least the initial two inches of buff travel to permit the mixture of gas and liquid in the high pressure chamber to reach a predetermined high value before opening of the buff flow passage for the metering of the mixed gaseous and liquid fluid from the high pressure chamber to the low pressure chamber, said valve means upon return draft travel after buff travel closing the buff flow passage and opening the restricted draft flow passage to permit the metering of the mixed gaseous and liquid fluid from the low pressure chamber to the high pressure chamber and return of the cushioning unit to neutral position.

4,040,524
APPARATUS FOR HANDLING PIPE AT WELL SITE
William C. Lamb, Lafayette, and Rodney J. Wetzel, St. Martinville, both of La., assignors to Lamb Industries, Inc., Lafayette, La.
Filed June 7, 1971, Ser. No. 150,331
Int. Cl.² E21B *19/00*
U.S. Cl. 214—2.5 **5 Claims**



1. Apparatus for transporting pipe-like members between the elevated floor of a well derrick and a lower storage area which comprises:

a. support cable means extending between and being supported at one end proximate said elevated floor and at the opposite end proximate said storage area and being unsupported therebetween to provide a track between said floor and said storage area;

b. trolley means for stably supporting said pipe-like member at least at two spaced points, said trolley means being adapted for travel along said support cable means and including:

i. two independently movable trolleys having means to receive and support said pipe-like member,

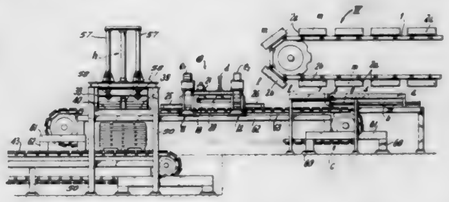
ii. trolley cable means passing from said elevated floor, through the uppermost of said two trolleys and affixed to the lowermost of said two trolleys, and

iii. holding means on said uppermost trolley to grip said trolley cable means to prevent movement of said uppermost trolley independent of said trolley cable means;

c. means to move said trolley means on said support cable means from the vicinity of said elevated floor to the vicinity of said storage area; and

d. cable tensioning means having means to anchor one end of said support cable means, and having means to selectively change the unsupported length of said support cable means to enable said support cable means to assume a first slackened position wherein said two spaced points on said trolley means are disposed substantially horizontally in the vicinity of said storage area and a second position wherein said support cable means extends in a substantially direct incline from said storage area to said elevated floor.

4,040,525
METHOD AND APPARATUS FOR STACKING INGOTS ACCORDING TO PREDETERMINED ARRANGEMENTS
Koichi Tokunaga, and Akira Fukuda, both of Kamagaya, Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan
Filed June 14, 1976, Ser. No. 695,962
Claims priority, application Japan, Sept. 22, 1975, 50-114500
Int. Cl.² B65G *57/22*
U.S. Cl. 214—6 P **8 Claims**



1. A method of stacking in alternate tiers a plurality of first ingot groups of first predetermined pattern each formed by arranging four ingots in two parallel rows each consisting of a pair of longitudinally aligned ingots, and a plurality of second ingot groups of second predetermined pattern each formed by arranging a pair of ingots in longitudinally parallel relation and disposing another pair of ingots on the longitudinally opposite sides of the former normal thereto, comprising the step of:

delivering one ingot pair from a mold of predetermined shape carried by an endless chain conveyor of a continuous casting apparatus onto an ingot receiving member disposed above an ingot receiving end of a main conveyor and adapted for reciprocating movement in the running direction of said main conveyor so as to arrange the ingots of the ingot pair in longitudinally parallel relation with the running direction of said main conveyor;

retracting said ingot receiving member while restricting the movement of the ingot pair together with the retracting

movement of said ingot receiving member thereby feeding the ingot pair onto said main conveyor;

stopping the movement of said main conveyor temporarily and actuating a push plate disposed between said ingot receiving member and said main conveyor and adapted for reciprocating movement in the running direction of said main conveyor thereby advancing the ingot pair to a predetermined position on said main conveyor;

conveying by said main conveyor a plurality of stack units each consisting of two ingot pairs delivered from said molds and arranged in longitudinally parallel relation with the running direction of said main conveyor;

rotating two ingots 90° relative to the remaining two in alternate stack units being conveyed by said main conveyor thereby changing the pattern into another pattern such that the two rotated ingots formerly disposed on the longitudinally opposite sides of and in longitudinally normal relation to the latter two ingots arranged in longitudinally parallel relation with the running direction of said main conveyor are arranged transversely thereto;

transferring the stack units of alternately different patterns across the conveying end of said main conveyor into a rotary casing which acts to turn the ingots upside down so as to direct the legs downward when the stack unit transferred thereinto consists of four legged ingots; and

stacking in alternate tiers the stack units of different patterns passed through said rotary casing on a transfer conveyor.

3. An apparatus for stacking in alternate tiers a plurality of first ingot groups of first predetermined pattern each formed by arranging four ingots in two parallel rows each consisting of a pair of longitudinally aligned ingots, and a plurality of second ingot groups of second predetermined pattern each formed by arranging a pair of ingots in longitudinally parallel relation and disposing another pair of ingots on the longitudinally opposite sides of the former normal thereto, comprising:

an endless chain conveyor forming part of a continuous casting apparatus and having a pair of parallel mold trains each including a predetermined number of molds for casting a plain ingot and two molds for casting a legged ingot, the transversely adjacent ones of said molds in said mold trains being of the same type;

an endless conveyor having the ingot receiving end thereof disposed beneath the delivery end of said chain conveyor for successively receiving the ingot pairs delivered from said molds in longitudinally parallel relation with the running direction thereof so as to convey a plurality of stack units each consisting of the first and second ingot pairs delivered at different timing from said molds and arranged in longitudinally parallel relation with the running direction of said main conveyor;

pattern changing means mounted to a frame structure spanning across said main conveyor and including stopper means retractably advanced to engage the longitudinally aligned ingots in the first and second ingot pairs while conveying the ingot pairs by said main conveyor thereby bringing the trailing ingot in the first ingot pair into side-by-side relation with the leading ingot in the second ingot pair, and a first and a second arm swingably mounted to said frame structure for rotating the leading ingot the first ingot pair and the trailing ingot in the second ingot pair 90° relative to the remaining two ingots respectively;

a push plate for urging the stack units of alternately different patterns one after another across said main conveyor;

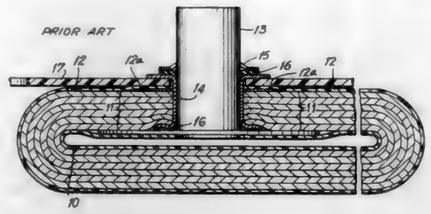
a rotary casing disposed adjacent to the conveying end of said main conveyor for receiving therein the stack units of alternately different patterns forced one after another by said push plate across said main conveyor, said rotary casing operating to turn the ingots upside down so as to direct the legs downward when the stack unit transferred thereinto consists of four legged ingots, and

means disposed adjacent to said rotary casing for receiving the stack units of alternately different patterns passed one after another through said rotary casing and stacking the stack units in alternate tiers on a transfer conveyor disposed therebeneath.

4,040,526
DUNNAGE BAG

Robert Olin Baxter, and Arthur Louis Rothschild, III, both of Camden, Ark., assignors to International Paper Company, New York, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,709
Int. Cl.² B60P 7/14
U.S. Cl. 214—10.5 D **1 Claim**



1. In an expandable dunnage bag having an airtight bladder, a multi-ply tube formed of a plurality of bladder reinforcing sheets enclosing the bladder, and a valve extending through the sheets through which air is introduced into the bladder to expand the bag, the improvement comprising

a moisture resistant coating on the outermost one of the sheets;

a moisture resistant overslip surrounding each of two opposite ends of the bag, the overslips together surrounding only a minor portion of the bag, each overslip being made of thermoplastic material compatible with the coating on the outermost sheet and having an open and closed end, the closed end of each overslip being adjacent the outermost edge of the end of the bag the overslip surrounds and the open end of each overslip being heat sealed to the outermost sheet;

the outermost sheet having at least one seam extending from one to the other of the two opposite ends of the bag, the overslips each covering an end of the seam and a moisture resistant tape covering the portion of the seam between the seam ends;

portions of one of the overslips defining an opening through which the valve extends, the opening having a diameter substantially equal to the inside diameter of the valve, so that the opening defining portions tightly fit around the valve;

a first clip through which the valve extends, the first clip underlying the opening defining portions of the first overslip and being in frictional engagement with the valve;

a bag handle through which the valve extends, the handle overlying the opening defining portions of the first overslip and having a cap for sealing the valve;

a second clip overlying the opening defining portions of the first overslip and being in frictional engagement with the valve, so that the opening defining portions of the first overslip are positioned between the first and second clips, whereby the overslips and coating weatherproof the bag by preventing moisture from pervading the sheets.

4,040,527
INSTALLATION FOR MANUFACTURING MOTOR VEHICLES OR OTHER PRODUCTS COMPRISING A NUMBER OF COMPONENT ELEMENTS

Walter Krieg, Brugg, Switzerland, assignor to Digitron AG., Brugg-Biel, Switzerland

Filed Jan. 9, 1975, Ser. No. 539,734
Claims priority, application Germany, Jan. 21, 1974, 2402665
Int. Cl.² E04H 6/06
U.S. Cl. 214—16.4 A **6 Claims**

1. An assembly line and apparatus for conveying an element along said assembly line in a manufacturing apparatus, said assembly line including guide means defining a path in said manufacturing process, said assembly line and apparatus comprising:

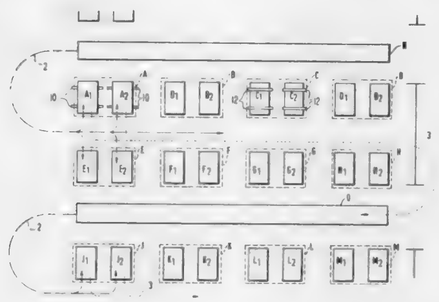
truck means and drive means therefor, said truck means including control means responsive to said guide means for effecting a steering of said truck means to maintain a predefined relation of said truck means to said guide means and said path;

first support means on said truck means;

platform means removably mounted on said first support means and having means thereon for supporting an element, said platform means including a longitudinally extending beam and a pair of parallel and longitudinally spaced transverse beams extending transversely of said longitudinally extending beam;

centering means on said truck means for effecting a centering of said platform means on said truck means, said centering means being positioned so that said platform means is incapable of moving in directions parallel to a theoretical plane containing said platform means and permitting a movement of said platform means only vertically relative to said truck means, said centering means engaging said longitudinally extending beam and said transversely extending beams to effect said centering of said platform means on said truck means;

roller means mounted on said platform means, said roller



means being oriented on said platform means to facilitate a rolling movement in one direction;

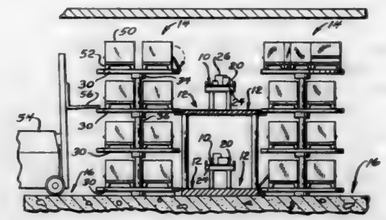
work station means spaced along said path and having movable support members at spaced locations therein adapted to be moved into supporting relationship with said platform means to free said truck means from supporting said platform means and thereby facilitate a movement of said truck means to locations remote from said platform means; and

buffer storage means located in said path, said buffer storage means having second support means thereon for engaging said platform means traveling along said path, said buffer storage means including means defining a plurality of locations for storing a plurality of said platform means, said second support means on said buffer storage means including a plurality of elongated and parallel bar supports adapted to engage said roller means for facilitating a movement of said platform means relative to said bar supports, said second means further including second centering means cooperative with said longitudinally extending beam for centering said platform means on said buffer storage means, said second centering means including at least one grooved roller rotatable about an axis perpendicular to said longitudinally extending beam, said longitudinally extending beam being received in the groove of said grooved roller.

4,040,528
WAREHOUSING SYSTEM WITH TURNTABLE HAVING OPPOSED ARTICLE RECEIVING STATIONS THEREON

Kenneth A. Hutchins, Fort Wayne, Ind., assignor to Peter Eckrich and Sons, Inc., Fort Wayne, Ind.

Filed June 30, 1975, Ser. No. 591,457
Int. Cl.² B65G 1/06
U.S. Cl. 214—16.4 A **10 Claims**

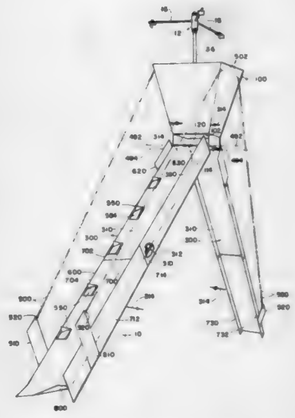


1. A warehousing system comprising: an elongated conveyor for moving material in a predetermined direction; means defining an elongated walkway on at least one side of said conveyor; means defining a material loading area extending in parallel spaced relationship to said walkway; a plurality of turntables, at least one of said turntables having independently rotatable shelves thereon, each shelf having opposite material receiving stations, said turntables being disposed between said walkway and said material loading area in a series extending parallel to said walkway, said turntables being mounted for rotation about parallel vertical axes so that either of said material receiving stations may be selectively disposed to face and being accessible from the walkway with the other of said material receiving stations facing and being accessible to said loading area to be reloadable therefrom as desired; and means for placing on a receiving station facing the loading area concurrently a plurality of warehoused articles to be removed manually piecemeal therefrom and placed on said conveyor when the so placed articles are brought adjacent to the walkway by subsequent rotation of the turntable.

4,040,529
GRAIN FLOW PROPELLED GRAIN SPREADER

Marion E. Wurdeman; James E. Wurdeman, both of Highway 30 East, Columbus, Nebr. 68601, and Arnold F. Kopaska, Rte. 3, Guthrie Center, Iowa 50115

Filed May 17, 1976, Ser. No. 687,194
Int. Cl.² B65G 65/32
U.S. Cl. 214—17 CB **9 Claims**



1. A grain spreader comprising support means attachable to an upper part of a grain bin, a hopper disposed beneath said

support means, means rotatably mounting said hopper on said support means for rotation about a vertical axis, fins attached to said hopper and disposed at least mostly above the bottom of said hopper, said fins being disposed at angles with respect to the vertical such that when grain is directed so as to flow into the top of said hopper said grain will strike said fins and exert forces on said fins causing rotation of said hopper in a given direction, said hopper having an open top and bottom, a plurality of elongated slides each extending downwardly from the underside of said hopper and away from said axis at an angle with respect to the vertical and disposed such that said grain can flow out of the bottom of said hopper and down said slides, means attaching said slides to said hopper so that said slides are maintained in the position described, each slide having a leading side and a trailing side with respect to the rotation of said hopper, each slide having a barrier wall means on the leading side thereof so as to restrain grain from spilling off said leading side, means along each said slide and so disposed as to cause grain gravitating down said slides to fall at various positions from the trailing side along the length thereof.

4,040,530

SHAFT FURNACE FEED DEVICE

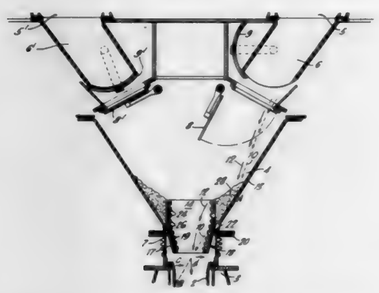
René N. Mahr, Howald-Hesperange, and Aloyse J. Engel, Schouweiler, both of Luxembourg, assignors to S.A. Des Anciens Etablissements Paul Wurth, Luxembourg, Luxembourg

Filed July 2, 1976, Ser. No. 702,104

Claims priority, application Luxembourg, July 11, 1975, 72956

Int. Cl.[2] C21B *7/00*

U.S. Cl. 214—35 R **11 Claims**



1. In a furnace charging installation, the installation including at least a first storage hopper and a movable distribution chute, the charging installation also including a discharge funnel and a feed channel which serially guide charge material released from the hopper to the chute, the improvement comprising:

a tubular plug positioned in the small diameter end of the discharge funnel, said plug extending upwardly into the funnel in spaced relationship to the inner wall thereof to define a cavity for receiving and holding charge material between the outer wall of said plug and the inner wall of said funnel whereby an accumulation of charge material is caused to form about the smaller diameter discharge end of the funnel, the accumulated charge material extending upwardly along the funnel wall at least to the region of impact of freely falling material released into the funnel from the hopper.

4,040,531

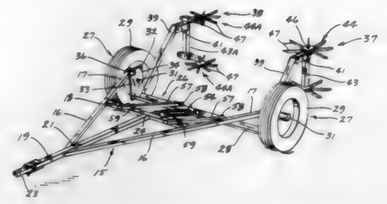
BALE HANDLING APPARATUS

Bryan C. Cross, R.R. No. 3, Box 135, Bedford, Iowa 50833

Filed Dec. 10, 1975, Ser. No. 639,276

Int. Cl.[2] A01D *87/12*

U.S. Cl. 214—77 R **14 Claims**



1. A bale handling apparatus for lifting and moving a hay bale comprising:

a. a portable frame,

b. a pair of lift arms spaced transversely of said frame a distance apart to receive a bale lengthwise therebetween,

c. means pivotally supporting said lift arms adjacent one end of said frame for up and down pivotal movement from a bale loading position to a bale transport position, and

d. a bale engaging unit adjacent the free end of each lift arm engageable with one end of a bale to be handled, each bale engaging unit including a finger assembly rotatable in a substantially horizontal plane when a lift arm is in the bale loading position therefor whereby on advance of said one frame end toward a ground supported bale said finger assemblies are movable into engagement with the opposite ends of the bale.

4,040,532

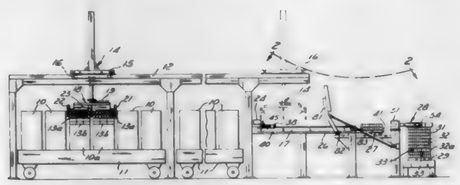
BRICK HANDLING SYSTEM

Frank S. Pearne, San Gabriel; Florentin J. Pearne, Blue Jay; William P. Osborn, Whittier; Terance M. King, Placentia, and Joseph A. Guzzetta, Newport Beach, all of Calif., assignors to Aircraft Mechanics, Inc., Downey, Calif.

Division of Ser. No. 431,967, Jan. 9, 1974, Pat. No. 3,917,081. This application Oct. 29, 1975, Ser. No. 626,721

Int. Cl.[2] B65G *57/22*

U.S. Cl. 214—152 **6 Claims**



1. A method of forming stacks of brick including full layers of laterally and lengthwise aligned and abutting rows of brick and at least one intermediate partial layer of laterally abutting brick having spaced voids between at least two adjacent rows of lengthwise aligned brick to receive the fork of stack handling equipment comprising forming said full layers of laterally abutting rows, sequentially gripping and transferring said full layers as units to a stacking location, and depositing said full layers one on another to form said stacks; and providing said partial layers in said stack by conveying columns of brick along conveyor means to a marshalling location with the columns providing laterally abutting rows of lengthwise aligned brick extending laterally of said columns, moving adjacent lengthwise aligned rows apart as said marshalling location to produce said partial layer with at least two spaced voids while other rows remain laterally abutting, gripping and transferring said partial layer as a unit to said stacking location, and depositing said partial layer on a previously deposited full layer before a subsequent full layer is deposited thereon.

4,040,533

TRANSPORT DEVICE FOR TEST SAMPLE CARRIERS

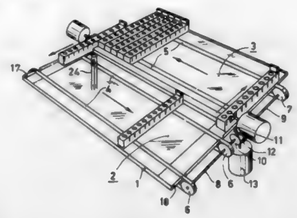
Wilhelmus Johannes De Boer; Willem Schinkel, both of Almelo, Netherlands, and Francis Johannes Span, Villebon-sur-Yvette, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 21, 1976, Ser. No. 651,118

Claims priority, application Netherlands, Apr. 3, 1975, 7502498

Int. Cl.[2] B65G *65/04*

U.S. Cl. 214—310 **3 Claims**



1. Test-sample handling apparatus comprising elongate rectangular test-sample containers each having a plurality of open-ended compartments respectively adapted to receive test-sample holders to be brought to a treatment station one after the other, a rectangular table having two adjacently situated longitudinally extending zones, a pair of parallel longitudinally extending conveyor belts arranged in each zone, said containers being transversely positionable on said belts and having protrusions on their undersides for resting on said belts, means to continuously move said respective pairs of conveyor belts in opposite directions, a stop provided at the end of each zone toward which the containers are moved by the conveyor belts, means at the respective ends of the table for transversely displacing a container from one zone to the other in a step-wise manner, at least one of the table ends being associated with a treatment station over which each container is passed during its step-wise transverse displacement and means at said treatment station for ejecting each successive test-sample holder free of the test-sample container which carries said holder.

4,040,534

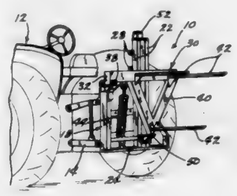
BALED HAY LOADING AND TRANSPORT DEVICE

John B. Kenworthy, Ottumwa, Iowa, assignor to Hay Handling Equipment Company, Des Moines, Iowa

Filed Nov. 11, 1975, Ser. No. 631,148

Int. Cl.[2] A01D *87/12*

U.S. Cl. 214—766 **6 Claims**



1. A baled hay handling vehicle for transporting and elevating round hay bales comprising,

a tractor vehicle having a pair of lifting arms and a stabilizer arm,

a hay handling device frame having front and rear sides with mounting means on the front side connected to said tractor vehicle lifting and stabilizer arms for raising and lowering said device,

a hay-carrying arm pivotally connected to the rear of said frame for pivotal movement in a plane parallel to said frame,

a hay-engaging finger on said hay carrying arm extending perpendicular to said arm and rearwardly of said frame, and

pivoting means engaging said hay-carrying arm for pivoting said hay carrying arm between raised and lowered positions to elevate a bale of hay above the pivotal axis of said arm whereby said hay bale may be elevated to a height equal to the combined elevating capabilities of said tractor lifting arms and said pivoting means for pivoting said hay carrying arm.

4,040,535

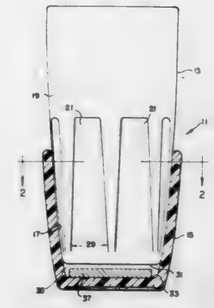
CONDENSATION PROOF DRINKING GLASS ASSEMBLY

Donald L. Shephard, Memphis, Mich., assignor to Helen I. Shephard, Memphis, Mich., a part interest

Filed Sept. 22, 1975, Ser. No. 615,250

Int. Cl.[2] B65D *23/06*

U.S. Cl. 215—100.5 **2 Claims**



1. A condensation proof glass assembly comprising a cup of plastic material having an inner wall surface of predetermined shape, and a bottom wall;

a glass container with a lower outer wall surface of substantially the same shape as the cup inner wall and having a bottom wall;

snugly and frictionally projected down into said cup;

said bottom walls being spaced apart defining a spill over and condensation reservoir;

a plurality of upright substantially parallel grooves in the outer surface of the container defining corresponding ridges engaging said cup for a series of line contacts therewith;

said grooves forming a series of drip channels conducting water to said reservoir;

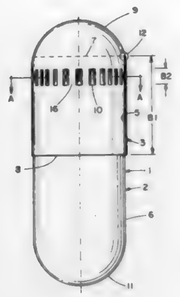
said grooves extending from intermediate the height to the bottom of the container;

said cup extending over about the lower one half of the container;

said grooves being concave in shape transversely of the container, of gradually increasing width;

and decreasing depth towards the container bottom.

4,040,536
LOCKING HARD GELATIN CAPSULE
Erwin Schwarz, Eberbach, Baden, Germany, assignor to R. P. Scherer Corporation, Detroit, Mich.
Filed May 5, 1975, Ser. No. 574,324
Int. Cl.[2] A61B *19/02*; B65D *43/10*
U.S. Cl. 220—8 **4 Claims**



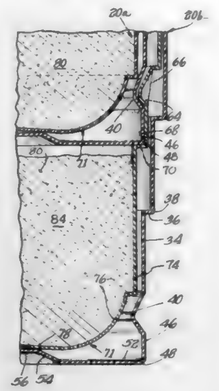
1. A gelatin capsule for receiving a filling comprising, in combination:

a. a body having a closed end, a substantially cylindrical wall and an open end defining a sealing rim, and

b. a telescoping cap having a closed end with an interior surface, a substantially cylindrical wall and an open end, the open end of the cap receiving the open end of the body with cap wall telescopically overlapping the body wall, said cap wall including a plurality of tooth-like spaced projections in a continuous row about the entire circumference of the cap wall, each of said tooth-like projections projecting inwardly to collectively define a circumferential bead-like rib, each of said tooth-like projections compressing the opposed portion of the body wall inwardly and simultaneously deforming the body wall outwardly intermediate the compressed portions to lock the cap against axial and rotational movement relative to the body upon positioning the rim against the interior surface of the cap to provide a substantially air tight seal, air spaces being provided between the tooth-like projections for escape of air upon assembly of the cap over the body.

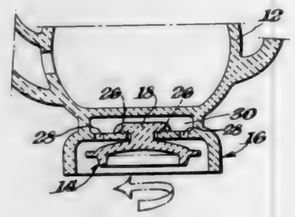
4,040,537
DOUBLE-WALLED CUP CONSTRUCTION FOR INTERLOCKING IN NESTED STACKS TO SEAL A FOOD CONCENTRATE BETWEEN ADJACENT CUPS
Bryant Edwards, Clarendon Hills, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Continuation of Ser. No. 536,840, Dec. 27, 1974, abandoned.
This application July 6, 1976, Ser. No. 702,906
Int. Cl.[2] B65D *21/02, 25/18, 85/72*
U.S. Cl. 220—9 R **13 Claims**

1. A double-wall thin wall plastic cup comprising inner and outer cup members each having a bottom transverse wall and a sidewall diverging upwardly therefrom to an open outer end, the sidewalls of said cup members being joined together adjacent said upper outer end and the inner cup member thereby being suspended substantially freely within said outer cup member, said inner cup member from its joinder with said outer cup member on down throughout a major portion of the vertical height thereof being substantially laterally spaced from and thereby being laterally substantially unrestrained by said outer cup member, said inner cup member having a circumferential sealing area of predetermined inner diameter and an adjacent inwardly projecting locking ring section above said sealing area and spaced a substantial distance down from said joinder, said outer cup member likewise having a circumferential sealing area spaced below said inner cup member sealing area and having an outer diameter substantially equal to said predetermined inner diameter and an adjacent inwardly projecting locking ring section above said outer cup member sealing area, the outer cup member locking ring section being substantially complimentary to the inner cup member locking ring section of a subjacent telescoped cup but projecting inwardly a greater distance than the locking ring section of said inner cup member to lock telescoped cups together with the sealing ring section of axially adjacent cups in sealing surface



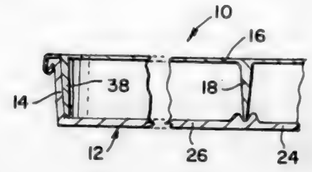
engagement providing a substantially sealed storage compartment at the bottom of an inner cup member of a subjacent pair of cups for receipt of a soluble substance, the suspension of said inner cup member and the absence of lateral restraint thereof by the outer cup member permitting deformation of the axis of a stack of cups and canting or pivoting of an inner cup member relative to an outer cup member without breaking of the seal between axially adjacent cups.

4,040,538
TEAPOT AND LID COMBINATION
Samuel L. Gerson, P.O. Box 1887, Wilmington, Del. 19899
Filed June 14, 1976, Ser. No. 687,706
Int. Cl.[2] B65D *1/24, 1/36, 57/00*
U.S. Cl. 220—20 **5 Claims**



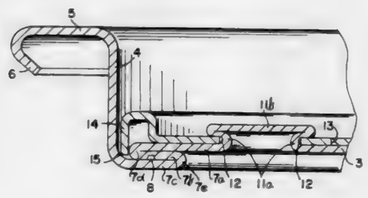
1. A teapot body and lid combination comprising a vertically-extending base on the teapot enclosing a space, a shelf means horizontally disposed within the base separating it into the upper and lower spaces, an unround hole substantially in the midportion of the shelf, an unround knob on the lid slightly smaller than the unround hole in the shelf to permit the knob to be inserted through the hole, the unround knob and hole causing the knob to hang on the shelf when it is inserted through it and rotated out of alignment with it, and the lower space in the base being sufficiently large to store the lid within the base when the knob is hung on the shelf.

4,040,539
COOKING UTENSIL
Silla Patterson, 6959 S. Union Ave., Chicago, Ill. 60621
Filed Apr. 15, 1976, Ser. No. 677,160
Int. Cl.[2] B65D *25/08, 1/24*
U.S. Cl. 220—22 **10 Claims**



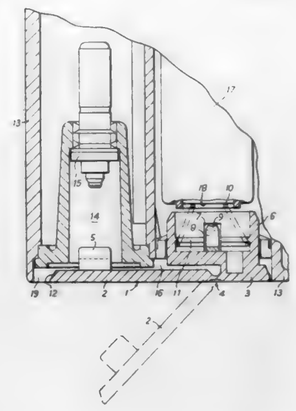
1. A cooking utensil for packaging a plurality of food ingredients to be mixed with one another and subsequently cooked comprising container means having bottom wall means and first side wall means extending around the periphery of said bottom wall means, cover means for closing said container, compartment divider means projecting downwardly from said cover means into said bottom wall means, second side wall means extending around said cover means and projecting downwardly, said second side wall means having an inner face and an outer face, said inner face being sealed to the ends of said divider means to form compartments projecting downwardly from said cover means, said first side wall means and said second side wall means abuttingly engageable with one another, said cover means being sealable to the free end of said first side wall means, divider receiving means positioned on said bottom wall means for sealingly engaging said divider means whereby when said cover means is on said container means, said divider means and said divider receiving means being engageable to form a plurality of compartments sealed on all sides for holding food ingredients to be mixed so that when said cover means is removed said divider means are removed from said container means and the contents of said compartments may be readily mixed with one another in said container means and cooked.

4,040,540
EDGE PROTECTION FOR EASY OPENING END CLOSURE
Obert M. Ostrem, Westmont; Donald F. Kulikowski, Oak Forest, and Sam C. Pulciani, Norridge, all of Ill., assignors to The Continental Group, Inc., New York, N.Y.
Continuation of Ser. No. 641,472, Dec. 17, 1975, abandoned.
This application Aug. 9, 1976, Ser. No. 712,440
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—273 **15 Claims**



1. An easy opening container end closure having a ledge portion and a removable panel portion, a single band folded under said panel portion and over said ledge portion, and a score located in said band intermediate the folds of the band presenting smooth turned surfaces on the ledge and the removable panel portion after said score is fractured and the panel portion removed.

4,040,541
HINGED CLOSURE FOR A BATTERY-OPERATED CIGARETTE LIGHTER
Donald Leslie William Brooks, Ashtead, England, assignor to Ronson Corporation, Woodbridge, N.J.
Filed Sept. 24, 1976, Ser. No. 726,188
Claims priority, application United Kingdom, Sept. 30, 1975, 40042/75
Int. Cl.[2] B65D *43/14, 51/04*
U.S. Cl. 220—339 **13 Claims**

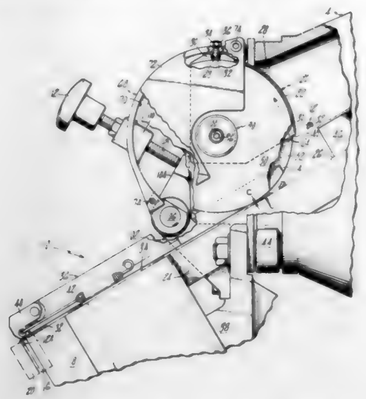


1. A cover for a recess in a battery-operated cigarette lighter, said cover comprising an integral body formed of plastics material, said body comprising a plate-like closure section for the recess and said closure section having a first portion which constitutes a flap movable between a closed position and an open position, a second portion connected to the first portion by means of a region of reduced thickness such that the first and second portions are hinged with respect to each other and together form the closure section for the recess, means associated with said second portion for releasably securing the second portion within the recess in the lighter, and electrically conductive spring means associated with said second portion for retaining a part in place within the lighter and for providing an electrical connection therefor.

4,040,542
CLEARING WHEEL ASSEMBLY FOR THREAD ROLLING MACHINE AND THE LIKE
James Francis Gibb, Terryville, Conn., assignor to The Hartford Special Machinery Company, Simsbury, Conn.
Filed Oct. 28, 1975, Ser. No. 626,365
Int. Cl.[2] B65H *9/00*
U.S. Cl. 221—162 **1 Claim**

1. Apparatus for feeding headed work blanks of small size to a work station and comprising a rotary hopper for tumbling the work blanks, the hopper having a discharge opening, a pair of feed rails for receiving blanks from the hopper to be fed to the work station, the feed rails defining a track for supporting the head of each blank with its shank received between the rails, the track having an input end located within the hopper with the track extending through the discharge opening, a pair of clearing wheels spaced apart side-by-side and coaxially supported for rotation adjacent the hopper in aligned relation to the track, the clearing wheels received within the discharge opening and located in part within the hopper in elevated spaced relation to the track to define a predetermined minimum clearance therebetween sufficient to permit the head of a blank to pass under the clearing wheels in a direction generally opposite the angular direction of rotation of the clearing wheels adjacent the track when the blank is properly oriented with its head seated on the track, the clearing wheels each

having a circumferentially extending peripheral rim with a knurled surface pattern providing a gripping surface for clearing improperly oriented blanks from the input end of the track while preventing blank trapping or lodging within the rim, and a shield having an arcuate cover plate and a flat mounting plate secured to the cover plate in perpendicular relation thereto for mounting the shield in fixed relation to the clearing wheels, the cover plate circumferentially extending about arcuate portions of the clearing wheels located within the hopper in interfering relation to the path of movement of blanks being driven out of the hopper discharge opening under the driving force of the



rotating clearing wheels, the cover plate being spaced outwardly from said arcuate portions of the clearing wheels located within the hopper and defining a radial clearance between the clearing wheels and the shield cover plate, said radial clearance being less than the shank diameter of the blanks being handled, the flat mounting plate of the shield being located within the space between the clearing wheels within the hopper above the track and substantially filling space to reduce the clearance between the shield plate and the wheels to a dimension less than the shank diameter of the blanks being handled.

4,040,543

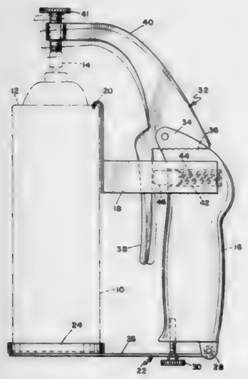
ADJUSTABLE AEROSOL CAN HOLDER

Rafael Guillen, 2826 18th St., National City, Calif. 92050

Filed Dec. 11, 1975, Ser. No. 639,791

Int. Cl.[2] A47G *19/14*

U.S. Cl. 222—473 **1 Claim**



1. A holder and dispenser for a cylindrical pressurized canister having an upper rim and a firing head comprising:

a. an elongated handle;

b. a hooked member mounted to said handle for engaging the upper rim of a pressurized cannister;

c. a clamp element pivotally mounted on said handle for engaging the bottom of said cannister and a set screw passing through said clamp element and threadably engaging said handle to force said clamp element towards said hooked member to engage a pressurized cannister therebetween and such that the spacing between said clamping element and hooked member is variable;

d. an actuator pivotally mounted to said handle and having an arm extending into adjacency with said firing head for firing same and a trigger element extending along said handle in spaced relation thereto; and

e. a variably extendible firing head depressor mounted in the distal end of said actuator arm to fire said cannister upon moving said actuator, whereby a plurality of cannisters of different rim-to-firing head spacing may be accommodated and the cannister may be temporarily set in its dispensing mode.

4,040,544

MATERIAL DISPENSER WITH SNAP-ACTING OUTLET VALVE

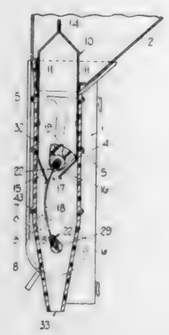
David Higgins, Stratford upon Avon, England, assignor to William Ernest Golcher, Walsall, England

Filed Jan. 21, 1976, Ser. No. 650,845

Claims priority, application United Kingdom, July 19, 1975, 30356/75

Int. Cl.[2] B65D *47/20*

U.S. Cl. 222—477 **10 Claims**



1. A dispensing apparatus comprising a container for material to be dispensed, an outlet spout from said container through which a quantity of material to be dispensed can be discharged, valve means including a curved blade spring movable across the spout between first and second positions in each of which it partially closes the spout, and a valve element connected to the blade spring and movable simultaneously therewith across the spout in a generally opposite direction to the spring between first and second positions in each of which it completes closure of the spout, and operating means connected to the blade spring and operable to deform the blade spring in a direction away from one towards the other of its first and second positions until the blade spring reaches a position from which it snaps rapidly across the spout to its said other position, causing simultaneous movement of the valve element to the other of the valve element positions, whereby a quantity of material is able to pass through the spout during movement of the spring and element thereacross.

4,040,545

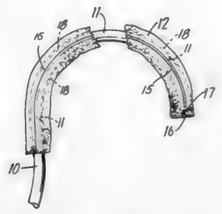
CLOTHING HANGER GUARD

Andrew Joseph Hill, Long Beach, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 7, 1975, Ser. No. 593,655

Int. Cl.[2] A47J *51/098*

U.S. Cl. 223—85 **1 Claim**



1. A clothing hanger shaped for the support of articles of clothing which may be hung from said hanger, including a curved hook section of the hanger which is shaped so as to support the hanger and any clothing attached on the hanger when the hook section is grasped or fixed, together with

a protector member detachably mounted about the curved wire of the hook section of the hanger, said protector member serving to reduce the lifting stress, applied in bearing, to the hook section of the hanger, when the hanger is held from the hook section,

said protector member being a tube of circular cross-section of a larger outer diameter than the wire of the hook section of the hanger, in which the protector is fabricated of a tube of flexible plastic material which is softer than the wire of the hook section of the hanger, said tube slitted along its length, in which the protector member is formed of a hollow tube closed at one end of the tube to form a closed tip at said end, with the slit of the tube terminating short of the said closed tip.

4,040,546

HOLLOW PLASTIC GARMENT HANGER

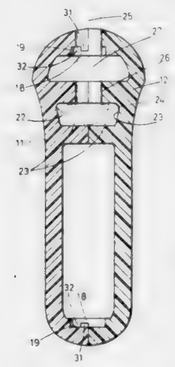
Johannes Liebscher, Nassau, Lahn, and Rolf G. Schulein, Singhofen, both of Germany, assignors to Leifheit International Gunter Leifheit GmbH, Nassau, Lahn, Germany

Filed Dec. 8, 1975, Ser. No. 637,857

Claims priority, application Germany, Dec. 6, 1974, 2457738

Int. Cl.[2] A47J *51/097*

U.S. Cl. 223—88 **14 Claims**



1. A hanger, comprising an elongated hanger body including a plurality of shell-shaped hanger halves separated from one another substantially in a longitudinal plane of symmetry of said hanger body, each of said shell-shaped halves having a raised peripheral edge portion bounding a recess which has an inner wall surface, said recesses together forming a hollow interior of said hanger body when said hanger halves are connected together; means for connecting said shell-shaped hanger halves to one another to form said hanger body, said connecting means including a plurality of mating male and female connecting portions formed at a plurality of locations interspersed over the entire inner wall surface of said recesses of the respective halves, said connecting portions of the respective hanger halves matingly engaging one another when said hanger is assembled and extending across said hollow interior of said hanger body so as to simultaneously connect said hanger halves with one another and to impart rigidity to the hanger body at said plurality of locations whereby to reinforce it against flexing; and at least one hook-shaped suspension element connected to said hanger body.

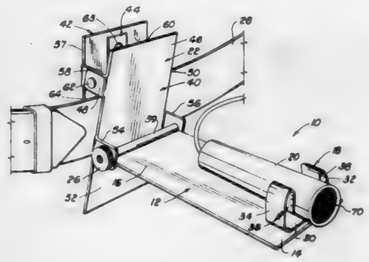
4,040,547

APPARATUS FOR HOLDING A MICROPHONE

Ralph E. Dickey, 821 North Walnut, Box 267, Medicine Lodge, Kans. 67104

Int. Cl.[2] A45F *5/02*

U.S. Cl. 224—5 H **1 Claim**



1. An apparatus for holding a microphone, the apparatus comprising:

a flat angular shaped base having a first end portion and a second end portion, the second end portion of said base folded into a hollow cylindrical portion;

a U-shaped clip, said clip having a bottom portion secured to the top of the first end portion of said base, and side portions extending upwardly from the bottom portion, the ends of the side portions folded over and positioned facing each other, the space between the side portions being smaller than the diameter of the microphone so the microphone may be received therebetween and retained in a press fit;

a spring biased clip for releasably engaging an article of clothing worn by the user of the microphone, said spring biased clip including;

a first member having an upper portion with a pair of ears extending rearwardly from the opposite sides of the upper portion, and a lower portion having a pair of ears extending outwardly from the opposite sides of the lower portion and having apertures therein,

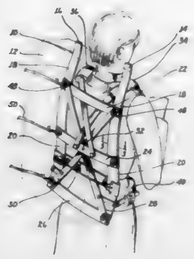
a second member having an upper portion with a pair of ears extending outwardly from the opposite sides of the upper portion, the ears pivotally attached to the ears of the upper portion of the first member.

a U-shaped leaf spring, one end of the leaf spring attached to the upper portion of the second member, the other end of the leaf spring biased against the upper portion of the first member; and

a threaded bolt slidably received through the hollow cylinder portion of the second end portion of said base and slidably received through the apertures in the ears of the lower portion of the first member of said spring biased clip for receiving a locking nut, whereby by loosening said locking nut on said bolt, said base and microphone may be

pivoted relative to said spring biased clip and locked again in a desired angular orientation.

4,040,548
FLEXIBLE BACK PACK FRAME
Joe H. Guglielmo, 340 Pinal St., Globe, Ariz. 85501
Filed Mar. 17, 1976, Ser. No. 667,636
Int. Cl.² A45F *3/00*
U.S. Cl. 224—25 A **2 Claims**



1. A flexible, laminated back pack frame conforming to the dual curvature of a wearer's back for supporting and distributing a load over the wearer's back and shoulder region while simultaneously accomodating movement of the wearer by readily deforming to fit the changing contour of the wearer's back in response to both bending and twisting movements of his body, said frame comprising in combination:

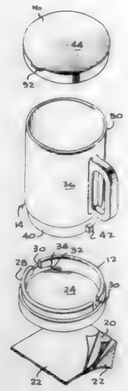
a. a pair of parallel, upright laminated members each having an outwardly curved upper section conformingly fitted to the upper portion of the wearer's back and shoulder region, and an inwardly curved lower portion conformingly fitted to the lower position of the wearer's back, said upright members comprising a laminate having a first ply of glass reinforced plastic positioned adjacent the wearer's back, a second ply of glass reinforced plastic and a wooden filler ply of glass reinforcedplastic and a wooden filler ply situated between and bonded to said glass reinforced plastic plys, said laminate being continuously flexible into a conforming relationship with the wearer's back in response to body movements;

b. upper, central, and lower laminated horizontal crosspieces, each individually bonded to and spanning said upright members, said crosspieces having a curvature conforming to the lateral curvature of the wearer's back at the respective locations of each of said crosspieces; and

c. first and second diagonal brace members extending diagonally between said upright members, said diagonal brace members intersecting at a position adjacent the middle of said second crosspiece and having a curvature conforming to the adjacent curvature of the wearer's back; whereby the back pack frame readily and continuously conforms to the contour of the wearer's back in response to both bending and twisting motions of his body and thereby distributes the load over the wearer's back and shoulder region.

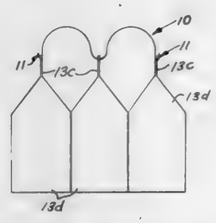
4,040,549
THREE IN ONE CAR CUP AND HOLDER
Clyde John Sadler, 207 Lansing, Lynchburg, Va. 24503
Filed May 27, 1975, Ser. No. 580,884
Int. Cl.² B60N *3/10*
U.S. Cl. 224—29 G **2 Claims**

1. A non-spilling cup and coin holder assembly for mounting in vehicles or the like, said assembly comprising a holder having a bottom with an upwardly projecting side wall forming an inner bore, said inner bore having generally vertical slots connecting with circumferential slots extending from the vertical slots, an adhesive attachment means for fastening the holder to the dashboard of the vehicle, a cup having an upper lip and a generally cylindrical base of a diameter smaller than the diameter of said inner bore and insertable into said inner bore, said cup having outwardly directed tabs insertable into said vertical slots and circumferential slots, and a cover means having an internal diameter slightly larger than both the cup's upper lip and the holder's side walls and being selectively attachable to said upper lip of the cup or to an upper portion of



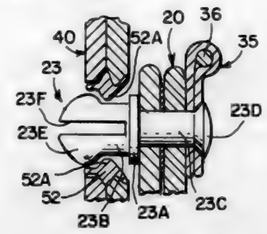
said upwardly projecting sidewall of said holder when said cup is not positioned in said holder thereby providing a covered cup which is securely held in position by the holder to prevent any spilling from the cup and also to provide a covered holder for retaining coins and the like when the cup has been removed from the holder and the cover means has been attached to the holder.

4,040,550
BEER CASE AND SOFT DRINK CARTON CARRIER STRAP
Bernard L. Kleinert, 56937 State Road 123, South Bend, Ind. 46619
Int. Cl.² B65D *33/06*
U.S. Cl. 224—45 P **1 Claim**



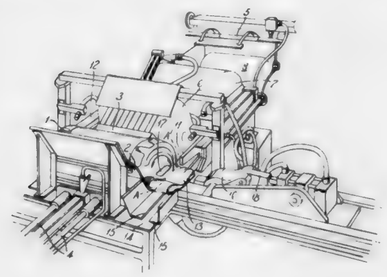
1. A beer can and soft drink carton carrier strap assembly, comprising in combination, an elongated flat strap made of a flexible material, each opposite free end of said strap being permanently affixed by means of a plurality of rivet fasteners to one end of a metal hanger, each said metal hanger having a generally U-shaped transverse bend thereacross, said opposite free ends of said strap and said hangers together each forming a hook, an end edge of each said hook extending parallel to an axis of said bend, a generally semi-circular notch along a center of at least one of said hook end edges for engaging around a bottle neck below a crown cap for removal of said cap, said at least one of said hangers having a length that is less than a transverse width thereof whereby said hanger may be held in the palm of a hand adjacent the strap end such that a downward force applies leverage so as to remove said crown cap; said hangers at opposite ends of said assembly being engageable in handle openings provided on beverage cartons while said strap is slidable through said carton handle of an intermediate carton when more than two such cartons are carried adjacent each other.

4,040,551
SKI AND SKI POLE CARRIER
Andrew L. Brumbaugh, Rte. No. 1, Wyalusing, Pa. 18853
Filed June 2, 1976, Ser. No. 692,102
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 S **9 Claims**



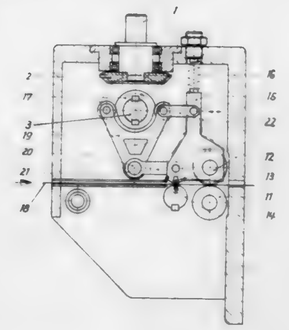
1. A transporting device for skis and ski poles, said device comprising an upper clamping assembly interconnected to a lower clamping assembly, said upper clamping assembly and said lower clamping assembly each including at least one ski pole clamp pivotably and releasably secured to at least one ski clamp, said at least one ski clamp is pivotably and releasably secured to at least one pole clamp by means of a lug passing through apertures within said ski clamp and said pole clamp, said lug including a shoulder portion positioned between said ski clamp and said pole clamp with a large diametered shank portion extending through the aperture in said pole clamp and being secured thereto by an enlarged head portion and an oppositely extending smaller diametered shank extending through the aperture in said ski clamp and being secured thereto by a flanged portion.

4,040,552
STRIPPING FLASH FROM BLOW MOULDED HOLLOW CONTAINERS
Robert W. Taylor, Bletchley, England, assignor to Plysu Limited, England
Continuation of Ser. No. 468,384, May 9, 1974, abandoned. This application Apr. 9, 1976, Ser. No. 675,634
Claims priority, application United Kingdom, May 18, 1973, 23818/73
Int. Cl.² B26F *3/02*
U.S. Cl. 225—1 **4 Claims**



1. A device for stripping a fin-like flash projecting substantially perpendicularly from a surface of a blow-moulded hollow container, comprising: means for locating a container at a stripping station with the fin-like flash located in a first plane and the surface of the container from which the flash is projecting located in a second plane, and a powered stripping tool which includes two parallel stripping jaws, the tool being mounted for reciprocation with the two jaws reciprocating on opposite sides of the said first plane, the forwardmost portion of each jaw which first engages the flash including a stripping surface which is acutely inclined firstly with respect to both the first and second planes and also with respect to a third plane perpendicular to both the first and second planes whereby, when the said stripping surface engages the flash, the resulting force on the flash includes a first component urging the flash out of the path of the tool in the direction of travel, a second component urging the flash out of the path of the tool and away from the said surface of the container and a third component urging the flash out of the path of the tool and inwardly toward the other stripping jaw.

4,040,553
INTERMITTENT STOCK FEED MECHANISM
Martin Götz, Sersheim, Germany, assignor to Erich Grau Stanzwerk fur Elektrobleche, Sersheim, Germany
Filed Nov. 10, 1975, Ser. No. 630,264
Claims priority, application Germany, Nov. 16, 1974, 2454514
Int. Cl.² B65H *17/22*
U.S. Cl. 226—151 **6 Claims**



1. A feeding mechanism for intermittently feeding stock to a processing machine, comprising

a rocker lever having at its outer end a gear segment,

a crank drive, including a crank which is operatively connected to said rocker lever, said crank drive being operable to impart an oscillation to said rocker lever,

a feeding clamp, comprising first and second, reversably rotatable, toothed feed rollers arranged to mesh with each other when said feeding clamp is closed, said first feed roller being in mesh with said gear segment,

a retaining clamp for holding said stock in position, said retaining clamp and said feeding clamp defining a stock path,

said retaining clamp comprising first and second clamping jaws, disposed on the same sides of said stock path as said first and second feed rollers respectively,

a forked lever carrying said second feed roller and said second clamping jaw,

a cam wheel operatively connected to said crank drive, said cam wheel positively controlling said forked lever, to cyclically open and close said feeding clamp and said retaining clamp, in alternation,

a pivoted roller bearing extending around and engaging said cam wheel and pivotable thereby, and

means comprising a lever and a link for linking said double roller bearing to said forked lever, so that said double roller bearing controls said forked lever.

4,040,554

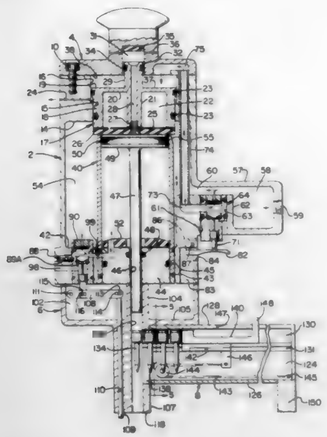
PNEUMATIC APPARATUS

Harry M. Haytayan, Sunnyside Lane, Lincoln, Mass. 01773

Continuation-in-part of Ser. No. 547,221, Feb. 5, 1975, abandoned, which is a continuation-in-part of Ser. No. 496,453, Aug. 12, 1974, and a continuation-in-part of Ser. No. 312,665, Dec. 6, 1972, abandoned. This application Dec. 4, 1975, Ser. No. 637,571

Int. Cl.[2] B25C *1/04*

U.S. Cl. 227—8 **43 Claims**



1. An improved fastener driving apparatus comprising:

a hollow housing having first and second opposite ends;

a cylinder mounted within said housing and extending between said first and second opposite ends, said cylinder having first and second opposite ends and the interior of said housing being divided into a first chamber located between said housing and said cylinder and a second chamber within and defined by said cylinder;

first and second end means closing off said first ends of said housing and said cylinder respectively, said second end means defining a first opening communicating with the interior of said cylinder;

a hammer disposed so as to be movable lengthwise through said first opening between a first retracted position and a second extended position;

a piston slidably mounted within said cylinder for driving said hammer from one to the other of its said first and second positions;

a first passageway communicating with the interior of said cylinder at said first end thereof,

third end means including a poppet valve closing off said second end of said housing, said poppet valve including a hollow valve casing and a poppet valve member comprising piston means slidably mounted in said valve casing for reciprocal movement between a first position wherein said poppet valve member is spaced from said cylinder and said second chamber is open to said first chamber via said second end of said cylinder and a second position wherein said poppet valve member engages said second end of said cylinder and closes off said second chamber from said first chamber;

a third chamber having an inlet for connection to a supply of pressurized air and an outlet communicating with said first chamber;

a second opening connecting said first passageway with said first chamber;

an exhaust port in said housing connecting with said first passageway;

a first control valve for selectively blocking flow of air between said first passageway and either said second opening or said exhaust port;

means defining at least one second passageway for transmitting air from said third chamber to the interior of said poppet valve casing so as to exert air pressure on said piston means in a direction to urge said poppet valve member to its said second position; and

a second control valve for selectively (a) blocking flow of air from said third chamber to said second passageway and for simultaneously venting air from said second passageway and said valve casing, whereby when said first control valve blocks flow of air between said first passageway and said second opening, the pressure of air in said first chamber forces said piston means to move said poppet valve member to said first position and forces said piston to drive said hammer to its second extended position, and (b) resuming flow of air to said second passageway from said third chamber and stopping the venting of air from said second passageway and said valve casing whereby (1) flow of air in said second passageway to said poppet valve casing causes said piston means to move said poppet valve member to its said second position and (2) when said first control valve blocks flow of air between said first passageway and said exhaust port said piston is forced under the pressure of air in said first chamber to drive said hammer back to its said first position.

4,040,555

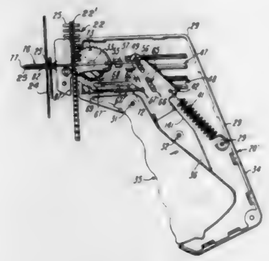
TAG ATTACHING APPARATUS

William A. Jenkins, Englewood, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Mar. 26, 1976, Ser. No. 670,797

Int. Cl.[2] B25C *1/00*

U.S. Cl. 227—67 **20 Claims**



1. Apparatus for attaching tags using fasteners, each fastener including a bar section and a button section joined by a filament section, with a connector joined to each bar section, and means for interconnecting the connectors to provide a unitary fastener assembly, the apparatus comprising: a body, a needle having a piercing end extending outwardly of the body and having an enlarged portion, a bore extending lengthwise of the needle, an elongated first slot in the side of the needle communicating with the bore, a second slot in the side of the enlarged portion for enabling entry of a bar section into the bore, means for advancing the bar sections one-at-a-time into alignment with the bore, a knife inserted into the enlarged portion adjacent the bore, the knife having a cutting edge disposed opposite the piercing end, and a push rod engageable with the bar section to effect severing of the bar section from its respective connector by the cutting edge and for thereafter driving the bar section through the bore while the filament section of the fastener extends through the first slot.

4,040,556

HAND-OPERATED STAPLER

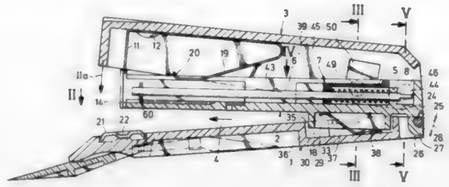
Gerald Dahle, Coburg, Germany, assignor to Wilhelm Dahle Buro- und Zeichengeratefabrik, Coburg, Germany

Filed July 22, 1976, Ser. No. 707,704

Claims priority, application Germany, July 31, 1975, 2534178

Int. Cl.[2] B25C *5/02*

U.S. Cl. 227—120 **12 Claims**



1. In a hand operated, portable stapler composed of a first part constituting a base plate having an anvil at one end for bending staple legs, a second part constituting a staple magazine for holding a strip of staples and bringing each staple in succession into an ejection position at one end of the magazine, a third part constituting an actuating lever carrying a staple driver aligned with the ejection position, first connecting means pivotaly connecting the other end of the first part to the second part to permit the second part to pivot toward and away from the first part, second connecting means pivotally connecting the third part to the second part to permit the third part to pivot toward and away from the second part to enable the staple driver to drive successive staples in the ejection position, the first and second connecting means presenting parallel pivot axes, and at least one of the parts being provided with lateral guide surfaces to confine the pivotal movement of that part and a part connected thereto to the direction defined by the pivot axes, the improvement wherein:

each said connecting means comprises at least one pivot pin carried by one of said parts which it connects and the other of said parts which it connects is provided with at least one recess for each said pin, and at least one of said parts associated with each said connecting means is elastically deformable in the region of said connecting means for permitting said pin to be inserted into its respective recess by elastic deformation of at least one of said parts associated with said connecting means; and

said base plate is provided with a recess which opens toward said staple magazine and is defined by side walls which extend longitudinally of said base plate and which are directed toward said staple magazine, said side walls presenting surfaces which face one another to define longitudinal boundaries of said recess and to define first ones of said lateral guide surfaces, and said staple magazine presents second ones of said lateral guide surfaces which are guided by said first ones of said guide surfaces.

4,040,557

ELLIPTICAL SEAM WELDING APPARATUS

James S. Heverly, Upper Darby, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 23, 1976, Ser. No. 651,757

Int. Cl.[2] B23K *9/10*

U.S. Cl. 228—9 **7 Claims**

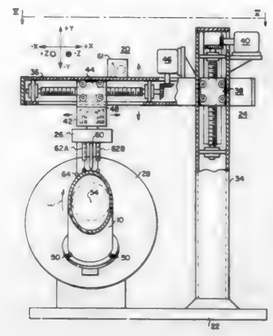
1. Apparatus for welding a complexly, convexly curved member, said apparatus comprising:

a welding torch;

means for rotating said convexly curved member at varying angular velocities to produce a predetermined generally constant linear speed relative to said torch;

a pair of probes disposed in a spaced relation to each other and to said torch, each probe abutting said convexly curved member and responding to variations in distance from a datum plane to produce a signal proportional to said variations;

means for moving said torch in X and Y directions in response to the signal from said probes to a point on said convexly curved member which point is successively the greatest distance from said datum plane;



whereby said welding torch forms a weld pool adjacent said point to automatically form a uniform weld adjacent the periphery of said complexly, convexly curved member as said member rotates.

4,040,558

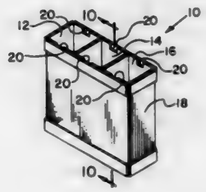
COMBINATION SHIPPING AND STORAGE CONTAINER AND METHOD

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Mar. 11, 1975, Ser. No. 557,420

Int. Cl.[2] B65D *5/35, 5/02*

U.S. Cl. 229—23 BT **19 Claims**



1. A combination shipping and storage container comprising:

a. a removable and reuseable outer shell having at least an open bottom;

b. an inner container, positioned within said outer shell, said inner container having at least one product receiving cell; and

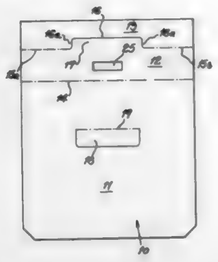
c. removing means, associated with said container, for removing said outer shell by lifting said outer shell upwardly from said inner container, said inner container being used to contain the products for storage purposes and said outer shell being reusable, and said removing means comprising in part a notch being formed in opposite sides of the upper portion of the inner container.

4,040,559

CARTON WITH SMOOTH REINFORCED HAND HOLE

Buddy E. Giebel, Monroe, Mich., assignor to Union Camp Corporation, Wayne, N.J.

Filed Nov. 15, 1976, Ser. No. 741,683
Int. Cl.[2] B65D *13/00, 5/46*
U.S. Cl. 229—23 R **4 Claims**



1. In a Bliss-type carton of paperboard having the bottom and side walls secured to individual end walls the improvement in each end wall comprising:

a full height outer panel;

a hand hole cut out of the outer panel to provide a hand hole flap hinged along a top score line and reverse folded and secured to the inner surface of the outer panel;

an inner panel connected to the top of the outer panel along a first score line; and

an intermediate panel connected to the inner panel along end score lines spaced apart and in line with each other;

the inner and intermediate panels each having a height no greater than the distance between the top of the hand hole and the top of the outer panel;

a U-shaped cut out between the spaced end score lines formed by a straight line cut and end cuts, the outer ends of the end cuts running to the inner ends of the spaced end score lines to provide a recess in the intermediate panel and a projection from the inner panel;

the inner and intermediate panels being reverse folded above the hand hole and secured to the outer panel with the projection overlying and secured to the hand hole flap and the hand hole flap within the recess;

thereby providing a smooth hand hole and a triple layer reinforced area above the hand hole.

4,040,560

CARTON ADAPTED TO BE STACKED FLAT AND SNAPPED OPEN

Milton J. Grossman, 10296 S. Mina, Whittier, Calif. 90605, and Deanna Rose Lewis, 2061 Wallace No. B, Costa Mesa, Calif. 92627

Filed Nov. 8, 1976, Ser. No. 740,124
Int. Cl.[2] B65D *5/36*
U.S. Cl. 229—41 B **13 Claims**

1. A flattenable carton, comprising:

four sides;

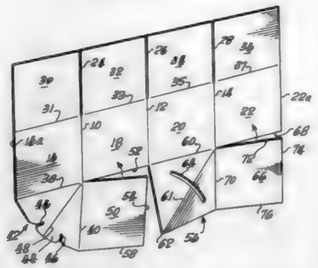
means forming a bottom for said carton, said means comprising a flap connected to one end of one of the sides, said flap having a tongue at the outer free edge and a score line extending from a lower corner of the side from which the tongue extends and along which said tongue is adapted to be folded;

a second flap having one edge connected to the first flap, there being a score line separating said flap, the other edges of said second flap being free;

a third flap connected to the side opposite the side to which the first flap is connected, said third flap having a generally diagonally arranged slot, and a score line extending diagonally of the third flap and intersecting said slot;

a fourth flap having one edge connected to a third flap along a score line, the other edges of the fourth flap being free;

when the carton is folded and flattened, the second and fourth flaps are secured to the inner surfaces of the respective adjacent sides, and the first and third flaps are folded



along their fold lines with the tongue of the first flap in alignment with the slot of the third flap; and

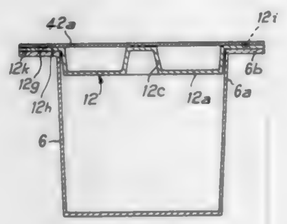
pressure on the outer corners of the folded and flattened carton causing the tongue to enter the trough of the slotted flap and enter the slot to complete the bottom of the carton.

4,040,561

PROCESS AND INSTALLATION FOR PACKING A LIQUID PASTY, OR GRANULAR PRODUCT AND A PACKING CONTAINER

Raymond C. Philippon, Saint-Cloud, France, assignor to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques - ERCA, France

Filed Apr. 24, 1975, Ser. No. 571,204
Claims priority, application France, Apr. 25, 1974, 74.14503
Int. Cl.[2] B65D *5/64, 77/00*
U.S. Cl. 229—43 **7 Claims**



1. A packing container provided with a profiled closure lid and a guarantee sheet, the closure lid being sealed on a flat rim of the container and the guarantee sheet being sealed on the edge of the closure lid, the closure lid comprising a flat ring which is sealed to the flat rim of the container and whose outer periphery coincides with the outer periphery of the flat rim of the container, a flat dish rim being formed inside the flat ring and resting freely on an inner marginal zone of the flat rim of the container, the dish rim having an outer periphery of substantially the same shape as the inner periphery of the said flat ring, and being partially connected to the said flat ring by at least one attachment tongue made of the same material as the flat ring and the dish rim, said at least one attachment tongue being disposed in a straight line coinciding with one of the edges of the dish rim, the guarantee sheet being sealed on said flat ring.

4,040,562

PLASTIC BAG AND CARRIER HANDLE

Gregory A. Ward, Balboa Island, and Lawrence P. Casey, III, Garden Grove, both of Calif., assignors to Casard Industries, Inc., Newport Beach, Calif.

Filed Mar. 9, 1973, Ser. No. 339,504
Int. Cl.[2] B65D *33/06*
U.S. Cl. 229—54 R **4 Claims**



1. A container for the manual emergency transportation of a small quantity of fuel by a vehicle operator, comprising:

a pair of thin, flexible sheet members having a substantially trapezoidal surface configuration, said sheet members overlying one another, the edges of said sheets bonded together by a marginal seal which extends throughout substantially the entire length of the respective sides and base of said trapezoidal sheets but not the top thereof, the upper portion of said bonded pair of sheet members, removed from said base seam, forming a cone, truncated at said top, when said container is filled with fuel and inverted, the open truncated top of said cone being large enough to receive the standard nozzle used at filling stations for supplying fuel to said bag, the weight of fuel included in said container during use being progressively applied through said trapezoidal sheet members to said top when said container is carried, said top of said trapezoidal sheets sized to permit said top, when placed in the fill opening of an automobile when said container is inverted, to expand against said opening to form a tight fit with said opening to prohibit fuel leakage and thereby operate as a sealed funnel for the included fuel during discharge from the container; and

a handle including a grip portion adapted to be hand held by said operator and a sealing portion, said sealing portion including a gripping surface for frictionally engaging said flexible sheet members adjacent the top of said trapezoidal surfaces;

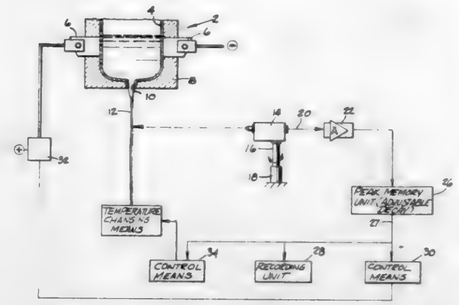
said top of said trapezoidal sheets wrapped around said sealing portion of said handle to press said pair of sheets adjacent said top against one another in sealing engagement between said gripping portion of said handle and a portion of said sheets removed from said top, so that the weight of said included fuel seals said top of said sheets together when said container is manually carried.

4,040,563

SYSTEM AND METHOD OF MONITORING THE PEAK TEMPERATURE OF A MOVING MASS

James Alfred Schairer, Richmond, Ind., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 19, 1975, Ser. No. 633,529
Int. Cl.[2] C03B *5/24;* **G01J** *5/02*
U.S. Cl. 236—15 BC **7 Claims**



1. A system for monitoring the peak temperature of a mass moving past a given area wherein the peak temperature changes location within the confines of the mass and of said area, comprising:

a. means for sensing the temperature of a portion of said mass which portion is located adjacent to a segment of said area, said sensing means being spaced from said mass and capable of emitting a first signal having a magnitude representative of the temperature of said mass at said portion, said first signal comprising peaks and valleys and magnitude differences therebeween,

b. means for oscillating said sensing means and thereby scanning said moving mass such that on each half cycle of oscillation said sensing means scans the peak temperature of the moving mass,

c. means for receiving said first signal and for generating a second signal that relates to at least the peak magnitude of that portion of said first signal received during each half cycle of oscillation, said receiving and generating means also having means for decaying the magnitude of said second signal at a desired rate between the times that the peak temperatures are sensed in sequential half cycles of oscillation by the sensing means, said second signal having peaks and valleys and magnitude differences therebetween, the magnitude differences of said second signal being much smaller than the corresponding magnitude differences of said first signal.

4,040,564

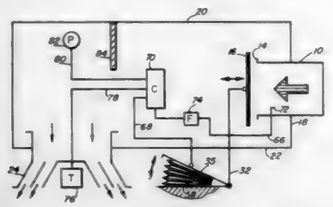
SYSTEM POWERED DAMPER AND CONTROL UNIT

William J. Waeldner, Waverly, and William J. Harris, Tunkhannock, both of Pa., assignors to Dynamics Corporation of America, New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,323
Int. Cl.[2] F24F *13/10*
U.S. Cl. 236—49 **16 Claims**

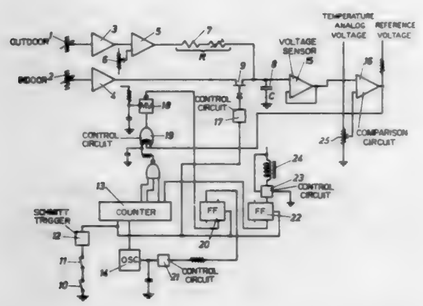
1. In a system powered damper and control unit for controlling air flow through a conduit in an air conditioning system; the combination comprising a damper movable between open and closed positions for controlling conduit air flow, means defining a seat engageable by the damper in its closed position to seal the conduit against air flow, an expansible and contractible bellows disposed externally of said conduit, a fixed plate disposed on one side of said bellows, a movable plate disposed on an opposite side of said bellows and pivotally mounted on a generally horizontal axis for swinging movement in one and an opposite direction on expansion and contraction of the bel-

lows, the weight of the plate bearing against and tending to contract the bellows for a gravity bias in said opposite direction and for damper opening movement, damper closing movement being effected by bellows expansion, pressure supply means interconnecting said bellows and conduit for a supply of air under pressure to the former, a control associated with said pressure supply means and bellows and operable to control bellows expansion and contraction and thereby determine the position of said movable plate, a motion transmitting device interconnecting said movable plate and damper and operable to position the latter in said conduit in accordance with plate



position, said last mentioned means including a floating connection with said damper for accommodating free damper movement about at least two discrete axes and thereby permitting slight damper adjustment for full closing thereof against said seat and sealing of the conduit, and a means for limiting plate movement in the bellows contracting direction while permitting free bellows and plate movement in the bellows expanding direction, said means thus serving to limit damper movement in the conduit opening direction whereby to maintain a predetermined minimum conduit pressure drop for bellows operation under low flow conditions.

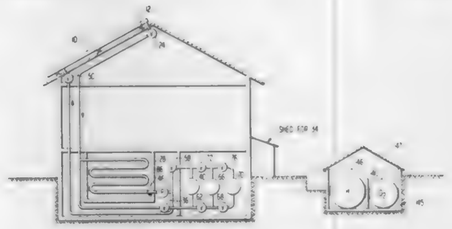
4,040,565
CONTROL UNIT FOR THERMAL CONDITIONING SYSTEMS
Jorn Uffe Christiansen, Hvidovre Strandvej 48, DK-2650 Hvidovre, Denmark
Filed Apr. 20, 1976, Ser. No. 678,497
Claims priority, application Denmark, Apr. 21, 1975, 1715/75
Int. Cl.² G05D *23/00*; F28D *7/10*
U.S. Cl. 236—91 G **5 Claims**



1. A central unit for shutting down and restarting a thermal conditioning system, such as for at least one building space, comprising:

a. a first voltage source responsive to outdoor temperature;
b. a second voltage source responsive to the temperature of at least one building element;
c. a resistor sized to be the analog of the thermal constants affecting said space;
d. a third voltage source responsive to indoor temperature in the space;
e. a condenser sized to be the analog of the capacity of the thermal conditioning system;
f. said first, second and third voltage sources and said resistor being connected together to form a charging network connected to said condenser;
g. a voltage sensor connected to said condenser;
h. a comparison circuit connected to said voltage sensor and to a preadjusted fourth voltage source representing the desired temperature;
i. a time clock switch; and
j. a time-determining network under the control of said time clock switch and said comparison circuit for energizing the system when needed in order for the building space to reach the desired temperature at a predetermined time.

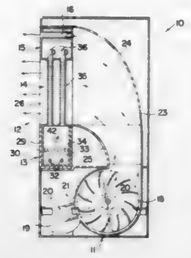
4,040,566
POLLUTION-FREE HEATING SYSTEM
Carl Chiarelli, 20 Lake End Road, Merrick, N.Y. 11566
Filed Sept. 15, 1975, Ser. No. 613,492
Int. Cl.² F24J *3/02*
U.S. Cl. 237—1 A **6 Claims**



1. A system for heating a building and providing it with heated water for domestic use comprising in combination:

a. solar heating means, which includes
a heating panel comprising a plurality of is circulated; and
means mounted for exposure to sunlight, for intensifying the sunlight at said plurality of parallel pipes to thereby raise the temperature of the liquid circulated therein;
b. means mounting said solar heating means to the roof of the building;
c. heat exchange means to heat air circulated within the building from said liquid;
d. a liquid circulating means, which includes
a circulating pump for said liquid,
connecting means to deliver said liquid from an outlet of said circulating pump to an inlet of said heating panel.
connecting means to deliver said liquid from an outlet of said heating panel to an inlet of said heat exchange means, and
means to deliver said liquid from an outlet of said heat exchange means to an inlet of said circulating pump;
e. means for reducing heat loss from said heating panel during periods of little or no sunshine;
f. means for heating potable water for domestic use from said liquid;
g. a plurality of insulated liquid storage tanks, each having an inlet and an outlet;
h. inlet connecting means which connect said inlets of said storage tanks to said outlet of said liquid circulating pump;
i. outlet connecting means which connect said outlets of said storage tanks to said inlet of said heat exchange means;
j. valve means for each liquid storage tank, disposed in said inlet and outlet connecting means, whereby said liquid storage tanks can be successively connected to said circulating means; and
k. liquid temperature sensing means disposed within said heat exchange means, which successively opens said valve means for each liquid storage tank at a different predetermined high temperature for each liquid storage tank, and closes all valve means for each liquid storage tank at a single predetermined low temperature of said liquid in said heat exchange means.

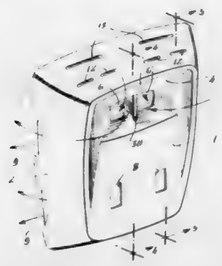
4,040,567
HEATING UNIT
Charles D. McNeely, Uniontown, Ohio, assignor to NEPRO, Inc., Uniontown, Ohio
Division of Ser. No. 544,276, Jan. 27, 1975, Pat. No. 3,941,311.
This application Oct. 8, 1975, Ser. No. 620,769
Int. Cl.² F24D *1/02*
U.S. Cl. 237—81 **4 Claims**



1. A method for facilitating heat transfer in a heating unit comprising the steps of:

providing a lower phase liquid having a specific heat less than unity and a boiling point greater than 200° F;
floating an upper phase liquid upon the lower phase liquid;
heating and vaporizing the lower phase liquid whereby the vapor percolates through said upper phase liquid; and,
circulating the vapor of the lower phase liquid throughout the heating unit to transfer heat.

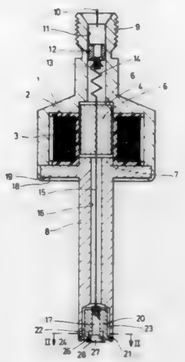
4,040,568
DISPENSER FOR VAPORIZABLE MATERIAL ACCENTUATED BY AMBIENT AIR FLOW
Stanley I. Mason, Jr., Weston; Michael D. Handler, Bridgeport, and James E. Richardson, Weston, all of Conn., assignors to Simco, Inc., Weston, Conn.
Filed Sept. 15, 1975, Ser. No. 613,308
Int. Cl.² A61L *9/04*
U.S. Cl. 239—57 **12 Claims**



1. A dispenser for releasing volatile material in the presence of surrounding air movement, said dispenser including,

a pair of similar containers, each containing volatile material, said containers each having an opening at one end thereof and a partitioned container extension proximate to said opening, said extension being concave towards said opening,
a housing having an air inlet on one surface thereof and an air exit,
means for mounting said containers in said housing with part of each said extension facing and opening to said air inlet, and so the remaining portion of said extension facing the inside surface of said housing and defining a gap therebetween,
whereby ambient air may enter one side of each said container extension, pass into said container and leave, carrying volatile material, out the other side of said container extension.

4,040,569
ELECTRO-MAGNETIC FUEL INJECTION VALVE
Heinrich Knapp, Leonberg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Feb. 6, 1976, Ser. No. 655,877
Claims priority, application Germany, Feb. 26, 1975, 2508390
Int. Cl.² F02M *51/08*
U.S. Cl. 239—467 **7 Claims**



1. In an electro-magnetic injection valve for timed low pressure fuel injection systems of internal combustion engines utilizing induction tube injection, including; a housing; a stationary iron core located within the housing; a fixed magnetic winding supported within the housing by the iron core; an armature-plunger mounted within the housing in co-axial relationship with the iron core, said armature-plunger being immersed by the fuel within the housing; a hollow stem connected to the housng; means within the hollow stem which define a valve seat; and a valve needle connected to the armature-plunger and forming an injection nozzle with the valve seat, the improvement comprising: a non-rigid wire rod which connects the valve needle to one end of the armature-plunger, said rod being immersed by the fuel within the valve; tension means connecting the other end of the armature-plunger to the housing, said tension means and the fuel pressure at the valve needle placing the non-rigid wire rod and armature-plunger under tension; and a plurality of bores formed within the valve seat defining means which are dimensioned to determine the apportionment of fuel by the injection nozzle and are appropriately disposed to transform the pressure energy associated with the fuel apportionment into kinetic energy for utilization in the preparation of the fuel, wherein:

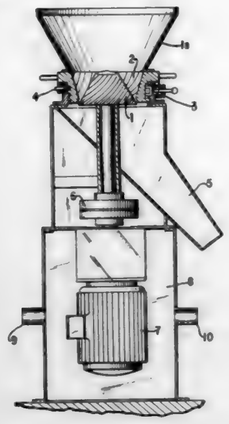
i. the valve seat defining means is formed as a hollow member within the free end of the hollow stem where it is immersed by the fuel within the valve, said hollow member having a central axis about which a circumferential surface lies which defines an annular cylindrical space with the interior wall of the hollow stem;
ii. the plurality of bores comprising two mutually parallel disposed bores each serving as a throttle and each being formed within the wall of the hollow member to extend inwardly toward the central axis, with each bore being disposed at the same distance from the central axis; and
iii. the valve needle is lifted outwardly from its valve seat by the movement of the armature-plunger and non-rigid wire rod as a unit.

4,040,570

PREPARATION OF UNIFORM BLACK POWDER GRANULES

Wolfgang Wiedemann, Dulmen, and Friedrich Platte, Recklinghausen, both of Germany, assignors to Wasag Chemie GmbH, Munich, Germany

Continuation of Ser. No. 281,622, Aug. 18, 1972, abandoned.
This application July 11, 1975, Ser. No. 595,221
Claims priority, application Germany, Aug. 31, 1971, 2143443
Int. Cl.[2] B02C *19/12*
U.S. Cl. 241—3 2 Claims



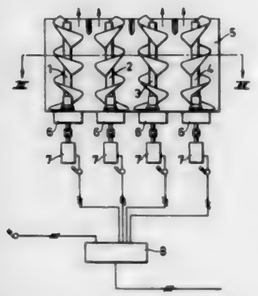
1. A method for the production of black powder granules of a given uniform grain size comprising compressing black powder meal, coarse crushing the compressed black powder and grinding the coarse ground black powder particles with little relative movement of the particles to each other in a gap between a conical, spirally grooved rotor and a conical, oppositely spirally grooved stator.

4,040,571

METHOD OF CONVEYING AND DESINTEGRATING REFUSE AND THE LIKE, AND APPARATUS FOR CARRYING OUT THIS METHOD

David Georg Lindeborg, Blomstermala, Sweden, assignor to Norba Aktiebolag, Blomstermala, Sweden

Continuation of Ser. No. 571,518, April 25, 1975, abandoned.
This application Sept. 17, 1976, Ser. No. 724,309
Claims priority, application Sweden, May 3, 1974, 7405908
Int. Cl.[2] B02C *19/22*
U.S. Cl. 241—30 9 Claims



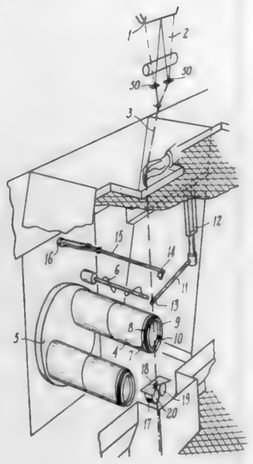
1. Method of conveying and disintegrating composite goods such as refuse comprising the steps of (1) advancing said goods through a chamber by rotating in said chamber a plurality of mutually cooperating, substantially parallel rotatable feed screws which define therebetween axially extending interspaces, said rotation being in the axial direction of said feed screws; and (2) cyclically intermittently reversing the direction of rotation of at least one of said feed screws relative to at least one other of said feed screws according to a predetermined program, whereby to temporarily feed part of the goods backwards.

4,040,572

STRAND ATTENUATION AND WINDING APPARATUS AND METHOD

Giuseppe-Fabrizio Mario Melan, Chambery, and Jean Raymond Nicoulaud, Challe-les-Eaux, both of France, assignors to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Nov. 11, 1975, Ser. No. 630,925
Claims priority, application France, Nov. 13, 1974, 74.37434
Int. Cl.[2] B65H *54/02*
U.S. Cl. 242—18 A 22 Claims



1. A method of starting the winding of a continuous strand on a rotating collet comprising, positioning a portion of the strand in proximity to an end face of the collet, continuously drawing the strand under tension across the end face of the collet in a manner such that portions of the strand extend beyond two points on the periphery of said end face, engaging the strand with strand engaging means disposed on said end face of the collet and aligned with said two points on the periphery of said end face, conducting the strand from the strand engaging means to the collet and winding the strand on a portion of the collet until the collet reaches operating speed, and shifting the strand to a winding core on the collet after the collet has reached operating speed.

4,040,573

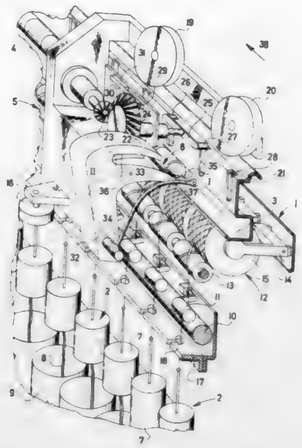
METHOD OF AND APPARATUS FOR TRANSPORTING EMPTY BOBBIN TUBES TO A PICK-UP AND DELIVERY STATION IN OPEN-END SPINNING, WINDING, YARN TEXTURING AND SIMILAR MACHINES

František Buryšek, Usti nad Orlici; Karel Mikulecký, Chocen, and Jan Janoušek, Brandys nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Aug. 16, 1976, Ser. No. 714,778
Claims priority, application Czechoslovakia, Aug. 28, 1975, 5860/75
Int. Cl.[2] B65H *54/26, 67/06*
U.S. Cl. 242—35.5 A 3 Claims

1. A method of conveying empty bobbin tubes through a channel member extending along a plurality of working units of open-end spinning, winding, yarn texturing and similar machines having a transporting member adapted to automatically exchange a fully-wound bobbin for an empty bobbin at a bobbin withdrawing and supply station, comprising the steps of

moving a plurality of empty bobbins along said channel member in an end-to-end column formation in a stepwise manner, said transporting member also moving in a stepwise manner along said channel member,



said transporting member pushing said end-to-end column formation of empty bobbin tubes along said channel member a distance corresponding to a fraction of its stepwise movement and the distance of each step corresponding to the distance between adjacent working stations,

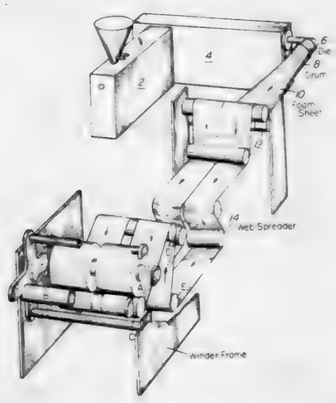
whereby the leading empty bobbin tube of said column formation is positioned at the next following bobbin withdrawing and supply station from which it is subsequently withdrawn by said transporting member.

4,040,574

METHOD AND APPARATUS FOR REPLACING A ROLL OF POLYSTYRENE FOAM SHEET WITH EMPTY CORE ROLL

David Emil Johnson, Macedon, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 10, 1976, Ser. No. 665,486
Int. Cl.[2] B65H *19/20*
U.S. Cl. 242—56 A 6 Claims



1. In an arrangement for forming mill rolls of polystyrene foam sheet material, the method for replacing a full mill roll with a core roller and transfer of a severed end of said sheet material to said core roller which comprises

a. automatically actuating rotating drives connected to a full roll of sheet material and a core roll arranged opposite one another in the turret of a winder frame when the full roll reaches a preselected diameter and without interrupting the winding of the sheet material,

b. rotating the turret to replace the full roll winding position with said core roller,

(b-1) bringing continuously advancing sheet into contact with said core roller,

c. raise a driven sheet material lay-on roller in nipping engagement with said core roll and thereafter sever the web of the sheet material with a horizontal knife sufficiently encompassing the core roller to direct a severed end of said sheet material in nipping engagement between said lay-on roller and said core roller,

d. retracting the horizontal knife from contact with said sheet material during winding of a full roll thereof and,

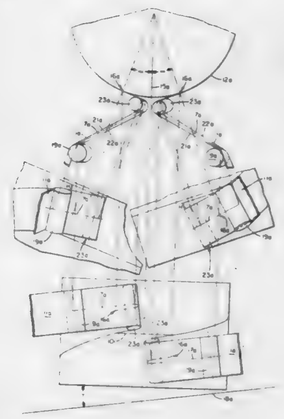
e. initiating the sequence of step (a) above when a preselected roll diameter of sheet material is formed.

4,040,575

TAPE GUIDING STRUCTURE

Dennis M. Ryan, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Apr. 29, 1976, Ser. No. 681,468
Int. Cl.[2] B65H *27/00*
U.S. Cl. 242—76 5 Claims



1. Structure for guiding at least one shank of tape between a cylindrical drum on which the tape is helically wrapped, and a number of first cylindrical guides normal to a predetermined reference plane, the drum being tilted with respect to the reference plane, and the tape centerline on the first cylindrical guide being parallel to the reference plane, comprising:

at least one second cylindrical guide for said tape shank, each second guide having a sector thereof engaging the respective shank of tape between the drum and the first guides;

said second guides being mounted with the generatrices thereof that lie in the tape engaging sectors thereof oriented to be perpendicular to the tape centerline around the sector; and

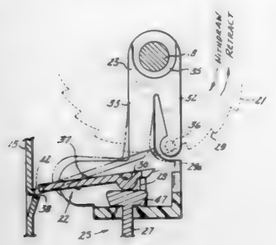
at least one of said second guides having tape edge-guiding flanges formed thereon in planes normal thereto.

4,040,576

RETRACTOR LOCK AND PAWL SADDLE THEREFOR

Ronald Jay Walker, Sterling Heights; Dewayne James Sherwin, Imlay City, and Robert John Rumpf, Grosse Pointe, all of Mich., assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 10, 1975, Ser. No. 639,472
Int. Cl.[2] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.4 A **5 Claims**



1. A retractor lock and pawl saddle structure for seat belt retractors comprising:

a saddle made from a resin plastic having bifurcated arms to form a first arm portion and a second arm portion pivotal relative to said first arm portion;

a pawl element pivotally supported solely by said saddle in the second arm portion;

a retractor drum for selected retraction and withdrawal of seat belt webbing therefrom;

a ratchet wheel rotatable with said drum and secured against withdrawal rotation when said pawl is engaged thereagainst;

a shaft about which said drum and said wheel rotates; and

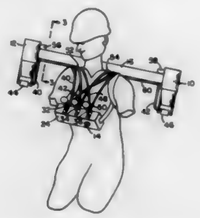
a channel shaped frame, the upstanding legs of said frame in support of said shaft, a stop buttress on said frame, and means on said frame and said first arm portion for fixing said first arm portion relative to said frame, whereby upon said pawl locking against said ratchet wheel said second arm portion pivots relative to said first arm portion bringing said pawl into engagement with said stop buttress.

4,040,577

LOCKWOOD AIRFOIL USED IN CONJUNCTION WITH MAN TRANSPORT DEVICE

Thomas M. Moore, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 17, 1977, Ser. No. 759,937
Int. Cl.[2] B64C *39/02*
U.S. Cl. 244—4 A **4 Claims**



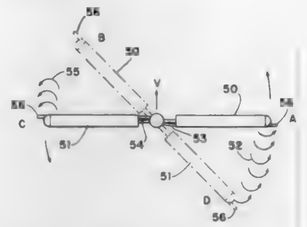
1. A device for transporting an individual in the atmosphere comprising a pair of jet engines interconnected by a wing structure that has openings therein for the blowing of a fluid chordwise over the wing to increase lift of the device and thereby the range of the device, said wing structure being attached to a back plate with a harness connecting said back plate to a front control panel for mounting the device on an individual, said front control panel having means thereon for controlling the starting of the jet engines and three control actuators interconnected to means at the jet engines for controlling exhausting forces from the jet engines, for controlling the amount of fuel supplied to the jet engines and for controlling fluid flow from a high pressure side of the jet engines to said openings in the wing structure.

4,040,578

ROTOR VORTEX CONTROL

Shao Wen Yuan, 6701 Montour Drive, Falls Church, Va. 22043

Continuation-in-part of Ser. No. 425,143, Dec. 17, 1973, Pat. No. 3,936,013. This application Feb. 2, 1976, Ser. No. 654,695
The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.
Int. Cl.[2] B64C *23/06*
U.S. Cl. 244—17.19 **5 Claims**



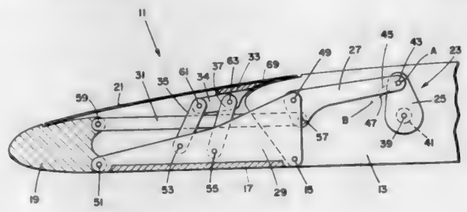
1. Apparatus for abating jet-circulation-control helicopter rotor-blade tip vortices formed at the tip of a blade when it is in fluid stream flowing relative to said blade, said vortex being formed as a result of a difference in fluid pressure on one side of the blade relative to the fluid pressure on the opposite side of the blade which causes a rush flow of fluid from the side of higher pressure to the side of lower pressure, said apparatus comprising a jet-circulation-control rotor blade system having at least a pair of blade tips, a source of pressurized fluid, a plurality of jetting means, and means connecting said jetting means to said source of pressurized fluid, each of said plurality of jetting means being located outwardly of a respective one of the said tips for emitting pressurized fluid from said jetting means in the direction toward said side of higher pressure and in a plane substantially perpendicular to the direction of flow of said fluid stream.

4,040,579

VARIABLE CAMBER LEADING EDGE AIRFOIL SYSTEM

Maurice E. McKinney, Bellevue, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 25, 1975, Ser. No. 607,177
Int. Cl.[2] B64C *3/48*
U.S. Cl. 244—214 **2 Claims**



1. A variable camber leading edge airfoil system that is attached to the forward section of the fixed wing section of an aircraft comprising:

a. a rigid lower panel;

b. a leading edge beam;

c. a flexible upper panel;

d. an actuating mechanism;

e. at least one lower panel drive element including first, second and third sides a first pivot point near the intersection of said first and second sides, a second pivot point near the intersection of said second and third sides and a third pivot point near the intersection of said third and first sides.

f. said first side of said lower panel drive element being rigidly connected to said rigid lower panel with said third pivot point being adjacent the forward edge of said rigid lower panel and said first pivot point being adjacent the rearward edge of said rigid lower panel, and said lower panel drive element and said rigid lower panel being rotatably mounted to the forward section of said fixed wing section at said first pivot point;

g. the rearward edge of said flexible upper panel being in slidable contact with the upper surface of said forward section of said fixed wing section;

h. and said lower panel drive element and the forward edge of said rigid lower panel being rotatably mounted at said third pivot point to the lower rearward edge of said leading edge beam;

i. the forward edge of said flexible panel being rigidly attached along the upper rearward edge of said leading edge beam;

j. said actuating mechanism including a power element, a drive crank and an elongated drive link;

k. said power element being operably connected to said drive crank and said drive crank being rotatably connected to said lower panel drive element at said second pivot point;

l. one end of said drive link being rotatably connected to said drive crank and the other end rotatably connected to the upper rearward section of said leading edge beam.

m. an upper panel bending beam including at least one bracket;

n. said upper panel bending beam being rigidly connected along the rearward edge of said flexible upper panel;

o. means interconnecting said bracket and said lower panel drive element;

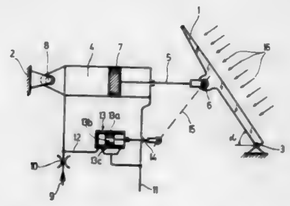
p. counterclockwise rotation of said rigid lower panel and said lower panel drive element results in counter clock rotation of said flexible upper panel and clockwise rotation of said upper panel bending beam with respect to said flexible upper panel thereby causing additional bending of said flexible upper panel.

4,040,580

CONTROL APPARATUS FOR AN AIR BRAKE

Hans-Jüergen Schwäerzler, Taufkirchen, Germany, assignor to Messerschmitt-Boelkow-Blohm GmbH, Munich, Germany

Filed Sept. 12, 1975, Ser. No. 612,634
Claims priority, application Germany, Sept. 17, 1974, 2444310; July 4, 1975, 2529894
Int. Cl.[2] B64C *13/36, 9/32*
U.S. Cl. 244—78 **11 Claims**



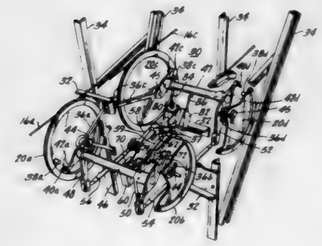
1. A control apparatus for an air brake flap comprising pressure responsive power drive means (4,7) including a power drive cylinder piston arrangement, means (5) operatively connecting said air brake flap to said power drive means for moving said air brake flap through a range of angular positions, pressure control means (13) operatively associated with said power drive means (4), and air brake flap position response means directly and operatively interconnected between said pressure control means (13) and said air brake flap whereby said pressure control means (13) is continuously and directly responsive to the angular positions (d) of said air brake flap (1) to control the pressure in said power drive cylinder as a direct function of said angular positions of the air brake flap in such a manner that the flap at all times assumes the postion determined by the required braking action, whereby the dynamic pressure exerted by the air flow on the air brake flap is continuously in equilibrium with the pressure in said power drive means.

4,040,581

REVERSE THRUST LIMITING SYSTEM

George A. Schlanert, Tustin; Lorin A. Wood, Lakewood, and Gerald A. Rayburn, Garden Grove, all of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Feb. 6, 1976, Ser. No. 656,129
Int. Cl.[2] B64C *13/30*
U.S. Cl. 244—83 K **19 Claims**



1. Apparatus for limiting the travel of a cable driven system which includes a drive cable, the apparatus comprising:

a cable drum for frictionally engaging the drive cable;

projecting means attached to the drum for rotation therewith;

variable stop means including a stop lever arm rotatably mounted to engage the projecting means in at least one stop position and an actuator coupled to the stop lever arm for moving the arm into and away from said stop position in response to applied control signals, the variable stop means being selectively positionable for engaging the projecting means to prevent rotation of the cable drum, and thereby movement of the associated drive cable, past a selected position;

support means mounting the cable drum and the stop lever arm for rotation about a common axis; and

coupling means coupling the actuator to the stop lever arm at a point remote from said axis.

4,040,582

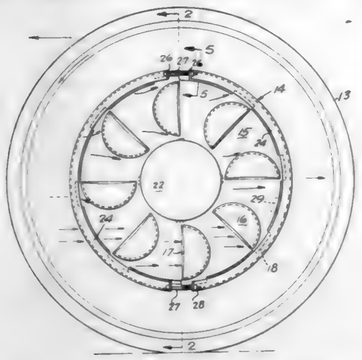
WIND POWER ACCESSORY FOR A VEHICLE WHEEL

Ronald C. Krauss, 515 E. 15th St., Grand Island, Nebr. 68801

Filed Sept. 9, 1975, Ser. No. 611,816
Int. Cl.[2] B64C *25/36*
U.S. Cl. 244—103 S **6 Claims**

1. A wind-utilization attachment for a vehicle wheel of a type having a flanged rim and a pneumatic tire seated on said rim with securing means at the inner portion of the wheel, said attachment comprising a main body engageable in the wheel and having a central aperture through which said wheel securing means are accessible and having peripheral portions engageable with a rim flange, spaced cup members on said main body facing in the same direction of rotation, and clamp means engageable over said peripheral portions and said rim flange for securing said main body to said rim flange, wherein said

peripheral portions of the main body comprise spaced integral lugs engageable on the rim flange, and wherein said clamp means comprises a pair of substantially semi-circular clamping



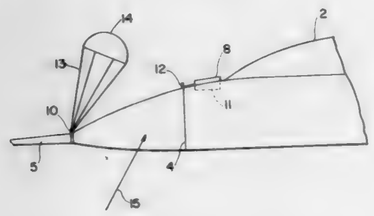
bars engageable on said spaced lugs and having flanges receivable between said rim flange and the adjacent side wall of the pneumatic tire.

4,040,583

METHODS AND APPARATUS FOR EFFECTING RECOVERY OF A HIGH SPEED AIRCRAFT FROM A CONDITION OF INCIPIENT OR DEVELOPED SPIN

William Bihrle, Jr., 284A Tennis Court Road, Cove Neck, N.Y. 11771

Filed Feb. 6, 1976, Ser. No. 656,029
Int. Cl.[2] B64D *17/80*
U.S. Cl. 244—113 14 Claims



1. A method of effecting recovery of a high speed aircraft from a condition of incipient or developed spin, comprising the step of, upon entry into said condition, deploying at least one parachute coupled only to the forebody of the aircraft forward of the center of gravity of the aircraft and being of a size such as to have a negligible influence on the free falling rate of sink of the aircraft while alleviating the spin condition.

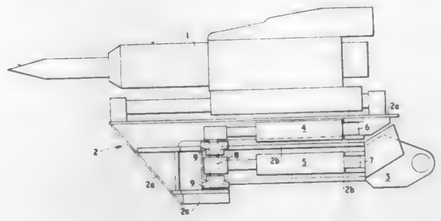
12. In a high speed aircraft, spin recovery apparatus comprising at least one deployable parachute located in the forebody of the aircraft and coupled only to the forebody of the aircraft forward of the center of gravity, the size of said parachute, when deployed for alleviation of a spin condition, being such as to have a negligible influence on the free falling rate of sink of the aircraft.

4,040,584

MOUNTING ARRANGEMENTS FOR MINERAL DISPLACING TOOLS

Arthur David Thompson, Chorley, England, assignor to Dobson Park Industries Limited, Nottingham, England

Filed Feb. 6, 1976, Ser. No. 655,872
Claims priority, application United Kingdom, Feb. 26, 1975, 7948/75
Int. Cl.[2] E21C *11/02*; F16M *13/00*
U.S. Cl. 248—2 13 Claims



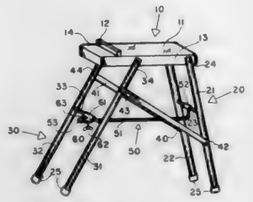
1. A mounting arrangment for a mineral displacing tool comprising a carrier for the tool, pivot means pivotably securing said carrier to a support, a link member attached at one end to said pivot means, and first and second pressure-fluid-operated rams pivotally connected to act between the other end of said link means and said carrier and support respectively, with each ram acting to extend the arc of slewing of the carrier with respect to the support attainable by means of the other ram and about the same pivot axis of said pivot means.

4,040,585

ADJUSTABLE PROJECTOR TABLE

Eduardo L. Socas, 4113 Ortisi Drive, Orlando, Fla. 32807

Filed May 18, 1976, Ser. No. 687,524
Int. Cl.[2] F16M *1/00*
U.S. Cl. 248—11 7 Claims



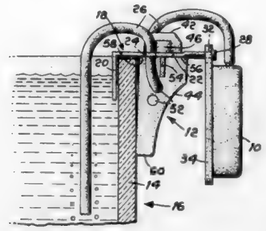
1. An adjustable table for supporting a slide projector or the like, comprising:
- a tiltable table top having a front and rear section;
- a rear leg assembly pivotably attached to said rear section of said top;
- a front leg assembly pivotally attached near said front section of said top;
- linking means pivotally connecting said rear leg assembly and said front leg assembly; and
- locking means associated with said front leg assembly and said rear leg assembly for selectively locking said top, said front and rear leg assemblies, and said linking means in a fixed relationship, said locking means arranged to permit continuous adjustment of such relationship;
- whereby said table top can be continuously adjusted and locked to selected angular positions with respect to said leg assembly and said table can be folded and locked in a folded position for storage.

4,040,586

AQUARIUM BRACKET ASSEMBLY

Robert Newsteder, 349 Irving Ave., South Orange, N.J. 07079

Filed July 12, 1976, Ser. No. 704,360
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—14 10 Claims



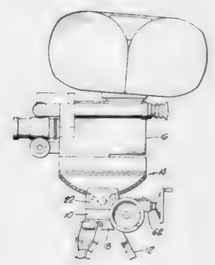
1. A bracket assembly comprising: an upper support angle member having a downwardly extending flange and an outwardly extending platform section, said platform section including a plurality of coplanar openings through the common wall of said platform, and support means projecting from the outer end of said platfrom; a generally vertical member having an upper end engageable with said upper support angle member through one of said openings in said platform section and a downwardly extending lower end, said upper end including an opening there-through positioned adjacent the upper surface of said platform section upon engagement with said upper support member, and a slidable locking member having one end engageable with said vertical member through said opening in said upper end and a downward projection engageable with another of said openings in said upper support member platform section, said locking member securing said vertical member to said upper support member upon said engagement.

4,040,587

CAMERA CRADLE TILT MECHANISM

Robert E. Gottschalk, and Albert K. Saiki, both of Los Angeles, Calif., assignors to Robert E. Gottschalk, Los Angeles, Calif.

Filed May 15, 1975, Ser. No. 577,728
Int. Cl.[2] F16M *11/12*
U.S. Cl. 248—185 4 Claims



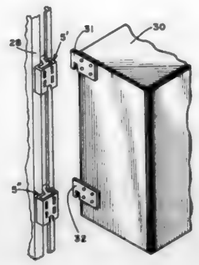
1. A tilt mechanism for a cradle comprising: a support frame, a cradle, mounting means for mounting said cradle on said support frame such that said cradle may move about a fixed axis in an arc relative to said support frame, said tilt frame having an arcuate surface concentric to said axis, tilt control means for controlling the position of said cradle relative to said support frame, said tilt control means including an elongated toothed strap member of resilient material fixed at each end thereof to said arcuate surface, gear means engaging and partially encompassed by said elongated toothed member, and means for turning said gear means.

4,040,588

BRACKET BASE

William G. Papsco; Harry Cohn, Jr., both of Portola Valley, and Robert E. Bryan, San Jose, all of Calif., assignors to Papsco, Inc., Sunnyvale, Calif.

Filed May 13, 1976, Ser. No. 686,117
Int. Cl.[2] A47G *29/02*; B65D *25/24*
U.S. Cl. 248—245 4 Claims



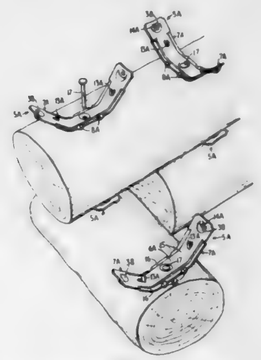
1. A bracket base for connecting a shelf bracket to a forwardly opening lipped channel member comprising
- a tubular member with at least one end open and having a rectangular cross section, said member having plane front and back walls and side walls, said front and back walls being wider than said side walls whereby the long dimension of the rectangular open end of the member is parallel to the front and back walls,
- said back wall having a central rearwardly inclined T-shaped tongue projecting therefrom at said one end and adapted to be inserted into the opening of said channel member,
- said front wall having a plurality of laterally spaced pairs of longitudinally elongated longitudinally spaced slots adapted to receive portions of a bracket to be supported, and
- means on the end of said back wall opposite said one end for locking said base to said channel member.

4,040,589

INTERCONNECTING BRACKET FOR LOGS

Roger Berry Cameron McLay, 72 The Serpentine, Bilgola Beach, New South Wales 2107, Australia

Filed Mar. 25, 1976, Ser. No. 670,461
Claims priority, application Australia, Apr. 3, 1975, 1101/75
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—300 14 Claims



1. A bracket for interconnecting adjacent logs in a stack of logs to stabilise stack, comprising a generally flat base for fastening upon a log, four depending projections arranged in pairs, the projections of each of said pairs being substantially

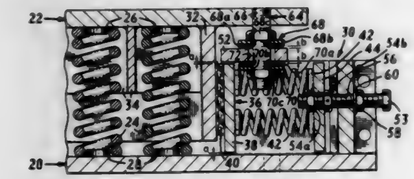
symmetrically disposed about the mid point of the base for gripping of said log in any one of a plurality of relative angular dispositions between said base and said log, a pair of spaced support arms upstanding from opposite parts of the base to accommodate an upper adjacent log therebetween, means for reinforcing said support arms which includes lateral upstanding ribbing extending along said base and part way along said arms, and serrations on said ribbing facilitating gripping of said arms to said adjacent log.

4,040,590

VIBRATION ISOLATOR WITH INTEGRAL NON-AMPLIFYING SEISMIC RESTRAINT

Paul Baratoff, Jackson Heights, N.Y., assignor to Korfund Dynamics Corporation, Westbury, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,582
Int. Cl.[2] F16F *15/04*
U.S. Cl. 248—358 AA **16 Claims**



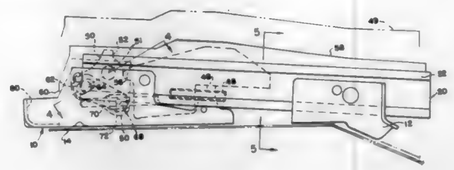
1. In a vibration isolator having a first member, a second member and at least one spring supporting the second member in spaced relation to the first member for vibration isolation of vibratory equipment carried by the second member, the improvement comprising friction restraint means coacting between the members for restraining vibration of the first member relative to the second member in excess of a selected amplitude *a*, the amplitude *b* being greater than the amplitude of vibration in normal operation of the equipment, by a selected and adjusted frictionally developed force F while permitting essentially undamped vibration of any amplitude less than the amplitude *a*, said friction restraint means including at least one friction brake shoe, means interposed between the first and second members for mounting the brake shoe in a rest position between said interposed means and one of the members for essentially free movement from the rest position toward and away from said one of the members up to an amount equal to the amplitude *a* and for preventing movement of the brake shoe from the rest position relative to said one of the members in excess of said amplitude *a*, at least one brake plate affixed to the other member positioned for engagement by the brake shoe, and spring means urging the brake shoe into engagement with the brake plate with a force sufficient to develop the frictional force F upon relative movement of the members in excess of the amplitude *a*, whereby a substantial part equal to the force F of an input force imposed upon one of the members tending to cause such relative movement is transmitted without amplification to the other member by the friction restraint means, and energy-absorbing stop means interposed between the members for restraining vibration of the first member relative to the second member in excess of a selected amplitude *b*, the amplitude *b* being greater than the amplitude *a*, by absorbing energy generated by an input acceleration of one member relative to the other in response to an input force imposed thereon that is in excess of the frictional force F.

4,040,591

POWER SEAT MECHANISM

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Aug. 21, 1975, Ser. No. 606,540
Int. Cl.[2] A45D *19/04*; F16M *13/00*
U.S. Cl. 248—394 **2 Claims**



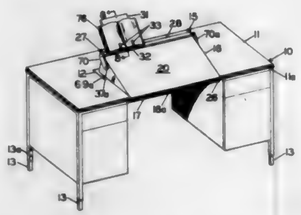
1. An adjustable vehicle seat construction comprising a carriage having slides at opposite sides thereof, a seat construction, lift means intermediate said slides and seat construction, said lift means comprising a pair of bell cranks, pivot means connecting said bell cranks to said slides for rotation about a common axis extending transversely of the vehicle, lift pins carried by said bell cranks remote from said pivot means, depending portions of said seat construction having elongated generally horizontal slots receiving said pins, a torsion tube receiving the inner ends of said pins and adapted to transmit movement from a first one of said pair of bell cranks to the second one, a nut supporting arm fixed to the exterior surface of said tube spaced from the end of said tube and adjacent said first bell crank, a nut pivoted between said arm and said first bell crank, a threaded shaft engaged in said nut, said pins being non-rotatively fixed to said bell cranks and to said torsion tube, the pin connected to said first bell crank extending into said tube beyond said arm and interfitting in reinforcing relation thereto.

4,040,592

DESK TOP WORK SUPPORT DEVICE

Robert E. Jones, 4818 Marathon Drive, Madison, Wis. 53705

Filed Sept. 9, 1976, Ser. No. 721,703
Int. Cl.[2] A47G *1/24*
U.S. Cl. 248—460 **17 Claims**



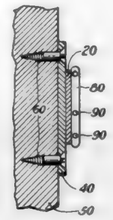
1. A desk top work support device comprising:
a. an inclinable primary work support member having a primary work surface;
b. a secondary work support member;
c. at least one link arm having a pivoted end and a connected end, the pivoted end being pivotable with respect to the primary work support member and the connected end rotatably engaging the secondary work support member;
d. a positioning shaft mounted on the primary work support member; and
e. rotating means comprising a drive member fixedly mounted on the positioning shaft, a driven member fixedly attached to the secondary work support member, and a drive connector engaged with the drive member and the driven member in connecting relation whereby pivotal movement of the link arm will cause rotation of the secondary work support member with respect to the link arm.

4,040,593

PICTURE HANGING DEVICE

Kenneth Wiley, Coral Springs, Fla., assignor to The Raymond Lee Organization, Inc., a part interest

Filed May 4, 1976, Ser. No. 683,019
Int. Cl.[2] A47G *1/16*
U.S. Cl. 248—489 **2 Claims**



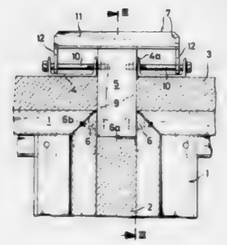
1. A device for hanging flat pictures upon a wall and maintaining the pictures in a level position, comprising:
a first flat plate attached to the wall;
a pedestal attached to the plate and extending outwardly away from it perpendicularly to the wall;
a circular lip located at the outwardmost end of the pedestal, the lip lying in a vertical plane and having a convexly curved outer surface;
a second flat plate attached to the back of a flat picture and located directly above the center of gravity of the picture; and
a flexible circular hollow rim with a convex outer surface and a concave inner surface attached to the second plate, the rim occupying a plane parallel to the plane of the picture and detachably fitting over the lip so as to enable the picture to be secured parallel to the wall while being free to rotate parallel to the wall and thereby reach a level equilibrium position.

4,040,594

ARRANGEMENT FOR CONNECTING AND ALIGNING ADJACENT CASTING FORMS FOR THE CONSTRUCTION OF MULTI-STORY BUILDINGS

Josef Maier, Kreuzbuhlstr. 5, 7611 Steinach, Germany

Filed Mar. 24, 1976, Ser. No. 670,175
Claims priority, application Germany, Mar. 29, 1975, 2514043
Int. Cl.[2] E04G *11/02*
U.S. Cl. 249—27 **13 Claims**



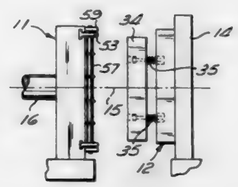
1. An arrangement for casting concrete for the erection of a multi-story building having a ceiling and vertical walls in alignment with each other, comprising casting forms each having vertical panel means and horizontal panel means connected to upper ends of said vertical panel means; at least one intermediate body arranged between adjacent vertical panel means of adjacent casting forms to properly space said adjacent vertical panel means and projecting with an upper portion thereof beyond said horizontal panel means of said adjacent casting forms for a distance greater than the thickness of the ceiling to be cast on said horizontal panel means; connecting means releasably connecting a lower portion of said intermediate body with said adjacent vertical panel means of said adjacent forms; a pair of profiled rails; and carrying means on said projecting portion of said intermediate body carrying said rails spaced from each other a distance corresponding to the thickness of a wall to be cast between said vertical panel means and extending parallel to each other in horizontal direction parallel to said vertical panel means and upwardly spaced from the horizontal panel means of said adjacent casting forms a distance corresponding to the thickness of a ceiling to be cast on said horizontal panel means.

4,040,595

INJECTION MOLDING MACHINE

Charles Tecco, Northfield Center, Ohio, assignor to Weatherchem Corporation, Twinsburg, Ohio

Filed Aug. 9, 1976, Ser. No. 712,589
Int. Cl.[2] B29C *7/00*; B29F *1/00*
U.S. Cl. 249—68 **11 Claims**



1. An injection molding machine comprising a stationary mold half, a movable mold half, means for moving said movable mold half along a longitudinal axis relative to said stationary mold half between a molding position adjacent said stationary mold half and an ejecting position spaced from said stationary mold half, said stationary mold half and said movable mold half cooperatively defining a mold cavity when said movable mold half is in said molding position, said mold cavity defining an end closure article having a base and a recloseable tab disposed in an open position relative to said base and connectable friction means on said base and said tab for holding said tab in a closed position relative to said base when said tab is fully closed, means for fully closing said tab and connecting said friction means of said molded plastic article before ejecting said article from one of said stationary and movable mold halves, and means for ejecting said molded plastic article from said one of said mold halves after said full closing of said tab, said means for fully closing said tab including a closing surface and actuator means for moving said closing surface laterally between a retracted position spaced from said mold cavity when said movable mold half is in said molding position and an operating position engaging said tab when said movable mold half is moved away from said molding position by said moving means.

4,040,596

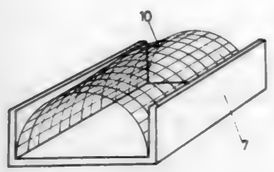
PROTECTIVE DEVICE FOR CASTING MOLDS

Ivo Henych; Erwin Fischer, and Jürg Reist, all of Schaffhausen, Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed May 19, 1976, Ser. No. 688,028
Claims priority, application Switzerland, May 27, 1975, 6735/75
Int. Cl.[2] B22D *7/12*
U.S. Cl. 249—117 **3 Claims**

1. A device for protecting the inner walls of a casting mold, particularly in a mold of the permanent type which is filled by top pouring of molten casting material thereinto, and for im-

proving the surface quality of castings formed in said mold, said mold defining a mold cavity including a bottom, said device comprising a metallic member positioned upon said bottom of said mold cavity and located to be directly impinged by molten casting material poured into said mold, said metallic



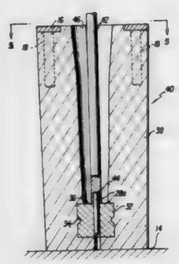
member being essentially composed of material to effect integration of said metallic member into the casting formed in said mold, said metallic member configured with a bottom plate and a pair of laterally spaced upstanding side walls formed of sheet metal, and a wire lattice arranged above said bottom plate and spaced a distance therefrom.

4,040,597

CORE HOLDING STRUCTURE FOR MOLDS

Fred W. Pierson, Sr., Grand Rapids; Fred W. Pierson, Jr., Wyoming, and Gordon J. Weidenfeller, Grandville, all of Mich., assignors to M&T Mfg. Co., Grand Rapids, Mich.

Filed July 25, 1975, Ser. No. 599,145
Int. Cl.[2] B22C *9/24*; B28B *7/32*
U.S. Cl. 249—134 **6 Claims**



1. A plaster mold structure for molding hollow articles which comprises

a. a one piece plaster mold having an elongated cavity therein,

b. a bushing member permanently locked within said one piece plaster mold having a longitudinal bore contiguous with and in substantial alignment with the longitudinal axis of said elongated cavity,

c. pin means received within said bore of said bushing and extending above the upper surface of said bushing member and partially into said cavity, and

d. a rod-like core member mounted on said pin means of said bushing member with said pin means and a portion of the upper surface of said bushing member providing the sole support for said rod-like core member,

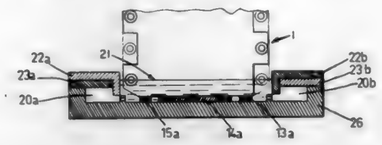
1. said rod-like core member adapted to provide a core for a hollow article molded within said cavity and extending partially out of said mold.

4,040,598

DEVICE FOR THE SEALING OF A BLOCK FORMED OF A PILE OF PLATES, SUCH AS A BLOCK OF A FUEL CELL, WHILE MAINTAINING FREE PASSAGEWAYS BETWEEN THESE PLATES

Jacques Cheron, Versailles, France, assignor to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Division of Ser. No. 88,532, Nov. 12, 1970, abandoned. This application Apr. 16, 1973, Ser. No. 351,645
Claims priority, application France, Nov. 13, 1969, 69.39099
Int. Cl.[2] B29C *5/00, 6/00, 1/12, 1/14*
U.S. Cl. 249—176 **3 Claims**



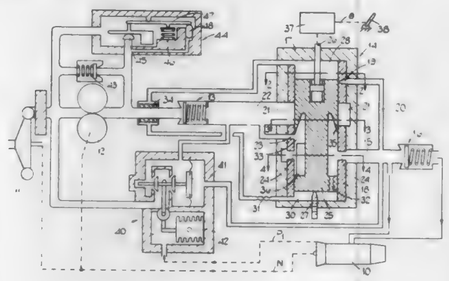
1. A flexible elastic separation comb in combination with a block formed of a pile of spaced plates which is to be sealed by a solidifiable material, said comb comprising a longitudinal base having spaced teeth secured to and extending therefrom, said teeth having a thickness slightly smaller than the width of corresponding spaces between adjacent plates in which respective teeth are inserted, the spacing of the teeth on said base corresponding to the distance between the spaces formed between the plates in which respective teeth are inserted, said teeth having a width less than the width of said plates and a height at least equal to the height of the solidifiable material used to seal the block, wherein the thickness of said teeth and the spacing between adjacent teeth are so selected that small spaces are maintained between each tooth and the facing surfaces of adjacent plates on both sides of each tooth whereby a film of solidifiable material is formed between each tooth and said facing surfaces as said block is sealed.

4,040,599

FLOW CONTROL VALVES FOR LIQUIDS

Trevor Stanley Smith, Sutton Coldfield, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Dec. 9, 1975, Ser. No. 639,042
Claims priority, application United Kingdom, Jan. 17, 1975, 2206/75
Int. Cl.[2] F16K *31/124*
U.S. Cl. 251—28 **14 Claims**



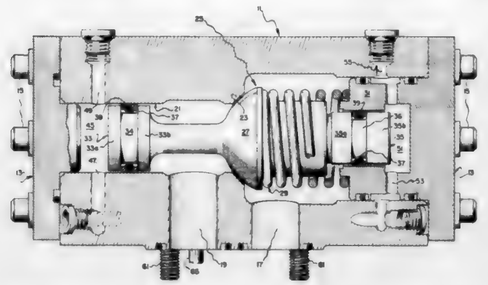
1. A flow control valve for liquids, comprising a body having an axial bore and an inlet port and an outlet port opening into said bore, a control member which is rotatable and axially slidable within said bore to control flow between said inlet and outlet ports, said control member being axially slidable in response to variations in a servo pressure signal, a control orifice opening onto a circumferential face of said bore, and means for rotating said control member, said control member having a generally axially-directed face which includes a portion which co-operates with said control orifice to define a pilot valve for controlling said servo pressure signal, an increase or decrease in said servo pressure signal as a result of rotation of said control member causing the latter to be urged in respective directions which decrease and increase said servo pressure signal.

4,040,600

SHUT-OFF VALVE

Patrick S. Coppola, Schenectady, and Stephen Kotansky, Watervliet, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,427
Int. Cl.[2] F16K *31/122*
U.S. Cl. 251—63 **6 Claims**



1. A fluid actuated, remotely controlled shut-off valve comprising:

a valve housing including an inlet port and an outlet port whereby a controlled fluid is passed through the valve housing;

an axial bore formed within the valve housing, the bore including a valve seat between the inlet port and the outlet port;

a valve member slidable within the axial bore, the valve member being formed with a hemispherical poppet; the valve member having first and second positions whereby in the first position the hemispherical poppet is seated on the valve seat closing the outlet port to the inlet port, and in the second position the hemispherical poppet is unseated for opening the outlet port to the inlet port;

a first spool formed at one end of the valve member in fluid communication with a valve actuating fluid supply;

a second spool formed at the other end of the valve member in fluid communication with a drain; and, wherein each spool comprises:

i. at least two annular lands spaced apart in the axial direction having at least one annular groove formed therebetween;

ii. an "O" ring disposed within each annular groove; and,

iii. slide means comprising an annular channel member disposed about each "O" ring and extending beyond the circumference of said spool in contact with said axial bore.

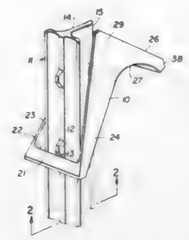
4,040,601

FENCE POST REMOVER

Robert William Boardman, 22742 Yosemite Blvd., Waterford, Calif. 95386

Continuation-in-part of Ser. No. 709,213, July 27, 1976, abandoned. This application Nov. 17, 1976, Ser. No. 742,452
Int. Cl.[2] B66F *3/00*
U.S. Cl. 254—133 R **6 Claims**

1. A device for removing from the ground a metal fence post of the type being substantially T-shaped in horizontal cross-section with uniformly spaced lugs on the face of the T, each said lug defining a predetermined angle to said face; said device having a cross-bar of substantial thickness and an inner face, said cross bar forming an opening in conjunction with two flange members which converge forming an apex having substantial cross-section so as to form a relatively long juncture along the vertical axis, a member of substantial cross-section



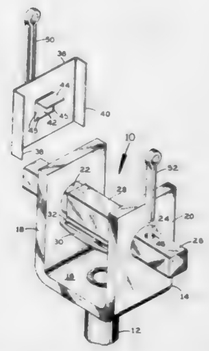
distending downwardly and away from the apex on the side opposite said flanges with the lower terminus thereof forming a substantially flat, concave surface with the lower surface of said flange.

4,040,602

TENSIONING ANCHOR

Howard F. Foster, Sr., 4500 Cavandish Circle, Fort Lauderdale, Fla. 33319

Filed Apr. 1, 1976, Ser. No. 672,754
Int. Cl.[2] A63B *61/04*
U.S. Cl. 254—164 **10 Claims**



1. In a tensioning anchor for tensioning a flexible element such as a wire, strap or cable, said tensioning anchor including a frame with spaced legs having respective openings therein, and a tensioning member extending between said legs and rotatably received in said openings, said tensioning member having generally flat sides, the improvement which comprises:

a sleeve means slidably received on said tensioning member between said legs and having aperture means formed therein for receiving the flexible element that is to be tensioned by wrapping the same around said sleeve means and said tensioning member;

and a locking member having an opening therein with corresponding flat sides for selectively locking said tensioning member against rotation;

said locking member having a pair of opposed, parallel flanges on opposite sides thereof for embracing one leg of said frame;

and said locking member having a third flange at said flat sided opening therein for engaging at least one of the corresponding flat sides of said tensioning member;

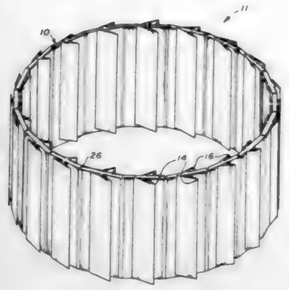
said flanges serving to lock said tensioning member.

4,040,603

BARBED METAL TAPE

Michael R. Mainiero, Monroe, Conn., assignor to Man Barrier Corporation, Ansonia, Conn.

Filed Apr. 22, 1976, Ser. No. 679,155
Int. Cl.[2] B01F *25/00*
U.S. Cl. 256—8 14 Claims



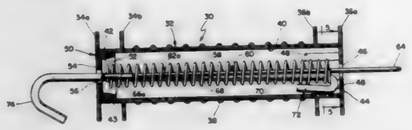
1. A coiled tape formed from substantially planar metal strip stock and comprising a plurality of closed turns of successive linear tape segments each angularly offset in the plane of the tape at a uniform bend angle to its trailing segment at a bend zone between the tape segments, the tape segments each being of substantially equal length and having a bend forming opening between the tape segments in the bend zone of the tape about which opening the tape is edge bent in the plane of the tape to form the angularly offset successive linear tape segments.

4,040,604

GATE HANDLE FOR AN ELECTRIC FENCE

Howard Langlie, and Albert T. Berg, Jr., both of Ellendale, Minn. 56026

Filed Apr. 1, 1976, Ser. No. 672,800
Int. Cl.[2] A01K *3/00*
U.S. Cl. 256—10 6 Claims



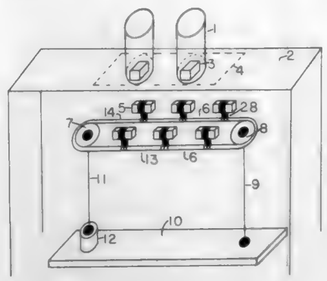
1. A gate handle for electric fences comprising a tubular casing having first and second ends, a compression coil spring contained in said casing having first and second ends, said first spring end residing nearer said first casing end and said second spring end residing nearer said second casing end, a first rod member having a hook at one end engaging said first spring end and having its other end projecting from said second casing end for attachment to one portion of an electric fence, said first rod member having a longitudinal shank extending freely from its hook end through said coil spring and freely through said second casing end to its projecting end, whereby said second casing end is readily movable relative to said first rod member, and a second rod member having a hook at one end engaging said second spring end and having its other end projecting from said first casing end for attachment to another portion of the electric fence, said second rod member having a longitudinal shank extending freely from its hook end through said coil spring and freely through said first casing end to its said projecting end, whereby said first casing end is readily movable relative to said second rod member, said tubular casing having an inwardly projecting portion at its said first end engageable with the hook end of sid first rod member when said casing is moved in the direction of the projecting end of said first rod member to cause said first spring end to move toward said projecting end of said first rod member, movement of said second spring end being resisted by the hook end on said second rod member, whereby said coil spring is compressed.

4,040,605

MAGNETIC STIRRING APPARATUS

Marvin Stanley Towsend, 1365 Potomac Heights Drive, Oxon Hill, Md. 20022

Filed July 14, 1976, Ser. No. 705,113
Int. Cl.[2] B01F *7/00, 13/08*
U.S. Cl. 259—64 13 Claims



1. A magnetic stirring apparatus for stirring the contents of plural containers each containing a magnetic stir bar, comprising:

an energy source for driving the magnetic fluxes of a group of drive magnets;

a group of drive magnets, distributed in a first horizontal plane, whose magnetic fluxes are translated repetitively in a predetermined pattern of parallel curves which define a continuous stirring region by said energy source; and

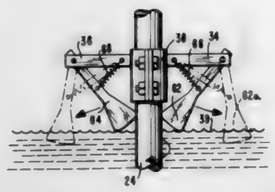
a horizontal support surface of low magnetic permeability, beneath which the magnetic fluxes of said group of drive magnets are repetitively translated in the predetermined pattern of parallel curves and upon which, in said continuous region defined by the predetermined pattern of parallel curves, the containers containing the magnetic stir bars are placed for rotationally agitating the magnetic stir bars in a second horizontal plane by their interaction with the repetitively translated magnetic fluxes of said group of drive magnets, for stirring the contents of the containers.

4,040,606

LIQUID REACTION VESSEL WITH MEANS FOR REMOVING DEPOSITS ON ITS INNER WALLS

Rudolf Mueller, Berlin, Germany, assignor to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed June 20, 1974, Ser. No. 481,240
Claims priority, application Germany, June 21, 1973, 2331993
Int. Cl.[2] B01F *7/16;* B08B *3/00, 9/00*
U.S. Cl. 259—107 9 Claims



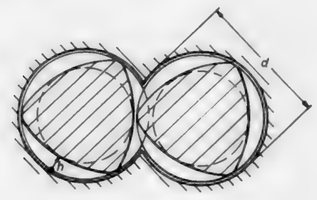
1. A reaction vessel for containing a liquid reaction mixture at a predetermined level comprising: a closed chamber; agitating means extending into said chamber, including a rotatable shaft for agitating the liquid reaction mixture at a given rotational speed and for rotating at a higher rotational speed upon command; means for rotating said shaft at said given speed and at said higher speed; means for rinsing deposits from the inner surfaces of said chamber above said predetermined level of the liquid reaction mixture, said rinsing means including dispersing means having one end for engaging the surface of said liquid reaction mixture only during such increased rotational speed and for spraying said liquid reaction mixture on the inner surfaces of said chamber, and arm means for connecting said dispersing means to said shaft.

4,040,607

METHOD OF BUILDING UP PRESSURE BY MULTI-SHAFT SCREW EXTRUDERS

Martin Ullrich, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 22, 1975, Ser. No. 615,268
Claims priority, application Germany, Sept. 28, 1974, 2446436
Int. Cl.[2] B29B *1/10*
U.S. Cl. 259—192 2 Claims



1. A method of building up pressure within a material comprising using a multi-shaft screw extruder having a plurality of screw shafts arranged to intermesh in pairs and to rotate pairwise in the same sense, in which each screw shaft of a pair has a double thread pressure buildup section corresponding to that of the other screw shaft, wherein the pressure buildup sections have at least in part a ratio of screw pitch t to the internal diameter of the housing d within the range given by the following relationships:

$$\frac{t}{d} > 0.7 \cdot f\left(\frac{h}{d}, \frac{q}{n \cdot d^3}\right);$$

$$\frac{t}{d} < 1.8 \cdot f\left(\frac{h}{d}, \frac{q}{n \cdot d^3}\right)$$

where q is the volumetric throughput of material of a screw pair, n is the speed of rotation of the screw shafts and h is the screw thread depth, and:

$$f\left(\frac{h}{d}, \frac{q}{n \cdot d^3}\right) = \frac{A}{h/d} \cdot \left[a \cdot \left(\frac{q}{n \cdot d^3}\right) - b \cdot \left(\frac{q}{n \cdot d^3}\right)^2 + c \cdot \left(\frac{q}{n \cdot d^3}\right)^3\right]$$

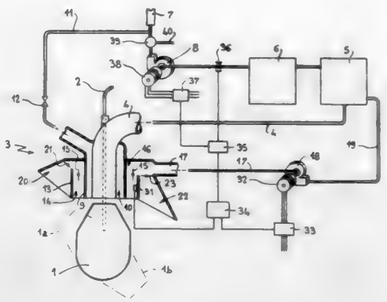
wherein
$A = 0.206$;
$a = 8.8212$;
$b = 18.414$;
and
$c = 31.668$

4,040,608

METHOD FOR THE RECOVERY OF GASES COMING FROM REFINING FURNACES

Jean-François Vicard, Lyon, France

Filed Oct. 24, 1975, Ser. No. 625,724
Claims priority, application France, Oct. 29, 1974, 74.40613; Nov. 29, 1974, 74.40698; Jan. 30, 1975, 75.03510
Int. Cl.[2] C21B *7/22*
U.S. Cl. 266—44 12 Claims



1. In a method for the recovery of gases issuing from a metallurgical refining furnace or converter, in which said gases are drawn off through a hood disposed above the outlet of the furnace and are entered as a gas column into a combustion chamber from which the burnt gases are drawn off by a main blower while air is simultaneously drawn from a space around the furance adjacent to the inlet of said hood by means of an auxiliary blower and is forced into said combustion chamber to burn combustible components of said gases therewithin, the method including the steps of withdrawing a fraction of said combustible gases by sucking them from said gas column substantially before they are mixed with burnt combustion products generated within said combustion chamber to send said withdrawn fraction to utilization means which are external to said combustion chamber.

10. Apparatus for the recovery of gases issuing from a metallurgical refining furnace or converter, of the type having a main hood disposed above the outlet of the furnace, and having a combustion chamber connected with the hood, and having a main blower connected to draw combustible gases through the hood and chamber, and the apparatus having an auxiliary blower connected to draw air from an auxiliary hood located in a space around the main hood and force it into said combustion chamber to burn said gases therein, the improvement comprising:

a first end wall and a second end wall mutually spaced from each other and closing said combustion chamber;

a gas inlet adjacent to said first end wall and extending into said chamber, said gas inlet being connected with said main hood;

a gas outlet from said chamber adjacent to said second end wall, said gas outlet being connected with said main blower;

an air inlet extending into the chamber and connected to receive air drawn by said auxiliary blower;

a withdrawal pipe in the chamber opposed to said gas inlet and opening directly in front of and substantially coaxially with said inlet;

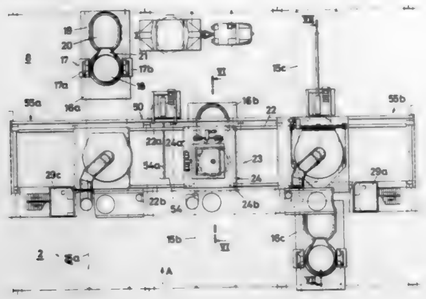
and a third blower connected with said withdrawal pipe and operative to suck combustible gases from said combustion chamber substantially before they have mixed with combustion products generated within said chamber.

4,040,609

METAL SMELTING PLANT WITH TREATMENT STAND TO REGULATE THE ANALYSIS OF METAL SMELTS, PARTICULARLY FOR DESULPHURIZATION OF LIQUID CRUDE IRON OR LIQUID UNREFINED STEEL

Rolf Kullmann, and Erhard Pfeil, both of Duisburg, Germany, assignors to DEMAG Aktiengesellschaft, Duisburg, Germany

Filed Feb. 17, 1976, Ser. No. 658,101
Claims priority, application Germany, Feb. 18, 1975, 2506704
Int. Cl.[2] C21B *13/14*
U.S. Cl. 266—143 **13 Claims**



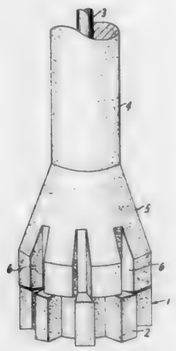
1. A metal smelting plant comprising
a. a charging hall;
b. a smelting furnace hall adjacent said charging hall;
c. a casting hall adjacent said charging hall;
d. a main production line for carrying metal smelts through said smelting furnace hall, and said charging hall to said casting hall; the improvement characterized by
e. an additive treatment area for said smelts adjacent said main production line;
f. at least one branch transportation means connecting said main production line and said additive treatment area; and
g. said additive treatment area including floor mounted treating means and suspended treating means.

4,040,610

APPARATUS FOR REFINING MOLTEN METAL

Andrew Geza Szekely, Yorktown Heights, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,669
Int. Cl.[2] C22B *9/00*
U.S. Cl. 266—235 **9 Claims**



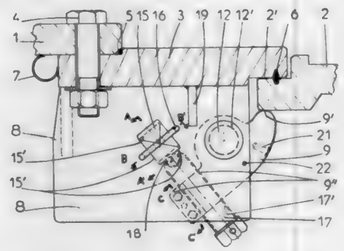
1. A vessel adapted for maintaining metal in a molten state comprising, in combination:
a. an insulating refractory shell having side walls and a bottom wall and being impervious to molten metal.
b. a lining for a major proportion of that interior surface of said side walls and bottom wall, which surface will be below the surface of the melt, said lining comprising graphite or silicon carbide blocks, which blocks (i) are positioned so that said blocks will come in contact with the melt, and (ii) are free to expand in at least two directions in response to the application of heat; and
c. at least one electric resistance heating element disposed within any of the blocks, which comprise the lining for a side wall, said element being non-fixedly attached to, and not in electrical contact with, the block within which it is disposed.

4,040,611

DEVICE FOR CLAMPING THE BASE PLATE OF A STEEL REFINING CONVERTER

Pierre Leroy, 23, rue de Tourville, 78100 Saint-Germain-en-Laye, France, and Emile Sprunck, 5, rue Joffre, 57250 Moyeuvre-Grande, France

Filed Nov. 29, 1976, Ser. No. 745,824
Claims priority, application France, Dec. 5, 1975, 75.37375
Int. Cl.[2] C21C *5/48*
U.S. Cl. 266—243 **8 Claims**



1. A device for clamping the base plate of a steel refining converter against a plate support ring attached to the casing of the converter, the device comprising:
a plurality of rotatable brackets arranged to be beneath and around the circumference of the plate;
a pair of parallel support flanges in respect of each bracket and attached to the ring;
means for mounting each bracket for rotation on a respective pair of flanges and between an operative clamping position and an inoperative position, said mounting means comprising a metal spindle which extends through the support flanges;
a metal bolt adapted to be engaged in openings formed in a respective pair of flanges and bearing a semi-cylindrical groove,
wherein each said bracket has a first shoulder with a hard surface and arranged to bear against the base plate when the bracket is in its operative position, and a second internally threaded shoulder into which a retaining screw is threaded, the retaining screw being provided with a ball at one end which engages in the groove in the bolt when the bracket is in its operative position.

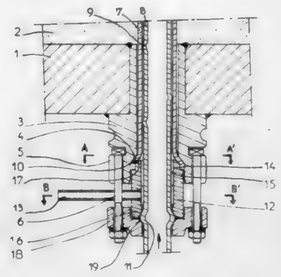
4,040,612

BLAST PIPE ASSEMBLY FOR THE BOTTOM PLATE OF A CONVERTER OR FURNACE FOR REFINING METALS

Pierre Leroy, 23, rue de Tourville, 78100 Saint-Germain-en-Laye, and Emile Sprunck, 5, rue Joffre, 57250, Moyeuvre-Grande, both of France

Filed Nov. 30, 1976, Ser. No. 746,153
Claims priority, application France, Dec. 10, 1975, 75.37802
Int. Cl.[2] C21C *5/48*
U.S. Cl. 266—268 **3 Claims**

1. A blast pipe assembly for mounting on, attachment to and dismounting from the bottom plate means of a convertor or a furnace for refining metals, the plate means including a hollow cylindrical part for surrounding the blast pipe and having at its lower end portion an inner shoulder and a flange for clamping bolts, the blast pipe assembly comprising;
two concentric pipes for double separate feed, the inner pipe of said concentric pipes being longer than the outer pipe of said concentric pipes and the inner diameter of said outer pipe being greater than the outer diameter of said inner pipe to define a gap between said pipes for admission of fluid, the lower end of said outer pipe, which is arranged to be at the level of said shoulder of said hollow cylindrical part, being flared, said inner pipe having, at a level below the lower end of said outer pipe, a circular swelling;
a hollow cylindrical injector body adapted to be arranged between said flared portion of said outer pipe and said circular swelling on said inner pipe, said injector body having a lateral inlet for fluid for feeding said gap between



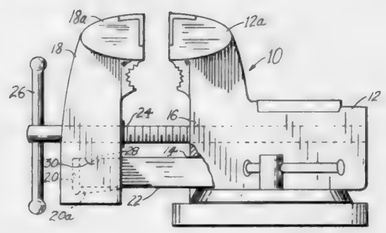
said pipes with fluid, at the lower end thereof an inwardly directed machined circular face for bearing in a fluid tight manner against the upper part of said circular swelling on said inner pipe, and towards the upper end thereof a circular round-off for bearing in a fluid tight manner against said flared portion of said outer pipe; and
an annular clamping flange adapted to be arranged beneath said injector body and said swelling on said inner pipe, said clamping flange being adapted to receive the clamping bolts of the hollow cylindrical part and having an inwardly directed machined circular face for fitting against the lower part of said circular swelling on said inner pipe;
the arrangement being such that the mounting, attachment and dismounting of said assembly as a whole are carried out by simple screwing up or unscrewing of the bolts.

4,040,613

VISE CONSTRUCTION

Raymond H. Kartasuk, Lincolnwood; Walter R. Smierciak, Elgin, and Edward A. Hlinka, Westchester, all of Ill., assignors to Wilton Corporation, Schiller Park, Ill.

Filed Dec. 8, 1975, Ser. No. 638,650
Int. Cl.[2] B25B *1/10*
U.S. Cl. 269—247 **23 Claims**



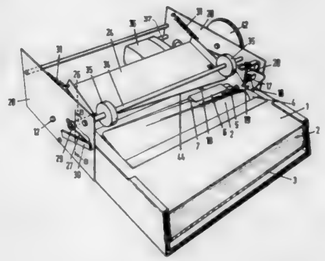
1. A vise construction comprising, a fixed body for mounting to a support surface, a slide passage formed in said fixed body slidably to receive guide bar means, a threaded passage formed in said fixed body to receive a clamping screw, a first jaw means formed on said fixed body, a movable body positioned adjacent said fixed body, a second jaw means formed on said movable body to cooperate with said first jaw means for holding an object, a clamping screw passing through said movable body and threadedly engaging said threaded passage for moving said second jaw means toward and away from said first jaw means, a recess formed in said movable body, slide bar means having one end portion thereof insertable into said recess, said slide bar means extending into said slide passage of said fixed body,, and locking means to secure said slide bar means to said movable body including a mechanical element interposed between said slide bar and said movable body to maintain said one end portion engaged with said recess.

4,040,614

SEPARATOR DEVICE

Lucas van der Does, Oenkerk, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Netherlands

Filed Oct. 20, 1975, Ser. No. 623,941
Claims priority, application Netherlands, Oct. 24, 1974, 7413932
Int. Cl.[2] B65H *3/50*
U.S. Cl. 271—19 **5 Claims**



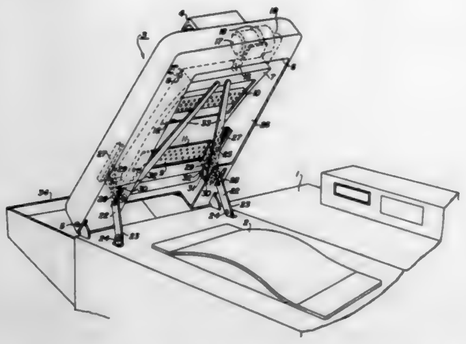
1. A separator device including side walls for singularly moving a rectangular sheet such as a film sheet from a stack of sheets to a transport member, said stack being accommodated in a storage cassette having a rectangular, slotted sheet discharge opening and a hold-down plate for maintaining the uppermost sheet of said stack against a bulge forming means disposed adjacent the discharge opening, said bulge forming means controlled by a first cam disc adapted to perform a reciprocating movement to engage the leading edge of said uppermost sheet of said stack, said uppermost sheet being at least partly released from said stack by forming a bulge at said discharge opening, and wherein there is disposed catching means controlled by a second cam disc proximate to said bulge of said uppermost sheet, said catching means being adapted to lift said leading edge of said uppermost sheet, whereby after release of said uppermost sheet by said catching means said uppermost sheet is caused to lie on a sheet guide means thereby permitting transport rollers to withdraw said uppermost sheet from said stack, characterized in that said bulge forming means and said catching means comprise a pushing element disposed adjacent a corner of said leading edge at said sheet discharge opening and a hook, respectively, and wherein there is provided a third cam disc for imparting a reciprocating movement to said sheet guide means, said guide means having a receding leading edge relative to said storage cassette proximate to said pushing means.

4,040,615

ORIGINAL DISCHARGING DEVICE FOR COPIERS

Takefumi Kurosaki, Isehara, Japan, assignor to Rank Xerox Ltd., London, England

Filed Aug. 16, 1976, Ser. No. 709,143
Claims priority, application Japan, Sept. 21, 1975, 50-109984
Int. Cl.[2] B65H *29/32, 29/48*
U.S. Cl. 271—63 2 Claims



1. An automatic document ejecting device adapted for incorporation in a platen cover of a copying machine having a platen glass for placement of documents to be exposed by the copying machine comprising:

a pivotal cover overlying the platen glass, said cover being pivotable about an axis between a closed position adjacent the platen glass and an open position remote from the platen glass;

vacuum plenum means mounted in said cover for attracting and supporting a document, said means being adapted to press the document against the platen glass when said cover is in said closed position; and,

discharge guiding means moveably mounted in said cover for movement to a position under a document held by said vacuum plenum means responsive to movement of said cover to said open position to support and guide the document from said cover when the vacuum is shut off from said vacuum plenum means, said guide means being moveable to a position alongside the document position responsive to movement of said cover to said closed position.

4,040,616

SHEET TURN AROUND/INVERTER

Stanley G. Clarkson, Penfield, N.Y., and Joseph N. Muscarella, deceased, late of Albria, N.Y., by Ida M. Muscarella, administratix, assignors to Xerox Corporation, Stamford, Conn.

Filed Jan. 14, 1976, Ser. No. 648,832
Int. Cl.[2] B65H *29/66*
U.S. Cl. 271—65 26 Claims

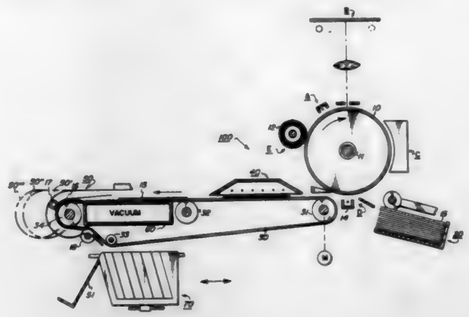
1. A sheet handling apparatus for selectively inverting sheets comprising:

conveying means adapted to convey sheets,

biasing means adjacent to the conveying means adapted to bias sheets against said conveying means, the conveying means conveying the sheets past the biasing means with a leading edge and a trailing edge, said conveying means being shaped so that the leading edge of the sheet separates from the conveyor downstream of the biasing means,

urging means to urge a selected available edge of the sheet back onto the conveyor means after it has been separated from the conveyor means downstream of the biasing means,

movable deflector means to selectively invert the sheet, said deflector means having a first slope and a second slope relative to the leading edge portion of the sheet, said second slope deflecting the leading edge of the sheet away from the conveying means so that the trailing edge of the sheet becomes the available edge to be first urged back to the conveying means, and said first slope deflecting the leading edge of the sheet toward the conveying means to that the leading edge of the sheet becomes the available edge to be first urged back to the conveyor means, and



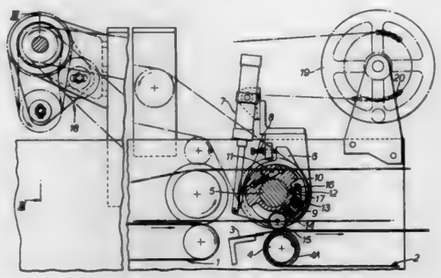
selector means to select either the first or second slope to act on the leading edge of the sheet whereby the sheet is inverted before being placed on the conveyor means only when the first slope is selected to deflect the leading edge of the sheet as the sheet passes beyond the biasing means.

4,040,617

SHEET FEEDING APPARATUS

Colin Walkington, Bristol, England, assignor to Masson Scott Thrissell Engineering Limited, Bristol, England

Filed June 14, 1976, Ser. No. 695,565
Claims priority, application United Kingdom, June 17, 1975, 25765/75
Int. Cl.[2] B65H *29/38, 29/66*
U.S. Cl. 271—177 9 Claims



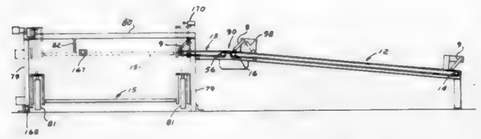
1. A sheet overlapping device comprising a fast upstream conveyor, a slow downstream conveyor arranged to receive sheets delivered in succession from the fast conveyor, the slow conveyor having a roll at its upstream end around which a conveyor element is traversed, a rotary shaft, a rolling element resiliently mounted on the shaft, and means for synchronising the rotation of the shaft with the sheet delivery on the fast conveyor, the shaft being arranged so that the rolling element will nip the trailing portion of each sheet to the upstream roll of the slow conveyor at a point lower than and upstream of the top run of that conveyor and will travel with that sheet, maintaining the nip, over an arc of rotation of the said roll.

4,040,618

SHEET STACKING APPARATUS

Roy E. Vermes, Southwick, and Richard E. Cosby, Feeding Hills, both of Mass., assignors to Reveo, Inc., Agawam, Mass.

Filed Apr. 19, 1976, Ser. No. 678,318
Int. Cl.[2] B65H *29/68*
U.S. Cl. 271—182 9 Claims



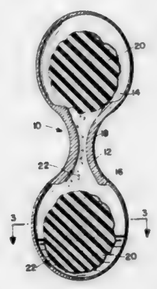
1. Machine for stacking corrugated sheets and the like in superposed edge-to-edge relation comprising a shingling conveyor having a driven endless belt for frictionally carrying said sheets in shingled relation, a transfer conveyor disposed in spaced end-to-end relation with the shingling conveyor for receiving said sheets from the shingling conveyor and including a driven belt for supporting said sheets thereon and frictionally carrying said sheets, a vertically movable platform disposed to receive sheets from the transfer conveyor, means for lowering said platform from a position approximately coplanar with said transfer conveyor as the height of the stack thereon increases, said machine having an automatic stack transfer cycle when said stack achieves a predetermined height, means for controlling the speed of said shingling conveyor and said transfer conveyor and means operable for said stack transfer cycle for stopping movement of said sheets from the shingling conveyor onto the transfer conveyor and including means to arrest movement of said sheets while the belt of said shingling conveyor is moving, said speed control means including means reducing the speed of said shingling conveyor and increasing the speed of said transfer conveyor in relation to the actuation of the said stop means whereby sheets are continuously moved toward said stop means by said shingling conveyor and discharged at increased speed by the transfer conveyor onto said vertically movable platform during said stack transfer cycle.

4,040,619

SQUEEZE TOY AND EXERCISING DEVICE

James V. Landi, 213 Windmill St., N. Providence, R.I. 02904

Filed Aug. 24, 1976, Ser. No. 717,215
Int. Cl.[2] A63B *21/30*
U.S. Cl. 272—68 4 Claims



1. An amusement and exercising device comprising:

a flexible and resilient housing means which is manually collapsible for exerting a force on a liquid saturated sponge for forcing the liquid therein from an upper and to a lower portion, said housing means including upper and lower portions, said portions being connected by a constricted neck portion, and a liquid-saturated sponge loosely held within each of said portions.

4,040,620

RESILIENT EXERCISE DEVICE

Stanton L. Friedman, 2285 Triway, Houston, Tex. 77043

Filed Nov. 17, 1975, Ser. No. 632,391
Int. Cl.[2] A63B *21/02*
U.S. Cl. 272—137 5 Claims



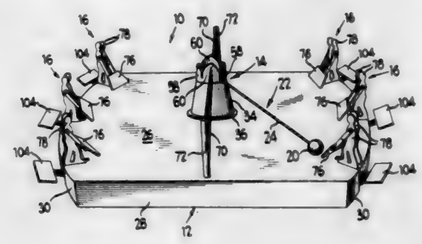
1. An exercise device which incorporates a stretchable resilient member having two ends, each of which is adapted to be grasped in the hands of a user, only one central tubing member telescoped over the stretchable resilient member and extending substantially the full length of the stretchable resilient and which does not extend to the ends of said stretchable resilient member in order to expose the ends thereof, and two end tubular members respectively slidably telescoped over the ends of said central tubing member and which end tubular members are fixed relative to the exposed ends of said stretchable resilient member.

4,040,621

SIMULATED VOLLEYBALL GAME APPARATUS

Gordon A. Barlow, Evanston, and Anson Isaacson, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Jan. 30, 1976, Ser. No. 653,933
Int. Cl.[2] A63F *7/06*
U.S. Cl. 273—85 C 10 Claims



10. A simulated volley ball game apparatus, comprising:

a base structure;

a generally, centrally disposed standard on the base structure;

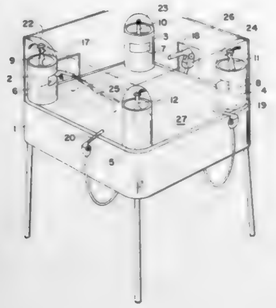
a ball connected to the top of the standard by a rigid elongated tethering means, said rigid tethering means being mounted to the standard by a universal connection so that the ball may pivot about the top of the standard in any direction;

a plurality of manually actuatable ball impelling means posi-

tioned on the base radially about the standard so as to enable contacting of the ball by timed actuation of the ball impellers to cause the ball to be pivoted about its universal connection across the standard; and

a plurality of detent means on the standard for engagement with the rigid tethering means for limiting and positively directing the ball only toward one of said ball impelling means.

4,040,622
WATER GUN GAME
Vernon J. Sinnott, Calgary, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Aug. 30, 1976, Ser. No. 718,863
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—86 R **3 Claims**



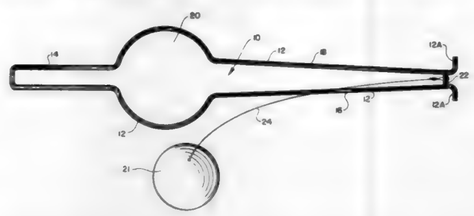
1. A toy game, comprising

a pan-type game board having a plurality of spaced water tanks thereon, each water tank having an opening therethrough for admitting water thereinto, figurine pivotally mounted atop the tank in a manner whereby the figurine is in one of an upright visible position above the tank and a substantially horizontal non-visible position at the top of the tank, float means pivotally mounted in the tank in a manner whereby when water in the tank is beneath a predetermined level, the float means is in upright position and non-buoyant and when water in the tank exceeds the predetermined level, the float means is buoyed by the water to a substantially horizontal position and coupling means for coupling the figurine to the float means whereby when the float means is buoyed to a substantially horizontal position it pivotally moves the figurine to its substantially horizontal position; and

a plurality of spaced water guns on the game board each adjustably mounted in a manner whereby it is directable to a corresponding one of the water tanks so that water may be directed from each of said guns into a corresponding one of the tanks via the opening thereof.

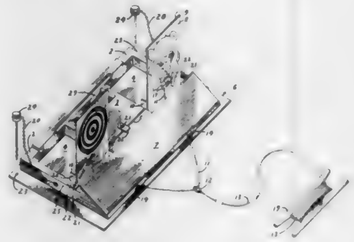
4,040,623
TETHERED BALL AND LOOP TOY OR EXERCISING DEVICE
Howard E. Ott, 280 W. Kenneth Road, Glendale, Calif. 91202
Continuation-in-part of Ser. No. 639,626, Dec. 11, 1975, abandoned. This application Aug. 6, 1976, Ser. No. 712,235
Int. Cl.[2] A63B *67/10*
U.S. Cl. 273—98 **2 Claims**

1. A toy and exercising device comprising: an elongated frame member formed of a continuous wire bent at one end into a U-shaped configuration to define a first pair of sides spaced from one another to form a handle for the device, and said wire further defining a second pair of sides at the other end of the device spaced from one another, and further defining an intermediate loop, the first and second pairs of sides being spaced apart a distance less than the diameter of said loop; a ball; a further wire extending transversely across the frame-like member at the end thereof remote from said handle means; and a flexible line secured to said further wire for tethering said ball to said frame, said line having a length to permit the ball and the frame to be turned relative to one another about the axis of



said further wire to permit the ball to pass through the intermediate loop, in which the extremities of the first-named wire at said remote end of the frame are bent outwardly in substantial axial alignment with the further wire to provide secondary handles for the device.

4,040,624
PULL CORD RIGHTING PORTABLE TARGET
Robert Wayne Lee, 3895 W. 2nd Ave., Hialeah, Fla. 33012
Filed Feb. 24, 1976, Ser. No. 660,913
Int. Cl.[2] F41J *7/04*
U.S. Cl. 273—102 AP **17 Claims**



1. A target device comprising a base means, at least two target elements mounted pivotly on said base means and mounted laterally to each other, and a target element resetting means; wherein said target element resetting means comprises a flexible bridling linkage of which one end terminates closely adjacent to one of said target elements, and the other end of said flexible bridling linkage terminates closely adjacent to another of said target elements, and wherein said flexible bridling linkage is maintained medially between said target elements.

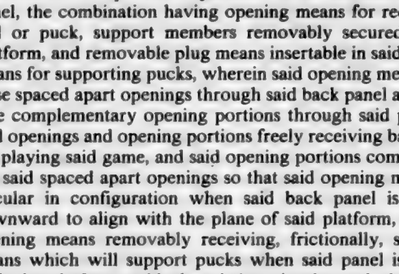
4,040,625
FLYING DISC HANDLING APPARATUS
Victor Malafronte, 2910 Newbury St., Berkeley, Calif. 94703
Continuation-in-part of Ser. No. 643,537, Jan. 26, 1976, abandoned. This application Jan. 24, 1977, Ser. No. 761,818
Int. Cl.[2] A63B *67/06*
U.S. Cl. 273—104 **8 Claims**

4. A flying disc handling apparatus comprising

a ring member arranged for wearing on the finger of the player;

a shaft secured to said ring member and projecting therefrom to extend from the end of the player's finger; and

a roller journalled on said shaft, said roller having an external configuration formed for engaging the inside edge of the rim of the flying disc and to permit the disc to continue



spinning after it has been caught by the player on the apparatus.

4,040,626
BALL AND PUCK GAME
Pasquale Sterlicchi, and Helen Sterlicchi, both of 1-J Kimberton Marrows Road, Newark, Del. 19713
Filed May 7, 1976, Ser. No. 684,303
Int. Cl.[2] A63B *63/04*
U.S. Cl. 273—123 R **1 Claim**

1. A combination ball and puck game, comprising a platform, a back panel which is adjustable and hinged to said platform so as to provide adjustment of the inclination of said panel, the combination having opening means for receiving a ball or puck, support members removably secured to said platform, and removable plug means insertable in said opening means for supporting pucks, wherein said opening means comprise spaced apart openings through said back panel and alignable complementary opening portions through said platform, said openings and opening portions freely receiving ball means for playing said game, and said opening portions complementing said spaced apart openings so that said opening means are circular in configuration when said back panel is pivoted downward to align with the plane of said platform, and said opening means removably receiving, frictionally, said plug means which will support pucks when said panel is aligned with the platform, said plugs being circular and placed in a recessed manner within said openings.

4,040,627
FRICTION TYPE EXERCISING DEVICE WITH IMPROVED FRICTION SETTING MECHANISM
Ronald E. Useldinger, 1150 Wunderlich Drive, San Jose, Calif. 95129
Filed July 22, 1976, Ser. No. 707,895
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—133 **7 Claims**

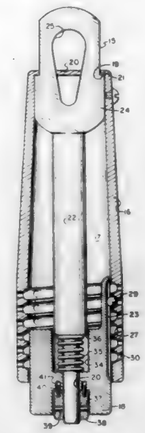
1. An exercising device comprising, in combination:

a body member having an outer wall forming a hollow cavity, said body member having a central axis and axially aligned first and second openings in opposite ends thereof communicating with said cavity;

a hub positioned in said first opening and including an axially extending central opening aligning with said second opening in the body member and including a pair of second openings extending axially and positioned radially outward from the central opening;

a shaft extending through the body member second opening and the hub central opening, said shaft including a hole therein adjacent said body member second opening;

a rope-like member extending through the pair of second openings in the hub, around the shaft and through the hole therein with both ends extending out through the hub; and



means for mounting the hub in the body member and allowing relative rotation thereto, said mounting means including a ball race formed by the hub outer surface and the body member cavity wall with a ball in the race positioned to travel around the body member interior wall as the hub is rotated;

releasable locking means for interlocking the hub and the shaft such that by release of said locking means the hub can be rotated about the shaft to adjust the number of turns of the rope-like member about the shaft;

and means allowing viewing of the position of the ball in the body member thereby to indicate the relative setting of the hub and the body member for determining the approximate frictional force exerted on the rope as it is pulled through the exercise device.

4,040,628
DIETING GAME BOARD APPARATUS
Isaac Louis Pope, 5 Ben Yehuda Str., Netanya, Israel
Filed Feb. 19, 1976, Ser. No. 659,265
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 B **7 Claims**

1. Dieting game board apparatus adapted to be played by a plurality of players operating in turn, the apparatus comprising a combination of:

manually manipulable means bearing indicia for making a chance selection;

a plurality of playing pieces each representing a dieter;

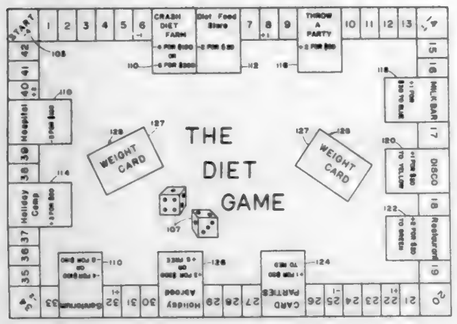
simulated weight indication means corresponding to each playing piece and functioning as a scoring device;

a playing board having a playing surface defined on a base surface thereof;

a series of playing locations defined about the perimeter of said playing surface in substantially contiguous relationship comprising a playing path along which said playing pieces are moved in discrete steps between successive

locations as indicated by said manually manipulable means, said series of playing locations comprising;

a first plurality of locations indicating that a player whose piece lands thereon is to gain weight; and



a second plurality of locations indicating that a player whose piece lands thereon is to lose weight.

4,040,629

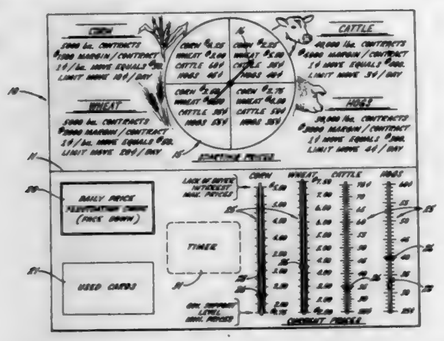
COMMODITIES BOARD GAME APPARATUS

John Kelly, 1020 Glen Flora Ave., Waukegan, Ill. 60085

Filed June 23, 1975, Ser. No. 589,019

Int. Cl.[2] A63F *3/00*

U.S. Cl. 273—135 C **3 Claims**



1. A playing apparatus comprising a playing board delineating a plurality of commodities and the trading terms at which each commodity may be traded by any player during a given playing period,

means for randomly establishing, at the beginning of the game, prices for each of the commodities at which all players may trade the commodities during the first playing period,

a plurality of cards for randomly establishing, at the beginning of each successive playing period, respective incremental price changes for each of the commodities, to give a new set of prices at which all players may trade the commodities during respective successive playing periods, each of said cards having indicia thereon indicating an amount of change in the respective price of each commodity,

an individual scale on said board for each commodity, said scales having divisions to represent incremental price differences between a minimum and maximum values for each commodity,

an individual pointer slideably disposed in said board adjacent each respective scale for individually indicating the current price of each commodity,

means for recording each players purchases and scales of said commodities at the prices in effect during the playing period when the respective purchases and sales were transacted, and

means for regulating the amount of trading during said playing after which the net gain or loss from each players trading is determined.

4,040,630

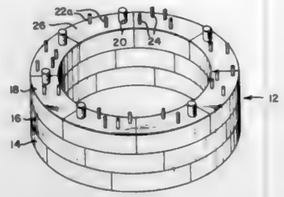
PUZZLE

William G. Brattain, 806 E. Tacoma St., Ellensburg, Wash. 98926

Filed Jan. 2, 1976, Ser. No. 646,195

Int. Cl.[2] A63F *9/12*

U.S. Cl. 273—157 R **16 Claims**



1. A puzzle comprising a plurality of stacked pieces each having a subset of coded symbols taken from a set of said symbols, said coded symbols being present on both the top and bottom surfaces of said pieces with the top symbols of each piece being adapted to interface with matching symbols on the bottom of other pieces, said subsets being derived from said set such that said pieces, when arranged in a puzzle solution, mate with other pieces to form continuous loops with vertically mating pieces overlapping each other such that a plurality of bottom symbols of each piece match a plurality of top symbols of a mating piece adjacent one end thereof, and a plurality of top symbols of each piece match a plurality of bottom symbols of a mating piece adjacent the other end thereof.

4,040,631

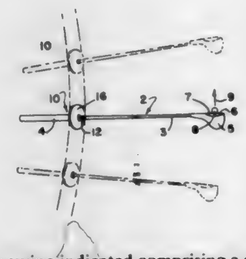
GOLF CLUB SWING GUIDE

Jarvis F. Flippin, 2146 School St., Winston-Salem, N.C. 27105

Filed June 22, 1976, Ser. No. 698,364

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—186 A **7 Claims**



1. A golf club swing indicated comprising a damp connected to the shaft of a golf club, an elongated pin connected to the clamp and extending a substantial distance forward from the clamp and golf club shaft parallel to a line of a lower leading edge of the face of the golf club head attached to the shaft, and a plate connected to the pin adjacent the lower end thereof, said plate defining a plane of substantial area perpendicular to said pin and leading edge so that a golfer in addressing a golf ball may use said plate and pin as an effective reference of the desired swing plane of the shaft and a line perpendicular to the desired direction of ball travel.

4,040,632

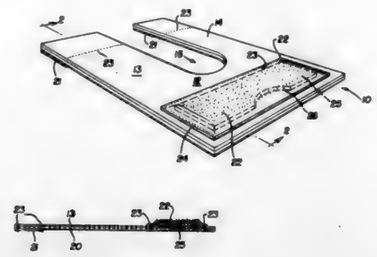
SPORTS TRAINING AID

Eddie Pawl, 31246 Gay, Roseville, Mich. 48066

Filed Jan. 2, 1976, Ser. No. 646,017

Int. Cl.[2] A63B *69/36, 69/38*

U.S. Cl. 273—189 A **4 Claims**



1. In a removable support training aid for golf or tennis or the like adapted to be worn on the wrist and hand to prevent bending of the wrist in either direction without interfering with the normal gripping action of the hand including a relatively thin generally U-shaped member having a base and opposed spaced apart first and second elongated legs; said base being enlarged in a direction parallel to the elongated axis of said legs to define an enlarged base to fit over the back of the hand, the back of the wrist and the back of the lower portion of the forearm of the wearer; said first leg being wider than said second leg in a direction transverse to the longitudinal axis of the legs; and fastener means attached to the distal end of each leg and to the base for individually fastening each leg to the base; the improvement comprising:

the fastener means attached to said base to define a pocket between said fastener means and said base to receive a removable reinforcing member therein;

so that upon placing the training aid base on the back of the hand, the back of the wrist and the back of the forearm, said first leg may be encircled around the wrist and forearm of the wearer and attached to the base and the second leg extended between the thumb and forefinger and encircled across the palm and around the hand to the back of the hand and attached to the base to thereby rigidly reinforce the wrist of the wearer against bending in either direction without interfering with the normal gripping function of the hand.

4,040,633

GOLF SWING TRAINING MACHINE

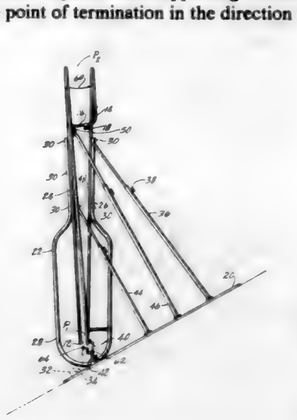
Frank A. Sciarrillo, 9550 Sepulveda Blvd., Sepulveda, Calif. 91343

Filed Feb. 26, 1976, Ser. No. 661,658

Int. Cl.[2] A63B *69/36*

U.S. Cl. 273—191 A **7 Claims**

1. A golf practice device comprising a helically shaped guide having at least one and a half turns to provide overlapping portions, means supporting the guide from a horizontal surface with the axis of the helix tilted from the horizontal so as to extend perpendicular to the plane of the normal golf swing, one end of the helical guide terminating adjacent the lowermost part of the helix adjacent the supporting surface and extending from the point of termination in the direction of the backswing to provide spaced overlapping sections of the helical guide in the backswing region of the golf swing.



4,040,634

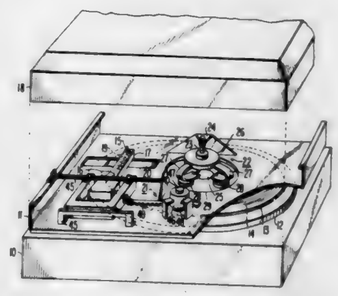
OVERHEAD DISC RECORD GROUNDING APPARATUS

Marvin Allan Leedom, S. Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 557,180, March 10, 1975, abandoned. This application Apr. 12, 1976, Ser. No. 676,288

Int. Cl.[2] G11B *1/00*

U.S. Cl. 274—2 **4 Claims**



1. In a playback system including a base; a turntable rotatably mounted on said base; said turntable having a surface for supporting a disc record; said disc record having a centering hole; a major surface of said disc record having geometrical variations in a spiral groove with information recorded therein; said turntable having a centering hub for concentric alignment of said disc record by engagement of said hub in said centering hole; a pickup arm carrying a signal pickup; said signal pickup during playback subject to a cooperative engagement with said spiral groove for retrieving said information when relative motion is established between said signal pickup and said disc record; said disc record having a conductive coating; a portion of said disc record conductive coating being present in an area surrounding said centering hole; a disc record grounding apparatus comprising:

a. a point of reference potential for said playback system;

b. a cover mounted to said base for motion between an open position and a closed position;

c. a conductive spring element rotatably secured to said cover; wherein when said cover is disposed in said closed position, the axis of rotation of said spring element is substantially collinear with the axis of rotation of said turntable centering hub;

d. means for electrically coupling said spring element to said point of reference potential; and

e. a conductive pad affixed to said spring element such that a movement of said cover to said closed position causes said spring element to firmly press said conductive pad against said conductive coating of said disc record, thereby mechanically and electrically coupling said spring element to said disc record conductive coating.

4,040,635

RELEASABLE STYLUS ARM MAGNETIC COUPLING

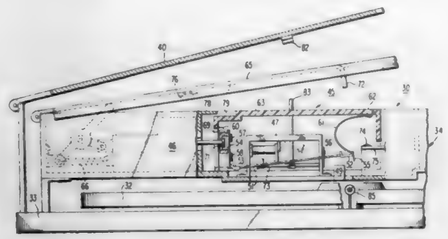
Marvin Allan Leedom, South Brunswick Township, Middlesex County, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,388

Claims priority, application United Kingdom, Sept. 18, 1975, 38458/75; Nov. 28, 1975, 49109/75

Int. Cl.² G11B *3/02*; H01F *7/20*

U.S. Cl. 274—37 **5 Claims**



1. In a system for playing back prerecorded signals from a spirally grooved record; said system including a support element; said system further including a stylus arm carrying a stylus at one end thereof; an apparatus comprising:

A. a first substantially flat magnetizable coupling element secured to the other end of said stylus arm;

B. a second magnetizable coupling element secured to said support element, and subject to a releasable engagement with said first magnetizable coupling element; wherein said second coupling element has magnetizable walls defining a recess; and

C. a permanent magnet mounted in said recess with a separation from said walls such that it forms an annular cavity with said magnetizable walls; the dimensions of said permanent magnet relative to the wall dimensions being such that a gap between said permanent magnet and said first coupling element is established, during said engagement between said coupling elements, which provides a separation between said permanent magnet and said first magnetizable coupling element that is greater than the separation between said permanent magnet and said magnetizable walls.

4,040,636

COMPOSITE PACKING

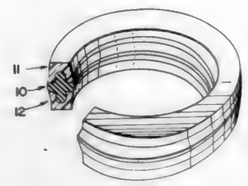
Kenneth Ray Albertson, and Gerald Helmut Beck, both of Salt Lake City, Utah, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Oct. 4, 1976, Ser. No. 729,252

Int. Cl.² F16J *15/24*

U.S. Cl. 277—188 A **13 Claims**

1. A composite packing comprising a first ring of deformable elastomeric material positioned between second and third rings of deformable material but which is less readily deformable than the first ring, said second and third rings each having a recess open to an axial end thereof that faces and is adjacent the first ring, said recesses each forming radially inner and outer lips on the respective second and third rings, each recess having an undercut, said first ring having a central portion and an axial extension at each end of the central portion, each lip having a free end adjacent said central portion, each axial extension fitting within a respective one of said recesses and extending laterally into the undercut thereof to form a mechanical interlock therewith whereby said interlocks cause said rings to be retained as a unitary assembly.



4,040,637

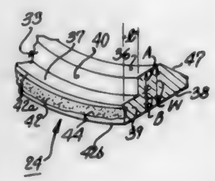
LOW FRICTION BALANCED PISTON RING

Harold E. McCormick, Ballwin, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Filed Mar. 4, 1976, Ser. No. 663,832

Int. Cl.² F16J *9/20*

U.S. Cl. 277—224 **16 Claims**



1. In combination in an internal combustion engine, a piston, a cylindrical bore in which said piston reciprocates and an annular piston ring adapted to be received in a groove in said piston, said piston ring having an upper radial surface, a lower radial surface substantially parallel to the upper radial surface, a first outer axial bearing surface which extends upwardly from the lower radial surface and terminates at an intermediate inwardly extending surface, which intermediate surface terminates at a second outer axial recessed surface and which second outer axial recessed surface terminates at said upper radial surface, an inner axial surface which extends between the upper and lower radial surfaces and against which gas pressure in the groove in said piston acts to urge said piston ring radially outwardly, said second outer axial recessed surface providing a surface against which gas pressure in said bore exerts a radially inwardly directed force to offset at least in part the radially outwardly directed force exerted by the gas pressure acting on said inner axial surface, and which radially inwardly directed force does not appreciably change during the life of the ring, said second outer axial recessed surface having a maximum radius less than the radius of said piston when said ring is in the groove in the piston and in the cylindrical bore of said internal combustion engine.

4,040,638

REFUSE COLLECTING AND CONVEYING VEHICLE

Raymond C. Flagg, P.O. Box 1692, Medford, Oreg. 97501

Filed May 3, 1976, Ser. No. 682,759

Int. Cl.² B62B *13/18*

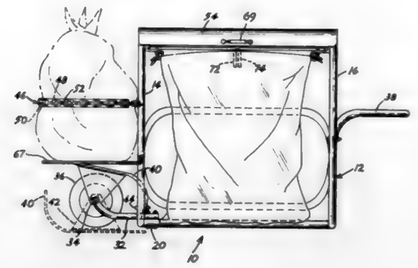
U.S. Cl. 280—9 **7 Claims**

1. A manually operable, ground supported refuse collecting and transporting vehicle comprising, in combination,

a. a rigid bag supporting frame,

b. means for supporting the bag, open end up, within the frame,

c. an unitary, rigid bag cover pivotally mounted on the frame with freedom for movement in its entirety, about a single laterally offset axis, between bag covering and uncovering positions, and



d. horizontally operative bag mouth opening and closing means responsive to operation of the unitary bag cover to spread the bag mouth as an incident of uncovering the bag and to close the bag mouth as an incident of covering the bag.

4,040,639

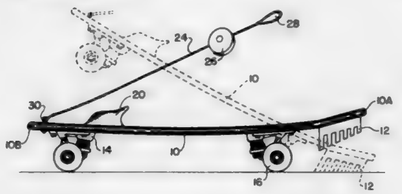
SKATEBOARD

Anthony Scardenzan, 269 N. Hillcrest Blvd., Inglewood, Calif. 90301

Filed Mar. 25, 1976, Ser. No. 670,361

Int. Cl.² A63C *17/14*

U.S. Cl. 280—87.04 A **2 Claims**



1. A skateboard for carrying an operator in a standing position along a particular path on a supporting surface, the skateboard comprising: an elongated platform for supporting the operator and having a forward end section and an upwardly tilted rear end section; a first wheel truck assembly mounted to the underside of the platform at the forward end section, and a second wheel truck assembly mounted to the underside of the platform forward of the upwardly tilted rear end section; a braking pad secured to the underside of the platform under the upwardly tilted rear end section between the second wheel truck assembly and the rear extremity of the platform in position to engage the supporting surface in a braking relationship when the platform is tilted about the pivot axis of the second wheel truck assembly in a direction to raise the forward end section of the platform; a line tethered to the forward end section of the platform; a spring-loaded reel connected to the line for receiving the line; clip means attached to the line for attaching the line to the operator of the skateboard; and a foot binding mounted on the top side of the platform adjacent to the forward end section thereof and having an open rear end for releasably receiving one foot of the operator on the platform.

4,040,640

VEHICLE CHASSIS

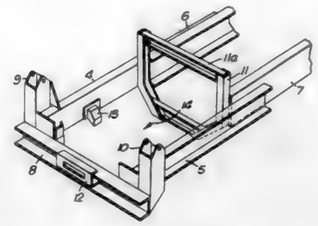
John Robert William Begg, Adlington, near Chorley, England, assignor to British Leyland UK Limited, London, England

Filed Mar. 31, 1976, Ser. No. 672,242

Claims priority, application United Kingdom, Apr. 26, 1975, 17418/75

Int. Cl.² B62D *21/02*

U.S. Cl. 280—106 R **2 Claims**



1. A motor vehicle chassis frame which comprises:

a. a first pair of mutually parallel channel-sectioned members and a plurality of transverse cross-members, means connecting the said first pair to the cross-members to form a first sub-frame, the flanges of the channel-sectioned members facing outwardly away from one another;

b. a second pair of mutually parallel channel-sectioned members and a plurality of transverse cross-members, means connecting the said second pair to the cross-members to form a second sub-frame, the flanges of the channel-sectioned members facing inwardly towards one another;

c. one of the ends of each of the two channel members of the first pair overlapping and abutting one of the ends of each of the two channel members of the second pair on the outside thereof so that the distance between the channel members of the first pair is greater than that between those of the second pair; and

d. means securing the said overlying ends of the said first pair to the said ends of the second pair of channel sectioned members.

4,040,641

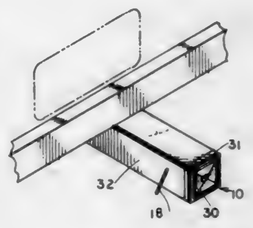
TRAILER HITCH COVER

Raymond E. Riecke, Box 404, Ruthven, Iowa 51358

Filed Feb. 6, 1976, Ser. No. 655,737

Int. Cl.² B60D *7/00*

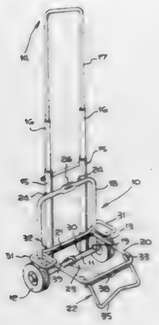
U.S. Cl. 280—507 **3 Claims**



1. Tube hitch protecting apparatus comprising tube insert means for insertion in a tube hitch, said insert means comprising a member, the outer wall of which slidingly engages the inner wall of a tube hitch, first aperture means in said tube insert means for securing said tube insert means to a tube hitch by locking pin means, second aperture means in said tube hitch, said first aperture and said second aperture being alignable for securing said tube insert to a tube hitch by said locking pin means, adjustable extension means comprising threaded shaft

means engaging said tube insert means for moving said extension longitudinally into and out of a tube hitch to align said first and second apertures with one another, opening means in said tube insert for receiving said threaded shaft means, said adjustable extension means being secured to and adjustably projecting outwardly from said insert, tube seal means attached to said extension for sealing the end of a tube hitch when said insert means is positioned in and secured to a tube hitch through said first and second aperture means.

4,040,642
COLLAPSIBLE LUGGAGE CARRIER
Melvin J. David, 16221 Quemada Road, Encino, Calif. 91314
Filed Jan. 15, 1976, Ser. No. 649,341
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—654 **6 Claims**



1. Luggage carrying apparatus comprising:

a. a telescoping handle assembly comprising a pair of extension members in parallel spaced relation to one another, each extension member comprising a plurality of cylindrical extension segments of uniformly graded diameter is axial alignment with one another, said extension segments of each extension member being concentrically mounted whereby the extension segments of each extension member extend and contract along a common axis;

b. frictional coupling means for coupling each pair of adjacent extension segments of said extension members;

c. an axle assembly rigidly secured to the termini of said extension members and being perpendicular thereto;

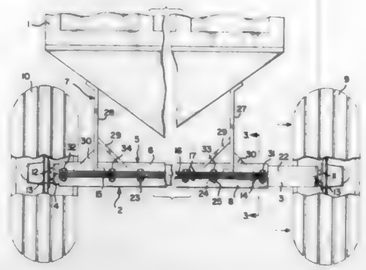
d. a base support being substantially U-shaped and including first and second legs and integral cross-member therebetween, said cross-member being rigidly secured to said extension members perpendicular thereto, said termini of each of said first and second legs being rigidly secured to said axle assembly;

e. a support frame being substantially U-shaped and having first and second legs and an integral cross-member therebetween, said termini of the first and second legs of said support frame being pivotally mounted to the first and second legs respectively of said base support;

f. a brace having first and second legs and a support stand integrally mounted therebetween, the first and second legs of said brace being pivotally mounted between the first and second legs of said support frame in the proximity of the cross-member of said support frame; and

g. retention means for limiting the rotational movement of said support frame with respect to said support base, said retention means coupled intermediate said frame and said axle.

4,040,643
ADJUSTABLE VEHICLE AXLE
Quintin A. Applequist, and Laird V. Hawley, both of Salina, Kans., assignors to Roberts Industries, Inc., Salina, Kans.
Filed Oct. 15, 1975, Ser. No. 622,770
Int. Cl.[2] B62D *63/06*
U.S. Cl. 280—656 **6 Claims**



1. In a load carrying vehicle having a body and wheels, an apparatus for adjustable, lateral spacing of the wheels, including:

a. an axle assembly having elongate, cooperating, first and second intermediate members extending transversely of the vehicle body;

b. said first intermediate member being fixed to the vehicle body, and said first and second intermediate members each having a channel therein, extending transversely of said vehicle body and in facing relation, each channel having first and second planar, diverging surfaces which meet at an apex;

c. first and second end members having portions at one end thereof with wheels rotatably mounted thereon and elongate portions extending between said intermediate members, said elongate portions of said end members each having opposed planar faces and substantially mating with the diverging surfaces of each channel and seating therein at opposing ends of said axle assembly, said elongate portions selectively telescoping within said channels;

d. spaced means adjustably connecting said first and second intermediate members and drawing said second intermediate member toward the first intermediate member, and securing said elongate portion of each of said end members by clamping the same between said intermediate members; and

e. said first intermediate member being attached to said vehicle in a manner whereby a line connecting each channel apex is, in an operational position, disposed in a normally, substantially vertical orientation.

4,040,644
REFUSE BAG CARRIER
Raymond C. Flagg, P.O. Box 1692, Medford, Oreg. 97501
Filed June 17, 1976, Ser. No. 697,134
Int. Cl.[2] B62B *1/12*
U.S. Cl. 280—659 **7 Claims**

1. A carrier device for refuse collecting bags comprising, in combination,

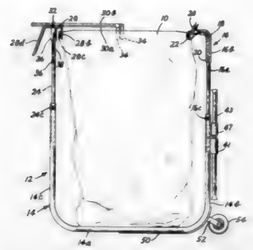
a. an U-shaped frame having a stable base portion and front and rear upstanding arms,

b. first and second bag supporting members carried in telescoping relation by the respective upstanding arms,

c. means for adjustably, individually fixing the bag supporting members at desired levels relative to the upstanding arms according to the length of the bag chosen for use,

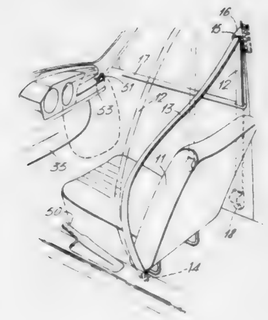
d. an extensible coil spring carried by the first bag supporting member, said spring being anchored at one end to the spring carrying member and equipped at the other end with means for effecting detachable connection with a knotted portion of a bag mouth,

e. a slotted member carried by the second bag supporting member adapted for detachable connection with another knotted portion of the bag mouth, and



f. means carried by said second bag supporting member for spreading the bag mouth.

4,040,645
SEAT-BELT APPARATUS
William McAlpin Giffen, Hailey, England; John Michael Pollitt, Gretna, Scotland, and Roy Clifford, Carlisle, England, assignors to Auto Restraint Systems Limited, London, England
Filed June 9, 1975, Ser. No. 585,426
Claims priority, application United Kingdom, June 10, 1974, 25703/74
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—745 **8 Claims**



1. A seat-belt apparatus of the kind which is arranged to be mounted in a vehicle for automatically moving a seat-belt of the apparatus into, and away from, an operative position across a vehicle seat comprising,

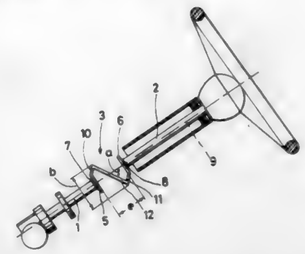
a seat-belt retraction mechanism mounted on a vehicle door adajcent said seat,

means coupling said seat-belt to the retraction mechanism to permit withdrawal of the seat-belt from the retraction mechanism,

said retraction mechanism including acceleration responsive means operable to inhibit withdrawal of the seat-belt from the retraction mechanism when said mechanism is subjected to an acceleration in excess of a predetermined magnitude and to permit such withdrawal at all other times,

and means responsive to the position of said door for permitting said acceleration-responsive means to inhibit withdrawal of the seat-belt only when said door is closed and to prevent such inhibition whenever the door is open.

4,040,646
SAFETY STEERING COLUMN WITH A DEFORMING ELEMENT
Burckhard Becker, Solingen-Widdert, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany
Filed Oct. 22, 1975, Ser. No. 624,925
Claims priority, application Germany, Nov. 30, 1974, 2456794
Int. Cl.[2] B62D *1/18*
U.S. Cl. 280—750 **3 Claims**

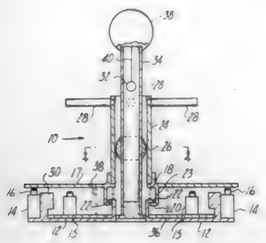


1. In a safety steering column of the type having a deforming element inserted between a first steering column part connected to a steering gear mechanism for a vehicle and a second steering column part coaxial with the first and mounting a steering wheel for the vehicle, said deforming element connecting the steering column parts in a torsionally rigid manner and being responsive to impact forces occurring in the direction of the steering column axis, the improvement wherein the deforming element is formed from a flat rectangular piece of material which is bent widthwise so as to have a zig-zag longitudinal cross-section generally in the shape of a Z or M, said bends in the element symmetrically defining end legs normal to the steering column axis which are welded to adjoining surfaces of the respective steering column parts, inclined legs continuing obliquely from the end legs, and at least one intermediate leg connecting the inclined legs and intersecting the steering column axis at an acute angle thereto, and wherein the length of the at least one intermediate leg in relation to the other legs of the element, the transverse extension of the element from bend to bend on opposite sides of the steering column axis, and the angle of the at least one intermediate leg to the steering column axis are selected such that the element has both a long deformation path and the property of symmetrical deformation in which the steering column parts move toward each other and remain substantially coaxial upon application of impact forces on the steering column.

4,040,647
MANUAL CONTROLLER FOR VEHICLE LEVEL ADJUSTMENT
Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 19, 1976, Ser. No. 668,351
Int. Cl.[2] B60S *9/14*
U.S. Cl. 280—766 **5 Claims**

1. In a wheeled vehicle having jacks at or near its four corners for temporarily raising and supporting the vehicle in a substantially level attitude irrespective of the slope of the terrain, an improved control mechanism for selectively energizing the jacks: said control mechanism including a vehicle-affixed base structure carrying four perimetrically-spaced switches which individually energize respective ones of the jacks to produce vertical motion of the vehicle in one direction; a rockable platform positioned on the base structure and carrying four other perimetrically-spaced switches which individually energize respective ones of the jacks to produce vertical motion of the vehicle in the other direction; a tiltable switch actuator plate overlying the platform and base structure; first manual means connected to the actuator plate for

tilting said plate downwardly around selected ones of its edges to thereby selectively actuate different ones of the first mentioned switches; means restricting the actuator plate to tilting movements in any of four distinct separate directions that will provide only four possible switch actuations when a tilt force is applied to the first manual means; second manual means connected to the platform for rocking said platform upwardly



around selected ones of its edges to thereby cause the overlying plate to actuate the one of the second mentioned switches that is in an elevated condition; and means restricting the platform to rocking movements in any of four distinct separate directions that will provide only four possible switch actuations when a rocking force is applied to the second manual means.

4,040,648

RECORD SHEETS SENSITIZED WITH REDUCED CHARGE MONTMORILLONITE PIGMENT

Peter A. H. Isaac, Summit, and T. Dixon Oulton, Watchung, both of N.J., assignors to Engelhard Minerals & Chemicals Corporation, Menlo Park, Edison, N.J.

Filed Jan. 12, 1976, Ser. No. 648,253

The portion of the term of this patent subsequent to Nov. 23, 1993, has been disclaimed.

Int. Cl.[2] B41L *1/20*; B32B *5/16*; B41M *3/12*

U.S. Cl. 282—27.5 **15 Claims**

1. A pressure-sensitive record system comprising transfer sheets coated with an encapsulated solution of crystal violet lactone, crystal violet lactone being the sole chromogen in said record system, and image-receiving sheets coated uniformly throughout a recording area thereof with a paper coating adhesive and particles of a reactive pigment obtained by exchanging exchangeable cations in a clay material, a substantial proportion of which is dioctahedral montmorillonite clay, with from about 60 to 120 meq./100 g. of lithium ions, said clay material containing no more than about 7% hydrated silica, heating the clay thus treated at a temperature in the range of 160° C. to 250° C. until the structure of the dioctahedral montmorillonite is collapsed, as evidenced by the fact that the product has a basal planar spacing in the range of about 9.8 to 10.2A., said particles of reactive pigment being essentially all finer than 15 microns and predominantly in the size range of ½ to 5 microns and containing from 0.5 to 4% by weight Li_2O based on the weight of the particles after being heated to constant weight at 1800° F.

4,040,649

OIL WELL TOOL WITH PACKING MEANS

Henry Wayne Blackwell, Venus, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 31, 1975, Ser. No. 627,633

Int. Cl.[2] F16L *37/22*; E21B *33/12*

U.S. Cl. 285—3 **5 Claims**

1. A hydraulically actuated releasable connection comprising:

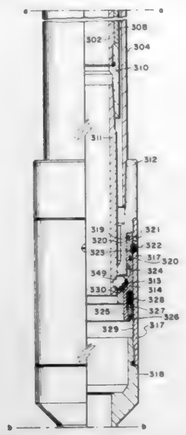
an inner member having locking recess means formed therein;

an outer housing telescoped over said inner member, forming an annular space therebetween, and having ports through the wall thereof;

an intermediate retainer sleeve in said annular space, having openings adjacent said recess means, and being attached to said housing;

locking means in said openings releasably engageable in said recess means;

piston means in said annular space, slidingly and sealably engaged between said retainer sleeve and said housing,



and having abutment means for abutting said locking means into engagement in said recess means;

said piston means being in communication with said port means and further having release channel means formed therein adjacent said abutment means and arranged to receive said locking means therein; and,

latch means attached to said piston means and adapted to be latched to said housing after hydraulic actuation of said piston through said ports.

4,040,650

ARTICULATE CONDUIT CONNECTOR

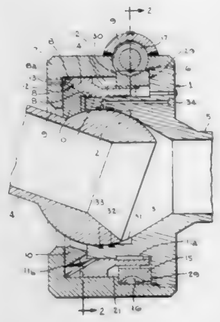
Keith Shotbolt, Gerrards Cross, England, assignor to Comex Marine Services, Inc., Houston, Tex.

Filed Nov. 24, 1975, Ser. No. 634,767

Claims priority, application France, Jan. 7, 1975, 75.01191

Int. Cl.[2] F16L *27/06*

U.S. Cl. 285—18 **22 Claims**



1. Apparatus for joining elongated members in an articulated relationship comprising:

a male member, attached to one of said elongated members, having a radially enlarged portion thereon;

a female member, attached to another of said elongated members, into which said male member may be inserted;

gripping means, carried by said female member, movable from a radially expanded position, in which said male member may be freely inserted and removed from said female member, to a radially contracted position gripping said enlarged portion of said male member preventing removal of said male member and locking it in a fixed articulated relationship with said female member;

wedge means engageable with cooperating surfaces of said gripping means and movable from a first position, in which said gripping means is in said expanded position, to a second position in which said gripping means is forced into said contracted position; and

means rotatable by a force applied externally of said apparatus for moving said wedge means between said first and second positions, said rotatable means being self-locking so that upon removal of said externally applied force, said gripping means remains in said contracted, locked position.

4,040,651

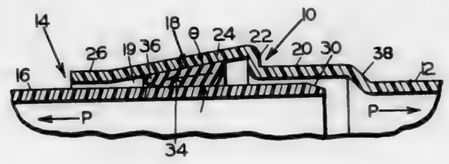
SELF-LOCKING PIPE COUPLING

Harvey W. LaBranche, Olympia, Wash., assignor to Western Plastics Corporation, Tacoma, Wash.

Filed Mar. 3, 1976, Ser. No. 663,466

Int. Cl.[2] F16L *17/00*

U.S. Cl. 285—113 **2 Claims**



1. A self-locking pipe coupling for joining the adjacent ends of a pair of pipe sections, comprising

a. a cylindrical spigot portion **(16)** arranged at one end of a first one of said pipe sections;

b. a bell portion **(10)** arranged at one end of a second one of said pipe sections, said bell portion including, in succession,

1. a cylindrical terminal portion **(26)** having a diameter for receiving said spigot portion,
2. a truncated conical portion **(24)** of increasing diameter in the direction toward the other end of said second pipe, said truncated portion defining an angle ϕ relative to the axis of said second pipe,
3. a first radially inwardly directed step **(22)** terminating said truncated portion,
4. a cylindrical inner socket portion **(20)** having a diameter generally equal to the diameter of said terminal portion, and
5. a second step **(38)** terminating said inner socket portion and merging into the remaining portion of said second pipe; and

c. a resilient cylindrical seal **(18)** arranged concentrically within said truncated portion and having an inner diameter for snugly receiving said spigot portion and an outer surface conforming with the inner surface of said truncated bell portion, said seal having a length less than the distance between said cylindrical terminal portion and said first step, said seal having an inner coefficient of friction μ_2 between its inner surface and the outer surface of said spigot, and an outer coefficient of friction μ_1 between its outer surface and the inner surface of said bell truncated portion, where μ_2 is greater than but less than twice μ_1, and where

$$\mu_2 = \frac{\sin\theta + \mu_1 \cos\theta}{\cos\theta - \mu_1 \sin\theta},$$

whereby upon axial insertion of said spigot portion concentrically within said bell portion and said seal, said seal is caused to abut said first step and said spigot portion is caused to abut said second step, so that said seal has a first interference — fit position relative to said spigot portion;

d. said first pipe being axially displaced apart from said second pipe to cause the seal in said first position relative to said spigot portion to be tightly wedged in sealed relation between the inclined inner surface of said bell truncated conical portion and said spigot portion.

4,040,652

DOOR LOCK

Soren Christian Schoubye Arfelt, Ebberup; Ib Christian Clausen, Allested; Johannes Jensen, Odense; Knud Hansen Fynbo, and Jean Arnold Fischer, both of Hjallese, all of Denmark, assignors to Daempa A/S, Knarreborg, Denmark

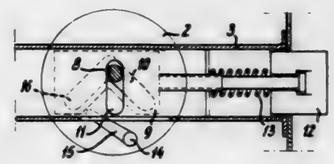
Continuation of Ser. No. 340,583, March 12, 1973, abandoned.

This application Feb. 11, 1974, Ser. No. 441,602

Claims priority, application Denmark, Mar. 20, 1972, 1300/72

Int. Cl.[2] E05C *1/06*

U.S. Cl. 292—167 **2 Claims**



1. A lock for a door or the like, comprising in combination

a tubular casing,

a bolt slidably disposed in said casing along a longitudinal axis thereof,

said bolt being movable between a plurality of positions including a latched position, a locked position and a released position,

actuator means carried by said casing,

an operative connection between said actuator means and said bolt for transmitting movement therebetween in response to movement of the actuator means, said operative connection including a crank element and a connecting rod articulated to said crank element and connected to said bolt by a universal joint, the arrangement being such that in the locked and the released positions,

respectively, of said bolt, the point of articulation between said crank element and said connecting rod is spaced from and located on one and the other side, respectively, of a plane perpendicular to the direction of movement of said bolt and containing the axis of said crank, while in the latched position of said bolt the spacing of said point of articulation from said plane is smaller than such spacing in said locked position,

means biasing said bolt toward its latched and locked positions, and

said casing including a first part which contains said actuator means and said crank and a second part which contains said bolt, said first and second parts being rotatable approximately 180° in relation to each other around the longitudinal axis of the casing, whereby the lock may be subject to left and right hand installation.

4,040,653

CONTROL DEVICE FOR STOPPING THE WITHDRAWING OF UNIT CASES

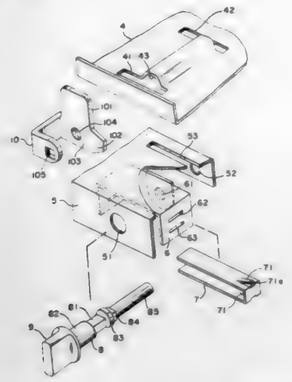
Masaru Takahashi, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed June 17, 1976, Ser. No. 696,920

Claims priority, application Japan, June 19, 1975, 50-83782[U]; June 19, 1975, 50-83781[U]

Int. Cl.² E05C *3/04, 7/06*

U.S. Cl. 292—202 **8 Claims**



1. In a control device for stopping the withdrawing of a drawer type unit case to a predetermined position by interlocking a main pawl of a latch carried by the unit case, which is slidable in the direction of sliding of said unit case and is fitted on an operating shaft, also carried by the unit case, and rotatable therewith about the axis thereof, with a partition between adjacent unit cases, the improvement which comprises:

a yoke secured to said unit case in the upper frontal area thereof, said yoke having aligned holes therein for rotatably receiving said operating shaft and a latch receiving elongate opening for receiving said main pawl of said latch in one position thereof;

said partition being disposed between adjacent vertically arranged unit cases, adjacent the front end of the cabinet housing said unit cases, said partition having elongate parallel interlocking openings therein arranged parallel to said latch receiving opening of said yoke and a fine groove formed perpendicular thereto and connecting said interlocking openings, so that in a closed position of said unit case, one of said interlocking openings in said partition is aligned with said latch receiving opening of said yoke, whereby said main pawl of said latch locks said unit case in a closed position;

said latch also having a small pawl slidable in said fine groove of said partition, said small pawl facing said fine groove upon turning of said latch to a second position, whereby the unit case may be drawn out in the direction of the operating shaft and the small pawl may be interlocked to the other of said interlocking openings in said drawing step so as to stop said unit case at a predetermined position established by said other of said interlocking openings of said partition.

4,040,654

LINKAGE FOR HINGED TAILGATES

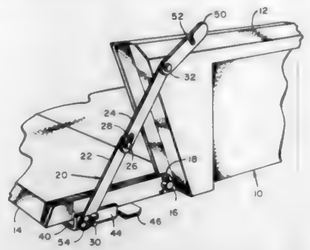
Max Lee Hill, Listie, and Richard James Kimmel, Stoystown, both of Pa., assignors to The Coleman Company Inc., Wichita, Kans.

Filed Feb. 4, 1976, Ser. No. 655,133

Int. Cl.² B62D *33/02*

U.S. Cl. 296—57 R **5 Claims**

1. A linkage used in combination with a vehicle body having an end opening and a hinged tailgate for opening and closing said end opening; said linkage comprising an articulated linkage including first and second link arms; a linkage plate attached to said tailgate; a tailgate pivot screw mounted to said linkage plate; a projecting guide tab on said plate extending laterally outwardly of the tailgate, said projecting tab being located between the tailgate pivot screw and the hinged lower edge of the tailgate; folding pivot means connecting together said first and second link arms, at least one of said link arms having a longitudinal slot receiving the folding pivot means, the distal end of said first arm defining a hole through which the tailgate pivot screw extends to form a tailgate pivot point; pivot means fixed on the vehicle body connecting the distal



end of said second link arm to said vehicle body whereby said first and second link arms extended in line with the tailgate are held by said articulated linkage in a generally horizonal position in which said vehicle end opening is open, and operative by depressing said articulated linkage downward at said folding pivot means and raising the tailgate for said guide tab to gather the linkage and the tailgate to close said end opening; a lock lever pivotally connected to said vehicle body and having a slot to engage said tailgate pivot screw; and a wing nut on said tailgate pivot screw to lock the lock lever in place when said tailgate is closed.

4,040,655

PNEUMATIC SYSTEMS AND VALVES THEREFOR

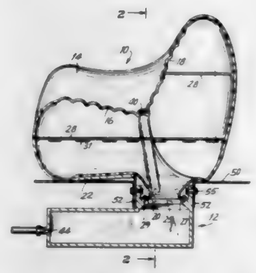
Laurence James Garrick, and Rachel Simon, both of 27 Ohayo Mountain Road, Woodstock, N.Y. 12498

Continuation of Ser. No. 351,762, April 16, 1973, abandoned. This application Oct. 28, 1975, Ser. No. 625,925

Claims priority, application United Kingdom, Apr. 17, 1972, 17673/72

Int. Cl.² B60N *1/02*

U.S. Cl. 296—63 **10 Claims**



1. A pneumatic system designed and adapted for use in a powered vehicle, the system comprising (1) a fluid pump having a high pressure outlet and a low pressure inlet; (2) drive means for the fluid pump, designed and adapted to operatively connect the fluid pump to the vehicle power source; (3) a stabilized, firmly anchored inflatable article, the inflatable article comprising a flexible, substantially fluid-impermeable member, the flexible member being shaped to define a fluid space; marginal portions on the flexible member defining an opening therethrough; and a rigid retaining member in fluid-tight connection with the marginal portions, the rigid retaining member and the flexible member defining a fluid-tight space; (4) fluid feed conduit means in fluid flow connection with the fluid pump and with the fluid-tight space; (5) regulating valve means designed and adapted to be positioned in intermediate fluid flow relationship with the fluid pump and the inflatable article, so as to control the flow of fluid between the fluid-tight space, and the fluid pump through the fluid feed conduit means, the regulating valve means comprising (a) a valve housing divided into two mutually sealed off chamber, an inlet chamber being in fluid flow connection with the inlet to the pump, with the atmosphere and with the fluid feed conduit to the inflatable article, a fluid outlet chamber being in fluid flow connection with the outlet from the pump, the atmosphere and the fluid feed conduit to the inflatable article; (b) first valve means capable of closing off the atmosphere from the inlet chamber; (c) second valve means capable of closing off the inlet chamber from the fluid feed conduit; (d) third valve means capable of closing off the outlet chamber from the atmosphere; (e) fourth valve means capable of closing off the outlet chamber from the fluid feed conduit, and (f) integrating means for ordering the action of the first, second, third and fourth valve means to place the pneumatic system is desired sequential operating conditions, whereby in a neutral, or idle, condition, the second and fourth valve means are in the closed position and the first and second valve means are in the open position; in an inflating condition, the first and the fourth valve means are in open positions and the second and the third valve means are in closed positions, permitting the high pressure air from the outlet from the pump to pass to the inflatable article; and in a deflating condition the first and the fourth valve means are in closed positions and the second and the third valve means are in open positions, permitting the pump to draw air from the inflatable article to the low pressure inlet to the pump; the rigid retaining member being designed and adapted to be rigidly connected to a substantially rigid surface on a powered vehicle whereby, in the inflated condition, the flexible member extends outwardly and laterally from the rigid retaining member and portions of the flexible member press against the rigid surface thereby stabilizing the inflatable article with regard to the rigid surface.

4,040,656

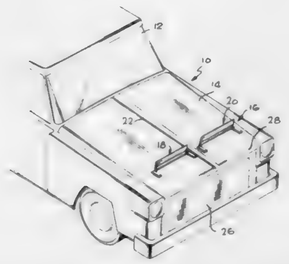
BUG DEFLECTOR

Alain Jean-Marie Clenet, 160 Santo Tomas Lane, Montecito, Calif. 93108

Filed June 11, 1975, Ser. No. 585,845

Int. Cl.² B60J *1/20*

U.S. Cl. 296—91 **2 Claims**



2. Apparatus for deflecting windshield-blockable material in the atmosphere away from the windshield of a moving vehicle which has a hood in front of the windshield, comprising:

a holder having mount means for mounting on a vehicle hood location in front of the windshield of the vehicle; and

a deflector pivotally mounted on said holder, to pivot between an up position wherein said holder lies above the level of said hood location to deflect air away from the windshield and a down position below said up position;

said deflector comprising an elongated laterally-extending member of constant cross-section with opposite ends, said member including a sheet having a rear edge portion forming the walls of most of a substantially cylindrical hole, a middle portion forming the walls of most of a substantially cylindrical hole on the lower face of the sheet, and a forward edge portion which is bent to extend largely downwardly when the deflector is in its down position; and

said holder includes a pair of hold members located at either end of said deflector member and pivotally connected to said deflector member, at least a first of said hold members having a longitudinally-extending guide slot with a rearward end wall; and including

a Z-rod having a middle portion extending between said first hold member and said deflector member, having a first end portion slideably received in the guide slot of said first hold member, and having a second end portion pivotally received in said hole of said middle deflector member portion; and

a pair of pins each having one end extending into said hole of said deflector rear edge portion and another end mounted on a different one of said hold members.

4,040,657

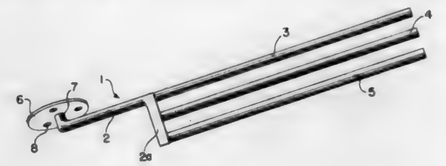
VARIABLE-DENSITY VEHICLE GLARE SHIELD

Joyce P. Penzes, Rte. 116, Purdys, N.Y. 10578

Filed June 24, 1976, Ser. No. 699,317

Int. Cl.² B60J *3/00*

U.S. Cl. 296—97 R **8 Claims**



1. A variable-density vehicle glare shield, comprising

at least two elongated transparent anti-glare shield elements each having a first and a substantially parallel second longitudinally extending edge portion, said elements each being of a different color and one of said elements having intermediate said edge portions a width which is greater than the width of the other element intermediate said edge portions thereof; and

means connected to one of said edge portions of each element for mounting said elements adjacent an upper edge of a vehicle windshield for movement severally as well as jointly to and from a position in which a user may look through said elements so as to be shielded against glare, said mounting means mounting said elements so that when the same are jointly moved to said position the others of said edge portions are in registry with one another.

4,040,658

FOLDING PICNIC TABLE

George Mayol, 512 State St., Mahomet, Ill. 61853

Filed Aug. 19, 1975, Ser. No. 605,906

Int. Cl.² A47C *3/14*

U.S. Cl. 297—159 **1 Claim**

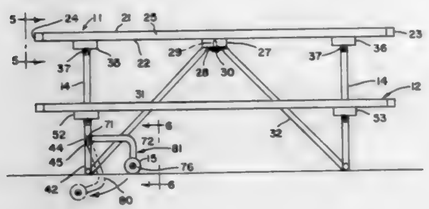
1. A folding pinic table comprising, in combination:

a flat table top, a pair of elongated flat bench-type seats, a pair of side frame members, means pivotably mounting the side frame members to the table top, and means for selectively rolling and stabilizing the table, where the table top is of a flat rectangular configuration having a flat top surface, a flat bottom surface, opposed and edges, and

opposed side edges, and wherein each of the bench seats are identical in configuration and include a flat top surface, a flat bottom surface, opposed flat end edges, and opposed flat side edges: and

each of said side frame members being generally of an inverted T-shaped configuration having their base portion pivotably affixed to the bottom surface of the table top end having their arm portions extending outwardly therefrom to engage the ground surface, and further characterized by a series of vertical members projecting upwardly from the arm portions and adapted to supportingly receive the bench seats thereon with the picnic table in the open position, said vertical members being further characterized by holes therein extending parallel to said arm portions, the holes in adjacent vertical members being aligned in pairs, and wherein further the means pivotably affixing each of said side frame members to said table top being comprised of a pair of mounting blocks each affixed to the bottom surface of said table top and extending transversly thereacross adjacent opposite end edges thereof, and a pivot pin hingedly connecting the base portin of said side frame member to the surface of said block; and

a pair of strut members each having one end affixed to the



arm portion of one of said side frame members and extending upwardly and outwardly therefrom, a mounting block affixed centrally of the bottom surface of the table top and having a threaded bore opening therefrom, and a bolt adapted to engage the free ends of each of the struts and be threadably received in the threaded opening of said mounting block to removably secure the struts thereto; and

said means for selectively rolling and stabilizing the table including a pair of wheels, a pair of L-shaped supporting arms, each wheel having an L-shaped supporting arm associated therewith with the wheel being rotatively mounted to one end thereof, the end of each said L-shaped supporting arm opposite said wheel mounted thereon having a hole extending therethrough parallel to the axis of said wheel and being aligned with a pair of said holes in adjacent vertical members of said side frame members, and pin means removably positioned in said aligned holes of adjacent vertical members and in the hole in each said L-shaped supporting arm to adapt said L-shaped supporting arms for rotatable movement about said pin means and allow said wheels to be selectively positioned between an inoperative storage position and an operative position wherein said table is adapted to be rolled on said wheels.

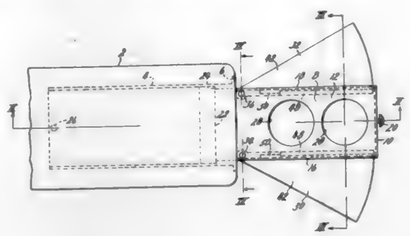
4,040,659

FOOD TRAY FOR AUTOMOBILES

Addie M. Arnold, Box 2603, Kansas City, Mo. 64142

Filed June 1, 1976, Ser. No. 691,233
Int. Cl.² A47C *7/62*
U.S. Cl. 297—194 **3 Claims**

1. A food tray for automobiles comprising:
   a. a hollow, elongated tubular arm,
   b. mounting means operable to support said arm for longitudinal sliding movement horizontally in the arm rest of an automobile, whereby said arm may be extended forwardly from the forward end of said arm rest, and
   c. a pair of tray leaves normally enclosed in said hollow arm, said leaves being substantially horizontal, each having a transverse width substantially equal to the transverse width of said arm, and being disposed in over-and-under



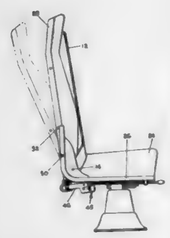
relation when enclosed in said arm, each of said tray leaves being pivotally mounted within said hollow arm on a vertical axis, whereby to be laterally extensible from said arm in a horizontal direction.

4,040,660

ADJUSTABLE BACK SEAT WITH REDUCED MOMENT ARM

Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.

Continuation-in-part of Ser. No. 602,882, Aug. 7, 1975, abandoned. This application Sept. 14, 1976, Ser. No. 723,202
Int. Cl.² A62B *35/00*
U.S. Cl. 297—389 **23 Claims**



1. A vehicle seat having a movable back and a seat frame, said seat back being pivotally mounted about a pivot point comprising:
   means for reducing the moment arm of a force applied to the seat back at an application point so the moment arm is less than the distance from the pivot point to the application point thereby decreasing the torque applied to the seat back, said means for reducing the moment arm comprising:
   a back support stop means extending from one of said seat back or seat frame and spaced from the pivot point, said stop means being positioned to engage the other of said seat back or seat frame at a restraining point when the back is not in a backwardly pivoted position.

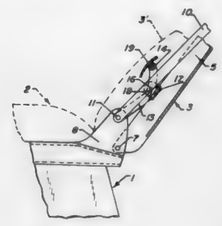
4,040,661

VEHICLE SEAT WITH HEADREST MOVEMENT RESPONSIVE TO SEAT BACK TILTING

Gerard T. Hogan, Southington, and Kirby B. Weik, Litchfield, both of Conn., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 520,311, Nov. 4, 1974, Pat. No. 3,929,374. This application Dec. 19, 1975, Ser. No. 642,520
Int. Cl.² A47C *3/00*
U.S. Cl. 297—284 **3 Claims**

1. In a vehicle passenger seat having a seat section, seat support framing and a reclining seat back, the improved construction to provide a movable headrest section, which comprises in combination,
   a. an elongated tilting seat back section having a hinged connection at its lower end to a fixed location on non-moving seat support framing,
   b. a relatively short tilting headrest section having a hinged connection from its lower portion to the rearward part of the upper end portion of said seat back section and forming an extended portion for the latter,
   c. a fixed length, linking member connecting to a fixed position, non-translating, lower pivot means on the non-moving seat support framing at a position spaced upwardly from said hinged connection for said back section, and said linking member extending upwardly to an upper pivot means on said headrest section which is spaced from and positioned forward of the hinged connection between the upper part of said seat back section and said headrest section,
   d. said linking member positioned to be generally parallel to the tilting seat back section, such that as the latter is tilted from a generally upright position to a recline position there is a resulting translation of the top end portion of the



seat back section relative to said upper pivot point means between said linking member and said headrest section and a resulting forward tilting of the latter section with respect to the back section, and
   e. a transverse lumbar support bar extending across the lower portion of said tilting seat back section in the zone of the lumbar region of a seat occupant, said support bar having fixedly connected arm members which extend downwardly to pivotally connect with the seat support framing to thereby provide for an arcuate movement of the lumbar support bar about the connection points to the framing, longitudinal slot means being provided in the midportions of each of the arm members from the lumbar support bar, and fixed pin means from each side portion of said seat back section being provided to extend through the respective slot means for said arm members whereby the tilting movement of the seat back section provides a relative movement between the seat back framing and said arm members from the fixed pin means in said slot means and there is a resulting translation of the connecting lumbar support bar to move with respect to the framing for the seat back section.

4,040,662

INTEGRAL SEATING UNIT

John A. Speidel, 7955 Upper River Road, Maineville, Ohio 45039

Filed Apr. 30, 1973, Ser. No. 355,656
The portion of the term of this patent subsequent to July 17, 1990, has been disclaimed.
Int. Cl.² A47C *5/12*
U.S. Cl. 297—445 **6 Claims**

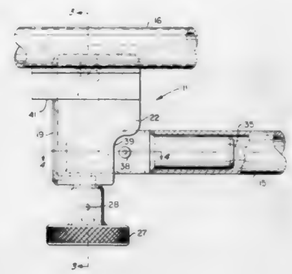
1. A seating unit integrally formed from a single sheet of material comprising,
   a. a seat section and support section joined by connecting sections,
   b. the entire support seat and connecting sections being developable to a unitary flat pattern,
   c. said support, seat, and connecting sections being ruled surfaces in which rule lines thereof meet upon the contour of the unit, the images of said rule lines when projected on the pattern meeting on the pattern,
   d. rule lines of the contours and the images thereof when projected on the pattern meeting at other than a straight line extending from edge to edge of the contour and pattern, respectively, and
   e. the seating unit thus formed being self-sustaining and load-carrying.

4,040,663

SEAT BACK TILT CONTROL UNIT

Fredrich M. Christensen, 10256 Prairie Road, Omaha, Nebr. 68134

Filed Nov. 16, 1976, Ser. No. 742,254
Int. Cl.² A47C *1/024*
U.S. Cl. 297—361 **6 Claims**



1. A self-contained unit for adjusting the tilt of a chair back relative to the chair seat, the unit comprising
   a. a housing having top and bottom walls, a pair of upright side walls and a front end wall, and being open at the rear end;
   b. bracket means on the outside of one side wall and adapted to be connected to a chair seat;
   c. a vertical shaft supported for rotation and held captive against axial movement by the top and bottom walls, the shaft having a threaded central section within the housing and a plain end section which extends to the exterior of the housing through the bottom wall;
   d. an actuating knob fixed to the plain shaft section outside the housing;
   e. a pivot member threaded onto the central shaft section and being free to move vertically within the housing as the shaft is turned; and
   f. an adjusting member having a portion outside the housing adapted to be connected to a tilting chair back and being joined to the pivot member by a pivotal connection located adjacent the rear end of the housing,
   g. the pivotal connection between the pivot and adjusting members including a pivot pin which is normal to the axis of the shaft, is pressed into one of those members and has a close sliding fit in a slot formed in the other of said members.

4,040,664

HARNESS ANCHORING FOR CHILD SAFETY SEAT

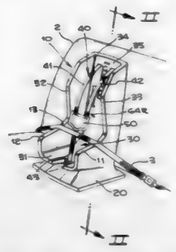
Akira Tanaka, Northridge, and Charles J. Ulrich, Montecito, both of Calif., assignors to American Safety Equipment Corporation, Encino, Calif.

Continuation of Ser. No. 608,657, Aug. 28, 1975. This application Nov. 9, 1976, Ser. No. 740,208
Int. Cl.² A62B *35/00*
U.S. Cl. 297—389 **10 Claims**

1. In a child safety seat having front and rear sides and a

harness for maintaining a child against the front side, the improvement comprising the provision of:

slot means for passage of part of said harness from the front side to the rear side of the seat; and anchoring means



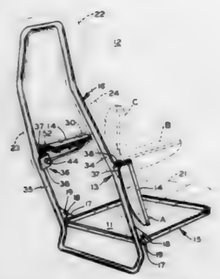
secured only to said seat on its rear side for providing a plurality of selectable independent anchoring locations on the seat for anchoring said part of the harness at selected vertical independent anchoring locations on the rear side of the seat.

4,040,665

ARM REST ASSEMBLY FOR SEATING STRUCTURES

Earl C. Wallace, and Richard A. Bell, both of Andrews, Ind., assignors to General Engineering & Mfg. Corporation, Andrews, Ind.

Filed Mar. 12, 1976, Ser. No. 666,181
Int. Cl.[2] A47C *7/54*
U.S. Cl. 297—417 **5 Claims**



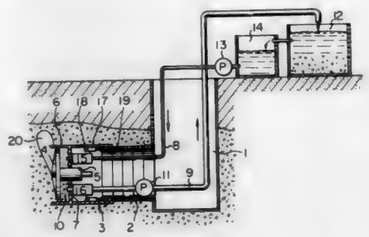
1. An arm rest assembly for a seating structure having a seat and a back secured to said seat comprising a rigid, elongate arm rest element having an arm supporting surface and adapted to be supported on said back to extend said arm supporting surface generally normal to said back; a first pivotal element mounted on said arm rest element; a second pivotal element mounted on said back and adapted to cooperate with said first pivotal element in establishing an arc of motion of said arm rest element in planes generally normal to the general plane of said back and extending between a first position in which said arm supporting surface is generally parallel to said seat back and intermediate said second pivotal element and said seat and a second position in which said arm supporting surface subtends an acute angle with said back; detenting means on said first and second pivotal elements cooperating to latch said arm rest element against pivotal motion at a third position in the arc of its motion intermediate said first and second positions; said first and second pivotal elements being a cylinder and a journal for said cylinder; said detent means including a first abutment mounted on said cylinder and an abutment on said journal and selectively engageable with said first abutment; and biasing means tending to displace said cylinder and said journal relatively axially to engage said first and second abutments; wherein said cyclinder is hollow and said journal includes a cup adapted to receive the end of said cylinder, wherein said abutment on said cylinder is a bar extending diametrically across a section of said cylinder, and wherein said biasing means is a coiled compression spring fitted within said cylinder with adjacent turns thereof gripping said bar and with an end thereof extending beyond said cylinder for compressive engagement with the interior of said cup.

4,040,666

APPARATUS AND METHOD OF SHIELD EXCAVATION

Yoshiaki Uchida, Ichikawa, and Kazuhiko Ishiwata, Tokyo, both of Japan, assignors to Tekken Kensetu Co. Ltd., Tokyo, Japan

Filed May 17, 1976, Ser. No. 687,200
Claims priority, application Japan, Oct. 13, 1975, 50-122534
Int. Cl.[2] E21D *9/04, 9/12*
U.S. Cl. 299—1 **6 Claims**



1. An apparatus for detecting at an early stage any fluctuation in solid body amount passing through a fluid path comprising in combination,

a feeding system and discharging system forming said fluid path,

a means for adding solid bodies to said fluid path at a position between respective said feeding and discharging system, said solid body adding means being movable and including means for detecting movements of the solid body adding means,

a first measuring means for measuring flowing amount of a fluid passing through said feeding system at a position in close proximity to said solid body adding means,

a second measuring means for measuring flowing amount of a fluid containing said solid bodies added and passing through said discharging system at position in close proximity to the solid body adding means,

a means for detecting an amount of said solid bodies added by the adding means, said detecting means being connected with said first and second flow measuring means for comparing measured values of respective flowing amounts of both of said systems, and

a means for determining any difference between detected values of both detecting means so as to make the added solid body amount substantially constant by adjusting the movement of the solid body adding means in response to output value of said determining means.

4,040,667

APPARATUS FOR RECOVERING PARTICULATE MATERIAL FROM THE SEA BOTTOM

Hans Tax, Munich, and Herbert Kurz, Putzbrunn, both of Germany, assignors to Hans Tax, Munich, Germany

Filed Aug. 13, 1975, Ser. No. 604,151
Claims priority, application Germany, Aug. 16, 1974, 2439485
Int. Cl.[2] E02F *5/00, 9/06*
U.S. Cl. 299—8 **17 Claims**

1. Apparatus for recovering manganese nodules from the bottom of the sea comprising:

a. a transfer station;

b. suspending means for suspending said station from a surface ship at a fixed depth;

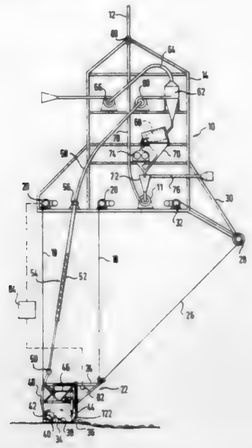
c. a winch on said station;

d. a flexible tension member depending from said winch;

e. a dredging tool assembly suspended by said tension member from said station;

f. sensing means on said assembly for sensing the spacing of said assembly from said bottom of the sea;

g. control means operatively connected to said sensing means and to said winch and responsive to the sensed spacing for operating said winch and for thereby varying the effective length of said tension member between said winch and said assembly;



h. first conveying means for conveying dredged material from said assembly to said station; and

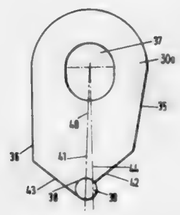
i. second conveying means for conveying said material from said station to said surface ship.

4,040,668

GROOVE CUTTING APPARATUS

Ernest Sidney Fairweather, London, and Philip Jackson, Barlborough, near Chesterfield, both of England, assignors to Errut Products Limited, London, England

Filed Dec. 23, 1975, Ser. No. 643,937
Claims priority, application United Kingdom, June 30, 1975, 27523/75
Int. Cl.[2] E01C *23/09*
U.S. Cl. 299—39 **8 Claims**



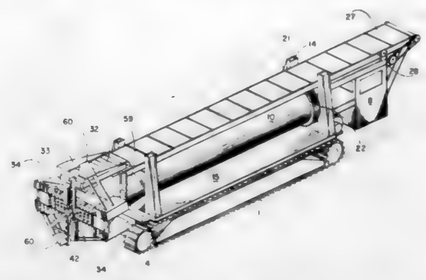
1. Groove-cutting apparatus comprising a carriage carrying a rotatable cutting drum, and drive means for rotating the cutting drum, the cutting drum comprising a central shaft, a plurality of spaced drum segments coaxially mounted on the central shaft, a plurality of second shafts spaced circumferentially around the central shaft and supported by the drum segments, and apertured cutting members mounted on the secondary shafts and spaced by the drum segments, each of the cutting members including an elongated plate, and a cutting tip insert mounted in a recess at one end of the plate, each of the plates having an elongated aperture axially aligned with the respective cutting tip and arranged so that the center of gravity of the cutting member is between the respective aperture and cutting tip, and each of the plates having a leading edge and a trailing edge which tapers towards the respective cutting tip, the taper of the leading edge being steeper than the taper of the respective trailing edge.

4,040,669

SELF PROPELLED EXCAVATING VEHICLE

Wesley D. Franklin, 1005 D. Pleasant Oaks Road, Baltimore, Md. 21234

Filed Dec. 11, 1975, Ser. No. 639,737
Int. Cl.[2] E21D *9/10*
U.S. Cl. 299—56 **9 Claims**



1. A self propelled excavating vehicle comprising:

a. a base frame having a tractive means, the lower portion of said tractive means connected to said base frame by a hinge means;

b. extension means fixedly secured to said base frame and hingedly affixed to the upper portion of the tractive means, said extension means, when activated, causing rotation of said tractive means about said hinge means;

c. a movable platform pivotally supported by said base frame;

d. means for pivotally rotating said base frame with respect to said movable platform;

e. bearing assembly means fixedly mounted on said movable platform;

f. a rotatable shaft carried by said bearing assembly means and supporting a drill head assembly at one end thereof;

g. first conveyor belt means supported by said drill head assembly;

h. second conveyor belt means secured to said bearing assembly means for cooperating action with said first conveyor means; and

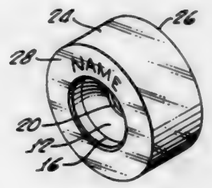
i. an operator's cab and operating control means attached to the most rearward of said bearing assembly means whereby said cab maintains the same vertical attitude as said most rearward bearing assembly means while operating said vehicle.

4,040,670

METHOD OF MOLDING A SKATE WHEEL HAVING A POLYESTER CORE AND A POLYURETHANE CASE AND THE PRODUCT THEREOF

Maurice Charles Williams, Anaheim, Calif., assignor to Perma Rain Irrigation, Inc., Lindsay, Calif.

Continuation-in-part of Ser. No. 566,792, April 10, 1975, abandoned. This application Jan. 21, 1976, Ser. No. 651,186
Int. Cl.[2] B29C *6/00, 27/00;* B29D *9/00*
U.S. Cl. 301—5.3 **9 Claims**



1. The method of molding a precision low cost wheel comprising the steps of

molding a wheel core of butyrate polymer about wheel

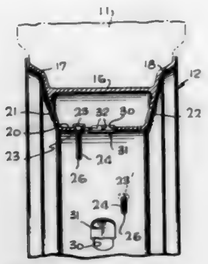
bearing parts to thereby position and lock said bearing parts within said wheel core, and molding a wheel casing of polyester polyurethane to substantially completely encase said core in close and intimate contact therewith and fusion bonding said core and casing together around the circumference of the core and inwardly along both sides of said core from the outermost circumference of said wheel toward the axis of said wheel, thereby to firmly and securely lock said casing to said core.

4,040,671

SPOKED WHEEL

Lawrence K. Hersh, 6306 Whitsett Ave., North Hollywood, Calif. 91606

Filed June 23, 1975, Ser. No. 589,202
Int. Cl.[2] B60B *1/02*
U.S. Cl. 301—58 **7 Claims**



1. A spoked wheel rim for mounting a plurality of spoke anchoring pins comprising the combination of:

a circular main rim having a pair of outwardly projecting circular flanges adapted to sealingly engage with the beads of a tubeless pneumatic tire;

a circular second rim arranged in fixed spaced apart relationship to said main rim so as to be coaxial therewith;

a plurality of holes provided in said second rim for receiving and mounting one of said spoke anchoring pins therein;

each of said plurality of holes having a diameter sufficient to receive the shank of one of said spoke anchoring pins;

an access aperture provided in said second rim between adjacent pairs of said anchoring pins whereby access is gained to the radially outer end of a pair of said spoke anchoring pins via a single one of said access apertures; and

said access aperture having a diameter substantially greater than said diameter of each of said holes so as to accept passage therethrough of the spoke anchoring pin;

closure means removably covering each of said access apertures when not in use;

said circular second rim has a center plane and said access apertures lie on said center plane in fixed spaced apart relationships; and wherein

said plurality of holes are disposed on opposite sides of said center plane.

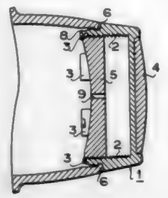
4,040,672

CENTER CAP FOR A WHEEL

Shigeyuki Imahashi, No. 27-47 Takanawa-1 Chome, Minato, Tokyo, Japan (108)

Filed Aug. 22, 1975, Ser. No. 606,948
Int. Cl.[2] B60B *7/06*
U.S. Cl. 301—108 A **3 Claims**

1. A center cap for a wheel hub having an open end and an inwardly directed annular protruding part on the edge of the hub open end comprising, in combination, a cylindrical cap body having an open end, a plurality of circumferentially spaced, elastically deformable joint ratchets on the open end edge of said body, the outer periphery of said body having an annular groove adjacent the inner end of said joint ratchets for receiving said protruding part in the assembled position of said cap on said wheel hub and the outer periphery of said joint ratchets having a beveled surface extending inwardly from said groove to the free end of said ratchets for sliding engagement with said protruding part and an axially movable restrict member means within said cap body for moving between an inoperative position remote from said joint ratchets and an operative position in underlying concentric relationship with said joint ratchets for preventing elastic deformation of said joint ratchets in an inwardly radial direction, said restrict member means comprising a circular member wherein the outer periphery of said circular member is provided with threads for engagement with a spiral guide groove formed in the inner surface of said cap body to permit said axial movement of said circular member and including a slit disposed centrally in said circular member accessible to a driving device from the inside of said wheel hub for moving said circular member axially between its operative and inoperative positions.

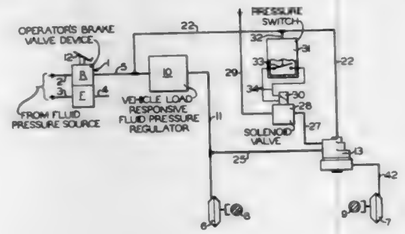


4,040,673

FLUID PRESSURE OPERABLE BRAKE APPARATUS WITH LOAD-COMPENSATING MEANS FOR VEHICLES WITH TANDEM REAR AXLES

Gerhard Ahaus, Fellbach; Siegfried Netzer, Waiblingen, and Hans-Peter Liebig, Esslingen, all of Germany, assignors to WABCO Westinghouse GmbH, Hannover, Germany

Filed Oct. 21, 1976, Ser. No. 734,391
Claims priority, application Germany, Nov. 3, 1975, 2548975
Int. Cl.[2] B60T *8/22*
U.S. Cl. 303—6 C **9 Claims**



1. Fluid pressure operable brake apparatus for vehicles having tandem rear axles including a driving axle and a trailing axle and respective brake cylinders therefor, said brake apparatus comprising:

a. a first source of fluid under pressure;

b. first means for effecting supply of a first braking pressure from said first source to the driving axle brake cylinders at a selected degree;

c. second means interposed between said first means and said driving axle brake cylinders for modifying said first braking pressure supplied to said driving axle brake cylinders according to vehicle load;

d. a relay valve means being formed therein with a first pressure area, a second pressure area, and a third pressure area, each sealingly isolated form the others, said relay valve means connected in parallel relation to said first means and to said second means and actuable for effecting supply of a second braking pressure therefrom to the trailing axle brake cylinders at a degree of pressure determined by the combined effect of a first actuating pressure from said first means acting on said first pressure area and a second actuating pressure from said second means acting on said third pressure area;

e. a second source of fluid at a controlled pressure; and

f. third means connected in parallel relation to said first means, to said relay valve means, and to said second source, and including a valve device normally occupying a closed position in which communication between said second source and said relay valve means is cut off,

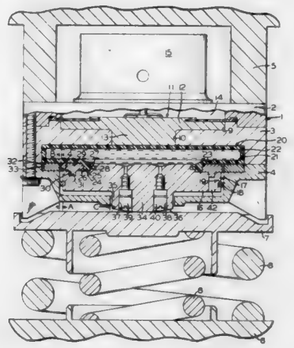
g. said third means being operable responsively to said first actuating pressure at a degree greater than a change-over pressure for effecting operation of said valve device to an open position in which fluid from said second source is communicated to said relay valve means for effecting supply of braking pressure to said trailing axle brake cylinders at a degree determfined by the combined effect of said first actuating pressure from said first means acting on said first pressure area, said second actuating pressure from said second means acting on said third pressure area, and said controlled pressure acting on said second pressure area.

4,040,674

VEHICLE LOAD FORCE PROPORTIONING DEVICE

Roger Marcillaud, Clichy sous Bois, France, assignor to WABCO Westinghouse, Freinville-Sevran, France

Filed June 7, 1976, Ser. No. 693,359
Int. Cl.[2] B60T *8/22*
U.S. Cl. 303—22 R **9 Claims**



1. A vehicle load force proportioning device for translating the load force into an operating force for a vehicle brake control device, said force proportioning device comprising:

a. a housing;

b. first piston means reciprocably operable in said housing with a first radial clearance therebetween and on which the vehicle load force is applied;

c. second piston means reciprocably operable in said housing in axial alignment with and having an effective pressure area of different dimension than said first piston means;

d. a resilient transfer member sandwiched between and having opposite sides thereof in abutting contact with respective adjacent pressure areas of said first and second piston means for transferring said vehicle load force from said first piston means to said second piston means and either reducing or amplifying said load force according to the relative dimensions of said pressure areas; and

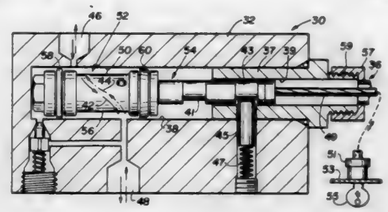
e. a securing ring concentrically and peripherally carried by said first piston means adjacent said transfer member, said securing ring being of such diametrical dimension as to form a second radial clearance adjacent the resilient transfer member smaller than said first radial clearance for inhibiting extrusion of the transfer member into said second radial clearance.

4,040,675

ANTI-THEFT VEHICLE BRAKE-SUPERVISING DEVICE

Raymond Richmond, 249-20 Thornhill Ave., Little Neck, N.Y. 11362; Edward Parmer, 118 N. Waldinger St., Valley Stream, N.Y. 11580, and Edward G. Parmer, Jr., 167 Caroline Ave., Garden City, N.Y. 11530

Filed July 26, 1976, Ser. No. 708,920
Int. Cl.[2] B60T *17/16*
U.S. Cl. 303—89 **4 Claims**



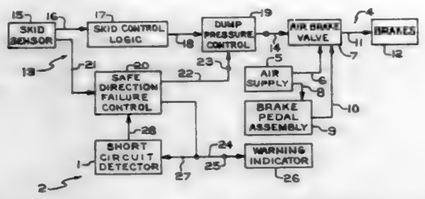
1. An anti-theft vehicle brake-supervising device of the type which selectively prevents reverse flow of a fluid from at least one vehicle wheel cylinder back to the vehicle master cylinder to thereby maintain the braking function of said fluid within said wheel cylinder, the improvement comprising wall means defining a cylindrical flow chamber of a prescribed diameter having opposite distal and proximal ends, a first fluid connection connected from said flow chamber distal end to said vehicle master cylinder, a second fluid connection connected from said flow chamber proximal end to said vehicle wheel cylinder, said first and second fluid connections cooperating to normally allow opposite direction fluid flow between said master cylinder and wheel cylinder through said flow chamber, a bypass passageway connected between said distal end of said flow chamber and said second fluid connection having a one-way valve operatively disposed therein effective to permit fluid flow only from said master cylinder into said wheel cylinder incident to utilizing said fluid to selectively immobilize said vehicle, and a cylindrically shaped flow control member having a medial portion of a prescribed smaller radius size than said cylindrical flow chamber and having enlarged diameter portions with sealing means thereon at opposite ends extending into sealing contact with said flow chamber wall to thereby define an external flow passage of a prescribed longitudinal length and in encircling relation about said cylindrical flow control member bounded at opposite ends by said sealing means, said cylindrical flow control member being operatively arranged to be manually urged through movement in said flow chamber between an operative position adjacent said proximal end thereof in which said external flow passage is in communication only with said wheel cylinder fluid connection and an operative position adjacent said flow chamber distal end in which the longitudinal length of said external flow passage extends also to said master cylinder fluid connection to thereby provide communication between said wheel cylinder and said master cylinder through said external flow passage incident to the release of said fluid immobilizing said vehicle, whereby the manual urging of said cylindrical flow control member from said proximal end to said distal end of said flow chamber to cause the release of said vehicle is aided by the pressure and flow direction of said fluid returning to said master cylinder.

4,040,676

ANTI-SKID BRAKE CONTROL SYSTEM WITH SHORT CIRCUIT PROTECTION

Yudh Vir Rajput, Dayton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed May 11, 1976, Ser. No. 685,267
Int. Cl.[2] B60T *8/00*
U.S. Cl. 303—92 **5 Claims**



1. In an anti-skid brake control system for normally overriding manual operation of the brakes of a vehicle upon sensing a skid condition, and wherein the anti-skid brake control system includes disabling means for disabling said system upon detecting a fault condition in the latter and means for indicating to the operator of the vehicle that such a disabling of said system has occurred and, therefore, that said system is disabled from overriding manual operation of the vehicle brakes, the improvement comprising:

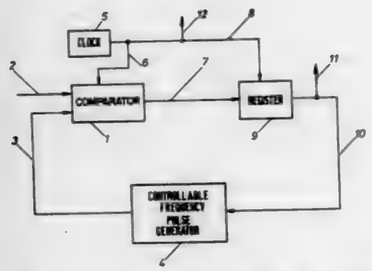
short circuit detector means for detecting a short circuit condition in said system at said means for indicating, said short circuit detector means being coupled in said system to effect disabling of said system from controlling the vehicle brakes upon detecting such a short circuit condition.

4,040,677

DEVICE FOR UTILIZATION IN ANTI-SKID CONTROL SYSTEMS

Hans-Wilhelm Bleckmann, Frankfurt am Main, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,926
Claims priority, application Germany, May 3, 1975, 2519866
Int. Cl.[2] B60T *8/02*
U.S. Cl. 303—95 **10 Claims**



1. A device for converting the rate of a pulse train which is proportional to the rotational velocity of a vehicle wheel into a binary number for use in a digital computer for anti-skid control systems including:

a comparator;

means for supplying said pulse train to said comparator;

means coupling the output of said comparator to the input of a storage register which cumulatively adds said pulse train to the contents of said storage register, taking into account the sign of the output signal of said comparator;

a controllable frequency pulse generator coupled to said storage register to be controlled by the contents of said storage register for producing a comparison pulse train;

means coupling said frequency generator to an input of said comparator whereby said comparator is adapted to provide the difference between the frequency of said two pulse trains in the form of a binary number, said binary number being supplied to said storage register whereby the contents of said storage register represent the binary number corresponding to said frequency; and

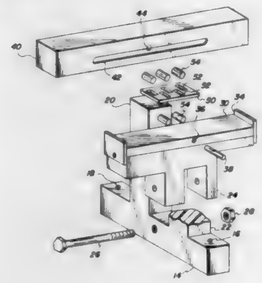
a clock pulse generator for controlling said comparator and said storage register.

4,040,678

BEARING ASSEMBLY

Everett A. Rote, Corona, and Edward G. Smith, Riverside, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,338
Int. Cl.[2] F16C *29/04*
U.S. Cl. 308—6 R **1 Claim**



1. For use in an electroplating bath environment, a bearing assembly including:

an electrically insulating mounting assembly on a fixed electroplating bath,

an upper stainless steel surface on said mounting assembly,

a reciprocal member movably mounted above the upper stainless steel surface and having a stainless steel lower surface,

a retainer member movably mounted on said upper surface with a plurality of apertures therein,

a plurality of stainless steel bearing cylinders movably mounted within the apertures of said retainer member to contact said upper and lower surfaces and constitute a roller bearing assembly,

means to impart reciprocation to said upper and lower surfaces whereby a bearing action is imparted to the moving elements by the rolling action of the cylinders,

said reciprocal member having downwardly extending flanges with a longitudinal slot formed in one of said flanges,

an aperture in said mounting assembly transverse to the direction of motion of said reciprocal member and

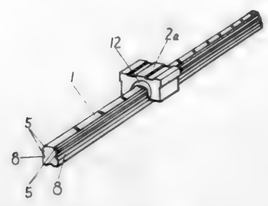
a pin slidably mounted in the aperture of said mounting assembly, said pin being movable in said aperture from a first position wherein it rides in the longitudinal slot of said reciprocal member for guiding the motion between said reciprocal member and said mounting assembly, said pin being movable in said aperture to a second position wherein it is within said aperture but not in the longitudinal slot to permit the removal of said reciprocal member from said mounting assembly.

4,040,679

SLIDE WAY BEARING

Hiroshi Teramachi, 2-34-8, Higashi-tamagawa, Setagaya, Tokyo, Japan

Filed Feb. 25, 1976, Ser. No. 661,329
Claims priority, application Japan, Feb. 28, 1975, 50-27675[U]; Feb. 28, 1975, 50-27676[U]
Int. Cl.[2] F16C *29/04*
U.S. Cl. 308—6 C **9 Claims**



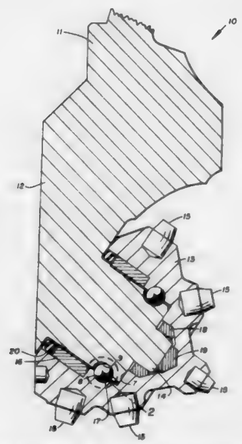
1. A slideway bearing comprising in combination an elongated bar having a track shaft part and a bed part, a slide saddle member being formed by integrating an outer sleeve part of a ball bearing assembly with a saddle part, said sleeve part and track shaft part having complementary grooves formed therein to define a bearing raceway, ball bearings disposed in said raceway and a ball retainer for maintaining said ball bearings in said raceway.

4,040,680

ROCK BIT HAVING A BALL BEARING RACEWAY WITH ANTI-GALLING MATERIAL

Wilbur S. Keller, Arlington, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 7, 1976, Ser. No. 720,716
Int. Cl.[2] F16C *19/00*
U.S. Cl. 308—8.2 **10 Claims**



1. An earth boring bit that encounters an out thrust load, comprising:

a bit body;

a bearing pin extending from said bit body;

a roller cutter rotatably mounted on said bearing pin;

bearing means between said cutter and said bearing pin, said bearing means including a multiplicity of ball bearings;

a cooperating pair of ball bearing raceways, one raceway in said bearing pin and the other raceway in said cutter;

at least one of said ball bearing raceways having a relieved portion with the relieved portion being positioned so that said out thrust load tends to force said ball bearings toward said relieved portion; and

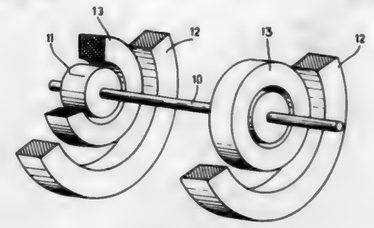
an anti-galling material filling said relieved portion so that said out thrust load tends to force said series of bearings toward said anti-galling material.

4,040,681

MAGNETICALLY LEVITATED OBJECT

Hendrik van der Heide, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 6, 1974, Ser. No. 467,384
Claims priority, application Netherlands, May 21, 1973, 7307042
Int. Cl.[2] F16C *39/00*
U.S. Cl. 308—10 **11 Claims**



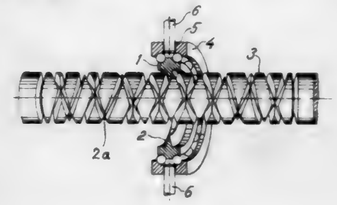
1. A magnetically levitated object comprising a first permanent support magnet, permanent magnet support means secured to the object and which via an air gap cooperates magnetically with the first permanent support magnet to levitate the object, and a stabilizing device for holding the levitated object in a stable condition and which includes means for generating a magnetic alternating field of constant amplitude in which the permanent magnet support means is disposed, the first permanent support magnet, the permanent magnet support means and the magnetic field generating means being related so that the dynamic stiffness due to the stabilizing device is greater than the static stiffness due to the first permanent support magnet and the permanent magnet support means.

4,040,682

MECHANISM FOR TRANSFORMATION OF A ROTARY MOTION INTO A TRANSLATORY MOTION OR VICE VERSA

Peder Ulrik Poulsen, Lonholt Ladegaard, DK-3480 Fredensborg, Denmark

Filed June 23, 1976, Ser. No. 698,865
Claims priority, application Denmark, July 8, 1975, 3075/75
Int. Cl.[2] F16C *19/04*
U.S. Cl. 308—176 **2 Claims**



1. Mechanism for transformation of a rotary motion into a translatory motion or vice versa, comprising a curve follower and a rotary cylindrical curve body, said curve body being provided with a curved guide in the shape of a track in the body, the curve follower comprising a ring with a larger diameter than that of the curved body, and located eccentrically on the body in such a manner that the inner edge of the ring

meshes with the track, the ring being the inner ring of a roller or ball bearing, characterized in that the outer ring of the bearing is pivotally mounted about an axis situated in the plane of the bearing in such a manner that this axis mainly goes through the point of engagement and preferably is at right angles to the axis of the curve body.

4,040,683

HUB BEARING UNIT

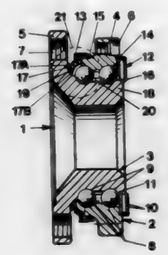
Abraham Korenhof, Driebergen, Netherlands, assignor to SKF Industrial Trading and Development Company B.V., Nieuwegein, Netherlands

Filed Sept. 22, 1975, Ser. No. 615,511

Claims priority, application Netherlands, Sept. 24, 1974, 7412565

Int. Cl.² F16C *1/24*

U.S. Cl. 308—187.1 **11 Claims**



1. A rolling bearing comprising an integrally assembled fastening flange and inner and outer races, a plurality of rolling elements between said inner and outer races, said rolling elements separated from one another by a bearing cage, and flexible material seals for sealing the area of said rolling elements and their contact surfaces for inhibiting penetration by foreign matter or loss of lubricant, at least one of said seals being fastened on one side of said rolling elements between said inner and outer races against respective first and second walls, each respective end of said seal contacting said first and second walls respectively, and means for holding said seal ends against said first and second walls, said means for holding comprising a relatively inflexible material element applied onto an exterior side of said seal out of contact with said walls and surrounding said exterior side of said seal for maintaining said seal ends in position.

4,040,684

ROLLING BEARING

Hendrikus Jan Kapaan, Ijsselstein, Netherlands, assignor to SKF Industries, Inc., King of Prussia, Pa.

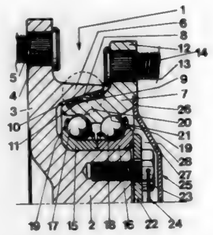
Filed Mar. 16, 1976, Ser. No. 667,517

Claims priority, application Netherlands, Mar. 18, 1975, 7503173

Int. Cl.² F16C *33/78*

U.S. Cl. 308—187.1 **23 Claims**

1. A rolling bearing comprising two rotating parts formed by an inner and outer race fitted with mounting flanges, a plurality of rows of rolling elements, separated by cages, positioned between said races, and plane sealing means for sealing said races to prevent the ingress of foreign substances while retaining any lubricant that is present in the space between said races and the seal, said plane sealing means including a space formed in a substantially axial direction by opposing surfaces of said



two rotating parts and having said seal placed therein in contact with said opposing surfaces and across said space.

4,040,685

MEASURING APPARATUS

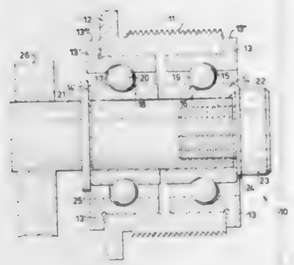
Sture Berglund, Tyreso, Sweden, assignor to Alfredeen Production AB, Bandhagen, Sweden

Filed Mar. 30, 1976, Ser. No. 672,008

Claims priority, application Sweden, Apr. 3, 1975, 7503837

Int. Cl.² F16C *19/14*

U.S. Cl. 308—189 R **6 Claims**



1. A bearing assembly which is effective to transmit small movements from a measured object to a measuring device, said assembly comprising a rotatable shaft, and at least two bearing means arranged on said shaft, each bearing means comprising an outer ring and an inner ring and pressure-distributing means arranged between the rings and permitting relative movement thereof, the bearing means being arranged within a sleeve having an external screw thread, and limiting abutment surfaces for fixing the axial position of the bearing means in the sleeve arranged between the sleeve and the outer ring of each bearing means, and wherein said bearing means have means for providing a variable tension effect between the respective inner rings of the bearing devices, one end of the shaft being provided with an axial bore having an internal screw thread which is intended to accommodate a screw which can be actuated from outside and which engages only the inner ring of one bearing means, the inner ring of the other bearing means being arranged to co-act with an abutment surface in a manner such that actuation of the screw causes respective inner rings of the bearing means to be moved axially relative to the two outer rings of the bearing devices, and such as to provide a tensioning effect between the screw and the abutment surfaces.

4,040,686

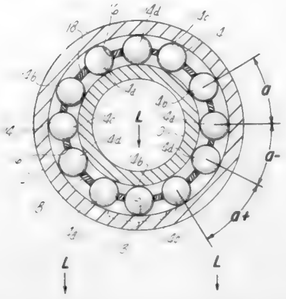
ANTI-FRICTION BEARING

Erwin F'Geppert, Novi, Mich., assignor to The U.S. Government as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 23, 1975, Ser. No. 625,334

Int. Cl.² F16C *19/20*

U.S. Cl. 308—201 **1 Claim**



1. An anti-friction bearing comprising a load-applying annular race; a load-absorption annular race; a series of substantially identical anti-friction elements rollably engaging both races in orbiting fashion; and a separator concentric with the races, said separator engaging the anti-friction elements to maintain three different predetermined spacings therebetween; the total anti-friction element complement being an even multiple of the different element spacings, and each element spacing being repeated at regularly spaced intervals along the separator, whereby a given element spacing is in every case different than the preceding element spacing; a first one of the element spacings (a) being an even fraction of the total element spacing, a second one of the element spacings (a−) being slightly less than an even fraction of the total element spacing, and the third one of the element spacings (a+) being slightly greater than an even fraction of the total element spacing; the element spacing order being the same for each spacing group.

4,040,687

BALL RETAINER FOR BALL BEARINGS

Wilford P. Rogers, Bristol, Conn., assignor to TRW Inc., Cleveland, Ohio

Filed May 22, 1975, Ser. No. 580,059

Int. Cl.² F16C *19/20*

U.S. Cl. 308—201 **4 Claims**



1. Apparatus comprising a generally cylindrical ball bearing retainer member having a longitudinal axis, a plurality of ball receiving pockets circumferentially-spaced substantially equidistantly around one axial side of said cylindrical member and having pocket entrance openings which open axially outwardly generally parallel to said axis, said pockets including a plurality of first pockets having first entrance openings defined between opposite outwardly yieldable fingers having finger tips spaced apart a distance less than the maximum width of each said first pocket, a plurality of second pockets having second entrance openings, said second entrance openings being defined by portions of said cylindrical member other than yieldable fingers and being of greater width than said first entrance openings, said first pockets being separated from one another by at least one of said second pockets, said pockets having centers and said first entrance openings being spaced outwardly from said centers of said first pockets a substantially greater distance than the spacing of said second entrance openings from said centers of said second pockets, adjacent pockets having common walls, and said yieldable fingers each having a thickness over a major portion of their length which is greater than one-half the thickness of each said common wall measured on a line extending between the centers of adjacent pockets.

4,040,688

NOVEL CYLINDRICAL ROLLERS

Karl-Ludwig Grell, Aurachtal, Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Germany

Filed Nov. 4, 1974, Ser. No. 520,621

Claims priority, application Germany, Dec. 8, 1973, 2361330

Int. Cl.² C21D *9/64*; F16C *33/26*

U.S. Cl. 308—202 **3 Claims**

1. A process for the preparation of rollers comprising hot rolling steel wire with a carbon content of 0.7 to 1.2% by weight, cooling the wire during or after coiling of the wire, reducing the wire by cold reduction without intermediate annealing whereby the wire hardness is increased to at least 50 HRC and then forming the rollers with a carbon content of 0.7 to 1.2% by weight, a sorbitic structure and a hardness of at least 50 HRC.

4,040,689

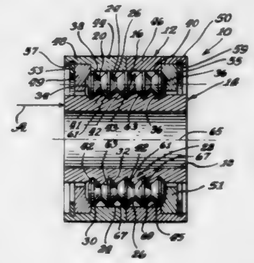
ANTIFRICTION ROLLER BEARING

Richard B. Stanley, 17763 G Drive North, Marshall, Mich. 49068

Continuation-in-part of Ser. No. 449,699, March 11, 1974, Pat. No. 3,963,286. This application Jan. 16, 1976, Ser. No. 649,694

Int. Cl.² F16C *13/00*

U.S. Cl. 308—205 **12 Claims**



1. In a rolling bearing assembly defining a bearing axis and including an inner race, an outer race disposed about the inner race and concentric with the bearing axis, and a plurality of rolling bearing interposed between the inner and outer races, with the rolling bearings each comprising an elongate roller defining a shank intermediate the ends thereof, the improvement wherein:

the inner race is formed to define an inner raceway thereabout,

said inner raceway and said shanks of said rollers being formed to define right flanges and right grooves in substantially complementing interfitting relation forming the areas of rolling engagement of the rollers with the inner race raceway,

said rollers each defining a thrust bearing surface at either end of same that is angled relative to the longitudinal axis of the respective rollers, and

radial load transmitting surfacing in circumambient relation about the respective rollers,

said areas of flanges and grooves of said roller shanks form-

ing a plurality of thrust transmitting faces that are angled relative to the longitudinal axis of the respective rollers,

said outer race defining outer raceway surfaces thereabout on which said roller surfaces and surfacing respectively ride in rolling engagement therewith,

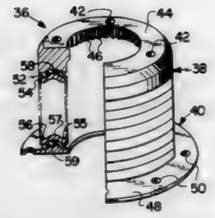
with said roller bearing surface angulation being greater than said thrust transmitting face angulation.

4,040,690

LAMINATED BEARING

Robert H. Finney, Erie, Pa., assignor to Lord Corporation, Erie, Pa.

Filed Nov. 17, 1975, Ser. No. 632,423
Int. Cl.[2] F16C *9/00*
U.S. Cl. 308—237 R **16 Claims**



1. A laminated bearing comprising a plurality of alternating and bonded layers of elastomeric material and nonextensible material, said layers alternating along a common axis extending lengthwise of the bearing so as to permit the bearing to support compressive loads applied generally normal to the layers and to accommodate torsional loads applied about said common axis, each layer being contoured to have in section taken radially of said common axis a portion projecting longitudinally toward one end of the bearing, the layers of elastomeric material adjacent said one end of the bearing having larger compression moduli than layers of elastomeric material located more centrally along the length of the bearing.

4,040,691

WAVEGUIDE HOLDER-HUMIDIFIER

Donald J. David, Centerville, and Michael C. Willson, Waynesville, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation-in-part of Ser. No. 689,403, May 24, 1976, abandoned. This application Sept. 20, 1976, Ser. No. 724,482
Int. Cl.[2] A47B *81/00*
U.S. Cl. 312—31 **5 Claims**

3. A coated waveguide holder-humidifier for a gradient light analytical detector, comprising:

A. a cylindrical container having a removable end,

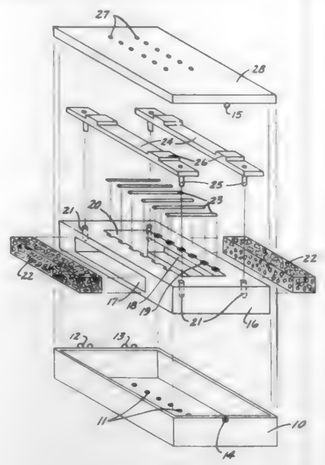
B. a cylindrical stem attached to and depending from said removable end and said stem having an enlarged cylindrical base,

C. a spring around said stem and adjacent said removable end,

D. a hollow cylindrical frame positional around said stem below said spring with flanges at the top and bottom of said stem, a notch in the under side of the top flange and a hole through the bottom flange for a waveguide,

E. a porous material capable of absorbing water and desorbing water vapor, located in the other end portion of said container,

F. opening means to the side of said container, said opening means being covered with screen material to exclude



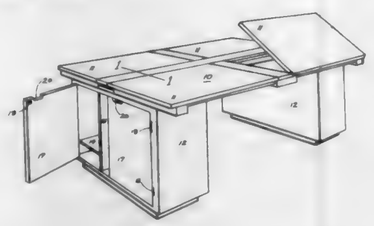
particulate matter but provide for a fluid sample to enter said container.

4,040,692

CONVERTIBLE MULTIPURPOSE TABLE

Daniel B. Sass, 27 High St., Alfred, N.Y. 14802; William A. Earl, 1571 Waterweels Road; Joseph Fasano, B. D., both of Alfred Station, N.Y. 14803

Filed June 6, 1975, Ser. No. 584,462
Int. Cl.[2] A47B *27/00*
U.S. Cl. 312—194 **4 Claims**



1. A multiple purpose unitary convertible work table having inclinable surface portions for separately accomodating a plurality of individuals or alternatively providing a relatively large and substantially smooth work surface comprising:

a table top assembly having opposed sides and opposed ends, said table top assembly consisting of a support member having corresponding opposed sides and ends for supporting all of said surface portions in a horizontal position in a single plane, said surface portions being generally disposed lengthwise along each of said opposed sides and on top of said support member in parallel planar relation and being adapted to be selectively moved from a horizontal position to an incline position, hinge means connecting the outermost lengthwise edge of each surface portion to one of the opposed sides of said support member for allowing each of said surface portions to be pivotally moved from a horizontal position to an incline position, incline support means associated with each of said surface portions for holding said surface portion in an incline position when moved thereto, and a surface member connected to said support member and fitting between and immediately adjacent said surface portions when said surface portions are disposed in said horizontal position to form a substantially smooth work surface;

table support means for supporting said table top assembly in a substantially horizontal position; and

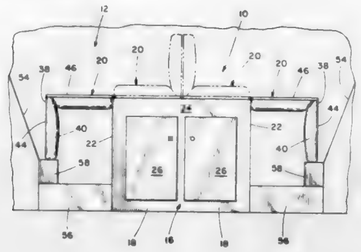
a base member having connecting means for connecting said table top assembly to said table support means.

4,040,693

GALLEY UNIT

Edward W. Peterson, Lake Bluff, and Charles J. Bednar, Oak Park, both of Ill., assignors to Arctic Enterprises, Inc., Thief River Falls, Minn.

Filed June 23, 1975, Ser. No. 589,337
Int. Cl.[2] A47B *77/08, 85/04*
U.S. Cl. 312—236 **2 Claims**



1. In a boat having a hull with a floor, the improvement of a multipurpose galley assembly which includes a storage enclosure and which is convertible from a galley to furniture for sleeping and to furniture for seating, said assembly comprising, in combination:

a. an upright base mounted on the floor of the hull, said base having an upper portion and a lower portion with at least one side,

b. abutments in the floor of the hull on opposite lateral sides of the base, distinct from said one side,

c. a kitchen galley unit located in said upper portion of said base and being at a work level height, said lower portion defining a storage space below said kitchen galley unit and having access from said one side,

d. a cover unit hingedly connected to the upper portion of said base, said cover unit having a first position for covering said kitchen galley unit and for supporting a person in a seated position and having a second position for defining work areas adjacent to and on opposite lateral sides of said kitchen galley unit and furniture for sleeping, said cover unit comprising:

1. a pair of seats, each seat having a seat bottom with a front edge and a seat back with top edge, said bottom and back being connected at substantially right angles to each other, each seat also including a horizontal work surface portion defining the seat bottom, each of said seats being hingedly connected at said front edge to one of the opposite lateral edges of said base, each of said seats being pivotal to the first position about the seat hinge connection to cover a portion of the top of the kitchen galley unit with each of said seat backs being at a substantially upright position for supporting a person's back, said seat backs being in back-to-back relationship to each other when said cover unit in the first position; and each of said seats pivotal to the second position about the hinge connection, each of said seat backs defining upright supports for the work surface portions by cooperative engagement of the top edge of each seat back with each abutment in the floor of the hull to hold each of said horizontal work surface portions in a substantially horizontal position on opposite lateral sides of said kitchen galley unit; and

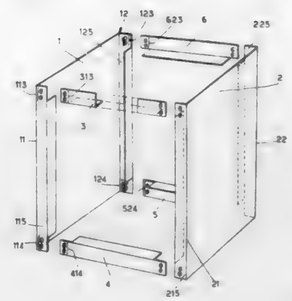
2. a separate cover member hingedly connected to the back edge of said base and covering said kitchen galley unit below said seat bottoms when in said first position, and defining a continuous surface with each of said horizontal work surface portions of said seats when said seats are moved to the second position to provide a sleeping surface, and pivotal from the kitchen galley unit when the seats are in the second position to provide a kitchen galley unit with lateral work surface portions.

4,040,694

FRAMEWORK FOR METAL CABINET

Alain Lascarrou, Epinay-sur-Seine, France, assignor to La Telemecanique Electrique, France

Filed Dec. 3, 1975, Ser. No. 637,256
Claims priority, application France, Dec. 12, 1974, 74.40883
Int. Cl.[2] A47B *47/02*; F16B *21/00*
U.S. Cl. 312—263 **4 Claims**



1. A metal enclosure, for electrical equipment, having a frame including:

i. a plurality of post elements

ii. a plurality of cross-arm elements at least two of which are utilised to connected pairs of the post elements, and

iii. means for releasably fastening the post elements to the cross-arm elements with a face of the post element abutting a face of the cross-arm element, said fastening means comprising

a. a portion of one of said elements having therein a circular hole opening at the abutting face,

b. a first annular portion extending from the abutting face of the other element and having a cylindrical external face forming a fit in the circular hole,

c. a second annular portion extending from the first annular portion remote from the abutting face said second annular portion being externally frusto-conical and reducing in diameter in the direction away from said abutting face,

d. releasable holding means to bear against the two elements to retain the respective faces in abutment.

4,040,695

FLIP HANDLE

Dale A. Brann, 1600 N. Wilmot Road No. 213, Tucson, Ariz. 85712

Filed May 17, 1976, Ser. No. 687,021
Int. Cl.[2] A47B *88/00*
U.S. Cl. 312—320 **5 Claims**

1. A flip handle for drawer fronts and the like, said flip handle comprising in combination:

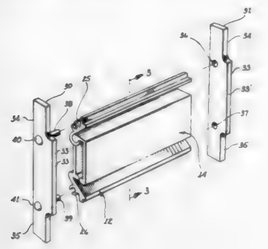
a. a pair of supports for securing said flip handle to the drawer;

b. a base for mounting said flip handle within the drawer front intermediate said pair or supports, said base including a channel partially closed upon itself and having a cross-section defining an arc;

c. a handle positionally pivotable from a first position flush with the face of the drawer to a second position, said handle in mechanical engagement with said base, said base leg having a bulbous edge with a cross-section defining a

longitudinal segment of a cylinder commensurate with the arced section of said channel for retainingly engaging said channel;

d. a bumper disposed upon said base for restricting downward pivotal movement of said handle and defining said first position of said handle; and



e. a flange extending from said channel for interferingly contacting said base leg and restricting upward pivotal movement of said handle and defining said second position of said handle;

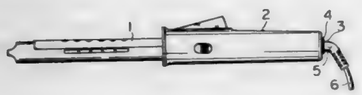
whereby, said base retains said handle while accommodating pivotal movement of said handle with respect to the drawer front.

4,040,696

ELECTRIC DEVICE HAVING ROTARY CURRENT COLLECTING MEANS

Yukio Wada; Yoshinori Abura, and Takeshi Matsui, all of Hikone, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed Apr. 23, 1976, Ser. No. 679,661
Claims priority, application Japan, Apr. 30, 1975, 50-52948
Int. Cl.[2] H01R *39/00*
U.S. Cl. 339—8 R **20 Claims**



1. An electric device having rotary current collecting means comprising a current collecting block which comprises an electric source cord, a first cnductor carrier for carrying an end part of said cord penetrating axially through said carrier and a current feeding conductor connected with the cord and a second conductor carrier having axial end parts, the second conductor carrier mounting a current collecting conductor brought into contact with said current feeding conductor of said first carrier, means for supporting the first carrier rotatably substantially at both axial end parts of said second carrier, and an electric device body including a load and housing therein said current collecting block, the body having means for engaging said second conductor for holding it stationary, the first conductor carrier being rotatable therein.

4,040,697

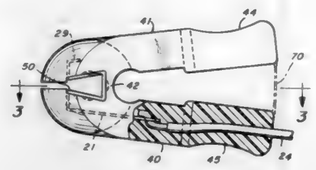
ELECTRICAL CONNECTOR

Donald C. Ramsay, Braintree, and James M. Tantillo, Brockton, both of Mass., assignors to Component Manufacturing Service, Inc., West Bridgewater, Mass.

Filed Apr. 7, 1976, Ser. No. 674,397
Int. Cl.[2] H01R *11/22*
U.S. Cl. 339—61 R **6 Claims**

1. An electrical connector comprising a resilient metallic stamped contact defining a narrow neck reentrant contact area entrance and having extension ends on either side of said area carrying means for engaging a plastic body,

a plastic body section embedding said extension ends and providing two side by side legs extending from said area arranged to act as levers so that pressure on said legs resiliently opens said narrow neck to allow entrance of an electrode contact and relaxation of pressure cause resilient spring action of said stamped contact to provide gripping of said electrode,



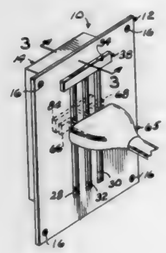
said stamped contact defining wall means carrying three detents positioned so that said resilient action provides positive gripping of said electrode with said electrode urged into engagement with each of said three detents of said resilient contact, said wall means having sections converging towards each other in the direction of said reentrant contact area entrance.

4,040,698

ELECTRICAL SAFETY OUTLET AND PLUG

Nilson V. Ortiz, San Francisco, Calif., assignor to Nilson V. Ortiz and Francisco R. Rollojay, both of San Francisco, Calif.

Filed Oct. 12, 1976, Ser. No. 731,603
Int. Cl.[2] H01R *13/44, 13/54*
U.S. Cl. 339—75 P **5 Claims**



1. An electrical safety outlet and plug, comprising:

an elongated casing having a back wall and a face plate;

a pair of longitudinally extending spaced conductor strips within said casing,

each said conductor strip comprising a forward member disposed adjacent said face plate and a rearward member parallel with said forward member and spaced toward said casing back wall,

said face plate having a pair of spaced longitudinal slots aligned with said conductor strips for longitudinally slidably receiving the conductor prongs of an electric plug,

said face plate having an intermediate longitudinal slot disposed between the pair of slots and having a transverse slot in one end portion communicating with the pair of slots and the intermediate slot;

an electric plug having a body portion enclosing one end portion of a pair of conductor wires;

a pair of conductor prongs secured at one end portion to the respective said wires within said plug body in parallel equally spaced relation with repsect to said pair of face plate slots,

the other end portion of each conductor prong projecting laterally of its said one end portion in the planes of the parallel end portions;

a nonconductor prong slidably received by the face plate intermediate slot and secured at one end portion within said plug body between said pair of conductor prongs and having an opposite end portion projecting laterally of its first said one end portion parallel to the plane of said conductor prongs other end portions; and,

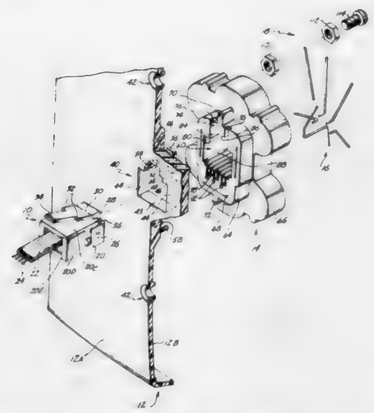
plunger means normally closing the face plate transverse slot.

4,040,699

FEMALE CONNECTOR AND ESCUTCHEON PLATE COMBINED THEREWITH FOR TELEPHONE EQUIPMENT

Harry R. Rasmussen, Tacoma, Wash., assignor to Crest Industries, Inc., Puyallup, Wash.

Filed Oct. 18, 1976, Ser. No. 733,227
Int. Cl.[2] H01R *9/08, 13/54*
U.S. Cl. 339—91 R **8 Claims**



1. An electrical termination including a female connector for telephone equipment which is adapted to be installed in wall-mounted outlet receptacles having pulled therein a plurality of electrical leads, and for use with a male connector including a body formed from dielectric material, the body being of substantially parallelopiped configuration and having a front surface and an adjoining lower surface, the male connector further including a plurality of metallic, flat blade contacts disposed in the body and spaced apart from each other, the flat blade contacts being exposed to the exterior of the body through the front and lower surfaces thereof, said electrical termination comprising:

a. plate means formed from dielectric material and including means for securing said plate means to the outlet receptacle, said plate means having a front surface, a back surface, and a connector-receiving aperture defined therein by a plurality of surfaces, including a lower surface, extending from said front surface to said back surface, said connector-receiving aperture being generally complementary to the body of the male connector;

b. a body member fromed from dielectric material and having a first surface and a second surface, a connector-receiving cavity being defined in said body member and extending inwardly from said first surface to a rear surface situated within said body member, said body member being joined to said plate means and with said first surface of said body member being adjacent to said rear surface of said plate means, said cavity being also defined by a plurality of surfaces including a lower surface, extending from said first surface to said rear surface which generally correspond to and which are aligned with said plurality of surfaces and said plate means in assembly so that said connector-receiving cavity is also complementary to the body of the male connector, a plurality of bores being defined in said body member and spaced apart from each other and extending through said body member from said first surface to said second surface, a plurality of first grooves spaced apart from each other in said lower surface of said connector-receiving cavity and extending from said first surface inwardly, each of said plurality of first grooves communicating adjacent said first surface with a corresponding one of said plurality of bores, a plurality of terminal-receiving cavities extending inwardly into said body member from said second surface, and a plurality of second grooves in said second surface of said body member, each of said plurality of second grooves interconnecting one of said plurality of terminal-receiving cavities with a corresponding one of said plurality of bores;

c. a plurality of electrical conductors, each being formed into a first wire spring contact portion located within one of said plurality of first grooves and extending from said first surface of said body member inwardly into said connector-receiving cavity for engaging a corresponding one of the plurality of flat blade contacts upon insertion of the male connector into said connector-receiving cavity through said connector-receiving aperture, each of said plurality of conductors also being formed into a second portion located in the corresponding one of said plurality of bores and second grooves and terminating in a corresponding one of said plurality of terminal receiving cavities; and

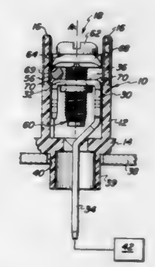
d. a plurality of electrical terminal means, each of said electrical terminal means being located within one of said plurality of terminal receiving cavities and providing electrical interconnection between the termination of the corresponding one of said plurality of electrical conductors located therein and one of the pluality of leads in the outlet receptacle.

4,040,700

ELECTRICAL TERMINATING DEVICE

Edward A. Obuch, Linden, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Feb. 24, 1976, Ser. No. 661,012
Int. Cl.[2] H01R *9/08*
U.S. Cl. 339—95 R **14 Claims**



1. In an electrical terminating device of the type having an electrical terminal member and a clamping means for detachably connecting a conductive element to the terminal member, the improvement comprising:

an electrical terminal member having a platform for receiving a conductive element to be detachably connected to the terminal member;

clamping means including a clamping surface juxtaposed with the platform and selectively movable toward and away from the platform for selectively clamping or releasing the conductive element from between the clamping surface and the platform when the conductive element

extends in a longitudinal direction between the clamping surface and the platform;

at least one resiliently deflectable cantilevered projection unitary with the terminal member and extending laterally relative to said longitudinal direction, said tang having a remotely extending free end and a pair of opposed side edges, each of said side edges being spaced inwardly from the longitudinal extremities of said platform, said tang extending upwardly toward the clamping surface, and at an acute angle to the platform such that upon clamping the conductive element between the clamping surface and the platform, the projection will be deflected resiliently and will establish a resilient clamping force upon the conductive element tending to confine the conductive element between the clamping surface and the platform.

4,040,701

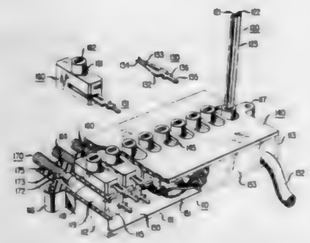
QUICK CONNECTOR FOR SERVICE WIRES

Tillman Johnson Gressitt, Long Valley, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 30, 1976, Ser. No. 710,020

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—99 R **19 Claims**



1. A wire terminal block including

at least one pair of insulation penetrating quick-connect terminals, each of said terminals having provision therein for making an electrical connection with opposite sides of an insulation covered electrical conductor,

means for accepting a coupled pair of insulation covered electrical conductors, said accepting means including

a generally rectangular-shaped member,

first and second grooves in opposite sides of said member, said grooves displaced from one another so as to be in alignment with said pair of insulation penetrating quick-connect terminals,

means, integral with and extending outwardly from a central portion of said rectangular-shaped member, for receiving said coupled pair of insulation covered electrical conductors, said receiving means having a generally oval-shaped aperture therein which extends through said rectangular-shaped member, an axis of said oval-shaped aperture perpendicularly intersecting first and second parallel planes containing said first and second grooves, and

first and second depressions having faired entry faces at a terminus of said first and second grooves, said depressions juxtaposed said oval-shaped aperture to reduce insulation buildup as said quick-connect terminals make electrical connection with said insulation covered electrical conductor, and

means for urging said accepting means and said pair of insulation penetrating quick-connect terminals into engagement with one another.

4,040,702

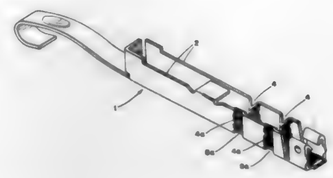
SOLDERLESS TERMINATION SYSTEM

William H. McKee, West Covina, Calif., and Roy Witte, Rolling Meadows, Ill., assignors to TRW Inc., Elk Grove Village, Ill.

Continuation of Ser. No. 589,308, June 23, 1975, abandoned, which is a division of Ser. No. 443,678, Feb. 19, 1974. This application Oct. 6, 1976, Ser. No. 730,561

Int. Cl.[2] H01R *11/20*

U.S. Cl. 339—97 R **18 Claims**



1. The method of making an electrical wire termination system comprising:

forming a flat sheet of metal into an elongated wire receiving body having a bottom and facing sides defining a wire receiving channel;

notching the sides from their upper edges at areas at which jaws are to be formed;

forming-in at least one pair of wire contacting jaws, the jaws being oppositely positioned and extending transversely of the side and into the wire receiving channel, to receive and hold a wire inserted in the wire receiving channel when the body is formed, and the notches providing a lead-in portion on each jaw, wherein the notch edges form upper edges of the jaws and extend from the side inwardly and downwardly into the wire receiving channel; and

coining the edge of each of said notches at its apex so that said edge presents a uniform angular lead-in to the wire being inserted and facilitates the compression and deformation of the wire being inserted.

4,040,703

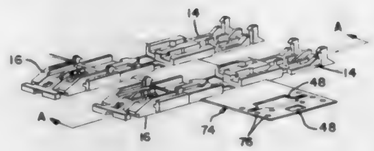
TRI-LEAD CABLE CONNECTOR

Howard Richard Shaffer, Westminister, Md., and Robert Houston Frantz, Carlisle, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 610,815, Sept. 9, 1975, abandoned. This application June 28, 1976, Ser. No. 700,370

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—99 R **11 Claims**



1. An electrical connector assembly for terminating multiconductor cable with contacts enabling electrical connection with other electrical terminating means comprising:

a connector housing having first and second mating housing members of substantially rigid first insulator material, said mating members together defining therebetween at least first and second contact receiving cavities and at least one cable receiving recess, and at least one integral stud on each said housing member;

hinge means joining said housing members together and comprising a web of flexible second insulator material having a plurality of apertures therein, said studs of said mating housing members passing through said apertures

and being bonded thereto thereby forming an integral housing assembly;

latching means integral with said housing members spaced remote from said hinge means and adapted to detachably secure said mating members together in a closed condition;

a first contact having an insulation piercing conductor engaging portion and a matable portion, said first contact being received in said first cavity of said first housing member with said conductor engaging portion directed toward the second of said housing members,

a second contact having an insulation piercing conductor engaging portion and a matable portion, said second contact being received in the second cavity of said housing member with said conductor engaging portion directed towards the first of said housing members; and

said at least one cable receiving recess having a transverse profile defined by at least two members fitting together in an interdigitated fashion whereby adjacent conductors of a cable inserted therein will be displaced in opposite directions into two parallel spaced planes and be driven into engagement with the conductor engaging portions of the respective contacts.

4,040,704

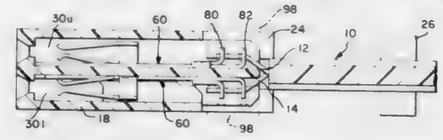
COAXIAL RIBBON CABLE CONNECTOR

John Henry Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 528,294, Nov. 29, 1974, abandoned, which is a division of Ser. No. 391,727, Aug. 27, 1973, Pat. No. 3,864,011. This application June 30, 1976, Ser. No. 701,266

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—99 R **1 Claim**



1. A connector for terminating ribbon coaxial cable of the type having a plurality of signal carrying wires and parallel drain wires, which comprises:

a. a housing of insulating material having a plurality of cavities extending from front to back thereof, said cavities being arranged in upper and lower rows, and further opening out vertically and rearwardly at the rear end of the housing to provide contact openings with the contact openings in the upper row being opened vertically upwardly and the contact openings in the lower row opening vertically downwardly; and

b. a plurality of conductive contact members positioned in the cavities, each contact member comprising:

i. an elongated flat base having first and second ends;

ii. means on the first end for engaging contact elements on other electrical circuits;

iii. a first terminal formed at and from the second end of the base, said end being bent upwardly to provide a vertical portion, a wire-receiving slot extending through the vertical portion and into a portion of the adjacent horizontal base; and

iv. a second terminal having vertical and horizontal portions relative to the base, a wire-receiving slot extending through the vertical and into the horizontal portions, said second terminal being positioned inwardly from the first terminal and in overlying relation to the base and attached thereto by a section of material extending from the horizontal portion to a side of the base so that the second terminal may be moved independently from the first terminal and the base.

4,040,705

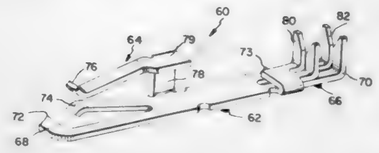
COAXIAL RIBBON CABLE CONNECTOR

John Henry Huber, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 675,838, April 12, 1976, abandoned, which is a continuation of Ser. No. 564,501, April 2, 1975, abandoned, which is a division of Ser. No. 507,170, Sept. 18, 1974, Pat. No. 3,907,396, which is a division of Ser. No. 391,727, Aug. 27, 1973, Pat. No. 3,864,011. This application Feb. 8, 1977, Ser. No. 766,632

Int. Cl.[2] H01R *13/38*

U.S. Cl. 339—99 R **1 Claim**



1. A contact member stamped and formed from a coplanar sheet of conductive material, which comprises:

a. an elongated flat base having first and second ends;

b. means on the first end for engaging contact elements on other electrical circuits;

c. a first terminal formed at and from the second end of the base, said end being bent upwardly to provide a vertical portion, a wire-receiving slot extending through the vertical portion and into a portion of the adjacent horizontal base; and

d. a second terminal having vertical and horizontal portions relative to the base, a wire-receiving slot extending through the vertical and into the horizontal portions, said second terminal being positioned inwardly from the first terminal and in overlying relation to the base and attached thereto by a section of material extending from the horizontal portion to a side of the base so that the second terminal may be moved independently from the first terminal and the base.

4,040,706

CONTACT STRIP

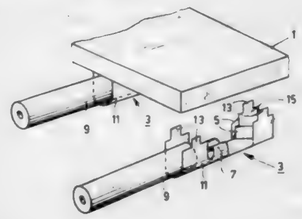
Gijsbert Frederik Maria De Bresser; Teunis Adrianus Kassenaar; Ludovicus-Gerardus Johannes Godefrida Versa, and Leon Pieter Weenink, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,272

Claims priority, application Netherlands, Jan. 4, 1975, 7503831

Int. Cl.[2] H01R *13/58*

U.S. Cl. 339—103 R **4 Claims**



1. A contact strip comprising an electrically insulating support having an essentially flat surface, at least one linearly extending metal contact member mounted on said support by means of connection tags formed on said contact member, one end of said contact member being formed with first contact means for detachably mating with another contact means, and an insulated connection wire extending from the other end of

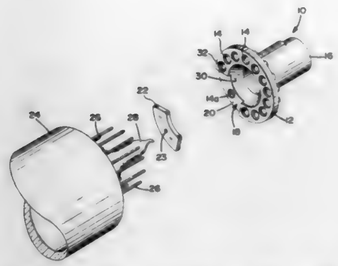
said contact member, the end of said connection wire having its insulation removed and being electrically and mechanically connected to the contact member, said other end of the contact member including a U-shaped extension partly enclosing the insulated portion of the connection wire, each leg of said U-shaped extension being provided with one of said connection tags, the arrangement being such that the insulated portion of the connection wire is pressed by the U-shaped extension against the support surface.

4,040,707

CATHODE RAY TUBE BASE

John J. Pisano, Auburn, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 2, 1976, Ser. No. 702,094
Int. Cl.[2] H01R *13/46*
U.S. Cl. 339—111 **2 Claims**



1. In combination with a cathode ray tube, a base therefor, said cathode ray tube having a cylindrical terminal portion closed by a substantially planar wall provided with a plurality of annularly spaced, projecting tube pins each surrounded by a raised nubbin with a diameter larger than said pins where said pins exit from said wall, said base comprising a flat, circular rim having a diameter substantially equal to that of said cylindrical terminal portion; a plurality of tube pin receiving apertures extending through said rim for engaging said tube pins, said apertures being spaced inwardly from the outer circumference of said rim; and at least one tube pin isolating means formed within said flat circular rim, said tube pin isolating means including a cut-out portion having a depth less than the thickness of said rim and extending over a circumferential arc of less than 180° and an electrically insulating plug formed to fit said cut-out portion, said plug containing at least one aperture for receiving one of said tube pins, said one aperture having a diameter at least as large as the diameter of said nubbin.

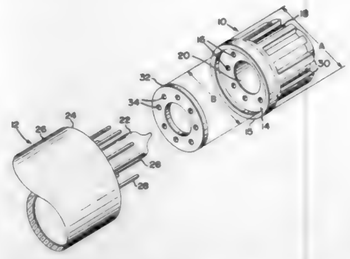
4,040,708

CATHODE RAY TUBE BASE

Ralph E. Neuber, and Charles H. Rehkopf, both of Seneca Falls, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 2, 1976, Ser. No. 702,096
Int. Cl.[2] H01R *13/46*
U.S. Cl. 339—111 **3 Claims**

1. In combination, a cathode ray tube and a base therefor, said cathode ray tube having a cylindrical terminal portion closed by a substantially planar wall provided with a plurality of annularly arrayed, spaced, projecting tube pins each surrounded by a raised circumferential nubbin with a diameter larger than said pins where said pins exit from said wall, said base comprising: a circular rim having a given diameter surrounded by a peripheral wall having a given internal wall height; a plurality of tube pin receiving apertures extending through said rim, said apertures being spaced inwardly from the inner circumference of said peripheral wall and being annularly arrayed; a hollow, substantially centrally located crown positioned on said rim on a side opposite said peripheral wall and projecting therefrom, the internal portion of said crown being adapted to receive the terminus of an exhaust tubulation, the outside circumference of said crown having a diameter equal to the diameter of the inside edges of said tube pin receiving apertures and being further provided with a plurality of radially extending fins, said fins being located



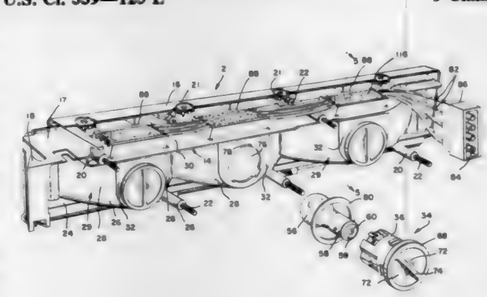
between said apertures; and an electrically insulating, soft washer fitted within said peripheral wall, said washer having a thickness greater than the internal height of said peripheral wall and being further provided with a plurality of apertures matching in number and location said tube pin receiving apertures in said rim, said apertures having a diameter closely matching the diameter of said nubbins.

4,040,709

LIGHTING UNIT ASSEMBLY

Frank Peter Dola, Port Richey, and Frederick William Rossler, Jr., New Port Richey, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Nov. 12, 1975, Ser. No. 631,253
Int. Cl.[2] H02B *1/02*
U.S. Cl. 339—125 L **9 Claims**



1. A lighting unit assembly which is intended to be mounted in a panel from one side thereof and to be serviced from the other side thereof, said lighting unit assembly comprising:

an assembly housing having a plurality of lamp bulb sites therein, said housing being dimensioned to be inserted into said panel from said one side thereof,

a plurality of electrical conductors extending along said housing, said conductors extending past electrical tap locations adjacent to said lamp bulb sites,

electrical tap connector means at each of said tap locations, each of said tap connector means comprising a connector housing having electrical contact tap terminal means therein, each of said contact tap terminal means beings electrically connected to one of said conductors and each contact tap terminal means having a contact portion, said contact portion extending from said tap location towards the associated lamp bulb site,

a bulb holder means removably mounted in said assembly housing at each of said lamp bulb sites, each of said bulb holder means comprising a bulb holder housing of insulating material, each of said bulb holder housings being individually mounted in said assembly housing, each of said bulb holder means having a socket for a lamp bulb, said bulb holder means and said assembly housing having cooperating mounting means for said bulb holder means, said mounting means permitting removal of said holders means from said other side of said panel,

said contact portions of said contact tap terminal means in said tap connector means being in electrical contact with bulbs in said bulb holder means whereby,

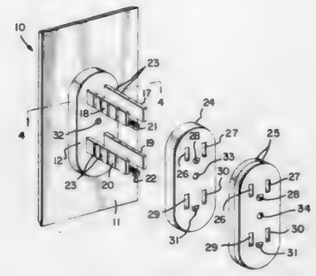
said lighting unit assembly can be assembled to said panel from said one side thereof, and said bulb holder means can be individually removed from said lighting unit assembly from the other side of said panel without disturbance to said conductors.

4,040,710

PLUG-IN ELECTRICAL RECEPTACLE EXTENDER

Arnold Marvin Damsky, 821 - 83rd St., Miami Beach, Fla. 33141

Filed May 24, 1976, Ser. No. 688,982
Int. Cl.[2] H01R *13/46*
U.S. Cl. 339—154 A **4 Claims**



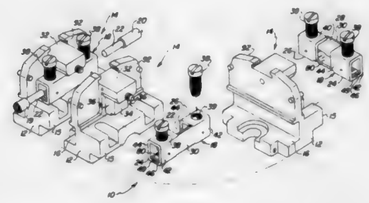
1. A plug-in electrical receptacle extender comprising, in combination, a flat electrical receptacle cover plate, a comparatively thick body member extending centrally outwardly of one side of said plate and integrally formed therewith, a plurality of electrical prong connector terminals secured in said body member and extending perpendicularly outwardly thereof at said one side of said cover plate, end portions of said prong connector terminal extensions being adapted to fit into corresponding prong terminal openings in an electrical receptacle to be extended for making electrical connection therewith, and a non-electrically conductive apertured spacer slidingly received over said prongs for electrically insulating said electrical plug terminal extensions between said body member and end portions of said extensions to be fitted into an electrical receptacle.

4,040,711

TUBULAR ELECTRICAL CONNECTOR

William T. Waddington, Fanwood; Harold F. Jenkins, Irvington, and Paul T. Filak, Roselle Park, all of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Apr. 15, 1976, Ser. No. 677,406
Int. Cl.[2] H01R *7/12, 9/10*
U.S. Cl. 339—198 R **6 Claims**



1. An electrical connector for connecting the terminal ends of electrical conductors in a terminal block assembly, said terminal block assembly including a projection thereon adapted to cooperatively engage said electrical connector, said electrical connector comprising:

first and second tubular contact members, each contact member having a bottom wall extending longitudinally between opposite ends, a top wall and opposite side walls;

the confronting ends of the bottom walls of the first and second tubular contact members and at least first ones of said top and side walls being spaced apart longitudinally such that a gap exists between the first and second tubular contact members;

a strap unitary with corresponding second ones of said top and side walls and bridging the gap between the first and second tubular contact members;

a contact bar extending into each tubular contact member, juxtaposed with the bottom walls thereof, and bridging the gap, said contact bar being of a material havng an electrical conductivity greater than that of the material of the strap;

a clamping member mounted in the top wall of each tubular contact member for clamping a conductor against the contact bar;

wherein the contact bar includes opposite end portions located within the tubular contact members against the bottom walls thereof, and an intermediate portion located longitudinally between the confronting ends of the bottom walls such that relative longitudinal movement between the contact bar and the tubular contact members is precluded by engagement of the intermediate portion with the confronting ends of the bottom walls; and

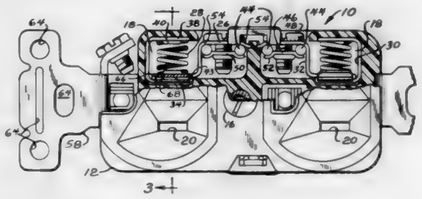
wherein the gap is adapted to engagingly receive said terminal block projection to secure the connector in the terminal block and establish an abutment between the tubular contact members, against which abutment the conductors may be placed.

4,040,712

DOUBLE-ACTING ELECTRICAL RECEPTACLE

Arvid Dahlstrom, Chicago, Ill., assignor to Dahltron Corporation, Lombard, Ill.

Filed Jan. 26, 1976, Ser. No. 652,390
Int. Cl.[2] H01R *13/16*
U.S. Cl. 339—255 R **10 Claims**



10. A double-acting electrical receptacle comprising:

body means;

contact means disposed in the body means and being connected operatively for engagement with the sides of a prong of a plug, said contact means including a bus bar, a shunt element, and resilient means;

said bus bar including extended end portions;

said shunt element being formed of a U-shaped construction and having a first side and a second side positioned oppositely and spaced apart from the first side; and

said resilient means being normally disposed in the body means between the second side of the shunt element and one of the extended end portions of the bus bar to bias them in opposite directions toward each other to resiliently urge the first side of the shunt element and one of

the extended end portions against the sides of the prong inserted therebetween.

4,040,713

DOUBLE SPRING CONTACT AND METHOD OF MAKING THE SAME

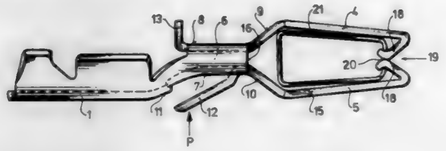
Alfred Könnemann, Wuppertal, Germany, assignor to Grote & Hartmann, Wuppertal, Germany

Filed Nov. 20, 1975, Ser. No. 633,989

Claims priority, application Germany, Nov. 21, 1974, 2455140; Oct. 2, 1975, 2544011

Int. Cl.² H01R *13/16*

U.S. Cl. 339—259 R **8 Claims**



1. A double-spring contact, comprising a one-piece body having a base part of substantially tubular configuration and having a top wall portion, a bottom wall portion parallel to said top wall portion and two curved side wall portions connecting said top and bottom wall portions; contact spring arms extending from said top and bottom wall portions at one end of said base part; a connecting portion extending from said bottom wall portion at the other end of said base part, said contact spring arms and said connecting portion all being stepped and offset at perspective bending zones in direction outwardly away from said base part; and a retaining spring arm formed from the material of said bottom wall portion and projecting outwardly away from the latter, the bending zone of said connecting portion forming an abutment shoulder, and the length of said retaining spring arm being so selected that a free end of said retaining spring arm engages said abutment shoulder when the retaining spring arm undergoes deflection in direction inwardly of said base part.

4,040,714

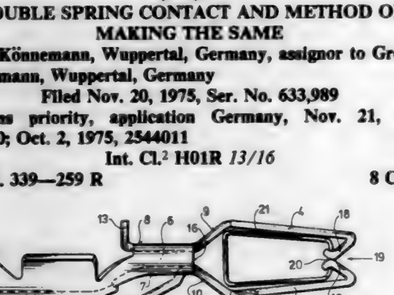
C-CLAMP GROUND ADAPTERS

Vijay K. Grover, Warren, and Woodie Zachry, Troy, both of Mich., assignors to Airco, Inc., Montvale, N.J.

Filed May 6, 1976, Ser. No. 683,857

Int. Cl.² H01R *11/26*

U.S. Cl. 339—264 R **10 Claims**



1. A C-clamp adaptor for connecting electrical cables to an object upon retention of said adapter and said object in a C-clamp comprising a base; means for connecting one or more electrical cables to said base; a plurality of adjustable cowling members for receiving one pad of a C-clamp each of said cowling members including a base portion and an angularly ascending portion with said base portion having at least one slot formed therein; and means extending through said slot for releasably securing said cowling members to said base to retain said pad in contact with said base with the secured location of said cowling members corresponding to the size of said received pad.

4,040,715

SCREW TERMINAL WITH A CAPTIVE SCREW

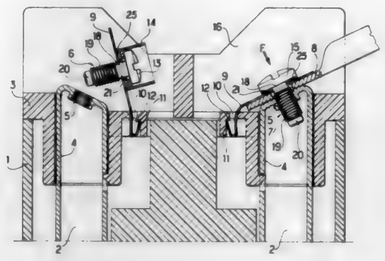
Jean Debaigt, Maisons Laffitte, France, assignor to Cgee Alsthom SA., Levallois-Perret, France

Filed Nov. 10, 1976, Ser. No. 742,136

Claims priority, application France, Nov. 26, 1975, 75.36171

Int. Cl.² H01R *9/10*

U.S. Cl. 339—272 A **5 Claims**



1. A screw terminal disposed between two cheeks and comprising a conductor provided with a tapped hole and an associated screw carried by a support spring wherein the screw has a shank and a head, the shank having a threaded portion and a neck of smaller diameter than the outside diameter of the threaded portion situated between the threaded portion and the head, he support spring being a strip of resilient material having a width substantially equal to the distance between the cheeks and having one end fixed in relation to the said conductor with the tapped hole, the support spring having a screw-retaining keyhole comprising a slot portion centrally disposed between the cheeks and parallel thereto and having a width suitable for retaining the screw by its neck, an off-center portion of the same width and an end portion of sufficient diameter to receive the threaded portion of the shank, the head of the screw once in position in the slot portion being prevented by the cheeks from sideways displacement sufficient to allow the screw to slide through the off-center portion to the end portion.

4,040,716

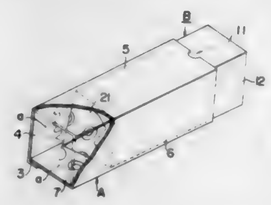
KALEIDOSCOPIC PEEP-SHOW VIEWING DEVICE

Izuru Matsubara, Kyoto, Japan, assignor to Dai Nippon Insatsu Kabushiki Kaisha and Meiji Seika Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 8, 1976, Ser. No. 664,881

Int. Cl.² G02B *27/08*

U.S. Cl. 350—4 **10 Claims**



1. A kaleidoscopic peep-show viewing device comprising:

an outer box of tubular shape having a polygonal cross-section and first and second open opposite ends, said outer box being fabricated by folding a sheet of relatively stiff material, said outer box further having at said first open end thereof a first bendable tab folded inwardly thereof;

an inner box of polygonal cross-section, telescopically slidable within said outer box, said inner box being fabricated by folding a sheet of relatively stiff material, said inner box further having, at an end remote from said first open end of said outer box having said first tab, a second bendable tab coupled to said inner box and folded outwardly, said first tab of said outer box and said second tab of said inner box being interposed between the mutually slidable inner and outer surfaces of said outer and inner boxes respectively and being mutually engageable to prevent the inner box from being slipped out of said outer box when said inner box is slid outward from said outer box through said open end of said outer box;

a lid wall foldably connected to said inner box at the end thereof adjacent said second open end of said outer box and closing said end of said inner box; and

an optically reflecting member of hollow pyramidal shape fabricated by folding a sheet of material and having a base part, vertex and reflecting surfaces, said reflecting member having a third tab member coupled to said reflecting member at the base part thereof and folded to engage the surface of said lid wall facing the interior of the inner box thereby connecting said reflecting member to that end of the inner box where said lid wall is provided, said reflecting member joined to said inner box so as to extend outwardly from said inner box toward said second open end of said outer box, said outer box having on the inner surface thereof printed inscriptions which, when viewed through said second open end of said outer box, has reflections on said reflecting surfaces which are optically collected into single pictures successively appearing and disappearing as said inner box is slid within said outer box.

4,040,718

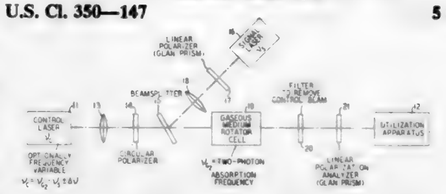
POLARIZATION ROTATOR BASED ON DISPERSION DUE TO TWO-PHOTON TRANSITIONS

Gary Carl Bjorklund, West Windsor, and Paul Foo-Hung Liao, Middletown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 5, 1976, Ser. No. 646,425

Int. Cl.² B01F *1/01*

U.S. Cl. 350—147 **5 Claims**



1. A magnetic-field-free polarization rotator comprising an atomic gaseous medium, means for applying to said medium a linearly-polarized beam to be polarization rotated, said beam of arbitrary frequency not coinciding with a single-photon resonance of said medium, means for applying to said medium a circularly-polarized beam of frequency complementary to that of the first beam for generating two-photon dispersion and of a power level sufficient for substantial dispersion, the frequencies and polarizations of the linearly-polarized and of the circularly-polarized beams being appropriate for determining interaction of the beams according to a quantum state selection rule, and optical filter means at the output of the rotator for removing any residual portion of the applied circularly-polarized beam, the sum of the frequency of a photon of the linearly-polarized beam and the frequency of a photon of the circularly-polarized beam being at least approximately equal to a two-photon resonance transition frequency of said atomic gaseous medium.

4,040,717

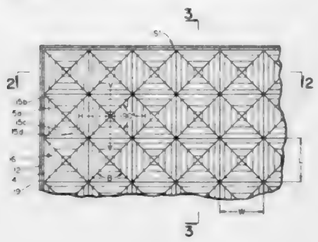
PROJECTION SCREEN FOR OPTICAL IMAGES

Alphonse P. Cinque, 65 Earle Ave., and Mark G. Cinque, 15 Elm St., both of Lynbrook, N.Y. 11563

Filed Nov. 26, 1975, Ser. No. 635,696

Int. Cl.² G03B *21/60*

U.S. Cl. 350—127 **10 Claims**



1. A projection screen, comprising:

a sheet for receiving optical images projected thereon, said sheet having a face formed with a rectangular array of contiguous concavities disposed in horizontal rows and vertical columns, at least alternate concavities in each of said horizontal rows having four triangular sections apically and laterally contiguous to form a quadrangle so that the intensity of images transmitted from said face have substantially equal illumination intensity at all viewing points within a conical viewing core, where the axis of said core is coincident with the axis of optical porjection.

4,040,719

FREQUENCY INDICATOR FOR RECEIVING DEVICES

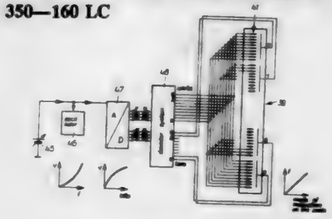
Heinz F. Schiebelhuth, Frankfurt am Main, Germany

Filed July 21, 1975, Ser. No. 597,644

Claims priority, application Germany, July 22, 1974, 2435088

Int. Cl.² G02F *1/28*; H04B *1/16*; H03J *1/04*

U.S. Cl. 350—160 LC **6 Claims**



1. A display panel having a plurality of liquid crystal elements arranged to indicate operating frequency of signal receiving means being tuned by a DC analog tuning signal having a continuously variable magnitude comprising:

logarithmic analog-to-digital converter means for converting said analog tuning signal to digitally coded signals;

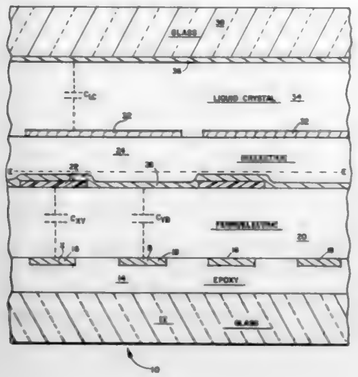
decoder means responsive to said digitally coded signals for providing digital control signals; and

means for converting said digital control signals to an alternating current signal for operating said liquid crystal elements.

4,040,720
FERROELECTRIC LIQUID CRYSTAL DISPLAY

Paul K. York, Placentia, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 21, 1975, Ser. No. 570,115
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—160 LC 3 Claims

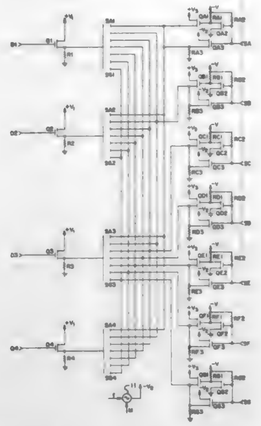


1. A ferroelectric liquid crystal display device having a plurality of unit display cells, said device comprising:
- a layer of ferroelectric material having an upper and a lower surface;
- a first plurality of electrodes disposed adjacent said lower surface of said layer of ferroelectric material, each electrode in said first plurality of electrodes extending across a plurality of unit display cells;
- a second plurality of electrodes disposed adjacent said lower surface of said layer of ferroelectric material, each electrode of said second plurality of electrodes being restricted to a single unit display cell;
- a third plurality of electrodes disposed adjacent to said upper surface of said layer of ferroelectric material, each electrode of said third plurality extending across a plurality of unit display cells;
- a fourth plurality of electrodes adjacent said upper surface of said layer of ferroelectric material, each electrode of said fourth plurality of electrodes being restricted to a single unit display cell;
- capacitance spoiler means disposed adjacent at least one of said upper and lower surfaces of said layer of ferroelectric material between said ferroelectric and said first or said third plurality of electrodes at those locations at which the electrodes of said first and third pluralities overlap;
- dielectric means disposed adjacent said upper surface of said layer of ferroelectric material, the electrodes of said third plurality of electrodes, and the electrodes of said fourth plurality of electrodes;
- a plurality of distribution electrodes overlying said dielectric means, each of said distribution electrodes in electrical contact with one of said fourth plurality of electrodes;
- a layer of liquid crystal material overlying said plurality of distribution electrodes;
- transparent electrode means overlying said layer of liquid crystal material;
- transparent face plate means overlying said transparent electrode means; and
- sealing means sealing the edges of said display device, thereby preventing leakage of said liquid crystal material.

4,040,721
DRIVER CIRCUIT FOR LIQUID CRYSTAL DISPLAY

Masakatsu Kurita, Nagaokakyo, Japan, assignor to Omron Tateisi Electronics Co., Kyoto, Japan

Filed July 14, 1975, Ser. No. 595,661
Int. Cl.[2] G02F *1/28*
U.S. Cl. 350—160 LC 15 Claims

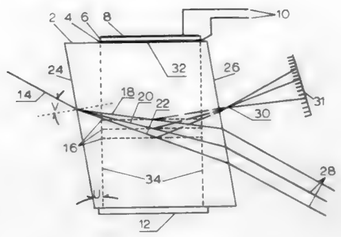


1. A driver circuit for receiving decoded segment and digit drive signals for determining application of electrical potential between predetermined segment and digit electrodes having liquid crystal material disposed therebetween to thereby form a liquid crystal display, said liquid crystal material operating to provide maximum contrast between areas underlying energized segment electrodes and surrounding areas when RMS voltage between segment and digit electrodes is at or above a saturating voltage and no contrast between such areas when RMS voltage therebetween is below a threshold voltage, said liquid crystal display having an upper cut-off frequency related to display capacitive characteristic,
- comprising a digit driver for each digit in the display for switching an enabling signal to the predetermined digit electrode responsive to the decoded digit drive signal,
- a segment driver for each segment in the digit for switching an actuating signal to the predetermined segment electrodes responsive to the decoded segment drive signals,
- said actuating signal having a frequency below the upper cutoff frequency and a polarity opposite from the polarity of said enabling signal,
- one like segment electrode in each digit being common with one like segment electrode in each other digit, whereby said decoded segment drive signal applies said actuating signal to all like segment electrodes simultaneously,
- said decoded digit drive signals operating to apply said enabling signal to said digit electrodes in sequence within a digit multiplexing cycle, said digit driver including means for applying a quiescent digit signal to said digit electrode in the absence of said digit drive signal,
- said segment driver including means for applying a quiescent segment signal to said segment electrodes in the absence of said segment drive signal,
- means for adjusting the amplitude of said actuating signal, so that the RMS value of the difference between said enabling and actuating signals during one digit multiplexing cycle at an actuated segment is greater than said saturation voltage, and
- means for adjusting the amplitude of said quiescent segment signal, so that the RMS value of the difference between said digit and segment quiescent signals during one digit multiplexing cycle at a quiescent segment is less than said threshold voltage, whereby maximum contrast appears in the display at actuated segments and ghost displays at quiescent segments are eliminated.

4,040,722
LIGHT BEAM CONTROLLER

Asger Torben Nielsen, Fullerton, Calif., assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed Mar. 29, 1976, Ser. No. 671,706
Int. Cl.[2] G02F *1/32*
U.S. Cl. 350—161 W 2 Claims

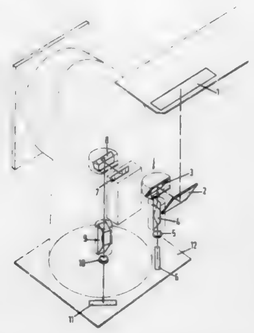


1. An acousto optical diffraction cell comprising:
- a. a piezoelectric transducer, including a pair of electrodes bonded to opposite sides of said transducer;
- b. a monoclinic prism bonded to said transducer in such a way, that an ultrasonic wavefront generated by said transducer propagates in a direction that makes the same acute angle with both surfaces where light enters and exits;
- c. the value of said acute angle is chosen such that incoming light of different wavelengths meet said ultrasonic wavefronts at angles that are substantially equal to the Bragg angle.

4,040,723
OPTICAL APPARATUS FOR REPRODUCING A PAIR OF DATA IMAGES ON A COMMON PHOTOGRAPHIC PLANE

Abraham Groeneweg, Ridderkerk, Netherlands, assignor to N. V. Optische Industrie "De Oude Delft", Delft, Netherlands

Filed Dec. 15, 1975, Ser. No. 640,769
Claims priority, application Netherlands, Dec. 20, 1974, 7416674
Int. Cl.[2] G02B *17/00*; G03B *17/24*
U.S. Cl. 350—203 5 Claims

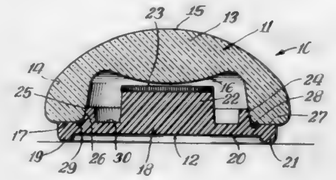


1. An optical apparatus for reproducing at least two independent data images on a common plane and adapted for use along with apparatus for producing a photographic image on that plane comprising
- a first optical system for reproducing the first data image on the common plane and having an optical axis generally perpendicular to that plane,
- first image rotating and inverting means in the first optical system arranged for rotation between discrete positions about the optical axis thereof,
- a second optical system for reproducing the second data image on the common plane and having an optical axis generally parallel to the optical axis of the first optical system,
- second image rotating and inverting means in the second optical system arrange for rotation between discrete positions about the optical axis thereof, and
- a pair of interchangeable optical elements, a first of which produces an even number of reflections and a second of which produces an odd number of relections, a one of the pair of optical elements being included in each of the first and second optical systems respectively, the pair of optical elements being mounted so that they are interchangeable.

4,040,724
MAGNIFYING DISPLAY ARTICLE

Josef F. Klingler, 1335 Gregory, Wilmette, Ill. 60091

Filed Aug. 22, 1975, Ser. No. 607,029
Int. Cl.[2] G02B *27/02*
U.S. Cl. 350—239 13 Claims

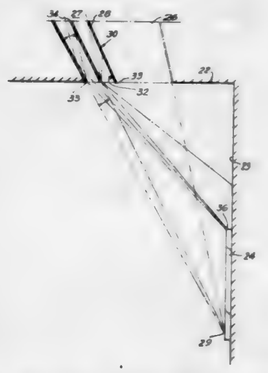


1. An article of manufacture comprising: a transparent cover defining a magnifying lens having a central vertical axis; a base having an upstanding mounting portion, an annular framing portion circumscribing said mounting portion and centering means engaging said cover for coaxially centering the mounting portion below said lens in fixed association therewith; and a display carried by and substantially fully covering said mounting portion for in-focus observation of the display through said lens, said framing portion immediately surrounding the display and being spaced below said display sufficiently to be out of focus.

4,040,725
DISPLAY ILLUMINATING STRUCTURE

Isaac Goodbar, Queens Village, N.Y., assignor to Edison Price, Inc., New York, N.Y.

Filed Jan. 22, 1976, Ser. No. 651,289
Int. Cl.[2] G02B *27/00*
U.S. Cl. 350—263 5 Claims



1. A display illuminating structure comprising a ceiling, a floor, a vertically extending display area disposed between said

ceiling and floor and delineated by top and bottom edges, said ceiling having a light transmissive window therein with front and rear edges proximate and remote from the plane of said display area and being exposed to the exterior ambient light, the planes between the top and bottom edges of said display area and the front rear edges of said window being at angles between about 15° and 45° to the plane of said display area, and means registering with said window directing and confining the major portion of the light incident on said window to said display area, wherein the light directing means comprises a plurality of transversely spaced, laterally extending slats inclined at angles between 15° and 45° to the vertical, and said angles of inclination increase with the distance of the respective slats from the plane of the display area, and the rearwardly directed faces of said slats are of low light reflectivity.

4,040,726
SEE-THROUGH MIRROR WITH SPACED REFLECTIVE STRIPS

Francis B. Paca, 1902 Leo Lane, Alexandria, Va. 22308

Filed Mar. 12, 1976, Ser. No. 666,366
Int. Cl.² G02B 5/08, 27/14
U.S. Cl. 350—288 **3 Claims**



1. In an automotive vehicle, a rear view mirror located in near adjacency to the vehicle windshield for observation from the driver's seat; said rear view mirror having a light-reflective surface that is interrupted at a number of spaced points thereacross so that the mirror is subdivided into contiguous interspersed vertical reflective strips and vertical transparent strips; the transverse width of each transparent strip being approximately the same as the transverse width of each reflective strip; each transparent strip and reflective strip having an imaginary vertical centerline; the centerlines of successive transparent strips being spaced apart by a distance equal to the average driver interpupillary distance of 60 millimeters times the factor X, where X is selected from the numerical grouping consisting of 2, 2/3, 2/5 and 2/7; each strip having an appreciable recognizable width whereby an average driver is enabled to simultaneously train one eye on a transparent strip and the other eye on a reflective strip.

4,040,727
TRANSFLECTOR

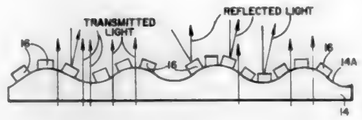
Richard D. Ketchpel, Santa Barbara, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 10, 1975, Ser. No. 612,121
Int. Cl.² G02B 5/08
U.S. Cl. 350—288 **9 Claims**

1. A transflector comprising,

a sheet of light transmitting material having an undulating surface, and

a discontinuous film of light reflecting material on said surface of said sheet forming a plurality of islands which exhibit a fissured pattern running in one direction across said sheet,

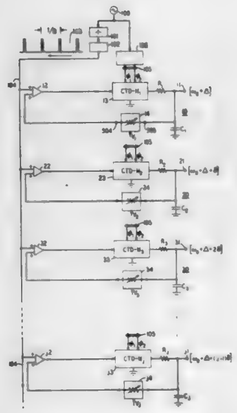


said film arranged to reflect substantial portions of incident light to prevent incident light from passing through said sheet and to permit light to be transmitted through said sheet from a light source behind said sheet.

4,040,728
ORDERED ARRAY OF INTEGRATED CIRCUIT SEMICONDUCTOR CHARGE TRANSFER DEVICE FEEDBACK DELAY TYPE OF STABILIZED PHASE-LOCKED RECURSIVE OSCILLATORS

Harold Seidel, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 27, 1976, Ser. No. 708,938
Int. Cl.² H03B 9/12
U.S. Cl. 331—55 **16 Claims**

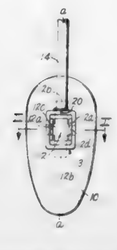


1. Semiconductor apparatus which comprises an array of a first plurality of electrical oscillators, each oscillator including different semiconductor charge transfer device delay lines; an input terminal of said transfer device being connected to an output terminal of a separate amplifier having first and second input terminals and an output terminal of said transfer device being connected to a separate one of said feedback paths, each path going from said output terminal of the corresponding charge transfer device to the second input terminal of the amplifier; a second plurality, that is equal to or smaller than said first plurality but is greater than one-half of the first plurality, of said feedback paths including a spearate variolosser element connected in series with a separate incremental time delay element for producing an incremental time delay in the feedback path which is less than that of the corresponding charge transfer device; whereby electrical oscillations having a predetermined different sinusoidal frequency in each oscillator can be generated in response to a locking signal delivered to said first input terminal of each of said amplifiers; and further including a different output terminal means in each of said oscillators for delivering an output signal of the corresponding oscillator in accordance with the corresponding said predetermined frequency.

4,040,729
ARTICULATED NOSE SUPPORT FOR SPECTACLE FRAME

Emil Winkler, Ispringen, and Manfred Kappler, Pforzheim, both of Germany, assignors to Fa. Frey & Winkler GmbH & Co. KG, Pforzheim, Germany

Filed Apr. 28, 1975, Ser. No. 572,151
Claims priority, application Germany, Apr. 29, 1974, 7415001[U]
Int. Cl.² G02C 5/12
U.S. Cl. 351—137 **15 Claims**



1. An articulated nose support for a spectacle frame designed to be supported on the flanks of the wearer's nose by engaging them with a spaced pair of such nose supports, each nose support comprising in combination:

a stem arm extending downwardly from the spectacle frame;

a generally rectangular, substantially closed stem frame rigidly attached to the lower end of the stem arm and serving as a first pivot member;

a substantially parallel-faced nose pad which is generally oblong in contour, vertically oriented, and has a suitably curved front face for supportive contact with a wearer's nose flank;

a bracket insert attached to the nose pad in the midportion thereof and having a carrying portion extending rearwardly and generally horizontally therefrom, said carrying portion being of a contour to fit inside the stem frame, to cooperate therewith as a second pivot member; and

a pivot connection between said two pivot members, thereby attaching the stem frame to the carrying portion of the bracket insert, so that the nose pad is made pivotable about a horizontal axis which is oriented substantially parallel to the general plane of the nose pad and which is spaced a distance from its rear face; and wherein

the pivot connection includes two axially spaced male and female pivot elements in the form of journal bores and cooperating journal trunnions defined by said two pivot members, respectively;

the journal trunnions are short, generally cylindrical axial extensions of one pivot member received inside matching journal bores of the other pivot member;

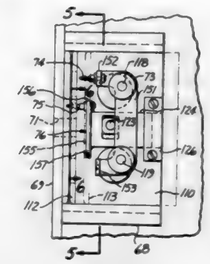
at least one of the two pivot members is elastically deformable in the axial direction, so as to permit axial movement of its pivot elements during assembly; and

the journal trunnions of one pivot member and at least one outer edge of the other pivot member define together entry taper means serving as a wedge during assembly, whereby the carrying portion of the bracket insert can be snapped into the stem frame, as the deformable pivot member is forcibly deflected in the axial direction.

4,040,730
FILM ADVANCING MECHANISM WITH FILM THREADING FACILITY

Harold A. Scheib, Encino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 657,342
Int. Cl.² G03B 1/22, 27/48
U.S. Cl. 352—192 **11 Claims**



1. In photographic film handling apparatus, the improvement comprising in combination:

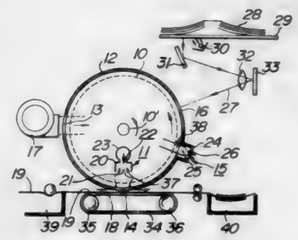
means for providing a film aperture; and

means for transporting photographic film relative to said film aperture, including a film advancing mechanism, a film pressure plate and a carriage for supporting said film advancing mechanism, means for releasably mounting said carriage, film advancing mechanism and film pressure plate for movement between an active position at said film aperture and a passive position spaced from said film aperture and enabling threading of film relative to said film aperture, and means for driving said film advancing mechanism in said active position for an advancement of film past said film aperture.

4,040,731
ELECTROPHOTOGRAPHIC APPARATUS HAVING A SCREEN-TYPE PHOTOCONDUCTIVE DRUM

Masaji Nishikawa, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1976, Ser. No. 672,444
Claims priority, application Japan, Apr. 4, 1975, 50-41080; Apr. 5, 1975, 50-40819
Int. Cl.² G03G 15/02, 15/22
U.S. Cl. 355—3 R **4 Claims**



1. An electrographic apparatus comprising:

a drum type screen photosensitive body rotatably mounted on a rotatable shaft,

a corona charge device located along the periphery of said photosensitive body and including a corona discharge wire connected through a high voltage source to ground, a grounded shield electrode and a grounded field electrode, said photosensitive body being interposed between said corona discharge wire and said shield electrode,

a substantially hermetically sealed cylindrical cover for

surrounding said photosensitive body and having at its periphery an air inlet opening and an ion outlet opening opposite to said corona discharge wire, and

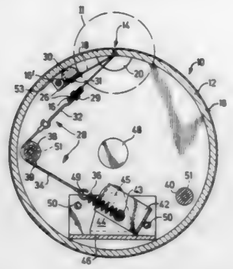
a fan opposite to said air inlet opening, whereby air under pressure is introduced through said air inlet opening into said cylindrical cover and discharged therefrom through said ion outlet opening.

4,040,732

PHOTOCONDUCTOR BELT AND DRUM ARRANGEMENT FOR PHOTOCOPYING APPARATUS

Wolfgang Hummel, Mainz-Kastel, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 27, 1976, Ser. No. 662,275
Claims priority, application Germany, Mar. 3, 1975, 2509117
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **15 Claims**



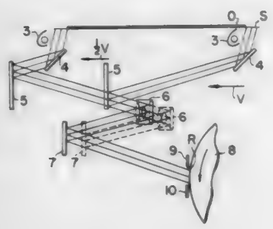
1. An electrophotographic copying apparatus comprising a cylindrical drum member having a circumferential wall and an aperture in said circumferential wall, and a photoconductor belt having first and second end sections, said belt covering the outer face of said wall, said belt passing through said aperture having a width of between 2 and 3 times the thickness of said belt and extending into the inner space defined by said circumferential wall to form a seal for said aperture by pressing together under tension against the face of said aperture, said end sections being secured in said inner space, the first of said sections being attached to a means for maintaining tension in said belt and the second of said end sections being attached to a fixed member within said drum.

4,040,733

VARIABLE MAGNIFICATION SLITWISE EXPOSURE PROCESS AND APPARATUS THEREFOR FOR USE WITH ELECTROPHOTOGRAPHIC COPYING MACHINE

Toyokazu Satomi, Yokohama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 23, 1975, Ser. No. 643,794
Claims priority, application Japan, Dec. 25, 1974, 50-3815
Int. Cl.² G03B *27/48, 27/50, 27/70, 27/32*
U.S. Cl. 355—8 **16 Claims**



1. A variable magnification slitwise exposure apparatus, for use with electrophotographic copying machines of the type in which a photosensitive surface is moved at a constant speed in a direction along a predetermined path having an exposure range therein at a fixed position while an original is scanned progressively by relative movement between the original and a source of light, said apparatus comprising: (a) holding means for supporting an original to be copied with its leading edge, considered in the scanning direction, always at a fixed position on the holding means irrespective of the magnification selected, (b) means operable to slitwise scan, at a constant rate which is adjusted dependent upon the magnification selected, an image of the original on said holding means, in order to transmit the original image onto said photosensitive surface, moving at said constant speed, at said fixed exposure range, (c) lens means having an optical axis and operable to focus the original image onto said photosensitive surface at said fixed exposure range, (d) means operable to adjust a first optical distance, between the original and said lens means, and a second optical distance, between said lens means and said photosensitive surface, in accordance with the magnification selected, (e) means operable to adjust said lens means, in accordance with the selected magnification, in a direction perpendicular to the optical axis of said lens means at a magnification of unity, by a distance y which is expressed by the following equation:

$$y = \frac{1-\beta}{1+\beta} h$$

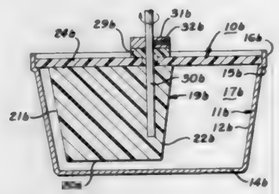
wherein β represents the selected magnification and h represents the height of a portion of the original image being scanned at unity magnification, and (f) means maintaining constant the quantity of light incident on a unit of area of said photosensitive surface through said lens means at any magnification for a given original image.

4,040,734

CRUST FORMER

Luther Ellis Glasgow, 2122 Lakeshore Ave., Oakland, Calif. 94606

Continuation-in-part of Ser. No. 361,654, May 18, 1973, Pat. No. 3,902,837. This application Aug. 28, 1975, Ser. No. 608,641
The portion of the term of this patent subsequent to Sept. 2, 1992, has been disclaimed.
Int. Cl.² A47J *43/00*
U.S. Cl. 425—218 **34 Claims**



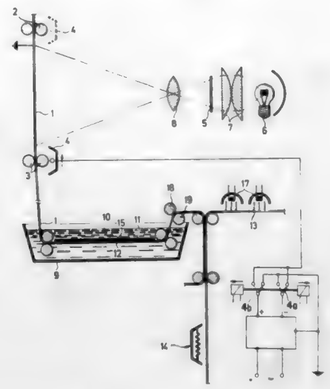
32. In a device for spreading material to form a crust in a container having a bottom wall and a peripheral side wall: a forming head having a bottom wall, a side wall and a wall extending between the bottom and side walls of the forming head to provide a radially extending surface for spreading crust material upon rotation of the forming head about the center of the container; support structure engageable with the container and having means to constrain the support structure against rotation relative to the container; and means rotatively mounting the forming head to the support structure for rotation about the center of the container with the bottom and side walls of the forming head facing the corresponding walls of the container.

4,040,735

APPARATUS FOR MICROFILM RE-ENLARGEMENT

Detlef Winkelmann, Wiesbaden-Biebrich; Bernd Löhr, and Helmut Stieger, both of Wiesbaden, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Continuation of Ser. No. 423,721, Dec. 11, 1973, abandoned, which is a division of Ser. No. 319,198, Dec. 29, 1972. This application Sept. 24, 1975, Ser. No. 616,476
Claims priority, application Germany, Dec. 31, 1971, 2165901
Int. Cl.² G03G *15/02*
U.S. Cl. 355—10 **2 Claims**



1. An apparatus for the re-enlargement of a positive or negative microfilm original comprising

charging means for the uniform charging negatively or positively respectively of a photoconductor which includes a high potential device with means for reversing the sign of the high potential for discharge elements providing the charge,

exposure means for projecting an enlarged image of a microfilm original onto said charged photoconductor,

developer means for applying one and the same developer onto said photoconductor, said developer means including a trough adapted to contain a liquid developer including particles having one polarity only, a developing electrode mounted in an insulated manner and having numerous uniformly distributed perforations, the electrode being located a short distance from the photoconductor in a developer bath and adapted to form a capacitor together with an aluminum vapor-coated conductive backside of the photoconductor when said photoconductor is arranged between both capacitor plates,

transfer means for transferring a developed charge image onto a copy support,

and means for moving the photoconductor through the apparatus.

4,040,736

STEP-AND-REPEAT PROJECTION ALIGNMENT AND EXPOSURE SYSTEM

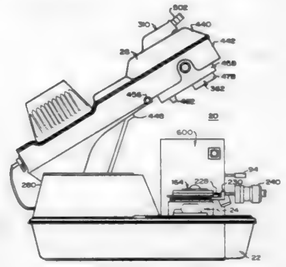
Karl-Heinz Johannsmeier, Mountain View, Calif., assignor to Kasper Instruments, Inc., Mountain View, Calif.

Division of Ser. No. 396,413, Sept. 12, 1973, Pat. No. 3,940,211, which is a continuation of Ser. No. 126,769, March 22, 1971, abandoned. This application Nov. 4, 1975, Ser. No. 628,793
Int. Cl.² G03B *27/42*
U.S. Cl. 355—43 **37 Claims**

1. Alignment apparatus comprising:

a workpiece holder for holding a workpiece, said workpiece holder being mounted for translational movement only along an optical axis of the workpiece;

a mask holder for holding a mask, said mask holder being mounted for translational movement along at least two orthogonal axes orthogonally intersecting an optical axis of the mask holder to permit alignment of the mask with a selected region of the workpiece; and



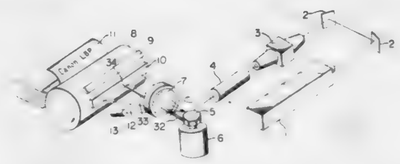
means mounted adjacent to the workpiece holder for selectively moving the workpiece to different positions thereon to permit alignment of different regions of the workpiece with the same mask.

4,040,737

METHOD AND ARRANGEMENT FOR ELIMINATING GHOST IMAGE

Katsumi Masaki, Kodaira; Kazuhiro Hirayama, Yokohama; Yasushi Sato, Kawasaki, and Yoichi Hirabayashi, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 25, 1975, Ser. No. 616,629
Claims priority, application Japan, Jan. 28, 1975, 50-11532
Int. Cl.² G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—49 **17 Claims**



17. An apparatus for eliminating a ghost image in an image handling apparatus comprising:

means for reflecting a light beam, having at least two non-parallel reflecting surfaces and movable about a fixed shaft;

light beam receiving means having a surface to be scanned by the light beam reflected by said reflecting means; and

means for displacing any light reflected by said light receiving means and re-reflected by said reflecting means away from the scanning line formed by said reflected light beam.

4,040,738

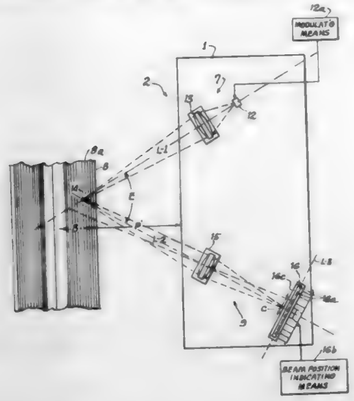
RAILROAD TRACK PROFILE SPACING AND ALIGNMENT APPARATUS

Herbert A. Wagner, Corona Del Mar, Calif., assignor to Gulton Industries, Inc., Metuchen, N.J.

Filed Mar. 20, 1975, Ser. No. 560,539
Int. Cl.² G01C *3/00*; E01B *29/04*
U.S. Cl. 356—1 **18 Claims**

1. In combination with a track rail with an upper section having a top and side surface on which the wheel of a railroad car rolls, a railroad car mounted for rolling movement on said track rails, the improvement in range sensor apparatus mounted on said railroad car for measuring the distance between a given point on said railroad car and said rail, said apparatus comprising: image projecton means for focusing the image of a light source on said side surface of said rail, re-

flected light image responsive means upon which the reflected diffuse light image is to be directed, and eflected diffuse light image receiving means for receiving the diffuse image reflected from said rail surface, said diffuse light image receiving means including means for focusing said reflected diffuse image onto said light image responsive means, the position of the focussed reflected diffuse light image on said reflected light image responsive means being a measure of the distance be-



tween said image projection means and said rail surface, and means supporting said image projection means and image receiving means relative to one another and said surface wherein the axis along which said image is focussed on said rail surface and the axis along which said image receiving means receives a focussed diffuse reflected image for said rail surface are in a plane making an oblique angle to said surface and extending longitudinally of said track.

4,040,739

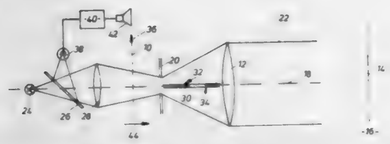
METHOD AND DEVICE FOR GENERATING A SIGNAL DEPENDENT ON THE DISTANCE OF AN OBJECT IN AN OBJECT SPACE

Wolfgang W. Witte, Burgbergring 9, 777 Uberlingen, Germany

Filed Mar. 15, 1976, Ser. No. 666,880

Int. Cl.² G01C *3/08*

U.S. Cl. 356—4 **24 Claims**



1. A method for generating a signal dependent on the distance of an object in an object space, comprising the steps of
   a. forming in said object space a real first pattern image having area portions of different optical characteristics;
   b. optically imaging said first pattern image as a second pattern image backwards on a physical pattern similar to said second pattern image;
   c. generating relative movement between said second pattern image and said physical pattern; and
   d. determining the variation of the radiation flux, from said object space and through said physical pattern, caused by said relative movement and producing a signal based on that determination.

4,040,740

OPTO-ELECTRONIC SENSOR

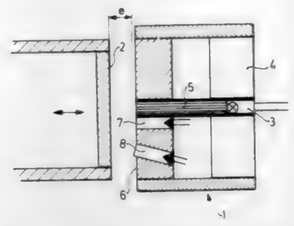
Dieter Handtmann, Sindelfingen, Germany, and Jean-Pierre Lavanchy, Neuchatel, Switzerland, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 30, 1975, Ser. No. 582,137

Claims priority, application Germany, July 2, 1974, 2431630

Int. Cl.² G01C *3/08*

U.S. Cl. 356—4 **9 Claims**



1. An apparatus for measuring the distance between first and second reference points, comprising; in combination:
   A. a frame defining said first reference point;
   B. a reflective reference surface defining said second reference point, movably associated with said frame;
   C. a source of light fixed in said frame for directing light toward said reference surface;
   D. a first light detector, fixed in said frame immediately adjacent to said light source for detecting primarily light which is retro-reflected from said reference surface and generating a first detector signal;
   E. a second light detector, fixed in said frame at a lateral distance from said light source and from said first light detector, for detecting primarily light which has been angularly reflected by said reference surface and for generating a control signal;
   F. circuit means, connected to said second light detector and to said source of light for so controlling the intensity of light provided by said source of light that said control signal from said secondary control detector remains substantially constant;

   whereby the magnitude of said first signal is independent of change in the coefficient of reflectance of said reflecting surface.

4,040,741

POLARIZED GRATING OPTICAL ODOMETER

David William Swift, Prestatyn, Wales, assignor to Perkin-Elmer Limited, Bucks, England

Continuation of Ser. No. 441,469, Feb. 11, 1974. This application June 18, 1976, Ser. No. 697,489

Claims priority, application United Kingdom, Feb. 14, 1973, 7125/73

Int. Cl.² G01P *3/36*

U.S. Cl. 356—28 **14 Claims**

1. Apparatus for measuring displacement of velocity relative to a surface characterized by non-uniform luminous intensity with respect to which said apparatus is independently supported at a distance, said apparatus comprising:
   grating means, having bands of two different optically selected characteristics arrayed transversely of the path of displacement and in alternating sequence, for rendering light from said surface which is incident on the bands having one characteristic optically distinguishable from that incident on the bands of the other characteristic;
   means including optically selective filter means for separating light from the bands having said one characteristic from the light coming from the bands of said other characteristic, thereby to provide from the light from the respective bands separate light signals representative of luminous intensity variations of such a surface; and

   means for comparing said separate light signals to produce



   an output signal derived from the difference therebetween.

4,040,742

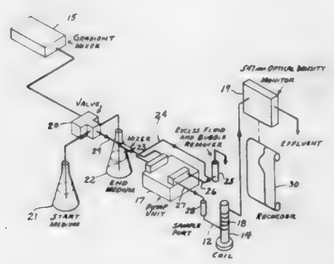
CAPILLARY FLOW METHOD AND APPARATUS FOR DETERMINATION OF CELL OSMOTIC FRAGILITY

Yoichiro Ito, Bethesda, and Peter Carmeci, Potomac, both of Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 713,045

Int. Cl.² G01N *33/16, 21/26*

U.S. Cl. 356—39 **13 Claims**



1. A method for determining cell osmotic fragility of a cell-containing sample comprising passing a salt solution through a capillary tube with substantially horizontal portions and wherein the flow follows Poiseuille's parabolic flow pattern, changing the osmotic gradient of the salt solution with time as it is passed through the capillary tube, inserting the sample in the tube so that it reaches said substantially horizontal portions, whereby the salt solution flows faster than the cells of the sample at said substantially horizontal portions and whereby the cells are exposed to salt solution of changing osmolarity, and continuously plotting the variation of optical density with time of the effluent from the capillary tube.

4,040,743

METHOD AND APPARATUS FOR MEASURING THE BRIGHTNESS OF PULP SLURRY

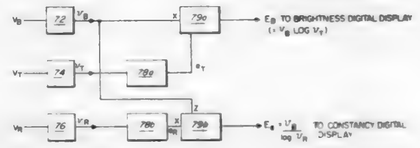
Henry F. Villaume, Intervale, N.H.; D. Stephen Collins, Bridgton, Maine, and Patrick J. Peoples, Intervale, N.H., assignors to Howell Laboratories, Incorporated, Bridgton, Maine

Filed Sept. 22, 1975, Ser. No. 615,584

Int. Cl.² G01N *21/00, 21/26*

U.S. Cl. 356—73 **31 Claims**

1. A brightness meter which comprises:
   a. means to introduce a beam of energy into a pulp slurry to measure a property of the slurry, which property is dependent upon at least two variables and which energy is back-scattered in a first direction, reflected in a second direction, and transmitted in a third direction;
   b. means to receive the back-scattered energy and to select the transmitted energy and to provide a selected signal;
   c. means to convert the selected signal to a log function;



   d. means to multiply the signal corresponding to the back-scattered energy with the selected signal, whereby one of the variables is eliminated in making the measurement of the desired property of the pulp slurry; and,
   e. means to display and processed measurement.

4,040,744

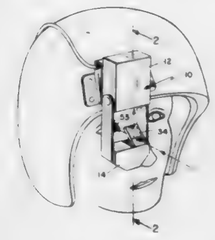
MULTIPLE SPECTRUM CO-AXIAL OPTICAL SIGHT AND CLOSED LOOP GUN CONTROL SYSTEM

Charles W. Schertz, and Edward H. Ritter, both of Claremont, Calif., assignors to General Dynamics

Filed Oct. 5, 1973, Ser. No. 404,077

Int. Cl.² G01B *11/26*

U.S. Cl. 356—152 **6 Claims**



1. A sight system for use in closed-loop gun control systems comprising:
   a plurality of detector means for detecting radiant energy at selected and different optical energy wave lengths;
   at least one of said detector means including a multiple element detector means for producing a signal indicative of the angular displacement and orientation of incident optical radiant energy;
   display means for converting processed signals from said multiple element detector means into a visual signal; and
   optical means for superimposing the visual signals from said display means into the visual sight line.

4,040,745

INSPECTION TOOL

James Garman Belleson, Hillsborough, Calif., and Kendall Clark, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

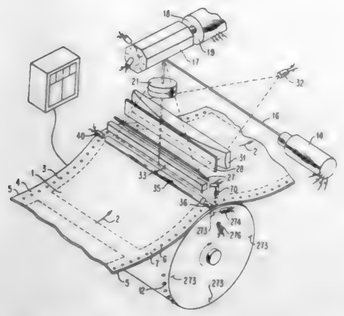
Division of Ser. No. 592,154, June 30, 1975. This application Mar. 25, 1976, Ser. No. 670,489

Int. Cl.² G02B *27/17*

U.S. Cl. 356—167 **21 Claims**

1. An inspection tool comprising: means to position a workpiece in a work zone, said workpiece having a pattern to be inspected; a source of coherent light and means to effect a sweep of said coherent light across said work zone; first light detector means positioned adjacent said work zone to receive

light reflected from said workpiece from a sweep of coherent light; a grating having a plurality of interdigitated light receiving and light transmitting lines thereon; means to reflect at least a portion of said coherent light onto said grating to intercept said lines on said grating at an oblique angle; second light detector means positioned to receive light transmitted by said light transmitting lines of said grating so that the position of said sweep of coherent light across said work zone may be determined; means to adjust the angle of said coherent light interception of said lines on said grating responsive to the light received by said first and second light detector means as compared with the position of a pattern on a nominal workpiece; means to provide relative movement between said workpiece and said sweep of coherent light across said work zone in a path substantially perpendicular to said sweep; an elongated flexible prism mounted for rotation adjacent said work zone in the path of said sweep of coherent light; first and second actuator means connected respectively to opposite ends of said prism; means to energize at least one of said first and second actuator means to effect rotation of at least said one end of said flexible prism upon said first light detector means detecting misalignment of said pattern on said workpiece relative to the position of the pattern on said nominal workpiece.

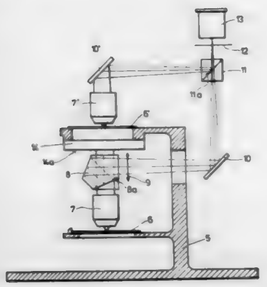


4,040,746

OPTICAL CONGRUENCE COMPARATOR

Christian Lietar, Morges, Switzerland, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed July 21, 1976, Ser. No. 707,322
Claims priority, application Germany, Aug. 21, 1975, 2537153
Int. Cl.² G02B *21/18*
U.S. Cl. 356—168 **7 Claims**



1. Optical congruence comparator to compare the outlined dimensions, in respective image planes of two objects (6, 6') comprising

a slide carrier (5) supporting said objects (6, 6') in superposed alignment with respect to a line perpendicular to said planes;

a microscope optic (7–10; 7'–10', 10''; 11–13) forming superposed images of said respective objects and including two objective channels (7, 7') having objective planes parallel to said imaging planes,

wherein the focal length of the microscope objective in one channel (7) is equal to one-half the distance (H) of separation of corresponding elemental area (A, A'), zones or points of the objects to be compared and the microscope optic generates an image of the areas, zones or points to be compared at, or close to essentially infinity; and

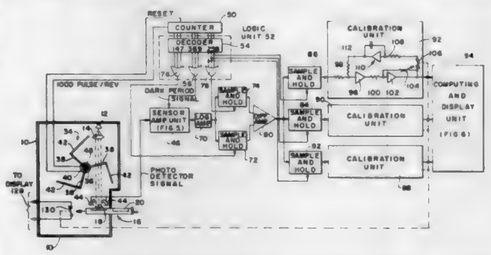
a plane mirror (14) fixedly connected to said carrier (5) and having a mirror plane (14*a*) which extends parallel to said imaging planes so that small rotary distortion of the carrier will not interfere with congruence of corresponding elemental areas, zones or points of the respective objects (6, 6') in the superposed microscope images.

4,040,747

OPTICAL ANALYZER FOR AGRICULTURAL PRODUCTS

Donald R. Webster, Laurel, Md., assignor to Neotec Corporation, Silver Spring, Md.

Continuation of Ser. No. 283,270, Aug. 24, 1972, abandoned. This application Aug. 15, 1974, Ser. No. 497,727
Int. Cl.² G01J *3/48*; G01N *21/48*
U.S. Cl. 356—188 **13 Claims**



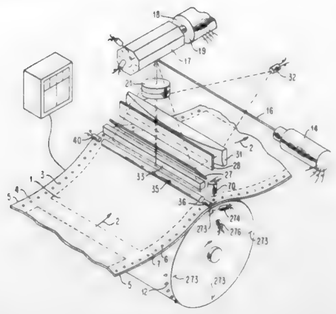
1. Optical measuring apparatus, comprising means for illuminating an object with a plurality of wavelengths of light in a continuous sequence, light sensitive means operatively positioned to produce an output indicative of the level of light received from said object, logic means responsive to said continuous sequence for producing a plurality of outputs indicative of illumination of said object by certain wavelengths of light, logarithmic amplifier means operatively receiving the output of said light sensitive means, a pair of sample and hold circuits operatively connected to receive the output of said logarithmic amplifier means and connected respectively for selective control by said logic means, differential amplifier means operatively connected to receive the outputs of said pair of sample and hold circuits to produce an output indicative of ΔOD, wherein ΔOD represents the difference in optical density at a pair of different wavelengths, a plurality of additional sample and hold circuits operatively connected to receive the output of said differential amplifier and respectively connected for selective control by said logic means to store separate outputs indicative of ΔOD at different pairs of wavelengths, and computer means operatively receiving the outputs of said additional sample and hold circuits for computing the value of mathematical function of the outputs of said additional sample and hold circuits.

4,040,748

INSPECTION TOOL

James Garman Belleson, Hillsborough, Calif., and Kendall Clark, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 592,154, June 30, 1975. This application Mar. 25, 1976, Ser. No. 670,488
Int. Cl.² G02B *27/17*
U.S. Cl. 356—199 **13 Claims**



1. An inspection tool comprising: means to position a workpiece in a work zone, said workpiece having a pattern to be inspected; a source of coherent light and means to effect a sweep of said coherent light across said work zone; first light detector means positioned adjacent said work zone to receive light reflected from said workpiece from said sweep of coherent light; a grating having a plurality of interdigitated light receiving and light transmitting lines thereon; means to reflect at least a portion of said coherent light onto said grating to intercept said lines on said grating at an oblique angle; second light detector means positioned to receive light transmitted by said light transmitting lines of said grating so that the position of said sweep of coherent light across said work zone may be determined; means to adjust the angle of said coherent light interception of said lines on said grating responsive to the light received by said first and second light detector means as compared with the position of a pattern on a nominal workpiece; means to provide relative movement between said workpiece and said sweep of coherent light across said work zone in a path substantially perpendicular to said sweep of coherent light; and means interconnecting the means to provide relative movement and said means to effect said sweep for synchronizing said sweep of coherent light to said relative movement of a workpiece in said path.

4,040,749

ORGANIC VAPOR DETECTION WITH LIQUID CRYSTALS

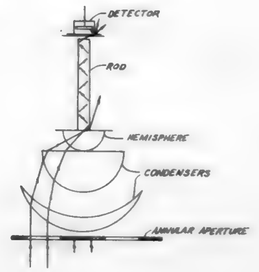
Donald J. David, Centerville, and Edgar E. Hardy, Kettering, both of Ohio, assignors to Monsanto Research Corporation, St. Louis, Mo.

Continuation of Ser. No. 547,311, Feb. 5, 1975, abandoned. This application July 16, 1976, Ser. No. 705,962
Int. Cl.² G01N *21/22, 21/48*
U.S. Cl. 356—201 **4 Claims**

1. A device for detecting organic vapors comprising

a. an elongated waveguide having on the surface thereof a sufficient amount of liquid crystal material sensitive to organic vapor to measurably change the light transmitting capability of said waveguide upon contacting said waveguide with said vapor.

b. a light source positioned to transmit light lengthwise through said waveguide, and



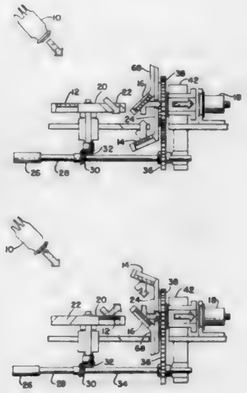
c. means for measuring the light exiting from said waveguide.

4,040,750

REAL TIME REFLECTOMETER

James M. Zwiener, Madison, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 28, 1976, Ser. No. 691,256
Int. Cl.² G01N *21/48*
U.S. Cl. 356—212 **7 Claims**



1. A reflectometer comprising:

radiation source;

fixed detector for determining reflectance;

rotating sample wheel containing an aperture and a sample cell, said sample wheel disposed in the optical path of said radiation source;

rotating optical wheel having an axis of rotation transverse to the axis of rotation of said sample wheel, said optical wheel means disposed in the optical path of said radiation source;

mirror means mounted upon said optical wheel for receiving radiation reflected from said sample cell and directing said reflected radiation into said detector, and for receiving radiation passing through said aperture and directing said unreflected radiation into said detector;

drive motor; and

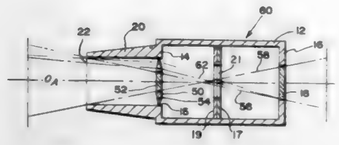
drive means connected to said motor, said sample wheel and said optical wheel for simultaneously rotating both said sample wheel and said optical wheel.

4,040,751

UNICELL PHOTOMETER DEVICE

Philip G. Baker, Peabody, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 13, 1976, Ser. No. 648,651
Int. Cl.[2] G01J 1/42; H01J 3/14
U.S. Cl. 356—225 10 Claims



1. A radiation measuring device compriaing;

a photoelectric transducer having a central axis and a photosensitive surface of given dimensions substantially perpendicular to said central axis;

an antiflare bezel extending around said axis in front of said transducer and having an open end for admitting radiation therethrough;

means for defining a variable limiting aperture positioned intermediate said open end of said bezel and said photoelectric transducer; and

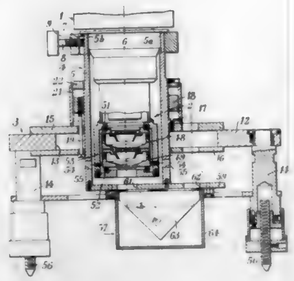
an optical element positioned along said axis intermediate said open end of said bezel and said transducer, said optical element in combination with said given dimensions of said photosensitive surface defining the field of view of said device, said optical element collecting radiation from within the field of view of said device to selectively direct said radiation toward said photosensitive surface of said transducer, said optical element including a first portion radially spaced away from said central axis to provide said device with a first directional response pattern to a discrete constant energy source positioned a given distance away from and in front of said device such that when said source is moved across the field of view of said device at said given distance said first directional response pattern includes a peak on-axis response which exponentially decreases as a function of the angular field position of said source such that said response equals zero when the source is outside of the field of view of said device and a second portion extending radially outward from said central axis to meet said first portion of said optical element to provide said device with a second directional response pattern to the source having a peak on-axis response lower than that of said first directional response pattern and which exponentially decreases as a function of the angular field position of said source at a lower rate than the exponential decrease of said first directional response pattern so that said first and second directional response patterns, when combined, provide said device with a preferred directional response pattern to the source which includes a peak on-axis response less than the peak on-axis response of said first directional response pattern but which exponentially decreases at a rate intermediate the rates of decrease of said first and said second directional response patterns.

4,040,752

LASER UNIT WITH A LASER BEAM AUTOMATICALLY ALIGNED TO THE VERTICAL DIRECTION

Luc André Tagnon, Saint Mande, France, assignor to Essilor International (Compagnie Générale d'Optique), Joinville Le-Pont, France

Filed Mar. 28, 1975, Ser. No. 562,891
Claims priority, application France, Apr. 24, 1974, 74.14229
Int. Cl.[2] G01C 9/18
U.S. Cl. 356—249 12 Claims



1. A laser unit for directing a laser beam in a strictly vertical direction which comprises a laser proper, an afocal system, a base structure having means for supporting said laser and afocal system in a position such that said laser has its axis disposed in a substantially vertical position, an optical device for automatically correcting the verticality of the laser beam emitted from said laser, said optical device being located after said afocal system on the substantially vertical path of said laser beam and comprising a pair of coaxially superposed cups containing a liquid having an index of refraction of 1.5, the bottom of each one of said cups consisting at least partly of a parallel-faced transparent blade, said blades being parallel to each other, said support means comprising means allowing the assembly of said laser, focal system and automatic correction device to rotate about the substantially vertical axis of said laser beam, said cups being housed in a cylindrical case having coaxial top and bottom aperture permitting the passage of the laser beam, said case being secured coaxially to said laser, and adjustment means adapted to be actuated from the outside of said case for adjusting the orthogonality of said parallel-faced transparent blades of said pair of cups with respect to the incident laser beam.

4,040,753

APPLICATOR INSTRUMENT

Vernon D. Griffith, Wichita, Kans., assignor to Griffith, Inc., Wichita, Kans.

Filed July 15, 1976, Ser. No. 705,409
Int. Cl.[2] B43M 11/06
U.S. Cl. 401—186 10 Claims

1. A liquid applicator instrument comprising:

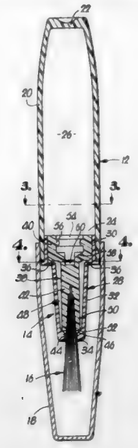
a compressible hollow body adapted to contain said liquid and having an open end;

a nozzle assembly mounted in the open end of the body and including a stem element and a ferrule element, said ferrule element having a base retained within the open end of the hollow body, and a tip extending outwardly from the base;

liquid passage means through the nozzle, said passage means being open when said elements are in one relative position and closed when said elements are in another relative position; and

brush means mounted in the nozzle assembly and disposed to receive liquid from the passage means when the latter is open,

said ferrule element including a flexible wall interconnecting the base and the tip of said ferrule, whereby said tip may be shifted to said one relative position with respect to said stem upon compression of said hollow body to open said passage and to said other relative position upon release of such compression to close said passage

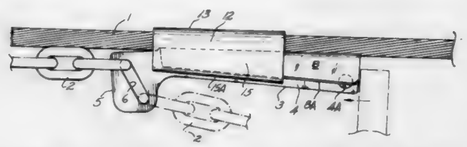


4,040,754

CABLE ATTACHMENT

Elvin O. Burroughs, 81650 Lost Creek Road, Dexter, Oreg. 97431

Filed Feb. 26, 1976, Ser. No. 661,747
Int. Cl.[2] F16G 11/04
U.S. Cl. 403—16 1 Claim



1. A cable attachment adapted for wedged engagement with a segment of tensioned cable, said attachment comprising,

a main body member for lengthwise abutment against said cable segment, said body member having a lengthwise orientated base and a pair of surfaces offset from and inclined relative to the axis of said cable segment, an enlarged head portion at one end of said base and at the lower end of the incline defining an elongate opening inclined to the cable axis within which a tensionable member is retained,

a secondary member adapted for engagement with said main member and having lengthwise orientated surfaces for coaction with the pair of inclined surfaces on said main body whereby relative movement between said members will draw said members toward one another and into gripping engagement with said cable segment, and

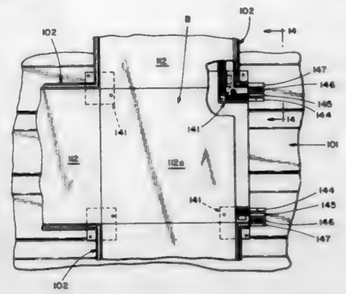
said main body member and secondary member adapted for disengagement by sudden impacting of the tensionable member against that part of the head portion defining the outer end of said elongate opening.

4,040,755

TRENCH DUCT CONNECTOR

George N. Jorgensen; Frank D. King, and DeForest D. Butler, all of Oxford, Ohio, assignors to Square D Company, Park Ridge, Ill.

Continuation of Ser. No. 545,109, Jan. 29, 1975, abandoned. This application Feb. 20, 1976, Ser. No. 660,202
Int. Cl.[2] E04F 17/08; F16B 9/02
U.S. Cl. 403—205 8 Claims



1. A connector for use as an inside connector in one position and as an outside corner in an inverted position in a trench duct system of a type including spaced apart elongated generally parallel side rails and removable cover plates spanning the distance between the side rails to engage correlative surfaces of the side rails, said connector comprising:

two angularly disposed leg segments forming a first generally planar surface and a second generally planar surface on a side opposite the first surface with both surfaces adapted to engage a cover plate, an acute-angle side surface and an obtuse angle side surface, and two distal end surfaces;

a first rib-like elongated portion located on and protruding above the first surface, extending alongside the acute angle side, and having a top surface generally parallel to the upper surface and raised above the first surface a height selected to form a surface coplanar with the cover plates when assembled;

a second rib-like elongated portion located on and protruding above the second surface, extending alongside the obtuse angle side, and having a surface generally parallel to the second surface and raised above the second surface a height selected to form a surface coplanar with the cover plates when assembled; and

a means for fastening the connector to adjoining side rails of the trench duct sections.

4,040,756

DRILL ROD THREAD FORM

Edward Alfred Donegan, St. Catharines, Canada, assignor to TRW Canada Limited, Canada

Filed Mar. 5, 1976, Ser. No. 664,259
Int. Cl.[2] F16B 7/00
U.S. Cl. 403—307 4 Claims



1. Apparatus for use in percussion drilling for transmitting rotary and downwardly directed percussive forces to a drill bit, said apparatus comprising a first part and a second part, said first part having a cylindrical internal thread structure which cooperates with a cylindrical external thread structure

on said second part, said thread structures on said first part and said second part being formed about a thread axis and constructed to minimize unlocking torque, the threads on said parts each having first and second axially spaced flanks, said first flanks each having a linear portion, said threads on each of said parts also having a crest portion extending between the outer edges of said first and second flanks and a root portion for interconnecting adjacent threads, said root portions of at least said second part being continuously curved and tangentially joined to the flank portions adjacent therewith such that local stress concentration is reduced, the crest portions of said threads being radially spaced from the root portion of the cooperating threads, said linear portions on said first flanks on one of said parts abutting said linear portions on said first flanks on the other of said parts, said first flanks being axially spaced from said second flanks to provide a thread of a thickness to accommodate substantial erosion of said first flanks by rotary and percussive forces during percussion drilling, said second flanks on said one part being spaced from said second flanks on the other of said parts, said first flanks being inclined at an angle of between 25° and 40° to the thread axis, and the crest portion of the threads of both said first and second parts being angled away from the abutting first flank portion of that thread toward the root portion of that thread to form a peak portion of the crest adjacent the abutting first flank portion such that after substantial wear of the abutting flank the crest portion of that thread remains out of substantial contact with the cooperating thread.

4,040,757

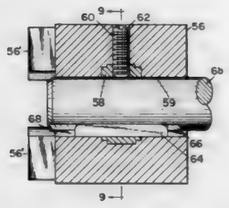
DRIVE COUPLING

Ernest H. Pauli, Watchung, N.J., assignor to The Hilliard Corporation, Elmira, N.Y.

Continuation-in-part of Ser. No. 286,346, Sept. 5, 1972, Pat. No. 3,884,049. This application Mar. 12, 1975, Ser. No. 557,826

Int. Cl.[2] F16B *3/00*

U.S. Cl. 403—356 **2 Claims**



1. A universal drive coupling element adapted to be mounted on a first, rotatable shaft to form a drive connection with a second shaft comprising, a cylindrical molded plastic member, a plurality of symmetrically disposed axially projecting forward end portions operable to form a slideable, torque transmitting, engagement with a similar coupling element oppositely disposed on a second shaft, a rearwardly extending cylindrical body member, an axially disposed bore extending inwardly from the rearward end of said member to slideably receive said first shaft therein, an annular metal member integrally molded in said rearward body member concentric with said shaft receiving bore, and having a central opening whose surface is contiguous with and forms a longitudinal segment intermediate the ends of said shaft receiving bore, a radially disposed threaded member extending through the wall of said rearward body member and said annular metal insert threadedly engaged with said metal insert and engagable with (a) the shaft in said bore, said first shaft contains a longitudinal key slot and having a projecting locking member in lateral engagement with said annular member that projects into said key slot to resist relative rotation of said coupling member and said first shaft.

4,040,758

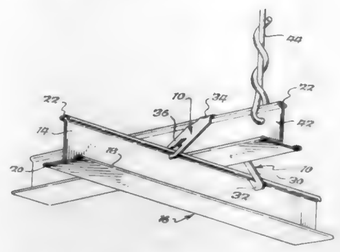
SUSPENDED CEILING HANGING CLIP

Gale E. Sauer, Williamsville, N.Y., assignor to Roblin Industries, Inc., Buffalo, N.Y.

Filed Jan. 24, 1975, Ser. No. 543,920

Int. Cl.[2] E04B *5/52*

U.S. Cl. 403—397 **7 Claims**



1. In combination, a first grid system member having an upstanding web portion surmounted by a longitudinal bead means, a second grid system member disposed above said first grid member, and a hanger clip for supporting said first grid member from said second grid member, said hanger clip comprising:

a first end, said first end having a substantially planar web means and a tongue means protruding outwardly from said web means wherein said tongue means is substantially perpendicular to the plane of said web means, is transversely centered thereon and includes a reduced neck portion adjacent to said web means for connection thereto, said first end further including hook means adapted for locking engagement with said bead means of said first grid member and

a second end, said second end being integrally connected to said first end and having hook means adapted for locking engagement with said first grid member, said hook means comprising a pair of bifurcated, snap acting legs disposed on the portion of said second end most distal from said first end for snap locking engagement on said longitudinal bead means of said first grid system member, said clip further including a flexible connective portion between said ends thereof wherein said flexible connective portion is disposed to straddle said second grid member and said hook means on said first and second ends lockingly engage said bead means of said first grid member on opposite sides of said second grid member and therebelow so that said first grid member is supported from said second grid member.

4,040,759

WARNING, MARKING AND/OR BARRIER ARRANGEMENT

Olaf Narten Skalle, Vollebergvn. 32, 1620 Gressvik, Norway

Filed Sept. 1, 1976, Ser. No. 719,448

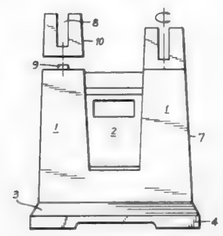
Claims priority, application Norway, Sept. 3, 1975, 753024; Aug. 4, 1976, 762701

Int. Cl.[2] E01F *15/00*

U.S. Cl. 404—6 **12 Claims**

1. A warning, marking and/or barrier arrangement with trestle barriers, barrier planks, and mountings for signboards combinable into units for warning, marking and/or barring purposes, and comprising: a trestle barrier of plastic material and shape of a hollow double pyramid having a hollow connecting web; a hollow support for mounting said pyramid and web; the top of each pyramid having grooves extending in two normal directions; barrier planks having securing elements at their end portions; mounting means for placement of signboard means; said mounting means being in lowermost portions adapted to said grooves, said mounting means having lugs in

center portions and having a hole in uppermost portions; a slide bar secured to said hole, said slide bar having a slot and



having an upper edge shaped to engage over the edge of a sign board.

4,040,760

DIRECTION-INDICATING SURFACE MARKING APPARATUS FOR ROADWAYS AND THE LIKE

Charles W. Wyckoff, 85 Pine St., Needham, Mass. 02192

Continuation of Ser. No. 478,453, June 12, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,267

Int. Cl.[2] E01F *9/08*

U.S. Cl. 404—14 **14 Claims**



1. In combination with a roadway surface, a direction-indicating surface marker apparatus comprising a thin, elongated strip of substantially continuous solid-surface planar plastic material pre-formed separately from said roadway surface and adhered to said roadway surface by a thin layer of adhesive between the strip and the roadway surface, said strip being intermittently deformed upwardly to provide successive transversely-disposed contiguous wedges of saw-tooth cross-sectional configuration, each wedge having one substantially continuous solid surface inclining upwardly and another substantially continuous solid surface inclining downwardly; said downwardly inclining surfaces being integrally covered by retroreflective means, and presenting a predetermined color, said retroreflective means comprising a highly reflective layer and refractive elements thereon for conjointly reflecting incident light in a direction opposite to the direction of incidence, said downwardly inclining surfaces forming acute angles relative to the roadway surface that are in the range from about 45° to almost 90° and said downwardly inclining surfaces being disposed on said strip so that said retroreflective means is exposed to incident light at small acute angles relative to said roadway surface for retroreflection; said upwardly inclining surfaces being differently colored, said strip having sufficient structural strength to permit it to be handled and secured to said roadway surface and being substantially flat as a whole on said roadway surface so as to avoid tire chatter for vehicles riding over the strip.

4,040,761

PIGGYBACK TRACTOR POWERED ROLLER

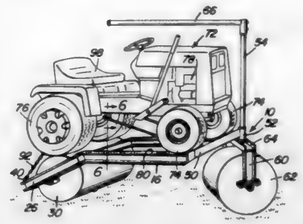
LeRoy W. Rahn, Rte. 2, Box 181 A, Waupun, Wis. 53963

Filed Nov. 23, 1976, Ser. No. 744,328

Int. Cl.[2] E01C *19/23*

U.S. Cl. 404—86 **8 Claims**

1. In combination, a roller chassis including front and rear ends, a rear horizontal transverse roller journalled from the rear end of said chassis, a front roller support dependingly supported from the front end of said chassis for oscillation about a vertical axis, a front horizontal roller journalled from said roller support, said chassis including opposite side longitudinally extending wheel ramp portions projecting forwardly from said rear roller adapted to support the front wheels of a lawn tractor rolled forwardly therealong, said chassis including a rear portion adapted to have one portion of tractor anchoring structure anchored thereto, said front roller support



including a central upwardly projecting steering shaft including a generally horizontal rearwardly projecting steering tiller arm spaced above said chassis sufficiently to receive therebeneath the forward end of a lawn tractor having its front wheels supported from said wheel ramp portions, said tiller arm projecting rearwardlyfrom said steering shaft a distance sufficient to extend to the operator's position of said lawn tractor.

4,040,762

DEVICE AT ROAD ROLLER

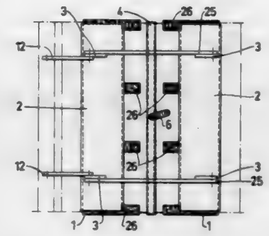
Mats Ake Nilsson, Taftea, Sweden (91035)

Filed Jan. 15, 1976, Ser. No. 649,418

Claims priority, application Sweden, Jan. 17, 1975, 7500490

Int. Cl.[2] E01C *19/26*

U.S. Cl. 404—129 **15 Claims**



1. A device for preventing material from adhering to the roll surface of a roller of a road roller, which comprises

a water tank;

an apertured spray tube leading from the water tank to and above the roll surface and intermediate the edges of the latter; and

at least one mat which abuts the roll surface and extends over the whole width thereof which mat is provided with means preventing water coming from the spray tube from flowing out in axial direction over the edges of the roll surface.

4,040,763

METHOD AND FIXTURE FOR REAMING PISTON PIN BUSHINGS IN CONNECTING RODS

Gerhard Assenmacher, 5725 Olde Stage Road, Boulder, Colo. 80302

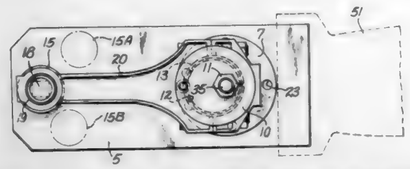
Filed Oct. 28, 1975, Ser. No. 626,050

Int. Cl.[2] B23B *35/00, 41/12*

U.S. Cl. 408—1 R **16 Claims**

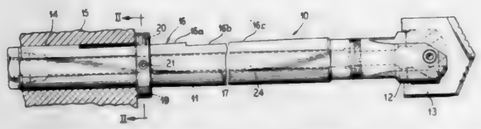
1. A fixture for reaming piston pin bushings in connecting rods comprising an elongated base member having support

column means secured to one end thereof and at least one reamer guide bushing mounting means on the remaining end thereof; rotatable eccentric means mounted on said support column means supporting the crankshaft journal end of a connecting rod to be reamed; indexing means supported on said base member and including detent means coacting with means providing different predetermined fixed rotational positions for said rotatable eccentric means for setting and fixedly detaining said rotatable eccentric means in a selected one of a number of different predetermined fixed rotational positions,



said detent means being readily adjusted to set said rotatable eccentric means in a precise easily reproduced manner to any selected one of said number of different predetermined fixed rotational positions whereby said fixture readily and with precision can be adjusted to accommodate different length connecting rods; and locking means securing a connecting rod to be reamed in position on said fixture with the crankshaft journal end thereof supported on said rotatable eccentric means and the piston pin end centered over the reamer guide bushing mounting means.

4,040,764
TOOL HOLDER
Walter Baturka, Frankenmuth, Mich., assignor to Houdaille Industries, Inc., Buffalo, N.Y.
Filed May 6, 1976, Ser. No. 683,666
Int. Cl.[2] B23B *51/06*
U.S. Cl. 408—59 **8 Claims**



1. A holder for holding a cutting tool in a machine tool, comprising:

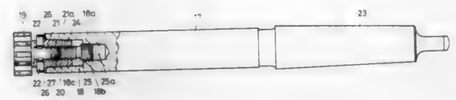
a. a shank adapted at one end to support the cutting tool, the other end thereof being receivable in the machine tool and adapted to locate the holder accurately in a radial direction;

b. means intermediate said ends defining an elongated outwardly facing straight ramp extending along the length of said shank, said ramp gradually sloping radially outwardly as it extends toward said one end;

c. means on said shank defining a flat surface extending along the length of said ramp and angularly displaced therefrom; and

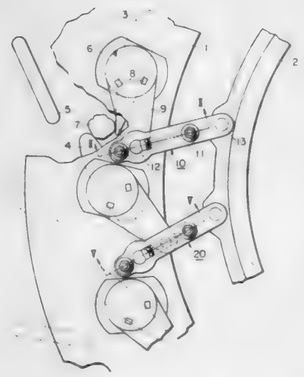
d. a lock ring surrounding said shank and clamped thereto on said ramp and on said flat surface, said ring being adapted to engage the machine tool with a side thereof facing said one end.

4,040,765
REAMER
Istvan Vig, Olten, Switzerland, assignor to Merz AG Dulliken, Dulliken, Switzerland
Filed Oct. 16, 1975, Ser. No. 622,856
Claims priority, application Switzerland, Oct. 18, 1974, 13983/74
Int. Cl.[2] B23B *31/04*
U.S. Cl. 408—239 A **8 Claims**



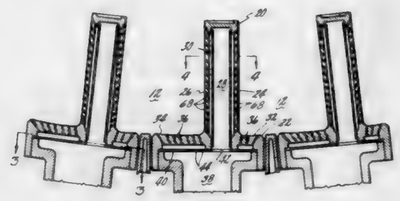
1. A reamer comprising a tool shank having at one end means for engagement in the lathe spindle of a machine tool and at the other end a conical socket; a reamer head having an integral conical butt for seating engagement in said socket to achieve precision alignment of said head with said tool shank; cooperating detent means carried on said sleeve portion and butt respectively for preventing rotation of said reamer head relative to said tool shank; and means for releasably securing the conical butt in said socket, said releasable securing means comprising a screw threaded portion arranged on the tool shank coaxially with the shank axis, an axially movable screw threaded nut means for threadwise engagement with said threaded portion, and a rigid longitudinal force-transmitting member received in and extending lengthwise of said shank for independent axial movement, means for releasably connecting said force transmitting member at one end to said butt, and means associated with said member at the other end for connecting said member to said nut means for transmitting the axial movement of the threaded nut means to said conical butt through said force transmitting member to move the conical butt into and out of said conical socket.

4,040,766
GATE PROTECTING DEVICE FOR HYDRAULIC MACHINES
Kenzi Sekido, and Tsugio Yoshikawa, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 17, 1976, Ser. No. 658,680
Claims priority, application Japan, Feb. 14, 1975, 50-17810
Int. Cl.[2] B23B *39/04*
U.S. Cl. 415—9 **12 Claims**



1. A gate protecting device for hydraulic machines having a plurality of movable gate vanes having their position controlled by a movable control member, comprising: a plurality of link means for transferring a control force from the control member to corresponding ones of the gate vanes and each having a pair of spaced apart link members facing each other and mounted for movement toward and away from each other; a plurality of lever means for driving the gate vanes and being disposed between corresponding pairs of said link members; spring means biasing said link members towards each other to decrease the distance between said link members; connecting means normally pivotally connecting said link members to said lever means and to the control member; when the control force transmitted between one of said lever means and the control member exceeds a predetermined amount, said connecting means providing relative translation of one of said one lever means and the control member with respect to said link members; and friction means between said link members and said connecting means braking the relative translation, and including means moving said link members apart during translation against the bias of said spring means causing a frictional force resisting relative translation.

4,040,767
COOLABLE NOZZLE GUIDE VANE
James Albert Dierberger, Hebron, and Loren Hawdon White, East Hartford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Continuation-in-part of Ser. No. 583,142, June 2, 1975, abandoned. This application Aug. 11, 1976, Ser. No. 713,734
Int. Cl.[2] F01D *25/12*; F02C *7/18*
U.S. Cl. 415—115 **9 Claims**



1. In a gas turbine engine having a flow path which extends axially through the turbine section of the engine, a nozzle guide vane disposed across the path, which includes:

an airfoil section comprising

a pressure wall having an inner surface and a multiplicity of cooling holes disposed therein,

a suction wall having an inner surface and a multiplicity of cooling holes disposed therein, and which is joined to the pressure wall forming an airfoil cavity therebetween,

a plurality of sealing ribs which extend from the inner surfaces of the pressure and suction walls of the airfoil section in a spanwise direction with respect to the airfoil section, and

baffle means within the airfoil cavity which contact the ribs forming a plurality of axially adjacent chambers along the inner surfaces of the platform and suction walls, the baffle means having a multiplicity of orifices which are sized and spaced to provide flow into each chamber from the airfoil cavity at a velocity which is sufficient to cause the admitted air to impinge upon the opposing inner surfaces of the airfoil walls; and

a platform section having an internal platform cavity and comprising

a pressure wall having an inner surface and a multiplicity of cooling holes disposed therein,

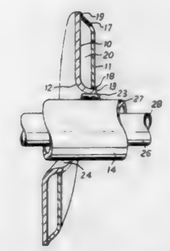
a suction wall having an inner surface and a multiplicity of cooling holes disposed therein,

a plurality of sealing ribs which extend into the platform cavity from the inner surfaces of the pressure and suction walls of the platform section, and

baffle means within the platform cavity which contact the ribs forming a plurality of adjacent chambers, the baffle means having a multiplicity of orifices which are sized and spaced to provide flow into each chamber from the platform cavity at a velocity which is sufficient to cause the admitted air to impinge upon the inner surfaces of the platform walls,

the cooling holes of said platform and airfoil walls and the orifices of said airfoil and platform baffle means being sized and spaced to provide a diminished cooling air pressure in each axially adjacent downstream chamber during operation of the engine.

4,040,768
MIXING, CONVEYING HEATING AND/OR COOLING APPARATUS
Robert Francis Christian, San Francisco, Calif., assignor to Jude Engineering Incorporated, San Francisco, Calif.
Filed Dec. 8, 1975, Ser. No. 638,633
Claims priority, application United Kingdom, Mar. 27, 1975, 12997/75
Int. Cl.[2] B01F *7/08*
U.S. Cl. 416—122 **4 Claims**



1. A heat exchange apparatus comprising a shaft and a hollow helical blade mounted on and surrounding the shaft, said blade being made of pairs of helically shaped split discs, the first disc of each pair being shaped with its inner margin curved into or nearly into the axial direction, the remainder of the disc being substantially radial to the shaft, and the second disc being welded to the first disc at its inner edge to the outer surface of the inner margin of the first disc and its outer margin curved towards the first disc and welded to it, the remainder of the second disc being substantially radial to the shaft, the discs being spaced apart between their inner and outer edges to form a single continuous space extending helically around the shaft and through which a heat exchange medium can flow through the hollow blade.

4,040,769
FAN WHEEL
Robert N. Britz, 105 Murphy Lake Road, Park Ridge, Ill. 60068
Filed Feb. 20, 1976, Ser. No. 659,790
Int. Cl.[2] F04D *29/34*
U.S. Cl. 416—213 A **5 Claims**

1. An axial flow fan wheel comprising a hub having an opening for receiving a rotatable shaft and means for attaching said hub to such shaft, a pair of axially spaced discs each having a center opening receiving said hub and being welded to said hub around said center opening, a cylindrical ring in the axial space between said discs being welded at each of its edges to one of said discs radially inwardly from the terminal edges of said discs so as to define with said terminal edges of said discs a pair of flanges which protrude radially beyond said ring, a plurality of fan blades extending radially from said ring, each blade having its inner edge contacting and generally

conforming in shape to the outer surface of said ring, said inner edge being welded to said ring, and each blade also being



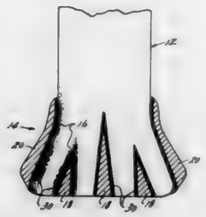
welded to each of said flanges along its front and back edges extending radially outwardly from said inner edge.

4,040,770

TRANSITION REINFORCEMENT OF COMPOSITE BLADE DOVETAILS

Robert G. Carlson, Greenhills, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 643,497
Int. Cl.[2] F01D *5/28*
U.S. Cl. 416—230 **5 Claims**



1. In a blade comprising an airfoil and dovetail including a plurality of bonded filament laminates comprising elongated filaments embedded in a matrix material, the laminates being splayed at a location along their length and receiving a metallic insert for bonding therebetween, the improvement comprising a transition material comprising a wire mesh embedded in the same matrix material, bonded along substantially the entire interface between the filament laminates and the insert, said transition material having a modulus of elasticity greater than that of the insert and less than that of the laminates.

4,040,771

LINE RELAY VALVE

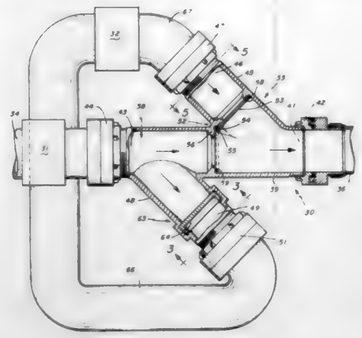
Paul A. Leach, Jaffrey, N.H., assignor to Jaffrey Fire Protection Company, Inc., Jaffrey, N.H.

Filed May 14, 1976, Ser. No. 686,452
Int. Cl.[2] E03B *5/00*
U.S. Cl. 417—62 **8 Claims**

1. In a fire fighting system of the type having a first portable pumper with an elongated influent flexible hose for connection to a distant source of water and an effluent flexible hose for directing said water onto a fire, the combination of line relay valve means, said means comprising:

a generally Z-shaped, unitary valve body having a straight tubular trunk with a first hose coupling at trunk effluent end and a second hose coupling at a trunk influent end, a first tubular branch angled to said trunk proximate said trunk effluent end and having a third hose coupling at a first branch influent end and a second tubular branch angled to said trunk proximate said trunk influent end and having a fourth hose coupling at second branch effluent end;

automatically operable valve means comprising a valve seat in said first branch, an identical valve seat in said trunk and a clapper pivoted to said body to swing from one said seat to the other for blocking flow through said branch or said trunk;



a manually operable gate valve in said second branch for blocking flow therethrough when closed;

and a second portable pumper with an influent flexible hose coupled to said third hose coupling

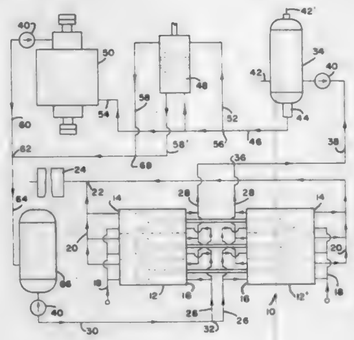
whereby opening said gate valve and operation of said second pumper causes said clapper to swing to close the said seat in said trunk to by-pass the water from said first pumper through said second pumper and thence through said first branch to said effluent hose.

4,040,772

FLUID ENERGY SYSTEM

Antonio Caldarelli, Apt. 29, Clinton Manor, 281 W. Clinton St., Dover, N.J. 07801

Filed Sept. 5, 1974, Ser. No. 503,255
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—364 **4 Claims**



1. A fluid energy system, comprising:

means defining an internal combustion engine;

said engine-defining means comprising means for generating pressured working fluid;

means for storing pressured working fluid;

means for conducting pressured working fluid from said engine-defining means to said storage means for storage; and

means for discharging stored, pressured working fluid from said storing means for use in powering ancillary fluid-powered machines; wherein

said engine-defining means define at least one reciprocating, internal combustion engine;

said at least one engine having at least a first pair of cylinders disposed in juxtaposition, and a second pair of cylinders, also disposed in juxtaposition, and double-acting pistons, each of said cylinders having one of said pistons reciprocatable therewithin;

a first of said pistons, which is reciprocatable in one cylinder of said first pair of cylinders, is rigidly fixed to one end of a first, piston rod;

a second of said pistons, which is reciprocatable in one cylinder of said second pair of cylinders, is rigidly fixed to the other end of said first piston rod;

a third of said pistons, which is recprocatable in the other cylinder of said first pair of cylinders, is rigidly fixed to one end of a second, piston rod;

a fourth of said pistons, which is reciprocatable in the other cylinder of said second pair of cylinders, is rigidly fixed to the other end of said second piston rod; and

said first and second piston rods are commonly coupled to a single, rigid carrier for coincident reciprocation together;

said system further including

means for addressing working fluid to one of two opposite ends of each of said pistons, to cause said working fluid to be pressured by said pistons during power strokes of said pistons;

said pistons have means for communicating a quantity of working fluid addressed to said one ends thereof with slidably interfacing walls of said pistons and their associated cylinders for lubricating said walls, and means prohibiting a communication of said quantity of fluid with the other of said opposite ends of said pistons;

means coupled to said cylinders operative for admitting fuel thereinto for ignition to operate on said opposite ends of said pistons, to drive said pistons in power strokes;

means coupled to said rigid carrier for operating said fuel admitting means coincident with reciprocation of said carrier and said piston rods; wherein

said fuel admitting means comprises intake and exhaust valving;

said operating means comprises means actuable for operating said valving, and means borne by said carrier for actuating said valving-operating means;

said valving-operating means and said actuating means are co-operative to effect a lost motion, between said valving-operating means and said actuating means, to cause said valving-operating means to manifest a delayed response to motion induced in said carrier;

said carrier has recesses formed therein;

said actuating means comprises a pair of parallel, reciprocatable rods;

said latter rods are slidably disposed in said recesses, and each of said latter rods has a pair of spaced-apart prominences thereon; and

said carrier has a limb projecting therefrom, intermediate said prominences, for alternating and delayed contacting engagement directly with said spaced-apart prominences to cause reciprocation of said pair of parallel, reciprocatable rods; and

said reciprocatable rods are coupled to crank units which rotate valve-operating eccentrics.

4,040,773

OIL-WATER INTERFACE CONTROL FOR SUBMERSIBLE ELECTRIC MOTOR

John J. Tuzson, Evanston, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 24, 1975, Ser. No. 634,793
Int. Cl.[2] F04B *17/00*
U.S. Cl. 417—424 **2 Claims**

1. Apparatus for maintaining a predetermined level of the oil-well fluid interface in a seal section associated with a submersible electric motor which drives a submersible pump comprising:

a housing;

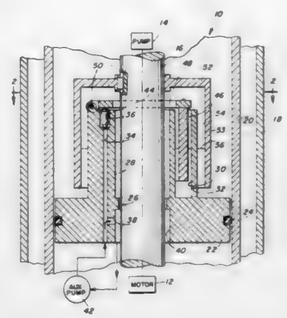
means dividing said housing into a motor compartment and a pump compartment;

an electric motor in said motor compartment, said motor compartment being filled with oil;

a pump in said pump compartment, said pump compartment being filled with well fluid;

a shaft means forming the driving connection between the motor and the pump and passing through the dividing means;

means defining a chamber in communication with said motor compartment and said pump compartment and having both oil and water with an interface therebetween;



means in said motor compartment for supplying oil under pressure to said chamber;

means comprising a valve to regulate the supply of said oil to said chamber;

sensing means comprising a float to sense the level of said interface and to control said regulating means to thereby sense changes in said interface level and regulate the supply of oil to said chamber in response to said changes in interface level;

a cup-shaped member connected to said shaft means and defining an outer rotating wall of said chamber and a cylindrical portion of said driving means, and means defining an inner stationary wall of said chamber; and

a cavity in said cylindrical portion communicating with said chamber, said float being confined in said cavity.

4,040,774

APPARATUS FOR CONSTRUCTING CONCRETE WALLS

Herman Scheller, Eaton, Colo., assignor to Research-Cottrel, Inc., Bound Brook, N.J.

Filed Apr. 29, 1976, Ser. No. 681,723
Int. Cl.[2] E04G *11/04, 11/28*
U.S. Cl. 425—65 **3 Claims**

1. Apparatus for forming a concrete wall comprising

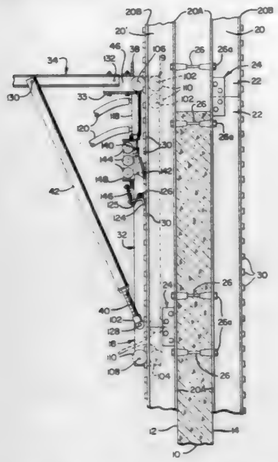
a. a plurality of generally vertical supports spaced apart along both sides of the wall being formed, each support being located opposite to another support on the other side of the wall and detachably connected to said opposing support by a plurality of spacers some of which are contained in the wall previously formed, each support consisting of separate segments detachably joined together at their ends, and the lower portion of each support being held contiguous the surface of the wall previously formed by said spacers while the upper portion extends above the portion of the wall previously formed.

b. a carriage mounted on each support with means for advancing the carriage upwardly along the supports as the wall is formed,

c. a plurality of concrete casting assemblies located along and on both sides of the wall being formed adjacent its

top, each assembly supported at its ends by two carriages on adjacent supports and each assembly having a generally vertical casting surface extending between the adjacent supports so that the assemblies and the supports together define a continuous mold extending on top of the wall into which concrete is poured, whereby as the concrete hardens the carriages and assemblies are moved upwardly on the supports to form a new level of wall and, at intervals, support segments are detached from the bottom of each support and attached to the top to provide a continuous track for the carriages,

d. each casting surface comprises the inner surfaces of generally horizontal, plywood sheets which combine to form a continuous casting surface,



e. each casting assembly comprising a plurality of generally horizontal braces positioned contiguous the outer surface of the plywood sheets to support the sheets while the concrete is setting against the inner surface of said sheets, and

f. each casting assembly comprising at least a pair of slotted beams movably carried by adjacent carriages, said plurality of horizontal braces mounted between said slotted beams which are adapted to be wedged against said adjacent carriages, so that by wedging the slotted beams against the carriages the inner surface of the sheets are drawn into contact against the adjacent supports thereby providing said continuous mold.

4,040,775

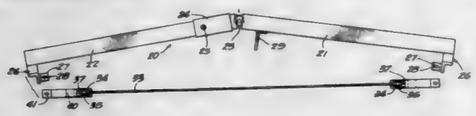
APPARATUS FOR MAKING A PRESTRESSED CONCRETE SLAB

John A. Nordbak, 10919 Lakewood Blvd., Downey, Calif. 90241

Filed Sept. 29, 1975, Ser. No. 617,712

Int. Cl.[2] B28B *23/06*

U.S. Cl. 425—111 **4 Claims**



1. Apparatus for producing and maintaining a set of generally parallel wires in tension while enclosing them in a concrete slab, comprising:

first and second platelike means for being affixed to the opposite ends of said wires, respectively, each said platelike means including a plate having an opening within which a bar is slidingly received, said bar having openings through which the wire ends are respectively adapted to be received and bushings operatively associated with each bar adapted to be secured onto each wire end and being of dimensions greater than those of the bar openings such that said bushings are unable to pass through the bar openings;

a pair of elongated lever bars having a first end portion of each bar pivotally interconnected together and having their second end portions connected respectively to the first and second platelike means, said lever bars being of such length that when pivoted into straight line relationship the lever bars move the platelike means away from each other placing the wires in tension;

a table having a surface for supporting the tensioned wires, platelike means and lever bars;

means carried by at least one of said lever bars for locking said lever bars in said straight line relationship; and

means affixing the platelike means to the table surface to maintain the tension in the wires while the lever bars are disconnected from the platelike means and plastic concrete is deposited onto said wires to form the concrete slab.

4,040,776

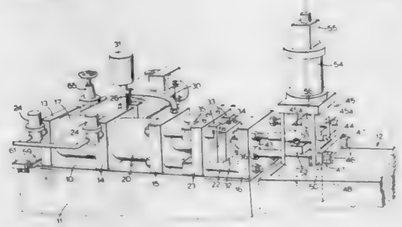
PRESSURE MOULDING MACHINES AND MOULD PARTS THEREFOR

Norbert R. Kelz, 45 Knoll Street, Port Colborne, Ontario, Canada

Division of Ser. No. 390,270, Aug. 21, 1973, Pat. No. 3,942,928. This application Dec. 3, 1975, Ser. No. 637,332

Int. Cl.[2] B29F *1/00*

U.S. Cl. 425—145 **9 Claims**



1. A pressure moulding machine comprising a base, a machine frame mounted on the base with one end fixed to the base and the other end movable thereon, means on the frame mounting two mould parts for movement relative to one another for opening and closing the mould constituted by the mould parts, motor means mounted by the frame and operatively connected to one mould part to move it relative to the other part and to hold the parts in engagement with one another under pressure, a mechanical movement detector mounted on the machine to be operative between the frame and the base for detecting movement of the movable end of the machine frame resulting from stretch of the machine frame under said pressure engagement of the mould parts by the motor means, a pump mounted by the machine injecting material into the die during a moulding operation, and control means responsive to detection by the movement detector of a predetermined movement of the movable frame end for at least initiating operation of the said pump.

4,040,777

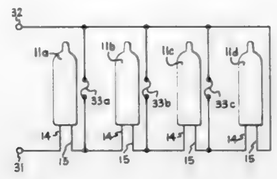
FLASH LAMP ARRAY HAVING SHORTING LAMPS

Edward J. Collins, Euclid, and Donald C. Medved, Bellevue, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,196

Int. Cl.[2] F21K *5/02*

U.S. Cl. 431—95 A **15 Claims**



1. A photoflash lamp comprising a bulb having a hollow interior containing combustible material adapted to produce light and heat when the lamp is flashed, at least two wires extending outside of said bulb and sealed into said bulb through a seal region extending away from said interior of the bulb, and switch material coated on a portion of the exterior of said bulb and bridging across and in contact with said two wires, said switch material extending toward said bulb interior along one or more sides of said seal region and having a relatively high impedance prior to flashing of said lamp and having the characteristic of reacting to heat produced by said lamp when flashed so as to have a relatively low impedance after the lamp is flashed.

4,040,778

BAKING PIT FURNACES

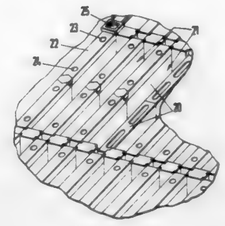
William Brown Black, Bridge of Weir, Scotland, assignor to Refractory Services International Limited, Glasgow, Scotland

Filed Dec. 12, 1975, Ser. No. 640,281

Claims priority, application United Kingdom, Apr. 9, 1975, 14482/75; June 4, 1975, 24036/75

Int. Cl.[2] F27B *5/02, 5/16*

U.S. Cl. 432—192 **8 Claims**



1. A baking pit furnace flue formed of interconnected precast refractory concrete parts including two side walls, two end walls, a bottom wall, a cap, a central baffle extending between said side walls substantially midway between said end walls of said flue, and tying means for said side walls together over each length thereof positioned between said central baffle and each one of said two end walls of said flue.

4,040,779

DRY HEAT PROCESS FOR DYEING AND PRINTING ORGANIC MATERIAL WHICH CAN BE DYED WITH CATIONIC DYES

Peter Loew, Munchenstein; Raymond Defago, Riehen, and Stefan Koller, Ramlinsburg, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed June 11, 1975, Ser. No. 586,132

Claims priority, application Switzerland, June 12, 1974, 8039/74; Feb. 13, 1975, 1790/75

Int. Cl.[2] D06P *3/00, 5/00, 3/70*

U.S. Cl. 8—2.5 R **21 Claims**

1. A dyestuff composition for use in the dry heat transfer printing process which comprises a member selected from the group consisting of water, organic solvent and mixtures thereof, said member having dispersed or dissolved therein at least one heat transferable carbinol base of cationic dye or a derivative thereof and an indicator dye which does not exhibit acid reaction and which possesses the same shade as that of the carbinol base after conversion to its salt form.

4,040,780

FLAME RETARDANT

Albert Y. Garner, Yellow Springs, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

Division of Ser. No. 490,608, July 22, 1974, Pat. No. 4,000,191. This application June 25, 1976, Ser. No. 699,921

Int. Cl.[2] D06M *1/00*

U.S. Cl. 8—116 P **7 Claims**

1. A process for making flame-retardant material of cellulose such as cotton, paper and sponge or polyester-cotton having about 30 to 70% by weight cotton comprising treating said material with an aqueous solution of the product made by reacting cyanamide with PCl_5 followed by reaction with anhydrous ammonia in excess of that required to react with the chlorine on the cyanamide and PCl_5 intermediate product in sufficient amount and curing the treated material at a sufficient temperature to make the treated and cured material self-extinguishing when subjected to a flame-sufficient to ignite and consume the untreated material.

4,040,781

NOVEL 2-(ALKYLSULFINYL)ETHYL SULFATES AND COMPOSITIONS EMPLOYING SAME

Vincent Lamberti, Upper Saddle River, and Wilder F. Pease, Norwood, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

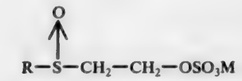
Division of Ser. No. 597,722, July 21, 1975, Pat. No. 3,986,986, which is a division of Ser. No. 476,809, June 6, 1974, Pat. No. 3,940,433. This application May 27, 1976, Ser. No. 690,690

Int. Cl.[2] B08B *3/00*

U.S. Cl. 8—137 **3 Claims**

1. A process for the washing of materials selected from the group consisting of fabrics and dishware which comprises the steps contacting said materials with a detergent composition comprising

a. from about 1% to about 75% of a surfactant having the structure



wherein R is a straight chain saturated aliphatic radical having from 10–20 carbon atoms and M is an alkali metal or ammonium cation,

b. from 0% to about 50% of a builder compound selected from the group consisting of (i) water-soluble inorganic alkaline salts which include alkali metal carbonates, borates, phosphates, polyphosphates, bicarbonates, silicates and hexametaphosphates and (ii) water-soluble organic alkaline salts which include aminopolycarboxylates, phytates, polyphosphonates, polycarboxylate homo and copolymers, citrates, mellitates, carboxymethyloxysuccinates, oxydiacetates and mixtures thereof.

c. from about 0% to about 25% detergent adjuvants wherein said detergent adjuvants are soil suspending agents, hydrotropes, corrosion inhibitors, dyes, perfumes, fillers, buffers, optical brighteners, perborates, bleaches, bleach activators, enzymes, suds boosters, suds depressants, germicides, fungicides, anti-tarnishing agents, fabric softening agents, opacifiers or organic solvents, and

d. the balance being water, wherein said washing temperature ranges from about 50° F to about 200° F and subsequently rinsing and drying said materials.

4,040,782

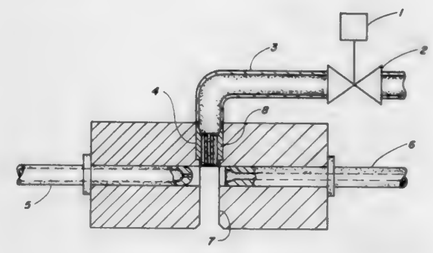
NOISE REDUCTION INSERT FOR APPARATUS TO PREVENT MELTED YARN STOPPED IN A HIGH TEMPERATURE YARN TEXTURING JET

William Robert Weiss, Walnut Creek, Calif.; Anthony Michael Saich, and James Judson Cooksey, both of Colonial Heights, Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 14, 1975, Ser. No. 631,810

Int. Cl.[2] D02G *1/16*

U.S. Cl. 28—271 **2 Claims**



1. In an apparatus to prevent melted yarn when stopped in a high temperature yarn texturing jet device, having a high temperature fluid flowing across a yarn entry, comprising a sensor to detect yarn stoppage which actuates a valve in a high pressure conduit communicating with an orifice opposite said yarn entry in said high temperature texturing jet device so that upon actuation of said valve by said sensor, a blast of high pressure fluid diverts and dilutes any undiverted said high temperature fluid flowing across said yarn entry in said texturing jet device out of said texturing jet device through said yarn entry,

the improvement comprising

a noise reduction insert at said orifice, said insert comprising a cylinder having a series of from about 5 to 10 cylindrical openings evenly distributed across said orifice and with axes parallel to said orifice axis; said cylindrical openings having a length to diameter ratio of from about 5 to 10, and said insert having a tapered inlet adjacent the inlet of said cylindrical openings.

4,040,783

METHOD OF AND APPARATUS FOR ANALYSIS OF THE EXHAUST GASES FROM INTERNAL COMBUSTION ENGINES

Lars Th. Collin, Molndal, Sweden, assignor to Lars Collin Consult AB, Molndal, Sweden

Filed Feb. 21, 1975, Ser. No. 551,683

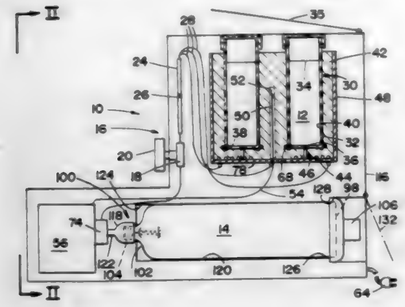
Claims priority, application Sweden, Mar. 5, 1974, 028762

Int. Cl.[2] G01N *31/00, 33/00*

U.S. Cl. 23—232 R **11 Claims**

1. A method of analyzing the emission-content of exhaust gases from an internal combustion engine, comprising steps of:

(a) removing a sample of exhaust gas from an internal combustion engine over a given period of time;
(b) passing the sampled gas to a storage container;
(c) buffering said sample of exhaust gas in said storage container;
(d) passing the gas from the storage container to a plurality of parallel-connected exhaust gas analyzing tubes, each tube containing different media therein capable of indicating the presence of certain compounds contained in the exhaust gas;



(e) simultaneously passing a predetermined proportional flow of the sampled exhaust gas through said plurality of analyzing tubes so that a constituent of said exhaust gas contacts the medium in the analyzing tubes for sensing the presence of the compound in the sampled gas being tested; and incorporating in each of said analyzing tubes a resistance essentially exceeding the resistance of a single tube to ensure a proportionate division of the gas flow.

4,040,784

METHOD FOR CHECKING THE ACCURACY OF A TEST, USING A SERUM-SOLUBLE CHOLESTEROL COMPOUND

Arvind D. Deshmukh, 1011 Pearl St., Santa Monica, Calif. 90405

Filed Aug. 23, 1976, Ser. No. 716,615
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **3 Claims**

1. In a method for checking the accuracy of a test for the quantitative determination of the cholesterol content of a biological fluid wherein said test is conducted on a standard comprising a solution in said biological fluid of a known quantity of a serum-soluble cholesterol compound, the improvement in accordance with which said cholesterol compound is at least one ester of cholesterol reactively combined with a peptide or protein solubilizing agent, said ester being an ester of a lower dicarboxylic acid having 2 to 5 carbon atoms in its longest chain.

4,040,785

LYSABLE BLOOD PRESERVATIVE COMPOSITION

Young Ran Kim, Hartsdale; Leonard Ornstein, White Plains, both of N.Y., and Henry Cook Waters, III, Oxford, Conn., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Oct. 18, 1976, Ser. No. 733,435
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **13 Claims**

1. A preserved lysable anticoagulated blood composition comprising a mixture of blood sample and preservative reagent wherein said preservative reagent comprises an aqueous mixture of a mono-, di- or trisaccharide component and formaldehyde, the resulting preserved blood composition containing said saccharide in the range of from 0.05% to 1.0% by weight and said formaldehyde in the range of from 0.1% to 0.8% by weight.

4,040,786

CHEMICAL ANALYSIS METHOD USING REACTION CONTAINER

Ramesh C. Trivedi; Henry R. Bungay, III, both of Freehold, and Paul J. Cuccolo, Toms River, all of N.J., assignors to Worthington Biochemical Corporation, Freehold, N.J.

Division of Ser. No. 578,147, May 16, 1975, Pat. No. 3,961,899, which is a continuation-in-part of Ser. No. 473,942, May 28, 1974, abandoned. This application Feb. 12, 1976, Ser. No. 657,635
Int. Cl.² G01N *33/16;* **C12K** *1/04;* **G01N** *21/24*
U.S. Cl. 23—230 R **14 Claims**



1. In a method for measuring the extent of reaction between reaction reagents respectively contained in aqueous solutions wherein said solutions are commingled and the extent of reaction initiated by said commingling is measured by measuring the amount of change in optical density that follows said commingling and said solutions are respectively contained in two chambers of a reaction container and are commingled by one of said solutions being forced through an open passage the two chambers into solution in the other chamber the steps of simultaneously introducing solutions of different reagents respectively into said chambers through openings at the top of said chambers essentially without travel of either solution through said open passage into the other chamber and simultaneously reducing the reagents dissolved in said solutions to the solid state by lyophilization.

4,040,787

UREA DETERMINATION OF BIOLOGICAL FLUIDS USING DIACETYLMONOXIME REACTION

Alejo V. Roy, Carmel, and Jane R. Heiwig, Indianapolis, both of Ind., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 21, 1976, Ser. No. 678,811
Int. Cl.² C09K *3/00;* **G01N** *31/06, 33/16;* **252** *408*
U.S. Cl. 23—230 B **9 Claims**

5. In a method for the determination of urea nitrogen in biological fluids which comprises mixing a biological fluid with diacetylmonoxime, thiosemicarbazide, and an aqueous solution of an analytically-acceptable strong acid selected from the group consisting of sulfuric acid, phosphoric acid, hydrochloric acid, trichloroacetic acid, dichloroacetic acid and mixtures thereof, and heating the resulting mixture, the improvement which comprises the step of adding a linearity-enhancing amount of 4-aminoantipyrine to the mixture prior to the heating step, whereby a chromophor is formed having an absorbance peak between 500 and 550 nanometers when urea is present.

4,040,788

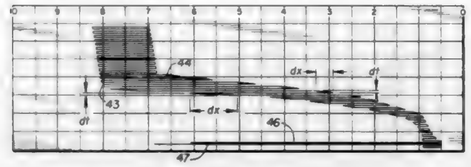
APPARATUS, INSTRUMENTATION, AND METHOD FOR COMPARING SAMPLES

Sanford L. Simons, Morrison, and Frederick M. McNeill, Denver, both of Colo., assignors to Sanford L. Simons, Morrison, Colo.

Filed Apr. 5, 1976, Ser. No. 673,765
Int. Cl.² G01N *33/16, 21/28*
U.S. Cl. 23—230 R **42 Claims**

38. A method for displaying representations of rates of change for a plurality of samples subjected to process and time

influences comprising providing a plurality of samples for testing, obtaining substantially continuous output status signals from each of said samples, switching each of said sample related signals on and off in a sequential manner whereby only one output signal is released at a time, applying the resulting



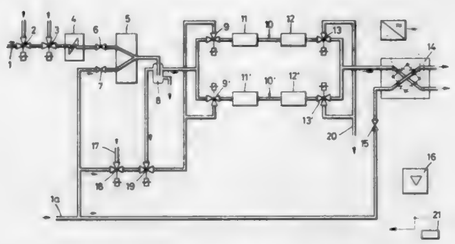
released signal to a single marking element of a chart recorder wherein the chart is moved at a regular real time rate with said marking element accordingly moving from one separate sample related signal position to another as the signal outputs are switched, and the total trace obtained is made up of separate segmental traces interconnected by time based lines whereby the length of segmental traces is indicative of rates of change for the related samples.

4,040,789

USE OF THE CONTINUOUS BLAST FURNACE GAS ANALYSIS FOR SUPERVISION AND REGULATION OF THE BLAST FURNACE OPERATION

Eltel Voss; Karl-Heinz Waldofner, both of Duisburg, and Kurt Harz, Moers, all of Germany, assignors to August Thyssen-Hutte AG, Duisburg-Hamborn, Germany

Filed Nov. 22, 1976, Ser. No. 743,831
Claims priority, application Germany, Nov. 29, 1975, 2553756
Int. Cl.² C21B *7/24;* **G01N** *25/18;* **C21B** *5/00*
U.S. Cl. 23—230 A **24 Claims**



1. In a process for continuously regulating the operation of a blast furnace in response to analysis of the effluent blast furnace gas containing CO, CO_2, N_2 and H_2 the improvement which comprises continuously admixing said blast furnace gas with a carrier gas, removing from the resultant admixture CO, CO_2 and H_2 and thereafter continuously feeding the remaining admixture comprising said carrier gas and said N_2 into a nitrogen measuring means.

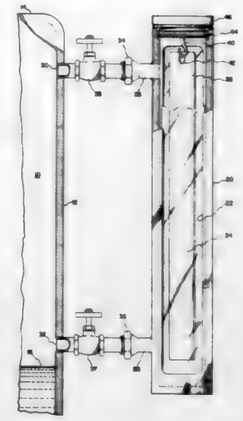
4,040,790

MOISTURE AND RUST DETECTOR FOR HYDRAULIC CONTROL SYSTEMS

Robert B. McBride, Troy, and Phillip J. Tiberio, Schenectady, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 29, 1976, Ser. No. 709,793
Int. Cl.² G01N *17/00;* **G01F** *15/00*
U.S. Cl. 23—253 C **10 Claims**

1. In a steam turbine control system wherein hydraulic fluid is utilized to actuate steam valves the combination of:
a. a reservoir for containing hydraulic fluid for said system;
b. a working fluid for said system, said working fluid having a density greater than water so that any moisture which becomes admixed with said fluid will rise to the surface of said fluid in said reservoir;
c. means for detecting the presence of water vapor in said reservoir above the level of fluid contained therein and including:
c1. a case including transparent material permitting visual inspection of the interior of said case;
c2. means for providing communication between the



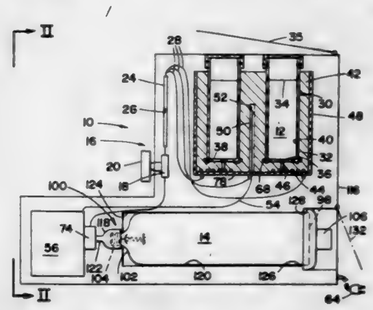
reservoir at a level above the fluid level therein and said case; and
c3. a strip of material disposed within said case and visible through said transparent material;
c4. said material being highly susceptible to rusting in the presence of moisture.

4,040,791

SPECIMEN COLLECTING DEVICE

David H. Kuntz, 6027 Halm St., Los Angeles, Calif. 90056

Filed June 22, 1976, Ser. No. 698,707
Int. Cl.² G01N *33/16, 1/10;* **A61B** *10/00*
U.S. Cl. 23—259 **21 Claims**



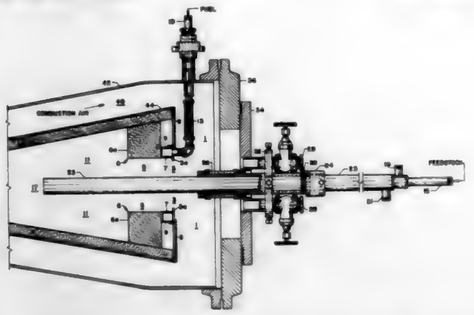
1. A urine specimen collecting device for collecting a selected specimen from a midstream portion during voiding, comprising:
a receiving chamber having an opening for receiving the voided urine;
a transfer chamber communicating with the receiving chamber for accepting urine from the receiving chamber;
means for diverting and bleeding out of said device a first portion of the urine received in the receiving chamber;
a conduit extending from the transfer chamber to a coupling for connection to an associated container for transferring the selected midstream portion through the conduit to the container; and
an overflow passage communicating with the receiving chamber above the diverting means for diverting excess urine above a predetermined level in the receiving chamber to drain out of the device, thereby bypassing the transfer chamber.

4,040,792

GAS BURNER FOR CARBON BLACK REACTOR

Don T. Norman, Sulphur, La., assignor to Continental Carbon Company, Houston, Tex.

Filed July 6, 1976, Ser. No. 703,025
Int. Cl.[2] C09C *1/50*
U.S. Cl. 23—259.5 10 Claims



1. In combination with an elongate, substantially tubular carbon black reactor, a fuel burner assembly concentrically disposed within said reactor at the upstream end thereof, said burner assembly comprising:

a hollow annular metallic ring positioned coaxially within the reactor tube at its upstream end;

a fuel supply conduit being connected to said ring for supplying fuel to the hollow portion of said ring; said ring having a plurality of fuel supply holes positioned around the inner surface of said ring for discharge of fuel radially toward the axis of said reactor;

a refractory burner block defining a cylindrical tunnel coaxial with said reactor and downstream of said ring, the surface of said tunnel being aligned with the inner surface of said ring, the diameter of said tunnel being less than the diameter of said reactor tube;

a circular member or lip affixed to or a part of said ring, said lip defining an orifice of diameter less than the diameter of said cylindrical tunnel, said lip being positioned immediately upstream of said holes or positioned immediately downstream of said holes between said holes and said block;

means for passing combustion air through said orifice into said tunnel;

a combustion zone, within said reactor tube, downstream of said tunnel; and

means for injecting feedstock into said reactor downstream of said tunnel.

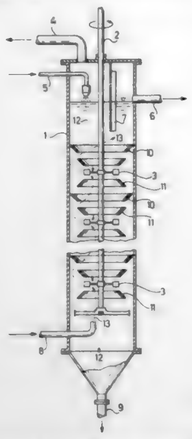
4,040,793

APPARATUS FOR THE PURIFICATION OF TEREPHTHALIC ACID DIMETHYL ESTER

Eberhard Achsel, Fischbach,Taunus; Hans-Peter Hortig, Hattersheim (Main); Heinrich Seipp, and Heinz Giller, both of Offenbach (Main), all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 467,833, May 7, 1974, Pat. No. 3,962,315.
This application Jan. 19, 1976, Ser. No. 650,003
Claims priority, application Germany, May 9, 1973, 2323219
Int. Cl.[2] B01D *9/00*
U.S. Cl. 23—273 R 3 Claims

1. Apparatus adapted to be used in purifying a crude crystalline material comprising in combination a counter-current washing column, an inlet for said crude material in molten or solvent suspension form near the top of said column, an inlet for fresh solvent near the bottom of said column, an outlet for solvent vapors near the top of said column, an outlet for solvent containing dissolved impurities and crystals near the top of said column, an outlet for purified crystals near the bottom of said column, an agitator shaft arranged for axial rotation within said column and carrying a plurality of axially spaced paddles, a frusto-conical baffle between each pair of adjacent paddles extending inwardly and downwardly from the interior wall of said column and a frusto-conical guide plate located between each baffle and the proximate paddle of said agitator shaft, said guide plate having a central opening and being spaced inwardly from the wall of said column and converging



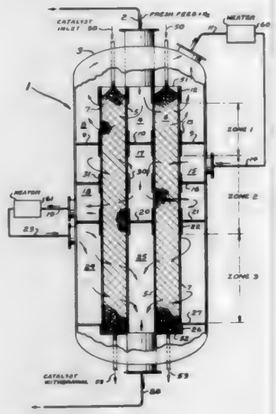
in the direction of said proximate paddle whereby vigorous agitation of the mixture of crystals and solution occurs in the central portions of said column and counter-current flow of the solution and crystals occurs in the peripheral portions of said column.

4,040,794

MOVING BED CONTACTING PROCESS AND APPARATUS

Richard D. Stone, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 24, 1975, Ser. No. 625,418
Int. Cl.[2] B01J *8/12;* C10G *35/12*
U.S. Cl. 23—288 G 5 Claims



1. An apparatus adapted to contain a vertical annular moving bed of catalyst and at least two reaction sections comprising:

a. a vertically elongated pressure-tight vessel;

b. a vertical annular catalyst bed, whose cross-sectional area is undiminished from the top to the bottom of the vessel, within said vessel and defined by a cylindrical inner perforated screen and an outer perforated screen said screens also defining inner and outer distributing spaces;

c. a catalyst outlet means connective with the bottom of the catalyst bed;

d. a reactant inlet connected to one said reaction section and a reactant outlet connected to another said reaction section;

e. said reaction section being selected from the group of an upper end section, a lower end section and one or more middle sections, as hereinafter defined, wherein the end sections of the apparatus are of upper end, lower end, or middle section type, and all central sections of the apparatus are of the middle section type, and wherein all sections are connective with at least one other section and with another section, reactant inlets or outlet, and comprising:

1. an upper end reaction defined at the lower limit thereof by horizontal baffles sealingly affixed across the inner and outer distributing spaces and by vertical baffles on the inner and outer screens having a height greater than the radial thickness of the catalyst bed, and containing two fluid transfer means one connective with the inner distributing space and the other connective with the outer distributing space;

2. a middle reaction section defined by horizontal baffles sealingly affixed at the top and bottom of the inner distributing space of the middle section, horizontal baffles, sealingly affixed at the top, bottom and middle of the outer distributing space of the middle section, and vertical screen baffles having a height greater than the radical thickness of the catalyst bed at the top, bottom and middle of the section and containing two middle section fluid transfer means, one connective with the outer distributing space above, and the other below, the horizontal baffle in the middle of the outer distributing space and providing radial out to in to out flow through said middle section;

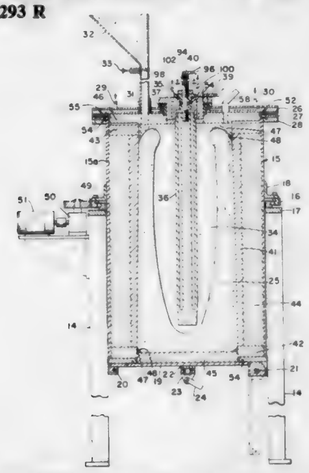
3. a lower end reaction section defined at the upper limit thereof by horizontal baffles sealingly affixed across the inner and outer distributing spaces and by vertical baffles on the inner and outer screens having a height greater than the radial thickness of the catalyst bed and containing two fluid transfer means, one connective with the inner distributing space and the other connective with the outer distributing space.

4,040,795

METHOD FOR THE CONVERSION OF CRYSTALLINE SILICA RAW MATERIALS INTO AMORPHOUS SILICA

Lothar Jung, 31 Lurline Drive, Millington, N.J. 07946

Division of Ser. No. 476,220, June 4, 1974, Pat. No. 3,895,174.
This application Apr. 16, 1975, Ser. No. 568,431
Int. Cl.[2] C03B *5/26, 5/02;* C01B *33/12;* B01J *6/00*
U.S. Cl. 23—293 R 4 Claims



1. In a process for the conversion of particulate crystalline silica into an amorphous silica mass by charging a furnace with the particulate crystalline silica and heating the charge to a temperature within the range of from about 1,728° to about 1,900° C for a period of time sufficient to melt and convert the silica to the amorphous state while evacuating the furnace to draw off gaseous by-products and rotating the furnace at a speed sufficient to cause the silica charge to be forced against the furnace wall, wherein the furnace is a vertically mounted rotatable electric furnace provided with a central internal resistance heating element and with a cylindrical body portion having an interior surface defining an interior of a configuration approximating a truncated cone, the base of the cone defining a bottom discharge opening, the improvement comprising:

cooling the amorphous silica mass within the furnace to a temperature within the range of 1,300°–1,400° C to rigidify the mass and then rapidly discharging said cooled rigid mass through the furnace bottom by gravity to permit more rapid cooling.

4,040,796

FAST LIGHTING ARTIFICIAL FIRELOG

George C. Vincent, Hayward, and David Rauch, Castro Valley, both of Calif., assignors to The Kingsford Company, Louisville, Ky.

Filed June 30, 1975, Ser. No. 591,886
Int. Cl.[2] C10L *5/36, 11/00*
U.S. Cl. 44—14 20 Claims

1. An artificial fast lighting firelog consisting essentially of an elongated flammable body formed of particulate material and a binder, and means for fast lighting said body including means forming part of said body and defining a groove extending substantially between opposite ends of said elongated body, and a starter fuel disposed within and along said groove lying substantially coextensive therewith for igniting said body, and an over-wrapper for said firelog formed of flammable material, said over-wrapper comprising sheet material, and means carried by said over-wrapper forming an oil resistant barrier therethrough, said firelog adapted to be positioned whereby when said over-wrapper is ignited at an end thereof said fuel will ignite along the length of said groove to thereby rapidly ignite said over-wrapper along the length thereof and said firelog without removal of said over-wrapper.

20. A method of manufacturing an artificial fast lighting firelog comprising:

passing a mixture of particulate material and a binder therefor through an extrusion barrel to form an elongated firelog, having a notch extending along the outer surface of the firelog parallel to the longitudinal axis thereof and a substantially flattened surface along one side of the log adjacent said notch; disposing a starter fuel in said notch while said mixture is passed along said extrusion barrel; cutting the elongated firelog to form discrete lengths thereof as it emerges from the extrusion barrel; providing an over-wrapper of sheet material carrying an oil resistant barrier thereon; wrapping said discrete lengths with said over-wrapper to form an artificial firelog with a wrapper which may be ignited by igniting said wrapper at an end thereof and thereby igniting the starter fuel in the notch.

4,040,797

ARSENIC CONTAINING FUELS

Dean Arthur Young, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Mar. 22, 1976, Ser. No. 669,314
Int. Cl.[2] C10L *1/18*
U.S. Cl. 44—68 9 Claims

1. A fuel composition comprising a shale oil or fraction thereof containing between 2 and 80 ppmw As, and uniformly blended therewith by dissolution one or more added metallic components selected from the class consisting of the metals, Mg, Ba, Zn, Ni, and the compounds thereof in an additive metal/arsenic atomic ratio in the range of 0.5/1 to 50/1, said components being added such that a larger proportion of the As contained in said fuel composition is retained in the ash

produced by the combustion thereof than is retained in the ash produced by the combustion of said shale oil under the same conditions.

4,040,798

HYDROCARBON COMPOSITIONS CONTAINING RUST INHIBITORS

Robert R. Kuhn, Lansdale, and Warren H. Machleder, Bluebell, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

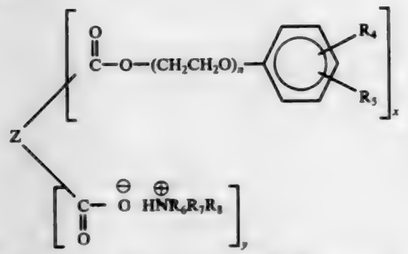
Division of Ser. No. 379,670, July 16, 1973, Pat. No. 3,912,771. This application Apr. 7, 1975, Ser. No. 565,934

The portion of the term of this patent subsequent to Jan. 1, 1991, has been disclaimed.

Int. Cl.² C10L *1/22*

U.S. Cl. 44—71 **8 Claims**

1. A composition consisting essentially of a hydrocarbon fuel or oil containing a rust inhibiting amount of a surface active alkyl ammonium carboxylate salt-ethoxylated alkyl phenol ester of a polycarboxylic acid, said acid being the polycarboxylic polymerization product of an unsaturated or hydroxy substituted aliphatic C_{16} to C_{18} monocarboxylic acid and said polymerization product having an average number of carboxylic acid groups of about 1.9 to about 3.5, said ester having the formula:



wherein n is an average number from about 1 to 12.5, x and y each have values such that the ratio of x to y is in the range of about 1:4 to about 4:1, and wherein:

R_4 is an alkyl group containing 4 to 12 carbon atoms;

R_5 is H or an alkyl group containing 4 to 12 carbon atoms;

R_6 is an alkyl group containing 1 to 24 carbon atoms which may be straight or branched chain or an amine substituted alkyl group of 2 of 24 carbon atoms;

R_7 is H or is the same as R_6;

R_8 is H or is the same as R_6;

Z is a saturated or unsaturated hydrocarbon residue of the acid, said residue having an average of about 34 to about 51 carbon atoms.

4,040,799

CYCLOHEXLAMINES USED AS FUEL ADDITIVES

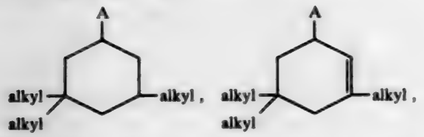
Bernardus A. Oude Alink, St. Louis; Neil E. S. Thompson, University City, and Ronald P. Hutton, St. Louis, all of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Oct. 7, 1974, Ser. No. 512,424

Int. Cl.² C10L *1/22*

U.S. Cl. 44—75 **6 Claims**

1. A distillate fuel oil containing a stabilizing amount of a compound of the formula



or combinations thereof, where A represents an amino group having no more than one hydrogen atom attached to the nitrogen atom, with the remaining groups of the amine not interfering with reductive amination.

4,040,800

REACTOR FOR GASIFYING SOLID FUELS, PARTICULARLY COAL, UNDER SUPERATMOSPHERIC PRESSURE

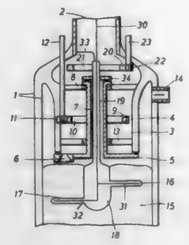
Paul Rudolph, Bad Homburg; Herbert Bierbach, Frankfurt am Main; Hans Küpfer, Frankfurt am Main; Carl Hafke, Frankfurt am Main, and Rudolf Kohlen, Wehrheim, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 17, 1976, Ser. No. 715,077

Claims priority, application Germany, Feb. 26, 1976, 2607742

Int. Cl.² C10J *3/30, 3/32*

U.S. Cl. 48—85.2 **3 Claims**



1. An apparatus for gasifying solid fuels in a packed bed by a treatment with a free oxygen-containing gas and water vapor under pressure, comprising a water-cooled reactor housing provided in its lower portion with gasifying agent inlet openings, a fuel distributor mounted on a vertical hollow bearing shaft in the upper portion of the reactor, a rotatable distributing disc attached to the lower end of said bearing shaft, a stirrer mounted on a stirrer shaft, said stirrer being disposed in the fuel bed in the upper portion of the reactor, and independent first and second drive means for independently rotating the fuel distributor and stirrer.

4,040,801

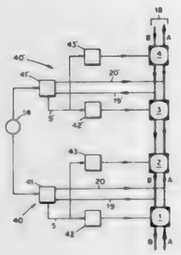
METHOD AND APPARATUS FOR RAPID ADJUSTMENT OF PROCESS GAS INVENTORY IN GASEOUS DIFFUSION CASCADES

Robert H. Dyer; Andrew H. Fowler, and Paul R. Vanstrum, all of Oak Ridge, Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 674,201, April 5, 1976, abandoned. This application June 14, 1976, Ser. No. 696,149

Int. Cl.² B01D *53/22*

U.S. Cl. 55—16 **12 Claims**



1. In the operation of a gaseous diffusion cascade wherein electrically driven compressors circulate a process gas through a plurality of serially connected gaseous diffusion stages to establish first and second countercurrently flowing cascade streams of process gas, one of said streams being at a relatively low pressure and enriched in a component of said process gas and the other being at a higher pressure and depleted in the same, and wherein automatic control systems position process gas flow control valves to maintain the stage process gas pressures at values which are functions of reference-signal inputs to said systems, the improved method of altering the cascade process gas inventory while said cascade is operating comprising:

simultaneously directing into separate process-gas freezing zones a plurality of substreams derived from one of said first and second streams at different points along the lengths thereof to solidify approximately equal weights of process gas in said zones while reducing said reference-signal inputs to maintain the positions of said control valves substantially unchanged despite the removal of process gas inventory via said substreams, and subsequently

4. In the operation of a gaseous diffusion cascade wherein electrically driven compressors circulate a process gas through a plurality of serially connected gaseous diffusion stages to establish first and second countercurrently flowing cascade streams of process gas, one of said streams being at a relatively low pressure and enriched in a component of said process gas and the other being at a higher pressure and depleted in the same, and wherein automatic control systems position process gas flow control valves to maintain the stage process gas pressures at values which are functions of reference-signal inputs to said systems, the improved method of altering the cascade process gas inventory while said cascade is operating comprising:

simultaneously directing into separate process-gas freezing zones a plurality of substreams derived from one of said first and second streams at different points along the lengths thereof to solidify approximately equal weights of process gas in said zones while reducing said reference-signal inputs to maintain the positions of said control valves substantially unchanged despite the removal of process gas inventory via said substreams, and subsequently regenerating separate substreams of said process gas by evaporating the solids in said zones and introducing the regenerated substreams to the other of said streams at different points along the length thereof while increasing said reference-signal inputs to maintain the position of said control valves substantially unchanged despite the addition of process gas via the regenerated substreams.

4,040,802

ACTIVATION OF WATER SOLUBLE AMINES BY HALOGENS FOR TRAPPING METHYL RADIOACTIVE IODINE FROM AIR STREAMS

Victor R. Deitz, Chevy Chase, and Charles H. Blachly, West Hyattsville, both of Md., assignors United States Energy Research and Development Administration, Washington, D.C.

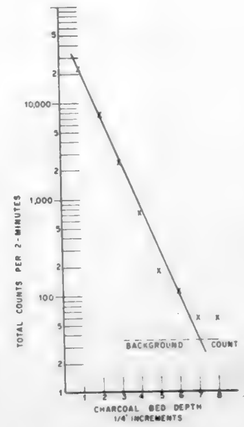
Filed Apr. 22, 1975, Ser. No. 570,925

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² B01D *53/04*

U.S. Cl. 55—71 **1 Claim**

1. In the method of removing methyl iodine^{131} gas from the effluent of a reactor by passing the effluent gas through an organic impregnated charcoal, the improvement comprising employing an impregnated charcoal prepared by contacting charcoal with an aqueous mixture of a halogen selected from the group consisting of iodine and bromine, and a tertiary amine selected from the group consisting of hexamethylenetetramine, triethyanolamine, triethylenediamine, N-methylmorpholine, N, N, N′, N′-tetramethylethylenediamine, 1, dimethylamino-2-propanol, N-methylpiperazine, and N, N, N′, N′-tetramethyl-1,4-butanediamine, wherein the concentration of halogen in the charcoal is between 0.4 and 1.6%, and the



concentration of tertiary amine in the charcoal is between 2 and 7%, based on the weight of the charcoal.

4,040,803

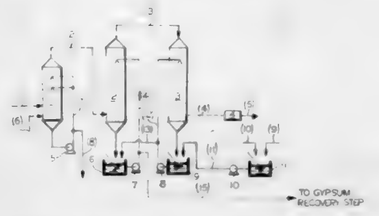
WET WASTE FLUE GAS DESULFURIZING PROCESS USING LIME AS ABSORBENT

Masumi Atsukawa; Kazumi Kamei; Naoharu Shinoda, and Hiroyuki Ushio, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 549,031, Feb. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 298,822, Oct. 19, 1972, abandoned. This application Mar. 18, 1976, Ser. No. 667,972

Int. Cl.² B01D *53/14*

U.S. Cl. 55—73 **1 Claim**



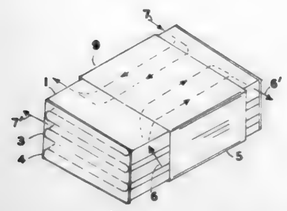
1. In a wet waste flue gas desulfurizing process using lime as absorbent, wherein a sulfur oxide-containing waste flue gas is washed with a liquid absorbent containing calcium hydroxide or calcium carbonate for the purpose of removing the sulfur oxide from said waste flue gas, the improvement wherein a liquid absorbent is circulated through an absorbing device divided into two stages arranged in tandem with respect to the flow of the waste flue gas, said liquid absorbent being circulated and controlled in both stages, such that in the first state absorbing device the liquid absorbent has a lime available percentage of more than 96% and controlled in the second stage absorbing device such that the liquid absorbent has a lime available percentage of 85–95%.

4,040,804

HEAT AND MOISTURE EXCHANGER

Henry Harrison, Locust Valley, N.Y., assignor to Halm Instrument Co., Inc., Glen Head, N.Y.

Filed May 23, 1975, Ser. No. 580,317
Int. Cl.[2] B01D *13/00*
U.S. Cl. 55—158 **5 Claims**



1. Heat and moisture exchanger means comprising a folded sheet of heat and moisture permeable paper having a plurality of folds,

means between said folds to separate said folds,

means closing the end of the folds,

impermeable means connected to and surrounding the central part of said folded sheet to support said folded sheet and to provide a plurality of air passages on one side of the sheet interleaved in juxtaposition with a plurality of air passages on the other side of the sheet,

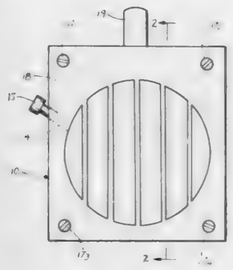
means connected to the folded sheet to direct air in one direction through said folds on one side of said folded paper, the return air flowing in the opposite direction through said folds on the other side of said folded paper whereby water and heat are transferred through the paper between one air stream and the other air stream flowing in the opposite direction.

4,040,805

PERSONAL MONITORING DEVICE, OR DOSIMETER, FOR MEASURING EXPOSURE OF PERSONNEL TO ORGANIC VAPORS

Leonard H. Nelms; Kenneth D. Reiszner, and Philip W. West, all of Baton Rouge, La., assignors to Board of Supervisors Louisiana State University Agricultural and Mechanical College, Baton Rouge, La.

Filed Oct. 22, 1976, Ser. No. 735,010
Int. Cl.[2] B01D *13/00*
U.S. Cl. 55—158 **10 Claims**



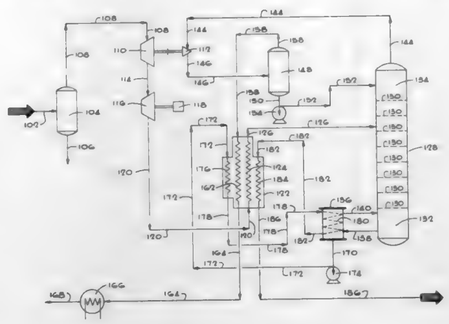
10. A monitoring device useful for the detection and and quantification of the exposure of a wearer of the device to an air-vinyl chloride mixture, which comprises: a body provided with a shallow top cavity which is filled with particulate activated carbon, covered and physically retained in place by a membrane permeable to vinyl chloride which is dissolved within, transported through, then released from the opposite side of said membrane and then adsorbed on the activated carbon in direct proportion to the exposure of the wearer to vinyl chloride as related to the external vinyl chloride concentration and time of exposure.

4,040,806

PROCESS FOR PURIFYING HYDROCARBON GAS STREAMS

Kenneth B. Kennedy, Rte. 2, Box 343, Lee's Summit, Mo. 64063

Continuation of Ser. No. 218,884, Jan. 19, 1972, abandoned. This application May 3, 1976, Ser. No. 682,486
Int. Cl.[2] F25J *3/02*
U.S. Cl. 62—28 **2 Claims**



1. A method for separating a non-combustible, nitrogen-rich gaseous feed mixture comprising nitrogen present in the amount of 50 to 80 mole percent and one or more hydrocarbons present in the total amount of 50 to 20 mole percent, into a nitrogen-rich overhead gas product and a combustible hydrocarbon-rich bottom liquid product, said method consisting of the steps of:

1. first cooling said gaseous feed mixture to a temperature below the lowest boiling point of any hydrocarbon present to be separated as a liquid product thereby providing a partially liquefied feed mixture;
2. distilling said partially liquefied feed mixture in a plural stage distillation apparatus so as to form an overhead gas phase and combustible, bottom liquid phase product richer in hydrocarbon then said gaseous feed mixture at a pressure below the critical pressure of both said overhead and bottom products;
3. passing the overhead gas phase directly from the distillation step (2) through turbo-expander means so as to provide an inlet/outlet pressure ratio of between10-1 to 20-1, said ratio being sufficient distillation step (2), in a quantity sufficient to enable recovery of said combustible bottom liquid phase product from said non-combustible feed mixture

(4) thereafter using at least a porion of said overhead gas product as a refrigerant to cool the gaseous feed mixture.

4,040,807

DRAWING DIELECTRIC OPTICAL WAVEGUIDES

John Edwin Midwinter, Ipswich, and Clive Richard Day, London, both of England, assignors to The Post Office, London, England

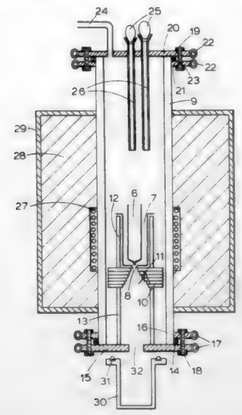
Filed June 30, 1975, Ser. No. 591,958
Claims priority, application United Kingdom, July 10, 1974, 30525/74
Int. Cl.[2] C03C *25/02;* C03B *5/26, 3/00*
U.S. Cl. 65—3 A **16 Claims**

1. A method of manufacturing a bubble-free dielectric optical waveguide comprising:

loading preformed core and cladding glasses in rod form into the inner and outer compartments respectively of a metallic double crucible, having concentric adjacent outlet orifices, cladding glass being loaded in said outer and core glass in said inner compartment

melting the glasses in said crucible;

completely surrounding the double crucible containing melted glasses with a nonoxidising atmosphere;



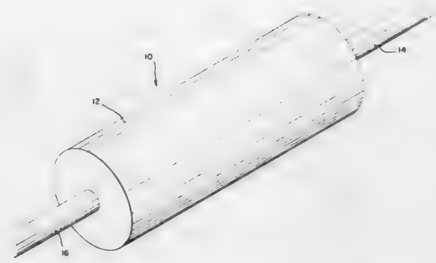
drawing from said orifices core and cladding glasses to form a clad dielectric optical waveguide; and continuously replenishing said inner and outer compartments of the double crucible by feeding preformed core and cladding glass rods having a diameter between 3 and 10 millimeters into the glass melt at a rate less than 30 millimeters per minute thereby avoiding pulling gas into the glass melt.

4,040,808

METHOD FOR MANUFACTURE OF VANADIUM DIOXIDE POLYCONDUCTORS

David Kahn, and Raymond James Geckle, both of Harrisburg, Pa., assignors to AMP Incorported, Harrisburg, Pa.

Division of Ser. No. 479,242, June 14, 1974, Pat. No. 3,983,074. This application July 24, 1975, Ser. No. 598,913
Int. Cl.[2] C03B *32/00, 35/00;* H01B *1/06*
U.S. Cl. 65—33 **4 Claims**



1. A method for the production of a polyconducting device comprising vanadium dioxide in a binder by the steps comprising:

a. admixing, (1) a member selected from the group consisting of particulate vanadium dioxide, and (2) doped vanadium oxide, wherein the dopant is an oxide selected from the group consisting of Cr, Fe, Ga, Al, Ti, Os, Ru, Ge, Nb, Ta, Mo and W, and mixtures of oxides of the same, with particulate binder in a ratio of from 5-50%, said particulate binder consisting essentially of 80% to 50% of vanadium pentoxide with complementary proportions of phosphorus pentoxide, to obtain a powdered mixture of said binder and said vanadium dioxide;

b. heating said mixture to effect melting of the binder to produce a glass;

c. shaping said glass under a pressure sufficient to achieve a density in said mixture of at least 80% of the theoretical density of the vanadium dioxide and binder; and

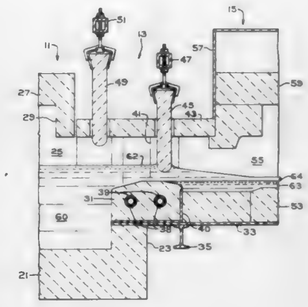
d. cooling said glass to obtain said polyconductive device.

4,040,809

GLAZED REFRACTORY SUPPORT FOR DELIVERING GLASS TO A FORMING CHAMBER

George A. Pecoraro, Lower Burrell, and Richard L. Bayne, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1976, Ser. No. 670,597
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—182 R **10 Claims**



1. In an apparatus for making flat glass comprising a glass furnace connected to a forming chamber through a molten glass delivery facility wherein the forming chamber includes an impervious metal casing having an inner refractory liner containing a pool of molten metal for supporting glass during forming and the delivery facility includes a refractory support for supporting molten glass during its delivery to the forming chamber, the refractory support having glass contacting surfaces and outer surfaces, the improvement which comprises

a substantially impervious, glazed, refractory layer of differing composition from that of the refractory support disposed on and affixed by fusing to a sufficient portion of the outer surfaces of the refractory support to effectively diminish the diffusivity of the refractory support.

4,040,810

APPARATUS AND METHOD FOR TREATING WASTE PRODUCTS

Harry J. Eby, Greenbelt, and Neal O. Morgan, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Mar. 10, 1976, Ser. No. 665,586
Int. Cl.[2] C05F *11/08*
U.S. Cl. 71—9 **1 Claim**

1. A process for treating manure, culturing fly larvae and recovering products formed during the treatment, comprising:

a. loading the manure into a rotatable bioreducing unit;

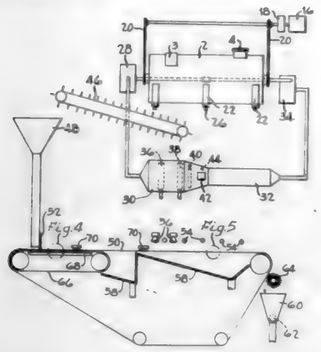
b. adding fly eggs to the manure in the unit;

c. aerating the manure-fly egg mixture in the unit;

d. allowing the fly eggs to hatch to the larval stage;

e. tumbling the manure-fly larvae mixture while circulating air through the unit to provide an environment for the larvae to burrow at least a foot and a half into the manure and for the manure to be dynamically bioreduced;

f. converting gases exhausted from the unit to salts and recovering the salts;



g. separating the bioreduced manure and fly larvae; and

h. dehydrating and granulating the fly larvae.

4,040,811

METHOD FOR THE CULTIVATION OF PLANTS EMPLOYING N-ALKYL-N-PHENYLSULFENYL-N'-PHENYL-FORMAMIDINE DERIVATIVES

Manfred Böger, Haltingen, Germany; Joseph Drabek, Allschwil, Switzerland, and Georg Pissiotas, Lorrach, Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 551,464, Feb. 20, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,840

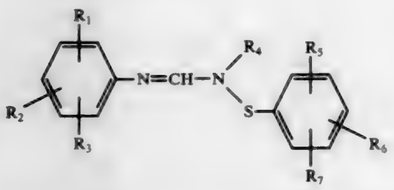
Claims priority, application Switzerland, Feb. 25, 1974, 2630/74; July 30, 1974, 10472/74; Sept. 10, 1974, 12300/74; Feb. 7, 1975, 1549/75

Int. Cl.² A01N *5/00*

U.S. Cl. 71—78 **5 Claims**

1. A method for inhibiting the growth of lateral suckers on tobacco plants, which method comprises applying to the tobacco plant an effective sucker growth inhibiting amount of a compound of the formula I

(I)



wherein

R_1, R_2 and R_3, independently of one another, represent hydrogen, chlorine, bromine, methyl, ethyl, trifluoromethyl or cyano,

R_4 represents methyl or ethyl and

R_5, R_6 and R_7, independently of one another, represent hydrogen, chlorine, bromine or C_1–C_4-alkyl.

4,040,812

HERBICIDAL CARBONATES AND THIOCARBONATES OF THIADIAZOLYL-2(1H)-PYRIMIDINONES

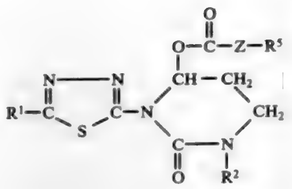
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed June 18, 1975, Ser. No. 587,944

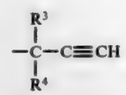
Int. Cl.² A01N *9/12*; C07D *239/04*

U.S. Cl. 71—90 **10 Claims**

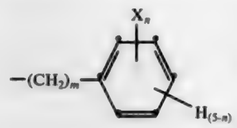
1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl, lower alkylsulfinyl and cycloalkyl of from 3 to 7 carbon atoms; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower chloroalkyl, lower bromoalkyl and



wherein R^3 and R^4 are each selected from the group consisting of hydrogen and lower alkyl; Z is selected from the group consisting of oxygen and sulfur; and R^5 is selected from the group consisting of lower alkyl, lower chloroalkyl, lower bromoalkyl, lower alkenyl, lower alkynyl, lower alkoxyalkyl, cycloalkyl of from 3 to 7 carbon atoms and



wherein X is selected from the group consisting of lower alkyl, halogen, lower haloalkyl, nitro, cyano and lower alkoxy, and *m* and *n* are each integers from 0 to 3.

10. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as the essential active ingredient, in a quantity toxic to weeds, a compound of claim **1**.

4,040,813

PLANT REGULATOR COMPOSITIONS BASED ON 2-HYDROXYCYCLOALKYL QUATERNARY AMMONIUM COMPOUNDS

William F. Newhall, Winter Haven, Fla., assignor to FMC Corporation, Philadelphia, Pa.

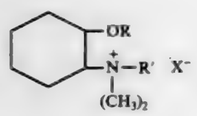
Continuation-in-part of Ser. No. 319,126, Dec. 29, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 555,952

Int. Cl.² A01N *9/24*; C07C *87/36*

U.S. Cl. 71—121 **21 Claims**

1. Plant regulator composition comprising

a. as active ingredient an effective amount of a compound of the formula:



wherein R is H, alkanoyl of 2–3 carbon atoms, or benzoyl; R' is a straight or branched, saturated or unsaturated hydrocarbon radical of 6–16 carbon atoms; and X is an agriculturally acceptable, non-phytotoxic anion;

b. an inert agricultural carrier; and

c. a compatible surface-active agent.

4,040,814

METHOD OF PRODUCING A COMPOSITION CONTAINING A LARGE AMOUNT OF VANADIUM AND NITROGEN

Rodney Francis Merkert, Buffalo, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,682

Int. Cl.² C22B *34/22*; C22C *38/12*

U.S. Cl. 75—.5 BC **2 Claims**

1. A method for making a material containing vanadium and nitrogen substantially in the form of V_2N and containing less than about 2% by weight in the aggregate of carbon and oxygen said method comprising

i. providing a mixture of V_2O_3 and carbon in substantially stoichiometric proportions in accordance with the following formula:

$$V_2O_3 + 3\,C \rightarrow 2\,V + 3\,CO$$

ii. subjecting the mixture in a furnace to a temperature in the range of from about 1100° C to 1500° C under a reduced pressure in the range of from about 5mm to 100 microns to cause reaction between mixture constituents and the evolution of CO and maintaining the temperature and pressure in said ranges until CO is substantially no longer evolved from the mixture

iii. maintaining the temperature in the furnace in the range of about 1100° C to 1500° C and introducing nitrogen gas into the furnace to provide a nitrogen atmosphere in the furnace at a pressure of at least about 0.25 atmosphere

iv. thereafter repeating, in sequence, step (ii), step (iii) and step (ii) until the nitrogen content of the mixture is in the range of about 10 to 12 by weight

v. subsequently cooling the mixture in a nonoxidizing environment.

4,040,815

VERY FINELY DIVIDED LITHIUM AND PROCESS FOR MANUFACTURING SAME

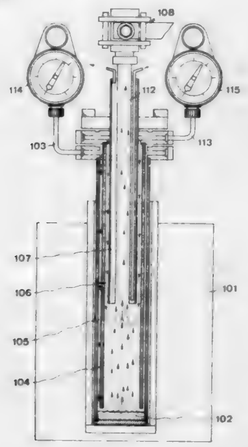
Bernard Francois, Strasbourg; Michel Vernois, Puteaux; Paul Martin, Lutzelhouse, and Emile Franta, Souffelweyershein, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Jan. 30, 1976, Ser. No. 653,747

Claims priority, application France, Feb. 7, 1975, 75.03890

Int. Cl.² C22C *1/04*

U.S. Cl. 75—.5 B **6 Claims**



1. A process for preparing very finely divided lithium comprising filtering a mixture of inert gas and fine particles of lithium in suspension in the said gas on a bed of solid bodies which can be renewed, notably by stirring, the mesh size of said bodies, the height of said bed and the speed of stirring being such that the metal particles are retained without causing a metallic slab to be formed on the surface.

4,040,816

PROCESS FOR THE PRODUCTION OF SPONGE IRON

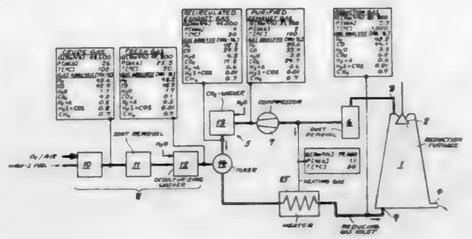
Klaus Altenhöner, Gahlen; Walter Jansen, Mulheim; Klaus Knop, Oberhausen; Ulrich Pohl, Dinslaken, all of Germany, and Jan G. Reerink, Rio de Janeiro, Brazil, assignors to Thyssen Purofer GmbH, Dusseldorf, Germany

Filed Dec. 17, 1975, Ser. No. 641,618

Claims priority, application Germany, Dec. 18, 1974, 2459876

Int. Cl.² C21B *13/00*

U.S. Cl. 75—35 **7 Claims**



1. In a process for the production of sponge iron from iron ore, wherein the iron ore is introduced into the head of a shaft furnace and reduced iron is removed from the bottom thereof as sponge iron, the iron ore being contacted during its descent in the furnace with hot reduction gas produced from a carbon-containing energy carrier and consisting predominantly of carbon monoxide and hydrogen, the improvement wherein:

a. said reduction gas is formed

a_1. in part by a desulfurized fresh gas produced by a partial oxidation of a hydrocarbon and desulfurization, and

a_2. in part by recirculated exhaust gas drawn from the head of said furnace having its carbon oxide content reduced by about 10 volume percent;

b. said fresh gas is mixed with said exhaust gas in a volume ratio of fresh-gas/exhaust-gas of 0.8 : 1.0 to produce a cold mixed gas having the following composition:

Hydrogen	about 45 volume percent
Carbon Monoxide	about 44 volume percent
Water Vapor	about 3 volume percent
Carbon Dioxide	about 6 volume percent
Balance, in trace amounts: lower hydrocarbons, nitrogen and impurities;	

c. said mixed gas is heated to a temperature of about 1000° C directly before being introduced into said shaft furnace as said reductin gas; and

d. a heated mixed gas is introduced into the shaft furnace at the latter temperature.

4,040,817

METHOD FOR THE REDUCTION OF IRON ORES IN A SHAFT FURNACE, ESPECIALLY IN A BLAST FURNACE WITH OIL INJECTION

Friedrich August Karl Luth, Luegplatz 3, 4 Dusseldorf-Oberkassel, Germany

Filed Oct. 4, 1974, Ser. No. 512,152

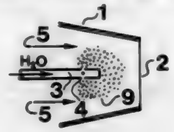
Claims priority, application Germany, Oct. 4, 1973, 2349930

Int. Cl.² C21B *5/00*

U.S. Cl. 75—42 **6 Claims**

1. A method of reducing iron ores into pig iron in a shaft furnace, wherein a stream consisting of oil is injected through at least one pipe having a nozzle head, each pipe being ar-

ranged in the area of the longitudinal axis of a blast tuyere through which tuyere blast air heated to a high temperature is blown into the furnace, the oil being injected radially outwards in the form of injection jets at an outlet velocity at which said oil is distributed into said blast air flow up to a position closely adjacent the inner wall of said blast tuyere, said pipe and said nozzle head, at least in portions thereof, are subjected to the high temperature of the blast air, which method comprises continuously controlling the ratio of the volume of the oil relative to the introduced volume of the blast air in response of



the respectively existing value of the volume of the blast air so that the injected oil is kept from the inner wall of said blast tuyere a distance which corresponds approximately to the distance at the full rated volume of the blast air, and, when the injected oil volume is reduced from about 40 to 60 volume % of the oil supply at the full rated volume of the blast air, adding in a controlled manner, a liquid coolant to the oil prior to its entry into the thermally stressed portion of the pipe so that the total amount of the oil and of the coolant ensures a cooling effect which safely prevents clogging of said pipe by setting or stopping of the flow of the oil due to temperature influence.

4,040,818

ADDITION OF MAGNESIUM TO MOLTEN METAL

Gordon A. Clegg, Rossendale; Geoffrey Maurice Cull, Salford; Phillip Andrew Fisher, Urmston, and William Unsworth, Manchester, all of England, assignors to Magnesium Elektron Limited, Manchester, England

Filed Nov. 17, 1975, Ser. No. 632,823

Claims priority, application United Kingdom, Nov. 20, 1974, 50263/74

Int. Cl.² C22C *33/08*

U.S. Cl. 75—58 **21 Claims**

1. An additive for a ferrous melt comprising an agglomerated, substantially homogeneous mixture of from 15 to 50% by weight of magnesium particles and from 1 to 10% by weight of calcium fluoride, the balance comprising particles of a refractory material which is inert to magnesium at the melting point of the latter, the refractory material providing a coherent metal-permeable matrix when subjected to the temperature of the ferrous melt.

4,040,819

BASIC OXYGEN STEEL FURNACE AND PROCESS

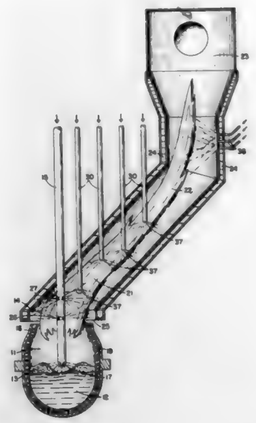
Gerald L. Rounds, Box 1074, Fontana, Calif. 92335

Filed Aug. 6, 1976, Ser. No. 712,352

Int. Cl.² C21C *5/38*

U.S. Cl. 75—60 **6 Claims**

1. In a method of producing steel, of the type wherein oxygen is blown into a charge comprising molten metal and slag-forming components within a furnace, having a mouth, to generate the heat of reaction required to refine the metal, and wherein generated off-flow gases are removed from the furnace by passage through a hood above the mouth of the furnace, the improvement comprising the step of contacting the off-flow gases with oxygen by introducing a stream of substantially pure oxygen into the hood above the mouth of the furnace whereby to oxidize the carbon monoxide component of said off-flow gases to carbon dioxide.



4,040,820

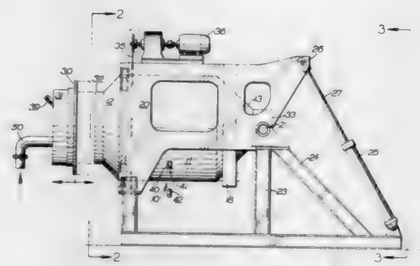
PROCESSING ALUMINUM SKIM

James A. Loach, Vienna, and Harold R. Kirby, Ripley, both of W. Va., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 9, 1976, Ser. No. 656,690

Int. Cl.² C22B *7/04*

U.S. Cl. 75—68 R **12 Claims**



1. An essentially salt-free method of recovering metallic aluminum entrained in molten aluminum-containing skim removed from a molten aluminum surface comprising,

a. tumbling said aluminum-containing skim in a refractory lined rotary furnace with an essentially halide-free atmosphere, while maintaining the temperature of the skim between 1200° and 1500° F to effect an agglomeration of the molten aluminum entrained in the skim and a separation thereof from the skim;

b. discharging the separated molten aluminum from the rotary furnace; and then

c. discharging the essentially aluminum-free skim from the rotary furnace.

4,040,821

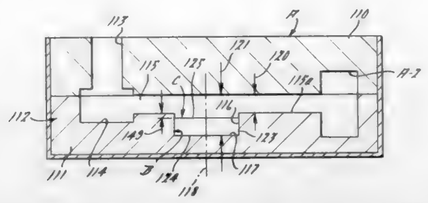
NODULARIZING CATALYST FOR CAST IRON AND METHOD OF MAKING SAME

Adolf Hetke, Livonia; Prem P. Mohla, Plymouth, and Robert J. Warrick, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 606,908, Aug. 22, 1975. This application Aug. 4, 1976, Ser. No. 711,680

Int. Cl.² C22C *33/08, 28/00*

U.S. Cl. 75—134 S **4 Claims**



1. A nodularizing agent in unitary discrete form suitable for placement in an interior recess of a mold gating system, said agent having a solid impervious brittle body consisting essentially of an iron-silicon base alloyed with 5–15% by weight of nodularizing elements effective to cause the formation of spheroidal graphite during solidification of cast iron, said body having substantially flat side and bottom walls to mate snugly with said mold gating system for the substantial exclusion of molten metal therebetween.

4,040,822

ALUMINUM BASE FLUXLESS BRAZING ALLOY

Marvin J. Stern, Seattle, Wash., assignor to Alloy Metals, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 433,016, Jan. 10, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,091

Int. Cl.² C22C *21/12*

U.S. Cl. 75—140 **17 Claims**

1. A fluxless brazing alloy suitable for brazing aluminum, having a brazing temperature of about 1080° F, or less, consisting essentially of, by weight:

4	to	15%	Silicon
0.1	to	5%	Magnesium
0.1	to	5%	Rare earth
1	to	3%	Tin
0	to	6%	Gallium
0	to	10%	Palladium
0	to	5%	Copper
0	to	8%	Silver
0	to	0.25%	Bismuth
0	to	0.25%	Strontium, and
the Balance			Aluminum.

4,040,823

METHOD OF PRODUCING AN ELECTRICAL RESISTANT FLUID-PERMEABLE HEAT GENERATING MEMBER

Takeshi Yamaguchi, Tokyo, Japan, assignor to Lorraine M. Cleland, Milwaukee, Wis.

Division of Ser. No. 497,821, Aug. 15, 1974, Pat. No. 3,965,047, which is continuation-in-part of Ser. No. 260,133, June 6, 1972, Pat. No. 3,828,161. This application Apr. 9, 1976, Ser. No. 675,528

Claims priority, application Japan, July 20, 1971, 46-54014

Int. Cl.² B22F *1/00*

U.S. Cl. 75—203 **9 Claims**

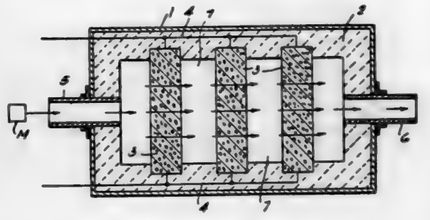
1. A method of manufacturing sintered electrically resistive fluid-permeable heat generating members comprising the sequential steps of:

I. mixing a starting material mixture into a substantially homogeneous mass, said starting material mixture being composed of:

A about 87% to 94% by weight of said starting mixture of a first material comprised of about 80% to 95% by weight of silicon carbide particles and about 50% to 20% by weight of a mixture of carbonyl iron particles, nickel-chromium alloy particles, metallic cobalt particles and carbon particles;

B. about 5% to 10% by weight of said starting mixture of a second material comprised of about 85% to 95% by weight of a liquid organic binder and about 5% to 25% by weight of an isocyanate;

C. about 0.2% to 3% by weight of said starting mixture of a third material selected from the group consisting of polystyrene powder, sawdust, wood flour, starch, corn flour and mixtures thereof;



II. placing said homogeneous mass into selected molds and subjecting said filled molds to initial curing conditions sufficient to form self-sustaining members from said homogeneous mass:

III. removing the self-sustaining members from said molds and subjecting said members to further curing conditions sufficient to impart electrical conductivity characteristics to said members; and

IV. sintering the electrically conductive members by gradually heating said members to a temperature in the range of about 1000° to 1600° F. and maintaining said conditions for a period of time sufficient to substantially destroy all organic material within said members and sinter the remaining materials into a uniformly porous body.

4,040,824

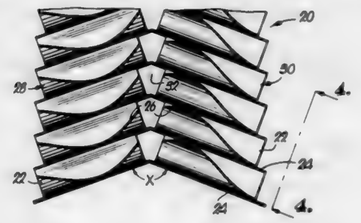
DUAL PATH DRIFT ELIMINATOR STRUCTURE AND METHOD FOR CROSSFLOW COOLING TOWER

Ohler L. Kinney, Jr., Leawood, Kans., assignor to The Marley Company, Mission, Kans.

Continuation-in-part of Ser. No. 526,848, Nov. 25, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 724,417

Int. Cl.² B01D *47/00*

U.S. Cl. 55—257 R **19 Claims**



1. A method of removing entrained water particles from a moist airstream traveling along a generally horizontal initial path, comprising the steps of:

initially diverting said moist airstream upwardly relative to said initial path such that a vector representing travel of the moist air along said initial path, and a vector represent-

ing travel of the moist air during said upward and lateral diversion, cooperatively establish a reference plane,

said diversion including the steps of moving said moist air into individual elongated first air cells located in parallel relationship and oriented for causing said upward diversion and defined by walls presenting said first air cells therebetween

thereafter secondarily diverting moist air laterally relative to the path of the air from the first air cells such that a vector representing travel of the moist air during the second lateral diversion thereof is at an angle relative to said reference plane,

said secondary diversion including the steps of moving said moist air from said first air cells into individual elongated second air cells spaced from the air cells disposed in parallel relationship and oriented for causing said second lateral diversion and defined by walls presenting said second air cells therebetween;

permitting the entrained water particles in said airstream to impinge against the walls defining said first and second air cells during said initial and secondary diversions airstream; and

draining the water collected by virtue of said impingement by allowing at least a part of said water to gravitate between said first and second air cells along the space therebetween.

4,040,825

SPECTRAL SENSITIZATION OF PHOTOGRAPHIC MATERIAL WITH NATURAL COLLOIDS CONTAINING SENSITIZING DYE GROUPS

Rolf Steiger, Praroman; Jean-Francois Reber, Marly, both of Switzerland; Aaron David Ezekiel, Sevenoaks, and Geoffrey Ernest Ficken, Ilford, both of England, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Mar. 11, 1976, Ser. No. 665,981

Claims priority, application United Kingdom, Mar. 18, 1975, 11187/75; Switzerland, Apr. 16, 1975, 4847/75; Feb. 20, 1976, 2100/76

Int. Cl.² G03C *1/02, 1/08, 1/16;* **G03G** *5/09*

U.S. Cl. 96—1.7 **7 Claims**

1. Light-sensitive photographic material with a light-sensitive heavy metal compound and a spectral sensitiser, wherein the spectral sensitiser is a compound in which the radicals of a sensitising dyestuff are covalently bonded to amino, imino, hydroxyl, mercapto, carboxylic acid or carboxylic acid amide groups of a natural hydrophilic colloid.

4,040,826

MAGING SYSTEM OF MIGRATION MATERIAL IN SOFTENABLE LAYER

William L. Goffe, Webster; Joseph Mamming, Penfield, and Joan R. Ewing, Rochester, all of N.Y., assignors to Zerox Corporation, Stemford, Conn.

Division of Ser. No. 837,591, June 30, 1969, Pat. No. 4,013,462. This application Apr. 22, 1976, Ser. No. 679,308

Int. Cl.²G03G *5/04, 16/00*

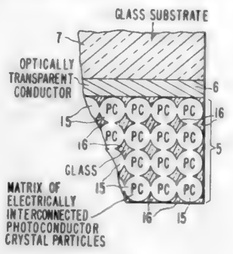
U.S. Cl. 96—1/PS **14 Claims**

1. An imaging method comprising:

(a) providing an imaging member comprising a layer of softenable material having migration marking material dispersed through said softenable material, said softenable material capable of having its resistance to migration of migration marking material decreased sufficiently to allow migration of said material in depth in said softenable material;

(b) applying a migration force to said migration marking material; and

(c) imagewise developing said imaging member by decreasing, in image configuration, the resistance to migration of migration marking material in depth in the layer of softenable material at least sufficient to allow imagewise



migration of migration material at least in depth in said softenable layer.

4,040,827

DEVELOPMENT IMAGING METHODS

Ralph A. Hamaker, Penfield, and George Phillip Carr, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1975, Ser. No. 626,689

Int. Cl.² G03G *15/10, 13/10;* **B05D** *1/28*

U.S. Cl. 96—1 LY **7 Claims**

1. A method of cyclically developing an electrostatic latent image on a reusable imaging surface comprising

forming an electrostatic latent image on the imaging surfaces,

developing the image with a liquid developer carried in the valleys of a patterned applicator roll comprising a hard, dimensionally stable, patterned surface having a thickness of from about 4 to about 12 mils and having a plurality of lands and valleys, said surface covering a deformable, resilient substrate having from about 0.05 to about one inch thickness and a Shore A hardness of from about 50 to about 90 on a support,

transferring the developing image from the imaging surface to a receiving surface in image configuration, and repeating the cycle at least one additional time.

4,040,828

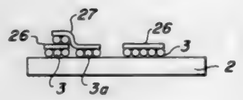
MULTICOLOR IMAGING METHOD AND IMAGED MEMBER EMPLOYING COMBINATIONS OF TRANSPARENT TONER AND COLORANT

Paul F. Evans, Plano, Tex., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 6, 1975, Ser. No. 538,826

Int. Cl.² G03G *13/01, 9/00, 9/08*

U.S. Cl. 96—1.2 **25 Claims**



1. A method for the reproduction of a multicolored original, comprising:

a. forming a first pattern of dry transparent unpigmented toner by developing with said toner a first electrostatic latent image of a first color in said original, transferring said first pattern of said toner to a base member, tackifying said first pattern of said toner, and applying a layer of a first colorant upon said first pattern of said toner; and

b. forming at least a second pattern of dry transparent unpigmented toner by developing a second electrostatic latent image of a second color in said original, transferring said second pattern of said toner to said base member in a position relative to said first pattern which corresponds to the relative positioning of said first and second colors of said original, tackifying said second pattern, and applying a layer of a second colorant upon said second pattern.

4,040,829

MULTILAYER MULTICOLOR PHOTOGRAPHIC MATERIALS

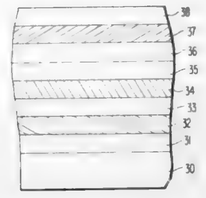
Hideki Ohmatsu, and Hirozo Ueda, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 4, 1975, Ser. No. 583,816

Claims priority, application Japan, June 4, 1974, 49-63082

Int. Cl.² G03C *7/04, 3/00*

U.S. Cl. 96—6 **10 Claims**



1. An incorporated-dye image forming coupler type multilayer photographic material comprising a support having thereon a silver halide emulsion layer which is sensitive to a first wavelength region of the visible spectrum, a silver halide emulsion layer thereon which is sensitive to a second wavelength region of the visible spectrum and thereon a silver halide emulsion layer which is sensitive to a third wavelength region of the visible spectrum, wherein the silver halide emulsion layer which receives first the light at image exposure is positioned so that said layer first receiving said light receives the light through a non-sensitive hydrophilic layer containing a semi-diffusible coupler which can form a dye image having a substantially complementary color to the sensitive wavelength range of said silver halide emulsion layer first receiving light at image exposure and which has a diffusion coefficient of from about 0.25 to 0.80 as defined by the relationship

$$\text{diffusion coefficient} = D_B/D_A$$

wherein D_A is the color density formed by the color coupler where the color coupler is present in the same layer as silver halide particles developed without imagewise exposure, and D_B is the color density obtained with the color coupler incorporated in a layer which does not contain silver halide particles on a layer which contains silver halide particles developed without image-wise exposure, the components thereof, amounts thereof and production conditions thereof being the same and the development conditions thereof being the same and with the layers being adjusted using a hardening agent so that the coefficient of expansion of the layers in water at a pH of 7.0 to 25° C does not exceed 400%.

4,040,830

PHOTOGRAPHIC PRODUCTS COMPRISING EMBOSSED SUPPORTS

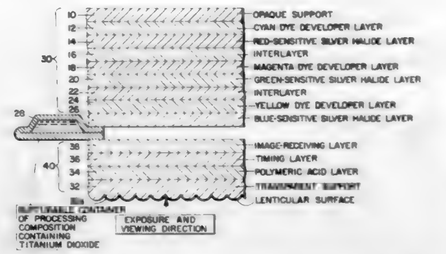
Howard G. Rogers, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 27, 1975, Ser. No. 608,062

Int. Cl.² G03C *1/72, 1/84, 1/40, 1/76*

U.S. Cl. 96—73 **36 Claims**

1. A photographic product comprising a first support carrying a red-sensitive silver halide emulsion; a green-sensitive silver halide emulsion, and a blue-sensitive silver halide emulsion; said silver halide emulsions having associated therewith, respectively, a cyan image dye-providing substance, a magenta image dye-providing substance and a yellow image dye-providing substance, each said image dye-providing substance being selected from the group consisting of image dyes and image-dye intermediates; an image-receiving layer for receiving image dyes transferred thereto by diffusion as a function of exposure and development of said silver halide emulsion layers; said image-receiving layer being carried by one of said first support and a second support; at least said support carrying said image-receiving layer being transparent, said image-receiving layer being viewable through said transparent support; a rupturable container releasable holding a processing composition adapted, upon distribution between predetermined layers of said product to develop said silver halide emulsions and to effect the formation of a multicolor transfer image in dye in said image-receiving layer, said processing composition also being adapted to provide a permanent laminate including said developed silver halide emulsions and said image-receiving layer; and means providing a light-reflecting layer between said image-receiving layer and said silver halide emulsions to provide a white background for viewing said multicolor transfer image and for masking said developed silver halide emulsions; the outer surface of said transparent support being a non-planar, embossed surface.



4,040,831

METHOD FOR THE PREPARATION OF RELIEF STRUCTURES

Roland Rubner, Rottenbach u. Forchheim; Wolfgang Kleeberg, and Eberhard Kuhn, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

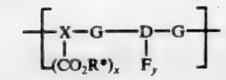
Filed July 24, 1975, Ser. No. 598,829

Claims priority, application Germany, Aug. 2, 1974, 2437348

Int. Cl.² G03C *5/00*

U.S. Cl. 96—35.1 **7 Claims**

1. In a method for the preparation of relief structures consisting of highly heat resistant polymers comprising the steps of applying a soluble, photo or radiation-sensitive prepolymer in the form of a film or foil to a substrate, said prepolymer being a poly-addition or polycondensation prepolymer having repeating units of the formula:



wherein,

X and D each comprise a carbocyclic and/or heterocyclic nucleus;

G is selected from the group consisting of amide, urea or urethane linkages;

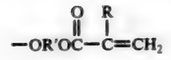
R* is an organic radical containing a photo- or radiation induced di- or polymerizable olefinic double bond; and is a component of ester group CO_2R^*, said group bound to said nucleus in ortho or peri-position to G;

F is a group capable of reacting with the carbonyl group of CO_2R^* to form a cyclic structure upon heating of the prepolymer to liberate R*OH; and wherein F is arranged in ortho- or peri-position to G;

x is 1 or 2; and

y is 0 or 2;

exposing or irradiating the photo or radiation active layer through a negative pattern, dissolving or stripping the unexposed or unirradiated portions and annealing the relief structure obtained; the improvement which comprises using as said R*, a radical represented by the formula:



wherein R is hydrogen or methyl and R is an alkylene group.

4,040,832

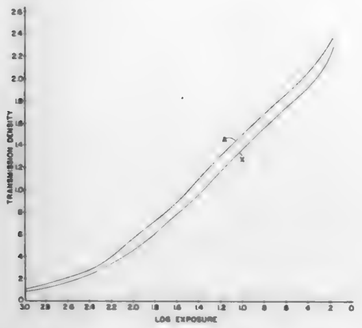
PYRAZOLIDONE TYPE DEVELOPING AGENTS

Stanley M. Bloom, Waban, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

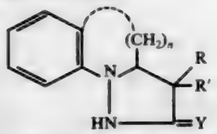
Continuation-in-part of Ser. No. 592,398, July 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 451,740, March 18, 1974, abandoned. This application Sept. 9, 1976, Ser. No. 721,859

Int. Cl.[2] G03C *5/54, 5/30, 5/38, 1/48*

U.S. Cl. 96—29 R **42 Claims**



14. A method of developing a silver halide emulsion which comprises treating an exposed silver halide emulsion layer with an aqueous alkaline processing composition of a silver halide developing agent of the formula:



wherein R and R′ each are hydrogen or lower alkyl having 1 to 4 carbon atoms, Y is =O or =NH and *n* is a positive integer from 1 to 7.

4,040,833

RADIOGRAPHIC PROCESS AND SENSITIVE MATERIAL FOR THE SAME

Masanao Hinata; Haruo Takei; Nobuaki Miyasaka, and Kenji Takahashi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Apr. 2, 1976, Ser. No. 672,947

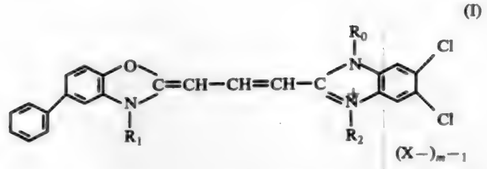
Claims priority, application Japan, Apr. 3, 1975, 50-40577

Int. Cl.[2] G03C *1/92, 1/14*

U.S. Cl. 96—45.1 **14 Claims**

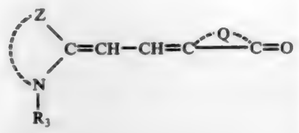
1. In a process for forming radiographic images which comprises exposing a photographic sensitive material comprising a support and at least one silver halide photographic emulsion layer to radiation from a fluorescent intensifying screen to form a latent image and thereafter developing the same, the improvement which comprises the fluorescent intensifying screen having a maximum emission wavelength in the range of about 500 to about 570 nm and a distribution such that at least about ½ of the emission energy is at a wavelength of above about 400 nm, and said silver halide photographic emulsion layer contains at least one sensitizing dye represented by formula (I) and at least one sensitizing dye represented by formula (II):

(I)



wherein R_0 represents an alkyl group and R_1 and R_2 each represent an alkyl group, but at least one of R_1 and R_2 represents a sulfoalkyl group, X represents an anion, and m represents an integer of 1 or 2,and $m=1$ when the dye forms an inner salt,

(II)



wherein Z represents the group of atoms necessary to complete a benzoxazole nucleus, R_3 represents an alkyl group, and Q represents the group of atoms necessary to complete a 2-thioimidazolidine-2,4-dione nucleus.

4,040,834

REGENERATION OF PHOTOGRAPHIC PROCESSING SOLUTIONS

Haruhiko Iwano, and Isao Shimamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 18, 1976, Ser. No. 658,963

Claims priority, application Japan, Feb. 18, 1975, 50-20196

Int. Cl.[2] G03C *5/26, 5/32;* **B01D** *13/00*

U.S. Cl. 96—50 A **8 Claims**

1. In photographic processing involving image intensification of a photographic element comprising a substrate and at least one layer containing image-wise distributed silver in the presence of a reducing agent by application of a cobalt (III) complex having ligands selected from the group consisting of ammine, nitrite, nitrate, azide, chloride, thiocyanate, isocyanate and H_2O; a method for reusing the intensifier solution containing the cobalt (III) complex characterized by:

subjecting used intensifying solution to reverse osmosis whereby the cobalt (III) complex is concentrated and unfavorable contaminants are removed, and

adjusting the pH to about 4 to 10, said solution thereby being regenerated for further intensifying.

4,040,835

TWO-EQUIVALENT MAGENTA COUPLERS WITH AMIDO COUPLING-OFF GROUPS

Atsuaki Arai; Keisuke Shiba; Minoru Yamada; Nobuo Furutachi, and Kotaro Nakamura, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 27, 1975, Ser. No. 590,998

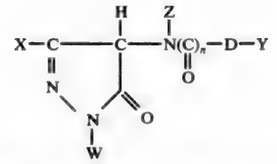
Claims priority, application Japan, June 27, 1974, 49-73673

Int. Cl.[2] G03C *7/00, 1/40*

U.S. Cl. 96—56.5 **5 Claims**

3. The process of forming color images which comprises processing an exposed color photographic material comprising a support having thereon at least one silver halide emulsion layer with a color developer containing a primary aromatic amino color developing agent in the presence of a two-equivalent magenta coupler represented by the general formulae (II) to (V):

(II)

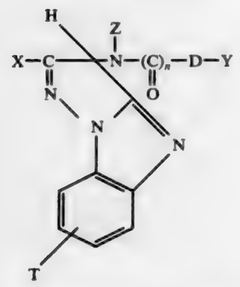


wherein W represents a hydrogen atom; or has up to 40 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloakenyl group, an aryl group, heterocyclic group, an acyl group, a thioacyl group, an alkylsulfonyl group, an arylsulfonyl group, an alkylsulfinyl group, an arylsulfinyl group, a carbamyl group, or a thiocarbamoyl group;

X represents a hydrogen atom; or has up to 40 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkenyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, an alkoxycarbonyl group, an aryloxycarbonyl group, an aralkyloxycarbonyl group, an alkoxy group, an aryloxy group, an alkylthio group, an arylthio group, a carboxyl group, an acylamino group, a diacylamino group, an N-alkylacylamino group, an N-arylacylamino group, a ureido group, a thioureido group, an alkoxycarbamido group, an aryloxycarbamido group, an alkythiocarbamido group, an arylthiocarbamido group, an anilino group, an alkylamino group, a cycloamino group, an alkycarbonyl group, an arylcarbonyl group, a sulfoamido group, a carbamoyl group, a sulfamoyl group, a guanidino group, a cyano group, an acyloxy group, a sulfonyloxy group, a hydroxyl group, a mercapto group, a halogen atom, or a sulfo group; Z represents a hydrogen atom, a alkyl group, an aryl group, or a heterocyclic group; and

D represents an oxygen atom, a sulfur atom or a —NR— group; R of the —NR— group represents hydrogen atom, an alkyl group or an aryl group; Y represents an alkyl group, an aryl group or a heterocyclic group; *n* is 1 or 2

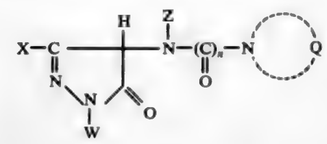
(III)



wherein X, Y, Z, D, and *n* are each as defined hereinbefore, and,

T represents a hydrogen atom; or has up to 40 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, a heterocyclic group, a cyano group, an alkoxy group, an alkoxycarbonyl group, a halogen atom, an aryloxy group, a carboxyl group, an aryloxycarbonyl group, an acyloxy group, an alkylcarbonyl group, an arylcarbonyl group, an alkylthiocarbonyl group, an arylthiocarbonyl group, a sulfo group, a sulfomoyl group, a carbamoyl group, an acylamino group, a diacylamino group, a ureido group, a thioureido group, an alkoxycarbamido group, an aryloxycarbamido group, an alkythiocarbamido group, an arythiocarbamido group, a sulfonamido group, an alkysulfonyloxy group, an arylsulfonyloxy group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylthio group, an alkylsulfinyl group, an arysulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-arylanilino group, a N-alkylanilino group, an N-acylanilino group, a hydroxyl group, or a mercapto group;

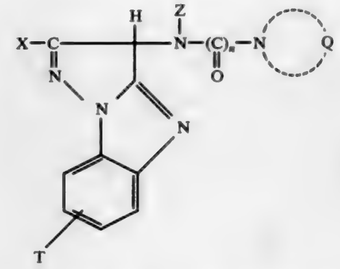
(IV)



wherein Q of the —N⟨ ⟩Q residue represents a non-metal atomic group necessary for forming a 5-membered or 6-membered nitrogen-containing heterocyclic ring and

wherein W, X, Z, —N⟨ ⟩Q, and *n* are each as defined hereinbefore;

(V)

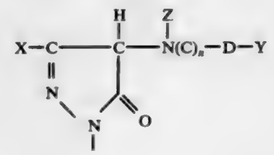


wherein X, Z, T, —N⟨ ⟩Q, and *n* are each as defined hereinbefore; or represented by the general formulae (VI*a*) to (VI*d*)

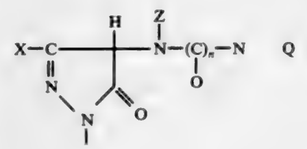
Cp — W′ — Cp (VI*a*)

wherein W′ represents a divalent moiety of the groups hereinbefore described for W; and Cp, which may be the same or different, each represents a moiety of the general formulae (II*a*) and (IV*a*)

(IIa)



(IVa)

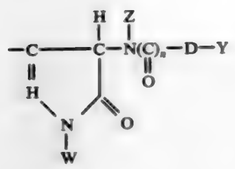


wherein X, Y, Z, D, —N⟨ ⟩Q and *n* are as hereinbefore described

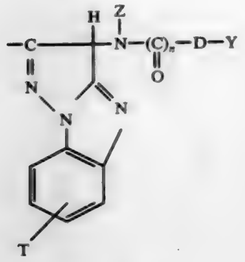
Cp — X′ — Cp (VI*b*)

wherein X′ represents a divalent moiety of the groups hereinbefore described for X; and Cp, which may be the same or

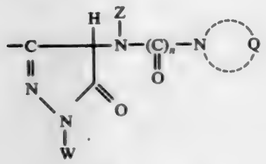
different, each represents a moiety of the formula (II*b*), (III*a*), (IV*b*) or (V*a*)



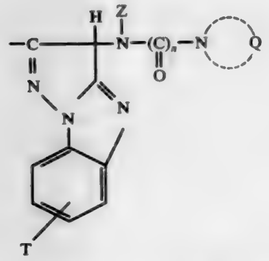
(IIIa)



(IVb)



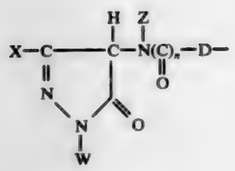
(Va)



wherein T, W, Y, Z, D, —N⬭Q and *n* are as hereinbefore described;

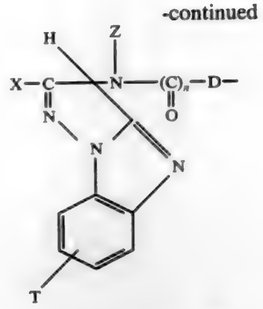
Cp — Y′ — Cp (VI*c*)

wherein Y′ represents a divalent moiety of the groups hereinbefore described for Y; and Cp, which may be the same or different, each represents a moiety of formula (II*c*) or (III*b*)



(IIIb)

-continued



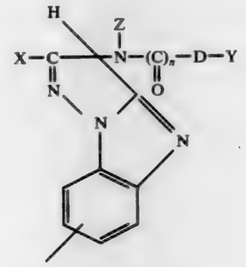
(IIb)

wherein T, W, X, Z, D, —N⬭Q, and *n* are as hereinbefore described;

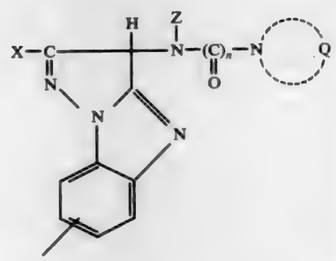
Cp — T′ — Cp (VI*d*)

wherein T′ represents a divalent moiety of the groups hereinbefore described for T; and Cp, which may be the same or different, each represents a moiety of the formula (III*c*) or (V*b*)

(IIIc)



(Vb)



wherein X, Y, Z, D, —N⬭Q, and *n* are as hereinbefore described.

4,040,836

SILVER HALIDE EMULSION CONTAINING TWO-EQUIVALENT COUPLER

Atsuaki Arai; Kotaro Nakamura; Minoru Yamada, and Nobuo Furutachi, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

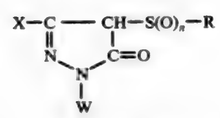
Filed July 18, 1975, Ser. No. 597,280

Claims priority, application Japan, July 18, 1974, 49-82415

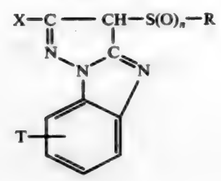
Int. Cl.² G03C *7/00, 1/40*

U.S. Cl. 96—56.5 **10 Claims**

1. A method of forming images which comprises developing a silver halide photographic light-sensitive material in the presence of a photographic two-equivalent magenta coupler, wherein said magenta coupler is represented by the following general formula (II) or (III)



(II)



(III)

wherein

W represents a hydrogen atom; or has up to 35 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group or a cycloalkenyl group, in which each of these groups can be substituted with one or more of a halogen atom, a nitro group, a cyano group, an aryl group, an alkoxy group, an aryloxy group, a carboxy group, an alkylcarbonyl group, an arylcarbonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, an acyloxy group, a sulfamoyl group, a carbamoyl group, an acylamino group, a diacylamino group, an ureido group, a thioureido group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, an alkoxythiocarbonylamino group, an aryloxythiocarbonylamino group, a sulfonamido group, a heterocyclic group, an arylsulfonyl group, an alkylsulfonyl group, an arylsulfonyloxy group, an alkylsulfonyloxy group, an arylthio group, an alkylthio group, an alkylsulfinyl group, an arylsulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-arylanilino group, an N-alkylanilino group, an N-acylanilino group, a hydroxy group and a mercapto group as substituents; an aryl group in which the aryl group can be substituted with one or more of a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, a nitro group, a cyano group, an aryl group, an alkoxy group, an aryloxy group, a carboxy group, an alkylcarbonyl group, an arylcarbonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, an acyloxy group, a sulfamoyl group, a carbamoyl group, an acylamino group, a diacylamino group, a ureido group, a thioureido group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, an alkoxythiocarbonylamino group, an aryloxythiocarbonylamino group, a sulfonamido group, a heterocyclic group, an arylsulfonyloxy group, an alkylsulfonyloxy group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylthio group, an alkylsulfinyl group, an arylsulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-alkylanilino group, an N-arylanilino group, an N-acylanilino group, a hydroxy group and a mercapto group as substituents; an aryl group in which the aryl group can be substituted with one or more of a halogen atom, an alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, a nitro group, a cyano group, an aryl group, an alkoxy group, an aryloxy group, a carboxy group, an alkylcarbonyl group, an arylcarbonyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a sulfo group, an acyloxy group, a sulfamoyl group, a carbamoyl group, an acylamino group, a diacylamino group, a ureido group, a thioureido group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, an alkoxythiocarbonylamino group, an aryloxythiocarbonylamino group, a sulfonamido group, a heterocyclic group, an arylsulfonyloxy group, an alkylsulfonyloxy group, an arylsulfonyl group, an alkylsulfonyl group, an arylthio group, an alkylthio group, an alkylsulfinyl group, an arylsulfinyl group, an alkylamino group, a dialkylamino group, an anilino group, an N-arylanilino group, an N-alkylanilino group, an N-acylanilino group, a hydroxy group and a mercapto group as substituents; an acyl group; a thioacyl group; an alkylsulfonyl group; an arylsulfonyl group; an alkylsulfinyl group; an arylsulfinyl group; a carbamoyl group; or a thiocarbamoyl group;

X represents a hydrogen atom; or has up to 35 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, or a heterocyclic group, in which each of these groups can be substituted with onr or more of the respective substituents as described above for W; an alkoxycarbonyl group; an aryloxycarbonyl group; an aralkyloxycarbonyl group; an alkoxy group; an aryloxy group; an alkylthio group; an arylthio group; a carboxy group; an acylamino group; a diacylamino group; an N-alkylacylamino group; an N-arylacylamino group; a ureido group; a thioureido group; an alkoxycarbonylamino group; aryloxycarbonylamino group; an alkoxythiocarbonylamino group; an aryloxythiocarbonylamino group; an anilino group; an alkylamino group; a cycloamino group; an alkylcarbonyl group; an arylcarbonyl group; a sulfonamido group; a carbamoyl group; a sulfamoyl group; a guanidino group; a cyano group; an acyloxy group; a sulfonyloxy group; a hydroxy group; a mercapto group; a halogen atom; or a sulfo group;

T represents a hydrogen atom; or has up to 35 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, a cycloalkyl group, an aralkyl group, a cycloalkenyl group, an aryl group, or a heterocyclic group, in which each of these groups can be substituted with one or more of the respective substituents as described above for W; a cyano group; an alkoxy group; an aryloxy group; a halogen atom; a carboxy group; an alkoxycarbonyl group; an aryloxycarbonyl group; an acyloxy group; an alkylcarbonyl group; an arylcarbonyl group; an alkylthiocarbonyl group; an arylthiocarbonyl group; a sulfo group; a sulfamoyl group; a carbamoyl group; an acylamino group; a diacyclamino group; a ureido group; a thioureido group; an alkoxycarbonylamino group; an aryloxycarbonylamino group; an alkoxythiocarbonylamino group; an aryloxythiocarbonylamino group; a sulfonamide group; an alkylsulfonyloxy group; an arylsulfonyloxy group; an arylsulfonyl group; an alkylsulfonyl group; an arylthio group; an alkylthio group; an alkylsulfinyl group; an arylsulfinyl group; an alkylamino group; a dialkylamino group; an anilino group; an N-alkylanilino group; an N-arylanilino group; an N-acylanilino group; a hydroxy group; or a mercapto group;

R has up to 40 carbon atoms and represents a straight chain or branched chain alkyl group, an alkenyl group, or an aralkyl group, in which each of these groups can be substituted with one or more of a halogen atom, a nitro group, a carboxy group, an alkoxy group, an alkylamido group, an arylamido group, a sulfamoyl group, a carbamoyl group, a substituted amino group, an alkylthio group, and an arylthio group as substituents; an aryl group in which the aryl group can be substituted with one or more of a halogen atom, an alkyl group having 1 to 20 carbon atoms, an aralkyl group, an alkenyl group, an alkyloxy group, an aryloxy group, a nitro group, a cyano group, a carboxy group, an alkyloxycarbonyl group, an aryloxycarbonyl group, an acyloxy group, an alkylamido group, an arylamido group, a diacylamino group, a sulfamoyl group, a sulfonamido group, a ureido group, a thioureido group, an alkoxycarbonylamino group, an aryloxycarbonylamino group, an alkoxythiocarbonylamino group, an aryloxythiocarbonylamino group, a carbamoyl group, a substituted amino group, an alkylthio group, an arylthio group, a sulfonyl group and a carbonyl group as substituents; and a heterocyclic group in which the heterocyclic group can be substituted with one or more of the substituents as described above for the aryl group for R; and *n* is 1 or 2.

4,040,837

PHOTOGRAPHIC BLEACH-FIXER

Kenro Sakamoto; Isamu Fushiki, and Sigeharu Koboshi, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Filed Dec. 2, 1975, Ser. No. 636,948

Claims priority, application Japan, Dec. 5, 1974, 49-140322

Int. Cl.² G03C *5/32*

U.S. Cl. 96—60 BF **5 Claims**

1. A photographic bleach-fixer comprising per liter 0.1 to 1.5 moles of an organometallic complex salt of an organic acid, selected from the group consisting of ethylenediaminetetraacetic acid, nitrilotriacetic acid, diethylenetriaminepentaacetic

acid, 1,2-cyclohexanediaminetetraacetic acid, glycol ether diaminetetraacetic acid, oxybis-(ethyleneoxyethylenenitrilo) tetraacetic acid, oxalic acid and citric acid, coordinated with an ion selected from the group consisting of Iron (III), Cobalt (III) and Copper (II) ion, 0.2 to 2.0 moles of a silver halide-fixing agent, and 0.5 to 7.0 moles of a halide of the general formula:

$$A - X$$

wherein A is selected from the group consisting of hydrogen, lithium, sodium, potassium and ammonium; and X is selected from the group consisting of bromine and iodine.

4,040,838

PROCESSING COLOR PHOTOGRAPHIC MATERIALS

Seiya Yamaguchi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Mar. 5, 1976, Ser. No. 664,225
Claims priority, application Japan, Mar. 5, 1975, 50-27276
Int. Cl.[2] G03C *5/32*
U.S. Cl. 96—60 R **15 Claims**

1. A process of bleaching or blixing silver halide color photographic materials which comprises processing exposed and color developed photographic materials in a bleach solution or a blix solution having a pH of from 5.0 to 7.5 containing an iron III, cobalt III or copper II complex salt of an organic acid, a water soluble ammonium compound and a magnesium compound selected from the group consisting of magnesium acetate, magnesium bromide, magnesium chloride, magnesium sulfate, magnesium carbonate, magnesium citrate, magnesium hydroxide, magnesium lactate, magnesium nitrate, magnesium oxalate, magnesium oxide, magnesium perchlorate, magnesium secondary phosphate, magnesium tertiary phosphate, magnesium silicate, magnesium bromate, magnesium sulfite, or magnesium chromate.

4,040,839

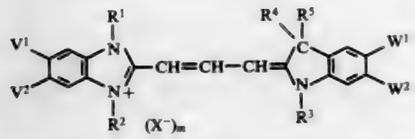
DIRECT-POSITIVE PROCESS UTILIZING A SUPERSENSITIZED SILVER HALIDE EMULSION

Junichi Matsuyama; Masanao Hinata, and Akira Sato, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 19, 1976, Ser. No. 687,819
Claims priority, application Japan, May 19, 1975, 50-59479
Int. Cl.[2] G03C *5/24, 1/28*
U.S. Cl. 96—64 **8 Claims**

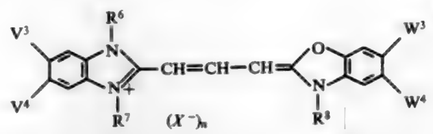
1. A method of obtaining a direct positive image, which comprises image-wise exposing a layer of an internal latent image silver halide emulsion, and then surface developing in contact with a fogging agent, wherein the internal latent image silver halide photographic emulsion yields a direct positive image on surface development in contact with said fogging agent and contains at least one sensitizing dye of the following general formula (I) and at least one sensitizing dye of the following general formula (II) and/or (III), in an amount effective to achieve supersensitization:

(I)



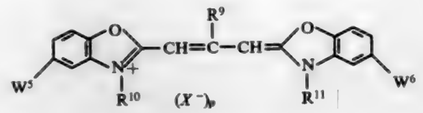
wherein V^1 and V^2 each represents a hydrogen atom, halogen atom, trifluoromethyl, cyano, carboxy, alkoxycarbonyl, aminosulfonyl or alkylsulfonyl; W^1 and W^2 each represents a hydrogen atom, halogen atom, alkyl, alkoxy, hydroxy, acyloxy or phenyl; R^1 represents alkyl or substituted alkyl; R^2 and R^3 each represents alkyl or substituted alkyl, and at least one of R^2 and R^3 represents substituted alkyl containing a carboxy or sulfo radical; R^4 and R^5 each has the same meaning as R^1; X^- represents an acid anion; and m represents 1 or 0;

(II)



wherein V^3 and V^4 each has the same meaning as V^1 and V^2; W^3 and W^4 each has the meaning as W^1 and W^2; R^6 has the same meaning as R^1; R^7 and R^8 each has the same meaning as R^2 and R^3; X^- represents an acid anion; and n represents 1 or 0;

(III)



wherein W^5 and W^6 each has the same meaning as W^3 and W^4; R^{10} and R^{11} each has the same meaning as R^2 and R^3; R^9 represents an alkyl group; X^- represents an acid anion; and p represents 0 or 1.

4,040,840

PHOTOGRAPHIC SENSITIVE ELEMENTS HAVING DYED LAYERS

Masatoshi Sugiyama, and Akira Ogawa, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 23, 1976, Ser. No. 744,353
Claims priority, application Japan, Nov. 26, 1975, 50-142580
Int. Cl.[2] G03C *1/84*
U.S. Cl. 96—84 A **12 Claims**

1. A silver halide photographic light-sensitive element comprising a support, at least one silver halide light-sensitive emulsion layer and at least one hydrophilic colloid layer, wherein said hydrophilic colloid layer comprises at least one merocyanine dye having an isoxazole nucleus, a pyrazoline-5-one nucleus and at least one acid group in the dye molecule, the 3-position of the isoxazole nucleus being linked through a methine chain to the 4-position of the pyrazoline-b 5-one nucleus, and a basic polymer having tertiary- or quaternary-nitrogen containing basic residues on the main chain or on the side chains thereof.

4,040,841

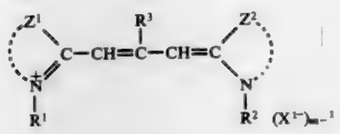
SILVER HALIDE PHOTOGRAPHIC EMULSION

Masanao Hinata; Haruo Takei; Akira Sato; Tadashi Ikeda, and Atsuo Iwamoto, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 6, 1975, Ser. No. 602,508
Claims priority, application Japan, Aug. 9, 1974, 49-91369
Int. Cl.[2] G03C *1/14*
U.S. Cl. 96—126 **11 Claims**

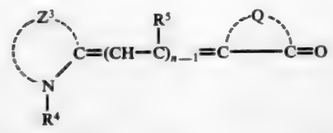
1. A silver halide photographic emulsion containing, in supersensitizing amounts, the combination of at least one sensitizing dye represented by the following general formula (I)

(I)



wherein Z^1 represents the atoms necessary to form a benzimidazole ring, an oxazole ring, a benzoxazole ring or a naphthoxazole ring; Z^2 represents the atoms necessary to form a thiazole ring, a benzothiazole ring, a naphthothiazole ring, a selenazole ring, a benzoselenazole ring or a naphthoselenazole ring; R^1 and R^2 each represents an aliphatic group; R^3 represents a hydrogen atom, an alkyl group, an aryl group or an aralkyl group; X^1 represents an acid anion; m represents 1 or 2, and m represents 1 when the dye forms an intramolecular salt; and at least one second sensitizing dye represented by the following general formula (II)

(II)



wherein Z^3 represents the atoms necessary to complete a benzoxazole, ring; Q represents the atoms necessary to form a thiohydantoin ring; R^4 represents an aliphatic group; R^5 represents a hydrogen atom, an alkyl group, an aryl group or an aralkyl group; and n is 2.

4,040,842

RUST PREVENTING COATING COMPOSITION

Hiroshi Makishima; Minoru Hosoda, both of Yokohama; Eiichi Kasiwagi, Fujisawa, and Toshiharu Hayashi, Yokohama, all of Japan, assignors to Dai Nippon Tokyo Co., Ltd., Osaka, Japan

Continuation of Ser. No. 557,382, March 11, 1975, abandoned. This application Oct. 21, 1976, Ser. No. 734,596
Claims priority, application Japan, July 23, 1974, 49-84504
Int. Cl.[2] C09D *5/10*
U.S. Cl. 106—1 **9 Claims**

1. In a rust preventive aqueous coating composition having an extended pot life and consisting essentially of a major amount of, and a minor amount of zinc powder at least one silicate selected from the group consisting of alkali metal silicates and ammonium silicate; the improvement comprising 0.0001 to 1% by weight of at least one salt selected from the group consisting of molybdates, tungstates, phosphomolybdates and phosphotungstates.

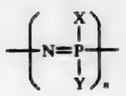
4,040,843

FLAME-RETARDANT REGENERATED CELLULOSE FILAMENTS CONTAINING OLIGOMERIC PHOSPHONITRILIC COMPOUNDS

Borivoj Richard Franko-Filipasic, Morrisville, Pa., and John Francis Start, Mercerville, N.J., assignors to FMC Corporation, Philadelphia, Pa.

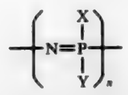
Continuation-in-part of Ser. No. 428,111, Dec. 26, 1973, abandoned, which is a division of Ser. No. 230,955, March 1, 1972, Pat. No. 3,836,599. This application Feb. 9, 1976, Ser. No. 656,681
Int. Cl.[2] C08L *1/08, 1/24;* D01F *2/08;* D06M *13/32, 13/44*
U.S. Cl. 106—15 FP **9 Claims**

1. Regenerated cellulose filaments and filamentary articles, said filaments having dispersed therein a flame-retardant amount of a substantially water-insoluble viscous phosphorus-containing oligomeric flame-retardant fluid made by heating together at a temperature of about 50 to 180° C for at least 2 hours up to 36 hours (a) phosphoric anhydride with (b) a fluid phosphonitrilic ester having the general formula:



in which n is at least 3 and wherein X and Y represent the same or different —OR groups wherein R is an alkyl or alkenyl radical having 1 to 12 carbon atoms, at a mole ratio of 1 mole of (a) to 10 to 20 moles of (b), wherein moles of (b) are based on a monomeric unit of the ester general formula.

5. The method of preparing flame-retardant regenerated cellulose filaments which combines mixing viscose and a flame-retardant amount of a substantially water-insoluble viscous phosphorus-containing oligomeric flame-retardant fluid made by heating together at a temperature of about 50° to 180° C for at least 2 hours up to 36 hours (a) phosphoric anhydride with (b) a fluid phosphonitrilic ester having the general formula:



in which n is at least 3 and wherein X and Y represent the same or different —OR groups wherein R is an alkyl or alkenyl radical having 1 to 12 carbon atoms, at a mole ratio of 1 mole of (a) to 10 to 20 moles of (b), wherein moles of (b) are based on a monomeric unit of the ester general formula, and, thereafter, spinning the mixture into filaments.

4,040,844

PORCELAIN TOOTH AND METHOD OF MANUFACTURE

Rafael Gnecco, 3820 Waldo Ave., Bronx, N.Y. 10463

Filed June 10, 1975, Ser. No. 585,529
Int. Cl.[2] A61C *13/08;* C09K *3/00*
U.S. Cl. 106—35 **5 Claims**

1. A method of making a porcelain tooth structure, comprising preparing a paste of powder-form porcelain and an adhesive material, in an amount sufficient to form a cohesive mass of said porcelain, forming said paste into the general shape of a desired, finished porcelain tooth and drying said formed paste to produce an unbaked, dry, coherent tooth structure,

said adhesive in at least part of said tooth structure being a water-soluble adhesive treated with an agent during the formation of the paste to render said adhesive water-resistant after drying, said agent entering into a physico-chemical reaction with said adhesive, and said adhesive being volatilizable below vitrification temperature and leaving no discoloring effect,

and said porcelain being compatible with standard commercial porcelains so that when standard commercial porcelain is added to the structure and the entire structure is fired, a monolithic structure results.

4,040,845

CERAMIC COMPOSITION AND CRUCIBLES AND MOLDS FORMED THEREFROM

David W. Richerson, and Donald R. Schuyler, II, both of Tempe, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Mar. 4, 1976, Ser. No. 663,641
Int. Cl.[2] B28B *7/34;* C04B *35/50*
U.S. Cl. 106—38.9 **10 Claims**

1. A ceramic composition for use in constructing crucibles and molds used in reactive metal casting consisting essentially of a mixture of a major amount of yttrium oxide and a minor amount of heavy rare earth mixed oxides consisting essentially of dysprosium oxide, ytterbium oxide, erbium oxide, gadolinium oxide, terbium oxide, holmium oxide, thulium oxide and lutetium oxide.

4,040,846

OPTICAL FLUOROPHOSPHATE GLASS AND PROCESS OF MAKING SAME

Heinz Broemer, Hermannstein, and Norbert Meinert, Bielhausen, both of Germany, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Mar. 17, 1976, Ser. No. 667,836
Claims priority, application Germany, Mar. 29, 1975, 2514017
Int. Cl.[2] C03C *3/16, 3/18*
U.S. Cl. 106—47 Q 24 Claims

1. An optical fluorophosphate glass of a high positive anomalous partial dispersion $\Delta\nu_e$ within the range of from about +10.0 to about +21.0, a relatively high index of refraction n_e within the range of from about 1.47 to about 1.54 and an Abbe number ν_e within the range of from about 84.1 to about 51.0, said glass being composed of the following components in approximate weight percent:

OXIDE COMPONENTS (a):
9% to 20% of phosphorus pentoxide (P_2O_5)
0% to 4% of cadmium oxide (CdO)
0% to 15% of lead monoxide (PbO)
0% to 14% of antimony trioxide (Sb_2O_3)
0% to 10% of lanthanum oxide (La_2O_3)
0% to 3% of germanium dioxide (GeO_2)
0% to 6% of titanium dioxide (TiO_2)
0% to 7% of niobium pentoxide (Nb_2O_5)
0% to 7% of molybdenum trioxide (MoO_3)
0% to 9% of tungsten trioxide (WO_3);
FLUORIDE COMPONENTS (b):
3% to 7% of magnesium fluoride (MgF_2)
5% to 19% of calcium fluoride (CaF_2)
0% to 11% of strontium fluoride (SrF_2)
0% to 34% of barium fluoride (BaF_2)
0% to 4% of cadmium fluoride (CdF_2)
21% to 23% of aluminum fluoride (AlF_3)
0% to 10% of bismuth trifluoride (BiF_3);
COMPLEX FLUORIDE COMPONENTS (c):
0% to 6% of potassium hydrogen fluoride (KHF_2)
0% to 15% of potassium titanium hexafluoride (K_2TiF_6)
0% to 24% of barium titanium hexafluoride ($BaTiF_6$);

the calculated phosphorus content of said glass being between about 4.1% and about 8.4%, by weight, the calculated fluorine content thereof being between about 30.8% and about 37.6%, by weight, and the ratio of fluorine to phosphorus (F/P) being between about 3.7 and about 8.2.

4,040,847

TEMPERATURE STABLE FIBROUS INSULATION COMPOSITION AND "WET" PACKAGE FORMED THEREOF

William Clyde Miiller, Denver, Colo., assignor to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 14, 1976, Ser. No. 676,776
Int. Cl.[2] C04B *35/80*
U.S. Cl. 106—69 7 Claims

1. A temperature stable refractory fiber insulation composition which comprises a binder impregnated refractory fiber blanket, said binder comprising a binder system consisting essentially of 25% to 95% by volume of an aqueous suspension of colloidal silica containing 15 to 30 weight percent solids, wherein the silica is in the form of particles having a mean particle diameter of not greater than 10 nanometers; 5 to 12 volume percent ethylene glycol; and up to 70% added water.

4,040,848

POLYCRYSTALLINE SILICON ARTICLES CONTAINING BORON BY SINTERING

Charles D. Greskovich, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 6, 1976, Ser. No. 646,969
Int. Cl.[2] C01B *33/00, 35/02;* C04B *35/16*
U.S. Cl. 106—73.5 9 Claims

1. A process for producing a polycrystalline sintered body of silicon which comprises forming a particulate mixture of silicon powder and boron, said silicon powder and boron having an average particle size less than 3 microns, said boron being present in an amount ranging from 0.1% by weight to 5% by weight of said silicon powder, shaping said mixture into a green body having a density of at least 30% of the theoretical density of silicon, and sintering the green body at a temperature ranging from 1250° C to a temperature below the melting point of silicon in an atmosphere which has no significant deteriorating effect on the green body or the resulting sintered body to produce a sintered body having a density of at least 60% of the theoretical density of silicon, and sintering densifying said green body in an amount of at least 2%.

4,040,849

POLYCRYSTALLINE SILICON ARTICLES BY SINTERING

Charles D. Greskovich, and Joseph H. Rosolowski, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 6, 1976, Ser. No. 646,968
Int. Cl.[2] C01B *33/02;* C04B *35/16*
U.S. Cl. 106—73.5 8 Claims

1. A process for producing a polycrystalline sintered body of silicon which comprises shaping silicon powder having an average particle size less than 0.1 micron into a green body having a density of at least 30% of the theoretical density of silicon, said powder having a structure ranging from amorphous to crystalline, and sintering the green body at a temperature ranging from 1250° C to a temperature below the melting point of silicon in an atmosphere which has no significant deteriorating effect on the green body or the resulted sintered body to produce a sintered body having a density of at least 60% of the theoretical density of silicon, said sintering densifying said green body in an amount of at least 2%.

4,040,850

PRODUCTION OF POROUS GYPSUM MOLDINGS

Hans Kyri, Cologne; Karl Brändle, Leverkusen; Martin Miller, and Heinrich Heise, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 14, 1975, Ser. No. 604,856
Claims priority, application Germany, Sept. 3, 1974, 2442021
Int. Cl.[2] C04B *11/00*
U.S. Cl. 106—87 10 Claims

1. In the production of a gypsum based porous body of high strength by foaming a gypsum-water mixture, the improvement which comprises including in said mixture of water and calcium sulfate about 0.1 to 1 part of a water-soluble aluminum salt per 100 parts by weight of gypsum, at least about 0.1% by weight of calcium oxide or the equivalent amount of calcium hydroxide in such a quantity that the final mixture has a pH-value in the range of about 10 to 13, a decomposition catalyst, and about 0.5 to 5 parts of hydrogen peroxide, expressed as a 35% solution, per 100 parts by weight of mixture, the ratio of solids to liquid being about 1:0.4 – 1.

4,040,851

COTTON-CEMENT ARTICLES

B. Randall Ziegler, Freehold, N.J., assignor to GAF Corporation, New York, N.Y.

Filed May 30, 1975, Ser. No. 582,165
Int. Cl.[2] C04B *7/353*
U.S. Cl. 106—93 22 Claims

1. A fiber reinforced cementitious hydrated reaction product of curing a reaction mixture comprising on a dry basis:
a. between about 25 and about 75 wt. % Portland cement;
b. between about 1 and about 15 wt. % cotton fiber;
c. between about 3 and about 30 wt. % inorganic filler; and
d. at least sufficient water to supply water of hydration.

4,040,852

LIGHTWEIGHT AGGREGATE

Dennis A. Jones, Vandalia, Ohio, assignor to Amax Resource Recovery Systems, Inc., Atlanta, Ga.

Continuation of Ser. No. 564,878, April 4, 1975, abandoned, which is a division of Ser. No. 489,905, July 19, 1974, Pat. No. 3,961,973. This application June 17, 1976, Ser. No. 697,276
The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—97 1 Claim

1. The process of producing a concrete mix for the manufacture of lightweight structural concrete and the like comprising the steps of:
1. selecting dry bottom ash formed as a by-product of burning pulverized coal in a suspended state in a dry bottom furnace, said ash being essentially free of fly ash and other excess fine particles so that no more than 25 percent passes a 100-mesh screen, and having less than 1 percent iron pyrite by weight and not more than 5 percent sulfur trioxide by weight; and
2. mixing said selected dry bottom ash with Portland cement as the principal lightweight aggregate component of the resulting concrete mix.

4,040,853

PROCESS FOR THE PREPARATION OF RAW MIX FOR THE PRODUCTION OF CEMENT AND SULPHURIC ACID

Walter Binder, Linz; Josef Hutter, Linz-Dornach; Heinrich Stich, Ottensheim; Kurt Ruckensteiner, Leonding, all of Austria; Josef Tines, deceased, late of Linz, Austria; by Antonie Tines, legal representative, Altmunster, and by Heide Schwarz, legal representative, Linz, both of Austria, assignors to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Dec. 16, 1975, Ser. No. 641,589
Claims priority, application Germany, Dec. 23, 1974, 2461133
Int. Cl.[2] C04B *7/04*
U.S. Cl. 106—103 11 Claims

1. A process for the preparation of a raw mix suitable for use in the production of cement and sulphuric acid by the cement-sulphuric acid process, which comprises separately grinding coke to a degree of comminution such that 25 to 40% by weight of the ground coke has a grain size of less than 60μ, 8 to 15% by weight of the ground coke has a grain size of 60 to 90μ, and 45 to 70% by weight of the ground coke has a grain size of greater than 90μ, and mixing the ground coke with a ground mixture of calcium sulphate and remaining additives.

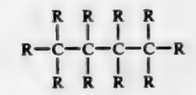
4,040,854

METHODS OF USING CEMENTING COMPOSITIONS HAVING IMPROVED FLOW PROPERTIES, CONTAINING PHOSPHONOBUTANE TRICARBOXYLIC ACID

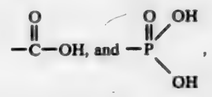
Leonard J. Persinski, Pittsburgh, Pa.; Fred David Martin, Socorro, N. Mex., and Sally Lee Adams, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 553,775, Feb. 27, 1975, Pat. No. 3,964,921. This application Apr. 14, 1976, Ser. No. 676,844
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.[2] C04B *7/02, 7/35*
U.S. Cl. 106—90 6 Claims

1. In a method of subjecting an aqueous hydraulic cement slurry to flow for the purpose of handling or transporting said slurry, the improvement comprising adding to said slurry, prior to subjecting said slurry to flow, from about 0.01 to about 5.0 percent by weight, based on weight of hydraulic cement on a dry basis, of a phosphonobutane tricarboxylic acid additive of the following formula:



wherein R is independently selected from —H,



provided that three R groups are



and one R group is



4,040,855

MANUFACTURE OF LIGHTWEIGHT CONCRETE

Arthur A. Rady-Pentek, 3379 Rte. 46, Apt. 14-F, Parsippany, N.J. 07054, and Edwin William Fairweather, 21894 Knudsen Drive, Grosse Ile, Mich. 48138

Filed Aug. 4, 1975, Ser. No. 601,254
Int. Cl.[2] C04B *7/35*
U.S. Cl. 106—90 4 Claims

1. The method of making lightweight concrete having a density of 0.340 to 1.060 grams per cubic centimeter which comprises mixing with cement, water, water-reducing admixture and air-entraining agent an aggregate material consisting essentially of a mixture of first and second portions of particles of polystyrene expanded to a density of 0.013 to 0.019 grams per cubic centimeter, said particles being of controlled size such that said first portion thereof consists of beads which in their unexpanded form are substantially all of a diameter between 1.04 and 0.35 millimeters and 90 percent by weight of a diameter between 0.9 and 0.4 millimeters, and said second portion thereof consists of beads which in their unexpanded form are substantially all of a diameter between 1.29 and 0.35 millimeters and 90 percent by weight of a diameter between 1.24 and 0.58 millimeters, said portions being admixed in a

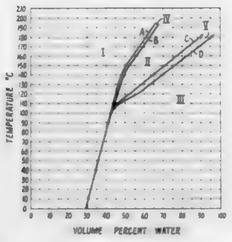
weight ratio of 2.5 to 3.5 parts by weight of said second portion per one part by weight of said first portion, the mixture of particles being of such uniformity that ten samples each of approximately 1200 to 1500 cubic centimeters in volume of loose and dry expanded beads exhibit a co-efficient of variation C_V in respect to absolute-volume factor of under 3.0, said aggregate being mixed with water, cement, water-reducing admixture, air-entraining agent and optionally sand to form said lightweight concrete under conditions such that bead-to-bead contact is substantially wholly avoided.

4,040,856

PRODUCTION OF DISCRETE CELLULOSE ACETATE FIBERS BY EMULSION FLASHING

Paul C. Litzinger, Camas, Wash., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed June 17, 1975, Ser. No. 587,772
Int. Cl.[2] C08L *1/08*
U.S. Cl. 106—170 **6 Claims**



1. A process for producing discrete cellulose alkanoate fibers comprising

a. forming a mixture of a substantially water-insoluble cellulose alkanoate, water and a solvent for the cellulose alkanoate, which solvent has a normal boiling point of less than about 100° C, is present in an amount of from about 1 to 60 volume percent based on the volume of water and solvent, and is miscible with the water in the emulsion at the temperature of the emulsion, the concentration of the cellulose alkanoate being such that the mixture appears as an emulsion of solvent-plasticized liquid droplets of cellulose alkanoate in a continuous water-solvent phase at the temperature of the emulsion, the temperature of the emulsion being between about 120° and 200° C and at least 60° C above the normal boiling point of the solvent, and

b. passing the emulsion through a nozzle into a zone of lower pressure, the pressure in the zone of lower pressure being such that rapid vaporization of the solvent causes the cellulose alkanoate to solidify as discrete fibers.

4,040,857

NON-NEWTONIAN PHARMACEUTICAL COMPOSITIONS

Kenneth J. Lissant, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 201,562, Nov. 23, 1971, Pat. No. 3,892,881, Continuation-in-part of Ser. No. 784,905, Dec. 18, 1968, abandoned. This application Feb. 21, 1975, Ser. No. 551,727
Int. Cl.[2] A01N *9/04;* B01J *13/00;* C08L *91/00*
U.S. Cl. 106—243 **10 Claims**

1. A pharmaceutical thixotropic high internal phase ratio emulsion characterized by the presence of a pharmaceutical agent therein,

said thixotropic high internal phase ratio emulsion having the characteristics of a solid when at rest and the characteristics of a liquid when a force is exerted on it, the emlsion having (1) an emulsifying agent, (2) a pharmaceutically acceptable emulsifiable oil, and (3) a liquid pharmaceutically acceptable non-oil,

said thixotropic high internal phase ratio emulsion being selected from the group consisting of (1) an oil-in-non-oil emulsion and (2) a non-oil-in-oil emulsion,

the internal phase of said emulsion being present in an amount of at least 80% by volume of the emulsion.

4,040,858

PREPARATION OF PRECIPITATED SILICAS HAVING CONTROLLED REFRACTIVE INDEX

Satish K. Wason, Churchville, Md., assignor to J. M. Huber Corporation, Locust, N.J.

Continuation-in-part of Ser. No. 519,720, Oct. 31, 1974, which is a continuation-in-part of Ser. No. 286,655, Sept. 6, 1972, Pat. No. 3,893,840. This application June 7, 1976, Ser. No. 693,591
The portion of the term of this patent subsequent to Oct. 26, 1993, has been disclaimed.
Int. Cl.[2] C09C *1/28*
U.S. Cl. 106—288 B **11 Claims**

1. A method for the adjustment of the refractive index of a precipitated silica, said precipitated silica being formed by the acidification of a solution of an alkali metal silicate by addition of a mineral acid, wherein the silica precipitates on acidification of the solution, comprising the step of adding an adduct element selected from the group consisting of aluminum, magnesium, zinc and calcium to said solution containing said precipitated silica.

4,040,859

TIN-CONTAINING LUSTROUS PIGMENTS

Reiner Esselborn, and Horst Bernhard, both of Darmstadt, Germany, assignors to Merck Patent Gesellschaft mit beschraenkter Haftung, Darmstadt, Germany

Filed May 18, 1976, Ser. No. 687,458
Claims priority, application Germany, May 22, 1975, 2522573
Int. Cl.[2] C09C *1/00*
U.S. Cl. 106—291 **10 Claims**

1. A lustrous, light-stable mica flake pigment consisting essentially of mica flakes coated by precipitation with up to 90% by weight of the pigment of a continuous, smooth, uniform layer consisting essentially of tin dioxide or a hydrate thereof and up to 10% by weight of coprecipitated aluminum oxide or a hydrate thereof.

4,040,860

CHROMIUM OXIDE PIGMENT FROM SODIUM CHROMATE DIHYDRATE PLUS AMMONIUM SALT

Manfred Mansmann, and Wolfgang Rambold, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 6, 1976, Ser. No. 656,040
Claims priority, application Germany, July 9, 1975, 2530565
Int. Cl.[2] C09C *1/34*
U.S. Cl. 106—302 **12 Claims**

1. In the production of chromium oxide green pigment by heating a substantially stoichiometrically equivalent mixture of sodium dichromate dihydrate and an ammonium salt selected from the group consisting of the sulfate and chloride, the improvement which comprises thoroughly dry mixing sodium dichromate dihydrate having a particle size less than about 2 mm with the ammonium salt having a particle size less than about 0.5 mm, adding water to the mixture in about 1 to 10% by weight of the sodium dichromate dihydrate plus ammonium salt, heating the resulting mixture over a period of about 15 minutes to a pigment-forming temperature of about 800° to 1100° C. calcining the mixture at a temperature in that range, an separating the formed pigment from the salts.

4,040,861

PROCESS OF REFINING ENZYMATICALLY PRODUCED LEVULOSE SYRUPS

Raoul G. P. Walon, Brussels, Belgium, assignor to CPC International Inc., Englewood Cliffs, N.J.

Filed Sept. 9, 1976, Ser. No. 721,741
Claims priority, application Belgium, Mar. 15, 1976, 54881
Int. Cl.[2] C13D *3/12, 3/14;* C13K *11/00*
U.S. Cl. 127—46 A **10 Claims**

1. Process for refining an enzymatically produced levulose-bearing syrup comprising subjecting said syrup to treatment with a cation exchanger and an anion exchanger for the removal of ions, and sulfonated coal for the removal of color bodies and color percursors.

4,040,862

PROCESS FOR MAKING A THERMAL CONVERTING STARCH BY MODIFICATION OF OXIDIZED STARCH WITH ALUMINUM SALTS

John E. Voigt, and Edward M. Bovier, both of St. Louis County, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed July 2, 1976, Ser. No. 702,032
Int. Cl.[2] C13L *1/08;* C08B *31/00*
U.S. Cl. 127—70 **9 Claims**

1. A process for preparing starch for use in paper coating compositions comprising the steps of:

a. forming an aqueous slurry of an unmodified starch,

b. oxidizing said starch to a degree equivalent to that obtained by oxidizing with about 1.0 to about 2.0% available chlorine,

c. adding a water-soluble aluminum salt to said oxidized starch, and

d. adjusting the pH to about 6 to about 7.

4,040,863

METHOD OF TREATING SURFACE OF COPPER AND ITS ALLOYS

Koji Kitamura, Fuji, Japan, assignor to Tokai Denka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 26, 1976, Ser. No. 735,442
Claims priority, application Japan, Jan. 14, 1976, 51-2737
Int. Cl.[2] B08B *3/08*
U.S. Cl. 134—3 **3 Claims**

1. In a method of treating surfaces of copper and its alloys to dissolve a layer of metal or oxide scale thereon by contacting said surfaces with an acidic aqueous solution of hydrogen peroxide in the presence of chlorine ions, the improvement which comprises adding to the solution a compound selected from the group consisting of cyclohexanol, methylcyclohexanol, and mixtures thereof, in an amount effective to inhibit reduction of the dissolving activity of the solution by the chlorine ions.

4,040,864

DEVICE AND METHOD FOR CLEANING LEAVES AND DEBRIS FROM SWIMMING POOLS

Claire L. Steeves, 1300 Mistletoe, Fort Worth, Tex. 76110

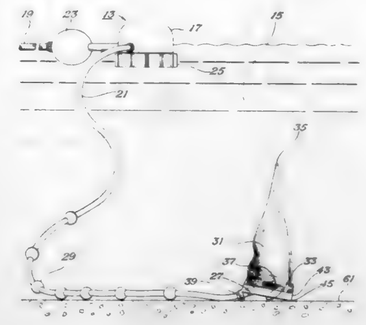
Filed Mar. 12, 1976, Ser. No. 666,507
Int. Cl.[2] B08B *7/00*
U.S. Cl. 134—6 **10 Claims**

1. A method of cleaning leaves and debris from the bottom of a swimming pool, comprising the steps of:

connecting the mouth of a reticulated bag to the nozzle of an outlet hose of a swimming pool cleaner of the type that has a floating body, an inlet hose connected to a high pressure water supply, a flexible outlet hose for discharging high pressure spray for cleaning, and means for the body to self-propel itself about the swimming pool; the nozzle being oriented so as to direct water spray generally into the bag;

lowering the bag to the swimming pool bottom with the bag oriented so that the hose nozzle is on the upper portion of the mouth;

releasing the hose so that its weight causes the closed end of the bag to tip upwardly, with the mouth facing generally towards the swimming pool bottom and the nozzle on the forward portion of the mouth with respect to the spray,



the rearward portion of the mouth being in contact with the swimming pool bottom; and

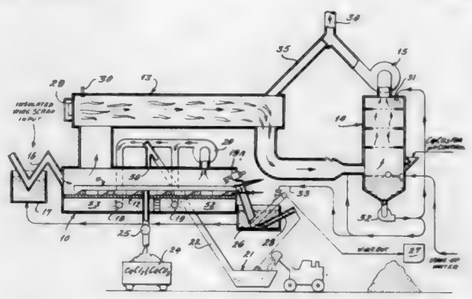
providing water pressure to the swimming pool cleaner so that it will drag the hose and bag about the pool, the rearward edge of the mouth preventing leaves and debris from escaping.

4,040,865

REMOVING CHLORINE-CONTAINING INSULATION WITH A FLUIDIZED MEDIUM CONTAINING REACTIVE CALCIUM COMPOUNDS

Frank W. Eggers, III, Hermann, Mo.; Ralph O. Wigger, Yonkers, N.Y., and Richard L. Coan, Clayton, Mo., assignors to Cerro Corporation, New York, N.Y.

Division of Ser. No. 429,967, Jan. 2, 1974, Pat. No. 3,932,118. This application Jan. 12, 1976, Ser. No. 648,114
Int. Cl.[2] B08B *7/04, 15/00*
U.S. Cl. 134—7 **11 Claims**



1. A continuous method for removing insulation containing a chlorine producing substance from items comprising the steps of

A. Feeding the insulation covered items continuously into an enclosed space,

B. Moving the items through said enclosed space,

C. Continuously contacting said items with a particulate reactive fluidized medium which includes a calcium containing compound as said items are moved through said enclosed space,

D. Continuously decomposing the insulation and releasing the reaction chlorine gas therefrom and contacting and reacting the released chlorine gas with the particles of reactive calcium containing fluidized medium, and

E. Continuously removing insulation-free items from the enclosed space.

4,040,866

LAUNDERING OF OIL BASE MUD CUTTINGS

Thomas C. Mondshine, Houston, Tex., assignor to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 404,000, Oct. 5, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,553

Int. Cl.[2] B08B *7/00*

U.S. Cl. 134—26 **6 Claims**

1. The method of removing oil adhering as a coating to drilled well cuttings obtained during the course of drilling which comprises the steps of intimately contacting said cuttings with a mixture of a solvent selected from the group consisting of ethyleneglycol monoisobutyl ether, diethyleneglycol monobutyl ether acetate, ethyl butyl ketone, ethyleneglycol monobutyl ether, ethyleneglycol monomethyl ether acetate, diethyleneglycol diethyl ether, and diethyleneglycol mono-n-hexyl ether and mixtures thereof in any proportion, together with a paraffin oil, the relative proportions of said solvent and said oil being within the range of about 10:90 to 80:20 by volume, so as to form a mixture of oil and said solvent on said cuttings; and thereafter removing said oil-solvent from said cuttings by washing said contacted cuttings with water.

4,040,867

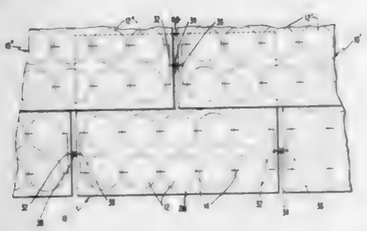
SOLAR CELL SHINGLE

Americo F. Forestieri, Berea; Anthony F. Ratajczak, Medina, and Leroy G. Sidorak, Brookpark, all of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 24, 1976, Ser. No. 717,319

Int. Cl.[2] H01L *31/04;* **E04D** *1/00*

U.S. Cl. 136—89 P **6 Claims**



1. A solar cell shingle comprising a substrate having a cell portion and an adjacent overlap portion, an array of electrically interconnected solar cells mounted on said cell portion and connected to connectors on said shingle, whereby a like shingle may be arranged in overlapping relation on said overlap portion leaving said cells exposed.

4,040,868

SEMICONDUCTOR DEVICE MANUFACTURE

Mike F. Chang, Liverpool; Harvey E. Cline, and Thomas R. Anthony, both of Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 9, 1976, Ser. No. 665,276

The portion of the term of this patent subsequent to Feb. 15, 1994, has been disclaimed.

Int. Cl.[2] H01L *21/225*

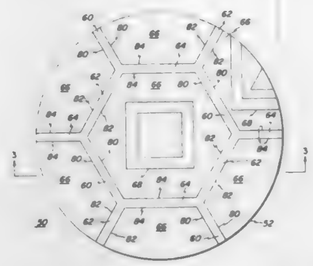
U.S. Cl. 148—1.5 **33 Claims**

1. An improved method for migrating a melt of metal-rich semiconductor material through a solid body of the semiconductor material including the process steps of:

a. selecting a body of single crystal semiconductor material having two major opposed surfaces comprising the top and bottom surfaces thereof, a predetermined type conductivity, a predetermined level of resistivity, a preferred diamond cubic crystal structure, a preferred planar crystal orientation for at least one of the major surfaces, a vertical axis substantially perpendicular to the opposed major surfaces, and a first preferred crystal axis substantially parallel with the vertical axis and substantially perpendicular to the opposed major surfaces;

b. vapor depositing a layer of metal on the major surface having a preferred planar crystal orientation, the layer having a preferred width and a preferred thickness and so oriented as to form at least one metal wire having a longitudinal axis substantially aligned parallel with a second preferred crystal axis of the crystal structure of the material of the body;

c. heating the body and the layer of metal to an elevated temperature for a predetermined period of time sufficient



to alloy the metal of the layer to at least that portion of the semiconductor material of the major surface of the body in contact therewith;

d. heating the body and the alloyed metal wire to a predetermined elevated temperature sufficient to form a melt of metal-rich semiconductor material on the surface of the body;

e. establishing a temperature gradient substantially parallel to the vertical axis of the body and the first axis of the crystal structure; and

f. migrating the melt of metal-rich semiconductor material through the solid body, substantially aligned with the first axis of the crystal structure, to a predetermined depth beneath that major surface to form a planar region of recrystallized material of the body having solid solubility of the metal of the layer therein.

4,040,869

HIGH VOLTAGE DEEP DIODE POWER SEMICONDUCTOR SWITCH

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 556,709, March 10, 1975, Pat. No. 3,988,767, which is a continuation of Ser. No. 411,019, Oct. 30, 1973, abandoned. This application Apr. 19, 1976, Ser. No. 678,293

Int. Cl.[2] H01L *7/00, 29/00, 29/74, 23/32*

U.S. Cl. 148—1.5 **18 Claims**

1. A method for making a high voltage deep diode power semiconductor switch comprising the process steps of

a. selecting a body of single crystal semiconductor material having two major opposed surfaces comprising, respectively, the top and bottom surfaces thereof, a first predetermined level of resistivity, a first predetermined type conductivity, and a preferred planar crystal structure orientation for at least one of the major opposed surfaces, the planar crystal structure orientation is one selected from the group consisting of (111), (100) and (110);

b. orienting the body so that the vertical axis of the body is substantially aligned with a first crystal axis of the crystal

structure of the material and which is substantially perpendicular to the at least one major opposed surface having the preferred planar crystal structure orientation;

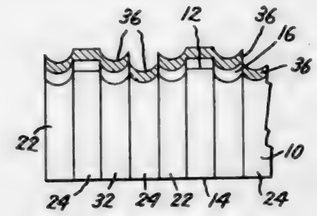
c. disposing a first array of metal wires having a selected configuration on a major surface of the body, the metal comprising at least one material suitable for imparting to a portion of the material of the body a second predetermined type conductivity and a second predetermined level of resistivity, each metal wire having a preferred stable wire direction which is dependent upon the planar orientation of the major surface and is oriented substantially parallel with a second preferred axis of the material of the body;

d. heating the body and the first array of metal wires to a temperature sufficient to form an array of liquid wires of metal-rich semiconductor material on the major surface of the body;

e. establishing a first thermal gradient in the body substantially parallel with the vertical axis of the body and the first crystal axis of the material of the body, the major surface having the array of liquid wires being at the lower temperature;

f. migrating the array of liquid wires entirely through the body from the major surface of lower temperature to the major surface of higher temperature substantially parallel with the first crystal axis;

g. forming in situ in the body a plurality of first spaced planar regions, each having two opposed major surfaces and consisting of recrystallized semiconductor material of the body having solid solubility of the metal of the liquid



wire therein, as determined by the temperature of migration, the semiconductor material and the metal of the migrated wire, each first region being formed by the migration of one particular liquid wire, the level of concentration of the at least one material being sufficient to impart the second and opposite type conductivity and the second predetermined level of resistivity to each first spaced planar region;

h. forming first and second P-N junctions at the respective abutting major surfaces of the material of each first spaced region and that of the body, each P-N junction being substantially perpendicular to the opposed major surfaces of the body and thereby forming a lamellar structure of a plurality of integral planar regions of alternate and opposite type conductivity;

i. disposing a second array of metal wires having a selected configuration on a major surface of the body wherein each wire is disposed between a pair of the first planar regions, the metal comprising at least one material suitable for imparting to a portion of the material of the body a second predetermined type conductivity and a third predetermined level of resistivity, each metal wire having a preferred stable wire direction which is oriented substantially parallel to the second preferred axis of the material of the body;

j. establishing a second thermal gradient in the body substantially parallel with the vertical axis of the body and the first crystal axis of the material of the body, the major surface having the array of liquid wires being at the lower temperature;

k. migrating the array of liquid wires entirely through the body from the major surface of lower temperature to the major surface of higher temperature substantially parallel with the first crystal axis;

l. forming in situ in the body a plurality of second spaced planar regions, each having two major opposed surfaces and consisting of recrystallized semiconductor material of the body having solid solubility of the metal of the liquid wire therein as determined by the temperature of migration, the semiconductor material of the body and the metal of the migrated wire, each second region being formed by the migration of one particular liquid wire, the level of concentration of the at least one material being sufficient to impart the second and opposite type conductivity and the third predetermined level of resistivity to each second spaced planar region;

m. forming third and fourth P-N junctions at the respective abutting major surfaces of the material of each second spaced region and that of the body, each third and fourth P-N junctions being substantially perpendicular to the opposed major surfaces of the body and thereby forming one or more groups of a lamellar structure of four integral planar regions of first and second planar regions and two regions of material of the body;

n. disposing a third array of metal wires having a selected configuration on a major surface of the body wherein each wire is disposed between, and overlaps a portion of each of, a pair of first and second spaced planar regions and the respective first and fourth P-N junctions therebetween, the metal comprising at least one material suitable for imparting to a portion of the material of the body a first type conductivity and a fourth predetermined level of resistivity, each metal wire having a preferred stable wire direction which is oriented substantially parallel to the second preferred axis of the material of the body;

o. establishing a third thermal gradient in the body substantially parallel with the vertical axis of the body and the first crystal axis of the material of the body, the major surface having the array of liquid wires being at the lower temperature;

p. migrating the array of liquid wires entirely through the body from the major surface of lower temperature to the major surface of higher temperature substantially parallel with the first crystal axis;

q. forming in situ in the body a plurality of third spaced planar regions, each having two major opposed surfaces and consisting of recrystallized semiconductor material of the body having solid solubility of the metal of the liquid wire therein as determined by the temperature of migration, the semiconductor material of the body and the metal of the migrated wire, each third region being formed by the migration of one particular liquid wire, the level of concentration of the at least one material being sufficient to impart the first type conductivity and the third predetermined level of resistivity to each third spaced planar region;

r. reforming the first and the fourth P-N junctions at the respective abutting major surfaces of the material of each third planar region and that material of the first planar region and that material of the second planar region;

s. dividing the processed body into at least one group of four integral planar regions of alternate and opposite conductivity forming a lamellar structure having in order the first planar region, a fourth planar region which consists of material of the body, the second planar region and the third planar region, and

t. affixing an ohmic electrical contact to the first planar region and affixing an ohmic electric contact to the third planar region whereby the lamellar structure will function as a semiconductor switch when a voltage is impressed across the two ohmic electrical contacts.

4,040,870

DEPOSITION METHOD

Robert A. Holzl, La Canada, Calif., assignor to Chemetal Corporation, Pacoima, Calif.

Continuation-in-part of Ser. No. 358,110, May 7, 1973, abandoned. This application June 19, 1975, Ser. No. 588,390
Int. Cl.[2] C23C *11/00*
U.S. Cl. 148—6.3 16 Claims

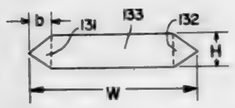
1. A method for producing a hard deposit on a substrate, comprising, providing a gaseous volatile halide of titanium, reducing said volatile halide off the surface of the substrate to form a lower halide of titanium, reacting said lower halide in the presence of a volatile halide of boron, carbon or silicon downstream from said halide reduction while maintaining the pressure and substrate temperature such as to cause the deposition on the substrate of an intermediate compound of titanium which is in a liquid phase, and reacting the liquid phase intermediate compound on the surface of the substrate with a volatile halide of boron, carbon or silicon to produce a hard deposit containing titanium and boron, carbon or silicon.

4,040,871

METHOD FOR PRODUCING AN INDIVIDUAL FIN-FREE SPOT SCARFING CUT

Stephen August Engel, Shenorock, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Aug. 26, 1975, Ser. No. 607,888
Int. Cl.[2] B23K *7/06*
U.S. Cl. 148—9.5 4 Claims



1. In a process for machine scarfing individual defects from the surface of a metal body, wherein a sheet-like stream of oxygen is directed obliquely against a reaction zone of molten metal to produce a thermochemical reaction thereon, and wherein relative movement is produced between the oxygen stream and the metal surface in order to continue the reaction along the length of the metal surface and to produce the desired individual scarfing cut, the improvement comprising: preventing the formation of fins along the edges of the scarfing cut by restricting the flow of said oxygen at the edges of said stream so as to gradually diminish the intensity of the oxygen stream at the edges thereof to such an extent that the flow of oxygen at the edges of the stream is insufficient to produce a scarfing reaction on the metal surface but sufficient to oxidize any molten metal at the edges of the scarfing reaction zone thereby preventing said molten metal from solidifying and adhering to the surface of said metal body along the edges of the scarfing cut in an unoxidized state and producing a fin-free scarfing cut narrower than the width of the oxygen stream, and wherein the flow of oxygen at the edges of said stream is restricted by directing said stream of scarfing oxygen through a nozzle terminating in a discharge orifice characterized by having:

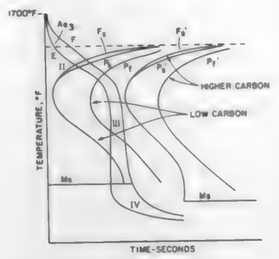
a. a width greater than its maximum height, and said height gradually decreasing to zero at the edges thereof,
b. a center section and two end sections, the ratio of the width of the end sections of the orifice to the height of said end sections being from about 2:1 to 10:1, and
c. the center section of said orifice comprising parallel upper and lower edge surfaces.

4,040,872

PROCESS FOR STRENGTHENING OF CARBON STEELS

Edeki Mudiare, Chicago, Ill., assignor to LaSalle Steel Company, Chicago, Ill.

Filed Apr. 16, 1976, Ser. No. 677,742
Int. Cl.[2] C21D *9/52*
U.S. Cl. 148—12 B 31 Claims



1. A method for the strengthening of a carbon steel comprising the steps of (1) rapidly heating the carbon steel to raise the temperature of the steel into the austenite region at a rate sufficient to minimize grain growth of austenite grains, (2) cooling the austenitized carbon steel to transform the steel to a fine mixture of acicular pro-eutectoid ferrite and a finely divided eutectoid aggregate of ferrite and iron carbide, and (3) working the resulting steel to strengthen the steel.

4,040,873

METHOD OF MAKING LOW YIELD POINT COLD-REDUCED STEEL SHEET BY CONTINUOUS ANNEALING PROCESS

Kazuhide Nakaoka, and Kenji Araki, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,525
Claims priority, application Japan, Aug. 23, 1975, 50-102283
Int. Cl.[2] C21D *9/48*
U.S. Cl. 148—12 C 4 Claims

1. In a process of making a low carbon steel sheet for press-forming through a continuous annealing, an improved method substantially comprising the following treatment:

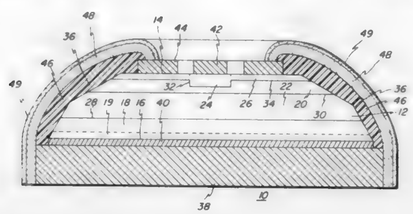
a. In steelmaking stage, the chemical composition of said low carbon steel is controlled as follows,
C, 0.03% to 0.10%
Mn, 0.10% to 0.60%
P, 0.04% or less
S, 0.05% or less
Si, 0.2% or less
Sol.Al, 0.005% or less
O_2, 0.02% or less, by addition of Si and Al.
b. In hot-rolling stage after ordinary slabbing, a hot-roller steel strip is finished at 800° C or more and is coiled at a temperature of 650° C to 800° C.
c. In continuous annealing stage after ordinary pickling and cold reducing, a cold-reduced steel strip is subjected to the full continuous annealing process comprising the following steps,
1. heating up within the range of 680° C to 900° C and holding for 30 to 180 seconds,
2. cooling to 500° C or less with a rate of 10° C/second or more,
3. over-aging treating within the range of 350° C to 500° C for 30 to 600 seconds,
4. cooling to room temperature and then coiling.

4,040,874

SEMICONDUCTOR ELEMENT HAVING A POLYMERIC PROTECTIVE COATING AND GLASS COATING OVERLAY

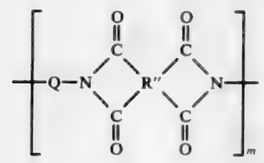
Alexander J. Yerman, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 601,839, Aug. 4, 1975, Pat. No. 4,017,340. This application Jan. 10, 1977, Ser. No. 757,887
Int. Cl.[2] H01L *29/28*
U.S. Cl. 148—33.3 26 Claims

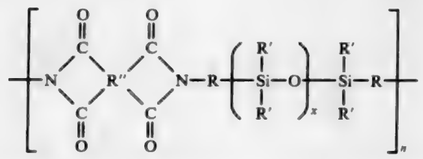


1. A semiconductor element comprising:

a body of semiconductor material having at least two regions of opposite type conductivity and a P-N junction disposed between, and formed by the abutting surfaces of, each pair of regions of opposite type conductivity;
an end portion of at least one P-N junction exposed at a surface of the body;
a layer of a protective coating material disposed on the exposed end portion of the at least one P-N junction;
the protective coating material is a polymer which is, when cured, one selected from the group consisting of the reaction product of a silicon-free organic diamine and an organic tetracarboxylic dianhydride, a silicon-free organic diamine, an organic tetracarboxylic dianhydride and a polysiloxane diamine and a blend of polyimide compound of recurring structural units of the formula:



with a polyimide, as required, composed of recurring structural units of the formula:



wherein the molar proportion of the latter is from 0 to 50 mol percent
wherein
R is a divalent hydrocarbon radical,
R′ is a monovalent hydrocarbon radical,
R″ is a tetravalent organic radical,
Q is a divalent silicon-free organic radical
which is the residue of an organic diamine,
x is a whole number equal to at least 1 and advantageously from 1 to 8 and as high as 1 to 10,000 or more,
m is an integer greater than 1
n is zero or an integer greater than 0, and
at least one layer of a glass material disposed on the layer of protective coating material.

4,040,875

DUCTILE CAST IRON ARTICLES

Charles H. Noble, 3541 Brookwood Road, Birmingham, Ala. 35223

Division of Ser. No. 564,608, April 3, 1975, Pat. No. 3,977,227, which is a continuation-in-part of Ser. No. 445,655, Feb. 5, 1974, abandoned. This application May 3, 1976, Ser. No. 682,251
Int. Cl.[2] C22C *37/10*
U.S. Cl. 148—35 6 Claims

1. An article of manufacture comprising an annular ductile iron piece containing
1–4.25% carbon,
1–4.25% silicon,
0–.20% phosphorous, and
at least one nodularizing agent,
at least an axial portion of said ductile iron piece being characterized by
having the carbon content thereof in the form of significantly flattened bodies which are predominantly disposed in planes parallel to the central axis of the piece and normal to the outer surface of the piece along the line of intersection between the plane and the outer surface, and
by having the iron grains thereof significantly extended both in a direction parallel to the central axis of the piece and in directions which are transverse to said axis and parallel to said planes;
said piece having a smooth uninterrupted outer surface and being from from structural failure discontinuities,
at least said axial portion having been cold extruded through a tapered female die by applying axial pressure to the piece until the compressive yield point of the ductile iron is reached and the metal is caused to traverse the die in plastic flow while maintained under hoop compression.

4,040,876

HIGH TEMPERATURE ALLOYS AND MEMBERS THEREOF

Melvin L. Bleiberg, Pittsburgh; Sidney Diamond, Monroeville; Arthur F. Rowcliffe, Greensburg, and John A. Spitznagel, Export, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 2, 1974, Ser. No. 485,465
Int. Cl.[2] C22C *38/44*; C21D *7/02*
U.S. Cl. 148—37 2 Claims

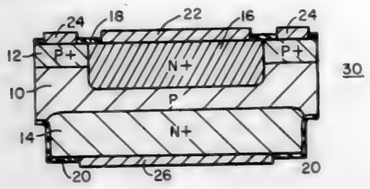
1. A shaped alloy member suitable for use in a nuclear reactor incorporating sodium wherein the member is in contact with the molten sodium at temperatures up to about 1325° F and subject to high neutron flux, the alloy comprising said member consisting essentially of from about 14% to 19% chromium, from about 25% to 35% nickel, from about 2% to 3% molybdenum, from about 0.1% to 1% silicon, up to about 0.5% manganese, from about 0.03% to 0.05% carbon, up to about 0.01% sulphur, up to about 0.01% phosphorus, up to about 0.003% boron, up to about 0.01% oxygen, up to about 0.02% nitrogen, the balance being essentially iron with trace impurities with the N, value thereof being between 1.6 and 2.8, said alloy characterized by a low corrosion rate not in excess of from about 1 to 2 mils per year for the surfaces in contact with the sodium and further characterized by a low swelling not exceeding about 5% after exposure to 3×10^{23} nvt, said shaped alloy member having been worked equivalent to from about 20% to 30% of cold working and heat treated to solution harden it and to develop high creep rupture strength and high yield strength at the temperatures of use in the nuclear reactor.

4,040,877

METHOD OF MAKING A TRANSISTOR DEVICE

Joseph E. Johnson, Churchill, and John A. Ostop, Greensburg, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1976, Ser. No. 717,076
Int. Cl.[2] H01L 21/22
U.S. Cl. 148—187 6 Claims



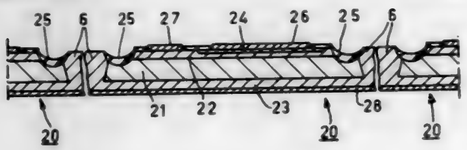
1. A method of making a transistor device comprising the steps:
   a. diffusing shallow regions of a first conductivity type into both sides of a semiconductor wafer of a second conductivity type,
   b. etching moats in one surface of the wafer, the moats penetrating through the shallow first conductivity type regions into the second conductivity type region to form isolated transistor portions surrounded by the moats,
   c. depositing a passivation layer on the surfaces of the semiconductor wafer,
   d. driving the first conductivity type regions to a predetermined depth in the wafer,
   e. opening windows through the passivation layer to expose surface portions for contacting the wafer, and
   f. applying metal contacts to the wafer through the windows.

4,040,878

SEMICONDUCTOR DEVICE MANUFACTURE

Colin M. Rowe, Manchester, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,946
Claims priority, application United Kingdom, Mar. 26, 1975, 12649/75
Int. Cl.[2] H01L 21/225
U.S. Cl. 148—188 12 Claims



1. A method of manufacturing a semiconductor device comprising a silicon semiconductor body with a portion forming at least one semiconductor device region, said portion being bounded by a deep p-type annular portion, said method comprising the steps of:
   a. providing an aluminum diffusion source on part of at least a first major surface of said silicon semiconductor body by depositing aluminum to form a metallic layer having a thickness in the range of 0.2 micron to 5 microns and locally removing parts of said metallic layer to leave a metallic aluminum pattern comprising at least one annular portion,
   b. subjecting said body in an oxidizing atmosphere to one or more heating states during which the body is heated under temperature and time conditions so as to diffuse aluminum from said aluminum pattern into said body to form in said body a deep p type region with a total depth of at least 75 microns, which region extends locally in said body from said first major surface and comprises at least one deep p type annular portion, said oxidizing atmosphere serving to inhibit diffusion of aluminum in said body except in the form of said deep p type region,
   c. growing a silicon oxide layer by said oxidizing atmophere at portions of said first major surface not covered by said aluminum pattern, said silicon oxide layer serving to extract aluminum from underlying parts of said body and to transport said extracted aluminum into the oxidizing atmosphere,
   d. removing from said body the residue of said diffusion source and said silicon oxide layer to leave said deep diffused p type region, and
   e. providing at least one further semiconductor device region at the portion of said body bounded by said deep p-type annular portion.

4,040,879

PROCESS FOR PREPARING A MATCH HEAD COMPOSITION CONTAINING PARTICULATE NITROCELLULOSE AND NO SULFUR

Shuzo Nagatugi, Kobe; Akira Miyagawa, and Suguru Fukuoka, both of Himeji, all of Japan, assignors to Daicel Ltd., Osaka, Japan

Filed Feb. 2, 1976, Ser. No. 654,346
Int. Cl.[2] C06B 45/08
U.S. Cl. 149—18 4 Claims

1. In a method for preparing a match head composition which comprises blending a mixture consisting essentially of potassium chlorate as an igniting agent, a combustion controlling agent selected from the group consisting of glass powder, mica powder, talc, diatomaceous earth, colloidal clay, boric acid and mixtures thereof, and a binder selected from the group consisting of glue and gelatin, the improvement which comprises: blending in said match head composition as a combustion agent, an effective amount, but not more than 10 weight percent (dry basis), of cellulose nitrate particles having a particle size of less than 840 microns and containing more than 20 weight percent of water, said match head composition being free of sulfur and being free of organic solvent.

4,040,880

PERCHLORATE SENSITIZING AGENT

Julius Rothenstein, Carmichael, and G. A. Zimmerman, Sacramento, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 28, 1973, Ser. No. 375,244
Int. Cl.[2] C06B 31/28
U.S. Cl. 149—76 10 Claims

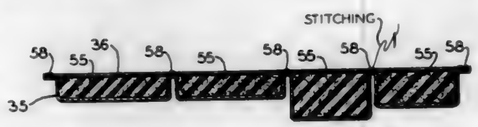
1. The method of sensitizing inorganic perchlorate salts comprising mixing said salts with about 1–8 percent by weight of copper chromite, said weight being based on the weight of inorganic perchlorate.

4,040,881

METHOD OF FORMING TUFTED CUSHION ELEMENTS

Earl C. Wallace, Andrews, Ind., assignor to General Engineering & Manufacturing Corporation, Andrews, Ind.

Filed Mar. 22, 1976, Ser. No. 669,307
Int. Cl.[2] B32B 7/08
U.S. Cl. 156—93 12 Claims



1. A method of forming flexible, tufted cushion elements having an array of a plurality of contiguous sections of different thicknesses, geometric forms and sizes enclosed in a continuously flexible sheet material comprising:
   placing a first sheet of flexible material on a female pattern form having an array of cavities of different depths, geometric forms and sizes corresponding to said cushioned elements separated by partitions;
   tucking the first flexible sheet of material into the partitioned cavities of said female pattern form to conform to the walls of the form cavities;
   pre-forming bodies of resilient cushioning material of the general geometric form of said sections;
   mounting the respective bodies in the respective form cavities to overlie the first flexible sheet within said cavities and expose portions of the first flexible sheet portions extending across the exposed edges of the partitions; and
   adhesively bonding a second flexible sheet on the exposed portions of the first flexible sheet.

4,040,882

PRIMER COMPOSITION, COMPOSITE AND METHOD FOR MAKING THE SAME

Donald G. LeGrand, Burnt Hills, and Gina G. Vitale, Saratoga Springs, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 29, 1975, Ser. No. 618,474
Int. Cl.[2] C03C 27/04; C32B 17/10; C07F 7/02
U.S. Cl. 156—106 10 Claims

1. A primer composition in the form of the equilibrated reaction product of
   A. water
   B. a $C_{(1-8)}$ alkanol, and
   C. the reaction mixture at temperatures in the range of between 0° C to 90° C of 1 to 3 moles of an amino alkyl polyalkoxysilane per mole of a diorganocarbonate,
   where there is employed in such equilibrated reaction product on a volume basis, from 0.5 to 10 parts of (A), and from 0.5 to 10 parts of (C) per 100 parts of (B).

5. A method for making a multi-ply composite which comprises heating to an elevated temperature an assembly of at least two plies comprising a glass substrate and a polydiorganosiloxane-polycarbonate block copolymer, while subjecting such assembly to a pressure of at least about atmospheric which is sufficient to insure substantially uniform contact between the plies, where the glass substrate has been primed with a composition in the form of the equilibrated reaction product of
   A. water
   B. a $C_{(1-8)}$ alkanol, and
   C. the reaction mixture at temperatures in the range of between 0° C to 90° C of 1 to 3 moles of an amino alkyl polyalkoxysilane per mole of a diorganocarbonate,
where there is employed in such equilibrated reaction product on a volume basis, from 0.5 to 10 parts of (A), from 0.5 to 10 parts of (C) per 100 parts of (B).

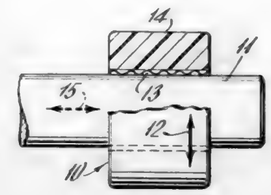
4,040,883

METHOD OF MAKING A LOW-FRICTION FABRIC BEARING

Richard J. Matt, West Simsbury, and Richard T. Thompson, Haddam, both of Conn., assignors to Textron, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 511,086, Oct. 1, 1974, abandoned. This application June 28, 1976, Ser. No. 700,151
Int. Cl.[2] B32B 5/08
U.S. Cl. 156—148 22 Claims

1. The method of making an annular bearing having a low-friction fabric lined surface of predetermined contour to accommodate a load under sliding conditions wherein the fabric surface slides generally along a particular directional path of movement, which method comprises selecting a loosely twisted yarn consisting of TFE filaments and bondable filaments, constructing a knitted tube with said yarn as the most predominant component, said tube being so constructed that on one side of said tube exposed filaments are primarily oriented in the direction of the tube axis and on the other side of said tube exposed filaments are primarily oriented normal to and circumferential to the tube axis, impregnating the fabric with an uncured synthetic resin, conforming the circumferential extent of a selected side of the knitted tube to a selected forming element having a forming-surface contour conforming



to said predetermined contour, the selected side forming the bearing interface and being chosen as that for which there is the greater non-conformance of primary orientation of the exposed filaments with respect to said particular directional path of movement, curing the resin while the tube is thus confined, and mounting the bearing such that sliding action under load is along said particular directional path of movement.

4,040,884

MEDICAL SPONGES

Roy William Roth, New Canaan, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 480,643, June 19, 1974, Pat. No. 3,977,406.
This application Dec. 22, 1975, Ser. No. 643,467
Int. Cl.[2] B31F 1/00
U.S. Cl. 156—209 7 Claims

1. A method for the production of a flexible, hydrophilic polyurethane sponge adapted for medical usage which comprises (1) embossing, with a fused design, a flat, hydrophilic polyurethane foam sheet of about 1/16 to about ¼ inch in thickness to about 25 to about 95% of its original thickness in the area of said design, the remaining area being of the original thickness, at a temperature ranging from about 250° to about 350° F and a pressure of from about 1000 psi to about 2000 psi, said design being composed of a series of continuous, unbroken lines no more than about one inch apart, each end of each line terminating at an edge of said sheet and intersecting another line at least about every inch in each direction, (2) texturizing the complete surface of said sheet at a temperature of from about 50° to about 300° F at a pressure of from about 2000 psi to about 3000 psi so as to break substantially all of the reticulated cells at said surface of said sheet and (3) recovering the resultant sponge.

4,040,885

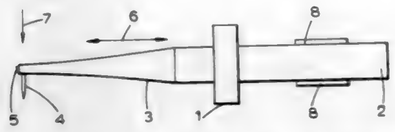
ULTRASONIC BONDING APPARATUS

Michael John Hight, Redhill; Roy Victor Winkle, Crawley, and John Robert Dale, Brighton, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 9, 1975, Ser. No. 594,271
Claims priority, application United Kingdom, July 9, 1974, 30383/74
Int. Cl.[2] B23K 1/06
U.S. Cl. 156—378 22 Claims

2. An ultrasonic wire bonding apparatus comprising, a bonding tool for securing a wire to a body, primary transducer means coupled to the bonding tool for converting electrical input signals into mechanical vibrations of the bonding tool at ultrasonic frequency, secondary transducer means for producing electrical signals indicative of the amplitude of the vibrations of the bonding tool, signal sampling means for sampling

signals derived from the secondary transducer means at a certain power input to the primary transducer means and with the bonding tool in a freely vibrating condition and for sampling signals derived from the secondary transducer means with the same power input to the primary transducer means and with a wire bonding operation in progress, signal comparison means for comparing the signals sampled in the freely



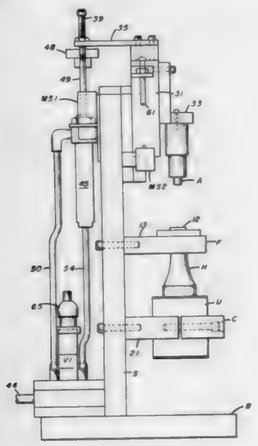
vibrating condition of the bonding tool with the signals sampled when said bonding operation is in progress, and indicator means associated with the signal comparison means for indicating a bond of unacceptable quality corresponding to a predetermined minimum amplitude deviation between the freely vibrating condition and the vibration during a bonding operation.

4,040,886

APPARATUS FOR TREATING A WORKPIECE

Edward Chen-Hsiung Yen, and Thomas Arthur Jenssen, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,948
Int. Cl.[2] B29C *27/08*; B23K *1/06*; B30B *1/00*
U.S. Cl. 156—350 **8 Claims**



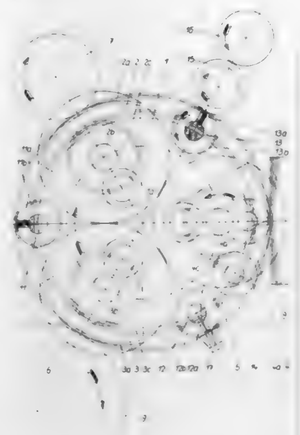
1. Apparatus for applying ultrasonic vibrations to a workpiece, said apparatus comprising:
an ultrasonic transducer including a horn engageable with the workpiece for transmitting ultrasonic vibrations to the workpiece;
an anvil vertically aligned with said horn for supporting the workpiece against the vibrations transmitted by said horn;
a fixture including means for releasably holding the workpiece between said anvil and said horn;
vertically moveable means including one of said transducer and said anvil for engaging the workpiece between said transducer and said anvil to apply pressure on the workpiece;
mean for releasably holding said vertically moveable means spaced above said fixture in a ready position;
means for releasing said vertically moveable means from the ready position to fall solely by the force of gravity toward said fixture; and
dampening means coacting with said vertically moveable means for retarding the fall of said vertically moveable means to an acceleration less than gravity;
whereby the pressure exerted on the workpiece between said transducer and said anvil is due solely to the weight of said vertically moveable means, but the impact of said vertically moveable means upon engagement with the workpiece is less than would be due to the free falling weight of said vertically moveable means.

4,040,887

LABELLING MACHINE

Rudolf Zodrow, Dusseldorf, Germany, assignor to Jagenberg-Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Apr. 8, 1976, Ser. No. 675,015
Claims priority, application Germany, Apr. 19, 1975, 2517442
Int. Cl.[2] B41M *1/00*
U.S. Cl. 156—384 **6 Claims**



1. In a labelling machine for objects, such as bottles, and having glue applying means, a stack of labels, and a label transfer station arranged about a circle, at least one pick-up element for the labels, a support for said pick-up element, means for rotating said support and thereby said pick-up element so the pick-up element successively receives glue, picks up a label and transfers it to another member for subsequent application to a bottle, and means for printing said labels prior to application to said bottles, the improvement wherein said printing means comprises an inking element positioned between the glue applying means and the stack of labels and touching the circle tangentially, and an ink receiving stamping element carried by said support behind each pick-up element, whereby upon rotation of said support said stamping element is inked and after a pick-up element removes a label from the stack the inked stamping element prints the next now-uppermost label in the stack.

4,040,888

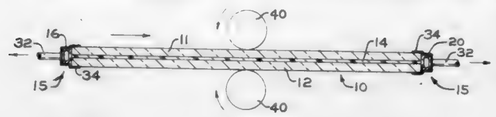
APPARATUS FOR PREPRESSING TRANSPARENT LAMINATED ASSEMBLIES

Frank A. Soska, Arnold, and Lyle L. Shumaker, Natrona Heights, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 487,334, July 10, 1974, abandoned.
This application Oct. 1, 1975, Ser. No. 618,587
Int. Cl.[2] B32B *31/00*; B30B *3/04*
U.S. Cl. 156—497 **6 Claims**

1. Apparatus for prepressing an assembly of rectangular configuration to be laminated without requiring the insertion of said assembly within a bag, said assembly comprising a series of alternate layers of rigid transparent material and of inter-

layer material having a given total thickness between the outer major surfaces of said assembly, said layers being assembled in matching rectangular outline, said apparatus comprising
1. an evacuation chamber abutting against and extending around the periphery of said assembly and having a pair of opposite walls whose outer surfaces form the outer surfaces of said chamber and are spaced from one another less than said total thickness, said outer surfaces being disposed inward of the major surfaces of said assembly, said evacuation chamber having an apertured inner wall whose apertures are adapted to abut the marginal edge of said assembly in position to enable said evacuation chamber to communicate with the interfacial surfaces intermediate said alternate layers on all four peripheral edges of said assembly,
2. means adapted to communicate said evacuation chamber to a source of vacuum,
3. thin, flexible means impervious to gas and moisture superimposed over said outer surfaces of said evacuation cham-



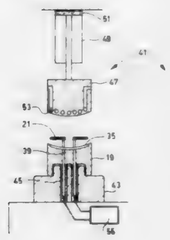
ber and the marginal portion only of said outer major surfaces of said assembly to connect said outer surfaces of said evacuation chamber to the outer major surfaces of said assembly and to hold said evacuation chamber in said relation to said assembly, said flexible means having a maximum thickness such that the total thickness of two layers thereof plus that of the peripheral evacuation chamber as measured between said outer surfaces of said evacuation chamber is less than the thickness of said assembly,
4. a pair of resilient nipper rolls mounted for rotation, and
5. means to maintain said nipper rolls at a space therebetween such that the minimum distance between the opposing peripheries of the rolls is approximately equal to the thickness of the assembly, so that when said rolls rotate across said assembly, they engage the opposite major surfaces of the assembly and pass over the evacuation chamber in non-contacting relation to the portion of said flexible means superimposed over said outer surfaces of said evacuation chamber.

4,040,889

APPARATUS FOR MANUFACTURING AN ELECTROWELDING COMPONENT OF SYNTHETIC MATERIAL COMPRISING A RESISTANCE ELEMENT

Petrus Marinus Acda, Enkhuizen, Netherlands, assignor to Polva Nederland,BV, Enkhuizen, Netherlands

Filed Feb. 17, 1976, Ser. No. 658,221
Claims priority, application Netherlands, Feb. 21, 1975, 7502051
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—498 **1 Claim**



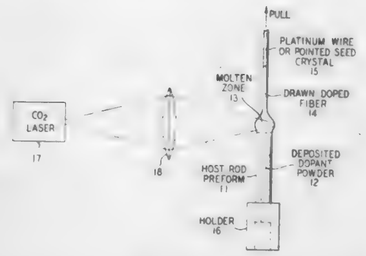
1. An apparatus for manufacturing an electrowelding component, comprising a jig having a surface shaped for locating and supporting said component, said jig comprising two sleeves of insulating material extending parallel to each other through said jig from said shaped surface and arranged for receiving electrical connection pins for a component to be assembled; a die having a pressure surface shaped so as to form a surface of the component, said die comprising a material having a high coefficient of heat conductivity, and having duct means for passing cooling medium therethrough; means for locating and moving said die with respect to said jig, and pressing said jig and said die toward each other; and electric energy means for passing electrical current through pins of a component placed in said sleeves.

4,040,890

NEODYMIUM OXIDE DOPED YTTRIUM ALUMINUM GARNET OPTICAL FIBER

Charles Andrew Burrus, Jr., Fair Haven, and Julian Stone, Rumson, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 27, 1975, Ser. No. 591,178
Int. Cl.[2] B01J *17/18, 17/36*
U.S. Cl. 156—605 **1 Claim**



1. A method for drawing a craze-free single-crystal fiber of YAG (yttrium aluminum garnet) of diameter less than about 200 micrometers, doped with neodymium to a uniform concentration of about 1 percent by weight comprising the steps of:
mechanically distributing a deposit of dopant consisting of a powder or slurry of neodymium oxide over an entire axial length of a rod of YAG, the concentration of applied dopant being within the range from about 1 percent to about 5 percent by weight,
creating a melt at one end of the rod by focusing a laser beam thereon,
pulling a reduced diameter single-crystal rod from said melt, the ratio of the diameter of the feed rod to that of the drawn rod being less than about 3:1,
repeating the above steps of melting and pulling until the rod is reduced to a fiber having a diameter of about 200 micrometers,
repeating the above melting and pulling steps at a pull speed of less than about one half centimeter per minute, until the desired diameter of fiber is reached.

4,040,891

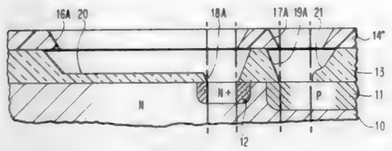
ETCHING PROCESS UTILIZING THE SAME POSITIVE PHOTORESIST LAYER FOR TWO ETCHING STEPS

Kenneth Chang, Hopewell Junction, and Marvin S. Pittler, Poughkeepsie, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,068
Int. Cl.[2] H01L *21/306*; C23F *1/02*
U.S. Cl. 156—651 **11 Claims**

1. In integrated circuit fabrication, a method for etching a substrate comprising
forming a positive photoresist layer on a substrate,
selectively exposing and developing portions of the photore-

sist layer to form a photoresist mask having a pattern of openings therethrough exposing the underlying substrate,
etching the substrate exposed in said openings to form a corresponding pattern of recesses in said substrate,
selectively exposing and developing portions of the remaining photoresist layer respectively adjacent to said openings to laterally expand said openings, and
etching said substrate exposed in said expanded openings whereby the portions of recesses underlying the original openings are etched deeper than the portions of the recesses underlying the expanded portions of said openings.



4,040,892

METHOD OF ETCHING MATERIALS INCLUDING A MAJOR CONSTITUENT OF TIN OXIDE

Paul L. Sargent, Schenectady, and Mario Ghezzo, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,370
Int. Cl.² C23F *1/02*
U.S. Cl. 156—659 **7 Claims**

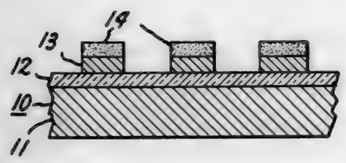
1. A method of etching a first pattern in a layer of a binary compound material including a major constituent of tin oxide and a minor constituent of antimony oxide on a substrate comprising
depositing a film of material which is resistant to the etching action of hot concentrated hydroiodic acid over the exposed surface of said layer,
forming in said film a second pattern which is substantially identical to said first pattern to expose portions of said layer of material uncovered thereby,
etching said uncovered portions of said layer of material in a concentrated solution of hot hydroiodic acid.

4,040,893

METHOD OF SELECTIVE ETCHING OF MATERIALS UTILIZING MASKS OF BINARY SILICATE GLASSES

Mario Ghezzo, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,367
Int. Cl.² H01L *21/312*; B44C *1/22*; C23E *1/00*
U.S. Cl. 156—659 **13 Claims**



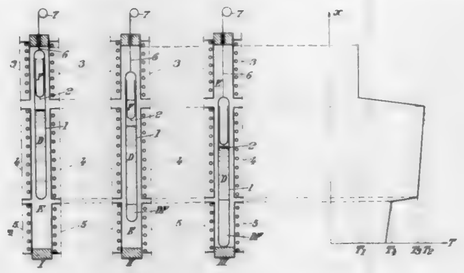
1. A method of etching a first pattern in a layer of material formed on the surface of a substrate including a region of silicon dioxide comprising
depositing a film of a binary silicate glass on the exposed surface of said layer,
forming in said film a second pattern which is substantially identical to said first pattern to expose portions of said layer of material uncovered thereby,
etching said uncovered portions of said layer with a first etchant which does not etch silicon dioxide,
removing said film of binary silicate glass with a second etchant which does not etch silicon dioxide or the material of said layer.

4,040,894

PROCESS OF PREPARING CRYSTALS OF COMPOUNDS AND ALLOYS

Huguette Fumeron Rodot; Maurice Schneider, both of 1, Place Aristide Briand, 92 - Bellevue, France, and Arnost Hruby, Czechoslovak Academy of Science, Institute of Solid State Physics, Prague 6, Cukrovarnicka 10, Czechoslovakia

Continuation of Ser. No. 232,240, March 6, 1972, abandoned, which is a continuation of Ser. No. 841,667, June 13, 1968, abandoned. This application Nov. 27, 1974, Ser. No. 527,688
Claims priority, application France, June 13, 1967, 67.110074
Int. Cl.² B01J *12/26*
U.S. Cl. 156—609 **3 Claims**



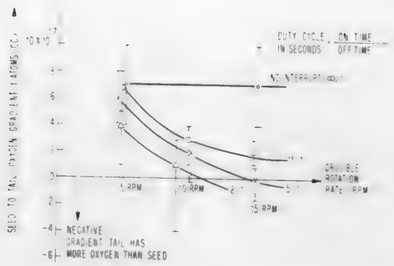
1. A process of preparing large size crystals of substances which are compounds or alloys of at least two constituents at least one of which is relatively low volatility and one is of relatively high volatility comprising:
1. feeding continuously to the surface of a liquid phase solution which contains said components of low volatility, but does not contain said more volatile constituent, vapors of at least said component of high volatility from a source maintained at a constant temperature to vaporize and provide a vapor pressure on the surface of said liquid phase solution to continuously dissolve said vapors in said liquid so that all the constituents necessary to form said substance are then present in said solution; said process being carried out in a closed container containing said liquid phase in its one end and in its other end an interior container containing at least said component of high volatility;
2. simultaneously subjecting said liquid phase solution to a first slight temperature gradient zone in which zone the temperature is sufficiently high to maintain said liquid phase and in which the temperature gradient is sufficiently slight to ensure gradual and homogeneous diffusion of said substance formed at said surface through said solution, the temperature of the upper surface end of said zone being higher than the lower end thereof, allowing said liquid phase to reach saturation with said substance in the lower end only of said first temperature gradient zone;
3. maintaining a second steep temperature gradient zone located beneath said first temperature gradient zone in which the temperature is lower than in said temperature gradient zone;
4. crystallizing said substance at the level of the second gradient to form a solid-liquid interface;
5. ascertaining by the application of Fick's law when saturation of the liquid phase with said substance at said solid/-liquid interface is reached;
6. when said saturation is reached, moving said liquid phase relative to said first and second temperature gradients while maintaining the solid-liquid interface at the same temperature and same composition within the second gradient by controlling the rate of relative movement at a speed ascertained by Fick's law and while maintaining the continuous feeding of vapor to the surface of said liquid phase; thereby
7. continuously forming and growing crystals of said substance at said interface.

4,040,895

CONTROL OF OXYGEN IN SILICON CRYSTALS

William John Patrick, Poughkeepsie, and Wolfgang Alfred Westdorp, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,618
Int. Cl.² B01J *17/18*; C01B *33/02*
U.S. Cl. 156—618 **4 Claims**



1. A process for controlling the oxygen content gradient in a silicon crystal, which is drawn from a melt of silicon contained in a silica crucible, comprising:
continuously rotating the crystal as it is drawn from the melt, while rotating the crucible in a direction opposite to the direction of crystal rotation with the rate of crucible rotation ranging from about 5 to 20 rpm; and
controlling the oxygen concentration of the melt during the crystal growing process by periodically stopping the rotation of the crucible, to create fluid shearing at the melt-crucible interface, in regular on time/off time duty cycles in which the on time and the off time each range from about 1 to 15 seconds with the duty cycles and the rate of crucible rotation being selected such that adverse effects on crystal quality do not occur while the oxygen concentration gradient in the silicon crystal is kept to about 4×10^{17} atoms/cc or less.

4,040,896

CHEMICAL POLISH FOR BaF_2 AND CaF_2

James A. Harrington, and Don A. Gregory, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 15, 1976, Ser. No. 741,651
Int. Cl.² C23F *3/00*
U.S. Cl. 156—645 **3 Claims**

1. A method for producing high quality, low scattering surfaces on a crystal selected from the crystals consisting of BaF_2 and CaF_2, said crystals when selected having surface irregularities and imperfections on the surface thereof that are removed by said method to yield crystals with polished surfaces as required for use as laser windows and for use in calorimetry measurements, said method comprising the completion of a multi-stage mechanical polishing cycle that is repeated as required for removing surface irregularities and polishing said surfaces which produces crystal surfaces with no visible scratches at 280 magnification and said method comprising the completion of a chemical polishing cycle that is repeated as required to produce said high quality, low scattering surfaces on said crystals; said multi-stage mechanical polishing cycle comprising:
i. removing large imperfections from said crystal surface with sandpaper, beginning with 240 grit and eventually ending with 600 grit;
ii. polishing said crystal surface with a cloth covered rotating wheel using polishing compounds of decreasing particle size, said polishing compounds comprised substantially of diamond from grit size of about 1200 to about 100,000, said polishing beginning with about 1200 grit and eventually end with 100,000 grit which prepares said crystal surface for a final mechanical polishing cycle;
iii. completing a final mechanical polishing cycle by further polishing said crystal surface that has been polished with said polishing compounds comprised substantially of a cloth covered rotating wheel using aluminum oxide having decreasing particle sizes of about 5 micrometers, 0.5 micrometers, and 0.03 micrometers, said final mechanical polishing cycle repeated as required to produce a crystal surface with no visible scratches at 280 magnification, said mechanical polishing cycle preparing said crystal surface for said chemical polishing cycle that follows cleaning and drying crystal surface;
iv. cleaning said mechanically polished crystal surface with water to remove said polishing compound from said crystal surface;
v. drying said polished and cleaned crystal surface which further prepares said crystal surface for said chemical polishing cycle; and completing said chemical polishing cycle which comprises:

vi. lowering and positioning for a predetermined immersion time said mechanical polished, washed, and dried crystal surface into a container which contains a prepared polishing solution in sufficient amount for immersion of said crystal and comprised of from about 3.5 to about 4.5 parts of concentrated sulfuric acid mixed with from about 8 to about 10 parts of glacial acetic acid when said crystal selected is BaF_2 and said prepared solution comprised of from about 2.7 to about 3.3 parts of concentrated sulfuric acid mixed with from about 1.8 to about 2.2 parts of glacial acetic acid when said crystal selected is CaF_2, said lowering and positioning accomplished so that said mechanically polished, washed, and dried crystal surface has the polished sides perpendicular to the surface of said prepared solution, said predetermined immersion times being limited to approximately 16 minutes per immersion cycle for CaF_2 and to approximately several hours per immersion cycle for BaF_2, said predetermined immersion time per immersion cycle being based on an immersion time that will not etch the surfaces of said crystals;
vii. removing said chemically polished crystal from said prepared polishing solution, rinsing said chemically polished crystal with distilled water, and then drying said chemically polished crystal to complete said chemical polishing cycle.

4,040,897

ETCHANTS FOR GLASS FILMS ON METAL SUBSTRATES

Richard C. Blish, II, and Kyle Eugene Lemons, both of San Jose, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 574,503, May 5, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,546
Int. Cl.[2] H01L *21/312*
U.S. Cl. 156—656 7 Claims

1. In a method of selectively etching a pyralytic glass layer on a metal substrate without substantially attacking the underlying metal, the step of contacting the glass layer with a dilute aqueous etch solution for a sufficient time to etch through the glass layer, said etch solution comprising buffered hydrofluoric acid, sodium chloride at a concentration from about 1% by weight of solution to the point just below saturation where the sodium chloride begins to precipiate, and a fluorocarbon surfactant capable of forming a thin protective film on the metal substrate, said etch solution being diluted with water.

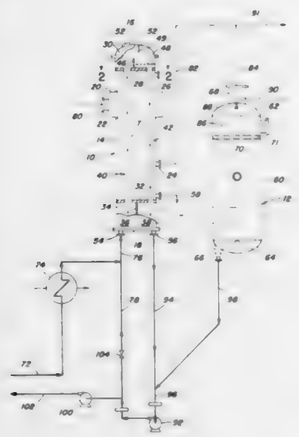
4. In a method of selectively etching a pyralytic glass layer on a metal substrate without substantially attacking the underlying metal, the step of contacting the glass layer with a dilute aqueous etch solution for a sufficient time to etch through the glass layer, said etch solution comprising buffered hydrofluoric acid, sodium chloride at a concentration from about 1% by weight of solution to the point just below saturation where the sodium chloride begins to precipitate, and a 6-hydroxy alcohol, said etch solution being diluted with water.

4,040,898

EVAPORATING APPARATUS AND PROCESS

Harlan P. Englander, Tonawanda, and Edward B. Pinkel, Buffalo, both of N.Y., assignors to Blaw-Knox Food and Chemical Equipment, Inc., Buffalo, N.Y.

Continuation of Ser. No. 254,427, May 18, 1972, abandoned. This application Feb. 4, 1976, Ser. No. 655,221
Int. Cl.[2] B01D *1/06*
U.S. Cl. 159—27 R 3 Claims



1. A process for concentrating liquids by passing said liquids through a concentration zone defined by a plurality of upflow passageways and down-flow passageways, with said passages being in direct heat exchange relation with a source of heat, characterized by the steps of

a. passing the fresh liquids to be concentrated through said upflow passageways to form a first liquid-vapor phase;
b. withdrawing in a first withdrawing step said first liquid-vapor phase from the upper ends of said upflow passageways;
c. introducing said first liquid-vapor phase into the upper ends of said down-flow passageways;
d. said introducing step being carried out by passing said first liquid-vapor phase through orifices coaxial with said down-flow passageways;
e. said orifices being smaller in diameter than their related down-flow passageways;
f. withdrawing in a second withdrawing step a second liquid-vapor phase from the lower ends of said down-flow passageways;
g. separating said second liquid-vapor phase into a vapor phase and a liquid phase;
h. withdrawing a portion of said liquid phase as product;
i. recirculating the remainder of said liquid phase to said upflow passageways along with said fresh liquids;
j. visually monitoring said first withdrawing step to avoid pulsations in said first liquid-vapor phase; and
k. adjusting the rate of recirculation of said liquid phase from said separated second liquid-vapor phase in accordance with said monitoring step so as to maintain a continuous film on the surface of said down-flow passageways.

4,040,899

PRODUCTION OF HIGH STRENGTH PACKAGING PAPERS FROM STRAW

James Wade Emerson, Hazlet, N.J., assignor to Clupak, Inc., New York, N.Y.

Continuation of Ser. No. 268,508, July 3, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 528,584
Int. Cl.[2] D21C *3/00*
U.S. Cl. 162—13 7 Claims

1. A paper constituently comprising in combination straw fiber of relatively short fiber length in the range of approximately 0.70 to 4.00 millimeters and relatively longer softwood fibers randomly and generally intermittently mixed with the straw fibers, the paper comprising at least 60% straw fiber with the balance of fibers comprising said relatively longer fibers, said paper having a basis weight of more than 55 pounds and having substantially all of its fiber laterally crimped and intertwined such that the paper exhibits substantial permanent extensibility in excess of the paper web as laid.

6. A straw paper suitable for use as high strength packaging paper and for making high strength multi-walled paper sacks, said paper comprising at least 40% by weight straw fiber and the remainder softwood pulp fiber, a majority of the straw fibers being in the range of approximately 0.70 to 4.00 millimeters in length, said straw fiber being randomly and generally uniformly mixed with said softwood pulp fiber, said paper having a basis weight of more than 55 pounds, substantially all of its fibers locally crimped and intertwined such that the paper has a percent elongation of at least 7.9 and substantial permanent extensibility in excess of the paper web as laid.

4,040,900

METHOD OF SIZING PAPER

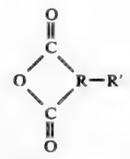
Emil D. Mazzarella, Mountainside; Leonard J. Wood, Jr., Berkeley Heights, and Walter Maliczyszyn, Piscataway, all of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 535,443, Dec. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 471,230, May 20, 1974, abandoned. This application May 5, 1976, Ser. No. 683,405
Int. Cl.[2] D21D *3/00*
U.S. Cl. 162—158 7 Claims

1. A method for sizing paper products comprising the steps of

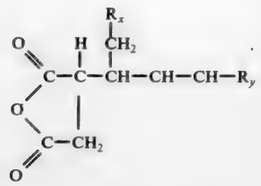
1. providing a paper stock system;
2. forming, in the absence of high shearing forces and under normal pressures, a sizing emulsion consisting essentially of:
   a. from 80 to 97 parts of substituted cyclic dicarboxylic acid anhydride corresponding to the formula

(A)



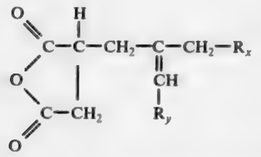
wherein R represents a dimethylene or trimethylene radical and wherein R′ is a hydrophobic group containing more than 5 carbon atoms which may be selected from the class consisting of alkyl, alkenyl, aralkyl, or aralkenyl groups;

(B)



wherein R_x is an alkyl radical containing at least 4 carbon atoms and R_y is an alkyl radical containing at least 4 carbon atoms, and R_x and R_y are interchangeable;

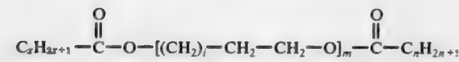
(C)



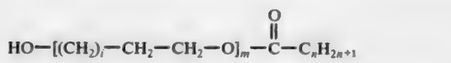
wherein R_x is an alkyl radical containing at least 5 carbon atoms and R_y is an alkyl radical containing at least 5 carbon atoms and R_x and R_y are interchangeable;

b. from 3 to 20 parts of a polyoxyalkylene alkyl or polyoxyalkylene alkyl-aryl ether or the corresponding mono- or diester selected from the group consisting of:

i)



ii)



wherein *x* and *n* are integers in the range of 8 to 20; R is an aryl radical; *m* is an integer in the range of 5 to 20; and *i* is 0 or 1; and

3. forming a web from the paper stock system; change c. water;
4. intimately dispersing said emulsion within the paper stock either before or after formation of said web but prior to passing said web through the drying stage of the paper making operation in an amount sufficient to provide a concentration of the substituted cyclic dicarboxylic acid anhydride of from 0.1 to 2.0%, based on dry fiber weight.

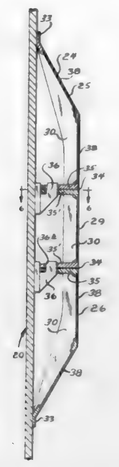
6. The method of claim 1 wherein there is dispersed within the paper stock prior to the conversion of the paper stock into a dry web at least 0.01%, based on dry fiber weight, of a cationic retention agent.

4,040,901

MOUNTING FOR SECTIONAL SCREEN

Everett R. Leisure, Portland, Oreg., assignor to Esco Corporation, Portland, Oreg.

Filed Aug. 16, 1976, Ser. No. 714,517
Int. Cl.[2] D21C *7/00*; B01D *25/02*
U.S. Cl. 162—251 7 Claims



1. In combination with the interior wall of a vessel, a sectional screen mounted thereon, each section comprising a frame which is generally rectangular in front elevation to provide a pair of vertical edges and first and second horizontal edges, said vertical edges being generally arcuate in side elevation to position said first horizontal edge adjacent the vessel wall and said second horizontal edge spaced from said wall, and hook receiving means on said frame adjacent said second horizontal edge and extending toward said wall for supporting and stabilizing said section in place, said sections being arranged in a plurality of pairs, the sections in each pair being vertically related to position said first horizontal edge of the lower section downwardly and said first horizontal edge of the upper section upwardly, said second horizontal edges of each pair being in abutting relation to position the hook receiving means of each section of each pair in abutting, aligned relation, and a single hook means on said wall engaging said hook receiving means and passing through the openings in the aligned hook-receiving means of each pair.

4,040,902

METHOD FOR AXIALLY SHUFFLING FUEL ELEMENTS IN A NUCLEAR REACTOR

Karol J. Mysels, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

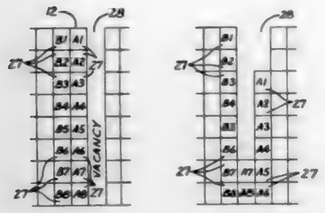
Filed Apr. 3, 1975, Ser. No. 564,773
Int. Cl.[2] G21C *19/00*
U.S. Cl. 176—30 10 Claims

1. A method of refueling the fuel columns in the active core of a nuclear reactor having upper and lower ends and including fuel columns comprised of substantially equal stacks of fuel elements having hexagonal transverse configurations, said method comprising the steps of:

a. completely removing a predetermined number of adjoining fuel columns to initially create a plurality of adjoining vacant columns;
b. filling one of said vacant columns with at least one fresh hexagonal shaped fuel element, and a plurality of complementary hexagonal shaped fuel elements transferred from a single fuel column adjoining at least one of said vacant columns by laterally transferring said plurality of complementary fuel elements as a unit to said one of said vacant

columns through adjoining column vacancies by substantially lateral movement so as to maintain their same relative stack positions during said transferring and without lifting or lowering the major portion of any of said fuel elements beyond the upper or lower bounds of the active core during said transferring;

c. discarding a number of fuel elements from said single adjoining fuel column equal to the number of said fresh



fuel elements placed in said one of said vacant columns to thus create a new vacant column;

d. repeating steps b and c until all of said fuel columns in said active core have been refueled except a number of finally remaining vacant columns equal to the number of initially created vacant columns; and

e. refilling said remaining vacant columns with a number of hexagonal shaped fuel elements as necessary to establish full fuel columns.

4,040,903

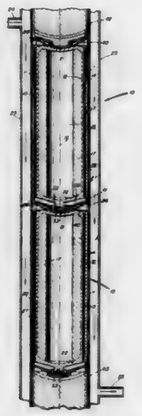
THERMIONIC ENERGY CONVERTERS

James E. Monroe, Jr., Timonium, Md., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Continuation of Ser. No. 384,080, July 21, 1964. This application Sept. 3, 1974, Ser. No. 502,420

Int. Cl.² G21C *3/02*

U.S. Cl. 176—39 **2 Claims**



1. A thermionic device for the conversion into electrical energy of nuclear energy released by a fissionable material comprising:

a tubular anode formed of niobium;

a cylindrical cathode having a sealed interior chamber positioned concentrically within said tubular anode with an interelectrode gap therebetween, said cathode being formed of a refractory metal composition consisting essentially of a mixture of molybdenum and approximately ½% titanium and having on its outer surface an emitter coating of ruthenium;

a nuclear fuel solid of annular configuration with an axial void on the centerline thereof bonded metallurgically to the interior of said cathode and partially filling said sealed interior chamber, said axial void being evacuated for the collection and containment of fission product gases within said interior chamber, said fuel solid consisting essentially of particles of a fissionable material-containing ceramic composition dispersed in a matrix of molybdenum to promote the transfer of thermal energy through said fuel solid to said cathode; and

a cesium vapor located at least partially within said interelectrode gap in operation.

4,040,904

NOVEL RABIES VIRUS VACCINE AND PROCESSES

Eban A. Slater, 1 Lindenwood Lane, St. Joseph, Mo. 64505

Filed July 21, 1975, Ser. No. 597,654

Int. Cl.² C12K *7/00*; A61K *39/28*

U.S. Cl. 195—1.3 **5 Claims**

1. A method for the preparation of a novel live rabies virus strain which exhibits reproducibly significant cytopathic effect which correlates with the virus titer, said method comprising passing the ERA strain rabies virus in tissue culture of PK_2A cells for a number of passages sufficient to develop said novel strain.

4,040,905

SUB-HUMAN PRIMATE DIPLOID CELL LINES AS SUBSTRATES FOR VIRUS VACCINE PRODUCTION

John C. Petricciani, Washington, D.C.; Hope E. Hopps, Silver Spring; Douglas E. Lorenz, Bethesda, both of Md.; Paul J. Vasington, and Roslyn E. Wallace, both of Pearl River, N.Y., assignors to The United States Government, Washington, D.C.

Filed Oct. 27, 1971, Ser. No. 193,176

Int. Cl.² C12K *9/00*

U.S. Cl. 195—1.8 **1 Claim**

1. A cell culture for virus vaccine production comprising a sub-human primate diploid cell line bearing ATCC Accession No. CL-160 and a nutrient medium therefor.

4,040,906

METHOD OF PRODUCING CARBON SOURCE FOR CITRIC ACID FERMENTATION

Ryosuke Uchio, Zushi; Kenji Kikuchi, Yokosuka; Soichiro Asai, Tokyo, and Kenichi Yarita, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Apr. 23, 1976, Ser. No. 679,711

Int. Cl.² C12D *1/04*; C12B *3/04*

U.S. Cl. 195—36 R **5 Claims**

1. In the fermentation production of citric acid wherein fermentation is effected by the use of a microorganism of the species *Aspergillus niger* or *Aspergillus awamori*, the improvement which comprises:

admixing a substantially neutral hydrolyzate of juices of cane or beet, crude sugar, or molasses containing glucose and fructose cooled to below 10° C with calcium hydroxide to form a fructose addition product precipitate, and

neutralizing the remaining mother liquor, simultaneously eliminating calcium ions therefrom, and utilizing the remaining liquor as the carbon source for said fermentation.

4,040,907

IODOTHYRONINE ENZYME CONJUGATES

Edwin F. Ullman, Atherton, and Kenneth E. Rubenstein, Menlo Park, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 481,023, June 20, 1974, Pat. No. 3,975,237, which is a division of Ser. No. 304,157, Nov. 6, 1972, Pat. No. 3,852,157, which is a continuation-in-part of Ser. No. 143,609, May 14, 1971, abandoned. This application Dec. 29, 1975, Ser. No. 644,489

Int. Cl.² C07G *7/02*

U.S. Cl. 195—63 **16 Claims**

11. A thyroxine conjugate to an enzyme at other than the active site of the enzyme, having on the average from about 1 to 20 of said thyroxine bonded to said enzyme.

4,040,908

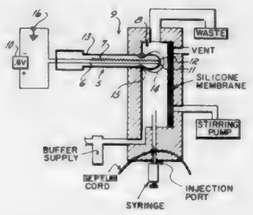
POLAROGRAPHIC ANALYSIS OF CHOLESTEROL AND OTHER MACROMOLECULAR SUBSTANCES

Leland C. Clark, Jr., Cincinnati, Ohio, assignor to Children's Hospital Medical Center, Cincinnati, Ohio

Filed Mar. 12, 1976, Ser. No. 666,252

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **23 Claims**



1. A method for quantitative polarographic determination of a substance which is convertible by at least one enzyme to produce ultimately hydrogen peroxide comprising the steps of

providing a polarographic cell including at least one electrode sensitive to hydrogen peroxide positioned behind a membrane permeable to hydrogen peroxide and impermeable to said substance being measured, said cell containing an electrolyte,

at least one enzyme contained in said cell on the side of the membrane opposite said electrode for enzymatic reaction with said substance to produce ultimately hydrogen peroxide,

establishing a potential across said cell such that current is produced which is proportional to the amount of hydrogen peroxide produced,

adding a quantity of material containing said substance for said enzymatic reaction on the side of the membrane opposite said electrode and to effect diffusion of at least a portion of said hydrogen peroxide into said membrane and into contact with said electrode, and

determining the current flowing across said cell as a function of the amount of hydrogen peroxide formed and as an indication of the amount of said substance in said material.

4,040,909

DIAGNOSTIC DEVICE FOR A LIQUID SAMPLE

Gary Libman, Des Plaines, and Frank K. Villari, Oak Park, both of Ill., assignors to The Kendall Company, Boston, Mass.

Division of Ser. No. 495,978, Aug. 29, 1974, Pat. No. 3,952,729. This application Nov. 21, 1975, Ser. No. 634,110

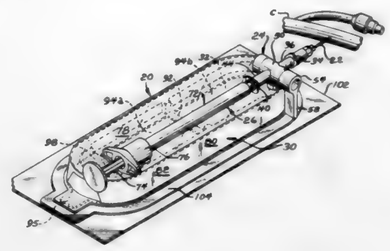
Int. Cl.² C12K *1/10*

U.S. Cl. 195—127 **2 Claims**

1. A diagnostic device for a source of liquid sample, comprising:

an elongated receptacle having a culture medium longitudinally disposed in a generally planar configuration along a wall of the receptacle;

pump means connected intermediate the source and receptacle;



means in addition to the pump means for directing the sample from the pump means into the receptacle only adjacent one end of said medium for passage along the medium; and

an absorbent pad located adjacent the other end of the medium remote from the directing means to capture and retain excess liquid.

4,040,910

APPARATUS FOR CHARGING COKE OVENS

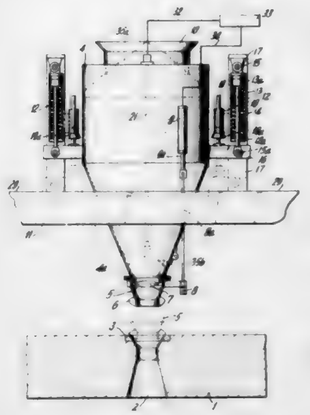
Johannes Knappstein, and Josef Stratmann, both of Recklinghausen, Germany, assignors to Firma Carl Still, Germany

Filed May 10, 1976, Ser. No. 684,572

Claims priority, application Germany, June 3, 1975, 2524462

Int. Cl.² C10B *31/04*

U.S. Cl. 202—262 **13 Claims**



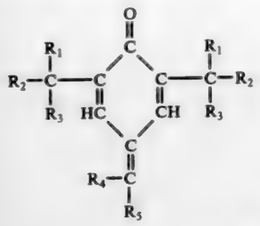
1. An apparatus for charging coke ovens with coal through filling openings in the oven roof, comprising a hopper support positionable over the filling openings, at least one charging hopper adapted to be filled with coal and having a bottom discharge connection engageable in a filling opening, means on said support supporting said hopper for upward and downward movement, and drive means on said support connected to said hopper to move said hopper downwardly to engage said discharge connection into the associated oven filling opening to discharge the coal from said hopper into the oven and to raise said hopper after discharging is completed.

4,040,911
PROCESS FOR INHIBITING THE POLYMERIZATION OF STYRENE

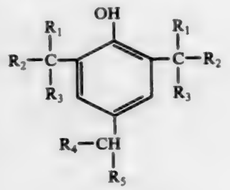
John D. Bacha, and Charles M. Selwitz, both of Monroeville, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 2, 1976, Ser. No. 646,399
Int. Cl.[2] B01D *3/10*; C07C *15/10*
U.S. Cl. 203—9 6 Claims

1. In a method for inhibiting the polymerization of styrene monomers during the vacuum distillation processing thereof, the improvement which comprises a continuous mass process for preparing styrene, adding said processing a polymerizing inhibiting amount of a quinone alkide in combination with a hindered phenol, said quinone alkide having the formula:



wherein R_1, R_2 and R_3 are either alike or different, members selected from the group consisting of hydrogen, straight or branched chain members selected from alkyl moieties having from 1 to 8 carbon atoms, phenyl and alkyl substituted phenyl moieties having up to 9 carbon atoms, cyclic hydrocarbon moieties having from 3 to 5 carbon atoms; and wherein R_4 and R_5 are either alike or different, members selected from the group consisting of hydrogen, straight or branched chain alkyl moieties having from 1 to 18 carbon atoms, phenyl and alkyl substituted phenyl moieties having 9 carbon atoms, and cyclic hydrocarbon moieties having from 3 to 5 carbon atoms; and said phenol having the formula:



wherein R_1, R_2, R_3, R_4 and R_5 are defined above.

4,040,912
POLYMERIZATION INHIBITOR FOR VINYL AROMATIC COMPOUNDS

James M. Watson, Big Spring, Tex., assignor to Cosden Technology, Inc., Big Spring, Tex.

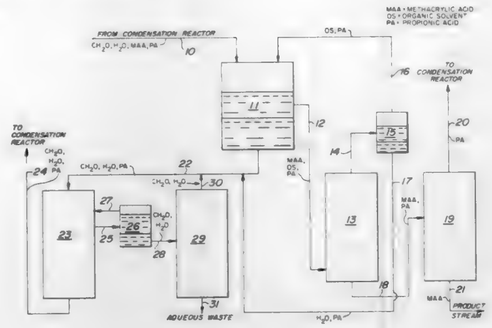
Filed Dec. 9, 1974, Ser. No. 531,066
Int. Cl.[2] B01D *3/34*; C07C *7/00*
U.S. Cl. 203—9 7 Claims

1. A process for the distillation of a readily polymerizable vinyl aromatic compound, which comprises subjecting said component to distillation conditions in a distillation system and adding to said system a polymerization inhibitor comprising an adduct of nitric oxide gas and styrene, said adduct of nitric oxide gas and styrene being present in an amount of from about 50 to 3000 ppm based upon the contents of the distillation system, whereby polymerization of the vinyl aromatic compound in the distillation system is substantially inhibited.

4,040,913
RECOVERY OF METHACRYLIC ACID FROM THE EFFLUENT OBTAINED FROM THE CONDENSATION OF FORMALDEHYDE AND PROPIONIC ACID

James S. Clovis, Morrisville; Jerome Dohling, Huntingdon Valley, both of Pa., and Francis J. Nicastro, Cherry Hill, N.J., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Sept. 2, 1975, Ser. No. 609,337
Int. Cl.[2] B01D *3/34*; C07C *57/04*
U.S. Cl. 203—69 13 Claims



1. A process for the recovery of methacrylic acid from an aqueous effluent produced by the vapor phase condensation of formaldehyde and propionic acid, said effluent further containing unreacted formaldehyde and propionic acid, where the recovery comprises:

a. contacting the aqueous effluent with an organic solvent having a high extractive efficiency for methacrylic acid, a low extractive efficiency for formaldehyde and water and capable of preferentially extracting and azeotroping with propionic acid, to obtain an organic layer and an aqueous raffinate;
b. distilling the organic layer obtained in step (a) to azeotropically remove about 50-100% of the unreacted propionic acid extracted by the organic solvent and to strip off the organic solvent, leaving as bottoms a mixture of methacrylic acid and remaining unreacted propionic acid;
c. distilling the bottoms of step (b) to obtain any remaining propionic acid overhead and pure methacrylic acid as bottoms;
d. azeotropically distilling the aqueous raffinate of step (a) with an entrainer to obtain water and formaldehyde overhead and formaldehyde/propionic acid bottoms.
e. sending the overhead of step d) to a separator to allow entrainer to separate from the water/formaldehyde taken overhead; and
f. distilling the water/formaldehyde overhead obtained in step e. to concentrate the formaldehyde for recycle to step d), while disposing of the aqueous bottoms as organic waste.

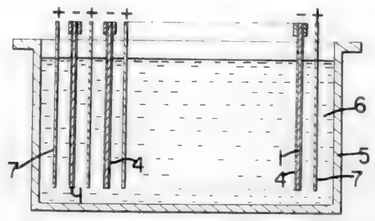
4,040,914
CATHODE STARTING BLANKS FOR METAL DEPOSITION

Antonio Nidola; Placido M. Spaziante, both of Milan, Italy, and Vittorio de Nora, Nassau, Bahamas, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed Apr. 28, 1976, Ser. No. 680,982
Int. Cl.[2] C25D *1/20*; C25C *7/08*; C25B *11/10*
U.S. Cl. 204—12 19 Claims

16. In the method of electrolytically depositing a strippable metal layer on a cathode starting blank from a metal containing electrolyte and stripping the metal deposit from the blank, the

improvement wherein the cathode starting blank comprises a valve metal base coated over at least a portion of its surface

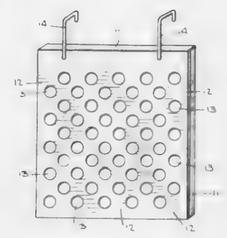


with a thin layer containing a material selected from the group consisting of silver, silver-valve metal alloy and oxides thereof.

4,040,915
METHOD FOR PRODUCING REGULAR ELECTRONICKEL OR S NICKEL ROUNDS FROM ELECTROPLATING BATHS GIVING HIGHLY STRESSED DEPOSITS

Gordon Lloyd Fisher, Mahwah, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Filed June 15, 1976, Ser. No. 696,209
Int. Cl.[2] C25D *1/10, 1/20*
U.S. Cl. 204—12 7 Claims



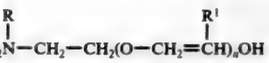
1. A permanent reuseable mandrel for electrodeposition of discrete electrodeposits of metal having a high internal stress as deposited comprising and essentially flat plate of metal resistant to the corrosive environment of a metal electrodeposition bath and adapted to be suspended in such a bath in contact as a cathode with an electrical energizing means, said flat plate being masked with an adherent electrical resist to define islands of bare metal on the surface of said plate, each of said islands having a major lateral dimension of about 7 to about 50 mm and having a continuous non-undercut recess in the bare metal surface thereof adjacent to and parallel to the perimeter of each of said islands, said recess being about 0.12 mm to about 1.6 mm in depth with the ratio of lateral dimension to depth of recess being about 5 to 50.

4,040,916
ZINC PLATING BATH AND METHOD OF FORMING A NON-DENDRITIC ZINC LAYER

Fritz G. Will, and Fred F. Holub, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 636,204, Nov. 28, 1975, abandoned. This application Aug. 18, 1976, Ser. No. 715,226
Int. Cl.[2] C25D *3/22*; H01M *10/26*
U.S. Cl. 204—55 R 10 Claims

1. A method for forming a non-dendritic zinc layer which comprises providing a deposition solution containing a zinc compound and from 0.001 to 10 weight percent of a non-ionic surfactant additive which has the formula:



where m is a number from 3 to 15, R is alkyl radical having from 1 to 10 carbon atoms, R^1 is a member of a group consisting of hydrogen and methyl radical, n is a number for the group from 0 to 30, and the surfactant additive has a molecular weight range of approximately 550–1500; positioning a pair of spaced apart electrodes within the deposition solution, applying an electric current to the electrodes, and depositing a non-dendritic zinc layer on the negative electrode.

4,040,917
PREPARATION OF INTERCALATED CHALCOGENIDES

M. Stanley Whittingham, Fanwood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 592,592, July 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 396,001, Sept. 10, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 673,695
Int. Cl.[2] C25B *1/00*
U.S. Cl. 204—92 18 Claims

1. A process for the preparation of intercalated chalcogenides which comprises applying a current to a system comprising:

a. a cathode containing as the cathode-active material the chalcogenide to be intercalated, said chalcogenide having a layered structure and having the fomrula MZ_x wherein M is at least one metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium, tantalum and molybdenum; Z is at least one chalcogen selected from the group consisting of sulfur, selenium and tellurium; and x has a numerical value between about 1 and about 2.05;
b. an anode containing as the anode-active material an electronically conductive material selected from the group consisting of Group IVb metals, Group Vb metals, Group VIb metals, Group VIIb metals, Group VIII metals and electronically conductive compounds of the aforesaid metals; and
c. an electrolyte comprising an ionically conductive material which will provide the cathode with ions of the species which are to intercalate the chalcogenide, said electrolyte having the formula LX wherein L is the intercalating species and is at least one cationic moiety selected from the group consisting of Group Ia metals, Group Ib metals, Group IIa metals, Group IIb metals, Group IIIa metals, ammonium and substituted ammonium; X is at least one anionic moiety selected from the group consisting of halides, sulfates, nitrates, beta-alumina, phosphofluorides, thiocyanates and perchlorates,

said current being applied at a voltage sufficiently high to cause the intercalation of the cathode active material and sufficiently low to avoid deposition onto the chalcogenide of the species being intercalated into the chalcogenide.

4,040,918
METHOD OF ACTIVATING AN ANODE

Harlan B. Johnson, Rittman; Aleksandrs Martinsons, Wadsworth, and John O. Snodgrass, Akron, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 26, 1976, Ser. No. 661,582
Int. Cl.[2] C25B *1/34, 11/08, 11/10*
U.S. Cl. 204—98 6 Claims

1. In a method of electrolyzing an alkali metal chloride brine comprising passing an electrical current from an anode through said brine to a cathode, evolving chlorine at an overvoltage on said anode, said anode having a surface coating comprising an oxide of a film-forming metal and an oxide of a platinum group metal on a metal substrate, said surface coating

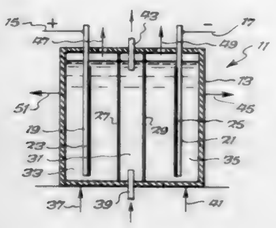
formed by applying compounds of said film-forming metal and said platinum group metal to the substrate and heating said substrate to form a coating of the oxides, the improvement comprising abrading an external portion of said oxide coating whereby to reduce the initial overvoltage of said anode.

4,040,919

VOLTAGE REDUCTION OF MEMBRANE CELL FOR THE ELECTROLYSIS OF BRINE

Jeffrey D. Eng, N. Vancouver, Canada, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation of Ser. No. 518,903, Oct. 29, 1974, abandoned.
This application Feb. 11, 1976, Ser. No. 657,134
Int. Cl.² C25B *1/16, 1/26, 13/00*
U.S. Cl. 204—98 **9 Claims**



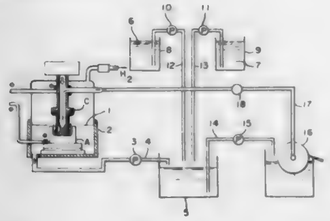
1. In the electrolysis of brine in a membrane cell, the improvement which comprises lowering the voltage drop across the cell by dissolving deposits upon the membrane by increasing the acidity of the anolyte, diluting the electrolyte located immediately adjacent to said anolyte and separated from said anolyte by a membrane, reducing the current density, and maintaining such conditions during electrolysis for a period sufficiently long to rejuvenate said membrane.

4,040,920

METHOD OF PREVENTING POLLUTION OF SLUDGE FORMED BY ELECTROLYTIC ETCHING WORK

Koji Takada, and Takashi Misu, both of Nagoya, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 30, 1976, Ser. No. 682,119
Claims priority, application Japan, May 21, 1975, 50-59669
Int. Cl.² C25F *3/02, 7/00, 7/02*
U.S. Cl. 204—129.75 **6 Claims**



1. A method of preventing pollution of a sludge formed by an electrolytic etching work which comprises admixing an aqueous solution of ferrous nitrate or ferrous chloride to an electrolytic solution which is recycled, at a ratio of more than stoichiometric amount of ferrous nitrate or ferrous chloride to chromium (VI) compound and adjusting pH of the mixture to 8 to 8.5 by adding an aqueous solution of sodium hydroxide, and separating a sludge formed by the neutralization.

4,040,921

PROCESS FOR BETA-HYDROXYALKYLSULFOXIDES

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 29, 1976, Ser. No. 709,781
Int. Cl.² B01J *1/10*
U.S. Cl. 204—158 R **13 Claims**

1. A process for preparing β-hydroxyalkylsufoxides by reacting an olefinically unsaturated compound containing 2 to 30 carbon atoms and a thiol containing 1 to 24 carbon atoms with oxygen in the presence of a dye sensitizer using visible light as an energy source at a temperature within the range from about −10° to +70° C.

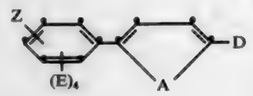
4,040,922

PHOTOPOLYMERIZABLE POLYMERIC COMPOSITIONS CONTAINING HALOGEN CONTAINING HETEROCYCLIC COMPOUND

Richard H. S. Wang; Gordon C. Newland, and James G. Pacifici, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 6, 1975, Ser. No. 620,100
Int. Cl.² C08F *2/46, 4/00*
U.S. Cl. 204—159.15 **13 Claims**

1. A composition capable of forming coatings hardenable by ultraviolet radiation comprising a mixture of a photopolymerizable or photocrosslinkable ethylenically unsaturated compound and from 0.01 to 10% by weight of a photoinitiator selected from the group consisting of compounds having the formula



wherein A is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12 carbon atoms;
Z is a $-CH_2X$, $-CHX_2$ or $-CX_3$ group;
X is a halogen atom;
E is hydrogen, halogen, alkyl, alkoxy, aryl, aryloxy, hydroxy, amino, carbonylalkoxy or cyano; and
D is alkyl, substituted alkyl, aryl or substituted arly group.

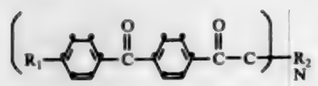
4,040,923

PHOTOPOLYMERIZABLE POLYMERIC COMPOSITIONS CONTAINING HALOGEN CONTAINING AROMATIC KETONES

James G. Pacifici; Gordon C. Newland, both of Kingsport, and Hobert M. Beard, Jr., Johnson City, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 3, 1976, Ser. No. 692,403
Int. Cl.² C08F *8/00, 2/46*
U.S. Cl. 204—159.15 **30 Claims**

1. A composition capable of forming coatings hardenable by ultraviolet radiation comprising a mixture of a photopolymerizable or photocrosslinkable ethylenically unsaturated compound and from 0.01 to 10% by weight of a photoinitiator selected from the group consisting of aryl ketone compounds having the formula



wherein R_1 is $-CH_2X$, $-CHX_2$, and $-CX_3$, where X is chlorine or bromine, N is an integer and is equivalent to the valence of R_2, and R_2 is monovalent lower alkyl containing 1 to 10 carbon atoms, a polyvalent alkylene group of the formula

C_xH_{2x-y} in which x is 2 to 10 and y is 0 to 2, a cycloalkylene group or aryl group containing 6 carbon atoms.

4,040,924

AQUEOUS CATIONIC ELECTRODEPOSITION OF EPOXY RESINS HAVING QUATERNARY GROUPS CARRYING BLOCKED NCO

James E. Jones, Lower Burrell, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 601,111, Aug. 1, 1975, Pat. No. 4,009,133. This application Nov. 1, 1976, Ser. No. 737,359
Int. Cl.² C25D *13/06*; C08F *8/30, 8/34*; C08G *18/58*
U.S. Cl. 204—181 **6 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode and an anode and an aqueous electrodepositable composition wherein the electrodepositable composition comprises an aqueous dispersion of:

A. a hydroxyl group-containing resinous vehicle comprising the acidified reaction product of:
1. an organic polyepoxide,
2. an organic tertiary amine which contains blocked isocyanate groups or organic thioether which contains blocked isocyanate groups, said blocked isocyanate groups capable of unblocking at elevated temperature to crosslink said resinous vehicle.

4,040,925

ULTRAVIOLET CURING OF ELECTROCOATING COMPOSITIONS

Vincent D. McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed May 2, 1974, Ser. No. 466,127
Int. Cl.² C25D *13/06*
U.S. Cl. 204—181 **3 Claims**

1. In a process for electrocoating a paint film onto an anode substrate dispersed within an aqueous electrocoating bath, the electrocoating composition being dispersed in water and comprising an ethylenically unsaturated polymer containing ethylenically unsaturated groups selected from acrylyl, acrylamide, and allyl, said ethylenically unsaturated polymer having a carboxylic group functionality and an acid number of at least about 20, said ethylenically unsaturated polymer being solubilized in water by reacting said polymer with at least about 1% by weight of a solubilizing derivative selected from aliphatic amines, aromatic amines, alkynolamines, sodium hydroxide and potassium hydroxide, and electrocoating said polymer onto the anode substrate to form a film thereon, the improvement comprising:

reacting at least about 2% by weight of an ultraviolet sensitizer with said polymer to attach the ultraviolet sensitizer to the polymer structure, said ultraviolet sensitizer being reacted onto the polymer structure prior to the step of neutralizing the polymer and prior to dispersing the polymer into the electrocoating water bath;

electrocoating said polymer containing the ultraviolet sensitizer connected to the polymer structure onto the anode substrate wherein the ultraviolet sensitizer remains tied to the polymer structure while electrocoating a polymeric film onto the anode substrate; and

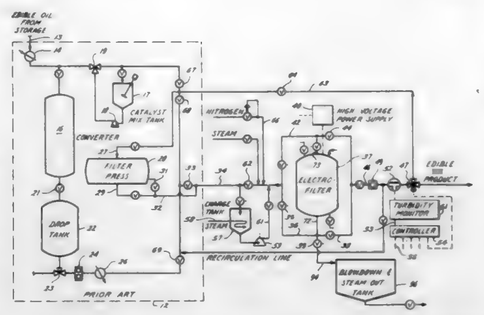
exposing said polymeric film to ultraviolet energy to activate the ultraviolet sensitizer connected to the polymer structure and cross-link the ethylenic unsaturation in the polymer structure to provide a cured paint film on the anode substrate.

4,040,926

ELECTROFILTRATION PROCESS FOR PURIFYING ORGANIC LIQUIDS

Serafin Bess Oberton, Missouri City, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed Nov. 28, 1975, Ser. No. 636,261
Int. Cl.² B03C *5/00*
U.S. Cl. 204—186 **40 Claims**



1. An electrofiltration process for removing hydrogenation catalyst and other undissolved solids from a stream of edible oil which has been subjected to catalytic hydrogenation, and process comprising:

a. providing the stream of so hydrogenated edible oil at a sufficient temperature that organic solids such as stearine are in solution and cannot plug an electrofilter bed adapted to remove the undissolved solids carried therein;
b. passing said stream of oil through a chemically inert bed having multitudinous flow channels between rigid masses of a solid material having a dielectric constant not in excess of about 7;
c. establishing a d.c. electrical field within said bed having an intensity sufficient for removing the undissolved solids from said stream of oil by electrically induced adhesion of the solids in said bed material;
d. removing the purified oil stream with reduced undissolved solids content from said bed; and
e. cleaning at selected intervals at least a portion of said material of adhering solids by interruption of said electrical field, passing a cleaning fluid to remove adhering solids from said material and removing the fluid with the removed solids from said material.

4,040,927

CADMIUM TELLURITE THIN FILMS

John H. Chaffin, III, Minnetonka, and Richard A. Skogman, Inver Grove Heights, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

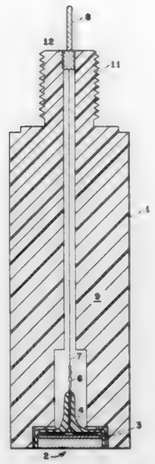
Filed Nov. 19, 1975, Ser. No. 633,532
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 S **4 Claims**

1. A method of depositing a layer of a cadmium-tellurium-oxygen compound, the method comprising:

providing a substrate; and

sputter depositing the cadmium-tellurium-oxygen compound onto the substrate by sputter depositing from a cadmium telluride target in an oxygen atmosphere.

4,040,928
SPECIFIC ION SENSOR AND METHOD OF MANUFACTURE
Walter R. Kraus, Centerville; David J. Kelch, Bellbrook, and Gerald A. Jensen, Kettering, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 235,055, March 16, 1972, abandoned. This application July 10, 1973, Ser. No. 378,025
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 M **9 Claims**



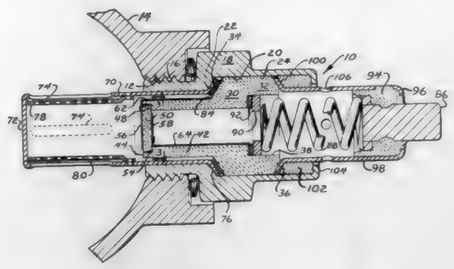
1. A specific ion sensor comprising:
a. a housing,
b. a membrane mounted in said housing, said membrane being produced by placing a layer of powdered specific ion sensing material selected from the class consisting of silver sulfide and silver bromide in a die in contact with a layer of powdered metallic silver and pressing said powder layers into a solid, impervious and intimately bonded mass with the silver portion thereof having an average thickness ranging between about 15 and 500 microns; the mounting of said membrane being such that said ion sensing material faces outwardly for contact with a process solution and said silver layer is electrically isolated from the exterior of the housing,
c. an electrical terminal mounted in said housing for delivering a signal to an external instrument, and
d. solid electrical connection means between said silver layer and said terminal.

4,040,929
OXYGEN SENSOR HAVING THIN FILM ELECTROLYTE
Carl F. Bauer, Chicago; Lawrence B. Welsh, Evanston, both of Ill.; Karl J. Youtsey, Decatur, Ala., and Frank R. Szofran, Des Plaines, Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.
Filed Sept. 15, 1975, Ser. No. 613,657
Int. Cl.[2] G01N *27/46, 27/58*
U.S. Cl. 204—195 S **13 Claims**



1. A thin film oxygen sensor comprising a substrate; a reference electrode coating on the substrate; an oxide-electrode interface region; a thin film layer of solid electrolyte having a thickness of less than about 1.5 μm; and a porous measuring electrode coating on the electrolyte; said oxide-electrode interface region being positioned between and in intimate contact with said reference electrode coating and said solid electrolyte so as to provide a stable reference oxygen partial pressure at the reference electrode.

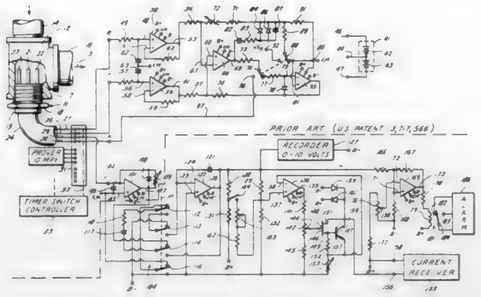
4,040,930
OXYGEN SENSOR
James E. Dillon, Elgin, Ill., assignor to UOP Inc., Des Plaines, Ill.
Filed Feb. 5, 1976, Ser. No. 655,662
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **7 Claims**



1. An oxygen sensor for use in an automotive exhaust stream comprising a metal housing having a shouldered recess portion intermediate its ends, fastening means on the inner end of said metal housing adapted to cooperate with complementary fastening means on the side wall of an exhaust member containing gases to be sensed, a hollow, generally tubular, ceramic insulating body positioned within said metal housing and having an enlarged diameter shoulder portion intermediate its ends which is restrained against forward movement toward said inner end of said metal housing by said shouldered recess portion, the forward portion of said insulating body being unsupported and radially spaced from the inner wall of said metal housing, a solid electrolyte member of a material different from the ceramic body sealed to said ceramic insulating body at the inner end thereof and having electrodes on the opposed sides thereof, the combined length of the forward portion of said insulating body and said solid electrolyte member being less than 150% of the outer diameter of said forward portion, said solid electrolyte member being positioned axially at about the inner end of said metal housing, a generally tubular, apertured metal shield member extending axially from said metal housing a sufficient distance that its inner end will be in or near the center of the exhaust stream when said sensor is mounted in the side wall of an exhaust conduit.

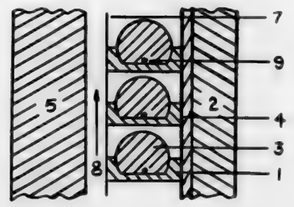
4,040,931
CORROSION RATEMETER
Homer M. Wilson, Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.
Filed Aug. 16, 1976, Ser. No. 714,559
Int. Cl.[2] G01N *27/46, 27/26*
U.S. Cl. 204—195 C **20 Claims**

1. In a corrosion ratemeter having reference, test and third electrodes adapted to be placed into contact with a corrodant, a voltage loop circuit including a voltage comparator connecting said reference and test electrodes, a current loop circuit including a current source means connecting said test and third electrodes, signal correction means and reference signal means associated with said voltage and current loops for freely corroding potential correction and polarization potential addition therein and current-to-voltage converting means in said current loop provide a voltage signal proportional to current flow in said current loop; the improvement comprising:
a. first capacitance means connected with said current-to-voltage converting means for storing a first voltage proportional in magnitude to said voltage signal;
b. storage means having a second capacitance with means with a second voltage therein; and



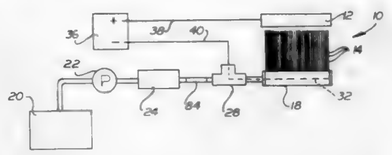
c. means for periodically connecting the first capacitance means across the storage means whereby the second capacitance means stores a resultant voltage, which resultant voltage is in proportion to the first voltage by the capacitance ratio of the first capacitance means to the sum of the first and second capacitance means, and summed with the second voltage on the second capacitance means by the capacitance ratio of the second capacitance means to the sum of the first and second capacitance means.

4,040,932
VERTICAL LIQUID ELECTRODE EMPLOYED IN ELECTROLYTIC CELLS
Donald J. Cotton, 3315 Sherman Ave. NW., Washington, D.C. 20010
Filed Oct. 28, 1975, Ser. No. 626,308
Int. Cl.[2] C25D *17/12;* C25C *7/00;* C25B *9/00*
U.S. Cl. 204—219 **21 Claims**



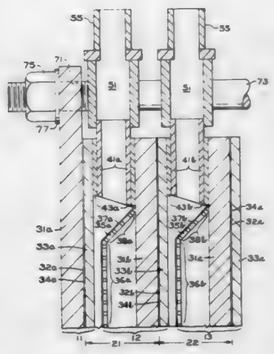
1. An electrode having a vertical component of surface created by the method of confining a liquid in a horizontal capillary trough to which said liquid is nonadhesive, so that a meniscus with a vertical component of surface of said liquid projects above the edge of said capillary trough, wherein said electrode consists of an electrode liquid which forms the active electrode surface, a suitable number of capillary troughs filled with said electrode liquid, and support for said capillary troughs to form a rigid structure having a suitable geometric shape.

4,040,933
FILTER ASSEMBLY FOR ELECTROCHEMICAL MACHINING APPARATUS
James D. Andrews, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio
Filed Oct. 26, 1976, Ser. No. 735,620
Int. Cl.[2] C25D *17/00, 21/06;* B01D *23/26, 29/10*
U.S. Cl. 204—224 M **11 Claims**



1. An apparatus for use in electrolytically removing material from a workpiece, said apparatus comprising nozzle means for directing flow of electrolyte toward the workpiece, said nozzle means at least partially defining an electrolyte flow path which decreases from a relatively large cross sectional area to a minimum cross sectional area, pump means connected in fluid communication with said nozzle means for inducing a flow of electrolyte under pressure through said nozzle means along said flow path, and filter means for removing particles from the electrolyte before it is conducted to said nozzle means, said filter means including a plurality of tubes through which electrolyte is conducted before passing through said nozzle means, each of said tubes including inner surface means defining an electrolyte flow path, at least a portion of said electrolyte flow path through each of said tubes having a cross sectional area which is less than the minimum cross sectional area of the flow path through said nozzle means to enable each of said tubes to block the passage through said filter means of particles having a cross sectional area which is greater than the minimum cross sectional area of the flow path through said nozzle means.

4,040,934
BIPOLAR ELECTROLYZER HAVING SILICON LAMINATE BACKPLATE
Howard H. Hoekje, Akron; Gordon A. Carlson, Wadsworth, and Robert B. Simmons, Norton, all of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 14, 1975, Ser. No. 632,048
Int. Cl.[2] C25B *11/04*
U.S. Cl. 204—256 **2 Claims**



1. In a bipolar electrolyzer having a first bipolar unit and a second bipolar unit, said second bipolar unit being spaced from and parallel to said first bipolar unit and defining a single electrolytic cell therebetween, each of said bipolar units having anode means on one surface thereof and cathode means on the opposite surface thereof whereby the cathode means of

said first bipolar unit faces the anode means of the second bipolar unit, the improvement wherein at least one of said bipolar units comprises:

an electroconductive, electrolyte impermeable backplate having a steel plate as one exposed surface thereof, a silicon sheet in electrical contact with said steel plate as the opposite exposed surface of said backplate, and bonding means comprising a resilient electroconductive resinous material between said steel plate and said silicon sheet;

an electrocatalytic material on the exposed surface of the silicon sheet of said backplate; and

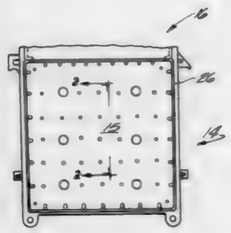
electrolyte permeable, electroconductive cathode means electrically and mechanically connected to, spaced from, and parallel to said steel plate.

4,040,935

PROTECTIVE COVERING FOR ELECTROLYTIC FILTER PRESS CELL FRAMES

Shyam D. Argade, Woodhaven; John J. Bortak, Plymouth; Stephen M. Collins, Trenton, and Eugene Y. Weissman, Birmingham, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Apr. 11, 1975, Ser. No. 567,293
Int. Cl.² C25B *1/26, 1/16, 9/00*
U.S. Cl. 204—256 **11 Claims**



1. In a bipolar electrolytic filter press cell of the type having a polypropylene cell frame interposed between adjacent electrodes, the bipolar cell having bipolar connectors for transmitting electrical energy to the cell, the improvement which comprises:

a. a protective covering mounted to the cell frame the protective covering being chemically inert to the electrolytes, the covering being configured to the configuration of the cell frame, and

b. means for mounting the covering to the cell frame.

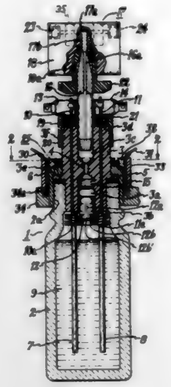
4,040,936

WET CHLORINE GAS GENERATOR FOR INSTRUMENT APPLICATIONS

Edward D. Orth, Boxford; John A. Roberts, Lynnfield, both of Mass., and Raymond J. D. Smith, Morrison, Ill., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 2, 1976, Ser. No. 711,024
Int. Cl.² C25B *1/26, 9/00*
U.S. Cl. 204—271 **15 Claims**

1. A wet chlorine gas generator for instruments requiring an accurately controlled rate of gas flow, comprising an open-ended container for holding a metal chloride electrolyte solution therein, a first corrosion-resistant plug having wall means defining a gas transmitting passageway therethrough, said plug being positioned in the open end of said container to substantially close it but for said passageway, first gas-tight sealing means disposed in sealing relationship between the plug and the container to prevent gas flow therebetween, a pair of spaced electrodes mounted in fixed relationship adjacent the inner side of said plug, electrical circuit means connected to said electrodes to develop a voltage between them when connected to a source of direct current electric power, a pressure responsive gas flow regulating means mounted in fixed relationship relative to said plug and arranged to receive gas flowing from the container through the passageway in the plug, second gas-tight sealing means disposed in sealing relationship



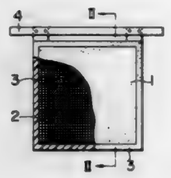
between the plug and said flow regulating means to prevent gas flowing out of the container along said circuit means, and gas conduit means connected to receive gas from said flow regulating means and guide the gas away from the container.

4,040,937

MOTHER BLANK FOR PRODUCING STARTING SHEETS USED IN ELECTROLYTIC NON-FERROUS METAL PRODUCTION

Ryozo Iijima, Osaka; Yukio Matsubara, Iwaki; Ginichi Yamaguchi, Iwaki, and Masatoshi Fukushima, Iwaki, all of Japan, assignors to Ryozo Iijima, Osaka and Onahama Seiren Kabushiki Kaisha, Tokyo, both of Japan

Filed Dec. 29, 1975, Ser. No. 645,289
Claims priority, application Japan, Dec. 28, 1974, 50-3518
Int. Cl.² C25B *11/00*; C25C *7/02*
U.S. Cl. 204—281 **11 Claims**



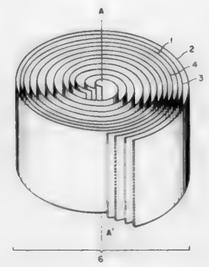
1. A mother blank for producing starting sheets used in electrolytic non-ferrous metal production comprising a laminar electrolytic deposition member and a frame-like insulating member attached integrally to the periphery of the laminar electrolytic deposition member, said laminar electrolytic deposition member comprising a plurality of electrically conductive polybutene resin layers, two of the layers forming the electrolytic deposition surfaces of the said laminar electrolytic deposition member and a planar metal member interposed between the electrically conductive polybutene resin layers; said frame-like insulating member being made of an electrically non-conductive polybutene resin, each of said electrically conductive and non-conductive polybutene resins being a crystalline polybutene resin selected from the group consisting of homopolymer of butene-1, copolymers of butene-1 and an α-olefin having carbon atoms of 2 to 4 in an amount not exceeding 20% by weight of the butene-1, and a polymer mixture of polybutene-1 and polymer of an α-olefin having carbon atoms of from 2 to 4 in an amount not exceeding 20% by weight of the polybutene-1, and wherein said electrically conductive polybutene resin is a mixture of said crystalline polybutene resin and an electrically conductive powdery substance.

4,040,938

ELECTRODE ARRANGEMENT FOR ELECTROCHEMICAL CELLS

Peter Murday Robertson, 19 Bruttenerstrasse, Oberwil, Switzerland

Filed Mar. 18, 1975, Ser. No. 559,605
Claims priority, application Germany, Apr. 1, 1971, 2415784; Jan. 30, 1975, 2503819
Int. Cl.² C25B *3/02, 11/02, 13/00*
U.S. Cl. 204—283 **10 Claims**



1. An electrode arrangement for electrochemical cells including at least one electrode roll formed by spiralling a deformable sandwich arrangement of electrode layers and spacing layers for preventing direct electrical contact between them, at least one of the spacing layers being ion-permeable and the electrodes and spacing layers having shapes and material structures which co-operate with each other to enable electrolyte flow through the electrode roll, the electrode arrangement being characterized in that the electrode rolls are rolled up around a hollow axle and arranged by pairs, each pair having a gap between the electrode rolls and the hollow axle having orifices which enable electrolyte flow from the interior of the hollow axle into the gap of each pair of electrode rolls.

4,040,939

LEAD DIOXIDE ELECTRODE

Barry A. Schenker, Mayfield Heights, and C. Richard Franks, North Madison, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Dec. 29, 1975, Ser. No. 645,014
Int. Cl.² C25B *11/10*; C25C *7/02*
U.S. Cl. 204—290 F **10 Claims**

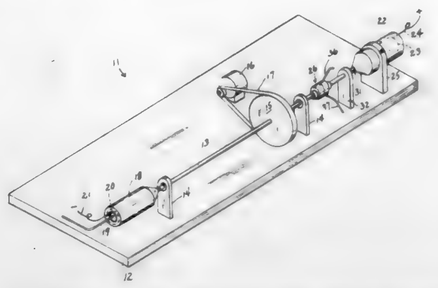
1. An electrode for use in an electrolytic process comprising: a valve metal substrate selected from the group of aluminum, molybdenum, niobium, tantalum, titanium, tungsten, zirconium, and alloys thereof; on the surface of said valve metal substrate, a semi-conductive intermediate coating consisting essentially of tin and antimony compounds applied and converted to their respective oxides such that said semi-conductive intermediate coating attains a weight greater than 2 grams per square meter of said valve metal substrate surface area; and on the surface of said semi-conductive intermediate coating, a top coating consisting essentially of lead dioxide such that said top coating attains a weight greater than 25 grams per square meter of the surface of the electrode.

4,040,940

ELECTROPHORETIC FRACTIONAL ELUTION APPARATUS EMPLOYING A ROTATIONAL SEAL FRACTION COLLECTOR

Milan Bier, Tucson, Ariz., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Dec. 21, 1976, Ser. No. 753,103
Int. Cl.² G01N *27/26, 27/28*
U.S. Cl. 204—299 R **12 Claims**



1. A fractional elution apparatus comprising an electrophoresis column having two longitudinally aligned abutting parts with registering lumens, means to rotate the parts axially relative to each other, and means defining a rotating seal fraction collector for the elution of fractions separated electrophoretically within the lumens, said collector comprising two mated flat surfaces perpendicular to the axis of the column at the abutting ends of said parts, one of said flat surfaces rotating and the other flat surface being stationary, and means for directing at least one narrow jet of eluting buffer perpendicular to the axis of rotation substantially at the interface formed by said mated surfaces.

4,040,941

PROCESS FOR LIQUEFYING COAL

Yasuhiro Yamada; Hidemasa Honda, and Hitoo Kakiyama, all of Tosu, Japan, assignors to Director-General of the Agency of Industrial Science and Technology, Tokyo, Japan

Filed Nov. 17, 1975, Ser. No. 632,656
Int. Cl.² C10G *1/04*
U.S. Cl. 208—8 **7 Claims**

1. A process for liquefying coal, characterized by mixing a pitch obtained by heating asphalt at a temperature of 350°–450° C for a time of about 0.5-3 hours and until an atomic ratio C/H of said asphalt becomes at least 0.9 with a sufficient amount of powdery coal to give a mixing ratio by weight of 2:1 to 1:10 of pitch to said powdery coal, and then heating the mixture for 0.5–10 hours at 320°–400° C to substantially dissolve said coal in said pitch and form a substantially homogeneous mixture substantially free of undissolved coal particles.

4,040,942

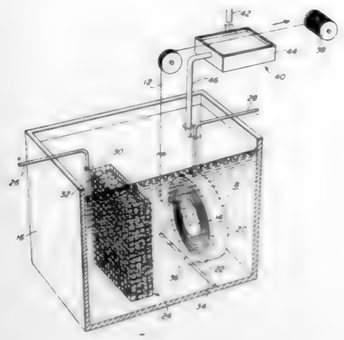
MULTIPLE-TRACK CATHODE FOR ELECTROFORMATION OF METALLIC FILAMENTS

David W. Marshall, North Reading; Kenneth W. MCGrath, Attleboro, both of Mass.; William R. O'Day, Jr., Brookfield, Wis., and Thomas C. Wilder, Cambridge, Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,839
Int. Cl.² C25D *1/04, 1/20*
U.S. Cl. 204—13 **10 Claims**

1. In a cathode for total immersion in a plating solution for the continuous electroformation of metallic filaments, comprising an electrically conductive closed-loop plating pattern on a planar surface of said cathode, the improvement wherein said pattern comprising of substantially congruent adjacent narrow plating surfaces, and insulating regions intermediate said plat-

ing surfaces; whereby a plurality of filaments are simultaneously electroformed on said cathode in patterns that enable



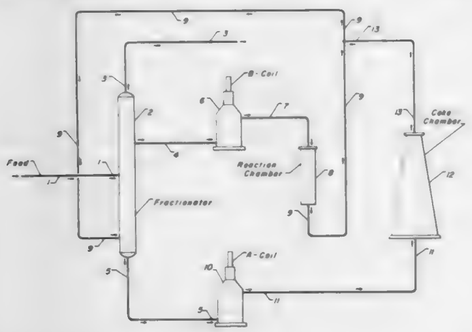
simultaneous stripping from said cathode of all filaments deposited on said plating surfaces.

4,040,943

COMBINATION THERMAL CRACKING AND COKING PROCESS

Frank Stolfa, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed June 30, 1976, Ser. No. 701,327
Int. Cl.[2] C10B *55/00*; C10G *9/14, 37/02*
U.S. Cl. 208—80 **3 Claims**



1. A process for the conversion of black oil containing high molecular weight sulfurous and nitrogenous compounds and hydrocarbon-insoluble asphaltic and organo-metallic compounds, and having an end boiling point above 1050° F., which comprises;

a. introducing said black oil at an intermediate point in the height of a fractionator and removing from the fractionator an overhead gasoline stream, an intermediate heavy distillate stream and a bottoms stream;

b. passing said heavy distillate stream through a first thermal cracking coil and a reaction chamber and therein cracking the same;

c. passing said bottoms stream through a second thermal cracking coil and thence into a coke chamber and separating vapors from coke in said chamber;

d. commingling the vapors from the coke chamber with the effluent from said reaction chamber; and

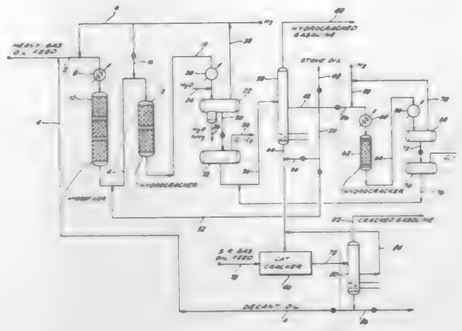
e. introducing the resultant mixture to the lower portion of said fractionator at a point below the point of introduction of said black oil thereto.

4,040,944

MANUFACTURE OF CATALYTIC CRACKING CHARGE STOCKS BY HYDROCRACKING

Arnold E. Kelley, Orange; Cloyd P. Reeg, Fullerton; Frederick C. Wood, Fullerton, and George D. Cheadle, Fullerton, all of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 720,508, April 11, 1968, Pat. No. 3,728,251. This application Feb. 22, 1973, Ser. No. 334,765
Int. Cl.[2] C10G *23/00*
U.S. Cl. 208—89 **7 Claims**



1. A process for the manufacture of high-octane gasoline products from an initial mineral oil feedstock containing less than 20 weight-percent of material boiling below 600° F and at least 20 weight-percent of material boiling above 800° F, and also containing condensed polyaromatic compounds, sulfur compounds and nitrogen compounds, which comprises:

1. subjecting said initial feedstock plus added hydrogen to catalytic hydrofining at elevated temperatures and pressures above about 1000 psig, in the presence of a hydrofining catalyst under hydrofining conditions correlated to give a substantial desulfurization and denitrogenation of said feedstock while synthesizing less than about 10 volume-percent of C_6–400° F. gasoline;
2. subjecting total effluent from step (1) to catalytic hydrocracking at temperatures between about 650° and 875° F. and pressures above about 1000 psig in the presence of a crystalline zeolite hydrocracking catalyst, and correlating the hydrocracking conditions so as to limit the synthesis of C_6–400° F. gasoline to between about 5 percent and 30 percent by volume and produce a hydrocracked product containing a higher weight ratio of material boiling above 800° F to material boiling between 600° and 800° F than was contained in the effluent from step (1), said zeolite hydrocracking catalyst consisting essentially of a Group VIB and/or Group VIII metal hydrogenating component supported on an aluminosilicate zeolite cracking base having relatively uniform crystal pore diameters between about 4 and 14 A and wherein the zeolite cations are mainly hydrogen ions and/or polyvalent metal ions;
3. recovering from the hydrocracked effluent a hydrocracked gasoline product and a catalytic cracking charge stock boiling above 400° F. and containing a substantial proportion of material boiling above 800° F., including the highest boiling fraction of said hydrocracked effluent;
4. subjecting said catalytic cracking charge stock to catalytic cracking at temperatures of about 850° – 1150° F. and pressures below about 1000 psig, and recovering therefrom a cracked gasoline product, an intermediate boiling range cycle oil, and a heavy bottoms fraction boiling mainly above 800° F.; and
5. withdrawing from the process at least a portion of said heavy bottoms fraction.

4,040,945

HYDROCARBON CATALYTIC CRACKING PROCESS

Joel D. McKinney, Pittsburgh, and Bruce R. Mitchell, Sarver, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 2, 1976, Ser. No. 646,020
Int. Cl.[2] C10G *11/04*; B01J *8/24*
U.S. Cl. 208—113 **7 Claims**

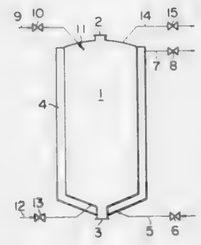
1. In a process which comprises contacting a hydrocarbon feed with a cracking catalyst containing at least 1500 ppm nickel equivalents as metal contaminants in a cracking zone under cracking conditions and thereafter heating the deactivated catalyst in the presence of oxygen in a regeneration zone; the improvement which comprises introducing tin into said cracking zone so as to maintain a volume ratio of carbon dioxide to carbon monoxide of at least 3.0 in the gaseous effluent withdrawn from said regeneration zone.

4,040,946

PROCESS FOR THE PRODUCTION OF A PETROLEUM COKE AND COKING CRYSTALLIZER USED THEREOF

Kiyoshige Hayashi, Tokyo; Mikio Nakaniwa, Ohme; Nobuyuki Kobayashi, Ichihara; Minoru Yamamoto, Ichihara, and Yoshihiko Hase, Ichihara, all of Japan, assignors to Maruzen Petrochemical Co., Ltd., Tokyo, Japan

Filed Sept. 18, 1975, Ser. No. 614,675
Claims priority, application Japan, Sept. 26, 1974, 49-109966
Int. Cl.[2] C10G *9/14*
U.S. Cl. 208—131 **11 Claims**



1. A process for the production of a petroleum coke of unusually high-crystalline texture and of a high purity from a petroleum starting material having a low sulfur content and suitable for the production of premium grade coke which comprises the steps of:

subjecting the starting material to heat treatment to remove non-crystalline substances contained therein as pitch or coke and to form a heavy oil fraction of the starting material;

heating a heavy oil fraction of the starting material derived from the preceding stage to a temperature required for the subsequent coking;

continuously introducing the preheated oil with downward injection into a vertical, pressure coking-crystallizer, which is provided with a heating jacket surrounding the body thereof, a first injection nozzle at the upper part thereof for downwardly injecting the preheated oil and a second injection nozzle at the lower part thereof for upwardly injecting a purging gas;

maintaining said crystallizer at a coking temperature whereby gaseous light hydrocarbons are formed either by evaporation or by reactions of the oil introduced and whereby the remaining pitch-like heavy oil flows downwardly and is progressively accumulated and coked;

discharging, during coking, gaseous light hydrocarbons through an outlet positioned at the upper part of the crystallizer

introducing, during coking, a small amount of a heated purging gas through said second injection nozzle into said crystallizer at a slow rate capable of preventing the clogging of the gas injection nozzle, thereby conducting the coking with a high growth and high orientation of coke crystals formed until the coke accumulated in the crystallizer reaches near said first injection nozzle;

terminating the introduction of preheated oil into the crystallizer;

increasing the amount of the purging gas flow to expel remaining oily materials; and

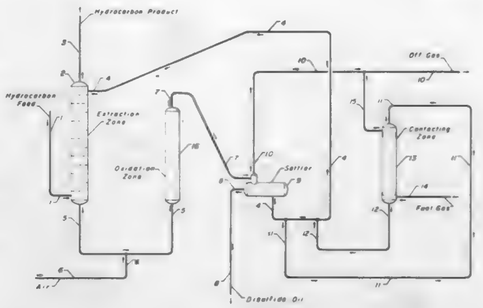
removing the coke from the crystallizer.

4,040,947

MERCAPTAN EXTRACTION PROCESS UTILIZING A STRIPPED ALKALINE SOLUTION

William J. Christman, Barrington, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 8, 1976, Ser. No. 675,081
Int. Cl.[2] C10G *19/02, 21/28*
U.S. Cl. 208—235 **5 Claims**



1. A continuous process for the removal of mercaptans from a feed stream comprising at least 2000 wt. ppm. mercaptans and a mixture of hydrocarbons having boiling points below about 650° F., which comprises the steps of:

a. contacting the feed stream with an alkaline solution comprising water and an alkaline reagent in an extraction zone maintained at extraction conditions effective to promote the transfer of essentially all of the mercaptans from the feed stream to the alkaline solution and the formation of a treated product stream, which is removed from the extraction zone, and a mercaptan-containing alkaline solution;

b. contacting the mercaptan-containing alkaline solution with oxygen with an oxidation catalyst in an oxidation zone at conditions effective to form an oxidation zone effluent stream comprising disulfide compounds, in said alkaline solution;

c. passing the oxidation zone effluent stream into a phase separation zone operated at conditions selected to produce a first liquid phase comprising said alkaline solution, a second liquid phase comprising said disulfide compounds and an off-gas stream comprising oxygen;

d. withdrawing the second liquid phase from the phase separation zone of step (c);

e. recycling a first portion of said first liquid phase from step (c) to the extraction zone of step (a);

f. removing said off-gas stream from said process in admixture with a first vapor stream as hereinafter delineated;

g. countercurrently contacting a second portion of said first liquid phase with a second vapor stream comprising hydrocarbons having less than five carbon atoms at conditions effective to strip water from said second portion of said first liquid phase and to form said first vapor stream; and,

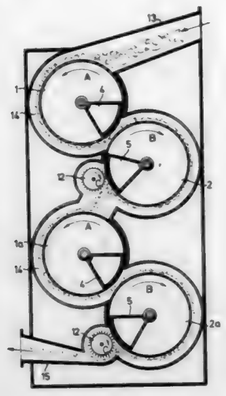
h. admixing the stripped second portion of said first liquid phase from step (g) with said first portion of said first liquid phase of step (e) being recycled to the extraction zone to form said alkaline solution of step (a), whereby water formed in the oxidation zone is removed from the process and the concentration of alkaline reagent in the alkaline solution is controlled.

4,040,948

DEVICE FOR CLEANING FLOCK FORMED BY NATURAL FIBERS, ESPECIALLY COTTON FLOCK, OF DIRT PARTICLES

Herbert Hergeth, and Walter Wirth, both of Dulmen, Germany, assignors to Hergeth KG Maschinenfabrik und Apparatebau, Germany

Filed June 11, 1975, Ser. No. 585,859
Claims priority, application Germany, June 27, 1974, 2431018
Int. Cl.² B07B *9/00*
U.S. Cl. 209—22 **2 Claims**



1. Apparatus for cleaning natural fibers by removing therefrom particles of dirt, fiber dust, broken fiber particles and like contaminants comprising a pair of rotary drum sieves each having a porous peripheral surface, means for rotating said drum sieves in opposite directions, means for feeding natural fibers to a first of said drum sieves, means for drawing a vacuum within each drum sieve whereby natural fibers adhere to said porous peripheral surfaces and contaminants are drawn through said porous peripheral surfaces, said drum sieves being disposed with portions of their peripheral surfaces defining a throat through which the fibers pass, means only at and contiguous said throat for cutting off the vacuum effect of said first drum sieve porous peripheral surface at said throat whereby the fibers are transferred from said first drum sieve to the second drum sieve whereby due to the opposite rotation of said drum sieves contaminants are withdrawn from opposite sides of said fibers as they pass along said pair of drum sieves, means for removing fibers from the porous peripheral surface of said second drum sieve, said fiber removing means being a roller rotating in a direction opposite to that of said second drum sieve, and the porosity of the porous peripheral surface of an upstream one of said drum sieves is greater than the porosity of the porous peripheral surface of a downstream one of said drum sieves.

4,040,949

METHOD FOR SEPARATION OF MIXTURE OF POLYESTER AND CELLULOSE DERIVATIVE

Kozo Saitoh, Tokyo, and Sumio Izumi, Kokubunji, both of Japan, assignors to Mitsui Mining & Smelting Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 469,723, May 14, 1974, Pat. No. 3,941,688. This application Sept. 10, 1975, Ser. No. 612,150
Claims priority, application Japan, Dec. 8, 1973, 48-138254; Dec. 8, 1973, 48-138255
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **3 Claims**

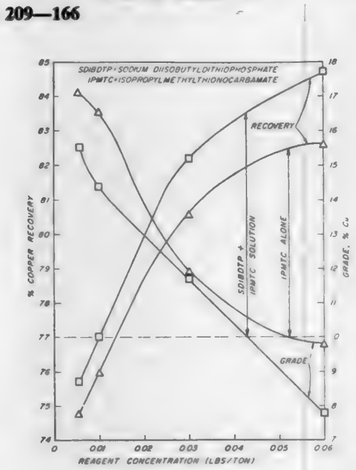
1. A method for the separation of a mixture of a polyester and a cellulose plastic derivative selected from the group consisting of cellulose diacetate, cellulose triacetate and nitrocellulose consisting of introducing gas bubbles into a dispersion of a mixture of said polyester and said cellulose derivative, said polyester and said cellulose derivative being solid pieces having a size of 1 to 50 mm, in an aqueous liquid medium, thereby floating said polyester from separating said polyester and said cellulose derivative.

4,040,950

CONCENTRATION OF ORE BY FLOTATION WITH SOLUTIONS OF AQUEOUS DITHIOPHOSPHATES AND THIONOCARBAMATE AS COLLECTOR

Donald Edwin Zipperian; James Allen Jones, and Thomas Brian Buza, all of Tuscon, Ariz., assignors to American Cyanamid Company, Stamford, Conn.

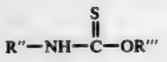
Division of Ser. No. 493,946, Aug. 1, 1974, Pat. No. 3,925,218. This application June 6, 1975, Ser. No. 584,685
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **5 Claims**



1. In the process of recovering copper sulfide values from a copper-bearing ore by froth flotation employing a collector for said copper sulfide values, the improvement which comprises employing as said collector an aqueous solution comprising from about 35 to 50 weight percent of an alkali metal or ammonium salt of a dialkyl dithiophosphate of the formula



wherein M is an alkali metal or ammonium ion and R and R′ are individually selected from alkyl groups of 2 to 8 carbon atoms and, correspondingly, from about 65 to 50 weight percent of water, said solution containing dissolved therein an N-alkyl O-alkyl thionocarbamate of the structure



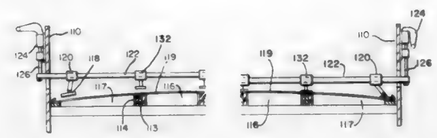
wherein R″ and R‴ are individually selected from alkyl groups of about 1 to 6 carbon atoms, said thionocarbamate being present in an amount sufficient to provide a weight ratio in the range of from about 30:70 to 95:5 of said dialkyldithiophosphate solution to said thionocarbamate, respectively, said collector being present in an amount of from about 0.001 to about 0.1 pounds per ton or ore.

4,040,951

APPARATUS FOR RETAINING AND READILY RELEASING A SHAKER SCREEN

Kenneth Raymond Cole, R.D. 1 Smith Road, Sussex, N.J. 07461

Filed Dec. 16, 1975, Ser. No. 641,310
Int. Cl.² B07B *1/42*
U.S. Cl. 209—408 **8 Claims**



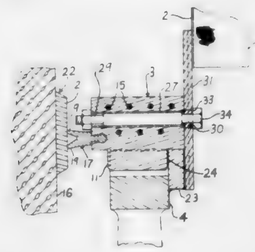
1. Apparatus for retaining and ready release of the screen in a shaker frame, said apparatus including: (a) a shaker frame of conventional construction and having side and end members; (b) a screen of conventional construction and having apertures of determined and selected size; (c) a screen supporting grid carried by said frame and having a supporting surface contoured and conditioned to suit the screen to be supported during the shaking operation; (d) a plurality of toggle mechanisms carried on each of the side members, the toggle mechanisms arranged so that the toggle actuated member portion is moved selectively to an upper and a lower position at which limits of movement the mechanisms remain until manipulated to be moved to the other limit; (e) a transverse rod carried below the support grid at each end by one of the toggle mechanism actuated members, a toggle mechanism being arranged on each side member of the frame, and (f) a plurality of pressure pad portions carried by the transverse rods and including a plurality of T-nuts which is slidable along the rod and while mounted on the rod the head of the nut prevents the turning of the nut and there is mounted in each T-nut a T-bolt whose head is larger than the aperture in the screen and whose shank is sized to pass through the aperture in the screen, each pad portion when moved to the down position by the rod as it is moved by the toggle mechanism engaging the upper surface of the screen to urge the screen into retained condition on the supporting grid and when the toggle mechanism is moved to the upper position the pressure pads are carried upwardly by the transverse rods and from engagement with the screen which is now free for removal and replacement in the frame and on the support grid.

4,040,952

TRAVELING BAND SCREEN

Wolfgang Jopp, Niederneisen, Germany, assignor to Passavant-Werke Michelbacher Hutte, Aarbergen, Germany

Filed Dec. 4, 1975, Ser. No. 637,748
Claims priority, application Germany, Feb. 26, 1975, 2508352
Int. Cl.² B01D *33/04*
U.S. Cl. 210—400 **7 Claims**



1. In a screening unit embodying an endless traveling band screen formed of a plurality of screening elements,

a. an endless, impermeable, flexible belt extending alongside each side of said traveling band screen adjacent the ends of said screening elements,

b. upper and lower rotary members around which the endless belts pass,

c. means operatively connecting each end of each said screening element to the belt adjacent thereto, and

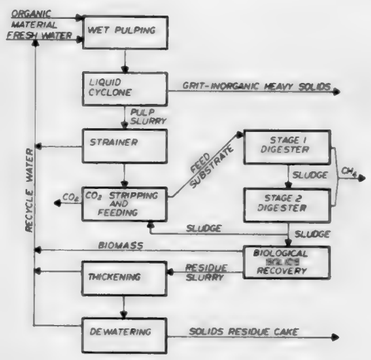
d. a laterally projecting endless sealing member carried by each said belt in position to sealingly engage an adjacent wall of the screen unit.

4,040,953

ANAEROBIC DIGESTION PROCESS

Jay E. Ort, Lewistown, Pa., assignor to RecTech, Inc., State College, Pa.

Filed Mar. 10, 1976, Ser. No. 665,606
Int. Cl.² C02C *1/14*
U.S. Cl. 210—6 **7 Claims**



1. A process for treating a liquid slurry of organic material to produce a gaseous product comprising a major amount of methane gas and a minor amount of carbon dioxide gas, said process involving anaerobic digestion in a stage 1 digestor and a stage 2 digestor and maintaining said liquid slurry in a well mixed condition under temperature conditions effective in producing said gaseous product, said liquid slurry being maintained in each digester with an air space above defining an interface with said liquid slurry being maintained at a volume-to-interface ratio of at least 100 gal. per ft.², and a total combined digestor liquid retention time of at least 24 hours whereby the faster molecular diffusion rate of methane gas as compared with carbon dioxide gas enables the passage through said interface of substantial amounts of the methane gas evolving from said slurry while minimizing the passage of carbon dioxide gas through said interface to achieve a gaseous product having a major amount of methane gas and a minor amount of carbon dioxide gas and a spent sludge containing said carbon dioxide, said anaerobic digestion taking place initially by introducing said liquid slurry into a stage 1 digester for a first holding time effective in producing said gaseous product, removing said gaseous product from said stage 1 digester, with the resulting sludge from the stage 1 digester being transferred to a stage 2 digester wherein said anaerobic digestion continues for a second holding time effective in producing said gaseous product, removing said gaseous product from the stage 2 digestor and transferring the spent sludge from the stage 2 digester to a stripping zone wherein the pH of the sludge is adjusted to from 6.0 to 6.5 by the addition of acid, stripping said carbon dioxide from said spend sludge, and recycling said spend sludge from said stripping zone to said stage 1 digester.

4,040,954

CONTROL OF FLOCCULANT ADDITION IN SEDIMENTATION APPARATUS

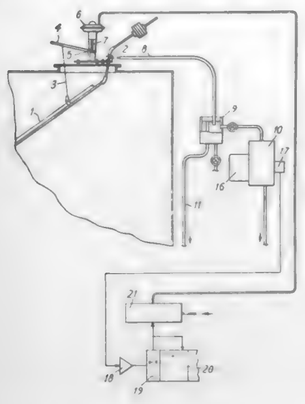
John Leslie Chandler, Mandeville, Jamaica, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Jan. 22, 1976, Ser. No. 651,565

Claims priority, application United Kingdom, Jan. 24, 1975, 3310/75

Int. Cl.² C02B *1/20*; B01D *21/01*

U.S. Cl. 210—42 R **7 Claims**



1. A process for settling suspended particles in a liquid medium comprising supplying a stream of liquor containing suspended particles to a settlement vessel for clarification by settlement of particles concentrating in the form of a flowable mud in the lower portion of the vessel thereby providing substantially clear liquor in the upper portion of the vessel, taking off an overflow of said substantially clear liquor from the top of the settlement vessel, removing settled particles in the form of said flowable mud from the bottom of the settlement vessel, supplying flocculating agent for admixture with the liquor entering said settlement vessel and controlling the relative proportions of flocculating agent and supplied liquor for maintaining a substantial layer of cloudy liquor lying between said flowable mud and a supernatent clear liquor layer in said settlement vessel.

4,040,955

METHOD OF TREATING WASTEWATER CONTAINING EMULSIFIED OILS

Dennis D. Davidson, Detroit, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Aug. 14, 1975, Ser. No. 604,698

Int. Cl.² B01D *21/01*; C02B *1/20*

U.S. Cl. 210—44 **14 Claims**

1. In the method of treating industrial wastewater for the removal of oil dispersed therein in which a floc forming constituent is added to the water and upon formation of floc a substantial amount of oil is adsorbed from the water, the improvement comprising: separating most of the wastewater from the floc after adsorption has occurred and retaining a minor amount of the wastewater with the floc, dissolving a substantial amount of the floc in the retained wastewater whereby the retained wastewater becomes enriched in the dissolved floc forming constituent and the remaining floc becomes enriched in adsorbed oil, separating the remaining floc from the enriched retained wastewater, and adding untreated wastewater to the enriched retained wastewater whereby floc reforms and adsorbs oil from the wastewater.

4,040,956

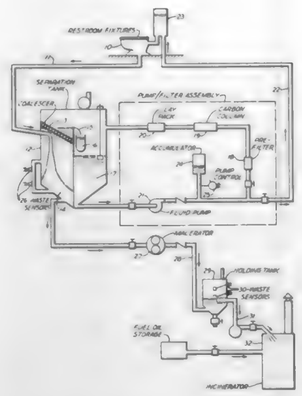
SYNTHETIC FLUSH FLUIDS

Charles M. Selwitz, Monroeville, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed June 7, 1976, Ser. No. 693,199

Int. Cl.² E03D *5/016*

U.S. Cl. 210—60 **5 Claims**



1. In a process for disposing of sewage in which a synthetic flush fluid receives the sewage, carries the sewage to apparatus for disposition thereof and is recirculated to receive additional sewage, the improvement which comprises a cyclohexylalkane synthetic flush fluid wherein the alkane carbon chain is selected from straight or branched chain alkyl moieties having from 12 to 14 carbon atoms; and wherein said cyclohexylalkane is selected from the group of cyclohexyldodecane; cyclohexltridecane; cyclohexyltetradecane; cyclohexyl-methyldodecane; cyclohexyl-methyl-tridecane; and mixtures thereof, said flush fluid having a viscosity of up to about 10 centistokes at 100° F, a pour point of about 0° F or lower, an aniline point of at least about 170° F, a flash point of at least about 325° F, and a density of from about 0.75 to about 0.90 at 60° F.

4,040,957

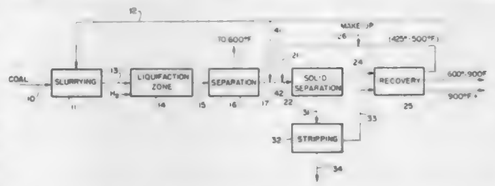
SEPARATION OF INSOLUBLE MATERIAL FROM COAL LIQUEFACTION PRODUCT BY USE OF A DILUENT

Morgan C. Sze, Upper Montclair, and George J. Snell, Fords, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Feb. 20, 1976, Ser. No. 659,725

Int. Cl.² C10G *1/00*

U.S. Cl. 210—73 R **6 Claims**



1. A process for separating insoluble material from a coal liquefaction product produced from a coal feed and comprised of insoluble material and carbonaceous matter dissolved in a coal liquefaction solvent, said coal liquefaction product having quinoline insolubles of at least 15 wt. %, comprising:

diluting said coal liquefaction product with a liquid diluent, said liquid diluent being a solvent for the quinoline soluble and benzene insoluble components in said coal liquefaction product and a nonsolvent for quinoline insoluble components and being added in an amount to provide a mixture of coal liquefaction product and diluent having quinoline insolubles of no greater than 13 wt.%;

mixing the diluted coal liquefaction product with a liquid promoter, said liquid promoter being different from said diluent and having a 5 volume percent distillation temperature of at least about 250° F and a 95 volume percent distillation temperature of at least about 350° F and no greater than about 750° F, said promoter liquid having a characterization factor (K) of at least 9.75, said liquid promoter having a characterization factor greater than said coal liquefaction solvent; and

separating insoluble material from said diluted coal liquefaction product mixed with liquid promoter by gravity settling to thereby recover a liquid overflow essentially free of insoluble material and a liquid underflow containing the insoluble material.

4,040,958

PROCESS FOR SEPARATING SOLIDS FROM HIGH-BOILING HYDROCARBONS IN A PLURALITY OF SEPARATION STAGES

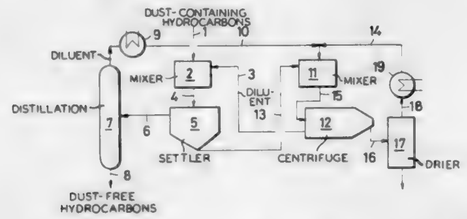
Roland Rammler, Konigstein, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 26, 1976, Ser. No. 652,589

Claims priority, application Germany, Feb. 4, 1975, 2504488

Int. Cl.² B01D *21/00, 21/26*

U.S. Cl. 210—73 R **8 Claims**



1. Process of separating solids from solids-containing, high-boiling hydrocarbons in two or more separation stages, each separation stage comprising a mixing zone and downstream from said mixing zone a separation zone, said process comprising (a) withdrawing from each separation zone a low-solids liquid phase and a solids-enriched phase and feeding said solids-enriched phase from each separation zone to the mixing zone of the following stage; (a) feeding said solids-containing, high-boiling hydrocarbons together with a low-boiling liquid hydrocarbon diluent and the low-solids liquid phase withdrawn from the separation zone of the second separation stage to the mixing zone of the first separation stage, said diluent containing at least one component selected from the group consisting of medium oil, light oil or gasoline, (c) feeding the low-solids liquid phase from said first separation stage to a distillation zone and recovering said low-boiling diluent therefrom, (d) feeding the low-solids liquid phase of each stage following said first stage to the mixing zone of the preceding stage and (e) recovering solids-free, high-boiling hydrocarbons from said distillation zone.

4,040,959

MULTI-PURPOSE BLOOD BAG

Irwin R. Berman, 1155 Park Ave., New York, N.Y. 10028, and Ira M. Nathan, Old Forge Drive, Carmel, N.Y. 10512

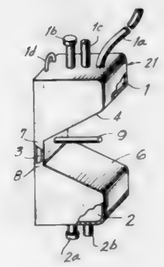
Filed June 22, 1976, Ser. No. 698,569

Int. Cl.² B01D *33/02*; B04B *3/00*

U.S. Cl. 210—78 **21 Claims**

1. A blood bag in combination with a rigid support means, said blood bag of flexible, at least translucent plastic for separation of whole blood into fractions and for direct transfusion therefrom, said bag comprising an upper chamber, a lower chamber, a sealable neck of reduced cross section connecting said upper and lower chambers, said upper and lower chambers and neck cooperating to define a gap when said blood bag is filled with blood, said rigid support means having a shape which generally conforms to the contour of said gap, said support means when positioned in said gap functioning to prevent collapse of said upper chamber toward said lower chamber during centrifugation, means for introducing blood into said blood bag and means for removing fractions of said blood subsequent to separating same, whether by gravity or by centrifugation, said upper and lower chambers and said neck being so sized that when separation of blood of normal range hematocrit into packed red blood cells, buffy coat and plasma is carried out in said bag, the interfaces between said packed red blood cells and said buffy coat and between said buffy coat and said plasma will lie in said neck, said plastic being of a flexibility such that application of pressure to either one of said chambers will move said interfaces toward the other chamber, thereby providing for positioning both of said interfaces within said sealable neck prior to sealing same.

11. A method of separating whole blood into recoverable fractions, comprising the steps of filling with blood a flexible, at least translucent bag having upper and lower chambers connected by a neck with a gap between said chambers, positioning rigid support means in said gap between said chambers, said upper and lower chambers being sized so that on settling, buffy coat will lie within said neck with blood of normal hematocrit, centrifuging said bag with support means causing packed red cells to separate from said blood, exerting pressure



on one of said chambers where necessary to bring the upper surface of said packed red blood cells into said neck and near the bottom thereof, and sealing said neck immediately below said upper surface, thereby making it possible to recover virtually 100% of said packed red blood cells from the blood in said bag.

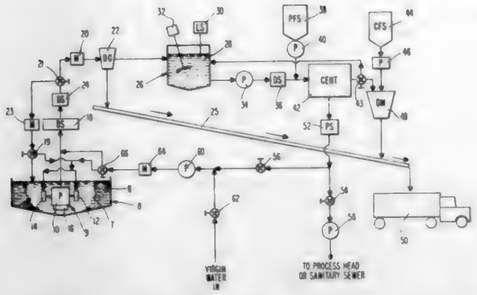
21. A blood bag of flexible, at least translucent plastic for separation of whole blood into fractions and for direct transfusion therefrom, said bag comprising an upper chamber, a lower chamber, a sealable first neck of reduced cross section connecting said upper and lower chambers, a second neck connecting said chambers, means for introducing blood into said blood bag and means for removing fractions of said blood subsequent to separating same, whether by gravity or by centrifugation, said upper and lower chambers and said first neck being so sized that when separation of blood of normal range hematocrit into packed red blood cells, buffy coat and plasma is carried out in said bag, the interfaces between said buffy coat and said plasma will lie in said first neck, said second neck initially having seals at the top and bottom thereof, and containing therein, means to open said seals, said second neck functioning upon the opening of said seals to mix plasma with red blood cells within said bag after separating same, said plastic being of a flexibility such that application of pressure to either one of said chambers will move said interfaces toward the other chamber, thereby providing for positioning both of said interfaces within said sealable first neck prior to sealing same.

4,040,960

CATCH BASIN PROCESSING APPARATUS

Lauren P. Taylor, Swarthmore, and Alex Petroski, Springfield, both of Pa., assignors to LRS Research Limited, Broomall, Pa.

Filed July 26, 1976, Ser. No. 709,566
Int. Cl.² B01D *21/00*
U.S. Cl. 210—96 R **25 Claims**



1. A catch basin cleaning system for removing liquid, solid and semi-solid wastes from catch basins comprising:

a. pumping means including means for injecting liquid under pressure into said catch basin to combine with and suspend wastes therein, and means for removing waste containing liquids therefrom said pumping means further comprising shunt means for selectively returning waste containing liquids directly to said catch basin, said shunt means further comprising shunt density sensor means for determining the solids content of the waste containing liquid removed from said catch basin, and shunt control means responsive to said shunt density sensor means for continuously controlling the amount of said waste containing liquid returned to said catch basin;

b. equalization means for receiving waste containing liquids from at least said pumping means and temporarily holding said waste containing liquids;

c. dewatering means for receiving said waste containing liquids from said equilization means and for removing liquid from said waste containing liquids to produce at least a liquid and a thickened portion;

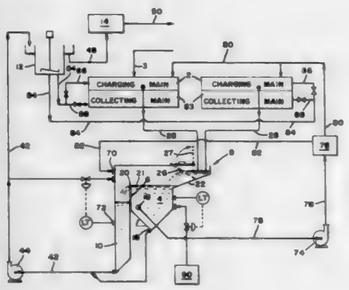
d. water supply means for supplying liquid at least to said pumping means and for receiving said liquid portion from said dewatering means.

4,040,961

SEPARATION OF SOLIDS FROM A LIQUID

Rufus F. Davis, Jr., Kenwood, Ky., and Donald G. Marting, Murray Hill, N.J., assignors to Coaltek Associates, Morristown, N.J.

Filed June 26, 1975, Ser. No. 590,751
Int. Cl.² B01D *21/10*
U.S. Cl. 210—195 R **8 Claims**



1. An apparatus for separating solid particles suspended in a liquid, said solid particles including a light particle portion which tends to float at or close to the surface of the liquid and a heavy particle portion which tends to sink to the bottom of the liquid, said separation apparatus comprising:

a separation tank for receiving said liquid and said suspended solid particles;

inlet means for conducting said liquid into said separator tank;

conduit means for conducting said liquid containing solid particles into said inlet means, said conduit means having an output end connected to said inlet means, said output end of said conduit means having a substantially U-shape with two upstanding legs, each of said legs of said U-shape arranged in a substantially vertical plane, one of said legs connected to said inlet means and extending into said inlet means;

screening means arranged in the bottom of said inlet means through which said liquid containing said solid particles flow from said inlet means into said separation tank;

a weir disposed in said separation tank, said weir having an upper edge, said upper edge arranged at an elevation in said separation tank which is slightly lower than a normal level of the liquid in said separation tank to permit said light particles to flow over said weir and out of said separation tank;

outlet means disposed at the bottom of said separation tank to permit the heavy particles in said liquid which sink toward the bottom of the liquid in said separation tank to flow out of said separation tank; and

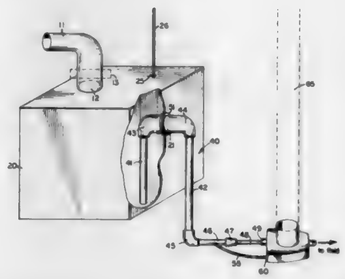
outlet means disposed at an intermediate elevation in said separation tank for conducting substantially clear liquid out of said separation tank.

4,040,962

APPARATUS FOR FEEDING CHEMICALS TO A LIQUID STREAM

William E. Hanford, 4956 Sentinel Drive, Sumner Village, Bethesda, Md. 20016

Filed Feb. 27, 1976, Ser. No. 662,209
Int. Cl.² C02B *3/06*; C02C *1/40*
U.S. Cl. 210—206 **9 Claims**



1. Apparatus for feeding, without use of a pump, substantially uniform amounts of a chemical into a liquid stream having an irregular flow pattern, comprising:

a holding tank having an inlet port for receiving said liquid stream, said tank having an aperture located at a relatively high position in a side wall thereof;

siphon means comprising a section of pipe passing through said aperture with an inner leg which extends to a position near the bottom of said tank and an outer leg which extends to a position substantially below the bottom of said tank;

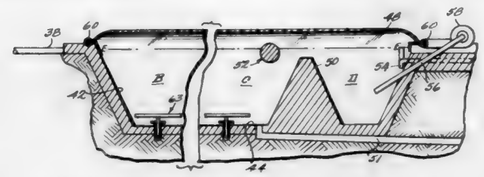
chemical feeding means coupled to the outer pipe leg of said siphon means, said feeding means containing a supply of said chemical and being operative to feed said chemical into the liquid discharged from said outer leg at a rate which has dependence upon the liquid discharge rate; whereby liquid will accumulate in said holding tank without discharge until the level in said tank reaches the aperture whereupon discharge will occur at a substantially uniform rate to empty the tank to a level corresponding to about the bottom of the inner leg, the uniform discharge into said chemical feeding means providing a uniform chemical feed rate without the need for a pump.

4,040,963

ANAEROBIC WASTE TREATMENT FACILITY

Warren A. Garrott, Jr., Box 4612, 1816 Douglass Drive, Jackson, Miss. 39216

Filed May 19, 1975, Ser. No. 578,861
Int. Cl.² C02C *1/14*
U.S. Cl. 210—219 **4 Claims**



1. An anaerobic waste treatment facility comprising

a. a digestor having a bottom, side walls, an open top, said open top being defined by a peripheral top surface, and a cover for said open top said digestor adapted to hold a quantity of liquid containing organic matter to be digested therein, said liquid assuming a liquid level in said digestor, said digestor having an inlet, a mixing zone, a quiescent zone, a clear zone, and an outlet, said inlet providing entry of liquid into said mixing zone, and said outlet for removing liquid from said clear zone,

b. means for preventing the entry of large particles from said quiescent zone into said clear zone, and

c. means for selectively circulating liquid from said clear zone to said mixing zone and agitating the liquid in said mixing zone as liquid in introduced into said mixing zone from said clear zone, said means comprising a rotor member disposed below the liquid level of said digestor, and means formed in said rotor member for transferring the force of liquid circulating through said rotor into rotary movement of said rotor and rotary circulation of liquid from said rotor into liquid in said mixing zone, said rotor member comprising a first conduit member stationary with respect to said digestor, and a second conduit member movable generally vertically with respect to and rotatable with respect to said first member about a generally vertical axis of rotation, said second member moving vertically upwardly and rotating with respect to said first member upon the introduction of liquid under pressure into said first member, and means for limiting the vertical movement of said second member with respect to said first member so that said second member is always disposed below the level of liquid in said digestor.

4,040,964

ADJUSTABLE CONTAINER STRAINER AND HANDLE

Eugenia Hegyi, 2477 W. Lincoln, Apt. 49, Anaheim, Calif. 92801

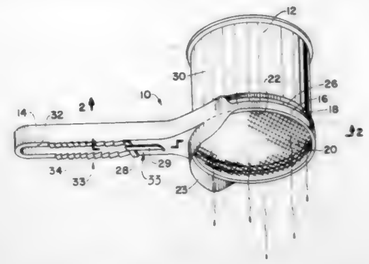
Filed June 22, 1976, Ser. No. 698,526
Int. Cl.² B01D *35/28*
U.S. Cl. 210—238 **4 Claims**

1. An adjustable container strainer and handle comprising:

a. a handle element;

b. a trainer element affixed to said handle element; and

c. securing means for adjustably securing said strainer element over the mouth of a container permitting the straining of contents therein by the tilting thereof; said securing means comprises a flexible band element adapted to circumscribe the outer walls of a container and being affixed on one end to said handle element and on the other end to an arm having a tongue member slidably disposed within an elongated cavity within said handle element providing the tensioning of said flexible band element by the movement of said arm away from said container; and



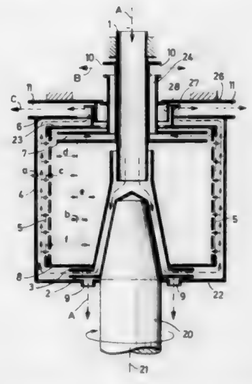
d. locking means for locking the arm in position within the handle element thereby locking said container strainer and handle over the mouth of said container; the locking means comprising a multiplicity of protrusions affixed to said handle adapted to engage said arm and said tongue member and secure the same thereagainst.

4,040,965

ROTARY FILTER SEPARATOR

Robert Kohlheb, Bovenden, Germany, assignor to Firma Supraton Aurer & Zucker OHG, Neuss, Germany

Filed July 6, 1976, Ser. No. 703,029
Claims priority, application Germany, July 3, 1975, 2529614
Int. Cl.² B01D *31/00*
U.S. Cl. 210—297 **7 Claims**



1. A rotary filter separator for continuous filtration comprising:

a. a cylindrical drum of predetermined diameter and length and mounted for rotation about a substantially vertical axis, said drum having means closing the lower end of said drum and including at least one port therein at a predetermined first radial distance from said axis and first annular means partially closing the upper end of said drum and defining an axially disposed first opening of predetermined second radial distance longer than said first radial distance,

b. a cylindrical filter element of smaller diameter and length than said drum axially mounted interiorally of said drum, said filter element having second annular means partially closing lower end of said filter element and third annular means partially closing the upper end of said filter element, said second and third annular means defining second and third axially disposed openings respectively, said

third opening having a predetermined third radial distance shorter than said first radial distance, whereby a first passage is defined between said closure means at the lower end of said drum and said second annular closure means, between the interior surface of said drum and the exterior surface of said filter element, and between said first and third annular closure means;

c. means defining a second passage within said filter element extending radially toward the interior surface of said filter element adjacent the upper end thereof, said second passage having an annular inlet spaced from the interior surface of said filter element a predetermined fourth radial distance which is greater than said first, second and third radial distances, and

d. means for feeding a solution to be filtered into said first passage between said closure means at the lower end of said drum and second annular closure means

e. whereby the solution is continuously filtered through said cylindrical element, the filtrate is conducted from said separator through said second passage and the concentrate is conducted from said first passage between said first and third annular closure means.

4,040,966

FABRIC SOFTENER

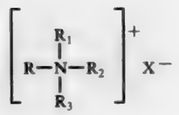
Roger C. Steinhauer, Park Forest, Ill., and Richard J. Bertozzi, Phoenix, Ariz., assignors to Armour-Dial, Inc., Phoenix, Ariz.

Filed Jan. 2, 1976, Ser. No. 645,871
Int. Cl.[2] D06M *13/46*
U.S. Cl. 252—8.8 **19 Claims**

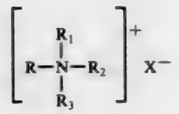
1. A fabric softening composition comprising 0.1 to 35 weight percent of an amine oxide having the formula:



in which R is an alkyl radical containing a chain of from 8 to 22 carbon atoms and R_1 and R_2 are each methyl or ethyl, 0.1 to 45 weight percent of a first quaternary ammonium compound having the formula:



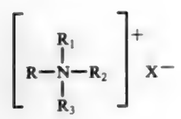
wherein R is an alkyl radical having a chain of 8 to 22 carbon atoms, R_1, R_2 and R_3 are each methyl or ethyl, and X is chlorine, bromine, fluorine, ethyl sulfate, methyl sulfate or SO_4, 0.1 to 60 weight percent of a second quaternary ammonium compound having the formula:



in which R is methyl, ethyl or 2-hydroxyethyl, preferably methyl,

R_1 and R_3 are each ethyl or methyl,

R_2 is $CH_2(CH_2CH_2O)_nH$, where n is from 8 to 41, and X is chlorine, bromine, iodine, ethyl sulfate, methyl sulfate or acetate, and 0.1 to 60 weight percent of a third quaternary ammonium compound having the formula:



in which:

R is phenylalkyl in which the alkyl group contains a chain of 8 to 22 carbon atoms,

R_1 and R_2 are each methyl or ethyl,

R_3 is methyl, ethyl, or phenylalkyl in which the alkyl group contains a chain of 8 to 22 carbon atoms, and

X is chlorine, bromine, iodine, ethyl sulfate or methyl sulfate, said percentages of said amine oxide first, second and third quaternary ammonium compounds being based on the dry weight of the respective compounds and the total weight of the composition, said amine oxide being contained in an amount of 35 to 65 weight percent based on the weight of the amine oxide and the total weight of the amine oxide and said first quaternary ammonium compound and said third quaternary ammonium compound containing at least in part an amount of compound containing two phenylalkyl groups in which each contains an alkyl radical of from 8 to 22 carbon atoms.

4,040,967

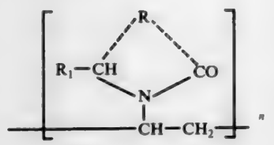
METHOD OF FRACTURING SUBTERRANEAN FORMATIONS PENETRATED BY A WELL

Kenneth H. Nimerick, and Benny E. Simpson, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 487,512, July 11, 1974. This application June 27, 1975, Ser. No. 591,196
Int. Cl.[2] E21B *43/26;* **B01F** *3/20, 1/00*
U.S. Cl. 252—8.55 R **1 Claim**

1. In a method of fracturing subterranean formations penetrated by a borehole, wherein an effective amount of a particulate water soluble organic polymer selected from the group consisting of natural gums and derivatives thereof, cellulosic derivatives, derivatives of starch, and polyacrylamide, is introduced into an aqueous liquid to thicken the liquid. said thickened liquid then being employed as a fracturing fluid, the improvement which comprises:

a. introducing said polymer into the aqueous liquid as a particulate coated with an efective quantity of a water soluble polyvinyl lactam, said polyvinyl lactam being selected from the group consisting of a polymer corresponding to the formula



wherein R is an alkylene group containing a sufficient number of carbon atoms to form a heterocyclic ring containing from 5 to 7 members, R_1 is hydrogen or a lower alkyl group and n is sufficient to provide a polymer having a molecular weight ranging from about 300 to 2,000,000 or a copolymer containing at least 20 percent by weight of N-vinyl lactam corresponding to the above formula and at least one other organic monomer to provide a copolymer having a molecular weight ranging from about 300 to 2,000,000, to increase the dispersibility of the water soluble organic polymer into the aqueous liquid; and

b. introducing a sufficient quantity of said resulting thickened aqueous liquid into said borehole and in contact with said formation under sufficient pressure to fracture said formation.

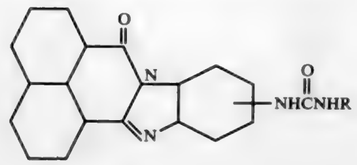
4,040,968

KETOHETEROBICYCLIC GREASE THICKENERS

Howard A. Harris, New York, N.Y., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1976, Ser. No. 716,614
Int. Cl.[2] C10M *1/32, 3/26, 5/20, 7/30*
U.S. Cl. 252—51.5 A **5 Claims**

1. A grease composition consisting essentially of a major account of a lubricating oil base vehicle and in an amount sufficient to thicken the base vehicle to grease consistency, a ketoheterobicyclic compound defind by the formula:



wherein R is an aliphatic hydrocarbyl radical of 16 to 22 carbon atoms.

4,040,969

HIGH SURFACE AREA CARRIER

Lewis O. Jones, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 30, 1974, Ser. No. 474,623
Int. Cl.[2] G03G *9/00*
U.S. Cl. 252—62.1 R **8 Claims**

1. An electrostatographic developer mixture for use in magnetic brush development apparatus, said developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of classified high surface area ferromagnetic carrier materials, said carrier materials having been classified as to have a specific surface area of at least about 150 cm^2/gram, a particle size volume distribution geometric standard deviation of less than about 1.3, and a particle size distribution wherein said carrier particles have an average particle diameter of less than about 100 microns, said carrier materials being further characterized as exhibiting improved triboelectric properties when mixed with said finely-divided toner particles.

4,040,970

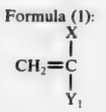
LIQUID DEVELOPER FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE

Terukuni Tsuneda, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 8, 1975, Ser. No. 575,720
Claims priority, application Japan, May 17, 1974, 49-55774
Int. Cl.[2] G03G *9/12*
U.S. Cl. 252—62.1 L **8 Claims**

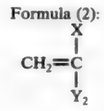
1. A liquid developer for developing an electrostatic latent image comprising an electrically insulating carrier liquid, a toner dispersed therein, and a copolymer for rendering the toner negatively charged composed of at least one member selected from the monomers of the formula (1) at least one member selected from the monomers of the formula (2) and at least one member selected from the monomers of the formula (3),

Formula (1):

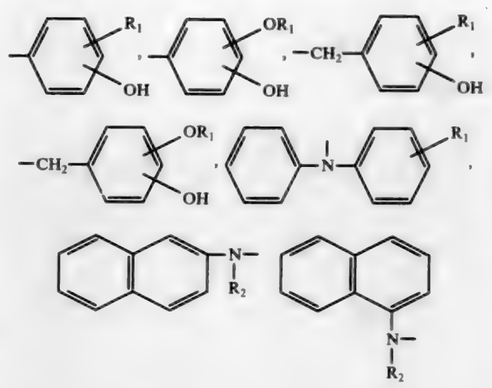


wherein X is selected from the class of H and CH_3 and Y_1 is selected from the class of $-C_nH_{2n+1}$, $-OC_nH_{2n+1}$ and $-COOC_nH_{2n+1}$, wherein n is an integer from 8 to 20;

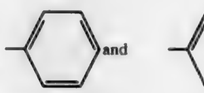
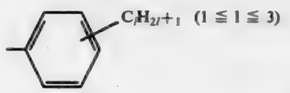
Formula (2):



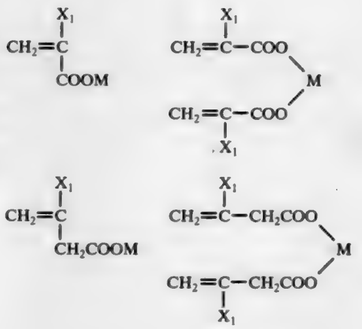
wherein X is selected from the class of H and CH_3 and Y_2 is selected from the class of the following:



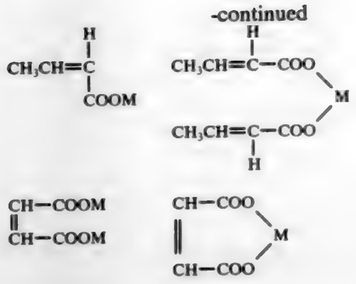
wherein R_1 is selected from the class of H and $-C_nH_{2n+1}(1 \leqq n \leqq 4)$, and R_2 is selected from the class of H, $-C_mH_{2m+1}$


and

$(1 \leqq l \leqq 3)$

Formula (3):



-continued



wherein X_1 is selected from H, CH_3 and COOM and M is selected from the class of an alkali metal and an alkaline earth metal, said monomers of formulae (1), (2), and (3) in a mole ratio sufficient to prevent a decrease in the solubility of the copolymer in the carrier liquid.

4,040,971

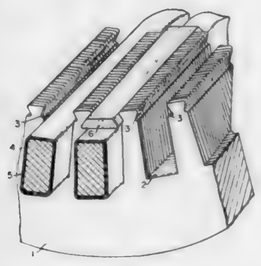
MAGNETIC WEDGE

Leonard B. Simmonds, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 219,663, Jan. 21, 1972, Pat. No. 3,976,902. This application Jan. 6, 1976, Ser. No. 646,793

Int. Cl.[2] H01F *1/00*

U.S. Cl. 252—62.54 **9 Claims**



1. A magnetic wedge comprising a cured thermosetting resin system containing about 65 to about 75% by volume elongated magnetizable particles oriented in the direction of said wedge and having a length to diameter ratio of at least about 250.

4,040,972

ION-EXCHANGING ALUMINUM SILICATE WITH HYDROPHILIC SURFACES

Wolfgang Roebke, Altenstadt; Dieter Kneitel, and Erfried Parr, both of Rodenbach, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt and Henkel & Cie GumbH, Dusseldorf-Holthausen, both of Germany

Filed Mar. 5, 1976, Ser. No. 664,174

Claims priority, application Germany, Mar. 12, 1975, 2510675; Mar. 12, 1975, 2510742; Mar. 12, 1975, 2510676; Mar. 12, 1975, 2510741

Int. Cl.[2] C01B *33/28;* C02B *1/16, 1/44;* C11D *7/29*

U.S. Cl. 252—179 **20 Claims**

1. A process for the production of an ionexchanging alkali metal aluminum silicate having a hydrophilic surface comprising mixing a crystalline ion exchanging alkali metal aluminum silicate with a hydrophilic material which is ortho phosphoric acid, an alkali metal ortho phosphate, pentasodium tripolyphosphate, tartaric, acid, an alkali metal tartrate or pentaerythritol in the presence of water, said hydrophilic material being employed in an amount sufficient to impart hydrophilicity to the alkali metal aluminum silicate but not over 30% of the weight of the silicate, drying and subsequently grinding the treated silicate to a particle size of not over 100 microns.

4,040,973

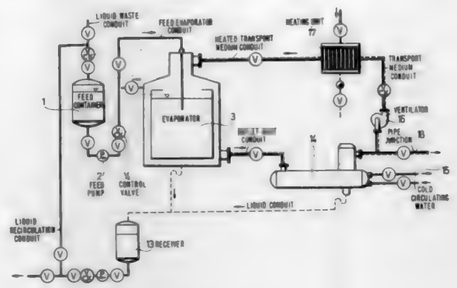
PROCESS AND APPARATUS FOR THE CONCENTRATION AND STORAGE OF LIQUID RADIOACTIVE WASTES

Károly Szivós; Gyula Lovass; Läszlo Lipták; József Hirling, and Ozskár Pavlik, all of Budapest, Hungary, assignors to Magyar Tudomanyos Akademia Izotop Intezete, Budapest, Hungary

Filed Jan. 3, 1974, Ser. No. 430,585

Int. Cl.[2] C09K *3/00, 11/04*

U.S. Cl. 252—301.1 W **9 Claims**



1. An apparatus for evaporation of liquid components from a liquid radioactive waste and storage of the resulting pasty radioactive concentrate comprising a substantially cylindrical inner container having an open top for receiving said liquid radioactive waste, tangential inlet means located above the surface of the liquid radioactive waste within said inner container and adapted to inject a hot gaseous medium in a vortex stream into the entire vapor zone located above said liquid surface, a closed outer container arranged about said inner container, outlet means located at the lower part of said outer container for removing said gaseous medium carrying vapor from said vapor zone, a gas diverting spiral arranged in the space defined between said outer and said inner containers for directing said gaseous medium from said vapor zone along the outer surface of said inner container towards said outlet means, thereby transferring heat from said gaseous medium to said radioactive waste within said inner container, and a closed loop gas circulating system communicating said inlet and said outlet means during evaporation, said system being adapted to remove vapor from and subsequently apply heat to said gaseous medium.

4,040,974

SYNTHESIZED GELLANTS CONTAINING SMECTITE-TYPE CLAY AND PROCESS FOR PRODUCING SAME

Alan C. Wright, and Joseph Paul Rupert, both of Houston, Tex., assignors to N L Industries, Inc., New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,593

Int. Cl.[2] B01J *13/00*

U.S. Cl. 252—316 **34 Claims**

1. A process for preparing a gellant consisting of a complex of a fluorine-containing trioctahedral smectite-type clay and an occluded amorphous phase selected from the group consisting of lithium hydroxide, sodium hydroxide, magnesium hydroxide, lithium oxide, sodium oxide, magnesium oxide, and mixtures thereof, said gellant containing mole ratios of Li, Na, Mg and Si, expressed as oxides, and F, of

$$a\mathrm{Li_2O}{:}b\mathrm{Na_2O}{:}c\mathrm{MgO}{:}d\mathrm{F}{:}8\mathrm{SiO_2} \qquad (I)$$

where $0.25 \leqq a < 1.1$, $0 \leqq b < 0.60$, $4.75 < c < 5.85$, $0.5 < d \leqq 3.5$, $0.6 \leqq a+b < 1.25$, $6.0 < a+b+c < 6.65$, and said gellant being characterized as having a cation exchange capacity within the range from about 0.7 to 1.2 milliequivalents per gram, a Bingham Yield Value of at least about 50 dynes/cm.[2] as a 2% dispersion in water, and the ability to disperse in deionized water within 15 minutes at a concentration of 2% by weight to produce a sol having a Bingham Yield Value less than 20 dynes/cm.[2], which sol is slowly converted to a thixotropic gel having a Bingham Yield Value above 50 dynes/cm.[2], said process comprising:

a. forming an aqueous suspension containing from 12 to 35% solids by weight, the solidss having the chemical composition represented by formula I, by: (i) combining and mixing magnesium oxide, water, hydrofluoric acid, and a base selected from the group consisting of lithium hydroxide, sodium hydroxide, and mixtures thereof, until the base is dissolved; and (ii) adding a silica sol;

b. agitating and heating the suspension until a viscous slurry is obtained from which no solids settle out;

c. allowing the slurry to gel;

d. hydrothermally reacting the gel under autogenous pressure at a temperature withir the range from 85° to about 250° C for a period of time sufficient to form said gellant; and

e. drying the solid obtained.

4,040,975

FOAM GENERATOR FOR FOAMING LIQUIDS

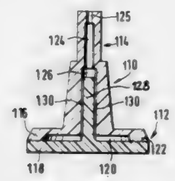
Adam Wittersheim, Nieder-Ramstadt-Trautheim, Germany, assignor to Goldwell GmbH Chemische Fabrik H.E. Dotter, Darmstadt-Eberstadt, Germany

Filed May 27, 1976, Ser. No. 690,458

Claims priority, application Germany, Feb. 3, 1976, 2604066; Apr. 1, 1976, 2614043

Int. Cl.[2] B01J *13/00;* B01F *3/04*

U.S. Cl. 252—359 E **10 Claims**



1. A foam generator for foaming liquids including a housing element comprising:

a first housing constituting an upper housing including a peripheral disk portion;

a second housing constituting a lower housing including a peripheral disk portion;

one of said housings including a recessed area;

a protruding socket having a gas inlet bore therein;

said first housing having a cylindrically shaped recess connecting said recessed area with said gas inlet bore;

a retaining pin extending from said second housing through said recessed area into said cylindrically shaped recess and forming therewith at least one recess, said gas inlet bore and said at least one recess forming a continuous passageway connected with said recessed area; and

means connecting said housings together with said peripheral disk portion in mating relationship and said recessed area of said housing facing said other housing to form a hollow space between said housings whereby gas fed to said housing element through said gas inlet bore enters said recess and said hollow space and exits between said peripheral disk portions thereby forming air streams to foam the liquids.

4,040,976

PROCESS OF TREATING CARBONACEOUS MATERIAL WITH CARBON DIOXIDE

Marvin Greene, Somerset, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed July 6, 1976, Ser. No. 702,544

Int. Cl.[2] C01B *2/14;* C01J *3/00*

U.S. Cl. 252—373 **5 Claims**

1. A non-catalytic process of reacting solid carbonaceous material with carbon dioxide to produce a carbon monoxide-containing gas, comprising

a. contacting the carbonaceous material with carbon dioxide,

b. adding the mixture of carbon dioxide and carbonaceous material to a reactor at a temperature of about 2° to about 300° C,

c. contacting the material mixture with hot carbon dioxide to heat the carbonaceous material in the mixture at a rate greater than about 500° C./sec. but less than about 250,000° C./sec., thus giving a preheat time of from about 0.1 to about 50 milliseconds,

d. reacting the reactor contents at a temperature of from about 535° C. to about 1100° C. and at a pressure of from about 50 to about 3000 psig, and,

e. quenching the reaction mixture, with the total residence time of the reactants in the reactor varying from about 10 milliseconds to about 5000 milliseconds.

4. A non-catalytic process of making a synthesis gas mixture comprising CO and H_2, the steps comprising:

a. contacting a solid carbonaceous material with a mixture of carbon dioxide and hydrogen,

b. adding the mixture of (a) to a reactor at a temperature of about 2° to about 300° C,

c. contacting the mixture with hot carbon dioxide to heat the carbonaceous material in the mixture at a rate greater than about 500° C./sec. but less than about 250,000° C./sec., thus giving a preheat time of from about 0.1 to about 50 milliseconds,

d. reacting the reactor contents at a temperature of from about 535° C. to about 1100° C. and at a pressure of from about 50 to about 3000 psig, and,

e. quenching the reaction mixture, with the total residence time of the reactants in the reactor varying from about 10 milliseconds to about 5000 milliseconds.

4,040,977

PRESERVATIVE AND DISINFECTANT

Heinz Eggensperger, Hamburg, and Karl-Heinz Diehl, Norderstedt, both of Germany, assignors to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 511,643, Oct. 3, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,862

Claims priority, application Germany, Oct. 16, 1973, 2351821

Int. Cl.[2] C09K *15/16;* A61L *9/00;* C02B *3/08*

U.S. Cl. 252—401 **30 Claims**

1. An aqueous preservative and disinfectant composition comprising acetamide-alcohol-formaldehyde condensation products prepared by reacting in water, in the presence of a basic catalyst in an amount sufficient to catalyze the condensation and for a time and at a temperature sufficient to form the condensation products, (a) an acetamide selected from 2-haloacetamide, thiocyanoacetamide and mixtures of said acetamides; (b) an alcohol selected from saturated alkanols, unsaturated alkanols, cycloalkanols, aralkanols unsubstituted on aryl or substituted on aryl by one or two halo substituents, aroxyalkanols, lower-alkoxyalkanols, diethylene glycol mono-lower-alkyl ethers, triethylene glycol, alkanols substituted by one or two substituents selected from bromo and chloro, nitroalkanols, and mixtures of said alcohols; and (c) formaldehyde.

4,040,978
PRODUCTION OF (AMM)OXIDATION CATALYST
Tao P. Li, Chesterfield, Mo., assignor to Monsanto Company, St. Louis, Mo.
Filed Nov. 28, 1975, Ser. No. 636,011
Int. Cl.² B01J 27/14
U.S. Cl. 252—437 10 Claims

1. A process for the production of an (amm) oxidation catalyst comprising: Individually forming the molybdate of at least one of the elements in the group consisting essentially of cobalt, nickel and iron and an oxide or salt of bismuth; thereafter forming an aqueous slurry consisting essentially of the individual molybdates and bismuth oxide or salt; separating the solid phase from the slurry, and calcining the solid phase to form the catalyst.

4,040,979
HYDROCARBON CONVERSION CATALYTIC COMPOSITE
Stanley A. Gembicki, Western Springs, Ill., and John I. Hammerman, Ardmore, Okla., assignors to UOP Inc., Des Plaines, Ill.
Filed Feb. 23, 1976, Ser. No. 660,749
Int. Cl.² B01J 27/02, 29/06
U.S. Cl. 252—439 5 Claims

1. A catalytic composite comprising a combination of a nickel component, and tungsten component with a silica-alumina carrier material wherein the atomic ratio of nickel to nickel plus tungsten is about 0.1 to about 0.3.

5. A catalytic composite comprising a combination of the catalyst composite of claim 1 with a sulfur component in amounts sufficient to incorporate about 0.05 to about 1 wt. % sulfur, calculated on an elemental basis.

4,040,980
REDUCED COPPER CATALYST ON SUPPORT
Ken Matsuda, and William Austin Barber, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.
Filed Nov. 28, 1975, Ser. No. 636,289
Int. Cl.² B01J 21/04, 23/72
U.S. Cl. 252—463 7 Claims

1. A method of making reduced copper catalyst supported on a water-insoluble, porous catalyst support, said method comprising the steps:

a. impregnating said catalyst support with a solution of cuprous compound dissolved in a solvent selected from acetonitrile and acrylonitrile, and
b. evaporating the solvent from the support, leaving cuprous compound deposited on the support, and
c. reducing the cuprous compound on the support to copper in situ by contacting the impregnated support with a reducing agent.

4,040,981
PROCESS FOR PRODUCING DENITRATING CATALYSTS
Hideya Inaba; Masayoshi Ichiki, and Yoshinori Wakiyama, all of Osaka, Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan
Filed June 24, 1976, Ser. No. 699,472
Claims priority, application Japan, June 30, 1975, 50-81339
Int. Cl.² B01J 21/04, 23/74, 23/86
U.S. Cl. 252—463 11 Claims

1. A process for producing a denitrating catalyst comprising the steps of plating the surface of unactivated metal with aluminum to form a first layer containing the metal diffused in the aluminum and a second layer containing the aluminum diffused in the metal, immersing the resulting layered product in an aqueous aluminum-dissolving solution to dissolve out the aluminum into the aqueous solution, and contacting the metal from which all or part of the aluminum is dissolved out with a gas containing sulfurous acid gas to thereby activate the surface of the unactivated metal.

4,040,982
OZONIZATION CATALYST
Michael R. Basila, Munster, Ind., and Frank R. Broersma, Fullerton, Calif., assignors to Nalco Chemical Company, Oak Brook, Ill.
Filed Jan. 12, 1976, Ser. No. 648,133
Int. Cl.² B01J 21/04, 23/74
U.S. Cl. 252—466 J 2 Claims

1. An ozonization catalyst consisting essentially of 1% to 20% by weight of ferric oxide supported on catalytically active alumina, said catalyst being water insoluble and having a surface area of 150–450 square meters per gram and a pore volume of at least 0.3 cc per gram.

4,040,983
OXIDATION CATALYSTS AND PROCESS FOR PREPARING SAME
Robert A. Innes, Pittsburgh, and Anthony J. Perrotta, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.
Filed Dec. 30, 1975, Ser. No. 645,419
Int. Cl.² B01J 21/00, 23/18
U.S. Cl. 252—469 12 Claims

1. The novel compound defined by the formula:

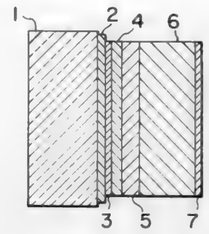
$$Usb_{3-x}A_xO_{9-10}$$

wherein A is a Group IV B element, x is the number about 0.25 to about pb 1.50.

4,040,984
ELECTROCONDUCTIVE POLYSALT COMPLEXES
Andrew Jackson Sharpe, Jr., McMurray; Robert H. Windhager, Pittsburgh, and Kathleen Seese Hearp, Trafford, all of Pa., assignors to Calgon Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 576,901, May 12, 1975, abandoned.
This application Oct. 27, 1976, Ser. No. 735,857
Int. Cl.² H01B 1/00
U.S. Cl. 252—500 6 Claims

1. The method of making conductivized materials which comprises applying to the material to be conductivized an effective quantity of an electroconductivizing agent comprising a polysalt complex consisting essentially of (A) a cationic component of a water soluble, strongly cationic quaternary ammonium homopolymer or copolymer of poly-(dimethyl diallyl ammonium chloride); and (B) an anionic component of a water soluble, weakly anionic material comprising (a) a water soluble, weakly anionic polymeric carboxylic acid selected from homopolymers and copolymers of acrylic acid and of maleic acid; or (b) a water soluble, weakly anionic multifunctional carboxylic acid selected from maleic acid, succinic acid and glutaric acid; or (c) mixtures of (a) and (b); said weakly anionic materials being characterized by having a pK value greater than 3; and wherein the ratio of equivalents of the anionic component to the cationic component is 0.01 to 10.0, and the polysalt complex forms a stable, homogeneous aqueous solution.

4,040,985
PHOTOCONDUCTIVE FILMS
Keiichi Shidara, Tama; Naohiro Goto, Machida; Eiichi Maruyama, Kodaira; Tadaaki Hirai, Koganei, and Tsutomu Fujita, Mobara, all of Japan, assignors to Hitachi, Ltd. and Nippon Hoso Kyokai, both of, Japan
Filed Apr. 6, 1976, Ser. No. 674,086
Claims priority, application Japan, Apr. 16, 1975, 50-45198
Int. Cl.² H01L 31/00
U.S. Cl. 252—501 3 Claims



1. A photoconductive film comprising;

a first region having a thickness in a range greater than 100 A and containing Se in which Te and elements capable of forming deep levels in Se are added at concentrations lower than 10 atomic % inclusive on an average, respectively,

a second region disposed on said first region, said second region having a thickness in a range between 200 A and 5000 A and containing Se in which Te is added with a continuous distribution of concentration having a peak value greater than 15 atomic % inclusive,

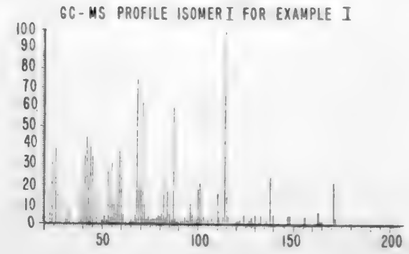
a third region disposed on said second region, said third region having a thickness in a range between 500 A and 3,000 A and containing Se in which at least one element capable of forming deep levels in Se is added with a continuous distribution of concentration having a peak value greater than 15 atomic % inclusive, and

a fourth region disposed on said third region and containing Se in which Te and at least one element capable of forming deep levels in Se are added at concentrations lower than 10 atomic % inclusive on an average, respectively, said at least one element capable of forming the deep levels in Se being selected from the group consisting of As, Sb, Bi, Se, Ge, and a mixture thereof.

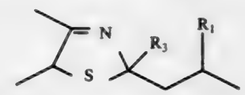
4,040,986
PREPARATION OF 4-METHOXYBENZONITRILE PERFUME COMPOSITIONS
Harmannus Boelens; Hendrik J. Takken, both of Huizen, and Petrus C. Traas, Naarden, all of Netherlands, assignors to Naarden International N.V., Naarden-Bussum, Netherlands
Filed Feb. 3, 1976, Ser. No. 654,936
Claims priority, application Netherlands, Feb. 11, 1975, 7501607
Int. Cl.² C11B 9/00
U.S. Cl. 252—522 2 Claims

1. A process for the production of perfume compositions, comprising admixing perfume components usual for this purpose and 4-methoxybenzonitrile in an amount of 0.0001–10% by weight.

4,040,987
2-ALKYL-SUBSTITUTED-4,5-DIMETHYL THIAZOLINE PERFUME AND COLOGNE COMPOSITIONS
Edward J. Shuster, Brooklyn, N.Y.; Donald Arthur Withycombe, Lincroft, N.J.; Braja Dulal Mookherjee, Holmdel, N.J., and Cynthia J. Mussinan, Bricktown, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.
Filed Oct. 7, 1976, Ser. No. 730,653
Int. Cl.² C11B 9/00
U.S. Cl. 252—522 6 Claims



1. A perfumed composition comprising a perfuming quantity of a 2-alkyl-substituted-4,5-dimethyl thiazoline having the structure:



wherein R_1 and R_3 are the same or different and each is selected from the group consisting of hydrogen and methyl, and at least one adjuvant selected from the group consisting of natural perfume oils, synthetic perfume oils, alcohols, aldehydes, ketones, nitriles, esters and lactones.

4,040,988
BUILDER SYSTEM AND DETERGENT PRODUCT
Richard W. Benson, Cincinnati; Steven D. Cherney, Springdale, and Everett J. Collier, Cincinnati, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed Sept. 27, 1974, Ser. No. 509,866
Int. Cl.² E11D 3/065
U.S. Cl. 252—532 37 Claims

1. A granular detergent additive consisting essentially of:

a. from about 0.5% to about 60% by weight of submicron calcium carbonate particles;
b. from about 0.5% to about 80% by weight of a first builder component selected from the group consisting of the alkali metal carbonates, bicarbonates, and sesquicarbonates and mixtures thereof;
c. from about 5% to about 70% by weight of a sequestering builder selected from the group consisting of the alkali metal pyrophosphates, tripolyphosphates, nitrilotriacetates, and citrates, and mixtures thereof; and
d. from about 5% to about 40% by weight of an alkali metal silicate having a $M_2O:SiO_2$ ratio of from about 1:2 to about 1:3.75 wherein M is an alkali metal;

wherein component (a) and component (b) are combined to form one discrete granule and component (c) and component (d) are present as a second discrete granule wherein the second discrete granule is dried to a moisture content of less than about 7% by weight.

15. A granular detergent product consisting essentially of:

a. from about 0.5% to about 50% by weight of submicron calcium carbonate particles;
b. from about 5% to about 70% by weight of a first builder

component selected from the group consisting of the alkali metal carbonates, bicarbonates, and sesquicarbonates and mixtures thereof;

c. from about 5% to about 70% by weight of a sequestering builder selected from the group consisting of the alkali metal pyrophosphates, tripolyphosphates, nitrilotriacetates, and citrates, and mixtures thereof;

d. from about 5% to about 40% by weight of an alkali metal silicate having a $M_2O:SiO_2$ ratio of from about 1:2 to about 1:3.75 wherein M is an alkali metal; and

e. from about 5% to about 40% by weight of a water-soluble detergent selected from the group consisting of anionic, nonionic, zwitterionic, and ampholytic detergents, and mixtures thereof;

wherein component (a) and component (b) are combined to form one discrete granule and components (c), (d), and (e) are present as a second discrete granule wherein the second discrete granule is dried to a moisture content of less than 7% by weight.

4,040,989

LIQUID DETERGENT

Jean Renaud, Bougival, and Jean-Paul Narcy, Paris, both of France, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,382
Claims priority, application France, May 25, 1973, 73.19155
Int. Cl.² C11D 1/86
U.S. Cl. 252—548 **7 Claims**

1. A liquid dishwashing detergent having a medium or medium-low foam volume that is stable in the presence of grease soil which consists essentially of:

a. a detergent selected from the group consisting of 25% to 40% by weight of a water-soluble C_{10}–C_{20} paraffin sulfonate, 15% to 30% by weight of a water-soluble linear C_8–C_{15} alkyl benzene sulfonate, and 20% to 40% by weight of a mixture thereof;

b. 5% to 30% by weight of a nonionic detergent selected from the group consisting of a condensate of C_{10}–C_{16} alkanol with a heteric mixture of ethylene oxide and propylene oxide in a weight ratio from 2.5:1 to 4:1 respectively, said condensate having a 60 to 85% content of ethylene oxide and propylene oxide, a C_2–C_6 alkyl ether of an ethoxylated C_6–C_{10} alkyl phenol having 9 to 14 ethenoxy groups, and mixtures thereof;

c. 1% to 8% by weight of a C_1–C_3 alkanolamide of a C_{10}–C_{16} alkanoic acid; and

d. an aqueous medium; the total content of (a), (b), and (c) being from 35 to 50% by weight of the composition.

4,040,990

PARTIALLY PYROLYZED MACROPOROUS POLYMER PARTICLES HAVING MULTIMODAL PORE DISTRIBUTION WITH MACROPORES RANGING FROM 50–100,000 ANGSTROMS

James W. Neely, Levittown, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 550,495, Feb. 18, 1975, abandoned. This application Jan. 26, 1976, Ser. No. 652,019
Int. Cl.² C08J 9/00; B01J 1/22
U.S. Cl. 260—2.1 R **10 Claims**

1. Partially pyrolyzed particles of a macroporous synthetic polymer having properties suitable for use in adsorption, molecular screening and/or catalysis and high resistance to crushing and particle sloughage comprising the product of controlled thermal degradation of a macroporous synthetic polymer containing macorpores ranging from between about 50 to about 100,000 Angstroms in average critical dimension, a carbon-fixing moiety, and derived from one or more ethylenecically unsaturated monomers, or monomers which may be condensed to yield macroporous polymers, or mixtures thereof, which partially pyrolyzed particles have: (a) at least 85% by weight of carbon, (b) multimodal pore distribution with macropores ranging in size from about 50 A to about 100,000 A in average critical dimension and (c) a carbon to hydrogen atom ratio of between about 1.5 : 1 and about 20 : 1.

9. A process for producing partially pyrolyzed particles of a macroporous synthetic polymer having properties suitable for use in adsorption, molecular separations, and/or catalysis and high resistance to crushing and particle sloughage which comprises thermally degrading at a temperature between about 300° C and about 900° C and in an inert gaseous atmosphere optionally containing an activating gas, a macroporous synthetic polymer containing macropores ranging from between about 50 to about 100,000 Angstroms in average critical dimension, a carbon-fixing moiety, and derived from one or more ethylenically unsaturated monomers or monomers which may be condensed to yield macroporous polymers or mixtures thereof for a time sufficient to drive off sufficient volatile components of the synthetic polymer to yield particles having: (a) at least 85% by weight of carbon, (b) multimodal pore distribution with macropores ranging in size from about 50 A to about 100,000 A in average critical dimension and (c) a carbon to hydrogen atom ratio of between about 1.5 : 1 and about 20 : 1, and thereafter cooling said particles under said inert atmosphere to a temperatur below that which would cause oxidation in air.

4,040,991

POLYURETHANE FOAM RECONSTITUTION

Edwin W. Wiggins, Bridgeton, and James F. Carpenter, St. Louis County, both of Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Dec. 10, 1973, Ser. No. 423,152
Int. Cl.² C08G 18/14; B64C 3/34
U.S. Cl. 260—2.5 BD **7 Claims**

1. The process of treating reticulated polyester urethane foam materials positioned in a fuel tank, said foam containing molecular linkages which have undergone hydrolysis and partial reversion comprising passing a reconstitution diisocyanate or polyfunctional epoxy compound through the fuel tank, and contacting the hydrolyzed polyurethane foam with said reconstitution material to produce a reconstituted foam structure in situ.

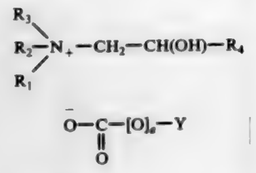
4,040,992

CATALYSIS OF ORGANIC ISOCYANATE REACTIONS

Ibrahim S. Bechara, Boothwyn; Felix P. Carroll, Chester; Dewey G. Holland, Chadds Ford, and Rocco L. Mascioli, Media, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed July 29, 1975, Ser. No. 600,015
Int. Cl.² C08G 18/18
U.S. Cl. 260—2.5 AW **25 Claims**

1. In the process of promoting organic isocyanate condensation and/or polymerization reactions in the production of products containing respectively urethane and isocyanurate groups, the improvement which consists in utilizing for such promotion a catalytic quantity of a hydroxyalkyl quaternary ammonium compound corresponding to the general formula



wherein a = zero or one

R_1, R_2 and R_3 are independently alkyl or hydroxyalkyl of 1 to 20 carbon atoms, or cycloalkyl groups of 3 to 8 carbon atoms, aralkyl, aryl, alkenyl of 2 to 20 carbon atoms, or alkynyl of 2 to 6 carbon atoms, or

R_1, R_2 and R_3 together constitute a heterocyclic structure from the group consisting of quinuclidine, N-methyl morpholine, N-ethyl morpholine and N,N′-dimethyl piperazine;

R_4 is H, phenyl, an alkyl group of 1 to 15 carbon atoms, an alkenyl group of 2 to 15 carbon atoms, an alkynyl group of 2 to 6 carbon atoms, a hydroxy alkyl group of 1 to 9 carbon atoms, a keto alkyl group having a total of 3 to 15 carbon atoms; or an alkoxy alkyl group having a total of 2 to 10 carbon atoms;

Y is H, an alkyl group of 1 to 20 carbon atoms, an alkenyl group of 2 to 15 carbon atoms, a cycloalkyl group of 3 to 6 carbon atoms, phenyl, an alkyl phenyl having 1 to 9 carbon atoms in the alkyl group or groups attached to the phenyl ring, benzyl, an alkyl benzyl having 1 to 9 carbon atoms in the alkyl group or groups attached to the ring, or a

$$CH_{(3-b)}Z_{(b)}\text{ group,}$$

wherein (3_b) b = 1 to 3 and Z is OH, CN, Cl, an alkoxy group of 1 to 5 carbon atoms, a phenyl group or methoxy phenyl group, or Z is

$$(CH_2)_dCOOR,$$

wherein d is equal to zero to four and R is hydrogen or an alkyl group of up to 20 carbon atoms.

4,040,993

LOW DISSIPATION FACTOR ELECTROSTATIC EPOXY WIRE COATING POWDER

Irving N. Elbling, Pittsburgh, and Howard E. Saunders, Penn Hills, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,074
Int. Cl.² C08L 63/00, 91/00
U.S. Cl. 260—18 EP **12 Claims**

1. A coating powder made by

A. preparing by dry mixing a composition which comprises:

1. about 20 to about 80 phr of a first diglycidyl ether of bisphenol A having an E.E.W. of at least 1600 and a Durran's softening point of at least 113° C;
2. about 10 to about 60 phr of a second diglycidyl ether of bisphenol A having an E.E.W. of 700 to 900 and a Durran's softening point of at least 112; and,
3. about 5 to about 50 phr of a third digylycidyl ether of bisphenol A having an E.E.W. of less than 1000 and a Durran's softening point of less than 105° C;
4. about 10 to about 60 phr of a pre-prepared epoxy ester, the epoxy portion of said ester being derived from a diglycidly ether of bisphenol A having an E.E.W. of at least about 400 and a Durran's softening point of at least about 70, and the ester portion being derived from a dibasic acid having the formula $HOOC—(CH_2)_m—COOH$, where m is about 18 to about 54; and
5. about 5 to about 20 phr of a curing agent for said diglycidyl ethers, at least about 10% by weight of the anhydride equivalent weight of said curing agent being selected from the group consisting of trimellitic anhydride, esterified trimellitic anhydride, and mixtures thereof;

B. hot melt mixing said composition;

C. cooling said composition to form a solid;

D. grinding said composition into a powder having a particle size of about 5 to about 149 microns.

4,040,994

CURED EPOXY RESINS

Morton Lewis, Elmhurst, and John F. Rohrer, Lombard, both of Ill., assignors to Unitech Chemical Inc., Chicago, Ill.

Filed Nov. 26, 1976, Ser. No. 745,454
Int. Cl.² C08G 59/02
U.S. Cl. 260—18 PF **10 Claims**

1. A thermosetting epoxy resin comprising the reaction product of (a) from about 25 to 75% by weight (basis total epoxy content) of a non-fatty polyepoxide compound, having reactive 1,2-epoxy groups (b) from about 25 to 75% by weight (basis total epoxy content) of at least two epoxidized fatty acid esters, and (c) from about 0.4 to 1.2 chemical equivalents (basis total epoxy content) of a polycarboxylic acid anhydride curing agent.

4,040,995

HIGH SOLIDS OVERPRINT VARNISH

Kazys Sekmakas, and George E. Gotschall, both of Chicago, Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Aug. 9, 1976, Ser. No. 712,697
Int. Cl.² C09D 3/52, 3/66
U.S. Cl. 260—22 CQ **19 Claims**

1. A fluid overprint varnish containing less than about 30% of volatile organic solvent and which cures on baking, said varnish consisting essentially of a mixture of:

1. an hydroxy functional, oil-modified polyester resin consisting essentially of;
   A. a polyhydric alcohol containing at least four hydroxy groups per molecule;
   B. diol having a neo-structure, said diol being 2,2-dimethyl-3-hydroxypropyl-2,2-dimethyl-3-hydroxypropionate;
   C. a dicarboxylic acid component; and
   D. a saturated oil or fatty acid derived therefrom;
   the oil-modified polyester having an equivalent ratio of carboxyl to hydroxyl functionalities of from 0.5 to 0.8 equivalents of carboxyl per equivalent of hydroxyl, said neo-structured diol providing from 20% to 45% of the total hydroxy functionality in said polyester, and the fatty acid in said oil or fatty acid providing from 10 to 40% of the total carboxyl functionality in the polyester,
2. liquid low volatile diol; and
3. liquid hexafunctional melamine resin; said oil-modified polyester constituting from about 10 – 50% of the mixture, the liquid diol constituting from about 10 – 40% of the mixture, and the balance of the mixture of the three components consisting essentially of said liquid melamine resin.

4,040,996

METHOD OF INCORPORATING PROCESSING ADDITIVES IN POLYVINYL CHLORIDE RESINS AND EMULSION FOR USE THEREIN

Nicolaas C. Van Vonno, Mountain Lakes, N.J., assignor to American Hoechst Corporation, Bridgewater, N.J.

Filed Mar. 9, 1976, Ser. No. 665,176
Int. Cl.² C08L 91/00
U.S. Cl. 260—23 XA **15 Claims**

1. The method of making a polyvinyl chloride molding composition which comprises adding to a body of particulate polyvinyl chloride an aqueous emulsion of a lubricating amount of a processing lubricant and a stabilizing amount of a stabilizer and mixing the resulting mixture at an elevated temperature to evaporate the water of the emulsion and the coat the polyvinyl chloride particles with said lubricant and stabilizer.

4,040,997

METHOD FOR INCORPORATING PROCESSING ADDITIVES IN POLYVINYL CHLORIDE RESINS AND ADDITIVE CONCENTRATE FOR USE THEREIN

Nicolaas C. Van Vonno, Mountain Lakes, and John O. Allaire, Milford, both of N.J., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Mar. 9, 1976, Ser. No. 665,177
Int. Cl.² C08L 91/00
U.S. Cl. 260—23 XA **17 Claims**

1. The method of making a polyvinyl chloride molding

composition which comprises preparing an aqueous emulsion containing from 10% to 45% by weight of a processing lubricant and from 3% to 30% by weight of stabilizer, mixing said emulsion with a finely divided particulate solid selected from fillers, pigments and mixtures thereof to form an additive concentrate in the form of a free-flowing powder containing no more than 30% by weight of water and mixing a portion of said concentrate with polyvinyl chloride to form said polyvinyl chloride molding composition.

4,040,998

AQUEOUS DISPERSION OF CERAMIC SLURRY

Joseph Nemeth, St. Clair Shores, Mich., assignor to Champion Spark Plug Company, Toledo, Ohio

Filed July 17, 1975, Ser. No. 596,897
Int. Cl.[2] C08L *83/04*
U.S. Cl. 260—29.2 M **2 Claims**

1. An aqueous dispersion consisting essentially of from 50 to 90 parts by weight alumina, from ¼ to 6 parts by weight flux, from 6 to 45 parts by weight silicone resin which consists essentially of a phenyl lower alkyl silicone resin wherein the total of phenyl and lower alkyl groups divided by the number of silicon atoms is from 0.9 to 1.5 and each alkyl group has not more than 4 carbon atoms, from ¼ to 7 parts by weight detergent which is a combined alkylolamine condensate of an intermediate fatty acid and alkylolamine soap of a higher fatty acid, and sufficient water that said dispersion has a viscosity at 25° C. of from 300 to 3,000 centipoises.

4,040,999

POLLUTION FREE METHOD OF MAKING PHENOL FORMALDEHYDE RESOLE TIRE CORD DIP AND PRODUCT

Edward Florent Kalafus, Akron, and Satish Chander Sharma, Mogadore, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed June 3, 1976, Ser. No. 692,242
Int. Cl.[2] C08L *61/10, 61/12*
U.S. Cl. 260—29.3 **13 Claims**

1. A process for making a cord dip containing a phenol formaldehyde resin which comprises:

A. reacting in the presence of 0.01 to 0.8 moles of a base catalyst
  1. one mole of phenol with
  2. from about 1.0 to 4.0 moles of formaldehyde to form a reaction mixture containing phenol formaldehyde resin.

B. without separating the phenol formaldehyde resin from the reaction mixture adding based on the following ingredients by dry weight
  1. a minor amount of a curing agent selected from the group consisting of resorcinol and resorcinol formaldehyde resin and
  2. a major amount of an alkaline dispersion of a rubbery vinyl pyridine 1,3-butadiene copolymer in which copolymer the vinyl pyridine is present as a minor component.

4,041,000

MAKING FIREPROOF NON-POLLUTING LIQUID COATING COMPOSITION

Alexander Farcnik, 9850 Reseda Blvd., Apt. 311, Northridge, Calif. 91403

Filed Dec. 12, 1975, Ser. No. 640,287
Int. Cl.[2] C08L *31/04*
U.S. Cl. 260—29.6 B **9 Claims**

1. An improved fireproof non-polluting liquid coating composition, said composition consisting essentially of:

a. water as a vehicle;
b. a silica-containing refractory material in granular form;
c. pollution-free silicate selected from the group consisting of calcium silicate, sodium silicate and mixtures thereof;
d. a thermoplastic resin binder;
e. zinc oxide in granular form; and,
f. alkali metal fluorosilicate drying agent.

4,041,001

WASH-RESISTANT ANTISTATIC COATING COMPOSITIONS

Chester D. Szymanski, Martinsville, and Ronald DeMartino, Wayne, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Nov. 25, 1974, Ser. No. 526,820
Int. Cl.[2] C08L *25/18*
U.S. Cl. 260—29.6 WA **4 Claims**

1. An antistatic coating composition consisting essentially of an aqueous solution of a combination of water dispersible polyhydroxy organic compound selected from the group consisting of aliphatic diols, triols and tetrols and their condensation polymers, cyclic diols and triols and polymeric polyhydroxy compounds; and polystryrene sulfonic acid having a degree of substitution of from about 0.7 to 1.0 and an average molecular weight of from about 20,000 to 7,000,000, said polyhydroxy compound and said polystryrene sulfonic acid each being present in a concentration of from about 0.1 to 10.0%, by weight, and a ratio of from 1 to 5 and 5 to 1, by weight.

4,041,002

THERMOPLASTIC RESIN COMPOSITION

Michihiro Aboshi, Tokyo; Tsutomu Kakutani, Tama; Katsumi Yoshitake, Kawasaki, and Toshinori Koseki, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 452,690, March 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 429,083, Dec. 28, 1973, abandoned. This application Aug. 1, 1975, Ser. No. 601,173
Int. Cl.[2] C08K *5/01, 5/09, 5/10, 5/49*
U.S. Cl. 260—30.6 R **5 Claims**

1. A thermoplastic resin composition having excellent lubricity and wear resistance comprising from 55 to 99.5 percent by weight of thermoplastic polyacetal, from 0.3 to 25 percent by weight of a liquid lubricant which does not dissolve the resin, and from 0.2 to 20 percent by weight of an ethylene-vinyl acetate copolymer which contains from 15 to 50 percent by weight of vinyl acetate comonomer.

4,041,003

PROCESS FOR MOLDING AROMATIC POLYCARBONATES HAVING PERFLUOROALKANESULPHONIC ACID DERIVATIVES AS MOLD RELEASE AGENTS

Siegfried Adelmann, Krefeld; Dieter Margotte, Krefeld-Fischeln; Hugo Vernaleken, Krefeld-Bockum; Hans Niederprüm, Monheim, Rhineland; Johann Nikolaus Meussdoerffer, and Werner Nouvertne, both of Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 9, 1976, Ser. No. 656,229
Claims priority, application Germany, Feb. 18, 1975, 2506726
The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.
Int. Cl.[2] C08K *5/36*
U.S. Cl. 260—30.8 R **8 Claims**

1. In a process for molding thermoplastic, high molecular weight, aromatic polycarbonates, the improvement which comprises adding to the aromatic polycarbonate from about 0.001 to 1% by weight of a mold release agent selected from the group consisting of perfluoro-alkanesulphonic acid amides and cyclimmonium salts of perfluoro-alkanesulphonic acids.

4,041,004

POLYEPOXY-3,3',4,4'-BENZHYDROL TETRACARBOXYLIC DIANHYDRIDE LAMINATING RESINS

Walter P. Barie, Jr., Shaler Township, Allegheny County; Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 20, 1974, Ser. No. 534,901
Int. Cl.[2] C08K *5/07*
U.S. Cl. 260—32.8 EP **9 Claims**

1. A stable, substantially non-reacted and carboxyl-free resin solution for impregnating reinforcing material in the preparation of reinforced laminates comprising

a nonplasticizing 1,2-epoxy resin which contains on the average more than one 1,2-epoxy group per molecule,

sufficient anhydride hardener component for an A/E ratio of between about 0.4 and about 1.0, said anhydride hardener component comprising

about 15 to 100 weight percent 3,3',4,4'-benzhydrol tetracarboxylic dianhydride and

up to about 85 percent of a nonplasticizing monoanhydride, and

from about 30 to about 85 weight percent of the total solution of a solvent having a boiling point no greater than about 110° C. selected from a lower alkyl ketone having up to five carbon atoms, a lower alkyl carboxylic acid ester having up to five carbon atoms, a chlorinated hydrocarbon having up to two carbon atoms, an aromatic hyrocarbon having up to seven carbon atoms, and mixtures thereof; said stable solution being at a temperature no higher than about 50° C.

4,041,005

IMPACT IMPROVEMENT OF RUBBER-MODIFIED NITRILE RESINS

Herbert Talsma, Cleveland Heights, and William M. Giffen, Jr., Aurora, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 15, 1976, Ser. No. 649,222
Int. Cl.[2] C08K *5/05, 5/06, 5/07*
U.S. Cl. 260—32.8 A **10 Claims**

1. An impact-resistant resin composition comprising an intimate mixture of from 1 to 30 parts by weight of an essential oil and 100 parts by weight of a resin resulting from the polymerization of a major proportion of an unsaturated nitrile in the presence of a preformed rubber component and optionally a minor proportion of at least one other polymerizable component.

4,041,006

FLOCCULANT COMPOSITION AND PROCESS

Ronald A. Fong, Levittown; James A. Latty, Wallingford, and Roger P. McDonnell, Warminster, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 571,884, April 25, 1975, abandoned. This application Oct. 29, 1975, Ser. No. 626,897
Int. Cl.[2] C08F *28/02;* **C08K** *5/01, 5/54*
U.S. Cl. 260—33.6 UA **12 Claims**

1. A process for the in situ preparation of a vinylimidazoline polymer composition dispersed in an inert oil comprising:

a. reacting polyacrylonitrile with ethylene diamine in mol ratios of at least about 1:1 in a volatile solvent medium containing an organic or inorganic sulfide catalyst capable of generating at least trace amounts of hydrogen sulfide while retaining the reaction medium at a temperature between 40° C. and 100° C. and under a dry inert atmosphere to produce poly(vinylimidazoline) and continuously purging off the by-product gaseous ammonia; and

b. distilling off excess unreacted ethylene diamine and volatile solvent under reduced pressure while concurrently adding an inert oil in an amount sufficient to yield a dispersion in which the concentration is poly(vinylimidazoline) in oil of not greater than 65%.

4,041,007

EPOXY COMPOSITION AND ARTICLE OF MANUFACTURE THEREOF

William D. Waters, Tulsa, Okla., assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Mar. 5, 1976, Ser. No. 664,092
Int. Cl.[2] C08L *63/00*
U.S. Cl. 260—37 EP **7 Claims**

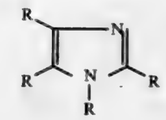
1. An epoxy composition which comprises,

an epoxy resin,

an aromatic amine and substantially the stoichiometric amounts sufficient to react with the epoxy groups in said epoxy resin,

a clay filler, and

a retarding agent having a composition as follows:



wherein R may be hydrogen or an organic radical,

said retarding agent being provided in an amount in the range from 0.06% to 3.30% by weight of the total composition and in the range from 0.2% to 12% by weight of the clay filler.

4,041,008

LOW SMOKE DENSITY FIRE-RETARDANT RESINS

Joseph M. Makhlouf, Mars, and Earl E. Parker, Allison Park, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 12, 1975, Ser. No. 576,915
Int. Cl.[2] C08K *3/22*
U.S. Cl. 260—40 R **16 Claims**

1. A curable aliphatic polyester resin, suitable for molding and laminating, being essentially free of aromatic constituents comprising a mixture of:

A. an unsaturated aliphatic polyester derived from polycondensing:
  1. organic polyols having a functionality of at least 2,
  2. organic polycarboxylic acids having a functionality of at least 2 in which the unsaturated component of the unsaturated polyester is an alpha, beta-ethylenically unsaturated polycarboxylic acid and the equivalent ratio of alpha, beta-ethylenically unsaturated polycarboxylic acid to all other polycarboxylic acid components in the polyester is at least 1 to 1; and

B. an aliphatic vinyl monomer which is a lower alkyl ester containing 1 to 4 carbon atoms of methacrylic or acrylic acid and which is copolymerizable with said polyester,

C. at least 50 percent by weight hydrated alumina, the percentage by weight being based on total weight of (A), (B) and (C),

said composition capable of being completely cured to produce strong thermoset articles of construction which, when burned, produce little smoke.

4,041,009

PROCESS FOR PRODUCING ANTI-BLOCKING AND LOW PRESSURE MOLDABLE DIALLYL PHTHALATE RESIN MOLDING MATERIALS

Shiroh Takeda, Sagamihara; Yuji Nagai, Komae, and Takenori Suzuki, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 8, 1976, Ser. No. 748,678
Int. Cl.² C08K 7/14
U.S. Cl. 260—42.18 **6 Claims**

1. A process for the production of anti-blocking and low pressure moldable diallyl phthalate resin molding materials, wherein a mixture of 100 parts by weight of at least one diallyl phthalate resin prepolymer 50 to 150 parts by weight of glass fiber, 30 to 200 parts by weight of at least one finely divided inorganic filler, 0.1 to 1.0 part by weight of t-butylperoxy 2-ethylhexanoate and 1.5 to 4.0 parts by weight of at least one organic peroxide having a half life of 1 hour at a temperature within the range of from 120° to 150° C, is milled at a temperature of 40° to 100° C.

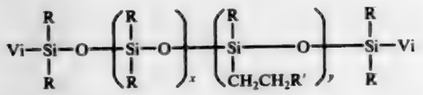
4,041,010

SOLVENT RESISTANT ROOM TEMPERATURE VULCANIZABLE SILICONE RUBBER COMPOSITIONS

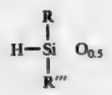
Edward M. Jeram, Burnt Hills, N.Y., assignor to General Electric Company, Waterford, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,592
Int. Cl.² C08L 83/06; C08K 3/10; C08G 77/12
U.S. Cl. 260—42.26 **18 Claims**

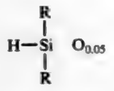
1. A solvent resistant room temperature vulcanizable silicone rubber composition comprising (A) 100 parts of a mixture composed of (i) 100 parts of a vinyl-containing polymer of the formula,



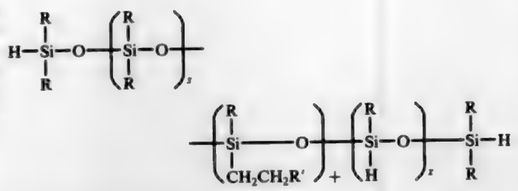
wherein Vi is vinyl, R is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms and phenyl, R′ is perfluoroalkyl of 1 to 8 carbon atoms, x and y are at least 1, and the viscosity of the compound varies from 1,000 to 100,000 centipoise at 25° C, and the concentration of siloxy units taken y times varies from 5 to 98 mole percent; (ii) from 1 to 60 parts of a vinyl-containing resin selected from the class consisting of a resin having $ViRR''SiO_{0.5}$ units and SiO_2 units where the hydrocarbon substituent to Si ratio varies from 0.8 to 2.7; a resin having $ViRR''SiO_{0.5}$ units, SiO_2 units and $RR''SiO$ units where the hydrocarbon substituent to Si ratio varies from 0.8 to 2.4 and a resin having $ViR_2SiO_{0.5}$ units, $R_2R''SiO_{0.5}$ units, SiO_2 units and $RR''SiO$ units where the hydrocarbon substituent to Si ratio varies from 0.8 to 2.4; a resin having $ViR_2SiO_{0.5}$ units, $R_2R''SiO_{0.5}$ units, SiO_2 units, $ViR''SiO$ units and $RR''SiO$ units where the hydrocarbon substituent to Si ratio varies from 0.8 to 2.4 and a resin having a $R_2R''SiO_5$ units, SiO_2 units and $ViR''SiO$ units where the hydrocarbon substituent to Si ratio varies from 0.8 to 2.4 where Vi and R are as previously defined, R″ is an $-CH_2CH_2R''$ radical, where R′ is as previously defined and the vinyl concentration of said resin must not differ more than 20 mole percent from the vinyl concentration of polymer (*i*); (iii) from 0.1 to 50 parts per million of the total composition of a platinum catalyst; and (B) from 1 to 50 parts based on 100 parts of the mixture (A) of a cross-linking polymer selected from the class consisting of (iv) a resin having



units and SiO_2 units where the R + H + R‴ to Si ratio varies from 1.0 to 2.7l; (v) a resin having



units, SiO_2 units and $RR'''SiO$ units where the H + R + R‴ to Si ratio varies from 1.2 to 2.7 and (vi) a polymer of the formula,



and mixtures thereof and where the concentration of the units taken t times varies from 0 to 75 mole percent, where R,R′ are as previously defined, s is at least l, t and z may be zero or a positive integer and the viscosity of the polymer varies from 10 to 1,000 centipoise at 25° C, and R‴ is selected from the class consisting of alkyl radicals of 1 to 8 carbon atoms and $-CH_2CH_2R'$ radicals.

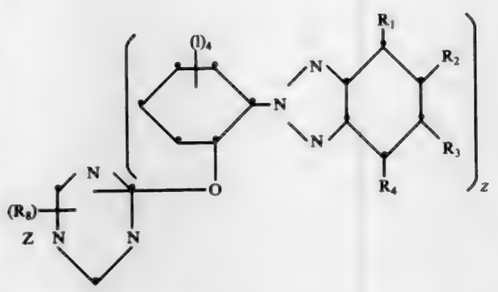
4,041,011

BENZOTRIAZOLE ORTHO-ESTER ULTRAVIOLET STABILIZERS

David Martin Pond, and Richard Hsu-Shien Wang, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 511,565, Oct. 2, 1974, Pat. No. 3,936,418. This application Oct. 28, 1975, Ser. No. 626,520
Int. Cl.² C08K 5/34, 5/49
U.S. Cl. 260—45.8 NT **14 Claims**

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amount of a composition of matter having the following formula:



wherein Z is an integer 1, 2 or 3;

R_1, R_2, R_3 and R_4 are hydrogen, chloro, bromo lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, alkoxy, amino, substituted amino, cyano, carboxy and the substituents R_1 and R_2, R_2 and R_3, R_3 and R_4, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3 and R_4; R_8 may be halogen, hydroxy, halogen, C_1-C_{12} substituted or unsubstituted alkyl, amino, alkylamino, dialkylamino, arylamino, dirarylamino, alkoxy, aryl, or aryloxy; and

I is the same as R_1, R_2, R_3 and R_4 and is present on all positions of the benzenoid ring, except the carbon atom attached to the carbonyl linking substituent, said I substituents can all be one of the substituents listed above or different listed substituents.

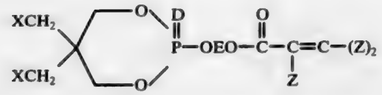
4,041,012

ACRYLATE ESTERS OF DIHALONEOPENTYL GLYCOL PHOSPHATES (PHOSPHORINANES) AND THEIR USE AS FLAME RETARDANTS

James A. Albright, and Michael W. Lindvay, both of Ann Arbor, Mich., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed June 1, 1976, Ser. No. 691,533
Int. Cl.² C07F 9/06; C08K 5/52; C08L 37/00
U.S. Cl. 260—45.8 A **14 Claims**

1. A compound of the formula



wherein each X is halogen, E is a lower alkylene group containing from about 2 to about 4 carbon atoms, D is chalcogen and each Z is independently selected from the group consisting of hydrogen and alkyl groups containing from about 1 to about 4 carbon atoms per group.

8. An acrylic polymeric composition comprising an acrylic polymer and a flame retarding amount of the compound of claim 1.

4,041,013

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,796
The portion of the term of this patent subsequent to Aug. 9, 1994, has been disclaimed.
Int. Cl.² C08L 81/06
U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition consisting essentially of a polysulfone having incorporated therein an effective amount of bisphenoxy compound, which functions as a flame retardant for said composition, having the formula



wherein (a) Z is bromine; (b) m and m' are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,041,014

NON-TOXIC STABILIZER FOR VINYL CHLORIDE RESINS

Gerry P. Mack, Jackson Heights, N.Y., assignor to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 29,760, April 27, 1970, abandoned, which is a continuation of Ser. No. 694,868, Jan. 2, 1968, abandoned. This application July 30, 1973, Ser. No. 384,025
Int. Cl.² C08K 5/58
U.S. Cl. 260—45.75 S **6 Claims**

1. A non-toxic stabilized polyvinyl chloride containing resin composition having desirable odor characteristics consisting essentially of a homopolymer or copolymer of at least one resin selected from the group consisting of polyvinyl chloride, vinyl chloride-vinyl acetate copolymers, vinyl chloride-fumaric acid copolymers, vinyl chloride-maleic acid copolymers, vinyl chloride-propylene copolymers, and vinyl chloride-ethylene copolymers, and containing between 1% and 3%, by weight based on the weight of polymer in said resin composition, of (A) a sulfur-containing stabilizer composition comprising between 94.8% and 98.2% by weight of di(n-octyl)tin S,S′bis-(isooctyl mercaptoacetate), between 1.8% and 5% of a total of (1) mono-n-octyltin S,S′S″-tris(isooctyl mercaptoacetate) and (2) tri (n-octyl)tin S-isooctyl mercaptoacetate, up to 1.5% of di(2-ethylhexyl)tin S,S′-bis(isooctyl mercaptoacetate), said sulfur-containing stabilizer composition containing between 15.1% and 16.4% of tin and between 8.1 and 8.9% of sulfur, and (B) a di)n-octyl)tin maleate polymer having the formula $[(n-C_8H_{17})_2SnC_4H_2O_4]_x$, wherein x is an integer selected from the group consisting of 2, 3, and 4, said maleate polymer having a melting point between about 93° C. and 97° C. and containing between 25.2 and 26.5% of tin; the weight ratio of said mercaptoacetate and said maleate being more than 2 parts by weight of said mercaptoacetate per part of said maleate up to a ratio of about 4:1.

4,041,015

MELT VISCOSITY STABILIZERS FOR VINYL CHLORIDE POLYMERS

William A. Larkin, Morristown, N.J., assignor to M&T Chemicals Inc., Greenwich, Conn.

Filed June 27, 1975, Ser. No. 591,109
Int. Cl.² C08K 3/30
U.S. Cl. 260—45.75 R **3 Claims**

1. A method for stabilizing the melt viscosity of vinyl chloride polymer compositions said method consisting essentially of incorporating into said composition between 0.1 and 10%, based on the weight of the vinyl chloride polymer, of a linear polysulfide of the general formula $A_x(S_z)_y$ wherein each A is individually selected from the group consisting of elements exhibiting an atomic weight of between 6.9 and 209, inclusive and a valence v, the elements being in turn selected from groups I-A, I-B, II-A, II-B, III-A, IV-B, V-A, VI-B, VII-B and VIII of the periodic table, tin and lead, wherein x is 1 when v is even and x is 2 when v is odd, y is 1 when v is 1 or 2, y is 2 when v is 4 and y is equal to v when v is 3 or 5, and z is an integer between 3 and 8, inclusive.

4,041,016

FIRE RETARDANTS

David J. Fenoglio, Carol Stream, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 17, 1974, Ser. No. 434,347
Int. Cl.² C08K 5/09, 5/07, 5/06, 5/02
U.S. Cl. 260—45.85 E **2 Claims**

1. A polyolefin composition having improved fire retardant properties comprising a polyolefin and a compound selected from the group consisting of 1,2,3,4-tetrahalonaphthobornadienes, 1,2,3,4,7,7-hexahalonaphthoboranadienes, 1,2,3,4-tetrahalo-7,7-dialkoxynaphthobornadienes, 1,2,3,4-tetrahalo-7-one-naphthobornadienes and 2,3,4-trihalo-9,10,4a,9a-tetrahydroanthracene-1-carboxylic acid wherein said compound is present in a concentration of 5 to 50 part by weight per 100 parts by weight polyolefin.

4,041,017

REACTIVE LIGHT-SENSITIVE HIGH POLYMER COMPOUND CONTAINING FURYL PENTADIENIC ESTER GROUPS AND INSOLUBILIZED BY ACTION OF HEAT, LIGHT OR ELECTRON BEAMS

Yukio Maekawa; Masato Satomura, and Akira Umehara, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

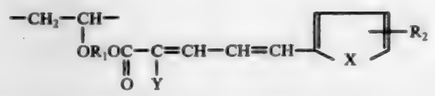
Division of Ser. No. 439,637, Feb. 4, 1974. This application June 13, 1975, Ser. No. 586,776

Claims priority, application Japan, Feb. 2, 1973, 48-13511; Feb. 2, 1973, 48-13513

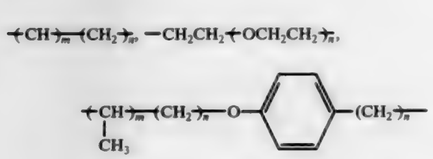
Int. Cl.[2] G03C *1/58*

U.S. Cl. 260—47 UA **12 Claims**

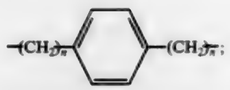
1. A light-sensitive polymer comprising an organic solvent soluble homopolymer or copolymer of the monomer unit represented by the following formula:



wherein X represents O or S; Y represents H or CN; R_1 represents



or



R_2 represents H, C_nH_{2n+1}, Cl, Br, F or NO_2; n represents 1, 2, 3 or 4; and m represents 0 or 1.

4,041,018

THERMOPLASTIC CARBONATE-MODIFIED COPOLYESTERS AND A PROCESS FOR THEIR PREPARATION

Rudolf Binsack, Krefeld, and Hugo Vernaleken, Krefeld-Bockum, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed July 18, 1975, Ser. No. 597,167

Claims priority, application Germany, July 24, 1974, 2435507

Int. Cl.[2] C08G *63/18, 63/62*

U.S. Cl. 260—75 R **4 Claims**

1. A copolyester prepared by esterifying or transesterifying in the presence of an esterification or transesterification catalyst and at elevated temperature a mixture consisting essentially of substantially equal molar amounts of

a. an aromatic dicarboxylic acid or ester thereof and

b. a carbonic acid ester of the formula



wherein R is a divalent aliphatic radical with 2 to 10 carbon atoms and n is an integer from 0 to 2 and subsequently polycondensing resulting product in the presence of a polycondensation catalyst at a temperature of about 200 ° to 300° C. and under reduced pressure.

4,041,019

DELAYED-ACTION, HEAT ACTIVATED-URETHANE CATALYST

Philip W. McGraw, Angleton, Tex.; George A. Doorakian, Bedford, Mass., and Randall C. Rains, Denton, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Oct. 22, 1975, Ser. No. 624,698

Int. Cl.[2] C08G *18/20, 18/14*

U.S. Cl. 260—75 NC **9 Claims**

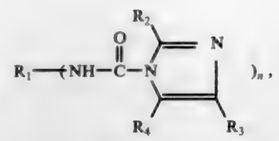
1. A composition comprising

a. an organic compound bearing at least one reactive isocyanato group;

b. an organic compound bearing active hydrogen; and

c. a small but sufficient amount of a catalyst to catalyze the reaction between the isocyanato group in (a) and the active hydrogen in (b); said catalyst corresponding to the formula

I



wherein: n is an integer of from 1 to 3;

R_1 is an n-valent organic radical

R_2 is hydrogen, hydrocarbyl or inertly-substituted hydrocarbyl;

R_3 and R_4 are each independently hydrogen, hydrocarbyl, inertly-substituted hydrocarbyl, or, R_3 and R_4 are joined to form a 5- or 6-membered carbocylic ring.

4,041,020

PROCESS FOR SPINNING ABSORBENT ARTICLES FROM COPOLYMERS HAVING A COPOLYMERIZED CROSSLINKER

James R. Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 494,439, Aug. 5, 1974. This application Aug. 20, 1975, Ser. No. 606,372

Int. Cl.[2] C08F *28/00;* **C08G** *75/00*

U.S. Cl. 260—79.3 M **10 Claims**

1. A method of preparing substantially dry water swellable polyelectrolyte fibers which comprises

1. preparing a, solution comprising

I. a solvent selected from the groups consisting of water, lower alcohols and mixtures thereof,

II. about 5 to about 60% by weight based on (I) of a crosslinkable carboxylic copolymer which contains in the copolymer

A. about 25 to about 98% by weight based on the total weight of the copolymer of units derived from an alkali metal salt of an olefinically unsaturated monosulfonic or monocarboxylic acid;

B. about 2 to about 50% by weight of units derived from an olefinically unsaturated monocarboxylic acid; and

C. about 0.1 to about 5.0% by weight of units derived from an N-substituted acrylamide or methacrylamide wherein the substituent group is a hydroxy methylene or an alkomethylene group having 1–8 carbons,

2. extruding said solution into a bath comprising lower alkyl ketones or chlorinated hydrocarbons to form extruded fiber,

3. separating the extruded fiber from said bath, and

4. heating said fibers to a temperature greater than about 30° C to crosslink said polyelectrolyte.

4,041,021

AP-GLYCOPROTEINS AND PROCESS FOR ISOLATING THEM

Hans Bohn, Marbach near Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Continuation of Ser. No. 354,117, April 24, 1973, abandoned. This application July 1, 1975, Ser. No. 592,179

Claims priority, application Germany, Apr. 29, 1972, 2221261

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 B **5 Claims**

1. A process for isolating $alpha_2$-AP-glycoprotein and $beta_1$-AP-glycoprotein from a protein solution containing the same which comprises:

a. adding diaminoethoxyacridine lactate to said protein solution at an alkaline pH in an amount from 10 to 30 percent by weight of the protein content of said solution, whereby a first precipitate forms;

b. recovering said first precipitate and dispersing it in aqueous sodium chloride, whereby a second precipitate forms;

c. separating and discarding said second precipitate and adding ammonium sulfate to the remaining supernatant liquid, whereby a third precipitate forms;

d. separating said third precipitate and dissolving it in an aqueous solution;

e. chromatographing said solution and collecting those fractions which contain the AP-glycoproteins;

f. adding ammonium sulfate to said fractions in an amount from 2 to 2.5 mols per liter, whereby a further precipitate forms in every fraction;

g. separating said further precipitates, dissolving them in water, and dialyzing the resulting solution against a buffer solution at a pH from 8.0 to 8.5;

h. subjecting the dialyzed solutions to zone electrophoresis and recovering the zone in the $alpha_2$ range, which contains the $alpha_2$-AP-glycoprotein, and the zone in the $beta_1$ range, which contains the $beta_1$-AP-glycoprotein.

4,041,022

PROCESS FOR THE MANUFACTURE OF THYROCALCITONIN

Robert Neher, Binningen, and Friedrich Werner Kahnt, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 98,153, Dec. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 728,897, May 14, 1968, abandoned. This application Aug. 15, 1975, Ser. No. 604,966

Claims priority, application Switzerland, May 24, 1967, 7346/67; July 12, 1967, 9950/67; Jan. 25, 1968, 1159/68

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 T **8 Claims**

1. Process for the procurement of porcine thyrocalcitonin which comprises extracting defatted porcine thyroid gland tissue at least once with a solvent system comprising essentially water and a lower alkanol at a pH of about 1–6, and precipitating thyrocalcitonin from the extract(s) at least once with trichloracetic acid and subjecting the thus-obtained crude thyrocalcitonin to counter-current distribution in a solvent system containing n-butanol and water and gel chromatography on polyacryl amide having a fractionation range from molecular weights of 1000 – 5000 or to counter-current dialysis to yield the pure (1) thyrocalcitonin, (2) thyrocalcitonin-sulfoxide or (3) mixture of thyrocalcitonin and thyrocalcitonin-sulfoxide.

4,041,023

LABELLED PEPTIDES

Arthur Martin Felix, West Caldwell, and Arnold Alvin Liebman, Upper Saddle River, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 14, 1976, Ser. No. 676,969

Int. Cl.[2] C07C *103/52*

U.S. Cl. 260—112.5 R **18 Claims**

1. An improved process for preparing a non-randomized deuterated or tritiated amino acid or peptide product which process comprises treating respectively an ethylenically unsaturated amino acid or a peptide analogous to said peptide product, said analogous peptide containing at least one ethylenically unsaturated amino acid with deuterium or tritium in the presence of palladium oxide catalyst.

4,041,024

SULFO CONTAINING MONOAZO DYESTUFFS CONTAINING A BENZTHIAZOLE DIAZO MOIETY AND AN N-BENZYLAMINO ANILINO COUPLING COMPONENT

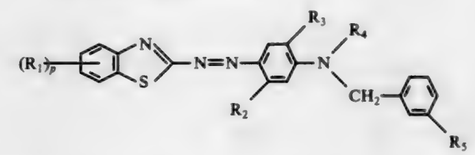
Gerhard Wolfrüm, Opladen, and Hans-Günter Otten, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 33,516, April 30, 1970, abandoned. This application Oct. 3, 1972, Ser. No. 294,526

Int. Cl.[2] C09B *35/06, 35/22;* **D06P** *1/06, 3/24*

U.S. Cl. 260—158 **1 Claim**

1. Azo dyestuff of the formula



wherein

R_1 denotes hydrogen, C_1-C_4 alkyl, Cl, Br, —OCH_3, —OC_2H_5, —NO_2, —CN, —SCN, —SO_2CH_3, —$SO_2C_2H_5$, —SO_3H or —SO_2NX_2 with X being H or C_mH_{2m+1} and m representing a number from 1 to 4, or R_1 represents —$COOC_nH_{2n+1}$, with n representing a number from 0 to 4,

R_2 represents hydrogen, —CH_3, —C_2H_5, —OCH_3, —OC_2H_5, Cl, Br or —$NHCOC_nH_{2n+1}$, with n representing a number from 0 to 4,

R_3 denotes hydrogen or —OCH_3, —OC_2H_5, CH_3 or C_2H_5,

R_4 represents C_nH_{2n+1}, with n representing a number from 0 to 4, or R_4 represents —CH_2CH_2—SO_3H,

R_5 represents hydrogen or sulphonic acid and p is 1 or 2, with the proviso that the dyestuff contains only one sulphonic acid radical and one of R_1, R_4 and R_5 represents or contains the said sulphonic acid radical.

4,041,025

P-AMINOAZO DISPERSE DYES

Karl Maier; Guenter Hansen, both of Ludwigshafen, and Wolf-Dieter Kermer, Fussgoenheim, all of Germany, assignors to BASF Aktiengesellschaft, Germany

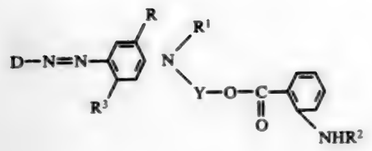
Filed Sept. 11, 1975, Ser. No. 612,352

Claims priority, application Germany, Sept. 27, 1974, 2446213

Int. Cl.[2] C09B *29/08, 29/26;* **D06P** *1/01, 3/54*

U.S. Cl. 260—158 **9 Claims**

1. A compound of the formula



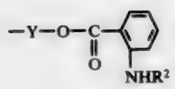
in which

D is thiadiazolyl substituted by methylmercapto, β-cyanoethylmercapto or β-C_1- to C_4-alkoxycarbonylmercapto; nitrothiazolyl; thienyl substituted by cyano, methyl, acetyl or C_1- to C_4-alkoxycarbonyl; or benzisothiazolyl substituted by chloro, bromo, cyano or nitro;

R is hydrogen, methoxy or ethoxy,

R^3 is hydrogen, methyl, chloro, acetylamino or propionylamino,

R^1 is hydrogen, C_1- to C_4-alkyl, β-cyanoethyl, β-hydroxyethyl or -propyl, β-C_1- to C_4-alkoxycarbonylethyl, β-C_1- to C_4-alkoxyethyl or -propyl, cyclohexyl, benzyl, phenylethyl, phenyl or



R^2 is hydrogen, C_1- to C_4-alkyl, β-chloroethyl or β-cyanoethyl and Y is $—CH_2CH_2—$, $—CH_2CH(CH_3)—$ or $—CH_2CH(C_2H_5)—$.

4,041,026

1,5-DIHYDRO-2H-1,4-BENZODIAZEPIN-2-ONE DERIVATIVES

Masaru Ogata, Kobe, and Hiroshi Matsumoto, Takatsuki, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

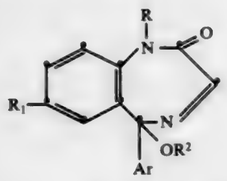
Filed Sept. 7, 1976, Ser. No. 720,832

Claims priority, application Japan, Sept. 11, 1975, 50-110753

Int. Cl.[2] C07D *243/24*

U.S. Cl. 260—239.3 D **5 Claims**

1. A compound of the formula:



wherein Ar represents pyridyl, phenyl, or halogenophenyl; R represents C_1 – C_6 alkyl; R^1 represents halogen, nitro, trifluoromethyl, or cyano; and R^2 represents C_1 – C_6 alkyl.

4,041,027

INSECTICIDAL OXIME DERIVATIVES

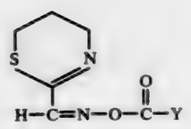
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 23, 1976, Ser. No. 716,918

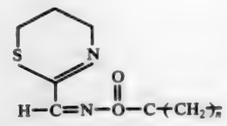
Int. Cl.[2] C07D *279/06*

U.S. Cl. 542—400 **1 Claim**

1. A compound of the formula



wherein Y is alkyl or alkoxy of from 1 to 20 carbon atoms; alkenyl, alkenyloxy or alkynyl of from 3 to 20 carbon atoms; cycloalkyl, alkylcycloalkyl or cycloalkylalkyl of from 3 to 10 carbon atoms, with from 3 to 6 carbon atoms in the ring; alkoxycarbonylalkyl of from 3 to 10 carbon atoms; alkylthioalkyl of from 2 to 10 carbon atoms; di(C_1-C_4 alkoxy)phosphinyloxy(C_2-C_6 alkenyl)-; styryl; mono(C_1-C_4 alkyl or alkoxy)phenyl; phenyl optionally substituted by from 1 to 3 of one or more of halogen, amino, mono- or di(C_1-C_4 alkyl)amino, nitro, cyano or phenoxy, heteroaryl selected from 2-furanyl, 2-thienyl, 2- and 3-pyridyl, and their corresponding phenylmethyl and heteroarylmethyl counterparts; or is



wherein *n* is 0, 1, 2, 3 or 4.

4,041,028

CHLORINATION OF 2,3-DIMETHYL-1,2,4-BENZOTHIA-DIAZINE 1,1-DIOXIDE

Gianluigi Soldati, Mercerville, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,425

Int. Cl.[2] C07D *279/08*

U.S. Cl. 544—12 **1 Claim**

1. A process for preparing a compound selected from the group consisting of 2-methyl-3-trichloromethyl-1,2,4-benzothiadiazine-1,1-dioxide and 6-chloro-2-methyl-3-trichloromethyl-1,2,4-benzothiadiazine-1,1-dioxide which comprises dissolving a compound of the formula:



Wherein X is hydrogen or chlorine, in dimethylformamide and chlorinating with chlorine at 45°–80° C, and recovering the desired product.

4,041,029

ACYLIMINE CEPHALOSPORINS

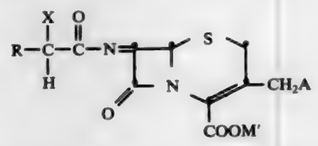
Raymond A. Firestone, Fanwood; Lovji D. Cama, Edison, and Burton G. Christensen, Metuchen, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 340,803, March 13, 1973, abandoned, which is a continuation-in-part of Ser. No. 203,056, Nov. 29, 1971, abandoned. This application Sept. 23, 1975, Ser. No. 615,856

Int. Cl.[2] C07D *501/16, 499/02, 501/04, 499/04*

U.S. Cl. 544—25 **5 Claims**

1. The compound



wherein

R is phenyl or a 5-membered heterocyclic ring having one O or one S hetero atom;

X is hydrogen, amino, or carboxyl;

M′ is benzyl, benzhydryl, trimethylsilyl, trichloroethyl, methoxymethyl, benzoylmethyl, or methoxybenxzyl; and

A is hydrogen, loweralkanoyloxy, carbamoyloxy, thiocarbamoyloxy, N-loweralkylcarbamoyloxy, N-loweralkylthiocarbamoyloxy, N,N-diloweralkylcarbamoyloxy, N,N-diloweralkylthiocarbamoyloxy, pyridinium, alkylpyridinium, halopyridinium, or aminopyridinium.

4,041,030

ARYLAMINO PYRIMIDINIC DERIVATIVES

Claude P. Fauran, Paris; Guy R. Bourgery, Colombes; Guy M. Raynaud, Paris, and Claude J. Gouret, Meudon, all of France, assignors to Delalande S.A., Courbevoie, France

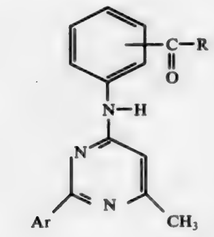
Continuation-in-part of Ser. No. 502,285, Sept. 3, 1974, Pat. No. 3,978,055. This application Aug. 16, 1976, Ser. No. 714,473

Claims priority, application France, Sept. 20, 1973, 73.338310; Mar. 26, 1974, 74.10327; July 7, 1976, 76.20775

Int. Cl.[2] C07D *413/12*

U.S. Cl. 544—117 **13 Claims**

1. A compound having the formula



in which

a. Ar is p-chlorophenyl and R is morpholino or piperidino, or

b. Ar is o-chlorophenyl and R is morpholino, or

c. Ar is m-fluorophenyl and R is piperidino, or

d. Ar is 3,4-methylenedioxyphenyl and R is morpholino or amino, or

e. Ar is 3,4,5-trimethoxyphenyl and R is morpholino or amino.

4,041,031

METHOD OF MAKING FIBER REINFORCED PROTECTIVE HEADGEAR

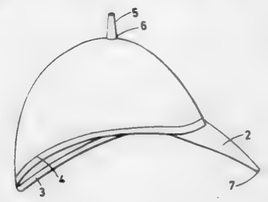
Peter John Robert Heasman, Hale, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Dec. 6, 1974, Ser. No. 530,486

Claims priority, application United Kingdom, Dec. 20, 1973, 59055/73; Dec. 20, 1973, 59057/73

Int. Cl.[2] B29D *3/02*; B29F *1/00*

U.S. Cl. 264—250 **10 Claims**



1. A method of making a shell for an article of protective headgear having a peak of a flexible thermoplastic organic polymeric material and a crown portion moulded thereto, said crown portion comprising a thermoplastic organic polymeric material reinforced with 10 to 40% by weight of a fibrous material wherein the fibres have an average length of at least 5 mm, comprising injecting in a molten state the crown material comprising the thermoplastic organic polymeric material containing the fibrous material into a mould cavity having a part defining the crown portion and a part defining the peak portion of the shell to contact and fuse with an earlier formed peak, situated in the part of the mould cavity defining the peak portion of the shell and formed from a peak material comprising the flexible thermoplastic organic polymeric material, said peak material having a melting point below the temperature at which the crown material is injected into the mould cavity, and cooling the resultant moulding to solidify the plastics materials, the polymers of said crown and peak portions being bondable to each other.

4,041,032

PYRAZINE DERIVATIVES

Masuo Murakami; Kozo Takahashi, both of Tokyo; Yasuhumi Hirata, Ageo; Mutsuo Takashima, Kawagoe; Masaaki Takeda, Urawa; Hiroyoshi Ino, and Sumio Iwanami, both of Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

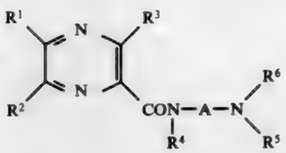
Filed Dec. 19, 1974, Ser. No. 534,636

Claims priority, application Japan, Jan. 16, 1974, 49-7726; Apr. 16, 1974, 49-43027

Int. Cl.[2] C07D *241/28*

U.S. Cl. 260—250 BN **6 Claims**

1. A pyrazine derivative represented by the formula



wherein R^1 and R^2, which may be the same or different, each represents a member selected from the group consisting of a hydrogen atom, a halogen atom, a hydroxy group, a C_{1-4} alkoxy group, a phenyl C_{1-4} alkoxy group, a phenoxy group, a mercapto group, a C_{1-4} alkylthio group, a phenyl C_{1-4} alkylthio group, a phenylthio group, an amino group, a substituted amino group selected from the group consisting of mono C_{1-4} alkylamino, di C_{1-4} alkylamino, hydroxy C_{1-4} alkylamino, di C_{1-4} alkylamino C_{1-4} alkylamino, C_{5-6} cycloalkylamino, C_{2-4} alkenylamino, phenylamino, C_{1-4} alkanoylamino, phenyl C_{1-4} alkylamino, benzoylamino, pyrrolidino, piperidino, morpholino, piperazino and 4-C_{1-4} alkylpiperazino, a C_{1-4} alkyl group, a carbamoyl group, and a sulfamoyl group, R^3 represents a C_{1-4} alkoxy group; R^4, R^5, and R^6, which may be the same or different, each represents a member selected from the group consisting of a hydrogen atom, a C_{1-4} alkyl group, a C_{5-6} cycloalkyl group, a phenyl C_{1-4} alkyl group, and a phenyl group; and A represents a C_{1-4} alkylene group; said R^4 and A, R^5 and A, R^4 and R^5, or R^5 and R^6 may form together with the nitrogen atom a pyrrolidine, piperidine, piperazine, morpholine and imidazolidine ring and the pharmacologically acceptable non-toxic acid addition salts thereof.

4,041,033

NOVEL DERIVATIVES OF PYRIDAZINE-2-OXIDE

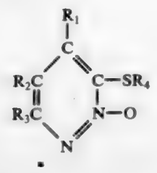
Miriam L. Douglass, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 444,597, Feb. 21, 1974, Pat. No. 3,966,928, which is a continuation of Ser. No. 207,536, Dec. 13, 1971, abandoned. This application Feb. 17, 1976, Ser. No. 658,570

Int. Cl.[2] C07D *237/20*

U.S. Cl. 260—250 A **3 Claims**

1. A 3-mercaptopyridazine-2-oxide compound having the following structural formula:



wherein R_1, R_2, R_3 are each independently selected from the group consisting of hydrogen, straight and branched chain alkyl group; R_4 is $C(NH_2)_2X$ where X is a negatively charged group.

4,041,034

HEAT-CONVERTIBLE REACTION PRODUCTS OF EQUAL MOL RATIOS OF S-DIPHENYLCARBAZIDE AND AN AROMATIC DIANHYDRIDE

Eli Simon, 7175 Little Harbor Drive, Huntington Beach, Calif. 92648

Filed July 19, 1976, Ser. No. 706,477

Int. Cl.[2] C07D *237/32;* C08G *73/10;* C07G *73/00*

U.S. Cl. 260—250 P **2 Claims**

1. Heat-convertible, solvent-soluble, intermediate products of equal mol ratios of s-diphenylcarbazide and an aromatic dianhydride selected from pyromellitic dianhydride, 3,3',4,4'-benzophenonetetracarboxylic dianhydride, and 1,4,5,8,-naphthalenetetracarboxylic dianhydride, prepared by reaction in a mutual solvent medium such as 1-methyl-2-pyrrolidinone at a temperature greater than 150° C. and less than 200° C., for thin film applications to metallic and non-metallic substrates at conversion temperatures in excess of 250° C., and preferably between 300° to 400° C.

4,041,035

1-BENZYL-1,2-DIHYDRO-3-METHYL-2-OXOPYRIMIDINIUM IODIDE

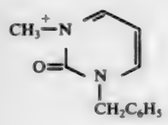
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwick, N.Y.

Filed June 8, 1976, Ser. No. 693,934

Int. Cl.[2] C07D *239/22*

U.S. Cl. 260—251 R **1 Claim**

1. A compound of the formula:



I^-

4,041,036

WATER-INSOLUBLE COLORANTS, PROCESS FOR PREPARING THEM AND THEIR USE

Klaus Hunger, Kelkheim, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

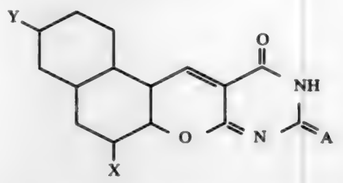
Filed Apr. 14, 1976, Ser. No. 676,925

Claims priority, application Germany, Apr. 16, 1975, 2516700

Int. Cl.[2] C07D *491/22*

U.S. Cl. 260—256.4 F **9 Claims**

1. A compound of the formula



in which A is oxygen, sulfur or imino, Y is hydrogen, chlorine, bromine or methoxy and X is carboxy or a group of the formula —CO—NH—Ar, in which Ar is naphthyl; phenyl; phenyl substituted by 1 to 3 equal or different substituents selected from alkyl, alkoxy, alkylsulfonyl, carboalkoxy, trifluoromethyl, nitro, cyano, alkanoylamino, benzoylamino, carbamoyl mono- or di-N alkyl-carbamoyl, N-phenylcarbamoyl, sulfamoyl, mono- or di-N-alkyl-sulfamoyl, N-phenyl sulfamoyl and halogen; or Ar is benzimidazolonyl, chlorobenzimidazolonyl, tetrahydro-quinazoline-dionyl, tetrahydro-quinoxaline-dionyl, phthalimidyl or tetrahydro-phthalazine-dionyl; wherein each alkyl, alkoxy and alkanoyl moiety has 1 to 4 carbon atoms.

4,041,037

ANTITUMOR DERIVATIVES OF PERIODATE-OXIDIZED CYTIDINE

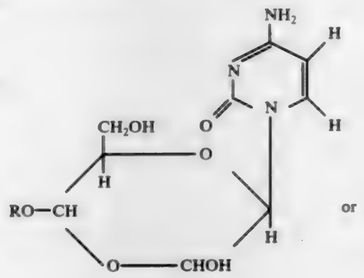
William Dvonch, Radnor, and Harvey E. Alburn, West Chester, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 585,646, June 10, 1975, Pat. No. 4,000,137. This application June 21, 1976, Ser. No. 697,881

Int. Cl.[2] C07D *405/04*

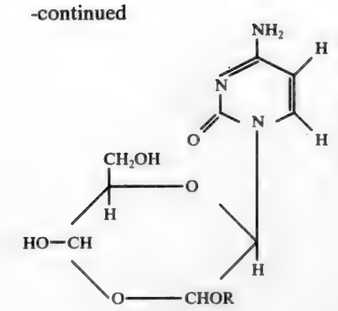
U.S. Cl. 260—256.4 C **3 Claims**

1. A compound of the formula



or

-continued



wherein R is methyl or ethyl.

4,041,038

1-(3-PHENYLPROPYL)-4-(BETA-ALKOXYACRYLOYL)-PIPERAZINE DERIVATIVES

Tsutomu Irikura, Tokyo, Japan, assignor to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Feb. 11, 1976, Ser. No. 657,278

Claims priority, application Japan, Dec. 26, 1975, 50-155133; May 27, 1975, 50-62551

Int. Cl.[2] C07D *295/10, 241/06*

U.S. Cl. 260—268 C **19 Claims**

1. The compound of trans-1-(3-Phenylpropyl)-2,5-dimethyl-4-(β-ethoxyacryloyl)piperazine

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4,041,039

PROCESS FOR PREPARING 2-ETHYL-PYRIDINE

Hans-Jürgen Arpe, Fischbach, Taunus, and Hansjörg Hey, Langenhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 476,992, June 6, 1974, Pat. No. 3,957,792. This application Feb. 17, 1976, Ser. No. 658,571

Claims priority, application Germany, June 8, 1973, 2329389

Int. Cl.[2] C07D *213/06*

U.S. Cl. 260—290 R **16 Claims**

1. A process for the preparation of 2-ethyl-pyridine which comprises reacting 2-methyl-pyridine and methanol in the gaseous state at a reaction temperature in the range of about 200° C to about 600° C. in the presence of a catalyst composition consisting essentially of silicon dioxide and (a) an oxide of bismuth, (b) oxides of bismuth and antimony, (c) oxides of bismuth, antimony and an element of the lanthanide series of the Periodic System or a mixture thereof, or (d) oxides of antimony and an element of the lanthanide series of the Periodic System or a mixture thereof, to form 2-ethyl-pyridine, which catalyst composition is activated by heating to about 150° C. to about 850° C.

4,041,040

ECGONINE DERIVATIVE

James Gordon Christenson, North Caldwell; Harvey Gurien, Irvington, and Sidney Teitel, Clifton, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 22, 1976, Ser. No. 725,913

Int. Cl.[2] C07D *471/08*

U.S. Cl. 260—292 **5 Claims**

1. Ecgonine methyl ester (p-lower alkanoyloxy) benzoate and acid addition salts thereof.

3. 4-Hydroxybenzoyl ecgonine and acid addition salts thereof.

4,041,041

ACETYLENE DERIVATIVES OF AMINO ACIDS

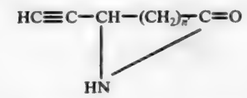
Brian Walter Metcalf, Strasbourg, and Michel Jung, Illkirch, both of France, assignors to Merrell Toraude et Compagnie, Strasbourg, France

Division of Ser. No. 559,547, March 18, 1975, Pat. No. 3,959,356. This application Mar. 8, 1976, Ser. No. 664,516

Int. Cl.[3] C07D *211/76, 207/26;* C07C *103/183* C07D *103/28*

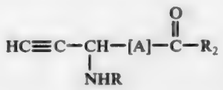
U.S. Cl. 260—293.86 **6 Claims**

1. A compound of the formula

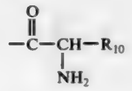


wherein n' is the integer 2 or 3; or a pharmaceutically useful salt and individual optical isomers thereof.

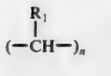
2. A compound of the formula:



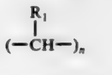
wherein R is hydrogen, alkylcarbonyl wherein the alkyl moiety contains from 1 to 4 carbon atoms, or



wherein R_{10} is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, benzyl or *p*-hydroxybenzyl; R_2 is a lower alkylamino group wherein the alkyl moiety has from 1 to 4 carbon atoms; [A] is —CH=CH— or



wherein R_1 is hydrogen, lower alkyl of from 1 to 4 carbon atoms, phenyl or substituted phenyl wherein the substituents on the substituted phenyl may be attached at the ortho, meta or para positions of the phenyl ring and are halogen, lower alkoxy of from 1 to 4 carbon atoms or lower alkyl of from 1 to 4 carbon atoms; n is an interger of from 1 to 5; and the lactams of said compounds wherein [A] represents



wherein R_1 represents hydrogen, and n is the integer 2 or 3; or a pharmaceutically acceptable salt and individual optical isomers thereof.

4,041,042

INTERMEDIATE COMPOSITION

Arthur C. Fabian, Flanders; Jerome D. Genzer, Livingston; Charles Francis Kasulanis, Hopatcong; John Shavel, Jr., Mendham, and Harold Zinnes, Rockaway, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 577,568, May 21, 1975, Pat. No. 3,957,772. This application Dec. 29, 1975, Ser. No. 645,058

Int. Cl.[2] C07D *275/06*

U.S. Cl. 260—301 **2 Claims**

1. A composition comprising a reaction mixture containing approximately equimolar quantities of a salt of saccharin per

mole of 3-(haloacetamido)-5-methylisoxazole in N,N'-dimethylformamide.

4,041,043

PARTICULARLY SUBSTITUTED THIAZOLESULFENAMIDES

Marion J. Gattuso, Hoffman Estates, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 399,213, Sept. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 139,145, April 30, 1971, abandoned, which is a continuation-in-part of Ser. No. 100,508, Dec. 21, 1970, abandoned. This application Dec. 5, 1975, Ser. No. 637,994

Int. Cl.[2] C07D *277/80*

U.S. Cl. 260—306.6 A **2 Claims**

1. An N-phenyl-N-alkyl-benzothiazole-2-sulfenamide in which the sulfenamide is N-phenyl-N-sec-octylbenzothiazole-2-sulfenamide.

2. An N-phenyl-N-alkyl-benzothiazole-2-sulfenamide in which the sulfenamide is N-phenyl-N-dodecylbenzothiazole-2-sulfenamide.

4,041,044

PROCESS FOR THE PRODUCTION OF 2-ARYL-2H-BENZOTRIAZOLES

Howard L. White, Warwick, R.I., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

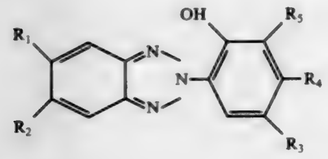
Continuation-in-part of Ser. No. 527,179, Nov. 25, 1974, abandoned. This application Oct. 15, 1975, Ser. No. 622,572

Int. Cl.[2] C07D *249/20*

U.S. Cl. 260—308 B **16 Claims**

1. An improved process for the production of 2-aryl-2H-benzotriazoles of the formula I

(I)



wherein

R_1 is hydrogen,

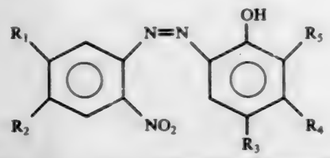
R_2 is hydrogen or chlorine,

R_3 is methyl, sec-butyl, tert-butyl, tert-amyl, tert-octyl, cyclohexyl, chlorine or carboxyethyl,

R_4 is hydrogen, and

R_5 is chlorine, methyl, tert-butyl, sec-butyl, tert-amyl, tert-octyl or α-methylbenzyl

by the reduction at a temperature between about 55° to about 73° C of the corresponding o-nitroazobenzene intermediate

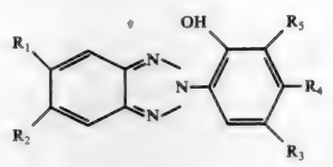


by adding zinc to an aqueous alkali metal hydroxide medium containing said o-nitroazobenzene intermediate wherein the improvement comprises

employing an initial ratio of moles of alkali to moles of o-nitroazobenzene intermediate in the range of 0.2 to 0.848/1 in the presence of an amount of iron impurities in the reaction system of less than 150 ppm based on zinc used, and with no additional alkali or o-nitroazobenzene being added during the reduction reaction.

10. An improved process for the production of 2-aryl-2H-benzotriazoles of the formula I

(I)



wherein

R_1 is hydrogen,

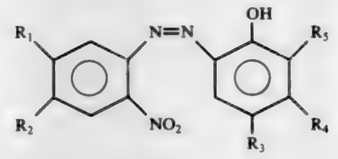
R_2 is hydrogen or chlorine,

R_3 is metyl, sec-butyl, tert-butyl, tert-amyl, tert-octyl, cyclohexyl, chlorine or carboxyethyl,

R_4 is hydrogen, and

R_5 is hydrogen

by the reduction at a temperature between about 45° and 75° C of the corresponding o-nitroazobenzene intermediate



by adding zinc to an aqueous alkali metal hydroxide medium containing said o-nitroazobenzene intermediate wherein the improvement comprises

employing an initial ratio of moles of alkali to moles of o-nitroazobenzene intermediate in the range of 1.2 to 1.7/1 in the presence of an amount of iron impurities in the reaction system of less than 150 ppm based on zinc used, and with no additional alkali or o-nitroazobenzene being added during the reduction reaction.

4,041,045

DIHYDROIMIDAZ OISOINDOLEDIONES AND THE USE THEREOF AS HERBICIDAL AGENTS

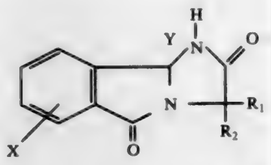
Marinus Los, Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 12, 1975, Ser. No. 631,356

Int. Cl.[2] C07D *235/02*

U.S. Cl. 548—302 **10 Claims**

1. A compound having the formula:



wherein X is H, CH_3, NO_2, Cl, OCH_3 or SCH_3; R_1 is alkyl C_1–C_4; R_2 is alkyl C_1–C_6, cycloalkyl C_3–C_6, alkenyl C_2–C_4, phenyl, halophenyl or benzyl; and when R_1 and R_2 are taken together with the carbon to which they are attached they may form cycloalkyl C_3–C_6 optionally substituted with methyl; Y is hydrogen, $—NR_3R_4$, $—OR_5$ or $—SR_6$; R_3, R_4, R_5 and R_6 are each hydrogen or alkyl C_1–C_4; and the optical and stereo isomers thereof.

4,041,046

1,2-DIALKYL-3,4,5-TRISUBSTITUTED PYRAZOLE COMPOUNDS

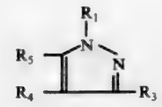
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 584,686, June 6, 1975, Pat. No. 3,963,742, which is a continuation-in-part of Ser. No. 487,826, July 12, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,113

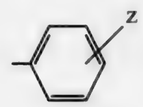
Int. Cl.[2] C07D *231/12*; A01N *9/22*

U.S. Cl. 548—375 **9 Claims**

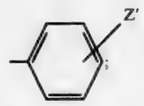
1. A compound having the formula:



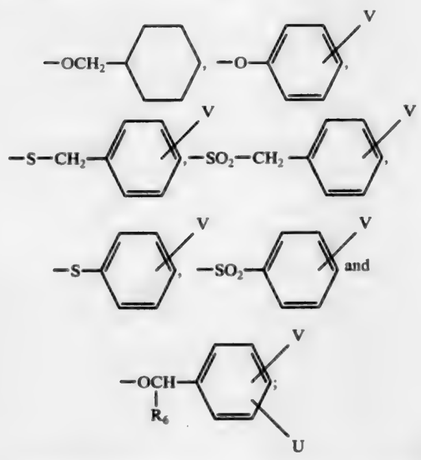
wherein R_1 represents a member selected from the group consisting of hydrogen, alkyl C_1–C_5, allyl and benzyl; R_3 represents a member selected from the group consisting of



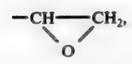
and naphthyl; R_5 is



R_4 represents a member selected from the group consisting of alkoxy C_2–C_{22}, alkenyloxy C_3–C_4, halogen substituted alkenyloxy C_3–C_4, alkynyloxy C_3–C_4, $—O—(CH_2)_n—W$, alkylthio C_1–C_{22}, alkylsulfonyl C_1–C_{22},



R_6 represents a member selected from the group consisting of hydrogen, methyl and phenyl; U and V each represent members selected from the group consisting of hydrogen, halogen, alkyl C_1–C_4, alkoxy C_1–C_4, NO_2 and CF_3; W represents a member selected from the group consisting of halogen, cyano, carbalkoxy C_1–C_7,



alkoxy C_1–C_7, alkylthio C_1–C_7, alkylsulfonyl C_1–C_7, benzylthio and benzylsulfonyl; Z and Z' each represent members selected from the group consisting of hydrogen, halogen, alkyl C_1–C_{12}, alkoxy C_1–C_4 and phenyl with the proviso that when R_1 is ethyl, R_4 cannot be ethoxy; *n* represents an integer selected from 1,2,3 and 4.

4,041,047

9-THIAPROSTAGLANDINS

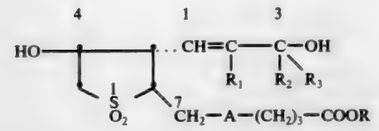
Isidoros Vlattas, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 516,293, Oct. 21, 1974, Pat. No. 3,970,670, which is a continuation-in-part of Ser. No. 460,837, April 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 361,752, May 18, 1973, Pat. No. 3,881,017. This application Oct. 14, 1975, Ser. No. 621,901

Int. Cl.[2] C07D *333/48*

U.S. Cl. 260—332.1 **7 Claims**

1. A 7-[3-hydroxy-3-hydrocarbylpropyl or -1-propenor ynyl)-4-hyroxy-tetrahydro-2β-thienyl]-alkanoic or 5-alkenoic acid of the formula



wherein R is hydrogen, an alkali metal, one equivalent of an alkaline earth metal, ammonium, mono-, di- or tri-lower alkylammonium, alkyl with up to 12 carbon atoms, lower alkenyl, lower alkynyl, Ph or Ph-C_nH_{2n}, wherein Ph is phenyl, (lower alkyl)-phenyl, (halogeno)-phenyl or (trifluoromethyl)-phenyl, and *n* is an integer from 1 to 4, A is ethylene or ethenylene, each of R_1 and R_2 is hydrogen or lower alkyl and R_3 is alkyl with up to 12 carbon atoms, lower alkenyl or lower alkynyl, or the 1,2-dihydroderivatives or 1,2-dehydro-derivatives thereof.

4,041,048

3,2-BENZOXAZEPINE DERIVATIVES

Giorgio Pifferi, Milan; Amedeo Omodei-Salé', Pavia, and Pietro Consonni, Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

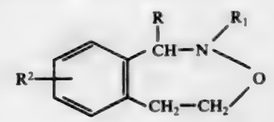
Continuation-in-part of Ser. No. 234,336, March 13, 1972, abandoned. This application Nov. 14, 1974, Ser. No. 523,790

Claims priority, application Italy, Mar. 18, 1971, 21930/71; Jan. 20, 1972, 19575/72

Int. Cl.[2] C07D *267/02*

U.S. Cl. 260—333 **7 Claims**

1. A benzoxazepine compound represented by the formula



wherein R represents hydrogen or lower alkyl, R^1 represents a member of the group consisting of hydrogen; lower alkyl; lower alkenyl; and hydroxy lower alkyl; and R^2 may be in position 7 or 8 of the benzoxazepine ring and represents hydrogen, nitro, amino, acetamino or halo.

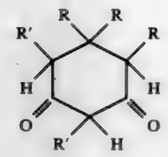
4,041,049

PROCESS FOR THE MANUFACTURE OF CYCLOHEXANE-1,3-DIONES AND 6-ALKYL-3,4-DIHYDRO-2-PYRANONES

Werner Heinrich Müller, Kelkheim, Taunus; Hansjörg Hey, Hofheim, Taunus, and Helmut Meidert, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

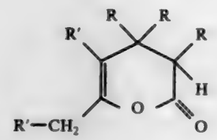
Filed Oct. 10, 1975, Ser. No. 621,584
Claims priority, application Germany, Oct. 12, 1974, 2448677
Int. Cl.[2] C07C *45/00, 45/18;* **C07D** *309/30*
U.S. Cl. 260—343.5 **3 Claims**

1. A process for the manufacture of cyclohexane-1,3-diones of the formula I



(I)

having up to 24 carbon atoms in admixture with 6-alkyl-3,4-dihydro-2-pyranones of the formula II



(II)

having up to 24 carbon atoms, in which formulae the radicals R and R′ may be identical or different and each represent a hydrogen atom, an alkyl, a cycloalkyl or an aryl group each having up to 12 carbon atoms and the two radicals R′ together optionally represent a $-(CH_2)_3$-group, which comprises passing 4-oxocarboxylic acids of the formula III



(III)

having up to 24 carbon atoms and in which R and R′ have the above meaning at a temperature of from 250° to 500° C in the gaseous phase over a dehydration catalyst.

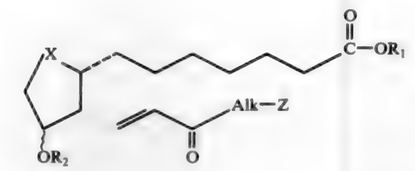
4,041,050

3,5-BISOXYGENATED 2-(ω-HALO-3-OXO-1-ALKENYL)-CYCLOPENTANE-1-HEPTANOIC ACIDS AND DERIVATIVES THEREOF

Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 577,675, May 15, 1975, Pat. No. 3,997,588. This application Sept. 20, 1976, Ser. No. 724,500
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—345.7 **7 Claims**

1. A compound of the formula



wherein R_1 is hydrogen or an alkyl radical containing 1-12 carbon atoms; R_2 is hydrogen, a tetrahydropyran-2-yl or trialkylsilyl radical, or alkanoyl radical containing 1-12 carbon atoms; X is a carbonyl or hydroxymethylene radical; Z is a chloro, bromo, or iodo radical; Alk is an alkylene radical containing 3–8 carbon atoms; and the wavy lines represent the alternative α and β stereochemical configurations.

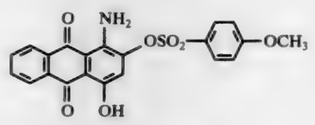
4,041,051

ANTHRAQUINONE DISPERSE DYESTUFFS

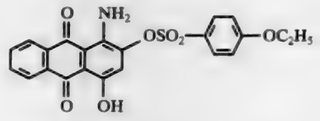
Eiji Yamada, Takatsuki; Hiroaki Ito, Toyonaka, and Takashi Akamatsu, Ashiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Aug. 2, 1966, Ser. No. 569,586
Claims priority, application Japan, June 28, 1966, 41-42537; Aug. 4, 1965, 40-47371
Int. Cl.[2] C07C *143/68;* **C09B** *1/52*
U.S. Cl. 260—373 **2 Claims**

1. A compound of the formula,



2. A compound of the formula,



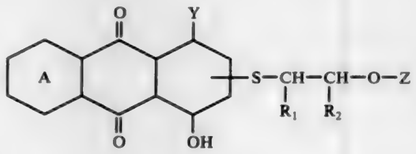
4,041,052

ANTHRAQUINONE DYESTUFFS OF THE DISPERSE SERIES

Hansrudolf Schwander, Riehen, and Urs Karlen, Magden, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,467
Claims priority, application Switzerland, Feb. 20, 1975, 2153/75
Int. Cl.[2] C09B *1/54, 1/56, 1/02*
U.S. Cl. 260—380 **12 Claims**

1. An anthraquinone dyestuff which is sparingly soluble in water of the formula



wherein Y is amino, alkylated amino or hydroxyl, the ring A can be substituted by halogen, methyl, ethyl, methoxy, ethoxy, nitro or acylamino, Z is C_1–C_4-alkylcarbonyl, C_1–C_4-alkylaminocarbonyl, C_1–C_4-alkyloxycarbonyl, —CHO or hydrogen, and one of R_1 and R_2 is hydrogen and the other is C_1–C_8-alkyl, C_1–C_8-alkyl substituted by cyclohexyl, cyclopentyl, phenyl, nitrophenyl, C_1–C_2-alkoxyphenyl, chlorophenyl, C_1–C_2-alkylphenyl, bromophenyl, fluorophenyl, cyano, chlorine or bromine, cycloalkyl, or aryl or substituted aryl or a carboxy ester group.

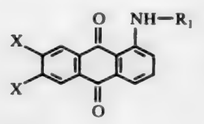
4,041,053

PROCESS FOR THE PREPARATION OF ANTHRAQUINONE COMPOUNDS

Helmut Herzog, Leverkusen; Hans-Samuel Bien, Burscheid, and Walter Hohmann, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 24, 1976, Ser. No. 669,893
Claims priority, application Germany, Mar. 29, 1975, 2513950
Int. Cl.[2] C09B *1/16*
U.S. Cl. 260—381 **5 Claims**

1. Anthraquinone compounds of the formula



as well as their mixtures,

wherein R_1 represents cyclopentyl, cycloheptyl, cyclohexyl, methylcyclohexyl, dimethylcyclohexyl, trimethylcyclohexyl, chlorocyclohexyl, benzyl, α-phenylethyl, β-phenylethyl, chlorobenzyl, methylbenzyl or methoxybenzyl; and one X represents chlorine and the other X represents hydrogen.

4,041,054

PROCESS FOR THE PREPARATION OF SYMMETRIC 4-HALOGEN-4′,4″-DIARYLAMINO-TRIPHENYLMETHANE COMPOUNDS

Manfred Hähnke, Kelkheim, Taunus, and Theodor Papenfuhs, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 17, 1975, Ser. No. 587,413
Claims priority, application Germany, June 20, 1974, 2429673
Int. Cl.[2] C09B *11/10*
U.S. Cl. 260—393 **6 Claims**

1. In a process for the preparation of symmetric 4-halogeno-4′,4″-diarylamino-triphenyl-methane compounds by reacting a complex compound of a 4,4′,4″-trihalogeno-triphenylmethylhalide and aluminum chloride, iron-(III) chloride or bortrifluoride with an aromatic amine which is substituted in m- or p-position to the amino group, at an elevated temperature, the improvement comprises reacting 1 mol of the complex compound with 5–8 mols of the aromatic amine at a temperature of from about 80° to 100° C in a halobenzene as solvent, and subsequently converting the so obtained complex compound from 4-halogeno-4′,4″-diarylamino-triphenyl-methyl-halide and aluminum chloride, iron-(III) chloride or bortrifluoride first into the anhydro- or carbinol base of the dyestuff with the aid of an aqueous alkali metal hydroxide solution and then precipitating the salt of the dyestuff by addition of an acid in excess.

4,041,055

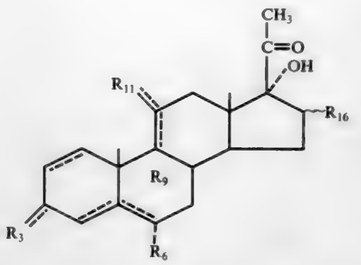
PROCESS FOR THE PREPARATION OF 17α-HYDROXYPROGESTERONES AND CORTICOIDS FROM ANDROSTENES

Kenneth Paul Shephard, and Verlan H. Van Rheenen, both of Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 17, 1975, Ser. No. 632,671
Int. Cl.[2] C07J *5/00, 7/00*
U.S. Cl. 260—397.3 **92 Claims**

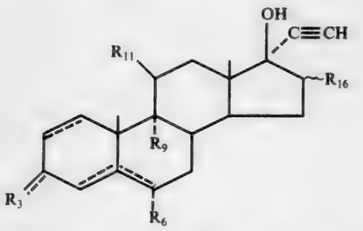
1. A process for the preparation of a steriod of the formula

X



where R_3 is an oxygen atom (O) or a hydroxyl group (HO) with the proviso that when R_3 is (O) there are double bonds between C_3 and R_3 and between C_4 and C_5, and when R_3 is (HO) there is a single bond between C_3 and R_3 a double bond between C_5 and C_6; where R_6 is a hydrogen or fluorine atom or methyl group; where R_9 is a hydrogen, fluorine, chlorine, or bromine atom, or hydroxyl group; where R_{11} is (H), (H,H), (H,αOH), (H,βOH) or (O); where R_{16} is a hydrogen atom or methyl group; where ~ indicates the attachment of the R_{16} group in the alpha or beta configuration; and where ==== is a single or double bond which comprises starting with a steroidal propargyl alcohol of the formula

IV

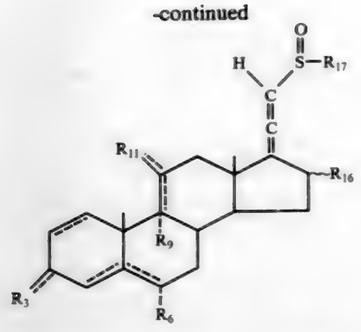


where R_3, R_6, R_9, R_{11}, R_{16}, ~, and ==== are defined above and subjecting the steroidal propargyl alcohol IV to the following reactions:

1. sulfenylating with a substituted sulfenylating agent of the formula R_{17}-S-M; where M is a chlorine or bromine atom, phenylsulfone, phthalimide or imidazole group; where R_{17} is alkyl of one thru 10 carbon atoms, trichloromethyl, phenyl or phenyl substituted with one thru 3 nitro groups or substituted with one thru 3 trifluoromethyl groups, aralkyl of 7 thru 12 carbon atoms, phthalimide, $(R_{121})_2$-N where R_{121} is alkyl of one thru 10 carbon atoms, phenyl, phenyl substituted with alkyl of one thru 4 carbon atoms, aralkyl of 7 thru 12 carbon atoms with the proviso that the two R_{121} groups may be the same or different, to form an allene sulfoxide of the formula

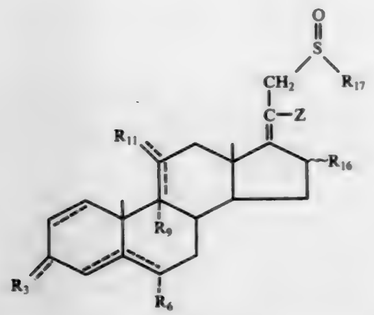
VI

-continued



where R_3, R_6, R_9, R_{11}, R_{16}, R_{17}, ~, and ==== are defined above;

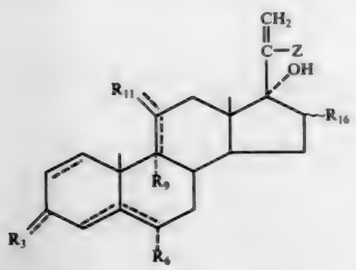
2. Michael addition to the allene sulfoxide of step (1) with an alkoxide, mercaptide or dialkyl amine to form a sulfoxide of the formula



where R_3, R_6, R_9, R_{11}, R_{16}, R_{17}, ~, and ==== are defined above and where Z is -O-R_{20}, -S-R_{120} or -N-(R_{120})$_2$ where R_{20} is alkyl of one thru 5 carbon atoms, phenyl or phenyl substituted with one thru 4 carbon atoms, or alkyl of 7 thru 12 carbon atoms, and where R_{120} is alkyl of one thru 5 carbon atoms;

3. reacting the product of step (2) with a thiophile selected from the group consisting of trimethylphosphite and diethylamine to form a compound of the formula

IX

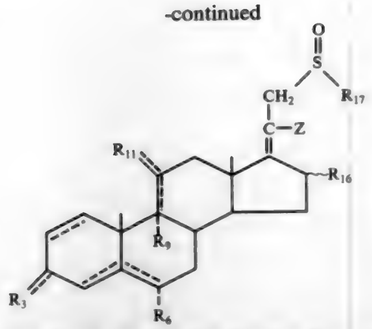


where R_3, R_6, R_9, R_{11}, R_{16}, ~, ====, and Z are defined above; and

4. hydrolyzing the product of step (3) in the presence of an effective catalytic amount of an acid.

60. A sulfoxide of the formula

-continued



where R_3, R_6, R_9, R_{11}, R_{16}, R_{17}, R_{20}, R_{120}, R_{121}, ~, ==== and Z are defined in claim **1.**

4,041,056

REACTION PRODUCTS OF WAX-ANHYDRIDE COMPOUNDS AND POLYAMINES

VII **William J. Heintzelman, and Michael I. Naiman, both of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.**

Continuation of Ser. No. 107,569, Jan. 18, 1971, abandoned, which is a division of Ser. No. 607,877, Jan. 9, 1967, Pat. No. 3,590,076, which is a continuation-in-part of Ser. No. 527,075, Feb. 14, 1966, abandoned. This application Mar. 12, 1976, Ser. No. 666,256

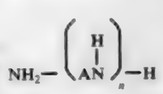
Int. Cl.[2] **C11C** *3/00*

U.S. Cl. 260—404.5 **11 Claims**

1. A wax-maleic compound coupled with a polyfunctional polyamine selected from the group cosisting of

1. a polyamine of the formula

(1) a polyamine of the formula



wherein A is $-(CH_2)_m-$, $-CH(CH_3)-CH_2-$, $-CH_2-CH(CH_3)-CH_2-$, or $-CH(CH_3)-CH(CH_3)-$

m being 2–10, and n is 1–8,

(2) $C_8H_{17}N(H)-CH_2CH_2NH_2$,

(3) $C_{14}H_{29}N(H)-CH_2CH_2NH_2$,

(4) $C_{16}H_{33}N(H)-CH_2CH_2NH_2$,

(5) $C_{12}H_{25}N(H)-C_2H_4NC_2H_4N(H)-C_2H_4NH_2$,

(6) $C_{12}H_{25}N(H)-C_3H_6NH_2$,

(7) $C_{15}H_{31}N(H)-C_3H_6NH_2$,

VII

-continued

(8) $C_{10}H_{21}N(H)-C_4H_8NH_2$,

(9) $C_{12}H_{25}N(H)-C_3H_6N(C_2H_2)-C_2H_4-NH_2$,

(10) $CH_2-OCH_2CH_2CH_2NH_2$
$CH_2-OCH_2CH_2CH_2NH_2$,

(11) $NH_2-C_6H_4-NH_2$,

(12) m-phenylene diamine,

(13) $NH_2-C_6H_4-C_6H_4-NH_2$,

(14) $NH_2-C_6H_4-R-C_6H_4-NH_2$,

wherein R is O, S, $-S-$, $-S(=O)_2-$,

$+CH_2+_x$

x being 1–4,

$-C(R')_2-$,

R' being H or alkyl,

$-C(=O)-N(H)-$, or

$-Si(R'')_2-$,

R'' being alkyl,

(15) $NH_2CH_2-C_6H_4-CH_2NH_2$,

(16) $NH_2CH_2-C_6H_4-C_6H_4-CH_2NH_2$, and

(17) $NH_2CH_2-C_6H_4-O-C_6H_4-CH_2NH_2$

said wax-maleic compound having a wax molecule moiety to which at least one maleic compound unit is attached,

(1) said maleic compound being selected from the group consisting of maleic acid, maleic anhydride, citraconic acid, citraconic anhydride, ethyl maleic acid, ethyl maleic anhydride, glutaconic acid, glutaconic acid anhydride, itaconic acid, itaconic acid anhydride, methylitaconic acid and methylitaconic acid anhydride and (2) said wax being selected from the group consisting of plastic microcrystalline waxes, tank bottom microcrystalline waxes, solvent extracted microcrystalline waxes, Fischer-Tropsch waxes, and mixtures thereof, having a melting point of at least 150° F. and a penetration of from about 0+ to about 50 (ASTM Test Method D5-25), the molar ratio of (1) to (2) being from about 1.0 to about 1.5.

4,041,057

HYDROESTERIFICATION PROCESS

Robert J. Fanning, Farmington Hills, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed July 2, 1975, Ser. No. 592,642

Int. Cl.[2] **C11C** *3/02;* **C07C** *67/04, 67/38*

U.S. Cl. 260—410.9 R **7 Claims**

1. A process for producing esters which comprises:

A. reacting olefin having from about 3 to about 40 carbon atoms per molecule, CO and alcohol having from about 1 to about 20 carbon atoms per molecule in the presence of cobalt carbonyl catalyst to produce ester in admixture with residual catalyst and residual reactants,

B. recovering at least a portion of the ester product from said reaction thereby producing a cobalt-containing catalyst residue,

C. heating the catalyst residue at a temperature of from about 1000° F to about 4000° F under oxidizing conditions wherein the cobalt of the catalyst residue is converted to cobalt oxide,

D. reacting the cobalt oxide with carbon monoxide and hydrogen to form a cobalt carbonyl complex, and

E. recycling the cobalt carbonyl complex to the olefin-CO-alcohol reaction step to provide at least a portion of the catalyst therein.

4,041,058

SYNTHESIS OF 2,6,10-TRIMETHYL-UNDECAN-1-OL

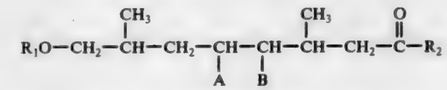
Noal Cohen, Montclair, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 544,154, Jan. 27, 1975, abandoned. This application Dec. 8, 1975, Ser. No. 638,722

Int. Cl.[2] **C11C** *3/02;* **C07D** *309/22*

U.S. Cl. 260—410.9 R **5 Claims**

1. A compound of the formula:



wherein A and B are individually hydrogen or taken together form a carbon to carbon bond; R_2 is lower alkoxy; R_1 is t-butyl, tetrahydropyranyl, benzyl, benzhydryl or trityl with the proviso that when R_1 is benzyl, benzhydryl or trityl, A and B form a carbon to carbon bond.

4,041,059

METHOD OF IMPROVING THE OXIDATION RESISTANCE OF AN OIL OR FAT

Haruo Watanabe, Funabashi; Toru Kitagawa, Ichikawa; Masaaki Negishi, Chiba; Kiichi Aonuki, Tokyo, and Harunobu Kobayashi, Musashino, all of Japan, assignors to Showa Sangyo Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 426,501, Dec. 20, 1973, abandoned. This application June 24, 1975, Ser. No. 589,665

Claims priority, application Japan, Dec. 25, 1972, 47-855

Int. Cl.[2] **B01D** *11/00*

U.S. Cl. 260—424 **11 Claims**

1. A method for improving the oxidation resistance of an animal or vegetal fat or oil containing an amount of a heavy metal sufficient to catalyze autoxidation of said fat or oil, which comprises:

a. subjecting said fat or oil to steam distillation while in contact with a body of said heavy metal for a period sufficient to pick up said amount of said heavy metal;

b. intimately contacting said fat or oil in the liquid state with solid citric, malic, or tartaric acid,

1. the amount of said acid being sufficient to leave at least a major portion thereof undissolved after said contacting,

2. the temperature of said fat or oil during said contacting being below the melting point of said acid; and
c. separating the undissolved acid from said fat or oil.

4,041,060

PROCESS FOR SYNTHESIZING ORGANO-TIN COMPOUNDS

Andre Paul de Haan, Avenue Lemiez, 35 - B 7020 Hyon, Belgium

Continuation-in-part of Ser. No. 564,978, April 3, 1975, abandoned. This application Apr. 7, 1976, Ser. No. 674,537
Claims priority, application Belgium, Apr. 3, 1974, 142797
Int. Cl.² C07F *7/22*
U.S. Cl. 260—429.7 **8 Claims**

1. A process for synthesizing organo-tin halides of the formula R_nSnX_{4-n}, wherein R represents an alkyl or aryl radical, X represents a halogen atom and n represents an integer equal to 1, 2 or 3, by reacting an organic halide of the formula RX, wherein R and X have the meanings indicated above, in the gaseous phase at a temperature between 300°and 400° C, with finely divided solid alloy particles consisting of tin and a catalyst of the group consisting of copper, gold and silver, characterized in that contact of the solid alloy particles, having a particle size between about 50 and 250 microns, with one another is avoided by separating said particles in a fluidized bed by means of a fluid, comprising said organic halide mixed with an inert gas, at a flow rate of 5 to 40 1/hour-cm2, by admixing refractory particles with said alloy particles and by thoroughly stirring the fluidized bed.

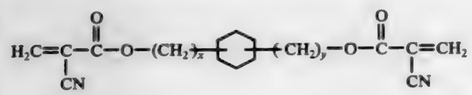
4,041,061

MODIFIED CYANOACRYLATE MONOMERS AND METHODS OF PREPARATION

Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 633,146, Nov. 18, 1975, abandoned, which is a division of Ser. No. 512,276, Oct. 4, 1974, Pat. No. 3,975,422, which is a continuation-in-part of Ser. No. 308,375, Nov. 21, 1972, abandoned, and Ser. No. 308,376, Nov. 21, 1972, abandoned. This application June 23, 1976, Ser. No. 699,146
Int. Cl.² C07C *121/46, 121/54*
U.S. Cl. 260—464 **1 Claim**

1. A monomer composition of the formula



where *x* and *y* are integers of from 1 to 6 inclusive and



is a 1,2; 1,3; 1,4 substituted cyclohexane ring or a meta, para or ortho substituted benzene ring.

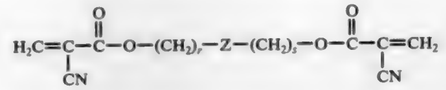
4,041,062

MODIFIED CYANOACRYLATE MONOMERS AND METHODS OF PREPARATION

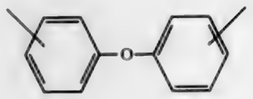
Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 633,146, Nov. 18, 1975, abandoned, which is a division of Ser. No. 512,276, Oct. 4, 1974, Pat. No. 3,975,422, which is a continuation-in-part of Ser. No. 308,375, Nov. 21, 1972, abandoned, which is a continuation-in-part of Ser. No. 308,376, Nov. 21, 1972, abandoned. This application June 23, 1976, Ser. No. 699,148
Int. Cl.² C07C *121/20, 121/60*
U.S. Cl. 260—465 D **6 Claims**

1. A monomer composition of the formula



where *r* and *s* are independent integers of from 1 to 10 inclusive and *r* and *s* total from 2 to 20 and Z is selected from the group consisting of: —O—, —S—, —CH=CH, —C≡C—, and



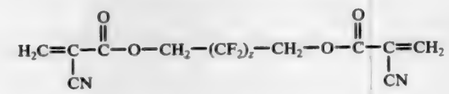
4,041,063

MODIFIED CYANOACRYLATE MONOMERS AND METHODS OF PREPARATION

Carl J. Buck, Berkeley Heights, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 633,146, Nov. 18, 1975, abandoned, which is a division of Ser. No. 512,276, Oct. 4, 1974, Pat. No. 3,975,422, which is a continuation-in-part of Ser. No. 308,375, Nov. 21, 1972, abandoned, and Ser. No. 308,376, Nov. 21, 1972, abandoned. This application June 23, 1976, Ser. No. 699,129
Int. Cl.² C07C *121/30*
U.S. Cl. 260—465.4 **1 Claim**

1. A monomer composition of the formula



where *z* is an integer of from 1 to 10 inclusive.

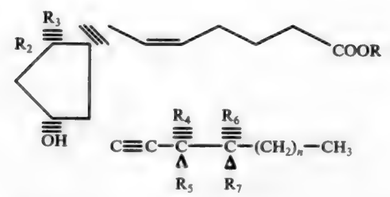
4,041,064

16-METHYL PROST-5-EN-13-YNOIC ACID DERIVATIVES

Carmelo Gandolfi; Gianfederico Doria; Renato Pellegata, and Mario M. Usardi, all of Milan, Italy, assignors to Carlo-Erba S.p.A., Milan, Italy

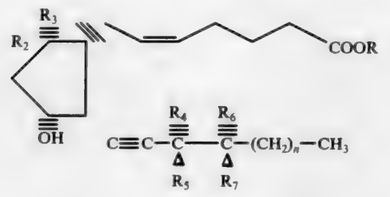
Filed July 29, 1975, Ser. No. 600,187
Claims priority, application Italy, Sept. 17, 1974, 27333/74
Int. Cl.² C07C *177/00*
U.S. Cl. 560—121 **13 Claims**

1. A compound of the formula:



wherein:
R is hydrogen, a C_1–C_{12} alkyl group or a cation of a pharmaceutically acceptable base;
R_2 and R_3 taken together form an oxo group;
one of R_4 and R_5 is hydrogen and the other is a hydroxy group;
R_6 is a 16(S) C_1–C_4 alkyl group and R_7 is hydrogen; and
n is an integer of 3 to 6.

3. A compound of the formula:



wherein:
R is hydrogen, a C_1–C_{12} alkyl group or a cation of a pharmaceutically acceptable base;
R_2 and R_3 taken together form an oxo group;
one of R_4 and R_5 is hydrogen and the other is a hydroxy group;
R_6 is hydrogen and R_7 is a 16(R) C_1–C_4 alkyl group; and
n is an integer from 3 to 6.

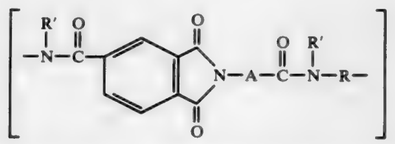
4,041,065

POLYAMIDE-IMIDES PREPARED FROM 4-CARBOXY-PHTHALIMIDE ALIPHATIC CARBOXYLIC ACIDS

Steven E. Lindberg, Naperville; Kerford A. Marchant, Jr., Evanston, both of Ill., and Richard E. Van Strien, Griffith, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jan. 24, 1975, Ser. No. 543,967
Int. Cl.² C08G *73/14*
U.S. Cl. 260—47 CZ **10 Claims**

1. An amide-imide type polymeric composition with an inherent viscosity of 0.1 to 10.0 consisting essentially of recurrent units of:



where A is a difunctional alkylene radical having from 1 to 11 carbon atoms, R is a bivalent hydrocarbon radical having from 2 to 20 carbon atoms, and R′ is either hydrogen or methyl.

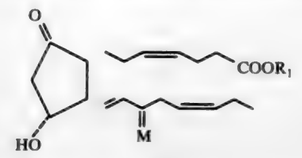
4,041,066

4,5-CIS-DIDEHYDRO-PGE$_1$ COMPOUNDS

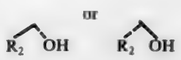
Bengt Samuelsson, Stockholm, Sweden, and Barney J. Magerlein, Portage, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 440,628, Feb. 7, 1974, Pat. No. 3,954,835, which is a continuation of Ser. No. 248,005, April 27, 1972, abandoned. This application Sept. 9, 1975, Ser. No. 611,804
Int. Cl.² C07C *177/00*
U.S. Cl. 260—468 D **6 Claims**

1. An optically active compound of the formula



or a racemic compound of that formula and the mirror image thereof, wherein M is



wherein R_2 is hydrogen, methyl, or ethyl; wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, or phenyl substituted with one, 2, or 3 chloro or alkyl of one to 4 carbon atoms, inclusive; including the lower alkanoates thereof, and the pharmacologically acceptable salts thereof when R_1 is hydrogen.

4. 15(R)-15-Methyl-4,5-cis-didehydro-PGE$_1$, and the methyl ester thereof.

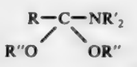
4,041,067

SYNTHESIS OF OXALATE ESTERS BY THE OXIDATIVE CARBONYLATION OF AMIDE ACETALS

Lee R. Zehner, Media, and John G. Zajacek, Devon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed July 21, 1976, Ser. No. 707,391
Int. Cl.² C07C *69/36*
U.S. Cl. 260—485 R **23 Claims**

1. A process for the preparation of oxalate esters which comprises reacting under substantially anhydrous conditions, an amide acetal having the formula



wherein R may be hydrogen, an alkyl, aryl or alicyclic group and R′ and R″ may be an alkyl or aralkyl group, which R, except when hydrogen, R′ and R″ may contain substituents which do not interfere with the reaction, with carbon monoxide and oxygen at a pressure of between about 500 psi and 3000 psi and at a temperature in the range of about 50° to 200° C. in the presence of an effective amount of a catalyst selected from the group consisting of palladium, platinum, rhodium, cadmium, cobalt, zinc and copper salt compounds and a catalytic amount of an aliphatic, cycloaliphatic, aromatic or heterocyclic amine or ammonia and a catalytic amount of a monohydric, aliphatic, alicyclic or aralkyl alcohol which may contain other substituents which do not interfere with the reaction, and recovering the desired oxalate ester.

4,041,068

SYNTHESIS OF OXALATE ESTERS BY CATALYTIC OXIDATIVE CARBONYLATION OF BORATE ESTERS

Lee R. Zehner, Media, and John G. Zajacek, Devon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed June 29, 1976, Ser. No. 700,947

Int. Cl.² C07C *69/36*

U.S. Cl. 260—485 R **27 Claims**

1. A process for the preparation of oxalate esters which comprises reacting under substantially anhydrous conditions in orthoborate ester having the formula



wherein R is alkyl or aralkyl groups which may contain substituents which do not interfere with the reaction, with carbon monoxide and oxygen at a pressure of between about 500 psi and 3000 psi and at a temperature in the range of about 50° C. to 200° C. in the presence of an effective amount of a catalyst selected from the group consisting of palladium, platinum and rhodium salt compounds and a catalytic amount of an aliphatic, cycloaliphatic, aromatic or heterocyclic amine, and a catalytic amount of a monohydric aliphatic, alicyclic or aromatic alcohol which may contain substituents which do not interfere with the reaction, and recovering the desired oxalate ester.

4,041,069

ALKYL-2-METHYL-3,4-PENTADIENOATES

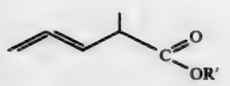
John B. Hall, Rumson; Denis E. Hruza, Brick Town; Manfred Hugo Vock, Locust; Joaquin Vinals, Red Bank, all of N.J., and Edward J. Shuster, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 566,118, April 8, 1975, Pat. No. 3,978,239. This application May 5, 1976, Ser. No. 683,303

Int. Cl.² C07C *69/54*

U.S. Cl. 260—486 R **3 Claims**

1. A compound having the structure:



wherein R′ is selected from the group consisting of n-hexyl and isobutyl.

4,041,070

TETRAHYDRO-4-IMINO-1-NAPHTHYLUREAS

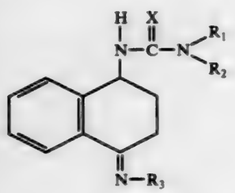
Goro Asato, Titusville, and Terence James Bentley, Cranbury, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 14, 1976, Ser. No. 705,313

Int. Cl.² C07C *127/19, 157/09;* A61K *31/17, 31/175*

U.S. Cl. 260—553 A **5 Claims**

1. A compound of formula:



wherein X is oxygen or sulfur; R_1 is hydrogen or alkyl C_1–C_4; R_2 is hydrogen, alkyl C_1–C_4, 2-propynyl, alkoxy C_1–C_4 or benzyloxy; R_3 is a radical selected from the group consisting of $-OR_4$, and $-N(CH_3)_2$; R_4 is hydrogen, alkyl C_1–C_4 or benzyl; R_5 is alkyl C_1–C_4; the racemic mixtures and the optical isomers thereof.

4,041,071

ANTI-CONVULSANT CINNAMIDE COMPOUNDS

Eugene M. Grivsky, Chapel Hill, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed July 17, 1975, Ser. No. 596,653

Claims priority, application United Kingdom, Aug. 9, 1974, 35279/74

Int. Cl.² C07C *103/22, 103/76;* A61K *31/165*

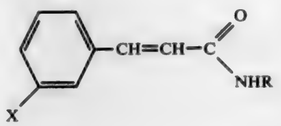
U.S. Cl. 260—558 R **6 Claims**

1. The compound trans 3-iodocinnamamide.

2. Trans 3 - Bromo - N - ethylcinnamamide.

3. The trans compound of formula I

(I)



where X is iodo and R is alkyl having 1 to 3 carbons.

4,041,072

ACETAMIDOXIME COMPOUNDS

Claude P. Fauran, Paris; Guy R. Bourgery, Colombes, and Claude J. Gouret, Meudon, all of France, assignors to Delalande S. A., Courbevoie, France

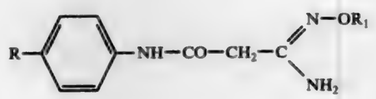
Filed Mar. 18, 1976, Ser. No. 668,061

Claims priority, application France, Mar. 25, 1975, 75.09263; Feb. 24, 1976, 76.05098

Int. Cl.² C07C *103/28, 103/76, 103/365;* A61K *31/165*

U.S. Cl. 260—558 A **19 Claims**

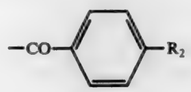
1. A compound having the formula



wherein

R is hydrogen, chloro, alkyl having one to 4 carbons or alkoxy having one to 3 carbons,

R_1 is hydrogen,



wherein

R_2 is hydrogen, chloro, nitro, alkoxy having one to 3 carbons or $-CF_3$ or $-CO-NH-R_3$ wherein

R_3 is alkyl having one to 4 carbons, cycloalkyl having no more than 6 carbons, or phenyl.

4,041,073

3,4,5-TRICHLORO-N,N-di(LOWERALKYL)-2-(MERCAPTO) BENZENESULFONAMIDES

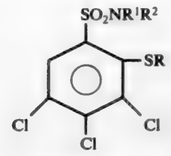
Christian T. Goralski; R. Garth Pews, both of Midland, and George A. Burk, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 645,060, Dec. 29, 1975. This application Oct. 6, 1976, Ser. No. 730,034

Int. Cl.² C07C *143/78*

U.S. Cl. 260—556 AR **3 Claims**

1. A compound corresponding to the formula



wherein R represents hydrogen; and each of R^1 and R^2 represents loweralkyl of 1 to 4 carbon atoms.

4,041,074

1-HYDROXYARYL-2-AMIDOALKYLAMINOETHANOL DERIVATIVES

Brian Geoffrey Main, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

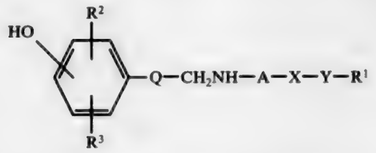
Division of Ser. No. 607,932, Aug. 26, 1975, Pat. No. 3,957,870, which is a division of Ser. No. 485,994, July 5, 1974, Pat. No. 3,933,911. This application Mar. 1, 1976, Ser. No. 662,953

Claims priority, application United Kingdom, July 19, 1973, 34465/73

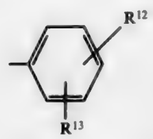
Int. Cl.² C07C *143/74, 143/77, 143/78;* A61K *31/18*

U.S. Cl. 260—556 AR **6 Claims**

1. A phenylethylamine derivative selected from compounds of the formula:



wherein A is alkylene of up to 6 carbon atoms, wherein Q is carbonyl or hydroxymethylene, wherein R^1 is alkyl or cycloalkyl each of up to 6 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino or hydroxymethyl, alkyl, alkoxy, acylamino or alkanesulphonamido each of up to 6 carbon atoms, or phenyl, wherein X is $NHSO_2$ and wherein Y is a direct link, or is alkylene or alkyleneoxy each of up to 6 carbon atoms; and the acid-addition salts thereof.

4,041,075

PHENOXY-ALKANOLAMINE DERIVATIVES

Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

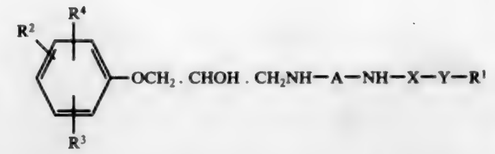
Division of Ser. No. 526,921, Nov. 25, 1974, Pat. No. 3,959,369. This application Mar. 4, 1976, Ser. No. 664,044

Claims priority, application United Kingdom, Dec. 12, 1973, 57517/73

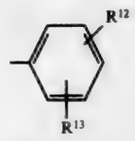
Int. Cl.² C07C *103/38, 103/78;* A61K *31/16, 31/165*

U.S. Cl. 260—558 P **7 Claims**

1. An alkanolamine derivative selected from a compound of the formula:



wherein A is alkylene of from 2 to 12 carbon atoms; wherein R^1 is hydrogen, alkyl, halogenoalkyl, alkenyl or cycloalkyl each of up to 10 carbon atoms, or aryl of the formula:



wherein wherein R^2 and R^3, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, or alkyl, cycloalkyl, alkenyl, alkoxy, alkylthio, alkenyloxy or alkanoyl each of up to 6 carbon atoms, and wherein R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, or alkyl, alkenyl, alkoxy, alkenyloxy or alkanoyl each of up to 6 carbon atoms, or wherein R^{12} and R^{13} together are trimethylene, tetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with the adjacent benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; wherein R^4 stands for a substituent of the formula:

$R^{15}R^{16}N-CO-Q-$

$R^{15}R^{16}N-CO-NH-Q-$

$R^{15}R^{16}N-CO-Q^1-O-$

or

Ti $R^{16}-X-NR^{15}-Q-$

wherein Q is a direct link or is alkylene or alkenylene each of up to 6 carbon atoms; wherein Q^1 is alkylene of up to 6 carbon atoms; wherein R^{15} is hydrogen or alkyl of up to 6 carbon atoms; wherein R^{16} is hydrogen, or alkenyl, cycloalkyl, hydroxyalkyl or alkoxyalkyl each of up to 6 carbon atoms, or alkyl, aryl, aralkyl or aralkenyl each of up to 10 carbon atoms; wherein X is carbonyl and wherein Y is a direct link, or is alkylene, oxyalkylene or alkyleneoxy each of up to 6 carbon atoms, or, except when R^1 is hydrogen, is oxygen; and a non-toxic, pharmaceutically-acceptable acid-addition salt thereof.

4,041,076

IMMUNOASSAY FOR PHARMACOLOGICALLY ACTIVE PHENETHYLAMINES

Richard William Avenia, Nutley; James Gordon Christenson, North Caldwell, and Benjamin Pecherer, Montclair, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 517,267, Oct. 23, 1974, abandoned. This application Mar. 9, 1976, Ser. No. 665,205
Int. Cl.[2] C07C *103/38*
U.S. Cl. 260—559 A 2 Claims

1. N-[2-(4-hydroxyphenyl)ethyl]-2-[4-(2-aminopropyl)-phenoxy] acetamide.

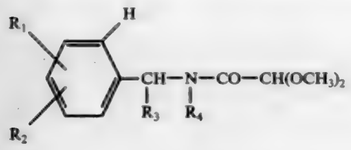
4,041,077

N-BENZYL-2,2-DIMETHOXY-ACETAMIDES

Léon Ghosez, Guy Rossey, both of Heverlee, and Freddy Didderen, Petit-Rechain, all of Belgium, assignors to U C B, Societe Anonyme, Saint-Gilles-lez-Brussels, Belgium

Filed May 24, 1976, Ser. No. 689,148
Claims priority, application United Kingdom, May 27, 1975, 23184/75; May 27, 1975, 23183/75
Int. Cl.[2] C07C *103/127, 103/34*
U.S. Cl. 260—562 R 21 Claims

1. An N-benzyl-2,2-dimethoxy-acetamide of the formula



wherein

R_4 and R_2 each represents hydrogen, halogen, alkyl having 1 to 6 carbon atoms, alkoxy having 1 to 6 carbon atoms, phenyl or naphthyl, said phenyl and naphthyl being unsubstituted or substituted by halogen, alkyl having 1 to 6 carbon atoms or alkoxy having 1 to 6 carbon atoms,

R_3 is hydrogen, alkyl having 1 to 6 carbon atoms, phenyl, naphthyl, benzyl, phenethyl, cyclopentyl or cyclohexyl, said phenyl, naphthyl, benzyl, phenethyl, cyclopentyl and cyclohexyl being unsubstituted or ring-substituted by halogen, alkyl having 1 to 6 carbon atoms or alkoxy having 1 to 6 carbon atoms, and

R_4 is hydrogen, alkyl having 1 to 6 carbon atoms, phenyl, naphthyl, benzyl or phenethyl, said phenyl, naphthyl, benzyl and phenethyl being unsubstituted or ring-substituted by halogen, alkyl having 1 to 6 carbon atoms or alkoxy having 1 to 6 carbon atoms.

4,041,078

METHOD OF PREPARING POLYAMINOPOLYPHENYLMETHANES

Edward T. Marquis, and Lewis W. Watts, Jr., both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,085
Int. Cl.[2] C07C *85/24*
U.S. Cl. 260—570 D 3 Claims

1. A method of preparing diaminodiphenylmethane and higher homologues thereof which comprises the step of condensing aniline and formaldehyde in the presence of a fluorinated graphite catalyst.

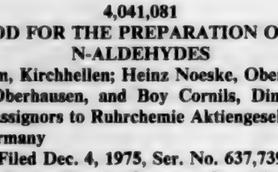
4,041,079

BICYCLIC COMPOUNDS

Hirosada Sugihara, Osaka; Michio Motohashi, Kobe; Masazumi Watanabe, Osaka; Masao Nishikawa, Kyoto, and Yasushi Sanno, Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Dec. 13, 1973, Ser. No. 424,315
Claims priority, application Japan, Dec. 18, 1972, 47-126970
Int. Cl.[2] C07C *91/40*
U.S. Cl. 260—574 8 Claims

1. A compound selected from the group consisting of compounds of the formula



wherein Y represent methylene, Z represents hydrogen and R represents hydrogen or alkyl of 1 to 6 carbon atoms, and pharmaceutically acceptable salts thereof.

4,041,080

PROCESS FOR THE PRODUCTION OF PRIMARY AMINES

Herbert Göthel, Oberhausen-Holten; Boy Cornils; Hans Feichtinger, both of Dinslaken; Hans Tummes, Oberhausen-Sterkrade-Nord, and Jurgen Falbe, Dinslaken, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Continuation of Ser. No. 182,773, Sept. 22, 1971, abandoned. This application Nov. 20, 1973, Ser. No. 417,590
Claims priority, application Germany, Oct. 3, 1970, 2048750
Int. Cl.[2] C07C *85/02*
U.S. Cl. 260—585 B 11 Claims

1. In a process for the production of a primary amine by conversion at a first pressure of a compound selected from the group consisting of an aliphatic aldehyde having 2–15 carbon atoms, a cycloaliphatic aldehyde and an aryl aldehyde, said aldehydes containing no other functional group other than a carbonyl group, with ammonia to produce a reaction product and catalytic hydrogenation of said reaction product in the presence of a catalyst, wherein the catalyst contains cobalt, nickel, or a mixture thereof, the improvement which consists essentially of reacting said compounds with ammonia at a temperature of between about 15° and 80° C. at a pressure of between about 1 and 15 atmospheres, separating the water formed during the reaction from said reaction product and hydrogenating said product under a second pressure, said second pressure being greater than said first pressure.

4,041,081

METHOD FOR THE PREPARATION OF PURE N-ALDEHYDES

Ludger Bexten, Kirchhellen; Heinz Noeske, Oberhausen; Hans Tummes, Oberhausen, and Boy Cornils, Dinslaken, all of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed Dec. 4, 1975, Ser. No. 637,739
Claims priority, application Germany, Dec. 14, 1974, 2459152
Int. Cl.[2] C07C *47/02*
U.S. Cl. 260—601 R 15 Claims

1. A process for the isolation of n-aldehyde from an organic solution containing n-aldehyde and i-aldehyde obtained by the reaction of an olefin with carbon monoxide and hydrogen in the presence of a catalyst at a reaction temperature between room temperature and 130° C. by adding no more than a stoichiometric amount based on said n-aldehyde of an alkali metal hydrogen sulfite in aqueous solution to said organic solution whereby a preciptate of n-aldehyde hydrogen sulfite is formed, and removing said n-aldehyde from said preciptate.

4,041,082

PROCESS FOR PRODUCING ALDEHYDES

Takeru Onoda, Yokohama, and Tetsuo Masuyama, Machida, both of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Filed July 25, 1975, Ser. No. 599,198
Claims priority, application Japan, July 25, 1974, 49-85523
Int. Cl.[2] C07C *45/08*
U.S. Cl. 260—604 HF 18 Claims

1. In a process for producing an aldehyde including the steps of supplying to a hydroformylation reaction zone an olefin selected from the group consisting of ethylene, propylene, butene and hexene, carbon monoxide and hydrogen together with a catalyst solution consisting essentially of a solvent and a rhodium-tertiary phosphine complex catalyst dissolved therein to form an aldehyde, distilling the reaction mixture obtained from the hydroformylation reaction zone and containing the aldehyde formed in a distillation zone to separate the aldehyde from the catalyst solution, and recycling the catalyst solution from the distillation zone to the hydroformylation reaction zone, the improvement which comprises contacting at least a part of the catalyst solution with carbon dioxide having the partial pressure higher than about 1 Kg/cm^2 at a temperature of about 60° to 200° C in the hydroformylation reaction zone.

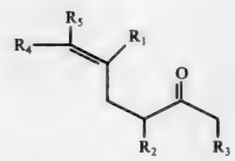
4,041,083

PROCESS FOR THE SELECTIVE HYDROGENATION OF THE KETO GROUP IN NONCONJUGATED OLEFINIC KETONES

Peter S. Gradeff, Andover, and Giuseppe Formica, Piscataway, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Filed Sept. 30, 1976, Ser. No. 728,346
Int. Cl.[2] C07C *29/00*
U.S. Cl. 260—617 C 16 Claims

1. A process for the preparation of olefinically unsaturated alcohols which comprises selectively hydrogenating the keto group of nonconjugated olefinic ketones having the general formula:



wherein

R_1 is selected from the group consisting of hydrogen, methyl and ethyl; and

R_1 taken together with one of R_4 and R_5 to form an unsaturated cycloaliphatic ring;

R_2 is selected from the group consisting of hydrogen, and, when R_3 is hydrogen, methyl;

R_3 is selected from the group consisting of hydrogen, and, when R_2 is hydrogen, methyl, ethyl and phenyl; and

R_2 and R_3 taken together to form a six-membered saturated cycloaliphatic ring comprising the keto group;

R_4 and R_5 are selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, cycloalkyl, alkcycloalkyl and cycloalkalkyl, having from one to about fifty carbon atoms; and

R_4 and R_5 taken together to form a cycloaliphatic ring; in the presence of hydrogen; chromium-promoted Raney nickel prepared by alkaline digestion of the alloy of nickel aluminum and chromium and containing from about 0.5 to about 20% by weight chromium; a strong alkali selected from the group consisting of alkali metal hydroxides and alcoholates having from one to about thirty carbon atoms; and a lower alkanol having from one to two carbon atoms.

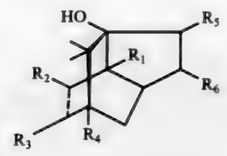
4,041,084

TRICYCLIC ALCOHOLS

Kenneth K. Light, Long Branch, N.J.; Edward J. Shuster, Brooklyn, N.Y.; Joaquin F. Vinals, Red Bank, and Manfred Hugo Vock, Locust, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 485,554, July 3, 1974, abandoned. This application May 5, 1976, Ser. No. 683,246
Int. Cl.[2] C07C *35/22*
U.S. Cl. 260—617 F 3 Claims

1. A compound having the structure:



wherein each of R_1, R_2, R_3, R_4, R_5 and R_6 is selected from the group consisting of hydrogen and methyl; wherein the dashed line is a carbon-carbon single bond or a carbon-carbon double bond; and wherein when the dashed line is a carbon-carbon single bond, one of R_2 or R_3 is hydrogen.

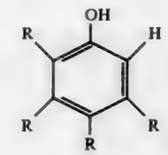
4,041,085

ORTHO-ALKYLATION OF PHENOLS

Alton J. Frabetti, Jr., Wrentham, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 852,453, Aug. 22, 1969, abandoned. This application Nov. 17, 1975, Ser. No. 632,561
Int. Cl.[2] C07C *37/16*
U.S. Cl. 260—621 R 12 Claims

1. In a process for selectively alkylating a phenol in the ortho position which comprises the vapor phase reaction in the presence of a magnesium oxide alkylation catalyst of an alkyl alcohol and a phenol having the general formula:



where R is a monovalent substituent from the group consisting of hydrogen, alkyl, phenyl and alkyl substituted phenyl; the improvement comprising adding water vapor to the vapor phase reaction in which said phenol is treated with said alkyl alcohol.

4,041,086

PROCESS OF MANUFACTURE OF FLOURINATED ALKYLADAMANTANES

Robert E. Moore, New Castle County, Del., and Edward J. Janoski, Havertown, Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 224,266, Feb. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 314,529, Oct. 7, 1963, abandoned, and Ser. No. 440,614, March 17, 1965, Pat. No. 3,641,167. This application Jan. 12, 1976, Ser. No. 647,944
The portion of the term of this patent subsequent to Feb. 8, 1989, has been disclaimed.
Int. Cl.[2] C07C *23/18*
U.S. Cl. 260—648 F 5 Claims

1. Highly fluorinated hydrocarbons formed by fluorinating an alkyladamantane having from 11 to 30 carbon atoms in

which the degree of fluorination is at least 75% of that corresponding to perfluorination.

4,041,087

METHOD FOR THE DIRECT PREPARATION OF HALOGENATED HYDROCARBONS BY THE REACTION OF CO, H_2 AND HALOGEN IN THE PRESENCE OF A CATALYST

M. Albert Vannice, Boalsburg, Pa., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 26, 1975, Ser. No. 607,763
Int. Cl.² C07C *19/00, 27/06*
U.S. Cl. 260—652 R **18 Claims**

1. A method for the preparation of halogenated hydrocarbons of the formula $C_AH_{2A+2-B}X_B$ wherein X is a halogen selected from the group consisting of fluorine, chlorine, bromine and iodine, A is an integer ranging from 1 to 4 inclusive and B is an integer ranging from 1 to 10 inclusive, except that 2A+2—B may not be less than zero, which method comprises the steps of:

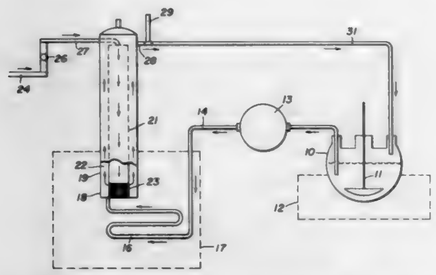
1. preparing a system comprising CO, H_2 and a source of halogen wherein the source of halogen is selected from the group consisting of molecular halogen and hydrogen halides;
2. passing said system over a catalyst metal selected from the group consisting of Group VIII metals, rhenium, and platinum-iridium and platinum-rhenium alloys, which catalyst metal is in combination with an acidic inorganic oxide material;
3. heating the system containing the CO, H_2 and halogen source over the catalyst to a temperature in the range of 200° C – 1000° C; and
4. pressurizing the system to a level in the range of 0.1 atm. to 500 atm.

4,041,088

RECIRCULATION TELOMERIZATION PROCESS AND ITS LIQUID TELOMERS AND LIQUID TELOMERS PRODUCED THEREBY

Ricardo O. Bach, and Robert C. Morrison, both of Gastonia, N.C., assignors to Lithium Corporation of America, Gastonia, N.C.

Filed Nov. 8, 1976, Ser. No. 739,484
Int. Cl.² C07C *15/02*
U.S. Cl. 260—668 B **17 Claims**



1. In a recirculation process of producing normally liquid telogens wherein a telogen is metalated with an organometal initiator in a container and said metalated telogen is then reacted with at least one gaseous taxogen selected from the group of conjugated dienes and vinyl-substituted aromatic compounds, the steps which comprise forming and maintaining a solution of said telogen and said initiator in said container, passing said solution into the reaction zone of a reactor, continuously passing a controlled stream of said gaseous taxogen through fine apertures into said reaction zone of said reactor where it commingles with said solution of the telogen and the initiator to produce a reaction mixture containing normally liquid telomer, returning said reaction mixture to said container to commingle with the solution therein of said telogen and initiator, and recirculating the contents of said container into said reaction zone for further reaction with said gaseous taxogen passing through said fine apertures.

4,041,089

PROCESS FOR THE ISOMERIZATION OF DIMETHYLNAPHTHALENES USING A MORDENITE/ALUMINA CATALYST

John K. Allen, Batavia, Ill., and Ralph J. Bertolacini, Chesterton, Ind., assignors to Standard Oil Company a corporation of Indiana, Chicago, Ill.

Filed June 28, 1976, Ser. No. 700,323
Int. Cl.² C07C *5/24*
U.S. Cl. 260—668 A **11 Claims**

1. A method for isomerization of dimethylnaphthalenes including conversion of a feed containing 1,5-dimethylnaphthalene to 1,6 and 2,6-dimethylnaphthalenes, the process comprising contacting said feed at isomerization conditions with a catalyst consisting essentially of from about 35 to about 45 weight percent of mordenite in the hydrogen form dispersed in a gamma alumina matrix, to effect the production of said 1,6 and 2,6-dimethylnaphthalenes.

4,041,090

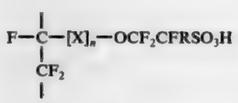
ETHYLBENZENE PROCESS USING AN UNSUPPORTED PERFLUORINATED POLYMER CATALYST

James D. McClure, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 663,897, March 4, 1976. This application Dec. 20, 1976, Ser. No. 752,350
Int. Cl.² C07C *3/52*
U.S. Cl. 260—671 R **3 Claims**

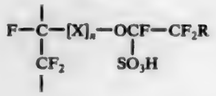
1. A liquid phase process for the preparation of ethylbenzene which comprises contacting an ethylene feed stream with a benzene feed stream at a reaction temperature of between about 125° and about 225° C in the presence of an unsupported solid perfluorinated polymer catalyst wherein said catalyst contains a repeating structure selected from the group of:

a)



or

b)



where *n* is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoroalkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:

$[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

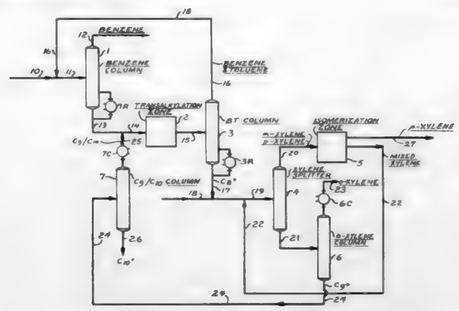
where *m* is an integer from 2 to 10 and Y is a radical selected from the class consisting of fluorine and trifluoromethyl radical.

4,041,091

FRACTIONATION OF AROMATIC STREAMS

Michel Jacques Henry, Brussels, Belgium, assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 19, 1976, Ser. No. 659,393
Int. Cl.² C07C *3/62*
U.S. Cl. 260—672 T **5 Claims**



1. A combination xylene separation and a toluene transalkylation process, for producing benzene and orthoxylene comprising the steps of:

a. transalkylating a mixture of toluene and C_9 alkylbenzene in a transalkylation zone at transalkylation conditions to produce a transalkylation zone effluent comprising benzene, toluene, C_8 alkylbenzenes, C_9 alkylbenzenes, and C_{10} alkylbenzenes;
b. fractionating at least a portion of said transalkylation zone effluent in a distillation column wherein benzene and toluene are recovered as an overhead fraction and materials heavier than toluene are recovered as a bottoms fraction;
c. fractionating said benzene and toluene fraction in a fractionation column to produce a benzene product and to recover a toluene-rich stream which comprises at least a portion of the charge to the transalkylation zone;
d. passing at least a portion of said bottoms fraction, comprising material heavier than toluene, into a xylene fractionator, and recovering overhead a stream comprising orthoxylene and recovering as a bottoms fraction a stream comprising C_9 and C_{10} alkylbenzenes;
e. passing the C_9 and C_{10} alkylbenzene bottoms fraction to a fractionation zone to recover overhead a stream comprising C_9 alkylbenzenes, at least a portion of which C_9 alkylbenzenes stream is charged to the transalkylation zone;
f. reboiling the column producing benzene product by indirect heat exchange with vapors from the column producing C_9 alkylbenzenes as an overhead fraction; and,
g. reboiling the column producing benzene and toluene as an overhead fraction by indirect heat exchange with a stream comprising orthoxylene vapors obtained as an overhead vapor fraction from the xylene fractionator.

4,041,092

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 555,648, March 5, 1975, Pat. No. 3,956,103. This application Apr. 23, 1976, Ser. No. 679,605
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² C07C *5/22*
U.S. Cl. 260—673.5 **21 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum or palladium, about 0.01 to about 2 wt. % rhodium, about 0.01 to about 2 wt. % rhenium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum or palladium, rhodium and rhenium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum or palladium is present in the elemental metallic state; and wherein substantially all of the rhenium and rhodium are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,041,093

METHOD OF DEHYDROGENERATION, DEHYDROCYCLIZATION AND HYDRODEALKYLATION

Viktor Sergeevich Smirnov, Kutuzovsky prospekt, 26, kv. 555; Vladimir Mikhailovich Gryaznov, Leninskie Gory, MG4, Zona L, kv. 11; Valentina Ivanovna Lebedeva, Leninsky prospekt, 48a, kv. 29; Alexandr Petrovich Mischenko, Khersonskaya ulitsa, 7, korpus 4, kv. 115; Victoria Petrovna Polyakova, ulitsa Trofimova, 15, kv. 201, and Evgeny Mikhailovich Savitsky, ulitsa Dm.Ulyanova, DNR-3, kv. 13, all of Moscow, U.S.S.R.

Continuation of Ser. No. 434,224, Jan. 17, 1974, abandoned, which is a division of Ser. No. 271,186, July 12, 1972, Pat. No. 3,865,891, which is a division of Ser. No. 23,037, March 26, 1970, abandoned. This application May 19, 1975, Ser. No. 578,659
Int. Cl.² C07C *5/32*; B01J *23/64, 35/02*
U.S. Cl. 260—673.5 **5 Claims**

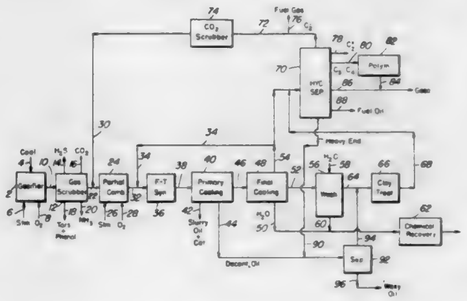
1. A method for the selective preparation of aromatic hydrocarbons by the dehydrocyclization of paraffins, which comprises the passing of a vaporized paraffin hydrocarbon feedstock at a temperature of 300° to 650° C over a catalyst in the form of a foil made of palladium alloyed with at least one member selected from the group consisting of rhenium, tungsten, and a combination of tungsten and ruthenium, the content of palladium in said alloy ranging from 60 to 99 weight percent.

4,041,094

METHOD FOR UPGRADING PRODUCTS OF FISCHER-TROPSCH SYNTHESIS

James C. Kuo, Cherry Hill; Charles Dwight Prater, Pitman, both of N.J., and John J. Wise, Media, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,587
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **4 Claims**



1. A method for upgrading Fischer-Tropsch synthesis products boiling below about 560° F which comprises cooling and separating at a temperature of about 100° F a Fischer-Tropsch synthesis product boiling below about 560° F into a gaseous phase, a water phase and a hydrocarbon phase,

water washing said hydrocarbon phase to recover oxygen-

ates and combining the water phase above obtained for chemical processing,

passing said hydrocarbon phase in contact with a crystalline aluminosilicate zeolite conversion catalyst that has a pore size greater than about 5 Angstroms; a silica to alumina ratio of at least 12; and a constraint index within the range of 1 to 12 under temperature conditions selected from within the range of 500° to 950° F and a pressure selected from within the range of 0 to 300 psig to produce a gasoline product of improved octane rating,

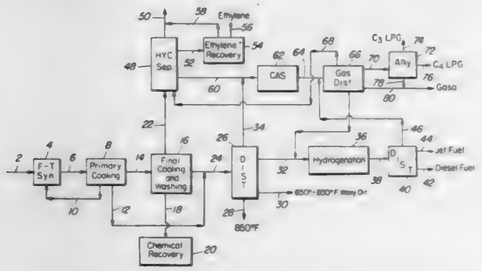
separating the product of said crystalline zeolite conversion operation and said synthesis product gaseous phase under conditions to recover an ethylene rich fraction, a gaseous components fraction suitable for conversion to gasoline boiling materials, a gasoline fraction of improved octane rating, a light fuel oil fraction and a heavier oil fraction.

4,041,095

METHOD FOR UPGRADING C_3 PLUS PRODUCT OF FISCHER-TROPSCH SYNTHESIS

James C. Kuo, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,582
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **3 Claims**



1. In a process combination wherein the effluent of a Fischer-Tropsch synthesis operation is cooled and separated to provide a decant oil fraction, a liquid hydrocarbon fraction boiling below said decant oil, a gaseous hydrocarbon fraction and a water fraction, the method for improving the quality of the hydrocarbon fractions thus separated which comprises,

recovery from said liquid hydrocarbon fractions, a first gasoline fraction, a waxy oil fraction boiling up to about 850° F, a fraction boiling above about 850° F and a light oil fraction boiling between said first gasoline fraction and said recovered waxy oil fraction,

hydrogenating said light oil fraction and separating the hydrogenated product thereof to recover a diesel fuel product, a jet fuel boiling product and a lighter fraction boiling below said jet fuel,

separating said gaseous hydrocarbon fraction recovered from the Fischer-Tropsch synthesis effluent under conditions to recover an ethylene rich stream from a stream comprising C_3 to C_6 hydrocarbons, combining said stream comprising C_3 to C_6 hydrocarbons with said separated first gasoline fraction and contacting the thus combined streams with a selective crystalline zeolite conversion catalyst under conditions to substantially raise the octane number of the gasoline charged thereto,

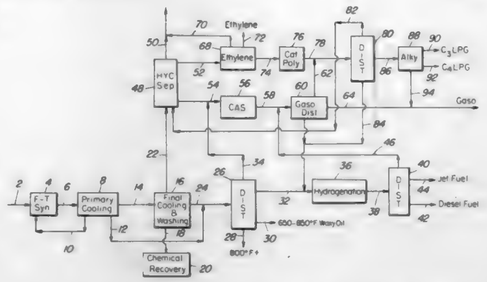
separating the effluent of said crystalline zeolite conversion operation and said lighter fraction separated from said jet fuel under conditions to recover a higher octane gasoline boiling product fraction, a fraction comprising C_3 to C_4 hydrocarbons and a hydrocarbon fraction higher boiling than said higher octane gasoline fraction, passing the thus recovered higher boiling hydrocarbon fraction to said hydrogenation step, alkylating said fraction comprising C_3 to C_4 hydrocarbons to produce LPG product and gasoline boiling product and blending gasoline boiling product of said alkylation operation with said higher octane gasoline product.

4,041,096

METHOD FOR UPGRADING C_5 PLUS PRODUCT OF FISCHER-TROPSCH SYNTHESIS

James C. Kuo, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,590
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **4 Claims**



1. In a process combination wherein the effluent of Fischer-Tropsch synthesis is cooled, water washed and separated to provide a decant oil fraction, a liquid hydrocarbon fraction boiling below said decant oil fraction, a gaseous fraction and a water phase, the method for upgrading the hydrocarbon fractions thus recovered which comprises,

combining the decant oil fraction with the lower boiling liquid hydrocarbon fraction and separating the combined fractions under conditions to recover a first gasoline and lower boiling fraction, a light oil fraction, and a heavy waxy oil fraction of an end point of about 850° F, said light oil fraction having an initial boiling point within the range of 325° to 400° F and an end boiling point within the range of 600° to 650° F,

subjecting the light oil fraction to catalytic hydrogenation under conditions to produce upon separation of the product, a diesel fuel product, a jet fuel product and a second gasoline containing fraction comprising lower boiling components,

separating the gaseous fraction recovered from the Fischer-Tropsch synthesis product under conditions to recover an ethylene rich fraction, lower boiling gaseous material, a fraction comprising C_2 to C_4 hydrocarbons and a fraction comprising C_5 and higher boiling materials,

separating said C_2 to C_4 hydrocarbon fraction into an ethylene rich stream and a C_3 and C_4 stream thereafter passed to catalytic polymerization,

combining said C_5 and higher boiling fraction with said first gasoline and lower boiling fraction above recovered and contacting the thus combined materials wth a crystalline zeolite catalyst under conditions selective for producing a gasoline product of improved octane rating, combining the effluent of the crystalline zeolite catalyst step with the recovered second gasoline fraction and separating the thus combined material to recover a third gasoline product fraction of improved octane rating, a C_4 minus gaseous fraction and product fraction boiling above said third gasoline product fraction,

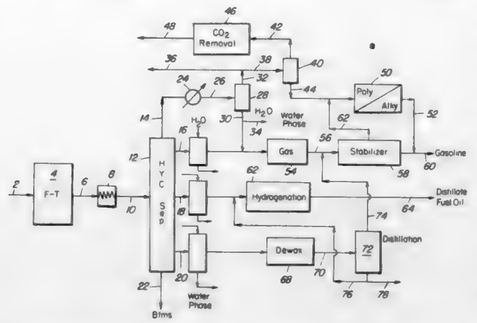
separating the C_4 minus gaseous fraction above recovered with the product effluent of said catalytic polymerization operation to recover material higher boiling than gasoline, a C_2 minus material fraction and a C_3-C_4 rich stream thereafter passed to catalytic alkylation and blending an alkylate product with said gasoline product of improved octane above recovered.

4,041,097

METHOD FOR ALTERING THE PRODUCT DISTRIBUTION OF FISCHER-TROPSCH SYNTHESIS PRODUCT

Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,588
Int. Cl.² C07C *1/04*
U.S. Cl. 260—676 R **8 Claims**



1. A method for upgrading the products of Fischer-Tropsch synthesis which comprises,

separating the product effluent of Fischer-Tropsch synthesis into a gaseous fraction comprising C_5 and lower boiling components, a C_5 plus gasoline fraction, a light oil fraction boiling in the range extending from said gasoline fraction up to about 600° F, and a high boiling waxy fraction,

cooling said gaseous fraction under conditions to separate and recover a water phase from a gaseous hydrocarbon phase comprising C_5 and lower boiling gaseous components,

separating the gaseous hydrocarbon phase to recover a fraction rich in C_2 to C_5 hydrocarbons thereafter catalytically converted to gasoline boiling range components,

passing C_5 plus gasoline boiling material in contact with a crystalline zeolite conversion catalyst selective for producing a gasoline product of improved octane rating and separating the gasoline of improved octane rating from lower boiling gaseous material,

passing the separated high boiling waxy fraction in contact with a hydrodewaxing catalyst selective for producing a dewaxed light oil fraction and a gasoline fraction of relatively high octane rating subsequently separated from one another,

combining the dewaxed light oil fraction produced above with said separated light oil product of Fischer-Tropsch snythesis and passing the combined light oil material in contact with a hydrogenation catalyst maintained under hydrogenating conditions, recovering a hydrogenated light oil product and

recovering the gasoline products of the improving combination.

4,041,098

METHOD FOR THE OLIGOMERIZATION OF ALPHA-OLEFINS

Frederick C. Loveless, Cheshire, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 484,836, July 1, 1975, abandoned. This application Nov. 17, 1975, Ser. No. 632,342
Int. Cl.² C07C *3/10*; B01J *31/12*
U.S. Cl. 260—683.15 D **9 Claims**

1. A method of oligomerizing straight chain alpha olefins having at least 3 carbon atoms comprising, generating in situ a soluble catalyst system by simultaneously adding with stirring to a reactor having an inert atmosphere and a temperature up to 200° C., a first feed comprising a straight chain alpha-olefin monomer having at least 3 carbon atoms and a minor amount of a soluble aluminum alkyl halide and a second feed comprising a straight chain alpha-olefin monomer having at least three carbon atoms and a minor amount of a soluble organic halide; wherein said soluble aluminum alkyl halide compound is selected from the group consisting of ethyl aluminum sesquichloride, ethyl aluminum dichloride and diethyl aluminum chloride, and said soluble organic halide is selected from the group consisting of a primary, secondary or tertiary aliphatic halide, an allylic halide or a benzylic halide, said soluble organic halide possessing; (a) at least one halogen-bearing carbon atom in the molecule and (b) not more than one halogen atom attached to any single carbon atom in said molecule; said aluminum alkyl halide being present in said catalyst system in an amount of at least about 0.1% by weight of the total monomer content and in sufficient amount to provide a total Hal/Al ratio in said catalyst system of at least about 2.5/1.

4,041,099

PARAFFIN DEHYDROGENATION USING PLATINUM-TIN PROMOTED ZINC ALUMINATE CATALYST AND SILICA-FREE PARTICLES

Thomas Hutson, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 216,100, Jan. 7, 1972, Pat. No. 4,005,985. This application Sept. 3, 1976, Ser. No. 720,317
Int. Cl.² C07C *5/36*
U.S. Cl. 260—683.3 **3 Claims**

1. A process for dehydrogenating a hydrocarbon feedstock comprising alkanes, cycloalkanes, arylalkanes or mixtures thereof in which the feedstock is dehydrogenated in contact with a layer of platinum-tin promoted zinc aluminate catalyst, said process comprising maintaining a first and a second layer of silica-free particles with the catalyst layer arranged between these layers of silica-free particles and passing the feed stream through one of said first and second layers of silica-free particles and thereafter through the catalyst layer.

4,041,100

CATALYTIC ALKYLATION UTILIZING OLEFINIC, CONJUGATED CYCLIC HYDROCARBONS AS PROMOTER THEREIN

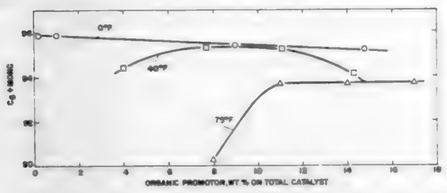
William C. Behrmann; Earl E. Turner, both of Baton Rouge, La., and Victor C. Bastron, Seabrook, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Dec. 19, 1975, Ser. No. 642,539
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.47 **16 Claims**

1. In an alkylation process which comprises contacting a paraffin with an olefin at alkylation conditions and in the presence of an organic promoter comprising olefinic conjugated cyclic hydrocarbons and an alkylation catalyst comprising a strong acid catalyst selected from the group consisting of halosulfuric acid, trihalomethanesulfonic acid and mixtures thereof, the improvement which comprises the steps of:

1. effecting substantially the entire alkylation at a tempera-

ture from above about 0° F. to about 120° F by adding to the alkylation at least 4 to about 20 wt. %, based on total catalyst, of said organic promoter and



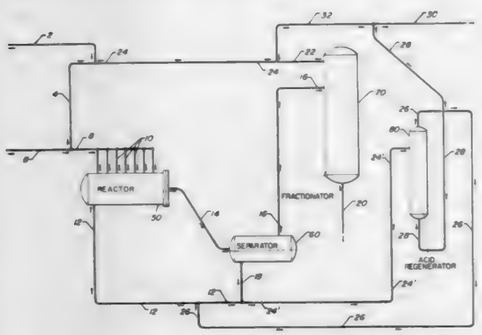
2. recovering from step (1) an alkylate of enhanced product quality relative to that obtained when said alkylation is effected outside the conditons set forth in step (1).

4,041,101

HF ALKYLATION PROCESS WITH ADDITION OF ACID REGENERATOR BOTTOMS TO THE RECYCLE ISOPARAFFIN STREAM

Jay E. Sobel, Highland Park, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 3, 1975, Ser. No. 637,444
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.51 **4 Claims**



1. In a process for alkylating an olefin with an isoparaffin in the presence of HF acid catalyst in a reaction zone wherein the amount of isoparaffin is in excess of that required to react with the olefin, unreacted isoparaffin is recovered by fractionation from alkylate product, at least a portion of unreacted isoparaffin is recycled to the reaction zone, and wherein there is present in the recycle isoparaffin stream a HF acid of high activity and wherein at least a portion of the HF acid catalyst used in the reaction zone is removed from the process for regeneration in a HF acid regenerator fractionator and a stream of organic diluent is recovered as a bottoms fraction from said fractionator, the improvement comprising addition at least a portion of said organic diluent to the recycle isoparaffin stream thereby attenuating the activity of the HF acid contained in the recycle isoparaffin.

4,041,102

CAUSTIC TREATMENT OF ALKYLATE-CONTAINING HYDROCARBON

John A. Wronka, Pennsauken, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed Sept. 12, 1975, Ser. No. 613,007
Int. Cl.² C07C *3/54*
U.S. Cl. 260—683.62 **3 Claims**

1. In a continuous process for treating an alkylate-containing hydrocarbon phase exiting from an anionic surfactant-promoted, sulfuric acid-catalyzed alkylation unit, wherein the hydrocarbon phase contains said alkylate, unreacted isoparaffin, traces of the sulfuric acid alkylation catalyst and doecylbenzenesulfonic acid alkylation promotor, the improvement comprising,

a. mixing said hydrocarbon stream with a water caustic solution, having at least 15% by wt. concentration of caustic, such that the salt of the promotor appears as a flocculent precipitate at the hydrocarbon-caustic interface in a hydrocarbon-caustic separator, and (b) introducing the hydrocarbon-caustic mixture into a hydrocarbon-caustic solution separator at a position above said hydrocarbon-caustic solution interface within said hydrocarbon-caustic separator, by allowing the hydrocarbon-caustic mixture to fall by gravity from the introduction point into said hydrocarbon-caustic solution separator, and thus allowing separation of the hydrocarbon stream from the hydrocarbon-caustic solution mixture to be accomplished in a quiescent, non-turbulent manner.

4,041,103

BLENDS OF CERTAIN HYDROGENATED BLOCK COPOLYMERS

Sol Davison, and William P. Gergen, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

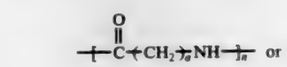
Filed June 7, 1976, Ser. No. 693,462
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 D **8 Claims**

1. A composition comprising the admixture obtained by intimately mixing 100 parts by weight of a block copolymer and about 5 to about 200 parts by weight of a polyamide so as to form an interpenetrating network wherein:

a. said block copolymer comprises at least two monoalkenyl arene polymer end blocks A and at least one substantially completely hydrogenated conjugated diene polymer midblock B, said block copolymer having an 8 to 55 percent by weight monoalkenyl arene polymer block content, each polymer block A having an average molecular weight of between about 5,000 and about 125,000, and each polymer block B having an average molecular weight of between about 10,000 and about 300,000; and

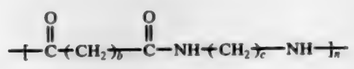
b. said polyamide has the formula:

I



or

II



where *a* or *b* or *c* individually vary from 4 to 12 inclusive, and n is chosen so that the number average molecular weight is between about 10,000 and about 30,000.

4,041,104

HIGH IMPACT CORROSION RESISTANT POLYMERS

Jeffrey E. Selley, East Amherst, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 29, 1975, Ser. No. 608,931
Int. Cl.² C08L *75/00*
U.S. Cl. 260—859 R **13 Claims**

1. A polymerizable composition comprising (A) a vinyl monomer, present in an amount of about 30 to 50 weight percent; and (B) a prepolymer blend, present in an amount of about 50 to 70 weight percent, obtained by the steps of (a) reacting an organic dissocyanate and a hydroxyl-terminated polydiene in a molar ratio of about 0.01 to about 0.2 moles of polydiene per mole of diisocyanate, wherein greater than 75% of the unsaturation present in said polydiene is of the 1,4-type and less than 25% of the unsaturation present is of the 1,2-type, ane (b) reacting the product of step (a) with a hydroxyalkyl acrylate in a molar ratio of about 1.5 to about 2.0 moles per mole of said diisocyanate.

4,041,105

POLYURETHANE ELASTOMER DERIVED FROM GRAFT OF ETHYLENICALLY UNSATURATED MONOMER ON POLYALKYLENE ETHER GLYCOL

Francis X. O'Shea, Naugatuck, and Chung-Ling Mao, Sandy Hook, both of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,595
Int. Cl.² C08H *75/00*
U.S. Cl. 260—859 R **5 Claims**

1. A thermally stable polyurethane elastomer which is a reaction product of: (a) a graft polyol prepared by the in situ polymerization of ethylenically unsaturated monomeric material in a poly(oxypropylene)-poly(oxyethylene)glycol of molecular weight from about 1750 to 4000 and containing from 30% to 50% oxyethylene groups by weight, the amount of polymerized monomer in the graft polyol being from 5 to 50 % by weight; (b) methylenebis(4-phenylisocyanate); and (c) 1,4-butanediol; the NCO/OH equivalents ratio being from 0.95 to 1.2 and the molar ratio of (c) and (a) being from 4/1 to 12/1; said elastomer having a hardness of about 40 to 55 Shore D, an elongation of greater than 30%, an ultimate tensile strength of at least 2500 psi and a Die C tear strength of at least 500 pli, said elastomer displaying improved thermal stability as evidenced by its ability to retain at least twice as much of its original tensile strength, after exposure to a temperature of 415° F. for twenty minutes, as an otherwise similar elastomer in which (a) contains 10% or less of oxyethylene groups.

4,041,106

VINYL CHLORIDE POLYMER COMPOSITION MODIFIED FOR TRANSPARENCY, IMPACT AND THERMAL RESISTANCE

Fumio Ide; Kazuo Kishida, and Norihisa Osaka, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed May 11, 1976, Ser. No. 685,145
Claims priority, application Japan, May 15, 1975, 50-58389
Int. Cl.² A43B *13/04*; C08L *51/06*; C08F *6/24*
U.S. Cl. 260—876 R **6 Claims**

1. A thermoplastic vinyl chloride polymer composition comprising a blend of:

I. 61 to 85 parts by weight of polyvinyl chloride and/or a copolymer comprised of no less than 80% by weight of vinyl chloride and no more than 20% by weight of at least one other copolymerizable monoethylenically unsaturated monomer, and;

II. 15 to 39 parts by weight of a composite elastomer composition consisting essentially of:

A. 20 to 60% by weight, based on the weight of the composite elastomer composition, of a graft copolymer consisting of (a) 15 to 45% by weight of graft monomers consisting of 30 to 70% by weight of methyl methacrylate and 30 to 70% by weight of styrene and (b) 55 to 85% by weight of a butadiene rubber, said graft copolymer being prepared by a sequential polymerization procedure of at least two stages, wherein during the first stage at least part of the methyl methacrylate is polymerized in the presence of a latex of said butadiene rubber, said butadiene rubber particles dispersed therein having an average particle size of 0.10 to 0.30 micron and a refractive index of 1.530 to 1.550 was determined at 20° C, and then, in a subsequent sequential stage or stages, which can be carried out in any order, the first polymerizate is separately polymerized with styrene and separately polymerized with the remainder of the methyl methacrylate, if any, and

B. 40 to 80% by weight, based on the weight of the composite elastomer composition, of a copolymer consisting of 35 to 65% by weight of α-methylstyrene, 10 to 60% by weight of methyl methacrylate, 5 to 35% by weight of acrylonitrile and 0 to 10% by weight of at least one other copolymerizable monoethylenically unsaturated monomer.

4,041,107

THERMALLY STABLE POLYPHOSPHONATES AS FLAME RETARDANTS

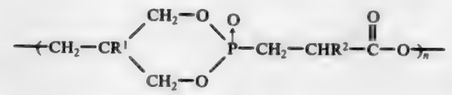
James S. Clovis, and Francis R. Sullivan, both of Warminster, Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 139,948, May 3, 1971, Pat. No. 3,755,270.
This application May 29, 1973, Ser. No. 364,838
Int. Cl.² C08F *259/00, 275/00*
U.S. Cl. 260—876 R **5 Claims**

1. As an article of manufacture, an acrylic composition comprising an addition polymer formed by polymerizing a mixture comprising:

a. at least 50 weight percent of methyl methacrylate; and

b. 5 to 30 weight percent of a flame-resistant phosphonate polymer defined by the general formula



wherein R^1 is methyl or ethyl, R^2 is hydrogen or methyl and *n* is 3 to 100.

4,041,108

PROCESS FOR PRODUCING VINYL GRAFT COPOLYMER RESIN

Fusaji Shoji; Hiroyoshi Kokaku; Hisashi Kohkame, and Koiti Kakefuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 14, 1975, Ser. No. 558,373
Claims priority, application Japan, Mar. 20, 1974, 49-30950
Int. Cl.² C08L *33/08*
U.S. Cl. 260—881 **19 Claims**

1. A process for producing a vinyl graft copolymer resin by graft copolymerization of a cross-linked acrylic rubber obtained from an acrylic acid ester having the general formula:

$$CH_2 = CH - COOR$$

wherein R is an alkyl group having 2 – 8 carbon atoms, and a polymerizable vinyl monomer which comprises agglomerating acrylic rubber particles by stirring a mixture of 5 to 50 parts by weight (solid rubber basis) of an aqueous latex of the acrylic rubber and 95 to 50 parts by weight of the vinyl monomer consisting essentially of a polymerizable aromatic vinyl monomer in the presence of a coagulating agent to form an aqueous emulsion, the particle size of the acrylic rubber particle agglomerates being adjusted to a range 0.2 to 10λ, initiating graft polymerization by emulsion polymerization of the acrylic rubber particle agglomerates and the vinyl monomer in the presence of a free radical initiator, adding a surface active agent during the emulsion polymerization, continuing the emulsion polymerization until demulsification occurs while the particle size of the agglomerates of the acrylic rubber particles and grafted acrylic rubber particles is adjusted to a range of 0.2 to 10λ, and then completing the graft polymerization by suspension polymerization.

4,041,109

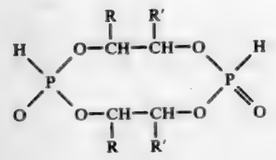
DIPHOSPHOROUS

Jean Abblard, St. Didier au Mont d'Or; Georges Marmain, Fontaine sur Seine, and Andrée Viricel, Lyon, all of France, assignors to Philagro, France

Filed Mar. 24, 1975, Ser. No. 561,220
Claims priority, application France, Mar. 22, 1974, 74.10988
Int. Cl.[2] C07F *9/21*; A01N *9/36*
U.S. Cl. 260—927 R **3 Claims**

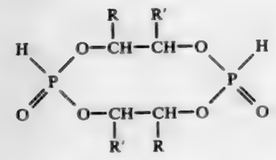
1. Isomeric cyclic diphosphorous compounds of the following formulae:

(I)



and

(II)



wherein

R and R′ are hydrogen, but cannot both be hydrogen;
alkyl radicals containing 1 to 5 carbon atoms; and
halogenated alkyl radicals of 1–5 carbon atoms; and mixtures thereof.

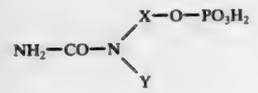
4,041,110

MONOPHOSPHORIC ACID ESTERS OF HYDROXY ALKYL UREA COMPOUNDS

Friedrich Krüeger, Edingen, and Güenter Schmidt, Ludwigshafen, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen (Rhine), Germany

Filed Nov. 7, 1975, Ser. No. 629,755
Claims priority, application Germany, Nov. 8, 1974, 2453037
Int. Cl.[2] C07F *9/141*; C02B *5/06*
U.S. Cl. 260—938 **4 Claims**

1. A phosphoric acid ester of a hydroxy alkyl urea compound of the formula



in which

X is a member selected from the group consisting of lower alkyl with 2 to 6 carbon atoms and lower alkoxy lower alkyl with 2 to 6 carbon atoms, while

Y is a member selected from the group consisting of hydrogen and the —X—O—PO_3H_2 group or the water soluble salts thereof.

4,041,111

PHOSPHONATE MONOESTERS AND METHOD OF PREPARATION

Susan J. Kelly, Lafayette, and Larry G. Butler, West Lafayette, both of Ind., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Mar. 4, 1975, Ser. No. 555,097
Int. Cl.[2] C07F *9/40*
U.S. Cl. 260—954 **6 Claims**

1. A substrate for phosphodiesterase enzymes, said substrate being a biologically active phosphonate monoester that is hydrolized by said phosphodiesterase enzymes with said phosphonate monoester being selected from the group consisting of 4-nitrophenyl phenylphosphonate, 2-naphthyl phenylphosphonate, 4-nitrophenyl cyclohexylphosphonate, 2-naphthyl cyclohexylphosphonate, 4-nitrophenyl 1-propylphosphonate, 2-naphthyl 1-propylphosphonate, 4-nitrophenyl 2-propylphosphonate, 2-naphthyl 2-propylphosphonate, 4-nitrophenyl chloromethylphosphonate, 2-naphthyl chloromethylphosphonate, and 2-naphthyl methylphosphonate.

2. A method for synthesising phosphonate monoesters, said method comprising:

providing a phosphonic acid dichloride capable of being reacted to form a monoester monochloride in an aromatic solvent;

adding dimethylformamide in an amount up to about twice that of said phosphonic acid dichloride to said phosphonic acid dichloride in said aromatic solvent to prevent formation of diester;

adding 2-naphthol or 4-nitrophenol in an amount up to about three times that of said phosphonic acid dichloride after the additiion of said dimethylformamide so that an interaction occurs with said phosphonic acid dichloride to displace chloride therefrom and form a monoester monochloride;

hydrolyzing the monochloride and any remaining dichloride; and

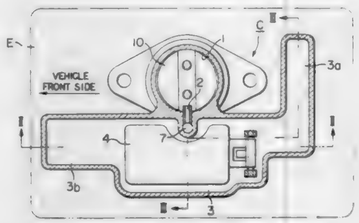
separating the monoester from the free phosphonic acid.

4,041,112

CARBURETOR FOR VEHICLE ENGINES

Akihisa Nakamura, Ohizumigakuen; Takashi Kamezaki, Tokyo; Kenji Naito, Kawasaki, and Kunichika Usui, Asaka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 28, 1976, Ser. No. 681,268
Claims priority, application Japan, Apr. 28, 1975, 50-50640
Int. Cl.[2] F02M *5/14*
U.S. Cl. 261—72 R **3 Claims**



1. A carburetor for vehicle engines comprising a suction duct, a single float chamber disposed adjacent one side of the suction duct, a vertically arranged main fuel passage opening into said float chamber, a main fuel nozzle communicating with said fuel passage and opening into the suction duct, and a single float member arranged to float on the surface of fuel in said float chamber for regulating the fuel therein at a constant level, said float chamber having one longitudinal end portion bent toward the adjacent side of said suction duct to project transversely beyond said main fuel nozzle so as to form a lateral extension, and another end portion elongated in the longitudinal direction to compensate for the increased volume of said lateral extension, so that front and rear halves of said chamber divided by a transversely extending vertical plane passing through the vertical axis of said main fuel passage are substantially equal in effective volume to each other, the lateral halves of said chamber divided by a longitudinally extending vertical plane passing through the vertical axis of said main fuel nozzle being substantially equal in effective volume to each other whereby a substantially constant level of fuel can be maintained in said main fuel passage during acceleration, deceleration, or turning of the vehicle.

4,041,113

TOWER PACKING ELEMENTS

Kevin Joseph McKeown, Windermere Westmoreland, England, assignor to Mass Transfer Limited, Kendal, England

Continuation of Ser. No. 474,322, May 29, 1974, abandoned.
This application July 2, 1976, Ser. No. 702,008
Claims priority, application United Kingdom, May 30, 1973, 25791/73; Aug. 31, 1973, 41146/73
Int. Cl.[2] B01F *3/04*
U.S. Cl. 261—98 **5 Claims**



1. Fluid-fluid contact apparatus comprising a packed bed and means for introducing fluids to said bed for contact therein in which at least a part of the bed is a dumped bed formed of packing elements each comprising a tubular member of given diameter and width having two strip portions oppositely curved with respect to a diametric symmetry plane, the ratio of the diameter of said tubular member to its width being from 2:1 – 5:1, each of said strip portions being on opposite sides of a parting plane which extends perpendicular to said symmetry plane and divides said tubular member into two equal sections, and wherein each of said strip portions includes a single additional strip portion having no free ends and being oppositely curved with respect thereto as well as oppositely curved with respect to each other, said additional strip portions extending inwardly from the inside wall of said tubular member leaving apertures therein and providing protrusions which prevent nesting of said packing elements and thus facilitate, in cooperation with said diameter to width ratio, a generally horizontal alignment of said elements with respect to one another in said bed.

4,041,114

INDENT DUPLICATING PROCESS

George Johannus Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Filed July 3, 1975, Ser. No. 592,723
Int. Cl.[2] B29D *11/00*
U.S. Cl. 264—1 **3 Claims**

1. A method of making microfiche elements including the steps of,

a. forming a microfiche blank of a generally transparent sheet,

b. forming a block having a relief surface defined by nodules, the nodule distribution corresponding to a plurality of information sets, each information set corresponding to a unique macro scene, each information set occupying dispersed areas interlaced with but distinct from the dispersed areas occupied by any other informaion set,

c. pressing said relief surface onto one surface of said sheet to selectively indent portions thereof and thus form dimples in the sheet corresponding to the raised portions of said relief surface,

d. forming the other surface of said generally transparent sheet so that it has a plurality of integral lenses, the lenses being related to the dimples such that each sub-set of dimples which corresponds to each macro scene is in optical alignment with a unique sub-set of integral lenses,

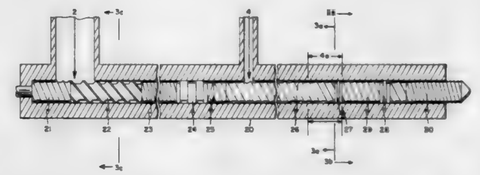
e. whereby the dimpled portions of the transparent sheet correspond to a plurality of macro scenes.

4,041,115

CONTINUOUS PROCESS FOR PREPARING PARTICULATE MICROPOROUS, OPEN-CELLED POLYMER STRUCTURES IN A SCREW-TYPE EXTRUDER

Francis Edward Jenkins, and Daniel Gregory Tynan, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 12, 1975, Ser. No. 576,632
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—5 **1 Claim**



1. A continuous process for preparing particulate, microporous, open-celled polymer structures comprising

i. continuously feeding about 5 to 50 parts by weight of a normally solid organic polymer having a glass transition temperature or a crystalline melting point of at least 293° K, and about 95 to 50 parts by weight of a chlorofluorocarbon or a mixture of chlorofluorocarbons having a boiling point in the range of about 10° to 150° C, a melting point in the range of about −40° to 125° C, an entropy of fusion of less than 10 calories/°K/mole, a plastic flow index of at least 0.1 g/10 minutes at the reduced temperature of 0.96 to 0.99 and a solubility in water of less than 2 weight percent to a screw-type extruder having first and second temperature zones,

ii. nonrandomly milling said polymer and said chlorofluorocarbon in said first zone at a temperature equal to or above the melting point of the highest melting chlorofluorocarbon present to provide a solution of the polymer in the chlorofluorocarbon,

iii. passing said solution to said second zone and nonrandomly milling said solution and cooling said solution to a temperature equal to or below the solidification temperature of the lowest melting chlorofluorocarbon present to form a frozen mass,

iv. extruding said frozen mass from said second zone as an uncompacted snow-like mass, and

v. removing the chlorofluorocarbon from said snow-like mass at a temperature equal to or below the solidification temperature of the lowest melting chlorofluorocarbon present to form said particulate, microporous, open-celled polymer structures.

4,041,116

METHOD FOR THE MANUFACTURE OF CARBON-CARBON COMPOSITES

Michael F. Baud, Elizabethton, Tenn., and Jay A. Harvey, East Amherst, N.Y., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 360,469, May 15, 1973, abandoned. This application July 15, 1974, Ser. No. 488,566

Int. Cl.[2] C04B *43/02*

U.S. Cl. 264—29.5 **8 Claims**

1. A method for the manufacture of carbon mats consisting of carbon from about 20 to about 96 weight percent from carbon fiber, from 0 to about 72 weight percent from a carbonaceous flour, and from about 3 to about 15 weight percent from a carbonized resin which consists in:

a. combining the appropriate quantities of carbon fibers of from 0.01 to 0.05 inches in length, a thermosetting resin and solvent therefor, and a carbonaceous flour so that the liquid to solid weight ratio is from about 50:1 to about 30:1, and the solvent to resin ratio is about 6:1 to about 20:1;

b. allowing the solids to settle to equilibrium height in the liquid;

c. pressing the settled solids at up to about 100 psi and removing the excess liquid therefrom by vacuum;

d. heating the resulting mat to a sufficient temperature to cure the resin; and

e. carbonizing the resulting mat by heating to a temperature between about 1000° C. to about 2800° C., to form a mat wherein the fibers are oriented randomly in the plane perpendicular to the direction of force used to settle the fibers and with no fibers oriented in the axis parallel to the settling force.

4,041,117

SILICON CARBIDE SINTERED BODY

Svante Prochazka, Ballston Lake, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 591,840, June 30, 1975, abandoned. This application June 21, 1976, Ser. No. 698,483

Int. Cl.[2] C04B *35/56, 35/64*

U.S. Cl. 264—63 **2 Claims**

1. A method of producing a silicon carbide sintered body having temperature-resistant properties which comprises providing a substantially homogeneous submicron particulate mixture consisting essentially of silicon carbide composed of β-SiC and from 0.05% to 5% by weight of α-SiC based on said β-SiC, said β-SiC particles having an average particle size ranging up to 0.45 micron and said α-SiC particles having a particle size of at least about twice as large as that of said β-SiC particles, an amount of boron additive selected from the group consisting of boron and boron carbide equivalent to 0.3% to 3.0% by weight of boron based on the total amount of silicon carbide, and an amount of a carbonaceous additive selected from the group consisting of free carbon and a carbonaceous organic material equivalent to 0.1% to 1.0% by weight of free carbon based on the total amount of silicon carbide, said carbonaceous organic material completely decomposing at a temperature ranging from about 50° C to 1000° C to said free carbon and gaseous products of decomposition, shaping the mixture into a green body, and sintering the green body at a temperature ranging from about 1950° C to 2300° C in an atmosphere in which it is substantially inert at atmospheric pressure or below atmospheric pressure to produce a sintered body having a density of at least 80% of the theoretical density for silicon carbide and containing α-SiC in an amount of at least 70% by weight of the total amount of silicon carbide.

4,041,118

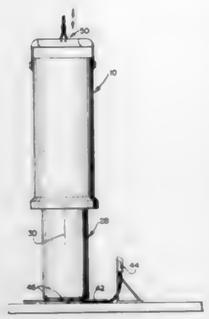
METHOD AND APPARATUS FOR MAKING CONCRETE PIPE

Norman Ottmann, Simsbury, and Walter Strever, Cromwell, both of Conn., assignors to Atlantic Pipe Corporation, Plainville, Conn.

Filed Feb. 5, 1975, Ser. No. 547,333

Int. Cl.[2] B28B *1/10, 21/14, 21/18, 21/28*

U.S. Cl. 264—71 **4 Claims**



4. A method for making "dry mix" wire reinforced concrete pipe comprising the steps of forming the pipe within a cylindrical upstanding jacket by effecting progressive axial upward movement and concurrent rotation of a packerhead from a lower to an upper end of the jacket and concurrently feeding mix onto an upper surface of the packerhead, the packerhead in turn distributing the mix radially outwardly about and between its periphery and the jacket to form the pipe, providing a radially expandable and contractable cylinder at least as long as the pipe and having an external diameter approximating the pipe internal diameter, effecting relative axial movement between the pipe and cylinder whereby the pipe and jacket are disposed about the cylinder with the latter in a contracted condition, expanding the cylinder into engagement with and throughout the length of the internal surface of the pipe, vibrating the pipe while maintaining expansion pressure on the cylinder whereby to compact, reduce the length, eliminate voids and relieve residual forming stresses in the pipe and in its wire reinforcement, terminating vibration and contracting the cylinder, effecting relative axial movement between the pipe and cylinder whereby to separate the same, effecting at least one additional upward rotary pass of a packerhead through the pipe, feeding mix onto the upper surface of the packerhead during said additional pass to re-establish the desired pipe internal diameter, to finish the internal pipe surface, and to fill the void created at the upper end of the pipe by the aforesaid length reduction, and curing the pipe.

4,041,119

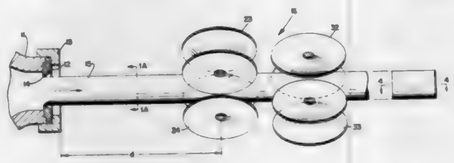
METHOD FOR PRODUCING VARIEGATED SOAP

Charles F. Fischer, Jersey City, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed July 16, 1975, Ser. No. 596,299

Int. Cl.[2] B29F *3/12*

U.S. Cl. 264—75 **2 Claims**



1. A method of producing variegated soap bars having contoured striations comprising the steps of continually extruding a striated soap column from a plodder nozzle, peripherally gripping said moving column at a region located a predetermined distance forwardly of said nozzle and there applying a predetermined torque for twisting the column about its longitudinal axis through a predetermined angle relative to its direction of movement from said nozzle while permitting substantially unimpeded longitudinal movement of said extruding column, and then subdividing the twisted column into blanks and pressing the blanks into soap bars exhibiting the desired contour striations.

4,041,120

PROCESS FOR PRODUCING A SYNTHETIC RESIN ARTICLE HAVING IMPROVED RESISTANCE TO SURFACE ABRASION

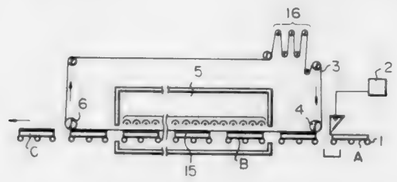
Akira Oshima; Keisuke Yoshihara; Mikio Shiki, and Tuneo Ikeda, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 212,047, Dec. 27, 1971, abandoned. This application May 28, 1974, Ser. No. 473,910

Claims priority, application Japan, Dec. 28, 1970, 46-119373

Int. Cl.[2] B29D *7/08, 7/14, 9/00*

U.S. Cl. 264—171 **10 Claims**



1. In a process for producing a synthetic resin article having a synthetic resin surface layer firmly adhered to a resin and having greatly improved resistance to surface abrasion; said process comprising the steps of:

a. spreading onto all or part of the inner surface of a mold member a polymerizable material selected from the group consisting of (i) a compound having a total of at least three acryloxy (CH_2=CH·CO·O-) and/or methacryloxy (CH_2=C(CH_3)·CO·O-) groups in the molecule, (ii) a monomer mixture comprising at least **40%** by weight of said compound and at most **60%** by weight of other copolymerizable ethylenically unsaturated monomer and (iii) a partially polymerized product of said compound or of said monomer mixture,

b. adhering a preformed film having little or no affinity for said polymerizable material closely to the spread surface,

c. polymerizing said polymerizable material to an extent such that the polymerized material can not be swollen with or dissolved into a monomer for the base resin to be charged into said mold member,

d. removing the film from the polymerized material,

e. charging a mixture of the monomer for the base resin and a polymerization initiator into the mold,

f. polymerizing the monomer, and

g. after the completion of polymerization, releasing the cast article from the mold, the improvement comprising upstream of a polymerization zone wherein said polymerizable material is polymerized while passing therethrough, coating said polymerizable material onto the surface of at least one of two horizontal upper and lower endless belts continuously traveling at the same speed and in the same direction and applying a continuous length of said film onto the polymerizable material on the continuously traveling endless belts whereby said length of film is closely adhered onto the coated polymerizable material; downstream of the polymerization zone, continuously removing said length of film from the polymerized material on said endless belts; and continuously charging said monomer mixture for the base resin into an upstream end of a casting space defined by the two opposed,, horizontal upper and lower polymerized material-conted belt surfaces and side seals.

9. In a process for producing a synthetic resin article having a synthetic resin surface layer firmly adhered to a resin and having greatly improved resistance to surface abrasion; said process comprising the steps of:

a. spreading onto all or part of the inner surface of a mold member a polymerizable material selected from the group consisting of (i) a compound having a total of at least three acryloxy (CH_2=CH·CO·O-) and/or methacryloxy (CH_2=C(CH_3)·CO·O-) groups in the molecule, (ii) a monomer mixture comprising at least 40% by weight of said compound and at most 60% by weight of other copolymerizable ethylenially unsaturated monomer and (iii) a partially polymerized product of said compound or of said monomer mixture,

b. adhering a preformed film having little or no affinity for said polymerizable material closely to the spread surface,

c. polymerizing said polymerizable material to an extent such that the polymerized material can not be swollen with or dissolved into a monomer for the base resin to be charged into said mold member,

d. removing the film from the polymerized material,

e. charging a mixture of the monomer for the base resin and a polymerization initiator into the mold,

f. polymerizing the monomer, and

g. after the completion of polymerization, releasing the cast article from the mold, the improvement comprising coating said polymerizable material onto each upper surface of a plurality of continuously moving molds, aligned at stated intervals in the moving direction upstream of a polymerization zone wherein the coated polymerizable material is polymerized while passing therethrough, closely adhering, upstream of said polymerization zone a continuous length of said film onto the coated polymerizable material coated on the plurality of molds; and, downstream of the polymerization zone, continuously removing said film from the polymerized material.

4,041,121

METHOD FOR MAKING HIGH FLUID-HOLDING FIBER MASS

Frederick R. Smith, Wilmington, Del., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Continuation-in-part of Ser. No. 309,290, Nov. 24, 1972, abandoned. This application Oct. 24, 1975, Ser. No. 625,445

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.[2] D01F *2/08*

U.S. Cl. 264—191 **2 Claims**

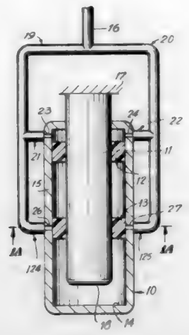
1. A method of making fluid absorbent alloy fibers comprising mixing an aqueous solution of polyvinylpyrrolidone with a filament-forming viscose, said polyvinylpyrrolidone have an average molecular weight of from about 100,000 and 400,000 and a K-value of from 50 to 100 and being present in an amount less than, but at least 6% of, the weight of the cellulose in the viscose, shaping the mixture into fibers, coagulating and regenerating the shaped fibers of regenerated cellulose containing said polyvinylpyrrolidone dispersed therein, and thereafter drying the fibers, said shaping, coagulating and regenerating being effected by extruding the viscose mixture through a spinnerette into a spinning bath comprising sulfuric acid, sodium sulfate and zinc sulfate, said polyvinylpyrrolidone being present in amount such as to increase the water-holding capacity of said fibers.

4,041,122

PROCESS FOR MOLDING OF HOLLOW ARTICLES

James R. Quick, and William A. Wittosch, Jr., both of Warwick, N.Y., assignors to International Paper Company, New York, N.Y.

Filed June 1, 1976, Ser. No. 691,470
Int. Cl.[2] B29C *1/06*
U.S. Cl. 264—277 **14 Claims**



1. The process of manufacturing a hollow article which comprises:

a. providing a mold with a first wire longitudinally disposed therein and containing first and second followers disposed about the first wire in close abutment with both the first wire and inside wall of the mold, said followers maintaining the first wire spaced from the inside wall of the mold so as to define an annular space between the first wire and the inside wall of the mold;

b. positioning the second follower proximally of the distal end of the mold and spaced distally from the first follower thereby sealing a set of gates provided in the mold;

c. introducing a molding material under pressure into said annular space proximally of the proximal end of the first follower thereby distally displacing the first follower;

d. continuing the distal displacement of the first follower thereby engaging the second follower and, thereafter, distally displacing both the first and second followers thereby unsealing the set of gates;

e. thereafter introducing molding material into the annular space through the set of gates to continue the distal displacement of the followers while material is molded around the first wire; and

f. stripping the resulting hollow article from the first wire.

4,041,123

METHOD OF COMPACTING SHAPED POWDERED OBJECTS

Frederick F. Lange, Murrysville, and Gerald R. Terwilliger, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 135,642, April 20, 1971, abandoned. This application Dec. 22, 1972, Ser. No. 317,878
Int. Cl.[2] C04B *35/60*
U.S. Cl. 264—332 **8 Claims**

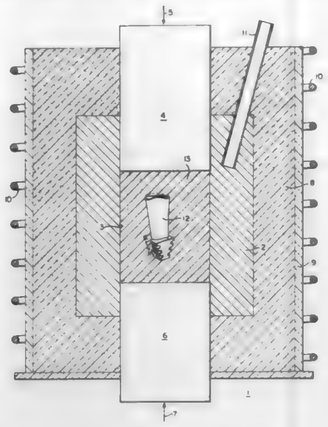
1. In the method of producing a substantially fully dense shaped member of a refractory powdered material having a given densification temperature, the steps comprising:

a. forming a shaped body from refractory powdered material said shaped body characterized by voids and being larger than, but similar to, the desired final shape of the member,

b. surrounding the shaped body with a confined mass of a transverse diameter of at least twice that of the maximum transverse dimension of the body, of a non-reactive, non-fusible pressure-transmitting powder having a melting point above the given densification temperature of body, the shaped body being symmetrically or centrally disposed within the confined mass,

c. applying an initial pressure undirectionally to the confined mass of pressure-transmitting powder and the body therein, and heating the body to a temperature substantially below its densification temperature,

d. thereafter, incrementally increasing the temperature of the body until the given densification temperature is



reached and concurrently incrementally increasing the unidirectional pressure to the confined pressure-transmitting powder, the pressure being isostatically transmitted to the body, whereby the voids in the body are substantially completely eliminated and the body has been compacted to the desired shape, and

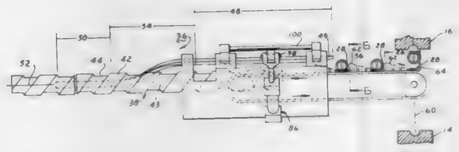
e. thereafter, cooling the shaped body and releasing the pressure, and separating the formed shaped body from the pressure-transmitting powder.

4,041,124

METHOD IMPROVEMENTS IN REMOVING ARTICLES FROM WHEEL BLOW MOLDING MACHINES

John F. Seelye, Thomaston, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed May 12, 1975, Ser. No. 576,559
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—336 **10 Claims**



1. In a method of removing blow molded thermoplastic articles from a vertically disposed wheel blow molding machine having continuously revolving mold sections containing said articles sequentially moving radially away from the wheel axis during mold opening, which method includes:

ejecting said articles transversely downwardly out of the mold sections in a direction substantially along the plane of rotation of said sections to pockets of a takeaway conveyor;

the improvements in said method comprising, in combination, the steps of:

A. positioning the articles in the conveyor pockets such that an end portion protrudes laterally of one side thereof;

B. capturing such end portions within a spiral channel of a rotating screw while the articles advance with the pockets of the moving conveyor; and then

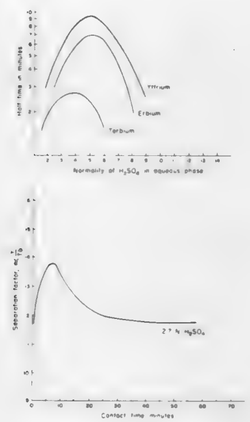
C. turning such captured articles sequentially downwardly to a substantially vertical position beyond the end of said conveyor by means of such rotating screw and contour of a cooperating guide rail.

4,041,125

PROCESS FOR SEPARATION OF THE LANTHANIDES

Jorolf Alstad, Oslo, and Leif Farbu, Strommen, both of Norway, assignors to Forskningsgruppe for Sjeldne Jordarter, Oslo, Norway

Continuation-in-part of Ser. No. 478,357, June 11, 1974, abandoned. This application May 19, 1976, Ser. No. 688,046
Claims priority, application Norway, June 15, 1973, 732492
Int. Cl.[2] C01F *17/00*
U.S. Cl. 423—21 **3 Claims**



1. A liquid-liquid extraction process for the separation of yttrium from terbium comprising:

a. admixing a mixture of rare earth elements including at least yttrium and terbium and impurities in aqueous solution with sulfuric acid to form an aqueous phase comprising an aqueous solution of rare earth sulfates including at least yttrium sulfate and terbium sulfate;

b. contacting said aqueous phase with an organic phase comprising an organic solvent containing di(2-ethylhexyl) phosphoric acid, said organic solvent being substantially immiscible with water;

c. maintaining the contact between the aqueous phase and the organic phase for a sufficient time so that substantially all of the yttrium and terbium are extracted into the organic phase;

d. separating the aqueous phase from the organic phase;

e. subjecting the separated organic phase of step (d) to a back extraction with an aqueous phase comprising an aqueous solution with sulfuric acid;

f. regulating the time of contact between the separated organic phase and the back extraction aqueous phase to a period of less than the time to total extraction equilibrium for the phases and between the half time in minutes for the extraction of terbium from the separated organic phase into the back extraction aqueous phase and the half time in minutes for the extraction of yttrium from the separated organic phase into the back extraction aqueous phase; and

g. separating the separated organic phase from the back extraction aqueous phase.

4,041,126

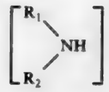
SEPARATION AND SELECTIVE RECOVERY OF PLATINUM AND PALLADIUM BY SOLVENT EXTRACTION

John Baltz, Lakewood, and Enzo Coltrinari, Arvada, both of Colo., assignors to PGP Industries, Inc., Santa Fe Springs, Calif.

Filed Dec. 18, 1975, Ser. No. 642,146
Int. Cl.[2] C01G *55/00*
U.S. Cl. 423—22 **14 Claims**

1. A process for the separation and selective recovery of platinum and palladium values from an aqueous acidic medium which comprises:

contacting the medium with a mixed organic extraction reagent comprising a water immiscible solvent having dissolved therein an organically substituted secondary amine compound of the general formula:



wherein R_1 and R_2 are hydrocarbon groups and $R_1 + R_2$ contain between 18 and 35 carbon atoms, said compound being sufficiently soluble in said solvent to make a 1% solution and capable of forming complexes with platinum and palladium that are preferentially soluble in said solvent and whereby said contacting results in the formation of an organic extract phase and an aqueous raffinate phase,

maintaining said medium at an emf of between about −425 and −650 millivolts during said contacting operation,

separating said organic extract phase from said aqueous raffinate phase,

contacting said organic extract phase with an acidified aqueous solution of a water soluble reducing agent to form an aqueous phase loaded with palladium and a platinum containing organic extract phase,

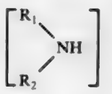
separating said platinum containing organic phase from said palladium containing aqueous phase,

contacting said platinum containing organic extract phase with at least the stoichiometric quantity of an aqueous alkaline stripping agent required for neutralization of said extract phase, said contact resulting in the formation of an aqueous phase loaded with platinum and a stripped organic phase.

13. A continuous process for the separation and selective recovery of platinum dissolved in aqueous chloride solutions with palladium which comprises:

reducing said aqeuous chloride solution to an emf between about −425 mv and −650 mv,

contacting said aqueous chloride solution for a predetermined time period with an organic solvent containing at least 1% by weight of an organically substituted secondary amine compound of the general formula



wherein R_1 and R_2 are hydrocarbon groups and $R_1 + R_2$ contain between 18 and 35 carbon atoms, said compound having a solubility of at least 1% in said solvent and being capable of forming complexes of platinum and palladium that are preferentially soluble in the organic solvent and whereby the contacting results in the creation of an organic extract phase and an aqueous raffinate phase,

isolating said extract phase from said raffinate phase,

contacting said extract phase with at least the stoichiometric quantity of an aqueous alkaline solution required to neutralize the chloride form of said amine to selectively sepa-

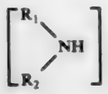
rate said platinum values from said palladium values in said organic extract phase, and form a platinum stripped organic extract phase and an aqueous platinum containing strip solution, and

isolating said aqueous solution from said platinum extract phase.

14. A continuous process for the separation and selective recovery of palladium dissolved in aqueous chloride solutions with platinum which comprises:

reducing said solution to an emf between about −425 mv and −650 mv,

contacting said aqueous chloride solution for a predetermined time period with an organic solvent containing at least 1% by weight of an organically substituted secondary amine compound of the general formula:



wherein R_1 and R_2 are hydrocarbon groups and $R_1 + R_2$ contain between 18 and 35 carbon atoms, said compound capable of forming complexes of platinum and palladium that are preferentially soluble in the organic xolvent and whereby said contacting results in the creation of an organic extract phase and an aqueous raffinate phase,

separating said organic extract phase from said aqueous raffinate phase,

contacting said organic extract phase with an aqueous solution containing a reducing agent acidified to between about 0.1 to about 3.0 N-HCL to strip palladium values from said organic extract phase, said contact resulting in the formation of a palladium loaded aqueous phase and a stripped organic phase containing said platinum,

separating said loaded aqeuous phase and said stripped organic phase, and recovering palladium from said loaded aqueous phase.

4,041,127

METHOD OF TREATING THE FLUORINE-CONTAINING MUD PRODUCED BY THE ACID POLISHING OF LEAD GLASS SO AS TO FORM BASIC LEAD CARBONATE

Wolfgang Porcham, Hall in Tirol, Austria, assignor to D. Swarovski & Co., Wattens, Austria

Filed May 14, 1976, Ser. No. 686,599

Claims priority, application Germany, July 2, 1975, 2529545

Int. Cl.² C01G *21/14*

U.S. Cl. 423—92 **4 Claims**

1. A process for the production of lead carbonate by treatment of fluorine-containing mud produced in the polishing of lead glass with etching acid said mud being substantially of the following composition by weight:

$PbSO_4$—15 to 70
K_2SiF_6—20 to 50
Na_2SiF_6—10 to 25
$BaSO_4$—0 to 10
$CaSO_4$—0 to 3
KBF_4—0 to 3

and comprising the steps of:

a. separating said mud from the etching acid;

b. reacting the same with an aqueous alkali carbonate solution and filtering the solution;

c. dissolving the residue in nitric acid and precipitating the fluorides in the form of alkali hexafluorosilicates by the addition of a compound providing a source of alkali ions at a pH of the solution under 4 and filtering out the precipitate; and

d. adjusting the pH of the resulting solution to above 6.5 by the addition of alkali carbonate to the solution to precipitate basic lead carbonate.

4,041,128

METHOD FOR PURIFICATION OF EXHAUST GASES

Henry C. Bramer, Venetia, and Edward Shapiro, Pittsburgh, both of Pa., assignors to Pittsburgh Environmental and Energy Systems, Inc., Pleasant Hills, Pa.

Filed Aug. 18, 1975, Ser. No. 605,558

Int. Cl.² B01D *53/34*

U.S. Cl. 423—213.2 **4 Claims**

1. A process for the removal of sulfur oxides from internal combustion engine exhaust at ambient to 1200° F which consists essentially of passing said exhaust through a chamber containing a chemically reactive mixture consisting essentially of a sulfide and an oxide of a single metal selected from the group consisting of iron, copper and zinc; said sulfide and oxide being initially present in a ratio of about one part of sulfide to 1–2 parts of oxide

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4,041,129

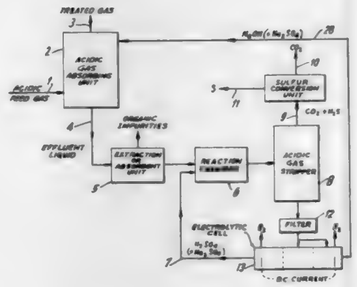
REMOVAL OF ACIDIC GASES FROM HYDROCARBON STREAMS

Raymond C. Foster, Boston, and James J. Humphries, Jr., Wellesley, both of Mass., assignors to Stone & Webster Engineering Corporation, Boston, Mass.

Continuation of Ser. No. 21,383, March 20, 1970, abandoned. This application July 23, 1974, Ser. No. 490,935

Int. Cl.² B01D *53/34*

U.S. Cl. 423—234 **17 Claims**



1. In a cyclic process for substantially reducing the carbon dioxide and/or hydrogen sulfide content present as acidic gases in a gas obtained from the cracking of a hydrocarbon selected from the group consisting of gas oil, naphtha and ethane, and said gas further containing undesirable organic impurities therein, with simultaneous regeneration of reagent materials which comprises:

a. passing the cracked gas containing the acidic gases through an aqueous sodium hydroxide solution and obtaining an effluent containing the undesirable organic impurities and said acidic gases in converted form;

b. reacting said effluent liquid with aqueous sulfuric acid or an aqueous mixture containing sulfuric acid and sodium sulfate in an amount sufficient to substantially liberate the converted acidic gases consisting essentially of hydrogen sulfide and/or carbon dioxide that may be present therein;

c. subjecting said treated effluent liquid to a stripping operation to remove any liberated gases therefrom and thereby leaving an aqueous sodium sulfate containing solution; and

d. subjecting said resulting aqueous sodium sulfate containing solution to an electrolytic process treatment whereby aqueous sulfuric acid or an aqueous mixture of sulfuric acid and sodium sulfate is collected at the anode and is recycled for utilization in the aforesaid reaction step and aqueous sodium hydroxide which forms at the cathode is collected and recycled for use in the sodium hydroxide treatment step, the improvement which comprises treating the effluent from the alkali metal hydroxide treatment of step (a) to remove substantially all organic impurities therefrom.

4,041,130

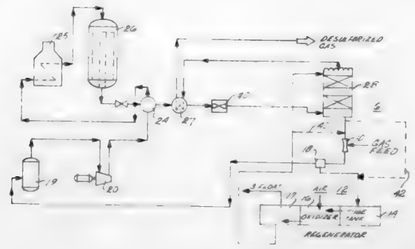
PROCESS FOR DESULFURIZATION OF COKE OVEN GAS

Mark Mackles, Tarzana, Calif., assignor to The Ralph M. Parsons Company, Pasadena, Calif.

Filed Dec. 29, 1975, Ser. No. 644,759

Int. Cl.² B01D *53/34*

U.S. Cl. 423—220 **25 Claims**



1. A continuous process for reducing the sulfur content of a feed gas stream which contains hydrogen, water, and as sulfur species, hydrogen sulfide, at least one organo-sulfur compound, and an inorganic carbon-sulfur compound selected from the group consisting of carbon disulfide, carbonyl sulfide, and mixtures thereof, which comprises:

a. treating the feed gas stream to remove hydrogen sulfide in a hydrogen sulfide extraction zone;

b. compressing the treated feed gas stream to provide a partial pressure of hydrogen in the treated feed gas stream of at least about 10 psia when at a temperature sufficient for the catalytic hydrogenation of such a sulfur species to hydrogen sulfide;

c. heating the compressed gas stream to a temperature sufficient for the catalytic hydrogenation of such a sulfur species to hydrogen sulfide to form a reaction stage feed gas stream;

d. catalytically hydrogenating such an organo-sulfur compound to hydrogen sulfide in the reaction stage feed gas stream in a reaction stage at a temperature sufficient for catalytic hydrogenation of such a sulfur species while simultaneously hydrolyzing in the presence of water contained in the feed gas stream the inorganic carbon-sulfur compounds to hydrogen sulfide to provide an effluent gas stream at a temperature substantially above the reaction stage feed gas stream temperature; and

e. cooling and treating the effluent gas stream from the reaction stage to remove hydrogen sulfide in a hydrogen sulfide extraction zone.

4,041,131

SULFUR RECOVERY PROCESS

James T. Forbes, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 14, 1975, Ser. No. 621,701

Int. Cl.² B01D *53/14*

U.S. Cl. 423—242 **6 Claims**

1. In a process for removing sulfur oxides from gas mixtures with a solid acceptor for sulfur oxides wherein the solid acceptor is periodically regenerated with a steam-diluted reducing gas and the regeneration off-gas is charged to an absorber-stripper to produce a concentrated sulfur oxides gas stream the improvement which comprises:

a. cooling the regeneration off-gas to a temperature at which a substantial part of the steam contained therein condenses;

b. contacting in a contacting zone the cooled regeneration off-gas with a sulfur dioxide-selective liquid absorbent thereby obtaining a substantially sulfur dioxide free regeneration off-gas and a sulfur dioxide rich liquid absorbent, wherein the sulfur dioxide content of the sulfur dioxide rich liquid varies periodically with the periodic regeneration of the solid acceptor;

c. passing said sulfur dioxide rich liquid absorbent, during periods of operation which produce rich absorbent containing a relatively high sulfur dioxide content, to a rich absorbent holding tank;

d. passing said sulfur dioxide rich liquid absorbent, during periods of operation in which said rich absorbent contains a relatively low amount of sulfur dioxide, to a lean absorbent holding tank;

e. withdrawing a stream of sulfur dioxide rich liquid absorbent from said rich holding tank and passing it at a substantially constant rate to a stripping zone;

f. heating in said stripping zone the sulfur dioxide rich liquid absorbent from step (e) to a temperature at which sulfur dioxide gas is expelled thereby regenerating the liquid absorbent;

g. recovering expelled sulfur dioxide gas,

h. passing said regenerated liquid absorbent to the contacting zone of step (b) to further absorb sulfur dioxide; and,

i. supplying at least intermittently, as a portion of the absorbent to step (b), absorbent from the lean absorbent holding tank, whereby variation of the sulfur dioxide content of the regeneration off-gas is accommodated by varying levels in the rich absorbent holding tank.

4,041,132

FLUID BED DEHYDRATION OF BORAX

George W. Campbell, Jr., Hesperia; David G. Wilkins, and Jerome T. Muench, both of Lancaster, all of Calif., assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.

Continuation of Ser. No. 504,350, Sept. 9, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,915

Int. Cl.² C01B *35/12*

U.S. Cl. 423—279 **8 Claims**

1. A process for dehydrating borax in a fluidized bed system comprising: introducing borax into a first-stage fluidized bed having a temperature of from about 140° to about 170° F.; transferring said borax from said first-stage fluidized bed to a second-stage fluidized bed, said second stage fluidized bed having a temperature of from about 250° to about 300° F.; transferring said borax without cooling from said second-stage fluidized bed to a third-stage fluidized bed, said third-stage fluidized bed having a temperature of from about 450° to about 600° F. to produce a hot dehydrated borax; transferring said hot borax to a compactor for compaction while said borax is at a temperature of at least 120° up to 600° F., grinding the resultant compacted product, and screening to produce a final dehydrated borax product having about 0.15 to 1 mole of water of hydration, a bulk density of 50 to 60 lbs./ft.³, and about 35 –68% B_2O_3.

4,041,133

AMMONIUM POLYPHOSPHATE PRODUCTION

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Aug. 15, 1975, Ser. No. 605,016

Int. Cl.² C01B *15/16, 25/26;* C05B *11/00*

U.S. Cl. 423—305 **11 Claims**

1. The method of producing stable, aqueous solutions of ammonium polyphosphate product having an equivalent polymeric P_2O_5 content of at least about 25 percent of the total P_2O_5 present and higher than the polymeric content obtainable from the acid feed hereinafter defined with only the autogenous heat of reaction between ammonia and the acid mixture hereinafter defined, from a phosphoric acid feed having a polyphosphate content at least 10 percent less than said product determined as a percentage of total P_2O_5, including the steps of;

1. mixing said feed with an amount of substantially anhydrous mineral acid selected from the group consisting of

sulfuric, nitric and hydrochloric acids and combinations thereof, in an amount of at least about 0.1 mole of said mineral acid per mole of P_2O_5 and sufficient to produce a reaction temperature of about 500° to about 750° F. upon neutralization of the resultant acid mixture with ammonia;

2. reacting said acid mixture with at least about 0.12 weight parts of anhydrous ammonia per weight part of said acid mixture under conditions sufficient to produce a molten product melt at said reaction temperature by the autogenous heat of neutralization, said temperature being sufficient to increase the polymeric P_2O_5 content of said acid by at least about 10 percent and form said product of which at least about 25 percent of said P_2O_5 is present as polyphosphate; and
3. quenching the reaction product to a temperature of about 200° F. or less by immersion in an aqueous quench medium.

4,041,134

PROCESS FOR REMOVING SULFATE IONS FROM EXTRACTED PHOSPHORIC ACID EMPLOYING BARIUM COMPOUNDS AND ACTIVATED CARBON

Mitsuo Kikuchi, and Yoichi Hiraga, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd, Japan

Filed June 11, 1976, Ser. No. 695,309
Claims priority, application Japan, Feb. 13, 1976, 51-13943
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—321 S **6 Claims**

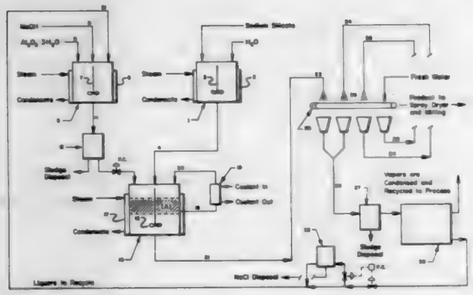
1. A process for removing sulfate ions from extracted phosphoric acid which is substantially free of metallic ion contaminants, which comprises adding less than the stoichiometric equivalent of a barium compound relative to the amount of dissolved sulfate ion to said extracted phosphoric acid to form barium sulfate crystals, adding active carbon to the resulting slurry, separating the solid components from the slurry and recovering purified phosphoric acid.

4,041,135

PRODUCTION OF HIGH CAPACITY INORGANIC CRYSTALLINE BASE EXCHANGE MATERIALS

Lloyd E. Williams, Bel Air; Robert K. Mays, Havre de Grace, and Joseph E. Wagner, III, Abingdon, all of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Filed July 25, 1975, Ser. No. 599,232
Int. Cl.[2] C01B *33/28;* C11D *9/18*
U.S. Cl. 423—329 **20 Claims**



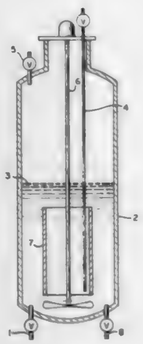
1. A method for producing crystalline base exchange alumino silicate materials having high total ion exchange capacities and specific initial exchange rates, said method comprising the steps of:
   a. preparing an aqueous solution of alkali metal silicate, said silicate having an SiO_2/X_2O mole ratio of from about 1 to 4, wherein X is an alkali metal;
   b. subjecting said solution to vigorous agitation and adding to said solution at a controlled rate a clarified aqueous solution of an alkali metal aluminate, said clarified alkali metal aluminate solution being substantially free of halide impurities, organic discoloring complexes and ferruginous sludge;
   c. continuing the vigorous agitation of the reaction mass formed by the addition of said alkali metal aluminate to said alkali metal silicate solution while maintaining the temperature of said reaction mass in the range of between 70° and 180° F. and the pH of said reaction mass at a level of at least 10.0;
   d. precipitating a finely divided pigmentary amorphous alkali metal alumino silicate intermediate in the substantial absence of gel formation;
   e. crystallizing the precipitated intermediate in the reaction mass by maintaining the mass at a temperature on the order of from 170° to 230° F.;
   f. quenching the reaction mass containing the crystalline product to prevent further crystallization thereof;
   g. separating and recovering the solid crystalline base exchange alumino silicate material from the reaction mass to provide aqueous process liquids containing alkali metal aluminate values;
   h. treating said aqueous process liquids to remove halide impurities, organic discoloring complexes and ferruginous sludge, and adjusting to the desired concentration to form clarified aqueous process liquids of suitable concentration to serve as a source of alkali metal aluminate in the initial reaction; and
   i. recycling the resulting clarified aqueous process liquids to step (b) for addition to said alkali metal silicate solution as a source of the alkali metal aluminate.

4,041,136

PROCESS FOR THE PRODUCTION OF SILANE

Robert E. Franklin, Spotswood, N.J.; Arthur W. Francis, New City, N.Y., and Gregorio Tarancon, Woodbridge, N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 24, 1976, Ser. No. 726,115
Int. Cl.[2] C01B *33/04*
U.S. Cl. 423—347 **12 Claims**



1. A process for the production of silane in a reaction vessel comprising
   i. a single closed chamber,
   ii. a hollow tube open at both ends and having a theoretical axis running from end to end which axis is about parallel to the theoretical vertical axis of the chamber, said tube being disposed in the lower portion of the chamber; and
   iii. means for circulating liquid in the lower portion of the chamber in such a manner that the liquid flows in a downward direction through the tube and in an upward direction outside of the tube

comprising the following steps:
   a. maintaining a melt of lithium chloride in the lower portion of the chamber, the level of the melt being above the tube;
   b. activating the circulating means;
   c. introducing liquid lithium into the melt in such a manner that at least a part thereof is brought to the surface of the melt;
   d. introducing hydrogen gas above the surface of the melt in such a manner that hydrogen gas reacts with lithium at the surface of the melt to form lithium hydride,
   the lithium, lithium hydride, and melt being admixed by the circulating means to provide a homogeneous mixture thereof;
   e. introducing, as a gas, a compound or a mixture of compounds having the formula

$$SiH_xCl_{4-x}$$

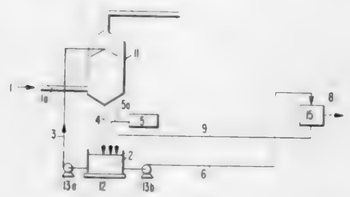
wherein
x is 0 or an integer from 1 to 3
in such a manner that the gas is dispersed by the circulating means into the mixture whereby the gas contacts the lithium hydride to form silane gas; and
   f. removing the silane gas from the chamber.

4,041,137

METHOD OF PRODUCING ALUMINUM FLUORIDE

Tatsuo Abe, Kasugai; Toshiki Okamoto, Nagaya; Takao Sakakura, Nagaya, and Tatsuo Tateno, Nagaya, all of Japan, assignors to Sumitomo Aluminum Smelting Company, Ltd., Osaka, Japan

Filed Mar. 25, 1976, Ser. No. 670,215
Claims priority, application Japan, Mar. 25, 1975, 50-36361
Int. Cl.[2] C01F *7/50*
U.S. Cl. 423—489 **18 Claims**



1. A method for the production of aluminum fluoride from a gas containing a fluorine compound, which method comprises circulating between a gas absorbing zone and a storage zone a gas absorbing liquor comprising either water containing alumina or hydrated alumina, or an aqueous aluminum fluoride solution containing alumina or hydrated alumina, introducing said gas into said gas absorbing zone and absorbing said gas into said gas absorbing liquor whereby the absorbed fluorine compound is reacted with alumina or hydrated alumina to precipitate the fluorine as hydrated aluminum fluoride, filtering said precipitated hydrated aluminum fluoride from said gas absorbing liquor and recycling the filtrate from the filtration to the storage zone and recycling same therefrom into the absorbing zone.

4,041,138

PROCESS FOR THE PREPARATION OF CRYSTALLINE POTASSIUM TANTALUM FLUORIDE

Wolfgang Glaeser, and Wolfgang Mathy, both of Goslar, Germany, assignors to Hermann C. Starck, Berlin, Germany

Filed July 21, 1976, Ser. No. 707,225
Claims priority, application Germany, Aug. 21, 1975, 2537354
Int. Cl.[2] C01B *9/08;* C01G *35/00;* C01D *3/02*
U.S. Cl. 423—464 **12 Claims**

1. A process for the production of potassium tantalum fluoride substantially free from compounds of silicon and niobium by use of aqueous hydrofluoric acid having a substantial content of dissolved silicon, which comprises: mixing an aqueous hydrofluoric and sulfuric acid solution of tantalum and niobium salts with a water-insoluble organic solvent thereby extracting at least a portion of said salts from said aqueous solution; separating said organic solvent containing said salts from the residual aqueous solution; mixing said separate organic solvent with aqueous medium thereby selectively extracting substantially all of said niobium from said organic solvent; separating said organic solvent from the residual aqueous medium; mixing said separated organic solvent with aqueous hydrofluoric acid having a substantial content of dissolved silicon; separating the organic solvent from the hydrofluoric acid with which it is mixed; mixing said organic solvent with a silicon-free aqueous solution of an ionizable potassium compound at a temperature above 50° C.; separating said aqueous solution; and cooling said aqueous solution thereby precipitating crystalline potassium tantalum fluoride therefrom substantially free from silicon.

4,041,139

RECOVERY OF SELENIUM FROM URETHANE SOLUTIONS

Thomas A. Washall, Wilmington, Del., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 30, 1976, Ser. No. 718,635
Int. Cl.[2] C01B *19/00*
U.S. Cl. 423—508 **14 Claims**

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:
   adding water to the selenium-containing urethane solution forming a urethane-water-alcohol mixture;
   contacting the urethane-water-alcohol mixture with a saturated aliphatic or alicyclic paraffin hydrocarbon having from 5 to 16 carbon atoms, or mixtures thereof, to extract selenium compounds from said mixture and form a selenium-containing hydrocarbon phase and a urethane-containing alcohol-water phase;
   separating the hydrocarbon phase from the alcohol-water phase;
   separating the hydrocarbon from the hydrocarbon phase leaving a selenium compound concentrate; and
   recovering selenium from said selenium concentrate.

4,041,140

METHOD OF MAKING A SULPHIDE CERAMIC BODY

Tsuneharu Nitta, Katano; Shigeru Hayakawa; Yukio Kasahara, both of Hirakata, and Ziro Terada, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 16, 1974, Ser. No. 489,048
Int. Cl.[2] C01B *17/20;* C04B *35/70*
U.S. Cl. 423—561 R **6 Claims**



1. A method of making a sulphide ceramic, comprising forming a compacted body from a metal oxide powder starting material, said powder having a mean particle size of less than 1 micron, and sulphurizing at least one portion of said compacted body in an atmosphere consisting essentially of carbon disulphide at a temperature in the range of 400° to 1,000° C, said temperature being less than the transformation tempera-

ture of said sulphide and for a time sufficient to make at least one portion a sulphide having a density of at least 92% and a uniform ceramic texture of from 1 to 10 microns grain size.

4,041,141

PRODUCTION OF ELEMENTAL SULPHUR

Gerald Moss, Oxford, England, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 12, 1976, Ser. No. 657,539

Claims priority, application United Kingdom, Feb. 3, 1975, 4486/75

Int. Cl.² C01B *17/06*

U.S. Cl. 423—571 **13 Claims**

1. A method of producing elemental sulphur from a solid compound of sulphur, comprising treating particles ccontaining the said solid compound in a lower fluidized bed under such conditions that sulphur is liberated as SOx, passing the SOx upwardly into an upper fluidized bed at a temperature within the range of 310° to 1350° C. and containing char, (as herein defined), whereby at least some SOx is reduced to elemental sulphur, the char of the upper fluidized bed having a density lower than the density of the particles in the lower fluidized bed, whereby the upper fluidized bed floats upon the lower fluidized bed.

4,041,142

METHOD FOR REMOVING SULFUR OXIDE FROM WASTE GASES AND RECOVERING ELEMENTAL SULFUR

Raymond H. Moore, Richland, Wash., assignor to Battelle Memorial Institute, Richland, Wash.

Filed Dec. 8, 1975, Ser. No. 638,677

Int. Cl.² B01D *47/00;* C01B *17/02*

U.S. Cl. 423—573 G **11 Claims**

1. A process for removing sulfur dioxide from a gaseous stream containing said sulfur dioxide, which comprises:

in a scrubber contacting said stream with a sulfur dioxide depleted molten fused salt mixture, containing a dissolved oxidizing catalyst and maintained at a temperature not greater than 500° C., to (1) oxidize said sulfur dioxide to sulfur trioxide, (2) dissolve said sulfur trioxide and (3) form a sulfur dioxide depleted gaseous stream and a sulfur trioxide loaded molten liquid salt mixture

separating said sulfur trioxide loaded molten liquid salt mixture and the sulfur dioxide depleted gaseous stream before the molten salt mixture becomes saturated with sulfur trioxide,

dissociating the separated sulfur trioxide loaded molten liquid salt mixture to produce a gaseous effluent of sulfur trioxide and to regenerate said sulfur dioxide depleted molten fused salt mixture,

combining said sulfur trioxide with hydrogen sulfide to form a gaseous mixture having a SO_3:H_2S molar ratio not substantially greater than 1:3, and

maintaining said mixture in a Claus reactor at an elevated temperature sufficient to cause said hydrogen sulide to reduce said sulfur trioxide to produce elemental sulfur and water.

4,041,143

PROCESS FOR PREPARING FIBROUS ALKALI METAL TITANATE

Yoshinori Fujiki, and Fujio Izumi, both of Sakura, Japan, assignors to National Institute for Researches in Inorganic Materials, Ibaraki, Japan

Filed Mar. 19, 1976, Ser. No. 668,535

Claims priority, application Japan, Mar. 20, 1975, 50-034027

Int. Cl.² C01G *23/00;* C01D *13/00, 17/00*

U.S. Cl. 423—598 **5 Claims**

1. A process for preparing a fibrous alkali metal titanate, which comprises:

mixing 5–50 mole % of an alkali metal titanate of the formula: M_2O $(TiO_2)_n$, wherein M is sodium, potassium, rubidium or cesium and *n* ranges from 1 to 7, or an alkali metal titanate forming components with a flux of sodium, potassium, rubidium or cesium tungstate or molybdate, wherein the alkali metal component of each reactant is the same alkali metal;

melting the mixture at a temperature of 700°-1350° C, whereby said alkali metal titanate grows as a fibrous material; and

recovering said fibrous alkali metal titanate from said flux.

4,041,144

PROCESS FOR PREPARING STANNIC OXIDE HYDRATE

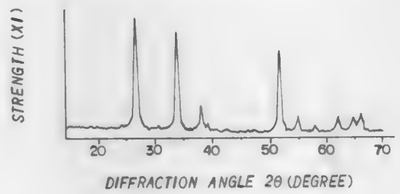
Isao Obara, and Kazuo Yagami, both of Yatsushiro, Japan, assignors to Kohjin Co., Ltd., Tokyo, Japan

Filed May 7, 1975, Ser. No. 575,228

Claims priority, application Japan, May 10, 1974, 49-51275

Int. Cl.² C01G *19/02*

U.S. Cl. 423—618 **5 Claims**



1. A process for preparing stannic oxide hydrate substantially amorphous with respect to X-ray diffraction and having bound water in the range from about 0.5 to about 0.7 mole of H_2O per 1 mole of SnO_2 which comprises

a. forming a slurry containing β-stannic acid having a free water content of not more than 70% by weight,

b. adjusting the slurry to a pH in the range of from about 2 to about 4.5,

c. heating the slurry to a temperature in the range from 80° C to 130° C in an atmosphere having a humidity of not less than 0.5 kg. of steam/1 kg. of dry air, and

d. recovering the resulting stannic oxide hydrate product, the product having a free water content of from 5% to 25% by weight and bound water in the range from about 0.5 to about 0.7 mole of H_2O per 1 mole of SnO_2.

4,041,145

SELENYL AND TELLURYL DERIVATIVES OF STEROIDS

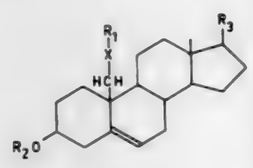
Augustinus Petrus Maria van der Veek, Voorschoten, Netherlands, assignor to Philips-Duphar B.V., Amsterdam, Netherlands

Filed Nov. 28, 1975, Ser. No. 636,099

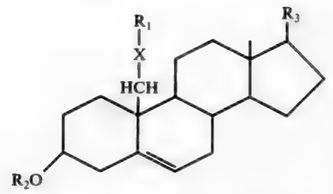
Claims priority, application Netherlands, Nov. 28, 1974, 7415526

Int. Cl. A61k *43/00;* C07j *9/00*

U.S. Cl. 424—1 **20 Claims**



1. Novel selenyl- and telluryl compounds of the formula



in which X is selected from the group consisting of a selenium and tellurium atom, R_1 is a hydrocarbon radical, R_2 is selected from the group consisting of a hydrogen atom, an alkanoyl group or an organic group that is easily removed from the oxygen atom, and R_3 is a 1,5-dimethyl hexyl optionally containing a member of the group consisting of methyl, and ethyl at the 4-position.

12. A diagnostic composition for diagnostic examination into abnormalities of internal organs, wherein the composition contains, besides a liquid or solid carrier material that can be tolerated by the human body, a radioactively labelled selenyl- or telluryl derivative of a steroid of claim **1.**

4,041,146

METHOD FOR DETECTION OF BIOLOGICAL PARTICLES

Ivar Giaever, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed May 1, 1975, Ser. No. 573,610

Int. Cl.² G01N *33/00, 33/16;* A61K *43/00*

U.S. Cl. 424—1 **31 Claims**

1. A diagnostic method for determining the presence or absence of select biological particles in a liquid sample comprising the steps of:

contacting surface area of a substrate with first biological particles, said first biological particles being specific to the select biological particles and being dispersed as a first layer coating said surface area;

contacting the coated surface area of said substrate with the sample liquid for a preselected period of time;

applying a tagging medium to the coated surface area resulting from the preceding step, said tagging medium making tags available to said coated surface area;

contacting the coated surface area resulting from the preceding step with a cleaving agent solution, said cleaving agent solution being capable of selectively destroying such bonding as may exist between said first biological particles and select biological particles;

separating from said substrate the cleaving agent solution used in the preceding step together with any matter contained therein released from the coated surface area and

examining said separated cleaving agent and contents thereof for the presence of emanations from the tags to indicate the presence of the select biological particles in said liquid sample.

4,041,147

ANGIOTENSIN IRADIOIMMUNOASSAY

Rinaldo G. Pagnucco, Somerville, N.J.; Roberta J. Muse, Philadelphia, Pa., and Dasika R. Murty, North Brunswick, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed July 29, 1976, Ser. No. 709,674

Int. Cl.² G01N *33/00;* G21H *5/02*

U.S. Cl. 195—103.5 A **4 Claims**

1. A process for maximizing the generation of angiotensin I from angiotensinogen which comprises incubating the angiotensinogen substrate in a buffer solution of pH about 7.4, said buffer comprising about equimolar amounts of tris (hydroxymethyl)aminomethane and maleic acid.

4,041,148

NEW AEROSOL PROPELLANTS FOR PERSONAL PRODUCTS

Charles W. Simons, Bedford; Gerald J. O'Neill, Arlington, and Joel A. Gribens, Framingham, all of Mass., assignors to W. R. Grace & Co., Cambridge, Mass.

Continuation-in-part of Ser. No. 622,246, Oct. 14, 1975, abandoned. This application Aug. 16, 1976, Ser. No. 714,522

Int. Cl.² C09K *3/30*

U.S. Cl. 424—45 **4 Claims**

1. An aerosol container pressurized by a material selected from the class consisting of bis(difluoromethyl) ether, perfluorodimethyl ether and mixtures thereof.

4,041,149

COMPOSITION AND METHOD OF CONTROLLING AND PREVENTING MOUTH ODOR

Maria Corazon Gaffar; Abdul Gaffar, both of Somerset, and John P. Hauschild, Sommerville, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,231

Int. Cl.² A61K *7/16*

U.S. Cl. 424—57 **9 Claims**

1. An improved oral composition containing a peroxydiphosphate salt as an effective non-antimicrobial, non-staining mouth odor inhibitor.

5. A method of preventing and controlling mouth odor which comprises applying the composition of claim **1** to the oral cavity, wherein the peroxydiphosphate is activated by the salivary phosphatases to form the peroxymonophosphate anion which slowly and continuously generate hydrogen peroxide which deodorizes the oral cavity.

4,041,150

KERATIN MODIFYING AGENTS AND METHOD OF BENEFICIALLY MODIFYING FILAMENTOUS KERATIN MATERIALS

Sulo A. Karjala, Chicago, Ill., assignor to Wilson Foods Corporation, Oklahoma City, Okla.

Filed May 27, 1971, Ser. No. 147,623

Int. Cl.² A61K *7/09, 7/11*

U.S. Cl. 424—71 **9 Claims**

1. A method of modifying filamentous keratins which comprises contacting said keratins with an effective amount of an aqueous treating composition containing an effective amount of a reducing agent and 0.1 to 8% of a water or alkali-soluble reaction product of (1) a water-soluble product of acid hydrolysis of keratinaceous materials to a peptide state with (2) a beneficiating agent for said filamentous keratins capable of reacting with said water-soluble hydrolysis product through the formation of amide linkages, removing the excess aqueous treating composition from said keratins, and contacting the modified filamentous keratins with an effective amount of an aqueous solution of an oxidizing agent.

4,041,151

RESIN COMPOSITIONS CONTAINING 0,0,0′,0′-TETRAMETHYL 0,0′-THIODI-P-PHENYLENE PHOSPHOROTHIOATE

Jerry Peter Milionis, Somerset, and Larry Dean Spicer, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 2, 1975, Ser. No. 592,433

Int. Cl.² A61K *31/74;* A01N *9/36*

U.S. Cl. 424—78 **11 Claims**

1. A method for the prolonged control of siphonaptera on dogs and cats, comprising attaching to the dogs or cats a flexible collar of a composition of a polyvinyl chloride resin having a weight average molecular weight of from 60,000 to 280,000 and an inherent viscosity of from about 0.5 to 1.2, and as the active siphonapteracidal agent from 13% to 50% by weight of 0,0,0′,0′-tetramethyl 0,0′-thiodi-p-phenylene phosphorothioate

around the neck of the dog or cat which is to be protected against siphonaptera infestation or reinfestation.

4,041,152

PHARMACEUTICAL FORMULATION OF INTERFERON INSOLUBILIZED BY FIXATION ON A SUPPORT

Charles Chany, 17, rue Emile-Dubois, Paris, France; Brigitte Galliot, 11, rue Thibaud, Paris, France (75014); Marie-Josephe Chevalier, 13, rue Epee de Bois, Paris, France (75005), and Helmut Ankel, 74, av. Denfert-Rochereau, Paris, France (75674)

Filed July 22, 1974, Ser. No. 490,658

Claims priority, application France, July 27, 1973, 73.27538

Int. Cl.[2] A61K *45/02*

U.S. Cl. 424—85 **6 Claims**

1. A pharmaceutical product comprising an effective amount of interferon rendered insoluble by fixation by way of covalent bonds on a previously activated support selected from the group consisting of agarose, dextran, levan, mannan, pectin, xylan, galactan, glycerol-pectate and heparin.

4. A pharmaceutical product comprising interferon fixed by electrostatic bonds on a support comprising concavallin A.

4,041,153

METHODS AND PHARMACEUTICAL PREPARATION FOR THE TREATMENT OF HYPERCHOLESTEROLAEMIA

Alan N. Howard, Cambridge, England, assignor to Bristol-Myers Company, New York, N.Y.

Filed June 2, 1975, Ser. No. 583,308

Claims priority, application United Kingdom, June 4, 1974, 24794/74

Int. Cl.[2] A61K *33/24, 31/215, 31/19*

U.S. Cl. 424—131 **10 Claims**

1. A pharmaceutical composition for use in the treatment per os of hypercholesterolemia, which comprises a hypocholesteremic effective amount of

a. a compound selected from p-chlorophenoxyisobutyric acid, the methyl, ethyl, propyl or butyl ester thereof or a sodium, potassium, calcium, magnesium, aluminum, zinc, bismuth or iron salt thereof, and

b. an ingestible non-toxic bismuth salt capable of dissolution in human gastrointestinal juices, the total amount of non-toxic metal being from 3.2 to 90 equivalents per mole of p-chlorophenoxyisobutyric acid or ester or salt thereof.

6. A method for the treatment of hypercholesterolemia, in which there is administered to the patient per os a hypocholesteremic effective dose of a pharmaceutical composition comprising

a. a compound selected from p-chlorophenoxyisobutyric acid, the methyl, ethyl, propyl or butyl ester thereof or a sodium, potassium, calcium, magnesium, aluminum, zinc, bismuth or iron salt thereof, and

b. an ingestible non-toxic bismuth salt capable of dissolution in human gastrointestinal juices, the total amount of non-toxic metal being from 3.2 to 90 equivalents per mole of p-chlorophenoxyisobutyric acid or ester or salt thereof.

4,041,154

MAGNESIUM-CONTAINING PHARMACEUTICAL COMPOSITIONS

Joachim Helbig, and Franz Fischer, both of Tutzing, Germany, assignors to Verla-Pharm Arzneimittel-Fabrik Apotheker H. J. v. Ehrlich, Tutzing, Germany

Filed Feb. 17, 1976, Ser. No. 658,717

Claims priority, application Germany, Feb. 20, 1975, 2507354

Int. Cl.[2] A61K *31/195, 33/14, 33/18;* **C07C** *101/22*

U.S. Cl. 424—150 **3 Claims**

1. A pharmaceutical preparation useful as an infarct prophylactic, a sedative and muscle relaxant, or a sedative and tranquilizer, comprising in combined form one of magnesium diglutamate and magnesium diaspartate, and at least one alkali or alkaline earth metal halogenide selected from magnesium chloride, magnesium bromide, magnesium iodide, sodium or potassium chloride, sodium or potassium bromide, sodium or potassium iodide, calcium chloride, calcium bromide, and calcium iodide, the ratio of the alkali or alkaline earth metal halogenide to the one of magnesium diglutamate and magnesium diaspartate being substantially equimolecular.

4,041,155

LONG ACTING SOMATOSTATIN COMPOSITION

Richard L. Fenichel, Wyncote, and Howard J. Levin, Norristown, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 29, 1974, Ser. No. 518,650

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **3 Claims**

1. A long-acting growth hormone release-inhibiting composition suitable for subcutaneous or intramuscular injection comprising:

a. Somatostatin or linear somatostatin, and

b. an aqueous vehicle containing about **80%** polyethylene glycol **400.**

4,041,156

N^2-ALKOXYNAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto, Kobe; Ryoji Kikumoto; Kazuo Ohkubo, both of Tokyo; Tohru Tezuka, Yokohama; Shinji Tonomura, Tokyo; Yoshikuni Tamao, Yokohama, and Akiko Hijikata, Kobe, all of Japan, assignors to Mitsubishi Chemical Industries Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 671,436, March 29, 1976, which is a division of Ser. No. 622,390, Oct. 14, 1975, abandoned. This application Feb. 6, 1976, Ser. No. 656,014

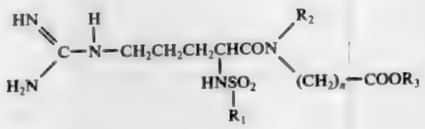
Claims priority, application Japan, Nov. 8, 1974, 49-128774; Nov. 8, 1974, 49-128775; Nov. 29, 1974, 49-136695; Nov. 29, 1974, 49-136697; Feb. 25, 1975, 50-023268; Feb. 26, 1975, 50-023635; Mar. 5, 1975, 50-026768; Mar. 11, 1975, 50-029357; Mar. 11, 1975, 50-029358

The portion of the term of this patent subsequent to Apr. 19, 1994, has been disclaimed.

Int. Cl.[2] C07C *103/52;* **A61K** *37/00*

U.S. Cl. 424—177 **7 Claims**

1. N^2-alkoxynaphthalenesulfonyl-L-argininamides having the formula (I):



(I)

or the pharmaceutically acceptable salts thereof wherein R_1 is naphthyl substituted with at least one C_1-C_5 alkoxy; R_2 is C_3-C_{10} cycloalkyl or C_4-C_{10} cycloalkylalkyl; R_3 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_6-C_{10} aryl and C_7-C_{12} aralkyl; and n is an integer of 1, 2 or 3.

4,041,157

FUNGICIDAL PYRIMIDINE DERIVATIVES

Brian Kenneth Snell, Bracknell, England, assignor to Imperial Chemical Industries Limited, London, England

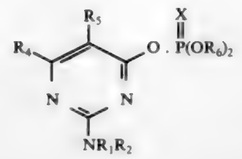
Division of Ser. No. 114,079, Feb. 9, 1971, Pat. No. 3,906,094, which is a continuation-in-part of Ser. No. 624,126, March 20, 1967, abandoned. This application Aug. 27, 1975, Ser. No. 608,331

Claims priority, application United Kingdom, Mar. 31, 1966, 14266/66; Mar. 31, 1966, 14267/66

Int. Cl.[2] A01N *9/36;* **C07D** *239/24*

U.S. Cl. 424—200 **10 Claims**

1. A pyrimidine derivative having the formula:



or a salt thereof wherein X is an atom of oxygen or sulphur; R_1 is hydrogen; R_2 is hydrogen, alkyl containing not more than 6 carbon atoms or alkenyl containing not more than 6 carbon atoms; phenyl or halo- or methyl-substituted phenyl, cyclohexyl or acetyl; R_4 is alkyl containing not more than 6 carbon atoms or a phenyl radical; R_5 is hydrogen, or alkyl containing not more than 6 carbon atoms or alkenyl containing not more than 6 carbon atoms; R_6 is alkyl containing not more than 6 carbon atoms.

7. A method of combating plant fungus which comprises applying to a plant or to seeds thereof, a fungicidally effective amount of a pyrimidine derivative as defined in claim **1.**

4,041,158

O-ALKYL-O-[1-(3-NITROPHENYL)-2-CARBALKOXY-VINYL]-THIONO(THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS

Fritz Maurer; Hans-Jochem Riebel, both of Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

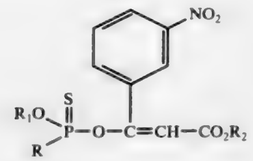
Filed Nov. 11, 1975, Ser. No. 630,856

Claims priority, application Germany, Nov. 26, 1974, 2455763

Int. Cl.[2] A01N *9/36;* **C07F** *9/18, 9/205*

U.S. Cl. 424—212 **10 Claims**

1. An 0-alkyl-0-[1-(3-nitrophenyl)-2-carbalkoxyvinyl]-thiono(thiol)-phosphoric(phosphonic) acid ester of the formula



in which

R is alkyl, alkoxy or alkylthio, each with 1 to 6 carbon atoms, or phenyl, and

R_1 and R_2 each independently is alkyl with 1 to 6 carbon atoms.

9. A method of combating insect pests which comprises applying to the pests or a habitat thereof an insecticidally effective amount of a compound according to claim **1.**

4,041,159

NEMATOCIDAL 4-AMINO-N-THIO-SUBSTITUTED 3,5-DINITROBENZENESULFONAMIDES

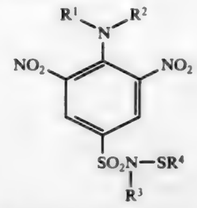
James L. Platt, Novato, and William L. Schinski, San Rafael, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 12, 1976, Ser. No. 657,678

Int. Cl.[2] A01N *9/16*

U.S. Cl. 424—228 **5 Claims**

1. A method for the control of nematodes which comprises applying to said nematodes a nematocidally effective amount of a compound of the formula



wherein R^1 is alkyl of 1 to 6 carbon atoms, R^2 is alkyl of 1 to 6 carbon atoms, R^3 is alkyl of 1 to 6 carbon atoms and R^4 is alkyl of 1 to 6 carbon atoms, haloalkyl of 1 to 2 carbon atoms and 1 to 5 of the same or different halogens selected from fluoro, chloro or bromo, or phenyl substituted with up to 2 fluoro, chloro, bromo or alkyl of 1 to 4 carbon atoms.

4,041,160

WATER-SUSPENDIBLE COMPOSITION COMPRISING ROBENIDINE

Morris E. Stolar, Tel-Aviv, Israel, assignor to Abic Ltd., Israel

Filed Dec. 30, 1975, Ser. No. 645,379

Claims priority, application Israel, Jan. 8, 1975, 46406

Int. Cl.[2] A61K *31/63, 31/635, 31/155*

U.S. Cl. 424—229 **15 Claims**

1. A composition which forms a stable suspension in water, said composition comprising a compound selected from the group consisting of 1,3-bis-[(p-chlorobenzylidene) amino]-guanidine and physiologically acceptable salts thereof, N-methyl-2-pyrrolidone, a protective colloid and water, buffered to a pH of 7–9.5.

4,041,161

CEPHALOSPORINS HAVING AN α-ACYLAMINOACETIC ACID SIDE CHAIN

Karoly Kocsis, Basel; Heinrich Peter, and Hans Bickel, both of Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

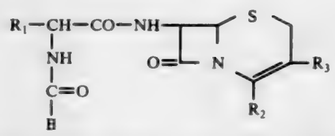
Filed May 9, 1975, Ser. No. 576,398

Claims priority, application Switzerland, May 13, 1974, 6494/74

Int. Cl.[2] C07D *501/36;* **A61K** *31/38;* **C07D** *501/32, 501/54*

U.S. Cl. 424—246 **6 Claims**

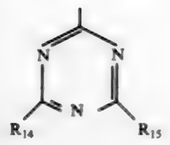
1. A compound of the formula



(I)

wherein R_1 denotes phenyl, thienyl, furyl, 1,4-cyclohexadienyl or phenyl substituted by hydroxy, R_2 represents a free carboxyl group, R_3 denotes hydrogen, lower alkanoyloxymethyl, benzoylthiomethyl, pyridiniomethyl, pyridiniomethyl substituted by lower alkyl, halogen, trifluoromethyl, hydroxyl, carboxyl and lower alkoxy carbonyl, and B denotes one of the groups B_5 or B_6, of which B_5 represents the formula

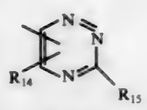
(B5)



wherein R_{14} and R_{15} independently of one another denote hydrogen, halogen, a free hydroxyl or mercapto group, a lower alkoxy or a lower alkyl mercapto group or a lower alkoxy carbonyloxy or a lower alkoxy carbonyl mercapto group, or mono- or di-lower alkylated amino group, a lower alkanoylated amino group, or ureido group

or of which B_6 represents the formula

(B6)



wherein R_{14} and R_{15} have the meaning mentioned under formula (B_5), the substituent R_{14} preferably occupying the 5-position of the as-triazine ring, a tautomer, or a salt thereof.

5. A pharmaceutical preparation for combatting bacteria which comprises an antibacterially effective amount of a compound of claim **1** and a pharmaceutically usable excipient.

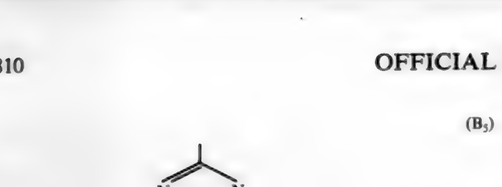
4,041,162

7-ACYL-3-(SULFOALKYL SUBSTITUTED OXADIAZOLYLTHIOMETHYL) CEPHALOSPORINS

David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

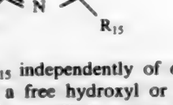
Filed Mar. 11, 1976, Ser. No. 666,095
Int. Cl.[2] C07D *501/36;* A61K *31/38*
U.S. Cl. 424—246 **19 Claims**

1. A compound of the formula:



in which:

R^1 is an acyl group of the formula:



where:

X is thienyl, dihydrophenyl, phenyl or phenyl monosubstituted with hydroxy, hydroxymethyl, formamido, ureido or carboxymethylamino;

A is NH_2, OH, COOH or SO_3H; or formyloxy where X is phenyl; and

n is one to five,

or a non-toxic pharmaceutically acceptable salt thereof.

13. An antibacterially effective pharmaceutical composition comprising a compound as claimed in claim **1** and a pharmaceutically acceptable carrier therefor.

15. A method of treating bacterial infections comprising administering internally by injection to an infected or susceptible warm-blooded animal an antibacterially effective but non-toxic dose of a compound as claimed in claim **1.**

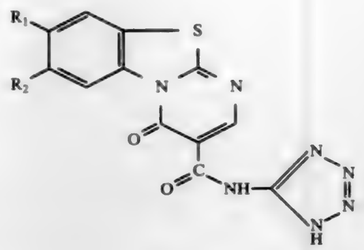
4,041,163

N-(5-TETRAZOLYL)-4-OXO-4H-PYRIMIDO(2,1-B)BENZOTHIAZOLE-3-CARBOXAMIDE ANTIALLERGY AGENTS

Jasjit S. Bindra, Groton, and Saul B. Kadin, New London, both of Conn., assignors to Pfizer Inc., New York, N.Y.

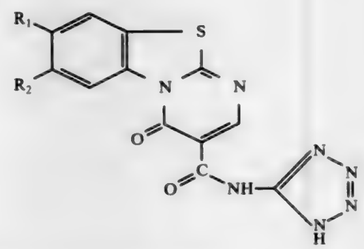
Filed Mar. 29, 1976, Ser. No. 671,030
Int. Cl.[2] A61K *31/505;* C07D *513/02*
U.S. Cl. 424—251 **16 Claims**

1. A compound selected from the group consisting of:



and a pharmaceutically acceptable base salt thereof wherein R_1 is selected from the group consisting of hydrogen, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, hydroxy, chloro, fluoro, trifluoromethyl, nitro, amino and methylthio; R_2 is selected from the group consisting of hydrogen, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, hydroxy, chloro, fluoro and methylthio; and R_1 and R_2 when taken together are selected from the group consisting of methylenedioxy and ethylenedioxy.

9. A method of inhibiting the release of mediators of anaphylaxis in mammals and thereby reducing bronchoconstriction covered by said mediators, said method which comprises oral, intraperitoneal or inhalation administration to a mammal an amount of a compound which inhibits release of said mediators, said compound being selected from the group consisting of



and a pharmaceutically acceptable base salt thereof wherein R_1 is selected from the group consisting of hydrogen, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, hydroxy, chloro, fluoro, trifluoromethyl, nitro, amino and methylthio; R_2 is selected from the group consisting of hydrogen, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, hydroxy, chloro, fluoro and methylthio; and R_1 and R_2 when taken together are selected from the group consisting of methylenedioxy and ethylenedioxy.

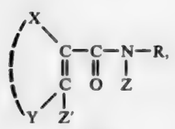
4,041,164

FUNGICIDAL DISPERSIONS OF CARBOXYLIC ACID AMIDES

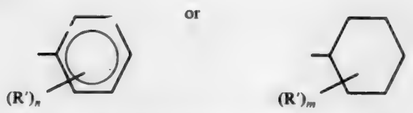
Konrad Albrecht, Fischbach, Taunus; Heinz Frensch, Frankfurt am Main, and Kurt Härtel, Hofheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 2, 1974, Ser. No. 511,120
Claims priority, application Germany, Oct. 4, 1973, 2349908; June 26, 1974, 2430625
Int. Cl.[2] A01N *9/22*
U.S. Cl. 424—263 **8 Claims**

1. A fungicidal dispersion comprising from 0.2 to 5 percent, by weight of said dispersion, of an aluminum chelate of a polynuclear hydroxy-quinone selected from the group consisting of naphthazarin, quinizarin, chrysazin, and alizarin present in said dispersion as a stabilizer discouraging crystal growth of the fungicidally-active ingredient, said dispersion comprising, as the fungicidally-active ingredient, from 5 to 50 percent by weight of a compound of the formula



wherein X and Y, together with the —C=C— group, form a partially unsaturated or totally unsaturated five- or six-membered carbocyclic or heterocyclic ring system selected from the group consisting of unsubstituted furan, pyran, dihydrofuran, dihydropyran, oxazole, triazole, thiadiazole, thiazole, dioxane, dithiane, 4H-thiapyran, 4H-thiapyran dioxide, 4H-thiapyran monoxide, 5,6-dihyro-1,4-oxathiine, 5,6-dihydro-oxathiine-4,4-dioxide, pyridine, cyclopentene, cyclohexene, norbornadiene, and phenyl, and such ring systems which, in addition to substituent Z', are substituted with at least halogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, oxymethylene, or phenyl; Z' is hydrogen, halogen, or alkyl having 1 to 4 carbon atoms; Z is hydrogen, straight or branched alkyl having 1 to 6 carbon atoms, or straight or branched haloalkyl having from 1 to 6 carbon atoms; and R is



wherein R' is dioxymethylene or the same or different alkyl or alkoxy having 1 to 4 carbon atoms, *m* is an integer from 0 to 3, and *n* is an integer from 0 to 3 or, if



is dihydropyran and Z is methyl, then *n* is integer from 1 to 3, said fungicidally-active ingredient being dispersed in at least one member selected from the group consisting of C_8 to C_{25} paraffinic mineral oils boiling at a temperature above 140° C.; rape-seed oil; arachis oil; sunflower oil; cotton seed oil; liquid monoesters and diesters formed between C_1 to C_{12} monoalcohols and C_2 to C_{10} monobasic and dibasic carboxylic acids, and monoesters having from 8 to 12 carbon atoms and said diesters having at most 32 carbon atoms.

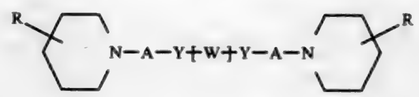
4,041,165

PHARMACEUTICALLY USEFUL NITROGEN CONTAINING HETEROCYCLIC DERIVATIVES

Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 370,425, June 15, 1973, Pat. No. 3,937,835.
This application Nov. 3, 1975, Ser. No. 628,529
Int. Cl.[2] A61K *31/445*
U.S. Cl. 424—267 **8 Claims**

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a compound of the formula



wherein [W] is an aromatic polycyclic nucleus selected from the group consisting of dibenzofuran, dibenzothiophene, carbazole, N-(lower)alkylcarbazole, xanthene, xanthone, thioxanthene, and phenoxathiin; each Y is carbonyloxy, carbonylthio, oxygen, divalent sulfur, or carbonyl with the proviso that when Y is carbonyloxy or carbonylthio, [W] is other than thioxanthene or phenoxathiin, and when Y is oxygen or divalent sulfur, [W] is other than thioxanthene or phenoxathiin; A is a straight or branched alkylene chain of from 1 to 6 carbon atoms with the proviso that when Y is carbonyloxy or carbonylthio, A contains from 2 to 6 carbon atoms; R is hydrogen, a straight or branched lower alkyl group of from 1 to 4 carbon atoms, phenyl or benzyl; or a pharmaceutically acceptable acid addition salt thereof, in an amount effective to suppress delayed hypersensitivity.

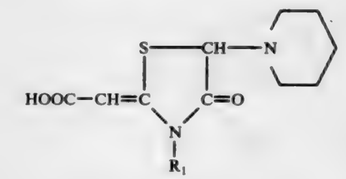
4,041,166

METHOD OF PRODUCING DIURESIS USING THIAZOLIDINONE ACETIC ACID DERIVATIVES

Gerhard Satzinger, Denzlingen; Manfred Herrmann, St. Peter, and Karl-Otto Vollmer, Freiburg im Breisgar, all of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 553,715, Feb. 27, 1975, Pat. No. 3,971,794.
This application Mar. 18, 1976, Ser. No. 668,159
Claims priority, application Germany, Mar. 25, 1974, 2414345
Int. Cl.[2] A61K *31/44*
U.S. Cl. 424—267 **1 Claim**

1. A method for producing diuresis in a mammal which comprises the administration of a compound of the general formula:



wherein R_1 is a lower alkyl radical containing 1 to 4 carbon atoms in an effective amount to cause diuresis.

4,041,167

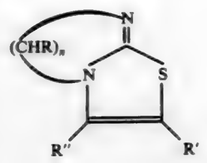
ANTIINFLAMMATORY IMIDAZOTHIAZOLES

Robert E. Moser, Mentor; Larry J. Powers, Madison, and Zaven S. Ariyan, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Jan. 19, 1976, Ser. No. 650,318
Int. Cl.[2] A61K *31/425*
U.S. Cl. 424—270 **9 Claims**

7. A method of preventing and inhibiting the formation of

granuloma tissue in an animal subject, which method comprises administering to said animal a nontoxic antiinflammatory amount of a compound of the formula:



wherein *n* is 2; R is hydrogen or methyl; R′ is hydrogen, C_1–C_3 alkyl or thioalkyl, phenyl, or carboxy methyl; and R″ is C_1–C_4 alkyl, 2-benzofuranyl, naphthyl, phenyl, or mono- or disubstituted phenyl, or an acid addition or quaternary salt thereof.

4,041,168

NITROIMIDAZOLE DERIVATIVE WITH ANTIBACTERIAL ACTIVITY

Alessandro Assandri, Milan; Giancarlo Lancini, Pavia; Giancarlo Volpe, and Bruno Cavalleri, both of Milan, all of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Dec. 29, 1975, Ser. No. 644,382

Claims priority, application United Kingdom, Jan. 15, 1975, 01684/75

Int. Cl.² A61K *31/415;* **C07D** *233/91*

U.S. Cl. 424—273 **4 Claims**

1. The compound 5-[(1-hydroxy-1-methyl)ethyl]-1-methyl-2-nitroimidazole.

3. A method for combatting the infections caused by *Trichomonas vaginalis* in mammals, which comprises administering an effective amount of 5-[(1-hydroxy-1-methyl)ethyl]-1-methyl-2-nitro-imidazole.

4,041,169

PHARMACEUTICAL METHOD FOR USING PYRANO-AND THIOPYRANOINDOLE DERIVATIVES

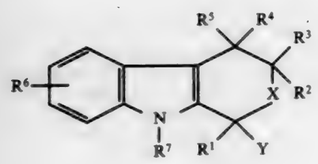
Christopher A. Demerson, Montreal; Leslie G. Humber, Dollard des Ormeaux; Andre A. Asselin, Lemoyne; Ivo Jirkovsky, Montreal, and Thomas A. Dobson, Roxboro, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 555,906, March 5, 1975, Pat. No. 4,003,913, which is a continuation-in-part of Ser. No. 377,837, July 9, 1973, Pat. No. 3,880,853, and Ser. No. 217,627, Jan. 13, 1972, Pat. No. 3,852,285. This application Oct. 28, 1976, Ser. No. 736,624

Int. Cl.² A61K *31/40*

U.S. Cl. 424—274 **8 Claims**

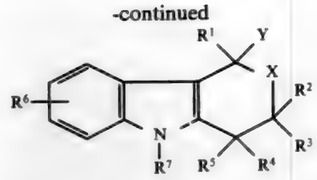
1. A method of preventing and treating ulcers in warm blooded animals which comprises:
administering to said mammal an effective dose of from about 0.1 milligram to about 50 milligrams per kilogram of mammal weight per day of a compound selected from those of the formulae I and Ia



1

1a

-continued



in which R^1 is lower alkyl or lower cycloalkyl; R^2, R^3, R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; R^6 is hydrogen, lower alkyl, hydroxy, lower alkoxy, lower alkanoyloxy, nitro or halo; R^7 is hydrogen, lower alkyl, lower alkenyl, propargyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula -Alk-NR^8R^9 wherein Alk is an alkylene selected from the group consisting of $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$, and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are either the same or different selected from the group consisting of hydrogen and lower alkyl, or R^8 is lower alkyl and R^9 is p-chlorophenacyl, or R^8 and R^9 together with the nitrogen atom to which they are joined form a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl, 4-(lower alkyl)-1-piperazinyl and 4-[hydroxy(lower)alkyl]-1-piperazinyl; X is thio; and Y is lower akyl, phenyl(lower)alkyl or an amino(lower)alkyl radical of formula -Alk-NR^8R^9 is an alkylene selected from the group consisting of $CR^{10}R^{11}$, $CR^{10}R^{11}CR^{12}R^{13}$, $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}$ and $CR^{10}R^{11}CR^{12}R^{13}CR^{14}R^{15}CR^{16}R^{17}$ wherein R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16} and R^{17} are hydrogen or lower alkyl and R^8 and R^9 are as defined herein; with the proviso that at least one of R^7 and Y is -Alk-NR^8R^9 and that in the compounds of formula Ia, Y is -Alk NR^8R^9 as defined herein; and the corresponding acid addition salt with a pharmaceutically acceptable acid.

4,041,170

FIELD AND GARDEN AGRICULTURAL FUNGICIDE

Takaaki Ohtsuka; Keigo Satake; Shiro Yamazaki; Nobuo Hatakeyama, and Takeo Watanabe, all of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

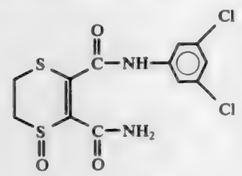
Filed Jan. 26, 1976, Ser. No. 652,011

Claims priority, application Japan, Jan. 24, 1975, 50-9686

Int. Cl.² C07D *339/08*

U.S. Cl. 424—277 **4 Claims**

1. 2-carbamoyl-3-N-(3′,5′-dichlorophenyl)-carbamoyl-5,6-dihydro-p-dithiin-1-oxide having a general formula:



4,041,171

OCTYL THIOBENZOATE USED AS AN ACARICIDE

Jean Marie De Muylder, Kraainem, Belgium, assignor to Societe d'Etudes et de Realisations Scientifiques en Abrege S.E.R.E.S.C.I.S.P.R.L., Brussels, Belgium

Filed Dec. 29, 1975, Ser. No. 645,070

Claims priority, application United Kingdom, Jan. 2, 1975, 00033/75

Int. Cl.² A01N *9/12*

U.S. Cl. 424—301 **7 Claims**

1. A process for treating animals or plants infested with acarid pests which comprises applying thereto an acaricidally effective amount of octyl thiobenzoate.

4,041,172

COMPOSITIONS AND METHODS FOR COMBATING INSECT PESTS OR FUNGAL PESTS OF PLANTS

Charles Brian Barlow, Camberley, England, assignor to Imperial Chemical Industries Limited, London, England

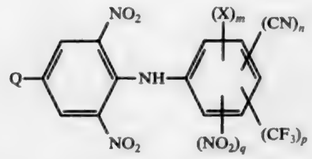
Division of Ser. No. 461,219, April 15, 1974, Pat. No. 3,950,377, which is a continuation-in-part of Ser. No. 425,279, Dec. 17, 1973, abandoned. This application Nov. 28, 1975, Ser. No. 636,298

Claims priority, application United Kingdom, Dec. 20, 1972, 58692/72; Feb. 9, 1973, 6392/73; Feb. 9, 1973, 6393/73; Feb. 9, 1973, 6394/73; Feb. 9, 1973, 6395/73; May 15, 1973, 23046/73; May 15, 1973, 23047/73

Int. Cl.² A01N *9/06, 9/20*

U.S. Cl. 424—304 **12 Claims**

1. An insecticidal or plant fungicidal composition for use against insect pests or fungal pests of plants comprising as an active ingredient an insecticidally or fungicidally amount of a diphenylamine derivative of the formula:



wherein either (a) Q represents a cyano or trifluoromethyl group, and X represents a halogen atom, *m* is an integer from zero to three, *n* is zero or one, *p* is an integer from zero to two, and *q* is an integer from zero to three, the sum of *m, n, p* and *q* being an integer from two to five; or (b) Q represents a nitro group and X represents a halogen atom, *m* is an integer from zero to three, *n* is zero to one, *p* is an integer from zero to two, and *q* is an integer from zero to three, the sum of *n* and *p* being an integer from one to three, and the sum of *m, n, p* and *q* being an integer from two to five, with a major amount of an insecticidally or plant fungicidally acceptable carrier.

4,041,173

2-CARBOXY-(7-,8- AND 9-SUBSTITUTED)-5-OXO-5H-DIBENZO (a,d) CYCLOHEPTENES AND THE CORRESPONDING 10,11-DIHYDRO COMPOUNDS

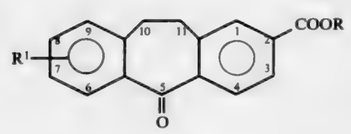
Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Oct. 6, 1975, Ser. No. 619,723

Int. Cl.² C07C *63/44*

U.S. Cl. 424—308 **13 Claims**

1. A compound selected from the group of compounds represented by the formula



R is hydrogen or alkyl having one to twelve carbon atoms;
R^1 is at the 7, 8 or 9 position and is halogen, hydroxy, lower alkoxy of 1 to 6 carbon atoms inclusive or lower alkyl of 1 to 4 carbon atoms, inclusive;
the dotted lines represent an additional bond between the carbon atoms at the 10- and 11- positions; and
the pharmaceutical acceptable salts thereof.

4,041,174

METHOD OF TREATING DEPRESSION

Alfred T. Sapse, Beverly Hills, Calif., assignor to Rom-Amer Pharmaceuticals, Ltd., Las Vegas, Nev.

Filed Aug. 16, 1974, Ser. No. 498,176

Int. Cl.² A61K *31/245*

U.S. Cl. 424—310 **22 Claims**

1. A method of treating depression which method consists essentially of treating a depressed patient with,

I. by injection or infusion, during a period of at least three weeks, at least 600 mg a week, or

II. at least about 300 mg daily, taken orally, for a period of at least about 30 days, of

i. an ester local anesthetic, which may be administered by injection, infusion, or orally, and which is selected from the class consisting of butylaminobenzoate, amydricaine, benoxinate, benzocaine, isobucaine, butacaine, butethamine, meta butethamine, meta butoxycaine, cyclomethycaine, hexylcaine, mepivacaine, meprylcaine, naepaine, parethoxycaine, piperocaine, procaine, 2-chloroprocaine, propanocaine, proparacaine, propoxycaine, tetracaine, tutocaine, the hydrates thereof, the acid salts thereof, and complexes thereof which hydrates, acid salts, and complexes slowly release the active material; or

ii. metabolic splinters of such ester anesthetic.

4,041,175

USE OF PLEUROMUTILIN FOR THE TREATMENT OF SWINE DYSENTERY

William E. Brown, Princeton; Charles O. Baughn, Flemington, both of N.J., and Wayne H. Linkenheimer, Washington Crossing, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 13, 1974, Ser. No. 469,260

Int. Cl.² A61K *31/22*

U.S. Cl. 424—311 **4 Claims**

1. A method for treating swine dysentery which comprises orally administering to an infected swine an effective amount of pleuromutilin.

4,041,176

PRESERVATIVE COMPOSITION FOR WOOD AND WOOD BUILDING MATERIALS AND METHOD OF USING SAME

Wolfgang Metzner, Krefeld, and Hubert Koddebusch, Moers, both of Germany, assignors to Desowag-Bayer Holzschutz GmbH, Dusseldorf, Germany

Filed Aug. 7, 1975, Ser. No. 602,903

Claims priority, application Germany, Aug. 9, 1974, 2438334

Int. Cl.² A01N *9/24*

U.S. Cl. 424—318 **29 Claims**

1. In a preservative composition for wood, including an organic solvent base, at least one insecticide, an organic solvent base, at least one insecticide, organic fungicide or wood-preserving organic chemical compound which is soluble in said solvent, and a marking agent, the improvement which comprises said marking agent comprising at least one organic lithium compound soluble in said solvent, said organic lithium compound being present in an amount sufficient to permit a qualitative determination of the lithium in wood to which said composition is applied.

4,041,177

4-NITRO-4'-[N-(N'-BENZOYL)-UREIDO]-DIPHENYL ETHERS

Wilhelm Sirrenberg, Sprockhoevel; Jürgen Schramm, Dormagen; Erich Klauke, Odenthal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

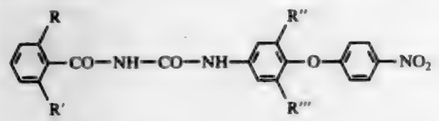
Filed Jan. 23, 1976, Ser. No. 651,986

Claims priority, application Germany, Feb. 6, 1975, 2504983

Int. Cl.² C07C *127/22;* A61K *31/17*

U.S. Cl. 424—322 **13 Claims**

1. A 4-nitro-4'-[N-(N'-benzoyl)-ureido]-diphenyl ether of the formula



(I),

in which

R is chlorine, fluorine, or methyl,

R' is hydrogen, chlorine or fluorine, and

R'' and R''' are identical and are each hydrogen or chlorine, but if R is chlorine and R' is hydrogen, R'' and R''' can only be hydrogen.

12. A method of combating insects which comprises applying to the insects or an insect habitat an insecticidally effective amount of a compound according to claim **1**.

4,041,178

SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHEMIC AGENTS

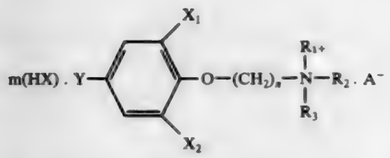
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664, which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application Jan. 12, 1976, Ser. No. 648,555

Int. Cl.² A61K *31/14*

U.S. Cl. 424—329 **8 Claims**

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula



wherein Y represents amino, loweralkylamino or dioweralkylamino; R_1 and R_2 represent lower alkyl; R_3 independently is selected from the group consisting of phenacyl, mono-, di-, or trihalophenacyl, substituted lower alkyl, substituted lower alkenyl and substituted lower alkynyl substituted with a substituent selected from the group consisting of phenyl, halophenyl, dihalophenyl, and trihalophenyl; X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; *n* represents one of the integers 2, 3 or 4; HX represnets a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers 0 and 1.

4,041,179

WATER DISPERSIBLE CHEWING GUM BASE

Marcella C. Stubits, St. Louis, and James Teng, St. Louis County, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed June 25, 1976, Ser. No. 699,661

Int. Cl.² A23G *3/30*

U.S. Cl. 426—3 **5 Claims**

1. A hydroxypropyl starch acetate having elastic properties and having variable water solubility characteristics, said starch acetate having a degree of molecular substitution of hydroxypropyl groups of about 3 to about 6 and a degree of substitution of acetate group of about 0.5 to about 0.92.

4,041,180

INTRODUCING GASES INTO FERMENTATION LIQUIDS

Richard John Hugh Wilson, Copthorne, England, assignor to Brewing Patents Limited, London, England

Filed Mar. 5, 1976, Ser. No. 664,352

Claims priority, application United Kingdom, Apr. 8, 1975, 14461/75

Int. Cl.² C12C *11/00;* C12B *1/14*

U.S. Cl. 426—11 **10 Claims**

1. A method of oxygenating brewers' wort during fermentation which consists of introducing into said wort a solution of oxygen or air in an aqueous carrier liquid selected from the group consisting of water, brewers' wort and beer, said solution being introduced into said wort at a predetermined depth, at a higher pressure than the pressure at said predetermined depth and under conditions such that the oxygen or air is retained in solution in the wort, said solution being supersaturated with oxygen or air at the temperature and under the pressure of the wort at said predetermined depth, the volume of said oxygen or air solution introduced during a single fermentation being not more than about 5% of the bulk volume of said wort in said fermentor.

2. A method of degassing brewers' wort during fermentation or degassing fermented beer, said wort or beer being supersaturated with carbon dioxide, which method comprises

1. dissolving a gas selected from the group consisting of oxygen, nitrogen, carbon dioxide and a mixture thereof in an aqueous carrier liquid selected from the group consisting of water, brewers' wort and beer to form a solution which is saturated with said gas at a superatmospheric pressure, and
2. introducing said solution into said wort or beer at a predetermined depth, under conditions leading to a high degree of shear thereby causing said gas to be liberated from said supersaturated solution as a multitude of microbubbles, said multitude of microbubbles being characterized by a distinctive milky appearance, said solution becoming supersaturated with said gas under the temperature and pressure of said wort or beer at said predetermined depth.

4,041,181

PET FOOD AND METHOD OF MAKING SAME

Ian Edward Burrows, Gaddesby; Peter Arthur Cheney, Mountsorrell, and Stephen Arthur Ariss, Melton Mowbray, all of England, assignors to Pedigree Petfoods Limited, Melton Mowbray, England

Filed Oct. 9, 1974, Ser. No. 513,281

Claims priority, application United Kingdom, Oct. 18, 1973, 48664/73

Int. Cl.² A23B *4/12*

U.S. Cl. 426—55 **4 Claims**

1. A method of making a proteinaceous food product comprising the steps of: subjecting proteinaceous material in the presence of added fermentable carbohydrate to acid-producing fermentation and autolysis until said material is semi-liquid and has an acid pH; incorporating 3 to 25% of a gellable or coagulable binder selected from the group consisting of heatcoagulable protein, starch and hydrophillic gums and mixtures thereof with the fermented and autolysed material; adding humectant in the quantity of from 2 to 10% by weight of the total mix; shaping the mix; and heating said mixture thereby causing the binder to gel or coagulate to form a coherent chewy solid shaped product; the acidity and moisture content of said fermented and autolysed material being such that the final product has a pH value of 4.0–5.5 and water activity between 0.85 and 1.00.

4,041,182

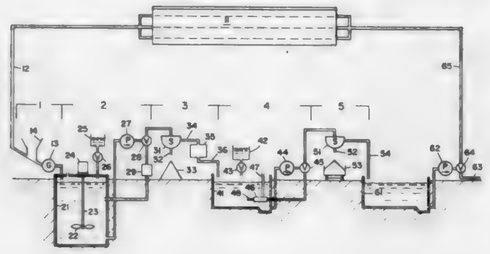
BIO-PROTEIN FEED MANUFACTURING METHOD

Lennart G. Erickson, 1070 E. Meadow Circle, Palo Alto, Calif. 94303, and Howard E. Worne, Rte. 73, Lyton Industrial Park, Berlin, N.J. 08009

Filed Apr. 16, 1975, Ser. No. 568,768

Int. Cl.² C02C *1/14;* A23K *1/12*

U.S. Cl. 426—59 **13 Claims**



1. A method for manufacturing a bioprotein animal feed supplement comprising: providing a slurry of raw organic waste containing biochemically volatile and biochemically non-volatile components, converting said biochemically volatile component to water soluble lower molecular weight intermediates essentially by the addition of organism-free hydrolyzing enzymes to said raw organic waste slurry at a temperature of about 60°–140° F, then separating said soluble lower molecular weight intermediates from biiochemically non-volatile solids in said waste solution, thereafter combining the separated lower molecular weight intermediates with cell synthesizing microorganisms substantially only under aerobic conditions permitting the microorganisms to feed upon said soluble lower molecular weight intermediates and thereby grow to produce a biomass of single cell microorganisms, and recovering said biomass of cells in a form suitable for use as an animal feed supplement.

4,041,183

METHOD FOR THE FORMATION OF ARTICLES FROM COLLAGENOUS MATERIAL

Leonard Daniel, 44 Budyan Road, Grays Point, New South Wales, Australia

Continuation of Ser. No. 395,943, Sept. 10, 1973, abandoned. This application July 17, 1975, Ser. No. 596,605

Claims priority, application Australia, Sept. 18, 1972, 462/72

Int. Cl.² B65D *81/34*

U.S. Cl. 426—105 **32 Claims**

1. A method for the formation of a water soluble collagenous article comprising the steps of:

mixing the collagenous paste, slurry or dispersion with an ester of alginic acid selected from the group consisting of water dispersable alkylene glycols up to pentylene glycol and methyl ester, the ester being present in a weight ratio of from about 1:25 to about 1:5 relative to the collagenous material on a dry weight basis, and the mixture having a solids content of from about 5% to about 20% by weight to produce a coherent plastic mass;

forming the mixture into the shape of the article to be formed;

increasing the pH of the mixture to render it sufficiently alkaline that setting of the mixture is obtained when an increased pH in alkaline range is maintained, the increase in pH being obtained by using an alkali capable of effecting such setting without the necessity of drying to effectively reform a collagen article having the desired shape in which the collagen fibers are bound together by the alginate ester, and

maintaining the mixture at the increased pH until the mixture is set.

4,041,184

METHOD OF CANDYING FRUIT AND FRUIT RINDS

Remigio Bonacina, Via Ai Monti 2, Mandello Lario (Como), Italy

Filed June 2, 1976, Ser. No. 692,240

Claims priority, application Italy, June 5, 1975, 5166/70

Int. Cl.² A23B *7/08*

U.S. Cl. 426—321 **4 Claims**

1. A method for candying fruit or fruit rinds comprising the steps of

selecting said fruit or fruit rinds and subjecting them to a preliminary cooking;

immersing the cooked fruit or fruit rinds into a candying syrup having a starting concentration in soluble solids in the range of about 10° to 60° Brix at a temperature of about 50°–60° C;

controlling the value of the concentration of the syrup until it is decreased to a constant value and measuring said constant value together with the time elapsed DT;

calculating the difference DC between the value of the starting concentration and the constant value of said concentration of the syrup;

calculating the mean absorption rate of the treated fruit or fruit rinds as a ratio DC/DT of the difference between the starting and the constant value of the concentration of the syrup and the time interval DT;

increasing the concentration of the syrup at the same rate DC/DT until it reaches a final concentration in the range of about 65° to 75° Brix.

4,041,185

BLUEBERRY FLAVOR

Thomas Holden Parliment, New City, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 607,319, Aug. 25, 1975, abandoned. This application Nov. 24, 1976, Ser. No. 744,836

Int. Cl.² A23L *1/235*

U.S. Cl. 426—534 **12 Claims**

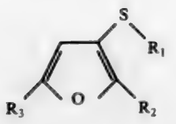
1. A blueberry flavoring composition comprising linalool and a flavorant selected from the group consisting of trans-2-hexenol, trans-2-hexenal, cis-3-hexenol, cis-3-hexenal and combinations thereof, the linalool and flavorant being combined in a weight ratio of about 1:1 to about 1:4 and the flavoring composition effective to impart a blueberry flavor to a liquid foodstuff when employed at a level of about 0.1 to 1.0 microliters linalool and about 0.1 to 4.0 microliters of flavorant per 100 ml. of liquid and to a dry foodstuff system when employed at a level of about 0.0002% to 0.004% linalool and about 0.0002% to 0.016% flavorant by weight of the dry system.

4,041,186
FLAVORING WITH (2-METHYL-3-FURYL)(METHYLTHIOMETHYL) SULFIDE

William J. Evers, Middletown; Howard H. Heinsohn, Jr., Hazlet; Manfred Hugo Vock, Hartshorne, and Christopher Giacino, Califon, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 666,347, March 12, 1976, Pat. No. 4,007,287, which is a continuation-in-part of Ser. No. 581,962, May 29, 1975, Pat. No. 3,988,510. This application Nov. 11, 1976, Ser. No. 740,947
Int. Cl.[2] A23L *1/226*
U.S. Cl. 426—535 **2 Claims**

1. A process for augmenting or enhancing the flavor of a foodstuff comprising adding to said foodstuff from about 0.0001 ppm up to about 250 ppm of a 3-furyl sulfide compound having the strucutre:



wherein R_1 is methylthiomethyl, R_2 is methyl, and R_3 is hydrogen.

4,041,187
SOYBEAN BEVERAGE AND PROCESS

Alvin I. Nelson; Marvin P. Steinberg, both of Champaign, and Lun-Shin Wei, Urbana, all of Ill., assignors to The University of Illinois Foundation, Urbana, Ill.

Continuation-in-part of Ser. No. 374,581, July 6, 1973, Pat. No. 3,901,978, which is a continuation-in-part of Ser. No. 282,499, Aug. 21, 1972, abandoned. This application June 23, 1975, Ser. No. 588,101
The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.
Int. Cl.[2] A23L *2/02*
U.S. Cl. 426—598 **37 Claims**

1. Process for preparing a bland, stable aqueous dispersion of soybeans comprising:

i. heating soybean cotyledons sufficiently to inactivate the lipoxidase enzyme contained therein and to partially tenderize said soybean cotyledons,

ii. further tenderizing said soybean cotyledons unitl the soybeans exhibit a tenderometer value of between about 16 and about 300 pounds/100 grams of soybeans; and

iii. homogenizing an aqueous slurry of said tenderized soybeans, said slurry having a soybean concentration of less than about 20% by weight, in at least one pass through a homogenization zone at a pressure between about 1000 and 10,000 psi. at a temperature between about 32° F. and the boiling point of the slurry at the pressure within the homogenizing zone, thereby obtaining a bland, stable aqueous dispersion of soybeans.

4,041,188
FOOD COMPOSITION

Derek Cottier, London, and John Barry Rossell, Loughton, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed July 23, 1975, Ser. No. 598,454
Claims priority, application United Kingdom, July 26, 1974, 33176/74; July 26, 1974, 33175/74
Int. Cl.[2] A23D *5/00*
U.S. Cl. 426—607 **9 Claims**

1. Method of preparing a confectionery fat comprising selectively hydrogenating and blending first and second fats from different vegetable fat source, the first fat being a vegetable fat containing 10 to 40% by weight of disaturated glycerides of which two-thirds of the saturated fatty acids are palmitic acid and the second vegetable fat containing a lesser amount of such glycerides not exceeding 20%, the fats being blended in an amount of from 50 to 90% by weight of the first fat to 10 to 50% by weight of the second fat and selectively hydrogenated in the presence of a metl catalyst while retaining in the glycerides hydrogenated a single olefinic bond in each unsaturated fatty acid residue to provide a blend with a trans index of about 25, of an Iodine Value of 40 to 90 and a dilatation at 20° C of 1000 to 1800.

4,041,189
PRODUCTION OF EDIBLE PROTEIN CONTAINING SUBSTANCES

Peter John Towersey, High Wycombe; John Longton, Chesham, and Geoffrey Norman Cockram, Henley-on-Thames, all of England, assignors to Ranks Hovis McDougall Limited, London, England

Filed Sept. 18, 1974, Ser. No. 507,123
Claims priority, application United Kingdom, Sept. 24, 1973, 44708/73
Int. Cl.[2] C12B *1/00*
U.S. Cl. 426—656 **8 Claims**

7. An edible protein-containing substance obtained by maintaining cells of a grown non-toxic strain of Fusarium microfungus of the class Fungi Imperfecti in a suspension at a pH between 4.7 and 7.0 and at a temperature between 55 and 72° C for a time of at least 60 seconds and sufficient to reduce the nucleic acid content to below 4%.

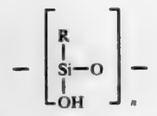
4,041,190
METHOD FOR PRODUCING A SILICA MASK ON A SEMICONDUCTOR SUBSTRATE

Jean-Claude Dubois, and Maryse Gazard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation-in-part of Ser. No. 264,235, June 19, 1972, abandoned. This application Dec. 13, 1974, Ser. No. 532,691
Claims priority, application France, June 29, 1971, 71.23624
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—43 **7 Claims**

1. A method of producing a precise silica insulating mask on predetermined areas of a semiconductor substrate, comprising the following steps:

1. depositing a thin film of an organic resin upon said semiconductor substrate, said resin consisting of polysiloxane of the structure:



where *n* is an integer ranging from 2 to about 30, and where R is an alkyl, aryl or alkenyl group;

2. irradiating and scanning said film by an electron beam, the width of the electron beam at the point of intersection with the surface of said resin of the order of 0.01 to 1 micron in diameter, according to a predetermined pattern of said mask thereby cross-linking and insolubilizing the exposed areas of said organic resin;

3. eliminating the non-irradiated areas of the film by means of a solvent and

4. thermally treating the irradiated film and substrate in a furnace and in an oxidizing atmosphere at a temperature ranging from 500 to 1000° C for about 2 hours, thereby converting the irradiated polysiloxane organic resin to a precise silica insulating mask impervious to penetration by a gas, liquid, or solid.

4,041,191
RESINS FOR USE AS ELECTRON RESISTS

Pierre Leclerc, and Jean Claude Dubois, both of 173 Bld Haussmann, 75008 Paris, France

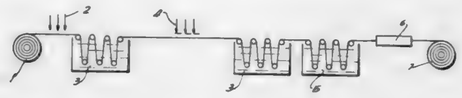
Filed Nov. 6, 1975, Ser. No. 629,543
Claims priority, application France, Nov. 8, 1974, 74.37077
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—43 **4 Claims**

1. A resin for use as an electron resist comprising a random polymer of ethylene glycol monomethacrylate with triethylene glycol dimethacrylate, and randomly crosslinked, and having a degree of polymerization of from 10 to 1000.

4,041,192
METHOD OF ENHANCING HIGH POLYMERS, PARTICULARLY TEXTILES

Adolf Heger; Helmar Pässler, and Frank Bennemann, all of Dresden, Germany, assignors to VEB Textilkombinat, Cottbus, Germany

Filed Apr. 15, 1975, Ser. No. 568,245
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—43 **43 Claims**



1. A method of enhancing the properties and appearance of polymeric substances, particularly textiles, comprising treating a surface portion of a polymer so as to effect graft polymerization over substantially the entire extent of said surface portion in such a manner that variations in graft density occur across said surface portion, whereby the properties of said surface portion are enhanced due to graft polymerization over substantially the entire extent thereof and a textured appearance is imparted to said surface portion due to said variations in graft density, the treating step comprising grafting a substance over said surface portion substantially homogeneously, and said substantially homogeneous grafting comprising substantially homogeneously irradiating said surface portion so as to cause the formation of chemically active species and substantially homogeneously contacting said surface portion with a substance which undergoes a graft polymerization reaction with said species, the treating step also comprising grafting a substance over localized regions of said surface portion only, and said localized grafting comprising substantially homogeneously irradiating said surface portion so as to cause the formation of chemically active species, eliminating the latter in the regions of said surface portion other than said localized regions and substantially homogeneously contacting said surface portion with a substance which undergoes a graft polymerization reaction with the chemically active species in said localized regions.

4,041,193
METHOD FOR FANNING EACH SET OF MULTI-PLY SHEETS

Takao Hayashi, and Hiroharu Matsukawa, both of Fujimiya, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Oct. 31, 1974, Ser. No. 519,734
Claims priority, application Japan, Oct. 31, 1973, 48-122542; Oct. 31, 1973, 48-122543
Int. Cl.[2] B41M *5/00*
U.S. Cl. 427—151 **8 Claims**

1. A method for fanning units comprising multi-ply sheets, which comprises applying an adhesive composition containing a sodium salt or potassium salt of naphthalenesulfonate-formaldehyde condensate to one side of a stack of multi-ply sheets and separating each unit of said sheets, wherein said naphthalenesulfonate-formaldehyde condensate is present in said composition in a proportion of about 5 to 40% by weight.

4,041,194
DECORATIVE COATING COMPOSITION FOR COATING GLASSWARE

Kennedy A. Jenkins, Washington, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Sept. 29, 1975, Ser. No. 617,608
Int. Cl.[2] C03C *17/32*; B05D *3/00*
U.S. Cl. 427—226 **9 Claims**

1. A thermofluid decorative coating composition consisting essentially of by weight

a. 20 to 50% of an essentially water-insoluble vehicle having a melt softening point range from about 45° to about 65° C. and

b. 80 to 50% of a particulate, non-vitrifiable filler material intimately dispersed in said vehicle,

said vehicle consisting essentially of by weight from 5 to 75% of at least one normally solid saturated aliphatic monohydric alcohol having 14 to 32 carbon atoms, 0 to 55% of paraffin wax, 0 to 40% of one or more polyalkylene glycols having an average molecular weight ranging from about 1500 to 20,000 in which the alkylene groups have 2 to 3 carbon atoms, 7 to 55% of at least one polystyrene having an average molecular weight ranging from about 200 to about 1200 and a softening point below 105° C., and 0 to 20% of one or more lower alkyl acrylate polymers having an inherent viscosity between about 0.2 and about 0.7, the sum of said alcohol, wax and polyalkylene glycol components being 45 to 77% of the vehicle and the sum of said polystyrene and acrylate polymer components being 23 to 55% of the vehicle.

4,041,195
MANUFACTURING PROCESS OF POROUS TUBULAR MEMBERS

Pierre Dussaussoy, Pantin, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 8, 1972, Ser. No. 224,638
Claims priority, application France, Feb. 16, 1971, 71.05158
Int. Cl.[2] B05C *7/14*
U.S. Cl. 264—60 **7 Claims**

1. Process for making porous tubular elements having two superposed coaxial layers, an external layer of rough texture and of high mechanical strength, and an internal layer of small radial thickness and fine texture, the steps of preparing a tubular shape of rough texture agglomerated by an organic binder, forming a thin layer of fine texture on a rigid core having a smaller external diameter than the internal diameter of the tubular shape, isostatically compressing the tubular shape for radial compression of the shape onto the rigid core, releasing the isostatic compression on the resulting assembly with radial expansion of the tubular shape and of the thin layer adhered thereto away from the rigid core, withdrawing the rigid core from the assembled tubular shape and thin layer and then baking the assembly.

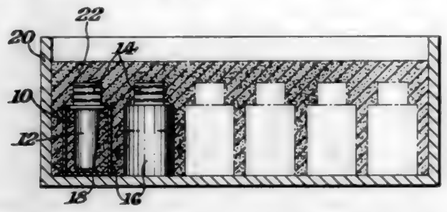
4,041,196
DIFFUSION TREATMENT OF METAL

Alfonso L. Baldi, Drexel Hill, Pa., and Victor V. Damiano, Pennsauken, N.J., assignors to Alloy Surfaces Company, Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 507,126, Sept. 18, 1974, abandoned, and Ser. No. 466,908, May 3, 1974, Pat. No. 3,958,047, which is a continuation-in-part of Ser. No. 328,378, Jan. 31, 1973, Pat. No. 3,867,184. This application May 13, 1975, Ser. No. 576,981
Int. Cl.[2] C23C *9/00*
U.S. Cl. 427—252 **6 Claims**

1. In the chromizing of a superalloy article by diffusion coating the article in a chromium-containing powder pack at atmospheric or superatmospheric pressure to cause the surface

of the article to pick up at least 1 milligram of chromium per square centimeter, the improvement according to which the



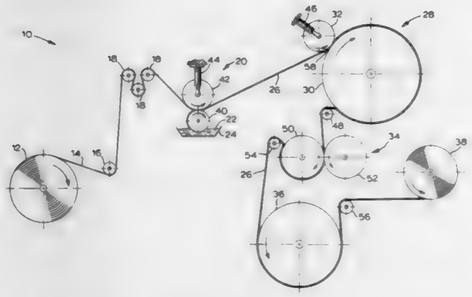
diffusion coating is effected with essentially no alpha-chromium formation by conducting it in an unperforated retort cup not over about 5 inches in height.

4,041,197

METHOD FOR COATING A SUBSTRATE WITH PLASTIC

Rudy L. Gagné, 998 Ingram Crescent, Midland, Ontario, Canada

Filed Dec. 29, 1975, Ser. No. 645,170
Claims priority, application Canada, Nov. 7, 1975, 239380
Int. Cl.[2] B05D *3/12, 1/28*
U.S. Cl. 427—278 **14 Claims**



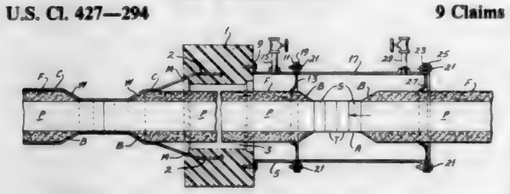
1. A method of producing a plastic coated substrate comprising: coating the substrate with a plastisol; providing a nip defined by a transverse put-on roll and a transverse heat drum for compressing the coated substrate; locating the substrate in said nip; smoothing and spreading the plastisol over the substrate by producing relative movement between the coated substrate and said nip; and heating the coated substrate in said nip to partially cure the plastisol.

4,041,198

APPARATUS AND METHOD FOR FORMING WATER STOPS ON INSULATED PIPE

Gerry E. McPherson, Houston, Tex., assignor to General Steel Industries, Inc., St. Louis, Mo.

Filed Oct. 1, 1975, Ser. No. 618,366
Int. Cl.[2] B05D *3/00*
U.S. Cl. 427—294 **9 Claims**



6. The method of applying protective plastic sheathing to an elongated generally cylindrical workpiece having alternating large and small diameter sections, comprising the steps of passing the workpiece through a first annular sealing flap of flexible material into a first passageway of larger diameter than the maximum diameter of the workpiece and thence through a second annular sealing flap of flexible material into a second passageway of larger diameter than the maximum diameter of the workpiece, the distance between the sealing flaps being sufficient that at all times at least one of the sealing flaps is in sealing engagement with a large diameter section of the workpiece, applying a vacuum to the chamber defined by said first and second flaps, the first passageway and the exterior surface of the workpiece, passing the workpiece through an extrusion die annularly spaced from and surrounding the workpiece and forming the outlet end of said second passageway, extruding plastic sheathing material from the extrusion die onto the workpiece and applying a vacuum to the chamber defined by the second annular sealing flap, the second passageway, the outer surfaces of the workpiece, and the annular portion of the plastic sheathing material between the outer surface of the workpiece and the outlet of the extrusion die to draw the extruded plastic material into close conformity with the exterior surface of the workpiece including the minimum diameter portions thereof.

4,041,199

REFRACTORY HEAT-INSULATING MATERIALS

John Edward Cartwright, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Continuation-in-part of Ser. No. 429,799, Jan. 2, 1974, abandoned, which is a continuation of Ser. No. 189,462, Oct. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 860,398, Sept. 23, 1969, abandoned. This application Dec. 4, 1975, Ser. No. 637,522
Int. Cl.[2] F16L *59/02;* **C04B** *35/52, 35/14, 35/02*
U.S. Cl. 428—36 **6 Claims**

1. A refractory heat-insulating material consisting essentially of 45–75% by weight of aluminosilicate fibre; 1–20% by weight of an element selected from the class consisting of aluminium, magnesium and silicon in particulate form; 0–25% by weight of a particulate refractory filler; and 2–16% by weight of a binding agent consisting of starch and a colloidal silica binder prepared by drying a colloidal silica sol.

6. A slab or sleeve suitable for use as a lining for a riser, feeder head, hot top or mould in the casting of steel comprising a refractory heat-insulating material consisting of 45–75% of its weight of aluminosilicate fibre, the remainder of the material consisting essentially of an element selected from the groups consisting of aluminium, magnesium and silicon in particulate form and present in an amount of 1–20% by weight and 2–16% by weight of a binding agent consisting of starch and colloidal silica binder prepared by drying a colloidal silica sol binder.

4,041,200

STACK OF TILES WHICH HAVE A RELEASE LAYER ON ONE MAJOR FACE AND AN ADHESIVE LAYER ON THE OPPOSED MAJOR FACE DOES NOT REQUIRE DISPOSABLE RELEASE INTERLAYERS

Armen G. Boranian, New Windsor, and Walter C. Timm, Newburgh, both of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,839
Int. Cl.[2] B05D *5/10;* **B32B** *7/14, 31/12;* **E04F** *13/20, 15/10*
U.S. Cl. 428—40 **13 Claims**

1. A verticle stack of rigid vinyl tiles each of which has pressure sensitive adhesive adhered to one surface thereof and release agent for said adhesive adhered to the opposite surface thereof with individual tiles in such stack being substantially in the horizontal plane and the lowermost tile in each such stack being subjected to a pressure between about 30 and about 500 lbs. per square foot.

9. A process for making and packaging rigid vinyl tile comprising:

a. forming a plurality of pieces of rigid vinyl tile, each of said pieces having pressure sensitive adhesive adhered to one surface thereof and a release agent for said adhesive adhered to the opposite surface thereof; and

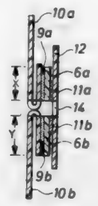
b. stacking said pieces for storage in such a manner that at least a majority of the surfaces of said pieces having adhesive adhered thereto are in direct contact with surfaces of said pieces having release agent adhered thereto.

4,041,201

ADHESIVE STRIP SET FOR SPLICING FILM STRIPS

Carl H. Würker, D 7239 Oberndorf-Aistaig, Schwarzwald, Germany

Filed Nov. 14, 1975, Ser. No. 632,058
Claims priority, application Germany, Nov. 16, 1974, 7438280
Int. Cl.[2] G03D *15/04*
U.S. Cl. 428—40 **6 Claims**



1. An adhesive strip set for splicing abutting ends of motion picture film strip portions of the type having sprocket holes and having sound track and compensating track locations along opposite edges of one surface thereof comprising

a first foil to be adhered to the surface of the film strip portions having the sound and compensating track locations

a second foil to be adhered to the opposite surface of the film strip portions,

each of said first and second foils having a coating of pressure-sensitive adhesive on each surface thereof,

the width of said first foil being less than the distance between the sound and compensating track locations;

first and second separate, releasable masking strip means releasably adhered to coatings on one side of each of said first and second foils, respectively, for covering the adhesive coatings on the surfaces thereof which are to be placed adjacent the film strip portions, said first and second strip means being more easily releasable from said coatings than are said foils;

a third holding and masking strip releasably adhered to the coatings on the opposite surfaces of both of said first and second foils, the coatings adhering said third strip being removable from said foils with said third strip; and

means defining apertures in said third strip, said apertures being longitudinally arranged in said third strip between said first and second foils to permit alignment of said strip set with the sprocket holes in the film so that one of said foils is properly positioned adjacent one surface of the film,

said third means being foldable along line parallel with said apertures to position the other one of said foils adjacent the opposite surface of the film.

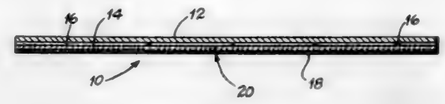
4,041,202

STRIPPABLE TAPE

Robert E. Williams, 5812 Five Oaks Parkway, St. Louis, Mo. 563127

Continuation-in-part of Ser. No. 72,348, Sept. 15, 1970, abandoned. This application Mar. 7, 1973, Ser. No. 339,379
Int. Cl.[2] B32B *3/10*
U.S. Cl. 428—138 **13 Claims**

1. In a laminated, strippable tape for joining separable parts of an object: an upper strength layer and a bottom layer, the layers being of strip material adhered together substantially throughout their common width; adhesive on the bottom of the bottom layer of strip material by which the tape may be adhered to the object, the bottom layer also having a narrow medial slit of predetermined direction at least substantially through the thickness thereof leaving a line of separation between the lateral components of the layer not substantially wider than a conventional carton joint, whereby when the bottom layer is adhered to the separate parts of the object across a joint, the tape is bonded to the parts substantially from side to side of the tape; the bottom layer of the tape being paper



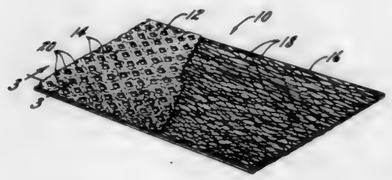
of a low internal bond material that is internally delaminatable and the strength layer being of a material stronger than the bottom layer and resistant to internal delamination, so that when the tape is adhered to the object, and is pulled away therefrom, the bottom layer becomes internally delaminated by the lifting of the strength layer with part of the bottom layer, leaving no more than a delaminated portion of the bottom layer that is medially separated by the slit into separate parts, so that the joined parts of the object are then freed from each other.

4,041,203

NONWOVEN THERMOPLASTIC FABRIC

Robert J. Brock, Neenah, and Gary H. Meitner, Winneconne, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 460,363, April 12, 1974, abandoned, which is a continuation-in-part of Ser. No. 286,691, Sept. 6, 1972, abandoned. This application Oct. 4, 1976, Ser. No. 729,356
Int. Cl.[2] B32B *27/00*
U.S. Cl. 428—157 **26 Claims**



1. A nonwoven fabric-like material comprising a web of substantially continuous and randomly deposited, molecularly oriented filaments of a thermoplastic polymer having an average filament diameter in excess of about 12 microns and an integrated mat of generally discontinuous, thermoplastic polymeric microfibers having an average fiber diameter of up to about 10 microns and a softening temperature of about 10°–40°C. less than the softening temperature of the continuous filaments; said web and mat being positioned in laminar surface-to-surface relationship and united together at intermittent discrete bond regions formed by the application of heat and pressure to thereby provide a unitary structure having desirable textile-like appearance and drape characteristics and to integrate the web of substantially continuous filaments so that said web can function as an effective load bearing constituent of the material during straining thereof.

4,041,204

DRY TRANSFER SHEETS

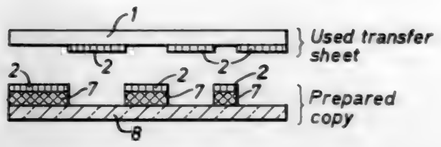
Martin Hepher, Berkhampstead; John Arthur Sperry, Chalfont St. Peters, and Malcolm John Stewart, London, all of England, assignors to The Autotype Company Limited, London, England

Filed Jan. 18, 1974, Ser. No. 434,595

Claims priority, application United Kingdom, Jan. 18, 1973, 2685/73; Feb. 1, 1973, 5177/73

Int. Cl.² B32B *3/00, 7/06*

U.S. Cl. 428—199 **7 Claims**



1. In a dry transfer sheet, which comprises a transparent or otherwise translucent carrier sheet, and photographically-produced pressure-transferable stencil images of letters, numbers or other indicia disposed upon one side of the carrier sheet, the stencil images being formed of a photo-polymerizable or photo-crosslinkable film derived from a photo-sensitive layer provided upon the carrier sheet and subjected to photographic exposure and development in conjunction with an original of the indicia, such photosensitive layer and the stencil images derived therefrom containing an adhesive substance capable of providing the stencil images with a pressure-sensitive adhesive property; the improvement comprising, between the carrier sheet and the stencil images carried thereby, a layer of a temporary keycoat material which provides adhesion between the carrier sheet and the photosensitive layer in the dry state and during processing, the temporary keycoat material remaining on the carrier sheet during development, the temporary keycoat material further having the properties, upon transfer of a stencil image from the carrier sheet, of separating from the sheet only directly over the selected letter, number or other indicium and adhering sufficiently to the stencil image to transfer with it, whereby the temporary keycoat material lowers the surface tack of the transferred stencil image, the remainder of said keycoat material remaining on said carrier sheet, the transferred keycoat material thereafter precluding penetration of the adhesive material from the transferred stencil image into the transferred keycoat material, said letters, numbers or other indicia being spaced apart from each other thereby to be selectively individually transferable, and a copy sheet that receives a transferred said stencil image, said transferred image having a greater adhesion to said copy sheet than said keycoat has to said carrier sheet, said keycoat having a greater adhesion to said transferred image than said keycoat has to said carrier sheet, and said keycoat having a greater adhesion to said carrier sheet than to said copy sheet.

4,041,205

RESIDUE-FREE FABRIC SOFTENING ARTICLE FOR USE IN LAUNDRY DRYER

Russell Edward Compa, West Orange; Marvin Liebowitz, Edison, and Ralph Paul Messina, Somerset, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Oct. 18, 1973, Ser. No. 407,477

Int. Cl.² D06M *13/00*

U.S. Cl. 428—220 **11 Claims**

1. A solid fabric softening and conditioning article in the form of a sheet with a surface to volume ratio of 20:1 to 400:1 which comprises, by weight 10–99% of at least one fabric softening compound selected from the group consisting of cationic, non-ionic, anionic, and zwitterionic fabric softening compounds and as a reinforcing material for such compound 1–40% of finely divided cellouse, microcrystalline protein or nylon fibers of a length of 0.005 to 0.1 mm and a diameter of 0.001 to 0.01 mm to prevent premature disintegration of the article during use in the softening of moving fabrics in the drying zone of an automatic laundry dryer by contact of the article with them to transfer softening agent to them, which reinforcing material gradually disintegrates during use of the softening article and leaves no residue in the drying zone after use thereof.

4,041,206

LAMINATED POLYESTER FILM

Kenji Tsunashima, Kyoto; Masanao Sugioka; Atsuhiko Soda, both of Otsu; Hiroyuki Ikeuchi, and Michihiko Tanaka, both of Ehime, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 447,578, March 3, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 642,182

Int. Cl.² B32B *27/36, 7/10, 31/20, 31/26*

U.S. Cl. 428—409 **5 Claims**

1. A laminated polyester film having improved heat-adhesive strength and slipperiness consisting essentially of a biaxially oriented layer of a terephthalate polymer selected from the group consisting of polyethylene terephthalate and polybutylene terephthalate.

said biaxially oriented terephthalate polymer having at least one surface laminated directly by heat-sealing and without any added adhesive layer to an axially oriented crystalline copolyester layer, the number of axes of orientation being 1 to 2,

said crystalline copolyester layer containing from about 10 to 40 weight % of a terephthalate polymer selected from the group consisting of polyethylene terephthalate and polybutylene terephthalate,

said crystalline copolyester being selected from the group consisting of butylene terephthalate isophthalate copolyester and hexylene terephthalate isophthalate copolyester, and consisting essentially of from about 50 to 80 mole % of terephthalate units based upon the total number of moles of acid components of the copolyester.

4,041,207

HEAT RESISTANT RUBBER LAMINATES

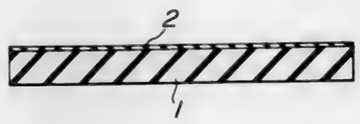
Tsutomu Takada, Yokohama; Shingo Kato, Tokyo; Tadashi Utsunomiya, Yokohama, and Sakae Inoue, Kodaira, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 7, 1976, Ser. No. 730,397

Claims priority, application Japan, Oct. 7, 1975, 50-120244

Int. Cl.² B32B *27/00*

U.S. Cl. 428—421 **18 Claims**



1. A heat resistant rubber laminate composed of a base layer consisting mainly of a heat resistant rubber composition and a heat resistant top cover, wherein said heat resistant top cover being a rubber composition consisting mainly of ethylene-fluoropropylene copolymeric rubber.

4,041,208

TRANSPARENT, IMPACT-RESISTANT POLYESTERURETHANE LAMINATES

Nelson V. Seeger, Cuyahoga Falls, and Andrew J. Kaman, Norton, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 154,944, June 21, 1971, abandoned, and Ser. No. 242,347, April 10, 1972, abandoned. This application May 21, 1974, Ser. No. 472,019

Int. Cl.² B32B *27/40*

U.S. Cl. 428—424 **26 Claims**

1. An optically-clear, energy-absorbing laminate, comprising at least one glass sheet bonded to a sheet of a substantially unreacted isocyanate free, thermoplastic, transparent polyesterurethane that is the reaction product of (a) essentially linear hydroxy-terminated polyester having a liquidus temperature of at least 44° C., said polyester being selected from the group consisting of poly(1,4-butylene adipate) and poly(1,4-butylene azelate) having a molecular weight of about 2000, (b) 4,4'-methylene-bis-(cyclohexyl isocyanate), and (c) aliphatic diol containing from 4 to 8 carbon atoms, the mole ratio of (c) to (a) being from about 1.5:1 to about 5:1, the isocyanate groups provided by (b) being substantially numerically equivalent to the sum of hydroxyl groups provided by (c) and (a) whereby to provide a polyesterurethane that is substantially free of unreacted isocyanate groups, said mole ratio of (c) to (a) being so proportioned within said range that a rigidly held laminate prepared from about 0.030 inch thick sheeting of said polyesterurethane sandwiched between two 12 × 12 × ¼ inch glass sheets is non-brittle at 0° F. and exhibits a mean penetration velocity of at least 20 miles per hour at laminate temperatures of 0° F. and 70° F., and a mean penetration velocity of at least 17 miles per hour at a laminate temperature of 120° F. when impacted with a five pound free falling steel ball.

4,041,209

MULTIPLE WALL PACKAGING MATERIAL CONTAINING SULFITE COMPOUND

William R. Scholle, Compton, Calif., assignor to Scholle Corporation, Northlake, Ill.

Continuation-in-part of Ser. No. 544,587, Jan. 27, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,238

Int. Cl.² B65D *81/28;* **B32B** *27/32, 21/06*

U.S. Cl. 428—500 **3 Claims**

1. A structural multiple ply wall for a product container, said wall comprising:

an inner container sheet ply selected from the group consisting of cellulosic and polymeric materials having a composition providing low product permeability through said ply for a product disposed adjacent to a first face of said ply;

a fluid coating having an oxygen scavenger composition actively providing removal of oxygen from a gaseous atmosphere contacting said fluid coating, said fluid coating disposed adjacent to the second face of said inner sheet ply, said oxygen scavenger composition having disposed therein at least one compound comprising water soluble salts of sulfite ion (SO_3^{--}), bisulfite ion (HSO_3^-), meta bisulfite ion ($S_2O_5^{--}$), hydrosulfite ion ($S_2O_4^{--}$); and

at least one sheet exterior ply consisting of polymeric material having one face of one said exterior ply disposed adjacent to said fluid coating;

said inner ply, said fluid coating, and said at least one sheet exterior ply being contiguously integrally disposed together, forming said structural multiple ply wall, said wall being suitable for providing at least the major proportion of the container wall area.

4,041,210

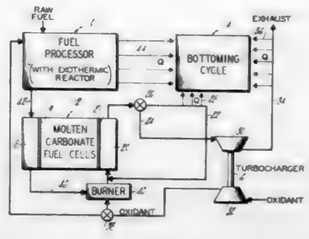
PRESSURIZED HIGH TEMPERATURE FUEL CELL POWER PLANT WITH BOTTOMING CYCLE

Leslie L. Van Dine, Manchester, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 30, 1976, Ser. No. 719,049

Int. Cl.² H01M *8/06*

U.S. Cl. 429—16 **30 Claims**



1. A fuel cell power plant comprising:

a plurality of molten carbonate fuel cells connected electrically in series, each cell including means defining a fuel space and means defining an oxidant space;

turbocharger means including first turbine means operably connected to a compressor for driving said compressor;

second turbine means operably connected to an electric generator;

burner means disposed downstream of said fuel space for burning fuel space effluent;

means for delivering pressurized, processed fuel into said fuel space including fuel processing apparatus disposed upstream of said fuel space;

means for delivering raw fuel into said fuel processing apparatus;

means for delivering pressurized oxidant from said turbocharger means and effluent from said fuel space into said burner means;

means for delivering effluent from said burner means into said oxidant space;

means for dividing the oxidant space effluent into a first portion and a second portion and for recycling said first portion through said oxidant space and for delivering said second portion into said first turbine means for driving said compressor; and

means for transferring heat energy from the oxidant space effluent to said second turbine means to drive said electric generator, including means for transferring heat energy from the first turbine means exhaust gases to said second turbine means.

4,041,211

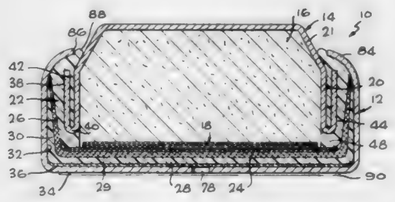
PRODUCTION OF ZINC-AIR BUTTON CELL

Marian Wiacek, Montreal, Canada, assignor to Unican Electrochemical Products Ltd., Montreal, Canada

Filed Oct. 6, 1975, Ser. No. 620,107

Int. Cl.² H01M *2/08*

U.S. Cl. 429—36 **29 Claims**



1. A metal-air cell which comprises an outer metal can and

an inner metal can disposed within said outer metal can, said inner can containing electrode material, a downwardly tapered polymeric seal between the outer wall of said inner can and the inner wall of said outer can, a catalyst electrode positioned between said seal and the inner wall of said outer can, a separator between said electrode material and said catalyst electrode, and a pressure sensitive coating on the outer wall of said inner can and disposed between said outer wall and said seal, said pressure sensitive coating being an alkali resistant elastomer characterized by an ability to creep under pressure substantially without cracking or forming voids, and providing a substantially continuous seal, said elastomer coating forming an elastic film having rubber-like characteristics and remaining resilient.

4,041,212

ALKALINE ELECTRIC STORAGE BATTERIES

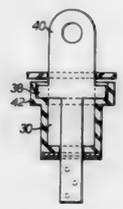
Albert Thomas Hewitt, Redditch, England, assignor to Chloride Group Limited, London, England

Filed May 18, 1976, Ser. No. 687,599

Claims priority, application United Kingdom, May 21, 1975, 21937/75

Int. Cl.[2] H01M 2/26

U.S. Cl. 429—89 **12 Claims**



1. An electric storage battery of alkaline electrolyte type, comprising:

a case accommodating at least one cell, said cell including plates of each polarity;

a lid covering said case and including at least one elongated slot and a respective supporting surface at each end of said slot;

at least one pair of plate straps, each plate strap respectively interconnecting said plates of each polarity; and

at least one pair of metal strip connectors, each connector extending above said lid for respective external connection to the plates of each polarity and extending downwardly through said elongated slot, the lower end of each said connector being secured to the associated plate strap and including an ear projecting respectively from its opposite edges and resting on said supporting surfaces to support the weight of said electrode plates within said case.

4,041,213

POWER CELL COMPARTMENT FOR AN ELECTRICALLY ENERGIZED TIMEPIECE

Henri Schneider, Mont Soleil, Switzerland, assignor to Societe Suisse Pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

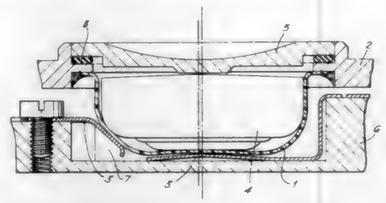
Filed June 18, 1976, Ser. No. 697,665

Claims priority, application United Kingdom, June 30, 1975, 27512/75

Int. Cl.[2] H01M 2/06

U.S. Cl. 429—98 **4 Claims**

1. Power cell compartment for an electrically energized timepiece wherein an envelope formed from an anisotropically conductive elastomer partially encloses the power cell and is fixed to the timepiece casing so as to provide a mechanical seal between the movement compartment and the power cell compartment and to assure electrical connection between the movement contacts and the power cell electrodes.



4,041,214

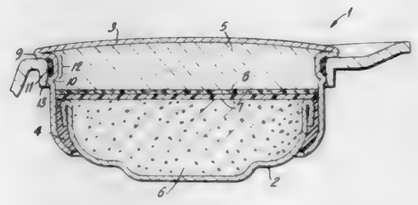
BUTTON CELL CONFIGURATION

Jean Claude Salin, Besancon, France, assignor to Timex Corporation, Waterbury, Conn.

Filed May 20, 1976, Ser. No. 688,457

Int. Cl.[2] H01M 2/10

U.S. Cl. 429—98 **2 Claims**



1. An improved energy cell for a watch or hearing aid having a case with an opening for inserting the cell therein, wherein the improvement comprises:

an outer container for said cell having a retaining ledge portion having a first circumference,

flange means having a circumference less than said first circumference and having a concave portion for flexing to exert a pressure against the case when said cell is inserted into the opening in the case for holding said cell in the opening of the case, and

gasket means affixed between said retaining ledge portion and said flange means for forming a seal between the opening in the case and the cell whereby dust and moisture are substantially prevented from entering into the interior of the case.

4,041,215

METHOD FOR FORMING SOLID ELECTROLYTE COMPOSITE

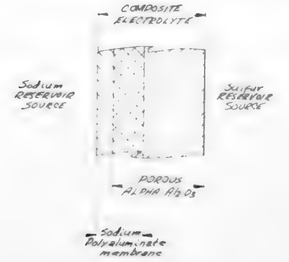
Kenneth R. Kormanyos, Rossford; Howard L. McCollister, and Paul L. White, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Filed Apr. 5, 1976, Ser. No. 673,784

Int. Cl.[2] H01M 2/16

U.S. Cl. 429—104 **9 Claims**

1. A method for forming a solid electrolyte composite having a porous crystalline alpha-Al_2O_3 exposed portion and an exposed ionic conductive crystalline sodium polyaluminate membrane portion comprising: contacting a surface of a porous, anhydrous, crystalline body consisting of alpha-Al_2O_3 with a precursor which on a dry oxide basis substantially corresponds to a sodium polyaluminate composition and heating said contacted surface at a temperature and for a time sufficient to convert the precursor to a crystalline ionic conductive membrane of sodium polyaluminate and form said composite.



4,041,216

SODIUM-SULPHUR BATTERY, MORE PARTICULARLY FOR ELECTRICAL DRIVE

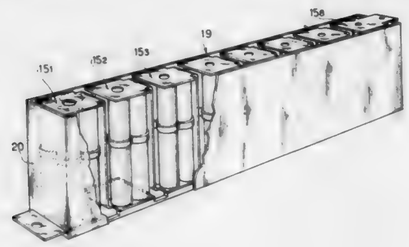
Gérard Desplanches, Villejust; Yvon Lazennec, St Michel sur Orge, and Alain Wicker, Limours, all of France, assignors to Compagnie Generale d'Electricite S.A., Paris, France

Filed Mar. 2, 1976, Ser. No. 663,027

Claims priority, application France, Mar. 17, 1975, 75.08258

Int. Cl.[2] H01M 6/18

U.S. Cl. 429—104 **10 Claims**



1. A battery comprising:

a plurality of cells; each cell comprising:

a cathode tank containing a cathode reagent which is liquid at operating temperature and is chosen from the group formed by the elements of sulphur, phosphorous, selenium, and alkyline salts of those elements,

a solid electrolyte tube partially immersed in the cathode reagent; said tube being closed at its lower end and open at its upper end and containing a sodium anode reagent which is liquid at the operating temperature, the wall of the tube being made of alkaline beta alumina,

a ceramic insulating support supporting the electrolyte tube in the cathode tank, and a glass seal between the support and the tube,

an anode tank containing a supply of the anode reagent and mounted above the cathode tank, so that the upper end of the electrolyte tube opens into the anode tank, said support separating the open ends of the anode and cathode tanks;

means connecting sets of *p* cells of said plurality of cells in parallel and comprising:

a first conductive plate connected to the anode tank tops of each set of *p* cells, and

a second conductive plate connected to the cathode tank bottoms of each set of *p* cells so that the cells in each set are separated from each other by a common space,

each of said first and second plates containing an aperture in communication with said common space; and

a conductive strap joining each first plate with the second plate of an adjacent set of *p* cells so that the sets of cells are connected electrically in series to form a group of series connected sets of cells, said strap being substantially perpendicular to the first and second plates of adjacent cells.

4,041,217

THERMAL BATTERY WITH METAL-METAL OXIDE HEATING COMPOSITION

William H. Collins, Timonium, Md., assignor to Catalyst Research Corporation, Baltimore, Md.

Filed June 23, 1964, Ser. No. 378,489

Int. Cl.[2] H01M 6/36

U.S. Cl. 429—112 **7 Claims**



1. A thermal battery comprising a plurality of cells, said cells comprising a metallic positive electrode and a metallic negative electrode spaced by a normally inactive electrolyte that becomes electrically active when heated, a combustible composition disposed between said cells and in contact therewith for supplying heat to the electrolyte, means for igniting said composition, said composition comprising an intimate mixture of a finely divided metal oxide and a finely divided metal capable of exothermically reacting with said metal oxide to form an electrically conductive metal oxide reaction product, thereby forming an electrically conductive ash when burned and providing an electrical connection between said cells.

4,041,218

SEPARATOR FOR ALKALINE STORAGE BATTERIES

Shoya Samuilovich Axelrod, prospekt Energetikov, 46, korpus 1, kv. 215, Leningrad; Viktor Grigorievich Belozerov, ulitsa Mendeleeva, 53, kv. 71, Kursk; Mikhail Bentzionovich Gershman, prospekt Kima, 30, kv. 25, Leningrad; Evel Grigorievich Margolin, Svetlanovsky prospekt, 62, korpus 1, kv. 233, Leningrad, and Mikhail Borisovich Shapot, Shkolnaya ulitsa, 64, kv. 7, Leningrad, all of U.S.S.R.

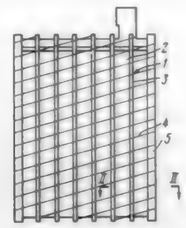
Filed Jan. 7, 1976, Ser. No. 647,460

Int. Cl.[2] H01M 2/18

U.S. Cl. 429—136 **5 Claims**

1. A separator for alkaline storage batteries comprising a reticular flexible envelope formed by a first group of parallel

rods, and a second group of rods arranged with an inclination relative to said first group of rods and being secured thereto,



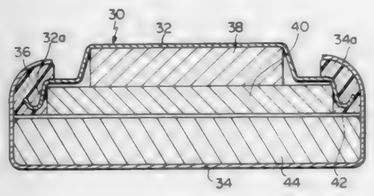
and the rods of said first group of said rods having a greater thickness than the rods of said second group of said rods.

4,041,219

SILVER PEROXIDE-ZINC BATTERY

Hajime Nishimura, Tokyo, and Yasushi Nomura, Tokorozawa, both of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,075
Claims priority, application Japan, Dec. 12, 1975, 50-148294
Int. Cl.² H01M *10/32*
U.S. Cl. 429—144 **11 Claims**



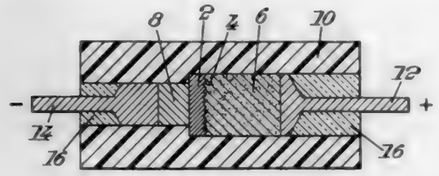
1. A silver peroxide-zinc battery comprising a positive active material, zinc as a negative active material, and an electrolyte, said positive active material consisting essentially of silver peroxide and a proportion of an oxide of manganese.

4,041,220

MIXED CONDUCTORS OF GRAPHITE, PROCESSES FOR THEIR PREPARATION AND THEIR USE, NOTABLY FOR THE PRODUCTION OF ELECTRODES FOR ELECTROCHEMICAL GENERATORS, AND NEW ELECTROCHEMICAL GENERATORS

Michel B. Armand, Grenoble, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Division of Ser. No. 389,617, Aug. 17, 1973, Pat. No. 3,956,194. This application Jan. 28, 1976, Ser. No. 653,181
Claims priority, application France, Aug. 18, 1972, 72.29734
Int. Cl.² H01M *6/18*
U.S. Cl. 429—191 **13 Claims**



1. Electrochemical generator comprising a negative electrode containing an alkali metal such as Li, Na, K, Rb or Cs either in the metallic state or in the form of an alloy with another metal, and an electrolyte permitting conduction of ions of said alkali metal, wherein the positive electrode contains a compound $M_{x_1}C_n(M'_yX_z)$ in which M is the same alkali metal as that of the negative electrode; x_1 is zero or comprised between zero and a value depending on the affinity of the selected alkali metal for the corresponding compound of formula $C_n(M'_yX_z)$; y and z have values corresponding to the indices defining the relative proportions of the metal and non-metallic atoms respectively in the formula of the corresponding product M'_yX_z n has a value equal to or higher than a minimum value which is a function of the initial binding energy between graphite and the corresponding compound M'_yX_z, this value not exceeding however that corresponding to the formation of continuous monomolecular graphite layers interposed between the layers of the compound M'_yX_z in the corresponding compound $C_n(M'_yX_z)$.

4,041,221

ZINC ELECTRODES AND METHODS OF MAKING SAME

Aldo S. Berchielli, Westerly, R.I., and Roland F. Chireau, Quaker Hill, Conn., assignors to Yardney Electric Corporation, Pawcatuck, Conn.

Filed July 27, 1976, Ser. No. 709,138
Int. Cl.² H01M *10/24*
U.S. Cl. 429—206 **8 Claims**

1. In a rechargeable electrochemical generator having a negative electrode comprising a relatively electronegative zinc electrode material which is in essentially elemental metallic form in a charged state of said generator, a positive electrode comprising a relatively electropositive electrode material in oxidized form in said charged state, and including an alkaline electrolyte in electrochemical contact with electrodes, the improvement which comprises:

an inorganic titanate compound dispersed in said zinc electrode material in an amount between about 0.2% by weight and about 1.8% by weight of the weight of said zinc electrode material in an uncharged state.

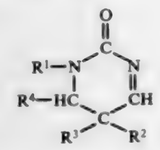
4,041,222

RUBBER MIXTURES HAVING IMPROVED SURFACE TACK

Hubert Schoeppl, Mannheim; Harro Petersen, Frankenthal; Gerhard Paulus, Weinheim, and Hubertus Queins, Friedelsheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 493,779, Aug. 1, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,251
Claims priority, application Germany, Aug. 13, 1973, 2340048
Int. Cl.² C08K *5/34*
U.S. Cl. 526—6 **1 Claim**

1. Rubber mixtures containing from 1 to 20 parts of a 2-oxotetrahydropyrimidine for every 100 parts of rubber wherein said 2-oxotetrahydropyrimidines having the formula:



in which the radicals R^1 to R^4 each denotes hydrogen or alkyl of from 1 to 20 carbon atoms and may be the same or different.

4,041,223

PROCESS FOR PREPARING HYDROLYZED ETHYLENE-VINYL ACETATE COPOLYMER HAVING IMPROVED HEAT STABILITY

Kiyosi Amemiya, Ibaraki, and Hiroshi Takida, both of Takatsuki, Japan, assignors to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1975, Ser. No. 608,020
Claims priority, application Japan, Aug. 30, 1974, 49-100279; Sept. 5, 1974, 49-103380
Int. Cl.² C08F *8/12*
U.S. Cl. 526—10 **6 Claims**

1. A process for preparing hydrolyzed ethylene-vinyl acetate copolymers which comprises the steps of

a. hydrolyzing an ethylene-vinly acetate copolymer having an ethylene content of 20 to 50% by mole in an alcoholic medium in the presence of an alkaline metal catalyst to produce particles of hydrolyzed copolymer having a degree of hydrolysis in vinyl acetate units of more than 90% by mole,

b. separating said particles from the resulting hydrolysis reaction mixture and removing an alkali metal salt, wherein the alkali metal is selected from the group consisting of sodium and potassium which is included in the particles of the hydrolyzed copolymer to the extent that not more than 1.5% by weight based on the dry weight of the hydrolyzed copolymer of residual alkali metal salt remains in the copolymer,

c. contacting the particles obtained by the step (b) with an aqueous or alcoholic solution of a phosphoric acid selected from the group consisting of orthophosphoric acid, phosphorous acid and pyrophosphoric acid to incorporate the phosphoric acid into the particles in an amount of 0,001 to 0.5% by weight of phosphorus-containing radical calculated as $—PO_4$ radical to the dry weight of the particles of the hydrolyzed copolymer and of not less than an equal amount of weight to the residual alkali metal ion of the salt in the particles of the hydrolyzed copolymer,

d. separating the particles of the hydrolyzed copolymer from the mixture, and

e. drying the particles of the hydrolyzed copolymer.

4,041,224

CATALYST, METHOD AND POLYMERIZATION PROCESSES

Raymond E. Hoff, Palatine; Thomas J. Pullukat, Hoffman Estates, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Filed Nov. 19, 1975, Ser. No. 633,507
Int. Cl.² C08F *4/24, 10/00*
U.S. Cl. 526—96 **36 Claims**

1. A catalyst prepared by the process of (1) forming a mixture of a finely divided, difficultly reducible, support selected from the group consisting of silica, alumina, zirconia, thoria and mixtures thereof and a chromium compound, followed by (2) adding a titanium compound, then (3) heat activating said product of (2) in an inert or reducing atmosphere, and then (4) partially oxidizing by heating said product (3) in a gas that comprises oxygen.

4,041,225

POLYMERIZATION CATALYST AND METHOD

Thomas J. Pullukat, Hoffman Estates, Ill., assignor to Chemplex Company, Rolling Meadows, Ill.

Filed Dec. 29, 1975, Ser. No. 645,284
Int. Cl.² C08F *4/78, 10/00*
U.S. Cl. 526—96 **33 Claims**

1. The method of making an active catalyst consisting essentially of: ion exchanging (1) a chromium (III) amine complex onto (2) a support which is a finely divided, difficultly reducible, inorganic support of the class consisting of silica, alumina, thoria, zirconia, titania, magnesia and mixtures thereof substantially free of adsorbed water and having cations on the surface thereof; and (3) activating the resulting ion exchanged material by heating to and at an elevated temperature in a non-oxidizing atmosphere.

4,041,226

CHROMIUM TRIS-DIORGANO-ORTHOPHOSPHATE-ALKYL ALUMINUM HALIDE CATALYSTS FOR OLEFIN POLYMERIZATION AND ALKYLATION OF AROMATIC COMPOUNDS

Jeffrey G. Meyer, Adrian, Mich., assignor to Anderson Development Company, Adrian, Mich.

Division of Ser. No. 532,010, Dec. 12, 1974, Pat. No. 3,969,272, which is a continuation-in-part of Ser. No. 319,621, Dec. 29, 1972, Pat. No. 3,907,849. This application Nov. 24, 1975, Ser. No. 634,592
Int. Cl.² C08F *2/06, 4/62, 10/00*
U.S. Cl. 526—144 **9 Claims**

1. The method comprising

1. mixing at least two components from (A) a chromium tris-diorgano-orthophosphate of the formula $Cr[OP(O)(OR)_2]_3$ in which each R is selected from the class consisting of non-aromatic hydrocarbon groups free of aliphatic unsaturation and containing one to eight carbon atoms, non-aromatic hydrocarbon ether groups free of aliphatic unsaturation and containing three to six carbon atoms and chlorinated and brominated derivatives thereof, (B) an alkyl aluminum halide of the general formula R'_cAlX_d in which each R′ is an alkyl group of one to six carbon atoms, each X is a halogen atom, each c and d is 1 or 2 and the total of c and d is 3, the mol ratio of (A) to (B) ranging from 1:1 to 1:20, and (C) at least one aliphatic, cycloaliphatic and/or aromatic olefin containing no more than about 20 carbon atoms;
2. adding the remaining component, if any, the mol ratio of total (A) and (B) to (C) ranging from 0.0001:1 to 0.01:1;
3. heating the mixture at a temperature and for a time sufficient to initiate the reaction of component (C); and separating the resulting product from the reaction mixture.

4,041,227

CLEAVABLE BRANCHING AGENTS IN EMULSION POLYMERIZATION SYSTEMS

Carl A. Uraneck, and Paul W. Solomon, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 25, 1975, Ser. No. 635,002
Int. Cl.² C08F *2/16, 2/22, 2/38*
U.S. Cl. 526—190 **23 Claims**

1. As compositions of matter, polymers of a conjugated diene monomer, or of a conjugated diene monomer with a vinyl comonomer, prepared by the aqueous emulsion polymerization of said monomer in the presence of a free radical initiator, emulsifier, molecular weight modifier, aqueous medium, and a minor effective amount of bis(1,3-dienyl)dialkyltin, -lead, or -germanium branching agent,

wherein said bis(1,3-dienyl)dialkyltin, -germanium, or -lead, branching agent is represented by the formula:



wherein each D represents an acyclic hydrocarbyl conjugated dienyl radical, or a ring-substituted styryl; wherein each R is a hydrocarbyl radical and is alkyl or cycloalkyl, and wherein M represents said tin, germanium, or lead.

4,041,228

ABSORBENT ARTICLES AND METHODS FOR THEIR PREPARATION

James Richard Gross, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 468,794, May 9, 1974, Pat. No. 3,980,663, which is a continuation-in-part of Ser. No. 371,909, June 20, 1973, abandoned. This application May 9, 1975, Ser. No. 576,053
Int. Cl.[2] C08F *8/42*
U.S. Cl. 526—240 9 Claims

1. A method of preparing substantially water swellable polyelectrolyte fibers which comprises

A. extruding a composition comprising

1. a solution of a carboxylic synthetic polyelectrolyte wherein the solution comprises water, lower alcohols, or mixtures thereof and about 5 to about 60% by weight of a carboxylic polyelectrolyte, and
2. at least about 0.1% by weight based on the polyelectrolyte of a crosslinking agent reactive with carboxylate groups into a bath comprising lower alkyl ketones or chlorinated hydrocarbons to form an extruded fiber,

B. separating the extruded fiber from said bath, and

C. heating said fibers to a temperature greater than about 30° C to crosslink said polyelectrolyte fibers.

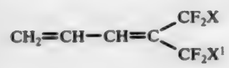
4,041,229

POLYMERIC FLUOROMETHYLATED DIENES

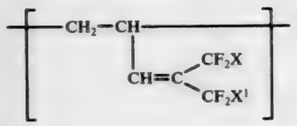
Victor A. Pattison, Clarence Center, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 656,219, Feb. 9, 1976, Pat. No. 4,004,073, which is a continuation of Ser. No. 411,869, Nov. 1, 1973, abandoned, which is a continuation-in-part of Ser. No. 788,009, Dec. 30, 1968, abandoned. This application Nov. 8, 1976, Ser. No. 739,760
Int. Cl.[2] C08F *136/16, 136/18*
U.S. Cl. 526—249 14 Claims

1. A copolymer of a halomethylated diene of the formula



wherein X and X[1] are halogen and a monomer copolymerizable therewith, said copolymer being characterized by the repeating units



in the skeletal chain, and produced by the process comprising allowing said halomethylated diene and said copolymerizable monomer to copolymerize by the use of a free radical catalyst.

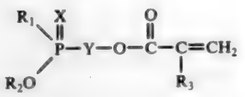
4,041,230

FLAMEPROOFED MODACRYLIC COPOLYMERS OF UNSATURATED CARBOXY-PHOSPHINIC ACID DERIVATIVES

Bernd Huber, Hofheim, Taunus, and Hans-Jerg Kleiner, Kronberg, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 17, 1975, Ser. No. 623,335
Claims priority, application Germany, Oct. 19, 1974, 2449469; Oct. 19, 1974, 2449466
Int. Cl.[2] C08F *30/02, 230/02, 26/06, 4/30*
U.S. Cl. 526—278 5 Claims

1. A modacrylic copolymer of 35 to 85% by weight of acrylonitrile, 5 to 45% by weight of vinyl chloride, vinyl bromide, vinylidene chloride or a mixture thereof and 5 to 30% by weight of a carboxy phosphinic acid of the formula



wherein R_1 and R_2 are alkyl or haloalkyl radicals having a total of up to 8 carbon atoms; R_3 is hydrogen or methyl; X is oxygen or sulfur; Y is linear or branched alkylene having up to 6 carbon atoms, and 0 to 15% by weight of other unsaturated compounds with activated double bond.

4,041,231

WATER SWELLABLE ARTICLES

James R. Gross, Lake Jackson, and Russell T. McFadden, Freeport, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 450,650, March 13, 1974, Pat. No. 3,926,891. This application June 30, 1975, Ser. No. 591,732
Int. Cl.[2] C08F *22/38*
U.S. Cl. 526—317 8 Claims

1. A method of preparing substantially water swellable polyacrylate fibers which comprises

A. extruding a solution into a bath comprising lower alkyl ketones or chlorinated hydrocarbons to form an extruded fiber wherein said solution is prepared by forming a polyacrylate solution having about 30 to about 70 weight percent alkali metal carboxylates by dissolving in an aqueous alkali metal hydroxide solution a polyacrylate comprising

1. about 30 to about 92 percent by weight of an alkyl acrylate wherein the alkyl group has 1–10 carbon atoms, an alkyl methacrylate wherein the alkyl group has 4–10 carbon atoms, or mixtures thereof,
2. about 8 to about 50 percent by weight of an olefinically unsaturated carboxylic acid, and
3. about 0 to about 15 percent by weight of an omega hydroxy-alkyl acrylate having 1–4 carbon atoms in the hydroxy alkyl group heating the solution until saponification is complete, and adding to said solution about 0.1 to about 10 weight percent, based on the dissolved polymer, of a water soluble crosslinking agent which is reactive with carboxylate salt groups,

B. separating the extruded fiber from said bath, and

C. heating said fibers to a temperature greater than about 30° C to crosslink said polyacrylate.

4,041,232

AMPHOTERICIN B METHYL ESTER SALTS

Frank Sipos, Princeton, and Adam J. Keseleski, Edison, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Feb. 23, 1976, Ser. No. 660,598
Int. Cl.[2] C07H *17/08*
U.S. Cl. 536—17 10 Claims

1. A salt of the methyl ester of amphotericin B, said salt being selected from mono and dicarboxylic amino acid salts of the methyl ester of amphotericin B.

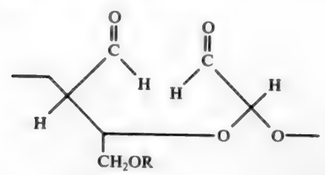
4,041,233

ALDEHYDE-CONTAINING UREA-ABSORBING POLYSACCHARIDES

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of William A. Mueller, Glendale, Calif.; George C. Hsu, La Crescenta, Calif., and Harold E. Marsh, Jr., La Canada, Calif.

Filed Mar. 15, 1976, Ser. No. 666,992
Int. Cl.[2] C08B *3/22, 11/20, 15/02, 31/18*
U.S. Cl. 536—56 7 Claims

1. A modified polysaccharide containing 10% to 35% by weight of C_2 – C_3 aldehyde groups and in which 0.05 to 0.5 of the amylose units are of the formula:



where R is the residue of an ether or ester moiety.

4,041,234

DISPERSIBLE GLYOXAL-XANTHAN GUM COMPLEXES

Fred J. Maske, St. Paul, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Aug. 23, 1976, Ser. No. 716,630
Int. Cl.[2] C08B *37/00*
U.S. Cl. 536—114 1 Claim

1. A hand stirring-dispersible xanthomonas gum-glyoxal complex comprising the reaction product of xanthomonas gum and from about 0.02% to 5% by weight glyoxal based upon the weight of dry xanthomonas gum.

4,041,235

SYNTHETIC RESIN COMPOSITION

Akira Suzuki, Shibukawa; Ituo Orihara, Maebashi, and Akira Ishida, Fujimi, all of Japan, assignors to Kanto Denka Kogyo Co., Ltd., Tokyo, Japan

Filed May 19, 1975, Ser. No. 578,508
Claims priority, application Japan, May 29, 1974, 49-59790
Int. Cl.[2] B32B *27/38, 27/30*
U.S. Cl. 428—413 11 Claims

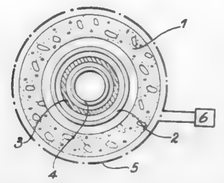
1. A molding composition which is normally solid, said composition comprising a thermoplastic resin having a polymerization degree of from 1000 to 1500 prepared by suspension copolymerizing in liquid phase of monomers consisting essentially of from about 0.5% to about 10% by weight of glycidyl methacrylate monomer as an internal heat stabilizer, from about 70% to about 95% by weight of vinylidene chloride monomer and the balance vinyl chloride monomer.

4,041,236

FURNACE HAVING CERAMIC HEATING ELEMENTS

Pierre Dumont, La Celle Saint Cloud, and Alain Moise, Saint Remy les Chevreuse, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 8, 1976, Ser. No. 674,952
Claims priority, application France, Apr. 11, 1975, 75.11335
Int. Cl.[2] H05B *3/10*
U.S. Cl. 13—25 10 Claims



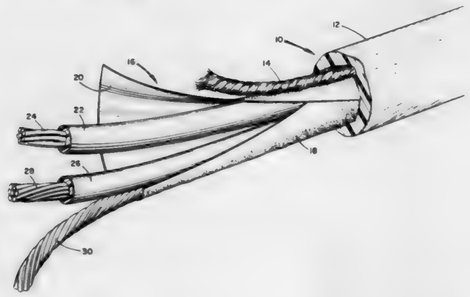
1. A furnace having ceramic heating elements and essentially provided within the central furnace cavity from the periphery to the center with a first thermal insulation, at least one element of lanthanide chromite, a second thermal insulation and at least one element of ceramic material which is capable of operating at approximately 2000° C.

4,041,237

ELECTRIC CONDUCTOR ADAPTED FOR USE IN PROCESS INSTRUMENTATION

Clifford R. Stine, Solon; Bruce E. Klipec, Aurora, and William J. Herbert, Mantua, all of Ohio, assignors to Samuel Moore & Company, Aurora, Ohio

Continuation of Ser. No. 498,716, Aug. 19, 1974, abandoned.
This application Feb. 9, 1976, Ser. No. 656,722
Int. Cl.[2] H01B *3/30, 7/18*
U.S. Cl. 174—36 13 Claims



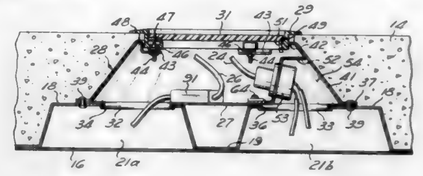
1. An electrical cable having improved dimensional stability and other properties which adapt it for use at elevated temperatures comprising at least two electrical conductors each having (1) an electrical insulating coating, said coating being an irradiation cured member selected from the group consisting of ethylene-tetrafluoroethylene copolymer, ethylene-chlorotrifluoroethylene copolymer and polyvinyl chloride, and (2) a protective jacket selected from the group consisting of irradiation cured halosulfonated polyethylene polymer, a polychloroprene and chlorinated polyethylene about the insulated conductors.

4,041,238

PRESET HOUSING FOR ELECTRICAL DISTRIBUTION SYSTEMS

John P. Penczak, Euclid, Ohio, assignor to Bargar Metal Fabricating Company, Cleveland, Ohio

Filed Dec. 5, 1975, Ser. No. 638,176
Int. Cl.[2] H02G *3/12*
U.S. Cl. 174—48 19 Claims



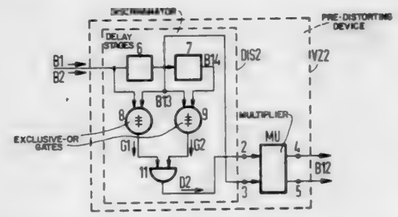
1. A preset access housing for under floor electrical distribution systems having raceway cells extending below the surface of a concrete or the like floor comprising a base wall adapted to fit against a cell and provide access thereto, a generally conical sidewall joined with said base wall at one end having a first diameter and continuously converging to an open second end having a second diameter substantially smaller than said first diameter, said sidewall being proportioned to locate said open end adjacent to but below the surface of a floor, and closure means closing said open end, said conical sidewall providing a substantially continuous curve for stiffness to support the concrete or the like forming a floor and providing a gradual transition from said first diameter to said second diameter without resulting in a thin layer of concrete or the like in the floor around said open end.

4,041,239

METHOD AND APPARATUS FOR THE TRANSMISSION OF DATA

Adolf Haass, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Sept. 4, 1974, Ser. No. 503,167
Claims priority, application Germany, Sept. 24, 1973, 2347898
Int. Cl.[2] H04L *3/00*
U.S. Cl. 178—68 5 Claims



1. Apparatus for transmitting data so as to reduce the effects of signal distortions caused by a transmission medium, comprising:

a source of data signals,

encoding means for forming from said data signals a combination of wide rectangular pulses and narrow rectangular pulses having a pulse width equal to half the width of said wide rectangular pulses,

discriminator means for producing a discriminator signal upon the appearance of a said wide rectangular pulse,

multiplier means for producing a pre-distorted signal by multiplying said encoded data signal with said discriminator signal and

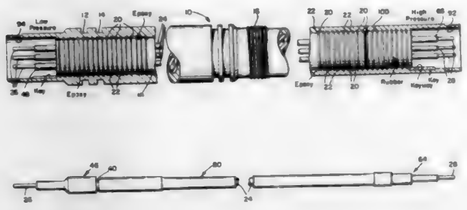
means for transmitting said pre-distorted signal and said narrow rectangular pulses over the transmission medium.

4,041,240

ELECTRICAL FEED-THROUGH ASSEMBLY AND METHOD OF MAKING SAME

Alexander D. Sipowicz, 4218 W. 168th St., Lawndale, Calif. 90260

Filed Dec. 8, 1975, Ser. No. 638,524
Int. Cl.[2] H01B *17/30*
U.S. Cl. 174—151 **13 Claims**



1. An electrical feed-through assembly comprising:
- a hollow tubular casing having means on the periphery for restraining and sealing said casing in a high differential pressure environment,
- a plurality of separate electrical conductors electrically insulated from each other and mechanically supported within the length of said hollow casing,
- separate rigid dielectric materials bonded to the end portions of each conductor for providing electrical insulation and mechanical rigidity against the differential pressure for each conductor, and
- a separate flexible tube of dielectric material completely covering each conductor and bonded and sealed to said rigid dielectric materials at each end of each conductor and to each conductor therebetween.

7. An electrical feed-through assembly comprising:
- a hollow tubular casing having means on the periphery for restraining and sealing said casing between a high and low pressure environment,
- a plurality of separate electrical conductors electrically insulated and supported within the length of said hollow casing,
- dielectric materials completely covering and bonded to each conductor,
- a separate deformable dielectric bonding material adjacent the high pressure end for sealing and insulating said conductors within said casing whereby pressure will deform said material to improve the seal between said conductors and said casing, and
- a substantially non-deformable dielectric bonding material located adjacent said deformable material and extending within said casing to the area of the low pressure end for fixedly supporting and insulating said conductors in said casing whereby the conductors will withstand both high voltage and high pressure differentials.

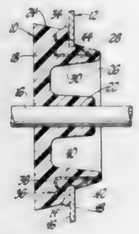
9. The method of constructing a feed-through assembly having a plurality of conductors located within a casing and capable of withstanding high voltage and high pressure differentials comprising the steps of:
- first epoxy a fiberglass dielectric insert to each end of the conductors,
- then cover portions of each insert with a tube of polyolefin dielectric that is shrunk in place over the conductor and the inserts,
- locate a filling hole in the side of the casing close to the high pressure end,
- then locate and hold the individual conductors within the casing,
- then holding the casing in a vertical position with the high pressure end down charge the casing with a first small amount of epoxy and heat cure,
- then charge the casing with a second amount of epoxy larger than the first and heat cure,
- then charge the casing with a third amount of epoxy to a point below the filling hole and heat cure,
- then place the casing on its side with the filling hole vertical and heat,
- then insert neoprene heated within the filling hole until the casing is full,
- then heat the casing again until the neoprene is vulcanized, and
- then insert a plug into the filling hole and seal.

4,041,241

SEALING GROMMET

Clarence W. Olmstead, Lawton, and Fred E. Triquet, Paw Paw, both of Mich., assignors to Arco Industries Corporation, Schoolcraft, Mich.

Filed Aug. 2, 1976, Ser. No. 710,825
Int. Cl.[2] H01B *17/30;* **F16L** *5/02*
U.S. Cl. 174—153 G **8 Claims**



1. A snap in grommet of the type for mounting in a panel opening wherein an elastomeric body is formed with an opening adapted to sealingly support a member therein, said body opening including a longitudinal axis, and a nonelastomeric element having a base portion imbedded in said elastomeric body, said element including locking means extending longitudinally from said base portion, said locking means having radially outwardly offset portions, wherein the improvement comprises: said elastomeric body having an annular portion spaced radially outwardly of the body opening, said annular body portion including inner and outer wall surfaces, the locking means of said non-elastomeric element being imbedded in said body such that the radially outwardly offset portions terminate at the outer wall surface of said annular portion, said elastomeric body including a longitudinally extending lip concentrically spaced outwardly of said annular portion and disposed proximate the radially offset portions of said locking means whereby said lip, the radially offset portions of said locking means and the annular body portion coact to sealingly lock the grommet within a panel opening.

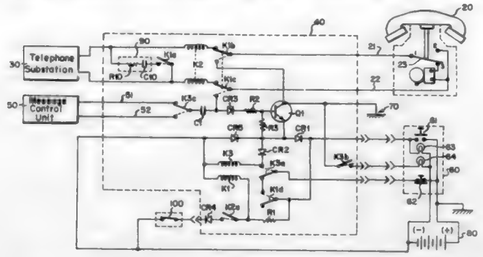
4,041,242

TELEPHONE SIGNALLING SYSTEM HAVING INTERRUPTION PREVENTIVE MEANS

Steven T. Churchill, Wilton, Conn., assignor to Letot, Incorporated, Fairfield, Conn.

Filed Mar. 8, 1976, Ser. No. 665,107
Int. Cl.[2] H04M *11/04*
U.S. Cl. 179—2 A **4 Claims**

1. A telephone signalling system comprising at least one telephone having a manually operated switch which in one position is adapted to connect the telephone for audio communication and in a second position to connect the telephone to a calling signal means, a telephone substation, telephone wires connecting said substation to said telephone, a message control unit adapted to be connected to said telephone wires and control means for selectively disconnecting said telephone wires from said substation and connecting said telephone wires to said message control unit; the improvement comprising having non-interrupt means separate and independent of said telephone substation responsive to loop current in said telephone



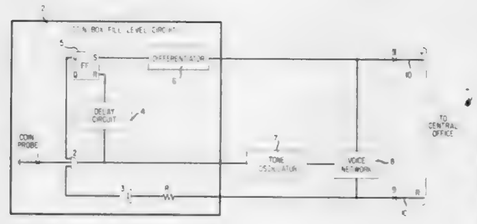
wires when said telephone is connected for audio communication to prevent selective operation of said control means.

4,041,243

COIN BOX SIGNALING ARRANGEMENT

Alfred Zarouni, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 20, 1976, Ser. No. 724,651
Int. Cl.[2] H04M *17/02*
U.S. Cl. 179—6.5 **7 Claims**



1. A signaling arrangement for indicating to a remote location that coins in the cash receptacle of a coin-operated device have accumulated to a predetermined fill level, said device being interconnected to said location by transmission means and having an oscillator actuatable to apply a tone signal to said transmission means, said arrangement comprising
- a gate circuit responsive to the presence of three enabling inputs for actuating said oscillator;
- means responsive to a predetermined accumulation level of coins in said receptacle for enabling one input of said gate;
- means responsive to a first predetermined potential on said transmission means for enabling a second input of said gate; and
- means responsive to a second predetermined potential on said transmission means for enabling a third input of said gate.

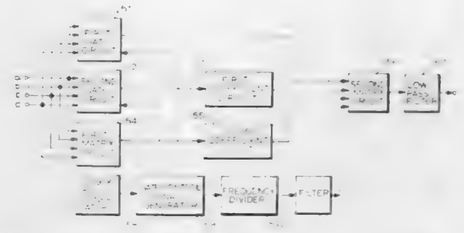
4,041,244

COMPOSITE STEREOPHONIC SIGNAL GENERATOR

Osamu Yamazaki, Suita; Sukeichi Miki, Ikoma, and Tsuneo Takezaki, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation-in-part of Ser. No. 428,732, Dec. 27, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,733
Claims priority, application Japan, Dec. 29, 1972, 48-3611
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—15 BT **3 Claims**

1. A stereophonic composite signal generator for generating a stereophonic composite signal having one main channel signal, at least one double side-band subsidiary channel signal and at least one pilot signal, the generator comprising gating circuit means for gating plural input signals in rotation in a predetermined sequence and frequency and with a constant duration for each input signal so as to produce a signal corresponding to said stereophonic composite signal and spurious harmonic signals which are (1) outside the frequency band of said stereophonic composite signal, and (2) double side-band signals, the center frequencies of which are integral multiples of the frequency of the rotation of said predetermined sequence, at least one spurious harmonic signal the center frequency of which is three times higher than the frequency of the rotation of said predetermined sequence representing at least one closest spurious harmonic signal closest to said stereophonic composite signal, a single time base source being coupled to said gating circuit means for controlling the gating operation of said gating circuit means and from which said pilot signal is derived, further gating circuit means for gating said input signals in a further sequence, the reverse of said predetermined sequence of the gating operation of said first mentioned gating circuit means and with a further constant duration for each input signal, said time base source being coupled to said further gating circuit means for controlling the gating operation of said further gating circuit means, and the



sum of the duration of the passages of three sequentially gated input signals through said further gating circuit means being synchronized with the duration of the passage of one input signal through said firstmentioned gating circuit means for causing the frequency of the rotation of said further sequence to be three times higher than the frequency of the rotation of said predetermined sequence so as to produce a cancellation signal having a signal component corresponding to said at least one closest spurious harmonic signal and no signal component in the frequency band of said subsidiary channel signals in said stereophonic composite signal; a coefficient circuit means coupled to said further gating circuit means for adjusting the output amplitude of said further gating circuit means; a matrix circuit means coupled to said gating circuit means and to said coefficient circuit means for combining the output signals from said gating circuit means and from said coefficient circuit means so as to cancel said at least one closest spurious harmonic signal in the output signal of said gating circuit means, and at least one filter coupled to said matrix circuit means for attenuating the remaining spurious harmonic signals, if any.

4,041,245

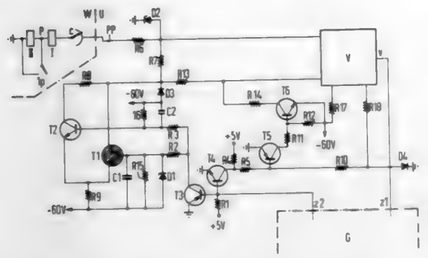
SWITCHING ARRANGEMENT FOR TELECOMMUNICATION SWITCHING SYSTEMS

Justus König, Munich, and Josef Röhrig, Oberhaching, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 22, 1976, Ser. No. 668,954
Claims priority, application Germany, Mar. 21, 1975, 2512633
Int. Cl.[2] H04Q *3/00*
U.S. Cl. 179—18 AB **1 Claim**

1. In a telecommunication switching system having a plurality of switching components, wherein each ready for seizure switching component indicates that readiness by applying an idle potential through a seizing circuit to a test point therein, the busy state being indicated by the absence of said idle potential, and including test switching means in switching components preceding the ready for seizure switching components for determining the busy-idle state of said ready for seizure

switching components, said test switching means having an internal impedance established by connecting said test switching means to a said test point and thereby establishing a test and seizing circuit, and wherein an auxilary test switching means applies a blocking potential differing from said idle potential to a said test point for blocking the said switching component associated with the latter switch point, said auxiliary testing means having an internal impedance equal to that of said test switching means, the improvement comprising:



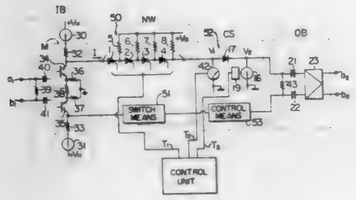
constant current source in each said ready for seizure switching component for supplying the said seizing circuit in the ready for seizure switching component a current of a value bringing about a test current ratio for one or more preceding switching components which is inversely proportional to the number of parallel-testing ones of said preceding switching components.

4,041,246

THYRISTOR CROSS-POINT SWITCH WITH CONTROL

Takuzi Mukaemachi; Toshiaki Toyama, both of Yokohama, and Taturu Miyoshi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 14, 1975, Ser. No. 595,497
Claims priority, application Japan, July 17, 1974, 49-81100
Int. Cl.[2] H04Q *3/52*
U.S. Cl. 179—18 GF **1 Claim**



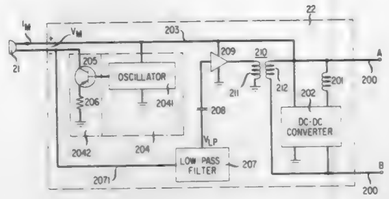
1. A transmission system comprising: a network including cross-point switches formed by four-layer semiconductor switching elements having self-holding function; an input connection circuit disposed at the high potential side of the link of said network to supply said four-layer semiconductor switching elements with dc bias current for holding them conductive and including means to restrict the upper limit of the dc bias current and modulating means for superposing a signal to be transmitted on the dc bias current; a current control circuit disposed at the low potential side of the link of said network and including a current switch circuit and an absorption type constant current circuit, connected in parallel through a diode to said current switch circuit, both circuits being so connected as to permit the dc bias current from the high potential side to the low potential side of said link, an output connection circuit, means for causing said current switch and said absorption type constant current circuit to activate thereby rendering said four-layer semiconductor switching elements conductive when the link of said network is to be closed and means for turning off said current switch so that the dc bias current is transferred to said absorption type constant current circuit.

4,041,247

METHOD AND APPARATUS FOR OPERATION OF CARBON MICROPHONES AT LOW AVERAGE CURRENT LEVELS

Bruce Edwin Briley, Countryside, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 12, 1976, Ser. No. 731,693
Int. Cl.[2] H04R *3/00*
U.S. Cl. 179—81 R **17 Claims**



1. Apparatus for controllably energizing a carbon microphone comprising

means for receiving a steady current having an average value in the low signal-to-noise region of the operating characteristic of said microphone, and

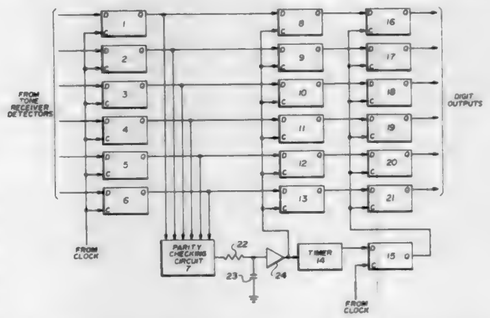
means of converting said current received by said receiving means into a series of pulses for energizing said microphone, said pulses having said same average value but having a peak value in the high signal-to-noise region of the operating characteristic of said microphone.

4,041,248

TONE DETECTION SYNCHRONIZER

Robert Herbert Beeman, Berkeley, and Lloyd Arthur Tarr, Elmhurst, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Oct. 21, 1976, Ser. No. 734,494
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF **6 Claims**



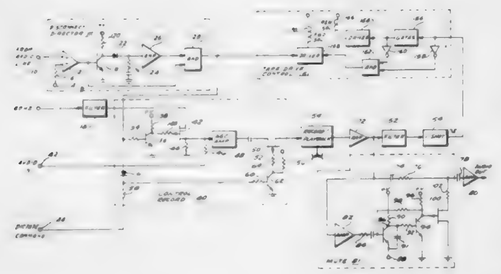
1. A tone synchronizer circuit connected to at least one tone detector and to a source of regularly recurring clock pulses, said tone synchronizer circuit comprising: input latch means connected to said tone detector and including a circuit connection to said pulse source, conditioned in response to a signal from said tone detector and operated in response to a pulse from said pulse source; output latch means including an output circuit; intermediate latch means connected between said input latch means and said output latch means, conditioned in response to operation of said input latch means; a timer circuit; a delay circuit connected between said input latch means and said timer and including an output circuit connection to said intermediate latch means, operated in response to operation of said input latch means after a predetermined period of time, to operate said timer circuit and to operate said conditioned intermediate latch means; said output latch means conditioned in response to operation of said intermediate latch means; and a control latch circuit connected between said timer circuit and said output latch means and including a circuit connection to said pulse source, conditioned in response to operation of said timer circuit and operated in response to a pulse from said pulse source, to operate said conditioned output latch means; whereby a synchronized output signal representative of the signal from said connected tone detector is generated at said output latch means output circuit.

4,041,249

CENTRAL DICTATION SYSTEM WITH PRIVACY SIGNAL USED FOR TRANSCRIBING SCANNING

Bjorn J. Matz, Forest Hills, N.Y., and Edward J. Foster, Ridgefield, Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,754
Int. Cl.[2] G11B *27/30, 27/34, 19/20*
U.S. Cl. 179—100.1 DR **13 Claims**



1. In a recording system having a recording station adapted to communicate with a record/reproduce device whereat information is recorded on and reproduced from a recording medium through transducer means, apparatus comprising:

a source for supplying a signal of relatively low oscillating frequency;

detecting means for detecting when communication between said recording station and said record/reproduce device is terminated and for producing an output signal representative thereof, said output signal having a predetermined time duration;

drive means for providing relative movement between said recording medium and said transducer means;

means for applying said output signal of predetermined duration to said drive means to effect forward relative movement between said recording medium and said transducer means for the duration of said output signal;

switch means coupled between said source and said transducer means;

means for applying said output signal to said switch means to actuate said switch means for said predetermined time duration to supply said low frequency signal to said transducer means, whereby said low frequency signal to said transducer means, whereby said low frequency signal is recorded on said recording medium for the duration of said output signal; and

control means coupled to said transducer means and responsive to the reproduction of said low oscillating frequency signal during reverse relative movement between said recording medium and said transducer means to prevent further reverse relative movement thereof and to cause said drive means to effect forward relative movement between said recording medium and said transducer means for a pre-established time duration.

3. In a recording system having a recording station adapted to communicate with a record/reproduce device whereat information is recorded on and reproduced from a recording medium through transducer means, apparatus comprising:

a source for supplying a signal of relatively low oscillating frequency;

detecting means for detecting when communication between said recording station and said record/reproduce device is terminated and for producing an output signal representative thereof, comprising:

voltage sensing means coupled to said recording station for sensing a predetermined change in voltage produced when said recording station terminates communication with said record/reproduce device;

a timing circuit including capacitance means normally charged to a predetermined level when said recording station is in communication with said record/reproduce device and discharged when said voltage sensing means senses said predetermined voltage change;

and AND gate means coupled to said voltage sensing means and said timing circuit for producing said output signal proportional to the coincidence of the signal produced by said voltage sensing means and the signal produced by said timing circuit while said capacitance means discharges;

drive means for providing relative movement between said recording medium and said transducer means;

means for applying said output signal to said drive means to effect forward relative movement between said recording medium and said transducer means for the duration of said output signal;

switch means coupled between said source and said transducer means; and

means for applying said output signal to said switch means to actuate said switch means for said duration of said output signal to supply said low frequency signal to said transducer means, whereby said low frequency signal is recorded on said recording medium for the duration of said output signal.

8. In a transcribinhg device for transcribing information recorded on a recording medium in a format wherein successive messages are separated by a recorded predetermined low frequency signal, apparatus comprising:

drive means for providing relative movement between said recording medium and transducing means, said movement including a normal forward movement for reproducing said information, a fast forward movement for rapidly scanning said recording medium and a reverse movement;

drive control means coupled to said drive means for selectively establishing a mode of operation for said relative movement;

filter means coupled to said tranducing means for detecting the reproduction of said low frequency signal;

means coupled to said filter means for producing an output signal of predetermined duration when said low frequency signal is detected;

indicating means responsive to said output signal for producing an indication of said predetermined duration representing that the end of one message and the beginning of the next succeeding message has been reached; and

means for applying said output signal to said drive means for temporarily halting said relative movement for said predetermined duration and for resuming said relative movement upon the conclusion of said output signal.

4,041,250

COUPLING DEVICE FOR CASSETTE TAPE RECORDER

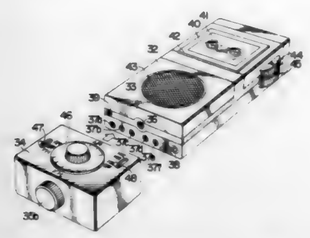
Masanobu Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd, Tokyo, Japan

Filed Dec. 10, 1975, Ser. No. 639,271

Claims priority, application Japan, Dec. 23, 1974, 49-155007[U]; Dec. 27, 1974, 50-157061[U]; Dec. 28, 1974, 50-2698[U]

Int. Cl.² G11B *31/00*

U.S. Cl. 179—100.11 **8 Claims**



1. A combination accessory and cassette tape recorder comprising a cassette tape recorder including a coupling surface which is formed with a plurality of socket contacts and a locating recess, a threaded bore formed in the coupling surface, an accessory unit such as a tuner, microphone preamplifier or the like including a coupling surface which is formed with a plurality of pin contacts and a locating pin, the pin contacts being adapted to be brought into electrial connection with the socket contacts of the recorder and the locating pin being adapted to be engaged with the locating recess in the recorder when the accessory unit is physically coupled with the recorder, and a connection screw rotatably received within the accessory unit and having a free end which projects from the coupling surface thereof for threadable engagement with the threaded bore in the coupling surface of the recorder.

4,041,251

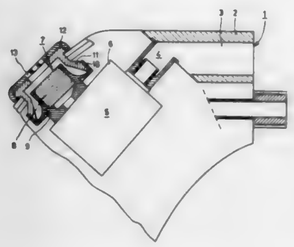
HEARING AID TO BE WORN BEHIND THE EAR OF THE USER AND PROVIDED WITH A PRESSURE-GRADIENT MICROPHONE

Johannes Matheus Gerardus Maria Kaanders, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 483,614, June 27, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 622,998

Int. Cl.² H04R *1/38, 25/00*

U.S. Cl. 179—107 FD **10 Claims**



1. A directional hearing aid to be worn behind the ear comprising, a pressure-gradient microphone containing a vibratory diaphragm and having a first sound admitting opening in a front wall of the microphone case and a second sound admitting opening in a lateral wall thereof and which communicates with the rear surface of the diaphragm whereby sound is transmitted to both sides of the diaphragm, a crescent shaped housing inside of which the microphone is mounted, said housing including acoustic duct means having a frontal sound entrance aperture coupled to said microphone first sound admitting opening and a dorsal sound entrance aperture located rearwardly of the frontal sound entrance aperture and coupled to said microphone second sound admitting opening, an acoustic impedance positioned outside of the microphone case between the dorsal aperture and said second sound admitting opening and comprising a body of sintered material forming capillary ducts through which the sound must pass to reach said second sound admitting opening, the overall sound transmission area of said body being less than one half of the effective area of the microphone diaphragm, and a resilient mount having an opening on one face thereof and a recess in which said sintered body is mounted so as to be readily removable from the mount via said opening therein, said mount being located external of the microphone case and within said housing so that the sintered body is positioned normal to at least one of said microphone sound admitting openings.

2. A directional hearing aid to be worn behind the ear comprising, a pressure-gradient microphone housing a vibratory diaphragm, acoustic duct means having a frontal sound entrance aperture coupled to a first sound admitting access opening of the microphone and a dorsal sound entrance aperture located to the rear of the microphone and coupled to a second sound admitting access opening of the microphone that communicates with the rear surface of the diaphragm, said frontal sound aperture being located substantially at right angles to the dorsal sound entrance aperture, an acoustic impedance coupled between said dorsal aperture and said second access opening and comprising a block of sintered material forming a plurality of capillary ducts, the overall sound transmission area of said block being less than one half of the effective area of said microphone diaphragm, and a rubber mount in which the block is detachably accomodated.

4. A directional hearing aid to be worn behind the ear comprising, a pressure-gradient microphone housing a vibratory diaphragm, acoustic duct means having a frontal sound entrance aperture coupled to a first sound admitting access opening located in a front wall of the microphone housing and a dorsal sound entrance aperture located to the rear of the microphone and coupled to a second sound admitting access opening located in a lateral wall of the microphone housing that communicates with the rear surface of the diaphragm, said frontal sound aperture being located substantially at right angles to the dorsal sound entrance aperture, and an acoustic impedance coupled between said dorsal aperture and said second access opening and comprising a block of sintered material forming a plurality of capillary ducts, said block of sintered material being mounted external to the microphone housing and within the acoustic duct means and having diameter to height dimensions in the ratio of approximately 3:2 and with the overall sound transmission area of said block being less than one half of the effective area of said microphone diaphragm.

6. A miniature directional hearing aid to be worn behind the ear comprising, a pressure-gradient microphone containing a vibratory diaphragm and having a first sound admitting opening in a front wall of the microphone case and a second sound admitting opening in a lateral wall thereof and which communicates with the rear surface of the diaphragm whereby sound is transmitted to both sides of the diaphragm, a crescent shaped housing inside of which the microphone is mounted, said housing including acoustic duct means having a frontal sound entrance aperture coupled to said microphone first sound admitting opening and a dorsal sound entrance aperture located rearwardly of the frontal sound entrance aperture and coupled to said microphone second sound admitting opening, and an acoustic impedance positioned outside of the microphone case between the dorsal aperture and said second sound admitting opening and comprising a body of sintered material forming capillary ducts through which the sound must pass to reach said second sound admitting opening, the overall sound transmission area of said body being less than one half of the effective area of the microphone diaphragm.

4,041,252

TRANSFORMERLESS TWO-WIRE/FOUR-WIRE HYBRID WITH DC SOURCING CAPABILITY

Earl Thomas Cowden, Galion, Ohio, assignor to North Electric Company, Galion, Ohio

Filed June 7, 1976, Ser. No. 694,027

Int. Cl.² H04B *1/58*

U.S. Cl. 179—170 NC **6 Claims**



1. A transformerless hybrid arrangement for coupling a two-wire communication path having first and second terminals to a four-wire communication path having an input terminal pair and an output terminal pair and for simultaneously providing said two-wire communication path with DC battery feed, said arrangement comprising;

first and second combined battery and voice signal injection means for furnishing AC voice signals in series with DC battery potential at respective combined injection means outputs, first and second input amplifiers respectively coupling a four-wire input signal at said input terminal pair to the inputs of said first and second combined battery and voice signal injection means, first and second coupling means for respectively coupling the outputs of said first and second injection means to said first and second terminals of said two-wire communication path,

a differential amplifier having inputs respectively coupled to said first and second terminals of said two-wire communication path, a buffer amplifier having one input coupled to the output of said differential amplifier and an output coupled to said output terminal pair of said four-wire communication path, and

transhybrid balance means having an input arranged for receipt of a signal proportional to said four-wire input signal and having an output coupled to said one input of said buffer amplifier.

4,041,253

BUS MONITOR CIRCUIT FOR DETECTING MALFUNCTION OF TELEPHONE CIRCUITS CONNECTED IN GROUPS TO A COMMON BUS

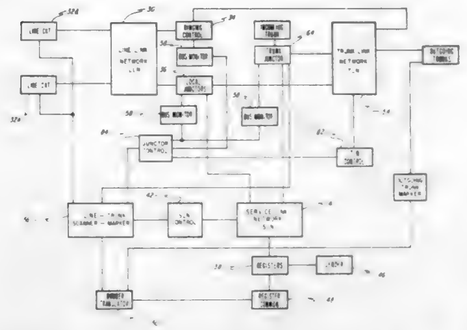
Otto Altenburger, Rochester, and Alton E. Dorazio, Rochester, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,003

Int. Cl.² H04M *3/22*

U.S. Cl. 179—175.2 R **12 Claims**

1. In a telephone system including a plurality of first circuits each having a plurality of terminals selectively connectable to one end of a multi-conductor bus which is connected at the other end thereof to terminals of a second circuit having timing means for timing the operation thereof, a bus monitor circuit comprising detection means for detecting a predetermined electrical potential, connection means responsive to said timing means for connecting said detection means to each of said terminals of at least some of said first circuits when said second circuit fails to complete its operation in a predetermined time, and control means responsive to said detection means detecting said predetermined electrical potential for disabling the first circuits connected to said detection means.



4,041,254

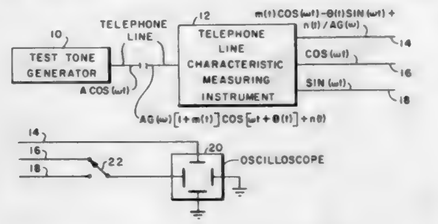
TELEPHONE LINE CHARACTERISTIC DISPLAY

Frank R. Bradley, Bronx, and Rawley D. McCoy, Bronxville, both of N.Y., assignors to Bradley Telcom Corporation, Leonia, N.J.

Filed Aug. 24, 1976, Ser. No. 717,350

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 R **8 Claims**



1. A transmission path characteristic display system comprising means for processing a received signal having test tone and disturbance components therein to derive a first signal substantially representative of the instantaneous disturbance component and in which the test tone component is substantially eliminated, display means having first and second orthogonal inputs responsive to the application of signals thereto for generating a display, means for coupling said first signal to said first input, and means for applying to said second input a periodic signal which is synchronous with the received test tone component.

4,041,255

SWITCHING CIRCUIT FOR TELECOMMUNICATIONS LINES

Ronan Malcolm Cambridge, and Douglas John Watson, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Sept. 29, 1976, Ser. No. 727,709

Int. Cl.² H04B *3/46*

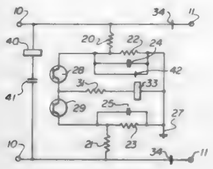
U.S. Cl. 179—175.3 R **10 Claims**

1. A switching circuit for connecting and disconnecting subscriber equipment associated with a subscriber loop, in response to a voltage control signal momentarily transmitted on the subscriber loop, the switching circuit comprising:

switch means including a magnetically latching relay and associated contact means, the contact means for connection in series between the subscriber loop and subscriber

equipment, whereby operation of the latching relay effects a connected state or a disconnected state between the subscriber equipment and the subscriber loop via the contact means;

a variable impedance means connected in series with the latching relay, the variable impedance means having high and lower impedance states and being responsive to a predetermined voltage to switch from the high to the lower impedance state and being responsive to the current flow therethrough being reduced below a predetermined level to switch to the high impedance state;



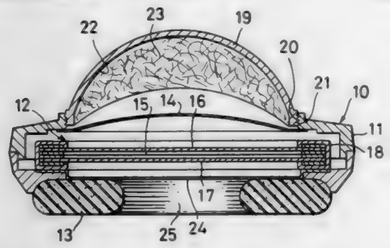
switch control means connected to the switch means, the switch control means including charge storage means for connection via a predetermined impedance means to a lead in the subscriber loop, whereby the voltage control signal causes an accumulation of charge to occur in the charge storage means at a potential of up to said predetermined voltage whereafter the accumulated charge is rapidly dissipated through the variable impedance means and the latching relay causes the associated contacts to effect one of the two states.

4,041,256

OPEN-BACK TYPE HEADPHONE WITH A DETACHABLE ATTACHMENT

Kazuho Ohta, Sagamihara; Fumio Matsuda, Machida; Tsutomu Tanaka, Yamato; Katsuhiro Ohnuki; Naotaka Miyaji, both of Tokyo, and Hidetoshi Sato, Yamato, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Apr. 30, 1976, Ser. No. 682,165
Claims priority, application Japan, May 6, 1975, 50-53147
Int. Cl.² H04R *1/10*
U.S. Cl. 179—182 R **7 Claims**



1. An open-back type headphone comprising:

a driver unit for operating as a sound generating source;

a case accommodating therewithin said driver unit and having a front face on the side to confront and be pressed against an ear of a listener and a back face on the side opposite that of the front face, said back face being acoustically open;

an ear pad provided on said front face of the case and forming at the center thereof a front air chamber; and

an attachment detachably attached to said back face of the case,

said attachment having an open end communicable with the back face of the case and an internal space of a specific volume and being adapted to cover and seal the back face of the case,

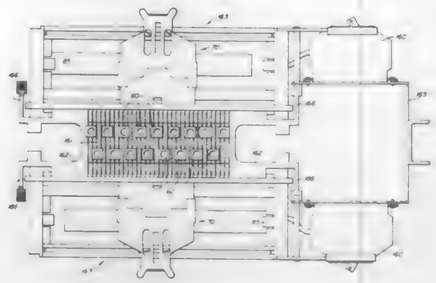
said attachment and said case having cooperatively an attaching mechanism by which the attachment can be detachably attached to the case.

4,041,257

CROSS CONNECT PANEL FOR LIGHTING SYSTEMS

LeRoy D. Yancey, 1834 S. Oakmont Drive, Bountiful, Utah 84010

Filed Mar. 24, 1976, Ser. No. 669,882
Int. Cl.² H01H *9/00*; H02B *1/04*
U.S. Cl. 200—1 R **27 Claims**



1. A cross-connect panel, comprising:

a base supply section having

a pair of approximately parallel, side support members, each including a bottom element, an inner side wall upstanding from said bottom element, an elevated support element extending approximately normal from said inner side wall away from the other said side support member and an outer side wall upstanding from said elevated support element, said side support elements being spaced to form a channel between their respective inner side walls;

a plurality of bus bars arranged in approximately parallel spaced relationship within and in approximately longitudinal alignment with said channel;

a plurality of insulating strips interleaved with said bus bars to electrically isolate said bus bars from each other and said side support members;

means for restraining said bus bars from movement longitudinally in said channel;

means for restraining said bus bars from movement either up or down from said channel; and

means for electrically connecting said bus bars individually to power supply means; and

a cross-connect load section comprising a plurality of load-connector modules mounted in approximately parallel relationship transverse the bus bars on said elevated support elements each of said load-connector modules including:

a support member including at least one flat surface upstanding from and transverse said bus bars, said surface carrying a thin conductive strip electrically isolated from said bus bars, and including means for connecting said conductive strip to an external load circuit; and

a brush assembly mounted to slide along said support member parallel said surface, and including:

a brush contact mounted in slideable engagement with said conductive strip, and

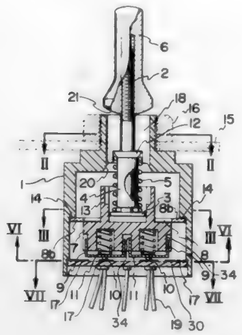
a main bus bar contact operable for selective engagement with a selected of said plurality of bus bars in circuit with said brush contact to selectively make or break an electrical circuit between said bus bar and said conductive strip.

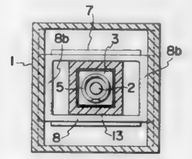
4,041,258

SWITCH HAVING UNIVERSAL TYPE ACTUATOR AND GUIDE PLATE

Shinichi Harada, Tokyo, Japan, assignor to Niles Parts Company, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 565,001, April 4, 1975, abandoned. This application June 2, 1976, Ser. No. 692,123
Claims priority, application Japan, Apr. 27, 1974, 49-47588
Int. Cl.² H01H *25/04, 15/00*
U.S. Cl. 200—6 A **2 Claims**





1. A lever switch comprising:

a housing having a vertical hole with a cruciform cross-sectional shape formed in its upper portion, said hole having an outwardly tapered recess;

a substantially square base secured to said housing, said base having a pair of stationary contacts formed along each side thereof;

a block having an integrally formed hollow cube formed on top of the block, said cube having a smaller cross-sectional area than said block whereby a pair of spaced and parallel abutment surfaces are formed on the top of the block along two opposite sides thereof;

said block being positioned within the housing and having movable contacts at its base adapted for selected engagement with the stationary contacts on the base of the housing; a rectangular guide plate having two short sides and two long sides and a rectangular oblong aperture formed therethrough, said hollow cube being positioned through said oblong aperture in said guide plate so that the bottom of the long sides of the guide plate abut against the abutment surfaces on said block whereby said guide plate permits said hollow cube to move longitudinally along said oblong aperture but prevents lateral movement of the cube;

the short sides of the guide plate being slidably received along shoulder abutments formed in said housing;

a shift lever protruding upward from said housing after passing through a flanged sleeve and the vertical hole and provided at its inner end with a square plate inserted loosely in said hollow cube and having a knob attached to its outer end; and

a coil spring arranged between the flange of said sleeve and the square plate so as to push said flange against the bottom of the vertical hole and pull the knob attached to the outer end of said shift lever onto the top of said vertical hole;

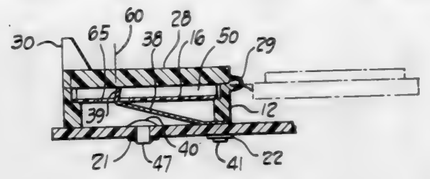
whereby said shift lever is operable to both move said hollow cube along said oblong aperture in said guide plate to selectively make contact between the movable contacts on said block and the stationary contacts on two opposite sides of said base, and also to move the short sides of said guide plate along said housing shoulder surfaces so that said guide plate moves said cube to thereby selectively make contact between the movable contacts on said block and the stationary contacts on the other two sides of said base.

4,041,259

SWITCH MECHANISM

Andrew F. Deming, Alliance, Ohio, assignor to The Alliance Manufacturing Company, Inc., Alliance, Ohio

Filed Nov. 28, 1975, Ser. No. 636,079
Int. Cl.² G06K *7/06*
U.S. Cl. 200—46 **37 Claims**



1. A switch mechanism comprising, in combination,

a housing having a first reference plane,

support means in said housing,

a removable card supported on said support means transverse to said reference plane and having abutment means,

first and second contact means,

said first contact means including a contact blade having a mounting portion, a movable contact portion and a movable actuable portion,

first means relatively mounting said mounting portion and said housing with said actuable portion in said first reference plane and transverse to said card,

second means relatively mounting said second contact means and said housing in a position for engagement of said second contact means by said contact blade contact portion,

and selective means to actuate said first and second contact means selectively into one of contact closed and contact open circuit conditions including said card and including first locator means establishing disposition of said card in said support means with said abutment means on said card in said first reference plane to engage said contact blade actuable portion to establish said first and second contact means in a contact closed circuit condition.

4,041,260

INTERLOCK FOR CIRCUIT BREAKERS

David L. Swindler, Franklin, and Donald L. Dykes, Middletown, both of Ohio, assignors to Square D Company, Park Ridge, Ill.

Filed Oct. 10, 1975, Ser. No. 622,284
Int. Cl.² H01H *9/20, 3/20*
U.S. Cl. 200—50 A **7 Claims**

1. An interlocking means for enabling the closure of a circuit breaker of the type controlled by an external control system comprising:

a first connector, a shaft, means rotatably supporting said shaft on said first connector,

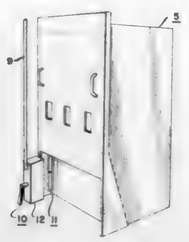
a second connector for engagement with said first connector and having an opening to receive the shaft for rotation in said opening when said first connector is moved relatively towards said second connector, said first and second con-

nectors including means for establishing an electrical connection between said circuit breaker and said control system in response to the full engagement of said first connector with said second connector;

a latching means;

operating means effective for normally moving said latching means for enabling the closure of the circuit breaker;

disabling means normally effective for preventing movement of said latching means by said operating means in response to the disengagement of said shaft from said opening;



and control means operated by said shaft in response to the rotation of said shaft in said opening for moving said first connector relative said second connector to fully engage the first connector with the second connector and establish said electrical connection and for simultaneously rendering said disabling means ineffective to prevent movement of the latching means and thereby enable said operating means to independently move said latching means and enable closure of said circuit breaker.

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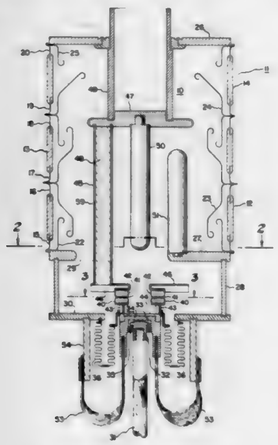
HIGH CURRENT CAPACITY ROD ARRAY VACUUM ARC DISCHARGE DEVICE

Joseph A. Rich, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed June 24, 1975, Ser. No. 589,892

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **20 Claims**



1. A vacuum arc discharge device comprising:

a hermetically sealed, evacuated envelope;

a plurality of contact pairs arranged in a predetermined pattern within said envelope, each of said contact pairs including a movable contact and a fixed contact, each of the movable contacts being electrically interconnected and mechanically coupled to a common, movable support having a major portion of its volume situated outside said envelope;

a first plurality of electrically conducting rods contained in said envelope, each rod of said first plurality being mechanically and electrically coupled to a respective one of the fixed contacts and to a common metallic support plate;

a second plurality of electrically conducting rods contained in said envelope and interdigitally spaced in alternating fashion with respect to said first plurality of rods; and

a second metallic plate mechanically and electrically connecting each rod of said second plurality to said envelope, said second metallic plate having an opening therein to permit passage therethrough of each rod of said first plurality.

4,041,262

CONTACT ARRANGEMENT FOR AN ELECTRICAL SWITCH, ESPECIALLY FOR A VACUUM SWITCH

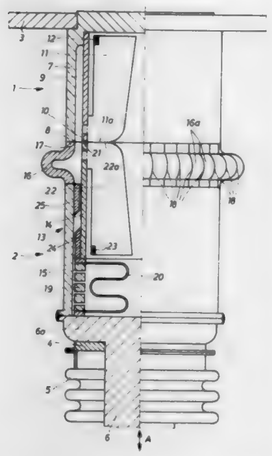
Joachim Amsler, Seon, Switzerland, assignor to Sprecher & Schuh AG, Aarau, Switzerland

Filed June 25, 1975, Ser. No. 590,281

Claims priority, application Switzerland, Sept. 2, 1974, 11908/74

Int. Cl.² H01H *33/66*

U.S. Cl. 200—144 B **7 Claims**



1. A contact arrangement for an electrical switch, especially for a vacuum switch, comprising two contact components movable relative to one another in a first predetermined direction, said contact components having a closed position, one of said contact components defining a movable contact component, the other of said contact components defining a stationary contact component, each of said contact components comprising two contact elements electrically connected in parallel, said contact elements of each of said contact components having an essentially hollow cylindrical configuration and being arranged substantially coaxially with respect to one another to define respective outer and inner contact elements, each of said contact elements having a contact surface, the inner contact and the outer contact elements of said contact components being axially positioned in the direction of movement of said movable contact component, each of said contact elements of said one of said

4,041,263

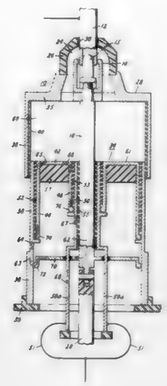
ELECTRIC CIRCUIT INTERRUPTER OF THE PUFFER TYPE COMPRISING A MAGNETICALLY ACTUATED PISTON

Heinz O. Noeske, Cherry Hill, N.J., assignor to General Electric Company, Philadelphia, Pa.

Filed Aug. 22, 1975, Ser. No. 607,084

Int. Cl.² H01H *33/20*

U.S. Cl. 200—148 A **13 Claims**



1. In a puffer-type electric circuit interrupter:

a. a pair of separable contacts,

b. a movable conductive rod electrically connected to and mechanically coupled to one of said contacts,

c. means for transmitting contact-separating force to said conductive rod,

d. a cylinder having an end wall coupled to said conductive rod,

e. a piston located within said cylinder and relatively movable with respect to said cylinder for pressurizing fluid within said cylinder when said piston is moved relative to said end wall in a direction toward said end wall,

f. means for conveying pressurized fluid from said cylinder to the space between said contacts upon contact-separation to aid in extinguishing arcs formed between said contacts,

g. first tubular conductive structure surrounding said conductive rod,

h. second tubular conductive structure surrounding said first tubular conductive structure and said conductive rod,

i. said piston having a portion forming an electrical connection between said first and second tubular conductive structures and being movable with respect to said first and second tubular conductive structures,

j. conductive bridging structure extending between and electrically interconnecting said conductive rod and said second tubular conductive structure,

k. means effective during a contact-separating operation for forcing current flowing through said conductive rod to follow a loop-shaped path that extends in series through said rod, said bridging structure, said second tubular conductive structure, said piston portion, and said first tubular conductive structure, with the instantaneous current in said path flowing through said first tubular structure and said rod in a first direction longitudinally of said rod and flowing through said second tubular structure in a second direction longitudinally of said rod which is generally opposite to said first direction,

l. the magnetic effect of current through said loop-shaped path via said piston portion acting to drive said piston toward said cylinder end wall, thereby pressurizing fluid within said cylinder.

4,041,264

OPERATING DEVICE FOR A CONTACT DEVICE FOR A PRE-INSERTION RESISTOR IN A HIGH-VOLTAGE CIRCUIT BREAKER

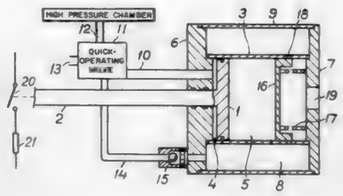
Per Olof Grune, Ludvika, Sweden, assignor to Asea Aktiebolag, Vasteras, Sweden

Filed Sept. 8, 1975, Ser. No. 611,323

Claims priority, application Sweden, Sept. 30, 1974, 7412254

Int. Cl.² H01H *33/54*

U.S. Cl. 200—148 R **3 Claims**



1. An operating device for rapid On-Off operation of a contact device having a movable contact for a pre-insertion resistor in a high-voltage compressed gas circuit breaker, which operating device comprises a high pressure chamber, a cylinder, a piston (**1**) movable in the cylinder (**3**) and connected to the movable contact of said contact device, one side of said piston limiting a first cylinder space (**4**), a quick-operating control valve (**11**) for connecting said first cylinder space alternatively to said high-pressure chamber for closing the contact device and to a low-pressure space for opening the contact device, the other side of the piston (**1**) limiting a second cylinder space (**5**), a delay space, at least one opening which, at least during the latter stage of the contact operation, connects the delay space (**8**) with the second cylinder space, said control valve including means to connect said delay space (8) to the high-pressure chamber to be supplied with high-pressure gas substantially simultaneously with pressurizing said first cylinder space (**4**), and a non-return valve in the connection between the delay space (**8**) and the control valve (**11**).

4,041,265

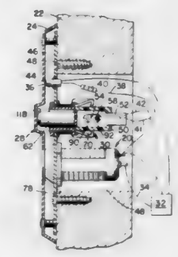
ELECTRIC SWITCH

Ronald M. Brave, 3950 McDonogh Road, Randallstown, Md. 21133; Dennis G. Brave, Glencliffe Circle, Brooklandville, Md. 21022, and Arnold S. Feldeman, 10 Melisa Court, Owings Mill, Md. 21208

Filed Feb. 19, 1976, Ser. No. 659,515

Int. Cl.² H01H *3/12, 13/64*

U.S. Cl. 200—159 R **7 Claims**



1. An electric switch for controlling an electric circuit of the type including a pair of terminals mounted in an insulating body and each having defined therein an opening and an electrically conductive contactor rod mounted on an electrically insulative non-rotatable plunger for movement therewith, the rod extending between the terminals to contact same, the plunger being movably received within the body to move inwardly and outwardly thereof and the contactor rod being

received in the terminal openings for selectively connecting the terminals together when the plunger is in a first position to complete an electric circuit when the contactor rod contacts both terminals, and breaking the electric circuit when the plunger is in a second position when the connector rod is positioned to be out of contact with the terminals, means for mounting the base on a mounting element including a face plate, an insulating member mounted in the base and engaging the terminals for holding the plunger and preventing short-circuiting, and means for biasing the plunger outwardly of the body, the plunger abutting said face plate to hold that plunger in the first position, the improvement comprising: sizing the lengthwise dimension of the opening in each of the terminals to be less than the distance which the plunger can move inwardly of the body so that the contactor rod will assume a third position contacting both terminals at a location spaced from said first and second positions wherein the electric circuit is activated when the plunger is pushed into the body a predetermined distance beyond the second position.

4,041,266

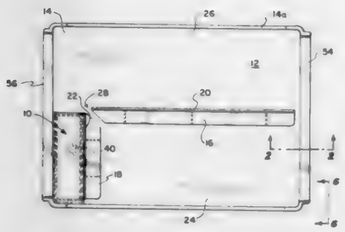
SENSOR AND TRAY ARRANGEMENT

Donald G. Moore, Glencoe, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 380,487, July 18, 1973, Pat. No. 3,935,415, and a continuation-in-part of Ser. No. 300,763, Oct. 25, 1972, Pat. No. 3,936,626. This application Oct. 21, 1975, Ser. No. 624,633

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 E **21 Claims**



1. A tray, for supporting and serving food items exposed to microwave energy, said tray arranged to carry a plurality of food items in distinct zones and in which zones are applied different amounts of microwave energy, said tray including means to prevent inadvertent transfer of food items during stacking, comprising:

a tray base having an upper surface defining said zones, and said base being made of electrically non conductive material;

flange means at the boundaries of said zones which comprises microwave energy shielding means for restricting the amount of microwave energy within a zone which energy is not intended to be directed into said shielded zone, and said base having a groove formed on said upper surface and receiving a portion of said flange means;

microwave sensing assembly means in a recessed portion of said tray base for sensing the microwave energy incident on said tray; and

supporting means positioned at the periphery of said tray base for maintaining said tray base in a horizontal plane during stacking.

4,041,267

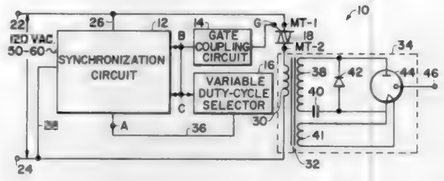
MICROWAVE OVEN POWER CONTROL CIRCUIT

Reuben Wechsler, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg

Filed Aug. 28, 1975, Ser. No. 608,813

Int. Cl.[2] H05B 9/06

U.S. Cl. 219—10.55 B **21 Claims**



1. A power control circuit suitable for controlling the power supplied by a power source to a load operatively coupled to the power source, comprising in combination:

means for converting an alternating line power supply to power at a different frequency;

switching means operatively interposed between the alternating line power supply and said converting means; and

means for controlling the switching operation of said switching means to control the intensity of the power provided by said converting means, said controlling means including synchronization circuit means responsive to the alternating line power supply for producing a sync pulse in timed relationship to each successive negative half cycle of the alternating line power suppy for rendering said switching means conductive and nonconductive in a predetermined timed relationship to the alternating line power supply frequency to minimize transients in the power control circuit.

11. A power control circuit suitable for controlling the power supplied by a suource of microwave energy in a microwave oven; comprising in combination:

means for converting an alternating line power supply to microwave power;

switching means operatively interposed between said converting means and the alternating line power supply; and

means for controlling the switching operation of said switching means, said controlling means including synchronization circuit means responsive to the alternating line power supply for producing a sync pulse in timed relationship to each successive negative half cycle of the alternating line power supply for rendering said switching means conductive and nonconductive in a predetermined timed relationship to the alternating line power supply frequency to minimize transients in the power control circuit.

4,041,268

METHOD FOR ADJUSTING THE ECCENTRICITY OF A SPARK-EROSION MACHINING ELECTRODE ENDOWED WITH A MOVEMENT OF CIRCULAR TRANSLATION AND A DEVICE FOR THE APPLICATION OF SAID METHOD

Pierre Braudeau, Paris, and Alfred Marie Aimé Maillet, Versailles, both of France, assignors to Carel Fouche Languepin, Paris, France

Filed Mar. 23, 1976, Ser. No. 669,521

Claims priority, application France, Mar. 25, 1975, 75.09252

Int. Cl.[2] B23P 1/08

U.S. Cl. 219—69 G **8 Claims**

1. A method for automatically increasing the eccentricity of a circular translation movement of an electrode relative to a workpiece, in a spark erosion machine, said movement having a period of travel, a machining voltage being applied between said electrode and said workpiece, comprising the steps of:

measuring said machining voltage between said electrode and said workpiece;

generating a reference voltage;

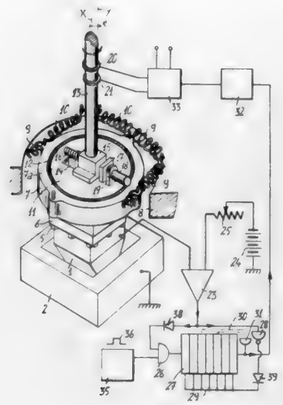
comparing said machining voltage and said reference voltage;

measuring the time interval during which said machining voltage remains continuously higher than said reference voltage;

generating a control signal only said time interval is at least equal to said period of travel; and

controlling the increase of said eccentricity in response to said control signal.

2. A spark-erosion machine comprising an electrode for machining a workpiece, means for applying between said electrode and said workpiece a machining voltage, driving means to drive said electrode and workpiece in a circular translation



movement relative to each other, said circular translation movement having an eccentricity and a period of travel, and means for automatically increasing said eccentricity, said means comprising:

means for measuring the machining voltage between said electrode and said workpiece;

a voltage supply for delivering a reference voltage;

comparision means for comparing said machining voltage and said reference voltage;

means for measuring the time interval during which said machining voltage has remained continuously higher than said reference voltage;

means for generating a control signal only when said time interval is at least equal to said period of travel; and

an electric motor controlled by said control signal to act upon said driving means so as to increase said eccentricity.

4,041,269

CARTRIDGE FOR AN ELECTRICAL DISCHARGE MACHINING APPARATUS

George Edward Baker, Asfordby, near Melton Mowbray, England, assignor to Amchem Company Limited, England

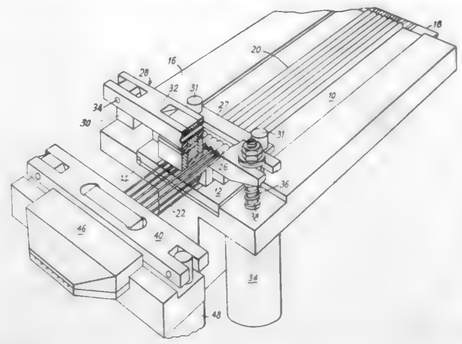
Filed Mar. 15, 1976, Ser. No. 666,916

Claims priority, application United Kingdom, Mar. 15, 1975, 10908/75

Int. Cl.[2] B23P 1/08

U.S. Cl. 219—69 E **11 Claims**

1. A cartridge for an electrical discharge machining apparatus having an electrode nose guide, said cartridge comprising a carriage in the form of a grooved slide having a groove and mounted for sliding movement with respect to said nose guide, an assembly removably received in said groove, a plurality of parallel tubes being mounted on said assembly and insulated one from the other and from the assembly, said tubes being capable of each receiving an electrode as a sliding fit and guiding the electrodes towards said nose guide, said assembly including two supports which are stepped one relative to the other, a first of said supports supporting said electrode tubes and a second of said supports, which second support lies adjacent said nose guide, supporting the electrodes alone, clamp



means mounted upon said carriage and including means operable to lock said electrodes in a fixed position within said cartridge, and means mounted upon said carriage and offering frictional resistance against sliding electrode movement within said tubes.

4,041,270

METHODS OF WELDING CORNER JOINTS

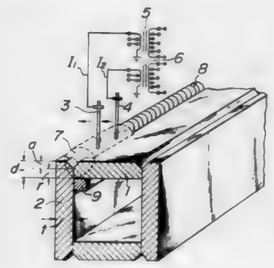
Kozo Akahide, and Kazuo Agusa, both of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed June 2, 1975, Ser. No. 583,102

Claims priority, application Japan, June 14, 1974, 49-67086

Int. Cl.[2] B23K 25/00

U.S. Cl. 219—73 R **3 Claims**



1. A method of welding corner joints by means of a multiple electrode submerged-arc welding, comprising forming a shallow groove between a steel flange plate and a steel web plate, each having a thickness on the order of at most 5.0 cm, covering said groove with a bed of flux, and feeding at least two electrodes separated from each other along said groove in succession and submerged under said flux, said welding being effected under the following three conditions:

1. The distance between the first and second electrodes is 30 to 80 mm,

2. The current flowing through the second electrode is 60 to 85% of the current flowing through the first electrode, and

3. The welding input heat H is given by

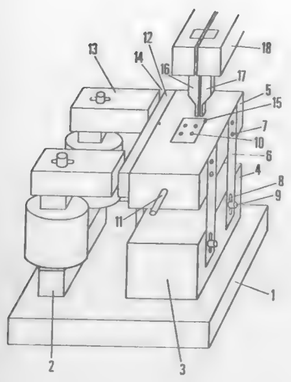
$$H \leqq 24\ d.t \text{ Kjoules/cm}$$

where t is a thickness of said steel flange plate in cm and d is a required penetration depth in cm, whereby a weld bead is completed by a single pass of welding.

4,041,271
MACHINE FOR WELDING SOLAR CELL CONNECTIONS

Dominique Y. Lorans, Paris, France, assignor to Societe Anonyme de Telecommunications, Paris Cedex, France

Filed Jan. 26, 1976, Ser. No. 652,247
Claims priority, application France, Jan. 10, 1975, 75.03126
Int. Cl.[2] B23K *11/10*
U.S. Cl. 219—86 **2 Claims**



1. A welding machine for welding a connection to a silvered surface of a silicon wafer solar cell comprising:

a base;

a welding mount rigidly secured to said base having an indexed upper surface for positioning the solar cell along a reference line serving as the index line;

an electrical connection on said upper surface for energizing said solar cell at its silvered surface;

holding means on said welding mount for holding said solar cell in place on said upper surface;

at least one welding electrode over said upper surface;

means to lower said welding electrode to make pressuring contact with said electrical connection and said solar cell;

trigger pulse means to apply electric current pulses to said electrode cell and electrical connection means for a preselected time period and at preselected pressures;

the upper surface of said welding mount being in an upper part of said mount which is fastened to the lower part of said mount by a spring means;

an electromagnetic means to impart to the upper part of said welding mount on alternating movement on transverse to said reference line, said alternating transverse movement being of predetermined frequency and predetermined amplitude;

said electromagnetic means comprising an electromagnet fastened to said base, positioned next to said welding mount and including a gap between said electromagnet and said mount;

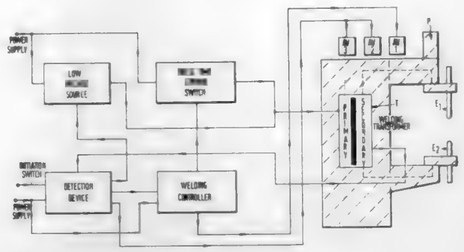
said spring means between the upper and lower parts of said mount below said silicon wafer responding to the vibrations imparted by said electromagnetic means through said gap; and,

adjustable wafer holding means formed as flat springs with oval holes and fastening means attached thereto for holding said silicon wafer solar cell.

4,041,272
RESISTANCE WELDING APPARATUS AFFORDING OPERATOR PROTECTION

Peter Edward Burton, Wallingford; Derek James Pasquire, Witney, and Peter Edward George Marshall, Haddenham, all of England, assignors to British Leyland UK Limited, London, England

Filed Sept. 26, 1975, Ser. No. 617,085
Int. Cl.[2] B23K *11/24*
U.S. Cl. 219—89 **5 Claims**



1. Resistance welding apparatus comprising:

first and second welding electrodes,

a power-operated welding head operatively connected to said first electrode to move said first electrode from a first position remote from said second electrode to a second position in electrical contact therewith, and adapted to operate in either a low-force non-welding or a high-force welding mode,

a welding transformer having a secondary winding short-circuited across the welding electrodes when said electrodes are in electrical contact, and

electrically actuated operator protection means comprising:

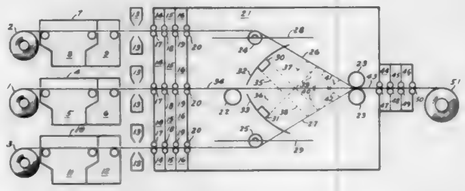
a. means for inducing a low voltage in said secondary winding, and

b. control means responsive to the change in the induced low voltage which results from a short circuit of said secondary winding through the welding electrode and connected to switch the welding head from its non-welding low-force to its high-force welding mode when a short-circuit occurs.

4,041,273
METHOD FOR VACUUM METAL CLADDING

Herbert H. Francisco; Anthony P. Martocci, and Sydney B. Beitel, all of Bethlehem, Pa., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 21, 1975, Ser. No. 624,492
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 EM **10 Claims**



1. A method for vacuum cladding a first metal strip with a second strip of a different metal, comprising:

a. providing the adjacent surfaces of the metal strips with a surface finish of less than 25 microinch R.M.S.,

b. introducing the metal strips into a vacuum chamber,

c. maintaining a pressure in the vacuum chamber not higher than 1×10^{-3} Torr,

d. impinging the adjacent surfaces of the strips in the vacuum chamber with a stream of electrons having sufficient force to provide strips heated to below the temperature of incipient fusion and with very clean, adjacent surfaces, and

e. placing the very clean, adjacent surfaces of the heated strips into contiguous contact between at least one pair of rolls operating in the vacuum to bond the first metal strip with the second metal strip and produce a strip of clad metal.

4,041,274
MARAGING STAINLESS STEEL WELDING ELECTRODE

Edward Peter Sadowski, Ringwood, N.J., assignor to The International Nickel Company, Inc., New York, N.Y.

Division of Ser. No. 487,780, July 11, 1974, Pat. No. 3,967,036.
This application Mar. 5, 1976, Ser. No. 664,402
Int. Cl.[2] B32B *9/00, 15/18*
U.S. Cl. 219—137 WM **6 Claims**

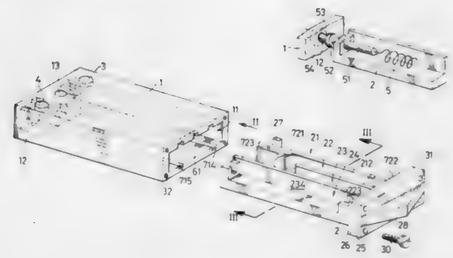
1. A maraging stainless steel article having a structural configuration adapted for use as an arc welding electrode and having a chemical composition consisting essentially of up to 0.05% carbon, 6.5% to 8% nickel, 9.5% to 11.5% chromium, 0.5% to 0.9% silicon, up to 1% molybdenum, up to 0.1% manganese, up to 0.1% aluminum, up to 0.1% titanium, up to 0.01% sulfur, up to 0.015% phosphorus and the balance iron.

3. In a welding process wherein a welding metal is fused by heat of an electric arc and is deposited on a base metal while shielding the welding metal against atmospheric oxidation, the improvement comprising providing as the welding metal a maraging stainless steel consisting essentially of up to 0.05% carbon, 6.5% to 8% nickel, 9.5% to 11.5% chromium, 0.5% to 0.9% silicon, up to 1% molybdenum, up to 0.1% manganese, up to 0.1% aluminum, up to 0.1% titanium, up to 0.01% sulfur, up to 0.015% phosphorus and the balance iron.

4,041,275
ELECTRICAL HEATING ELEMENT

Claus-Holmer Gerdes, Pirolweg 1, 314 Luneburg, Germany

Filed Apr. 28, 1975, Ser. No. 572,089
Claims priority, application Germany, Mar. 25, 1975, 2513094
Int. Cl.[2] F24H *1/10*
U.S. Cl. 219—307 **10 Claims**

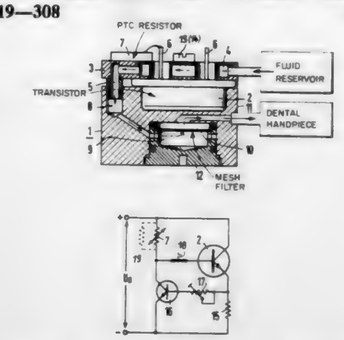


1. An electrical heating element for heating liquid flowing therethrough, comprising: an electrically insulated housing having an inlet, an an outlet, and liquid conducting duct means between said inlet and said outlet for the liquid to be heated; electrical heating coils within said duct means; said housing having an inner part and an outer sleeve part detachably and telescopically receiving with a snug sliding fit said inner part; said inner part having a continuous channel with return bend and adjacent channel portions, with partition walls between adjacent channel portions, and with said channel being open on one side over its entire length; when telescopically assembled, said outer sleeve part closing the open side of said channel to thereby form between said outer sleeve part and said inner part said duct means; sealing means between said inner part and said outer sleeve part for sealing the interior of said housing containing therein said duct means except for said inlet and said outlet; said outer sleeve part and said partition walls having form interlocking sealing means telescopically assembled with a close sliding fit between adjacent channel portions.

4,041,276
ELECTRIC FLUID HEATING DEVICE

Werner Schwarz; Eugen Hohmann, both of Heppenheim, and Bernd Nickel, Bensheim, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 6, 1973, Ser. No. 413,268
Claims priority, application Germany, Nov. 14, 1972, 2255736
Int. Cl.[2] H05B *1/02;* **F24H** *1/12;* **A61F** *7/00*
U.S. Cl. 219—308 **3 Claims**



1. An electrical heating device in dental instruments for heating small amounts of a fluid medium, said device comprising a casing consisting of a material with a good thermal conductivity and having an inlet, an outlet and an inner chamber connected with said inlet and said outlet, said chamber being adapted to receive the fluid medium to be heated, a heating element consisting of a controllable semi-conductor, means having a temperature responsive operating member mounted in thermal contact with said casing, said semi-conductor comprising a load output for current flow therethrough when connected to a source of voltage and a control input, and connecting means electrically connecting said control input with said temperature responsive operating member for controlling said current flow, wherein said casing consists of two parts located one on top of the other, the first part of the casing having a recess receiving said semi-conductor, the second part of the casing containing said inner chamber and supporting said operating member determining the temperature of the medium, said semi-conductor having casing surfaces and having upon a casing surface electrical contacting connections extending through the second part of the casing while being insulated therefrom and electrically connected with said semiconductor, said second part of the casing being thermally connected with said casing surface.

4,041,277
PORTABLE TRAY WARMING UNIT

George Shumrak, Natick, and Anthony Mack, North Reading, both of Mass., assignors to Sweetheart Plastics, Inc., Wilmington, Mass.

Filed June 18, 1976, Ser. No. 697,356
Int. Cl.[2] F27D *11/02*
U.S. Cl. 219—386 **9 Claims**

1. A portable tray warming unit comprising

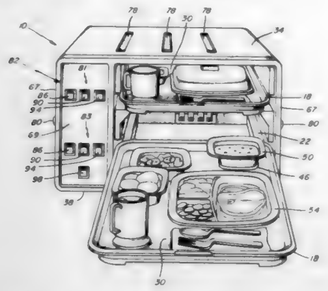
a casing having at least one tray supporting rack, said casing being of dimensions such that it is convenient for lifting and carrying by a single user,

said casing having an opening for providing access to said rack,

terminal means connected to said casing for receiving energy from an energy source external to said unit,

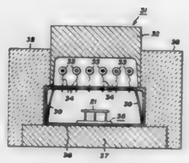
at least one tray constructed and arranged to be removably

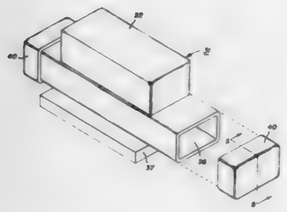
supported on the rack and having a supporting surface which receives food receptacles,
said tray having at least one localized heat transfer device in said surface,
said surface of said tray having a substantial portion free of said heat transfer devices,
electrical connecting means for supplying energy from said terminal in the casing to the heat transfer device in the surface of said tray to energize said device when the tray is in place on said rack in the casing,



at least one food receptacle, for removable placement on said surface of said tray, constructed and arranged to be in a heat exchanging relationship with said localized heat transfer device in said tray so as to transmit heat between the device and food contained in said food receptacle,
an upper surface of said casing being capable of supporting the lower surface of an identical tray warming unit and each upper and lower surface carrying complementary means for registration and interlocking with other like tray warming units,
said terminal means including means for electrically connecting said unit to a low voltage outside source.

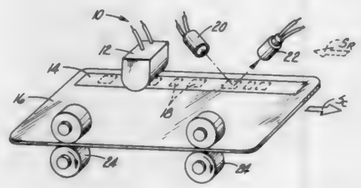
4,041,278
HEATING APPARATUS FOR TEMPERATURE GRADIENT ZONE MELTING
John K. Boah, Auburn, N.Y., assignor to General Electric Company, Auburn, N.Y.
Filed May 19, 1975, Ser. No. 578,736
Int. Cl.[2] H05B *3/02;* **F27D** *11/02;* **H01L** *21/324;* **F27D** *5/00*
U.S. Cl. 219—411 **10 Claims**





1. Apparatus for practicing temperature gradient zone melting comprising:
a tubular quartz glass member defining a work chamber for receiving a body of semiconductor material to be processed, said tubular member having top, bottom and side walls;
an infrared radiation source optically coupled to the interior of said chamber through said top wall of said tubular member for irradiating the body of semiconductor material with radiation which is widely dispersed so as to evenly illuminate a substantial portion of said work chamber, said radiation source comprising a plurality of generally parallel elongated infrared lamps in a planar array;
a semiconductor support means in said chamber and carried by the bottom wall of said tubular member for supporting the semiconductor body with one surface thereof facing and generally parallel to said planar array, said support means making only minimal thermal contact with a surface of the semiconductor body opposite said one surface; and
a metallic cooling block in direct heat conductive engagement with the exterior of the bottom wall of said tubular member.

4,041,279
DATA READING DEVICE
Francis C. Foote, Rocky River, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio
Filed Aug. 4, 1975, Ser. No. 601,541
Int. Cl.[2] G06K *5/00, 7/08, 7/10*
U.S. Cl. 235—61.7 B **11 Claims**

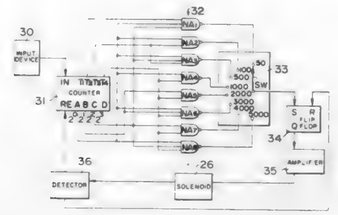


1. A device for reading documents containing optical data elements and magnetic data elements separate from said optical data elements and with fixed spacial relationships between said optical and magnetic data elements, said device comprising:
magnetic read means for sensing magnetic data elements from a document and providing first signals representative thereof,
optical read means for sensing said optical data elements from the document and providing second signals representative thereof, and
means associated with said magnetic and optical read means for establishing a predetermined reference between said first and second signals whereby the presence or absence of the spacial relationship between the optical and magnetic data elements may be determined.

4,041,280
MONEY COUNTING MACHINE
Kyoichi Ohsako, Kita, and Katusuke Yamashita, Matsudo, both of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan
Filed Feb. 13, 1976, Ser. No. 658,086
Claims priority, application Japan, Feb. 17, 1975, 50-19592
Int. Cl.[2] G06M *3/02;* **G07D** *9/00*
U.S. Cl. 235—92 CN **4 Claims**

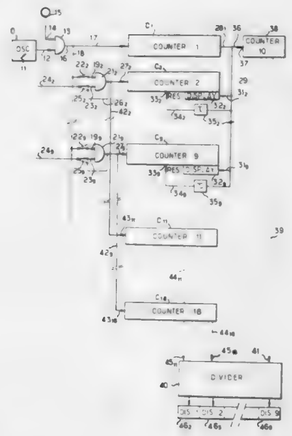
1. A coin mounting machine comprising detecting means for counting coins and for providing coin count signals corresponding to counted number of coins, a plural-digit counter including a plurality of digit select terminals from which clock pulses are sequentially delivered in regular time intervals and a plurality of bit signal terminals, said counter being connected with the detecting means to receive the coin count signals therefrom and produce bit signals in at least one of said bit signal terminals representative of counted number of coins and corresponding to the digit which is represented by one of the clock pulses of the digit select terminals from which the clock

pulse is being delivered, means connected with said digit selecting terminals and said bit signal terminals to receive signals therefrom for producing an output signal pulse when a predetermined number of coins have been counted, and memory



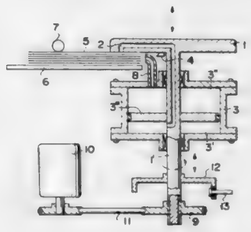
circuit means for memorizing the output signal pulse to produce a stop signal for terminating counting operation of said counting means, said memory circuit means being connected to receive said output signal pulse when a predetermined number of coins have been counted.

4,041,281
APPARATUS FOR THE ANALYSIS OF THE OPERATION OF A SYSTEM USING BINARY SIGNALS
Bruno Gaudeul, Versailles, France, assignor to Iria Institut de Recherche D'Informatique et D'Automatique, Le Chesnay, France
Filed May 18, 1976, Ser. No. 687,605
Claims priority, application France, May 23, 1975, 75.16194
Int. Cl.[2] G07C *3/10*
U.S. Cl. 235—92 PD **5 Claims**



1. An apparatus for the analysis of the operation of components using binary signals, such as computer components, comprising:
an oscillator constituting an adjustable time basis, and provided with an output;
a plurality of probes activated by the operation of said components;
a plurality of counters provided with reset inputs, each counter being associated with a respective one of said probes;
a displaying means connected to each counter;
logical connection means between each counter and, on the one hand, the associated probe and on the other hand the output of the oscillator;
activating means controlling said connection means such that each counter can count either the number of state changes of the oscillator during the activation periods of the associated probe, or the number of the activations of said probe; and
a driving counter having an input and an output, said input being connected to the output of said oscillator and said output being connected to the reset input of each counter, in order for the probe-associated counters to be reset each time the count in the driving counter is completed, and to the displaying means.

4,041,282
LEAVES COUNTING MACHINE
Isamu Uchida, Chigasaki; Eiichi Kokubo, Urawa, and Minoru Yoshida, Tokyo, all of Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan
Filed Jan. 27, 1976, Ser. No. 652,889
Claims priority, application Japan, Jan. 29, 1975, 50-12218
Int. Cl.[2] B61L *1/16*
U.S. Cl. 235—98 R **2 Claims**



1. A sheet separator machine comprising a shaft, a rotary disc fixed to the upper end of said shaft and having a suction hole and a leaf scraping-up piece, a pump positioned below said rotary disc and having a piston fixed to said shaft to define upper and lower pump chambers therein, said upper chamber communicating with said suction hole, means for rotating said shaft and its rotary disc and means for vertically reciprocating said shaft and the rotary disc during their rotation, upon upward movement of said piston by said shaft suction being produced through said suction hole due to reduction in pressure in said lower chamber of said pump.

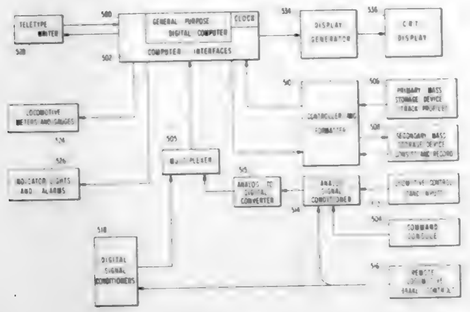
4,041,283
RAILWAY TRAIN CONTROL SIMULATOR AND METHOD
John E. Mosier, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.
Continuation-in-part of Ser. No. 599,043, July 25, 1975, which is a continuation of Ser. No. 436,700, Jan. 25, 1974, abandoned. This application Aug. 31, 1976, Ser. No. 719,331
Int. Cl.[2] G05B *17/00;* **G05D** *1/00*
U.S. Cl. 235—150.2 **20 Claims**

1. A method for simulating operation and control of a railway train having at least one manually operated locomotive in a locomotive set and a plurality of cars, each car of the plurality of cars having a coupler transmitting a coupling force between it and that portion of the train which precedes it in the train, comprising the steps of:
a. providing a simulator control station including a train speed control throttle and a train braking controller each providing a signal related to the degree of operation thereof by a simulator control station operator;
b. providing data related to track profile, train consist, and the location of the train on the track for a predetermined

train and for a predetermined section of track over which the operation of the train is to be simulated;

c. providing data related to locomotive tractive effort and train braking in response to the signals from the control throttle and the train braking controller;

d. calculating from the provided data the coupling forces



between each of a plurality of adjacent cars in the train; and

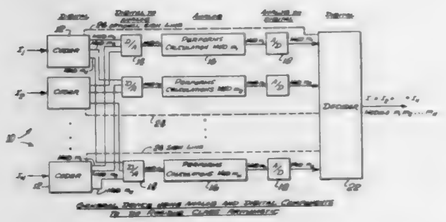
e. displaying to the simulator control station operator each of a plurality of the calculated coupling forces relative to the position in the train of the cars for which the calculations were made whereby operation and control of the railway train is simulated.

4,041,284

SIGNAL PROCESSING DEVICES USING RESIDUE CLASS ARITHMETIC

James W. Bond, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 7, 1976, Ser. No. 720,915
Int. Cl.² G06J *1/00*
U.S. Cl. 235—150.5 **8 Claims**



1. Apparatus for performing arithmetical calculations on a plurality, N, of digital input signals, utilizing residue class arithmetic, comprising:

a plurality N of means for coding the N input digital signals into digital modulo m_i integers, $K \leqq i \geqq 1$;

a plurality N of means, each means having an input connected to each coding means, for converting the digital modulo m_i integers into corresponding analog modulo m_i signals;

a plurality N of means for performing a mathematical operation on analog modulo m_i integers, each means having an input connected to a D/A converting means;

a plurality N of means, connected to the N operation means, for converting the analog modulo m_i integers from the operation means into digital modulo m_i integers; and

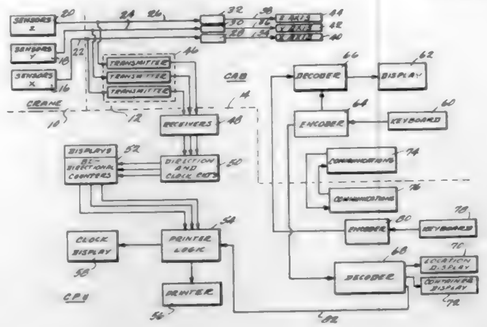
means, connected to the N A/D converting means, for decoding the digital modulo m_i numbers into digital outputs.

4,041,285

BI-DIRECTIONAL MOTION SENSING AND CLOCKING SYSTEM

Jerome E. Shidel, Mill Run, and Harry R. Sampey, Vanderbilt, both of Pa., assignors to Pentron Industries, Inc., Cleveland, Ohio

Filed Apr. 12, 1976, Ser. No. 675,750
Int. Cl.² G01S *11/00*; G06F *15/20*
U.S. Cl. 235—150.27 **20 Claims**



1. An electrical bi-directional motion sensing and clocking system for identifying the relative sense and magnitude of movement experienced by a moving body, said system comprising:

a sensor mounting means,

target means mounted for relative motion with respect to said sensor mounting means in a direction and in a magnitude corresponding to the relative direction and magnitude of movements experienced by said moving body,

a first sensor mounted on said sensor mounting means in proximity to the path of said target means and producing a first input signal in response to the passage of said target means thereby,

a second sensor also mounted on said sensor mounting means in proximity to the path of said target means and producing a second input signal in response to the passage of said target means thereby,

said first and second sensors being located relative to one another such that said first and second input signals each occur once in a first sequence for a predetermined increment of movement in a first direction by said moving body and once in a second reverse sequence for a predetermined increment of movement by the body in a second direction opposite to said first direction,

first recording means connected to said first sensor for recording the occurrence of said first input signal,

second recording means connected to said second sensor for recording the occurrence of said second input signal,

output gate means connected to said first and second recording means for producing a clock output signal upon the recorded occurrence of both said first and second input signals,

clearing means connected to said first and second recording means and to said output gate means for clearing the recorded contents of the first and second recording means upon the production of said clock output signal thereby preparing for similar processing of the next succeeding pair of first and second input signals, and

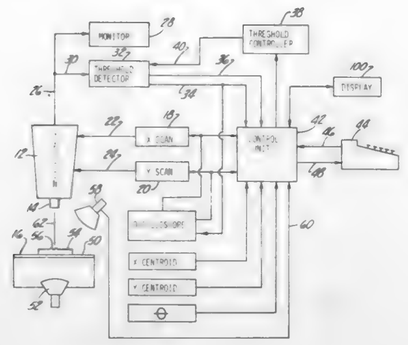
sequence recording means connected to detect whether the first input signal or the second input signal last occurred just prior to the production of said clock output signal and to provide a respectively corresponding sequence output signal representing the input signal sequence and hence direction of body movement to be associated with the increment of body movement represented by said clock output signal.

4,041,286

METHOD AND APPARATUS FOR DETECTING CHARACTERISTIC FEATURES OF SURFACES

Norman R. Sanford, Piqua, Ohio, assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 20, 1975, Ser. No. 633,940
Int. Cl.² G06F *15/20*; H04N *7/02*
U.S. Cl. 235—151.3 **9 Claims**



9. A method of identifying a face of a test object relative to faces of comparison objects, the steps of the method comprising:

identifying individually a plurality of faces of comparison objects by illuminating a face in at least two directions to create a comparison image; producing a comparison signal representative of the relative amount of white and black at two different gray-level thresholds for each face; and storing the comparison signal as representative of the face;

illuminating the test object in at least two directions to create a test image of the test object;

generating a signature signal indicative of the relative amounts of white and black in the test image at corresponding to two different gray-level thresholds; and

comparing the signature signal generated with at least one of the stored comparison signals to identify the test object with respect to the faces of the comparison objects, whereby the face of the test object may be identified as corresponding to one of the faces of the comparison objects.

4,041,287

FINAL SERVO CONTROL IN NC SYSTEMS

Norbert C. Kolell, and John P. Conners, both of Fond du Lac, Wis., assignors to Giddings & Lewis, Inc., Fond du Lac, Wis.

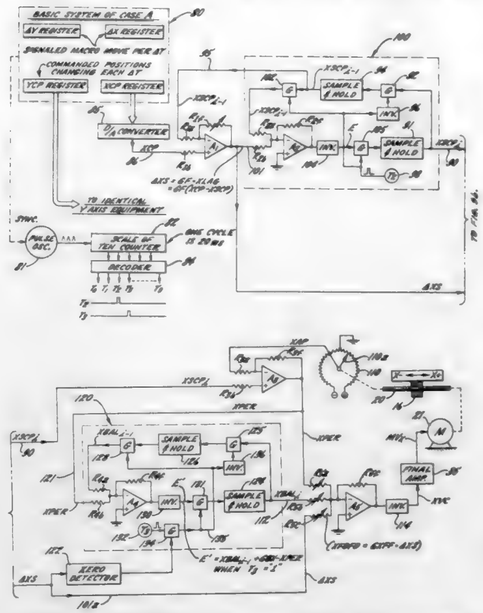
Filed Sept. 8, 1976, Ser. No. 721,404
Int. Cl.² G06F *15/46*
U.S. Cl. 235—151.11 **24 Claims**

1. In a method of controlling the velocity and position of a member movable along an axis wherein a primary position command signal (XCP) is changed by incremental amounts ΔX during each of successive time periods, the improvement which comprises:

a. producing a secondary position command signal,

b. changing said secondary command signal at a rate which is proportional to the difference between the primary and secondary command signals, and

c. utilizing said secondary command signal (XSCP) to excite servo power means to keep the actual position of said



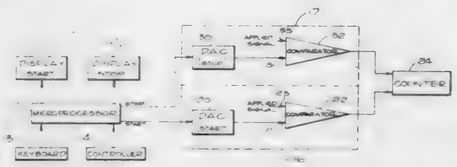
member substantially in agreement with the position represented by said secondary command signal.

4,041,288

VOLTAGE LEVEL DISPLAY CIRCUIT

Arch W. Conway, Mission Viego, and Nelson Urdaneta, La Verne, both of Calif., assignors to Dana Laboratories, Inc., Irvine, Calif.

Filed Sept. 15, 1976, Ser. No. 723,405
Int. Cl.² G01R *13/00*
U.S. Cl. 235—151.31 **10 Claims**



1. In an instrument for measuring the voltage-time characteristic of an applied signal having a magnitude which varies as a function of time, to produce a transition in output state at each instant of time at which the magnitude of the applied signal exceeds the magnitude of a fixed, level setting voltage, the combination comprising:

a. means responsive to an input command to select the magnitude at which the level setting voltage is to produced;

b. a controller coupled to said means and responsive to the magnitude selected for the level setting voltage, said controller producing a digital signal representing the level setting voltage;

c. converter means coupled to said controller and responsive to the digital signal for converting said digital signal to an analog voltage;

d. display means coupled to said controller and responsive to the digital signal representing the level setting voltage for displaying its numeric value; and

e. comparator means having a first input coupled to the output of said converter means for receiving said level

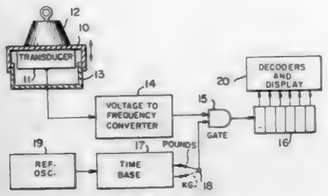
setting voltage and a second input coupled to receive said applied signal, whereby said comparator means produces a transition in output state at the point of time at which the magnitude of the applied signal passes the magnitude of the level setting voltage.

4,041,289

DIGITAL SCALE OR WEIGHING APPARATUS

Amnon Brosh, Montvale, N.J., and Dana F. Geiger, New York, N.Y., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Nov. 12, 1975, Ser. No. 631,383
Int. Cl.² G01G *9/00*
U.S. Cl. 235—151.33 **10 Claims**



1. An electronic digital weighing apparatus having a weighing platform to accommodate an object to be weighed, comprising:

a. transducer means coupled to said platform and responsive to the weight of said object to provide an analog signal indicative of said weight,

b. a voltage to frequency converter coupled to said transducer means and operative to provide an output frequency linearly related to said analog signal,

c. logic means coupled to said converter for providing a timing signal having a duration selected in accordance with said output frequency to enable a number of pulses indicative of the weight of said object to be transmitted during said duration of said timing signal, wherein the number of pulses transmitted is a direct indication of the weight of said object,

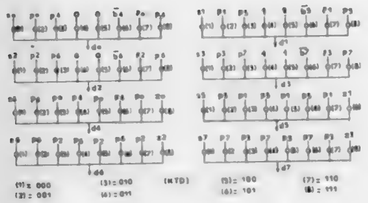
d. utilization means coupled to said logic means and responsive to said number of said pulses as transmitted to display a number manifesting said weight.

4,041,290

MICROPROGRAM CONTROLLED BINARY DECIMAL CODED BYTE OPERATOR DEVICE

Jean-Louis Fressineau, Les Clayes-Sous-Bois, and Maurice Hubert, Versailles, both of France, assignors to Compagnie Internationale pour l'Informatique, Louveciennes, France

Filed Jan. 6, 1975, Ser. No. 539,034
Claims priority, application France, Jan. 7, 1974, 74.00463
Int. Cl.² G06F *7/38*
U.S. Cl. 235—156 **10 Claims**



1. A microprogram controlled byte operator device for processing strings of bytes wherein each byte has the same number of binary bit quartets comprising in combination:

a byte arithmetical and logical operator circuit having first and second byte inputs and a byte output;

a multi-byte register means connected to the output of said operator circuit;

first and second addressable byte stores, each capable of storing a plurality of bytes and having a byte write-in input and a byte readout output, the byte readout outputs of said first and second stores being respectively connected to said first and second byte inputs of said arithmetical and logical operator circuit; input means adapted to sequentially receive the bytes of the strings of bytes;

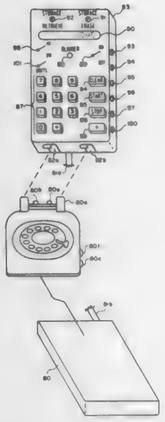
a plural input multiplexer circuit having a plurality of byte inputs and a plurality of quartet inputs and having an output connected to the byte write-in inputs of said first and second addressable byte stores, one of said byte inputs being connected to a byte output of said multi-byte register means and of said input means.

4,041,291

DOLLARS AND CENTS TELEPHONE METERING COMPUTER

Philip D. Pavda, 12 Prospect Ave., Voorhees, N.J. 08043

Filed Dec. 19, 1975, Ser. No. 646,769
Int. Cl.² G06F *15/20*
U.S. Cl. 235—156 **3 Claims**



1. An electronic solid state telephone toll call calculator of a size capable of being hand-held or affixed to a telephone by a snap-on arrangement, said calculator comprising:

a display for displaying and noting the running telephone toll cost plus tax in dollars and cents;

a keyboard having ten numerically marked pushbutton keys for entering the numerals 0–9 and four pushbar keys labeled "clear", "start", "stop" and "+";

a calculator chip for computing the running cost of long distance telephone calls and connected to said display;

a calculator memory for storing the values computed by the calculator chip; elapsed minute timer logic means responsive to actuation of the start key for measuring the duration of a long distance telephone call in minute intervals and generating a timing signal at the end of each interval;

cost count logic means responsive to said timing signals for generating a cost signal representative of the cost for each interval measured by the elapsed minute timer logic means;

opto-driver switching and isolator for calculator programming means responsive to said cost signals for enabling the calculator chip to add the cost represented by each cost signal to the running cost stored in the calculator memory;

tax logic means responsive to actuation of the stop key for directing the calculator chip to compute the tax on the telephone call and add it to the running cost stored in the memory;

means responsive to actuation of said clear key for clearing all circuits within the elapsed minute timer logic means, the calculator chip and the tax logic means;

a blinker light for blinking on and off during telephone conversations to indicate that the calculator circuits are functioning;

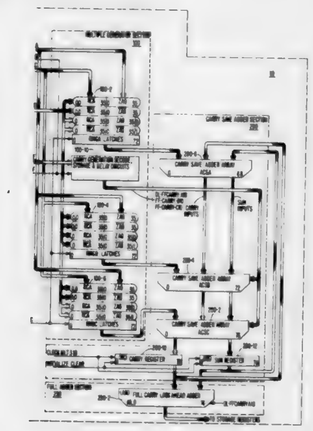
means for retrieving the running cost stored in said memory and displaying the same in response to actuation of a storage retrieve button or key switch on said keyboard; and means for erasing the value stored in said memory in response to actuation of a storage erase button or key switch located on said keyboard.

4,041,292

HIGH SPEED BINARY MULTIPLICATION SYSTEM EMPLOYING A PLURALITY OF MULTIPLE GENERATOR CIRCUITS

Jerry L. Kindell, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 22, 1975, Ser. No. 642,844
Int. Cl.² G06F *7/52*
U.S. Cl. 235—164 **25 Claims**



1. A high speed multiplication system for performing a multiplication operation upon received signals corresponding to a multiplier and multiplicand, said system comprising:

a plurality of multiple generator means for producing different multiples of said multiplicand, each of said plurality of multiple generator means being connected to receive a different group of said signals of said multiplier and said signals of said multiplicand and each including register means for storing signals representative of at least one multiple generated in response to said different group of multiplier signals and said multiplicand signals;

a corresponding number of series connected levels of carry save adder means for generating sum and carry signals, each of said levels of carry save adder means being connected to a different one of said multiple generator circuits for summing with sum and carry signals from another one of said number of levels of carry save adder means the sets of multiple signals produced by said generator means to generate sum and carry signals, a last one of said levels of adder circuits being connected to apply said sum and carry signals to a first one of said levels of adder means; and,

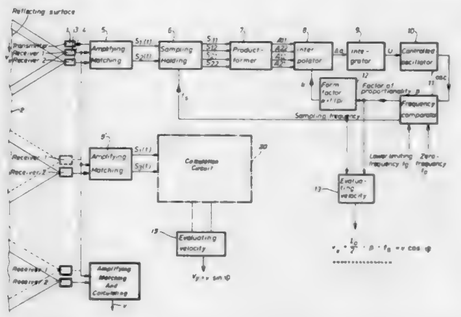
timing control means for generating clock signals defining cycles of operation when said sets of multiple signals produced by said generator circuits are simultaneously applied to each of said levels, said timing control means including circuit means coupled to said plurality of multiple generating means, said circuit means generating said clock signals for enabling each of said multiple generator means to overlap the generation of said sets of multiple signals with the summing of sets of multiple signals produced during previous cycles thereby minimizing the number of cycles for performing said multiplication operation.

4,041,293

METHOD OF MEASURING THE VELOCITY OF AN OBJECT RELATIVE TO A REFERENCE AND A DEVICE FOR EFFECTING SAID METHOD

Gunnar Axel Kihlberg, Sollentuna, Sweden, assignor to Jungner Instrument AB, Solna, Sweden

Filed Sept. 23, 1975, Ser. No. 615,932
Claims priority, application Sweden, Sept. 25, 1974, 7412075
Int. Cl.² G01P *3/42*; G06G *7/19*
U.S. Cl. 235—151.32 **10 Claims**



5. Apparatus for measuring the velocity (v) of an object relative to a reference, comprising:

at least one transmitter at said object for transmitting a signal to a reference;

at least two receivers and associated aerials at said object for receiving the signals by said reference, said receivers being attached to said object at a given geometric distance (l_o) from each other in the measuring direction, said signals being transmitted by said transmitter within a lobe area that is substantially common to the at least two receiving aerials which are coupled to said receivers;

means coupled to said transmitter and receivers for transforming the signals transmitted by said object and those reflected by said reference and received by said object into similar signals but with a time shift (τ_o) between them, the size of said time shift (τ_o) being a function of said geometric distance (l_o) between said receivers and on the velocity (v) of the object relative to said reference in accordance with the relation $l_o = v \cdot \tau_o$ the resultant signals generated by said transforming means being stochastic functions of signals reflected by said reference with respect to the geometric displacement of said object relative to said reference;

correlation means coupled to said transforming means for generating signals (A_{11}, A_{22} and A_{12}, A_{21}) corresponding to the auto- and cross-correlations of the signals received by said receivers, said correlation signals being a function of the geometry of the transmitter-receiver system and of the signal processing and being substantially independent of the reflection properties of said reference, said auto- and cross-correlations of the signals having substantially identical shape yet with a displacement (l_o) of the cross-correlation signals (A_{12}, A_{21}) relative to the auto-correlation signals (A_{11}, A_{22}), one of the cross-correlation signals

being displaced in the positive direction of measurement, and the other signal in the negative direction of measurement;

means coupled to said correlation means for measuring the ratio of the auto- and cross-correlations for a certain time shift (τ, where $\tau<\tau$) of the two signals received by said receivers;

means coupled to said ratio measuring means for interpolating a geometric displacement (l, where $-l_o < l < +l_o$) corresponding to said time shift; and

means coupled to said interpolation means for measuring the velocity (v) of said object relative to said reference in accordance with the relation $v = l/\tau$.

4,041,294

AUTOMATIC ASSEMBLY CONTROL METHOD AND APPARATUS THEREFORE

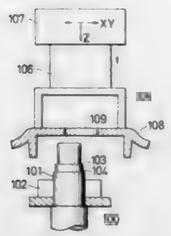
Tadao Inoyama, Yokohama; Tatsuo Goto, Tokyo; Kiyoo Takeyasu, Tokorozawa; Hiroshi Ishimura, Narashino, and Junichi Suzuki, Ichikawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 2, 1975, Ser. No. 636,835

Claims priority, application Japan, Dec. 4, 1974, 49-138393

Int. Cl.[2] B23Q *17/00*

U.S. Cl. 235—151.11 **12 Claims**



1. An automatic assembly control apparatus for assembling together first and second members comprising:

first means for holding one of said first and second members;

second means for driving a drive shaft along the respective axes of a selected, coordinate system;

third means for elastically coupling said first means to said drive shaft;

fourth means, responsive to the displacement of said third means, relative to said first means, for generating a signal representative thereof;

fifth means for selecting a predetermined signal of said signals generated from said fourth means;

sixth means for controlling said second and fifth means, which includes a memory means and an address counter means, said memory means storing predetermined assembly steps for assembling said first and second members, said address counter means being coupled to said memory means and so constructed that the contents of said address counter means are changed in response to the output from said fifth means, said fifth means selecting the predetermined signal in response to an output of said sixth means.

4,041,295

ELECTRONIC TIMEPIECE CALCULATOR

Kazuo Ido, and Mitsuaki Maruyama, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 7, 1974, Ser. No. 522,085

Claims priority, application Japan, Nov. 7, 1973, 48-125182

Int. Cl.[2] G06F *7/48, 15/02;* **G04B** *19/30*

U.S. Cl. 235—156 **9 Claims**

1. A calculator input circuit particularly suited for use in an electronic digital display wristwatch having timekeeping circuitry and calculator circuitry, the improvement comprising a plurality of input means each said input means being adapted to supply to said calculator circuitry data signals representative of numerical information and operating functions, said operating functions effecting processing in said calculator circuitry of said numerical information supplied by said data signals; means for indexing through said plurality of input means to select a



plurality of at least one of said numerical information and operating functions; and manually operable switch means for selectively applying a selected number or function to said calculator means when said selected number or function is indexed by said indexing means.

4,041,296

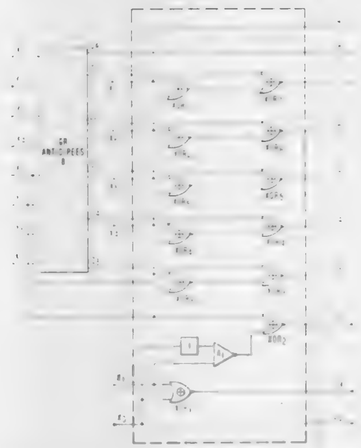
HIGH-SPEED DIGITAL MULTIPLY-BY-THREE-DEVICE

Alain Dauby; Vladimir Riso, both of Nice, and Daniel Roger-Rodés, Antibes, all of France, assignors to International Business Machines Incorp., Armonk, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,359

Int. Cl.[2] G06F *7/52*

U.S. Cl. 235—164 **3 Claims**



1. Apparatus for generating a three times multiple of a binary number X having orders X_0, X_1, X_2, X_3, X_4 . . et sequence comprising, in combination,

a. a multi-order sum generator which receives as one input signals representative of the orders of said X number X_0, X_1, X_2, X_3, . . . et sequence in corresonding orders of said sum generator to obtain in effect an entry of one times said X number into said sum generator;

b. circuit routing means arranged in said sum generator for inputting the signals representative of each order X_0, X_1, X_2, X_3 . . . et sequence of said X number also to the succeeding higher order of said sum generator to obtain in effect an entry of two times said X number into said sum generator;

c. a multi-order carry circuit for generating the carry bit for each stage of order $k+1$ of said sum generator by means of logic circuits providing

$$C_{k+1}=X_kX_{k-1}+(X_{k-1}X_{k-2}+\ldots+X_{k-1}X_{k-3}X_{k-5}\ldots X_1)+(X_kX_{k-2}X_{k-3}+\ldots+X_kX_{k-2}X_{k-4}\ldots X_0)$$

where k is any integer n taking on a value from two et sequence, said orders X_0, X_1, X_2, X_3, X_4, . . . et sequence of said input number X also being applied to said carry generator, and wherein for said binary number X a carry signal bit is generated for each order starting at order three et sequence;

d. a separate carry generating means included within said sum generator and responsive also to the second order of said X value and the first order of said routed X-Valve to separately generate a carry digit for entry to the third order of said sum generator;

e. and means applying each carry signal generated by said multi-order carry circuit as an input to the related order of said sum generator, and any carry signal generated by said separate carry generator for input to said third order of the sum generator, said inputs of said one times said X-value, two times said X-value and the carry signals generating on multi-order outputs of said sum generator, a three times multiple of said binary number X.

4,041,297

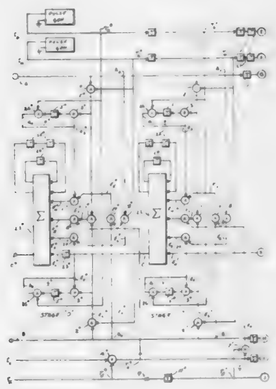
REAL-TIME MULTIPLIER WITH SELECTABLE NUMBER OF PRODUCT DIGITS

Harold V. Jesse, 11 Granite St., Cambridge, Mass. 02139

Continuation of Ser. No. 530,225, Dec. 6, 1974, abandoned, which is a continuation of Ser. No. 380,991, July 19, 1973, abandoned, which is a continuation of Ser. No. 174,897, Aug. 24, 1971, abandoned. This application Sept. 17, 1975, Ser. No. 614,143

Int. Cl.[2] G06F *7/52*

U.S. Cl. 235—164 **5 Claims**



1. A real time multiplier for multiplying digital serial operand electrical signals representing a multiplicand, $a_0a_1 \cdots a_{n-1}$ and a multiplier $b_0b_1 \cdots b_{n-1}$ to provide a product $c_kc_{k+1} \cdots c_{2n-1}$, wherein $0 \leqq k \leqq 2n-1$ comprising

a plurality of serially connected multiplier stages,

a first, second, third, fourth, fifth and sixth electrically conducting lines,

means for simultaneously applying each of the multiplicand and multiplier signals serially at a fixed rate in time coincidence to the input terminals of said first and second lines, respectively, with the signals corresponding to the least significant digit a_o, b_o, being applied first,

a plurality of delay elements each having a delay of one digit-time-duration,

said first and second lines being connected to corresponding inputs of each multiplier stage, said first and second lines having a delay element in each line between alternate mutiplier stages, the first delay element being in said first and second lines between the connections to the inputs of the second multiplier stage **1** and the third multiplier stage **2**,

means for applying a first gating pulse to the input terminal of the third line t_a connected to one input of each multiplier stage, said third line t_a having a delay element between corresponding inputs of each multiplier stage and an additional delay element in line t_a between the multiplier stages having said delay elements in said first and second lines, said first gating pulse being in time coincidence with the least signficant digits a_o, b_o of the operands at the input to said multiplier,

means for applying a second gating pulse to the input terminal of a fourth line t_b connected as a second input to each multiplier stage, said fourth line t_b having a delay element between corresponding inputs of each multiplier stage and an additional delay element in line t_b between the multiplier stages having said delay element in said first and second lines,

said second gating pulse being applied to the input of the first multiplier stage at the same time as the most significant operand digits a_{n-1}, b_{n-1} are applied on their respective signal lines to the input of the first multiplier stage,

means for applying a third gating pulse to a fifth line t_d,

a plurality of two-input OR gates,

the output of each OR gate being connected as an input to each of said multiplier stages,

the input of each OR gate being connected to said fifth line at locations such that said third gating pulse on said fifth line is applied as an input to the OR gate connected to the input of stage $n/2$ at a time when operand signal $a_{n/2}$ arrives to be stored in stage $n/2$ for n even, (or stage $(n+1)/2$ and at a time when operand signal $a_{(n+1)/2}$ arrives to be stored in stage $(n+1)/2$ for n odd,) said fifth line t_d containing a means for delay of one pulse interval between the first and second stages and alternate stages following the second stage,

the OR gate whose output is connected to the input of the first multiplier stage **0** also being connected to the input of the sixth line, the sixth line being connected as an input to each OR gate connected to the remaining multiplier stages,

said sixth line containing a delay element of unit-pulse-length delay after the second multiplier stage **1** and the following alternate multiplier stages,

said third gating pulse being of time duration equal to that of two signal digits,

means for effecting the storage of each successive digit of the multiplier and multiplicand in each successive serially-connected multiplier stage in response to the first gating pulse on said third line t_a and the multiplicand and multiplier on said first and second lines, respectively,

means for effecting the removal by gating from storage of said stored digit in each stage in response to the second gating pulse on line t_b,

means for summing and providing a carry in the summing means of each stage of those product terms a_ib_j where $i+j=r$ and where $k \leqq r \leqq 2n-1$, $r=2n-1$ for the first multiplier stage and increasing by one for each stage until $r=k$ for the last stage, said product terms being provided to the input of said summing means from said storage means and the delayed output of the summing means of the next successive stage,

means for delaying the summed product terms, a_ib_j of the output of a summing means of each stage by a delay element between the output of the summing means of a stage and an input of the summing means of a preceding stage,

the first multiplier stage producing at its output c^* the product terms $c_k, c_{k+1}, \cdots c_{2n-1}$ in serial time sequence.

4,041,298

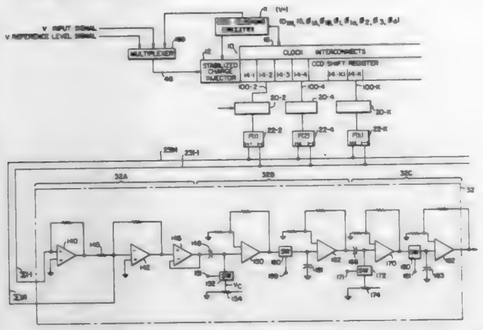
FLOATING CLOCK SENSOR FOR BUFFERED, INDEPENDENT, NON-DESTRUCTIVE READOUT OF CHARGE TRANSFER DEVICES

Donald R. Lampe, Ellicott City, and Marvin H. White, Laurel, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 507,115, Sept. 17, 1974. This application Oct. 24, 1975, Ser. No. 625,697

Int. Cl.[2] G06G *7/12;* **H03K** *5/159*

U.S. Cl. 235—193 **16 Claims**



1. A system for providing non-destructive readout from a charge transfer device wherein said charge transfer device includes plural stages each defined by a corresponding group of plural electrodes and at least one of said stages comprises an output stage wherein one of said group of plural electrodes thereof comprises a predetermined sensor electrode in which a voltage is induced by a charge packet propagating through the corresponding stage, comprising:

control means for supplying clocking signals to respective ones of said plural electrodes of each of said stages to shift a charge packet through the successive stages of said charge transfer device at a predetermined cyclic shift rate, and defining in each shift cycle thereof a succession of reset, clamp, mux, and sample intervals in relation to the said clocking signals, said control means generating a reset signal in timed relation to said clocking signals for defining said reset interval,

switching means connected to the said predetermined sensor electrode and to said control means for receiving the clocking signal associated with said sensor electrode, said switching means normally being open so as to isolate said sensor electrode from said clocking signal and said control means,

said switching means being rendered conductive in response to said reset signal, for applying said corresponding clocking signal to said sensor electrode to render the latter repulsive and then attractive during said reset interval, said control means applying corresponding clocking signals to others of said group of electrodes of said output stage during said reset interval to isolate said sensor electrode from charge packets propagating through said charge transfer device prior to said sensor electrode clocking signal rendering said sensor electrode attractive during said reset interval,

said control means terminating said reset signal and opening said switching means thereby to isolate said sensor electrode from said clocking signal and said control means, said sensor electrode maintaining said attractive potential condition thereof, during said clamp, mux, and sample intervals,

said corresponding clocking signals applied to others of said electrodes of said group advancing a charge packet to the potential well of said sensor electrode during said mux interval and confining said charge packet therein during said sample interval,

means connected to said sensor electrode for sampling the potential induced therein by the charge packet retained in the potential well thereof during said sample interval and producing an output signal sample representative thereof, and

said sample interval terminating prior to a next successive reset interval.

4,041,299

MULTIPLICATION APPARATUS

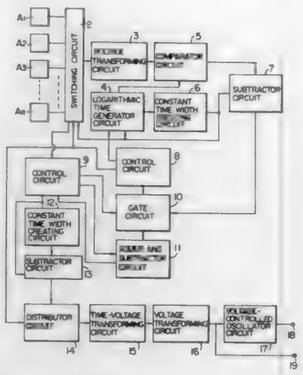
Nobuaki Miyakawa, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 30, 1976, Ser. No. 671,988

Claims priority, application Japan, Apr. 4, 1975, 50-40269

Int. Cl.[2] G06G *7/16, 7/24*

U.S. Cl. 364—841 **4 Claims**



1. Multiplication apparatus comprising:

a plurality of input means each receiving an input analog signal to be multiplied;

a first means for producing a first pulse in response to said input signal to thereby convert said plurality of input signals into a plurality of first pulses, said first pulse having a time width in logarithmic relation with the analog value of said input analog signal;

a switching means having switches connected between said plurality of input means and said first means, said switches being changed-over one by one sequentially in predetermined order to thereby conduct said input analog signals to said first means one by one sequentially;

a second means for producing a train of pulses in response to said first pulse to thereby convert said plurality of first pulses into a plural train of pulses, said train of pulses having a predetermined period and being produced while said first pulse is applied thereto;

a counter means for counting up the number of pulses of said plural trains of pulses which are supplied from said second means in accordance with said predetermined order;

a third means for producing a second pulse having a time width corresponding to the contents of said counter means; and

a fourth means for converting said second pulse into a signal having a voltage which is in antilogarithmic relation with said time width of said second pulse.

4,041,300

PHOTOFLASH ARRAY WITH DISCHARGE PATH FOR ELECTROSTATIC CHARGES

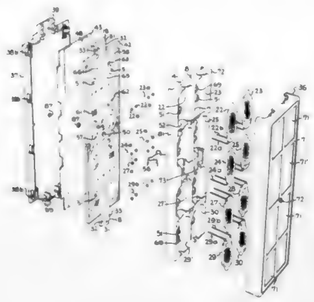
Richard Blount, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,339

Int. Cl.[2] G03B *15/02;* **H05F** *3/00*

U.S. Cl. 240—1.3 **9 Claims**

1. A flash lamp array comprising a walled hollow housing containing flash lamps and circuitry including electrical ground, conductive material on at least a portion of the outer surface of said housing, and means providing a path through



the wall of said housing for electrostatic discharges between said conductive material and said electrical ground, thereby reducing the possibility of accidental flashing of lamps by said electrostatic discharges.

4,041,301

KEY ILLUMINATING DOOR HANDLE

Paul F. Pelchat, Plymouth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 24, 1976, Ser. No. 670,056

Int. Cl.[2] E05B *17/10*

U.S. Cl. 240—2.13 **3 Claims**

1. In a vehicle door having a recess in the outer panel thereof, a door latch, a lift bar type door handle mounted on the door for movement between a first position overlying the recess and a second position outwardly of the recess to operate the door latch, and a key cylinder for operating a door lock, the improvement comprising: a light emitting means mounted on the vehicle door within the recess and covered by the handle when the handle is in the first position overlying the recess, reflective means on the undersurface of the handle for directing light from the light emitting means to the key cylinder when the handle is moved outwardly of the recess to the second position, and switch means operative upon movement of the handle to the second position for energizing the light emitting means.

4,041,302

DUAL COLOR TAILLAMP

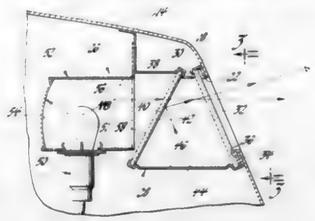
Vilho Koljonen, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 6, 1976, Ser. No. 702,672

Int. Cl.[2] B60Q *1/30, 1/34, 1/44*

U.S. Cl. 240—8.3 **2 Claims**

1. A concealed lamp assembly for association with contiguous panel structures of vehicles comprising a housing having an exterior lens of light transparent material, an interior lens of light transparent material having a semi-transparent light reflective metallic coating facing the exterior lens, a colored surface interposed between said interior and exterior lens to receive outside ambient light from said exterior lens, said interior lens being disposed angularly with respect to said exterior lens and said colored surface to reflect an image of said colored surface from said coating through said exterior lens to cause said interior lens to appear opaque under ambient light conditions and to produce a first apparent lamp light color when the lamp is not illuminated, a lamp and reflector for illuminating the interior lens to direct light from said exterior lens when the light is energized to produce a second apparent lamp light color when the lamp is illuminated, said semi-transparent coating further serving to intercept outside ambient light directed at said reflector and redirect such intercepted light when said lamp is deenergized.



4,041,303

VEHICLE HEADLAMPS

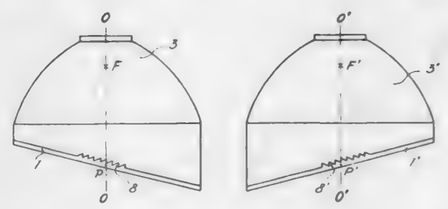
Jacques Ricard, Fontenay sous Bois, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Aug. 4, 1975, Ser. No. 601,547

Claims priority, application France, Aug. 23, 1974, 74.28980

Int. Cl.[2] F21M *3/04*

U.S. Cl. 240—41.4 R **3 Claims**



1. A lighting system for a motor vehicle comprising a right-hand and a left-hand headlamp, the headlamps having optical axes which are substantially parallel to one another and to a central longitudinal plane extending between them, along said vehicle, the head-lamps having front lenses which are symmetrically inclined on either side of the said central plane, each lens having a region of prismatic elements for lateral spread of the beam, each element having a pair of plane surfaces inclined to one another, and intersecting one another along a linear edge; one surface being inclined to the optical axis and the other surface lying exactly parallel to the optical axis.

4,041,304

FLASHLIGHT

Samuel Spector, Box 404, York Beach, Maine 03910

Filed Jan. 22, 1976, Ser. No. 651,344

Int. Cl.[2] F21D *7/00;* **F21V** *23/04*

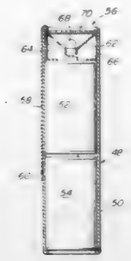
U.S. Cl. 240—10.68 **3 Claims**

1. A disposable flashlight, comprising

a. at least one metal-clad cylindrical battery,

b. a dielectric cylindrical sleeve engaging the sides of said battery and coextensive therewith,

c. the lower end of said sleeve being crimped over the lower end of said battery
d. said sleeve being formed with a relatively small opening to expose the metal side of said battery,
e. a narrow strip of aluminum foil slightly wider than said opening bonded to the outer surface of said sleeve and extending lengthwise therealong from the upper end of said sleeve to at least over said opening to fully cover said opening and form a switch therewith,



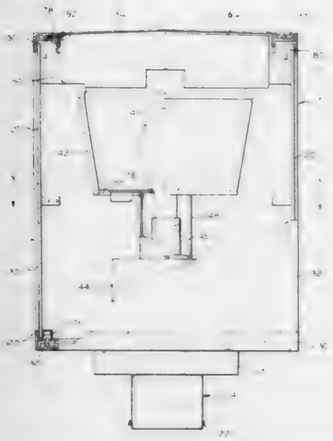
f. a head mounted in the upper end of said sleeve,
g. said head being formed with an electrically conductive sleeve adapted to engage the upper, inner face of said sleeve and contact said strip,
h. conductive reflector integral with said sleeve and a bulb mounted to said reflector and in contact with said battery, and,
i. the upper end of said sleeve being crimped over said head.

4,041,305

LUMINAIRE USING ONE-WAY MIRROR AS EXTERIOR LENS

John Richard Dean, Memphis, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 28, 1976, Ser. No. 700,461
Int. Cl.[2] F21V *13/00*
U.S. Cl. 240—92 **9 Claims**



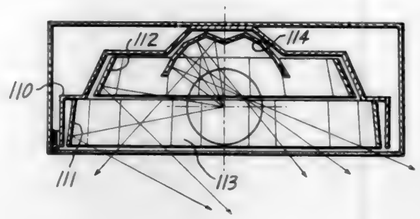
1. A luminaire having a light source enclosed by a plurality of panels for transmitting light from said source, at least one of said panels spaced from said source and reflective of light from outside said luminaire while emitting light from said source when said source is energized, a pair of baffles extending radially from said source toward respective ends of said panel to render said luminaire opaque to light passing into said panel with the light source de-energized.

4,041,306

LUMINAIRE AND REFLECTOR THEREFOR

Wayne W. Compton, Irvine, and Robert Paul Draper, Sunland, both of Calif., assignors to Kim Lighting, Inc., City of Industry, Calif.

Filed Dec. 15, 1975, Ser. No. 640,466
Int. Cl.[2] F21V *7/09*
U.S. Cl. 240—103 R **32 Claims**



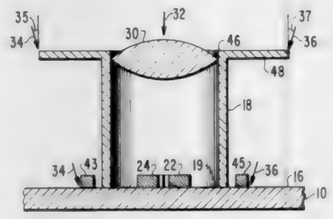
1. A reflector having a nominal axis of emission for casting a pattern of light which is substantially rectangular in a plane normal to said axis of emission from a lamp which has an axis of radiation and the property of emitting a disproportionately larger percentage of its luminous flux in an annulus which lies between a substantial bounding region at each end of the lamp boundary, in which said boundary regions the emission is disproportionately low, said reflector having a concave cavity, a cutoff edge forming an aperture opening from said cavity, said aperture being devoid of any refracting element and of any reflecting element, said cutoff edge lying in a plane normal to said nominal axis, support means to mount the lamp in the cavity above the cutoff edge, and specularly reflecting means shaped and placed in the cavity whereby to reflect supplementary light rays comprising at least some of the light rays emitted from the lamp in the angular subtense above the limiting rays which graze the cutoff edge into a pattern supplementary to direct rays which pass directly from the lamp through the aperture to the surface in ares on the surface where the direct rays provide insufficient illumination to form a substantially rectangular pattern with a predetermined luminar intensity on areas of said surface which is a function of the distance of the respective areas from the intersection of nominal axis with the surface, said supplementary light rays, together with the direct rays, providing such illumination over substantially the entire pattern.

4,041,307

POSITIONING A PLATFORM WITH RESPECT TO RAYS OF A LIGHT SOURCE

Louis Sebastian Napoli, Hamilton Square, and Richard Everet Marx, Jamesburg, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed June 7, 1976, Ser. No. 694,044
Int. Cl.[2] G01J *1/20*
U.S. Cl. 250—203 R **5 Claims**



1. Apparatus for maintaining a platform in a desired attitude with respect to rays from a source of light energy, comprising: an opaque, open-ended, tubular member having a bottom

disposed upon a surface of said platform to enclose a tracking area thereon where a first imaginary line is a projection of an axis of rotation of said platform and a second imaginary line is substantially orthogonal to said first line;
a lens mounted within said member to concentrate upon said tracking area rays of the light energy substantially normal to said surface;
a pair of first tracking sensors carried by said tracking area on opposite sides of said first line and along said second line, each first tracking sensor providing a first tracking signal having an amplitude in direct relation to the quantity of received light;
a pair of first acquisition sensors, carried by said surface outside of said tubular member along said second line on opposite sides of said first line, each first acquisition sensor providing a first acquisition signal having an amplitude in direct relation to the quantity of received light; and
a transducer coupled to said first sensors for rotating said platform about said axis in response to a difference between said first tracking signals and in response to a difference between said first acquisition signals.

4,041,308

AUTOMATIC CONTROL DEVICE FOR CORRECTING FILTERS

Yoshihiro Fujita, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 11, 1976, Ser. No. 685,219
Claims priority, application Japan, May 13, 1975, 50-56972
Int. Cl.[2] G01J *3/34*
U.S. Cl. 250—226 **7 Claims**



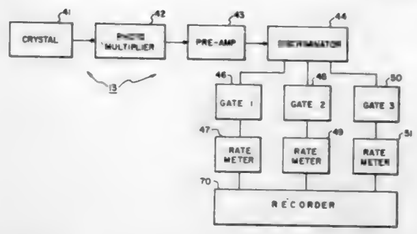
1. An automatic filter selection apparatus, for selecting from a plurality of light condition correcting filters the proper ones for use in a photography operation, comprising
a. a first discriminator means responsive to the spectral characteristic of an illuminating source of light for providing a first output signal, the condition of which indicates whether or not the illuminating source of light is incandescent lighting,
b. a second discriminator means responsive to the amount of flicker is an illuminating source of light for providing a second output signal, the condition of which indicates whether or not the illuminating signal is sunlight,
c. first logic means responsive to said first and second output signals for generating a group of logic output signals, the condition of which indicates whether the illuminating light is sunlight, incandescent or fluorescent,
d. first selecting means responsive to said group of logic signals for selecting a correcting filter from a first set of said correcting filters in dependence upon the condition of said logic signals,
e. second selecting means responsive to said group of logic signals for selecting a correcting filter from a second set of said correcting filters in dependence upon the condition of said logic signals, and
f. switching means for selectively applying said group of logic signals to said first and second selecting means.

4,041,309

BACKGROUND SUBTRACTION SYSTEM FOR PULSED NEUTRON LOGGING OF EARTH BOREHOLES

Eric C. Hopkinson, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Sept. 2, 1976, Ser. No. 719,758
Int. Cl.[2] G01V *5/00*
U.S. Cl. 250—262 **10 Claims**



1. Apparatus for radioactivity well logging, comprising:
an elongated instrument adapted to traverse an earth borehole;
a source of neutrons within said instrument;
radiation detection means within said instrument in spaced relation to said source, said detection means including means to generate electrical signals indicative of such detected radiation;
first, second and third gates within said instrument connected to the output of said detection means; and
means within said instrument to repetitively pulse said neutron source and to trigger said first, second and third gates in timed relationship with the pulsing of said neutron source, said means being characterized by the gate widths of said first and second gates being substantially equal, by the gate width of said third gate being substantially wider than the widths of said first and second gates, by the first and second gates being opened after each time the neutron source is pulsed, and by the third gate being opened only after the neutron source has been pulsed a substantial number of times and then not pulsed for a plurality of cycles.

4,041,310

WATER WASHABLE DYE PENETRANT COMPOSITION AND METHOD OF APPLICATION

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 580,258, May 23, 1975, Pat. No. 4,011,174, which is a continuation-in-part of Ser. No. 444,433, Feb. 21, 1974, Pat. No. 3,915,886, and Ser. No. 521,730, Nov. 7, 1974, Pat. No. 3,939,092. This application Sept. 7, 1976, Ser. No. 721,603
Int. Cl.[2] G01N *21/16*
U.S. Cl. 250—302 **13 Claims**

1. A method for detecting cracks and flaws in the surface of an object which comprises applying to said surface a biodegradable liquid dye penetrant composition consisting essentially of (1) a biodegradable nonionic surfactant which consists essentially of ethoxylates of linear secondary aliphatic alcohols, with the hydroxyl groups randomly distributed, the linear aliphatic portion of said alcohols being a mixture of alkyl chains containing in the range from 10 to 17 carbon atoms, and containing an average of from 3 to 12 moles of ethylene oxide, (2) a dye soluble in said surfactant and (3) glycol monobutyl ether as extender, applying a water wash to the surface of said object over said dye penetrant composition thereon, and preferentially removing said glycol monobutyl ether from said dye penetrant composition, followed substantially instantaneously by removing the remaining liquid dye penetrant uniformly distributed on said surface, during said water wash application, a portion of said last mentioned liquid penetrant free of said

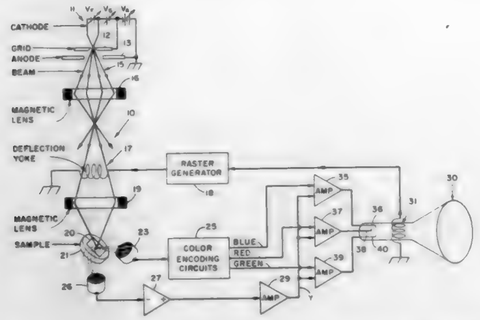
glycol monobutyl ether remaining in said cracks and flaws in said surface, and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and flaws.

4,041,311

SCANNING ELECTRON MICROSCOPE WITH COLOR IMAGE DISPLAY

David Michael Martin, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed July 12, 1976, Ser. No. 704,181
Int. Cl.[2] H01J *37/00*
U.S. Cl. 250—311 **7 Claims**



1. In combination with a scanning electron microscope having a primary electron beam impinging on a sample of material located in a target area and first deflection means including raster generator means for moving said primary beam in a predetermined pattern on said sample, an improved display system comprising: first detector means for detecting a first phenomenon induced from said sample in response to the impingement thereon of said primary electron beam and for generating a first signal representative thereof; color encoding circuit means receiving said first signal for generating first, second and third color signals therefrom, each color signal being a changing function of said first signal over at least a portion of the range of said first signal; color kinescope means having first, second and third electron beams, each generating a different color response in said kinescope means and responsive to said first, second and third color signals respectively, and said deflection means responsive to said raster generator means for deflecting said first, second and third electron beams in a pattern corresponding to said predetermined pattern, whereby said kinescope means generates a color image of said sample and the hue of said image at any point is representative of said first signal at the corresponding point on said sample; second detector means for detecting a second phenomenon induced from said sample in response to the impingement thereof of said primary electron beam and for generating a second signal representative thereof; and means responsive to said second signal for modulating the brightness of said color kinescope means in accordance with the detection of said second phenomenon.

4,041,312

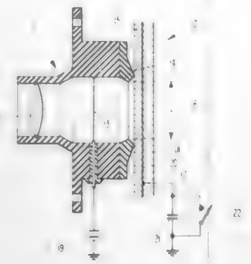
APPARATUS FOR ELECTROSTATICALLY CHARGING AN ELECTROPHOTOGRAPHIC FILM

John D. Plumadore, Westfield, Mass., assignor to A. B. Dick/-Scott, S. Hadley, Mass.

Filed Apr. 23, 1975, Ser. No. 570,822
Int. Cl.[2] G01M *21/34*
U.S. Cl. 250—315 R **6 Claims**

1. In an apparatus for electrostatically charging an electrophotographic film comprising a photoconductive layer and a conductive layer with a corona source, wherein the film is held stationary with respect to the corona source during charging, the improvement comprising:

a capacitor interconnecting the conductive layer of the film



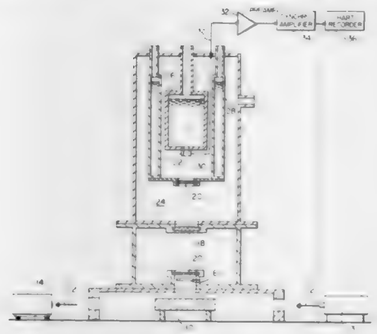
with ground, the capacitor having a value smaller than the capacitor value of the portion of the film being charged, whereby the amount of charge deposited upon the film during corona charging is limited.

4,041,313

EMITTANCE CALORIMETRIC METHOD

Roy F. Potter, San Diego, and Donald L. Stierwalt, El Cajon, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 3, 1975, Ser. No. 628,261
Int. Cl.[2] G01N *21/22*
U.S. Cl. 250—341 **8 Claims**



1. A method of making a precise measurement of the absorption of weakly absorbing optical materials by measuring the temperature rise of the sample when light of the wavelength of interest passes through said sample, comprising the steps of:

a. passing light of a first predetermined wavelength through a sample of the weakly absorbing material;

b. measuring the rate of increase in power emitted by said sample at a second predetermined wavelength.

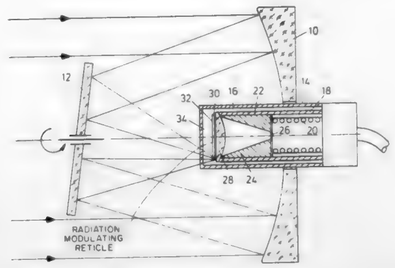
4,041,314

DETECTOR DEVICE RESPONSIVE TO INFRARED RADIATION

Hans Oppelt, Uberlingen, Bodensee, Germany, assignor to Bodenseewerk, Geratetechnik GmbH, Uberlingen, Bodensee, Germany

Filed May 3, 1976, Ser. No. 682,270
Claims priority, application Germany, Sept. 19, 1975, 2541818
Int. Cl.[2] G01J *1/42*
U.S. Cl. 250—352 **2 Claims**

1. In a detector device responsive to infrared radiation and including a double-walled vessel having an inner wall which forms a cooling means container and an outer wall, the two walls defining a vacuum chamber; a detector element to be exposed to the infrared radiation located within said vacuum chamber in heat-conducting connection with the cooling means container, said detector element being exposed to the infrared radiation in an imaging path of rays through the end of the outer wall; an opaque screen located in the vacuum chamber, said screen enclosing the detector element and defining a radiation entrance aperture and being also in heat-conducting



connection with the cooling means container; optical imaging means arranged in the radiation entrance aperture of the opaque screen; and a radiation modulating reticle located in the image plane and being partly transparent and partly opaque, the improvement comprising:

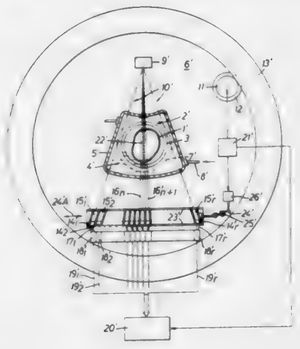
the reticle being located in the vacuum chamber and in heat-conducting connection with the cooling means container.

4,041,315

COMPUTERIZED TOMOGRAPHY COMPRISING LATERALLY SHIFTING DETECTED BEAMS WITHIN A ROTATED FAN OF RADIATION

Godfrey Newbold Hounsfield, Newark, England, assignor to E M I Limited, Hayes, England

Continuation of Ser. No. 489,084, July 17, 1974, Pat. No. 3,934,142, and Ser. No. 481,443, June 20, 1974, which is a division of Ser. No. 358,980, May 10, 1973, Pat. No. 3,881,110. This application Jan. 19, 1976, Ser. No. 650,281
Claims priority, application United Kingdom, May 17, 1972, 23064/72; July 21, 1973, 34859/73
Int. Cl.[2] A61B *6/02*; G01N *23/08*; H05G *1/30*
U.S. Cl. 250—360 **1 Claim**



1. A method of radiographically examining the body of a patient in order to produce an image of the variation of absorption coefficient, with respect to penetrating radiation, over a planar region disposed in said body, comprising the steps of:

a. projecting radiation through the body, in the plane of said region, from a position external of the body; the radiation conforming to a fan-shaped spread of angle which substantially equals, or exceeds, the angle subtended at said position by said region,

b. scanning said spread of radiation relative to the body so as to irradiate said region from a plurality of different positions; the scanning consisting of an angular movement about an axis substantially perpendicular to said region,

c. detecting the radiation emergent from the body, in said plane, along each of a plurality of mutually divergent beam paths within said spread from each of said positions, and providing an output signal indicative of the radiation transmitted through the body along each of said beam paths,

d. shifting the positions of said beam paths, within said spread, during the angular movement so that output signals, provided during one portion of said angular movement, relate to beam paths interleaved with beam paths in respect of which output signals are provided during another portion of the angular movement, the relationship between the scanning and the shifting being such that the region is irradiated from a plurality of said positions during each of said portions, and

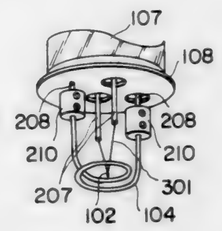
e. processing the output signals to produce said image.

4,041,316

FIELD EMISSION ELECTRON GUN WITH AN EVAPORATION SOURCE

Hideo Todokoro, and Tsutomu Komoda, both of Tokyo, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 17, 1975, Ser. No. 614,311
Claims priority, application Japan, Sept. 20, 1974, 49-107819; Aug. 13, 1975, 50-97656; Aug. 13, 1975, 50-97657; Aug. 13, 1975, 50-97658
Int. Cl.[2] H01J *29/48*
U.S. Cl. 250—396 R **3 Claims**



1. A method of starting a field emission electron gun having a vacuum chamber, a field emission tip disposed in said vacuum chamber, an anode spaced apart from said field emission tip and defining a space therebetween in which said field emission tip emits electrons, and vacuum pump means for evacuating said vacuum chamber, the method serving to prevent electrons emitted from said field emission tip from causing deteriorating gas molecules from being drawn out of the surfaces within said vacuum chamber comprising the steps of:

a. operating said vacuum pump means to evacuate said vacuum chamber to a predetermined degree of vacuum;

b. vaporizing a material for a predetermined time adjacent said field emission tip while said vacuum pump means is still operating to form protective evaporation layers on those surfaces within said vacuum chamber from which said deteriorating gas molecules would otherwise be drawn out by said emitted electrons; and

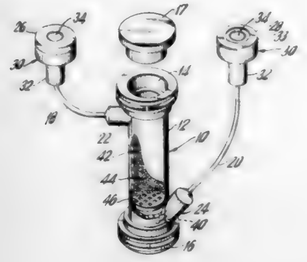
c. after vaporizing said material for said predetermined time, connecting a voltage source means to said field emission tip to cause electrons to be emitted therefrom.

4,041,317

MULTIPLE PH ALUMINA COLUMNS FOR MOLYBDENUM-99/TECHNETIUM-99M GENERATORS

Nabil A. Morcos, Kendall Park; Gerald A. Bruno, Shrewsbury, and Thomas A. Haney, East Brunswick, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed May 19, 1976, Ser. No. 687,713
Int. Cl.[2] G01M *21/24*
U.S. Cl. 250—432 PD **10 Claims**



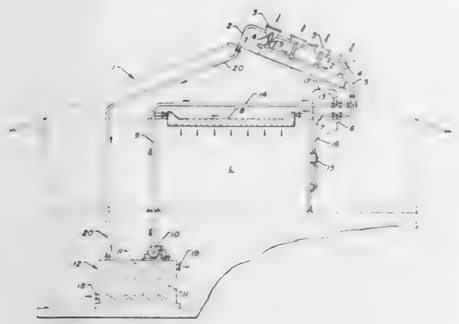
1. Apparatus for the generation of technetium-99m from molybdenum-99 comprising an alumina support medium for adsorption of the molybdenum-99, means for containing said alumina support medium, inlet means for receiving eluant, and outlet means for removing eluate, wherein said alumina support medium comprises at least two beds of alumina, a first bed having a pH above about 6.0 and a second bed having a pH below about 6.0, the difference in the pH of the two beds being at least 0.5.

4,041,318

SOLAR HEAT-LIGHT RECOVERY SYSTEM

Harold W. Poulsen, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 1, 1976, Ser. No. 662,985
Int. Cl.[2] F21K *2/02*
U.S. Cl. 250—459 **4 Claims**



1. A method for effecting the useful recovery of energy from solar radiant energy which comprises:

a. passing a fluid stream with entrained phosphorescent particles to a solar radiant energy exposure zone and effecting the absorption of both heat and light energy into such particles and stream,

b. passing at least a portion of the resulting light regenerated phosphorescent particles in the carrying fluid stream to a light release zone and providing for the passage of such particles through light emitting containment means to, in turn, provide for light emission therefrom into said light release zone, and

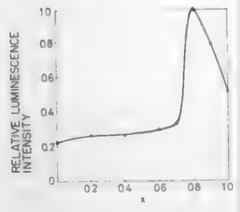
c. subsequently returning the stream and particles to said solar energy exposure zone for reheating and re-exposure to sunlight.

4,041,319

RADIOGRAPHIC PHOSPHOR SCREEN

Tadashi Fukuzawa, Tokyo; Teruki Suzuki, Funabashi, and Shigeru Sato, Matsudo, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of, Japan

Filed Mar. 26, 1976, Ser. No. 670,833
Claims priority, application Japan, Mar. 26, 1975, 50-35537
Int. Cl.[2] G01J *1/58*
U.S. Cl. 250—460 **22 Claims**



1. A radiographic phosphor screen comprising a substrate and, supported thereon, a phospho-vanadate phosphor represented by the following general formula:

$$M(P_x, V_{1-x})O_4$$

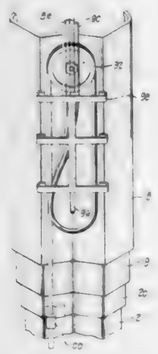
wherein M stands for at least one element selected from the group consisting of Y, La, Lu and Gd, and x is a number of from 0.7 to 0.99.

4,041,320

TELESCOPIC COLUMN FOR X-RAY APPARATUS

William H. Amor, Jr., Auburn Township, Cuyahoga County, and Robert J. Steffek, Wickliffe, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Division of Ser. No. 418,128, Nov. 21, 1973, Pat. No. 3,986,697. This application June 4, 1976, Ser. No. 692,976
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—523 **3 Claims**



1. In an X-ray apparatus including a support and a mechanism for contributing to the production of an X-ray image, an improved telescopic column connecting the mechanism to the support comprising:

at least three elongated sections telescoped together in nested relationship, said sections being guided for relative telescoping movement and constructed and arranged to each move longitudinally relative to the next an equal distance when extended or retracted,

a longitudinal slot in a first of said sections that surrounds at least a second and third other section when nested,

a pulley shaft carried by said second section, extending through said slot, and a pulley on said shaft outside said first section,

a cable extending from said support to said mechanism, said cable including a loop substantially greater in length than the circumference of said pulley when said sections are nested, one portion of the loop being supported by said pulley, and

means carried by said third section securing a portion of said cable between the loop and the mechanism in fixed relationship to the third section,

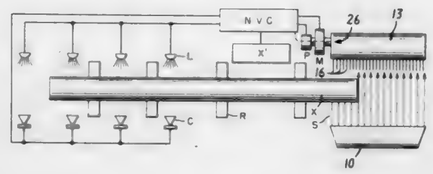
whereby the length of the cable between the pulley and said means securing cable to the third section changes at the same rate as the length of the column changes between the pulley and said securing means when the sections are moved telescopically.

4,041,321

MEASURING APPARATUS

Robert Housú Linard, 12, bis Rue de Serre, 54000 Nancy, France

Continuation-in-part of Ser. No. 594,234, July 9, 1975. This application Aug. 11, 1976, Ser. No. 713,592
Claims priority, application France, Nov. 4, 1974, 74.40629
The portion of the term of this patent subsequent to Jan. 11, 1994, has been disclaimed.
Int. Cl.[2] G01N *21/30*.
U.S. Cl. 250—560 **10 Claims**



1. A device for measuring a length of an object, such as a rolled metal product, comprising;

a light emitter unit;

a light receiver unit for receiving light emited by the emitter unit, subject to imposition of a shadow on the emitted light by an object interposed between the units, the length of which object is to be measured, a length of the shadow corresponding to the length of the object and one of the units having a rotary, apertured cylindrical member and a fixed, apertured, cylindrical member having a common axis with the rotary member;

means connected with the unit having said members for rotating the rotary member to cooperate with the fixed member in providing a linearly changeable aperture for the emitted light with the shadow imposed on it to be received in the light receiver unit;

a light guiding device in the light receiver unit and extending along the common axis of said members; and

photosensitive means disposed in the light receiver unit for exposure thereof, through the light guiding device, to the received light to sense the length of the shadow and thereby to measure the length of the object.

4,041,322

APPARATUS FOR GENERATING POLYPHASE SCAN PATTERNS

Thomas D. Hayosh, Bloomfield Hills, and Anthony J. Torre, Warren, both of Mich., assignors to Schiller Industries, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 466,771, May 3, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,408
Int. Cl.[2] G06K *7/14*
U.S. Cl. 250—568 **8 Claims**



1. A scanner for producing a polyphase scan pattern of plural trace segments for use in reading bar code symbols on packages passing across a reading field adjacent a scanning window, said reading field having a horizontal axis perpendicular to the transverse axis, said scanner comprising means for producing a light beam, deflection means including an oscillating mirror in the path of said light beam, an oscillatory drive means connected with said mirror for producing a cyclically deflected beam with a vertical scanning motion component which varies as a sinusoidal function of time at a substantially constant frequency, a rotary multifaceted mirror in the path of said cyclically deflected beam, a rotary drive means connected with the multifaceted mirror for producing a scanning beam with a horizontal scanning motion component which varies periodically as a linear function of time at a substantially constant frequency, the oscillatory drive means and the rotary drive means having respective operating frequencies such that the ratio of the vertical scanning frequency to the horizontal scanning frequency is established at a nominal ratio value of $K^+ - n/\phi$ (where K is any integer, ϕ is the number of phases of the polyphase scan pattern and n is any integer less than ϕ except that those which can be divided equally into ϕ), said deflection means thereby producing successive trace segments in the reading field with each trace segment having a sinusoidal waveform of uniform wavelength, and means for maintaining the operating frequencies at values which are at least approximately equal to the values which yields said nominal ratio value, whereby n successive trace segments will start at different vertical deflection points and the n successive trace segments will be phase displaced from the preceding trace segments by a phase angle equal to $(1^n - /\phi)$ (360°).

4,041,323

NON-LINEAR OPTICAL FREQUENCY DOUBLING DEVICES

Wilhelm Stürmer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 124,675, March 16, 1971, abandoned. This application Sept. 25, 1975, Ser. No. 616,679

Claims priority, application Germany, Mar. 20, 1970, 2013315

Int. Cl.[2] G02F *1/37, 1/39*

U.S. Cl. 307—88.3 **2 Claims**

1. A frequency-doubling non-linear optical device comprising a laser means producing infrared light and a crystal optically connected therewith for receiving said light and doubling the frequency thereof, said crystal being composed of a material corresponding to the formula $M[Hg(SCN)_4]$ wherein M is selected from the group consisting of Cd and Zn.

4,041,324

MAGNETIC SHIELD SYSTEM FOR ELECTRIC CARS

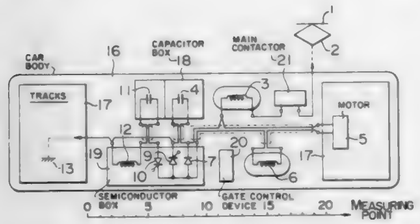
Korefumi Tashiro, Hitachi, and Kosuke Ishikawa, Fukuoka, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1976, Ser. No. 652,784

Claims priority, application Japan, Jan. 31, 1975, 50-13695; July 31, 1975, 50-93900; July 31, 1975, 50-93904; July 31, 1975, 50-93908

Int. Cl.[2] H04B *15/00*

U.S. Cl. 307—91 **7 Claims**



1. A magnetic shield system for an electric car comprising:
a car body;
a plurality of electrical devices arranged on the underside of the floor of said car body;
means including electric wires for electrically connecting said electrical devices according to their functions;
those of said electric wires through which currents of substantially the same magnitude flow in opposite directions being closely located to each other; and
tube means made of magnetic material for magneticaly shielding said those electric wires.

4,041,325

THERMOSTAT TIMER

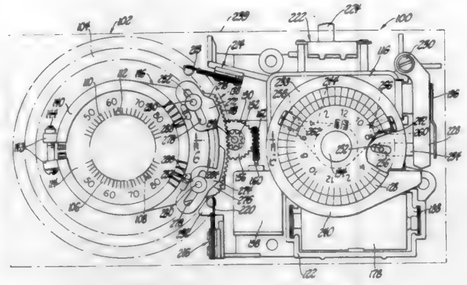
Paul G. Angott, Troy, Mich., assignor to Thermotrol Corporation, Madison Heights, Mich.

Continuation-in-part of Ser. No. 586,069, June 11, 1975, abandoned. This application Apr. 12, 1976, Ser. No. 675,719

Int. Cl.[2] F16H *5/76;* **G05D** *23/00;* **H01H** *73/10*

U.S. Cl. 307—141 **48 Claims**

1. A device for automatically adjusting the setting of a control mechanism having an externally accessible adjuster for raising and lowering the setting of the control mechanism, said device comprising: mechanically driven means for engaging and moving the adjuster of the control mechanism, drive means for driving said mechanically driven means, electrical circuit means for controlling the operation of said drive means including multiple switch means for opening and closing said electrical circuit means, timing means for controlling one of said switch means for periodically closing said electrical circuit means at predetermined times for a limited time interval to activate said drive means, and switch control means for controlling another of said switch means movable simultaneously with said mechanically driven means for opening said electrical circuit means after a predetermined amount of adjusting movement.



4,041,326

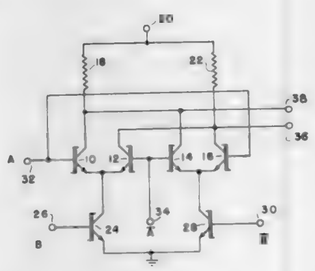
HIGH SPEED COMPLEMENTARY OUTPUT EXCLUSIVE OR/NOR CIRCUIT

Barry J. Robinson, Fremont, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation-in-part of Ser. No. 704,259, July 12, 1976, abandoned. This application Feb. 22, 1977, Ser. No. 770,968

Int. Cl.[2] H03K *19/32*

U.S. Cl. 307—216 **7 Claims**



1. A high-speed exclusive OR/NOR circuit comprising:
a plurality of NPN transistor pairs arranged in a tree configuration of at least two levels, the first of said pairs being at a first level and having the emitters of each transistor in said pair being connected directly to ground reference, the collector of each transistor in said first pair being connected to the interconnected emitters of a second transistor pair and a third transistor pair in the second level;
first input signal means coupled to said first transistor pair for selectively enabling the first and disabling the second transistor in said first pair;
second input signal means coupled to said second and said third transistor pair for selectively enabling the first and disabling the second transistor in each of said second and said third pairs;
first current source circuitry including a first resistance coupled between a source of D.C. potential and a first conductor intercoupling the collector of the transistor in said second pair enabled by said second input signal means with the transistor in said third pair disabled by said second input signal means;
second current source circuitry including a second resistance coupled between said source of D.C. potential and a second conductor intercoupling the collector of the transistor in said third pair enabled by said second input signal means with the transistor in said second pair disabled by said input signal means; and

first output means coupled to said first conductor for signalling current flow from said source of D.C. potential through said first resistance and through enabled transistors to ground potential.

4,041,327

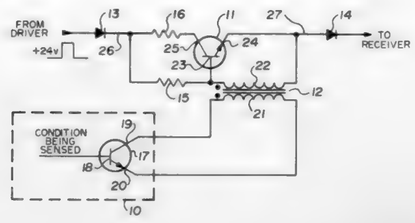
SENSE POINT CIRCUIT

Robert M. Thomas, Maitland, Canada, assignor to GTE Automatic Electric (Canada) Ltd., Brockville, Canada

Filed Aug. 2, 1976, Ser. No. 711,018

Int. Cl.[2] H03K *5/08*

U.S. Cl. 307—231 **7 Claims**



1. A sense point circuit for sensing the active or inactive condition of an electrical path as represented by the conduction or nonconduction of a solid state device, in response to an interrogating signal pulse, said sense point circuit comprising:
an input for receiving the interrogating signal pulses;
an output for providing a first current signal or relatively small magnitude in response to a received interrogating pulse indicating that the solid state device is conductive and a second current signal of relatively greater magnitude in response to a received interrogating pulse indicating that the solid state device is nonconductive;
a solid state switch having first and second sides, and a control gate, said second side being coupled to said output;
a variable impedance means coupled to said switch across said gate and said second side and to said solid state device for enabling said switch to close only when said solid state device is nonconductive;
a first resistor coupled between said input and said gate; and
a second resistor coupled in series between said input and said first side of said switch, said first resistor having a resistance which is substantially greater than the resistance of said second resistor; whereby,
when said solid state device is conductive, said variable impedance means will cause said switch to remain open upon receipt of an interrogating pulse to thereby cause the interrogating pulse to be conducted from said input to said output through said first resistor and said variable impedance means to thereby provide said first current signal and when said solid state device is nonconductive, said variable impedance means will enable said switch to close upon receipt of an interrogating pulse to thereby cause the interrogating pulse to be conducted from said input to said output through said second resistor and said switch to thereby provide said second current signal.

4,041,328

ARRANGEMENT FOR THE DETERMINATION AND VISUALIZATION OF MEASURING SIGNALS

Michael Maas, Uttenreuth, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

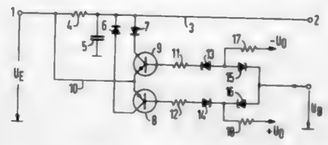
Filed Nov. 12, 1975, Ser. No. 631,395

Claims priority, application Germany, Nov. 19, 1974, 2454839

Int. Cl.[2] H03K *5/20;* **A61B** *5/04*

U.S. Cl. 307—351 **5 Claims**

1. In an arrangement for the determination and visualization of measuring signals having incident narrow and high-amplitudinal voltage peaks, particularly EKG signals with superimposed pacemaker impulses, including an RC-filter connected into a measuring signal path and comprising at least one ohmic resistance and at least one filter condenser; two transistors having respective conductive paths connected across the ohmic resistance, the conductive path of one of said transistors providing a path for current flow of positive polarity between an input side of the RC-filter and the filter condenser bypassing said ohmic resistance in said RC-filter in a short-circuiting mode upon the occurrence of positive voltage peaks and the conductive path of the other transistor providing a path for current flow of negative polarity between



the input side of the RC-filter and the filter condenser for bypassing said ohmic resistance in said RC-filter in a short-circuiting mode upon the occurrence of negative voltage peaks, each transistor in a conductive condition thereby directly connecting said measuring signal in said measuring signal path to said filter condenser, said transistors each having control inputs, and means providing a reference voltage connected to the control inputs of the transistors for controlling the conductive condition of said transistors responsive to the measuring signal voltage reaching respective positive and negative voltage peaks deviating from the reference voltage by a predetermined differential value.

4,041,329

MANUALLY SELECTABLE SWITCH ARRAYS

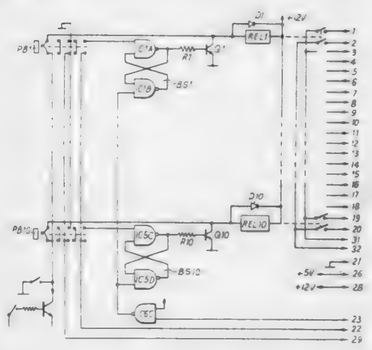
Harry Ainsworth Haskell, Ashford, England, assignor to AEP-International Ltd., Staines, England

Filed Dec. 3, 1975, Ser. No. 637,406

Claims priority, application United Kingdom, Dec. 5, 1974, 52752/74

Int. Cl.[2] H03K *17/16*

U.S. Cl. 307—247 A **2 Claims**



1. A manually actuatable selector switch assembly comprising:
a. a plurality of bistable devices each having a set input, a reset input and an output which provides a signal having a first signal potential when the bistable is in the set condition and a second signal potential when the bistable is in the reset condition,
b. a plurality of electrical switching circuits each of which has a control terminal connected to the output of a corresponding one of said bistable devices whereby said switching circuit is rendered operative in response to the pres-

ence of said first signal potential at the output of the corresponding bistable,

c. a plurality of double pole manually actuatable push button switches each having two pairs of contacts adapted to be closed upon depression of the push button, of which a first contact of one pair in each switch is connected to the set input of a different one of said bistable devices, and of which first contacts of the second said pairs in all said switches are connected in common to a source of signal potential, and

d. a monostable pulse generating circuit having an input and first and second outputs, said monostable circuit providing in response to a signal received at its input two output pulses at said first and second outputs respectively, said pulses being spaced in time such that the pulse at said first output occurs before the pulse at said second output, the input of said monostable circuit being connected in common to the second contacts of the said second pairs in all said push button switches, the said first output being connected in common to the reset inputs of all said bistable devices, and the said second output being connected in common to the second contacts of the said first pairs in all said push button switches.

4,041,330

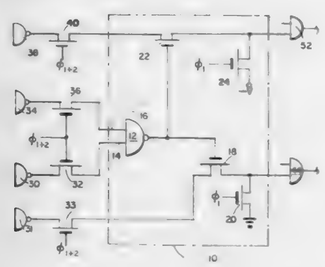
SELECTABLE EIGHT OR TWELVE DIGIT INTEGRATED CIRCUIT CALCULATOR AND CONDITIONAL GATE OUTPUT SIGNAL MODIFICATION CIRCUIT THEREFOR

John R. Spence, Villa Park, and Bruce W. Kinney, Jr., Anaheim, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 456,997, April 1, 1974, Pat. No. 3,965,459. This application Nov. 19, 1975, Ser. No. 633,307

Int. Cl.[2] H03K *17/56, 5/13, 19/08;* **G11C** *11/21*

U.S. Cl. 307—251 **10 Claims**



1. Conditional modification means for conditionally modifying the output of a clocked gate means in response to the logical value of the output signal from at least one first-type gate, said modification being made without consuming a phase time in performing the modification, said conditional modification means comprising:

control gate means having an input terminal and an output terminal, said control gate means being responsive to said at least one first-type gate, said control gate means providing a first isolation control signal at the output terminal thereof;

conditional isolation means having an input terminal, an output terminal and a control terminal, the input terminal of said conditional isolation means connected to an output terminal of said clocked gate means the control terminal of said conditional isolation means connected to the output terminal of said control gate means, said conditional isolation means rendering said input terminal of said conditional isolation means and said output terminal of said conditional isolation means electrically connected when a first type signal is applied to said control terminal of said conditional isolation means and rendering said input terminal of said conditional isolation means and said output terminal of said conditional isolation means electrically isolated when a second type signal is applied to said control terminal of said conditional isolation means; and

output precharging means having an input terminal and an output terminal, said output terminal of said precharging means being connected to the output terminal of said conditional isolation means for precharging the output terminal of said conditional isolation means to a predetermined state, said predetermined state being the one to which the output of said clocked gate means is to be modified when the control gate means renders the conditional isolation means isolating.

4,041,331

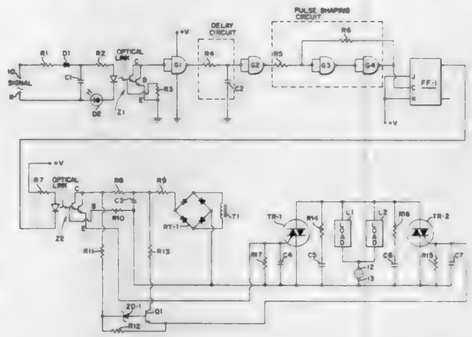
SOLID STATE RELAY CIRCUIT

David J. Westerman; Louis S. McTamaney, both of San Jose, and David J. Kauber, Redwood City, all of Calif., assignors to FMC Corporation, San Jose, Calif.

Filed Aug. 23, 1974, Ser. No. 499,942

Int. Cl.[2] H03K *17/78*

U.S. Cl. 307—252 Q **13 Claims**



1. A solid state relay circuit of the alternating impulse type comprising a thyristor having a pair of primary terminals and a gate terminal; means for connecting a load and an AC source voltage in series with said primary terminals; and a triggering circuit connected to said gate terminal for triggering the thyristor into conduction to provide a current to said load, said triggering circuit comprising means for receiving an input trigger signal, a pulse shaping circuit connected to said last named means for shaping said input trigger signal into a squared pulse, a toggle flip-flop having two output states connected to the output of said pulse shaping circuit, said flip-flop being connected to said pulse shaping circuit so as to provide alternate output states for successive input pulses, and an optically isolated switch connected between the output of said flip-flop and said gate terminal of said thyristor, said switch having a power supply separate from the power supplies for the other components in said triggering circuit.

4,041,332

SEMICONDUCTOR SWITCH DEVICE

Ichiro Ohhinata, Yokohama; Shinzi Okuhara, Fujisawa, and Michio Tokunaga, Zushi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 25, 1975, Ser. No. 599,135

Claims priority, application Japan, July 26, 1974, 49-85151

Int. Cl.[2] H03K *17/72*

U.S. Cl. 307—252 J **11 Claims**

1. A semiconductor switch device comprising:

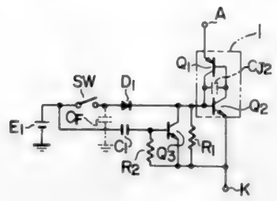
a PNPN switch having three PN junctions;

a transistor;

two impedance elements; and

a capacitive element; and wherein

one of said impedance elements is connected between the collector and the emitter of said transistor, the collector and the emitter of said transistor being connected across one of said three PN junctions at one end of said PNPN switch, said capacitive element being connected between



the base of said transistor and a fixed potential so that only transient current is supplied to the base from the fixed potential; and wherein

the other impedance element is connected between the base and emitter of said transistor.

4,041,333

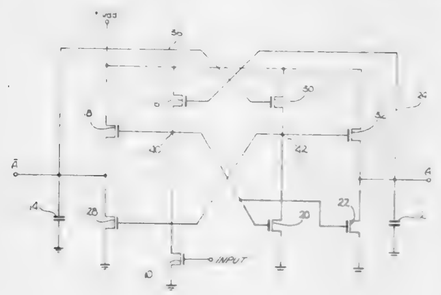
HIGH SPEED INPUT BUFFER CIRCUIT

Eli Porat, Albany, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 15, 1975, Ser. No. 640,435

Int. Cl.[2] H03K *19/08, 3/26*

U.S. Cl. 307—279 **10 Claims**



1. A high speed buffer circuit having an input and true and inverted outputs for receiving an input signal and producing true and inverted output signals therefrom comprising:

an input transistor for receiving said input signal;

means coupling said input transistor to said outputs, said outputs having capacitive loads coupled thereto; and

feedback means coupling said outputs to said input transistor, said feedback means being operable for shortening the response time of said true and inverted output signals at said outputs in response to said input signal at said input, and said capacitive loads being operable for delaying the effect of said output signals on said feedback means, the capacitive loads coupled to said outputs being charged in accordance with the state of said input signal being applied to said input transistor to produce said output signals at said true and inverted outputs.

4,041,334

CONTROL CIRCUIT FOR ACTUATING A DEVICE AT A DELAYED TIME WITH RESPECT TO THE TURNING ON OF A POWER SUPPLY AND FOR DEACTUATING THE DEVICE SUBSTANTIALLY SIMULTANEOUSLY WITH THE TURNING OFF OF THE POWER SUPPLY

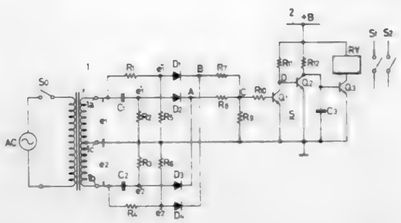
Kaoru Umeda, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 20, 1976, Ser. No. 659,689

Claims priority, application Japan, Feb. 22, 1975, 50-22135

Int. Cl.[2] H03K *5/13;* **H01H** *47/18*

U.S. Cl. 307—293 **11 Claims**



1. A control circuit comprising:

means for receiving an AC voltage;

first rectifying means coupled to said receiving means for producing a first output;

second rectifying means coupled to said receiving means for producing a second output, said first and second outputs having a predetermined phase difference therebetween;

means for combining said first and second outputs to produce a third output, said third output commencing when said AC voltage first is received and terminating when said AC voltage no longer is received;

energizing means coupled to said combining means and responsive to the commencement of said third output for producing an energizing signal at a predetermined delayed time subsequent thereto and responsive to the termination of said third output for substantially simultaneously terminating said energizing signal; and

switching means coupled to said energizing means and controlled by said energizing signal.

11. A control circuit for operating a switching device in response to the turning on and turning off of an AC power supply, comprising converting means coupled to said AC power supply for receiving the voltage supplied by said AC power supply and for converting same to a substantially constant DC level when said AC power supply is turned on and for terminating said DC level when said AC power supply is turned off, a capacitor; a DC power supply for producing a DC voltage; impedance means coupled between said DC power supply and said capacitor for supplying said DC voltage to said capacitor; a first transistor coupled to said converting means, said first transistor being conductive in response to the production of said DC level; and a second transistor coupled to said first transistor and connected to said capacitor in a discharge path therefor, said second transistor being non-conductive when said first transistor is conductive and being conductive when said first transistor is non-conductive, whereby said capacitor is charged through said impedance means when said first transistor is conductive in response to said production of said DC level so as to produce a turn-on signal at a predetermined time following the production of said DC level, and whereby said first transistor is non-conductive and said second transistor is conductive substantially simultaneously with the termination of said DC level for discharging said capacitor through said second transistor so as to substantially simultaneously terminate said turn-on signal; and a switching device supplied with and actuated by said turn-on signal.

4,041,335

PIEZOELECTRIC CERAMIC RESONATOR WITH VIBRATION DAMPING MEANS

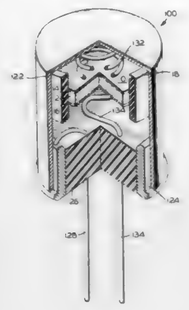
Takashi Nagata, Ikeda; Michio Ishibashi, Suita, and Yasuo Nakajima, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 58,781, July 28, 1970, abandoned, which is a continuation-in-part of Ser. No. 589,683, Oct. 26, 1966, abandoned. This application Sept. 14, 1972, Ser. No. 288,977

Claims priority, application Japan, Oct. 26, 1965, 40-66220

Int. Cl.[2] H01L *41/04*

U.S. Cl. 310—321 4 Claims



1. In a piezoelectric ceramic resonator including a thin flat disk of piezoelectric ceramic material which has parallel major planar surfaces and is polarized in one direction, the thickness dimension of said disk being such as to impart thereto a resonance of vibration in a thickness-shear mode at a selected frequency higher than 1MHz, operating electrodes applied to said major surfaces, and vibration damping means attached to the contour of the edge of said flat disk;

the improvement wherein the direction of polarization is at an angle of from 0° to 60° with respect to said major surfaces of the disk, and disk having a ratio of the diameter to the thickness of from 6:1 to 20:1, and said damping means is a rubber ring having a hardness from 20 to 70 on the Shore A Scale and is attached to said edge of the disk under a tension of 20–500 gr/cm.

4,041,336

SINGLE PHASE STEPPER MOTOR

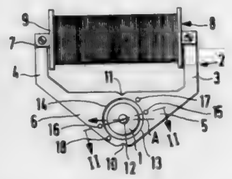
Roland Sudler, and Klaus-Dieter Hartung, both of Frankfurt, Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Dec. 17, 1975, Ser. No. 641,561

Claims priority, application Germany, Jan. 27, 1975, 2503206

Int. Cl.[2] H02K *37/00*

U.S. Cl. 310—49 R 8 Claims



1. A single-phase stepper motor comprising:

A. a permanent magnet rotor having a plurality of poles,

B. a stator comprising two L-shaped stator parts, each stator part being provided at one end with a pole shoe comprising main poles and auxiliary poles, the other end of each stator part having no pole shoes,

C. a bridge connecting the ends of the stator parts without pole shoes,

D. a stator winding on the bridge,

E. two intermediate parts connecting the two stator parts at opposite sides of the pole shoes, the intermediate parts being magnetically saturated when the stator winding is energized,

F. the two stator parts and the two intermediate parts forming a single one-piece unit,

G. the length of the permanent magnet of the rotor being greater than the effective length of the stator,

H. each pole shoe being provided with a semicircular recess, concentric with the rotor shaft and serving as a main pole, and

I. on at least one stator front side, a metal sheet with at least one extension protruding radially toward the rotor and beyond the recess and serving as auxiliary pole.

4,041,337

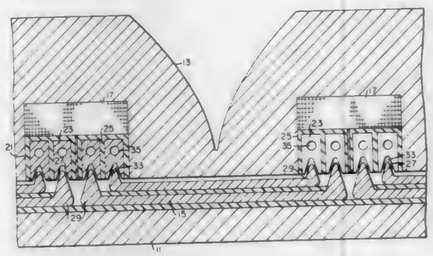
SEGMENTED MAGNET HOMOPOLAR DYNAMOELECTRIC MACHINES HAVING FLUID COOLED LIQUID METAL CURRENT COLLECTING ZONES

Cecil J. Mole, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 338,489, March 6, 1973, now Defensive Publication No. T920,005. This application Aug. 19, 1975, Ser. No. 605,964

Int. Cl.[2] H02K *31/00*

U.S. Cl. 310—178 12 Claims



1. A homopolar dynamoelectric machine comprising:

a generally cylindrical shell of ferromagnetic material;

a generally cylindrical core of ferromagnetic material concentric with said shell, said core and said shell mounted for relative rotation therebetween;

a plurality of electrical conductors supported by said shell and spaced at intervals about the circumference thereof, said conductors being arranged in a plurality of axially displaced sets, said conductors being separated by insulation from said shell;

excitation coils located in said core to form a plurality of magnetic poles, on such magnetic pole adjacent each of said sets of conductors;

current collecting projecting rings electrically connected to the ends of said conductors; and,

means for collecting current from said current collecting projecting rings.

4,041,338

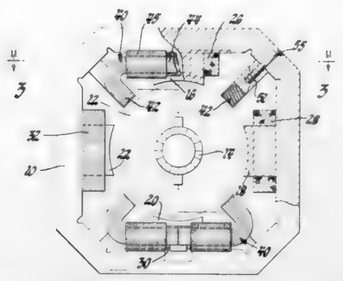
DIRECT CURRENT DYNAMOELECTRIC MACHINE COMMUTATING POLE ASSEMBLY

John E. Madsen, Lemont, and Walter Drabik, Downers Grove, both of Ill., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1975, Ser. No. 633,826

Int. Cl.[2] H02K *1/10*

U.S. Cl. 310—186 1 Claim



1. In a direct current dynamoelectric machine having an armature assembly including a commutator through which electrical power is supplied to the armature windings mounted for rotation within the space defined by the interior surface of a frame member and a plurality of salient field pole assemblies extending radially inwardly from the interior surface of the frame member and terminating adjacent the armature, a plurality of commutating pole assemblies for improving armature commutation, each of said commutating pole assemblies comprising:

a commutating pole piece supported by said frame member made up of a plurality of laminations of a magnetic material having a first elongated portion located in the space between adjacent said field pole assemblies and extending in a direction axial to said armature and an integral second portion extending substantially normal to said elongated first portion, and

an electrical commutating winding positioned upon said integral second portion of said commutating pole piece.

4,041,339

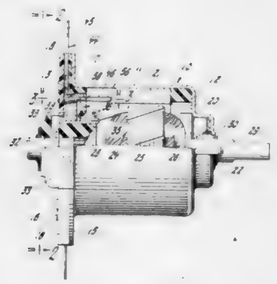
DYNAMOELECTRIC MACHINE WITH BRUSH HOLDING STRUCTURE

David A. Huber, Trotwood, and Roy C. Schoen, West Milton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 10, 1975, Ser. No. 630,212

Int. Cl.[2] H02K *13/00*

U.S. Cl. 310—239 1 Claim



1. In a dynamoelectric machine having a rotor in a case with a drum shaped commutator at one end thereof, brush holding apparatus adapted for easy installation and removal of brushes and comprising:

a member forming one axial end of the case and receiving one end of the rotor rotatably therein, the member having a pair of diametrically opposed brush boxes formed therein, each brush box having a radial opening adjacent the commutator and an axial opening to the outside of the case, whereby brushes can be inserted into the brush boxes from outside the case and then biased at a right angle from the direction of insertion into engagement with the commutator;

a pair of brushes, one within each brush box insertable and removable through the axial opening and engageable with the commutator through the radial opening, each brush having a spring contacting surface on the side opposite the commutator, the spring contacting surface slanting away from the commutator axis in the direction of the inside of the machine;

a pair of brush connectors, one for each brush, each brush connector comprising a terminal portion engaging the axial case member adjacent a brush box and projecting outward therefrom to define a external electrical connection, the terminal portion further including a right angle bend projecting into the associated brush box and engaging the side thereof opposite the commutator, the brush connector further including a spring member having a portion attached to the terminal portion, a first leg projecting axially into the brush box adjacent the right angle bend of the terminal portion and a second leg joined to the first leg at the end thereof opposite the connecting portion in an acute-angled apex to form a V-shaped spring between the right angle bend and the brush, the second leg engaging the spring contacting surface of the brush, the shallow slant of the spring-engaging surface transmitting a large radial component of force to bias the brush against the commutator and a smaller axial component of force to help retain the brush within the brush box.

4,041,340

BRUSHLESS ALTERNATOR

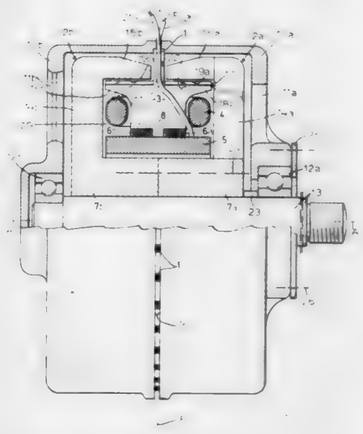
Ivan Mrcun, Kajuhova 4, Domzale, Yugoslavia (61230)

Filed Oct. 22, 1975, Ser. No. 624,933

Claims priority, application Yugoslavia, Oct. 22, 1974, 2819/74; Oct. 22, 1974, 2820/74

Int. Cl.[2] H02K *1/22*

U.S. Cl. 310—263 10 Claims



1. In an electrical machine comprising two relatively rotatable members centered on a common axis, one of said members having a magnetically permeable body which includes a magnetized hub and two axially spaced annular arrays of pole

pieces rigid with opposite extremities of said hub, the other of said members including a set of peripherally spaced teeth interconnected by an annular yoke and positioned for magnetic interaction with said pole pieces, said yoke and said teeth being magnetically permeable, and armature windings surrounding said teeth, the pole pieces of one array having substantially axially extending faces on one side of a transverse midplane and being peripherally offset from the oppositely polarized pole pieces of the other array, the latter having substantially axially extending faces on the other side of said midplane,

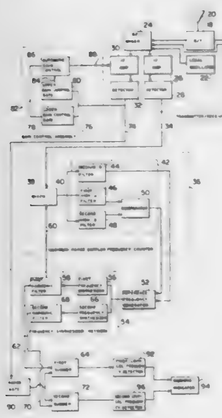
the improvement wherein said hub and said pole pieces together define an annular space surrounding said hub, said annular space being bounded in part by said axially extending faces, said teeth having major portions interconnected by said yoke in said annular space and surrounded by said armature windings.

4,041,341

DOPPLER-RADAR TERRAIN-CLEARANCE WARNING SYSTEM

Gerald E. Hart, Box 127 LOW, Locust Grove, Va. 22508

Filed May 25, 1976, Ser. No. 689,896
Int. Cl.² G01S 9/22; G01C 5/00
U.S. Cl. 343—5 R **7 Claims**



7. A method for utilizing the doppler radar system of an aircraft to determine if terrain clearance drops below a predetermined aircraft safety clearance at a known slant range comprising the steps of:

transmitting radar pulses;

receiving and determining the highest doppler frequency of said radar return pulses

generating a reference frequency related to said highest doppler frequency;

synthesizing from said reference frequency a frequency related to the computed doppler frequency for said predetermined aircraft safety clearance;

receiving and determining all doppler frequencies from radar return pulses received from within a predetermined slant range and rejecting all other frequencies;

summing said synthesized frequency and said doppler frequencies from within said predetermined slant range;

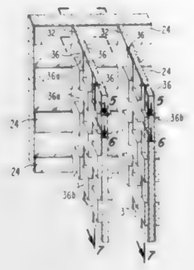
detecting if said summed frequency reaches said predetermined frequency related to said predetermined aircraft safety clearance to provide an indication if terrain clearance drops below said predetermined aircraft safety clearance.

4,041,342

ELECTRON MULTIPLIER WITH BEAM CONFINEMENT STRUCTURE

Carmen Anthony Catanese, Rocky Hill, and Scott Allen Keneman, Trenton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,358
Int. Cl.² H01J 43/18, 43/10
U.S. Cl. 313—105 R **18 Claims**



1. An electron multiplier, comprising:

at least two spaced substrates of electrically insulative material;

a cathode at one end of said substrates; and

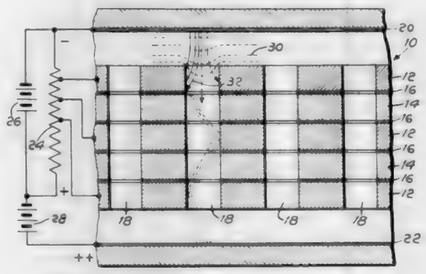
a plurality of parallel dynodes on the surfaces of said substrates which face each other, said dynodes on one of said surfaces being in staggered relation to said dynodes on the other of said surfaces with at least some of said dynodes including a nonplanar structure periodically along the length thereof, said nonplanar structure forming channels extending from said cathode and traversing said parallel dynodes and comprising confinement bumps which are adjacent to active dynode areas.

4,041,343

ELECTRON MULTIPLIER MOSAIC

Richard K. Orthuber, Sepulveda, Canada, assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed July 12, 1963, Ser. No. 294,764
Int. Cl.² H01J 43/00
U.S. Cl. 313—105 R **13 Claims**



1. An electron multiplier mosaic structure comprising:

a plurality of alternate layers of uniform metallic and insulating material;

an intermediate coating of metallic bonding material joining each adjacent layer in a solid unitary structure;

a plurality of closely spaced apertures formed through said layers and arranged in a regular pattern on the opposite ends of said structure, each said aperture forming a continuous smooth interior surface between said ends, the metallic layer portions of said surface having secondary emission characteristics.

4,041,344

ELLIPSOIDAL REFLECTOR LAMP

Frank F. LaGiusa, Cleveland Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 30, 1976, Ser. No. 718,525
Int. Cl.² H01J 5/02, 5/08; H01K 1/32
U.S. Cl. 313—113 **6 Claims**



1. An ellipsoidal reflector lamp characterized by low brightness and high illumination comprising:

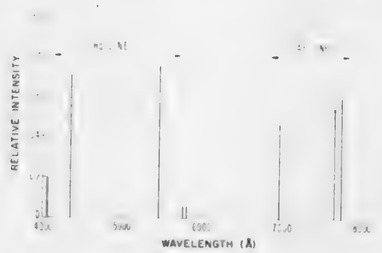
a blown glass envelope having an ellipsoidal, specular surface and a translucent face, wherein the minor diameter of the ellipsoid defines the approximate boundary between said surface and said translucent face, said ellipsoid has an eccentricity of from 0.66 to 0.88 inclusive, said face is positioned no further that $\frac{1}{4}$ d from the intersection of the axes of the ellipsoid, where d is the distance from said intersection to a focus of the ellipsoid, and wherein direct and reflected light are produced within approximately equal solid angles.

4,041,345

BLUE COLOR AC GAS DISCHARGE DISPLAY PANEL AND METHOD

Omesh Sahni, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,593
Int. Cl.² H01J 61/12
U.S. Cl. 313—225 **15 Claims**



1. In an AC gas discharge display panel having a luminous ionizable gaseous medium therein and an open panel structure exhibiting characteristics such that said gaseous medium may periodically be driven by the drive voltage therefor to a substantially zero voltage condition thereacross, the improvement comprising an argon-based gaseous medium seeded with mercury vapor to provide a luminous gaseous medium which exhibits blue-green emission due to the efficient recombination of mercury ions during said zero voltage condition.

4,041,346

ELECTROCHEMICAL GENERATION OF FIELD DESORPTION EMITTERS

Maurice M. Bursey, Chapel Hill, N.C.; Deborah M. Hinton, Champaign, Ill.; Martin C. Sammons, Cincinnati, Ohio, and R. Mark Wightman, Lawrence, Kans., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 624,102, Oct. 22, 1975. This application May 13, 1976, Ser. No. 686,646
Int. Cl.² H01J 1/16, 19/10
U.S. Cl. 313—336 **2 Claims**

1. A field desorption emitter comprising:

two metal rod elements;

an insulator which mechanically positions and electrically isolates the two rod elements;

a small diameter wire attached to one end of each of said elements; and

a coating of a plurality of tree-like metal dendrites electrochemically deposited using a plurality of short duration electrical pulses on said wire in a generally radially outward direction having

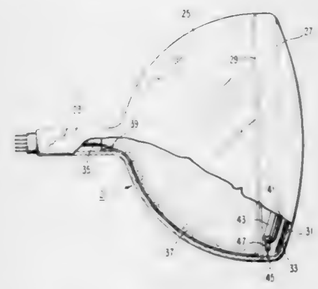
a length greater than the diameter of said wire, said metal dendrites being formed from a material selected from the group consisting of silver, nickel, cobalt, manganese, rhenium, niobium, tantalum, molybdenum and tungsten.

4,041,347

CATHODE-RAY TUBE HAVING CONDUCTIVE INTERNAL COATING EXHIBITING REDUCED GAS ABSORPTION

Samuel Broughton Deal, Lancaster, and Donald Walter Bartch, Columbia, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,681
Int. Cl.² H01J 29/46
U.S. Cl. 313—450 **10 Claims**

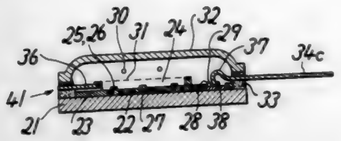


1. A cathode-ray tube comprising an evacuated envelope and a conductive coating adhered to at least a portion of the interior walls of said envelope, said coating comprising carbon particles and a silicate binder consisting essentially of about 25 to 45 weight percent lithium silicate and about 75 to 55 weight percent of at least one member of the group consisting of sodium silicate and potassium silicate, said coating having a point-to-point electrical resistance of about 200 to 2,000 ohms per inch.

4,041,348
MULTI-FIGURE FLUORESCENT DISPLAY TUBE WITH ELECTRICAL LEAD-INS HAVING INNER SPRING CONTACT PORTIONS

Goro Eto, and Yukihiko Utamura, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Chiba, Japan

Division of Ser. No. 657,590, Feb. 12, 1976. This application Aug. 4, 1976, Ser. No. 711,577
Claims priority, application Japan, Feb. 13, 1975, 50-017476
Int. Cl.² H01J *1/72, 63/02*
U.S. Cl. 313—497 **1 Claim**



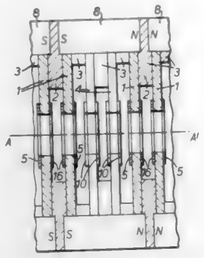
1. A multi-figure fluorescent display tube comprising:
an anode plate and an upper cover connected to each other through a seal portion therebetween thereby forming a casing,
the anode plate having in a laminated state a substrate made of insulating material at the bottom thereof,
a plurality of wiring films coated on the substrate,
an insulating film coated on the substrate,
a plurality of segment electrodes forming a plurality of anode display portions provided in parallel,
a fluorescent material layer provided on each of the segment electrodes,
the wiring films electrically connected respective adjacent common segment electrodes,
a plurality of conductive sections provided on the substrate with each connecting respective common segment electrodes through the wiring films,
cathodes disposed opposite to the anode display portions,
control electrodes disposed between the cathodes and the anode display portions,
lead-in wires for a cathode terminal connected to the cathodes and extended in an air-tight manner through the seal portion of the casing,
lead-in wires for a control electrode terminal connected to the control electrodes and extended in an air-tight manner through the seal portion of the casing,
a plurality of lead-in wires for the segment electrode terminal extended in an air-tight manner through the seal portion of the casing,
each of the lead-in wires for the segment electrode terminal having a contact at the end thereof inside the casing through a spring portion,
the contact coming in contact with each of the conductive sections by the action of the spring portion thereby establishing an electrical connection.

4,041,349
TRAVELLING WAVE TUBES

Peter Robert Davis, Chelmsford, England, assignor to English Electric Valve Company Limited, England

Filed Feb. 17, 1976, Ser. No. 658,826
Int. Cl.² H01J *25/34*
U.S. Cl. 315—3.5 **4 Claims**

1. A coupled cavity travelling wave tube including a stack of alternately slotted and apertured plates assembled to provide a plurality of successive coupled cavities coupled for the fundamental mode of operation; a magnetic pole piece provided at each nth cavity (where n is an integer greater than 2), which pole piece consists of an apertured plate made of ferromagnetic material and positioned between a pair of thinner slotted plates which also consist of ferromagnetic material and which have regions extending the ferromagnetic path, provided by the first mentioned apertured plate, close to the electron beam path of the tube, each pair of said thinner slotted plates being spaced apart from each other by the thickness of the first mentioned apertured plate to define a cavity between them; a periodic permenent magnetic focussing structure surrounding said stack and consisting of ring shaped magnets which provide permanent magnetic fields through said pole pieces to said electron beam path,

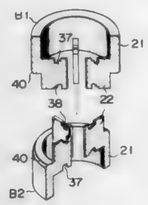


means axially thickening the central portions of said slotted plates in surrounding relation to the apertures of said apertured plates.

4,041,350
MAGNETRON ANODE AND A METHOD FOR MANUFACTURING THE SAME

Hisao Shitara, Hiratsuka, and Takada Koosuke, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 14, 1975, Ser. No. 631,913
Claims priority, application Japan, Nov. 14, 1974, 49-131273; Oct. 7, 1975, 50-120282
Int. Cl.² H01J *25/587*
U.S. Cl. 315—39.75 **5 Claims**

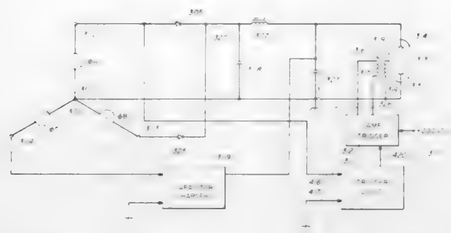


1. A magnetron anode comprising: first and second divided anode cylinders concentrically joined together with their contacting end faces perpendicular to the cylinder axis, a plurality of substantially rectangular vanes molded to the inner periphery of each divided anode cylinder in number equal to half the number of all the vanes of the magnetron anode, arranged at prescribed intervals in the circumferential direction of the divided anode cylinder, and extending in the radial direction of the divided anode cylinder from the inner periphery of the same and in the axial direction of the divided anode partly from an end thereof, and means for integrally joining together said first and second divided anode cylinders in a state wherein the vanes of one divided anode cylinder are interdigitated with those of the other divided anode cylinder and bonded to the inner periphery of the other divided anode cylinder so as to have their upper and lower edges placed in a plane perpendicular to the cylinder axis.

4,041,351
FLASH LAMP POWER SUPPLY WITH DIRECT ENERGIZATION FROM AN AC POWER SUPPLY SOURCE

David R. Whitehouse, Weston, and David W. Hartshorn, Framingham, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 470,697, May 16, 1974, abandoned, which is a division of Ser. No. 359,827, May 14, 1973, Pat. No. 3,896,396. This application Aug. 4, 1975, Ser. No. 601,908
Int. Cl.² H05B *41/22*
U.S. Cl. 315—205 **14 Claims**

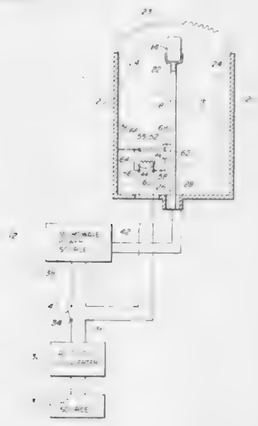


1. In combination:
uncontrolled rectifying means for coupling one or more means for producing radiation to a source of alternating power, said radiation producing means operating upon application thereto of a trigger signal, and said radiation producing means drawing the major portion of operating power directly from said alternating power source with no substantial energy storage means located therebetween; and
means for producing said trigger signal at a predetermined phase angle of said alternating power source.

4,041,352
AUTOMATIC STARTING SYSTEM FOR SOLID STATE POWERED ELECTRODELESS LAMPS

William H. McNeill, Carlisle; Paul O. Haugsjaa, Acton; Joseph Lech, Westford, and Robert J. Regan, Needham, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed July 14, 1976, Ser. No. 705,323
Int. Cl.² H05B *41/16, 41/24*
U.S. Cl. 315—248 **5 Claims**

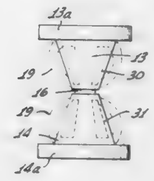


1. In an electrodeless light source having a source of power at a microwave frequency, an electrodeless lamp having an envelope made of a light-transmitting material and a volatile fill material emitting light upon breakdown and excitation and a termination fixture having an inner conductor and an outer conductor disposed around the inner conductor, the conductors having first ends associated with the lamp and second ends coupled to the source so that the microwave power terminates at the lamp to cause breakdown and excitation of the fill material, a starting control circuit comprising:
a. the source including a dc power source and a microwave power source receiving the dc power for providing microwave power in an amount related to the amount of dc power received by the dc power source, the output of the microwave power source being coupled to the inner and outer conductors,
b. switch means for controlling the application of dc power to the microwave power source,
c. a UV light source disposed near the lamp and coupled in series between the dc power source and the microwave power source to emit UV light upon actuation of the switch means to assist in starting the lamp, the UV source upon emission of light decreasing the amount of dc power coupled to the microwave power source to reduce its output as the lamp is started, and
d. means responsive to a preselected amount of heat from the UV source for providing a shunt path for the dc power to bypass the UV source and to apply maximum power to the microwave power source.

4,041,353
GLOW DISCHARGE METHOD AND APPARATUS

Alan S. Penfold, Playa del Rey, and John A. Thornton, Los Angeles, both of Calif., assignors to Telic Corporation, Santa Monica, Calif.

Continuation of Ser. No. 254,504, May 18, 1972, abandoned, and a continuation-in-part of Ser. No. 178,240, Sept. 7, 1971, Pat. No. 3,884,793. This application Dec. 23, 1974, Ser. No. 535,429
Int. Cl.² C23C *15/00;* **H01J** *17/04, 17/14;* **H05R** *41/24*
U.S. Cl. 315—267 **56 Claims**



1. A method of generating a glow discharge, comprising the steps of:
supporting an electrode assembly within a working gas environment;
applying electrical voltage to said electrode assembly; and
forming a magnetic field which defines, together with said electrode assembly, a plurality of traps for containing substantially all electrons emitted from said electrode assembly and having sufficient energy to further ionize said working gas.

4,041,354
PINCUSHION CORRECTION CIRCUIT

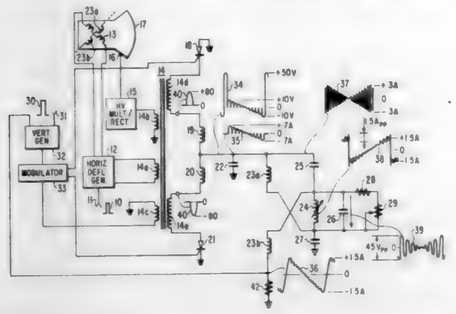
Peter Eduard Haferl, Zurich, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 618,842
Int. Cl.² H01J *29/70, 29/76*
U.S. Cl. 315—371 **6 Claims**

1. A pincushion correction circuit comprising:
a first capacitor;
a vertical deflection winding coupled in parallel with said capacitor;
means coupled to said first capacitor for charging said capacitor with respective decreasing and increasing amounts

of horizontal rate energy during respective first and second scan portions of each vertical deflection interval, the discharge of which capacitor providing a substantially linear vertical rate sawtooth current in said winding;

a resonant circuit tuned to approximately said horizontal



rate coupled to said means, for receiving said decreasing and increasing amounts of horizontal rate energy; and

a portion of said resonant circuit serially coupled with said vertical winding for providing a generally parabolic horizontal rate current component in said winding of such a phase as to reduce top and bottom pincushion distortion.

4,041,355

HIGH VOLTAGE GENERATING CIRCUIT

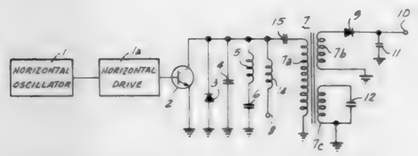
Toshio Onodera, Yokosuka, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 16, 1975, Ser. No. 623,107

Claims priority, application Japan, Oct. 21, 1974, 49-127007[U]

Int. Cl.² H01J *29/70*

U.S. Cl. 315—411 **5 Claims**



1. A high voltage generating circuit comprising:

a horizontal oscillator developing an output signal at the horizontal sweep frequency;

a flyback transformer;

means for coupling the horizontal oscillator output to the primary of said flyback transformer;

the primary and secondary windings of said flyback transformer being coupled loosely to provide substantial isolation therebetween;

circuit means causing the input resonant frequency of said flyback transformer to be in the vicinity of and higher than the frequency of said horizontal oscillator; and

said flyback transformer having a separate resonant circuit associated with its primary winding and having a resonant frequency in the vicinity of and lower than that of said horizontal oscillator.

4,041,356

AIR-BREAK CIRCUIT INTERRUPTER HAVING MAGNETICALLY-ASSISTED ARC-DIVIDING ELECTRODES

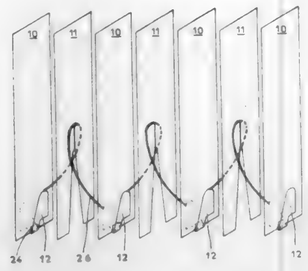
Gaston Buisson, St. Egreve, and Jacques Hennebert, Grenoble, both of France, assignors to Merlin Gerin, Grenoble, France

Filed Dec. 20, 1974, Ser. No. 535,116

Claims priority, application France, Dec. 20, 1973, 73.45892

Int. Cl.² H02H *7/22*

U.S. Cl. 361—14 **3 Claims**



1. An air-break circuit interrupter comprising:

a plurality of stacked plates of insulating material shaped to define therebetween a plurality of shallow arc-extinguishing chambers;

a plurality of electrodes straddling the lower edge of said plates, respectively, and having a generally U-shaped base portion interconnecting a pair of upwardly diverging flat arcing wings extending in said chambers in such a manner that an arc drawn below said plates transversely thereof may eventually divide into a number of elementary arcs upon contact with the lowermost part of said base portion of said electrodes, the diverging wings of adjacent electrodes extending in each chamber causing the corresponding elementary arc to develop in said chamber in an expanding loop so that the path of the current flowing in said electrodes and in said elementary arcs develops substantially in the form of an expanding helix; and

a plurality, one for each electrode, of inserts of ferromagnetic material sandwiched between the upstanding parts of said U-shaped base portion of said electrodes thereby to enhance the migratory movement of the roots of said elementary arcs attached to said electrodes from said lowermost part along said upstanding parts toward said wings.

4,041,357

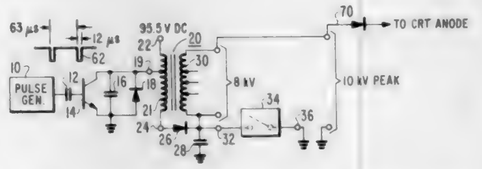
HIGH VOLTAGE PROTECTION CIRCUIT

Charles Albert Clark, Jr., Chatsworth, Calif., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,587

Int. Cl.² H02H *3/00*

U.S. Cl. 361—6 **7 Claims**



1. In a high voltage power supply having high impedance output terminals across which is impressed a high voltage, the improvement for controlling the output voltage of said power supply comprising;

normally open switch means in shunting relationship with said terminals; and

means responsive to a change beyond some given amount in an environmental parameter for closing said switch to reduce said high voltage.

4,041,358

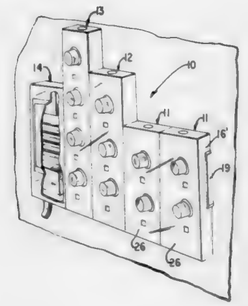
METER MODULE ASSEMBLY FOR A METER PANEL

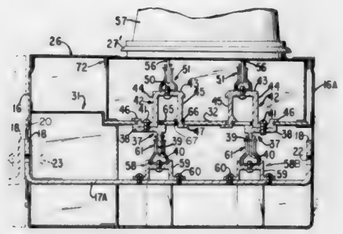
James T. Donahue; Kenneth M. Hall, both of Manchester, and Arthur J. Worth, Hooksett, all of N.H., assignors to Sola Basic Industries, Inc., Milwaukee, Wis.

Filed July 23, 1975, Ser. No. 598,543

Int. Cl.² H02B *9/00*

U.S. Cl. 361—365 **18 Claims**





1. In a meter panel comprising a plurality of meter modules, each meter module including an enclosure having a front face opening and side walls, a plurality of parallel horizontal line buses extending within said enclosure between said side walls, means at both ends of each said line bus at said side walls interconnecting a line bus to a corresponding line bus in said adjacent meter module, a meter section removably mounted in each said front face opening, a plurality of vertical line buses within each said meter section electrically connected to said horizontal line buses, meter sockets in a forward face of each said meter section, electrical contacts within said meter sockets electrically connected to a meter mounted within each said meter socket, and electrical connecting means selectively mounted on and connected with said horizontal line buses to provide the desired phasing, said electrical connecting means holding said meter sections in place.

4,041,359

METHOD OF MAKING AN ELECTROLYTIC CAPACITOR AND ELECTROLYTIC CAPACITOR MADE THEREBY

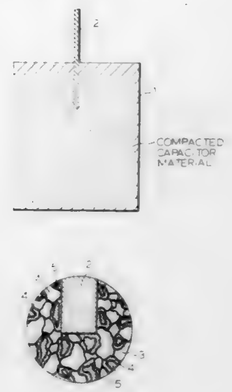
Wataru Mizushima; Koreaki Nakata, both of Hirakata; Nobuhiro Hamasaki, Neyagawa, and Yoshio Iida, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Continuation of Ser. No. 419,965, Nov. 29, 1973, abandoned. This application June 16, 1975, Ser. No. 586,977

Claims priority, application Japan, Dec. 6, 1972, 47-122764; Dec. 28, 1972, 48-3428; Jan. 20, 1973, 48-8860; Jan. 20, 1973, 48-8861; Jan. 20, 1973, 48-8862; Jan. 20, 1973, 48-8863

Int. Cl.² H01G *9/00*

U.S. Cl. 361—433 **12 Claims**



1. An electrolytic capacitor comprising a compact unsintered body as an anode structure, said body having particles of a tantalum metal powder, each particle being composed of plural intertwined particle elements which serve as plural protruding parts protruding from the particle, and an electrically insulating lubricant-binder material selected from the group consisting of Al_2O_3, SiO_2, MgF_2, CaF_2, MoS_2, $BaSO_4$, glass, quartz and fluoro ethylene polymer, said metal powder and lubricant-binder material being compressed together to an extent sufficient to bind said particles securely to each other; a conductive wire partially embedded in said compact body and in electrical contact with some of the particles of said valve metal powder; a dielectric insulating film on the surface of the particles of said valve metal powder and the embedded part of said conductive wire, said body having interstices therein among the bound together particles, the lubricant-binder material, the embedded part of said conductive wire and said dielectric insulating film; a conductive material substantially filling said interstices and covering the outer surface of said compact body; and a further conductive material on said compact body which is in electrical contact with said conductive material.

4,041,360

CONTROL CIRCUIT FOR AN ELECTRIC MOTOR

George E. Morris, Sterling, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Filed Oct. 15, 1975, Ser. No. 622,658

Int. Cl.² H02P *1/44*

U.S. Cl. 318—221 R **22 Claims**

1. A control circuit for an electric motor operable generally at three different speeds and having three windings serially connected together in a main winding circuit with an end of one of the windings being adapted for connection with one side of a power source, the control circuit comprising a relay device including first and second contacts for connection with the winding circuit across another of the windings, switching means having a generally at-rest position in making engage-

ment with said first contact so as to render the three windings effective in the main winding circuit, a pole piece adapted to be magnetized for attracting said switching means into making engagement with said second contact so as to render the one winding and the third winding effective in the main winding circuit, and a coil associated with said pole piece for magnetizing it with said coil having one end thereof adapted for connection with the one side of the power source; and a temperature condition responsive device including a third contact connected with the other end of said coil, a first switch blade adapted for connection with the other side of the power source and having a generally at-rest position in engagement with said third contact, said pole piece being magnetized by said coil to attract said switching means into engagement with said second contact when said first switch blade is engaged with said third contact, a fourth contact for connection with the winding circuit between the one winding and the third winding, a fifth contact connected with said switching means, a second switch blade for engagement with said fourth and fifth contacts having a generally at-rest position in engagement with said fourth



contact and adapted for connection with the other side of the power source, the one winding being energized to effect operation of the motor at a first speed when said first and second switch blades are respectively engaged with said third and fourth contacts and said switching means is engaged with said second contact, and means actuated generally upon the occurrence of one preselected temperature condition for driving said second switch blade into engagement with said fifth contact when said first switch blade is engaged with said third contact to connect the one winding and the third winding across the power supply thereby to effect operation of the motor at a second speed and said driving means being further actuated upon the occurrence of another preselected temperature condition to drive said first switch blade toward disengagement from said third contact when said second switch blade is engaged with said fifth contact to connect the three windings across the power source thereby to effect operation of the motor at a third speed, said switching means returning to its generally at-rest position upon demagnetization of said pole piece when said first switch blade is disengaged from said third contact.

4,041,361

CONSTANT TORQUE INDUCTION MOTOR DRIVE SYSTEM

Edward P. Cornell, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,951
Int. Cl.[2] H02K *17/02*
U.S. Cl. 318—227 **3 Claims**

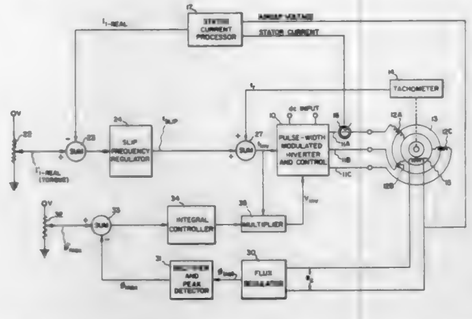
1. A constant torque induction motor control system comprising

a power converter for supplying adjustable frequency and amplitude alternating excitation voltage to a plurality of stator supply lines for connection to the stator windings of an induction motor, said motor having a stator and a rotor with an airgap therebetween,

voltage sensing means comprising a search coil for sensing the instantaneous rotor-stator airgap voltage, speed sensing means for sensing the rotor frequency, and current sensing means for sensing the instantaneous per phase stator supply line current and for respectively generating sensor signals representative thereof,

stator current processor means for deriving directly from only said airgap voltage and stator current sensor signals a sensed real stator current with respect to airgap voltage signal, and

first feedback control means responsive to the summation of a real stator current command signal and said sensed real stator current with respect to airgap voltage signal for generating a variable slip frequency signal, second feedback control means responsive to the summation of said rotor frequency sensor signal and slip frequency signal for



generating a first control signal which determines the frequency of the alternating excitation voltage supplied by said converter, and third feedback control means responsive to the summation of an airgap flux command signal and a sensed airgap flux signal derived from said airgap voltage sensor signal for generating a second control signal which determines the amplitude of the alternating excitation voltage supplied by said converter, whereby the airgap power and flux are maintained constant for selected values of said command signals,

said stator current processor means being comprised by a multiplier having as inputs said airgap voltage and stator current sensor signals and generating an instantaneous power signal, means for generating therefrom an average power signal, means for generating a root-mean-square airgap voltage signal, and a divider for dividing said average power signal by said root-mean-square airgap voltage signal to derive said sensed real stator current with respect to airgap voltage signal.

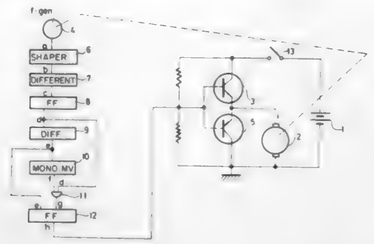
4,041,362

MOTOR CONTROL SYSTEM

Toshikazu Ichiyanagi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 324,809, Jan. 18, 1973, abandoned, which is a continuation of Ser. No. 107,809, Jan. 19, 1971, abandoned. This application Jan. 23, 1975, Ser. No. 543,321
Claims priority, application Japan, Jan. 23, 1970, 45-6145; Mar. 13, 1970, 45-21686; Mar. 13, 1970, 45-21687; Apr. 3, 1970, 45-28464; Apr. 24, 1970, 45-35187; Nov. 14, 1970, 45-100611; Nov. 14, 1970, 45-100612; May 9, 1970, 45-45265[U]
Int. Cl.[2] G05B *5/00*; H02K *27/20*; H02P *5/00*
U.S. Cl. 318—318 **15 Claims**

2. A control system for driving an electric motor at a predetermined rotational speed, comprising a power source for driving the electric motor, switching means connected between the motor and the power source for applying discontinuous pulse driving currents thereto from the power source, the motor and switching means being connected in series with the power source, tacho-generator means for producing an output corresponding to the rotational speed of the motor, analog-to-digital transforming means responsive to said tacho-generator means and coupled with said switching means for transforming an analog signal of the output of said tacho-generator means to digital signals to cause said switching means to discontinuously switch current from said power source to the motor so as to maintain the electric motor at a desired rotational speed wherein said analog-to-digital transforming means including a shaper circuit for producing square waves from said tacho-



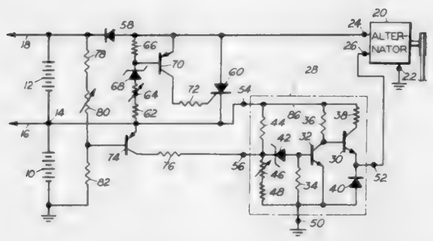
generator means, a bistable circuit responsive to the output of said shaper circuit, a monostable circuit responsive to said bistable circuit so as to be synchronized therewith and producing pulses in each cycle having a constant time period, a second bistable circuit for producing a substantially constant output when the cyclical period of the output of said first bistable circuit is less than a predetermined relation to the constant time period and for producing an asymmetrical pulse output when the cyclical period at the output of said first bistable circuit is greater than the constant time period.

4,041,363

DUAL BATTERY CHARGE CONTROL

Ralph E. Scheidler, 12712 SE. Flavel St., Portland, Oreg. 97236

Continuation of Ser. No. 477,593, June 10, 1974, abandoned. This application Sept. 19, 1975, Ser. No. 614,850
Int. Cl.[2] H02J *7/14*
U.S. Cl. 320—15 **12 Claims**



1. A charge control device for external connection between first and second series connected batteries and the single output terminal of a voltage regulated, DC output, generating means, comprising:

blocking diode means normally connecting the output terminal of the generator to that pole of the first of the batteries remote from the junction between the two so as to charge the pair of batteries in series;

latchable electrically actuable switch means, operable when actuated to establish a low resistance direct current path between the output terminal of the generating means and the junction between the first and second batteries;

electrical switch actuator means arranged for connection across the first of the batteries and responsive to a predetermined voltage drop across the first battery to actuate said switch means;

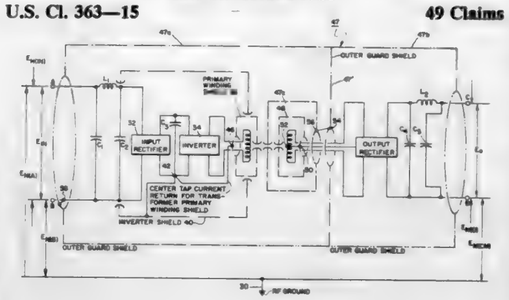
said switch means latching on after actuation to maintain said low resistance direct current path between the generating means output terminal and the junction between the batteries so as to charge only the second battery of the pair during the flow of direct current in said path and irrespective of further voltage variations in the first battery.

4,041,364

ELECTROMAGNETICALLY SHIELDED ELECTRICAL CONVERTER AND AN IMPROVED ELECTROMAGNETIC SHIELD THEREFOR

Harold A. Gauper, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 555,425, March 5, 1975, abandoned. This application Feb. 3, 1977, Ser. No. 654,740
Int. Cl.[2] H02M *3/22*
U.S. Cl. 363—15 **49 Claims**



1. An electromagnetic interference shield for electrically enclosing a source of electromagnetic interference signals and thus substantially reducing the emanation of such signals beyond the enclosure boundary, said electromagnetic interference shield comprising:

an electrically conductive surface defining the boundary of a substantially enclosed volume for containing said source therewithin; and

an electrical center tap connection electrically connected to a first predetermined electrical reference point,

said electrical center tap connection being located at a predetermined null point on said surface where voltages induced in said surface by said electromagnetic interference signals are substantially balanced out whereby injection of such induced interference voltages to said first reference point are substantially reduced.

4,041,365

CIRCUIT FOR DETECTING A MALFUNCTION IN AN INVERTER

Steven C. Peak, and Thomas E. Anderson, both of Normal, Ill., assignors to General Electric Company, New York, N.Y.

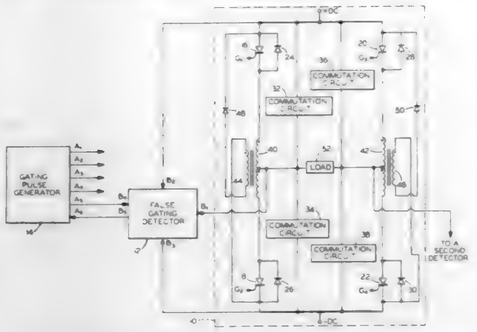
Filed Sept. 20, 1976, Ser. No. 724,803
Int. Cl.[2] H02M *1/18*
U.S. Cl. 363—58 **5 Claims**

1. A circuit for detecting a malfunction in a self-commutating inverter including a series combination of at least first and second gate controlled rectifiers and a commutating interval current limiting center tapped reactor connected in series with and interposed between said rectifiers, and commutating means connected to the center tap of said reactor, said series combination being connected across a direct current source of potential, comprising:

a. means coupled to the center tap of said reactor for generating a first signal upon detecting and for the duration of an interval when both of said rectifiers are ON;

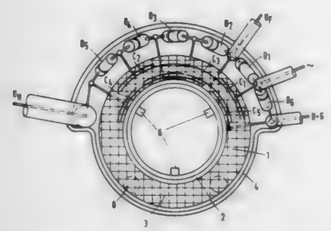
b. means, responsive to a first pulse used to initiate the interval when either of said first and second rectifiers is to be ON,, for generating a second signal having a duration greater than the normal duration of said first signal; and

c. means responsive to said first and second signals for generating a control signal to cause cessation in the operating of



said inverter if said second signal is absent at any time during the occurrence of said first signal.

4,041,366
VOLTAGE MULTIPLIER ARRANGEMENT
Werner Bauer, Nurnberg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Feb. 23, 1976, Ser. No. 660,528
Int. Cl.² H02M *7/10*
U.S. Cl. 363—61 **18 Claims**



1. A voltage multiplier arrangement having a multiplicity of interconnected diodes and capacitors, including input and output connections to both a.c. and d.c. terminals wherein said capacitors are formed into a tubular multiple high voltage capacitor roll and said diodes are arranged in zigzag form along the outer circumference of said roll.

4,041,367
APPARATUS FOR GENERATING ALTERNATING CURRENTS OF ACCURATELY PREDETERMINED WAVEFORM
Bernard Samuel Gold, Cheam, and Peter Alan Smithers, Crawley, both of England, assignors to Roband Electronics Limited, Horley, England
Filed Feb. 17, 1976, Ser. No. 658,742
Claims priority, application United Kingdom, Feb. 21, 1975, 7490/75
Int. Cl.² H02P *13/20*
U.S. Cl. 363—97 **5 Claims**

1. A circuit arrangement for providing to an electrical load an a.-c. supply of predetermined voltage waveform; said circuit arrangement comprising, in combination:

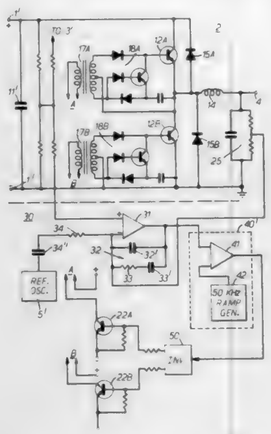
direct current supply means having positive and negative poles;

reference generator means developing reference alternating voltages of said predetermined waveform in respective phases corresponding to the number of said load terminals;

and comprising, for each said load terminal, control means comprising amplifier means having an input and an output means developing a monitor signal representative of the potential at a said load terminal, and means applying said monitor signal and a respective said reference alternating voltage in opposition to said amplifier input thereby developing at said amplifier output an error signal representing the difference between said monitor and reference signals;

ramp generator means developing a cyclically repetitive ramp voltage at a repetition rate that is a high multiple of the frequency of said reference voltages;

modulator means comprising a comparator amplifier having two inputs and an output and yielding an output signal at said output when a signal applied to a first said input exceeds a signal applied to the other said input, and means applying said ramp voltage to said first comparator input and said error signal to said second comparator input



whereby said comparator provides at its output a pulse train that is pulse-duration modulated in accordance with the magnitude of said error signal;

inverter means having an input and two outputs and yielding at said two outputs in response to a pulse train applied to said input respective direct and inverter pulse trains in each of which transitions in a first direction are delayed with respect to corresponding transitions in the other said pulse train;

means applying said comparator output signal to said inverter input;

respective first and second pulse driven transistor switching means coupled each said pole of said direct current supply means with said load terminal; and

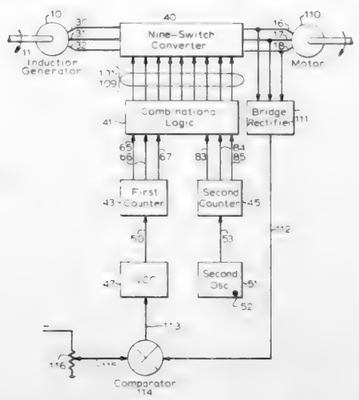
means applying said direct and inverted pulse trains respectively to drive said first and second switching means.

4,041,368
THREE-PHASE, QUASI-SQUARE WAVE VSCF INDUCTION GENERATOR SYSTEM
David James Gritter, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jan. 2, 1976, Ser. No. 646,230
Int. Cl.² H02P *9/30*
U.S. Cl. 322—47 **11 Claims**

1. An ac-to-ac power conversion system having three system input connections for receiving three-phase a-c energy from an induction generator having an electric field sustained by periodic shorting of the generator terminals, and three system output connections for providing three-phase a-c energy, comprising:

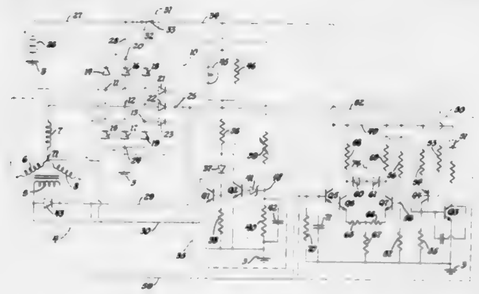
a converter, comprising nine power switches connected in a matrix between the system input connections and the system output connections such that the power switches

can be closed in different combinations to effectively regulate the periodic shorting of the generator terminals and to apply different potentials to the system output connections; and



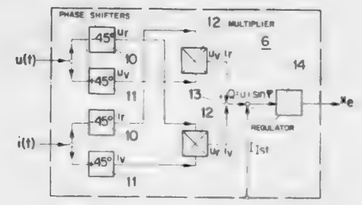
control means, coupled to the converter, for regulating turn-on and turn-off of the nine power switches to both regulate the shorting of the generator terminals and to determine the potentials applied to the system output connections.

4,041,369
STORAGE BATTERY CHARGING SYSTEM FAULT INDICATING CIRCUIT
Charles W. King; Donald O. Ruff, both of Anderson, and Leonard J. Sheldrake, Noblesville, all of Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed Dec. 17, 1975, Ser. No. 641,565
Int. Cl.² H02J *7/14*; H02P *9/00*
U.S. Cl. 322—99 **1 Claim**



1. In a storage battery charging system of the type including a three phase alternator having alternating current output circuitry including three "wye" connected output coils and a field winding; a rectifier circuit including alternating current input circuitry interconnected with the alternator output circuitry, two separate selected polarity output terminals and a common output terminal of the opposite polarity and electrical circuitry connecting the battery to be charged and the alternator field winding across respective ones of the two separate selected polarity output terminals and the common output terminal of the rectifier circuit, a system fault indicating circuit comprising: an electrically energizable fault indicating device, a fault indicating device switching transistor having a control electrode and two current carrying electrodes connected in series with said fault indicating device across a source of energizing potential, a transistor having a control electrode connected to the one of said two separate rectifier circuit output terminals to which said alternator field winding is connected and two current carrying electrodes properly electrically poled for forward conduction therethrough; means for producing a reference potential of a predetermined direct current potential level, means including a transistor having the control electrode thereof connected to the neutral point of said "wye" connected alternator output coils for producing a sensing potential of a direct current potential level directly proportional to the direct current output potential of said rectifier circuit and, in the absence of an alternator fault, substantially equal to said reference potential, a differential amplifier circuit including a pair of transistors having first and second input terminals and first and second output terminals, means for applying said reference potential and said sensing potential each to a respective one of said differential amplifier input terminals; a first and a second Zener diode; first circuit means for connecting said first and second output terminals of said differential amplifier circuit, each through a respective one of said first and second Zener diodes, to said control electrode of said fault indicating device switching transistor; and second circuit means for connecting a selected one of said current carrying electrodes of said transistor to said control electrode of said fault indicating device switching transistor.

4,041,370
APPARATUS FOR RAPIDLY DETECTING AND CALCULATING THE ROOT MEAN SQUARE OF ELECTRICAL MEASURING VALUES IN ALTERNATING CURRENT NETWORKS
Dierk Schröder, Hohensachsen, Germany, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Oct. 1, 1975, Ser. No. 618,403
Claims priority, application Germany, Oct. 2, 1974, 2446943
Int. Cl.² H02J *3/18*
U.S. Cl. 323—8 **9 Claims**



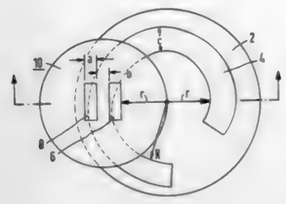
1. Apparatus for monitoring inductive reactive power within an a.c. voltage supply mains, comprising an inductive reactance component connected to said a.c. mains in parallel with a load circuit supplied by said mains, means connected in series with said reactance component for adjusting current flow therethrough, means deriving an a.c. voltage signal indicative of the voltage in said load circuit, means deriving an a.c. current signal indicative of the current flowing in said load circuit, means including phase shifting means for producing from said a.c. voltage and current signals an analog d.c. voltage proportional to the instantaneous reactive power consumption of the load and which represents the nominal value for the control, means deriving an analog d.c. signal voltage proportional to the instantaneous value of the current in the circuit containing said reactance, means comparing said analog d.c. voltages and producing a differential d.c. voltage signal, a regulator having an integral section, means connecting last said differential d.c. voltage signal to the input of said regulator, means for periodically reading the output signal from said regulator, and means connecting the periodically read output of said regulator to said means for adjusting the current flow through said reactance.

4,041,371

ARRANGEMENT FOR THE GENERATION OF ELECTRICAL SIGNALS BY MEANS OF MAGNETIC FIELD-DEPENDENT SEMICONDUCTOR COMPONENTS

Paul Hini, Barschenweg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 30, 1975, Ser. No. 572,890
Claims priority, application Germany, May 15, 1974, 2423500
Int. Cl.² H01L *43/08*
U.S. Cl. 323—94 H **2 Claims**



1. An arrangement for generating electrical signals comprising:

a magnet;

first and second pole pieces each comprised of magnetically soft material and each connected to one pole of said magnet;

first and second magnetic field-dependent semiconductor components each of a first width and spaced apart a distance approximately equal to said first width connected to said first and second pole pieces, respectively;

and means arranged to influence the flux of said magnet including:

a rotatable control cam comprised of non-magentic material;

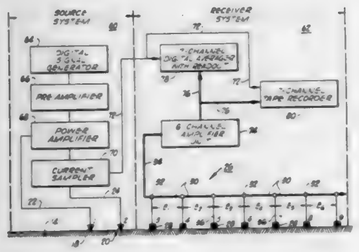
and a spiral-shaped, magnetically soft control element of a constant width approximately equal to said first width plus said spaced distance arranged on said cam such that when said cam rotates a part of said control element permeated by the flux of said magnet is shifted from said first semiconductor component to said second semiconductor component.

4,041,372

APPARATUS FOR MULTI-CHANNEL INDUCED POLARIZATION SURVEYING

Dale E. Miller; William L. Chapman, both of Ponca City, Okla.; Donald E. Dunster, Denver, Colo., and Bobby J. Thomas, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.

Continuation of Ser. No. 611,503, Sept. 8, 1975, abandoned, which is a continuation of Ser. No. 324,618, Jan. 18, 1973, abandoned. This application May 25, 1976, Ser. No. 689,952
Int. Cl.² G01V *3/06*
U.S. Cl. 324—9 **9 Claims**



1. A system for multiple channel induced polarization geophysical surveying along a selected earth surface line of survey, comprising:

a pair of current electrode means disposed in conductive contact with said earth surface in predetermined spacing at a selected current induction point;

signal generator means connected to energize said current electrode means which is adjustable to apply thereto a selected amplitude varying signal for energization of said current electrode means;

a plurality of potential electrodes each disposed in contact with said earth surface in predetermined successive array, said potential electrodes being spaced and extending at selected spacing from said current induction point;

differential amplifier means having plural input channels;

a plurality of plural conductor cable means serially interconnected with a selected different conductor of each successive plural conductor cable means connecting a successive one of the respective successively arrayed potential electrodes, and including an additional plural conductor cable means connecting the first successively arrayed potential electrode such that said plural conductors are applied as input to respective different input channels of said differential amplifier means thereby to provide plural output signals each of which is indicative of potential difference as between a selected pair of the successively arrayed potential electrodes;

current sampling means for providing a replica signal indicative of said signal generating means amplitude varying signal;

signal averaging means receiving said potential difference output signals from each respective channel of said differential amplifier means as well as receiving said replica signal output from said current sampling means, whereby each of said potential difference output signals is averaged with said replica signal over a predetermined duration to provide output of respective potential difference data values; and

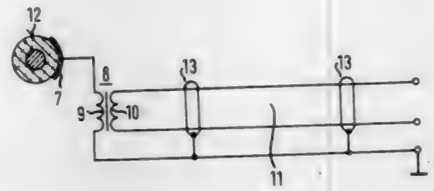
means receiving each of said respective potential difference data values for generating an output display to indicate simultaneous relative potential variations representative of multiple depths along said line of survey on said earth surface.

4,041,373

CAPACITIVE PULSE PICKUP

Albert Maringer, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Jan. 20, 1976, Ser. No. 650,727
Claims priority, application Germany, Jan. 23, 1975, 2502715
Int. Cl.² G01R *13/42*
U.S. Cl. 324—15 **7 Claims**



1. A capacitive pulse pickup for use with an ignition cable having a conductor therein, said pickup comprising:

capacitive electrode means for placement in contact with said ignition cable so as to be subject to voltage influences other than the voltage on the conductor of said cable, said electrode means forming with the conductor of said cable a capacitor, whereby said electrode detects the voltage on said conductor;

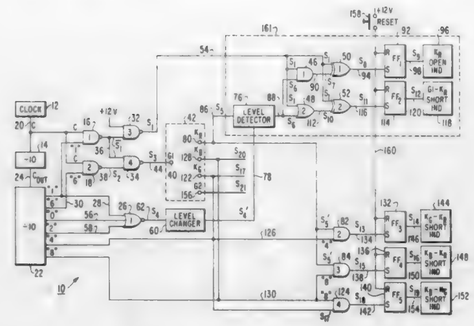
a pulse transformer comprising primary and secondary windings, said primary winding having one end directly connected to said electrode means and its other end grounded, and said secondary winding providing an output related to said voltage detected by said electrode means.

4,041,374

INTERELECTRODE OPEN AND SHORT CIRCUIT TESTER

Richard Edward Bronislaw Frankowski, Toronto, Canada, assignor to RCA Corporation, New York, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,119
Int. Cl.² G01R *31/024*
U.S. Cl. 324—20 CR **11 Claims**



1. An apparatus for measuring open and short circuits between electrodes of an electron tube having at least two electrodes, said apparatus comprising:

a. means for applying, during an open circuit test interval, at least one input pulse to a terminal of a first electrode of said electron tube, each input pulse having a predetermined amplitude and duration;

b. means for detecting, during said open circuit test interval, the amplitude of each open circuit test output pulse produced at a terminal of a second electrode of said electron tube in response to each of said open circuit test interval input pulses;

c. means for indicating an open circuit upon measurement of an open circuit test interval output pulse amplitude having a magnitude which is less than a predetermined minimum value;

d. means for applying, during at least one short circuit test interval, at least one input pulse to a terminal of an electrode, each input pulse having a predetermined amplitude;

e. means for detecting, during each short circuit test interval, the amplitude of each output pulse produced at a terminal of at least one other electrode in response to each of said short circuit test interval input pulses; and

f. means for indicating a short circuit upon measurement of a short circuit test interval output pulse amplitude having a magnitude which exceeds a predetermined maximum value.

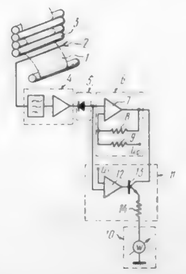
4,041,375

APPARATUS FOR MEASURING CONTENT OF MOVING DIELECTRIC MATERIALS MOISTURE

Ljudmila Alexeevna Polukhina; Vladimir Nikolaevich Polukhin, both of ulitsa Shishkova, 7, korpus 3, kv. 44, and Anna Georgievna Kochetkova, mikroraion Novye Scherbinki, 28, kv. 58, all of Gorky, U.S.S.R.

Filed Feb. 21, 1975, Ser. No. 551,680
Claims priority, application U.S.S.R., Apr. 18, 1974, 2018940
Int. Cl.² G01R *5/28, 31/02*
U.S. Cl. 324—32 **2 Claims**

1. An apparatus for measuring the moisture content of moving dielectric materials, comprising: an aerial provided to receive directly electromagnetic signals irradiated by discharges of static electricity occurring at each moment of time between a production apparatus and the moving dielectric material and carrying information about the moisture content of said material; a band-pass tuned filter connected to said aerial; a detector circuit connected to receive an output of said filter; an inverter connected to receive an output of said detector circuit; and a registering device connected electrically with



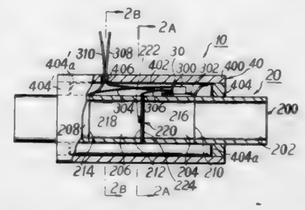
an output of said inverter circuit; a first comparator means, said first comparator means including a zero circuit connected to the output of said detector circuit; said comparator means further including a transistor triode, the base of which is connected to an output of said zero circuit; the collector of said transistor triode being connected to an output of said detector circuit and the emitter of said transistor triode being connected to said registering device.

4,041,376

DETECTOR FOR DETECTING THE STATE OF ELECTRICALLY NON-CONDUCTIVE OR SUBSTANTIALLY ELECTRICALLY NON CONDUCTIVE FLUID

Yoshio Furuto, Naka, and Masaaki Ban, Tokyo, both of Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan

Filed Mar. 27, 1974, Ser. No. 455,296
Claims priority, application Japan, Nov. 6, 1973, 48-124725
Int. Cl.² G01N *27/00*; G01F *1/00*
U.S. Cl. 324—33 **9 Claims**



1. A flow meter for generally electrically non-conductive liquid, comprising a transducer to generate an electrical signal responsive to the flowing state of liquid therethrough, including a radiation source to ionize said liquid and first and second ionizing areas each having a pair of electrodes exposed to said ionized liquid and defining said respective ionizing areas, said first and second ionizing areas arranged in a flowing direction of said liquid; an amplifier having a high input impedance and a low output impedance and connected to said electrodes of said first and second ionizing areas; and electrically conductive shielding means to shield said transducer and said amplifier, characterized by that said transducer further includes a conduit by which said first and second ionizing areas are enclosed and into which said liquid is introduced so that it passes through one of said first and second ionizing areas and then through the other ionizing area, and that said amplifier together with its high impedance input side is disposed within the space between said conduit and said shielding means, with

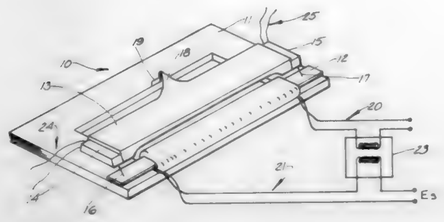
output lead means from said amplifier extending through and out of said shielding means for adaption to connection with an external circuit.

4,041,377

MAGNETOSTRICTION TESTING APPARATUS HAVING DIGITAL OUTPUT DISPLAY

Richard F. Lyke, Middletown, Ohio, assignor to Armco Steel Corporation, Middletown, Ohio

Filed Aug. 25, 1976, Ser. No. 717,631
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 MA **9 Claims**



1. In a magnetostriction testing apparatus of the type having means for inducing an alternating and periodic induction in a test specimen and having at least one displacement sensitive transducer mounted in association with said test specimen for generating a magnetostriction signal representative of the magnetostrictive deformation of said test specimen in response to said induction, the improvement comprising:

a. a timing circuit in association with said means for inducing said induction for developing a plurality of timing signals, some at least of said timing signals having logical transitions corresponding to the occurrences of zero and maximum induction in said test specimen;

b. a conversion circuit responsive to said timing signals for generating from said magnetostriction signal a DC difference signal proportional to the difference between the amplitudes of said magnetostriction signal corresponding to the occurrences of maximum and zero induction in said test specimen, and

c. means responsive to said conversion circuit for producing a display reflecting the magnitude and polarity of said DC difference signal.

4,041,378

INTERCHANGEABLE PROBE TIP FOR A MAGNETIC THICKNESS GAUGE

Albert Ott, Sindelfingerstrasse 118 BRD, 7032 Sindelfingen, Germany

Filed Jan. 21, 1976, Ser. No. 650,902
Claims priority, application Germany, Dec. 13, 1975, 2556340
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 TK **7 Claims**

1. An interchangeable end piece for fastening to the front surfaces of a soft-iron magnetic yoke of a measuring probe which measuring probe is used for measuring the thickness of thin non-ferromagnetic layers on a ferromagnetic base, comprising

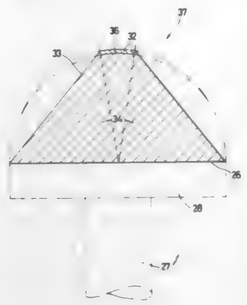
a pin element having a headplate,

a contact piece welded to the headplate which contact piece is made from a mass-produced, high-precision steel element having a contact surface with a single radius of curvature,

the radial angle of the contact surface, measured from the center of the underside of the contact piece, is much smaller than 90°,

the surface of the contact piece outside the radial angle range is depressed below the radius of curvature,

the maximum surface described by the radial angle is much



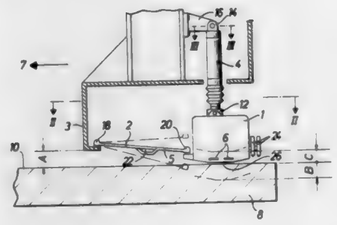
smaller than the cross-sectional area of the pin element at the underside of the headplate.

4,041,379

APPARATUS FOR TESTING METAL BLANKS UTILIZING AT LEAST ONE INSPECTING HEAD MOVED ALONG THE SURFACE THEREOF

Per-Olle Karlsson, Oxelosund, Sweden, assignor to Granges Oxelosunds Jarnverk AB, Sweden

Filed June 30, 1975, Ser. No. 591,938
Claims priority, application Germany, Aug. 19, 1974, 2439662
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—37 **22 Claims**



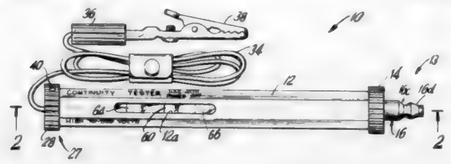
1. Apparatus for non-destructive testing of an object in the form of a metal blank, especially steel slabs, flat steel or billets for defects such as cracks, seams, cavities, bubbles or the like disposed at or near the surface of the test object, comprising inspecting means for detecting defects at or near the surface of the test object and being arranged in at least one inspection head movable in a traveling direction relative to the surface of the test object, said at least one inspecting head being supported by a support arm member and having a contact surface for contacting the surface of the test object to be scanned, first and second connecting means for connecting said at least one inspecting head to said support arm member, said first connecting means extending in a direction substantially perpendicular to the contact surface of said at least one inspecting head, said first connecting means transmitting to said inspecting head forces substantially perpendicular to said contact surface of said at least one inspecting head, and said second connecting means extending in a direction substantially parallel to said contact surface of said at least one inspecting head, said second connecting means transmitting forces to said at least one inspecting head substantially exclusively in the travel direction of said at least one inspecting head and substantially parallel to the surface of the object to be scanned and preventing lateral displacement of the inspecting head from the traveling direction.

4,041,380

MULTI-FUNCTION TESTER WITH REMOVABLE CIRCUIT CARTRIDGE

Harry Epstein, Seaford, N.Y., assignor to Kastar, Inc., Belport, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,710
Int. Cl.[2] G01R *31/02, 1/06*
U.S. Cl. 324—51 **19 Claims**



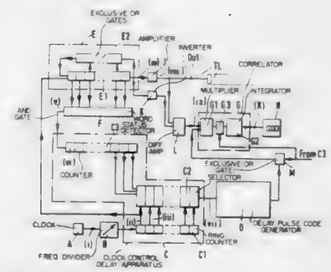
1. A multi-function tester comprising a substantially hollow case; first and second electrically conductive probes associated with said case; a cartridge removably receivable within said case; electrical circuit means contained within said cartridge for performing a predetermined number of tests; a plurality of electrical contacts on said cartridge connected to said electrical circuit means, said first probe being electrically connected to one of said contacts when said cartridge is received within said case, the number of said electrical contacts corresponding to said predetermined number of tests and being spaced from each other; and indexing means mounted for movement relative to said case and said cartridge and having a conductive portion connected to said second probe and being successively engageable with different ones of said predetermined number of electrical contacts with movement of said indexing means relative to said case and said cartridge, whereby any one of a plurality of different tests can be performed by moving said indexing means to bring different electrical contacts into engagement with said conductive portion and thereby to electrically connect different electrical contacts to said first and second probes.

4,041,381

METHODS AND EQUIPMENT FOR TESTING REFLECTION POINTS OF TRANSMISSION LINES

Lim Ching Hwa, 29 Lorong Batai, Damansara Heights, Kuala Lumpur, Malaysia

Filed Oct. 6, 1975, Ser. No. 620,194
Claims priority, application United Kingdom, Nov. 14, 1974, 49350/74; Oct. 9, 1974, 43699/74
Int. Cl.[2] G01R *31/11*
U.S. Cl. 324—52 **13 Claims**



1. A method of locating and/or measuring the distance of a point of reflection in a transmission line and/or of measuring the level of coefficient of reflection at said point, said method comprising the steps of:

repeatedly transmitting into said line a digital word which is a predetermined number of digital bits in length, and has the property that the autocorrelation function of the digital words has an impuse function;

receiving said words after reflection back from a point of reflection;

repeatedly producing similar digital words, each word having the aforesaid number of bits in length;

delaying said similar words by a series of steps of time delay, each step occurring after a predetermined number of repetitions of said similar words;

multiplying the received reflected words by the delayed similar words;

integrating the result of multiplication by an integrator; and

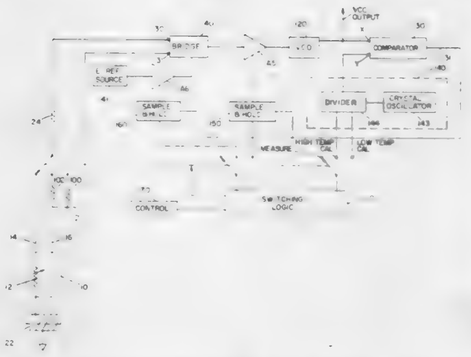
utilizing the peak value of the output of the integrator to determine the distance along the line of the point of reflection and/or to determine the level or coefficient of reflection at said point.

4,041,382

CALIBRATING A MEASUREMENT SYSTEM INCLUDING BRIDGE CIRCUIT

Ralph G. Washburn, Marion, Mass., assignor to The Sippican Corporation, Marian, Mass.

Filed Aug. 16, 1976, Ser. No. 714,386
Int. Cl.[2] G01R *27/02*
U.S. Cl. 324—65 R **19 Claims**



1. In a measurement system of the type having a sensor the electrical resistance of which varies as a function of a parameter being measured, and a bridge circuit connected to said sensor, wherein a source of a reference voltage is provided to excite said bridge to produce a bridge output indicative of the parameter being measured when said bridge is balanced, said bridge output being dependent upon the sensor resistance and said reference voltage except that said system includes circuitry for causing said output to be independent of said reference voltage at one end of a range of values of said parameter, and output circuitry is provided for converting said bridge output into a system output in accordance with an output function, that improvement comprising

first calibration circuitry connected to said output circuitry to provide a first calibration signal for calibrating said system at said one end of said range by controlling said output function,

second calibration circuitry connected to said bridge circuit to provide a second calibration signal for calibrating said system at the other end of said range by controlling the effective value of said reference voltage supplied to said bridge circuit,

sequencing circuitry for automatically causing said first calibration circuitry to calibrate said system at said one end of said range, and then automatically causing said second calibration circuitry to calibrate said system at the other end of said range, and,

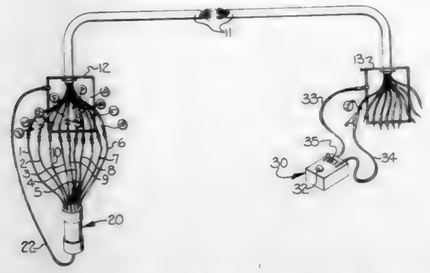
a control for activating said sequencing circuitry.

4,041,383

METHOD FOR MATCHING WIRES IN MULTIPLE WIRE CONDUITS

James Lynn Howard, Lancaster, S.C., assignor to Earl Cooper Phifer, Stanfield, N.C., a part interest

Filed Apr. 5, 1976, Ser. No. 673,660
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—66 **2 Claims**



1. A method for matching the corresponding opposite end portions of wires located at opposite ends of a multi-wire conduit with the use of a direct current circuit tester in conjunction with a plurality of diodes, the diodes having respective pairs of leads and being electricly interconnected in series in alternating polarity, and the circuit tester including a battery, an indicator, and first and second leads connected thereto, with a polarity reversing switch connected to the leads for reversing the polarity of the leads, said method being particularly suited for practice by one person, thereby avoiding the necessity of having persons at both ends of the conduit, and said method comprising

a. connecting corresponding leads of the respective series-interconnected diodes to a predetermined number of the wires at one end of the conduit,
b. connecting the free lead of the first diode of the series to a common ground connection,
c. connecting to the common ground connection at the opposite end of the conduit a first lead of the circuit tester having a polarity corresponding to the polarity of the grounded free end of the first diode,
d. applying the second lead of the circuit tester to the unidentified wires at said opposite end of the conduit until a wire is located which completes the circuit on the circuit tester, thus indicating a match with the wire connected to the first diode of the series at said one end of the conduit,
e. connecting the thus located wire to said first lead of the circuit tester,
f. actuating the polarity reversing switch to thereby reverse the polarity of the leads of the circuit tester,
g. applying said second lead of the circuit tester to the then remaining unidentified wires until a wire is located which completes the circuit on the circuit tester, thus indicating a match with the wire connected to the next diode of the series at said one end of the conduit, and
h. repeating steps (e), (f) and (g) until all of the predetermined number of wires have been identified.

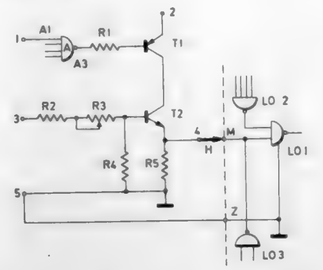
4,041,384

CIRCUIT SYSTEM FOR ADJUSTING THE INPUT OF A CONNECTED-UP LOGIC CIRCUIT

Jiri Kupec, and Rehor Hrdlicka, both of Prague, Czechoslovakia, assignors to Tesla, narodni podnik, Prague, Czechoslovakia

Filed May 27, 1975, Ser. No. 580,711
Claims priority, application Czechoslovakia, Nov. 5, 1973, 7591/73
Int. Cl.[2] G01R *15/12*
U.S. Cl. 324—73 PC **1 Claim**

1. A test circuit system for stimulating the input of a connected-up logic circuit to the logical one level in which the inputs and/or one output of other logic circuits are connected to this input comprising a control pulse input terminal connected at least to the first input of a NAND logic circuit, the output of which is connected through a first resistor to the base of a first switching PNP transistor, the emitter of which is connected to a first positive voltage supply terminal and the collector of which is connected to the collector of a second switching NPN transistor the base of which is connected both through a fourth resistor to an earth terminal of the circuit



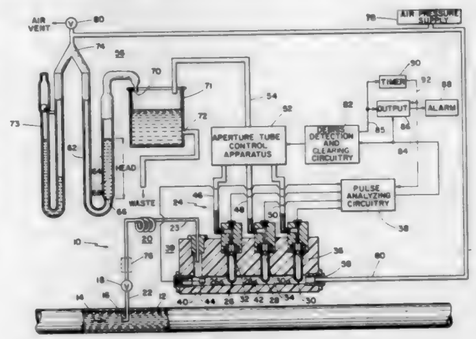
system and through a third resistor and a second resistor to a second positive voltage supply terminal and the emitter of which is connected both through a fifth resistor to the earth terminal of the circuit system and to an output terminal, means for selectively connecting said output terminal to a measuring point, means for connecting said measuring point to the input of the connected-up logic circuit, and means for simultaneously connecting said connected-up logic circuit to the earth terminal of the test circuit system.

4,041,385

ON-LINE SAMPLING SYSTEM FOR MONITORING PARTICLES SUSPENDED IN A FLUID

Henry Howard Gulliford, and Harvey John Dunstan, St. Albans, both of England, assignors to Coulter Electronics, Inc., Hialeah, Fla.

Continuation of Ser. No. 476,408, June 5, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,219
Int. Cl.[2] G01N *27/00, 1/20*
U.S. Cl. 324—71 CP **16 Claims**



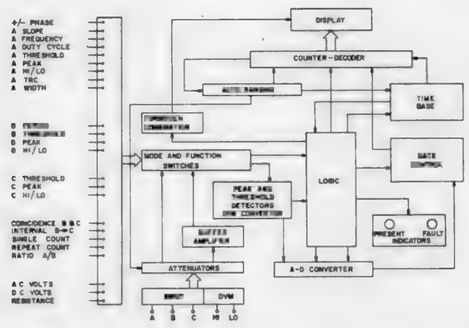
1. For use in the monitoring of a particle suspension, a method of regulating fluid pressure in a particle analyzing apparatus of the Coulter type and employing a sampling chamber for receiving a particle suspension from a large system of flowing fluid, subject to pressure variations said method serving to maintain approximately constant the pressure of suspension within the sampling chamber and comprising the steps of: placing in conjunction two chambers of different cross-sectional area, coupling the chamber of smaller cross-sectional area to the sampling chamber, whereby to introduce the particle suspension into the smaller cross-sectional area chamber, introducing into the larger cross-sectional area chamber a liquid having a density greater than that of the particle suspension so as to maintain a pressure head of the greater density liquid within the larger cross-sectional area chamber with respect to the pressure within the sampling chamber, wherein, when the said pressure head is balanced by the suspension pressure, the liquid is retained in the larger cross-sectional area chamber, and causing the particle suspension to pass through the greater density liquid when the pressure within the sampling chamber is greater than the pressure head.

4,041,386

MULTIFUNCTIONAL CIRCUIT ANALYZER

Paul Dana Thomas, Lafayette, Calif., and Dale Leroy Burton, Houston, Tex., assignors to Data Test Corporation, Concord, Calif.

Filed May 21, 1976, Ser. No. 688,700
Int. Cl.[2] G01R *23/16*
U.S. Cl. 324—77 R **20 Claims**



1. A circuit analyzer capable of digitally measuring the duty cycle of an incoming electrical signal which comprises:

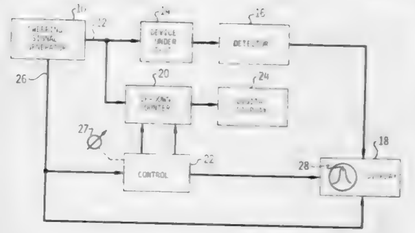
1. an input circuit means for receiving said incoming electrical signal;
2. a high threshold voltage circuit means connected to said input circuit means for providing a high threshold digital signal when the voltage of the incoming electrical signal passes through a selected high threshold voltage;
3. a low threshold voltage circuit means connected to said input circuit means for providing a low threshold digital signal when the voltage of the incoming electrical signal passes through a selected low threshold voltage;
4. a duty cycle circuit means connected to said high and said low threshold voltage circuit means for providing a first preselected DC signal when the voltage of the incoming electrical signal either (1) passes through the low or high threshold voltage to a higher voltage or (2) passes through the high or low threshold voltage to a lower voltage, and for providing a second preselected DC signal when the voltage of the incoming electrical signal subsequently either (1) passes through the high or low threshold voltage to a lower voltage or (2) passes through the low or high threshold voltage to a higher voltage;
5. an analog to digital converter means connected to said duty cycle circuit means for converting said first and second preselected DC signals into a functional digital signal proportional to the time average voltage of the first and second preselected DC signals;
6. a gate control circuit means connected to said analog to digital converter means for providing a digital start gate signal when the functional digital signal is present and a stop gate signal when the functional digital signal changes state;
7. a gate circuit means connected to said gate control circuit means for permitting a time base signal to pass through said gate circuit means when said start gate signal occurs and preventing said time base signal from passing through the gate circuit means when said stop gate signal occurs;
8. a time base circuit means connected to said gate circuit means for generating at least one time base signal of known frequency;
9. a counting circuit means connected to said gate circuit means for counting the number of cycles in the time base signal during the time interval between said start gate signal and said stop gate signal and providing a plurality of first code signals representing the total number of cycles counted;
10. a decoding circuit means connected to said counting circuit means for receiving said plurality of first code signals and providing a plurality of stable digital second code signals representing the total number of cycles counted by said counting circuit means;
11. a display means connected to said decoding means for receiving said plurality of stable digital second code signals and displaying the total number of cycles counted by a plurality of digits.

4,041,387

APPARATUS AND METHOD FOR MEASURING THE FREQUENCY OF A SWEEPING SIGNAL

Rolf W. Dalichow, and Frederic W. Woodhull, both of Santa Rosa, Calif., assignors to Hewlett-Packard Company, PaloAlto, Calif.

Filed Sept. 18, 1975, Ser. No. 614,570
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 R **8 Claims**



1. A method for measuring the frequency of an output signal from a sweeping signal generator at a predetermined point in the sweep of the generator, the method comprising the steps of:

receiving a start signal;
counting the number of periods of the output signal during a first time interval in response to receipt of the start signal;
stopping the counting during a second time interval subsequent to the first time interval; and
counting the number of periods of the output signal during a third time interval subsequent to the second time interval and subtracting the number of periods of the output signal counted during the third time interval from the number of periods of the output signal counted during the first time interval, thereby producing a measurement number of counts indicative of the frequency of the output signal at the time the start signal was received.

4,041,388

TRANSISTOR CIRCUIT

Hugh Arnoldi, Londondary, N.H., and Leonard Robert Salvatore, Greenbrook, N.J., assignors to RCA Corporation, New York, N.Y.

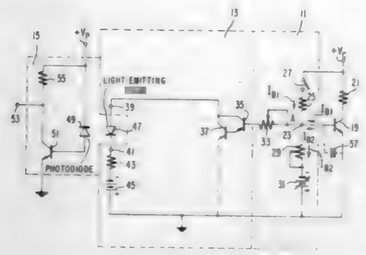
Filed Feb. 4, 1975, Ser. No. 547,020
Int. Cl.[2] G01R *31/22;* H03K *5/153*
U.S. Cl. 324—158 T **8 Claims**

1. A circuit for indicating when a bipolar transistor switches from a conducting to a nonconducting state, said transistor

having a base-emitter junction, emitter, and base electrodes, said junction exhibiting a capacitance, said circuit comprising:

means for forward biasing the base-emitter junction of the transistor, whereby said base-emitter capacitance becomes charged in a sense to forward bias the transistor, and for then removing the forward bias;

a discharge circuit including a source of reverse bias voltage



and a variable resistor connected in series between said base and emitter electrodes for providing a discharge path for said capacitance; and

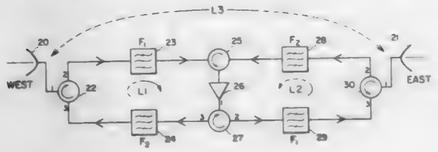
means coupled to a point in said discharge circuit, for sensing the natural decay of the voltage across said capacitance as it discharges into said discharge circuit, and for producing an output signal in response to said voltage reaching a given level.

4,041,389

NONFREQUENCY-CONVERTING MICROWAVE RADIO REPEATER USING A LOW POWER CONSUMPTION AMPLIFIER

John Willson Oades, Redwood City, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 9, 1975, Ser. No. 594,419
Int. Cl.² H04B *1/60*
U.S. Cl. 325—3 **15 Claims**



1. In an angle-modulated microwave radio system, a nonfrequency-converting microwave radio repeater providing duplex operation for angle-modulated carrier signals F_1 and F_2, where $F_1 \neq F_2$, and having nonoverlapping modulation bands ΔF_1 and ΔF_2, said repeater comprising:

first input terminal receiving said F_1 carrier and transmitting said F_2 signal;

second input terminal receiving said F_2 carrier and transmitting said F_1 carrier;

first circulator coupling means connected to said first input terminal;

second circulator coupling means connected to said second input terminal;

a first bandpass filter having a bandwidth of ΔF_1 centered at F_1 and having an input and output, said input coupled to said first circulator coupling means;

a second bandpass filter having a bandwidth of ΔF_2 centered at F_2 and having an input and output, said output coupled to said first circulator coupling means;

a third bandpass filter having a bandwidth of ΔF_1 centered at F_1 and an input and output, said output coupled to said second circulator coupling means;

a fourth bandpass filter having a bandwidth of ΔF_2 centered at F_2 and an input and output, said input coupled to said second circulator coupling means; and

third circulator coupling means operatively connected to said first filter means output and to said first filter means output;

fourth circulator coupling means operatively connected to said second filter means input and to said third filter means input;

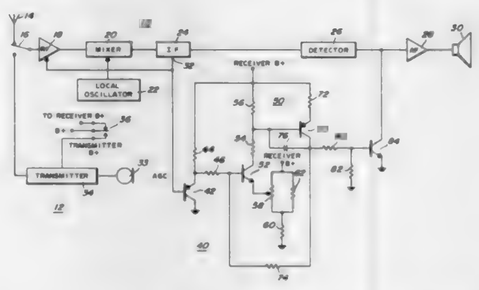
amplifier means having an input operatively connected to said third circulator coupling means and an output operatively connected to said fourth circulator coupling means, said amplifier means providing gain to at least the band of frequencies ΔF_1 and ΔF_2.

4,041,390

TRANSCEIVER SQUELCH CIRCUIT

Daniel Ray Schroeder, Lombard, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,216
Int. Cl.² H04B *1/44*
U.S. Cl. 325—21 **8 Claims**



1. A squelch circuit adapted for use in the receiver portion of a transceiver having a switching means to select either the transmit or receive mode, the receiver including a means for providing an automatic gain control (AGC) signal, the squelch circuit comprising:

hysteresis means for unmuting the receiver at a first AGC threshold level and muting the receiver at a second AGC threshold level; and

delaying means, responsive to the switching means, for muting the receiver for a predetermined period after the transceiver has been switched from the transmit to the receive mode.

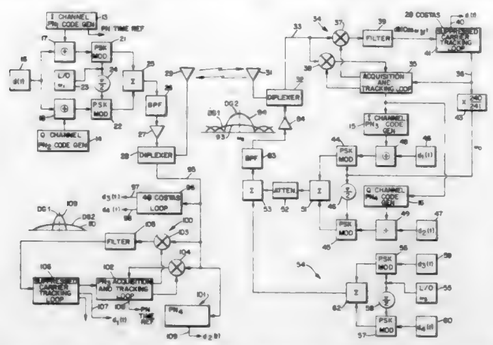
4,041,391

PSEUDO NOISE CODE AND DATA TRANSMISSION METHOD AND APPARATUS

Leonard F. Deerkoski, Crofton, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Dec. 30, 1975, Ser. No. 645,510
Int. Cl.² H04L *27/10*; H04B *15/00*
U.S. Cl. 325—30 **12 Claims**

1. A method of communicating pseudo noise codes having a predetermined chipping rate and first binary data signals each having a bit rate less than an order of magnitude of the chipping rate on the same first carrier, as well as second binary data signals each having a bit rate not restricted by the chipping rate of the first carrier, from a first station to a second station, the second binary data being on a second carrier slightly displaced from the first carrier so that there is frequency overlap in transmitting the noise codes and the first and second data signals, comprising, at the first station: forming a first wave that is a suppressed carrier quadriphase digitally modulated by the pseudo noise code and the first binary data signal, the suppressed carrier of the first wave being the first carrier, forming a second wave that is a suppressed carrier quadriphase digitally modulated by the second data, the suppressed carrier of the second wave being the second carrier, and simultaneously transmitting from the first station to the second station the first and second waves so that the effective isotropic radi-



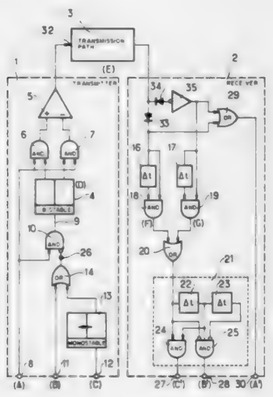
ated power of the first wave is controlled so as not to degrade the detectability of the second wave at the second station; at the second station: receiving the waves transmitted from the first station, and separating the received second wave from the received first wave.

4,041,392

SYSTEM FOR SIMULTANEOUS TRANSMISSION OF SEVERAL PULSE TRAINS

Gilles Gauriat, Paris; Jacques Vernezy, Viroflay, and Jean-Claude Barigot, Brie Comte Robert, all of France, assignors to Compagnie Industrielle des Telecommunications Cit-Alcatel S.A., Paris, France

Filed July 2, 1976, Ser. No. 702,326
Claims priority, application France, July 4, 1975, 75.21091
Int. Cl.² H04B *1/00*; H04L *7/00*
U.S. Cl. 325—38 A **8 Claims**



1. A system for transmitting a main pulse train at a main frequency and at least two derived pulse trains at submultiples of the main frequency, the frequencies and phase positions of the derived pulse trains being so chosen that the pulses of the derived pulse trains do not coincide, the system comprising:

a transmitter and a receiver connected by a transmission path, said transmitter including

a bipolar signal generator having an input for receiving the main pulse train and an output at which alternate pulses of the main pulse train applied at said input appear as pulses of alternate polarity, and

means for inhibiting the alternation of the polarity of the output of said bipolar signal generator, respective pulses of said at least two derived pulse trains coinciding with pulses of said main pulse train, said inhibiting means being connected to receive as inputs said at least two derived pulse trains, a first one of said derived pulse trains being applied directly to inhibit the alternation of the polarity of the output of said bipolar signal generator to create a single violation and each pulse of a second one of said derived pulse trains causing the inhibition of the alternation of the polarity of the output of said bipolar signal generator for two successive pulse periods of said main pulse train to create a double violation,

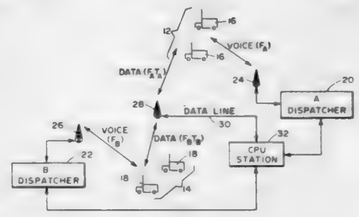
said receiver including means for detecting the single and double violations of bipolarity.

4,041,393

VEHICLE VOICE DATA LINK

Roger R. Reed, Arlington, Mass., assignor to Cadec Systems, Inc., Burlington, Mass.

Filed Feb. 14, 1975, Ser. No. 549,887
Int. Cl.² H04B *1/00*
U.S. Cl. 325—54 **18 Claims**



1. A voice and data communication system for use between at least one base station and a plurality of mobile stations comprising:

mobile station located means for transmitting and receiving data and voice signals on a single assigned frequency between said base station and the mobile station;

means associated with said base station for transmitting and receiving voice and data signals between said mobile station and said base station;

means associated with said base station for providing a sequence of separate time periods in a repeating interval for data transmission to corresponding ones of said plurality of mobile stations;

means for providing reception of data signals from said plurality of mobile stations intermediate the periods of data transmission in a noninterfering pattern;

means associated with each of said plurality of mobile stations for synchronizing to the pattern of data transmission and reception for said base station to identify times for data reception and transmission by that mobile station;

operator actuable means associated with at least one of said base and plurality of mobile stations for providing an indicia of operator desire for voice communication for transmission therefrom in the assigned frequency; and

means for responding to said indicia as received for initiation of voice communication during data transmission and reception on the assigned frequency.

4,041,394

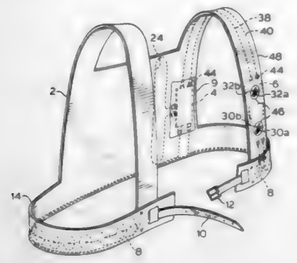
RADIO CONTROL TRANSMITTER

Ronald W. Pate, District of Algoma, Canada, assignor to River Range Developments Limited, Sault Ste. Marie, Canada

Filed July 6, 1976, Ser. No. 703,062
Int. Cl.² H04B *1/04*
U.S. Cl. 325—102 **11 Claims**

1. In a radio remote control transmitter assembly, comprising an antenna and a transmitter, said transmitter comprises radio frequency means connected to the antenna to supply a radio frequency signal thereto and means to modulate the radio

frequency signal supplied by the radio frequency means, said assembly further comprising switching means, a source of electrical energy, and encoder means selectively supplying any of a plurality of distinctive output signals to the modulating means in response to different conditions of said switching means, the improvement wherein the components comprised



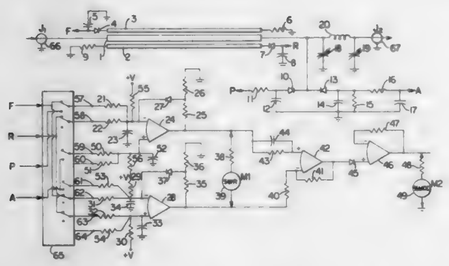
by the transmitter assembly are incorporated into the structure of a vest-type garment, and the switching means comprises a plurality of switches located on said garment at spaced locations relative by the trunk of a user, said switches being of a non-manipulatory type selectively operable to juxtaposition of a switch control means attached to a portion of the user's body movable relative to said locations on the user's trunk.

4,041,395

TRANSMITTER PERFORMANCE MONITOR AND ANTENNA MATCHING SYSTEM

John Carroll Hill, Rochester, Mich., assignor to Integral Engineering & Manufacturing Corporation, Detroit, Mich.

Filed Aug. 2, 1976, Ser. No. 710,611
Int. Cl.[2] H04B *17/00*
U.S. Cl. 325—133 **9 Claims**



1. A measurement system for output signals from radio transmitters and the like, comprising:

sensor means responsive to said output signals for producing first and second measurement signals which together define an operating characteristic of said transmitter or the like;

first and second operational amplifier means each having plural sum and difference computing input means to which said first and second measurement signals are applied, said first and second operational amplifier means also having means rendering logarithmic the outputs thereof;

means coupled across the output paths of said first and second operational amplifier means for responding to the difference between said outputs thereof and thus for providing a signal which is a logarithmic function of the ratio of two quantities, one of which quantities is related to the difference between said first and second measurement signals and the other of which quantities is related to at least one of said first and second measurement signals; and

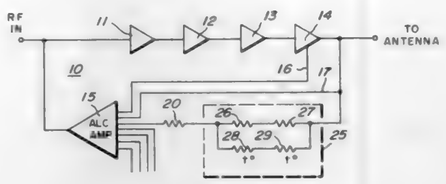
means responsive to said log function signal for providing a system output which is a measure of said operating characteristic of said transmitter or the like.

4,041,396

ENVIRONMENTALLY SENSITIVE TRANSMIT POWER MAXIMIZING CIRCUITRY AND METHOD

Chris Steven Fedde, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 22, 1975, Ser. No. 643,215
Int. Cl.[2] H04B *1/04;* H03F *1/30*
U.S. Cl. 325—150 **4 Claims**



1. Environmentally sensitive transmit power maximizing circuitry for use in a transmitter designed for periods of extended use, said circuitry comprising:

a. power amplifying means forming a portion of the transmitter and having input, an output heat producing elements and means including a temperature dependent device for protecting said elements against high temperatures;

b. temperature sensitive means in addition to said temperature dependent device, having an electrical characteristic which varies in accordance with the temperature of said temperature sensitive means;

c. mounting means for mounting said temperature sensitive means remote from said heat producing elements and said protecting means of the transmitter and in a position to sense ambient temperatures adjacent the transmitter and

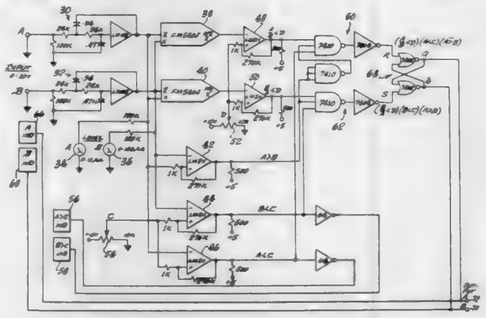
d. connecting means electrically connecting said temperature sensitive means to said power amplifying means and utilizing the temperature variable electrical characteristic for reducing the initial power output of said power amplifying means in a predetermined relation to increase in the ambient temperature adjacent the transmitter.

4,041,397

SATELLITE UP LINK DIVERSITY SWITCH

Peter W. Bauer, and Merle R. Paulson, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 28, 1976, Ser. No. 680,840
Int. Cl.[2] H04B *7/20*
U.S. Cl. 325—304 **1 Claim**



1. A system for maximizing the signal received at a satellite terminal transmitted from a ground station comprising:

a. plurality of antenna means associated with said ground station for receiving a beacon signal from the satellite terminal and for transmitting signals to the satellite terminal,

b. logic circuitry for comparing the levels of said received beacon signals comprising,

1. first circuit means for providing an output signal when the ratio of the beacon signal level received at a first antenna to the beacon signal level received at a second antenna is less than a reference voltage,

2. second circuit means for providing an output signal when the ratio of the beacon signal level received at the second antenna to the beacon signal level received at the first antenna is less than said reference voltage,

3. third circuit means for providing an output signal when the beacon signal level received at said first antenna is greater than the beacon signal level received at said second antenna,

4. fourth circuit means for providing an output signal when the beacon signal level received at said first antenna is less than a predetermined reference voltage,

5. fifth circuit means for providing an output signal when the beacon signal level received at said second antenna is less than said predetermined reference voltage,

first AND gate circuit means having a first input coupled to said first circuit means, a second input coupled to said third circuit means and a third input coupled to said fourth circuit means for providing a high output switching signal when signals are present at all three inputs simultaneously,

second AND gate circuit means having a first input coupled to said second circuit means, a second imput coupled to said third circuit means and a third input coupled to said fifth circuit means for providing a second high output switching signal when signals are present at all three inputs simultaneously,

c. an RF transmitter;

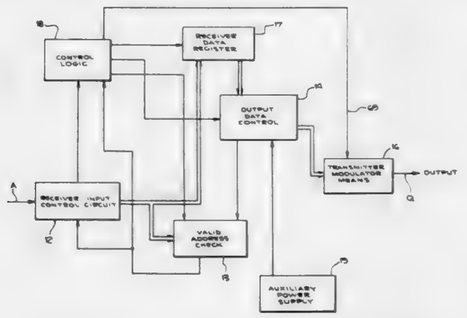
d. an RF switch coupled to said RF transmitter, said plurality of antenna means, and to said logic circuitry and being responsive to the output switching signal for connecting the RF transmitter to the antenna means receiving the strongest beacon signal.

4,041,398

BI-DIRECTIONAL DIGITAL COMMUNICATION NETWORK

Michael L. Ellis, San Diego, Calif., assignor to ICC, Inc., San Diego, Calif.

Filed June 3, 1976, Ser. No. 692,487
Int. Cl.[2] H04B *1/46*
U.S. Cl. 325—308 **22 Claims**



1. A low frequency bidirectional digital communication unit for use over coaxial cables of the cable TV system type, for requesting the performance of services by transmitting data to a central computer comprising:

address byte register means for registering an address codeword associated with said unit,

modem control code register means for registering a data word corresponding to services requested by said unit,

shift register means coupled to said address byte register means and said modem control code register means for receiving the contents of said address byte register means and the contents of said modem control code register means in parallel and for shifting said address codeword and said data word out of said data shift register serially to provide a serial output to the central computer on the coaxial cable, and

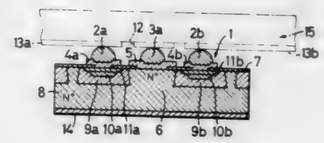
transmitter modulator means coupled to the serial output of said shift register means for transmitting said serial output of said shift register means to said central computer on a low frequency carrier wave to request the performance of services.

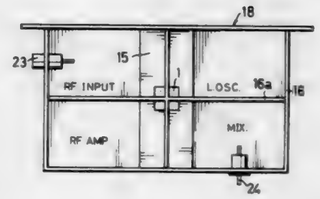
4,041,399

SEMICONDUCTOR VARACTOR DEVICE AND ELECTRONIC TUNER USING SAME

Yukio Tsuda, Machida, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 17, 1976, Ser. No. 686,782
Claims priority, application Japan, May 20, 1975, 50-59859
Int. Cl.[2] H04B *1/08;* H01L *29/93*
U.S. Cl. 325—357 **15 Claims**





1. A varactor device, comprising:

plural varactor elements each including first and second semiconductor regions of opposite conductivities in a semiconductor body, said first and second regions defining a PN junction therebetween, any two of said varactor elements being separated from each other by semiconductor material of one conductivity type and being electrically isolated from each other;

electrode means on said semiconductor material of one conductivity type;

plural electrodes on said plural varactor elements, respectively, each said electrode being in contact with said first semiconductor region; and

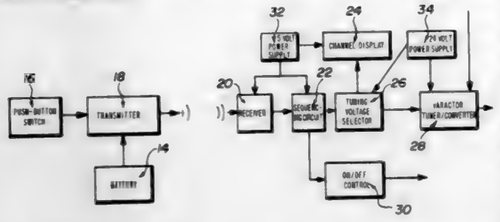
individual conducting means on said electrode means and on said plural electrodes, respectively, said individual conducting means being arranged on a substantially common surface of said varactor device, and any two of said conducting means on said electrodes being separated from each other by said conducting means on said electrode means.

4,041,400

TELEVISION REMOTE CONTROL SYSTEM

Gary P. Watts, Schaumburg, Ill., assignor to Sperry Electronics Ltd., Melrose Park, Ill.

Filed Feb. 23, 1976, Ser. No. 660,648
Int. Cl.[2] H04B 1/16
U.S. Cl. 325—392 **10 Claims**



1. Apparatus adapted to be retro-fitted to a television for electronically controlling the selecting of channels and the ON/OFF functions thereof, the television including a tuner, the television's tuner being tuned to a predetermined unused channel and the television being turned ON, comprising, in combination:

a hand control comprising transmitter means operable to transmit a sonic signal;

a control unit comprising:

a varactor tuner;

converter means coupled to said varactor tuner for converting the output signals thereof to signals having the frequency corresponding to the frequency of the unused channel to which the television tuner is tuned, said signals having the frequency to which the television tuner is tuned being coupled to the television tuner;

channel display means operated to provide an indication of the channel to which said varactor turner is tuned;

receiver means responsive to said sonic signals transmitted by said transmitter means;

circuit means comprising a tuning voltage selector circuit for selectively coupling tuning voltages to said varactor tuner to tune the same to the respective ones of said plurality of different channels, and a sequencing circuit operated responsive to the receipt by said receiver means of said sonic signals transmitted by said transmitter means for controlling the operation of said tuning voltage selector circuit to sequentially selectively couple the tuning voltages to said varactor tuner to progressively tune said varactor tuner to each of said plurality of different channels in a step-by-step fashion;

said sequencing circuit further comprising time delay means operated each time said varactor tuner is tuned to one of said plurality of different channels to inhibit further operation of said sequencing circuit for a pre-established time interval whereby a pause is provided after the varactor tuner is tuned to a channel before the varactor tuner is tuned to the next channel; and

a manually operable channel selector switch means for operating said circuit means, whereby the television can be both remotely and manually selectively tuned to a channel by operating the transmitter means and the channel selector switch means.

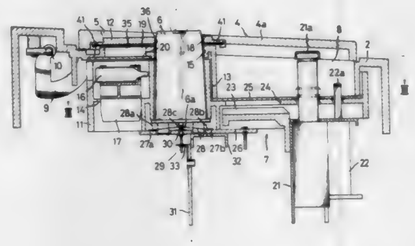
4,041,401

CHANNEL INDICATING APPARATUS

Nobuo Kitamura, Sagamihara; Katsuo Takada, and Hiroshi Fukagawa, both of Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 1, 1975, Ser. No. 592,212
Claims priority, application Japan, July 12, 1974, 49-82527[U]
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—455 **3 Claims**

1. A channel selecting and indicating apparatus for a television receiver having a cabinet provided with a control panel, said apparatus cooperating with tuner means included in said television receiver to enable an operator to preset said tuner means to selected, predetermined channels and to subsequently select any one of said preset channels, comprising: a predetermined number of channel indicating locations on said control panel; a plurality of individually adjustable variable resistors mounted in said control panel, each said variable resistors being associated with a corresponding one of said channel indicating locations and accessible by said operator to preset said tuner means to a desired one of said channels; a plurality of manually operable channel selecting switches, each switch being associated with a corresponding one of said channel indicating locations and mounted on said control panel to be selectively manually operated for tuning said tuner means to the one channel preset by said variable resistor associated with said one channel indicating location; a plurality of illuminating means disposed at said channel indicating locations, each being energized when an associated channel selecting switch at said channel indicating location is operated; a moveable cover



mounted over said control panel, said moveable cover having a front side and a reverse side; a plurality of channel indicating tabs mounted on the reverse side of said moveable cover, each of said tabs being mounted at a position on said cover such that when said cover is closed over said control panel, each of said tabs is positioned over a corresponding one of said illuminating means, each of said tabs having portions of differing light transmissivity to define a channel numeral, whereby the particular channel numeral defined by the corresponding channel indicating tab is illuminated when the associated channel selecting switch at said channel indicating location is operated to energize its associated illuminating means; and a plurality of manually operable band change-over switches separate from and independent of said channel indicating tabs, each of said band change-over switches being associated with a corresponding channel indicating location and a corresponding one of said variable resistors for selecting the desired frequency band of operation of said tuner means in response to a manual activation thereof.

4,041,402

CHANNEL SELECTION AND INDICATING SYSTEM

Takao Mogi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed July 1, 1975, Ser. No. 592,339
Claims priority, application Japan, July 5, 1974, 49-76962
Int. Cl.[2] H04B 1/06
U.S. Cl. 325—465 **10 Claims**

1. In a television receiver having an electronic tuner which is responsive to a given input tuning voltage for establishing a tuning condition, a channel selection and indicating system comprising:

a plurality of channel selection means for producing respective input tuning voltages,

each of said channel selection means having a switch connected in circuit therewith,

means responsive to the operation of one of said switches for

coupling a tuning voltage from a predetermined one of said channel selection means to said electronic tuner,

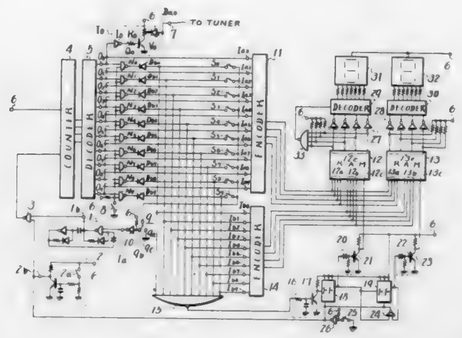
a memory means having address terminals, data terminals and output terminals,

address signal generating means coupled between said channel selection means and said address terminals of said memory means,

data signal generating means coupled in circuit between said switches and said data terminals of said memory means,

channel indicating means coupled in circuit with the output terminals of said memory means,

mode switching means for causing said switches to have in one mode the function of channel selection and in another mode the function of providing a path for programming



the output of said memory thereby to yield a given channel number for a given address of said memory,

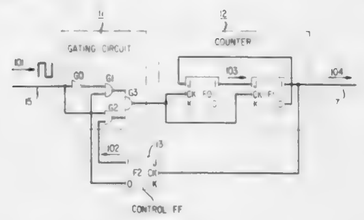
said channel selecting means comprising a pulse generating means, a counter connected to said pulse generating means, a decoder connected to said counter, and tuning voltage generating means connected to said decoder, each one of said switches being in circuit with said pulse generating means and respective outputs of the decoder such that a respective signal output of the decoder is coupled through said respective switches to operate the pulse generating means and such that the pulse generating means ceases to operate when the output of the decoder acquires a predetermined state as a result of the count of said counter.

4,041,403

DIVIDE-BY-N/2 FREQUENCY DIVISION ARRANGEMENT

Richard Samuel Chiapparoli, Jr., Freehold, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed July 28, 1975, Ser. No. 599,341
Int. Cl.[2] H03K 21/00, 23/08
U.S. Cl. 328—39 **3 Claims**



1. A frequency divider circuit for deriving two output pulses for every N input pulses where N is an odd number comprising:

a source of pulses,

gating means having two operating states and either of said states to the other thereof, a third input connected to said source and an output terminal for reproducing said input pulses at said output terminal in one of said states and for inverting said input pulses at said output terminal in the other of said states,

synchronous counter means having an input connected to said gating means output terminal and selectively operated in response to a receipt of each group of $(N+1)/2$ of said reproduced and of said inverted input pulses from said output terminal for producing an output pulse, said counter means including,

a plurality of J-K flip-flops each having a J data input, a K data input, a clock input and logic outputs,

means for interconnecting particular ones of said data inputs and said outputs of said plurality of flip-flops, and

means connecting said clock inputs of each of said flip-flops in parallel to said gating means output terminal for changing the state of individual ones of said flip-flops in response to a receipt of a pulse from said gating means output terminal synchronously to increment a pulse count, and

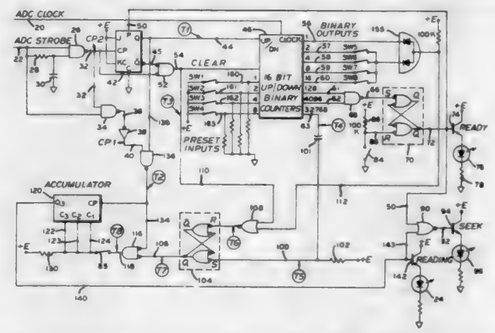
toggle switch means having outputs connected selectively to actuate one of said pair of inputs of said gating means and an input responsive to a receipt of said counter means output pulse for effecting a toggling of said switch means to switch the state of said gating means and for effecting the inverting of said pulses at said gating means output terminal to yield two equally spaced output pulses upon the receipt of two of said groups of $(N+1)/2$ pulses at said output terminal.

4,041,404

APPARATUS AND METHOD FOR DETECTING WHEN A MEASURED VARIABLE REPRESENTED BY A STRING OF DIGITAL PULSES REACHES A PLATEAU

Ronald Cyril Lewis, Jr., Willow Grove, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed June 1, 1976, Ser. No. 691,687
Int. Cl.[2] H03K 5/153, 5/18
U.S. Cl. 328—150 **6 Claims**



1. Apparatus for detecting when the value of a measured variable has reached a plateau when that value is represented by periodically produced strings of pulses having pulse counts representative of the value, comprising;

a first counting means operable to count consecutive pairs of said pulse strings so that the consecutive counts are in opposite directions,

a second counting means, and

means responsive to the output of said first counting means at the end of each pair of pulse strings and operable to increment said second counting means when the count accumulated by said first counting means at the end of the second string of said pair is within a predetermined number of counts of the count existing before counting the first string of the pair and to clear said second counting means when the count is not within the predetermined number, whereby the accumulation of a predetermined number of

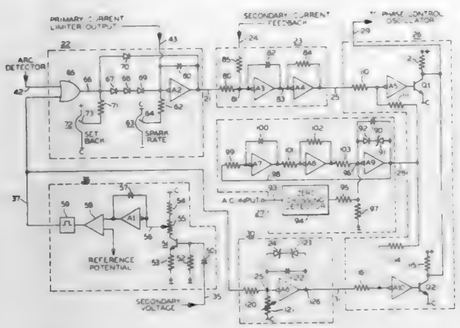
counts in said second counter is indicative of said measured variable reaching a plateau.

4,041,405

SAWTOOTH WAVEFORM GENERATOR

Richard Kent Davis, Salem, Va., assignor to General Electric Company, New York, N.Y.

Filed Aug. 13, 1976, Ser. No. 714,152
Int. Cl.[2] H03K *4/10*
U.S. Cl. 328—181 **5 Claims**



1. A sawtooth waveform generator adapted to provide a train of sawtooth waveform signal having equal bi-polar excursions of predetermined amplitude and of frequency accurately related to the frequency of an AC input signal, comprising:

a. first integrating means comprising an input, and an output adapted to supply said train of sawtooth waveform signal;

b. a source of AC signal;

c. pulse generating means responsive to said AC signal for producing unidirectional pulses having a predetermined frequency relationship with the frequency of said AC signal, and having a pulse duration which is short in respect to the time interval between pulses;

d. first coupling means for coupling said unidirectional pulses to the input of said first integrating means for causing said first integrating means during application of each pulse to integrate in a first direction and to produce at its output rapid excursions of potential in a first polarity direction;

e. voltage limiting means coupled to the output of said integrating means for limiting said excursions in a first polarity direction to a predetermined magnitude;

f. a source of DC potential;

g. second coupling means for coupling said source of DC potential to the input of said first integrating means for causing said first integrating means to integrate in a second direction commencing with the termination of each pulse and terminating with the initiation of a subsequent pulse, and to produce at its output gradual excursions of potential in a second polarity direction;

h. second integrating means having a long RC time constant in respect to the frequency of said unidirectional pulses and comprising an input and and output;

i. means for coupling the sawtooth waveformsignal produced by said first integrating means to the input of said second integrating means to produce at the output of said second integrating means an error signal constituting a time integral of amplitude differences between the bi-polar excursions of said sawtooth waveform; and

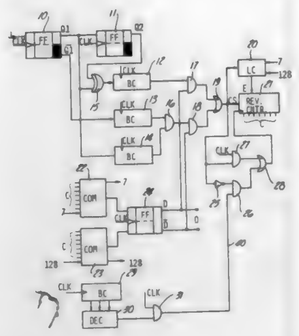
j. means for coupling said error signal from the output of said second integrating means to the input of said first integrating means in a manner to reduce said amplitude differences so as to provide a sawtooth waveform signal having equal bi-polar excursions of predetermined amplitude.

4,041,406

METHOD AND APPARATUS FOR THE DETERMINATION OF THE TRANSITION OF DIGITAL DATA SIGNALS MODULATED WITH TWO DIFFERENT SIGNAL FREQUENCIES

Lorenz Hanewinkel, Paderborn, Germany, assignor to Nixdorf Computer AG, Paderborn, Germany

Filed July 1, 1976, Ser. No. 701,567
Claims priority, application Germany, July 3, 1975, 2529784
Int. Cl.[2] H03K *9/06*; H04L *27/14*
U.S. Cl. 329—107 **23 Claims**



1. A method for determining the transition between a first and second signal frequency of a data signal wherein the data signal is modulated with different signal frequencies, comprising the steps of:

generating a comparison pulse of a first or second duration at each pulse front of said data signal during said second or first signal frequency, respectively,

generating a control pulse at the leading edge of each comparison pulse,

terminating the control pulse at the trailing edge of each comparison pulse,

changing the contents of a storage means in a first direction during said control pulses,

changing the contents of said storage means in a direction opposite from said first direction during the intervals between said control pulses, and

establishing a pair of separated threshold values whereby the attainment of one of said threshold values by said contents of storage means is interpreted as a transition of the data signal from one signal frequency to the other signal frequency, which transition is also used for the change over of the duration of the comparison pulses.

4,041,407

DRIVER CIRCUIT FOR DEVELOPING QUIESCENT AND DYNAMIC OPERATING SIGNALS FOR COMPLEMENTARY TRANSISTORS

W. Eric Main, Mesa, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Oct. 22, 1975, Ser. No. 624,690
Int. Cl.[2] H03F *3/183*
U.S. Cl. 330—13 **17 Claims**

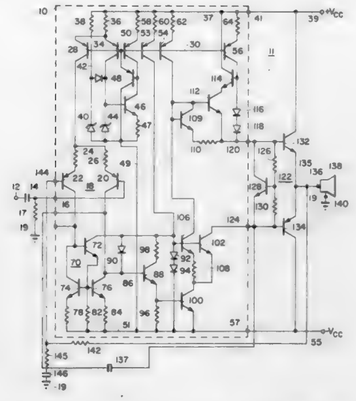
1. A push-pull driver circuit for providing dynamic and quiescent output signals to first and second push-pull connected output electron control devices which have a bias circuit for preventing crossover distortion coupled thereto, the push-pull driver circuit including in combination:

first current supply means for providing a substantially constant current at an output terminal thereof;

first driver transistor means for amplifying a dynamic driving signal and having first, second, and control electrodes, said control electrode being coupled to said output terminal of said first current supply means, said first electrode being adapted to be coupled to both the control electrode of the first push-pull connected electron control device, and to the bias circuit;

first bias means for enabling said first driver transistor means to have a high gain and for controlling the magnitude of the quiescent current provided by said first driver transistor means to the first push-pull connected electron control device, said first bias means being coupled between said control and first electrodes of said first driver transistor means;

second driver transistor means for amplifying a dynamic driving signal and having first, second and control electrodes, said second electrode of said second driver transistor means being adapted to be coupled to both the control



electrode of the second push-pull connected electron control device and to the bias circuit; and

second bias means coupled to said second driver transistor means for enabling said second driver transistor means to have a high gain and for controlling the magnitude of the quiescent current provided by said second driver transistor means to the second push-pull connected electron control device; and

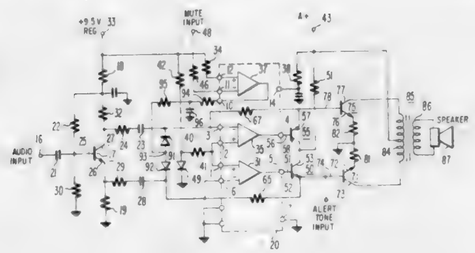
driver circuit means for dynamically driving said first and second driver transistor means, said driver circuit means being coupled between said output terminal of said first current supply means and said control electrodes of said first driver transistor means and said second driver transistor means.

4,041,408

PUSH-PULL AUDIO AMPLIFIER SYSTEM WITH MUTING

Vincent William Trotnick, Jr., West Newton, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1976, Ser. No. 741,510
Int. Cl.[2] H03F *3/26*
U.S. Cl. 330—15 **4 Claims**



1. In an audio amplifying system including a pair of amplifiers connected in push-pull for driving a loud speaker coil, the combination therewith for amplifying and muting the speaker comprising:

a pair of current-differencing operational amplifiers characterized by inverting and non-inverting current responsive inputs to provide an output voltage proportional to the difference in the input currents, each of said operational amplifiers having a feedback circuit including a resistor coupled between the output and inverting input,

means for coupling a first of said operational amplifiers to a first of said amplifiers connected in push-pull and for coupling the second of said operational amplifiers to the second of said amplifiers connected in push-pull,

means for biasing said operational amplifiers to provide in the quiescent state a DC output voltage therefrom of a value sufficient to equally forward bias the first and second amplifiers connected in push-pull and to provide with the value of said feedback resistors substantially equal currents to the inverting and non-inverting inputs of said operational amplifiers whereby said operational amplifiers are biased into the linear region,

phase splitter means having one output coupled to the inverting input of said first operational amplifier and having a second output terminal coupled to the inverting input of said second operational amplifier and being responsive to audio signals at the input for providing first power divided audio signals of a first phase and magnitude to the inverting input of said first operational amplifier and for providing second power divided audio signal of equal magnitude and 180° out-of-phase with said first power divided signal to the inverting input of said second operational amplifier whereby the first and second power divided audio signals are amplified and applied separately to said first and second amplifiers connected in push-pull, and

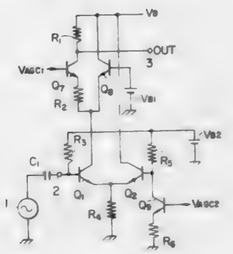
muting means responsive to a squelching signal for simultaneously applying sufficient DC current to the inverting input terminals of both current differencing operational amplifiers to decrease the DC output level therefrom to a muting level below the forward bias level of said first and second amplifiers connected in push-pull to simultaneously bias said first and second amplifiers off and mute the speaker.

4,041,409

AUTOMATIC GAIN CONTROL CIRCUIT

Yasuo Kominami, Kokubunji; Yukio Suzuki, Hirai Hinode, and Masami Kawamura, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 6, 1976, Ser. No. 729,984
Claims priority, application Japan, Oct. 8, 1975, 50-120673
Int. Cl.[2] H03G *3/30*
U.S. Cl. 330—29 **9 Claims**



1. An automatic gain control circuit comprising:

a first pair of transistors whose emitters are commonly coupled to one end of common impedance means, the other end of said common impedance means being connected to a reference potential source;

a second pair of transistors whose emitters are commonly

coupled to a collector of one of said first pair of transistors, the collector of the other of said first pair of transistors being connected to a source of operating potential;

load impedance means for coupling the collector of one of said second pair of transistors to said source of operating potential, the collector of the other of said second pair of transistors being directly connected to said source of operating potential;

means for applying an input signal to said one of said first pair of transistors; and

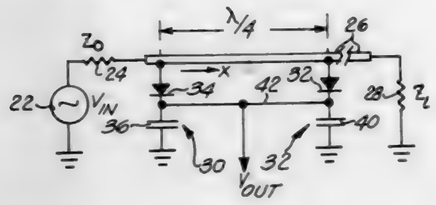
means for supplying a gain control signal to the base of either transistor in each pair of said first pair of transistors and said second pair of transistors so as to increase the collector bias current of said one of said first pair of transistors and conversely decrease the collector bias current of said one of said second pair of transistors in response to an increase of said input signal.

4,041,410

RF LEVEL DETECTOR

Donald Keith Belcher, Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Apr. 12, 1976, Ser. No. 675,761
Int. Cl.[2] H03G *3/20*
U.S. Cl. 330—129 **6 Claims**



1. Apparatus for feedback stabilizing an RF amplifier and comprising:

a variable gain RF amplifier responsive to an input signal for providing an RF output signal, and further responsive to a control input for adjusting the gain of said amplifier;

a trasmission line connected to the output of said RF amplifier such that said RF output signal propagates along said transmission line;

amplitude detection means having a plurality of input circuits each responsive to a respective input signal for providing a signal having a value reflective of the peak amplitude of the greater of said input signals;

means for connecting said input circuits to said transmission line at selected distances from one another whereby said peak signal generated by said detection means reflects a signal amplitude corresponding to at least the amplitude produced when said transmission line is terminated in a matched impedance, and responsive to changing VSWR; and,

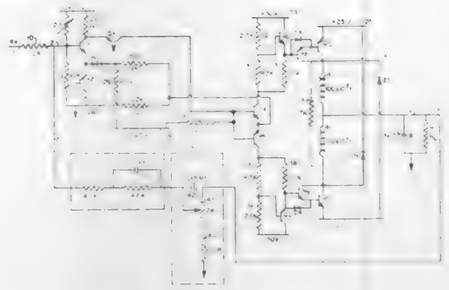
means for supplying said peak signal to said control input of said RF amplifier so as to control the gain of said amplifier in accordance therewith and thereby feedback stabilize said amplifier.

4,041,411

QUANTIZED AMPLIFIER

Clayton L. Sturgeon, Fort Worth, Tex., assignor to Ranger Engineering Corporation, Fort Worth, Tex.

Continuation-in-part of Ser. No. 508,767, Sept. 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 340,682, March 13, 1973, abandoned. This application Mar. 1, 1976, Ser. No. 662,871
Int. Cl.[2] H03F *21/00*
U.S. Cl. 330—207 A **17 Claims**



13. An amplifier for coupling a positive DC supply and a negative DC supply to a load in accordance with an input signal, comprising:

response delay means connected operatively in series with the load,

means for comparing only the instantaneous output signal as developed at the load and having a value proportional to an input signal with the input signal and generating an error signal, and

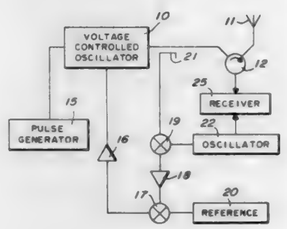
a transistorized two state circuit responsive only to the polarity of the error signal for completing and maintaining an interconnection between one of the DC sources and said response delay means and for maintaining an open connection between the other of the DC sources and said response delay means until the polarity of the error signal reverses and interchanging said interconnection between the DC sources and said response delay means in response to a reversal of error signal polarity.

4,041,412

HIGH POWER, PULSED MICROWAVE FREQUENCY CONVERTER

Hugh Robert Malone, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 14, 1976, Ser. No. 695,698
Int. Cl.[2] H03B *3/04*
U.S. Cl. 331—10 **5 Claims**



1. In a microwave communications system, a high power, pulsed microwave frequency converter comprising:

a. a voltage controlled microwave oscillator having a bias input, a control input and an output, and supplying microwave frequency signals at the output only when a proper bias is applied to the bias input thereof;

b. bias pulse generating means providing periodic pulses of bias power connected to the bias input of said voltage controlled microwave oscillator each of said bias pulses having a duration of less than approximately 250 nanoseconds;

c. a mixer having a first input coupled to the output of said voltage controlled microwave oscillator, a second input and an output;

d. local oscillator means having an output connected to the second input of said mixer;

e. a phase detector having a first input coupled to the output of said mixer, a second input and an output;

f. an intermediate frequency reference source having an output connected to the second input of said phase detector;

g. a wideband amplifier having an input coupled to the output of said phase detector and an output coupled to the control input of said voltage controlled microwave oscillator; and

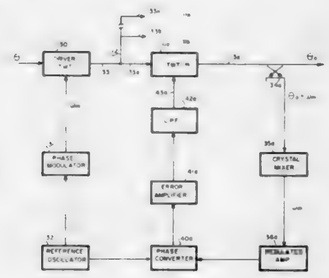
h. said voltage controlled microwave oscillator and said wideband amplifier having means therein for providing sufficient tuning range and bandwidth, respectively, to cause the converter to lock onto a desired microwave frequency within a period shorter in duration than approximately ten percent of the bias pulse duration.

4,041,413

AUTOMATIC PHASE COMPENSATION CIRCUIT FOR PARALLELING POWER AMPLIFIERS IN THE MICROWAVE FREQUENCY RANGE

Claude Strothers, Jr., 30742 Tarapaca Road, Rancho Palos Verdes, Calif. 90274

Filed Jan. 2, 1976, Ser. No. 646,279
Int. Cl.[2] H03F *3/58*
U.S. Cl. 330—43 **7 Claims**



1. An automatic phase control microwave amplifier system employing a plurality of microwave power amplifiers;

means applying a microwave signal to be amplified in parallel to the power amplifiers;

a reference signal source having a lower frequency than the frequency of the microwave signal applied to the microwave power amplifiers;

means phase modulating the microwave signal to be amplified with the output of the reference signal source;

respective means coupled to the output of each microwave power amplifier for detecting the phase of the modulation frequency content of the output of the respective power amplifiers;

respective means for phase comparing the reference signal from its reference signal source and the reference signal detected at the output of its respective microwave power amplifier;

respective means developing an error signal proportional to the phase error between the reference signal and the reference signal as detected at the output of the microwave power amplifier; and

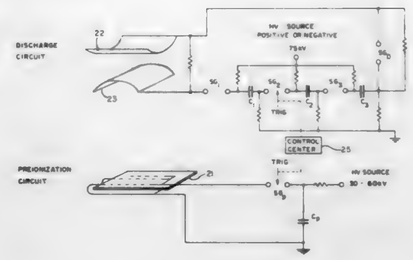
means applying respective the error signals to each respective microwave power amplifier as a phase correction signal.

4,041,414

MULTIPLE ARC RADIATION PREIONIZER FOR GAS LASERS

Martin C. Richardson, and Kurt Leopold, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Mar. 21, 1974, Ser. No. 453,517
Claims priority, application Canada, May 30, 1973, 172712
Int. Cl.[2] H01S *3/097*
U.S. Cl. 331—94.5 G **4 Claims**



1. A multiple arc radiation preionizer for gas lasers of the type having two main electrodes defining a main laser discharge region between them comprising:

a. a sheet of dielectric material,

b. an elongated metallic conductor positioned over the surface of the sheet,

c. said conductor having formed over a portion of its length a series of gaps to form a series of intervening discharge electrodes and thus an overall linear array of arc gap positions,

d. said conductor having end connections such that on connection to a high voltage source, simultaneous arcs producing ultra violet radiation are formed between said discharge electrodes over the surface of the dielectric sheet, and

e. a metal conductor positioned on said sheet in spaced relation to said electrodes to form a low inductance ground plane, said conductor being connected to one of said end connections or to ground.

4,041,415

COAXIAL ELECTRON BEAM PUMPED LASER

Earl R. Ault, Rolling Hills Estates; Philip C. Stevens, Redondo Beach; Robert H. Sipman, Agoura, and Robert S. Bradford, Jr., Los Angeles, all of Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Filed May 7, 1976, Ser. No. 684,456
Int. Cl.[2] H01S *3/097*
U.S. Cl. 331—94.5 PE **6 Claims**

1. A laser comprising:

a hollow cylindrical cathode member fabricated of an electrically conductive material,

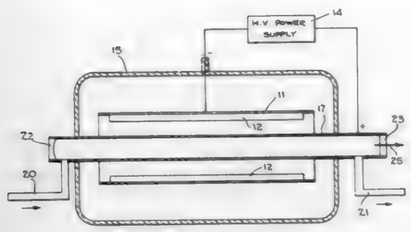
a hollow cylindrical anode member having a smaller diameter than said cathode member and being mounted in internal concentricity therewith,

means for feeding a lasing gas to within the chamber formed by said cylindrical anode member, said anode member being sealed at the opposite ends thereof to contain said gas,

optical reflector means positioned at the opposite ends of said cylindrical anode member for forming a laser oscilla-

tor cavity, one of said optical means being only partially reflective, and

high voltage means connected between said anode and cathode members to generate an e-beam which penetrates the



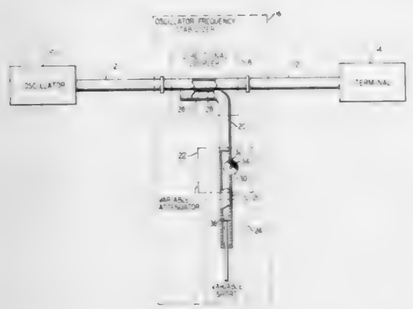
wall of said cylindrical anode member and excites the gas contained therein to effect a population inversion in said gas, whereby a laser beam is generated and laser energy emitted through said partially reflective optical means.

4,041,416

METHOD AND APPARATUS FOR FREQUENCY STABILIZING OSCILLATORS

Bernard Glance, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 22, 1976, Ser. No. 734,718
Int. Cl.² H03B *3/06*
U.S. Cl. 331—96 **4 Claims**



1. A method of stabilizing the frequency of an oscillator comprising the steps of:

a. tapping a fraction of the output signal from the oscillator propagating in a main transmission line into a second waveguide transmission line section having a coefficient of thermal expansion per degree Centigrade (/° C) which is greater than the coefficient of relative frequency drift/° C of the oscillator, said oscillator output signal including frequency deviations due to the effect of ambient temperature variations on the oscillator;

b. attenuating the tapped signal propagating in said second waveguide transmission line section by a predetermined amount;

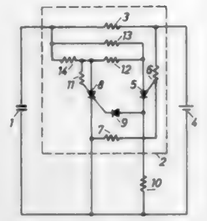
c. reflecting the attenuated signal back along said second waveguide transmission line section towards said oscillator, said second waveguide transmission line section elements functioning in response to ambient temperature variations to produce reactive load variations having a corresponding magnitude and an opposite sign to impedance changes in the oscillator caused by said ambient temperature variations which, in turn, produce said frequency deviations therein.

4,041,417

LOW DUTY CYCLE PULSE GENERATOR USING TWO THYRISTORS

Arne Goran Gabrielsson, Vallingby, and Jan Erik Lindstrom, Spanga, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed May 27, 1976, Ser. No. 690,421
Claims priority, application Sweden, June 19, 1975, 7507127
Int. Cl.² H03K *3/35*
U.S. Cl. 331—107 R **2 Claims**



1. A pulse generator with a low duty factor comprising a power supply, a capacitor having a pair of terminals connected across said power supply and arranged to alternately be charged via a first current path including a charging resistance means and discharged via a second current path, the second current path comprising a first thyristor element having its anode-cathode circuit connected across the capacitor and being arranged to be activated by a predetermined capacitor voltage and to be deactivated by a second thyristor element, means connected across said power supply for maintaining the anode gate of said first thyristor element at a predetermined fraction of the voltage of the power supply, a resistor network comprising a first resistor means connected between the anodes of the thyristor elements and second and third resistor means arranged to connect a first terminal of the capacitor to the anode of the first thyristor element and to the anode of the second thyristor element, respectively, the second thyristor element being arranged to be provided with a trigger voltage generated across a cathode load of the first thyristor element, low resistive means connecting the anode gate of said second thyristor element to the anode thereof, and means for connecting the cathode of said second thyristor element to the second terminal of said capacitor.

4,041,418

EQUALIZER FOR PARTIAL RESPONSE SIGNALS

Helmut Koeth, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 431,433, Jan. 7, 1974, abandoned. This application June 24, 1975, Ser. No. 589,930
Claims priority, application Germany, Jan. 5, 1973, 2300454
Int. Cl.² H04B *3/04*
U.S. Cl. 333—18 **4 Claims**

1. An equalizer for partial-response signals having data detection means for receiving input data signals and transforming same into signals of predetermined discrete amplitudes and error means for producing error signals indicative of the differences between said input signal amplitudes and said discrete amplitudes, comprising:

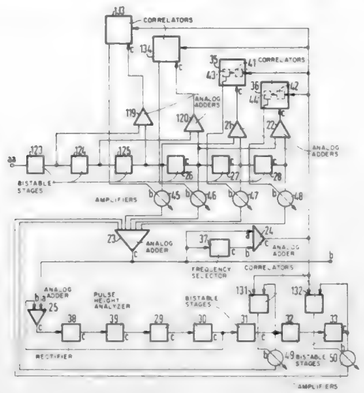
first shift register means comprising a plurality of bistable stages forming a transversal filter,

a plurality of adjustable gain amplifier means, each having an input connected to an output of a different one of said bistable stages of said first shift register means, said amplifiers being coupled to said error means so that said error signals control the gains thereof,

first analog adder means having inputs connected to outputs of said plurality of adjustable gain amplifier means,

second shift register means having a plurality of bistable stages and

second analog adder means having an input connected to an output of said first analog adder and another input connected to the output of a predetermined one of the stages



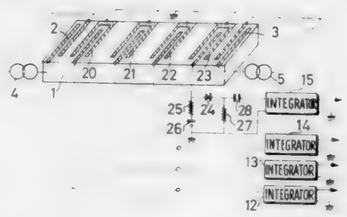
of said second shift register means and having an output coupled to an input of the first stage of said second shift register means.

4,041,419

SURFACE ELASTIC WAVE ANALOGUE CORRELATOR

Bernard Desormiere; Olivier Menager; Albert Courty, and Grégoire Eumurian, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed July 7, 1975, Ser. No. 593,245
Claims priority, application France, July 9, 1974, 74.23837
Int. Cl.² H03H *9/26, 9/30;* H01L *27/20;* G06G *7/18*
U.S. Cl. 333—30 R **6 Claims**



1. A surface elastic wave analogue correlator having a first and a second input designed to be respectively supplied with a first and a second signal and *m* outputs each designed to deliver one of *m* samples of the correlation function of said first and second signals, *m* being a positive whole number, comprising:

a surface elastic wave delay device comprising a piezo-electric substrate, an electro-mechanical transducer located on a propagating surface on said substrate connected to said first input and adapted for emitting a surface wave propagating on said substrate and *m* surface wave sensing areas positioned for receiving said surface wave; and

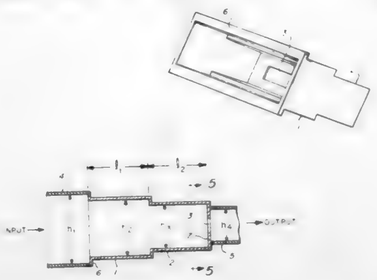
m analogue processing channels, said *m* analogue processing channels having respective input means arranged at said *m* sensing areas, each of said channels comprising a non-linear transmission device having a first input connected to the input of said channel, a second input connected to said second input of said correlator and an output, each channel further comprising integrator means having an input connected to the said output of said transmission device and an output forming one said *m* output of the correlator.

4,041,420

SHUNTED STEPPED WAVEGUIDE TRANSITION

Henry J. Riblet, 100 Westcliff Road, Weston, Mass. 02193

Filed June 30, 1976, Ser. No. 701,303
Int. Cl.² H01P *5/08*
U.S. Cl. 333—35 **3 Claims**



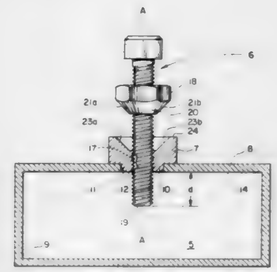
1. In a stepped transformer of the type having one or more sections of waveguide that are each substantially one quarter wavelength long at the mid-band frequency of the transformer, the improvement comprising a resonant element which provides a non-zero admittance shunting the lowimpedance end of the transformer, the resonant element being a window disposed at one end of a section of rectangular waveguide, and the integrated width and the integrated height of the window being less than the corresponding internal dimensions of the waveguides on both sides of the window.

4,041,421

STABILIZED LOCKING MECHANISM FOR THREADED TUNING SCREWS IN WAVEGUIDES

David Donald Owlett, Belmont, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 3, 1976, Ser. No. 682,690
Int. Cl.² H01P *1/20, 7/06, 1/28*
U.S. Cl. 333—73 W **4 Claims**



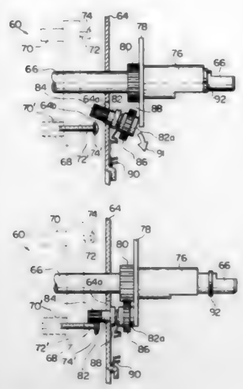
1. In a structure supporting propagation of electromagnetic waves and having a tuning screw threadably supported in an aperture in wall means thereof so as to have first and second screw portions on opposite sides of the wall means, apparatus for locking the position of the tuning screw in the structure while maintaining the axial position of the screw substantially fixed so as to prevent lateral movement thereof, comprising: a locknut being threaded onto the first portion of the screw on one side of the wall means, and a given surface on the one side of the wall means adjacent to the aperture; said locknut having a bottom surface for rotatably mating with said given surface of the wall means; said mating surfaces being tapered with respect to the axis of the screw in the aperture for maintaining the axial position of the screw substantially fixed to prevent lateral movement thereof as the locknut is threaded on the screw to securely force said mating surfaces together.

4,041,422

FINE TUNING ASSEMBLY FOR PRESET TUNER

Tasuku Noji, and Yoichi Yasuma, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed July 21, 1976, Ser. No. 707,217
Claims priority, application Japan, July 25, 1975, 50-103274
Int. Cl.[2] H03J *5/28*
U.S. Cl. 334—49 **6 Claims**



1. A tuning assembly comprising:
a frame;
a channel selector shaft rotatably supported by the frame;
a support member fixed to the selector shaft;
a plurality of tuning elements mounted on the support member, each tuning element including a rotary shaft and a gear fixed to the rotary shaft, the selector shaft being rotatable to move a selected one of the tuning elements to a tuning position;
a tuning shaft rotatably and translatably supported by the frame;
a tuning gear and an actuator member fixed to the tuning shaft;
an idler shaft rotatably supported by the frame;
first and second idler gears fixed to the idler shaft and engagable with the tuning gear and the gear of said selected tuning element respectively; and
biasing means urging the idler shaft to tilt over an edge of the frame so that the first and second idler gears disengage from the tuning gear and the gear of said selected tuning element respectively, the tuning shaft being translatable so that the actuator member engages with the idler shaft and tilts the idler shaft against a force of the biasing means so that the first and second gears drivably engage with the tuning gear and the gear of said selected tuning element respectively.

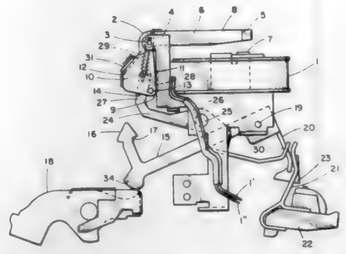
4,041,423

UNDERVOLTAGE RELEASE FOR CIRCUIT BREAKER

Darrell P. Ophaug, Marion, and Beryl W. Layton, Cedar Rapids, both of Iowa, assignors to Square D Company, Park Ridge, Ill.

Filed Dec. 8, 1975, Ser. No. 638,482
Int. Cl.[2] H01H *83/12*
U.S. Cl. 335—20 **14 Claims**

1. An undervoltage release mechanism for a circuit breaker having main latch means and main contact opening means, comprising coil means connected in said circuit breaker in series with an electrical source for energization by said source, armature means operatively associated with said coil means; for movement by said coil means between an open and a closed position in accordance with the state of energization of said coil means, undervoltage trip means operatively associated with said armature means and with said main latch means for movement between a set position to permit said main latch means for movement between a set position to permit said main latch means to latch said main contact opening means when said armature means is in one of its said positions and a trip position to trip said main latch means for releasing said contact opening means when said armature means is in the other of its said positions, and main latch restraint means operatively assoicated with said armature means and with said main latch



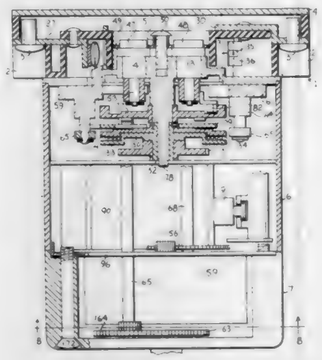
means for automatic movement by said armature means and independently of said undervoltage trip means to a released positon to permit said main latch means to latch said contact opening means when said armature means is in one of its said position and to a restraint position to restrain said main latch means from latching said contact opening means when said armature means is in the other of its said positions.

4,041,424

AUTOMATIC RESET TIMER

John L. Harris, Clearwater, Fla., assignor to Deltrol Corporation, Bellwood, Ill.

Division of Ser. No. 333,767, Feb. 23, 1973, Pat. No. 3,968,698.
This application Jan. 28, 1976, Ser. No. 652,967
Int. Cl.[2] H01H *3/00*
U.S. Cl. 335—75 **27 Claims**



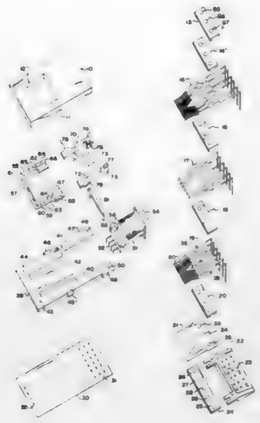
1. In an automatic reset timer having a switch, timing means, a motor, drive means driven by the motor including a clutch for driving the timing means in one direction when the clutch is engaged, reset means for returning the timing means to a starting position if the clutch is disengaged, the timing means being arranged to cause movement of the switch from a timing position to a timed-out position when driven by the motor to a predetermined position, return means controlling the return of the switch to timing position, a first controller for controlling said return means, a second controller for controlling the clutch, and means for actuating said controllers, said last named means including a common reciprocating power member and separate mechanical linkages between the power member and said controllers, and adjustable means in one of said linkages for revising the action of the reciprocating power member on its respective controller.

4,041,425

MINIATURE LOW PROFILE RELAY

Douglas J. Brush, Villa Park; David L. Vonder, Addison, and Anthony J. Wilkis, Downers Grove, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed June 18, 1975, Ser. No. 587,937
Int. Cl.[2] H01H *67/02*
U.S. Cl. 335—129 **15 Claims**



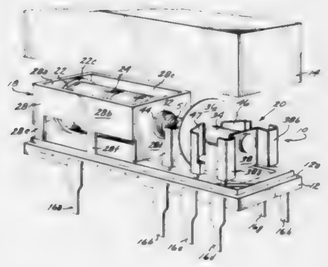
1. A low profile relay comprising:
spring pile-up means including relay springs and contacts;
bobbin means for mounting a coil;
E-core means including two outer elongated arms and a center arm shorter than said two outer arms to provide a space coplanar with the arms for locating therein said spring pile-up means, said two outer arms supporting said spring pile-up means between them in said space coplanar with the arms and said center arm supporting said bobbin means;
armature spring means mounted on said E-core means; and
armature means affixed to said armature spring means for actuating said contacts in cooperation with said coil.

4,041,426

MINIATURE ARMATURE RELAY

Zdenek S. Zemanek, Huntington Beach, and Jack M. Brown, Costa Mesa, both of Calif., assignors to Esterline Electronics Corporation, Costa Mesa, Calif.

Filed Oct. 22, 1975, Ser. No. 624,521
Int. Cl.[2] H01H *51/08*
U.S. Cl. 335—131 **4 Claims**



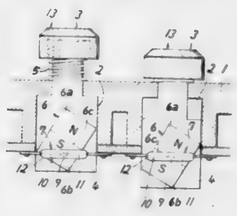
1. A miniature armature relay comprising in combination,
a generally flat coplanar header and a cover therefor,
an electromagnetic operator fixed to said header comprising an electrically energizable winding and means affording a magnetic circuit including an armature,
alignment means comprising a pair of anchor lugs fixed to said header on opposite sides of said armature and a flexible member fixed to said armature and to said anchor lugs to limit said armature to rectilinear movement,
biasing means urging said armature in one direction, the electromagnetic operator being operable to overcome said biasing means to move said armature in the direction opposite to said one direction,
at least one pair of electrically conductive mounting lugs in said header on opposite sides of said armature,
a stationary contact fixed to each of said lugs,
an electrically conductive contactor carried by said armature for reciprocatable movement into bridging engagement with said stationary contacts with corresponding movement of said armature,
and a mounting terminal for each of said lugs connected in circuit therewith within said header and extending from the edge of said flat header, said terminals being formed with a right angle exteriorly of said header for insertion in appropriate openings in a printed circuit board.

4,041,427

REED SWITCHING OPENING AND CLOSING DEVICE

Hideo Chusha, Mobara, Japan, assignor to Futaba Denshi Kogyo K. K., Japan

Filed Oct. 6, 1975, Ser. No. 620,176
Claims priority, application Japan, Apr. 15, 1975, 50-44779
Int. Cl.[2] H01H *36/00*
U.S. Cl. 335—205 **5 Claims**



1. A reed switch opening and closing device comprising:
a reed switch having first and second reeds, the first and second reeds extending generally longitudinally along a first line, the first and second reeds being resiliently biassed so as not to contact each other unless the first reed is disposed in a magnetic field of a first polarity and the second reed is disposed in a magnetic field of a second polarity opposite to the first polarity;
a magnetic means having a first pole of the first polarity and a second pole of the second polarity, the first pole being joined to the second pole along a second line which is obliquely disposed with respect to the first line along which the first and second reeds generally longitudinally extend, the first pole generating a first magnetic field of the first polarity and the second pole generating a second magnetic field of the second magnetic polarity;
the reed switch having closed and open positions, the closed position occurring when the first reed is disposed within the first magnetic field and the second reed is disposed within the second magnetic field causing the first and second reeds to attract each other and to make contact with each other, the open position occurring when the first and second reeds are both disposed in the first magnetic field in order to overcome the peripheral influence of the second magnetic field to permit the first and second reeds to be resiliently biassed so as to not contact each other;
the switching from the closed position to the open position and from the open position to the closed position occurring with linear displacement of the second line with

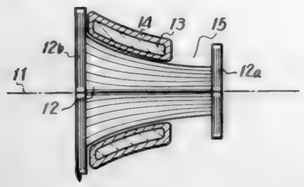
respect to the first line, the second line passing through the area in which the first and second reeds contact each other when in the closed position.

4,041,428

DEFLECTION YOKE FOR USE WITH IN-LINE CATHODE RAY TUBES

Yasuo Kikuchi; Yasuyuki Ohmichi, both of Yokohama; Osamu Terasaki, and Koichi Sakai, both of Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 31, 1976, Ser. No. 719,101
Claims priority, application Japan, Sept. 2, 1975, 50-106154
Int. Cl.[2] H01F *7/00*
U.S. Cl. 335—210 **6 Claims**



1. A deflection yoke for use with an in-line cathode ray tube in which a plurality of electron beams are laid in a plane, said deflection yoke comprising:

a. a first deflection winding formed in the saddle shape with front and rear bends at both end portions thereof, through which the electron beams pass from said rear bend to said front bend when the deflection yoke is mouned on the cathode ray tube;

b. a magnetic core disposed to surround said frist deflection winding between said front and rear bends; and

c. a second deflection winding would toroidally around said magnetic core so as also to surround said first deflection winding between said front and rear bends, said second deflection winding being shorter than the distance between said front and rear bends of the first deflection winding and being positioned adjacent said front bend of the first deflection winding at one end thereof and with a predetermined space between the other end thereof and said rear bend of the first deflection winding.

4,041,429

ELECTROMAGNETIC ACTUATOR

George E. Parker, and Daniel C. Garvey, both of Fort Collins, Colo., assignors to Woodward Governor Company, Rockford, Ill.

Filed Apr. 20, 1976, Ser. No. 678,559
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—276 **18 Claims**

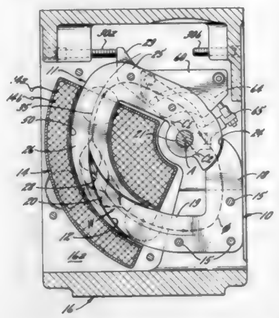
1. In an electromagnetic actuator, the combination comprising

first and second members of magnetically permeable material, one of which is a stator and one of which is a rotor,

means pivotally interconnecting said first and second members to swing relative to one another about an axis, said members being shaped to jointly form a closed ring with respective opposed extremities which approach toward or retreat from one another in jaw-like fashion as the swinging movement about said axis occurs to narrow or widen a gap therebetween,

said first member's extremity being shaped to define a tapered tooth, said second member's extremity being bifurcated to form fingers defining a tapered mouth which substantially complements said tooth, thereby to create said gap in two substantially equal halves lying respectively between the surfaces of said tooth and the opposed complemental surfaces of said mouth, and

a coil linked with the closed ring formed by said members and which, when excited, creates m.m.f. in such ring to establish magnetic flux threading the ring and dividing to



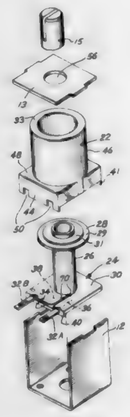
pass in substantially equal halves across the two halves of said gap.

4,041,430

COIL BOBBIN AND MATCHING COVER FOR SOLENOID ASSEMBLY

Orest Hrynewycz, Elmwood Park, Ill., assignor to Guardian Electric Manufacturing Co., Chicago, Ill.

Filed Mar. 8, 1976, Ser. No. 664,870
Int. Cl.[2] H01F *27/02*
U.S. Cl. 336—92 **4 Claims**



1. An electrical solenoid assembly comprising in combination: a core piece; a bobbin having first and second spaced flanges, said second flange having a peripheral edge; a hollow tubular portion joining said flanges to define a space, said tubular portion being hollow to receive the solenoid core piece, and including a plurality of inwardly projecting projections on the interior of the hollow tubular portion for supporting the core piece in central position; a wound wire in said space, said wound wire having lead wires extending therefrom, an outwardly projecting shelf on said second flange; an outer end on said shelf; first and second terminal members projecting laterally outwardly from recessed spaced terminal openings in said shelf, a pocket in said second flange passing from one terminal member to said tubular portion, said pocket receiving and insulatingly spacing one lead wire from the remaining portions of said wound wire, said second terminal member receiving the other lead wire, slack provided in said lead wires so as to compensate for expansion and contraction of said wound wire resulting from coil temperature variations, a re-

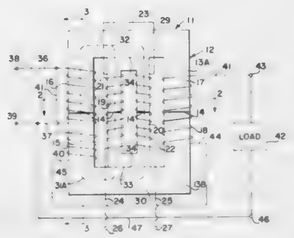
movable cover member covering said bobbin including said projecting shelf of said second flange and insulatingly covering said bobbin and said wound wire, apertures in said cover for permitting the passage of said terminal members therethrough outwardly from the edge of the second flange, a downwardly extending side portion on said cover member, said downwardly extending side portion covering said pocket forming an enclosed insulated passageway to thereby insulate said other lead from said one lead wire and said wound wire, said downwardly extending side portion of said cover fitting over the edge of the second flange intermediate the terminals, said terminals projecting outwardly through slots in the front portion a first insulating ridge integrally molded in the second flange and extending laterally downwardly from the plane of the second flange adjacent the terminals and normal thereto, said cover including an opening for receipt of a projection of the tubular member from the first flange; a second insulating ridge on the cover member parallel to and spaced from the first ridge; a U shaped field piece which fits between the ridges and cradles the cover and bobbin; and an end plate attached at the open end of the U shaped field piece.

4,041,431

INPUT LINE VOLTAGE COMPENSATING TRANSFORMER POWER REGULATOR

Gerald E. Enoksen, Karlstad, Minn., assignor to Ralph Ogden, Munster, Ind.

Filed Nov. 22, 1976, Ser. No. 743,768
Int. Cl.[2] H01F *21/08*; G05F *1/32*
U.S. Cl. 336—160 **7 Claims**



1. A transformer power regulator for efficiently and variably supplying at least 50 watts of power to a load from an A.C. voltage source while simultaneously compensating for variations from a nominal potential supplied by the voltage source, said regulator comprising:

a laminated core structure defining a primary winding leg portion, a secondary winding leg portion, and a pair of control winding leg portions, all of said leg portions being in coplanar relationship;

said control winding leg portions being intermediate to said primary and said secondary winding leg portions for effectively shunting flux induced in said primary winding leg portion away from said secondary winding leg portion;

said core structure further including back portions between said primary and secondary winding leg portions thereby defining a main magnetic flux circuit that is of closed circuit configuration and is continuous and uninterrupted between said primary and secondary leg portions;

said core structure also including bridge portions between said control winding leg portions thereby defining a control magnetic flux circuit that is of closed circuit configuration and is continuous and uninterrupted between said control winding leg portions with said control magnetic flux circuit being separate from said main magnetic flux circuit;

a control winding on each of said control winding leg portions, said control windings being electrically connected in bucking relation for application thereto of equal ampere turns for energizing same between deenergized and fully energized conditions to correspondingly vary the reluctance of said control winding leg portions between minimum and maximum conditions such that said control winding leg portions variably shunt flux from said primary winding leg portion of the main magnetic flux circuit away from said secondary winding leg portion in inverse proportion to reluctance of said control winding leg portions;

a primary winding with a plurality of turns wound about said primary winding leg portion including first and second leads for connecting same to the A.C. voltage source;

a bucking winding with a plurality of turns, but with fewer turns than said primary winding, wound about said primary winding leg portion with a first lead of same connected to one of the leads of the primary winding such that said bucking winding is phased in bucking relationship to said primary winding; and

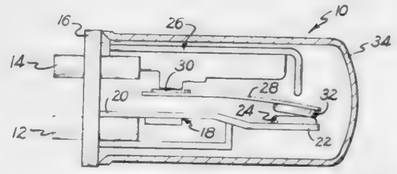
a secondary winding with a plurality of turns wound about said secondary winding leg portion with a first lead connectible to a load to which power is to be supplied, and a second lead of same connected to a second lead of the bucking winding such that said secondary winding is phased in aiding relationship with respect to said primary winding whereby most of power is transmitted from the A.C. voltage source directly through the bucking and secondary windings of the transformer regulator to the load with the bucking winding dropping a portion of the input voltage thereacross to compensate for the maximum expected over-voltage conditions of the A.C. voltage source and the secondary winding supplying an additional voltage variable by the degree of energization of said control windings to supply a regulated voltage to the load independent of deviations in the A.C. voltage source from the nominal value thereof.

4,041,432

MOTOR PROTECTOR FOR HIGH TEMPERATURE APPLICATIONS AND THERMOSTAT MATERIAL FOR USE THEREIN

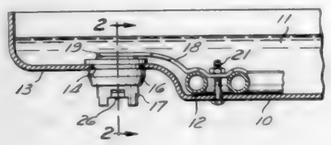
Norman Yarworth, Attleboro, and Radi Pejouhy, Marshfield, both of Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 16, 1975, Ser. No. 613,789
Int. Cl.[2] H01H *37/54*
U.S. Cl. 337—111 **9 Claims**



1. A composite thermostat material for use in high operating temperature overload protection devices comprising an outer layer of a first preselected metallic alloy having a relatively high coefficient of thermal expansion, a second outer layer of approximately equal thickness of a second preselected metallic alloy having a relatively lower coefficient of thermal expansion than said first preselected metallic alloy and an intermediate layer of a third preselected metallic alloy having a relatively low value of electrical resistivity, said composite having an electrical resistivity value from 20 ohm/c.m.f. to 400 ohm/c.m.f. and a flexivity value from 90×10^{-7} inches per inch per degree Fahrenheit to 110×10^{-7} inches per inch per degree Fahrenheit.

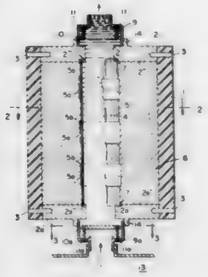
4,041,433
VENTED THERMOSTAT
Wayne T. Watson, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio
Filed May 3, 1976, Ser. No. 682,745
Int. Cl.² H01H *61/00, 71/02*
U.S. Cl. 337—112 **7 Claims**



1. In combination a device having a first zone of high moisture content and a second zone of reduced moisture content and a thermostatic control for said device, said thermostat including a body assembly having two parts with a joint therebetween, said joint being substantially sealed against free flow of moisture therethrough but permitting limited flow when pressure differentials occur across said joint, said joint being in communication with said first zone, said body assembly including a vent isolated from said first zone and communicating with said second zone, said vent preventing pressure differentials from occurring across said joint.

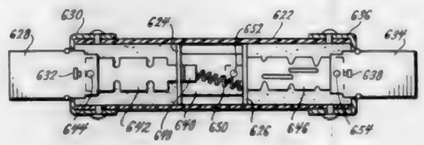
7. A bimetal snap disc thermostat comprising a switch body, a disc cap cooperating with said switch body to define a switch cavity closed along the joint therebetween, a mounting for said thermostat tending to cause moisture to collect along said joint, said joint being provided with a sufficiently good seal to prevent material flow of moisture therethrough when a pressure differential does not exist across said joint, and a vent open to said switch cavity from a substantially dry location operable to prevent a pressure differential from occurring across said joint and allowing escape of moisture from said switch chamber.

4,041,434
COOLED ELECTRIC FUSE
Philip C. Jacobs, Jr., 53 Walden St., Newtonville, Mass. 02160, and Erwin Salzer, P.O. Box 45, Waban, Mass. 02168
Filed July 26, 1976, Ser. No. 708,396
Int. Cl.² H01H *85/02*
U.S. Cl. 337—204 **5 Claims**



1. An electric current-limiting fuse including
a. a casing of electric insulating material;
b. a pair of terminal elements closing the ends of said casing;
c. said pair of terminal elements each having a port for the passage of fluid through said casing during the normal current-carrying operation of said fuse;
d. a tubular fusible element conductively interconnecting said port in each of said pair of terminal elements;
e. a toroidal body of quartz sand inside said casing and outside said tubular fusible element in physical contact with said tubular fusible element;
f. said tubular fusible element having a plurality of perforations covered by annular means precluding said quartz sand from penetrating into said tubular fusible element during the normal operation of said fuse, and said annular means being permeable to fluid so that said body of quartz sand is immersed in said fluid during said normal current carrying operation of said fuse.

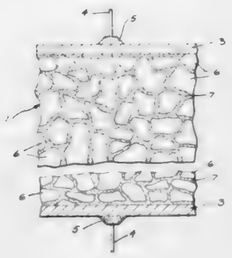
4,041,435
PROTECTOR FOR ELECTRIC CIRCUIT
Aldino J. Gaia, St. Louis, Mo., assignor to McGraw-Edison Company, Elgin, Ill.
Filed Oct. 1, 1974, Ser. No. 511,059
Int. Cl.² H01H *85/04*
U.S. Cl. 337—159 **72 Claims**



1. An electric fuse that comprises
terminals which can be secured to an electric circuit,
a first electrical conducting path which extends between said terminals.
a second electrical conducting path which extends between said terminals and which is in electrical parallel relation with said first electrical conducting path,
said terminals and said first and second electrical conducting paths being integral parts of the same piece of metal,
said first electrical conducting path having a first weak spot therein which is dimensioned to respond to a predetermined level of current flowing through said first electrical conducting path to fuse before any nearby portion of said first electrical conducting path can fuse,
said second electrical conducting path having a first weak spot therein which is dimensioned to respond to a second predetermined level of current flowing through said second electrical conducting path to fuse before any nearby portion of said second electrical conducting path can fuse,
said first weak spot in said first electrical conducting path being displaced longitudinally relative to said first weak spot in said second electrical conducting path,
said first electrical conducting path having the main part, of that length thereof which is located between said first weak spot thereof and a point which is in register with said first weak spot in said second electrical conducting path, physically disconnected from the corresponding part of said second electrical conducting path,
said first weak spot in said first electrical conducting path acting, whenever it fuses, to form a first arc in said first electrical conducting path,
said first weak spot in said second electrical conducting path acting, whenever it fuses, to form a first arc in said second electrical conducting path,
said first electrical conducting path having a second weak spot therein which is close enough to said first weak spot in said second electrical conducting path to respond to said first arc that will develop in said second electrical conducting path, as said first weak spot in said second electrical conducting path fuses, to fuse and thereby form a second arc in said first electrical conducting path,
said second electrical conducting path having a second weak spot therein which is close enough to said first weak spot in said first electrical conducting path to respond to said first arc that will develop in said first electrical conducting path, as said first weak spot in said first electrical conducting path fuses, to fuse and thereby form a second arc in said second electrical conducting path,
said electric fuse acting, as long as the total current flowing therethrough is less than the sum of the first said and of said second predetermined levels, to provide two weak spots that are in electrical parallel relation but that are displaced longitudinally,
said electric fuse acting, whenever the current flowing through said first weak spot in said first electrical conducting path exceeds said first said predetermined level and the current flowing through said first weak spot in said second electrical conducting path exceeds said second predetermined level, to permit said first arc to develop at said first weak spot in said first electrical conducting path and to permit said first arc to develop at said first weak spot in said second electrical conducting path and thereby provide two arcs in electrical parallel relation,
said second weak spot in said first electrical conducting path responding to said first arc in said second electrical conducting path to fuse and develop said second arc in said first electrical conducting path, and said second weak spot in said second electrical conducting path responding to said first arc in said first electrical conducting path to fuse and develop said second arc in said second electrical conducting path, and thereby provide two arcs in electrical series relation in said first electrical conducting path while also providing two arcs in electrical series relation in said second electrical conducting path,
said second arc in said first electrical conducting path coacting with said first arc in said first electrical conducting path to help reduce the current to zero,
said second arc in said second electrical conducting path coacting with said first arc in said second electrical conducting path to help reduce the current to zero.
whereby said electric fuse has, under normal conditions of operation, the characteristics of parallel-arranged weak spots and has, at the time it opens the circuit therethrough, the current-interrupting effect of series-arranged arcs,

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4,041,436
CERMET VARISTORS
Allan Kouchich, Milwaukee, and George W. Taylor, Oak Creek, both of Wis., assignors to Allen-Bradley Company, Milwaukee, Wis.
Filed Oct. 24, 1975, Ser. No. 625,605
Int. Cl.² H01C *7/10*
U.S. Cl. 338—21 **10 Claims**



1. A varistor having a nonlinear current-voltage characteristic defined by the relation

$$I = (V/C)^{\alpha}$$

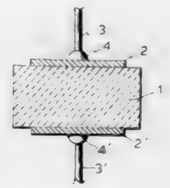
where I is the current flowing through the varistor, V is the voltage across the varistor, C is a constant proportional to the varistor, and α is a constant > 1 and is a measure of the nonlinearity of the varistor, said varistor having an α value in excess of 10, comprising:
an inert substrate;
a thick film associated with said inert substrate comprising a varistor composition consisting essentially of from about 75.0 to about 92.0 weight percent of a semi-conductive material and from about 25.0 to about 8.0 weight percent of glass matrix;
said semi-conductive material consisting predominantly of zinc oxide in admixture with a small amount of at least one metal oxide selected from the group consisting of chromium oxide, cobalt oxide and manganese oxide;
said glass matrix consisting primarily of a borosilicate glass with, as an additive, at least one metal oxide selected from the group consisting of cobalt oxide and manganese oxide; and
a pair of electrodes applied to said thick film.

7. A varistor having a nonlinear current-voltage characteristic defined by the relation

$$I = (V/C)^{\alpha}$$

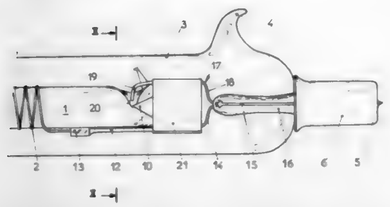
where I is the current flowing through the varistor, V is the voltage across the varistor, C is a constant proportional to the varistor, and α is a constant > 1 and is a measure of the nonlinearity of the varistor, said varistor having an α value in excess of 10, comprising:
a bonded mass of particles comprising a varistor composition consisting essentially of from about 90.0 to about 99.0 weight percent of a semi-conductive material and from about 10.0 to about 1.0 weight percent of a glass matrix;
said semi-conductive material consisting predominantly of zinc oxide in admixture with a small amount of at least one metal oxide selected from the group consisting of chromium oxide, cobalt oxide and manganese oxide;
said glass matrix consisting primarily of a borosilicate glass with, as an additive, at least one metal oxide selected from the group consisting of cobalt oxide and manganese oxides; and
a pair of electrodes applied to said bonded mass.

4,041,437
HUMIDITY SENSOR
Mikio Matsuura; Nobuji Nishi; Masatsugu Yamaguchi, all of Hirakata; Michio Matsuoka, Ibaragi, and Takeshi Masuyama, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Dec. 24, 1975, Ser. No. 644,414
Claims priority, application Japan, Dec. 27, 1974, 50-2791; Jan. 20, 1975, 50-8896; Jan. 20, 1975, 50-8897; Jan. 20, 1975, 50-8898
Int. Cl.² H01C *13/00*
U.S. Cl. 338—35 **11 Claims**



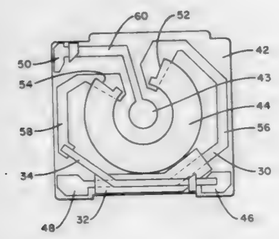
1. A humidity sensor comprising a sintered material having electrodes applied thereto, said sintered material having a negative coefficient of resistivity for relative humidity and comprising 99.99 to 10 mole percent of iron oxide (Fe_2O_3) and 0.01 to 90 mole percent of at least one member selected from the group consisting of lithium oxide (Li_2O), sodium oxide (Na_2O), potassium oxide (K_2O) and cesium oxide (Cs_2O).

4,041,438
ELECTRIC HEATING DEVICE
Odette Landeroin Duvernois, "L'Archerie", Cellettes, 41120 Les Montils, France
Filed Feb. 17, 1976, Ser. No. 658,865
Int. Cl.[2] H01C *1/024*
U.S. Cl. 338—237 **14 Claims**



1. In a electric heating element, comprising an elongated support, a resistance wire coiled about said support and an outer tube under vacuum surrounding said support and resistance wire while being spaced therefrom; a mounting assembly provided at each end of said support and comprising a centering part having resilient outwardly projecting arms, engaged over said end of said support, said arms extending up to the inner surface of said outer tube for centrally positioning said support within said outer tube, means for retaining said part on said support end, an axial conductor provided at each end of the electric heating element, and a supply lead extending between said conductor and said resistance wire.

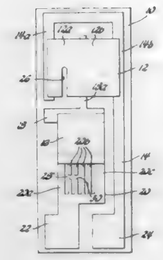
4,041,439
POTENTIOMETERS
Clark M. Steddom, Santa Barbara, and Charles W. Yungblut, Irvine, both of Calif., assignors to Carrier Corporation, Syracuse, N.Y.
Filed Aug. 20, 1975, Ser. No. 606,262
Int. Cl.[2] H01C *10/00*
U.S. Cl. 338—78 **4 Claims**



1. In a potentiometer having a resistance track, a wiper element adapted for relative movement therebetween, and first, second and third terminals connected by first electrical conductors respectively to each end of said resistance track and to said wiper element, movement of said wiper element relative to said resistance track in a first direction increasing the resistance between the third terminal and a selected one of the terminals connected to an end of the resistance track, and relative movement of said wiper element in a second direction decreasing the resistance therebetween, the improvement comprising:

second electrical conductors connected to said first and second terminals, with said first and second terminals being disconnected from said first conductors, to reverse the electrical position of said terminals at the ends of said resistance track whereby relative movement of said wiper element in said first direction will decrease the resistance between the third terminal and said selected one end terminal, and relative movement of said wiper in said second direction will increase the resistance therebetween.

4,041,440
METHOD OF ADJUSTING RESISTANCE OF A THICK-FILM THERMISTOR
James L. Davis, and Keith E. Ewing, both of Kokomo, Ind., assignors to General Motors Corporation, Detroit, Mich.
Filed May 13, 1976, Ser. No. 686,151
Int. Cl.[2] H01C *10/00*
U.S. Cl. 338—195 **7 Claims**



1. A functionally adjusted thick-film thermistor-resistor network having an accurate electrical resistance and change of electrical resistance with temperature corresponding to preselected values, said network comprising:

a ceramic substrate having a surface;

a thick-film cermet generally temperature stable resistor bonded to said surface;

a thick-film cermet thermistor bonded to said surface;

a plurality of thick-film cermet conductor segments bonded to said surface;

parts of said thick-film resistor, thick-film thermistor, and thick-film conductor segments overlapping one another and providing an electrical network;

said thick-film resistor having a non-printed groove therein for increasng as-formed electrical resistance of said thick-film resistor;

a plurality of parallel paths in one of said thick-film thermistor and a contacting thick-film conductor segment;

some of said parallel paths having a gap therein completely blocking electrical current flow therethrough, so as to electrically isolate each such path in said network; and

the remainder of said parallel paths being continuous and providing thermistor resistance, and change in network electrical resistance with change in temperature, accurately corresponding to a functionally tested preselected value.

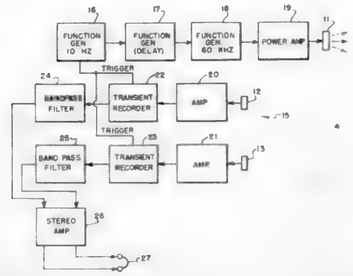
4,041,441
DIVER'S PULSE STRETCH SONAR
Clarence S. Johnson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Aug. 13, 1976, Ser. No. 714,436
Int. Cl.[2] G01S *9/66, 7/54*
U.S. Cl. 340—3 R **8 Claims**

1. An apparatus for discriminating underwater targets by a diver comprising:

means carried on headgear worn by the diver for projecting spaced repetitions of single cycles of ensonifying signals above the audio spectrum to the targets;

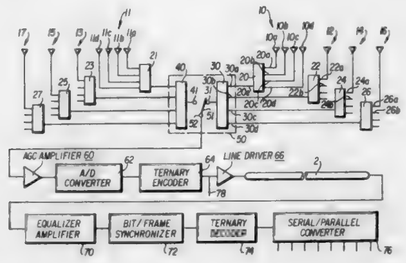
means mounted on the headgear at opposite lateral extremes of the means for receiving echo signals of the ensonifying signals;

means coupled to the receiving means for digitizing the echo signals and for replaying the echo signals within the audio range; and



means coupled to the digitizing and replaying means for providing stored echo signals to within the audio spectrum indicative of underwater targets.

4,041,442
ACOUSTIC DATA ACQUISITION SYSTEM
Robert Alden Marquardt, Syracuse, N.Y., assignor to General Electric Company, Syracuse, N.Y.
Filed Mar. 3, 1976, Ser. No. 663,376
Int. Cl.[2] G01S *3/80*
U.S. Cl. 340—6 R **6 Claims**



6. A data acquisition system for acquiring acoustic information from objects submerged in a body of water and for transmitting the information from an array disposed in the water to remotely located data processing equipment, said array comprising:

a. first and second groups of sensors arranged to receive acoustic signals from the submerged objects, each sensor providing an analog electrical signal representative of the acoustic signal received thereby;

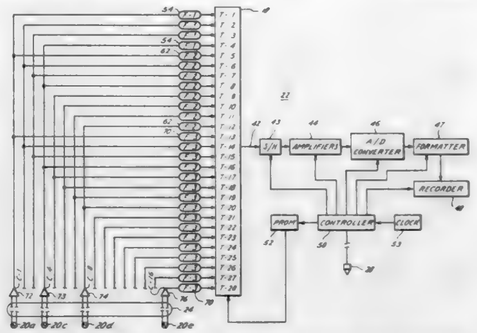
b. first and second multiplexers for sampling analog signals from the sensors, each of said multiplexers having a plurality of inputs and a single output, each of the inputs of said first multiplexer being connected to a corresponding one of the first group of sensors, each of the inputs of said second multiplexer being connected to a corresponding one of the second group of sensors;

c. an A/D converter for converting sampled analog signals to digital signals for transmission to the data processing equipment;

d. switching means for alternately connecting the outputs of the first and second multiplexers to the A/D converter, said switching means connecting the output of one of said multiplexers to the A/D converter while the other of said multiplexers is changing connection of its output from one of its inputs to another of its inputs, whereby any transients resulting from the changing of such connection are not transmitted to the A/D converter; and

e. a single transmission line for transmitting the digital signals from the A/D converter to the data processing equipment.

4,041,443
SEISMIC RECORDING APPARATUS HAVING A TIME-VARYING SAMPLE
Ben B. Thigpen, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.
Filed June 1, 1976, Ser. No. 691,795
Int. Cl.[2] G01V *1/28*
U.S. Cl. 340—15.5 AF **23 Claims**



1. A multichannel seismic signal processing and recording apparatus comprising:

a plurality of input channels for receiving seismic signals;

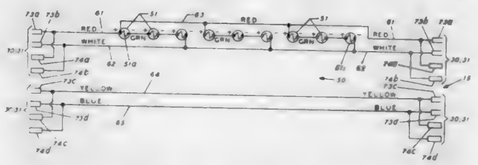
a plurality of seismic sensor means for applying seismic signals to said input channels;

means for initiating a seismic impulse at a predetermined location and for initiating a recording cycle;

filter means for differently filtering the seismic signals from different sets of said input channels at different times during said recording cycle; and

means for sampling differently filtered seismic signals at correspondingly different sample rates during said recording cycle.

4,041,444
COMBINATION FLYER-JUMPER AND METHOD OF MANUFACTURE OF SAME IN WHICH THE JUMPER/FLYER IS ASSOCIATED WITH A GEOPHYSICAL DATA ACQUISITION SYSTEM THAT PROVIDES DIGITAL DATA IN THE FIELD BEFORE RECORDING
Reid F. Carter, Houston, Tex., assignor to Chevron Research Company, San Francisco, Calif.
Filed June 28, 1976, Ser. No. 700,689
Int. Cl.[2] G01V *1/22*
U.S. Cl. 340—15.5 TS **9 Claims**



1. A geophone flyer-jumper for use in conjunction with a remote data acquisition and telemetering circuit (RDATC) equipped to receive several channels of information simultaneously, comprising:

a central geophone cable segment including N+1 conductors and a series of interconnected geophones therein where N is any positive number greater than two;

a plurality of N/2 branch cable segments connected at each end of certain of said N+1 conductors of said central cable segment; and

a series of N/2 hermaphroditic connectors connected to said plurality of N/2 branch cable segments, each of said hermaphroditic connectors having an outer housing but matched at the opposite end to a like colored and similarly electrically connected connector, whereby at least one paired, like color-coded set of connectors electrically connect to said geophones and at least another pair of like color-coded set of connectors electrically connect to certain N+1 conductors which are electrically isolated from said geophones, said at least another set of connectors having color codes that are distinct from that of said one set of connectors;

2. between each adjacent flyer-jumpers of any C serially arranged flyer-jumpers, connecting like-colored hermaphroditic connectors together to form a geophone flyer group, providing at least a summed signal output per group at an output end thereof; and

3. at said output end of each flyer group, connecting un-alike color-coded hermaphroditic connectors in a pattern repeated up-survey and down-survey toward said RDATC where final connection is provided to provide input channel information to said RDATC.

5. In the manufacture of the flyer-jumper for use in conjunction with a remote data acquisition unit equipped to receive several channels of information simultaneously, the steps of:

a. cutting an N+1 conductor cable into a series of cut segments where N is any even, positive number greater than two;

b. electrically connecting said series of cut segments between geophones of a set of geophones of preselected number to form a central cable/geophone segment;

c. connecting N/2 branch cable segments to certain of said N+1 conductors of said central segment at N/2 electrical joints; and

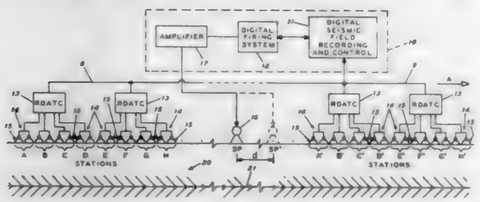
d. connecting a nonpolarized hermaphroditic connector to each of said N/2 branch cable segments to form said flyer-jumper.

4,041,445

METHOD OF CONNECTING FLEXIBLE NUMBERS OF GEOPHONE FLYER GROUPS TO DATA ACQUISITION UNITS

Reid F. Carter, Houston, Tex., assignor to Chevron Research Company, San Francisco, Calif.

Filed June 28, 1976, Ser. No. 700,688
Int. Cl.[2] G01V *1/22*
U.S. Cl. 340—15.5 TS **4 Claims**



1. A method of providing a series of flyer groups made up of selected but flexible numbers of geophone flyers per group connected to a remote data acquisition and telemetering circuit (RDATC) equipped to receive a number of channels of information simultaneously comprising the steps of:

1. laying out a series of C flyer-jumpers where C is any whole positive number equal to the number of flyer-jumpers selected per group, and where each of said series of flyer-jumper comprises a central geophone cable segment including N+1 conductors where N is any even positive number greater than two and a series of interconnected geophones therein; a plurality of N/2 branch cable segments connected at each end of certain of said N+1 conductors of said central cable segment; and a series of N/2 hermaphroditic connectors connected to said plurality of N/2 branch cable segments, each of said hermaphroditic connectors having an outer housing, but matched at the opposite end to a like colored and similarly electrically connected connector, whereby at least one paired, like color-coded set of connectors electrically connect to said geophones and at least another pair of like color-coded set of connectors electrically connected to certain N+1 conductors which are electrically isolated from said geophones, said at least another set of connectors having

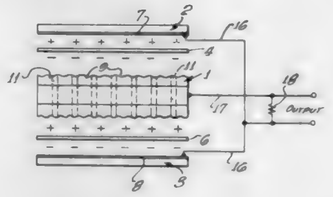
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4,041,446

CAPACITIVE-TYPE DISPLACEMENT AND PRESSURE SENSITIVE TRANSDUCER

Leonard N. Liebermann, La Jolla, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 20, 1976, Ser. No. 688,210
Int. Cl.[2] G01V *1/16*
U.S. Cl. 340—17 R **4 Claims**



1. An air-filled electro-acoustical transducer producing a voltage output proportionately responsive to displacement pressures of preselected acoustic wave frequencies, the transducer comprising:

a plurality of elongate members of substantially equal length sandwiched in a loose contact one with the other whereby substantial transducer lengths can be extrudable formed, said transducer having a length greater than the wave length of a particular preselected frequency of interest,

said plurality of sandwiched members including:

an outer casing member providing an enclosure formed of elongate upper and lower flexible walls and end walls, said upper and lower walls having electrically-conductive inner surfaces and being displaceable responsively to said wave pressures acting only on their outer surfaces,

a central electrically-conductive solid plate member disposed axially of said casing member flexible walls and having irregular upper and lower air-trapping surfaces and aperatures for permitting passage of said air transversely through said plate member, said plate member further having sufficient mass for remaining substantially stationary relative to said flexible wall displacements, and

a sheet-like member formed of permanently-polarized dielectric material disposed co-extensively between said stationary plate-like member and each of said upper and lower flexible walls for establishing a voltage potential between said member and said walls, and

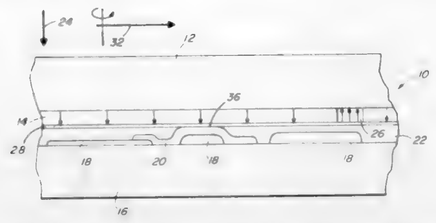
voltage-output means coupled to the conductive surfaces of said plate member and said walls, said output means including a resistance member of sufficient value for assuring a voltage output proportional to the flexible wall displacements produced by said preselected frequency of interest.

4,041,447

BONDED MAGNETIC BUBBLE MEMORY

Alfred E. Feuersanger, Framingham, and Brian A. Shortt, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 520,583, Nov. 4, 1974, abandoned. This application June 4, 1976, Ser. No. 693,069
Int. Cl.[2] G11C *19/08*
U.S. Cl. 340—174 TF **2 Claims**



1. A bubble memory device of the type adapted to operate at a rate in excess of 50K bits per second comprising:

a. a first substrate made of a single crystal, nonmagnetic material and having a planar surface thereon,

b. a thin film, single crystal layer of a magnetic material on the planar surface of the first substrate,

c. a second substrate made of a non-conductive and nonmagnetic material and having a planar surface thereon,

d. a desired pattern of thin film magnetic elements and conductive elements on the planar surface of the second substrate, the pattern having a plurality of at least three, spaced, non-colinear points, the heights of which measured from the planar surface of the second substrate are equal, predetermined and greater than the heights of the other portions of the elements, the layer on the first substrate being adjacent to and in contact with the spaced points so that a controlled spacing is maintained over the entire juxtaposed substrates of the resulting bubble memory device, and

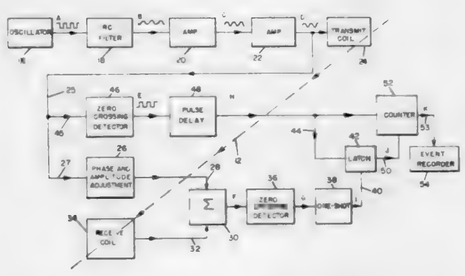
e. a quantity of Canada balsam cement composition disposed around the peripheral portions of the substrates and partially within the space between the substrates for securing the substrates in the juxtaposed orientation, the variation in spacing between the first and second substrates being no greater than 500 A.

4,041,448

ELECTRONIC RAILROAD TRACK MARKER SYSTEM

Richard H. Noens, Arlington Heights, Ill., assignor to Vapor Corporation, Chicago, Ill.

Filed Aug. 5, 1976, Ser. No. 711,996
Int. Cl.[2] G08C *25/00, 21/00*
U.S. Cl. 340—32 **11 Claims**



1. A vehicle position detector comprising:

means for generating an oscillating signal;

a transmit coil mounted on the vehicle and connected to the output of the generating means for radiating an electromagnetic signal having the frequency of the oscillating signal;

a receive coil mounted on the vehicle in proximity to the transmit coil;

means connected to the receive coil for canceling any interferring signal induced in the receive coil as a result of its proximity to the transmit coil;

means connected to the output of the canceling means for detecting a position indicating signal which exceeds a predetermined amplitude;

means connected in circuit with the output of the detecting means for sampling the output at predetermined clocking intervals to determine the phase relation between a detected signal and a clocking signal having the same frequency as the generating means, the sampling means latching into a set state when a preselected phase relation exists; and

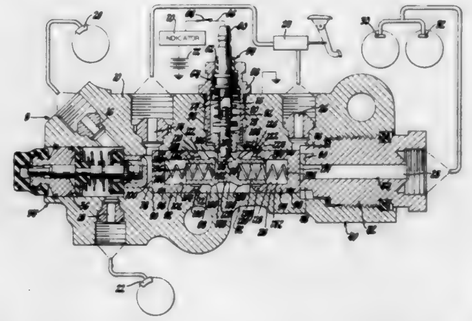
counter means responsive to the latching of the sampling means for a predetermined count, the counter means generating a signal indicating that a preselected position has been detected.

4,041,449

FAILURE WARNING SWITCH ACTUATOR WITH AUTOMATIC RESET

Ronald L. Shellhause, Vandalia, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 21, 1976, Ser. No. 678,910
Int. Cl.[2] B60T *17/22*
U.S. Cl. 340—52 C **4 Claims**



1. A dual pressure circuit failure warning actuator comprising:

a cylinder having a center section and end sections and adapted to receive pressure from one pressure circuit in one end and pressure from the other pressure circuit in the other end;

first and second pistons reciprocably received in said cylinder in axially spaced relation, each of said pistons having an end wall adapted to be acted upon by one of the pressures to urge said pistons toward the cylinder center;

a shuttle member reciprocably received in said cylinder axially between said piston end walls and having failure warning actuating means operable to actuate a failure warning device upon a predetermined movement of said shuttle member in either axial direction from a center position in said cylinder in response to a predetermined pressure differential across said pistons, and shuttle member latching means including said actuating means and adapted to latch said shuttle member to prevent recentering movement after it has been moved said predetermined amount in one axial direction;

a pair of centering springs with one acting on each side of said shuttle member and on one of said pistons to continu-

ally urge said pistons toward said cylinder ends and said shuttle member to its center position;
and means on and including said pistons adapted to act to overcome the latching of said shuttle member latching means and to return said shuttle member to its center position by movement of said pistons toward said cylinder center section by substantially equal forces generated when both pressures concurrently increase to a predetermined pressure level.

4,041,450
INTRUSION ALARM-IGNITION CONTROL SYSTEM FOR A MOTOR VEHICLE

James Knight, 1838 Hone Ave., Bronx, N.Y. 10460, assignor to Lawrence Peska Associates, New York, N.Y.

Filed Apr. 10, 1975, Ser. No. 566,948
Int. Cl.[2] B60R *25/10*
U.S. Cl. 340—64 **8 Claims**

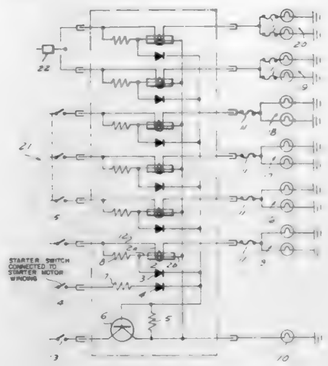


1. An intrusion alarm ignition control system for a motor vehicle having a body with a plurality of doors and their associated frame and opening, a hood of said motor vehicle and its associated frame and opening, an engine hood and its associated frame and opening, an ignition wire communicating between a battery and an ignition switch of said motor vehicle, and each said associated frame having an elongated aperture therein, which comprises:
a. a transmitter for transmitting a signal having an associated antenna adapted to be received in said motor vehicle;
b. an electric key lock receivably disposed in said body of said motor vehicle;
c. a plurality of activation switches adapted to be received in said frame, each said activation switch being activated upon opening of one of said doors, said engine hood, and said trunk hood;
d. means for preventing closure of said doors, said engine hood, or said trunk hood, said means including an elongated bar having a pair of ends with a transverse central pin member extending through said elongated bar, the ends of said pin adapted to be rotatably received in said frame with said bar adapted to be rotatably received in said elongated aperture of said frame, an electromagnet element wired in series to each said activation switch, each said activation switch received in said aperture below one said end of said bar, a coil spring adapted to be received in each said aperture below said other end of each said bar and affixed onto said other end of said bar, and parallel circuits of each said series circuit of said electromagnet element and said activation switch wired between said battery and said electric key lock switch;
e. means for preventing flow of current through said ignition wire upon activation of said activation switch, said means including an electromagnet member wired in series between said transmitter and said battery, a lever type electric switch member adapted to be received in said ignition wire, said electromagnetic member opening and closing said lever type electric switch upon the opening and closing of one of said activation switches;
f. a receiver unit located remotely from said radio transmitter for receiving said signal; and
g. a signal device associated with said receiver unit.

4,041,451
CIRCUIT FOR MONITORING THE OPERATIVENESS OF CURRENT-CONSUMING ELECTRICAL DEVICES

Konstantin Zarkadas, Am Lindenplatz 5, 3014 Laatzen, Germany

Filed May 3, 1976, Ser. No. 682,912
Claims priority, application Germany, May 2, 1975, 2519725
Int. Cl.[2] B60Q *1/26;* G08B *21/00*
U.S. Cl. 340—79 **9 Claims**



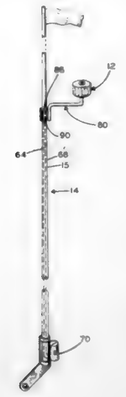
1. In an automotive vehicle provided with a starter motor having a starter motor winding and at least one current-consuming electrical device receiving current via a current path, a monitoring circuit for monitoring the operativeness of the at least one electrical device, comprising, in combination, indicating means operative when activated for providing an indication; control means operative for activating the indicating means when proper current ceases flowing in the current path of the monitored electrical device, the control means including an inert-gas reed switch and electronic switch means electrically connected to the inert-gas reed switch and controlled by the latter, the inert-gas reed switch and the electronic switch means connecting the indicating means to the current path of the monitored electrical device and being operative for controlling the activation of the indicating means, and inductance means connected in the current path of the monitored electrical device and operative for generating a magnetic field which controls the operation of the reed switch in dependence upon the flow of current through the current path of the monitored electrical device; and checking means for checking the operativeness of the monitoring circuit including means electrically connecting the electronic switch means to the starter motor winding for controlling the electronic switch means in response to start-up energization of the starter motor winding.

4,041,452
A ROTATING BEACON FOR A BICYCLE

Castulo J. Moya, 8166 Molokai Way, Fair Oaks, Calif. 95628

Continuation-in-part of Ser. No. 548,254, Feb. 10, 1975, abandoned. This application July 3, 1975, Ser. No. 592,754
Int. Cl.[2] B62J *3/00, 5/00*
U.S. Cl. 340—134 **12 Claims**

12. In combination with a bicycle, a visually detectable warning device comprising a beacon including a housing, an elongated staff having a base end portion and a distal end portion, means releasably securing the base end portion of said staff to said bicycle with the distal end portion thereof being projected substantially upwardly therefrom, when the bicycle is in an operative configuration, means for generating a beam of light including a light source comprising an electrically

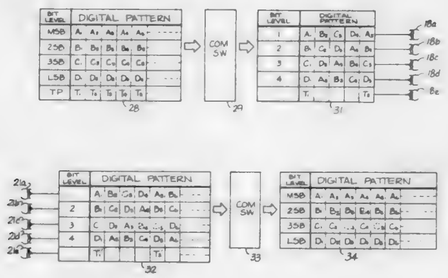


energizable lamp disposed in said housing for propagating a beam of light from the housing, and means rotatably connecting said housing to the distal end portion of said staff.

4,041,453
SIGNAL HANDLING SYSTEM FOR MINIMIZING DROPOUT EFFECT

Kenkichi Umeda; Shoichi Nakamura, both of Tokyo; Jun Takayama, Kokubunji; Tetsuya Horichi, Yokohama, and Yoshikazu Tsuchiya, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Nov. 14, 1974, Ser. No. 523,918
Claims priority, application Japan, Nov. 20, 1973, 48-130405
Int. Cl.[2] H03K *13/243*
U.S. Cl. 340—146.1 BE **11 Claims**

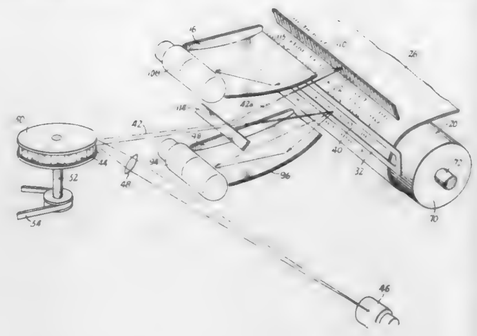


1. A signal handling system comprising:
A. a plurality of electrically parallel signal paths over which successive groups of encoded pulse signals are transmitted, each of the pulse signals in a group having a certain weighting factor, a like plurality of input terminals to which each group of pulse signals is applied at a certain rate, those pulse signals having the same weighting factor in respective groups being applied to a corresponding one of said input terminals; and
B. means for switching signals from each of the input terminals to a different one of the paths in a determinable order at the same rate as the rate at which said pulse signals are applied, whereby successive pulse signals of the same weight in successive groups are not transmitted through the same path in succession so as to substantially minimize the possibility of having two successive dropouts of the same pulse weight in any path.

4,041,454
DATA HANDLING SYSTEM WITH REMOTE DOCUMENT SCANNER

David H. Shepard, Rye, and Edward J. Gushue, Bedford Hills, both of N.Y., assignors to Cognitronics Corporation, Stamford, Conn.

Continuation of Ser. No. 569,051, April 17, 1975, abandoned, which is a continuation of Ser. No. 66,149, Aug. 21, 1970, Pat. No. 3,893,079, which is a continuation of Ser. No. 624,445, March 20, 1967, abandoned. This application July 12, 1976, Ser. No. 704,575
The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 F **3 Claims**



1. Data handling apparatus including means for scanning documents carrying graphic indicia; said apparatus comprising:
a first station having a document scanning unit including means to support a document in geometrical shape presenting contiguous, parallel straight-line elements passing through the graphic indicia;
said scanning unit also including a laser producing a beam of coherent radiation which is directed to said document to develop thereon a spot of light of small diameter;
scanning means including a rotatable mirror in the path of said beam for repetitively sweeping said laser beam along a scan path extending parallel to said straight-line elements;
means for advancing said document in synchronism with the operation of said scanning means so as to scan said graphic indicia with a series of successive adjacent scan paths parallel to each other and also parallel to said straight-line elements of said document;
said advancing means being constructed and arranged to provide said adjacent scan paths with center-to-center spacings at least approximately equal to said diameter of said spot of light;
sensing means to detect light reflected from the document as a result of the scanning thereof by said laser beam;
clock means coupled to the output of said detecting means for producing scan signals in the form of binary sample pulses each indicating the presence or absence of graphic indicia elements at corresponding regularly-spaced positions along each scan path with said positions being identical for successive scan sweeps;
a second station having receiving means for processing the graphic indicia information represented by said scan signals;
transmission means coupling said first station to said second station; and

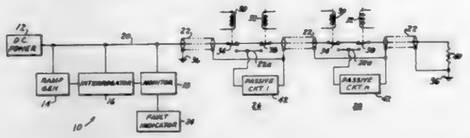
means at said first station responsive to said scan signals to develop and to direct to said transmission means corresponding signals suitable to be sent through said transmission means to said receiving means at said second station to transfer thereto the graphic indicia information representing said graphic indicia.

4,041,455

INTERROGATION AND MONITORING SYSTEM

Gayle Russell Norberg, Columbia Heights, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 2, 1976, Ser. No. 710,989
Int. Cl.[2] G06F *11/00*; G08B *29/00*
U.S. Cl. 340—146.1 C **13 Claims**



1. A monitoring system for monitoring individual modules comprising, in combination:

a central station including:

supply means for supplying a monitor signal,

interrogator means for supplying an interrogation signal,

monitor means responsive to a fault signal for initiating operation of said interrogator means, and

decode means responsive to a coded signal for indicating which of a plurality of modules initiated a fault signal;

data channel means connected to said central station for carrying said monitor signal, interrogation signal, fault signal and coded signal; and

a plurality of remote stations connected to said data channel means, each of said remote stations including:

responder means, and

switch means responsive to a fault condition in the respective module for connecting said responder means to said data channel means,

said responder means including first circuit means responsive to said monitor signal for supplying said fault signal to said data channel means, and passive circuit means responsive to said interrogation signal for supplying said coded signal to said data channel means, the coded signal of each responder means being unique to each such responder means, whereby, upon the occurrence of a fault condition in a module, the data channel means is connected to the respective responder means and said respective responder means supplies a fault signal to said monitor means, whereupon said monitor means operates said interrogator means to supply said interrogation signal, and the respective responder means responds to interrogation signal to supply said coded signal indicative of the faulted module to said decode means.

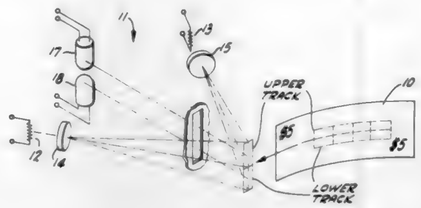
4,041,456

METHOD FOR VERIFYING THE DENOMINATION OF CURRENCY

David M. Ott; Cynthia Bunce Ott, both of 1720 Walnut St., El Cerrito, Calif. 94530, and John G. Stoides, 206 W. Asher, Culpeper, Va. 22701

Filed July 30, 1976, Ser. No. 710,217
Int. Cl.[2] G06K *9/00*
U.S. Cl. 340—146.3 R **11 Claims**

1. A method for verifying the denomination of currency relative to other denominations of such currency using digital logic with a memory comprising the following steps: storing in said memory a pattern representative of the reflectivity of at least one predetermined segment of at least one currency denomination; scanning a currency to be verified as having said one denomination over said one predetermined segment and generating a pattern representative of such semgent; comparing said pattern of said scanned currency with said stored pattern of said one denomination and generating a quantitative function indicative of the amount of comparison between said



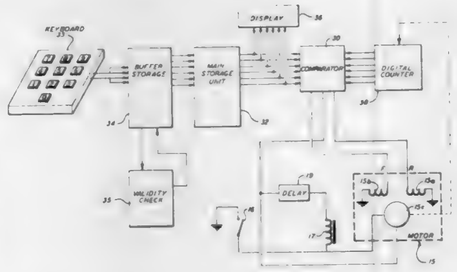
patterns; storing quantitative functions indicative of the amount of comparison between said stored pattern of said one denomination and corresponding segments of said other denominations; comparing each of said quantitative functions of said other denominations with said generated quantitative function.

4,041,457

SOUND-SLIDE PROJECTOR CONTROL APPARATUS

Herbert Joachim Koch, Tiefenthaler Strasse 13, D-62 Wiesbaden, Germany

Filed Mar. 16, 1976, Ser. No. 667,362
Int. Cl.[2] H04Q *9/00*; G03B *23/02, 23/12*
U.S. Cl. 340—147 MD **6 Claims**



6. Sound-slide projection and transmission apparatus which allows random retrieval of sound slides from a slide tray reciprocable along a first axis, comprising, in combination, a slide-changing mechanism which includes slide translating means reciprocable along a second axis perpendicular to said first axis between extended and retracted positions, said slide translating means being operable to move a slide from a projection position to within said tray upon translation from said extended position to said retracted position and operable to move a slide from within said tray to said projection position upon translation from said retracted position to said extended position, said apparatus including a flywheel, and means for mechanically connecting said mechanism to be operated by said flywheel, said mechanism being operated through a cycle each time it is operated by said flywheel, said cycle consisting of a translation from said extended position to said retracted position followed by translation from said retracted position to said extended position; a reversible drive motor means connected to position said tray along said first axis, keyboard means for providing signals representing a slide desired to be retrieved; a solenoid operable to interrupt operation of said slide-changing mechanism by said flywheel; and switch means for temporarily operating said solenoid and connecting said motor to respond to

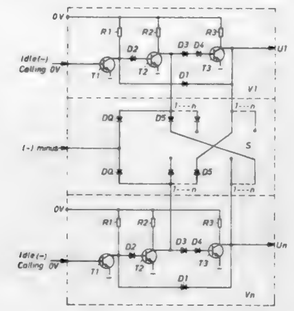
said signals when said slide translating means is translated to said retracted position.

4,041,458

ARRANGEMENT FOR CARRYING OUT RANDOM SELECTION AMONG A PLURALITY OF SELECTABLE DEVICES IN A TELECOMMUNICATION SYSTEM

Eugen Gravdahl, Hagersten, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Sept. 27, 1976, Ser. No. 727,025
Claims priority, application Sweden, Oct. 17, 1975, 7511664
Int. Cl.[2] H04Q *3/42*
U.S. Cl. 340—166 R **3 Claims**



1. Arrangement in a telecommunication system for random selection of one among a plurality of devices each being associated with a marking wire indicating by its condition whether said device is selectable or not containing, a selecting chain consisting of a number of switching circuits each connected to one of said devices, means in each switching circuit for preventing upon activation of one of said circuits activation of other switching circuits of the chain, a logical circuit with bistable characteristics included in each switching circuit, a gate circuit being connected to the input of each switching circuit which gate circuit at a first input is activated by the condition of said marking wire, one pulse signal source for each of said gate circuits sending pulses to a second input of the gate circuit, said pulse sources having slightly different frequencies in order to achieve a random transmission of a conditioning signal from the marking wires to the switching circuits so that upon simultaneous activation of several marking wires it is prevented that that one of the switching circuits which due to the characteristics of its components is most rapid always is selected first.

4,041,459

INTEGRATED PROGRAMMABLE LOGIC ARRANGEMENT

Karlheinrich Horninger, Eglharting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 28, 1976, Ser. No. 681,170
Claims priority, application Germany, Apr. 29, 1975, 2519078
Int. Cl.[2] G11C *8/02, 11/40*
U.S. Cl. 340—166 R **8 Claims**

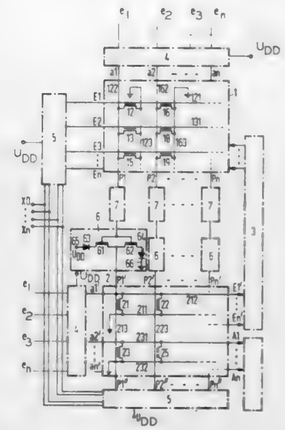
1. An integrated, programmable logic arrangement comprising:

a. an AND-matrix and an OR-matrix, each having individual gates, each gate having a selector line, a base line, and a control line;

b. switching transistors being provided at AND-matrix intersection points, each point being formed by an intersecting control line and selector line, each of said switching transistors having a gate terminal connected to the intersecting control line, one end of the switching transistor being connected to the intersecting selector line, and the other end being connected to a base line connected to a reference potential;

c. switching transistors being provided at OR-matrix intersection points, each point being formed by an intersecting control line and selector line, each of said switching transistors having a gate terminal connected to the intersecting control line, one end of the switching transistor being connected to the intersecting selector line, and the other end being connected to a base line connected to a reference potential;

d. each control line of the OR-matrix being connected via an inverter to a selector line of the AND-matrix;



e. said switching transistors in the AND- and OR- matrices comprising MI_1I_2S (metal-insulation **1-insulation 2-semi**-conductor) storage transistors; and

f. decoder means for the production of a logic pattern in the AND and OR-matrices comprising,

1. a decoder having outputs connected to each control line of the AND-matrix, a decoder having outputs connected to each control line of the OR-matrix, said decoders having inputs for writing in a logic pattern, and

2. a decoder arrangement having outputs connected to each selector line of the AND-matrix, a decoder arrangement having outputs connected to each selector line of the OR-matrix, said decoder arrangements having inputs for items of information.

4,041,460

MULTI-PROCESSOR DATA PROCESSING SYSTEM PERIPHERAL EQUIPMENT ACCESS UNITS

Graham John Wisdom; Peter Verne Creteau, both of Wimborne, and John Lloyd Williams, Cambridge, all of England, assignors to Plessey Handel und Investments AG., Zug, Switzerland

Filed May 17, 1976, Ser. No. 686,925
Claims priority, application United Kingdom, May 17, 1975, 21061/75
Int. Cl.[2] G06F *11/06*
U.S. Cl. 364—900 **1 Claim**

1. A data processing system comprising in combination

a plurality of processor modules;

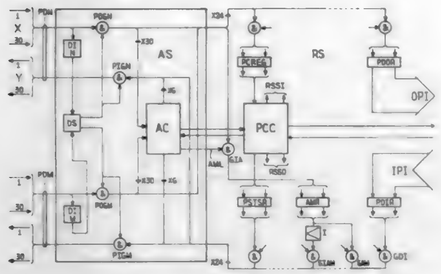
a plurality of data communication paths, one for each processor module allocated on a mutually exclusive basis and arranged to carry processor module generated address information;

a plurality of multi-port access units each including a data communication path selection and terminating means and an identity address recognition means conditioned with a unique identity code and responsive to the reception of said unique identity code within said address information

when applied to any one of said data communication paths;

a plurality of memory modules each including an individual access unit and

a group of peripheral equipments each including an individual access unit and each peripheral equipment access unit includes a plurality of processor module accessible registers and an unaccessible register selection means responsive to part of said address information, wherein the improvement comprises the provision in each access unit of an address monitor register into which the address information received from a processor module data communication path is written and said address monitor register includes first means for sending the address information received back to an interrogating processor module and second means for sending the inverse of the said address information received back to the interrogating processor module and said accessible register selection means is conditioned by the reception of a first register selection address to activate said first means and by the reception of a second register selection address to activate said second means.



4,041,461

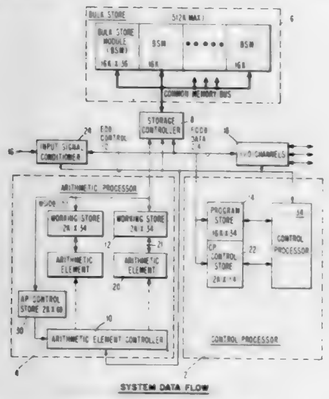
SIGNAL ANALYZER SYSTEM

Gary L. Kratz, Warrenton; William W. Sproul, III, Reston, both of Va.; Eugene T. Walendziewicz, Wakefield; Donald E. Wallis, Marblehead, both of Mass., and Charles A. Dennis, Warrenton, Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 25, 1975, Ser. No. 599,306

Int. Cl.[2] G06F *9/10, 13/00*

U.S. Cl. 364—200 **40 Claims**



1. A digital computer system comprising:

an arithmetic processor containing a plurality of pipelined processor arithmetic elements in parallel array with each element connected to a respective working store for temporarily storing data, with all of the elements being connected to and under microprogram control of an arithmetic element controller, for arithmetically processing said data;

said arithmetic element controller including an arithmetic element control store for storing arithmetic element microinstructions and a memory address register connected to an address input of said arithmetic element control store for accessing said arithmetic element microinstruction;

a bulk store for storing said data and said arithmetic element microinstructions prior to the time of an initial microprogram load into said arithmetic processor;

a storage controller connected to said bulk store and to said working store and said arithmetic element control store in said arithmetic processor for selectively transferring said arithmetic element microinstructions from said bulk store to said arithmetic element control store in response to a first transfer command word and selectively transferring said data from said bulk store to said working store in response to a second transfer command word;

a control processor connected to an input of said memory address register in said arithmetic element controller and to said storage controller by means of an external bus, for sending said first transfer command word to said storage controller at said initial microprogram load time to load said microinstructions into said control store, for sending a first control store address to said memory address register after said load time to initiate execution by the microprogram in said arithmetic processor, and for subsequently sending said second transfer command word to said storage control during execution time, to transfer said data to said working store;

whereby the control processor is free to carry out supervisory and data management functions during said execution time and the program storage and data storage functions are separated during execution time, minimizing storage bandwidth requirements.

4,041,462

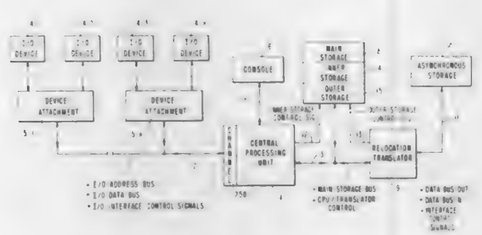
DATA PROCESSING SYSTEM FEATURING SUBROUTINE LINKAGE OPERATIONS USING HARDWARE CONTROLLED STACKS

Michael Ian Davis; Gary Wayne Mayes; Thomas Stephen McDermott, and Larry Edward Wise, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,002

Int. Cl.[2] G06F *9/18*

U.S. Cl. 364—200 **7 Claims**



1. A subroutine linkage feature for a data processing system enabling the preservation of register contents of a requesting program and allocation of a dynamic work area for data generated during the subroutine operation, comprising:

main storage means having sequentially addressable storage locations for storing information representing control signals and data signals;

level storage means, said level storage means comprising a plurality of groups of prioritized level registers for storing and providing signals representative of significant information relative to program execution such as instruction addresses, level status indications and other information pertaining to the programs to be executed;

level control means interconnected with said level storage means and responsive to sequencing control signals during operation of said system to operate said level storage means to select said level register groups for transfer of information to and from said level registers in accordance with a predetermined priority arrangement;

an instruction source, said source providing signals representative of operations to be performed in said system as well as information to be utilized;

sequencing means responsive to signals from said instruction source including signals representative of a subroutine operation for providing control signals in timed sequence and including means for generating subroutine call signals from calling programs during operation of individual programs determined by said level control means in said system together with related Register to Storage instruction signals, said Register to Storage instruction signals including signals representative of (1) a Register to Storage Operation, (2) the starting address of a block of selected storage locations in said main memory, (3) at least one register in said level level storage means, said at least one register including an instruction address indicative of the calling program, and (4) a number of storage location in said main memory comprising a dynamic work area to be accessed during a subroutine operation;

microcode storage means having individual microcode storage locations for storing microcode signal sequences including a first signal sequence for activating said system according to a predetermined Register to Storage sequence to (1) transfer the contents of the selected at least one register from the level register group in current use to the selected block of said main storage and to (2) reserve the dynamic work area in the selected block specified by said Register to Storage instruction signals;

microcode address means responsive to a single Register to Storage instruction signal set from said sequencing means to access in sequential order the microcode Register to Storage signal sequence in said microcode storage means; and

decode means interconnected with said main storage means, said level control means, and said sequencing means and responsive to a microcode Register to Storage signal sequence as it is accessed to generate control signals to activate said main storage means, and said level control means in accordance with said predetermined Register to Storage signal sequence.

4,041,463

DOCUMENT FILING, UPDATING AND RETRIEVAL SYSTEM

Joel Slutzky, Placentia; LeeRoy W. Hausman, Jr., Fullerton, both of Calif., and Ronald F. Kostenbauer, Buffalo, Wyo., assignors to Infodetics, Inc., Anaheim, Calif.

Filed Jan. 22, 1976, Ser. No. 651,472

Int. Cl.[2] G11B *27/02*

U.S. Cl. 364—900 **12 Claims**

1. A document storage and retrieval system for filing and updating source documents comprising:

storage means having a plurality of storage locations, each storage location having first and second areas;

filing means for converting the images on a source document to an electronic image signal representative of said images on said source document;

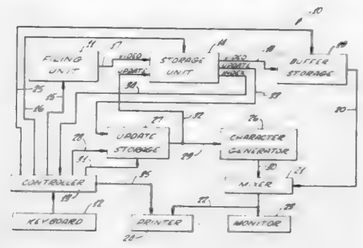
means for generating electronic update signals representative of update information for source documents;

controller means for logically and selectively directing said image signals to said first areas of said storage locations and said update signals to said second areas of said storage locations, the update signals for a particular source document being stored in the same storage location as the image signal therefor;

output means for reproducing source documents from the image signals representative thereof;

means operatively controlled by said controller means for selectively conducting the image signals stored in any said first area of any said storage location to said output means; and

means operatively controlled by said controller means and



responsive to said image signals from said conducting means and said update signals from said storage means for selectively mixing the update signals stored in said second area of the same said storage location with said image signals stored in said first area for conduction to said output means whereby said output means reproduces said source document without the update information represented by the update signals therefor.

4,041,464

DATA PROCESSING SYSTEMS

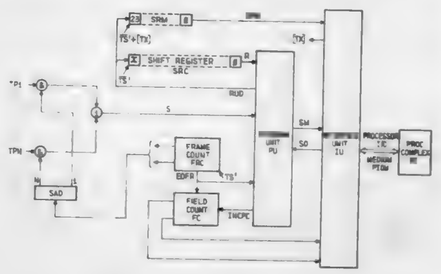
John Spencer Arnold, Liverpool, England, assignor to Plessey Handel und Investments AG., Zug, Switzerland

Filed July 1, 1975, Ser. No. 592,263

Claims priority, application United Kingdom, July 2, 1974, 29191/74

Int. Cl.[2] G06F *9/16, 3/00*

U.S. Cl. 364—200 **5 Claims**



1. A scanner for use as an interface equipment between a plurality of binary digital data scan points to be interrogated and a central data processing equipment, the scanner being arranged to detect, temporarily store and report changes of state of the scan points by cyclically performing a scanning sequence, the scanner including:

a counter means and scan point selection means for cyclically interrogating the state of each of the scan points during a scanning sequence,

a control register having at least one location for each scan point and being arranged to store information relative to the condition of the scan point when last interrogated and

a program unit including (1) a program memory each location of which stores information which includes a program memory adjustment value and a control register conditioning indication, (2) a program memory addressing mechanism for selecting the program memory location to be read out in accordance with an n-bit address word and

(3) an address adder for forming the n-1 most significant bits of said address word by adding (a) a memory adjustment value read from the program memory to (b) the n-1 most significant bits of the current memory address in said program memory addressing mechanism and (c) the binary value of the state of the scan point currently being interrogated,

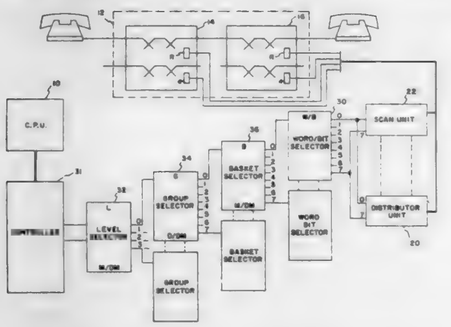
the scanner being arranged when performing a scanning sequence to address each scan point to be interrogated in sequence and as each scan point is interrogated a program memory location is addressed by the n-bit address word formed by said addressing mechanism by the output from said address adder together with the binary state of the corresponding bit in the control register relative to the scan point being interrogated said corresponding bit being used to form the least significant bit of the address word and at each sequence step and corresponding bit in the control register after use is set to the state indicated by the register conditioning indication read out of the program memory during the current scanning sequence step.

4,041,465

SCANNER-DISTRIBUTOR APPARATUS FOR MATRIX SYSTEM

Howard Jeffery Conerly, Milan, Tenn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Apr. 27, 1976, Ser. No. 680,743
Int. Cl.² G06F *3/00*; H04M *3/22*; H04Q *3/54*
U.S. Cl. 364—900 **7 Claims**



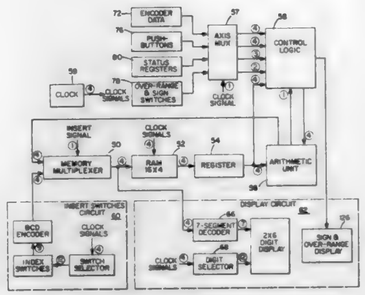
1. A scanner-distributor system for testing the condition of at least one of a plurality of bi-stable elements of a processor-controlled switching network, and for changing the condition of selected ones of said elements, said system comprising a plurality of drive units each coupled to one of said elements and each individually activatable for changing the condition of the coupled element on activation of the coupled drive unit, and a plurality of scan units each coupled to one of said elements for testing the condition of the element on activation of the coupled scan unit, with each of said elements being represented by a predetermined address word for controlling access to that element, an electronic plural stage multiplexer for accessing each of said drive units and scan units through the use of a multiple bit address word emanating from said processor with each stage of said multiplexer network corresponding to certain bits of address word of a selected element, and logic means for controlling the transmission of a selected address word from said processor through said multiplexer to select the drive unit coupled to the element represented by the selected address word, and said logic means operative to activate a plurality of drive units represented by a predetermined portion of a selected address word to change the condition of all elements having said predetermined portion in their addresses.

4,041,466

MULTI-AXIS ENCODER PROCESSING AND DISPLAY SYSTEM

Robert W. Stuart, Bedford, Morocco, assignor to Dynamics Research Corporation, Wilmington, Mass.

Filed Jan. 19, 1976, Ser. No. 650,541
Int. Cl.² G06F *15/46*
U.S. Cl. 364—900 **7 Claims**



1. A system for processing signals from a plurality of positional encoders indicating the movement or non-movement thereof, to provide output signals representative of the position of each of the encoders, said output signals being selectively representative of encoder position in one of at least two different sets of dimensional units, comprising:

storage means for storing data representative of each digit of a plurality of first multi-digit values, each value being representative of a first position of a respective encoder;

means for sequentially retrieving from said storage means said data representative of each of the stored digits;

means for selecting the dimensional units in which said encoder positions are to be represented and for producing a signal representative thereof;

means periodically operative in response to the signals from the encoders for individually processing the retrieved data representing each digit of said plurality of multi-digit values to produce data representative of each digit of a plurality of subsequent multi-digit values representing the subsequent position of each of the encoders, said processing means including:

clock means for producing signals indicating which digit of which multi-digit value is being processed by the processing means;

control means, operative in response to the signals from said selecting means and to the signals from said plurality of encoders, for determining proper values to be added to or subtracted from each of the digits as the data representative thereof is sequentially retrieved by said retrieving means; and

means responsive to said control means for adding and subtracting said proper values to said first plurality of multi-digit values to produce said subsequent plurality of multi-digit values; and

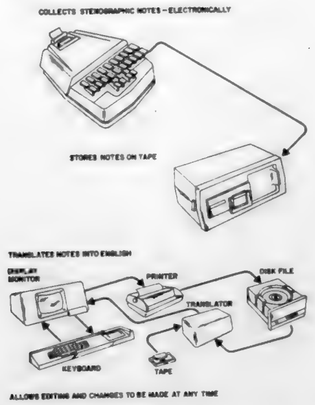
means operative for storing in the storage means the data representative of each of the digits of the subsequent multi-digit values representing the then present position of each of the encoders.

4,041,467

TRANSCRIBER SYSTEM FOR THE AUTOMATIC GENERATION AND EDITING OF TEXT FROM SHORTHAND MACHINE OUTLINES

Dan E. Cota, Los Angeles; Ted R. Charter, Santa Ana; Robert M. Beeson, Palos Verdes Estates, all of Calif., and Robin D. Kinkead, Dallas, Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 636,268
Int. Cl.² G06F *3/02, 3/10, 3/14*
U.S. Cl. 364—900 **5 Claims**



1. A transcriber system for the computer-aided translation of shorthand notes in the form of outlines that are machine readable by the system into text, and the editing of said text, comprising:

shorthand machine means for generating said outlines,

determining means for locating word outlines in said outlines from said shorthand machine means,

means for translating said outlines from said determining means into text,

means for storing said outlines and corresponding text from said translating means,

display means for displaying said text from said translating means and said storage means, and

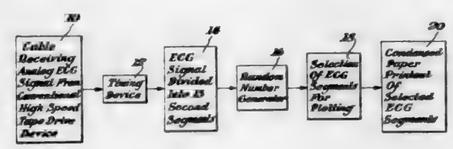
editor means coupled to said display means and said translator means for generating an electronic cursor to identify a text word to be edited, and for modifying said identified word, said cursor selectively conforming for an identified text word to the word boundaries determined by said translator means.

4,041,468

METHOD AND SYSTEM FOR ANALYSIS OF AMBULATORY ELECTROCARDIOGRAPHIC TAPE RECORDINGS

John H. Perry, Silver Spring, Md.; David S. Salsburg, New London, and Colin R. Taylor, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,628
Int. Cl.² G06F *3/12*
U.S. Cl. 364—900 **10 Claims**



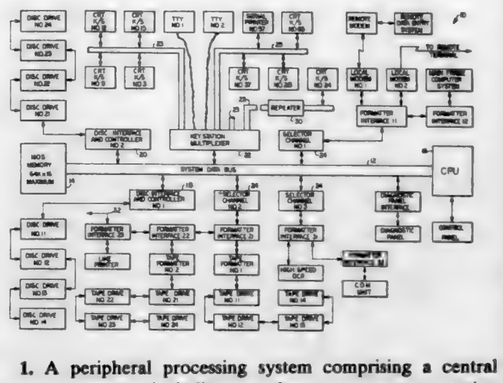
1. A method for rapidly analyzing an electrocardiographic tape recording comprising the steps of generating and receiving an analog ECG signal from a tape reading device, applying a timing signal to the analog ECG signal to provide an ECG signal divided into segments of predetermined relatively short duration of time, selecting a random number of predetermined time segments constituting a relatively small percentage of the tape recording and plotting the selected segments for visual analysis.

4,041,469

CRT KEY STATION WHICH IS RESPONSIVE TO CENTRALIZED CONTROL

Alan K. Jennings, Anaheim, Calif., assignor to Pertec Corporation, Los Angeles, Calif.

Filed Dec. 13, 1974, Ser. No. 532,714
Int. Cl.² G06F *3/02, 3/04*
U.S. Cl. 364—900 **12 Claims**



1. A peripheral processing system comprising a central processing system including a random access memory storing program information and a central processing unit operating in response to both stored program information and a data signal indicative of actuation of keyboard key to generate key station command information; the peripheral processing system further comprising a key station connected for communication with the central processing system, the key station including:

a keyboard having a plurality of manually actuatable keys;

an information output circuit connected to generate the data signal which is an indication of the actuation of a keyboard key, said signal including information indicative of the particular key that has been actuated, and to communicate the data signal to the central processing system;

an information input circuit connected to receive the key station command information generated by the central processing unit, said key station command information including information for controlling the operation of the key station with respect to keyboard entry of information by an operator; and

control circuitry connected to execute a key station function relating to entry of information through the keyboard by an operator in response to the key station command information received by the information input circuit.

4,041,470

FAULT MONITORING AND REPORTING SYSTEM FOR TRAINS

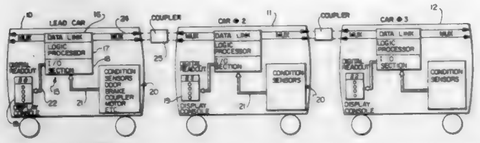
Francis L. Slane, Lancaster, and Truman L. Allison, York, both of Pa., assignors to Industrial Solid State Controls, Inc., York, Pa.

Filed Jan. 16, 1976, Ser. No. 649,678
Int. Cl.² B60L *3/00*; G06F *3/04, 11/06, 15/50*
U.S. Cl. 364—900 **8 Claims**

1. A monitoring and reporting system for use on a vehicle having a plurality of interconnected cars including a lead car and at least one other car, comprising

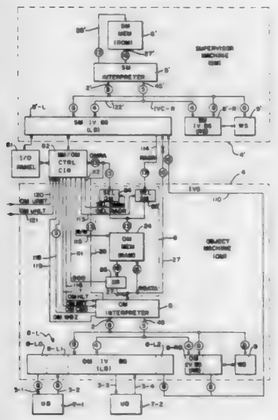
sensor means in each of said cars for monitoring a plurality of physical conditions in said cars and for altering circuit

conditions to represent the state of said physical conditions;
means in each of said cars connected to said sensor means in the same car for repetitively and sequentially detecting each of said circuit conditions and for producing a digitial signal having a value representative of the state of each physical condition;
means in each of said cars for evaluating said digital signals in accordance with predetermined criteria to produce and repetitively update a set of second digital signals having values representative of the existence or nonexistence of faults in said physical conditions;
first memory means in each of said cars for storing said set of second digital signals;



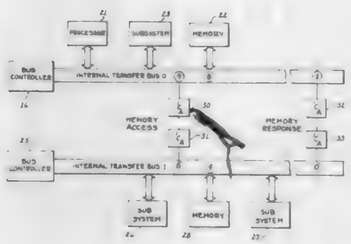
circuit means interconnecting said cars for transmission of digital signals;
logic means in said lead car for repetitively and sequentially sending interrogation signals individually to said first memory means in each of said cars, including said lead car, to determine the existence of faults;
means in each of said cars responsive to said interrogation signals for transmitting status signals representative of said second digital signals to said lead car to provide fault information to said lead car; and
display means in said lead car for receiving and storing said status signals and for providing a visual display of fault conditions reported in said status signals.

4,041,471
DATA PROCESSING SYSTEM INCLUDING A PLURALITY OF PROGRAMMED MACHINES AND PARTICULARLY INCLUDING A SUPERVISOR MACHINE AND AN OBJECT MACHINE
Kenneth D. Krossa, and Douglas B. Earl, both of Los Altos, Calif., assignors to Scientific Micro Systems, Inc., Mountain View, Calif.
Filed Apr. 14, 1975, Ser. No. 567,717
Int. Cl.² G06F *15/16*
U.S. Cl. 364—200 **17 Claims**



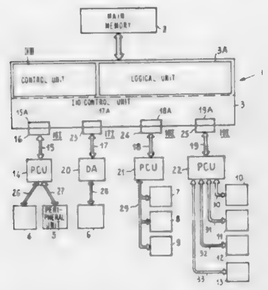
1. A data processing apparatus comprising first and second programmed data processing machines wherein each data processing machine includes,
buffer means for storing operands,
memory means for storing a program of instructions,
interpreter means including means connected to said memory means for sequentially fetching instructions from said memory means, means for executing fetched instructions, and means connected to said buffer means for fetching and storing operands from and to said buffer means in the execution of instructions,
and wherein said buffer means includes a plurality of buffer stores wherein each of said buffer stores includes,
a plurality of latches for storing input signals for a digital device and for storing output signals for a digital device where said input and output signals are said operands,
device bus connection means for connecting a digital device to said latches,
interpreter bus connection means for connecting said interpreter means to said latches,
device enable means for enabling said device bus connection means to connect information into or out from said latches,
interpreter enable means, including an enable latch, for enabling said interpreter bus connection means to connect information into or out from said latches,
address detector means connected to said interpreter bus connection means and operative to enable said enable latch in response to a unique address and to disable said enable latch in response to all other addresses,
and wherein said data processing apparatus further includes
control circuit means responsive to operands from said buffer means of said first data processing machine formed as a result of executing instructions in said first data processing machine for halting and starting said second data processing machine from and means for transferring instructions from said first data processing machine to said second data processing machine for execution in said second data processing machine.

4,041,472
DATA PROCESSING INTERNAL COMMUNICATIONS SYSTEM HAVING PLURAL TIME-SHARED INTERCOMMUNICATION BUSES AND INTER-BUS COMMUNICATION MEANS
Niranjan S. Shah, and James F. Taylor, both of Escondido, Calif., assignors to NCR Corporation, Dayton, Ohio
Filed Apr. 29, 1976, Ser. No. 681,363
Int. Cl.² G06F *3/04, 13/00*
U.S. Cl. 364—900 **4 Claims**



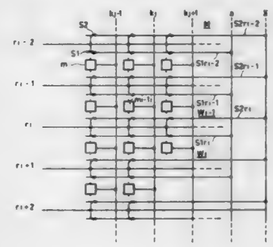
1. In a data processing system having a plurality of subsystems, a memory-sharing system comprising:
a. a plurality of time-shared buses for carrying messages among subsystems connected thereto, each of said buses having a plurality of addressable ports to which subsystems may be connected;
b. a memory subsystem connected to one of said buses at one of said ports for receiving and storing data and for supplying data in response to requests therefor;
c. a requesting subsystem, connected to another of said buses at one of said ports, having means to generate a request message for memory, said request message including a message destination address and a message source address;
d. a first inter-bus communication means connected to said one bus and to said other of said buses at a port on each bus, said inter-bus communication means responsive to the receipt of a message from said requesting subsystem for changing the destination address of said request message to direct said request message to the port on said one bus to which said memory is connected;
e. said memory responsive to a request message received from said first inter-bus communication means requesting data for supplying said data and forming a response message, including a destination address the same as the source address of the request message received from said first inter-bus communication means;
f. a second inter-bus communication means connected to said one bus and said other of said buses at a port on each bus, said second inter-bus communication means responsive to the response message of said memory for transmitting said response message from said one bus to the other of said buses; and
g. said first and second inter-bus communication means each including a first adapter having an input buffer for receiving messages from said one bus and an output buffer for placing messages on said one bus, and a second adapter having an input buffer for receiving messages from said other bus and an output buffer for placing messages on said other bus, and a cable means connecting said first and second adapters with the output buffer of one connected to receive messages from the input buffer of the other, all messages and data transmitted from one bus to the other bus being transmitted through the input and output buffers of said first or second inter-bus communication means.

4,041,473
COMPUTER INPUT/OUTPUT CONTROL APPARATUS
Angelo Bardotti, Cesano Boscone (Milan), and Renzo Pederzini, Melegnano (Milan), both of Italy, assignors to Honeywell Information Systems Italia, Minneapolis, Minn.
Filed May 12, 1975, Ser. No. 576,523
Claims priority, application Italy, May 16, 1974, 22812/74
Int. Cl.² G06F *3/00*
U.S. Cl. 364—900 **10 Claims**



1. In a digital computer system comprising a central processor, a first peripheral unit controlled by a peripheral control unit, and a second peripheral unit, the improved interface for providing for said central processor simultaneously to communicate with said peripheral control unit and to control directly and communicate with said second peripheral unit comprising:
first interface apparatus comprising a first universal port and a first module removably connectable to said first port and comprising a first circuit group and a first set of lines coupling said first circuit group to said peripheral control unit, said first circuit group for receiving control signals and data signals from said first port and from said peripheral control unit and in response to said signals received thereby transmitting appropriate and corresponding control and data signals to said first port and to said peripheral control unit; and
second interface apparatus comprising a second universal port and a second module removably connectable to said second port and comprising a second circuit group and a second set of lines coupling said second circuit group to said second peripheral unit, said second circuit group for receiving control signals and data signals from said second port and from said second peripheral unit and in response to said signals received thereby transmitting appropriate and corresponding control and data signals to said second port and to said second peripheral unit; wherein said first circuit group includes first control means for responding to a first plurality of control signals received from said peripheral control unit and for transmitting a second plurality of control signals to said peripheral control unit, said second circuit group includes second control means for responding to a third plurality of control signals received from said second peripheral unit and for transmitting a fourth plurality of control signals to said second peripheral unit, said first and third pluralities being different in number and said second and fourth pluralities being different in number; and said first control means transmits a subset of said second plurality of control signals in response to receipt of respective ones of a subset of said first plurality of control signals, said second control means transmits a subset of said fourth plurality of control signals in response to receipt of respective ones of a subset of said third plurality, said first and second circuit groups further including timing means for controlling the respective duration of said subset of said second plurality of signals to differ from the respective durations of said subset of said fourth plurality of signals, and for controlling the relative timing among the signals of said subset of said second plurality of signals to differ from the relative timing among said subset of said fourth plurality of signals; and
wherein said first and second universal ports are identical, each of said ports comprising an equal number of lines coupled to said central processor for transmitting control signals and data signals between said central processor and the one of said modules coupled to said port.

4,041,474
MEMORY MATRIX CONTROLLER
Claude Jan Principe Frederik Le Can, Nijmegen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 512,684, Oct. 7, 1974. This application Jan. 30, 1976, Ser. No. 653,923
Claims priority, application Netherlands, Oct. 11, 1973, 7313983
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **1 Claim**



1. A memory storage device, comprising a plurality of memory elements organized as a matrix of rows and columns, ech of said rows including at least one marked memory element associated therewith;
first selection means having a first terminal associated therewith for selection of a first predetermined one of said rows;

second selection means, having a second terminal associated therewith for selection of a second predetermined one of said rows;

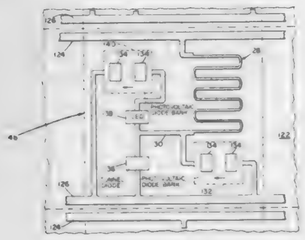
control means comprising first and second signal lines coupled with said respective first and second terminals, and a logical component for supplying a control signal to said first and second selection means, said control signal being applied to said first terminal and the complement of said control signal being supplied to said second terminal; and

means for activating said control means, by means of a single predetermined instruction, comprising a central processor having a plurality of control lines, including a control line, activated by an increment instruction executed by said central processor, connected to said control means.

4,041,475
COMPUTER MEMORY

Ali Javan, Cambridge, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed July 16, 1975, Ser. No. 596,208
Int. Cl.² G11C *11/34*
U.S. Cl. 340—173 LS **5 Claims**



1. In a memory system having an assembly of memory cells with identifying address values, each cell capable of assuming alternatively either of two states, the states defining the value of information stored in the cell, the improvement comprising in combination

an array of memory cells spatially arranged on a substrate in accordance with identifying address values, each cell comprising

electrical circuitry having two alternative stable states, and

input-output means, connected to said circuitry, said means being responsive to incident optical radiation having two distinct alternative characterizations and producing two alternative electrical effects in correspondence thereto, said means being reponsive to the operating state of said circuitry to emit radiation indicating the operating state of said circuitry,

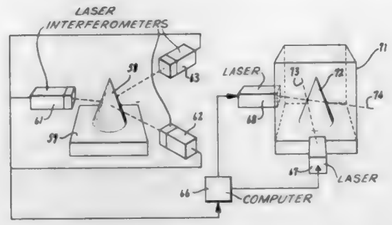
said circuitry being arranged and connected so that when said input-output means is stimulated by directionally-controlled optical radiation having a first of said distinct charcterizations said circuitry assumes a first of said stable states in response to the first of said effects and when said means is stimulated by optical radiation of a second of said characterizations said circuitry assumes a second of said operating states in response to the second of said effects,

a radiation processor arranged to send directionallycontrolled optical radiation to and receive radiation from said array, said processor having data input, data output, and adress input, said processor arranged to operate in a write-in mode generating a beam of optical radiation directed selectively to the one of said cells corresponding to the value of an addressing signal received on said address input, the radiation of said beam having two distinctive alternative characterizations corresponding to the value of a data signal received on said data input, said processor including a radiation receiver arranged to operate in a read-out mode responding selectively to radiation from the one of said cells corresponding to the value of an addressing signal received on said address input and to emit on said data output an electrical signal of value corresponding to the characterization of the received radiation, said radiation processor including a lens system focussing optical radiation on a selected one of said cells, and said array being supported on a surface of a lens of said lens system.

4,041,476
METHOD, MEDIUM AND APPARATUS FOR PRODUCING THREE-DIMENSIONAL FIGURE PRODUCT

Wyn Kelly Swainson, P.O. Box 4262, Berkeley, Calif. 94704

Continuation-in-part of Ser. No. 744,027, July 11, 1968, abandoned. This application July 23, 1971, Ser. No. 165,042
Int. Cl.² G11C *13/04*
U.S. Cl. 340—173 CC **72 Claims**



1. A method of generating a three-dimensional pattern in a volume of material comprising the steps of:

a. generating control signals specifying the coordinate positions of a plurality of points within a volume of material which is capable of undergoing a change in optical properties in response to energy level changes within said volume, and

b. generating in response to said control signals energy level changes which cooperate within said volume at selected locations therein corresponding to said coordinate positions to produce the simultaneous visual display of said plurality of points.

4,041,477
FERROELECTRIC-PHOTOCONDUCTOR OPTICAL STORAGE

Jurgen Drenckhan, Jena-Neulobeda, Germany, assignor to Jenoptik Jena G.m.b.H., Jena, Germany

Filed Mar. 29, 1976, Ser. No. 671,601
Claims priority, application Germany, June 9, 1975, 186521
Int. Cl.² G11C *11/22, 11/42*
U.S. Cl. 340—173.2 **1 Claim**



1. A ferroelectric photoconductor optical storage comprising

a pair of transmissive electrodes

a sandwich parcel constituted of an alternating arrangement of ferroelectric layers and photoconductive layers,

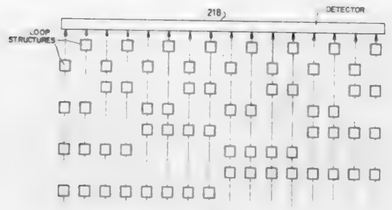
said pair of transmissive electrodes enclosing said sandwich parcel and being oppositely located relative to photoconductive layers out of said alternating arrangement,

said ferroelectric layers being selected from bismuth titanate.

4,041,478
MEMORY DEVICE

Adrianus Wilhelmus Maria van den Enden; Franciscus Antonius Kuipers; Edmond de Niet, and Willem Frederik Druyvesteyn, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,024
Claims priority, application Netherlands, Oct. 31, 1974, 7414216
Int. Cl.² G11C *11/02*
U.S. Cl. 340—174 TF **8 Claims**



1. A memory device comprising

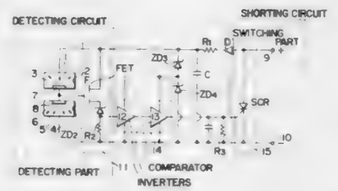
a plate of magnetic material capable of maintaining magnetic domains therein;

a domain guide structure in said plate for guiding the transport of said magnetic domains therein, comprising a plurality of discrete elements including a domain generating device, an input structure connected to said generating device, a storage structure connected to said input structure, and an output structure connected to said storage structure, and including loop structures displaced over discrete portions of said output structure for selectively controlling the transport of a magnetic domain from a first position to a second position on a predetermined one of said loop structures under control of at least two external rotary magnetic field sequences of different duration which distinguish each of said output structures by synchronization with the presence of magnetic domains on said loop structures.

4,041,479
OUTPUT CIRCUIT OF AN IONIZATION SMOKE SENSOR

Atsushi Miyabe, Tokyo, Japan, assignor to Hochiki Corporation, Japan

Filed Feb. 9, 1976, Ser. No. 656,701
Claims priority, application Japan, Feb. 10, 1975, 50-17774[U]
Int. Cl.² G08B *21/00*
U.S. Cl. 340—237 S **4 Claims**



1. A high impedance circuit arrangement having ionization smoke sensors, comprising the ionization smoke sensor which has a high impedance and which is included in each of a plurality of alarm circuits connected to a common d.c. power source and being independent of one another, a power source shorting circuit which is so formed that a thyristor adapted to short-circuit said power source when triggered is connected in parallel with the corresponding ionization smoke sensor, said each shorting circuit including a relay which is energized by a current increased when said power source is shortcircuited and which serves to actuate peripheral means, a detecting circuit which is so formed that a semiconductor element adapted to current-amplify an impedance change of the corresponding ionization smoke sensor is connected in parallel with said ionization smoke sensor under the state of parallel connection to the corresponding shorting circuit, and a trigger circuit which is connected between an output end of the corresponding detecting circuit and a gate of the corresponding thyristor and which has a pair of inverters connected in a complementary relationship, whereby said pair of inverters hold the corresponding trigger circuit "off" in response to an output from the corresponding detecting circuit as is smaller than an operating voltage of said inverters, while they transmit a normalized voltage from said trigger circuit to the gate of the corresponding thyristor to turn said thyristor "on" and to close the corresponding shorting circuit in response to an output not smaller than said operating voltage.

4,041,480
DISPENSER COVER AND INDICATOR

James Boyle, 358 Maple Glen Ridge, Pomona, N.Y. 10970

Filed Mar. 17, 1976, Ser. No. 667,571
Int. Cl.² G08B *21/00*
U.S. Cl. 340—280 **3 Claims**



1. An indicating device for a cup dispenser comprising:

a. a cover adapted to enclose a cup dispenser containing a plurality of vertically stacked removable cups therein;

b. sensing means secured within said cover to an upper surface for sensing the distance between the uppermost cup and a lower reference point,

c. indicator means secured to said cover to indicate when said uppermost cup reaches said lower reference point; and

d. switching means actuated by said sensing means to switch on said indicator means when said uppermost cup reaches said reference point, said sensing means including a spring controlled reel, a length of wire wound on said reel, a weight secured to the end of said wire, said weight being adapted to rest on said uppermost cup and move with said uppermost cup to pull said wire from said reel as said uppermost cup moves down said stack, and means for actuating said switching means when said length of wire and weight reach said reference point, said reel rewinding said wire when said weight is lifted above said reference point to deactivate said switching means and turn off said indicator means.

4,041,481

SCANNING APPARATUS FOR AN ELECTROPHORETIC MATRIX DISPLAY PANEL

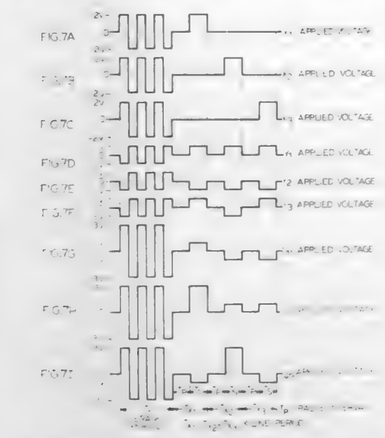
Teruo Sato, Kyoto, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 1, 1975, Ser. No. 618,681

Claims priority, application Japan, Oct. 5, 1974, 49-114903; Oct. 5, 1974, 49-114905

Int. Cl.² G06K *15/18*; G02F *1/13*

U.S. Cl. 340—324 M **3 Claims**



1. A scanning apparatus for an electrophoretic matrix display panel having opposed spaced X-line and Y-line electrodes and having a multiplicity of display cells located between said X-line and Y-line electrodes, said scanning apparatus comprising an X-line electrode driving circuit adapted to be coupled to said X-line electrodes and having a set of X-line drivers for supplying an X-erasing pulse and a selecting pulse with a pause interval to an X-line electrode, said pause interval being supplied before said selecting pulse is supplied and after said X-erasing pulse is supplied so as to stop the supply of any voltage to said X-line electrode during said pause interval; a Y-line electrode driving circuit adapted to be coupled to said Y-line electrodes and having a set of Y-line drivers for supplying a Y-erasing pulse and a data pulse with a pause interval to a Y-line electrode, said Y-erasing pulse, pause interval and data pulse supplied to said Y-line electrode being synchronized with said X-erasing pulse, pause interval and selecting pulse supplied to said X-line electrode, respectively, so as to stop the supply of any voltage to the display cell at the intersection of said X-line electrode and said Y-line electrode during said pause interval, the voltage difference between said selecting pulse and said data pulse being applied as an information pulse to said display cell; and an information signal supply means coupled to said X-line and Y-line electrode driving circuits.

4,041,482

CHARACTER GENERATOR FOR THE REPRODUCTION OF CHARACTERS

Jurgen Freudeberg, and Reimer Von Osten, both of Eiserfeld, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

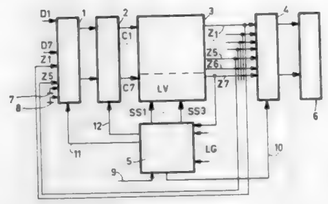
Filed Mar. 11, 1976, Ser. No. 665,955

Claims priority, application Germany, Mar. 25, 1975, 2513059

Int. Cl.² G06F *3/14*

U.S. Cl. 340—324 AD **5 Claims**

1. A character generator for generating the signals for a reproduction device for the reproduction of characters composed of a matrix of dots, comprising a store which is addressed by an address control system and which contains in each addressed storage location at least a part of the information for generating the signals for a character assigned to this address, characterized in that for any desired character form the store (3) comprises a storage location containing the associated complete character information, and a storage location assigned to a character which can be reproduced in respective different forms containing address information, each storage location further including at least one storage position for control information which indicates whether the storage location contains address information or character information,



any access to a storage location causing this storage position to be read first, the control information read out controlling a switch (1) which subsequently applies the address information read from the storage location to the address control system (2), thus initiating the reading of the information of a character to be reproduced and present at this address which corresponds to the address information.

4,041,483

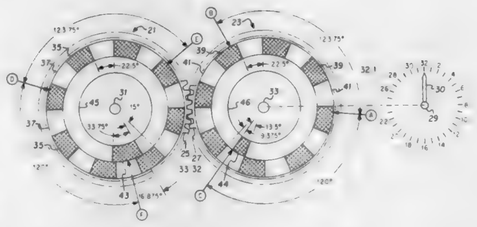
ABSOLUTE INCREMENTAL HYBRID SHAFT POSITION ENCODER

Alvin H. Groff, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 18, 1975, Ser. No. 569,414

Int. Cl.² H03K *13/02*; G01D *5/34*

U.S. Cl. 340—347 P **11 Claims**



1. Shaft position encoder means comprising:

a. first means including a first coded track and an associated first sensor means between which relative movement is caused by rotation of said shaft, said first sensor means being arranged so as to be sensitive only to said first track, and said first sensor means generating, in response to said relative movement within said first means, a first signal at each of substantially regular angular intervals α of rotation of said shaft.

b. second means including a second coded track and an associated second sensor means between which relative movement is also caused by rotation of said shaft, said second sensor means being arranged so as to be sensitive only to said second track, and said second sensor means generating, in response to said relative movement within said second means, a second signal at each of substantially regular angular intervals β of rotation of said shaft, where $\beta = M/N \times \alpha$, and M and N are positive intergers >1 which contain no prime factor, other than the prime number one, which is common to both, and

c. third means including a third coded track and an associated third sensor means between which relative movement is also caused by rotation of said shaft, said third sensor means being arranged so as to be sensitive only to said third track, and said third sensor means generating, in response to said relative movement within said third means, a voltage or current transition at each of substantially regular angular intervals $\beta/M/k$ of rotation of said shaft where k is a positive integer,

whereby for a predetermined direction and amount of shaft rotation each positionally different first signal has associated therewith a corresponding and identifying electrical signature comprising a predetermined number of said transitions occurring between the associated first signal and the second signal last occurring prior to the associated first signal, each said electrical signature being different from all the other electrical signatures within said predetermined amount of shaft rotation in that each said electrical signature comprises a different number of said transitions.

4,041,484

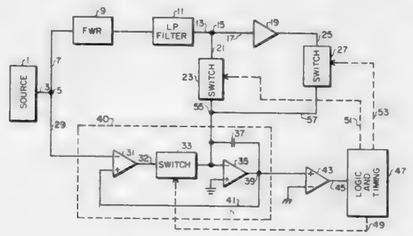
ANALOG-TO-DIGITAL CONVERTER USING COMMON CIRCUITRY FOR SAMPLE-AND-HOLD AND INTEGRATING FUNCTIONS

Alberto Boleda, Menlo Park, and Robert J. Tracey, San Mateo, both of Calif., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 6, 1975, Ser. No. 556,048

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 NT **2 Claims**



1. A circuit arrangement for converting a time-varying or *d–c* signal into a digital representation which comprises:

timing means;

logic means;

first switching means;

reference voltage means comprising:

a full-wave rectifier connected to receive the analog signal; and

a low pass filter connected to the output of the full-wave rectifier to reduce the ripple and harmonic voltages generated during rectification; and means for connecting the reference voltage output from said filter means to said first switching means;

means for generating a ramp signal comprising:

combined sampling, holding and integrating means for timed selection of samples of said signal at intervals set by said timing means, said logic means controlling the connection of said reference voltage via said first switching means to said combined sampling, holding and integrating means; said generating means further comprising:

a first operational amplifier having an inverting input connected to receive the signal, a non-inverting input, and an output;

second switching means having one end connected to the output of said first operational amplifier; and

a second operational amplifier having an inverting input connected to the other end of said first and second switching means; having a non-inverting input connected to ground, and having a capacitor connected between the inverting input and the output; and a feedback means connected between the output of said operational amplifier and the non-inverting input of said first operational amplifier;

means for comparing said ramp signal to ground; and

means for counting the time duration of the ramp signal for durations less than a predetermined period.

4,041,485

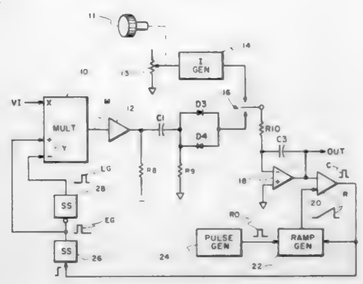
SPLIT GATE TRACKER USING BIPOLAR CONVERTER

Howard R. Stevenson, Jr., Herkimer, N.Y., assignor to General Electric Company, Utica, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,458

Int. Cl.² G01S *9/16*

U.S. Cl. 343—7.3 **5 Claims**



1. A split gate pulse tracking circuit comprising, in combination:

a multiplier having first and second input ports and an output port;

means for applying a video signal containing a pulse to be tracked to said first input port;

means for generating sequential and contiguous early and late gate sampling pulses and for applying said pulses to said second input port, said sampling pulses being received by said multiplier in opposite polarity states such that the output produced by said multiplier coincident with said sampling pulses is a bipolar representation of a portion of said video signal;

integrating means connected to said output port for integrating the multiplier output signal; and

means responsive to changes in the output of said integrating means for shifting the timing of said early and late gate pulses.

4,041,486

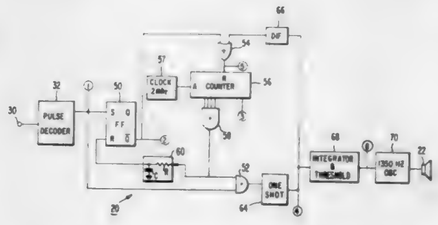
PULSE STREAM IDENTIFICATION CIRCUIT

Mohammed Imam Hussain, Los Angeles, Calif., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,730

Int. Cl.² G01S *9/02*

U.S. Cl. 343—7.3 **6 Claims**



1. In a system for identifying a stream of uniformly spaced pulses at a fixed period T from a stream of randomly spaced

pulses separated in time from the uniformly spaced pulses, in combination:

means responsive to at least each pulse of said uniformly spaced pulses for producing an interrogation pulse at the fixed time, T, of the next expected uniformly spaced pulse;

means responsive to the concurrent presence of said interrogation pulse and a pulse of said streams of pulses for producing a concurrence signal; and

means responsive to the presence of a predetermined number of concurrence signals corresponding to successive uniformly spaced pulses for producing a signal indication that uniformly spaced pulses are present.

4,041,487

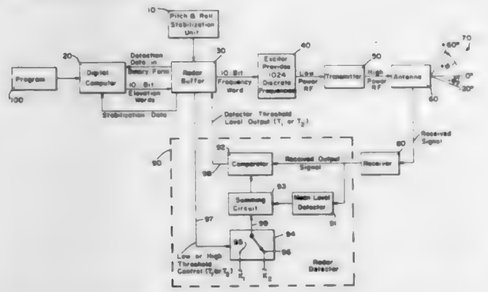
LOW ELEVATION ANGLE RADAR TRACKING SYSTEM

Norol T. Evans, San Pedro; Barry S. Pearlstein, Anaheim; Merlin A. Job, Fullerton, and Donald L. Hoagland, Newport Beach, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation-in-part of Ser. No. 455,698, March 25, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,822

Int. Cl.[2] G01S *9/02*

U.S. Cl. 343—7.5 **19 Claims**



14. A method for controlling of threshold levels and hence the required signal levels of a pair of sequentially switched radar beams of a radar system having a buffer circuit, comprising the steps of:

switching, in a predetermined time sequence, the threshold levels;

comparing the switched threshold levels with signals received by the system; and

feeding the compared signals to the buffer circuit.

4,041,488

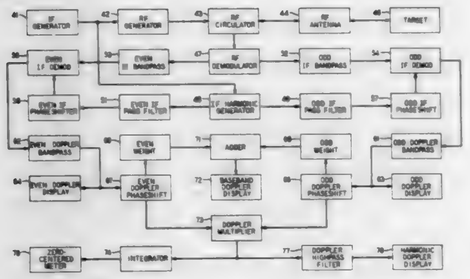
DOPPLER RADAR SYSTEM

William Fishbein, Elberon, and Otto Rittenbach, Neptune, both of N.J., assignors to The United States of America as represented by the Department of the Army, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 677,948

Int. Cl.[2] G01S *9/50*

U.S. Cl. 343—8 **9 Claims**



1. In a radar system of the type wherein an antenna directs a beam of radio frequency energy at a target, said target reflecting a portion of said beam back towards said antenna, said system including:

means for generating said radio frequency energy; and

means for demodulating the beam portion reflected back by said target, the improvement which comprises:

means for generating a sinusoidal signal of a first frequency;

means for frequency- or phase-modulating said radio frequency generating means with said sinusoidal signal;

means for generating odd and even harmonics of said sinusoidal signal of a first frequency;

means, connected to the output of said demodulating means and to the output of said harmonic generating means, for developing phase-quadrature Doppler signals from said reflected beam portion; and

said Doppler signal developing means including:

means, connected to the output of said harmonic generating means, for passing at least one of the even harmonics of said sinusoidal signal;

means, connected to the output of said harmonic generating means, for passing at least one of the odd harmonics of said sinusoidal signal;

means, connected to the output of said demodulating means, for passing components of the reflected beam portion centered about said at least one even harmonic of said sinusoidal signal;

means, connected to the output of said demodulating means, for passing components of the reflected beam portion centered about said at least one odd harmonic of said sinusoidal signal;

a first Doppler demodulator connected to the output of said even harmonic passing means and to the output of said even component passing means;

a second Doppler demodulator connected to the output of said odd harmonic passing means and to the output of said odd component passing means; and

first and second bandpass filters respectively connected to the outputs of said first and second Doppler demodulators for blocking all signal components other than the desired Doppler signals.

4,041,489

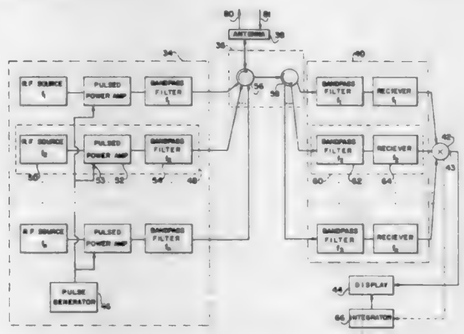
SEA CLUTTER REDUCTION TECHNIQUE

Bernard L. Lewis, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 25, 1974, Ser. No. 482,970

Int. Cl.[2] G01S *7/28*

U.S. Cl. 343—17.1 R **3 Claims**



1. A radar system comprising:

a radar transmitter for generating a multi-frequency radar pulse, said pulse having at least two discrete carrier frequency components;

radar antenna means for radiating said radar pulse and for receiving the return radar signal;

first coupling means for coupling said transmitter means to said antenna means whereby the energy of said pulse is directed only to said antenna means;

a radar receiver for receiving and separately simultaneously processing each of said carrier frequency components of said return signal;

second coupling means for coupling said antenna means to said receiver means whereby the energy of said return radar signal is directed only to said receiving means;

multiplying means connected to the output of said receiver for multiplying together the processed output of each frequency component; and

means connected to the output of said multiplying means for indicating the result of said multiplication whereby said receiving signals having only radar frequency energy within selected narrow frequency bands are detected in said radar receiver and constitute said processed output, and said processed outputs of each said frequency component are multiplied together in said multiplying means,

said radar transmitter comprising parallel transmitter branches, each of said branches being capable of generating an output radar signal pulse of predetermined radar frequency energy, each said frequency dfferent from the frequency of the other of said branches, said branches being simultaneously operable to produce a multi-frequency radar pulse having at least two carrier frequency components,

said radar receiver connected to said second coupling means having parallel receiving branches, equal in number to the number of said parallel transmitter branches, and having corresponding receiving frequencies,

said second coupling means coupling the received signals to each input of said receiving branches whereby the energy of said return radar signal is directed to said parallel receiver branches having corresponding receiving frequencies,

said multiplying means being connected to the output of each said parallel receiver branch for combining the output of each of said receiving branches by multiplying them all together to form the product thereof,

each said parallel transmitter branch comprising a radar frequency generator, a pulsed power amplifier connected to said radar frequency generator for amplifying the output of said radar frequency generator, each said pulsed power amplifier being connected to a pulse generator whereby each pulsed power amplifier amplifies only during a period that it receives a pulse from said pulse generator, and bandpass filter connected to the output of said pulsed power amplifier, and

each said parallel receiver branch comprising a bandpass filter and a radar frequency receiver connected in series in the order recited and further wherein said receiver means includes a signal detection means.

4,041,490

MEASUREMENT SYSTEM CALIBRATED TO BE INSENSITIVE TO TEMPERATURE VARIATION INDUCED CHANGES IN INTERNAL PHASE SHIFTS PRESENT IN THE SYSTEM

Richard Edwin Watt, San Diego, Calif., assignor to Cubic Corporation, San Diego, Calif.

Filed June 25, 1976, Ser. No. 699,898

Int. Cl.[2] G01S *7/40*

U.S. Cl. 343—17.7 **5 Claims**

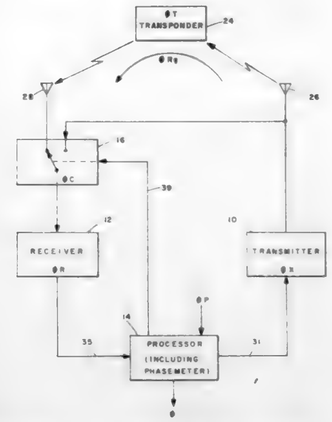
1. A measurement system wherein a given quantity is determined by measuring the phase shift between a transmitted continuous wave signal from a transmitter and a continuous wave signal received by a receiver from a transponder in response to said transmitted signal, comprising

said transmitter,

said receiver, and

a digital phasemeter for measuring said phase shift and for providing a count representative thereof, and including means for presetting the count therein to compensate for internal phase shifts in the measurement system,

wherein the improvement comprises



a calibration system connected to the transmitter and the receiver for making the measurement system insensitive to temperature variation induced changes in internal phase shifts present in the transmitter and the receiver.

4,041,491

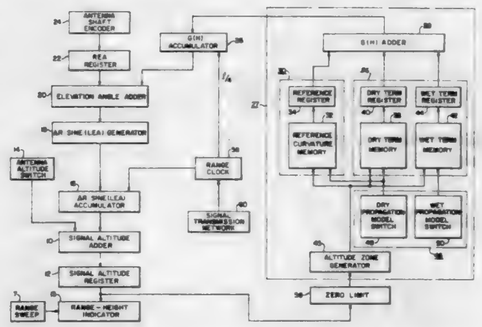
METHOD AND APPARATUS FOR DETERMINING THE ALTITUDE OF A SIGNAL PROPAGATION PATH

John W. Taylor, Jr., and Carl A. McGrew, both of Baltimore, Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 14, 1975, Ser. No. 631,976

Int. Cl.[2] G01R *29/08*

U.S. Cl. 343—100 R **37 Claims**



2. A signal processor for determining the altitude of a signal transmitted from an antenna and propagated through the atmosphere, said processor comprising:

means for encoding the elevation angle of said antenna;

first means for selecting the altitude of said antenna;

second means for selecting a model atmosphere through which said signal is propagated; and

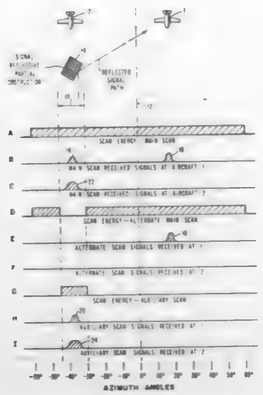
means for determining the propagation path of said signal in relation to said elevation angle, antenna altitude and model atmosphere.

4,041,492

RADIO NAVIGATION WITH SEPARATE CORRELATED SCANS TO AVOID REFLECTION INTERFERENCE

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,696
Int. Cl.[2] G01S *1/54, 1/16*
U.S. Cl. 343—106 R **15 Claims**



1. A method for providing navigation signals for aircraft over a full navigation angle sector in the presence of a signal-reflective fixed obstruction within a sub-sector of the navigation sector while avoiding the consequences of reflected signal interference therefrom, comprising

transmitting radio energy containing navigation information in a directional beam which is scanned in a main scan over said navigation sector.

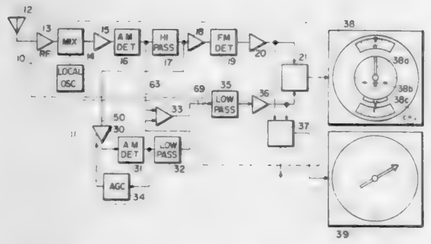
and separetly transmitting radio energy containing navigation information in a directional beam which is scanned in an auxiliary scan only over said obstruction sub-sector while transmitting auxiliary scan identifying information to distinguish the auxiliary scan from the main scan to thereby provide information sufficient for a receiver within said navigation sector to distinguish true signals from signals reflected from the signal reflective obstruction.

4,041,493

ELIMINATION OF EXTRANEOUS MODULATION FROM VHF OMNIRANGE RECEIVER

John G. Mast, Irving, Tex., assignor to Textron, Inc., Providence, R.I.

Filed Nov. 7, 1975, Ser. No. 629,968
Int. Cl.[2] G02S *1/44*
U.S. Cl. 343—106 R **9 Claims**



1. In a VHF omnirange receiver intercepting a VOR transmission signal wherein extraneous amplitude modulation of the carrier occurs close to the frequency of a variable phase VOR modulation signal and a subcarrier is frequency modulated by a fixed phase signal at the freqtecny of said variable phase signal, the combination which comprises:

a. means to detect amplitude modulation of said subcarrier,

b. means to amplify with phase reversal the detected modulation signal, the amplification being by an amount equal to the ratio of the carrier amplitude to the subcarrier amplitude to produce a cancellation signal, and

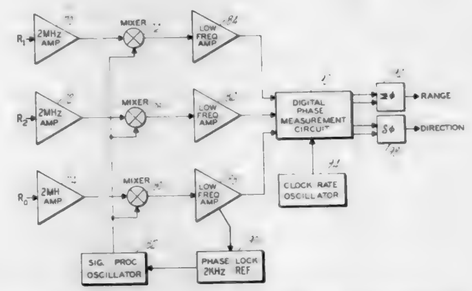
c. means for adding said cancellation signal to said transmission signal to eliminate the effects of said extraneous amplitude modulation at said frequency on said carrier.

4,041,494

DISTANCE MEASURING METHOD AND APPARATUS

Harold I. Ewen, Weston, and George G. Haroules, Lexington, both of Mass., assignors to The United States of America as represented by the Secretary of the Department of Transportation, Washington, D.C.

Filed Nov. 10, 1975, Ser. No. 630,161
Int. Cl.[2] G01S *3/02*
U.S. Cl. 343—112 D **9 Claims**



1. A method for the measurement of distance comprising the steps of:

generating a carrier frequency signal;

generating a modulation signal;

employing the modulation and carrier signals to generate a first sideband signal at a frequency related to said carrier frequency;

simultaneously transmitting the carrier and first sideband signals;

receiving the transmitted carrier and sideband signals at three points linearly spatially displaced along a common baseline;

extracting the intermediate frequency from the carrier and sideband signals received at each point to thereby provide three intermediate frequency signals each having a different phase relationship commensurate with the respective distances between the point of transmission and points of reception;

comparing the phase at said intermediate frequency of two pair of the three signals provided by extracting the intermediate frequency to obtain information corresponding to the differences in phase between the compared intermediate frequency signals of each pair; and

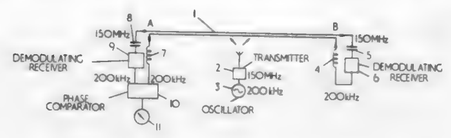
summing the phase differences at the intermediate frequency to provide a measure of the distance from the baseline to the point of transmission.

4,041,495

APPARATUS FOR DETERMINING THE POSITION OF AN OBJECT

David James Reginald Martin, Leatherhead, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Sept. 4, 1975, Ser. No. 610,393
Claims priority, application United Kingdom, Oct. 4, 1974, 43129/74
Int. Cl.[2] G01S *3/02*; G08B *21/00*
U.S. Cl. 343—112 R **10 Claims**



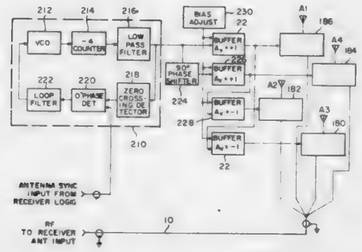
1. Apparatus for determining the position of an object along a fixed path in which the apparatus includes a receiving aerial line in or adjacent the path, a transmitter associated with the object and movable therewith, first demodulating means connected to one end of the line and arranged to feed a demodulated signal into the line, second demodulating means connected to the other end of the line, and phase comparator means connected to the said other end of the line to receive demodulated signals from the first demodulating means and also connected to receive demodulated signals form the second demodulating means, the demodulating means and phase comparator means being responsive to transmitter signals and further adapted to determine the phase difference of the demodulated signals received and to give an output signal indicative of the phase difference, which is related to position of an object.

4,041,496

AUTOMATIC DIRECTION FINDING SYSTEM

Paul R. Norris, P.O. Box 925, Issaquah, Wash. 98027

Filed Apr. 26, 1976, Ser. No. 680,203
Int. Cl.[2] G01S *5/02*
U.S. Cl. 343—113 DE **21 Claims**



1. An automatic direction finding system for indicating the bearing of a radio transmission, comprising:

an antenna array including at least three non-unidirectional antenna elements circumferentially spaced along a circular path;

antenna control means for simultaneously varying the coupling from each of said antenna elements to an antenna output line, said control means being continuously adjustable within a predetermined coupling range in accordance with respective antenna coupling signals such that said antenna array effectively simulates a single antenna element moving along a circular path at a frequency corresponding to the frequency of said coupling signals.

signal generating means for producing said antenna coupling signals;

receiver means for extracting a doppler modulation signal from the signal at said antenna output line, said modulation signal having a frequency equal to the frequency of said coupling signals; and

direction indicating means for comparing the phase of said modulation signal to the phase of a coupling signal and for producing a direction indication signal proportional thereto.

4,041,497

HEADBAND WITH RECEIVER AND DIRECTIONAL ANTENNA

Tore Georg Palmaer, Smultronvagen 28, S-331 00 Varnamo, Sweden

Filed May 5, 1975, Ser. No. 574,701
Int. Cl.[2] H01Q *1/24*
U.S. Cl. 343—702 **1 Claim**



1. In combination with a portable radio receiver, a housing for enclosing said receiver, a headband for supporting said housing along one side of the head of a user, said headband and housing defining a plane of symmetry coincident with the lateral plane of symmetry of the head of the user an antenna integrally mounted in said housing with said receiver, said antenna comprising a coil having a longitudinal axis, said coil being fixedly mounted with respect to said receiver at a rearwardly inclined angle of between 15° – 45° with respect to the plane of symmetry of the headband and receiver when worn in the normally geometric vertical position on the head.

4,041,498

COLLAPSIBLE ADJUSTABLE LENGTH CITIZENS-BAND ANTENNA WITH COIL CONCEALING STRUCTURE

Ronald J. Freimark, and Laszlo N. Repay, both of Chagrin Falls, Ohio, assignors to Tenna Corporation, Cleveland, Ohio

Filed May 27, 1976, Ser. No. 690,578
Int. Cl.[2] H01Q *9/18*
U.S. Cl. 343—749 **2 Claims**

1. An adjustable length, collapsible, motor driven antenna suitable for use with so-called citizens-band transceivers, comprising:

inner, outer, and intermediate longitudinally movable telescoping antenna sections, at least all but the inner section being tubular;

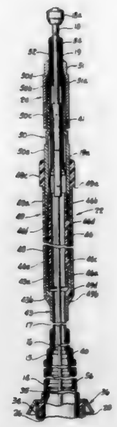
a support for said sections into which the sections are at least partially receivable when the antenna is collapsed, said support being elongated and having an opening at one end through which the sections pass when moved into and out of said support;

an electrically powered drive including motor and transmission secured to said support and a flexible cord extensible through at least all but the inner antenna section and driven by said motor and transmission, to extend and retract the antenna sections;

a loading coil carried by and electrically coupled with an intermediate section next adjacent to the inner section, said coil being around a tubular coil form secured at one end to said carrying section and having a collet secured to

the other end, the coil being electrically coupled with the carrying section and the collet;

a tubular antenna segment shorter than said sections, coaxial with and of the same diameter as said carrying section, slidably secured within said collet and forming an extension of the carrying section and which when moved axially in the collet changes the length of the antenna beyond the coil; and



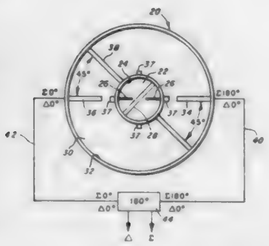
a cover sleeve over the tuning coil and coil form, said sleeve having a central portion of a diameter no greater than that of the outer movable telescoping section and receivable in said opening and support, and a portion at the opposite end of the sleeve tapered inwardly in a direction away from said central portion.

4,041,499

COAXIAL WAVEGUIDE ANTENNA

Charles Chung-Yeh Liu, Dallas, and James Alec Fuller, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Nov. 7, 1975, Ser. No. 629,723
Int. Cl.² H01Q *13/06, 13/08*
U.S. Cl. 343—756 **7 Claims**



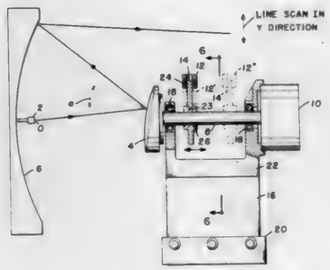
1. A coaxial waveguide horn antenna system comprising a source of electromagnetic monopulse signals, a hybrid circuit means coupled to the source of electromagnetic monopulse signals for producing sum and difference monopulse signals, said hybrid circuit means including first and second 180° hybrids, said first hybrid being connected to a source of power at a first selected frequency bandwidth for producing a sum signal, said second hybrid being connected to a source of power at a second selected frequency for producing a difference signal, and a coaxial waveguide horn antenna for radiating monopulse signals in sum and difference patterns, said coaxial waveguide horn antenna comprising first and second sections, said first section coupled to the first hybrid for radiating the sum signal in a sum pattern, and said second section coupled to the second hybrid for radiating the difference signal in a difference pattern, said first and second sections being formed by a plurality of spaced concentric cylindrical walls, the outer wall of the first section forming the inner wall of the second section, the inner wall of the second section having a circumference substantially equal to one wavelength of the lowest frequency of its bandwidth and the outer wall of the second section having a circumference substantially equal to two wavelengths of the lowest frequency of the bandwidth.

4,041,500

LINE SCAN RADAR ANTENNA USING A SINGLE MOTOR

Roger H. Lapp, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 12, 1976, Ser. No. 685,866
Int. Cl.² H01Q *3/12, 19/18*
U.S. Cl. 343—761 **10 Claims**



1. A line scan radar antenna comprising:

a secondary reflector,

a motor,

a shaft coupling the motor to the secondary reflector, the axis of the shaft forming an angle α with the axis of symmetry of the secondary reflector,

means affixed to the shaft for translating the shaft in a direction transverse to the axis of the shaft in response to the rotation of the motor and secondary reflector, and

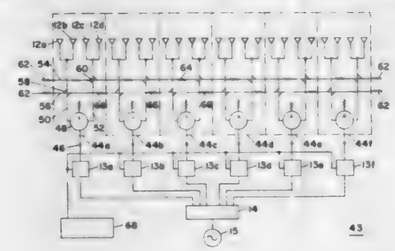
a primary reflector which receives radar rays reflected off the secondary reflector and reflects them in a line scan.

4,041,501

LIMITED SCAN ARRAY ANTENNA SYSTEMS WITH SHARP CUTOFF OF ELEMENT PATTERN

Richard F. Frazita, Deer Park; Alfred R. Lopez, Commack, and Richard J. Giannini, Setauket, all of N.Y., assignors to Hazeltine Corporation, Greenlawn, N.Y.

Filed July 10, 1975, Ser. No. 594,934
Int. Cl.² H01Q *3/26*
U.S. Cl. 343—844 **38 Claims**



1. An antenna system for radiating wave energy signals into a selected angular region of space and in a desired radiation pattern comprising:

an aperture comprising a plurality of element groups, each group comprising two or more radiating elements;

a plurality of first coupling means, each for coupling supplied wave energy signals to the elements in a corresponding one of said element groups;

and second coupling means for interconnecting said plurality of first coupling means to cause wave energy signals supplied to any of said first coupling means to be additionally coupled to selected elements in substantially all of the remaining element groups of said aperture with predetermined amplitudes and phases, thereby causing said aperture to radiate wave energy signals primarily in said selected region of space;

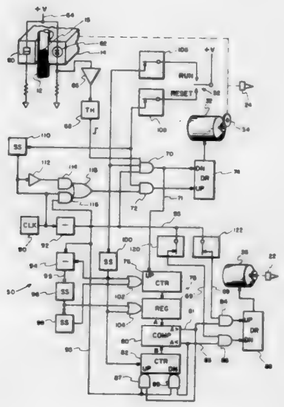
whereby when wave energy signals are supplied to each of said first coupling means with a predetermined amplitude and phase, said aperture will radiate wave energy signals in said desired radiation pattern.

4,041,502

SEDIMENTATION RECORDER

Raymond H. Williams, Chadwicks, and Emil J. Misiaszek, New York Mills, both of N.Y., assignors to Williams Tool, Inc., Chadwicks, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,088
Int. Cl.² G01D *5/32, 9/30*
U.S. Cl. 346—33 A **6 Claims**



1. In a sedimentation recorder the combination comprising:

a transparent tube containing a liquid-solid mixture;

a movable carrriage supported adjacent to said tube and arranged to move in a path parallel thereto;

irradiation means arranged to direct a beam of radiation through said tube;

photodetection means mounted on said carriage in a position to detect said beam of radiation, said photodetection means being further adapted to generate an output signal indicating the intensity of said detected radiation;

a motor for driving said carriage;

a motor drive circuit;

a coincidence circuit having a first and second input and an output connected to said motor drive circuit;

a threshold circuit connected to receive said output signal from said photodetection means and adapted to feed a first contrOl signal to the first input of said coincidence circuit when said photodetector output exceeds a predetermined level;

means for supplying a second control signal to the second input of said coincidence circuit whereby the latter operates to energize said motor in response to outputs from said threshold circuit such that said carriage is caused to track the liquid-solid separation boundary within said tube; and

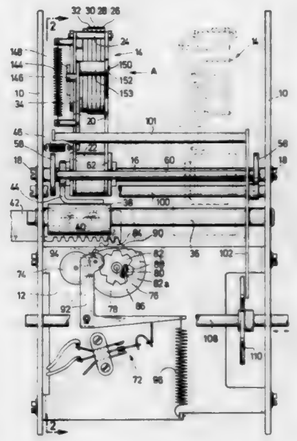
recording means for generating a record of the motion of said motor thus producing a record of the settling of the solids within said liquid-solid mixture.

4,041,503

ATTENDANCE TIME RECORDER

Wilfried Michel, Plochingen; Hartmut Reichert, and Erich Willmann, both of Esslingen, all of Germany, assignors to Simplex Time Recorder, Gardner, Mass.

Continuation of Ser. No. 556,850, March 10, 1975, abandoned.
This application Oct. 7, 1976, Ser. No. 730,348
Claims priority, application Germany, Mar. 13, 1974, 2411975
Int. Cl.² G07C *1/06*
U.S. Cl. 346—83 **15 Claims**



1. In an in-and-out time recorder the combination comprising a printing device for printing clock times along the lines of a data medium; retaining means for holding the data medium adjacent the printing device; said printing device being slidably mounted for displacement substantially parallel to the lines of the data medium; said printing device comprising a plurality of adjacent number wheels provided with number print types for imprinting clock times onto the data medium; indexing means connected to said number wheels for indexing said number wheels; an electric motor for effecting displacement of the printing device relative to the retaining means; drive means coupling said electric motor to said printing device, and including a resilient coupling switch means for switching said electric motor on and off at the beginning and approximately at the end respectively of each displacement of said printing device, and positioning means positively coupled with the printing device in at least one direction of displacement of said printing device for positioning the same in predetermined positions relative to a line of the data medium.

4,041,504

PHOTOGRAPHIC EXPOSURE SETTING DEVICE

Vitautas Jurgio Iodvalkis, ulitsa Dzerzhinskogo, 9, Kv. 13; Richardas Prano Nomitsas, ulitsa Kestuche, 5, Kv. 2, both of Vilnjus; Anatoly Fedorovich Andreev, ulitsa Karpinskogo, 10, Kv. 35, and Vladimir Borisovich Grekov, Sinyavinskaya ulitsa, 16, Kv. 10, both of Leningrad, all of U.S.S.R.

Filed May 19, 1975, Ser. No. 579,071
Int. Cl.² G03B *7/08*
U.S. Cl. 354—23 R **3 Claims**

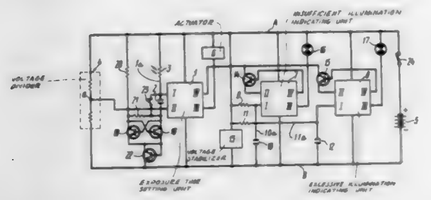
3. A photographic exposure setting device for a camera

having a shutter, the device comprising: a power source (5) having a positive and negative supply buses (A, B);

a. an exposure time setting unit (1) for a camera having a shutter, said exposure time setting unit having two inputs (I, II) and two outputs (III, IV); said unit (a) including a threshold amplifier (25) whose two inputs are connected to said inputs (I, II) of the unit (a); said amplifier including serially connected transistors (28 to 31) constituting a common-emitter circuit, the first transistor (28) operating in the linear mode, whereas the remaining transistors (29 to 31) operate in the switching mode; one input of said amplifier constitute one (I) of said inputs of the unit (a), being the base of said first transistor; another input of said amplifier, which forms another one (II) of said inputs of the unit (a), being linked to the interconnected emitters of two (29, 31) of said transitors, the output of said amplifier being linked to the collector of the last one (31) of said transistors;

b. means (26) for shifting the output voltage level of said amplifier (25), said means constituting a cascade of transistors (36 to 39) serially interconnected by way of their base - emitter junctions, the base of the first one (36) of said last-named transistors being connected to said output of the amplifier (25);

c. a current amplifier (27) whose input is connected to the emitter of the last one (39) of said transistors of the means (b), said current amplifier including serially interconnected transistors (42 to 45) constituting a common-emitter circuit and operating in the switching mode, one output of said current amplifier (27) being the collector of the last one (45) of its transistors, another output thereof being



the collector of one (43) of said transitors, both said last-named outputs constituting said outputs (III, IV) of the unit (a);

d. three integrating timing RC circuits (1*a*, 10*a*, 11*a*), leads of a first one (1*a*) of said circuits being connected to respective ones of said supply buses, whereas a center tap of said first circuit (1*a* in d) is connected to said one (I) input of the unit (a);

e. a voltage divider (4) whose leads are connected to respective ones of said supply buses, a center tap of said divider (e) being connected to said input (II) of the unit (a);

f. a voltage stabilizer (13) also connected to said positive supply bus via a ballast current-limiting resistor (66), said stabilizer (f) including at least two transistors (64, 65) that are serially interconnected via their base - emitter junctions;

g. a first transistor switch (14) having two inputs and one output, one of said inputs being connected to one (IV) of said outputs of the unit (a); said second circuit (10*a* in d) being connected to the output of said stabilizer (f) and to said negative supply bus;

h. an insufficient illumination indicating unit (7) having two inputs (I, II) and two outputs (III, IV), there being connected to one (I) of said inputs of the unit (b) the center tap of said second circuit (10*a* in d), whereas an output of said switch (g) is connected to the other (II) of said inputs of the unit (h); the latter including a threshold current amplifier including serially interconnected transistors (48 to 50) constituting a common-emitter circuit and operating in the switching mode; one input of said threshold current amplifier, which forms said one input (I) of the unit (h), being the base of the first one (48) of said transistors, the other input of said threshold current amplifier, which forms said other input (II) of the unit (h), being the base of one (49) of said transistors, one output of said threshold current amplifier, and of said unit (h), being common with the collector of the last one (50) of said transistors in the current amplifier, another output of the latter being the collector of said last transistor (50), said last-names other output being connected to said other input of the switch (g);

i. a second transistor switch (15), having two inputs and one output, one of said inputs being connected to said one output (IV) of the unit (a); said third circuit (11*a* in d) having its leads connected to said output of the stabilizer (f) and said negative supply bus;

j. an excessive illumination indicating unit (8) having two inputs (I, II) and two outputs (III, IV), there being connected to one (I) of said inputs the center tap of said third circuit (11*a* in d), another one (II) of said inputs being connected to said output of the switch (i), said unit (j) including a threshold current amplifier including serially interconnected transistors (56 to 59) that constitute a common-emitter circuit and operate in the switching mode, one input of said last-named threshold current amplifier, which forms said one input (I) of the unit (j), being the base of one (57) of said transistors, one output of the same amplifier, and of the unit (j), being the collector of the last one (59) of said transistors in the threshold current amplifier, said other output being the collector of another one (58) of said transistors, said other output being connected to said other input of the switch (i);

k. an actuator (6) connected between said positive supply bus and said one output (III) of the unit (a); and

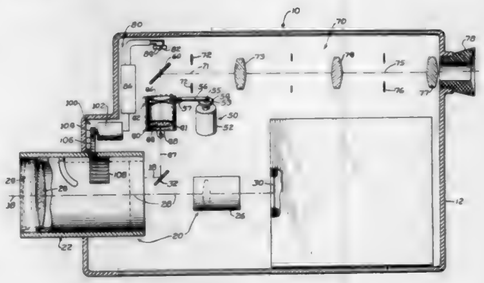
l. two indicator lamps (16, 17), each having one of its terminals connected to said positive supply bus, the other terminals being respectively connected to said one outputs of the units (h and j).

4,041,505

AUTOMATIC ELECTRONIC RANGEFINDER

Rudolf Hartmann, Skokie, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1975, Ser. No. 645,764
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—25 **7 Claims**



1. In an automatic focusing system for use in photographic apparatus comprising:

focusable objective lens means for receiving and refracting light radiation reflected from an object to be focused upon;

optical means having a rear nodal point for receiving and refracting the light radiation from the objective lens means through the rear nodal point to form an image in an image plane;

oscillating means for oscillating the optical means about the rear nodal point, whereby the image is cyclically displaced at the frequency of said oscillation means when the image is out of focus, the magnitude of said image displacement being proportional to the degree that the image is out of focus;

sensing means including at least one photocell means displaced from the central axis of the light radiation refracted from said optical means for sensing said cyclical image displacement to provide an image displacement signal having an amplitude indicative of the magnitude of said image displacement and having a phase indicative of the direction in which said objective lens means is out of focus with respect to said object;

processing means responsive to said sensing means to provide an output signal which indicates the amount and direction said objective lens means must be moved to bring the image into focus; and

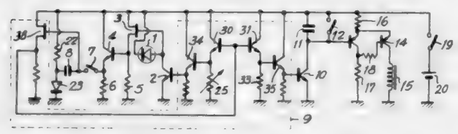
servo means responsive to the output signal for moving the objective lens means to bring the image into focus.

4,041,506

TIMING CIRCUITS FOR CAMERA SHUTTERS

Masahiro Kawasaki, and Hirokazu Ando, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed July 25, 1975, Ser. No. 599,005
Claims priority, application Japan, July 27, 1974, 49-89965
Int. Cl.[2] G03B 7/08
U.S. Cl. 354—51 **10 Claims**



1. In an electric shutter circuit for use in a camera of the type employing a light receiving element which generates a current corresponding to the light received by the camera from a scene, said circuit including a memory capacitor which is charged according to said current, buffer amplifier means connected between said light receiving element and capacitor and having a large input impedance and a low output impedance, said buffer amplifier means being connected with said capacitor for charging the latter with said low output impedance, and, for controlling the discharge time of said capacitor, voltage responsive means connected in series with said capacitor and operative to alter the rate at which said current charges said capacitor according to said light received, said voltage responsive means being directly coupled at least in part between said capacitor and a point of reference potential, forming the only means connecting said memory capacitor to said reference potential, for reducing the level to which said memory capacitor is charged to thereby attain a decrease in discharge time of the memory capacitor enabling rapid shutter operation.

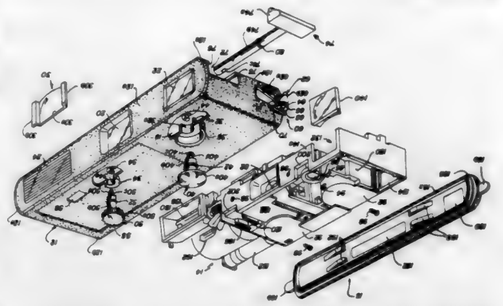
4,041,507

CAMERA FOR UNDERWATER AND ABOVE WATER USE

Norman Wah Man Ko and Chan Kwok Yan, both of North Point, Hong Kong, assignors to W. Haking Industries, Ltd., Hong Kong, Hong Kong

Filed July 2, 1975, Ser. No. 592,634
Int. Cl.[2] G03B 187/08
U.S. Cl. 354—64 **13 Claims**

1. A camera adapted for underwater as well as above water use comprising: a camera mechanism support frame supporting camera mechanism constituting substantially all of the functional components of the camera and characterized in that by itself it is incapable of insulating the camera mechanism associated with it from contact with the elements including rain and dust and including a film unit-receiving portion for receiving a film unit in operative picture-taking position without opening of any closure means thereof; and a housing comprising a housing body having opening-forming portions which provides an entry for the insertion of said support frame into a compartment defined by the housing body and the passage of said film unit into said operative position in said support frame without removal of the support frame from said housing body, said housing body having a front wall portion forming transparent objective and viewfinder window means for admitting picture forming and viewfinder light rays for exposing film carried by the camera mechanism support frame and for enabling a user to view a scene to be photographed by the camera, and removable closure means for the opening-forming



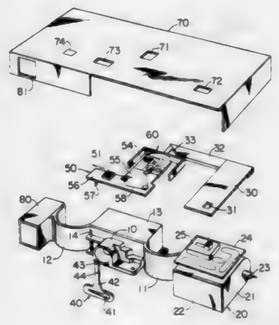
portions in the housing body for enabling film to be inserted into and removed from the support frame while the support frame is positioned in the compartment defined by the housing body, said closure means being provided with sealing means for enabling the closure means to be engaged in watertight and dustproof locked relationship with the main housing body, and said housing further having opening forming portion through which operating controls extend in watertight operation between the exterior of the camera housing to said camera mechanism on the support frame for operating the same.

4,041,508

CAMERA INSTALLED WITH ELECTRONIC FLASH

Akio Edamoto, Kawasaki, and Tooru Hayakawa, Yokohama, both of Japan, assignors to Sunpak Corporation, Tokyo, Japan

Filed Feb. 25, 1976, Ser. No. 661,382
Int. Cl.[2] G03B 17/18
U.S. Cl. 354—128 **9 Claims**



1. An electronic flash-installed camera, including means for securing a power source therein, in which the shutter speed is fixed and the iris opening is variable, said camera comprising an outer casing, at least one iris opening indicating window formed on the surface of the outer casing, an iris member having an iris hole for controlling the iris opening, weather marks indicating the weather condition by pictures, distance marks indicating by pictures a distance to an object to be photographed, a first means for moving said weather marks and distance marks below said iris opening indicating window and for moving said iris member in correspondence with

movement of the weather marks and distance marks to thereby change the iris opening value, a power switch for turning said power source on and off, and an indication change-over device mechanically coupled to said power switch for selectively exposing one of said distance marks or weather marks through said iris opening indicating window in response to on and off switching motions of said power switch.

4,041,509

SINGLE LENS REFLEX CAMERA

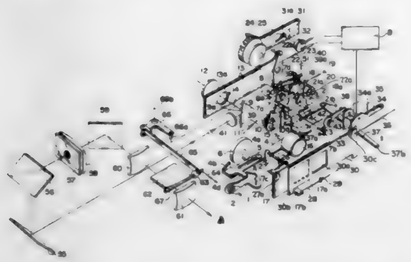
Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Japan

Filed Nov. 3, 1975, Ser. No. 628,312

Claims priority, application Japan, Nov. 2, 1974, 49-126097; Dec. 27, 1974, 49-002268

Int. Cl.[2] G03B *19/12*

U.S. Cl. 354—152 **12 Claims**



1. A single lens reflex camera having an objective lens, a shutter member, means for opening the shutter to initiate exposure, means for closing the shutter to terminate the exposure and a mirror driving mechanism, the mirror driving mechanism comprising:

a shaft arranged off the optical path of picture-taking light transmitted through said objective lens and in parallel with the optical axis of said objective lens;

a lever pivotally supported on said shaft and pivotable between a first position and a second position;

a mirror having a reflecting surface, said mirror being rigidly mounted on said lever so that when said lever is in said first position said mirror is positioned in a viewing position where the center of said reflecting surface is positioned substantially along the optical axis of said objective lens and when said lever is pivoted into its second position said mirror is simultaneously pivoted with said lever into a picture-taking position where said reflecting surface is retracted from the optical path of picture-taking light transmitted through said objective lens;

operating means for pivotally moving said lever from said first position to said second position, prior to commencement of an exposure operation, in response to a shutter releasing operation; and

returning means for returning said lever from said second position to said first position in response to completion of such exposure operation.

4,041,510

INDICATING DEVICE FOR PHOTOGRAPHIC APPARATUS

Frederick William Kern, Fairport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1976, Ser. No. 656,037

Int. Cl.[2] G03B *17/36*

U.S. Cl. 354—217 **13 Claims**

1. A photographic camera for use with an insertable and removable cartridge containing sequentially exposable film image areas, said camera comprising:

means defining an exposure station;

means defining a chamber for receiving the cartridge in an operative position wherein the film image areas are sequentially locatable at said exposure station;

means for making an exposure of each of the film image areas when located at said exposure station;

means actuatable after each said exposure for transporting the exposed one of the film image areas from said exposure station;

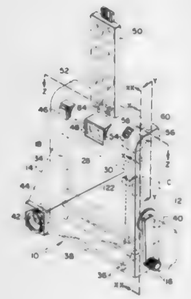
means defining a site for displaying indicia presented thereto;

an exposure counter bearing indicia for identifying the film image areas and for indicating, exclusively, absence or presence of the cartridge in said chamber, said counter being mounted for movement to a plurality of positions respectively presenting said indicia to said site, said positions including a first position presenting to said site a first indicium indicating exclusively absence of the cartridge from said chamber, a second position presenting to said site a second indicium indicating exclusively presence of the cartridge in said chamber, and subsequent positions presenting sequentially to said site subsequent indicia identifying respectively the film image areas;

first biasing means biasing said counter in a first direction toward said first position;

ratchet means coupled to said counter;

indexing means movably mounted for engaging said ratchet



means and indexing said counter, in a second direction opposite to said first direction, from said first position to said second position in response to insertion of the cartridge into said operative position in said chamber and for preventing said first biasing means from returning said counter to said first position so long as the cartridge remains in said operative position;

second biasing means for urging said indexing means away from said ratchet means in response to removal of the cartridge from said chamber, to permit said first biasing means to return said counter to said first position, said indexing means being movable into counter-indexing engagement with said ratchet means in opposition to said second biasing means upon insertion of the cartridge into said operative position;

advancing means movably mounted for engaging said ratchet means and advancing said counter in said second direction to a respective one of said subsequent positions in response to each actuation of said transporting means; and

third biasing means biasing said advancing means away from said ratchet means irrespective of absence or presence of the cartridge in said chamber, said advancing means being movable into counter-advancing engagement with said ratchet means in opposition to said third biasing means upon actuation of said transporting means.

4,041,511

DRIVING DEVICE OF LENS SHUTTER OF SINGLE-LENS REFLEX CAMERA

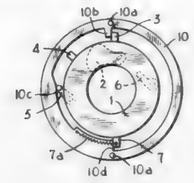
Kiyoshi Kitai, Tokyo; Yukio Nakamura, Yotsukaido; Shogo Kato, Daiei, and Shinji Nagaoka, Yotsukaido, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Apr. 18, 1974, Ser. No. 462,181

Claims priority, application Japan, Apr. 19, 1973, 48-43650

Int. Cl.[2] G03B *9/00, 9/10*

U.S. Cl. 354—232 **4 Claims**



1. A lens shutter for a single-lens reflex camera comprising, shutter blade means, an operating ring for operating said shutter blade means for closing the shutter and opening the shutter, a driving device for driving the operating ring in opposite directions for effecting control of the shutter blade means and for driving said operating ring for cocking the shutter, said driving device comprising two operating rods driven axially in opposite axial directions, a first gear rack on one of said rods for driving the operating ring, coupling means coupling the gear rack to the operating ring, and said rods having means coactive for sequencing the reversal of direction of travel of both rods.

4,041,512

LIGHT CONTROL DEVICE

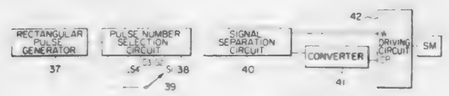
Hiroshi Iwata, Osaka, and Katsuji Ishikawa, Daito, both of Japan, assignors to West Electric Co., Ltd., Japan

Filed Feb. 18, 1975, Ser. No. 550,544

Claims priority, application Japan, Feb. 22, 1974, 49-21154; Feb. 22, 1974, 49-21155

Int. Cl.[2] G03B *9/08*

U.S. Cl. 354—234 **21 Claims**



1. A light control device comprising:

A. a light control mechanism comprising

a. shutter blade means drivable to a plurality of positions for defining at each position a different aperture, and

b. shutter blade driving means connected to said shutter blade means for driving said shutter blade means to successive positions in response to each pulse of a first pulsatory signal and for controlling the direction of driving said shutter blade means in response to each pulse of a second pulsatory signal,

B. a control circuit for providing said pulsatory signals comprising,

a. a rectangular pulse generator for generating driving pulse signals and having an output terminal,

b. circuit means connected to said pulse generator for selectably controlling the number of pulses applied to said output terminal of said pulse generator,

c. circuit means responsive to said pulses at said output terminal for producing said first pulsatory signal, and

d. circuit means continuously responsive to said pulses at said output terminal for producing said second pulsatory signal, whereby said second pulsatory signal may occur a plurality of times for a selected number of pulses at said output terminal.

4,041,513

SHUTTER FOR PHOTOGRAPHIC CAMERAS

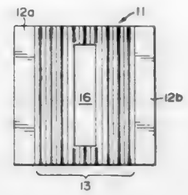
Toshihiro Kondo, Chofu, Japan, assignor to Toshihiro Kondo, Tokyo and Fuji Photo Film Co., Ltd., both of, Japan

Filed Mar. 19, 1976, Ser. No. 668,807

Claims priority, application Japan, Mar. 19, 1975, 50-33196; May 14, 1975, 50-57134

Int. Cl.[2] G03B *9/28, 9/32*

U.S. Cl. 354—241 **6 Claims**



1. A shutter blind for a photographic camera for opening and closing a film aperture in a camera body comprising a light impervious flexible sheet having a number of accordion pleats forming parallel folding lines therebetween, said sheet being shrinkable and expandable in the direction perpendicular to said folding lines and having an exposure opening in the middle thereof extending parallel to said folding lines, and both ends of said sheet being fixed to the camera body at opposite ends of a film aperture.

4,041,514

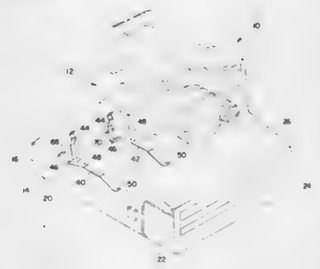
PHOTOGRAPHIC CAMERA HAVING EXTERNAL POWER SUPPLY

Bruce K. Johnson, Andover, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed May 27, 1975, Ser. No. 581,113

Int. Cl.[2] G03B *17/02*

U.S. Cl. 354—288 **4 Claims**



1. A camera comprising:

a housing;

means defining a chamber for receiving a film cassette containing at least one film unit;

means for performing a function associated with the processing of the film unit;

electrically energizable means adapted to be operatively coupled to said performing means;

an electrical circuit connected to said electrically energizable means, said circuit including a pair of contacts adapted for engagement with the terminals of a battery located within said camera to provide a source of energy for said electrically energizable means; and

means for defining a recess in an exterior surface of said

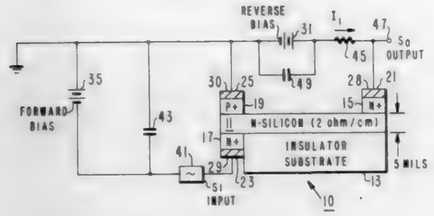
housing for releasably receiving at least a portion of a battery assembly to couple the battery assembly to said housing, said recess including means for guiding a pair of battery terminals on the battery assembly to a position within said housing whereat the battery terminals on the battery assembly engage and move said contacts out of engagement with the terminals of the battery located within the camera thereby providing a new source of energy for said electrically energizable means.

4,041,515

AVALANCHE TRANSISTOR OPERATING ABOVE BREAKDOWN

Kern Ko Nan Chang, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 14, 1975, Ser. No. 632,062
Int. Cl.[2] H01L *29/90*
U.S. Cl. 357—13 **3 Claims**



1. An avalanche device comprising,

a body of semiconductor material having a substrate of one conductivity type material with two separate regions of highly doped material of said one conductivity type on said substrate and a region of highly doped material of a second different conductivity type on said substrate,

means for applying a reverse bias voltage between said region of material of said second conductivity type and one of said regions of highly doped material of said one conductivity type, said reverse bias voltage having a magnitude to exceed the avalanche breakdown of voltage of said substrate where current amplification factor is many times that of unity and,

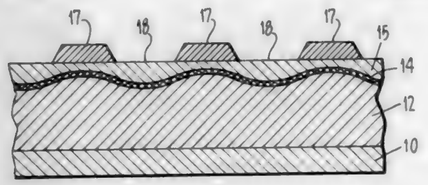
means for applying a controllable forward bias voltage between said region and of material of said second conductivity type and the other of said regions of said one conductivity type for controlling the number of minority carriers injected into the substrate to thereby change the breakdwon voltage and operating point of said device.

4,041,516

HIGH INTENSITY LIGHT-EMITTING DIODE

Roger W. Murray, Sunnyvale, Calif., assignor to Litronix, Inc., Cupertino, Calif.

Continuation of Ser. No. 430,855, Jan. 4, 1974, abandoned. This application July 28, 1975, Ser. No. 599,734
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 **6 Claims**



1. A non-coherent light-emitting diode array having improved radiation intensity and distribution characteristics, said array comprising:

a semiconductor body having a top surface, a first zone of one conductivity type, and a second zone of opposite conductivity type contiguous with said first zone and forming a rectifying junction therebetween, said second zone having a varying thickness dimension extending from said rectifying junction to said top surface; and

a dielectric surface layer adhered to said top surface, said dielectric surface layer having a plurality of apertures,

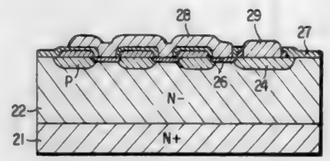
said thickness dimension of said second zone being substantially greater in regions underlying said apertures than in regions underlying solid portions of said dielectric surface layer.

4,041,517

VERTICAL TYPE JUNCTION FIELD EFFECT SEMICONDUCTOR DEVICE

Noboru Fuse, and Kenichi Muramoto, both of Hyogo, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Aug. 12, 1975, Ser. No. 604,024
Claims priority, application Japan, Sept. 4, 1974, 49-10155
Int. Cl.[2] H01L *29/80, 27/02*
U.S. Cl. 357—22 **8 Claims**



1. A vertical type junction field effect transistor comprising:

a body of semiconductor material having first and second main faces,

the body including:

a source region of a first conductivity type and having a high concentration of conductivity type determining impurities, the source region extending into the body from the first main face of the body;

a drain region of the first conductivity type and having a high concentration of conductivity type determining impurities, the drain region extending into the body from the second main face of the body and disposed opposite the source region;

a gate region of a second conductivity type opposite to the first conductivity type, the gate region extending into the body from the first main face of the body and directly contacting and surrounding the source region in the form of a closed loop to form a PN junction between the source region and the gate region at only an outer edge of the source region to maintain the gate to source capacity small and to maintain the time constant on the gate input side small; and

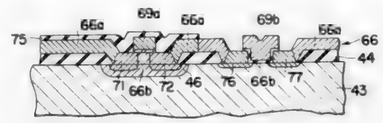
a channel region of the first conductivity type and having a low concentration of conductivity type determining impurities, the channel region extending from the source region towards the drain region and having a channel of varying width in the vicinity of the source region according to the change of a depletion layer arising in the channel region upon voltage application to the gate region.

4,041,518

MIS SEMICONDUCTOR DEVICE AND METHOD OF MANUFACTURING THE SAME

Shinji Shimizu, Choufu; Seiichi Iwamatsu, and Makoto Homma, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 445,658, Feb. 25, 1974, abandoned.
This application Apr. 14, 1976, Ser. No. 677,023
Claims priority, application Japan, Feb. 24, 1973, 48-22545
Int. Cl.[2] H01L *29/78, 29/04, 27/02*
U.S. Cl. 357—23 **31 Claims**



1. A metal insulator semiconductor field effect device comprising:

a monocrystalline substrate;

a first layer of insulating material disposed on the surface of said substrate and having an opening therethrough exposing a first surface portion of said substrate;

a layer of monocrystalline semiconductor material having a first and second spaced-apart portions of a first conductivity type, disposed on the first surface portion of said substrate; first and second monocrystalline semiconductor regions formed beneath the respective first and second spaced-apart portions of said monocrystalline semiconductor layer, and having said first conductivity type, said first and second spaced-apart portions of said layer together with first and second regions respectively constituting source and drain regions of said field effect device;

first and second polycrystalline semiconductor layers having said first conductivity type respectively contacting said first and second spaced-apart portions of said layer of monocrystalline semiconductor material and extending onto said first layer of insulating material, and respectively constituting source and drain electrodes for said source and drain regions;

a second layer of insulating material disposed on a third portion of said layer of monocrystalline semiconductor material between said first and second spaced-apart portions thereof, said third portion of said layer of monocrystalline semiconductor material having a second conductivity type, opposite said first conductivity type; and

a gate electrode disposed on said second layer of insulating material between said first and second spaced-apart surface portions of said substrate.

4,041,519

LOW TRANSIENT EFFECT SWITCHING DEVICE AND METHOD

Roger D. Melen, 565 Arastradero, No. 304, Palo Alto, Calif. 94306

Filed Feb. 10, 1975, Ser. No. 548,407
Int. Cl.[2] H01L *27/14, 31/00, 29/78, 27/02*
U.S. Cl. 357—30 **9 Claims**

1. An array image sensor responsive to sequentially applied control signals for converting an incident energy pattern into pulses electrical output energy substantially free of switching noise, comprising:

an array of reversed biased energy responsive diodes which receive the incident pattern and accumulate electrical charge in response thereto;

output means for outputting the pulses electrical output energy;

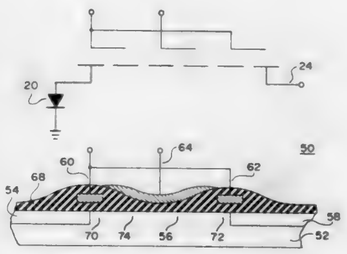
a plurality of MOS transistor switching devices, one associated with each diode of the array, each switching device serially connected between the associated diode of the array and the output means, each switching device having:

a substrate means with a source electrode means and drain electrode means formed in spaced relationship therein, the source electrode means connected to the associated diode and the drain electrode means connected to the output means;

a first and second control gate means and an electric shield gate means formed over the substrate means in spaced relationship between the electrode means, the gate means being activated by the control signals for establishing electrical continuity within the substrate means between the electrode means;

an insulative means formed between the electrode means and the gate means;

the first control gate means positioned proximate the source electrode means between the source electrode means and the second control gate means for reducing the electrical capacitance from the second control gate means to the source electrode means, and being activated by control signals prior to activation of the second control gate means for charging the electrical capacitance from the first control gate means to source electrode means, and for establishing a field induced inversion region in conjunction with the accumulated charge within the substrate means proximate the source electrode means and the first control gate means;



the shield gate means positioned proximate the drain electrode means between the drain electrode means and the second control means for reducing the electrical capacitance from the second control gate means to the drain electrode means, and being activated by the control signals prior to activation of the second control gate means for charging the electrical capacitance from the shield gate means to the drain electrode means, and for establishing a field induced depletion region within the substrate means proximate the drain electrode means and the shield gate means;

the second control gate means positioned between the first control gate means and the shield gate means and being activated by control signals subsequent to the first control gate means and the shield gate means for establishing a field induced region within the substrate proximate the second control gate means which connects the depletion region proximate the drain electrode means with the inversion region proximate the source electrode means to provide temporary electrical continuity between the electrode means permitting the accumulated charge to flow from the diode through the switching device to the output means forming a pulse of electrical output energy with a minimum of switching noise;

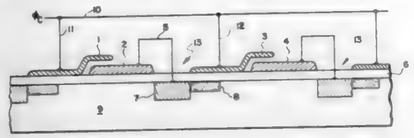
whereby the accumulated electrical charge of a particular diode of the array is selectively discharged to the output means by the first and second control gate means of the associated switching device being activated by the control signals.

4,041,520

UNIPHASE CHARGE TRANSFER DEVICE

Wallace Edward Tchon, Phoenix, Ariz., assignor to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Aug. 6, 1976, Ser. No. 712,302
Int. Cl.² H01L *29/78, 29/04;* G11C *19/28*
U.S. Cl. 357—24 **10 Claims**



1. A uniphase charge transfer device comprising
a substrate of semiconductor material,
an insulating layer of substantially uniform thickness on one surface of said substrate,
a plurality of electrode pairs disposed on said insulating layer, a first electrode of each of said electrode pairs having a portion which overlaps the second electrode of each of said electrode pairs, the first and second electrodes of each electrode pair being in the same relative positions and of the same relative dimensions, and the first electrode of each electrode pair being laterally separated from the second electrode of an adjacent electrode pair by a separation of a predetermined length,
a plurality of first conduction regions in said substrate and proximate to said surface of said substrate, said first conduction regions being heavily doped to a conductivity material type opposite to that of said substrate, said first conduction regions being located opposite to and substantially coextensive with said separations between adjacent electrode pairs,
a plurality of second conduction regions in said substrate and proximate to said surface of said substrate, said second conduction regions being of the same conductivity material type as said substrate and having a substantially greater charge density than said substrate, said second conduction regions being located adjacent to said first conduction regions and underlying a portion of said first electrode of each of said electrode pairs,
means for electrically connecting said second electrode of each of said electrode pairs with said first conduction region which is adjacent to it, and
means for alternatingly applying a voltage of a given magnitude to said first electrode of each of said electrode pairs to cause minority charges to move in a predetermined direction along the surface of said substrate.

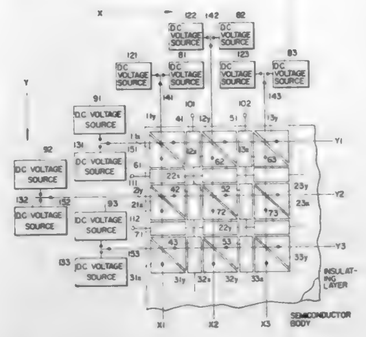
4,041,521

SHIFT ARRAY FOR PATTERN INFORMATION PROCESSING DEVICE UTILIZING CHARGE COUPLED SEMICONDUCTOR DEVICE

Hideo Sunami, Kokubunji; Yokichi Itoh, Hachioji; Fumiyuki Inose, and Yoshiaki Kamigaki, both of Kokubunji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 18, 1972, Ser. No. 298,569
Claims priority, application Japan, Oct. 18, 1971, 46-81691
Int. Cl.² H01L *29/78*
U.S. Cl. 357—24 **8 Claims**

1. A shift array for shifting carriers introduced into a semiconductor body along first and second respective directions, comprising:
a semiconductor body;
an insulating film disposed on the semiconductor body;
a matrix of sets of electrodes disposed on said insulating layer made of n rows of sets of electrodes disposed in said first direction and m columns of sets of electrodes disposed in said second direction, each second of electrodes comprising a pair of electrode portions located next to one another;
n conductors respectively connected to a first electrode portion of each electrode set in a corresponding row of said *n* rows of sets of electrodes;
m conductors respectively connected to a second electrode portion of each electrode set in a corresponding column of said *m* columns of sets of electrodes;



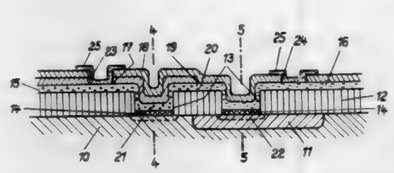
first means, disposed adjacent the last ones of said sets of electrodes, for detecting transferred minority carriers; and
second means for selectively applying D.C. voltages to the conductors of said rows and columns for effecting the transfer of minority carriers along the surface of the semiconductor body therebeneath toward said first means.

4,041,522

INTEGRATED CIRCUIT AND MANUFACTURE THEREOF

Henri J. Oguey, Corcelles, NE, and Bernard Gerber, Neuchatel, both of Switzerland, assignors to Centre Electronique Horloger S.A., Switzerland

Filed Aug. 19, 1975, Ser. No. 605,845
Claims priority, application Switzerland, Aug. 29, 1974, 11788/74
Int. Cl.² H01L *27/02, 29/78, 29/04*
U.S. Cl. 357—42 **1 Claim**



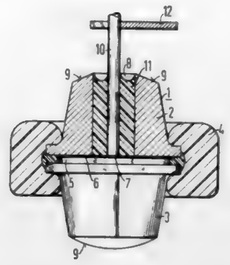
1. In an integrated circuit comprising complementary field effect transistors (FET) having channels extending on the surface of a substrate for one type of transistor and on the surface of a well in the substrate for the complementary type and gates formed in a layer of polycrystalline silicon insulated from the substrate and from each said well, and at least one so-called floating diode connected neither to the substrate nor to a said well, the improvement comprising a doped insulator covering a first region of said layer of polycrystalline silicon, the remainder of said layer of polycrystalline silicon forming a second oppositely-doped region, said two regions being contiguous at at least one location under an edge of said doped insulator to form an autoaligned junction forming said diode, said diode having a reverse conductivity notably greater than that of a junction in monocrystalline silicon, and having well-reproduceable characteristics.

4,041,523

CONTROLLABLE SEMICONDUCTOR COMPONENT HAVING MASSIVE HEAT DISSIPATING CONICALLY SHAPED METAL BODIES

Herbert Vogt, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 1, 9176, Ser. No. 691,622
Claims priority, application Germany, June 6, 1975, 2525390
Int. Cl.² H01L *23/28, 23/02, 23/12, 23/42*
U.S. Cl. 357—72 **8 Claims**



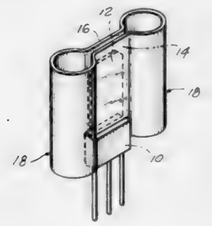
1. A controllable semiconductor component for mounting in conically shaped recesses, said component comprising:
a semiconductor element including a ring-shaped cathode on one side, an anode on the opposite side and a control electrode within said ring-shaped cathode;
a housing including a pair of massive metal bodies on respective sides of said semiconductor element connected to said cathode and said anode, respectively, in a heat and electric conductive relationship, said metal body on said cathode side including a central opening therethrough, and an insulating ring securing and sealing said bodies in the area of contact with said semiconductor element, each of said metal bodies comprising a conical shape tapering in the direction away from said semiconductor element for mounting in the conically shaped recesses; and
a control lead electrically connected to said control electrode, said control lead extending through said opening to the exterior of housing and rigidly mounted in an insulated manner within said opening.

4,041,524

HEAT DISSIPATING DEVICE FOR TRANSISTOR WITH OUTWARDLY EXTENDING HEAT CONDUCTIVE TAB

Edmund G. Trunk, East Meadow, and Alfred Skrobisch, Huntington Station, both of N.Y., assignors to The Staver Company, Inc., Bay Shore, N.Y.

Continuation-in-part of Ser. No. 537,089, Dec. 30, 1974, abandoned. This application Mar. 24, 1976, Ser. No. 670,000
Int. Cl.² H01L *23/42, 23/44, 23/46, 23/02*
U.S. Cl. 357—81 **20 Claims**



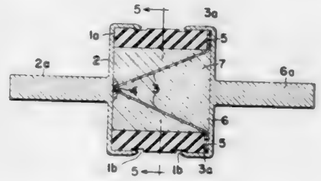
1. A heat dissipating device for mounting on the heat conductive tab of a transistor or the like having a casing in which the transistor is mounted and a heat conductive tab in thermal communication with the transistor, mounted on and extending outwardly from said casing in a given direction, said device comprising a substantially closed body comprising a pair of substantially parallelly situated planar members spaced to receive the tab therebetween with the interior surface of each substantially parallel to and in engagement with the exterior surface of the tab adjacent thereto and resilient connecting means situated on opposite ends of said members and extending therefrom in a direction substantially perpendicular to said given direction for variably spacing said planar members with respect to each other while maintaining said members substantially in said parallel relationship to permit insertion and retention of the tab therebetween.

4,041,525

ELECTRIC FUSE AND PROCESS OF MANUFACTURING THE SAME

Frederick J. Kozacka, South Hampton, N.H., assignor to The Chase-Shawmut Company, Newburyport, Mass.

Filed Apr. 5, 1976, Ser. No. 673,375
Int. Cl.² H01H *85/04*
U.S. Cl. 337—295 **8 Claims**



1. An electric fuse including
a. a tubular casing of electric insulating material having a pair of circular rims at the axially outer ends thereof;
b. a granular arc-quenching filler inside said casing;
c. a pair of ferrules each having an axially inner end surface mounted on the ends of said casing and closing said ends thereof; and
d. fusible element means in ribbon form embedded in said arc-quenching filler, one end of said fusible element means being arranged adjacent the center region of said axially inner end surface of one of said pair of ferrules and conductively connected by a first metal fusion joint to said center region, and the other end of said fusible element means being angularly bent, resting on one of said pair of rims of said casing and being conductively connected to the peripheral region of said axially inner end surface of the other of said pair of ferrules by a second metal fusion joint.

4,041,526

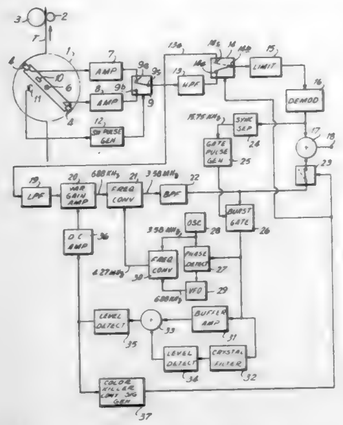
CONTROL OF AUTOMATIC COLOR CONTROL AND COLOR KILLER CIRCUITS IN VIDEO SIGNAL REPRODUCING APPARATUS

Shinji Kaneko, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,409
Claims priority, application Japan, Oct. 21, 1974, 49-121156
Int. Cl.² H04N *5/76, 9/49*
U.S. Cl. 358—4 **10 Claims**

1. Apparatus for reproducing a signal recorded on a record medium and which includes an information signal and a reference signal of a predetermined frequency occurring only during spaced intervals, comprising transducer means for reproducing the signal recorded on the record medium, variable gain amplifier means receiving the reproduced signal and providing a controlled level reproduced signal, gate means receiving said controlled level reproduced signal and being controlled in synchronism with said spaced intervals so as to provide a first output signal including said reference signal during each of said intervals, filter means coupled to said gate

means and tuned to said predetermined frequency for receiving said first output signal and passing only said reference signal therein so as to produce a second output signal, combining means coupled to receive said first and second output signals



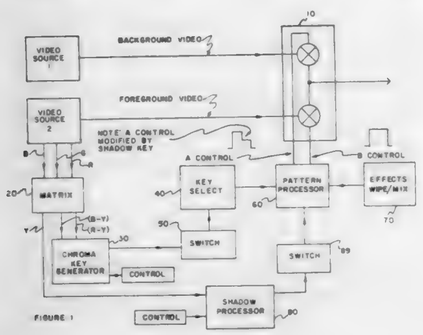
for combining the levels of said first output signal as provided by said gate means and said second output signal as produced by said filter means, and means for controlling the gain of said variable gain amplifier means in accordance with said combined levels of said first and second output signals.

4,041,527

VIDEO EFFECTS GENERATOR

Bruce Leland Rayner, and Gerald Graham Taylor, both of Nevada City, Calif., assignors to The Grass Valley Group, Inc., Grass Valley, Calif.

Filed Mar. 15, 1976, Ser. No. 667,242
Int. Cl.[2] H04N *9/00*
U.S. Cl. 358—22 **11 Claims**



1. An apparatus for switching a plurality of video signals so as to produce a composite video signal that produces a composite image containing portions of the incoming video signals including intensities to provide shadows, the apparatus comprising:

video source means for generating a plurality of incoming video signals, said signals defining a plurality of color signals forming at least first and second color video signals representing first and second information;

matrix means coupled with said video source means for forming color difference signals and a luminance signal representing a portion of information of one of said color video signals;

color selector means responsive to said color difference signals for developing a first key signal representing a selectable color of said portion of information of said one of said color video signals;

luminance selector means responsive to said luminance signal for developing a second key signal representing variable intensities of said portion of information of said one of said color video signals;

processor means responsive to both said first and second key signals for developing control signals, at least one of which is modulated in accordance with the variable intensities of said portion of information of said one of said color video signals; and

combining means into which said plurality of incoming video signals and said control signals are fed for providing thereoutof the composite video signal.

11. A composite color television system wherein separate background and foreground scenes derived from a background color video source and a foreground color video source are provided to be combined so as to produce a composite video signal that produces a composite image containing portions of the background and foreground scenes including intensities to produce shadows, the apparatus comprising:

a first processing channel for processing color difference signals representing the foreground scene derived from the foreground color video source;

a second processing channel for processing luminance signals representing the foreground scene derived from the foreground color video source;

a third processing channel for combining the processed color difference signals and the processed luminance signals to form control signals; and

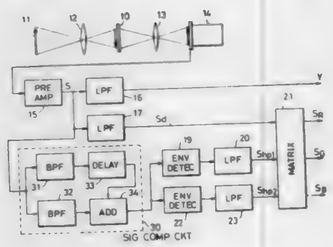
mixing means, coupled to receive inputs from both the background and foreground color video sources, under the control of said control signals for combining said inputs in such a manner as to produce the composite video signal.

4,041,528

COLOR TELEVISION SIGNAL GENERATING APPARATUS FOR USE IN A SINGLE CAMERA TUBE

Tadayoshi Miyoshi; Shintaro Nakagaki; Itsuo Takanashi; Sumio Yokokawa, all of Yokohama; Kenichi Miyazaki, Sagamihara; Hisanori Tumiyama, Yokohama, and Koithiro Motoyama, Kanagawa, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 9, 1976, Ser. No. 656,205
Claims priority, application Japan, Feb. 20, 1975, 50-20405; Feb. 25, 1975, 50-23297; Mar. 1, 1975, 50-24515; Mar. 3, 1975, 50-25782; Mar. 5, 1975, 50-25895
Int. Cl.[2] H04N *9/07*
U.S. Cl. 358—47 **6 Claims**



1. A color television signal generating apparatus comprising:

a color-resolving striped filter comprising a plurality of groups of filter stripes, said groups being disposed in parallel and consecutively in a sequentially repeated arrangement, each of said groups comprising at least three filter stripes from among

a first filter stripe having a light transmission characteristic for transmitting the light of one of the three primary colors of an addition mixture color,

a second filter stripe having a light transmission characteristic for transmitting the light of a mixed color which includes the primary color transmitted through said first filter stripe and one of the other two primary colors, and

a transparent third filter stripe for transmitting white light,

said at least three filter stripes being arranged in parallel and consecutively in a specific sequence;

a camera tube having said color-resolving striped filter disposed on the front surface thereof and producing a superimposed output signal comprising, in superimposition:

a direct wave signal containing signals of the three primary colors of said addition mixture color, and

a high-band signal component comprising a group of modulated color signals resulting from an amplitude modulation of a carrier wave by the signals of two primary colors other than the primary color of the light transmitted through said first filter stripe, said carrier wave having a frequency equal to a space frequency determined by the number of said groups of filter stripes, and said carrier wave also having frequency components which are higher harmonics of the frequency of said carrier wave;

low-pass filter means for separating said direct wave signal from the output signal of said camera tube;

first band-pass filter means for separating a fundamental carrier wave signal component having a frequency equal to the space frequency of the filter stripes from the high-band signal component of said output signal of said camera tube;

second band-pass filter means for separating a harmonic signal component having a second harmonic relationship to the frequency of the fundamental carrier wave signal component from said high-band signal component;

adding means for adding the output signals of said first and second band-pass filter means in such a ratio that the amplitude of the fundamental carrier wave signal component is substantially twice that of the harmonic signal component in the output of said adding means;

first envelope detection means for producing a demodulated signal responsive to an envelope formed by successively connecting positive peak values of the output signal of said adding means;

second envelope detection means for producing a demodulated signal responsive to an envelope formed by successively connecting negative peak values of the output signal of said adding means; and

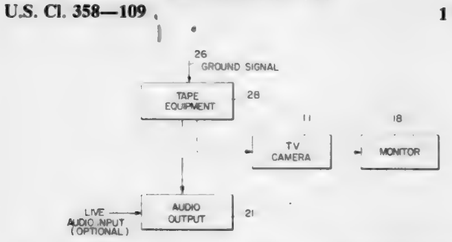
matrix means responsive to the output signals of said low-pass filter means and the first and second envelope detection means for producing three primary color output signals.

4,041,529

AIRPLANE ROUTE VIEWING SYSTEM

Clarence William Masterfield, Petaluma, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y.; a part interest

Filed Apr. 12, 1976, Ser. No. 675,727
Int. Cl.[2] H04N *7/18*
U.S. Cl. 358—109 **1 Claim**



1. A system for automatic display of visual televised information on an airplane accompanied by a recorded audio narrative comprising

a television camera mounted on an airplane focused to televise a pictorial representation of the ground scene below the airplane in flight, said camera joined to a visual monitoring screen in the cabin of the airplane,

sound playback equipment connected to a loudspeaker in the said airplane cabin, said equipment equipped with a recorded message describing the sequence of visual scenes that are to be displayed on the said monitoring screen over a particular section of the route of the airplane,

said playback equipment activated by radio means on the aircraft in association with ground marker beacon means on the path of said route,

said camera and monitoring equipment connected to said playback equipment so that the playback equipment, when activated, serves to actuate the said camera and monitoring equipment such that

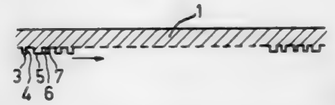
actuation of said playback equipment causes the playback of said recorded message in synchronization with operation of the said camera and monitoring screen.

4,041,530

VIDEO DISC WITH PHASE STRUCTURE

Pieter Kramer; Klaas Compaan, both of Eindhoven, Netherlands, and Robert Franz Karl Forsthuber, Vienna, Austria, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 396,399, Sept. 12, 1973, abandoned, which is a continuation of Ser. No. 229,285, Feb. 25, 1972, abandoned. This application Sept. 30, 1975, Ser. No. 618,215
Claims priority, application Netherlands, Mar. 4, 1971, 7102863
Int. Cl.[2] H04N *5/76*; G11B *7/24, 23/00*
U.S. Cl. 358—128 **8 Claims**



1. A carrier for storing information in the form of a signal angle modulated by said information and readable with a light beam comprising a disk provided with a spiral pattern of regions having flat substantially coplanar upper surfaces, each region separated from an adjacent region by a flat area of the disk that is coplanar with all of the other flat areas between adjacent regions of the spiral pattern, both the areas and regions being of varying lengths, the plane of the flat areas being parallel to the plane of the regions, the material with which said regions and areas are composed having the same optical properties, and the distance between the plane of the flat areas and the plane of the regions being sufficient to introduce a phase difference of $nL/2$ between beam portions which coact with the flat areas and those which coact with the regions, where n is a positive odd integer and L is the wavelength of the light beam.

4,041,531

TELEVISION SIGNAL PROCESSING APPARATUS INCLUDING A TRANSVERSAL EQUALIZER

Joseph Peter Bingham, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

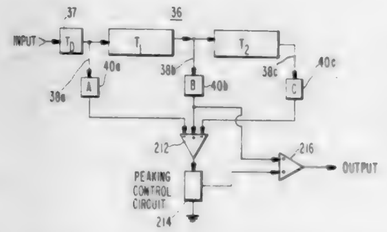
Continuation-in-part of Ser. No. 486,241, July 5, 1974, abandoned. This application Feb. 27, 1975, Ser. No. 553,642
Int. Cl.[2] H04N *9/535*
U.S. Cl. 358—37 **30 Claims**

1. In a color television receiver including a source of composite video signals, said composite video signals including a luminance component occupying a wide band of frequencies and a chrominance component occupying a portion of said wide band of frequencies, said chrominance component comprising modulated color subcarrier waves; apparatus for processing said composite video signals, comprising:

a chrominance channel coupled to said source of composite video signals and including means responsive to said modulated subcarrier waves for deriving therefrom a plurality of color difference signals with an effective delay of a given magnitude;

a luminance channel including:

1. a delay line coupled to said source of composite video signals, said delay line having a plurality of terminals for providing a plurality of delayed video signals, said plurality of delayed video signals being delayed by different amounts;
2. first means providing a first combined signal comprising the sum of two of said delayed video signals which differ in delay by a time interval substantially equal to NT/2, where T is a period at the frequency of the color subcarrier of said composite video signals, and N is an integer greater than one;
3. means for deriving a broadband signal from at least one other of said delayed video signals, said broadband signal having an average delay between the delays of



the signals comprising said first combined signal and of a delay magnitude substantially corresponding to said given magnitude of delay;

4. second means for combining said broadband signal with said first combined signal to produce a second combined signal having first and second amplitude transition portions of a black-going direction and a white-going direction, respectively;
5. means for adjusting the amplitude of said second combined signal to produce a resultant signal of the form of said second combined signal; and
6. third means for combining said broadband signal with said resultant signal to produce an output signal having controllably accentuated black-going and white-going amplitude transition portions as determined by said first and second amplitude transition portions of said second combined signal; and

means for combining said output signal with each of said plurality of color difference signals to form a plurality of color signals.

4,041,532

METHOD OF RECORDING WIDE-BAND SIGNALS ON A THERMOPLASTIC FILM BY USE OF A BEAM OF ELECTRONS

Graham Stuart Plows, and Gordon Malcolm Edge, both of London, England, assignors to Decca Limited of Decca House, London, England

Division of Ser. No. 463,252, April 23, 1974, Pat. No. 3,952,146, and a continuation-in-part of Ser. No. 247,443, April 28, 1972, Pat. No. 3,821,488. This application July 31, 1975, Ser. No. 600,573

Claims priority, application United Kingdom, Apr. 28, 1971, 11993/71

Int. Cl.² H04N *5/82*

U.S. Cl. 358—128 **5 Claims**

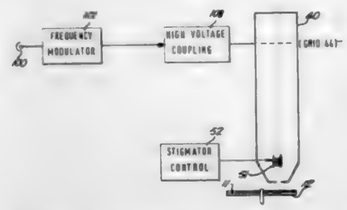
1. A method of recording a wide-band signal on a master record medium in the form of a groove which is to determine the shape of a corresponding groove in a derived record medium which groove therein is to be tracked by a reproducing stylus, comprising the steps of:

directing a beam of electrons at a thin film of electrically resistive thermoplastic material which is supported by a conductive substrate;

moving said film relative to said beam so as to cause said beam to deposite a continuous track of electrical charge on the film;

modulating the intensity of the beam in accordance with the said wide-band signal;

focussing said beam to produce a focus having an effective diameter, in a sense along the direction of progression of



the track, which is substantially less than the shortest wave-length in said wide-band signal;

producing astigmatism in said beam to produce an elliptical focus which is elongate in a direction transverse the direction of progression of said track and has in the said transverse direction a second diameter which is a substantial fraction of the width of the track, so as thereby to cause said track to be of a width which is significantly wider than the effective diameter and has a charge density which is substantially greater in the middle of the track than at the edges thereof; and

heating and cooling said film.

4,041,533

DELAY CIRCUITRY

Katsuhiko Yamamoto, Neyagawa; Kunihiko Hontani, Katano; Hiromu Kitaura, Osaka, and Michio Nakamura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sept. 19, 1975, Ser. No. 615,084

Claims priority, application Japan, Dec. 19, 1974, 49-155700[U]; Dec. 19, 1974, 49-155701[U]; Feb. 18, 1975, 50-22727[U]; Sept. 28, 1974, 49-112177

Int. Cl.² H04N *5/14;* **H03B** *3/04*

U.S. Cl. 358—160 **20 Claims**



1. A delay circuitry comprising

carrier signal generating means;

modulating means coupled to said carrier signal generating means for modulating the carrier signal from said carrier signal generating means with an input signal;

delaying means coupled to said modulating means for delaying the modulated carrier signal from said modulating means and in which drift or fluctuation of the delay time may occur;

demodulating means coupled to said delaying means for demodulating the modulated and delayed carrier signal from said delaying means with a demodulating signal to produce a delayed signal;

first circuit means coupled to said delaying means and said demodulating means for detecting the phase difference between said demodulating signal and said modulated and delayed carrier signal to generate a detected voltage; and

second circuit means coupled to said first circuit means and being responsive to said detected voltage and also coupled to the carrier signal generating means for controlling the phase relationship between said demodulating signal and said modulated and delayed carrier signal so as to be constant, whereby the delayed signal is not affected by drift or fluctuation of the delay time which may occur in said delaying means.

4,041,534

AUTOMATIC DISTORTION CORRECTION ARRANGEMENT

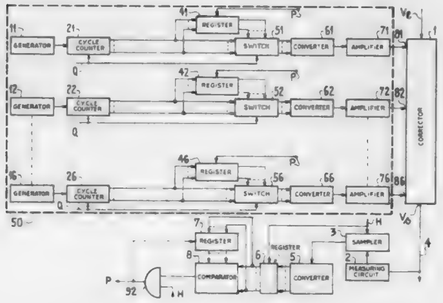
Pierre Chabanel, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Feb. 11, 1976, Ser. No. 657,290

Claims priority, application France, Feb. 14, 1975, 75.04698

Int. Cl.² H04N *5/38*

U.S. Cl. 358—186 **4 Claims**



1. An automatic distortion correcting arrangement comprising:

a variable characteristic corrector having an input for receiving an input signal, *n* independent control inputs for respectively controlling *n* parameters of said variable characteristic, where *n* is a positive integer, and an output;

a generating system, having a control input, for supplying said *n* control inputs respectively with a set of *n* random signals, during each one of recurrent test time intervals separated by longer time intervals, and with a set of *n* signals identical with a selected set of *n* signals previously generated by said generating system during one of said test time intervals, during each one of said longer time intervals;

a channel having an input coupled to said corrector output, and an output;

measuring means, having an input coupled to said channel output, and an output, for delivering in the course of each one of recurrent time intervals including at least all the test time intervals, an output measurement signal characteristic of the degree of distortion of the output signal from said channel;

and a control circuit having an input coupled to said measuring means and an output coupled to said generating system control input, for controlling the selected set of *n* signals applied to said corrector *n* control inputs, during each one of said longer time intervals.

4,041,535

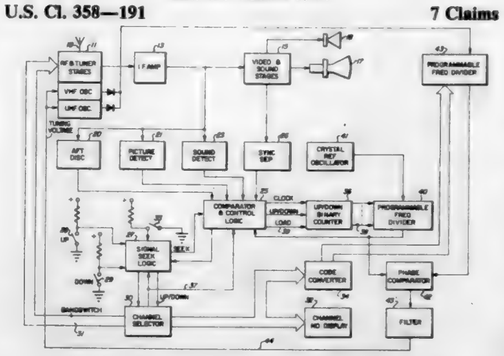
FREQUENCY SYNTHESIZER TUNING SYSTEM WITH SIGNAL SEEK CONTROL

Theodore S. Rzeszewski, Lombard; Paul D. Frantzis, Chicago, both of Ill., and Sotirios Sideris, Sunnyvale, Calif., assignors to Matsushita Electric Corporation of America, Franklin Park, Ill.

Filed July 22, 1976, Ser. No. 707,674

Int. Cl.² H04N *5/44*

U.S. Cl. 358—191 **7 Claims**



1. A frequency synthesizer signal seek tuning system for a tuner of a television receiver capable of receiving a composite television signal, said system including in combination:

reference oscillator means providing a reference signal at a predetermined frequency;

local oscillator means in the tuner providing a variable output frequency in response to the application of a control signal thereto;

a programmable frequency divider having an input coupled to said reference oscillator means for producing an output signal having a frequency which is a programmable fraction of the frequency of the signal applied to the input thereto from said reference oscillator means;

means coupled to the output of said programmable frequency divider and the output of said local oscillator means for developing a control signal and applying such control signal to said local oscillator means for controlling the frequency of operation thereof;

channel selection means coupled to said programmable frequency divider for establishing a predetermined initial programmable fraction therein each time a new channel is selected by said channel selection means;

control means coupled to the output of the tuner of the television receiver and further coupled to said programmable frequency divider for controlling said frequency divider to change the programmable fraction thereof in response to predetermined conditions of the signals from the tuner; and

signal seek tuning means coupled to said channel selection means and said control means for causing said channel selection means to select a new channel in response to said predetermined conditions of the tuner signals persisting for a predetermined time period.

4,041,536

OPTICAL SCANNER

Robert Lee Melcher, Yorktown Heights, and Norman Steven Shiren, Ossining, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1975, Ser. No. 643,971

Int. Cl.² H04N *5/30*

U.S. Cl. 358—213 **12 Claims**

1. Apparatus for converting an optical image into a related electrical signal comprising

a photosensitive semiconductor body,

a piezoelectric substrate adjacent to said semiconductor containing defect sites on which electrons can be trapped

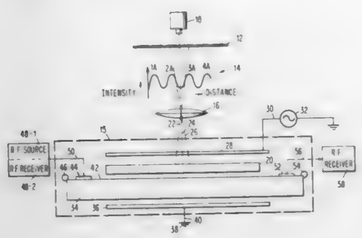
and such traps can be subsequently ionized by electric fields,

means for applying radiofrequency electrical field to said semiconductor of frequency ω_2,

means for imaging the optical image on said semiconductor to fill electron traps therein corresponding to said optical pattern, whereby charge distributions appear in the semiconductor in accordance with information present in the optical image,

means for propagating an input acoustic wave of frequency ω_1 along said piezoelectric substrate in one direction to interact parametrically said electrical field and said acoustic wave to form a modulated backward propagating output acoustic wave of frequency ω_1, said frequencies being related by $\omega_2 = \omega_1/n$, where n is an integer other than zero and

means for converting said modulated output acoustic wave into a related electrical signal.



11. In an apparatus for scanning an optical pattern, a fully anion-compensated photosensitive piezoelectric substrate containing defects on which electrons can be trapped and such traps can be subsequently ionized by electric fields,

means for applying an optical pattern of charging light to said piezoelectric substrate to fill electron traps therein corresponding to said optical pattern,

an acoustic wave input transducer means attached to said piezoelectric substrate for generating an input acoustic wave of frequency ω_1 in one direction past said film,

means for applying a radiofrequency electric field of frequency ω_2, where $\omega_1 = \omega_2$, in said film where said charge distributions and said acoustic wave are adjacent to interact non-linearly said acoustic wave and said radiofrequency electric field to produce stored charge distributions in said film representative of said optical pattern.

4,041,537

TAPE CASSETTE WITH LOCKING SENSOR SLIDE

Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

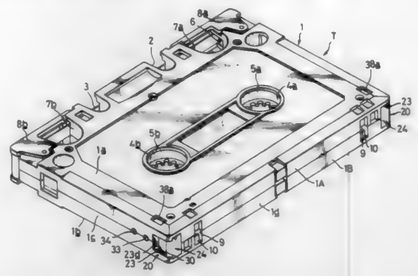
Filed Apr. 9, 1976, Ser. No. 675,461

Claims priority, application Japan, Apr. 17, 1975, 50-52352[U]

Int. Cl.² G11B *23/08, 23/00*

U.S. Cl. 360—60 **11 Claims**

1. A tape cassette for use in tape recording and reproducing apparatus that includes cassette locating means for positioning the cassette at an operative station in the apparatus, and an actuating element that extends adjacent said station and is movable between two positions for selectively placing the recording circuit of said apparatus in its operative and inoperative modes respectively: said cassette comprising a housing including a wall portion, and means defining a recess in said housing with an opening to said recess at a location in said wall portion which is disposed adjacent said actuating element when the cassette is at said operative station; and a control element including a body portion slidably movable in said recess between first and second positions in which said body portion substantially blocks and unblocks, respectively, said opening to the recess so that, in said first position of said body portion, the latter excludes said actuating element from said recess for establishing one of said two positions of the actuating element and, in said second position of said body portion, the latter permits the entry of said actuating element through said opening into said recess for establishing the other of said two positions of the actuating element, and a resilient arm connected at one end with said body portion for movement with the latter along an inner surface of said wall portion adjacent said opening to the recess, said resilient arm having an outwardly directed projection adjacent its other end, and said wall portion having first and second through-holes therein spaced apart in the direction of said movement of the resilient arm with said body portion and selectively receiving said projec-



tion in said first and second position, respectively, of the body portion, each of said through holes being dimensioned to closely engage said projection when the latter is received therein for locking said body portion in the respective one of said positions of the latter and for permitting disengagement of the projection therefrom only by inward displacement of said projection substantially normal to said wall portion said projection, when received in one of said through-holes, being accessible through the latter from the outside of said wall portion for effecting said inward displacement of said projection out of said one through-hole and thereby freeing said body portion for movement to the other of said positions of the latter.

4,041,538

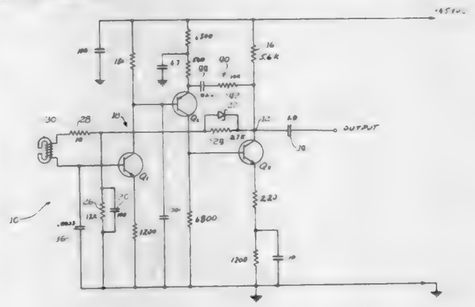
LOW NOISE MAGNETIC TRANSDUCER PREAMPLIFIER HAVING FLAT RESPONSE

Robert R. Parker, Des Plaines, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Apr. 12, 1976, Ser. No. 676,237

Int. Cl.² G11B *5/02*

U.S. Cl. 360—67 **11 Claims**



1. An improved reproduction preamplifier in a machine utilizing a magnetic recording medium, comprising:

a reproduction amplifier circuit including at least one transistor and having an input terminal and an output terminal;

a feedback loop between said output terminal and said input terminal; and

a magnetic playback transducer connected in a direct current series circuit with said feedback loop and said input and output terminals whereby direct current feedback current provides a predetermined direct current bias level for the magnetic playback transducer.

4,041,539

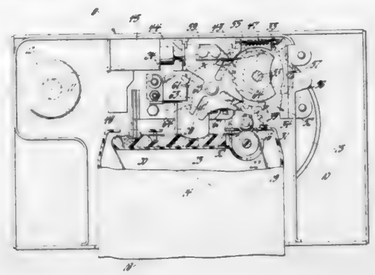
TAPE HEAD SHIFT APPARATUS FOR MULTI-TRACK TAPE PLAYER

Wilbur A. Robarge, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,586

Int. Cl.² G11B *21/08, 5/55*

U.S. Cl. 360—106 **1 Claim**



1. In a multi-track tape player including a magnetic head shiftable between tape tracks, apparatus for continuously driving the tape past the magnetic head and intermittently shifting the magnetic head between tracks, the apparatus comprising, in combination:

a tape-driving capstan; motor means for continuously driving the capstan; a rotatable first cam; a cam follower connected to the magnetic head for co-movement therewith and biased to follow the first cam and thus shift the magnetic head between tape tracks with cam rotation; a driving member fixed to the capstan for rotation therewith; an idler member being actuable to engage the driving member to be positively rotatably driven thereby through a predetermined rotational angle and, having been so driven, disengage from the driving member; solenoid means selectively actuable to actuate the idler member; and geneva gear apparatus connecting the idler member to the first cam, the geneva gear apparatus comprising a geneva drive member being connected to the idler member for rotation therewith and having a circular second cam with a concave excluded sector and a pin adjacent the excluded sector and further comprising a geneva driven member having a plurality of wings, one wing for each tape track, each wing having a concave peripheral surface matching the second cam and being separated from adjacent wings by radial slots, the geneva driven member being fixed to the first cam for rotation therewith and positioned adjacent the driving member with a wing normally engaging the second cam to prevent rotation thereof while engaged and a slot adjacent the wing being adapted to receive the pin during rotation of the driving member to rotate the next adjacent wing into engagement with the second cam and thus rotate the first cam to shift the magnetic head between tape tracks.

4,041,540

SOLID STATE OVERLOAD RELAY CIRCUIT

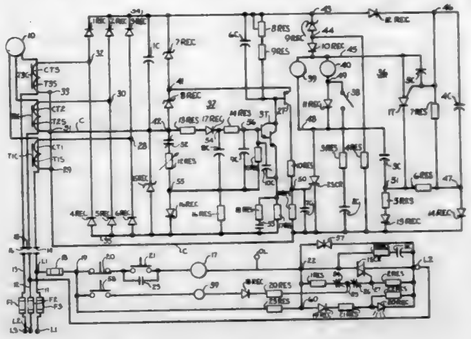
Julian C. Kampf, Grafton; Winfred R. Lemke, Mequon, and James T. Tucker, Milwaukee, all of Wis., assignors to Square D Company, Park Ridge, Ill.

Filed Feb. 2, 1976, Ser. No. 654,425

Int. Cl.² H02H *7/085*

U.S. Cl. 361—24 **12 Claims**

1. A solid state overload relay comprising: a current transformer having a secondary winding energized by current in a conductor and providing an output signal indicative of the magnitude of the current in the conductor, a capacitor, circuit means including a magnet coil, energized by the output signal for charging the capacitor to an adjustable fraction of the magnitude of the output signal, said circuit means including a plurality of impedance circuits connectible in parallel across the capacitor with each of said impedance circuits including a switch connected in series with a precisely calibrated resistor, said resistors having impedances selected so the closure of the switch in its associated circuit will cause the impedance connected in parallel with the capacitor to be reduced by a preselected increment whereby the magnitude of the output signal required to charge the capacitor to a preprogrammed level may be varied in precise preselected increments and each of said switches having an operator accessible from the exterior of a housing for the relay, whereby the response of the relay to current in the conductor may be programmed by actuating the operators of selected switches, and means responsive to the charge on the capacitor for causing the magnet coil to be de-energized when the charge on the capacitor equals the preprogrammed level.



4,041,541

SUPERVISORY AND CONTROL SYSTEM FOR ROTARY MACHINERY, PARTICULARLY ROTARY ELECTRICAL MACHINES

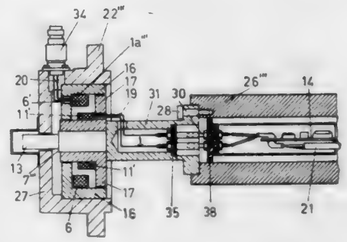
Emile Frossard, Wettingen; Fritz Schleuniger, Wurenlos, and Bruno Stadler, Untersiggenthal, all of Switzerland, assignors to Brown, Boveri & Cie., Baden, Switzerland

Filed Dec. 31, 1975, Ser. No. 645,889

Claims priority, application Switzerland, Jan. 17, 1975, 588/75

Int. Cl.² H02H *7/08*

U.S. Cl. 361—27 **35 Claims**



1. Rotary machine supervisory system for components of a rotating part of the machine comprising

at least one measuring sensor (**53,54**) providing measuring signals, located in or on the rotary machine part;

a rotary transducer (**1**) forming a transformer having a stator (**1*a***), including a stator core and a stator winding located

on a stationary part of the machine, and a rotor (7) including a rotor core and a rotor winding located on the rotary machine part;

the core of the stator being ring-shaped and having, in axial section, an L-shaped cross section and the core of the rotor (7) being ring-shaped and having, in axial section, an L-shaped cross section, said cores of the stator, and rotor, respectively, being positioned to form, together, a generally O-shaped, or rectangular axial section providing for coupling of said cores and hence of said windings.

a threshold circuit (14) rotating with the rotor (7) and electrically coupled to the sensor, or sensors (53, 54) and converting the measured signals into threshold-value signals having discrete steps or intervals between adjacent threshold levels, the threshold circuit having its output electrically coupled to the rotor (7) of the rotary transducer (1) in form of a load to load the rotor winding, selectively, in said discrete steps;

an electrical power supply (50) connected to the stator winding to transfer power to the rotor winding by transformer action;

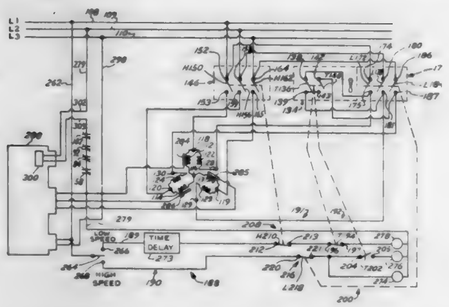
and a control unit (33) connected to the power supply and electrically coupled to the stator (1a) of the rotary transducer (1), the control unit including response circuits providing discrete output signals corresponding to the discrete levels of the signals provided by the threshold circuit (14) and coupled through the transducer (1) to the control unit, said transducer further coupling electrical power from the stator to the rotor and hence to the threshold circuit (14) and the sensor, or sensors (53, 54).

4,041,542

CONTROL APPARATUS FOR TWO-SPEED COMPRESSOR

David M. Pfarrer, Hurst, and Sidney A. Parker, Fort Worth, both of Tex., assignors to Lennox Industries, Inc., Marshalltown, Iowa

Division of Ser. No. 436,179, Jan. 24, 1974, Pat. No. 3,935,519.
This application Sept. 5, 1975, Ser. No. 610,530
The portion of the term of this patent subsequent to Jan. 27, 1993, has been disclaimed.
Int. Cl.² H02H 7/08
U.S. Cl. 361—27 2 Claims



1. In a refrigerant compressor of the type having a compression mechanism for receiving refrigerant gas from a suction line, compressing the refrigerant gas and discharging the compressed refrigerant gas through a discharge line, and a motor for rotating shaft means in the compression mechanism at low speed and at high speed from a source of three-phase electrical power including first, second and third power terminals, said motor including a first stator coil, a second stator coil and a third stator coil adapted to receive three-phase electrical power, each stator coil having an inner end point connected to a common conductor and also having an outer end point, improved control apparatus for protecting the stator coils comprising:

a fourth stator coil having a second end point and also having a first end point connected to the outer end point of the first stator coil;

a fifth stator coil having a second end point and also having a first end point connected to the outer end of the second stator coil;

a sixth stator coil having a second end point and also having a first end point connected to the outer end point of the third stator coil;

first sensor means located adjacent the first coil for indicating a change in temperature of the first coil;

second sensor means located adjacent the second coil for indicating a change in temperature of the second coil;

third sensor means located adjacent the third coil for indicating a change in temperature of the third coil;

first control means for interrupting the flow of current to said stator coils in response to an indication from any of said sensor means that the temperature of any of said stator coils exceeds a predetermined value;

second control means for interconnecting the second end points of the fourth, fifth and sixth stator coils, for connecting the outer end point of the first stator coil to the first power terminal, for connecting the outer end point of the second stator coil to the second power terminal and for connecting the outer end point of the third stator coil to the third power terminal, whereby the motor rotates at high speed; and

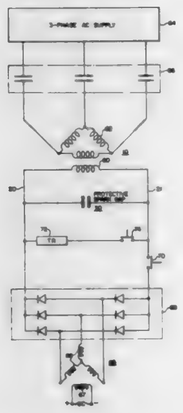
third control means for connecting the second end point of the fourth stator coil to the first power terminal, for connecting second end point of the fifth stator coil to the second power terminal and for connecting the second end point of the sixth stator coil to the third power terminal, whereby the motor rotates at low speed.

4,041,543

FIELD PROTECTOR FOR SYNCHRONOUS MACHINES

Maurice J. Pasculle; Edgar F. Merrill, both of Pittsburgh, and Carl J. Heyne, Allison Park, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1975, Ser. No. 561,725
Int. Cl.² H02H 7/09
U.S. Cl. 361—33 7 Claims



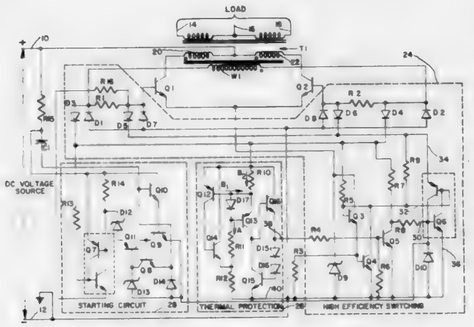
1. In a dynamoelectric machine of the type in which a rotating magnetic field causes a voltage to be induced within a winding, the combination with said winding of a weldable spark gap electrically connected in parallel with said winding, said spark gap having a plurality of electrodes which are closely spaced to weld together when the voltage induced in said winding exceeds a predetermined safe operating level.

4,041,544

DC TO AC INVERTER HAVING IMPROVED SWITCHING EFFICIENCY, OVERLOAD AND THERMAL PROTECTION FEATURES

John P. Walden, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 516,773, Oct. 21, 1977, Pat. No. 3,956,684.
This application Dec. 18, 1975, Ser. No. 641,997
Int. Cl.² H02H 7/122
U.S. Cl. 361—106 4 Claims



1. A thermal protection circuit for an integrally formed integrated electrical circuit which provides an electrical signal representative of the temperature of the integrated electrical circuit thus enabling protective action to be taken such as disablement of the integrated circuit operation, said protection circuit comprising:

at least one temperature sensitive element integrally formed with said integrated circuit and having a predetermined voltage variation thereacross versus temperature variations thereof at a predetermined current level therethrough, and

current regulation means connected to supply and substantially maintain said predetermined current through said temperature sensitive element except for possible current variations as a function of temperature in a direction to enhance the temperature sensitivity of said thermal protection circuit, said current regulation means including first and second transistor means each having base, collector and emitter elements,

said first transistor means having its collector and emitter elements electrically connected in a series circuit with a source of electrical current, said temperature sensitive element and the base-emitter circuit of said second transistor means,

the collector of said second transistor means being connected to the base of said first transistor means and also operatively connected to said current source for by-passing at least a portion of non-temperature related current variations therefrom around said temperature sensitive element;

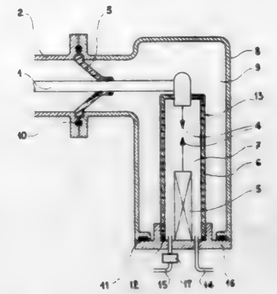
said electrical signal being produced as the voltage across said temperature sensitive element.

4,041,545

LIGHTNING CONDUCTOR IN A METALLIC CASING

Robert Deville, Lyon, France, assignor to Delle-Alsthom, Villeurbanne, France

Filed Oct. 1, 1975, Ser. No. 618,612
Claims priority, application France, Oct. 2, 1974, 74.33188
Int. Cl.² H02H 9/06
U.S. Cl. 361—120 4 Claims



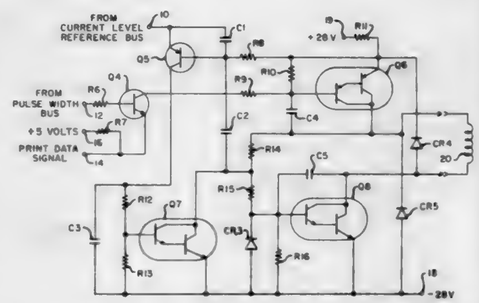
1. A lightning conductor comprising: a metallic casing filled with dielectric fluid under pressure; an enclosure arranged on the inside of said metallic casing and filled with insulating gas, said enclosure having inlet means for the flow of insulating gas from the exterior of said casing to the interior of said enclosure, said enclosure having outlet means for the flow of insulating gas from the exterior of said casing to the interior of said enclosure, said enclosure having outlet means for the flow of insulating gas from the interior of said enclosure to the exterior of said casing, the pressure within said enclosure being substantially lower than the pressure of the dielectric fluid in said metallic casing, said inlet means and outlet means inhibiting effects from rise of pressure within said enclosure due to penetration of dielectric fluid into said enclosure, said dielectric fluid being arranged to hold a high-tension electrical device in said casing.

4,041,546

SOLENOID DRIVER CIRCUIT

John W. Stewart, Wichita, Kans., assignor to NCR Corporation, Dayton, Ohio

Filed June 4, 1976, Ser. No. 693,034
Int. Cl.² H01H 47/04
U.S. Cl. 361—152 10 Claims



2. An excitation control circuit for an actuating solenoid member comprising:

an actuating solenoid;

a first and a second terminal for receiving a differential voltage;

switch means having a closed and an open state for connecting and disconnecting said first and said second terminal in

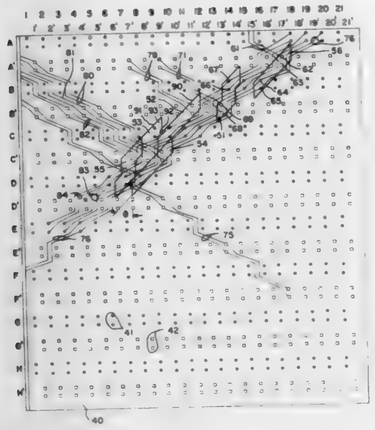
circuit with said actuating solenoid in response to the commands of a control signal;
means for providing a sensing signal indicative of the current level in said actuating solenoid; and
means responsive to said sensing signal for providing said control signal for closing said switch means in response to a solenoid activation signal and for cyclically opening said switch means in response to the level of said sensed signal for fixed periods in order to maintain the level of current through said actuating solenoid below a pre-selected level during solenoid activation.

4,041,547

CONNECTOR SYSTEM FOR CONNECTING TOGETHER TERMINAL POSTS ARRANGED IN TWO MATRICES WHOSE ROWS AND COLUMNS ARE INTERLEAVED

Winfield Warren Loose, Linglestown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 588,271, June 18, 1975, abandoned.
This application Oct. 26, 1976, Ser. No. 735,488
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—410 **3 Claims**



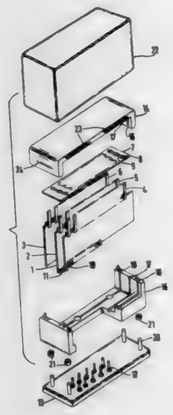
1. In combination with an array of terminal posts mounted vertically upon a planar substrate and arranged in a pair of matrices superimposed upon one another with the columns and rows thereof being interleaved in alternate manner and with each matrix intersection point in both matrices containing at least two terminal posts, a connector system for selectively and simultaneously connecting first pairs of terminal posts at each of the intersection points in one of said matrices to second or third pairs of terminal posts, respectively, at intersection points located in the adjacent row and the adjacent column, or the column next to said adjacent column, of the other matrix and comprising:
a first connector housing comprising a center section constructed to fit between adjacent rows of pairs of terminal posts and aligned with said columns;
said first connector housing further comprising end sections extending angularly off said center section at opposite ends thereof and on opposite sides thereof to cover one each of said first and second pairs of terminal posts;
first and second contacts;
said first connector housing comprising cavities to receive and retain said first and second contacts;
said first and second contacts each constructed to connect a contact of said first pair of terminal posts individually to a contact of the second pair of terminal posts;
a second connector housing comprising a substantially straight section constructed to have the ends thereof cover said first and third pairs of terminal posts;
third and fourth contacts;
said second connector housing comprising cavities to receive and retain said third and fourth contacts;
said third and fourth contacts each constructed to connect a contact of said first pair of terminal posts, in the absence of another connector being connected thereto, individually to a contact of said third pair of terminal posts;
said first and second housings being configured, when positioned side-by-side in a given row of intersection points to connect two adjacent pairs of terminal posts in said given row to two pairs of terminal posts spaced apart in the row adjacent said given row by a third pair of terminal posts, to space said housings apart a distance to enable another of said housings to fit therebetween and connect said third pair of terminal posts to a pair of terminal posts in a third row adjacent said adjacent row;
each of said contacts comprising a bifurcated terminal post engaging section with the legs of each bifurcation constructed and positioned within said housing to grip one of said terminal posts therebetween;
said legs of each of said bifurcations having the edge thereof which faces the substrate flared outwardly to facilitate entry of said terminal post between said legs of said bifurcation.

4,041,548

HYBRID CIRCUIT PACKAGE

Ian David Salisbury, Gaimpton, and Roy Edward Ingram, Brixham, both of England, assignors to ITT Industries, Incorporated, New York, N.Y.

Filed Jan. 19, 1976, Ser. No. 650,201
Claims priority, application United Kingdom, Mar. 11, 1975, 10034/75
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—396 **2 Claims**



1. A hybrid circuit package comprising:
at least two hybrid circuits having several rigid leads;
a printed circuit board secured substantially at right angles to the plane of each hybrid circuit for interconnecting said leads;
a dismantleable framework for holding said at least two hybrid circuits and said printed circuit board, said dismantleable framework including first and second plastic molded parts having grooves therein for receiving and feeding said hybrid circuits;
a hermetically sealed case for resiliently holding said dismantleable framework; and
an electrical lead-out sealed in a wall of said case and coupled to said at least two hybrid circuits.

DESIGN PATENTS

GRANTED AUGUST 9, 1977

ERRATA

For CLASS	See PATENT NO.
010–116	245,325
064–011 B	245,341
014–043	245,342
015–143	245,366
014–020	245,369
024–059	245,372

DESIGNS

AUGUST 9, 1977

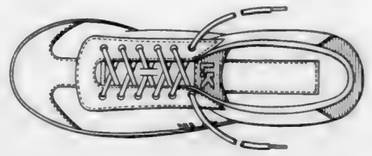
245,291
COMBINED BLOUSE AND PANTY HOSE ENSEMBLE
Joyce Curry, 2300 S. 24th Road, Apt. 730, Arlington, Va. 22206, and Martha G. Pugh, 11 New Providence Ave., Summit, N.J. 07901
Division of Ser. No. 130,867, April 2, 1971, Pat. No. Des. 233,489, which is a continuation-in-part of Ser. No. D. 24,491, Aug. 14, 1970, abandoned. This application July 15, 1974, Ser. No. 488,455
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29



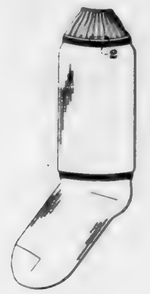
245,292
COMBINED BLOUSE AND PANTY HOSE ENSEMBLE
Joyce Curry, 2300 S. 24th Road, Apt. 730, Arlington, Va. 22206, and Martha G. Pugh, 11 New Providence Ave., Summit, N.J. 07901
Division of Ser. No. 130,867, April 2, 1971, Pat. No. Des. 233,489, which is a continuation-in-part of Ser. No. D. 24,491, Aug. 14, 1970, abandoned. This application July 15, 1974, Ser. No. 488,457
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—29



245,293
SPORT SHOW (BAL PATTERN)
Morris L. Krome, 9 Roland Mews, Baltimore, Md. 21210
Filed Sept. 22, 1975, Ser. No. 615,521
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—310



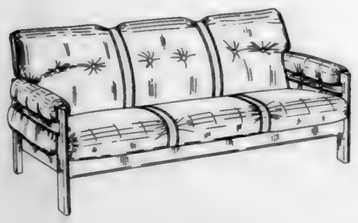
245,294
SKI SOCK
Robert E. Chesebro, Jr., Sheboygan, Wis., assignor to Wigwam Mills, Inc., Sheboygan, Wis.
Filed Mar. 22, 1976, Ser. No. 669,200
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—330



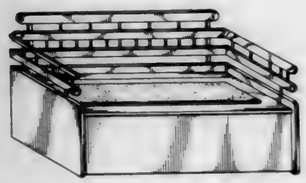
245,295
BUTTON-SUPPORTED TENNIS BALL POCKET
Estelle Margaret Guardino, 180 Bedell St., Hempstead, N.Y. 11551
Filed Apr. 29, 1976, Ser. No. 681,535
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—400



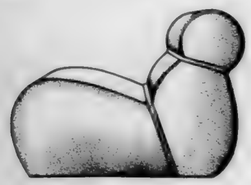
245,296
SOFA
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed July 23, 1975, Ser. No. 598,338
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



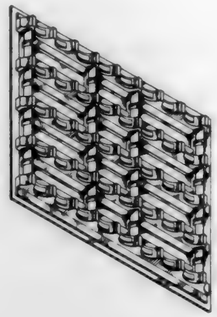
245,297
COMBINED BENCH AND PHONOGRAPH RECORD STORAGE CHEST
James F. Curtin, 16044 E. Queenside Drive, Covina, Calif. 91722
Filed Oct. 7, 1974, Ser. No. 512,617
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—64



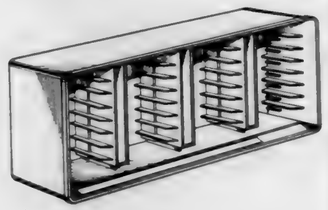
245,298
MODULAR CHAIR
Harry Brahm, P.O. Box 372, Riverside Station, Miami, Fla. 33135
Filed Feb. 25, 1976, Ser. No. 661,175
Term of patent 7 years
Int. Cl. D6—*01*
U.S. Cl. D6—66



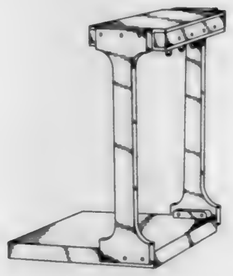
245,299
WALL MOUNTED RACK FOR BEER CANS OR THE LIKE
Paul Beck, 4044 N. Avers Ave., Chicago, Ill. 60618
Filed Jan. 7, 1976, Ser. No. 647,191
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—114



245,300
MAGNETIC TAPE WALL STORAGE UNIT
Gregory Mathus, Sudbury; George Lyman, Weston, both of Mass., and David Roche, Nashua, N.H., assignors to Data Packaging Corporation, Cambridge, Mass.
Filed Apr. 1, 1976, Ser. No. 672,780
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—130



245,301
PORTABLE KITCHEN ISLAND
Carl Brandenfels, Scappoose, Oreg., assignor to H T Products, Inc., Scappoose, Oreg.
Filed Feb. 26, 1976, Ser. No. 661,790
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—157



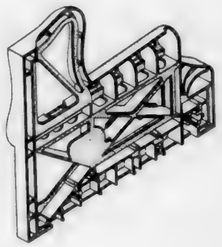
245,302
TABLE
Marion Pratt, High Point, N.C., assignor to J. G. Redmond Associates, Inc. (Entire), High Point, N.C.
Filed Dec. 10, 1975, Ser. No. 639,597
Term of patent 3½ years
Int. Cl. D6—*03*
U.S. Cl. D6—177



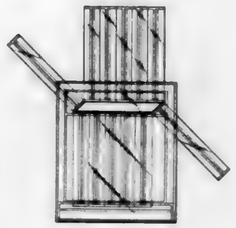
245,303
ELECTRONIC MODULAR DESK, OR SIMILAR ARTICLE
Kenneth F. Gazarek, Warrenville, Ill., assignor to Equipto Electronics Corporation, Aurora, Ill.
Filed Dec. 24, 1975, Ser. No. 644,052
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—177



245,304
FRAME FOR A FURNITURE ARM
Charles P. Bohan, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.
Filed Nov. 3, 1975, Ser. No. 628,011
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—195



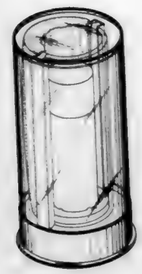
245,305
PHOTOGRAPH DISPLAY STAND
George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.
Continuation-in-part of Ser. No. 522,425, Nov. 11, 1974. This application Aug. 5, 1976, Ser. No. 712,023
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D6—234



245,306
PORTABLE GOLF BALL WASHER CASE
Elihu Daniel Ryden, 14145 Piedmont St., Detroit, Mich. 48223, and Henry Walter Denski, 11941 Amherst Court, Plymouth, Mich. 48170
Filed June 9, 1975, Ser. No. 584,714
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—161

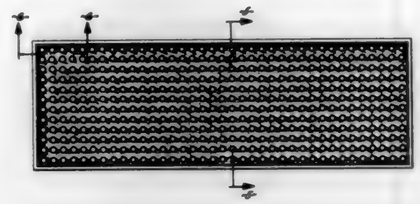


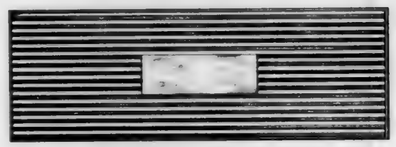
245,307
RECORD CLEANER KIT
Howard Mont, Port Washington, N.Y., assignor to Recoton Corporation
Filed July 12, 1976, Ser. No. 704,235
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



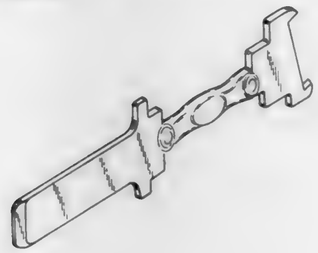


245,308
MAT FOR BEVERAGE CONTAINERS
Clyde B. Baker, P.O. Box 1053, Sacramento, Calif. 95987
Filed Apr. 5, 1976, Ser. No. 673,396
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—188

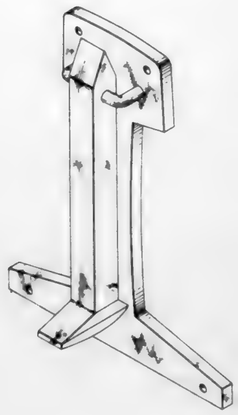




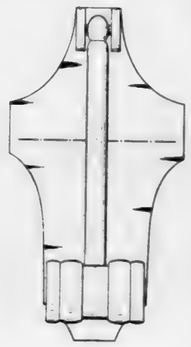
245,309
DIVER'S TOOL
Richard P. Rauth, 205 E. Clifton Ave., Anaheim, Calif. 92805
Filed Mar. 22, 1976, Ser. No. 668,932
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—16



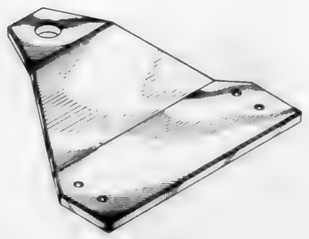
245,310
DOORKNOCKER OR SIMILAR ARTICLE
Francis M. Fenice, 1026 Edgerton Road, Secane, Pa. 19018
Filed Aug. 16, 1976, Ser. No. 714,638
Term of patent 14 years
Int. Cl. D8—*09;* D10—*06*
U.S. Cl. D8—178



245,311
DOOR KNOCKER
Phyllis Smith Galanthay, 22 Manor Way, Poughkeepsie, N.Y. 12603
Filed Sept. 15, 1976, Ser. No. 723,562
Term of patent 14 years
Int. Cl. D8—*09;* D10—*06*
U.S. Cl. D8—178



245,312
CAMPER TIE DOWN
Reed Rasmussen, 168 W. Gentile, Layton, Utah 84041, and Carl M. Rasmussen, 197 E. 1400 South, Bountiful, Utah 84010
Continuation of Ser. No. 280,708, Aug. 14, 1972, abandoned.
This application Mar. 31, 1975, Ser. No. 563,877
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356



245,313
DUAL WHEEL CASTER
Earl H. Koepke, Youngstown, Ohio, assignor to Harter Corporation, Sturgis, Mich.
Filed Nov. 12, 1976, Ser. No. 741,420
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D8—375



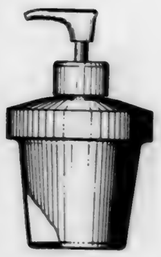
245,314
BOTTLE
Bernard A. Mitchell, 1000 N. Lake Shore Drive, Chicago, Ill. 60611
Filed Aug. 20, 1975, Ser. No. 606,017
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—107



245,315
COMBINED BOTTLE AND CAP
Bernard A. Mitchell, 1000 N. Lake Shore Drive, Chicago, Ill. 60611
Filed Aug. 20, 1975, Ser. No. 606,014
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—107



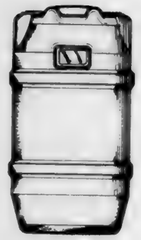
245,316
LIQUID DISPENSER
George Malcolm McConnell, New York, N.Y., assignor to Pfizer Inc., New York, N.Y.
Filed Dec. 10, 1974, Ser. No. 531,230
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—131



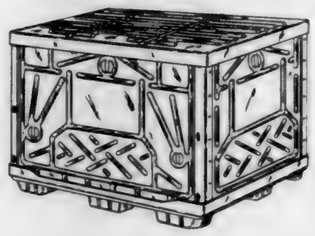
245,317
BOTTLE
John Pardo, Yonkers, N.Y., assignor to The Procter & Gamble Company
Division of Ser. No. 505,307, Sept. 12, 1974. This application Feb. 23, 1976, Ser. No. 660,739
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—156



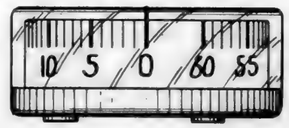
245,318
DRUM
William M. Yavorsky, Spartanburg, S.C., assignor to Harley Corporation, Spartanburg, S.C.
Filed July 7, 1975, Ser. No. 593,647
Term of patent 14 years
Int. Cl. D9—*02*
U.S. Cl. D9—170



245,319
SHIPPING CONTAINER
William Roy Wodell, Stratford, Conn., assignor to Richard R. Barnes, Jr., Bridgeton and Douglas E. MacArthur, Chesterfield, both of, Mo.
Filed Jan. 26, 1976, Ser. No. 652,216
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—246



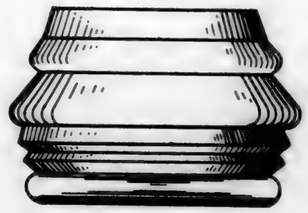
245,320
KITCHEN TIMER OR SIMILAR ARTICLE
Dana W. Mox, Elk Grove Village, Ill., assignor to Hanson Limited, Sligo, Ireland
Filed Feb. 25, 1976, Ser. No. 661,376
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



245,321
INSTRUMENT CLUSTER
Robert A. Skyer, Palatine, and James R. McGirk, Medinah, both of Ill., assignors to International Harvester Company
Filed Sept. 5, 1975, Ser. No. 610,702
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—102

245,322
FIRE ALARM
Donald A. White, 4701 E. Kessler View, Indianapolis, Ind. 46220
Filed Feb. 9, 1976, Ser. No. 656,250
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106

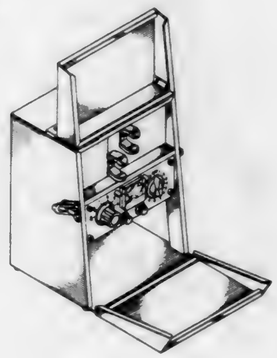
245,323
RING OR SIMILAR ARTICLE
Theodore Galeza, 6109 Stanton Ave., Pittsburgh, Pa. 15215
Filed May 18, 1976, Ser. No. 687,444
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—39



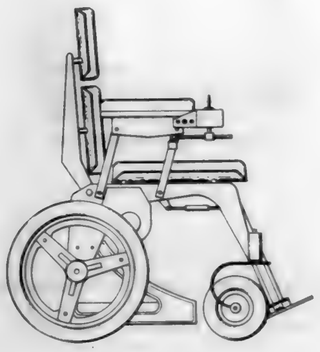
245,324
MOTOR VEHICLE
Herbert L. Adams, 1036 San Carlos Road, Pebble Beach, Calif. 93953
Filed Nov. 19, 1975, Ser. No. 633,271
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—110



245,325
PORTABLE ULTRASONIC GENERATOR UNIT
Robert J. Lindquist, 605 S. Lucerne Blvd., Los Angeles, Calif. 90020
Filed Jan. 8, 1976, Ser. No. 647,618
Term of patent 14 years
Int. Cl. D10—*06*; D13—*03X*
U.S. Cl. D10—116



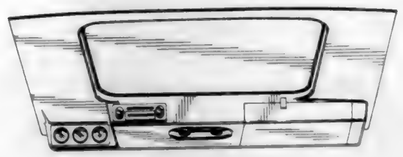
245,326
BATTERY POWERED WHEELCHAIR
Vincent Grippi, Jr., Oakland, Calif., assignor to Center for Independent Living, Inc., Berkeley, Calif.
Filed July 26, 1976, Ser. No. 708,701
Term of patent 14 years
Int. Cl. D12—*12*
U.S. Cl. D12—131



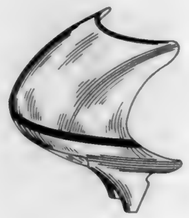
245,327
TIRE FOR A VEHICLE WHEEL
Brian Sidney Bennett, Barton-under-Needwood, England, assignor to Dunlop Limited, London, England
Filed June 8, 1976, Ser. No. 693,773
Claims priority, application United Kingdom, Dec. 19, 1975, 973726/75
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—146



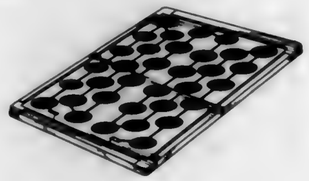
245,328
AUTOMOTIVE TRUCK SERVICE MODULE
Joseph O. Davis, Los Angeles; Edward W. Scott, Culver City, and Lawrence G. McCain, Beverly Hills, all of Calif., assignors to Cruisaire Motor Corporation, Gardena, Calif.
Filed Feb. 11, 1976, Ser. No. 657,030
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155



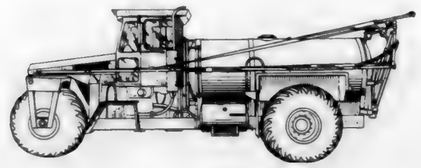
245,329
BICYCLE FAIRING
Gerald A. Wiegert, 1623 W. Washington Blvd., Venice, Calif. 90291
Filed May 5, 1976, Ser. No. 683,262
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—182

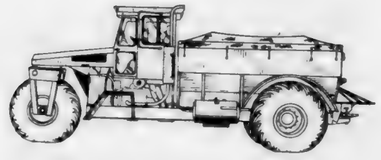


245,330
SOLAR CELL PANEL
Yvon Salles, Thaon, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 10, 1975, Ser. No. 611,866
Claims priority, application France, Mar. 14, 1975, 73.711
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—4

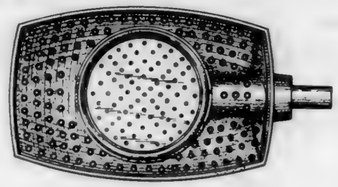


245,331
HIGH FLOTATION VEHICLE FOR USE IN AGRICULTURAL FERTILIZING OR THE LIKE
Lawrence N. Tangeman, Beatrice, Nebr., assignor to Dempster Industries, Inc., Beatrice, Nebr.
Filed Oct. 31, 1975, Ser. No. 627,681
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—13



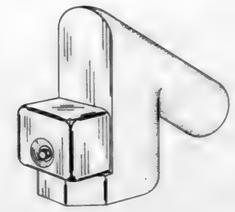


245,332
SPRAY HEAD
Sidney J. Shames, 57 Holly Place, Briarcliff Manor, N.Y. 10510, and Harold Shames, 5 Agnes Circle, Ardsley, N.Y. 10502
Filed Oct. 1, 1976, Ser. No. 728,953
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35

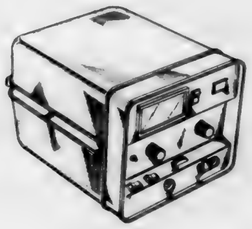




245,333
PIPE VENT
William V. Porter, c/o The Porter Company, 1620 S. Seguin Ave., New Braunfels, Tex. 78130, and Maurice A. Riordan, 6126 Lynbrook, Houston, Tex. 77057
Filed May 26, 1976, Ser. No. 690,306
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41



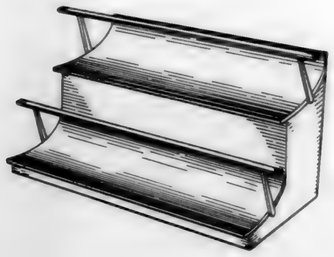
245,334
IMPEDANCE CARDIOGRAPH ENCLOSURE
Leslie R. Walstrom, Excelsior, Minn., assignor to Fabri-Tek Incorporated, Minneapolis, Minn.
Filed Dec. 2, 1976, Ser. No. 746,781
Term of patent 7 years
Int. Cl. D24—*01*
U.S. Cl. D24—17



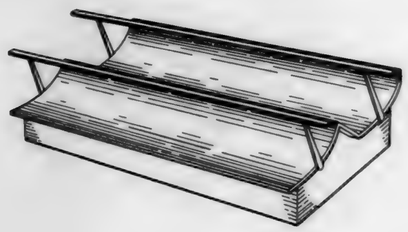
245,335
ORTHODONTIC PACIFIER
Paul K. Meeker, 412 Park, Kent, Ohio 44266, and Richard E. Cone, 249 Bowman Drive, Kent, Ohio 44240
Filed Sept. 2, 1976, Ser. No. 719,981
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—45



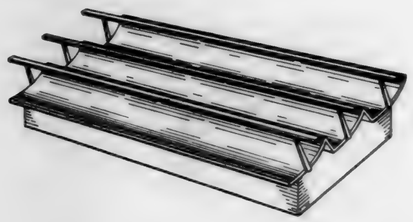
245,336
BUILDING STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Continuation of Ser. No. 562,646, March 27, 1975. This application Sept. 23, 1976, Ser. No. 725,747
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



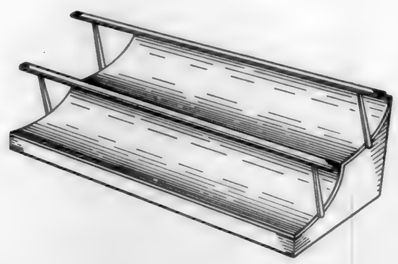
245,337
BUILDING STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Continuation of Ser. No. 562,643, March 27, 1975. This application Sept. 23, 1976, Ser. No. 725,748
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



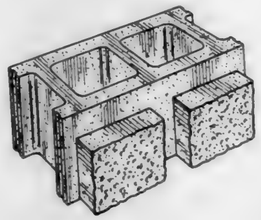
245,338
BUILDING STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Continuation of Ser. No. 562,645, March 27, 1975. This application Sept. 23, 1976, Ser. No. 725,749
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



245,339
BUILDING STRUCTURE
Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Continuation of Ser. No. 562,644, March 27, 1975. This application Sept. 23, 1976, Ser. No. 725,750
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



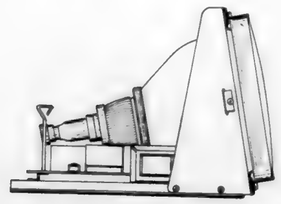
245,340
BUILDING BLOCK
Donald O. Johnson, Hopkins, Minn., assignor to Chas. M. Freidheim Company
Filed May 19, 1976, Ser. No. 687,625
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—92

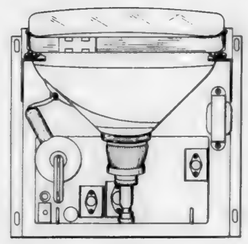


245,341
ELECTRONIC CALCULATING MACHINE
Isao Kitai, Osaka, Japan, assignor to Sharp Kabushiki Kaisha, Japan
Filed June 26, 1975, Ser. No. 590,845
Claims priority, application Japan, Dec. 26, 1974, 50-1099
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

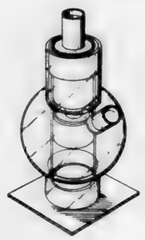


245,342
DISPLAY DEVICE FOR A COMPUTER
Reiji Takeuchi, Tokyo, Japan, assignor to Chuomusen Company, Ltd., Omorinishi, Japan
Filed Sept. 25, 1975, Ser. No. 616,705
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43





245,343
SMOKING PIPE OR SIMILAR ARTICLE
Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234
Filed Dec. 23, 1975, Ser. No. 643,753
Term of patent 14 years
Int. Cl. D27—*02*
U.S. Cl. D27—3



245,344
CIGARETTE SNUFFER
Arthur A. Fisher, 4712 E. Indian School Road, Phoenix, Ariz. 85018
Filed Apr. 26, 1976, Ser. No. 680,503
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—09



245,345
CIGARETTE GAS LIGHTER
Tomio Nitta, Yokohama, Japan, assignor to Tokai Seiki Co., Ltd., Yokohama, Japan
Filed Mar. 30, 1976, Ser. No. 672,077
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



245,346
CIGARETTE LIGHTER
Sadao Yoshinaga, Tokyo, Japan, assignor to Yoshinaga Prince Co., Ltd., Tokyo, Japan
Filed June 16, 1976, Ser. No. 696,711
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

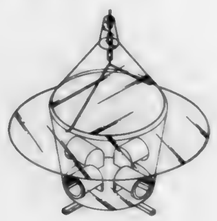


245,347
PERFORATOR FOR CIGAR OR CIGARETTE
Everett Randolph Casey, 5845 Old Orchard Trail, Orchard Lake, Mich. 48033
Filed Sept. 15, 1975, Ser. No. 613,166
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51



245,348
PET HOUSE
John G. Haviland, 4604 Pine Ridge, Julian, Calif. 92036
Filed Feb. 20, 1976, Ser. No. 659,963
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1

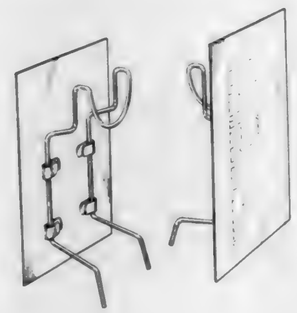
245,349
BIRD FEEDER
James B. Fisher, Jr., 2 Graybridge Lane, St. Louis, Mo. 63124
Filed June 27, 1975, Ser. No. 591,036
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—15



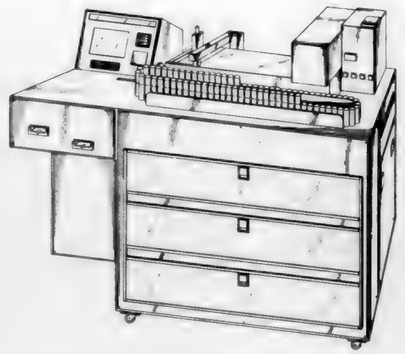
245,350
PET HARNESS
Catherine P. Geary, 438 Majorca Ave., Coral Gables, Fla. 33134
Filed Feb. 9, 1976, Ser. No. 656,449
Term of patent 14 years
Int. Cl. D30—*04*
U.S. Cl. D30—38



245,351
REMEMBRANCE PLAQUE
Edward M. Hyde, 540 Buhl Blvd., and George A. Kraynak, 409 N. Hermitage Road, both of Sharon, Pa. 16146
Filed May 24, 1976, Ser. No. 689,151
Term of patent 14 years
Int. Cl. D20—*03*; D31—*00*
U.S. Cl. D31—13



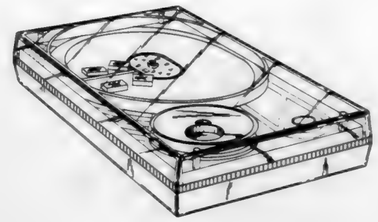
245,352
MULTICHANNEL AUTOMATED APPARATUS FOR ANALYSIS OF CHEMICAL SAMPLES
John J. Moran, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.
Filed Aug. 11, 1976, Ser. No. 713,401
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—1.1



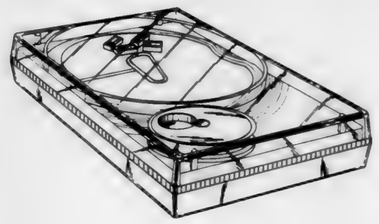
245,353
DOLL
Ann S. Haapanen, 5 Halco Drive, Paramus, N.J. 07652
Filed Mar. 4, 1976, Ser. No. 663,720
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



245,354
POCKET RACING GAME BOX
Arisuke Yamagata, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Aug. 13, 1975, Ser. No. 604,096
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CC



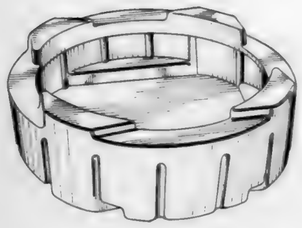
245,355
POCKET RACING GAME BOX
Arisuke Yamagata, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Aug. 13, 1975, Ser. No. 604,315
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 CC



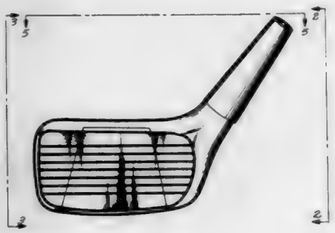
245,356
COMBINED PLAY STEPS AND SLIDE
Kenneth Peter Burgess, Kew Surrey, and Timothy Sefton Elsdale, London, both of England, assignors to WCB Containers Limited
Claims priority, application United Kingdom, 969943
Filed Aug. 19, 1975, Ser. No. 605,893
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 E



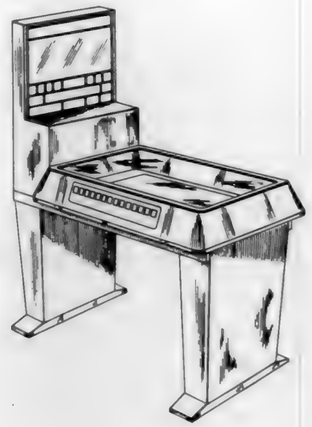
245,357
SAND OR WATER PLAY DRUM
Kenneth Peter Burgess, Kew Surrey, and Timothy Sefton Elsdale, London, both of England, assignors to WCB Containers Limited
Filed Aug. 19, 1975, Ser. No. 605,898
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D34—5 F



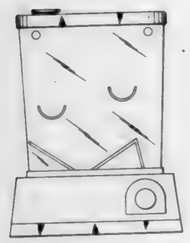
245,358
GOLF CLUB WOOD HEAD
Jerry Barber, P.O. Box 550, La Canada, Calif. 91011
Filed Oct. 8, 1975, Ser. No. 620,696
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



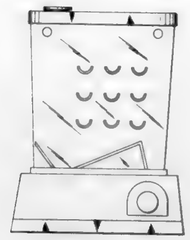
245,359
TABLE-TYPE GAME APPARATUS
William F. Wilke, 702 N. Minnesota St., Carson City, Nev. 89701
Filed Oct. 15, 1975, Ser. No. 622,713
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 J



245,360
WATER GAME CASE
Shizuka Kojima, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 12, 1976, Ser. No. 666,308
Claims priority, application Japan, Dec. 12, 1975, 50-49253
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 JJ



245,361
WATER GAME CASE
Shizuka Kojima, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 12, 1976, Ser. No. 666,427
Claims priority, application Japan, Dec. 12, 1975, 50-49255
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 JJ



245,362
SAVINGS BANK OR THE LIKE
Leonard Patsiner, York, Pa., assignor to Mar-Lyn Imports, Inc.
Filed Feb. 24, 1976, Ser. No. 660,830
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D34—11 R



245,363
BALANCING TOY
George David Wichodil, 2321 Pamela Lane, Sacramento, Calif. 95825
Filed June 12, 1975, Ser. No. 539,438
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 N



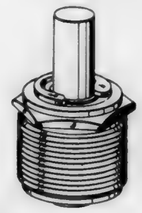
245,364
TOY REFRIGERATOR
Joseph M. McClary, Brentwood, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Apr. 14, 1976, Ser. No. 675,534
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AC



245,365
TOY BIRD
Masami Shirashi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 10, 1976, Ser. No. 684,843
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



245,366
BEARING UNIT FOR MECHANICAL MEASURING DEVICES
Sture Berglund, Tyreso, Sweden, assignor to Alfredeen Production AB, Bandhagen, Sweden
Filed Sept. 26, 1975, Ser. No. 617,020
Claims priority, application Sweden, Apr. 3, 1975, 75679
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—143



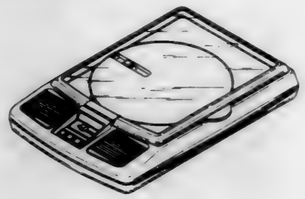
245,367
LUMINAIRE HOUSING
Kurt Franck, Newark, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.
Filed May 27, 1975, Ser. No. 581,328
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—20 A



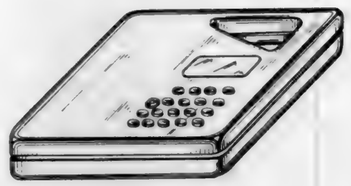
245,368
LAMP BASE
Harry E. Mueller, 2149 Delmar, Granite City, Ill. 62040
Filed Aug. 11, 1976, Ser. No. 713,288
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—20 R



245,369
AUDIO-VISUAL SHEET PLAYER
Hideto Furuoka, Tokyo, Japan, assignor to Gakken Co., Ltd., Tokyo, Japan
Filed Apr. 30, 1975, Ser. No. 573,052
Claims priority, application Japan, Mar. 10, 1975, 50-9041
Term of patent 14 years
Int. Cl. D14—*01, 99*
U.S. Cl. D14—20



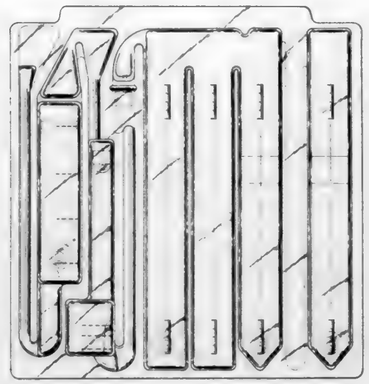
245,370
CALCULATOR OR SIMILAR ARTICLE
Hisashi Maeda, Nagaokakyo, and Hironori Yoshikawa, Hirakata, both of Japan, assignors to Al Nyman & Son, Inc., Miami Springs, Fla.
Filed Mar. 19, 1975, Ser. No. 559,773
Claims priority, application Japan, Oct. 18, 1974, 49-36591
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B



245,371
KEY HOLDER CARD
William B. Mowry, 9118 W. 70th St., Shawnee Mission, Kans. 66204
Filed Feb. 2, 1976, Ser. No. 654,072
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—8



245,372
UNDERWATER DRAINAGE DEVICE WITH DUAL COLLECTION CHAMBERS
Leonard D. Kurtz, Woodmere, and Robert E. Bidwell, Melville, both of N.Y., assignors to Deknatel, Inc.
Filed Apr. 7, 1976, Ser. No. 674,748
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—59



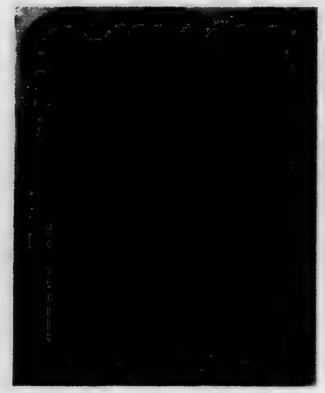
245,373
UPHOLSTERY FABRIC OR THE LIKE
Verner Panton, Binningen, Switzerland, assignor to MIRA-X S.A. Suhr, Suhr, Switzerland
Filed Mar. 26, 1975, Ser. No. 562,372
Claims priority, application Switzerland, Dec. 27, 1974, 60138/74
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—1 T



245,374
UPHOLSTERY FABRIC OR THE LIKE
Verner Panton, Binningen, Switzerland, assignor to MIRA-X S.A. Suhr, Suhr, Switzerland
Filed Mar. 26, 1975, Ser. No. 562,373
Claims priority, application Switzerland, Dec. 27, 1974, 60138/74
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—1 T



245,375
UPHOLSTERY FABRIC OR THE LIKE
Verner Panton, Binningen, Switzerland, assignor to MIRA-X S.A. Suhr, Suhr, Switzerland
Filed Mar. 26, 1975, Ser. No. 562,374
Claims priority, application Switzerland, Dec. 27, 1974, 60138/74
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D92—1 P



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF AUGUST, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. B. Dick/Scott: *See—*
Plumadore, John D., 4,041,312, Cl. 250-315.00R.

A/S Hoyer-Ellefsen: *See—*
Eide, Ove; and Clausen, Carl F., 4,040,263, Cl. 61-86.000.

A & T Development Corporation: *See—*
Grosse, Aristid V., 4,040,216, Cl. 52-169.130.

Abblard, Jean; Marmain, Georges; and Viricel, Andree, to Philagro. Diphosphorous. 4,041,109, Cl. 260-927.00R.

Abe, Seikou: *See—*
Tanaka, Eizi; Mochizuki, Hiroshi; Kosuda, Tooru; Abe, Seikou; and Ohashi, Michihiro, 4,040,405, Cl. 123-139.0BG.

Abe, Tatsuo; Okamoto, Toshiki; Sakakura, Takao; and Tateno, Tatsuo, to Sumitomo Aluminum Smelting Company, Ltd. Method of producing aluminum fluoride. 4,041,137, Cl. 423-489.000.

Abic Ltd.: *See—*
Stolar, Morris E., 4,041,160, Cl. 424-229.000.

Aboshi, Michihiro; Kakutani, Tsutomu; Yoshitake, Katsumi; and Koseki, Toshinori, to Asahi Kasei Kogyo Kabushiki Kaisha. Thermoplastic resin composition. 4,041,002, Cl. 260-30.60R.

Abramowitz, Philip Herbert; and Balliett, Robert Wayne, to St. Joe Minerals Corporation. High-precision, fine-detail forging process. 4,040,286, Cl. 72-377.000.

Abura, Yoshinori: *See—*
Wada, Yukio; Abura, Yoshinori; and Matsui, Takeshi, 4,040,696, Cl. 339-8.00R.

Acda, Petrus Marinus, to Polva Nederland,BV. Apparatus for manufacturing an electrowelding component of synthetic material comprising a resistance element. 4,040,889, Cl. 156-498.000.

ACF Industries, Incorporated: *See—*
Carle, Ross G.; and Reinhardt, James R., 4,040,523, Cl. 213-46.00R.
Walk, Howard J.; and Rollins, Dallas W., 4,040,363, Cl. 105-377.000.

Achsel, Eberhard; Hortig, Hans-Peter; Seipp, Heinrich; and Giller, Heinz, to Hoechst Aktiengesellschaft. Apparatus for the purification of terephthalic acid dimethyl ester. 4,040,793, Cl. 23-273.00R.

ACS Industries, Inc.: *See—*
Botvin, George B., 4,040,139, Cl. 15-209.00B.

Adams, Ralph Delta; and Ingram, Charles Junior, to Cubic-Western Data. Ticket advance and printer mechanism. 4,040,345, Cl. 101-66.000.

Adams, Sally Lee: *See—*
Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 4,040,854, Cl. 106-90.000.

Addressograph Multigraph Corporation: *See—*
Foote, Francis C., 4,041,279, Cl. 235-61.70B.
Nielsen, Asger Torben, 4,040,722, Cl. 350-161.00W.

Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, to Bayer Aktiengesellschaft. Process for molding aromatic polycarbonates having perfluoroalkanesulphonic acid derivatives as mold release agents. 4,041,003, Cl. 260-30.80R.

Adinolfi, Rocco J., to Gillette Company, The. Hair styling tool. 4,040,432, Cl. 132-9.000.

AEP-International Ltd.: *See—*
Haskell, Harry Ainsworth, 4,041,329, Cl. 307-247.00A.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Armand, Michel B., 4,041,220, Cl. 429-191.000.
Francois, Bernard; Vernois, Michel; Martin, Paul; and Franta, Emile, 4,040,815, Cl. 75-.50B.

Agency of Industrial Science and Technology: *See—*
Otaki, Hideyuki, 4,040,327, Cl. 85-46.000.

Agrimatic Corporation: *See—*
Miller, Gary E., 4,040,388, Cl. 119-1.000.

Agusa, Kazuo: *See—*
Akahide, Kozo; and Agusa, Kazuo, 4,041,270, Cl. 219-73.00R.

Ahaus, Gerhard; Netzer, Siegfried; and Liebig, Hans-Peter, to WABCO Westinghouse GmbH. Fluid pressure operable brake apparatus with load-compensating means for vehicles with tandem rear axles. 4,040,673, Cl. 303-6.00C.

Air Preheater Company, Inc., The: *See—*
Stockman, Richard Franklin; and Baker, Roderick Jay, 4,040,475, Cl. 165-9.000.
Wheeler, Lewis Halsay, 4,040,473, Cl. 165-5.000.

Air Products and Chemicals, Inc.: *See—*
Bechara, Ibrahim S.; Carroll, Felix P.; Holland, Dewey G.; and Mascioli, Rocco L., 4,040,992, Cl. 260-2.5AW.

Airco, Inc.: *See—*
Grover, Vijay K.; and Zachry, Woodie, 4,040,714, Cl. 339-264.00R.

Aircraft Mechanics, Inc.: *See—*
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 4,040,532, Cl. 214-152.000.

Airflow Developments Limited: *See—*
Wilson, Alexander Connor, 4,040,293, Cl. 73-211.000.

Aisin Seiki Kabushiki Kaisha: *See—*
Isogai, Mitsuyuki; Tikusa, Kouiti; and Nakamura, Yosihiko, 4,040,162, Cl. 29-420.500.

Aizawa, Tatsuo: *See—*
Washio, Takaji; Sasaki, Koichi; and Aizawa, Tatsuo, 4,040,387, Cl. 118-658.000.

Ajinomoto Co., Inc.: *See—*
Uchio, Ryosuke; Kikuchi, Kenji; Asai, Soichiro; and Yarita, Kenichi, 4,040,906, Cl. 195-36.00R.

Akahide, Kozo; and Agusa, Kazuo, to Kawasaki Steel Corporation. Methods of welding corner joints. 4,041,270, Cl. 219-73.00R.

Akamatsu, Takashi: *See—*
Yamada, Eiji; Ito, Hiroaki; and Akamatsu, Takashi, 4,041,051, Cl. 260-373.000.

AKDOV Animal Health Care Products, Inc.: *See—*
Kuhn, Burt L., 4,040,422, Cl. 128-223.000.

Albany International Corporation: *See—*
Miessler, James D.; and Johnson, Arne I., 4,040,165, Cl. 29-458.000.

Albatex A.G.: *See—*
Genini, Graziano, 4,040,454, Cl. 139-448.000.

Alberny, Robert; and Vedda, Louis, to Institut des Recherches de la Siderurgie Francaise. Continuous-casting system with electro-magnetic mixing. 4,040,467, Cl. 164-49.000.

Albertson, Kenneth Ray; and Beck, Gerald Helmut, to Parker-Hannifin Corporation. Composite packing. 4,040,636, Cl. 277-188.00A.

Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, to Hoechst Aktiengesellschaft. Fungicidal dispersions of carboxylic acid amides. 4,041,164, Cl. 424-263.000.

Albright, James A.; and Lindvay, Michael W., to Velsicol Chemical Corporation. Acrylate esters of dihaloneopentyl glycol phosphates (phosphorinanes) and their use as flame retardants. 4,041,012, Cl. 260-45.80A.

Alburn, Harvey E.: *See—*
Dvonch, William; and Alburn, Harvey E., 4,041,037, Cl. 260-256.40C.

Alcan Research and Development Limited: *See—*
Chandler, John Leslie, 4,040,954, Cl. 210-42.00R.

Alexandre, Philippe, to Societe Generale de Constructions Electriques et Mecaniques Alsthom. Valve seat construction for valves for controlling the pressure of liquids. 4,040,442, Cl. 137-543.170.

Alfredeen Production AB: *See—*
Berglund, Sture, 4,040,685, Cl. 308-189.00R.

Allaire, John O.: *See—*
Van Vonno, Nicolaas C.; and Allaire, John O., 4,040,997, Cl. 260-23.0XA.

Allen-Bradley Company: *See—*
Kouchich, Allan; and Taylor, George W., 4,041,436, Cl. 338-21.000.

Allen, John K.; and Bertolacini, Ralph J., to Standard Oil Company a corporation of Indiana. Process for the isomerization of dimethylnaphthalenes using a mordenite/alumina catalyst. 4,041,089, Cl. 260-668.00A.

Alliance Manufacturing Company, Inc., The: *See—*
Deming, Andrew F., 4,041,259, Cl. 200-46.000.

Allied Chemical Corporation: *See—*
Libowitz, George G., 4,040,410, Cl. 126-270.000.
Weiss, William Robert; Saich, Anthony Michael; and Cooksey, James Judson, 4,040,782, Cl. 28-271.000.

Allison, Truman L.: *See—*
Slane, Francis L.; and Allison, Truman L., 4,041,470, Cl. 364-900.000.

Allori, Raymond J.: *See—*
Kestian, Anthony M.; and Allori, Raymond J., 4,040,499, Cl. 180-77.00R.

Alloy Metals, Inc.: *See—*
Stern, Marvin J., 4,040,822, Cl. 75-140.000.

Alloy Surfaces Company, Inc.: *See—*
Baldi, Alfonso L.; and Damiano, Victor V., 4,041,196, Cl. 427-252.000.

Alps Electric Co., Ltd.: *See—*
Noji, Tasuku; and Yasuma, Yoichi, 4,041,422, Cl. 334-49.000.

Alstad, Jorolf; and Farbu, Leif, to Forskningsgruppe for Sjeldne Jordarter. Process for separation of the lanthanides. 4,041,125, Cl. 423-21.000.

Altenburger, Otto; and Dorazio, Alton E., to Stromberg-Carlson Corporation. Bus monitor circuit for detecting malfunction of telephone circuits connected in groups to a common bus. 4,041,253, Cl. 179-175.20R.

Altenhoner, Klaus; Jansen, Walter; Knop, Klaus; Pohl, Ulrich; and

Reerink, Jan G., to Thyssen Purofer GmbH. Process for the production of sponge iron. 4,040,816, Cl. 75-35.000.

Amax Resource Recovery Systems, Inc.: *See—*
Jones, Dennis A., 4,040,852, Cl. 106-97.000.

Amchem Company Limited: *See—*
Baker, George Edward, 4,041,269, Cl. 219-69.00E.

Amemiya, Kiyosi; and Takida, Hiroshi, to Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha. Process for preparing hydrolyzed ethylene-vinyl acetate copolymer having improved heat stability. 4,041,223, Cl. 526-10.000.

Amerace Corporation: *See—*
Obuch, Edward A., 4,040,700, Cl. 339-95.00R.
Waddington, William T.; Jenkins, Harold F.; and Filak, Paul T., 4,040,711, Cl. 339-198.00R.

American Brands, Inc.: *See—*
Ashworth, James G.; Glock, Eugene; Kelly, James G.; McLaughlin, James L.; and Merwin, Owen T., 4,040,431, Cl. 131-140.00P.

American Cyanamid Company: *See—*
Asato, Goro; and Bentley, Terence James, 4,041,070, Cl. 260-553.00A.
Cross, Barrington; and Walworth, Bryant Leonidas, 4,041,046, Cl. 548-375.000.
Los, Marinus, 4,041,045, Cl. 548-302.000.
Matsuda, Ken; and Barber, William Austin, 4,040,980, Cl. 252-463.000.
Milionis, Jerry Peter; and Spicer, Larry Dean, 4,041,151, Cl. 424-78.000.
Roth, Roy William, 4,040,884, Cl. 156-209.000.
Zipperian, Donald Edwin; Jones, James Allen; and Buza, Thomas Brian, 4,040,950, Cl. 209-166.000.

American Hoechst Corporation: *See—*
Van Vonno, Nicolaas C., 4,040,996, Cl. 260-23.0XA.
Van Vonno, Nicolaas C.; and Allaire, John O., 4,040,997, Cl. 260-23.0XA.

American Home Products Corporation: *See—*
Dvonch, William; and Alburn, Harvey E., 4,041,037, Cl. 260-256.40C.
Fenichel, Richard L.; and Levin, Howard J., 4,041,155, Cl. 424-177.000.

American Safety Equipment Corporation: *See—*
Tanaka, Akira; and Ulrich, Charles J., 4,040,664, Cl. 297-389.000.

American Seating Company: *See—*
Barecki, Chester J., 4,040,660, Cl. 297-389.000.

Amor, William H., Jr.; and Steffek, Robert J., to Picker Corporation. Telescopic column for X-ray apparatus. 4,041,320, Cl. 250-523.000.

AMP Incorporated: *See—*
Brown, Leon Richard, 4,040,180, Cl. 29-753.000.
Dola, Frank Peter; and Rossler, Frederick William, Jr., 4,040,709, Cl. 339-125.00L.
Huber, John Henry, 4,040,704, Cl. 339-99.00R.
Huber, John Henry, 4,040,705, Cl. 339-99.00R.
Loose, Winfield Warren, 4,041,547, Cl. 361-410.000.
Sanchez, Miguel Ruiz, 4,040,179, Cl. 29-749.000.
Shaffer, Howard Richard; and Frantz, Robert Houston, 4,040,703, Cl. 339-99.00R.

AMP Incorported: *See—*
Kahn, David; and Geckle, Raymond James, 4,040,808, Cl. 65-33.000.

Ampex Corporation: *See—*
Ryan, Dennis M., 4,040,575, Cl. 242-76.000.

Amplett, Robert, to Rist's Wires & Cables Limited. Apparatus for assembling a flexible sleeve to a lead. 4,040,178, Cl. 29-745.000.

Amsler, Joachim, to Sprecher & Schuh AG. Contact arrangement for an electrical switch, especially for a vacuum switch. 4,041,262, Cl. 200-144.00B.

Anchor Hocking Corporation: *See—*
Siler, Harold L., Jr.; and Roberts, Cecil P., 4,040,236, Cl. 53-67.000.

Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,041,013, Cl. 260-45.75R.

Anderson Development Company: *See—*
Meyer, Jeffrey G., 4,041,226, Cl. 526-144.000.

Anderson, Raymond R. Rock windrower. 4,040,490, Cl. 171-63.000.

Anderson, Thomas E.: *See—*
Peak, Steven C.; and Anderson, Thomas E., 4,041,365, Cl. 363-58.000.

Ando, Hirokazu: *See—*
Kawasaki, Masahiro; and Ando, Hirokazu, 4,041,506, Cl. 354-51.000.

Andreev, Anatoly Fedorovich: *See—*
Iodvalkis, Vitautas Jurgio; Nomitsas, Richardas Prano; Andreev, Anatoly Fedorovich; and Grekov, Vladimir Borisovich, 4,041,504, Cl. 354-23.00R.

Andrews, James D., to TRW Inc. Filter assembly for electrochemical machining apparatus. 4,040,933, Cl. 204-224.00M.

Andrews, Ottie H. Wave-pump apparatus. 4,040,257, Cl. 61-20.000.

Angott, Paul G., to Thermotrol Corporation. Thermostat timer. 4,041,325, Cl. 307-141.000.

Anheuser-Busch, Incorporated: *See—*
Stubits, Marcella C.; and Teng, James, 4,041,179, Cl. 426-3.000.
Voigt, John E.; and Bovier, Edward M., 4,040,862, Cl. 127-70.000.

Ankel, Helmut: *See—*
Chany, Charles; Galliot, Brigitte; Chevalier, Marie-Josephe; and Ankel, Helmut, 4,041,152, Cl. 424-85.000.

Anthony, Thomas R.; and Cline, Harvey E., to General Electric Company. High voltage deep diode power semiconductor switch. 4,040,869, Cl. 148-1.500.

Anthony, Thomas R.: *See—*
Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., 4,040,868, Cl. 148-1.500.
Cline, Harvey E.; and Anthony, Thomas R., 4,040,171, Cl. 29-577.000.

Antos, George J., to UOP Inc. Dehydrocyclization with an acidic multimetallic catalytic composite. 4,041,092, Cl. 260-673.500.

Aonuki, Kiichi: *See—*
Watanabe, Haruo; Kitagawa, Toru; Negishi, Masaaki; Aonuki, Kiichi; and Kobayashi, Harunobu, 4,041,059, Cl. 260-424.000.

Applequist, Quintin A.; and Hawley, Laird V., to Roberts Industries, Inc. Adjustable vehicle axle. 4,040,643, Cl. 280-656.000.

Arai, Atsuaki; Shiba, Keisuke; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, to Fuji Photo Film Co., Ltd. Two-equivalent magenta couplers with amido coupling-off groups. 4,040,835, Cl. 96-56.500.

Arai, Atsuaki; Nakamura, Kotaro; Yamada, Minoru; and Furutachi, Nobuo, to Fuji Photo Film Co., Ltd. Silver halide emulsion containing two-equivalent coupler. 4,040,836, Cl. 96-56.500.

Araki, Kenji: *See—*
Nakaoka, Kazuhide; and Araki, Kenji, 4,040,873, Cl. 148-12.00C.

Arco Industries Corporation: *See—*
Olmstead, Clarence W.; and Triquet, Fred E., 4,041,241, Cl. 174-153.00G.

Arctic Enterprises, Inc.: *See—*
Peterson, Edward W.; and Bednar, Charles J., 4,040,693, Cl. 312-236.000.

Arfelt, Soren Christian Schoubye; Clausen, Ib Christian; Jensen, Johannes; Fynbo, Knud Hansen; and Fischer, Jean Arnold, to Daempa A/S. Door lock. 4,040,652, Cl. 292-167.000.

Argabright, Perry A.; and Presley, C. Travis, to Marathon Oil Company. Method of consolidating particles. 4,040,258, Cl. 61-36.00C.

Argade, Shyam D.; Bortak, John J.; Collins, Stephen M.; and Weissman, Eugene Y., to BASF Wyandotte Corporation. Protective covering for electrolytic filter press cell frames. 4,040,935, Cl. 204-256.000.

Ariss, Stephen Arthur: *See—*
Burrows, Ian Edward; Cheney, Peter Arthur; and Ariss, Stephen Arthur, 4,041,181, Cl. 426-55.000.

Ariyan, Zaven S.: *See—*
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,041,167, Cl. 424-270.000.

Armand, Michel B., to Agence Nationale de Valorisation de la Recherche (ANVAR). Mixed conductors of graphite, processes for their preparation and their use, notably for the production of electrodes for electrochemical generators, and new electrochemical generators. 4,041,220, Cl. 429-191.000.

Armco Steel Corporation: *See—*
Lyke, Richard F., 4,041,377, Cl. 324-34.0MA.
Neilon, Claude R., 4,040,264, Cl. 61-86.000.

Armour-Dial, Inc.: *See—*
Steinhauer, Roger C.; and Bertozzi, Richard J., 4,040,966, Cl. 252-8.800.

Arnold, Addie M. Food tray for automobiles. 4,040,659, Cl. 297-194.000.

Arnold, John Spencer, to Plessey Handel und Investments AG. Data processing systems. 4,041,464, Cl. 364-200.000.

Arnold, Ruben Robert. Emergency locator system for locating and retrieving sunken vessels. 4,040,135, Cl. 9-9.000.

Arnoldi, Hugh; and Salvatore, Leonard Robert, to RCA Corporation. Transistor circuit. 4,041,388, Cl. 324-158.00T.

Aro Corporation, The: *See—*
Clifford, Earl W., 4,040,428, Cl. 128-351.000.

Arpe, Hans-Jurgen; and Hey, Hansjorg, to Hoechst Aktiengesellschaft. Process for preparing 2-ethyl-pyridine. 4,041,039, Cl. 260-290.00R.

Aryamane, Avinash P.: *See—*
Williamson, Harold L.; and Aryamane, Avinash P., 4,040,175, Cl. 29-623.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Aboshi, Michihiro; Kakutani, Tsutomu; Yoshitake, Katsumi; and Koseki, Toshinori, 4,041,002, Cl. 260-30.60R.

Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Kawasaki, Masahiro; and Ando, Hirokazu, 4,041,506, Cl. 354-51.000.

Asai, Soichiro: *See—*
Uchio, Ryosuke; Kikuchi, Kenji; Asai, Soichiro; and Yarita, Kenichi, 4,040,906, Cl. 195-36.00R.

Asato, Goro; and Bentley, Terence James, to American Cyanamid Company. Tetrahydro-4-imino-1-naphthylureas. 4,041,070, Cl. 260-553.00A.

Asea Aktiebolag: *See—*
Grune, Per Olof, 4,041,264, Cl. 200-148.00R.

Ashworth, James G.; Glock, Eugene; Kelly, James G.; McLaughlin, James L.; and Merwin, Owen T., to American Brands, Inc. Method of increasing the filling capacity of shredded tobacco tissue. 4,040,431, Cl. 131-140.00P.

Assandri, Alessandro; Lancini, Giancarlo; Volpe, Giancarlo; and Cavalleri, Bruno, to Gruppo Lepetit S.p.A. Nitroimidazole derivative with antibacterial activity. 4,041,168, Cl. 424-273.000.

Asselin, Andre A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,041,169, Cl. 424-274.000.

Assenmacher, Gerhard. Method and fixture for reaming piston pin bushings in connecting rods. 4,040,763, Cl. 408-1.00R.

Atchley, Gary S.: *See—*
Hatcher, Charles S.; and Atchley, Gary S., 4,040,153, Cl. 28-221.000.

Atkins, Frederick Joseph; and Keene, Henry Rich, to Edson Corporation, The. Boat steering system. 4,040,375, Cl. 114-160.000.

Atlantic Pipe Corporation: *See—*
Ottmann, Norman; and Strever, Walter, 4,041,118, Cl. 264-71.000.

Atlantic Richfield Company: *See—*
Richards, Lawrence M., 4,040,480, Cl. 166-57.000.
Washall, Thomas A., 4,041,139, Cl. 423-508.000.
Zehner, Lee R.; and Zajacek, John G., 4,041,067, Cl. 260-485.00R.
Zehner, Lee R.; and Zajacek, John G., 4,041,068, Cl. 260-485.00R.

Atsukawa, Masumi; Kamei, Kazumi; Shinoda, Naoharu; and Ushio, Hiroyuki, to Mitsubishi Jukogyo Kabushiki Kaisha. Wet waste flue gas desulfurizing process using lime as absorbent. 4,040,803, Cl. 55-73.000.

Auburn Research Foundation: *See—*
Goodling, John S.; McDaniel, Gayner R.; and Steadham, Richard A., 4,040,425, Cl. 128-303.140.

August Thyssen-Hutte AG: *See—*
Voss, Eitel; Waldofner, Karl-Heinz; and Harz, Kurt, 4,040,789, Cl. 23-230.00A.

Ault, Earl R.; Stevens, Philip C.; Sipman, Robert H.; and Bradford, Robert S., Jr., to Northrop Corporation. Coaxial electron beam pumped laser. 4,041,415, Cl. 331-94.5PE.

Austin, Robert Roy; and Tyson, George Noblit. Apparatus for generation of carbon dioxide gas and the carbonation of water. 4,040,342, Cl. 99-323.100.

Auto Restraint Systems Limited: *See—*
Giffen, William McAlpin; Pollitt, John Michael; and Clifford, Roy, 4,040,645, Cl. 280-745.000.

Automobiles Peugeot: *See—*
Leichle, Claude, 4,040,397, Cl. 123-32.0AE.

Autotype Company Limited, The: *See—*
Hepher, Martin; Sperry, John Arthur; and Stewart, Malcolm John, 4,041,204, Cl. 428-199.000.

Avco Corporation: *See—*
Webb, George, 4,040,358, Cl. 102-79.000.

Avenia, Richard William; Christenson, James Gordon; and Pecherer, Benjamin, to Hoffmann-La Roche Inc. Immunoassay for pharmacologically active phenethylamines. 4,041,076, Cl. 260-559.00A.

Avtex Fibers Inc.: *See—*
Smith, Frederick R., 4,041,121, Cl. 264-191.000.

Axelrod, Shoya Samuilovich; Belozerov, Viktor Grigorievich; Gershman, Mikhail Bentsionovich; Margolin, Evel Grigorievich; and Shapot, Mikhail Borisovich. Separator for alkaline storage batteries. 4,041,218, Cl. 429-136.000.

Ayerst McKenna and Harrison Ltd.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,041,169, Cl. 424-274.000.

B. F. Goodrich Company, The: *See—*
Hess, Nelson Claire, 4,040,380, Cl. 116-34.00R.
Rajput, Yudh Vir, 4,040,676, Cl. 303-92.000.

Bach, Ricardo O.; and Morrison, Robert C., to Lithium Corporation of America. Recirculation telomerization process and its liquid telomers and liquid telomers produced thereby. 4,041,088, Cl. 260-668.00B.

Bacha, John D.; and Selwitz, Charles M., to Gulf Research & Development Company. Process for inhibiting the polymerization of styrene. 4,040,911, Cl. 203-9.000.

Baillargeon, John L.; and Clifford, Leonard W., to Eltra Corporation. Ignition breaker point arrangement. 4,040,406, Cl. 123-146.50A.

Baker, George Edward, to Amchem Company Limited. Cartridge for an electrical discharge machining apparatus. 4,041,269, Cl. 219-69.00E.

Baker, Philip G.; and Johnson, Bruce K., to Polaroid Corporation. Unicell photometer device. 4,040,751, Cl. 356-225.000.

Baker, Roderick Jay: *See—*
Stockman, Richard Franklin; and Baker, Roderick Jay, 4,040,475, Cl. 165-9.000.

Baldi, Alfonso L.; and Damiano, Victor V., to Alloy Surfaces Company, Inc. Diffusion treatment of metal. 4,041,196, Cl. 427-252.000.

Balliett, Robert Wayne: *See—*
Abramowitz, Philip Herbert; and Balliett, Robert Wayne, 4,040,286, Cl. 72-377.000.

Baltz, John; and Coltrinari, Enzo, to PGP Industries, Inc. Separation and selective recovery of platinum and palladium by solvent extraction. 4,041,126, Cl. 423-22.000.

Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., to Olinkraft, Inc. Combination shipping and storage container and method. 4,040,558, Cl. 229-23.0BT.

Ban, Masaaki: *See—*
Furuto, Yoshio; and Ban, Masaaki, 4,041,376, Cl. 324-33.000.

Baratoff, Paul, to Korfund Dynamics Corporation. Vibration isolator with integral non-amplifying seismic restraint. 4,040,590, Cl. 248-358.0AA.

Barber-Colman Company: *See—*
Trost, Wayne C.; and Capps, John B., 4,040,451, Cl. 139-48.000.

Barber, William Austin: *See—*
Matsuda, Ken; and Barber, William Austin, 4,040,980, Cl. 252-463.000.

Bardotti, Angelo; and Pederzini, Renzo, to Honeywell Information Systems Italia. Computer input/output control apparatus. 4,041,473, Cl. 364-900.000.

Barecki, Chester J., to American Seating Company. Adjustable back seat with reduced moment arm. 4,040,660, Cl. 297-389.000.

Bargar Metal Fabricating Company: *See—*
Penczak, John P., 4,041,238, Cl. 174-48.000.

Barie, Walter P., Jr.; Onopchenko, Anatoli; and Schulz, Johann G. D., to Gulf Research & Development Company. Polyepoxy-3,3',4,4'-benzhydrol tetracarboxylic dianhydride laminating resins. 4,041,004, Cl. 260-32.8EP.

Barigot, Jean-Claude: *See—*
Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, 4,041,392, Cl. 325-38.00A.

Barlow, Charles Brian, to Imperial Chemical Industries Limited. Compositions and methods for combating insect pests or fungal pests of plants. 4,041,172, Cl. 424-304.000.

Barlow, Gordon A.; and Isaacson, Anson, to Marvin Glass & Associates. Simulated volleyball game apparatus. 4,040,621, Cl. 273-85.00C.

Bartch, Donald Walter: *See—*
Deal, Samuel Broughton; and Bartch, Donald Walter, 4,041,347, Cl. 313-450.000.

BASF Aktiengesellschaft: *See—*
Maier, Karl; Hansen, Guenter; and Kermer, Wolf-Dieter, 4,041,025, Cl. 260-158.000.
Schoeppl, Hubert; Petersen, Harro; Paulus, Gerhard; and Queins, Hubertus, 4,041,222, Cl. 526-6.000.

BASF Wyandotte Corporation: *See—*
Argade, Shyam D.; Bortak, John J.; Collins, Stephen M.; and Weissman, Eugene Y., 4,040,935, Cl. 204-256.000.

Basila, Michael R.; and Broersma, Frank R., to Nalco Chemical Company. Ozonization catalyst. 4,040,982, Cl. 252-466.00J.

Bastron, Victor C.: *See—*
Behrmann, William C.; Turner, Earl E.; and Bastron, Victor C., 4,041,100, Cl. 260-683.470.

Batozsky, Vadim Ivanovich: *See—*
Makeev, Boris Anatolievich; Stepochkin, Lev Mikhailovich; Korot, Garri Moiseevich; Batozsky, Vadim Ivanovich; Khodorov, Alexandr Iosifovich; Zhuravlev, Vitaly Ivanovich; and Eremenko, Adolf Grigorievich, 4,040,318, Cl. 83-71.000.

Battelle Development Corporation: *See—*
Henager, Charles H., 4,040,220, Cl. 52-259.000.

Battelle Memorial Institute: *See—*
Moore, Raymond H., 4,041,142, Cl. 423-573.00G.

Baturka, Walter, to Houdaille Industries, Inc. Tool holder. 4,040,764, Cl. 408-59.000.

Baud, Michael F.; and Harvey, Jay A., to Great Lakes Carbon Corporation. Method for the manufacture of carbon-carbon composites. 4,041,116, Cl. 264-29.500.

Bauer, Carl F.; Welsh, Lawrence B.; Youtsey, Karl J.; and Szofran, Frank R., to Universal Oil Products Company. Oxygen sensor having thin film electrolyte. 4,040,929, Cl. 204-195.00S.

Bauer, Peter W.; and Paulson, Merle R., to United States of America, Navy. Satellite up link diversity switch. 4,041,397, Cl. 325-304.000.

Bauer, Timothy R.: *See—*
Horton, Robert A.; and Bauer, Timothy R., 4,040,466, Cl. 164-17.000.

Bauer, Werner, to International Standard Electric Corporation. Voltage multiplier arrangement. 4,041,366, Cl. 363-61.000.

Baughn, Charles O.: *See—*
Brown, William E.; Baughn, Charles O.; and Linkenheimer, Wayne H., 4,041,175, Cl. 424-311.000.

Baxter, Robert F. Utility system wall safe. 4,040,365, Cl. 109-50.000.

Baxter, Robert Olin; and Rothschild, Arthur Louis, III, to International Paper Company. Dunnage bag. 4,040,526, Cl. 214-10.50D.

Baxter Travenol Laboratories, Inc.: *See—*
Stockdale, Douglas P.; Mencarini, Richard; Deaton, Carlton D.; and Owen, Ralph M., 4,040,234, Cl. 53-38.000.

Bayer Aktiengesellschaft: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,041,003, Cl. 260-30.80R.
Binsack, Rudolf; and Vernaleken, Hugo, 4,041,018, Cl. 260-75.00R.
Herzog, Helmut; Bien, Hans-Samuel; and Hohmann, Walter, 4,041,053, Cl. 260-381.000.
Kyri, Hans; Brandle, Karl; Muller, Martin; and Heine, Heinrich, 4,040,850, Cl. 106-87.000.
Mansmann, Manfred; and Rambold, Wolfgang, 4,040,860, Cl. 106-302.000.
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,158, Cl. 424-212.000.
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,177, Cl. 424-322.000.
Ullrich, Martin, 4,040,607, Cl. 259-192.000.
Wolfrum, Gerhard; and Otten, Hans-Gunter, 4,041,024, Cl. 260-158.000.

Baylor, John M.: *See—*
Schuck, Paul R.; and Baylor, John M., 4,040,261, Cl. 61-72.600.

Bayne, Richard L.: *See—*
Pecoraro, George A.; and Bayne, Richard L., 4,040,809, Cl. 65-182.00R.

BBC Brown Boveri & Company Limited: *See—*
Schroder, Dierk, 4,041,370, Cl. 323-8.000.

Beard, Hobert M., Jr.: *See—*
Pacifici, James G.; Newland, Gordon C.; and Beard, Hobert M., Jr., 4,040,923, Cl. 204-159.150.

Beaven, Herbert R., Jr.; and Roberts, Daniel M., to Rockwell International Corporation. Paper moving mechanism. 4,040,511, Cl. 197-133.00R.

Bechara, Ibrahim S.; Carroll, Felix P.; Holland, Dewey G.; and Masci-

oli, Rocco L., to Air Products and Chemicals, Inc. Catalysis of organic isocyanate reactions. 4,040,992, Cl. 260-2.5AW.
Beck, Gerald Helmut: *See—*
Albertson, Kenneth Ray; and Beck, Gerald Helmut, 4,040,636, Cl. 277-188.00A.
Becker, Burckhard, to Volkswagenwerk Aktiengesellschaft. Safety steering column with a deforming element. 4,040,646, Cl. 280-750.000.
Becton, Dickinson and Company: *See—*
Young, H. Theodore, 4,040,421, Cl. 128-218.00N.
Bednar, Charles J.: *See—*
Peterson, Edward W.; and Bednar, Charles J., 4,040,693, Cl. 312-236.000.
Beeler, Alfred; and van der Mijden, Wilhelmus Marinus Cornelius, to U.S. Philips Corporation. Method of manufacturing an electrical contact. 4,040,177, Cl. 29-630.00C.
Beeman, Robert Herbert; and Tarr, Lloyd Arthur, to GTE Automatic Electric Laboratories Incorporated. Tone detection synchronizer. 4,041,248, Cl. 179-84.0VF.
Beeson, Robert M.: *See—*
Cota, Dan E.; Charter, Ted R.; Beeson, Robert M.; and Kinkead, Robin D., 4,041,467, Cl. 364-900.000.
Begg, John Robert William, to British Leyland UK Limited. Vehicle chassis. 4,040,640, Cl. 280-106.00R.
Behringwerke Aktiengesellschaft: *See—*
Bohn, Hans, 4,041,021, Cl. 260-112.00B.
Behrmann, William C.; Turner, Earl E.; and Bastron, Victor C., to Exxon Research and Engineering Company. Catalytic alkylation utilizing olefinic, conjugated cyclic hydrocarbons as promoter therein. 4,041,100, Cl. 260-683.470.
Beitel, Sydney B.: *See—*
Francisco, Herbert H.; Martocci, Anthony P.; and Beitel, Sydney B., 4,041,273, Cl. 219-121.0EM.
Belcher, Donald Keith, to Harris Corporation. RF level detector. 4,041,410, Cl. 330-129.000.
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Briley, Bruce Edwin, 4,041,247, Cl. 179-81.00R.
Burrus, Charles Andrew, Jr.; and Stone, Julian, 4,040,890, Cl. 156-605.000.
Chiapparoli, Richard Samuel, Jr., 4,041,403, Cl. 328-39.000.
Glance, Bernard, 4,041,416, Cl. 331-96.000.
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Seidel, Harold, 4,040,728, Cl. 331-55.000.
Zarouni, Alfred, 4,041,243, Cl. 179-6.500.
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Benson, Richard W.; Cherney, Steven D.; and Collier, Everett J., to Procter & Gamble Company, The. Builder system and detergent product. 4,040,988, Cl. 252-532.000.
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Berchielli, Aldo S.; and Chireau, Roland F., to Yardney Electric Corporation. Zinc electrodes and methods of making same. 4,041,221, Cl. 429-206.000.
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Berglund, Sture, to Alfredeen Production AB. Measuring apparatus. 4,040,685, Cl. 308-189.00R.
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Bihrle, William, Jr. Methods and apparatus for effecting recovery of a high speed aircraft from a condition of incipient or developed spin. 4,040,583, Cl. 244-113.000.
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Bindra, Jasjit S.; and Kadin, Saul B., to Pfizer Inc. N-(5-Tetrazolyl)-4-oxo-4H-pyrimido(2,1-b)benzothiazole-3-carboxamide antiallergy agents. 4,041,163, Cl. 424-251.000.
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Black, William Brown, to Refractory Services International Limited. Baking pit furnaces. 4,040,778, Cl. 432-192.000.
Blackwell, Henry Wayne, to Dresser Industries, Inc. Oil well tool with packing means. 4,040,649, Cl. 285-3.000.
Blajda, Raymond S.; Kantenwein, Robert W.; Gaughan, Gerald E.; and Sikra, John F., to United States of America, Army. Discarding frangible rotating band. 4,040,359, Cl. 102-93.000.
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Blanchard, Clarence E., to Outboard Marine Corporation. Method and apparatus for installing a marine propulsion device. 4,040,378, Cl. 115-74.000.
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Englander, Harlan P.; and Pinkel, Edward B., 4,040,898, Cl. 159-27.00R.
Bleckmann, Hans-Wilhelm, to ITT Industries, Incorporated. Device for utilization in anti-skid control systems. 4,040,677, Cl. 303-95.000.
Bleiberg, Melvin L.; Diamond, Sidney; Rowcliffe, Arthur F.; and Spitznagel, John A., to Westinghouse Electric Corporation. High temperature alloys and members thereof. 4,040,876, Cl. 148-37.000.
Blish, Richard C., II; and Lemons, Kyle Eugene, to Signetics Corporation. Etchants for glass films on metal substrates. 4,040,897, Cl. 156-656.000.
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Blount, Richard, to General Electric Company. Photoflash array with discharge path for electrostatic charges. 4,041,300, Cl. 240-1.300.
Blue, Sidney D. Convertible shirt collar. 4,040,125, Cl. 2-139.000.
Boah, John K., to General Electric Company. Heating apparatus for temperature gradient zone melting. 4,041,278, Cl. 219-411.000.
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Boger, Manfred; Drabek, Joseph; and Pissiotas, Georg, to Ciba-Geigy Corporation. Method for the cultivation of plants employing N-alkyl-

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Bohn, Hans, to Behringwerke Aktiengesellschaft. AP-glycoproteins and process for isolating them. 4,041,021, Cl. 260-112.00B.
Boleda, Alberto; and Tracey, Robert J., to GTE Automatic Electric Laboratories Incorporated. Analog-to-digital converter using common circuitry for sample-and-hold and integrating functions. 4,041,484, Cl. 340-347.0NT.
Bonacina, Remigio. Method of candying fruit and fruit rinds. 4,041,184, Cl. 426-321.000.
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Boranian, Armen G.; and Timm, Walter C., to GAF Corporation. Stack of tiles which have a release layer on one major face and an adhesive layer on the opposed major face does not require disposable release interlayers. 4,041,200, Cl. 428-40.000.
Border, Robert O.; and Rudman, Ronald H., to United States of America, Army. Variable spring rate equilibrators. 4,040,332, Cl. 89-37.00F.
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Bosche, Earl E.; Havlik, Jay M.; and Kyle, James C., to Dow Chemical Company, The. Flume mixer. 4,040,256, Cl. 61-15.000.
Botvin, George B., to ACS Industries, Inc. Scouring pad or the like. 4,040,139, Cl. 15-209.00B.
Boundy, Geoffrey A., to Boundy, Glenys Irene. Pipe sealing apparatus. 4,040,450, Cl. 138-94.000.
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Boyd, Keith A., to Eaton Corporation. Flexible drive for rotating a fan. 4,040,272, Cl. 64-26.000.
Boyle, James. Dispenser cover and indicator. 4,041,480, Cl. 340-280.000.
Bradford, Robert S., Jr.: *See—*
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Bradley, Frank R.; and McCoy, Rawley D., to Bradley Telcom Corporation. Telephone line characteristic display. 4,041,254, Cl. 179-175.30R.
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Bramer, Henry C.; and Shapiro, Edward, to Pittsburgh Environmental and Energy Systems, Inc. Method for purification of exhaust gases. 4,041,128, Cl. 423-213.200.
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Brattain, William G. Puzzle. 4,040,630, Cl. 273-157.00R.
Braudeau, Pierre; and Maillet, Alfred Marie Aime, to Carel Fouche Languepin. Method for adjusting the eccentricity of a spark-erosion machining electrode endowed with a movement of circular translation and a device for the application of said method. 4,041,268, Cl. 219-69.00G.
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Brave, Ronald M.; Brave, Dennis G.; and Feldeman, Arnold S. Electric switch. 4,041,265, Cl. 200-159.00R.
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Bretone, Salvatore William. Building block and wall construction. 4,040,225, Cl. 52-585.000.
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Brimm, Collen Kieth. Partial turn panel fastener. 4,040,151, Cl. 24-221.00K.
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Britz, Robert N. Fan wheel. 4,040,769, Cl. 416-213.00A.
Brock, Robert J.; and Meitner, Gary H., to Kimberly-Clark Corporation. Nonwoven thermoplastic fabric. 4,041,203, Cl. 428-157.000.
Broemer, Heinz; and Meinert, Norbert, to Ernst Leitz G.m.b.H. Optical fluorophosphate glass and process of making same. 4,040,846, Cl. 106-47.00Q.
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Brown, Cicero C., deceased; Brown, Joe Russell, executor; and Brown, Ramey Lee, executor. Check valve assembly. 4,040,441, Cl. 137-519.500.
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Brown, Leon Richard, to AMP Incorporated. Wire cone assembly. 4,040,180, Cl. 29-753.000.
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Brumbaugh, Andrew L. Ski and ski pole carrier. 4,040,551, Cl. 224-45.00S.
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Burrows, Ian Edward; Cheney, Peter Arthur; and Ariss, Stephen Arthur, to Pedigree Petfoods Limited. Pet food and method of making same. 4,041,181, Cl. 426-55.000.

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Capaul, Raymond W. Unitary structural panel for ceiling and wall installations. 4,040,213, Cl. 52-145.000.

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Carroll, Felix P.: *See—*
Bechara, Ibrahim S.; Carroll, Felix P.; Holland, Dewey G.; and Mascioli, Rocco L., 4,040,992, Cl. 260-2.5AW.

Carson, William S. Nestable fruit harvesting container. 4,040,461, Cl. 150-51.000.

Carter, Jesse Donald. Storage and carrying case for compact cassettes. 4,040,518, Cl. 206-387.000.

Carter, Reid F., to Chevron Research Company. Combination flyer-jumper and method of manufacture of same in which the jumper/-flyer is associated with a geophysical data acquisition system that provides digital data in the field before recording. 4,041,444, Cl. 340-15.5TS.

Carter, Reid F., to Chevron Research Company. Method of connecting flexible numbers of geophone flyer groups to data acquisition units. 4,041,445, Cl. 340-15.5TS.

Carter-Wallace, Inc.: *See—*
Soldati, Gianluigi, 4,041,028, Cl. 544-12.000.

Cartner, Donald W.: *See—*
Hopkins, Evan Leon; and Cartner, Donald W., 4,040,140, Cl. 15-236.00R.

Cartwright, John Edward, to Foseco International Limited. Refractory heat-insulating materials. 4,041,199, Cl. 428-36.000.

Casard Industries, Inc.: *See—*
Ward, Gregory A.; and Casey, Lawrence P., III, 4,040,562, Cl. 229-54.00R.

Casey, Lawrence P., III: *See—*
Ward, Gregory A.; and Casey, Lawrence P., III, 4,040,562, Cl. 229-54.00R.

Cassier, Robert X. Coin roll opener. 4,040,183, Cl. 30-296.00R.

Castello, Leo J. Knit-in pocket and method. 4,040,275, Cl. 66-64.000.

Catalyst Research Corporation: *See—*
Collins, William H., 4,041,217, Cl. 429-112.000.

Catanese, Carmen Anthony; and Keneman, Scott Allen, to RCA Corporation. Electron multiplier with beam confinement structure. 4,041,342, Cl. 313-105.00R.

Caterpillar Tractor Co.: *See—*
Nieman, John R., 4,040,468, Cl. 164-55.000.

Cavalleri, Bruno: *See—*
Assandri, Alessandro; Lancini, Giancarlo; Volpe, Giancarlo; and Cavalleri, Bruno, 4,041,168, Cl. 424-273.000.

CBS Inc.: *See—*
Lover, Seth E., 4,040,321, Cl. 84-1.150.

Cecil, Leonard. Golf glove. 4,040,126, Cl. 2-161.00A.

Centre Electronique Horloger S.A.: *See—*
Oguey, Henri J.; and Gerber, Bernard, 4,041,522, Cl. 357-42.000.

Cerro Corporation: *See—*
Eggers, Frank W., III; Wigger, Ralph O.; and Coan, Richard L., 4,040,865, Cl. 134-7.000.

Cgee Alsthom SA.: *See—*
Debaigt, Jean, 4,040,715, Cl. 339-272.00A.

Chabanel, Pierre, to Thomson-CSF. Automatic distortion correction arrangement. 4,041,534, Cl. 358-186.000.

Chaffin, John H., III; and Skogman, Richard A., to Honeywell Inc. Cadmium tellurite thin films. 4,040,927, Cl. 204-192.00S.

Champion Spark Plug Company: *See—*
Nemeth, Joseph, 4,040,998, Cl. 260-29.20M.

Chan, Kwok Yan; and Ko, Norman Wah Man, to W. Haking Industries, Ltd. Camera for underwater and above water use. 4,041,507, Cl. 354-64.000.

Chandler, John Leslie, to Alcan Research and Development Limited. Control of flocculant addition in sedimentation apparatus. 4,040,954, Cl. 210-42.00R.

Chaney, Preston E.; and Morgan, George W., to Suntech, Inc. Ice anchor. 4,040,262, Cl. 61-86.000.

Chang, Kenneth; and Pittler, Marvin S., to International Business Machines Corporation. Etching process utilizing the same positive photoresist layer for two etching steps. 4,040,891, Cl. 156-651.000.

Chang, Kern Ko Nan, to RCA Corporation. Avalanche transistor operating above breakdown. 4,041,515, Cl. 357-13.000.

Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Semiconductor device manufacture. 4,040,868, Cl. 148-1.500.

Chany, Charles; Galliot, Brigitte; Chevalier, Marie-Josephe; and Ankel, Helmut. Pharmaceutical formulation of interferon insolubilized by fixation on a support. 4,041,152, Cl. 424-85.000.

Chapman, William L.: *See—*
Miller, Dale E.; Chapman, William L.; Dunster, Donald E.; and Thomas, Bobby J., 4,041,372, Cl. 324-9.000.

Charter, Ted R.: *See—*
Cota, Dan E.; Charter, Ted R.; Beeson, Robert M.; and Kinkead, Robin D., 4,041,467, Cl. 364-900.000.

Chase-Shawmut Company, The: *See—*
Kozacka, Frederick J., 4,041,525, Cl. 337-295.000.

Cheadle, George D.: *See—*
Kelley, Arnold E.; Reeg, Cloyd P.; Wood, Frederick C.; and Cheadle, George D., 4,040,944, Cl. 208-89.000.

Chemetal Corporation: *See—*
Holzl, Robert A., 4,040,870, Cl. 148-6.300.

Chemetron Corporation: *See—*
Moore, Donald G., 4,041,266, Cl. 219-10.55E.
Oppenheim, Carl Emil; and McKenna, James, 4,040,362, Cl. 105-226.000.

Chemie Linz Aktiengesellschaft: *See—*
Binder, Walter; Hutter, Josef; Stich, Heinrich; Ruckensteiner, Kurt; Tines, Josef, deceased; Tines, Antonie, legal representative; and Schwarz, Heide, legal representative, 4,040,853, Cl. 106-103.000.

Chemplex Company: *See—*
Hoff, Raymond E.; Pullukat, Thomas J.; and Shida, Mitsuzo, 4,041,224, Cl. 526-96.000.
Pullukat, Thomas J., 4,041,225, Cl. 526-96.000.

Cheney, Peter Arthur: *See—*
Burrows, Ian Edward; Cheney, Peter Arthur; and Ariss, Stephen Arthur, 4,041,181, Cl. 426-55.000.

Cherney, Steven D.: *See—*
Benson, Richard W.; Cherney, Steven D.; and Collier, Everett J., 4,040,988, Cl. 252-532.000.

Cheron, Jacques, to Institut Francais du Petrole, des Carburants et Lubrifiants. Device for the sealing of a block formed of a pile of plates, such as a block of a fuel cell, while maintaining free passageways between these plates. 4,040,598, Cl. 249-176.000.

Chetelat, Fernand, to Ebauches S.A. Electronic watch. 4,040,245, Cl. 58-4.00A.

Chevalier, Marie-Josephe: *See—*
Chany, Charles; Galliot, Brigitte; Chevalier, Marie-Josephe; and Ankel, Helmut, 4,041,152, Cl. 424-85.000.

Chevron Research Company: *See—*
Carter, Reid F., 4,041,444, Cl. 340-15.5TS.
Carter, Reid F., 4,041,445, Cl. 340-15.5TS.
Platt, James L.; and Schinski, William L., 4,041,159, Cl. 424-228.000.

Chiapparoli, Richard Samuel, Jr., to Bell Telephone Laboratories, Incorporated. Divide-by-N/2 frequency division arrangement. 4,041,403, Cl. 328-39.000.

Chiarelli, Carl. Pollution-free heating system. 4,040,566, Cl. 237-1.00A.

Children's Hospital Medical Center: *See—*
Clark, Leland C., Jr., 4,040,908, Cl. 195-103.50R.

Chireau, Roland F.: *See—*
Berchielli, Aldo S.; and Chireau, Roland F., 4,041,221, Cl. 429-206.000.

Chivari, Ilie. Coupling adapted to connect radially offset shafts. 4,040,270, Cl. 64-19.000.

Chlipalski, Adam. Apparatus for handling liquid filled flexible pouches. 4,040,235, Cl. 53-59.00R.

Chloride Group Limited: *See—*
Hewitt, Albert Thomas, 4,041,212, Cl. 429-89.000.

Chouinard, Donald N.: *See—*
Heitmann, Arnold M.; Brassert, Walter L.; and Chouinard, Donald N., 4,040,251, Cl. 60-39.360.

Christensen, Burton G.: *See—*
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,041,029, Cl. 544-25.000.

Christensen, Fredrich M. Seat back tilt control unit. 4,040,663, Cl. 297-361.000.

Christenson, James Gordon; Gurien, Harvey; and Teitel, Sidney, to Hoffmann-La Roche Inc. Ecgonine derivative. 4,041,040, Cl. 260-292.000.

Christenson, James Gordon: *See—*
Avenia, Richard William; Christenson, James Gordon; and Pecherer, Benjamin, 4,041,076, Cl. 260-559.00A.

Christian, Robert Francis, to Jude Engineering Incorporated. Mixing, conveying heating and/or cooling apparatus. 4,040,768, Cl. 416-122.000.

Christiana Industries Corporation: *See—*
Ferris, Robert C., 4,040,176, Cl. 29-624.000.

Christiansen, Jorn Uffe. Control unit for thermal conditioning systems. 4,040,565, Cl. 236-91.00G.

Christman, William J., to UOP Inc. Mercaptan extraction process utilizing a stripped alkaline solution. 4,040,947, Cl. 208-235.000.

Christopoulos, John, to Singer Company, The. Knit, tuck and welt cams for circular knitting machines. 4,040,274, Cl. 66-57.000.

Chrysler Corporation: *See—*
Davidson, Dennis D., 4,040,955, Cl. 210-44.000.

Churchill, Steven T., to Letot, Incorporated. Telephone signalling system having interruption preventive means. 4,041,242, Cl. 179-2.00A.

Chusha, Hideo, to Futaba Denshi Kogyo K. K. Reed switching opening and closing device. 4,041,427, Cl. 335-205.000.

Ciba-Geigy AG: *See—*
Loew, Peter; Defago, Raymond; and Koller, Stefan, 4,040,779, Cl. 8-2.50R.
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron David; and Ficken, Geoffrey Ernest, 4,040,825, Cl. 96-1.700.

Ciba-Geigy Corporation: *See—*
Boger, Manfred; Drabek, Joseph; and Pissiotas, Georg, 4,040,811, Cl. 71-78.000.
Kocsis, Karoly; Peter, Heinrich; and Bickel, Hans, 4,041,161, Cl. 424-246.000.
Neher, Robert; and Kahnt, Friedrich Werner, 4,041,022, Cl. 260-112.50T.
Schwander, Hansrudolf; and Karlen, Urs, 4,041,052, Cl. 260-380.000.
Vlattas, Isidoros, 4,041,047, Cl. 260-332.100.
White, Howard L., 4,041,044, Cl. 260-308.00B.

Cibie Projecteurs: *See—*
Ricard, Jacques, 4,041,303, Cl. 240-41.40R.

Cinque, Alphonse P.; and Cinque, Mark G. Projection screen for optical images. 4,040,717, Cl. 350-127.000.

Cinque, Mark G.: *See—*
Cinque, Alphonse P.; and Cinque, Mark G., 4,040,717, Cl. 350-127.000.

Cities Service Company: *See—*
Greene, Marvin, 4,040,976, Cl. 252-373.000.
Wronka, John A., 4,041,102, Cl. 260-683.620.

Citizen Watch Company Limited: *See—*
Nishimura, Hajime; and Nomura, Yasushi, 4,041,219, Cl. 429-144.000.

Civic & Civic PTY Limited: *See—*
Cull, Alan Sidney, 4,040,222, Cl. 52-365.000.

Clark, Charles Albert, Jr., to RCA Corporation. High voltage protection circuit. 4,041,357, Cl. 361-6.000.

Clark, Joseph H.; and Grove, Leslie W., Jr. Method and arrangement for air testing of sewer lateral connections. 4,040,289, Cl. 73-46.000.

Clark, Kendall: *See—*
Belleson, James Garman; and Clark, Kendall, 4,040,745, Cl. 356-167.000.
Belleson, James Garman; and Clark, Kendall, 4,040,748, Cl. 356-199.000.

Clark, Leland C., Jr., to Children's Hospital Medical Center. Polarographic analysis of cholesterol and other macromolecular substances. 4,040,908, Cl. 195-103.50R.

Clarkson, Stanley G.; and Muscarella, Joseph N., deceased (by Muscarella, Ida M., administratrix), to Xerox Corporation. Sheet turn around/inverter. 4,040,616, Cl. 271-65.000.

Clausen, Carl F.: *See—*
Eide, Ove; and Clausen, Carl F., 4,040,263, Cl. 61-86.000.

Clausen, Ib Christian: *See—*
Arfelt, Soren Christian Schoubye; Clausen, Ib Christian; Jensen, Johannes; Fynbo, Knud Hansen; and Fischer, Jean Arnold, 4,040,652, Cl. 292-167.000.

Claypool, James P.; and Hoogenraad, Gerrit, to Delich, Donald C., a part interest. Page turner apparatus. 4,040,195, Cl. 40-341.000.

Clayton, Hadwen A.: *See—*
Zahn, Carl W.; and Clayton, Hadwen A., 4,040,259, Cl. 62-37.000.

Clegg, Gordon A.; Cull, Geoffrey Maurice; Fisher, Phillip Andrew; and Unsworth, William, to Magnesium Elektron Limited. Addition of magnesium to molten metal. 4,040,818, Cl. 75-58.000.

Cleland, Lorraine M.: *See—*
Yamaguchi, Takeshi, 4,040,823, Cl. 75-203.000.

Clenet, Alain Jean-Marie. Bug deflector. 4,040,656, Cl. 296-91.000.

Clifford, Earl W., to Aro Corporation, The. Control valves for tracheotomy patient or laryngeal prosthesis. 4,040,428, Cl. 128-351.000.

Clifford, Leonard W.: *See—*
Baillargeon, John L.; and Clifford, Leonard W., 4,040,406, Cl. 123-146.50A.

Clifford, Roy: *See—*
Giffen, William McAlpin; Pollitt, John Michael; and Clifford, Roy, 4,040,645, Cl. 280-745.000.

Cline, Harvey E.; and Anthony, Thomas R., to General Electric Company. Deep diode zeners. 4,040,171, Cl. 29-577.000.

Cline, Harvey E.: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,040,869, Cl. 148-1.500.
Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., 4,040,868, Cl. 148-1.500.

Cloup, Jean. Apparatus for erecting a mast. 4,040,217, Cl. 52-115.000.

Cloup, Jean. Punching machines. 4,040,320, Cl. 83-527.000.

Clovis, James S.; Dohling, Jerome; and Nicastro, Francis J., to Rohm and Haas Company. Recovery of methacrylic acid from the effluent obtained from the condensation of formaldehyde and propionic acid. 4,040,913, Cl. 203-69.000.

Clovis, James S.; and Sullivan, Francis R., to Rohm and Haas Company. Thermally stable polyphosphonates as flame retardants. 4,041,107, Cl. 260-876.00R.

Clupak, Inc.: *See—*
Emerson, James Wade, 4,040,899, Cl. 162-13.000.

Coal Industry (Patents) Limited: *See—*
Martin, David James Reginald, 4,041,495, Cl. 343-112.00R.

Coaltek Associates: *See—*
Davis, Rufus F., Jr.; and Marting, Donald G., 4,040,961, Cl. 210-195.00R.

Coan, Richard L.: *See—*
Eggers, Frank W., III; Wigger, Ralph O.; and Coan, Richard L., 4,040,865, Cl. 134-7.000.

Coats & Clark, Inc.: *See—*
Einhorn, Ruediger, 4,040,149, Cl. 248-493.000.

Cockram, Geoffrey Norman: *See—*
Towersey, Peter John; Longton, John; and Cockram, Geoffrey Norman, 4,041,189, Cl. 426-656.000.

Cognitronics Corporation: *See—*
Shepard, David H.; and Gushue, Edward J., 4,041,454, Cl. 340-146.30F.

Cohen, Noal; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Synthesis of 2,6,10-trimethyl-undecan-1-ol. 4,041,058, Cl. 260-410.90R.

Cohn, Harry, Jr.: *See—*
Papsco, William G.; Cohn, Harry, Jr.; and Bryan, Robert E., 4,040,588, Cl. 248-245.000.

Cole, Kenneth Raymond. Apparatus for retaining and readily releasing a shaker screen. 4,040,951, Cl. 209-408.000.

Coleman Company Inc., The: *See—*
Hill, Max Lee; and Kimmel, Richard James, 4,040,654, Cl. 296-57.00R.

Colgate-Palmolive Company: *See—*
Compa, Russell Edward; Liebowitz, Marvin; and Messina, Ralph Paul, 4,041,205, Cl. 428-220.000.
Douglass, Miriam L., 4,041,033, Cl. 260-250.00A.
Fischer, Charles F., 4,041,119, Cl. 264-75.000.
Gaffar, Maria Corazon; Gaffar, Abdul; and Hauschild, John P., 4,041,149, Cl. 424-57.000.
Renaud, Jean; and Narcy, Jean-Paul, 4,040,989, Cl. 252-548.000.

Collier, Everett J.: *See—*
Benson, Richard W.; Cherney, Steven D.; and Collier, Everett J., 4,040,988, Cl. 252-532.000.

Collin, Lars Th., to Lars Collin Consult AB. Method of and an apparatus for analysis of the exhaust gases from internal combustion engines. 4,040,783, Cl. 23-232 R.

Collins, D. Stephen: *See—*
Villaume, Henry F.; Collins, D. Stephen; and Peoples, Patrick J., 4,040,743, Cl. 356-73.000.

Collins, Edward J.; and Medved, Donald C., to General Electric Company. Flash lamp array having shorting lamps. 4,040,777, Cl. 431-95.00A.

Collins, Robert F., to Kendall Company, The. Surgical drape with retaining means. 4,040,418, Cl. 128-132.00D.

Collins, Stephen M.: *See—*
Argade, Shyam D.; Bortak, John J.; Collins, Stephen M.; and Weissman, Eugene Y., 4,040,935, Cl. 204-256.000.

Collins, William H., to Catalyst Research Corporation. Thermal battery with metal-metal oxide heating composition. 4,041,217, Cl. 429-112.000.

Coltrinari, Enzo: *See—*
Baltz, John; and Coltrinari, Enzo, 4,041,126, Cl. 423-22.000.

Comex Marine Services, Inc.: *See—*
Shotbolt, Keith, 4,040,650, Cl. 285-18.000.

Commissariat a l'Energie Atomique: *See—*
Dumont, Pierre; and Moise, Alain, 4,041,236, Cl. 13-25.000.
Dussaussoy, Pierre, 4,041,195, Cl. 264-60.000.

Compa, Russell Edward; Liebowitz, Marvin; and Messina, Ralph Paul, to Colgate-Palmolive Company. Residue-free fabric softening article for use in laundry dryer. 4,041,205, Cl. 428-220.000.

Compaan, Klaas: *See—*
Kramer, Pieter; Compaan, Klaas; and Forsthuber, Robert Franz Karl, 4,041,530, Cl. 358-128.000.

Compagnie Generale d'Electricite S.A.: *See—*
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,041,216, Cl. 429-104.000.

Compagnie Industrielle des Telecommunications Cit-Alcatel SA.: *See—*
Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, 4,041,392, Cl. 325-38.00A.

Compagnie Internationale pour l'Informatique: *See—*
Fressineau, Jean-Louis; and Hubert, Maurice, 4,041,290, Cl. 235-156.000.

Component Manufacturing Service, Inc.: *See—*
Ramsay, Donald C.; and Tantillo, James M., 4,040,697, Cl. 339-61.00R.

Composite Structures Corporation: *See—*
Fetherston, William H.; and Theriault, Maurice N., 4,040,137, Cl. 9-310.0AA.

Compton, Wayne W.; and Draper, Robert Paul, to Kim Lighting, Inc. Luminaire and reflector therefor. 4,041,306, Cl. 240-103.00R.

Conerly, Howard Jeffery, to International Telephone and Telegraph Corporation. Scanner-distributor apparatus for matrix system. 4,041,465, Cl. 364-900.000.

Conners, John P.: *See—*
Kolell, Norbert C.; and Conners, John P., 4,041,287, Cl. 235-151.110.

Consonni, Pietro: *See—*
Pifferi, Giorgio; Omodei-Sale', Amedeo; and Consonni, Pietro, 4,041,048, Cl. 260-333.000.

Consupak, Inc.: *See—*
Farrell, John Jerome, 4,040,203, Cl. 432-124.000.

Continental Carbon Company: *See—*
Norman, Don T., 4,040,792, Cl. 23-259.500.

Continental Group, Inc., The: *See—*
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., 4,040,540, Cl. 220-273.000.

Continental Oil Company: *See—*
Miller, Dale E.; Chapman, William L.; Dunster, Donald E.; and Thomas, Bobby J., 4,041,372, Cl. 324-9.000.

Control Data Corporation: *See—*
Norberg, Gayle Russell, 4,041,455, Cl. 340-146.10C.

Conway, Arch W.; and Urdaneta, Nelson, to Dana Laboratories, Inc. Voltage level display circuit. 4,041,288, Cl. 235-151.310.

Cook, Harold L., Jr.; Geer, Ernest C.; and Katz, Donald L., to Transco Energy Company. Method for increasing the recovery of natural gas from a geo-pressured aquifer. 4,040,487, Cl. 166-314.000.

Cooksey, James Judson: *See—*
Weiss, William Robert; Saich, Anthony Michael; and Cooksey, James Judson, 4,040,782, Cl. 28-271.000.

Cooper, John LaMonte; and Newnam, James Alvis, to Du Pont de Nemours, E. I., and Company. Polysiloxane coated polyester fibers blended with other fibers to obtain fibrous mass having more acceptable flame resistance than a mass of unblended polysiloxane coated fibers. 4,040,371, Cl. 112-420.000.

Coppola, Patrick S.; and Kotansky, Stephen, to General Electric Company. Shut-off valve. 4,040,600, Cl. 251-63.000.

Cornell, Edward P., to General Electric Company. Constant torque induction motor drive system. 4,041,361, Cl. 318-227.000.

Cornils, Boy: *See—*
Bexten, Ludger; Noeske, Heinz; Tummes, Hans; and Cornils, Boy, 4,041,081, Cl. 260-601.00R.
Gothel, Herbert; Cornils, Boy; Feichtinger, Hans; Tummes, Hans; and Falbe, Jurgen, 4,041,080, Cl. 260-585.00B.

Corwin, John Roy: *See—*
Tappan, Harold B.; and Corwin, John Roy, 4,040,312, Cl. 74-801.000.

Cosby, Richard E.: *See—*
Vermes, Roy E.; and Cosby, Richard E., 4,040,618, Cl. 271-182.000.

Cosden Technology, Inc.: *See—*
Watson, James M., 4,040,912, Cl. 203-9.000.

Costa, Paul F.: *See—*
Silverman, Seymour; Costa, Paul F.; and Block, Charles, 4,040,366, Cl. 112-121.290.

Cota, Dan E.; Charter, Ted R.; Beeson, Robert M.; and Kinkead, Robin D., to Xerox Corporation. Transcriber system for the automatic generation and editing of text from shorthand machine outlines. 4,041,467, Cl. 364-900.000.

Cottier, Derek; and Rossell, John Barry, to Lever Brothers Company. Food composition. 4,041,188, Cl. 426-607.000.

Cotton, Donald J. Vertical liquid electrode employed in electrolytic cells. 4,040,932, Cl. 204-219.000.

Coulter Electronics, Inc.: *See—*
Gulliford, Henry Howard; and Dunstan, Harvey John, 4,041,385, Cl. 324-71.0CP.

Courty, Albert: *See—*
Desormiere, Bernard; Menager, Olivier; Courty, Albert; and Eumurian, Gregoire, 4,041,419, Cl. 333-30.00R.

Coussan, Sidney G., to Production Specialties, Inc. Arrangement for positioning a member in a receiving section of a side pocket mandrel. 4,040,481, Cl. 166-214.000.

Cowden, Earl Thomas, to North Electric Company. Transformerless two-wire/four-wire hybrid with DC sourcing capability. 4,041,252, Cl. 179-170.0NC.

CPC International Inc.: *See—*
Walon, Raoul G. P., 4,040,861, Cl. 127-46.00A.

Crawford, William B.; and Solomon, Anthony T., to Burlington Industries, Inc. Bobbin low detector. 4,040,367, Cl. 112-273.000.

Crest Industries, Inc.: *See—*
Rasmussen, Harry R., 4,040,699, Cl. 339-91.00R.

Creteau, Peter Verne: *See—*
Wisdom, Graham John; Creteau, Peter Verne; and Williams, John Lloyd, 4,041,460, Cl. 364-900.000.

Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 1,2-Dialkyl-3,4,5-trisubstituted pyrazole compounds. 4,041,046, Cl. 548-375.000.

Cross, Bryan C. Bale handling apparatus. 4,040,531, Cl. 214-77.00R.

Crown Zellerbach Corporation: *See—*
Litzinger, Paul C., 4,040,856, Cl. 106-170.000.

Cubic Corporation: *See—*
Watt, Richard Edwin, 4,041,490, Cl. 343-17.700.

Cubic-Western Data: *See—*
Adams, Ralph Delta; and Ingram, Charles Junior, 4,040,345, Cl. 101-66.000.

Cuccolo, Paul J.: *See—*
Trivedi, Ramesh C.; Bungay, Henry R., III; and Cuccolo, Paul J., 4,040,786, Cl. 23-230.00R.

Cull, Alan Sidney, to Civic & Civic PTY Limited. Cavity wall and method using adjustable spacing devices. 4,040,222, Cl. 52-365.000.

Cull, Geoffrey Maurice: *See—*
Clegg, Gordon A.; Cull, Geoffrey Maurice; Fisher, Phillip Andrew; and Unsworth, William, 4,040,818, Cl. 75-58.000.

Curti, Ezio. Adjustable work table for silk screen printer. 4,040,352, Cl. 101-407.0BP.

Curtiss-Wright Corporation: *See—*
Woodier, George H., 4,040,392, Cl. 123-8.450.

D. Swarovski & Co.: *See—*
Porcham, Wolfgang, 4,041,127, Cl. 423-92.000.

Daempa A/S: *See—*
Arfelt, Soren Christian Schoubye; Clausen, Ib Christian; Jensen, Johannes; Fynbo, Knud Hansen; and Fischer, Jean Arnold, 4,040,652, Cl. 292-167.000.

Dahle, Gerald, to Wilhelm Dahle Buro- und Zeichengeratefabrik. Hand-operated stapler. 4,040,556, Cl. 227-120.000.

Dahlstrom, Arvid, to Dahltron Corporation. Double-acting electrical receptacle. 4,040,712, Cl. 339-255.00R.

Dahltron Corporation: *See—*
Dahlstrom, Arvid, 4,040,712, Cl. 339-255.00R.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Matsubara, Izuru, 4,040,716, Cl. 350-4.000.

Dai Nippon Tokyo Co., Ltd.: *See—*
Makishima, Hiroshi; Hosoda, Minoru; Kasiwagi, Eiichi; and Hayashi, Toshiharu, 4,040,842, Cl. 106-1.000.

Daicel Ltd.: *See—*
Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, 4,040,879, Cl. 149-18.000.

Daimler-Benz Aktiengesellschaft: *See—*
Zeilinger, Karl, 4,040,391, Cl. 123-8.090.

Dale, John Robert: *See—*
Hight, Michael John; Winkle, Roy Victor; and Dale, John Robert, 4,040,885, Cl. 156-378.000.

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Conway, Arch W.; and Urdaneta, Nelson, 4,041,288, Cl. 235-151.310.

Daniel, Leonard. Method for the formation of articles from collagenous material. 4,041,183, Cl. 426-105.000.

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Lundsgart, Henning Borge, 4,040,472, Cl. 164-154.000.

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Thomas, Paul Dana; and Burton, Dale Leroy, 4,041,386, Cl. 324-77.00R.

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Midwinter, John Edwin; and Day, Clive Richard, 4,040,807, Cl. 65-3.00A.

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Stockdale, Douglas P.; Mencarini, Richard; Deaton, Carlton D.; and Owen, Ralph M., 4,040,234, Cl. 53-38.000.

Debaigt, Jean, to Cgee Alsthom SA. Screw terminal with a captive screw. 4,040,715, Cl. 339-272.00A.

De Boer, Wilhelmus Johannes; Schinkel, Willem; and Span, Francis Johannes, to U.S. Philips Corporation. Transport device for test sample carriers. 4,040,533, Cl. 214-310.000.

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Plows, Graham Stuart; and Edge, Gordon Malcolm, 4,041,532, Cl. 358-128.000.

Decker, Gerd; Steinke, Dieter; and Reichel, Kurt, to Volkswagenwerk Aktiengesellschaft. Ignited internal combustion engine operated with charge stratification. 4,040,393, Cl. 123-30.00A.

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Kahle, Glenn W.; and Olsen, Sydney A., 4,040,249, Cl. 60-39.51H.

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Loew, Peter; Defago, Raymond; and Koller, Stefan, 4,040,779, Cl. 8-2.50R.

DeFrees, Joseph H. Openable bottom loading adapter for transport tank. 4,040,456, Cl. 141-349.000.

de Haan, Andre Paul. Process for synthesizing organo-tin compounds. 4,041,060, Cl. 260-429.700.

Dehye Harvesters Limited: *See—*
Moore, George Edgar; and Morris, Alan Francis, 4,040,344, Cl. 100-95.000.

Deitz, Victor R.; and Blachly, Charles H. Activation of water soluble amines by halogens for trapping methyl radioactive iodine from air streams. 4,040,802, Cl. 55-71.000.

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Claypool, James P.; and Hoogenraad, Gerrit, 4,040,195, Cl. 40-341.000.

Delle-Alsthom: *See—*
Deville, Robert, 4,041,545, Cl. 361-120.000.

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Harris, John L., 4,041,424, Cl. 335-75.000.

De Lucchi, Gerald B. Charcoal broiler. 4,040,343, Cl. 99-421.00H.

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Kullmann, Rolf; and Pfeil, Erhard, 4,040,609, Cl. 266-143.000.

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Dennis, Charles A.: *See—*
Kratz, Gary L.; Sproul, William W., III; Walendziewicz, Eugene T.; Wallis, Donald E.; and Dennis, Charles A., 4,041,461, Cl. 364-200.000.

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Sekmakas, Kazys; and Gotschall, George E., 4,040,995, Cl. 260-22.0CQ.

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Metzner, Wolfgang; and Koddebusch, Hubert, 4,041,176, Cl. 424-318.000.

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Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,040,972, Cl. 252-179.000.

Deville, Robert, to Delle-Alsthom. Lightning conductor in a metallic casing. 4,041,545, Cl. 361-120.000.

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Hopkins, Roger A., 4,040,350, Cl. 101-376.000.

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Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,041,167, Cl. 424-270.000.
Schenker, Barry A.; and Franks, C. Richard, 4,040,939, Cl. 204-290.00F.

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Diamond, Sidney: *See—*
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Dickey, Ralph E. Apparatus for holding a microphone. 4,040,547, Cl. 224-5.00H.

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Wood, Gail E.; and Dickmeyer, Robert D., 4,040,309, Cl. 74-665.00T.

Dictaphone Corporation: *See—*
Matz, Bjorn J.; and Foster, Edward J., 4,041,249, Cl. 179-100.1DR.

Didderen, Freddy: *See—*
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Diehl, Karl-Heinz: *See—*
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Dietrich, William J., to DMI, Inc. Automatic reset plow. 4,040,491, Cl. 172-269.000.

Digitron AG.: *See—*
Krieg, Walter, 4,040,527, Cl. 214-16.40A.

Dillon, James E., to UOP Inc. Oxygen sensor. 4,040,930, Cl. 204-195.00S.

Director-General of the Agency of Industrial Science and Technology: *See—*
Yamada, Yasuhiro; Honda, Hidemasa; and Kakiyama, Hitoo, 4,040,941, Cl. 208-8.000.

DMI, Inc.: *See—*
Dietrich, William J., 4,040,491, Cl. 172-269.000.

Dobson Park Industries Limited: *See—*
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Dobson, Thomas A.: *See—*
Demerson, Christopher A.; Humber, Leslie G.; Asselin, Andre A.; Jirkovsky, Ivo; and Dobson, Thomas A., 4,041,169, Cl. 424-274.000.

Dohling, Jerome: *See—*
Clovis, James S.; Dohling, Jerome; and Nicastro, Francis J., 4,040,913, Cl. 203-69.000.

Dola, Frank Peter; and Rossler, Frederick William, Jr., to AMP Incorporated. Lighting unit assembly. 4,040,709, Cl. 339-125.00L.

Donahue, James T.; Hall, Kenneth M.; and Worth, Arthur J., to Sola Basic Industries, Inc. Meter module assembly for a meter panel. 4,041,358, Cl. 361-365.000.

Donegan, Edward Alfred, to TRW Canada Limited. Drill rod thread form. 4,040,756, Cl. 403-307.000.

Doorakian, George A.: *See—*
McGraw, Philip W.; Doorakian, George A.; and Rains, Randall C., 4,041,019, Cl. 260-75.0NC.

Dorazio, Alton E.: *See—*
Altenburger, Otto; and Dorazio, Alton E., 4,041,253, Cl. 179-175.20R.

Doria, Gianfederico: *See—*
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Douglas, Robert Ritson, to Singer Company, The. Gas meter temperature compensating tangents. 4,040,296, Cl. 73-281.000.

Douglass, Miriam L., to Colgate-Palmolive Company. Novel derivatives of pyridazine-2-oxide. 4,041,033, Cl. 260-250.00A.

Dow Chemical Company, The: *See—*
Bosche, Earl E.; Havlik, Jay M.; and Kyle, James C., 4,040,256, Cl. 61-15.000.
Goralski, Christian T.; Pews, R. Garth; and Burk, George A., 4,041,073, Cl. 260-556.0AR.
Gross, James R., 4,041,020, Cl. 260-79.30M.
Gross, James R.; and McFadden, Russell T., 4,041,231, Cl. 526-317.000.
Gross, James Richard, 4,041,228, Cl. 526-240.000.
McGraw, Philip W.; Doorakian, George A.; and Rains, Randall C., 4,041,019, Cl. 260-75.0NC.
Nelson, Wayne F., 4,040,488, Cl. 166-317.000.
Nimerick, Kenneth H.; and Simpson, Benny E., 4,040,967, Cl. 252-8.55R.
Roy, Alejo V.; and Heiwig, Jane R., 4,040,787, Cl. 23-230.00B.
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Downing, Alvin. Pontoon boat. 4,040,134, Cl. 9-2.00F.

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Boger, Manfred; Drabek, Joseph; and Pissiotas, Georg, 4,040,811, Cl. 71-78.000.

Drabik, Walter: *See—*
Madsen, John E.; and Drabik, Walter, 4,041,338, Cl. 310-186.000.

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Compton, Wayne W.; and Draper, Robert Paul, 4,041,306, Cl. 240-103.00R.

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Blackwell, Henry Wayne, 4,040,649, Cl. 285-3.000.
Hopkinson, Eric C., 4,041,309, Cl. 250-262.000.
Keller, Wilbur S., 4,040,680, Cl. 308-8.200.
Saxman, William Craig, 4,040,493, Cl. 175-374.000.

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Dunlop Limited: *See—*
Mitchell, William Eric, 4,040,465, Cl. 152-381.100.

Dunphy, Gerald P.: *See—*
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Dunstan, Harvey John: *See—*
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Dunster, Donald E.: *See—*
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Cooper, John LaMonte; and Newnam, James Alvis, 4,040,371, Cl. 112-420.000.
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Dyer, Robert H.; Fowler, Andrew H.; and Vanstrum, Paul R., to United States of America, Energy Research and Development Administration. Method and apparatus for rapid adjustment of process gas inventory in gaseous diffusion cascades. 4,040,801, Cl. 55-16.000.

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Dynamit Nobel Aktiengesellschaft: *See—*
Budich, Wolfgang, 4,040,219, Cl. 52-209.000.

E M I Limited: *See—*
Hounsfield, Godfrey Newbold, 4,041,315, Cl. 250-360.000.

E. R. Squibb & Sons, Inc.: *See—*
Brown, William E.; Baughn, Charles O.; and Linkenheimer, Wayne H., 4,041,175, Cl. 424-311.000.
Morcos, Nabil A.; Bruno, Gerald A.; and Haney, Thomas A., 4,041,317, Cl. 250-432.0PD.
Pagnucco, Rinaldo G.; Muse, Roberta J.; and Murty, Dasika R., 4,041,147, Cl. 195-103.50A.
Sipos, Frank; and Keseleski, Adam J., 4,041,232, Cl. 536-17.000.

Earl, Douglas B.: *See—*
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Earl, William A.: *See—*
Sass, Daniel B.; Earl, William A.; and Fasano, Joseph, 4,040,692, Cl. 312-194.000.

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Knapp, Kenneth K.; and Koch, William E., 4,040,254, Cl. 60-420.000.
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Tappan, Harold B.; and Corwin, John Roy, 4,040,312, Cl. 74-801.000.
Uppal, Sohan, 4,040,439, Cl. 137-115.000.

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Chetelat, Fernand, 4,040,245, Cl. 58-4.00A.
Laesser, Claude, 4,040,248, Cl. 58-38.00R.

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Edge, Gordon Malcolm: *See—*
Plows, Graham Stuart; and Edge, Gordon Malcolm, 4,041,532, Cl. 358-128.000.

Edison Price, Inc.: *See—*
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Edison, Robert G. Toothpick and container assembly. 4,040,433, Cl. 132-89.000.

Edson Corporation, The: *See—*
Atkins, Frederick Joseph; and Keene, Henry Rich, 4,040,375, Cl. 114-160.000.

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Eggers, Frank W., III; Wigger, Ralph O.; and Coan, Richard L., to Cerro Corporation. Removing chlorine-containing insulation with a fluidized medium containing reactive calcium compounds. 4,040,865, Cl. 134-7.000.

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Elzinga, Eugene Robert, to Exxon Research and Engineering Company. Fuel cells and methods of operating them. 4,040,435, Cl. 429-14.000.

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Swain, Leonard W.; and Bower, Allen M., 4,040,455, Cl. 141-225.000.

Emerson, James Wade, to Clupak, Inc. Production of high strength packaging papers from straw. 4,040,899, Cl. 162-13.000.

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Eng, Jeffrey D., to Hooker Chemicals & Plastics Corporation. Voltage reduction of membrane cell for the electrolysis of brine. 4,040,919, Cl. 204-98.000.

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Engel, Stephen August, to Union Carbide Corporation. Method for producing an individual fin-free spot scarfing cut. 4,040,871, Cl. 148-9.500.

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Billings, Roger Evan; and Lynch, Franklin Earl, 4,040,398, Cl. 123-44.00R.

England, Fred. Plant holder and anchor for orchid plants and the like. 4,040,208, Cl. 47-67.000.

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English Electric Valve Company Limited: *See—*
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Epstein, Harry, to Kastar, Inc. Multi-function tester with removable circuit cartridge. 4,041,380, Cl. 324-51.000.

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Esco Corporation: *See—*
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Tagnon, Luc Andre, 4,040,752, Cl. 356-249.000.

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Zemanek, Zdenek S.; and Brown, Jack M., 4,041,426, Cl. 335-131.000.

Ethyl Corporation: *See—*
Fanning, Robert J., 4,041,057, Cl. 260-410.90R.
Laborde, Joseph N., 4,040,231, Cl. 52-664.000.
Marsee, Frederick J., 4,040,401, Cl. 123-117.00A.
Snyder, Louis J., 4,040,299, Cl. 73-421.50R.

Eto, Goro; and Utamura, Yukihiko, to Futaba Denshi Kogyo K. K. Multi-figure fluorescent display tube with electrical lead-ins having inner spring contact portions. 4,041,348, Cl. 313-497.000.

Eumurian, Gregoire: *See—*
Desormiere, Bernard; Menager, Olivier; Courty, Albert; and Eumurian, Gregoire, 4,041,419, Cl. 333-30.00R.

Evans, Norol T.; Pearlstein, Barry S.; Job, Merlin A.; and Hoagland, Donald L., to Hughes Aircraft Company. Low elevation angle radar tracking system. 4,041,487, Cl. 343-7.500.

Evans, Paul F., to Xerox Corporation. Multicolor imaging method and imaged member employing combinations of transparent toner and colorant. 4,040,828, Cl. 96-1.200.

Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, to International Flavors & Fragrances Inc. Flavoring with (2-methyl-3-furyl)(methylthiomethyl) sulfide. 4,041,186, Cl. 426-535.000.

Ewen, Harold I.; and Haroules, George G., to United States of America, Transportation. Distance measuring method and apparatus. 4,041,494, Cl. 343-112.00D.

Ewing, Joan R.: *See—*
Goffe, William L.; Mammino, Joseph; and Ewing, Joan R., 4,040,826.

Ewing, Keith E.: *See—*
Davis, James L.; and Ewing, Keith E., 4,041,440, Cl. 338-195.000.

Exxon Research and Engineering Company: *See—*
Behrmann, William C.; Turner, Earl E.; and Bastron, Victor C., 4,041,100, Cl. 260-683.470.
Elzinga, Eugene Robert, 4,040,435, Cl. 429-14.000.
Moss, Gerald, 4,041,141, Cl. 423-571.000.
Vannice, M. Albert, 4,041,087, Cl. 260-652.00R.
Whittingham, M. Stanley, 4,040,917, Cl. 204-92.000.

Ezekiel, Aaron David: *See—*
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron David; and Ficken, Geoffrey Ernest, 4,040,825, Cl. 96-1.700.

F. lli Marzoli & C. S.p.A.: *See—*
Marzoli, Angelo, 4,040,145, Cl. 19-81.000.
Marzoli, Angelo, 4,040,146, Cl. 19-159.00R.

Fa. Frey & Winkler GmbH & Co. KG: *See—*
Winkler, Emil; and Kappler, Manfred, 4,040,729, Cl. 351-137.000.

Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, to Warner-Lambert Company. Intermediate composition. 4,041,042, Cl. 260-301.000.

Fairchild Camera and Instrument Corporation: *See—*
Robinson, Barry J., 4,041,326, Cl. 307-216.000.

Fairweather, Edwin William: *See—*
Rady-Pentek, Arthur A.; and Fairweather, Edwin William, 4,040,855, Cl. 106-90.000.

Fairweather, Ernest Sidney; and Jackson, Philip, to Errut Products Limited. Groove cutting apparatus. 4,040,668, Cl. 299-39.000.

Falbe, Jurgen: *See—*
Gothel, Herbert; Cornils, Boy; Feichtinger, Hans; Tummes, Hans; and Falbe, Jurgen, 4,041,080, Cl. 260-585.00B.

Fanning, Robert J., to Ethyl Corporation. Hydroesterification process. 4,041,057, Cl. 260-410.90R.

Farbu, Leif: *See—*
Alstad, Jorolf; and Farbu, Leif, 4,041,125, Cl. 423-21.000.

Farcnik, Alexander. Making fireproof non-polluting liquid coating composition. 4,041,000, Cl. 260-29.60B.

Farrell, John Jerome, to Consupak, Inc. Rotating core rods. 4,040,203, Cl. 432-124.000.

Fasano, Joseph: *See—*
Sass, Daniel B.; Earl, William A.; and Fasano, Joseph, 4,040,692, Cl. 312-194.000.

Fastner, Thorwald, to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft. Method of continuously casting steel. 4,040,470, Cl. 164-58.000.

Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Gouret, Claude J., to Delalande S.A. Arylamino pyrimidinic derivatives. 4,041,030, Cl. 544-117.000.

Fauran, Claude P.; Bourgery, Guy R.; and Gouret, Claude J., to Delalande S. A. Acetamidoxime compounds. 4,041,072, Cl. 260-558.00A.

Faust, Hans B., to Weber Marking Systems, Inc. Magnetically held printing mat. 4,040,351, Cl. 101-382.0MV.

Fedde, Chris Steven, to Motorola, Inc. Environmentally sensitive transmit power maximizing circuitry and method. 4,041,396, Cl. 325-150.000.

Feichtinger, Hans: *See—*
Gothel, Herbert; Cornils, Boy; Feichtinger, Hans; Tummes, Hans; and Falbe, Jurgen, 4,041,080, Cl. 260-585.00B.

Feisel, Armin: *See—*
Gramespacher, Herbert; and Feisel, Armin, 4,040,316, Cl. 82-32.000.

Feldeman, Arnold S.: *See—*
Brave, Ronald M.; Brave, Dennis G.; and Feldeman, Arnold S., 4,041,265, Cl. 200-159.00R.

Felix, Arthur Martin; and Liebman, Arnold Alvin, to Hoffmann-La Roche Inc. Labelled peptides. 4,041,023, Cl. 260-112.50R.

Fenichel, Richard L.; and Levin, Howard J., to American Home Products Corporation. Long acting somatostatin composition. 4,041,155, Cl. 424-177.000.

Fenoglio, David J., to Standard Oil Company (Indiana). Fire retardants. 4,041,016, Cl. 260-45.85E.

Fernaeus, Sven Evert; and Jonsson, Erik Anselm. Building block with wave-shaped upper and lower support surfaces. 4,040,226, Cl. 52-594.000.

Ferris, Robert C., to Christiana Industries Corporation. Method for manufacturing insulated grounding straps. 4,040,176, Cl. 29-624.000.

Ferro Manufacturing Corporation: *See—*
Pickles, Joseph, 4,040,591, Cl. 248-394.000.

Fetherston, William H.; and Theriault, Maurice N., to Composite Structures Corporation. Binding for water ski. 4,040,137, Cl. 9-310.0AA.

Feuersanger, Alfred E.; and Shortt, Brian A., to GTE Laboratories Incorporated. Bonded magnetic bubble memory. 4,041,447, Cl. 340-174.0TF.

F'Geppert, Erwin, to United States of America, Army. Manual controller for vehicle level adjustment. 4,040,647, Cl. 280-766.000.

F'Geppert, Erwin, to United States of America, Army. Anti-friction bearing. 4,040,686, Cl. 308-201.000.

Fiat-Allis Construction Machinery, Inc.: *See—*
Beveridge, Thomas Anthony, 4,040,505, Cl. 184-6.280.

Ficken, Geoffrey Ernest: *See—*
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron David; and Ficken, Geoffrey Ernest, 4,040,825, Cl. 96-1.700.

Fields, Ellis K., to Standard Oil Company a corporation of Indiana. Process for beta-hydroxyalkylsulfoxides. 4,040,921, Cl. 204-158.00R.

Filak, Paul T.: *See—*
Waddington, William T.; Jenkins, Harold F.; and Filak, Paul T., 4,040,711, Cl. 339-198.00R.

Finney, Robert H., to Lord Corporation. Laminated bearing. 4,040,690, Cl. 308-237.00R.

Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., to Merck & Co., Inc. Acylimine cephalosporins. 4,041,029, Cl. 544-25.000.

Firestone Tire & Rubber Company, The: *See—*
Walker, Ronald Jay; Sherwin, Dewayne James; and Rumpf, Robert John, 4,040,576, Cl. 242-107.40A.

Fischer, Charles F., to Colgate-Palmolive Company. Method for producing variegated soap. 4,041,119, Cl. 264-75.000.

Fischer, Erwin: *See—*
Henych, Ivo; Fischer, Erwin; and Reist, Jurg, 4,040,596, Cl. 249-117.000.

Fischer, Franz: *See—*
Helbig, Joachim; and Fischer, Franz, 4,041,154, Cl. 424-150.000.

Fischer, Jean Arnold: *See—*
Arfelt, Soren Christian Schoubye; Clausen, Ib Christian; Jensen, Johannes; Fynbo, Knud Hansen; and Fischer, Jean Arnold, 4,040,652, Cl. 292-167.000.

Fischer, Karl-Heinz: *See—*
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Reichenberger, Roland; Kesselring, Horst; and Fischer, Karl-Heinz, 4,040,347, Cl. 101-349.000.

Fishbein, William; and Rittenbach, Otto, to United States of America, Army. Doppler radar system. 4,041,488, Cl. 343-8.000.

Fisher, Gordon Lloyd, to International Nickel Company, Inc., The. Method for producing regular electronickel or S nickel rounds from electroplating baths giving highly stressed deposits. 4,040,915, Cl. 204-12.000.

Fisher, Phillip Andrew: *See—*
Clegg, Gordon A.; Cull, Geoffrey Maurice; Fisher, Phillip Andrew; and Unsworth, William, 4,040,818, Cl. 75-58.000.

Fitzpatrick, Richard L., to Raymond Lee Organization, Inc., The, a part interest. Elements for supporting wheels above ground and device for connecting the elements. 4,040,521, Cl. 211-24.000.

Flagg, Raymond C. Refuse collecting and conveying vehicle. 4,040,638, Cl. 280-9.000.

Flagg, Raymond C. Refuse bag carrier. 4,040,644, Cl. 280-659.000.

Flanders, Robert D. Method for detachably sealing together the sections of a barrel container assembly. 4,040,372, Cl. 113-120.00L.

Flippin, Jarvis F. Golf club swing guide. 4,040,631, Cl. 273-186.00A.

Floyd, Roger M.: *See—*
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,040,558, Cl. 229-23.0BT.

FMC Corporation: *See—*
Franko-Filipasic, Borivoj Richard; and Start, John Francis, 4,040,843, Cl. 106-15.0FP.
Makino, Shinobu, 4,040,303, Cl. 74-61.000.
Newhall, William F., 4,040,813, Cl. 71-121.000.
Westerman, David J.; McTamaney, Louis S.; and Kauber, David J., 4,041,331, Cl. 307-252.00Q.

Fong, Ronald A.; Latty, James A.; and McDonnell, Roger P., to Rohm and Haas Company. Flocculant composition and process. 4,041,006, Cl. 260-33.6UA.

Foote, Francis C., to Addressograph Multigraph Corporation. Data reading device. 4,041,279, Cl. 235-61.70B.

Forbes, James T., to UOP Inc. Sulfur recovery process. 4,041,131, Cl. 423-242.000.

Ford Motor Company: *See—*
Hetke, Adolf; Mohla, Prem P.; and Warrick, Robert J., 4,040,821, Cl. 75-134.00S.

Forestieri, Americo F.; Ratajczak, Anthony F.; and Sidorak, Leroy G., to United States of America, National Aeronautics and Space Administration. Solar cell shingle. 4,040,867, Cl. 136-89.00P.

Formica, Giuseppe: *See—*
Gradeff, Peter S.; and Formica, Giuseppe, 4,041,083, Cl. 260-617.00C.

Forskningsgruppe for Sjeldne Jordarter: *See—*
Alstad, Jorolf; and Farbu, Leif, 4,041,125, Cl. 423-21.000.

Forsthuber, Robert Franz Karl: *See—*
Kramer, Pieter; Compaan, Klaas; and Forsthuber, Robert Franz Karl, 4,041,530, Cl. 358-128.000.

Foseco International Limited: *See—*
Cartwright, John Edward, 4,041,199, Cl. 428-36.000.

Potier, Pierre Roger; and Sota, Tadamichi, 4,040,469, Cl. 164-56.000.

Foster, Edward J.: *See—*
Matz, Bjorn J.; and Foster, Edward J., 4,041,249, Cl. 179-100.1DR.

Foster, Howard F., Sr. Tensioning anchor. 4,040,602, Cl. 254-164.000.

Foster, Kenneth William Samuel, to Renold Limited. Multi-lobe cam for hydraulic piston-and-cylinder machines. 4,040,337, Cl. 91-491.000.

Foster, Raymond C.; and Humphries, James J., Jr., to Stone & Webster Engineering Corporation. Removal of acidic gases from hydrocarbon streams. 4,041,129, Cl. 423-234.000.

Fowler, Andrew H.: *See—*
Dyer, Robert H.; Fowler, Andrew H.; and Vanstrum, Paul R., 4,040,801, Cl. 55-16.000.

Frabetti, Alton J., Jr., to General Electric Company. Ortho-alkylation of phenols. 4,041,085, Cl. 260-621.00R.

Francis, Arthur W.: *See—*
Franklin, Robert E.; Francis, Arthur W.; and Tarancon, Gregorio, 4,041,136, Cl. 423-347.000.

Francisco, Herbert H.; Martocci, Anthony P.; and Beitel, Sydney B., to Bethlehem Steel Corporation. Method for vacuum metal cladding. 4,041,273, Cl. 219-121.0EM.

Francois, Bernard; Vernois, Michel; Martin, Paul; and Franta, Emile, to Agence Nationale de Valorisation de la Recherche (ANVAR). Very finely divided lithium and process for manufacturing same. 4,040,815, Cl. 75-.50B.

Frank Ellman Co., Inc.: *See—*
Winzelberg, Abraham, 4,040,285, Cl. 72-370.000.

Frank, Horst; and Langebach, Hans Peter, to Linde Aktiengesellschaft. Multistage cooling of crude hydrocarbon gases. 4,040,266, Cl. 62-121.000.

Franklin, Robert E.; Francis, Arthur W.; and Tarancon, Gregorio, to Union Carbide Corporation. Process for the production of silane. 4,041,136, Cl. 423-347.000.

Franklin, Wesley D. Self propelled excavating vehicle. 4,040,669, Cl. 299-56.000.

Franko-Filipasic, Borivoj Richard; and Start, John Francis, to FMC Corporation. Flame-retardant regenerated cellulose filaments containing oligomeric phosphonitrilic compounds. 4,040,843, Cl. 106-15.0FP.

Frankowski, Richard Edward Bronislaw, to RCA Corporation. Inter-electrode open and short circuit tester. 4,041,374, Cl. 324-20.0CR.

Franks, C. Richard: *See—*
Schenker, Barry A.; and Franks, C. Richard, 4,040,939, Cl. 204-290.00F.

Franta, Emile: *See—*
Francois, Bernard; Vernois, Michel; Martin, Paul; and Franta, Emile, 4,040,815, Cl. 75-.50B.

Frantz, Robert Houston: *See—*
Shaffer, Howard Richard; and Frantz, Robert Houston, 4,040,703, Cl. 339-99.00R.

Frantzis, Paul D.: *See—*
Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, 4,041,535, Cl. 358-191.000.

Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See—*
Theurer, Josef; and Thole, Waldemar Friedrich, 4,040,292, Cl. 73-84.000.

Frazita, Richard F.; Lopez, Alfred R.; and Giannini, Richard J., to Hazeltine Corporation. Limited scan array antenna systems with sharp cutoff of element pattern. 4,041,501, Cl. 343-844.000.

Frederick, Leonard L. Modular leads frame with noise abatement system and pile feeder. 4,040,492, Cl. 173-1.000.

Freimark, Ronald J.; and Repay, Laszlo N., to Tenna Corporation. Collapsible adjustable length citizens-band antenna with coil concealing structure. 4,041,498, Cl. 343-749.000.

Frensch, Heinz: *See—*
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,041,164, Cl. 424-263.000.

Fressineau, Jean-Louis; and Hubert, Maurice, to Compagnie Internationale pour l'Informatique. Microprogram controlled binary decimal coded byte operator device. 4,041,290, Cl. 235-156.000.

Freudeberg, Jurgen; and Von Osten, Reimer, to U.S. Philips Corporation. Character generator for the reproduction of characters. 4,041,482, Cl. 340-324.0AD.

Fried. Krupp Gesellschaft mit beschrankter: *See—*
Tack, Hans, 4,040,156, Cl. 29-96.000.

Friedman, Stanton L. Resilient exercise device. 4,040,620, Cl. 272-137.000.

Frossard, Emile; Schleuniger, Fritz; and Stadler, Bruno, to Brown, Boveri & Cie. Supervisory and control system for rotary machinery, particularly rotary electrical machines. 4,041,541, Cl. 361-27.000.

Frye, Norman V. Adjustable ground support for volleyball poles and the like. 4,040,214, Cl. 52-157.000.

Fuchs, Francis Joseph, Jr., to Western Electric Co., Inc. Pressure vessels. 4,040,284, Cl. 72-272.000.

Fuji Photo Film Co., Ltd.: *See—*
Arai, Atsuaki; Shiba, Keisuke; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 4,040,835, Cl. 96-56.500.
Arai, Atsuaki; Nakamura, Kotaro; Yamada, Minoru; and Furutachi, Nobuo, 4,040,836, Cl. 96-56.500.
Fujita, Yoshihiro, 4,041,308, Cl. 250-226.000.
Hayashi, Takao; and Matsukawa, Hiroharu, 4,041,193, Cl. 427-151.000.
Hinata, Masanao; Takei, Haruo; Miyasaka, Nobuaki; and Takahashi, Kenji, 4,040,833, Cl. 96-45.100.
Hinata, Masanao; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, 4,040,841, Cl. 96-126.000.

Iwano, Haruhiko; and Shimamura, Isao, 4,040,834, Cl. 96-50.00A.
Kondo, Toshihiro, 4,041,513, Cl. 354-241.000.
Maekawa, Yukio; Satomura, Masato; and Umehara, Akira, 4,041,017, Cl. 260-47.0UA.
Matsuyama, Junichi; Hinata, Masanao; and Sato, Akira, 4,040,839, Cl. 96-64.000.
Ohmatsu, Hideki; and Ueda, Hirozo, 4,040,829, Cl. 96-6.000.
Sugiyama, Masatoshi; and Ogawa, Akira, 4,040,840, Cl. 96-84.00A.
Yamaguchi, Seiya, 4,040,838, Cl. 96-60.00R.

Fuji Photo Optical Co. Ltd.: *See—*
Ohshiro, Susumu, 4,040,413, Cl. 128-6.000.

Fujiki, Yoshinori; and Izumi, Fujio, to National Institute for Researches in Inorganic Materials. Process for preparing fibrous alkali metal titanate. 4,041,143, Cl. 423-598.000.

Fujioka, Kotaro; Tsuchihashi, Osami; Endo, Tetsuhiko; and Hirota, Masakazu, to Toray Industries, Inc. Method and apparatus for doubling and twisting a yarn by a two-step changeover system. 4,040,240, Cl. 57-34.0CP.

Fujita, Tsutomu: *See—*
Shidara, Keiichi; Goto, Naohiro; Maruyama, Eiichi; Hirai, Tadaaki; and Fujita, Tsutomu, 4,040,985, Cl. 252-501.000.

Fujita, Yoshihiro, to Fuji Photo Film Co., Ltd. Automatic control device for correcting filters. 4,041,308, Cl. 250-226.000.

Fujitsu Limited: *See—*
Takeda, Shiroh; Nagai, Yuji; and Suzuki, Takenori, 4,041,009, Cl. 260-42.180.

Fukagawa, Hiroshi: *See—*
Kitamura, Nobuo; Takada, Katsuo; and Fukagawa, Hiroshi, 4,041,401, Cl. 325-455.000.

Fukazawa, Koji, to Nittetsu Mining Company, Ltd. Froth flotation process for recovering sheelite. 4,040,519, Cl. 209-166.000.

Fukuda, Akira: *See—*
Tokunaga, Koichi; and Fukuda, Akira, 4,040,525, Cl. 214-6.00P.

Fukumoto, Noriyoshi. Button for clothes. 4,040,148, Cl. 24-108.000.

Fukuoka, Suguru: *See—*
Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, 4,040,879, Cl. 149-18.000.

Fukuroi, Takeo, to Yoshida Kogyo Kabushiki Kaisha. Slide fastener having discrete coupling elements. 4,040,150, Cl. 24-205.13R.

Fukushima, Masatoshi: *See—*
Iijima, Ryozo; Matsubara, Yukio; Yamaguchi, Ginichi; and Fukushima, Masatoshi, 4,040,937, Cl. 204-281.000.

Fukuzawa, Tadashi; Suzuki, Teruki; and Sato, Shigeru, to Hitachi, Ltd.; and Hitachi Medical Corporation. Radiographic phosphor screen. 4,041,319, Cl. 250-460.000.

Fuller, James Alec: *See—*
Liu, Charles Chung-Yeh; and Fuller, James Alec, 4,041,499, Cl. 343-756.000.

Funaki, Takashi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Method of manufacturing symbol indication drum. 4,040,160, Cl. 29-159.00R.

Furukawa Electric Co., Ltd., The: *See—*
Furuto, Yoshio; and Ban, Masaaki, 4,041,376, Cl. 324-33.000.

Furutachi, Nobuo: *See—*
Arai, Atsuaki; Shiba, Keisuke; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 4,040,835, Cl. 96-56.500.
Arai, Atsuaki; Nakamura, Kotaro; Yamada, Minoru; and Furutachi, Nobuo, 4,040,836, Cl. 96-56.500.

Furuto, Yoshio; and Ban, Masaaki, to Furukawa Electric Co., Ltd., The. Detector for detecting the state of electrically non-conductive or substantially electrically non conductive fluid. 4,041,376, Cl. 324-33.000.

Fuse, Noboru; and Muramoto, Kenichi, to Tokyo Shibaura Electric Co., Ltd. Vertical type junction field effect semiconductor device. 4,041,517, Cl. 357-22.000.

Fushiki, Isamu: *See—*
Sakamoto, Kenro; Fushiki, Isamu; and Koboshi, Sigeharu, 4,040,837, Cl. 96-60.0BF.

Futaba Denshi Kogyo K. K.: *See—*
Chusha, Hideo, 4,041,427, Cl. 335-205.000.
Eto, Goro; and Utamura, Yukihiko, 4,041,348, Cl. 313-497.000.

Fynbo, Knud Hansen: *See—*
Arfelt, Soren Christian Schoubye; Clausen, Ib Christian; Jensen, Johannes; Fynbo, Knud Hansen; and Fischer, Jean Arnold, 4,040,652, Cl. 292-167.000.

G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,041,050, Cl. 260-345.700.
Zipper, Jaime A., 4,040,417, Cl. 128-130.000.

Gabrielsson, Arne Goran; and Lindstrom, Jan Erik, to Telefonaktiebolaget L M Ericsson. Low duty cycle pulse generator using two thyristors. 4,041,417, Cl. 331-107.00R.

GAF Corporation: *See—*
Boranian, Armen G.; and Timm, Walter C., 4,041,200, Cl. 428-40.000.
Ziegler, B. Randall, 4,040,851, Cl. 106-93.000.

Gaffar, Abdul: *See—*
Gaffar, Maria Corazon; Gaffar, Abdul; and Hauschild, John P., 4,041,149, Cl. 424-57.000.

Gaffar, Maria Corazon; Gaffar, Abdul; and Hauschild, John P., to Colgate-Palmolive Company. Composition and method of controlling and preventing mouth odor. 4,041,149, Cl. 424-57.000.

Gagne, Rudy L. Method for coating a substrate with plastic. 4,041,197, Cl. 427-278.000.

Gaia, Aldino J., to McGraw-Edison Company. Protector for electric circuit. 4,041,435, Cl. 337-159.000.

Galliot, Brigitte: *See—*
Chany, Charles; Galliot, Brigitte; Chevalier, Marie-Josephe; and Ankel, Helmut, 4,041,152, Cl. 424-85.000.

Gandolfi, Carmelo; Doria, Gianfederico; Pellegata, Renato; and Usardi, Maria M., to Carlo-Erba S.p.A. 16-Methyl prost-5-en-13-ynoic acid derivatives. 4,041,064, Cl. 560-121.000.

Garberick, Thayne K. Heat recovery apparatus. 4,040,477, Cl. 165-103.000.

Garcia, Onofre S. Wing to swim. 4,040,136, Cl. 9-302.000.

Gard, Inc.: *See—*
Peters, Walter A.; Hozian, Curtis A.; and Gusek, Richard W., 4,040,510, Cl. 194-2.000.

Garner, Albert Y., to Monsanto Research Corporation. Flame retardant. 4,040,780, Cl. 8-116.00P.

Garrett Corporation, The: *See—*
Richerson, David W.; and Schuyler, Donald R., II, 4,040,845, Cl. 106-38.900.

Garrett, William R.: *See—*
Kellner, Jackson M.; and Garrett, William R., 4,040,495, Cl. 175-73.000.

Garrick, Laurence James; and Simon, Rachel. Pneumatic systems and valves therefor. 4,040,655, Cl. 296-63.000.

Garrott, Warren A., Jr. Anaerobic waste treatment facility. 4,040,963, Cl. 210-219.000.

Garvey, Daniel C.: *See—*
Parker, George E.; and Garvey, Daniel C., 4,041,429, Cl. 335-276.000.

Gattuso, Marion J., to UOP Inc. Particularly substituted thiazolesulfenamides. 4,041,043, Cl. 260-306.60A.

Gaudeul, Bruno, to Iria Institut de Recherche D'Informatique et D'Automatique. Apparatus for the analysis of the operation of a system using binary signals. 4,041,281, Cl. 235-92.0PD.

Gaughan, Gerald E.: *See—*
Blajda, Raymond S.; Kantenwein, Robert W.; Gaughan, Gerald E.; and Sikra, John F., 4,040,359, Cl. 102-93.000.

Gauper, Harold A., Jr., to General Electric Company. Electromagnetically shielded electrical converter and an improved electromagnetic shield therefor. 4,041,364, Cl. 363-15.000.

Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, to Compagnie Industrielle des Telecommunications Cit-Alcatel SA. System for simultaneous transmission of several pulse trains. 4,041,392, Cl. 325-38.00A.

Gazard, Maryse: *See—*
Dubois, Jean-Claude; and Gazard, Maryse, 4,041,190, Cl. 427-43.000.

Geckle, Raymond James: *See—*
Kahn, David; and Geckle, Raymond James, 4,040,808, Cl. 65-33.000.

Geeck, Joseph S. Chain saw blade sharpening accessory. 4,040,314, Cl. 76-78.00R.

Geer, Ernest C.: *See—*
Cook, Harold L., Jr.; Geer, Ernest C.; and Katz, Donald L., 4,040,487, Cl. 166-314.000.

Geiger, Dana F.: *See—*
Brosh, Amnon; and Geiger, Dana F., 4,041,289, Cl. 235-151.330.

Gembicki, Stanley A.; and Hammerman, John I., to UOP Inc. Hydrocarbon conversion catalytic composite. 4,040,979, Cl. 252-439.000.

General Atomic Company: *See—*
Mysels, Karol J., 4,040,902, Cl. 176-30.000.

General Dynamics: *See—*
Schertz, Charles W.; and Ritter, Edward H., 4,040,744, Cl. 356-152.000.
Slysh, Paul, 4,040,333, Cl. 89-37.50R.
Speer, Spencer J., 4,040,420, Cl. 128-218.00M.

General Electric Company: *See—*
Anthony, Thomas R.; and Cline, Harvey E., 4,040,869, Cl. 148-1.500.
Blount, Richard, 4,041,300, Cl. 240-1.300.
Boah, John K., 4,041,278, Cl. 219-411.000.
Carlson, Robert G., 4,040,770, Cl. 416-230.000.
Chang, Mike F.; Cline, Harvey E.; and Anthony, Thomas R., 4,040,868, Cl. 148-1.500.
Cline, Harvey E.; and Anthony, Thomas R., 4,040,171, Cl. 29-577.000.
Collins, Edward J.; and Medved, Donald C., 4,040,777, Cl. 431-95.00A.
Coppola, Patrick S.; and Kotansky, Stephen, 4,040,600, Cl. 251-63.000.
Cornell, Edward P., 4,041,361, Cl. 318-227.000.
Darrow, Kenneth A.; Kydd, Paul H.; and Daly, John W., 4,040,159, Cl. 29-156.80H.
Davis, Richard Kent, 4,041,405, Cl. 328-181.000.
Frabetti, Alton J., Jr., 4,041,085, Cl. 260-621.00R.
Gauper, Harold A., Jr., 4,041,364, Cl. 363-15.000.
Ghezzo, Mario, 4,040,893, Cl. 156-659.000.
Giaever, Ivar, 4,041,146, Cl. 424-1.000.
Greskovich, Charles D.; and Rosolowski, Joseph H., 4,040,848, Cl. 106-73.500.
Greskovich, Charles D.; and Rosolowski, Joseph H., 4,040,849, Cl. 106-73.500.
Howard, Webster L., 4,040,268, Cl. 62-335.000.
Jeram, Edward M., 4,041,010, Cl. 260-42.260.
LaGiusa, Frank F., 4,041,344, Cl. 313-113.000.
LeGrand, Donald G.; and Vitale, Gina G., 4,040,882, Cl. 156-106.000.
Marquardt, Robert Alden, 4,041,442, Cl. 340-6.00R.

McBride, Robert B.; and Tiberio, Phillip J., 4,040,790, Cl. 23-253.00C.
Morris, George E., 4,041,360, Cl. 318-221.00R.
Noeske, Heinz O., 4,041,263, Cl. 200-148.00A.
Orth, Edward D.; Roberts, John A.; and Smith, Raymond J. D., 4,040,936, Cl. 204-271.000.
Peak, Steven C.; and Anderson, Thomas E., 4,041,365, Cl. 363-58.000.
Prochazka, Svante, 4,041,117, Cl. 264-63.000.
Rich, Joseph A., 4,041,261, Cl. 200-144.00B.
Sargent, Paul L.; and Ghezzo, Mario, 4,040,892, Cl. 156-659.000.
Stevenson, Howard R., Jr., 4,041,485, Cl. 343-7.300.
Walden, John P., 4,041,544, Cl. 361-106.000.
Will, Fritz G.; and Holub, Fred F., 4,040,916, Cl. 204-55.00R.
Yerman, Alexander J., 4,040,874, Cl. 148-33.300.

General Engineering & Mfg. Corporation: *See—*
Wallace, Earl C.; and Bell, Richard A., 4,040,665, Cl. 297-417.000.
Wallace, Earl C., 4,040,881, Cl. 156-93.000.

General Foods Corporation: *See—*
Parliment, Thomas Holden, 4,041,185, Cl. 426-534.000.

General Mills Chemicals, Inc.: *See—*
Maske, Fred, 4,041,234, Cl. 536-114.000.

General Motors Corporation: *See—*
Davis, James L.; and Ewing, Keith E., 4,041,440, Cl. 338-195.000.
Huber, David A.; and Schoen, Roy C., 4,041,339, Cl. 310-239.000.
King, Charles W.; Ruff, Donald O.; and Sheldrake, Leonard J., 4,041,369, Cl. 322-99.000.
Koljonen, Vilho, 4,041,302, Cl. 240-8.300.
Madsen, John E.; and Drabik, Walter, 4,041,338, Cl. 310-186.000.
Pelchat, Paul F., 4,041,301, Cl. 240-2.130.
Robarge, Wilbur A., 4,041,539, Cl. 360-106.000.
Shellhause, Ronald L., 4,041,449, Cl. 340-52.00C.

General Steel Industries, Inc.: *See—*
Jackson, Keith L., 4,040,360, Cl. 105-136.000.
Jackson, Keith L., 4,040,361, Cl. 105-136.000.
McPherson, Gerry E., 4,041,198, Cl. 427-294.000.

General Tire & Rubber Company, The: *See—*
Kalafus, Edward Florent; and Sharma, Satish Chander, 4,040,999, Cl. 260-29.300.

Genini, Graziano, to Albatex A.G. Drawing gripper for gripping and transporting weft yarns in continuous weft feed looms. 4,040,454, Cl. 139-448.000.

Genzer, Jerome D.: *See—*
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 4,041,042, Cl. 260-301.000.

Georg Fischer Aktiengesellschaft: *See—*
Gramespacher, Herbert; and Feisel, Armin, 4,040,316, Cl. 82-32.000.
Henych, Ivo; Fischer, Erwin; and Reist, Jurg, 4,040,596, Cl. 249-117.000.

George, Flint R.: *See—*
Vann, Roy R.; and George, Flint R., 4,040,485, Cl. 166-297.000.

Gerber, Bernard: *See—*
Oguey, Henri J.; and Gerber, Bernard, 4,041,522, Cl. 357-42.000.

Gerdes, Claus-Holmer. Electrical heating element. 4,041,275, Cl. 219-307.000.

Gergen, William P.: *See—*
Davison, Sol; and Gergen, William P., 4,041,103, Cl. 260-857.00D.

Gerin, Merlin: *See—*
Buisson, Gaston; and Hennebert, Jacques, 4,041,356, Cl. 361-14.000.

Gerry, Martin E.: *See—*
Wotherspoon, John G., 4,040,211, Cl. 52-100.000.

Gershman, Mikhail Bentsionovich: *See—*
Axelrod, Shoya Samuilovich; Belozerov, Viktor Grigorievich; Gershman, Mikhail Bentsionovich; Margolin, Evel Grigorievich; and Shapot, Mikhail Borisovich, 4,041,218, Cl. 429-136.000.

Gerson, Samuel L. Teapot and lid combination. 4,040,538, Cl. 220-20.000.

Gertsch, Peter; and Wehrli, Alfons, to Maschinenfabrik Wifag. Ductor or film-transferring inking mechanism, particularly for offset presses. 4,040,348, Cl. 101-350.000.

Ghezzo, Mario, to General Electric Company. Method of selective etching of materials utilizing masks of binary silicate glasses. 4,040,893, Cl. 156-659.000.

Ghezzo, Mario: *See—*
Sargent, Paul L.; and Ghezzo, Mario, 4,040,892, Cl. 156-659.000.

Ghosez, Leon; Rossey, Guy; and Didderen, Freddy, to U C B, Societe Anonyme. N-benzyl-2,2-dimethoxy-acetamides. 4,041,077, Cl. 260-562.00R.

Giacino, Christopher: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 4,041,186, Cl. 426-535.000.

Giaever, Ivar, to General Electric Company. Method for detection of biological particles. 4,041,146, Cl. 424-1.000.

Giannini, Richard J.: *See—*
Frazita, Richard F.; Lopez, Alfred R.; and Giannini, Richard J., 4,041,501, Cl. 343-844.000.

Gibb, James Francis, to Hartford Special Machinery Company, The. Clearing wheel assembly for thread rolling machine and the like. 4,040,542, Cl. 221-162.000.

Giddings & Lewis, Inc.: *See—*
Kolell, Norbert C.; and Conners, John P., 4,041,287, Cl. 235-151.110.

Giebel, Buddy E., to Union Camp Corporation. Carton with smooth reinforced hand hole. 4,040,559, Cl. 229-23.00R.

Giebel, Joseph L., to Mine Safety Appliances Company. Completely expendable mine anchor line cutting tool. 4,040,376, Cl. 114-221.00A.

Giffen, William M., Jr.: *See—*
Talsma, Herbert; and Giffen, William M., Jr., 4,041,005, Cl. 260-32.80A.

Giffen, William McAlpin; Pollitt, John Michael; and Clifford, Roy, to Auto Restraint Systems Limited. Seat-belt apparatus. 4,040,645, Cl. 280-745.000.

Gilgallon, Carl. Saddle for U-bolt clamp. 4,040,152, Cl. 24-277.000.

Giller, Heinz: *See—*
Achsel, Eberhard; Hortig, Hans-Peter; Seipp, Heinrich; and Giller, Heinz, 4,040,793, Cl. 23-273.00R.

Gillette Company, The: *See—*
Adinolfi, Rocco J., 4,040,432, Cl. 132-9.000.

Gilreath, Murvin Bruce. Bedding attachment system. 4,040,133, Cl. 5-320.000.

Girling Limited: *See—*
Newstead, Charles, 4,040,506, Cl. 188-72.500.

Girlock Limited of Belmore: *See—*
Ince, Bernard John, 4,040,291, Cl. 73-81.000.

Giroux, Pierre. Hydraulic torque converting wheel. 4,040,310, Cl. 74-688.000.

GKN Transmissions Limited: *See—*
Rolt, Anthony P. R.; Walker, Frederick J.; and Webb, Oswald, 4,040,271, Cl. 64-26.000.

Glaeser, Wolfgang; and Mathy, Wolfgang, to Starck, Hermann C. Process for the preparation of crystalline potassium tantalum fluoride. 4,041,138, Cl. 423-464.000.

Glance, Bernard, to Bell Telephone Laboratories, Incorporated. Method and apparatus for frequency stabilizing oscillators. 4,041,416, Cl. 331-96.000.

Glasgow, Luther Ellis. Crust former. 4,040,734, Cl. 425-218.000.

Glock, Eugene: *See—*
Ashworth, James G.; Glock, Eugene; Kelly, James G.; McLaughlin, James L.; and Merwin, Owen T., 4,040,431, Cl. 131-140.00P.

Glockler, Otto: *See—*
Kraus, Bernd; and Glockler, Otto, 4,040,408, Cl. 123-179.00L.

Gnecco, Rafael. Porcelain tooth and method of manufacture. 4,040,844, Cl. 106-35.000.

Goffe, William L.; Mammino, Joseph; and Ewing, Joan R., to Zerox Corporation. Imaging system of migration material in softenable layer. 4,040,826, Cl. 96-1PS.

Golcher, William Ernest: *See—*
Higgins, David, 4,040,544, Cl. 222-477.000.

Gold, Bernard Samuel; and Smithers, Peter Alan, to Roband Electronics Limited. Apparatus for generating alternating currents of accurately predetermined waveform. 4,041,367, Cl. 363-97.000.

Goldman, Abraham. Shielding holder for a syringe having indirect viewing means. 4,040,419, Cl. 128-215.000.

Goldwell GmbH Chemische Fabrik H.E. Dotter: *See—*
Wittersheim, Adam, 4,040,975, Cl. 252-359.00E.

Goodbar, Isaac, to Edison Price, Inc. Display illuminating structure. 4,040,725, Cl. 350-263.000.

Goodling, John S.; McDaniel, Gayner R.; and Steadham, Richard A., to Auburn Research Foundation. Poultry beak remover. 4,040,425, Cl. 128-303.140.

Goodman Equipment Corporation: *See—*
Kamner, Haim J., 4,040,308, Cl. 74-586.000.

Goralski, Christian T.; Pews, R. Garth; and Burk, George A., to Dow Chemical Company, The. 3,4,5-Trichloro-N,N-di(loweralkyl)-2-(mercapto) benzenesulfonamides. 4,041,073, Cl. 260-556.0AR.

Goransson, Per Staffan, to Kommanditbolaget Pemac Invention AB & Co. Latticed wire structure with a sound-absorbing material. 4,040,212, Cl. 52-145.000.

Gorsky, Egon; and Minknow, Morse. Timepiece with electronic chime generator. 4,040,246, Cl. 58-23.00R.

Gothel, Herbert; Cornils, Boy; Feichtinger, Hans; Tummes, Hans; and Falbe, Jurgen, to Ruhrchemie Aktiengesellschaft. Process for the production of primary amines. 4,041,080, Cl. 260-585.00B.

Goto, Naohiro: *See—*
Shidara, Keiichi; Goto, Naohiro; Maruyama, Eiichi; Hirai, Tadaaki; and Fujita, Tsutomu, 4,040,985, Cl. 252-501.000.

Goto, Tatsuo: *See—*
Inoyama, Tadao; Goto, Tatsuo; Takeyasu, Kiyoo; Ishimura, Hiroshi; and Suzuki, Junichi, 4,041,294, Cl. 235-151.110.

Gotschall, George E.: *See—*
Sekmakas, Kazys; and Gotschall, George E., 4,040,995, Cl. 260-22.0CQ.

Gottling, Helmut, to WABCO Westinghouse GmbH. Automatic fluid pressure cut-off safety device. 4,040,437, Cl. 137-102.000.

Gottschalk, Robert E.; and Saiki, Albert K., to Gottschalk, Robert E. Camera cradle tilt mechanism. 4,040,587, Cl. 248-185.000.

Gotz, Martin, to Erich Grau Stanzwerk fur Elektrobleche. Intermittent stock feed mechanism. 4,040,553, Cl. 226-151.000.

Gouret, Claude J.: *See—*
Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Gouret, Claude J., 4,041,030, Cl. 544-117.000.
Fauran, Claude P.; Bourgery, Guy R.; and Gouret, Claude J., 4,041,072, Cl. 260-558.00A.

Gradeff, Peter S.; and Formica, Giuseppe, to Rhodia, Inc. Process for the selective hydrogenation of the keto group in nonconjugated olefinic ketones. 4,041,083, Cl. 260-617.00C.

Gramespacher, Herbert; and Feisel, Armin, to Georg Fischer Aktiengesellschaft. Lathe bed. 4,040,316, Cl. 82-32.000.

Granges Oxelosunds Jarnverk AB: *See—*
Karlsson, Per-Olle, 4,041,379, Cl. 324-37.000.

Grant, Samuel Edward: *See—*
Bush, Thomas P., Jr.; and Grant, Samuel Edward, 4,040,459, Cl. 144-312.000.

Grass Valley Group, Inc., The: *See—*
Rayner, Bruce Leland; and Taylor, Gerald Graham, 4,041,527, Cl. 358-22.000.

Gravdahl, Eugen, to Telefonaktiebolaget L M Ericsson. Arrangement for carrying out random selection among a plurality of selectable devices in a telecommunication system. 4,041,458, Cl. 340-166.00R.

Great Lakes Carbon Corporation: *See—*
Baud, Michael F.; and Harvey, Jay A., 4,041,116, Cl. 264-29.500.

Green, Harry. Chord indicator for instruments having organ and piano-type keyboards. 4,040,324, Cl. 84-478.000.

Green, William P.: *See—*
Hattan, Mark, 4,040,462, Cl. 151-14.0CS.

Greene, Leonard M., to Safe Flight Instrument Corporation. Automatic pilot for a sailboat. 4,040,374, Cl. 114-144.00C.

Greene, Marvin, to Cities Service Company. Process of treating carbonaceous material with carbon dioxide. 4,040,976, Cl. 252-373.000.

Gregory, Don A.: *See—*
Harrington, James A.; and Gregory, Don A., 4,040,896, Cl. 156-645.000.

Grekov, Vladimir Borisovich: *See—*
Iodvalkis, Vitautas Jurgio; Nomitsas, Richardas Prano; Andreev, Anatoly Fedorovich; and Grekov, Vladimir Borisovich, 4,041,504, Cl. 354-23.00R.

Grell, Karl-Ludwig, to Industriewerk Schaeffler OHG. Novel cylindrical rollers. 4,040,688, Cl. 308-202.000.

Greskovich, Charles D.; and Rosolowski, Joseph H., to General Electric Company. Polycrystalline silicon articles containing boron by sintering. 4,040,848, Cl. 106-73.500.

Greskovich, Charles D.; and Rosolowski, Joseph H., to General Electric Company. Polycrystalline silicon articles by sintering. 4,040,849, Cl. 106-73.500.

Gressitt, Tillman Johnson, to Bell Telephone Laboratories, Incorporated. Quick connector for service wires. 4,040,701, Cl. 339-99.00R.

Gribens, Joel A.: *See—*
Simons, Charles W.; O'Neill, Gerald J.; and Gribens, Joel A., 4,041,148, Cl. 424-45.000.

Griffith, Inc.: *See—*
Griffith, Vernon D., 4,040,753, Cl. 401-186.000.

Griffith, Vernon D., to Griffith, Inc. Applicator instrument. 4,040,753, Cl. 401-186.000.

Gristina, Anthony G., to Howmedica, Inc. Trispherical prosthetic shoulder device. 4,040,131, Cl. 3-1.910.

Gritter, David James, to Borg-Warner Corporation. Three-phase, quasi-square wave VSCF induction generator system. 4,041,368, Cl. 322-47.000.

Grivsky, Eugene M., to Burroughs Wellcome Co. Anti-convulsant cinnamide compounds. 4,041,071, Cl. 260-558.00R.

Groeneweg, Abraham, to N. V. Optische Industrie "De Oude Delft". Optical apparatus for reproducing a pair of data images on a common photographic plane. 4,040,723, Cl. 350-203.000.

Groff, Alvin H., to Rockwell International Corporation. Absolute incremental hybrid shaft position encoder. 4,041,483, Cl. 340-347.00P.

Gross, James R., to Dow Chemical Company, The. Process for spinning absorbent articles from copolymers having a copolymerized crosslinker. 4,041,020, Cl. 260-79.30M.

Gross, James R.; and McFadden, Russell T., to Dow Chemical Company, The. Water swellable articles. 4,041,231, Cl. 526-317.000.

Gross, James Richard, to Dow Chemical Company, The. Absorbent articles and methods for their preparation. 4,041,228, Cl. 526-240.000.

Grosse, Aristid V., to A & T Development Corporation. Pillars, walls and buildings. 4,040,216, Cl. 52-169.130.

Grossman, Milton J.; and Lewis, Deanna Rose. Carton adapted to be stacked flat and snapped open. 4,040,560, Cl. 229-41.00B.

Grote & Hartmann: *See—*
Konnemann, Alfred, 4,040,713, Cl. 339-259.00R.

Grove, Leslie W., Jr.: *See—*
Clark, Joseph H.; and Grove, Leslie W., Jr., 4,040,289, Cl. 73-46.000.

Grover, Vijay K.; and Zachry, Woodie, to Airco, Inc. C-clamp ground adapters. 4,040,714, Cl. 339-264.00R.

Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
Tost, Heinrich, 4,040,385, Cl. 118-326.000.

Grune, Per Olof, to Asea Aktiebolag. Operating device for a contact device for a pre-insertion resistor in a high-voltage circuit breaker. 4,041,264, Cl. 200-148.00R.

Gruppo Lepetit S.p.A.: *See—*
Assandri, Alessandro; Lancini, Giancarlo; Volpe, Giancarlo; and Cavalleri, Bruno, 4,041,168, Cl. 424-273.000.
Pifferi, Giorgio; Omodei-Sale', Amedeo; and Consonni, Pietro, 4,041,048, Cl. 260-333.000.

Gryaznov, Vladimir Mikhailovich: *See—*
Smirnov, Viktor Sergeevich; Gryaznov, Vladimir Mikhailovich; Lebedeva, Valentina Ivanovna; Mischenko, Alexandr Petrovich; Polyakova, Victoria Petrovna; and Savitsky, Evgeny Mikhailovich, 4,041,093, Cl. 260-673.500.

GTE Automatic Electric (Canada) Ltd.: *See—*
Thomas, Robert M., 4,041,327, Cl. 307-231.000.

GTE Automatic Electric Laboratories Incorporated: *See—*
Beeman, Robert Herbert; and Tarr, Lloyd Arthur, 4,041,248, Cl. 179-84.0VF.
Boleda, Alberto; and Tracey, Robert J., 4,041,484, Cl. 340-347.0NT.
Brush, Douglas J.; Vonder, David L.; and Wilkis, Anthony J., 4,041,425, Cl. 335-129.000.
Oades, John Willson, 4,041,389, Cl. 325-3.000.
Owlett, David Donald, 4,041,421, Cl. 333-73.00W.

GTE Laboratories Incorporated: *See—*
Feuersanger, Alfred E.; and Shortt, Brian A., 4,041,447, Cl. 340-174.0TF.
McNeill, William H.; Haugsjaa, Paul O.; Lech, Joseph; and Regan, Robert J., 4,041,352, Cl. 315-248.000.

GTE Sylvania Incorporated: *See—*
Neuber, Ralph E.; and Rehkopf, Charles H., 4,040,708, Cl. 339-111.000.
Pisano, John J., 4,040,707, Cl. 339-111.000.

Guardian Electric Manufacturing Co.: *See—*
Hrynewycz, Orest, 4,041,430, Cl. 336-92.000.

Guglielmo, Joe H. Flexible back pack frame. 4,040,548, Cl. 224-25.00A.

Guillen, Rafael. Adjustable aerosol can holder. 4,040,543, Cl. 222-473.000.

Gulf Research & Development Company: *See—*
Bacha, John D.; and Selwitz, Charles M., 4,040,911, Cl. 203-9.000.
Barie, Walter P., Jr.; Onopchenko, Anatoli; and Schulz, Johann G. D., 4,041,004, Cl. 260-32.8EP.
Innes, Robert A.; and Perrotta, Anthony J., 4,040,983, Cl. 252-469.000.
McKinney, Joel D.; and Mitchell, Bruce R., 4,040,945, Cl. 208-113.000.
Selwitz, Charles M., 4,040,956, Cl. 210-60.000.

Gulliford, Henry Howard; and Dunstan, Harvey John, to Coulter Electronics, Inc. On-line sampling system for monitoring particles suspended in a fluid. 4,041,385, Cl. 324-71.0CP.

Gulton Industries, Inc.: *See—*
Wagner, Herbert A., 4,040,738, Cl. 356-1.000.

Gurien, Harvey: *See—*
Christenson, James Gordon; Gurien, Harvey; and Teitel, Sidney, 4,041,040, Cl. 260-292.000.

Gusek, Richard W.: *See—*
Peters, Walter A.; Hozian, Curtis A.; and Gusek, Richard W., 4,040,510, Cl. 194-2.000.

Gushue, Edward J.: *See—*
Shepard, David H.; and Gushue, Edward J., 4,041,454, Cl. 340-146.30F.

Guzzetta, Joseph A.: *See—*
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 4,040,532, Cl. 214-152.000.

H. & D. E. Watts: *See—*
Watts, Horace, 4,040,446, Cl. 137-625.170.

Haass, Adolf, to Siemens Aktiengesellschaft. Method and apparatus for the transmission of data. 4,041,239, Cl. 178-68.000.

Haferl, Peter Eduard, to RCA Corporation. Pincushion correction circuit. 4,041,354, Cl. 315-371.000.

Hafke, Carl: *See—*
Rudolph, Paul; Bierbach, Herbert; Kupfer, Hans; Hafke, Carl; and Kohlen, Rudolf, 4,040,800, Cl. 48-85.200.

Hahnke, Manfred; and Papenfuhs, Theodor, to Hoechst Aktiengesellschaft. Process for the preparation of symmetric 4-halogen-4',4''-diarylamino-triphenylmethane compounds. 4,041,054, Cl. 260-393.000.

Hall, John B.; Hruza, Denis E.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., to International Flavors & Fragrances Inc. Alkyl-2-methyl-3,4-pentadienoates. 4,041,069, Cl. 260-486.00R.

Hall, Kenneth M.: *See—*
Donahue, James T.; Hall, Kenneth M.; and Worth, Arthur J., 4,041,358, Cl. 361-365.000.

Halliburton Company: *See—*
Mosier, John E., 4,041,283, Cl. 235-150.200.

Halm Instrument Co., Inc.: *See—*
Harrison, Henry, 4,040,804, Cl. 55-158.000.

Hamaker, Ralph A.; and Carr, George Phillip, to Xerox Corporation. Development imaging methods. 4,040,827, Cl. 96-1.0LY.

Hamasaki, Nobuhiro: *See—*
Mizushima, Wataru; Nakata, Koreaki; Hamasaki, Nobuhiro; and Iida, Yoshio, 4,041,359, Cl. 361-433.000.

Hammann, Ingeborg: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,158, Cl. 424-212.000.
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,177, Cl. 424-322.000.

Hammerman, John I.: *See—*
Gembicki, Stanley A.; and Hammerman, John I., 4,040,979, Cl. 252-439.000.

Handler, Michael D.: *See—*
Mason, Stanley I., Jr.; Handler, Michael D.; and Richardson, James E., 4,040,568, Cl. 239-57.000.

Handtmann, Dieter; and Lavanchy, Jean-Pierre, to Robert Bosch GmbH. Opto-electronic sensor. 4,040,740, Cl. 356-4.000.

Hanewinkel, Lorenz, to Nixdorf Computer AG. Method and apparatus for the determination of the transition of digital data signals modulated with two different signal frequencies. 4,041,406, Cl. 329-107.000.

Haney, Thomas A.: *See—*
Morcos, Nabil A.; Bruno, Gerald A.; and Haney, Thomas A., 4,041,317, Cl. 250-432.0PD.

Hanford, William E. Apparatus for feeding chemicals to a liquid stream. 4,040,962, Cl. 210-206.000.

Hansel, William B., to Sun Oil Company of Pennsylvania. Dispenser member for filling fluid storage containers. 4,040,448, Cl. 138-42.000.

Hansel, William B., to Sun Oil Company of Pennsylvania. Gasoline tank fillpipe adapter. 4,040,458, Cl. 141-392.000.

Hansen, Guenter: *See—*
Maier, Karl; Hansen, Guenter; and Kermer, Wolf-Dieter, 4,041,025, Cl. 260-158.000.
Happy Sewing Machine Manufacturing Company: *See—*
Kaito, Yukio, 4,040,369, Cl. 112-258.000.
Hara, Hideo, to Kabushiki Kaisha Komatsu Seisakusho. Control system for a hydraulically actuated device such as the vibrator motor of a self-propelled vibratory compactor. 4,040,255, Cl. 60-445.000.
Harada, Shinichi, to Niles Parts Company, Limited. Switch having universal type actuator and guide plate. 4,041,258, Cl. 200-6.00A.
Hardy, Edgar E.: *See—*
David, Donald J.; and Hardy, Edgar E., 4,040,749, Cl. 356-201.000.
Haroules, George G.: *See—*
Ewen, Harold I.; and Haroules, George G., 4,041,494, Cl. 343-112.00D.
Harrington, James A.; and Gregory, Don A., to United States of America, Army. Chemical polish for BaF_2 and CaF_2. 4,040,896, Cl. 156-645.000.
Harris Corporation: *See—*
Belcher, Donald Keith, 4,041,410, Cl. 330-129.000.
Harris, Frank D., to Harris, Ralph D. Roof insulation support means. 4,040,224, Cl. 52-509.000.
Harris, Howard A., to Shell Oil Company. Ketoheterobicyclic grease thickeners. 4,040,968, Cl. 252-51.50A.
Harris, John L., to Deltrol Corporation. Automatic reset timer. 4,041,424, Cl. 335-75.000.
Harris, Ralph D.: *See—*
Harris, Frank D., 4,040,224, Cl. 52-509.000.
Harris, William J.: *See—*
Waeldner, William J.; and Harris, William J., 4,040,564, Cl. 236-49.000.
Harrison, Henry, to Halm Instrument Co., Inc. Heat and moisture exchanger. 4,040,804, Cl. 55-158.000.
Harrison, Robert Adams: *See—*
Walasewicz, Stanley John; Erickson, Virgil William; Harrison, Robert Adams; and Houghton, Royal Elwin, 4,040,409, Cl. 125-11.0AS.
Harry Ferguson Limited: *See—*
Rolt, Anthony P. R.; Walker, Frederick J.; and Webb, Oswald, 4,040,271, Cl. 64-26.000.
Hart, Gerald E. Doppler-radar terrain-clearance warning system. 4,041,341, Cl. 343-5.00R.
Hartel, Kurt: *See—*
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,041,164, Cl. 424-263.000.
Hartford Special Machinery Company, The: *See—*
Gibb, James Francis, 4,040,542, Cl. 221-162.000.
Hartmann, Rudolf, to Bell & Howell Company. Automatic electronic rangefinder. 4,041,505, Cl. 354-25.000.
Hartshorn, David W.: *See—*
Whitehouse, David R.; and Hartshorn, David W., 4,041,351, Cl. 315-205.000.
Hartung, Klaus-Dieter: *See—*
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Harvey, Jay A.: *See—*
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Harz, Kurt: *See—*
Voss, Eitel; Waldofner, Karl-Heinz; and Harz, Kurt, 4,040,789, Cl. 23-230.00A.
Hase, Yoshihiko: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,040,946, Cl. 208-131.000.
Haskell, Harry Ainsworth, to AEP-International Ltd. Manually selectable switch arrays. 4,041,329, Cl. 307-247.00A.
Haswell, John W. Lift truck. 4,040,501, Cl. 180-89.180.
Hatakeyama, Nobuo: *See—*
Ohtsuka, Takaaki; Satake, Keigo; Yamazaki, Shiro; Hatakeyama, Nobuo; and Watanabe, Takeo, 4,041,170, Cl. 424-277.000.
Hatcher, Charles S.; and Atchley, Gary S., to Phillips Petroleum Company. Method and apparatus for restraining a yarn wad. 4,040,153, Cl. 28-221.000.
Hattan, Mark, to Green, William P., a part interest. Fasteners having threads formed of essentially helical coil structures. 4,040,462, Cl. 151-14.0CS.
Haugsjaa, Paul O.: *See—*
McNeill, William H.; Haugsjaa, Paul O.; Lech, Joseph; and Regan, Robert J., 4,041,352, Cl. 315-248.000.
Haus, Paul Z., Jr.: *See—*
Signorelli, John A.; and Haus, Paul Z., Jr., 4,040,279, Cl. 70-34.000.
Hauschild, John P.: *See—*
Gaffar, Maria Corazon; Gaffar, Abdul; and Hauschild, John P., 4,041,149, Cl. 424-57.000.
Hausman, LeeRoy W., Jr.: *See—*
Slutzky, Joel; Hausman, LeeRoy W., Jr.; and Kostenbauer, Ronald F., 4,041,463, Cl. 364-900.000.
Havlik, Jay M.: *See—*
Bosche, Earl E.; Havlik, Jay M.; and Kyle, James C., 4,040,256, Cl. 61-15.000.
Hawley, Laird V.: *See—*
Applequist, Quintin A.; and Hawley, Laird V., 4,040,643, Cl. 280-656.000.
Hay Handling Equipment Company: *See—*
Kenworthy, John B., 4,040,534, Cl. 214-766.000.
Hayakawa, Shigeru: *See—*
Nitta, Tsuneharu; Hayakawa, Shigeru; Kasahara, Yukio; and Terada, Ziro, 4,041,140, Cl. 423-561.00R.
Hayakawa, Tooru: *See—*
Edamoto, Akio; and Hayakawa, Tooru, 4,041,508, Cl. 354-128.000.
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, to Maruzen Petrochemical Co., Ltd. Process for the production of a petroleum coke and coking crystallizer used thereof. 4,040,946, Cl. 208-131.000.
Hayashi, Takao; and Matsukawa, Hiroharu, to Fuji Photo Film Co., Ltd. Method for fanning each set of multi-ply sheets. 4,041,193, Cl. 427-151.000.
Hayashi, Toshiharu: *See—*
Makishima, Hiroshi; Hosoda, Minoru; Kasiwagi, Eiichi; and Hayashi, Toshiharu, 4,040,842, Cl. 106-1.000.
Haydon, Arthur W., to Tri-Tech, Inc. Clock drive apparatus. 4,040,247, Cl. 58-23.00R.
Hayosh, Thomas D.; and Torre, Anthony J., to Schiller Industries, Inc. Apparatus for generating polyphase scan patterns. 4,041,322, Cl. 250-568.000.
Haytayan, Harry M. Pneumatic apparatus. 4,040,554, Cl. 227-8.000.
Hazeltine Corporation: *See—*
Frazita, Richard F.; Lopez, Alfred R.; and Giannini, Richard J., 4,041,501, Cl. 343-844.000.
Hearp, Kathleen Seese: *See—*
Sharpe, Andrew Jackson, Jr.; Windhager, Robert H.; and Hearp, Kathleen Seese, 4,040,984, Cl. 252-500.000.
Heasman, Peter John Robert, to Imperial Chemical Industries Limited. Method of making fiber reinforced protective headgear. 4,041,031, Cl. 264-250.000.
Heberlein Maschinenfabrik AG: *See—*
Raschle, Josef, 4,040,242, Cl. 57-77.300.
Raschle, Josef, 4,040,244, Cl. 57-77.450.
Heger, Adolf; Passler, Helmar; and Bennemann, Frank, to VEB Textilkombinat. Method of enhancing high polymers, particularly textiles. 4,041,192, Cl. 427-43.000.
Hegyi, Eugenia. Adjustable container strainer and handle. 4,040,964, Cl. 210-238.000.
Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Jeschke, Willi, 4,040,349, Cl. 101-365.000.
Heine, Heinrich: *See—*
Kyri, Hans; Brandle, Karl; Muller, Martin; and Heine, Heinrich, 4,040,850, Cl. 106-87.000.
Heine, Joseph, to Robert Bosch GmbH. Internal combustion engine distributor-breaker unit holding and adjustment arrangement. 4,040,407, Cl. 123-146.50A.
Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 4,041,186, Cl. 426-535.000.
Heintzelman, William J.; and Naiman, Michael I., to Petrolite Corporation. Reaction products of wax-anhydride compounds and polyamines. 4,041,056, Cl. 260-404.500.
Heitmann, Arnold M.; Brassert, Walter L.; and Chouinard, Donald N., to Northern Research and Engineering Corporation. Gas turbine combustion chamber arrangement. 4,040,251, Cl. 60-39.360.
Heiwig, Jane R.: *See—*
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Helbig, Joachim; and Fischer, Franz, to Verla-Pharm Arzneimittel-Fabrik Apotheker H. J. v. Ehrlich. Magnesium-containing pharmaceutical compositions. 4,041,154, Cl. 424-150.000.
Hellerman, Lance W.; and Hollyer, Richard S., to Marine Engineering Systems, Inc. Mobile offshore platform. 4,040,265, Cl. 61-91.000.
Henager, Charles H., to Battelle Development Corporation. Concrete joints. 4,040,220, Cl. 52-259.000.
Henkel & Cie GmbH: *See—*
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,040,972, Cl. 252-179.000.
Hennebert, Jacques: *See—*
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Henry, Michel Jacques, to UOP Inc. Fractionation of aromatic streams. 4,041,091, Cl. 260-672.00T.
Henson, Jesse L.: *See—*
Johnson, James B.; and Henson, Jesse L., 4,040,498, Cl. 180-68.00P.
Henych, Ivo; Fischer, Erwin; and Reist, Jurg, to Georg Fischer Aktiengesellschaft. Protective device for casting molds. 4,040,596, Cl. 249-117.000.
Hepher, Martin; Sperry, John Arthur; and Stewart, Malcolm John, to Autotype Company Limited, The. Dry transfer sheets. 4,041,204, Cl. 428-199.000.
Herbert, William J.: *See—*
Stine, Clifford R.; Klipec, Bruce E.; and Herbert, William J., 4,041,237, Cl. 174-36.000.
Hercules Incorporated: *See—*
Hopler, Robert B., Jr., 4,040,355, Cl. 102-22.00R.
Jenkins, Kennedy A., 4,041,194, Cl. 427-226.000.
Hergeth, Herbert; and Wirth, Walter, to Hergeth KG Maschinenfabrik und Apparatebau. Device for cleaning flock formed by natural fibers, especially cotton flock, of dirt particles. 4,040,948, Cl. 209-22.000.
Hergeth KG Maschinenfabrik und Apparatebau: *See—*
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Hersh, Lawrence K. Spoked wheel. 4,040,671, Cl. 301-58.000.
Herzog, Helmut; Bien, Hans-Samuel; and Hohmann, Walter, to Bayer Aktiengesellschaft. Process for the preparation of anthraquinone compounds. 4,041,053, Cl. 260-381.000.
Hess, Nelson Claire, to B. F. Goodrich Company, The. Low pressure tire warning device. 4,040,380, Cl. 116-34.00R.
Hessel, Harold H.; and Kiele, Francis S., to Stewart-Hall Chemical Co. Chemical dispensing apparatus. 4,040,515, Cl. 206-.500.
Hessert, James E., to Phillips Petroleum Company. Gel formation by polymer crosslinking. 4,040,484, Cl. 166-294.000.
Hetke, Adolf; Mohla, Prem P.; and Warrick, Robert J., to Ford Motor Company. Nodularizing catalyst for cast iron and method of making same. 4,040,821, Cl. 75-134.00S.
Heverly, James S., to Westinghouse Electric Corporation. Elliptical seam welding apparatus. 4,040,557, Cl. 228-9.000.
Hewitt, Albert Thomas, to Chloride Group Limited. Alkaline electric storage batteries. 4,041,212, Cl. 429-89.000.
Hewlett-Packard Company: *See—*
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Pasculle, Maurice J.; Merrill, Edgar F.; and Heyne, Carl J., 4,041,543, Cl. 361-33.000.
Higgins, David, to Golcher, William Ernest. Material dispenser with snap-acting outlet valve. 4,040,544, Cl. 222-477.000.
Hight, Michael John; Winkle, Roy Victor; and Dale, John Robert, to U.S. Philips Corporation. Ultrasonic bonding apparatus. 4,040,885, Cl. 156-378.000.
Hightower, Tafari. Cutting instrument. 4,040,184, Cl. 30-298.000.
Hijikata, Akiko: *See—*
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Hill, Andrew Joseph, to Raymond Lee Organization, Inc., The, a part interest. Clothing hanger guard. 4,040,545, Cl. 223-85.000.
Hill, Fred L. Row crop rogue vehicle. 4,040,238, Cl. 56-167.000.
Hill, John Carroll, to Integral Engineering & Manufacturing Corporation. Transmitter performance monitor and antenna matching system. 4,041,395, Cl. 325-133.000.
Hill, Max Lee; and Kimmel, Richard James, to Coleman Company Inc., The. Linkage for hinged tailgates. 4,040,654, Cl. 296-57.00R.
Hilliard Corporation, The: *See—*
Pauli, Ernest H., 4,040,757, Cl. 403-356.000.
Hillstrom, David U., to Marketing Displays, Inc. Panel framing device and method. 4,040,223, Cl. 52-483.000.
Hilti Aktiengesellschaft: *See—*
McCray, Walter A.; and Smith, Charles L., 4,040,471, Cl. 164-92.000.
Hinata, Masanao; Takei, Haruo; Miyasaka, Nobuaki; and Takahashi, Kenji, to Fuji Photo Film Co., Ltd. Radiographic process and sensitive material for the same. 4,040,833, Cl. 96-45.100.
Hinata, Masanao; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsion. 4,040,841, Cl. 96-126.000.
Hinata, Masanao: *See—*
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Hindmarsh, Graham John: *See—*
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Hini, Paul, to Siemens Aktiengesellschaft. Arrangement for the generation of electrical signals by means of magnetic field-dependent semiconductor components. 4,041,371, Cl. 323-94.00H.
Hino, Masanori; Eguchi, Taro; and Shiraga, Chitoshi, to Onkyo Kabushiki Kaisha. Horn speaker. 4,040,503, Cl. 181-192.000.
Hinton, Deborah M.: *See—*
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Hirota, Masakazu: *See—*
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Inoyama, Tadao; Goto, Tatsuo; Takeyasu, Kiyoo; Ishimura, Hiroshi; and Suzuki, Junichi, 4,041,294, Cl. 235-151.110.
Kominami, Yasuo; Suzuki, Yukio; and Kawamura, Masami, 4,041,409, Cl. 330-29.000.
Matsuda, Yasumasa; Kimura, Ichiro; Sagawa, Akio; and Hiramatsu, Tsutomu, 4,040,294, Cl. 73-117.300.
Miyakawa, Nobuaki, 4,041,299, Cl. 364-841.000.
Mukaemachi, Takuzi; Toyama, Toshiaki; and Miyoshi, Taturu, 4,041,246, Cl. 179-18.0GF.
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,041,332, Cl. 307-252.00J.
Sekido, Kenzi; and Yoshikawa, Tsugio, 4,040,766, Cl. 415-9.000.
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Shimizu, Shinji; Iwamatsu, Seiichi; and Homma, Makoto, 4,041,518, Cl. 357-23.000.
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Sunami, Hideo; Itoh, Yokichi; Inose, Fumiyuki; and Kamigaki, Yoshiaki, 4,041,521, Cl. 357-24.000.
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Hitachi Shipbuilding & Engineering Co., Ltd.: *See—*
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Hlinka, Edward A.: *See—*
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Hochiki Corporation: *See—*
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Achsel, Eberhard; Hortig, Hans-Peter; Seipp, Heinrich; and Giller, Heinz, 4,040,793, Cl. 23-273.00R.
Albrecht, Konrad; Frensch, Heinz; and Hartel, Kurt, 4,041,164, Cl. 424-263.000.
Arpe, Hans-Jurgen; and Hey, Hansjorg, 4,041,039, Cl. 260-290.00R.
Hahnke, Manfred; and Papenfuhs, Theodor, 4,041,054, Cl. 260-393.000.
Huber, Bernd; and Kleiner, Hans-Jerg, 4,041,230, Cl. 526-278.000.
Hummel, Wolfgang, 4,040,732, Cl. 355-3.00R.
Hunger, Klaus, 4,041,036, Cl. 260-256.40F.
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Hoekje, Howard H.; Carlson, Gordon A.; and Simmons, Robert B., to PPG Industries, Inc. Bipolar electrolyzer having silicon laminate backplate. 4,040,934, Cl. 204-256.000.
Hoff, Raymond E.; Pullukat, Thomas J.; and Shida, Mitsuzo, to Chemplex Company. Catalyst, method and polymerization processes. 4,041,224, Cl. 526-96.000.
Hoffmann-La Roche Inc.: *See—*
Avenia, Richard William; Christenson, James Gordon; and Pecherer, Benjamin, 4,041,076, Cl. 260-559.00A.
Christenson, James Gordon; Gurien, Harvey; and Teitel, Sidney, 4,041,040, Cl. 260-292.000.
Cohen, Noal; and Saucy, Gabriel, 4,041,058, Cl. 260-410.90R.
Felix, Arthur Martin; and Liebman, Arnold Alvin, 4,041,023, Cl. 260-112.50R.
Hogan, Gerard T.; and Weik, Kirby B., to UOP Inc. Vehicle seat with headrest movement responsive to seat back tilting. 4,040,661, Cl. 297-284.000.
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Holster, Peter Leendert; Ooms, Adam; and van den Hoogen, Marinus Johannes Gerardus, to U.S. Philips Corporation. Vibration amplitude transducer. 4,040,290, Cl. 73-71.000.
Holub, Fred F.: *See—*
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Holzl, Robert A., to Chemetal Corporation. Deposition method. 4,040,870, Cl. 148-6.300.

Homma, Makoto: *See—*
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Honeywell Inc.: *See—*
Chaffin, John H., III; and Skogman, Richard A., 4,040,927, Cl. 204-192.00S.
Honeywell Information Systems Inc.: *See—*
Kindell, Jerry L., 4,041,292, Cl. 235-164.000.
Tchon, Wallace Edward, 4,041,520, Cl. 357-24.000.
Honeywell Information Systems Italia: *See—*
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Yamamoto, Katsuhiko; Hontani, Kunihiko; Kitaura, Hiromu; and Nakamura, Michio, 4,041,533, Cl. 358-160.000.
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Pattison, Victor A., 4,041,229, Cl. 526-249.000.
Selley, Jeffrey E., 4,041,104, Cl. 260-859.00R.
Hopkins, Evan Leon; and Cartner, Donald W., to Hopkins Manufacturing Corporation. Ice scraper. 4,040,140, Cl. 15-236.00R.
Hopkins Manufacturing Corporation: *See—*
Hopkins, Evan Leon; and Cartner, Donald W., 4,040,140, Cl. 15-236.00R.
Hopkins, Roger A., to Diagraph-Bradley Industries, Inc. Rotary printer. 4,040,350, Cl. 101-376.000.
Hopkinson, Eric C., to Dresser Industries; Inc. Background subtraction system for pulsed neutron logging of earth boreholes. 4,041,309, Cl. 250-262.000.
Hopler, Robert B., Jr., to Hercules Incorporated. Excavation apparatus and method. 4,040,355, Cl. 102-22.00R.
Hopps, Hope E.: *See—*
Petricciani, John C.; Hopps, Hope E.; Lorenz, Douglas E.; Vasington, Paul J.; and Wallace, Roslyn E., 4,040,905, Cl. 195-1.800.
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Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Integrated programmable logic arrangement. 4,041,459, Cl. 340-166.00R.
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Horton, Robert A.; and Bauer, Timothy R., to Precision Metalsmiths, Inc. Investment shell molding process. 4,040,466, Cl. 164-17.000.
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Hounsfield, Godfrey Newbold, to E M I Limited. Computerized tomography comprising laterally shifting detected beams within a rotated fan of radiation. 4,041,315, Cl. 250-360.000.
Howard, Alan N., to Bristol-Myers Company. Methods and pharmaceutical preparation for the treatment of hypercholesterolaemia. 4,041,153, Cl. 424-131.000.
Howard, James Lynn, to Phifer, Earl Cooper, a part interest. Method for matching wires in multiple wire conduits. 4,041,383, Cl. 324-66.000.
Howard, Webster L., to General Electric Company. Multi-circuited A-coil heat exchanger. 4,040,268, Cl. 62-335.000.
Howell Laboratories, Incorporated: *See—*
Villaume, Henry F.; Collins, D. Stephen; and Peoples, Patrick J., 4,040,743, Cl. 356-73.000.
Howmedica, Inc.: *See—*
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Hunt, James R., to Will Ross, Inc. Surgical pad. 4,040,424, Cl. 128-290.00R.
Hussain, Mohammed Imam, to RCA Corporation. Pulse stream identification circuit. 4,041,486, Cl. 343-7.300.
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Hutson, Thomas, Jr., to Phillips Petroleum Company. Paraffin dehydrogenation using platinum-tin promoted zinc aluminate catalyst and silica-free particles. 4,041,099, Cl. 260-683.300.
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Ichiyanagi, Toshikazu, to Canon Kabushiki Kaisha. Motor control system. 4,041,362, Cl. 318-318.000.
Ide, Fumio; Kishida, Kazuo; and Osaka, Norihisa, to Mitsubishi Rayon Co., Ltd. Vinyl chloride polymer composition modified for transparency, impact and thermal resistance. 4,041,106, Cl. 260-876.00R.
Ido, Kazuo; and Maruyama, Mitsuaki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece calculator. 4,041,295, Cl. 235-156.000.
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Iijima, Ryozo; Matsubara, Yukio; Yamaguchi, Ginichi; and Fukushima, Masatoshi, to Ryozo Iijima; and Onahama Seiren Kabushiki Kaisha. Mother blank for producing starting sheets used in electrolytic nonferrous metal production. 4,040,937, Cl. 204-281.000.
Iijima, Tomeo. Automatic paste board box forming machine. 4,040,340, Cl. 93-49.00R.
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Main, Brian Geoffrey, 4,041,074, Cl. 260-556.0AR.
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Ince, Bernard John, to Girlock Limited of Belmore. Hardness tester. 4,040,291, Cl. 73-81.000.
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Iodvalkis, Vitautas Jurgio; Nomitsas, Richardas Prano; Andreev, Anatoly Fedorovich; and Grekov, Vladimir Borisovich. Photographic exposure setting device. 4,041,504, Cl. 354-23.00R.
Iowa State University Research Foundation, Inc.: *See—*
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Irikura, Tsutomu, to Kyorin Pharmaceutical Co., Ltd. 1-(3-Phenylpropyl)-4-(beta-alkoxyacryloyl)piperazine derivatives. 4,041,038, Cl. 260-268.00C.
Isaac, Peter A. H.; and Oulton, T. Dixon, to Engelhard Minerals & Chemicals Corporation. Record sheets sensitized with reduced charge montmorillonite pigment. 4,040,648, Cl. 282-27.500.
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Ito, Hiroaki: *See—*
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Iwano, Haruhiko; and Shimamura, Isao, to Fuji Photo Film Co., Ltd. Regeneration of photographic processing solutions. 4,040,834, Cl. 96-50.00A.
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Jacobs, Philip C., Jr.; and Salzer, Erwin. Cooled electric fuse. 4,041,434, Cl. 337-204.000.
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Jenkins, Francis Edward; and Tynan, Daniel Gregory, to Du Pont de Nemours, E. I., and Company. Continuous process for preparing particulate microporous, open-celled polymer structures in a screw-type extruder. 4,041,115, Cl. 264-5.000.
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Jenkins, Kennedy A., to Hercules Incorporated. Decorative coating composition for coating glassware. 4,041,194, Cl. 427-226.000.
Jenkins, William A., to Monarch Marking Systems, Inc. Tag attaching apparatus. 4,040,555, Cl. 227-67.000.
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Jensen, Johannes: *See—*
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Jepson, Michael John; and Kilbourne, Bernard, to Breedon Press Limited, The. Method of and a machine for separating and fitting insulated conductors of multi-conductor ribbon cables to connectors in housings. 4,040,167, Cl. 29-564.400.
Jeram, Edward M., to General Electric Company. Solvent resistant room temperature vulcanizable silicone rubber compositions. 4,041,010, Cl. 260-42.260.
Jeschke, Willi, to Heidelberger Druckmaschinen Aktiengesellschaft. Ink fountain assembly for printing presses. 4,040,349, Cl. 101-365.000.
Jesse, Harold V. Real-time multiplier with selectable number of product digits. 4,041,297, Cl. 235-164.000.
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Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Reichenberger, Roland; Kesselring, Horst; and Fischer, Karl-Heinz, to Veb Polygraph Leipzig Kombinat Fur Polygraphische Maschinen Und Ausrustungen. Inking arrangement for printing machine. 4,040,347, Cl. 101-349.000.
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Schairer, James Alfred, 4,040,563, Cl. 236-15.0BC.
Johnson, Arne I.: *See—*
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Johnson, Bruce K., to Polaroid Corporation. Photographic camera having external power supply. 4,041,514, Cl. 354-288.000.
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Johnson, Clarence S., to United States of America, Navy. Diver's pulse stretch sonar. 4,041,441, Cl. 340-3.00R.
Johnson, David Emil, to Mobil Oil Corporation. Method and apparatus for replacing a roll of polystyrene foam sheet with empty core roll. 4,040,574, Cl. 242-56.00A.
Johnson, Harlan B.; Martinsons, Aleksandrs; and Snodgrass, John O., to PPG Industries, Inc. Method of activating an anode. 4,040,918, Cl. 204-98.000.
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Johnson, Joseph E.; and Ostop, John A., to Westinghouse Electric Corporation. Method of making a transistor device. 4,040,877, Cl. 148-187.000.
Johnson, Lawrence P., to Western Cutlery Co. Locking blade knife. 4,040,181, Cl. 30-161.000.
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Jones, Allen, Jr. Steering and stabilization apparatus for watercraft. 4,040,373, Cl. 114-126.000.
Jones, Dennis A., to Amax Resource Recovery Systems, Inc. Lightweight aggregate. 4,040,852, Cl. 106-97.000.
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Jones, James E., to PPG Industries, Inc. Aqueous cationic electrodeposition of epoxy resins having quaternary groups carrying blocked NCO. 4,040,924, Cl. 204-181.000.
Jones, John Leslie, Sr. Urine trap diaper. 4,040,423, Cl. 128-287.000.
Jones, Lewis O., to Xerox Corporation. High surface area carrier. 4,040,969, Cl. 252-62.10R.
Jones, Robert E. Desk top work support device. 4,040,592, Cl. 248-460.000.
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Juillard, Yves; and Riner, Victor, to Societe Alsacienne de Constructions Mecaniques de Mulhouse, of Mulhouse Cedex. Shuttleless loom of the single or double layer type. 4,040,453, Cl. 139-446.000.
Jung, Lothar. Method for the conversion of crystalline silica raw materials into amorphous silica. 4,040,795, Cl. 23-293.00R.
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Metcalf, Brian Walter; and Jung, Michel, 4,041,041, Cl. 260-293.860.
Jungner Instrument AB: *See—*
Kihlberg, Gunnar Axel, 4,041,293, Cl. 235-151.320.
Kaanders, Johannes Matheus Gerardus Maria, to U.S. Philips Corporation. Hearing aid to be worn behind the ear of the user and provided with a pressure-gradient microphone. 4,041,251, Cl. 179-107.0FD.
Kabushiki Kaisha Komatsu Seisakusho: *See—*
Hara, Hideo, 4,040,255, Cl. 60-445.000.
Kabushiki Kaisha Sankyo Seiki Seisakusho: *See—*
Funaki, Takashi, 4,040,160, Cl. 29-159.00R.
Kabushiki Kaisha Suwa Seikosha: *See—*
Ido, Kazuo; and Maruyama, Mitsuaki, 4,041,295, Cl. 235-156.000.
Kadin, Saul B.: *See—*
Bindra, Jasjit S.; and Kadin, Saul B., 4,041,163, Cl. 424-251.000.
Kahan, William; Rupinski, Fredrick Alexander; Wagner, John Francis; and Peer, Thomas Richard, to Singer Company, The. Automated home knitting machine with program card reader. 4,040,277, Cl. 66-154.00A.
Kahle, Glenn W.; and Olsen, Sydney A., to Deere & Company. Single shaft gas turbine engine with axially mounted disk regenerator. 4,040,249, Cl. 60-39.51H.
Kahn, David; and Geckle, Raymond James, to AMP Incorported. Method for manufacture of vanadium dioxide polyconductors. 4,040,808, Cl. 65-33.000.
Kahnt, Friedrich Werner: *See—*
Neher, Robert; and Kahnt, Friedrich Werner, 4,041,022, Cl. 260-112.50T.
Kaiser Aluminum & Chemical Corporation: *See—*
Loach, James A.; and Kirby, Harold R., 4,040,820, Cl. 75-68.00R.
Kaito, Yukio, to Happy Sewing Machine Manufacturing Company. Convertible-bed type sewing machine head. 4,040,369, Cl. 112-258.000.
Kakefuda, Koiti: *See—*
Shoji, Fusaji; Kokaku, Hiroyoshi; Kohkame, Hisashi; and Kakefuda, Koiti, 4,041,108, Cl. 260-881.000.
Kakiyama, Hitoo: *See—*
Yamada, Yasuhiro; Honda, Hidemasa; and Kakiyama, Hitoo, 4,040,941, Cl. 208-8.000.

Kakutani, Tsutomu: *See—*
Aboshi, Michihiro; Kakutani, Tsutomu; Yoshitake, Katsumi; and Koseki, Toshinori, 4,041,002, Cl. 260-30.60R.
Kalafus, Edward Florent; and Sharma, Satish Chander, to General Tire & Rubber Company, The. Pollution free method of making phenol formaldehyde resole tire cord dip and product. 4,040,999, Cl. 260-29.300.
Kalvelage, Gerald J. Orthodontic plier-type tool. 4,040,186, Cl. 32-66.000.
Kaman, Andrew J.: *See—*
Seeger, Nelson V.; and Kaman, Andrew J., 4,041,208, Cl. 428-424.000.
Kamei, Kazumi: *See—*
Atsukawa, Masumi; Kamei, Kazumi; Shinoda, Naoharu; and Ushio, Hiroyuki, 4,040,803, Cl. 55-73.000.
Kamezaki, Takashi: *See—*
Nakamura, Akihisa; Kamezaki, Takashi; Naito, Kenji; and Usui, Kunichika, 4,041,112, Cl. 261-72.00R.
Kamigaki, Yoshiaki: *See—*
Sunami, Hideo; Itoh, Yokichi; Inose, Fumiyuki; and Kamigaki, Yoshiaki, 4,041,521, Cl. 357-24.000.
Kamner, Haim J., to Goodman Equipment Corporation. Pull rod assembly. 4,040,308, Cl. 74-586.000.
Kampf, Julian C.; Lemke, Winfred R.; and Tucker, James T., to Square D Company. Solid state overload relay circuit. 4,041,540, Cl. 361-24.000.
Kaneko, Shinji, to Sony Corporation. Control of automatic color control and color killer circuits in video signal reproducing apparatus. 4,041,526, Cl. 358-4.000.
Kantenwein, Robert W.: *See—*
Blajda, Raymond S.; Kantenwein, Robert W.; Gaughan, Gerald E.; and Sikra, John F., 4,040,359, Cl. 102-93.000.
Kanto Denka Kogyo Co., Ltd.: *See—*
Suzuki, Akira; Orihara, Ituo; and Ishida, Akira, 4,041,235, Cl. 428-413.000.
Kapaan, Hendrikus Jan, to SKF Industries, Inc. Rolling bearing. 4,040,684, Cl. 308-187.100.
Kappler, Manfred: *See—*
Winkler, Emil; and Kappler, Manfred, 4,040,729, Cl. 351-137.000.
Karjala, Sulo A., to Wilson Foods Corporation. Keratin modifying agents and method of beneficially modifying filamentous keratin materials. 4,041,150, Cl. 424-71.000.
Karlen, Urs: *See—*
Schwander, Hansrudolf; and Karlen, Urs, 4,041,052, Cl. 260-380.000.
Karlsson, Per-Olle, to Granges Oxelosunds Jarnverk AB. Apparatus for testing metal blanks utilizing at least one inspecting head moved along the surface thereof. 4,041,379, Cl. 324-37.000.
Karsmakers, Mathijs Antonius; and Somers, Gerardus Henricus Johannus, to U.S. Philips Corporation. Pressure transducer. 4,040,297, Cl. 73-398.0AR.
Kartasuk, Raymond H.; Smierciak, Walter R.; and Hlinka, Edward A., to Wilton Corporation. Vise construction. 4,040,613, Cl. 269-247.000.
Kasahara, Yukio: *See—*
Nitta, Tsuneharu; Hayakawa, Shigeru; Kasahara, Yukio; and Terada, Ziro, 4,041,140, Cl. 423-561.00R.
Kasiwagi, Eiichi: *See—*
Makishima, Hiroshi; Hosoda, Minoru; Kasiwagi, Eiichi; and Hayashi, Toshiharu, 4,040,842, Cl. 106-1.000.
Kasper Instruments, Inc.: *See—*
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Kassenaar, Teunis Adrianus: *See—*
De Bresser, Gijsbert Frederik Maria; Kassenaar, Teunis Adrianus; Veraa, Ludovicus-Gerardus Johannes Godefrida; and Weenink, Leon Pieter, 4,040,706, Cl. 339-103.00R.
Kastar, Inc.: *See—*
Epstein, Harry, 4,041,380, Cl. 324-51.000.
Kasulanis, Charles Francis: *See—*
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 4,041,042, Cl. 260-301.000.
Katarao, Tadamichi, to Mitsubishi Jukogyo Kabushiki Kaisha. Chain drive for a transfer machine. 4,040,302, Cl. 74-37.000.
Kato, Shingo: *See—*
Takada, Tsutomu; Kato, Shingo; Utsunomiya, Tadashi; and Inoue, Sakae, 4,041,207, Cl. 428-421.000.
Kato, Shogo: *See—*
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,041,511, Cl. 354-232.000.
Katz, Donald L.: *See—*
Cook, Harold L., Jr.; Geer, Ernest C.; and Katz, Donald L., 4,040,487, Cl. 166-314.000.
Kauber, David J.: *See—*
Westerman, David J.; McTamaney, Louis S.; and Kauber, David J., 4,041,331, Cl. 307-252.00Q.
Kawamura, Masami: *See—*
Kominami, Yasuo; Suzuki, Yukio; and Kawamura, Masami, 4,041,409, Cl. 330-29.000.
Kawasaki, Masahiro; and Ando, Hirokazu, to Asahi Kogaku Kogyo Kabushiki Kaisha. Timing circuits for camera shutters. 4,041,506, Cl. 354-51.000.
Kawasaki Steel Corporation: *See—*
Akahide, Kozo; and Agusa, Kazuo, 4,041,270, Cl. 219-73.00R.
Keene, Henry Rich: *See—*
Atkins, Frederick Joseph; and Keene, Henry Rich, 4,040,375, Cl. 114-160.000.
Kelch, David J.: *See—*
Kraus, Walter R.; Kelch, David J.; and Jensen, Gerald A., 4,040,928, Cl. 204-195.00M.
Kelch, George W., to United Technologies Corporation. Apparatus and method for removing a plurality of blade dies. 4,040,161, Cl. 29-239.000.
Keller, Wilbur S., to Dresser Industries, Inc. Rock bit having a ball bearing raceway with anti-galling material. 4,040,680, Cl. 308-8.200.
Kelley, Arnold E.; Reeg, Cloyd P.; Wood, Frederick C.; and Cheadle, George D., to Union Oil Company of California. Manufacture of catalytic cracking charge stocks by hydrocracking. 4,040,944, Cl. 208-89.000.
Kellner, Jackson M., to Smith International, Inc. Drill director. 4,040,494, Cl. 175-45.000.
Kellner, Jackson M.; and Garrett, William R., to Smith International, Inc. Drilling apparatus. 4,040,495, Cl. 175-73.000.
Kelly, James G.: *See—*
Ashworth, James G.; Glock, Eugene; Kelly, James G.; McLaughlin, James L.; and Merwin, Owen T., 4,040,431, Cl. 131-140.00P.
Kelly, John. Commodities board game apparatus. 4,040,629, Cl. 273-135.00C.
Kelly, Susan J.; and Butler, Larry G., to Purdue Research Foundation. Phosphonate monoesters and method of preparation. 4,041,111, Cl. 260-954.000.
Kelz, Norbert R. Pressure moulding machines and mould parts therefor. 4,040,776, Cl. 425-145.000.
Kendall Company, The: *See—*
Collins, Robert F., 4,040,418, Cl. 128-132.00D.
Libman, Gary; and Villari, Frank K., 4,040,909, Cl. 195-127.000.
Winnie, Alon P., 4,040,427, Cl. 128-348.000.
Zoephel, Richard L., 4,040,124, Cl. 2-51.000.
Keneman, Scott Allen: *See—*
Catanese, Carmen Anthony; and Keneman, Scott Allen, 4,041,342, Cl. 313-105.00R.
Kennecott Copper Corporation: *See—*
Marshall, David W.; MCGrath, Kenneth W.; O'Day, William R., Jr.; and Wilder, Thomas C., 4,040,942, Cl. 204-13.000.
Kennedy, Kenneth B. Process for purifying hydrocarbon gas streams. 4,040,806, Cl. 62-28.000.
Kenworthy, John B., to Hay Handling Equipment Company. Baled hay loading and transport device. 4,040,534, Cl. 214-766.000.
Keogh, Gerard G., Jr.: *See—*
Keogh, Gerard G., Sr.; and Keogh, Gerard G., Jr., 4,040,381, Cl. 116-86.000.
Keogh, Gerard G., Sr.; and Keogh, Gerard G., Jr. Visual burglar alarm. 4,040,381, Cl. 116-86.000.
Kermer, Wolf-Dieter: *See—*
Maier, Karl; Hansen, Guenter; and Kermer, Wolf-Dieter, 4,041,025, Cl. 260-158.000.
Kern, Frederick William, to Eastman Kodak Company. Indicating device for photographic apparatus. 4,041,510, Cl. 354-217.000.
Keseleski, Adam J.: *See—*
Sipos, Frank; and Keseleski, Adam J., 4,041,232, Cl. 536-17.000.
Kesselring, Horst: *See—*
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Reichenberger, Roland; Kesselring, Horst; and Fischer, Karl-Heinz, 4,040,347, Cl. 101-349.000.
Kestian, Anthony M.; and Allori, Raymond J., to International Harvester Company. Vehicle control armrest in a vibration isolated control module. 4,040,499, Cl. 180-77.00R.
Ketchpel, Richard D., to Rockwell International Corporation. Transflector. 4,040,727, Cl. 350-288.000.
Khodorov, Alexandr Iosifovich: *See—*
Makeev, Boris Anatolievich; Stepochkin, Lev Mikhailovich; Korot, Garri Moiseevich; Batozsky, Vadim Ivanovich; Khodorov, Alexandr Iosifovich; Zhuravlev, Vitaly Ivanovich; and Eremenko, Adolf Grigorievich, 4,040,318, Cl. 83-71.000.
Kiejzik, Paul A. Film trimming device. 4,040,317, Cl. 83-56.000.
Kiele, Francis S.: *See—*
Hessel, Harold H.; and Kiele, Francis S., 4,040,515, Cl. 206-.500.
Kiener, Karl. Internal combustion process and engine. 4,040,400, Cl. 123-68.000.
Kihlberg, Gunnar Axel, to Jungner Instrument AB. Method of measuring the velocity of an object relative to a reference and a device for effecting said method. 4,041,293, Cl. 235-151.320.
Kikuchi, Kenji: *See—*
Uchio, Ryosuke; Kikuchi, Kenji; Asai, Soichiro; and Yarita, Kenichi, 4,040,906, Cl. 195-36.00R.
Kikuchi, Mitsuo; and Hiraga, Yoichi, to Toyo Soda Manufacturing Co., Ltd. Process for removing sulfate ions from extracted phosphoric acid employing barium compounds and activated carbon. 4,041,134, Cl. 423-321.00S.
Kikuchi, Yasuo; Ohmichi, Yasuyuki; Terasaki, Osamu; and Sakai, Koichi, to Sony Corporation. Deflection yoke for use with in-line cathode ray tubes. 4,041,428, Cl. 335-210.000.
Kikumoto, Ryoji: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,041,156, Cl. 424-177.000.
Kilbourne, Bernard: *See—*
Jepson, Michael John; and Kilbourne, Bernard, 4,040,167, Cl. 29-564.400.
Kim Lighting, Inc.: *See—*
Compton, Wayne W.; and Draper, Robert Paul, 4,041,306, Cl. 240-103.00R.
Kim, Young Ran; Ornstein, Leonard; and Waters, Henry Cook, III, to

Technicon Instruments Corporation. Lysable blood preservative composition. 4,040,785, Cl. 23-230.00B.
Kimberly-Clark Corporation: *See*—
Brock, Robert J.; and Meitner, Gary H., 4,041,203, Cl. 428-157.000.
Kimmel, Richard James: *See*—
Hill, Max Lee; and Kimmel, Richard James, 4,040,654, Cl. 296-57.00R.
Kimura, Ichiro: *See*—
Matsuda, Yasumasa; Kimura, Ichiro; Sagawa, Akio; and Hiramatsu, Tsutomu, 4,040,294, Cl. 73-117.300.
Kimura, Osamu, to Tomy Kogyo Co., Inc. Base and rotatably mounted doll with relatively movable part. 4,040,206, Cl. 46-138.000.
Kindell, Jerry L., to Honeywell Information Systems Inc. High speed binary multiplication system employing a plurality of multiple generator circuits. 4,041,292, Cl. 235-164.000.
King, Charles W.; Ruff, Donald O.; and Sheldrake, Leonard J., to General Motors Corporation. Storage battery charging system fault indicating circuit. 4,041,369, Cl. 322-99.000.
King, Frank D.: *See*—
Jorgensen, George N.; King, Frank D.; and Butler, DeForest D., 4,040,755, Cl. 403-205.000.
King, Marguerite. Shoulder strap retainer. 4,040,147, Cl. 24-86.00A.
King, Terance M.: *See*—
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 4,040,532, Cl. 214-152.000.
Kingsford Company, The: *See*—
Vincent, George C.; and Rauch, David, 4,040,796, Cl. 44-14.000.
Kinkead, Robin D.: *See*—
Cota, Dan E.; Charter, Ted R.; Beeson, Robert M.; and Kinkead, Robin D., 4,041,467, Cl. 364-900.000.
Kinney, Bruce W., Jr.: *See*—
Spence, John R.; and Kinney, Bruce W., Jr., 4,041,330, Cl. 307-251.000.
Kinney, Ohler L., Jr., to Marley Company, The. Dual path drift eliminator structure and method for crossflow cooling tower. 4,040,824, Cl. 55-257.00R.
Kirby, Harold R.: *See*—
Losch, James A.; and Kirby, Harold R., 4,040,820, Cl. 75-68.00R.
Kirkland, Joe D., Jr., to Taylor, Steve, a part interest. Method and apparatus for air development and rejuvenation of water wells. 4,040,486, Cl. 166-311.000.
Kishi, Yoshio, to Sony Corporation. Tape cassette with locking sensor slide. 4,041,537, Cl. 360-60.000.
Kishida, Kazuo: *See*—
Ide, Fumio; Kishida, Kazuo; and Osaka, Norihisa, 4,041,106, Cl. 260-876.00R.
Kitagawa, Toru: *See*—
Watanabe, Haruo; Kitagawa, Toru; Negishi, Masaaki; Aonuki, Kiichi; and Kobayashi, Harunobu, 4,041,059, Cl. 260-424.000.
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, to Seiko Koki Kabushiki Kaisha. Driving device of lens shutter of single-lens reflex camera. 4,041,511, Cl. 354-232.000.
Kitamura, Koji, to Tokai Denka Kogyo Kabushiki Kaisha. Method of treating surface of copper and its alloys. 4,040,863, Cl. 134-3.000.
Kitamura, Nobuo; Takada, Katsuo; and Fukagawa, Hiroshi, to Sony Corporation. Channel indicating apparatus. 4,041,401, Cl. 325-455.000.
Kitaura, Hiromu: *See*—
Yamamoto, Katsuhiko; Hontani, Kunihiko; Kitaura, Hiromu; and Nakamura, Michio, 4,041,533, Cl. 358-160.000.
Klauke, Erich: *See*—
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,177, Cl. 424-322.000.
Kleeberg, Wolfgang: *See*—
Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, 4,040,831, Cl. 96-35.100.
Kleiner, Hans-Jerg: *See*—
Huber, Bernd; and Kleiner, Hans-Jerg, 4,041,230, Cl. 526-278.000.
Kleinert, Bernard L. Beer case and soft drink carton carrier strap. 4,040,550, Cl. 224-45.00P.
Kline, Gregory G. Synthetic material drumstick. 4,040,323, Cl. 84-422.00S.
Klingler, Josef F. Magnifying display article. 4,040,724, Cl. 350-239.000.
Klipec, Bruce E.: *See*—
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Knapp, Heinrich, to Robert Bosch GmbH. Electro-magnetic fuel injection valve. 4,040,569, Cl. 239-467.000.
Knapp, Kenneth K.; and Koch, William E., to Eaton Corporation. Hydrostatic transmission with automatic displacement shifter. 4,040,254, Cl. 60-420.000.
Knappstein, Johannes; and Stratmann, Josef, to Carl Still, Firma. Apparatus for charging coke ovens. 4,040,910, Cl. 202-262.000.
Kneitel, Dieter: *See*—
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,040,972, Cl. 252-179.000.
Knight, James, to Lawrence Peska Associates. Intrusion alarm-ignition control system for a motor vehicle. 4,041,450, Cl. 340-64.000.
Knop, Klaus: *See*—
Altenhoner, Klaus; Jansen, Walter; Knop, Klaus; Pohl, Ulrich; and Reerink, Jan G., 4,040,816, Cl. 75-35.000.
Ko, Norman Wah Man: *See*—
Chan, Kwok Yan; and Ko, Norman Wah Man, 4,041,507, Cl. 354-64.000.
Kobashi, Kiyoshi: *See*—
Nohira, Hidetaka; Kobashi, Kiyoshi; and Tanaka, Masaaki, 4,040,402, Cl. 123-119.00A.
Kobayashi, Harunobu: *See*—
Watanabe, Haruo; Kitagawa, Toru; Negishi, Masaaki; Aonuki, Kiichi; and Kobayashi, Harunobu, 4,041,059, Cl. 260-424.000.
Kobayashi, Nobuyuki: *See*—
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Sakamoto, Kenro; Fushiki, Isamu; and Koboshi, Sigeharu, 4,040,837, Cl. 96-60.0BF.
Koch, Herbert Joachim. Sound-slide projector control apparatus. 4,041,457, Cl. 340-147.0MD.
Koch, William E.: *See*—
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Kochetkova, Anna Georgievna: *See*—
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Smith, Jessop; and Kocis, Thomas Robert, 4,040,196, Cl. 42-23.000.
Kocsis, Karoly; Peter, Heinrich; and Bickel, Hans, to Ciba-Geigy Corporation. Cephalosporins having an α-acylaminoacetic acid side chain. 4,041,161, Cl. 424-246.000.
Koddebusch, Hubert: *See*—
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Koegel, Ralph A., to Bunker Ramo Corporation. Sinkler cam segment. 4,040,276, Cl. 66-107.000.
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Koeth, Helmut, to Siemens Aktiengesellschaft. Equalizer for partial response signals. 4,041,418, Cl. 333-18.000.
Kohjin Co., Ltd.: *See*—
Obara, Isao; and Yagami, Kazuo, 4,041,144, Cl. 423-618.000.
Kohkame, Hisashi: *See*—
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Kohlen, Rudolf: *See*—
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Kohlheb, Robert, to Supraton Aurer & Zucker OHG, Firma. Rotary filter separator. 4,040,965, Cl. 210-297.000.
Kokaku, Hiroyoshi: *See*—
Shoji, Fusaji; Kokaku, Hiroyoshi; Kohkame, Hisashi; and Kakefuda, Koiti, 4,041,108, Cl. 260-881.000.
Kokubo, Eiichi: *See*—
Uchida, Isamu; Kokubo, Eiichi; and Yoshida, Minoru, 4,041,282, Cl. 235-98.00R.
Kolell, Norbert C.; and Conners, John P., to Giddings & Lewis, Inc. Final servo control in NC systems. 4,041,287, Cl. 235-151.110.
Koljonen, Vilho, to General Motors Corporation. Dual color taillamp. 4,041,302, Cl. 240-8.300.
Koller, Stefan: *See*—
Loew, Peter; Defago, Raymond; and Koller, Stefan, 4,040,779, Cl. 8-2.50R.
Kominami, Yasuo; Suzuki, Yukio; and Kawamura, Masami, to Hitachi, Ltd. Automatic gain control circuit. 4,041,409, Cl. 330-29.000.
Kommanditbolaget Pemac Invention AB & Co.: *See*—
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Komoda, Tsutomu: *See*—
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Kondo, Toshihiro, to Kondo, Toshihiro; and Fuji Photo Film Co., Ltd. Shutter for photographic cameras. 4,041,513, Cl. 354-241.000.
Konig, Justus; and Rohrig, Josef, to Siemens Aktiengesellschaft. Switching arrangement for telecommunication switching systems. 4,041,245, Cl. 179-18.0AB.
Konishiroku Photo Industry Co., Ltd.: *See*—
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Konnemann, Alfred, to Grote & Hartmann. Double spring contact and method of making the same. 4,040,713, Cl. 339-259.00R.
Kopaska, Arnold F.: *See*—
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Korenhof, Abraham, to SKF Industrial Trading and Development Company B.V. Hub bearing unit. 4,040,683, Cl. 308-187.100.
Korfund Dynamics Corporation: *See*—
Baratoff, Paul, 4,040,590, Cl. 248-358.0AA.
Kormanyos, Kenneth R.; McCollister, Howard L.; and White, Paul L., to Owens-Illinois, Inc. Method for forming solid electrolyte composite. 4,041,215, Cl. 429-104.000.
Korot, Garri Moiseevich: *See*—
Makeev, Boris Anatolievich; Stepochkin, Lev Mikhailovich; Korot, Garri Moiseevich; Batozsky, Vadim Ivanovich; Khodorov, Alexandr Iosifovich; Zhuravlev, Vitaly Ivanovich; and Eremenko, Adolf Grigorievich, 4,040,318, Cl. 83-71.000.
Koseki, Toshinori: *See*—
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Kostenbauer, Ronald F.: *See*—
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Koster, Marinus Pieter, to U.S. Philips Corporation. Worm gear transmission. 4,040,307, Cl. 74-425.000.
Kosuda, Tooru: *See*—
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Kotelnikov, Grigory Vladimirovich; and Krylov, Gennady Petrovich. Differential microcalorimeter. 4,040,288, Cl. 73-15.00B.
Kouchich, Allan; and Taylor, George W., to Allen-Bradley Company. Cermet varistors. 4,041,436, Cl. 338-21.000.
Kozacka, Frederick J., to Chase-Shawmut Company, The. Electric fuse and process of manufacturing the same. 4,041,525, Cl. 337-295.000.
Kozuka, Hajime: *See*—
Yoshida, Hiroshi; Kozuka, Hajime; Sakano, Toyoshi; Honda, Yoichiro; and Omuro, Shojiro, 4,040,502, Cl. 180-149.000.
Kramer, Pieter; Compaan, Klaas; and Forsthuber, Robert Franz Karl, to U.S. Philips Corporation. Video disc with phase structure. 4,041,530, Cl. 358-128.000.
Kratz, Gary L.; Sproul, William W., III; Walendziewicz, Eugene T.; Wallis, Donald E.; and Dennis, Charles A., to International Business Machines Corporation. Signal analyzer system. 4,041,461, Cl. 364-200.000.
Kraus, Bernd; and Glockler, Otto, to Robert Bosch GmbH. System for reducing toxic components in the exhaust gas of an internal combustion engine. 4,040,408, Cl. 123-179.00L.
Kraus, Walter R.; Kelch, David J.; and Jensen, Gerald A., to Mead Corporation, The. Specific ion sensor and method of manufacture. 4,040,928, Cl. 204-195.00M.
Krauss, Ronald C. Wind power accessory for a vehicle wheel. 4,040,582, Cl. 244-103.00S.
Krenzer, John, to Velsicol Chemical Corporation. Herbicidal carbonates and thiocarbonates of thiadiazolyl-2(1H)-pyrimidinones. 4,040,812, Cl. 71-90.000.
Krieg, Walter, to Digitron AG. Installation for manufacturing motor vehicles or other products comprising a number of component elements. 4,040,527, Cl. 214-16.40A.
Krossa, Kenneth D.; and Earl, Douglas B., to Scientific Micro Systems, Inc. Data processing system including a plurality of programmed machines and particularly including a supervisor machine and an object machine. 4,041,471, Cl. 364-200.000.
Krueger, Friedrich; and Schmidt, Guenter, to Joh. A. Benckiser GmbH. Monophosphoric acid esters of hydroxy alkyl urea compounds. 4,041,110, Cl. 260-938.000.
Krylov, Gennady Petrovich: *See*—
Kotelnikov, Grigory Vladimirovich; and Krylov, Gennady Petrovich, 4,040,288, Cl. 73-15.00B.
Kubokura, Kuniaki: *See*—
Sunada, Masayoshi; and Kubokura, Kuniaki, 4,040,508, Cl. 192-12.00D.
Kubota, Ltd.: *See*—
Okada, Yoshitsugu; Nanao, Teruaki; and Sugino, Toshio, 4,040,443, Cl. 137-546.000.
Kuhn, Burt L., to AKDOV Animal Health Care Products, Inc. Animal medication dispenser. 4,040,422, Cl. 128-223.000.
Kuhn, Eberhard: *See*—
Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, 4,040,831, Cl. 96-35.100.
Kuhn, Robert R.; and Machleder, Warren H., to Rohm and Haas Company. Hydrocarbon compositions containing rust inhibitors. 4,040,798, Cl. 44-71.000.
Kuipers, Franciscus Antonius: *See*—
van den Enden, Adrianus Wilhelmus Maria; Kuipers, Franciscus Antonius; de Niet, Edmond; and Druyvesteyn, Willem Frederik, 4,041,478, Cl. 340-174.0TF.
Kulikowski, Donald F.: *See*—
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., 4,040,540, Cl. 220-273.000.
Kulisch, Ruth. Air bubbling massaging apparatus. 4,040,415, Cl. 128-66.000.
Kulite Semiconductor Products, Inc.: *See*—
Brosh, Amnon; and Geiger, Dana F., 4,041,289, Cl. 235-151.330.
Kurtz, Anthony D.; and Mallon, Joseph R., 4,040,172, Cl. 29-580.000.
Kullmann, Rolf; and Pfeil, Erhard, to DEMAG Aktiengesellschaft. Metal smelting plant with treatment stand to regulate the analysis of metal smelts, particularly for desulphurization of liquid crude iron or liquid unrefined steel. 4,040,609, Cl. 266-143.000.
Kuntz, David H. Specimen collecting device. 4,040,791, Cl. 23-259.
Kuo, James C.; Prater, Charles Dwight; and Wise, John J., to Mobil Oil Corporation. Method for upgrading products of Fischer-Tropsch synthesis. 4,041,094, Cl. 260-676.00R.
Kuo, James C., to Mobil Oil Corporation. Method for upgrading C_3 plus product of Fischer-Tropsch Synthesis. 4,041,095, Cl. 260-676.00R.
Kuo, James C., to Mobil Oil Corporation. Method for upgrading C_5 plus product of Fischer-Tropsch Synthesis. 4,041,096, Cl. 260-676.00R.
Kupec, Jiri; and Hrdlicka, Rehor, to Tesla, narodni podnik. Circuit system for adjusting the input of a connected-up logic circuit. 4,041,384, Cl. 324-73.0PC.
Kupfer, Hans: *See*—
Rudolph, Paul; Bierbach, Herbert; Kupfer, Hans; Hafke, Carl; and Kohlen, Rudolf, 4,040,800, Cl. 48-85.200.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Ohtsuka, Takaaki; Satake, Keigo; Yamazaki, Shiro; Hatakeyama, Nobuo; and Watanabe, Takeo, 4,041,170, Cl. 424-277.000.
Kurita, Masakatsu, to Omron Tateisi Electronics Co. Driver circuit for liquid crystal display. 4,040,721, Cl. 350-160.0LC.
Kurosaki, Takefumi, to Rank Xerox Ltd. Original discharging device for copiers. 4,040,615, Cl. 271-63.000.
Kurtz, Anthony D.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Method of manufacturing integral transducer assemblies employing built-in pressure limiting. 4,040,172, Cl. 29-580.000.
Kurz, Herbert: *See*—
Tax, Hans; and Kurz, Herbert, 4,040,667, Cl. 299-8.000.
Kydd, Paul H.: *See*—
Darrow, Kenneth A.; Kydd, Paul H.; and Daly, John W., 4,040,159, Cl. 29-156.80H.
Kyle, James C.: *See*—
Bosche, Earl E.; Havlik, Jay M.; and Kyle, James C., 4,040,256, Cl. 61-15.000.
Kyorin Pharmaceutical Co., Ltd.: *See*—
Irikura, Tsutomu, 4,041,038, Cl. 260-268.00C.
Kyri, Hans; Brandle, Karl; Muller, Martin; and Heine, Heinrich, to Bayer Aktiengesellschaft. Production of porous gypsum moldings. 4,040,850, Cl. 106-87.000.
La Coste and Romberg, Inc.: *See*—
LaCoste, Lucien J. B., 4,040,189, Cl. 33-304.000.
La Telemecanique Electrique: *See*—
Lascarrou, Alain, 4,040,694, Cl. 312-263.000.
Laborde, Joseph N., to Ethyl Corporation. Framing system. 4,040,231, Cl. 52-664.000.
LaBranche, Harvey W., to Western Plastics Corporation. Self-locking pipe coupling. 4,040,651, Cl. 285-113.000.
LaCoste, Lucien J. B., to La Coste and Romberg, Inc. Method and apparatus for leveling an instrument in a well bore. 4,040,189, Cl. 33-304.000.
Lacroix, Jean R. Automatic apparatus for making rolled cigarettes. 4,040,429, Cl. 131-51.000.
Laesser, Claude, to Ebauches S.A. Alarm electric watch. 4,040,248, Cl. 58-38.00R.
LaGiusa, Frank F., to General Electric Company. Ellipsoidal reflector lamp. 4,041,344, Cl. 313-113.000.
Lamb Industries, Inc.: *See*—
Lamb, William C.; and Wetzel, Rodney J., 4,040,524, Cl. 214-2.500.
Lamb, William C.; and Wetzel, Rodney J., to Lamb Industries, Inc. Apparatus for handling pipe at well site. 4,040,524, Cl. 214-2.500.
Lamberti, Vincent; and Pease, Wilder F., to Lever Brothers Company. Novel 2-(alkylsulfinyl)ethyl sulfates and compositions employing same. 4,040,781, Cl. 8-137.000.
Lampe, Donald R.; and White, Marvin H., to Westinghouse Electric Corporation. Floating clock sensor for buffered, independent, nondestructive readout of charge transfer devices. 4,041,298, Cl. 235-193.000.
Lancaster, William R. Self-fertilizing pot. 4,040,207, Cl. 47-80.000.
Lancini, Giancarlo: *See*—
Assandri, Alessandro; Lancini, Giancarlo; Volpe, Giancarlo; and Cavalleri, Bruno, 4,041,168, Cl. 424-273.000.
Land, Edgel T. Low cost storm window. 4,040,210, Cl. 52-2.000.
Landeroin Duvernois, Odette. Electric heating device. 4,041,438, Cl. 338-237.000.
Landi, James V. Squeeze toy and exercising device. 4,040,619, Cl. 272-68.000.
Lange, Frederick F.; and Terwilliger, Gerald R., to Westinghouse Electric Corporation. Method of compacting shaped powdered objects. 4,041,123, Cl. 264-332.000.
Langebach, Hans Peter: *See*—
Frank, Horst; and Langebach, Hans Peter, 4,040,266, Cl. 62-121.000.
Langlie, Howard; and Berg, Albert T., Jr. Gate handle for an electric fence. 4,040,604, Cl. 256-10.000.
Lapp, Roger H., to United States of America, Navy. Line scan radar antenna using a single motor. 4,041,500, Cl. 343-761.000.
Larkin, William A., to M&T Chemicals Inc. Melt viscosity stabilizers for vinyl chloride polymers. 4,041,015, Cl. 260-45.75R.
Lars Collin Consult AB: *See*—
Collin, Lars Th., 4,040,783, Cl. 23-232 R.
LaSalle Steel Company: *See*—
Mudiare, Edeki, 4,040,872, Cl. 148-12.00B.
Lascarrou, Alain, to La Telemecanique Electrique. Framework for metal cabinet. 4,040,694, Cl. 312-263.000.
Lasier, Thomas R.; Rodseth, William G.; and Schnarr, Raymond H., to Schlage Lock Company. Releasable door hold-open device. 4,040,143, Cl. 16-48.00J.
Lasier, Thomas R.; and Schnarr, Raymond H., to Schlage Lock Company. Door assister. 4,040,144, Cl. 16-66.000.
Lattner, Elmer A., to PPG Industries, Inc. Apparatus for scrubbing stain into sheet or board material. 4,040,384, Cl. 118-120.000.
Latty, James A.: *See*—
Fong, Ronald A.; Latty, James A.; and McDonnell, Roger P., 4,041,006, Cl. 260-33.6UA.
Laure, George R., to Laure Prosthetics, Inc. Wrist joint prosthesis. 4,040,130, Cl. 3-1.910.
Laure Prosthetics, Inc.: *See*—
Laure, George R., 4,040,130, Cl. 3-1.910.
Laurel Bank Machine Co., Ltd.: *See*—
Ohsako, Kyoichi; and Yamashita, Katusuke, 4,041,280, Cl. 235-92.0CN.
Uchida, Isamu; Kokubo, Eiichi; and Yoshida, Minoru, 4,041,282, Cl. 235-98.00R.
Watanabe, Kenkichi; and Ohsako, Kyoichi, 4,040,434, Cl. 133-1.00A.

Lavanchy, Jean-Pierre: *See—*
Handtmann, Dieter; and Lavanchy, Jean-Pierre, 4,040,740, Cl. 356-4.000.

Lawrence Peska Associates: *See—*
Knight, James, 4,041,450, Cl. 340-64.000.

Layton, Beryl W.: *See—*
Ophaug, Darrell P.; and Layton, Beryl W., 4,041,423, Cl. 335-20.000.

Lazennec, Yvon: *See—*
Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,041,216, Cl. 429-104.000.

Leach, Paul A., to Jaffrey Fire Protection Company, Inc. Line relay valve. 4,040,771, Cl. 417-62.000.

Lebedeva, Valentina Ivanovna: *See—*
Smirnov, Viktor Sergeevich; Gryaznov, Vladimir Mikhailovich; Lebedeva, Valentina Ivanovna; Mischenko, Alexandr Petrovich; Polyakova, Victoria Petrovna; and Savitsky, Evgeny Mikhailovich, 4,041,093, Cl. 260-673.500.

Le Can, Claude Jan Principe Frederik, to U.S. Philips Corporation. Memory matrix controller. 4,041,474, Cl. 340-173.00R.

Lech, Joseph: *See—*
McNeill, William H.; Haugsjaa, Paul O.; Lech, Joseph; and Regan, Robert J., 4,041,352, Cl. 315-248.000.

Leclerc, Pierre; and Dubois, Jean Claude. Resins for use as electron resists. 4,041,191, Cl. 427-43.000.

Lee, Char-Shin; and Wang, Hsug-Fang. Gearless pressure or temperature gauge. 4,040,298, Cl. 73-406.000.

Lee, Robert Wayne. Pull cord righting portable target. 4,040,624, Cl. 273-102.0AP.

Leedom, Marvin Allan, to RCA Corporation. Overhead disc record grounding apparatus. 4,040,634, Cl. 274-2.000.

Leedom, Marvin Allan, to RCA Corporation. Releasable stylus arm magnetic coupling. 4,040,635, Cl. 274-37.000.

Leeds & Northrup Company: *See—*
Lewis, Ronald Cyril, Jr., 4,041,404, Cl. 328-150.000.

Lefebvre, Michel Serge, to OPI Metriservice, Societe Anonyme. Process for coloring surfaces. 4,040,353, Cl. 101-426.000.

LeGrand, Donald G.; and Vitale, Gina G., to General Electric Company. Primer composition, composite and method for making the same. 4,040,882, Cl. 156-106.000.

Leichle, Claude, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Control of electromagnetic fuel injectors in internal combustion engines. 4,040,397, Cl. 123-32.0AE.

Leifheit International Gunter Leifheit GmbH: *See—*
Liebscher, Johannes, 4,040,138, Cl. 15-42.000.
Liebscher, Johannes; and Schulein, Rolf G., 4,040,546, Cl. 223-88.000.

Leisure, Everett R., to Esco Corporation. Mounting for sectional screen. 4,040,901, Cl. 162-251.000.

Lemke, Winfred R.: *See—*
Kampf, Julian C.; Lemke, Winfred R.; and Tucker, James T., 4,041,540, Cl. 361-24.000.

Lemons, Kyle Eugene: *See—*
Blish, Richard C., II; and Lemons, Kyle Eugene, 4,040,897, Cl. 156-656.000.

Lennox Industries, Inc.: *See—*
Pfarrer, David M.; and Parker, Sidney A., 4,041,542, Cl. 361-27.000.

Leopold, Kurt: *See—*
Richardson, Martin C.; and Leopold, Kurt, 4,041,414, Cl. 331-94.50G.

Leroy, Pierre; and Sprunck, Emile. Device for clamping the base plate of a steel refining converter. 4,040,611, Cl. 266-243.000.

Leroy, Pierre; and Sprunck, Emile. Blast pipe assembly for the bottom plate of a converter or furnace for refining metals. 4,040,612, Cl. 266-268.000.

Letot, Incorporated: *See—*
Churchill, Steven T., 4,041,242, Cl. 179-2.00A.

Lever Brothers Company: *See—*
Cottier, Derek; and Rossell, John Barry, 4,041,188, Cl. 426-607.000.
Lamberti, Vincent; and Pease, Wilder F., 4,040,781, Cl. 8-137.000.

Levin, Howard J.: *See—*
Fenichel, Richard L.; and Levin, Howard J., 4,041,155, Cl. 424-177.000.

Lewals, Inc.: *See—*
Walls, Leroy C., 4,040,513, Cl. 198-530.000.

Lewis, Bernard L., to United States of America, Navy. Sea clutter reduction technique. 4,041,489, Cl. 343-17.10R.

Lewis, Deanna Rose: *See—*
Grossman, Milton J.; and Lewis, Deanna Rose, 4,040,560, Cl. 229-41.00B.

Lewis, Morton; and Rohrer, John F., to Unitech Chemical Inc. Cured epoxy resins. 4,040,994, Cl. 260-18.0PF.

Lewis, Ronald Cyril, Jr., to Leeds & Northrup Company. Apparatus and method for detecting when a measured variable represented by a string of digital pulses reaches a plateau. 4,041,404, Cl. 328-150.000.

Lewis, Terence John; Brooks, Raymond; and Selby, John, to Torrington Company Limited, The. Cutting or grinding tool protecting guard. 4,040,336, Cl. 90-11.00R.

Li, Tao P., to Monsanto Company. Production of (amm)oxidation catalyst. 4,040,978, Cl. 252-437.000.

Liao, Paul Foo-Hung: *See—*
Bjorklund, Gary Carl; and Liao, Paul Foo-Hung, 4,040,718, Cl. 350-147.000.

Libman, Gary; and Villari, Frank K., to Kendall Company, The. Diagnostic device for a liquid sample. 4,040,909, Cl. 195-127.000.

Libowitz, George G., to Allied Chemical Corporation. Thermal energy storage systems employing metal hydrides. 4,040,410, Cl. 126-270.000.

Liebermann, Leonard N., to United States of America, Navy. Capacitive-type displacement and pressure sensitive transducer. 4,041,446, Cl. 340-17.00R.

Liebig, Hans-Peter: *See—*
Ahaus, Gerhard; Netzer, Siegfried; and Liebig, Hans-Peter, 4,040,673, Cl. 303-6.00C.

Liebman, Arnold Alvin: *See—*
Felix, Arthur Martin; and Liebman, Arnold Alvin, 4,041,023, Cl. 260-112.50R.

Liebowitz, Marvin: *See—*
Compa, Russell Edward; Liebowitz, Marvin; and Messina, Ralph Paul, 4,041,205, Cl. 428-220.000.

Liebscher, Johannes, to Leifheit International Gunter Leifheit GmbH. Drive for use in a sweeping device. 4,040,138, Cl. 15-42.000.

Liebscher, Johannes; and Schulein, Rolf G., to Leifheit International Gunter Leifheit GmbH. Hollow plastic garment hanger. 4,040,546, Cl. 223-88.000.

Lietar, Christian, to Robert Bosch GmbH. Optical congruence comparator. 4,040,746, Cl. 356-168.000.

Light, Kenneth K.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Tricyclic alcohols. 4,041,084, Cl. 260-617.00F.

Linard, Robert Housu. Measuring apparatus. 4,041,321, Cl. 250-560.000.

Lindberg, Steven E.; Marchant, Kerford A., Jr.; and Van Strien, Richard E., to Standard Oil Company (Indiana). Polyamide-imides prepared from 4-carboxy-phthalimide aliphatic carboxylic acids. 4,041,065, Cl. 260-47.0CZ.

Linde Aktiengesellschaft: *See—*
Frank, Horst; and Langebach, Hans Peter, 4,040,266, Cl. 62-121.000.

Lindeborg, David Georg, to Norba Aktiebolag. Method of conveying and desintegrating refuse and the like, and apparatus for carrying out this method. 4,040,571, Cl. 241-30.000.

Lindemann Maschinenfabrik GmbH: *See—*
Pessel, Kurt; and Stodt, Eberhard, 4,040,230, Cl. 53-24.000.

Lindstrom, Jan Erik: *See—*
Gabrielsson, Arne Goran; and Lindstrom, Jan Erik, 4,041,417, Cl. 331-107.00R.

Lindvay, Michael W.: *See—*
Albright, James A.; and Lindvay, Michael W., 4,041,012, Cl. 260-45.80A.

Linkenheimer, Wayne H.: *See—*
Brown, William E.; Baughn, Charles O.; and Linkenheimer, Wayne H., 4,041,175, Cl. 424-311.000.

Liptak, Laszlo: *See—*
Szivos, Karoly; Lovass, Gyula; Liptak, Laszlo; Hirling, Jozsef; and Pavlik, Ozskar, 4,040,973, Cl. 252-301.10W.

Lissant, Kenneth J., to Petrolite Corporation. Non-Newtonian pharmaceutical compositions. 4,040,857, Cl. 106-243.000.

Lithium Corporation of America: *See—*
Bach, Ricardo O.; and Morrison, Robert C., 4,041,088, Cl. 260-668.00B.

Litman, Alan, to Smith & Wesson Chemical Company, Inc. Dual purpose projectile and weapon combination. 4,040,331, Cl. 89-14.00C.

Litronix, Inc.: *See—*
Murray, Roger W., 4,041,516, Cl. 357-17.000.

Littelfuse, Inc.: *See—*
Williamson, Harold L.; and Aryamane, Avinash P., 4,040,175, Cl. 29-623.000.

Litzinger, Paul C., to Crown Zellerbach Corporation. Production of discrete cellulose acetate fibers by emulsion flashing. 4,040,856, Cl. 106-170.000.

Liu, Charles Chung-Yeh; and Fuller, James Alec, to Texas Instruments Incorporated. Coaxial waveguide antenna. 4,041,499, Cl. 343-756.000.

Ljungberg, Sten Herman, to Nitro Nobel AB. Method and arrangement for charging of shotholes. 4,040,329, Cl. 86-20.00C.

Loach, James A.; and Kirby, Harold R., to Kaiser Aluminum & Chemical Corporation. Processing aluminum skim. 4,040,820, Cl. 75-68.00R.

Lockheed Aircraft Corporation: *See—*
Smethers, Rollo G., Jr., 4,040,334, Cl. 89-1.804.

Loew, Peter; Defago, Raymond; and Koller, Stefan, to Ciba-Geigy AG. Dry heat process to dyeing and printing organic material which can be dyed with cationic dyes. 4,040,779, Cl. 8-2.50R.

Logansport Machine Co., Inc.: *See—*
Wilson, John J.; and Rhoades, Donald M., 4,040,338, Cl. 92-106.000.

Logisticon, Inc.: *See—*
Blakeslee, Thomas R., 4,040,500, Cl. 180-98.000.

Lohr, Bernd: *See—*
Winkelmann, Detlef; Lohr, Bernd; and Stieger, Helmut, 4,040,735, Cl. 355-10.000.

Longton, John: *See—*
Towersey, Peter John; Longton, John; and Cockram, Geoffrey Norman, 4,041,189, Cl. 426-656.000.

Loose, Winfield Warren, to AMP Incorporated. Connector system for connecting together terminal posts arranged in two matrices whose rows and columns are interleaved. 4,041,547, Cl. 361-410.000.

Lopez, Alfred R.: *See—*
Frazita, Richard F.; Lopez, Alfred R.; and Giannini, Richard J., 4,041,501, Cl. 343-844.000.

Lorans, Dominique Y., to Societe Anonyme de Telecommunications. Machine for welding solar cell connections. 4,041,271, Cl. 219-86.000.

Lord Corporation: *See—*
Finney, Robert H., 4,040,690, Cl. 308-237.00R.

Lorenz, Douglas E.: *See—*
Petricciani, John C.; Hopps, Hope E.; Lorenz, Douglas E.; Vasington, Paul J.; and Wallace, Roslyn E., 4,040,905, Cl. 195-1.800.

Los, Marinus, to American Cyanamid Company. Dihydroimidaz oisoindolediones and the use thereof as herbicidal agents. 4,041,045, Cl. 548-302.000.

Lovass, Gyula: *See—*
Szivos, Karoly; Lovass, Gyula; Liptak, Laszlo; Hirling, Jozsef; and Pavlik, Ozskar, 4,040,973, Cl. 252-301.10W.

Loveless, Frederick C., to Uniroyal, Inc. Method for the oligomerization of alpha-olefins. 4,041,098, Cl. 260-683.15D.

Lover, Seth E., to CBS Inc. Electromagnetic pickup and method for tine-type electric piano, and piano incorporating such pickup. 4,040,321, Cl. 84-1.150.

LRS Research Limited: *See—*
Taylor, Lauren P.; and Petroski, Alex, 4,040,960, Cl. 210-96.00R.

Lucas Industries Limited: *See—*
Saunders, Arthur Frank; and Hindmarsh, Graham John, 4,040,250, Cl. 60-39.28R.
Smith, Trevor Stanley, 4,040,599, Cl. 251-28.000.

Lummus Company, The: *See—*
Sze, Morgan C.; and Snell, George J., 4,040,957, Cl. 210-73.00R.

Lundsgart, Henning Borge, to Dansk Industri Syndikat A/S. Casting mould advancing plant. 4,040,472, Cl. 164-154.000.

Lustgraaf, William John. Precision circular saw blade grinding machine. 4,040,313, Cl. 76-37.000.

Luth, Friedrich August Karl. Method for the reduction of iron ores in a shaft furnace, especially in a blast furnace with oil injection. 4,040,817, Cl. 75-42.000.

Lyke, Richard F., to Armco Steel Corporation. Magnetostriction testing apparatus having digital output display. 4,041,377, Cl. 324-34.0MA.

Lynch, Franklin Earl: *See—*
Billings, Roger Evan; and Lynch, Franklin Earl, 4,040,398, Cl. 123-44.00R.

M&T Chemicals Inc.: *See—*
Larkin, William A., 4,041,015, Cl. 260-45.75R.
Mack, Gerry P., 4,041,014, Cl. 260-45.75S.

M&T Mfg. Co.: *See—*
Pierson, Fred W., Sr.; Pierson, Fred W., Jr.; and Weidenfeller, Gordon J., 4,040,597, Cl. 249-134.000.

Maas, Michael, to Siemens Aktiengesellschaft. Arrangement for the determination and visualization of measuring signals. 4,041,328, Cl. 307-351.000.

Machleder, Warren H.: *See—*
Kuhn, Robert R.; and Machleder, Warren H., 4,040,798, Cl. 44-71.000.

Mack, Anthony: *See—*
Shumrak, George; and Mack, Anthony, 4,041,277, Cl. 219-386.000.

Mack, Gerry P., to M&T Chemicals Inc. Non-toxic stabilizer for vinyl chloride resins. 4,041,014, Cl. 260-45.75S.

Mackles, Mark, to Ralph M. Parsons Company, The. Process for desulfurization of coke oven gas. 4,041,130, Cl. 423-220.000.

Madsen, John E.; and Drabik, Walter, to General Motors Corporation. Direct current dynamoelectric machine commutating pole assembly. 4,041,338, Cl. 310-186.000.

Maekawa, Yukio; Satomura, Masato; and Umehara, Akira, to Fuji Photo Film Co., Ltd. Reactive light-sensitive high polymer compound containing furyl pentadienic ester groups and insolubilized by action of heat, light or electron beams. 4,041,017, Cl. 260-47.0UA.

Magerlein, Barney J.: *See—*
Samuelsson, Bengt; and Magerlein, Barney J., 4,041,066, Cl. 260-468.00D.

Magnesium Elektron Limited: *See—*
Clegg, Gordon A.; Cull, Geoffrey Maurice; Fisher, Phillip Andrew; and Unsworth, William, 4,040,818, Cl. 75-58.000.

Magyar Tudomanyos Akademia Izotop Intezete: *See—*
Szivos, Karoly; Lovass, Gyula; Liptak, Laszlo; Hirling, Jozsef; and Pavlik, Ozskar, 4,040,973, Cl. 252-301.10W.

Mahr, Rene N.; and Engel, Aloyse J., to S.A. Des Anciens Etablissements Paul Wurth. Shaft furnace feed device. 4,040,530, Cl. 214-35.00R.

Maier, Josef. Arrangement for connecting and aligning adjacent casting forms for the construction of multi-story buildings. 4,040,594, Cl. 249-27.000.

Maier, Karl; Hansen, Guenter; and Kermer, Wolf-Dieter, to BASF Aktiengesellschaft. p-Aminoazo disperse dyes. 4,041,025, Cl. 260-158.000.

Maillet, Alfred Marie Aime: *See—*
Braudeau, Pierre; and Maillet, Alfred Marie Aime, 4,041,268, Cl. 219-69.00G.

Main, Brian Geoffrey, to Imperial Chemical Industries Limited. 1-Hydroxyaryl-2-amidoalkylaminoethanol derivatives. 4,041,074, Cl. 260-556.0AR.

Main, James; Moss, Leslie Robert; and Perryman, Ralph. Anti-manipulation device for permutation locks. 4,040,280, Cl. 70-333.00R.

Main, W. Eric, to Motorola, Inc. Driver circuit for developing quiescent and dynamic operating signals for complementary transistors. 4,041,407, Cl. 330-13.000.

Mainiero, Michael R., to Man Barrier Corporation. Barbed metal tape. 4,040,603, Cl. 256-8.000.

Makeev, Boris Anatolievich; Stepochkin, Lev Mikhailovich; Korot, Garri Moiseevich; Batozsky, Vadim Ivanovich; Khodorov, Alexandr Iosifovich; Zhuravlev, Vitaly Ivanovich; and Eremenko, Adolf Grigorievich. Transfer machine for cutting rolled sheet metal. 4,040,318, Cl. 83-71.000.

Makhlouf, Joseph M.; and Parker, Earl E., to PPG Industries, Inc. Low smoke density fire-retardant resins. 4,041,008, Cl. 260-40.00R.

Makino, Shinobu, to FMC Corporation. Two mass vibratory material handling apparatus and methods of manufacturing and fine tuning the same. 4,040,303, Cl. 74-61.000.

Makishima, Hiroshi; Hosoda, Minoru; Kasiwagi, Eiichi; and Hayashi, Toshiharu, to Dai Nippon Tokyo Co., Ltd. Rust preventing coating composition. 4,040,842, Cl. 106-1.000.

Malafronte, Victor. Flying disc handling apparatus. 4,040,625, Cl. 273-104.000.

Maliczyszyn, Walter: *See—*
Mazzarella, Emil D.; Wood, Leonard J., Jr.; and Maliczyszyn, Walter, 4,040,900, Cl. 162-158.000.

Mallon, Joseph R.: *See—*
Kurtz, Anthony D.; and Mallon, Joseph R., 4,040,172, Cl. 29-580.000.

Malone, Hugh Robert, to Motorola, Inc. High power, pulsed microwave frequency converter. 4,041,412, Cl. 331-10.000.

Mammino, Joseph: *See—*
Goffe, William L.; Mammino, Joseph; and Ewing, Joan R., 4,040,826.

Man Barrier Corporation: *See—*
Mainiero, Michael R., 4,040,603, Cl. 256-8.000.

Mancik, Andy: *See—*
Butler, DeForest D.; and Mancik, Andy, 4,040,449, Cl. 138-92.000.

Mansmann, Manfred; and Rambold, Wolfgang, to Bayer Aktiengesellschaft. Chromium oxide pigment from sodium chromate dihydrate plus ammonium salt. 4,040,860, Cl. 106-302.000.

Mao, Chung-Ling: *See—*
O'Shea, Francis X.; and Mao, Chung-Ling, 4,041,105, Cl. 260-859.00R.

Marathon Oil Company: *See—*
Argabright, Perry A.; and Presley, C. Travis, 4,040,258, Cl. 61-36.00C.

Marchant, Kerford A., Jr.: *See—*
Lindberg, Steven E.; Marchant, Kerford A., Jr.; and Van Strien, Richard E., 4,041,065, Cl. 260-47.0CZ.

Marcillaud, Roger, to WABCO Westinghouse. Vehicle load force proportioning device. 4,040,674, Cl. 303-22.00R.

Marforio, Nerino. Closure cover for an opening providing access to sewing machine mechanisms. 4,040,368, Cl. 112-258.000.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Stitch control device for sewing machines. 4,040,370, Cl. 112-299.000.

Margolin, Evel Grigorievich: *See—*
Axelrod, Shoya Samuilovich; Belozerov, Viktor Grigorievich; Gershman, Mikhail Bentsionovich; Margolin, Evel Grigorievich; and Shapot, Mikhail Borisovich, 4,041,218, Cl. 429-136.000.

Margotte, Dieter: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,041,003, Cl. 260-30.80R.

Marine Engineering Systems, Inc.: *See—*
Hellerman, Lance W.; and Hollyer, Richard S., 4,040,265, Cl. 61-91.000.

Maringer, Albert, to Siemens Aktiengesellschaft. Capacitive pulse pickup. 4,041,373, Cl. 324-15.000.

Marketing Displays, Inc.: *See—*
Hillstrom, David U., 4,040,223, Cl. 52-483.000.

Marley Company, The: *See—*
Kinney, Ohler L., Jr., 4,040,824, Cl. 55-257.00R.

Marmain, Georges: *See—*
Abblard, Jean; Marmain, Georges; and Viricel, Andree, 4,041,109, Cl. 260-927.00R.

Marquardt, Robert Alden, to General Electric Company. Acoustic data acquisition system. 4,041,442, Cl. 340-6.00R.

Marquis, Edward T.; and Watts, Lewis W., Jr., to Texaco Development Corporation. Method of preparing polyaminopolyphenylmethanes. 4,041,078, Cl. 260-570.00D.

Marsee, Frederick J., to Ethyl Corporation. Spark vacuum advance control. 4,040,401, Cl. 123-117.00A.

Marsh, Harold E., Jr.: *See—*
United States of America, National Aeronautics and Space Administration; Mueller, William A.; Hsu, George C.; and Marsh, Harold E., Jr., 4,041,233, Cl. 536-56.000.

Marshall, David W.; MCGrath, Kenneth W.; O'Day, William R., Jr.; and Wilder, Thomas C., to Kennecott Copper Corporation. Multiple-track cathode for electroformation of metallic filaments. 4,040,942, Cl. 204-13.000.

Marshall, Peter Edward George: *See—*
Burton, Peter Edward; Pasquire, Derek James; and Marshall, Peter Edward George, 4,041,272, Cl. 219-89.000.

Martin, David James Reginald, to Coal Industry (Patents) Limited. Apparatus for determining the position of a object. 4,041,495, Cl. 343-112.00R.

Martin, David Michael, to Iowa State University Research Foundation, Inc. Scanning electron microscope with color image display. 4,041,311, Cl. 250-311.000.

Martin, Fred David: *See—*
Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 4,040,854, Cl. 106-90.000.

Martin, Paul: *See—*
Francois, Bernard; Vernois, Michel; Martin, Paul; and Franta, Emile, 4,040,815, Cl. 75-.50B.

Marting, Donald G.: *See—*
Davis, Rufus F., Jr.; and Marting, Donald G., 4,040,961, Cl. 210-195.00R.

Martinsons, Aleksandrs: *See—*
Johnson, Harlan B.; Martinsons, Aleksandrs; and Snodgrass, John O., 4,040,918, Cl. 204-98.000.

Martocci, Anthony P.: *See—*
Francisco, Herbert H.; Martocci, Anthony P.; and Beitel, Sydney B., 4,041,273, Cl. 219-121.0EM.

Maruyama, Eiichi: *See—*
Shidara, Keiichi; Goto, Naohiro; Maruyama, Eiichi; Hirai, Tadaaki; and Fujita, Tsutomu, 4,040,985, Cl. 252-501.000.

Maruyama, Mitsuaki: *See—*
Ido, Kazuo; and Maruyama, Mitsuaki, 4,041,295, Cl. 235-156.000.

Maruzen Petrochemical Co., Ltd.: *See—*
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,040,946, Cl. 208-131.000.

Marvin Glass & Associates: *See—*
Barlow, Gordon A.; and Isaacson, Anson, 4,040,621, Cl. 273-85.00C.

Marx, Richard Everet: *See—*
Napoli, Louis Sebastian; and Marx, Richard Everet, 4,041,307, Cl. 250-203.00R.

Marzoli, Angelo, to F. lli Marzoli & C. S.p.A. Machine for loosening and removing textile fibers from fiber bales. 4,040,145, Cl. 19-81.000.

Marzoli, Angelo, to F. lli Marzoli & C. S.p.A. Device for distributing textile fiber slivers inside collection boxes in spinning preparation machines. 4,040,146, Cl. 19-159.00R.

Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Hirabayashi, Yoichi, to Canon Kabushiki Kaisha. Method and arrangement for eliminating ghost image. 4,040,737, Cl. 355-49.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
Tronsberg, Walter, 4,040,163, Cl. 29-423.000.

Maschinenfabrik Wifag: *See—*
Gertsch, Peter; and Wehrli, Alfons, 4,040,348, Cl. 101-350.000.

Mascioli, Rocco L.: *See—*
Bechara, Ibrahim S.; Carroll, Felix P.; Holland, Dewey G.; and Mascioli, Rocco L., 4,040,992, Cl. 260-2.5AW.

Masel, Jacob J. Orthodontic neck band including safety strap. 4,040,188, Cl. 32-14.00D.

Maske, Fred, to General Mills Chemicals, Inc. Dispersible glyoxal-xanthan gum complexes. 4,041,234, Cl. 536-114.000.

Mason, Stanley L., Jr.; Handler, Michael D.; and Richardson, James E., to Simco, Inc. Dispenser for vaporizable material accentuated by ambient air flow. 4,040,568, Cl. 239-57.000.

Mass Transfer Limited: *See—*
McKeown, Kevin Joseph, 4,041,113, Cl. 261-98.000.

Massachusetts Institute of Technology: *See—*
Javan, Ali, 4,041,475, Cl. 340-173.0LS.

Masson Scott Thrissell Engineering Limited: *See—*
Walkington, Colin, 4,040,617, Cl. 271-177.000.

Mast, John G., to Textron, Inc. Elimination of extraneous modulation from VHF omnirange receiver. 4,041,493, Cl. 343-106.00R.

Masterfield, Clarence William, to Raymond Lee Organization, Inc., The, a part interest. Airplane route viewing system. 4,041,529, Cl. 358-109.000.

Masuyama, Takeshi: *See—*
Matsuura, Mikio; Nishi, Nobuji; Yamaguchi, Masatsugu; Matsuoka, Michio; and Masuyama, Takeshi, 4,041,437, Cl. 338-35.000.

Masuyama, Tetsuo: *See—*
Onoda, Takeru; and Masuyama, Tetsuo, 4,041,082, Cl. 260-604.0HF.

Mathy, Wolfgang: *See—*
Glaeser, Wolfgang; and Mathy, Wolfgang, 4,041,138, Cl. 423-464.000.

Matrosov, Evgeny Arkadievich: *See—*
Shikhirev, Boris Nikolaevich; Matrosov, Evgeny Arkadievich; and Deresh, Ilya Abramovich, 4,040,209, Cl. 51-80.00A.

Matsubara, Izuru, to Dai Nippon Insatsu Kabushiki Kaisha; and Meiji Seika Kabushiki Kaisha. Kaleidoscopic peep-show viewing device. 4,040,716, Cl. 350-4.000.

Matsubara, Yukio: *See—*
Iijima, Ryozo; Matsubara, Yukio; Yamaguchi, Ginichi; and Fukushima, Masatoshi, 4,040,937, Cl. 204-281.000.

Matsuda, Fumio: *See—*
Ohta, Kazuho; Matsuda, Fumio; Tanaka, Tsutomu; Ohnuki, Katsuhiro; Miyaji, Naotaka; and Sato, Hidetoshi, 4,041,256, Cl. 179-182.00R.

Matsuda, Isamu; and Ono, Taizo, to Matsushita Electric Industrial Co., Ltd. Display device. 4,040,193, Cl. 40-28.00C.

Matsuda, Ken; and Barber, William Austin, to American Cyanamid Company. Reduced copper catalyst on support. 4,040,980, Cl. 252-463.000.

Matsuda, Yasumasa; Kimura, Ichiro; Sagawa, Akio; and Hiramatsu, Tsutomu, to Hitachi, Ltd. Apparatus for detecting misfire in multicylinder internal combustion engine. 4,040,294, Cl. 73-117.300.

Matsui, Takeshi: *See—*
Wada, Yukio; Abura, Yoshinori; and Matsui, Takeshi, 4,040,696, Cl. 339-8.00R.

Matsukawa, Hiroharu: *See—*
Hayashi, Takao; and Matsukawa, Hiroharu, 4,041,193, Cl. 427-151.000.

Matsumoto, Hiroshi: *See—*
Ogata, Masaru; and Matsumoto, Hiroshi, 4,041,026, Cl. 260-239.30D.

Matsuoka, Michio: *See—*
Matsuura, Mikio; Nishi, Nobuji; Yamaguchi, Masatsugu; Matsuoka, Michio; and Masuyama, Takeshi, 4,041,437, Cl. 338-35.000.

Matsushita Electric Corporation of America: *See—*
Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, 4,041,535, Cl. 358-191.000.

Matsushita Electric Industrial Co., Ltd.: *See—*
Matsuda, Isamu; and Ono, Taizo, 4,040,193, Cl. 40-28.00C.
Matsuura, Mikio; Nishi, Nobuji; Yamaguchi, Masatsugu; Matsuoka, Michio; and Masuyama, Takeshi, 4,041,437, Cl. 338-35.000.
Mizushima, Wataru; Nakata, Koreaki; Hamasaki, Nobuhiro; and Iida, Yoshio, 4,041,359, Cl. 361-433.000.
Nagata, Takashi; Ishibashi, Michio; and Nakajima, Yasuo, 4,041,335, Cl. 310-321.000.
Nitta, Tsuneharu; Hayakawa, Shigeru; Kasahara, Yukio; and Terada, Ziro, 4,041,140, Cl. 423-561.00R.
Sato, Teruo, 4,041,481, Cl. 340-324.00M.
Yamamoto, Katsuhiko; Hontani, Kunihiko; Kitaura, Hiromu; and Nakamura, Michio, 4,041,533, Cl. 358-160.000.
Yamazaki, Osamu; Miki, Sukeichi; and Takezaki, Tsuneo, 4,041,244, Cl. 179-15.0BT.

Matsushita Electric Works, Ltd.: *See—*
Wada, Yukio; Abura, Yoshinori; and Matsui, Takeshi, 4,040,696, Cl. 339-8.00R.

Matsuura, Mikio; Nishi, Nobuji; Yamaguchi, Masatsugu; Matsuoka, Michio; and Masuyama, Takeshi, to Matsushita Electric Industrial Co., Ltd. Humidity sensor. 4,041,437, Cl. 338-35.000.

Matsuyama, Junichi; Hinata, Masanao; and Sato, Akira, to Fuji Photo Film Co., Ltd. Direct-positive process utilizing a supersensitized silver halide emulsion. 4,040,839, Cl. 96-64.000.

Matt, Richard J.; and Thompson, Richard T., to Textron, Inc. Method of making a low-friction fabric bearing. 4,040,883, Cl. 156-148.000.

Matz, Bjorn J.; and Foster, Edward J., to Dictaphone Corporation. Central dictation system with privacy signal used for transcribing scanning. 4,041,249, Cl. 179-100.1DR.

Matzen, Nils Denny. Method of charging drill holes and means for carrying out the method. 4,040,330, Cl. 86-20.00C.

Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-alkyl-0-[1-(3-nitrophenyl)-2-carbalkoxy-vinyl]-thiono(thiol)-phosphoric (phosphonic) acid esters. 4,041,158, Cl. 424-212.000.

Mayes, Gary Wayne: *See—*
Davis, Michael Ian; Mayes, Gary Wayne; McDermott, Thomas Stephen; and Wise, Larry Edward, 4,041,462, Cl. 364-200.000.

Mayol, George. Folding picnic table. 4,040,658, Cl. 297-159.000.

Mays, Robert K.: *See—*
Williams, Lloyd E.; Mays, Robert K.; and Wagner, Joseph E., III, 4,041,135, Cl. 423-329.000.

Mazzarella, Emil D.; Wood, Leonard J., Jr.; and Maliczyszyn, Walter, to National Starch and Chemical Corporation. Method of sizing paper. 4,040,900, Cl. 162-158.000.

McBride, Robert B.; and Tiberio, Phillip J., to General Electric Company. Moisture and rust detector for hydraulic control systems. 4,040,790, Cl. 23-253.00C.

McCabe, Francis J. Clutch motor for use in resettable fire damper. 4,040,304, Cl. 74-230.17T.

McClure, James D., to Shell Oil Company. Ethylbenzene process using an unsupported perfluorinated polymer catalyst. 4,041,090, Cl. 260-671.00R.

McCollister, Howard L.: *See—*
Kormanyos, Kenneth R.; McCollister, Howard L.; and White, Paul L., 4,041,215, Cl. 429-104.000.

McCormick, Harold E., to Ramsey Corporation. Low friction balanced piston ring. 4,040,637, Cl. 277-224.000.

McCormick, Joseph F., to Ruben, Murray A. Electrical linear force motor for servo controls, fluid valves, and the like. 4,040,445, Cl. 137-596.180.

McCoy, Rawley D.: *See—*
Bradley, Frank R.; and McCoy, Rawley D., 4,041,254, Cl. 179-175.30R.

McCray, Walter A.; and Smith, Charles L., to Hilti Aktiengesellschaft. Method of making or repairing and securing lugs and trunnion members to ingot molds. 4,040,471, Cl. 164-92.000.

McDaniel, Gayner R.: *See—*
Goodling, John S.; McDaniel, Gayner R.; and Steadham, Richard A., 4,040,425, Cl. 128-303.140.

McDermott, Thomas Stephen: *See—*
Davis, Michael Ian; Mayes, Gary Wayne; McDermott, Thomas Stephen; and Wise, Larry Edward, 4,041,462, Cl. 364-200.000.

McDonnell Douglas Corporation: *See—*
Schlanert, George A.; Wood, Lorin A.; and Rayburn, Gerald A., 4,040,581, Cl. 244-83.00K.
Wiggins, Edwin W.; and Carpenter, James F., 4,040,991, Cl. 260-2.5BD.

McDonnell, Roger P.: *See—*
Fong, Ronald A.; Latty, James A.; and McDonnell, Roger P., 4,041,006, Cl. 260-33.6UA.

McDougall, Ian Leitch, to Imperial Metal Industries (Kynoch) Limited. Formers for coils. 4,040,173, Cl. 29-599.000.

McFadden, Russell T.: *See—*
Gross, James R.; and McFadden, Russell T., 4,041,231, Cl. 526-317.000.

McGinniss, Vincent D., to SCM Corporation. Ultraviolet curing of electrocoating compositions. 4,040,925, Cl. 204-181.000.

MCGrath, Kenneth W.: *See—*
Marshall, David W.; MCGrath, Kenneth W.; O'Day, William R., Jr.; and Wilder, Thomas C., 4,040,942, Cl. 204-13.000.

McGraw-Edison Company: *See—*
Gaia, Aldino J., 4,041,435, Cl. 337-159.000.

McGraw, Philip W.; Doorakian, George A.; and Rains, Randall C., to Dow Chemical Company, The. Delayed-action, heat activated-urethane catalyst. 4,041,019, Cl. 260-75.0NC.

McGrew, Carl A.: *See—*
Taylor, John W., Jr.; and McGrew, Carl A., 4,041,491, Cl. 343-100.00R.

McKee, William H.; and Witte, Roy, to TRW Inc. Solderless termination system. 4,040,702, Cl. 339-97.00R.

McKenna, James: *See—*
Oppenheim, Carl Emil; and McKenna, James, 4,040,362, Cl. 105-226.000.

McKeown, Kevin Joseph, to Mass Transfer Limited. Tower packing elements. 4,041,113, Cl. 261-98.000.

McKinney, Joel D.; and Mitchell, Bruce R., to Gulf Research & Development Company. Hydrocarbon catalytic cracking process. 4,040,945, Cl. 208-113.000.

McKinney, Maurice E., to United States of America, Navy. Variable camber leading edge airfoil system. 4,040,579, Cl. 244-214.000.

McLaughlin, James L.: *See—*
Ashworth, James G.; Glock, Eugene; Kelly, James G.; McLaughlin, James L.; and Merwin, Owen T., 4,040,431, Cl. 131-140.00P.

McLay, Roger Berry Cameron. Interconnecting bracket for logs. 4,040,589, Cl. 248-300.000.

McNeely, Charles D., to NEPRO, Inc. Heating unit. 4,040,567, Cl. 237-81.000.

McNeill, Frederick M.: *See—*
Simons, Sanford L.; and McNeill, Frederick M., 4,040,788, Cl. 23-230.0R.

McNeill, William H.; Haugsjaa, Paul O.; Lech, Joseph; and Regan, Robert J., to GTE Laboratories Incorporated. Automatic starting system for solid state powered electrodeless lamps. 4,041,352, Cl. 315-248.000.

McPherson, Gerry E., to General Steel Industries, Inc. Apparatus and method for forming water stops on insulated pipe. 4,041,198, Cl. 427-294.000.

McTamaney, Louis S.: *See—*
Westerman, David J.; McTamaney, Louis S.; and Kauber, David J., 4,041,331, Cl. 307-252.00Q.

Mead Corporation, The: *See—*
Kraus, Walter R.; Kelch, David J.; and Jensen, Gerald A., 4,040,928, Cl. 204-195.00M.

Medved, Donald C.: *See—*
Collins, Edward J.; and Medved, Donald C., 4,040,777, Cl. 431-95.00A.

Meidert, Helmut: *See—*
Muller, Werner Heinrich; Hey, Hansjorg; and Meidert, Helmut, 4,041,049, Cl. 260-343.500.

Meiji Seika Kabushiki Kaisha: *See—*
Matsubara, Izuru, 4,040,716, Cl. 350-4.000.

Meinert, Norbert: *See—*
Broemer, Heinz; and Meinert, Norbert, 4,040,846, Cl. 106-47.00Q.

Meininger, James R., to Brunswick Corporation. Back draft carburetor for two cycle engines. 4,040,399, Cl. 123-65.00R.

Meitner, Gary H.: *See—*
Brock, Robert J.; and Meitner, Gary H., 4,041,203, Cl. 428-157.000.

Melan, Giuseppe-Fabrizio Mario; and Nicoulaud, Jean Raymond, to Saint-Gobain Industries. Strand attenuation and winding apparatus and method. 4,040,572, Cl. 242-18.00A.

Melcher, Robert Lee; and Shiren, Norman Steven, to International Business Machines Corporation. Optical scanner. 4,041,536, Cl. 358-213.000.

Melen, Roger D. Low transient effect switching device and method. 4,041,519, Cl. 357-30.000.

Menager, Olivier: *See—*
Desormiere, Bernard; Menager, Olivier; Courty, Albert; and Eumurian, Gregoire, 4,041,419, Cl. 333-30.00R.

Mencarini, Richard: *See—*
Stockdale, Douglas P.; Mencarini, Richard; Deaton, Carlton D.; and Owen, Ralph M., 4,040,234, Cl. 53-38.000.

Merck & Co., Inc.: *See—*
Firestone, Raymond A.; Cama, Lovji D.; and Christensen, Burton G., 4,041,029, Cl. 544-25.000.

Merck Patent Gesellschaft mit beschraenkter Haftung: *See—*
Esselborn, Reiner; and Bernhard, Horst, 4,040,859, Cl. 106-291.000.

Merkert, Rodney Francis, to Union Carbide Corporation. Method of producing a composition containing a large amount of vanadium and nitrogen. 4,040,814, Cl. 75-.5BC.

Merrell Toraude et Compagnie: *See—*
Metcalf, Brian Walter; and Jung, Michel, 4,041,041, Cl. 260-293.860.

Merrill, Edgar F.: *See—*
Pasculle, Maurice J.; Merrill, Edgar F.; and Heyne, Carl J., 4,041,543, Cl. 361-33.000.

Merwin, Owen T.: *See—*
Ashworth, James G.; Glock, Eugene; Kelly, James G.; McLaughlin, James L.; and Merwin, Owen T., 4,040,431, Cl. 131-140.00P.

Merz AG Dulliken: *See—*
Vig, Istvan, 4,040,765, Cl. 408-239.00A.

Messerschmitt-Boelkow-Blohm GmbH: *See—*
Schwaerzler, Hans-Juergen, 4,040,580, Cl. 244-78.000.

Messina, Ralph Paul: *See—*
Compa, Russell Edward; Liebowitz, Marvin; and Messina, Ralph Paul, 4,041,205, Cl. 428-220.000.

Metallgesellschaft Aktiengesellschaft: *See—*
Rammler, Roland, 4,040,958, Cl. 210-73.00R.

Rudolph, Paul; Bierbach, Herbert; Kupfer, Hans; Hafke, Carl; and Kohlen, Rudolf, 4,040,800, Cl. 48-85.200.

Metcalf, Brian Walter; and Jung, Michel, to Merrell Toraude et Compagnie. Acetylene derivatives of amino acids. 4,041,041, Cl. 260-293.860.

Metzner, Wolfgang; and Koddebusch, Hubert, to Desowag-Bayer Holzschutz GmbH. Preservative composition for wood and wood building materials and method of using same. 4,041,176, Cl. 424-318.000.

Meussdoerffer, Johann Nikolaus: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,041,003, Cl. 260-30.80R.

Meyer, Bengt E., to Eaton Corporation. Pulley splitting machine-control system. 4,040,281, Cl. 72-10.000.

Meyer, Jeffrey G., to Anderson Development Company. Chromium tris-diorgano-orthophosphate-alkyl aluminum halide catalysts for olefin polymerization and alkylation of aromatic compounds. 4,041,226, Cl. 526-144.000.

Michel, Wilfried; Reichert, Hartmut; and Willmann, Erich, to Simplex Time Recorder. Attendance time recorder. 4,041,503, Cl. 346-83.000.

Midwinter, John Edwin; and Day, Clive Richard, to Post Office, The. Drawing dielectric optical waveguides. 4,040,807, Cl. 65-3.00A.

Miessler, James D.; and Johnson, Arne I., to Albany International Corporation. Method of making syntatic modules. 4,040,165, Cl. 29-458.000.

Miiller, William Clyde, to Johns-Manville Corporation. Temperature stable fibrous insulation composition and "wet" package formed thereof. 4,040,847, Cl. 106-69.000.

Miki, Sukeichi: *See—*
Yamazaki, Osamu; Miki, Sukeichi; and Takezaki, Tsuneo, 4,041,244, Cl. 179-15.0BT.

Mikulecky, Karel: *See—*
Burysek, Frantisek; Mikulecky, Karel; and Janousek, Jan, 4,040,573, Cl. 242-35.50A.

Milionis, Jerry Peter; and Spicer, Larry Dean, to American Cyanamid Company. Resin compositions containing 0,0,0',0'-tetramethyl 0,0'-thiodi-p-phenylene phosphorothioate. 4,041,151, Cl. 424-78.000.

Miller, Dale E.; Chapman, William L.; Dunster, Donald E.; and Thomas, Bobby J., to Continental Oil Company. Apparatus for multi-channel induced polarization surveying. 4,041,372, Cl. 324-9.000.

Miller, Gary E., to Agrimatic Corporation. Method and apparatus for automatic egg injection. 4,040,388, Cl. 119-1.000.

Mine Safety Appliances Company: *See—*
Giebel, Joseph L., 4,040,376, Cl. 114-221.00A.

Minknow, Morse: *See—*
Gorsky, Egon; and Minknow, Morse, 4,040,246, Cl. 58-23.00R.

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Stroom, Paul D.; and Braunreiter, Carl J., 4,040,474, Cl. 165-9.000.
Vandervort, John D., 4,040,383, Cl. 118-60.000.

Minolta Camera Kabushiki Kaisha: *See—*
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Mischenko, Alexandr Petrovich: *See—*
Smirnov, Viktor Sergeevich; Gryaznov, Vladimir Mikhailovich; Lebedeva, Valentina Ivanovna; Mischenko, Alexandr Petrovich; Polyakova, Victoria Petrovna; and Savitsky, Evgeny Mikhailovich, 4,041,093, Cl. 260-673.500.

Misiaszek, Emil J.: *See—*
Williams, Raymond H.; and Misiaszek, Emil J., 4,041,502, Cl. 346-33.00A.

Missioux, Jean Leon. Autonomous group for mechanical control of machines. 4,040,509, Cl. 192-150.000.

Misu, Takashi: *See—*
Takada, Koji; and Misu, Takashi, 4,040,920, Cl. 204-129.750.

Mita Industrial Co. Ltd.: *See—*
Washio, Takaji; Sasaki, Koichi; and Aizawa, Tatsuo, 4,040,387, Cl. 118-658.000.

Mitchell, Bruce R.: *See—*
McKinney, Joel D.; and Mitchell, Bruce R., 4,040,945, Cl. 208-113.000.

Mitchell, William Eric, to Dunlop Limited. Wheel rim assemblies. 4,040,465, Cl. 152-381.100.

Mitsubishi Chemical Industries Limited: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,041,156, Cl. 424-177.000.
Onoda, Takeru; and Masuyama, Tetsuo, 4,041,082, Cl. 260-604.0HF.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Takada, Koji; and Misu, Takashi, 4,040,920, Cl. 204-129.750.
Takahashi, Masaru, 4,040,653, Cl. 292-202.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Yoshida, Hiroshi; Kozuka, Hajime; Sakano, Toyoshi; Honda, Yoichiro; and Omuro, Shojiro, 4,040,502, Cl. 180-149.000.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Atsukawa, Masumi; Kamei, Kazumi; Shinoda, Naoharu; and Ushio, Hiroyuki, 4,040,803, Cl. 55-73.000.
Katarao, Tadamichi, 4,040,302, Cl. 74-37.000.
Yoshida, Hiroshi; Kozuka, Hajime; Sakano, Toyoshi; Honda, Yoichiro; and Omuro, Shojiro, 4,040,502, Cl. 180-149.000.

Mitsubishi Rayon Co., Ltd.: *See—*
Ide, Fumio; Kishida, Kazuo; and Osaka, Norihisa, 4,041,106, Cl. 260-876.00R.
Oshima, Akira; Yoshihara, Keisuke; Shiki, Mikio; and Ikeda, Tuneo, 4,041,120, Cl. 264-171.000.

Mitsui Mining & Smelting Co., Ltd.: *See*—
Saitoh, Kozo; and Izumi, Sumio, 4,040,949, Cl. 209-166.000.
Tokunaga, Koichi; and Fukuda, Akira, 4,040,525, Cl. 214-6.00P.
Miyabe, Atsushi, to Hochiki Corporation. Output circuit of an ionization smoke sensor. 4,041,479, Cl. 340-237.00S.
Miyagawa, Akira: *See*—
Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, 4,040,879, Cl. 149-18.000.
Miyaji, Naotaka: *See*—
Ohta, Kazuho; Matsuda, Fumio; Tanaka, Tsutomu; Ohnuki, Katsuhiro; Miyaji, Naotaka; and Sato, Hidetoshi, 4,041,256, Cl. 179-182.00R.
Miyakawa, Nobuaki, to Hitachi, Ltd. Multiplication apparatus. 4,041,299, Cl. 364-841.000.
Miyasaka, Nobuaki: *See*—
Hinata, Masanao; Takei, Haruo; Miyasaka, Nobuaki; and Takahashi, Kenji, 4,040,833, Cl. 96-45.100.
Miyazaki, Kenichi: *See*—
Miyoshi, Tadayoshi; Nakagaki, Shintaro; Takanashi, Itsuo; Yokokawa, Sumio; Miyazaki, Kenichi; Tumiyama, Hisanori; and Motoyama, Koithiro, 4,041,528, Cl. 358-47.000.
Miyoshi, Tadayoshi; Nakagaki, Shintaro; Takanashi, Itsuo; Yokokawa, Sumio; Miyazaki, Kenichi; Tumiyama, Hisanori; and Motoyama, Koithiro, to Victor Company of Japan, Limited. Color television signal generating apparatus for use in a single camera tube. 4,041,528, Cl. 358-47.000.
Miyoshi, Taturu: *See*—
Mukaemachi, Takuzi; Toyama, Toshiaki; and Miyoshi, Taturu, 4,041,246, Cl. 179-18.0GF.
Mizushima, Wataru; Nakata, Koreaki; Hamasaki, Nobuhiro; and Iida, Yoshio, to Matsushita Electric Industrial Co., Ltd. Method of making an electrolytic capacitor and electrolytic capacitor made thereby. 4,041,359, Cl. 361-433.000.
Mobil Oil Corporation: *See*—
Ireland, Henry R.; and Stein, Thomas R., 4,041,097, Cl. 260-676.00R.
Johnson, David Emil, 4,040,574, Cl. 242-56.00A.
Kuo, James C.; Prater, Charles Dwight; and Wise, John J., 4,041,094, Cl. 260-676.00R.
Kuo, James C., 4,041,095, Cl. 260-676.00R.
Kuo, James C., 4,041,096, Cl. 260-676.00R.
Mochizuki, Hiroshi: *See*—
Tanaka, Eizi; Mochizuki, Hiroshi; Kosuda, Tooru; Abe, Seikou; and Ohashi, Michihiro, 4,040,405, Cl. 123-139.0BG.
Mogendorf, Friedel: *See*—
Pielsticker, Klaus Peter; Mogendorf, Friedel; and Sonnabend, Karl Heinrich, 4,040,514, Cl. 198-774.000.
Mogi, Takao, to Sony Corporation. Channel selection and indicating system. 4,041,402, Cl. 325-465.000.
Mohla, Prem P.: *See*—
Hetke, Adolf; Mohla, Prem P.; and Warrick, Robert J., 4,040,821, Cl. 75-134.00S.
Moise, Alain: *See*—
Dumont, Pierre; and Moise, Alain, 4,041,236, Cl. 13-25.000.
Mole, Cecil J., to Westinghouse Electric Corporation. Segmented magnet homopolar dynamoelectric machines having fluid cooled liquid metal current collecting zones. 4,041,337, Cl. 310-178.000.
Molina, Orlando G., to Rockwell International Corporation. Water washable dye penetrant composition and method of application. 4,041,310, Cl. 250-302.000.
Molins, Desmond Walter; and Jackson, Norman Walter, to Molins Limited. Apparatus for making composite filters. 4,040,341, Cl. 93-77.0FT.
Molins, Desmond Walter, to Molins Limited. Method and apparatus for making filter cigarettes. 4,040,430, Cl. 131-94.000.
Molins Limited: *See*—
Molins, Desmond Walter; and Jackson, Norman Walter, 4,040,341, Cl. 93-77.0FT.
Molins, Desmond Walter, 4,040,430, Cl. 131-94.000.
Monacelli, Umberto. Tack-strip as obtained by head-cementing. 4,040,325, Cl. 85-17.000.
Monarch Marking Systems, Inc.: *See*—
Jenkins, William A., 4,040,555, Cl. 227-67.000.
Mondshine, Thomas C., to N L Industries, Inc. Laundering of oil base mud cuttings. 4,040,866, Cl. 134-26.000.
Monroe, James E., Jr., to United States of America, Energy Research and Development Administration. Thermionic energy converters. 4,040,903, Cl. 176-39.000.
Monsanto Company: *See*—
Li, Tao P., 4,040,978, Cl. 252-437.000.
Seelye, John F., 4,041,124, Cl. 264-336.000.
Monsanto Research Corporation: *See*—
David, Donald J.; and Willson, Michael C., 4,040,691, Cl. 312-31.000.
David, Donald J.; and Hardy, Edgar E., 4,040,749, Cl. 356-201.000.
Garner, Albert Y., 4,040,780, Cl. 8-116.00P.
Mookherjee, Braja Dulal: *See*—
Shuster, Edward J.; Withycombe, Donald Arthur; Mookherjee, Braja Dulal; and Mussinan, Cynthia J., 4,040,987, Cl. 252-522.000.
Moore, Donald G., to Chemetron Corporation. Sensor and tray arrangement. 4,041,266, Cl. 219-10.55E.
Moore, George Edgar; and Morris, Alan Francis, to Dehye Harvesters Limited. Feed roller mechanisms for forage harvesters. 4,040,344, Cl. 100-95.000.
Moore, Raymond H., to Battelle Memorial Institute. Method for removing sulfur oxide from waste gases and recovering elemental sulfur. 4,041,142, Cl. 423-573.00G.
Moore, Robert E.; and Janoski, Edward J., to Sun Ventures, Inc. Process of manufacture of flourinated alkyladamantanes. 4,041,086, Cl. 260-648.00F.
Moore, Thomas M., to United States of America, Army. Lockwood airfoil used in conjunction with man transport device. 4,040,577, Cl. 244-4.00A.
Morcos, Nabil A.; Bruno, Gerald A.; and Haney, Thomas A., to E. R. Squibb & Sons, Inc. Multiple pH alumina columns for molybdenum-99/technetium-99m generators. 4,041,317, Cl. 250-432.0PD.
Morgan, A. Perry, Jr. Table apparatus including a lockable, rotatable tray. 4,040,364, Cl. 108-28.000.
Morgan, George W.: *See*—
Chaney, Preston E.; and Morgan, George W., 4,040,262, Cl. 61-86.000.
Morgan, Neal O.: *See*—
Eby, Harry J.; and Morgan, Neal O., 4,040,810, Cl. 71-9.000.
Morphy, Paul H., to Hobart Corporation. Method of construction of insulated cabinet. 4,040,166, Cl. 29-460.000.
Morris, Alan Francis: *See*—
Moore, George Edgar; and Morris, Alan Francis, 4,040,344, Cl. 100-95.000.
Morris, George E., to General Electric Company. Control circuit for an electric motor. 4,041,360, Cl. 318-221.00R.
Morrison, Charles F., Jr., to Valleylab, Inc. Electrosurgical method and apparatus for initiating an electrical discharge in an inert gas flow. 4,040,426, Cl. 128-303.170.
Morrison, Robert C.: *See*—
Bach, Ricardo O.; and Morrison, Robert C., 4,041,088, Cl. 260-668.00B.
Morton-Norwich Products, Inc.: *See*—
Schwan, Thomas J., 4,041,035, Cl. 260-251.00R.
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., to Diamond Shamrock Corporation. Antiinflammatory imidazothiazoles. 4,041,167, Cl. 424-270.000.
Mosier, John E., to Halliburton Company. Railway train control simulator and method. 4,041,283, Cl. 235-150.200.
Mosier, Stanley A.; and Pierce, Robert M., to United Technologies Corporation. Catalytic premixing combustor. 4,040,252, Cl. 60-39.360.
Moss, Gerald, to Exxon Research and Engineering Company. Production of elemental sulphur. 4,041,141, Cl. 423-571.000.
Moss, Leslie Robert: *See*—
Main, James; Moss, Leslie Robert; and Perryman, Ralph, 4,040,280, Cl. 70-333.00R.
Motohashi, Michio: *See*—
Sugihara, Hirosada; Motohashi, Michio; Watanabe, Masazumi; Nishikawa, Masao; and Sanno, Yasushi, 4,041,079, Cl. 260-574.000.
Motorola, Inc.: *See*—
Fedde, Chris Steven, 4,041,396, Cl. 325-150.000.
Main, W. Eric, 4,041,407, Cl. 330-13.000.
Malone, Hugh Robert, 4,041,412, Cl. 331-10.000.
Schroeder, Daniel Ray, 4,041,390, Cl. 325-21.000.
Wechsler, Reuben, 4,041,267, Cl. 219-10.55B.
Motoyama, Koithiro: *See*—
Miyoshi, Tadayoshi; Nakagaki, Shintaro; Takanashi, Itsuo; Yokokawa, Sumio; Miyazaki, Kenichi; Tumiyama, Hisanori; and Motoyama, Koithiro, 4,041,528, Cl. 358-47.000.
Moya, Castulo J. A rotating beacon for a bicycle. 4,041,452, Cl. 340-134.000.
Mrcun, Ivan. Brushless alternator. 4,041,340, Cl. 310-263.000.
Mudiare, Edeki, to LaSalle Steel Company. Process for strengthening of carbon steels. 4,040,872, Cl. 148-12.00B.
Mueller, Richard A., to G. D. Searle & Co. 3,5-Bisoxygenated 2-(ω-halo-3-oxo-1-alkenyl)-cyclopentane-1-heptanoic acids and derivatives thereof. 4,041,050, Cl. 260-345.700.
Mueller, Rudolf, to Schering Aktiengesellschaft. Liquid reaction vessel with means for removing deposits on its inner walls. 4,040,606, Cl. 259-107.000.
Mueller, William A.: *See*—
United States of America, National Aeronautics and Space Administration; Mueller, William A.; Hsu, George C.; and Marsh, Harold E., Jr., 4,041,233, Cl. 536-56.000.
Muench, Jerome T.: *See*—
Campbell, George W., Jr.; Wilkins, David G.; and Muench, Jerome T., 4,041,132, Cl. 423-279.000.
Muenchinger, Herman G., to Research Engineering & Manufacturing, Inc. Thread-forming fastener having dual lobulation and dies for making the same. 4,040,328, Cl. 85-46.000.
Mukaemachi, Takuzi; Toyama, Toshiaki; and Miyoshi, Taturu, to Hitachi, Ltd. Thyristor cross-point switch with control. 4,041,246, Cl. 179-18.0GF.
Muller, Martin: *See*—
Kyri, Hans; Brandle, Karl; Muller, Martin; and Heine, Heinrich, 4,040,850, Cl. 106-87.000.
Muller, Werner Heinrich; Hey, Hansjorg; and Meidert, Helmut, to Hoechst Aktiengesellschaft. Process for the manufacture of cyclohexane-1,3-diones and 6-alkyl-3,4-dihydro-2-pyranones. 4,041,049, Cl. 260-343.500.
Munnis, David V.: *See*—
Taylor, Peter, 4,040,205, Cl. 46-51.000.
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasuhumi; Takashima, Mutsuo; Takeda, Masaaki; Ino, Hiroyoshi; and Iwanami, Sumio, to

Yamanouchi Pharmaceutical Co., Ltd. Pyrazine derivatives. 4,041,032, Cl. 260-250.0BN.
Muramoto, Kenichi: *See*—
Fuse, Noboru; and Muramoto, Kenichi, 4,041,517, Cl. 357-22.000.
Murray, Roger W., to Litronix, Inc. High intensity light-emitting diode. 4,041,516, Cl. 357-17.000.
Murty, Dasika R.: *See*—
Pagnucco, Rinaldo G.; Muse, Roberta J.; and Murty, Dasika R., 4,041,147, Cl. 195-103.50A.
Muscarella, Ida M., administratrix: *See*—
Clarkson, Stanley G.; and Muscarella, Joseph N., deceased, 4,040,616, Cl. 271-65.000.
Muscarella, Joseph N., deceased: *See*—
Clarkson, Stanley G.; and Muscarella, Joseph N., deceased, 4,040,616, Cl. 271-65.000.
Muse, Roberta J.: *See*—
Pagnucco, Rinaldo G.; Muse, Roberta J.; and Murty, Dasika R., 4,041,147, Cl. 195-103.50A.
Mussinan, Cynthia J.: *See*—
Shuster, Edward J.; Withycombe, Donald Arthur; Mookherjee, Braja Dulal; and Mussinan, Cynthia J., 4,040,987, Cl. 252-522.000.
Mysels, Karol J., to General Atomic Company. Method for axially shuffling fuel elements in a nuclear reactor. 4,040,902, Cl. 176-30.000.
N L Industries, Inc.: *See*—
Mondshine, Thomas C., 4,040,866, Cl. 134-26.000.
Wright, Alan C.; and Rupert, Joseph Paul, 4,040,974, Cl. 252-316.000.
N. V. Optische Industrie "De Oude Delft": *See*—
Groeneweg, Abraham, 4,040,723, Cl. 350-203.000.
van der Does, Lucas, 4,040,614, Cl. 271-19.000.
Naarden International N.V.: *See*—
Boelens, Harmannus; Takken, Hendrik J.; and Traas, Petrus C., 4,040,986, Cl. 252-522.000.
Nagai, Yuji: *See*—
Takeda, Shiroh; Nagai, Yuji; and Suzuki, Takenori, 4,041,009, Cl. 260-42.180.
Nagaoka, Shinji: *See*—
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,041,511, Cl. 354-232.000.
Nagata, Takashi; Ishibashi, Michio; and Nakajima, Yasuo, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ceramic resonator with vibration damping means. 4,041,335, Cl. 310-321.000.
Nagatugi, Shuzo; Miyagawa, Akira; and Fukuoka, Suguru, to Daicel Ltd. Process for preparing a match head composition containing particulate nitrocellulose and no sulfur. 4,040,879, Cl. 149-18.000.
Naiman, Michael I.: *See*—
Heintzelman, William J.; and Naiman, Michael I., 4,041,056, Cl. 260-404.500.
Naito, Kenji: *See*—
Nakamura, Akihisa; Kamezaki, Takashi; Naito, Kenji; and Usui, Kunichika, 4,041,112, Cl. 261-72.00R.
Nakagaki, Shintaro: *See*—
Miyoshi, Tadayoshi; Nakagaki, Shintaro; Takanashi, Itsuo; Yokokawa, Sumio; Miyazaki, Kenichi; Tumiyama, Hisanori; and Motoyama, Koithiro, 4,041,528, Cl. 358-47.000.
Nakajima, Yasuo: *See*—
Nagata, Takashi; Ishibashi, Michio; and Nakajima, Yasuo, 4,041,335, Cl. 310-321.000.
Nakamura, Akihisa; Kamezaki, Takashi; Naito, Kenji; and Usui, Kunichika, to Honda Giken Kogyo Kabushiki Kaisha. Carburetor for vehicle engines. 4,041,112, Cl. 261-72.00R.
Nakamura, Kotaro: *See*—
Arai, Atsuaki; Shiba, Keisuke; Yamada, Minoru; Furutachi, Nobuo; and Nakamura, Kotaro, 4,040,835, Cl. 96-56.500.
Arai, Atsuaki; Nakamura, Kotaro; Yamada, Minoru; and Furutachi, Nobuo, 4,040,836, Cl. 96-56.500.
Nakamura, Michio: *See*—
Yamamoto, Katsuhiko; Hontani, Kunihiko; Kitaura, Hiromu; and Nakamura, Michio, 4,041,533, Cl. 358-160.000.
Nakamura, Shoichi: *See*—
Umeda, Kenkichi; Nakamura, Shoichi; Takayama, Jun; Horichi, Tetsuya; and Tsuchiya, Yoshikazu, 4,041,453, Cl. 340-146.1BE.
Nakamura, Yosihiko: *See*—
Isogai, Mitsuyuki; Tikusa, Kouiti; and Nakamura, Yosihiko, 4,040,162, Cl. 29-420.500.
Nakamura, Yukio: *See*—
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,041,511, Cl. 354-232.000.
Nakaniwa, Mikio: *See*—
Hayashi, Kiyoshige; Nakaniwa, Mikio; Kobayashi, Nobuyuki; Yamamoto, Minoru; and Hase, Yoshihiko, 4,040,946, Cl. 208-131.000.
Nakaoka, Kazuhide; and Araki, Kenji, to Nippon Kokan Kabushiki Kaisha. Method of making low yield point cold-reduced steel sheet by continuous annealing process. 4,040,873, Cl. 148-12.00C.
Nakata, Koreaki: *See*—
Mizushima, Wataru; Nakata, Koreaki; Hamasaki, Nobuhiro; and Iida, Yoshio, 4,041,359, Cl. 361-433.000.
Nalco Chemical Company: *See*—
Basila, Michael R.; and Broersma, Frank R., 4,040,982, Cl. 252-466.00J.
Nanao, Teruaki: *See*—
Okada, Yoshitsugu; Nanao, Teruaki; and Sugino, Toshio, 4,040,443, Cl. 137-546.000.
Napoli, Louis Sebastian; and Marx, Richard Everet, to RCA Corporation. Positioning a platform with respect to rays of a light source. 4,041,307, Cl. 250-203.00R.
Narcy, Jean-Paul: *See*—
Renaud, Jean; and Narcy, Jean-Paul, 4,040,989, Cl. 252-548.000.
Nathan, Ira M.: *See*—
Berman, Irwin R.; and Nathan, Ira M., 4,040,959, Cl. 210-78.000.
National Institute for Researches in Inorganic Materials: *See*—
Fujiki, Yoshinori; and Izumi, Fujio, 4,041,143, Cl. 423-598.000.
National Starch and Chemical Corporation: *See*—
Mazzarella, Emil D.; Wood, Leonard J., Jr.; and Maliczyszyn, Walter, 4,040,900, Cl. 162-158.000.
Szymanski, Chester D.; and DeMartino, Ronald, 4,041,001, Cl. 260-29.6WA.
National Steel Corporation: *See*—
Saunders, William T., 4,040,282, Cl. 72-41.000.
NCR Corporation: *See*—
Shah, Niranjan S.; and Taylor, James F., 4,041,472, Cl. 364-900.000.
Stewart, John W., 4,041,546, Cl. 361-152.000.
Neely, James W., to Rohm and Haas Company. Partially pyrolyzed macroporous polymer particles having multimodal pore distribution with macropores ranging from 50–100,000 angstroms. 4,040,990, Cl. 260-2.10R.
Negard, Donald J. Pneumatic wheel balancing apparatus. 4,040,300, Cl. 73-459.000.
Negishi, Masaaki: *See*—
Watanabe, Haruo; Kitagawa, Toru; Negishi, Masaaki; Aonuki, Kiichi; and Kobayashi, Harunobu, 4,041,059, Cl. 260-424.000.
Neher, Robert; and Kahnt, Friedrich Werner, to Ciba-Geigy Corporation. Process for the manufacture of thyrocalcitonin. 4,041,022, Cl. 260-112.50T.
Neilon, Claude R., to Armco Steel Corporation. Controlled buoyancy underwater riser system. 4,040,264, Cl. 61-86.000.
Nelms, Leonard H.; Reiszner, Kenneth D.; and West, Philip W., to Board of Supervisors Louisiana State University Agricultural and Mechanical College. Personal monitoring device, or dosimeter, for measuring exposure of personnel to organic vapors. 4,040,805, Cl. 55-158.000.
Nelson, Alvin I.; Steinberg, Marvin P.; and Wei, Lun-Shin, to University of Illinois Foundation, The. Soybean beverage and process. 4,041,187, Cl. 426-598.000.
Nelson, Peter H.; and Untch, Karl G., to Syntex (U.S.A.) Inc. 2-Carboxy-(7-,8- and 9-substituted)-5-oxo-5H-dibenzo (a,d) cycloheptenes and the corresponding 10,11-dihydro compounds. 4,041,173, Cl. 424-308.000.
Nelson, Wayne F., to Dow Chemical Company, The. Differential valve. 4,040,488, Cl. 166-317.000.
Nemeth, Joseph, to Champion Spark Plug Company. Aqueous dispersion of ceramic slurry. 4,040,998, Cl. 260-29.20M.
Neotec Corporation: *See*—
Webster, Donald R., 4,040,747, Cl. 356-188.000.
NEPRO, Inc.: *See*—
McNeely, Charles D., 4,040,567, Cl. 237-81.000.
Ness, Warren C. Method of and means for indexing articles. 4,040,512, Cl. 198-460.000.
Netzer, Siegfried: *See*—
Ahaus, Gerhard; Netzer, Siegfried; and Liebig, Hans-Peter, 4,040,673, Cl. 303-6.00C.
Neuber, Ralph E.; and Rehkopf, Charles H., to GTE Sylvania Incorporated. Cathode ray tube base. 4,040,708, Cl. 339-111.000.
Newhall, William F., to FMC Corporation. Plant regulator compositions based on 2-hydroxycycloalkyl quaternary ammonium compounds. 4,040,813, Cl. 71-121.000.
Newland, Gordon C.: *See*—
Pacifici, James G.; Newland, Gordon C.; and Beard, Hobert M., Jr., 4,040,923, Cl. 204-159.150.
Wang, Richard H. S.; Newland, Gordon C.; and Pacifici, James G., 4,040,922, Cl. 204-159.150.
Newnam, James Alvis: *See*—
Cooper, John LaMonte; and Newnam, James Alvis, 4,040,371, Cl. 112-420.000.
Newstead, Charles, to Girling Limited. Hydraulically operated disc brakes for vehicles. 4,040,506, Cl. 188-72.500.
Newsteder, Robert. Aquarium bracket assembly. 4,040,586, Cl. 248-14.000.
Nicastro, Francis J.: *See*—
Clovis, James S.; Dohling, Jerome; and Nicastro, Francis J., 4,040,913, Cl. 203-69.000.
Nickel, Bernd: *See*—
Schwarz, Werner; Hohmann, Eugen; and Nickel, Bernd, 4,041,276, Cl. 219-308.000.
Nicoulaud, Jean Raymond: *See*—
Melan, Giuseppe-Fabrizio Mario; and Nicoulaud, Jean Raymond, 4,040,572, Cl. 242-18.00A.
Nidola, Antonio; Spaziante, Placido M.; and de Nora, Vittorio, to Diamond Shamrock Technologies S.A. Cathode starting blanks for metal deposition. 4,040,914, Cl. 204-12.000.
Niederprum, Hans: *See*—
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,041,003, Cl. 260-30.80R.
Nielsen, Asger Torben, to Addressograph Multigraph Corporation. Light beam controller. 4,040,722, Cl. 350-161.00W.
Nieman, John R., to Caterpillar Tractor Co. Method and apparatus for introducing additives into a casting mold. 4,040,468, Cl. 164-55.000.
Niese, Karl; and Hundhausen, Eckhard, to Braun Aktiengesellschaft.

Automatic opening of juice outflow conduit in response to detection of container, without physical contact. 4,040,457, Cl. 141-361.000.
Nieuwenhoven, Hendricus Jacobus Cornelis: *See*—
van der Lely, Cornelis; and Nieuwenhoven, Hendricus Jacobus Cornelis, 4,040,227, Cl. 52-745.000.
Niles Parts Company, Limited: *See*—
Harada, Shinichi, 4,041,258, Cl. 200-6.00A.
Nilsson, Mats Ake. Device at road roller. 4,040,762, Cl. 404-129.000.
Nimerick, Kenneth H.; and Simpson, Benny E., to Dow Chemical Company, The. Method of fracturing subterranean formations penetrated by a well. 4,040,967, Cl. 252-8.55R.
Nippon Gohsei Kagaku Kogyo Kabushiki Kaisha: *See*—
Amemiya, Kiyosi; and Takida, Hiroshi, 4,041,223, Cl. 526-10.000.
Nippon Hoso Kyokai: *See*—
Shidara, Keiichi; Goto, Naohiro; Maruyama, Eiichi; Hirai, Tadaaki; and Fujita, Tsutomu, 4,040,985, Cl. 252-501.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Nakaoka, Kazuhide; and Araki, Kenji, 4,040,873, Cl. 148-12.00C.
Nippon Soken, Inc.: *See*—
Tanaka, Eizi; Mochizuki, Hiroshi; Kosuda, Tooru; Abe, Seikou; and Ohashi, Michihiro, 4,040,405, Cl. 123-139.0BG.
Nishi, Nobuji: *See*—
Matsuura, Mikio; Nishi, Nobuji; Yamaguchi, Masatsugu; Matsuoka, Michio; and Masuyama, Takeshi, 4,041,437, Cl. 338-35.000.
Nishikawa, Masaji, to Olympus Optical Co., Ltd. Electrophotographic apparatus having a screen-type photoconductive drum. 4,040,731, Cl. 355-3.00R.
Nishikawa, Masao: *See*—
Sugihara, Hirosada; Motohashi, Michio; Watanabe, Masazumi; Nishikawa, Masao; and Sanno, Yasushi, 4,041,079, Cl. 260-574.000.
Nishimura, Hajime; and Nomura, Yasushi, to Citizen Watch Company Limited. Silver peroxide-zinc battery. 4,041,219, Cl. 429-144.000.
Nisson Motor Company, Limited: *See*—
Tagawa, Katsuhiro, 4,040,404, Cl. 123-136.000.
Nitro Nobel AB: *See*—
Ljungberg, Sten Herman, 4,040,329, Cl. 86-20.00C.
Nitta, Tsuneharu; Hayakawa, Shigeru; Kasahara, Yukio; and Terada, Ziro, to Matsushita Electric Industrial Co., Ltd. Method of making a sulphide ceramic body. 4,041,140, Cl. 423-561.00R.
Nittetsu Mining Company, Ltd.: *See*—
Fukazawa, Koji, 4,040,519, Cl. 209-166.000.
Nixdorf Computer AG: *See*—
Hanewinkel, Lorenz, 4,041,406, Cl. 329-107.000.
Noble, Charles H. Ductile cast iron articles. 4,040,875, Cl. 148-35.000.
Noens, Richard H., to Vapor Corporation. Electronic railroad track marker system. 4,041,448, Cl. 340-32.000.
Noeske, Heinz: *See*—
Bexten, Ludger; Noeske, Heinz; Tummes, Hans; and Cornils, Boy, 4,041,081, Cl. 260-601.00R.
Noeske, Heinz O., to General Electric Company. Electric circuit interrupter of the puffer type comprising a magnetically actuated piston. 4,041,263, Cl. 200-148.00A.
Nohira, Hidetaka; Kobashi, Kiyoshi; and Tanaka, Masaaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas re-circulation system for an internal combustion engine. 4,040,402, Cl. 123-119.00A.
Noji, Tasuku; and Yasuma, Yoichi, to Alps Electric Co., Ltd. Fine tuning assembly for preset tuner. 4,041,422, Cl. 334-49.000.
Nolan, John J., to Sala Magnetics, Inc. Air-precluding flow regulator. 4,040,444, Cl. 137-561.00A.
Nomitsas, Richardas Prano: *See*—
Iodvalkis, Vitautas Jurgio; Nomitsas, Richardas Prano; Andreev, Anatoly Fedorovich; and Grekov, Vladimir Borisovich, 4,041,504, Cl. 354-23.00R.
Nomura, Yasushi: *See*—
Nishimura, Hajime; and Nomura, Yasushi, 4,041,219, Cl. 429-144.000.
Norba Aktiebolag: *See*—
Lindeborg, David Georg, 4,040,571, Cl. 241-30.000.
Norberg, Gayle Russell, to Control Data Corporation. Interrogation and monitoring system. 4,041,455, Cl. 340-146.10C.
Nordbak, John A. Apparatus for making a prestressed concrete slab. 4,040,775, Cl. 425-111.000.
Nordblad, Sven Sigurd; and Svensson, Karl-Erik, to Telefonaktiebolaget L M Ericsson. Apparatus for continuously cooling wire shaped objects. 4,040,269, Cl. 62-374.000.
Norman, Don T., to Continental Carbon Company. Gas burner for carbon black reactor. 4,040,792, Cl. 23-259.500.
Norris, Paul R. Automatic direction finding system. 4,041,496, Cl. 343-113.0DE.
North Electric Company: *See*—
Cowden, Earl Thomas, 4,041,252, Cl. 179-170.0NC.
Northern Conveyor & Manufacturing Corporation: *See*—
Zimmerman, John E.; and Reis, Richard M., Sr., 4,040,278, Cl. 69-42.000.
Northern Research and Engineering Corporation: *See*—
Heitmann, Arnold M.; Brassert, Walter L.; and Chouinard, Donald N., 4,040,251, Cl. 60-39.360.
Northern Telecom Limited: *See*—
Cambridge, Ronan Malcolm; and Watson, Douglas John, 4,041,255, Cl. 179-175.30R.
Northrop Corporation: *See*—
Ault, Earl R.; Stevens, Philip C.; Sipman, Robert H.; and Bradford, Robert S., Jr., 4,041,415, Cl. 331-94.5PE.
Nouvertne, Werner: *See*—
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,041,003, Cl. 260-30.80R.
Nuovo Pignone S.p.A.: *See*—
Santucci, Nicola, 4,040,452, Cl. 139-302.000.
Oades, John Willson, to GTE Automatic Electric Laboratories Incorporated. Nonfrequency-converting microwave radio repeater using a low power consumption amplifier. 4,041,389, Cl. 325-3.000.
Obara, Isao; and Yagami, Kazuo, to Kohjin Co., Ltd. Process for preparing stannic oxide hydrate. 4,041,144, Cl. 423-618.000.
Oberton, Serafin Bess, to Petrolite Corporation. Electrofiltration process for purifying organic liquids. 4,040,926, Cl. 204-186.000.
O'Brien, Edward F., to Package Machinery Company. Sealing jaw mechanism for package making machine. 4,040,237, Cl. 53-180.00M.
Obuch, Edward A., to Amerace Corporation. Electrical terminating device. 4,040,700, Cl. 339-95.00R.
O'Day, William R., Jr.: *See*—
Marshall, David W.; MCGrath, Kenneth W.; O'Day, William R., Jr.; and Wilder, Thomas C., 4,040,942, Cl. 204-13.000.
O'Dell, Dennis R. Holder for glass cutter. 4,040,182, Cl. 30-164.950.
Offeringa, Jan, to Shell Oil Company. Recovery of oil by circulating hot fluid through a gas-filled portion of a network interconnected fractures. 4,040,483, Cl. 166-272.000.
Officine Savio, S.p.A.: *See*—
Speranzin, Claudio, 4,040,241, Cl. 57-35.000.
Ogata, Masaru; and Matsumoto, Hiroshi, to Shionogi & Co., Ltd. 1,5-Dihydro-2H-1,4-benzodiazepin-2-one derivatives. 4,041,026, Cl. 260-239.30D.
Ogawa, Akira: *See*—
Sugiyama, Masatoshi; and Ogawa, Akira, 4,040,840, Cl. 96-84.00A.
Oguey, Henri J.; and Gerber, Bernard, to Centre Electronique Horloger S.A. Integrated circuit and manufacture thereof. 4,041,522, Cl. 357-42.000.
Ohashi, Michihiro: *See*—
Tanaka, Eizi; Mochizuki, Hiroshi; Kosuda, Tooru; Abe, Seikou; and Ohashi, Michihiro, 4,040,405, Cl. 123-139.0BG.
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, to Hitachi, Ltd. Semiconductor switch device. 4,041,332, Cl. 307-252.00J.
Ohkubo, Kazuo: *See*—
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,041,156, Cl. 424-177.000.
Ohmatsu, Hideki; and Ueda, Hirozo, to Fuji Photo Film Co., Ltd. Multilayer multicolor photographic materials. 4,040,829, Cl. 96-6.000.
Ohmichi, Yasuyuki: *See*—
Kikuchi, Yasuo; Ohmichi, Yasuyuki; Terasaki, Osamu; and Sakai, Koichi, 4,041,428, Cl. 335-210.000.
Ohnuki, Katsuhiro: *See*—
Ohta, Kazuho; Matsuda, Fumio; Tanaka, Tsutomu; Ohnuki, Katsuhiro; Miyaji, Naotaka; and Sato, Hidetoshi, 4,041,256, Cl. 179-182.00R.
Ohsako, Kyoichi; and Yamashita, Katusuke, to Laurel Bank Machine Co., Ltd. Money counting machine. 4,041,280, Cl. 235-92.0CN.
Ohsako, Kyoichi: *See*—
Watanabe, Kenkichi; and Ohsako, Kyoichi, 4,040,434, Cl. 133-1.00A.
Ohshiro, Susumu, to Fuji Photo Optical Co. Ltd. Endoscope. 4,040,413, Cl. 128-6.000.
Ohta, Kazuho; Matsuda, Fumio; Tanaka, Tsutomu; Ohnuki, Katsuhiro; Miyaji, Naotaka; and Sato, Hidetoshi, to Victor Company of Japan, Limited. Open-back type headphone with a detachable attachment. 4,041,256, Cl. 179-182.00R.
Ohtsuka, Takaaki; Satake, Keigo; Yamazaki, Shiro; Hatakeyama, Nobuo; and Watanabe, Takeo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Field and garden agricultural fungicide. 4,041,170, Cl. 424-277.000.
Okada, Yoshitsugu; Nanao, Teruaki; and Sugino, Toshio, to Kubota, Ltd. Sleeve valve. 4,040,443, Cl. 137-546.000.
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, to Mitsubishi Chemical Industries Limited. N^2-alkoxynaphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,041,156, Cl. 424-177.000.
Okamoto, Toshiki: *See*—
Abe, Tatsuo; Okamoto, Toshiki; Sakakura, Takao; and Tateno, Tatsuo, 4,041,137, Cl. 423-489.000.
Okuhara, Shinzi: *See*—
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,041,332, Cl. 307-252.00J.
Olinkraft, Inc.: *See*—
Bamburg, Robert A.; Duncan, Farris N.; and Floyd, Roger M., 4,040,558, Cl. 229-23.0BT.
Oliver, Ray J.; and Sammarcelli, Stanford M. Cover and lock for keyboard of an electronic organ. 4,040,335, Cl. 84-183.000.
Olmstead, Clarence W.; and Triquet, Fred E., to Arco Industries Corporation. Sealing grommet. 4,041,241, Cl. 174-153.00G.
Olsen, Robert H. Mooring whip base. 4,040,377, Cl. 114-230.000.
Olsen, Sydney A.: *See*—
Kahle, Glenn W.; and Olsen, Sydney A., 4,040,249, Cl. 60-39.51H.
Olympus Optical Co., Ltd.: *See*—
Nishikawa, Masaji, 4,040,731, Cl. 355-3.00R.
Tsuda, Naotsune, 4,040,174, Cl. 29-603.000.
Olympus Optical Co., Ltd: *See*—
Sato, Masanobu, 4,041,250, Cl. 179-100.110.

Omodei-Sale', Amedeo: *See*—
Pifferi, Giorgio; Omodei-Sale', Amedeo; and Consonni, Pietro, 4,041,048, Cl. 260-333.000.
Omron Tateisi Electronics Co.: *See*—
Kurita, Masakatsu, 4,040,721, Cl. 350-160.0LC.
Omuro, Shojiro: *See*—
Yoshida, Hiroshi; Kozuka, Hajime; Sakano, Toyoshi; Honda, Yoichiro; and Omuro, Shojiro, 4,040,502, Cl. 180-149.000.
Onahama Seiren Kabushiki Kaisha: *See*—
Iijima, Ryozo; Matsubara, Yukio; Yamaguchi, Ginichi; and Fukushima, Masatoshi, 4,040,937, Cl. 204-281.000.
O'Neill, Gerald J.: *See*—
Simons, Charles W.; O'Neill, Gerald J.; and Gribens, Joel A., 4,041,148, Cl. 424-45.000.
Onkyo Kabushiki Kaisha: *See*—
Hino, Masanori; Eguchi, Taro; and Shiraga, Chitoshi, 4,040,503, Cl. 181-192.000.
Ono, Taizo: *See*—
Matsuda, Isamu; and Ono, Taizo, 4,040,193, Cl. 40-28.00C.
Onoda, Takeru; and Masuyama, Tetsuo, to Mitsubishi Chemical Industries Limited. Process for producing aldehydes. 4,041,082, Cl. 260-604.0HF.
Onodera, Toshio, to Sony Corporation. High voltage generating circuit. 4,041,355, Cl. 315-411.000.
Onopchenko, Anatoli: *See*—
Barie, Walter P., Jr.; Onopchenko, Anatoli; and Schulz, Johann G. D., 4,041,004, Cl. 260-32.8EP.
Ooms, Adam: *See*—
Holster, Peter Leendert; Ooms, Adam; and van den Hoogen, Marinus Johannes Gerardus, 4,040,290, Cl. 73-71.000.
Ophaug, Darrell P.; and Layton, Beryl W., to Square D Company. Undervoltage release for circuit breaker. 4,041,423, Cl. 335-20.000.
OPI Metriservice, Societe Anonyme: *See*—
Lefebvre, Michel Serge, 4,040,353, Cl. 101-426.000.
Oppelt, Hans, to Bodenseewerk, Geratetechnik GmbH. Detector device responsive to infrared radiation. 4,041,314, Cl. 250-352.000.
Oppenheim, Carl Emil; and McKenna, James, to Chemetron Corporation. Railway bolster integral wear liner. 4,040,362, Cl. 105-226.000.
Orihara, Ituo: *See*—
Suzuki, Akira; Orihara, Ituo; and Ishida, Akira, 4,041,235, Cl. 428-413.000.
Orlens, Alfreds; and Hubbard, David W., to Pitney-Bowes, Inc. Label printing apparatus with tape cassette. 4,040,346, Cl. 101-336.000.
Ornstein, Leonard: *See*—
Kim, Young Ran; Ornstein, Leonard; and Waters, Henry Cook, III, 4,040,785, Cl. 23-230.00B.
Ort, Jay E., to RecTech, Inc. Anaerobic digestion process. 4,040,953, Cl. 210-6.000.
Orth, Edward D.; Roberts, John A.; and Smith, Raymond J. D., to General Electric Company. Wet chlorine gas generator for instrument applications. 4,040,936, Cl. 204-271.000.
Orthuber, Richard K., to International Telephone and Telegraph Corporation. Electron multiplier mosaic. 4,041,343, Cl. 313-105.00R.
Ortiz, Nilson V., to Ortiz, Nilson V.; and Rollojay, Francisco R. Electrical safety outlet and plug. 4,040,698, Cl. 339-75.00P.
Osaka, Norihisa: *See*—
Ide, Fumio; Kishida, Kazuo; and Osaka, Norihisa, 4,041,106, Cl. 260-876.00R.
Osborn, William P.: *See*—
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 4,040,532, Cl. 214-152.000.
O'Shea, Francis X.; and Mao, Chung-Ling, to Uniroyal, Inc. Polyurethane elastomer derived from graft of ethylenically unsaturated monomer on polyalkylene ether glycol. 4,041,105, Cl. 260-859.00R.
Oshima, Akira; Yoshihara, Keisuke; Shiki, Mikio; and Ikeda, Tuneo, to Mitsubishi Rayon Co., Ltd. Process for producing a synthetic resin article having improved resistance to surface abrasion. 4,041,120, Cl. 264-171.000.
O'Steen, Alvan D. Windshield wiper installation. 4,040,141, Cl. 15-250.190.
Ostop, John A.: *See*—
Johnson, Joseph E.; and Ostop, John A., 4,040,877, Cl. 148-187.000.
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., to Continental Group, Inc., The. Edge protection for easy opening end closure. 4,040,540, Cl. 220-273.000.
Otaki, Hideyuki, to Agency of Industrial Science and Technology. High fatigue screw threads. 4,040,327, Cl. 85-46.000.
Ott, Albert. Interchangeable probe tip for a magnetic thickness gauge. 4,041,378, Cl. 324-34.0TK.
Ott, Cynthia Bunce: *See*—
Ott, David M.; Ott, Cynthia Bunce; and Stoides, John G., 4,041,456, Cl. 340-146.30R.
Ott, David M.; Ott, Cynthia Bunce; and Stoides, John G. Method for verifying the denomination of currency. 4,041,456, Cl. 340-146.30R.
Ott, Howard E. Tethered ball and loop toy or exercising device. 4,040,623, Cl. 273-98.000.
Otten, Hans-Gunter: *See*—
Wolfrum, Gerhard; and Otten, Hans-Gunter, 4,041,024, Cl. 260-158.000.
Ottmann, Norman; and Strever, Walter, to Atlantic Pipe Corporation. Method and apparatus for making concrete pipe. 4,041,118, Cl. 264-71.000.
Oude Alink, Bernardus A.; Thompson, Neil E. S.; and Hutton, Ronald P., to Petrolite Corporation. Cyclohexlamines used as fuel additives. 4,040,799, Cl. 44-75.000.
Oulton, T. Dixon: *See*—
Isaac, Peter A. H.; and Oulton, T. Dixon, 4,040,648, Cl. 282-27.500.
Outboard Marine Corporation: *See*—
Betts, E. Douglas, 4,040,379, Cl. 115-37.000.
Blanchard, Clarence E., 4,040,378, Cl. 115-74.000.
Owen, Ralph M.: *See*—
Stockdale, Douglas P.; Mencarini, Richard; Deaton, Carlton D.; and Owen, Ralph M., 4,040,234, Cl. 53-38.000.
Owens-Illinois, Inc.: *See*—
Kormanyos, Kenneth R.; McCollister, Howard L.; and White, Paul L., 4,041,215, Cl. 429-104.000.
Owlett, David Donald, to GTE Automatic Electric Laboratories Incorporated. Stabilized locking mechanism for threaded tuning screws in waveguides. 4,041,421, Cl. 333-73.00W.
Paca, Francis B. See-through mirror with spaced reflective strips. 4,040,726, Cl. 350-288.000.
Pacifici, James G.; Newland, Gordon C.; and Beard, Hobert M., Jr., to Eastman Kodak Company. Photopolymerizable polymeric compositions containing halogen containing aromatic ketones. 4,040,923, Cl. 204-159.150.
Pacifici, James G.: *See*—
Wang, Richard H. S.; Newland, Gordon C.; and Pacifici, James G., 4,040,922, Cl. 204-159.150.
Package Machinery Company: *See*—
O'Brien, Edward F., 4,040,237, Cl. 53-180.00M.
Page, Derrick J.: *See*—
Schlegel, Earl S.; and Page, Derrick J., 4,040,170, Cl. 29-577.000.
Page, Joe W., Jr.; and Stahlhuth, Paul H., to Page, Joe W., Jr. Dental handpiece. 4,040,311, Cl. 74-750.00R.
Pagnucco, Rinaldo G.; Muse, Roberta J.; and Murty, Dasika R., to E. R. Squibb & Sons, Inc. Angiotensin iradioimmunoassay. 4,041,147, Cl. 195-103.50A.
Palmaer, Tore Georg. Headband with receiver and directional antenna. 4,041,497, Cl. 343-702.000.
Paltior Corporation, The: *See*—
Skubic, Leroy F., 4,040,228, Cl. 52-710.000.
Papenfuhs, Theodor: *See*—
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Papsco, Inc.: *See*—
Papsco, William G.; Cohn, Harry, Jr.; and Bryan, Robert E., 4,040,588, Cl. 248-245.000.
Papsco, William G.; Cohn, Harry, Jr.; and Bryan, Robert E., to Papsco, Inc. Bracket base. 4,040,588, Cl. 248-245.000.
Parker, Earl E.: *See*—
Makhlouf, Joseph M.; and Parker, Earl E., 4,041,008, Cl. 260-40.00R.
Parker, George E.; and Garvey, Daniel C., to Woodward Governor Company. Electromagnetic actuator. 4,041,429, Cl. 335-276.000.
Parker-Hannifin Corporation: *See*—
Albertson, Kenneth Ray; and Beck, Gerald Helmut, 4,040,636, Cl. 277-188.00A.
Parker, Robert R., to Bell & Howell Company. Low noise magnetic transducer preamplifier having flat response. 4,041,538, Cl. 360-67.000.
Parker, Sidney A.: *See*—
Pfarrer, David M.; and Parker, Sidney A., 4,041,542, Cl. 361-27.000.
Parkyns, Raymond; and Hubble, Terence H. Bows for musical instruments. 4,040,322, Cl. 84-282.000.
Parliment, Thomas Holden, to General Foods Corporation. Blueberry flavor. 4,041,185, Cl. 426-534.000.
Parmer, Edward: *See*—
Richmond, Raymond; Parmer, Edward; and Parmer, Edward G., Jr., 4,040,675, Cl. 303-89.000.
Parmer, Edward G., Jr.: *See*—
Richmond, Raymond; Parmer, Edward; and Parmer, Edward G., Jr., 4,040,675, Cl. 303-89.000.
Parr, Erfried: *See*—
Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, 4,040,972, Cl. 252-179.000.
Pasculle, Maurice J.; Merrill, Edgar F.; and Heyne, Carl J., to Westinghouse Electric Corporation. Field protector for synchronous machines. 4,041,543, Cl. 361-33.000.
Pasquire, Derek James: *See*—
Burton, Peter Edward; Pasquire, Derek James; and Marshall, Peter Edward George, 4,041,272, Cl. 219-89.000.
Passavant-Werke Michelbacher Hutte: *See*—
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Passler, Helmar: *See*—
Heger, Adolf; Passler, Helmar; and Bennemann, Frank, 4,041,192, Cl. 427-43.000.
Pate, Ronald W., to River Range Developments Limited. Radio control transmitter. 4,041,394, Cl. 325-102.000.
Patrick, William John; and Westdorp, Wolfgang Alfred, to International Business Machines Corporation. Control of oxygen in silicon crystals. 4,040,895, Cl. 156-618.000.
Patterson, Silla. Cooking utensil. 4,040,539, Cl. 220-22.000.
Pattison, Victor A., to Hooker Chemicals & Plastics Corporation. Polymeric fluoromethylated dienes. 4,041,229, Cl. 526-249.000.
Pauli, Ernest H., to Hilliard Corporation, The. Drive coupling. 4,040,757, Cl. 403-356.000.
Paulson, Merle R.: *See*—
Bauer, Peter W.; and Paulson, Merle R., 4,041,397, Cl. 325-304.000.

Paulus, Gerhard: *See—*
Schoeppl, Hubert; Petersen, Harro; Paulus, Gerhard; and Queins, Hubertus, 4,041,222, Cl. 526-6.000.

Pavda, Philip D. Dollars and cents telephone metering computer. 4,041,291, Cl. 235-156.000.

Pavlik, Ozskar: *See—*
Szivos, Karoly; Lovass, Gyula; Liptak, Laszlo; Hirling, Jozsef; and Pavlik, Ozskar, 4,040,973, Cl. 252-301.10W.

Pawl, Eddie. Sports training aid. 4,040,632, Cl. 273-189.00A.

Payne, Frederick George, to Canron Limited. Steel mill rolls. 4,040,158, Cl. 29-123.000.

Peak, Steven C.; and Anderson, Thomas E., to General Electric Company. Circuit for detecting a malfunction in an inverter. 4,041,365, Cl. 363-58.000.

Pearlstein, Barry S.: *See—*
Evans, Norol T.; Pearlstein, Barry S.; Job, Merlin A.; and Hoagland, Donald L., 4,041,487, Cl. 343-7.500.

Pearne, Florentin J.: *See—*
Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., 4,040,532, Cl. 214-152.000.

Pearne, Frank S.; Pearne, Florentin J.; Osborn, William P.; King, Terance M.; and Guzzetta, Joseph A., to Aircraft Mechanics, Inc. Brick handling system. 4,040,532, Cl. 214-152.000.

Pease, Wilder F.: *See—*
Lamberti, Vincent; and Pease, Wilder F., 4,040,781, Cl. 8-137.000.

Pecherer, Benjamin: *See—*
Avenia, Richard William; Christenson, James Gordon; and Pecherer, Benjamin, 4,041,076, Cl. 260-559.00A.

Pecoraro, George A.; and Bayne, Richard L., to PPG Industries, Inc. Glazed refractory support for delivering glass to a forming chamber. 4,040,809, Cl. 65-182.00R.

Pederzini, Renzo: *See—*
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Pedigree Petfoods Limited: *See—*
Burrows, Ian Edward; Cheney, Peter Arthur; and Ariss, Stephen Arthur, 4,041,181, Cl. 426-55.000.

Peer, Thomas Richard: *See—*
Kahan, William; Rupinski, Fredrick Alexander; Wagner, John Francis; and Peer, Thomas Richard, 4,040,277, Cl. 66-154.00A.

Pejouhy, Radi: *See—*
Yarworth, Norman; and Pejouhy, Radi, 4,041,432, Cl. 337-111.000.

Pelchat, Paul F., to General Motors Corporation. Key illuminating door handle. 4,041,301, Cl. 240-2.130.

Pellegata, Renato: *See—*
Gandolfi, Carmelo; Doria, Gianfederico; Pellegata, Renato; and Usardi, Maria M., 4,041,064, Cl. 560-121.000.

Penczak, John P., to Bargar Metal Fabricating Company. Preset housing for electrical distribution systems. 4,041,238, Cl. 174-48.000.

Penfold, Alan S.; and Thornton, John A., to Telic Corporation. Glow discharge method and apparatus. 4,041,353, Cl. 315-267.000.

Penton, Hugh V.; Dunphy, Gerald P.; and Stevens, Clayton O. Changeable message sign construction. 4,040,194, Cl. 40-142.00A.

Pentron Industries, Inc.: *See—*
Shidel, Jerome E.; and Sampey, Harry R., 4,041,285, Cl. 235-150.270.

Penzes, Joyce P. Variable-density vehicle glare shield. 4,040,657, Cl. 296-97.00R.

Peoples, Patrick J.: *See—*
Villaume, Henry F.; Collins, D. Stephen; and Peoples, Patrick J., 4,040,743, Cl. 356-73.000.

Perez, Jose Miguel. Athletic training shoe. 4,040,192, Cl. 36-108.000.

Perkin-Elmer Limited: *See—*
Swift, David William, 4,040,741, Cl. 356-28.000.

Perma Rain Irrigation, Inc.: *See—*
Williams, Maurice Charles, 4,040,670, Cl. 301-5.300.

Perren, Stephan M.: *See—*
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Perrotta, Anthony J.: *See—*
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Perry, John H.; Salsburg, David S.; and Taylor, Colin R., to Pfizer Inc. Method and system for analysis of ambulatory electrocardiographic tape recordings. 4,041,468, Cl. 364-900.000.

Perryman, Ralph: *See—*
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Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, to Calgon Corporation. Methods of using cementing compositions having improved flow properties, containing phosphonobutane tricarboxylic acid. 4,040,854, Cl. 106-90.000.

Personal Communications, Inc.: *See—*
Yevick, George Johannus, 4,041,114, Cl. 264-1.000.

Pertec Corporation: *See—*
Jennings, Alan K., 4,041,469, Cl. 364-900.000.

Pessel, Kurt; and Stodt, Eberhard, to Lindemann Maschinenfabrik GmbH. Method for filling containers with compressed blocks of garbage. 4,040,230, Cl. 53-24.000.

Peter Eckrich and Sons, Inc.: *See—*
Hutchins, Kenneth A., 4,040,528, Cl. 214-16.40A.

Peter, Heinrich: *See—*
Kocsis, Karoly; Peter, Heinrich; and Bickel, Hans, 4,041,161, Cl. 424-246.000.

Peters, Walter A.; Hozian, Curtis A.; and Gusek, Richard W., to Gard, Inc. Stamp vending machine. 4,040,510, Cl. 194-2.000.

Petersen, Harro: *See—*
Schoeppl, Hubert; Petersen, Harro; Paulus, Gerhard; and Queins, Hubertus, 4,041,222, Cl. 526-6.000.

Peterson, Edward W.; and Bednar, Charles J., to Arctic Enterprises, Inc. Galley unit. 4,040,693, Cl. 312-236.000.

Petricciani, John C.; Hopps, Hope E.; Lorenz, Douglas E.; Vasington, Paul J.; and Wallace, Roslyn E., to United States of America, Government. Sub-human primate diploid cell lines as substrates for virus vaccine production. 4,040,905, Cl. 195-1.800.

Petrolite Corporation: *See—*
Heintzelman, William J.; and Naiman, Michael I., 4,041,056, Cl. 260-404.500.
Lissant, Kenneth J., 4,040,857, Cl. 106-243.000.
Oberton, Serafin Bess, 4,040,926, Cl. 204-186.000.
Oude Alink, Bernardus A.; Thompson, Neil E. S.; and Hutton, Ronald P., 4,040,799, Cl. 44-75.000.
Wilson, Homer M., 4,040,931, Cl. 204-195.00C.

Petroski, Alex: *See—*
Taylor, Lauren P.; and Petroski, Alex, 4,040,960, Cl. 210-96.00R.

Petrus, Stephen, to Eaton Corporation. Fastener. 4,040,463, Cl. 151-41.750.

Pews, R. Garth: *See—*
Goralski, Christian T.; Pews, R. Garth; and Burk, George A., 4,041,073, Cl. 260-556.0AR.

Pfarrer, David M.; and Parker, Sidney A., to Lennox Industries, Inc. Control apparatus for two-speed compressor. 4,041,542, Cl. 361-27.000.

Pfeil, Erhard: *See—*
Kullmann, Rolf; and Pfeil, Erhard, 4,040,609, Cl. 266-143.000.

Pfizer Inc.: *See—*
Bindra, Jasjit S.; and Kadin, Saul B., 4,041,163, Cl. 424-251.000.
Perry, John H.; Salsburg, David S.; and Taylor, Colin R., 4,041,468, Cl. 364-900.000.

PGP Industries, Inc.: *See—*
Baltz, John; and Coltrinari, Enzo, 4,041,126, Cl. 423-22.000.

Phifer, Earl Cooper: *See—*
Howard, James Lynn, 4,041,383, Cl. 324-66.000.

Philagro: *See—*
Abblard, Jean; Marmain, Georges; and Viricel, Andree, 4,041,109, Cl. 260-927.00R.

Philippon, Raymond C., to Societe Anonyme dite: Etude et Realisation de Chaines Automatiques - ERCA. Process and installation for packing a liquid pasty, or granular product and a packing container. 4,040,561, Cl. 229-43.000.

Philips-Duphar B.V.: *See—*
van der Veek, Augustinus Petrus Maria, 4,041,145, Cl. 424-1.000.

Phillips Petroleum Company: *See—*
Hatcher, Charles S.; and Atchley, Gary S., 4,040,153, Cl. 28-221.000.
Hessert, James E., 4,040,484, Cl. 166-294.000.
Hughes, James K.; and Erickson, Wayne K., 4,040,155, Cl. 28-248.000.
Hutson, Thomas, Jr., 4,041,099, Cl. 260-683.300.
Uraneck, Carl A.; and Solomon, Paul W., 4,041,227, Cl. 526-190.000.
Zahn, Carl W.; and Clayton, Hadwen A., 4,040,259, Cl. 62-37.000.

Picker Corporation: *See—*
Amor, William H., Jr.; and Steffek, Robert J., 4,041,320, Cl. 250-523.000.

Pickles, Joseph, to Ferro Manufacturing Corporation. Power seat mechanism. 4,040,591, Cl. 248-394.000.

Pielsticker, Klaus Peter; Mogendorf, Friedel; and Sonnabend, Karl Heinrich, to Schloemann-Siemag-Aktiengesellschaft of Duesseldorf. Lifting beam cooling and conveying bed. 4,040,514, Cl. 198-774.000.

Pierce, Robert M.: *See—*
Mosier, Stanley A.; and Pierce, Robert M., 4,040,252, Cl. 60-39.360.

Pierson, Fred W., Jr.: *See—*
Pierson, Fred W., Sr.; Pierson, Fred W., Jr.; and Weidenfeller, Gordon J., 4,040,597, Cl. 249-134.000.

Pierson, Fred W., Sr.; Pierson, Fred W., Jr.; and Weidenfeller, Gordon J., to M&T Mfg. Co. Core holding structure for molds. 4,040,597, Cl. 249-134.000.

Pifferi, Giorgio; Omodei-Sale', Amedeo; and Consonni, Pietro, to Gruppo Lepetit S.p.A. 3,2-Benzoxazepine derivatives. 4,041,048, Cl. 260-333.000.

Pinkel, Edward B.: *See—*
Englander, Harlan P.; and Pinkel, Edward B., 4,040,898, Cl. 159-27.00R.

Pisano, John J., to GTE Sylvania Incorporated. Cathode ray tube base. 4,040,707, Cl. 339-111.000.

Pissiotas, Georg: *See—*
Boger, Manfred; Drabek, Joseph; and Pissiotas, Georg, 4,040,811, Cl. 71-78.000.

Pitney-Bowes, Inc.: *See—*
Orlens, Alfreds; and Hubbard, David W., 4,040,346, Cl. 101-336.000.

Pittler, Marvin S.: *See—*
Chang, Kenneth; and Pittler, Marvin S., 4,040,891, Cl. 156-651.000.

Pittsburgh Environmental and Energy Systems, Inc.: *See—*
Bramer, Henry C.; and Shapiro, Edward, 4,041,128, Cl. 423-213.200.

Platt, James L.; and Schinski, William L., to Chevron Research Company. Nematocidal 4-amino-N-thio-substituted 3,5-dinitrobenzenesulfonamides. 4,041,159, Cl. 424-228.000.

Platte, Friedrich: *See—*
Wiedemann, Wolfgang; and Platte, Friedrich, 4,040,570, Cl. 241-3.000.

Plessey Handel und Investments AG.: *See—*
Arnold, John Spencer, 4,041,464, Cl. 364-200.000.
Wisdom, Graham John; Creteau, Peter Verne; and Williams, John Lloyd, 4,041,460, Cl. 364-900.000.

Plows, Graham Stuart; and Edge, Gordon Malcolm, to Decca Limited of Decca House. Method of recording wide-band signals on a thermoplastic film by use of a beam of electrons. 4,041,532, Cl. 358-128.000.

Plumadore, John D., to A. B. Dick/Scott. Apparatus for electrostatically charging an electrophotographic film. 4,041,312, Cl. 250-315.00R.

Plysu Limited: *See—*
Taylor, Robert W., 4,040,552, Cl. 225-1.000.

Pogson, John T.; and Streck, Donald A., to Boeing Company, The. External tube artery flexible heat pipe. 4,040,478, Cl. 165-105.000.

Pohl, Ulrich: *See—*
Altenhoner, Klaus; Jansen, Walter; Knop, Klaus; Pohl, Ulrich; and Reerink, Jan G., 4,040,816, Cl. 75-35.000.

Polaroid Corporation: *See—*
Baker, Philip G.; and Johnson, Bruce K., 4,040,751, Cl. 356-225.000.
Bloom, Stanley M., 4,040,832, Cl. 96-29.00R.
Johnson, Bruce K., 4,041,514, Cl. 354-288.000.
Rogers, Howard G., 4,040,830, Cl. 96-73.000.

Pollitt, John Michael: *See—*
Giffen, William McAlpin; Pollitt, John Michael; and Clifford, Roy, 4,040,645, Cl. 280-745.000.

Polukhin, Vladimir Nikolaevich: *See—*
Polukhina, Ljudmila Alexeevna; Polukhin, Vladimir Nikolaevich; and Kochetkova, Anna Georgievna, 4,041,375, Cl. 324-32.000.

Polukhina, Ljudmila Alexeevna; Polukhin, Vladimir Nikolaevich; and Kochetkova, Anna Georgievna. Apparatus for measuring content of moving dielectric materials moisture. 4,041,375, Cl. 324-32.000.

Polva Nederland,BV: *See—*
Acda, Petrus Marinus, 4,040,889, Cl. 156-498.000.

Polyakova, Victoria Petrovna: *See—*
Smirnov, Viktor Sergeevich; Gryaznov, Vladimir Mikhailovich; Lebedeva, Valentina Ivanovna; Mischenko, Alexandr Petrovich; Polyakova, Victoria Petrovna; and Savitsky, Evgeny Mikhailovich, 4,041,093, Cl. 260-673.500.

Pond, David Martin; and Wang, Richard Hsu-Shien, to Eastman Kodak Company. Benzotriazole ortho-ester ultraviolet stabilizers. 4,041,011, Cl. 260-45.8NT.

Pope, Isaac Louis. Dieting game board apparatus. 4,040,628, Cl. 273-134.00B.

Porat, Eli, to Intel Corporation. High speed input buffer circuit. 4,041,333, Cl. 307-279.000.

Porcham, Wolfgang, to D. Swarovski & Co. Method of treating the fluorine-containing mud produced by the acid polishing of lead glass so as to form basic lead carbonate. 4,041,127, Cl. 423-92.000.

Post Office, The: *See—*
Midwinter, John Edwin; and Day, Clive Richard, 4,040,807, Cl. 65-3.00A.

Potier, Pierre Roger; and Sota, Tadamichi, to Foseco International Limited. Casting of molten metals. 4,040,469, Cl. 164-56.000.

Potter, Roy F.; and Stierwalt, Donald L., to United States of America, Navy. Emittance calorimetric method. 4,041,313, Cl. 250-341.000.

Poulsen, Harold W., to UOP Inc. Solar heat-light recovery system. 4,041,318, Cl. 250-459.000.

Poulsen, Peder Ulrik. Mechanism for transformation of a rotary motion into a translatory motion or vice versa. 4,040,682, Cl. 308-176.000.

Powell, Charles G.: *See—*
Powell, Kenneth W., 4,040,239, Cl. 54-80.000.

Powell, Kenneth W., to Powell, Charles G., a part interest. Protective headgear for horses. 4,040,239, Cl. 54-80.000.

Powers, Larry J.: *See—*
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,041,167, Cl. 424-270.000.

PPG Industries, Inc.: *See—*
Hoekje, Howard H.; Carlson, Gordon A.; and Simmons, Robert B., 4,040,934, Cl. 204-256.000.
Johnson, Harlan B.; Martinsons, Aleksandrs; and Snodgrass, John O., 4,040,918, Cl. 204-98.000.
Jones, James E., 4,040,924, Cl. 204-181.000.
Lattner, Elmer A., 4,040,384, Cl. 118-120.000.
Makhlouf, Joseph M.; and Parker, Earl E., 4,041,008, Cl. 260-40.00R.
Pecoraro, George A.; and Bayne, Richard L., 4,040,809, Cl. 65-182.00R.
Seeger, Nelson V.; and Kaman, Andrew J., 4,041,208, Cl. 428-424.000.
Soska, Frank A.; and Shumaker, Lyle L., 4,040,888, Cl. 156-497.000.

Prater, Charles Dwight: *See—*
Kuo, James C.; Prater, Charles Dwight; and Wise, John J., 4,041,094, Cl. 260-676.00R.

Precision Metalsmiths, Inc.: *See—*
Horton, Robert A.; and Bauer, Timothy R., 4,040,466, Cl. 164-17.000.

Presley, C. Travis: *See—*
Argabright, Perry A.; and Presley, C. Travis, 4,040,258, Cl. 61-36.00C.

Prochazka, Svante, to General Electric Company. Silicon carbide sintered body. 4,041,117, Cl. 264-63.000.

Procter & Gamble Company, The: *See—*
Benson, Richard W.; Cherney, Steven D.; and Collier, Everett J., 4,040,988, Cl. 252-532.000.

Production Specialties, Inc.: *See—*
Coussan, Sidney G., 4,040,481, Cl. 166-214.000.

Pryke, David Speaight, to Pynford Limited. Pile with downwardly extending elongated elements. 4,040,260, Cl. 61-53.620.

Pulciani, Sam C.: *See—*
Ostrem, Obert M.; Kulikowski, Donald F.; and Pulciani, Sam C., 4,040,540, Cl. 220-273.000.

Pullukat, Thomas J., to Chemplex Company. Polymerization catalyst and method. 4,041,225, Cl. 526-96.000.

Pullukat, Thomas J.: *See—*
Hoff, Raymond E.; Pullukat, Thomas J.; and Shida, Mitsuzo, 4,041,224, Cl. 526-96.000.

Purdue Research Foundation: *See—*
Kelly, Susan J.; and Butler, Larry G., 4,041,111, Cl. 260-954.000.

Pynford Limited: *See—*
Pryke, David Speaight, 4,040,260, Cl. 61-53.620.

Quarrie, Eugene A. Educational game. 4,040,191, Cl. 35-1.000.

Queins, Hubertus: *See—*
Schoeppl, Hubert; Petersen, Harro; Paulus, Gerhard; and Queins, Hubertus, 4,041,222, Cl. 526-6.000.

Quick, James R.; and Wittosch, William A., Jr., to International Paper Company. Process for molding of hollow articles. 4,041,122, Cl. 264-277.000.

R. P. Scherer Corporation: *See—*
Schwarz, Erwin, 4,040,536, Cl. 220-8.000.

Rady-Pentek, Arthur A.; and Fairweather, Edwin William. Manufacture of lightweight concrete. 4,040,855, Cl. 106-90.000.

Rahn, LeRoy W. Piggyback tractor powered roller. 4,040,761, Cl. 404-86.000.

Rains, Randall C.: *See—*
McGraw, Philip W.; Doorakian, George A.; and Rains, Randall C., 4,041,019, Cl. 260-75.0NC.

Rajput, Yudh Vir, to B. F. Goodrich Company, The. Anti-skid brake control system with short circuit protection. 4,040,676, Cl. 303-92.000.

Ralph M. Parsons Company, The: *See—*
Mackles, Mark, 4,041,130, Cl. 423-220.000.

Ralph Ogden: *See—*
Enoksen, Gerald E., 4,041,431, Cl. 336-160.000.

Rambold, Wolfgang: *See—*
Mansmann, Manfred; and Rambold, Wolfgang, 4,040,860, Cl. 106-302.000.

Rammler, Roland, to Metallgesellschaft Aktiengesellschaft. Process for separating solids from high-boiling hydrocarbons in a plurality of separation stages. 4,040,958, Cl. 210-73.00R.

Ramsay, Donald C.; and Tantillo, James M., to Component Manufacturing Service, Inc. Electrical connector. 4,040,697, Cl. 339-61.00R.

Ramsey Corporation: *See—*
McCormick, Harold E., 4,040,637, Cl. 277-224.000.

Ranger Engineering Corporation: *See—*
Sturgeon, Clayton L., 4,041,411, Cl. 330-207.00A.

Rank Xerox Ltd.: *See—*
Kurosaki, Takefumi, 4,040,615, Cl. 271-63.000.

Ranks Hovis McDougall Limited: *See—*
Towersey, Peter John; Longton, John; and Cockram, Geoffrey Norman, 4,041,189, Cl. 426-656.000.

Raptis, George M. Fishing line sinker assembly. 4,040,199, Cl. 43-43.140.

Raschle, Josef, to Heberlein Maschinenfabrik AG. Twist tube for false-twisting devices. 4,040,242, Cl. 57-77.300.

Raschle, Josef, to Heberlein Maschinenfabrik AG. Apparatus for false-twist texturing of textile yarns. 4,040,244, Cl. 57-77.450.

Rasmussen, Harry R., to Crest Industries, Inc. Female connector and escutcheon plate combined therewith for telephone equipment. 4,040,699, Cl. 339-91.00R.

Ratajczak, Anthony F.: *See—*
Forestieri, Americo F.; Ratajczak, Anthony F.; and Sidorak, Leroy G., 4,040,867, Cl. 136-89.00P.

Rauch, David: *See—*
Vincent, George C.; and Rauch, David, 4,040,796, Cl. 44-14.000.

Rayburn, Gerald A.: *See—*
Schlanert, George A.; Wood, Lorin A.; and Rayburn, Gerald A., 4,040,581, Cl. 244-83.00K.

Raymond Lee Organization, Inc., The: *See—*
Fitzpatrick, Richard L., 4,040,521, Cl. 211-24.000.
Hill, Andrew Joseph, 4,040,545, Cl. 223-85.000.
Masterfield, Clarence William, 4,041,529, Cl. 358-109.000.
Sinnott, Vernon J., 4,040,622, Cl. 273-86.00R.
Wiley, Kenneth, 4,040,593, Cl. 248-489.000.

Raynaud, Guy M.: *See—*
Fauran, Claude P.; Bourgery, Guy R.; Raynaud, Guy M.; and Gouret, Claude J., 4,041,030, Cl. 544-117.000.

Rayner, Bruce Leland; and Taylor, Gerald Graham, to Grass Valley Group, Inc., The. Video effects generator. 4,041,527, Cl. 358-22.000.

Raytheon Company: *See—*
Whitehouse, David R.; and Hartshorn, David W., 4,041,351, Cl. 315-205.000.

RCA Corporation: *See—*
Arnoldi, Hugh; and Salvatore, Leonard Robert, 4,041,388, Cl. 324-158.00T.
Bingham, Joseph Peter, 4,041,531, Cl. 358-37.000.

Catanese, Carmen Anthony; and Keneman, Scott Allen, 4,041,342, Cl. 313-105.00R.
Chang, Kern Ko Nan, 4,041,515, Cl. 357-13.000.
Clark, Charles Albert, Jr., 4,041,357, Cl. 361-6.000.
Deal, Samuel Broughton; and Bartch, Donald Walter, 4,041,347, Cl. 313-450.000.
Frankowski, Richard Edward Bronislaw, 4,041,374, Cl. 324-20.0CR.
Haferl, Peter Eduard, 4,041,354, Cl. 315-371.000.
Huang, Ho-Chung, 4,040,168, Cl. 29-571.000.
Hussain, Mohammed Imam, 4,041,486, Cl. 343-7.300.
Leedom, Marvin Allan, 4,040,634, Cl. 274-2.000.
Leedom, Marvin Allan, 4,040,635, Cl. 274-37.000.
Napoli, Louis Sebastian; and Marx, Richard Everet, 4,041,307, Cl. 250-203.00R.
Trotnick, Vincent William, Jr., 4,041,408, Cl. 330-15.000.

Reber, Jean-Francois: *See—*
Steiger, Rolf; Reber, Jean-Francois; Ezekiel, Aaron David; and Ficken, Geoffrey Ernest, 4,040,825, Cl. 96-1.700.

RecTech, Inc.: *See—*
Ort, Jay E., 4,040,953, Cl. 210-6.000.

Reed, Roger R., to Cadec Systems, Inc. Vehicle voice data link. 4,041,393, Cl. 325-54.000.

Reeg, Cloyd P.: *See—*
Kelley, Arnold E.; Reeg, Cloyd P.; Wood, Frederick C.; and Cheadle, George D., 4,040,944, Cl. 208-89.000.

Reerink, Jan G.: *See—*
Altenhoner, Klaus; Jansen, Walter; Knop, Klaus; Pohl, Ulrich; and Reerink, Jan G., 4,040,816, Cl. 75-35.000.

Refractory Services International Limited: *See—*
Black, William Brown, 4,040,778, Cl. 432-192.000.

Regan, Robert J.: *See—*
McNeill, William H.; Haugsjaa, Paul O.; Lech, Joseph; and Regan, Robert J., 4,041,352, Cl. 315-248.000.

Regie Nationale des Usines Renault: *See—*
Leichle, Claude, 4,040,397, Cl. 123-32.0AE.

Rehkopf, Charles H.: *See—*
Neuber, Ralph E.; and Rehkopf, Charles H., 4,040,708, Cl. 339-111.000.

Reichel, Kurt: *See—*
Decker, Gerd; Steinke, Dieter; and Reichel, Kurt, 4,040,393, Cl. 123-30.00A.

Reichenberger, Roland: *See—*
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Reichenberger, Roland; Kesselring, Horst; and Fischer, Karl-Heinz, 4,040,347, Cl. 101-349.000.

Reichert, Hartmut: *See—*
Michel, Wilfried; Reichert, Hartmut; and Willmann, Erich, 4,041,503, Cl. 346-83.000.

Reinhardt, James R.: *See—*
Carle, Ross G.; and Reinhardt, James R., 4,040,523, Cl. 213-46.00R.

Reis, Richard M., Sr.: *See—*
Zimmerman, John E.; and Reis, Richard M., Sr., 4,040,278, Cl. 69-42.000.

Reise, Herman A. Automatic trailer sway sensing and brake applying system. 4,040,507, Cl. 188-112.000.

Reist, Jurg: *See—*
Henych, Ivo; Fischer, Erwin; and Reist, Jurg, 4,040,596, Cl. 249-117.000.

Reiszner, Kenneth D.: *See—*
Nelms, Leonard H.; Reiszner, Kenneth D.; and West, Philip W., 4,040,805, Cl. 55-158.000.

Renaud, Jean; and Narcy, Jean-Paul, to Colgate-Palmolive Company. Liquid detergent. 4,040,989, Cl. 252-548.000.

Renold Limited: *See—*
Foster, Kenneth William Samuel, 4,040,337, Cl. 91-491.000.

Repay, Laszlo N.: *See—*
Freimark, Ronald J.; and Repay, Laszlo N., 4,041,498, Cl. 343-749.000.

Research-Cottrel, Inc.: *See—*
Scheller, Herman, 4,040,774, Cl. 425-65.000.

Research Engineering & Manufacturing, Inc.: *See—*
Muenchinger, Herman G., 4,040,328, Cl. 85-46.000.

Revco, Inc.: *See—*
Vermes, Roy E.; and Cosby, Richard E., 4,040,618, Cl. 271-182.000.

Rhoades, Donald M.: *See—*
Wilson, John J.; and Rhoades, Donald M., 4,040,338, Cl. 92-106.000.

Rhodia, Inc.: *See—*
Gradeff, Peter S.; and Formica, Giuseppe, 4,041,083, Cl. 260-617.00C.

Riblet, Henry J. Shunted stepped waveguide transition. 4,041,420, Cl. 333-35.000.

Ricard, Jacques, to Cibie Projecteurs. Vehicle headlamps. 4,041,303, Cl. 240-41.40R.

Rich, Joseph A., to General Electric Company. High current capacity rod array vacuum arc discharge device. 4,041,261, Cl. 200-144.00B.

Richards, Lawrence M., to Atlantic Richfield Company. Storage of radioactive material. 4,040,480, Cl. 166-57.000.

Richardson, James E.: *See—*
Mason, Stanley I., Jr.; Handler, Michael D.; and Richardson, James E., 4,040,568, Cl. 239-57.000.

Richardson, Martin C.; and Leopold, Kurt, to Canadian Patents and Development Limited. Multiple arc radiation preionizer for gas lasers. 4,041,414, Cl. 331-94.50G.

Richardson-Merrell Inc.: *See—*
Shemano, Irving, 4,041,165, Cl. 424-267.000.

Richerson, David W.; and Schuyler, Donald R., II, to Garrett Corporation, The. Ceramic composition and crucibles and molds formed therefrom. 4,040,845, Cl. 106-38.900.

Richmond, Raymond; Parmer, Edward; and Parmer, Edward G., Jr. Anti-theft vehicle brake-supervising device. 4,040,675, Cl. 303-89.000.

Ricoh Company, Ltd.: *See—*
Satomi, Toyokazu, 4,040,733, Cl. 355-8.000.

Riebel, Hans-Jochem: *See—*
Maurer, Fritz; Riebel, Hans-Jochem; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,158, Cl. 424-212.000.

Riecke, Raymond E. Trailer hitch cover. 4,040,641, Cl. 280-507.000.

Rieger, Klaus R.: *See—*
Campbell, Bonnie J.; and Rieger, Klaus R., 4,040,479, Cl. 165-133.000.

Riley, Myrne Rodney, to Rohm and Haas Company. Jet texturing process and apparatus. 4,040,154, Cl. 28-273.000.

Riner, Victor: *See—*
Juillard, Yves; and Riner, Victor, 4,040,453, Cl. 139-446.000.

Riso, Vladimir: *See—*
Dauby, Alain; Riso, Vladimir; and Roger-Rodes, Daniel, 4,041,296, Cl. 235-164.000.

Rist's Wires & Cables Limited: *See—*
Amphlett, Robert, 4,040,178, Cl. 29-745.000.

Rittenbach, Otto: *See—*
Fishbein, William; and Rittenbach, Otto, 4,041,488, Cl. 343-8.000.

Ritter, Edward H.: *See—*
Schertz, Charles W.; and Ritter, Edward H., 4,040,744, Cl. 356-152.000.

River Range Developments Limited: *See—*
Pate, Ronald W., 4,041,394, Cl. 325-102.000.

Roband Electronics Limited: *See—*
Gold, Bernard Samuel; and Smithers, Peter Alan, 4,041,367, Cl. 363-97.000.

Robarge, Wilbur A., to General Motors Corporation. Tape head shift apparatus for multi-track tape player. 4,041,539, Cl. 360-106.000.

Robbins, Daniel T., to Robbins, Danny Joel; and Brown, Stanley M. Automatic fishing pole holder. 4,040,197, Cl. 43-15.000.

Robbins, Danny Joel: *See—*
Robbins, Daniel T., 4,040,197, Cl. 43-15.000.

Robert Bosch GmbH: *See—*
Handtmann, Dieter; and Lavanchy, Jean-Pierre, 4,040,740, Cl. 356-4.000.
Heine, Joseph, 4,040,407, Cl. 123-146.50A.
Knapp, Heinrich, 4,040,569, Cl. 239-467.000.
Kraus, Bernd; and Glockler, Otto, 4,040,408, Cl. 123-179.00L.
Lietar, Christian, 4,040,746, Cl. 356-168.000.
Romann, Peter, 4,040,295, Cl. 73-228.000.
Wahl, Josef; Schmidt, Peter Jurgen; and Zechnall, Richard, 4,040,394, Cl. 123-32.0EA.

Roberts, Cecil P.: *See—*
Siler, Harold L., Jr.; and Roberts, Cecil P., 4,040,236, Cl. 53-67.000.

Roberts, Daniel M.: *See—*
Beaven, Herbert R., Jr.; and Roberts, Daniel M., 4,040,511, Cl. 197-133.00R.

Roberts Industries, Inc.: *See—*
Applequist, Quintin A.; and Hawley, Laird V., 4,040,643, Cl. 280-656.000.

Roberts, John A.: *See—*
Orth, Edward D.; Roberts, John A.; and Smith, Raymond J. D., 4,040,936, Cl. 204-271.000.

Robertson, Peter Murday. Electrode arrangement for electrochemical cells. 4,040,938, Cl. 204-283.000.

Robinson, Barry J., to Fairchild Camera and Instrument Corporation. High speed complementary output exclusive OR/NOR circuit. 4,041,326, Cl. 307-216.000.

Roblin Industries, Inc.: *See—*
Sauer, Gale E., 4,040,758, Cl. 403-397.000.

Rockwell International Corporation: *See—*
Beaven, Herbert R., Jr.; and Roberts, Daniel M., 4,040,511, Cl. 197-133.00R.
Groff, Alvin H., 4,041,483, Cl. 340-347.00P.
Ketchpel, Richard D., 4,040,727, Cl. 350-288.000.
Molina, Orlando G., 4,041,310, Cl. 250-302.000.
Spence, John R.; and Kinney, Bruce W., Jr., 4,041,330, Cl. 307-251.000.
York, Paul K., 4,040,720, Cl. 350-160.0LC.

Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,040,370, Cl. 112-299.000.

Rodot, Huguette Fumeron; Schneider, Maurice; and Hruby, Arnost. Process of preparing crystals of compounds and alloys. 4,040,894, Cl. 156-609.000.

Rodseth, William G.: *See—*
Lasier, Thomas R.; Rodseth, William G.; and Schnarr, Raymond H., 4,040,143, Cl. 16-48.00J.

Roebke, Wolfgang; Kneitel, Dieter; and Parr, Erfried, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler; and Henkel & Cie GmbH. Ion-exchanging aluminum silicate with hydrophilic surfaces. 4,040,972, Cl. 252-179.000.

Roger-Rodes, Daniel: *See—*
Dauby, Alain; Riso, Vladimir; and Roger-Rodes, Daniel, 4,041,296, Cl. 235-164.000.

Rogers, Howard G., to Polaroid Corporation. Photographic products comprising embossed supports. 4,040,830, Cl. 96-73.000.

Rogers, Wilford P., to TRW Inc. Ball retainer for ball bearings. 4,040,687, Cl. 308-201.000.

Rognon, Armand. Control device sensitive to speeds in excess of a pre-determined rotation speed. 4,040,301, Cl. 74-3.000.

Rohm and Haas Company: *See—*
Clovis, James S.; Dohling, Jerome; and Nicastro, Francis J., 4,040,913, Cl. 203-69.000.
Clovis, James S.; and Sullivan, Francis R., 4,041,107, Cl. 260-876.00R.
Fong, Ronald A.; Latty, James A.; and McDonnell, Roger P., 4,041,006, Cl. 260-33.6UA.
Kuhn, Robert R.; and Machleder, Warren H., 4,040,798, Cl. 44-71.000.
Neely, James W., 4,040,990, Cl. 260-2.10R.
Riley, Myrne Rodney, 4,040,154, Cl. 28-273.000.

Rohrer, John F.: *See—*
Lewis, Morton; and Rohrer, John F., 4,040,994, Cl. 260-18.0PF.

Rohrig, Josef: *See—*
Konig, Justus; and Rohrig, Josef, 4,041,245, Cl. 179-18.0AB.

Rollins, Dallas W.: *See—*
Walk, Howard J.; and Rollins, Dallas W., 4,040,363, Cl. 105-377.000.

Rollojay, Francisco R.: *See—*
Ortiz, Nilson V., 4,040,698, Cl. 339-75.00P.

Rolt, Anthony P. R.; Walker, Frederick J.; and Webb, Oswald, to Harry Ferguson Limited; and GKN Transmissions Limited. Viscous shear couplings. 4,040,271, Cl. 64-26.000.

Rom-Amer Pharmaceuticals, Ltd.: *See—*
Sapse, Alfred T., 4,041,174, Cl. 424-310.000.

Roman, Steven A., to Shell Oil Company. Insecticidal oxime derivatives. 4,041,027, Cl. 542-400.000.

Romann, Peter, to Robert Bosch GmbH. Air intake flowmeter for internal combustion engines. 4,040,295, Cl. 73-228.000.

Ronson Corporation: *See—*
Brooks, Donald Leslie William, 4,040,541, Cl. 220-339.000.

Rose, Ralph E., to Watkins-Johnson Co.; and Signetics Corporation. Method of fabricating an array of semiconductor devices. 4,040,169, Cl. 29-577.000.

Rose, William Lester; and Johnson, Herbert Joe. Air-fuel mixture control system. 4,040,403, Cl. 123-133.000.

Rosenbaum, James E. Animal grooming tool. 4,040,390, Cl. 119-86.000.

Rosolowski, Joseph H.: *See—*
Greskovich, Charles D.; and Rosolowski, Joseph H., 4,040,848, Cl. 106-73.500.
Greskovich, Charles D.; and Rosolowski, Joseph H., 4,040,849, Cl. 106-73.500.

Rossell, John Barry: *See—*
Cottier, Derek; and Rossell, John Barry, 4,041,188, Cl. 426-607.000.

Rossey, Guy: *See—*
Ghosez, Leon; Rossey, Guy; and Didderen, Freddy, 4,041,077, Cl. 260-562.00R.

Rossler, Frederick William, Jr.: *See—*
Dola, Frank Peter; and Rossler, Frederick William, Jr., 4,040,709, Cl. 339-125.00L.

Rote, Everett A.; and Smith, Edward G., to Xerox Corporation. Bearing assembly. 4,040,678, Cl. 308-6.00R.

Roth, Roy William, to American Cyanamid Company. Medical sponges. 4,040,884, Cl. 156-209.000.

Rothenstein, Julius; and Zimmerman, G. A., to United States of America, Navy. Perchlorate sensitizing agent. 4,040,880, Cl. 149-76.000.

Rothschild, Arthur Louis, III: *See—*
Baxter, Robert Olin; and Rothschild, Arthur Louis, III, 4,040,526, Cl. 214-10.50D.

Rounds, Gerald L. Basic oxygen steel furnace and process. 4,040,819, Cl. 75-60.000.

Rowcliffe, Arthur F.: *See—*
Bleiberg, Melvin L.; Diamond, Sidney; Rowcliffe, Arthur F.; and Spitznagel, John A., 4,040,876, Cl. 148-37.000.

Rowe, Colin M., to U.S. Philips Corporation. Semiconductor device manufacture. 4,040,878, Cl. 148-188.000.

Roy, Alejo V.; and Heiwig, Jane R., to Dow Chemical Company, The. Urea determination of biological fluids using diacetylmonoxime reaction. 4,040,787, Cl. 23-230.00B.

Ruben, Murray A.: *See—*
McCormick, Joseph F., 4,040,445, Cl. 137-596.180.

Rubenstein, Kenneth E.: *See—*
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,040,907, Cl. 195-63.000.

Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, to Siemens Aktiengesellschaft. Method for the preparation of relief structures. 4,040,831, Cl. 96-35.100.

Ruckensteiner, Kurt: *See—*
Binder, Walter; Hutter, Josef; Stich, Heinrich; Ruckensteiner, Kurt; Tines, Josef, deceased; Tines, Antonie, legal representative; and Schwarz, Heide, legal representative, 4,040,853, Cl. 106-103.000.

Rudman, Ronald H.: *See—*
Border, Robert O.; and Rudman, Ronald H., 4,040,332, Cl. 89-37.00F.

Rudolph, Paul; Bierbach, Herbert; Kupfer, Hans; Hafke, Carl; and Kohlen, Rudolf, to Metallgesellschaft Aktiengesellschaft. Reactor for gasifying solid fuels, particularly coal, under superatmospheric pressure. 4,040,800, Cl. 48-85.200.

Ruff, Donald O.: *See—*
King, Charles W.; Ruff, Donald O.; and Sheldrake, Leonard J., 4,041,369, Cl. 322-99.000.

Ruhrchemie Aktiengesellschaft: *See—*
Bexten, Ludger; Noeske, Heinz; Tummes, Hans; and Cornils, Boy, 4,041,081, Cl. 260-601.00R.
Gothel, Herbert; Cornils, Boy; Feichtinger, Hans; Tummes, Hans; and Falbe, Jurgen, 4,041,080, Cl. 260-585.00B.

Rumpf, Robert John: *See—*
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Rupert, Joseph Paul: *See—*
Wright, Alan C.; and Rupert, Joseph Paul, 4,040,974, Cl. 252-316.000.

Rupinski, Fredrick Alexander: *See—*
Kahan, William; Rupinski, Fredrick Alexander; Wagner, John Francis; and Peer, Thomas Richard, 4,040,277, Cl. 66-154.00A.

Rust, Rudolph. Apparatus for concentration of solar radiation. 4,040,411, Cl. 126-271.000.

Ryan, Dennis M., to Ampex Corporation. Tape guiding structure. 4,040,575, Cl. 242-76.000.

Ryozo Iijima: *See—*
Iijima, Ryozo; Matsubara, Yukio; Yamaguchi, Ginichi; and Fukushima, Masatoshi, 4,040,937, Cl. 204-281.000.

Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, to Matsushita Electric Corporation of America. Frequency synthesizer tuning system with signal seek control. 4,041,535, Cl. 358-191.000.

Sadler, Clyde John. Three in one car cup and holder. 4,040,549, Cl. 224-29.00G.

Sadowski, Edward Peter, to International Nickel Company, Inc., The. Maraging stainless steel welding electrode. 4,041,274, Cl. 219-137.0WM.

Safe Flight Instrument Corporation: *See—*
Greene, Leonard M., 4,040,374, Cl. 114-144.00C.

Sagawa, Akio: *See—*
Matsuda, Yasumasa; Kimura, Ichiro; Sagawa, Akio; and Hiramatsu, Tsutomu, 4,040,294, Cl. 73-117.300.

Sahni, Omesh, to International Business Machines Corporation. Blue color AC gas discharge display panel and method. 4,041,345, Cl. 313-225.000.

Saich, Anthony Michael: *See—*
Weiss, William Robert; Saich, Anthony Michael; and Cooksey, James Judson, 4,040,782, Cl. 28-271.000.

Saiki, Albert K.: *See—*
Gottschalk, Robert E.; and Saiki, Albert K., 4,040,587, Cl. 248-185.000.

Saint-Gobain Industries: *See—*
Melan, Giuseppe-Fabrizio Mario; and Nicoulaud, Jean Raymond, 4,040,572, Cl. 242-18.00A.

St. Joe Minerals Corporation: *See—*
Abramowitz, Philip Herbert; and Balliett, Robert Wayne, 4,040,286, Cl. 72-377.000.

Saitoh, Kozo; and Izumi, Sumio, to Mitsui Mining & Smelting Co., Ltd. Method for separation of mixture of polyester and cellulose derivative. 4,040,949, Cl. 209-166.000.

Sakai, Koichi: *See—*
Kikuchi, Yasuo; Ohmichi, Yasuyuki; Terasaki, Osamu; and Sakai, Koichi, 4,041,428, Cl. 335-210.000.

Sakakura, Takao: *See—*
Abe, Tatsuo; Okamoto, Toshiki; Sakakura, Takao; and Tateno, Tatsuo, 4,041,137, Cl. 423-489.000.

Sakamoto, Kenro; Fushiki, Isamu; and Koboshi, Sigeharu, to Konishiroku Photo Industry Co., Ltd. Photographic bleach-fixer. 4,040,837, Cl. 96-60.0BF.

Sakano, Toyoshi: *See—*
Yoshida, Hiroshi; Kozuka, Hajime; Sakano, Toyoshi; Honda, Yoichiro; and Omuro, Shojiro, 4,040,502, Cl. 180-149.000.

Sala Magnetics, Inc.: *See—*
Nolan, John J., 4,040,444, Cl. 137-561.00A.

Salin, Jean Claude, to Timex Corporation. Button cell configuration. 4,041,214, Cl. 429-98.000.

Salisbury, Ian David; and Ingram, Roy Edward, to ITT Industries, Incorporated. Hybrid circuit package. 4,041,548, Cl. 361-396.000.

Salsburg, David S.: *See—*
Perry, John H.; Salsburg, David S.; and Taylor, Colin R., 4,041,468, Cl. 364-900.000.

Salvatore, Leonard Robert: *See—*
Arnoldi, Hugh; and Salvatore, Leonard Robert, 4,041,388, Cl. 324-158.00T.

Salzer, Erwin: *See—*
Jacobs, Philip C., Jr.; and Salzer, Erwin, 4,041,434, Cl. 337-204.000.

Sammarcelli, Stanford M.: *See—*
Oliver, Ray J.; and Sammarcelli, Stanford M., 4,040,335, Cl. 84-183.000.

Sammons, Martin C.: *See—*
Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,041,346, Cl. 313-336.000.

Sampey, Harry R.: *See—*
Shidel, Jerome E.; and Sampey, Harry R., 4,041,285, Cl. 235-150.270.

Samuel Moore & Company: *See—*
Stine, Clifford R.; Klipec, Bruce E.; and Herbert, William J., 4,041,237, Cl. 174-36.000.

Samuelsson, Bengt; and Magerlein, Barney J., to Upjohn Company, The. 4,5-Cis-didehydro-PGE_1 compounds. 4,041,066, Cl. 260-468.00D.

Sanchez, Miguel Ruiz, to AMP Incorporated. Apparatus for mating first and second portions of an electrical connector. 4,040,179, Cl. 29-749.000.

Sanford, Norman R., to Bendix Corporation, The. Method and apparatus for detecting characteristic features of surfaces. 4,041,286, Cl. 235-151.300.
Sanno, Yasushi: *See—*
Sugihara, Hirosada; Motohashi, Michio; Watanabe, Masazumi; Nishikawa, Masao; and Sanno, Yasushi, 4,041,079, Cl. 260-574.000.
Santucci, Nicola, to Nuovo Pignone S.p.A. Device for holding cut weft threads to be folded up into the shed to form a tucked selvedge in a fabric made by a shuttleless loom having a continuous weft supply mechanism. 4,040,452, Cl. 139-302.000.
Sapse, Alfred T., to Rom-Amer Pharmaceuticals, Ltd. Method of treating depression. 4,041,174, Cl. 424-310.000.
Sargent, Paul L.; and Ghezzo, Mario, to General Electric Company. Method of etching materials including a major constituent of tin oxide. 4,040,892, Cl. 156-659.000.
Sasaki, Koichi: *See—*
Washio, Takaji; Sasaki, Koichi; and Aizawa, Tatsuo, 4,040,387, Cl. 118-658.000.
Sass, Daniel B.; Earl, William A.; and Fasano, Joseph. Convertible multipurpose table. 4,040,692, Cl. 312-194.000.
Satake, Keigo: *See—*
Ohtsuka, Takaaki; Satake, Keigo; Yamazaki, Shiro; Hatakeyama, Nobuo; and Watanabe, Takeo, 4,041,170, Cl. 424-277.000.
Sato, Akira: *See—*
Hinata, Masanao; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, 4,040,841, Cl. 96-126.000.
Matsuyama, Junichi; Hinata, Masanao; and Sato, Akira, 4,040,839, Cl. 96-64.000.
Sato, Hidetoshi: *See—*
Ohta, Kazuho; Matsuda, Fumio; Tanaka, Tsutomu; Ohnuki, Katsuhiro; Miyaji, Naotaka; and Sato, Hidetoshi, 4,041,256, Cl. 179-182.00R.
Sato, Masanobu, to Olympus Optical Co., Ltd. Coupling device for cassette tape recorder. 4,041,250, Cl. 179-100.110.
Sato, Shigeru: *See—*
Fukuzawa, Tadashi; Suzuki, Teruki; and Sato, Shigeru, 4,041,319, Cl. 250-460.000.
Sato, Takuya R. Bioelectrodes. 4,040,412, Cl. 128-2.06E.
Sato, Teruo, to Matsushita Electric Industrial Co., Ltd. Scanning apparatus for an electrophoretic matrix display panel. 4,041,481, Cl. 340-324.00M.
Sato, Yasushi: *See—*
Masaki, Katsumi; Hirayama, Kazuhiro; Sato, Yasushi; and Hirabayashi, Yoichi, 4,040,737, Cl. 355-49.000.
Satomi, Toyokazu, to Ricoh Company, Ltd. Variable magnification slitwise exposure process and apparatus therefor for use with electrophotographic copying machine. 4,040,733, Cl. 355-8.000.
Satomura, Masato: *See—*
Maekawa, Yukio; Satomura, Masato; and Umehara, Akira, 4,041,017, Cl. 260-47.0UA.
Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, to Warner-Lambert Company. Method of producing diuresis using thiazolidinone acetic acid derivatives. 4,041,166, Cl. 424-267.000.
Saucy, Gabriel: *See—*
Cohen, Noal; and Saucy, Gabriel, 4,041,058, Cl. 260-410.90R.
Sauer, Gale E., to Roblin Industries, Inc. Suspended ceiling hanging clip. 4,040,758, Cl. 403-397.000.
Saunders, Arthur Frank; and Hindmarsh, Graham John, to Lucas Industries Limited. Electronic fuel control for a gas turbine engine. 4,040,250, Cl. 60-39.28R.
Saunders, Howard E.: *See—*
Elbling, Irving N.; and Saunders, Howard E., 4,040,993, Cl. 260-18.0EP.
Saunders, William K., to United States of America, Army. Air target fuze. 4,040,357, Cl. 102-70.20P.
Saunders, William T., to National Steel Corporation. Ironing ring having improved lubricating characteristics. 4,040,282, Cl. 72-41.000.
Savitsky, Evgeny Mikhailovich: *See—*
Smirnov, Viktor Sergeevich; Gryaznov, Vladimir Mikhailovich; Lebedeva, Valentina Ivanovna; Mischenko, Alexandr Petrovich; Polyakova, Victoria Petrovna; and Savitsky, Evgeny Mikhailovich, 4,041,093, Cl. 260-673.500.
Saxman, William Craig, to Dresser Industries, Inc. Rock boring cutter with thread-on replaceable cutting element. 4,040,493, Cl. 175-374.000.
Scardenzan, Anthony. Skateboard. 4,040,639, Cl. 280-87.04A.
Scepter Manufacturing Company Limited: *See—*
Torokvei, Thomas Evald, 4,040,517, Cl. 206-144.000.
Schairer, James Alfred, to Johns-Manville Corporation. System and method of monitoring the peak temperature of a moving mass. 4,040,563, Cl. 236-15.0BC.
Scheib, Harold A., to Bell & Howell Company. Film advancing mechanism with film threading facility. 4,040,730, Cl. 352-192.000.
Scheidler, Ralph E. Dual battery charge control. 4,041,363, Cl. 320-15.000.
Scheller, Herman, to Research-Cottrel, Inc. Apparatus for constructing concrete walls. 4,040,774, Cl. 425-65.000.
Schenker, Barry A.; and Franks, C. Richard, to Diamond Shamrock Corporation. Lead dioxide electrode. 4,040,939, Cl. 204-290.00F.
Schering Aktiengesellschaft: *See—*
Mueller, Rudolf, 4,040,606, Cl. 259-107.000.
Schertz, Charles W.; and Ritter, Edward H., to General Dynamics. Multiple spectrum co-axial optical sight and closed loop gun control system. 4,040,744, Cl. 356-152.000.
Schiebelhuth, Heinz F. Frequency indicator for receiving devices. 4,040,719, Cl. 350-160.0LC.
Schiller Industries, Inc.: *See—*
Hayosh, Thomas D.; and Torre, Anthony J., 4,041,322, Cl. 250-568.000.
Schinkel, Willem: *See—*
De Boer, Wilhelmus Johannes; Schinkel, Willem; and Span, Francis Johannes, 4,040,533, Cl. 214-310.000.
Schinski, William L.: *See—*
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Schlage Lock Company: *See—*
Lasier, Thomas R.; Rodseth, William G.; and Schnarr, Raymond H., 4,040,143, Cl. 16-48.00J.
Lasier, Thomas R.; and Schnarr, Raymond H., 4,040,144, Cl. 16-66.000.
Schlanert, George A.; Wood, Lorin A.; and Rayburn, Gerald A., to McDonnell Douglas Corporation. Reverse thrust limiting system. 4,040,581, Cl. 244-83.00K.
Schlegel, Earl S.; and Page, Derrick J., to Westinghouse Electric Corporation. Integrated gate assisted turn-off, amplifying gate thyristor, and a method for making the same. 4,040,170, Cl. 29-577.000.
Schleuniger, Fritz: *See—*
Frossard, Emile; Schleuniger, Fritz; and Stadler, Bruno, 4,041,541, Cl. 361-27.000.
Schloemann-Siemag-Aktiengesellschaft of Duesseldorf: *See—*
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Schmidt, Guenter: *See—*
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Wahl, Josef; Schmidt, Peter Jurgen; and Zechnall, Richard, 4,040,394, Cl. 123-32.0EA.
Schnarr, Raymond H.: *See—*
Lasier, Thomas R.; Rodseth, William G.; and Schnarr, Raymond H., 4,040,143, Cl. 16-48.00J.
Lasier, Thomas R.; and Schnarr, Raymond H., 4,040,144, Cl. 16-66.000.
Schneider, Henri, to Societe Suisse Pour l'Industrie Horlogere Management Services S.A. Power cell compartment for an electrically energized timepiece. 4,041,213, Cl. 429-98.000.
Schneider, Maurice: *See—*
Rodot, Huguette Fumeron; Schneider, Maurice; and Hruby, Arnost, 4,040,894, Cl. 156-609.000.
Schoen, Roy C.: *See—*
Huber, David A.; and Schoen, Roy C., 4,041,339, Cl. 310-239.000.
Schoeppl, Hubert; Petersen, Harro; Paulus, Gerhard; and Queins, Hubertus, to BASF Aktiengesellschaft. Rubber mixtures having improved surface tack. 4,041,222, Cl. 526-6.000.
Scholle Corporation: *See—*
Scholle, William R., 4,041,209, Cl. 428-500.000.
Scholle, William R., to Scholle Corporation. Multiple wall packaging material containing sulfite compound. 4,041,209, Cl. 428-500.000.
Schramm, Jurgen: *See—*
Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,177, Cl. 424-322.000.
Schroder, Dierk, to BBC Brown Boveri & Company Limited. Apparatus for rapidly detecting and calculating the root mean square of electrical measuring values in alternating current networks. 4,041,370, Cl. 323-8.000.
Schroeder, Daniel Ray, to Motorola, Inc. Transceiver squelch circuit. 4,041,390, Cl. 325-21.000.
Schuck, Paul R.; and Baylor, John M., to J.I. Case Company. Vibratory plow. 4,040,261, Cl. 61-72.600.
Schulein, Rolf G.: *See—*
Liebscher, Johannes; and Schulein, Rolf G., 4,040,546, Cl. 223-88.000.
Schulz, Johann G. D.: *See—*
Barie, Walter P., Jr.; Onopchenko, Anatoli; and Schulz, Johann G. D., 4,041,004, Cl. 260-32.8EP.
Schumann, Gunter: *See—*
Johne, Hans; Jentzsch, Arndt; Schumann, Gunter; Reichenberger, Roland; Kesselring, Horst; and Fischer, Karl-Heinz, 4,040,347, Cl. 101-349.000.
Schuyler, Donald R., II: *See—*
Richerson, David W.; and Schuyler, Donald R., II, 4,040,845, Cl. 106-38.900.
Schwaerzler, Hans-Juergen, to Messerschmitt-Boelkow-Blohm GmbH. Control apparatus for an air brake. 4,040,580, Cl. 244-78.000.
Schwan, Thomas J., to Morton-Norwich Products, Inc. 1-Benzyl-1,2-dihydro-3-methyl-2-oxopyrimidinium iodide. 4,041,035, Cl. 260-251.00R.
Schwander, Hansrudolf; and Karlen, Urs, to Ciba-Geigy Corporation. Anthraquinone dyestuffs of the disperse series. 4,041,052, Cl. 260-380.000.
Schwarz, Erwin, to R. P. Scherer Corporation. Locking hard gelatin capsule. 4,040,536, Cl. 220-8.000.
Schwarz, Heide, legal representative: *See—*
Binder, Walter; Hutter, Josef; Stich, Heinrich; Ruckensteiner, Kurt; Tines, Josef, deceased; Tines, Antonie, legal representative; and Schwarz, Heide, legal representative, 4,040,853, Cl. 106-103.000.
Schwarz, Werner; Hohmann, Eugen; and Nickel, Bernd, to Siemens Aktiengesellschaft. Electric fluid heating device. 4,041,276, Cl. 219-308.000.

Sciarrillo, Frank A. Golf swing training machine. 4,040,633, Cl. 273-191.00A.
Scientific Micro Systems, Inc.: *See—*
Krossa, Kenneth D.; and Earl, Douglas B., 4,041,471, Cl. 364-200.000.
SCM Corporation: *See—*
McGinniss, Vincent D., 4,040,925, Cl. 204-181.000.
Scott, Gordon N. Protection of pipe against damage to insulation and/or corrosion. 4,040,447, Cl. 138-106.000.
Seeger, Nelson V.; and Kaman, Andrew J., to PPG Industries, Inc. Transparent, impact-resistant polyesterurethane laminates. 4,041,208, Cl. 428-424.000.
Seelye, John F., to Monsanto Company. Method improvements in removing articles from wheel blow molding machines. 4,041,124, Cl. 264-336.000.
Seidel, Harold, to Bell Telephone Laboratories, Incorporated. Ordered array of integrated circuit semiconductor charge transfer device feedback delay type of stabilized phase-locked recursive oscillators. 4,040,728, Cl. 331-55.000.
Seiko Koki Kabushiki Kaisha: *See—*
Kitai, Kiyoshi; Nakamura, Yukio; Kato, Shogo; and Nagaoka, Shinji, 4,041,511, Cl. 354-232.000.
Seipp, Heinrich: *See—*
Achsel, Eberhard; Hortig, Hans-Peter; Seipp, Heinrich; and Giller, Heinz, 4,040,793, Cl. 23-273.00R.
Sekido, Kenzi; and Yoshikawa, Tsugio, to Hitachi, Ltd. Gate protecting device for hydraulic machines. 4,040,766, Cl. 415-9.000.
Sekmakas, Kazys; and Gotschall, George E., to DeSoto, Inc. High solids overprint varnish. 4,040,995, Cl. 260-22.0CQ.
Selby, John: *See—*
Lewis, Terence John; Brooks, Raymond; and Selby, John, 4,040,336, Cl. 90-11.00R.
Selley, Jeffrey E., to Hooker Chemicals & Plastics Corporation. High impact corrosion resistant polymers. 4,041,104, Cl. 260-859.00R.
Selwitz, Charles M., to Gulf Research & Development Company. Synthetic flush fluids. 4,040,956, Cl. 210-60.000.
Selwitz, Charles M.: *See—*
Bacha, John D.; and Selwitz, Charles M., 4,040,911, Cl. 203-9.000.
Shaffer, Howard Richard; and Frantz, Robert Houston, to AMP Incorporated. Tri-lead cable connector. 4,040,703, Cl. 339-99.00R.
Shah, Niranjan S.; and Taylor, James F., to NCR Corporation. Data processing internal communications system having plural time-shared intercommunication buses and inter-bus communication means. 4,041,472, Cl. 364-900.000.
Shanly, Alan L., to Xerox Corporation. Drum support apparatus. 4,040,157, Cl. 29-123.000.
Shapiro, Edward: *See—*
Bramer, Henry C.; and Shapiro, Edward, 4,041,128, Cl. 423-213.200.
Shapot, Mikhail Borisovich: *See—*
Axelrod, Shoya Samuilovich; Belozerov, Viktor Grigorievich; Gershman, Mikhail Bentsionovich; Margolin, Evel Grigorievich; and Shapot, Mikhail Borisovich, 4,041,218, Cl. 429-136.000.
Sharma, Satish Chander: *See—*
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Sharpe, Andrew Jackson, Jr.; Windhager, Robert H.; and Hearp, Kathleen Seese, to Calgon Corporation. Electroconductive polysalt complexes. 4,040,984, Cl. 252-500.000.
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Harris, Howard A., 4,040,968, Cl. 252-51.50A.
McClure, James D., 4,041,090, Cl. 260-671.00R.
Offeringa, Jan, 4,040,483, Cl. 166-272.000.
Roman, Steven A., 4,041,027, Cl. 542-400.000.
Shellhause, Ronald L., to General Motors Corporation. Failure warning switch actuator with automatic reset. 4,041,449, Cl. 340-52.00C.
Shemano, Irving, to Richardson-Merrell Inc. Pharmaceutically useful nitrogen containing heterocyclic derivatives. 4,041,165, Cl. 424-267.000.
Shepard, David H.; and Gushue, Edward J., to Cognitronics Corporation. Data handling system with remote document scanner. 4,041,454, Cl. 340-146.30F.
Shephard, Donald L., to Shephard, Helen I., a part interest. Condensation proof drinking glass assembly. 4,040,535, Cl. 215-100.500.
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Shephard, Donald L., 4,040,535, Cl. 215-100.500.
Shephard, Kenneth Paul; and Van Rheenen, Verlan H., to Upjohn Company, The. Process for the preparation of 17α-hydroxyprogesterones and corticoids from androstenes. 4,041,055, Cl. 260-397.300.
Sheppard, Howard H. Indicator for relay or the like. 4,040,382, Cl. 116-124.00L.
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Shidara, Keiichi; Goto, Naohiro; Maruyama, Eiichi; Hirai, Tadaaki; and Fujita, Tsutomu, to Hitachi, Ltd.; and Nippon Hoso Kyokai. Photoconductive films. 4,040,985, Cl. 252-501.000.
Shidel, Jerome E.; and Sampey, Harry R., to Pentron Industries, Inc. Bi-directional motion sensing and clocking system. 4,041,285, Cl. 235-150.270.
Shikhirev, Boris Nikolaevich; Matrosov, Evgeny Arkadievich; and Deresh, Ilya Abramovich. Device for the treatment of sheet materials. 4,040,209, Cl. 51-80.00A.
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Shimizu, Shinji; Iwamatsu, Seiichi; and Homma, Makoto, to Hitachi, Ltd. MIS semiconductor device and method of manufacturing the same. 4,041,518, Cl. 357-23.000.
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Shionogi & Co., Ltd.: *See—*
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Shitara, Hisao; and Takada Koosuke, to Tokyo Shibaura Electric Co., Ltd. Magnetron anode and a method for manufacturing the same. 4,041,350, Cl. 315-39.750.
Shoji, Fusaji; Kokaku, Hiroyoshi; Kohkame, Hisashi; and Kakefuda, Koiti, to Hitachi, Ltd. Process for producing vinyl graft copolymer resin. 4,041,108, Cl. 260-881.000.
Shortt, Brian A.: *See—*
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Shuster, Edward J.; Withycombe, Donald Arthur; Mookherjee, Braja Dulal; and Mussinan, Cynthia J., to International Flavors & Fragrances Inc. 2-Alkyl-substituted-4,5-dimethyl thiazoline perfume and cologne compositions. 4,040,987, Cl. 252-522.000.
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Konig, Justus; and Rohrig, Josef, 4,041,245, Cl. 179-18.0AB.
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Maringer, Albert, 4,041,373, Cl. 324-15.000.
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Rose, Ralph E., 4,040,169, Cl. 29-577.000.
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Silverman, Seymour; Costa, Paul F.; and Block, Charles, to Silverman

Machines, Inc. Automatic hemming apparatus. 4,040,366, Cl. 112-121.290.
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Simon, Eli. Heat-convertible reaction products of equal mol ratios of s-diphenylcarbazide and an aromatic dianhydride. 4,041,034, Cl. 260-250.00P.
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Simons, Sanford L.; and McNeill, Frederick M., to Simons, Sanford L. Apparatus, instrumentation, and method for comparing samples. 4,040,788, Cl. 23-230.00R.
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Kahan, William; Rupinski, Fredrick Alexander; Wagner, John Francis; and Peer, Thomas Richard, 4,040,277, Cl. 66-154.00A.
Sinnott, Vernon J., to Raymond Lee Organization, Inc., The, a part interest. Water gun game. 4,040,622, Cl. 273-86.00R.
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Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. 4-Nitro-4'-[N-(N'-benzoyl)-ureido]-diphenyl ethers. 4,041,177, Cl. 424-322.000.
Skalle, Olaf Narten. Warning, marking and/or barrier arrangement. 4,040,759, Cl. 404-6.000.
SKF Industrial Trading and Development Company B.V.: *See—*
Korenhof, Abraham, 4,040,683, Cl. 308-187.100.
SKF Industries, Inc.: *See—*
Kapaan, Hendrikus Jan, 4,040,684, Cl. 308-187.100.
Skibo, Phillip M. Bait casting device. 4,040,198, Cl. 43-19.000.
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Slovitt, Simon; and Slovitt, Miriam. Lip protector. 4,040,127, Cl. 2-174.000.
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Slysh, Paul, to General Dynamics. Isogrid shell gun mount. 4,040,333, Cl. 89-37.50R.
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Smith, Richard E., to Xerox Corporation. Retractable edge seals for electrostatographic development systems. 4,040,386, Cl. 118-653.000.
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Societe Anonyme dite: Etude et Realisation de Chaines Automatiques - ERCA: *See—*
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Societe D'Exploitation Des Procedes Felix Amiot S.E.P.F.A.: *See—*
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Societe Generale de Constructions Electriques et Mecaniques Alsthom: *See—*
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Apparatus for prepressing transparent laminated assemblies. 4,040,888, Cl. 156-497.000.
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Spector, Samuel. Flashlight. 4,041,304, Cl. 240-10.680.
Speer, Spencer J., to General Dynamics. Packaging and dispensing kit. 4,040,420, Cl. 128-218.00M.
Speidel, John A. Integral seating unit. 4,040,662, Cl. 297-445.000.
Spence Engineering Company: *See—*
Zaki, Moustafa A., 4,040,440, Cl. 137-375.000.
Spence, John R.; and Kinney, Bruce W., Jr., to Rockwell International Corporation. Selectable eight or twelve digit integrated circuit calculator and conditional gate output signal modification circuit therefor. 4,041,330, Cl. 307-251.000.
Speranzin, Claudio, to Officine Savio, S.p.A. Device for distributing softening liquid on the yarn during the twisting process. 4,040,241, Cl. 57-35.000.
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Jorgensen, George N.; King, Frank D.; and Butler, DeForest D., 4,040,755, Cl. 403-205.000.
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Stanelle, Karl-Heinz. Vessel with an upright shell. 4,040,218, Cl. 52-194.000.
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Steinhauer, Roger C.; and Bertozzi, Richard J., to Armour-Dial, Inc. Fabric softener. 4,040,966, Cl. 252-8.800.
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Sirrenberg, Wilhelm; Schramm, Jurgen; Klauke, Erich; Hammann, Ingeborg; and Stendel, Wilhelm, 4,041,177, Cl. 424-322.000.
Stepochkin, Lev Mikhailovich: *See—*
Makeev, Boris Anatolievich; Stepochkin, Lev Mikhailovich; Korot, Garri Moiseevich; Batozsky, Vadim Ivanovich; Khodorov, Alexandr Iosifovich; Zhuravlev, Vitaly Ivanovich; and Eremenko, Adolf Grigorievich, 4,040,318, Cl. 83-71.000.
Sterlicchi, Helen: *See—*
Sterlicchi, Pasquale; and Sterlicchi, Helen, 4,040,626, Cl. 273-123.00R.
Sterlicchi, Pasquale; and Sterlicchi, Helen. Ball and puck game. 4,040,626, Cl. 273-123.00R.
Sterling Drug Inc.: *See—*
Eggensperger, Heinz; and Diehl, Karl-Heinz, 4,040,977, Cl. 252-401.000.
Stern, Allen E., to United States of America, Army. Gravity-deployed double-ended anti-tank mine. 4,040,354, Cl. 102-8.000.
Stern, Marvin J., to Alloy Metals, Inc. Aluminum base fluxless brazing alloy. 4,040,822, Cl. 75-140.000.
Stevens, Clayton O.: *See—*
Penton, Hugh V.; Dunphy, Gerald P.; and Stevens, Clayton O., 4,040,194, Cl. 40-142.00A.
Stevens, Philip C.: *See—*
Ault, Earl R.; Stevens, Philip C.; Sipman, Robert H.; and Bradford, Robert S., Jr., 4,041,415, Cl. 331-94.5PE.
Stevenson, Howard R., Jr., to General Electric Company. Split gate tracker using bipolar converter. 4,041,485, Cl. 343-7.300.
Stewart-Hall Chemical Co.: *See—*
Hessel, Harold H.; and Kiele, Francis S., 4,040,515, Cl. 206-.500.
Stewart, John W., to NCR Corporation. Solenoid driver circuit. 4,041,546, Cl. 361-152.000.
Stewart, Malcolm John: *See—*
Hepher, Martin; Sperry, John Arthur; and Stewart, Malcolm John, 4,041,204, Cl. 428-199.000.
Stich, Heinrich: *See—*
Binder, Walter; Hutter, Josef; Stich, Heinrich; Ruckensteiner, Kurt; Tines, Josef, deceased; Tines, Antonie, legal representative; and Schwarz, Heide, legal representative, 4,040,853, Cl. 106-103.000.
Stieger, Helmut: *See—*
Winkelmann, Detlef; Lohr, Bernd; and Stieger, Helmut, 4,040,735, Cl. 355-10.000.
Stierwalt, Donald L.: *See—*
Potter, Roy F.; and Stierwalt, Donald L., 4,041,313, Cl. 250-341.000.
Stine, Clifford R.; Klipec, Bruce E.; and Herbert, William J., to Samuel Moore & Company. Electric conductor adapted for use in process instrumentation. 4,041,237, Cl. 174-36.000.
Stockdale, Douglas P.; Mencarini, Richard; Deaton, Carlton D.; and Owen, Ralph M., to Baxter Travenol Laboratories, Inc. Method and device for racking and sealing containers. 4,040,234, Cl. 53-38.000.
Stockman, Richard Franklin; and Baker, Roderick Jay, to Air Preheater Company, Inc., The. Axially movable sector plate support for rotary regenerative heat exchanger. 4,040,475, Cl. 165-9.000.
Stodt, Eberhard: *See—*
Pessel, Kurt; and Stodt, Eberhard, 4,040,230, Cl. 53-24.000.
Stoides, John G.: *See—*
Ott, David M.; Ott, Cynthia Bunce; and Stoides, John G., 4,041,456, Cl. 340-146.30R.
Stolar, Morris E., to Abic Ltd. Water-suspendible composition comprising robenidine. 4,041,160, Cl. 424-229.000.
Stolfa, Frank, to UOP Inc. Combination thermal cracking and coking process. 4,040,943, Cl. 208-80.000.
Stone, Julian: *See—*
Burrus, Charles Andrew, Jr.; and Stone, Julian, 4,040,890, Cl. 156-605.000.
Stone, Richard D., to UOP Inc. Moving bed contacting process and apparatus. 4,040,794, Cl. 23-288.00G.
Stone & Webster Engineering Corporation: *See—*
Foster, Raymond C.; and Humphries, James J., Jr., 4,041,129, Cl. 423-234.000.
Stratmann, Josef: *See—*
Knappstein, Johannes; and Stratmann, Josef, 4,040,910, Cl. 202-262.000.
Streck, Donald A.: *See—*
Pogson, John T.; and Streck, Donald A., 4,040,478, Cl. 165-105.000.
Strever, Walter: *See—*
Ottmann, Norman; and Strever, Walter, 4,041,118, Cl. 264-71.000.

Stromberg-Carlson Corporation: *See—*
Altenburger, Otto; and Dorazio, Alton E., 4,041,253, Cl. 179-175.20R.
Stroom, Paul D.; and Braunreiter, Carl J., to Minnesota Mining and Manufacturing Company. High efficiency heat exchanger with ceramic rotor. 4,040,474, Cl. 165-9.000.
Strothers, Claude, Jr. Automatic phase compensation circuit for paralleling power amplifiers in the microwave frequency range. 4,041,413, Cl. 330-43.000.
Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythemic agents. 4,041,178, Cl. 424-329.000.
Stuart, Robert W., to Dynamics Research Corporation. Multi-axis encoder processing and display system. 4,041,466, Cl. 364-900.000.
Stubits, Marcella C.; and Teng, James, to Anheuser-Busch, Incorporated. Water dispersible chewing gum base. 4,041,179, Cl. 426-3.000.
Sturgeon, Clayton L., to Ranger Engineering Corporation. Quantized amplifier. 4,041,411, Cl. 330-207.00A.
Sturmer, Wilhelm, to Siemens Aktiengesellschaft. Non-linear optical frequency doubling devices. 4,041,323, Cl. 307-88.300.
Sudler, Roland; and Hartung, Klaus-Dieter, to VDO Adolf Schindling AG. Single phase stepper motor. 4,041,336, Cl. 310-49.00R.
Sudyk, John R.: *See—*
Telle, Byron J.; and Sudyk, John R., 4,040,476, Cl. 165-76.000.
Sugihara, Hirosada; Motohashi, Michio; Watanabe, Masazumi; Nishikawa, Masao; and Sanno, Yasushi, to Takeda Chemical Industries, Ltd. Bicyclic compounds. 4,041,079, Cl. 260-574.000.
Sugino, Toshio: *See—*
Okada, Yoshitsugu; Nanao, Teruaki; and Sugino, Toshio, 4,040,443, Cl. 137-546.000.
Sugioka, Masanao: *See—*
Tsunashima, Kenji; Sugioka, Masanao; Soda, Atsuhiko; Ikeuchi, Hiroyuki; and Tanaka, Michihiko, 4,041,206, Cl. 428-409.000.
Sugiyama, Masatoshi; and Ogawa, Akira, to Fuji Photo Film Co., Ltd. Photographic sensitive elements having dyed layers. 4,040,840, Cl. 96-84.00A.
Sullivan, Francis R.: *See—*
Clovis, James S.; and Sullivan, Francis R., 4,041,107, Cl. 260-876.00R.
Sumitomo Aluminum Smelting Company, Ltd.: *See—*
Abe, Tatsuo; Okamoto, Toshiki; Sakakura, Takao; and Tateno, Tatsuo, 4,041,137, Cl. 423-489.000.
Sumitomo Chemical Company, Limited: *See—*
Yamada, Eiji; Ito, Hiroaki; and Akamatsu, Takashi, 4,041,051, Cl. 260-373.000.
Sun Oil Company of Pennsylvania: *See—*
Hansel, William B., 4,040,448, Cl. 138-42.000.
Hansel, William B., 4,040,458, Cl. 141-392.000.
Sun Ventures, Inc.: *See—*
Moore, Robert E.; and Janoski, Edward J., 4,041,086, Cl. 260-648.00F.
Sunada, Masayoshi; and Kubokura, Kuniaki, to Hitachi, Ltd. Control circuit for controlling the shaft speed of a motor having clutch and brake devices. 4,040,508, Cl. 192-12.00D.
Sunami, Hideo; Itoh, Yokichi; Inose, Fumiyuki; and Kamigaki, Yoshiaki, to Hitachi, Ltd. Shift array for pattern information processing device utilizing charge coupled semiconductor device. 4,041,521, Cl. 357-24.000.
Sunpak Corporation: *See—*
Edamoto, Akio; and Hayakawa, Tooru, 4,041,508, Cl. 354-128.000.
Suntech, Inc.: *See—*
Chaney, Preston E.; and Morgan, George W., 4,040,262, Cl. 61-86.000.
Supraton Aurer & Zucker OHG, Firma: *See—*
Kohlheb, Robert, 4,040,965, Cl. 210-297.000.
Suriano, Patsy. Bending rolls machine. 4,040,283, Cl. 72-175.000.
Suroff, Leonard W., to Xygiene, Inc. Ultrasonic personal care instrument and method. 4,040,414, Cl. 128-24.00A.
Suzuki, Akira; Orihara, Ituo; and Ishida, Akira, to Kanto Denka Kogyo Co., Ltd. Synthetic resin composition. 4,041,235, Cl. 428-413.000.
Suzuki, Junichi: *See—*
Inoyama, Tadao; Goto, Tatsuo; Takeyasu, Kiyoo; Ishimura, Hiroshi; and Suzuki, Junichi, 4,041,294, Cl. 235-151.110.
Suzuki, Takenori: *See—*
Takeda, Shiroh; Nagai, Yuji; and Suzuki, Takenori, 4,041,009, Cl. 260-42.180.
Suzuki, Teruki: *See—*
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Suzuki, Yukio: *See—*
Kominami, Yasuo; Suzuki, Yukio; and Kawamura, Masami, 4,041,409, Cl. 330-29.000.
Svensson, Karl-Erik: *See—*
Nordblad, Sven Sigurd; and Svensson, Karl-Erik, 4,040,269, Cl. 62-374.000.
Swain, Leonard W.; and Bower, Allen M., to Emco Limited. Automatic shut off for gravity filling system for liquid storage tanks. 4,040,455, Cl. 141-225.000.
Swainson, Wyn Kelly. Method, medium and apparatus for producing three-dimensional figure product. 4,041,476, Cl. 340-173.0CC.
Swanson, Donald F., to Whirlpool Corporation. Ice maker with thermostatic water control. 4,040,267, Cl. 62-180.000.
Swanson, Kenneth R. Multidirectional animal trap. 4,040,201, Cl. 43-90.000.
Sweetheart Plastics, Inc.: *See—*
Shumrak, George; and Mack, Anthony, 4,041,277, Cl. 219-386.000.
Swift, David William, to Perkin-Elmer Limited. Polarized grating optical odometer. 4,040,741, Cl. 356-28.000.
Swindler, David L.; and Dykes, Donald L., to Square D Company. Interlock for circuit breakers. 4,041,260, Cl. 200-50.00A.
Syntex (U.S.A.) Inc.: *See—*
Nelson, Peter H.; and Untch, Karl G., 4,041,173, Cl. 424-308.000.
Syva Company: *See—*
Ullman, Edwin F.; and Rubenstein, Kenneth E., 4,040,907, Cl. 195-63.000.
Sze, Morgan C.; and Snell, George J., to Lummus Company, The. Separation of insoluble material from coal liquefaction product by use of a diluent. 4,040,957, Cl. 210-73.00R.
Szekely, Andrew Geza, to Union Carbide Corporation. Apparatus for refining molten metal. 4,040,610, Cl. 266-235.000.
Szivos, Karoly; Lovass, Gyula; Liptak, Laszlo; Hirling, Jozsef; and Pavlik, Ozskar, to Magyar Tudomanyos Akademia Izotop Intezete. Process and apparatus for the concentration and storage of liquid radioactive wastes. 4,040,973, Cl. 252-301.10W.
Szofran, Frank R.: *See—*
Bauer, Carl F.; Welsh, Lawrence B.; Youtsey, Karl J.; and Szofran, Frank R., 4,040,929, Cl. 204-195.00S.
Szymanski, Chester D.; and DeMartino, Ronald, to National Starch and Chemical Corporation. Wash-resistant antistatic coating compositions. 4,041,001, Cl. 260-29.6WA.
Tack, Hans, to Fried. Krupp Gesellschaft mit beschrankter. Adjusting device for milling cutters. 4,040,156, Cl. 29-96.000.
Tagawa, Katsuhiro, to Nisson Motor Company, Limited. Fuel tank pressure-vacuum relief valve. 4,040,404, Cl. 123-136.000.
Tagnon, Luc Andre, to Essilor International (Compagnie Generale d'Optique). Laser unit with a laser beam automatically aligned to the vertical direction. 4,040,752, Cl. 356-249.000.
Takada, Katsuo: *See—*
Kitamura, Nobuo; Takada, Katsuo; and Fukagawa, Hiroshi, 4,041,401, Cl. 325-455.000.
Takada, Koji; and Misu, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Method of preventing pollution of sludge formed by electrolytic etching work. 4,040,920, Cl. 204-129.750.
Takada Koosuke: *See—*
Shitara, Hisao; and Takada Koosuke, 4,041,350, Cl. 315-39.750.
Takada, Tsutomu; Kato, Shingo; Utsunomiya, Tadashi; and Inoue, Sakae, to Bridgestone Tire Company Limited. Heat resistant rubber laminates. 4,041,207, Cl. 428-421.000.
Takahashi, Kenji: *See—*
Hinata, Masanao; Takei, Haruo; Miyasaka, Nobuaki; and Takahashi, Kenji, 4,040,833, Cl. 96-45.100.
Takahashi, Kozo: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasuhumi; Takashima, Mutsuo; Takeda, Masaaki; Ino, Hiroyoshi; and Iwanami, Sumio, 4,041,032, Cl. 260-250.0BN.
Takahashi, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Control device for stopping the withdrawing of unit cases. 4,040,653, Cl. 292-202.000.
Takanashi, Itsuo: *See—*
Miyoshi, Tadayoshi; Nakagaki, Shintaro; Takanashi, Itsuo; Yokokawa, Sumio; Miyazaki, Kenichi; Tumiyama, Hisanori; and Motoyama, Koithiro, 4,041,528, Cl. 358-47.000.
Takashima, Mutsuo: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasuhumi; Takashima, Mutsuo; Takeda, Masaaki; Ino, Hiroyoshi; and Iwanami, Sumio, 4,041,032, Cl. 260-250.0BN.
Takayama, Jun: *See—*
Umeda, Kenkichi; Nakamura, Shoichi; Takayama, Jun; Horichi, Tetsuya; and Tsuchiya, Yoshikazu, 4,041,453, Cl. 340-146.1BE.
Takeda Chemical Industries, Ltd.: *See—*
Sugihara, Hirosada; Motohashi, Michio; Watanabe, Masazumi; Nishikawa, Masao; and Sanno, Yasushi, 4,041,079, Cl. 260-574.000.
Takeda, Masaaki: *See—*
Murakami, Masuo; Takahashi, Kozo; Hirata, Yasuhumi; Takashima, Mutsuo; Takeda, Masaaki; Ino, Hiroyoshi; and Iwanami, Sumio, 4,041,032, Cl. 260-250.0BN.
Takeda, Shiroh; Nagai, Yuji; and Suzuki, Takenori, to Fujitsu Limited. Process for producing anti-blocking and low pressure moldable diallyl phthalate resin molding materials. 4,041,009, Cl. 260-42.180.
Takei, Haruo: *See—*
Hinata, Masanao; Takei, Haruo; Miyasaka, Nobuaki; and Takahashi, Kenji, 4,040,833, Cl. 96-45.100.
Hinata, Masanao; Takei, Haruo; Sato, Akira; Ikeda, Tadashi; and Iwamoto, Atsuo, 4,040,841, Cl. 96-126.000.
Takeyasu, Kiyoo: *See—*
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Takezaki, Tsuneo: *See—*
Yamazaki, Osamu; Miki, Sukeichi; and Takezaki, Tsuneo, 4,041,244, Cl. 179-15.0BT.
Takida, Hiroshi: *See—*
Amemiya, Kiyosi; and Takida, Hiroshi, 4,041,223, Cl. 526-10.000.
Takken, Hendrik J.: *See—*
Boelens, Harmannus; Takken, Hendrik J.; and Traas, Petrus C., 4,040,986, Cl. 252-522.000.
Talsma, Herbert; and Giffen, William M., Jr., to Standard Oil Company, The. Impact improvement of rubber-modified nitrile resins. 4,041,005, Cl. 260-32.80A.

Tamao, Yoshikuni: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,041,156, Cl. 424-177.000.
Tanaka, Akira; and Ulrich, Charles J., to American Safety Equipment Corporation. Harness anchoring for child safety seat. 4,040,664, Cl. 297-389.000.
Tanaka, Eizi; Mochizuki, Hiroshi; Kosuda, Tooru; Abe, Seikou; and Ohashi, Michihiro, to Nippon Soken, Inc. Fuel injection system for internal combustion engine. 4,040,405, Cl. 123-139.0BG.
Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Single lens reflex camera. 4,041,509, Cl. 354-152.000.
Tanaka, Masaaki: *See—*
Nohira, Hidetaka; Kobashi, Kiyoshi; and Tanaka, Masaaki, 4,040,402, Cl. 123-119.00A.
Tanaka, Michihiko: *See—*
Tsunashima, Kenji; Sugioka, Masanao; Soda, Atsuhiko; Ikeuchi, Hiroyuki; and Tanaka, Michihiko, 4,041,206, Cl. 428-409.000.
Tanaka, Tsutomu: *See—*
Ohta, Kazuho; Matsuda, Fumio; Tanaka, Tsutomu; Ohnuki, Katsuhiro; Miyaji, Naotaka; and Sato, Hidetoshi, 4,041,256, Cl. 179-182.00R.
Taniyama, Masayo. Cutter for cutting vegetables and fruits, the cutter having blades that are movable at the time of cutting. 4,040,319, Cl. 83-425.300.
Tantillo, James M.: *See—*
Ramsay, Donald C.; and Tantillo, James M., 4,040,697, Cl. 339-61.00R.
Tappan, Harold B.; and Corwin, John Roy, to Eaton Corporation. Planetary reduction drive unit. 4,040,312, Cl. 74-801.000.
Tarancon, Gregorio: *See—*
Franklin, Robert E.; Francis, Arthur W.; and Tarancon, Gregorio, 4,041,136, Cl. 423-347.000.
Tarr, Lloyd Arthur: *See—*
Beeman, Robert Herbert; and Tarr, Lloyd Arthur, 4,041,248, Cl. 179-84.0VF.
Tashiro, Korefumi; and Ishikawa, Kosuke, to Hitachi, Ltd. Magnetic shield system for electric cars. 4,041,324, Cl. 307-91.000.
Tassone, Joseph V.: *See—*
Candor, James T.; and Tassone, Joseph V., 4,040,229, Cl. 53-29.000.
Tateno, Tatsuo: *See—*
Abe, Tatsuo; Okamoto, Toshiki; Sakakura, Takao; and Tateno, Tatsuo, 4,041,137, Cl. 423-489.000.
Tax, Hans; and Kurz, Herbert, to Tax, Hans. Apparatus for recovering particulate material from the sea bottom. 4,040,667, Cl. 299-8.000.
Taylor, Colin R.: *See—*
Perry, John H.; Salsburg, David S.; and Taylor, Colin R., 4,041,468, Cl. 364-900.000.
Taylor, George W.: *See—*
Kouchich, Allan; and Taylor, George W., 4,041,436, Cl. 338-21.000.
Taylor, Gerald Graham: *See—*
Rayner, Bruce Leland; and Taylor, Gerald Graham, 4,041,527, Cl. 358-22.000.
Taylor, James F.: *See—*
Shah, Niranjan S.; and Taylor, James F., 4,041,472, Cl. 364-900.000.
Taylor, John W., Jr.; and McGrew, Carl A., to Westinghouse Electric Corporation. Method and apparatus for determining the altitude of a signal propagation path. 4,041,491, Cl. 343-100.00R.
Taylor, Lauren P.; and Petroski, Alex, to LRS Research Limited. Catch basin processing apparatus. 4,040,960, Cl. 210-96.00R.
Taylor, Peter, to Munnis, David V. Spinning balance toy. 4,040,205, Cl. 46-51.000.
Taylor, Robert W., to Plysu Limited. Stripping flash from blow moulded hollow containers. 4,040,552, Cl. 225-1.000.
Taylor, Steve: *See—*
Kirkland, Joe D., Jr., 4,040,486, Cl. 166-311.000.
Tchon, Wallace Edward, to Honeywell Information Systems Inc. Uniphase charge transfer device. 4,041,520, Cl. 357-24.000.
Tecco, Charles, to Weatherchem Corporation. Injection molding machine. 4,040,595, Cl. 249-68.000.
Technicon Instruments Corporation: *See—*
Kim, Young Ran; Ornstein, Leonard; and Waters, Henry Cook, III, 4,040,785, Cl. 23-230.00B.
Teitel, Sidney: *See—*
Christenson, James Gordon; Gurien, Harvey; and Teitel, Sidney, 4,041,040, Cl. 260-292.000.
Tekken Kensetu Co. Ltd.: *See—*
Uchida, Yoshiaki; and Ishiwata, Kazuhiko, 4,040,666, Cl. 299-1.000.
Telefonaktiebolaget L M Ericsson: *See—*
Gabrielsson, Arne Goran; and Lindstrom, Jan Erik, 4,041,417, Cl. 331-107.00R.
Gravdahl, Eugen, 4,041,458, Cl. 340-166.00R.
Nordblad, Sven Sigurd; and Svensson, Karl-Erik, 4,040,269, Cl. 62-374.000.
Telic Corporation: *See—*
Penfold, Alan S.; and Thornton, John A., 4,041,353, Cl. 315-267.000.
Telle, Byron J.; and Sudyk, John R., to Johnson Rubber Company, The. Keel cooler with spiral fluted tubes. 4,040,476, Cl. 165-76.000.
Teng, James: *See—*
Stubits, Marcella C.; and Teng, James, 4,041,179, Cl. 426-3.000.
Tenna Corporation: *See—*
Freimark, Ronald J.; and Repay, Laszlo N., 4,041,498, Cl. 343-749.000.
Terada, Ziro: *See—*
Nitta, Tsuneharu; Hayakawa, Shigeru; Kasahara, Yukio; and Terada, Ziro, 4,041,140, Cl. 423-561.00R.
Teramachi, Hiroshi. Slide way bearing. 4,040,679, Cl. 308-6.00C.
Terasaki, Osamu: *See—*
Kikuchi, Yasuo; Ohmichi, Yasuyuki; Terasaki, Osamu; and Sakai, Koichi, 4,041,428, Cl. 335-210.000.
Terwilliger, Gerald R.: *See—*
Lange, Frederick F.; and Terwilliger, Gerald R., 4,041,123, Cl. 264-332.000.
Tesla, narodni podnik: *See—*
Kupec, Jiri; and Hrdlicka, Rehor, 4,041,384, Cl. 324-73.0PC.
Texaco Development Corporation: *See—*
Marquis, Edward T.; and Watts, Lewis W., Jr., 4,041,078, Cl. 260-570.00D.
Texas Instruments Incorporated: *See—*
Liu, Charles Chung-Yeh; and Fuller, James Alec, 4,041,499, Cl. 343-756.000.
Yarworth, Norman; and Pejouhy, Radi, 4,041,432, Cl. 337-111.000.
Textron, Inc.: *See—*
Mast, John G., 4,041,493, Cl. 343-106.00R.
Matt, Richard J.; and Thompson, Richard T., 4,040,883, Cl. 156-148.000.
Tezuka, Tohru: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,041,156, Cl. 424-177.000.
Theriault, Maurice N.: *See—*
Fetherston, William H.; and Theriault, Maurice N., 4,040,137, Cl. 9-310.0AA.
Therm-O-Disc, Incorporated: *See—*
Watson, Wayne T., 4,041,433, Cl. 337-112.000.
Thermotrol Corporation: *See—*
Angott, Paul G., 4,041,325, Cl. 307-141.000.
Theurer, Josef; and Thole, Waldemar Friedrich, to Franz Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Method and apparatus for indicating the density of ballast. 4,040,292, Cl. 73-84.000.
Thigpen, Ben B., to Western Geophysical Co. of America. Seismic recording apparatus having a time-varying sample. 4,041,443, Cl. 340-15.5AF.
Thole, Waldemar Friedrich: *See—*
Theurer, Josef; and Thole, Waldemar Friedrich, 4,040,292, Cl. 73-84.000.
Thomas, Bobby J.: *See—*
Miller, Dale E.; Chapman, William L.; Dunster, Donald E.; and Thomas, Bobby J., 4,041,372, Cl. 324-9.000.
Thomas, Harold D., to Tri Tractor Manufacturing Co., Inc. Tractor. 4,040,497, Cl. 180-53.00R.
Thomas, Paul Dana; and Burton, Dale Leroy, to Data Test Corporation. Multifunctional circuit analyzer. 4,041,386, Cl. 324-77.00R.
Thomas, Robert M., to GTE Automatic Electric (Canada) Ltd. Sense point circuit. 4,041,327, Cl. 307-231.000.
Thompson, Arthur David, to Dobson Park Industries Limited. Mounting arrangements for mineral displacing tools. 4,040,584, Cl. 248-2.000.
Thompson, Neil E. S.: *See—*
Oude Alink, Bernardus A.; Thompson, Neil E. S.; and Hutton, Ronald P., 4,040,799, Cl. 44-75.000.
Thompson, Richard T.: *See—*
Matt, Richard J.; and Thompson, Richard T., 4,040,883, Cl. 156-148.000.
Thomson-CSF: *See—*
Chabanel, Pierre, 4,041,534, Cl. 358-186.000.
Desormiere, Bernard; Menager, Olivier; Courty, Albert; and Eumurian, Gregoire, 4,041,419, Cl. 333-30.00R.
Dubois, Jean-Claude; and Gazard, Maryse, 4,041,190, Cl. 427-43.000.
Thornton, John A.: *See—*
Penfold, Alan S.; and Thornton, John A., 4,041,353, Cl. 315-267.000.
Thornton, Sidney. Collapsible bucket. 4,040,460, Cl. 150-48.000.
Thyssen Purofe: GmbH: *See—*
Altenhoner, Klaus; Jansen, Walter; Knop, Klaus; Pohl, Ulrich; and Reerink, Jan G., 4,040,816, Cl. 75-35.000.
Tiberio, Phillip J.: *See—*
McBride, Robert B.; and Tiberio, Phillip J., 4,040,790, Cl. 23-253.00C.
Tikusa, Kouiti: *See—*
Isogai, Mitsuyuki; Tikusa, Kouiti; and Nakamura, Yosihiko, 4,040,162, Cl. 29-420.500.
Timex Corporation: *See—*
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Timm, Walter C.: *See—*
Boranian, Armen G.; and Timm, Walter C., 4,041,200, Cl. 428-40.000.
Tines, Antonie, legal representative: *See—*
Binder, Walter; Hutter, Josef; Stich, Heinrich; Ruckensteiner, Kurt; Tines, Josef, deceased; Tines, Antonie, legal representative; and Schwarz, Heide, legal representative, 4,040,853, Cl. 106-103.000.
Tines, Josef, deceased: *See—*
Binder, Walter; Hutter, Josef; Stich, Heinrich; Ruckensteiner, Kurt; Tines, Josef, deceased; Tines, Antonie, legal representative; and Schwarz, Heide, legal representative, 4,040,853, Cl. 106-103.000.
Todokoro, Hideo; and Komoda, Tsutomu, to Hitachi, Ltd. Field emission electron gun with an evaporation source. 4,041,316, Cl. 250-396.00R.

Tokai Denka Kogyo Kabushiki Kaisha: *See—*
Kitamura, Koji, 4,040,863, Cl. 134-3.000.

Tokunaga, Koichi; and Fukuda, Akira, to Mitsui Mining & Smelting Co., Ltd. Method and apparatus for stacking ingots according to predetermined arrangements. 4,040,525, Cl. 214-6.00P.

Tokunaga, Michio: *See—*
Ohhinata, Ichiro; Okuhara, Shinzi; and Tokunaga, Michio, 4,041,332, Cl. 307-252.00J.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Fuse, Noboru; and Muramoto, Kenichi, 4,041,517, Cl. 357-22.000.
Shitara, Hisao; and Takada Koosuke, 4,041,350, Cl. 315-39.750.

Toman, Donald J., to Tull Aviation Corporation. Radio navigation with separate correlated scans to avoid reflection interference. 4,041,492, Cl. 343-106.00R.

Tomita, Hitoshi, to Diesel Kiki Co., Ltd. Fuel injection valve for internal combustion engine. 4,040,396, Cl. 123-32.0JV.

Tomita, Shuzo. Portable container for fish, live bait, and the like. 4,040,200, Cl. 43-57.000.

Tomy Kogyo Co., Inc.: *See—*
Kimura, Osamu, 4,040,206, Cl. 46-138.000.

Tonomura, Shinji: *See—*
Okamoto, Shosuke; Kikumoto, Ryoji; Ohkubo, Kazuo; Tezuka, Tohru; Tonomura, Shinji; Tamao, Yoshikuni; and Hijikata, Akiko, 4,041,156, Cl. 424-177.000.

Tootal Limited: *See—*
Wilson, Thomas William; and Topham, Michael Johnston, 4,040,496, Cl. 177-105.000.

Topham, Michael Johnston: *See—*
Wilson, Thomas William; and Topham, Michael Johnston, 4,040,496, Cl. 177-105.000.

Toray Industries, Inc.: *See—*
Fujioka, Kotaro; Tsuchihashi, Osami; Endo, Tetsuhiko; and Hircta, Masakazu, 4,040,240, Cl. 57-34.0CP.
Tsunashima, Kenji; Sugioka, Masanao; Soda, Atsuhiko; Ikeuchi, Hiroyuki; and Tanaka, Michihiko, 4,041,206, Cl. 428-409.000.

Torokvei, Thomas Evald, to Scepter Manufacturing Company Limited. Stacking case. 4,040,517, Cl. 206-144.000.

Torre, Anthony J.: *See—*
Hayosh, Thomas D.; and Torre, Anthony J., 4,041,322, Cl. 250-568.000.

Torrington Company Limited, The: *See—*
Lewis, Terence John; Brooks, Raymond; and Selby, John, 4,040,336, Cl. 90-11.00R.

Tost, Heinrich, to Grundig E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig. Apparatus for depositing flux-fluid onto conductor plates. 4,040,385, Cl. 118-326.000.

Totsuka Komuten Co., Ltd.: *See—*
Totsuka, Yasutaro, 4,040,215, Cl. 52-168.000.

Totsuka, Yasutaro, to Totsuka Komuten Co., Ltd. Decay-resisting construction of lower structure for wooden buildings. 4,040,215, Cl. 52-168.000.

Towersey, Peter John; Longton, John; and Cockram, Geoffrey Norman, to Ranks Hovis McDougall Limited. Production of edible protein containing substances. 4,041,189, Cl. 426-656.000.

Towsend, Marvin Stanley. Magnetic stirring apparatus. 4,040,605, Cl. 259-64.000.

Toyama, Toshiaki: *See—*
Mukaemachi, Takuzi; Toyama, Toshiaki; and Miyoshi, Taturu, 4,041,246, Cl. 179-18.0GF.

Toyo Soda Manufacturing Co., Ltd: *See—*
Kikuchi, Mitsuo; and Hiraga, Yoichi, 4,041,134, Cl. 423-321.00S.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Nohira, Hidetaka; Kobashi, Kiyoshi; and Tanaka, Masaaki, 4,040,402, Cl. 123-119.00A.

Traas, Petrus C.: *See—*
Boelens, Harmannus; Takken, Hendrik J.; and Traas, Petrus C., 4,040,986, Cl. 252-522.000.

Tracey, Robert J.: *See—*
Boleda, Alberto; and Tracey, Robert J., 4,041,484, Cl. 340-347.0NT.

Transco Energy Company: *See—*
Cook, Harold L., Jr.; Geer, Ernest C.; and Katz, Donald L., 4,040,487, Cl. 166-314.000.

Tri-Tech, Inc.: *See—*
Haydon, Arthur W., 4,040,247, Cl. 58-23.00R.

Tri Tractor Manufacturing Co., Inc.: *See—*
Thomas, Harold D., 4,040,497, Cl. 180-53.00R.

Triple-S Development Co., Inc.: *See—*
Smith, Jessop; and Kocis, Thomas Robert, 4,040,196, Cl. 42-23.000.

Triquet, Fred E.: *See—*
Olmstead, Clarence W.; and Triquet, Fred E., 4,041.241, Cl. 174-153.00G.

Trivedi, Ramesh C.; Bungay, Henry R., III; and Cuccolo, Paul J., to Worthington Biochemical Corporation. Chemical analysis method using reaction container. 4,040,786, Cl. 23-230.00R.

Tronsberg, Walter, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Method for making a container of composite material. 4,040,163, Cl. 29-423.000.

Trost, Wayne C.; and Capps, John B., to Barber-Colman Company. Triaxial weaving machine having heddles with weftwise lateral projections. 4,040,451, Cl. 139-48.000.

Trotnick, Vincent William, Jr., to RCA Corporation. Push-pull audio amplifier system with muting. 4,041,408, Cl. 330-15.000.

Trunk, Edmund G.; and Skrobisch, Alfred, to Staver Company, Inc., The. Heat dissipating device for transistor with outwardly extending heat conductive tab. 4,041,524, Cl. 357-81.000.

TRW Canada Limited: *See—*
Donegan, Edward Alfred, 4,040,756, Cl. 403-307.000.

TRW Inc.: *See—*
Andrews, James D., 4,040,933, Cl. 204-224.00M.
McKee, William H.; and Witte, Roy, 4,040,702, Cl. 339-97.00R.
Rogers, Wilford P., 4,040,687, Cl. 308-201.000.

Tsuchihashi, Osami: *See—*
Fujioka, Kotaro; Tsuchihashi, Osami; Endo, Tetsuhiko; and Hirota, Masakazu, 4,040,240, Cl. 57-34.0CP.

Tsuchiya, Yoshikazu: *See—*
Umeda, Kenkichi; Nakamura, Shoichi; Takayama, Jun; Horichi, Tetsuya; and Tsuchiya, Yoshikazu, 4,041,453, Cl. 340-146.1BE.

Tsuda, Naotsune, to Olympus Optical Co., Ltd. Method of manufacturing magnetic heads. 4,040,174, Cl. 29-603.000.

Tsuda, Yukio, to Sony Corporation. Semiconductor varactor device and electronic tuner using same. 4,041,399, Cl. 325-357.000.

Tsunashima, Kenji; Sugioka, Masanao; Soda, Atsuhiko; Ikeuchi, Hiroyuki; and Tanaka, Michihiko, to Toray Industries, Inc. Laminated polyester film. 4,041,206, Cl. 428-409.000.

Tsuneda, Terukuni, to Canon Kabushiki Kaisha. Liquid developer for developing an electrostatic latent image. 4,040,970, Cl. 252-62.10L.

Tucker, James T.: *See—*
Kampf, Julian C.; Lemke, Winfred R.; and Tucker, James T., 4,041,540, Cl. 361-24.000.

Tull Aviation Corporation: *See—*
Toman, Donald J., 4,041,492, Cl. 343-106.00R.

Tumiyama, Hisanori: *See—*
Miyoshi, Tadayoshi; Nakagaki, Shintaro; Takanashi, Itsuo; Yokokawa, Sumio; Miyazaki, Kenichi; Tumiyama, Hisanori; and Motoyama, Koithiro, 4,041,528, Cl. 358-47.000.

Tummes, Hans: *See—*
Bexten, Ludger; Noeske, Heinz; Tummes, Hans; and Cornils, Boy, 4,041,081, Cl. 260-601.00R.
Gothel, Herbert; Cornils, Boy; Feichtinger, Hans; Tummes, Hans; and Falbe, Jurgen, 4,041,080, Cl. 260-585.00B.

Turner, Earl E.: *See—*
Behrmann, William C.; Turner, Earl E.; and Bastron, Victor C., 4,041,100, Cl. 260-683.470.

Tuzson, John J., to Borg-Warner Corporation. Oil-water interface control for submersible electric motor. 4,040,773, Cl. 417-424.000.

Tynan, Daniel Gregory: *See—*
Jenkins, Francis Edward; and Tynan, Daniel Gregory, 4,041,115, Cl. 264-5.000.

Tyson, George Noblit: *See—*
Austin, Robert Roy; and Tyson, George Noblit, 4,040,342, Cl. 99-323.100.

U C B, Societe Anonyme: *See—*
Ghosez, Leon; Rossey, Guy; and Didderen, Freddy, 4,041,077, Cl. 260-562.00R.

Uchida, Isamu; Kokubo, Eiichi; and Yoshida, Minoru, to Laurel Bank Machine Co., Ltd. Leaves counting machine. 4,041,282, Cl. 235-98.00R.

Uchida, Yoshiaki; and Ishiwata, Kazuhiko, to Tekken Kensetu Co. Ltd. Apparatus and method of shield excavation. 4,040,666, Cl. 299-1.000.

Uchio, Ryosuke; Kikuchi, Kenji; Asai, Soichiro; and Yarita, Kenichi, to Ajinomoto Co., Inc. Method of producing carbon source for citric acid fermentation. 4,040,906, Cl. 195-36.00R.

Ueda, Hirozo: *See—*
Ohmatsu, Hideki; and Ueda, Hirozo, 4,040,829, Cl. 96-6.000.

Ullman, Edwin F.; and Rubenstein, Kenneth E., to Syva Company. Iodothyronine enzyme conjugates. 4,040,907, Cl. 195-63.000.

Ullrich, Martin, to Bayer Aktiengesellschaft. Method of building up pressure by multi-shaft screw extruders. 4,040,607, Cl. 259-192.000.

Ulrich, Charles J.: *See—*
Tanaka, Akira; and Ulrich, Charles J., 4,040,664, Cl. 297-389.000.

Umeda, Kaoru, to Sony Corporation. Control circuit for actuating a device at a delayed time with respect to the turning on of a power supply and for deactuating the device substantially simultaneously with the turning off of the power supply. 4,041,334, Cl. 307-293.000.

Umeda, Kenkichi; Nakamura, Shoichi; Takayama, Jun; Horichi, Tetsuya; and Tsuchiya, Yoshikazu, to Sony Corporation. Signal handling system for minimizing dropout effect. 4,041,453, Cl. 340-146.1BE.

Umehara, Akira: *See—*
Maekawa, Yukio; Satomura, Masato; and Umehara, Akira, 4,041,017, Cl. 260-47.0UA.

Unican Electrochemical Products Ltd.: *See—*
Wiacek, Marian, 4,041,211, Cl. 429-36.000.

Union Camp Corporation: *See—*
Giebel, Buddy E., 4,040,559, Cl. 229-23.00R.

Union Carbide Corporation: *See—*
Engel, Stephen August, 4,040,871, Cl. 148-9.500.
Franklin, Robert E.; Francis, Arthur W.; and Tarancon, Gregorio, 4,041,136, Cl. 423-347.000.
Merkert, Rodney Francis, 4,040,814, Cl. 75-.5BC.
Szekely, Andrew Geza, 4,040,610, Cl. 266-235.000.

Union Oil Company of California: *See—*
Kelley, Arnold E.; Reeg, Cloyd P.; Wood, Frederick C.; and Cheadle, George D., 4,040,944, Cl. 208-89.000.
Young, Dean Arthur, 4,040,797, Cl. 44-68.000.
Young, Donald C., 4,041,133, Cl. 423-305.000.

Uniroyal, Inc.: *See—*
Loveless, Frederick C., 4,041,098, Cl. 260-683.15D.
O'Shea, Francis X.; and Mao, Chung-Ling, 4,041,105, Cl. 260-859.00R.

Unitech Chemical Inc.: *See—*
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United States Borax & Chemical Corporation: *See—*
Campbell, George W., Jr.; Wilkins, David G.; and Muench, Jerome T., 4,041,132, Cl. 423-279.000.

United States of America
Agriculture: *See—*
Eby, Harry J.; and Morgan, Neal O., 4,040,810, Cl. 71-9.000.
Weller, Heber W., Jr., 4,040,243, Cl. 57-58.890.
Army: *See—*
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Border, Robert O.; and Rudman, Ronald H., 4,040,332, Cl. 89-37.00F.
F'Geppert, Erwin, 4,040,647, Cl. 280-766.000.
F'Geppert, Erwin, 4,040,686, Cl. 308-201.000.
Fishbein, William; and Rittenbach, Otto, 4,041,488, Cl. 343-8.000.
Harrington, James A.; and Gregory, Don A., 4,040,896, Cl. 156-645.000.
Moore, Thomas M., 4,040,577, Cl. 244-4.00A.
Saunders, William K., 4,040,357, Cl. 102-70.20P.
Stern, Allen E., 4,040,354, Cl. 102-8.000.
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Monroe, James E., Jr., 4,040,903, Cl. 176-39.000.
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Ito, Yoichiro; and Carmeci, Peter, 4,040,742, Cl. 356-39.000.
National Aeronautics and Space Administration; administrator; with respect to an invention of:
Mueller, William A.; Hsu, George C.; and Marsh, Harold E., Jr. Aldehyde-containing urea-absorbing polysaccharides. 4,041,233, Cl. 536-56.000.
National Aeronautics and Space Administration: *See—*
Deerkoski, Leonard F., 4,041,391, Cl. 325-30.000.
Forestieri, Americo F.; Ratajczak, Anthony F.; and Sidorak, Leroy G., 4,040,867, Cl. 136-89.00P.
Zwiener, James M., 4,040,750, Cl. 356-212.000.
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Bond, James W., 4,041,284, Cl. 235-150.500.
Johnson, Clarence S., 4,041,441, Cl. 340-3.00R.
Lapp, Roger H., 4,041,500, Cl. 343-761.000.
Lewis, Bernard L., 4,041,489, Cl. 343-17.10R.
Liebermann, Leonard N., 4,041,446, Cl. 340-17.00R.
McKinney, Maurice E., 4,040,579, Cl. 244-214.000.
Potter, Roy F.; and Stierwalt, Donald L., 4,041,313, Cl. 250-341.000.
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Transportation: *See—*
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U.S. Philips Corporation: *See—*
Beeler, Alfred; and van der Mijden, Wilhelmus Marinus Cornelius, 4,040,177, Cl. 29-630.00C.
De Boer, Wilhelmus Johannes; Schinkel, Willem; and Span, Francis Johannes, 4,040,533, Cl. 214-310.000.
De Bresser, Gijsbert Frederik Maria; Kassenaar, Teunis Adrianus; Veraa, Ludovicus-Gerardus Johannes Godefrida; and Weenink, Leon Pieter, 4,040,706, Cl. 339-103.00R.
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Hight, Michael John; Winkle, Roy Victor; and Dale, John Robert, 4,040,885, Cl. 156-378.000.
Holster, Peter Leendert; Ooms, Adam; and van den Hoogen, Marinus Johannes Gerardus, 4,040,290, Cl. 73-71.000.
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Karsmakers, Mathijs Antonius; and Somers, Gerardus Henricus Johannus, 4,040,297, Cl. 73-398.0AR.
Koster, Marinus Pieter, 4,040,307, Cl. 74-425.000.
Kramer, Pieter; Compaan, Klaas; and Forsthuber, Robert Franz Karl, 4,041,530, Cl. 358-128.000.
Le Can, Claude Jan Principe Frederik, 4,041,474, Cl. 340-173.00R.
Rowe, Colin M., 4,040,878, Cl. 148-188.000.
van den Enden, Adrianus Wilhelmus Maria; Kuipers, Franciscus Antonius; de Niet, Edmond; and Druyvesteyn, Willem Frederik, 4,041,478, Cl. 340-174.0TF.
van der Heide, Hendrik, 4,040,681, Cl. 308-10.000.

United Technologies Corporation: *See—*
Dierberger, James Albert; and White, Loren Hawdon, 4,040,767, Cl. 415-115.000.
Kelch, George W., 4,040,161, Cl. 29-239.000.
Mosier, Stanley A.; and Pierce, Robert M., 4,040,252, Cl. 60-39.360.
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Universal Oil Products Company: *See—*
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University of Illinois Foundation, The: *See—*
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Unsworth, William: *See—*
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Nelson, Peter H.; and Untch, Karl G., 4,041,173, Cl. 424-308.000.

UOP Inc.: *See—*
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Campbell, Bonnie J.; and Rieger, Klaus R., 4,040,479, Cl. 165-133.000.
Christman, William J., 4,040,947, Cl. 208-235.000.
Dillon, James E., 4,040,930, Cl. 204-195.00S.
Forbes, James T., 4,041,131, Cl. 423-242.000.
Gattuso, Marion J., 4,041,043, Cl. 260-306.60A.
Gembicki, Stanley A.; and Hammerman, John I., 4,040,979, Cl. 252-439.000.
Henry, Michel Jacques, 4,041,091, Cl. 260-672.00T.
Hogan, Gerard T.; and Weik, Kirby B., 4,040,661, Cl. 297-284.000.
Poulsen, Harold W., 4,041,318, Cl. 250-459.000.
Sobel, Jay E., 4,041,101, Cl. 260-683.510.
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Upjohn Company, The: *See—*
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Shephard, Kenneth Paul; and Van Rheenen, Verlan H., 4,041,055, Cl. 260-397.300.

Uppal, Sohan, to Eaton Corporation. Cushion valve arrangement. 4,040,439, Cl. 137-115.000.

Uraneck, Carl A.; and Solomon, Paul W., to Phillips Petroleum Company. Cleavable branching agents in emulsion polymerization systems. 4,041,227, Cl. 526-190.000.

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Conway, Arch W.; and Urdaneta, Nelson, 4,041,288, Cl. 235-151.310.

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Useldinger, Ronald E. Friction type exercising device with improved friction setting mechanism. 4,040,627, Cl. 272-133.000.

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Atsukawa, Masumi; Kamei, Kazumi; Shinoda, Naoharu; and Ushio, Hiroyuki, 4,040,803, Cl. 55-73.000.

Usui, Kunichika: *See—*
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Valeron Corporation, The: *See—*
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Valleylab, Inc.: *See—*
Morrison, Charles F., Jr., 4,040,426, Cl. 128-303.170.

Valyi, Emery I. Method of obtaining a filled, fluid barrier resistant plastic container. 4,040,233, Cl. 53-21.00R.

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van den Enden, Adrianus Wilhelmus Maria; Kuipers, Franciscus Antonius; de Niet, Edmond; and Druyvesteyn, Willem Frederik, to U.S. Philips Corporation. Memory device. 4,041,478, Cl. 340-174.0TF.

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Beeler, Alfred; and van der Mijden, Wilhelmus Marinus Cornelius, 4,040,177, Cl. 29-630.00C.

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Vandervort, John D., to Minnesota Mining and Manufacturing Company. Fuser roll lubricator-cleaner. 4,040,383, Cl. 118-60.000.

Van Dine, Leslie L., to United Technologies Corporation. Pressurized high temperature fuel cell power plant with bottoming cycle. 4,041,210, Cl. 429-16.000.

Vann, Roy R. Optional fire and release tool and method. 4,040,482, Cl. 166-255.000.

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Vann, Roy R.; and George, Flint R., 4,040,485, Cl. 166-297.000.

Vannice, M. Albert, to Exxon Research and Engineering Company. Method for the direct preparation of halogenated hydrocarbons by the reaction of CO. H_2 and halogen in the presence of a catalyst. 4,041,087, Cl. 260-652.00R.

Van Rheenen, Verlan H.: *See—*
Shephard, Kenneth Paul; and Van Rheenen, Verlan H., 4,041,055, Cl. 260-397.300.

Van Strien, Richard E.: *See—*
Lindberg, Steven E.; Marchant, Kerford A., Jr.; and Van Strien, Richard E., 4,041,065, Cl. 260-47.0CZ.

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Vasington, Paul J.: *See—*
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VDO Adolf Schindling AG: *See—*
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Veb Polygraph Leipzig Kombinat Fur Polygraphische Maschinen Und Ausrustungen: *See—*
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VEB Textilkombinat: *See—*
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Vedda, Louis: *See—*
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Velsicol Chemical Corporation: *See—*
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De Bresser, Gijsbert Frederik Maria; Kassenaar, Teunis Adrianus; Veraa, Ludovicus-Gerardus Johannes Godefrida; and Weenink, Leon Pieter, 4,040,706, Cl. 339-103.00R.

Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft: *See—*
Fastner, Thorwald, 4,040,470, Cl. 164-58.000.

Verla-Pharm Arzneimittel-Fabrik Apotheker H. J. v. Ehrlich: *See—*
Helbig, Joachim; and Fischer, Franz, 4,041,154, Cl. 424-150.000.

Vermes, Roy E.; and Cosby, Richard E., to Revco, Inc. Sheet stacking apparatus. 4,040,618, Cl. 271-182.000.

Vermeulen-Amelot, Francoise; and Vermeulen, Thierry F. Load-bearing concrete members provided with moisture and damp proof. 4,040,221, Cl. 52-265.000.

Vermeulen, Thierry F.: *See—*
Vermeulen-Amelot, Francoise; and Vermeulen, Thierry F., 4,040,221, Cl. 52-265.000.

Vernaleken, Hugo: *See—*
Adelmann, Siegfried; Margotte, Dieter; Vernaleken, Hugo; Niederprum, Hans; Meussdoerffer, Johann Nikolaus; and Nouvertne, Werner, 4,041,003, Cl. 260-30.80R.
Binsack, Rudolf; and Vernaleken, Hugo, 4,041,018, Cl. 260-75.00R.

Vernezy, Jacques: *See—*
Gauriat, Gilles; Vernezy, Jacques; and Barigot, Jean-Claude, 4,041,392, Cl. 325-38.00A.

Vernois, Michel: *See—*
Francois, Bernard; Vernois, Michel; Martin, Paul; and Franta, Emile, 4,040,815, Cl. 75-.50B.

Vicard, Jean-Francois. Method for the recovery of gases coming from refining furnaces. 4,040,608, Cl. 266-44.000.

Vickery, Warren J. Magazine rack. 4,040,522, Cl. 211-88.000.

Victor Company of Japan, Limited: *See—*
Miyoshi, Tadayoshi; Nakagaki, Shintaro; Takanashi, Itsuo; Yokokawa, Sumio; Miyazaki, Kenichi; Tumiyama, Hisanori; and Motoyama, Koithiro, 4,041,528, Cl. 358-47.000.
Ohta, Kazuho; Matsuda, Fumio; Tanaka, Tsutomu; Ohnuki, Katsuhiro; Miyaji, Naotaka; and Sato, Hidetoshi, 4,041,256, Cl. 179-182.00R.

Vig, Istvan, to Merz AG Dulliken. Reamer. 4,040,765, Cl. 408-239.00A.

Villari, Frank K.: *See—*
Libman, Gary; and Villari, Frank K., 4,040,909, Cl. 195-127.000.

Villaume, Henry F.; Collins, D. Stephen; and Peoples, Patrick J., to Howell Laboratories, Incorporated. Method and apparatus for measuring the brightness of pulp slurry. 4,040,743, Cl. 356-73.000.

Vinals, Joaquin: *See—*
Hall, John B.; Hruza, Denis E.; Vock, Manfred Hugo; Vinals, Joaquin; and Shuster, Edward J., 4,041,069, Cl. 260-486.00R.

Vinals, Joaquin F.: *See—*
Light, Kenneth K.; Shuster, Edward J.; Vinals, Joaquin F.; and Vock, Manfred Hugo, 4,041,084, Cl. 260-617.00F.

Vincent, George C.; and Rauch, David, to Kingsford Company, The. Fast lighting artificial firelog. 4,040,796, Cl. 44-14.000.

Viricel, Andree: *See—*
Abblard, Jean; Marmain, Georges; and Viricel, Andree, 4,041,109, Cl. 260-927.00R.

Vitale, Gina G.: *See—*
LeGrand, Donald G.; and Vitale, Gina G., 4,040,882, Cl. 156-106.000.

Vlattas, Isidoros, to Ciba-Geigy Corporation. 9-Thiaprostaglandins. 4,041,047, Cl. 260-332.100.

Vock, Manfred Hugo: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; Vock, Manfred Hugo; and Giacino, Christopher, 4,041,186, Cl. 426-535.000.
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Vogt, Herbert, to Siemens Aktiengesellschaft. A controllable semiconductor component having massive heat dissipating conically shaped metal bodies. 4,041,523, Cl. 357-72.000.

Voigt, John E.; and Bovier, Edward M., to Anheuser-Busch, Incorporated. Process for making a thermal converting starch by modification of oxidized starch with aluminum salts. 4,040,862, Cl. 127-70.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Becker, Burckhard, 4,040,646, Cl. 280-750.000.
Decker, Gerd; Steinke, Dieter; and Reichel, Kurt, 4,040,393, Cl. 123-30.00A.

Vollmer, Karl-Otto: *See—*
Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, 4,041,166, Cl. 424-267.000.

Volpe, Giancarlo: *See—*
Assandri, Alessandro; Lancini, Giancarlo; Volpe, Giancarlo; and Cavalleri, Bruno, 4,041,168, Cl. 424-273.000.

Vonder, David L.: *See—*
Brush, Douglas J.; Vonder, David L.; and Wilkis, Anthony J., 4,041,425, Cl. 335-129.000.

Von Osten, Reimer: *See—*
Freudeberg, Jurgen; and Von Osten, Reimer, 4,041,482, Cl. 340-324.0AD.

Voreck, Wallace E., Jr.; and Dalrymple, Everett W., to United States of America, Army. Converging wave detonator. 4,040,356, Cl. 102-28.00R.

Voss, Eitel; Waldofner, Karl-Heinz; and Harz, Kurt, to August Thyssen-Hutte AG. Use of the continuous blast furnace gas analysis for supervision and regulation of the blast furnace operation. 4,040,789, Cl. 23-230.00A.

Vyzkumny ustav bavlnarsky: *See—*
Burysek, Frantisek; Mikulecky, Karel; and Janousek, Jan, 4,040,573, Cl. 242-35.50A.

W. B. Marvin Mfg. Co.: *See—*
Johnson, James B.; and Henson, Jesse L., 4,040,498, Cl. 180-68.00P.

W. Haking Industries, Ltd.: *See—*
Chan, Kwok Yan; and Ko, Norman Wah Man, 4,041,507, Cl. 354-64.000.

W. R. Grace & Co.: *See—*
Simons, Charles W.; O'Neill, Gerald J.; and Gribens, Joel A., 4,041,148, Cl. 424-45.000.

W. van den Broek's Machinefabriek B.V.: *See—*
van den Broek, Adriaan, 4,040,190, Cl. 34-11.000.

WABCO Westinghouse: *See—*
Marcillaud, Roger, 4,040,674, Cl. 303-22.00R.

WABCO Westinghouse GmbH: *See—*
Ahaus, Gerhard; Netzer, Siegfried; and Liebig, Hans-Peter, 4,040,673, Cl. 303-6.00C.
Gottling, Helmut, 4,040,437, Cl. 137-102.000.

Wada, Yukio; Abura, Yoshinori; and Matsui, Takeshi, to Matsushita Electric Works, Ltd. Electric device having rotary current collecting means. 4,040,696, Cl. 339-8.00R.

Waddington, William T.; Jenkins, Harold F.; and Filak, Paul T., to Amerace Corporation. Tubular electrical connector. 4,040,711, Cl. 339-198.00R.

Waeldner, William J.; and Harris, William J., to Dynamics Corporation of America. System powered damper and control unit. 4,040,564, Cl. 236-49.000.

Wagner, Herbert A., to Gulton Industries, Inc. Railroad track profile spacing and alignment apparatus. 4,040,738, Cl. 356-1.000.

Wagner, John Francis: *See—*
Kahan, William; Rupinski, Fredrick Alexander; Wagner, John Francis; and Peer, Thomas Richard, 4,040,277, Cl. 66-154.00A.

Wagner, Joseph E., III: *See—*
Williams, Lloyd E.; Mays, Robert K.; and Wagner, Joseph E., III, 4,041,135, Cl. 423-329.000.

Wahl, Josef; Schmidt, Peter Jurgen; and Zechnall, Richard, to Robert Bosch GmbH. Apparatus repetitively controlling the composition of exhaust emissions from internal combustion engines, in predetermined intervals. 4,040,394, Cl. 123-32.0EA.

Wakiyama, Yoshinori: *See—*
Inaba, Hideya; Ichiki, Masayoshi; and Wakiyama, Yoshinori, 4,040,981, Cl. 252-463.000.

Walasewicz, Stanley John; Erickson, Virgil William; Harrison, Robert Adams; and Houghton, Royal Elwin, to Bryant Grinder Corporation. Grinding wheel truing mechanism. 4,040,409, Cl. 125-11.0AS.

Walden, John P., to General Electric Company. DC to AC inverter having improved switching efficiency, overload and thermal protection features. 4,041,544, Cl. 361-106.000.

Waldofner, Karl-Heinz: *See—*
Voss, Eitel; Waldofner, Karl-Heinz; and Harz, Kurt, 4,040,789, Cl. 23-230.00A.

Walendziewicz, Eugene T.: *See—*
Kratz, Gary L.; Sproul, William W., III; Walendziewicz, Eugene T.; Wallis, Donald E.; and Dennis, Charles A., 4,041,461, Cl. 364-200.000.

Walk, Howard J.; and Rollins, Dallas W., to ACF Industries, Incorporated. Combination hatch covers. 4,040,363, Cl. 105-377.000.

Walker, Frederick J.: *See—*
Rolt, Anthony P. R.; Walker, Frederick J.; and Webb, Oswald, 4,040,271, Cl. 64-26.000.

Walker, Ronald Jay; Sherwin, Dewayne James; and Rumpf, Robert John, to Firestone Tire & Rubber Company, The. Retractor lock and pawl saddle therefor. 4,040,576, Cl. 242-107.40A.

Walkington, Colin, to Masson Scott Thrissell Engineering Limited. Sheet feeding apparatus. 4,040,617, Cl. 271-177.000.

Wallace, Earl C.; and Bell, Richard A., to General Engineering & Mfg. Corporation. Arm rest assembly for seating structures. 4,040,665, Cl. 297-417.000.

Wallace, Earl C., to General Engineering & Manufacturing Corporation. Method of forming tufted cushion elements. 4,040,881, Cl. 156-93.000.

Wallace, Roslyn E.: *See—*
Petricciani, John C.; Hopps, Hope E.; Lorenz, Douglas E.; Vasington, Paul J.; and Wallace, Roslyn E., 4,040,905, Cl. 195-1.800.

Wallis, Donald E.: *See—*
Kratz, Gary L.; Sproul, William W., III; Walendziewicz, Eugene T.; Wallis, Donald E.; and Dennis, Charles A., 4,041,461, Cl. 364-200.000.

Walls, Leroy C., to Lewals, Inc. Disc advancing and metering device. 4,040,513, Cl. 198-530.000.

Walon, Raoul G. P., to CPC International Inc. Process of refining enzymatically produced levulose syrups. 4,040,861, Cl. 127-46.00A.

Walters, James H. Animal feeding device. 4,040,389, Cl. 119-52.00R.

Walworth, Bryant Leonidas: *See—*
Cross, Barrington; and Walworth, Bryant Leonidas, 4,041,046, Cl. 548-375.000.

Wang, Hsug-Fang: *See—*
Lee, Char-Shin; and Wang, Hsug-Fang, 4,040,298, Cl. 73-406.000.

Wang, Richard H. S.; Newland, Gordon C.; and Pacifici, James G., to Eastman Kodak Company. Photopolymerizable polymeric compositions containing halogen containing heterocyclic compound. 4,040,922, Cl. 204-159.150.

Wang, Richard Hsu-Shien: *See—*
Pond, David Martin; and Wang, Richard Hsu-Shien, 4,041,011, Cl. 260-45.8NT.

Ward, Gregory A.; and Casey, Lawrence P., III, to Casard Industries, Inc. Plastic bag and carrier handle. 4,040,562, Cl. 229-54.00R.

Warner-Lambert Company: *See—*
Fabian, Arthur C.; Genzer, Jerome D.; Kasulanis, Charles Francis; Shavel, John, Jr.; and Zinnes, Harold, 4,041,042, Cl. 260-301.000.
Satzinger, Gerhard; Herrmann, Manfred; and Vollmer, Karl-Otto, 4,041,166, Cl. 424-267.000.

Warrick, Robert J.: *See—*
Hetke, Adolf; Mohla, Prem P.; and Warrick, Robert J., 4,040,821, Cl. 75-134.00S.

Wasag Chemie GmbH: *See—*
Wiedemann, Wolfgang; and Platte, Friedrich, 4,040,570, Cl. 241-3.000.

Washall, Thomas A., to Atlantic Richfield Company. Recovery of selenium from urethane solutions. 4,041,139, Cl. 423-508.000.

Washburn, Ralph G., to Sippican Corporation, The. Calibrating a measurement system including bridge circuit. 4,041,382, Cl. 324-65.00R.

Washio, Takaji; Sasaki, Koichi; and Aizawa, Tatsuo, to Mita Industrial Co. Ltd. Electrostatic photographic copying apparatus. 4,040,387, Cl. 118-658.000.

Wason, Satish K., to J. M. Huber Corporation. Preparation of precipitated silicas having controlled refractive index. 4,040,858, Cl. 106-288.00B.

Watanabe, Haruo; Kitagawa, Toru; Negishi, Masaaki; Aonuki, Kiichi; and Kobayashi, Harunobu, to Showa Sangyo Co. Ltd. Method of improving the oxidation resistance of an oil or fat. 4,041,059, Cl. 260-424.000.

Watanabe, Kenkichi; and Ohsako, Kyoichi, to Laurel Bank Machine Co., Ltd. Device for detecting stack of coins for use in coins-packaging machine. 4,040,434, Cl. 133-1.00A.

Watanabe, Masazumi: *See—*
Sugihara, Hirosada; Motohashi, Michio; Watanabe, Masazumi; Nishikawa, Masao; and Sanno, Yasushi, 4,041,079, Cl. 260-574.000.

Watanabe, Takeo: *See—*
Ohtsuka, Takaaki; Satake, Keigo; Yamazaki, Shiro; Hatakeyama, Nobuo; and Watanabe, Takeo, 4,041,170, Cl. 424-277.000.

Waters, Henry Cook, III: *See—*
Kim, Young Ran; Ornstein, Leonard; and Waters, Henry Cook, III, 4,040,785, Cl. 23-230.00B.

Waters, William D., to Youngstown Sheet and Tube Company. Epoxy composition and article of manufacture thereof. 4,041,007, Cl. 260-37.0EP.

Watkins-Johnson Co.: *See—*
Rose, Ralph E., 4,040,169, Cl. 29-577.000.

Watson, Douglas John: *See—*
Cambridge, Ronan Malcolm; and Watson, Douglas John, 4,041,255, Cl. 179-175.30R.

Watson, James M., to Cosden Technology, Inc. Polymerization inhibitor for vinyl aromatic compounds. 4,040,912, Cl. 203-9.000.

Watson, Wayne T., to Therm-O-Disc, Incorporated. Vented thermostat. 4,041,433, Cl. 337-112.000.

Watt, Richard Edwin, to Cubic Corporation. Measurement system calibrated to be insensitive to temperature variation induced changes in internal phase shifts present in the system. 4,041,490, Cl. 343-17.700.

Watts, Gary P., to Sperry Electronics Ltd. Television remote control system. 4,041,400, Cl. 325-392.000.

Watts, Horace, to H. & D. E. Watts. Mixer taps or valves. 4,040,446, Cl. 137-625.170.

Watts, Lewis W., Jr.: *See—*
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Weatherchem Corporation: *See—*
Tecco, Charles, 4,040,595, Cl. 249-68.000.

Webb, George, to Avco Corporation. Hydraulic delayed arming fuze. 4,040,358, Cl. 102-79.000.

Webb, Oswald: *See—*
Rolt, Anthony P. R.; Walker, Frederick J.; and Webb, Oswald, 4,040,271, Cl. 64-26.000.

Weber Marking Systems, Inc.: *See—*
Faust, Hans B., 4,040,351, Cl. 101-382.0MV.

Webster, Donald R., to Neotec Corporation. Optical analyzer for agricultural products. 4,040,747, Cl. 356-188.000.

Wechsler, Reuben, to Motorola, Inc. Microwave oven power control circuit. 4,041,267, Cl. 219-10.55B.

Weenink, Leon Pieter: *See—*
De Bresser, Gijsbert Frederik Maria; Kassenaar, Teunis Adrianus; Veraa, Ludovicus-Gerardus Johannes Godefrida; and Weenink, Leon Pieter, 4,040,706, Cl. 339-103.00R.

Wehrli, Alfons: *See—*
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Wei, Lun-Shin: *See—*
Nelson, Alvin I.; Steinberg, Marvin P.; and Wei, Lun-Shin, 4,041,187, Cl. 426-598.000.

Weidenfeller, Gordon J.: *See—*
Pierson, Fred W., Sr.; Pierson, Fred W., Jr.; and Weidenfeller, Gordon J., 4,040,597, Cl. 249-134.000.

Weik, Kirby B.: *See—*
Hogan, Gerard T.; and Weik, Kirby B., 4,040,661, Cl. 297-284.000.

Weiss, William Robert; Saich, Anthony Michael; and Cooksey, James Judson, to Allied Chemical Corporation. Noise reduction insert for apparatus to prevent melted yarn stopped in a high temperature yarn texturing jet. 4,040,782, Cl. 28-271.000.

Weissman, Eugene Y.: *See—*
Argade, Shyam D.; Bortak, John J.; Collins, Stephen M.; and Weissman, Eugene Y., 4,040,935, Cl. 204-256.000.

Weller, Heber W., Jr., to United States of America, Agriculture. Electrodes for electrostatic fiber collecting and spinning apparatus. 4,040,243, Cl. 57-58.890.

Welsh, Lawrence B.: *See—*
Bauer, Carl F.; Welsh, Lawrence B.; Youtsey, Karl J.; and Szofran, Frank R., 4,040,929, Cl. 204-195.00S.

West Electric Co., Ltd.: *See—*
Iwata, Hiroshi; and Ishikawa, Katsuji, 4,041,512, Cl. 354-234.000.

West, Philip W.: *See—*
Nelms, Leonard H.; Reiszner, Kenneth D.; and West, Philip W., 4,040,805, Cl. 55-158.000.

Westdorp, Wolfgang Alfred: *See—*
Patrick, William John; and Westdorp, Wolfgang Alfred, 4,040,895, Cl. 156-618.000.

Westerman, David J.; McTamaney, Louis S.; and Kauber, David J., to FMC Corporation. Solid state relay circuit. 4,041,331, Cl. 307-252.00Q.

Western Cutlery Co.: *See—*
Johnson, Lawrence P., 4,040,181, Cl. 30-161.000.

Western Electric Co., Inc.: *See—*
Fuchs, Francis Joseph, Jr., 4,040,284, Cl. 72-272.000.

Western Geophysical Co. of America: *See—*
Thigpen, Ben B., 4,041,443, Cl. 340-15.5AF.

Western Plastics Corporation: *See—*
LaBranche, Harvey W., 4,040,651, Cl. 285-113.000.

Westinghouse Electric Corporation: *See—*
Bleiberg, Melvin L.; Diamond, Sidney; Rowcliffe, Arthur F.; and Spitznagel, John A., 4,040,876, Cl. 148-37.000.
Elbling, Irving N.; and Saunders, Howard E., 4,040,993, Cl. 260-18.0EP.
Heverly, James S., 4,040,557, Cl. 228-9.000.
Johnson, Joseph E.; and Ostop, John A., 4,040,877, Cl. 148-187.000.
Lampe, Donald R.; and White, Marvin H., 4,041,298, Cl. 235-193.000.
Lange, Frederick F.; and Terwilliger, Gerald R., 4,041.123, Cl. 264-332.000.
Mole, Cecil J., 4,041,337, Cl. 310-178.000.
Pasculle, Maurice J.; Merrill, Edgar F.; and Heyne, Carl J., 4,041,543, Cl. 361-33.000.
Schlegel, Earl S.; and Page, Derrick J., 4,040,170, Cl. 29-577.000.
Simmonds, Leonard B., 4,040,971, Cl. 252-62.540.
Taylor, John W., Jr.; and McGrew, Carl A., 4,041,491, Cl. 343-100.00R.

Wetzel, Rodney J.: *See—*
Lamb, William C.; and Wetzel, Rodney J., 4,040,524, Cl. 214-2.500.

Wheeler, Lewis Halsay, to Air Preheater Company, Inc., The. Annular lens cleaner. 4,040,473, Cl. 165-5.000.

Whirlpool Corporation: *See—*
Swanson, Donald F., 4,040,267, Cl. 62-180.000.

White, Howard L., to Ciba-Geigy Corporation. Process for the production of 2-aryl-2H-benzotriazoles. 4,041,044, Cl. 260-308.00B.
White, Loren Hawdon: *See—*
Dierberger, James Albert; and White, Loren Hawdon, 4,040,767, Cl. 415-115.000.
White, Marvin H.: *See—*
Lampe, Donald R.; and White, Marvin H., 4,041,298, Cl. 235-193.000.
White, Paul L.: *See—*
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Whitehouse, David R.; and Hartshorn, David W., to Raytheon Company. Flash lamp power supply with direct energization from an AC power supply source. 4,041,351, Cl. 315-205.000.
Whittingham, M. Stanley, to Exxon Research and Engineering Company. Preparation of intercalated chalcogenides. 4,040,917, Cl. 204-92.000.
Wiacek, Marian, to Unican Electrochemical Products Ltd. Production of zinc-air button cell. 4,041,211, Cl. 429-36.000.
Wicker, Alain: *See—*
Desplanches, Gerard; Lazennec, Yvon; and Wicker. Alain, 4,041,216, Cl. 429-104.000.
Wiedemann, Wolfgang; and Platte, Friedrich, to Wasag Chemie GmbH. Preparation of uniform black powder granules. 4,040,570, Cl. 241-3.000.
Wigger, Ralph O.: *See—*
Eggers, Frank W., III; Wigger, Ralph O.; and Coan, Richard L., 4,040,865, Cl. 134-7.000.
Wiggins, Edwin W.; and Carpenter, James F., to McDonnell Douglas Corporation. Polyurethane foam reconstitution. 4,040,991, Cl. 260-2.5BD.
Wightman, R. Mark: *See—*
Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,041,346, Cl. 313-336.000.
Wilder, Thomas C.: *See—*
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Wiley, Kenneth, to Raymond Lee Organization, Inc., The, a part interest. Picture hanging device. 4,040,593, Cl. 248-489.000.
Wilhelm Dahle Buro- und Zeichengeratefabrik: *See—*
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Wilke, Raud A., to Koehring. Control valve with flow control means. 4,040,438, Cl. 137-106.000.
Wilkins, David G.: *See—*
Campbell, George W., Jr.; Wilkins, David G.; and Muench, Jerome T., 4,041,132, Cl. 423-279.000.
Wilkis, Anthony J.: *See—*
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Will, Fritz G.; and Holub, Fred F., to General Electric Company. Zinc plating bath and method of forming a non-dendritic zinc layer. 4,040,916, Cl. 204-55.00R.
Will Ross, Inc.: *See—*
Hunt, James R., 4,040,424, Cl. 128-290.00R.
Wille, Richard M. Fishing tackle storage case. 4,040,202, Cl. 43-57.50A.
Williams, Garland S. Detachable connection for pivotally mounting a face shield to a head protector. 4,040,123, Cl. 2-10.000.
Williams, John Lloyd: *See—*
Wisdom, Graham John; Creteau, Peter Verne; and Williams, John Lloyd, 4,041,460, Cl. 364-900.000.
Williams, Lloyd E.; Mays, Robert K.; and Wagner, Joseph E., III, to J. M. Huber Corporation. Production of high capacity inorganic crystalline base exchange materials. 4,041,135, Cl. 423-329.000.
Williams, Maurice Charles, to Perma Rain Irrigation, Inc. Method of molding a skate wheel having a polyester core and a polyurethane case and the product thereof. 4,040,670, Cl. 301-5.300.
Williams, Raymond H.; and Misiaszek, Emil J., to Williams Tool, Inc. Sedimentation recorder. 4,041,502, Cl. 346-33.00A.
Williams, Robert E. Strippable tape. 4,041,202, Cl. 428-138.000.
Williams Tool, Inc.: *See—*
Williams, Raymond H.; and Misiaszek, Emil J., 4,041,502, Cl. 346-33.00A.
Williamson, Harold L.; and Aryamane, Avinash P., to Littelfuse, Inc. Method of making a miniature plug-in fuse with fragile fuse link. 4,040,175, Cl. 29-623.000.
Willmann, Erich: *See—*
Michel, Wilfried; Reichert, Hartmut; and Willmann, Erich, 4,041,503, Cl. 346-83.000.
Willson, Michael C.: *See—*
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Wilson, Alexander Connor, to Airflow Developments Limited. Fluid flow measuring device. 4,040,293, Cl. 73-211.000.
Wilson Foods Corporation: *See—*
Karjala, Sulo A., 4,041,150, Cl. 424-71.000.
Wilson, Homer M., to Petrolite Corporation. Corrosion ratemeter. 4,040,931, Cl. 204-195.00C.
Wilson, John J.; and Rhoades, Donald M., to Logansport Machine Co., Inc. Fluid supply distributor. 4,040,338, Cl. 92-106.000.
Wilson, Richard John Hugh, to Brewing Patents Limited. Introducing gases into fermentation liquids. 4,041,180, Cl. 426-11.000.
Wilson, Thomas William; and Topham, Michael Johnston, to Tootal Limited. Automatic weighing machines. 4,040,496, Cl. 177-105.000.
Wilton Corporation: *See—*
Kartasuk, Raymond H.; Smierciak, Walter R.; and Hlinka, Edward A., 4,040,613, Cl. 269-247.000.
Windhager, Robert H.: *See—*
Sharpe, Andrew Jackson, Jr.; Windhager, Robert H.; and Hearp, Kathleen Seese, 4,040,984, Cl. 252-500.000.
Winkelmann, Detlef; Lohr, Bernd; and Stieger, Helmut, to Hoechst Aktiengesellschaft. Apparatus for microfilm re-enlargement. 4,040,735, Cl. 355-10.000.
Winkle, Roy Victor: *See—*
Hight, Michael John; Winkle, Roy Victor; and Dale, John Robert, 4,040,885, Cl. 156-378.000.
Winkler, Emil; and Kappler, Manfred, to Fa. Frey & Winkler GmbH & Co. KG. Articulated nose support for spectacle frame. 4,040,729, Cl. 351-137.000.
Winnie, Alon P., to Kendall Company, The. Catheter support assembly. 4,040,427, Cl. 128-348.000.
Winzelberg, Abraham, to Frank Ellman Co., Inc. Method and apparatus for making jewelry bands. 4,040,285, Cl. 72-370.000.
Wirth, Walter: *See—*
Hergeth, Herbert; and Wirth, Walter, 4,040,948, Cl. 209-22.000.
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CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar. 30, 1976	Jan. 11, 1977
B 54,859	4,000,101	Feb. 17, 1976	Dec. 28, 1976
B 59,512	3,999,216	Mar. 16, 1976	Dec. 21, 1976
B 66,272	4,014,978	Feb. 24, 1976	Mar. 29, 1977
B 71,613	4,008,393	Mar. 16, 1976	Feb. 15, 1977
B 73,017	4,001,879	Mar. 9, 1976	Jan. 4, 1977
B 78,315	3,982,192	Feb. 10, 1976	Sep. 21, 1976
B 79,099	3,982,177	Jan. 13, 1976	Sep. 21, 1976
B 97,259	3,999,614	Mar. 9, 1976	Dec. 28, 1976
B 105,006	4,007,074	Mar. 23, 1976	Feb. 8, 1977
B 111,130	4,001,380	Mar. 16, 1976	Jan. 4, 1977
B 141,968	4,013,442	Mar. 30, 1976	Mar. 22, 1977
B 150,142	3,981,767	Jan. 27, 1976	Sep. 21, 1976
B 159,570	4,036,870	Mar. 23, 1976	July 19, 1977
B 160,045	3,983,446	Jan. 13, 1976	Sep. 28, 1976
B 160,099	3,987,221	Jan. 13, 1976	Oct. 19, 1976
B 163,463	3,981,659	Jan. 27, 1976	Sep. 21, 1976
B 167,470	4,001,101	Mar. 2, 1976	Jan. 4, 1977
B 181,208	4,001,391	Mar. 9, 1976	Jan. 4, 1977
B 200,759	3,986,872	Feb. 3, 1976	Oct. 19, 1976
B 208,916	3,987,106	Jan. 13, 1976	Oct. 19, 1976
B 214,925	3,997,648	Mar. 9, 1976	Dec. 14, 1976
B 231,416	4,000,054	Mar. 30, 1976	Dec. 28, 1976
B 236,266	4,013,624	Mar. 23, 1976	Mar. 22, 1977
B 236,342	4,001,182	Feb. 10, 1976	Jan. 4, 1977
B 248,240	3,983,556	Jan. 13, 1976	Sep. 28, 1976
B 257,143	4,000,111	Mar. 16, 1976	Dec. 28, 1976
B 270,274	3,982,223	Feb. 17, 1976	Sep. 21, 1976
B 270,351	3,997,893	Mar. 30, 1976	Dec. 14, 1976
B 271,743	4,001,195	Mar. 16, 1976	Jan. 4, 1977
B 276,026	3,992,405	Feb. 3, 1976	Nov. 16, 1976
B 279,415	4,000,697	Mar. 16, 1976	Jan. 4, 1977
B 279,969	3,986,073	Jan. 13, 1976	Oct. 12, 1976
B 281,162	4,009,481	Mar. 23, 1976	Feb. 22, 1977
B 283,941	3,995,313	Feb. 3, 1976	Nov. 30, 1976
B 288,757	4,001,072	Mar. 30, 1976	Jan. 4, 1977
B 301,143	3,991,107	Jan. 27, 1976	Nov. 9, 1976
B 302,160	3,985,774	Feb. 3, 1976	Oct. 12, 1976
B 306,668	3,985,713	Feb. 3, 1976	Oct. 12, 1976
B 307,698	3,993,763	Feb. 3, 1976	Nov. 23, 1976
B 308,659	3,981,947	Jan. 27, 1976	Sep. 21, 1976
B 311,450	3,988,976	Mar. 9, 1976	Nov. 2, 1976
B 311,779	4,013,481	Feb. 10, 1976	Mar. 22, 1977
B 313,280	4,003,591	Apr. 6, 1976	Jan. 18, 1977
B 326,211	3,988,272	Mar. 23, 1976	Oct. 26, 1976
B 328,065	4,014,752	Mar. 30, 1976	Mar. 29, 1977
B 328,077	4,014,860	Apr. 13, 1976	Mar. 29, 1977
B 328,116	4,000,774	Mar. 9, 1976	Jan. 4, 1977
B 330,719	4,001,121	Mar. 16, 1976	Jan. 4, 1977
B 330,736	3,996,299	Feb. 3, 1976	Dec. 7, 1976
B 332,442	4,001,231	Mar. 30, 1976	Jan. 4, 1977
B 333,110	3,989,867	Mar. 16, 1976	Nov. 2, 1976
B 333,247	4,001,201	Mar. 16, 1976	Jan. 4, 1977
B 333,838	4,006,263	Mar. 23, 1976	Feb. 1, 1977
B 335,783	4,013,744	Mar. 30, 1976	Mar. 22, 1977
B 336,754	3,989,805	Mar. 16, 1976	Nov. 2, 1976
B 337,023	4,013,188	Mar. 30, 1976	Mar. 22, 1977
B 337,823	4,002,746	Mar. 23, 1976	Jan. 11, 1977
B 339,194	3,982,215	Feb. 3, 1976	Sep. 21, 1976
B 339,446	4,001,067	Feb. 24, 1976	Jan. 4, 1977
B 340,170	4,000,444	Mar. 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar. 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar. 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct. 5, 1976
B 349,370	3,989,684	Jan. 27, 1976	Nov. 2, 1976
B 351,455	4,001,309	Feb. 24, 1976	Jan. 4, 1977
B 354,222	4,012,305	Mar. 23, 1976	Mar. 15, 1977
B 354,959	3,995,996	Feb. 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan. 20, 1976	Sep. 21, 1976
B 356,470	4,014,789	Mar. 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar. 23, 1976	Jan. 4, 1977
B 358,260	3,989,661	Mar. 30, 1976	Nov. 2, 1976
B 358,427	3,989,896	Feb. 3, 1976	Nov. 2, 1976
B 359,768	4,013,684	Mar. 30, 1976	Mar. 22, 1977
B 359,901	3,981,729	Jan. 13, 1976	Sep. 21, 1976
B 361,954	4,014,753	Apr. 6, 1976	Mar. 29, 1977
B 363,565	4,004,821	Mar. 30, 1976	Jan. 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec. 7, 1976
B 367,092	4,014,920	Apr. 13, 1976	Mar. 29, 1977
B 367,305	3,998,640	Mar. 2, 1976	Dec. 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb. 24, 1976	Oct. 12, 1976
B 369,373	4,013,683	Mar. 23, 1976	Mar. 22, 1977
B 369,379	4,013,754	Mar. 30, 1976	Mar. 22, 1977
B 370,309	3,989,640	Jan. 20, 1976	Nov. 2, 1976
B 371,095	4,005,074	Mar. 23, 1976	Jan. 25, 1977
B 371,635	4,010,290	Mar. 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar. 2, 1976	Dec. 7, 1976
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B 372,232	4,000,967	Mar. 16, 1976	Jan. 4, 1977
B 372,722	3,998,925	Mar. 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan. 27, 1976	Nov. 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb. 15, 1977
B 374,588	3,985,899	Jan. 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar. 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan. 27, 1976	Sep. 21, 1976
B 378,760	4,001,477	Mar. 9, 1976	Jan. 4, 1977
B 379,177	3,981,976	Jan. 27, 1976	Sep. 21, 1976
B 380,137	4,014,802	Mar. 23, 1976	Mar. 29, 1977
B 381,006	4,009,447	Apr. 6, 1976	Feb. 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct. 5, 1976
B 381,985	3,990,775	Feb. 3, 1976	Nov. 9, 1976
B 382,120	4,013,639	Mar. 23, 1976	Mar. 22, 1977
B 383,697	4,008,211	Feb. 17, 1976	Feb. 15, 1977
B 384,225	3,998,523	Mar. 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan. 27, 1976	Oct. 12, 1976
B 384,654	3,992,681	Feb. 24, 1976	Nov. 16, 1976
B 385,024	3,994,911	Feb. 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb. 17, 1976	Nov. 23, 1976
B 385,631	3,982,924	Jan. 27, 1976	Sep. 28, 1976
B 386,257	3,981,915	Feb. 3, 1976	Sep. 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov. 23, 1976
B 386,828	3,992,440	Feb. 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar. 16, 1976	Jan. 25, 1977
B 388,675	4,012,459	Mar. 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar. 30, 1976	Jan. 4, 1977
B 389,304	3,986,829	Jan. 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan. 13, 1976	Oct. 12, 1976
B 390,408	3,992,426	Feb. 3, 1976	Nov. 16, 1976
B 390,979	4,003,850	Mar. 23, 1976	Jan. 18, 1977
B 391,473	3,988,370	Mar. 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar. 9, 1976	Oct. 26, 1976
B 391,828	4,014,933	Apr. 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar. 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar. 30, 1976	Dec. 7, 1976
B 394,248	3,989,764	Jan. 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan. 13, 1976	Sep. 21, 1976
B 394,742	4,009,285	Apr. 13, 1976	Feb. 22, 1977
B 395,554	3,998,156	Mar. 9, 1976	Dec. 21, 1976
B 395,97'	4,001,085	Mar. 2, 1976	Jan. 4, 1977
B 396,16	3,989,590	Feb. 3, 1976	Nov. 2, 1976
B 396,37	D 243,148	Apr. 6, 1976	Jan. 25, 1977
B 397,67·	3,998,438	Mar. 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb. 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct. 26, 1976
B 399,098	3,997,665	Feb. 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan. 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb. 17, 1976	Nov. 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr. 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar. 2, 1976	Nov. 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep. 28, 1976
B 402,657	4,013,665	Apr. 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb. 3, 1976	Nov. 9, 1976
B 403,076	4,014,917	Apr. 20, 1976	Mar. 29, 1977
B 403,243	3,996,232	Mar. 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar. 23, 1976	Jan. 4, 1977
B 403,477	3,995,315	Feb. 3, 1976	Nov. 30, 1976
B 403,507	3,982,095	Feb. 10, 1976	Sep. 21, 1976
B 403,766	3,994,834	Feb. 10, 1976	Nov. 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan. 4, 1977
B 405,726	3,981,241	Jan. 13, 1976	Sep. 21, 1976
B 406,546	D 242,966	Mar. 16, 1976	Jan. 11, 1977
B 407,205	4,000,966	Mar. 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb. 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar. 23, 1976	Mar. 1, 1977
B 408,123	4,014,887	Apr. 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan. 27, 1976	Sep. 28, 1976
B 410,074	4,001,303	Feb. 24, 1976	Jan. 4, 1977
B 410,694	3,995,530	Mar. 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb. 17, 1976	Sep. 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan. 4, 1977
B 411,765	3,993,428	Feb. 24, 1976	Nov. 23, 1976
B 412,068	3,981,244	Jan. 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar. 23, 1976	Feb. 8, 1977
B 413,379	4,001,325	Mar. 9, 1976	Jan. 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb. 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan. 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov. 9, 1976
B 415,021	3,994,173	Mar. 2, 1976	Nov. 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,122	3,997,503	Feb. 10, 1976	Dec. 14, 1976	B 440,548	4,001,271	Mar. 16, 1976	Jan. 4, 1977
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan. 4, 1977	B 440,633	4,000,116	Feb. 10, 1976	Dec. 28, 1976
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 417,014	3,981,851	Jan. 13, 1976	Sep. 21, 1976	B 441,543	4,014,755	Mar. 23, 1976	Mar. 29, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan. 4, 1977	B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar. 9, 1976	Oct. 12, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar. 22, 1977	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 418,489	3,989,592	Jan. 13, 1976	Nov. 2, 1976	B 442,163	D 242,192	Mar. 16, 1976	Nov. 9, 1976
B 419,173	3,999,728	Mar. 9, 1976	Dec. 28, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov. 2, 1976	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 420,176	4,001,017	Mar. 16, 1976	Jan. 4, 1977	B 442,810	3,997,533	Feb. 24, 1976	Dec. 14, 1976
B 420,321	3,990,645	Mar. 30, 1976	Nov. 9, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 420,472	3,993,934	Feb. 24, 1976	Nov. 23, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 421,373	4,001,326	Mar. 23, 1976	Jan. 4, 1977	B 442,970	3,989,890	Feb. 3, 1976	Nov. 2, 1976
B 421,608	4,013,806	Mar. 23, 1976	Mar. 22, 1977	B 443,163	3,981,242	Feb. 3, 1976	Sep. 21, 1976
B 421,975	3,994,693	Mar. 2, 1976	Nov. 30, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 422,063	3,994,835	Feb. 3, 1976	Nov. 30, 1976	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 422,156	4,010,401	Mar. 23, 1976	Mar. 1, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 423,365	3,996,186	Feb. 17, 1976	Dec. 7, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 423,404	3,990,958	Mar. 2, 1976	Nov. 9, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 444,294	4,013,634	Mar. 30, 1976	Mar. 22, 1977
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct. 19, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 424,354	D 242,416	Feb. 10, 1976	Nov. 23, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 424,410	4,021,196	Mar. 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 424,989	3,990,569	Feb. 3, 1976	Nov. 9, 1976	B 445,690	3,999,584	Feb. 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar. 23, 1976	Jan. 11, 1977	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 425,285	4,014,676	Apr. 13, 1976	Mar. 29, 1977	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar. 9, 1976	Dec. 21, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,588	3,985,111	Jan. 13, 1976	Oct. 12, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 426,157	4,013,714	Mar. 23, 1976	Mar. 22, 1977	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar. 2, 1976	Dec. 21, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,266	3,998,839	Mar. 2, 1976	Dec. 21, 1976	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar. 29, 1977	B 450,413	4,007,463	Mar. 23, 1976	Feb. 8, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,639	3,992,539	Feb. 3, 1976	Nov. 16, 1976	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 427,883	3,982,277	Jan. 20, 1976	Sep. 21, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 427,946	4,006,161	Mar. 23, 1976	Feb. 1, 1977	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 428,103	4,000,211	Feb. 10, 1976	Dec. 28, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 428,271	3,987,415	Mar. 23, 1976	Oct. 19, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,408	3,995,252	Mar. 2, 1976	Nov. 30, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 428,877	3,984,649	Jan. 27, 1976	Oct. 5, 1976	B 451,438	Re. 29,066	Mar. 2, 1976	Dec. 7, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov. 2, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct. 12, 1976
B 429,027	4,001,260	Mar. 23, 1976	Jan. 4, 1977	B 452,034	4,002,367	Mar. 23, 1976	Jan. 11, 1977
B 429,157	3,990,628	Jan. 27, 1976	Nov. 9, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov. 2, 1976	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 430,157	3,992,465	Feb. 17, 1976	Nov. 16, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan. 13, 1976	Sep. 28, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,213	4,013,514	Mar. 30, 1976	Mar. 22, 1977	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan. 20, 1976	Sep. 21, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb. 10, 1976	Nov. 23, 1976	B 452,915	4,013,933	Mar. 30, 1976	Mar. 22, 1977
B 430,326	4,003,581	Mar. 23, 1976	Jan. 18, 1977	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 430,334	3,981,677	Jan. 27, 1976	Sep. 21, 1976	B 452,944	4,009,773	Mar. 30, 1976	Mar. 1, 1977
B 431,072	3,985,610	Jan. 20, 1976	Oct. 12, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 431,334	3,988,095	Mar. 16, 1976	Oct. 26, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,713	4,000,167	Feb. 10, 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 431,785	3,999,950	Feb. 24, 1976	Dec. 28, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar. 30, 1976	Feb. 8, 1977	B 453,533	3,997,744	Feb. 17, 1976	Dec. 14, 1976
B 432,049	3,995,123	Mar. 23, 1976	Nov. 30, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 432,140	3,999,163	Mar. 23, 1976	Dec. 21, 1976	B 453,759	3,989,790	Jan. 27, 1976	Nov. 2, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar. 22, 1977	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,594	4,003,404	Mar. 30, 1976	Jan. 18, 1977	B 454,283	3,995,153	Feb. 3, 1976	Nov. 30, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec. 14, 1976	B 454,833	4,008,733	Mar. 30, 1976	Feb. 22, 1977
B 432,991	3,991,669	Mar. 2, 1976	Nov. 16, 1976	B 455,425	3,990,060	Feb. 3, 1976	Nov. 2, 1976
B 433,094	3,987,768	Jan. 27, 1976	Oct. 26, 1976	B 455,481	3,991,092	Feb. 24, 1976	Nov. 9, 1976
B 433,707	4,013,594	Mar. 23, 1976	Mar. 22, 1977	B 455,486	4,001,353	Mar. 16, 1976	Jan. 4, 1977
B 433,892	4,016,061	Apr. 6, 1976	Apr. 5, 1977	B 455,686	4,001,156	Mar. 2, 1976	Jan. 4, 1977
B 433,930	4,012,324	Mar. 23, 1976	Mar. 15, 1977	B 455,759	3,984,242	Feb. 24, 1976	Oct. 5, 1976
B 434,206	3,994,610	Feb. 3, 1976	Nov. 30, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 434,441	D 242,849	Mar. 16, 1976	Dec. 28, 1976	B 456,069	3,998,991	Mar. 9, 1976	Dec. 21, 1976
B 435,481	4,000,892	Mar. 9, 1976	Jan. 4, 1977	B 456,148	3,984,269	Jan. 13, 1976	Oct. 5, 1976
B 435,570	4,000,908	Mar. 16, 1976	Jan. 4, 1977	B 456,153	3,997,992	Mar. 9, 1976	Dec. 21, 1976
B 435,617	4,001,234	Mar. 16, 1976	Jan. 4, 1977	B 456,384	4,014,859	Apr. 6, 1976	Mar. 29, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov. 16, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan. 4, 1977	B 456,869	4,001,277	Mar. 9, 1976	Jan. 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov. 23, 1976	B 456,900	3,996,262	Feb. 3, 1976	Dec. 7, 1976
B 437,596	3,985,638	Jan. 27, 1976	Oct. 12, 1976	B 456,905	4,013,431	Mar. 23, 1976	Mar. 22, 1977
B 437,894	4,001,015	Mar. 2, 1976	Jan. 4, 1977	B 457,547	3,996,397	Feb. 17, 1976	Dec. 7, 1976
B 437,986	4,011,399	Apr. 20, 1976	Mar. 8, 1977	B 457,850	3,993,586	Feb. 10, 1976	Nov. 23, 1976
B 438,048	4,001,394	Mar. 23, 1976	Jan. 4, 1977	B 457,862	3,987,195	Jan. 27, 1976	Oct. 19, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov. 16, 1976	B 457,886	3,988,498	Jan. 13, 1976	Oct. 26, 1976
B 438,882	3,983,719	Feb. 24, 1976	Oct. 5, 1976	B 457,931	4,001,229	Mar. 16, 1976	Jan. 4, 1977
B 438,916	3,983,050	Jan. 13, 1976	Sep. 28, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 439,542	3,982,199	Jan. 27, 1976	Sep. 21, 1976	B 458,617	3,984,422	Feb. 3, 1976	Oct. 5, 1976
B 439,778	4,001,455	Feb. 3, 1976	Jan. 4, 1977	B 458,964	3,996,615	Mar. 2, 1976	Dec. 7, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 459,190	4,010,786	Mar. 30, 1976	Mar. 8, 1977	B 475,236	3,989,990	Feb. 3, 1976	Nov. 2, 1976
B 459,381	4,000,017	Mar. 9, 1976	Dec. 28, 1976	B 475,385	4,001,071	Mar. 9, 1976	Jan. 4, 1977
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977	B 475,681	3,983,332	Jan. 20, 1976	Sep. 28, 1976
B 459,597	3,996,711	Feb. 17, 1976	Dec. 14, 1976	B 476,267	4,005,068	Apr. 6, 1976	Jan. 25, 1977
B 459,811	3,982,173	Jan. 20, 1976	Sep. 21, 1976	B 476,372	3,985,771	Feb. 24, 1976	Oct. 12, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb. 1, 1977	B 476,542	4,013,549	Mar. 30, 1976	Mar. 22, 1977
B 460,388	3,989,448	Jan. 27, 1976	Nov. 2, 1976	B 476,568	3,999,456	Mar. 16, 1976	Dec. 28, 1976
B 460,441	3,981,828	Jan. 13, 1976	Sep. 21, 1976	B 476,577	3,982,070	Jan. 20, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct. 12, 1976	B 476,681	3,986,181	Jan. 13, 1976	Oct. 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov. 16, 1976	B 476,776	3,998,715	Mar. 23, 1976	Dec. 21, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan. 4, 1977	B 476,967	3,995,206	Mar. 9, 1976	Nov. 30, 1976
B 461,336	3,982,231	Feb. 3, 1976	Sep. 21, 1976	B 477,252	3,985,759	Jan. 13, 1976	Oct. 12, 1976
B 461,352	3,981,681	Jan. 13, 1976	Sep. 21, 1976	B 477,481	3,991,076	Feb. 3, 1976	Nov. 9, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977	B 477,584	D 242,855	Apr. 6, 1976	Dec. 28, 1976
B 461,752	4,016,541	Apr. 20, 1976	Apr. 5, 1977	B 477,597	3,993,912	Feb. 17, 1976	Nov. 23, 1976
B 461,874	3,982,276	Jan. 27, 1976	Sep. 21, 1976	B 477,892	4,010,355	Mar. 30, 1976	Mar. 1, 1977
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977	B 478,234	4,010,421	Mar. 30, 1976	Mar. 1, 1977
B 462,386	3,988,188	Jan. 13, 1976	Oct. 26, 1976	B 478,739	3,992,253	Feb. 17, 1976	Nov. 16, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov. 2, 1976	B 479,175	3,985,700	Feb. 17, 1976	Oct. 12, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976	B 479,242	3,983,074	Feb. 17, 1976	Sep. 28, 1976
B 462,893	3,984,253	Feb. 24, 1976	Oct. 5, 1976	B 479,502	3,999,030	Mar. 16, 1976	Dec. 21, 1976
B 463,322	3,989,982	Jan. 20, 1976	Nov. 2, 1976	B 479,681	D 242,672	Mar. 16, 1976	Dec. 14, 1976
B 463,388	3,992,605	Feb. 10, 1976	Nov. 16, 1976	B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 463,473	4,002,068	Mar. 23, 1976	Jan. 11, 1977	B 480,114	4,001,327	Mar. 2, 1976	Jan. 4, 1977
B 463,591	4,015,051	Mar. 30, 1976	Mar. 29, 1977	B 480,251	4,008,700	Mar. 23, 1976	Feb. 22, 1977
B 463,671	3,985,385	Jan. 13, 1976	Oct. 12, 1976	B 480,287	4,006,029	Mar. 30, 1976	Feb. 1, 1977
B 464,027	3,999,390	Mar. 16, 1976	Dec. 28, 1976	B 480,292	3,994,011	Mar. 16, 1976	Nov. 23, 1976
B 464,290	3,990,307	Feb. 3, 1976	Nov. 9, 1976	B 480,350	3,994,164	Feb. 10, 1976	Nov. 30, 1976
B 464,491	4,015,612	Mar. 30, 1976	Apr. 5, 1977	B 480,384	3,999,737	Mar. 23, 1976	Dec. 28, 1976
B 464,587	3,991,091	Feb. 3, 1976	Nov. 9, 1976	B 480,452	3,994,923	Feb. 10, 1976	Nov. 30, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,473	3,995,608	Mar. 2, 1976	Dec. 7, 1976
B 465,145	3,981,148	Jan. 27, 1976	Sep. 21, 1976	B 480,604	3,985,251	Jan. 13, 1976	Oct. 12, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov. 2, 1976	B 480,625	3,996,227	Feb. 24, 1976	Dec. 7, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct. 19, 1976	B 480,662	3,988,382	Mar. 2, 1976	Oct. 26, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,740	3,996,431	Mar. 2, 1976	Dec. 7, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec. 14, 1976	B 480,749	3,999,207	Mar. 9, 1976	Dec. 21, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb. 8, 1977	B 480,987	4,001,459	Mar. 30, 1976	Jan. 4, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 481,048	3,998,542	Mar. 16, 1976	Dec. 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 481,190	4,013,468	Mar. 30, 1976	Mar. 22, 1977
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 481,600	3,981,235	Jan. 27, 1976	Sep. 21, 1976
B 466,444	3,986,039	Jan. 20, 1976	Oct. 12, 1976	B 481,737	3,982,057	Jan. 13, 1976	Sep. 21, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov. 23, 1976	B 481,778	4,001,385	Mar. 30, 1976	Jan. 4, 1977
B 466,929	3,991,195	Jan. 27, 1976	Nov. 9, 1976	B 481,930	3,992,717	Feb. 24, 1976	Nov. 16, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976	B 481,989	4,008,337	Mar. 23, 1976	Feb. 15, 1977
B 467,328	3,997,599	Mar. 9, 1976	Dec. 14, 1976	B 482,058	4,001,398	Mar. 2, 1976	Jan. 4, 1977
B 467,412	3,981,265	Jan. 13, 1976	Sep 21, 1976	B 482,660	3,995,026	Feb. 10, 1976	Nov. 30, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976	B 482,709	3,985,733	Feb. 24, 1976	Oct. 12, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 482,907	3,984,811	Jan. 20, 1976	Oct. 5, 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct. 26, 1976	B 483,247	4,001,889	Apr. 13, 1976	Jan. 4, 1977
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976	B 483,256	3,981,723	Feb. 10, 1976	Sep. 21, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan. 4, 1977	B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 468,350	3,981,922	Jan. 13, 1976	Sep. 21, 1976	B 483,606	3,986,990	Jan. 27, 1976	Oct. 19, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977	B 483,615	3,988,637	Jan. 27, 1976	Oct. 26, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan. 18, 1977	B 483,746	4,014,923	Mar. 23, 1976	Mar. 29, 1977
B 469,036	4,005,926	Mar. 16, 1976	Feb. 1, 1977	B 483,762	3,993,608	Feb. 10, 1976	Nov. 23, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec. 28, 1976	B 483,865	3,985,693	Jan. 13, 1976	Oct. 12, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 484,029	3,983,558	Feb. 10, 1976	Sep. 28, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct. 19, 1976	B 484,067	3,992,374	Feb. 17, 1976	Nov. 16, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar. 22, 1977	B 484,068	3,994,937	Mar. 2, 1976	Nov. 30, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep. 21, 1976	B 484,121	3,997,770	Mar. 16, 1976	Dec. 14, 1976
B 470,576	3,997,507	Feb. 24, 1976	Dec. 14, 1976	B 484,269	4,000,159	Feb. 10, 1976	Dec. 28, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct. 12, 1976	B 484,332	3,986,540	Mar. 2, 1976	Oct. 19, 1976
B 470,798	3,987,480	Jan. 20, 1976	Oct. 19, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep. 28, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan. 11, 1977	B 484,419	4,001,292	Mar. 9, 1976	Jan. 4, 1977
B 470,899	3,996,441	Mar. 2, 1976	Dec. 7, 1976	B 484,437	4,013,740	Mar. 30, 1976	Mar. 22, 1977
B 470,900	4,001,213	Mar. 2, 1976	Jan. 4, 1977	B 484,482	3,994,017	Mar. 23, 1976	Nov. 23, 1976
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977	B 484,769	3,999,498	Mar. 16, 1976	Dec. 28, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan. 4, 1977	B 485,051	3,992,418	Feb. 17, 1976	Nov. 16, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 485,060	3,983,067	Feb. 17, 1976	Sep. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov. 23, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov. 23, 1976	B 485,188	4,001,170	Mar. 16, 1976	Jan. 4, 1977
B 471,579	3,985,689	Jan. 13, 1976	Oct. 12, 1976	B 485,401	3,985,859	Jan. 27, 1976	Oct. 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov. 30, 1976	B 485,575	3,996,565	Feb. 24, 1976	Dec. 7, 1976
B 471,681	4,012,844	Apr. 13, 1976	Mar. 22, 1977	B 485,926	4,006,357	Mar. 23, 1976	Feb. 1, 1977
B 471,735	3,989,408	Feb. 3, 1976	Nov. 2, 1976	B 485,972	4,017,472	Mar. 23, 1976	Apr. 12, 1977
B 471,836	4,000,150	Feb. 24, 1976	Dec. 28, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep. 28, 1976
B 472,241	3,992,453	Feb. 17, 1976	Nov. 16, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec. 7, 1976
B 472,256	3,985,789	Jan. 13, 1976	Oct. 12, 1976	B 486,678	4,001,273	Mar. 2, 1976	Jan. 4, 1977
B 472,284	3,982,078	Jan. 13, 1976	Sep. 21, 1976	B 486,828	3,989,651	Mar. 2, 1976	Nov. 2, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar. 22, 1977	B 487,062	D 241,256	Feb. 10, 1976	Nov. 9, 1976
B 472,760	4,001,330	Apr. 13, 1976	Jan. 4, 1977	B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 473,039	3,985,747	Feb. 10, 1976	Oct. 12, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov. 2, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov. 9, 1976
B 473,813	3,989,071	Mar. 9, 1976	Nov. 2, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep. 28, 1976
B 473,972	3,984,043	Jan. 13, 1976	Oct. 5, 1976	B 487,423	3,998,810	Mar. 2, 1976	Dec. 21, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976	B 487,427	3,995,788	Mar. 2, 1976	Dec. 7, 1976
B 474,747	3,997,704	Feb. 24, 1976	Dec. 14, 1976	B 487,467	4,014,847	Apr. 13, 1976	Mar. 29, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,529	4,022,750	Mar. 30, 1976	May 10, 1977	B 497,896	D 243,091	Apr. 6, 1976	Jan. 18, 1977
B 488,111	3,985,765	Jan. 13, 1976	Oct. 12, 1976	B 497,960	3,991,325	Jan. 20, 1976	Nov. 9, 1976
B 488,395	3,982,245	Jan. 27, 1976	Sep. 21, 1976	B 498,208	4,001,480	Apr. 13, 1976	Jan. 4, 1977
B 488,634	3,982,158	Jan. 20, 1976	Sep. 21, 1976	B 498,288	4,013,657	Mar. 23, 1976	Mar. 22, 1977
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977	B 498,205	3,989,611	Feb. 10, 1976	Nov. 2, 1976
B 489,290	3,998,081	Feb. 17, 1976	Dec. 21, 1976	B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 489,328	3,990,088	Jan. 20, 1976	Nov. 2, 1976	B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 489,331	3,996,175	Feb. 17, 1976	Dec. 7, 1976	B 498,820	3,996,670	Mar. 9, 1976	Dec. 14, 1976
B 489,485	D 243,266	Apr. 13, 1976	Feb. 1, 1977	B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 489,550	4,000,710	Mar. 16, 1976	Jan. 4, 1977	B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 489,685	3,984,085	Feb. 24, 1976	Oct. 5, 1976	B 499,209	3,995,907	Feb. 24, 1976	Dec. 7, 1976
B 490,067	3,986,600	Jan. 27, 1976	Oct. 19, 1976	B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec. 28, 1976	B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 490,551	D 243,168	Apr. 6, 1976	Jan. 25, 1977	B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 490,589	3,990,680	Feb. 3, 1976	Nov. 9, 1976	B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 490,623	3,996,964	Mar. 2, 1976	Dec. 14, 1976	B 499,718	3,990,058	Jan. 27, 1976	Nov. 2, 1976
B 490,647	3,985,196	Feb. 24, 1976	Oct. 12, 1976	B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 490,806	3,989,486	Feb. 3, 1976	Nov. 2, 1976	B 500,171	3,997,262	Mar. 30, 1976	Dec. 14, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec. 21, 1976	B 500,176	3,995,316	Feb. 3, 1976	Nov. 30, 1976
B 490,946	3,993,652	Feb. 17, 1976	Nov. 23, 1976	B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 490,995	3,995,031	Feb. 3, 1976	Nov. 30, 1976	B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 491,032	3,981,892	Feb. 10, 1976	Sep. 21, 1976	B 500,959	4,014,853	Apr. 13, 1976	Mar. 29, 1977
B 491,052	3,985,790	Mar. 2, 1976	Oct. 12, 1976	B 500,981	3,984,681	Jan. 27, 1976	Oct. 5, 1976
B 491,111	3,997,916	Feb. 17, 1976	Dec. 14, 1976	B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 491,455	3,991,167	Feb. 3, 1976	Nov. 9, 1976	B 501,181	3,984,761	Feb. 10, 1976	Oct. 5, 1976
B 491,501	3,984,914	Jan. 13, 1976	Oct. 12, 1976	B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 491,618	4,007,950	Mar. 16, 1976	Feb. 15, 1977	B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 491,650	3,999,044	Mar. 9, 1976	Dec. 21, 1976	B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 491,673	3,994,770	Feb. 17, 1976	Nov. 30, 1976	B 501,415	3,982,051	Jan. 13, 1976	Sep. 21, 1976
B 491,776	3,986,298	Mar. 16, 1976	Oct. 19, 1976	B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 491,883	3,984,412	Feb. 3, 1976	Oct. 5, 1976	B 501,503	4,001,640	Mar. 2, 1976	Jan. 4, 1977
B 491,906	D 242,223	Feb. 10, 1976	Nov. 9, 1976	B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 492,039	3,997,541	Feb. 24, 1976	Dec. 14, 1976	B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 492,093	4,003,658	Mar. 23, 1976	Jan. 18, 1977	B 501,993	3,981,606	Jan. 13, 1976	Sep. 21, 1976
B 492,120	3,995,692	Feb. 24, 1976	Dec. 7, 1976	B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 492,301	3,981,073	Jan. 13, 1976	Sep. 21, 1976	B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 492,373	4,010,908	Mar. 30, 1976	Mar. 8, 1977	B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 492,688	3,983,415	Jan. 20, 1976	Sep. 28, 1976	B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 492,716	3,998,739	Mar. 2, 1976	Dec. 21, 1976	B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 492,774	4,001,843	Mar. 9, 1976	Jan. 4, 1977	B 502,571	D 242,433	Apr. 6, 1976	Nov. 23, 1976
B 492,902	3,993,859	Feb. 24, 1976	Nov. 23, 1976	B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 492,946	3,991,303	Jan. 27, 1976	Nov. 9, 1976	B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 493,254	D 243,267	Apr. 13, 1976	Feb. 1, 1977	B 502,667	3,991,431	Feb. 24, 1976	Nov. 16, 1976
B 493,370	3,984,792	Mar. 16, 1976	Oct. 5, 1976	B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar. 22, 1977	B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 493,474	4,013,565	Mar. 23, 1976	Mar. 22, 1977	B 503,029	3,986,879	Jan. 27, 1976	Oct. 19, 1976
B 493,501	3,988,061	Feb. 3, 1976	Oct. 26, 1976	B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 493,686	4,008,338	Mar. 23, 1976	Feb. 15, 1977	B 503,371	4,009,401	Mar. 30, 1976	Feb. 22, 1977
B 493,955	3,989,830	Mar. 9, 1976	Nov. 2, 1976	B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar. 9, 1976	Nov. 9, 1976	B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 494,138	4,034,002	Mar. 23, 1976	July 5, 1977	B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 494,234	3,983,808	Feb. 10, 1976	Oct. 5, 1976	B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 494,339	4,001,255	Mar. 16, 1976	Jan. 4, 1977	B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 494,383	3,991,289	Feb. 3, 1976	Nov. 9, 1976	B 503,742	3,989,756	Feb. 17, 1976	Nov. 2, 1976
B 494,669	3,991,104	Feb. 3, 1976	Nov. 9, 1976	B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 494,691	3,987,457	Mar. 16, 1976	Oct. 19, 1976	B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 494,806	3,989,210	Feb. 3, 1976	Nov. 2, 1976	B 503,817	3,988,307	Jan. 13, 1976	Oct. 26, 1976
B 494,944	3,992,469	Feb. 17, 1976	Nov. 16, 1976	B 504,056	3,993,923	Feb. 24, 1976	Nov. 23, 1976
B 495,185	3,999,166	Mar. 9, 1976	Dec. 21, 1976	B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 495,331	4,000,456	Mar. 16, 1976	Dec. 28, 1976	B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 495,402	3,983,988	Feb. 17, 1976	Oct. 5, 1976	B 504,169	3,981,219	Jan. 13, 1976	Sep. 21, 1976
B 495,408	4,000,222	Feb. 3, 1976	Dec. 28, 1976	B 504,404	3,996,499	Feb. 24, 1976	Dec. 7, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct. 5, 1976	B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 495,550	3,993,666	Feb. 3, 1976	Nov. 23, 1976	B 504,439	3,999,398	Mar. 16, 1976	Dec. 28, 1976
B 495,554	3,993,665	Feb. 3, 1976	Nov. 23, 1976	B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 495,759	3,989,998	Feb. 3, 1976	Nov. 2, 1976	B 504,582	4,005,138	Mar. 30, 1976	Jan. 25, 1977
B 495,781	4,013,699	Mar. 23, 1976	Mar. 22, 1977	B 504,778	3,986,650	Feb. 24, 1976	Oct. 19, 1976
B 495,903	3,995,997	Feb. 17, 1976	Dec. 7, 1976	B 504,877	3,997,564	Feb. 24, 1976	Dec. 14, 1976
B 496,430	3,991,140	Feb. 10, 1976	Nov. 9, 1976	B 504,899	3,991,273	Mar. 9, 1976	Nov. 9, 1976
B 496,431	3,985,894	Jan. 13, 1976	Oct. 12, 1976	B 505,126	3,981,745	Feb. 10, 1976	Sep. 21, 1976
B 496,487	3,982,261	Jan. 20, 1976	Sep. 21, 1976	B 505,221	4,013,627	Mar. 30, 1976	Mar. 22, 1977
B 496,500	3,985,962	Feb. 3, 1976	Oct. 12, 1976	B 505,582	4,001,659	Mar. 23, 1976	Jan. 4, 1977
B 496,502	3,987,444	Jan. 20, 1976	Oct. 19, 1976	B 505,689	3,987,631	Mar. 2, 1976	Oct. 26, 1976
B 496,792	3,999,959	Feb. 17, 1976	Dec. 28, 1976	B 505,813	3,985,175	Jan. 13, 1976	Oct. 12, 1976
B 496,964	3,999,219	Apr. 20, 1976	Dec. 21, 1976	B 506,144	3,991,147	Feb. 10, 1976	Nov. 9, 1976
B 496,999	3,983,804	Jan. 27, 1976	Oct. 5, 1976	B 506,148	3,988,319	Feb. 3, 1976	Oct. 26, 1976
B 497,021	3,985,039	Jan. 13, 1976	Oct. 12, 1976	B 506,167	3,990,652	Feb. 10, 1976	Nov. 9, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct. 26, 1976	B 506,286	3,982,085	Jan. 20, 1976	Sep. 21, 1976
B 497,292	3,994,052	Feb. 3, 1976	Nov. 30, 1976	B 506,461	3,987,348	Jan. 20, 1976	Oct. 19, 1976
B 497,293	4,011,412	Mar. 30, 1976	Mar. 8, 1977	B 506,566	3,985,402	Jan. 20, 1976	Oct. 12, 1976
B 497,473	3,990,839	Feb. 3, 1976	Nov. 9, 1976	B 506,624	3,999,695	Mar. 9, 1976	Dec. 28, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar. 1, 1977	B 506,648	3,994,857	Feb. 3, 1976	Nov. 30, 1976
B 497,584	3,988,184	Feb. 24, 1976	Oct. 26, 1976	B 506,744	3,981,176	Jan. 13, 1976	Sep. 21, 1976
B 497,702	3,996,589	Mar. 2, 1976	Dec. 7, 1976	B 506,760	4,012,835	Apr. 13, 1976	Mar. 22, 1977
B 497,780	3,997,500	Feb. 24, 1976	Dec. 14, 1976	B 506,839	4,005,389	Mar. 23, 1976	Jan. 25, 1977
B 497,853	3,987,934	Feb. 17, 1976	Oct. 26, 1976	B 506,840	4,002,928	Mar. 23, 1976	Jan. 11, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,916	3,986,140	Feb. 3, 1976	Oct. 12, 1976	B 516,804	3,991,209	Mar. 23, 1976	Nov. 9, 1976
B 506,926	3,993,232	Feb. 17, 1976	Nov. 23, 1976	B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 507,087	3,991,389	Feb. 17, 1976	Nov. 9, 1976	B 517,273	D 242,798	Mar. 16, 1976	Dec. 21, 1976
B 507,131	4,000,499	Mar. 2, 1976	Dec. 28, 1976	B 517,504	3,999,855	Mar. 9, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr. 13, 1976	Mar. 29, 1977	B 517,668	4,013,423	Apr. 6, 1976	Mar. 22, 1977
B 507,396	3,995,167	Feb. 10, 1976	Nov. 30, 1976	B 517,762	3,986,065	Mar. 16, 1976	Oct. 12, 1976
B 507,476	3,994,680	Feb. 10, 1976	Nov. 30, 1976	B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 507,647	3,982,240	Jan. 27, 1976	Sep. 21, 1976	B 517,956	D 243,088	Apr. 6, 1976	Jan. 18, 1977
B 508,118	3,992,283	Feb. 17, 1976	Nov. 16, 1976	B 517,957	D 243,089	Apr. 6, 1976	Jan. 18, 1977
B 508,119	3,992,285	Feb. 17, 1976	Nov. 16, 1976	B 518,076	4,014,914	Mar. 30, 1976	Mar. 29, 1977
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976	B 518,226	3,993,509	Feb. 10, 1976	Nov. 23, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan. 18, 1977	B 518,326	4,008,282	Mar. 23, 1976	Feb. 15, 1977
B 508,817	3,989,891	Feb. 3, 1976	Nov. 2, 1976	B 518,656	3,989,732	Feb. 17, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb. 3, 1976	Nov. 30, 1976	B 518,859	3,989,971	Feb. 3, 1976	Nov. 2, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep. 21, 1976	B 518,999	3,990,323	Feb. 3, 1976	Nov. 9, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct. 19, 1976	B 519,095	3,993,621	Feb. 24, 1976	Nov. 23, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976	B 519,355	4,014,829	Apr. 13, 1976	Mar. 29, 1977
B 509,165	3,999,155	Mar. 2, 1976	Dec. 21, 1976	B 519,377	3,987,223	Jan. 27, 1976	Oct. 19, 1976
B 509,185	3,989,996	Feb. 3, 1976	Nov. 2, 1976	B 519,446	3,985,815	Feb. 24, 1976	Oct. 12, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep. 28, 1976	B 519,485	3,991,134	Feb. 10, 1976	Nov. 9, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976	B 519,486	3,992,481	Feb. 17, 1976	Nov. 16, 1976
B 509,586	4,006,645	Feb. 3, 1976	Feb. 8, 1977	B 519,487	3,992,337	Feb. 17, 1976	Nov. 16, 1976
B 509,606	3,989,986	Feb. 3, 1976	Nov. 2, 1976	B 519,599	3,995,350	Feb. 17, 1976	Dec. 7, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976	B 519,623	4,012,049	Apr. 6, 1976	Mar. 15, 1977
B 509,819	4,014,712	Apr. 13, 1976	Mar. 29, 1977	B 519,680	4,014,660	Mar. 30, 1976	Mar. 29, 1977
B 510,026	4,016,763	Apr. 13, 1976	Apr. 12, 1977	B 519,932	3,988,618	Feb. 3, 1976	Oct. 26, 1976
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976	B 519,979	3,982,067	Feb. 3, 1976	Sep. 21, 1976
B 510,278	4,008,972	Mar. 30, 1976	Feb. 22, 1977	B 520,063	3,989,934	Mar. 2, 1976	Nov. 2, 1976
B 510,281	3,993,215	Mar. 9, 1976	Nov. 23, 1976	B 520,075	3,989,935	Feb. 24, 1976	Nov. 2, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976	B 520,076	3,989,936	Mar. 2, 1976	Nov. 2, 1976
B 510,458	4,000,221	Feb. 10, 1976	Dec. 28, 1976	B 520,082	3,989,937	Mar. 23, 1976	Nov. 2, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976	B 520,115	4,003,072	Mar. 23, 1976	Jan. 11, 1977
B 510,588	3,981,539	Jan. 27, 1976	Sep. 21, 1976	B 520,227	4,002,823	Mar. 30, 1976	Jan. 11, 1977
B 510,677	3,989,541	Feb. 24, 1976	Nov. 2, 1976	B 520,256	3,985,730	Jan. 13, 1976	Oct. 12, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977	B 520,277	3,995,635	Feb. 17, 1976	Dec. 7, 1976
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977	B 520,341	3,992,028	Mar. 16, 1976	Nov. 16, 1976
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976	B 520,384	3,986,592	Jan. 27, 1976	Oct. 19, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976	B 520,514	3,988,308	Mar. 9, 1976	Oct. 26, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976	B 520,534	3,997,119	Feb. 17, 1976	Dec. 14, 1976
B 510,998	3,992,336	Feb. 10, 1976	Nov. 16, 1976	B 520,543	3,986,768	Jan. 27, 1976	Oct. 19, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976	B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976	B 520,613	3,991,341	Mar. 16, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976	B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 511,346	3,984,072	Jan. 27, 1976	Oct. 5, 1976	B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 511,407	3,981,485	Feb. 10, 1976	Sep. 21, 1976	B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976	B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 511,665	4,001,037	Mar. 2, 1976	Jan. 4, 1977	B 520,928	3,983,617	Jan. 13, 1976	Oct. 5, 1976
B 511,885	3,981,346	Jan. 27, 1976	Sep. 21, 1976	B 520,952	4,000,876	Mar. 16, 1976	Jan. 4, 1977
B 511,886	3,989,991	Feb. 3, 1976	Nov. 2, 1976	B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 511,909	3,981,183	Feb. 17, 1976	Sep. 21, 1976	B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 512,324	3,985,084	Feb. 17, 1976	Oct. 12, 1976	B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976	B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976	B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977	B 521,125	3,994,865	Feb. 10, 1976	Nov. 30, 1976
B 512,818	3,997,363	Apr. 6, 1976	Dec. 14, 1976	B 521,126	3,997,510	Feb. 10, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb. 3, 1976	Sep. 21, 1976	B 521,127	3,996,201	Feb. 17, 1976	Dec. 7, 1976
B 512,964	3,995,279	Feb. 10, 1976	Nov. 30, 1976	B 521,128	3,997,511	Feb. 10, 1976	Dec. 14, 1976
B 513,014	3,991,113	Feb. 10, 1976	Nov. 9, 1976	B 521,324	3,983,143	Jan. 27, 1976	Sep. 28, 1976
B 513,027	3,995,143	Feb. 17, 1976	Nov. 30, 1976	B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 513,134	4,006,764	Mar. 23, 1976	Feb. 8, 1977	B 521,600	3,981,458	Jan. 27, 1976	Sep. 21, 1976
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976	B 521,612	4,000,251	Mar. 9, 1976	Dec. 28, 1976
B 513,368	3,982,138	Feb. 3, 1976	Sep. 21, 1976	B 521,620	3,983,749	Jan. 27, 1976	Oct. 5, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976	B 521,643	3,997,567	Mar. 2, 1976	Dec. 14, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976	B 521,711	3,989,835	Feb. 10, 1976	Nov. 2, 1976
B 513,781	4,001,324	Feb. 24, 1976	Jan. 4, 1977	B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 513,789	3,981,599	Feb. 3, 1976	Sep. 21, 1976	B 521,984	3,983,220	Feb. 17, 1976	Sep. 28, 1976
B 513,791	4,008,608	Mar. 30, 1976	Feb. 22, 1977	B 521,985	4,012,404	Mar. 23, 1976	Mar. 15, 1977
B 514,259	4,013,649	Mar. 23, 1976	Mar. 22, 1977	B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 514,687	3,986,522	Jan. 27, 1976	Oct. 19, 1976	B 522,009	3,995,444	Feb. 17, 1976	Dec. 7, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977	B 522,038	3,993,119	Feb. 3, 1976	Nov. 23, 1976
B 515,135	3,990,085	Feb. 17, 1976	Nov. 2, 1976	B 522,227	3,992,904	Mar. 30, 1976	Nov. 23, 1976
B 515,303	3,987,939	Jan. 20, 1976	Oct. 26, 1976	B 522,309	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 515,368	4,014,733	Apr. 6, 1976	Mar. 29, 1977	B 522,354	3,984,959	Jan. 20, 1976	Oct. 12, 1976
B 515,452	3,995,243	Feb. 10, 1976	Nov. 30, 1976	B 522,446	4,001,194	Mar. 30, 1976	Jan. 4, 1977
B 515,455	3,982,149	Jan. 27, 1976	Sep. 21, 1976	B 522,537	3,999,587	Mar. 30, 1976	Dec. 28, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977	B 522,567	3,996,238	Feb. 17, 1976	Dec. 7, 1976
B 515,908	3,984,676	Jan. 20, 1976	Oct. 5, 1976	B 522,568	D 242,785	Apr. 6, 1976	Dec. 21, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976	B 522,577	3,982,123	Jan. 27, 1976	Sep. 21, 1976
B 516,032	3,986,634	Jan. 27, 1976	Oct. 19, 1976	B 522,629	4,001,155	Mar. 16, 1976	Jan. 4, 1977
B 516,047	3,985,741	Feb. 10, 1976	Oct. 12, 1976	B 523,226	4,006,367	Mar. 23, 1976	Feb. 1, 1977
B 516,060	3,983,572	Feb. 17, 1976	Sep. 28, 1976	B 523,696	3,986,071	Jan. 13, 1976	Oct. 12, 1976
B 516,069	3,986,208	Mar. 16, 1976	Oct. 12, 1976	B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 516,296	3,984,404	Feb. 3, 1976	Oct. 5, 1976	B 523,952	3,988,707	Mar. 23, 1976	Oct. 26, 1976
B 516,537	3,996,784	Feb. 17, 1976	Dec. 14, 1976	B 524,026	3,992,206	Feb. 10, 1976	Nov. 16, 1976
B 516,564	3,993,931	Feb. 17, 1976	Nov. 23, 1976	B 524,121	3,982,536	Feb. 3, 1976	Sep. 28, 1976
B 516,609	3,994,486	Feb. 24, 1976	Nov. 30, 1976	B 524,179	3,985,872	Jan. 13, 1976	Oct. 12, 1976
B 516,625	4,013,542	Mar. 30, 1976	Mar. 22, 1977	B 524,464	3,985,580	Feb. 10, 1976	Oct. 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 524,806	4,000,065	Mar. 2, 1976	Dec. 28, 1976
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976
B 526,106	3,990,073	Jan. 27, 1976	Nov. 2, 1976
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976
B 526,279	4,013,138	Apr. 13, 1976	Mar. 22, 1977
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977
B 526,997	3,985,695	Jan. 13, 1976	Oct. 12, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977
B 527,054	3,981,559	Feb. 17, 1976	Sep. 21, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976
B 527,187	3,995,202	Feb. 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976
B 527,972	4,000,016	Mar. 9, 1976	Dec. 28, 1976
B 527,999	3,981,682	Feb. 3, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar. 16, 1976	Jan. 4, 1977
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976
B 528,401	3,991,619	Feb. 3, 1976	Nov. 16, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep. 21, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov. 2, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov. 2, 1976
B 529,156	3,989,158	Jan. 13, 1976	Nov. 2, 1976
B 529,194	4,000,776	Mar. 23, 1976	Jan. 4, 1977
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977
B 529,659	3,996,875	Feb. 24, 1976	Dec. 14, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976
B 529,925	4,014,003	Mar. 30, 1976	Mar. 22, 1977
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976
B 530,709	4,012,944	Apr. 6, 1976	Mar. 22, 1977
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977
B 530,925	3,983,161	Feb. 24, 1976	Sep. 28, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976
B 531,267	3,997,040	Feb. 24, 1976	Dec. 14, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976
B 531,753	3,988,843	Mar. 2, 1976	Nov. 2, 1976
B 531,929	3,986,067	Jan. 20, 1976	Oct. 12, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov. 16, 1976
B 532,140	4,001,299	Mar. 2, 1976	Jan. 4, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976
B 532,326	3,993,959	Mar. 23, 1976	Nov. 23, 1976
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan. 4, 1977
B 533,056	3,983,969	Jan. 13, 1976	Oct. 5, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec. 7, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976
B 534,016	3,983,381	Feb. 3, 1976	Sep. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976
B 534,333	3,981,480	Feb. 17, 1976	Sep. 21, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976
B 534,574	3,995,624	Feb. 24, 1976	Dec. 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov. 9, 1976
B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 535,076	3,981,718	Jan. 20, 1976	Sep. 21, 1976
B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 535,386	3,981,150	Jan. 13, 1976	Sep. 21, 1976
B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 540,872	3,982,135	Jan. 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 541,015	3,993,208	Jan. 27, 1976	Nov. 23, 1976
B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 546,295	3,987,070	Jan. 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 548,058	3,983,050	Feb. 17, 1976	Sep. 28, 1976
B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976

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DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,302	3,983,414	Feb. 17, 1976	Sep. 28, 1976
B 548,440	3,993,401	Feb. 3, 1976	Nov. 23, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec. 7, 1976
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976
B 549,198	3,981,975	Jan. 13, 1976	Sep. 21, 1976
B 549,244	3,981,125	Jan. 27, 1976	Sep. 21, 1976
B 549,394	3,981,611	Jan. 27, 1976	Sep. 21, 1976
B 549,931	3,986,141	Jan. 20, 1976	Oct. 12, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976
B 550,693	3,982,194	Jan. 20, 1976	Sep. 21, 1976
B 550,744	3,993,550	Feb. 17, 1976	Nov. 23, 1976
B 550,810	4,000,910	Mar. 23, 1976	Jan. 4, 1977
B 551,133	3,996,740	Mar. 2, 1976	Dec. 14, 1976
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976
B 551,952	Re. 29,059	Mar. 2, 1976	Dec. 7, 1976
B 552,006	3,992,129	Feb. 3, 1976	Nov. 16, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976
B 552,508	4,001,250	Mar. 16, 1976	Jan. 4, 1977
B 552,629	3,994,773	Mar. 23, 1976	Nov. 30, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977
B 552,932	3,989,292	Feb. 3, 1976	Nov. 2, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan. 4, 1977
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977
B 554,939	3,994,013	Feb. 10, 1976	Nov. 23, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977
B 555,437	3,991,152	Feb. 3, 1976	Nov. 9, 1976
B 555,456	3,993,423	Mar. 30, 1976	Nov. 23, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep. 28, 1976
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov. 23, 1976
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977
B 557,299	3,990,357	Feb. 3, 1976	Nov. 9, 1976
B 557,621	3,990,800	Feb. 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov. 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976
B 558,819	3,990,160	Feb. 3, 1976	Nov. 9, 1976
B 558,973	3,981,126	Feb. 10, 1976	Sep. 21, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976
B 559,142	4,001,124	Mar. 2, 1976	Jan. 4, 1977
B 559,394	4,016,094	Apr. 20, 1976	Apr. 5, 1977
B 559,441	4,013,609	Mar. 23, 1976	Mar. 22, 1977
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976
B 559,700	4,001,189	Mar. 23, 1976	Jan. 4, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977
B 559,737	3,984,668	Jan. 20, 1976	Oct. 5, 1976
B 559,954	3,982,673	Feb. 3, 1976	Sep. 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov. 2, 1976
B 560,717	3,982,034	Feb. 10, 1976	Sep. 21, 1976
B 560,765	3,983,389	Feb. 3, 1976	Sep. 28, 1976
B 561,062	D 242,248	Feb. 10, 1976	Nov. 9, 1976
B 561,165	4,013,002	Mar. 30, 1976	Mar. 22, 1977
B 561,166	4,011,809	Mar. 30, 1976	Mar. 15, 1977
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976
B 561,405	4,003,770	Mar. 30, 1976	Jan. 18, 1977
B 561,712	3,992,126	Feb. 17, 1976	Nov. 16, 1976
B 561,732	3,991,460	Feb. 3, 1976	Nov. 16, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct. 5, 1976
B 561,770	4,000,366	Mar. 16, 1976	Dec. 28, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct. 5, 1976
B 562,413	4,000,930	Mar. 16, 1976	Jan. 4, 1977
B 562,462	3,985,836	Jan. 13, 1976	Oct. 12, 1976
B 562,519	4,013,125	Mar. 30, 1976	Mar. 22, 1977
B 562,601	3,998,360	Mar. 16, 1976	Dec. 21, 1976
B 562,698	3,983,972	Jan. 13, 1976	Oct. 5, 1976
B 562,813	3,985,491	Feb. 3, 1976	Oct. 12, 1976
B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 563,165	4,000,977	Mar. 9, 1976	Jan. 4, 1977
B 563,244	3,983,562	Jan. 27, 1976	Sep. 28, 1976
B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 563,419	3,999,051	Mar. 23, 1976	Dec. 21, 1976
B 563,722	3,990,925	Jan. 13, 1976	Nov. 9, 1976
B 563,780	3,987,769	Feb. 3, 1976	Oct. 26, 1976
B 563,932	4,000,638	Mar. 23, 1976	Jan. 4, 1977
B 564,252	4,001,293	Mar. 2, 1976	Jan. 4, 1977
B 564,255	4,015,996	Mar. 30, 1976	Apr. 5, 1977
B 564,314	3,984,996	Jan. 20, 1976	Oct. 12, 1976
B 564,902	4,001,351	Mar. 23, 1976	Jan. 4, 1977
B 565,180	3,981,685	Jan. 27, 1976	Sep. 21, 1976
B 565,275	3,990,299	Apr. 6, 1976	Nov. 9, 1976
B 565,717	3,999,138	Apr. 13, 1976	Dec. 21, 1976
B 565,754	4,011,626	Mar. 30, 1976	Mar. 15, 1977
B 566,464	3,996,367	Feb. 3, 1976	Dec. 7, 1976
B 566,556	3,998,511	Mar. 23, 1976	Dec. 21, 1976
B 566,572	3,988,590	Mar. 16, 1976	Oct. 26, 1976
B 566,585	4,001,083	Mar. 2, 1976	Jan. 4, 1977
B 567,058	3,985,188	Jan. 13, 1976	Oct. 12, 1976
B 567,076	4,011,187	Mar. 23, 1976	Mar. 8, 1977
B 567,158	3,988,073	Mar. 23, 1976	Oct. 26, 1976
B 567,207	3,991,689	Apr. 13, 1976	Nov. 16, 1976
B 567,435	3,995,724	Feb. 3, 1976	Dec. 7, 1976
B 567,854	3,985,038	Feb. 3, 1976	Oct. 12, 1976
B 567,892	4,000,855	Mar. 16, 1976	Jan. 4, 1977
B 568,226	3,992,698	Feb. 24, 1976	Nov. 16, 1976
B 568,770	3,982,213	Feb. 10, 1976	Sep. 21, 1976
B 569,125	3,986,980	Feb. 24, 1976	Oct. 19, 1976
B 569,293	4,004,149	Mar. 30, 1976	Jan. 18, 1977
B 569,501	3,999,250	Mar. 9, 1976	Dec. 28, 1976
B 569,519	3,993,133	Feb. 3, 1976	Nov. 23, 1976
B 569,646	3,985,222	Jan. 13, 1976	Oct. 12, 1976
B 569,859	3,994,160	Mar. 9, 1976	Nov. 30, 1976
B 570,172	3,987,763	Feb. 3, 1976	Oct. 26, 1976
B 570,615	3,998,570	Mar. 23, 1976	Dec. 21, 1976
B 570,862	3,991,639	Feb. 24, 1976	Nov. 16, 1976
B 570,925	4,040,802	Mar. 23, 1976	Aug. 9, 1977
B 571,219	3,991,388	Feb. 24, 1976	Nov. 9, 1976
B 571,638	4,001,244	Mar. 9, 1976	Jan. 4, 1977
B 571,659	3,995,186	Apr. 13, 1976	Nov. 30, 1976
B 572,642	3,990,715	Feb. 10, 1976	Nov. 9, 1976
B 572,726	4,015,020	Feb. 24, 1976	Mar. 29, 1977
B 573,033	3,995,224	Mar. 23, 1976	Nov. 30, 1976
B 573,114	4,014,843	Apr. 6, 1976	Mar. 29, 1977
B 573,991	4,013,704	Mar. 30, 1976	Mar. 22, 1977
B 573,994	4,000,641	Mar. 23, 1976	Jan. 4, 1977
B 574,128	3,982,961	Feb. 17, 1976	Sep. 28, 1976
B 574,616	4,000,424	Mar. 2, 1976	Dec. 28, 1976
B 574,996	3,989,718	Feb. 17, 1976	Nov. 2, 1976
B 575,583	4,000,928	Mar. 16, 1976	Jan. 4, 1977
B 575,757	3,981,170	Jan. 27, 1976	Sep. 21, 1976
B 575,761	4,013,123	Apr. 13, 1976	Mar. 22, 1977
B 575,776	4,013,124	Apr. 20, 1976	Mar. 22, 1977
B 575,851	3,985,826	Feb. 10, 1976	Oct. 12, 1976
B 576,385	4,009,498	Mar. 30, 1976	Mar. 1, 1977
B 576,859	3,991,526	Feb. 24, 1976	Nov. 16, 1976
B 576,903	3,995,032	Feb. 3, 1976	Nov. 30, 1976
B 578,447	3,982,658	Jan. 20, 1976	Sep. 28, 1976
B 579,104	3,982,081	Jan. 27, 1976	Sep. 21, 1976
B 579,116	3,986,227	Feb. 3, 1976	Oct. 19, 1976
B 579,153	4,013,745	Mar. 30, 1976	Mar. 22, 1977
B 579,806	3,995,318	Feb. 3, 1976	Nov. 30, 1976
B 580,379	4,000,796	Apr. 6, 1976	Jan. 4, 1977
B 580,826	3,988,391	Feb. 17, 1976	Oct. 26, 1976
B 580,921	3,984,054	Jan. 13, 1976	Oct. 5, 1976
B 581,564	4,036,653	Mar. 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar. 16, 1976	Jan. 4, 1977
B 583,051	3,990,714	Feb. 3, 1976	Nov. 9, 1976
B 583,089	3,982,174	Jan. 27, 1976	Sep. 21, 1976
B 583,712	3,995,064	Feb. 10, 1976	Nov. 30, 1976
B 584,520	3,981,149	Jan. 27, 1976	Sep. 21, 1976
B 584,997	4,000,030	Mar. 9, 1976	Dec. 28, 1976
B 585,247	3,989,914	Feb. 3, 1976	Nov. 2, 1976
B 585,731	3,993,603	Feb. 3, 1976	Nov. 23, 1976
B 586,215	3,985,302	Jan. 20, 1976	Oct. 12, 1976
B 586,380	3,983,885	Mar. 2, 1976	Oct. 5, 1976
B 586,387	3,981,311	Feb. 3, 1976	Sep. 21, 1976
B 586,663	3,992,080	Feb. 3, 1976	Nov. 16, 1976
B 587,118	Re. 29,067	Mar. 2, 1976	Dec. 7, 1976
B 587,786	3,991,204	Feb. 17, 1976	Nov. 9, 1976
B 587,936	3,999,052	Mar. 23, 1976	Dec. 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 589,179	4,001,102	Mar. 23, 1976	Jan. 4, 1977	B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976	B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 589,966	3,985,828	Feb. 17, 1976	Oct. 12, 1976	B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976	B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976	B 657,438	3,985,701	Jan. 20, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977	B 747,785	3,981,899	Feb. 10, 1976	Sep. 21, 1976
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977	B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976	B 843,038	3,981,785	Feb. 3, 1976	Sep. 21, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977	B 845,044	4,001,338	Mar. 30, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977	B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF AUGUST, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Amplatz, Kurt. Method for forming and sterilizing catheters. Re. 29,343, Cl. 53-21.0FC.

Barbe, Guy, to Etudes et Fabrications Aeronautiques. Buckle for retarded automatic unlocking of safety belts and harnesses of parachuting equipment and of vehicles. Re. 29,342, Cl. 24-230.00A.

Ben-Porath, Moshe: *See*—
Zukerman, Yoram; Ben-Porath, Moshe; and Sabbah, Benjamin, Re. 29,351, Cl. 358-81.000.

Bott, John A. Spare tire extraction device. Re. 29,348, Cl. 224-42.120.

Elscint Ltd.: *See*—
Zukerman, Yoram; Ben-Porath, Moshe; and Sabbah, Benjamin, Re. 29,351, Cl. 358-81.000.

Erb, Robert A., to Franklin Institute, The. Method and apparatus for non-surgical, reversible sterilization of females. Re. 29,345, Cl. 128-1.00R.

Etudes et Fabrications Aeronautiques: *See*—
Barbe, Guy, Re. 29,342, Cl. 24-230.00A.

Franklin Institute, The: *See*—
Erb, Robert A., Re. 29,345, Cl. 128-1.00R.

Friedman, Louis T. Measuring and dispensing apparatus. Re. 29,347, Cl. 222-14.000.

Hasegawa, Hakumi: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Nakagawa, Junichi; and Hasegawa, Hakumi, Re. 29,344, Cl. 72-60.000.

Kobe Steel, Ltd.: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Nakagawa, Junichi; and Hasegawa, Hakumi, Re. 29,344, Cl. 72-60.000.

Kopp, Klaus F., to Vital Assists, Inc. Single needle dialysis. Re. 29,346, Cl. 128-214.00R.

Matsushita, Tomiharu: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Nakagawa, Junichi; and Hasegawa, Hakumi, Re. 29,344, Cl. 72-60.000.

Minnesota Mining and Manufacturing: *See*—
Strebel, Elwood L., Re. 29,349, Cl. 260-566.00F.

Nakagawa, Junichi: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Nakagawa, Junichi; and Hasegawa, Hakumi, Re. 29,344, Cl. 72-60.000.

Noguchi, Masataka: *See*—
Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Nakagawa, Junichi; and Hasegawa, Hakumi, Re. 29,344, Cl. 72-60.000.

Sabbah, Benjamin: *See*—
Zukerman, Yoram; Ben-Porath, Moshe; and Sabbah, Benjamin, Re. 29,351, Cl. 358-81.000.

Schoen, Lowhardt A. A., to Stamicarbon, B.V. Process for chlorinating ethylene polymers. Re. 29,350, Cl. 526-45.000.

Stamicarbon, B.V.: *See*—
Schoen, Lowhardt A. A., Re. 29,350, Cl. 526-45.000.

Strebel, Elwood L., to Minnesota Mining and Manufacturing. Organic thermotropic nematic compounds. Re. 29,349, Cl. 260-566.00F.

Vital Assists, Inc.: *See*—
Kopp, Klaus F., Re. 29,346, Cl. 128-214.00R.

Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Nakagawa, Junichi; and Hasegawa, Hakumi, to Kobe Steel, Ltd. Method and apparatus for manufacturing tubes or tubular bodies with inner walls having cross sections of irregular shapes. Re. 29,344, Cl. 72-60.000.

Zukerman, Yoram; Ben-Porath, Moshe; and Sabbah, Benjamin, to Elscint Ltd. Video-display-processor. Re. 29,351, Cl. 358-81.000.

LIST OF PLANT PATENTEES

McColley, Robert H. Distinct variety of Philodendron plant. 4,090, 8-9-77, Cl. 88.000.

LIST OF DESIGN PATENTEES

AAI Corporation: *See*—
Barr, Irwin R., 245,336, Cl. D25-21.000.
Barr, Irwin R., 245,337, Cl. D25-21.000.
Barr, Irwin R., 245,338, Cl. D25-21.000.
Barr, Irwin R., 245,339, Cl. D25-21.000.

Adams, Herbert L. Motor vehicle. 245,324, 8-9-77, Cl. D12-110.000.

Al Nyman & Son, Inc.: *See*—
Maeda, Hisashi; and Yoshikawa, Hironori, 245,370, Cl. D64-11.00B.

Alfredeen Production AB: *See*—
Berglund, Sture, 245,366, Cl. D15-143.000.

Baker, Clyde B. Mat for beverage containers. 245,308, 8-9-77, Cl. D7-188.000.

Barber, Jerry. Golf club wood head. 245,358, 8-9-77, Cl. D34-5.0GH.

Barnes, Richard R., Jr.: *See*—
Wodell, William Roy, 245,319, Cl. D9-246.000.

Barr, Irwin R., to AAI Corporation. Building structure. 245,336, 8-9-77, Cl. D25-21.000.

Barr, Irwin R., to AAI Corporation. Building structure. 245,337, 8-9-77, Cl. D25-21.000.

Barr, Irwin R., to AAI Corporation. Building structure. 245,338, 8-9-77, Cl. D25-21.000.

Barr, Irwin R., to AAI Corporation. Building structure. 245,339, 8-9-77, Cl. D25-21.000.

Beck, Paul. Wall mounted rack for beer cans or the like. 245,299, 8-9-77, Cl. D6-114.000.

Bennett, Brian Sidney, to Dunlop Limited. Tire for a vehicle wheel. 245,327, 8-9-77, Cl. D12-146.000.

Berglund, Sture, to Alfredeen Production AB. Bearing unit for mechanical measuring devices. 245,366, 8-9-77, Cl. D15-143.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 245,296, Cl. D6-63.000.

Bidwell, Robert E.: *See*—
Kurtz, Leonard D.; and Bidwell, Robert E., 245,372, Cl. D24-59.000.

Bohan, Charles P., to Hercules Incorporated. Frame for a furniture arm. 245,304, 8-9-77, Cl. D6-195.000.

Brahm, Harry. Modular chair. 245,298, 8-9-77, Cl. D6-66.000.

Brandenfels, Carl, to H T Products, Inc. Portable kitchen island. 245,301, 8-9-77, Cl. D6-157.000.

Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, to WCB Containers Limited. Combined play steps and slide. 245,356, 8-9-77, Cl. D34-5.00E.

Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, to WCB Containers Limited. Sand or water play drum. 245,357, 8-9-77, Cl. D34-5.00F.

Casey, Everett Randolph. Perforator for cigar or cigarette. 245,347, 8-9-77, Cl. D27-51.000.

Center for Independent Living, Inc.: *See*—
Grippi, Vincent, Jr., 245,326, Cl. D12-131.000.

Chas. M. Freidheim Company: *See*—
Johnson, Donald O., 245,340, Cl. D25-92.000.

Chesebro, Robert E., Jr., to Wigwam Mills, Inc. Ski sock. 245,294, 8-9-77, Cl. D2-330.000.

Chuomusen Company, Ltd.: *See*—
Takeuchi, Reiji, 245,342, Cl. D14-43.000.

Cone, Richard E.: *See—*
Meeker, Paul K.; and Cone, Richard E., 245,335, Cl. D24-45.000.
Cruisaire Motor Corporation: *See—*
Davis, Joseph O.; Scott, Edward W.; and McCain, Lawrence G., 245,328, Cl. D12-155.000.
Curry, Joyce; and Pugh, Martha G. Combined blouse and panty hose ensemble. 245,291, 8-9-77, Cl. D2-29.000.
Curry, Joyce; and Pugh, Martha G. Combined blouse and panty hose ensemble. 245,292, 8-9-77, Cl. D2-29.000.
Curtin, James F. Combined bench and phonograph record storage chest. 245,297, 8-9-77, Cl. D6-64.000.
Data Packaging Corporation: *See—*
Lyman, George F., 245,305, Cl. D6-234.000.
Mathus, Gregory; Lyman, George; and Roche, David, 245,300, Cl. D6-130.000.
Davis, Joseph O.; Scott, Edward W.; and McCain, Lawrence G., to Cruisaire Motor Corporation. Automotive truck service module. 245,328, 8-9-77, Cl. D12-155.000.
Deknatel, Inc.: *See—*
Kurtz, Leonard D.; and Bidwell, Robert E., 245,372, Cl. D24-59.000.
Dempster Industries, Inc.: *See—*
Tangeman, Lawrence N., 245,331, Cl. D15-13.000.
Denski, Henry: *See—*
Ryden, Elihu Daniel; and Denski, Henry, 245,306, Cl. D7-161.000.
Dunlop Limited: *See—*
Bennett, Brian Sidney, 245,327, Cl. D12-146.000.
Elsdale, Timothy Sefton: *See—*
Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, 245,356, Cl. D34-5.00E.
Burgess, Kenneth Peter; and Elsdale, Timothy Sefton, 245,357, Cl. D34-5.00F.
Equipto Electronics Corporation: *See—*
Gazarek, Kenneth F., 245,303, Cl. D6-177.000.
Fabri-Tek Incorporated: *See—*
Walstrom, Leslie Robert, 245,334, Cl. D24-17.000.
Fenice, Francis M. Doorknocker or similar article. 245,310, 8-9-77, Cl. D8-178.000.
Fisher, Arthur A. Cigarette snuffer. 245,344, 8-9-77, Cl. D27-09.000.
Fisher, James B., Jr. Bird feeder. 245,349, 8-9-77, Cl. D30-15.000.
Franck, Kurt, to Johns-Manville Corporation. Luminaire housing design. 245,367, 8-9-77, Cl. D48-20.00A.
Furuoka, Hideto, to Gakken Co., Ltd. Audio-visual sheet player. 245,369, 8-9-77, Cl. D14-20.000.
Gakken Co., Ltd.: *See—*
Furuoka, Hideto, 245,369, Cl. D14-20.000.
Galanthay, Phyllis Smith. Door knocker. 245,311, 8-9-77, Cl. D8-178.000.
Galeza, Theodore. Ring or similar article. 245,323, 8-9-77, Cl. D11-39.000.
Gazarek, Kenneth F., to Equipto Electronics Corporation. Electronic modular desk. 245,303, 8-9-77, Cl. D6-177.000.
Geary, Catherine P. Pet harness. 245,350, 8-9-77, Cl. D30-38.000.
Grippi, Vincent, Jr., to Center for Independent Living, Inc. Battery powered wheelchair. 245,326, 8-9-77, Cl. D12-131.000.
Guardino, Estelle Margaret. Button-supported tennis ball pocket. 245,295, 8-9-77, Cl. D2-400.000.
H T Products, Inc.: *See—*
Brandenfels, Carl, 245,301, Cl. D6-157.000.
Haapanen, Ann S. Doll. 245,353, 8-9-77, Cl. D34-4.00R.
Hanson Limited: *See—*
Mox, Dana W., 245,320, Cl. D10-40.000.
Harley Corporation: *See—*
Yavorsky, William M., 245,318, Cl. D9-170.000.
Harter Corporation: *See—*
Koepke, Earl H., 245,313, Cl. D8-375.000.
Haviland, John G. Pet house. 245,348, 8-9-77, Cl. D30-1.000.
Hercules Incorporated: *See—*
Bohan, Charles P., 245,304, Cl. D6-195.000.
Hycel, Inc.: *See—*
Moran, John J., 245,352, Cl. D24-1.100.
Hyde, Edward M.; and Kraynak, George A. Remembrance plaque. 245,351, 8-9-77, Cl. D31-13.000.
International Harvester Company: *See—*
Skyer, Robert A.; and McGirk, James R., 245,321, Cl. D10-102.000.
J. G. Redmond Associates, Inc. (Entire): *See—*
Pratt, Marion, 245,302, Cl. D6-177.000.
Johns-Manville Corporation: *See—*
Franck, Kurt, 245,367, Cl. D48-20.00A.
Johnson, Donald O., to Chas. M. Freidheim Company. Building block. 245,340, 8-9-77, Cl. D25-92.000.
Kahler, Richard W. Smoking pipe or similar article. 245,343, 8-9-77, Cl. D27-3.000.
Kitai, Isao, to Sharp Kabushiki Kaisha. Electronic calculating machine. 245,341, 8-9-77, Cl. D64-11.00B.
Koepke, Earl H., to Harter Corporation. Dual wheel caster. 245,313, 8-9-77, Cl. D8-375.000.
Kojima, Shizuka, to Tomy Kogyo Co., Inc. Water game case. 245,360, 8-9-77, Cl. D34-5.0JJ.
Kojima, Shizuka, to Tomy Kogyo Co., Inc. Water game case. 245,361, 8-9-77, Cl. D34-5.0JJ.
Kraynak, George A.: *See—*
Hyde, Edward M.; and Kraynak, George A., 245,351, Cl. D31-13.000.
Krome, Morris L. Sport show (bal pattern). 245,293, 8-9-77, Cl. D2-310.000.
Kurtz, Leonard D.; and Bidwell, Robert E., to Deknatel, Inc. Underwater drainage device with dual collection chambers. 245,372, 8-9-77, Cl. D24-59.000.
Kusan, Inc.: *See—*
McClary, Joseph M., 245,364, Cl. D34-15.0AC.
Lindquist, Robert J. Portable ultrasound generator unit. 245,325, 8-9-77, Cl. D10-116.000.
Long, Stapleton, to Berkline Corporation, The. Sofa. 245,296, 8-9-77, Cl. D6-63.000.
Lyman, George: *See—*
Mathus, Gregory; Lyman, George; and Roche, David, 245,300, Cl. D6-130.000.
Lyman, George F., to Data Packaging Corporation. Photograph display stand. 245,305, 8-9-77, Cl. D6-234.000.
MacArthur, Douglas E.: *See—*
Wodell, William Roy, 245,319, Cl. D9-246.000.
Maeda, Hisashi; and Yoshikawa, Hironori, to Al Nyman & Son, Inc. Calculating machine. 245,370, 8-9-77, Cl. D64-11.00B.
Mar-Lyn Imports, Inc.: *See—*
Patsiner, Leonard, 245,362, Cl. D34-11.00R.
Mathus, Gregory; Lyman, George; and Roche, David, to Data Packaging Corporation. Magnetic tape wall storage unit. 245,300, 8-9-77, Cl. D6-130.000.
McCain, Lawrence G.: *See—*
Davis, Joseph O.; Scott, Edward W.; and McCain, Lawrence G., 245,328, Cl. D12-155.000.
McClary, Joseph M., to Kusan, Inc. Toy refrigerator. 245,364, 8-9-77, Cl. D34-15.0AC.
McConnell, George Malcolm, to Pfizer Inc. Liquid dispenser. 245,316, 8-9-77, Cl. D9-131.000.
McGirk, James R.: *See—*
Skyer, Robert A.; and McGirk, James R., 245,321, Cl. D10-102.000.
Meeker, Paul K.; and Cone, Richard E. Orthodontic pacifier. 245,335, 8-9-77, Cl. D24-45.000.
MIRA-X S.A. Suhr: *See—*
Panton, Verner, 245,373, Cl. D92-1.00T.
Panton, Verner, 245,374, Cl. D92-1.00T.
Panton, Verner, 245,375, Cl. D92-1.00P.
Mitchell, Bernard A. Bottle. 245,314, 8-9-77, Cl. D9-107.000.
Mitchell, Bernard A. Combined bottle and cap. 245,315, 8-9-77, Cl. D9-107.000.
Mont, Howard, to Recoton Corporation. Record cleaner kit. 245,307, 8-9-77, Cl. D7-178.000.
Moran, John J., to Hycel, Inc. Multichannel automated apparatus for analysis of chemical samples. 245,352, 8-9-77, Cl. D24-1.100.
Mowry, William B. Key holder card. 245,371, 8-9-77, Cl. D87-8.000.
Mox, Dana W., to Hanson Limited. Kitchen timer or similar article. 245,320, 8-9-77, Cl. D10-40.000.
Mueller, Harry E. Lamp base. 245,368, 8-9-77, Cl. D48-20.00R.
Nitta, Tomio, to Tokai Seiki Co., Ltd. Cigarette gas lighter. 245,345, 8-9-77, Cl. D27-42.000.
Panton, Verner, to MIRA-X S.A. Suhr. Upholstery fabric or the like. 245,373, 8-9-77, Cl. D92-1.00T.
Panton, Verner, to MIRA-X S.A. Suhr. Upholstery fabric or the like. 245,374, 8-9-77, Cl. D92-1.00T.
Panton, Verner, to MIRA-X S.A. Suhr. Upholstery fabric or the like. 245,375, 8-9-77, Cl. D92-1.00P.
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Kitai, Isao, 245,341, Cl. D64-11.00B.
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Skyer, Robert A.; and McGirk, James R., to International Harvester Company. Instrument cluster. 245,321, 8-9-77, Cl. D10-102.000.
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White, Donald A. Fire alarm. 245,322, 8-9-77, Cl. D10-106.000.
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Wiegert, Gerald A. Bicycle fairing. 245,329, 8-9-77, Cl. D12-182.000.
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Yavorsky, William M., to Harley Corporation. Drum. 245,318, 8-9-77, Cl. D9-170.000.
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1 :	4,040,208		4,040,518		4,041,132		4,040,774		4,040,497		4,040,995			
	4,040,425		4,040,520		4,041,133		4,040,788	17 :	4,040,124		4,041,016			
	4,040,459		4,040,532		4,041,159		4,040,847		4,040,143		4,041,043			
	4,040,479		4,040,543		4,041,173		4,041,126		4,040,144		4,041,050			
	4,040,577		4,040,545		4,041,174		4,041,429		4,040,175		4,041,065			
	4,040,750		4,040,560		4,041,182	9 :	4,040,247		4,040,176		4,041,089			
	4,040,875		4,040,562		4,041,209		4,040,346		4,040,186		4,041,092			
	4,040,896		4,040,575		4,041,233		4,040,542		4,040,204		4,041,101			
4 :	4,040,422		4,040,581		4,041,240		4,040,568		4,040,205		4,041,131			
	4,040,548		4,040,587		4,041,284		4,040,603		4,040,213		4,041,150			
	4,040,695		4,040,588		4,041,288		4,040,661		4,040,232		4,041,187			
	4,040,845		4,040,601		4,041,306		4,040,687		4,040,287		4,041,224			
	4,040,940		4,040,623		4,041,310		4,040,767		4,040,308		4,041,225			
	4,040,950		4,040,625		4,041,313		4,040,835		4,040,350		4,041,247			
	4,041,267		4,040,627		4,041,326		4,040,837		4,040,351		4,041,248			
	4,041,292		4,040,633		4,041,330		4,040,883		4,040,360		4,041,266			
	4,041,407		4,040,639		4,041,331		4,040,884		4,040,361		4,041,318			
	4,041,412		4,040,642		4,041,333		4,040,962		4,040,362		4,041,338			
	4,041,520		4,040,656		4,041,353		4,040,980		4,040,379		4,041,360			
5 :	4,040,526		4,040,664		4,041,357		4,041,098		4,040,418		4,041,365			
6 :	4,040,132		4,040,670		4,041,386		4,041,105		4,040,427		4,041,368			
	4,040,133		4,040,671		4,041,387		4,041,118		4,040,433		4,041,390			
	4,040,135		4,040,678		4,041,389		4,041,124		4,040,451		4,041,396			
	4,040,151		4,040,698		4,041,397		4,041,163		4,040,468		4,041,400			
	4,040,164		4,040,702		4,041,398		4,041,210		4,040,491		4,041,425			
	4,040,169		4,040,720		4,041,413		4,041,242		4,040,499		4,041,430			
	4,040,184		4,040,722		4,041,415	06 :	4,041,343		4,040,505		4,041,448			
	4,040,194		4,040,727		4,041,421	10 :	4,040,538		4,040,510		4,041,505			
	4,040,197		4,040,730		4,041,426		4,040,626		4,040,512		4,041,535			
	4,040,199		4,040,734		4,041,439		4,041,086		4,040,537		4,041,538			
	4,040,211		4,040,736		4,041,441		4,041,115		4,040,539	18 :	4,040,228			
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	4,040,311		4,040,745		4,041,456	12 :	4,040,123		4,040,621		4,040,312			
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	4,040,333		4,040,768		4,041,467		4,040,141		4,040,658		4,040,358			
	4,040,335		4,040,775		4,041,469		4,040,161		4,040,693		4,040,365			
	4,040,342		4,040,782		4,041,471		4,040,192		4,040,712		4,040,477			
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	4,040,412		4,040,880		4,041,490		4,040,593		4,040,872		4,040,787			
	4,040,420		4,040,897		4,041,516		4,040,602		4,040,909		4,040,881			
	4,040,423		4,040,902		4,041,519		4,040,624		4,040,921		4,040,982			
	4,040,436		4,040,907		4,041,527		4,040,709		4,040,929		4,041,111			
	4,040,447		4,040,944		4,041,529		4,040,710		4,040,930		4,041,369			
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U. S. GOVERNMENT PRINTING OFFICE : O - 1977

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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,514,074, Re. S.N. 809,645, Filed June 24, 1977, Cl. 251/127, HIGH ENERGY LOSS FLUID CONTROL, Richard E. Self, Owner of Record: *Inventor,* Attorney or Agent: Benjamin H. Sherman, et al., Ex. Gp.: 341

3,681,179, Re. S.N. 809,629, Filed June 24, 1977, Cl. 428/336, MOISTURE-RESISTANT SOLAR CONTROL FILM, Donald R. Theissen, Owner of Record: *Minnesota Mining and Manufacturing Company, St. Paul, Minn.,* Attorney or Agent: Cruzan Alexander, et al., Ex. Gp.: 164

3,792,531, Re. S.N. 806,992, Filed June 16, 1977, Cl. 32/15, DENTAL RESTORATIVE MATERIAL OF IMPROVED POLISHABILITY, Carl J. Rossi, Owner of Record: *Lee Pharmaceuticals, South El Monte, Calif.,* Attorney or Agent: Edward S. Irons, et al., Ex. Gp.: 333

3,937,882, Re. S.N. 810,583, Filed June 27, 1977, Cl. 178/69.5 R, FULL DUPLEX COMMUNICATION SYSTEM ON A TWO WIRE LINE, John A. C. Bingham, Owner of Record: *The Vadic Corporation, Mountain View, Calif.,* Attorney or Agent: Paul Janicke, et al., Ex. Gp.: 233

3,937,882, Re. S.N. 810,585, Filed June 27, 1977, Cl. 178/69.5 R, FULL DUPLEX COMMUNICATION SYSTEM ON A TWO WIRE LINE, John A. C. Bingham, et al., Owner of Record: *The Vadic Corporation, Mountain View, Calif.,* Attorney or Agent: Paul M. Janicke, et al., Ex. Gp.: 233

3,937,882, Re. S.N. 810,630, Filed June 27, 1977, Cl. 178/69.5 R, FULL DUPLEX COMMUNICATION SYSTEM ON A TWO WIRE LINE, John A. C. Bingham, et al., Owner of Record: *The Vadic Corporation, Mountain View, Calif.,* Attorney or Agent: Paul M. Janicke, et al., Ex. Gp.: 232

3,964,464, Re. S.N. 808,650, Filed June 21, 1977, Cl. 126/270, SOLAR RADIATION COLLECTOR AND CONCENTRATOR, Vernon J. Hockman, Owner of Record: *Oak Ridge Solar Engineering, Inc., Oak Ridge, Tenn.,* Attorney or Agent: William E. Anderson, et al., Ex. Gp.: 344

3,973,399, Re. S.N. 809,564, Filed June 24, 1977, Cl. 60/445, DEMAND COMPENSATED HYDRAULIC SYSTEM WITH PILOT LINE DITHER, Harlan Welbert Van Gerpen, Owner of Record: *Deere & Company, Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, et al., Ex. Gp.: 341

3,990,237, Re. S.N. 809,563, Filed June 24, 1977, Cl. 60/445, DEMAND COMPENSATED HYDRAULIC SYSTEM WITH PRESSURE AMPLIFIER, Harlan Welbert Van Gerpen, Owner of Record: *Deere & Company, Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, et al., Ex. Gp.: 341

4,004,418, Re. S.N. 809,562, Filed June 24, 1977, Cl. 60/422, DEMAND COMPENSATED HYDRAULIC SYSTEM WITH FLOW SENSITIVE DEVICE, Harlan Welbert Van Gerpen, Owner of Record: *Deere & Company, Moline, Ill.,* Attorney or Agent: H. Vincent Harsha, et al., Ex. Gp.: 341

PATENT NOTICES

Certificates of Correction for the Week of Aug. 16, 1977

Re. 29,164	4,001,000	4,018,723	4,024,223
Re. 29,204	4,003,124	4,018,884	4,024,242
Re. 29,207	4,003,502	4,018,931	4,024,439
Re. 29,246	4,003,627	4,019,266	4,024,600
3,686,889	4,003,847	4,019,369	4,024,602
3,704,483	4,003,946	4,019,387	4,024,625
3,741,779	4,004,151	4,019,518	4,024,815
3,760,204	4,005,105	4,019,609	4,024,932
3,767,508	4,005,219	4,019,612	4,024,983
3,796,741	4,005,388	4,019,698	4,025,034
3,882,188	4,006,015	4,020,023	4,025,089
3,897,445	4,006,144	4,020,219	4,025,193
3,900,092	4,007,134	4,020,451	4,025,210
3,917,486	4,008,299	4,020,517	4,025,217
3,919,113	4,008,833	4,020,950	4,025,325
3,932,416	4,009,084	4,021,122	4,025,407
3,940,001	4,009,183	4,021,215	4,025,556
3,947,386	4,009,265	4,021,257	4,025,621
3,951,033	4,009,641	4,021,258	4,025,827
3,962,234	4,010,133	4,021,323	4,025,874
3,962,459	4,012,381	4,021,479	4,025,983
3,966,034	4,012,448	4,021,515	4,026,090
3,966,191	4,012,606	4,021,544	4,026,229
3,966,784	4,012,839	4,021,609	4,026,284
3,973,129	4,013,496	4,021,683	4,026,610
3,974,160	4,013,654	4,021,813	4,026,780
3,974,259	4,013,680	4,022,125	4,026,889
3,976,262	4,014,011	4,022,284	4,026,951
3,978,142	4,014,154	4,022,427	4,026,976
3,978,407	4,014,350	4,022,773	4,027,152
3,980,576	4,014,737	4,023,193	4,027,197
3,981,827	4,014,954	4,023,234	4,027,425
3,982,149	4,015,164	4,023,246	4,027,673
3,984,818	4,015,963	4,023,372	4,027,678
3,986,578	4,015,964	4,023,436	4,028,323
3,988,359	4,016,159	4,023,524	4,028,380
3,990,994	4,016,382	4,023,644	4,028,442
3,993,702	4,016,422	4,023,650	4,028,453
3,994,795	4,016,864	4,023,657	4,028,551
3,997,397	4,016,995	4,023,772	4,028,582
3,998,110	4,017,122	4,023,785	4,029,830
3,998,377	4,017,553	4,023,843	
3,999,821	4,017,610	4,023,889	
4,000,046	4,017,650	4,024,005	

Disclaimers

3,086,528.—*Francis J. Eichelman,* Brookfield, Ill., and *Eldridge H. Smiley,* Los Angeles, Calif. INTERMITTENT VACUUM REGULATOR. Patent dated Apr. 23, 1963. Disclaimer filed June 8, 1977, by the assignee, *Chemetron Corporation.*

Hereby enters this disclaimer to all claims of said patent.

3,810,992.—*Julius Joel Menn,* Saratoga, Calif. ANTHELMINTIC BIS-THIOUREIDO BENZENE DERIVATIVE. Patent dated May 14, 1974. Disclaimer filed Nov. 1, 1976, by the assignee, *Stauffer Chemical Company.*

Hereby enters this disclaimer to claim 1 of said patent.

3,834,143.—*Carlo Menegatto,* Monza, Italy. SPINDLE UNIT FOR TEXTILE MACHINE. Patent dated Sept. 10, 1974. Disclaimer filed June 6, 1977, by the inventor.

Hereby enters this disclaimer to claims 1, 2, 6 and 7 of said patent.

3,888,820.—*Irving Touval,* Fords, and *Morris Dunkel,* Paramus, N.J. NOVEL FLAME RETARDANT COMPOSITIONS OF MATTER. Patent dated June 10, 1975. Disclaimer filed June 16, 1977, by the assignee, *UOP Inc.*

Hereby enters this disclaimer to all claims of said patent.

3,933,692.—*Bernard G. Kushlefsky,* Edison, and *Kenneth Treadwell,* Rahway, N.J. URETHANE FOAM CATALYST. Patent dated Jan. 20, 1976. Disclaimer filed Oct. 26, 1976, by the assignee, *M & T Chemicals Inc.*

Hereby enters this disclaimer to claims 1 through 13, all the claims therein, of said patent.

4,022,905.—*Hans Erik Eriksson,* Holo, and *Gosta Lennart Florvall,* Sodertalje, Sweden. BENZYLIDENE HYDRAZINO - 1,2,4 - TRIAZOLES, PHARMACEUTICALS THEREWITH, AND METHOD OF USE. Patent dated May 10, 1977. Disclaimer filed Feb. 18, 1977, by the assignee, *Astra Lakemedel Aktiebolag.*

The term of this patent subsequent to May 25, 1993 has been disclaimed.

Dedication

3,063,113.—*Theodore Operhall,* Whitehall, and *Emery E. Kuhary,* North Muskegon, Mich. DISPOSABLE PATTERN WITH LOWER MELTING EXTERNAL COATING. Patent dated Nov. 13, 1962. Dedication filed June 3, 1977, by the assignee, *Howmet Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

Errata

All reference to Patent No. 4,031,495 to Brian Crowle of Ashford, England, for DIFFERENTIAL AMPLIFIER appearing in the OFFICIAL GAZETTE of June 21, 1977 should be deleted since no patent was granted.

All reference to Patent No. 4,036,791 to James Leverette Guthrie et al. of Maryland for SIMULATED NATURAL SPONGE FROM URETHANE appearing in the OFFICIAL GAZETTE of July 19, 1977 should be deleted since no patent was granted.

All reference to Patent No. 4,037,012 to Edward Arthur Tilson et al. of England for TRANSFER MATERIALS appearing in the OFFICIAL GAZETTE of July 19, 1977, should be deleted since no patent was granted.

All reference to Patent No. 4,037,131 to Wellman L. Clark et al. of Virginia for RETINA FOR PYROELECTRIC VIDICON appearing in the OFFICIAL GAZETTE of July 19, 1977 should be deleted since no patent was granted.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUE PATENTS

GRANTED AUGUST 16, 1977

ERRATA

For CLASS	See PATENT NO.
542–417	29,358

REISSUES

AUGUST 16, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

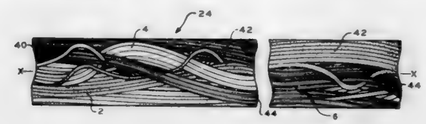
Re. 29,352
NON-TWISTED, HEATHER YARN AND METHOD FOR PRODUCING SAME

Richard C. Newton, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Original No. 3,811,263, dated May 21, 1974, Ser. No. 228,626, Feb. 23, 1972. Application for reissue May 19, 1976, Ser. No. 687,715

Int. Cl.[2] **D02G** *3/22, 1/16, 1/20*

U.S. Cl. 57—140 R **15 Claims**



1. A yarn having an axis and being formed of a multiplicity of continuous filaments, said filaments forming a plurality of major bundles at least one of which is of substantially different color relative to the remaining bundles, each of said bundles having from about 10 to about 90 percent of its filaments cohering to form a secondary bundle with the remaining filaments of the major bundle varying in number along the length of the yarn, being interlaced with other major bundles of the yarn, and being randomly oriented about the yarn axis, each of said secondary bundles in each unit length of yarn of about 6 inches having a portion thereof formed of greater than about 30 percent of the filaments of its major bundle and each of said secondary bundles in each unit length of yarn of about 8 inches being non-uniformly located relative to the yarn axis.

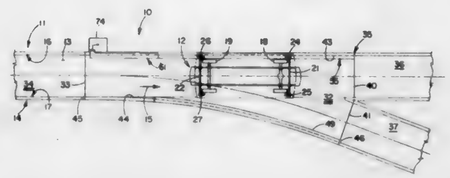
Re. 29,353
SWITCHING SYSTEM FOR A TRANSPORTATION SYSTEM EMPLOYING A GUIDEWAY

John M. Metcalf, Dallas, Tex., assignor to Vought Corporation, Dallas, Tex.

Original No. 3,782,292, dated Jan. 1, 1974, Ser. No. 202,753, Nov. 29, 1971. Application for reissue Dec. 29, 1975, Ser. No. 645,123

Int. Cl.[2] **E01B** *25/12*

U.S. Cl. 104—130 **30 Claims**



1. In a transportation system of the type employing vehicles adapted to travel along a guideway comprising a roadway and structure providing at least one guide surface, having vertical extension, extending along the guideway for guiding the vehicle, the system including a pluraity of guideway junctions, each junction having a first end communicating with a first portion of the guideway and a widened, bifurcated, second end communicating with second and third, mutually diverging portions of the guideway, the transportation system including at least one primary guideway and at least one secondary guideway, having inlet and outlet ends, connected to the primary guideway by respective, oppositely directioned switching systems, the transportation system further including programmable control means for sensing the positions of the respective vehicles and for automatically actuating respective ones of the switching systems at appropriate times in response to the movement of the respective vehicles and according to respective, preselected routes programmed in the control system with respect to each vehicle, an improved switching system adapted for use in such a transportation system, the switching system comprising:

a single movable guide rail positioned adjacent the first end of the junction and pivotable about an approximately vertical axis between first and second positions;

first guiding means, comprising a first guide surface on the movable guide rail, for guiding a vehicle toward the second guideway portion upon the vehicle entering the junction from the junction first end when the movable guide rail is in its first position; [and]

second guiding means, comprising a second guide surface on the movable guide rail, for guiding a vehicle toward the third guideway portion upon the vehicle entering the junction from the junction first end when the movable guide rail is in its second position,

third guiding means[, immovably positioned between the movable guide rail and the second guideway portion,] for guiding a vehicle through the junction and onto the second guideway portion upon the vehicle being initially guided by the first guiding means and comprising a guide surface defined by a structure *immovably positioned between the movable guide rail and the second guideway portion;* and

fourth guiding means[, immovably positioned between the first end of the junction and the third guideway portion,] for guiding a vehicle through the junction and onto the third guideway portion upon the vehicle being initially guided by the second guiding means, *the fourth guiding means comprising a guide surface defined by a structure immovably positioned between the first end of the junction and the third guideway portion, the movable guide rail being spaced laterally, relative to the junction, from the guide surface of the fourth guiding means, the movable guide rail having a first end adjacent the junction first end and a second end adjacent the guide surface of the third guiding means and between the structure of the third guiding means and the junction first end, the first and second guide surfaces extending along the movable guide rail to a location thereon adjacent the movable guide rail second end, the portions of the first and second guide surfaces adjacent the movable guide rail second end being intermediate the respective guide surfaces of the third and fourth guiding means upon the movable guide rail being in its second position.*

Re. 29,354
ELECTRIC NAILER

Bruce Malkin, Norwalk, Conn., assignor to Electro-Speed Tool Corporation, Norwalk, Conn.

Original No. 3,810,572, dated May 14, 1974, Ser. No. 307,415, Nov. 17, 1972. Application for reissue May 13, 1976, Ser. No. 686,322

Int. Cl.[2] **B25C** *1/06*

U.S. Cl. 227—132 **15 Claims**

12. An electrically operable portable hammer device comprising, in combination:

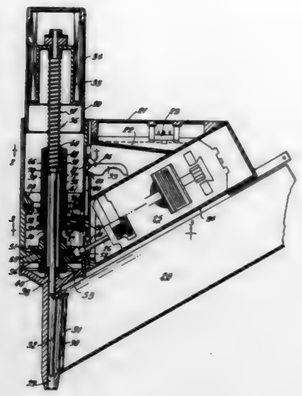
elongated axially movable hammer means;

energy storage means connected to said hammer means for delivering operating force to said hammer means;

an electrical motor, and a charging mechanism for coupling said electrical motor to said energy storage means to enable charging of said energy storage means to a predetermined

charged condition, said charging mechanism including a rotating sleeve having a plurality of charging balls trapped therein, and

wherein said elongated hammer means includes a threaded region engageable by said charging balls, whereby rotation of said sleeve causes said balls to drive said hammer means to



change the energy storage means to said predetermined charged condition;

latch means for latching said energy storage means in said predetermined position; and

trigger means for defeating said latch means to permit said energy storage means to operate said hammer means.

Re. 29,355

BOARD GAME APPARATUS

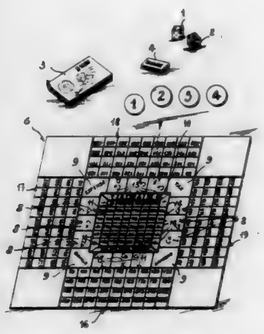
Andre Lefevre, and Rosemary Loweth Lefevre, both of 4 rue Albert Malet, 75012 Paris, France

Original No. 3,799,552, dated Mar. 26, 1974, Ser. No. 250,360, May 4, 1972. Application for reissue Mar. 26, 1976, Ser. No. 670,708

Claims priority, application France, May 5, 1971, 71.16188

Int. Cl.² A63F *3/00*

U.S. Cl. 273—134 AF **12 Claims**



9. A parlor game adapted to be played with tokens representing the different players, and with simulated currency, said game comprising:

a game board including

a first portion subdivided into discrete areas containing numerical indicia arranged in rows and columns,

a second portion subdivided into two sets of areas, the areas of one set being aligned with respective ones of the rows, and the areas of the other set with respective ones of the columns of the first portion, the areas of each set having distinctively different indicia denoting the different rows or columns with which they are aligned,

a third portion defining a track for movement of the tokens and divided into segments, at least some of the segments having indicia thereon designating objects available for purchase with the simulated currency, there being a plurality of different objects, the objects being cards bearing indicia corresponding to the indicia on the track; and

means operable by the players to select on the basis of chance specific ones of the indicia in the two sets of areas in the second portions, and to determine the movement of the tokens along the track.

Re. 29,356

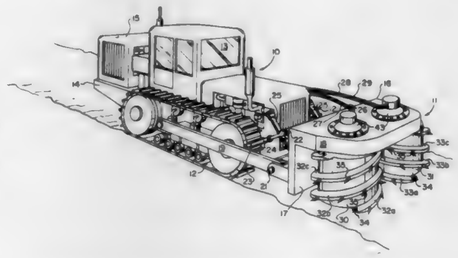
SYSTEM FOR CHIPPING AND MOVING ICE

John D. Bennett, Denton, Tex., assignor to Sun Oil Company (Delaware), Dallas, Tex.

Original No. 3,888,544, dated June 10, 1975, Ser. No. 420,815, Dec. 3, 1973. Application for reissue Sept. 20, 1976, Ser. No. 724,877

Int. Cl.² E01H *5/12*

U.S. Cl. 299—25 **11 Claims**



1. A system for chipping ice and forming a pathway through rough, icy terrain, comprising: a pair of cylindrical drums mounted for rotation about parallel vertical axes, each of said drums including a smooth, outwardly rounded lower end surface to support the weight of the drum; a plurality of spikes protruding outwardly from the cylindrical outside surface of each drum to engage and chip the ice, the circular paths formed by the tops of the spikes when the drums are rotated being overlapping in the [regioon] *region* between the drums; and means for rotating said drums in opposite directions to chip ice and pull the drums forwardly through the ice to form a pathway along a generally level grade.

Re. 29,357

IMAGE FORMATION AND DEVELOPMENT

J. T. Bickmore, Rochester, and William L. Goffe, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Original No. 3,518,081, dated June 30, 1970, Ser. No. 345,433, Feb. 17, 1964. Application for reissue June 29, 1972, Ser. No. 267,724

Int. Cl.² G03G *13/22;* B05D *3/06*

U.S. Cl. 96—1 R **12 Claims**

5. The method of forming a latent electrostatic image on an imaging layer comprising increasing the molecular weight of at least a surface of said layer by subjecting it to a polymerizing influence in imagewise configuration thereby modifying the triboelectric charging susceptibility of said surface in imagewise configuration and bringing said surface into frictional contact with a material remote in the triboelectric series from at least one of the modified and the unmodified portions of said surface so that a differential charge pattern is set up between image and non-image areas on said surface *as a consequence of said imagewise change in triboelectric susceptibility and said contact.*

13. The method of forming a latent electrostatic image on an imaging layer comprising modifying the triboelectric charging susceptibility of a surface of said layer in imagewise configuration by means of imagewise contaminating said surface with human body oils and bringing said imaging surface into contact with a material remote in the triboelectric series from at least one of the modified and the unmodified portions of said imaging surface so that a differential charge pattern is set up between image and non-image areas on said imaging surface as a consequence of said imagewise change in triboelectric susceptibility and said contact.

Re. 29,358

1,5-BIS SUBSTITUTED-1,4-PENTADIEN-3-ONE SUBSTITUTED AMIDINO HYDRAZONE SALTS AND METHOD OF PREPARING THE SAME

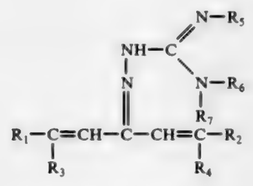
Andrew Stephen Tomcufcik, Old Tappan, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Original No. 3,878,201, dated Apr. 15, 1975, Ser. No. 337,033, Mar. 1, 1973. Continuation-in-part of Ser. No. 131,412, April 5, 1971, abandoned. Application for reissue July 16, 1976, Ser. No. 706,085

Int. Cl.² C07C *133/10;* C09B *23/00*

U.S. Cl. 542—417 **15 Claims**

1. A pentadiene of the formula:



wherein R_1 and R_2 may be the same or different and are selected from the group consisting of phenyl, halophenyl, carboxyphenyl, lower alkoxy (C_1–C_4)phenyl, diloweralkoxy (C_1–C_4)phenyl, biphenylyl, alkyl (C_1–C_4) phenyl, dialkyl (C_2–C_8)phenyl, nitrophenyl, trifluoromethylphenyl, lower alkyl (C_1-C_4)sulfonylphenyl, lower alkyl (C_1–C_4)thiophenyl, methylenedioxyphenyl, cyanophenyl, sulfamylphenyl, carboloweralkoxy (C_1–C_4)phenyl, naphthyl, lower alkoxy (C_1–C_4) naphthyl and halonaphthyl, R_3 and R_4 may be the same or different and are selected from the group consisting of hydrogen, lower alkyl C_1–C_4, phenyl and halophenyl; R_5 and R_6 are lower alkyl C_1–C_4 and when taken together an alkylene group of 2 to 9 carbon atoms, a methyl or a phenyl alkylene group of 2 to 4 carbon atoms, a dimethyl or a diphenyl alkylene group of 2 to 4 carbon atoms, *or a 1,2-cyclohexylene group,* and R_7 is hydrogen or lower alkyl C_1–C_4, and non-toxic acid salts thereof.

Re. 29,359

BRONCHODILATOR EXPECTORANT COMPOSITION CONTAINING THEOPHYLLINE AND A GUAIACOL

Neil H. Mercer, and Robert J. Bequette, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Original No. 3,109,773, dated Nov. 5, 1963, Ser. No. 147,436, Oct. 25, 1961. Application for reissue July 28, 1976, Ser. No. 709,569

Int. Cl.² A61K *31/52, 31/09*

U.S. Cl. 424—253 **12 Claims**

1. A pharmaceutical composition comprised of at least about 40% by volume of water having dissolved therein at room temperature more than 0.83 g. of theophylline per 100 ml. of water contained therein, and a solubilizing agent selected from the group consisting of guaiacol and pharmaceutically acceptable water soluble forms thereof in amount sufficient to maintain said theophylline in solution [.] *, wherein a greater amount of theophylline is dissolved at room temperature than the amount thereof which is soluble in the composition in the absence of said solubilizing agent, and wherein the greater amount of theophylline dissolved is made possible by the solubilizing agent.*

Re. 29,360

SYSTEM FOR RECORDING AND/OR REPRODUCING FOUR CHANNEL SIGNALS ON A RECORD DISC

Nobuaki Takahashi, Yamato, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

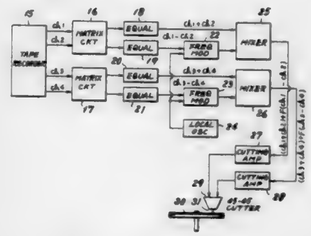
Original No. 3,883,699, dated May 13, 1975, Ser. No. 261,914, June 12, 1972. Continuation of Ser. No. 92,803, Nov. 25, 1970, Pat. No. 3,686,471. Application for reissue Sept. 7, 1976, Ser. No. 720,762

Claims priority, application Japan, Nov. 28, 1969, 44-95587; Mar. 15, 1970, 45-21826; Mar. 24, 1970, 45-24579; July 5, 1970, 45-58313

The portion of the term of this patent subsequent to Aug. 22, 1989, has been disclaimed.

Int. Cl.² G11B *3/00, 3/74;* H04B *5/00*

U.S. Cl. 179—100.4 ST **26 Claims**



1. A system for recording four channel signals in a single groove cut on a record disc, said system comprising signal source means for supplying four separate channel signals, matrix circuit means for composing a first sum signal and a first difference signal responsive to the first and second channel signals and also a second sum signal and a second difference signal responsive to the third and fourth channel signals of the four separate channel signals, single oscillator means for generating a carrier wave having a predetermined frequency, first modulator means for angle modulating said carrier wave with the first difference signal, second modulator means for angle modulating said carrier wave with the second difference signal, each of said modulator means comprising means whereby the phase angle deviation of said carrier wave is between 0.3 and 3 radians *for at least those frequencies which are higher than a predetermined frequency when the level of each of said difference signals applied respectively to said two modulator means is a standard level,* the lower frequency limit of the carrier wave in the output of each of said modulator means being higher than the upper frequency limit of the first and second sum signals, first mixer means for mixing and multiplexing the first sum signal with the output signal of the first modulator means, second mixer means for mixing and multiplexing the second sum signal with the output signal of the second modulator means, and means for simultaneously recording the output signal of said first mixer means on one wall of a single groove of the record disc and recording the output signal of said second mixer means on the other wall of the groove.

Re. 29,361

PROCESS FOR SHAPING WORKPIECE BY ELECTRICAL DISCHARGE AND APPARATUS THEREFOR

Nagao Saito; Kazuhiko Kobayashi, both of Nagoya, and Shigeru Takagi, Kasugai, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Original No. 3,705,287, dated Dec. 5, 1972, Ser. No. 132,519, Apr. 8, 1971. Application for reissue July 28, 1975, Ser. No. 599,392

Claims priority, application Japan, June 2, 1970, 45-47389

Int. Cl.[2] B23P *1/08*

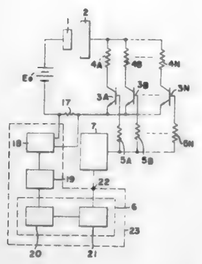
U.S. Cl. 219—69 C **6 Claims**

1. A process for shaping a workpiece using electric current comprising the steps of:

positioning a workpiece adjacent a working electrode such that the electrode and the workpiece are separated by a working gap,

impressing an intermittent pulse voltage across said working gap, *said intermittent pulse voltage comprising a repeating no-load voltage followed by a discharge voltage at the commencement of which a substantial current begins to flow within said working gap followed by a quiescent period during which no voltage is present in the gap,*

detecting the *no-load* time period between the instant at which a *no-load* voltage is impressed across said working gap and the instant at which a substantial current begins to flow within said working gap; and,



controlling the length of time during which said substantial current flows directly in response to the length of said *no-load* detected time period *and independently of the length of the quiescent period.*

PLANT PATENTS

GRANTED AUGUST 16, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,091

MINIATURE ROSE PLANT

Ernest D. Williams, Dallas, Tex., assignor to Ralph S. Moore, Visalia, Calif., a part interest

Filed Sept. 17, 1976, Ser. No. 725,081

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—7 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, upright, much branched habit, essentially as illustrated and described, characterized by buds and flowers of a bright red-orange to orange-pink color resembling the Mary Marshall miniature rose (U.S. Plant Pat. No. 3,346), the buds and flowers being slightly smaller in size than Mary Marshall; and further characterized by a plant which is vigorous and compact, said plant being easy to propagate from cuttings, with medium small, disease resistant, mat foliage, an abundance of bloom, with better than average keeping quality, with flowers borne singly or several to the stem in loose clusters.

4,092

CHRYSANTHEMUM PLANT NAMED COPPER HOSTESS

Robert E. Danielson, West Chicago, Ill., assignor to Pan American Plant Company, West Chicago, Ill.

Filed Oct. 12, 1976, Ser. No. 731,743

Int. Cl.[2] A01H *5/00*

U.S. Cl. Plt.—79 **1 Claim**

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and described, characterized particularly, when compared to its parent "Hostess", by its unique orange-bronze coloration, less longitudinal petal roll and less reflexing of the outer ray florets, and by its larger flower size.

PATENTS

GRANTED AUGUST 16, 1977

ERRATA

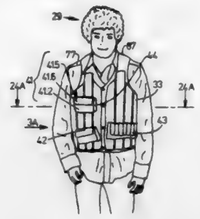
For CLASS	See PATENT NO.
072–410	4,041,740
072–389	4,041,765
072–402	4,041,766
074–751	4,041,835
173–013	4,042,036
173–152	4,042,043
211–049 D	4,042,095
211–049 D	4,042,096
211–182	4,042,097
126–121	4,042,160
251–044	4,042,178
269–088	4,042,264
431–004	4,042,313
428–678	4,042,341
428–585	4,042,342
428–667	4,042,426
209–074 R	4,042,491
106–288 Q	4,042,582
542–458	4,042,583
544–059	4,042,584
544–022	4,042,585
544–060	4,042,586
544–183	4,042,587
544–183	4,042,588
548–339	4,042,597
428–447	4,042,643
128–034	4,042,736
361–400	4,042,861
363–037	4,042,870
363–028	4,042,871
363–020	4,042,872
363–129	4,042,873
364–900	4,042,911
364–200	4,042,912
364–200	4,042,913
364–200	4,042,914
254–139.1	4,042,941
235–150.3	4,042,973

PATENTS

GRANTED AUGUST 16, 1977

GENERAL AND MECHANICAL

4,041,549
POCKETED GARMENT
Paul Ray Atkinson, 1624-A Hayden, Amarillo, Tex. 79102
Filed May 21, 1976, Ser. No. 688,790
Int. Cl.[2] A41D *1/04*
U.S. Cl. 2—94 **8 Claims**



1. A body contour fitting garment for human wear with detachable pockets comprising;

a. a vertically and horizontally extending flexible back panel with a side and a top edge,

b. a vertically and horizontally extending front flexible body fitting panel with a side edge and a top edge, said front and back panels joined at said top edges and said side edges of said panels, said front body fitting panel having a curved contour which matches an adjacent three dimensionally extending curved body contour of a wearer of said garment,

c. a vertically and horizontally extending detachable pocket comprising a front wall and a flexible rear wall joined together,

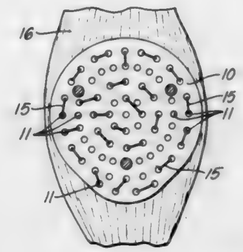
d. a horizontally evenly distributed array of a vertically extending evenly distributed series of outwardly curved loops the ends each of which are attached to and extend outward from a surface of a separately flexible loop supporting panel firmly yet flexibly attached to said front body fitting panel and having the same curved contour and said loops are substantially uniformly spaced apart along each of the two different planes perpendicular to each other over said surface of the separately flexible loop supporting panel and said array of loops has an outer surface that is free of palpable protuberances; and

e. a horizontally evenly distributed array of vertically extending evenly distributed series of resilient hook members attached to and extending outwardly from a surface of a hook supporting separately flexible panel firmly yet flexibly attached to said rear wall of said pocket and said hooks are substantially uniformly spaced apart along each of two planes perpendicular to each other over said surface of said hook support panel and the spacing of said hook members along said mutually perpendicular planes on the hook support panel is different from the spacing of the loops on the loop support panel along mutually perpendicular planes,

f. and the loop supporting panel is joined to said hook supporting panel by a series of non-parallel spaced apart resilient tension bearing combinations of said hook members and said loops in mechanical engagement with each other, and

g. adjacent said tension bearing combinations intermediate resilient compression members are compressed between said hook bearing panel and said loop bearing and, adjacent said tension bearing combinations, portions of said pile and hook support panels are resiliently pressed apart between neighboring members of said series of tension bearing combinations of mechanically joined hook members and loops by said resiliently compressed members and substantially all portions of the surfaces of the loop supporting panel and neighboring portions of the hook supporting panel so joined are firmly located equidistant from each other whereby said separately flexible loop bearing panel and said separately flexible hook bearing panels are firmly held spaced apart in a resulting three dimensionally stable stiffened structure having the curved contour of said curved loop support panel.

4,041,550
ARTIFICIAL PATELLA AND METHOD OF REPAIRING A NATURAL PATELLA
Calvin H. Frazier, 1808 Verdugo Blvd., Glendale, Calif. 91208
Filed July 30, 1976, Ser. No. 710,360
Int. Cl.[2] A61F *1/24*
U.S. Cl. 3—1.91 **10 Claims**



1. A method of repairing a natural patella which has been destroyed or damaged beyond normal repair comprising completely replacing or supplementing the remainder of said natural patella with an artificial patella, said artificial patella having a contour comparable to that of the undamaged natural patella, said artificial patella having a plurality of perforations, and suturing said artificial patella to the natural patellar tendon with a plurality of sutures extending through said perforations in said artificial patella and through the natural patellar tendon to securely attach said artificial patella in a position comparable to that of the natural patella, said artificial patella being adapted to function in a manner comparable to that of the natural patella.

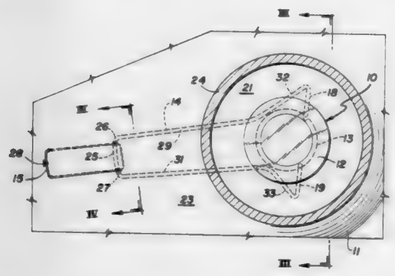
4,041,551
WAISTBAND
Morris Cohen, 9250 Meilleur, Montreal, Quebec, Canada (H2N 2B2)
Filed Aug. 12, 1976, Ser. No. 713,988
Int. Cl.[2] A41F *9/00*
U.S. Cl. 2—236 **14 Claims**



1. A waistband, comprising
an outer band,

a stiffening insert on the inner surface of said outer band, said outer band having an upper and a lower edge portions folded over the edges of said stiffening insert,
an anti-slip band on said stiffening insert,
a first lining with a first stiffening insert sewed to said lower folded over edge portion of said outer band by means of a first row of stitches,
a second lining with a second stiffening insert positioned partly on said first lining and partly on said anti-slip band, said second lining being sewed by said first row of stitches to said outer band and by a second row of stitches stitch passing through said anti-slip band to said outer band,
a third lining with a third stiffening insert positioned partly on said upper folded over edge portion of said outer band and partly on said anti-slip band, said third lining being sewed by a third row of stitches passing through said anti-slip band to said outer band and by a fourth row of stitches to said upper folded over edge portion of said outer band,
said first, second, third and fourth row of stitches extending through the body of said outer band and being visible on the outer surface of the waistband.

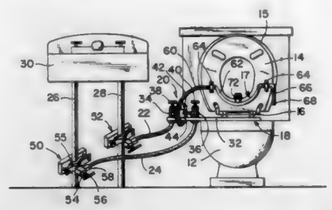
4,041,552
ARTIFICIAL LENS
Fotios Ganias, 4 N. Ashland St., Worcester, Mass. 01609
Filed Sept. 1, 1976, Ser. No. 719,672
Int. Cl.[2] A61F *1/16, 1/24*
U.S. Cl. 3—13 **9 Claims**



1. Artificial lens for application to the eye after the natural lens has been removed, comprising
a. a lens element adapted to lie adjacent the iris, and
b. a support arm connected at one end to the lens element and extending generally radially thereof, the other end of the arm having means for suturing it to the ciliary body and sclera at two substantially-spaced points equidistant from the center of the iris to prevent tipping of the lens element, the support arm being a loop of wire whose ends are connected to the lens element, the loop being generally U-shaped with the lens element located at the open end and the suture points located at two remote corners.

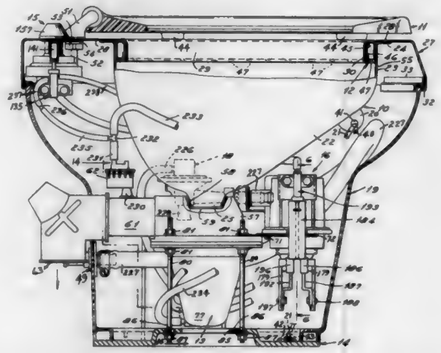
4,041,553
HYGIENIC JET
Sy Sussman, 740 Princeton Road, Franklin Square, N.Y. 11010
Continuation-in-part of Ser. No. 451,885, March 18, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,510
Int. Cl.[2] A47K *3/22, 11/08*
U.S. Cl. 4—7 **1 Claim**

1. A douching attachment for a toilet bowl having a hinged toilet seat including bolts for mounting the seat upon the toilet bowl comprising:
a. a mounting bracket containing bolt holes appropriately spaced for mounting upon the toilet seat bolts;
b. first and second valve means, each having an input port for connection to a water source and an output port mounted on said bracket;
c. Tee means interconnecting the output ports of said first and second valve means to provide a single unitary output port;
d. a tube having a pair of spaced colinear sections joined by an arcuate tube section and a right angle closed terminal section extending from one of the colinear sections and a flexible tube joining the end of the other of the colinear sections;
e. journal members for rotatably securing the colinear sections to the underside of the toilet seat for movement in a plurality of positions from a retracted position under a rear portion of said seat to a forward position adjacent to the front of said seat; and



f. a nozzle extending from the middle of the said arcuate section and in communication with the interior therewith, said nozzle being oriented to direct a stream of water at an angle of about 18° below the axis of rotation of said tube and tangential to a circle coaxial with the axis of rotation of the tube, said tube being closed at one end and having means for connection at its other end to a source of water, the curvature of said tube being such that it may be retracted completely beneath said rear portion of the seat and in the retracted position the stream is directed within the bowl.

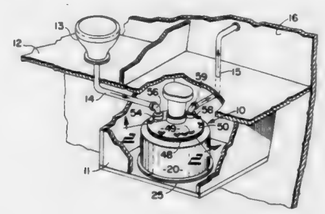
4,041,554
VACUUM FLUSH WATER CLOSET
Charles E. Gregory, Anchorville; Michael Brian, Orchard Lake; Jerald F. Thomas, Utica, and James F. Cameron, Milford, all of Mich., assignors to Jered Industries, Inc., Birmingham, Mich.
Filed Jan. 22, 1974, Ser. No. 435,511
Int. Cl.[2] B63B *29/14;* **E03D** *5/012*
U.S. Cl. 4—10 **26 Claims**



1. In a vacuum flush water closet, the combination, comprising:
a. a sewage discharge valve that is operated by vacuum;
b. means for producing a vacuum;
c. a bowl having an outlet neck at the lower end thereof which is seated on and solely supported by said vacuum operated sewage discharge valve;
d. support means for supporting said vacuum operated sewage discharge valve;
e. said bowl having an open upper end with a rim thereabout;
f. a seat mounted on said rim;
g. a vacuum operated flushing water supply means carried by said bowl for supplying a predetermined amount of flushing water into said bowl; and,
h. a vacuum operated control system carried by said bowl for selectively activating said vacuum operated sewage discharge valve and said vacuum operated flushing water supply means for a predetermined flushing cycle.

21. A vacuum control system including a vacuum operated sewage system having a vacuum flush water closet, a means for producing a vacuum, a flushing water flow control valve that is operated by vacuum, and a sewage discharge valve that is operated by vacuum, the combination comprising:
a. a vacuum operated vacuum control valve connected to said means for producing a vacuum and to said vacuum operated sewage discharge valve for selectively supplying vacuum to said vacuum operated sewage discharge valve;
b. timer means operated by vacuum and gravity for operating said vacuum operated flushing water flow control valve and said vacuum operated vacuum control valve; and,
c. push button activation switch connected to said means for producing a vacuum and said timer for initiating a flushing cycle in said water closet.

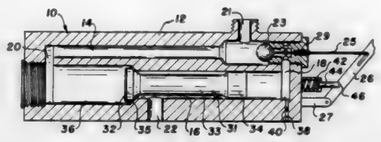
4,041,555
MARINE HOLDING TANK
David F. Cole, 99 Elmridge Road, Mansfield, Ohio 44907, and Walter Sutcliffe, Kinnelon (Smoke Rise), N.J. 07405
Continuation-in-part of Ser. No. 173,096, Aug. 19, 1971, abandoned. This application Nov. 5, 1973, Ser. No. 412,747
Int. Cl.[2] E03D *1/00, 3/00, 5/00*
U.S. Cl. 4—10 **13 Claims**



1. A holding tank in fluid communication with a toilet comprising a housing having intake port and exhaust port means, a basket mounted in said housing for receiving an excrement and water charge from the toilet through the intake port, rotary mixing means in said basket for mixing the excrement with the water, and heating means for said charge operated simultaneously with said mixing means, whereby said charge is reduced in the basket to a liquid-solid mixture and then to vapor and ashes for removal of the vapor and the ashes from the housing through the exhaust port means.

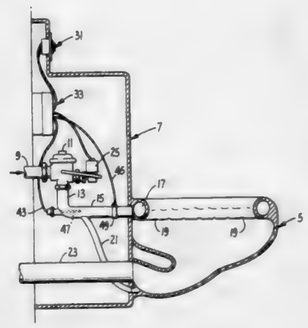
4,041,556
FLUSHING METHOD AND APPARATUS
Stanley N. Darling, and Reyi Darling, both of 1248 Craigflower Road, Victoria, British Columbia, Canada (V9A 2Y6)
Filed Mar. 31, 1976, Ser. No. 672,152
Claims priority, application Canada, Apr. 9, 1975, 224379
Int. Cl.[2] E03D *1/34*
U.S. Cl. 4—52 **23 Claims**

1. Flush valve apparatus comprising:
a valve body;
a channel formed in said body,
an inlet in communication with the channel near one end thereof,
an outlet in communication with the channel and spaced from said one end,
a flow valve in channel having a head, a stem of smaller cross section than the head and a guide portion that is a close, slidable fit in the channel and remote from the head,
a valve seat in the channel between said one end and the outlet,
said valve being reciprocal in the channel between a closed, rest position in which the valve head is located on the



valve seat to a second position in which the head is in the vicinity of said one end, the flow valve being adapted to ensure that, in use, liquid can pass the head and out through the outlet at all positions except the closed position, and
means to permit movement of the valve to move the head off the valve seat,
whereby, in use, when the valve is moved to said second position liquid can pass from the inlet to the outlet and simultaneously move the valve gradually back to the closed, rest position to stop passage of liquid through the outlet.

4,041,557
TOILET FLUSHING DEVICE WITH OVERFLOW INHIBITOR
Robin L. Ringler, San Francisco, Calif., assignor to Aluminum Plumbing Fixture Corporation, Burlingame, Calif.
Filed Sept. 29, 1976, Ser. No. 727,777
Int. Cl.[2] E03D *11/02, 11/18*
U.S. Cl. 4—75 **3 Claims**



1. A toilet having an electrical flushing mechanism includingan overflow inhibiting circuit, comprising in combination:
a. a toilet bowl having a water supply pipe leading thereto;
b. an electrically-actuated flushing valve for supplying flushing water through said supply pipe from a source of water supply;
c. an electric supply including a momentary contact switch for actuating said flushing valve;
d. an insulated electrode mounted in said water supply pipe;
e. said electrode leading to a detection circuit and means whereby said detection circuit deactivates said electric

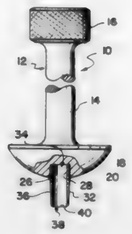
supply when water is in said supply pipe and completes the circuit between said electrode and ground.

4,041,558

SHEETROCK HOLE PUNCHER AND NAIL SETTER

Harvey Victor, 24 Back Drive, Edison, N.J. 08817

Filed May 10, 1976, Ser. No. 684,666
Int. Cl.[2] B25C *3/00*; B26F *1/32*
U.S. Cl. 7—14.1 R **3 Claims**



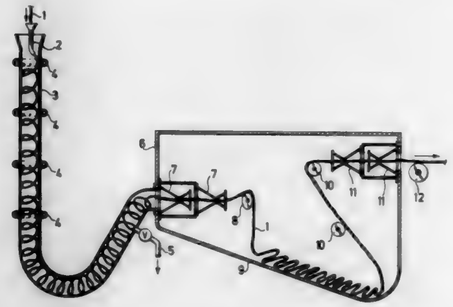
1. A sheetrock nail setter comprising in combination:
an impact tool including an elongated shank having an enlarged head at one end thereof adapted to receive impact blows delivered thereto, the other end of said shank having a cutting tool-receiving nail set head, the central portion of the lower surface of said nail set head being provided with a recess therein, the base of said recess being located sufficiently close to the lower surface of said nail set head as to be cooperable with a nail head to drive same into the sheetrock in countersunk relation therewith, said nail set head being dished upwardly from said central portion thereof to a level above the base of said recess and thus cooperable with said base to permit countersinking of the nail.

4,041,559

PROCESS FOR THE CONTINUOUS WET TREATMENT OF TEXTILE MATERIAL IN ROPE FORM

Hans-Ulrich von der Eltz, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Aug. 20, 1976, Ser. No. 716,241
Claims priority, application Germany, Aug. 23, 1973, 2537615
Int. Cl.[2] D06B *3/26, 3/28, 21/00, 23/18*
U.S. Cl. 8—149.1 **1 Claim**



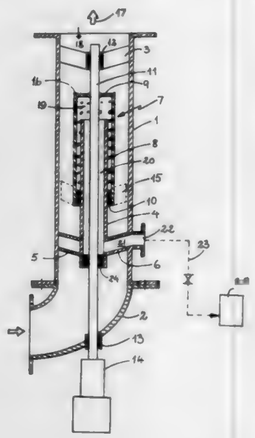
1. A continouos process for the wet treatment of textile material in the form of endless ropes and for dwelling the textile a certain period under high temperature (HT) conditions, which comprises introducing the material in curls into the long leg of a vertically positioned, U-shaped tubular tunnel having legs of different length, impregnating the textile under atmospheric pressure with hot treatment liquor that is ejected at a high flow rate by means of spraying nozzles which are positioned at the top and at additional locations further down the descending long leg of the tubular tunnel, conveying the textile along the bent portion of the tubular tunnel under the hydrostatic pressure exerted on the material by the weight of the liquid column in the long leg, conveying the textile from the short leg of the tubular tunnel into a pressure-tight reaction and fixing chamber through at least two pressure locks placed one behind the other at the entrance of the reaction and fixing chamber, allowing the textile to dwell during its passage through the reaction and fixing chamber under the action of a HT vapor atmosphere in stored condition, and finally withdrawing the textile from the reaction and fixing chamber through at least two other pressure locks.

4,041,560

METHOD AND DEVICE FOR DEWATERING OF SUSPENSIONS IN MOVEMENT

Finn Jacobsen, Karlstad, Sweden, assignor to Kamry AB, Karlstad, Sweden

Filed Apr. 13, 1976, Ser. No. 676,660
Claims priority, application Sweden, Apr. 15, 1975, 7504309
Int. Cl.[2] B01D *33/00*; D21C *9/18*; D21D *5/22*
U.S. Cl. 8—156 **17 Claims**



1. Apparatus for dewatering a suspension comprising
a generally cylindrical container through which suspension to be dewatered flows in a first direction, said container having an axis extending generally parallel to said first direction,
screen means for removal of a portion of the liquid from the suspension flowing through said container, said screen means extending generally along the axis of said container in which it is disposed and defining an interior variable volume chamber, the interior volume of said cylindrical container including said screen means remaining constant but the interior volume of said screen means interior chamber being variable within said container volume,
mechanical means for reciprocating a portion of said screen means in said first direction and in a second direction opposite to said first direction so that the volume of said interior chamber of said screen means is varied by said reciprocation, and
means connected to the interior chamber of said screen means for expelling liquid separated from said suspension to an area remote from said container.

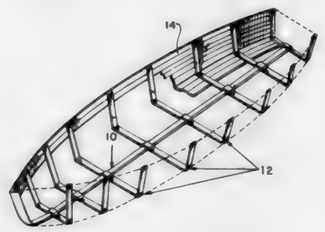
12. A method of dewatering a suspension of comminuted fiber material and liquid utilizing a mechanically reciprocal screen means extending along the axis of a generally cylindrical container in which it is disposed and through which suspension to be dewatered flows, the screen means defining a variable volume interior chamber, the interior volume of said cylindrical container including said screen means remaining constant but the interior volume of said screen means interior chamber being variable within said container volume, comprising the steps of
a. establishing a flow of suspension of comminuted fiber material and liquid in a first direction in the container,
b. mechanically moving a portion of the screen means in said first direction at about the speed of flow of suspension in said first direction so that liquid to be removed from the suspension flows through the screen means into the interior chamber thereof,
c. removing the separated liquid from the container to an area remote from the container, and
d. mechanically moving the portion of the screen means in a second direction opposite to the first direction to decrease the volume of the interior chamber of the screen means while continuously effecting removal of the separated liquid from the interior chamber.

4,041,561

FIBER-REINFORCED PLASTIC UNITIZED BOAT HULL FRAME

Richard V. Humphrey, 10 Loving Ave., Kingston, Mass. 02364

Continuation of Ser. No. 599,848, July 28, 1975, abandoned.
This application Nov. 12, 1976, Ser. No. 741,373
Int. Cl.[2] B63B *5/24*
U.S. Cl. 9—6 P **10 Claims**



1. A unitary fiber-reinforced plastic boat hull frame comprising in combination:
a. at least one longitudinal frame member consisting of fiber-reinforced plastic; and
b. a plurality of individual and separate transverse frame members positioned transverse said longitudinal frame member, at least one transverse member extending as an integral member from one side of the longitudinal member to the other, said transverse frame members consisting of fiber-reinforced plastic, said transverse and longitudinal frame members arranged to overlap one another, said longitudinal and said transverse frame members attached to each other at the overlap interface of said members.

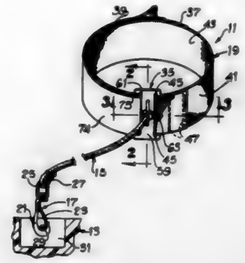
4,041,562

SURFBOARD LEASH

Robert B. Nealy, 129 Ladera Lane, San Clemente, Calif. 92672

Filed Apr. 23, 1976, Ser. No. 679,731
Int. Cl.[2] A63C *15/06*
U.S. Cl. 9—310 AA **7 Claims**

1. A surfboard leash comprising:
an ankle attachment including a flexible strap adapted to be wrapped around the ankle of the user, said strap having first and second ends and first and second generally opposite faces;
said ankle attachment including a buckle having at least one opening extending therethrough and means for connecting the buckle to the strap at a location along said strap which is spaced from said first end, a first region of said strap spaced from said location being extendable through the opening of the buckle to form the ankle attachment into a loop;
said ankle attachment including quick release fastener means for releasably attaching said first region of the strap to a second region of the strap whereby the quick release fastener means can releasably hold the ankle attachment in said loop;



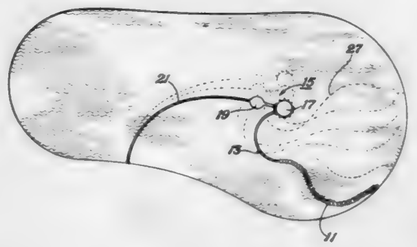
an elongated, flexible, resilient element attachable to the surfboard; and
a boss on said buckle for attaching the resilient element to the ankle attachment, said boss having a passage extending therethrough, said resilient element extends into said passage from one end thereof, and said surfboard leash includes means for preventing withdrawal of the resilient element from said passage.

4,041,563

SCOURING SLEEVE FOR USE WITH SWIMMING POOL CLEANER

Claire L. Steeves, 1300 Mistletoe, Fort Worth, Tex. 76110

Filed Mar. 26, 1976, Ser. No. 670,640
Int. Cl.[2] E04H *3/20*
U.S. Cl. 15—1.7 **2 Claims**

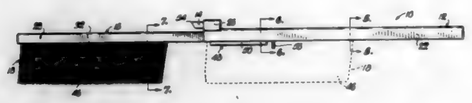


1. For use with an apparatus for cleaning sediment deposited on the floor of a swimming pool of the type having a flexible hose having an inlet connected to the swimming pool circulation system and an outlet for discharging water to loosen sediment and to cause the hose to constantly reposition itself, an improved scouring means comprising:
a reticulated sleeve of coarsely woven flexible plastic strips for covering portions of the hose for scouring the floor and walls of the swimming pool as the hose repositions itself; and
fastener means for retaining the sleeve over the hose comprising a band of plastic encircling the sleeve having means to restrain the band tightly over the sleeve.

4,041,564
COMBINATION SCRAPER AND BRUSH WITH EXTENSIBLE HANDLE

Charles W. Schlicher, Wichita, Kans., assignor to S/V Tool Company, Inc., Newton, Kans.

Filed Feb. 23, 1976, Ser. No. 660,420
Int. Cl.[2] A46B *17/08;* **A47L** *1/10*
U.S. Cl. 15—111 **4 Claims**

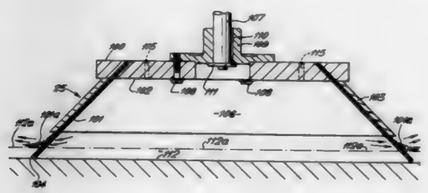


1. An extensible scraping and brushing tool of the kind utilized to remove ice and snow from vehicle windows or the like, said tool comprising:
an elongate handle;
a scraper member affixed to said handle at one end thereof;
an elongate brush assembly having at least one brush element proximal an end thereof; and
guide structure integral with said handle and said brush assembly interconnecting the latter with said handle for shiftable movement longitudinally relative thereto.
said brush assembly being reciprocable between a first, retracted position relative to said handle in which said brush element is adjacent an end of said handle to a second, extended position relative to said handle in which said brush element protrudes beyond said end of the handle,
said brsuh assembly including an elongate brush carrier slidable along said handle, said handle and said carrier having corresponding, transverse cross-sectional configurations with said carrier being nested within said handle such that their respective longitudinal axes are substantially parallel,
said brush carrier including an elongate channel having its longitudinal axis in parallelism with the longitudinal axis of said handle and in which said brush element is received,
said channel being of a generally U-shaped configuration having opposed, parallel sidewalls, said sidewalls each having an inwardly projecting flange extending longitudinally along its distal edge such that the flanges are in an opposing relationship, said brush element being press fit into said channel for retention therein by said flanges.

4,041,565
ROTATABLE BRUSHES

Kenneth John Hatley, Sanderstead, England, assignor to Butterworth Systems Inc., Bayonne, N.J.

Filed Mar. 17, 1976, Ser. No. 667,608
Claims priority, application United Kingdom, Mar. 24, 1975, 12153/75
Int. Cl.[2] A46B *7/08*
U.S. Cl. 15—200 **8 Claims**

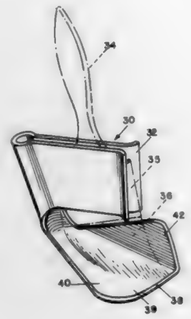


1. A brush adapted for cleaning a surface and having an axis of rotation substantially perpendicular to the surface, comprising a support substantially perpendicular to said axis, bristles attached to one face of the support adjacent to and disposed about the periphery thereof and extending at a diverging angle away from said one face, and a flexible membrane surrounding the bristles and which extends substantially from the support to substantially within 10 mm to 40 mm from the free ends of the bristles remote from said one face, said membrane defining a laterally confined volume with said one face of said support and diverging in substantially the same direction as said bristles and preventing liquid from entering said confined volume, such that the pressure within said confined volume is substantially reduced for producing a corresponding reduction in the power required to rotate said brush.

4,041,566
PAINT BRUSH BRISTLE SHAPING DEVICE

Norman F. Ford, R.D. No. 2, Clymer, Pa. 15726

Filed Apr. 26, 1976, Ser. No. 680,495
Int. Cl.[2] A46B *17/00*
U.S. Cl. 15—257 R **10 Claims**



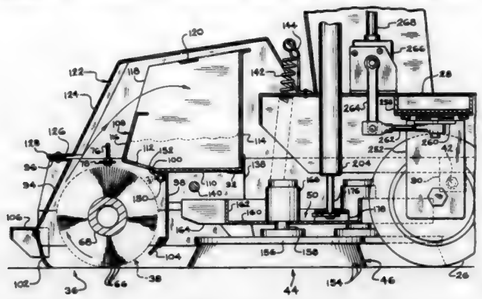
1. A paint brush bristle shaping device comprising:
holding means for receiving a paint brush and holding the brush; and
a base section spaced from said holding means and having a central portion lying in a plane normal to the longitudinal center line of a brush held by said holding means and side portions extending outwardly from said central portion with at least one of side portions having a flat surface, with said central and side portions being constructed and arranged to shape and retain the bottoms of the bristles of a brush into a generally flared pattern adapted for landscape painting whereby when a setting agent is applied to the bristles the retained shape will be held by the bristles when the brush is removed from the device.

4,041,567
COMBINATION SWEEPING-SCRUBBING APPARATUS

Jack L. Burgoon, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Apr. 10, 1975, Ser. No. 566,980
Int. Cl.[2] A47L *11/16, 11/18*
U.S. Cl. 15—320 **23 Claims**

11. A machine for cleaning a surface comprising a main frame, wheels for supporting said frame above the surface, a cleaning solution tank carried by said frame, at least one recovery solution tank posiitoned on said frame, a drum brush mounted below said frame for contacting the surface and for removing debris thereon and for distributing a cleaning solution on the surface, means on said frame near said drum brush for receiving debris therefrom, means for rotating said drum brush, a supply line for supplying cleaning solution from said cleaning solution tank for distribution on the surface by said drum brush, disc brush means located behind said drum brush, said disc brush means being effective to scrub a path of the surface having a width at least substantailly equal to the length of said drum, means for rotating said disc brush means, squeegee means located behind said disc brush means to gather the cleaning solution at a central point, and exhaust means for

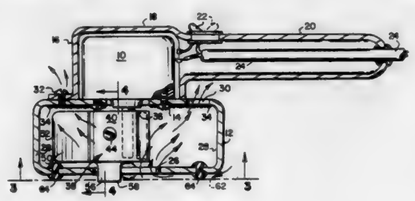


carrying the solution from the surface to said recovery solution tank.

4,041,568
VACUUM CLEANER

William A. Rhodes, 4421 N. 13th Place, Phoenix, Ariz. 85016

Continuation-in-part of Ser. No. 574,406, May 5, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,732
Int. Cl.[2] A47L *5/26*
U.S. Cl. 15—344 **7 Claims**



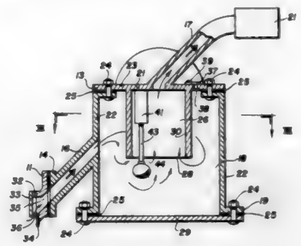
1. In a vacuum cleaner: a housing having a motor mounted thereon having a motor shaft extending into said housing; a centrifugal impeller rotatably mounted on said motor shaft; said housing having an outlet and a circular inlet opening; said impeller adapted to create an air stream into said housing through said inlet and outwardly through said outlet; said impeller having a flexible flapper portion extending outwardly through said inlet opening beyond said housing; whereby during rotation and centrifugal air pumping operations of said impeller said flexible flapper portion may contact foreign matter on a surface being cleaned to thereby loosen said foreign matter into the air stream entering said inlet opening; said flapper portion extending radially away from the axis of said motor shaft a distance substantially equal to the radius of said housing inlet opening; said impeller being a single blade structure and provided with a radially extending flexible extremity spaced from and adjacent to the inside of said housing to allow lint to be rolled into a ball between the extremity of said impeller and the inner surrounding wall of said housing; whereby said ball may subsequently be dropped from said housing through said inlet opening after the motor is deenergized and the impeller has come to rest.

4,041,569
SEPARATOR SYSTEM

Arne G. Petersen, Oak St., R.R. 26-D, Uxbridge, Mass. 01569

Filed Sept. 13, 1976, Ser. No. 722,410
Int. Cl.[2] A47L *9/10*
U.S. Cl. 15—353 **11 Claims**

1. A separator system for picking up flow substance from a surface, comprising
a. an exhaust means,
b. an outer chamber having a top with a central opening connected to the exhaust means, having a side wall, and having a bottom,
c. an inlet conduit having a first end which enters through the side wall of the outer chamber above a selected level,
d. a pick-up head attached to the other end of the inlet conduit, and

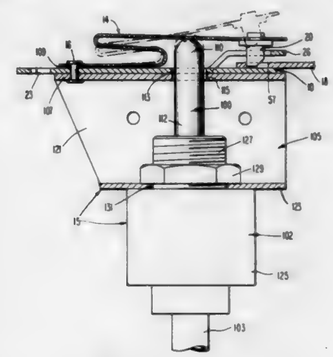


e. an inner chamber positioned within the upper portion of the outer chamber, the inner chamber having a tubular side wall surrounding the central opening and with an open bottom located below the said selected tubular level.

4,041,570
RESETTABLE, HEAT ACTUATABLE FIRE LINK

Francis J. McCabe, 239 Hastings Court, Doylestown, Pa. 18901

Filed Apr. 13, 1976, Ser. No. 676,483
Int. Cl.[2] E05F *15/20*
U.S. Cl. 16—48.5 **7 Claims**



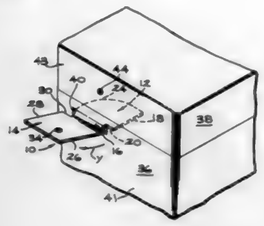
1. A resettable fire link comprising,
a. a releasable member;
b. gripping means associated with said releasable member for engaging said releasable member in a normal position, and for releasing said releasable member in an actuated position, said gripping means comprising at least one mounting element and heat responsive means for causing said gripping means to move to the normal position in response to a preselected ambient temperature and for causing said gripping means to move to the actuated position in response to a preselected increase in said ambient temperature; and
c. mechanical activation means connected to said mounting element for movement from a first withdrawn to a second extended position, said mechanical activation means in said first withdrawn position allowing said gripping means to move between said normal and said activated position and for causing said gripping means to move to the activated position in response to movement of said mechanical activation means to said second extended position.

4,041,571

FASTENING DEVICE AND METHOD FOR HINGEDLY ASSEMBLING MEMBERS

Theodore J. Blevins, Prospect, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 19, 1976, Ser. No. 687,693
Int. Cl.² E05D *9/00*
U.S. Cl. 16—128 R **8 Claims**



1. A fastening device for hingedly connecting a first member to a second member, the fastening device comprising:

a. a slot opening through the first member,

b. an integrally formed hinge member having a first planar portion with an end, a second planar portion, and an intermediate portion with its longitudinal axis at the junction of the first and second portions, said first portion having a shoulder formed on one side between the end and the intermediate portion and the other side being curved between the end and the intermediate portion, said first and intermediate portions being dimensioned to pass through the slot opening and the second portion dimensioned to be larger than the slot opening,

c. the intermediate portion of the hinge member being in the slot opening and the first and second planar portions being on opposite sides of the first member, and

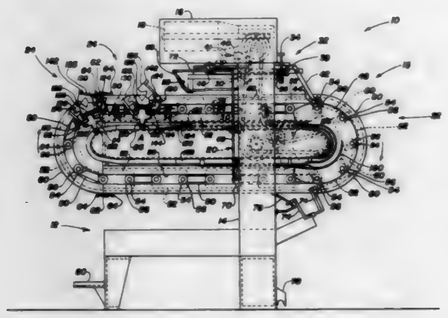
d. means for securing the second portion of the hinge member to the second member.

4,041,572

ANATOMICAL SECTION DE-BONING MACHINE

Eugene G. Martin, and Dale M. Risser, both of Ephrata, Pa., assignors to Victor F. Weaver, Inc., New Holland, Pa.

Filed Sept. 27, 1976, Ser. No. 726,982
Int. Cl.² A22C *17/04*
U.S. Cl. 17—46 **31 Claims**



1. A machine operable automatically to simultaneously debone individually a similar plurality of appendicular anatomical sections of a small edible animal and deliver therefrom respectively separated a meat component and a bone component, said machine comprising in combination:

a. a longitudinally disposed support frame having interconnected horizontal and vertical members,

b. an infeed end and a delivery end respectively positioned at the opposite longitudinally disposed ends of said machine,

c. a chain connected drive train having sprocket members mounted upon rotatably transverse shafts supportably positioned in said frame in longitudinally and vertically spaced relationship intermediate the infeed end and the delivery end of said machine and interconnectably communicating to rotatably drive a channel sprocket member mounted upon a rotatably transverse shaft said channel sprocket member being positioned in said frame intermediate of the lateral sides thereof and inward of the delivery end of said machine,

d. a longitudinally disposed endless conveyor extending around said channel sprocket and longitudinally disposed vertically spaced track means supportably positioned intermediate the lateral sides of said frame to provide vertically disposed upper and lower longitudinal guiding support spans for said conveyor,

e. drive means supported on said frame and interconnected by chain to one of said sprocket members of said drive train and operable to rotate said channel sprocket and thereby rotatably transport said conveyor in fixed unidirectional endless motion from said infeed end to said delivery end of said machine,

f. a plurality of regularly spaced longitudinally disposed conveyor member connecting rods extending respectively perpendicularly outward either side from said conveyor said rods adapted to receive upon adjacent pairs thereof on either lateral side of said conveyor a plurality of planetery operational head assemblies adapted to receive and clampably engage said appendicular anatomical sections individually,

g. de-boning means operable by engagement of cam follower means on said operational head assemblies with cam means supportably configured upon said frame on either lateral side of said conveyor so that during transport of said conveyor from said infeed end to said delivery end of said machine adjacent said vertically disposed upper longitudinal guiding support span thereof said meat component of said appendicular anatomical sections is individually and successively inversely removed from said bone component,

h. cutting means respectively positioned either lateral side of said frame at the delivery end of said machine to automatically sever meat component to bone component retaining tissue, and

i. means to respectively discharge said meat component and said bone component separately at said delivery end of said machine.

4,041,573

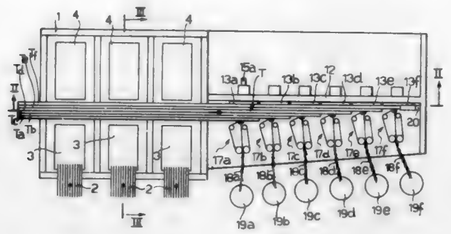
MACHINE FOR COMBING AND GRADING TEXTILE FIBERS

Bernardino Ruspa, Cameri (Novara), Italy, assignor to Sant'Andrea Novara Officine Meccaniche E Fonderie S.p.A., Novara, Italy

Filed May 7, 1975, Ser. No. 575,550
Claims priority, application Italy, June 4, 1974, 68752/74
Int. Cl.² D01G *37/00, 19/00, 19/12*
U.S. Cl. 19—65 R **3 Claims**

1. A machine for grading textile fibers according to their length comprising feeding means for feeding a free end of a web of textile fibers forward in incremental steps including movable jaw means located at a fixed position, movable grid means, a needle block adapted to be inserted into said grid means and means for moving said grid means and said needle block with respect to said jaw means to feed said web incrementally forwards, gripping means for gripping one end of the fibers at the free end of said web and driving means for moving said gripping means to pull from said free end of said web successive tufts of fibers, comb means for combing the other ends of said fibers of said tufts as they are pulled from said web, conveyor means comprising a plurality of conveyor elements

positioned side-by-side and disposed substantially perpendicular to the direction of movement of said gripping means, each conveyor element having a form of a closed loop with an upper, rectilinear, substantially horizontal run and a return run, said rectilinear upper run of each conveyor element being longer than that of the adjacent conveyor element on the side thereof nearest to said feeding means, a plurality of parallel rows of needles projecting upwardly from and carried by said conveyor element and means for driving all of said conveyor elements at the same linear speed, said gripping means being releasable to place successive tufts adjacent each other on said



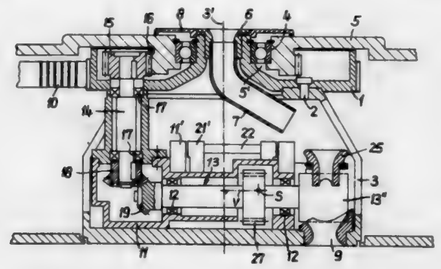
conveyor means with one end of each of said tufts being aligned along a line parallel to the direction of advance of said conveyor means and pressing means for pressing said tufts onto said needles so as to form thereon a mat of fibers of substantially constant thickness and a plurality of fiber selection means one of which is placed adjacent the end of the upper run of each of said conveyor elements whereby the longest fibers of said tufts are withdrawn first and the shortest fibers last as they travel along said conveyor means past said fiber selection means and whereby said needles comb said fibers as said fibers are removed from said conveyor means by said fiber selection means.

4,041,574

COILING DEVICE FOR DEPOSITING SLIVER IN CANISTERS

Peter Müller, Bremen-Lesum, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Sept. 9, 1975, Ser. No. 611,638
Claims priority, application Germany, Sept. 14, 1974, 2444020
Int. Cl.² B65H *54/80*
U.S. Cl. 19—159 R **2 Claims**



1. In a coiling device for depositing sliver in a canister including a rotary cage having an axis of rotation; means for rotating the cage; means defining an inlet opening through which the sliver is introduced into the cage; means defining an outlet opening in the cage eccentrically thereof for discharging the sliver in a path orbiting about the cage axis; a first calender roll supported in the cage; drive means connecting the cage with the first calender roll for rotating the first calender roll about its longitudinal axis upon rotation of the cage about the cage axis; a second calender roll supported in the cage on a pivotal shaft mounted in the cage and spaced from the second calender roll; means for urging the second calender roll against the first calender roll for generating a clamping force; means for driving the second calender roll about its longitudinal axis; the second calender roll and the pivotal shaft forming part of a pivotal unit having a center of gravity; the two rolls constituting a cooperating calender roll pair between the inlet opening and the outlet opening for drawing, by means of the clamping force, the sliver through the inlet opening and advancing it through the outlet opening; the roll pair moving with the cage as a unit; the improvement wherein a line representing the shortest distance between the center of gravity of said pivotal unit and said axis of rotation of said cage is parallel to the axis of said pivotal shaft, whereby any centrifugal force generated by the rotation of said cage and exerted on the pivotal unit has a zero torque about said axis of said pivotal shaft.

4,041,575

HOOK ASSEMBLAGE

J. Roderick MacArthur, Winnetka, Ill., assignor to Elder Laboratories, Morton Grove, Ill.

Filed July 29, 1976, Ser. No. 709,873
Int. Cl.² A44B *21/00*
U.S. Cl. 24—73 HH **10 Claims**



1. A hook assemblage for removably attaching an object to a fixed surface, comprising:

a pair of plates in which one has securement means for securing to said surface and the other has securement means for securing to said object;

said one plate defining an opening;

first flap means on said other plate which is receivable in said opening to interconnect said plates and limit relative movement of said plates in one direction; and

second flap means on at least one of said plates which is constructed and arranged to interlock with a portion of the other of said plates to limit relative movement of said plates in the opposite direction.

4,041,576

ATTACHMENT DEVICE

Carl T. Larson, P.O. Box 54, Richmond, Calif. 94807

Division of Ser. No. 316,959, Dec. 20, 1972, Pat. No. 3,858,281, which is a continuation-in-part of Ser. No. 77,164, Oct. 1, 1970, abandoned. This application Oct. 29, 1974, Ser. No. 518,559
Int. Cl.² A44B *9/10*
U.S. Cl. 24—156 **7 Claims**



1. An attachment device comprising: an elongated member; a bar; means interconnecting one end of the member and one

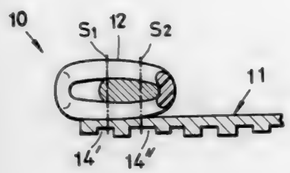
end of the bar and permitting said member to be moved toward and away from the bar; a head having a pair of spaced sides and being secured to the opposite end of the bar, said head having a passage thereinto for permitting the opposite end of the member to move into said head, said passage having an entrance; and a pair of relatively shiftable elements extending into the head from respective sides and between the latter, one of the elements having a pair of spaced extremities thereon, the other element having a surface and being biased into engagement with the extremities of said one element for yieldable closing said passage.

4,041,577

STRINGER FOR SLIDING CLASP FASTENER

Yoshio Matsuda, Nyuzen, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Feb. 24, 1976, Ser. No. 661,023
Claims priority, application Japan, Feb. 28, 1975, 50-25366
Int. Cl.[2] A44B *19/12, 19/02*
U.S. Cl. 24—205.16 C **3 Claims**



1. A fastener stringer which comprises a warp-knit tape and a row of interlocking fastener elements secured thereto, said tape having a web portion formed by chain stitches defining longitudinally extending wales, tricot stitches extending diagonally across and between a plurality of adjacent wales, and laid-in weft threads extending over and connecting every four wales and a longitudinal edge portion defined solely by knit-loop forming threads, including chain stitches defining plural longitudinal wales, and two groups of tricot stitches, the tricot stitches of each group thereof spanning a different number of wales of said chain stitches in the longitudinal edge portion, both of said portions being interconnected transversely of the tape by threads constituting said web portion and said edge portion, respectively, one of said wales adjacent said longitudinal edge portion being biased toward said web portion to widen an interwale valley between said one of wales and its neighboring wale.

4,041,578

AUTOMATIC LOCK SLIDER FOR SLIDE FASTENERS

Kiyoshi Oda, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Japan

Filed Nov. 12, 1976, Ser. No. 741,191
Claims priority, application Japan, Nov. 14, 1975, 50-155378[U]
Int. Cl.[2] A44G *19/30*
U.S. Cl. 24—205.14 R **6 Claims**

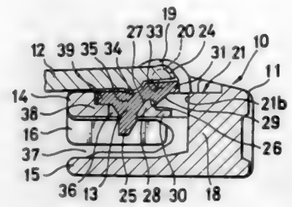
1. An automatic lock slider for slide fasteners which comprises:

a. a slider body having an upper and a lower wing connected by a neck portion, said upper wing having a recess for receiving a leaf spring and through opening parallel with said leaf spring;

b. a pull member pivotally supported on said slider body and having at one of its ends a first cam held in abutting relation to said leaf spring and a second cam parallel to said first cam;

c. a locking member actuated by said second cam and having a locking prong movable through said through opening into the path of fastener elements and disposed in close proximity to said neck portion when the slider is in locked position; and

d. a support stud extending upwardly from said recess adjacent to said through opening and having a stop adapted to limit pivotal movement of said locking member, said stud serving as a pivot about which said locking member is rotatable.

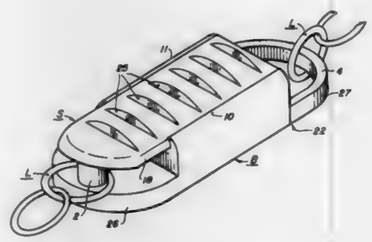


4,041,579

JEWELRY CLASP AND METHOD OF MAKING SAME

Barry H. Chappel, Dublin Road, P.O. Box 69, Southbury, Conn. 06488

Filed Apr. 12, 1976, Ser. No. 676,292
Int. Cl.[2] A44B *13/00, 21/00*
U.S. Cl. 24—230 AK **19 Claims**



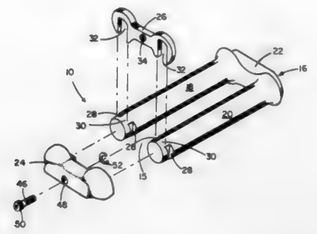
1. A jewelry clasp including an elongated base having a box-like portion open at the top and having walls surmounting the bottom of the base and having a spring-chamber between said walls, said walls having upper slider-bed surfaces for slidably supporting the below-mentioned slider for straight-line longitudinal to-and-fro sliding motion in relation to the base, a slider resting on said slider-bed surfaces and having longitudinal side-surfaces inclined inwardly in an upward direction, two opposite longitudinal slider-guides extending upwardly from said walls and flanking said side-surfaces of said slider and inclined in relation thereto so as slidably to interengage therewith to retain the slider on said slider-bed surfaces and to guide the slider for to-and-fro straight-line longitudinal motion in relation to the base, a link-receiving post carried by said base in front of said box-like portion thereof and spaced therefrom in a longitudinal direction, the top of said post being in operative alignment with said slider-bed surfaces so that the slider can be moved longitudinally thereon to over-ride the top of the post in close proximity thereto, a spring-abutment extending downwardly from said slider into said spring-chamber, a spring operatively interposed between said spring-abutment and an end of said spring-chamber and arranged to urge the slider in the direction of said post, and a link-anchorage at the opposite end of said base.

4,041,580

SEPARABLE LINK CONNECTOR

James Wesley Turner, deceased, late of El Centro, Calif. (by Thomas M. Heim, executor), and Ray E. Spinks, El Centro, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 12, 1976, Ser. No. 648,334
Int. Cl.[2] A44C *5/18*
U.S. Cl. 24—265 AL **2 Claims**



1. A separable link connector for aircraft landing drag chutes subject to abrasive and vibrational contact with a runway surface comprising:

a body including a pair of parallel spaced arm members and an end member forming an open-ended integral U-shaped body;

said members having a free end; detachable closure means including a latch member straddling the ends of arm members and having a centrally located threaded hold,

said latch member and arm ends having complementary interlocking shoulder surfaces lying in a plane of connection perpendicular to said common plane, said closure means including an end cap member separate from said latch member and having sockets housing and completely enclosing the free ends of the respective arm members, extending through said cap member and into said threaded hole

a single screw centrally located on the cap member said latch member positioned adjacent and against said cap member facing said arm members, for securing together the end cap member and the latch member;

supplemental means for locking said screw to the latch member; and

whereby said cap member will protect the entire free end of the screw to prevent its engagement with the landing runway.

4,041,581

METHOD FOR COMPACTING WOVEN GAUZE BANDAGES

Edmund A. Diggle, Jr., Ho-Ho-Kus, N.J., assignor to Compax Corporation, Woodside, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,313
Int. Cl.[2] D06C *21/00*
U.S. Cl. 26—18.6 **2 Claims**

1. A process for the mechanical compressive shrinkage of woven gauze bandage in multiple-ply form in a two-roll differential speed mechanical compactor, having opposed feeding and retarding rollers and a confining shoe cooperating with said feeding roller, which comprises

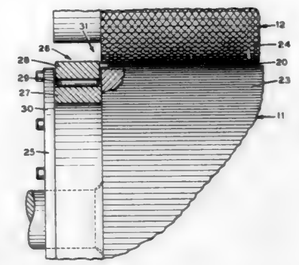
a. providing the feeding roller with an 80 pitch, straight knurled surface characteristic,

b. providing said retarding roller with a 40 pitch diamond knurled surface characteristic,

c. arranging said rollers and said confining shoe whereby the nip space between said rollers is less than the space between said feeding roller and said shoe,

d. feeding the bandage material onto the feeding roller and between said feeding roller and said confining shoe,

e. driving said retarding roller in the same direction as said feeding roller at their points of adjacency but at a significantly lower surface speed, and



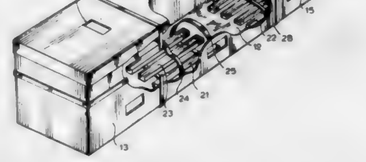
f. longitudinally compressively shrinking said gauze bandage material in a short zone between the terminal edge of the confining shoe and the nip formed by said rollers.

4,041,582

MARINE BURIAL CONTAINER

John P. MacDonald, 1914 Dawn Drive, Melbourne, Fla. 32935

Filed Mar. 25, 1976, Ser. No. 670,149
Int. Cl.[2] A61G *17/00*
U.S. Cl. 27—2 **11 Claims**



1. A marine burial container comprising in combination:

a paperboard container shaped to receive a corpse for burial; said container having a base with reinforcing material therein and a plurality of sides and said container having a plurality of reinforcing members attached to the sides of said container to increase the rigidity of said container;

weight means located to add weight to said container and to said corpse to reduce the buoyancy of the container and corpse;

means for connecting said weight means to said corpse; and

said container having openings therein at predetermined locations to release entrapped air and allows water in to reduce the buoyancy of said container.

4,041,583

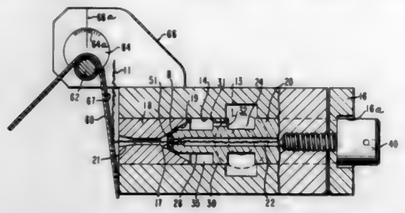
YARN TEXTURING JET

Marvin Sumner Hart, Wilmington, Del., and William James Powers, Jr., North East, Md., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1976, Ser. No. 688,247
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—254 **1 Claim**

1. In a yarn texturing jet including a body having yarn inlet and outlet ends connected by a central bore, means for introducing pressurized gas through a gas inlet into said bore between said ends, a venturi located in said bore at said outlet end, and a yarn guiding element extending into said bore from the yarn inlet end of the body, said element having a passage

therethrough for guiding yarn from the yarn inlet of the body past the gas inlet through the exit end of said element to the venturi, said element having a cylindrical portion thereon approximating the diameter of said bore, said portion extending beyond said gas inlet and terminating in a surface facing and spaced from said venturi, there being an orifice in said portion in communication with said gas inlet and exiting at said surface for directing pressurized gas from said gas inlet into said venturi, and a baffle located adjacent the outlet end of the jet, said baffle being pivotably mounted to a hinge pin, the improvement comprising: said guiding element being axially slidable in said body from a preset operating position to a stringup position back to said preset operating position and



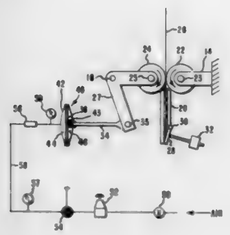
being attached to a flange located outside the body at the inlet end of the body; means for limiting movement of said flange away from the inlet end of the body to said preset operating position; a reduced region in the cylindrical portion on said yarn guiding element in communication with the pressurized gas means and said hole both in said stringup position and in said preset operating position whereby pressurized gas returns the yarn guiding element to said preset operating position from said stringup position, a bracket attached to the outlet end of said jet; and a cylinder rotatably mounted in said bracket, said hinge pin being attached off-center of said cylinder whereby the position of said baffle with respect to said outlet end may be varied by an eccentric motion.

4,041,584

LOADING APPARATUS FOR CRIMPER ROLLS

Thomas Donald Williamson, Lugoff, S.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 29, 1976, Ser. No. 727,660
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—269 **5 Claims**



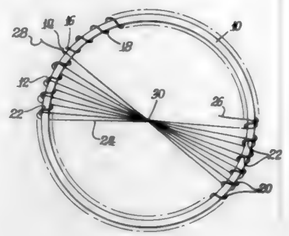
1. In an apparatus for crimping tow including a pair of rolls cooperating to form a nip between the rolls through which tow passes to a crimper chamber associated with said rolls, one of said rolls being movable with respect to the other to form an adjustable width nip, the improvement comprising: a single-acting loading device having a diaphragm dividing a single chamber into front and back chambers; a source of pressurized fluid in communication with the back chamber; a restricter connected between said source and said back chamber; and a linkage passing through said front chamber and connected between said diaphragm and said movable roll.

4,041,585

HAND LOOM CONSTRUCTION

Phill R. Berger; Joan P. Berger, both of P.O. Box 393, Carmel Valley, Calif. 93924, and Margery L. Magnani, 82 Fifth Ave., San Francisco, Calif. 94118

Filed Jan. 5, 1976, Ser. No. 646,656
Int. Cl.[2] D03D *29/00*
U.S. Cl. 28—149 **4 Claims**



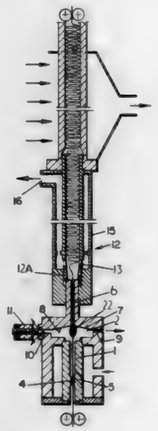
1. In a hand loom construction for receiving strands of yarn, the combination comprising; a rigidly closed base frame having a given perimeter outlining and enclosing an area which is to receive said strands of yarn, a secondary frame adjustably disposed relative to said base frame comprising a resilient wire-like strand encircling said base frame forming a series of helical loops disposed circumferentially about and having a perimeter that at least conforms to the perimeter of said base frame and wherein said base and secondary frame coact to provide holding means for stretchably and adjustably supportng said strands of yarn within said enclosed frame area.

4,041,586

TEXTILE FLUID BULKING PROCESS

Peter William Foster; Duncan Cameron Ferrier; Thomas Berry, all of Tiverton, England, and Karel Murenbeeld, Geneva, Switzerland, assignors to John Heathcoat & Company Limited, Tiverton, England

Filed July 28, 1975, Ser. No. 599,786
Claims priority, application United Kingdom, July 31, 1974, 33884/74
Int. Cl.[2] D02G *1/20, 1/16, 1/12*
U.S. Cl. 28—254 **1 Claim**



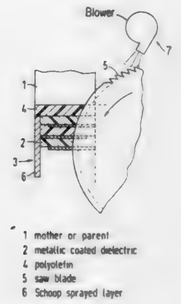
1. A process of producing a bulked multifilament yarn having filaments formed of at least one polymer comprising causing a multifilament yarn to be entrained in a stream of fluid at one pressure and at a temperature high enough to plasticize the yarn, causing the fluid to discharge into a space of finite volume maintained at a lower pressure by controlled escape of fluid from the space whereby to separate the filaments in the space and thus to bulk the yarn, then causing the bulked yarn to be entrained in a second stream of fluid flowing from said space and to be projected as a continuous operation against one end of an elongated package of already bulked yarn contained in a second space into which the second stream of fluid discharges and in which the pressure is caused to fluctuate between a maximum value and a minimum value with a frequency per second which is at least 1/600 the speed in meters per minute of the yarn just before it comes against said one end of the elongated package.

4,041,587

METHOD OF PRODUCING LAYER CAPACITORS

Hubert Kraus, Regensburg, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 24, 1976, Ser. No. 689,255
Claims priority, application Germany, June 11, 1975, 2526130
Int. Cl.[2] H01G *4/22*
U.S. Cl. 29—25.42 **5 Claims**



1. In a method of producing layer cpacitors in which synthetic dielectric layers carrying metallic coatings are formed into a multilayer mother capacitor, in which individual capacitors are cut from the mother capacitor by sawing and the synthetic layers shrink at the cut edges due to the heat generated during sawing causing the metallic coatings adjacent the cut edges to break up into islands which oxidize to become insulating islands and in which the saw blade is lubricated during sawing, the improvement therein comprising the steps of:

applying a meltable polyolefin layer to the mother capacitor before sawing as a lubricating layer; advancing the saw blade relative the mother capacitor to first penetrate the polyolefin layer prior to penetration of the remainder of the mother capacitor;

melting the polyolefin material during sawing; and spreading the melted material along the surfaces produced by sawing to nearly completely seal those surfaces.

4,041,588

MACHINE TOOL PROVIDED WITH A TOOL MAGAZINE

Hans Kuhnert, Munich, Germany, assignor to Friedrich Deckel Aktiengesellschaft, Munich, Germany

Filed July 8, 1975, Ser. No. 594,054
Claims priority, application Germany, July 11, 1974, 2433435
Int. Cl.[2] B23B *39/18*
U.S. Cl. 29—26 R **5 Claims**

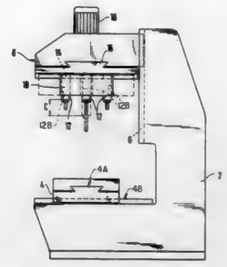
1. A machine tool, comprising:

a base having a support member and a work supporting surface thereon, said work supporting surface having first guide means guiding a movement of said work supporting surface relative to said support member;

tool magazine means mounted on said support member and having a plurality of tools thereon having parallel axes and oriented in rows and columns, said tool magazine having a surface from which said plurality of tools project spaced from said work supporting surface;

second guide means on said support member and said tool magazine guiding said tool magazine means for movement relative to said work supporting surface in a direction parallel to said rows;

third guide means on said support member and said tool magazine guiding said tool magazine means for movement relative to said work supportiing surface in a direction parallel to said columns; a tool driving means operative to drive a tool in registry therewith, said tool driving means



being aligned at a single reference position on said tool machine defining a reference axis which is parallel to the axes of said tools and intersects said support member at the junction of one selected row and one selected column, said reference axis remaining in a fixed location during movement of said work supporting surface on said first guide means and during movement of said tool magazine means on said second guide means; and

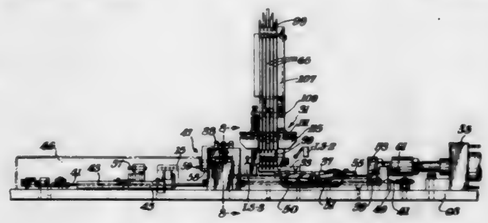
drive means operative to effect a stepwise traverse of said tools in said tool magazine in directions parallel to said rows and columns to facilitate a location of the axes of individual ones of different tools at said single reference position coaxial with said reference axis.

4,041,589

BOBBIN LUGGER

Richard William Black, Manchester, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 23, 1975, Ser. No. 616,021
Int. Cl.[2] B21B *15/00*; B26D *1/06, 5/14*; B27F *7/24*
U.S. Cl. 29—33 M **5 Claims**



1. In a bobbin lugger having a station to which a flanged bobbin and plural terminals are advanced simultaneously from opposite directions and at which the terminals are inserted and staked,

an upright feed assembly having plural slots, each adapted for the passage therethrough of a strip of edge-connected terminals,

a plate normally positioned beneath said assembly, said plate having a plurality of grooves, each in registry with a slot for receiving the last terminal in a strip,

means mounting said plate for sliding movement, and

a reciprocating drive connected to the plate for advancing it to and from said station,

said plate being adjacent said assembly when in the normal position and thereby adapted to sever the last terminal from each strip as it advances toward said station.

4,041,590

BROACHING DEVICE

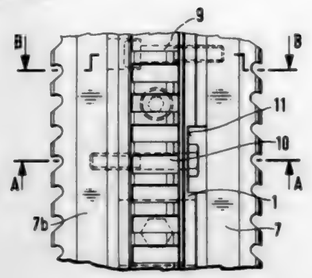
Jürgen Schibrowski, Lohmar, Germany, assignor to Jean Walterscheid GmbH, Lohmar, Germany

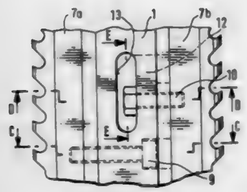
Filed Sept. 23, 1976, Ser. No. 726,059

Claims priority, application Germany, Sept. 23, 1975, 2542346

Int. Cl.² B23P *15/42*

U.S. Cl. 29—95.1 **7 Claims**





1. A broaching device comprising an elongated body having on one end thereof a stock portion engagable with a stock holder, a cutting portion and a tail piece on the other end thereof, said body portion having a polygonal cross section with an even number of faces, a plurality of toothed cutting elements having threaded apertures in a mounting face and being rigidly and detachably secure on respective opposite ones of a corresponding plurality of said body faces, a plurality of screw elements extending through said body portion in the direction of said opposite faces of said body to engage said apertures and secure said cutting elements thereon, said body having one of recesses and openings therein to provide access to said screw elements, said cutting elements having corresponding recesses.

4,041,591

METHOD OF FABRICATING A MULTIPLE FLOW PATH BODY

Dale A. Noll; Giacomo J. Piazza, and Robert L. Young, all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,880

Int. Cl.² B23P *15/26;* **F28F** *1/04*

U.S. Cl. 29—157.3 R **10 Claims**



1. An improved method of fabricating a multiple flow path body having a plurality of contiguous flow paths extending therethrough for separate fluid flow, from a honeycombed body having a matrix of thin walls defining a multiplicity of open-ended cells extending from one face end thereof to another face end thereof and being bounded on sides generally parallel to cell axes by generally opposed upper and lower boundary surfaces connected by first and second side boundary surfaces, the cells being grouped into a plurality of columns of cells, each column being separated from adjacent columns of cells by a fluid barrier wall surface extending continuously from the upper boundary surface to the lower boundary surface and from the one face end of the honeycombed body to the other face end thereof, wherein the improvement comprises

a. sealing the open-ended cells on at least one face end of the honeycombed body with a resist material which enters the cells to a predetermined depth, and thereafter becomes removably stiff,

b. forming channels of a predetermined depth in selected columns of cells from the at least one face end of the honeycombed body by removing portions of the cell walls and portions of at least one of the upper boundary surface and the lower boundary surface, all between adjacent fluid barrier wall surfaces in the selected columns of cells,

c. applying a final sealant material to the channels and transforming the channels in the selected columns of cells into conduits having at least one open-end by filling the channels from the at least one face end with the final sealant material to a depth less than the depth of the channels, and

d. removing the remaining resist material.

4,041,592

MANUFACTURE OF MULTIPLE FLOW PATH BODY

Everett F. Kelm, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,879

Int. Cl.² B23P *15/26;* **F28F** *1/04*

U.S. Cl. 29—157.3 R **10 Claims**



1. The method of fabricating a multiple flow path body having a plurality of contiguous flow paths extending therethrough for separate fluid flow, the method comprising the steps of

a. providing a honeycombed body having a matrix of thin walls defining a multiplicity of open-ended cells extending from one face end thereof to another face end thereof and being bounded on sides generally parallel to cell axes by generally opposed upper and lower boundary surfaces connected by first and second side boundary surfaces, the cells being grouped into a plurality of columns of cells, each column being separated from adjacent columns of cells by a fluid barrier wall surface extending continously from the upper boundary surface to the lower boundary surface and from the one face end of the honeycombed body to the other face end thereof,

b. removing portions of at least one of the upper and lower boundary surfaces and portions of the cell walls joining opposed fluid barrier wall surfaces in selected columns of cells near at least one face end of the honeycomed body to provide, respectively, fluid openings in the boundary surface or surfaces and fluid flow grooves extending from the openings and face end to cells in the selected columns, and

c. sealably enclosing the fluid flow grooves near a face end of the honeycombed body to form fluid flow conduits, such that first fluid flow paths are formed from the openings through the fluid flow conduits and the cells in the selected columns of cells to the other open ends thereof; and second fluid flow paths are formed through open-ended cells in unselected columns of cells.

4,041,593

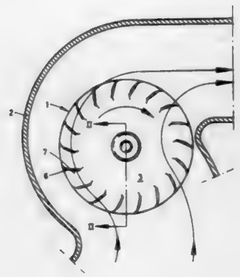
METHOD OF MAKING IMPELLERS FOR CROSS-FLOW FANS

Knut Olof Lennart Wallman, Fergas Aktiebolag Harstenagatan 2 S-582 21, Linkoping, Sweden

Division of Ser. No. 502,097, Aug. 30, 1974, Pat. No. 3,970,411, which is a continuation-in-part of Ser. No. 347,340, April 2, 1973, abandoned. This application Apr. 6, 1976, Ser. No. 674,297

Int. Cl.² B23P *15/00;* **B21D** *53/00;* **B23P** *11/00*

U.S. Cl. 29—156.8 CF **10 Claims**



1. The method of making a blower rotor of the type that comprises at least one sheet metal disc and a plurality of elongated blades which are secured to the disc at circumferentially spaced intervals around it and extend lengthwise parallel to the axis of the disc, said method being characterized by:

A. forming each of said blades with a substantial curvature across its width that is uniform along most of the length of the blade, but with the blade having, at a location at which it is to engage a disc, an indentation deformed within the blade and that

1. is elongated transversely of the blade,
2. has a curvature along its length which is substantially less than said curvature of the remainder of the blade.
3. has a width (as measured lengthwise of the blade) that is substantially equal to the thickness of said disc, and
4. is in flatwise offset relation to adjacent portions of the blade that have the first mentioned curvature;

B. forming the disc with a plurality of circumferentially spaced slots that open unrestrictedly to its periphery, one slot for each blade, each of said slots defining a pair of opposite edges which have a slightly different curvature along their lengths than said curvature of the indentation in the blade, said edges being spaced apart by a substantially uniform distance along their lengths but by a projected distance which is slightly less than the projected thickness of the blade through the indentation; and

C. inserting the indentation portion of each blade into a slot in the disc by forcing the blade edgewise thereinto, the shape and spacing of the edges of each slot being such in relation to the curvature and thickness of the indentation in the blade that each indentation is flexed along its length when received in its slot so that the blade is thus held against displacement relative to the disc.

4,041,594

BRAZED CORE RADIATOR IN ALUMINUM ALLOY AND ADDED HEADER BOXES

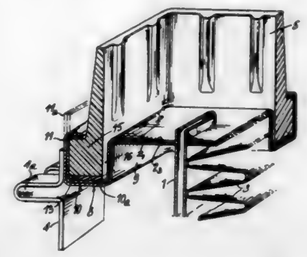
André Chartet, Meudon, France, assignor to Societe Anonyme des Usines Chausson, Asnieres, France

Division of Ser. No. 378,874, July 13, 1973, abandoned. This application Apr. 28, 1975, Ser. No. 572,448

Claims priority, application France, Aug. 2, 1972, 72.27893

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 C **14 Claims**



1. A method of the manufacture of radiators having a tube and fin core made of aluminum-containing metal, the core including tube plates and at least one header box connected to the tube plates by a soft gasket, comprising the steps of:

assembling fins to brazing alloy plated tubes;

providing tube plates made of laminated sheets of aluminum-containing metal and laminated with brazing alloy to form a laminate having a surface free of brazing alloy directed towards said header box;

shaping said laminate to delimit at the periphery of said laminate a hollow rim having a smooth inner bottom surface, said smooth inner bottom surface being free of brazing alloy;

assembling said tube plates on ends of said tubes, as an assembly, with said smooth inner bottom surface of said hollow rim directed outwardly of the radiator;

heating said assembly to brazing temperature, whereby said brazing alloy is melted thus brazing said tubes, fins and tube plates while smooth surface of each of said tube plates remains free from brazing alloy;

placing a soft deformable gasket on said smooth surface; and

securing with pressure said header box on said gasket.

4,041,595

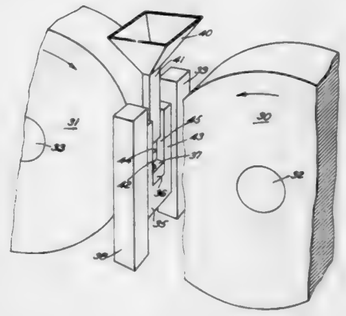
EXTRUSION PROCESS

William G. Voorhes, East Greenwich, R.I., assignor to Wanskuck Company, Providence, R.I.

Filed June 1, 1976, Ser. No. 691,353

Int. Cl.² B21C *27/00, 33/00*

U.S. Cl. 29—420 **6 Claims**



1. A process of continuously forming feedstock comprising the steps of providing a gripping means, gripping two opposed

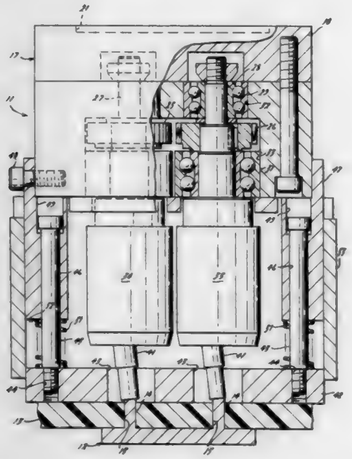
sides of feedstock material whereby the two opposing sides of the material are compressed to a pressure greater than the yield strength of the material, providing a fork-shaped element having opposed constraining walls, locating a die means in the vicinity of the base of the fork, moving the feedstock toward the die means by the gripping means, maintaining the gripping force greater than the yield strength of the material throughout the fork-shaped element, whereby as the feedstock is urged against the base of the fork, the feedstock upsets against the constraining wall surfaces and passes out through the die means, the gripping means advancing the feedstock into the fork, said gripping means and constraining wall surfaces of said fork forming a passageway, that improvement consisting of providing a fork-shaped element in which the distance between the constraining walls is not less than two times the height of said wall surfaces so that no lubrication of the ungripped surfaces of the feedstock is required.

4,041,596

FASTENING DEVICE

George Mink, 13130 Geoffrey, Warren, Mich. 48093

Filed Nov. 24, 1975, Ser. No. 634,661
Int. Cl.[2] B23P *11/00;* B21J *15/12*
U.S. Cl. 29—243.53 8 Claims



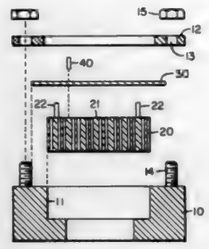
1. A fastening apparatus for affixing a trim piece having a projection to a backing piece having an opening therethrough, said fastening apparatus comprising a forming tool adapted to cooperate with the projection to upset the portion of its end extending through the backing piece opening against one side of the backing piece around said opening for affixing the trim piece to the backing piece, a compression member adapted to engage the one side of the backing piece and apply a compressive load thereto contiguous to the backing piece opening, means for supporting said forming tool and compression member for simultaneous movement from a retracted position until said compression member engages the one side of the backing piece and subsequently for limited movement of said forming tool relative to said compression member while said compression member is maintained in engagement with the one side of the backing piece for movement of said forming tool into engagement with the projection, said forming tool being adapted to upset the portion of the projection during the movement of said forming tool relative to said compression member, and biasing spring means acting on said compression member for applying a predetermined compression load upon the backing piece through said compression member upon the relative movement and during the upsetting of the projection portion.

4,041,597

METHOD OF MANUFACTURING A DIE FOR EXTRUDING HONEYCOMB ARTICLES

Robert G. Folmar, Corning, and Ronald J. Weetman, Rochester, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Aug. 19, 1976, Ser. No. 716,068
Int. Cl.[2] B23P *17/00*
U.S. Cl. 29—423 8 Claims



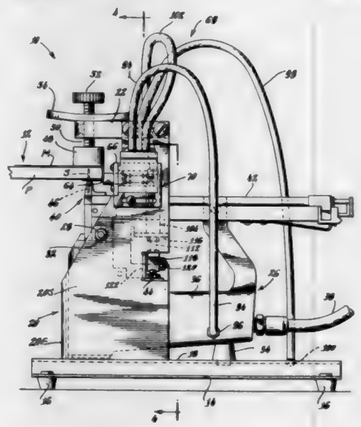
1. A method of making an extrusion die for forming honeycomb structures which comprises, providing a die body having an outlet face, forming feed holes in said die body, providing a plurality of pins of desired size and shape, forming a fixturing mask from a photosensitive material with a plurality of openings extending through said mask equivalent to the cross sectional size and shape of said pins and arranged in the desired orientation of said pins, aligning said mask with said die body adjacent said outlet face, positioning said pins within the openings formed in said mask and orienting said pins in a predetermined pattern upon said outlet face, fixturing said pins within the openings of said mask with one end of said pins in engagement with said die body, welding said pins to said die body, and removing said mask from said pins.

4,041,598

PNEUMATICALLY OPERATED STAPLING APPARATUS AND METHOD

Joseph J. D'Angelo, 378 Annette Court, Wycoff, N.J. 07481, and Joseph J. D'Angelo, Jr., 53 Iroquois Ave., Oakland, N.J. 07536

Filed June 30, 1976, Ser. No. 701,427
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—432 18 Claims



1. A pneumatically operated stapling apparatus for inserting a staple into a workpiece, such as a hand held panel and a sheet of material to be mounted thereon, whenever the workpiece is placed in a stapling position between a staple driver and a backing member, comprising:

a pneumatic stapler of the type having a staple driving mechanism controlled by means positionable either to connect the pneumatic air supply to the staple driving mechanism to advance the staple driver toward the backing member, or to block the air supply and to retract the staple driver;

a trigger element positioned to be depressed by the workpiece as it is placed in the stapling position; and

pneumatic control means actuated by depression of the trigger element for first positioning the stapler control means to cause the staple driver to advance and insert a staple into the workpiece, and then, while the trigger element remains depressed, for automatically changing the position of the stapler control means to retract the staple driver away from the workpiece to be removed from the stapling position to release the trigger element.

17. A pneumatic stapling method for inserting a staple into a workpiece, such as a hand held panel and a sheet of material to be mounted thereon, whenever the workpiece is placed in a stapling position between a staple driver and a backing member, using a pneumatic stapler of the type having a staple driving mechanism controlled by means positionable either to connect the pneumatic air supply to the staple driving mechanism to advance the staple driver, or to block the air supply and to retract the staple driver, said method for inserting a staple comprising:

depressing a trigger element with the workpiece as is placed in the stapling position,

in response to depression of the trigger element, first positioning the stapler control means to cause the staple driver to advance and insert a staple into the workpiece, and

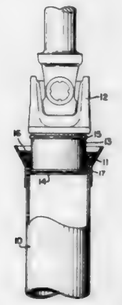
while the trigger element remains depressed, automatically changing the position of the stapler control means to retract the staple driver away from the workpiece and to permit the workpiece to be removed from the stapling position to release the trigger element.

4,041,599

METHOD OF CONCENTRIC BONDING OF A ROD IN A TUBULAR SHAFT

Derek Reginald Smith, Bristol, England, assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 14, 1976, Ser. No. 676,866
Int. Cl.[2] B23P *11/02*
U.S. Cl. 29—451 24 Claims



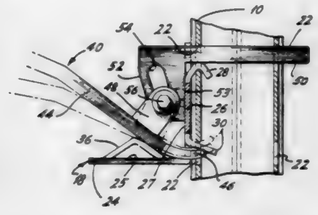
1. A process for securely bonding a rod concentrically in a tubular shaft which comprises: (1) fitting a pair of parallel annular grooves positioned near the base and top of the mating portion of the rod with a pair of resilient sealing rings having inner diameters such that they are retained in place by the grooves and outer diameters greater than that of the mating portion, said sealing rings being designed to fit snugly into the tubular shaft and form a tight fit between the mating portion and the shaft; (2) inserting the base of the mating portion containing the first of said resilient sealing rings into one end of the tubular shaft so as to compress said resilient sealing ring snugly between the mating portion and the inner circumference of that end of said tubular shaft, said end of said tubular shaft having the neck of a funnel tightly fitted about its outer circumference; (3) filling the funnel with a suitable liquid bonding agent; (4) further inserting the mating portion of the rod into the tubular shaft, thereby creating a vacuum in the annular spacing between said mating portion and said tubular shaft so as to cause the bonding agent in the funnel to flow into and fill said annular spacing; (5) continuing to insert the mating portion of the rod into the tubular shaft until the annular space between said mating portion and said tubular shaft has been completely filled with bonding agent and the second resilient sealing ring at the top of the mating portion has been forced into the shaft and snugly compressed between said mating portion and said tubular shaft, thereby entrapping and sealing said bonding agent in said annular space; and (6) curing said bonding agent to the thermoset state so as to bond the shaft and the mating portion of the rod together in concentric alignment.

4,041,600

METHOD OF ASSEMBLING STORAGE SYSTEM

Frederick Ruediger, Willow Grove, Pa., assignor to Standard Pressed Steel Co., Jenkintown, Pa.

Filed Mar. 19, 1976, Ser. No. 668,369
Int. Cl.[2] B21D *39/00;* B23P *11/02*
U.S. Cl. 29—513 4 Claims



1. A method of assembling a storage system including the steps of:

providing support posts having aligned slots extending along at least one face thereof;

erecting said support posts in a generally vertical position whereby said slots extend along a generally vertical line and face in the same direction;

providing a support member having a first leg providing a track surface along which storage containers can slide and on which storage containers can be supported, and having a second leg providing a guide surface for guiding storage containers sliding along said track surface, said second leg being provided with first connecting means at one end and second connecting means at the other end, said connecting means including a hook member and a tab member each of said tab members forming an angle greater than 90° with the surface portion of said second leg located between said hook member and said tab member;

inserting said hook members into aligned slots on said support posts so that said hook members underlie the outer surface of said post members, and rotating said support member to insert said tab members into other aligned slots on said support posts;

thereafter applying a bending force to said tab members to bend said tab members toward said hook members until said tab members form an angle less than 90 ° with the surface portion between said hook members and said tab members whereby said tab members underlie the outer surface of said support post members

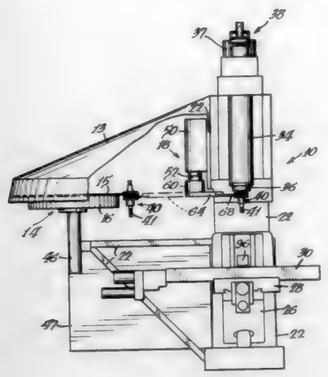
providing a reaction surface in said slots in which said hook members are received so that when said bending force is applied to said tab members it reacts through said reaction surface.

4,041,601

MACHINE TOOL WITH AN AUTOMATIC TOOL CHANGER

Freddie G. Schimanski, Portage, Mich., assignor to Wells Manufacturing Corporation, Three Rivers, Mich.

Filed Mar. 12, 1976, Ser. No. 666,324
Int. Cl.² B23Q *3/157*
U.S. Cl. 29—568 **10 Claims**



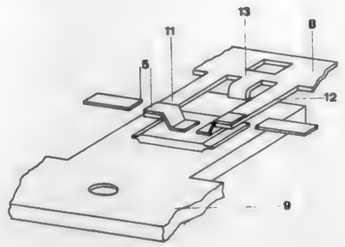
1. A machine tool comprising:
a frame;
a rotatable tool spindle journaled in said frame;
a tool storage magazine rigidly mounted on said frame and having a plurality of tool storage slots for storing a plurality of tools;
indexing means for said storage magazine to present a selected tool storage slot containing a tool to an engaging position for tool pickup and to subsequently present a selected empty storage slot to said engaging position for tool replacement;
tool changer means for transferring tools between said storage magazine and said spindle comprising a carriage slidably mounted on said frame for sliding substantially parallel to the axis of said spindle and a boom pivotally mounted on one end in said carriage, said boom having mounted thereon first and second telescoping tool transfer arms substantially coplanar and perpendicular to the axis of said spindle and said telescoping tool transfer arms extending away from one end of the boom displaced relative to each other at a fixed acute angle and together with the boom forming a substantially Y-shape;
motor means for sliding said carriage to raise and lower said boom reciprocally and substantially perpendicular to the plane of said transfer arms, and substantially parallel to the axis of said spindle;
motor means for pivoting said boom together with said transfer arms in a plane substantially normal to said spindle axis whereby each of said transfer arms can be positioned to engage a tool at said storage magazine engaging position and present said tool for reception by said spindle; and
control means for energizing said motor means and operating said storage magazine and said tool changer means whereby said boom is moved in sequence to locate said first transfer arm at said storage magazine engaging position to pick up a new tool, to subsequently locate said second transfer arm at said spindle to remove a used tool from said spindle, to subsequently locate said first transfer arm at said spindle to load said new tool into said spindle, and to subsequently locate said second transfer arm at said storage magazine engaging position to replace said used tool.

4,041,602

METHOD OF PRODUCING SEMICONDUCTOR COMPONENTS AND STRIP FOR CARRYING OUT THE METHOD

Altan Akyuerek, Heppenheim, and Eckhard Meyer, Lampertheim, both of Germany, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Mar. 11, 1976, Ser. No. 665,763
Claims priority, application Germany, Mar. 14, 1975, 2511209
Int. Cl.² B01J *17/00*
U.S. Cl. 29—588 **7 Claims**



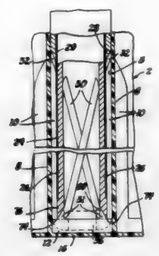
1. A process for the production of semiconductor devices by contacting the electrodes of disk-like semiconductor bodies having at least one p-n junction with a first prefabricated metal strip in the form of a comb whose comb projections are designated as contact projections, and comprising the steps of:
providing a second metal strip coated with solder at least on one side as an intermediate connection between the semiconductor bodies and the contact projections of the first metal strip;
uniformly bending the second metal strip into a number of identical sections each having a wing-like profile viewed normal to the length of the second metal strip;
next placing the side of the second metal strip which is opposite the wings onto the top main surfaces of the semiconductor bodies;
pre-attaching the semiconductor bodies to the second metal strip;
providing the first metal strip designated for connection with the wings and by means of these with the electrodes on the top main surfaces of the semiconductor bodies;
providing a third metal strip, in the form of a comb with cooling fins, designated for contacting the bottom main surfaces of the semiconductor bodies;
aligning the contact projections of the first metal strip and the cooling fins of the third metal strip;
then introducing the second metal strip with the pre-attached semiconductor bodies between the first and second metal strips so that its length runs normal to the direction of alignment of the contact projections of the first metal strip and the cooling fins of the third metal strip;
holding together the comb system thus formed by the three metal strips and the semiconductor bodies;
soldering the comb system while pressing down the second metal strip;
severing the second metal strip between the electrodes on the semiconductor bodies to disconnect the conducting links formed thereby;
lacquering the comb system;
baking the comb system;
surrounding the comb system with plastic except for part of the contact projections; and
dividing the comb system into individual constructional units.

4,041,603

RIB TRIMMING OF UNIVERSALLY MOLDED BATTERY CONTAINER

Robert H. Thune, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 17, 1976, Ser. No. 715,070
Int. Cl.² H01M *2/02*
U.S. Cl. 29—623.1 **3 Claims**



1. A process for adapting a standarized multicell open-topped battery case to use with multi-plate cell packs having different thicknesses depending primarily on the number of plates per pack, said case comprising end walls and intercell partitions paralleling said end walls for dividing said case into a plurality of individual cell compartments, said partitions and end walls having ribs thereon extending into said compartments in substantially opposed relation one to another for engaging and securely holding cell packs therebetween, said process comprising: forming said case with its ribs standing in relief a first predetermined elevation beyond their associated walls and partitions so as to have the distal portions thereof spaced apart one from the other across said compartment by a gap substantially equal to the thickness of the minimum-plate cell pack useful with said case; aligning said ribs with rib-trimming means, adapted for insertion into said compartments, said rib-trimming means including trimmers for removing predetermined amounts of said ribs and guide means cooperatively associated with said trimmers and adapted to engage said walls and partitions for guiding said trimmers into said compartment in a substantially uniform spaced relation from said ribs' associated walls and partitions; and inserting said rib-trimming means into said case through the open top thereof with said guide means engaging said walls and partitions, and progressively removing said predetermined amounts of said ribs such that the remanents thereof have a second lesser predetermined elevation than said first predetermined elevation and said gap is increased to approximately the thickness of cell packs having more plates than said minimum-plate cell pack and which are actually destined for use with the particular case being formed; whereby a single, universal-sized battery case is readily adapted to accommodate cell packs having different thicknesses so that a variety of batteries having different energy capacities may be produced from a standardized case.

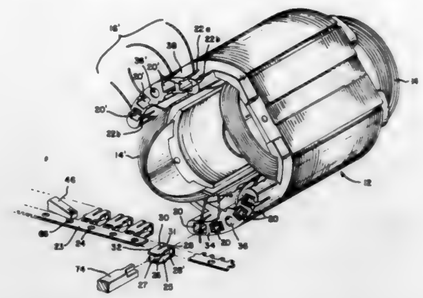
4,041,604

METHOD OF TERMINATING AN ELECTRICAL WIRE IN AN INSULATING HOUSING

George Nelson Ackley, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 618,649, Oct. 1, 1976, Pat. No. 3,984,908.
This application June 10, 1976, Ser. No. 694,753
Int. Cl.² H01R *43/00*
U.S. Cl. 29—628 **4 Claims**

1. A method of attaching a contact terminal to an electrical conductor and positioning said terminal and said conductor in a terminal receiving cavity in an insulating housing, said terminal having conductor receiving means for establishing electrical contact with said conductor upon relative movement of said terminal towards the axis of said conductor, said method comprising the steps of:
positioning said insulating housing with said cavity in alignment with an elongated insertion ram having a forward end and a rear end, said ram being movable towards and away from said cavity, positioning said conductor between said cavity and said forward end of said ram with said conductor spanning said cavity,
positioning said terminal in a guide track between said ram and said conductor with said terminal in alignment with said cavity and with said conductor receiving means in alignment with said conductor,



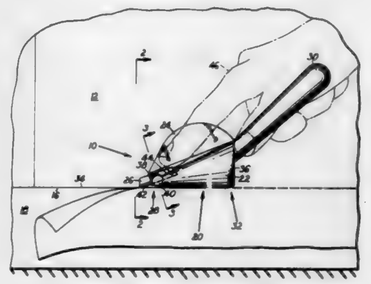
positioning a depth control device having first and second ends with said first end against an appropriate reference surface of said housing and between said housing and a ram stop fixed to said ram and located at said rearward end of said ram, and
moving said ram along said guide track with said front end of said ram pushing said terminal into said cavity so that said conductor receiving means establishes electrical contact with said conductor, with further movement of said ram being prevented when said ram stop abuts
said second end of said depth control device, whereby the final position of said conductor and said terminal with respect to said reference surface is determined by the relative length of said depth control devices and said ram.

4,041,605

WALLPAPER TRIMMER

Leroy K. Selfridge, Vista, Calif., assignor to Eugene W. Selfridge, Portland, Oreg.

Filed July 12, 1976, Ser. No. 704,500
Int. Cl.² B26B *29/00*
U.S. Cl. 30—293 **6 Claims**



1. A wallpaper trimming device for cutting wallpaper at a joint between a wall being papered and an adjacent structural member, said trimming device comprising:
a. a body member for positioning said trimming device against said adjacent structural member and guiding said

wallpaper gradually into said joint, and body member having a base end, an apex end and a conical outer surface, said body member providing a first position reference when placed with said conical outer surface resting upon said adjacent structural member, said apex end proximate the line of said joint and said base end spaced away from said wall;

b. a substantially flat flange attached along one edge thereof to said body member such that the plane of said flange is substantially tangent to said conical outer surface of said body member, said flange extending outwardly therefrom, for positioning said trimming device against said wall being papered and pressing said wallpaper against said wall, said flange providing a second position reference when placed against said wall with said wallpaper sandwiched therebetween while said conical surface of said body member is resting upon said adjacent structural member;

c. a handle attached to said base end of said body member for moving said body member and said flange along said adjacent structural member and said wall, respectively, relative to said first and second position references and in a direction generally from said apex end toward said base end of said body member; and

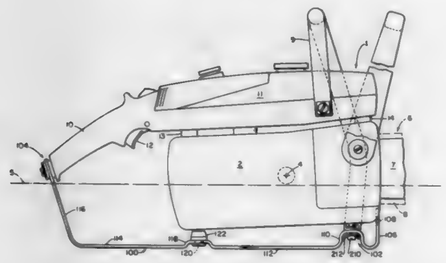
d. a cutting member attached to said body member at said apex end intermediate said body member and said flange for cutting said wallpaper at said joint, said cutting member comprising a blade having a cutting edge along one side, said blade being mounted on the same side of said flange as said body member at an angle from said flange in the direction of said body member and extending therefrom such as to have said cutting edge closely proximate said joint when said body member and said flange are positioned against said adjacent structure and said wall, respectively.

4,041,606

CHAIN SAW WITH FLEXIBLE SKID AND VIBRATION AND RESONANCE REDUCING MEANS

Stephen E. Thompson, Los Angeles, Calif., assignor to McCulloch Corporation, Los Angeles, Calif.

Filed Oct. 7, 1976, Ser. No. 730,638
Int. Cl.² B27B *17/02*
U.S. Cl. 30—381 **12 Claims**



12. A structure for reducing handle vibration and resonance and for inhibiting vibrational creep in a chain saw, which chain saw has

a vibration inducing drive assembly,
a front handle, and
a rear handle,

said structure comprising

an elastically resilient leaf spring skid;
a first stress relieving attachment means connecting said skid to said front handle; and
a second, stress relieving attachment means connecting said skid to said rear handle;
said first and second stress relieving attachment means and the elastic resilience of said leaf spring cooperating to reduce handle vibrations,
reduce resonance, and
inhibit vibrational creep of said chain saw when said skid is rested on a surface and the drive assembly is idling.

4,041,607

COMPOSITION AND METHOD FOR FORMING DENTAL RESTORATIONS

Arie L. Hirsch, 2241-16th Ave., San Francisco, Calif. 94116

Filed Apr. 26, 1976, Ser. No. 680,401
Int. Cl.² A61C *13/00*
U.S. Cl. 32—8 **2 Claims**

1. In a dental restoration having a metal frame the improvement comprising: forming said metal frame from an alloy of the composition

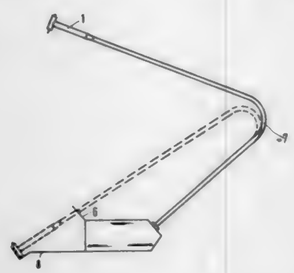
	Weight %	
	Min.	Max.
Nickel (+ Cobalt)	72.0	
Carbon		0.15
Manganese		1.00
Iron	6.00	10.00
Sulfur		0.015
Silicon		0.50
Copper		0.50
Chromium	14.00	17.00

4,041,608

CONNECTING LEAD SUPPORTS

Sven Vilhelm Emanuel Lundin, Wurzburg, Germany, assignor to Avenska Utvecklingsaktiebolaget (SU), Stockholm, Sweden

Filed Dec. 13, 1974, Ser. No. 532,490
Int. Cl.² A61C *19/02*
U.S. Cl. 32—22 **9 Claims**



1. In combination, with a housing and an instrument, a lead connected at one end to said housing and at the other end to said instrument, a support for said lead, said support comprising a flexible band, which runs longitudinally alongside and parallel to the longitudinal dimension of the lead, means connecting the band to the lead along the entire length of the lead, said band being arcuately shaped in cross-section and having its concave surface facing said lead wherefore the same is characterized by a degree of longitudinal stiffness.

4,041,609

FOOT CONTROL FOR DENTAL EQUIPMENT

Robert A. Bresnahan, York, Pa.; Edward W. Bass, Claymont, Del., and William G. Mader, York, Pa., assignors to Dentsply Research & Development Corporation, Milford, Del.

Filed May 21, 1976, Ser. No. 688,863
Int. Cl.² A61C *19/02*
U.S. Cl. 32—22 **16 Claims**

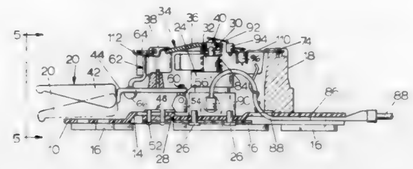
1. A foot control unit for fluids delivered to dental instruments comprising in combination,

a. a base adapted to be supported upon a surface such as a floor,

b. a control unit supported upon said base and including a plunger projecting therefrom and adapted to be moved axially in one direction to effect delivery of fluids to a dental instrument,

c. an actuating member supported above the upper end of said plunger of said control unit,

d. a plurality of foot-engageable members movably supported by said base at circumferentially spaced locations for movement selectively in horizontal and vertical directions,



e. connecting members respectively extending between said foot-engageable members and said actuating member, and

f. depressing means on said connecting members operable to move said actuating member in a direction to move said plunger in said one direction when said foot-engageable members are moved in either said horizontal or vertical directions

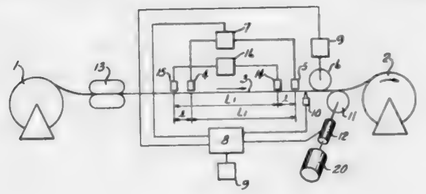
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4,041,610

APPARATUS FOR PRECISE MEASUREMENT OF THE LENGTH OF LONG LENGTH MATERIALS

Minoru Uesugi; Susumu Ihara, and Katsumi Mizuuchi, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 549,948, Feb. 14, 1975, abandoned.
This application June 4, 1976, Ser. No. 693,213
Int. Cl.² G01B *7/04*
U.S. Cl. 33—127 **3 Claims**



1. An apparatus for precise measurement of the length of longitudinally traveling long length materials comprising, a magnetic powder application device to apply a magnetic powder layer to the moving long length material, a magnetic device located downstream of said application device to periodically make a magnetic mark on said magnetic powder layer, a mark detector positioned a predetermined unit length downstream from said marking device to detect said magnetic marks as they pass by said detector, and operable upon detection of a magnetic mark to actuate said magnetic marking device to apply a magnetic mark to said magnetic powder layer, a second mark detector positioned said unit length downstream from said magnetic powder application device and operable upon detection of a magnetic mark to actuate said magnetic powder application device to apply said powder periodically to said material for marking.

4,041,611

MEANS OF MEASURING A PUPPY'S TAIL FOR SURGICALLY DOCKING THE SAME

Vernon B. Dvorak, 7211 Hickory Grove Road, Cary, Ill. 60013

Filed Aug. 18, 1975, Ser. No. 605,250
Int. Cl.² B43L *9/08*; A61B *5/10*
U.S. Cl. 33—174 D **1 Claim**



1. A puppy tail docking gauge comprising:

a lazy-tong means comprised of a plurality of tong elements pivotally secured together to form pivotally secured tong sections; said lazy-tong means including an end tong section comprised of two tong elements, means pivotally connecting said two tong elements to define an end pivot point,

a flat guide bar means secured to said end pivot point and dwelling in substantially the same plane as said lazy-tong means, said guide bar means adapted to engage the pelvic bone of the puppy whose tail is to be docked,

a flange means on said flat guide bar means extending transversely with respect thereto and generally at right angles with respect to said lazy tong means, said flange means dwelling in the same plane as said end pivot point,

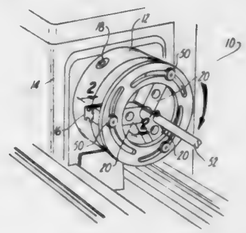
said flange means having a centrally disposed opening formed therein for receiving the tail of the puppy as the tail is extended along said lazy-tong means.

4,041,612

JAW TENSIONING DEVICE

Robert P. Skubic, 1005 Grant, Clawson, Mich. 48017

Filed Mar. 29, 1976, Ser. No. 671,595
Int. Cl.² G01B *3/30*
U.S. Cl. 33—181 R **8 Claims**

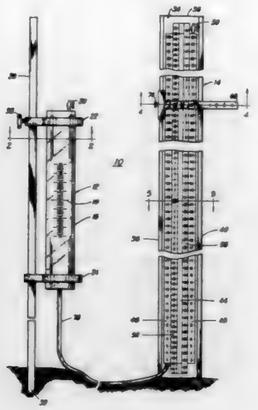


1. For use in conjunction with a chuck having at least two jaws, each jaw having a surface for gripping a workpiece, means for adjusting said jaws radially toward said workpiece; means for radially moving said jaws away from said workpiece and against said radial adjustment means comprising; a flat ring having at least two cam slots formed therethrough, said cam slots being formed as eccentric arcs wherein the centers of the eccentric arc for each cam slot lie on a circle which has as its center the axis of the chuck, said ring positioned coaxially on said chuck so that the ring is radially spaced from the workpiece gripping surfaces of said jaws;

at least two cam followers, each cam follower having a first portion and a second portion, wherein the first portion of

each cam follower is fixed to each of said jaws and wherein the second portion of each cam follower is slidably received in one of said cam slots in said ring whereby rotation of said ring tensions each of said jaws radially away from said workpiece.

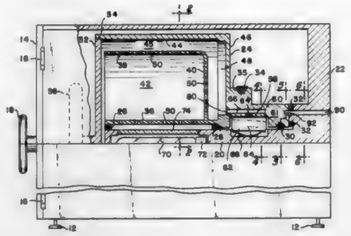
4,041,613
HYDROSTATIC LEVEL INSTRUMENT
Dale F. Bishop, 8704 NW. 35th St., Coral Springs, Fla. 33065
Filed May 22, 1975, Ser. No. 579,839
Int. Cl.[2] G01C *5/04*
U.S. Cl. 33—367 **4 Claims**



1. A hydrostatic level instrument, comprising: a liquid containing reservoir having a transparent side wall, said reservoir being generally elongated and having a uniform internal cross section, said side wall having a fixed graduated scale including uniformly spaced indicia increasing above and below a zero mark; a level including an elongated rod including a web and a pair of spaced flanges, one on each of the ends of said web, and being generally in the form of an "I" in cross section; said rod having at least one fixed scale including indicia directly measuring distances above a zero point at the bottom thereof; a transparent tube mounted on the web within the space between said flanges, said tube being flat and rectangular in transverse cross section with the sides thereof in contiguous relation with each other, said tube extending across the major width of said web; and a pair of movable tapes mounted for longitudinal movement, at least one of said tapes being movable over the face of said tube, each of said tapes having a scale including indicia increasing above and below a zero indicia thereon, said movable tapes being endless and mounted for movement within said flanges with the loops of the tapes passing over both sides of said web; a guide, means mounting said guide for longitudinal movement along said rod; and a flexible duct interconnecting the lower ends of said reservoir and said transparent tube.

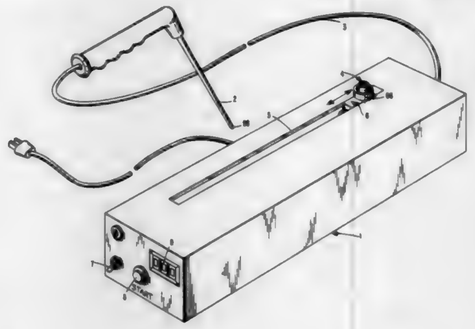
4,041,614
CLOTHES DRYER
Norman A. Robinet, 404-6505 Huntridge Hill NE., Calgary, Alberta, Canada (T2K5E5)
Filed July 12, 1976, Ser. No. 704,321
Int. Cl.[2] F26B *21/10*
U.S. Cl. 34—92 **5 Claims**

5. A clothes dryer comprising:
a stationary housing;
a horizontal shaft fixedly mounted within said housing;
a rotatable double drum with imperforate exterior wall portions journaled on said shaft;
said double drum having an interior compartment with perforate wall portions for holding clothes and a peripheral space about said interior compartment defined by said perforate wall portions and said exterior imperforate wall portions;



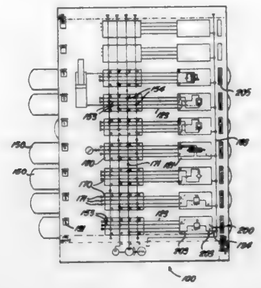
means for sealably closing said double drum; and
pump means mounted on said horizontal shaft having a rotor rotatable with said double drum and in communicating relation to the interior of said double drum for exhausting air and water vapor from said double drum.

4,041,615
SMALL-MOTION TEST DEVICE
Joseph Whitehill, R.D. 3 Box 278A, Chestertown, Md. 21620
Filed Aug. 3, 1976, Ser. No. 711,296
Int. Cl.[2] G09B *19/24*
U.S. Cl. 35—13 **10 Claims**



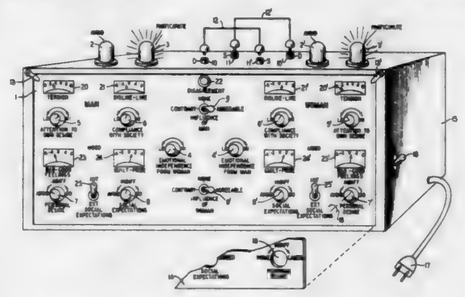
1. A small-motion test device for testing the hand-eye coordination, correction reflex, and small-motion muscle control of a test subject comprising
a target
means for moving said target along a path at a predetermined rate,
switch means coupled to said target for defining boundaries of a multi-dimensional envelope of freedom of movement of said target,
a wand controlled by said test subject to affirmatively position said target within the boundaries of said envelope of freedom of movement during travel of said target along said path, and
means responsive to said switch means for indicating the location of said target within said envelope of freedom of movement.

4,041,616
CIRCUIT DESIGN APPARATUS
Victor Hugh Hamblett, Worthing, England, assignor to B & G Hydraulics Limited, Worthing, England
Filed July 13, 1976, Ser. No. 704,850
Claims priority, application United Kingdom, July 14, 1975, 29505/75
Int. Cl.[2] G09B *23/06*
U.S. Cl. 35—19 R **12 Claims**



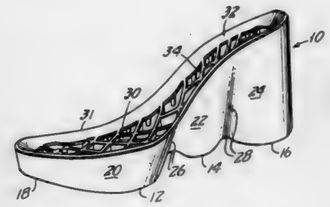
1. Apparatus for representing the connections between a plurality of circuit components to be connected in a circuit and a multiplicity of flow lines in the circuit, the apparatus comprising a first member having a multiplicity of equally spaced lines thereon to represent the flow lines in the circuit, and a plurality of connection members slidably mounted on the first member at spaced positions along the flow lines, each connection member being marked with connection indicia which are spaced apart in a direction perpendicular to the flow lines on the first member by distances equal to the spacing of the flow lines on the first member, the arrangement being such that, in use, the connection indicia and the flow lines can be viewed simultaneously and sliding movement of the connection members relative to the first member is operable to bring different connection indicia on the connection members into register with flow lines on the first member to indicate which flow lines are required to be connected to components represented by respective connection members.

4,041,617
APPARATUS AND METHOD FOR INDICATION AND MEASUREMENT OF SIMULATED EMOTIONAL LEVELS
James Fisher Hollander, 40 Middlesex St., Matawan, N.J. 07747
Filed July 26, 1976, Ser. No. 708,560
Int. Cl.[2] G09B *19/00*
U.S. Cl. 35—22 R **70 Claims**



1. Simulation apparatus comprising
a plurality of sources of respective physical forces, at least one of said force sources being substantially continuously adjustable in level, said forces being relatable to levels of positive and negative decisional influences;
means for comparing said physical forces so as to determine whether a combined total of levels of at least two of said decisional influences is positive or negative in character; and
means for indicating one or more simulated emotions, each simulated emotion having a range of simulated emotional levels, by measuring as an emotion at least one of said physical forces including a force from at least one said adjustable force source in a manner dependent on the positive or negative character determined by said comparing means.

4,041,618
CONTOURED SOLE FOR HIGH HEELED SHOES
Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Continuation of Ser. No. 710,097, July 30, 1976, abandoned, which is a continuation of Ser. No. 536,895, Dec. 27, 1974, abandoned. This application Oct. 1, 1976, Ser. No. 728,603
Int. Cl.[2] A43B *13/00*
U.S. Cl. 36—25 R **3 Claims**

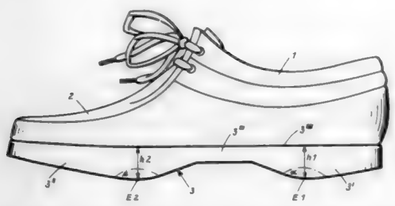


1. A substantially flexible solid appearing sole for high heeled shoes comprising
a. solid side, end and bottom walls defining an internal cavity;
b. a web disposed in said cavity comprised of a plurality of criss crossed, relatively thin walls defining a honeycomb construction, said web walls being integral with said side, end and bottom walls;
c. the outer surfaces of said side and bottom walls defining a plurality of juxtaposed alternating curves and troughs, said alternating curves of the side and bottom walls forming a compound-curved structure therein;
d. a plurality of pairs of integral horizontal ribs disposed in said cavity, one each of each pair of said ribs disposed on each side of one of said web walls between the top and bottom edges thereof.

4,041,619
SHOE
Peter Sapper, Auf der Burg, D-7121 Walheim, Wurttemberg, Germany
Filed Feb. 9, 1976, Ser. No. 656,635
Claims priority, application Germany, Mar. 21, 1975, 2512419
Int. Cl.[2] A43B *13/00*
U.S. Cl. 36—25 R **9 Claims**

1. A shoe comprising an upper and a sole, the sole including a sole body having upper and lower surfaces, the shape of the sole body, as viewed from above, being approximately that of the foot of a wearer, a front portion, an arch portion and a heel portion of the sole, two downwardly extending projections extending across the width of the lower surface of said sole body, the projections being produced by variations in the thickness of the sole body, the first of said projections being located under the heel portion of the sole body adjacent the arch portion and the second of said projections being located under the front portion at the location of the ball of the foot of

the wearer, the projections being of substantially equal height from said upper surface, the upper surface of the sole body in



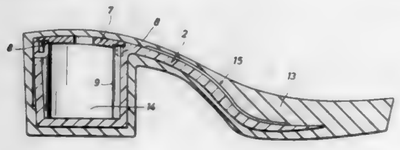
the arch and heel portions being curveless in the longitudinal direction and having a longitudinal axis in said portions extending in a horizontal plane.

4,041,620

INTEGRATED SHOE SOLE AND HEEL

Victor F. Anderson, Wenonah, N.J., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 27, 1976, Ser. No. 718,232
Int. Cl.[2] A43B *13/04*
U.S. Cl. 36—32 R **7 Claims**



1. An integrated shoe sole and heel article comprising:

a. an integral heel and shank insert formed from a thermoplastic polymer wherein

i. the heel portion comprises a hollow body part having a bottom and sides, the lower portions of which sides are continuous with the bottom and the upper portions of which sides bound an opening at the heel-seat area of the heel portion; and

ii. the shank portion is continuous with the upper portion of the heel portion;

b. a heel-seat part closing the opening of the hollow body part of the heel portion, said heel-seat part being bonded to the heel portion and said heel-seat part having a means to suspend the integral heal and shank insert with attached heel-seat part in a unit sole mold; and

c. a unit sole formed from a thermoplastic elastomeric composition, said unit sole encompassing the integral heel and shank insert with attached heel-seat part.

4,041,621

SNOWSHOE AND METHOD OF FABRICATING SAME

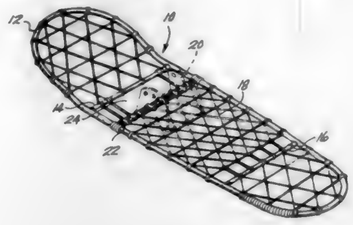
Richard Marlow Anderson, P.O. Box 211, Black Diamond, Wash. 98010

Filed Nov. 15, 1974, Ser. No. 524,235
Int. Cl.[2] A43B *5/04*; A43D *9/00*
U.S. Cl. 36—122 **10 Claims**

1. A light, flexible snowshoe including a frame comprising a toe piece and a heel piece joined at points laterally adjacent the foot mounting position by jointer section means fixedly mounted on said toe piece and slidable with respect to said heel piece;

transverse support rod means slidably mounted within holes in said toe and heel pieces, the support rod means associated with said toe piece extending through a part of said jointer section means to fixedly hold said jointer section means with respect to the toe piece; and

web means secured to and covering said frame to hold all said pieces in engagement with each other.

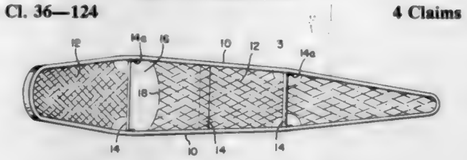


4,041,622

SNOWSHOE

David M. Schonbrun, 1100 E. Union, Seattle, Wash. 98122

Filed Sept. 27, 1976, Ser. No. 726,995
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—124 **4 Claims**



1. A lightweight snowshoe providing good traction for the wearer over lever and inclined terrain comprising:

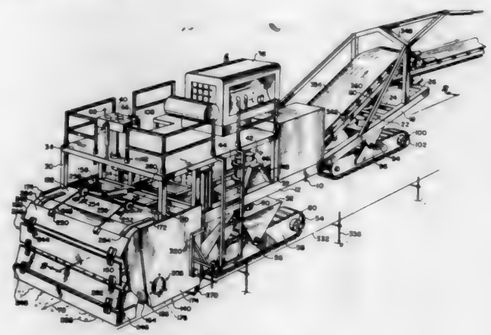
longitudinally extending spaced frame members joined together enclosing an area criss-cross by webbing, the frame member being of a configuration which is substantially rigid against bending along its major axis and flexible along its minor axis, the frame member further provided with sharp lower edges which penetrate the snow to prevent lateral slippage when traversing sloping terrain.

4,041,623

GRADE CUTTING MACHINE

David J. Miller, and Charles P. Miller, both of McHenry, Ill., assignors to Miller Formless Co., Inc., McHenry, Ill.

Filed Sept. 22, 1975, Ser. No. 615,767
Int. Cl.[2] E02F *5/00, 3/76*
U.S. Cl. 37—108 R **14 Claims**



1. A grade cutting machine comprising:

an elongated frame member having front and rear portions;

a grade cutting tool rotatably mounted on an axis transverse the front portion of said frame member and adapted to deposit loosened earth cutting therebehind;

a moldboard carried by said frame member and having its lower edge extending transverse said frame member and

spaced behind said cutting tool to grade said loose cuttings;

means adjustably and vertically supporting the opposite ends of said moldboard from said frame member whereby the elevation of the lower edge of said moldboard in relation to said cutting tool is variable and defines the depth of the layer of loose cuttings deposited upon said grade;

conveyor means having its receiving end in open communication with the loose cuttings graded by said moldboard to remove said cuttings to the rear of the machine;

a pair of ground engagement means disposed adjacent opposite sides of the front portion of said frame member to accommodate transportation of said machine along a path of travel;

front frame support means connecting opposite sides of said front portion of said frame member to the respective ground engagement means and adapted to adjustably support said frame member thereon;

single ground engagement means disposed from the rear central portion of said frame member;

frame support means connected to said rear ground engagement means to adjustably support the rear portion of said frame member;

actuating means supported by said frame member and responsive to an exterior grade reference disposed along said path of travel to be traversed by said machine, said actuating means being operatively connected to said pair of front frame support means whereby to extend and retract same silumtaneously for grade control;

actuating means supported by said frame member and operatively connected to said pair of front frame support means whereby to extend and retract same independently for slope control;

sterring means operatively connected to said single ground engagement means to turn said single ground engagement means on said vertical steering axis;

actuating means operatively connected to said steering means and responsive to the direction of said exterior reference to maintain said machine along said path of travel;

independent drive means for said front pair of ground engagement means and said single ground engagement means; and

means connecting said drive means for said pair of front ground engagement means to said steering means for said single ground engagement means whereupon actuation of said steering means induces a change in the driving speed between said front ground engagement means such that the front ground engagement means on the outside of a curve is driven faster than the front ground engagement means on the inside of a curve by a differential inversely proportional to the radius of said curve.

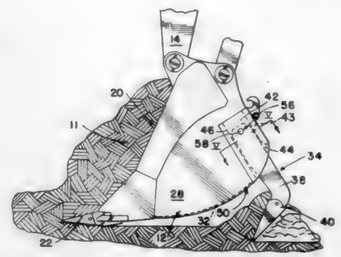
4,041,624

INTEGRAL RIPPERS FOR HYDRAULIC EXCAVATOR BUCKET

Max Dennis Fryrear, Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 17, 1974, Ser. No. 461,608
Int. Cl.[2] E02F *3/76*
U.S. Cl. 37—117.5 **10 Claims**

1. In combination with a bucket having a front end adapted for scooping material, a rear wall, and first and second sidewalls, the improvement comprising a ripper shank positioned between the first and second sidewalls and forwardly of the rear wall and adjacent the rear wall, and extending from the bucket along the rear wall generally parallel thereto through an opening defined by the bucket rearwardly of the front end adapted for scooping material, and guide means associated with the bucket, thr ripper shank being movable along the guide means to a first position extended relative to the bucket, and a second position retracted relative to the bucket, and means associated with the guide means and ripper shank for



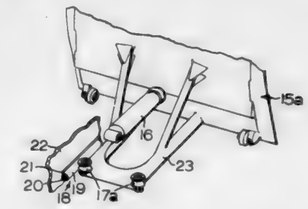
holding the ripper shank in said first position and in said second position.

4,041,625

GUIDE RAIL ASSEMBLY FOR THE EJECTOR OF A SCRAPER AND METHOD

George A. Fisher, and Warner G. Richardson, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 20, 1976, Ser. No. 752,709
Int. Cl.[2] B60P *1/36*; E02F *9/28*
U.S. Cl. 37—126 AE **17 Claims**



1. In a scraper of the type comprising a bowl structure, an elongated guide rail assembly secured on said bowl structure, an ejector assembly reciprocally mounted on said bowl structure for reciprocal movement thereon, and a guide roller rotatably mounted on said ejector assembly and engaging said guide rail assembly for guiding reciprocal movements of said ejector assembly on said bowl structure, the invention wherein said guide rail assembly comprises an elongated guide rod having a first cross sectional area and a pair of elongated locating rods disposed on either side of said guide rod and each having a second cross sectional area substantially less than said first cross sectional area and securing said guide rod to said bowl structure.

4,041,626

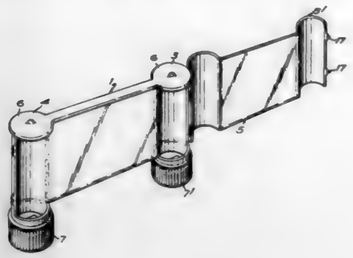
APPARATUS FOR PRESENTING READING MATTER AS A LINEAR BOOK

John Ellis, Dunmore East, County Waterford, and Liam Dunne, Sweetbriar, Tramore, County Waterford, both of Ireland

Filed Nov. 18, 1974, Ser. No. 524,898
Claims priority, application United Kingdom, Nov. 28, 1973, 55050/73
Int. Cl.[2] B65H *19/02*
U.S. Cl. 40—86 R **3 Claims**

1. Apparatus for presenting reading matter on the two sides of a web of paper or the like comprising a holder having a substantially rectangular body member of transparent rigid plastics material provided at opposite ends with part-cylindrical hollow end members, a closure having a substantially rectangular body of transparent rigid plastics material provided at opposite ends with part-cylindrical hollow end members, means pivotally connecting one of said closure end members

with one of said body end members whereby said closure may be moved between a holder open position and a holder closed position wherein said transparent body members are in opposed adjacent relation to define a narrow space between them and said end members cooperate to define parallel cylindrical chambers at opposite ends of that space, spindles upon which opposite ends of said web are secured, each of said holder body end members having one lateral open-mouthed end, each of said spindles having an end extended through its body member open-mouthed end, and means detachably rotatably mounting said spindles in the body end members comprising a pair of



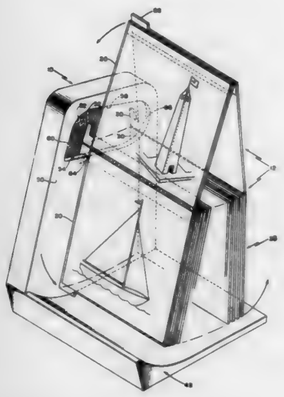
caps, closing each open-mouthed end, means formed on each said cap and the periphery of its corresponding open-mouthed end of one of said holder body end members for freely, rotatably mounting the cap thereon, and coacting interfitting means on said caps and the adjacent extended ends of the spindles for non-rotatably interconnecting each said cap with a spindle, whereby a web wound as a roll on one of said spindles in the chambers of the closed holder may be traversed through said space to read the matter on one side and then reversely traversed through said space to read the matter on the opposite side.

4,041,627

SEQUENTIAL DISPLAY DEVICE

George F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed Dec. 19, 1975, Ser. No. 642,298
Int. Cl.² G09F *11/12*
U.S. Cl. 40—97 **9 Claims**



1. A device for presenting a series of photographs or the like in endless sequence comprising:

a plurality of generally flat, substantially rectangular panels hinged together, edge-to-edge in an endless sequence, said panels being hinged in a manner to enable all but two of the panels to be arranged in a pack of accordian-like configuration, said two remaining of said panels defining a self-supporting, V-shaped configuration and extending away from the pack in a display position;

each of the panels having an inner edge, an outer edge and a pair of side edges, the inner edges of adjacent panels being hinged to each other and the outer edges of adjacent panels being hinged to each other, hinges connecting the adjacent inner edges being constructed and arranged to enable the panels to be hinged in one direction and the hinges connecting the outer edgess of adjacent panels being constructed and arranged to permit hinging in the opposite direction, and

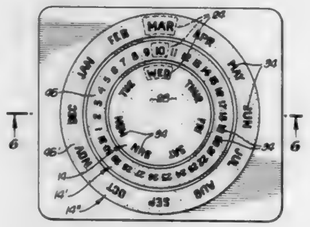
means for supporting the panels in a manner to enable said pair of panels to be pivoted toward an end of the pack and, in response thereto, to cause the leading pair of panels at the opposite end of the pack to be pivoted away from the pack and to be advanced to the display position.

4,041,628

APPARATUS FOR VISUALLY REGISTERING INDICIA

Eli Sasson, 605 N. Bedford, Beverly Hills, Calif. 90210

Filed Apr. 14, 1976, Ser. No. 676,786
Int. Cl.² G09D *3/06*
U.S. Cl. 40—111 **5 Claims**



1. For use in perpetual calendars and other uses to visually register indicia apparatus having rotatable members whereby relative rotation of the members visually registers indicia on one of the members, comprising:

a circular member having a supporting wall and a first top surface bridging the area between said wall,

said first top surface having an area of a first color, and interposed in said first color and of a lesser area, a second color distinct from said first color,

the area of said first color extending at least in a peripheral band around said first top surface spaced by said second color,

a circular cap rotatable on and overlying and surrounding the top and wall of the circular member, said cap having a second top surface having an area of said first color overlying said area of said first color on said circular member and extending at least in a peripheral band, there are a plurality of said circular members and said caps concentrically arranged, said plurality of circular members are joined and said caps are fitted to be independently rotated on respective circular members, and

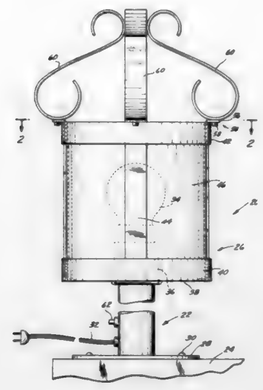
peripherally arranged transparent indicia formed in said second top surface in said area of said first color thereon whereby relative rotation of said members will cause a portion of said indicia to overlie and register with said second area of color to visually direct attention to said portion of said indicia the respective second areas of color are radially aligned.

4,041,629

SIGNAL DEVICE

Philip Hopp, New York, and Mort M. Allen, Bayside, both of N.Y., assignors to The Hopp Press, Inc., New York, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,417
Int. Cl.² G09F *13/04*
U.S. Cl. 40—130 R **3 Claims**



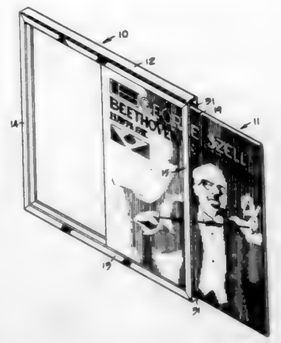
1. A signal device comprising; a support pole, a housing on the support pole, the housing being in the form of a cage with the bottom being disc-shaped and mounted to the top of the pole and having an upwardly extending annular skirt and the top being a circular band aligned with the annular skirt of the bottom, a plurality of spaced vertical ribs connected at one end to the bottom disc and at the other end to the circular band and the ribs being spaced to provide viewing apertures therebetween, means on the housing to removably receive and hold a a plurality of signal panels in position to be readily visually observable through the viewing apertures and being held in arcuate configuration so as to conform to the portion of the circular configuration of the housing where each panel is located, the panels being of deformable plastic material to facilitate their alteration of configuration to engage with the means on the housing in the desired position for visual observance through the appropriate viewing aperture, the panels being interchangeable and having predetermined indicia to enable the selection of a particular pattern to be observed while in the housing as a visual signal, the means on the housing to removably receive the panels includes a support bracket in alignment with each vertical member and attached to the housing at the location of the band, the bracket extending inwardly of the housing, each bracket cooperating with an adjacent bracket and the adjacent housing structure to receive a panel therebetween in deformed arcuate configuration and cooperate with the base of the housing to hold the panel in position for visual observance between the vertical members, a light source is mounted on the pole and positioned within the housing so as to illuminate the panels in position in the housing and enhance visual observance thereof from a distance, means being attached to the bottom of the pole to permit interconnection to a source of electrical energy to illuminate the light mounted at the top of the pole, the pole having support means to facilitate its ability to be placed in an upright position and the pole being of a predetermined length to position the housing when the pole is in the upright position in a high location to permit its visual observance from a distance.

4,041,630

FRAME FOR EXHIBITING ALBUMS AND THE LIKE

R. Patrick Holbrook, San Francisco, Calif., assignor to Album Frames Inc., San Francisco, Calif.

Filed June 1, 1976, Ser. No. 691,534
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152.1 **11 Claims**



1. An open album frame for displaying record albums and the like comprising

an upper section,

a lower section disposed in parallel relationship relative to said upper section,

a first side section secured between first ends of said upper and lower sections,

means defining an elongated groove on an inner side of each of said upper, lower and first side sections with the grooves defined in each of said upper and lower sections intersecting opposite ends of the groove defined in said first side section to further define generally C-shaped composite mounting grooves,

a second side section disposed in parallel relationship relative to said first side section and secured between second ends of said upper and lower sections to define a rectangular album frame,

means defining an elongated slot through said second side section which extends substantially the full length thereof, opposite ends of said slot intersecting the grooves defined in said upper and lower sections whereby an album may be inserted through said slot and slid into the C-shaped composite mounting grooves defined in said frame for display purposes, and

a hanger having a pair of first and second parallel legs secured together by a bridging portion, said upper section having a rail partially defining the groove therein and wherein said first leg is disposed in the groove and has a vertical height substantially equal to the depth thereof, said bridging portion is disposed in underlying and supporting relationship relative to said rail and said second leg has a vertical height greater than the vertical height of said first leg and is substantially coextensive with respect to the vertical height of said upper section.

4,041,631

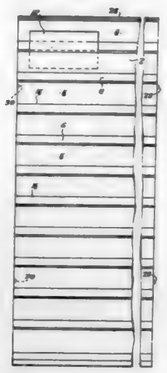
VISUAL DISPLAY BOARD OR PANEL

Arthur William Stevens, Courtdale House, Streete Court, Westgate-on-Sea, Kent, England

Filed Feb. 18, 1975, Ser. No. 550,862
Claims priority, application United Kingdom, Feb. 21, 1974, 7976/74
Int. Cl.² G09F *1/10*
U.S. Cl. 40—124.2 **8 Claims**

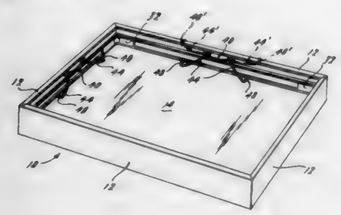
1. A visual display panel comprising a backing sheet and a plurality of generally parallel strips formed in one-piece therewith, each strip having two longitudinal edges and being inte-

grally joined to the backing sheet at a first one of said edges, the other edge being free and closely adjacent said backing sheet whereby a channel is defined between the backing sheet and the strip, said strips having been initially moulded inte-



grally with said backing sheet so as to jut outwardly therefrom and subsequently being deformed to bring their free edges adjacent said backing sheet and wherein each strip has a further fastening to the backing sheet.

4,041,632
ART FRAME
Robert Sarkisian, 4276 Stoneleigh Road, Bloomfield Hills, Mich. 48013
Filed Feb. 23, 1976, Ser. No. 660,703
Int. Cl.[2] G09F *1/12*
U.S. Cl. 40—156 **13 Claims**



1. An art frame for holding and displaying materials of substantially varying thicknesses, said frame having a plurality of corners and comprising

a plurality of frame sections forming a polygonal-shaped frame, each of said frame sections having a plurality of elongated channels formed therein,

frictional locking means positioned in each of said corners and adapted to securely hold two adjacent frame sections together, said frictional locking means being inserted in a first of said elongated channels in each of two adjacent frame sections,

brace means in each of said corners, said brace means being positioned in a second of said elongated channels in each of two adjacent frame sections,

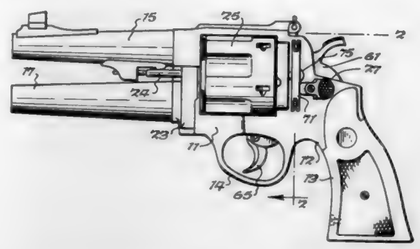
said first elongated channel and said elongated channel in each frame section being substantially perpendicular to each other, and

a plurality of spring members each comprising a body and at least one biased member extending therefrom, said body lying in a third of said elongated channels and said biased member being biased in a direction to securely hold said materials in place regardless of the thickness thereof,

said third elongated channel in each of said frame sections being in a plane substantially vertical to the plane of the display materials,

said biased member having a hooked portion at its outer end, said biased member and hooked portion being movable from a first position where said hooked portion is resting on said display materials holding them in place to a second position where said hooked portion is positioned on one of said frame sections allowing said materials to be inserted and removed from said frame.

4,041,633
DUAL-BARREL PISTOL
Pascal Scrufari, 457 12th St., Niagara Falls, N.Y. 14303
Filed Sept. 24, 1975, Ser. No. 616,139
Int. Cl.[2] F41C *1/00*
U.S. Cl. 42—65 **15 Claims**



1. In a pistol of the revolver type having a frame adapted for mounting a cylinder for holding cartridges, means for indexing said cylinder, a trigger, and a hammer interconnected with said trigger, the combination of two vertically spaced barrels with bores of different sizes, said barrels being attached to said frame; a rotatable cylinder carried by said frame having a plurality of chambers adapted to hold cartridges with bullets fitting each of said bores, said chambers being alignable with said barrels; a pair of firing pins carried in said frame, said firing pins being vertically spaced and adapted to fire cartridges in chambers of said cylinder aligned with said barrels; a hammer block engaging said firing pins and adapted to be struck by said hammer to produce firing of said cartridges; and barrel selecting means, movable with respect to said hammer block, for selectively preventing substantial movement of one or the other of said firing pins by said hammer block.

4,041,634
RELEASE OF FISHING HOOK
Anastacio Martinez, 2104 N. 39th St., Milwaukee, Wis. 53208
Filed Dec. 19, 1975, Ser. No. 642,477
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—17.2 **3 Claims**



1. A method of releasing a fishing hook snagged underwater to the far side of a submerged log or the like and where the hook is connected to relaxed fishing line, said method comprising:

a. providing a heavy weight attached at one end to a stringer,

b. attaching the other end of said stringer to the fishing line so that the stringer is slideable therealong,

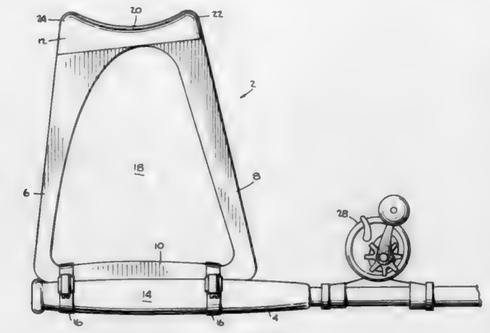
c. twirling said stringer to provide substantial centrifugal forces to said weight,

d. aiming said weight and releasing said stringer so that the momentum of the weight carries the latter generally horizontally through the air to the far side of said log where the weight drops downwardly into the water, and wherein said stringer follows said weight along the relaxed fishing line,

e. removing slack in said fishing line,

f. and yanking said fishing line rearwardly to cause said hook to releasably move in the opposite direction and toward said weight.

4,041,635
FISHING POLE LEVERAGE DEVICE
Robert M. Savage, 271 Carnation Ave., Floral Park, N.Y. 11001
Filed June 3, 1976, Ser. No. 692,468
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—25 **6 Claims**



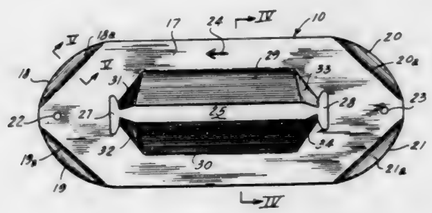
1. A leverage brace for reacting forces imposed on a fishing rod comprising:

a. a rigid column extending from the handle of the fishing pole to an upper surface;

b. an upper surface contoured to conform to the underarm of a fisherman; and

c. wherein the brace is formed of material having a lower density than water.

4,041,636
TROLLING ACCESSORY FOR FISHING
John F. Folker, 2615-17 N. Lakewood, Chicago, Ill. 60614
Filed Dec. 8, 1975, Ser. No. 638,645
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.31 **8 Claims**



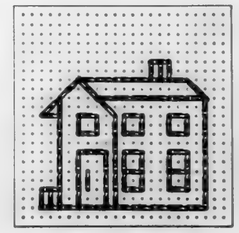
1. A fish attracting means for use with a fish capturing means such as a lure when said lure is drawn through a body of water comprising:

a flat rectangular body having attaching means at the front and rear portions thereof along the longitudinal axis of said body,

a rotation means carried by said body comprising plural upper and lower deflection surfaces on said front and rear portions and on opposite sides of the longitudinal axis of said body, said surfaces disposed at acute angles to the plane of the lure body to produce counterclockwise rotational moment, and

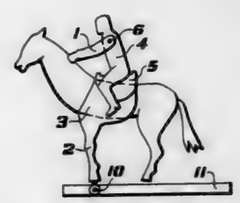
rotational drag reduction means to reduce a resistance to rotation comprising an elongated opening in a center portion of said body and along the longitudinal axis of said body having formed along one edge of said opening an upper flange and along the opposite edge a lower flange and each flange forming an acute angle to the plane of the lure body so that the water resisting rotation flows in a streamlined path through said opening.

4,041,637
PAPER CLIP CONSTRUCTION TOY
Robert S. Whitman, 6407 Beacon St., Pittsburgh, Pa. 15219
Filed June 9, 1975, Ser. No. 585,186
Int. Cl.[2] A63H *33/00*
U.S. Cl. 46—16 **3 Claims**



1. A game board for construction type games comprising a planar board member, a plurality of equally spaced generally perpendicularly projecting pegs all of substantially uniform height and cross section on one surface of said board, said pegs being located at the intersections of equally spaced apart sets of transverse parallel lines, said intersections and pegs being generally spaced apart so that a conventional paper clip spans at least two pegs in any straight line and a plurality of paper clips engaged over adjacent pegs to form a design, said adjacent pegs being frictionally engaged by said paper clips.

4,041,638
MODEL FIGURES
Robin Keith Knibbs, 18 Roman Road, Southwick, Sussex, England
Filed Nov. 28, 1975, Ser. No. 635,799
Claims priority, application United Kingdom, Nov. 28, 1974, 51539/74
Int. Cl.[2] A63H *11/10*
U.S. Cl. 46—127 **21 Claims**



18. A model figure representing a horse and rider, said figure including:

a. a base;

b. a first member representing a first portion of the rider and a first portion of the horse;

c. a second member mounted on said base and representing

a second portion of the rider and a second portion of the horse, and

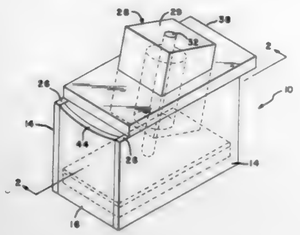
d. a pivotal connection between said first and second members, said pivotal connection being located within a part of the figure representing the rider and outside any part of the figure representing the horse.

4,041,639

GAME CALL WITH PEG GUIDED AT FIXED ANGLE TO STRIKING PLATE

Eldon E. Funk, R.D. No. 2, Newville, Pa. 17241

Filed Sept. 10, 1976, Ser. No. 721,955
Int. Cl.² A63H *5/00*
U.S. Cl. 46—189 **10 Claims**



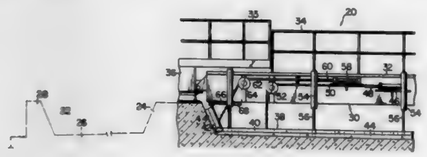
1. A game call of the type having a striking plate, supports on either side of the plate with edges parallel to the plate, a peg block having a bore extending inwardly from one end thereof with a vibratory peg centrally located in the bore extending from the closed end of the bore past the end of the block and having a rounded striking point at the free end thereof so as to produce a simulated call when moved across the striking plate, wherein the improvement comprises a stiffly resilient sound-insulating mounting strip resting on the edges of the supports above the striking plate, a central block-orienting opening extending through the thickness of the strip above the plate, the peg block being mounted within the opening with the striking point of the peg engaging the plate and with the block held by the strip at an angle of attack of less than 90° relative to the surface of the plate, whereby movement of the strip and block back and forth along the edges of the supports moves the striking point of the peg back and forth across the plate to produce a sound simulating a game call while the strip insulates transmission of sound between the block and supports.

4,041,640

CHLORELLA-CULTURING APPARATUS

Kojiro Itanami, and Masanori Ishizaki, both of Fukuoka, Japan, assignors to Chlorella Industry Co., Ltd., Tokyo, Japan

Filed May 5, 1976, Ser. No. 683,530
Claims priority, application Japan, Dec. 22, 1975, 50-151968; Mar. 1, 1976, 51-22021
Int. Cl.² A01G *33/00*
U.S. Cl. 47—1.4 **9 Claims**



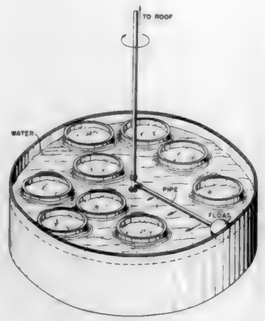
1. A chlorella-culturing apparatus comprising a circular chlorella-culturing tank defined by an outer inclined side wall and a bottom board, a pillar positioned at the center of said tank, at least one rotatable arm body supported upon said pillar and extending from the pillar to said tank side wall, a stirring mechanism fitted to the lower part of said arm body forcefully to produce stirring streams by stirring blades, and a scraping mechanism mounted on said arm body so as to slide up and down and, when the tank charge is drawn out, the scraping mechanism may be brought down to abut against the upper surface of said bottom board and the surface of said inclined side wall of said tank, thereby scraping off deposits collected on said surface.

4,041,641

PROCESS OF GROWING PLANTS WITHIN AN ENCLOSURE

Albert Louis Dietz, P.O. Box 5305, Santa Fe, N. Mex. 87501

Filed Aug. 8, 1975, Ser. No. 583,854
Int. Cl.² A01G *9/00*
U.S. Cl. 47—17 **4 Claims**



1. A novel growing unit comprising a walled enclosure, a predetermined portion of said enclosure being transparent to solar light, a circular water tank within said enclosure adapted to absorb said light and thereby provide a heat sink, a plurality of plant containers floating on the surface of said tank, and means extending from the exterior of said enclosure to the tank surface and being adapted to move said containers through a 360° path, at least a portion of which exposes said containers to the solar light.

4,041,642

PROCESS FOR IMPROVING THE YIELD OF SUGAR BEETS USING LOW INTENSITY LIGHT

Joel I. Krugler, Sudbury, and William F. Nelson, Weston, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed June 9, 1976, Ser. No. 694,264
Int. Cl.² A01G *1/00*
U.S. Cl. 47—58 **5 Claims**

1. A method for improving the yield of sugar beets comprising the step of illuminating the beets during at least a portion of the night with low intensity light having predominant spectral components with wavelengths in the range of 560nm to 700nm.

4,041,643

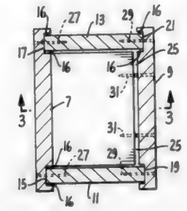
PLANTER BOX

Robert E. Sommerville, 541 Harriet, Aptos, Calif. 95063

Filed May 13, 1976, Ser. No. 686,180
Int. Cl.² A01G *9/02*
U.S. Cl. 47—66 **2 Claims**

1. A planter box having front and back members, said front and back members having deep dados therein and having side members fitting loosely into said dados to form a generally rectangular box-like member and nails passing from said front and back members at the centers of said dados into said side members, said nails holding said side members substantially in the center of said dados and a bottom for said planter box, said

bottom having an area substantially less than that encompassed by the front, back and side members, said bottom being located to leave gaps between the bottom and the two sides and the front, and being held in place solely with nails extending from



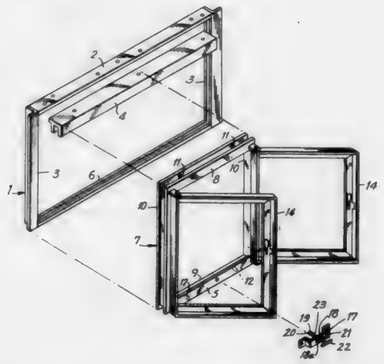
the front, bridging the gap between the bottom and the front and into the bottom whereby said bottom member can expand and slide over said nails without destroying the integrity of the planter box.

4,041,644

REVERSIBLE WINDOW

Eduardo V. Alcanzare, No. 16 Kamagong Street, L & S Subdivision, Angeles City, Philippines

Filed Sept. 8, 1976, Ser. No. 721,587
Claims priority, application Philippines, Oct. 7, 1975, 17633
Int. Cl.² E05D *15/50*
U.S. Cl. 49—163 **3 Claims**



1. A reversible window comprising a main frame, a movable frame disposed on said main frame and adapted to travel horizontally therein, and at least two identical sidewise swingable panels pivotally mounted on said movable frame, said swingable panels adapted to cover the entire space defined by the main frame.

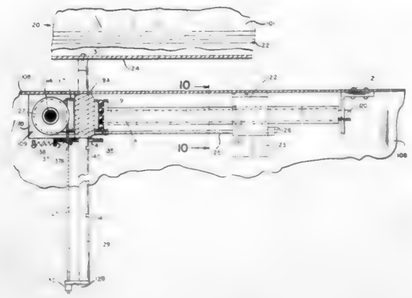
4,041,645

WINDOW CONTROL DEVICES

Jack T. Nourse, Rte. 1, Box 68C, Chisago City, Minn. 55013

Filed June 13, 1975, Ser. No. 586,633
Int. Cl.² E05F *11/04*
U.S. Cl. 49—347 **15 Claims**

1. An operable window assembly including a window unit, frame means for mounting said window unit for at least limited sliding movement in direction along said frame, a window unit operator mechanism comprising a screw mounted to have an axis generally parallel to the plane of the window unit, a screw follower, means acting between said screw follower and said window unit to cause movement of said window unit in a first direction when the screw is rotated and to permit movement of said window unit under gravity in a second direction including a cable member capable of carrying tension from said screw follower to said window unit, said cable being directly connected to said follower, a right angle gear drive means to drive said screw including a manual operator rotatable about an axis perpendicular to the plane of the window unit, and lock means



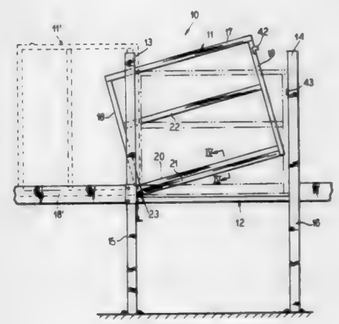
responsive to tension in the cable to lock said window unit against movement relative to said frame in said first direction when cable is slackened.

4,041,646

GATE

Douglas C. Mittag, Bolingbrook, Ill., assignor to Aurora Equipment Company, Aurora, Ill.

Filed Nov. 24, 1975, Ser. No. 634,503
Int. Cl.² E05D *7/00*
U.S. Cl. 49—385 **7 Claims**



1. A rotatable gate structure for a raised walkway entrance, comprising:

a. a raised walkway supported by a plurality of vertical support posts;

b. a railing alongside an edge of said walkway;

c. an entrance to said raised walkway at said edge defined by upward extensions of first and second of said vertical support posts which also define ends of the railing on each side of the entrance;

d. a rectangular vertically rotatable gate having first and second side members;

e. a hinge structure for vertical rotation of said gate connecting a lower corner of said gate to the upward extension of the first vertical post adjacent a surface of the walkway, the hinge structure positioning the gate such that the first side member of the gate is spaced inwardly towards the walkway from the first vertical post so that vertical rotation of the gate occurs alongside the first vertical post; and

f. locking means connecting said second side member of the rotatable gate to the upward extension of said second post for locking the gate and supporting the second side mem-

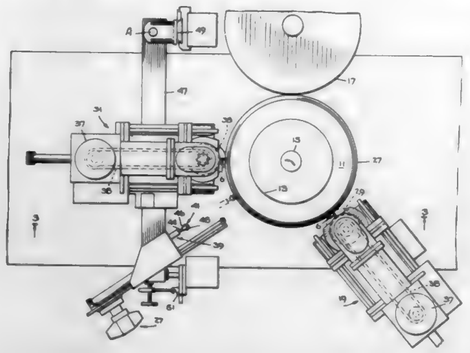
ber of the gate against horizontal forces directed toward the edge of the walkway.

4,041,647

APPARATUS FOR IMPROVING TIRE UNIFORMITY

John Walter Ugo, Warren, Mich., assignor to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 491,979, July 26, 1974, Pat. No. 3,963,427.
This application Jan. 7, 1976, Ser. No. 647,297
Int. Cl.² B24B *5/00*
U.S. Cl. 51—106 R **8 Claims**



1. Apparatus for improving the uniformity of an inflated, pneumatic tire in a continuous operation while the tire is continuously rotating, comprising:

means for simultaneously and continuously measuring both the variation in the free radial run-out of the tire along both shoulders and the center of the tire tread and the variation in the forces generated in the radial direction around the circumference of the tire tread;

a pair of grinders electrically connected to the radial force variation measuring means and to the means for measuring the free radial run-out of the shoulders of the tire, said grinders being situated adjacent the shoulders of the tire and capable of moving to the shoulders for grinding either or both of said shoulders for correction of excessive variation in the free radial run-out or radial forces thereof; and

a third grinder electrically connected to the means for measuring the free radial run-out of the center of the tire, said third grinder being situated adjacent the center of the tire tread and capable of moving to the center of the tire tread for grinding said center for correction of excessive variation in the free radial run-out thereof.

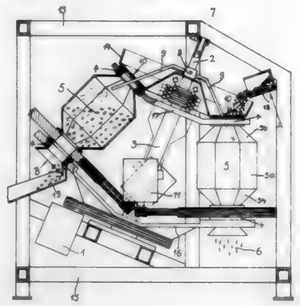
4,041,648

TUMBLING AND POLISHING MACHINE WITH PLANETARY ROTATING DRUMS

Ernst Heiberger, Winzingerstrasse 13, 7321 Reichenbach, Rechberg, Germany

Filed May 28, 1976, Ser. No. 691,063
Claims priority, application Germany, June 3, 1975, 2524566
Int. Cl.² B24B *31/02*
U.S. Cl. 51—164 **7 Claims**

1. In a tumbling and polishing machine including several planetary rotating drums for processing the surfaces and edges of workpieces by means of abrasive bodies in the drums, said drums comprising rotatable, driven, front end loading drums, means for mounting said drums on a rotor comprising two axially spaced discs, means for rotating said discs about a rotor axis on a fixed frame, the improvement characterized in that the rotating axes of the drums are inclined in the direction of their upper ends towards the rotation axis of the rotor, and the rotation axis of the rotor is inclined from the vertical such that the axes of the drums in the lowest position at any given time is approximately vertical, and wherein the drums are provided at their lower ends with an openable base door for emptying



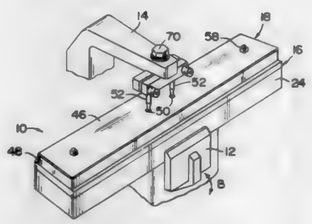
the drums and are apertured for the outflow of treatment and rinsing fluids.

4,041,649

ALIGNMENT DEVICE

Robert H. Stewart, Tampa, Fla., assignor to Practical Systems, Inc., Tarpon Springs, Fla.

Filed Nov. 15, 1976, Ser. No. 742,368
Int. Cl.² B24B *49/10*
U.S. Cl. 51—165.74 **8 Claims**



1. An alignment device of the type primarily intended for use in combination with an ophthalmic cylinder surfacing machine, said device comprising: a base member configured and dimensioned to be removably held by the lap table of said machine; and a top member including a plurality of apertures formed therein in corresponding relation to pins extending outwardly from the pin holder arm of said machine, whereby said top member may be positioned in contiguous, overlying relation to said base member; said base member comprising signal means mounted therein, said signal means including a plurality of first electrical contacts disposed on the surface of said base member; and a correspondingly positioned plurality of second electrical contacts disposed on the bottom of said top member, whereby said signal means will be actuated when all of said first electrical contacts mate with their corresponding second electrical contacts to indicate proper alignment of said ophthalmic cylinder surfacing machine.

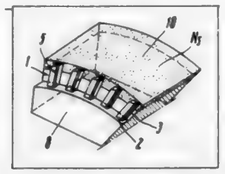
4,041,650

MATERIAL REMOVAL TOOL WITH MULTIPLE CUTTING EDGES

Wlodzimierz Sawluk, Hamburg, Germany, assignor to Ernst Winter & Sohn, Hamburg, Germany

Division of Ser. No. 385,478, Aug. 3, 1973, Pat. No. 3,898,772.
This application Aug. 6, 1975, Ser. No. 602,397
Claims priority, application Germany, Aug. 4, 1972, 2238387
Int. Cl.² B24D *7/18*
U.S. Cl. 51—206 R **9 Claims**

1. In a rotary material removing tool, a combination comprising a base member having a peripheral cylindrical face and end face normal to said cylindrical face; a plurality of cutting elements projecting from one of said faces spaced in the direction of rotation of the tool from each other, each of said cutting elements comprising a cutting member composed of a homogeneous mass including crystalline particles of at least one material chosen from the group consisting of crystalline diamond particles and crystalline boron nitrate particles and constituting at least 80% of the volume of said mass, each of said cutting members having a single cutting edge of predetermined outline, and a connecting member integral with said cutting member and connecting the latter to said one face of said base member so that said cutting elements are uniformly distributed in said direction with said cutting edges spaced from and parallel to each other; and a continuous layer of grinding material covering the other of said faces.

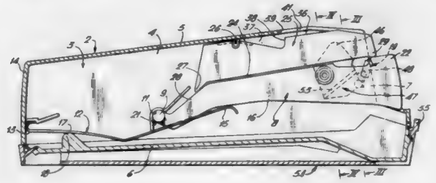


4,041,651

KNIFE SHARPENER

Peter Kingsley Bayly, Eltham North, Australia, assignor to Wiltshire Cutlery Company Proprietary Ltd., Australia

Filed Aug. 17, 1976, Ser. No. 715,003
Claims priority, application Australia, Aug. 22, 1975, 2893/75
Int. Cl.² B24B *3/54*
U.S. Cl. 51—214 **4 Claims**



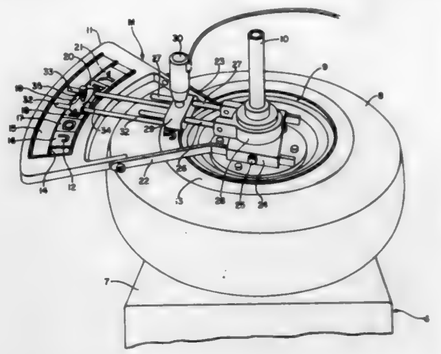
1. A knife sharpener including: a hollow enlongate housing having an access opening at a front end thereof; a carrier member located within said housing so as to extend generally lengthwise thereof and having a rear end portion pivotally connected to the housing at a location spaced rearwardly from said access opening, the axis of said carrier pivot extending transverse to the longitudinal axis of said housing so that pivotal movement of said carrier causes a front end portion thereof to be moved away from and towards an upper wall of said housing; a sharpening device mounted on said carrier front end portion adjacent said access opening; biasing means urging said carrier member to pivot towards said housing upper wall; and a reaction member at least partially located within said housing so as to be disposed between the upper surface of said carrier member and said housing upper wall and being pivotally connected to said housing for movement about an axis extending substantially parallel to said carrier pivot axis and which is located between the last said axis and said access opening; said reaction member having a rear section engaging said carrier upper surface at a location between the two said pivots, and a front end portion overlying that upper surface adjacent said access opening; the arrangement being such that a knife blade inserted into said housing through said access opening and engaging said sharpening device, causes separation of the front end portions of the two said members, but said rear section of the reaction member remains in engagement with said carrier member during the resulting pivotal movement of each of the two said members.

4,041,652

APPARATUS FOR ENGRAVING THE SIDEWALL OF A TIRE

Andrew A. Graven, Akron; David M. Ronyak, Copley, and Edward B. Bose, Stow, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 4, 1976, Ser. No. 692,812
Int. Cl.² B24B *19/22, 17/02;* B29H *21/02*
U.S. Cl. 51—241 R **20 Claims**



1. An apparatus used in the formation of indicia in the sidewall of a tire having a center axis, comprising:

a. means for supporting a tire and wheel rim on which the tire is mounted; to be formed in a sidewall of the tire mounted on the wheel rim, the indicia of the pattern having a traceable surface;

c. means, coacting with the tire and wheel rim supporting means, for mounting the pattern of indicia such that the indicia of the pattern are equally spaced from the center axis of the tire and wheel rim and the traceable surface of the indicia corresponds to the curved, outer surface of the sidewall receiving the indicia;

d. a stylus for tracing the indicia of the pattern;

e. a tool for grinding the indicia in the sidewall; and

f. means, coacting with said tire and wheel rim supporting means, for mounting the stylus and grinding tool for unitary corresponding radial and arcuate movement and any combination thereof, relative to the center axis of the tire and wheel rim.

4,041,653

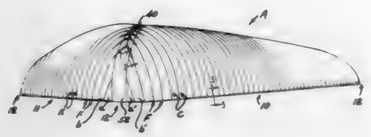
STRESS RELIEVED AIR SUPPORTED STRUCTURE

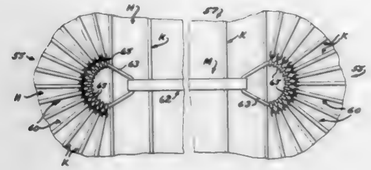
Lloyd H. Rain, Lexington, Ky., assignor to Irvin Industries, Inc., Stamford, Conn.

Filed May 27, 1976, Ser. No. 690,692
Int. Cl.² E04B *1/345, 1/347*
U.S. Cl. 52—2 **26 Claims**

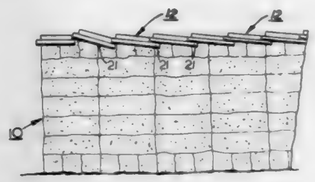
1. An air supported structure having a wall portion including a plurality of relatively elongated panel members joined together by seam means; anchor means being provided along the base perimeter of said wall portion; said panel members including a membrane configuration defining at least an exterior volute surface along said wall portion, and having web means interconnected thereto along said seam means; said wall portion having a relatively elongate central portion provided with an end closure portion at each end thereof; said central portion including a plurality of said panel members, said web means of said seam means interconnecting said panel members of said central portion extending transversely about said central portion and being attached to said anchor means along the base perimeter of said central portion at opposed sides of said

central portion; crown harness means including an end harness means for each said end closure portion and ridge harness means; each said end closure portion including a plurality of said panel members, said web means of said seam means interconnecting said panel members of each said end closure portion being respectively attached to said anchor means along the base perimeter of an end closure portion and attached in situ as a part of an end harness means of such end closure portion; said ridge harness means extending along and adjacent the apex of said central portion, in an overlying and unattached relation to said panel members of said central section and being unattached to said panel members of each said end closure portion; each said end harness means being unattached to said membrane configuration and seam means of the end closure portion for which the same is provided at at least the area of attachment thereto in situ as a part of said web means of said end closure portion for which the same is provided and being unattached to said panel members of said central portion; wherein the radius of curvature of said panel members is a direct geometric function of the width and height of said air supported structure; wherein the loads in said crown harness are a function of the end closure means and end harness means in relation to the width and height of said air supported structure, the primary radius of curvature thereof, and the design wind speed and inflation pressure thereof; wherein the loads in said anchor means are a function of the loads in said seam means; and wherein the loads in said seam means are a function of the geometry of the respective portion thereof of which they are a part, the primary radius of curvature thereof, and the design wind speed and inflation pressure thereof.



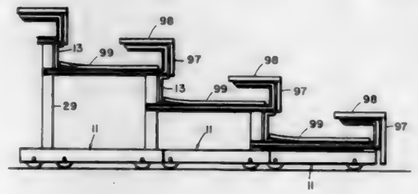


4,041,654
COVER FOR BALED HAY AND THE LIKE
Walter Nedila, Box 63, MacDowall, Saskatchewan, Canada
Filed May 13, 1976, Ser. No. 687,300
Claims priority, application Canada, Mar. 9, 1976, 247486
Int. Cl.[2] E04B *1/34*; B62D *63/04*
U.S. Cl. 52—3 **5 Claims**



1. A panel adapted to form a part of a protective cover for a stack of bales of hay or the like, said panel being elongated in form and adapted to be disposed on top of and to span the stack of bales, said panel defining an opposed pair of longitudinal marginal edges having means thereon for engaging additional ones of said panels which, in use, are disposed in side-by-side overlapping relationship with one another thereby to cover the entire top of the stack, the engaging means on said opposed longitudinal marginal edges comprising an upwardly turned lip extending along one of said edges and a downwardly turned lip extending along the other of said edges whereby, in use, adjacent oppositely directed lips of the overlapping panels can interengage one another in such away as to prevent water from leaking therebetween, and a plurality of anchoring means connected to the under surface of said panel and extending away from the panel surface, each anchoring means being elongated in form and adapted to project downwardly into the stack of bales with said anchoring means having means thereon for engaging the bales of hay thereby to permit the panel to be anchored to the stack said panel having a plurality of means attached to the undersurface thereof for releasably connecting said anchoring means thereto, said means for releasably connecting the anchoring means to the panel comprising spaced apart recess defining means constructed so as to permit the anchoring means to be slidably inserted thereinto and adjusted to and fro in a direction parallel to the panelundersurface.

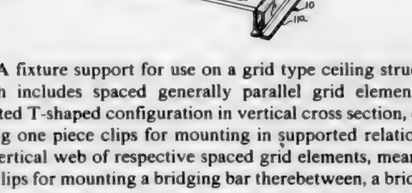
4,041,655
TELESCOPING SEATING SYSTEMS
Vincent Anthony Pari, Muskegon, Mich., assignor to Universal Bleacher Company, Champaign, Ill.
Filed July 26, 1976, Ser. No. 708,607
Int. Cl.[2] E04H *3/12*
U.S. Cl. 52—9 **22 Claims**



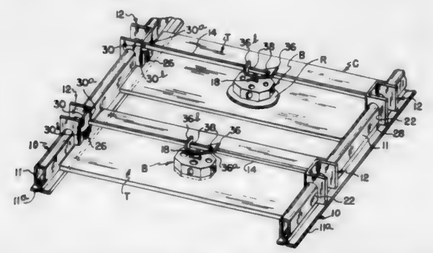
1. In a telescoping seating system having a plurality of row assemblies arranged for movement between a storage position in which the row assemblies are nested with support posts or columns laterally aligned, and a use position in which the row assemblies are extended from front to rear and in stepped relation, each row assembly comprising: a pair of laterally spaced floor-engaging carriage means, a post fixed to each carriage means and extending upwardly therefrom, deck means; means for connecting said deck means to a pair of posts for each row; said system characterized in that said posts are inclined relative to the vertical on each side of said system such that the center span between deck/post connections for a plurality of said row assemblies is the same.

4,041,656
DEVICE FOR PREVENTING ICE FORMATION ON A ROOF
Ralph Anderson, 665 Kallstrom Road, Cloquet, Minn. 55720
Filed June 17, 1976, Ser. No. 697,223
Int. Cl.[2] E04D *13/00*
U.S. Cl. 52—16 **9 Claims**

1. Device for draining melted snow from a roof comprising:
a. a collector tube having spaced sidewalls joined by a top and a bottom wall and open at both ends,
b. an elongated screen member mounted in said tube and spaced from the bottom wall of said tube adapted to contain
c. ice melting material thereon, and
d. means extending substantially laterally from said tube for directing melted snow to one end of the tube for travel under said screen upon said bottom and out the other end of said tube.

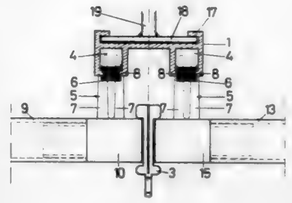


4,041,657
FIXTURE SUPPORT FOR GRID TYPE CEILING
Jerome T. Schuplin, Parma Heights, Ohio, assignor to Fastway Fasteners, Inc., Lorain, Ohio
Filed Sept. 18, 1975, Ser. No. 614,690
Int. Cl.[2] E04B *5/52*
U.S. Cl. 52—39 **20 Claims**



1. A fixture support for use on a grid type ceiling structure which includes spaced generally parallel grid elements of inverted T-shaped configuration in vertical cross section, comprising one piece clips for mounting in supported relation on the vertical web of respective spaced grid elements, means on said clips for mounting a bridging bar therebetween, a bridging bar for coaction with the last mentioned mounting means and adapted to bridge the associated clips, each of said clips having means for releasably gripping the respective grid element to hold the clip on the respective grid element, said gripping means including a resilient tongue adjacent the lower portion of each clip with the latter being adapted to be forced down over the associated grid element whereby said tongue will grip the vertical web of the respective grid element, and means adapted for coaction with said bar for suspending a fixture therefrom, said last mentioned mounting means providing for varying the vertical position of said bar and thus the vertical position of said suspending means with respect to said clips, and comprising a plurality of vertically spaced openings, a selected one of said vertically spaced openings in each clip adapted to receive a corresponding end of said bridging bar therein for supporting said bridging bar between said associated clips, the ends of the bridging bar being readily insertable into and removable from said selected opening in the respective clip.

4,041,658
CEILING EQUIPMENT FOR DEMONSTRATION EQUIPMENT
Jean-Pierre Cuvilly, Chennevieres-sur-Marne, Germany, assignor to E. Kalinna, Germany
Filed May 5, 1975, Ser. No. 574,707
Claims priority, application Germany, May 7, 1974, 2425633
Int. Cl.[2] G09F *7/20*
U.S. Cl. 52—39 **6 Claims**

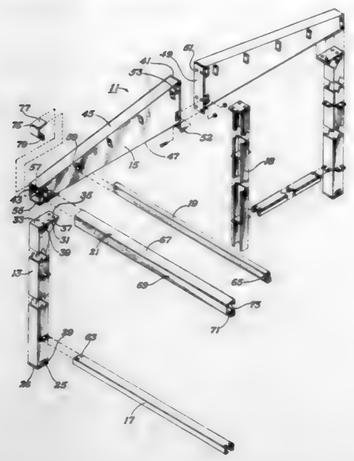


1. A suspended ceiling construction for demonstration equipment and comprising rectangle panels having mutually adjacent edges which define intersecting guide slots in which slides a link chain for carrying samples to be shown, said link chain having a laterally enlarged upper head which is supported on the upper surface of the panels close to their edges, and a supporting structure for the panels composed of parallel rails which each have on its lower side two parallel longitudinal undercut channels facing downwardly, clamping elements arranged on the panels in spaced relationship along the edges thereof parallel to said rails and channels and extending upwardly from the upper surfaces of the panels to be snapped into the undercut channels, said clamping elements being spaced from the edges of the panels to leave space for the head of the link chain, the distances between the channels of one rail and of each clamping element from the edge of the associated panel being such that the slots between the edges parallel to said rails of adjacent panels will be maintained at a width sufficient to accommodate the link chain, and spacing pieces in the longitudinal channels between the clamping elements of adjacent panels to determine between the edges, normal to the longitudinal channels, of adjacent panels a slot for accommodating the link chain.

4,041,659
METAL BUILDING STRUCTURE
Hubert L. McElhoe, 1426 Brazos St., Graham, Tex. 76046
Filed Sept. 15, 1975, Ser. No. 613,252
Int. Cl.[2] E04B *7/02*
U.S. Cl. 52—93 **7 Claims**

1. A metal building structure comprising:
pairs of spaced upright columns, each column having a rectangular transverse cross section of uniform size throughout its length;
pairs of rafters, each rafter having an outer end carried by one of the columns and connected to its mating rafter intermediate the columns to form a double pitched roof support; each rafter having a rectangular transverse cross section that increases in height from the outer end to the inner end; each rafter having a quadrilateral vertical cross section with parallel outer and inner ends, a bottom side perpendicular to the ends, and a top side at an acute angle with respect to the bottom side equal to a desired roof slope; the rafter's bottom side being substantially perpendicular to the longitudinal axis of the column; the bottoms of said rafters being co-planar and when installed lying in a flat, substantially horizontal plane facilitating installation of a ceiling;
a plurality of purlins fastened transversely between each pair of rafters, with the top side of each purlin substantially flush with the top side of the rafter; and

a plurality of girts fastened transversely between each pair of columns, with the sides of the girt substantially flush with



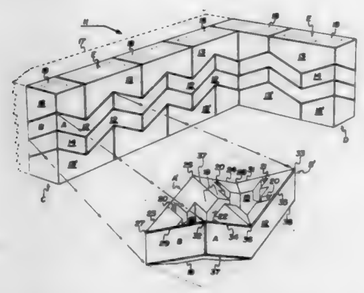
the sides of the column so as to be co-planar therewith and facilitate installation of an interior wall.

4,041,660

SELF-ALIGNING BLOCKS

William A. Yensen, 5419 Central Ave., Bonita, Calif. 92002

Filed Jan. 29, 1976, Ser. No. 653,436
Int. Cl.[2] E04C *1/12, 1/30*
U.S. Cl. 52—100 **4 Claims**



1. A self-aligning construction block comprising:

a basic block having two flat vertical sides connected by two flat vertical end surfaces;

a top surface and a bottom surface, at least one of said top surface and bottom surface being a compound angled surface consisting of first, second, third, and fourth facets, said first and second facets having high points at two top corners of one of said two flat vertical sides, and low points at the top center of said one of two flat vertical sides, and two low points at the top corners of the other of said two flat vertical sides;

said third and fourth facets having a high point at the top center of said other of two said flat vertical sides and a low point at the top center of said one of said two flat vertical sides, and low points at the top two corners of said another of said flat vertical sides; and

first and second hollow wells extending from said top surface through said bottom surface to define a central divider section therebetween;

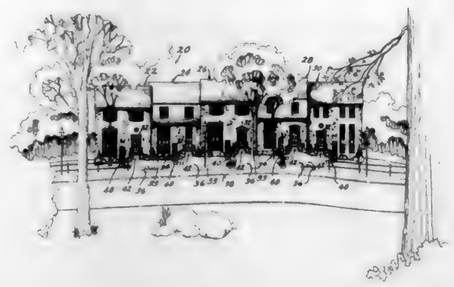
said divider section having a slot entrant therein from one of said surfaces and aligned essentially parallel to said sides to receive a portion of a steel reinforcing rod.

4,041,661

SINGLE FAMILY TOWNHOUSE UNITS

Myron Stuart Hurwitz, 4420 Forest Glen Court, Annandale, Va. 22003

Continuation-in-part of Ser. No. 151,858, June 10, 1971, abandoned. This application Aug. 25, 1975, Ser. No. 607,461
Int. Cl.[2] E02D *27/00*
U.S. Cl. 52—169.4 **32 Claims**



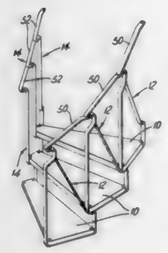
1. An improved townhouse unit of the type having a plurality of floors including ground and main or first floors which together define the living space for a single family therein so that there is interior communication for the family between all floors of the said townhouse unit and a front portion having a main entrance which includes at least a single door positioned at an intermediate location between said ground floor and said main or first floor for providing entrance into said main or first floor by way of a formal entrance wherein the improvement comprises a second entrance door horizontally spaced to side of and vertically spaced intermediately to said main entrance, said second door being substantially the same width as said single door in said main entrance said second door being fully exposed in said front portion and opening into the ground floor of said townhouse unit.

4,041,662

STAIRCASES

Donald Leslie Ward, Leigh-on-Sea, England, assignor to Wards Construction (Overseas) Ltd., Irish Town, Gibraltar

Filed May 20, 1975, Ser. No. 579,275
Claims priority, application United Kingdom, May 22, 1974, 22975/74; Nov. 18, 1974, 49895/74
Int. Cl.[2] E04F *11/00, 11/12*
U.S. Cl. 52—187 **20 Claims**



1. A kit from which a staircase can be constructed, said kit comprising a plurality of identical riser units each comprising a planar slab tread member and at least two associated bracket members, each riser unit being adapted to be secured in a predetermined relation to an identical riser unit, at least one bracket member of each riser unit comprising an elongated

member having a first planar part for supporting a tread, a side part extending normal to said first part from one end thereof, and a second part extending normal to the end of said side part at the end thereof away from said first part and in a direction to overlie said first part, said second part being shorter than said first part, first and second aligned holes extending through said first and second parts respectively in a direction parallel to said side part, a third hole in said first part spaced from said first hole and parallel to said side part, the axis of said third hole being spaced from said second part, said bracket having an extension from the end of at least one of said first and second parts away from said side part, whereby said extension lies on the same side of said first part as said second part, said extension having a third part parallel to said first part with a fourth hole aligned with said third hole, and a fourth part parallel to said third part with a fifth hole aligned with said second hole, said third part being spaced from said first part a greater distance than said second part, said third and fourth parts being spaced from said first and second parts by equal distances, said bracket member having adjacent said first part thereof at said third hole a first fixing point and adjacent said second part thereof at said second hole a second fixing point, adapted for fixing respectively to said second fixing point of another identical bracket member and to said first fixing point of another identical bracket member, said bracket member having adjacent said third and fourth parts thereof at said fourth and fifth holes respectively, third and fourth fixing points, said third fixing point being adapted for fixing to said fourth fixing point of an identical bracket member when the latter has the second fixing point thereof secured to said first fixing point of the bracket member in question, and said fourth point of the bracket in question being adapted for fixing to said third fixing point of an identical bracket member when the latter has the first fixing point thereof secured to said second fixing point of the bracket in question, said first, second, third and fourth fixing points of the bracket in question lying at the corners of an imaginary parallelogram, the holes of said first, second, third and fourth fixing points having axes parallel to the parallel sides of said parallelogram and extending perpendicularly through respective portions of said bracket.

4,041,663

REDUCING SOLAR RADIATION TRANSMITTANCE OF INSTALLED GLAZING

Renato J. Mazzoni, Tarentum, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 30, 1976, Ser. No. 710,031
Int. Cl.[2] E06B *3/28*
U.S. Cl. 52—203 **11 Claims**

1. A reglazed window installation having reduced solar radiation transmittance comprising:

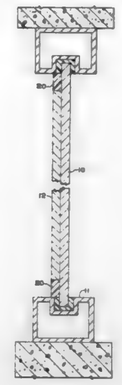
a building wall structure;

frame means connected to said building wall structure and outlining a vision opening, said frame means including a pane-edge-receiving channel;

an installed glazing unit which includes at least one transparent pane, said channel engaging edge portions of said glazing unit so as to retain said glazing unit in said vision opening;

an added transparent glass pane having height and width less than that of said vision opening and lying parallel to and in direct contact with a major glass surface on the exterior of said glazing unit, with the peripheral edges of said added pane spaced from said frame means, said added pane having visible light transmittance of no more than about 75 percent;

sealant disposed between the peripheral edges of said added pane and said frame means, said sealant being adhered to said added pane and to the adjacent surface of said glazing



unit so as to provide adhesion and a moisture resistant seal therebetween.

4,041,664

JOIST, STRUCTURAL ELEMENT AND DEVICES USED IN MAKING SAME

George Bradley Davis, Jr., P.O. Box 1096, Boulder, Colo. 80302

Division of Ser. No. 400,381, Sept. 24, 1973, Pat. No. 3,919,824, which is a division of Ser. No. 256,257, May 24, 1972, Pat. No. 3,813,834, which is a continuation-in-part of Ser. No. 41,426, May 28, 1970, abandoned. This application Sept. 29, 1975, Ser. No. 617,737
Int. Cl.[2] E04B *1/41;* **E04C** *3/18*
U.S. Cl. 52—223 R **6 Claims**



1. A structural element having a fire rating of approximately 2 hours when tested with the standard time-temperature curve established by the American Standards for Testing Materials, said elements having first and second sides, said second side during the fire rating test of said element, being exposed to flames, said elements comprising:

a. at least one prestressed concrete-joists, each joist having

i. a plate-like body portion forming at least a part of the first side of said element,

ii. at least one integrally formed, reinforced support ledges disposed normal to the plate-like body portion, each support ledge having a bottom end,

iii. each ledge having a nailing strip integrally molded centrally within the bottom end thereof, each nailing strip including a penetratable area formed internally adjacent thereof;

b. a plurality of sheets of material disposed adjacent the bottom ends of said ledges, said sheets being formed from a material selected from the group consisting of gypsum and a mineral fiber mixture, said sheets forming the second side of said element, the thickness of the material forming said sheets equalling at least one-half inch, each sheet of material forming at least one butt joint with an adjacent sheet, said butt joint extending longitudinally along the nailing strip within the bottom end of one of said ledges;

c. a plurality of metal channel-shaped members, each chan-

nel-shaped member being disposed along the length of each butt joint and intermediate said ledge bottom end and said sheets,

i. each channel-shaped member projecting laterally beyond the opposed sides of the nailing strip;

d. driven attachments means attaching said channel-shaped members to the nailing strips of said ledge bottom ends; and

e. additional attachment means attaching said sheets of material to said channel-shaped members laterally outward of the butt joint and of both sides of the nailing strip, said additional attachment means, channel-shaped members and nailing strips cooperating to secure the sheets to said joists while preventing undesirable distortion or warping thereof during the fire rating test.

4,041,665

INJECTION SEALABLE WATERSTOP AND METHOD OF INSTALLING SAME

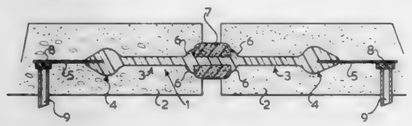
Eduard H. L. de Munck, The Hague, Netherlands, assignor to Vredestein N.V., The Hague, Netherlands

Filed Nov. 22, 1976, Ser. No. 744,100

Claims priority, application United Kingdom, Nov. 22, 1975, 48095/75

Int. Cl.[2] E04B *1/62;* **E04F** *15/14;* **E01C** *11/04*

U.S. Cl. 52—396 **9 Claims**



1. A water-stop composed of elastic deformable rubbery material for use in concrete structures which comprises a substantially flat middle portion and enlarged side wing anchor portions provided with sealing means, a pad of elastically-deformable sponge material being attached to one surface of at least of each side sealing means and attached to each said pad to as to be sealed thereby, and there being at least one injection tube of sufficient length to reach the outside surface of the concrete in which the water-stop is to be installed.

4,041,666

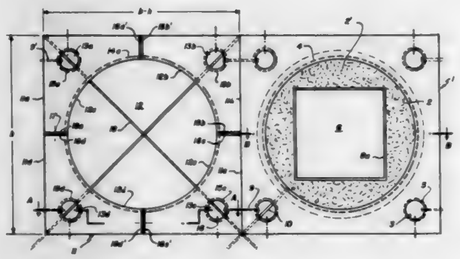
MODULAR CONCRETE BUILDING COMPONENTS FOR A LIGHT-WEIGHT STRUCTURE SYSTEM

Sargis E. Sargis, 19 Neive N. Jamshid-Abad, Tehran, Iran

Filed Dec. 4, 1974, Ser. No. 529,344

Int. Cl.[2] E04B *2/00*

U.S. Cl. 52—405 **3 Claims**



1. A modular building component for use in light-weight structural systems, comprising a substantially rectangular panel of concrete having transversely therethrough a relatively large central opening and a plurality of relatively small peripheral openings each disposed in, and significantly lessening the diagonal cross section of, a corresponding corner portion of said panel, said relatively large and relatively small openings being dimensioned so as to substantially reduce the weight of said panel while permitting effective distribution of forces due to vertical loads;

there being provided covers which overly at least a portion of said panel on both sides thereof to close said large opening;

at least some of the space of said opening between said covers being filled with heat-insulating material; and

said covers having a window therein defined by a frame formed by two mutually abutting portions which extend from said two corners, respectively, and retain said heat-insulating material in said large opening outwardly of said frame.

4,041,667

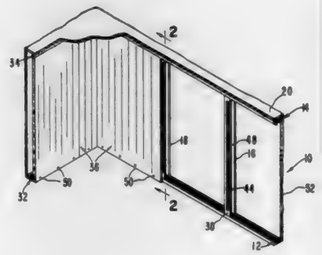
WALL ASSEMBLY

Robert L. Lindner, 225 Clyde Drive, Walnut Creek, Calif. 94598, and Luther E. Marshall, 21 Viewridge Road, Navoto, Calif.

Continuation of Ser. No. 262,860, June 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 174,843, Aug. 25, 1971. This application Oct. 15, 1973, Ser. No. 406,446

Int. Cl.[2] E04B *5/52*

U.S. Cl. 52—483 **13 Claims**



1. In a wall assembly: a pair of members adapted to be disposed in generally upright positions; each member having an outer surface; and quick-release fastener means for interconnecting said members, said means including a first tape having an adhesive on its opposed faces and a second tape having an adhesive only on one face thereof, said first tape being movable into bonded relationship to said first member, said second tape being normally releasably bonded to the first tape and movable into bonded relationship to the second member with the bond between the second tape and the second member having a greater resistance to separation than the bond between the first and second tapes.

4,041,668

CLIP STRUCTURE FOR A CONCEALED GRID STRUCTURE OF A SUSPENDED CEILING

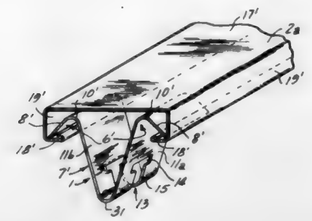
Martin D. Jahn, Riverside, and Glenn F. Balfanz, Jr., Western Springs, both of Ill., assignors to Chicago Metallic Corporation, Chicago, Ill.

Filed Dec. 4, 1975, Ser. No. 637,724

Int. Cl.[2] E04B *5/52*

U.S. Cl. 52—489 **4 Claims**

1. A clip member for use in suspended ceiling structures utilizing panel-supporting grid runners of inverted T-shape in transverse cross-section, having a flat central vertical web portion terminating at its lower edge in oppositely directed outwardly extending flanges disposed in a common plane, adapted to receive and support the edge portions of cooperable ceiling panels, with such web portions terminating at its upper edge in a longitudinally extending bead having a transverse width greater than the thickness of said web to form a generally T-shaped upper edge portion, said clip member comprising a single piece of strip stock formed to provide an upper mounting structure and a lower runner-supporting structure integrally connected therewith, the runner-supporting structure comprising a pair of walls which are connected at their bottom edges, and extend upwardly therefrom in diverging directions with each wall having a notch therein of generally T-shaped configuration, aligned with one another, and each defining a relatively narrow leg portion having parallel edges spaced apart a distance slightly greater than the thickness of such a runner web, and opening in common at their connecting bottom edges, each notch, at the top thereof, having a relatively larger portion, communicating with said narrow leg portion, of a size to receive the bead of such a runner with such larger portion having a configuration generally complemental



to the cross-sectional configuration of such a bead, said larger portion having bottom edge portions extending laterally outward from the respective vertical edges of said narrow portion, disposed to engage adjacent cooperable portions of such a bead for supporting the latter and thereby such a runner therefrom, with the latter adapted to be interlocked with the clip by insertion of the bead of such runner in said larger portion and said web in said narrow portion, and relative sliding movement between the clip and runner, said mounting structure comprising two mounting portions, each extending downwardly and outwardly from the upper free edge of a corresponding wall of said pair to form a clip of generally M-shape in transverse cross section, with each of said mounting portions adapted to engage respective cooperable upwardly facing means of a support member of inverted C-shaped configuration.

4,041,669

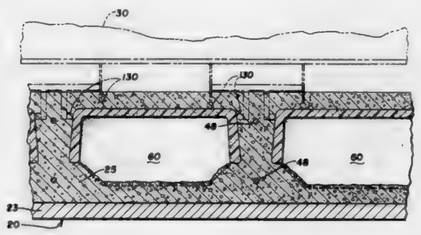
HOLLOW-CORE CONCRETE SLABS

Gerald A. Rauenhorst, 6817 Oaklawn Ave., Minneapolis, Minn. 55435

Continuation of Ser. No. 549,140, Feb. 12, 1975, abandoned. This application July 7, 1976, Ser. No. 703,198

Int. Cl.[2] E04C *1/00*

U.S. Cl. 52—576 **10 Claims**



1. A hollow-core concrete slab comprising an integral body of concrete and at least one foamed plastic core forming member positioned therewith so that concrete completely surrounds the core member at least along the length direction of said concrete slab, said core forming member being an integral structure of a top member having end, side and intermediate wall members extending at approximately right angles downwardly therefrom to define a plurality of recesses with open faces of a depth substantially equal to the height of said wall members to define voids in said slab which contains neither concrete nor foamed plastic.

4,041,670

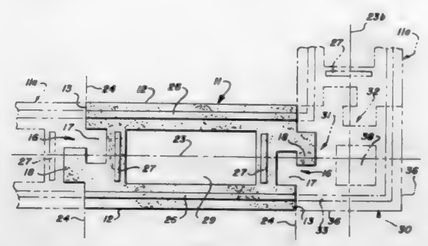
BUILDING BLOCKS

Richard D. Kaplan, 480 Park Ave., New York, N.Y. 10022

Continuation of Ser. No. 461,793, April 17, 1974, abandoned, which is a continuation of Ser. No. 214,791, Jan. 3, 1972, abandoned. This application July 30, 1976, Ser. No. 710,204

Int. Cl.[2] E04C *1/10, 1/30*

U.S. Cl. 52—591 **12 Claims**



1. A building block, including

i. a unit having a plurality of sides including a top, a bottom and an opposite pair of sides, and

ii. at least one integral complementary element symmetrically located with respect to a bilateral plane and adapted for effecting continuous weatherstops along said top and bottom sides when assembled with similar blocks, and

iii. an integrally formed unitary continuous self-jointing element on at least one side of the unit, said self-jointing element being complementary with similar elements on other blocks, comprising

a. an element inboard from a side wall, extending beyond said block and forming a doubled back male locking projection, which thus creates therewith,

b. a contiguous element inboard from the opposite side wall, recessed into said block, complementary with said element (a) and forming a doubled back female locking recess complementary with said formed male locking projection, the shape, area and volume of said formed male locking projection and said formed female locking recess being substantially equal, said continuous self-jointing element being capable of joining with a complementary substantially similar self-jointing element on a side of another building block, the formed male locking projection of each building block being capable of snug universal positive two-way interlocking relationship with the complementary formed female locking recess of each adjacent similar block, thus enabling said block to be selectively reversible around a vertical axis, and thus enabling each continuous self-jointing element to universally join with a complementary self-jointing element on another block in a positive two-way interlocking relationship without disturbing the continuity of weatherstops along said top and bottom sides when assembled with other similar blocks.

4,041,671

CONSTRUCTION METHOD

William I. Nicholson, 333 E. Hazel St., Inglewood, Calif. 90302

Filed Mar. 1, 1976, Ser. No. 662,359

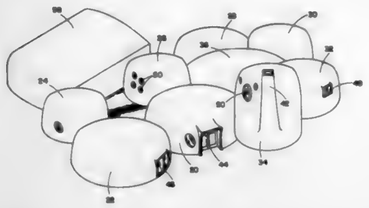
Int. Cl.[2] E04B *1/00*

U.S. Cl. 52—741 **40 Claims**

1. A method of forming building structures comprising:

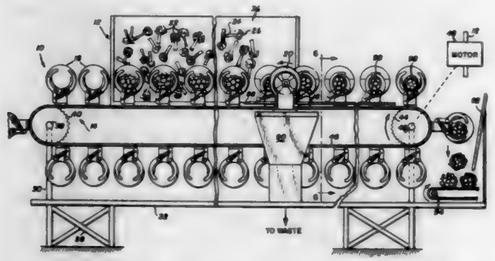
a. providing a foundation;

b. placing a balloon having a shape substantially similar to part of the building to be formed over part of the foundation and inflating the balloon;
c. providing a layer of material on the balloon to form a substantially rigid construction form shell;
d. placing a balloon having a shape substantially similar to another part of the building to be formed over part of the foundation so that the base of the balloon is intersected by the shell formed in step (c);



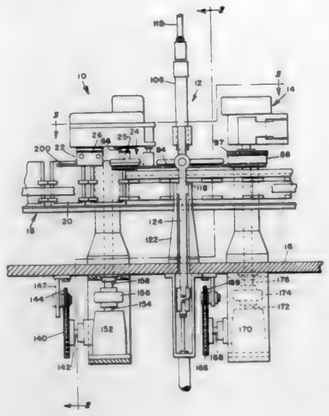
e. providing a layer of material on the balloon of step (d) to form a substantially rigid construction form shell intersected by the shell formed in step (c) to form one integral shell; and
f. providing at least one layer of material over the construction form shell, which when cured, will provide the structural shell of the building.

4,041,672
APPARATUS FOR BUNCHING BROCCOLI AND A METHOD THEREFOR
David L. Gularte, 1011 W. Alisal No. 4, Salinas, Calif. 93901
Filed July 26, 1976, Ser. No. 708,498
Int. Cl.[2] B65B *13/20*
U.S. Cl. 53—3 **18 Claims**



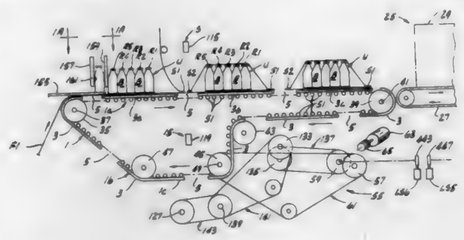
1. A method of forming vegetables with elongated stalks into bunches comprising:
providing a generally U-shaped holder;
driving said holder in a loop configuration;
placing a plurality of heads of vegetables into said holder with the stalks extending in generally the same direction;
clamping said stalks into a predetermined configuration;
removing portions of said stalks that extend beyond a predetermined length; and thereafter
inserting a band formed of an elastic material around said stalks while the stalks are clamped into a predetermined configuration to form the heads of vegetables into a bunch.

4,041,673
METHOD AND APPARATUS FOR FLATTENING AND SEALING POUCH TOPS
Arthur Alan Brooke, Toronto, and Rudy Loben, Westhill, both of Canada, assignors to Delamere & Williams Company Limited, Toronto, Canada
Filed Aug. 6, 1975, Ser. No. 602,219
Int. Cl.[2] B65B *7/06*
U.S. Cl. 53—39 **25 Claims**



1. Apparatus for closing and sealing the open tops of filled pouches traveling along a predetermined path at a predetermined speed at a predetermined spacing comprising means spaced along said predetermined path for straightening the edge portions of the pouches, rendering the straightened edge portions adhesive and squeezing the adhesived edge portions to seal the tops wherein the means for straightening the edge portions comprise longitudinally spaced clamping jaws and coacting gripping rolls arranged to simultaneously grasp the trailing and leading ends of the pouches and means for moving the clamping jaws forwardly along said path, but at a lesser speed than the pouches are moved therealong and for rotating the coacting gripping rolls at a rate such that their surfaces are traveling faster than the pouches are moving along said path.

4,041,674
APPARATUS FOR PACKING ARTICLES, SUCH AS BOTTLES
Laurie M. Reid, Luthersville, Ga., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.
Filed Jan. 26, 1976, Ser. No. 652,078
Int. Cl.[2] B65B *21/24, 35/40, 57/20*
U.S. Cl. 53—61 **16 Claims**

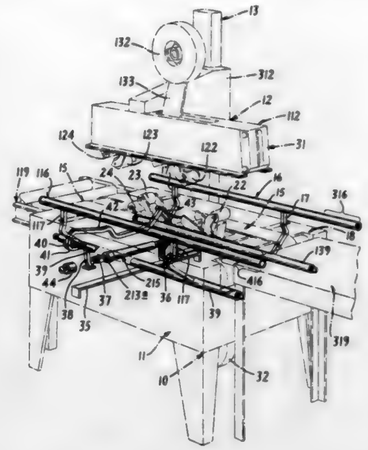


1. Apparatus for packing articles such as bottles in units with the articles in each unit arranged in parallel rows, each row comprising a plurality of articles arranged side-by-side, said apparatus comprising:
means for supporting articles for arrangement thereof in rows;

means mounting said supporting means for movement in a predetermined path generally at right angles to the length of the rows on said supporting means, said supporting means being movable forward along said path from a rearward retracted position;
a pusher for pushing rows of articles on said supporting means forward in said path generally at right angles to the length of the rows, said pusher being movable forward along said path from a rearward retracted position through a forward stroke and back through a return stroke to its retracted position;
a guide movable forward and back with the pusher and spaced forward of the pusher a distance such as to provide a space for a row of articles therebetween, said guide also being movable relative to the pusher between a lowered operative position at the level of the rows and a raised position above the rows;
means for feeding articles in single file one after another over said supporting means from one side of said path through said space when the pusher and guide are in their retracted position and the guide is lowered;
means for arresting the feeding of the articles to provide a row of articles on said supporting means in said space in a first position in front of the pusher;
means responsive to the arresting of feeding of the articles for driving the pusher and guide through a forward and return stroke whereby the pusher pushes the row of articles in front of the pusher forward to a second position and for simultaneously driving said supporting means forward through a predetermined forward stroke thereby to collate articles in rows on said supporting means;
means for moving the guide to its raised position so that, on its return with the pusher, the guide clears the articles in said second position;
presettable means for determining the number of rows of articles to be collated on said supporting means for a unit; and means responsive to said presettable means when it has determined the number of rows for a unit and the pusher and guide have been retracted and the guide lowered for retracting said supporting means to remove the support for the unit, the unit then being held against rearward movement by the guide.

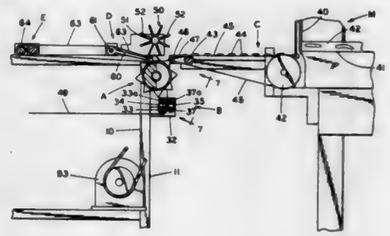
4,041,675
CARTON SEALING MACHINE CARTON SETTING UP AND LOADING EQUIPMENT
Winton Loveland, Fort Salonga, and Horst J. Hanemann, Manhasset, both of N.Y., assignors to The Loveshaw Corporation, Deer Park, N.Y.
Filed June 7, 1976, Ser. No. 693,200
Int. Cl.[2] B65B *57/00, 7/20*
U.S. Cl. 53—76 **7 Claims**

1. In a carton setting up and loading machine to facilitate an operator successively setting up in empty chamber-defining shape a plurality of cartons with their bottom closing flaps folded inward and loading their chambers to release them to the machine for sealing of their tops, comprising
1. a machine lateral bed having an entrance end and a discharge end with transport means laterally to move a loaded carton forward along a path from the former end to the latter end while sealing closed at least the folded top flaps thereof;
2. a carton setting up and loading lateral support preceding and adjacent to said entrance end of said machine bed;
3. a pair of substantially straight and parallel, laterally-extending and elongated, carton-clamping guidance side rails flanking opposite sides of the carton forward moving path to the discharge end and moderately elevated above said transport means with said rails initially separated transversely an appreciable distance intended successively to receive freely any of a number of the cartons of a width less than this distance of separation, said guidance rails having elongated entrance ends extending back from and preceding the entrance end of said machine bed and the transport means of the latter while overlapping a portion of said loading support;
4. means to move at least one of said guidance rails inward toward the other to snug their entrance ends against opposite sides of an intervening one of the cartons immediately preceding the entrance end of the machine while resting upon said loading support and with sufficient pressure as



to hold the carton temporarily firmly upright with its top open for loading of its chamber; and
5. means to maintain said side guidance rails in their relatively inward carton snugging and guiding positions when the loaded carton is transported from said loading table into the entrance end of said machine bed for engagement by said transport means to move it forward past closure sealing means to the discharge end.

4,041,676
APPARATUS FOR PACKING STRIPS OF MATERIAL
James P. Smithers, Glen Ellyn, Ill., assignor to Armour and Company, Phoenix, Ariz.
Continuation of Ser. No. 458,764, April 8, 1974, which is a division of Ser. No. 262,656, June 14, 1972, abandoned. This application Aug. 28, 1975, Ser. No. 608,590
Int. Cl.[2] B65B *35/30, 63/00*
U.S. Cl. 53—123 **9 Claims**



1. In a machine for packing strips of material comprising a roll having steps on the surface thereof, said steps each having a forward side, a high point, and a rearward side, means for rotating said rolls so that the top of said roll moves in a direction forward of said machine and means for passing film over said roll in conformity with said steps while said roll is rotating, the improvement which includes a conveyor, said strips being in spaced relation on said conveyor, and in which said conveyor constitutes means for supporting, transporting and

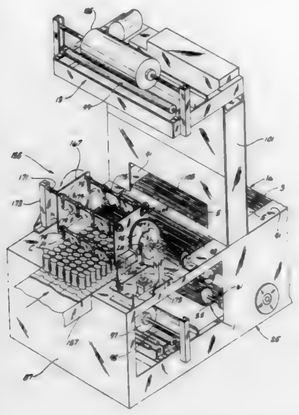
delivering separate strips of said material consecutively in said forward direction toward said roll until each of said strips is contacted by a high point of one of said steps which is coated by said film, whereby upon continued rotation of said roll each of said strips is brought in succession to rest on the film over the rear side of one of said steps.

4,041,677

PACKAGING APPARATUS

Laurie M. Reid, Luthersville, Ga., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Filed Oct. 6, 1975, Ser. No. 619,897
Int. Cl.[2] B65B *11/08, 35/30*
U.S. Cl. 53—159 **2 Claims**



1. Sleeve-wrapping apparatus for wrapping units each consisting of a number of rows of products comprising

an endless main conveyor having a generally horizontal upper reach for transporting units forward along a generally horizontal path and a return reach below the upper reach, said conveyor comprising a series of supports each adapted to hold a unit spaced at intervals along and throughout the length of the conveyor with gaps between the supports,

means for intermittently indexing the conveyor forward through a distance equal to one of said intervals with a dwell between successive cycles of operation successively to bring a gap in the conveyor to a sealing station located along said path, whereby, during each dwell of the conveyor between cycles, there is a gap at the sealing station, a support at a first position upstream from the sealing station and a support at a second position downstream from the sealing station, the support at the first position being at the upstream end of said upper reach and adapted to receive and hold a unit to be wrapped and to transport it, on indexing of the conveyor, through the sealing station to the second position,

means for supplying a first web of heat-sealable wrapping material to extend over the support at the first position and under a unit on said first support as said first support and said unit proceed to the second position,

means for supplying a second web of heat-sealable wrapping material to lie on top of said unit as it proceeds to the second position,

means for sealing the two webs together at said sealing station and severing the webs through the seal to form a trailing seal for the webs draped around the unit at the second position and a leading seal for the unit at the first position, said sealing means being operable through the gap in the endless conveyor at the sealing station during each dwell of the conveyor,

means for feeding forward a series of rows of products in the direction toward said upstream end of the upper reach of the main conveyor, and

means operable during each dwell of the main conveyor for arresting the forward feed of said series of rows upstream from the upstream end of the upper reach of the main conveyor and operable upon indexing of the main conveyor to release the rows for forward feed thereof and to push forward a predetermined number of rows of products forming a unit onto a support of the main conveyor as it comes around and forward to its said first position,

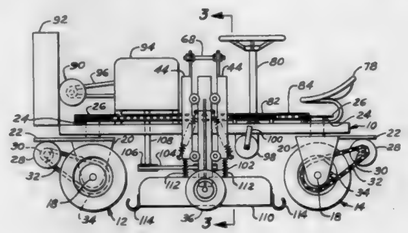
whereby, on each indexing of the main conveyor, a unit is moved from said first position through the sealing station to the second position for being wrapped, and another unit for the next cycle of operation is delivered onto the support of the main conveyor which comes to the first position.

4,041,678

SHORT TURN VEHICLE

Ray Owen Chaney, and Emsley M. Chaney, both of R.R. No. 2, Sidney, Ohio 45365

Filed Sept. 8, 1975, Ser. No. 611,399
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—10.7 **19 Claims**



1. A land vehicle comprising: a longitudinally extending frame having a longitudinally extending center line, front and rear power driven wheels generally on said center line and supporting said frame, means pivotally securing said wheels to said frame for rotation about generally vertical axes, a pair of stabilizer wheels respective ones of which are on opposite sides of said longitudinal center line, a rigid nonarticulated stabilizer frame extending transversely of said longitudinal frame and supporting said stabilizer wheels about axes fixed to said frame, and means biasing said rigid stabilizer frame downwardly relative to said longitudinally extending frame to hold the vehicle erect.

4,041,679

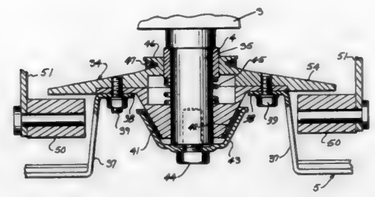
SELF-PROPELLED ROTARY LAWN MOWER

Lester H. Seifert, Kiel; Raymond P. Powers, Sheboygan, both of Wis.; William M. Schmidt, Grosse Point Shores, Mich.; Stanley E. Thorwaldsen, Grosse Point Farms, Mich., and Frederick W. Smith, Mount Clemens, Mich., assignors to Lester H. Seifert, Kiel, Wis.

Division of Ser. No. 438,589, Feb. 1, 1974, Pat. No. 3,890,772, which is a division of Ser. No. 289,539, Sept. 15, 1972, Pat. No. 3,802,170. This application Mar. 25, 1975, Ser. No. 561,985
The portion of the term of this patent subsequent to Apr. 9, 1991, has been disclaimed.
Int. Cl.[2] A01D *69/10*
U.S. Cl. 56—11.3 **7 Claims**

1. A rotary lawn mower, comprising a housing, power means mounted on the housing and including a drive shaft, wheel means connected to the housing to permit the housing to be moved over the ground, rotatable means disposed within

the housing, said rotatable means including an annular member journalled about the drive shaft, and a cutting blade carried by said annular member, clutch means interconnecting the drive shaft and the annular member and having an engaged position wherein the annular member and the cutter blade are drivingly connected to said drive shaft and having a disengaged position wherein said annular member and said cutter blade are disconnected from said drive shaft, clutch disengaging means for disengaging said clutch means to disconnect the annular member and the cutter blade from the drive shaft, and brake means operable in conjunction with operation of said clutch disengaging means for engaging said rotatable means and stopping rotation of said cutting blade on disengagement of said clutch means.

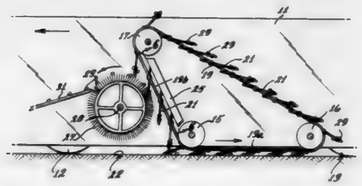


4,041,680

COTTON BOLL GLEANER

James M. Welch, 22151 Wood Island Lane, Huntington Beach, Calif. 92646

Filed May 7, 1976, Ser. No. 684,093
Int. Cl.[2] A01D *46/08*
U.S. Cl. 56—28 **7 Claims**



1. A cotton boll gleaner comprising:

a frame;

first means on said frame to move said frame along the ground;

an endless belt;

second means for mounting said belt on said frame to cause said belt to move down close to the ground, to rise, and again move down close to the ground;

a plurality of gleaning elements, pivotably mounted on said belt so that, as said belt passes the respective elements along the ground, the elements drag therealong to glean cotton bolls;

third means for removing the cotton bolls from said elements as said belt moves the elements toward the ground;

each of said elements comprising:

a slender, rigid rod-like body;

a plurality of barbs fixed by one end to said body so that said barbs are axially spaced along and radially spaced around said body;

a ball means fixed at one end of said body;

a finger fixed by one end to said ball means and forming an obtuse angle with said body; and

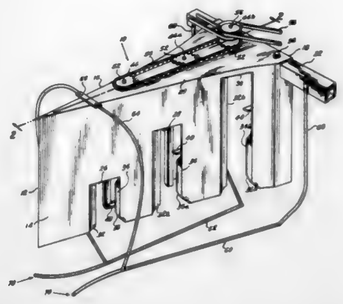
a socket fixed on said belt for pivotally supporting said ball means so that said body depends from said belt as said belt moves.

4,041,681

CORN DETASSELER

Lucio Chapa, III, 1229 Monroe Ave., Ottumwa, Iowa 52501

Filed May 6, 1976, Ser. No. 683,700
Int. Cl.[2] A01D *45/02*
U.S. Cl. 56—63 **12 Claims**



1. Apparatus for removing tassels from corn stalks, comprising:

a body member having a leading and trailing edge, a closed top, vertical sides, an open bottom and an open rear side for movement over a row of corn stalks having tassels thereon,

a plurality of tassel severing means operably mounted to and within said body member in spaced relationship between said leading and trailing edges,

the plane of operation of said respective tassel severing means being progressively higher from said leading edge to said trailing edge,

a respective passageway of a predetermined height range in said body member associated with each respective tassel severing means, and

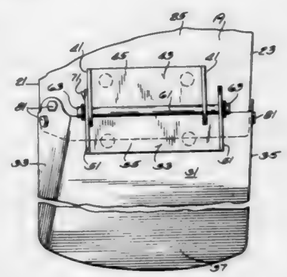
the height ranges of said passageways being progressively greater from said leading edge to said trailing edge whereby as said body member is moved over a row of corn stalks short stalks within the height range of the first encountered passageway will enter the same for contact with the tassel severing means therein and progressively taller stalks will enter successive passageways according to their relationship to the respective height ranges encountered.

4,041,682

MOUNTING ARRANGEMENT FOR ROTARY MOWER CHUTE EXTENSION

Earl H. Kidd, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Nov. 17, 1975, Ser. No. 632,256
Int. Cl.[2] A01D *75/20*
U.S. Cl. 56—320.2 **6 Claims**



1. A rotary lawn mower including a cutter blade, a cutter

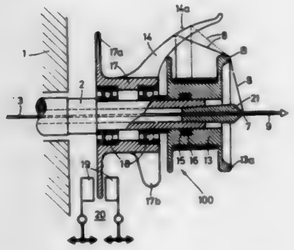
blade housing having a depending wall enclosing said cutter blade and a laterally extending, inverted U-shaped discharge chute having a pair of laterally spaced side walls, an inverted U-shaped discharge chute extension having a pair of laterally spaced side walls, and means connecting said chute extension to said discharge chute for movement of said chute extension from a raised, generally inoperative storage position extending upwardly from said discharge chute to a lowered guard position extending outwardly from said discharge chute with said side walls of said extension in laterally outwardly partially overlying relation to said sides of said chute, and for thereafter non-releasably fixedly holding said chute extension in the guard position.

4,041,683

MACHINE FOR COILING LAMP FILAMENTS

Peter Heimlicher, Thorishaus, Switzerland, assignor to Gluhlampenfabrik A.G., Fribourg, Switzerland

Filed Mar. 10, 1975, Ser. No. 556,532
Claims priority, application Switzerland, Jan. 7, 1975, 74/75
Int. Cl.[2] H01B *13/00, 13/08;* **B65H** *81/08*
U.S. Cl. 57—18 **3 Claims**



1. A machine for coiling filaments for incandescent bulbs or gas discharge tubes comprising, a motor-driven spindle, a supply reel mounted on said spindle for holding a supply of filament-wire, a rotor carrying a guide member mounted on said spindle, a motor-driven feed means for continuously advancing a support-wire through said spindle, said filament-wire describing a path between an unwinding location on said reel and a coiling location adjacent to an end of said spindle where said filament-wire is coiled on said support-wire, said guide member including a projecting arm adapted to deviate said filament-wire along said path, said rotor and said guide member being freely rotatable under the influence of said deviated filament on said spindle, said reel being integral in rotation with said spindle.

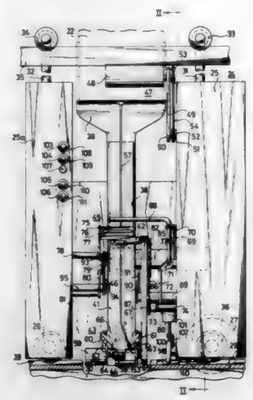
4,041,684

DEVICE FOR AUTOMATICALLY JOINING A THREAD FOR SPINNING

Heinz Kamp, Rickelrath, Germany, assignor to W. Schlafhorst & Co., Monchengladbach, Germany

Filed Sept. 20, 1976, Ser. No. 724,925
Claims priority, application Germany, Sept. 18, 1975, 2541589
Int. Cl.[2] D01H *15/00*
U.S. Cl. 57—34 R **10 Claims**

1. Device for automatically joining a thread for spinning in an open-end spinning maching having a pivotable bent suction tube for seizing a thread end located on a take-up coil, the suction tube being formed at the inside of the bend thereof with a longitudinally extending slit for passage therethrough of a sucked-in thread, comprising a pivot bearing for the pivotable suction tube, a negative pressure supply line connected to the suction tube at said pivot bearing, a transfer arm connected at one end thereof to the suction tube at said pivot bearing, and thread gripping means mounted for movement from said pivot bearing to the free end of said transfer arm for transfering a



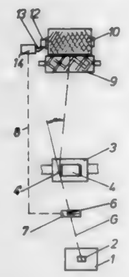
thread end from said pivot bearing to said free end of said transfer arm.

4,041,685

PROCESS AND APPARATUS FOR REATTACHMENT OF A THREAD IN AN OPEN-END SPINNING MACHINE

Gerhard Grau, Albershausen, and Otto Mayer, Ebersbach, both of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Germany

Filed Nov. 18, 1974, Ser. No. 524,874
Claims priority, application Germany, Nov. 16, 1973, 2357223
Int. Cl.[2] D01H *15/00, 1/12*
U.S. Cl. 57—34 R **7 Claims**



1. In a process for attachment of threads within an open-end spinning machine with at least one spinning rotor, a windup spindle and a pair of draw rollers, disposed between said spinning rotor and said windup spindle, including the steps of introducing the thread into said spinning rotor; attaching the thread to said fibers located in said spinning rotor; and winding up the thread on said windup spindle, with the thread length between the spinning rotor and the windup spindle defining a thread path; the improvement comprising the steps of:

a. orienting the pair of draw rollers in the spinning machine relative to the windup spindle and the spinning rotor such that an end face of one of the draw rollers lies in a plane displaced relative to the thread path;

b. placing the thread in contact with said end face for maintaining it in a position wherein it does not lie on the line of contact between said pair of draw rollers and is misaligned relative to said thread path;

c. sensing the increase in tension in the thread which occurs when the thread inserted into said spinning rotor shares the rotary motion thereof; and

d. initiating the rotary motion of the windup spindle in the winding up direction in response to said increase in tension; whereby the tension in the thread urges it to move onto the line of contact between said pair of draw rollers and into alignment with said thread path.

2. An apparatus for the attachment of threads within an open-end spinning machine comprising:

at least one spinning rotor;

a windup spindle associated with each spinning rotor;

a distribution means disposed between each spinning rotor and its associated windup spindle, the distribution means defining a thread guide traversing path along the axis of the windup spindle;

a thread guide disposed between each spinning rotor and its associated distribution means;

a pair of draw rollers disposed between each associated thread guide and distribution means, with an end face of at least one draw roller passing through a plane defined by the thread guide and the thread guide path of the distribution means so that a thread, which is run from the windup spindle along the thread guide traversing path of the distribution means through the thread guide and inserted into the spinning rotor for the purpose of attachment to fibers therein but which is not yet attached, lies against said at least one draw roller end face and defines a reverse path which deviates from the path that the thread would define during normal operation; and

a thread tension sensing means, disposed between each spinning rotor and its associated windup spindle, for starting the thread windup spindle upon sensing an increase in the thread tension caused when the end of the thread inserted into the spinning rotor shares the rotary motion thereof;

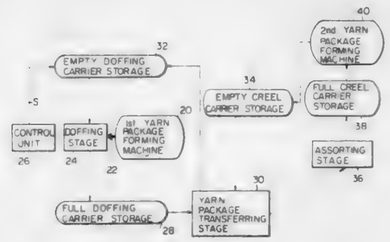
whereafter further increase in tension between the spinning rotor and its associated windup causes the thread to be guided into a pinch line between the two draw rollers.

4,041,686

METHOD OF AND ARRANGEMENT FOR TRANSPORTING YARN PACKAGES

Mitugu Inaba, Ibaragi; Noriyuki Kouguchi, Nishinomiya; Masao Kagawa, Suita; Kozo Hosho, and Yoshiaki Teraoka, both of Osaka, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 20, 1976, Ser. No. 752,623
Int. Cl.[2] D01H *9/00, 9/18;* **B65H** *54/22*
U.S. Cl. 57—34 R **15 Claims**



1. A method of transporting yarn packages from a first processing region in which there is arranged at least a first yarn package forming machine having a plurality of winding mechanisms, each having at least one winding spindle, into a second processing region in which there is arranged at least a second yarn package forming machine having a plurality of winding mechanisms, comprising:

doffing said yarn packages from said first yarn package forming machine and loading the doffed yarn packages onto a plurality of yarn package holding pegs of a first transporting carrier conveyed to a side of said first yarn package forming machine so that the mutual positional relationship between said yarn packages on said plurality of yarn package holding pegs is unchanged from that between said yarn packages while they were being formed by said first yarn package forming machine;

conveying said first transporting carrier loaded with said doffed yarn packages to a yarn package transferring stage;

transferring, at said yarn package transferring stage, said yarn packages from said plurality of pegs of said first transporting carrier to a plurality of yarn package holding pegs of a second transporting carrier, each of said yarn packages being transferred onto a predetermined peg of said second transporting carrier;

returning, after completion of said transferring of said yarn packages, the emptied first transporting carrier to a place adjacent to said first yarn package forming machine in said first processing region, thereby permitting said first transferring carrier to again receive freshly formed yarn packages from said first yarn package forming machine;

conveying said second transporting carrier loaded with said yarn packages transferred from said first transporting carrier to a position above said second yarn package forming machine in said second processing region, thereby permitting said second transporting carrier to function as a creel car for supplying filament yarns, which are unwound from said yarn packages, to said second yarn package forming machine, and;

returning said second transporting machine toward said yarn package transferring stage after completion of said supplying of said filament yarns.

5. An arrangement for transporting yarn packages comprising:

at least a first yarn package forming machine having a plurality of winding mechanisms, each having at least one winding spindle;

at least a second yarn package forming machine having a plurality of winding mechanisms, said second yarn package forming machine being spaced apart from said first yarn package forming machine;

means for doffing said yarn packages from said plurality of winding mechanisms of said first yarn package forming machine;

first means for transporting said yarn packages doffed by said doffing means into a yarn package transferring stage located between said first and second yarn package forming machines, said first transporting means having means for holding said doffed yarn packages;

second means for transporting said yarn packages from said yarn package transferring stage to said second yarn package forming machine when said yarn packages are transferred from said first transporting means onto said second transporting means, said second transporting means having means for holding said transferred yarn packages and being capable of functioning as creel means for supplying filament yarns to said second yarn package forming machine;

first means for conveying said first transporting means from a side of said first yarn package forming machine to said yarn package transferring stage and for returning said first transporting means from said yarn package transferring stage toward said first yarn package forming machine, and;

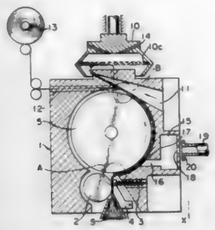
second means for conveying said second transporting means from said yarn package transferring stage to said second yarn package forming machine and for returning said second transporting means from said second yarn package forming machine toward said yarn package transferring stage.

4,041,687

DEVICE FOR REMOVING IMPURITIES SEPARATED FROM FIBERS IN OPEN END SPINNING UNIT

Kozo Motobayashi, Aichi; Takeshi Shimizu, and Noriaki Miyamoto, both of Kariya, Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha, both of Japan

Filed Mar. 29, 1976, Ser. No. 671,694
Claims priority, application Japan, Apr. 2, 1975, 50-40679
Int. Cl.² D01H *1/12, 11/00*
U.S. Cl. 57—56 **7 Claims**



1. A device for removing impurities separated from individual fibers opened up in a spinning unit of an open-end spinning machine, which has the spinning unit mounted on a frame thereof for movement between an operative position and an inoperative position, the spinning unit including a sliver supply section, and a sliver opening section combing out a sliver from the sliver supply section into the individual fibers, the impurity separating device comprising:

an impurity collecting chamber provided in the spinning unit in communication with the sliver opening section so that the impurities separated from the individual fibers enter the chamber;

a first passageway provided in the spinning unit for allowing the impurities in the chamber to come out thereof, the first passageway having an inner end opening into the chamber and an outer end opening into the atmosphere surrounding the spinning unit at all positions of said spinning unit;

a source of vacuum;

a second passageway fixedly mounted on the frame of the spinning machine and having one end connected to said source of vacuum and having the other end spaced from the outer end of the first passageway in all positions of the spinning unit; and

means for providing a predetermined gap between the outer end of the first passageway and the other end of the second passageway when the spinning unit is in the operative position, said means comprising a pair of surfaces defining a gap between said outer end and said other end and spaced from each other at a distance and having a total surface area for causing air flowing through the gap into the second passageway to encounter sufficient resistance to limit the amount of air flowing therethrough to an amount below a predetermined level, whereby the impurities in the chamber are removed therefrom through the disconnected first and second passageways.

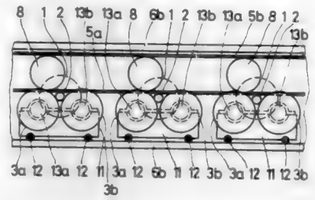
4,041,688

BEARING MEANS FOR SPINNING ROTORS OF AN OPEN-END SPINNING MACHINE

Hans Stahlecker, Suessen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, Germany

Filed July 29, 1975, Ser. No. 600,054
Claims priority, application Germany, Aug. 10, 1974, 2438527
Int. Cl.² D01H *1/241*
U.S. Cl. 57—104 **14 Claims**

1. A bearing arrangement for a spinning unit of an open-end spinning machine, the spinning unit including a spinning rotor having a rotor shaft driven by a tangential belt, the shaft is mounted in a wedge formed by supporting rings having bearing elements, the bearing arrangement comprising: one common pillow block means for mounting bearing elements of the supporting rings of the spinning unit, and elastic supporting



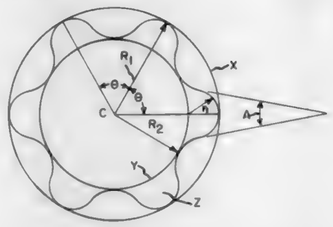
means having a preferred direction of movement for supporting said pillow block means at the spinning unit and for preventing seesaw movements of the rotor shaft about an axis located at right angles to the shaft.

4,041,689

MULTILOBAL POLYESTER YARN

Patrick Joseph Duncan, Hendersonville, Tenn., and Francis Edward Scrivener, Jr., Chester, Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 11, 1975, Ser. No. 631,127
Int. Cl.² D02G *3/02, 1/02*
U.S. Cl. 57—140 J **8 Claims**



1. An improved partially oriented multifilament polyester yarn for draw-false-twist texturing composed of polyester filaments of multilobal cross-section characterized by a total number (N) of 6 to 10 essentially symmetric lobes of substantially equal length, equispaced radially about the center of the filament cross-section, a modification ratio (M) between 1.17 and 1.85 and a denier per filament of a minimum of $3.8R_o$ and a maximum of $(5.88M - 10 + N)\,R_o$ at $M = 1.85$, wherein R_o is 1.25–5 and is equal to the ratio

$$M = \frac{1 + 0.01\,(E)}{1.35}$$

in which E is the break elongation of the partially oriented yarn.

4,041,690

NOVELTY YARN AND METHOD FOR MAKING SAME

John Wesley Lambert, Jr., Spartanburg, S.C., assignor to Tuscarora Cotton Mill, Mount Pleasant, N.C.

Filed Nov. 5, 1975, Ser. No. 629,019
Int. Cl.² D02G *3/34, 3/36*
U.S. Cl. 57—144 **19 Claims**

1. A novelty yarn comprising a ground strand of spun staple fibers, relatively short varying length and varying size auxiliary strands of staple fibers randomly arranged in spaced relation along the ground strand and being spirally twisted thereabout, the largest size auxiliary strands having portions thereof formed of such a large number of fibers and being so arranged spirally around the ground strand that adjacent turns

of said portions overlie and substantially shield the underlying ground strand from view, other intermediate size auxiliary strands formed of a lesser number of fibers and being so arranged spirally around the ground strand that both the ground strand and the auxiliary strand are individually discernible, and other smallest size auxiliary strands being formed of such a few number of fibers arranged spirally around the ground strand as to be barely discernible thereon.

13. A method of making a novelty yarn having relatively short varying length and varying size auxiliary strands randomly distributed therealong, said method comprising advanc-



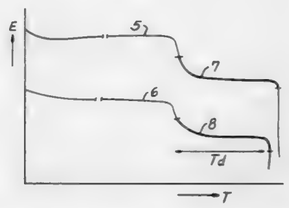
ing at least one strand of staple fibers into and through a drafting zone and drafting the fibers while continuously forming a single ground strand of drafted staple fibers therefrom and while feeding an auxiliary strand of staple fibers from outside the drafting zone directly into the delivery end of the drafting zone in such a manner as to effect a random parting of the auxiliary strand and thereby form relatively short varying length auxiliary strands randomly distributed along the ground strand, and twisting the ground strand and the randomly distributed auxiliary strands to arrange the auxiliary strands spirally around the ground strand and form a novelty yarn therefrom.

4,041,691

ELECTRONIC TIMEPIECE BATTERY MONITORING CIRCUIT

Hiroyuki Chihara, and Yasushi Okada, both of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 641,046
Claims priority, application Japan, Dec. 13, 1974, 49-143170
Int. Cl.² G04C *3/00;* **G08B** *21/00*
U.S. Cl. 58—23 BA **12 Claims**



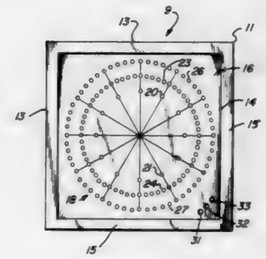
1. In an electronic timepiece including display means for displaying time in response to timekeeping signals applied thereto and for indicating a voltage level representative of impending failure of a power source in response to an indication signal applied thereto, the improvement comprising an electrochemical power source for delivering at least two characteristic voltage levels, said first voltage level corresponding to a first plateau of discharge, and a second voltage level corresponding to a last plateau of discharge being sustained essentially at said second voltage level for a predetermined interval of time prior to the ultimate failure of said electrochemical power source, battery voltage detecting means coupled to said electro-chemical power source for detecting a change from said first voltage level to said second voltage level and producing an indication signal in response to said second voltage level, and timekeeping means coupled to said power source for being energized by said power source when same is delivering said respective characteristic voltage levels and, in response to being energized by said power source, applying timekeeping signals to said display means.

4,041,692

ELECTRONIC CLOCK HAVING TIME INDICATING LIGHT DISPLAY

James B. Marshino, Goodland, Ind., assignor to Amelect Incorporated, Goodland, Ind.

Filed Jan. 8, 1976, Ser. No. 647,382
Int. Cl.² G04B *19/34;* **G04C** *3/00*
U.S. Cl. 58—50 R **16 Claims**



1. An electronic clock having a time indicating light display, said electronic clock comprising:

pulse generating means for producing output pulses at predetermined times;

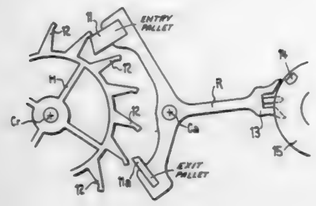
decoding means connected with said pulse generating means to recieve said output pulses therefrom, said decoding means including a plurality of frequency dividers providing separate outputs indicative of time in hours, minutes and seconds; and matrix means including a plurality of matrixes two of which are 6×10 matrixes and the other of which is a 1×12 matrix, each of which matrixes is connected with a different one of said plurality of frequency dividers of said decoding means to receive therefrom said indications of time in hours, minutes and seconds, said matrix means including light means positioned in three separate segments each of which segments surrounds a point common to all of said segments, said light means being connected with said timing means for selective energization of a portion of each segment of said light means to thereby produce three separate light displays the energized portion of one such segment indicating time in hours, the energized portion of a second of which segments indicates time in minutes, and the energized portion of the third of which segments indicates time in seconds.

4,041,693

ESCAPEMENT FOR A TIMEPIECE

Francois Bonsack, Le Locle, Switzerland, assignor to Les Fabriques d'Assortiments Reunies, Le Locle, Switzerland

Continuation of Ser. No. 390,343, Aug. 22, 1973, abandoned.
This application Sept. 19, 1975, Ser. No. 615,111
Claims priority, application Switzerland, Sept. 1, 1972, 12907/72
Int. Cl.² G04B *15/00*
U.S. Cl. 58—116 R **2 Claims**



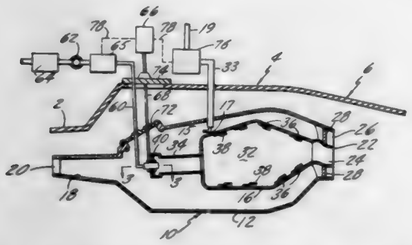
1. An escapement for a timepiece comprising an escape wheel having a plurality of teeth, and a pallet arm having entry and exit pallets disposed for cooperation with said teeth, said pallet arm being rotatable about an axis, and wherein a first line connecting the center of the entry-pallet to the center of the escape wheel defines an angle relative to a second line connecting the center of the escape wheel to the pallet axis, which angle embraces at least one tooth more of said wheel than the corresponding angle of the center of the exit-pallet relative to said second line, the angle β between the direction of movement of said teeth and the direction of movement of said pallets being acute for both said entry-pallet and said exit-pallet, and the inclination of the pallet faces being substantially equal to $\frac{1}{2}(\pi-\beta-\phi)$, where $\pi = 180°$ and $\phi =$ the angle of friction between said teeth and said pallets.

4,041,694

COMBUSTION TEMPERATURE CONTROL

George D. Lewis, North Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Aug. 25, 1975, Ser. No. 607,651
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.02 **10 Claims**



1. A flame temperature control system for a gas turbine engine having a combustion chamber, air inlet means, combustion chamber gas discharge means, and fuel injection means, including combustion chamber inlet air sampling means, combustion chamber hot gas sampling means, said inlet air sampling means including a first fixed area orifice for continuously directing a sample flow of inlet air therethrough, said hot gas sampling means including a second fixed area orifice for continuously directing a sample flow of hot gas therethrough, means for receiving said sample flows from said sampling means and directly mixing the samples, means for detecting the temperature of the mixed gases, and means for adjusting the fuel-air ratio in said combustion chamber in response to the detected temperature to maintain a desired temperature in said combustion chamber.

10. A method of maintaining a desired temperature in a combustion chamber comprising the steps of:

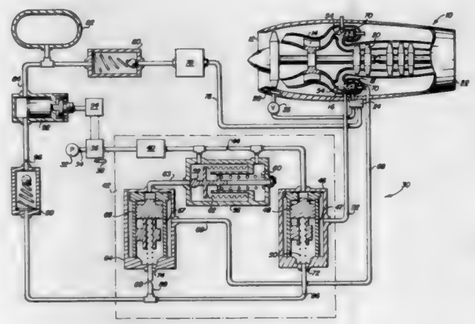
1. selecting a desired temperature for a combustion chamber;
2. taking a continuous sample of combustion chamber cold gas through a fixed area orifice;
3. taking a continuous sample of combustion chamber hot gas through a fixed area orifice,
4. directly mixing the two gas samples,
5. taking the resultant temperature of the mixed gas samples,
6. controlling the fuel-air ratio in said combustion chamber in response to the temperature of the mixed gas samples to maintain said selected temperature in said combustion chamber.

4,041,695

FUEL SYSTEM PNEUMATIC PURGE APPARATUS AND METHOD

John Everett Harper, and Louis H. Kell, both of Phoenix, Ariz., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Nov. 21, 1975, Ser. No. 634,219
Int. Cl.² F02C *7/22, 9/12, 7/26*
U.S. Cl. 60—39.02 **19 Claims**



1. A method of purging fuel from the fuel delivery system in a gas turbine engine upon shutdown of the engine, comprising the steps of:

bleeding air from the discharge of the compressor of the engine during substantially full speed operation;
storing said bleed air in a pneumatic accumulator;
reducing engine speed to reduce pressure in the combustion chamber of the engine to a value substantially less than that of bleed air stored in the accumulator;
interrupting flow of fuel being delivered through a fuel manifold to the combustion chamber;
communicating said accumulator with said fuel manifold after said engine speed reducing step to purge fuel from the manifold into the combustion chamber; and
relatively timing said interrupting step and said communicating step whereby the combustion process in the combustion chamber is maintained subsequent to initiation of said communicating step such that fuel purged from the manifold is burned.

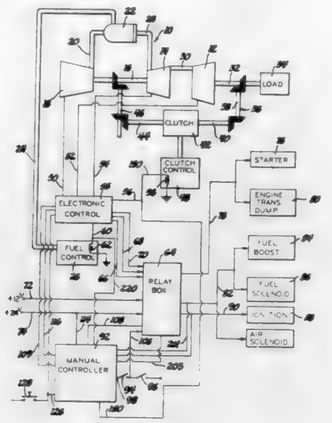
4,041,696

VEHICLE TURBINE MANUAL CONTROL

Donald E. Morrison, Plainfield, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 24, 1976, Ser. No. 689,131
Int. Cl.² F02C *7/26, 3/10*
U.S. Cl. 60—39.14 **5 Claims**

1. A gas turbine control system for controlling operation of a gas turbine engine starter and a gas turbine engine having a compressor driven by a turbine to supply air to a combustor having a fuel supply thereto for combustion with air to produce motive fluid for the turbine, said control system comprising: fuel control means energizable to modulate fuel flow to the combustor, automatic electronic control means responsive to predetermined engine parameters to produce a control signal connected to said fuel control means for control of engine operation, means for energizing said automatic electronic control means including a main switch and a start switch, a manual controller for energizing said fuel control means, means including said main switch and manual selector switch means to selectively and independently power said electronic control means and said manual controller, manual controller relay means responsive to operation of said main switch and



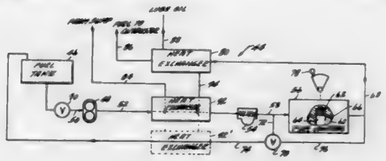
said manual selector switch means when said electronic control means is disabled, said manual controller further including timer means energized in response to energization of said relay, a DC battery voltage source, start circuit means responsive to energization of said relay and timer means for connecting said DC voltage source to the starter of said engine during a start phase of operation, means connected in circuit relationship with said start circuit for directing an initially reduced battery voltage as produced by current flow through said start circuit means to said fuel control means during the start phase of operation to produce a ramped fuel signal to increase fuel flow as a function of engine speed increased during a manual start phase of operation.

4,041,697

OIL COOLING SYSTEM FOR A GAS TURBINE ENGINE

George A. Coffinberry, Cincinnati, and Howard B. Kast, Fairfield, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed July 17, 1975, Ser. No. 596,641
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.28 R **21 Claims**



1. A fuel delivery and control system for use with a gas turbine engine and a fuel reservoir, said system comprising:

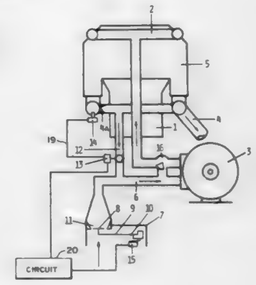
pump means communicating with the fuel reservoir for drawing fuel therefrom and pressurizing same;
a fuel control in downstream flow communication with the pump means for receiving fuel therefrom, said fuel control including metering means for scheduling the rate of fuel flow to the engine;
a first heat exchanger for receiving all of the metered fuel and further communicating with the gas turbine engine for receipt of hot engine oil therefrom, wherein the hot engine oil is maintained in heat exchange relation with the fuel and then returned to the engine at a cooler temperature; and
means for reducing the fuel temperature to the inlet of the first heat exchanger by returning all fuel in excess of engine requirements back to the fuel reservoir.

4,041,698

EXTERNAL COMBUSTION ENGINE WITH EXHAUST GAS RECIRCULATION OF CONSTANT MASS FLOW RATE

Mats Inge Moritz, Trelleborg, Sweden, assignor to Kommanditbolaget United Stirling (Sweden) AB & Co., Malmo, Sweden

Filed June 3, 1975, Ser. No. 583,472
Int. Cl.² F02G *1/04*
U.S. Cl. 60—39.52 **2 Claims**



2. An external combustion engine comprising a combustin air blower, a combustion air intake duct for said blower, a baffle in said intake duct movably mounted such that the combustion air flow in a further part of said intake duct has a substantially constant static pressure independent of variations in the mass flow magnitude of the combustion air flow therein, means for regulating the supply of fuel in proportion to the supply of combustion air, an exhaust gas duct, a recirculation duct connecting the exhaust gas duct to the said further part of the intake duct, means for establishing and maintaining a substantially constant static pressure in said exhaust gas duct, and means for maintaining a substantially constant predetermined resistance against the flow of exhaust gases through the recirculation duct.

4,041,699

HIGH TEMPERATURE GAS TURBINE

Helmut R. Schelp, Pacific Palisades, Calif., assignor to The Garrett Corporation, Los Angeles, Calif.

Filed Dec. 29, 1975, Ser. No. 645,004
Int. Cl.² F02C *7/00, 7/12*
U.S. Cl. 60—39.55 **10 Claims**

1. A gas turbine engine comprising:

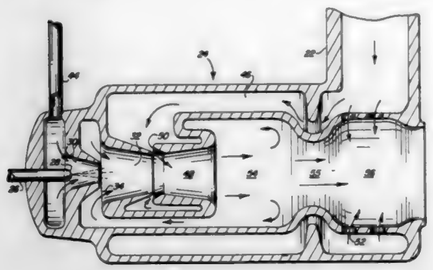
a shaft mounted for rotation about an axis;
compressor means attached to said shaft for rotation therewith;
turbine means attached to said shaft for rotation therewith, said turbine means having internal cooling passages therein and cooling liquid inlet and outlet openings;
first conduit means connected to the inlet opening in said turbine for conducting cooling liquid to said turbine;
combustor means for receiving cycle fluid from said compressor and fuel from a source of combustible fuel, said combustor comprising:
a first mixing chamber connected to said source of combusti-

ble fuel and said second conduit means for mixing said fuel and cooling liquid;

a second mixing chamber connected to receive the contents of said first mixing chamber and cycle fluid from said compressor means for vaporizing and mixing said fuel and cooling liquid mixture;

a first combustion chamber for receiving the contents of said second mixing chamber for gasification and primary combustion therein;

a second combustion chamber separated from said first combustion chamber and connected to receive the contents of said first combustion chamber and additional cycle fluid from said compressor for secondary combustion therein;



second conduit means connected to the outlet of said turbine cooling passages for conducting cooling liquid from said turbine to said combustor and combining it with said cycle fluid;

third conduit means for conducting the products of combustion of said combustor to said turbine for extraction of work therefrom; and

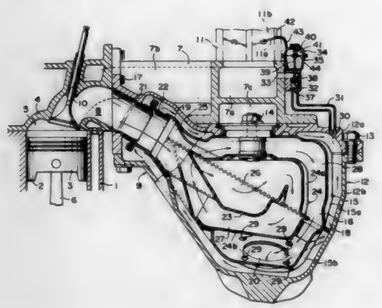
at least one heat exchanged connected in said second conduit means between the outlet opening of said turbine passages and the inlet to said combustor, said heat exchanger receiving heat from the exhaust gas from said turbine and transferring said heat to the cooling liquid from said turbine.

4,041,700

MANIFOLD REACTOR

Takamitsu Okamoto, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1976, Ser. No. 683,221
Claims priority, application Japan, Feb. 17, 1976, 51-17702
Int. Cl.² F02M *25/06*; F01N *3/10*
U.S. Cl. 60—278 **4 Claims**



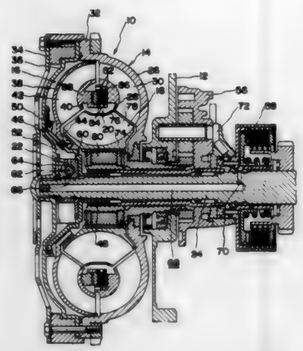
1. A manifold reactor comprising an inner core which defines a reactor chamber therein, said inner core having inlet and outlet ports for conducting exhaust gases into and out of said reactor chamber, and an outer core which encloses said inner core while defining a heat insulating space between said inner core while defining a heat insulating space between said inner and outer cores, said heat insulating space being connected with said reactor chamber through an opening formed in said inner core and communicating to an EGR gas intake port formed in said outer core.

4,041,701

HYDRAULIC TORQUE CONVERTER WITH A LOCKUP CLUTCH BETWEEN PUMP AND TURBINE

Isamu Goto, Kiyose; Sadanori Nishimura, Ohmiya, and Eiichiro Kawahara, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 24, 1976, Ser. No. 699,633
Claims priority, application Japan, June 28, 1975, 50-80326
Int. Cl.² F16D *33/00*
U.S. Cl. 60—347 **12 Claims**



1. In a hydraulic torque converter having pump means, turbine means and reactor means, and an output shaft, the improvement comprising a lockup clutch for directly coupling said pump means and said turbine means, said lockup clutch being accommodated in an annular space bounded by said pump means and said turbine means and said reactor means, a carriage coupled to the output shaft for rotation therewith and for relative axial travel, a flywheel coupled to said pump means for rotation therewith, said flywheel and carriage defining a clutch actuating chamber surrounding said output shaft, said clutch actuating chamber being effective to engage said lockup clutch when supplied with fluid pressure, a source of fluid under pressure, a control valve for selectively communicating said clutch actuating chamber with said source and with a fluid drain, said carriage being displaceable between a retracted and an advanced position corresponding to the connection with the drain or the fluid pressure source, and seal means between said carriage and said flywheel for sealing said clutch actuating chamber to isolate the same from said lockup clutch when the carriage is in retracted position.

4,041,702

CONTROL SYSTEM FOR A FLUID DRIVE VEHICLE

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 15, 1976, Ser. No. 732,673
Int. Cl.² F16H *39/46*
U.S. Cl. 60—431 **17 Claims**

1. A control system for a fluid drive vehicle of the type having an engine speed control movable from an idling position to increase engine speed, a fluid drive transmission having a control element movable fron a neutral position progressively to increase the drive ratio and fluid actuator means coupled to the control element for moving it from the neutral position in response to pressurized fluid received by the fluid actuator means, the control system comprising:

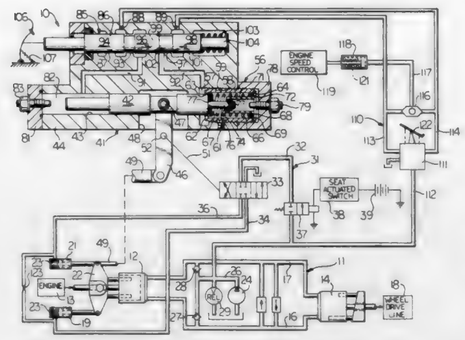
auxiliary pump means;

a first fluid circuit connecting the auxiliary pump means to the fluid actuator means including a control valve movable in a first direction from a neutral fluid blocking position progressively to increase the flow of pressurized fluid to the fluid actuator means;

a servo mechanism operatively connected to the control valve for moving it from the neutral position in response to pressurized fluid received by the servo mechanism;

a fluid motor resiliently biased to move the engine speed control to the idling position and operative to move the engine speed control to increase the engine speed in response to pressurized fluid received by the fluid motor; and

a second fluid circuit connecting the auxiliary pump means to the servo mechanism and the fluid motor including a



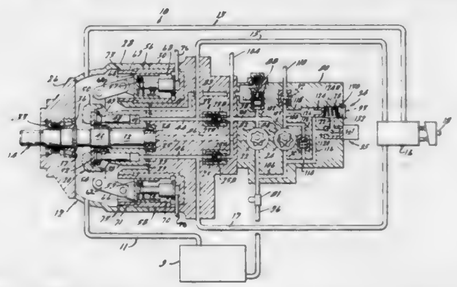
pressure control valve manually actuatable from a neutral fluid flow blocking position to an actuated position for providing fluid flow therethrough to the servo mechanism and the fluid motor and for regulating and maintaining the pressure of the fluid delivered to the servo mechanism and the fluid motor at a pressure level commensurate with said actuated position, and an inching valve selectively manually actuatable from an open position which permits substantially unrestricted fluid flow to the servo mechanism to an actuated position restricting fluid flow to the servo mechanism for reducing the pressure of the fluid delivered to the servo mechanism from the pressure control valve while maintaining the pressure of the fluid directed to the fluid motor at the pressure level determined by the pressure control valve.

4,041,703

HYDROSTATIC TRANSMISSION WITH INTEGRAL AUXILIARY PUMP

Kenneth K. Knapp, Battle Creek, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 24, 1976, Ser. No. 689,283
Int. Cl.² F16H *39/46*; F15B *15/18*
U.S. Cl. 60—464 **15 Claims**



1. In a hydrostatic transmission system of the type including a reservoir; a fluid actuated motor; and a pump assembly comprising a housing assembly, a shaft assembly carried for rotation in the housing assembly, a main pump assembly rotatively driven within the housing assembly by the shaft and fluidly connected to the motor, and a charge pump assembly rotatively driven within the housing assembly by the shaft assembly and fluidly connected at its inlet to the reservoir and at its outlet to the main pump assembly, the improvement wherein:

A. said pump assembly further comprises an auxiliary pump assembly rotatively driven within said housing assembly by said shaft assembly and having an inlet fluidly connected to said reservoir and an outlet and said system further comprises:

B. auxiliary hydraulic power takeoff means; and

C. means for directing the flow of fluid from said outlet of said auxiliary pump assembly, said fluid directing means comprises valve means selectively operable

1. in one condition to direct fluid to said hydraulic power takeoff means, and

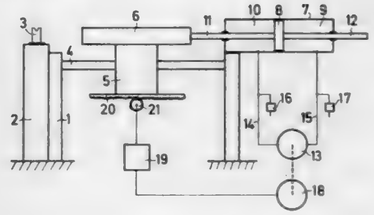
2. in another condition to direct fluid to said charge pump inlet.

4,041,704

STOP MECHANISM FOR A BENDING PRESS, PLATE SHEAR OR THE LIKE MACHINES

Walter Gygli, Niederbipp, Switzerland, assignor to Haemmerle, A. G. Maschinenfabrik, Zofinger, Switzerland

Filed May 20, 1976, Ser. No. 688,279
Claims priority, application Austria, June 18, 1975, 4728/75
Int. Cl.² F15B *15/18*
U.S. Cl. 60—473 **3 Claims**



1. A stop mechanism for a bending press, plate shearing press or like machine in combination with a work-table and with a work-piece stop which is horizontally adjustable along the work-table thereby defining the position of the work-piece relative to the bending or shearing machine comprising:

an adjustable position-preselector serving as a position control-unit coupled with said work-piece stop to determine the momentary difference between the actual position and the value set by the preselector;

an indicator of the momentary position of the workpiece stop which is mounted on said position control-unit;

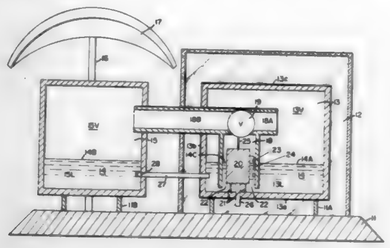
programming means for programming said position control-unit in a desired position;

a hydraulic piston-cylinder unit having hydraulic drive means;

said piston-cylinder unit having one cylinder with a chamber on each side of said piston which can be displaced in two opposite directions, the displacement of said piston in one of said directions displacing said stop in that direction and the displacement of said piston in the other direction displacing said stop in the other direction;

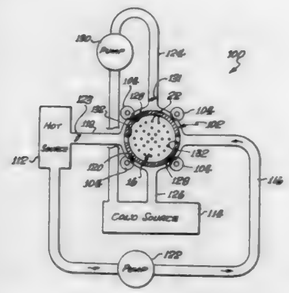
said hydraulic drive means comprising a pump and separate pipes from said pump to each of the chambers on each side of the piston so that the driving of said pump is controlled by said position control unit coupled with said work-piece stop under a slight over pressure of the hydraulic fluid.

4,041,705
LOW TEMPERATURE ENGINE
Israel Siegel, 351 W. 71 St., New York, N.Y. 10023
Filed Apr. 7, 1976, Ser. No. 674,552
Int. Cl.² F03G 7/04
U.S. Cl. 60—497 **11 Claims**



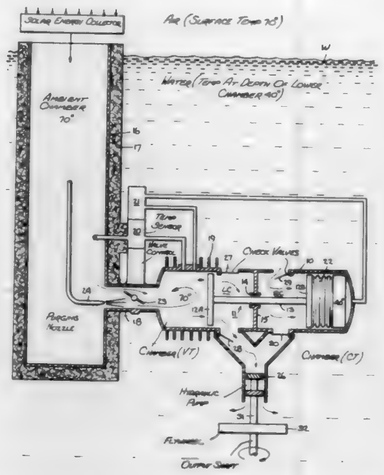
1. A low temperature engine comprising a warm chamber, adapted to keep a fluid at a relatively warm temperature,
a cold chamber adapted to keep a fluid at a relatively cold temperature,
said chambers being sealed from the outside air,
a supply of evaporating liquid in said chambers having a liquid level partitioning the chambers into vapor chamber portions and liquid chamber portions,
a tube which dips at its low open end in liquid portion inside warm chamber to define a liquid surface area inside and outside said tube,
means for intermittant communication of liquid surface area inside the tube with vapor phases of the cold and warm chambers, to effect changes of the fluid level,
and means for obtaining a temperature differential between the chambers.

4,041,706
LINEAR FORCE GENERATOR AND HEAT ENGINE EMBODYING SAME
Fred I. White, 489 W. 7th St., Claremont, Calif. 91711
Filed Mar. 17, 1975, Ser. No. 558,822
Int. Cl.² F03G 7/06
U.S. Cl. 60—527 **5 Claims**



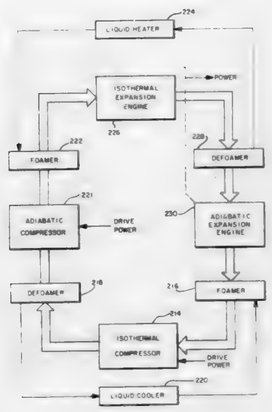
1. A heat powered linear force generator comprising:
a relatively fixed support,
a relatively movable output member,
means supporting said output member for reciprocating motion along a linear path toward and away from said support,
force producing means including at least one elongate linearly expandable and contractible force producing element having a relatively high coefficient of thermal expansion and contraction extending between and secured at its ends to said support and output member, respectively, and
means for exposing said force generating element alternately to relatively hot and relatively cold working fluids to effect alternate thermal expansion and contraction of said element, said exposing means comprising an elongate housing in closing said force producing means, hot and cold fluid supply conduits, ports in said housing, and means for moving said housing to communicate said housing ports with said hot and cold conduits alternately.

4,041,707
UNDERWATER THERMAL ENERGY CONVERSION UNIT
Donald Spector, 380 Mountain Road, Union City, N.J. 07087
Filed July 7, 1976, Ser. No. 703,284
Int. Cl.² F03G 7/04
U.S. Cl. 60—641 **15 Claims**



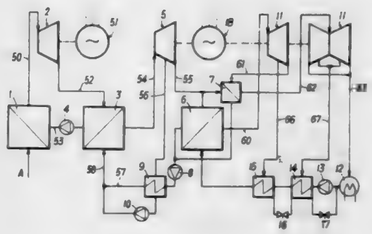
1. An underwater thermal energy conversion unit comprising:
A. a cylinder submergible in a body of water at a depth at which a marked temperature difference is encountered between ambient air temperature at the surface and water temperature;
B. a reciprocating piston assembly disposed in said cylinder and dividing the cylinder into an air-filled variable temperature first chamber and an air-filled constant temperature second chamber, both chambers being in heat exchange relationship with the cold water at the depth of submersion;
C. a duct communicating with said first chamber and extending to the surface whereby said first chamber is fillable with air at ambient temperature, the temperature of air in the second chamber always being that of the surrounding water;
D. a control valve interposed between said duct and said first chamber, whereby when the valve is open, the air temperature in said first chamber rises above the temperature of the water, and when the valve is closed, it falls to the temperature of the water at a rate determined by the heat exchange relationship between said first chamber and the surrounding water; and
E. means responsive to the temperature difference between the air in said first chamber and the air in said duct and to the temperature difference between the air in said first and second chambers to produce control signals for operating said valve, whereby when the air temperature in both chambers are at about the same level, the valve is caused to open to admit warm air therein, as a consequence of which the temperature in the first chamber rises to create a pressure difference causing the piston assembly to move in the direction of the second chamber and to compress the air therein until a point of pressure equilibrium is reached, and when the temperature in the first chamber reaches a temperature level close to that of the ambient air, the valve closes and the air temperature in the first chamber then proceeds to fall, in the course of which the compressed air in the second chamber forces the cylinder assembly in the direction of the first chamber until a point of pressure equilibrium is reached.

4,041,708
METHOD AND APPARATUS FOR PROCESSING VAPOROUS OR GASEOUS FLUIDS
Otto E. Wolff, Weston, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Division of Ser. No. 402,315, Oct. 1, 1973. This application Dec. 6, 1976, Ser. No. 747,716
Int. Cl.² F01K 25/04, 25/06
U.S. Cl. 60—649 **7 Claims**



1. A gas expansion engine apparatus comprising:
a first foaming unit for foaming a gas with a foamable liquid to provide a foam thereof, said foaming unit having an inlet arrangement and an outlet, said inlet arrangement including a first inlet conduit for introducing said gas to said first foaming unit and a second inlet conduit for introducing said foamable liquid to said first foaming unit, said outlet being adapted for withdrawal of said foam from said first foaming unit;
a first compressor having its inlet coupled to said outlet of said first foaming unit for receiving said foam therefrom and for compressing said foam from a first to a second pressure level to isothermally compress the gas contained in said foam from said first to said second pressure level;
a first defoaming unit having an inlet coupled to the outlet of said first compressor for receiving said foam therefrom and for separating said gas from said liquid of said foam while maintaining said separated gas at said second pressure level, said first defoaming unit having a gas outlet configured for independent withdrawal of said separated gas and a liquid outlet configured for independent withdrawal of said separated liquid;
a second compressor having its inlet coupled to said gas outlet of said first defoaming unit for receiving said separated gas therefrom and for compressing said gas to adiabatically raise the pressure thereof from said second level to a third level;
a second foaming unit coupled to the output of said second compressor for receiving said gas therefrom while maintaining said gas at said third pressure level and for foaming said received gas with a foamable liquid to provide a foam thereof, said second foaming unit having an inlet arrangement and an outlet, said inlet arrangement of said second foaming unit including a first inlet conduit for introducing said gas to said second foaming unit and a second inlet conduit for introducing said foamable liquid to said second foaming unit, said outlet being adapted for withdrawal of said foam from said second foaming unit;
a first expansion engine having a foam inlet and a foam outlet, said foam inlet of said first expansion engine being coupled to said output of said second foaming unit to receive said foam therefrom, said first expansion engine allowing said received foam to expand isothermally from said third level to an intermediate pressure level between said third and said first pressure levels to thereby produce engine output power, said gas contained in said foam expanding substantially isothermally;
a second defoaming unit having an inlet coupled to said foam outlet of said first expansion engine to receive said foam at said intermediate pressure level and for separating said gas from said liquid of said foam while maintaining said separated gas at said intermediate pressure level, said second defoaming unit having a gas outlet configured for withdrawal of said separated gas and a liquid outlet configured for withdrawal of said separated liquid; and
a second expansion engine having a gas inlet and a gas outlet, said gas inlet of said second expansion engine being coupled to said gas outlet of said second defoaming unit to receive said separated gas therefrom at substantially said intermediate pressure, said second expansion engine allowing said received gas to expand adiabatically from said intermediate pressure level to a pressure level close to said first pressure level to thereby produce engine output power.

4,041,709
THERMAL POWER PLANTS AND METHOD OF OPERATING A THERMAL POWER PLANT
Gundolf E. Rajakovics, Vienna, Austria, assignor to Vereinigte Edelstahlwerke Aktiengesellschaft, Vienna, Austria
Continuation of Ser. No. 480,898, June 19, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,961
Claims priority, application Germany, June 22, 1973, 2331741; Austria, Feb. 27, 1974, 1623/74
Int. Cl.² F01K 23/04
U.S. Cl. 60—655 **4 Claims**



1. A ternary power plant comprising a primary alkali metal energy conversion circuit utilizing an alkali metal as its working medium, a steam energy conversion circuit utilizing water as its working medium, an intermediate energy conversion circuit operatively interposed between said alkali metal circuit and said steam circuit, said intermediate circuit having as its working medium an organic substance which is incapable of vigorously reacting with either said alkali metal or water and is operating between an upper operating temperature and a condensing temperature, first heat transfer means interposed between said alkali metal circuit and said intermediate circuit to effect heat transfer between the working media thereof, and second heat transfer means interposed between said intermedi-

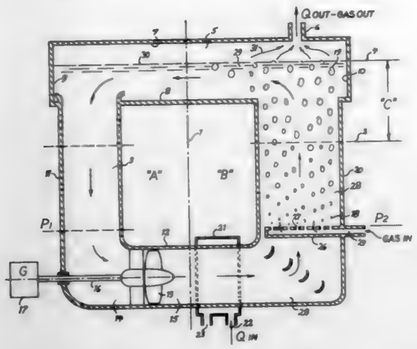
ate circuit and said steam circuit to effect heat transfer between the working media thereof, the upper operating temperature of said working medium of said intermediate circuit being within the range between about 420° and 480° C.

4,041,710

HYDRAULIC PRIME MOVER DEVICE

Robert August Kraus, and Edmund Josef Kraus, both of 14160 Redhill No. 39, Tustin, Calif. 92680

Filed Sept. 9, 1976, Ser. No. 721,849
Int. Cl.² F01K *25/06*
U.S. Cl. 60—673 **2 Claims**



1. A hydrodynamic prime mover device consisting of a closed, vertically oriented fluid recirculation system, utilizing a non-compressible fluid as a working medium and consisting of: a first vertically oriented fluid duct means and a second vertically oriented fluid duct means being laterally connected with each other at their uppermost and their lowermost portion in such a way as to assure a fluid flow from one into the other;

which fluid recirculation system has a fluid downward flow-oriented section, as well as a fluid upward flow-oriented section;

wherein said fluid downward flowing section comprises part of said upper lateral fluid conduit, said first vertical fluid duct means and part of said lower lateral fluid conduit;

and wherein the part of said lower lateral fluid conduit includes a hydraulic-turbine being connected via shaft to an electrical generator means;

which fluid downward flow-oriented section serves the function of generating electrical energy, first through the conversion of the downward flowing fluid's hydrodynamic potential into kinetical energy and then into mechanical energy by driving said turbine which, in turn, drives said electrical generator;

whereas said fluid upward flow-oriented section comprises the second part of said lower lateral fluid conduit, said second vertically oriented fluid duct means, as well as the second part of said upper lateral fluid conduit;

wherein the second part of said lower lateral fluid conduit includes a primary heating means for the heating of the turbine exhausted fluid and the maintenance of the operating temperature thereof, having a separate heating fluid inlet and a separate heating fluid outlet;

and wherein said second vertically oriented fluid duct means includes a gas inducer means at its lowermost effective portion for the induction of a cooled gas at liquid state into the heated upward flowing fluid, as well as including said second part of said upper lateral fluid conduit, which, in the whole, is a hermetically sealed fluid gas separator having a gas outlet at its uppermost portion and a substantial vertical space between the therethrough flowing fluid's surface and the inner upper containment wall;

which upward flow-oriented section serves the function of lifting the turbine exhausted and heated fluid back to its initial potential through the heat absorption of said induced cooled gas in contact with said heat fluid and its subsequent evaporation and expansion therein;

which expanded gas, by virtue of its fluid displacing action, gives rise to the lowering of the gas-containing fluid mass's specific gravity within the device's vertical riser, in contrast to the specific gravity of the gasless downward flowing fluid within the device's penstock;

thus, in turn, giving rise to the establishment of a difference in the hydrodynamic potentials between the downward and the upward flowing fluid respectively;

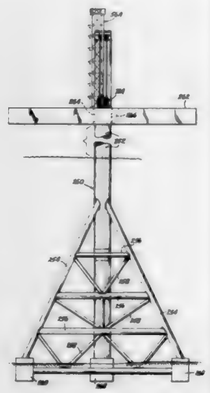
which, in turn, keeps the recirculating fluid in motion as long as a steady supply of thermal energy and a steady flow of cooled gas is made available to said device.

4,041,711

METHOD AND APPARATUS FOR QUICKLY ERECTING OFF-SHORE PLATFORMS

Joseph E. Lucas, Caracas, Venezuela, assignor to Marine Engineering Co., C.A., Caracas, Venezuela

Division of Ser. No. 353,665, April 23, 1973, Pat. No. 3,876,181. This application Jan. 23, 1976, Ser. No. 543,350
Int. Cl.² E02B *17/04*; B66F *1/00*
U.S. Cl. 61—91 **29 Claims**



1. The method of quickly elevating a drilling and production platform on a support including at least one bottomed, upright caisson, comprising the steps of: floating the platform which is formed with at least one caisson well open at one side of the platform into a position about said one caisson so that the caisson is received within said open caisson well; then placing a jacking head on the upper end of at least said one caisson; and then incrementally exerting a downward pull on at least said one jacking head and an upward pull on the platform to successively elevate the platform on at least said one caisson.

4,041,712

METHOD FOR REDUCING WATER LOSS THROUGH SOIL BY SEEPAGE

George Stepien, Jr., Montclair, N.J.; Frank L. Califano, deceased, late of Hackensack, N.J.; William DeLorenzo, Jr., co-executor; G. Bruce Gillard, co-executor, both of Hackensack, N.J.; Thomas E. Russell, deceased, late of Whippany, N.J., and by Florence P. Russell, executrix, Whippany, N.J., assignors to The Flintkote Company, Stamford, Conn.

Continuation-in-part of Ser. No. 457,969, April 4, 1974, Pat. No. 3,891,586, which is a division of Ser. No. 296,114, Oct. 10, 1972, Pat. No. 3,831,382. This application May 14, 1975, Ser. No. 577,209
Int. Cl.² E02D *3/14*
U.S. Cl. 61—36 R **5 Claims**

1. A process for creating a semi-permeable, subsurface barrier for reducing the loss of water by seepage through permeable soils comprising the steps of: applying to the surface of said soils, a composition comprising:

a. a 15 to 50% weight aqueous, cationic emulsion of a petroleum asphalt having a softening point of 90°to 200° F. and a penetration at 77° F. of from 4 dmm to 205 dmm, ninety percent of the particles of asphalt being less than about 10 microns in size;

b. a cationic emulsifier in from 0.15 to 0.75 percent by weight of said emulsion;

c. a non-ionic surface active agent in from 3.0 to 7.5 percent by weight of said emulsion selected from the group consisting of alkyl aryl polyether alcohols, polyethoxylated nonylphenols (average ethylene oxide content of 4–12 mols per mol of nonylphenol), benzyl ethers of octyl phenol and linear organic alcohols;

d. from 1.0 to 10.0 percent by weight of said emulsion of an elastomeric material; and

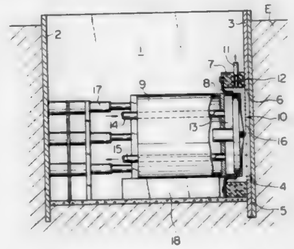
e. an acid in sufficient quantity to set the pH of said composition at from 3 to 7, and thereafter flooding said surface with water to force said emulsion downward into said soil to form a tough, flexible water-impervious mass below said surface.

4,041,713

METHOD AND APPARATUS FOR STARTING A TUNNELING MACHINE FROM AN INITIAL PLACEMENT WITHIN A VERTICAL SHAFT SUNK INTO THE GROUND AND PROVIDED WITH A STARTING PORT

Yasuyuki Iwamitsu, Ichikawa, and Kataro Taira, Tokyo, both of Japan, assignors to Tekken Construction Co. Ltd., Tokyo, Japan

Filed Oct. 8, 1976, Ser. No. 730,866
Claims priority, application Japan, Mar. 8, 1976, 51-24076
Int. Cl.² E01G *3/04*
U.S. Cl. 61—42 **17 Claims**



1. A method of starting a propulsion of a tunneling machine into a soft ground from a vertical shaft at the starting point beyond a retaining wall of the shaft, which comprising steps of

a. providing a second wall having a starting port for the machine inside said retaining wall at a position from where the machine is propelled into the ground,

b. defining a liquid-tight chamber inside the shaft at said starting port with the head part of the machine placed substantially in the starting port,

c. feeding a liquid to said liquid-tight chamber under a pressure at least equal to a pressure applied to the retaining wall from the ground,

d. removing the retaining wall out of the starting port to expose the ground and apply said pressure in the liquid-tight chamber to the exposed ground, and

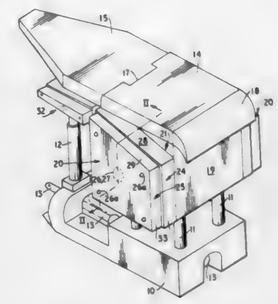
e. propelling the machine into the ground.

4,041,714

MINE ROOF SUPPORTS

Archelaius Dawson Allen, Leyland, England, assignor to Gullick Dobson Limited, England

Filed Sept. 26, 1975, Ser. No. 617,108
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **18 Claims**



1. A mine roof support comprising a base structure, hydraulically extensible prop means mounted on said base structure, a roof-engaging structure including a canopy mounted on said prop means and having an upper roof-engaging surface for application thereby to a roof to be supported, a laterally extensible and retractable auxiliary canopy positioned on at least one side of the support below said upper roof-engaging surface, mounting means connecting said auxiliary canopy to said at least one side of said support for permitting pivotal movement of said auxiliary canopy relative to the vertical, and a device for urging and extending said auxiliary canopy laterally outwardly with respect to the support.

4,041,715

PIT PROP WITH LIFTABLE FRONT END

Willy Watermann, Dortmund-Berghofen, and Walter von der Linden, Hoesel, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Aug. 31, 1976, Ser. No. 719,144
Claims priority, application Germany, Sept. 9, 1975, 2540048
Int. Cl.² E21D *15/44*
U.S. Cl. 61—45 D **10 Claims**

1. A pit prop comprising:

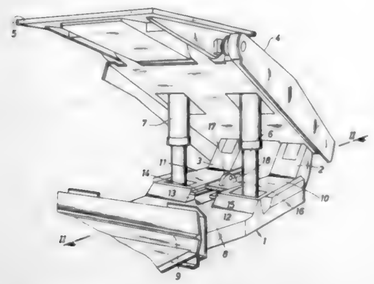
a floor-engaging foot slidable toward and away from a relatively fixed support in a predetermined direction;

a main link having a front end pivoted on said support and a rear end pivoted on said foot and slidable therealong generally parallel to said direction;

a displacement ram extending between said main link and said foot and expansible and contractile in said direction, whereby expansion and contraction of said displacement ram moves said foot relative to said support in said direction;

a secondary link having a front end pivoted on said rear end

of said main link and having a rear end bearing downwardly on and slidable along said foot; and



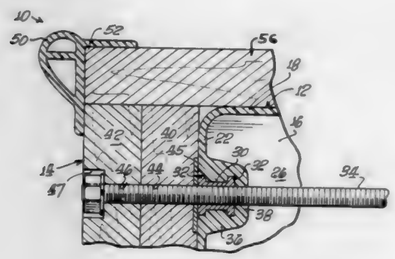
a lifting ram pivoted on said rear end of said main link above said secondary link and pivoted on said rear end of said secondary link, whereby expansion of said lifting ram urges said rear end of said main link upwardly.

4,041,716

SUPPORT STRUCTURE FOR A FLOATABLE MARINE DOCK

Thomas L. Thompson, 1531 Monrovia, Newport Beach, Calif. 92663

Filed Aug. 29, 1975, Ser. No. 608,880
Int. Cl.[2] B63B *35/00*
U.S. Cl. 61—48 **4 Claims**



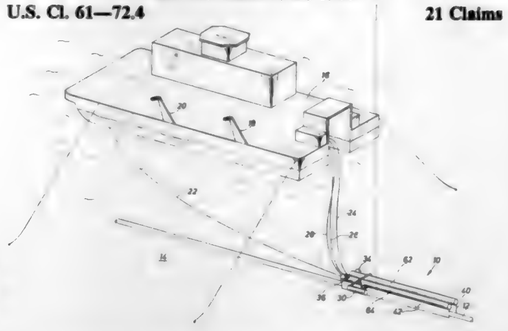
1. A support structure for a floatable marine dock comprising:
- a floating cell defining a sealed, buoyant housing having end walls, a top wall, a bottom wall and side walls formed from a high-density-polyethylene material, wherein said side walls include a plurality of inwardly protruding jackets;
- a plurality of support rods, each continuously threaded throughout the length thereof, each of said rods being threaded through oppositely aligned bushings, thereby forming a rigid structure therebetween, wherein each rod projects outwardly from said side walls thereof;
- sealing means provided by said jackets for sealing engagement with said rods to prevent leakage within said cell;
- a plurality of threaded bushings integrally formed within the side walls and molded within said jackets thereof, said bushings in one of said side walls being oppositely disposed to said bushings in said other side wall, and wherein opposite bushings are axially aligned with each other; and
- a dock-frame structure demountably attached to said projecting ends of said support rods.

4,041,717

SAND SHIELD JET SLED

Edwin J. Dressel, New Orleans, and Houston W. Hunter, Marrero, both of La., assignors to J. Ray McDermott & Co., Inc., New Orleans, La.

Filed July 21, 1976, Ser. No. 707,251
Int. Cl.[2] E02F *5/02, 1/00*
U.S. Cl. 61—72.4 **21 Claims**



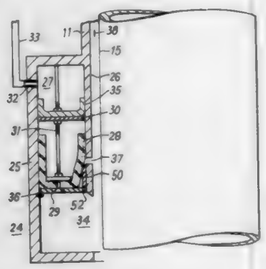
1. Apparatus for entrenching a submerged pipeline in a seabed, comprising:
- a jet sled adapted to straddle the submerged pipe laying on the seabed, said jet sled having jet legs depending downwardly therefrom for forming a trench in the seabed for the pipeline;
- an elongate member extending from the rear of the jet sled; and
- shields attached to said member and disposed on opposite sides of the unsupported portion of the pipeline extending from the surface of the seabed to the bottom of the trench, said shields preventing unconsolidated material from filling in the trench beneath the unsupported length of the pipeline.

4,041,718

SEALING DEVICES

William Bundy Stone, Houston, Tex., assignor to Deep Sea Grouting Packers, Inc., Gretna, La.

Continuation-in-part of Ser. No. 523,803, Nov. 14, 1974, Pat. No. 3,967,456. This application Mar. 24, 1976, Ser. No. 670,064
Claims priority, application United Kingdom, Mar. 24, 1975, 12209/75
Int. Cl.[2] E02D *5/52;* **F16J** *15/40*
U.S. Cl. 61—86 **22 Claims**



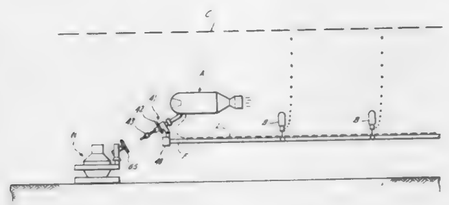
1. A sealing device for sealing an annular space disposed between a tubular supporting leg or a tubular piling can and a pile which passes through either of said tubular supporting legs or said tubular piling can, said tubular supporting leg and tubular piling can supporting a permanent platform disposed above the sea, said sealing device comprising an annular housing which includes an annular protective guard, said annular housing containing an annular sealing element and said annular protective guard being disposed between said annular sealing element and said pile before a seal is made with said pile, actuating means for causing relative axial movement between the annular protective guard and the annular sealing element, said axial movement releasing the annular sealing element whereby the annular sealing element moves into direct sealing contact with the pile and a plurality of support members pivotally connected to the body of the device adjacent the lower end portion of said sealing element, said support members having a length greater than the distance between the annular housing of the sealing device and the tubular piling and lying between the sealing element and the guard before said relative movement is effected and being released by said relative movement to yield into contact with the pile and support the sealing element against excessive deformation or rupture under pressure.

4,041,719

METHOD AND APPARATUS FOR CONNECTING SUBMARINE PIPELINES

Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Filed Apr. 19, 1976, Ser. No. 678,147
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—110 **1 Claim**



1. A method of laying a pipeline on an offshore water bottom, comprising the steps of:
- a. connecting lengths of line pipe end-to-end onshore to form a partial segment of the pipeline;
- b. securing one end of such partial segment to a submersible power vessel;
- c. connecting remotely actuatable submersible buoys to said segment for supporting it either at the water surface or at some desired depth beneath the surface;
- d. connection additional lengths of pipe to the partial segment at the shore end to form a continuous pipeline until the desired length is reached;
- e. connection additional remotely actuatable buoys to said pipeline segment to support the additional lengths of line pipe as needed;
- f. submerging the pipeline beneath the water surface;
- g. towing the submerged pipeline into position offshore with the submersible vessel;
- h. submerging said pipeline and said submersible vessel to a position near the bottom of the water body;
- i. guiding the offshore end of the pipeline segment with the submersible vessel to connect such offshore end with a pre-existing pipeline connection apparatus near the water bottom;
- j. submerging the pipeline to the bottom; and
- k. releasing the pipeline from the remotely actuatable buoys.

4,041,720

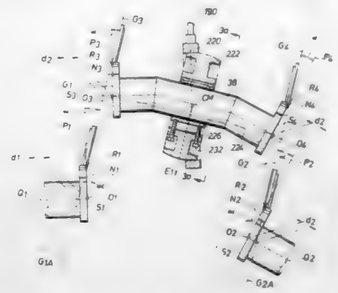
METHOD AND APPARATUS FOR INSTALLING A SPOOL BETWEEN TWO MISALIGNED PIPE SECTIONS

Maurice P. Lebourg, 3700 Greenway Plaza, No. 428, Houston, Tex. 77027

Filed Feb. 2, 1976, Ser. No. 654,411
Int. Cl.[2] F16L *1/00*
U.S. Cl. 61—110 **25 Claims**

1. A method for installing a spool fabricated to fit between the circular ends of two pipeline sections to define corresponding pipeline and spool faces when joinder is complete, said ends of the two pipeline sections being disposed such that the centers of the pipeline section ends can be connected by an imaginary line segment which does not intersect the wall of either pipeline section, and which pipeline ends lie in intersecting planes comprising the steps of:

orienting the spool for insertion between the pipeline ends such that the corresponding points on the mating spool and pipe end faces define parallel lines, and imaginary line segments may be extended from the center of each pipeline section end to the center of the corresponding spool end to which it is to be joined without intersecting the wall of the pipelines or the spool;



affixing guides to said pipeline ends and to the spool end defining planes parallel to the line of intersection between the planes of the pipeline ends and parallel to the line segments between the centers of the pipeline end and the corresponding end of the spool;

said guides extending beyond the perimeter of the pipeline ends and of the spool ends;

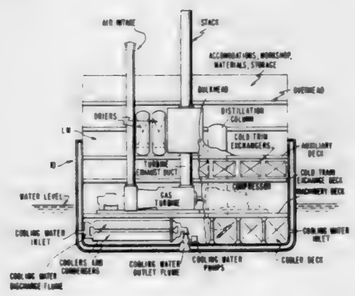
engaging the guides on said pipeline ends with the guides on the corresponding ends of the spool; and moving said spool into mating position with said pipeline section ends so that all the points on the spool travel along lines parallel to the planes of said guides while maintaining said guides in engagement.

4,041,721

VESSEL HAVING NATURAL GAS LIQUEFACTION CAPABILITIES

Ludwig Kniel, Scarsdale, N.Y., assignor to The Lummus Company, Bloomfield, N.J.

Filed July 7, 1975, Ser. No. 593,223
Int. Cl.[2] F17C *13/02*
U.S. Cl. 62—45 **3 Claims**



1. A vessel having natural gas liquefaction capabilities which comprises:
- a hull divided by transversely disposed bulkhead means into a plurality of liquefaction compartments, said bulkheads being substantially water and fire-proof; and

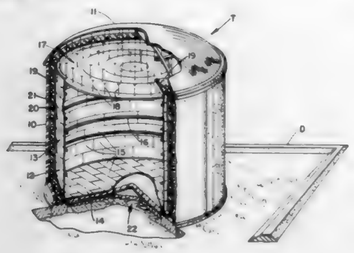
an integrated liquefaction assembly for liquefying natural gas disposed in each of said liquefaction compartments, said liquefaction assembly including compressors which are disposed transverse to the axis of said vessel with compressors of adjacent liquefaction assemblies having opposite senses of rotation.

4,041,722

IMPACT RESISTANT TANK FOR CRYOGENIC FLUIDS

John Terlesky, New Brighton; Hugh Emil Muller; John C. Murphy, both of Pittsburgh, and Harold F. Honath, Coraopolis, all of Pa., assignors to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.

Filed Sept. 26, 1975, Ser. No. 617,109
Int. Cl.² F17C *3/06*
U.S. Cl. 62—45 **42 Claims**



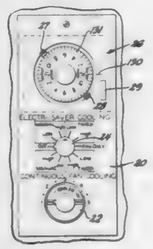
1. An impact resistant tank for storing cryogenic fluids, comprising: an inner tank of metallic material compatible with cryogenic temperatures and having a side wall, a bottom and a roof means; insulation means surrounding the side wall and positioned below the bottom and above the roof means for insulating the inner tank from ambient temperature; an impact resisting, free standing, reinforced concrete wall positioned in concentric, spaced relationship around said inner tank, said concrete wall extending at its upper end above the upper end of the inner tank side wall, said concrete wall being post-tensioned to increase the ability of the concrete to withstand cryogenic temperatures; an impact resisting, reinforced concrete bottom disposed in underlying relation to the inner tank bottom, said concrete wall protecting the inner tank wall from impact loads to maintain the liquid-containing integrity thereof, and said concrete bottom increasing the resistance of the inner tank bottom to impact loads thereon; and seal means on the inner surface and at the bottom edge of the reinforced concrete wall for containing cryogenic liquid in the event of a leak or rupture in the inner tank.

4,041,723

ROOM AIR CONDITIONER WITH TIMER

John Weibel, Jr., and Donald C. Ferdelman, both of Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 3, 1976, Ser. No. 738,612
Int. Cl.² F25B *49/00*
U.S. Cl. 62—126 **3 Claims**



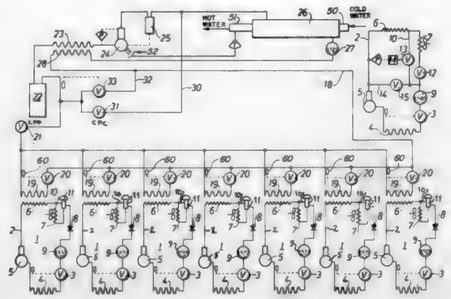
1. In a self-contained room air conditioner unit including a housing enclosing a compressor driven by a motor,a condensor, an evaporator connected in a refrigerant circuit and a fan driven by a motor for circulating room air to be cooled into heat exchange relation with said evaporator; and in which said housing has a room-side section with a control area thereon; the invention comprising an electric timer located at said control area, said timer including a timer motor and timer switch electrically connected in a control circuit and a manually operable time preselector means to preset when said timer switch shall close and open by selecting start and stop times for selectively controlling the time of operation of said unit, said control circuit including first and second supply conductors adapted for connecting the compressor motor and the fan motor to a power source; thermostat switch means operative to cycle in response to the temperature of said circulating air; a multiposition manually operable cycle selector switch connected in said control circuit for selectively operating said unit in a timed cooling mode wherein said fan motor and said compressor motor are cycled on-and-off together by said thermostat switch means only during a timed period defined by starting and stopping times preselected by said timer preselector means; said cycle selector switch including timer shunt selective contact means, compressor motor selective contact means, and fan motor selective contact means; each said selective contact means having a movable contact side and a fixed contact side, said cycle selector switch having first terminal means in series connection between said first supply conductor and the movable contact side of said timer shunt selective contact means, said cycle selector switch having second terminal means common to the fixed contact side of each said selective contact means; said control circuit including as a compressor circuit portion thereof the compressor motor in series connection with said second terminal means, said fixed contact side of the compressor motor selector contact means, said movable contact side of the compressor motor selector contact means, said thermostat switch means and said second supply conductor; said control circuit including as a fan motor circuit portion thereof the fan motor in series connection with said second terminal means, said fixed contact side of said compressor motor selector contact means, said movable contact side of said compressor motor selector contact means, said thermostat switch means, said fixed contact side of said fan motor selective contact means, said movable contact side of said fan motor selective contact means, and said second supply conductor; said timer motor having one side connected to said first terminal means and its other side connected to said second supply conductor whereby said timer motor runs continuously when said supply conductors are connected to said power source, said timer switch being connected between said first terminal means and said second terminal means, whereby upon manual operation of the movable contacts of said cycle selector switch to a predetermined position, said timer shunt selective contact means is electrically shunted in said control circuit by said timer switch which is electrically placed in series with said first and second terminal means to enable said unit to operate in said timed cooling mode for a time in accordance with the start and stop times preselected by said manually operable time preselector.

4,041,724

INSTALLATION FOR HEATING A FLUID, PREFERABLY WATER, IN A CONVENTIONAL CENTRAL HEATING SYSTEM, USING THE WASTE HEAT PRODUCED BY A NUMBER OF REFRIGERATORS

Berth Ulrik Gustafsson, Osterskar, Sweden, assignor to Projectus Industriprodukter AB, Stockholm, Sweden

Filed Jan. 20, 1976, Ser. No. 650,730
Claims priority, application Sweden, Feb. 18, 1975, 7501806
Int. Cl.² F25B *29/00*
U.S. Cl. 62—175 **5 Claims**



1. An installation for heating a fluid by utilizing the waste heat from a plurality of refrigerators, said installation comprising a plurality of refrigerators in combination with a heat pump, each of said refrigerators comprising a first refrigerant circuit including, in series, a first evaporator, a first compressor, a first condenser device and a first expansion valve, said heat pump comprising a second refrigerant circuit including, in series, a second evaporator device having expansion means, a second compressor and a second condenser, said heat pump being arranged to receive via said second evaporator device, the thermal energy from said first condenser device of the refrigerator, and to heat said fluid by heat exchange at said second condenser, said second evaporator device being arranged in the form of parallel-coupled evaporator units each of which is connected to an expansion valve controlled by the refrigerant temperature at the unit outlet; a first by-pass line including a valve, openable when said unit outlet pressure is reduced, arranged between the high pressure side of said second compressor and said second refrigerant circuit, following said second evaporator device; a second by-pass line having a valve controlled by the temperature at the inlet side of said second compressor, arranged in parallel with said second evaporator units being arranged in a heat exchanging relationship with its particular first condenser device of the refrigerators, said first condenser devices each comprising at least one additional condenser unit for the dissipation of the residual heat, a third by-pass line being arranged in parallel with said additional condenser unit, said third by-pass line having therein control means arranged to control the flow distribution between the condenser units as a function of the desired refrigerant pressure after the condenser device.

4,041,725

CONTROL SYSTEM FOR REFRIGERATION UNIT

David Garside, Rosemere, Canada, assignor to Galt Equipment Limited, Candiac, Canada

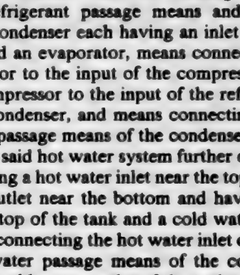
Filed Mar. 4, 1976, Ser. No. 664,026
Int. Cl.² F25D *25/00*
U.S. Cl. 62—223 **11 Claims**

1. In a refrigeration unit including a pressurized liquified gas reservoir and a gas pressure actuated flow valve for releasing the liquified gas, the improvement of a control system for metering liquified gas flow comprising:

a gas line from the liquified gas reservoir;

a first gas pressure actuated three-way valve having a normally closed port connected to the gas line, a normally opened port connected to vent, and a common port connected to the gas pressure actuator of the flow valve;

a second gas pressure actuated three-way valve having a common port connected to the gas pressure actuator of the first three-way valve, a normally opened port connected to the gas line, and a normally closed port connected to vent;



a first restricting means adapted to provide a first time delay for switching the second three-way valve from normally opened to normally closed;

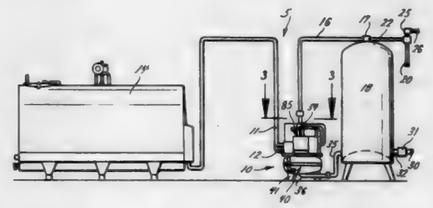
and a second restricting means adapted to provide a second time delay for switching the second three-way valve from normally closed to normally opened.

4,041,726

HOT WATER SYSTEM

Paul Mueller, and Ray A. Prine, both of Springfield, Mo., assignors to Paul Mueller Company, Springfield, Mo.

Filed Mar. 29, 1976, Ser. No. 671,579
Int. Cl.² F25B *27/02*
U.S. Cl. 62—238 **27 Claims**



1. A hot water system for producing hot water within a preselected temperature range by use of controlled convection flow in combination with a refrigeration system, said hot water system comprising a refrigeration system including a water-cooled condenser having refrigerant passage means and water passage means associated therewith defining a heat exchange surface, the refrigerant passage means and water passage means of said condenser each having an inlet and an outlet, a compressor, and an evaporator, means connecting the output of the evaporator to the input of the compressor, means connecting the compressor to the input of the refrigerant passage means of the condenser, and means connecting the output of the refrigerant passage means of the condenser to the input of the evaporator, said hot water system further comprising a hot water tank having a hot water inlet near the top of the tank and a cold water outlet near the bottom and having a hot water outlet near the top of the tank and a cold water inlet near the bottom, means connecting the hot water inlet of the tank to the outlet of the water passage means of the condenser, means connecting the cold water outlet of the tank to the inlet of the water passage means of the condenser, means connecting the cold water inlet of the tank to a source of water to be heated, and a temperature responsive water flow restricting means in the connecting means between the outlet of the water flow passage of the condenser and the hot water inlet of the tank for

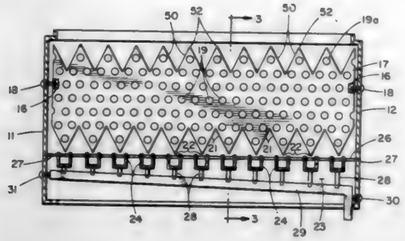
restricting water flow by convection below a preselected water temperature.

4,041,727

EVAPORATOR ASSEMBLY

Eugene Wendell Maudlin, York, Pa., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 2, 1975, Ser. No. 609,280
Int. Cl.² F25D *21/14*
U.S. Cl. 62—290 **1 Claim**



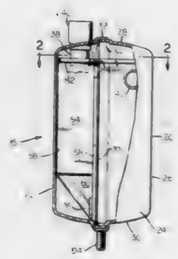
1. An evaporator coil assembly for use in an air conditioning system of the type in which the evaporator coil assembly is located within a plenum through which air to be conditioned is forced upwardly through said coil assembly comprising: an evaporator coil including a plurality of tube sections extending in at least two planes perpendicular to the direction of air flow; a plurality of substantially vertically arranged plate-like fins each lying in a plane parallel to the direction of air flow and being in heat exchange contact with substantially all the tube sections traversing said plane, each said fin having a lower edge providing V-shaped tapered portions with the apex thereof arranged at the lowermost condensate discharge point of each fin; a plurality of spaced parallel condensate-collecting troughs supported on said cabinet in said passage and extending substantially the length of said coil portions of said evaporator, said troughs underlying said V-shaped tapered portions of said fins and each trough having a width to underlie only the condensate discharge points of the adjacent fins to collect condensate gravitating from the fins while reducing interference with the flow of air through said passage to a minimum; and means defining an upper edge on each of said plate-like fins, said upper edge having a saw-tooth like configuration.

4,041,728

SUCTION ACCUMULATOR

Robert L. Morse, Adrian, Mich., and Sharon J. Hudson, Jr., Toledo, Ohio, assignors to Tecumseh Products Company, Tecumseh, Mich. and Sharon Manufacturing Company, Toledo, Ohio

Filed July 21, 1975, Ser. No. 597,584
Int. Cl.² F25B *43/00*
U.S. Cl. 62—503 **11 Claims**



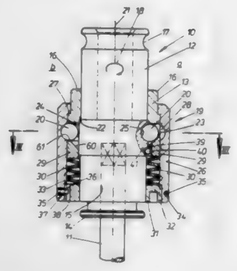
1. A refrigerant retention device comprising a suction accumulator or the like for a refrigerant compressing—evaporating system, said accumulator comprising in combination a pressure vessel, a vertically disposed weir member within said vessel, said vessel having first and second wall sections confronting said weir member on opposite sides of said weir member, said weir member forming a reservoir with said first confronting vessel wall section on one side of said weir member and an outlet flume with said second confronting vessel wall section on the other side of said weir member, a liquid metering aperture through the bottom of said weir member communicating said reservoir with said flume, a fluid inlet to the vessel entering into said reservoir, a fluid outlet from the vessel exiting from said flume, said fluid inlet being disposed generally horizontally and being oriented to direct a stream of fluid into said reservoir tangentially relative to said first confronting vessel wall section at an elevation below the upper end of said weir member and a baffle disposed in said vessel generally horizontally across said reservoir and above the elevation of said fluid inlet to thereby separate said reservoir into a lower, liquid-receiving chamber and an upper gas-accumulating chamber communicating with an inlet to said flume, said baffle having aperture means providing communication between said chambers.

4,041,729

OVERLAND COUPLING DEVICE

Reiner Bilz, Stuttgart, Germany, assignor to Otto Bilz Werkzeugfabrik, Ostfildern, Germany

Filed Feb. 25, 1976, Ser. No. 661,168
Claims priority, application Germany, Mar. 14, 1975, 2511148
Int. Cl.² F16D *3/56*
U.S. Cl. 64—29 **29 Claims**



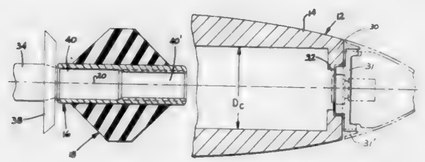
1. An overload coupling device for thread-cutter - chucks, quick-change inserts therefor, and the like, said device comprising a cylindrical sleeve loadable with the rotational drive moment; a drive shank drivable by means of the drive sleeve and held coaxially and rotatably within the latter, said shank having a mounting for the rotation-fast retention of a tap drill; a torque coupling with adjustable tripping torque seated in the force-transmission parts between drive sleeve and drive shank, said coupling being formed as spring-loaded ball-pocket coupling with at least one coupling ball, the drive sleeve being axially non-displaceably held on the drive shank and provided with at least one opening open in the axial direction on one axial end face and serving for the reception of said coupling ball, the angular width of said opening being at least as great as the coupling ball diameter, the drive shank in the axial region of the opening comprises a ball-pocket of a diameter smaller than the diameter of the coupling ball for the reception of the coupling balls, said opening being formed as cage slots which are inwardly and outwardly open in the radial direction and the axial extent of which is less than the coupling ball diameter, the cage slots being inclined toward the working drive direction of the drive sleeve, the ball-pockets being arranged on the outer peripheral surface of the drive shank facing the drive sleeve; a cylindrical closure sleeve coaxially enclosing the drive sleeve and the drive shank being axially non-displaceably held on the drive sleeve and possessing in the axial region of the cage slots in the interior an annular groove the bottom of which extends at a radial distance corresponding at least to the coupling ball diameter from the peripheral surface of the drive shank; and in the annular space between drive shank and closure sleeve on the axial side of the coupling balls remote from the bottom of the cage slots a thrust ring which is pressable axially in the direction towards the cage slots and against the coupling balls by means of thrust springs adjustably supported on the closure sleeve the two mutually opposite walls of each cage slot considered in a diametric plane at right angles to the longitudinal central axis each extending along a secant of the peripheral circle of the drive shank and of the drive sleeve and parallel to and with spacing from a diameter of said peripheral circle.

4,041,730

MARINE PROPELLER BUSHING COUPLING

Robert F. Kress, Grand Rapids, Mich., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 11, 1976, Ser. No. 657,258
Int. Cl.² F16D *7/02*
U.S. Cl. 64—30 D **2 Claims**



1. A marine propulsion drive coupling bushing assembly, comprising an outer housing, an inner sleeve, and an annular rubber bushing within said housing and around said sleeve; said housing, sleeve and bushing being symmetrical about a central axis of rotation, said housing forming an inner chamber, and having a substantially cylindrical inner engagement surface of diameter D_C surrounding said inner chamber; said sleeve having an outer surface of diameter D_S spaced radially inwardly of said housing inner engagement surface to define an annular chamber therebetween; said annular bushing having an inner surface bonded to said sleeve outer surface, and having a free configuration substantially trapezoidal in cross section on a radial plane, the base of the trapezoid being at said bushing inner surface; said bushing free configuration having a diameter D_B with the following relationship to diameters D_C and D_S:

$$\left(\frac{D_C^2 - D_S^2}{D_B^2 - D_S^2}\right) = \text{about } 0.4 \text{ to } 0.6$$

and said bushing, in its assembled condition in said annular chamber between said chamber inner surface and said sleeve outer surface, having a diameter equal to diameter D_C.

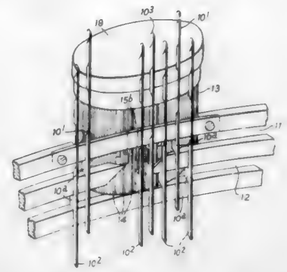
4,041,731

PATTERNING UNITS FOR CIRCULAR KNITTING MACHINES

Herbert York, Great Glen, England, assignor to Kroy Knitting Developments Ltd. and B.Y. (Simulated Furs) Limited, both of Kent, England

Filed Dec. 16, 1975, Ser. No. 641,173
Claims priority, application United Kingdom, Dec. 24, 1974, 55798/74
Int. Cl.² D04B *15/74*
U.S. Cl. 66—50 B **4 Claims**

1. In combination a patterning unit and a circular knitting machine having a rotatable needle cylinder, the patterning unit comprising an outer cylindrical pattern drum which is axially tricked around its periphery, the tricks being circumferentially spaced apart at the same pitch as the knitting instruments in the needle cylinder of the knitting machine, the drum being rotatable about an axis which is paralled to the knitting instruments in the cylinder, by way of all the needles in the needle cylinder which engage in tricks of the drum, a plurality of individually slidable selector elements arranged to function within predetermined ones only of the axial tricks in accordance with patterning requirements, a relatively fixed core-like inner component of cylindrical form housed within the rotatable outer drum, a suitably contoured cam formation surrounding said core-like inner component and adapted, by co-operation with complementary formations on the selector elements, to impart to the latter axially directed sliding movements to and fro within the tricks, the slidable selector elements being set out in the tricks in the rotary outer cylindrical pattern drum in a predetermined manner dictated by the required pattern area and the relative sizes of the knitting machine needle cylinder and the patterning unit itself.

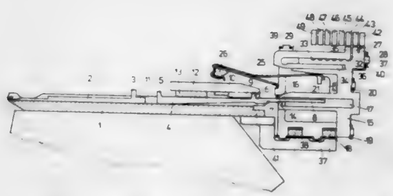


4,041,732

STRAIGHT AND CIRCULAR KNITTING MACHINE

Erich Krause, Bopfingen, Germany, assignor to Universal Maschinenfabrik Dr. Rudolf Schieber KG, Westhausen, Germany

Filed Mar. 31, 1976, Ser. No. 672,356
Claims priority, application Germany, Apr. 8, 1975, 2515201
Int. Cl.² D04B *7/00, 15/66*
U.S. Cl. 66—75.2 **16 Claims**



1. A straight knitting machine comprising: a needle bed, needle means carried by said needle bed, a slide, cam means carried by said slide for selectively actuating said needle means for carrying out casting-on, loop-forming and stitch transfer, by lowering or lifing the needle means into or out of the needle bed so that a foot of each needle means completely or partially projects from the needle bed or is withdrawn completely into the needle bed, spring means for raising said needle means, rows of pressure strips for pressing the needle means into the needle bed, said pressure strips being mounted for staggered displacement on said slide which carries said cam means, a selector element selectively adjustable in several stages with respect to each row of said pressure strips and being operatively associated with each slot in the needle bed for transmitting control movements from the pressure strips to each needle means, intermediate members, each needle means comprising a shaft, the shaft of said needle means being mounted in a respective intermediate member without clearance above and blow, at least some of said intermediate members having feet ar-

ranged in a plurality of rows for engagement by one or more of said pressure strips said feet being immovably arranged on at least some of said intermediate members, and at least on movable foot being provided on each intermediate member for movement selectively into different row, the position at which the intermediate members in a needle compartment of the knitting machine are inserted being non-alterable, said cam means having no displaceable lifting parts for moving the needle means.

4,041,733

YARN GUIDE CONTROL

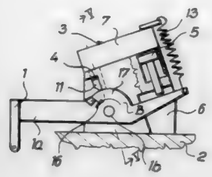
Pavel Brada; Jaromir Kučera; Otokar Chládek; Gustav Voda; Jindřich Nováček, and Jan Kollmann, all of Trebic, Czechoslovakia, assignors to Elitex, Liberec, Czechoslovakia

Filed Apr. 2, 1976, Ser. No. 672,844

Claims priority, application Czechoslovakia, Apr. 3, 1975, 2270/75

Int. Cl.² D04B *15/58*

U.S. Cl. 66—138 **5 Claims**



1. In a multifeed circular knitting machine apparatus for controlling the movement of a yarn guide secured at the end of a lever for pivotal movement between an inoperative and operative position comprising spring means for normal biasing said lever in the operative position, a first pneumatical piston actuable on said lever to selectively move said lever against said bias in response to a pneumatic impulse, a second pneumatic piston having a pawl, a recess formed in the lever at a position corresponding to said pawl when said lever is moved into the inoperative position, and spring means biasing said second piston to cause said pawl to normally engage said lever, said second piston being operable on receipt of a pneumatic impulse to release said pawl and permit said lever to move into the inoperative position.

4,041,734

DEVICE FOR SUPPORTING AND GUIDING KNITTING NEEDLES FOR KNITTING MACHINES

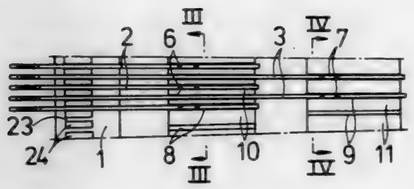
Inamoto Yoichi, No. 13 3-chome, Nagar-Naka-doori, Ooyodo, Osaka, Japan (531)

Filed May 21, 1976, Ser. No. 688,660

Claims priority, application Japan, June 6, 1975, 50-68809

Int. Cl.² D04B *15/00*

U.S. Cl. 66—115 **7 Claims**



1. A device for supporting and guiding knitting needles for use in a knitting machine comprising a needle bed having needle grooves for receiving the stems of knitting needles and to guide advance and retraction movements of the needles, the needle grooves being arranged side-by-side and provide in two rows in front and rear regions of the needle bed respectively with respect to the direction of the advance and retraction movements, at least the needle grooves in the front region being interconnected by flat wall surfaces and the needle grooves in one of the regions being out of alignment with the needle grooves in the other region and offset in a direction perpendicular to the direction of the movement, the stems of the knitting needles being alternatively insertable in the needle grooves of the rear region when in a position of use extend over the flat surface of the walls between the needle grooves of the front region.

4,041,735

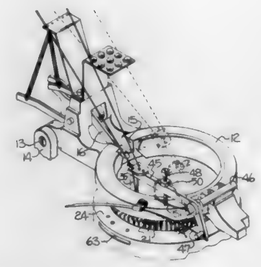
AUXILIARY KNITTING STATION FOR HOSIERY KNITTING MACHINE

Otis W. Holder, Mount Airy, N.C., assignor to Oakdale Knitting Company, Mount Airy, N.C.

Filed Aug. 27, 1976, Ser. No. 718,364

Int. Cl.² D04B *15/54*

U.S. Cl. 66—133 **8 Claims**



1. In a circular hosiery knitting machine including a needle cylinder, a circle of latch needles supported for vertical movement in said needle cylinder, a latch ring surrounding the upper end of said circle of latch needles, a sinker bed supported on said needle cylinder and containing radially movable sinkers, each of said sinkers including a lower ledge for forming body yarn stitch loops and an upper ledge for forming terry loops, and a main knitting station including yarn feed fingers supported for movement into and out of yarn feeding position in said latch ring, the combination therewith of an auxiliary knitting station comprising

a. auxiliary stitch cam means movable between operative and inoperative positions adjacent said needle cylinder and spaced from said main knitting station,

b. an auxiliary yarn feed finger sufficiently thin to be selectively movable between a lowered or active position between said latch ring and said circle of needles and a raised or inactive position above the circle of needles, said auxiliary yarn feed finger comprising

1. a relatively flat, substantially vertically disposed main body portion including a lower end positioned below the level of said upper ledges of said sinkers and closely adjacent said lower ledges of said sinkers when said auxiliary yarn feed finger is in said active position,
2. first yarn guide means adjacent said lower end of said main body portion for feeding a first yarn to said needles at a level below said upper ledges of said sinkers, and
3. second yarn guide means spaced above said first yarn guide means for feeding a second yarn to said needles at a level above the level of said upper ledges of said sinkers,

c. control means attached to the upper end portion of said main body portion of said auxiliary yarn feed finger and extending above said latch ring for controlling movement of said auxiliary yarn feed finger between said active and inactive positions, and

d. sinker cam means positioned at said auxiliary knitting station and being engageable with said sinkers for moving the same outwardly in advance of said auxiliary yarn feed finger so that said upper ledges of said sinkers may pass said auxiliary yarn feed finger and for moving said sinkers inwardly immediately after they pass said auxiliary yarn feed finger.

4,041,736

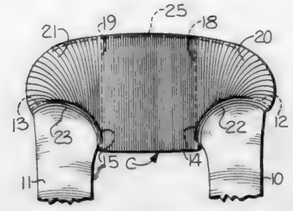
LOWER BODY GARMENT AND METHOD OF MAKING SAME

Oscar Fregeolle, Hickory, N.C., assignor to Pilot Research Corporation, Valdese, N.C.

Filed Oct. 16, 1973, Ser. No. 406,813

Int. Cl.² A41B *9/00, 11/00*

U.S. Cl. 66—177 **12 Claims**



1. A seamless knit lower body garment comprising a pair of seamless tubular leg portions and a panty portion connecting the two leg portions and having a waist opening extending across the upper edge thereof, said panty portion including a central body portion knit of full courses extending from the waist opening in the front of said garment to the waist opening in the rear of said garment and between said leg portions to provide a crotch area, and a single reciprocatorily knit fashioned body gusset on each side of said central body portion, one of said fashioned body gussets being integrally knit with one side of said central body portion and being formed solely of narrowed partial courses, the other of said fashioned body gussets being integrally knit with the other side of said central body portion and being formed solely of widened partial courses, and the partial courses of each of said body gussets having opposed ends joined directly to the adjacent complete courses of said leg portions along corresponding gore lines.

7. A method of making a seamless knit lower body garment comprising the successive steps of knitting a plurality of complete courses to form a first seamless tubular leg portion, reciprocatorily knitting a plurality of partial courses to form a first body gusset while fashioning to increase the width of the body gusset, knitting a plurality of full courses to form a central body portion integrally knit with the first body gusset and defining a crotch area, reciprocatorily knitting a plurality of partial courses to form a second body gusset while fashioning to reduce the width of the second body gusset, and knitting a plurality of complete courses to form a second tubular leg portion integral with the second body gusset.

4,041,737

CLOTHES WATER EXTRACTING MACHINE

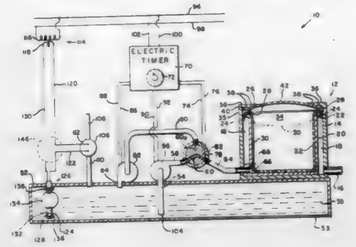
Saturno Angelo Masci, Bedford, Mass., assignor to Walter J. Kreske, Newton, Mass.

Filed Feb. 25, 1974, Ser. No. 445,801

Int. Cl.² D08F *47/00*

U.S. Cl. 68—242 **5 Claims**

1. In a laundry clothes water extracting machine of the type having a flexible diaphragm with an outer and inner surfaces and the inner surface forming a receptacle for receiving wet clothes for extraction of water therefrom, a water storage reservoir, pump means for pressurably applying the reservoir water from said reservoir about the outside surface of the diaphragm to thereby cause the diaphragm to compress against the clothes and squeeze the clothes water therefrom and thereafter return the reservoir water to the reservoir, and said pump means having a reservoir water intake opening positioned at a depth in said reservoir such that under normal non-leaking operating conditions said intake opening will continue to be immersed in said reservoir water below the reservoir water level reached when the amount of water remaining in said reservoir has been diminished by the amount of reservoir water applied against said diaphragm, the combination of a water valve having an inlet for coupling to an external water supply source which is different from that exhausted from said diaphragm and an outlet coupled to said reservoir, electrically energizable means coupled to said water valve for selectively opening and closing said water valve to flow of water from said external water supply source to said reservoir, electric



circuit means coupled to said electrically energizable means for applying electrical energy from an electric power source to said electrically energizable means, and a reservoir float operable switch in said electric circuit means positioned with both said switch and float in said reservoir for creating a closed electric circuit between said electric power source and said electrically energizable means at a first water level in said reservoir which is above said reservoir water intake opening and below said diminished reservoir water level and creating an open circuit between said electric power source and electrically energizable means at a second water level in said reservoir to supply additional water from said external water supply to a level which is above said first reservoir water level which leaves sufficient remaining capacity in said reservoir for the return of reservoir water applied against said diaphragm to thereby prevent injury to components of said machine from lack of reservoir water.

4,041,738

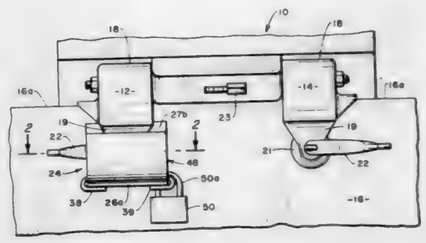
LOCKING DEVICE FOR OUTBOARD MOTOR

Stephen R. Vann, 20160 Van Owen, Canoga Park, Calif. 91306

Filed May 10, 1976, Ser. No. 684,553

Int. Cl.² F16B *41/00*

U.S. Cl. 70—212 **12 Claims**



1. A locking device for an outboard motor having a C-shaped mounting bracket fitting over the back transom of a boat and containing a mounting screw with a handle at one end and a foot at the other end, said locking device comprising:

a first member having two angularly positioned arms, one of said arms extending outwardly from said transom and the other of said arms being held adjacent said transom by said foot;

a second member having a first portion, a handle restraining portion extending from said first portion and shaped to prevent rotation of said handle; guide means for slidably connecting said first portion of said second member and said one arm of said first member; and

lock means for securing said one arm to said first portion in various relative positions, said lock means locking said members together in a relative position with said other arm adjacent said transom and said restraining portion adjacent said handle to prevent rotation of said handle.

4,041,739

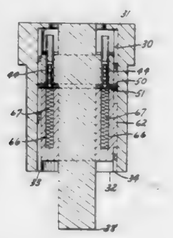
MULTIPLE AXIAL PIN TUMBLER LOCK

Leonard Mercurio, 34 Beaumont Drive, Plainview, N.Y. 11803

Filed Nov. 15, 1976, Ser. No. 741,892

Int. Cl.² E05B *27/08*

U.S. Cl. 70—363 **2 Claims**



1. In a multiple axial pin tumbler lock including an outer housing element adapted to be engaged in non-rotational relation relative to a supporting structure, a rotating cylinder element including a rearwardly projecting shaft for actuating a latch, a relatively fixed cylinder element axially aligned with said rotating cylinder element, and a plurality of split pin tumblers engaging bores in said rotating and relatively fixed cylinder elements to immobilize said rotating cylinder element, said pins defining a parting line which is aligned with an edge of said rotating cylinder upon insertion of a key engaging the outer ends of said pins, the improvement comprising: a thin plate having first and second planar surfaces abutting a planar surface of each of said rotating and fixed cylinder elements, said plate having peripherally disposed bores permitting the passage of pin tumblers therethrough and means preventing axial rotation of said plate relative to said housing element; said pin tumblers having annular recesses along the length thereof, said relatively fixed cylinder element being positioned in said housing element and having means permitting limited axial rotation of said relatively fixed cylinder element relative to said housing element; whereby upon an attempt to pick said lock by exerting a torque upon said rotating cylinder element in the absence of a proper key, said rotating and relatively fixed cylinder elements will execute limited rotation relative to said plate, resulting in disalignment of the peripherally disposed bores thereof with respect to corresponding bores in said fixed cylinder element, the edges of said bores in said plate engaged at least some of the annular recesses in said pins to prevent axial movement thereof.

4,041,740

HAND TOOL

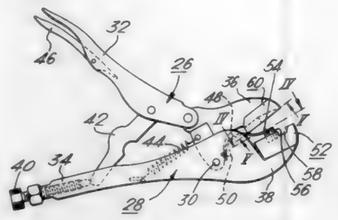
Francisco Villazon, Barcelona, Spain, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 30, 1976, Ser. No. 755,526

Claims priority, application United Kingdom, Jan. 17, 1976, 1845/76

Int. Cl.² B21D *9/08*

U.S. Cl. 72—410 **4 Claims**



1. A hand tool comprising a pair of arms which are pivotally connected together at a position intermediate their ends, the parts of the arms on one side of the pivot constituting handles and the parts of the arms on the other side of the pivot constituting jaws between which a workpiece can be compressed by movement of the handle parts of the arms towards each other, and including a spring wire member having one end secured to an arm of the tool adjacent the pivot and extending away from the pivot between the jaw parts of the tool, the spring wire member being bowed outwardly of one arm towards the other arm, and having its free end extending through a guide on the one arm, the guide permitting movement of the spring wire member therethrough towards the free ends of the jaw parts, the bowed portion of the spring wire member being engageable by the other arm of the tool as the jaw parts of the tool approach each other, thereby to urge the spring wire member through the guide such that the free end of the spring wire member passes over a recess in the jaw part of said one arm of the tool before the jaw parts of the tool reach their most closed position.

4,041,741

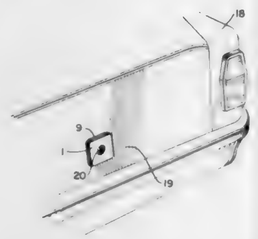
AUTOMOBILE TRUNK GUARD

Carlos U. Cintron, 8012 Bainbridge Road, Alexandria, Va. 22308

Filed Dec. 31, 1975, Ser. No. 645,926

Int. Cl.² E05B *63/00*

U.S. Cl. 70—417 **2 Claims**



1. Apparatus for protecting a trunk lid and trunk lock of an automobile to prevent forceable entry into the trunk of the automobile comprising:

a first protective plate made of a substantially heavy gauge metal, said first protective plate having a hole located substantially in the center thereof and having first and second threaded studs secured to one of its surfaces and projecting away from said surface, said first and second threaded studs being located on opposite sides of said hole and being spaced apart from said hole;

a resilient washer having substantially the same size and shape as said first protective plate and having a substantially centrally located hole of substantially the same diameter as said hole in said first protective plate, said resilient washer further having first and second holes located on opposite sides of said substantially centrally located hole of said resilient washer and spaced apart therefrom, said first and second holes in said resilient washer being located relative to said substantially centrally located hole in said resilient washer such that said first and second studs of said first protective plate will pass through said first and second holes of said resilient washer with said substantially centrally located hole of said resilient washer being aligned with said substantially centrally located hole in said first protective plate;

a second protective plate made of a substantially heavy gauge metal and having a substantially centrally located hole of sufficient diameter to permit said second protective plate to slip over the cylinder of said lock of said trunk lid and having first and second holes located on opposite sides of said substantially centrally located hole, said first and second holes in said second protective plate being so located relative to said substantially centrally located hole in said second protective plate that said first and second threaded studs will pass through said first and second holes of said second protective plate with the substantially centrally located hole in said second plate being substantially aligned with said substantially centrally located hole in said second plate when said first and second threaded studs are passed through said first and second holes in said second protective plate; and

first and second nuts for securing said first protective plate to said second protective plate such that said first protective plate is located on the outside surface of said trunk lid and said second protective plate is located against the inside surface of said trunk lid with said cylinder of said lock of said trunk lid extending beyond said second protective plate into said trunk, said resilient washer being sandwiched between said outside surface of said trunk lid and said first protective plate, said first and second nuts being threaded onto said first and second threaded studs of said first protective plate.

4,041,742

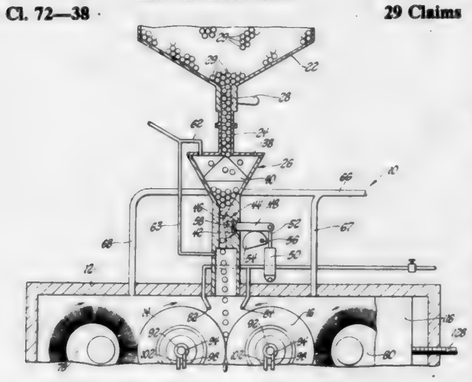
APPARATUS AND METHOD FOR COLD WORKING METAL POWDER

Walter J. Rozmus, Birmingham, Mich., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Jan. 15, 1976, Ser. No. 649,540

Int. Cl.² B21B *9/00*

U.S. Cl. 72—38 **29 Claims**



1. Cold rolling apparatus for powder metal comprising: an enclosed work chamber, a pair of rolls mounted for rotation within said chamber, drive means for rotatably driving said rolls, metering means for permitting the passage of metal powder between said rolls at a predetermined rate, supply means for supplying metal powder in bulk to said metering means, means for introducing an inert gas into said chamber, circulating and filter means for drawing said inert gas from said chamber, filtering said inert gas to remove solid contaminants, and returning filtered inert gas to said chamber, lubricating means for applying a lubricant to said metal powder prior to its passage through said rolls to reduce bonding of the powder particles to the rolls and to each other, and receiving means for receiving said metal powder subsequent to its passage through said rolls.

4,041,743

HIGH PRESSURE PRESS

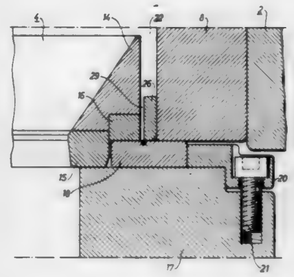
Hans Gunnar Larsson, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Nov. 20, 1975, Ser. No. 633,843

Claims priority, application Sweden, Dec. 6, 1974, 7415294

Int. Cl.² B21D *72/10*

U.S. Cl. 72—60 **6 Claims**



1. Press for hydrostatic extrusion comprising a press chamber adapted for enclosing a pressure medium said press chamber being formed of a high pressure cylinder with an inner liner, a piston movable into the cylinder at one end for effecting pressurization of an enclosed pressure medium, a die and a die support at the other end of the cylinder, and sealing means for preventing the pressure medium from escaping between the cylinder and the piston and die and die support at the ends thereof, in which there is a gap between the liner and the die, and in which the die support comprises an exchangeable support ring which engages the end surface of the liner of the high pressure cylinder and bridges the gap between the liner and the die and constitutes a support for the die against which one end surface of the die seals.

4,041,744

HIGH PRESSURE PRESS

Hans Gunnar Larsson, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed Nov. 20, 1975, Ser. No. 633,842

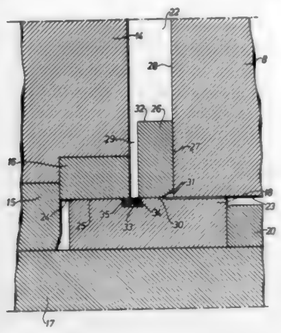
Claims priority, application Sweden, Dec. 6, 1974, 7415295

Int. Cl.² B21D *72/10*

U.S. Cl. 72—60 **2 Claims**

1. Press for hydrostatic extrusion comprising a pressure chamber adapted for enclosing a pressure medium, said pressure chamber including from a high pressure cylinder, a piston movable into the cylinder at one end for effecting a pressurization of an enclosed pressure medium, a die and a die support at the other end of the cylinder, and sealing means for preventing the pressure medium from escaping between the cylinder and the piston and the die and die support at the ends thereof, in which there is a metallic sealing ring in the high pressure cylinder having an outer cylindrical surface in contact with the inner wall of the cylinder by the pressure medium and an outer

end surface engaging a support member, the outer end surface of the sealing ring having a recessed portion forming together with the supporting member or together with the supporting member and the cylinder an annular space, said space commu-



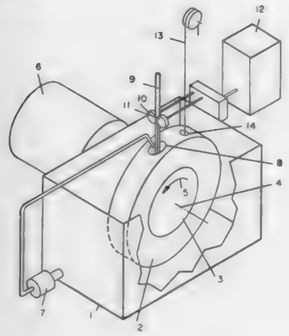
nicating with the surrounding atmosphere through a groove or channel in the support member or the cylinder, whereby the contact pressure between the outer end surface of the ring and the supporting member thus exceeds the pressure of the pressure medium in the pressure chamber.

4,041,745

APPARATUS FOR CONTINUOUS EXTRUSION

Marc Moreau, Asnieres, France, assignor to Trefimetaux, Paris, France

Filed Apr. 14, 1976, Ser. No. 676,908
Claims priority, application France, May 14, 1975, 75.15733
Int. Cl.² B21C *23/00*
U.S. Cl. 72—60 **8 Claims**



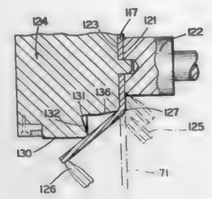
1. Apparatus for continuous extrusion of a first elongated object of indefinite length into a second object of the same type but of smaller cross section comprising, a unit defined by two co-axial members, one of said members being a rotor, and being driven by a motor and said other member being a stator, said members defining a four-sided passage between them, a groove formed in the surface of said rotor to define three sides of said passage, the opposed surface of the stator defining the fourth side of the passage, stop means carried by the stator to close the passage and an outlet die port in said stator near said stop means, an inlet port in said stator located at a position removed from said stop means and a die port, roller means including a pair of spaced rollers for forming a pair of substantially plane and parallel flats on said object to be extruded before it enters said inlet port, the said passage having two opposed sides which are substantially plane and parallel surfaces, the distance between them exceeding the distance between the rollers forming the said flats on the object by twice a quantity ranging from 0.001 to 0.1 mm, the depth of the passage, in a direction parallel to its lateral surfaces, exceeding the dimensions of the object to be extruded in that direction by at least three times the distance between a flat on the object to be extruded and the cooperating side of the groove, means for storing a supply of viscous fluid and means for feeding said fluid into the passage around the object to be extruded.

4,041,746

METHOD OF MAKING V-GROOVED SHEET METAL PULLEYS

Derald H. Kraft, Canton, Ohio, assignor to Aspro, Inc., Canton, Ohio

Division of Ser. No. 593,653, July 7, 1975, Pat. No. 3,995,474.
This application Aug. 16, 1976, Ser. No. 714,488
The portion of the term of this patent subsequent to Nov. 16, 1993, has been disclaimed.
Int. Cl.² B21D *22/14, 29/02*
U.S. Cl. 72—83 **10 Claims**



1. In a method of making a dynamically balanced cup-shaped sheet metal pulley blank of the type having a bottom hub flange wall and a connected outer cylindrical side wall terminating in an open end, from a flat sheet metal disc with pressure roll forming means, for use as a stage blank for forming a V- grooved pulley, including the steps of:

a. providing a flat uniform thickness sheet metal disc having a central hole formed therein:

b. clamping a central portion of the disc around the hole between opposed relatively axially movable complementary clamping faces of rotatable headstock and tailstock die means wherein the headstock die means also has cylindrical flange-forming means, reentrant conical flange forming means connected with the cylindrical flange forming means by a reentrant corner acutely angled in cross section, and axially extending hub forming means connecting the clamping face of the headstock die means with the reentrant conical flange forming means;

c. rotating the die means and clamped disc;

d. reforming the disc into a cup-shaped blank having a flat hub flange bottom wall, an annular reversely angled conical flange portion terminating in an axially extending open-ended cylindrical side wall portion and an axially extending annular hub wall portion connecting the bottom hub flange wall with the conical flange portion by pressure rolling, forming and ironing the rotating annular disc metal portions surrounding said central portion against the headstock die means axially extending hub forming means, the cylindrical and conical flange forming means and the connected reentrant corner;

e. said reforming step including forming a reentrant corner, acutely angled in cross section, connecting said reversely angled conical flange and said axially extending side wall portion;

f. maintaining the thickness of the disc metal throughout the hub flange bottom wall substantially unchanged from that of the sheet metal disc;

g. thinning and elongating the disc metal during the reforming step throughout the conical flange portion, the reentrant corner, the cylindrical side wall portion and the axially extending hub wall portion; and

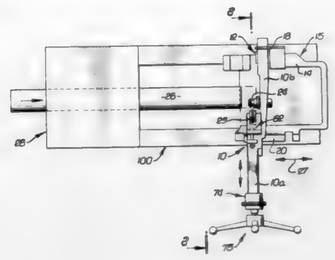
h. then while continuing rotation of the die means and clamped blank, trimming the open end of the cylindrical side wall to predetermined axial length with respect to the acutely angled reentrant corner.

4,041,747

PIPE GROOVING APPARATUS

Robert D. Elkin, Claremont, Calif., assignor to Collins Machinery Corporation, Monterey Park, Calif.

Filed Aug. 5, 1976, Ser. No. 711,800
Int. Cl.² B21D *17/04*
U.S. Cl. 72—105 **10 Claims**



1. In apparatus for grooving pipe extending longitudinally axially, the combination comprising

a. a tranversely elongated frame adapted to be displaced transversely relative to the pipe axis,

b. a grooving roller having an annular boss to swage the groove in the pipe, and a back-up roller having an annular recess in transverse alignment with said boss, said rollers carried by the frame,

c. and means to bodily and progressively displace one of the rollers relatively toward the other roller to cause the boss to progressively form the groove in the pipe wall being rotated between the rollers, the two rollers being rotated in response to pipe rotation,

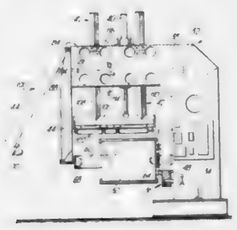
d. there being carriage structure carrying the frame for bodily transverse displacement to displace both rollers into position to receive the pipe wall therebetween, said structure floatably carrying the frame for said displacement, whereby the two rollers and frame may be bodily displaced transversely in response to groove formation.

4,041,748

METHOD AND APPARATUS FOR FABRICATING METAL CONTAINER

Eugene O. Wittke, 1609 - 29th St. SE., Medicine Hat, Alberta, Canada (T1A 2H8)

Filed July 28, 1976, Ser. No. 709,408
Claims priority, application Canada, May 3, 1976, 251671
Int. Cl.² B21D *5/08*
U.S. Cl. 72—166 **6 Claims**



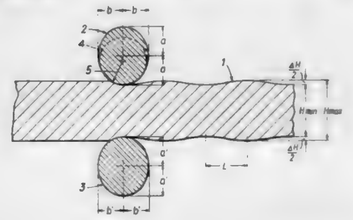
1. Apparatus for fabricating rectangular containers from a single steel sheet comprising a frame; a rectangular mandrel projecting from said frame and mounted for rotation about a horizontal axis; motor means for rotating said mandrel; a cantilever arm projecting outwardly of the frame and substantially parallel with above said mandrel horizontal axis; an end of gate on the end of said arm and depending therefrom, pivot means on the end of said gate remote from said arm for rotatably supporting one end of the mandrel; and vertically oriented hydraulic ram means mounted in said cantilever arm and having a tandem pressure roller assembly pivotally connected to the lower end of the piston rod thereof, said rollers being parllel with and directly above said mandrel rotational axis; said ram applying pressure through said tandem rollers against a steel sheet grasped between said rollers and the mandrel and rotated thereby, to form said rectangular container.

4,041,749

METHOD OF PRODUCING SHEET OR PLATE FROM ROLLING STOCK

Giswalt Veitl, Linz, Austria, assignor to Vereinigte Osterreichische Eisen- und Stahlwere-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Nov. 15, 1976, Ser. No. 741,760
Claims priority, application Austria, Nov. 24, 1975, 8907/75
Int. Cl.² B21B *1/02*
U.S. Cl. 72—187 **9 Claims**



1. In a method of producing sheet or plate from rolling stock in particular heavy plate having a thickness in excess of 100 mm, by hot rolling slabs, in particular continuously cast slabs, in a number of passes, wherein at least in one pass, the rolling stock is alternately deformed more strongly and less strongly between a pair of rolls, the improvement which comprises, when the rolling stock is less strongly deformed, observing the condition: α' equal to or smaller than ρ, and, when the rolling stock is more strongly deformed, observing the condition: ρ smaller than α smaller than 2ρ, α and α' representing the angles of engagement and ρ representing the angle of friction, and levelling out differences in thickness in longitudinal direction of the rolling stock in a subsequent pass.

4,041,750

METHOD AND APPARATUS FOR PRODUCING SERRATED METAL BARS

Keith William Moore, 8 Burradool Street, West Wollongong, New South Wales, Australia

Filed Mar. 15, 1976, Ser. No. 667,167
Claims priority, application Australia, Oct. 10, 1975, 3418/75
Int. Cl.² B21B *1/12*
U.S. Cl. 72—187 **10 Claims**

1. A method of producing flat metal bars each having at least one edge serrated, comprising passing a billet workpiece of hot metal which has hot roll characteristics through a series of stands of cooperating rolls in a hot roll mill, so as to elongate the billet into a bar and form the bar to a generally rectangular shape, passing the workpiece through a groove in a roll in a notching stand at a high speed, said groove having a root wall, and side walls which diverge outwardly and curve away from one another towards the groove mouth to define between them a bell-mouth shape in cross-section, said mouth being at a locality adjacent a working zone, supporting one edge of the

work-piece remote from the working zone by said groove root, forming serrations in the other edge of the bar in the working zone while it is still in its hot and plastic state by engaging that other edge with outstanding teeth of a second co-operating roll, while at the same time deforming the workpiece within



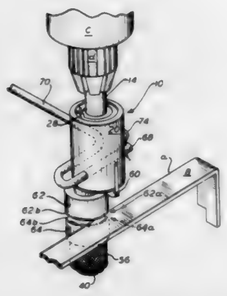
the groove to have its side faces contiguous with said groove side walls and to be supported thereby and passing the workpiece through a further stand and between cooperating rolls of that further stand which engage and flatten the workpiece side faces to a thickness which is determined by the space between said further stand rolls.

4,041,751

BURRING DEVICE WITH OPPOSITELY ACTING DEBURRING ELEMENTS

Hildaur L. Neilsen, 2 Juniper St., Metuchen, N.J. 08840

Filed Sept. 15, 1976, Ser. No. 723,489
Int. Cl.² B21J *7/32*
U.S. Cl. 72—199 **8 Claims**



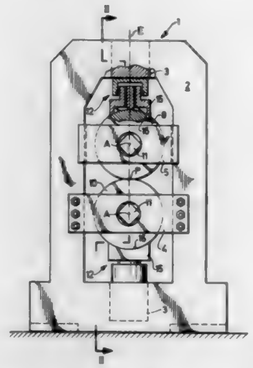
1. A deburring device for smoothing edges of sheet material, comprising intermittently acting hammer means, operating means for operating said hammer means rapidly to impart a vibratory action to said hammer means, a housing supported on and deriving vibrations from said hammer means, an extension stem rigidly integral with said housing, extending in parallelism with the direction of vibratory movement of said hammer means, an impact member loosely connected to said housing and coacting with said hammer means to be vibratorily actuated thereby, a first peening collar carried slidably and freely rotatably on said stem in position for engagement by said impact member to derive vibratory movement therefrom, a second peening collar carried slidably and freely rotatably on said stem adjacent to and in coacting relationship to said first peening collar, and adjustment means on said stem for controlling the coacting relationship of the two said collars; adjacent annular surfaces of said collars defining therebetween an annular recess for receiving a sheet material edge to be deburred, and one of said annular surfaces including a reversely curved annular surface adapted to roll and hammer upon a side edge portion of said sheet material to be deburred.

4,041,752

ROLLING MILLS HAVING HYDRAULIC FORCES EXERTED ON THE EXTERIOR ROLL SURFACES

Anton Dolenc, Winterthur; Alfred Christ, Zurich, and Rolf Lehmann, Mutschellen, all of Switzerland, assignors to Escher Wyss Limited, Zurich, Switzerland

Filed Feb. 6, 1976, Ser. No. 655,768
Claims priority, application Switzerland, Feb. 13, 1975, 1764/75
Int. Cl.² B21B *29/00, 27/10*
U.S. Cl. 72—201 **14 Claims**



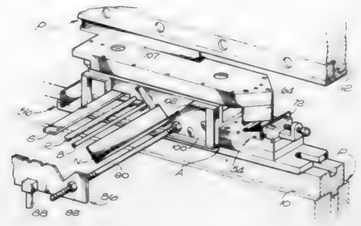
1. In a rolling mill having a frame and a plurality of rolls mounted thereon, means for exerting pressure on the exterior surface of at least one of said rolls which comprises at least one hydrostatic pressure device including a cylinder fixed with respect to said frame, a piston movable in said cylinder and defining a chamber therebetween, said piston having at one end a first surface area within said chamber and at the opposite end, a bearing surface facing said exterior surface of said roll, a plurality of hydrostatic pressure pockets formed in said bearing surface and a plurality of throttling ducts connecting said pockets individually with said chamber, and means for continuously applying fluid under pressure to said chamber and to said first piston surface area to force said piston toward said exterior roll surface and to supply fluid through said throttling ducts to said pockets so as to provide pressure fluid between said bearing surface and said exterior roll surface, the effective cross-sectional area of said bearing surface for producing forces between the bearing surface and the exterior surfaces of the roll being greater than the effective area of said first piston surface area exposed to pressure in said chamber so that the forces exerted by said fluid at both ends of said piston are such that said bearing surface and the surface of the roll are maintained in spaced apart relation during operation to permit a continuous fluid flow therebetween thereby avoiding direct contact between said piston and said roll and removing from said roll heat generated during said rolling operation.

4,041,753

PRESS BRAKE ATTACHMENT FOR FORMING AND CUTTING METAL

Alfred G. O. Hix, 3230 Rancho La Carlotta Road, Covina, Calif. 91722

Filed July 26, 1976, Ser. No. 708,778
Int. Cl.² B21D *37/08*
U.S. Cl. 72—332 **3 Claims**



1. A press brake attachment for use between the ram and the bed of the press brake as for cutting lengths of linear stock, comprising:

a striker bar adapted to be affixed to said ram to provide an impact surface;

a bed member adapted to be affixed to said bed and including a rigidly-supported shear plate defining at least one recess to supportably receive a length of linear stock, and a yield block yieldably aligned with said rigidly-supported shear plate and similarly defining at least one recess to supportably receive a length of linear stock;

a force member aligned above said bed member and spring biased away from said bed member, said force member including a movable shear plate defining at least one extension complementary to said one recess in said rigidly-supported shear plate, said movable shear plate being supported in a position of offset alignment with said rigidly-supported shear plate;

a pair of retainer plates to define apertures for matingly passing lengths of various linear stock and being fixed on opposed sides of said bed member, each defining at least one of at least one pair or passages aligned with said one recess in said bed member to receive a length of linear stock; and

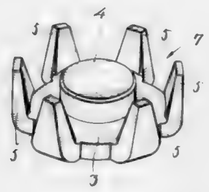
said attachment further including a forming punch affixed to said force member and a forming die affixed to said bed member for mating engagement to bend lengths of metal.

4,041,754

PROCESS FOR PREPARING A POLE PIECE FOR THE ROTOR OF A GENERATOR

Shoichi Otani, No. 5-13, 1-chome, Nishi Ogu, Arakawa, Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,059
Claims priority, application Japan, Sept. 4, 1975, 50-107808
Int. Cl.² B21D *22/00*
U.S. Cl. 72—356 **1 Claim**



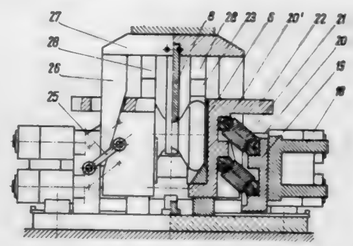
1. A process for preparing a pole piece for the rotor of a generator comprising the steps of cutting a slug having a predetermined volume of from a round metal bar of an indefinite length, of upsetting said slug to a disc-shaped member, of forming said member to provide a plurality of spiders extending radially and outwardly from the periphery of said member and a center boss on one major surface of the member, of forming said member to taper the opposite sides and one surface of said spiders, of bending of said spiders toward said boss until the nontapered surface of said spiders lie on a plane right angles to the plane of said member, of coining said member to remove any irregularity present on the member and of sizing said member to provide a complete pole piece for the rotor of a generator.

4,041,755

METHOD AND DEVICES FOR FORGING SINGLE CRANK THROWS OF SEMI-BUILT UP CRANKSHAFTS

Tadeusz Rut, Poznan, Poland, assignor to Instytut Obrobki Plastycznej, Poznan, Poland

Filed Feb. 26, 1976, Ser. No. 661,518
Claims priority, application Poland, Mar. 15, 1975, 178817
Int. Cl.² B21K *1/08*
U.S. Cl. 72—353 **7 Claims**



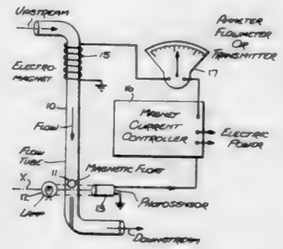
1. A method of forging single crank throw elements comprising upsetting a rough piece to form a blank having opposite shoulder portions with a narrowing connection portion, the connection portion narrowing from both shoulder portions to a central narrowest section, placing said blank in a die with said shoulder portions resting on inclined surfaces of the die such that clear spaces are formed between the shoulder portions and the inclined surfaces, applying a force against the narrowing connection portion in a direction perpendicular thereto to deform said connection portion in a direction to fill said clear spaces and concurrently applying upsetting forces on said shoulder portions in a direction perpendicular to the direction of the force applied to said connecting portion.

4,041,756

FORCE-TYPE FLOWMETER

Victor P. Head, Hatboro, and Peter J. Herzl, Morrisville, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Filed Oct. 29, 1975, Ser. No. 626,832
Int. Cl.² G01F *1/28, 1/56*
U.S. Cl. 73—194 E **3 Claims**



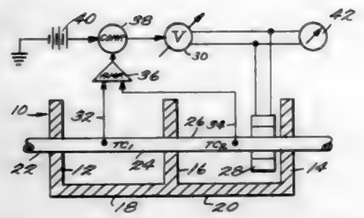
3. A flowmeter as set forth in claim 1, wherein said means to indicate is an ammeter in series with said electromagnet.

4,041,757

FLUID FLOWMETER

William C. Baker, Hampton, and John J. Chapman, Virginia Beach, both of Va., assignors to Teledyne, Inc., Los Angeles, Calif.

Filed Dec. 30, 1975, Ser. No. 645,454
Int. Cl.[2] G01F *1/68, 5/00*
U.S. Cl. 73—202 8 Claims



1. Apparatus for measuring fluid flow through a main supply line, comprising:
   a. a restrictive element within said main line for developing a differential pressure proportional to the square of the velocity of the fluid;
   b. a shunt line connected to the main line to divert fluid from the main line at the higher pressure side of the element and to return the fluid to the main line at the lower pressure side of the element, said shunt line having a pressure drop thereacross which is proportional to the first power of the velocity of the fluid passing through said shunt line;
   c. a thermal connected in said shunt line, said flow meter including:
      1. a conduit through which the diverted fluid passes;
      2. means at spaced locations along the exterior of said conduit for sensing the temperature of the conduit at said locations and for producing output signals representative of the temperatures sensed;
      3. means for heating a first portion of said conduit containing a first one of said temperature sensing means;
      4. means for preventing a second portion of said conduit from being heated when said first portion is heated, said second conduit portion containing a second one of said temperature sensing means;
      5. means responsive to the output signals produced by the temperature sensing means for varying voltage supplied to said heating means in order to maintain a constant difference in temperature between said first and second temperature sensing means; and
      6. indicating means responsive to the first power of the voltage supplied to said heating means to thereby provide a representation which is a function of the flow rate through said main supply line.

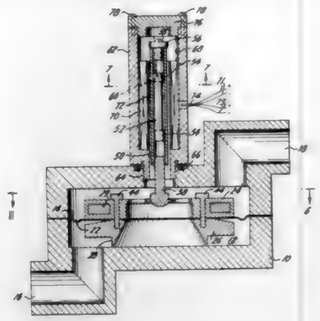
4,041,758

LINEAR RESPONSE FLOW METER

Nyyrikki K. Stenberg, Roslyn, Pa., assignor to Dart Industries, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 470,784, May 17, 1974, Pat. No. 3,964,310. This application Dec. 24, 1975, Ser. No. 644,016
Int. Cl.[2] G01F *1/22*
U.S. Cl. 73—207 16 Claims

1. A fluid flow measuring device characterized by a highly linear response and a substantially constant differential pressure operation comprising a main casing; a substantially horizontal partition member peripherally attached to the lateral walls of said casing in a fluid tight manner, said partition member having a large open area in the middle thereof and being sufficiently flexible to present negligible resistance to measurable vertical motion of its central portion in both directions from the horizontal; a fluid inlet into said casing below the level of said peripheral attachment of said partition member and a fluid outlet from said casing above said level; a rigid, symmetrically shaped fluid flow control element symmetrically mounted on the central portion of said partition member; rigidly mounted on said casing in uniform directly opposed alignment beneath said element a cooperatively designed fluid flow control element positioned so that it is substantially below the upper control element when said partition member is horizontal but within full contact reach of same upon deflection of the central portion of said partition as permitted by its said negligible resistance motion capability; and means for measuring said vertical motion upwards from the point of contact between the respective fluid flow control elements.

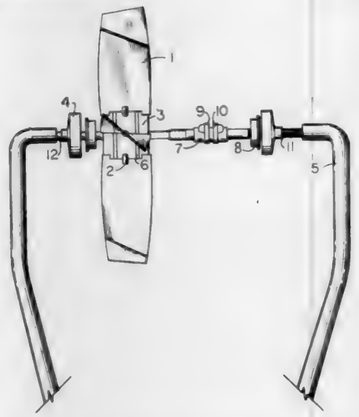


4,041,759

ENVIRONMENTALLY-RESISTANT ANEMOMETER

Thomas Y. Palmer, Fallbrook, and Clifford J. Auvil, Loma Linda, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 27, 1976, Ser. No. 680,650
Int. Cl.[2] G01F *1/10*
U.S. Cl. 73—231 R 3 Claims



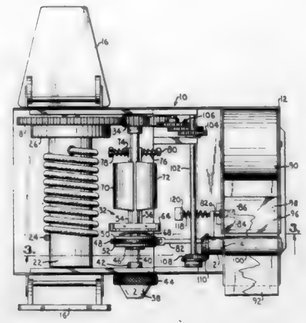
1. A cosine anemometer for measuring fluid velocity, which anemometer is composed of a plurality of helicoidal blades attached to a hub, the lower, notched end of said blades together with a plurality of parallel ridges around the circumference of said hub form a channel for deflecting air along said blades for the purpose of eliminating blade-created vortex interference with other blades, said hub rotatably mounted on a suitably supported shaft, which shaft and said hub contain devices to sense the rotational speed of said hub, which sensing devices are connected to appropriate recordation devices.

4,041,760

EXERCISE APPARATUS

Glen E. Henson, and Milton W. Fisher, both of Independence, Mo., assignors to Robar Mini-Gym, Inc., Independence, Mo.

Continuation of Ser. No. 375,938, July 2, 1973, Pat. No. 3,896,672. This application Mar. 14, 1975, Ser. No. 558,227
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.
Int. Cl.[2] G01L *5/02*
U.S. Cl. 73—379 20 Claims



1. Exercise apparatus comprising:
   a rotatable shaft;
   a first member having first and second frictional surfaces, said member being journaled on the shaft;
   means for holding said first member against rotation with the shaft;
   a second member coupled with the shaft and movable toward and away from said first surface for engagement with the latter upon rotation of the shaft;
   a third member rotatably coupled with the shaft on the side of said first member opposite said second member and movable longitudinally of the shaft into engagement with said second surface whereby to sandwich said first member between the second and third members;
   means for moving said third member a predetermined distance longitudinally of the shaft in the direction of said first member and for holding said third member in a predetermined longitudinal position whereby said third member grips said first member with a predetermined force;
   means adapted to be acted upon by a user of the apparatus for rotating said shaft; and
   centrifugal force responsive structure rotatably coupled with said shaft and responsive to the speed of rotation of the shaft for first moving said second member in the direction of said first member to engage the second member against the first member with greater force as the speed of rotation continues to increase, and for withdrawing the second member from the first member as the speed of rotation decreases.

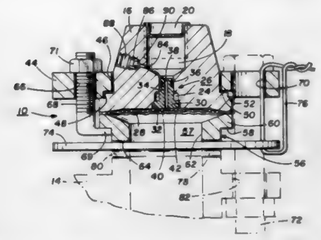
4,041,761

PREPACKAGED GUARD DEVICE SUB-ASSEMBLY FOR PRESSURE RESPONSIVE INSTRUMENTS

Jack Conti, Norwalk, Conn., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed June 7, 1976, Ser. No. 693,614
Int. Cl.[2] G01L *7/08*
U.S. Cl. 73—420 2 Claims

1. A subcombination flange type guard apparatus for a pressure sensitive instrument comprising in combination:
   a. a housing defining a central passage extending between an inlet for receiving a pressure change communicated from a connected fluid source and outlet for communicating with a pressure sensitive instrument;
   b. a diaphragm supported contiguously subtending said housing adapted to be exposed at its underside to a connected fluid source for transmitting pressure changes of the fluid source through said housing passage;
   c. a passage defining annular sleeve of non-metallic composition positioned with one end contiguous to said diaphragm oppositely of said housing, said sleeve defining a gasket sealing surface at its free end surrounding its passage and a radially extending annular shoulder at an intermediate location peripherally between its ends;
   d. securement means securing said housing, diaphragm unit and sleeve as a prepackaged sub-assembly in their operative relation to each other, said securement means including an annular mounting flange encircling said housing and L-shaped threaded fasteners mounted angularly displaced in said flange and each having a foot by which to grip the underside of said shoulder in securing said diaphragm in sandwiched relation between said sleeve and said housing;
   e. installation means provided for enabling said sub-assembly to be installed into sealed relation with a pressure source while maintaining the operative relation effected by said securement means, said installation means comprising a plurality of bolt apertures defined in said mounting flange displaced from said fasteners for receiving bolts capable of securing the sealing face of said sleeve into sealing relation with a received gasket and matchup sleeve at the pressure source; and
   f. a metallic liner positioned intervening between the foot of said fasteners and the underside of said sleeve shoulder.

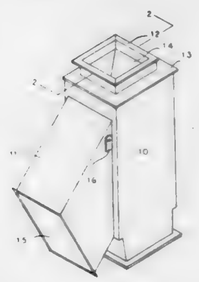


4,041,762

SWING CHUTE SAMPLER

George S. Shurtleff, Coon Rapids, Minn., assignor to Baker Oil Tools, Inc., Los Angeles, Calif.

Filed Oct. 15, 1975, Ser. No. 622,660
Int. Cl.[2] G01N *1/04*
U.S. Cl. 73—422 R 10 Claims



1. A swing chute sampler for particulate material comprising:
   a. an external housing having upper and lower openings and a side-arm chute communicating with an opening in the side of said housing,

b. a fixed internal chute disposed at least partially within the upper portion of said housing and having an upper opening and a lower opening, the upper opening of said internal chute sized to communicate with a feed chute and sealed within the upper opening of the housing, said fixed chute extending below the upper edge of the side arm opening of the housing,

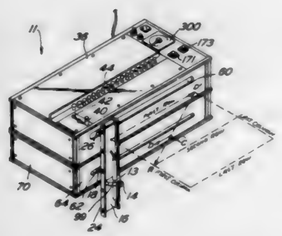
c. a swing chute having an upper opening and a lower opening and a cross-section of the same general shape as said internal chute, said swing chute having hinge means to pivot said chute at the upper edge of its forward wall near the junction of the upper edge of the side opening in the housing, said swing chute dimensioned to pivot about its attachment to the housing to move from a first position wherein the upper opening of said swing chute communicates with and slightly overlaps the lower opening of said internal chute and said lower opening communicates with said side opening so that material falling down said internal chute is diverted to said side arm chute and a second position wherein said swing chute is substantially axially aligned with said fixed internal chute, its upper opening encompassing the lower portion of said internal chute and substantially overlapping same and its lower opening removed from said-arm chute so that material falling down said internal chute passes through said swing chute and through the lower opening of said housing, said swing chute having sealing means to seal the lower edge of said side opening when said swing chute is in said second position.

4,041,763

METHOD AND APPARATUS FOR AUTOMATICALLY SAMPLING MATERIAL IN PRE-PROGRAMMED POSITIONS

Frederick Pfleger, F. P. Developments, Inc., 27 Cherry Ave., Maple Shade, N.J. 08052

Filed Feb. 10, 1976, Ser. No. 657,017
Int. Cl.² G01N *1/10*
U.S. Cl. 73—423 A **23 Claims**



1. Apparatus for scanning positions arranged in a rectangular array of columns and rows according to a predetermined program, comprising:

means for sampling material at said positions;

means for transporting said sampling means in the same direction along one or more predetermined rows of said positions according to said predetermined program;

means for selectively stopping said sampling means at one or more preselected positions in said predetermined rows according to said predetermined program; and

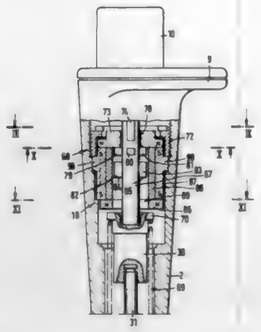
means responsive to said selectively stopping means for causing said sampling means to sample said material at each of said preselected positions according to said predetermined program.

4,041,764

PIPETTE DEVICE

Horst Sabloewski; Klaus Schürbrock, and Dieter Solter, all of Hamburg, Germany, assignors to Eppendorf Geratebau Netheler & Hinz GmbH, Hamburg, Germany

Filed Oct. 14, 1976, Ser. No. 732,212
Claims priority, application Germany, Nov. 5, 1975, 2549477
Int. Cl.² B01L *3/02*
U.S. Cl. 73—425.6 **11 Claims**



1. In a pipette device including an elongate casing, an actuating member projecting from an upper end of said casing, spring means disposed within an internal cavity of said casing between inner casing support means and said actuating member for urging said actuating member into an outwardly projecting position, abutment means within said casing cavity between said actuating member and an inner casing wall portion for restricting movements of the actuating member outwardly from said casing, a cylinder disposed within said casing cavity, a piston slidably mounted within said cylinder and coupled to said actuating member, the piston adapted to displace an air volume, a connector extension on said casing serving as connecting means for slip-on pipette tip members open at their upper and lower ends, said connector extension having an inner through bore in communication with said cylinder, whereby said actuating member is adapted to be moved inwardly into said casing for displacing an air volume in a blow-out direction, and said actuating means is adapted to be displaced further in the same direction for performing an excess lift movement to expel a fluid volume that has previously been drawn in by movement of the actuating means in the opposite direction, the fluid volume corresponding to the air volume displaced, and to optionally move an ejector device in the axial direction of the casing, the ejector device comprising a push member slidably movable within said casing and adapted to engage the upper end edge of a mounted slip-on pipette tip member, one of the means consisting of piston, piston rod and actuating member including stop means effective as an abutment during the lifting movement of the actuating member, the improvement wherein said abutment means **(24, 25, 86)** is coupled to releasable detent means **(18)** including two members, one of said two members defining the abutment **(25)**, and the other of said two members **(26)** being secured within said casing whereby said releasable detent means **(18)** is adapted to be released by application of a temporarily increased actuating pressure to said actuating member **(10)**.

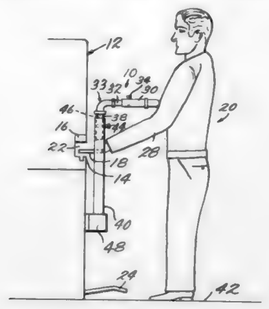
4,041,765

PRESS BRAKE GUARD

Morton L. Kemper, P.O. Box 6, Littlestown, Pa. 17340

Filed Aug. 26, 1976, Ser. No. 718,204
Int. Cl.² B21D *55/00*
U.S. Cl. 72—389 **4 Claims**

1. In combination with a pressing machine having a vertically movable ram which cooperates with a bed or the like to shape a work piece manually inserted between the ram and the bed by an operator, a safety guard for preventing entry of the operator's hands between the ram and the bed comprising a horizontal bar which is generally coextensive with the horizontal dimension of the ram and bed and a support assembly for said bar for supporting said bar in a position spaced from



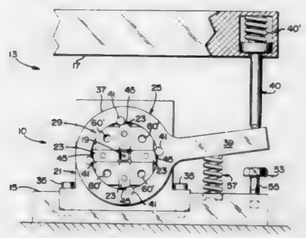
the machine and between the machine and an operator such that the bar is engaged by the operator's arms as the operator extends his hands and arms toward the machine, said support assembly including means for adjusting the vertical position of the bar relative to the machine and means for adjusting the horizontal position of the bar in a direction transverse to the length of the bar.

4,041,766

SWAGING DEVICE FOR USE WITHIN A DIE APPARATUS

Robert Richard Johnson, Ludlow; Robert Arthur Coons, Pittsfield, and John Andrew Zwald, York, all of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed June 3, 1976, Ser. No. 692,445
Int. Cl.² B21J *9/06*
U.S. Cl. 72—402 **9 Claims**



1. In a die apparatus including a stationary lower base member and a movable upper shoe member and incorporating a swaging device therein operating in conjunction with said die apparatus for swaging a wire intermittently passing through said die apparatus, the improvement wherein said swaging device comprises:

a housing secured to said stationary lower base member of said die apparatus, said housing having a first opening therein for permitting said wire to pass therethrough and having an annular portion projecting therefrom in alignment with said first opening, said annular portion having a plurality of spacedly and radially positioned channels therein, said channels at their inner ends meeting to form a second opening aligned with the first opening and in communication therewith,

a swaging member slidably carried in each of the aforesaid channels, the inner end of each swaging member being configured to cooperate with that of the other swaging members to produce the desired swaging action, the outer end of each swaging member having a cam surface shaped to provide the desired travel of the swaging member in its channel,

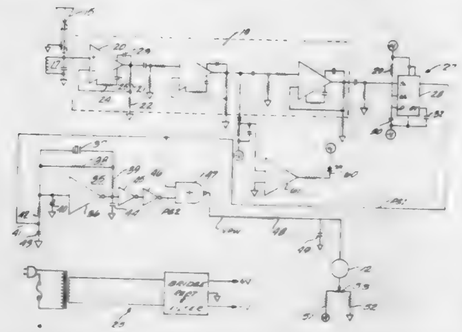
an actuator comprising a substantially annular body having its inner circular surface fitting over the outer surface of the annular portion projecting from the housing for rotation thereabout, a plurality of cylindrical pins carried by the annular body and positioned for alignment with the swaging members, a portion of the outer cylindrical surface of each pin extending beyond the inner surface of the annular body to engage the cam surface of its respective swaging member, and an arm extending from the annular body and operatively connected to the movable upper shoe member of said die apparatus, whereby upon downward movement of the upper shoe member the actuator arm is moved so as to cause the actuator body to rotate about the annular portion projecting from the housing thereby causing the pins to move over their respective cam surfaces to drive the swaging member inwardly to deform the wire.

4,041,767

TESTING APPARATUS FOR USE IN CALIBRATING WRISTWATCHES

Eugene R. Keeler, 11093 Petal Ave., Fountain Valley, Calif. 92708, and Michael R. Harrison, 7691 - 13th St., Westminster, Calif. 92683

Filed Oct. 18, 1976, Ser. No. 733,381
Int. Cl.² G04D *7/12*
U.S. Cl. 73—6 **6 Claims**



1. Apparatus for testing the timing accuracy of a wristwatch whose timing accuracy depends on the oscillation frequency of an electrical oscillator in the wristwatch, the apparatus comprising:

means for deriving electrical energy radiated from the wristwatch to produce a first periodic signal, the fundamental frequency of which depends on said oscillation frequency;

circuit means responsive to the first periodic signal for producing a second periodic signal, the fundamental frequency of which equals the fundamental frequency of the first periodic signal, the circuit means including frequency-dependent phase-shifting means for causing a phase shift to be defined between the first and second periodic signals with the amount of the phase shift being dependent on the frequency difference between the equal fundamental frequencies and a predetermined standard frequency;

an indicator; and

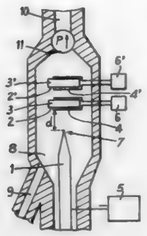
phase difference detecting means responsive to the first and second periodic signals for producing an indicator control signal to cause the indicator to display an indication of said frequency difference.

4,041,768

DEVICE FOR MEASURING THE MASS OF PARTICLES OF AN AEROSOL PER VOLUME UNIT

Alain Gibert, Gan, and Roger Camps, Jurancon, both of France, assignors to Societe Nationale des Petroles d'Aquitaine, Courbevoie, France

Filed Jan. 7, 1976, Ser. No. 647,066
Claims priority, application France, Jan. 15, 1975, 75.01128
Int. Cl.² G01N *15/06;* B03C *3/00*
U.S. Cl. 73—28 3 Claims



1. A device for measuring the mass of particles contained in an aerosol per volume unit thereof, comprising:

a block of electrical insulating material having a measuring cell and a reference cell defined therein;

each said cell comprising a measuring conduit, an inlet conduit communicating with said measuring conduit for introducing a flow of air loaded with particles into said measuring conduit, and an outlet conduit communicating with said measuring conduit at one end and with the atmosphere at the other end;

a pointed charging electrode disposed in each of said measuring conduits opposite each of the corresponding outlet conduits, the pointed end of each of said pointed electrodes being disposed adjacent the junction of said inlet conduit and said measuring conduit and oriented at an acute angle to said inlet conduit so that said inlet conduit directs said particle-loaded air stream toward said pointed end;

a vibratory element comprising a circular piezoelectric quartz disc disposed in each of said cells, each of said elements having a pre-determined resonance frequency, the vibratory element within said measuring cell having a circular planar measuring particle receiving electrode facing the corresponding pointed electrode and disposed a predetermined distance therefrom, the vibratory element disposed within said reference cell having a circular planar reference electrode disposed thereon facing the corresponding pointed electrode and disposed a predetermined distance therefrom, the plane of each of said electrodes being substantially normal to the direction of orientation of the corresponding pointed electrode, the distance between each pointed electrode and the corresponding planar electrode being greater than that required to generate a spark therebetween when a predetermined high voltage is applied between each of said pointed an a planar electrodes;

means for maintaining the current flowing between the electrodes of said measuring cell at a desired value;

each of said vibratory elements being disposed within the corresponding cell in such a manner that air may flow around all sides thereof between said inlet and outlet conduits;

means for suspending each of said vibratory elements within the corresponding cell thereof in such a manner that the resonance frequency of each element varies with its mass;

means for measuring the resonance frequency of each of said vibratory elements and generating an output signal corresponding to the difference therebetween;

the arrangement of each of said cells and the corresponding conduits being such that the surface of each vibratory member opposite the corresponding planar electrode faces the corresponding outlet conduit, and the distance between the point of each pointed electrode and the nearest point on the surface of the corresponding planar electrode is on the order of 15 mm.; and

means for establishing and maintaining a high voltage DC potential difference between (i) the pointed electrode and planar electrode of said measuring cell and (ii) the pointed electrode and planar electrode of said reference cell, the potential of each of said pointed electrodes being positive with respect to the corresponding planar electrode;

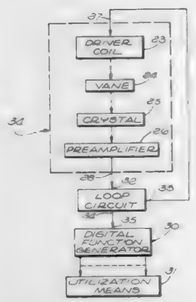
the voltage applied between the pointed and planar electrodes of said measuring cell being on the order of 10,000 volts to cause the flow of particle-containing air through said measuring cell by the effect of an electric wind, the geometry of said measuring cell as set forth above being such that said cell presents minimal impedance to said flow.

4,041,769

DENSITOMETER

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,779
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A 3 Claims



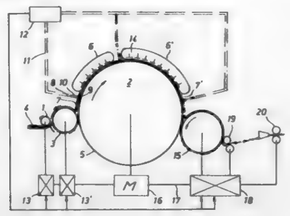
1. A vibration densitometer comprising: a probe having input and output leads; and a loop circuit having output and input leads connected respectively from and to said probe input and output leads, said probe having a magnetostrictive driver including a magnetostrictive tube, a coil mounted around said tube, said coil being connected from said probe input lead, and a permanent magnet fixed relative to one end of said tube to oppose the magnetic flux created by said coil by the flow of current therein in one direction, a vane to be vibrated by said tube, and means connected to said probe output lead responsive to vane vibrations to produce an electrical A.C. signal synchronously therewith and to impress the same on said coil, said probe and said loop circuit forming an electromechanical oscillator whose resonant frequency is a function of the density of the fluid in which said vane is immersed, said opposition to said magnetic flux allowing said flux to vary, but biasing the same in a manner such that it does not substantially reverse directions during the positive and negative swings of said A.C. signal so that the probe output lead has a signal with a frequency the same as that on the probe input lead.

4,041,770

METHOD AND APPARATUS FOR SENSING THE THICKNESS OF A FIBER LAYER ON A MOVING SURFACE

Paul Staheli, Wilen near Wil, and Robert Moser, Winterthur, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 29, 1975, Ser. No. 626,753
Claims priority, application Switzerland, Sept. 30, 1975, 12637/75
Int. Cl.² G01B *13/06*
U.S. Cl. 73—37.5 16 Claims



2. A fiber handling machine comprising

a moving surface for receiving and conveying an air containing fiber layer thereon;

a plate disposed a preset distance above said surface to define a chamber therebetween for passage of the fiber layer;

a duct connected to said plate in communication with at least one sensing point at a side of said plate facing the layer to transmit pneumatic signals caused by the air contained in the fiber layer and corresponding to thicknesses of the fiber layer thereat from said sensing point; and

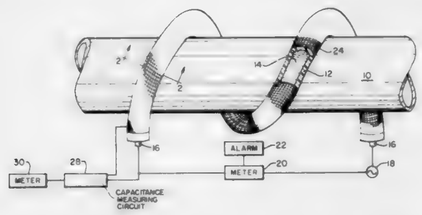
a measuring and control means for receiving pneumatic signals from said duct to produce a control signal in response thereto.

4,041,771

TEMPERATURE-SENSITIVE DETECTOR

Donald S. Allan, Westwood, and Daniel Schiff, Framingham Center, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed May 9, 1975, Ser. No. 576,083
Int. Cl.² G01M *3/18;* G01R *31/08*
U.S. Cl. 73—40.5 R 6 Claims



1. A leak detector for a first container adapted for holding a first body of material at temperatures which are different from ambient temperature, said detector comprising in combination:

an elongated tube of an electrically nonconductive material, said tube being adapted to be distributed along the exterior of said first container;

a second body of a second material in said tube, said second body being normally of a first electrical conductivity in a first phase at ambient temperature and capable of exhibiting at a predetermined temperature between said ambient temperature and said temperatures of said first body of material, a local change in phase and electrical conductivity between said first phase and a second phase at a location where said predetermined temperature occurs; and

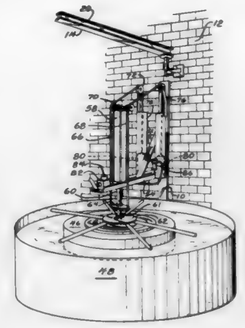
means for sensing the location of said local change in phase in said elongated tube, said means for sensing comprising elongated electrically-conductive means disposed along said tube and means for measuring from one end of said tube, the electrical capacitance between said elongated electrically-conductive means and said second material.

4,041,772

APPARATUS FOR LOCATING PUNCTURES IN TIRES

Albert Taich, Chicago, and Theodore Gill, Northlake, both of Ill., assignors to Consumer Tire & Supply Co., Inc., Chicago, Ill.

Filed Aug. 27, 1976, Ser. No. 718,174
Int. Cl.² G01M *3/06*
U.S. Cl. 73—45.6 4 Claims



1. An apparatus for locating leaks in a tubeless tire comprising;

means for lifting a tire into a tank of water;

power means operatively connected to a spider for urging the tire downwardly beneath the level of the water in the tank;

said power means including a cylinder and a piston rod, said piston rod having one end thereof connected to the spider and being adapted for vertical movement between a first position and a second position;

a pressure regulator being connected to the cylinder for controlling accurately the amount of pressure applied by the cylinder upon the tire;

means operatively connected to said cylinder and said piston rod for returning them from the second position to the first position upon de-activation of said cylinder and said piston rod; and

said returning means including a pair of counterweights adapted for lifting the piston rod and the spider.

4,041,773

ULTRASONIC INSPECTION APPARATUS FOR WELL OPERATIONS

H. Morris Hauldren, Culloden, W. Va.; Jack R. Claycomb, Lafayette, La.; Deke E. DeKerlegand, Lafayette, La., and Chi-Haung Chang, Lafayette, La., assignors to W. C. Lamb, Lafayette, La.

Filed Oct. 8, 1975, Ser. No. 620,747
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S 9 Claims

1. Apparatus for ultrasonic inspection of vertical tubular members which comprises:

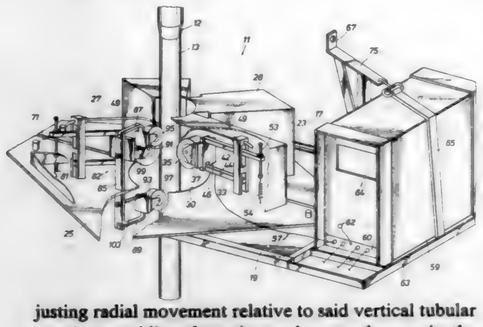
a frame defining a vertical passage for said tubular member accessible from a direction transverse to the longitudinal axis of said tubular members;

a plurality of ultrasonic search units disposed on said frame, each including an electro-acoustical transducer for transmitting an ultrasonic signal into the wall of said member;

a mechanism mounted each search unit on said frame to

yieldably urge said ultrasonic search unit into contact and sonically coupled relation with the surface of the tubular member;

said mechanism providing each search unit with self-ad-



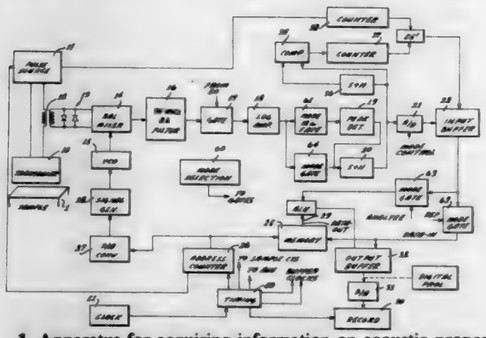
justing radial movement relative to said vertical tubular member, enabling the unit to adapt to changes in the size of said tubular member inspected without altering the orientation of the transducer inside said search unit with respect to the surface of said tubular member.

4,041,774

ACOUSTIC DATA ACQUISITION DEVICE

Winfred L. Morris, and Donald O. Thompson, both of Thousand Oaks, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed July 2, 1976, Ser. No. 702,254
Int. Cl.² G01N *29/00*
U.S. Cl. 73—67.9 **29 Claims**



1. Apparatus for acquiring information on acoustic properties of structural materials, comprising:

means for receiving an acoustic signal from a part of such a material;

means for processing the signal frequency-selectively for extracting therefrom narrow banded components having different frequencies;

means for extracting digital information from said narrow banded components;

means for storing digital reference information means for digitally processing the extracted digital information with the stored reference information; and

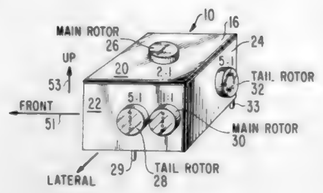
means for providing a representation of the processed information in dependence upon frequency.

4,041,775

VIBROMETER

James Arthur McNamee, Burlington, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,772
Int. Cl.² G01H *1/00*
U.S. Cl. 73—70.2 **2 Claims**



2. A method of testing, in flight, or on the ground the rotors of a helicopter comprising the steps of:

concurrently and individually measuring the amplitudes and modes of vibration of the respctive rotors of the helicopter; and

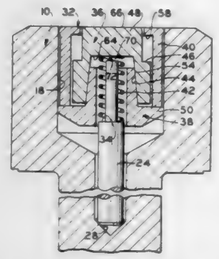
indicating, in response to the measurements, different fault vibratory conditions for each of the rotors.

4,041,776

STRAIN INDICATOR

William J. Payne, Greensburg, Pa., assignor to Modulus Corporation, Chagrin Falls, Ohio

Filed Mar. 22, 1976, Ser. No. 669,247
Int. Cl.² F16B *31/02*
U.S. Cl. 73—88 F **14 Claims**



1. An optical indicator comprising in combination:

a first member subject to stress-strain and having a head and a recess extending from said head into said member;

an internal surface within said first member;

an indicator element;

releasable connecting means operatively fixing said indicator element relative to said first member at such time as said first member has been placed under load;

said internal surface being movable relative to said indicator element as a function of the stress applied to said first member, there being at least a load position of said internal surface and a decreased load position;

said indicator element being released relative to said first member as a result of contact of said releasable connecting means and said internal surface as said internal surface moves from a load position to a decreased load position;

bias means to move said indicator element relative to said first member upon release of said releasable connecting means;

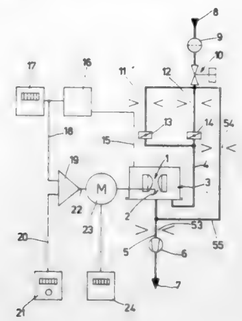
movement of said indicator element relative to said first member providing a visual indication of the fact that said first member has reached a condition of decreased load.

4,041,777

METHOD AND APPARATUS FOR TESTING CARBURETORS

Ernst Leunig, Fallersleben; Hans A. Schultze, Giessen, and Christian Pfeifer, Grunberg, all of Germany, assignors to Karl Weiss - Giessen, Fabrik Elektrophysikalischer Geraete, Werk Lindenstruth, Lindenstruth, Germany

Filed Mar. 7, 1974, Ser. No. 448,928
Claims priority, application Germany, Mar. 8, 1973, 2311486
Int. Cl.² G01F *9/00*
U.S. Cl. 73—118 **20 Claims**



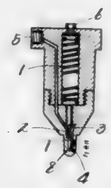
19. A method of testing a device through which a fluid flows and having adjusting means, comprising the steps of imposing a predetermined constant fluid flow through the device; measuring the fluid pressure prevailing at the inlet end of the device; comparing the measured value of fluid pressure with a predetermined value which is prescribed for the predetermined flowthrough of the fluid; and adjusting the adjusting means until said measured value is at least substantially equal to said predetermined value, while maintaining said predetermined constant throughflow.

4,041,778

FUEL INJECTION VALVE TESTING APPARATUS

Hiroaki Ikinobu, Neyagawa, Japan, assignor to Fuji Shoten Co. Ltd., Osaka, Japan

Filed Sept. 8, 1976, Ser. No. 721,468
Int. Cl.² G01M *3/28*
U.S. Cl. 73—119 A **2 Claims**



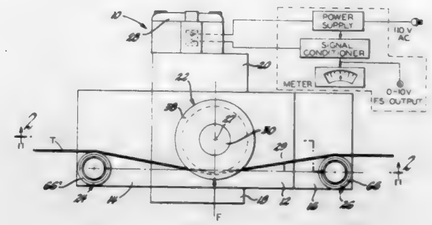
1. A fuel injection valve testing apparatus, comprising an oil pressure booster composed of a high pressure chamber having check valves on opposite sides and a cylinder chamber having a piston for reciprocating a plunger in said high pressure chamber, a fuel injection valve connected to said high pressure chamber of the oil pressure booster, an oil feed pump for feeding low pressure oil into the high pressure chamber and cylinder chamber of the oil pressure booster, and a switching valve for feeding low pressure oil from said oil feed pump alternately into oil inlet-outlet ports on opposite sides of the cylinder chamber, the arrangement being such that after the high pressure chamber of the oil pressure booster and the fuel injection valve are filled with low pressure oil, a high pressure is produced in the high pressure chamber and in the fuel injection valve and this high pressure oil is used to operate the fuel injection valve.

4,041,779

PNEUMATIC TENSION GAUGE

William H. Greb, Sandusky, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1976, Ser. No. 721,518
Int. Cl.² G01L *5/08*
U.S. Cl. 73—144 **3 Claims**



1. A tension gauge for measuring the tension in a running thread comprising

a support having a pair of laterally spaced idler rolls mounted thereon for rotation about spaced parallel axes,

a reaction roll mounted on said support intermediate said pair of idler rolls for rotation about an axis parallel to and intermediate said parallel axes,

said rolls being arranged such that a thread running under tension in driving engagement with the three rolls exerts a radial force on the reaction roll,

pneumatic means for rotatably supporting said reaction roll including an annular layer of pressurized gas between stationary and rotary members of the reaction roll, and

signal means responsive to the pressure in said annular layer of gas at diametrically opposed points located in a plane intersecting the plane defined by the spaced parallel axes of the idler rolls.

4,041,780

METHOD AND APPARATUS FOR LOGGING EARTH BOREHOLES

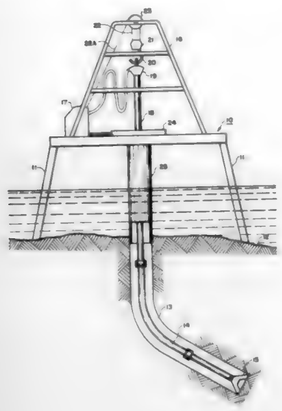
Jorg August Angehra, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed May 3, 1976, Ser. No. 682,940
Int. Cl.² E21B *47/00*
U.S. Cl. 73—151 **15 Claims**

12. A well logging apparatus adapted to be pumped down through a string of tubular goods located within an earth borehole, comprising:

an elongated body member having at least one logging module and electrical circuitry therein, said body member also including an accelerometer for activating at least a portion of said electrical circuitry; and

pressure-responsive means within said body member for activating at least a portion of said electrical circuitry.

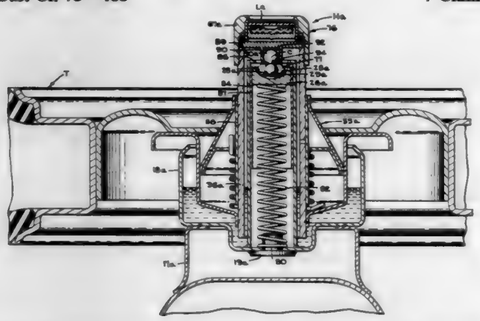


4,041,781

SELF-LEVELING STATIC WHEEL BALANCER

Thomas E. Roberts, Jr., Saratoga, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 20, 1975, Ser. No. 633,779
Int. Cl.² G01M *1/04*
U.S. Cl. 73—483 **7 Claims**



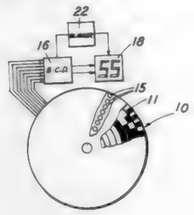
1. In a wheel balancer of the type comprising a post having a generally vertical axis, means for supporting said post on the floor, a wheel balance head having means for mounting and centering a wheel to be balanced in a plane that is normally horizontal, a level on said head, and universal pivot means for mounting said balance head on said post for freely accommodating tilting of said balance head plane relative to said post about a pivot point in response to wheel unbalance, the pivot point of said balance head plane being coincident with the axis of said post when the post axis is vertical; the improvement wherein said pivot includes a pivot ball, means for mounting said pivot ball on said balancing head, said post having an anvil formed with a concave spherical surface, at least three equal diameter support balls on said anvil for supporting said pivot balls, said anvil surface and said pivot ball normally being the sole confining means for said support balls, the radius of curvature of said spherical anvil surface equaling the sum of the radius of said pivot ball and the diameter of a support ball, the center of curvature of said concave surface being coincident with the center of said pivot ball for maintaining the pivot point of said balance head plane coincident with said post axis when the post axis is inclined from the vertical as well as when the balance head plane is tilted from the horizontal.

4,041,782

HOOD-MOUNTABLE DIGITAL SPEEDOMETER

Elmer J. Hingst, 521 Center St., Waukegan, Ill. 60085

Filed Aug. 3, 1976, Ser. No. 711,418
Int. Cl.² G01P *1/06, 1/08*
U.S. Cl. 73—493 **3 Claims**



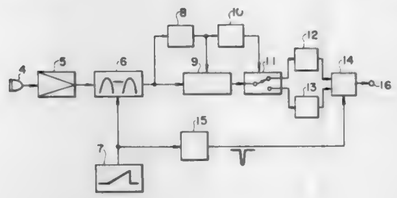
1. A hood-mountable digital speedometer comprising:
analog-to-digital converter means couplable to a speed-indicator of a vehicle-mountable speedometer for converting a position of the speed-indicator into a binary number;
binary-to-decimal number converter means connected to said analog-to-digital converter means for converting the binary number into a decimal number, wherein the speed-indicator is movable over a region of excessive speed of the speedometer, and said analog-to-digital converter means converts only the position of the speed-indicator in the excessive speed-region to the binary number;
display means mountable on the hood of a vehicle for displaying the decimal number; and
a blinker circuit interconnected between said analog-to-digital converter means and said display means for periodically flashing the displayed decimal number on and off, whereby said display means is disposed in a direct line of vision of a vehicle operator.

4,041,783

SYSTEM FOR MEASURING VIBRATION FREQUENCY OF VIBRATING OBJECT

Minoru Shimauchi, Hamamatsu, and Takashi Onoda, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 1, 1976, Ser. No. 662,687
Claims priority, application Japan, Mar. 5, 1975, 50-25885; Apr. 22, 1975, 50-58146
Int. Cl.² G01H *13/00;* G10G *7/02*
U.S. Cl. 73—552 **6 Claims**



1. A method for measuring the fundamental frequency of a vibrating object, comprising the steps of:
a. detecting the vibration of said vibrating object and converting the detected vibration to an electric signal;
b. deriving harmonic components of said vibrating object from said electric signal;
c. measuring the frequencies of the derived harmonic components; and
d. obtaining the difference between those frequencies, among the measured frequencies which correspond to any adjacent two harmonic components among said measured harmonic components,

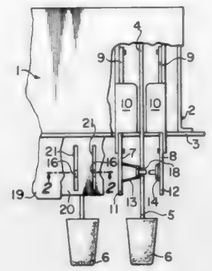
in which said step b) is accomplished by passing said electric signal through a variable band-pass filter whose middle frequency of pass band is varied successively; and
said step c) is accomplished by measuring the frequency of the output of said filter at each time a peak develops in the output of said variable band-pass filter.

4,041,784

ACTUATOR FOR PUSH BUTTON TUNER

Tamaki Ohashi, Tanashi, Japan, assignor to Nihon Technical Kabushiki Kaisha, Japan

Filed May 15, 1975, Ser. No. 577,712
Claims priority, application Japan, May 20, 1974, 49-55376
Int. Cl. F16H *35/18*
U.S. Cl. 74—10.33 **3 Claims**



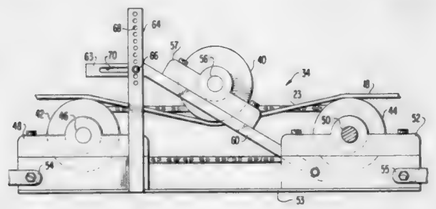
1. An actuator for a pushbutton tuner comprising: a pushbutton slide; a pair of slideable tuning slides; interconnecting means for selectively connecting said pushbutton slide with either one of the pair of tuning slides; and movable shift means for controlling the interconnecting means, said interconnecting means including a pair of interconnecting members, each interconnecting member including a body portion comprised of flexible material secured at one end on the respective tuning slide, means at the other end of the body portion for selectively engaging with said pushbutton slide, and means responsive to movement of said shift means for effecting movement of one of said interconnecting members to is operative position and movement of the other to its inoperative position.

4,041,785

MECHANICAL DRIVE SYSTEM FOR A REMOTE AREA

Thomas J. Roark, SR 2 Box 77, Nettie, W. Va. 26681

Filed July 7, 1976, Ser. No. 703,202
Int. Cl.² F16H *37/00, 7/00;* B65G *23/00*
U.S. Cl. 74—11 **10 Claims**



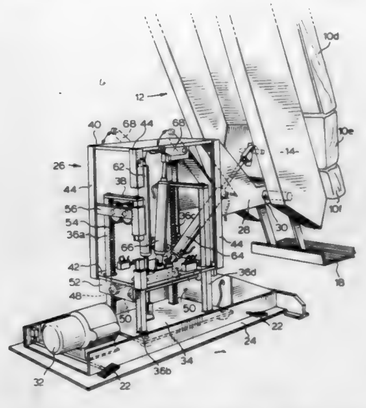
1. A system for obtaining mechanical power in a mine serviced by conveyor structure including a driven conveyor belt with a flight for removing mined material and a return flight, the system comprising,
power take-off apparatus with means for positioning such apparatus in contiguous relationship to the conveyor structure,
such power take-off apparatus including
driveable roller means,
framework structure for positioning the driveable roller means so as to be driven by the return flight of the conveyor belt,
belt tensioning means for selectively urging such conveyor belt to drive such roller means, and
a power shaft driven in response to rotation of such roller means for delivering mechanical drive power to auxiliary equipment.

4,041,786

LINEAR MOTION DEVICES

Hermann Freidrich Offterdinger, 602 Galway Drive, Burlington, Ontario, Canada

Filed Dec. 30, 1975, Ser. No. 645,433
Int. Cl.² F16H *19/04*
U.S. Cl. 74—29 **7 Claims**



1. A linear motion device comprising first and second members movable linearly relative to each other, four mutually-spaced parallel rack members carried by the first member, four mutually-spaced pinion members mounted by the second member each in engagement with a respective rack member for movement along the respective rack member upon rotation about its axis, two shafts each connecting two of the pinion members for rotation simultaneously with one another, and a stabilising member mounted by the second member spaced a substantial distance from the first-mentioned pinions and comprising at least two further pinions engaged with two different rack members and with one another.

4,041,787

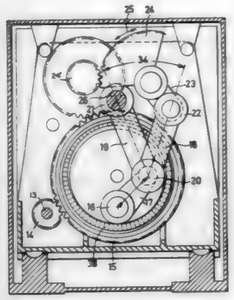
GEAR UNIT FOR THE TRANSFORMATION OF A UNIFORM ROTARY MOVEMENT TO A STEP OR STROKE MOVEMENT

Hans Josef Brundler, Kantonstraase, CH-8863 Buttikon, Switzerland

Filed Apr. 24, 1975, Ser. No. 570,763
Claims priority, application Germany, Apr. 25, 1975, 2420116
Int. Cl.² F16H *29/04*
U.S. Cl. 74—117 **11 Claims**

1. A geared transmission for converting continuous rotary motion into intermittent and adjustable motion and comprising; a frame, an input shaft in said frame adapted for being driven continuously in one direction, a rotary element in said frame continuously coupled to said input shaft, a crank pin eccentrically located on said rotary element, a link having one end connected to said crank pin, first and second reciprocable connecting rods each having one end pivotally connected to the other end of said link, a rotary driven member in said frame, drive means including a one-way drive clutch connecting said driven member to the other end of said first connecting rod so the driven member is driven in one direction of movement of the first connecting rod and is stationary in the other

direction of movement thereof, an anchor member connected to the other end of said second connecting rod, and means



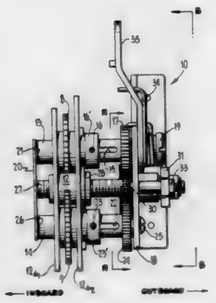
supporting the anchor member in the frame for adjustment of the position of said anchor member to adjust the stroke of said first connecting rod.

4,041,788

ELECTRICAL CONTROL FOR DERAILLEUR DRIVE

Nathan Vivien Nininger, Jr., Manhattan Beach, Calif., assignor to California Progressive Products, Inc., El Toro, Calif.

Filed July 30, 1975, Ser. No. 600,303
Int. Cl.² F16H *7/22*
U.S. Cl. 74—217 B **8 Claims**



1. In a derailleur gear changing system including a main drive sprocket, a plurality of rear sprocket gears, and a connecting drive chain, the combination comprising:

a. means for laterally displacing said drive chain by means of power derived solely from the motion of said drive chain;

b. control means to start the shifting of said chain displacing means, and to automatically shut off the shifting operation upon completion of a gear-ratio change.

4,041,789

BELT DRIVE INCLUDING TOOTHED BELTS AND TOOTHED PULLEYS OF IMPROVED TOOTH CONFIGURATIONS

Ronald D. Hoback, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Dec. 18, 1975, Ser. No. 642,089
Int. Cl.² F16G *1/28*; F16H *55/30, 7/00*
U.S. Cl. 74—229 **43 Claims**

1. A flexible power transmission belt having a plurality of flexible resilient teeth of uniform pitch length extending transversely thereof, each said tooth as viewed in longitudinal section comprising a base portion, an outermost portion spaced from said base portion and having a cross sectional dimension less than the cross sectional dimension of said base portion and opposite side portions extending from the ends of said base portion and converging inwardly to meet the ends of the outermost portion to thereby define the tooth profile, each said side portion including an integral stress-relieving portion adjoining



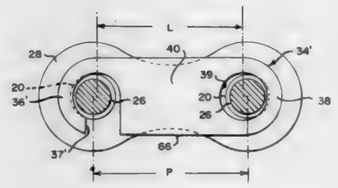
the base portion, said stress-relieving portion having an outer perimeter which is at least 30% of one half of the total outer perimeter of said tooth.

4,041,790

ROLLER CHAIN CONNECTING LINK SPRING CLIP

William T. Paul, Holyoke, Mass., assignor to Incom International Inc., Pittsburgh, Pa.

Filed Mar. 18, 1975, Ser. No. 559,497
Int. Cl.² F16G *13/06, 15/00, 15/08*
U.S. Cl. 74—258 **8 Claims**



1. A spring clip for selective installation on and removal from a pair of adjacent pins of a roller chain which said adjacent pins have a predetermined distance therebetween, each said pin having a recessed portion inwardly of an extended end, said spring clip comprising:

a body portion formed of sheet spring metal and having first and second ends and an intermediate section therebetween;

said first and said second ends of said body portion respectively having first and second openings therethrough;

said first opening being capable of being aligned for installation inwardly of said extended end and received at said recessed portion of a first of said adjacent pins;

said second opening being capable of being aligned for installation of said extended end and received at said recessed portion of a second of said adjacent pins;

at least said intermediate section of said body portion being preformed to a non-linear shape along the longitudinal axis of said body portion to provide a predetermined linear distance between said first and said second openings which said predetermined linear distance is different for said predetermined distance between said adjacent pins to prevent said openings from being simultaneously aligned with and received on their respective said adjacent pins;

said first and said second openings being capable of simultaneous said alignment with and receipt on said respective said adjacent pins by deformation of said non-linear shape of said intermediate section to provide a desired linear distance between said openings which is different from said predetermined linear distance and generally corresponds to said predetermined distance between said adjacent pins; and

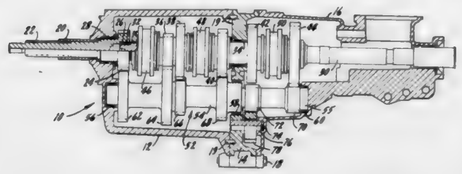
said non-linear shape of said intermediate section tending to re-establish said predetermined linear distance between said openings when said openings are simultaneously respectively received at said recessed portions of said adjacent pins to prevent inadvertent removal of said spring clip from said adjacent pins wherein said first end only partially encircles said first of said adjacent pins at said recessed portion by said first opening extending generally perpendicularly to one side of said body portion and said first opening allows said body portion to be rotated around said second end in a direction away from said one side when said non-linear shape of said intermediate portion is deformed to approach said desired linear distance between said openings.

4,041,791

METHOD OF MANUFACTURING A TRANSMISSION

Merle Dalton Coy, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Oct. 14, 1975, Ser. No. 622,588
Int. Cl.² F16H *3/08*
U.S. Cl. 74—325 **4 Claims**



1. A method of assembling a transmission having a case supporting first mainshaft and countershaft bearings, a center support supporting second mainshaft and countershaft bearings, and an extension housing supporting a third countershaft bearing and defining a bore, the method comprising the steps of mounting a mainshaft assembly on the center support with its mainshaft journalled in the second mainshaft bearing, mounting a cluster gear assembly having a one-piece countershaft on the center support with its countershaft journalled in the second countershaft bearing, mounting a reverse idler gear assembly on the center support with its reverse idler gear shaft press fit in the center support, slipping the case over the mainshaft and cluster gear assemblies to abut one side of the center support with the input shaft of the mainshaft assembly and the countershaft journalled respectively in the first mainshaft and countershaft bearings, slipping the extension housing over the mainshaft, countershaft, and reverse idler gear assemblies to abut the other side of the center support with the countershaft journalled in the third countershaft bearing and the reverse idler gear shaft slip fit in the bore, adjusting the extension housing relative to the center support to eliminate preloads on the bearings, and securing the case, center support and extension housing together.

4,041,792

DRIVE DISCONNECT DEVICE

Calvin L. Miller, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

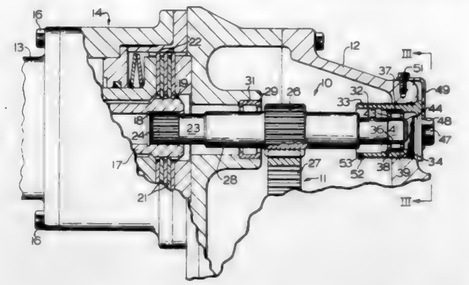
Filed Nov. 1, 1976, Ser. No. 737,642
Int. Cl.² F16H *57/00*
U.S. Cl. 74—405 **3 Claims**

1. A drive disconnect device for a power train of the type contained within a housing and having a rotary driving member normally engaged with a rotary driven shaft through a spline connection to transmit power therebetween, the drive disconnect device comprising:

means forming a threaded bore in the housing in alignment with the driven shaft;

a cage having an external thread formed thereon and threadably extending through the threaded bore;

means for rotatably attaching the driven shaft to the cage so that rotating the cage slidably moves the driven shaft in an



axial direction from said engaged position of the spline connection to a disengaged position of the spline connection; and

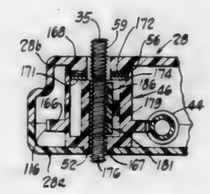
yieldable stop means disposed within the external thread of the cage and engageable with the housing when the driven shaft reaches the disengaged position to provide increased resistance to the rotation of the cage.

4,041,793

ELECTRICALLY ADJUSTABLE VEHICLE ACCESSORY

Laszlo N. Repay, Chagrin Falls, and Thomas A. Young, Burton, both of Ohio, assignors to Tenna Corporation, Cleveland, Ohio

Division of Ser. No. 470,569, May 16, 1974, Pat. No. 3,972,597.
This application May 12, 1976, Ser. No. 685,698
Int. Cl.² F16H *1/18, 55/22*; B62D *1/20*; F16C *1/10*
U.S. Cl. 74—424.8 R **6 Claims**



1. A drive nut for use with a screw, comprising a body with a central passage in which a screw is receivable, means carried by said body in a position to act against external threads of a screw in said central passage to drivingly interconnect the body with a screw so that relative rotation between the screw and body will move one relative to the other in a direction axially of the screw, said means being yieldable from a position at least partially within said passage in engagement with the threads of a screw to a position radially outwardly therefrom out of engagement with the threads in response to relative axial movement between the two without relative rotation or in response to relative rotation between the two without relative axial movement.

4,041,794

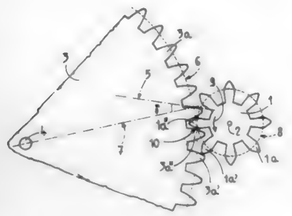
MECHANISM OF TRANSMISSION

Michel Belot, Boudry, and Norberto Perucchi, Saint-Blaise, both of Switzerland, assignors to Ebauches S.A., Switzerland

Filed Oct. 20, 1976, Ser. No. 733,994
Int. Cl.² F16H *55/04, 55/06*
U.S. Cl. 74—460 **10 Claims**

1. Mechanism of transmission comprising two toothed

wheels meshing with each other, characterized by the fact that the module of one of the said wheels is greater of 10 to 20% than this one of the other wheel, so that, when the wheel of great module is driving, the rotation of the mechanism takes



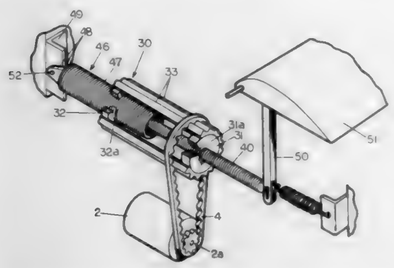
place normally, the wheel of small module being duly driven while, when the wheel of small module is driving, a locking effect takes place between the teeth of the two wheels, preventing any rotation.

4,041,795

MECHANISM FOR CONVERTING ROTARY MOTION INTO PRECISE LOW SPEED LINEAR MOTION

Michael George Rekoff, Jr., Huntsville, Ala., assignor to Teledyne Brown Engineering, Huntsville, Ala.

Filed Jan. 29, 1976, Ser. No. 653,572
Int. Cl.² F16H *1/18*
U.S. Cl. 74—424.8 B **2 Claims**



1. Mechanism for converting continuous rotary motion into a relatively slow speed rectilinear motion comprising:

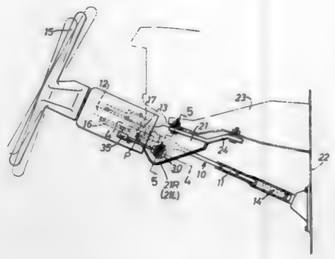
1. a thread carrying output rod fixed against rotation but free to shift in an axial direction;
2. a second thread carrying rod fixed against both axial and rotational movements and positioned with its axis parallel to the axis of said first thread carrying rod, one of said rods being hollow and dimensioned to freely surround said other rod;
3. a hollow cylindrical member supported by said first and second thread carrying rods, said cylindrical member defining a first internal thread means co-operating with the threads on said first thread carrying rod and a axially spaced second internal thread means co-operating with the threads on second threaded rod, and
4. means for continuously rotating said cylindrical member in either direction, whereby said output rod is axially shifted as a function of the difference of the thread pitches of said output rod and said second rod.

4,041,796

FASTENING DEVICE FOR TILTABLE STEERING WHEEL ASSEMBLY

Yoshio Shishido, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 17, 1975, Ser. No. 641,531
Claims priority, application Japan, Dec. 28, 1974, 50-1773[U]
Int. Cl.² B62D *1/16*
U.S. Cl. 74—493 **8 Claims**



1. A fastening device for a tiltable steering wheel assembly including a steering shaft tiltably connected to steering gear means, a column tube having said steering shaft journalled therein and a steering wheel mounted on said steering shaft, comprising:

a first bracket mounted on a portion of the vehicle body structure and having a pair of opposing arms;

a second bracket secured to said column tube and having a pair of opposing arms coupled and pivoted to the pair of arms of said first bracket to hold said column tube at a desired angle;

a fastening bolt extending transversely across the coupled portions of said first and second brackets;

a lock nut threaded on one end of said bolt at one side of the coupled portions of said first and second brackets;

a pressure plate slidably mounted on the other end of said bolt at the other side of the coupled portions of said first and second brackets;

a cam element pivoted on the other end of said bolt about an axis substantially perpendicular to the longitudinal axis of the bolt, said pressure plate being between said cam element and the coupled portions of said first and second brackets, said cam element including a curved cam surface to press said pressure plate towards said lock nut and a flat surface to be pressed against said pressure plate in the locked position, the center of the curved cam surface being eccentric with respect to the pivot axis of said cam element to engage the flat surface of said cam element with said pressure plate beyond the rotary dead point of said cam element; and

a locking lever integrally connected to said cam element to be positioned substantially parallel with respect to said column tube in a locked position thereof whereby when said locking lever is set in the locked position, said first and second brackets are fastened to each other between said lock nut and said pressure plate which is pressed by the flat surface of said cam element and the pressing contact of said pressure plate and said cam element is held due to a reaction force generated on said bolt.

4,041,797

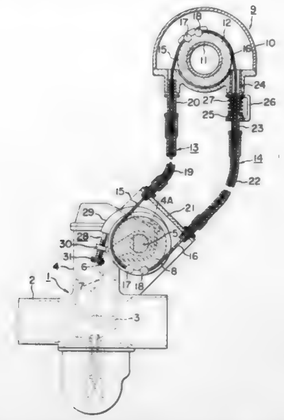
THROTTLE-VALVE OPERATING DEVICE FOR A CARBURETOR

Shigeo Mito, Yokohama, Japan, assignor to Kabushiki Kaisha Keihinseiki Seisakusho, Kawasaki, Japan

Filed Sept. 5, 1975, Ser. No. 610,732
Int. Cl.² F16L *5/10*
U.S. Cl. 74—501 R **2 Claims**

1. A throttle-valve operating device for a carburetor, of the

type including a throttle-valve actuating member rotatably mounted on the carburetor, a manual control member rotatably supported exteriorly of the carburetor, and a throttle operating wire interconnecting said actuating member and said control member; the device comprising a tubular flexible guide



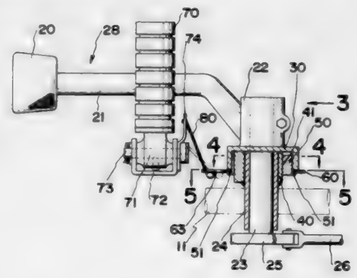
slidably covering said wire and including a guide having two portions axially slidable with respect to one another and spring means for biasing said guide portion in an extending direction under a predetermined pressure, said flexible guide being held fixed at opposite ends and flexed therebetween.

4,041,798

PARKING BRAKE

Takashi Shinozaki, Tokorozawa, and Susumu Asai, Sayama, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed June 11, 1976, Ser. No. 695,156
Claims priority, application Japan, June 17, 1975, 50-82135
Int. Cl.² G05G *1/14, 5/06;* B60T *7/04*
U.S. Cl. 74—512 **7 Claims**



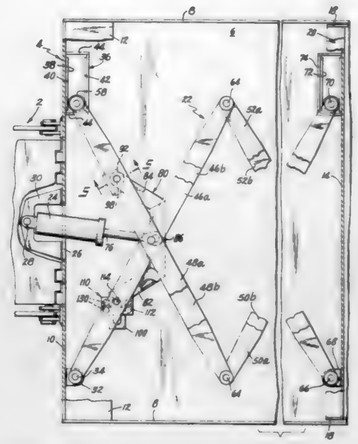
1. A parking brake mechanism for a vehicle of the type having a brake pedal which is to be turned in a predetermined direction for applying a brake on the vehicle, the parking brake mechanism comprising, in combination, a ratchet wheel connected to said brake pedal for simultaneous rotation therewith, said ratchet wheel having a series of ratchet teeth formed thereon, a pawl movable between a first position where said pawl engages said ratchet teeth on said ratchet wheel for permitting said brake pedal to be turned in said predetermined direction only and a second position where said pawl disengages said ratchet teeth on said ratchet wheel, resilient means yieldably urging said pawl toward said first position, cam means for normally holding said pawl in said second position against the force of said resilient means, said cam means being displaceable with respect to said pawl for permitting same to be moved from said second to said first position by said resilient means, and means actuated by a vehicle operator to cause displacement of said cam means with respect to said pawl.

4,041,799

POWER ACTUATED LAZY-TONGS ARRANGEMENT

John J. Teti, P.O. Box 756, Saltville, Va. 24370

Filed Oct. 7, 1975, Ser. No. 620,287
Int. Cl.² G05G *1/04*
U.S. Cl. 74—521 **12 Claims**



1. A power actuated lazy-tongs arrangement, comprising: lazy-tongs means, including a pair of base leg means; relatively fixed base means; bracket means connecting the mounting ends of said base leg means with said base means, and arranged to provide for scissors-like movements of said base leg means; bridge means connected to extend between said base leg means, and arranged to accommodate said scissors-like movements, said bridge means including a rigid bridge element, one end of said rigid bridge element being connected with one of said base leg means by a fixed pivot arrangement, and the other end of said rigid bridge element being connected to the other of said base leg means by a fixture providing for both pivotal and sliding movement between said bridge element and said other base leg means; and power piston means connected to the central portion of said bridge means, and operable to apply force thereto for extending and collapsing said lazy-tongs means, said bridge means being effective to apply such force substantially simultaneously and equally to both of said base leg means.

4,041,800

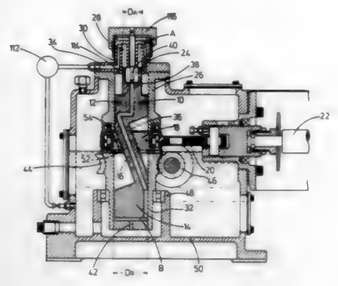
STROKE LENGTH ADJUSTING DEVICES

Ryuichi Sato; Teruo Oikawa, and Masahiro Nakata, all of Tokyo, Japan, assignors to Nikkiso Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1975, Ser. No. 608,223
Claims priority, application Japan, Apr. 7, 1975, 50-42093; Apr. 7, 1975, 50-42094
Int. Cl.² G05G *1/00*
U.S. Cl. 74—571 R **8 Claims**

1. Apparatus for converting rotary motion into reciprocating motion, comprising a housing, rotating crank means axially movable within said housing and adapted to be coupled to a linearly movable member, said crank means being connected to a pair of opposed rotating bodies cooperating with said housing to form pressure chambers, means for supplying a fluid

media to one of said pressure chambers and duct means extending between said pressure chambers to communicate with each



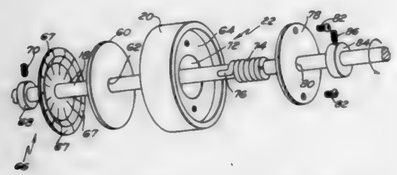
other whereby the pressure in said chambers may be balanced to adjust the axial position of said crank with said housing.

4,041,801

MECHANISM OF IMPROVING THE REGULATION OF ROTARY POWER SOURCES SUBJECT TO INTERMITTENT SHORT TERM OVERLOAD

Warren A. Anderson, 1874 Main Road, Tiverton, R.I. 02878

Filed Jan. 21, 1976, Ser. No. 651,014
Int. Cl.² F16D *67/00*; F16F *15/10*
U.S. Cl. 74—572 **2 Claims**



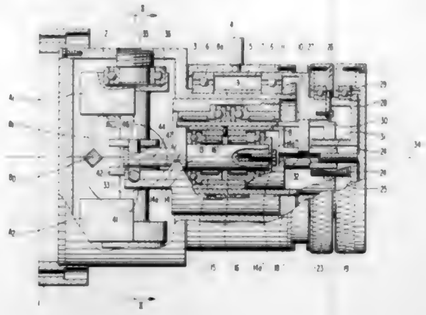
1. A power driven regulated rotary system comprising:
a shaft adapted to be driven at a rotating velocity for supplying rotational power;
a variable load including an electrical power source mechanically connected to said shaft for receiving said rotational power; and
a supplementary power supply, adapted for rotation, having a first coupling means connected to said shaft for slowly accelerating said supplementary power supply to shaft speed, said supplementary power supply receiving and storing energy when said shaft rotates at a velocity higher or equal to said supplementary power supply and said supplementary power supply having a second coupling means for connecting rigidly said supplementary power supply to said shaft for delivering power to said variable load on an overload by said variable load causing said shaft rotational velocity falling below the rotational velocity of said supplementary power supply, said supplementary power supply further comprises an inertial element, a slidable friction coupling device coupling said inertial element to said shaft, said slidable friction coupling device further comprises a frictional disc abutting said inertial element, and a spring finger washer frictionally abutting said friction disc and rigidly connected to said shaft, a clutch adapted to connect rigidly said inertial element to said shaft upon said inertial element rotating at a higher velocity than said shaft, said clutch further comprises a wire sping wound around said shaft and affixed to said inertial element, and a collar adapted for positioning said supplementary power supply.

4,041,802

BALANCING APPARATUS, PREFERABLY FOR GRINDING WHEEL

Rolf Brorsson Dahlin, Karrgrand 49, 162 46 Vallingby, Sweden

Filed Dec. 1, 1975, Ser. No. 636,462
Claims priority, application Sweden, Dec. 2, 1974, 7415037
Int. Cl.² F16F *15/22*
U.S. Cl. 74—573 **4 Claims**



1. In an apparatus usable with a rotatable object such as a grinding wheel, to balance an object during its rotation, having members mounted co-rotary with the object, members mounted non-co-rotary therewith, a plurality of weights (A_1, A_2, B_0, B_1 and B_2) coupled to the co-rotary members, said weights having their respective centers of gravity arranged displaceable relative to planes through the axis of rotation (34) of the object, actuating means coupled to the weights and supported by the non-co-rotary members, said actuating members displaceable along the axis of rotation, said weights being adapted for rotation about a pair of axles (35, 37), said axles extending angularly in relation to the axis of rotation (34), co-operating portions (44, 43 and 40, 41, 42) on said actuating means and weights provided with toothed elements (43, 45), by which rotation of the weights is effected, the improvement comprising: two of said plurality of weights (A_1, A_2) defining a first group of weights, and each of disc-shape and connected to each other by a central rotation axle (37), two of said plurality of weights (B_1, B_2), defining a second group of weights, and each of disc-shape and connected to each other by an intermediate bow portion (B_0) offset from a rotation axle (35) for said second group, wherein the rotation axles (35, 37) of said first and second weights form substantially right angles with each other and with the rotation axis (34) of the rotary object, and the rotation axles (37, 35) of said first and second weights are located substantially in the same plane.

4,041,803

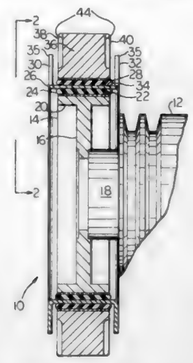
RUBBER TORSIONAL VIBRATION DAMPER WITH COOLING MEANS

Alexander Goloff, East Peoria, and Mark Frederick Sommars, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1975, Ser. No. 636,509
Int. Cl.² F16D *15/12*
U.S. Cl. 74—574 **10 Claims**

1. A torsional vibration damper for a rotary member comprising a hub member adapted to be mounted upon the rotary member for rotation therewith, a first vibratory movement energy absorbing and dissipating element means mounted upon said hub member, a cooling fin means mounted upon said first energy absorbing and dissipating element, a second vibratory movement energy absorbing and dissipating element means mounted upon said cooling fin means, a generally ring-shaped inertia member defining a pair of radially directed side surfaces mounted upon said second vibratory movement energy absorbing and dissipating element means, a plurality of radially

directed, integral cooling fins on said side surfaces, and wherein said cooling fin means comprise a first and a second plurality of cooling fins positioned adjacent to said side surfaces and thereby said integral fins, whereby air flow past said first and second plurality and said integral fins provides for heat flow away from said first and second vibratory movement energy absorbing and dissipating element means.

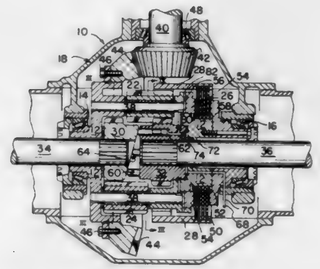


4,041,804

LIMITED SLIP DIFFERENTIAL WITH CLUTCH CONTROL MEANS

Ralph B. Clark, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 513,735, Oct. 10, 1974, abandoned.
This application May 26, 1976, Ser. No. 690,111
Int. Cl.² F16H *1/44*
U.S. Cl. 74—711 **5 Claims**



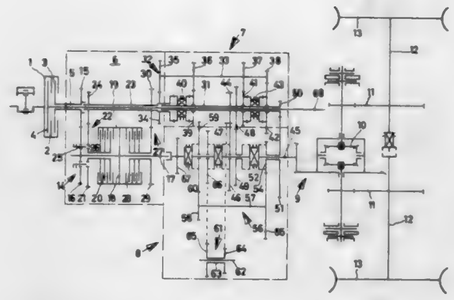
1. A new differential comprising:
a pair of coaxially juxtaposed axle gears, each mounted on a rotatably mounted drive axle;
a carrier mounted in said differential for rotation relative to the drive axles;
a plurality of first planet gears rotatably mounted on the carrier, each being in meshing engagement with one of the axle gears;
a plurality of second planet gears rotatably mounted on the carrier, each being in meshing engagement with the other of the axle gears and with the first planet gears;
a floating ring gear engaging one of said plurality of planet gears and mounted for rotation thereabout;
a fluid pressure actuable clutch means for coupling the ring gear to the carrier;
cam means rotatable with one of the axle gears,
fluid piston pump means engaging said cam means and rotatable with the other axle gear; and
fluid passage means communicating the fluid piston pump with the clutch means,
whereby relative rotation between the axle gears causes the fluid piston pump means to be actuated by the cam means to communicate fluid pressure to the clutch to actuate the clutch to resist relative rotation of the carrier and ring gear.

4,041,805

CHANGE GEAR TRANSMISSION IN GROUP ARRANGEMENT FOR MOTOR VEHICLES, ESPECIALLY FOR USE IN AGRICULTURE AND IN THE CONSTRUCTION FIELD

Dieter Jochmann, Hurth-Gleuel, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Mar. 3, 1975, Ser. No. 554,433
Claims priority, application Germany, Mar. 2, 1974, 2410164
Int. Cl.² F16H *37/00*; F16D *3/44, 13/22*
U.S. Cl. 74—740 **4 Claims**



1. In combination with a geared transmission in group arrangement, especially for motor driven agricultural and construction vehicles; a primary group having an input shaft adapted for connection to a source of power by a selectively operable friction clutch and an output shaft, a countershaft and a primary friction clutch member fixed on said countershaft, a pair of first gears rotatable on said countershaft, one on each side of said primary clutch member and a pair of secondary friction clutch members each connected to one of said first gears for selective cooperation with said primary friction clutch member, a pair of second gears fixed to said output shaft and each meshing with one of said first gears, so that selective engagement of one of said secondary friction clutch members with said primary friction clutch member will drive said output shaft through one of said first gears meshing with one of said second gears, another pair of meshing gears fixed to said input shaft and said countershaft, respectively, in a plane adjacent the plane of one pair of said first and second meshing gears, and coupling mechanism carried by said gear on said countershaft and the first gear in the adjacent plane comprising movable means on one of the said gears movable to engage cooperating means on the other of the said gears for driving the said first and second gears in a plane adjacent said another pair of meshing gears and said output shaft independently of said primary and secondary disengageable friction clutch members bypassed thereby, said transmission including means for connecting said output shaft to a load to be driven.

4,041,806

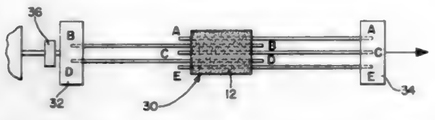
TESTING CORD-TO-ELASTOMER ADHESION

Kenneth K. Klar, Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Oct. 18, 1976, Ser. No. 733,583
Int. Cl.² G01M *19/00*
U.S. Cl. 73—159 **8 Claims**

1. A method of testing a cord-to-rubber adhesion comprising selecting a specimen of cords embedded in a rubber matrix, said specimen having three parallel cords, applying a force longitudinally of the first cord in a first direction and applying

a force to each cord of the pair thereof having the first cord therebetween in a second direction, and measuring the force



required to cause separation between said first cord and said pair thereof.

4,041,807

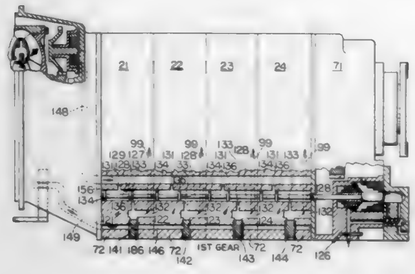
CONTROL SYSTEM FOR A MODULAR TRANSMISSION

Charles H. Herr, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 458,998, April 8, 1974, Pat. No. 3,913,415. This application Aug. 21, 1975, Ser. No. 606,613

Int. Cl.² F16H *3/74*

U.S. Cl. 74—752 C **2 Claims**



1. A power transmission including a plurality of sequentially arranged speed ratio modules, each of the modules comprising

an input shaft,

an output shaft,

a planetary gear set having a sun gear, a ring gear driven by the input shaft and a plurality of planetary gears mounted upon a rotatable carrier and engaged with the ring gear and the sun gear, the output shaft being coupled for rotation with the carrier,

a direct drive clutch selectively operable to cause rotation of the ring gear together with the sun gear,

a reduction drive clutch selectively locking the sun gear against rotation, and

control means for operating both the direct drive clutch and reduction drive clutch in response to a single hydraulic signal,

the power transmission also including a control system comprising

a source of signal fluid under pressure,

conduit means for communicating the signal fluid to each of the speed ratio modules,

a plurality of separate valve means each associated with a speed ratio module for selectively communicating the conduit means with the control means of the respective modules, each separate valve means comprising a valve spool member, the plurality of spool members axially aligned and extending continuously through the sequentially arranged speed ratio modules, and

governor means operatively coupled with a final output drive shaft of the power transmission and one of the valve means to condition all the valve means for sequentially communicating signal fluid to the respective modules relative to operating speed of the output shaft, the governor means comprising operating means for interaction with one end of the continuously extending spool members and hydralic means incrementally responsive to rotating speed of the final output drive shaft for adjusting the operating means and its interaction with the continuously extending spool members.

4,041,808

PLANETARY GEARING

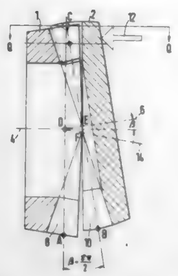
Kurt Gerhard Fickelscher, Frankenthal, Pfalz, Germany, assignor to Balke-Durr AG, Ratingen, Germany

Filed Apr. 14, 1976, Ser. No. 676,702

Claims priority, application Germany, Apr. 15, 1975, 2516474; Nov. 24, 1975, 2552588

Int. Cl.² F16H *1/28*

U.S. Cl. 74—800 **33 Claims**



1. Planetary gearing comprising a rotatable swash plate, at least another toothed plate engaged by said swash plate, said plates being disposed in respective intersecting radial planes having an angle β included therebetween, said plates having on respective faces thereof different numbers of teeth formed on respective conical surfaces, the teeth of said other toothed plate having flanks, extension lines from all of said flanks intersecting in points located on an imaginary circle having an axis coincident with the axis of said other toothed plate, the teeth of said toothed swash plate having flanks, extension lines from all of said flanks of said swash plate teeth intersecting in a common point, said common point, during rotation of said swash plate, defining said imaginary circle as the base of an imaginary cone, an angle $\gamma = 2\pi$ being included between projected radial planes of the respective rows of the teeth of said swash plate and said other plate and being defined in the following equation:

$$\gamma = \arcsin\left[\frac{\cos\alpha}{Z1/Z2}\cdot\left(\pm\sqrt{\sin^2\alpha + \left(\frac{Z1}{Z2}\right)^2 - 1} - \sin\alpha\right)\right]$$

where

$Z1$ = the number of teeth of the other plate,

$Z2$ = the number of teeth of the swash plate, and

2α = the angle formed between the flanks of a tooth.

4,041,809

MULTIPLE-TRANSMISION-RATIO TRANSMISSION ARRANGEMENT WITH GEAR-SHIFT OVERLAP ACTION OF AUTOMATICALLY VARIED DURATION

Heinrich Dick, Nattheim, and Erhard Kobinger, Giengen, Brenz, both of Germany, assignors to Voith Getriebe KG, Heidenheim, Brenz, Germany

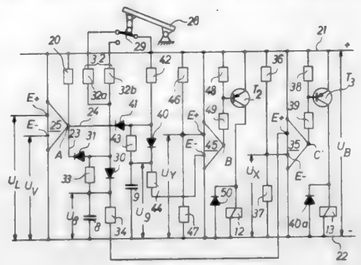
Filed Oct. 10, 1975, Ser. No. 621,634

Claims priority, application Germany, Oct. 16, 1974, 2449196

Int. Cl.² B60K *41/18*; F16H *3/74*

U.S. Cl. 74—866 **6 Claims**

1. In a multiple-transmission-ratio transmission arrangement of the type including at least first and second transmission-ratio-establishing units, particularly brakes and/or clutches, having hydraulically activated and unactivated states, the first and second transmission-ratio-establishing units together establishing a first transmission ratio when concurrently the first unit is in a predetermined one of its hydraulic activation states and the second unit is in a predetermined one of its hydraulic activation states, the first and second transmission-ratio-establishing units together establishing a second transmission ratio when concurrently the first unit is in the other of its hydraulic activation states and the second unit is in the other of its hydraulic activation states, an arrangement for changing the transmission ratio of the transmission arrangement in dependence upon variations in at least one monitored operating parameter of the transmission arrangement or of the engine or motor driving the transmission arrangement, comprising, in combination, a source of hydraulic fluid, first and second electrically controllable valve means each leading from moni-



tor signals, respectively, when but only when the associated one of said valve means is in that one of the energization states thereof corresponding to communication of the respective one of said units with said source, and safeguard means operative for receiving said first and second monitor signals and in response to the simultaneous receipt of both a first and a second monitor signal for longer than a preselected time interval operative for effecting deactivation of at least one of said units, wherein said first and second valve means comprise first and second solenoid valves comprised of first and second valve members each being at least in part electrically conductive, and wherein each of said monitoring means comprises a respective monitoring switch whose moving contact is constituted by the electrically conductive part of the valve member of the respective valve.

4,041,810

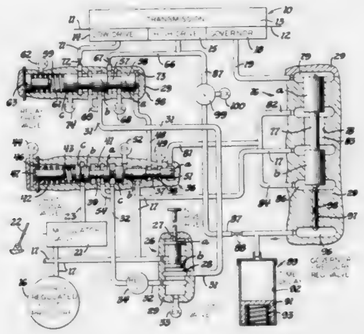
TRANSMISSION SHIFT CONTROL DEVICE SYSTEM

Kenneth B. Harmon, Indianapolis, and Ted M. McQuinn, Carmel, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1976, Ser. No. 658,399

Int. Cl.² B60K *41/14*

U.S. Cl. 74—868 **7 Claims**



1. In a transmission: multiratio drive means having a low fluid-operated device for establishing a low ratio drive and a high fluid-operated device for establishing a high ratio drive; a source of fluid at regulated pressure; governor means connected to said drive means and providing a governor pressure signal proportional to the speed of said drive means; automatic shift valve means connected to said source, said governor means and said low and high fluid-operated devices, having upshift force hysteresis means and downshift force hysteresis means and normally operative in low position to connect said source to said low fluid-operated device and said high fluid-operated device to exhaust for said low ratio drive and operative in response to said governor pressure signal of increased value to upshift to high position at a predetermined upshift speed to connect said low fluid-operated device to exhaust and to connect said source to said high fluid-operated device for establishing said high ratio drive and in response to said upshift of said shift valve means to actuate said upshift force hysteresis means without time delay to provide an upshift hysteresis force to prevent shift cycling and to actuate said downshift force hysteresis means after a time delay sufficiently longer than the time required for completely establishing said high ratio drive to provide a downshift hysteresis force substantially completely counteracting said upshift hysteresis force acting on said automatic shift valve means after the speed and governor pressure normally increases sufficiently to hold said automatic shift valve means in high drive position and to provide a downshift to said low ratio drive on a subsequent normal speed and governor pressure reduction at a downshift speed substantially the same as said upshift speed.

4,041,811

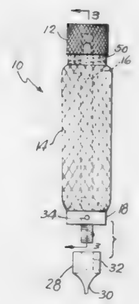
TORQUE LIMITING DRIVER

Walter F. Durant, 664 Noank Road, Mystic, Conn. 06355

Filed May 10, 1976, Ser. No. 684,929

Int. Cl.² B25B *23/14*

U.S. Cl. 81—52.4 R **8 Claims**



1. A torque-limiting driver, which comprises:

an elongated driven member having means for engaging a workpiece disposed at one end thereof and which is threaded at the other end thereof;

an elongated handle member movably disposed about said driven member and having a pair of clutch surfaces integrally formed one at each end thereof;

a first hub member axially and rotatingly secured to said elongaged driven member at said one end thereof adjacent one of said clutch surfaces of said handle member;

a second hub member rotatingly secured to said elongaged driven member but axially movable therealong adjacent the other of said pair of clutch surfaces; and

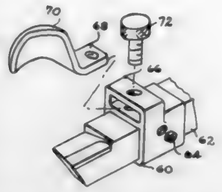
knob means threadingly secured to said other end of said elongated driven member adjacent said second hub member for permitting adjustment of the frictional fit between each of said hub members and their respective, adjacent clutch surfaces of said handle member.

4,041,812

SHIELD ELEMENT

Joseph F. Jiolo, R.D. No. 6, Mount Odin Heights, Greensburg, Pa. 15601, and Willis Howard Gardner, 823 Graham St., Belle Vernon, Pa. 15012

Filed June 29, 1976, Ser. No. 700,920
Int. Cl.² B23B *27/00*
U.S. Cl. 82—34 R 2 Claims



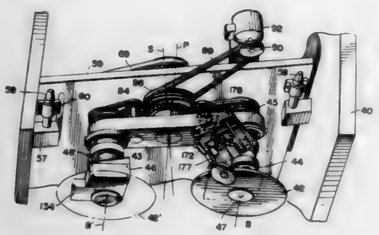
1. A chip shield, especially adapted for use with a turning tool having a chip taking cutting edge, comprising; a transparent element, support means near the lower edge of said element for supportingly and adjustably connecting the element to a cutting tool in a position to intercept chips taken by said cutting edge, said support means comprising a perforated tab projecting from the lower part of said element on the opposite side thereof from the cutting edge of the tool and a holder for the element, said holder comprising a first loop slidably receivable on a turning tool and a second loop integral with said first loop on top thereof for receiving said tab, said holder having a threaded aperture therein extending through said second loop and a wall of said first loop, and a clamp screw threaded into said aperture and extending through said perforation in said tab for securing the tab to the holder and clamping the holder to a tool on which the holder is mounted.

4,041,813

METHOD AND APPARATUS FOR TRANSVERSE CUTTING

Harvey J. Spencer, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Feb. 17, 1976, Ser. No. 658,181
Int. Cl.² B26D *1/56;* B23D *25/02*
U.S. Cl. 83—14 5 Claims



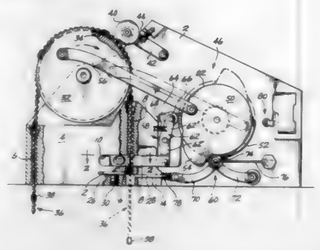
1. A method of cutting logs of convolutely wound web material, comprising:
- uniformly advancing a log along a path into a cutting station having an arm above said path,
- rotating said arm about an axis skewed with respect to said path, said arm having a disc blade mounted thereon with the blade axis spaced from the arm axis to cause said blade to intersect said path and cut a log, maintaining said blade axis at an angle skewed relative to said arm axis to position said disc blade continually perpendicular to said path whereby said disc blade makes a square cut through a log, and
- continuously planetarily rotating said disc blade about the blade axis from said arm axis.

4,041,814

METHOD AND DEVICE FOR DISPENSING PORTIONS OF A CHAIN

Cliff High, Tacoma, Wash., assignor to Morley Brotman, Tacoma, Wash.

Division of Ser. No. 628,399, Nov. 3, 1975. This application Sept. 16, 1976, Ser. No. 723,945
Int. Cl.² B26D *5/40*
U.S. Cl. 83—18 4 Claims



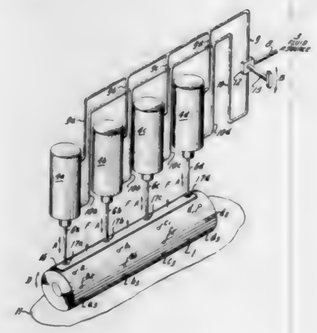
1. A method of dispensing portions of a chain having relatively diametrically enlarged segments at substantially regularly spaced intervals along the length thereof, comprising supporting the chain so that it is movable relatively lengthwise thereof through the opening in a collar which is capable of being opened and closed about the chain, and the opening of which has a diameter of less than that of the relatively enlarged segments of the chain in the closed condition of the collar, advancing the chain lengthwise in the direction of the collar when the collar is open, to the extent that a portion of the chain including one segment therein, is fed through the opening in the collar and assumes a position on the opposite side thereof, closing the collar about the chain, tensioning the chain against the collar, and severing the chain at a point on the opposite side of the collar to dispense the portion.

4,041,815

METHOD FOR PERFORATING ROOFING SHEET MATERIAL

Duane A. Davis, Plainfield, and Michael P. Krenick, Somerville, both of N.J., assignors to GAF Corporation, New York, N.Y.

Division of Ser. No. 566,765, April 10, 1975, Pat. No. 3,983,773.
This application Apr. 27, 1976, Ser. No. 680,887
Int. Cl.² B26F *1/24*
U.S. Cl. 83—30 5 Claims



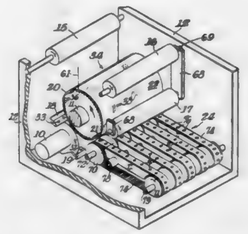
1. A method of forming perforation holes in sheet material comprising the steps of winding said sheet material into a roll, transporting said roll to a hole punching station, securely positioning said roll of sheet material at said hole punching station by applying a force thereto, simultaneously driving a plurality of punch rods axially spaced along said roll radially through said rolled sheet material simultaneously forming a plurality of apertures in successive wound layers of said sheet material permitting unrolling of said roll of sheet material so that said apertures will be positioned in rows and columns of the unwound sheet, and withdrawing said punch rods from said roll of sheet material substantially avoiding engagement with and tearing surrounding edges of said apertures.

4,041,816

ROTARY WEB CHOPPER

Michael Hillas Shearon, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 689,557, May 24, 1976, which is a continuation of Ser. No. 616,055, Sept. 23, 1975, abandoned.
This application Aug. 12, 1976, Ser. No. 713,807
Int. Cl.² B23D *25/12;* B26D *7/06*
U.S. Cl. 83—100 20 Claims



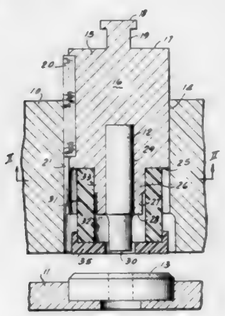
1. A cutter for a running web comprising:
- first and second axially co-parallel counter-rotating shafts driven in synchronism one with the other,
- a first blade mounted on said first shaft and having a straight cutting edge parallel to the axis thereof,
- a second blade mounted on said second shaft and having a shaped surface defined by generatrices parallel to the axis of said second shaft with the locus of said generatrices being an epitrochoid,
- said second blade having an outer peripheral surface forming with said shaped surface a second cutting edge, and
- said blades co-acting along their opposed cutting edges to effect a cut on a web therebetween.

4,041,817

PUNCH HOLDER AND STRIPPER COMBINATION

Paul Chris Nelson, Lake City, Minn., assignor to Houdaille Industries, Inc., Buffalo, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,089
Int. Cl.² B26F *1/14*
U.S. Cl. 83—139 5 Claims



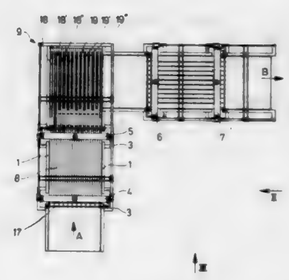
1. A punch holding device for use in punching comprising: a punch holder having a first body section with an outer diameter dimensioned to be received in a punch holder opening in a punching machine in a relatively close fit relationship, a second body section having a reduced outer diameter smaller than the outer diameter of the first body section and coaxial therewith projecting from the first body section and terminating in an end face, a punch receiving bore in said punch holder open to the end face having a diameter less than the outer diameter of the second body section, an elastomeric stripper having an outer diameter less than the outer diameter of the first body section and an inner diameter substantially equal to the outer diameter of the second body section received on the second body section and projecting therefrom beyond the end face.

4,041,818

APPARATUS FOR CUTTING CARPET SAMPLES

Jurgen Rummer, Industriestr 8, 8602 Trosdorf, Bamberg, Germany

Continuation of Ser. No. 557,265, March 11, 1975, abandoned.
This application Apr. 26. 1976, Ser. No. 680,571
Int. Cl.² B26D *3/02, 7/06, 11/00*
U.S. Cl. 83—256 15 Claims



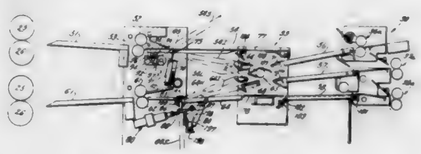
1. A device for progressively dividing carpet webs comprising a main frame; a conveying table mounted on the main frame and on which the carpet web will be supported and fed; four cutting tools, each pivotable about an axis transverse to the direction of the feed at that cutting tool, for cutting the carpet web into sample pieces and for chamfering the cut edges thereof, said cutting tools being arranged into a first pair for fashioning two opposite edges of the sample pieces and a second pair for fashioning the other two opposite edges of the sample pieces; and, between said first and second pairs of cutting tools, a straightening station for aligning carpet strips produced by the first pair of cutting tools in the direction of feed into the second pair of cutting tools.

4,041,819

LEAD-IN DEVICE FOR BI-LEVEL SLITTER

Paul Chu, Amityville; Gunther Weiskopf, New York, and Lawrence J. Saunders, Elmont, all of N.Y., assignors to S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.

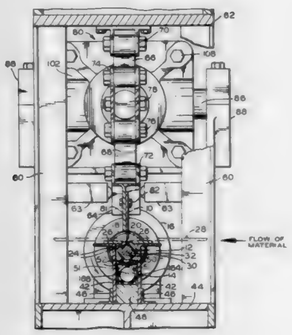
Filed Sept. 8, 1976, Ser. No. 721,380
Int. Cl.² B31B *1/16;* B26D *3/08, 11/00*
U.S. Cl. 83—302 14 Claims



1. Apparatus for producing sheets from a moving web including:
- upper and lower slitter means for longitudinally cutting a longitudinally moving wide web into a plurality of narrower webs;

upper lead-in table means operatively positioned to support webs issuing from said upper slitter means;
lower lead-in table means operatively positioned to support webs issuing from said lower slitter means;
upper and lower cutoff means downstream of said slitter means for transversely cutting webs into sheets;
upper and lower lead-in ramp means operatively positioned upstream of the respective upper and lower cutoff means to direct webs thereto;
each of said upper and lower lead-in table means being selectively operable independently between a lower position for directing webs toward said lower ramp means, and an upper position for directing webs toward said upper ramp means;
and director-support means intermediate said lead-in table means and said lead-in ramp means for guiding and supporting webs in the region between the table means and the ramp means.

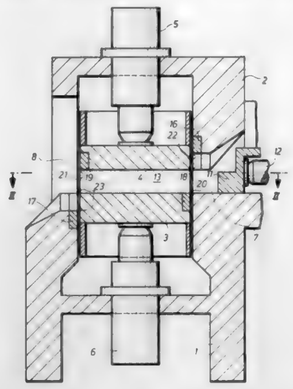
4,041,820
VENEER CLIPPER
David L. McGee, Portland, Oreg., assignor to Plymak Company, Inc., Portland, Oreg.
Filed Nov. 11, 1974, Ser. No. 522,576
Int. Cl.² B27L *5/08*
U.S. Cl. 83—356.2 **16 Claims**



1. An improved veneer clipper,
a knife,
means for reciprocating the knife,
anvil means having a cushioning portion,
support means mounting the anvil means in a position in which the cushioning portion is opposite the knife and is engaged by the knife when the knife is reciprocated,
means for shifting the cushioning portion of the anvil means laterally of the knife to change the part of the cushioning portion that is engaged by the knife,
braking means,
intermittently operable releasable means urging the anvil means against the braking means,
and means for preventing operation of the shifting means when the knife is moved toward the cushioning position.

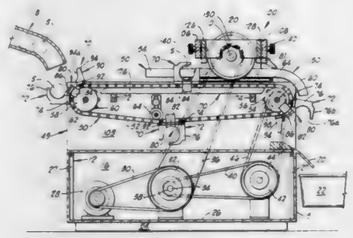
4,041,821
SCRAP SHEARING MACHINE
Hellmut Galter, Salzkotten, Germany, assignor to Lindemann Maschinenfabrik GmbH, Dusseldorf, Germany
Filed Sept. 14, 1976, Ser. No. 723,212
Claims priority, application Germany, Sept. 26, 1975, 2542909
Int. Cl.² B26D *11/00*
U.S. Cl. 83—382 **2 Claims**

1. In a scrap shearing machine for cutting up platelike scrap material, said machine comprising a first pair of knives and a second pair of knives, said first pair of knives comprising a first movable knife and a first stationary knife and said second pair of knives comprising a second movable knife and a second stationary knife, means operatively mounting said first pair of knives for cutting said scrap material in a first plane and means operatively mounting said second pair of knives for cutting said scrap in a second plane which lies at an angle to said first plane, said first pair of knives and said second pair of knives being adapted to cut said scrap material successively, the improvement comprising a housing, a first support carrying said first movable knife, means movably mounting said first support for cutting movement in said housing, a second support carrying said second movable knife, means mounting said second support for cutting movement in said housing counter to said



movement of said first support, means for moving said first support and said second support independently of each other, means defining an inlet opening into said housing for scrap material to be cut, means defining an outlet opening from said housing for cut pieces of said scrap material, said inlet opening being located on one side of said first plane and said outlet opening being located on the remote side of said second plane and said inlet and outlet openings being aligned with each other, and said first support and said second support forming rams which are adapted to clamp said scrap material between them during said cutting movements of said first support and said second support.

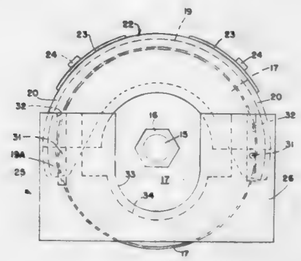
4,041,822
SAUSAGE SLICING MACHINE
Floyd S. Gabel, 5008 NW. Steanson, Oklahoma City, Okla. 73112
Filed June 11, 1976, Ser. No. 695,177
Int. Cl.² B26D *1/28*
U.S. Cl. 83—409.2 **16 Claims**



1. A sausage slicing machine comprising:
a framework;
a conveyor assembly mounted on said framework and including:
an endless chain having an upper horizontal run and a lower horizontal run; and

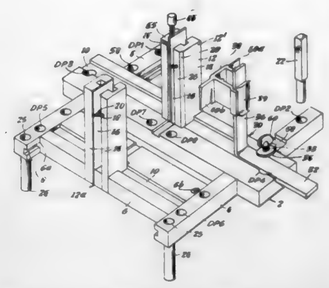
an articulated cradle subassembly secured to said chain and comprising:
a trailing element secured to said chain and extending transversely with respect to the direction of travel of the chain and including transversely spaced, concavely recessed roll backing plates;
a central element secured to a different part of said chain than said trailing element and movable independently of said trailing element, said central element extending transversely with respect to the direction of travel of the chain and including transversely spaced, concavely recessed roll bottoming plates; and
a leading element secured to a different part of said chain than said trailing element and central element and movable independently of said trailing element and said central element, said leading element including transversely spaced, concavely recessed roll confining plates;
said trailing, central and leading elements being responsive to the travel of said chain in a straight path in said upper horizontal run to move into a contiguous, juxtapositioned relationship to each other defining a generally cylindrical, hollow interior in the cradle subassembly adapted to contain and confine a cylindrical sausage roll, and further being responsive to movement of said chain to a semicircular path between said horizontal runs to open said elements apart from each other, whereby a sausage roll can be dropped into one of said concavely recessed plates; and
a cutter assembly supported above said framework over said conveyor assembly and including a plurality of rotatable, transversely spaced cutter blades aligned with the spaces between said transversely spaced, concavely recessed roll backing plates, and with the spaces between said roll bottoming plates and the spaces between said roll confining plates.

4,041,823
GUARD FOR SLITTING WHEEL
Walter L. Ashbrook, Fairfield, Ohio, assignor to Champion International Corporation, Stamford, Conn.
Filed Mar. 12, 1976, Ser. No. 666,437
Int. Cl.² B26D *7/22*
U.S. Cl. 83—478 **11 Claims**



1. A guard for rotatable slitting wheel mounted on a base comprising:
a. an upper guard portion including a wall positioned parallel to said wheel and formed integral with two bent-over tabs for attachment to a portion of the base; and ,
b. a lower guard portion including two walls positioned on either side of said wheel, joined at their lower edges by a horizontal guard plate; said guard formed with a slot through which the edge of the slitting wheel extends;
c. said lower guard portion also formed with vertical slots in one of said walls for adjustably securing the lower guard to the base.

4,041,824
LOCATION APPARATUS
Gordon Williams Wynn, 308, Northridge Way, Hemel Hempstead, Hertfordshire, England
Continuation of Ser. No. 174,423, Aug. 24, 1971, abandoned.
This application June 6, 1975, Ser. No. 584,289
Int. Cl.² B27G *5/02*; B27F *1/14*
U.S. Cl. 83—763 **29 Claims**



1. Location apparatus for use in making a saw cut in a workpiece and comprising, in combination, a base on which the workpiece is placed, at least one saw guide member mounted on said base to define a saw blade guide plane at a predetermined setting to the plane of said base, said saw guide member comprising a pair of elements extending vertically from the base at a spacing from each other to provide an upwardly open gap for the insertion and removal of a saw blade, a side face of one of said elements forming an abutment face for the saw blade and said other element comprising means for resiliently urging the saw blade against said face while yet enabling insertion and removal of the saw blade through said upwardly open gap, a series of fixed locations being provided at spaced positions on said base, a plurality of location elements being selectively engageable with respective ones of said locations for defining a series of different and predetermined angular settings for the workpiece relative the saw guide plane permitting correspondingly oriented saw cuts to be made in said workpiece, guide means on said base extending from adjacent said at least one saw guide member transversely to said guide plane, and transverse position location means displaceably guided by said guide means for providing a location for the workpiece in said direction transverse the saw guide plane.

4,041,825
KEYBOARD ASSIGNMENT SYSTEM FOR A POLYPHONIC ELECTRONIC MUSICAL INSTRUMENT
Armand N. Pascetta, 520 Revere Drive, Turnersville, N.J. 08012
Continuation-in-part of Ser. No. 515,057, Oct. 15, 1974, abandoned, which is a continuation of Ser. No. 393,429, Aug. 31, 1973, abandoned. This application Oct. 20, 1975, Ser. No. 623,659
Int. Cl.² G10H *1/00*
U.S. Cl. 84—1.01 **11 Claims**

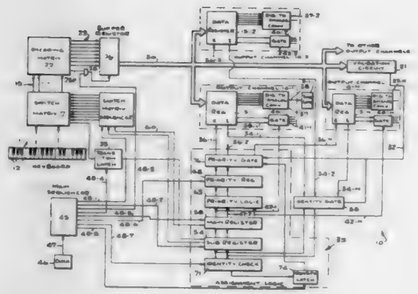
11. A keyboard assignment system for use in an electronic musical instrument comprising:
a switch matrix actuated by said keyboard and including a plurality of switch arrays interconnected to connect one of a first set of input lines to an output line associated with each depressed switch in a priority order,
a code matrix connected to said switch matrix to produce a parallel digital code indicative of the associated key when one of the switch matrix input lines is energized,
a buffer register connected to said code matrix and enabled upon receipt of a data entry signal to provide said parallel digital code to a set of note-identification code lines,
a switch matrix sequencer for sequentially energizing said switch matrix input lines,
scanning control sequencer means for providing sets of

sequential control signals, some of said control signals advancing said switch matrix sequencer means to energize the next switch matrix input line, another of said control signals comprising said data entry signal,

a lesser plurality of output channels, each including a data register connect to said note-identification code lines to receive said note-identification codes therefrom, each data register having a data storage section and a comparator means,

the comparator means in each data register being connected to said code lines and to the data storage section of the same data register for comparing the note-identification code present on said code lines with the contents of that data storage section and for providing an identity signal if said present code and said contents are identical, said identity signal indicating that the output channel providing the identity signal is assigned to the key associated with that note-identification code,

priority logic means, operatively connected to said scanning control sequencer and responsive to said identity signals from all of said comparator means, for establishing, during a cycle of said scanning control sequencer, the next available unassigned output channel,



validation circuit means, connected to said code lines, for providing a "valid code" signal when a note-identification code is present on said code lines,

identity check means, operatively connected to all of said comparator means and responsive to said identity signals, for providing a "note not assigned" signal when no identity signal is provided from any of said comparator means,

priority gate means, operatively connected to said validation circuit means, to said identity check means, and to said priority logic means, for assigning a newly selected note-identification code to said next available output channel, said gate means providing a data entry signal to said next available output channel in response to simultaneous occurrence of a "valid code" signal and a "note not assigned" signal, said data entry signal causing the note selection code present on said code lines to be stored in the data storage section of the data register of said next available output channel, and

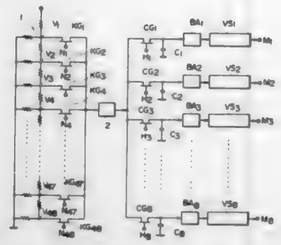
means for enabling generation of musical tones corresponding to notes identified by codes stored in said output channels.

4,041,826

ELECTRONIC MUSICAL INSTRUMENT

Akiyoshi Oya, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 4, 1975, Ser. No. 601,945
Claims priority, application Japan, Aug. 7, 1974, 49-90515; Aug. 12, 1974, 49-92172; Aug. 14, 1974, 49-93660
Int. Cl.² G10H *1/00*
U.S. Cl. 84—1.01 **5 Claims**



1. An electronic musical instrument comprising:

a voltage circuit for producing a plurality of d-c note voltages corresponding to respective keys;

a plurality of key gate circuits connected at inputs thereof to the outputs of said voltage circuit and connected at outputs thereof in common connection;

a key gate control signal generator for generating a key gate control signal used for enabling, in response to depression of a key, one of said key gate circuits corresponding to the depressed key;

a plurality of channel gate circuits connected to the common output terminal of said key gate circuits;

channel gate signal generation means for producing, in time-shared sequence, channel gate signals used for enabling said channel gate circuits;

storage means for separately storing each of the d-c note voltages supplied from said channel gate circuits; and

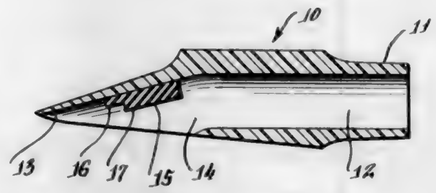
a plurality of musical tone generation systems for producing musical tone signals corresponding to the stored d-c note voltages.

4,041,827

TONE ENHANCING DEVICE FOR REED TYPE MUSICAL INSTRUMENTS

Nicholas T. Daglis, 42-23 Clearview Exp., Bayside, N.Y. 11361

Filed June 29, 1976, Ser. No. 700,796
Int. Cl.² G10D *9/02*
U.S. Cl. 84—383 R **5 Claims**



1. A tone enhancing element for incorporation in the mouthpiece of a reed type musical instrument, said mouthpiece having an air flow-through passage opening through the end of the mouthpiece to which a player applies his mouth to play the instrument, said end being generally V-shaped with said opening and its adjacent edge portions being shaped for a reed to be mounted over the opening, said element comprising:

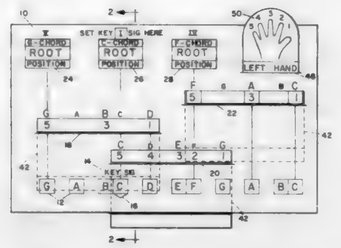
two successive, substantially well defined steps adapted to be positioned to project into said passage from the interior wall thereof opposite said opening, with the first of said steps in from said end of the mouthpiece being lower than the second so that the second step projects further into said passage than the first.

4,041,828

CHORD FINGERING COORDINATOR

Verna M. Leonard, 8701 Highway 41, Fresno, Calif. 93710

Filed Feb. 6, 1976, Ser. No. 655,702
Int. Cl.² G09B *15/02*
U.S. Cl. 84—471 R **8 Claims**



1. A multiple chord and scale integrator compising:

a. a backing sheet having displayed thereon the consecutive scale tones of a diatonic scale;

b. said backing sheet having a plurality of vertically staggered and horizontally overlapping mounting means; and

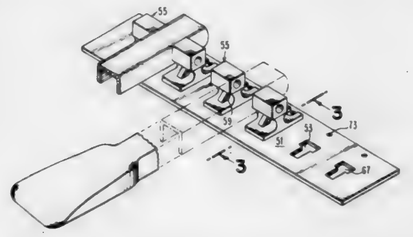
c. a plurality of panels removably mounted in said mounting means, each of said panels having indicia thereon to register with selected ones of said scale tones of said diatonic scale to indicate a particular chord or scale to be played from said diatonic scale.

4,041,829

PIANO PEDAL ASSEMBLY

Robert Ogden Robeson, Boiceville, N.Y. 12412, and Vincent Joseph Hart, 4 Smith Ave., Kingston, N.Y. 12401

Filed Sept. 30, 1975, Ser. No. 618,054
Int. Cl.² G10C *3/26*
U.S. Cl. 84—225 **10 Claims**



1. A piano pedal assembly comprising in combination

a plurality of pedals,

a support member having a plurality of openings therein,

a plurality of mounting blocks having notched portions adapted to fit within said openings, a pair of said mounting blocks being used to support each of said pedals,

means for coupling said pedals to said mounting blocks, and

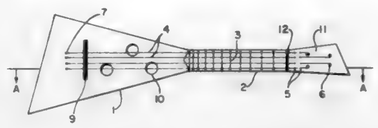
means for attaching said mounting blocks to said support member to provide registration and alignment of said pedals in said piano pedal assembly.

4,041,830

TEACHING UKELELE

J. Chalmers Doane, 31 Bridgeview Drive, Halifax, Nova Scotia, Canada

Filed Sept. 18, 1975, Ser. No. 614,373
Int. Cl.² G10D *3/14*
U.S. Cl. 84—305 **6 Claims**



1. In a stringed musical instrument of the type having a hollow sound box, a neck having a fingerboard mounted on the top surface thereof, a tuning head having tuning pegs, said tuning head being located at the end of said neck remote for said sound box, a nut mounted on the upper surface of said neck between said soundbox and said tuning head, a bridge mounted on said sound box, and a plurality of strings extending across said bridge, over said fingerboard and across said nut to said tuning pegs and attached thereto, the improvement comprising:

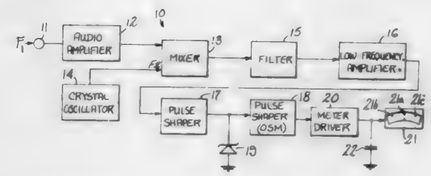
said tuning head having a pair of holes for each string penetrating through said tuning head between said nut and said tuning pegs for receiving said string at the upper surface of said tuning head and passing it to the lower surface thereof and for receiving said string at the lower surface of said tuning head and passing it to said upper surface.

4,041,831

INSTRUMENT FOR TUNING MUSICAL INSTRUMENTS

Ronald G. Arpino, 24 Damien Road, Branford, Conn. 06405

Filed July 8, 1975, Ser. No. 594,114
Int. Cl.² G10G *7/02*
U.S. Cl. 84—454 **14 Claims**



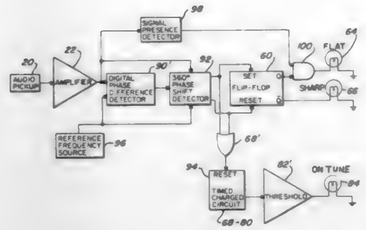
1. An instrument for indicating when an audio frequency signal such as a tuned frequency of a musical instrument is achieved comprising audio-receiving means adapted to receive an audio frequency signal, a local oscillator having a signal whose frequency differs by a small amount from the tuned frequency, a mixer for mixing the received audio frequency signal and the local oscillator signal to provide a difference frequency therebetween, filtering means, said filtering means having a pass range selected to pass a narrow frequency range including said difference frequency and exclude other frequency outputs of said mixer, said filter receiving the output of said mixer, pulse-shaping means responsive to the output of said filter for converting the difference frequency signal to a series of pulses of predetermined height and width of the same frequency as said difference frequency, an indicating meter, and means for applying said pulses to said indicating meter, said meter being calibrated to indicate the frequency of said pulses, whereby the meter may indicate when the difference frequency is a predetermined value.

4,041,832

TUNING AIDS

Douglas M. Risch, 816 E. 58th St., Loveland, Colo. 80537

Filed Nov. 25, 1975, Ser. No. 635,372
Int. Cl.² G10G *7/02*
U.S. Cl. 84—454 **5 Claims**



1. A tuning aid comprising:

a stable source of reference signal having a selectable frequency to produce a given digital tone signal;

means for sensing a note developed by an instrument and developing a corresponding digital measurement signal;

means for comparing said tone and measurement signals to produce indicating signals representing respectively the one present of the conditions of sharp, flat or on-tune of said measurement signal relative to said tone signal, said comparing means having a phase difference detector responsive to said tone and measurement signals for producing a difference signal and a single phase shift detector responsive to said tone and measurement signals and also to said difference signal for producing a first indication signal representing said sharp condition, a second indication signal representing said flat condition and a combination of said first and second signals representing said on-tune condition;

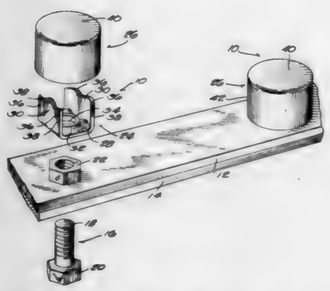
and means responsive to said indicating signals for displaying the respective one of said conditions indicated, said responsive means including first, second and third display elements individually energized in response to respective different ones of said indicating signals and each displaying a single, fixed, stationary and continuous indication of the respective one of the conditions to be indicated.

4,041,833

CAP ASSEMBLY FOR A NUT AND BOLT

Adolph A. Wagner, 3454 N. Shepard Ave., Milwaukee, Wis. 53211

Filed Aug. 13, 1976, Ser. No. 714,031
Int. Cl.² F16B *37/14*
U.S. Cl. 85—35 **9 Claims**



1. A cap assembly for a bolt having a head and a threaded shank with a nut threaded on the threaded shank comprising:

a retainer member of substantially U-shape having a base portion and a pair of legs extending therefrom, each of said legs having a pair of relatively sharp vertical edges thereon, said base portion having a threaded opening therein to facilitate threaded engagement between said retainer member and the threaded shank of said bolt; and

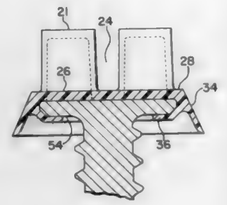
a cap member having a top portion and a wall portion integral therewith, said wall portion dimensioned so that when said cap member is fitted over the legs of said retainer member, the sharp edges of said legs will be in tight frictional engagement with the inside surface of said wall portion of said cap member.

4,041,834

PLASTIC HEADED FASTENER ASSEMBLY

Daniel Joseph Herkes, Aurora, and Ernest William Reinwall, Jr., McHenry, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 24, 1976, Ser. No. 717,295
Int. Cl.² F16B *23/00, 35/06*
U.S. Cl. 85—45 **4 Claims**



1. A threaded fastener with a composite, corrosive resistant head, including a metal body with a threaded shank and an integral radially enlarged head portion at one extremity and a drill point at the other extremity, a pair of slots formed in the head portion intersecting at right angles at their midpoints and at the axis of the threaded shank, the slots extending transversely of the head intersecting the outer periphery thereof, a flange extending radially outwardly of the head the bottommost surface thereof forming the clamping surface of the head portion, the slots defining four upstanding posts, each post thereby including a pair of internal, intersecting planar surfaces extending substantially perpendicular to the base of the slots and to each other, the base of the slots being coplanar and substantially perpendicular to the longitudinal axis of the fastener, a thin-walled, substantially uniform thickness of corrosive resistant thermoplastic coating covering all surfaces of the enlarged head portion including the flange, the outer periphery of the flange and at least the radial outermost surface region of the surface beneath the flange forming the clamping surface, the composite head thus providing a cruciform slot configuration presenting eight substantially equal, flat internal bearing surfaces maximizing the surface area on which a mating driving tool applies a rotary inducing force on four of said internal surfaces when torque is applied in a given direction compressing the plastic coating against the upstanding posts to minimize the stress on the thermoplastic material when subjected to large torque required in drilling and setting the fastener.

4,041,835

TORQUE TRANSMITTING APPARATUS

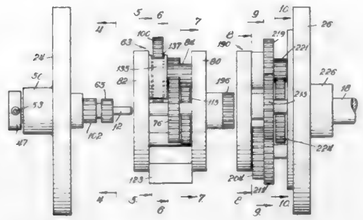
Ernst R. Isler, Zurich, Switzerland, assignor to Helena A. M. Isler, Zurich, Switzerland

Filed Dec. 18, 1975, Ser. No. 642,209
Int. Cl.² F16H *3/74*
U.S. Cl. 74—751 **11 Claims**

1. An apparatus for transmitting torque from a prime mover to a load, comprising:

an input planetary gear unit adapted to be connected drivingly to the output of the prime mover, said input unit including a plurality of input sun gears and a plurality of input planet gears;

an output planetary gear unit coupled to said input unit and adapted to be connected drivingly to the input of the load,



said output unit including a plurality of output sun gears and a plurality of output planet gears; and

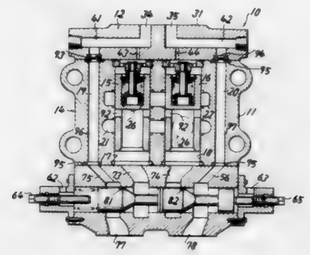
reaction means connecting rigidly said output planet gears and one of said input sun gears for causing said input planet gears to orbit about said input sun gears.

4,041,836

OPEN CIRCUIT TYPE ACCELERATION/DECELERATION DEVICE

Hikaru Murata, No. 1734, Sakakura, Sakahogi-cho, Kamo, Gifu, Japan

Filed May 7, 1975, Ser. No. 575,261
Claims priority, application Japan, May 8, 1974, 49-51004; May 8, 1974, 49-51005
Int. Cl.² F15B *13/043*
U.S. Cl. 91—29 **7 Claims**



1. An acceleration/deceleration system of the open-circuit type, comprising

a fluid motor having two motor ports;

a fluid pressure source;

a fluid reservoir;

supply conduit means connecting said source to said motor;

discharge conduit means connecting said motor to said reservoir;

an amplification vavle assembly interposed in both of said conduit means and comprising a valve body having two parallel cylindrical valve chambers having a first and a second axial end;

port means in said valve body including a first and a second external port respectively communicating with said source and said reservoir as well as with the respective chambers;

a plurality of internal ports in said valve body intercommunicating said chambers;

third and fourth external ports in said valve body each communicating said axial axial end of each of said chambers with a respective one of said motor ports;

hollow fluid pressure responsive first supply and exhaust valve spools axially slidable in the respective chambers relative to said internal ports between a neutral position in which they block the fluid flow through said chambers and an operating position in which they permit supply and exhaust fluid flow therethrough;

a pair of pilot flow passages in said valve body each having one end communicating with said first end of one of said chambers and also having another end connected with a respective external port;

a limiting orifice member interposed in each of said pilot flow passages;

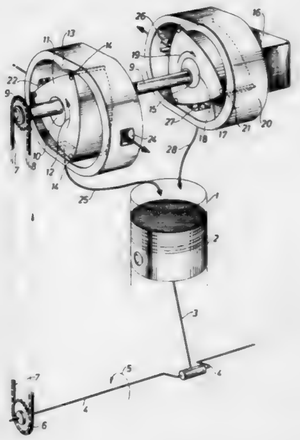
a valve passage in said valve body interconnecting each of said second axial ends with a respective pilot passage adjacent a respective external port; and pilot generated spool valve means including spool valves slidably interposed in said valve passage, a spool valve means control pilot circuit, and a valve spool control circuit, being operative for supplying fluid to a respective pilot flow passage and to the first end of a respective chamber to act on the respective pressure responsive valve spool for controlling the displacement of said valve spools in said chambers in dependence upon a pressure drop occurring between fluid flows passing said limiting orifice members in said pilot flow passages.

4,041,837

INDUCTION AND EXHAUST APPARATUS FOR PISTON MACHINES

Franz Weidlich, Snapphanevagen 150, 175 34 Jarfalla, Sweden

Filed Mar. 5, 1976, Ser. No. 664,186
Int. Cl.² F01L *33/02;* F15B *13/04*
U.S. Cl. 91—270 **7 Claims**



1. In combination with a cylinder of a four-stroke piston engine, the cylinder having a reciprocating working piston defining a working chamber therewith and a drive shaft connected to the piston: a device for sequentially controlling an intake, compression, power and exhaust stroke of the piston, the device comprising

a. a first and a second rotary valve means, each of the valve means including

1. a housing with an epitrochoidal shaped cavity having ports and

2. a triangularly shaped rotor supported in said cavity or epitrochoidal movement, the rotor having three surfaces defining respective chambers with the housing,

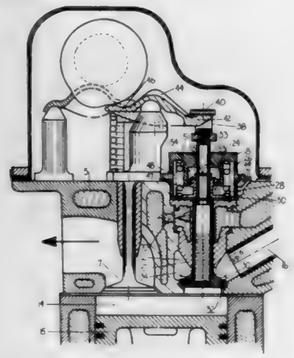
3. the ports in the housing of the first rotary valve means including an intake and an exhaust port, the ports in the housing of the second rotary valve means including an exhaust port, and an additional one of the ports in each of the housings serving for connection of one of the chambers to the working chamber of the cylinder,

b. duct means connecting the additional ports to the working chamber, and

c. synchronizing means connecting the drive shaft and the rotors for synchronizing the rotation of the drive shaft with that of the rotors, the synchronizing means including

1. reduction gearing causing the rotors to move so that, for each complete stroke, the one chamber in the housings is in communication with the working chamber of the cylinder through the duct means, the intake and the exhaust ports in the housing of the first valve means are selectively in and out of communication with the one chamber, the exhaust port in the housing of the second valve means is selectively in and out of communication with the one chamber, and such a surface of the rotors is exposed to gases coming from the working chamber of the cylinder during the power stroke that the gases contribute to the rotary movement of the rotors.

4,041,838
VALVE ARRANGEMENTS FOR RECIPROCATING PISTON MACHINES
Glenn B. Warren, 1361 Myron St., Schenectady, N.Y. 12309
Filed Nov. 17, 1975, Ser. No. 632,316
Int. Cl.² F01L *15/16*
U.S. Cl. 91—273 **11 Claims**



1. In a reciprocating piston machine wherein inlet and discharge valve means control the flow of fluid into and out of a working cylinder of said machine in a desired timed sequence, the combination with said machine of an improved inlet valve arrangement comprising:

a. an inlet valve having a head and a stem extending therefrom;

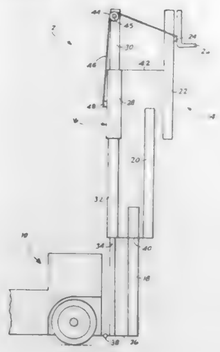
b. a housing member surrounding a portion of said stem and defining enclosed cavity means having first and second concentric inner and outer cylindrical bores adjacent said cylinder;

c. plunger means carried by said valve stem and within said enclosed housing means, said plunger means including a first portion disposed in sealed working relationship with the inner smaller diameter one of said cylindrical bores to define a sealed gas containing space above said first portion and a second portion within and near the bottom of said enclosed housing means, said second portion having a diameter smaller than the inside diameter of said outer larger diameter one of said cylindrical bores to define a small annular passage therewith;

d. a valve spring disposed within said larger diameter cylindrical bore and arranged therein and with said second portion of said plunger means to urge said valve to its closed position; and

e. valve actuating means including a rotary cam means driven in timed relationship with said machine and a pivotally mounted rocker arm means operatively associated with said cam means and with said inlet valve for actuating said inlet valve to its open position at the desired time in a direction away from said cylinder against the combined resistances of said valve closing spring and the gas compressed in said gas containing space by said first portion of said plunger means and for releasing said valve to be actuated to its closed position at the desired time by the combined forces of said valve spring and said compressed gas.

4,041,839
TELESCOPIC RAM
John E. Olson, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.
Filed Nov. 24, 1975, Ser. No. 634,422
Int. Cl.² F01B *15/02*
U.S. Cl. 91—189 R **6 Claims**



1. A fluid-actuated extensible-contractible device comprising

first, second and third operatively associated, relatively reciprocable units,

means defining a fluid chamber between said first and second units out of which, due to contraction of said chamber, fluid flows with extension of said second unit relative to said first unit,

means defining a fluid chamber between said second and third units into which fluid flows with extension of said first unit relative to said second unit, and

valve means mounted within said second unit for controlling the sequence of movements of said units, said valve means including a slidably movable valve spool operatively associated with said chambers, and operable, as a result of extension of said second unit relative to said first unit, to shift from one position allowing the escape of fluid from said first-mentioned chamber toward another position blocking such escape and capturing fluid in said two chambers, whereby to effect the transfer of fluid from said first-mentioned chamber to said second-mentioned chamber during extension of said second unit relative to said first unit to cause, as a result of such transfer alone, simultaneous extension of said third unit relative to said second unit.

4,041,840
CONTROL SYSTEM
Wilhelm Zirps, Hemmingen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Dec. 18, 1975, Ser. No. 641,914
Claims priority, application Germany, Dec. 31, 1974, 2461896
Int. Cl.² F15B *13/042, 15/17*
U.S. Cl. 91—416 **15 Claims**

1. In a follow-up control system, a combination comprising:

A. means for changing the position of a movable element during operation of the control system, including

a hydraulic cylinder having an interior for accommodating fluid;

a piston mounted for movement relative to said cylinder, said piston having a leading portion which divides the interior of said cylinder into a first and a second chamber, and a trailing portion adapted to be coupled to the element to be moved;

means for pumping fluid;

means for receiving fluid;

conduit means defining a fluid flow path intermediate said pumping means and one of said chambers, and another fluid flow path intermediate said receiving means and the other of said chambers; and

means for moving said piston relative to said cylinder, including switching means having a multi-position valving member movable in said flow paths for directing fluid flow, and electronic control means for moving said valving member between one position in which said chambers are respectively connected to said pumping means and said receiving means for moving said piston in one direction, and another position in which said chambers are respectively oppositely connected to said pumping means and said receiving means for moving said piston in an opposite direction; and

B. safety override means for adjusting the position of the movable element in the event of malfunction of said electronic control means, including

means associated with said piston for subdividing said second chamber into a first and a second compartment said first compartment being defined in part by said piston;

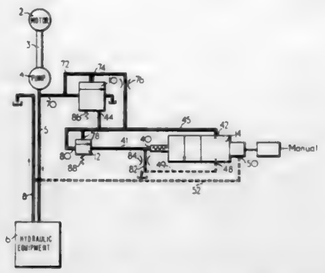
valve means having a valve element mounted on said piston for movement relative thereto between a first position in which said compartments are in communication with each other, and a second position in which said first chamber communicates with said first compartment;

a pressure-responsive movable member having a contact side facing said valve element, and an opposite side;

means for biasing said valving member of said switching means in the event of malfunction of said electronic control means to said one position in which said piston is moved in said one direction until said valve element mounted thereon overlies said contact side; and

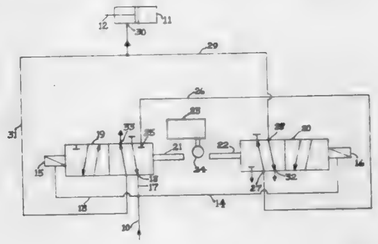
actuating means at said opposite side of said pressure-responsive member for moving said contact side of the latter into force-transmitting engagement with said valve element so as to move the latter from said first position towards said second position in which fluid from said first chamber enters said first compartment so as to move said piston in direction opposite to said one direction, whereby the position of the movable element is adjusted despite failure of said electronic control means.

4,041,841
METHODS OF AND APPARATUS FOR CONTROLLING HYDRAULIC EQUIPMENT
Francis Anthony Haskew, Burton-on-Trent, England, assignor to Coal Industry (Patents) Ltd., London, England
Filed Feb. 13, 1976, Ser. No. 657,878
Claims priority, application United Kingdom, Feb. 14, 1975, 06338/75
Int. Cl.² G05D *16/00*; F15B *11/08*
U.S. Cl. 91—421 **11 Claims**



1. A method of controlling hydraulic equipment including a pressure fluid feed and a pressure fluid return, comprising sensing the pressure fluid in the return to control exhausting of the pressure fluid in the feed such that a sensed preselected fall in the return pressure exhausts the pressure fluid in the feed.

4,041,842
DUAL-SOLENOID SAFETY VALVE
Barry A. Stunkel, 1170 W. Fork Drive, Lake Forest, Ill. 60045
Filed July 25, 1975, Ser. No. 599,188
Int. Cl.² F15B *11/08, 13/04*
U.S. Cl. 91—448 **6 Claims**



1. A dual-solenoid operated safety valve system for controlling the source of operating pneumatic pressure to a machine including a piston having reciprocal motion, comprising

a. a pair of control valves interposed between the source of operating pneumatic pressure and the piston of the machine, with each valve having an inoperative position wherein the pneumatic pressure is prevented from being admitted to and operating the piston of the machine,

b. electrically operated solenoid means for each of said control valves for independently operating the same so as to change said valves from their normal inoperative position to an operative position when said solenoid means are energized,

c. means connecting said control valves in series when moved into their operative position by said solenoid means so as to connect the source of operating pneumatic pressure through each of said control valves to the piston of the machine,

d. means connecting said control valves in parallel with the piston of the machine so as to exhaust pneumatic pressure

therefrom when either or both valves are in their inoperative position, and

e. switch means interposed between said control valves and operable by means provided by each of said control valves for electrically sensing when either of said valves remains in its operative position after said solenoid means are deenergized and for preventing reactivation of either of said control valves.

4,041,843

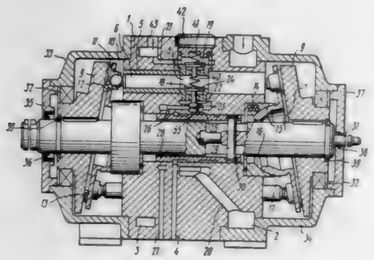
AXIAL-PISTON VARIABLE-DELIVERY PUMP WITH VALVE DIRECTIONAL CONTROL OF PRESSURE FLUID

Vladimir Petrovich Mischenko, ulitsa Moskovskaya, 76, kv. 166, Azov Rostovskoi oblasti; Anatoly Yakovlevich Oxenenko, 601 mikroraion, 30, kv. 134; Vladimir Alexandrovich Mischenko, ulitsa Chebotarskaya, 47, kv. 15, both of Kharkov; Georgy Konstantinovich Vasiliev, pereulok Krasnoarmeisky, 105, kv. 16, Azov Rostovskoi oblasti; Jury Alexandrovich Gavrilenko, ulitsa Kibalchicha, 25, kv. 59, Kharkov; Vladimir Vasilievich Povelitsa, 605 mikroraion, 6, kv. 41, Kharkov, and Ivan Vasilievich Kosenko, Dnepropetrovsky pereulok, 9, Kharkov, all of U.S.S.R.

Filed Mar. 15, 1976, Ser. No. 667,072

Int. Cl.[2] F01B *3/02*

U.S. Cl. 91—499 **7 Claims**



1. An axial-piston variable-delivery pump with a valve directional control of the pressure fluid flow, comprising:

a. a housing having an axis, said housing having an intake manifold, at least one pressure manifold, one pressure fluid admission duct, axial borings spaced equidistantly from the axis of said housing, radial borings and a further axial boring;

b. a drive shaft mounted in said further axial boring;

c. driving members secured to said drive shaft;

d. pistons oppositely arranged in said axial borings of the housing, said pistons being free to reciprocate in said borings, and to coact with said driving members and establish pump delivery chambers in said axial borings;

e. delivery valves to provide communication between said pump delivery chambers and said pressure manifold;

f. inlet valves to provide communication between said pump delivery chambers and said intake manifold;

g. actuator spindles for said inlet valves;

h. a cylindrical sleeve slidably mounted in said further axial boring of the housing, said sleeve embracing said drive shaft and being interconnected therewith so as to rotate cooperatively therewith, said cylindrical sleeve having an outer surface provided with a number of depressions and lands which bound said depressions to define individual zones, one of said zones being in constant communication with an exhaust line, while another of said zones is in communication with said pressure fluid admission duct; said depressions and lands forming a shaped surface on said cylindrical sleeve;

i. a plurality of first plungers each of which is accommodated in one of said radial borings in the housing coaxially with said inlet valve to cooperate with said actuator spindle of said inlet valve and establish, together with said radial boring of said housing, a chamber in said housing in communication with said shaped surface of the cylindrical sleeve;

j. at least one further plunger accommodated in at least one of said chambers coaxially with said first plunger to interact therewith; said housing having at least one further duct to admit pressure fluid to the zone of interaction of said plunger.

4,041,844

HYDROSTATIC PISTON MACHINE

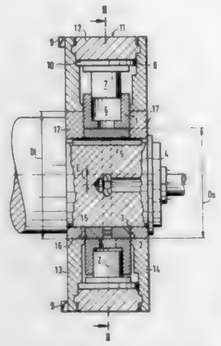
Anton Steiger, Ilnau, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed June 9, 1975, Ser. No. 584,943

Claims priority, application Switzerland, June 12, 1974, 8019/74

Int. Cl.[2] F01B *13/06*

U.S. Cl. 92—58 **7 Claims**



1. A hydrostatic piston machine comprising

a control journal having a cylindrical surface thereon of predetermined diameter;

a cylinder block mounted in rotatable relation on said surface of said control journal;

a plurality of pistons slidably mounted in said cylinder block radially thereof;

a pair of trunnions on said control journal, each said trunnion having an outer cylindrical bearing surface thereon of a diameter greater than said predetermined diameter and equal to each other; and

guide means for reciprocating said pistons in said cylinder block, said guide means being rotatably mounted on said bearing surfaces of said trunnions in rotatable relation to said control journal eccentrically of said cylinder block.

4,041,845

HYDRAULIC ELEVATOR APPARATUS

Jean-Marie L. Mean; Joseph K. Kraft, both of Gettysburg, and Leigh F. Jackson, Fayetteville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 633,999

Int. Cl.[2] F01B *11/02*; B66B *11/04*

U.S. Cl. 92—85 A **12 Claims**

1. Elevator apparatus, comprising:

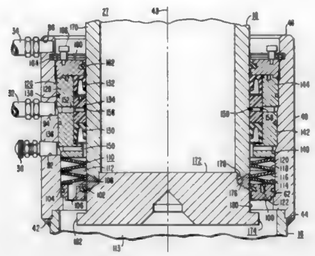
an elevator car,

a jack including a cylinder having a main fluid chamber and a fluid actuated plunger which supports said elevator car,

said cylinder including a cylinder head having limit means for cooperating with the plunger to stop the plunger at a predetermined travel limit,

said limit means including a first end member having fluid openings therein, and resilient means, said first end member and said resilient means cooperating to provide an auxiliary fluid chamber in fluid communication with said main fluid chamber,

said plunger stressing said resilient means as it nears said predetermined travel limit to reduce the volume of said auxiliary fluid chamber and force fluid therefrom into said main chamber via the fluid openings in said first end member,



said resilient means reducing the degree of fluid communication between said auxiliary and main fluid chambers as it is stressed to provide a hydraulic retarding force which cooperates with the resilient retarding force of the resilient means to smoothly decelerate and stop the plunger with reduced impact forces on said cylinder head.

4,041,846

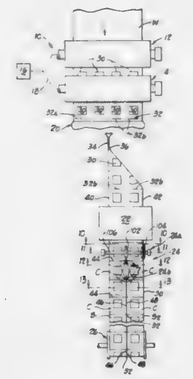
METHOD OF MAKING CONTAINER STRIPS

Bernard Lerner, Hudson, Ohio, assignor to Automated Packaging Systems, Inc., Twinsburg, Ohio

Filed Sept. 11, 1975, Ser. No. 612,462

Int. Cl.[2] B31B *1/64*

U.S. Cl. 93—35 PC **15 Claims**



11. The method of joining strips of open but separable containers together to register the containers of joined strips comprising:

a. heat softening edges of the container strips;

b. maintaining the strips separated until an integral, partially cooled, bead is formed on each strip, and,

c. thereafter bringingthe beads together while still sufficiently warm to be in a tacky state and thereby forming bridges between the strips.

4,041,847

APPARATUS FOR SEPARATING PUNCHED-OUT WORKPIECES FROM THE SURROUNDING WASTE MATERIAL

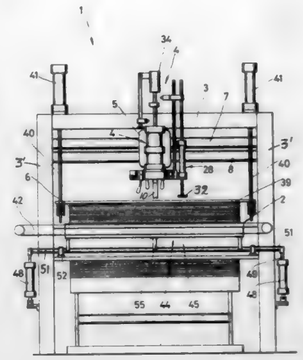
Ernst M. Spengler, Heusenstamm, Germany, assignor to Stanztechnik GmbH Roeder & Spengler, Bergen-Enkleim, Germany

Filed June 16, 1975, Ser. No. 586,896

Claims priority, application Germany, June 21, 1974, 2429903; Jan. 23, 1975, 2502543

Int. Cl.[2] B26D *7/18*

U.S. Cl. 93—36 A **17 Claims**



1. An apparatus for separating stacked and punched workpieces of flat material from waste material surrounding the workpieces along cut lines interrupted by bridges after a punching operation, comprising a frame structure, horizontal table support means for said stacked and punched workpieces of flat material in said frame structure, guide means secured to said frame structure above said horizontal table support means, said guide means extending across said horizontal table in a given direction, carriage means supported by said guide means for horizontal movement above and across said horizontal table support means in said given direction, tool drive means, adjustment means (9) secured to said carriage means, said tool drive means being connected to said carriage means through said adjustment means which are adjustable in a direction perpendicularly to said given direction, break-out tool means secured to said tool drive means for a controlled vertical up and down movement, said break-out tool means having a free end for controlled movement into said cut lines to break said bridges, whereby movement of said carriage means in said given direction in combination with movement of said adjustment means in the direction perpendicularly to said given direction permits positioning said tool means in unison in a rectangular coordinate system.

4,041,848

METHOD OF MAKING CONTAINER

Frank P. Richards, Kansas City, Mo., assignor to Phillips Petroleum Company, Bartlesville, Okla.

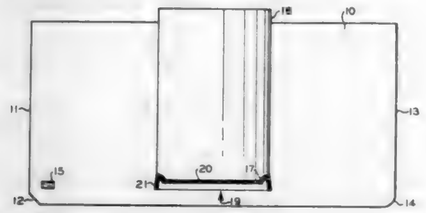
Division of Ser. No. 511,271, Oct. 2, 1974, Pat. No. 3,944,126. This application Dec. 15, 1975, Ser. No. 640,592

Int. Cl.[2] B31B *49/02*

U.S. Cl. 93—36.5 R **6 Claims**

1. The method of constructing a container from a geneally rectangular blank of paperboard or the like and a bottom closure member in the form of a generally circular disc having a depending skirt, which method comprises: positioning a bead of sealant on the blank near one corner thereof; forming the blank having the bead of sealant thereon into a cylindrical or conical side wall by lapping the side edge of the blank adjacent the bead of sealant over the other side edge so that the bead of sealant is on the inner side of the side wall at the resulting inner

seam, and positioning the bottom closure member in the end of the side wall adjacent the bead of sealant; and sealing the side edges of the blank and crimping the bottom edge of the blank to the depending skirt to form the container, said bead of



sealant having been positioned on said blank at a location such that the sealant is at the junction of the inner side wall seam and the inner seam formed by the blank and bottom closure member.

4,041,849

APPARATUS FOR FOLDING CARTON SHEET

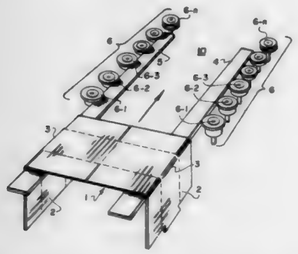
Yasuhiro Tsukasaki, 2-19, 4-chome, Higashikagaya, Suminoe, Osaka, Japan

Filed July 8, 1976, Ser. No. 703,590

Claims priority, application Japan, July 11, 1975, 50-85653; Mar. 26, 1976, 51-34016

Int. Cl.² B31B *1/56*

U.S. Cl. 93—52 **6 Claims**



1. A device for folding at least one side flap of a container blank having a central panel and at least one side flap hinged to said central panel, comprising a guide rail over which said blank is movable having an edge positionable at the hinged connection of said panel to said side flap, a plurality of guide rollers arranged along one side of said guide rail each having a top flange overlying said rail and engageable over said central panel and a bottom flange disposed in spaced vertical relation to and extending inwardly at an angle to said top flange portions, the angle of said bottom flanges of respective adjacent rollers decreasing in the direction of movement of said blank and progressively engageable with said flap to fold it upwardly against said panel as said blank is moved along said rail.

4,041,850

METHOD OF ERECTING CARTON BLANKS

Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

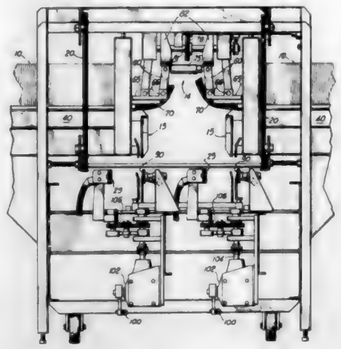
Division of Ser. No. 496,028, Aug. 9, 1974, Pat. No. 3,952,636. This application Jan. 21, 1976, Ser. No. 650,949

Int. Cl.² B31B *1/80*

U.S. Cl. 93—53 M **3 Claims**

1. A method of erecting cases stored in upright flattened positions in a pair of opposed magazines, said method including the steps of:

a. simultaneously gripping an end member flattened case in each magazine by suction means;
b. positioning each extracted flattened case over a drop chute;
c. releasing each flattened case from each of said suction means to allow each case to drop into each drop chute;
d. urging the flattened cases in a generally horizontal direction out of said drop chute;



e. opening the flattened cases by spreading the case sides apart;
f. tucking in lower case end flaps;
g. folding one case bottom panel in under the tucked end flaps;
h. applying adhesive to the folded bottom panel;
i. folding another bottom panel in under the bottom panel having adhesive thereon; and
j. compressing the two bottom panels together.

4,041,851

METHOD FOR MAKING PLASTIC BAGS

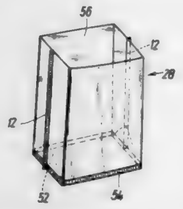
Hans G. Jentsch, Daimler Strasse 4, 43 Essen, Germany

Division of Ser. No. 151,320, June 9, 1971, abandoned. This application May 18, 1973, Ser. No. 361,665

Claims priority, application Germany, June 11, 1970, 2028693; Mar. 30, 1971, 2115350; Apr. 1, 1971, 7112470

Int. Cl.² B31B *31/60*

U.S. Cl. 93—35 SB **10 Claims**



1. A method of making a plastics container having a bottom wall in a W-shaped configuration from a single sheet or film of plastics material, comprising the steps of:

a. folding a laminated sheet or film blank having at least one layer of weldable plastics material upon itself to provide two superjacently disposed blank sections in a U-shaped configuration;
b. forming a tuck at the base of said U-shaped portion to impart a W-shaped configuration thereto to enable formation of said bottom wall;
c. welding the bottom creases resulting from said W-shaped folding to form weld seams defining in part said bottom;
d. forming longitudinal weld seams of said blank sections by applying first welding jaws at both exterior sides of the superjacent portions along each longitudinal seam, leaving a sealable opening formed by the upper edges of said container blank sections; and after cutting
e. overwelding the longitudinal weld seams at the outer edges thereof by applying further welding jaws at both exterior sides of said weld seams so that the layers of weldable plastics material are melted together thereby completely sealing the container relative to the exterior.

4,041,852

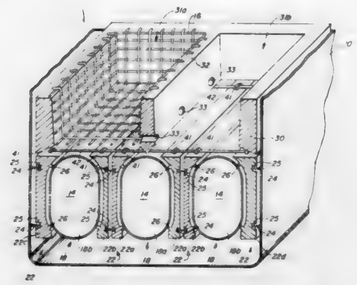
DEEP FAT FRYER FAT SAVER

Richard T. Keating, 715 S. 25th Ave., Oak Park, Ill. 60104

Continuation of Ser. No. 626,711, Oct. 29, 1975, abandoned. This application July 2, 1976, Ser. No. 702,355

Int. Cl.² A47J *37/12*

U.S. Cl. 99—403 **5 Claims**



1. In an open-top vessel containing fat for deep fat frying having a heating portion wherein heat exchanger tubes with convex outer walls on each side thereof are mounted in spaced relation with respect to each other and with respect to the walls of the said vessel and a frying portion wherein food-containing baskets inserted therein are suspended above said heating portion, the fat in said vessel at least filling said heating portion, the improvement comprising:

a. Removable first fat-displacement means inserted in the heating portion of the said vessel through the open top thereof inbetween the heat exchanger tubes therein and between said tubes and the walls of said vessel parallel therewith, means supporting said first fat-displacement means in spaced relation with the walls of said heat exchanger tubes; and
b. Removable second fat-displacement means inserted in the frying portion of the said vessel through the open top thereof inbetween the baskets therein and between said baskets and the walls of said vessel to raise the level of the fat therein sufficiently to cover the food in said baskets;

whereby the non-working fat in the said vessel is minimized and all surfaces therein are accessible to conventional cleaning tools through the open top thereof.

4,041,853

APPARATUS FOR ORGANIZING AND ARRANGING BUNDLES INTO STACKS

William G. A. Verwey, Phoenix, and Stephen Stanton, Baltimore, both of Md., assignors to Precision Industries, Inc., Baltimore, Md.

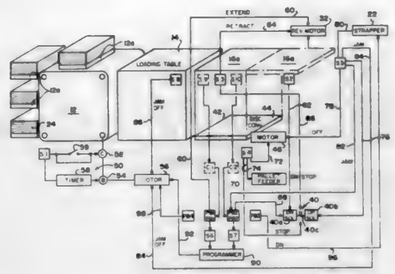
Filed Nov. 17, 1975, Ser. No. 632,583

Int. Cl.² B65B *13/18*

U.S. Cl. 100—4 **20 Claims**

1. Apparatus for organizing and arranging bundles into stacks, comprising:

means responsive to a first control signal for supplying bundles to a loading station, said supplying means including a conveyor having support members which remain horizontally disposed while transferring a bundle to said loading station;
means for receiving and supporting bundles from said loading station to form a layer of bundles, said receiving and supporting means being responsive to a second control signal to move between a retracted and an extended position;
stack-forming means mounted below said receiving and supporting means for receiving layers from said receiving and supporting means when said receiving and supporting means is retracted to form a stack of bundles from said layers, said stack-forming means being responsive to a third control signal to move between a receiving and a transfer position;
first actuating means for supplying said second control signal



to said receiving and supporting means to move it to said extended position so that each layer formed thereon is deposited on said stack-forming means to form a stack;
second actuating means for supplying said third control signal to said stack-forming means so that said formed stack is transferred to said transfer position so that said formed stack may be discharged; and
third actuating means for supplying said first control signal to said supplying means to control the rate of supply of bundles to said loading station so that it is synchronized with the rate at which bundles are arranged into layers to form stacks.

4,041,854

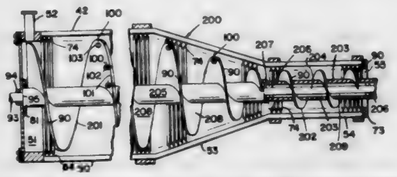
SLUDGE DEWATERING

Clyde H. Cox, 12723 Gaylawood Drive, Houston, Tex. 77066

Division of Ser. No. 477,797, June 10, 1974, Pat. No. 3,938,434, which is a continuation-in-part of Ser. No. 342,772, March 19, 1973, abandoned. This application Oct. 2, 1975, Ser. No. 619,048

Int. Cl.² B30B *9/14*

U.S. Cl. 100—112 **12 Claims**



1. A device for dewatering sludge, including in combination:
a filter-dewatering shell having an initial portion, a succeeding portion and a terminal portion, each comprising means for exit of fluid and retention of solid particles,
filtrate collection means outside said shell and spaced therefrom, for collecting filtrate,
a main shaft along the axis of said filter-dewatering shell in said initial and succeeding portions and having a reduced-diameter portion in said terminal portion,
a secondary shaft rotatably mounted on said reduced-diameter portion of said main shaft in said terminal portion,
a main sludge compression blade secured to said main shaft

in said initial and succeeding portions, said blade providing means for wiping the inner surfaces thereof, said means for wiping comprising a coil-spring blade supported by said main blade along its radially outer edge,

a filter-cake-discharging blade secured in said terminal portion to said secondary shaft, and

power means for rotating said shafts at different speeds relative to each other.

4,041,855

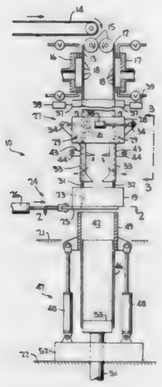
OPPOSED BOX BALING PRESS

Isaac Egosi, Kiryat Mozkin, Israel, assignor to Effic Trading and Services Ltd., Zurich, Switzerland

Continuation-in-part of Ser. No. 603,380, Aug. 11, 1975, Pat. No. 4,006,679. This application Aug. 4, 1976, Ser. No. 711,338

Int. Cl.² B30B *7/00*

U.S. Cl. 100—138 **6 Claims**



1. A baling press for forming bales of fibrous material, comprising:

a receptacle having infeed and discharge ends through which fibrous material is conveyed;

means for conveying fibrous material into said receptacle through said infeed end;

packing means including leg members axially movable along said receptacle for pre-packing fibrous material therein;

co-axial bale compression means including a compression chamber adjacent said discharge end of said receptacle;

a shiftable gate disposed between said discharge end and said compression chamber for opening and closing said discharge end, said leg members being movable toward said discharge end for transferring the fibrous material pre-packed in said receptacle through said discharge end into said compression chamber for compression into bales;

said gate being slotted so as to permit said gate to be closed over said discharge end while said leg members extend into said compression chamber during transfer of the pre-packed fibrous material thereinto, whereby said leg members serve to restrain the pre-packed fibrous material within said compression chamber, and whereby said leg members may be moved away from said discharge end while said gate is closed; and

said compression means including means for shifting said chamber to expose the bale for removal away from said compression means.

4,041,856

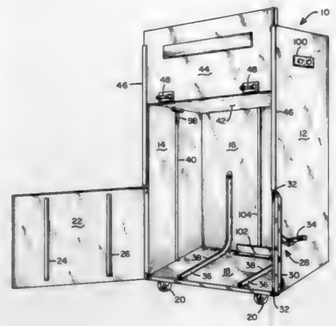
BALING MACHINE WITH IMPROVED PLATEN DRIVE AND GUIDE ASSEMBLY

Anthony Fox, 8306 Queen Ave. South, Minneapolis, Minn. 55431

Filed Sept. 26, 1975, Ser. No. 616,929

Int. Cl.² B30B *1/34, 15/04*

U.S. Cl. 100—214 **1 Claim**



1. In a baling machine of the type including a cabinet having top, bottom, right and left side walls and a rear wall and a rectangular platen having a central longitudinal axis being disposed for vertical motion within said cabinet, the improvement comprising:

a. first and second hydraulically actuatable cylinders disposed in said cabinet between said top and the upper surface of said platen, each cylinder having a ram arranged in extensible disposition therewithin;

1. said first cylinder having a first end pivotally attached to said top and to said right side wall and the free end of its ram pivotally attached to said platen at a point proximate the left edge of said platen, and laterally offset from the central longitudinal axis thereof in a certain first transverse direction;

2. said second cylinder having a first end pivotally attached to said top and to said left side wall and the free end of its ram pivotally attached to said platen at a point proximate the right edge of said platen, and laterally offset from the central longitudinal axis thereof in a direction opposed to said first transverse direction;

b. first and second vertical slots formed in said right and left side walls, with said slots being generally along said central longitudinal axis, respectively;

c. first and second guide bars affixed to the right and left edges of said rectangular platen and extending at least partially into said first and second vertical slots;

d. said rectangular platen comprising:

1. a rectangular metal plate having a top and a bottom surface;

2. first and second reinforcing bars affixed to the upper surface of said metal plate and extending diagonally thereacross;

3. third, fourth, fifth and sixth reinforcing bars affixed to the upper surface of said plate along the perimeter thereof; and

4. first and second triangular shaped metal side members attached to said upper surface of said metal plate at the left and right edges respectively, said first and second guide bars being attached to said triangular shaped metal side members and extending perpendicular to the top and bottom surfaces of said metal plate.

4,041,857

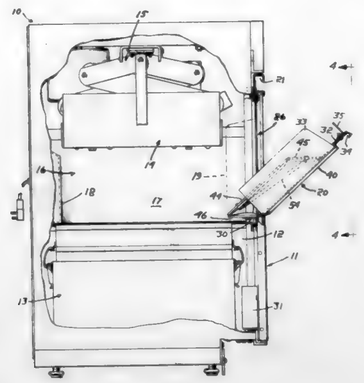
TRASH COMPACTOR

Charles B. Weeks, Boston, Mass., assignor to Norris Industries, Inc., Los Angeles, Calif.

Filed June 11, 1976, Ser. No. 695,258

Int. Cl.² B30B *15/30*

U.S. Cl. 100—215 **10 Claims**



1. A household trash compactor including a housing having a chamber in which a bag is to be held open to receive trash, compacting means includig a compacting head and a drive operable to reciprocate said head between an upper inoperative position and lower compacting positions which depend on the extent of the trash build-up, a front panel having a port opening into the compactor below but adjacent said inoperative position, and a door closing said port and including first and second parts, said first part including a front wall and sides which extend into the compactor a predetermined extent when the door is closed, said second part including a rear wall and upper and lower end walls hingedly connected thereto, means extending transversely of the bottom of the port to which the lower end wall is fixed, and a hinge connection between the upper end wall and said first part, said rear wall, when the door is closed, positioned substantially flush with the inner edges of the sides of said first part and, as said door is pulled open, said second part collapsing to bring said first and second parts into a chute-establishing relationship.

4,041,858

HOUSEHOLD COMPACTOR FOR WASTE MATERIALS

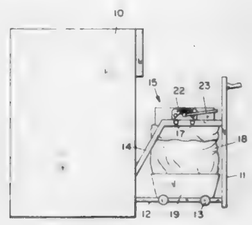
John Kenneth Crister Gustavsson, Savsjo, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

Filed June 12, 1975, Ser. No. 586,148

Claims priority, application Sweden, June 13, 1974, 7407789

Int. Cl.² B30B *15/00*

U.S. Cl. 100—229 A **5 Claims**



1. In a household compactor having a press unit and a bed plate, said bed plate being movable between two positions, one position being in vertical alignment with said press unit and the other position being a condition in which said bed plate is entirely removed from said press unit; the invention comprising a detachable hollow cylinder, means mounting said cylinder above said bed plate, a flexible container surrounding at least the bottom of said cylinder, the latter constituting two cylinder halves, said cylinder being divided along diametrically opposite generatrices which in the upper part pass into V-shaped notches, each cylinder half being provided with two lugs, each of said lugs co-acting with the corresponding lug of the other cylinder half, said co-acting lugs being pivotable in pairs about a common shaft, and a spring interconnecting the co-acting lugs whereby a force is applied thereto so that the ends of the cylinder halves facing said bed plate move laterally to form a larger spacing therebetween than the spacing between the ends at the opposite ends of said cylinder halves.

4,041,859

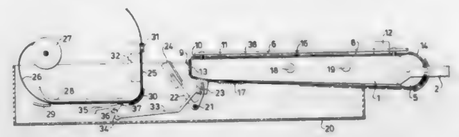
MARKING MACHINE

Uno K. Gillstrom, Alvkvarnsvagen 133, S-163 54 Spanga, Sweden

Filed Nov. 21, 1975, Ser. No. 634,102

Int. Cl.² B41J *1/60*

U.S. Cl. 101—111 **1 Claim**



1. A marking machine comprising a frame, a pressure distributing pad adapted to support a label mounted on said frame, carriage means mounted for reciprocating movement relative to said pad, a backing plate secured to said carriage means in opposed parallel relation to said pad, pulley means rotatably mounted on said carriage means, a plurality of type bands disposed over said pulley means and said backing plate, supporting plate means secured to said carriage and extending the entire distance between said pulley means and said backing plate for supporting said type bands along the entire distance between said pulley means and said backing plate, cover plate means secured to said supporting plate means in spaced apart parallel relationship to said supporting plate means to define a guiding channel for said type bands, said cover plate means having a window for viewing said type bands and a plurality of longitudinal slots, one for each type band extending parallel to said type bands, displacing means attached to each band and projecting through a respective slot for displacing each band, each type band comprising an inelastic band, a first series of consecutive type plates with individual symbols secured to said band and a second series of type plates identical to said first series secured to said band and elastic means connecting the opposite ends of said band, said second series coacting with said window so that a type plate disposed on said backing plate corresponds to a type plate disposed beneath said window, said backing plate and said supporting plate means being disposed substantially at right angles to each other whereby said elastic means of said type bands allows said type plates to make the transition from said supporting plate means to said backing plate upon movement of the bands without damaging said bands.

4,041,860

SCREEN PRINTING MACHINE

Mathias Mitter, Verl, Germany, assignor to Mitter & Co., Schloss Holte, Germany

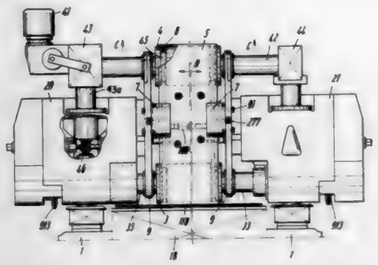
Filed Apr. 24, 1975, Ser. No. 571,410

Int. Cl.² B41F *15/10, 15/38*

U.S. Cl. 101—122 **18 Claims**

2. In a screen printing machine, a combination comprising at least two guide rollers each having a shaft; further comprising

bearing means journalling said shafts at opposite ends of said rollers for rotation; and support members mounted on and each embracing one of said shafts in the region of the respective bearing means; an endless printing screen having two lateral edge portions and being trained about said guide rollers for travel in an endless path; abutment means mounted on said edge portions for travel with said screen; tensioning means engaging said abutment means and operative for tensioning said screen in transverse direction by urging said abutment means of the respective edge portions apart from one another, said tensioning means comprising guide means mounted on said support members and having guide tracks which extend



lengthwise of said path and wherein said abutment means are engaged, said guide means each comprising at least one guide unit each having an angle member which partly surrounds a space in which the respective guide track is formed and which space has an open side, a cover member mounted on said angle member overlying said open side and a respective edge portion of said screen, and a block member located in said space and in part bounding said guide track, said block member being mounted on its associated angle member adjustable relative to the same; and means for shifting said block members of the guide units at said edge portions in unison relative to their associated angle member.

4,041,861

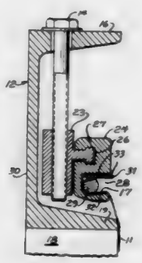
SCREEN PRINTING FRAME WITH FLOATING STRETCH-CLAMPS

David L. Alter, 112 Briarcliff Court, Hoffman Estates, Ill. 60172

Filed June 2, 1975, Ser. No. 582,742

Int. Cl.² B41F *15/36*

U.S. Cl. 101—128.4 **7 Claims**



5. A rigid four-sided frame for stretching screen printing fabrics including clamp-holding bars extending along all four sides of the frame to provide two sets of opposed generally parallel bars; and a series of clamps carried by each of said bars, for clamping an edge portion of said fabric therein with generally all parts of the edge portion for the length of each series being clamped in said series of clamps; and means for increasing the separation of each series of clamps from the other series of the same set, to stretch the fabric in the direction of their separation; at least some of said clamps of each series relatively near the ends of the bars being readily shiftable along the bars lengthwise of the bar, while subject to the tension of fabric they have stretched, to separate minutely from other clamps in the series under the influence of the stretching of the fabric lengthwise of one pair of bars by the increased separation of the other pair of bars.

6. The method of stretching a screen-printing fabric substantially free of distortion which comprises clamping edge portions of its four sides in clamps carried along the four sides of a rigid four-sided frame which includes clamp-holding bars extending along opposite sides of the frame to provide a set of opposed generally parallel bars, and a series of clamps carried by each bar of said set; with generally all parts of the edge portion for the length of each series of clamps being clamped therein; increasing the separation of said bars to stretch the fabric in both directions; and by said stretching causing at least some of said clamps of each series relatively near the ends of the bars to shift along the bars lengthwise of the bar, while subject to tension of fabric they have stretched, to separate minutely from other clamps in the series.

4,041,862

TRIPPING DEVICE FOR PRINTING CYLINDERS

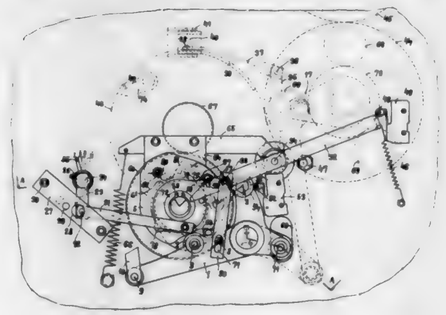
Jaroslav Jiruse, Blansko, Czechoslovakia, assignor to Adamovske Strojirny, narodni podnik, Adamov, Czechoslovakia

Filed Apr. 7, 1976, Ser. No. 674,601

Claims priority, application Czechoslovakia, Apr. 10, 1975, 2450/75

Int. Cl.² B41F *7/06, 13/28*

U.S. Cl. 101—218 **2 Claims**



1. A device for tripping printing cylinders into printing pressure contact, particularly on offset printing machines, comprising a multi-arm lever fixed on a first pivot and having a first follower roller and a second follower roller, said rollers being in riding contact with a double disk cam, said lever being connected by means of a second pivot to a second pull rod, by means of a third pivot to a control pull rod, and by means of a first connecting rod to an operating lever, said operating lever being pivotally mounted on the end of the first pivot and being further connected by means of a fourth pivot to one end of a second connecting rod, the other end of the second connecting rod being pivotally connected to a first control arm mounted on a first shaft of an offset cylinder, and further comprising a second operating pull rod connected by means of a fifth pivot to a second control arm pivotally mounted on a second shaft, a control lever on said second shaft and connected by means of a first operating pull rod for tripping off operation with an operating link for tripping off operation which cooperates with a roller of a feeler element for the control of paper sheets, said feeler being mounted on an impression cylinder, whereby the second control arm coacts with one end with a first operating roller of a first microswitch and the second follower roller coacts with a second operating roller of a second microswitch.

4,041,863

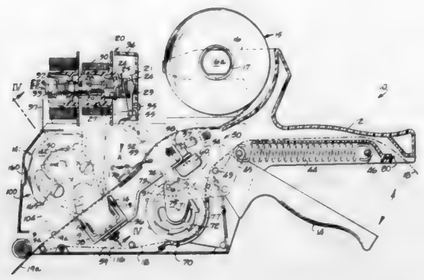
PRECISION HAND LABEL IMPRINTER AND DISPENSER

James W. Mullen, Moraga; Boone K. McReynolds, Concord, and Herbert D. Pace, Pleasanton, all of Calif., assignors to Vidac Corporation, Concord, Calif.

Filed July 18, 1975, Ser. No. 596,948

Int. Cl.² B41F *3/20*; B41J *33/12*; B41K *3/58*

U.S. Cl. 101—269 **18 Claims**



1. A hand-held precision label printer/dispenser comprising:

a case mechanism having a handle extending therefrom and an applicator means mounted in said case remote from said handle;

a lever means pivotally mounted adjacent to said handle for manually operating the printer;

slide means mounted in said case having a carrier mounted thereon for reciprocal movement, said carrier having a platen surface associated therewith;

planar print surface means mounted in said mechanism case adjacent to said carrier and engageable by said platen surface;

control means associated with said carrier and said planar print surface operable to cause said platen surface to engage said planar print surface means and separate therefrom;

linkage means interconnecting said lever means with said carrier and operable to move said carrier from its initial position in which said control means has positioned the platen surface for engagement with said planar print surface means to a second position wherein the control means will separate said platen surface from said planar print surface means whereby said planar surface will not engage said planar print surface means when it returns to its first position;

printing medium feed means and label stock feed means oriented normal to another and operable to place said printing medium and label stock in contiguous relationship with said printing surface whereby said platen surface will imprint the data on said planar print surface means on said label when the carrier moves from said initial position to said second position and said label stock feed means and printing medium feed means can advance when said carrier returns from said second position to its initial position due to the separation between said platen surface and said planar print surface means;

feed linkage means interconnecting said lever means with said printing medium feed means and said label stock feed means operable to advance said label stock feed means and said printing medium feed means as said carrier returns from such second position to its initial position; and

said printing medium means having supply and takeup spools coaxially mounted with spindle units on a common spindle, said common spindle having a one-way clutch connected to said feed linkage means whereby a loop of ribbon between said spools mounted on said spindle units is advanced by said feed linkage means, with one of said spindle units being operatively retained by detent means whereby it can be removed to facilitate loading new spools and removing old spools containing said ribbon providing the printing medium.

4,041,864

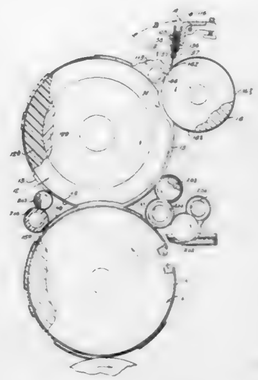
METHOD AND APPARATUS FOR INKING PRINTING PLATES

Harold P. Dahlgren, Dallas, Tex., and Harvey W. Dahlgren, Mobile, Ala., assignors to Dahlgren Manufacturing Company, Dallas, Tex.

Continuation of Ser. No. 251,740, May 9, 1972, abandoned. This application Apr. 24, 1975, Ser. No. 571,494

Int. Cl.² B41F *31/06*

U.S. Cl. 101—350 **16 Claims**



1. A method for inking the rotating applicator roller of a printing press so as to form thereon a uniform layer of ink of controllable thickness and to remove from the applicator roller any undesirable ink accumulations and image forming variations in the inked surface of the applicator roller that supplies ink for a printing member of said printing press, comprising the steps of

a. applying to a surface of said applicator roller which has previously supplied ink for said printing member during the rotational cycle of the applicator roller a volume of ink which exceeds the volume of ink to be next supplied for said printing member by that surface of the applicator roller and which is sufficient to destroy any image forming variations in the inked surface of said applicator roller;

b. forming a metering nip between said applicator roller and a metering unit;

c. initially forming on said metering unit at a point removed from said metering nip a substantially uniform, uninterrupted film of ink having a controllable film thickness;

d. contacting at the metering nip the ink on the surface of said applicator roller which has been provided with said excess of ink with said substantially uniform, uninterrupted film of ink supported on the metering unit and moving at a speed different from the speed of said applicator roller surface to cause said film of ink to shear ink from said applicator roller,

e. varying the physical properties of said film of ink on the metering unit to provide a continuous uniform metering surface of ink having uniform physical properties at the metering nip which upon contact with the ink on the applicator roller will remove all but a uniform layer of ink of a desired thickness from said applicator roller; and

f. upon the occurrence of changing conditions which cause variation in the desired thickness of the layer of ink on the surface of the applicator roller, adjusting one or more of the physical properties including thickness, viscosity or

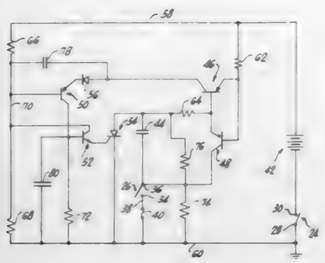
temperature of the film of ink moving from the point of formation thereof to the metering nip to maintain said uniform physical properties of the metering surface of ink at the metering nip to cause said metering surface of ink to maintain the uniform layer of ink of the desired thickness on the surface of said applicator roller as said applicator roller surface moves away from said metering surface of ink.

4,041,865

METHOD AND APPARATUS FOR DETONATING EXPLOSIVES

Seth F. Evans, Seal Beach, and Jairus Donn Hall, Newport Beach, both of Calif., assignors to Seth F. Evans, Seal Beach, Calif.

Filed June 4, 1975, Ser. No. 583,638
Int. Cl.² F42D *1/04*
U.S. Cl. 102—20 **40 Claims**



1. Detonator apparatus for supplying a firing current to a fuse, said apparatus comprising:
command switch means for initiating operation of said apparatus;
manually operable means for closing said command switch means from a location remote from said apparatus;
electrical time-delay and energy storage means, for generating a triggering signal after said command switch means has been closed for a predetermined time, and for simultaneously storing sufficient energy to fire the fuse, said electrical time-delay and energy storage means including resetting means for immediately reinitiating timing of the predetermined time in the event that said command switch means is opened and closed again; and
electrical means responsive to the triggering signal, for initiating a firing current to the fuse, whereby said electrical time-delay and energy storage means is incapable of firing the fuse without a sustained closure of said command switch means for the predetermined time.

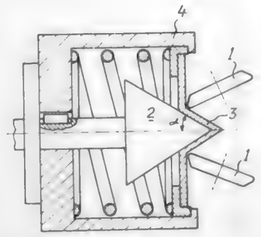
4,041,866

PROCESS FOR THE MANUFACTURE OF A BIMETALLIC FACING FOR HOLLOW CHARGES

Michel J. Thevenin, Paris; Michel Brun, Pau; Jacques Boileau, Paris, and Joseph Pegoud, Arpajon, all of France, assignors to Societe Nationale des Poudres et Explosifs and Etat Francais, both of, France

Filed Apr. 15, 1975, Ser. No. 568,265
Claims priority, application France, Apr. 17, 1974, 74.13409
Int. Cl.² F42B *1/02*
U.S. Cl. 102—24 HC **4 Claims**

1. Process for the manufacture of a conical bimetallic facing for hollow charges, characterized in that it comprises two successive stages:
a. explosive overlaying of two blanks of metals of different types, one of which metals is intended to form the inside of the conical facing and is copper or a copper alloy and the other of which metals is able to give rise to a core which disappears either by volatilisation or by disintegration under the conditions of elevated temperature and pressure which develop when the hollow charge is fired, and is intended to form the outside of the conical facing and is aluminium, and



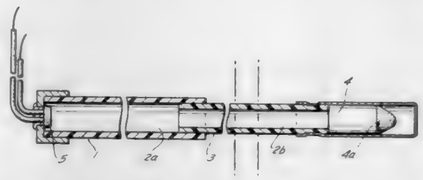
b. shaping the resulting bimetallic plate by conical flow turning, in order to obtain the desired conical bimetallic facing.

4,041,867

CONDUCTOR CONTAINING EXPLOSIVE GAS MIXTURE FOR INITIATION OF IGNITION ELEMENT AND EXPLOSIVE CHARGE

Bertil Petrus Enoksson, Gyttorp, Sweden, assignor to Nitro Nobel AB, Gyttorp, Sweden

Filed Apr. 12, 1976, Ser. No. 640,953
Claims priority, application Switzerland, Dec. 20, 1974, 16111/74
Int. Cl.² C06C *5/04*
U.S. Cl. 102—27 R **7 Claims**



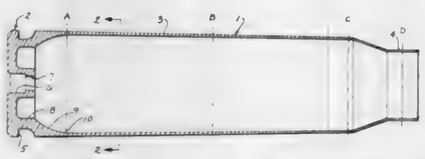
1. In a tubular fuse for initiation of an ignition element, such as a detonation cap provided with a solid ignition substance, said tubular fuse being filled with an explosive gas, wherein the improvement comprises: means formed on at least a portion of the inner circumferential surface of said tubular fuse for creating turbulence of said explosive gas, the turbulence created by said means aiding in the propogation and continuation of a detonation of the explosive gas to the ignition element.

4,041,868

THIN WALLED STEEL CARTRIDGE CASE

Roy E. Rayle, Waukesha; Robert J. Brey, Greendale, and Wilbur John Woodruff, Waukesha, all of Wis., assignors to Amron Corporation, Waukesha, Wis.

Filed Feb. 5, 1976, Ser. No. 655,634
Int. Cl.² F42B *9/28*
U.S. Cl. 102—43 F **8 Claims**



1. A thin walled steel cartridge case, comprising a head having a primer cavity, a hollow tapered thin wall section extending outwardly from the head and terminating in an open mouth, the inner surface of the head having an annular groove located concentrically of the primer cavity, and a generally curved outward diverging surface connecting the annular groove with the wall section, said case being formed of a steel having the following composition in weight percent:

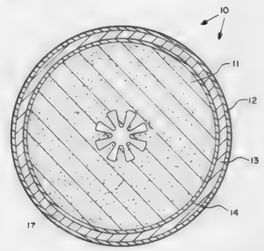
Carbon	0.18 – 0.23
Manganese	0.80 – 1.10
Phosphorus	0.03 max.
Sulfur	0.04 max.
Silicon	0.10 max.
Boron	0.0005 – 0.003
Iron	balance.

4,041,869

COOK-OFF LINER COMPONENT

Anthony San Miguel, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 15, 1976, Ser. No. 705,734
Int. Cl.² F42B *13/00, 25/20*
U.S. Cl. 102—56 R **10 Claims**



1. An ordnance item which exhibits an increased ability to survive exposure to a high temperature environment, said item comprising:
a casing for containing an energetic material;
energetic material including an oxidizer contained within said casing;
a first liner forming a continuous layer between said casing and said energetic material; and
a second liner forming a layer between said first liner and said energetic material;
said first liner being made from a first material which chemically degrades at a predetermined temperature to form a gaseous fuel, and said second liner being made from a second material which remains intact at said predetermined temperature and which second material is impervious to penetration by said gaseous fuel and said oxidizer;
for preventing combustion of said gaseous fuel and resultant ignition of said energetic material when said ordnance item is exposed to said high temperature environment.

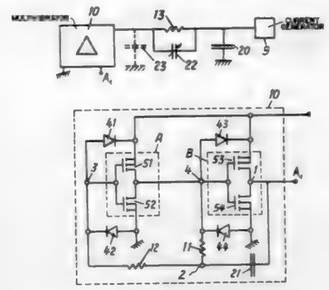
4,041,870

CIRCUIT ARRANGEMENT FOR SUPPLYING CLOCK PULSES TO A PROJECTILE FUZE

Godwin Ettel, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Dec. 5, 1975, Ser. No. 638,060
Claims priority, application Switzerland, Dec. 10, 1974, 16418/74
Int. Cl.² F42C *19/12*; F42B *9/00*; F42C *11/06, 9/00*
U.S. Cl. 102—70.2 GA **3 Claims**

1. A circuit for supplying clock pulses for a projectile fuze comprising:
a. a current generator producing an induced current during firing acceleration of the projectile;
b. a supply capacitor charged by said current generator;
c. an astable multivibrator with field-effect transistors supplied with a supply voltage and controlled by said supply capacitor after acceleration of the projectile;



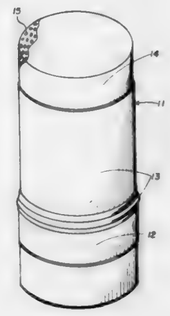
d. a resistor connected in circuit between the astable multivibrator and the supply capacitor preventing rapid dropping of the supply voltage; and
e. a trimmer capacitor connected in parallel with said resistor for stabilizing the frequency of the clock pulses by supplying a further supply voltage.

4,041,871

SHOCK BUFFER FOR LIQUID PROPELLANT GUN PROJECTILE

Leroy M. Stayton, and Robert A. Gould, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 15, 1976, Ser. No. 705,733
Int. Cl.² F42B *13/00, 7/08*
U.S. Cl. 102—95 **6 Claims**



1. A projectile for a liquid propellant gun comprising a metallic forward end and an aft end which is a shock buffer made up of microballoons bound in a binder resin.

4,041,872

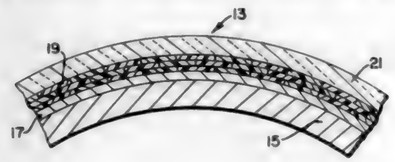
WRAPPER, STRUCTURAL SHIELDING DEVICE

Thomas E. McCown, Los Angeles; Ken A. McClymonds, Woodland Hills, and Robert W. Halprin, Los Angeles, all of Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Sept. 10, 1971, Ser. No. 179,531
Int. Cl.² F42B *13/00*
U.S. Cl. 102—105 **4 Claims**

1. A shielding device comprising a housing structure with a layer of tin mounted thereon, a layer of fiberglass mounted

about said tin layer and an outer layer of thermal insulation material mounted on said fiberglass whereby said thermal



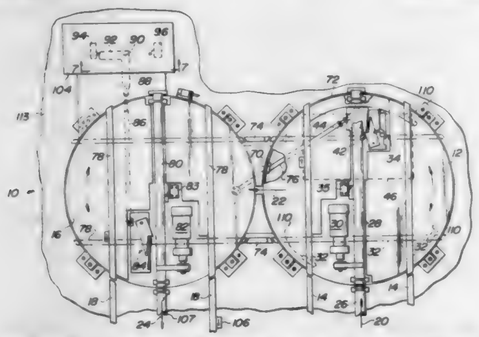
insulation and said fiberglass serve to maintain integrity of said tin layer when said shield device is subjected to radiation.

4,041,873

DRIVERLESS VEHICLE TURNTABLE SYSTEM

Vercoe C. Jones, Easton, Pa., assignor to Si Handling Systems, Inc., Easton, Pa.

Filed Aug. 25, 1975, Ser. No. 607,164
Int. Cl.[2] B61J *1/02*; B61B *13/12*
U.S. Cl. 104—35 **12 Claims**



1. A driverless vehicle turntable system comprising first and second stationary track, first and second turntables interconnected for simultaneous rotation for transferring driverless vehicles from said first set of tracks to said second set of tracks, each turntable having a set of tracks aligned with a set of tracks on the other turntable in one position of the turntables, each set of turntable tracks being aligned with one of said first and second sets of tracks in another position of the turntables, a discrete rotatable drive shaft on each turntable for propelling a vehicle supported by its associated turntable, said drive shafts being coaxial when the tracks on said turntables are aligned with each other, and stationary tracks between and adjacent said turntables, said last-mentioned stationary tracks being aligned with the tracks on said turntables when said drive shafts are coaxial, a motor coupled to said first turntable for rotating said first turntable, and a connecting rod pivotably connected at its ends to said turntables so that said first turntable causes said second turntable to rotate in an opposite direction.

4,041,874

APPARATUS FOR ROTATING AND INDEXING MINIATURE TRAIN TURNTABLES

Clarke J. Gernon, Sr., 4660 Fleet Drive, Baton Rouge, La. 70809

Filed Dec. 23, 1975, Ser. No. 643,628
Int. Cl.[2] B61J *1/02*; B60S *13/02*
U.S. Cl. 104—38 **3 Claims**

1. A device for rotating and precisely positioning model railroad turntables in selective alignment with plural stationary tracks radiating from a turntable pit, comprising in combination with said stationary tracks:

A. a turntable having deck track thereon, said turntable being mounted upon a rotatable shaft within the pit;

B. an indexing disc keyed to the shaft;

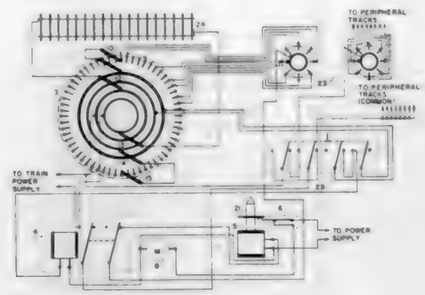
C. driving means engaging the shaft to provide torque to rotate the turntable and indexing disc;

D. locking means engageable and disengageable with the indexing disc to render the turntable immovable when engaged with the indexing disc;

E. an electric circuit within the system including:

E1. an electrical switch, the contacts of which are open as the locking means are engaged with the disc and closed when disengaged, said switch being in operative connection with the driving means;

E2. plural stationary contacts in the circuit, one each thereof corresponding to the respective plural tracks radiating from the turntable pit;



E3. rotary switch means to selectively energize a single stationary contact of the plural stationary contacts to the exclusion of others;

E4. two diametrically opposed moveable electrical contacts mounted upon the indexing disc, said moveable contacts having connection with the plural stationary contacts;

E5. a first relay for the selective activation of the locking means as the preselected single energized stationary contact may be encountered;

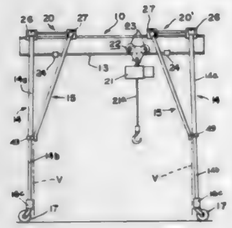
E6. a second relay interconnecting the moveable electric contacts and the first relay to determine which of said opposed moveable contacts may be sensitive to the electrical state of the stationary contacts.

4,041,875

ADJUSTABLE SINGLE-BEAM GANTRY

Bernard E. Wallace, Exton, Pa., assignor to B. E. Wallace Products Corporation, Malvern, Pa.

Filed Aug. 14, 1975, Ser. No. 604,682
Int. Cl.[2] E01B *23/00*
U.S. Cl. 104—126 **12 Claims**



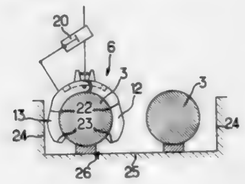
1. In a load-handling gantry, a single, unitary, bridging beam in combination with leg, brace, and mounting components so supporting said beam as to provide adjustment of gantry span, height, and spread, and use of the gantry in a number of leg and brace configurations, said components comprising: legs arranged in pairs with the legs of each pair spanning the beam, and extending downwardly and diverging laterally of the beam; a bracing struct associated with, and disposed to brace, each leg; a pair of rod-like mounting assemblies each supported directly upon said unitary bridging beam, movable along the beam to selected positions to vary the span between said assemblies, and including clamping means frictionally securing said assemblies in said positions; and means for coupling upper portions of the legs of each pair, and of the bracing struts for said legs, to a corresponding one of said assemblies, and establishing, between the coupled upper portions of each leg and its strut, a distance which is substantially fixed, said means for coupling also including apparatus coupling a lower portion of each bracing strut to an intermediate portion of its corresponding leg, in a position in which each strut extends upwardly and away from its leg, said mounting assemblies and coupling meanns being so configured, and disposed with respect to each other and to said beam, as to afford lateral clearance between the beam, legs, and struts sufficient to permit location of said assemblies, with their coupled legs and struts, at various positions along the length of said beam, and said coupling means further being adjustable, while substantially maintining said fixed distance, to accommodate arranagement of the bracing struts for the legs of both pairs in configurations either inboard or outboard of the legs thereof, or in configuration in which the bracing struts of one leg pair are arranged inboard and the bracing struts of the other leg pair are arranged outboard.

4,041,876

VEHICLE GUIDING SYSTEM

Robert Michel, Paris, France, assignor to Transports-Recherches-Etudes et Groupement d'Interet Economique (Tregie), Rueil-Malmaison, France

Filed Sept. 9, 1975, Ser. No. 611,724
Claims priority, application France, Sept. 13, 1974, 74.31110; United Kingdom, Aug. 28, 1975, 35554/75
Int. Cl.[2] E01B *25/02, 25/28*
U.S. Cl. 104—130 **5 Claims**



1. A guidance system for guiding a vehicle on a track, comprising

a track having a guidance member of circular cross-section;

a guide detector carried on a vehicle for contacting the guidance member to provide information as to the position of the vehicle with respect to the guidance member and having an internal contact surface complementary to the said circular-section guidance member, the contact surface extending around more than one half of the circumference of the circular-section guidance member to ensure a positive retention of the detector thereon;

a fork in the track at which the track forks into two branch tracks, walls extending along the opposite sides of said guidance member at said fork, the guidance member no longer being a single circular member but rather being progressively broadened at the fork until it divides into two guide members, one for each branch track;

means mounted on the vehicle for tilting the detector about the axis of its internal contact surface to a selected side of a median position to select one branch of the fork;

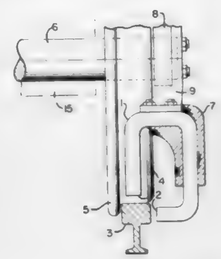
the broadened guidance member at the fork having a height less than that of the circular-section guidance member but having on each side a lower peripheral portion in the form of a part of a circle of the same diameter as the circular-section guidance member, whereby when the detector is tilted at a fork, a raised side thereof rides over the said broadened guidance member, each of said lower portions defining with the adjacent said wall a means for positively retaining the lower side of the tilted detector in operative engagement with said guidance member.

4,041,877

LATERAL GUIDANCE DEVICE FOR WHEEL SETS OF RAIL VEHICLES

Michael Simon, Munich-Obermenzing, and Norbert Degen, Munich, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Germany

Filed Mar. 17, 1975, Ser. No. 558,539
Claims priority, application Germany, Mar. 16, 1974, 2412823
Int. Cl.[2] B61F *5/44, 5/50, 9/00, 19/00*
U.S. Cl. 104—242 **7 Claims**



1. Lateral guidance apparatus for laterally guiding a wheel set of a rail vehicle as wheel means of the wheel set travel in a longitudinal direction along a support rail; said apparatus comprising:

magnet means, and

magnet support means for supporting said magnet means at said wheel set such that force interaction between magnet pole means of said magnet means and guide rail means effects lateral guidance of said wheel set with respect to said support rail, said magnet means and said guide rail means being continuously spaced from one another,

wherein pole faces of said magnet means extend longitudinally along the support rail when in operative positions carried by said vehicle, and wherein said magnet means includes at least one electromagnet having a multi-piece pole shoe with a plurality of pole faces disposed longitudinally spaced from one another along the support rail.

4,041,878

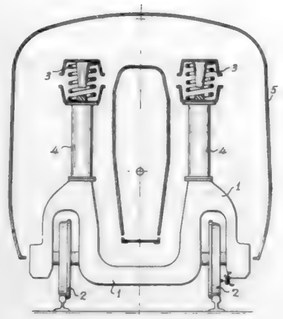
SPEED AND TRACK CURVATURE SUSPENSION CONTROL SYSTEM

Angel Toran, Madrid, Spain, assignor to Patentes Talgo, S.A., Madrid, Spain

Filed Apr. 11, 1975, Ser. No. 567,375
Int. Cl.[2] B61F *3/12, 5/24, 5/38, 5/50*
U.S. Cl. 105—164 **6 Claims**

1. In a pendular suspension system for use in a train having a plurality of cars, including resilient means located independent from one another symetrically on either side of a central vertical longitudinal plane of a vehicle and bearing upon a running gear frame and carrying at least one adjacent body, the resilient means bearing upon a base located above the center of gravity of the body and being able to yield vertically and horizontally in relation to the unbalance of centrifugal force, the improvement which induces an additional inclination, over that of the cant, of the body while the vehicle is traveling a canted curved path and allows occurance of the relative movements tending to be produced between the body and the running gear, comprising: the resilient means being independent pneumatic springs of the diaphragm type having air inlet and

exhaust means for level adjustment, and means operatively associated with the air inlet and exhaust means for effectively reducing flow of air therethrough and maintaining the springs distorted vertically and the body tilted in response to the



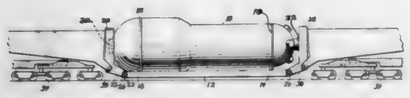
centrifugal force arising during travel of a canted curved path, said means being operative only when the train reaches a speed above a predetermined minimum, and only when the track has a sufficient predetermined degree of curvature to thereby reduce the passenger feeling of unbalanced centrifugal force.

4,041,879

SCHNABEL-TYPE CAR

Charles R. Cockrell, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 1, 1975, Ser. No. 636,498
Int. Cl.² B61D *3/12, 3/14, 3/16, 45/00*
U.S. Cl. 105—366 R **7 Claims**



1. A Schnabel-type car having independent wheeled sections at opposite ends that transport an elongate rigid load therebetween, an angular support means carried by each wheeled section in the form of a bell-crank including an upright arm and a horizontal arm, pivotal means at the intersection of the horizontal and vertical arms connecting each bell-crank to a wheeled section of the car, an elongate load carrying skid extending between wheeled sections of the car, means pivotally connecting the elongate skid to confronting ends of the horizontal arms, and compression pads on confronting surfaces of the upright arms adapted to contact the elongate rigid load supported on said skid whereby forces effected by the load bearing upon the skid are transmitted to the ends of the load through the compression pads.

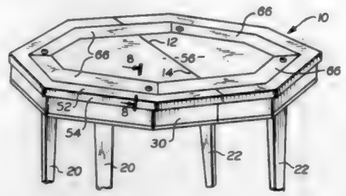
4,041,880

CONVERTIBLE POKER TABLE

Milton Schankman, Valley Stream, N.Y., assignor to Stakmore Co., Inc., New York, N.Y.

Filed Nov. 21, 1975, Ser. No. 634,285
Int. Cl.² A47B *3/00*
U.S. Cl. 108—112 **9 Claims**

1. A poker table including a table top having a perimeter which is a polygon with sides of substantially equal length having an even number of sides and having at least six sides, the table top comprising two sections, hinges connecting said sections together for movement between an extended position and a folded position in which the sections overlap one another for convenient storage, detachable fastening means on the sections near the hinges for preventing folding of said sections when they are in extended position forming the top of the table when set up and ready for use, four legs attached to the sections on the undersides thereof, two of the legs being attached to each section of the table and folding substantially parallel to the undersides of the respective sections of the table, and movable into positions substantially normal to the table top for supporting the table when in use, characterized by chip-holding recesses in the top surface of said sections near the periph-



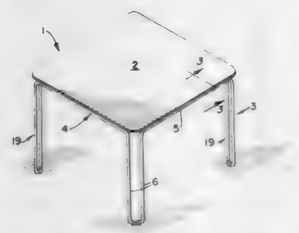
eral edges of the table top, a plurality of fillers that fit into the upper portions of the chip-holding recesses and that provide bridging surfaces closing the upper ends of the recesses, the table top having portions outward of the recesses, the top surface of the table above the recesses and above the portions outward of the recesses being substantially flush with the top surface of the sections inward of the chip-holding recesses when the fillers are in position closing the recesses whereby the table can be used as a dining table.

4,041,881

FURNITURE ARTICLE

Melvin A. Textoris, Struthers, and William Wahl, Chagrin Falls, both of Ohio, assignors to GF Business Equipment, Inc., Youngstown, Ohio

Filed Dec. 29, 1975, Ser. No. 645,234
Int. Cl.² A47B *3/06*
U.S. Cl. 108—159 **10 Claims**



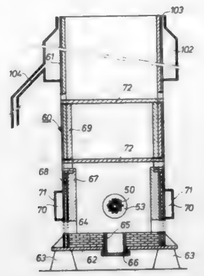
1. A table including, a planar top, a support assembly extending beneath the lower surface of said top comprising an endless elongated stock defining a plurality of U-shaped legs each said leg including a pair of vertical leg members, a horizontal top member joining one said member of each said leg to one said member of an adjacent said leg whereby, each said horizontal top member and said leg member joined to its end defining a support component having an inverted U-shaped configuration, said top having a vertical peripheral edge extending from said planar top to a point short of said top lower surface, an arcuate relief surface in said top joining said vertical peripheral edge and said lower surface and having a configuration mating with a segment of the periphery of said horizontal top member, and means on each said horizontal top member engaging the lower surface of said table top to permit attachment of said support assembly to said table top

4,041,882

APPARATUS FOR INCINERATING NON-HALOGENATED WASTE LIQUIDS

Peter Gerard Dierckx, Mortsel, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 527,595, Nov. 27, 1974, Pat. No. 3,980,417.
This application Mar. 1, 1976, Ser. No. 662,970
Claims priority, application United Kingdom, Nov. 29, 1973, 55391/73
Int. Cl.² F23G *7/00*
U.S. Cl. 110—7 B **6 Claims**



1. An installation for incinerating waste non-halogenated solvents, comprising:
an incinerator vessel
a burner assembly attached to said incinerator vessel for introducing into said vessel an atomized stream of solvents together with a stream of a mixture of compressed air and fuel, and comprising an atomizing nozzle unit, conduit means for delivering under pressure a stream of waste solvent to the nozzle of said nozzle unit, and conduit means for introducing a mixture of fuel and air through a plurality of orifices concentrically arranged around said nozzle into the incinerator vessel
pump means for delivering solvent to said burner assembly
a source of compressed air
a storage vessel for fuel
conduit means for passing a mixture of compressed air and fuel from said source and storage vessel to said burner assembly
a stack for discharging effluent gases from the incinerator into the atmosphere
a mantle disposed around said burner assembly
conduit means for passing air through said mantle and externally around said nozzle of said burner assembly into the incinerator, whereby the flame of the combusting mixture at the nozzle is stabilized
fan means for introducing air into said mantle and
means to filter the solvents prior to incinerating.

4,041,883

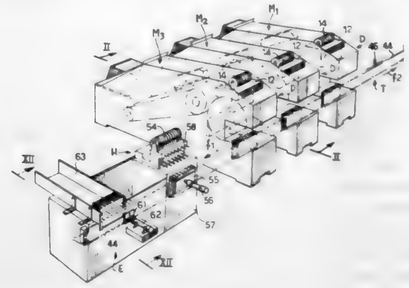
PROCESS AND PLANT FOR THE MANUFACTURE OF SEWN BOOKS

Gianattilio Meratti, Torre de' Roveri (Bergamo), Italy

Filed July 9, 1976, Ser. No. 703,986
Claims priority, application Italy, July 9, 1975, 68784/75
Int. Cl.² B42B *1/02*
U.S. Cl. 112—21 **10 Claims**

1. A process for the manufacture of sewn books from a plurality of signatures, comprising: forming spaced holes in the spine of each signature, inserting through pairs of said holes a length of at least partly thermoplastic filament such that part of the filament extends between two such holes on the inside of the signature and portions of the filament extend out through the holes to the exterior of the signature, placing a plurality of such signatures in close relationship, and welding the respective exterior parts of the filaments of the signatures to respective transverse at least partly thermoplastic members, thereby joining the signatures together.

5. Apparatus for manufacturing sewn books from a plurality of signatures, the apparatus comprising:
stitching means for forming spaced holes in the spine of each signature and for inserting the leading end of a length of at least partly thermoplastic filament through one said hole and out through another said hole, whereby part of the filament extends between two such holes on the inside of the signature and the end portions of the filament extend out through the holes to the exterior of the signature;



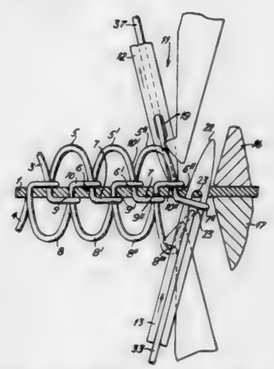
gathering means for placing the plurality of such signatures in close relationship;
means for bringing respective transverse at least partly thermoplastic members adjacent to the exteriors parts of the filaments; and welding means for welding the respective exterior parts of the filaments to the transverse members, thereby joining the signatures together.

4,041,884

APPARATUS FOR INSERTING SEAMS IN BASE FABRIC

Gerald Frank Ward, and Gordon Richard Wray, both of Loughborough, England, assignors to National Research Development Corporation, London, England

Continuation of Ser. No. 883,876, Dec. 10, 1969, abandoned.
This application Sept. 24, 1974, Ser. No. 509,021
Claims priority, application United Kingdom, Jan. 10, 1969, 1623/69
Int. Cl.² D05C *15/12*
U.S. Cl. 112—79 R **5 Claims**



1. Apparatus for producing a multiplicity of parallel lines of stitching to form a tufted fabric, comprising:
roller drive means, in use operating to advance a base fabric through a fabric position in a tuft insertion zone of the apparatus;
first needle bar means for supporting a set of needles on one side of said fabric position and second needle bar means for supporting a set of needles on the opposite side of said fabric position;
said roller drive means continuously advancing said base

fabric, when in position, at a substantially constant, non-intermittent, speed through said fabric position irrespective of whether any needles, when in position on said needle bars, are inserted through the base fabric in said fabric position;

first actuating means imposing a primary motion on said first needle bar for feeding said first needles from one side of and through the said fabric position and back again;

first secondary means imposing on said first needle bar a secondary motion whereby, at least when said first needles reach said fabric position and beyond, said first needles have a component of motion warpwise of any fabric fed in said fabric position, which component is equivalent to the driven rate of advance of the fabric;

second actuating means imposing a primary motion on said second needle bar for feeding said second needles from the opposite side of and through the said fabric position and back again;

second secondary means imposing on said second needle bar a secondary motion whereby, at least when said second needles reach said fabric position and beyond, said second needles have a component of motion warpwise of any fabric fed in said fabric position, which component is equivalent to the driven rate of advance of the fabric;

each of said first set of needles being arranged to co-operate with a corresponding needle of the second set of needles;

means for adjusting the speed of said roller drive means, in relation to the speed of operation of said first and second actuating means;

said second actuating means being driven in such relation to the movement of said first actuating means that the said first and second needles are fed alternately through the fabric position at substantially equally spaced intervals;

the general directions of feed and retraction of the first and second needles being inclined to each other and against the direction of fabric advance through the fabric position;

catch means in association with at least one of the two sets of needles, said catch means being situated in the vicinity of said tuft insertion zone and, in use, catching the threads of at least some of one of the sets of needles in their motions from and to said fabric position, the catch means being arranged to release said threads in the cycle of operations in use so as to leave tufting loops extending from the base fabric;

the said actuating means and secondary means of each of the two needle bars in turn causing the point of each of one set of needles to pass in the vicinity of the eye of its corresponding needle of the other set of needles, or between that eye and the fabric position when the eyes of both needles are on one side of the fabric position and as the corresponding needle is being retracted and the needle of the one set is being advanced towards the fabric position alternately in the respective motions of the two sets set of needles, whereby, in use, the thread of the retracting needle is engaged by the corresponding advancing needle to form a loop around the advancing needle P and means associated with each first and second actuating means and secondary means being provided which, in use of the apparatus, engage the threads of the retracting corresponding needles to cause those thread to tighten in the form of prone loops around the needles of the one set as the corresponding needles retract, whereby, in use, the threads of the set of needles will form loops lying prone on each side of a fabric passing through said fabric position, with said tufting loops extending on at least the one side of the fabric, each said tufting loop of one thread extending from one prone loop of the other thread at the point of insertion of the one thread into the fabric to the next prone loop of the other thread at the next point of insertion of the one thread.

4,041,885

APPARATUS FOR AND METHOD OF STABILIZING A MARINE VESSEL IN PITCH

Emilio C. Garcia, 441 Gravier St., New Orleans, La. 70130

Filed Dec. 31, 1975, Ser. No. 645,746
Int. Cl.[2] B63B *39/06*
U.S. Cl. 114—126 **1 Claim**



1. A pitch stabilizing device for a relatively narrow and fast marine vessel, having a bow, waterline and keel, and moving rapidly in high seas, comprising in combination:

a. vertical member means, having oppositely disposed upper and lower ends, vertically mounted in said bow and in alignment with and forward of said keel, said vertical member means for raising above said waterline and lowering said lower end to approximately keel level and forwardly thereof, and faired for its length to reduce resistance as it is moved rapidly through said high seas; and

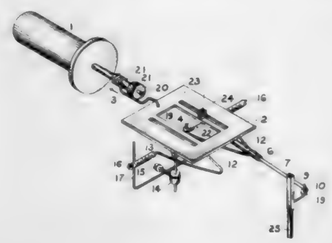
b. triangular shaped foil means, having zero lift characteristics and equal sides defining a leading angle, mounted on said lower end of said vertical member means and defining a dihedral angle therewith, said foil means extending forwardly and transverse said vertical member means and in alignment with said keel, whereby said foil means with zero lift characteristics when lowered to keel level at the bow of said rapidly moving narrow vessel engages said high seas to stabilize said vessel in pitch.

4,041,886

TIME LAPSE STEERING CONTROLS FOR SELF PROPELLED MODELS

Francis Knipp, 2009 Marshall St., Manitowoc, Wis. 54220

Filed Jan. 14, 1976, Ser. No. 648,924
Int. Cl.[2] B63H *25/00*
U.S. Cl. 114—144 R **13 Claims**



1. A time lapse steering control for self propelled model boats, cars, and airplanes, said steering control comprising:

a spring loaded dashpot, said dashpot acting as a timer to determine the instant when a turn will commence and the extent of the turn, and to provide power means to actuate the steering means of the model; said timer being equipped with a valve to regulate the rate at which fluid within the dashpot is forced through the timer;

a cam operatively linked to said timer to provide the actuating force for said steering means;

a cam follower acted on by said cam;

a lever arm fixed to and moving with said cam follower;

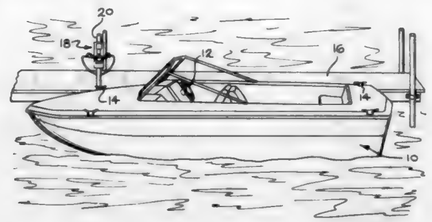
a supporting structure to which said timer, cam, and cam follower with fixedly attached lever arm are mounted to comprise an operative steering control unit; and a connecting link which transmits the motion of said lever arm fixedly attached to said cam follower, to a coresponding lever arm fixedly attached to said steering means of the model.

4,041,887

DOCKING APPARATUS FOR BOATS

William A. Paul, 1808 Parkside Blvd., Toledo, Ohio 43607

Filed June 14, 1976, Ser. No. 695,660
Int. Cl.[2] B63B *21/00*
U.S. Cl. 114—230 **7 Claims**



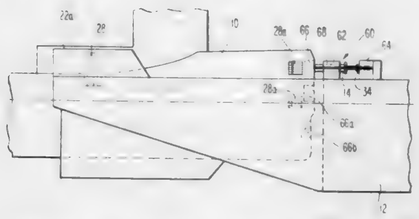
1. Apparatus for aiding in connecting a boat to a fixed upright member, said apparatus including, in combination, a boat having a line-engagable member thereon, a fixed upright member, a flexible line engaged with said upright member, holding means comprising at least one arm having one end movably supported on said upright member on the side of said upright member toward which the boat will approach with the other end of said arm having means for engaging said flexible line for holding a portion of said line above the level of said line-engagable member on the boat, at least the other end of said arm being movable in a vertical direction to move the portion of said line toward said line-engagable member, and means engagable with said arm and operable from the boat for actuating said holding means to drop said line around said line-engagable member, said operable means including means for enabling said arm to move downwardly to move said line toward engagement with said line-engagable member on the boat.

4,041,888

PUSH TUG-BARGE THRUST TRANSMITTAL MEANS

Ralph W. Hooper, Newtown Square, Pa.; Douglas A. MacLeod, Wenonah, N.J., and Clarence G. Murray, Media, Pa., assignors to Interstate and Ocean Transport Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 602,557, July 29, 1976, Pat. No. 3,993,014. This application Oct. 26, 1976, Ser. No. 735,435
Int. Cl.[2] B63B *21/56*
U.S. Cl. 114—248 **2 Claims**



1. Push tug and barge with thrust transmittal means comprising:

a. a thrust receiving member projecting rearwardly from the stern of said barge along its center line, said rearwardly projecting member including at its rear terminal point a convex hemispheric surface;

b. a non-projecting thrust exerting member mounted on the bow of said tug, said thrust exerting member having a hemispheric concave surface adapted to receive and mate with the convex surface of said thrust receiving member;

c. said two mating surfaces formed between said thrust receiving and thrust exerting members providing the sole means of transmitting pushing thrust to said barge from said tug while permitting relative pitching therebetween;

d. a notch at the stern of said barge with sidewalls on the two sides thereof, said barge stern and sidewalls and the bow of said tug being adapted so that said bow fits between said sidewalls upon engagement of said tug and barge, including fenders, rollers or other means through which contact is made between said sidewalls and said side of said tug to limit relative motion therebetween; and

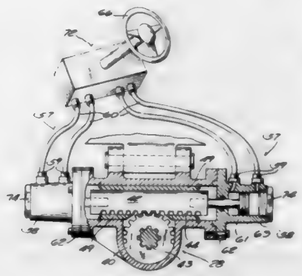
e. quickly releasable means independent of said cylindric and thrust receiving members, to restrain said tug and barge from separating from one another.

4,041,889

MARINE PROPULSION DEVICE STEERING ASSEMBLY

Clarence E. Blanchard, Kenosha, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 16, 1976, Ser. No. 714,809
Int. Cl.[2] B63H *5/12*
U.S. Cl. 115—18 R **10 Claims**

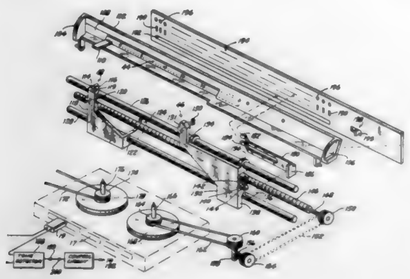


1. An outboard motor comprising a power head having an engine, a lower unit which carries said power head, said lower unit including a propeller adapted for rotation under water and a drive shaft housed within said lower unit and operatively coupled to said engine and to said propeller, and a swivel bracket adapted for mounting to a transom bracket for affording vertical tilting movement of said swivel bracket about a generally horizontal axis, said swivel bracket having a generally vertical bore and a generally horizontal cross bore which intersects said vertical bore, a pivot shaft supported within said vertical bore for rotation about a generally vertical axis, said pivot shaft having fixed thereto a pinion, and means for supporting said lower unit from said pivot shaft with said drive shaft being located in rearwardly spaced relation from said pivot shaft, a rack located in engagement with said pinion and supported within said horizontal cross bore to afford generally horizontal movement of said rack to effect rotation of said pinion and pivot shaft and said lower unit about said vertical axis, and steering control means for effecting horizontal movement of said rack so as to afford control of said rotation of said lower unit about said vertical axis, said rack and said steering control means being located below said generally horizontal axis.

4,041,890
INDEXING APPARATUS FOR A RECORD AND/OR PLAYBACK DEVICE

Leslie N. Wilder, Fairfield, and Anthony Ciaraldi, Huntington, both of Conn., assignors to Dictaphone Corporation, Rye, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,705
Int. Cl.² G01D *18/00*
U.S. Cl. 116—114 R **10 Claims**

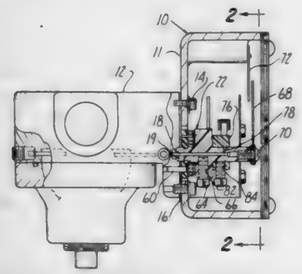


1. Indexing apparatus for providing an indication of the amount of record medium which has been driven past a predetermined position, comprising:
- a first carriage movable along a predetermined rectilinear path;
- driving means for bidirectionally driving said first carriage along said predetermined rectilinear path in synchronism with the relative movement of said record medium;
- a second carriage movable along said predetermined rectilinear path, said second carriage being moved when said first carriage is driven in one direction; and
- index means coupled to and movable with said second carriage for displaying at least a portion thereof representing said amount of record medium which has been driven past said predetermined position.

4,041,891
FLOW INDICATOR WITH IMPROVED BIASING ASSEMBLY

Nils O. Rosaen, Bloomfield Hills, Mich., assignor to Nancy Helen Rosaen, Ann Arbor, Mich., a part interest

Filed Mar. 22, 1976, Ser. No. 669,260
Int. Cl.² G01F *1/28*
U.S. Cl. 116—117 R **5 Claims**

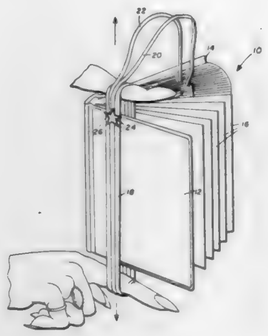


1. A fluid flow meter adapted to provide a visual indication of the fluid flow rate through said flow meter, said flow meter being of the type which imparts a rotation to a shaft in response to a variation in the flow rate through said flow meter, and biasing means for biasing said shaft in a rotational direction opposite to that produced by fluid flow through the flow meter, said biasing means further comprising a spring carrier, means for securing said spring carrier to said shaft, a coil spring secured at one end to said spring carrier and at its other end to a spring retainer shell, means for securing said retainer shell against rotation to said flow meter, removable locking means to secure said spring carrier against rotation to said retainer shell, and indicator means operatively secured to said spring carrier and adapted to provide a visual indication of the rotational position of said spring carrier, said removable locking means being removable from said spring carrier and said retainer shell after said spring carrier is secured to said shaft.

4,041,892
BOOK MARKER EMPLOYING ENDLESS ELASTIC BAND

Mary V. Nichols, 220 Cherrywood Gardens, Maitland, Fla. 32751

Filed Oct. 1, 1975, Ser. No. 618,439
Int. Cl.² B42D *9/00*
U.S. Cl. 116—119 **5 Claims**



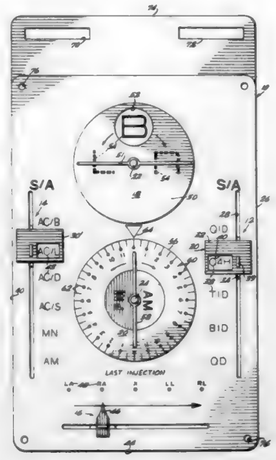
1. A book marker for books of the type having front and back covers comprising:
- an endless elastic band for encircling one of said front and back covers;
- at least two marking strips stitched tangent to said elastic band at a point along said band for marking preselected pages of a book between said front and back covers;
- a stitch pad sewn over both said marking strips at said point; and
- means for changing the length of said marking strips, said length changing means comprising means for rotating said band around said cover.

4,041,893
MEDICAL REFERENCE CHART

Edward B. Mulloy, 1434 Argyle Drive, Fort Myers, Fla. 33901

Filed Mar. 29, 1976, Ser. No. 671,327
Int. Cl.² G09F *9/00*
U.S. Cl. 116—131 **2 Claims**

1. A reference chart for use in hospitals and nursing homes or the like comprising,
- a relatively rigid sheet of any suitable material, generally rectangular in shape and including,
- a first indicator means for selective, manual operation to indicate the next procedure to be taken in the continuing care of a patient,
- a second indicator means for selective manual operation to indicate the performance of said procedure,
- a third indicator means for selective manual operation to indicate the portion of a patient's body to which said procedure was administered,
- said first, second and third indicator means being linear in form,
- a first rotary indicator means for selective, manual operation to indicate the last position to which a patient was turned in bed,
- said first rotary indicator means comprising a first disc, centrally pivoted to the upper, central portion of said sheet with a sight window therethrough, and

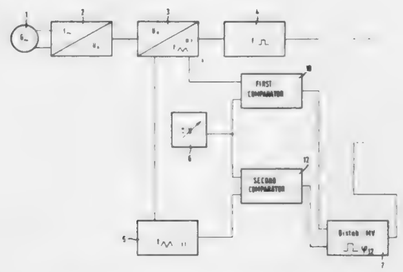


- an outwardly extending finger grip portion for manual rotation thereof into selective registration with any one of a plurality of indicia markings applied to the face of said sheet.

4,041,894
ELECTRONIC ARRANGEMENT FOR GENERATING TWO ALTERNATING VOLTAGES WHOSE PHASES ARE SHIFTABLE

Klaus Kimmich, Stuttgart, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 26, 1976, Ser. No. 717,849
Claims priority, application Germany, Sept. 5, 1975, 2539498
Int. Cl.² B05C *5/02*; H03K *5/00*
U.S. Cl. 118—7 **3 Claims**

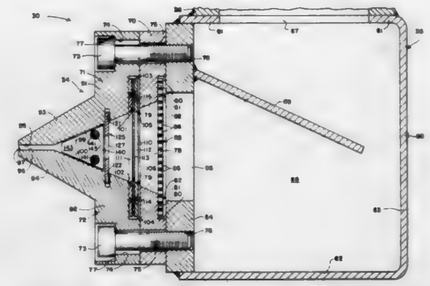


1. An elelctronic arrangement for generating from an input a.c. voltage variable in frequency at least two output a.c. voltages variable in frequency which are continuously shiftable in phase with respect to each other by a constant, frequency dependent angle $0 < \psi < 180°$, comprising:
- means for changing said variable input a.c. voltage to a triangular voltage of constant amplitude proportional in frequency to the input a.c. voltage;
- means for deriving a first square-wave voltage from said triangular voltage;
- means for inverting said triangular voltage;
- separate comparator means connected to said triangular voltage means and inverted triangular voltage means;
- manually variable d.c. voltage generating means connected to a second input of each of said comparator means;
- bistable multivibrator means connected to said comparators for generating a second square-wave voltage shiftable in phase by an angle ψ with respect to said first square-wave voltage by manually varying said d.c. voltage generating means.

4,041,895
COATING THICKNESS AND DISTRIBUTION CONTROL

Harold C. Overton, and Theodore L. Page, both of Gadsden, Ala., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Sept. 29, 1975, Ser. No. 617,742
Int. Cl.² B05C *11/06*
U.S. Cl. 118—7 **3 Claims**



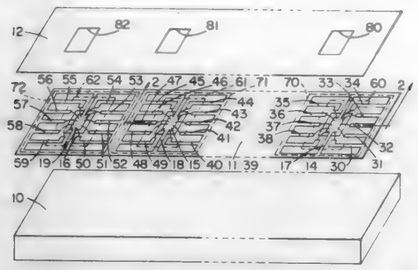
1. An apparatus for screeding excess coating material from a substrate as the substrate moves along a feed path, comprising:
- a. a nozzle positioned near the feed path and defining an elongated discharge opening oriented toward the feed path;
- b. a conduit defining a passage of elongated cross-section extending substantially the full length of and communicating with the discharge opening for supplying pressurized fluid to and discharging pressurized fluid through the discharge opening toward the feed path;
- c. flow regulating means for selectively regulating the rate of flow of fluid through portions of the conduit such that fluid discharging toward the feed path from the discharge opening has a predetermined nonuniform pressure profile along the length of the discharge opening that will cause all but a desired cross-sectional profile of coating material to be screeded from a substrate moving along the feed path past the nozzle, said flow regulating means including a shutter structure comprising an elongated member positionable across the conduit passage, said elongated member including at least one elongated opening which varies in width along its length, said opening defining a flow regulating formation for restricting fluid flow through the conduit passage, to a greater degree in some conduit portions than in other conduit portions; and
- d. vane means positioned downstream from the flow regulating means and in the conduit passage for guiding fluid which passes through the flow regulating means for discharge through the discharge opening, said vane means including a plurality of vanes arranged in a longitudinally spaced array near selected portions of the discharge opening, each vane including a base portion and a distal portion, said base portion being substantially aligned with the direction of flow of pressurized fluid toward the substrate, said distal portion extending laterally from the downstream end of said base portion toward the direction of the substrate edge to which it is closer.

4,041,896

MICROELECTRONIC CIRCUIT COATING SYSTEM

Tuh-Kai Koo, Dayton, and Armand J. van Velthoven, West Carrollton, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed May 12, 1975, Ser. No. 576,517
Int. Cl.[2] C23C *13/02*
U.S. Cl. 118—48 **20 Claims**



1. A microelectronic circuit coating system for depositing silicon dioxide on a die secured to an electrical conductor system with bonding wires connecting bonding pads on the die to leads on the electrical conductor system, comprising:

means for supporting an electrical conductor system having a die with wires extending from said die to leads on the electrical conductor system, said die and extending wires defining a first predetermined area,

means for directing a chemical deposition mixture onto said die and electrical conductor system,

means for heating said supporting means and electrical conductor system to an elevated temperature, and

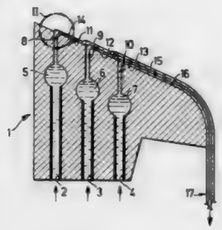
masking means positioned over said electrical conductor system and having an aperture corresponding to said first predetermined area and aligned therewith, whereby said masking means permits said deposition mixture to be deposited solely within said first predetermined area and prevents said deposition mixture from forming on said electrical conductor system in a second predetermined area outside said first predetermined area.

4,041,897

CASCADE COATER

Frank Ade, Fribourg, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed May 10, 1976, Ser. No. 684,693
Claims priority, application Switzerland, May 14, 1975, 6195/75
Int. Cl.[2] B05C *5/00*
U.S. Cl. 118—300 **4 Claims**



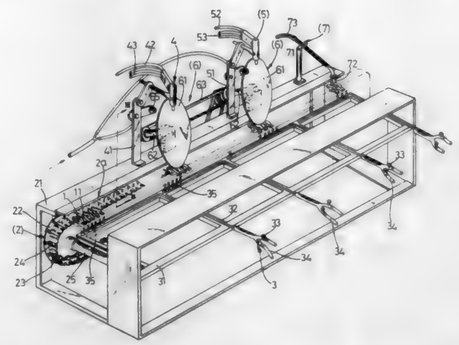
1. A cascade coater having at least one slideway and, extending thereinto, an associated feed slot having an upstream and a downstream boundary wall, the upstream boundary wall terminating in an edge parallel to the associated slideway, whereas the downstream boundary wall of the slot has a face between said boundary wall and the associated slideway at an angle of from approximately 100° to 170°, with the slideway and the face length as measured in a plane perpendicular to the slideway and to the downstream boundary wall being at least 0.5 mm and at most 5 mm.

4,041,898

METAL SPRAYING APPARATUS

Akiyoshi Tajima, Takatsuki, Japan, assignor to Osaka Welding Industrial Co., Ltd., Ibaraki, Japan

Filed July 27, 1976, Ser. No. 709,223
Claims priority, application Japan, Oct. 29, 1975, 50130729
Int. Cl.[2] B05B *15/04*
U.S. Cl. 118—301 **4 Claims**



1. A metal spraying apparatus comprising conveyor means for supporting and conveying works to be sprayed; preheating means disposed along the path of travel of the works for preheating the works from below; a plurality of metal spray nozzles arranged above and along the path of travel of the works for spraying melted metal powder onto the desired surface of each of the works to be treated to form a metal layer thereon; masking means for exposing the desired surface of the works and shielding the other portions of the works from the spray nozzle, the masking means including a masking disk disposed at the spraying position and so inclined that the lower portion thereof is positioned close to the path of travel of the works to expose the desired work surface and shield the other portion of the works, the masking disk being rotatably supported and coupled to drive means; an air nozzle being arranged remote from the masking portion of the masking disk and being arranged behind the upper portion of the rear surface of the masking disk in opposed relation thereto to spray air onto the rear surface of the upper portion of the disk to thereby cool the disk; and a fusing nozzle for heating the sprayed metal surface to a high temperature provided at a downstream portion of the conveyor means, the fusing nozzle being positioned above the path of the works.

4,041,899

RECIPROCATOR DEVICE

Eugene Earl Wolfe, and Allan Burkett Heath, both of Port Huron, Mich., assignors to Acheson Industries, Inc., Port Huron, Mich.

Filed June 17, 1976, Ser. No. 694,101
Int. Cl.[2] B05B *3/18*; F16H *21/02*
U.S. Cl. 118—323 **28 Claims**

1. A reciprocating device adapted to longitudinally reciprocate a spray head across a surface comprising:

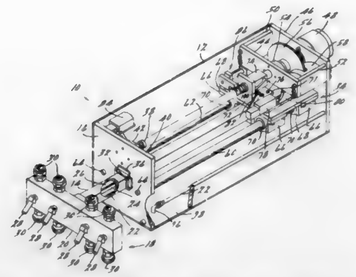
a supporting structure;

a reversible driving means having a driving shaft extending outward therefrom adapted to be rotationally driven by said driving means, said driving means being secured to said supporting structure;

a carriage assembly;

an elongated member having one end thereof removably secured to said carriage assembly;

means connecting said carriage assembly to said driving shaft so as to cause said carriage assembly and said elongated member to be lineally reciprocated in a longitudinal direction in response to said rotation of said driving shaft;



spray head means secured to another end of said elongated member; and,

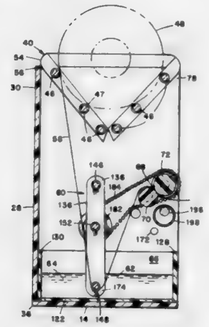
feed line means secured to said spray head means for supplying fluids to said spray head means from a supply source.

4,041,900

PIVOTED GUIDE MEANS FOR SELECTIVE IMMERSION OF WEB FEED

James H. Charles, 2506 Blount Ave., Maryville, Tenn. 37801

Filed Apr. 30, 1976, Ser. No. 681,778
Int. Cl.[2] B05C *3/12*
U.S. Cl. 118—419 **3 Claims**



1. An apparatus for dispensing a web of absorbent material selectively in a dry or wetted condition comprising:

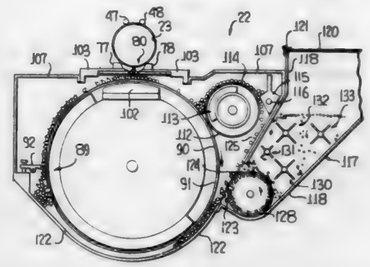
frame means, means mounted on said frame means for rotatably supporting a roll of said web, reservoir means containing a quantity of liquid disposed within said frame, manually operable drive roll means including a set of drive rolls mounted for rotation in said frame means and defining a nip therebetween through which said web is threaded, said drive rolls positively engaging said web threaded through said nip whereby forward rotation of said drive rolls draws said web from said roll and dispenses the same outwardly from said frame means, guide means mounted in said frame means for guiding said web along a path including a section spaced from said liquid and movable to a position for guiding said web into contact with said liquid in said reservoir, drive means including clutch means interconnecting said drive roll means and said guide means for movement of said guide means between a position for guiding said web into contact with said liquid upon reverse rotation of said drive roll means and a position for guiding said web along said section of said path spaced from said liquid upon forward rotation of said drive roll means.

4,041,901

APPARATUS FOR ELECTROSTATIC PRINTING OR COATING AND DEVELOPER MIX CIRCULATING SYSTEM

Kenneth W. Rarey, South Holland; Edward D. Higgins, Palos Heights; Donald L. Hungerford, and John B. Kennedy, Jr., both of Chicago, all of Ill., assignors to Continental Can Co., Inc., Chicago, Ill.

Continuation of Ser. No. 791,098, Jan. 14, 1969, abandoned. This application Feb. 22, 1974, Ser. No. 445,289
Int. Cl.[2] B05B *5/08*
U.S. Cl. 118—621 **31 Claims**



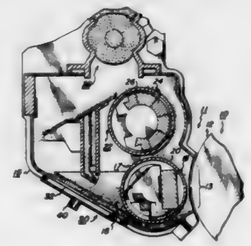
1. Electrostatic printing or coating apparatus for electrostatically depositing toner on portions of continuously conveyed articles comprising means for conveying articles along a predetermined path of travel through a toner application zone, means for transporting toner through said toner application zone, means for electrostatically propelling said toner in said toner application zone from said transporting means to articles conveyed along said path of travel, means defining an elongated narrow opening in said toner application zone between said transporting means and said conveying means whereby only the propelled toner passing through said opening is deposited upon said articles, the longitudinal axis of said opening is disposed in generally parallel relationship to said path of travel, said transporting means includes an endless moving surface upon which is supported said toner, and a portion of said endless moving surface is disposed adjacent said narrow opening and moves past said narrow opening in a direction transverse to the longitudinal axis thereof.

4,041,902

FILTER APPARATUS

Don B. Jugle, Penfield, and Anthony F. Lipani, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed May 11, 1976, Ser. No. 685,217
Int. Cl.[2] G03G *15/08*
U.S. Cl. 118—653 **5 Claims**



1. An improved filter apparatus for use in controlling the

emission of airborne toner particles from a developer housing comprising

a housing at least partially open to the atmosphere containing developer material including toner particles and relatively larger carrier particles,

a foraminous filter member having pore openings of size ranging from about 20 microns to about 100 microns positioned in an opening formed in the bottom of said housing at an acute angle inclined below the horizontal,

seal means for securing said filter member within the opening of said housing so that said filter member is flush therewith in the flow path of the developer material,

means for connecting a source of negative pressure to said seal means to cause any airborne toner particles to flow across the flow path of the developer material towards said filter member,

said filter member being made of a relatively rigid inert material which does not react chemically with said toner particles and in which the rigidity thereof is sufficient to support the flow of developer material thereacross.

4,041,903

DEVELOPING DEVICE FOR USE IN ELECTROPHOTOGRAPHY

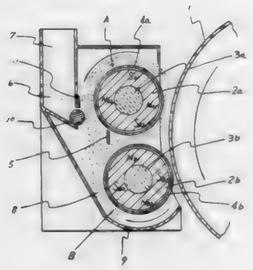
Hiroshi Katakura, Hachioji, and Keitaro Yamashita, Kamisato, both of Japan, assignors to Konishiroku Photo Industry Co., Ltd. and Hitachi Metals, Ltd., both of Tokyo, Japan

Division of Ser. No. 578,266, May 16, 1975, Pat. No. 4,008,686. This application Dec. 15, 1976, Ser. No. 750,768

Claims priority, application Japan, May 21, 1974, 49-56864

Int. Cl.² B05B *5/02*

U.S. Cl. 118—658 **4 Claims**



1. In an electrostatic latent image developing device having a pair of spaced magnet rolls for delivery of developer from a developer storage chamber to the latent image bearing surface of an electrostatic recording medium, and wherein each magnet roll is comprised of a fixed magnetic body having a plurality of magnetic poles and surrounded by a rotatable tube of nonmagnetic material, one of said magnet rolls being a developer magnet roll and positioned adjacent said electrostatic recording medium to deposit developer thereon, the improvement comprising: means for separating unused developer from the developer roll comprising a first magnetic pole on said developer roll spaced from the electrostatic recording medium in the direction of rotation of the rotatable tube associated with the developer roll, a second magnetic pole on the other side roll opposite in polarity to said first magnetic pole for attracting unused developer to said second magnetic pole, said other magnetic roll being in position to deliver the unused, separated developer to a housing compartment.

4,041,904

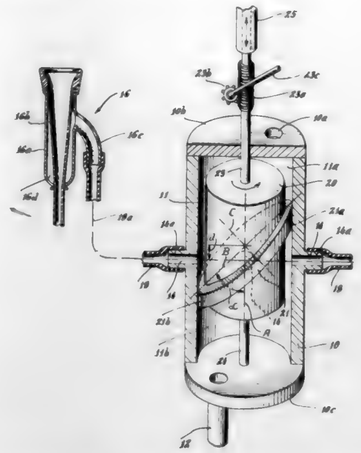
PNEUMATIC PULSATOR FOR TEAT CUPS

Denis C. Yang, Irvington, N.Y., assignor to The De Laval Separator Company, Poughkeepsie, N.Y.

Filed May 14, 1976, Ser. No. 686,654

Int. Cl.² A01J *5/10*

U.S. Cl. 119—14.41 **7 Claims**



1. In combination with a plurality of teat cups, a pneumatic pulsator comprising a housing forming a cylindrical chamber having a central axis, said chamber having upper and lower end portions maintained, respectively, at a high pressure and at a low pressure, the housing having a plurality of openings leading from a region of the chamber located between its said end portions, said openings being spaced from each other around said axis, said teat cups each having a pulsation space connected to a corresponding one of said openings, a rotor mounted in the housing chamber for rotation on said axis and having a peripheral surface engaging the cylindrical wall of the chamber substantially continuously around said axis, the rotor having first and second segments spaced from each other and forming first and second parts of said peripheral surface which are located, respectively, only above and only below said region of the chamber openings, means for driving the rotor on said axis to subject each said pulsation space alternately to said high pressure for a first time period and to said low pressure for a second time period, and means for adjusting the rotor axially in said chamber to vary the ratio of said time periods.

4,041,905

ANIMAL GROOMING APPARATUS HAVING IMPROVED TETHERING DEVICE

Charles H. Prager, 6105 N. 116th St., Milwaukee, Wis. 53225, and John J. Seller, 10414 E. Jefferson Road, Osecola, Ind. 46561

Filed Nov. 19, 1975, Ser. No. 633,551

Int. Cl.² A01K *29/00*

U.S. Cl. 119—103 **5 Claims**

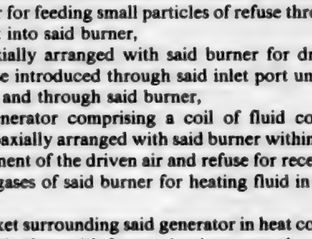
1. In apparatus for grooming animals having a grooming post arm with an end terminating above a raised work surface, an improved tethering device comprising:

a tether formed of a cord having means at one end suitable for use in restraining the animal; and

a tether control mounted on the arm, said tether control including;

a drum rotatably mounted on the arm so that the arm serves as an axle, said drum having first and second axially spaced flanges lying normal to the drum, said first flange being located adjacent the end of said arm, said second flange being spaced inwardly along the arm from the end and having an exposed planar outer surface, said cord being wrapped and unwrapped on said drum between said flanges for storing and paying out purposes,

a generally cup-shaped housing mounted on the arm beyond said second flange, said housing having a base through which the arm extends and presenting a planar surface normal to the arm, said housing including a tubular wall extending parallel to the arm, said housing internally receiving said drum within said tubular wall with said planar outer surface of said second flange contiguous with said planar surface of said base, said wall having a slot therein through which said cord extends, said housing containing means engagable with the arm for restraining rotation of said housing with respect to the arm while permitting axial movement of said housing along the arm,



resilient means mounted on said arm exteriorly of, and beyond, said housing and bearing on said housing for urging said housing and drum toward the end of the arm, and

means mounted on the end of the arm and engaging said first flange of said drum for moving said drum and housing along the arm away from the end in opposition to the urging of said resilient means for establishing an engagement of the surfaces of said second flange and said housing, said engagement establishing the amount of frictional resistance to rotation exerted by said housing on said drum, said resistance being sufficient to prevent movement of said drum responsive to normal movements of the animal on the raised work surface, but permitting movement of the animal responsive to the weight of the animal falling off the raised work surface for paying out said cord.

4,041,906

ENERGY SYSTEM PRODUCING ELECTRICITY, HOT WATER AND STEAM FROM COMBUSTIBLE REFUSE

Raymond S. Edwards, 4367 N. Miller Road, Scottsdale, Ariz. 85251

Filed Apr. 14, 1976, Ser. No. 677,073

Int. Cl.² F22B *33/00, 31/00*

U.S. Cl. 122—2 **3 Claims**

1. A refuse burner, energy generating system comprising in combination:

a pulse-jet sonic burner,

an inlet port for the introduction of refuse into said burner,

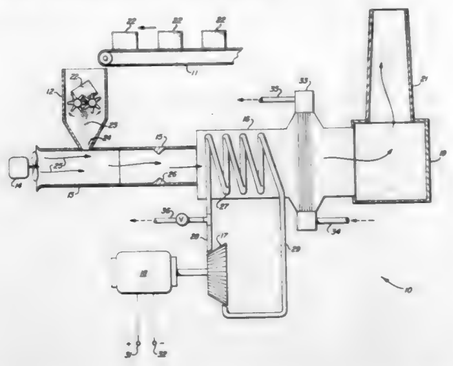
a pulverizer for feeding small particles of refuse through said inlet port into said burner,

means coaxially arranged with said burner for driving air and refuse introduced through said inlet port under pressure into and through said burner,

a steam generator comprising a coil of fluid conducting tubing coaxially arranged with said burner within the path of movement of the driven air and refuse for receiving the burning gases of said burner for heating fluid in said tubing,

a water jacket surrounding said generator in heat conductive relationship therewith for conducting water therethrough for heating by the burning gases passing through said generator, and

a precipitator connected to said generator for removing the smoke and pollutant matters emitted by said generator prior to exhaustion to atmosphere,



said burner comprising a generally cylindrical form employing a restriction along its length for creating high frequency pulsations in the flow pattern of the burning gases passing therethrough.

4,041,907

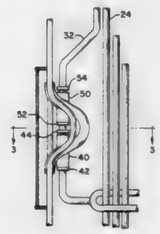
SPACER ARRANGEMENT FOR STEAM GENERATOR

Norman Chanine Chayes, Bloomfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 2, 1976, Ser. No. 710,485

Int. Cl.² F22B *37/24*

U.S. Cl. 122—510 **7 Claims**



1. A spacer tube arrangement for a steam generator having, a furnace, vertical tubes forming a planular wall of said furnace, and a tubular superheater pendant unit supported from an upper elevation and forming a plane transverse to the plane of the wall, comprising:

a. a pair of said vertical tubes bumped into the furnace at a restraining elevation area;

b. fluid cooled spacer tubes passing horizontally parallel to the plane of said pendant units in closely spaced relationship therewith and on each side thereof at a lower elevation below said restraining elevation;

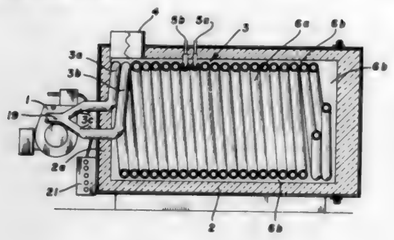
c. a vertical fluid cooled tubular means in series fluid flow relationship with said spacer tubes and passing vertically between said pair of vertical tubes; and

d. a freely rotatable sleeve surrounding said vertical fluid cooled tubular means at said restraining elevation area.

4,041,908
SUPER HEATER

Edward Rasinski, Hopkins, Minn., assignor to Moorhead Machinery & Boiler Co., Minneapolis, Minn.

Filed Jan. 22, 1976, Ser. No. 651,603
Int. Cl.[2] F22G *5/00, 7/08*
U.S. Cl. 122—479 R 7 Claims

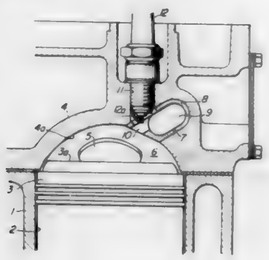


1. A steam superheater comprising,
a casing including an outside firebox wall construction
a hollow steam coil system to define therewithin a central radiant "black body" type heat transfer chamber and mounted within said casing with the outer surfaces of said coil system spaced slightly inwardly from the inside surfaces of the casing wall to provide a convection heat transfer passage around one end and the outside of said coil system,
said coil system consisting of a double helical coil unit having the convolutions of the two coils disposed in longitudinally adjacent side by side contact relation to produce coil chamber having the side wall thereof only the thickness of the diameter of a single coil tube to double the steam flow capacity thereof while maintaining the same surface area of contact with the products of combustion from said heat source for both coils.

4,041,909
INTERNAL-COMBUSTION ENGINE HAVING A SUB-COMBUSTION CHAMBER

Norihiko Nakamura, Mishima, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Dec. 12, 1974, Ser. No. 532,224
Claims priority, application Japan, Sept. 24, 1974, 49-115501[U]
Int. Cl.[2] F02B *23/00*
U.S. Cl. 123—32 SP 3 Claims

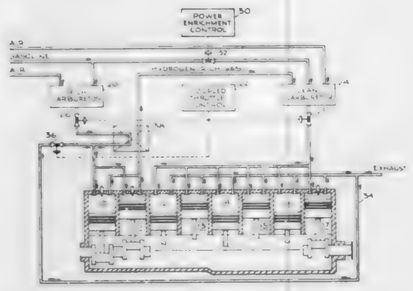


1. An internal-combustion engine comprising a cylinder, a cylinder head having a recess opening to the inner surface thereof, a piston for sliding movement within said cylinder, a main combustion chamber being defined between the inner surface of said cylinder head and the top surface of said piston and having an intake valve for admitting the lean air-fuel mixture thereinto and an exhaust valve for discharging the exhaust gas therefrom, a sub-chamber element fitted into said recess of the cylinder head in overall close contact relation with and securely held in position under contact pressure against said recess and formed therein with a sub-chamber and a passage which intercommunicate said sub-chamber and said main combustion chamber for providing the only supply of air-fuel mixture for said sub-chamber in which the coefficient of thermal expansion of said cylinder head is 1.5 to 2.5 times that of said sub-chamber element, thereby preventing said sub-chamber element from dropping into said main combustion chamber, and a spark plug having a sparking gap for exposing said gap to said passage.

4,041,910
COMBUSTION ENGINE

John Houseman, Pasadena, Calif., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 2, 1975, Ser. No. 564,622
Int. Cl.[2] F02B *75/20*
U.S. Cl. 123—59 EC 5 Claims

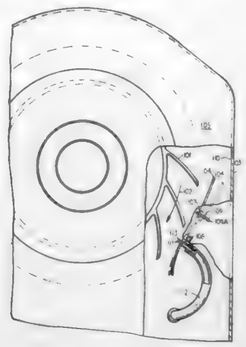


1. In an internal combustion engine of the type that has a plurality of cylinders each cylinder having a reciprocating piston, an intake means for enabling the timed introduction of fuel within each of said cylinders, an exhaust means for enabling the timed exhausting of the contents of each of said cylinders, and spark plug means for igniting fuel within each said cylinders, the improvement comprising
rich carburetor means for forming a first mixture of a hydrocarbon fuel with only enough air to partially oxidize said hydrocarbon fuel when ignited,
first means for introducing said first mixture into one of said cylinders from said rich carburetor means through its intake means to be compressed and ignited by operation of said internal combustion engine whereby hydrogen rich gases are formed in said one of said cylinders, said first means including first valve means for determining the amount of said first mixture introduced into said one of said cylinders,
lean carburetor means for forming a second mixture of hydrogen rich gases and enough air to fully oxidize said hydrogen rich gases,
means for transferring hydrogen rich gases from said one of said cylinders to said lean carburetor means,
second means for introducing said second mixture into the remaining cylinders of said engine through their intake means for use as a fuel, said second means including a second valve means for determining the amount of said second mixture introduced into the remaining cylinders of said engine, and
a throttle control means coupled to both said valve means for simultaneously controlling the respective amounts of first and second mixtures passed by both said valve means.

4,041,911
CARBURETTORS AND ASSOCIATED COMPONENTS

William Henry Steele, 3 Taft Place, Bonnet Bay, New South Wales 2226, and George Nejtek, 78 Townsend St., Condell Park, New South Wales 2200, both of Australia

Division of Ser. No. 398,800, Sept. 19, 1973, Pat. No. 3,939,231.
This application May 7, 1975, Ser. No. 575,396
Claims priority, application Australia, Sept. 20, 1972, 507/72
Int. Cl.[2] F02D *11/08*
U.S. Cl. 123—103 B 7 Claims

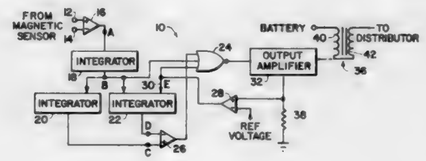


1. Apparatus for controlling a function of an engine in response to engine speed comprising a fluid pressure-operated means operable to control said function, an air impeller on the engine motivated by a drive shaft of the engine, a cowling at least partly enclosing said air impeller, an aerofoil surface on a vane movably mounted upon said cowling to adjust its position in the path of air flow from said impeller and fluid passage means having a terminal orifice connected to and positioned relative to said surface so as to be exposed to an air pressure that varies with changes in engine speed, and a fluid line connecting said fluid passage means with the fluid pressure-operated member.

4,041,912
SOLID-STATE IGNITION SYSTEM AND METHOD FOR LINEARLY REGULATING AND DWELL TIME THEREOF

Douglas Charles Sessions, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 25, 1975, Ser. No. 607,402
Int. Cl.[2] F02P *1/00*
U.S. Cl. 123—117 R 7 Claims

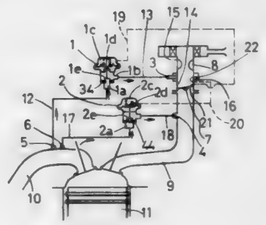


1. An ignition system for an internal combustion engine which is responsive to alternating ignition signals generated in timed relationship with the engine and which includes an amplifier switching circuit for charging and discharging an ignition coil, comprising in combination:
first circuit means responsive to each successive generated ignition signal for producing a monopulse output signal and a reference output signal comprising dual constant slopes, said monopulse signal being produced during a predetermined portion of a half cycle of the ignition signal, the first constant slope portion of said reference output signal being produced simultaneously with said monopulse output signal, the second constant slope portion of said reference output signal being produced during the remainder of the duration of the ignition signal;
second circuit means responsive to said monopulse signal for producing a variable threshold signal;
the amplifier switching circuit being responsive to the magnitude of said second slope portion of said reference signal reaching a predetermined value with respect to said variable threshold signal for charging the ignition coil and being responsive to said monopulse signal to discharge the coil;
feedback means responsive to the current through the amplifier switching circuit reaching a predetermined value for limiting the same thereat and for causing the magnitude of said variable threshold signal to be linearly varied for regulating the current limit duty cycle to be a fixed percent of the ignition signal time period.

4,041,913
EXHAUST GAS RECIRCULATING SYSTEM

Hidetaka Nohira, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyoda, Japan

Filed Aug. 29, 1975, Ser. No. 608,975
Claims priority, application Japan, Feb. 22, 1975, 50-22038
Int. Cl.[2] F02B *33/00;* F02M *7/00*
U.S. Cl. 123—119 A 8 Claims

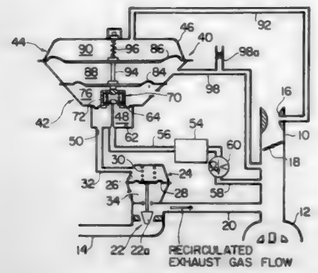


1. An exhaust gas recirculating system for use in an internal combustion engine of a motor vehicle, comprising:
first and second flow rate control valves, in which the interior of each of said valve is sealingly divided by means of a single diaphragm into one diaphragm chamber and a single valve chamber having one inlet and one outlet, a valve stem having a root portion with a valve body at its top secured to said diaphragm, said valve body being adapted to open and close each of said valves according to the motion of said diaphragm;
a pipe communicating the inlet of said first flow rate control valve with the exhaust system of said engine;
a pipe communicating the outlet of said first valve with the intake system of said engine in a position upstream of a throttle valve of said engine;
a negative-pressure pipe communicating the diaphragm chamber of said first flow rate control valve with said intake system of said engine in a position slightly upstream of the idle position of said throttle valve;
a pipe communicating the inlet of said second flow rate control valve with said exhaust system of said engine;
a pipe communicating the outlet of said second flow rate control valve with said intake system of said engine in a position downstream of said throttle valve of said engine; and
a pipe communicating said diaphragm chamber of said second flow rate control valve with said intake system of said engine in a position slightly upstream of the point where the first flow rate control valve is communicated with said intake system.

4,041,914
EXHAUST GAS RECIRCULATION SYSTEM WITH CONTROL APPARATUS FOR EXHAUST GAS FLOW CONTROL VALVE

Kunihiko Sugihara, Yokohama; Yasuo Nakajima, Yokosuka, and Yoshimasa Hayashi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed June 19, 1975, Ser. No. 588,238
Claims priority, application Japan, June 25, 1974, 49-72460
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **4 Claims**

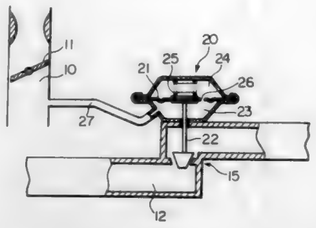


1. An exhaust gas recirculation system comprising:
a recirculation conduit to recirculate a portion of exhaust gas from the exhaust system of an internal combustion engine to the intake system having a carburetor and an intake manifold;
an exhaust gas flow control valve normally closing said recirculation conduit;
a valve actuator including a vacuum chamber and a diaphragm operatively connected to said exhaust gas flow control valve to urge said exhaust gas flow control valve toward its opening position so as to open said recirculation conduit responsive to a vacuum in the vacuum chamber of said valve actuator; and
a control apparatus comprising:
a housing having a vacuum regulating chamber, said vacuum regulating chamber having an inlet port connected to the vacuum chamber of said valve actuator, an air bleed port and an outlet port connected to a vacuum reservoir;
a first flexible diaphragm defining a wall of said vacuum regulating chamber;
a second flexible diaphragm cooperating with said first diaphragm means to form in said housing and between said first and second diaphragms an atmospheric pressure chamber;
a third flexible diaphragm cooperating with said second diaphragm means to form in said housing and between said second and third diaphragms a biasing chamber, said third flexible diaphragm forming on the opposite side of a side exposed to said biasing chamber and in said housing a venturi vacuum chamber communicating with the venturi of the carburetor;
interconnecting means for mechanically interconnecting said first, second and third diaphragms, said interconnecting means including a valve means for selectively closing the air bleed port and said outlet port in response to deflections of said first, second and third diaphragms, and a vacuum conduit connecting said biasing chamber with the intake manifold;
an effective area of said third diaphragm being larger than that of said first diaphragm and than that of said second diaphragm, and said vacuum conduit including an air bleeder orifice having a restriction chosen such that a vacuum in said biasing means is a reduction of the intake manifold vacuum.

4,041,915
APPARATUS TO CONTROL THE RECIRCULATION OF EXHAUST GASES INTO THE INTAKE PASSAGE IN AN INTERNAL COMBUSTION ENGINE

Hideki Konishi, Tokyo, Japan, assignor to Nissan Motor Company Limited, Yokohama City, Japan

Filed Jan. 12, 1976, Ser. No. 648,139
Claims priority, application Japan, Jan. 14, 1975, 50-5976
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **5 Claims**

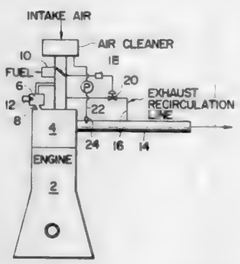


1. An exhaust gas recirculation control apparatus for an internal combustion engine having an exhaust passage for conducting exhaust gases from the engine, an intake passage for conducting a combustible mixture to the engine and a throttle valve in the intake passage, comprising a connecting passageway connecting the exhaust passage to the intake passage, valve means for controlling the flow of exhaust gases through the connecting passageway, a suction responsive motor having a diaphragm connected to said valve means, a first pressure chamber communicating with the intake passage downstream of the throttle valve, a second pressure chamber, the diaphragm being between said two pressure chambers, said diaphragm being preloaded by a spring to close said valve means and acted upon by the pressure difference between the pressures in the two chambers to hold the valve means in an open position when the differential pressure across the diaphragm increases at a predetermined rate with respect to time and means to provide a limited fluid communication between the two pressure chambers.

4,041,916
INTERNAL COMBUSTION ENGINE AND METHOD OF OPERATING SAME

Hiroshi Iida, Tokyo, and Kenichi Sasaki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 14, 1976, Ser. No. 676,663
Claims priority, application Japan, Apr. 15, 1975, 50-45553
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **20 Claims**

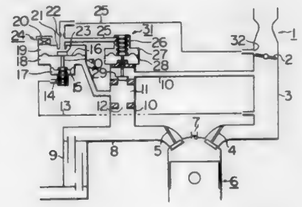


1. A method for operating a spark ignition internal combustion engine having an auxiliary combustion chamber connected to a main combustion chamber by a torch flame passage and means for igniting a fuel-air mixture in the auxiliary combustion chamber, comprising:
passing a fuel-air mixture into the auxiliary combustion chamber;
passing the fuel-air mixture into the main combustion chamber;
igniting the fuel-air mixture in the auxiliary combustion chamber for igniting the fuel-air mixture in the main combustion chamber; and
mixing the exhaust gas resulting from the combustion of the fuel-air mixtures in the auxiliary and main combustion chambers with the fuel-air mixture to be passed into the main combustion chamber.

4,041,917
EXHAUST GAS RECIRCULATION SYSTEM

Yukio Suzuki, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 21, 1976, Ser. No. 699,038
Claims priority, application Japan, Apr. 19, 1976, 51-47891[U]
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **3 Claims**



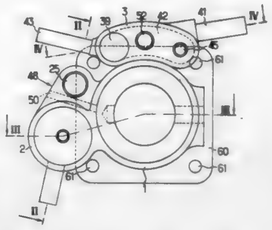
1. An exhaust gas recirculation system comprising:
a diaphragm type EGR valve mounted on an EGR pipe which connects the exhaust pipe with the intake pipe of the engine;
a pressure control chamber formed at the inlet of said EGR valve;
an orifice mounted on a communicating pipe which connects the diaphragm chamber of said EGR valve with the EGR port arranged near the throttle valve of the carburetor;
a relief pipe diverging from said communicating pipe between said orifice and said EGR valve, and;
a vacuum control valve mounted at the opening end of said relief pipe,
wherein said vacuum control valve comprises:
a first diaphragm;
a second diaphragm;
a first chamber which is formed outside said first diaphragm and communicating with the atmosphere;
a second chamber which is formed between said first and second diaphragms and communicating with said pressure control chamber, and;
a third chamber which is formed outside said second diaphragm and communicating with said intake pipe of said engine at the downstream of said throttle valve of said carburetor.

4,041,918
FUEL INJECTION SYSTEM

Jean-Pierre Rivere, Paris, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of, France

Filed Dec. 4, 1975, Ser. No. 637,629
Claims priority, application France, Dec. 13, 1974, 74.41170
Int. Cl.² F02M *69/00*
U.S. Cl. 123—139 AW **10 Claims**

1. A compact fuel feed system for fuel-injected internal combustion engines, comprising a throttle butterfly housing incorporating all the essential auxiliaries in combination with an inlet manifold thus avoiding the use of independent casings, in which an engine air supply unit comprises the throttle butterfly body which has at least two bosses, a first one of which is to be fed with engine coolant; the second boss comprising an annular recess incorporating a fuel pressure regulator, a bore accepting a decelerating air bypass for treatment of unburnt

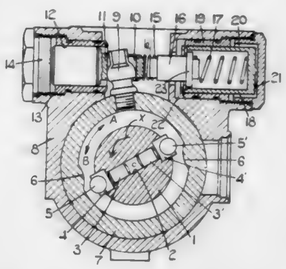


hydrocarbons during the deceleration phase and including adjustment means for enabling the engine idling speed to be adjusted, and a boss accepting a cold start injector; said first boss comprising a first bore accepting a cold start injector air bypass, a second bore accepting a thermostat for measuring engine temperature and designed to ensure enrichment when the engine is started, and a third bore accepting an anti-overchoking thermostat for controlling the cold start injector.

4,041,919
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES, IN PARTICULAR FOR DIESEL ENGINES

Jean Claude Bonin, Blois, France, assignor to Roto Diesel, Blois, France

Filed Jan. 19, 1976, Ser. No. 650,447
Claims priority, application France, Jan. 31, 1975, 75.03094
Int. Cl.² F02M *39/00*
U.S. Cl. 123—139 P **5 Claims**



1. A fuel injection pump for internal combustion engines, particularly diesel engines, of the type comprising a rotor with a diametral bore within which two opposing pistons slide freely, the inward stroke of the pistons being controlled by a predetermined cam profile defined on a cam-ring engageable with rollers supported by roller carriers slidable within the diametral bore in a radial direction and respectively in contact with outer ends of said pistons, a space between the two pistons being connected by means of an axial duct in the rotor, on the one hand to fuel inlet ducts and on the other hand, to a delivery duct which is successively connected during the rotation of the rotor with an injector of the associated engine, the pump comprising a housing; a first piston slidable within a bore in said housing, the said first piston being connected to said cam-ring in such a manner as to transmit angular movement thereto during movement of the first piston; means for supplying fluid pressure to said bore to one end of the first piston which fluid

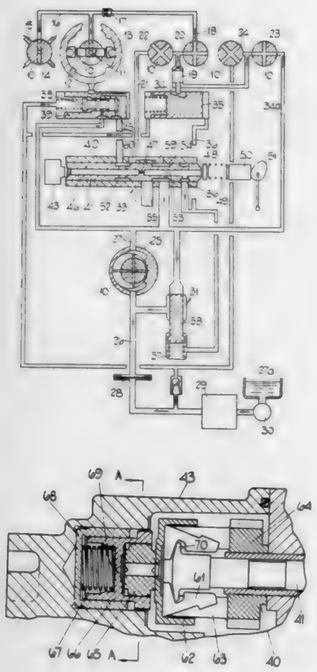
pressure is a function of an operating parameter of the associated engine; a second piston slidable in said housing; a first compression spring located between the other end of said first piston and one end of said second piston; a main advance spring positioned within said housing at the other end of said second piston, said second piston being subject to the reaction of said main advance spring acting against said first spring, a third piston slidable in said housing; the said main spring bearing against said third piston; and means allowing said third piston to be subjected, at a predetermined rotational speed of the associated engine, to a fluid pressure opposing the said main spring and varying as a function of said operating parameter of the associated engine, the force generated by the pressure upon said third piston being greater than the force exerted by the first pressure on said first piston.

4,041,920

FUEL INJECTION PUMPING APPARATUS

Robert Thomas John Skinner, High Wycombe, England, assignor to C.A.V. Limited, Birmingham, England

Continuation of Ser. No. 598,129, July 22, 1975, abandoned.
This application Sept. 13, 1976, Ser. No. 722,403
Claims priority, application United Kingdom, July 26, 1974, 33029/74
Int. Cl.[2] F02D *1/02*
U.S. Cl. 123—139 AM **4 Claims**



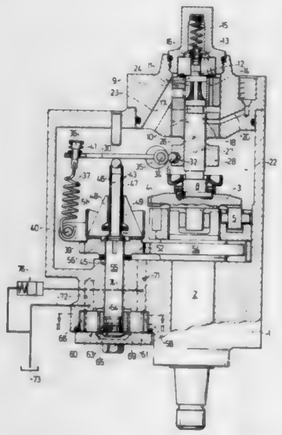
1. In a fuel injection pumping device having an injection pump for supplying fuel to an internal combustion engine, a feed pump for supplying fuel to said injection pump, a metering device between said fuel pump and said injection pump including a body, an axially movable control member within said body for controlling the amount of fuel supplied to said injection pump, a first biasing means at one end of said control member for urging said control member axially to increase the amount of fuel to said injection pump, and centrifugal weight means at the other end of said control member and rotatable as a function of the speed of the engine to exert a force opposing the force of said first biasing means to restrict movement of said control member by said first biasing means and means operable for increasing the force exerted by said first biasing means to move said control member against said centrifugal weight means to increase the supply of fuel to said injection pump, the improvement of a dash pot means for retarding sudden movement of said control member when the force exerted by said biasing means is increased by said operable means against said centrifugal weight means and comprising cage means engaging said centrifugal weight means and movable coaxially of said control member, means for rotating said cage means at a speed proportional to the speed of the engine, movable abutment means engaging said cage means and a second biasing means urging said abutment means against said cage means for opposing the force of said first biasing means, said body being provided with a fluid filled recess housing said cage means, said abutment means and said second biasing means, said abutment means dividing said recess into two chambers and being provided with a restricted aperture for communication of the fluid therethrough between said two chambers whereby when the force of said first biasing means is increased by said operable means, the movement of said control member is retarded by the dash pot means so that an excessive increase of fuel to the engine is temporarily prevented.

4,041,921

FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

Konrad Eckert, and Franz Eheim, both of Stuttgart, Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Continuation of Ser. No. 531,293, Dec. 10, 1974, abandoned.
This application July 27, 1976, Ser. No. 709,071
Claims priority, application Germany, Dec. 13, 1973, 2361958
Int. Cl.[2] F02M *39/00*; F02D *1/04*
U.S. Cl. 123—140 R **4 Claims**



1. In a fuel injection pump for internal combustion engines which includes a housing, a primary drive shaft disposed to rotate in said housing, cylinder means disposed within said housing, a reciprocating and rotating pump piston moving within said cylinder means and powered by said primary drive shaft, a centrifugal force governor for regulating the injected fuel quantity, and a fuel supply pump for supplying fuel to said cylinder means for delivery by said pump piston, the improvement comprising:

a secondary shaft, disposed to rotate within said housing and driven mediately by said primary drive shaft for simultaneously powering the motion of said centrifugal force governor and said fuel supply pump; and cover means, wherein:

i. said housing has an interior recess which together with said cover means define an enclosure within which said fuel supply pump is mounted, said fuel supply pump including a central movable member;

ii. the central movable member of said fuel supply pump is coaxially disposed on one end of said secondary drive shaft;

iii. said secondary shaft comprises an upper portion and a lower portion with said lower portion having a larger diameter than said upper portion;

iv. said primary shaft includes drive imparting means; and

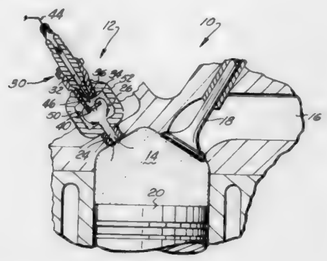
v. said lower portion has a drive receiving means mounted thereto which engages the drive imparting means of said primary shaft for driving said secondary shaft, and a drive imparting means mounted thereto which engages and imparts a drive to said central movable member of said fuel supply pump.

4,041,922

SYSTEM AND DEVICE FOR THE IGNITION OF AN INTERNAL COMBUSTION ENGINE USING A LEAN AIR-FUEL MIXTURE

Michio Abe, Kasugai Aichi, and Naoyuki Maeda, Inyuama, both of Japan, assignors to Tokai TRW & Co. Ltd., Kasugai Aichi, Japan

Filed June 30, 1975, Ser. No. 591,452
Claims priority, application Japan, July 8, 1974, 49-078008
Int. Cl.[2] F02B *23/00*; F02P *1/00*
U.S. Cl. 123—191 S **17 Claims**



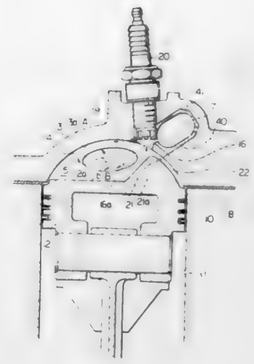
1. An engine comprising wall means for at least partially defining a main combustion chamber for receiving a relatively leans air-fuel mixture and an auxiliary combustion chamber which is connected in fluid communication with said main combustion chamber, said wall means including means for defining an opening through which the lean air-fuel mixture from said main combustion chamber can flow into said auxiliary combustion chamber, a spark plug connected with said wall means for igniting an air-fuel mixture in said auxiliary combustion chamber during operation of the engine, said spark plug including first and second electrodes exposed to the interior of said auxiliary combustion chamber and at least partially defining a path along which an electric arc passes to ignite an air-fuel mixture in said auxiliary combustion chamber, and means for establishing a corona discharge in said auxiliary combustion chamber to promote the accumulation of a relatively rich air-fuel mixture adjacent to said first and second electrodes, said means for establishing a corona discharge including a third electrode spaced apart from and disposed within said auxiliary combustion chamber and means for establishing between said first and third electrodes an electrical potential sufficient to cause a corona discharge.

4,041,923

INTERNAL COMBUSTION ENGINE OF LEAN AIR-FUEL MIXTURE COMBUSTION TYPE

Masami Konishi, Toyota, and Eishi Oono, Susono, both of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 28, 1976, Ser. No. 700,498
Claims priority, application Japan, May 14, 1976, 51-054250
Int. Cl.[2] F02B *23/00, 3/00*
U.S. Cl. 123—191 S **4 Claims**



1. An internal combustion engine of lean air-fuel mixture combustion type, comprising:

a cylinder block;

a piston reciprocably movable in the cylinder block and having a top surface;

a cylinder head fixed onto the cylinder block and having an inner surface;

a main combustion chamber formed between the top surface of the piston and the inner surface of the cylinder head;

a subsidiary combustion chamber formed in the cylinder head;

a connecting passage connecting the main combustion chamber with the subsidiary combustion chamber and opening into the main combustion chamber on the inner surface of the cylinder head for leading a lean air-fuel mixture from the main combustion chamber into the subsidiary combustion chamber and for injecting a high velocity burning jet from the subsidiary combustion chamber into the main combustion chamber;

a spark plug having a spark gap located in a subsidiary combustion region consisting of the subsidiary combustion chamber and the connecting passage, and;

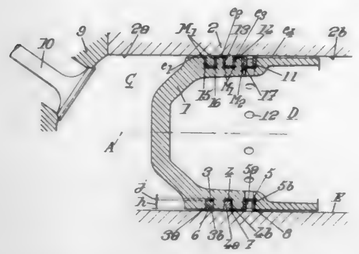
a squish flow producing means including a raised portion formed on one side of the top surface of the piston for forming a squish area which extends from the peripheral end of the inner surface of the cylinder head to the vicinity of the opening of the connecting passage along the inner surface of the cylinder head and for creating a squish flow along the inner surface of the cylinder head when the piston reaches the vicinity of the top dead center, said connecting passage being directed away from the squish area and arranged so that the high velocity burning jet injected from the connecting passage meets with the squish flow at an angle of less than 90°.

4,041,924

RECIPROCATING INTERNAL COMBUSTION ENGINE

Albert Grosseau, Chaville, France, assignor to Societe Anonyme Automobiles Citroen, France

Filed Sept. 15, 1975, Ser. No. 613,436
Claims priority, application France, Oct. 9, 1974, 74.34037
Int. Cl.² F02B 77/00; F01M 1/00
U.S. Cl. 123—193 CP **8 Claims**



1. A reciprocating internal combustion engine, comprising:
a cylinder having a substantially horizontal axis and having one end thereof shaped as a combustion chamber and the other end thereof opening into a crankcase adapted to receive a lubricating atmosphere, said cylinder having a bottom zone where liquid lubricant may collect when the engine is stationary;
a piston slidable in said cylinder and having a space therein communicating with said crankcase, said piston having an outside surface formed with at least one peripheral sealing groove and a peripheral scraper groove, said peripheral grooves being of rectangular cross-section with a base and a pair of transverse surfaces, said scraper groove being nearest said other end of said cylinder and having the base thereof formed with orifices via which said scraper groove communicates with said space in said piston;
a substantially rectangular cross-section piston ring received with a reduced clearance in each said sealing groove; and
a substantially rectangular cross-section scraper ring received with a reduced clearance in said scraper groove;
said piston being received in said cylinder with clearance whereby annular gaps are formed between said outside surface of said piston and said cylinder on each side of each of said piston and scraper rings; in which engine the improvement comprises:
each said sealing groove being provided with first narrow passage means providing a continuous communication between the base of said sealing groove and said annular gaps on both sides of said piston ring in said sealing groove;
said scraper groove being provided with second narrow passage means providing communication between the base of said second groove and at least that annular gap which is on the side of said scraper ring nearest said one end of said cylinder;
both said first and said second passage means being disposed at a level above said bottom zone of said cylinder.

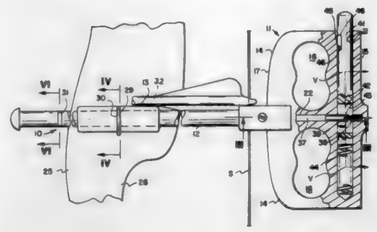
4,041,925

BOWSTRING RELEASE DEVICE

Robert R. Barrick, Parowan, Utah, assignor to John F. Cowen, Parowan, Utah

Filed Apr. 7, 1975, Ser. No. 565,516
Int. Cl.² F41B 5/00
U.S. Cl. 124—35 A **3 Claims**

1. An accessory for an archery bow, comprising:
a. a one-piece body member shaped to form a hand grip with a bow string receiving slot in the front and a recess at one side of said slot and opening toward the front of said body member;
b. a one-piece catch member mounted in said recess for pivotal movement about a vertical axis, said catch member having a hook on the outer edge to engage a bow string disposed in said slot, said catch member also having a shoulder-forming recess;
c. a latch pin guided in said body member for longitudinal movement toward and away from said catch member, said latch pin having a shoulder formed thereon adjacent the end remote from said catch member;
d. spring means yieldably urging said latch pin toward said



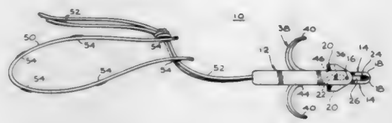
catch member to position the end adjacent thereto in said recess to engage the shoulder formed thereby and hold said catch member in bow-string retaining position; and
e. a plunger having a cam surface and an opening to receive said latch pin and position the shoulder thereon in registration with and engaging the cam surface on said plunger, the axial depression of said plunger causing the cam surface to react with the latch pin shoulder and move the latch pin out of the recess in the catch member and permit it to pivot and release the bow-string.

4,041,926

BOWSTRING RELEASE DEVICE

Fernando Troncoso, Jr., 1851 S. Orange Ave., Monterey Park, Calif. 91754, and Scott Lewis Bomar, 2910 S. Rita Way, Santa Ana, Calif. 92704

Filed Feb. 18, 1976, Ser. No. 659,099
Int. Cl.² F41B 5/00
U.S. Cl. 124—35 A **11 Claims**



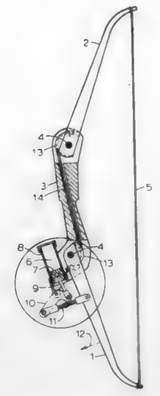
1. An improved archery bowstring release device, said device comprising, in combination:
a. a frame;
b. a pair of opposable spring biased jaws pivotably connected to said frame and having abuttable bowstring-retaining ends and opposite plunger engaging ends, the latter end when biased part defining a plunger space therebetween when said bowstring-retaining ends abut each other;
c. a trigger actuated plunger slideably disposed in said frame;
d. means biasing a portion of said plunger into said space to prevent movement of the jaws and to positively hold only a bowstring in bowstring-retaining position free of an arrow, the leading or jaw engaging end of said plunger portion having a diameter greater than that of the trailing end of said plunger portion so as to assure sudden non-creep opening of said jaws; and,
e. a trigger connected to said plunger for urging said plunger against said biasing and out of said space, thereby permitting said string-retaining ends to open and release a bowstring therefrom during shooting of an archery bow.

4,041,927

ARCHERY BOW WITH PIVOTED BOW LIMBS HAVING ROTATIONAL SYNCHRONIZER AND ADJUSTABLE DRAW FORCE MECHANISMS

Robert M. Van House, 268 Enfield Road, Dayton, Ohio 45459

Filed July 24, 1975, Ser. No. 598,569
Int. Cl.² F41B 11/00
U.S. Cl. 124—61 **13 Claims**



1. An archery bow comprising:
a generally elongate central handle member having a pair of opposed end portions,
a master bow limb pivotally attached to the central handle member adjacent one end portion thereof,
a slave bow limb pivotally attached to the central handle member adjacent the other end portion thereof,
only one single elongate tension means extending through the elongate central handle member and provided with a pair of opposed free end portions and having one free end portion secured to the master bow limb and having the other end portion secured to the slave bow limb for synchronizing pivotal movement of the limbs, the tension means extending between the master bow limb and the slave bow limb.
single spring means for exerting a force through one of said bow limbs in opposition to a drawing force on the bow limbs by a user,
means attaching the single spring means to the central handle member, for support thereby,
linkage means connecting the spring means only to the master bow limb, for operation therewith,
and a bow string connected to the limbs adjacent a portion thereof which is spaced from the central handle member.

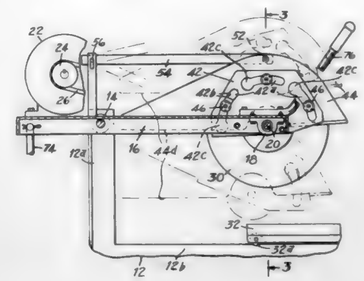
4,041,928

MASONRY SAW

Franklin E. Robinson, West Roxbury, Mass., assignor to Norton Company, Worcester, Mass.

Filed Apr. 29, 1976, Ser. No. 681,544
Int. Cl.² B28D 1/04
U.S. Cl. 125—13 SS **13 Claims**

1. A rotary saw comprising:
a support frame;
a work support on the frame;
a platform pivotally connected to an upper portion of the frame and having
a forward end portion extending above and pivotable toward and away from the work support;
bearing means on the forward end portion of the platform;
a shaft journalled in the bearing means;
a saw blade attached to the shaft for rotation about its axis;
drive means supported on the platform for rotating the saw blade;
a guide member attached to and extending adjacent the platform substantially normal to the axis of rotation and having
at least one arcuate slot between opposed arcuate guide surfaces spaced radially from and extending arcuately about the axis of rotation;
a safety guard, pivotally supported on the guide member, enclosing a circular segment of the saw blade, and pivotable about the saw blade relative to the guide member and having



a lower edge situated in a predetermined initial position; a follower attached to and projecting from a side of the guard into each arcuate slot and adapted for supporting, guiding and retaining engagement with the guide member during pivotal movement of the guard relative to the guide member;
link means, pivotally connected to the guard and frame, for pivoting and maintaining the lower edge of the guard in the predetermined initial position during pivotal movement of the saw blade relative to the work support and frame; and means for positioning and pivoting the platform and saw blade relative to the work support and frame.

4,041,929

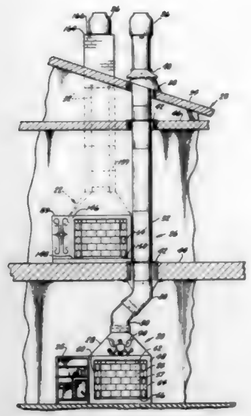
COMPOSITE FIREPLACE CONSTRUCTION

Jonathan Norton Cooksey, 3041 Kallin, Long Beach, Calif. 90808

Filed Feb. 10, 1975, Ser. No. 548,786
Int. Cl.² F24B 1/18
U.S. Cl. 126—120 **15 Claims**

1. A composite molded fireplace with a firebox and a hood attached to said firebox to conduct exhaust products therefrom, said firebox having:
an inner refractory liner comprised of magnesium oxychloride cement and slate dust;
an outer shell comprised of magnesium oxychloride cement, structural fibers and organic resin; and
an insulating layer between said inner liner and said outer shell of magnesium oxychloride cement and inorganic expanded insulation and said hood having:
an outer shell comprised of magnesium oxychloride cement, structural fibers, and organic resins; and

an insulating layer within said hood comprised of magnesium oxychloride cement and inorganic expanded insulation.



4,041,930

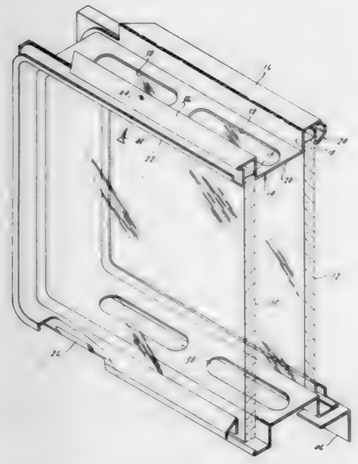
WINDOW UNIT FOR OVEN DOORS

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed Nov. 28, 1975, Ser. No. 635,100

Int. Cl.[2] F24C *15/04*

U.S. Cl. 126—198 **12 Claims**



1. A self-contained window unit adapted to be assembled into an oven door having front and back door panels with aligned window openings therein and means defining an air passage to allow air to flow upwardly through the door and the window unit therein, comprising first and second opposed glass panes, a continuous spacer member between said panes engaging the peripheral edges of said first pane and being spaced from the said second pane to define openings at the top and bottom of said unit communicating with the air passage in the door, connector plates extending across the peripheral edges of said panes at the bottom and side edges of said window unit, the connector plate at the bottom edge of said window unit including a channel formation surrounding the peripheral edge of one of said panes, said connector plates having flange portions holding said spacer member against the other said pane and holding said panes in spaced parallel relation, said one pane being removable from said channel formation by upward sliding movement to permit removal of said one pane.

4,041,931

RADIOPAQUE ANASTOMOSIS MARKER

Donald P. Elliott, 70 Eudora, Denver, Colo. 80220, and William L. Halseth, No. 3 Ponderosa Circle, Parker, Colo. 80134

Filed May 17, 1976, Ser. No. 687,034

Int. Cl.[2] A61B *19/00*

U.S. Cl. 128—1 R **4 Claims**



1. A radiopaque marker for internal implantation as a means for locating the site of an anastomosis during subsequent fluoroscopic examination, comprising a one-piece split ring of a radiopaque material and having a substantially circular configuration, said ring formed with a first loop intermediate the ends thereof providing a spring normally urging the ends toward one another and defining a suture receiving opening for suturing the ring to adjacent tissue, and the ends of the rings formed into closed, second and third loops, respectively, thus defining suture receiving openings and at the same time eliminating exposed sharp ends, said ring and loops being substantially coplanar and the ring being spreadable to enable placement of the ring over a sutured-in-place vein, the suture receiving openings being substantially diametrically opposite one another, thus preventing tilting of a sutured in place marker.

4,041,932

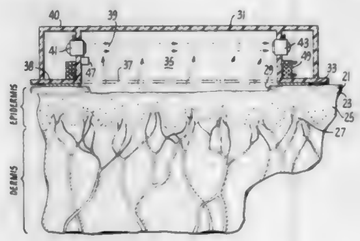
METHOD FOR MONITORING BLOOD GAS TENSION AND PH FROM OUTSIDE THE BODY

Moshe A. Fostick, 758-18th Ave., San Francisco, Calif. 94121

Filed Feb. 6, 1975, Ser. No. 547,649

Int. Cl.[2] A61B *5/00*

U.S. Cl. 128—2 G **28 Claims**



1. A method of monitoring a concentration of a constituent of interest in tissue fluids or blood of a person, comprising the steps of:

removing a substantial amount of the person's stratum corneium skin layer over an area,

positioning a chamber over said area in a manner to permit gases or fluids escaping from the body through said area to enter the chamber,

sealing the chamber to the skin around said removed skin area in a gas and liquid tight manner, thereby to isolate the chamber and the removed skin area from surrounding atmosphere,

collecting in the chamber gases or fluids emitted from the removed skin area in the chamber for a time until the transfer of the constituent of interest between the chamber and the body of the person is in equilibrium,

passing a beam of electromagnetic energy above the skin through the collected gases or fluids within said chamber, said electromagnetic energy including certain wavelengths that are absorbed an amount proportional to the concentration of said constituent of interest in said chamber, and

measuring the energy absorption of said certain wavelengths of said electromagnetic beam passing through said chamber, whereby the absorption level is proportional to the concentration of a constituent of interest in the body of said person.

4,041,933

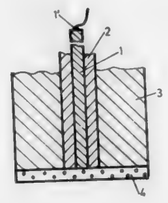
ELECTRODE FOR POLAROGRAPHIC MEASUREMENTS IN PHYSIOLOGICAL MEDIA

Helmut Reichenberger, Brand, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Apr. 11, 1975, Ser. No. 567,175

Int. Cl.[2] A61B *5/04*

U.S. Cl. 128—2 E **24 Claims**



1. In an electrode for polargraphic/measurements in physiological media, in particular an oxygen electrode for measuring the oxygen tension in the human or animal body, including a noble metal cathode and an insulating material sheathing said cathode, a connector for an electrical power supply, indicating and processing unit being provided at the distal end of said cathode, an oxygen-pervious conductive membrane covering the proximal end of said cathode, and said proximal end of the cathode being conductively connected to an anode through said physiological medium, the improvement comprising: said noble metal cathode having the form of a conductor cable piece including at least one noble metal wire embedded in said insulating material and extending therethrough so as to constitute a conductor wire; a further body-compatible insulating material sheathing said insulated noble metal cathode, said further insulating material including at least two foils, said noble metal cathode being embedded between said foils, said foils being intimately connectablewith each other through thermal welding and pressable into circular shape through thermoplastic deformation.

4,041,934

ARTERIAL BLOOD SAMPLING UNIT

Joseph Nicholas Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 2, 1976, Ser. No. 654,680

Int. Cl.[2] A61B *5/14*

U.S. Cl. 128—2 F **17 Claims**

1. A blood sampling unit comprising:

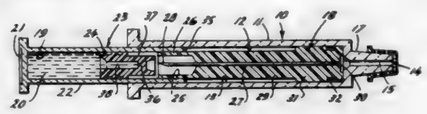
a barrel member defining a substantially tubular chamber having an internal wall section,

means defining a nozzle member communicating with said tubular chamber for attachment with a cap member in one instance and a needle in another instance,

a slidable member including a passage means in open communication with opposing ends of said slidable member, said slidable member having a closure piercing portion communicating with said passage means,

a sealing element operatively associated with said slidable member and disposed opposite said closure piercing portion, said sealing element constructed and arranged to engage the internal wall section of said barrel member,

said sealing element and said internal wall section engaged by said sealing element cooperating to provide a low friction sealing element,



said sealing element composed of a material having a coefficient of friction sufficient to permit said slidable member to be moved in said tubular chamber under the influence of arterial blood pressure,

a stoppered vial containing an anticoagulant material constructed and arranged to be accommodated within said tubular chamber of said barrel and engaged by said slidable member so that upon movement of said vial into said barrel said piercing portion of said slidable member will penetrate through said stopper of said vial and effect flow of anticoagulant material through said passage member and by means of further movement of said vial will effect placement of said anticoagulant material between said low friction sealing element and said nozzle member.

4,041,935

DEVICE FOR BREATHING MEASUREMENT

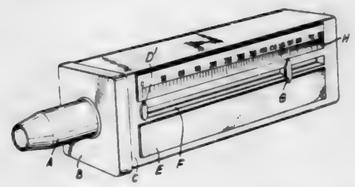
Dietmar Rudolf Garbe, Maids Moreton, England, assignor to Vitalograph (Ireland) Limited, Lifford Ennis, Ireland

Continuation of Ser. No. 556,014, March 6, 1975, abandoned. This application Sept. 16, 1976, Ser. No. 723,958

Claims priority, application United Kingdom, Mar. 7, 1974, 10194/74

Int. Cl.[2] A61B *5/08*

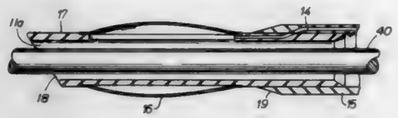
U.S. Cl. 128—2.08 **7 Claims**



1. A device for monitoring a patient's ability to exhale comprising a hollow body part, a piston member having first and second sides, said piston member being moveably mounted in said hollow body part, a mouthpiece mounted to said hollow body part and communicating with the interior of the hollow body part on the first side of the piston member for admitting exhaled air to said first side of the piston member, said piston member being moveable between a first position adjacent the point at which the mouthpiece is mounted to said hollow body part and a second position spaced from said point and determined by the patient's rate of exhalation into said mouthpiece, resilient loading means in the hollow body part and in contact with said piston member for opposing movement of the piston member in the hollow body part away from said mouthpiece

by pressure of exhaled air on said first side of the piston member, venting means in said hollow body part for permitting the discharge of part of the exhaled air from the interior of the hollow body part, said venting means being in communication with the interior of the hollow body part on the second side of said piston member when piston member is in said first position and venting the exhaled air to atmosphere only after the piston member passes said venting means as said piston member moves to said second position, said venting means comprising a plurality of individual vents, individual removable seals in said vents for controlling the amount of exhaled air permitted to be discharged from the hollow body part, the amount of exhaled air discharged from said hollow body part being increased by removal of one or more of said individual seals, and means for indicating the extent of travel of the piston member during an exhalation.

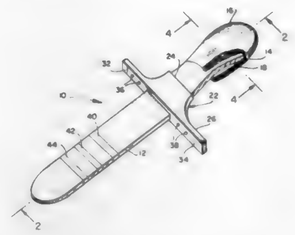
4,041,936
BRONCHOSCOPY TUBE
Edward Carden, Marina del Rey, Calif., assignor to Medical Engineering Corporation, Milwaukee, Wis.
Filed Apr. 23, 1975, Ser. No. 570,750
Int. Cl.[2] A61B *1/06, 17/24;* A61M *25/02*
U.S. Cl. 128—6 **8 Claims**



1. A tube for inserting a flexible, elongated, generally cylindrical, fiberoptic bronchoscope through the vocal cords in the larynx while maintaining adequate volumes of gas for ventilating the patient, said tube comprising:
- a tubular body of flexible material having first and second axially aligned sections with a central passage extending from a proximal to a distal end having received within each of said sections bronchoscope, said first section of said tubular body being immediately adjacent the distal end and having an external diameter sufficiently small to permit passage between the vocal cords of the patient and an internal diameter which maximizes clearance with the bronchoscope, said first section being sufficient in length to pass through the larynx into the trachea beyond, said distal end being shaped to provide a smooth tip for ease of insertion, said second section being adjacent said proximal end of said tube and having internal and external diameters greater than those of said first section and sufficiently large to pass gas volumes adequate to ventilate the patient with the bronchoscope in said central passage;
- an expandable, inflatable cuff located on said distal end of said first body section so as to be in the trachea below the larynx when the tube is in use;
- an axially extending inflation lumen disposed contiguous with said tubular body, said inflation lumen communicating with said cuff for permitting inflation of same; and
- an adaptor affixed to the proximal end of said tubular body and communicating with said central passage, said adaptor being provided with means for connection to ventilating gas supply means and an entry port for introducing the bronchoscope into said central passage, said port having means for forming a seal with the bronchoscope.

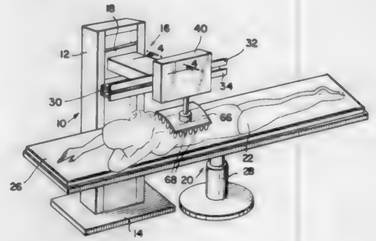
4,041,937
MEDICAL IMPLEMENT
Marcellina Diaz, 114-18 209th St., St. Albans, N.Y. 11411
Filed Aug. 23, 1976, Ser. No. 716,531
Int. Cl.[2] A61B *1/24*
U.S. Cl. 128—15 **10 Claims**

1. A medical implement in the form of a tongue blade suitable for use in rendering first aid assistance to seizure patients comprising a planar blade body having pressure pad means secured at one end thereof for contacting the patient's tongue to hold same firmly in place, mouthpiece means attached to the blade body being located for registration with the confronting



upper and lower teeth of the patient for providing protective cushioned tooth impact, said mouthpiece further having depth guide means extending transversely from the blade body for contacting the periphery of the mouth to prevent overinsertion of the tongue blade.

4,041,938
MASSAGE APPARATUS
Helen Wintoniw, Box 215, Keremeos, British Columbia, Canada
Filed July 8, 1976, Ser. No. 703,415
Int. Cl.[2] A61H *7/00*
U.S. Cl. 128—52 **6 Claims**

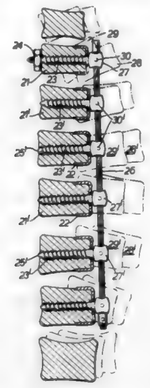


1. Massage apparatus comprising:
- a support;
- a housing mounted on said support;
- means for reciprocably driving said housing in a horizontal direction relative to said support;
- body massage means universally mounted on said housing; and
- means within said housing for reciprocably driving said body massage means in a vertical direction relative to said support.

4,041,939
SURGICAL IMPLANT SPINAL SCREW
John Emmett Hall, Boston, Mass., assignor to Downs Surgical Limited, Mitcham, England
Filed Apr. 26, 1976, Ser. No. 680,234
Claims priority, application United Kingdom, Apr. 28, 1975, 17612/75
Int. Cl.[2] A61F *5/00;* A61B *17/18*
U.S. Cl. 128—69 **10 Claims**

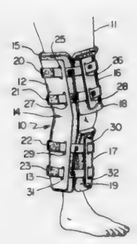
2. A surgical implant which comprises a metal spinal screw having a head provided with a hole through which a metal cable can be passed, the head being capable of being deformed to prevent movement of the cable within the hole, and a shank

having a relatively coarse self-tapping thread over a major portion of its length proximate said head and, on an end portion



remote from the head, a relatively fine nut-receiving thread of smaller external diameter.

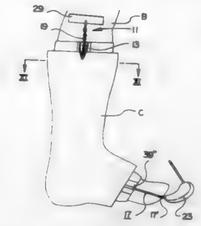
4,041,940
CONTOURED KNEE IMMOBILIZER
S. Arthur Frankel, 2 Poly Drive, Billings, Mont. 59101, and Glenn F. Cueman, R.D. 3, Lake Sharon, Warsaw, Ind. 46580
Filed Nov. 5, 1975, Ser. No. 629,192
Int. Cl.[2] A61F *3/00*
U.S. Cl. 128—80 C **4 Claims**



1. A contoured knee immobilizing device comprising
a unitary elongated substantially rigid shell in the form of a channel having a substantially U-shaped cross-section, said shell including
- an upper tapered portion to be fitted about the leg above the knee,
- a lower tapered portion to be fitted about the leg below the knee, and
- a midportion having a semi-circular dimension less than the adjacent portions of said upper and lower portions rigidly connecting said upper and lower portions with the axes of said upper and lower portions oriented at an obtuse angle of about 170°;

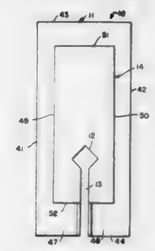
cushioning means carried within said shell to be disposed between the leg and said shell for cushioning the leg received by said shell;
a substantially rigid upper plate in the form of an inverted isosceles trapezoid with a curved recess at the bottom edge thereof adjacent said upper portion;
a substantially rigid lower plate in the form of an inverted isosceles trapezoid with a curved recess at the top edge thereof adjacent said lower portion;
foam pads coupled to said upper plate and said lower plate; and
straps coupled to said shell including a looped fabric located on one face of each strap and looped-fabric engaging hooks located on the same face of each strap for releasably coupling straps onto said upper and lower plates;
wherein said cushioning means and said foam pads are adapted to wholly encompass the human leg except for the patella.

4,041,941
MEANS FOR AND METHOD OF REMOVING A CAST
K. Dwight Driver, 5338 Patrick Henry, Bartlett, Tenn. 38134
Filed May 5, 1976, Ser. No. 683,315
Int. Cl.[2] A61F *15/02, 13/04*
U.S. Cl. 128—91 A **10 Claims**



1. Means for removing a cast from a body member, said means for removing a cast comprising a saw means for cutting through the cast, said saw means including a flexible elongated saw member having a first end and a second end, said saw member including a plurality of saw teeth provided only adjacent said second end thereof and being substantially smooth along its entire length except for said second end thereof, said saw means including a first handle member removably attached to said first end of said saw member and including a second handle member fixedly attached to said second end of said saw member.

4,041,942
SURGICAL DRAPE
Ramon C. Dougan, Schaumburg, Ill., and Helen T. Rudtke, Medford, N.Y., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed June 15, 1976, Ser. No. 696,385
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—132 D **25 Claims**

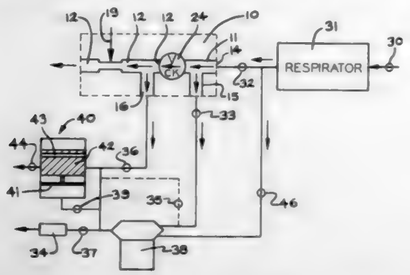


1. A surgical drape comprising a sterile sheet of non-woven cellulosic material, a generally diamond-shaped opening in said sheet and a slot extending from a corner of said opening to an edge of said sheet.

4,041,943
CONTROL APPARATUS FOR VARIABLE REGULATION OF LUNG INFLATION HOLD TIME
Bruce B. Miller, 714 Ashley Drive, Kalamazoo, Mich. 49001
Filed Aug. 25, 1975, Ser. No. 607,103
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **4 Claims**

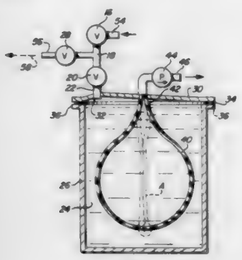
1. In a system used for intermittent positive pressure lung

treatment including a gas source, a first gas line, a breathing element for providing the gas to the lungs of a patient upon inspiration, respirator means providing an intermittent positive pressure from said source to said breathing element via said first gas line, a second gas line and a normally closed pressure sensitive exhaust valve means for allowing elimination of the gas upon expiration from the lungs including a valve element connected to the breathing element and a control chamber connected to the respirator via said second gas line, said valve element being responsive to a pressure within said control chamber whereby said exhaust valve element is opened at a predetermined pressure limit established in said control chamber when the pressure is released therefrom, the improvement



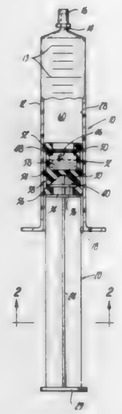
comprising a housing having a passageway therethrough, a one way check valve mounted in said passageway, said passageway being connected into said second gas line so as to have an upstream side connected to the respirator and a downstream side connected to the respirator and a downstream side connected to the exhaust valve control chamber, a vent connected to said passageway on the downstream side of said check valve and having a variable constriction for controlling gas flow out the vent, thereby relieving the pressure in said exhaust valve control chamber to establish said predetermined pressure limit at which said exhaust valve element opens, whereby there is a delay in the opening of the exhaust valve causing gas to be held in the lungs for a period of time.

4,041,944
BODY FLUID TRANSFUSION AND DISPLACEMENT APPARATUS AND METHOD
William A. Rhodes, 4421 N. 13th Place, Phoenix, Ariz. 85014
Filed July 21, 1975, Ser. No. 597,501
Int. Cl.[2] A61M *1/02, 5/14*
U.S. Cl. 128—214 B **5 Claims**



1. A means for displacing and transfusing body fluids relative to a patient comprising: a substantially rigid container; a distensible and collapsible container disposed in said substantially rigid container; a first fluid conduit communicating with the interior of said substantially rigid container; a second fluid conduit communicating with the interior of said distensible and collapsible container; first and second hollow needles adapted to be inserted into a patient's blood vessels; said first and second needles being coupled to and in communication with respective ones of said conduits and the interior of said first and second fluid containers respectively; and reversible means communicating with one of said conduits and adapted to move fluid into and out of a respective one of said containers; said pump communicating with said second fluid conduit; valve means disposed and adapted for purging air bubbles out of said substantially rigid container; said valve means comprises three valves; the first one of said valves communicating directly with the interior of said substantially rigid container; a second valve communicating with said first valve; said second valve communicating with said first fluid conduit; and a third valve communicating between said first and second valve for venting bubbles or the like.

4,041,945
MIXING SYRINGE
Aeneas C. Guiney, 2855 Silverhill, Pontiac, Mich. 48055
Filed June 7, 1976, Ser. No. 693,423
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 M **6 Claims**



1. A syringe assembly for storing two materials separately in readiness for mixing together and for injection as a liquid at the time of use, the combination of; a tubular cylinder, a needle adapter formed by one end of said cylinder for communication with the interior of said cylinder and being adapted to receive a hypodermic needle, a plunger slidably disposed in said cylinder and projecting from an open end thereof, said plunger forming a first chamber therein, a movable wall member forming part of said plunger and a wall of said first chamber, a second chamber formed in said cylinder between said plunger and said needle adapter, said second chamber being adapted to contain one of the materials to be mixed and said first chamber containing the other of said materials, said plunger having a head portion forming said first chamber, said movable wall member being relatively rigid and having a peripheral edge portion normally seated in sealing engagement with said head portion to separate said first and second chambers from each other, and means to displace said wall and open said chambers to each other for mixing said materials, said plunger being movable towards said needle adapter to displace said mixed materials from said cylinder.

4,041,946
MEDICATED MEMBER FOR PIERCED EARS
William R. Barton, 940 Catherine St., Green Bay, Wis. 54301
Filed Aug. 28, 1975, Ser. No. 608,776
Int. Cl.[2] A61M *7/00*; A61J *1/00*
U.S. Cl. 128—260 **8 Claims**

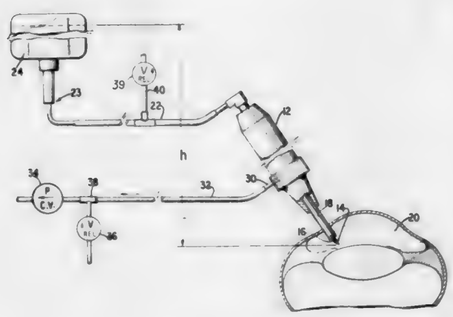
1. A medicated unit especially adapted for use in connection with a pierced earlobe, a means for providing a continuously

available supply of medicament to said earlobe comprising an elongated absorbent flexible member of substantially uniform circular cross-section and having a length that is substantially greater than the average thickness of said earlobe, said absorbent flexible member having two distal end portions, a first end portion including a jacket portion that defines a sleeve for receiving said distal end and terminating in a generally rounded head section, said head section communicating with said sleeve by a second member having a reduced diameter relative to said sleeve and head section, said second distal end



portion including a second exposed sleeve open at one end defining a mouth adapted to receive said head section and when said ends are joined said elongated absorbent flexible member is shaped to form a continuous loop, said member containing an effective amount of a suitable medicament distributed throughout the length thereof whereby when said medicated elongated absorbent flexible member length engages and passes through said pierced earlobe during normal use and is joined to said second sleeve said medicated member is in continuous movable dispensing contact with and through said pierced earlobe.

4,041,947
FLOW CONTROL SYSTEM
Steven N. Weiss, New York, and Alan Broadwin, Brooklyn, both of N.Y., assignors to Cavitron Corporation, New York, N.Y.
Division of Ser. No. 437,165, Jan. 28, 1974, Pat. No. 3,902,495.
This application June 23, 1975, Ser. No. 589,484
Int. Cl.[2] A61M *1/00*; G05D *11/11*
U.S. Cl. 128—276 **5 Claims**



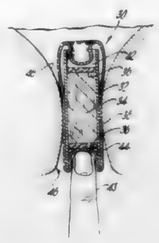
1. A fluidic flow system for use in irrigation of a small elastic pressure responsive chamber, said chamber having an opening therein for fluid communication with said chamber, said flow system comprising

an irrigation fluid source at a preselected pressure of from about 10 to 100 mm Hg,

fluid inflow means connected to said fluid source and suitable for fluid communication with said chamber through said opening, said fluid inflow means having a flow resistivity of from about 0.42 to 18.5 mm Hg per ml fluid per min so that the flow of the fluid from said source into said chamber is limited to a maximum predetermined flow rate, and

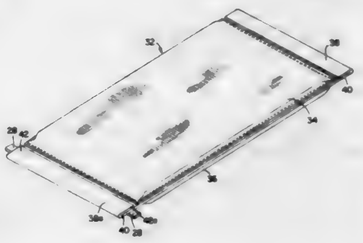
pressure limiting means in fluid communication with said fluid inflow means intermediate said chamber and said fluid source, said pressure limiting means operative in response to a predetermined pressure of being about 10 and 100 mm Hg in said fluid inflow means to limit in cooperation with said flow resistivity the pressure of the fluid intended for inflow to said chamber to said predetermined pressure.

4,041,948
DIGITAL TAMPON
Eric Flam, East Brunswick, and Doris Phyliss Partyka, Milltown, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.
Filed July 26, 1976, Ser. No. 708,507
Int. Cl.[2] A61F *13/20*
U.S. Cl. 128—285 **8 Claims**



1. In a catamenial tampon of the type comprising a generally cylindrical absorbent body and adapted for digital insertion, the improvement which comprises: providing therein an at least partially absorbent rigidifying element extending longitudinally and disposed centrally with respect to the axis of said tampon; said element consisting of a material having a dry resistance to compression sufficient to allow insertion and a wet resistance to compression less than the dry resistance and sufficiently low enough to allow said tampon to expand and be comfortable in use.

4,041,949
FLEXIBLE WAISTBAND DIAPER
Theodore Frederick Kozak, Manchester, Conn., assignor to Union Carbide Corporation, New York, N.Y.
Filed July 2, 1976, Ser. No. 702,211
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 **18 Claims**



1. A disposable diaper having a stretchable waistband comprising in combination a topsheet for placement adjacent to the body and being provided with means for passing liquid therethrough, a water impermeable backsheet and an absorbent pad disposed between said topsheet and backsheet, one of said topsheet or backsheet being fabricated from a water impermeable stretchable plastic film having a Young's Modulus of less than 5000 lbs/in^2 and which exhibits recovery characteristics such that at up to 20% elongation it will recover about 99%

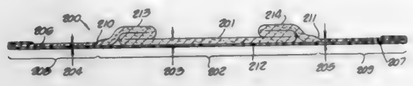
and from 20 to 50% elongation it will recover from 99 to 90%, respectively, and still maintain a force of 0.05 lbs, means for providing an expansible waist portion for the diaper comprising said stretchable plastic film having end portions extending beyond the longitudinal end of said absorbent pad, each end portion being folded upon itself and adhered to itself to form a stretchable waistband for the diaper, and a pair of laterally and oppositely extending fastening means disposed on said waistband for securing said diaper on an infant.

4,041,950

FLUFFED PULP URINE TRAP DIAPER

John Leslie Jones, Sr., 1070 Glen Oaks Blvd., Pasadena, Calif. 91105

Filed July 23, 1976, Ser. No. 706,762
Int. Cl.[2] A61F *13/16, 13/18*
U.S. Cl. 128—287 **12 Claims**



1. An infant diaper having a rectangular absorbent pad area formed of fluffed wood pulp and absorbent cellulose sheeting, aforesaid pad area having a pair of longitudinal pad margins oppositely disposed to each other, a central longitudinal pad axis, and a total pad width axis normal to said longitudinal pad axis, wherein the improvement combination comprises:

a pair of absorbent border pad areas and one central pad area together in combination form the aforesaid absorbent pad area, each one of said border pad areas having one longitudinal boundary margin adjacently coextensive with one central pad area longitudinal boundary margin, each one of said pair of border pad areas and said central pad area having a discrete weight concentration of fluffed cellulose pulp and cellulose sheeting per unit of each pad area;

a pair of narrow width pad pleats disposed parallel along the full longitudinal pad axis length, each one of said pair of pad pleats formed of said central pad area and disposed on the first face of said pad area adjacent to the longitudinal boundary margin of said central pad area, a major proportion of the central pad width being free of coverage by said pair of narrow pleats, the total absorbent pad width axis value having the value of the second face width of said absorbent pad area, excluding the side width values of the pair of narrow width pleat sides, said pair of pleats and the spaced pad area between said pleats together providing an excreta channel pad area; and,

a thin, flexible, fluid impermeable membrane disposed adjacently co-extensive with said second face of said absorbent pad area, said membrane also forming each one of a pair of opposed longitudinal border seals disposed on said pair of longitudinal diaper pad margins.

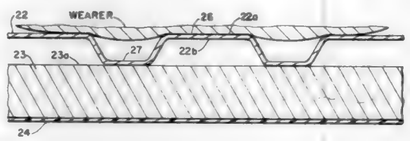
4,041,951

ABSORPTIVE STRUCTURE HAVING IMPROVED SURFACE DRYNESS AND IMPROVED RESISTANCE TO REWETTING IN-USE

Lawrence H. Sanford, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 2, 1976, Ser. No. 663,022
Int. Cl.[2] A61F *13/16*
U.S. Cl. 128—287 **12 Claims**

1. In a disposable diaper having a substantially planar, moisture absorbent layer disposed between a soft and bulky, wearer-contacting, topsheet which is uniformly moisture-pervious along its entire surface and a moisture-resistant backing sheet, the improvement wherein said uniformly moisture-pervious topsheet comprises a wet resilient, integral structure containing a multiplicity of upwardly open depressed areas which intimately contact the uppermost surface of said substantially planar, moisture absorbent layer in-use, non-depressed areas, surrounding said depressed areas and contacting the wearer's skin in-use, said depressed and said non-depressed areas being of substantially uniform density throughout, said non-



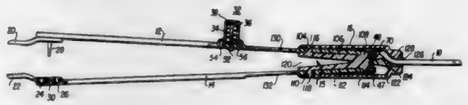
depressed areas tending to isolate the wearer's skin from moisture contained within said moisture-absorbent layer in-use, thereby providing improved surface dryness and improved resistance to rewetting.

4,041,952

ELECTROSURGICAL FORCEPS

Charles F. Morrison, Jr., Boulder, and Alan Z. Puszman, Lyons, both of Colo., assignors to Valleylab, Inc., Boulder, Colo.

Filed Mar. 4, 1976, Ser. No. 664,061
Int. Cl.[2] A61B *17/36*; A61N *3/06*
U.S. Cl. 128—303.13 **13 Claims**



1. An electrosurgical forceps comprising:

a first tine having a distal end and a proximal end;

a second tine having a distal end and a proximal end, said first and second tines being flexibly mounted with respect to each other with said distal ends being adjacent one another;

switching means mounted on only one of said tines, said switching means being manually operable to effect the closure thereof and comprising a first conductive member mounted with respect to and extending substantially perpendicularly from said one tine and a second conductive member comprising a flexible member concentrically disposed about and spaced from said first member and mounted with respect to said one tine so that said switching means may be manually closed by applying pressure to said flexible member until it engages said first member;

first and second electrically conductive contacts mounted on said one tine respectively contacting said first member and said flexible member of the switching means, said contacts being adapted for connection to an electrosurgical energy source; and

means disposed on said distal ends of said tines for applying said electrosurgical energy to a patient through said contacts upon closure of said switching means.

4,041,953

CARDIAC PACER CIRCUIT

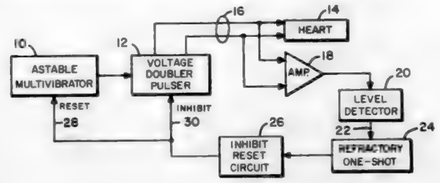
Jon A. Anderson, Marine-on-the-St. Croix, and Richard W. Kramp, Bloomington, both of Minn., assignors to Cardiac Pacemakers, Inc., St. Paul, Minn.

Continuation of Ser. No. 515,463, Oct. 17, 1974, abandoned, which is a continuation-in-part of Ser. No. 460,585, April 12, 1974, abandoned. This application Apr. 16, 1976, Ser. No. 677,735
Int. Cl.[2] A61B *1/36*
U.S. Cl. 128—419 PG **4 Claims**

1. A cardiac pacer circuit of the type including a pulse generator for producing electrical pacer pulses at a fixed rate and duration, electrode means coupled to the output of said pulse generator for applying said pulses to the heart of a patient and for picking up bipolar depolarization signals from said heart upon the normal beating action thereof and first inhibiting means responsive to said depolarization signals for inhibiting the output of said pulse generator upon the occurrence of said depolarization signals, the improvement comprising:

a. difference amplifier means coupled to said electrode means for amplifying said bipolar depolarization signals;

b. a bandpass filter network connected to the output of said



difference amplifier means for attenuating the frequency components of the amplifier output signals above and below a predetermined frequency band;

c. converter means connected to receive the output from said bandpass filter network for converting said bipolar signals to unipolar triggering pulses when the bipolar signals from said filter means exceed a predetermined amplitude; and

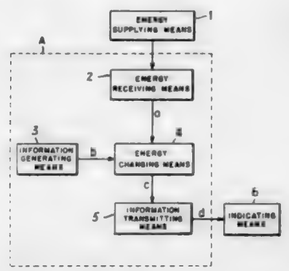
d. means for applying said triggering pulses to said inhibiting means.

4,041,954

SYSTEM FOR DETECTING INFORMATION IN AN ARTIFICIAL CARDIAC PACEMAKER

Yuichi Ohara, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed May 7, 1975, Ser. No. 575,129
Claims priority, application Japan, May 7, 1974, 49-50409; May 8, 1974, 49-50831; May 14, 1974, 49-53542
Int. Cl.[2] A61B *5/00*
U.S. Cl. 128—419 PT **22 Claims**



1. A system for detecting information about the e.m.f. of series-connected batteries in an artificial cardiac pacemaker comprising: energy supplying means for supplying energy to the artificial cardiac pacemaker from the outside; energy receiving means in the pacemaker for receiving said energy; information generating means for generating an information signal representative of the e.m.f. of the batteries in the pacemaker including a plurality of transistors each of which is connected to one of said batteries such that each transistor changes from one state to the other state when the e.m.f. of the corresponding battery becomes less than a predetermined value; energy changing means receptive of the energy passing through said energy receiving means for changing the energy into an information energy signal according to said information signal; transmitting means for transmitting said information energy signal to the outside of the pacemaker; and indicating means for indicating the information in the pacemaker according to said information energy signal.

4,041,955

IMPLANTABLE LIVING TISSUE STIMULATOR WITH AN IMPROVED HERMETIC METAL CONTAINER

Frank L. Kelly, Granada Hills, and Jozef I. Kie Sioe Tan, Sylmar, both of Calif., assignors to Pacesetter Systems Inc., Sylmar, Calif.

Filed Jan. 29, 1976, Ser. No. 653,464
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 P **15 Claims**

1. In an implantable living tissue stimulator of the type including a plurality of circuit means, the improvement comprising:

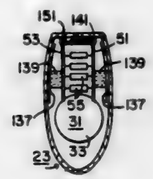
hermetic means for hermetically sealing at least some of said circuit means, said hermetic means comprising a hermetic container formed of a thin layer of metal of a thickness definable as T, said metal being characterized by an electrical resistivity definable as ρ, where $T/\rho < 0.03$, T being in mils and ρ in microhm-cm, said metal layer being impervious to body saline fluid and gases.

4,041,956

PACEMAKERS OF LOW WEIGHT AND METHOD OF MAKING SUCH PACEMAKERS

David L. Purdy, Indiana; Vernon L. Speicher, Leechburg; Frederick J. Shipko, Spring Church, and William L. Johnson, Kittanning, all of Pa., assignors to Coratomic, Inc., South Indiana, Pa.

Filed Feb. 17, 1976, Ser. No. 658,737
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 P **23 Claims**



1. The method of making a pacemaker of parts including a primary power source, an electrical converter, and open complementary sections of a container whose openings are bounded by substantially congruent rims, the said method comprising, engaging said source and converter to form a subassembly, prepotting said subassembly to provide a body of dimensions such that it nests in one of said sections, said prepotted body having opening means permitting injection of additional potting material on at least one wall thereof, nesting said body in said one section, joining said one section and said other complementary section along said congruent rims to form said container, and injecting potting material through said opening means to substantially fill the space between said one wall and said section.

6. The method of claim 1 wherein the sections of the container are so formed as to provide a hole therein through which conductor means to be connected to a catheter are brought out and wherein the additional prepotting material is injected by means inserted into the openings in the prepotted body through said hole.

4,041,957

SLENDERIZING LADIES' ROLL-ON BELT OF IMPROVED COMFORT

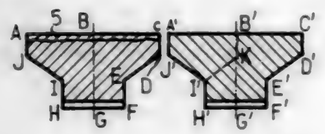
Guy Dubois, Avenue Lorette 9, Ohain, Belgium

Filed Dec. 3, 1975, Ser. No. 637,191

Claims priority, application Belgium, Dec. 10, 1974, 151341; June 12, 1975, 157275

Int. Cl.[2] A41C *1/00*

U.S. Cl. 128—540 **5 Claims**



1. A slenderizing and comfort-improving elastic underwear garment, comprising two assembled component panels of like shape made of elastic fabric having parallel resilient fibres defining lines of force, each panel having a longitudinal axis and being of a shape consisting of first and second substantially rectangular portions of different sizes interconnected by an intermediate trapezoidal portion, the first rectangular portion being of greater size than the second rectangular portion, said lines of force of the elastic fabric extending in each panel obliquely with respect to the longitudinal axis thereof, said panels being partially superposed in said garment and forming overlapping portions in which longitudinal edges of the first rectangular portion of each of said panels are assembled onto the other of said panels along the longitudinal axis thereof, said lines of force of said panels being crossed in said overlapping portions.

4,041,958

APPARATUS FOR PRODUCING A CONTINUOUS TOBACCO STREAM

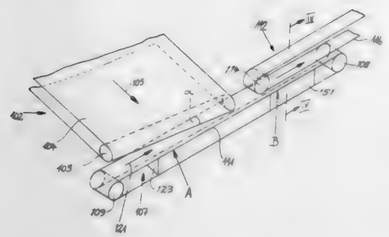
Günter Wahle, Reinbek; Dieter Ludszewelt, Hamburg; Jürgen Gömann, Dassendorf, and Horst Zessin, Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Feb. 6, 1975, Ser. No. 547,447

Claims priority, application Germany, Mar. 2, 1974, 2410168

Int. Cl.[2] A24B *3/00*; A24C *5/00*

U.S. Cl. 131—84 B **10 Claims**



1. Apparatus for converting a wide carpet of tobacco particles into a narrow stream, comprising a first conveyor having means for transporting said carpet in a first direction along a first path; a second conveyor having a first foraminous belt for transporting said stream along a second path which is spaced apart from said first path and a first suction chamber adjacent to said second path, said belt being located between said suction chamber and said second path; an intermediate conveyor having a second foraminous belt defining a third path extending between said first and second paths, means for moving said second belt in a second direction from said first path toward said second path and a second suction chamber adjacent to said third path, said second belt being located between said second chamber and said third path, the width of said second belt exceeding the width of said first belt and said first and third paths being inclined with respect to each other so that said first and second directions make an oblique angle; means for evacuating air from said second chamber to thereby transfer the particles of said carpet into said third path along a zone having a length exceeding the width of said second belt due to the inclination of said first and third paths with respect to each other, the thus transferred particles forming on said second belt a layer which advances along said third path toward said second path; and means for evacuating air from said first chamber to thereby transfer the particles of said layer from said third path into said second path with attendant conversion of said layer into said stream.

4,041,959

BRAID FORMING METHOD AND APPARATUS

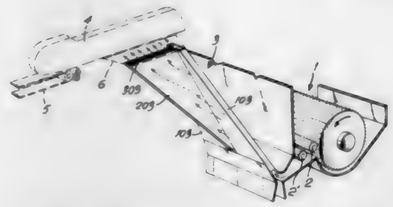
Franco Garrone, Bologna, Italy, assignor to AMF Incorporated, White Plains, N.Y.

Filed Sept. 8, 1976, Ser. No. 721,264

Claims priority, application Italy, Oct. 8, 1975, 12825/75

Int. Cl.[2] A24C *5/18*

U.S. Cl. 131—84 B **9 Claims**



1. Apparatus for forming a continuous cut tobacco braid in a cigarette maker, comprising

a substantially vertical T-shaped duct means with smooth walls having a longitudinally disposed leg and a pair of arms extending laterally from the root of said leg,

said duct means having an inlet at one end for receiving cut tobacco from a carding unit and an oulet at the other end for discharging cut tobacco to an endless belt type braid forming tape,

said inlet and outlet having generally the same geometrical shape and being disposed orthogonal to each other,

said arms being symmetrical to one another and tapered from said inlet to said outlet,

said leg being tapered from said outlet to said inlet,

and means at one end of said duct means for creating an air flow conveying cut tobacco from said inlet to said outlet.

4,041,960

LIQUID FILTERED SMOKING DEVICE

Richard W. Kahler, Rte. 1, Box 61, Rock Cave, W. Va. 26234

Filed Aug. 4, 1975, Ser. No. 601,826

Int. Cl.[2] A24F *1/30*

U.S. Cl. 131—173 **10 Claims**

1. A liquid filter smoking device, comprising:

a container having an opening at one end thereof and having a liquid filtering medium therein;

a hollow tube open at both ends, one of said ends being inserted into said container and immersed within said liquid filtering medium while the other end projects outwardly of said container;

a smoking bowl having one end disposed upon said other end of said hollow tube, for retaining smoking tobacco therewithin and for permitting smoke to pass therefrom into said tube;

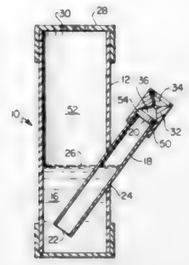
filter means disposed within said bowl for retaining ash and tobacco material within said smoking bowl; and

said filter means comprises:

an annular ring member;

a radially inwardly-projecting annular ring portion integrally connected to the bottom of said ring member; and

a disc-type filter medium having a diametrical extent, small enough so as to permit said filter medium to be disposed within said ring member and large enough so as to permit said filter medium to rest upon, and be supported by, said ring portion,



whereby smoke is permitted to pass from said smoking bowl into said tube, and liquid filtering medium, said container and out of said opening, while said ash and tobacco material is prevented from passing into said tube and liquid filtering medium.

4,041,961

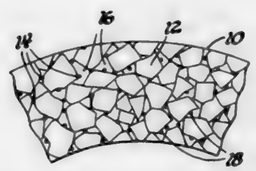
HAIR CURLER WITH SINTERED DESICCANT BODY

Amos J. Shaler, 705 W. Park Ave., State College, Pa. 16801, and Daniel C. McLean, 4029 Alicante, Fort Worth, Tex. 76133

Filed Feb. 9, 1976, Ser. No. 656,549

Int. Cl.[2] A45D *2/00*

U.S. Cl. 132—40 **9 Claims**



1. A hair treating device adapted to receive a hank of hair, said device including a porous body comprised of an array of granules of desiccant and particles of an organic polymeric binder attached to said granules with certain of said particles bridging between contiguous granules and bonding therebetween at discrete regions throughout the body to form a self-sustaining body, said particles of binder having a smaller size than the desiccant granules, said granules defining interstices which open into each other between said bonded regions for admission of water vapor to the surface of granules in the interior of said porous body, and a cover disposed over the exterior of said porous body, said cover being permeable to water vapor.

4,041,962

IMPLEMENT TO FACILITATE REMOVING BACTERIAL COATING FROM THE INTERSTITIAL AREAS OF ADJACENT TEETH AND CLEANING THE CREVICES THEREBETWEEN

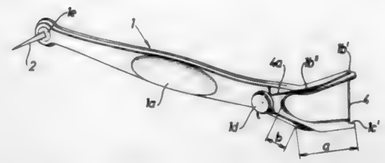
Erik Gunnar Johansson, Sagverksgatan 40, 122 41 Enskede; Bengt Ture Hubertus Blomberg, Artillerigatan 48 nb, 114 45 Stockholm, and Bernt Holger Elmquist, Fribovagen 2 E, 151 44 Sodertalje, all of Sweden

Filed Feb. 26, 1975, Ser. No. 553,419

Claims priority, application Sweden, Feb. 27, 1974, 7402562; Feb. 27, 1974, 7402563

Int. Cl.[2] A61C *15/00*

U.S. Cl. 132—91 **7 Claims**



1. A tooth cleaning instrument for manual use in removing bacterial coating (plaque) from the interstitial surfaces of adjacent teeth and in cleaning the crevices therebetween, comprising:

an elongate handle with opposite ends arranged for supporting different interstitial cleaning devices, said handle being configured for firm holding by the whole hand of the user outside of the month and for easily swinging either end portion into the mouth and into adjacency with the teeth;

a pair of springy tines extending from one said end of the handle, said tines having fixed end portions coplanar with said handle and extending divergently from the end of said handle, said tines being bent intermediate the ends thereof into a common plane angled from the plane of the handle by an angle of about 5° to 90°, said tines having free ends for support of a dental floss in tension therebetween;

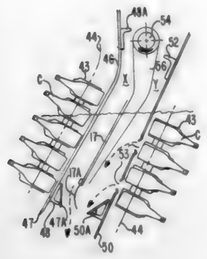
a fastening device on said handle adjacent said tines for holding opposite end portions of said dental floss;

an elongate and triangular cross-section toothpick having woodlike tooth cleaning surfaces;

means for supporting said toothpick for rotation and limited off-perpendicular movement with respect to said handle and locating a transverse hole at the other end of said handle, said toothpick being frictionally and removably engaged in said hole substantially at right angles to the plane of said handle;

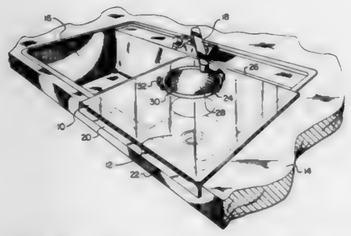
said handle being flat and platelike with a shallow, rounded thumb recess intermediate its ends, said thumb recess and fastening device being on one side of said handle and spaced longitudinally apart and said tines extending away from the opposite side of said handle, said means rotatably supporting said toothpick including an aperture in said other handle end and a bushing member rotatably mounted in said aperture, said bushing member having said pick hole extending therethrough so as to enable at least circumferential self-orientation of the triangular cross-section pick on contact thereof with teeth without need for reorientation of the handle, said divergent bent tines and said one handle end cooperatively forming a cradle of sufficient width for insertion of a finger of the user, said cradle and recess assisting reliable gripping of said handle by the hand of the user for cleaning guidance of said toothpick, said tines carrying substantially helically disposed tracks each defined by a pair of raised ridges separated by a floss groove, which tracks extend divergently along said one side of said tines to the bend zones thereof and terminate in the oppositely facing outboard edges of said tines short of the free ends of said tines, so as to direct floss from said fastening means to the free ends of tines and also reinforce each said tine in its own plane.

4,041,963
CONTAINER WASHER APPARATUS
Momir Babunovic, Des Peres, Mo., assignor to Barry-Wehmiller Company, St. Louis, Mo.
Filed July 30, 1976, Ser. No. 710,166
Int. Cl.[2] B08B *3/04*
U.S. Cl. 134—104 **12 Claims**



1. In apparatus for washing containers and removing labels therefrom, comprising: a washing tank containing washing solution; container conveyor means directed through said tank in a path having down and up passes joined in a looped pass spaced above the tank bottom, said conveyor means having container pockets open at opposite ends with the pockets aligned in rows transversely of the direction of travel along said path; fixed retainer means following the path of travel of said conveyor in position to retain the containers in the pockets; washing solution agitator means operably mounted adjacent said tank and extending downwardly into the washing solution in the upper zone thereof, said agitator means being movable alternately back and forth between said retainer means to establish flow of washing solution over the containers and through the container pockets; and washing solution flow control means cooperating with said agitator means and being located in position to force the washing solution to flow downwardly in said tank toward said looped pass of said conveyor means, whereby said flow of washing solution over the containers and through said pockets follows the alternate movement of said agitator means away from said container retainer means to effect label removal inwardly between said down and up passes of said conveyor means.

4,041,964
KITCHEN CUTTINGBOARD
Ellis Shamoon, 3618 Gillespie, Suite 109, Dallas, Tex. 75219
Filed June 21, 1976, Ser. No. 697,833
Int. Cl.[2] B08B *3/02*
U.S. Cl. 134—115 R **10 Claims**



1. A cuttingboard for use in kitchens in the preparation of foods, which cuttingboard is adapted for secured positioning by a person over a kitchen sink and countertop area beneath the arcuate path of rotation of a sink faucet, said cuttingboard comprising:
- a planar cutting surface adapted for generally horizontal positioning over a kitchen sink and having an aperture formed therein for open-ended communication with the sink area therebelow;
- a frontal flange depending from the front edge of said cutting surface and generally perpendicular thereto for abutting engagement against the kitchen sink countertop area with a person leaning thereagainst for stabilized positioning thereon;
- said cutting surface and frontal flange being adapted for positioning over the sink with said aperture disposed immediately under a portion of the arcuate path of rotation of the sink faucet; and
- a removable basket adapted for secured positioning in said aperture and beneath the sink faucet for holding foods prepared on said cutting surface for the washing thereof.

4,041,965
POOL CLEANING DEVICE
Jeffrey P. Rosenberg, 1270 Stillwater Drive, Miami Beach, Fla. 33141
Filed Oct. 16, 1975, Ser. No. 622,899
Int. Cl.[2] B08B *3/02, 9/08*
U.S. Cl. 134—167 R **9 Claims**

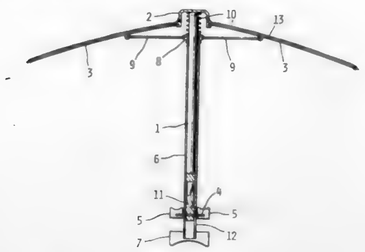


1. A pool cleaning device comprising:
- a debris receptacle trap having an upper end, a lower end and an axially extending side wall,
- said side wall including a truncated cone-shaped ramp-type deflector surface extending from said lower end upwardly and inwardly toward said upper end and toward a plurality of outwardly facing mouths in the wall to direct a flow of water and debris toward the device into the receptacle trap,
- a radially extending tubular arm,
- means rotatably connecting the arm to the housing for rotation with respect to the axis of the housing,
- means to connect the column of said arm in fluid communication with a source of water, and
- a water jet assembly supported distally on the tubular arm radially spaced outwardly from the housing and having
- a radially inwardly facing opening to direct water flow toward the housing, and
- a generally tangentially facing opening to cause the arm to turn about the axis of the receptacle trap.

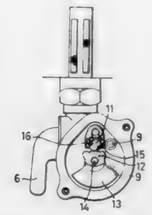
4,041,966
ONE HAND OPERATED UMBRELLA CAPABLE OF SELF-OPENING
Seiya Sakurai, 210 - 17th Ave., South, Seattle, Wash. 98144
Filed June 25, 1976, Ser. No. 700,059
Int. Cl.[2] A45B *25/16*
U.S. Cl. 135—22 **1 Claim**

1. A one hand operated umbrella comprising: an inner shaft, an upper hub member secured to the top of the inner shaft, a plurality of ribs each supporting an umbrella cloth and pivotally engaged at one end to the circumference of the upper hub member, a pin through and secured to the lower end of the inner shaft, two symmetrical upper handle grips securely attached to the pin, a tubular outer shaft concentrically and slidably mounted on the inner shaft and having at lower end dual longitudinal slots for the pin protrusions, a lower handle grip secured to the bottom of the tubular outer shaft, a lower hub member secured to the top of the tubular outer shaft, a plurality of rib-supporting spokes each pivotally engaged at one end of the lower hub member and at the other end to the intermediate portion of the ribs, a compression spring means

mounted on the inner shaft between the upper hub member and the lower hub member and forcing the pin in the inner shaft against the top portions of the dual longitudinal slots in the tubular outer shaft, thereby stabilizing the umbrella in open configuration, and when the upper handle grips are squeezed down against the force of the compression spring means to contact the lower handle grip to create simultaneously to the ribs inward and downward moments caused by radially differential inside support pivots on the ribs and the rib-supporting spokes moving in different paths to close the umbrella, a latch means provided in the lower portion of the inner shaft protrudes out and prevents the inner shaft from moving up thus retains the umbrella in closed configuration, whereby, upon pressing and releasing the latch means, the inner shaft is caused to move upward by the compression spring means and creating outward moment of the ribs, thereby automatically opening the umbrella.

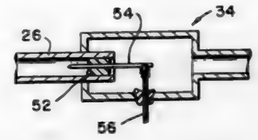


4,041,967
APPARATUS FOR PREVENTING FUEL FROM LEAKING ON TURNOVER OF A VEHICLE
Tsuneo Tsukisaka, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed May 10, 1976, Ser. No. 685,047
Claims priority, application Japan, May 14, 1975, 50-56022
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—39 **3 Claims**



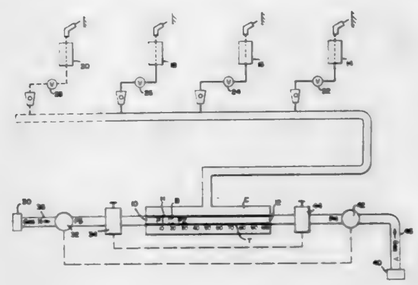
1. An apparatus for preventing fuel from leaking on accidental turnover of a vehicle, the latter having a fuel tank, a carburetor, and a passage communicating said tank with said carburetor; the apparatus comprising an ordinarily open safety valve such as a ball valve interposed in said passage, so arranged that, on the turnover of the vehicle, a pendulum-type weight detects the inclination of the vehicle, operating a cam to automatically close said safety valve; a manually operable fuel cock interposed in said passage, and a housing for said valve integrally formed therewith on one side thereof.

4,041,968
QUICK COOLING CRYOSTAT VALVE
J. Stanley Buller, Santa Barbara, Calif., assignor to Santa Barbara Research Center, Goleta, Calif.
Division of Ser. No. 532,355, Dec. 13, 1974, Pat. No. 3,952,543.
This application Feb. 2, 1976, Ser. No. 654,421
Int. Cl.[2] B67B *7/00*
U.S. Cl. 137—74 **2 Claims**



1. A valve for the control of cryogenic refrigerant flow, said valve comprising:
- a metallic tube for connection to a source of refrigerant gas under pressure and electrically connectable to one potential;
- a metallic wire positioned within said tube and spaced from the walls of said tube and electrically connectable to another potential;
- an electrically conductive fusible sealant plug annularly positioned around said wire and in said tube and sealed to both said wire and said tube to prevent the flow or refrigerant gas through said tube, said plug being of such material that it is thermally degraded when an electrical pulse is applied between said wire and said tube by electric current flowing through said plug material to heat the material to degradation so that upon degradation of the plug pressurized refrigerant gas can flow through said tube.

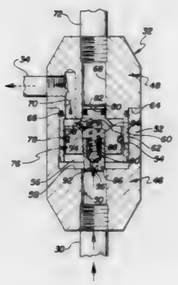
4,041,969
APPARATUS FOR CONTROLLING THE VOLUMETRIC RATIO BETWEEN MIXED GASES
Byron Hillen Acomb, and Roger Joseph Dolida, both of Florence, S.C., assignors to Union Carbide Corporation, New York, N.Y.
Filed Apr. 8, 1975, Ser. No. 566,135
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—88 **1 Claim**



1. Apparatus for adjustably controlling the volumetric ratio between two or more gases independent of the total mixed flow rate comprising:
- an elongated hollow porous tube;
- a ball freely moveable within said porous tube between the opposite ends of said tube respectively;
- a source of a first gas;
- means for supplying said first gas to one end of said tube;
- means for regulating the delivery pressure of said first gas at a predetermined location with respect to said one end of the tube;

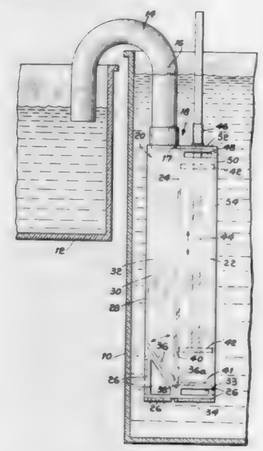
a source of a second gas;
means for supplying said second gas to the opposite end of the tube;
means for regulating the delivery pressure of said second gas at the regulated delivery pressure of said first gas and at a location with respect to the opposite end of the tube such that the pressure differential between the regulated pressure of each gas and the pressure on each side of the ball is maintained essentially equal for a predetermined ball location along the length of said tube;
a first adjustable valve for controllably restricting the flow of said first gas;
a second adjustable valve for controllably restricting the flow of said second gas, said first and second adjustable valves being coupled together for common adjustment so as to establish an inverse flow relationship between said first and second gases;
a chamber surrounding said porous tube for receiving and mixing the gas flow from said tube and having an output for delivering the mixed gases; and
means connected to the output of said chamber for adjusting the total mixed gas flow rate.

4,041,970
QUICK BLEED EXHAUST VALVE
Clifford M. Peters, Longview, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed June 9, 1976, Ser. No. 694,510
Int. Cl.[2] F16K *45/00*
U.S. Cl. 137—102 **3 Claims**



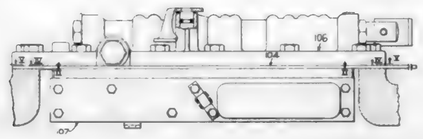
1. A fluid exhaust pilot valve for connection between a fluid actuator and a fluid supply for quick bleeding of fluid from the fluid actuator comprising:
a generally cylindrical valve body having an axial longitudinally extending inlet flow passage for connection to the fluid supply and a transversely extending outlet flow passage for connection to the fluid actuator, said valve body having a valve chamber between the inlet and outlet flow passages with said flow passages at opposite ends of the valve chamber and an exhaust passage in fluid communication with the outlet side of said valve chamber and in axial alignment with the inlet flow passage;
a valve member slidably mounted in said valve chamber for movement between open and closed positions relative to said exhaust passage and exposed on opposite sides thereof to inlet and outlet fluid pressures, said valve member having a large diameter cylindrical main body, a small diameter cylindrical extension extending axially from the main body, and a generally frusto-conical intermediate connecting portion between the extension and the main body;
said valve chamber having opposed annular abutments on which said valve member is seated at said open and closed positions, said valve member having a central bore extending from one end of the main body to said intermediate portion and an outlet opening through said intermediate portion to the valve chamber to provide fluid communication between the central bore and the valve chamber, said small diameter extension fitting within the exhaust passage in the closed position of said valve member to block fluid flow thereto and said intermediate portion of the valve member being seated on an end of the valve chamber and permitting fluid communication between the outlet opening and said outlet flow passage at said closed position;
a check valve member in said central bore to permit fluid flow from said inlet passage to said outlet passage and to prevent any reverse flow from the outlet passage to the inlet passage, said valve member being moved to a closed position of the exhaust passage and remaining in the closed position when the fluid pressure in the outlet flow passage is greater than the fluid pressure in the inlet flow passage, said check valve member being in a closed position when the fluid pressure in the inlet passage reaches an amount less than the fluid pressure in the outlet passage to permit a rapid relatively large pressure differential on opposite sides of the valve member and a fast movement of the valve member to its open position thereby opening the exhaust passage for bleeding fluid from the outlet flow passage.

4,041,971
SIPHON STARTING DEVICE
Robert Newsteder, South Orange, N.J.
Filed Dec. 15, 1975, Ser. No. 640,404
Int. Cl.[2] F04F *10/00*
U.S. Cl. 137—148 **11 Claims**



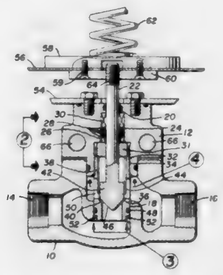
1. A siphon device comprising:
an enclosed longitudinal chamber having outer walls and an intermediate longitudinal wall dividing said chamber into first and second separate adjacent longitudinal sections, and a passageway at the lower end of said intermediate wall between said sections;
means providing an outlet for liquid at the upper end of said first section;
a valve pivotally secured across an end of said passageway to open and close said passageway, said valve contacting said intermediate wall in the closed position to block said passageway between said sections;
means for admitting said liquid into said first and second sections including an opening in the lower end of said first section; and
a movable longitudinal rod extending through the upper end of said chamber into said second section and having a lateral plunger at the lower end of said rod adapted to direct liquid from said second section into said first section through said passageway and open said valve upon downward movement of said rod and plunger, said valve contacting an outer wall of said first section in the open position to block said opening in said lower end of said first section.

4,041,972
HYDRAULIC STACK VALVE ASSEMBLY
Joseph R. Hoepfl, Greenfield, and Gerardus M. Ballendux, Waukesha, both of Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Aug. 4, 1976, Ser. No. 711,649
Int. Cl.[2] F15B *13/02*; F16K *11/10*
U.S. Cl. 137—269 **10 Claims**



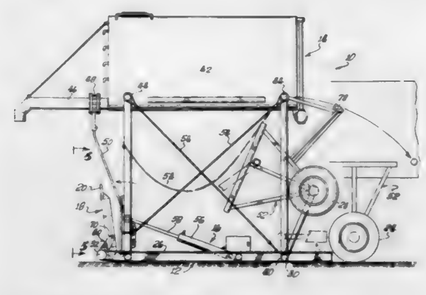
1. A hydraulic stack valve assembly comprising, a valve body, a valve cover and a flow director plate selectively and alternately positioned intermediate said valve body and said valve cover, means removably fastening said valve assembly together, inlet passage means in said valve assembly adapted for connection to a source of pressurized fluid, hydraulic actuator passage means in said valve assembly adapted for connection to at least one hydraulic actuator, sump passage means in said valve assembly adapted for connection to a sump, said valve body defining a plurality of flow control valves, a valve spool in each of said flow control valves, at least one of said valve spools defining lands and grooves for controlling fluid flow in said flow control valve, said valve cover including a pressure regulator valve and a pressure modulating valve to control the fluid pressure in said valve, connecting passage means in said valve body connecting said flow control valves, joining passage means joining said valves in said valve cover, said flow director plate defining openings permitting fluid flow between portions of said connecting passage means and said joining passage means of said valve assembly, actuating means selectively operating said flow control valves for selective communication with said hydraulic actuator.

4,041,973
QUICK CHANGE VALVE TRIM ASSEMBLY
Donald D. Rice, and Herbert H. Walton, both of Marshalltown, Iowa, assignors to Fisher Controls Company, Marshalltown, Iowa
Filed May 2, 1975, Ser. No. 574,176
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—315 **5 Claims**



1. A valve trim structure, comprising:
a unitary cage member having an inner surface and an outer surface, and a valve seat on said inner surface,
a plug member received within said cage member and reciprocable therein toward and away from said seat;
a stem member having a first end affixed to said plug member and having a second end extending out of one end of said cage member;
means for preventing relative rotation of said cage and said plug and stem members,
said second end of said stem being threaded for attachment to actuator means external of a valve; and
a valve bonnet;
said one end of said cage member from which said stem member extends being threaded for attachment to said valve bonnet;
whereby by turning said cage member, said threaded end of said cage member is affixed to said valve bonnet, while said stem member and said plug member are simultaneously turned by said cage member to affix said second end of said stem member to said external actuator means.

4,041,974
MOBILE TOWER
Keril M. Keiser, 409 N. Washington Ave., Glendora, Calif. 91740
Filed Feb. 23, 1976, Ser. No. 660,422
Int. Cl.[2] B60P *3/22*
U.S. Cl. 137—344 **6 Claims**



5. A mobile tower comprising:
a base frame having front and rear ends and upper and lower sides,
a hinged collapsible tower structure on said frame including front and rear supporting legs at the front and rear ends of said frame having normally upper and lower ends, a connecting member extending between the upper ends of said legs, pivotal connections between said frame and the lower ends of said legs, pivotal connections between said member and the upper ends of said legs, said pivotal connections having parallel pivot axes extending transversely of said frame, whereby said tower structure is swingable forwardly and upwardly to an erect position of use over said frame wherein said legs are disposed in upstanding positions relative to said frame and said structure is swingable rearwardly and downwardly to a collapsed towing position wherein said legs incline rearwardly of said frame, and actuator means for effecting movement of said tower structure between said positions,
a pair of ground wheels,
means mounting said wheels on said frame for supporting contact of said wheels with the ground when said tower structure is collapsed to permit towing of said tower by a vehicle having a trailer hitch,
a hitch tongue at the front end of said frame including coupling means for releasable engagement with said vehicle trailer hitch,
means mounting said tongue on said frame for movement between extended and retracted positions in a manner such that when said tower is disposed in towing relation behind said vehicle said tongue coupling means is engageable with said vehicle trailer hitch by extension of said tongue and said coupling means is disengageable from said hitch by retraction of said tongue, said tongue mounting

means comprising a first arm swingable mounted at one end on the front end of said frame on a pivot axis parallel to said supporting leg pivot axes, and means pivotally connecting the other end of said arm to said tongue between the tongue ends on a pivot axis paraliel to said leg pivot axes,

connecting means joining said tongue and tower structure for retraction of said tongue by elevation of said tower structure to its erect position and extension of said tongue by lowering of said tower structure to its collapsed position, and

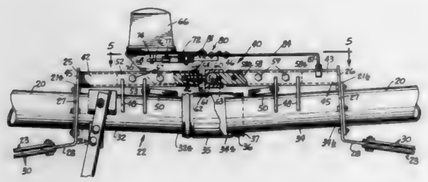
said tongue undergoing downward extension movement and upward retraction movement relative to said frame in a manner such that retraction of said tongue with said coupling means engaged with said vehicle hitch effects upward disengagement of said coupling means from said hitch and extension of said tongue effects downward engagement of said coupling means with said hitch.

4,041,975

ARTICULATING PIPE COUPLING AND ALIGNMENT CONTROL ASSEMBLY FOR CENTER PIVOT IRRIGATION SYSTEM

Kenneth R. Ames, Walla Walla, Wash., assignor to Frontier Machinery Company, Walla Walla, Wash.

Filed May 14, 1976, Ser. No. 686,530
Int. Cl.[2] B05B *3/12*
U.S. Cl. 137—344 **7 Claims**



1. In a center pivot irrigation system having an elongated water distribution conduit supported at intervals by mobile towers for transporting the conduit over a field, in which the conduit is comprised of conduit sections that are pivotally interconnected to each other by articulating pipe coupling and alignment control assemblies and supported between mobile towers by truss structures; each of said articulating pipe coupling and alignment control assemblies comprising:

two longitudinally spaced pipe segments having diameters complementary to the conduit sections;

articulating pipe coupling interconnecting adjacent inner ends of the pipe segments for fluidically interconnecting the pipe segments in a sealed relationship and for enabling each pipe segment to pivot vertically and horizontally with respect to the other pipe segment;

conduit section flanges that are affixed to outer ends of pipe segments, each conduit section flange having, (1 1) an upper portion attached to the ends of the conduit sections; and (2) a lower portion that extends downwardly below the conduit sections attaching to the truss structure;

an external pivot connection subassembly for operatively structurally interconnecting the conduit sections to enable each conduit section to angularly move both horizontally and vertically with respect to each other without interferring with the flow of liquid through the pipe segments;

said external pivot connection subassembly having two opposed longitudinally aligned support tubes affixed to and vertically above the pipe segments;

said external pipe connections subassembly having ball and socket articulating means between support tubes with shafts extending into and affixed to respective tubes, said articulating ball and socket means having a ball and socket located vertically above the pipe coupling for enabling the attached conduit sections to pivot horizontally about a vertical axis defined by the ball and socket;

a support bracket mounted on one of the tubes and extending over the one tube;

an alignment control box mounted to the support bracket;

an alignment arm subassembly pivotally mounted to the support bracket for pivotal movement about the vertical axis of the ball and socket; and

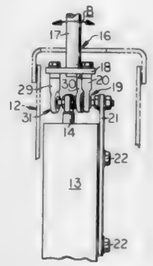
said alignment arm subassembly having an arm section extending horizontally from the vertical axis over to and engaging the other support tube to cause the alignment control subassembly to pivot about the vertical axis in response to angular movement between attached conduit sections.

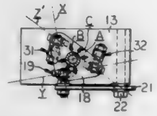
4,041,976

SINGLE LEVER CONTROL ARRANGEMENT FOR ACTUATING MULTIPLE VALVES

Roy D. Brownell, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 1, 1975, Ser. No. 636,510
Int. Cl.[2] F16K *11/18*; G05G *9/04*
U.S. Cl. 137—351 **10 Claims**





1. A control arrangement comprising

a housing,

a pair of first and second valve spools reciprocally mounted in said housing,

a handle assembly comprising a horizontally disposed plate having an upstanding handle secured thereon,

first universal connecting means pivotally mounting said handle assembly on said housing,

second universal connecting means pivotally connecting the plate of said handle assembly to said first valve spool, and

third universal connecting means pivotally connecting the plate of said handle assembly to said second valve spool, said first, second and third universal connecting means disposed in spaced triangular relationship relative to each other whereby pivotal movement of said handle assembly about said first and second universal connecting means will reciprocate said second valve spool only, pivotal movement of said handle assembly about said first and third universal connecting means will reciprocate said first valve spool only, and pivotal movement of said handle assembly only about said first universal connecting means will reciprocate said first and second valve spools simultaneously, said handle disposed centrally on said plate and at least substantially within and between imaginary lines defining the triangular disposition of said first, second and third universal connecting means, said first, second and third universal connecting means cooperating

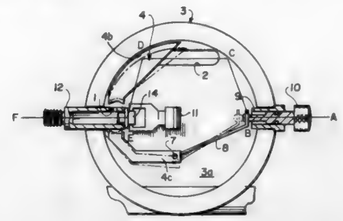
for substantially preventing rotation of said first and second valve spools and said handle assembly about their respective axes.

4,041,977

BREATHING APPARATUS FLOW REGULATOR

Takayoshi Matsuno, 1-10 Sumadera-cho, 2-chome, Suma, Kobe, Japan

Filed Aug. 4, 1975, Ser. No. 601,536
Int. Cl.[2] F16K *31/126*
U.S. Cl. 137—494 **4 Claims**



1. A device for regulating the flow of breathing gas mixtures, comprising a rectangular housing having an interior cylyindrical wall and a circular back wall with an elongated slot formation therein forming an inhalation discharge port, an inlet port in said cylindrical wall for the inflow of breathing gas into said housing spaced apart from said discharge port, a double armed baffle pivotally mounted in said housing and pivotable on said circular back wall and having a first arm facing said back wall defining a breathing gas flow space between said baffle and said back wall and also having a portion covering a part of said inhalation discharge port and a second arm connected to said first arm, said inlet port being adjacent one end of said gas flow space and said discharge port being adjacent the opposite end and partially in communication with said gas flow space, adjusting means displaceably mounted on said housing wall and connected to said baffle second arm for positioning said baffle first arm relative to said interior cylindrical wall, said first arm being pivotable by said adjusting means toward said wall to reduce the flow space area and cause a major portion of the air flow from said inlet port to flow directly into the portion of said discharge port which is covered by said first arm, said first arm being pivotable away from said wall to increase the area of the flow space and allow the gas flow from the inlet port to pass the discharge port and to be deflected by said housing interior wall around the housing and thereafter to flow indirectly into the portion of said discharge port which is not covered by said first arm.

4,041,978

PRESSURE REGULATOR FOR BREATHING APPARATUS

Karl Leemann, Zurich, Switzerland, assignor to Scubapro EU, Zurich, Switzerland

Filed Jan. 13, 1976, Ser. No. 648,717
Claims priority, application Switzerland, Jan. 20, 1975, 625/75
Int. Cl.[2] F16K *31/38*
U.S. Cl. 137—494 **1 Claim**

1. A pressure regulator for breathing apparatus comprising:

a source containing a gaseous mixture;

a diaphragm case having an interior space;

a diaphragm disposed in said diaphragm case;

a valve housing disposed in said diaphragm case;

a movable valve body disposed in said valve housing and cooperable with a valve seat of said housing for opening and closing said regulator;

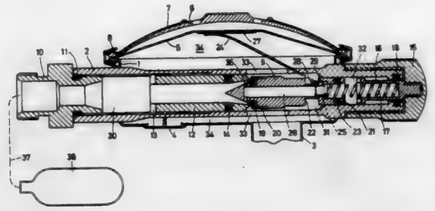
a control member for moving said valve body as a function of the position of said diaphragm with respect to said diaphragm case;

said valve housing being divided by said valve body, when said regulator is closed thereby, into a first chamber adapted to communicate with said gaseous mixture source, a second chamber communicating with said interior space of said diaphragm case, and a third chamber communicating with said first chamber;

said valve housing additionally comprising spaced first and second sealing surfaces;

said valve body comprising spaced third and fourth sealing surfaces respectively cooperating with said first and second sealing surfaces for sealing off said first chamber from said second chamber and said second chamber from said third chamber when said regulator is closed by said valve body;

a conical portion of said valve body extending into said first chamber beyond said first and third sealing surfaces and the base portion of which has a diametrical extent substantially equal to that of said valve seat so as to cooperate therewith for producing a laminar flow of said gaseous



mixture in the region of said first and third sealing surfaces when said regulator is opened by said valve body;

a channel, by which said third chamber communicates with said first chamber, disposed in said valve body and opening into said first chamber, from said conical portion in the vicinity of said base portion of said conical portion and said first and third sealing surfaces, at right angles to the direction of flow of said gaseous mixture in said first chamber for producing a lower pressure in said third chamber than exists in said first chamber when said gaseous mixture flows from said first chamber into said second chamber; and

the portion of said valve housing, which defines a part of said first chamber and which cooperates with said conical portion of said valve body, includes a portion tapering in the same direction as said conical portion of said valve body for additionally improving the laminar flow of said gaseous mixture in the region where said channel enters said first chamber.

4,041,979

CONTROL VALVE HAVING INDEPENDENTLY DRIVEN VALVES

Karlheinz Grotloh, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed July 19, 1976, Ser. No. 706,195
Claims priority, application Switzerland, July 25, 1975, 9708/75
Int. Cl.[2] F16K *11/22*
U.S. Cl. 137—599.2 **7 Claims**

1. A control valve comprising

a housing having at least a pair of spigots for a flow of working medium therethrough and a first valve seat therein;

a main valve including a movably mounted hollow spindle, a first valve body mounted on said spindle for sealingly seating on said first valve seat, said valve body having a passage for a flow of working medium therethrough, and a second valve seat within said first valve body about said passage;

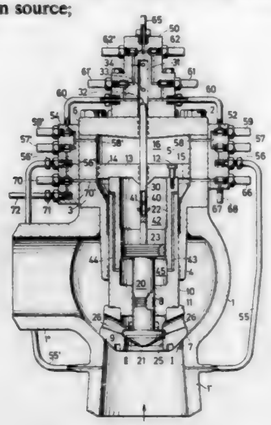
a second valve including a second spindle movably mounted concentrically within said hollow spindle and a second

valve body mounted on said second spindle for sealingly seating on said second valve seat;

a first servo-motor for moving said main valve and including a cylindrical chamber in said housing, and a first piston secured to said hollow spindle and slidably received in said chamber to define two chambers therein;

a second servo-motor for moving said second valve and including a second piston secured to said second spindle and slidably received in said hollow spindle to define two chambers therein;

a first control element for connecting said cylinder chamber of each said servo-motor closest said valve bodies to a pressure medium source;



a second control element for connecting said cylinder chamber of each servo-motor closest said valve bodies to a discharge line;

a third control element communicating said cylinder chambers of said servo-motors remote from said valve bodies to each other;

a fourth control element for connecting said cylinder chamber of said first servo-motor remote from said first valve body to a pressure medium supply; and

a fifth control element for connecting said cylinder chamber of said servo-motor remote from said second valve body to a discharge line.

4,041,980

CONTROL VALVE HAVING TWO INDEPENDENTLY DRIVEN VALVES

Karlheinz Grotloh, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed July 19, 1976, Ser. No. 706,149

Claims priority, application Switzerland, July 25, 1975, 9709/75

Int. Cl.[2] F16K *11/22*

U.S. Cl. 137—599.2 **7 Claims**

1. A control valve comprising

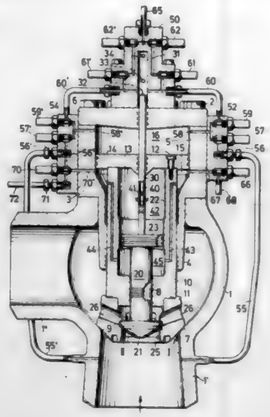
a housing having at least a pair of spigots for a flow of working medium therethrough and a first valve seat therein;

a main valve including a movably mounted hollow spindle, a first valve body mounted on said spindle for sealingly seating on said first valve seat, said valve body having a passage for a flow of working medium therethrough, and a second valve seat within said first valve body about said passage;

a second valve including a second spindle movably mounted concentrically within said hollow spindle and a second valve body mounted on said second spindle for sealingly seating on said second valve seat;

a first servo-motor for moving said main valve and including an insert mounted in said housing and defining a cylindrical chamber, and a first piston secured to said hollow spindle and slidably received in said insert to subdivide said chamber into a pair of chambers;

a second servo-motor for moving said second valve and including a second piston secured to said second spindle and slidably received in said hollow spindle to define two chambers therein;



a rod secured to said second piston and extending through said first piston, said rod having a longitudinal passage communicating one of said chambers within said hollow spindle of said second servo-motor with an end of said rod; and

means mounted on said housing to define a chamber, said latter chamber receiving said end of said rod therein to selectively deliver a pressurized medium to said one chamber and to vent said one chamber.

4,041,981

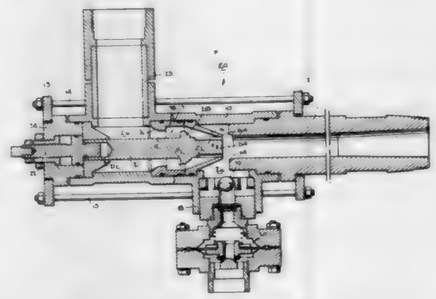
EJECTOR ASSEMBLY

James W. Davis, New Britain, and Garrett H. Hilton, Hatboro, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Filed Apr. 28, 1976, Ser. No. 681,200

Int. Cl.[2] F16K *19/00*

U.S. Cl. 137—604 **6 Claims**



1. An ejector assembly for intermingling a liquid with a gas to produce a solution to be fed to an application point, said assembly comprising:

A. an ejector body having an elongated tubular throat extending axially therefrom;

B. a nozzle disposed in a cylindrical cavity within said body, the mouth of said nozzle being adjacent the inlet of said throat to define an interaction zone therebetween, the space in said cavity behind said nozzle defining a liquid input zone;

C. means to feed liquid under pressure into said input zone whereby liquid at high velocity is emitted from the mouth of said nozzle into the interaction zone to create a vacuum, said liquid feed means being at right angles to the longitudinal flow axis of said ejector body to define an elbow rendering the liquid input to said nozzle turbulent;

D. means communicating with said interaction zone and coupled to a gas supply to cause gas to be drawn into said interaction zone by said vacuum to intermingle with the liquid therein and to produce said solution which is discharged through said throat; and

E. a plug coaxially-disposed within said nozzle and said input zone to define an annular flow path having flow disturbances therein imparting a high degree of turbulence to the liquid issuing from the nozzle, thereby enhancing its interaction with said gas, the internal bore of said nozzle being contoured to cooperate with a flange of enlarged diameter formed on said plug to create alternate restrictions and expansions in said flow path through said nozzle.

4,041,982

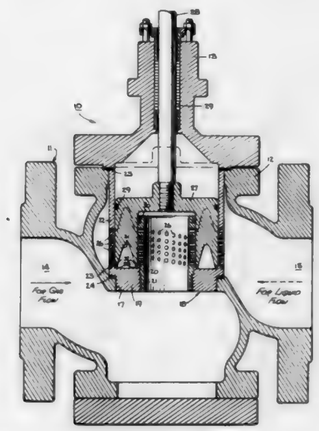
DOUBLE WALL PLUG CONTROL VALVE

Henry Paul Lindner, Middletown, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.

Filed Jan. 9, 1976, Ser. No. 647,886

Int. Cl.[2] F16K *47/14*

U.S. Cl. 137—625.3 **10 Claims**



1. A control valve comprising

a body defining a flow path for a fluid flow, said body including an inlet, an outlet and a valve bridge between said inlet and outlet defining a constricted opening within said path;

a double wall cage mounted within said body coaxially of said valve bridge opening, said cage including a pair of perforated walls disposed in spaced apart concentric relation for passage of a fluid flow therethrough; and

a valve plug reciprocally mounted in said body and located in slidable relation between said walls to control the fluid flow through said flow path from said inlet to said outlet.

4,041,983

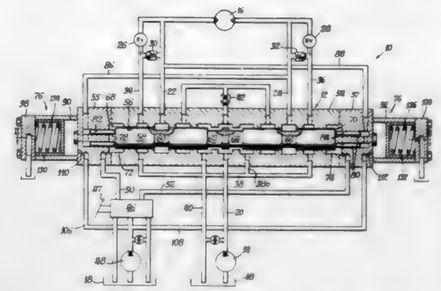
PRESSURE CONTROLLED SWING VALVE WITH SAFETY FEATURE

Donald L. Bianchetta, Coal City, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed July 9, 1975, Ser. No. 594,392

Int. Cl.[2] F15B *13/042*

U.S. Cl. 137—625.63 **3 Claims**



1. In a fluid motor control system for a reversable hydraulic motor having first and second fluid ports,

a pilot operated directional control valve comprising,

a valve having a bore provided therein and,

a valve spool reciprocally slidable within the bore,

first and second motor control ports and first and second motor exhaust ports provided in said housing in communication with said bore.

first motor conduit means for communicating the first motor control port with a first fluid motor port, and second motor conduit means for communicating the second motor control port with a second fluid port in a motor,

pilot pressure reaction chambers provided in the housing facing each opposite end area of the valve spool whereby pilot fluid pressure therein will act upon respective ends of the valve spool,

a pilot control valve in communication with a source of constant pilot pressure for selectively communicating pilot pressure to one of said pilot pressure reaction chambers for selective shifting of the valve spool,

pilot pressure conduit means communicating said pilot control valve with the respective pilot pressure reaction chambers,

a high pressure fluid inlet port provided in the valve body in communication with the bore and with a source of high pressure fluid independent of and separate from said source of pilot pressure,

sump outlet port means provided in the valve body,

and wherein the valve spool is shiftable from a neutral, centered position in which the high pressure fluid inlet port is communicated through the valve bore with the sump outlet port means, to first and second motor control positions respectively in which the high pressure fluid inlet port is communicated with the first and second motor control ports respectively and the first and second motor exhaust ports are communicated with the sump outlet means respectively,

constant force spool biasing means comprising,

first and second biasing piston means slidably disposed in the valve housing at respective opposite ends of the bore abutting the respective ends of the valve spool in its neutral position, and a single one of said first and second biasing piston means engaging said valve spool when it is respectively shifted from its neutral position,

conduit means constantly communicating constant pilot pressure with said biasing piston means,

first and second modulating piston means slidably diposed in the valve housing at respective opposite ends of the valve spool and abutting the ends of the valve spool,

and first and second modulating conduit means communicat-

ing the first motor control conduit with the second modulating piston means, and the second motor control conduit with the first modulating piston means,

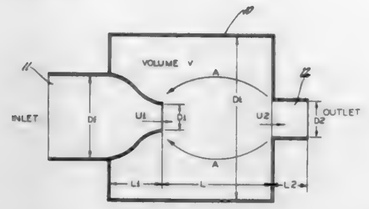
whereby fluid pressure supplied through the control valve and a motor conduit means for driving the motor will be communicated to a modulating piston to urge the valve spool toward closing of the motor conduit means together with the constant pilot pressure bias and against the selected pilot control pressure acting on the spool, whereby the hydraulic motor output is directly proportional to the pilot valve selector displacement.

4,041,984

JET-DRIVEN HELMHOLTZ FLUID OSCILLATOR

Thomas Morel, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed July 1, 1976, Ser. No. 701,537
Int. Cl.[2] F15D *1/08*
U.S. Cl. 137—842 **1 Claim**



1. A jet-driven Helmholtz fluid oscillator comprising: a fluid inlet nozzle having a feed duct opening of diameter Df and an inlet opening of diameter D1; a fluid outlet coaxially aligned with said inlet and having an opening of diameter D2 and a length L2; and a chamber disposed between said inlet and outlet having a volume V, a jet length L measured from the inlet opening to the fluid outlet end of said chamber, a nozzle protrusion length L1 measured from the fluid inlet end of said chamber to the inlet opening and a diameter Dt, wherein D1 is within the range of 25.4 mm to 200 mm, the ratio D2/D1 is within the range 1.0 to 2.1, the ratio L2/D1 is within the range 0–7.0, the ratio L/D1 is within the range 0.5 to 7.0, the ratio $V/D1^3$ is within the range 14 to 350, the ratio Df/D1 is within the range 2.5 to 10.0, the ratio L1/D1 is within the range 0 to 2.0 and the ratio Dt/D1 is within the range 4.0 to 8.0, said chamber having a Helmholtz frequency fo whereby when a fluid at a constant flow rate slightly larger than the product Lfo divided by a dimensionless frequency known as the Strouhal number is introduced at the fluid inlet, the fluid will be discharged from the outlet in a fluctuating manner to produce fluid flow and chamber pressure oscillations at a frequency slightly higher than the Helmholtz frequency which would be present with no flow.

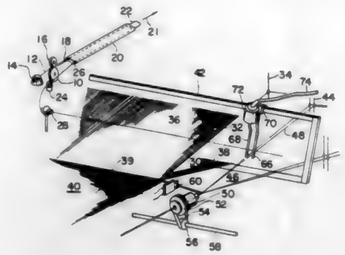
4,041,985

WEFT SENSOR SYSTEM OF SENSING MALFUNCTION OF A WEAVING LOOM

Miyuki Gotoh, Tokorozawa, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed May 7, 1975, Ser. No. 575,135
Int. Cl.[2] D03D *51/34*
U.S. Cl. 139—370.2 **6 Claims**

1. A system for use on a loom for sensing malfunction in a weft sensor of a weaving loom comprising, means to sense a weft yarn for producing an electrical signal in dependence upon said weft yarn having reached a predetermined position upon insertion of said weft yarn in a shed of a weaving loom comprising an electric circuit including therein two electrodes spaced apart from each other, said electric circuit being closed to produce said electric signal when said weft yarn touches both electrodes, a timer circuit connected to said electric circuit to produce an electrical signal representative of malfunction in the weft sensor when said means produces said electric signal for a period of time longer than a predetermined period of time including beat-up time, a NOT circuit connected to receive an output of said timer circuit, means in said timer circuit for producing an output signal when said electric signal is applied thereto from said electric circuit for a period of time



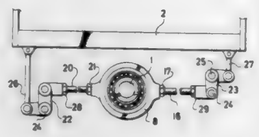
shorter than said predetermined time period and ceasing generation of said output signal when said electric signal is applied thereto from said electric circuit for a period of time longer than said predetermined time period, and said NOT circuit comprising means for producing an output signal for stopping the operation of said loom when said output signal of said timer circuit is absent.

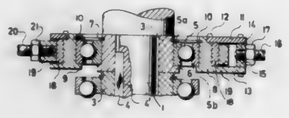
4,041,986

DEVICE FOR FORMING A SHED IN A WEAVING MACHINE

Josef Resch, Rychnov nad Kneznou; Miloslav Kadlec, Tyniste nad Orlici; Stanislav Zahradnik, Roztoky u Jilemnice, and Josef Parizek, Tyniste nad Orlici, all of Czechoslovakia, assignors to Elitex Koncern textilniho strojirenstvi, Liberec, Czechoslovakia

Filed July 16, 1976, Ser. No. 706,058
Claims priority, application Czechoslovakia, Aug. 25, 1975, 5782-75
Int. Cl.[2] D03C *5/02*
U.S. Cl. 139—58 **3 Claims**





1. In a weaving machine having an operatively mounted heald shaft, an arrangement for forming sheds, comprising

a drive shaft rotatably mounted in the weaving machine;

an eccentric non-rotatably mounted on said drive shaft;

a bearing mounted in the eccentric;

a rim member coaxially mounted on the bearing;

a sleeve mounted on said rim member; and

a pair of linkage means operatively connected to the heald shaft;

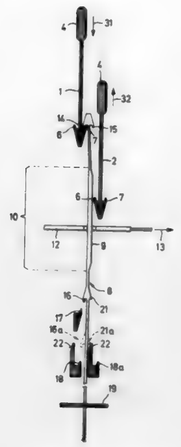
one of said pair of linkage means being operatively connected to said rim member and the other being operatively connected to said sleeve; whereby the heald shaft is reciprocated by the drive shaft when the eccentric is rotated by the drive shaft.

4,041,987

JACQUARD MACHINE EQUIPPED WITH LIFTING WIRES AND STATIONARY ARRESTING BLADES

Robert Bucher, Frick, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 23, 1976, Ser. No. 716,785
Int. Cl.[2] D03C *3/00, 3/08*
U.S. Cl. 139—59 **3 Claims**



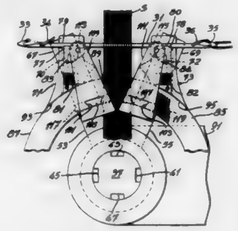
1. In a Jacquard machine having to-and-fro moving lifting wires provided with arresting hooks for coupling the lifting wires with stationary arresting blades, the improvement of a stationary arresting blade for fixing a lower shed position, at least one stationary guide edge provided at the region of said stationary arresting blade, a lifting wire neighboring said stationary arresting blade and movable into the lower shed position, a projection provided at said neighboring lifting wire, said guide edge cooperating with said projection when the lifting wire travels into the lower shed position, in order to deflect said lifting wire, and when the lifting wire assumes the lower shed position the lifting wire is coupled by means of its arresting hook with the stationary arresting blade.

4,041,988

METHOD AND APPARATUS FOR WEAVING AN ELONGATED FABRIC

Morris Benzakein, 2130 Bordeleau, Paroisse Notre Dame, St. Hyacinthe, Quebec, Canada

Filed Apr. 29, 1976, Ser. No. 681,405
Claims priority, application United Kingdom, Apr. 29, 1975, 17739/75
Int. Cl.[2] D03D *49/50, 47/42*; A44B *19/42*
U.S. Cl. 139—116 **9 Claims**



1. A method for forming a continuous fabric having parallel edges, including the steps of providing a plurality of warp yarns and inserting alternately from each side of the shed double picks of a pair of weft yarns taken from a stationary weft supply on either side of the shed and interlacing the loops along the edges of the web so formed to form a chain stitch at both edges, providing a pair of mock warp yarns in the shed near one side edge of the web, and locating at least a monofilament, which has been prescored to form a part of a zipper, as a warp adjacent the mock warp yarn inwardly thereof and successively pulling the monofilament through the mock warp yarn and the edge as it is being formed on one side edge thereof.

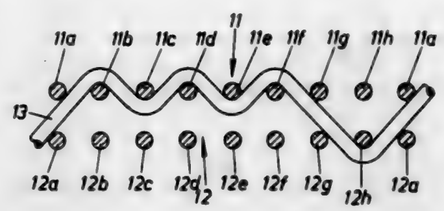
4. An apparatus for weaving a continuous web of fabric having parallel side edges, including a double headed latch needle, a first gripper means on one side of the shed path for gripping the needle, and passing said needle transversly through the shed while it is pulling a first weft pick, second gripping means on the other side of the shed for gripping the needle as the needle passes through the shed and withdrawing the needle from the shed, means for actuating said first gripper means to release the needle, means for reversing the travel of the needle and simultaneously picking up a second weft pick while releasing the first weft pick, said second gripping means passing the needle transversely through the shed in the opposite direction while pulling the second weft pick through the loop formed by the first weft pick.

4,041,989

FORMING FABRIC AND A METHOD FOR ITS MANUFACTURE

Arne Boris Johansson, Halmstad; Francisco Lorente Codorniu, Aled, both of Sweden, and Ingvald Strandly, Oslo, Norway, assignors to Nordiska Maskinfilt Aktiebolaget, Halmstad, Sweden

Filed Sept. 30, 1975, Ser. No. 618,067
Claims priority, application Sweden, Oct. 10, 1974, 7412722
Int. Cl.[2] D03D *15/00, 15/02*; B21F *1/10*; B10D *39/08*
U.S. Cl. 139—425 A **16 Claims**



1. An improved method of manufacturing forming fabrics intended for use in paper-making, cellulose or similar machines including the steps of providing two layers of synthetic weft threads and synthetic warp threads, said warp threads interconnecting said weft thread layers and additionally binding separately with the weft threads of the upper layer which, during the position of use of said fabric faces the material to be formed, and including the further improvement of arranging each one of said warp threads in such a manner that it binds with at the most every sixth thread of the layer of weft threads which in position of use of said fabric faces the dewatering elements of said machine, and stretching said warp threads so as to make said second weft thread layer which in the position of use of said fabric faces said machine dewatering elements tangent to a first plane positioned outside a second plane, said second plane being tangent to said warp threads interconnecting said weft layers.

10. An improved forming fabric comprising first and second layers of synthetic weft threads and a layer of synthetic warp threads interconnecting said weft thread layers anf additionally binding separately with the weft threads of said first layer

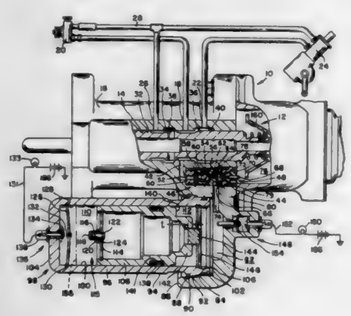
which during the position of use of said fabric faces the material to be formed, the improvement comprising said second weft thread layer which faces the machine dewatering element during position of use of said fabric, being tangent to a first plane positioned outside a second plane, said second plane being tangent to said warp threads interconnecting said weft layers, and said weft threads forming pairs, each warp thread binding in sequence between a first pair of weft threads, above a second pair of weft threads, between a third pair of weft threads, above a fourth pair of weft threads, between a fifth pair of weft threads, above a sixth pair of weft threads, between a seventh pair and beneath an eighth pair of weft threads before the procedure is repeated.

4,041,990

ACCUMULATOR FOR USE IN A HYDRAULIC SYSTEM

Louis S. Tang, Windsor, Canada; Dean E. Runkle, LaPorte, and Lloyd G. Bach, South Bend, both of Ind., assignors to The Bendix Corporation, South Bend, Ind.

Filed Apr. 5, 1976, Ser. No. 673,831
Int. Cl.² F16L *53/00*
U.S. Cl. 138—31 **10 Claims**



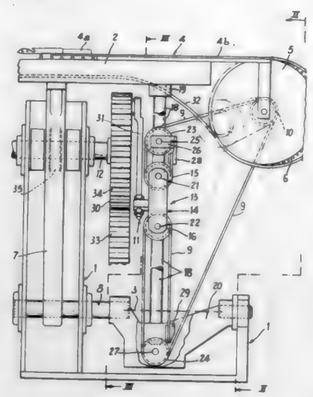
1. An accumulator for use in a hydraulic system comprising:
a housing having a bore therein;
piston means located in said bore for establishing a boost chamber and a hydraulic chamber, said boost chamber retaining a fixed volume of a compressible fluid, said hydraulic chamber being connected to a source of hydraulic fluid under pressure in said hydraulic system, said compressible fluid escaping from said boost chamber and replaced with hydraulic fluid from the hydraulic chamber after a period of time, said hydraulic fluid in said boost chamber being responsive to thermal energy to create a thermal hydraulic pressure, said thermal hydraulic pressure moving said piston means toward said hydraulic chamber; and
plug means attached to said piston means, said plug means being sheared from said piston means upon engagement with said housing through a predetermined movement of said piston means in said hydraulic chamber by said thermal hydraulic pressure to establish a flow path between said boost chamber and said hydraulic chamber to allow the hydraulic fluid in said boost chamber to be freely communicated to the hydraulic chamber and to thereby dissipate said thermal hydraulic pressure therein without damage to said housing.

4,041,991

WEAVING MACHINE WITH EXTERNAL WEFT SUPPLY

Raymond Dewas, Amiens, France, assignor to Control Drug, Inc., Port Reading, N.J.

Filed June 22, 1976, Ser. No. 698,535
Claims priority, application Luxembourg, June 24, 1975, 72791; Oct. 13, 1975, 73576
Int. Cl.² D03D *47/00*
U.S. Cl. 139—449 **8 Claims**



1. In a weaving machine with weft supplied from spools located outside the shed comprising a stationary frame, an oscillating slay, spaced swords located on opposite sides of said slay, vertical heddles mounted on the stationary frame and serving to move the warp threads, a weft inserter horizontally displaceably mounted on said slay, a driving wheel arranged for imparting movement of said weft inserter, said driving wheel mounted to be reciprocally rotated, a first pulley coupled to said driving wheel for reciprocally rotating said driving wheel, support means attached to said slay, a pair of spaced guiding pulleys secured on said support means, a toothed belt having the opposite ends thereof anchored, said toothed belt between the anchored ends thereof passing over said guiding pulleys and being in driving engagement with said first pulley, a driving means in engagement with said toothed belt for imparting reciprocal movement thereto, wherein the improvement comprises that said driving means includes a belt driving carriage mounted on said support means and reciprocally movable in the substantially vertical direction and arranged in engagement with said toothed belt for transmitting the reciprocal vertical movement thereto, a horizontal shaft extending transversely of the vertical direction of movement of said carriage and having a fixed axis extending parallel to the direction of movement of said weft inserter and said shaft positioned between said swords and said vertical heddles and arranged in cooperation with said swords for imparting oscillatory movement to said slay, a crank disk supported on said shaft, and a crank-arm eccentrically articulated at one point thereon to said crank disk and articulated at another point spaced from said one point of said carriage for moving said carriage in the vertical direction.

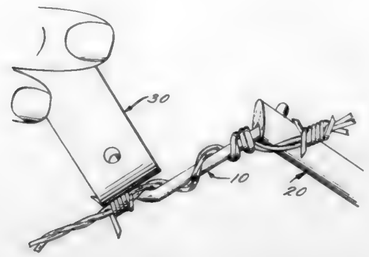
4,041,992

WIRE TIGHTENING DEVICE

Paul R. Lynn, 1302 N. Tennessee Blvd., Murfreesboro, Tenn. 37130

Filed Aug. 24, 1976, Ser. No. 717,399
Int. Cl.² B21F *9/00*
U.S. Cl. 140—123.5 **7 Claims**

1. A wire tightening device comprising:
link means with one end portion bent at substantially 60° relative to a main body portion and another end portion bent at substantially 90° relative to the main body portion and substantially 90° counter clockwise from the plane containing the bend of said one end portion, said other end portion having a further bend of substantially 20° in the same plane as and 90° clockwise to, the 90° bend in the other end portion;
first handle means having a hole defined through one end portion thereof with a diameter sufficient to permit the one end portion of the link means to be inserted therein and extend through the first handle means so as to be removably disposable thereon; and
second handle means having an L-shaped end portion with a hole defined in the foot portion thereof and having a diameter sufficient to permit the other end portion of the link means to be inserted therein and extend through the foot portion so as to be removably disposable thereon.

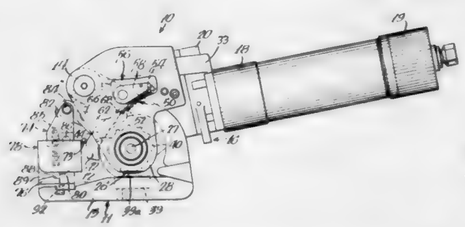


4,041,993

STRAP TENSIONER WITH AUTOMATIC CUT-OFF

Barry R. Angarola, Schaumburg, Ill., assignor to Signode Corporation, Glenview, Ill.

Filed Mar. 7, 1975, Ser. No. 556,268
Int. Cl.² B21F *9/00*
U.S. Cl. 140—123.6 **13 Claims**



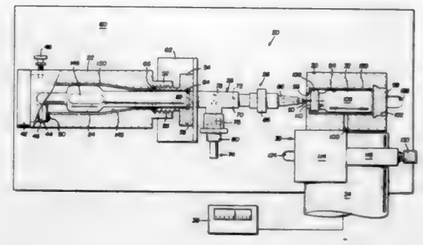
1. A strapping tool for tensioning and cutting strap comprising a frame;
a pivot shaft on said frame;
a tensioning assembly pivotally mounted on said pivot shaft and including a motor means having an output shaft and a rotatable tensioning wheel operably connected to said output shaft and adapted to engage an underlying portion of a strap so as to tension said strap when the tensioning wheel is rotated in a tensioning direction;
ratchet wheel means operably connected to said output shaft and driven simultaneously with said tensioning wheel;
pivotally mounted pawl means carried on said frame and adapted to be engaged by said ratchet wheel means when said tensioning wheel is rotated in a direction opposite to the tensioning direction; and
strap cutter means on said frame, linked to said pawl means, and driven by said ratchet wheel means to sever said strap.

4,041,994

DOSE DISPENSER FOR RADIOACTIVE GAS

Norman H. Horwitz, 6608 Cottonwood Knoll, West Bloomfield Hills, Mich. 48033, and Robert F. Gutkowski, 36824 Manning Court, Sterling Heights, Mich. 48077

Filed Sept. 22, 1975, Ser. No. 615,737
Int. Cl.² B65B *3/04*
U.S. Cl. 141—1 **13 Claims**



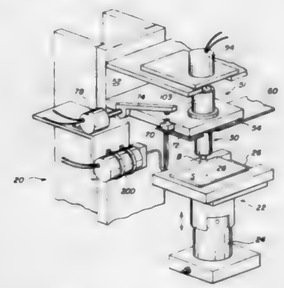
11. A method of dispensing unit do[illegible]of radioactive gas from a multi-Curie shipping ampul to a [illegible]n vial, the metering apparatus including a shielded ampul housing having a chamber, a metering valve and a shielded vial housing having a chamber in communication with [illegible] ampul chamber through said metering valve, said vial [illegible]ng having an aperture, an ionizing radiation detector supported adjacent said vial housing aperture and a meter electrically connected to said detector, said apparatus pivotally mounted on a support, comprising the steps of:
tilting the apparatus with the ampul housing opening upwardly at an angle;
inserting a weighted seal breaker in the ampul housing chamber;
inserting a multi-Curie shipping ampul having a center flame seal in the ampul housing and sealing the housing;
tipping the apparatus sharply with said ampul housing opening extending downwardly to break said flame seal of the shipping ampul;
opening said metering valve to permit the flow of radioactive gas into said serum vial; and
monitoring the activity of the radioactive gas in said serum valve with said radiation detector and meter.

4,041,995

GAS PRESSURE-ACTIVATED DROP DISPENSER

Richard L. Columbus, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 545,670, Jan. 30, 1975, abandoned. This application Dec. 24, 1975, Ser. No. 644,014
Int. Cl.² B01L *11/00*; B65D *83/14*
U.S. Cl. 141—275 **32 Claims**



26. A process for the precise dispensing onto a substrate of a

drop of a fluid having a surface tension which varies from between about 35 dynes/cm and about 75 dynes/cm, the process comprising the steps of

depositing the fluid in an open-top container having a dispensing aperture the maximum dimension of which is less than that which will permit gravity flow of the fluid;

pressurizing the air in the top of said container and thus the fluid in an amount sufficient to form a pendant drop outside the container at the aperture while maintaining the fluid free of contact with apparatus other than the container, and

while maintaining the container stationary, moving the substrate into contact, so as to cause removal of the drop onto the substrate.

4,041,996

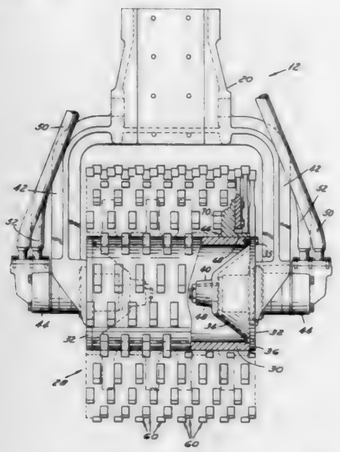
STUMP ERADICATOR

Ross D. Grover, Crystal, Mich., assignor to Ram Industries, Inc., Northville, Mich.

Filed June 10, 1975, Ser. No. 585,459

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—2 N **4 Claims**



1. Apparatus for eradicating tree stumps and the like, comprising a frame adapted to be mounted on a vehicle, a yoke on said frame having spaced arms, a cylindrical drum disposed between said arms and having cutting elements on the periphery thereof, a motor carried by one of said arms, said motor having an output shaft in axial alignment with the axis of rotation of said drum and directly connected to one end of said drum on its axis of rotation, said motor and its output shaft serving to mount said one end of said drum on said one arm of said yoke and also serving as a means to rotate said drum, and means rotatably mounting the other end of said drum on the other arm of said yoke.

4,041,997

ROUTING APPARATUS

Barry David Selfe, "Fourays", Seamans Green, Capel, Surrey, England

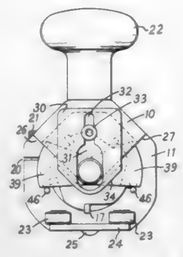
Filed Feb. 14, 1975, Ser. No. 550,050

Claims priority, application United Kingdom, Feb. 14, 1974, 6861/74

Int. Cl.[2] B27C *5/10*

U.S. Cl. 144—136 C **10 Claims**

1. Routing apparatus comprising a frame having an inner end shaped for connection with the housing of an electric motor having drive means, and an outer end having an integral arm thereon; a shaft having a routing cutter thereon and having one end located in said integral arm and the other end shaped so as to be coupled with said drive means; said arm having side faces that lie in respective planes which extend parallel to the axis of rotation of the shaft and have an included angle of up to and including 90°, and said arm further having at the free outer end thereof an arcuate end face with said planes extending tangentially thereto, the end face acting to define the maximum cutting depth; a boss on the outer face of the arm with a portion of the surface thereof coplanar with said arcuate end face; and at least part of the frame adjacent the arm being confined between the respective planes.



4,041,998

END-JOINTING OF TIMBER

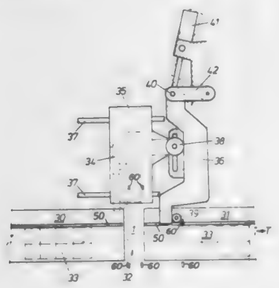
George Moorley, Leicester, England, assignor to Wadkin Limited of Green Lane Works, England

Filed Mar. 15, 1976, Ser. No. 667,213

Claims priority, application United Kingdom, Mar. 22, 1975, 12071/75

Int. Cl.[2] B27G *11/00*; B27F *1/08*

U.S. Cl. 144—315 R **8 Claims**



1. A method of joining pieces of timber end-to-end to form a continuous length, which comprises the following consecutive steps:

positioning two pieces of timber in end-to-end relationship;

moving a rotating cutter disc from a rest position transversely across the timber so that peripheral saw teeth on the cutter disc square the facing ends of the pieces of timber;

effecting relative movement between each piece of timber and the rotating cutter disc so as to bring the facing ends of the pieces of timber into contact with cutter teeth on opposite side faces of the cutter disc to cut arcuate grooves in the timber, adjacent grooves on each piece of timber being separated by arcuate fingers and the fingers on one piece of timber being aligned with the grooves on the other piece;

effecting relative movement between each piece of timber and the rotating cutter disc so as to remove the timber from the path of the cutter teeth;

removing the cutter disc transversely back to said rest position;

applying adhesive to the facing grooved ends of the timber and

pushing the facing grooved ends of timber together so that the fingers of each piece are received in the grooves of the other piece.

4,041,999

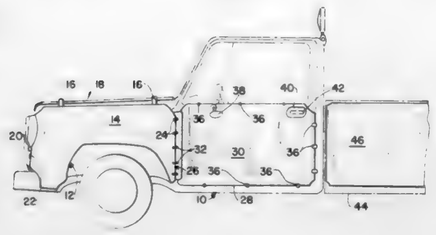
VEHICLE PROTECTOR

Richard E. Miller, 370 "K" St., Apt. No. 66, Chula Vista, Calif. 92010

Filed Nov. 2, 1976, Ser. No. 738,384

Int. Cl.[2] B60J *11/00*

U.S. Cl. 150—52 K **6 Claims**



1. A vehicle protector comprising a plurality of flexible sheets, one surface of the sheets having a soft resilient-like covering, the other surface of each of the sheets being formed from a flexible plastic waterproof material, a first pair of sheets having marginal edges substantially conforming to the marginal edges of the front fenders of a vehicle, a first elastic flexible band fixedly secured at the ends thereof to each of the sheets of said first pair of sheets, said first flexible band being disposed on the outermost surface of the hood of said vehicle when said first pair of sheets are disposed covering said front fender, a second elastic flexible band being disposed joining each of said first pair of sheets, said second flexible band being disposed covering the grille portion of said vehicle when said first pair of sheets are disposed covering said front fenders, a first plurality of snap fasteners being disposed in spaced apart relationship along one marginal edge of each of said first pair of sheets, said first plurality of snap fasteners being disposed removably secured to first complementary snap fasteners being disposed fixedly secured in spaced apart relationship to the exterior surface of said vehicle along first lines located adjacent to the leading marginal edge of the frontmost doors of said vehicle, a second pair of sheets having marginal edges substantially conforming to the marginal edges to the door panels of said frontmost doors of said vehicle, a second plurality of snap fasteners disposed in spaced apart relationship along one marginal edge of each of said second pair of sheets, a first plurality of hook-like members fixedly secured to and extending outwardly from the other marginal edges of said second pair of sheets, said second plurality of snap fasteners being disposed removably secured to a second plurality of complementary snap fasteners, said second plurality of complementary snap fasteners being disposed fixedly secured in spaced apart relationship along second lines, said second lines being disposed parallel to said first lines, said first plurality of hook-like members being disposed capturing a portion of said marginal edges of said door panels, a third pair of sheets having marginal edges substantially conforming to the substantially vertical remaining side panels of said vehicle, a third elastic flexible band being disposed joining each of said third pair of sheets, a second plurality of hook-like members being disposed fixedly secured to the marginal edges of each of said third pair of sheets, said second plurality of hook-like members being disposed capturing a portion of the marginal edges of said remaining side panels of said vehicle when said third pair of sheets are disposed covering said remaining side panels of said vehicle, said third flexible band being disposed at the rear end of said vehicle when said third pair of sheets are disposed covering said remaining side panels of said vehicle.

4,042,000

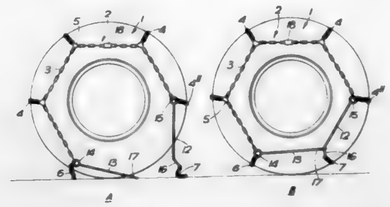
DEVICE FOR TIRE CHAINS

Kåre Jørgen Nylund, Makevelen 2, 4500 Mandal, Norway

Filed May 6, 1976, Ser. No. 683,703

Int. Cl.[2] B60C *27/06*

U.S. Cl. 152—213 A **3 Claims**



1. A tire chain permitting quick and easy attachment to the wheel of a car, comprising:

two side chains, a first chain for placement on the outer side of the wheel and a second side chain for placement on the inner side of the wheel, each of said side chains being made of a plurality of side chain segments;

gripping elements connected between said side chains;

connecting means for connecting the ends of said first side chain when in place around the tire;

a first bar forming the last said side chain segment of said second side chain, said first bar having a first eye on one end thereof and a second eye on the other end thereof; said first eye connecting said first bar to the rest of said second side chain, and said second eye forming the end of said second side chain, said second eye also connecting the endmost of said gripping elements, said second eye being turned 90° in relation to said first eye and being disposed at an angle with respect to the longitudinal axis of said first bar;

a second bar connected to the other end of said second side chain, said second bar having an eye connecting said second bar to the end of said second side chain opposite said first bar; and

a U-shaped hook at the end of said second bar, said U-shaped hook being turned 90° in relation to the eye of said second bar;

whereby the tire chain is attached to the wheel by placing the tire chain across the wheel with said first side chain on the outer side of the wheel, said U-shaped hook on said second bar is hooked around said first bar so that said second bar rests in a locking position against said second eye, said second eye lying outside said U-shaped hook of said second bar, so that said second side chain is locked together on the back of the wheel, and said first side chain is connected together on the outer side of the wheel by means of said connecting means.

4,042,001

WEAR-RESISTANT LINK FOR TIRE CHAINS

Anton Müller, Aalen-Unterkochen, Germany, assignor to Eisen -und Drahtwerk Erlau Aktiengesellschaft, Aalen, Germany

Filed Dec. 15, 1975, Ser. No. 641,071

Claims priority, application Germany, Dec. 14, 1974, 2459280

Int. Cl.[2] B60C *27/06*

U.S. Cl. 152—243 **6 Claims**

1. A connection member for chains, especially for protective tire chains, with a link body consisting of two arms parallel to each other and interconnected by a transverse piece extending substantially at right angles therebetween such that an essentially U-formed structural part is formed thereby defining an

inlet and receiving opening lying between the arms, and having a bearing piece formed by a bolt limiting the receiving opening for a chain member suspended in the receiving opening and arranged at least partially at right angles to the arms of the link body, the improvement therewith which comprises

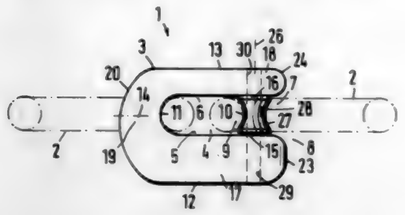


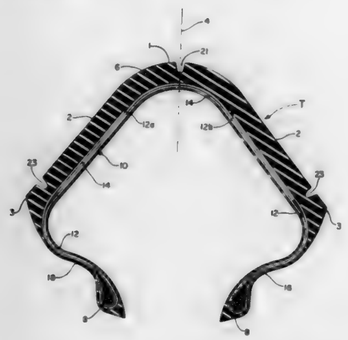
plate means of different thickness forming both of the arms, at least the thickest of said plate means having a smaller width measured in the vicinity of the bolt at right angles to the axis of the bolt than the width in an adjoining region of the receiving opening.

4,042,002

MOTORCYCLE TIRE

Clarence B. Alsobrook, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 31, 1976, Ser. No. 672,361
Int. Cl.² B60C *9/04, 9/22*
U.S. Cl. 152—354 **2 Claims**



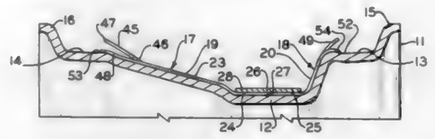
1. A motorcycle tire comprising a tread terminating in axially spaced circumferential shoulders, a pair of beads, and sidewalls having improved uniformity of flexure, said tire having a carcass consisting of a single bias carcass ply of cord angles of 20° to 38° (in the cured state) extending between the beads, and a single bias breaker ply of bias cord angles equal and opposite to the bias cord angles of the carcass ply disposed symmetrically and circumferentially about the carcass ply and terminating between the shoulders, said carcass ply being lapped under the beads and turned outward to extend through and beyond the sidewalls to overlie 50 to 90 percent of the breaker ply and between the breaker ply and the tread, whereby said motorcycle tire is provided with sidewalls free of discontinuity and the carcass ply turned about the beads terminates beneath the tread and radially outwardly of the shoulders thereof.

4,042,003

TIRE BEAD RETAINER

Gerald E. Gaskill, Farmington Hills, Mich., and James E. Woodlee, Kent, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sept. 10, 1975, Ser. No. 611,929
Int. Cl.² B60C *15/02*
U.S. Cl. 152—381.2 **15 Claims**



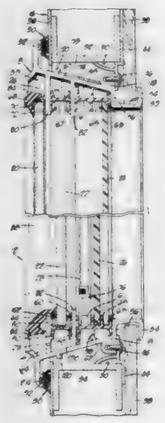
1. In combination with a wheel rim having an annular well and a bead seat axially spaced from said well at one side of said rim a tire bead retainer comprising a base portion for attachment to said rim in said well, said base portion having a surface conformable with said surface of said rim, a locking member mounted on said base portion for positioning on a side of said well and extending radially outward from the plane of said surface of said base portion to a locking position spaced from a surface of said rim, said locking member being retractable to a retracted position close to said surface and resilient means urging said locking member into locking position whereby a tire bead may be moved into said well and toward said side of said well over said base portion, said locking member being movable into the retracted condition by said bead during mounting of said tire and resiliently returned to said locking position after said bead has been moved onto said bead seat.

4,042,004

WINDOW ASSEMBLY

Gerald A. Kwan, Pasadena, Calif., assignor to Hehr International Inc., Los Angeles, Calif.

Continuation of Ser. No. 558,798, March 17, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,992
Int. Cl.² E06B *3/32*
U.S. Cl. 160—91 **4 Claims**



1. An improved window assembly adapted for installation in an aperture of a recreational vehicle wall structure and comprising:

a. a metal frame having a base and a plurality of approximately parallel inwardly extending flanges integral with and transverse to said base and surrounding said frame to form a plurality of channels therein of which the base provides a common floor, said frame also having an outwardly facing circumferential flange for surrounding said aperture and for lapping the outer surface of said wall structure adjacent said aperture, said floor being sloped with respect to a plane perpendicular to said wall structure, at least one of said channels having opposed ledges elevated above the floor of said channel and being adapted to support a flexible track member elevated above said floor, at least the two outermost flanges being slotted along a common axis adjacent said base to provide aligned drainage apertures through which any water in said one of said channels drains along said sloped floor to the exterior of said wall structure;

b. a stationary removable glass panel positioned in the outermost one of said channels, a slidable removable glass panel positioned in an inner one of said channels for sliding therein;

c. securing means positioned at the approximate center of said window assembly, said securing means comprising a latch member attached to a vertical edge of said slidable window panel and a catch member attached to a corresponding vertical edge of said stationary window panel whereby said latch member and said catch member may be securely interlocked for securing said window assembly in a closed configuration; and

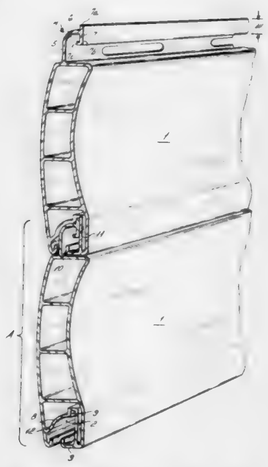
d. a flexible track member having a channel therein for slidably receiving one of said panels, said flexible track member being positioned in the said one of said channels having opposed ledges, said flexible track member having two separate legs, each such leg being positioned on a channel ledge whereby said track member is elevated above said channel floor to permit unobstructed drainage along the floor and through said aligned drainage apertures.

4,042,005

ROLLING SHUTTERS

Gerd Hammerstein, Haan, Germany, assignor to Carl Schnicks & Co., Haan, Germany

Filed Mar. 9, 1976, Ser. No. 665,262
Int. Cl.² E06B *3/14, 3/20*
U.S. Cl. 160—220 **1 Claim**



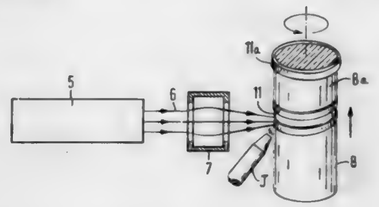
1. A rolling shutter comprising a plurality of vertically superposed slats of hollow-profile construction and composed of synthetic-resin material, said slats being formed along their respective upper and lower edges with mating formations defining lockable articulations between laterally contiguous slats, one of said formations being formed as a channel and the other formation being formed as a tongue, said tongue having a web projecting vertically in a vertical position of said slat, an arcuate portion on said web and a substantially vertical flange on said arcuate portion, said channels each being formed with a planar vertical partition within the respective slat in a vertical position thereof, rising from a limiting flange defining the mouth of said channel and parallel to but spaced from an outer wall of said slat, a diagonal partition extending from the top of said vertical partition to another outer wall of said slat opposite the first-mentioned outer wall and formed with an arcuate supporting surface conforming to and adapted to bear against said arcuate portion of a tongue of an adjoining slat, and a flange-receiving groove at the junction of said partitions opening towards said limiting flange and adapted to receive the flange of said tongue of said adjoining slat, said flange of said tongue being formed as a T-shaped head on the end of said bent portion, said head lying substantially in a vertical plane parallel to and abutting over its entire width the respective vertical partition in a vertical position of the slat with said vertical partition supporting said head over its entire width to provide lateral stability to the shutter, the bottom edge of said head being formed with a horizontally extending rib, said limiting flange being formed adjacent the mouth of said channel with an inwardly extending rib, said diagonal partition being formed in part by a connecting profile member joining a wall of said slat with said arcuate surface, said horizontally extending rib having a width which is less than the distance between said inwardly extending rib and said vertical partition, said groove having a depth and a bottom spaced from said limiting flange by by a distance W such that $(W - b) > w$, where w is the width of said T-shaped head.

4,042,006

PYROLYTIC PROCESS FOR PRODUCING A BAND-SHAPED METAL LAYER ON A SUBSTRATE

Alfred Engl, and Guenther Heim, both of Regensburg, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 429,100, Dec. 28, 1973, abandoned. This application Oct. 22, 1975, Ser. No. 624,711
Claims priority, application Germany, Jan. 5, 1973, 2300481
Int. Cl.² B22D *23/00;* **B05D** *3/02, 3/06*
U.S. Cl. 164—46 **1 Claim**



1. A pyrolytic method for the production on a cylindrical carrier member of resistors having a band-shaped resistance layer and a contact area at the ends thereof, comprising:

surrounding a surface of the carrier member to be coated with a first fluid mixture of at least one thermally decomposable metal compound and a carrier therefor;

substantially simultaneously heating only precise surface areas of said carrier member by a laser beam or an electron beam to a temperature slightly above the decomposition temperature of said metal compound, rotating said carrier member about a vertical axis thereof and axially moving said carrier member along the vertical axis thereof whereby a band-shaped helical metal deposit forms only on said precise surface areas of the carrier member;

removing said first fluid mixture from about the carrier member and stopping said axial movement of the carrier member while maintaining the rotational movement thereof;

surrounding the surface of such carrier member with a sec-

ond fluid mixture of at least one thermally decomposable metal compound and a carrier therefor;

heating only precise surface areas of the carrier member by a laser beam or an electron beam to a temperature substantially above the decomposition temperature of the metal compound in the second fluid mixture whereby a band-shaped cylindrical metal deposit forms only on said precise surface areas of the carrier member so as to define spaced metal contact areas on said helical metal deposit; and

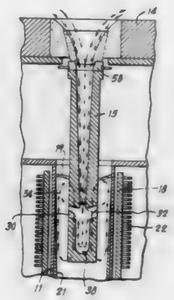
relatively quickly cooling the resultant carrier member with metal deposits thereon so as to form discontinuities in the carrier member for separating the helical metal deposits with the spaced contact areas thereon into individual resistors having contacts at opposite ends thereof.

4,042,007

CONTINUOUS CASTING OF METAL USING ELECTROMAGNETIC STIRRING

Alexander A. Zavaras, Athens, Greece; Robert Sobolewski, Streetsboro, and Cecil B. Griffith, North Royalton, both of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Apr. 22, 1975, Ser. No. 571,016
Int. Cl.[2] B22D *27/02, 11/10*
U.S. Cl. 164—49 **10 Claims**



1. In the continuous casting of metal wherein the liquid metal is poured through a submerged shroud into a cooled mold through which the metal moves in one direction with an outer solidifying shell defining a solid-liquid interface within the mold and which is lined with electrically conductive material, said shroud having a closed bottom and delivering metal to exit outwardly into a region located in an upper portion of the mold, the procedure comprising:

a. pouring the metal through a slag layer in contact with the metal substantially upstream of said region; and

electromagnetically circulating the metal in the mold by producing an alternating current field adjacent to the mold between approximately the slag-metal interface and a locality situated downstream of said outward exit, said alternating current being supplied to have at least two successively different phases in longitudinally successive regions to thereby provide circulation of the liquid metal in a direction generally opposite to said one direction along said solid-liquid interface from said locality to the slag layer and generally in said one direction along the outer surface of the shroud, said current being supplied at a frequency sufficiently high to move the metal in the described circulation and sufficiently low that effective metal-moving power is transmitted despite attenuation by said conductive lining such that the electromagnetically induced metal flow acts to positively sweep nonmetallic inclusions intrained in the outflow from the shroud along said solid-liquid interface in spaced relation thereto along the slag layer whereby removal of inclusions into the slag is promoted;

wherein the improvement comprises

c. the pouring step comprising pouring the liquid metal through a shroud having a central bore tapering continuously throughout the entire length of the shroud in a downstream direction to constitute a nozzle, and into a well defined by the closed bottom of the shroud downstream of and opening toward the nozzle, for outward exit of metal to the mold through ports opening laterally through the shroud between the well and the nozzle and oriented at an obtuse angle to said one direction, while maintaining a metal level in the mold at least several inches above said ports; and

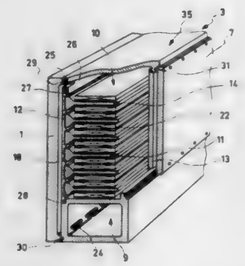
d. injecting an inert gas into the liquid metal being poured through the shroud, at a locality upstream of said region, for dispersing the gas through the liquid metal in the form of fine bubbles prior to exit of the metal into the mold.

4,042,008

CONTINUOUS-CASTING MOLD WITH ELECTROMAGNET

Robert Alberny, and Louis Vedda, both of Metz, France, assignors to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Laye, France

Filed Sept. 14, 1976, Ser. No. 723,194
Claims priority, application France, Sept. 17, 1975, 75.28439
Int. Cl.[2] B22D *11/02, 27/02*
U.S. Cl. 164—147 **10 Claims**



1. A mold for continuous casting, said mold comprising: a tube having a plurality of sides of non-magnetic material; a box defining a cooling chamber connected to one of said sides and having a wall parallel to said one side and an inlet and an outlet, whereby fluid can be passed through said chamber from said inlet to said outlet to cool said one side and said wall; means including a plurality of rigid metallic elements in said box braced between said one side and said wall for forming a rigid connection therebetween; and a coil wound on each of said elements, whereby electrical energization of said coils forms a magnetic field extending through said one side and said wall into said tube.

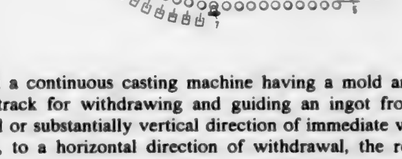
4,042,009

STRIP FOR COVERING AN ELONGATED MOLD CAVITY IN A CONTINUOUS CASTING MACHINE

Wilhelm Horstman, Osnabruck; Werner Meyer, Hannover, both of Germany, and Fred F. Polizzano, deceased, late of Allendale, N.J. (by Anita Polizzano, executrix), assignors to Kabel- und Metallwerke Gutehoffnungshutte Aktiengesellschaft, Hannover, Germany

Filed Aug. 7, 1975, Ser. No. 602,763
Claims priority, application Germany, Aug. 31, 1974, 2441795
Int. Cl.[2] B22D *11/06*
U.S. Cl. 164—278 **10 Claims**

1. In a casting machine having a rotating drum with a mold cavity defining groove or the like looping around its periphery, and having means pouring molten material into the groove an endless covering part of the groove along said periphery, (i) for completing the cavity from which an elongated casting is withdrawn and (ii) being cooled from the side opposite the covered groove for cooling the molten material when in the cavity, and (iii) moving in a closed loop part of which moving without covering any part of the grooves, comprising:



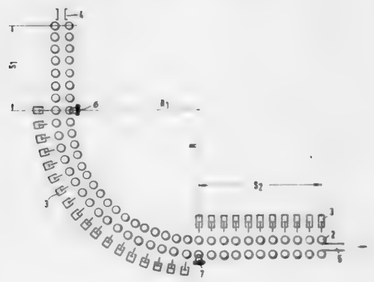
the strip being made of a heat resisting, age hardened copper alloy with a dominating copper content, and having oblique ends joined by fusion welding to obtain an endless belt with a fusion welded joint which extends at an angle of from about 30° to about 45° to a direction of movement and of longitudinal extension of the belt, the belt moving with the drum for covering said part on a progressive basis.

4,042,010

APPARATUS FOR WITHDRAWAL OF CONTINUOUSLY CAST INGOTS

Gerhard Komma, Dinslaken-Hiesfeld, and Hans Schrewe, Duisburg, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Dec. 22, 1975, Ser. No. 643,147
Claims priority, application Germany, Dec. 20, 1974, 2461045
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—282 **4 Claims**



1. In a continuous casting machine having a mold and a roller track for withdrawing and guiding an ingot from a vertical or substantially vertical direction of immediate withdrawal, to a horizontal direction of withdrawal, the roller track and withdrawal path being curved in between an arrangement of rolls, providing for at least one point or a first point of bending the ingot into the curved path and there being at least one point or a first point of straightening the ingot from the curved path into a straight horizontal path, the improvement comprising:

a first plurality of the rolls being disposed on an outside path of the track and extending from said one or first bending point to said one or the first straightening point, there being means for resiliently-yielding mounting the rolls of the first plurality of rolls with at least a component of movement in radial direction with regard to curving of the path and track;

a second plurality of the rolls being disposed in continuation of an inside path of the track in and beyond said one or first point of straightening in the direction of withdrawing, there being means for resiliently-yieldingly mounting the rolls of the second plurality of rolls with at least a component of movement in vertical direction;

a third plurality of rolls being disposed on an inside path of the track and extending from said one or first bending point to said one or the first straightening point, there being means for rigidly mounting the rolls of the third plurality of rolls; and

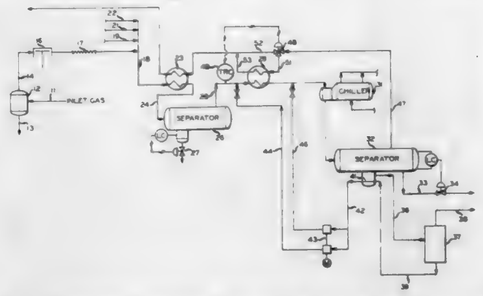
a fourth plurality of rolls being disposed on an outside path of the track in and beyond said one or first point of straightening in the direction of withdrawing, there being means for rigidly mounting the rolls of the fourth plurality of rolls.

4,042,011

REFRIGERATION CONTROL

Julius E. Schneider, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 22, 1975, Ser. No. 642,882
Int. Cl.[2] B01D *3/42, 5/00;* **F25J** *3/00*
U.S. Cl. 165—1 **12 Claims**



1. A process for cooling a first fluid stream with a second fluid stream which comprises:

cooling said first stream by passage through a first heat exchange zone;

measuring the temperature of said first stream after passing through said first heat exchange zone;

cooling said first stream further by passage through a second heat exchange zone;

heating a first part of said second fluid stream by passing through said second heat exchange zone while passing a second part of said second fluid stream through a bypass zone around said second heat exchange zone;

heating said second part of said second fluid stream by passage through said first heat exchange zone; and

controlling the flow of said first and second part of said second fluid stream in response to the measured temperature of said first stream.

11. Apparatus for cooling a first fluid stream with a second fluid stream which comprises:

a first heat exchanger;

means for passing a first fluid stream through said first heat exchanger;

means to measure the temperature of said first stream after passing through said first heat exchanger;

a second heat exchanger;

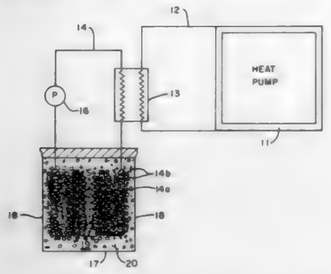
means to pass said first stream through said second heat exchanger for further cooling;

means to pass a first part of a second fluid stream through said second heat exchanger in heat exchange relation with said first fluid stream;

means to pass a second part of said second fluid stream through a bypass around said second heat exchanger and then through said first heat exchanger in heat exchange relation with said first stream; and

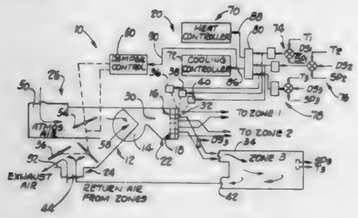
means to control the flow of said first and second parts of said second fluid stream in response to the measured temperature of said first fluid stream.

4,042,012
HEAT PUMP SYSTEM WITH IMPROVED HEAT TRANSFER
Elijah R. Perry, Portola Valley, and Mario Rabinowitz, Menlo Park, both of Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.
Filed Aug. 27, 1976, Ser. No. 718,348
Int. Cl.[2] F25B *27/02*; F28F *9/22*
U.S. Cl. 165—1 **20 Claims**



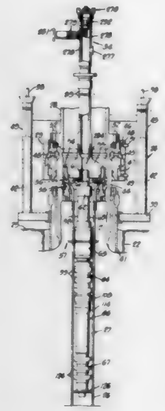
1. In a method for increasing the heat transfer to an underground heat pipe of a heat pump for heating or cooling an air conditioned space, the steps of
   a. digging a hole for the heat pipe,
   b. depositing an impermeable lower sheet with upwardly extending side walls and a bottom wall to conform to the hole,
   c. laying the heat pipes in the interior of the lower sheet,
   d. back-filling around the heat pipes with soil in which water-absorbent particles are dispersed comprising material capable of absorbing many times its own weight of water, and
   e. soaking said absorbent particles with water.

4,042,013
METHOD AND APPARATUS FOR CONTROLLING AIR-CONDITIONING SYSTEMS
Merlin E. Demaray, and Russell G. Attridge, Jr., both of Columbus, Ohio, assignors to Ranco Incorporated, Columbus, Ohio
Filed Feb. 26, 1976, Ser. No. 661,619
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **7 Claims**



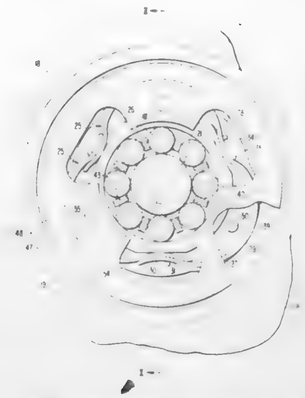
1. A method of controlling the temperature in an air conditioned zone by heating or cooling a temperature controlling medium flowing to the zone and by controlling the flow of the medium to the zone comprising:
   a. sensing zone temperature conditions;
   b. producing command signals which vary according to sensed zone temperature condition changes occurring outside of a no load band of zone temperatures;
   c. heating the medium when said command signal values are in a first predetermined range of values produced by sensing zone temperatures below the no load band;
   d. cooling the medium when said command signal values are in a second predetermined range of values produced by sensing zone temperatures above the no load band;
   e. altering the flow of medium to the zone in response to changing command signal values between said first and second ranges of values; and
   f. maintaining a substantially constant command signal value in response to sensed zone temperature conditions ranging within said no load band.

4,042,014
MULTIPLE STAGE CEMENTING OF WELL CASING IN SUBSEA WELLS
Lyle Burnell Scott, Sun City, Calif., assignor to BJ-Hughes Inc., Long Beach, Calif.
Filed May 10, 1976, Ser. No. 684,808
Int. Cl.[2] E21B *7/12*
U.S. Cl. 166—.5 **28 Claims**



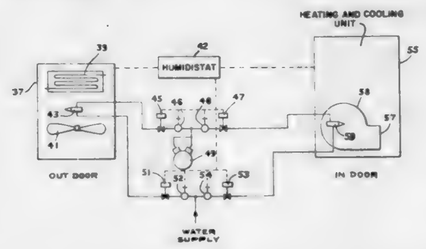
1. A plug stack assembly for use in stage cementing a well casing string in a well bore comprising:
   A. a shut-off plug receivable in the well casing string;
   B. first releasable means for connecting said shut-off plug to a mandrel inserted in the well casing string, said mandrel having a longitudinal passage for the flow of cementing fluids therethrough;
   C. a trip-plug receivable in the well casing string;
   D. second releasable means connecting said trip-plug directly to said shut-off plug;
   E. a first-stage cementing plug receivable in the well casing string;
   F. third releasable means connecting said first-stage cementing plug directly to said trip-plug;
   G. means defining a passage through each plug for the flow of cementing fluids from the longitudinal passage of the mandrel into the well casing string;
   H. said first-stage cementing plug having means cooperative with a first closure member in said cementing fluid to close the passage in said first-stage cementing plug and effect release of said thid releasable means responsive to cementing fluid pressure;
   I. said trip-plug having means cooperative with a second closure member in said cementing fluid to close the passage in said trip-plug and effect release of said second releasable means responsive to cementing fluid pressure; and
   J. said shut-off plug having means cooperative with a third closure member in said cementing fluid to close the passage in said shut-off plug and effect release of said first releasable means responsive to cementing fluid pressure.

4,042,015
CENTRAL MOUNTING OF THE HEAT-EXCHANGE PLATE OF A REGENERATIVE HEAT-EXCHANGER
Klaus Wiegard, Esslingen-Zollberg, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany
Filed Oct. 18, 1976, Ser. No. 733,051
Claims priority, application Germany, Oct. 22, 1975, 2547175
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—8 **7 Claims**



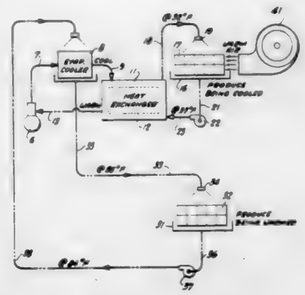
1. A heat-exchanger disk of a regenerative heat-exchanger of a gas turbine, which is secured on a rotatable carrier means under interposition of ring-shaped leaf spring elements which are connected with each other near their ends and which are supported under prestress by way of outwardly curved arcuate portions at counter-surfaces in a central opening of the heat-exchanger disk and by way of inwardly curved arcuate portions at countersurfaces of the carrier means, characterized in that a retaining disk means abuts at each end face of the heat-exchanger disk, said retaining disk means holding the leaf spring elements and the carrier means, in the central opening and being connected with each other by tie pins which extend through the annular space between the central opening and the carrier means.

4,042,016
ENVIRONMENTAL HUMIDIFICATION AND COOLING SYSTEM
Evelyn Boochever, and Michael Munk, both of 28 Dorchester Drive, Port Chester, N.Y. 10573
Filed Oct. 28, 1975, Ser. No. 625,923
Int. Cl.[2] F24F *3/14*
U.S. Cl. 165—20 **8 Claims**



1. In a closed environment air conditioning system receptive of air to be conditioned:
   a heating/cooling unit including a chamber receptive of recirculating air before the air enters the heating/cooling unit:
   means for simultaneously evaporatively cooling and humidifying the air to the conditioned comprising actuatable ultrasonic spray means including an ultrasonic spray nozzle positioned to spray into the recirculating air in the chamber and receptive of a supply of water during use for atomizing the water and spraying same into the air to be conditioned and controllable compressor means for supplying pressurized air to the ultrasonic spray nozzle; and
   means for actuating and deactuating the ultrasonic spray means to control the level of humidification in the conditioned air.

4,042,017
PRODUCE WARMER
Robert H. Dench, Monte Sereno, and Victor J. Dervin, Cupertino, both of Calif., assignors to Mobile Product Services, Inc., Burlingame, Calif.
Filed Oct. 29, 1975, Ser. No. 626,663
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—63 **4 Claims**



1. A produce warmer comprising an evaporative cooler, a heat exchanger, a primary refrigerant circuit including said evaporative cooler and said heat exchanger in series, means in said primary refrigerant circuit for circulating refrigerant therein in a direction through said evaporative cooler wherein said refrigerant is cooled and then through said heat exchanger wherein said refrigerant is warmed and then back to said evaporative cooler, a first housing for produce to be cooled, a secondary water circuit including said first housing and said heat exchanger in series, means in said secondary water circuit for circulating water therein in a direction through said heat exchanger wherein said water is cooled and then through said first housing wherein said water is warmed by heat transfer from produce therein and then back to said heat exchanger, a second housing for produce to be warmed, a tertiary water circuit including said second housing and said evaporative cooler in series, and means in said tertiary water circuit for circulating water therein in a direction through said evaporative cooler wherein said water is warmed and then through said second housing wherein said water is cooled by heat transfer to produce therein and then back to said evaporative cooler.

4,042,018
PACKAGING FOR HEAT EXCHANGERS
William Henry Zebuhr, Nashua, N.H., assignor to Des Champs Laboratories Incorporated, East Hanover, N.J.
Filed Sept. 29, 1975, Ser. No. 617,733
Int. Cl.[2] F28F *3/12*
U.S. Cl. 165—166 **6 Claims**

1. A heat exchanger assembly for transmitting thermal energy from one moving body of fluid to another comprising
   a folded sheet of heat conductive material, the individual folds of said sheet defining adjacent fluid flow passages, alternate ones of said passages defining a first conduit means for conducting relatively warm fluids, the other

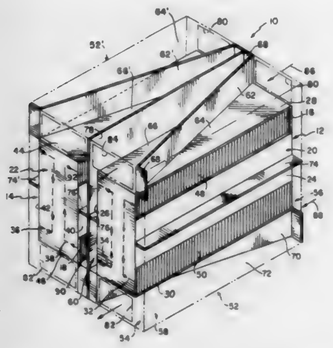
passages defining a second conduit means for conducting relatively cool fluids;

a casing containing said folded sheet having a substantially rectangular cross section having a pair of opposed side walls and first and second end walls, entrance and exit openings for said first conduit means being formed in one of said opposed sides adjacent the first and second end walls respectively and entrance and exit openings for said second conduit means being formed in the other of said opposed sides adjacent the second and first end walls respectively;

a housing enclosing said casing, said housing having a top and bottom walls substantially parallel to and spaced from said first and second end walls respectively, front and rear walls, and a pair of side walls, each being substantially parallel to and spaced from a respective one of said pair of opposed casing side walls;

a first baffle plate extending across and substantially perpendicularly to said first casing end wall having one elongate edge sealingly affixed thereto and the other elongate edge sealingly affixed to the top housing wall;

a second baffle plate extending across and substantially perpendicularly to said second casing end wall having one elongate edge sealingly affixed thereto and the other elongate edge sealingly affixed to the bottom housing wall;



a third baffle plate extending across one of said pair of opposed casing side walls having one elongate edge sealingly affixed thereto and the other elongate edge sealingly affixed to the corresponding housing side wall;

a fourth baffle plate extending across the other of said pair of opposed casing side walls having one elongate edge sealingly affixed thereto and the other elongate edge sealingly affixed to the corresponding housing side wall;

said first and third baffle plates defining a first plenum chamber fluidly communicating with the first conduit means entrance opening, said first and fourth baffle plates defining a second plenum chamber fluidly communicating with the second conduit means exit opening, said second and third baffle plates defining a third plenum chamber fluidly communicating with said first conduit means exit opening and said second and fourth baffle plates defining a fourth plenum chamber fluidly communicating with said second conduit means entrance opening;

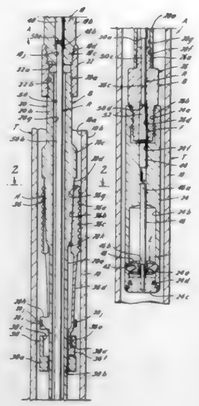
whereby fluid at a first temperature is directed into one of said first or third plenum chambers, into said first conduit means and then into the other of said first or third plenum chambers while fluid at a second temperature is directed into one of said second or fourth plenum chambers, into said second conduit means wherein thermal exchange occurs between said fluids, and then into the other of said second or fourth plenum chambers.

4,042,019

WIRELINE ACTUATED TUBING CUTTER

Jack A. Henning, P.O. Box 158, Refugio, Tex. 78377

Filed Mar. 15, 1976, Ser. No. 666,904
Int. Cl.[2] E21B *29/00*
U.S. Cl. 166—55 **6 Claims**



1. An apparatus adapted to be run into a well on a wireline for explosively cutting tubing, comprising:

explosive cutting means for explosively cutting tubing in a well;

a body member having an upper end and a lower end, said upper end of said body member being connected to the wireline and said lower end of said body member having said explosive cutting means mounted therewith;

settable hanging means movably mounted with said body member above said explosive cutting means for securing said body member with the bore of the tubing prior to detonation of said explosive cutting means, said settable hanging means being set by a downward setting force and released by an upward setting force; and,

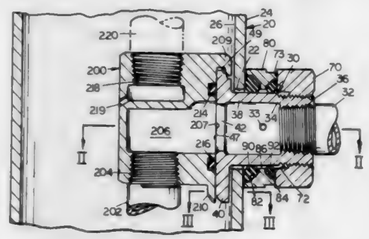
firing means for mechanically firing said explosive cutting means, said firing means mounted with said body member and actuated by the wireline transmitting a downward mechanical detonating force to said firing means to explosively activate said explosive cutting means for severing the tubing in the well.

4,042,020

POSITIVE SEAL PITLESS WELL ADAPTER

William Wellstein, P.O. Box No. 430, Fostoria, Ohio 44830

Filed Feb. 23, 1976, Ser. No. 660,396
Int. Cl.[2] E21B *33/03;* **F16L** *55/00*
U.S. Cl. 166—85 **22 Claims**



1. In a side pipe well casing adapter comprising:

A. a well casing having a radial hole in its side,

B. a hanger member having a nipple portion extending through said hole and having a flange plate means around said hole inside said casing,

C. a first pipe coupled to and extending outwardly from said nipple portion,

D. an elbow member inside said casing having a slide plate means fitting to said flange plate means and sealingly connecting said elbow member to said flange plate means,

E. a vertical track comprising parallel flanges along the parallel vertical side edges of one of said plate means forming a C-shaped horizontal cross-section track opening towards the other of said plate means,

F. a second pipe in said casing connected to the other end of said elbow member, and

G. means on said nipple portion to clamp said flange plate means against the inside of said casing and said nipple in said hole,

the improvement comprising:

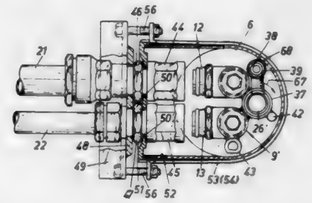
H. a hook means on the top of said slide plate means which extends over the top and behind the upper end of said flange plate means.

4,042,021

CONNECTION BETWEEN WATER TUBES

Bror Ingvar Forsell, Goteborg, Sweden, assignor to RP Rorprodukter AB, Goteborg, Sweden

Filed Apr. 16, 1976, Ser. No. 677,540
Claims priority, application Sweden, May 7, 1975, 7505328; Mar. 29, 1976, 7603739
Int. Cl.[2] E21B *33/03*
U.S. Cl. 166—85 **7 Claims**



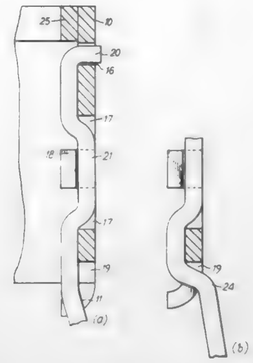
1. In a well having a well casing inserted therein, an improved coupling arrangement for removable interconnection, at a point below ground level of a vertically extending pipe inserted into said well and a pipe leading to a pump, said coupling comprising a coupling head, a lateral passage in said coupling head, said lateral passage being adapted to be connected to the upper end of said vertically extending pipe, a seat connected to said pump pipe and adjacent said lateral passage, said lateral passage being adapted to sealingly abut against said seat, the improvement comprising a lateral connecting branch provided on said coupling head adapted to be connected to said vertically extending pipe, an eccentric mounted on said coupling head for rotation about a vertically extending axis, an actuating rod operably connected to said eccentric to effect turning movement of said eccentric, said actuating rod being adapted to extend vertically through said coupling head and having an upper portion positioned adjacent the ground level for actuation, said eccentric arranged, when turned in one direction, to be urged against an abutment so as to displace said coupling head in the lateral direction until said connecting branch thereon engages in and sealingly abuts against said seat.

4,042,022

DEVICES FOR CENTRALIZING PIPES IN BORINGS

Stephen Francis Edmund Wills, and Henry Edward Pledger, both of Bedford, England, assignors to Weatherford Oil Tool (U.K.) Limited, Norfolk, England

Filed Oct. 6, 1975, Ser. No. 619,859
Claims priority, application United Kingdom, Oct. 8, 1974, 43544/74; Feb. 21, 1975, 7425/75
Int. Cl.[2] E21B *17/10*
U.S. Cl. 166—241 **9 Claims**



1. A centralising device comprising:

a. a plurality of blades each having a bent portion at both ends substantially at right angles to a portion of the blade adjacent the ends;

b. a pair of substantially cylindrical collars adapted to receive and carry the blades and each having at least two parts detachably connected to each other and including a locating slot for receiving each blade end;

c. pairs of deformable metal fixing projections carried on each of said collars and extending inwardly therefrom for securing each of said blades to said collars, whereby when the blades are fitted so as to lie internally of the collars, each bent end portion of said blades fits into one of said locating slots in each of said collars and said projections are deformed so as to lie on the face of said blade portions remote from the collars to thus fix said blade portions to said collars.

4,042,023

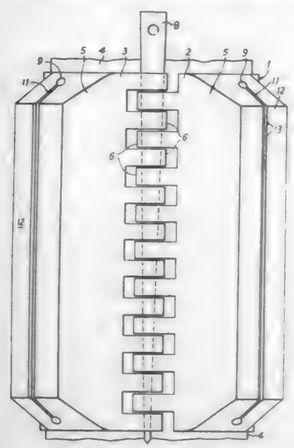
CONTROL LINE PROTECTOR

Roy Kelvin Noel Fox, Great Yarmouth, England, assignor to Weatherford Oil Tool Co., Inc., Houston, Tex.

Filed Sept. 3, 1975, Ser. No. 610,066
Claims priority, application United Kingdom, Sept. 12, 1974, 39784/74
Int. Cl.[2] E21B *17/10*
U.S. Cl. 166—241 **9 Claims**

1. In a positioning device, for insertion in a space between a well lining pipe and flow tubing in said well lining pipe, having a body adapted to seat about said flow tubing, said body having an internal face to abut against the flow tubing and an external face remote from the internal face, the improvement that said

body includes at least one rib of a resiliently deformable material containing a recess which opens at said external face and is



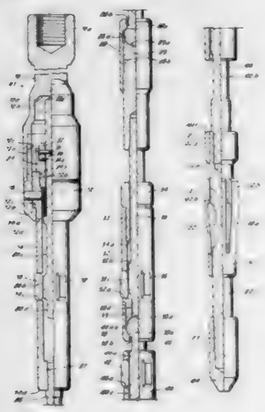
adapted to receive a control line tube by resilient deformation of said portion.

4,042,024

SUBSURFACE WELL APPARATUS HAVING FLEXING MEANS AND METHOD OF USING SAME

James D. Mott, Houston, Tex., assignor to Hydril Company

Division of Ser. No. 580,228, May 23, 1975. This application June 7, 1976, Ser. No. 693,326
Int. Cl.[2] E21B *23/00*
U.S. Cl. 166—243 **3 Claims**



1. A retrieving tool apparatus for retrieving an articulated surface-controlled subsurface safety valve having a flow controlling valve element and a tubular valve operator from a subsurface operating location in a well tubing where the safety valve is operably secured by using through-the-flowline techniques, including:

a retrieving tool body having means for connecting with a through-the-flowline carrier tool for moving the retrieving tool body to and from the subsurface valve operating location in the well, said retrieving tool body movable into the tubular valve operator;

said retrieving tool body having means for releasing the tubular valve operator from the subsurface operating location when said retrieving tool body moves into the tubular valve operator;

means mounted with said retrieving tool body for releasably securing the secured articulated safety valve with the retrieving tool body;

said means for releasably securing also operates the safety valve to release the safety valve from the secured condition and enable movement of the released safety valve with the retrieving tool body from the subsurface operating location; and

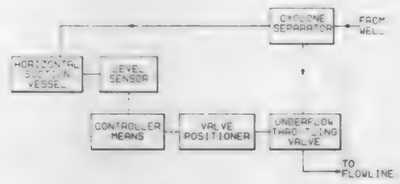
said retrieving tool body having a first body portion and a second body portion and means for connecting said first body portion and said second body portion for enabling limited angular movement of said first body portion relative to said second body portion wherein said retrieving tool body flexes.

4,042,025

HYDRAULIC CONTROL SYSTEM UNDERFLOW VALVE CONTROL METHOD AND APPARATUS

David R. Skinner, Odessa; Miles L. Sowell, and Marvin W. Justus, both of Levelland, all of Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sept. 17, 1976, Ser. No. 724,060
Int. Cl.[2] E21B *43/00*
U.S. Cl. 166—250 **8 Claims**



1. A control system for a well-fluid hydraulic pumping unit of the type wherein an above-ground pump, driven by a substantially constant-speed prime mover, supplies a flow of pressurized fluid, at least some of which is used as power fluid to a downhole hydraulically actuated pump, which downhole pump returns fluid which is at least some of the power fluid together with produced well fluids to the surface, a portion of which return fluid is conditioned and sent to a suction vessel for use as power fluid and wherein the remainder of the return fluid is sent to a flowline as output of the well, said control system comprising:

a. a cyclone separator having an inlet connected to the well, and overflow outlet connected to the suction vessel, and an underflow outlet, said cyclone being sized to have an inlet flow of about 1.05–1.5 times the inlet flow of the power-fluid pump;

b. an underflow throttling valve connected between said cyclone underflow outlet and the flowline;

c. an underflow valve positioner connected to control the position of said underflow valve;

d. level-sensing means to produce a signal indicative of the liquid level in the suction vessel; and

e. controller means connected to receive the level-sensing means signal and having an output connected to said underflow valve positioner, said controller means generating an output signal to adjust the position of the underflow valve to maintain the liquid level in the suction vessel essentially constant.

7. A method for controlling a well-fluid hydraulic pumping unit of the type wherein an above-ground pump is driven by a substantially constant-speed prime mover and takes fluid from a suction vessel and supplies a flow of pressurized fluid, at least some of which is used as power fluid to a downhole hydraulically actuated pump, which downhole pump returns fluid, which is at least some of the power fluid together with produced well fluids to the surface, a portion of which return fluid is conditioned and sent to the suction vessel and wherein the remainder of the return fluid is sent to a flowline as output of the well, and wherein a bleed flow is taken from the suction vessel to the flowline said method comprising:

a. sizing a cyclone separator to have a inlet flow of about 1.05–1.25 times the inlet flow of the power-fluid pump plus the bleed flow from the suction vessel;

b. sensing the liquid level in the suction vessel;

c. a valve between said cyclone underflow outlet and the flowline; and

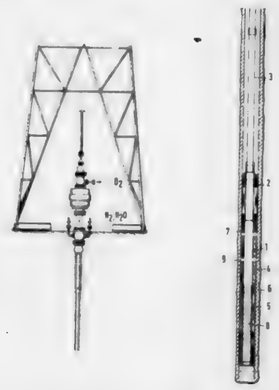
d. adjusting the throttling of said underflow valve as a function of the level in said suction vessel to maintain the level in said suction vessel, whereby the level in the suction vessel, proper flow to the cyclone, and an unplugged underflow from said cyclone are simultaneously maintained.

4,042,026

METHOD FOR INITIATING AN IN-SITU RECOVERY PROCESS BY THE INTRODUCTION OF OXYGEN

Gunter Pusch, Celle; Heinz Jurgen Klatt, Hohne, and Walter Frohlich, Wietze, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Feb. 5, 1976, Ser. No. 655,594
Claims priority, application Germany, Feb. 8, 1975, 2505420
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—258 **15 Claims**



1. A method for starting the operation of a process for the recovery of energy raw materials from a subterranean formation penetrated by a borehole comprising the steps of:

a. introducing into the upper region of said formation igniters known per se,

b. simultaneously introducing into the lower region of said formation an inert gas thereby preventing intrusion of said igniters into said lower region,

c. subsequently introducing a gas with a predetermined oxygen concentration and injection rate into the lower region until ignition occurs and a combustion front is formed as indicated by a corresponding increases in temperature,

d. continuing injection of said gas at said injection rate until the combustion front has been moved a predetermined distance into said formation,

e. increasing said injection rate of said gas and/or oxygen concentration in said gas to a maximum rate and/or concentration respectively,

f. injecting the said gas with the final oxygen concentration through at least one radially arranged outlet opening into the formation with a pressure ratio of flow-in pressure to discharge pressure at the outlet opening of 1.2 to 2.5, and

g. simultaneously injecting water into the upper region of said formation.

4,042,027

RECOVERY OF PETROLEUM FROM VISCOUS ASPHALTIC PETROLEUM CONTAINING FORMATIONS INCLUDING TAR SAND DEPOSITS

Joseph C. Allen, Bellaire, and Charles D. Woodward, Houston, both of Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 344,302, March 23, 1973, abandoned. This application June 24, 1974, Ser. No. 482,044
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—260 **18 Claims**

1. A method for recovering petroleum from a subterranean, porous, permeable formation containing petroleum having a high asphaltic content including tar sand deposits, penetrated by at least one injection well and at least one production well comprising:

a. cooling a low molecular weight paraffinic hydrocarbon solvent having from 2 to 6 carbon atoms to a temperature less than 150° F.;

b. injecting said low molecular weight hydrocarbon into the formation at a pressure at which the hydrocarbon solvent is entirely in the liquid phase into the portion of the formation adjacent the injection well, to precipitate asphaltic materials from the formation petroleum present in the portion of the formation adjacent to the injection well on the sand grains in the portion of the formation adjacent to the injection well;

c. thereafter injecting air into the formation following the solvent injection, and

d. igniting a portion of the formation adjacentthe injection well to initiate an in situ combustion reaction in the portion of the formation contacted by said solvent, said in situ combustion reaction utilizing the precipitated asphaltic material as fuel; and

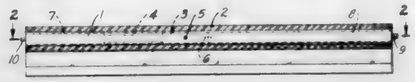
e. recovering petroleum from the formation via the production well.

4,042,028

ADJUSTABLE TUBE SHADE ROLLER

John W. Ennes, 26738 Columbia St., and John P. Ennes, 26374 Liberty Drive, both of Hemet, Calif. 92343

Filed Nov. 28, 1975, Ser. No. 636,109
Int. Cl.[2] A47G *5/02*
U.S. Cl. 160—263 **11 Claims**



1. A window shade roller comprising:

a main body including a tube, the opposite ends of said tube being open, said tube being adapted to have a window shade wound thereon;

a first shaft receivable in said one end of said tube, said first shaft including a motor tip exposed adjacent said one end of said tube;

means for drivingly coupling the first shaft to the tube so that the first shaft and the tube can rotate together;

a second shaft including a shaft tip, said second shaft being received within the other end of said tube with the shaft tip exposed at said other end of said tube;

adjustable means for limiting the innermost axial position of one of the shaft within the tube whereby the length of the window shade roller can be adjusted;

means for limiting the amount the other of the shafts can be inserted into the tube; and

said adjustable means including an insert mounted within said tube and adjustable length means cooperating with the insert to positively limit the innermost axial position of said one shaft within the tube.

4,042,029

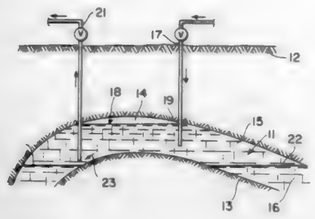
CARBON-DIOXIDE-ASSISTED PRODUCTION FROM EXTENSIVELY FRACTURED RESERVOIRS

Jan Offeringa, Rijswijk, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 571,463, April 25, 1975, abandoned, and Ser. No. 586,106, June 11, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,954

Int. Cl.[2] E21B *43/26*

U.S. Cl. 166—272 **10 Claims**



1. In a process for producing oil from an extensively fractured reservoir in which oil is contained in matrix blocks of relatively low permeability which are surrounded by a network of interconnected fractures of relatively high permeability, the improvement comprising:

treating the reservoir by injecting or producing fluid to the extent necessary to form within the fracture network a substantially gas-filled gas layer which (a) overlies a substantially oil-filled liquid layer, and (b) surrounds a multiplicity of relatively low permeability oil-containing matrix blocks;

injecting fluid which contains or comprises CO_2 in a manner such that gaseous CO_2 flows into the gas layer within the fracture network in an amount sufficient to provide a CO_2 partial pressure of at least about 30% of the total pressure in at least a lower portion of the gas layer;

producing an oil-containing liquid that is substantially free of undissolved gas from within the liquid layer; and

correlating the rates and locations of the injections and productions of fluid so that the interface between the gas and liquid layers is kept at selected depths within the network of fractures while the swollen oil is being displaced into and produced from the network of fractures.

4,042,030

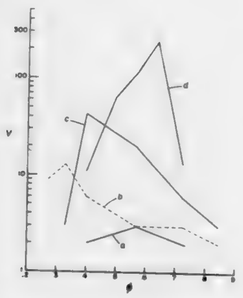
OIL RECOVERY BY VISCOUS WATERFLOODING

Joseph George Savins; Ralph F. Burdyn, and Jerry M. Waite, all of Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,445

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—273 **21 Claims**



1. In a method for the recovery of oil from a subterranean oil reservoir penetrated by spaced injection and production systems wherein an aqueous fluid is introduced into said reservoir via said injection system to displace oil to said production system, the improvement comprising employing as at least a portion of the fluid introduced into said injection system a viscous aqueous fluid having a monovalent salt salinity within the range of 0.8–2.5 weight percent and containing an alkyl aryl sulfonate surfactant having an average molecular weight within the range of 350–500 in a concentration within the range of 0.5–3.0 weight percent and a water-soluble C_4-C_6 aliphatic alcohol having a hydrocarbon chain length of at least 3 carbon atoms in a concentration to provide a ratio ϕ of said sulfonate surfactant to the sum of said sulfonate surfactant and said alcohol within the range of 0.3–0.8.

4,042,031

PLUGGING SUBTERRANEAN EARTH FORMATIONS WITH AQUEOUS EPOXY EMULSIONS CONTAINING FINE SOLID PARTICLES

Randolph H. Knapp, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 631,774, Nov. 13, 1975, Pat. No. 4,000,781, which is a continuation-in-part of Ser. No. 571,195, April 24, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,758

The portion of the term of this patent subsequent to Jan. 4, 1994, has been disclaimed.

Int. Cl.[2] E21B *33/138, 43/04*

U.S. Cl. 166—276 **10 Claims**

1. A process for plugging openings within a region into which fluid can be flowed, comprising:

compounding an oil-phase liquid solution of a polymerizable polyepoxide and a relatively water-soluble tertiary nitrogen-containing amine that is capable of both catalyzing the polyepoxide polymerization and oil-wetting a solid surface;

dispersing the oil-phase liquid solution in an aqueous liquid to form an oil-in-water cationic emulsion which is capable of wetting solid surfaces with a resin-forming solution which will subsequently form a solid resin;

mixing the emulsion with solid particles, which are at least about as finely divided as a silt, and with an aminoalkoxy silane which is capable of enhancing the oil-wetting of the surfaces of those particles with the oil-phase liquid component of the emulsion; and

flowing the resultant fine solids-containing suspension into and keeping it relatively static within the openings to be plugged, until the resin-forming components have formed a solid resin.

4,042,032

METHODS OF CONSOLIDATING INCOMPETENT SUBTERRANEAN FORMATIONS USING AQUEOUS TREATING SOLUTIONS

Buddy W. Anderson, Lafayette, La.; Bobby K. Bowles, Comanche, Okla.; Joseph R. Murphey, Duncan, Okla.; Kenneth D. Totty, Duncan, Okla., and Bill M. Young, Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 367,918, June 7, 1973. This application Oct. 2, 1975, Ser. No. 618,776

Int. Cl.[2] E21B *33/13, 43/04*

U.S. Cl. 166—276 **93 Claims**

1. A method of consolidating loose or incompetent sands in a formation penetrated by a well bore comprising the steps of:

contacting said formation with an aqueous preflush solution to condition said formation for the acceptance of a hardenable organic consolidating fluid capable of coating sand in an aqueous environment;

contacting said formation with said hardenable organic consolidating fluid so that at least a portion of said loose or incompetent sands are coated thereby;

contacting said formation with a spacer solution so that said hardenable organic consolidating fluid is distributed therein; and

causing said consolidating fluid to harden thereby forming a hard permeable mass in said formation.

4,042,033

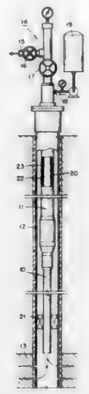
COMBINATION SUBSURFACE SAFETY VALVE AND CHEMICAL INJECTOR VALVE

Warren E. Holland, and Martin E. True, both of Houston, Tex., assignors to Exxon Production Research Company, Houston, Tex.

Filed Oct. 1, 1976, Ser. No. 728,683

Int. Cl.[2] E21B *43/00, 43/12*

U.S. Cl. 166—310 **10 Claims**



1. An apparatus for controlling the flow of fluids through the tubing string of a well and for injecting a chemical fluid into said tubing string which comprises:

a. a pressure responsive, fluid controlled safety valve;

b. pressure responsive injector means for injecting said chemical fluid into said tubing string of said well; and

c. conducting means, connected to said injector means, for supplying said chemical fluid to said injector means, said conducting means also being connected to said safety valve whereby said chemical fluid serves as the pressure control fluid for said safety valve.

4,042,034

METHOD FOR INCREASING THE RECOVERY OF NATURAL GAS FROM A GEO-PRESSURED AQUIFER

Harold L. Cook, Jr., and Ernest C. Geer, both of Houston, Tex., assignors to Transco Energy Company, Houston, Tex.

Continuation-in-part of Ser. No. 589,300, June 23, 1975, abandoned. This application May 24, 1976, Ser. No. 689,622

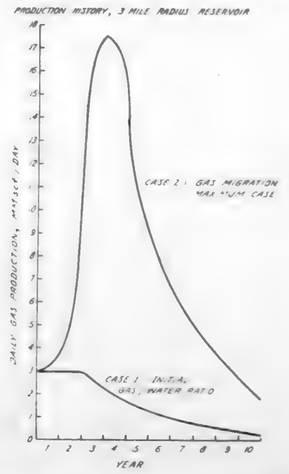
Int. Cl.[2] E21B *43/00*

U.S. Cl. 166—314 **10 Claims**

1. A method of increasing the recovery of natural gas from a geo-pressured aquifer containing water and gas in solution in the water and a zone of free gas dispersed in water comprising,

providing one or more wells extending from the surface and completed in the geo-pressured aquifer in said zone,

allowing the geo-pressured aquifer to flow water and natural gas under aquifer pressure through the well so as to lower the pressure in the aquifer sufficiently to allow a portion of the free gas dispersed in the water and a portion of the gas in solution to be released from the water whereby the



released natural gas will migrate more freely to the well and be produced.

4,042,035

APPARATUS FOR REMOVING, CLEANING AND REPLACING RAILROAD BALLAST

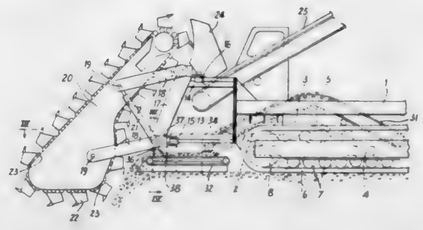
Jean Jacques Boyer, Montchauvet, France, assignor to Societe Anonyme Secmafer, Buchelay, Mantes, France

Filed July 2, 1976, Ser. No. 702,119

Claims priority, application France, July 2, 1975, 75.20742

Int. Cl.[2] E01B *27/08*

U.S. Cl. 171—16 **5 Claims**



1. Apparatus for removing, cleaning and redepositing railroad ballast, comprising a chassis mounted on endless treads, a bucket elevator mounted for horizontal swinging movement about a first vertical axis at the forward end of the chassis, means to receive and clean ballast from the bucket conveyor, and a conveyor belt whose upper run moves forwardly, for redepositing ballast from said cleaning means, means mounting said conveyor belt for horizontal swinging movement about a second vertical axis disposed adjacent the rear of the conveyor belt, the second axis being forward of the first axis, and means interconnecting a forward portion of the conveyor belt for horizontal swinging movement with and relative to said bucket conveyor about a third vertical axis.

4,042,036

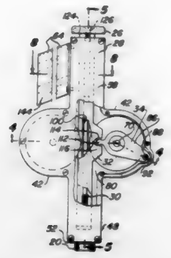
ELECTRIC IMPACT TOOL

James E. Smith, 217 Meadowlook Way, and James D. Cunningham, 2100 Topaz, both of, Boulder, Colo. 80302

Continuation of Ser. No. 403,493, Oct. 4, 1973, abandoned. This application May 23, 1975, Ser. No. 580,246

Int. Cl.[2] B25C *1/06*

U.S. Cl. 173—13 **34 Claims**



23. An impact tool for applying desired impact forces to an impact receiving object comprising:

a housing defining a drive path;

a flywheel having a peripheral edge and mounted on said housing;

means for rotating said flywheel;

elongate ram means having a rear end, an impacting end, and a side, said ram being mounted in said housing for movement toward and away from said impact receiving object from a repose position in which a central portion of said ram side is located immediately adjacent said flywheel peripheral edge and said rear end is spaced apart therefrom, into an impacting position in which said ram rear end is located immediately adjacent said flywheel peripheral edge;

means supporting at least one of the ram means and flywheel for movement relative to the other from normal spaced positions to an operating position with the side of said ram means engaged against the periphery of said flywheel in a tangential manner;

control means for moving said flywheel and ram means into driving engagement to move said ram means along said drive path in a direction toward said impact receiving object to apply a desired impact force thereto;

and retraction means for moving said ram means away from said impact receiving object upon disengagement of said flywheel.

4,042,037

LAWN EDGING DEVICE

William Bede Whiteley, Orange, Australia, assignor to Marie Ellen Whiteley, Orange, Australia

Filed Nov. 25, 1975, Ser. No. 635,485

Claims priority, application Australia, Dec. 3, 1974, 1861/74; May 5, 1975, 1483/75

Int. Cl.[2] A01B *35/26, 1/00*

U.S. Cl. 172—13 **2 Claims**

1. A lawn edging device comprising an elongated shank having a handle portion disposed at one end thereof, a planar cutting member having a sharpened lowermost cutting edge, and an upright straight edge fixed to the other end of the shank so that said cutting member extends from the shank in only a first direction, a footrest bar extending from the lower end of the shank at right angles to said first direction, an elongate member pivotally connected at one end thereof to the opposite side of said shank from said cutting member, and spring means connecting said elongate member to a point adjacent said other



end of said shank and normally biasing said elongate member towards said shank.

4,042,038

ROTARY HARROWS WITH SUPPORTING MEMBER POSITIONED TO PROTECT SOIL WORKING MEMBERS

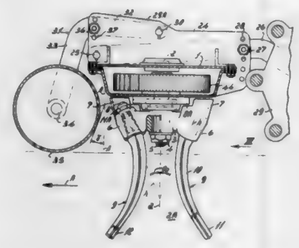
Cornelis van der Lely, Zug, Switzerland

Filed Feb. 27, 1975, Ser. No. 553,607

Claims priority, application Netherlands, Mar. 1, 1974, 7402786

Int. Cl.[2] A01B *33/06, 49/02*

U.S. Cl. 172—59 **21 Claims**



18. A rotary harrow comprising an elongated hollow frame portion and a plurality of rotatable soil working members supported on that portion, said soil working members being rotatable about upwardly extending axes positioned in a row that extends transverse to the normal direction of travel and being journalled in said frame portion, an elongated ground engaging supporting member being connected to said frame portion and being located immediately in front of said row of soil working members with respect to the direction of travel of the harrow, said supporting member extending for substantially the entire working width of said row and having a cross-section, the greatest dimension of which extends substantially parallel to the direction of travel, said soil working members comprising supports with depending tines fastened to those supports, said supporting member having an external circumference surface that, in part, faces immediately adjacent connections between said supports and their corresponding tines, said supporting member being positioned to press on the soil in advance of the soil working members and protect said members and frame portion during travel and said circumference surface part extending downwardly and away from the soil working member supports, whereby the distances between that part and the supports increases towards the soil, the rearmost portion of the circumference surface of said supporting member being located substantially directly beneath the frame

portion and adjacent same, said rearmost portion being in general horizontal alignment with the upper portions of said soil working members.

4,042,039

ROTARY HARROWS

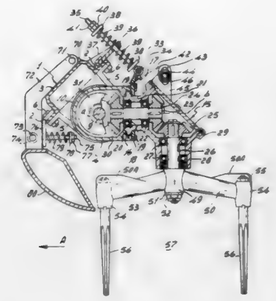
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Aug. 28, 1975, Ser. No. 608,564

Claims priority, application Netherlands, Sept. 3, 1974, 7411643

Int. Cl.[2] A01B *33/06, 33/14*

U.S. Cl. 172—59 **67 Claims**



1. A rotary harrow comprising a frame having an elongated frame portion, said portion extending transverse to the normal direction of travel of said harrow, a plurality of soil-working members being mounted side by side and being rotatable about upwardly extending axes defined by corresponding shafts supported on said portion, driving means connected to rotate said shafts and the shafts of adjacent soil-working members being rotated in relative opposite directions, each soil-working member comprising support means having downwardly extending tines and the tines of said members being rotatable about said shafts to work adjoining circular paths, the diameter of the circle defining each path substantially equalling or exceeding the distance between the axes of rotation of two adjacent soil-working members, at least some of said soil-working members being pivotable with repect to adjacent soil-working members about respective pivot axes that extend transverse to the direction of travel, each pivotable soil-working member being displaceable as a unit with respect to an adjacent member responsive to contact with obstacles in and on the ground.

4,042,040

CULTIVATORS

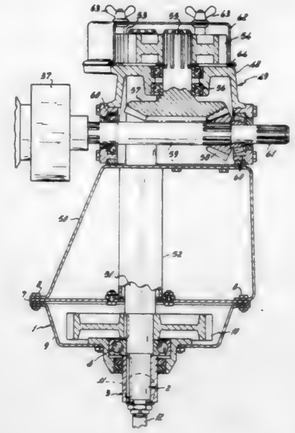
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Division of Ser. No. 450,738, March 13, 1974, Pat. No. 3,971,445, which is a continuation of Ser. No. 233,113, March 9, 1972, abandoned. This application May 11, 1976, Ser. No. 685,361

Int. Cl.[2] A01B *33/06, 33/08*

U.S. Cl. 172—59 **4 Claims**

1. A cultivator comprising a row of soil working members that are rotatable about upwardly extending axes defined by corresponding shafts, said shafts each having a pinion, the teeth of which are in mesh with neighboring pinions, at least one shaft of a soil working member being drivenly connected to an input shaft that is connectable to the p.t.o. of a prime mover and said one shaft being connected to said input shaft through a transmission mechanism, said mechanism comprising an upwardly extending transmission shaft and an extension of said one upwardly extending shaft, and transmission shaft and extension extending substantially parallel to one another and having respective pinion gears at their upper ends, said gears being in engagement with one another and having different numbers of teeth whereby the gears are exchangeable with one another to vary the speed of rotation of said soil working members, pinion gears being located at the top of said mechanism and being rotated about upwardly extending axes during



operation, said upwardly extending shaft extension being positioned in front of said transmission shaft with respect to the direction of cultivator travel.

4,042,041

ROTARY HARROWS

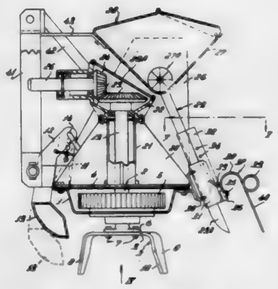
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Continuation of Ser. No. 504,076, Sept. 9, 1974, abandoned, which is a division of Ser. No. 312,882, Dec. 7, 1972, abandoned. This application Mar. 27, 1975, Ser. No. 562,415

Claims priority, application Netherlands, Dec. 8, 1971, 7116820

Int. Cl.[2] A01B *33/06*

U.S. Cl. 172—70 **5 Claims**



1. A rotary harrow comprising a frame with coupling means at the front thereof for attaching the harrow to a prime mover, an elongated portion of said frame extending transverse to the direction of travel and a plurality of soil-working members rotatably mounted on upwardly extending shafts supported on said transverse frame portion, drive means connected to said shafts and said soil-working members being rotatable by said drive means, an elongated ground engaging member being positioned in front of said soil-working member and extending for substantially the entire working width of said harrow, said ground engaging member being pivoted to said frame and deflectable against resilient opposition in a forward direction, said member being pivotable about an axis that extends substantially horizontally and perpendicular to the direction of travel, said axis being located substantially in vertical alignment with said ground engaging member.

4,042,042

SOIL CULTIVATING MACHINES

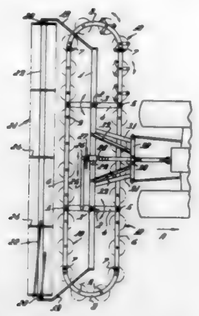
Cornelis van der Lely, 73 Bruschenrain, Zug, Switzerland

Filed Sept. 16, 1975, Ser. No. 613,885

Claims priority, application Netherlands, Sept. 16, 1974, 7412227

Int. Cl.[2] A61B *19/06*

U.S. Cl. 172—91 **10 Claims**



6. A soil cultivating machine comprising a frame with two elongated transverse beams, including a forward beam and a rear beam, said beams extending substantially horizontal and being spaced apart from one another with respect to the direction of normal travel of the machine, driving means connected to move said beams back and forth about substantially vertical axes and in directions transverse to said direction of travel, each beam supporting a plurality of cultivating members mounted along the length thereof and each beam having outer ends, the adjacent outer ends of the forward and rear beams being linked to one another by respective coupling members and further cultivating members being mounted along the lengths of said coupling members, said coupling members being supported by said beams and defining working sides of the machine, said coupling members being moved back and forth by the movements of said beams during operation.

4,042,043

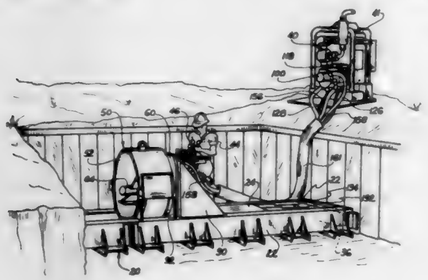
PORTABLE EARTH BORING MACHINE

William S. Appleman, Ashland, Ohio, assignor to The Richmond Manufacturing Company, Ashland, Ohio

Continuation of Ser. No. 455,254, March 27, 1974, abandoned. This application July 2, 1975, Ser. No. 592,791

Int. Cl.[2] E21D *9/02;* **E02D** *7/28*

U.S. Cl. 173—152 **2 Claims**



1. An earth boring apparatus for drilling holes and pushing casing sections therein, said apparatus comprising, in combination, track means; casing pusher means on said track means for engaging the rear end of a casing section; pushing cylinder means for moving said casing pusher means along said track means and including an extension chamber and a retraction chamber; auxiliary frame means for disposition at a location remote from said main frame means; an engine mounted on said auxiliary frame means; pump means driven by said engine for delivering pressurized fluid to said pushing cylinder means; conduit means connecting said pushing cylinder means with said pump means; control means including a directional valve means in the flow of pressurized fluid from said pump means to said pushing cylinder means, said directional valve means including a "closed center" position for isolating both of said chambers from said flow, an "extension" position for pressurizing said extension chamber and draining said retraction chamber, and a "retract" position for pressurizing said retraction chamber and draining said extension chamber; volumetric flow varying controller in said control means and including a "low flow" position for delivering a relatively low volumetric flow from said pump means to said pushing cylinder means and a "high flow" position for delivering a relatively high volumetric flow from said pump means to said pushing cylinder means; a first manual actuator for said control means for selectively positioning said directional valve means in said "center", "extension", and "retraction" positions; a second manual actuator for said control means for selectively positioning said volumetric flow varying valve means in said "low flow" and "high flow" positions and variable flow control means in the flow of pressurized fluid from said pump means to said directional controller, said pump means including a first pump for delivering a first flow of pressurized fluid to said directional valve means, and a second pump for delivering a second flow of pressurized fluid to said volumetric flow varying controller.

4,042,044

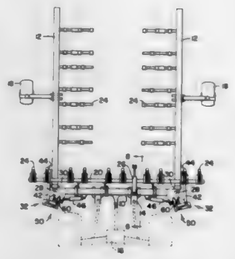
REAR FOLDING IMPLEMENT

Darrel Lee Honnold, Winterset, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Apr. 12, 1976, Ser. No. 675,813

Int. Cl.[2] A01B *65/02*

U.S. Cl. 172—311 **25 Claims**



23. A folding implement comprising: elongated beams extending in a transversely aligned disposition; a vertical hinge connecting the adjacent ends together to permit said beams to swing between an extended position in which the beams are transversely aligned and a rearward folded position in which one beam trails in a fore-and-aft disposition with respect to the other; elevating means on one of the beams; a toolbar offset rearwardly from the beams and carried on said elevating means, said toolbar extending transversely beyond said hinge to an overlapping end portion behind the adjacent beam; transversely spaced rearwardly extending tools mounted on the aforesaid adjacent beam to said overlapping end portion, and on the toolbar along its length; and power means on the beam with said elevating means for rocking the toolbar and the tools mounted thereon so that the latter project upwardly and at a level above the tools on the aforesaid adjacent beam to thereby permit said beams to move to and from their folded positions without creating interference between the tools.

4,042,045

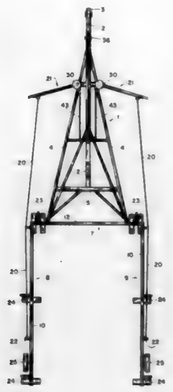
MULTIPLE SECTION FARM IMPLEMENT WITH BIASED SWINGING ARM STRUCTURE FOR ATTACHING REINFORCING MEMBER TO MAIN FRAME

Kenneth A. Hake, Tipton, Kans., assignor to Kent Manufacturing Co., Inc., Tipton, Kans.

Filed June 23, 1975, Ser. No. 589,127

Int. Cl.[2] A01B *73/00*

U.S. Cl. 172—311 **12 Claims**



1. In a multiple section farm implement having a main frame and a wing frame which is rearwardly foldable from an operating configuration to a transporting configuration, and vice versa, said wing frame being adapted for mounting of soil conditioning members thereon and having elongated, flexible reinforcing members attached thereto which extend to said main frame, the improvement for attaching said reinforcing members to said main frame, comprising:

a. swinging arm members each having an inner end thereof pivotally attached to the main frame, and an outer end thereof attached to one end of one of said reinforcing members at a point of connection; said arms rotating laterally of said main frame along a normally substantially horizontal plane; said arm members being pivoted forwardly wherein each point of connection is disposed adjacent to said main frame in an operating configuration, and being pivoted rearwardly wherein each point of connection is spaced apart from said main frame in a transporting configuration;

b. biasing means whereby rearward pivoting of said arm members is partially resisted during folding of the wing frame to a transporting configuration, and whereby each arm member point of connection is urged to pivot forwardly to a position adjacent to said main frame when said wing frame is folded to an operating configuration; and

c. latching means whereby said arm members are latched in said operating configuration and unlatched for pivoting each reinforcing member point of connection outwardly of said main frame during the folding of said wing frame to said transporting configuration.

4,042,046

DIRECTIONAL CONTROL MECHANISM FOR UNDERGROUND DRIVEN PIPES AND CONDUITS

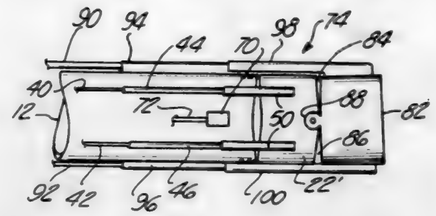
Anastasio Capoccia, Wixom, Mich., assignor to The Richmond Manufacturing Company, Ashland, Ohio

Filed Mar. 27, 1974, Ser. No. 455,188

Int. Cl.[2] E21B *7/04*

U.S. Cl. 175—73 **1 Claim**

1. A mechanism for controlling the direction of movement of a pipe being driven underground generally along a horizontal path, and wherein a mechanical device is employed at the rear end of the pipe to forcibly drive the pipe along the path, said mechanism comprising: a pipe; an auger means mounted coaxially within the pipe for removing earth in the path of the movement of the pipe; a cylindrical head pivotally mounted to the forward end of the pipe, said cylindrical head being pivotable independently of said auger means; control means for inclining said cylindrical head with respect to the longitudinal axis of said pipe, the movement of said cylindrical head being inclined independently with respect to said auger means; a



second cylindrical head pivotally carried by the forward end of said first mentioned cylindrical head for pivotal movement in a direction transverse to the direction of pivotal movement of said first mentioned cylindrical head and independently of said first mentioned cylindrical head to control the direction and movement of said pipe independently of said first head; second control means carried by said second head and extendable rearwardly of said pipe; and means for moving said second control means axially with respect to the longitudinal axis of said pipe for controlling the amount of inclination of said second cylindrical head with respect to said pipe axis.

4,042,047

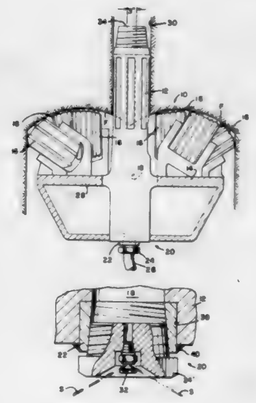
RAISE BORING HEAD HAVING FLUID TRAVERSING MEANS

Charles R. Dively, and Russell K. Peterson, both of Seattle, Wash., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 619,655, Oct. 6, 1975, abandoned. This application Nov. 11, 1976, Ser. No. 740,839

Int. Cl.[2] E21B *9/08*

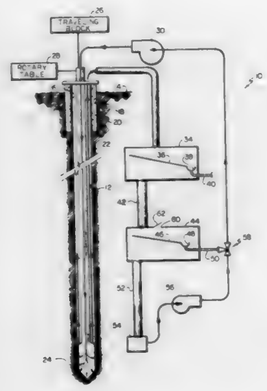
U.S. Cl. 175—340 **5 Claims**



1. A raise boring head having cuttings dust suppression means, comprising:

a passageway, formed in and traversing said raise boring head, for conducting a liquid, such as water, therethrough;
said raise boring head comprising a platform having a first, uppermost surface for mounting earth cutters thereto;
said platform also having a second, lowermost surface; wherein
said passageway has an outlet opening substantially centrally of said second surface; and including
means fixed in said outlet for discharging liquid therethrough in a conical-form spray pattern, to cause outlet-discharged liquid to form a dust-intercepting curtain and to impinge on, and wet down, raise bore walls.

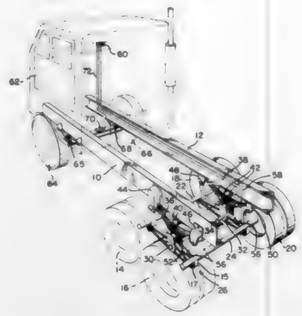
4,042,048
DRILLING TECHNIQUE
Willie Carl Schwabe, 5925 Killarney, Corpus Christi, Tex. 78412
Filed Oct. 22, 1976, Ser. No. 734,884
Int. Cl.² E21B 7/16
U.S. Cl. 175—380 **7 Claims**



1. Apparatus for shot drilling a well bore, comprising:
a hollow drill head having
an inlet section for receiving a drilling fluid-shot mixture; and
a bottom having a multiplicity of shoulders of generally tapered configuration providing a radially outermost apex extending away from the bottom center and defining a groove between adjacent shoulders, and a multiplicity of shot conducting passages opening through the shoulders at a location spaced radially inward of the shoulder apex providing communication between the drill head interior and each of the grooves for introducing shot between the drill head bottom and the well bore bottom.

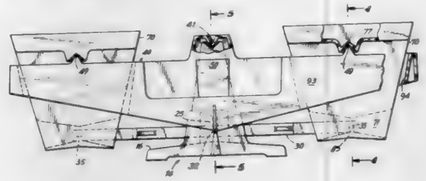
4,042,049
VEHICLE LOAD MEASURING SYSTEM
Keith W. Reichow, Renton; David C. English, Seattle, and Jerry L. McCauley, Renton, all of Wash., assignors to Structural Instrumentation, Inc., Tukwila, Wash.
Filed Sept. 29, 1975, Ser. No. 615,827
Int. Cl.² G01G 19/08, 3/14; G01B 7/16
U.S. Cl. 177—137 **24 Claims**

1. In a vehicle suspension having tandem wheels supported by forward and rear axles, an equalizing beam positioned at both sides of said vehicle, said equalizing beams having their forward ends connected with the forward axle, their rear ends connected with the rearward axle, and their midpoints pivotally supporting the frame of said vehicle, the improvement comprising a vehicle load monitor having a pair of transducer means operatively associated with respective of said equalizing



beams for indicating the deflection of such beams responsive to the weight of said vehicle.

4,042,050
BALANCE BEAM SCALE
Earl D. Myers, Scotch Plains, N.J., assignor to Ohaus Scale Corporation, Florham Park, N.J.
Filed Apr. 7, 1976, Ser. No. 674,509
Int. Cl.² G01G 21/24, 21/22
U.S. Cl. 177—198 **17 Claims**

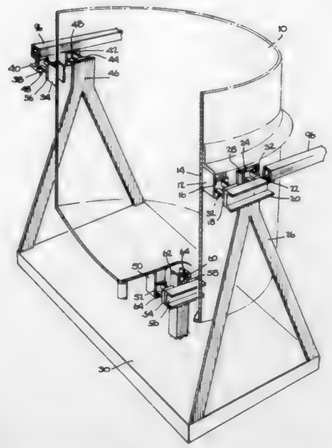


1. A balance beam scale which comprises:
a. a support member;
b. a balance beam pivotally mounted on said support member;
c. two weighing buckets, each of said buckets being pivotally mounted on a respective end of said balance beam, each of said buckets being open at the top for receiving therein an article to be weighed, the bottom of each of the said buckets being below the upper surface of said balance beam; and
d. a check lever pivotally secured to said buckets, adjacent to the bottom of said buckets.

4,042,051
FLEXIBLY MOUNTED CONTAINER SYSTEM
Ronald J. Ricciardi, 108 Malcolm Drive, Garfield, N.J. 07026
Continuation-in-part of Ser. No. 498,124, Aug. 16, 1974, abandoned. This application Apr. 16, 1975, Ser. No. 568,551
Int. Cl.² G01G 21/24; F16C 11/12
U.S. Cl. 177—255 **15 Claims**

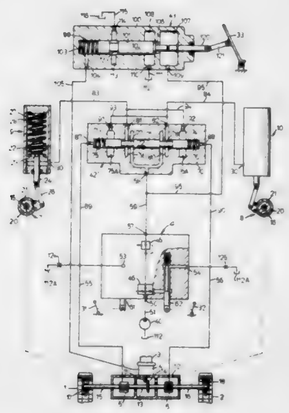
1. A flexibly mounted container system comprising a container, a mounting bracket fixedly mounted on said container, a first flange-like element fixedly mounted on said mounting bracket, a second flange-like element disposed in spaced parallel relationship with respect to said first flange-like element, a linking member fixedly mounted on said second flange-like element, a third flange-like element fixedly mounted on said linking member, a fourth flange-like element disposed in spaced, parallel relationship with respect to said third flange-like element, a support frame fixedly mounted on said fourth flange-like element, and a plurality of elongated resilient cross-members extending perpendicular to and interconnecting said

first and second and said third and fourth flange-like elements respectively, the cross-sectional area of said cross-members on any plane parallel to their respective flange-like elements col-



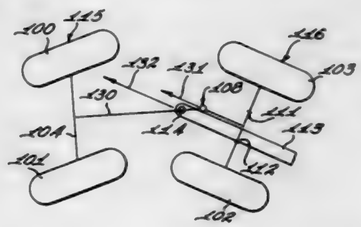
lectively being symmetrically disposed about a pivot axis extending perpendicular to their respective flange-like elements, and means for continuously detecting the movement of said container to determine the change in weight contained therein.

4,042,052
STEERING CLUTCH AND SINGLE PEDAL BRAKE CONTROL SYSTEM FOR CRAWLER TRACTOR
George Paul Koch, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.
Filed Dec. 15, 1975, Ser. No. 640,753
Int. Cl.² B62D 11/08
U.S. Cl. 180—6.7 **7 Claims**



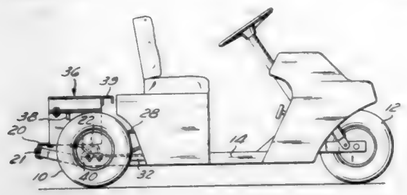
1. In a vehicle
an engine-driven transmission;
a pair of ground engaging drive means;
a pair of fluid actuated steering clutches for transmitting motive power from said transmission to said drive means;
a pair of brakes for said drive means;
a pair of hydraulic actuators for operating said brakes;
a pair of steering levers for said clutches;
a single brake pedal for said brakes;
a source of pressurized fluid;
and control means responsive to operation of said steering levers and said brake pedal to effect automatic application of both brakes if both steering levers are simultaneously operated to disengage both steering clutches when said single brake pedal is actuated,
and to effect application of one brake for one track if one steering lever is operated to disengage one steering clutch for said one track when said single brake pedal is actuated; said control means comprising steering valve means actuatable by said steering levers to operate said steering clutches by controlling fluid flow thereto from said source, brake valve means actuatable by said single brake pedal to operate said brakes and shuttle valve means responsive to fluid pressure in each of said steering clutches and further responsive to actuation of said brake valve to control fluid flow to and from said brake actuators.

4,042,053
FOUR-WHEEL DRIVE TRACTOR
Gerald E. Steren, Greendale, Wis., and Earl C. Musser, Madison, Ind., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.
Continuation-in-part of Ser. No. 536,089, Dec. 24, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,840
Int. Cl.² B60D 1/14; B60K 17/30, 17/32
U.S. Cl. 180—51 **12 Claims**



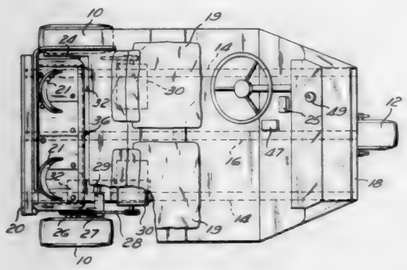
1. A four-wheel drive tractor comprising a chassis including a front frame and rear frame, a drawbar for applying a draft load, means pivotally connecting said drawbar to and carrying the draft load on said front frame of said chassis, an engine supported on the front frame of said chassis, an axle pivotally supporting the front frame of said chassis, front steerable drive wheels rotatably supporting said front axle and pivotal relative to said front axle for front-end steering, front wheel steering mechanism for steering the front wheels, a rear axle supporting said rear frame of said chassis, a pair of rear drive wheels rotatably supporting said rear axle, an articulating joint including vertically spaced pivotal bearings pivotally connecting said front frame which said rear frame of said chassis, an articulating steering mechanism for articulation of said front and rear frames, front wheel manual steering control means for steering said front wheels through said front wheel steering mechanism and rear wheel manual steering control means for steering said rear wheels of said tractor through said articulating steering mechanism, said front frame and said rear frame defining lenght ratios of approximately 3 to 1 with lengths from the center line of the articulating joint to the center line of the front axle relative to the center line of the articulating joint to the center line of the rear axle, means defining an operator station on said front frame of said chassis for operating said tractor.

4,042,054
VEHICLE AND BATTERY PACK
Eugene T. Ward, 5791 Wilson Mills Road, Highland Heights, Ohio 44143
Filed Dec. 18, 1975, Ser. No. 642,133
Int. Cl.[2] B60L *11/18*
U.S. Cl. 180—60 8 Claims



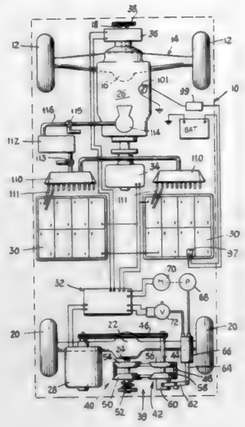
1. In an electrically driven vehicle, a unitary non-articulated chassis frame carrying a pair of drive wheels in the rear and steerable wheel means in the front, a rear axle, each drive wheel being mounted at its own end of the axle and being independently driven by its own motor and power linkage with no mechanical differential or other protuberance projecting upwardly from the center of the axle, a battery pack capable of ready removal and replacement and supported, in said absence of projection of any protuberance, immediately over the axle and removable rearwardly thereof, the battery pack being supported between the drive wheels and between the output ends of said power linkages, the weight of the battery pack being transmitted directly downwardly to the axle and thence to each wheel.

4,042,055
BATTERY POWERED VEHICLE AND DRIVE SYSTEM
Eugene T. Ward, 5791 Wilson Mills Road, Highland Heights, Ohio 44143
Filed Dec. 18, 1975, Ser. No. 642,135
Int. Cl.[2] B60L *11/18*
U.S. Cl. 180—60 4 Claims



1. In an electrically driven vehicle, driving wheel means carrying one end of the vehicle, steerable wheel means carrying the other end of the vehicle, the driving wheel means and the steerable wheel means being mounted together on a non-articulated unitary vehicle chassis, whereby the driving wheel means and the steerable wheel means share the weight of the vehicle without intervening chassis articulation between the driving wheel means and the steerable wheel means, the majority of the weight being on the driving wheel means but a substantial portion of the weight being on the steerable wheel means, the driving wheel means comprising a pair of drive wheels each with its own direct current motor drive, a non-rotating springing rear axle, each drive wheel being rotatably mounted at its own end of the axle, the motor drive for each wheel being mounted to maintain driving engagement with the rotatable mounting of the wheel during springing of the axle, switch means for alternatively connecting the motor drives to a power source in series or in parallel to provide respectively conditions of unlimited rotational slip and limited rotational slip between the drive wheels during power application.

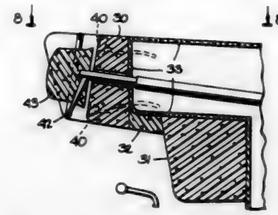
4,042,056
HYBRID POWERED AUTOMOBILE
Elwood R. Horwinski, Cheshire, Conn., assignor to Automobile Corporation of America, New Haven, Conn.
Filed Nov. 21, 1975, Ser. No. 634,263
Int. Cl.[2] B60L *11/12, 11/14*
U.S. Cl. 180—65 A 6 Claims



1. A hybrid powered automobile, comprising in combination:
a. a vehicle having wheels,
b. electric storage batteries,
c. an internal combustion engine,
d. an electric generator driven by said engine and connected to charge said batteries,
e. means including a clutch, providing a drive from the engine to wheels of the vehicle,
f. an electric drive motor,
g. means for energizing the drive motor from the batteries,
h. a variable-ratio mechanical transmission between the drive motor and other wheels of the vehicle, for imparting an electrical drive to the latter, and
i. automatic power means responsive to variation in the current drawn by, and consequently the loading of, the drive motor for altering the ratio of the mechanical transmission according to the load the vehicle imposes on said motor.

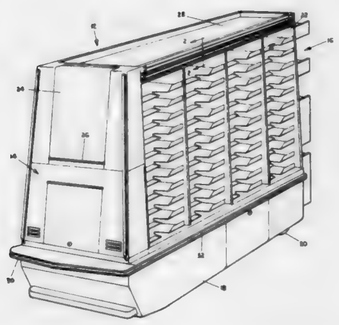
4,042,057
MOTOR VEHICLE INJURY AND DAMAGE PREVENTION SYSTEM
Addison S. Beckley, 48 Baltusrol Way, Short Hills, N.J. 07078
Continuation of Ser. No. 440,000, Feb. 6, 1974, abandoned, which is a division of Ser. No. 117,583, Feb. 22, 1971, Pat. No. 3,802,727, and a continuation-in-part of Ser. No. 35,720, May 8, 1970, Pat. No. 3,702,711. This application Dec. 23, 1975, Ser. No. 643,816
Int. Cl.[2] B60K *37/00*
U.S. Cl. 180—90 3 Claims

1. A motor vehicle capable of protecting passengers during frontal collisions comprising a vehicle body having a front windshield, an upwardly and rearwardly extending hood terminating inwardly of said windshield in a pad biasing top edge and an upper semi-rigid substantially vertical bracing wall, a lower semi-rigid substantially vertical bracing wall spaced forwardly of and lower than said upper bracing wall, a front passenger compartment with seat means for front seat occupants providing a normal leg position, chest position and knees position of the occupants, a first massive pad of shock-absorbing material disposed across the front of the passenger compartment rearwardly of the windshield and with its upper surface braced against said biasing top edge and said upper bracing wall and being at least as high as the occupant's normal chest position and with its lower surface above the occupant's normal knee positions, and a second massive pad of shock-absorbing material disposed across said passenger compartment below and forward of said first-named pad and having a



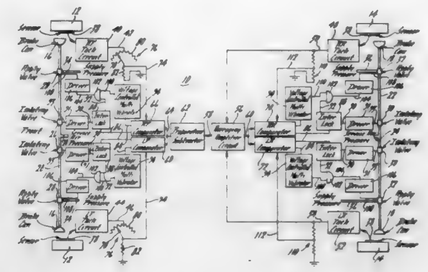
substantially vertical knee bracing face opposite to the occupant's leg position extending considerably above the knee position but below said first massive pad and braced adjacent said lower bracing wall, said pads being so shaped and placed that in combination they engage and brace both the upper body and legs simultaneously absorbing the kinetic energy of upper and lower portions, respectively, of bodies of front seat occupants as they are thrown forward and decelerated during a collision and reducing the likelihood of such occupants being thrown against or through a windshield.

4,042,058
EASILY ACCESSIBLE SWITCHES FOR MANUAL CONTROL OF AN AUTOMATICALLY CONTROLLED VEHICLE
Jack A. Cooper, Grand Rapids, Mich., assignor to Lear Siegler, Inc., Santa Monica, Calif.
Filed Dec. 18, 1975, Ser. No. 641,989
Int. Cl.[2] B60K *26/02*
U.S. Cl. 180—98 7 Claims



1. In a vehicle having a front end, back end and opposite sides, and which is driven in a back to front direction automatically along a preselected path, and which includes first switch means for arresting the movement of the vehicle along the path and a second switch means for restarting the vehicle along the path, the improvement which comprises:
said first switch means comprising a manually operable elongated switch element extending substantially the length of a side of the vehicle, said switch element having contacts which close said first switch means when pressure is applied to any portion of said switch element; the elongated switch element extending substantially horizontally along a top portion of the side of the vehicle; said elongated element protrudes from a plane of the side of the vehicle; and the second switch means comprising a second manually operable elongated switch element which closes when manual pressure is applied thereto at any point along its length, the second elongated switch being positioned alongside the first switch element means elongated switch element and extending substantially the length of a side of the vehicle.

4,042,059
ANTI-SPIN CONTROL SYSTEM
Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Company, Romulus, Mich.
Continuation-in-part of Ser. No. 362,334, May 21, 1973, abandoned. This application July 14, 1975, Ser. No. 595,566
Int. Cl.[2] B60T *8/18, 8/24*
U.S. Cl. 180—103 R 28 Claims



1. A spin control system for a steerable vehicle having first and second wheels which are driven at least under predetermined conditions and are steerable through varying angles of steering and which are disposed on laterally opposed sides of said vehicle so that an inside one of said wheels is disposed closer to the center of turning of said vehicle during steering in one direction than the other of said wheels comprising:
means for generating a signal representative of the speed of said inside wheel;
means for generating a reference signal;
compensating means for adjusting the value of said wheel speed signal in accordance with the steering angle of said inside steerable wheel so that, absent a spin condition at said inside steerable wheel, the output of said compensating means at the 0° steering angle position defines a first signal value and for turns in said one direction from a straight course, the value of the output signal from said compensating means is greater than said first signal value when the turning radius of said inside steerable wheel is less than the average turning radius of said vehicle, is equal to said first signal value when the turning radius of said inside steerable wheel is equal to the average turning radius of said vehicle, and is less than said first signal value when the turning radius of said inside steerable wheel is greater than the average turning radius of said vehicle; and
means for comparing said adjusted wheel speed signal and said reference signal for providing a spin signal.

7. A spin control system for a steerable vehicle having first and second wheels which are driven at least under predetermined conditions and are steerable through varying angles of steering and which are disposed on laterally opposed sides of said vehicle so that an inside one of said wheels is disposed closer to the center of turning of said vehicle during steering in one direction than the other of said wheels comprising:
means for generating a signal representative of the speed of said inside wheel;
means for generating a reference signal;
compensating means for adjusting the value of said reference

signal in accordance with the steering angle of said inside steerable wheel so that, absent a spin condition at said inside steerable wheel, the output of said compensating means at the 0° steering angle position defines a first signal value and for turns in said one direction from a straight course, the value of the output signal from said compensating means is less than said first signal value when the turning radius of said inside steerable wheel is less than the average turning radius of said vehicle, is equal to said first signal value when the turning radius of said inside steerable wheel is equal to the average turning radius of said vehicle, and is greater than said first signal value when the turning radius of said inside steerable wheel is greater than the average turning radius of said vehicle; and

means for comparing said wheel speed signal and said adjusted reference signal for providing a spin signal.

13. A spin control system for a steerable vehicle having first and second wheels which are driven at least under predetermined conditions and are steerable through varying angles of steering and which are disposed on laterally opposed sides of said vehicle so that an inside one of said wheels is disposed closer to the center of turning of said vehicle during steering in one direction than the other of said wheels comprising:

means for generating a signal representative of the speed of said inside wheel;

means for generating a reference signal;

means for comparing said wheel speed signal and said reference signal for providing a spin signal; and

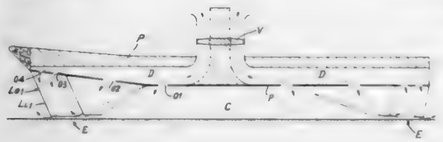
compensating means for adjusting the value of said spin signal in accordance with the steering angle of said inside steerable wheel so that, absent a spin condition at said inside steerable wheel, the output of said compensating means at the 0° steering angle position defines a first signal value and for turns in said one direction from a straight course, the value of the output signal from said compensating means is greater than said first signal value when the turning radius of said inside steerable wheel is less than the average turning radius of said vehicle, is equal to said first signal value when the turning radius of said inside steerable wheel is equal to the average turning radius of said vehicle, and is less than said first signal value when the turning radius of said inside steerable wheel is greater than the average turning radius of said vehicle.

4,042,060

AIR-LIFT VEHICLES

Jean Henri Bertin, Neuilly S. Seine; Paul Guienne, La Celle St. Cloud, and Andre Lafont, Paris, all of France, assignors to Bertin & Cie, Plaisir and Societe d'Etudes et de Developpement des Aeroglisseurs Marins, Terrestres et Amphibies S.E.D.A.M., Paris, both of, France

Filed July 23, 1975, Ser. No. 598,530
Claims priority, application France, Aug. 5, 1974, 74.27139
Int. Cl.² B60V *1/16*
U.S. Cl. 180—127 **4 Claims**



1. An air lift vehicle comprising:

a platform,

an inner multilobed skirt depending from said platform and defining a central air cushion region,

an outer multilobed skirt surrounding said inner skirt, each lobe of said outer skirt being paired with one of the lobes of said inner skirt to define a crescent-shaped compartment between them, said crescent-shaped compartment being completely formed by said pair of lobes,

means carried by said platform for providing air under pressure to the central air cushion region and to the crescent-shaped compartments,

each of said lobes being formed by a blank of flexible material bent to define an arcuate central portion and substantially planar side portions, each two adjacent lobes of each skirt being arranged with their arcuate central portions substantially tangent to each other and their adjacent side portions in face-to-face contact,

the lower edge of the arcuate central portion of each outer skirt lobe being horizontal and arranged in the same horizontal plane as the lower edges of the arcuate central portions of all the other outer skirt lobes, and

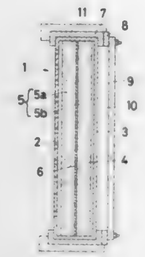
the outer generatrix of each lobe forming an angle α with the vertical, re-entrant from top to bottom, the angle varying according to the location of the lobe on the vehicle and decreasing in magnitude from the front to the rear of the vehicle.

4,042,061

CELL-BOX-TYPE NOISE BARRIER HAVING LARGE MAGNITUDE OF TRANSMISSION LOSS AND NOISE INSULATING METHOD

Norio Murakami, Kawasaki, Japan, assignor to Showa Koji K. K., Kawasaki, Japan

Filed Mar. 9, 1976, Ser. No. 665,230
Claims priority, application Japan, July 12, 1975, 50-84926
Int. Cl.² E04B *1/86*; G10K *11/04*
U.S. Cl. 181—33 HE **6 Claims**



1. A cell-box-type noise barrier having a large magnitude of transmission loss and comprising a plurality of single noise barrier structural units, each of said single noise barrier structural units consisting of (A) a hollow cell type block composed of a hollow cell-shaped box having a perforated sound-absorbing plate disposed on the side confronting the source of noise and a sound-insulating plate disposed on the opposite side relative to said perforated sound-absorbing plate and incorporating a sound-absorbing material to fill up the space therein and (B) a free-spacing plate disposed opposite said sound-insulating plate across a space and parallelly to said plate and connected with said sound-insulating plate by the medium of an elastic member so as to give rise to a free air layer between said free-spacing plate and said sound-insulating plate.

4,042,062

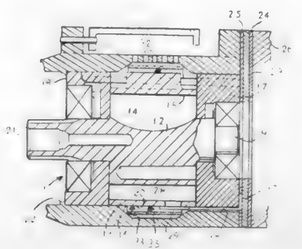
AIR PULSE NOISE DAMPER FOR A PNEUMATIC TOOL

Earl C. Tooley, Clayville, N.Y., assignor to Chicago Pneumatic Tool Company, New York, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,373
Int. Cl.² F01N *1/20*
U.S. Cl. 181—36 A **13 Claims**

1. A pneumatic tool including an air driven motor comprising a rotor liner defining a rotor chamber having an air driven multiple vane rotor operable therein and having at least one exhaust port through the periphery of the liner for exhaust of

driving air from the rotor chamber; a housing for the tool encasing the motor; and a sound attenuating system through which the exhaust air passes to atmosphere, comprising: an annular chamber around the liner into which the exhaust port opens; a leaf spring flap damper disposed in the annular chamber in overlying relation to the exhaust port; and porting communicating the annular chamber to atmosphere; the damper being adapted to flex and oscillate relative to the exhaust port under pressure of air exhausting from the rotor chamber through the exhaust port into the annular chamber.

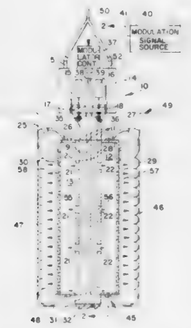


4,042,063

AIR CUSHION SHEAR WAVE VIBRATOR

Kenneth H. Waters, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Oct. 10, 1975, Ser. No. 621,440
Int. Cl.² G01V *1/14*
U.S. Cl. 181—119 **5 Claims**



3. A method of generating a seismic shear wave in a trench having two side walls comprising:

generating a steady state pressure against said side walls and modulating said steady state pressure against said side walls by simultaneously increasing said pressure on one of said walls and correspondingly decreasing said steady state pressure on said remaining side wall

whereby pressure variations will be applied to said walls simultaneously and in phase opposition to each other.

4,042,064

PLATFORM STRUCTURE

George W. Lobb, 110 N. Shaver, Pasadena, Tex. 77506

Filed Feb. 13, 1976, Ser. No. 657,756
Int. Cl.² E06C *7/16*
U.S. Cl. 182—115 **1 Claim**

1. A platform structure adapted for rapid assembly and disassembly over a platform foundation, comprising:

a plurality of prefabricated column assemblies;

column mounting means for removably mounting said column assemblies on a platform foundation;

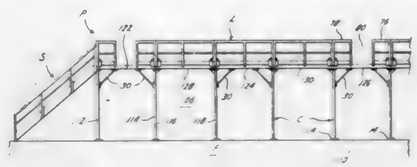
prefabricated landing assembly means mountable with said column assemblies for forming a landing above said column assemblies;

landing assembly mounting means for removably mounting said landing assembly means with said column foundation and wherein said landing assembly means includes a plurality of landing assemblies, each mountable with a selected pair of column assemblies;

said column assemblies include upright members;

said landing assembly mounting means includes:

means for mounting at least one of said landing assemblies with the ends of said landing assembly extending substantially over said upright members of a pair of said column assemblies; and



means for mounting at least one of said landing assemblies with the ends of said landing assembly extending substantially to but not over the ends of said upright members of a pair of said column assemblies;

a prefabricated stair assembly mountable between said landing assembly means and the platform foundation; and

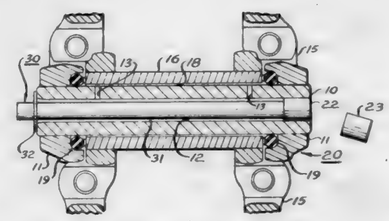
stair mounting means for removably mounting said stair assembly between said landing assembly means and the platform foundation.

4,042,065

TRACK LINK HINGE JOINT LUBRICATING SYSTEM

Robert L. Crum, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 12, 1975, Ser. No. 640,255
Int. Cl.² F01M *1/00*
U.S. Cl. 184—1 E **11 Claims**



1. In a track hinge joint wherein track links are joined one to the other by means of track pins secured to one track link and passing through a track link bushing carried by an adjacent track link to pivotally connect one track link to the other the improvement comprising

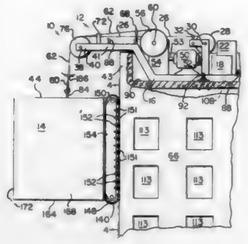
a lubricant retaining bore extending axially through said track pin,

aperture means extending through said track pin from said bore to the outer surface thereof adjacent said track link bushing, and

sealing means for closing the ends of said bore to retain lubricant therein,

said sealing means movable from a first sealing position adjacent an end of said track pin through said lubricant retaining bore formed therein to a second sealing position adjacent an opposite end of said track pin.

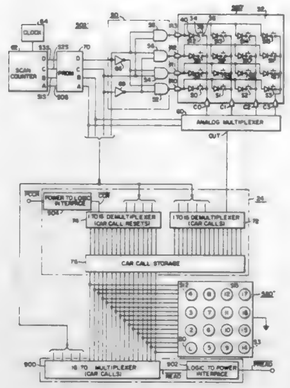
4,042,066
PORTABLE EMERGENCY FIRE FIGHTING AND RESCUE ELEVATOR
Martin J. Noone, 19 Hunting St., Cambridge, Mass. 02141
Filed Dec. 31, 1975, Ser. No. 645,823
Int. Cl.² B66B *9/00*
U.S. Cl. 187—6 **15 Claims**



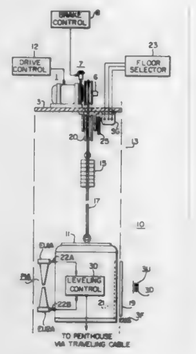
1. In a portable emergency rescue and evacuation elevator suitable for a high rise building the combination of:
   a. portable elevator prime mover means including elevator cable storage means with sufficient elevator cable to accomodate the height of the building; self contained motor power means operatively coupled to said elevator cable storage means for selectively holding in fixed stop position, for paying out, and winding in said elevator cable; and a base to which said elevator cable storage means and self contained motor power means are mounted to form a portable unitary structure transportable by helicopter to the roof of said high rise building and for positioning to pay out said elevator cable over the side of said building; and
   b. a portable elevator passenger cab transportable by truck to said building, said passenger cab having a wall between two caterpillar means each having an endless belt carried on a plurality of support wheels, fastening means for suspending said passenger cab on said elevator cable in position with the endless belts of said caterpillar means touching the side of said building, and a door in said passenger cab wall between the two caterpillar means facing and alignable with windows at respective storey levels of said building side as said cab is moved vertically by said elevator cable on said building side in response to motor power from said prime mover means on said roof.

4,042,067
ELEVATOR SYSTEM
Alan F. Mandel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed May 16, 1975, Ser. No. 578,303
Int. Cl.² B66B *1/16*
U.S. Cl. 187—29 R **16 Claims**

1. An elevator system, comprising:
   an elevator car mountgd for movement in a building to serve the floors therein,
   call entry means disposed in said elevator car, said call entry means including a plurality of switches, notation means identifying the floor each switch is associated with, and means for operating each switch to register a call, p1 selector means for addressing a selected switch of said plurality to detect the operation thereof,
   counter means for providing a continuously changing count value, and
   memory means programmed to provide predetermmined switch addresses for said selector means in response to predetermined count values of said counter means, with the predetermined switch addresses being provided by said memory means in a sequence which directs said selector means to monitor the switches in the order selected by said notation means.

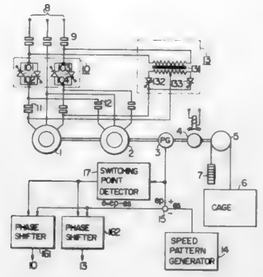


4,042,068
ELEVATOR SYSTEM
William M. Ostrander, Hackensack, and William J. Casper, Mountainside, both of N.J., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 25, 1975, Ser. No. 590,164
Int. Cl.² B66B *1/28*
U.S. Cl. 187—29 R **8 Claims**



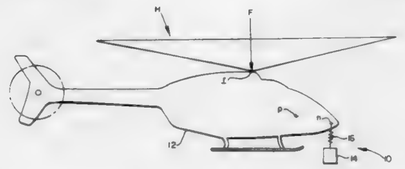
1. A traction elevator system in which the time required to start a motor driven elevator car stopped at a floor with its door open and brake set is reduced, and the start away from the floor when the elevator car makes a run is smooth notwithstanding an unbalanced load, comprising:
   means closing the door of the elevator car preparatory to a run,
   means monitoring the position of the elevator car relative to the floor while the door is closing,
   means releasing the brake before the door reaches the closed position,
   means correcting for unbalanced load when the brake is released to hold the elevator car at floor level,
   and means starting the elevator car away from the floor when the door reaches the closed position.

4,042,069
AC ELEVATOR CONTROL SYSTEM
Takeshi Ohira, and Akinori Watanabe, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan
Filed Mar. 4, 1975, Ser. No. 555,184
Claims priority, application Japan, Mar. 8, 1974, 49-26366
Int. Cl.² B66B *1/32*
U.S. Cl. 187—29 R **17 Claims**



1. In an ac elevator which is provided with a multi-speed induction motor until connected to a three-phase ac power source and including a high-speed induction motor having a relatively high synchronous speed and a low-speed induction motor having a relatively low synchronous speed, and means for starting and accelerating said elevator car by means of a high-speed induction motor, a control system comprising regeneration braking means for imparting a regenerative braking torque to said low-speed induction motor by application of ac voltage thereto from said ac power source so as to reduce the moving speed of the elevator car, additional braking means for imparting another type of braking torque to the elevator car driving system, means for detecting a predetermined switching point between impartation of said regenerative braking torque and impartation of said other braking torque occurring before said regenerative braking torque becomes ineffective, and switching means responsive to the output of said switching point detecting means for deenergizing said regenerative braking means and energizing said additional braking means.

4,042,070
REMOTE RESONATOR APPARATUS AND METHOD
William George Flannelly, South Windsor, Conn., assignor to Kaman Aerospace Corporation, Bloomfield, Conn.
Continuation-in-part of Ser. No. 606,701, Aug. 21, 1975, abandoned. This application June 21, 1976, Ser. No. 698,094
Int. Cl.² F16F *7/10*
U.S. Cl. 188—1 B **10 Claims**

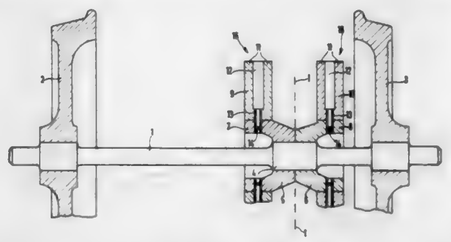


1. In combination with a structure which is excited by a vibratory force at a characteristic forcing frequency ω_f, the improvement comprising:
   a resonator attached to the structure at a point n remote from a point p on the structure and tuned to produce an antiresonance at the point p in accordance with the expression:

$$\Omega_r^2 = \frac{\omega_f^2}{1 + m_r(\ddot{Y}_{nn} - \ddot{Y}_{np}\left(\frac{\ddot{Y}_{nr}}{\ddot{Y}_{pr}}\right))}$$

where:
Ω_r is the tuned frequency of the resonator;
m_r is the mass characteristic of the resonator;
Y_{nn} and Y_{np} are the acceleration mobilities of the structure without the resonator at the characteristic forcing frequency ω_f; and
Y_{nr}/Y_{pr} is the ratio of the acceleration mobilities at the points n and p respectively due to a single disturbing force at point r when the structure is excited without the resonator.

4,042,071
WHEEL AND AXLE ASSEMBLY FOR RAILWAY VEHICLES HAVING DISC BRAKES
Hans Pöllinger, Munich, Germany, assignor to Knorr-Bremse GmbH, Munich, Germany
Continuation of Ser. No. 606,599, Aug. 21, 1975, abandoned. This application Jan. 12, 1977, Ser. No. 758,762
Claims priority, application Germany, Apr. 3, 1975, 2514597
Int. Cl.² B60T *1/06*
U.S. Cl. 188—18 A **5 Claims**



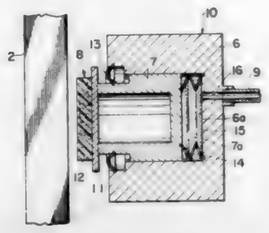
1. In a wheel and axle assembly for railway vehicles, a pair of brake discs on an axle, each brake disc comprising a separate hub having end faces and a force-fitted portion on the axle, each said hub having an axially offset annular portion radially spaced from and surrounding the axle and a friction disc member mounted on said spaced annular portion so that each of said force-fitted portions of said hubs is axially offset from the central radial plane of its respective friction disc member such that any radial expansion of said fricton discs will not be transmitted directly, radially to the force-fitted portions of said hubs, said brake discs being juxtaposed in a mirror-image relationship to each other with the end faces of the separate hubs axially remote from the respective friction disc members being substantially in contact with each other.

4,042,072
PISTON-CYLINDER UNIT FOR USE IN A DISC BRAKE ASSEMBLY
Takashi Baba, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Oct. 7, 1975, Ser. No. 620,266
Claims priority, application Japan, Mar. 28, 1975, 50-36901
Int. Cl.² F16D *55/12, 65/74*
U.S. Cl. 188—71.8 **18 Claims**

1. A piston-cylinder unit comprising:
   a. a cylinder having one open end and one closed end;
   b. a hydraulically actuated piston received in said cylinder for axial movement therein and having a piston head facing said closed end of said cylinder, and wherein an

outer surface of said piston slidably engages an inner surface of said cylinder;

c. a single flexible seal and biasing member having a first end fixedly attached in sealing engagement to said piston head and a second end fixedly attached in sealing engagement to said closed end of said clyinder axially opposed to said piston head for elastic expansion and contraction in an axial direction, said flexible seal and biasing member biasing said piston to a predetermined initial axial position and



defining therein between said piston head and said closed end of said cylinder a chamber for receiving fluid pressure for actuation of said piston to thereby move said piston axially toward said open end of said cylinder; and

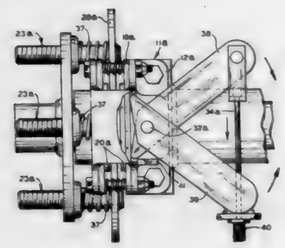
d. flexible means interconnecting said piston and said cylinder by fixed connection at said open end of said cylinder for preventing particles such as dust and water droplets from entering between said slidably engaging surfaces of said piston and said cylinder through said open end of said cylinder.

4,042,073

DISC BRAKE MECHANISM ACTUATING MEANS

William D. Dickenson, Auburn, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed May 27, 1976, Ser. No. 690,427
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—72.9 **3 Claims**



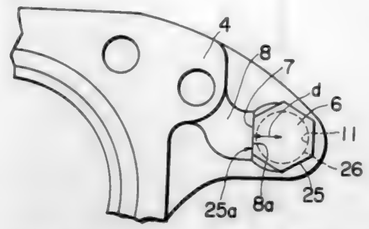
1. A disc mechanism having a pair of brake plates with brake pads that are carried by a caliper mechanism that is mounted on an axle housing comprising: in combination, a rotor adapted for rotation with the end of an axle external of the axle housing, a portion of the periphery of said rotor extending between the brake pads; spring means for urging the brake plates apart; means for actuating the caliper mechanism for axially squeezing the pads against said rotor, said actuating means including a pair of actuating levers that are pivotally mounted on a caliper mechanism bracket, the inner end of each of said levers being engaged with the inner one of the brake plates, the outer end of one of said levers being attached to an actuating cable and the outer end of the other one of said levers being attached to a sheath of said cable and stop means on the caliper mechanism bracket for preventing the movement of said other lever in the direction of movement of said cable when said cable is actuated.

4,042,074

PIN CONNECTION FOR A FLOATING TYPE DISC BRAKE

Yosuke Ishihara, Itami, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed July 30, 1976, Ser. No. 710,046
Claims priority, application Japan, Aug. 5, 1975, 50-108950[U]; Apr. 3, 1976, 51-41021[U]
Int. Cl.[2] F16D *55/224*
U.S. Cl. 188—73.3 **2 Claims**



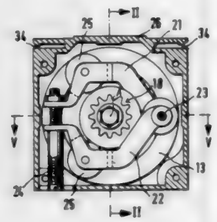
1. In a floating disc brake of the type having, a fixed member, inner and outer pads slidably guided by said fixed member into and out of pressing contact with opposite faces, respectively, of a disc to be braked, a caliper member spanning said disc and both said pads, one of said pads being mounted on one end of said caliper, piston means for acting between the other pad and the other end of said caliper member, and guide pins slidably connecting said caliper member to said fixed member, each said guide pin having a head portion secured to said caliper member and a shaft portion extending axially of said disc along said caliper in a direction away from the point at which said head portion is secured to said caliper member for sliding within a receiving opening in said fixed member, the improvement characterized by each said head portion and said caliper member in the vicinity of said head portion being matingly shaped to fit said head portion to said caliper member to prevent rotation of said guide pin, each said head portion comprising a part having a polygonal periphery with a plurality of side faces, one of said head side faces being closer to the center line of said guide pin than all the other side faces, said caliper member in the vicinity of each said head portion having a protrusion with a flat side face abutting the said one head side face to prevent rotation of said guide pin.

4,042,075

MOUNTING AND BRAKE ASSEMBLY FOR ROLLER BLIND

Klaus Hehl, Remscheid-Luttringhausen, Germany, assignor to Riloga-Werk Julius Schmidt, Remscheid-Luttringhausen, Germany

Filed July 15, 1976, Ser. No. 705,384
Claims priority, application Germany, July 17, 1975, 2531864
Int. Cl.[2] F16D *49/00*
U.S. Cl. 188—75 **10 Claims**



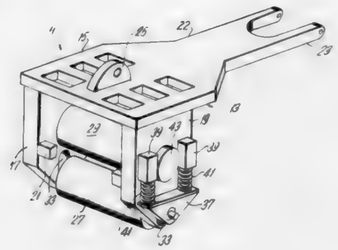
1. A mounting assembly for a roller blind, said assembly comprising a housing; a shaft rotatable on said housing about an axis and adapted to carry a roller blind; a drive wheel fixed on said shaft and rotatable in said housing about said axis by means of a flexible member; a friction-type brake wheel in said housing fixed on said shaft and jointly rotatable with and spaced from said drive wheel about said axis and having a periphery; a pair of levers in said housing each having one end pivoted on the one end of the other lever and each also having another end; a roller carried on each of said levers intermediate its ends and directly bearing radially continuously on said periphery; and means between the other ends of said levers for pulling same toward each other and thereby pressing said rollers continuously radially against said periphery.

4,042,076

BRAKING SYSTEM

Charles Citelli, P.O. Box 162, Lexington, N.Y. 12452

Continuation-in-part of Ser. No. 649,563, Jan. 15, 1976, abandoned. This application Dec. 6, 1976, Ser. No. 747,794
Int. Cl.[2] B60T *1/04*
U.S. Cl. 188—80 **11 Claims**



1. A braking system for a vehicle mounted on wheels comprising:

a first roller;

a second roller;

a housing means, said second roller being rotatably mounted in said housing means and said first roller being both rotatably and slidably mounted in said housing means to move to and from said second roller;

resilient means mounted on said housing means for forcing said first roller away from said second roller;

brake means operatively associated with said second roller for retarding the rotation of said second roller;

means for mounting said housing means on a vehicle; and

pressure means for frictionally engaging said first roller with a wheel mounted on the vehicle and for further forcing said first roller against said wheel so as to overcome the force of the resilient means and for frictionally engaging the first roller with the second roller.

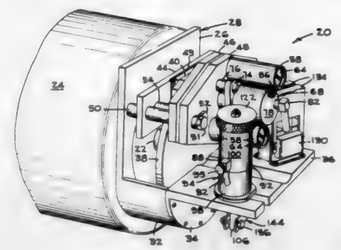
4,042,077

CALIPER DISC BRAKE OR THE LIKE

Richard H. McCarthy, West Allis, Wis., assignor to FMC Corporation, San Jose, Calif.

Filed July 28, 1976, Ser. No. 709,555
Int. Cl.[2] B60T *13/04*
U.S. Cl. 188—171 **10 Claims**

10. In a brake system or the like, wear compensating apparatus for maintaining a predetermined gap between the planar friction surfaces of relatively movable friction elements when the elements are in their released positions comprising; means for moving at least one of said elements relative to the other in a direction parallel to said planar surfaces; pressure applying means for normally urging said friction elements into engagement with each other for terminating said parallel relative movement between said friction elements, hydraulic piston and cylinder means operatively connected to said friction elements for overcoming said pressure applying means and moving said elements through said predetermined gap to said released position, said piston and cylinder means having a headspace which gradually reduces in volume in response to wear of said friction elements, means for directing a predetermined volume of hydraulic fluid into said hydraulic piston and cylinder means during each movement of said friction element to said released position, and reservoir means for receiving any excess hydraulic fluid from said diminishing headspace that is due to frictional wear of said elements prior to moving the elements to their released positions, piston means in said reservoir, and means urging said piston means against the hydraulic fluid in said reservoir thereby permitting said reservoir to be positioned in a plurality of different attitudes.

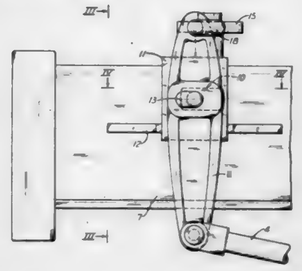


4,042,078

RAILWAY CAR BRAKE RIGGING FULCRUM LEVER MOUNTING

Roland E. Cale, Cortland, Ohio, assignor to Schaefer Manufacturing, Inc., Pittsburgh, Pa.

Filed Oct. 20, 1976, Ser. No. 734,037
Int. Cl.[2] B61H *13/38*
U.S. Cl. 188—231 **6 Claims**



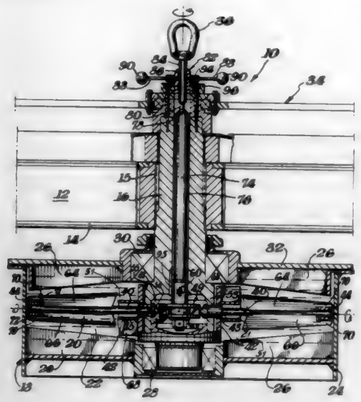
1. The combination with a railway car body having a center sill and supported by a truck provided with wheels mounted on a pair of axles, a live brake lever between the axles having upper and lower ends, a link pivotally connected at one end to the upper end of said lever and extending across the top of the adjacent axle, a substantially vertical fulcrum lever having a lower end pivotally connected to the opposite end of said link and having a circular opening through its central portion, the wall of said opening being convex from side to side of the fulcrum lever and forming an arc of a circle, and a rigid supporting member for the fulcrum lever projecting laterally from one side of said sill and having a hook at its outer end extending through said fulcrum lever opening and curved away from said live lever, said hook forming an arc of a circle and having a circular cross section, the radius of the inside of the hook being substantially the same as the radius of said wall arc, the inside diameter of said fulcrum lever opening being only slightly greater than the diameter of the hook in cross section, and the upper end of the fulcrum lever being formed for connection to means for rocking said fulcrum lever around said hook.

4,042,079

VARIABLE ENERGY ABSORBER FOR AIRCRAFT ARRESTING SYSTEM

Donald B. Doolittle, Hockessin, and Harry W. Deshay, Rambleton Acres, both of Del., assignors to All American Industries, Inc., Wilmington, Del.

Filed May 30, 1975, Ser. No. 582,214
Int. Cl.[2] F16D *57/02*
U.S. Cl. 188—290 **13 Claims**



1. A rotary fluid-operated energy absorbing device comprising a casing for containing a fluid, a rotor shaft having an outer end disposed outside the casing and an inner portion disposed within the casing, bearing means rotatably mounting the inner portion of the rotor shaft inside the casing, a rotary input driving means connected to the outer end of the rotor shaft, a plurality of axle and bearing assemblies connected at right angles to the rotor shaft inside the casing, a pair of rotor vanes secured to each of the axles, on opposite sides thereof, the portion of the rotor shaft disposed adjacent the axle and bearing assemblies being hollow to provide a compartment within it, motion transmitting means in the compartment and being connected to the axles for rotating them to vary the angle of the vanes, the rotor shaft also having a hollow center connecting the compartment within the shaft to the outer end of the shaft, a control rod disposed within the hollow center of the rotor shaft and connecting the motion-transmitting means in the compartment to the outer end of the rotor shaft, and control motion input means connected to the outer end of the control rod whereby a control motion is imparted to the motion-transmitting means for varying the angle of the vanes to their path of motion and accordingly varying the energy absorbed, the axle and bearing assemblies comprising a radial array of axles rotatably disposed within a radial array of inner and outer bearings, the inner axle bearings are disposed in a perforated wall in the rotor shaft at the compartment within it, the plurality of axle and bearing assemblies being secured together by segmented plates and the vanes on each of the axles being disposed on opposite sides of the segmented plates, the vanes on the same axle being substantially parallel and out of line with each other whereby the vanes on each axle are always disposed on the opposite sides of the segmented plates and may lie in one orientation thereof substantially contiguous to opposite sides of the segmented plates.

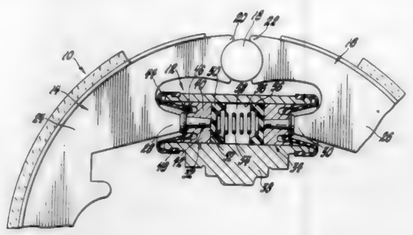
4,042,080

WHEEL CYLINDER PISTON CONSTRUCTION

Richard P. Nelson, Bellbrook, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 19, 1976, Ser. No. 688,047
Int. Cl.[2] F16D *65/24*
U.S. Cl. 188—361 **1 Claim**

1. A piston assembly for use in a hydraulic wheel cylinder assembly for a brake, said piston assembly having a powdered metal piston body preformed as a skirted cylinder with a flat end surface on one end and an annular depression on the other end and a passage extending axially therethrough and through said flat end surface, said annular depression having side walls, said flat end surface being adapted to engage and axially support a cup seal, the side walls of the annular depression defining the cylinder skirt interior wall and the outer wall of a center boss which surrounds the passage; and a hardened insert



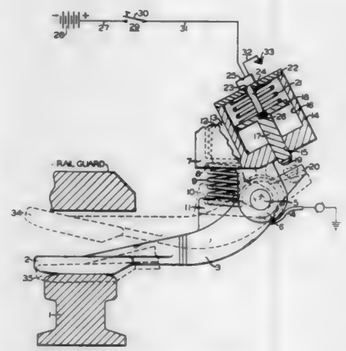
having a head and a tapered shank with a flat shank end, said shank being tapered from said head to said end, said head covering said center boss to provide a hard wear surface for an operating component of the brake, said shank end fitting substantially flush with said flat end surface whereby no air pocket at the shank end is formed which will trap air in a hydraulic wheel cylinder assembly, said shank fitting tightly into and sealing said passage for holding said insert in place during operation of the brake.

4,042,081

MANUAL CONTROL OF THIRD RAIL POWER KNOCKOUT

Jerome R. Pier, Bonita, Calif., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 24, 1975, Ser. No. 625,482
Int. Cl.[2] B60L *3/04, 5/38*
U.S. Cl. 191—8 **6 Claims**



1. Power knockout apparatus for disposition in a power-supply circuit extending from a third rail power supply to at least one electrically-operated prime mover of an electrically-propelled vehicle, said power knockout apparatus comprising in combination with the third rail and the power-supply circuit:

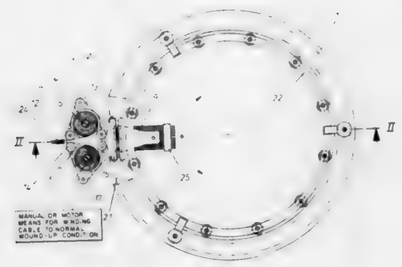
a. current-collecting means for current-collecting engagement with the third rail,
b. a fulcrum member,
c. a lever pivoted intermediate its ends on and in insulated relation with said fulcrum member, said lever carrying said current-collecting means at one end thereof and having an electrical connection with the power supply circuit for the at least one electrically-operated prime mover,
d. biasing means for transmitting a force to said lever to cause rocking thereof about said fulcrum member in one direction to force said current-collecting means into current-collecting engagement with the third rail,
e. means for causing rocking of said lever in a direction opposite said one direction to effect the lifting of said current-collecting means out of current-collecting engagement with the third rail,
f. potentially-explosive means normally effective to render said means ineffective to rock said lever in the direction opposite said one direction, and
g. manually-controlled electrically-operated means for effecting the explosion of said potentially-explosive means whereupon said rocking means is rendered effective to rock said lever in the direction to lift the current-collecting means out of current-collecting engagement with the third rail.

4,042,082

DEVICE FOR RECEIVING, FROM A FIXED ELECTRIC CONNECTION, ADAPTING TO LENGTH, AND HOLDING CONDUCTORS FOR THE ELECTRIC CURRENT SUPPLY OF MOVABLE CONSUMERS

Otto E. Hellmiss, and Heinrich Simon, both of Kassel, Germany, assignors to RHEINSTAHL Aktiengesellschaft, Essen, Germany

Filed Dec. 11, 1975, Ser. No. 639,870
Claims priority, application Germany, Dec. 12, 1974, 2458758
Int. Cl.[2] H02G *11/02*
U.S. Cl. 191—12.2 A **6 Claims**



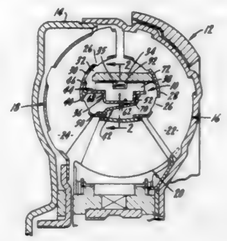
1. A device for receiving electric conductors from a fixed electric connection, adapting said conductors to length and holding the same for the electric current supply of movable consumers, which includes in combination: at least one spool box having at least one rotatably and exchangeably mounted winding storage mandrel associated with said spool box, said mandrel also being provided with means for passing said electric conductor in the form of a cable therethrough, winding-up means associated with said mandrel for winding up said cable, a consumer connection provided with entraining means forming a movable cable carrier, a guiding path for guiding said carrier along said guiding path, said spool box being provided with a plurality of guiding rollers for said cable, and the entraining means having guiding strips bent off at the ends thereof, and a roller path arranged outside said spool box and said entraining means for simultaneously guiding and holding the cable sections between the fixed electric connection and the spool box and between the latter and said entraining means.

4,042,083

TORQUE CONVERTOR WITH CENTRIFUGAL LOCK UP CLUTCH

Willis Lorenz Schulz, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 1, 1975, Ser. No. 636,518
Int. Cl.[2] F16H *45/02*
U.S. Cl. 192—3.31 **3 Claims**



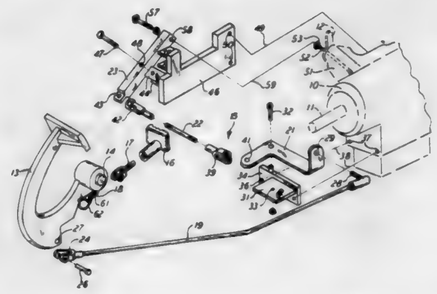
1. In a hydrodynamic device having a fluid impeller and a turbine with a space therebetween, a clutch mechanism in said space comprising a first annular clutch member connected to said impeller and having a clutch surface thereon, a second clutch member comprising an annular ring secured to the turbine having a plurality of ramp areas formed therein having ramp surfaces formed from the material of the ring thereon, friction means mounted in said ramp areas and in contact with and supported by said ramp surfaces between said ramp surfaces and said clutch surface, centrifugal force acting to urge said friction means into engagement with said clutch surface at a given speed of rotation to lock said elements together, said ramp surfaces acting after initial engagement of said devices to wedge said devices between said first and second clutch members, said second clutch member comprises an annular sheet metal continuous ring having said ramp areas and surfaces formed therein.

4,042,084

VEHICLE CLUTCH CONTROL ASSEMBLY

John Carl Schulz, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 15, 1976, Ser. No. 677,282
Int. Cl.[2] B60K *41/24, 41/26;* F16D *67/02;* F16H *57/10*
U.S. Cl. 192—13 R **3 Claims**



1. A vehicle clutch control assembly for use with a hydraulic transmission, comprising a fluid valve with an axially movable plunger axially positionable between a clutch engaged position and a clutch disengaged position and an intervening clutch neutral position, a spring operatively associated with said plunger for yieldingly urging said plunger to the clutch disengaged position, a brake pedal, linkage connected to said brake pedal, a lever connected with said linkage and having a portion engagable with said plunger and axially urging said plunger

against the urging of said spring and thus to the clutch engaged position, and said lever portion being operatively associatable with said plunger for allowing movement of said plunger from the clutch engaged position and through the clutch neutral position and to the clutch disengaged position, and a lock-out assembly selectively operatively associatable with said plunger and separately from any interconnection with said linkage and including a portion abuttable on said plunger for restraining said plunger in the clutch engaged position irrespective of the position of said brake pedal and said linkage, said lock-out assembly thereby being arranged to be associatable with said plunger to induce movement of said plunger in the axial direction opposite from that induced by said linkage.

4,042,085

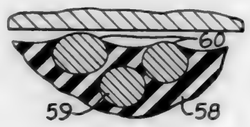
FRICTION COUPLING

Roger O. Bjerk, Edelstein; William D. Brandon; Frederick S. Engleking, both of Peoria, and John P. Jero, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 544,148, Jan. 27, 1975, abandoned, which is a continuation-in-part of Ser. No. 366,967, June 4, 1973, Pat. No. 3,898,361. This application May 10, 1976, Ser. No. 684,816

Int. Cl.² F16D *13/60, 69/02*

U.S. Cl. 192—57 **9 Claims**



1. A friction coupling comprising:

a rotatable friction plate formed of a martrix of a relatively soft elastomeric material providing a friction surface and selected from the group of elastomeric materials consisting of polyacrylate, silicone, fluorosilicone, chloroprene, acrylonitrile, urethane, and hexafluoropropylene-vinylidene fluoride copolymer and mixtures thereof;

a reaction plate of relatively rigid non-compressible material providing a mating surface for selective rotational frictional engagement with said friction surface of said friction plate;

a plurality of discrete particles of a vitreous or ceramic material intermixed with and dispersed throughout said elastomeric material to provide relatively high modulus asperities in said friction surface with said matrix reboundably deflecting to permit at least partial recession of the more prominently extended particles into the friction surface of the matrix to ensure maximum conformability to said mating surface and uniform distribution of engagement pressure over the entire surface area of the plates; and

a supply of fluid provided between said plates with the fluid hydrodynamically wedging between the asperities and the mating surface of the reaction plate during relative rotation of the plates for developing and sustaining a film of separating fluid over the asperities that produces a viscous drag upon the friction plate so as to cause substantially all of the energy of plate engagement to be absorbed in shear of said fluid film until just prior to complete engagement of the plates.

4,042,086

APPARATUS FOR CONNECTING A CLUTCH RELEASE BEARING TO A CLUTCH RELEASE ACTUATING ELEMENT

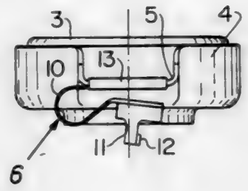
Horst M. Ernst, Eltingshausen; Manfred Brandenstein, Aschfel, and Armin Olschewski, Schweinfurt, both of Germany, assignors to SKF Industrial Trading and Development Company B.V., Amsterdam, Netherlands

Continuation of Ser. No. 508,088, Sept. 23, 1974, abandoned. This application Sept. 20, 1976, Ser. No. 725,149

Claims priority, application Germany, Oct. 2, 1972, 7335937

Int. Cl.² F16D *19/00*

U.S. Cl. 192—98 **3 Claims**



1. In a clutch release bearing having an outer cap provided with at least one extending lug adapted to engage a clutch release actuating element comprising a hook-like end having a curved outer edge and a slot opening along an inner edge, a connecting element comprising a flat spring member having a shank at one end adapted to be connected to said lug and a shank at the other end having a planar surface forming a rest plate for slidably engaging said curved outer edge, said spring being bent between said end shanks in an unstressed condition wherein said shanks lie at an acute angle to each other and which may thereafter be bent so that said shanks substantially overlie each other when connected to said lug and when slidingly engaging said clutch release actuating element so as to be in stressed condition, said spring being further formed with a perpendicular wall integral with said planar surface forming said rest plate along one side thereof and a web extending from said wall at right angles thereto overlying said planar surface and slidingly engaging within said slot.

4,042,087

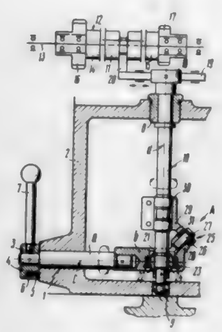
CLUTCH CONTROL DEVICE FOR A MACHINE TOOL

Artur Markovich Itin, Rostovskaya naberezhnaya, 1, kv. 47, and Vladimir Fedorovich Eremin, Chertanovskaya ulitsa, 66, kv. 24, both of Moscow, U.S.S.R.

Filed Nov. 24, 1975, Ser. No. 634,467

Int. Cl.² F16D *19/00*

U.S. Cl. 192—99 S **2 Claims**



1. A clutch control device for a machine tool, comprising a horizontal shaft; a handle secured to said shaft; a vertical shaft; the centerlines of said vertical and horizontal shafts extending through the same plane; a 3D spherical Geneva mechanism interconnecting said two shafts; a driving member and a driven member of said Geneva mechanism secured to said horizontal and vertical shafts, respectively; said horizontal shaft having a drilled opening to accommodate the vertical shaft, said drilled opening receiving the outer race of a spherical sliding bearing, an inner race of said bearing being secured to said vertical shaft.

4,042,088

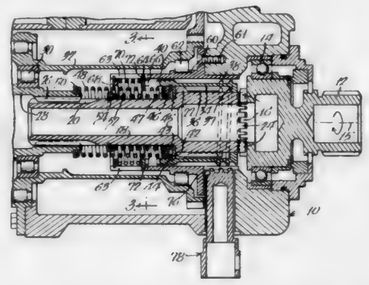
LOW SPEED DISCONNECT

James S. Schmohe, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 22, 1975, Ser. No. 643,253

Int. Cl.² F16D *13/60*

U.S. Cl. 192—114 R **12 Claims**



1. In a constant speed drive transmission having a housing, an input shaft extending into said housing, axially inwardly extending clutch teeth on the inner end of said input shaft, a splined coupling member axially aligned with said input shaft, clutch teeth axially extending from one end portion of said coupling member and adapted to mesh with said clutch teeth on said input shaft, a driven member splined to the other end portion of said coupling member, a sleeve encircling said coupling member and having a worm around the outer periphery thereof, said sleeve being splined to said coupling member for relative axial movement with respect to said coupling member, ratchet teeth formed on one axial end of said sleeve, an axially movable one-way detent teeth means carried by the housing and extending toward said ratchet teeth, means for resiliently urging said one-way detent teeth means toward said sleeve, first resilient means acting between said driven member and said sleeve to urge the sleeve toward the input shaft, means on the sleeve engaging the coupling member for urging said coupling member into coupled relationship with the input shaft, second resilient means acting between said coupling member and said sleeve for urging the coupling member away from the input shaft, and gear means movable into contact with said worm on said sleeve whereby the rotation of the input shaft and the coupling member will thread the worm along the coupling member away from the input shaft to positively disconnect the teeth on the coupling member from the teeth on the input shaft and will engage the ratchet teeth on the sleeve with the one-way detent teeth to permit the sleeve and coupling member to be moved axially away from the input shaft but prevent the sleeve from rotating reversely while the second resilient means prevents the coupling member from reengaging with said input shaft.

4,042,089

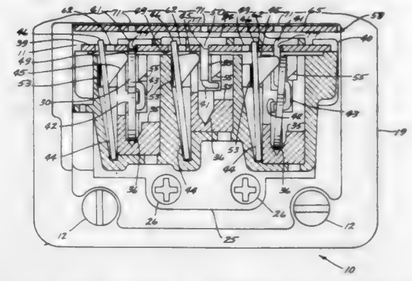
COIN SLIDE APPARATUS

John C. Mellinger, Newton, Iowa, assignor to The Maytag Company, Newton, Iowa

Filed July 9, 1976, Ser. No. 703,929

Int. Cl.² G07F *3/02*

U.S. Cl. 194—102 **15 Claims**



1. A coin slide apparatus for initiating the operation of a machine with a predetermined combination of coins supported substantially on edge, comprising: slide support means for mounting said coin slide apparatus to said machine including a faceplate and a slide housing defining a coin slide guideway extending through said faceplate; coin receiver means supported in said slide housing and defining a plurality of longitudinal grooves and a plurality of coin slots for receiving said coins and upon manual actuation for moving said coins from a coin receiving position to a coin measuring position; coin measuring means associated with each of said grooves and including a gaging block for supporting the lower edge of said coin and a shoulder spaced a predetermined distance above said gaging block and engageable by the face of said coin at the upper edge thereof; a coin sensing lever adjacent said groove at said coin measuring position and biased against said coin on the side opposite said shoulder and having a first posture with a proper sized coin engaging said shoulder and movable to a second posture with an undersized coin in said groove; and stop means engageable by said coin sensing lever in said second posture to prevent the advancement of said coin slide assembly from said coin measuring position to an actuating position.

4,042,090

KEY TOP

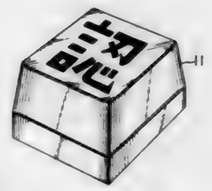
Sadao Hasebe, Tokyo; Hiromitsu Ono, Ichikawa; Minoru Murata, Yokohama, and Yuji Harada, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha and K.K. Chiyoda Gurabiya Insatsusha, both of Tokyo, Japan

Filed Sept. 17, 1974, Ser. No. 506,871

Claims priority, application Japan, Sept. 20, 1973, 48-106275

Int. Cl.² B41J *5/12*

U.S. Cl. 197—102 **1 Claim**



1. A key top which comprises:

i. a key top base composed of an integrally formed ABS resin having a side portion and a top portion,

ii. a colored portion in the form of a sign provided on the top portion of the key top base, the colored portion consisting

essentially of a mixture of polyvinyl chloride, polymethyl methacrylate and a colorant,

iii. an adhering layer provided between the top portion of the key top base and the colored portion, the adhering layer consisting essentially of a mixture of styreen resin and synthetic rubber,

iv. a protecting layer covering at least the colored portion, the protecting layer consisting essentially of a thermoplastic material of a mixture of polyvinyl chloride and nitrocellulose, and

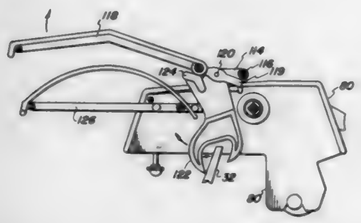
v. a second protecting layer covering the above mentioned protecting layer, the second protecting layer consisting essentially of a mixture of polyvinyl chloride, synthetic rubber, and silicon.

4,042,091

RECORD MATERIAL FEED APPARATUS

Leo Levinson, Berkeley, and Andrew Wong, Fremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 25, 1976, Ser. No. 670,464
Int. Cl.² B41J *15/04*
U.S. Cl. 197—138 R **2 Claims**



1. Record material feed apparatus for use with a printing machine of the type including a platen, means for rotating the platen about its axis, at least one roller, a lever capable of manual movement between first and second positions, and means coupled between the lever and said at least one roller for maintaining the roller in engagement with the platen when the lever is in its first position and for maintaining the roller spaced a predetermined distance from the platen when the lever is in its second position, said feed apparatus comprising:

a drive assembly capable of engaging and, when enabled, feeding a marginally punched record material that is loaded thereon;

a guide rack pivotably mounted to said drive assembly about a pivot pin and capable of manual pivotal movement between a first position in which a marginally punched record material may be loaded onto said drive assembly and a second position in which a marginally punched record material fed by said drive assembly may be guided along said guide rack; and

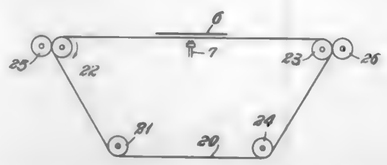
an interlock member pivotably mounted to said drive assembly about said pivot pin and capable of engaging said lever and being engaged by said guide rack when said feed apparatus is mounted to said printing machine for automatically moving said lever from its first position to its second position when said guide rack is manually pivoted from its first position to its second position, and for automatically returning said lever to its first position when said rack is manually returned to its first position.

4,042,092

DUPLICATING METHOD

Douglas A. Newman, Glen Cove, N.Y., assignor to Columbia Ribbon and Manufacturing Co., Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 302,188, Oct. 30, 1972, Pat. No. 3,937,178. This application July 28, 1975, Ser. No. 599,718
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.² B41J *31/14*
U.S. Cl. 197—171 **8 Claims**



1. Continuous duplicating method in which an inked ribbon is continuously moved into and out of a printing station into transfer position between a copy sheet and a printing member, ink being transferred from said ribbon to said copy sheet by means of energy applied to said ribbon by said printing member each time said ribbon enters said printing station, comprising the steps of providing an ink-impervious plastic film ribbon selected from the group consisting of chemically-oleophilic plastic films, plastic films which are treated to render them chemically-oleophilic and plastic films which are etched or coated to render one surface porous and physically-oleophilic having an ink-transfer surface which is receptive to liquid non-drying oil ink, contacting said ink-transfer surface with an ink-application roller containing a supply of liquid non-drying oil ink comprising liquid non-drying oil and pigment to apply a uniform, continuous, thin coating of said liquid non-drying ink to the ink-transfer surface of said plastic film ribbon, moving said ink-coated plastic film ribbon to said transfer position and applying a printing energy against the uncoated surface of said plastic film ribbon by means of said printing member to cause corresponding portions of said liquid ink coating to transfer to said copy sheet, moving said plastic film ribbon out of said transfer position, applying an additional amount of said liquid non-drying ink to the ink-transfer surface of said plastic film ribbon, at least in areas from which said ink has been transferred to said copy sheet, and reintroducing said ink-coated plastic film ribbon to transfer position in said printing station.

4,042,093

TEXTILE SLIVER CAN CHANGING AND STORAGE APPARATUS

Masakatsu Fujii, and Toshio Yasufuku, both of Ohgaki, Japan, assignors to Kabushikikaisha Hara Shokki Seisakusho, Japan

Filed July 8, 1976, Ser. No. 703,544
Claims priority, application Japan, July 17, 1975, 50-86703
Int. Cl.² B65G *25/10*
U.S. Cl. 198—339 **4 Claims**

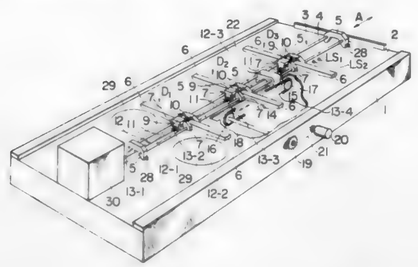
1. A can doffing apparatus having;

at least one series of a can filling station and one or more empty can ready stations spaced at regular intervals to sustain thereon respectively succeeding cans,

doffing means reciprocably disposed along the series of the stations to intermittently produce one cycle of reciprocation and having a series of pivoted arms identical in number and identically spaced with the series of stations,

means to swing the series of arms all simultaneously upright on retracting stroke of the reciprocation motion while keeping in horizontally swung down position on advancing stroke to thereby disengage from and engage the succeeding cans respectively on the retracting and advancing strokes,

said means to swing the series of arms comprising linear cam extending along and fast to the series of stations and one cam follower member mounted on the doffing means for each arm to transmit the cam action from the cam to the corresponding arm, and



electrical driving means to intermittently cause the doffing means to perform the said one cycle of reciprocation rest periods of which are evenly spaced and of equal length.

4,042,094

CONVEYING AND STORING APPARATUS

Alfred Schmermund, Kornerstrasse 62, 5820 Gevelsberg, Germany

Filed May 24, 1976, Ser. No. 689,411
Int. Cl.² B65G *43/08*; C10B *31/04*
U.S. Cl. 198—347 **8 Claims**



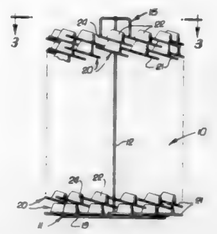
1. Conveying and storing apparatus for conveying articles between two machines and for storing articles in transit between the machines, comprising a conveyor to convey the articles in a conveying direction, the conveyor comprising a pivotable carrier member, two pulleys each of divided construction mounted on said carrier member respectively upstream and downstream in said conveying direction and rotatable about respective axes of rotation, a conveyor belt of divided construction extending around said pulleys, a plurality of article entraining elements each of divided construction and provided on said conveyor belt, said carrier member being pivotable about the axis of rotation of the downstream one of said pulleys and being disposed between divided portions of said pulleys, and store defining means to define with said conveyor a store for storing said articles, said store defining means comprising an arcuate wall element provided with a plurality of recesses receiving the divided portions of said entraining elements, said arcuate wall element being arranged adjacent to said conveyor belt at the upstream and of said conveyor and extending parallel to the path described by said upstream end of said conveyor under pivoting of said carrier member.

4,042,095

HIGH DENSITY MERCHANDISE DISPLAY AND RACK

George M. Sawyer, 8801 Calico Ave., Garden Grove, Calif. 92641

Filed Nov. 20, 1975, Ser. No. 633,863
Int. Cl.² A47F *7/00*
U.S. Cl. 211—49 D **1 Claim**



1. In a high density merchandise display,

a. a base and a support rod extending upwardly from the base, and

b. multiple display units for said merchandise fanning outwardly from and spaced circularly about the rod, the units having stacked relation,

c. each unit including a sheet, and including an item of merchandise carried on the sheet, the sheet containing an opening through which the rod projects, the item of merchandise located radially outwardly of the opening, all of said items of merchandise standing generally vertically in the same direction outwardly of the sheets and forming circularly spaced columns which are inclined from vertical, the sheets being interleaved, each sheet having an edge extending adjacent the side of a container for an item of merchandise on another adjacent and interleaved sheet, said edge extending generally horizontally, circularly adjacent units having sheet overlap producing tilting of substantially all sheets from horizontal,

d. each sheet comprising a card, and each item of merchandise being enclosed in one of said containers on the card, the container comprising a transparent receptacle standing outwardly from the plane of the card, the receptacles located closer to the edges of the cards remote from the support rod than to the edges closest to said rod,

e. the base substantially flat and formed by means spaced outwardly from and extending about said axis, and adjacent which the lowermost cards extend substantially horizontally,

f. the display formed by said units being substantially cylindrical in outline, throughout the height thereof.

4,042,096

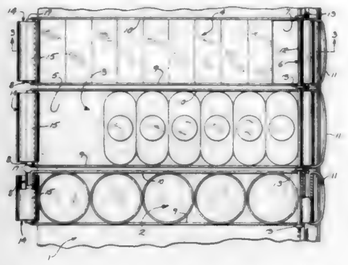
SHELF AID

Daniel F. Smith, 3278 N. 106th St., Milwaukee, Wis. 53222

Filed Mar. 15, 1976, Ser. No. 667,162
Int. Cl.² A47F *3/02*
U.S. Cl. 211—49 D **11 Claims**

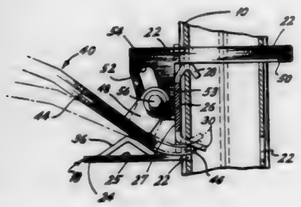
1. A shelf aid for displaying merchandise and the like in a plurality of adjacent series upon a shelf with each series containing like objects arranged in alignment from front to back on the shelf, comprising in combination with a shelf and a series of objects thereon, means including a pusher member at the rear of the series and tensioned side members extending forwardly therefrom separately encompassing each series of objects, a handle at the front of the shelf and attached to said side members for manually pulling the corresponding series of objects forwardly upon the shelf, a fixed stop extending upwardly from the shelf at its forward edge and engageable by the forward object of the series to limit the forward movement of said series, and resilient means constituting a part of said first named means and secured at the back edge of the shelf and to said

pusher member to return said first named means and its handle to a rearwardly retracted position following a manual pulling



thereof, said resilient means having a substantially constant spring rate.

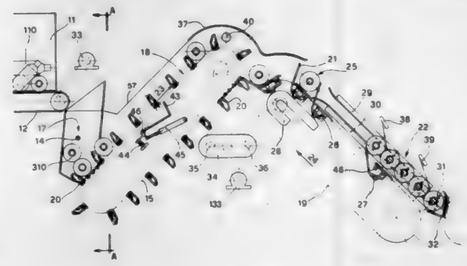
4,042,097
STORAGE SYSTEM
Leonard R. Clark, Oreland, and David W. Meehl, Hatboro, both of Pa., assignors to Standard Pressed Steel Co., Jenkintown, Pa.
Filed Mar. 19, 1976, Ser. No. 668,371
Int. Cl.[2] A47F *5/14, 5/00*
U.S. Cl. 211—182 **12 Claims**



1. An elongated support member having a generally L-shaped cross-sectional configuration including a first leg and a second leg forming a generally right angle with said first leg, said first leg providing a track surface over which a storage container may slide and on which a storage container may be supported and said second leg providing a guide surface for guiding storage containers sliding on said track surface, said second leg being formed with first connection means adjacent one end thereof and second connection means adjacent the other end thereof, said first and second connection means each including a hook member and an aligned tab member, said hook members being located adjacent the free edge of said second leg and said tab members being located adjacent the intersection of said first and second legs, said tab members forming an angle greater than 90° with the portions of said second leg between each pair of a hook member and a tab member whereby said hook members can be engaged in slots on support posts and the support member can be rotated so that the tab members are received in other slots on the support posts, said tab members being bendable about their juncture with said second leg to a position where they form an angle less than 90° with the portion of said second leg between each pair of a hook member and a tab member whereby said support member is securely retained on the post members.

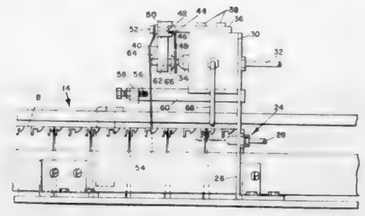
7. A storage system including a plurality of support posts extending in a generally vertical direction, each of said support posts being formed with a plurality of slots forming a row extending in a generally vertical direction, said slots being formed in at least one face of said support posts, support members extending between adjacent support posts in a pair forming a storage area in which storage containers can be supported, said support members including a first leg and a second leg forming a generally right angle with said first leg, said first legs providing track surfaces along which storage containers can slide and on which storage containers can be supported, said support surfaces extending at a generally right angle to the axis of said support posts, said second legs extending in a direction generally parallel to the axis of said support posts and providing guide surfaces for guiding storage containers sliding along said track surfaces, first connecting means formed on said support members adjacent one end thereof and second connecting means formed on said support members adjacent the other end thereof, said first and second connecting means securely retaining said support members on said pair of said support posts, each of said connecting means including a hook member and a tab member, said hook members being located adjacent the free edge of each of said second legs and said tab members being located adjacent the intersection of said first and second legs, said tab members forming an angle greater than 90° with the portion of said second legs between said hook members and said tab members whereby said hook members can be engaged in aligned slots on said pair of support posts and whereby said support members can be rotated such that said tab members are received in aligned slots on said pair of support posts, said tab members being bendable about a line where they join said second legs to a position forming an angle less than 90° with the portion of said second legs between said hook members and said tab members whereby a portion of said hook members and said tab members underlie the outer surfaces of their associated support post.

4,042,098
INTERMEDIATE STORAGE POINTS FOR COPS, AND THE INTERMEDIATE STORAGE POINTS THUS IMPROVED
Armando D'Agnolo, Porcia (PN), and Luigi Minto, S. Lucia Di Piave (TV), both of Italy, assignors to Officine Savio, S.p.A., Pordenone, Italy
Filed June 6, 1975, Ser. No. 584,350
Claims priority, application Italy, June 10, 1974, 83362/74
Int. Cl.[2] B65G *47/42*
U.S. Cl. 198—393 **7 Claims**



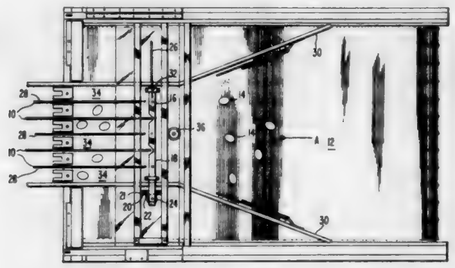
1. Apparatus for conveying cops from bulk storage to a usage station through intermediate storage points comprising a first conveyor belt which is sloped substantially upwardly carrying lateral limiting means to define single cop compartments, a second substantially horizontal or downwardly sloped conveyor belt which is positioned to receive cops discharged from said first belt, said second belt having pivotal limiting means to define single cop compartments whereby the limiting means for forming said single cop compartments pivot downwardly; an intermediate storage point substantially parallel and above said second belt carrying lateral guides for said cops and a frontal stop means at the end of said intermediate storage point; at least one compartment of the first conveyor belt substantially coinciding with one compartment of said second conveyor belt at a temporary position where they are both haltable at the same time, said first belt movable step by step out of phase with said second belt which is movable step by step, means for loading cops in bulk positioned upstream of the movement of said cops from said first conveyor belt and at least one spacer belt intermediate said cop loading means and said first conveyor belt to control the content of cops, said spacer belt being substantially parallel to and at least partially above an exit edge of the loading means and at right angles to said first conveyor belt.

4,042,099
AIR CONTROLLED SWITCH
Walter S. Sterling, Quincy, Mass., assignor to Pneumatic Scale Corporation, Quincy, Mass.
Filed Sept. 12, 1975, Ser. No. 613,028
Int. Cl.[2] B65G *47/14, 43/08, 53/00*
U.S. Cl. 198—393 **13 Claims**



13. In an apparatus for processing items, a passage along which items are moved in a continuous stream by jet propulsion produced by a jet disposed adjacent to one side of the passage so as to direct a jet of air across the passage at an angle to advance items along the passage, means for delivering items to said passage, control means for stopping and starting said means, said control means including pressure-responsive means operable when the jet stream is prevented from crossing the passage by a standing line of items in the passage to effect operation of the control means to stop delivery and means for maintaining the pressure supplied to said pressure-responsive means at a lower than operating pressure so long as the items continue to flow freely along said passage.

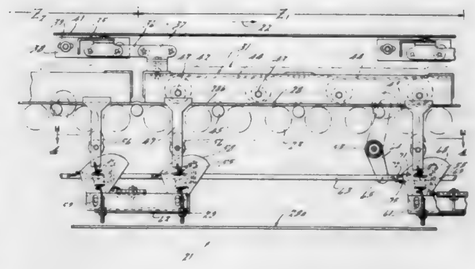
4,042,100
APPARATUS FOR ARRANGING ARTICLES
Ross Morrone, Lawrenceville, N.J., assignor to Otto Niederer Sons, Inc., Pennington, N.J.
Filed July 29, 1976, Ser. No. 709,675
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—446 **6 Claims**



1. An apparatus for arranging eggs and like articles which are positioned at random locations upon a conveyor by placing the eggs in orderly rows thereon, which comprises:

a. a plurality of channeling devices above the conveyor extending parallel with respect thereto to receive randomly positioned eggs and arrange them in orderly rows;
b. a rotatable gear means in engagement with the conveyor, said gear means being operable to rotate responsive to movement of the conveyor;
c. a cam means attached to said gear means;
d. a movably mounted carriage plate positioned above said channeling devices;
e. a cam follower movably secured to said carriage plate and biased into engagement with said cam means on said gear means;
f. biasing means attached to said carriage plate to urge said follower secured thereto into engagement with said cam means; and
g. a plurality of separator means secured to said carriage plate and extending downward therefrom adjacent the front ends of said channeling devices, said separator means adapted to move slightly in the horizontal plane to aid in the dividing of oncoming randomly positioned eggs into rows within said channeling device.

4,042,101
ACCUMULATING CONVEYOR
Robert Krammer, Farmington, Mich., and Michael T. McClellan, St. Paul, Minn., assignors to Standard Conveyor Company, North St. Paul, Minn.
Filed Nov. 4, 1975, Ser. No. 628,797
Int. Cl.[2] B65G *13/02*
U.S. Cl. 198—460 **21 Claims**

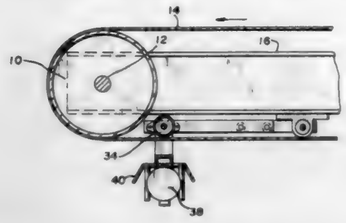


10. An accumulating conveyor comprising; a series of rotatable elements for supporting an article to be conveyed, said elements being disposed in side-by-side relationship along the path of the conveyor; a powered propelling member disposed above and adjacent one edge of said path; accumulating means including a frame disposed above said propelling member and being mounted for vertical movement with respect to said rotatable elements; a plurality of pressure rolls eccentrically mounted for rotation on said frame, said frame being normally disposed in a driving position in which said rolls rest upon and exert a downward pressure on said propelling member to cause it to drivingly engage said rotatable elements, said pressure rolls being rotatable by said propelling member when said frame is in said driving position to cause continual vertical oscillating movement of said frame between upper and lower positions; and retractable holding means for holding said frame in said upper position so that said propelling member does not drivingly engage said elements, thereby permitting the accumulation of articles on said conveyor.

4,042,102
VIBRATORY CLEANER FOR AN ENDLESS CONVEYOR BELT
Theodore S. Wadensten, P.O. Box 8, Stilson Road, Wyoming, R.I. 02898
Filed June 9, 1976, Ser. No. 694,379
Int. Cl.[2] B65G *45/00*
U.S. Cl. 198—494 **6 Claims**

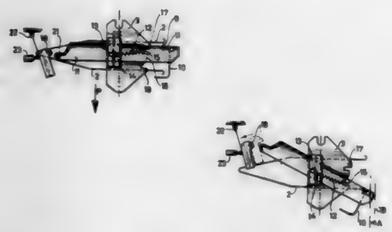
1. A vibratory belt cleaning apparatus for an endless conveyor belt as carried by head and tail pulleys on and by a conveyor frame, said apparatus disposed immediately adjacent

the tail pulley to remove attracted particles from the carrying surface of the belt as the belt is moved on its return portion of movement and prior to the return extent of belt reaching a snubber roller, idler pulley and the like which engages the carrying surface of the belt on the return extent, said belt cleaning apparatus including: (a) a support means for the conveyor belt and frame; (b) a first pair of arm members of like length, each pivotally retained at one end to and by the conveyor frame; (c) a second pair of arm members each having one end adapted to retain and carry a roller shaft, the other end of these arms adapted for attachment to the first arm member; (d) a shaft carried at each end by one of the second arm members; (e) a freely turning roller carried on and by the shaft, the roller disposed to engage the inside surface and under extent of the conveyor belt at said immediately adjacent position next to



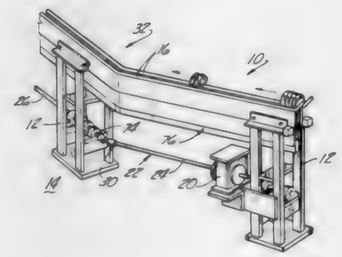
the tail pulley; (f) a vibrator isolator interposed between each of the first and second arm members where they are joined to form an arm assembly, these isolators inhibiting vibration transmittal from the pulley to the conveyor frame; (g) a bracket carried by the swinging ends of the pivoted arm assemblies, and (h) a variable speed and force vibrator carried by and on the bracket and having a vibratory range of twelve hundred to nine thousand cycles per minute, the vibrator so mounted and attached to the bracket that the vibrations from the vibrator are transmitted to the roller and from the roller to the conveyor belt which is locally vibrated to remove unwanted material from the outer surface of the belt, the bracket, vibrator and roller gravitationally urged toward the under extent of the belt with only the roller engaging the belt and with the vibrations from the vibrator isolated by the arm mounted isolators from the conveyor frame.

4,042,103
INSTALLATION FOR THE TREATMENT OF CONTAINER-PACKED COMMODITIES
Salomon Santen, Amsterdam, Netherlands, assignor to Stork Amsterdam B.V., Amstelveen, Netherlands
Filed June 16, 1976, Ser. No. 696,559
Claims priority, application Japan, June 19, 1975, 50-75412
Int. Cl.² B65G *17/46*
U.S. Cl. 198—645 **1 Claim**



1. Installation for the treatment of container-packed commodities, in particular for the sterilization of pharmaceutical products or the like foodstuff packed in pouches, said installation comprising an endless conveyor with carriers for the containers, travelling through a treatment space, the conveyor passing subsequently along a discharge station and a loading station lying outside the treatment space, wherein each carrier **(2)** is mounted mainly perpendicular to the conveyor**(1)** whilst each carrier is provided with a sidewardly directed opening **(9)** for the passage of the containers, said opening being closed by a cover **(10)** mounted near one end of a lever **(11)** which is pivotally connected to the conveyor with additional means for a limited longitudinal displacement against the action of a resilient element **(12)**, the pivotal movement being restricted by a cam-member **(15)** slidable along a cam surface **(16)** with at least one end recess **(17, 18)** for locking the cover in at least one of both its end positions (I, II), a mainly stationary abutment **(19, 20)** being provided before the discharge station **(7)** and beyond the loading station **(8)** resepctively, for engaging a protruding part **(21, 15)** of the lever in order to first shift the lever longitudinally and thereafter retain the lever so that by the continued travel of the conveyor, the lever is subsequently tilted so as to move the cover into one of its end positions.

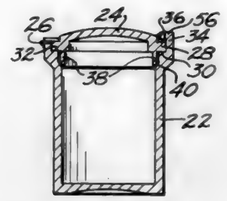
4,042,104
CONVEYOR
James L. Furlette, 984 Bal Isle, Fort Myers, Fla. 33902, and Donald Stadler, 10400 Hartland Road, Fenton, Mich. 48430
Filed Sept. 29, 1975, Ser. No. 617,411
Int. Cl.² B65G *25/02*
U.S. Cl. 198—774 **5 Claims**



1. In combination:
a conveyor comprising at least three stands each secured to a base and in spaced apart relationship,
said conveyor further comprising a pair of spaced and parallel rail members mounted to and between said stands in a generally horizontal position so that said rail members are supported only by said stands and wherein said rail members include at least one angled section, a trough assembly having an elongated base portion, said base portion being positioned beneath and parallel to said rail members and spaced apart from said rail members at a predetermined distance,
at least one workpiece, said workpiece having an upper portion supported by said rail members and a downwardly depending lower portion received in said trough assembly, said lower portion having a longitudinal length greater than said predetermined distance between said rail members and the base portion of said trough assembly so that the lower end of the workpiece lower portion abuts against the trough assembly base portion, and
means to vertically oscillate said trough assembly and said rail members relative to each other to thereby move said workpiece along said conveyor,
said means comprising a generally horizontal shaft and bearing support means secured to each of said stands for rotatably receiving said shaft, a generally horizontal drive rod disposed between each pair of stands and underneath said rail members, each of said drive rods being connected by universal joint means to said shafts whereby rotation of one drive rod simultaneously rotatably drives all of said shafts and said drive rods, means for rotating one of said drive rods, and means disposed in each of said stands for simultaneously and in unison translating the rotary motion

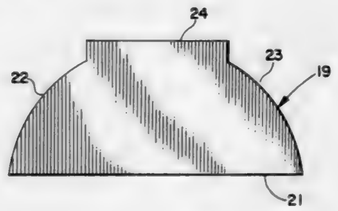
of said shafts into vertical, oscillating motion of said trough assembly and said rails relative to each other.

4,042,105
SAFETY CLOSURE FOR A CONTAINER AND METHOD FOR OPENING THE CLOSURE
Clarence R. Taylor, 28 Woodside Drive, Penfield, N.Y. 14526
Filed June 28, 1976, Ser. No. 700,584
Int. Cl.² B65D *43/16, 55/02*
U.S. Cl. 206—1.5 **11 Claims**



1. A safety closure for a container comprising:
a flexible body member having an opening;
a seat on said body member surrounding said opening;
a cap having a bottom surface mountable on said seat for closing said opening;
means on said cap and body member for releasably securing said cap on said seat; and
cam means on said body member adapted, when manually moved by a force toward and underneath said bottom surface to a depressed position and the force progressively applied while in said depression position along the length of said cam means, to cam said cap out of said seat against the bias of said securing means.

4,042,106
RECORD PROTECTOR
Paul W. Smith, 2818 Louisiana Ave. South, St. Louis Park, Minn. 55426
Filed Sept. 8, 1976, Ser. No. 721,554
Int. Cl.² B65D *85/30*
U.S. Cl. 206—313 **6 Claims**



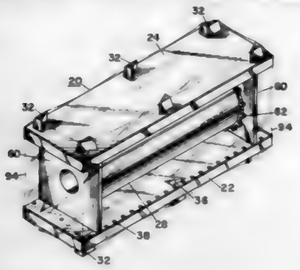
1. A hand-held protector device for removing a phonograph disc record of a given diameter, said record having a central spindle engaging opening from a record jacket, for placing the record on a phonograph spindle, for removing the record from the spindle and reinserting in a record jacket, all without touching the record, said protector device comprising:
A) an envelope composed of a pair of flat sheet members in face-to-face abutment,
1. said envelope being open along one straight edge and adapted to receive a record between the sheet members,
2. the length of the envelope along said straight edge being less than the diameter of the phonograph disc,
3. said sheet members being connected at their edges over at least a portion of the perimeter of said envelope which corresponds generally in geometrical configuration to the perimeter of the phonograph disc, and
4. the maximum width of said envelope being less than the radius of the phonograph disc, and
B. a straight handle portion on said envelope,
1. the edge of said handle portion being generally parallel to said open edge, and
2. the length of said edge being less than the length of the envelope.

3. A phonograph record package comprising in combination:
A. a phonograph record jacket composed of square flat sheet members in closely spaced face-to-face relation joined together along three sides and open along one edge,
B. an inner sleeve disposed in said jacket opposite from said open edge and comprised of:
1. a pair of flat rectangular sheet members in closely spaced face-to-face relation,
2. the length of said sheet members being substantially equal to the inside width of said jacket, and
3. the width of said sleeve being more than one-half the width of said jacket,
C. a protector device disposed in said jacket for removing a phonograph disc record of a given diameter, said protector device comprising:
1. an envelope composed of a pair of flat sheet members in face-to-face abutment,
a. said envelope being open along one straight edge and adapted to receive a record between the sheet members,
b. the length of the envelope along said straight edge being less than the diameter of the phonograph disc,
c. said sheet members being connected at their edges over at least a portion of the perimeter of said envelope which corresponds generally in geometrical configuration to the perimeter of the phonograph disc, and
d. the maximum width of said envelope being less than the radius of the phonograph disc, and
2. a straight handle portion on said envelope,
a. the edge of said handle portion being generally parallel to said open edge, and
b. the length of said edge being less than the length of the envelope, the edge of the handle portion of said device being in substantial longitudinal alignment with the sheet member edges defining the open edge of the jacket, and the open straight edge of said device being in abutment with the edge of said inner sleeve, and
D. a phonograph disc record disposed in said jacket between the sheet members of said protector device and said inner sleeve.

4,042,107
RETURNABLE ROLL SHIPPING CONTAINER
Robert N. Kendig, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.
Filed Feb. 24, 1975, Ser. No. 552,069
Int. Cl.² B65D *19/26, 19/42*
U.S. Cl. 206—386 **6 Claims**

1. A shipping container for shipping an elongated article comprising upper and lower rigid pallets, a pair of spaced upright end plate assemblies between said pallets and in engagement therewith, said end plate assemblies including means extending inwardly for supporting said elongated article therebetween, said pallets being of similar structure and each comprising (a) a platform, (b) support means extending outwardly from one side of said platform, the support means of the lower pallet extending downwardly and supporting the container, said support means being arranged so as to permit interlocking engagement between the support means of two similar but oppositely oriented pallets and thereby permit vertical stacking of a plurality of shipping containers, (c) first means on a surface

of each pallet extending from one end of said pallet toward the center thereof for receiving one of said end plate assemblies and second means on a surface of each pallet extending from the other end of said pallet toward the center thereof for receiving the other of said end plate assemblies, each of said



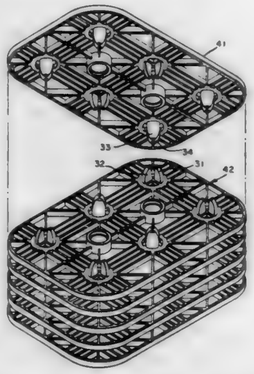
means comprising a plurality of longitudinally spaced end plate-engaging means, each of said end plate-engaging means being capable of engaging an end plate and retaining it in a desired position whereby each end plate can be placed in any one of a plurality of positions independently of the other end plate in accordance with the length of the elongated article.

4,042,108

STACKABLE YARN SUPPORT

Dale M. Brethauer, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1976, Ser. No. 730,024
Int. Cl.² B65D *85/67*
U.S. Cl. 206—392 **4 Claims**



1. A device for supporting bobbins of yarn wound on open-ended tubes, comprising a one-piece pallet molded of synthetic plastic and a plurality of spaced holding members integrally molded to the pallet which extend from each face of the pallet in the form of bullet-shaped protrusions adapted to fit in the ends of yarn tubes to maintain yarn bobbins in spaced relationship; the portion of each holding member which extends from one face of the pallet being composed of two segments disposed at 180° to each other, the portion of each holding member which extends from the second face of the pallet being composed of two segments disposed at 180° to each other and offset 90° from the segments on the first face, and the configuration of the segments being such that a plurality of empty pallets can be stacked with the holding members interengaged until used for supporting bobbins.

4,042,109

MEDICAL PROCEDURE PACKAGE

Donald S. Barcan, Union, N.J., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jan. 21, 1976, Ser. No. 651,881
Int. Cl.² B65D *1/34, 85/00;* **A61B** *19/02*
U.S. Cl. 206—440 **26 Claims**



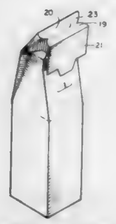
1. A medical procedure package comprising a tray and a drape secured to and about said tray, said tray having two pairs of generally opposed sides, said drape including generally diagonally opposed upwardly exposed tabs, said drape having opposed first and second side portions extending from a first pair of opposing sides of the tray and longitudinally beyond the second pair of opposing sides of the tray, one of said tabs appearing on each of said first and second side portions, said first and second side portions being transversely fan foldable to a point inward of the corresponding first pair of sides of the tray and defining longitudinal fan folds positioned within the transverse confines of the first pair of sides and projecting longitudinally beyond the second pair of sides so as to form fan folded end portions, the tabs remaining upwardly exposed at diagonally opposed points longitudinally beyond the second pair of opposed sides and on the fan folded end portions, said end portions being longitudinally fan foldable to a point inward of the corresponding second pair of sides of the tray and defining fan folds positioned within the longitudinal confines of the second pair of sides, said tabs remaining upwardly exposed at diagonally opposed points within the confines of the tray.

4,042,110

CARTON DISPLAY DEVICE

Richard H. Guernsey, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed May 24, 1976, Ser. No. 689,275
Int. Cl.² G09F *3/00*
U.S. Cl. 206—459 **4 Claims**



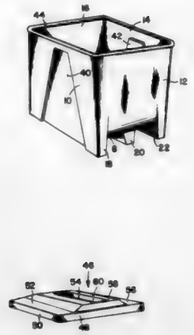
1. In an integral paperboard carton having a reclosable cover, the improvement comprising a display device panel integrally connected to a first tuck flap with a first crease line therebetween, said first tuck flap being connected by a second crease line to a similar second tuck flap adjacent the carton's cover, and folded against said second tuck flap along said second crease line for insertion into the interior of the carton when said cover is closed, said display device being detachable from said carton by a weakened area in one of said crease lines and having a fastening tab at its free end for removable engagement with a slot in the front wall of the carton to maintain said display device panel flush with the carton's front wall.

4,042,111

CONTAINER FOR BULK MATERIAL

Rush B. Smith, Philadelphia, Pa., assignor to Pennsylvania Pacific Corporation, Warminster, Pa.

Filed Dec. 12, 1975, Ser. No. 640,004
Int. Cl.² B65D *21/02*
U.S. Cl. 206—508 **2 Claims**



1. A container for the handling and storage of large quantities of bulk material comprising a unitary molded plastic liquid-tight tub having a bottom and four upwardly extending sides; a lip along the upper edges of the sidewalls; three parallel, laterally spaced, downwardly extending, hollow ridges forming supporting members for the container being integrally molded in said bottom; said ridges extending substantially the full length of the bottom of said tub, and establishing, between adjacent pairs of ridges, spaces for the entry of the tines of a forklift or pallet jack; removable cover means adapted to rest on the upper edges of said four upwardly extending sides and to enclose said tub; said cover means also being composed of molded plastic; said cover means having means for engaging the sides of the tub and preventing lateral movement of the cover with respect to the tub comprising four downwardly extending sides forming a skirt adapted to fit tightly over the lip along the upper edges of the tub sidewalls; said cover means also having means providing three elongated, parallel substantially coplanar surfaces on the upper side thereof; said cover surfaces being adapted to support parallel, laterally spaced, downwardly extending hollow ridges of another container resting thereon; at least one of said three elongated, parallel cover surfaces being surrounded by ridge means integrally molded into said cover; said ridge means extending upwardly from said cover surfaces; said ridge means conforming to the shape of a ridge of the container and being adapted thereby to surround said container ridge and to secure said container resting on said cover surfaces against lateral motion.

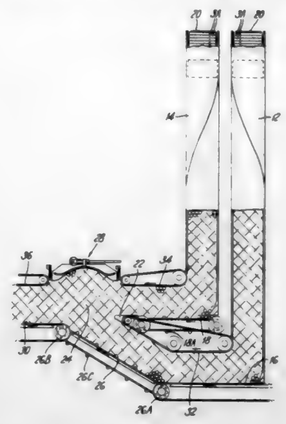
4,042,112

CONVEYING CIGARETTES AND OTHER ROD-LIKE ARTICLES

Desmond Walter Molins; Dennis Hinchcliffe; Peter Alec Clarke, and Frank Heybourn, all of London, England, assignors to Molins Limited, England

Filed Sept. 19, 1975, Ser. No. 614,899
Claims priority, application United Kingdom, Oct. 3, 1974, 42872/74
Int. Cl.² B26D *7/06*
U.S. Cl. 209—73 **22 Claims**

1. Apparatus for conveying filter-tipped cigarettes, comprising means for receiving two streams of such cigarettes with the filters of the two streams facing in opposite directions, means for conveying the two streams side by side while twisting the streams in opposite directionsabout longitudinal axes of the streams so that the cigarettes of the two respective streams are then parallel, with their centers all lying substantially in a



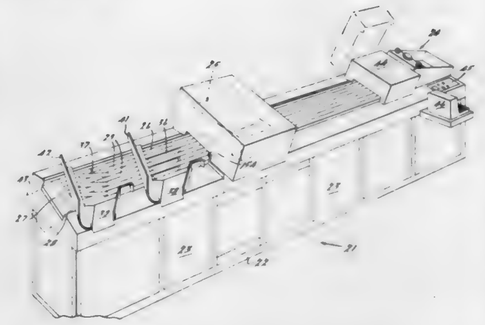
common plane transverse to the axes of the cigarettes and with the filters all facing in the same direction, and means for merging the two streams by movement of the streams substantially in directions transverse to the axes of the cigarettes.

4,042,113

SORTING DEVICE FOR MAGAZINE OR THE LIKE

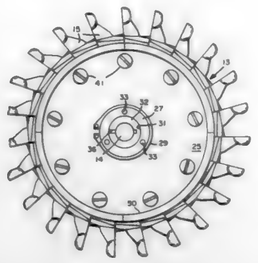
Leroy A. Duncan, Lathrup Village, and Steve M. Aksamit, Melvindale, both of Mich., assignors to Standard Alliance Industries, Inc., Oak Brook, Ill.

Filed June 18, 1976, Ser. No. 697,435
Int. Cl.² B65G *47/34*
U.S. Cl. 209—74 R **20 Claims**



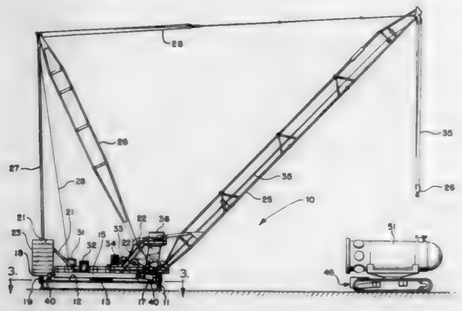
1. A sorter comprising an elongated bed, a hopper at one end of said bed for receiving a stack of magazines, belt means constantly movable along said bed, a portion of said belt means extending beneath said hopper, a scanner downstream from said hopper, diverter means on said bed downstream from said scanner, and separating means for ensuring that there is adequate space between magazines when they reach said scanner, said separating means comprising lifting means at the bottom of said hopper adjacent said belt means and movable between an upper position raising said magazines above said belt means and a lower position permitting the lowermost magazine to be removed from the stack by said belt means, and separating finger means downstream from said lifting means and movable between an upper position permitting the magazines on said belt means to pass therebelow and a lower position urged against said bed so as to intercept and stop an approaching magazine.

4,042,114
FEED WHEEL FOR A SORTING APPARATUS
Tor Arild, Woodside, and Russell R. Ames, San Jose, both of Calif., assignors to Accusort Corporation, Belmont, Calif.
Filed May 19, 1976, Ser. No. 687,981
Int. Cl.[2] B07C 5/344
U.S. Cl. 209—111.7 R **12 Claims**



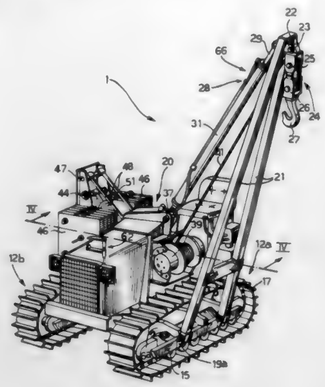
1. A feed wheel for use in apparatus for sorting small particles, such as beans, comprising the combination of a pair of disc members, a hub, one of said members being attached to said hub, means detachably supporting the other of said members on said hub, said members being positioned on said hub in parallel spaced relation, a plurality of particle-receiving scoops each having attaching means which when the scoop is positioned between peripheral portions of said disc members will engage said disc members and releasable locking means for clamping and locking said peripheral portions of said disc members to releasably hold said scoops.

4,042,115
ROTARY COUNTERWEIGHT CRANE WITH A REMOVAL TRACK SECTION
Daniel E. Beduhn; James G. Morrow, Sr., and David J. Pech, all of Manitowoc, Wis., assignors to The Manitowoc Company, Inc., Manitowoc, Wis.
Filed July 28, 1976, Ser. No. 709,451
Int. Cl.[2] B66C 23/72
U.S. Cl. 212—48 **7 Claims**



1. A crane assembly comprising, in combination, a ring defining an annular track, removable structure mounted within said ring defining a central king pin, an elongated platform fitted for rotation on said king pin, said platform having a boom carrier at one end in riding contact with said track and a counterweight support at the other end also in riding contact with said track, a boom pivoted on said carrier above said track, means including a mast on said platform interconnecting said counterweight support and said boom for positioning said boom, a load block suspended on said boom, apd means including powered hoists mounted on said platform for powered control of said boom and said load block, said ring having a removable section whereby said removable structure and said section can be removed from the assembly to permit a self-powered transporter having a king pin to be run within the ring and beneath the platform and be connected to the ring and platform to create a mobile assembly.

4,042,116
TRACK LAYING TRACTOR WITH MOVABLE BOOM WHICH CAN BE TILTED LATERALLY
Giorgio M. Bertolino, Torinio, Italy, assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.
Filed Jan. 9, 1976, Ser. No. 647,725
Claims priority, application Italy, Jan. 24, 1975, 67163/75
Int. Cl.[2] B66C 23/72
U.S. Cl. 212—140 **6 Claims**



1. In a crawler tractor including a tractor body supported by a pair of track laying units which comprise a track support frame about which the tracks pass in an endless path of movement, a load lifting crane mechanism having a movable boom supported on one side of the tractor body at the outer side of the adjacent track unit and a pulley device for lifting or moving loads, a variably positionable load balancing counterweight mechanism supported from the tractor body on the side opposite the crane mechanism for balancing the load connected to the crane mechanism, the improvement comprising

base support means extending transversely between and carried by the track support frame on each track unit for connecting the crane and counterweight mechanism to the tractor body,

each said track support frame carrying pivot means on an outer side thereof positioned within the area defined by the path of movement of the tracks moving endlessly thereabout,

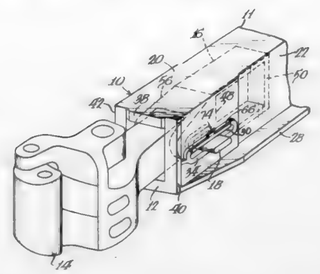
one of said pivot means detachably securing a first portion of the crane mechanism to one track support frame for lateral movement relative thereto, and the other of said pivot means removably securing a portion of the counterweight mechanism to the other track support frame for lateral movement relative thereto,

a support frame secured to and extending upwardly from said base support means for pivotally connecting, on opposite sides thereof, a second portion of the crane mechanism and another portion of the counterweight mechanism for lateral movement relative thereto,

means for pivotally moving said crane and counterweight mechanism laterally of said track support frame when pivotably connected thereto to balance the crawler tractor during load lifting operation, and

means for pivoting said second portion of said crane mechanism longitudinally of said track support frames from a first position in which said first and second portions of said crane mechanism are connected for load lifting operation to a second position in which said first and second portions of said crane mechanism are disconnected when said pivot means securing said crane mechanism to the track support frame is detached to facilitate transporting the tractor by limiting the width thereof to the outer edges of the tracks.

4,042,117
WEAR PLATE
Carl D. McClurg, Lockbourne, Ohio, assignor to Buckeye International, Inc., Columbus, Ohio
Filed July 7, 1975, Ser. No. 593,196
Int. Cl.[2] B61G 9/20
U.S. Cl. 213—50.5 **6 Claims**



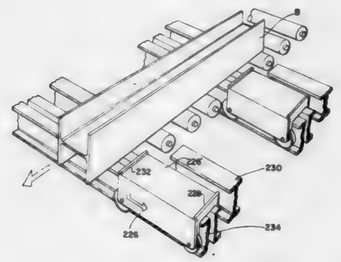
1. A center sill assembly for securing a coupler to said center sill in a railway car, comprising in combination:

a center sill having a pair of side walls, each of said walls having a key slot extending therethrough and an outer peripheral rib surrounding each key slot on the outer side of said wall and an inner peripheral rib surrounding each key slot on the inner side thereof and an upper bearing surface and lower bearing surface for each key slot;

an elongated draft key extending through each key slot and normally biased by the weight of said coupler toward said upper bearing surface of each key slot;

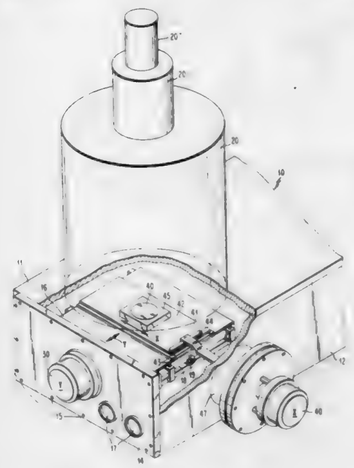
a wear plate for each key slot having elongated and substantially planar web means terminating intermediate the ends of the respective key slot for facile positioning within the respective key slot adjacent said upper bearing surface, said web means having a hardenable wear surface for engagement with the top of the draft key so as to protect the upper bearing surface from the rubbing action of the draft key during motion of the railway car, and flange means for securing each wear plate to said sill at one peripheral rib and for maintaining said web means in position adjacent said upper bearing surface.

4,042,118
COMBINATION ROLLER CONVEYOR AND CROSS-CONVEYOR SYSTEM
Hans V. Schmidt, Mount Vista Road, Kingsville, Md. 21087
Filed Mar. 9, 1976, Ser. No. 665,372
Int. Cl.[2] B65G 47/90
U.S. Cl. 214—1 BB **9 Claims**



6. In combination, a conveyor, a cross-conveyor passing through at least a portion of the conveyor, a storage table adjacent the cross-conveyor, the cross-conveyor having wagon structure elevatable and depressable for picking up elongate beams and the like from the storage table and carrying them to and depositing them on the conveyor, an upright flange on at least one end of the wagon structure; the amplitude of said elevation and depression of the wagon structure being proportioned for passing said flange beneath said an elongate beam on the storage table with the wagon structure depressed, thereafter for permitting the flange to engage a lateral portion of said an elongate beam and to urge it into orientation parallel with the conveyor with the wagon structure partially elevated, and thereafter for the wagon structure to pick up said an elongate beam and carry it and deposit it in said orientation onto the conveyor.

4,042,119
WORKPIECE POSITIONING APPARATUS
Javathu Kutikaran Hassan, Hopewell Junction, and Carl Vincent Rabstejnek, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 30, 1975, Ser. No. 592,152
Int. Cl.[2] B25J 3/04
U.S. Cl. 214—1 CM **5 Claims**



5. A workpiece support apparatus comprising:

a remotely positionable workpiece support means adapted for linear motion in each of at least two orthogonal directions contained in an enclosed chamber;

first and second motive means mounted on the walls externally of the enclosed chambers;

one of the walls of the chamber, having the first motive means fixedly attached thereto;

said one of the walls and first motive means being removable together with at least a portion of the workpiece support apparatus from the enclosed chamber;

each said first and second motive means having respective first and second drive means;

engaging means fixedly attached to the second drive means and to said workpiece support apparatus;

said engaging means permitting relatively frictionless motion along a longitudinal axis while constraining motion perpendicular to the longitudinal axis;

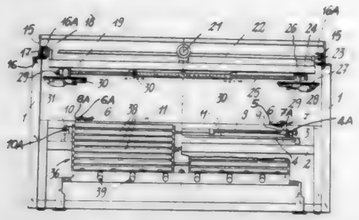
such that at least a portion of said workpiece support apparatus is adapted to be disengaged from said second drive means.

4,042,120

MACHINE FOR STRIPPING FROM FRAMES, PARTICULARLY PIN FRAMES, MATERIALS RESTRAINED TO SAID FRAMES

Vito Frigo, Cervignano del Friuli (Udine), Italy, assignor to Ausatuft S.p.A., Italy

Filed Aug. 21, 1975, Ser. No. 606,529
Claims priority, application Italy, Sept. 17, 1974, 27360/74
Int. Cl.² B65G *47/91*
U.S. Cl. 214—1 BB **7 Claims**



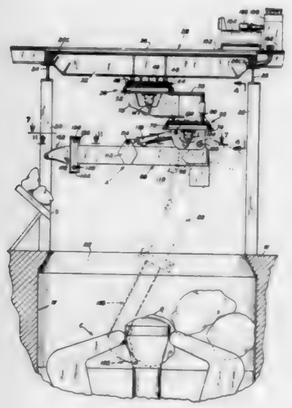
1. A machine for separating from frames, particularly pin frames, materials which have been restrained to said frames, such a machine comprising extractor means and guide means for accommodating dressed frames and positioning the same above said extractor means, the latter being upward movable to strip said material from said pin frame resulting in stripped material and stripped frames, means being provided for receiving said stripped material and evacuating said stripped frames.

4,042,121

DEVICE FOR MOVING A ROCK AT THE ENTRANCE OF A ROCK CRUSHER

Maurice James Bartell, 310 S. 1st Ave. E., Duluth, Minn. 55802

Filed Jan. 23, 1976, Ser. No. 651,794
Int. Cl.² B65G *7/00*
U.S. Cl. 214—1 R **7 Claims**



1. Device for moving a rock at the entrance of a rock crusher comprising:

a. an elongated support having means for mounting the support horizontally upon a horizontal wall,

b. first rotatable means carried by said support and depending therefrom,

c. second rotatable means,

d. rigid means extending within the extent of said elongated support and connecting said second rotatable means to said first rotatable means in depending relation with the rotational axis thereof offset from that of said first rotatable means,

e. a boom,

f. means pivotally mounting the inner end of said boom on said second rotatable means pivotal from a first horizontal position to and from alternatively depending angularly disposed positions,

g. means connected to said boom and said second rotatable means for pivoting said boom in a substantially vertical plane,

h. a hook,

i. means pivotally mounting said hook on the outer free end of said boom,

j. means mounted on said first rotatable means for rotating said first rotatable means on said support,

k. means mounted on said second rotatable means for rotating said second rotatable means on said connecting means, and

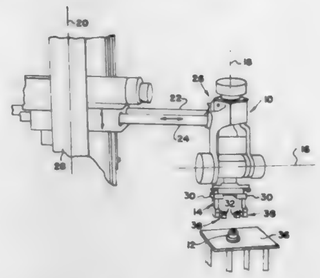
e. means for pivotally moving said hook.

4,042,122

REORIENTATION DEVICE FOR AN OBJECT MANIPULATOR

Donald M. Espy, and James L. Henry, both of Dayton, Ohio, assignors to The Bendix Corporation, Southfield, Mich.

Filed May 27, 1975, Ser. No. 581,326
Int. Cl.² B65G *47/90*
U.S. Cl. 214—1 CM **4 Claims**



1. In combination with a manipulating device of the type having means for holding an object, means for moving said object in a first direction, means for moving said objection a second direction which is transverse to said first direction wherein movement in said second direction is independent of movement in said first direction, means for rotating the object held by the holding means, and mechanical means selectively interposed in the path of the rotating means for stopping the rotating means after a rotation through a first angle of rotation, the improvement comprising:

second mechanical means for stopping the rotating means at a second angle of rotation, wherein said second angle of rotation is less than the first angle of rotation, said second stopping means being movable between a first position and a second position, wherein in one position the second stopping means is interposed in the path of the rotating means to stop the rotating means;

means for controlling the position of the second stopping means, whereby the object may be selectably rotated through either the first angle of rotation of the second angle of rotation; and

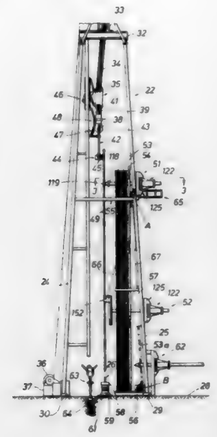
means for sensing the position of the rotating means for indicating the angle of rotation completed.

4,042,123

AUTOMATED PIPE HANDLING SYSTEM

Loren B. Sheldon, 8226 Bairnsdale, Houston, Tex. 77070; James R. Tomashek, 114 E. Division St., Wooddale, Ill. 60191; Robert R. Kelly, 138 Jamison Lane, Hoffman Estates, Ill. 60172; James S. Thale, 2749 Woodbine, Evanston, Ill. 60201; Jashwant C. Shah, 923 Anderson Terrace East, Des Plaines, Ill. 60016, and Donald H. Ward, 418 Ridgewood, Glen Ellyn, Ill. 60137

Filed Feb. 6, 1975, Ser. No. 547,375
Int. Cl.² E21B *19/00*
U.S. Cl. 214—2.5 **28 Claims**



1. A drill pipe handling system for the automated handling of drill pipe lengths, in a well being drilled or otherwise serviced, comprising:

rack means for receiving pipe stands and supporting said pipe stands in spaced apart vertical rows adjacent the side of a derrick, said rack means including a series of parallel rows for receiving said pipe stands and fingers selectively actuable for forming rectangular openings along said parallel rows for locking said pipe stands in place;

sensor means for sensing the individual actuation of said fingers;

racker means for successively moving said drill pipe stands between a position adjacent the center of the derrick and the rack means;

a racker arm extending horizontally from said racker means, said racker arm having a gripping means at the outer end thereof for engaging the drill pipe stands;

computer control means for controlling said rack means, said fingers, said racker means, and said racker arm;

said computer control means including,

a programmable general purpose digital computer;

a computer program for providing sequential instructions to said digital computer;

input-output means for monitoring and controlling said digital computer;

said input-output means including,

display apparatus for providing visual indication of the status of the computer program and for permitting data or instructions to be input to the digital computer; and

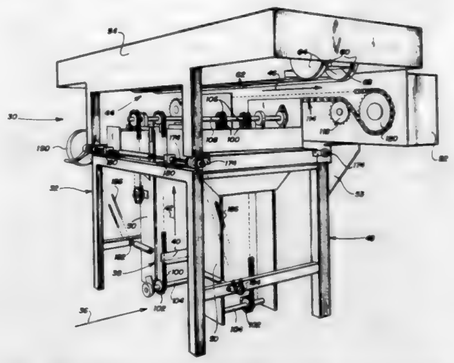
a driller's console for permitting control of the drill pipe handling system by inputing instructions to the digital computer, said console including a selector for selecting automated or manual operations of the handling system, and controls and indicator apparatus for starting or stopping the automated function of the handling system and for providing visual indication of the operating status of the handling system.

4,042,124

PAN UNSTACKING AND STACKING SYSTEM

William Perrin Bowdry, III, Dallas, Tex., and Irwin Edward Wickam, Wayzata, Minn., assignors to Stewart Engineering & Equipment Co., Richardson, Tex.

Filed June 2, 1975, Ser. No. 583,838
Int. Cl.² B65G *57/04*
U.S. Cl. 214—6 DS **64 Claims**



8. In a pan stacking and unstacking system, apparatus for vertically positioning pan stacks comprising:

fluid powered cylinder means including a selectively extendable rod;

a power input chain connected at one end of the rod of the fluid powered cylinder means;

a power input sprocket having the power input chain constrained therearound;

a power input shaft;

clutch means for selectively coupling the power input sprocket to the power input shaft;

a drive sprocket mounted on the power input shaft;

spaced parallel drive shafts;

a pair of drive sprockets each mounted on one of the spaced, parallel drive shafts;

a drive chain constrained around the drive sprocket on the power input shaft and the drive sprockets on the spaced, parallel drive shafts;

two pairs of spaced apart lift sprockets, each pair being mounted on one of the spaced, parallel drive shafts;

opposed pairs of spaced, parallel lift chains each constrained around one on the lift sprockets; and

at least one pair of opposed pan engaging members each mounted on a lift chain comprising one of the pairs for movement thereby into engagement with the lowermost pan comprising a stack of pans;

whereby the fluid powered cylinder means operates through the power input chain, the power input sprocket, the clutch means, the power input shaft, the drive sprocket mounted on the power input shaft, the drive chain, the drive sprockets mounted on the spaced, parallel shafts, the spaced, parallel shafts, the lift sprockets, and the lift chains to control the vertical positioning of the end engaging members and a stack of pans supported thereby; and

biasing means connected to the opposite end of the power input chain from the fluid powered cylinder means for maintaining tension on the power input chain.

24. In a pan stacking and unstacking system, apparatus for vertically positioning pan stacks comprising:

opposed pairs of spaced, parallel lift chains each constrained around lift sprockets mounted on spaced, parallel shafts;

at least one pair of opposed pan engaging members each mounted on the lift chains comprising one of the pairs for movement thereby into engagement with the lowermost pan comprising a stack of pans;

one of the shafts which support the lift sprockets comprising a drive shaft and extending to a drive sprocket;

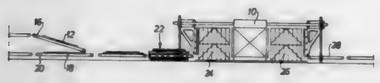
a drive chain constrained around the drive sprockets secured to each of the drive shafts and around a drive sprocket mounted on a power input shaft;
clutch means mounted on the power input shaft for selectively forming a driving connection thereto;
a power input sprocket mounted on the clutch means;
a power input chain constrained around the power input sprocket;
fluid powered cylinder means including a rod connected to the power input chain for selective actuation through the power input sprocket, the clutch means, the power input shaft, the drive sprocket mounted therein, the drive chain, the drive sprockets mounted on the drive shaft, the lift sprockets mounted on the drive shafts and engaged with the lift chains, and the lift chains to control the vertical positioning of a stack of pans supported by the pan engaging members on the lift chains;
at least one idler sprocket;
the drive chain being constrained around the idler sprocket in addition to the drive sprocket mounted on the power input shaft to define an upper chain course and a lower chain course;
one of the drive shafts having the lift chain engaging sprocket mounted thereon engaging the drive chain along the upper chain course; and
the other drive shaft having the lift chain engaging sprocket mounted thereon engaging the drive chain along the lower chain course.

4,042,125

METHOD AND APPARATUS FOR STACKING AND FEEDING BLANKS TO A TIERED MULTI-OPENING PRESS FOR THE PRODUCTION OF PRESSED BOARD

Willard Falkinger, Farsta, and Per Anders Asberg, Täby, both of Sweden, assignors to Defibrator AB, Stockholm, Sweden

Filed Oct. 17, 1975, Ser. No. 623,534
Claims priority, application Sweden, Oct. 23, 1974, 74133422
Int. Cl.² B65G *65/02;* **B30B** *15/30*
U.S. Cl. 214—6 BA **8 Claims**



1. In a system for producing pressed board and the like, in which the board blanks are pressed in tiers in a multi-opening press, the method of stacking and feeding the board blanks comprising:
a. depositing the board blanks on platens;
b. successively transporting the platens and superposed board blanks by conveyor means into a stacking device at predetermined intervals;
c. raising a predetermined number of platens and superposed board blanks successively above the conveyor means into retained contact with one another to form a stacked assembly of platens and board blanks and
d. introducing said stacked assemblies into the tiered opening in the multi-opening press.

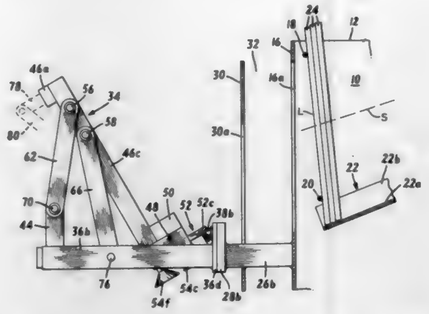
4,042,126

METHODS AND APPARATUS FOR RETRIEVAL OF STORED ARTICLES FROM A STACK

Lon Blauvelt, Niles, Mich.; J. Douglas Dickson, and Robert C. Russell, both of Columbus, Ohio, assignors to Simplicity Pattern Co. Inc., New York, N.Y.

Filed Feb. 26, 1976, Ser. No. 661,742
Int. Cl.² B65G *59/00*
U.S. Cl. 214—8.5 A **9 Claims**

3. A method for removing the lead article from a plurality of generally flat articles by use of a suction head comprising the steps of:
a. stacking said articles successively axially inwardly along a stacking axis and retaining said articles in such stack by imposing axial restraint upon first and second marginal portions of said lead article disposed transversely of said stacking axis;
b. preselecting a path for withdrawal from said stack of said lead article wherein said first portion thereof is free of such axial restraint;



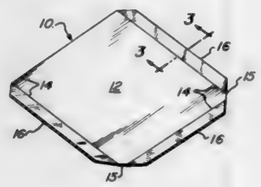
c. disposing said head in suctional engagement with said lead article and displacing said lead article inwardly along said stacking axis to free said first portion thereof from said axial restraint and dispose said first portion in such preselected path; and
d. moving said head outwardly of said stack in such suctional engagement with said lead article in manner maintaining said lead article in said preselected path.

4,042,127

SLIP PALLET AND DIVIDER SHEET

Charles Edward Brossia, Lakewood, Colo., assignor to Adolph Coors Company, Golden, Colo.

Filed Oct. 30, 1975, Ser. No. 627,101
Int. Cl.² B65D *19/00*
U.S. Cl. 214—10.5 R **17 Claims**



1. Apparatus for transporting and stacking, by use of a support device of a lift truck, an array of containers in a predetermined configuration including aligned vertically extending side surfaces and vertically spaced horizontally extending upper and lower surfaces and comprising:
a pallet member made of one piece of relatively thin plastic sheet material,
an upwardly facing container support surface on said pallet member defined by opposite pairs of generally parallel edges thereon having a peripheral configuration generally corresponding to the lower surface of an array of containers to be located thereabove in supportive engagement therewith,
a downwardly facing support surface on said pallet member extending generally parallel to said upwardly facing container support surface and having a peripheralconfiguration generally corresponding to the peripheral configuration of the upper surface of another array of containers to be located therebeneath,
an upwardly outwardly extending flap portion integral with said pallet member provided along at least one of said edges and being permanently formed in a generally upwardly outwardly extending postition relative to said upwardly facing container support surface to extend upwardly outwardly thereabove in space protective relationship to the adjacent side surface of the array of containers supported thereon while being resiliently deflectable relative to said upwardly outwardly extending position;
a divider member made of one piece of relatively thin plastic sheet material;
a downwardly facing support surface on said divider member defined by opposite generally parallel edges thereon having a peripheral configuration generally corresponding to the upper surface of an array of containers located therebeneath in supportive engagement therewith;
an upwardly facing support surface on said divider member extending generally parallel to said downwardly facing support surface and generally corresponding to the peripheral configuration of the lower surface of the array of containers thereabove for supportive engagement with the downwardly facing support surface on said pallet member;
a downwardly extending flap portion integral with said divider member provided along at least one of said edges corresponding in location to at least one of said edges of said pallet member having said upwardly outwardly extending flap portion thereon and being in a generally downwardly extending position relative to said downwardly facing support surface to extend downwardly therebelow in spaced protective relationship to the adjacent side surface of the other array of containers located therebelow; and
said upwardly outwardly extending flap portion on said pallet member and said downwardly extending flap portion of said divider member defining an outwardly diverging slot providing access for insertion of the support device of the lift truck in the space between said downwardly facing support surface on said pallet member and the upwardly facing surface on said divider member.

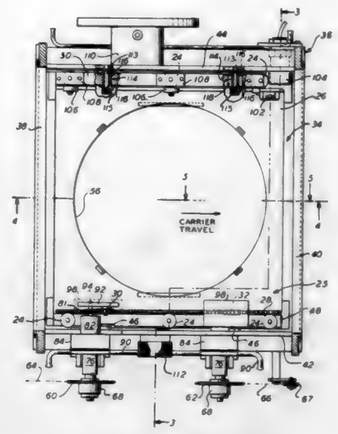
4,042,128

SUBSTRATE TRANSFER APPARATUS FOR A VACUUM COATING SYSTEM

Robert L. Shrader, Castro Valley, Calif., assignor to Airco, Inc., Montvale, N.J.

Filed Nov. 26, 1975, Ser. No. 635,475
Int. Cl.² C23C *13/08*
U.S. Cl. 214—17 B **11 Claims**

1. In vacuum processing apparatus of the in-line multiple chamber type including a process chamber located between a load-luck chamber and an unload-lock chamber, a transfer means for moving substrates between and through the chambers comprising:
a. a carrier for holding substrates:
b. a plurality of rollers for supporting and laterally guiding a longitudinal edge of the carrier as it moves along a linear path through the chambers:
c. a plurality of variable speed rotary gears spaced along the linear path of the carrier for driving the carrier between and through the chambers;
d. a gear-rack integral with the carrier and extending along a longitudinal edge thereof for sequentially engaging the rotary driving gears, said gear-rack adapted for concurrent engagement by at least two driving gears; and
e. motive means for operating the rotary driving gears to allow selective acceleration of the carrier.



4,042,129

REFUSE RECLAIMING APPARATUS

Robert K. Hampton, 119 Somerset Ave., Garden City, N.Y. 11530

Filed May 17, 1976, Ser. No. 687,020
Int. Cl.² B65G *65/42*
U.S. Cl. 214—17 DB **7 Claims**

1. Apparatus for reclaiming refuse from a pile thereof confined within a generally rectangular area of substantial length and stored with the top surface thereof fully exposed comprising in combination a below-ground-level elongated storage bin defined along its opposite sides by a pair of vertically extending laterally spaced parallel walls and a bottom floor extending horizontally between said side walls, said bin being provided along one side wall thereof with an adjacent elongated depressed trench which extends substantially the full length of said bin and has an open top disposed substantially flush with the bottom floor of said bin, said trench being spaced inwardly of its adjacent side wall of said bin to provide the latter with a bottom wall portion extending laterally beyond the outer side of said trench, a first endless conveyor mechanism having a running section operative to drag refuse from the top of the stored refuse pile toward one side thereof and into said trench, a traveling support for said conveyor mechanism shiftable lengthwise along said laterally extended bottom wall portion of said bin, means for operatively mounting said conveyor mechanism on said traveling support for vertical movement thereof into a position substantially paralleling the angle of repose of the stored refuse pile for penetrating engagement with the refuse resting on the surface of said pile, means for effecting operation of said conveyor mechanism and shifting

movement of its said traveling support whereby to drag refuse from the surface of said pile as said conveyor scans the same, and coacting means interconnecting said traveling support and said one side wall of said bin outboard of said trench to constantly maintain said support in vertical position against the counteracting tilting weight of said conveyor mechanism during the course of travel of the latter along the surface of said refuse pile.

4,042,130

CHARGING DEVICE FOR SHAFT FURNACE

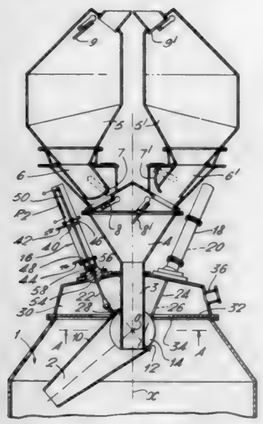
Edouard Legille, and Pierre Mailliet, both of Luxembourg, Luxembourg, assignors to S.A. des Anciens Etablissements Paul Wurth, Luxembourg

Filed Sept. 17, 1975, Ser. No. 614,307

Claims priority, application Luxembourg, Sept. 20, 1975, 70952

Int. Cl.² B66C *17/08*

U.S. Cl. 214—35 R **37 Claims**



1. Apparatus for charging a shaft furnace including:

tubular distribution means mounted in said furnace for distributing charge material to said furnace, said distribution means having an axis and oppositely disposed inlet and discharge ends;

guide means in said furnace for supporting said distribution means adjacent its inlet end for movement, said guide means permitting angular and rotary adjustment of the axis of said distribution means with respect to an axis of said furnace;

at least three control elements connected to said distribution means at spatially displaced points;

actuating means for longitudinally moving said control elements to direct the discharge of said distribution means to selected positions in said furnace; and

control means for independently regulating said actuating means in synchronism.

4,042,131

SWINGABLE BUCKET FOR EXCAVATORS

Frederic P. Buttke, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 7, 1975, Ser. No. 602,615

Int. Cl.² E02F *3/32*

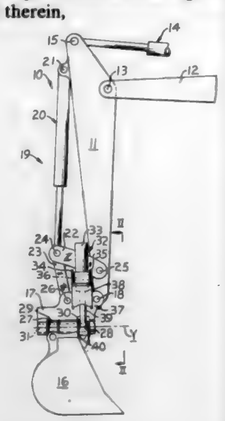
U.S. Cl. 214—138 R **4 Claims**

1. A dipper stick and bucket arrangement for an excavator comprising,

a normally vertically disposed dipper stick

a support bracket including spaced parallel upstanding plates having front and rear pin bores provided therein, and a depending portion having transverse pivot means provided therein, and wherein said front pin bores are pivotally connected to the distal end of the stick disposed intermediate said plates, said support bracket also including spaced parallel mounting plates extending from one of said upstanding plates on one side of said support bracket and having pivot bores provided in the distal ends thereof,

bucket means including spaced parallel mounting brackets provided on the top thereof each having front and rear pin bores provided therein,



bracket means pivotally mounted on said transverse pivot means and on said front and rear bracket pin bores and wherein said bracket means includes spaced parallel levers extending from one side thereof above the bucket intermediate the front and rear portions thereof, and

a hydraulic cylinder pivotally connected to said mounting plates and said levers whereby the bucket may be pivoted around said transverse axis upon actuation of said hydraulic cylinder.

4,042,132

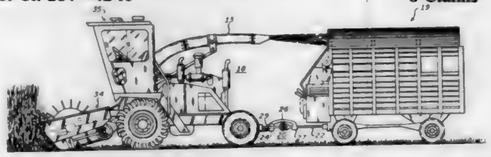
SPOUT CONTROL APPARATUS FOR AGRICULTURAL MACHINES

Carl E. Bohman, Sudbury; Hubert R. Durling, Jr., Lancaster; Leon Susman, Sudbury, and Norman F. Rolfe, Carlisle, all of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 1, 1976, Ser. No. 689,422

Int. Cl.² B65G *67/22*

U.S. Cl. 214—42 A **8 Claims**



1. Apparatus for automatically controlling the direction of a crop discharge spout on an agricultual machine with respect to a wagon attached thereto by means of a hitch assembly, said apparatus comprising:

first sensor means for providing a first sensor signal representative of the angle between the longitudinal axes of said agricultural machine and said wagon,

second sensor means for providing a second sensor signal representative of the angle between the directon of the crop discharge from said crop discharge spout and the longitudinal axis of said agricultural machine,

comparator means for comprising said first and second sensor signals and providing an error signal derived from the difference therebetween, and

utilization means coupled to said crop discharge spout and responsive to said error signal for adjusting the direction of the crop discharge from said crop discharge spout so that the discharged crop is continually directed into the wagon.

4,042,133

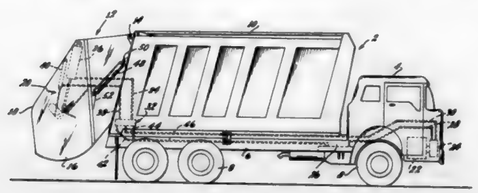
REFUSE COMPACTOR

Fred T. Smith, Newark, Ohio, assignor to Sargent Industries, Inc., Los Angeles, Calif.

Filed June 6, 1975, Ser. No. 584,299

Int. Cl.² B65F *3/00*

U.S. Cl. 214—83.3 **21 Claims**



1. In a refuse packer having a refuse storage body, a loading hopper and a passage leading from said hopper to said storage body at the forward end of the hopper, the improvement comprising:

collapsible packing means mounted in said hopper and including an upper packing panel and a lower packing panel freely pivotable relative to the upper packing panel between a collapsed position relative to the upper packing panel and an extended position relative to the upper packing panel;

said packing panel means being movable forwardly in the hopper from the collapsed position of the lower panel relative to the upper panel at the rear of the hopper to the extended condition of the lower panel relative to the upper panel to sweep refuse from said hopper into said passage;

said packing means being movable rearwardly from said passage to provide for the pivotal movement by the refuse in the hopper of the lower packing panel to said collapsed position relative to the upper packing panel;

said packing means in its partially collapsed condition being capable of moving over refuse in said hopper;

motive means drivingly connected to said upper packing panel to move the packing means forwardly and rearwardly in the hopper; and

guide means disposed on the lower packing panel in cooperative relationship with the hopper for producing a force on the lower packing panel relative to the upper packing panel during the movement of the packing means to provide for the pivotal movement of the lower packing panel from the collapsed position relative to the upper packing panel to the extended position relative to the upper packing panel during the forward movement of the panel means to sweep refuse through the passage into the storage body from the hopper.

4,042,134

REFUSE COLLECTION APPARATUS

Fred T. Smith, Dearborn Heights, Mich., assignor to Sargent Industries, Inc., Los Angeles, Calif.

Continuation of Ser. No. 440,746, Feb. 18, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,553

Int. Cl.² B65F *3/00*

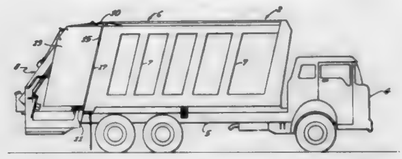
U.S. Cl. 214—83.3 **8 Claims**

1. In combination for use in packing refuse in a collection apparatus wherein the apparatus includes a hopper having a hollow configuration defined by a front surface and a pair of side surfaces spaced from each other,

a packing panel having a first surface for engaging the refuse in the hopper to pack the refuse in the hopper, the packing panel being movable initially forwardly in an arcuate path having a relatively large radius to define essentially a forward movement in the hopper to pack the refuse in the hopper and then being movable initially vertically upwardly in the hopper and then upwardly with progressively increasing forward components of movement to provide for the removal of the refuse from the hopper, the first surface of the packing panel being provided throughout its length with a concave curvature to provide for the breakage of the refuse into small pieces during the upward movement of the packing panel, and

means operatively coupled to the hopper for providing initially for the movement of the packing panel forwardly in the hopper in the arcuate path having the relatively large radius and then initially vertically upwardly in the hopper and then upwardly with progressively increasing forward components of movement,

the packing panel being provided with a second surface spaced from the first surface and being supported by a plurality of bracing members spaced from one another and disposed internally between the first and second surfaces in bracing relationship to the first and second surfaces,



the first surface extending outwardly from the second surface of the packing panel at one extremity to define a narrowed edge and the hopper being provided with an opening in its rear surface to provide for the insertion of refuse into the hopper and the lower extremity of the opening being defined by a lip and the packing panel being movable downwardly past the opening in the hopper with the narrowed edge in abutting relationship with the lip, prior to the forward movement of the panel in the hopper, to provide for a shearing of refuse overhanging the lip and the moving means for the packing panel providing for a downward movement of the packing panel past the opening in the hopper prior to the forward movement of the packing panel in the hopper,

a pair of ribs extending outwardly from the first surface of the hopper in spaced relationship to each other along the lateral dimension of the packing panel and the ribs extending along the curved configuration of the first surface and wherein the ribs are configured to converge toward the first surface.

4,042,135

LOAD HANDLING VEHICLE

Stuart Pugh, Loughborough, and Ridley Stokoe, Whitley Bay, both of England, assignors to The Liner Concrete Machinery Company Limited, Gateshead, England

Filed Oct. 14, 1975, Ser. No. 622,359

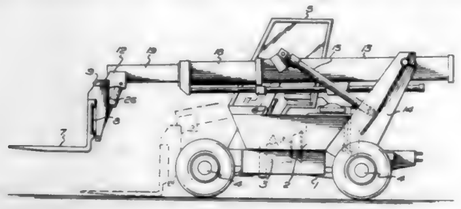
Claims priority, application United Kingdom, Oct. 12, 1974, 44295/74

Int. Cl.² E02F *3/38*

U.S. Cl. 214—141 **6 Claims**

1. A load handling vehicle comprising: a chassis, axles carrying the chassis on wheels, a telescopically extensible boom pivotally mounted on said chassis, a jack between the chassis and said boom for raising the boom, a pin having strain gauges mounted thereon, said pin connecting the chassis to one of said

axles, wherein when a turning moment of the chassis exceeds a predetermined level, said strain gauges operate an audible



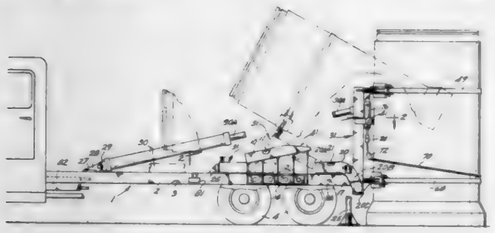
and/or visible alarm to warn of possible overload or unstable conditions.

4,042,136

MOBILE LOADING APPARATUS FOR LARGE ARTICLES

Philip R. Fairbanks, Nampa, Idaho, assignor to Idaho Concrete Pipe Co., Inc., Nampa, Idaho, a part interest

Filed Oct. 28, 1976, Ser. No. 736,746
Int. Cl.² B60P *1/00*
U.S. Cl. 214—146.5 **7 Claims**



1. In a vehicle for transporting articles of substantial mass, said vehicle including a frame and undercarriage, the improvement comprising,

a tiltable carriage movable between an upright loading-unloading position and a horizontal load transporting position, load securing means on said carriage,

a front pair of guideways with each guideway offset upwardly from a frame member of the vehicle, each guideway constituting an inclined pathway,

a rear pair of guideways supported by said frame members and each having angularly disposed segments with one segment thereof being downwardly and rearwardly inclined relative to the vehicle frame,

front and rear roller means on said carriage and respectively entrained for travel on said front and rear guideways and operable to confine the carrier for travel between upright and horizontal extreme positions, said rear roller means and the lower terminus of said rearwardly inclined guideway segments coacting to support the carriage for pivotal movement of the carriage about a fixed axis during tilting movement immediately prior and subsequent the carriage upright loading position, remaining carriage travel being determined by the travel of said front roller means along the inclined pathways of the front guideways and the travel of said rear roller means along the angularly disposed segments of said rear pair of guideways, and

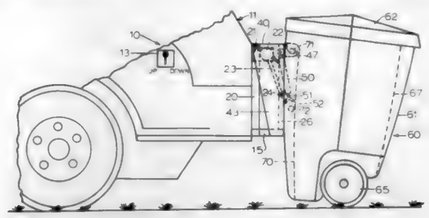
powered means carried by the vehicle and acting on the carriage throughout both arcuate travel of same about said fixed axis and coterminous travel along said guideways.

4,042,137

MUNICIPAL REFUSE COLLECTION SYSTEM

Thomas Philip Hughes, 803 Quail Court, Roanoke Rapids, N.C. 27870, and Clark Alexander Sherrill, 2811 Bleeker Square, Apt. H, Winston-Salem, N.C. 27106

Filed Apr. 8, 1976, Ser. No. 674,871
Int. Cl.² B65F *3/02*
U.S. Cl. 214—302 **8 Claims**



1. A system for containing in a portable waste container municipal refuse, and the like, and dumping the container contents into a refuse receptacle having an opening in a wall portion thereof, comprising in combination:

a. a portable container having upper and lower vertically-spaced horizontal locking bars on a selected side surface thereof;

b. a dumping mechanism on said refuse receptacle adjacent said opening and comprising:

i. a support frame secured to said receptacle and mounting reversible motor means and an elongated lift arm, said motor means being arranged to pivot said lift arm about a fixed horizontal axis extending through an inner end thereof adjacent said frame, said lift arm having track traveler means at an opposite outer end portion thereof adapted for riding in a cooperative track;

ii. a lift platform having a plate member providing an outer surface for engaging a portion of said selected side surface of said container and having an upper portion thereof pivotally secured to said frame for pivoting on said frame about a fixed horizontal axis, said platform plate member having track means on an inner surface thereof facing said frame for receiving said lift arm track traveler means enabling said platform plate member to be pivoted on said frame in correspondence with pivoting of said lift arm by said motor means;

iii. a fixed upper hook member secured to said outer surface of said platform plate member and adapted for engaging said container upper bar and supporting said container thereon;

iv. a fluid actuated piston-cylinder unit having a housing portion fixedly secured to the inner surface of said platform plate member and having a linearly movable piston rod associated therewith, said piston rod being downwardly angled and mounting on its outer extremity a lower hook member oriented to engage said container lower bar at selected times dependent upon actuation of said piston-cylinder unit; and

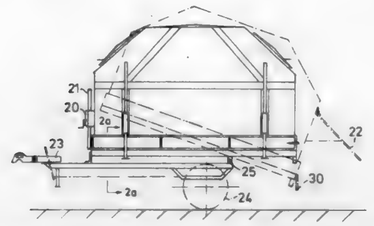
v. actuator means fixed to said frame and connected to an appropriate fluid source for said piston-cylinder unit and including control means governed by operation of said motor means, said motor means including a driven cam member and said actuator means including a cam follower member actuated by said cam member to control operation of said actuator means and thereby control actuation of said piston-cylinder unit in accordance with the positioning of said cam member, said actuator means being adapted to connect said fluid source to actuate said piston-cylinder unit in such manner that said piston-cylinder actuated lower hook is caused to positively and continuously engage said container lower bar and thereby rigidly secure said container to said platform at all times when the base of said container resides some predetermined distance above the ground and during which said container is being positioned between selected ground loading and elevated tilted dumping positions.

4,042,138

GARBAGE CONTAINER CARRIER

Jens Arne Krister Arvidsson, Illervagen 4 B, S-612 00 Finspang, Sweden

Filed June 28, 1976, Ser. No. 700,350
Int. Cl.² B65G *65/04*
U.S. Cl. 214—314 **4 Claims**



1. Transportable refuse container which is removably mounted on a two-wheel trailer provided with a dumping body which can be tipped in relation to the chassis of said trailer and a towbar intended to be coupled to a towing vehicle, the rear end of the container being provided with a door which makes it possible to empty the container by tipping it in a backwards direction, said container being provided with a forward pair and rear pair of supporting legs which can be raised and lowered and locked in vertical guiding sleeves attached to the sides of the container so that the legs can be adjusted to a length to support the container at a free height above the dumping body when the trailer is to be positioned under or removed from under the container, characterized in that the dumping body has sides, the rear side being movable from a blocking to a non-blocking position relative to said container door to permit opening of the container door, said container being held by the sides against movement on the dumping body, said guiding sleeves for the legs being supported by brackets, the inner end of each said bracket being attached to the container and mounted above the upper edge of the underlying side of the dumping body and supporting the sleeve in a position beyond said side, said legs having foot plates engaging the underside of the dumping body when the legs are adjusted and locked in an upper position to secure the container to the dumping body, the forward end of the container capable of being lifted by means of a jack which is mounted between the forward end of the container and the chassis of the trailer so that the backward tipping of the container can be effected during simultaneous tipping of the dumping body.

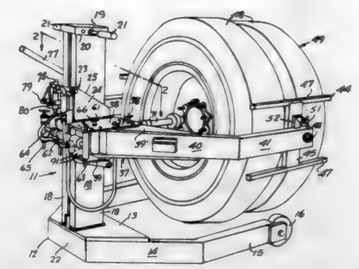
4,042,139

VEHICLE WHEEL-REMOVING AND HANDLING DEVICE

Harold R. Pernsteiner, Rte. No. 2, and Ernest H. Streckert, Rte. No. 3, both of Medford, Wis. 54451

Filed May 9, 1975, Ser. No. 575,959
Int. Cl.² B60B *29/00*
U.S. Cl. 214—331 **9 Claims**

1. A wheel-removing and handling device comprising a movable base, an upstanding post member on the rear portion of said base, carriage means slidably engaged on said post member, vertically-acting hydraulic cylinder means operatively connected between said base and said carriage means to adjust said carriage means vertically on said post member, a first horizontal clamping arm secured to one side of said carriage means, a second horizontal clamping arm pivoted on a vertical axis to the other side of said carriage means, said clamping arms having forwardly extending gripping portions provided with wheel-engaging means, horizontally acting clamping hydraulic cylinder means operatively connecting said second clamping arm to said carriage means, horizontally-acting wheel puller hydraulic cylinder means secured to the carriage means and extending forwardly between the clamping arms, hydraulic pump means on the carriage means, and conduit means operatively connecting said hydraulic pump means to the respective hydraulic cylinder means, said conduit means including respective control valves in circuit with the hydraulic cylinder means, said conduit means including respective control valves in circuit with the hydraulic cylirder means, said horizontally acting clamping hydraulic cylinder means disposed rearwardly of said upstanding post member and wherein said clamp members comprise respective bar elements pivoted at their intermediate portions to said clamping arms, and a plurality of spaced parallel cleat members rigidly secured to each bar element and adapted to transversely clampingly engage on a tire tread.

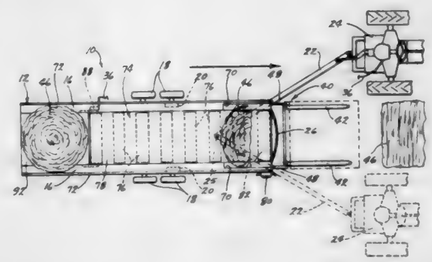


4,042,140

SELF-LOADING AND UNLOADING HAY BALE TRAILER

Douglas F. McFarland, Davis City, Iowa, assignor to Farmhand, Inc., Hopkins, Minn.

Continuation of Ser. No. 464,449, April 26, 1974. This application Aug. 13, 1975, Ser. No. 604,252
Int. Cl.² B60P *1/38*
U.S. Cl. 214—518 **9 Claims**



1. A bale trailer for loading bales of a size generally incapable of being handled and maneuvered by a single person onto the trailer at its forward end to a load position, conveying said bales along the trailer to a transport position and transporting said bales to a desired location, each of said bales having a longitudinal axis and a pair of end surfaces, said end surfaces having a transverse dimension and being generally parallel to each other and generally perpendicular to the longitudinal axis, said trailer comprising:

an elongated frame having front and rear ends and defining a generally horizontal bale supporting surface adapted for supporting a bale both while it is being conveyed from its load position to its transport position and while it is being transported to a desired location, the total width of said

elongated frame being generally no greater than approximately the transverse dimension of said bale such that said bale supporting surface is adapted to support a single row of bales positioned side by side along the centerline of said elongated frame;

an L-shaped bale handling fork pivotally connected to said frame about a generally horizontal axis at said front end and being positioned on the centerline of said frame;

power means independent of the movement of said bale trailer comprising collapsible means having one end pivotally attached to said fork and the other end pivotally connected with the trailer frame for pivoting said fork between a first and second position whereby the bale is lifted from a ground position in which its end surfaces are generally vertical and its longitudinal axis is generally horizontal and is tilted through approximately 90° to a load position in which its longitudinal axis is generally vertical and a portion of one of its end surfaces engages and is supported by said bale supporting surface;

said fork in said first position having a first leg means extending forward closely adjacent the ground and adapted for positioning under, and engagement with the underside of, a bale in a direction generally parallel to the longitudinal axis of said bale and a second leg means extending upwardly at approximately right angles to said first leg and defining a bale supporting portion positioned generally at right angles to said first leg means, wherein said bale supporting portion is adapted for engagement with one of the end surfaces of said bale throughout a substantial portion of said bale supporting portion and maintaining such engagement during the lifting of a bale from its ground position to its load position;

said fork in said second position having said first leg means extending vertically upwardly and said second leg means extending rearwardly at approximately right angles to said first leg and lying substantially in the plane of said bale supporting surface;

conveying means generally centrally disposed relative to said elongated frame, extending longitudinally of said frame at generally right angles with respect to the horizontal axis of said fork and having its front end positioned directly to the rear of said bale handling fork for engaging the bale and moving it between its load position and a selected transport position along the centerline of said frame, said conveying means further being disposed relative to said fork such that the forward end of said conveying means is adapted for conveying engagement with the bale when the bale has been lifted to its load position and while the bale is still in engagement with said first and second leg means of said fork; and

said frame including a pulling tongue pivotally connected near the front end thereof and adapted to pivot between a straight-ahead position and at least one position to the side of said straight-ahead position to allow said fork to move forwardly under a bale for loading onto said frame.

4,042,141

BUCKET ATTACHMENT FOR GARDEN TRACTORS

James R. Schweigert, 4696 Flag Ave. North, Minneapolis, Minn. 55428

Filed Apr. 28, 1976, Ser. No. 681,185
Int. Cl.² E02F *3/62*
U.S. Cl. 214—766 **5 Claims**

1. A scoop attachment, adapted to be connected to the lifting hitch of a power vehicle, comprising, in combination:

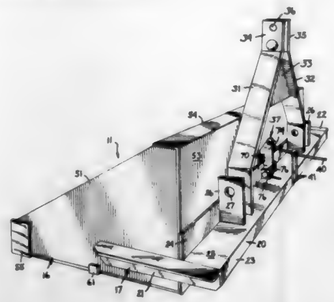
a scoop for loading, lifting, transporting, and dumping materials, having a closed back, closed ends, and a stop finger secured to the outer surface of said back between said ends, said finger including lower and rear stop faces and an upper latching face;

a frame, including a cross member, rigid means projecting from said cross member in a first direction and including coupling means for receiving the hitch of the vehicle, and

a pair of arms projecting from said cross member in a second direction toward said scoop;

means movably connecting the ends of said scoop to said arms for pivotal movement therebetween;

means rigid with said cross member and positioned to engage said stop faces of said stop finger in a predetermined pivoted position of said finger and said scoop in said frame, to limit said pivotal movement in a first sense and to prevent translational movement of said finger in a direction towards said frame;



a latching blade resiliently pivoted to said frame for automatically and releasably engaging said latching surface of said stop finger in said predetermined position thereof, to prevent said pivotal movement in a second sense opposite to said first sense;

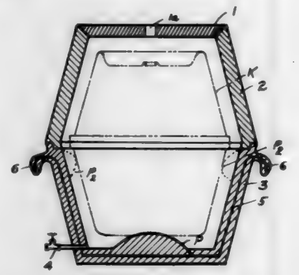
and manually operable means for pivotally releasing said latching blade from engagement wit said finger, to thereby enable pivotal movement of said scoop in said second sense.

4,042,142

BEER KEG COOLING CONTAINER

Robert W. Ruano, 2711 Locust Drive, Pittsburgh, Pa. 15241

Filed Apr. 30, 1976, Ser. No. 682,050
Int. Cl.² B65D *7/24*; A47J *27/10*
U.S. Cl. 220—4 B **5 Claims**



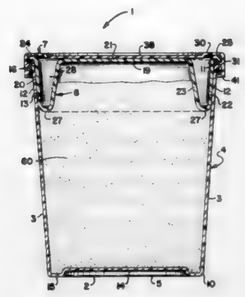
1. A container assembly for keeping cool a keg containing beer or other liquid, comprising a barrel shaped keg having outer walls, a container comprising a bottom half of insulating material reinforced with a basket-like reinforcing material and in the shape of a tub, a top half of insulating material generally of the shape of an inverted tub and made in two parts including a detachable lid with a central opening through which a tap of said keg is projected, said top and bottom halves having mating mouth portions which readily and detachably fit together, said container being spaced from said outer walls of the keg for receiving ice therebetween, and handle portions on diametrically opposite sides of said basket-like reinforcing material for carrying said container and keg.

4,042,143

DOUBLE SEAL CONTAINER

Robert B. Biggins, 4230 Wiedenmann Place, Kansas City, Mo. 64111

Filed Mar. 29, 1976, Ser. No. 671,622
Int. Cl.² B65D *51/18, 41/16*
U.S. Cl. 220—256 **3 Claims**



1. A container comprising:

a. a base with upstanding side walls attached thereto forming a wide-mouthed receptacle for receiving perishable contents therein, said side walls having an upper free edge which defines a container opening and includes a seat portion disposed adjacent to said free edge, said seat portion having a smooth inner surface which tapers inwardly from said free edge;

b. a removable snap-fitting closure engaging the upper free edge of said receptacle and closing said opening to form a first container seal about said free edge, said closure being imperforate;

c. a seal plug having a smooth outer surface with a tapered shape for cooperating contact with said seat portion and being removably positioned within said receptacle, the outer surface of said seal plug and the inner surface of said seat portion cooperatively abutting each other during use to form a second container seal between said surfaces;

d. said closure engaging said seal plug and retaining the same in a sealed position in the receptacle seat portion;

e. said receptacle side walls include a first bead formed on an outside surface thereof at a point positioned adjacent to said free edge;

f. said closure includes a top portion and a flange portion depending substantially normally therefrom and integrally connected therewith;

g. said flange includes a second bead formed integrally around an interior surface thereof, said second bead engaging said first bead and removably connecting said closure and said receptacle;

h. said seal plug includes a base with upstanding side walls attached thereto, said seal plug side walls having an upper end edge abutting an interior surface of the closure top portion along a line disposed adjacent to said flange whereby said closure wedgingly urges said seal plug snugly into said seat portion and retains the same therein; and

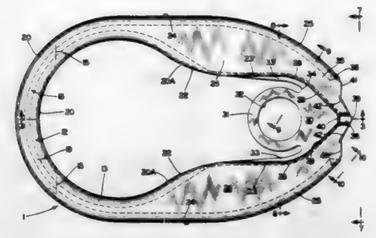
i. said seal plug base has a medial portion thereof in abutting contact with and supporting a medial portion of said closure to improve container packing and stacking efficiency.

4,042,144

PULL TAB CONSTRUCTION FOR FULL PANEL PULL-OUT ENDS FOR EASY OPENING CANS

George J. Henning, Canton; Lynn B. McKinney, and Joseph Scalia, both of Massillon, all of Ohio, assignors to Van Dorn Company, Cleveland, Ohio

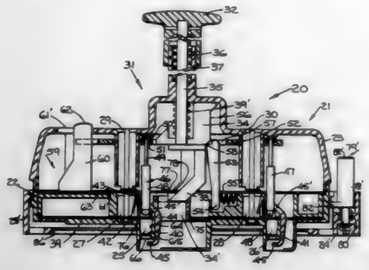
Filed Nov. 10, 1976, Ser. No. 740,373
Int. Cl.² B65D *41/32*
U.S. Cl. 220—273 **17 Claims**



1. A sheet metal pull tab for a full panel pull-out easy opening metal can including, flat top and rounded outer side walls forming a tab perimetric contour defined by spaced curved tab ring and nose ends connected by parallel tab sides; the flat tab top wall having an inner side wall defining a keyhole-shaped slot; the contour of the keyhole slot including a curved ring portion at the curved tab ring end connected by reversely curved portions to parallel portions extending toward the tab nose end; the rounded outer tab side wall having an inturned bead-forming flange extending around the tab perimeter ring end, parallel sides, and portions of the curved nose end, and ending in spaced bead terminals; the curved tab ring portion inner side wall being rounded and having an inturned bead-forming flange at the ring end, said last-mentioned bead-forming flange terminating at the reversely curved portion connections with said parallel keyhole portions; the inner keyhole slot side wall parallel portions being connected adjacent the tab nose end by portions curved inwardly toward the nose end; said last-mentioned inward curved inner side wall portions being connected with straight wall portions angled at 90° toward each other; the angled straight wall portions at the tab nose end extending downward from the flat tab top wall to and being connected with a generally right triangularly-shaped flat nose bottom wall; the parallel, inwardly curved, and straight angled tab inner side wall portions extending vertically downward from the flat tab top wall and vertically with respect to said flat nose bottom wall; the flat tab top wall at the tab nose end and the 90° angled straight tab inner side wall portions merging in a generally rectangular flat nose tip offset upward from the nose bottom wall in the zone of the projected intersection of the angled straight vertically oriented tab inner side wall portions; an ear extending rearward from the nose bottom wall; there being rivet-receiving aperture means formed in the ear; a narrow tapered side extension of the nose bottom wall located at either side of and spaced from the ear projecting toward the ear from the lower ends of the parallel keyhole vertical side wall portions; the narrow tapered side extensions terminating rearward of the nose bottom wall where the reversely curved inner side wall portions merge with the keyhole parallel inner side wall portions; there being curved slots formed between the ear and tapered side extensions; the curved slots having terminal zones located at hypotenuse corners of the right triangular nose bottom wall; the nose bottom wall right-angled corner being located adjacent the rectangular nose tip; the flat tab top wall having maximum width between adjacent parallel outer side and inner keyhole walls laterally of a tab centerline passing through the nose tip and rivet-receiving aperture means; and the flat tab top wall having a nose portion between each bead terminal and a straight angled nose wall portion whose width is approximately ¼ the maximum top wall width measured on a line

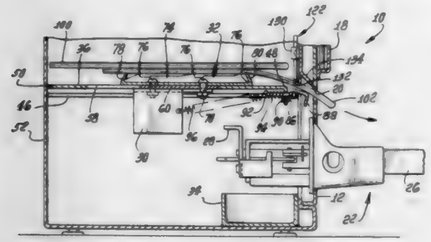
extending radially of the center of the rivet-receiving aperture means.

4,042,145
SENSITIVITY DISC DISPENSER WITH TAMPER MECHANISM
Stephen Jeffrey Ehrlich, Randallstown, Md., assignor to Becton, Dickinson and Company, East Rutherford, N.J.
Filed Nov. 3, 1975, Ser. No. 628,077
Int. Cl.² B65H *3/44*
U.S. Cl. 221—94 **23 Claims**



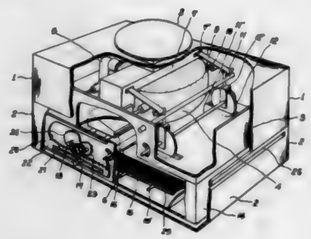
1. A sensitivity disc dispenser comprising; a dispensing structure for housing a plurality of disc containing cartridges and having means for simultaneously dispensing a disc from each cartridge through each one of a selected number of discharge ports containing a cartridge in a predetermined pattern, including means for positioning a disc from each cartridge into alignment with the discharge port, tamping means for expelling the discs through the respective discharge ports into a receiving dish and means for permitting dispensing through a selected number of ports less than the total number of ports.

4,042,146
MAP VENDING MACHINE
Jack W. Nutter, 7500 W. Eightieth St., Los Angeles, Calif. 90045
Filed Mar. 15, 1976, Ser. No. 667,124
Int. Cl.² B65G *59/06*
U.S. Cl. 221—152 **6 Claims**



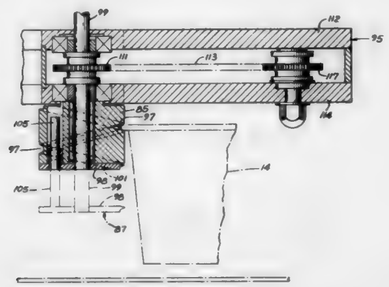
1. In a machine for vending folded paper items,
a housing having forward and rear walls,
a channel-shaped chute supported within said housing,
said chute being adapted to contain said items for vending, said chute having a bottom and said items being adapted to extend upwardly from adjacent the bottom of the chute,
slide means adjacent the bottom of said chute and associated therewith to support said items, said slide means being adapted to slide forwardly and rearwardly relative to said chute and having means to engage one of said items for sliding forward movement therewith,
an exit slot in the forward wall of said housing to permit the removal of one of said items as the result of said forward sliding movement,
drive means in said housing to slide said slide means rearwardly in said housing from a forward position to a rearward position,
the improvement comprising:
biasing means associated with said chute and said slide means to return said slide means from the rearward position to the forward position, said one item being engaged for said forward movement adjacent said rearward position by said means to engage and being positioned after said forward movement for removal from the housing when said slide means has returned to said forward position,
said means to engage on said slide means being upwardly and forwardly directed teeth for engaging said one item while said slide means is being returned from the rearward position to the forward position,
said teeth being arranged in non-parallel rows extending in the generally forwardly direction,
said slide means being secured to the channel bottom of said chute,
a forwardly-rearwardly directed slot in said channel bottom,
said slide means having means attached thereto adapted to slide in said slot, and
a tang extending downwardly from said slide means below said bottom for driving engagement by said drive means,
said drive means being secured to said forward wall and being adapted to drive in the rearward direction,
said drive means having a handle exteriorly of said housing and being adapted to be manually moved in the forward and rearward directions by said handle,
said forward wall being hinged to said housing for opening and closing said housing,
said drive means being moved out of said housing when said wall is moved on the hinge to open the housing,
said chute being accessible for filling with said items when said housing is opened.

4,042,147
TISSUE PAPER TAKE-OUT DEVICE
Young Yee Lee, 156-37, Nockbun-dong, Soudaemun, Seoul, South Korea
Continuation-in-part of Ser. No. 559,207, March 17, 1975, abandoned. This application Sept. 29, 1976, Ser. No. 727,749
Int. Cl.² B65H *5/00*
U.S. Cl. 221—225 **3 Claims**



1. Apparatus for removing the uppermost tissue from a stack of tissues comprising:
a. an upper and lower case forming a housing having an outlet slot for the tissues;
b. a movable support plate supported within said lower case upon which the tissues are stacked;
c. a deformable air chamber located in said upper case;
d. manually operable deforming means extending through said upper case for deforming said deformable air chamber;
e. nozzle means connected to said deformable air chamber and extending into said lower case adjacent said stack of tissues so as to direct air expelled from said air chamber upon its deformation onto the uppermost tissue of said stack;
f. pushing means bearing against the exposed surface of the uppermost tissue of said stack and movable with respect to said upper case so as to push said uppermost tissue toward said outlet slot;
g. connecting means connecting said pushing means to said manually operable deforming means such that said pushing means pushes said uppermost tissue toward said outlet slot when said deforming means deforms said air chamber; and
h. height adjusting means to adjust the height of said movable support plate so as to maintain the uppermost tissue of said stack in alignment with said outlet slot.

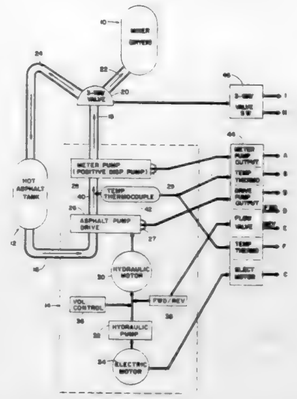
4,042,148
CUP FILLING AND CAPPING APPARATUS
Ralph D. Gerben, Glen Burnie, Md., assignor to Solo Cup Company, Urbana, Ill.
Division of Ser. No. 470,379, May 16, 1974, Pat. No. 3,965,656. This application Mar. 17, 1976, Ser. No. 667,649
Int. Cl.² B65G *59/10, 59/06, 33/06, 33/38*
U.S. Cl. 221—222 **4 Claims**



1. In an apparatus for positively dispensing cups each having a rim and an upper end thereon, the combination comprising means for receiving a vertical stack of nested cups for discharge from an opening in said means, a plurality of dispensing gears disposed about said opening and each having spiral grooves therein for receiving the rims of the cups to lower the cup rims with turning of said dispensing gears, said dispensing gears having lower ends thereon, means for rotating said dispensing gears to successively lower a cup rim, cup stripper means at the lower ends of said cup dispensing gears and rotatable therewith to strip cups from the stack and having portions thereof for engaging said cup rims leaving said spiral grooves, said cup stripper means including means for reciprocating said portions engaging said cup rims relative to said dispensing gears and for forcing said cups downwardly with downward movement of said cup stripping means, said portions of said cup stripping means each having a groove therein aligned with a spiral groove in an associated dispensing gear to receive the cup rim, and means maintaining said alignment of said grooves on said portions and said gears during the rotation thereof and during reciprocation of one relative to the other.

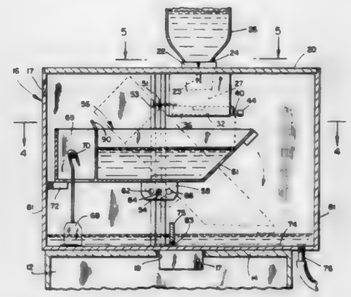
4,042,149
LIQUID PUMP AND METERING SYSTEM
Don R. Main, Broken Arrow, Okla., assignor to Combotronics, Inc., Tulsa, Okla.
Filed June 23, 1975, Ser. No. 589,461
Int. Cl.² B67D *5/32*
U.S. Cl. 222—40 **14 Claims**

1. A liquid pumping and metering system comprising:
a. a first positive displacement pump having a rotatable portion, an inlet port and an outlet port, said inlet port being connected to a liquid source;
b. a second positive displacement pump having a rotatable portion responsive only to viscous liquid flow, an inlet port and an outlet port, said outlet port being connected directly to the outlet port of the first pump, whereby liquid from the first pump may be flowed through the second pump in a reverse direction;



c. a rotational power source operably connected to the rotatable portion of the first pump for pumping liquid through said first pump and into the outlet portion of the second pump;
d. meter means operably connected to the rotating portion of the second pump for measuring the flow of liquid through said second pump, said flow of liquid causing rotation of the rotatable portion of said second pump.

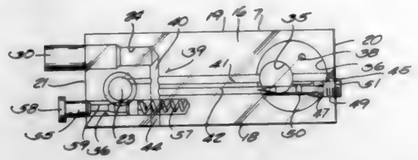
4,042,150
WATER GRAVITY PLANT FEEDER
Hans Walter Roos, 235 Mount Hope Place, Bronx, N.Y. 10457
Filed Mar. 31, 1976, Ser. No. 672,299
Int. Cl.² A01G *27/00*
U.S. Cl. 222—70 **7 Claims**



1. A water gravity plant feeder comprising a housing, including a base having a front, side and a back side, a water container mounted on top of said housing, said top having an aperture for inserting said threaded neck therethrough, a water tray adjustably mounted in said housing beneath said aperture, a trough swingably mounted in said housing below said water tray, means in said water tray for delivering water in predetermined amounts to said trough, a sump positioned below said trough, said trough being tiltable to deliver water to said sump when a predetermined volume of water is reached in said

trough, causing said trough to tilt by gravity first water distributing means for watering plants, secured to said front side and second water distributing means for watering plants, secured to said back side.

4,042,151
BEVERAGE MIXING AND DISPENSING MACHINE
Raymond Uttech, Watertown, Wis., assignor to KARMA division of BRANDT, Inc., Watertown, Wis.
Filed May 13, 1976, Ser. No. 686,149
Int. Cl.[2] B67D *5/56*
U.S. Cl. 222—129.2 **15 Claims**



1. A mixing and dispensing head for a beverage dispensing apparatus, by which water from a pressurized source thereof can be mixed with liquid beverage concentrate from a substantially unpressurized source thereof and delivered to a consumer container beneath the head, said mixing and dispensing head being characterized by:

A. structure defining

1. a water inlet connectable with a source of water under pressure,
2. a concentrate inlet connectable with a source of beverage concentrate, and
3. a holding chamber having a downwardly opening outlet;

B. aspirator means defining

1. a venturi passage having an inlet communicated with said water inlet and an outlet communicated with said holding chamber, and
2. first and second eduction inlets opening into said venturi passage and from which fluid can be drawn into said venturi passage in consequence of flow of water therethrough; and

C. passage defining means providing

1. a concentrate passage communicating said concentrate inlet with said first eduction inlet to enable concentrate to be educted into a stream of water flowing through the venturi passage and carried therewith into the holding chamber, and
2. a recirculation passage
   a. having one end communicated with said second eduction inlet, and
   b. having its other end in restricted communication with said holding chamber,

said recirculation passage thus causing a portion of the combined water and concentrate conducted to the holding chamber to be recirculated back to the venturi passage for limiting the proportion of concentrate educted into water flowing through said venturi passage.

4,042,152
DILUTING APPARATUS
Vladimir J. Drbal, Miramar, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.
Filed Nov. 21, 1975, Ser. No. 634,129
Int. Cl.[2] B67D *5/52*; G01N *1/14*
U.S. Cl. 222—137 **11 Claims**

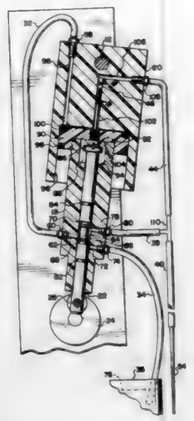
1. A diluting apparatus comprising:

at least a first chamber;

first piston means reciprocally disposed within said first chamber for moving a first fluid into and out of said chamber;

piston drive means for reciprocating said first piston means including valve means coupled at least to said first chamber for providing valving to said first chamber as said first piston means reciprocates;

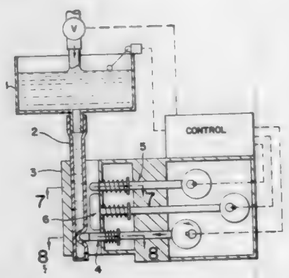
at least a second chamber disposed coaxial with said first chamber; and



second piston means reciprocally disposed within said second chamber for moving a second fluid into and out of said second chamber, coaxially mounted on said first piston means, and coupled to said piston drive means;

whereby transverse thrust against said piston drive means during reciprocal movement of said piston means is substantially eliminated.

4,042,153
LIQUID DROPPING DEVICE
James L. Callahan, Wooster; Arthur F. Miller, and Wilfrid G. Shaw, both of Lyndhurst, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio
Continuation-in-part of Ser. No. 341,179, March 14, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 632,536
Int. Cl.[2] B65D *37/00*
U.S. Cl. 222—207 **3 Claims**



1. A dropping device for forming uniform droplets of a liquid comprising:

a liquid reservoir;

a resilient tube having a substantially circular cross-section in respose and one end connected to said liquid reservoir in such manner that liquid from the liquid reservoir can flow through the resilient tube and out of a second end, said second end being in a vertical position and being capable of retaining liquid within said tube, and producing a uniform and distinct drop when force is asserted on the outer surface of said resilient tube;

a first valve which is located toward the second end of said resilient tube and being capable of restricting the flow of liquid through the resilient tube by action on the outer surface of said resilient tube in a closed position and allowing flow of liquid through the resilient tube in an open position;

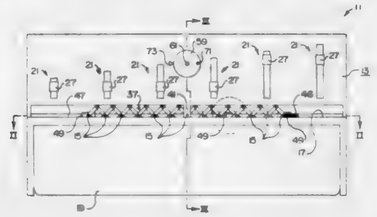
a second valve located along the resilient tube between said first valve and said liquid reservoir and being capable of restricting the flow of liquid through the resilient tube by action on the outer surface of said resilient tube in a closed position and allowing flow of liquid through said resilient tube in an open position; and

a plunger located between said first valve and said second valve, said plunger being capable of applying force on the outer surface of the resilient tube when said second valve is in the closed position and said first valve is in the open position, whereby a uniform and distinct drop is produced from said second end of the resilient tube.

2. The process of forming droplets from a slurry consisting of a suspending liquid and small particles suspended in the liquid comprising:

using as the dropping device the device of claim 1.

4,042,154
DRAPERY MARKING APPARATUS
Jack M. Lawson, 3161 Ashwood, No. 3, Memphis, Tenn. 38118
Filed Oct. 4, 1976, Ser. No. 729,103
Int. Cl.[2] A41H *43/00*
U.S. Cl. 223—28 **9 Claims**



1. An apparatus for use in mounting fold-type drapery supports to a drapery panel, said apparatus comprising:

a. a frame;

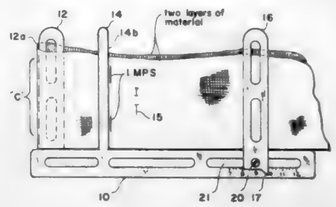
b. a plurality of indicator means movably supported adjacent said frame for indicating where the fold-type drapery supports should be mounted on the drapery panel;

c. computing means mounted on said frame for determining the required distance between each adjacent fold-type drapery support for a given hemmed width size of a drapery panel to obtain a desired number of folds; and

d. adjustment means for uniformly moving said plurality of indicator means to allow the distance between each adjacent indicator means to be uniformly varied, said adjustment means being mounted to said frame, each of said plurality of indicator means being mounted on said adjustment means, said adjustment means including a cam means mounted to said frame and including a lazy tong means fixedly mounted to said frame, said cam means including a cam member and a cam follower member, said cam follower member being operatively coupled to said lazy tong means for selectively extending and contracting said lazy tong means in response to the movement of said cam member.

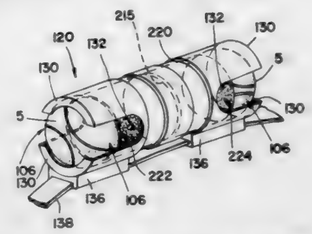
4,042,155
FABRIC PLEATER GUIDE INCLUDING A PLEAT FORMER
Edmund Jay Sprong, 38 Lockwood Lane, Riverside, Conn. 06878
Continuation-in-part of Ser. No. 638,530, Dec. 8, 1975, abandoned. This application May 17, 1976, Ser. No. 687,357
Int. Cl.[2] A41H *43/00*; D05B *35/08*
U.S. Cl. 223—34 **12 Claims**

1. A fabric pleater guide and pleat former for a pinch pleat comprising a base member having a calibrated measuring scale thereon, a fixed broad finger extending substantially perpendicular to said base member, an adjustable finger provided with an index part co-acting with said measuring scale whereby a length of fabric is doubled and the middle line thereof placed around an outer edge of one of said fingers and the cloth spread out, means for marking the placement of



spaced primary pleat loops on said fabric and setting up the placement thereof, said pleat former being of such a size and dimension as to be freely inserted within said primary pleat loop and centered over the seam of the loop thereby dividing said loop into three substantially equal folds to thereby create said pinch pleat.

4,042,156
TENNIS BALL HOLDER
Lynn E. Knight, 3726 Broderick St., San Francisco, Calif. 94123
Continuation-in-part of Ser. No. 528,005, Nov. 29, 1974, abandoned. This application Jan. 30, 1976, Ser. No. 653,700
Int. Cl.[2] B65D *85/00*
U.S. Cl. 224—5 D **7 Claims**



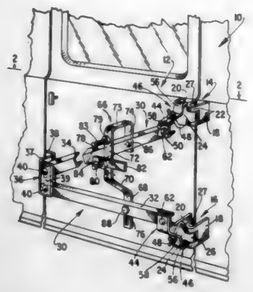
1. A carrier adapted to be attached to the person of a tennis player for temporarily enclosing at least one tennis ball, comprising: a generally rigid cylinder terminating in at least one open end, said open end having a pair of diametrically generally rigid protrusions each extending inwardly about a portion of the circumference of said cylinder to define a chamber with a circular opening therefrom less than the diameter of a tennis ball; a pair of diametrically opposed slots formed between said protrusions, said slots being of less width than the diameter of a tennis ball and extending along said cylinder to a location spaced from said opening by a distance sufficient to permit digital access to the back side of an enclosed ball; means for biasing said ball against said protrusions; and means for attaching said device to the person of said player, whereby a tennis ball temporarily enclosed by said can be removed therefrom such as by said player inserting a finger and thumb through said slots against the back side of said enclosed ball with sufficient force to the surface of said ball to cause said ball to be temporarily deformed without appreciable deformation of said protrusions so as to pass in an axial direction beyond said protrusions and be free of said chamber.

4,042,157

WHEEL AND TIRE CARRIER FOR ATTACHMENT TO MOTOR VEHICLE DOOR

Raywood C. Weiler, 17586 Vine St., Fontana, Calif. 92335

Filed May 14, 1975, Ser. No. 577,403
Int. Cl.[2] B62D *43/02*
U.S. Cl. 224—42.21 **5 Claims**



1. A wheel and tire carrier for attachment to the door of a motor vehicle in which the door is hingedly supported adjacent its hinged edge by upper and lower hinge means, with each of said hinge means having a front end offset outwardly of the front plane of the door, said wheel and tire carrier comprising a pair of substantially co-planar support members, each connected at their one end to the door adjacent to the opposite free edge thereof for limited pivotal adjustment, and diverging therefrom towards said upper and lower hinge means, independent and separated clamping means, adapted for readily attachable and detachable connection at each of said hinge means, affixed to the opposite end of each of said support members, each of said clamping means comprising a bracket having a substantially vertical end portion pivotally joined to said last mentioned end of each support member, a hook at an opposite end portion; which is adapted to hook around one edge of the front offset end of the hinge means, and an inclined intermediate section between said end portions, a J-bolt extending through said intermediate section of said bracket with the hook of said J-bolt adapted to hook around the other edge of the front offset end of the same hinge means, with the stem of the J-bolt threaded to receive a nut to lock said clamping means to said hinge means, one of said clamping means adapted to be independently clamped to the front offset end of said upper hinge means, and the other of said clamping means adapted to be independently clamped to the front offset end of said lower hinge means, said front offset end of each of said hinge means having no opening therein to permit attachment thereto, and a bracket means connected to said support members at intermediate points thereof and extending from one support member to the other support member for attachment of a tire wheel thereto, and one of said connections being adjustable to accommodate a variable spacing between said support members.

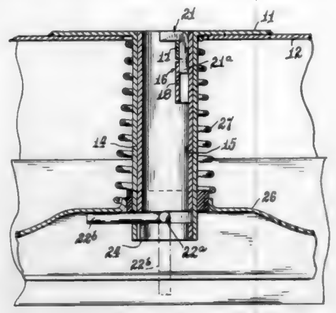
4,042,158

SPARE WHEEL CARRIER

Kenneth I. Cole, 10721 S. Plahm Court, Worth, Ill. 60482

Filed June 10, 1976, Ser. No. 694,778
Int. Cl.[2] B62D *43/04*
U.S. Cl. 224—42.23 **8 Claims**

1. A spare tire and wheel carrier for vehicles including a plate that is mounted securely in a suitable position proximate the underside of a vehicle body, a cylinder rigidly secured at its upper end to said plate, said cylinder extending downwardly from said plate and having a bayonet slot in its wall opening onto the bottom end thereof, an inner cylinder within said outer cylinder and rotatable relative to said outer cylinder between a first position and a second position, an arm pivotally connected to said inner cylinder adapted when the inner cylinder is in said first position relative to the outer cylinder to hang downwardly vertically and when the inner cylinder is in said second position relative to the outer cylinder to lie horizontally and project through the bayonet slot, and means on the inner



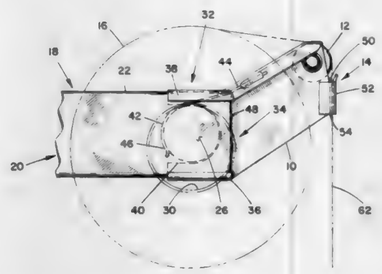
cylinder to facilitate rotation of said inner cylinder between said first and second positions, whereby a wheel, when telescoped onto the outer cylinder, is retained thereon by the arm when it is in its horizontal position.

4,042,159

TOILET ROLL TISSUE DISPENSER

Jane M. Tucky, Corona, Calif., assignor to Ben E. Lofstedt, Buena Park, Calif.

Filed July 31, 1975, Ser. No. 600,611
Int. Cl.[2] B26F *3/02*
U.S. Cl. 225—15 **4 Claims**



4. An improved toilet tissue roll dispenser for use in conjunction with a toilet tissue roll holder wherein said toilet tissue roll is rotatably mounted, via the central passageway therethrough, on a bar secured to the arms of a U-shaped structure, comprising:

a. frame means wherein the ends of said pair of fingers each have a slot therein for receiving said bar therein, and further including a first channel formed in each of said ends of said pair of fingers arranged along the top edge of said finger above said slot for slideably mating over the upper portion of said arms of said holder to form a cap therefor, and a second channel corresponding to said first channel and oppositely disposed thereto, said second channel being arranged along the bottom edge of said finger below said slot for slideably mating over the lower portion of said arms of said holder to form a cap therefor;

b. coupling means for securing said fingers of said frame means to said arms of said holder;

c. roller means disposed forwardly of said holder in spaced-apart, longitudinal relationship to said bar and above said first cross-member, said roller means having a pair of oppositely-disposed ends journaled for rotation within said receptacles of said frame means, whereinover said toilet tissue is drawn and thereafterwards is disposed in

intimate relationship to said blade-like edge of said first cross-member of said frame means; and

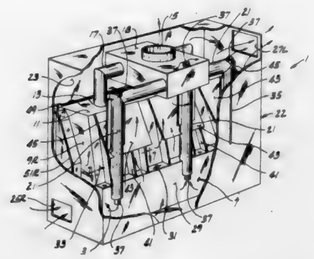
d. a pair of arcuate retainer springs, each having one end which is fixedly anchored respectively to said frame means and the other portion arranged to bridge the entrance to said slot, whereby when said bar is mated to said slot, said bar is captured therein by said spring bridging said slot entrance.

4,042,160

FIREPLACE FORM

John C. Ickes, 2017 Florida Ave., Joplin, Mo. 64801

Continuation-in-part of Ser. No. 516,170, Oct. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 465,853, May 1, 1974, abandoned. This application June 27, 1975, Ser. No. 590,793
Int. Cl.[2] F24B *7/00*
U.S. Cl. 126—121 **13 Claims**



1. A fireplace form comprising a firebox adapted to contain a fire of burning logs or other fuel having an open front, a back wall, and a pair of side walls at opposite sides of said back wall and extending toward said open front, said firebox having main flue outlet means generally at its top in communication with a chimney flue, said firebox having at least one aperture in its said back wall intermediate the bottom of the firebox and said main flue outlet means, said fireplace form further comprising duct means on the back side of said firebox in communication with said aperture and said chimney flue, said aperture and said duct means constituting auxiliary flue means for at least partially ducting away smoke and other products of combustion from said firebox, and means for circulating fresh air over the sides and back of said firebox and over said duct means so as to be heated and for exhausting said heated air into a room, said fresh air circulating means comprising an outer housing spaced from the outside of said firebox defining a chamber between said firebox and said outer housing, said chamber having inlet means for the intake of said fresh air and outlet means for the discharge of said heated air and further comprising a fresh air conduit disposed vertically within said duct means having an inlet at its lower end for the intake of fresh air and an outlet at its upper end for the discharge of heated air into said room via said outlet means.

4,042,161

AUTOMATIC WELDING APPARATUS

Shimon Ando, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Mar. 30, 1976, Ser. No. 672,079
Claims priority, application Japan, Apr. 2, 1975, 50-39153
Int. Cl.[2] B23K *37/02*
U.S. Cl. 228—102 **8 Claims**

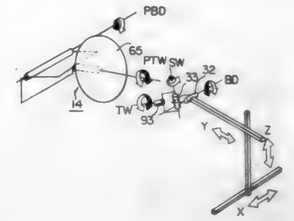
1. An automatic welding apparatus comprising a robot and a welding torch having a tip, wherein said robot comprises:

a main body serving as a drive means;

an arm supported by said main body and driven thereby to move in three-dimensional directions;

a wrist connected to a forward end of said arm and pivotable around at least two pivotal axes extending perpendicular to each other, said welding torch being supported by said wrist;

two tactile sensors mounted on said wrist for tactually sensing positions of components to be welded into a unitary structure and having respective axes extending perpendicular to one another, one of said tactile sensors extending perpendicular to one of said at least two pivotal axes of said wrist; and



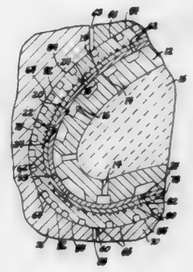
means for calculating the positions of points at which welding is to be performed based on the amount of displacement of each said tactile sensor and producing control signals whereby the tip of said welding torch can be positioned in each said point in response to each of said control signals.

4,042,162

AIRFOIL FABRICATION

George B. Meginnis, and Earl W. Sodeberg, both of Indianapolis, Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed July 11, 1975, Ser. No. 595,025
Int. Cl.[2] B23K *19/00*
U.S. Cl. 228—106 **3 Claims**



1. A method for bonding a laminated structure to a cast airfoil strut comprising: preforming a cast airfoil strut to have a leading edge, a trailing edge and first and second walls joining the leading edge to the trailing edge and the walls having cooling passages therethrough, preforming a laminated metallic sheath having an exterior surface and an inner surface each with a plurality of pin hole openings formed therein for communicating the wall cooling passages in the cast airfoil strut with the exterior surface of the sheath, wrapping said sheath by locating its inner surface over the first and second walls of said cast airfoil strut from the leading edge to the trailing edge and tack welding a portion thereon to the leading edge of said cast airfoil strut, preforming one side of a compressible pressure pad with a plurality of ribs and grooves each formed on the one side to extend completely across one length of the pad, preforming the opposite side of the compressible pressure pad to have a plurality of spaced apart separate lands, wrapping the pressure pad on the outer surface of the laminated metallic sheath to locate the plurality of ribs and grooves in contact across the full planar extent of the exterior surface of the laminated sheath including the full height thereof, thereafter placing the wrapped compressible pressure pad, laminated sheath

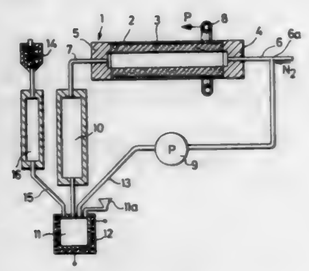
and cast airfoil strut between the contoured pressure blocks and applying a predetermined load to deform the separate lands and to press the plurality of ribs thereon against the exterior surface of the laminated sheath for distributing load to the laminated sheath without deformation thereof, applying a vacuum to the pressure loaded pieces and maintaining a bonding temperature thereon, directing outgas flow from between the cast airfoil strut and laminated sheath outwardly along the grooves formed in the one side of the compressible pad along the full height of the cast airfoil strut during the bonding operation, the inner surface of the laminated sheath being bonded to the outer surface of the cast airfoil strut by the pressure directed thereagainst across the grooved surface of the pressure pad without interruption of the gas flow through the grooves.

4,042,163

METHOD FOR THE MANUFACTURE OF A HEAT EXCHANGER OR HEAT TRANSFER ELEMENT

Hermann Johannes Schladitz, 74 Plaentschweg, Munich, Germany

Filed Aug. 20, 1975, Ser. No. 606,221
Claims priority, application Germany, Aug. 23, 1974, 2440563
The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.
Int. Cl.[2] B21D *53/02*; B23P *15/26*
U.S. Cl. 228—198 **9 Claims**



1. A method of manufacturing a heat exchanger or heat transfer element which comprises a heat-conductive tubular member having an inner surface enclosing a heat-conductive, porous body attached by thermally-conductive means to the inner surface of the tubular member, which comprises;

a. providing said porous body disposed within said tubular member;

b. passing vapors of a thermally decomposable metallic compound through the porous body and the tubular member; and

c. thermally decomposing said compound in a first zone of said porous body adjacent to the inner surface of the tubular member, by heating said tubular member while maintaining said compound from substantial thermal decomposition in a second zone of said porous body remote to the inner surface of the tubular member; whereby the metallic product of said decomposition is deposited at said first zone and connects the porous body to the inner surface of the tubular member.

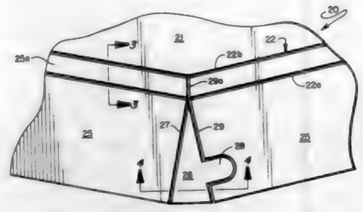
4,042,164

CONTAINER END STRUCTURE

Thomas E. Croley, Worthington, Ohio, assignor to Corco, Inc., Worthington, Ohio

Filed Dec. 10, 1976, Ser. No. 749,293
Int. Cl.[2] B65D *3/04, 13/04*
U.S. Cl. 229—23 BT **7 Claims**

1. An end structure for a tubular container of polygonal cross section comprising a substantially disc-like blank having an outer peripheral edge, said blank having a double score line inwardly of its edge and extending completely therearound and consisting of an inner score line and an outer score line in spaced parallel relationship and spaced inwardly of the edge of said blank to provide pairs of double score lines angularly disposed to form a polygonal outline complemental to the container body with which it is to be used, the lines of adjacent pairs coming together at a vertex and the lines being at a selected angle depending on the number of sides of the polygon,



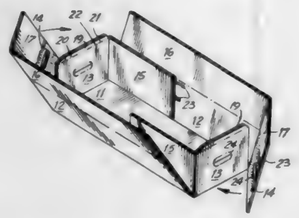
a slit extending from each vertex of the inner score line to the corresponding vertex of the outer score line to provide separate angularly-disposed connecting flanges, and a slit extending on from that slit to the outer edge of said blank to provide separate attaching flanges connected to said blank by the respective angularly-disposed connecting flanges.

4,042,165

REINFORCED PAPERBOARD BOX

Jerome Earl Elder, Minneapolis, Minn., assignor to International Paper Company, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,087
Int. Cl.[2] B65D *5/28*
U.S. Cl. 229—33 **3 Claims**



1. In a paperboard box for relatively large pieces of cut-up meat, that is adapted to be set-up, filled with meat and closed, using adhesive materials, on automatic equipment, that has reinforced side walls and end walls, and that is formed from: a generally rectangular, bottom panel **(11)**; a pair of upstanding, generally rectangular, side wall panels **(12)**, foldably connected to opposite edges of the bottom panel **(11)**; a pair of upstanding, generally rectangular, end wall panels **(13)**, foldably connected to opposite edges of the bottom panel **(11)**; a pair of upstanding, generally rectangular, side wall reinforcing flaps **(15)**, each foldably connected to an upstanding edge of one of the end wall panels **(13)** and located inwardly of and in face to face contact with one of the side wall panels **(12)**; a pair of upstanding, generally rectangular, end wall reinforcing flaps **(14)**, each foldably connected to an upstanding edge of one of the side wall panels **(12)** and located outwardly of and in face to face contact with one of the end wall panels **(13)**; a pair of generally rectangular, side closure flaps **(16)**, each foldably connected to the upper edge of one of the side wall panels **(12)** and disposed substantially perpendicular to the side wall panels **(12)**; and a pair of generally rectangular, end closure flaps **(17)**, each foldably connected to the upper edge of an end wall reinforcing flap **(14)** and disposed substantially perpendicular to the end wall panels **(13)**; the improvement which comprises:

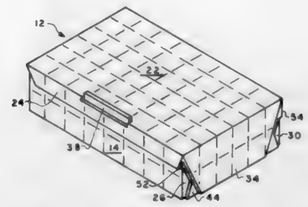
a pair of support tabs **(19)**, each underlying one of the end closure flaps **(17)** and the pair of side closure flaps **(16)** and each having disposed substantially perpendicular to the end wall panels **(13)** along a cut and scored fold line **(20)** between the upper edge of each end wall panel **(13)** and each support tab **(19)**.

4,042,166

PAPERBOARD CARTON

Howard Selin, Morton Grove, and John R. Marker, Jr., Waukegan, both of Ill., assignors to Stone Container Corporation, Chicago, Ill.

Filed Apr. 14, 1976, Ser. No. 677,011
Int. Cl.[2] B65D *5/30*
U.S. Cl. 229—33 **8 Claims**



1. In a carton blank having at least a first panel having a hingedly connected flap along a first edge thereof, an intermediate panel having a first width formed along a second edge opposite said first edge, a second panel formed adjacent to said intermediate panel, and a terminating panel having a width substantially equal to said intermediate panel width formed adjacent to said second panel, said terminating panel having a free end opposite said second panel, the improvement comprising:

a first pair of planar side panels having a width not exceeding said intermediate panel width each hingedly connected along opposite free edges of said second panel;

each of said side panels having a pair of opposite marginal edges free of the second panel to which it is connected, each of said marginal edges having an inwardly offset medial part, the remaining parts of each said marginal edges adapted to be assembled abutting the intermediate and terminating panels.

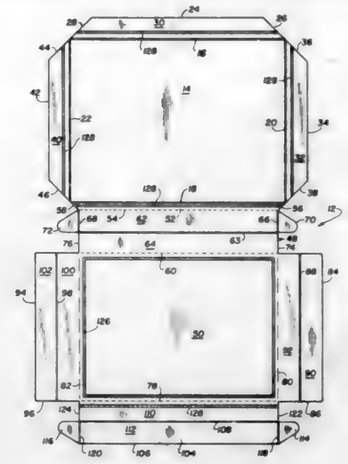
4,042,167

DIE CUT BLANK AND TRAY ASSEMBLED THEREFROM

Joseph R. D'Alessio, Wilbraham, Mass., assignor to Champion International Corporation, Stamford, Conn.

Filed Jan. 4, 1977, Ser. No. 756,626
Int. Cl.[2] B65D *5/22*
U.S. Cl. 229—34 HW **11 Claims**

1. A carton tray comprising a base member, and a plurality of side wall flanges upstanding thereon in adjacent continuous relationship; said base member comprising an integrally connected bottom and top panel, said top panel concentrically overlying said bottom panel; said base member including a continuous marginal flange extending outwardly beyond said side wall flanges upstanding thereon; said plurality of side wall flanges being formed form a corresponding plurality of discrete continuations of said top panel, one of said corresponding



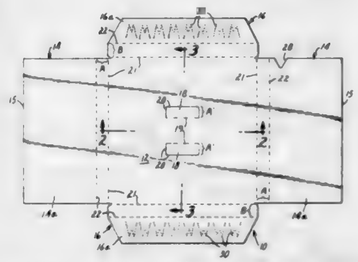
plurality of discrete continuations of said top panel being a commonly discrete continuation of said bottom panel.

4,042,168

PACKAGING CONTAINER BLANK

Richard G. Kasel, South St. Paul, Minn., and Paul C. Brown, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 31, 1976, Ser. No. 719,288
Int. Cl.[2] B65D *5/06, 85/671*
U.S. Cl. 229—40 **9 Claims**



1. A packaging container blank comprising a rectangular central section, two outer panels attached to opposite edges of said central section and two flange panels attached to the other opposite edges of said central section;

wherein said central section includes at least one tab hinged on one edge thereof to said central section and lying in the plane of said central section, the remaining edges of said tab being severed from said central section, said tab being adapted to be disposed normal to the plane of said central section at a distance equal to the interior height of the formed container;

wherein each of said outer panels and said flange panels are foldable along the edges of said central section and are further foldable along predetermined lines parallel to the edges of said central section; and

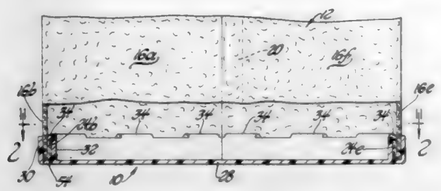
wherein each of said outer and flange panels are adapted to form right angles at the edges of said central section and at said predetermined lines when folded, and wherein the portions of said outer panels and of said flange panels between the edges of said central section and said prede-

termined lines form the sides of said packaging container upon folding; and wherein a portion of said flange panels are adapted to extend over said folded outer panels.

4,042,169
CONTAINER COVER

Joseph Louis Burgdorf, Rochester, Mich., assignor to Corrugated Drum of Michigan, Inc., Pontiac, Mich.

Filed Aug. 24, 1976, Ser. No. 717,451
Int. Cl.[2] B65D *5/64, 43/00*
U.S. Cl. 229—43 **10 Claims**



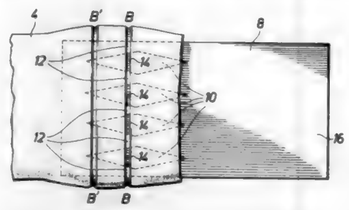
1. In combination with a multi-sided container of corrugated material having foldable flaps attached to the ends of at least some of the sides thereof along a fold line, each of said flaps being foldable against the side to which it is attached, an injection molded plastic container cover comprising: a multi-sided planar member having an equal number of sides as the container and an area approximately equal to the transverse cross-sectional area of the container, a first continuous skirt member around the periphery of said planar member extending generally laterally away from said planar member, a second continuous skirt member extending from said planar member in the same direction as said first skirt member and being generally parallel to said first skirt member and spaced inwardly from said first skirt member a distance approximately equal to the sum of the thicknesses of the container side and the flap thereby forming a cavity therebetween which is substantially rectangular in cross section for capturing the container flap and a portion of the container side and locking tabs on one of said skirt members extending toward the other of said skirt members, said locking tabs being located on said skirt member a distance from the planar member which is no less than the length of said flap captured in said cavity and having at least a portion thereof positioned to engage the end of the flap whereby, when said cover is telescopically applied to the container, the flaps are forced against their respective sides and compressed between said skirt members and the ends of the flaps are engaged by said locking tabs to permanently lock said cover in place.

4,042,170
STERILE PACKAGE

Bjorn Ekman, and Lars Tyrefors, both of Upplands Vasby, Sweden, assignors to AB Svenska Dental Instrument, Upplands Vasby, Sweden

Filed May 5, 1976, Ser. No. 683,621
Claims priority, application Sweden, May 6, 1975, 7505268
Int. Cl.[2] B65D *31/14, 19/00*
U.S. Cl. 229—62.5 **12 Claims**

1. A closed sterile package of flexible weldable plastic material having at least one end construction comprising two mutually opposite portions of said plastic material, a valve element disposed between said portions, said valve element being formed of a gas pervious material and defining at least one hole through the thickness thereof, and a welding seam extending across said portions and effecting a seal between said portions

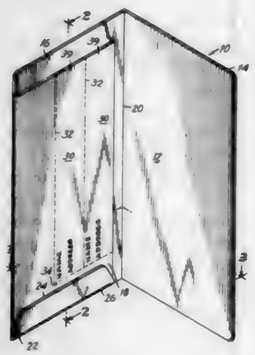


at least through said hole and a seal between said portions and said valve element elsewhere.

4,042,171
TRAVEL ENVELOPE CONSTRUCTION HAVING INTEGRALLY FORMED ELONGATED BAGGAGE IDENTIFICATION TAGS

Martin I. Ross, New York, and Arthur M. Rogers, Far Rockaway, both of N.Y., assignors to Exclusive Envelope Corporation, New York, N.Y.

Filed July 8, 1976, Ser. No. 703,470
Int. Cl.[2] B65D *27/08*
U.S. Cl. 229—72 **42 Claims**

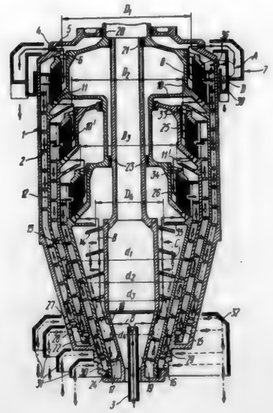


1. A wallet-type envelope construction comprising
an outer panel having a longitudinal dimension and a lateral dimension, and
an inner panel having a longitudinal dimension and a lateral dimension,
said outer panel being secured to said inner panel along a common edge,
means for securing the bottom edge portion of said inner panel to the bottom edge portion of said outer panel,
said outer and inner panels defining a pocket therebetween capable of having tickets and the like positioned therewithin,
a longitudinally extending portion of said inner panel having name and address indicia thereon to form at least one elongated identification tag,
at least a portion of said longitudinally extending identification tag having an adhesive layer disposed on the rear surface thereof, and
said elongated identification tab being a detachably secured portion of said inner panel.

4,042,172
BOWL CENTRIFUGE ROTOR

Andrei Stepanovich Nozdrovsky, Krasnaya ulitsa, 50, kv. 29, Leningrad, U.S.S.R.

Filed Apr. 14, 1976, Ser. No. 676,990
Int. Cl.[2] B04B *3/04*
U.S. Cl. 233—7 **6 Claims**



1. A bowl centrifuge rotor comprising a hollow rotary casing having a central axis, an internal cavity, and provided at one end with windows for discharge of clarified liquid and at an opposite end with sediment discharge windows: a hollow external screw conveyer installed in the cavity of said casing and being coaxial therewith, said conveyer having a discharge end oriented in the direction of the sediment discharge windows in said casing and provided with sediment discharge windows of its own, said external screw conveyer having a cavity for receiving at an end of said conveyer a suspension to be processed; a pack of separating plates positioned adjacent said external screw conveyer coaxial therewith in the path of flow of the suspension, during processing thereof, toward the windows made in said casing for discharge of clarified liquid; at least one internal screw conveyer installed in the cavity of said external screw conveyer coaxial therewith between its discharge end and said pack of separating plates and having a charging end oriented in the same direction as said external screw conveyer and rigidly secured to said casing for rotation therewith, as a result of which different sizes of solid phase fractions of the processed suspension are transported separately by said screw conveyers.

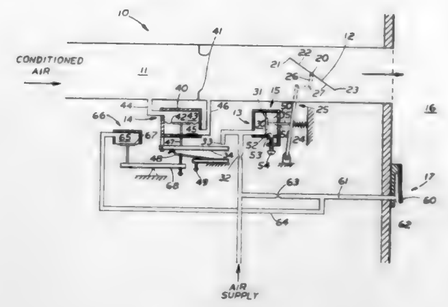
4,042,173
METHOD AND APPARATUS FOR CONTROLLING VOLUME AIR FLOW

George C. Boyer, and Raymond J. Fermanich, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Sept. 4, 1975, Ser. No. 610,122
Int. Cl.[2] F24F *7/04*
U.S. Cl. 236—49 **23 Claims**

1. A volume air flow controller employing as a damper biasing means a bias torque acting on said damper as a function of the unstable, unbalanced aerodynamic forces produced by the air flow past the damper, said controller comprising in combination a duct, a butterfly damper movable about a pivot between closed and opened positions to control air flow through said duct, means for applying to the damper a supplementary torque in a damper-closing direction substantially only sufficient to overcome the effective static friction of the damper in a damper-opening direction, an actuator applying an operating torque for moving said damper toward the fully opened position, said actuator being substantially only sufficiently powerful to balance the maximum resultant of said bias and supplementary torques, a flow sensor producing a flow signal as a function of the sensed value of said volume air flow, means for establishing a control signal as a function of a desired value of said volume air flow, and means responsive to the difference between said signals for controlling the actuator such that the damper is variably positioned to provide the desired value of said volume air flow.

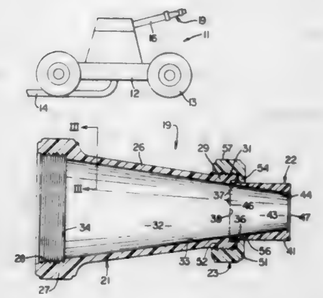
18. A method for controlling volume air flow through a duct comprising the steps of applying to a butterfly damper in said duct a damper- closing bias torque variable in magnitude as a function of unstable, unbalanced, aerodynamic forces produced by the air flow past the damper, applying to the damper a supplementary torque in a damper-closing direction substantially only sufficient to overcome the effective static friction of said damper in a damper-opening direction, sensing the volume air flow through the duct, and applying to the damper a damper-opening operating torque varying in magnitude as a function of said sensed volume air flow such that the damper is positioned to maintain a predetermined volume air flow through the duct by a balance between the operating bias and supplementary torques.



4,042,174
NOZZLE ADAPTER

Alvie G. Vaughn, R.R. No. 1, Osgood Road, Mendon, Mich. 49072

Filed June 21, 1976, Ser. No. 697,854
Int. Cl.[2] B05B *3/02*
U.S. Cl. 239—286 **1 Claim**



1. In an agricultural irrigation apparatus having a wheeled frame, a water discharge pipe swingably supported on said frame for substantially horizontal angular displacement, and nozzle means mounted on the discharge end of said discharge pipe, the improvement wherein said nozzle means comprises:
a tapered elongated one-piece sleevelike nozzle body having thread means associated with the large diameter end thereof for threadably attaching said nozzle body to said discharge pipe, said nozzle body having an elongated flow passage extending therethrough which is of a truncated

conical configuration, said flow passage having a large diameter inlet opening at the rearward end thereof which is of a diameter substantially equal to the diameter at the discharge end of said discharge pipe, said flow passage having a smaller diameter discharge opening at the other end thereof, said flow passage being of uniform slope as it extends between said inlet and discharge openings, said nozzle body also having a shallow annular recess extending inwardly from the small diameter end thereof in surrounding relationship to said discharge opening so that said recess forms a substantially annular seating surface which is within a plane substantially perpendicular to the axis of said nozzle body;

said nozzle body being of substantially uniform radial wall thickness throughout the circumferential and axially extending length thereof except for enlarged cylindrical portions formed at the large and small ends thereof, the enlarged cylindrical portion at the large end of said nozzle body being internally threaded for receiving therein the discharge end of said discharge pipe, and the cylindrical portion at the small end of said nozzle body being externally threaded;

a plurality of tip members each of different size, said tip members being individually interchangeably mountable on the small diameter end of said nozzle body;

each said tip member comprising a substantially cylindrical one-piece body member having an enlarged annular flange at one end thereof, said flange being of a size compatible with the recess formed in the small diameter end of said nozzle body, each said tip member also having a flow passage extending axially therethrough, said flow passage being of a truncated conical configuration and having an inlet orifice at one end of said cylindrical body which is of a diameter equal to the discharge opening formed in said nozzle body, each said tip member also having a discharge orifice formed at the other end thereof which is of a substantially smaller diameter than said inlet orifice, said discharge orifice being located directly in the axial end face of said cylindrical body as defined at said other end, and said flow passage being of uniform slope as it extends between said inlet and discharge orifices, the slope of the flow passage in said tip member being identical to the slope of the flow passage in said nozzle body;

said plurality of tip members being identical except for each tip member being of different axial length from all of the other tip members so that each tip member of said plurality has a different diameter discharge orifice, the cylindrical body forming each said tip member being of substantially uniform external diameter throughout the axial length thereof except for said annular flange which projects radially outwardly from said cylindrical body at said one end thereof, the discharge orifices defined by said plurality of tip members being of progressively increasing diameters so that the difference between the discharge orifices of the adjacent sizes of tip members is thus a preselected differential amount, the length of said plurality of tip members progressively decreasing as the diameters of the respective discharge orifices progressively increase, and the diameter of the discharge opening formed in said nozzle body being larger than the largest discharge orifice by said preselected differential amount, whereby said discharge opening can itself be utilized as a discharge orifice when a tip member is not mounted on said nozzle body; and

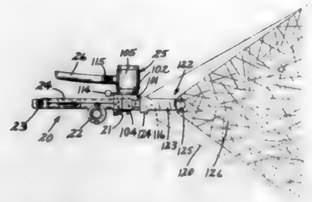
an annular one-piece nut encircling and being threadably connected to the externally threaded cylindrical portion at the small diameter end of said nozzle body, said nut having an annular flange which projects radially inwardly so as to overlap the axial end face of said nozzle body at the small end thereof, the flange on said nut also projecting radially inwardly so as to overlap the annular flange on each of said tip members for fixedly holding the flange on a selected tip member in snug bearing engagement with the seating surface on said nozzle body.

4,042,175

APPARATUS AND METHOD FOR DISPENSING AND REINFORCING CEMENTITIOUS MATERIALS

Iver L. Johnson, 7100 Down Road, Edina, Minn. 55435

Filed Oct. 29, 1975, Ser. No. 626,636
Int. Cl.² B05B 7/14
U.S. Cl. 239—420 **1 Claim**



1. Dispensing apparatus comprising, in combination:

means continuously supplying a paste of cementitious material;

a gun for receiving said material and aerodynamically projecting it as a first flat fan toward a receiving surface;

a housing having a delivery nozzle;

means supplying to said housing a roving of strands of glass compatible with said cementitious material;

means in said housing for continously dissevering said roving to give individual fibers of substantial length adjacent said nozzle;

means supplying air under pressure to said housing for emerging from said nozzle as a compact stream of air bearing said fibers in generally aligned orientation, the transverse dimension of said fan being several times as great as the transverse dimension of said stream in the same direction;

adjustable means securing said housing to said gun so that said fan and said stream have generally the same direction;

diffusing means for impingement by said compact stream to deflect said stream into a second fan which impinges on the first fan near said gun at a large acute angle, the transverse dimensions of said fans at the locus of their impingement being substantially the same, so that said fibers are uniformly distributed with respect to said cementitious material for immediate and complete coating of said fibers by said material;

and means mounting said diffusing means on said housing to extend into said stream at a distance from said housing greater than said length of said fibers, so that said impingement causes turbulence in said stream to result in random orientation of said fibers therein.

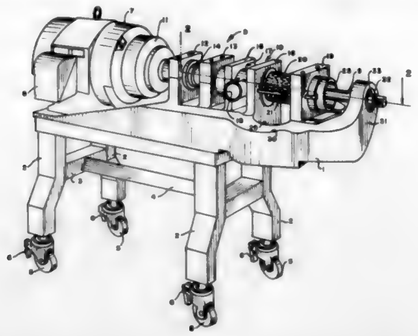
4,042,176

DEBONING APPARATUS AND METHOD

Nicholas Robert Beck, Atlanta; Gordon C. Leonard, Dalton, and Jack A. Prince, Gainesville, all of Ga., assignors to Meat Separator Corporation, Atlanta, Ga.

Filed Mar. 31, 1976, Ser. No. 672,317
Int. Cl.² B02C 23/16
U.S. Cl. 241—24 **32 Claims**

1. In the method of separating meat from bone in a deboning apparatus comprising infeeding bone laden material into the apparatus under the force and pressure of a grinder that reduces the same material to a particle size capable of being accommodated by the said apparatus, exposing the infeed material to the cooperative action of a pressure housing and a directly motor driven pressure auger to substantially increase the compressive forces exerted upon the said material therein to above 10,000 psi, revolving said pressure auger in excess of 500 revolutions per minute during functioning of the said apparatus, transferring the said pressurized material to the vicinity of the cooperative action between a perforated housing and a conveying auger to attain an expressing of meat through the said perforated housing and a transfer of its boney component to and through a valved section of the apparatus while gradually attaining a pressure release from the said material from its prepressurized levels, transferring the said bone laden material along the said auger means without effecting its



temperature increase in excess of 3° Fahrenheit, and thereafter passing the said boney component through the valved section of the apparatus for its immediate exposure to blades that achieve its prompt disposal from the said deboning apparatus during its functioning.

4,042,177

RECOVERY OF METALLIC LEAD, LEAD COMPOUNDS AND PLASTIC MATERIAL FROM SCRAP STORAGE BATTERIES

John P. Cestaro, Lawrenceville; Ranna K. Hebbar, Hightstown, and Uriel S. Sokolov, Princeton, all of N.J., assignors to N L Industries, Inc., New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,430
Int. Cl.² B02C 23/36
U.S. Cl. 241—20 **4 Claims**

1. Method for recovering metallic lead, lead compounds and plastic material from the inert material present in scrap storage batteries which comprises the sequential steps of crushing the scrap storage batteries; adding the crushed material to an aqueous suspension of magnetic granular material thereby to separate the inert and plastic material from the metallic lead and lead compounds; magnetically separating the magnetic granular material from the inert and plastic material; and separating the plastic material from the inert material.

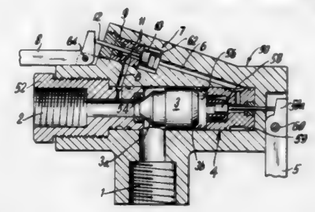
4,042,178

SHUTOFF VALVE CONSTRUCTION PARTICULARLY FOR HIGH PRESSURE

Elmar Michael Veltrup, Krefeld-Fischeln, and Wolfgang Maasberg, Krudenberg, Post Drevenack, both of Germany, assignors to Woma-Apparatebau Wolfgang Maasberg & Co. GmbH, Germany

Filed Jan. 22, 1976, Ser. No. 651,252
Claims priority, application Germany, Jan. 25, 1975, 2503121
Int. Cl.² F16K 31/143
U.S. Cl. 251—44 **4 Claims**

1. A shutoff valve or high pressures, particularly for high pressure spray guns, comprising a housing having an inlet passage, a discharge passage communicating with said inlet passage for the flow of fluid through said inlet passage and out said discharge passage, a valve seat defined between said inlet passage and said discharge passage, a differential piston movable in said housing between a closed position on said valve seat and closing said valve to close off the flow of fluid and to an open position spaced from said valve seat to open said valve, means defining a first control chamber on the side of said differential position opposite to said valve seat, a by-pass extending from said control chamber to said discharge passage having a second control chamber therein, first control valve means in said first control chamber including a first control member separately movable to an opened position to open said first control valve means and to communicate said first control chamber with said by-pass passage, second control valve means in said second control chamber including a second



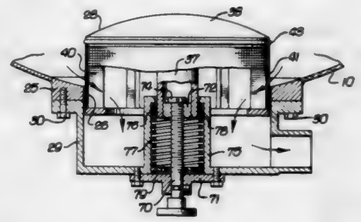
control member spaced apart from and movable separately from said first control member to an open position to open the said bypass passage and permit flow of fluid therethrough, said piston valve being movable to an open position only when both said first and second control members are moved to an open position.

4,042,179

MIXER WITH SCREEN VALVE

Claude K. Myers, and Gary A. Myers, both of 8376 Salt Lake Ave., Bell, Calif. 90201

Filed Mar. 8, 1976, Ser. No. 664,641
Int. Cl.² B02C 23/36
U.S. Cl. 241—46.11 **1 Claim**



1. In a mixer for mixing a material and a grinding media, the combination of:

a container for receiving a grinding media and material to be mixed, said container having an outlet opening at the bottom thereof;

agitator means for positioning in said container for mixing the grinding media and material;

a poppet valve mounted in said outlet opening for sliding movement between a lowered position closing said outlet opening and a raised position permitting fluid flow through said outlet opening,

said valve being cylindrical in shape with a closed upper end and apertured side for flow of the mixed material therethrough when in said raised position while retaining the grinding media in said container; and

means for rotating said valve while in said raised position including

a threaded shaft journaled in a bushing below said valve,

a nut mounted on said shaft and affixed to said valve, and

a stop for limiting movement of said nut along said shaft,

with rotation of said shaft in one direction translating said nut and valve from said lowered position to said raised position and when said nut engages said stop, rotating said valve for dislodging grinding media from said apertured side, and

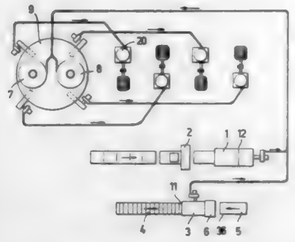
with rotation of said shaft in the opposite direction translating said nut and valve from said raised position to said lowered position closing said outlet opening.

4,042,180

FEEDING AND RATIONING EQUIPMENT FOR MECHANICAL WOOD PULP, PRODUCTION WASTE AND EQUIVALENT

Gunnar Nordgren, Helsinki, Finland, assignor to Oy. Suomen Vanutehdas - Finnwad Ltd., Helsinki, Finland

Continuation of Ser. No. 516,928, Oct. 22, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,283
Claims priority, application Finland, Dec. 21, 1973, 3955/73
Int. Cl.[2] B02C *23/10*
U.S. Cl. 241—79 **5 Claims**



1. Feeding and rationing equipment for mechanical wood pulp, production waste and equivalent, comprising:

a. a sheet tearing unit;
b. a tearing unit for wood pulp;
c. a distributor unit connected to receive raw material from said two tearing units;
d. first cyclone means connected in the path of raw material passing from said two tearing units to said distributor unit;
e. a mixing mechanism disposed in the distributor unit to mix raw material therein;
f. a rationing device connected to remove mixed raw material from the distributor unit at a predetermined rate;
g. at least one feeding unit which is connected to receive material removed from the distributor unit by said rationing device and which comprises:
a vertical pipe,
a hinged door arranged at said vertical pipe,
a flywheel and camshaft arrangement arranged to give outwards directed blows to said door,
two wheels rotating in opposite directions and having spiral-shaped wings for receiving said raw materials, and a relatively small mixing roller arranged underneath said two wheels; and
h. second cyclone means connected in the path of raw material passing from said distributor unit to said feeding unit.

4,042,181

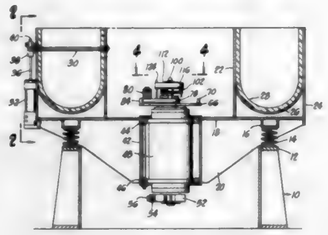
LEAD ANGLE CONTROLLING MECHANISM

Gene A. Huber, San Dimas, and Jon A. Knartzer, Buena Park, both of Calif., assignors to SWECO, Incorporated, Los Angeles, Calif.

Filed June 23, 1976, Ser. No. 698,934
Int. Cl.[2] B02C *17/08*
U.S. Cl. 241—175 **9 Claims**

1. A lead angle controlling mechanism for a vibratory apparatus having a reversible shaft drive mechanism, comprising

a first eccentric weight fixedly mounted to the shaft of the reversible shaft drive mechanism;
a second eccentric weight rotatably mounted to the shaft;
stop means fixed to rotate with the shaft for constraining the rotational motion of said second eccentric weight to an arc between two preselected angles relative to the position of said first eccentric weight on the shaft, said second eccentric weight thereby assuming a first position at one of said angles upon rotation of the shaft in a first direction and assuming a second position at the other of said angles upon rotation of the shaft in a second direction; and
biasing means fixed to rotate with the shaft and extending to said second eccentric weight biasing said second eccentric weight toward said first position, said bias means being of



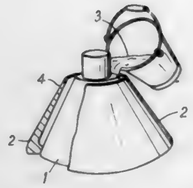
sufficient strength to prevent damaging impact of said second eccentric weight against said stop means when the shaft is rotated in said second direction.

4,042,192

CRUSHING, MATERIAL-REDUCING, GRINDING AND LIKE MACHINES

Arthur Gerard Williamson, Shrewsbury, England, assignor to Mazel Holdings Limited, Douglas Isle of Man, England

Filed Dec. 2, 1975, Ser. No. 637,100
Claims priority, application United Kingdom, Dec. 3, 1974, 52287/74
Int. Cl.[2] B02C *15/10*; B32B *27/40*
U.S. Cl. 241—207 **8 Claims**



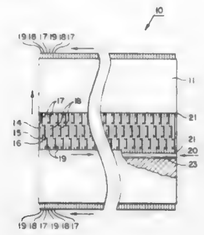
1. A machine part or component for use in crushing, material reducing, grinding and like machine, including a wearable metal portion and a layer of shock-absorbing backing material in close contact therewith in which said backing material comprises a filled polyurethane resin composition, the polyurethane resin being the reaction product of a cold-curing system comprising (a) a polyol component comprising (i) at least one polyether polyol having at least two hydroxyl groups per molecule, the average number of hydroxyl groups per molecule being more than 2, (ii) at least one polyol having at least two hydroxyl groups per molecule and containing both ether and ester groups, the average number of hydroxyl groups per molecule being more than 2, and (iii) at least one polyether diol; and (b) at least one aromatic polyisocyanate which is present in an amount such that there is an excess of isocyanate groups over hydroxy groups in the system, said at least one polyether polyol providing from 1.5 to 3.5 hydroxyl groups per hydroxyl group provided by said at least one polyol containing ether and ester groups, and said at least one polyether diol providing 10 to 30% of the total number of hydroxyl groups in the polyol component the major proportion of said composition being filler and sufficient resin being present to bind the filler into a unitary component.

4,042,183

ROTOR FOR MIXER-REFINER-REACTOR

Edward H. Cumpston, 43 Monument Ave., Old Bennington, Vt. 05201

Filed Apr. 21, 1976, Ser. No. 678,997
Int. Cl.[2] B02C *7/12*
U.S. Cl. 241—292.1 **17 Claims**



1. A rotor having a generally cylindrical body extending axially of a mixer-refiner-reactor, said body having a plurality of axially extending slots opening radially inward from the cylindrical periphery of said body, said slots being narrower at said periphery of said body than in a region radially inward from said periphery of said body, said rotor comprising:

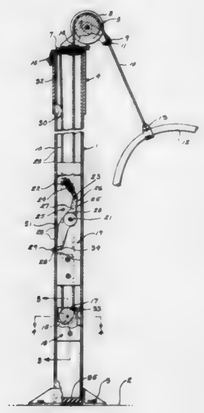
a. a plurality of flat plates extending generally transversely across said slots and arranged adjacent each other for substantially filling the axial length of each of said slots;
b. said plates being shaped to fit in said slots to be held against radially inward facing edges of said slots at the limit of radial outward movement of said plates relative to said slots;
c. at least some of said plates each having a projection extending radially outward beyond the periphery of said body; and
d. said projections providing working surfaces engaging material being worked through said mixer-refiner-reactor.

4,042,184

PUMP HOSE RETRIEVER

Willard J. Langenohl, 11142 W. Bradley Road, Milwaukee, Wis. 53224

Filed Sept. 2, 1976, Ser. No. 719,724
Int. Cl.[2] B65H *75/36*
U.S. Cl. 242—47.5 **7 Claims**



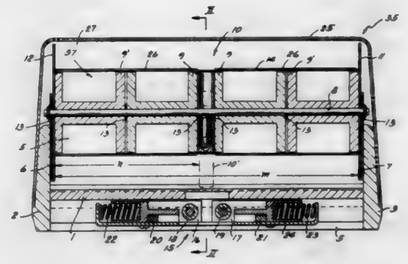
1. A pump hose retriever adapted to be connected to the discharge hose of a fuel pump, which comprises a hollow column disposed to be anchored in a fixed position, a pair of weights disposed inside the column with one being located above the other and the uppermost weight being of substantially greater weight than the lowermost weight and the lowermost weight being of a weight to keep the cable taut, means inside the column preventing rotation of the weights within the column, a cable secured to the upper portion of the column at one side thereof extending into the column and downwardly thereof when in nonservice position to substantially the bottom of the column and then reverse looped to extend upwardly and out the upper end of the column and disposed to be connected to the pump hose, meanssecured to the lower weight around which the cable is looped and the cable extending through elongated openings in the uppermost weight so that when the cable is pulled from the column the lower weight engages the uppermost weight and forces the latter upwardly in the column, spring loaded pawl means pivoted to the uppermost weight and the column having spaced apertures in the wall thereof over which the pawl means rides when moved upwardly with the uppermost weight within the column and in which the pawl means lodges upon a slight release of the cable by the operator, first cam means located inside the upper portion of the column, second cam means located inside the lower portion of the column in a position substantially opposite to the first cam means, and the first cam means engaging the pawl means to move it over center to a non-operative position so that the uppermost weight is free to move downwardly with the lowermost weight to retract the cable to a storage position inside the column, and the second cam means engaging the pawl means to move it over center to the initial position where it may again engage the apertures in the column and anchor the uppermost weight in a fixed position preventing retraction of the cable when the latter is in a service position.

4,042,185

DEVICE FOR RECEIVING A TAPE OF MATERIAL

Jean-Claude Risse, Prangins, Switzerland, assignor to J. Bobst & Fils S.A., Switzerland

Filed July 23, 1976, Ser. No. 707,942
Claims priority, application Switzerland, July 29, 1975, 009844/75
Int. Cl.[2] G03B *17/26*
U.S. Cl. 242—71.7 **9 Claims**



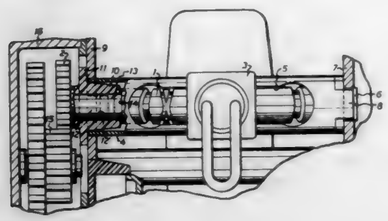
1. In a device for receiving a tape of material such as an exposed photographic film or exposed photographic paper and including a closed case having a light-tight chamber and a tape infeed channel provided with shutters in communication with the chamber, the improvements comprising means for supporting a tape in the chamber during a winding of the tape, said means for supporting being disposed in the chamber for rotation about an axis, means disposed in the chamber for continuously pressing the tape against the means for supporting the tape, and means for laterally guiding the tape as it is being wound on the means for supporting, said means for laterally guiding including a disk disposed at each end of the means for supporting, a retractable guide member, and means for pivotably mounting the retractable guide member between the two

disks including a spring urging the guide member from a retracted position to an extended guiding position so that with the guide member in the extended guiding position, a narrow tape will be guided between the guide member and one disk and with the guide member in the retracted position, a wide tape is guided between the pair of disks.

4,042,186
FISHING REEL WITH BEARING FOR LEVEL WIND SHAFT

Borje Sigurd Moosberg, Morrum, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden

Filed Oct. 20, 1975, Ser. No. 623,990
Claims priority, application Sweden, Oct. 21, 1974, 7413211
Int. Cl.[2] A01K *89/04*; F16C *27/00, 43/00*
U.S. Cl. 242—84.42 **7 Claims**

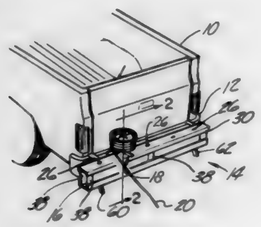


1. In a fishing reel having a frame including a wall member, a line-guide mechanism comprising a rotatable reversely threaded traversing screw, a line guide slidable on and operatively associated with said screw, and a bearing member for said screw mounted in said wall member, said wall member having an opening and said bearing member having a front end portion axially insertable in said opening, a rear end portion extending backwardly from said opening when the bearing member mounted on the screw is inserted in said opening, said wall member having two angularly spaced slots and said bearing member having two angularly spaced resilient projections extending axially from the rear end portion thereof in positions to be received each by one of said slots when the bearing member is inserted in said opening to a seated operative position therein for journalling the screw, said resilient projections being dimensioned and formed to be elastically radially deformed by axial force exerted upon said bearing member under insertion thereof into said opening and then, in conjunction with the arrival of said bearing member at its operative position, to spring back into locking engagements with said wall member to lock said bearing member in said position.

4,042,187
REELED WIRE HOLDER

Gene J. Snyder, 3820 Pontiac Lake Road, Waterford, Mich. 48095

Filed Sept. 2, 1975, Ser. No. 609,384
Int. Cl.[2] B65H *17/46*
U.S. Cl. 242—86.5 R **10 Claims**



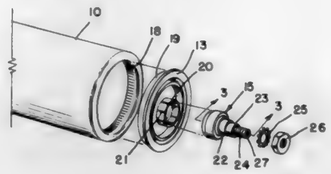
1. A reeled wire holder, comprising:

a. a support stand,
b. means for detachably mounting the support stand to a bumper of a vehicle,
c. means for mounting a coil of wire onto the support stand, and
d. means for receiving a leg formed on the support stand such that upon receiving a leg the support stand can be detached from the bumper and stood upon the ground.

4,042,188
YARN PACKAGE SUPPORT BEARING

Michael S. Richards, High Point, N.C., assignor to Shawn Products Company, High Point, N.C.

Filed June 3, 1976, Ser. No. 692,342
Int. Cl.[2] B65H *49/00*; F16C *13/00, 33/00*
U.S. Cl. 242—129.51 **4 Claims**

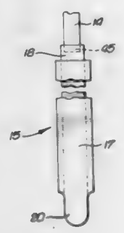


1. A yarn package support bearing member for rotatably and releaseably retaining a yarn carrier cradled between supporting pivotable arms comprising; a stub shaft fastened to one of said pivotable arms intermediate the arm link, said shaft having an eccentric portion thereon for communicating with said arm, an enlarged head integrally formed on said shaft at one end thereof, said head having at least a partial spherical bearing contour, a cup bearing retaining housing in spaced relation to said enlarged head, a plurality of bearing members retained between said housing and said head, a closure member securely retaining said housing, bearing members and head in bearing relationship, said closure member having a stub shaft opening greater than the shaft diameter for a relatively loose shaft fit for angular displacement, means for retaining the shaft on said arm, and a yarn package supporting flange for releaseable mounting on said housing.

4,042,189
TAPE LEADER CHARACTERIZED BY DIFFERENTIAL BENDING STIFFNESS

Richard A. Lewis, Sherman Oaks, Calif., assignor to Interdyne Company, Van Nuys, Calif.

Filed Nov. 3, 1975, Ser. No. 628,117
Int. Cl.[2] G03B *1/04*; G11B *15/32*
U.S. Cl. 242—195 **16 Claims**

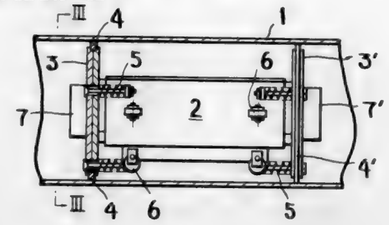


5. In combination:
a. an elongated tape, and
b. an elongated leader strip connected with the tape at an end thereof, the strip comprising at least two sub-strips which are interconnected in stacked relation, edge portions defined by one sub-strip projecting laterally beyond the edges defined by another sub-strip,
c. said leader strip having characteristic lengthwise unit bending stiffness which is substantially greater than leader characteristic widthwise unit bending stiffness at said edge portions of the one sub-strip,
d. the two sub-strips having different bending moduli.

4,042,190
CONVEYANCE TRUCK WITH MOVABLE SEAL PLATES

Eijiro Ueno, Tokyo, Japan, assignor to Ueno Kohgyo Ltd., Tokyo and Taishin Kohgyo Co., Ltd., Kawaguchi, both of, Japan

Filed Nov. 19, 1975, Ser. No. 633,545
Int. Cl.[2] B65G *51/04*
U.S. Cl. 243—32 **2 Claims**



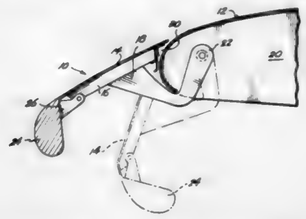
1. A conveyance truck for being movably positioned within a transport tube, said truck comprising:
a truck body;
a plurality of roller means affixed to the undersurface and sides of said truck body for supporting said truck body against the walls of said transport tube and for allowing said truck body to run along the inside of said tube; and
seal plate means attached to each end of said truck body and forced against the inside of said tube for securing said truck body air-tightly within said tube;
spring means connecting said seal plate means to said truck body for displacing said seal plate means relative to the position of said truck body with respect to curvatures of said tube and maintaining said seal plate means in contact with the inside of said tube, whereby said seal plate means continuously contacts said tube wall and an air-tight seal is maintained regardless of curvatures in said transport tube; and
said seal means is comprised of:
a seal plate member attached to said spring means and spaced from the end of said truck body, the outer edge of said seal plate member being spaced from the inside edge of said tube and having a groove therein around the circumference thereof; and
sealing material fitted in said groove in said plate member and extending outward therefrom against the inside of said tube.

4,042,191
SLOT SEAL FOR LEADING EDGE FLAP

Kirby William Johnson, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed May 3, 1976, Ser. No. 682,567
Int. Cl.[2] B64C *9/26*
U.S. Cl. 244—214 **5 Claims**

1. In a leading edge flap assembly for an airplane wing, said wing having a leading edge portion, an upper surface and a span, said flap having an upper surface, a span, an underside, and a trailing edge, said assembly including means for mounting said flap for movement between a retracted position wherein said flap is stowed in said wing, and an extended position wherein said flap is positioned forwardly of said wing so that its trailing edge is positioned adjacent the leading edge of said wing and so that the upper surface of said flap is oriented to increase the camber and chord of said wing and so as to form a slot between the leading edge of said wing and said flap, an improved assembly for sealing said slot comprising:
a member having a lateral dimension and a longitudinal dimension, said member having in the lateral dimension an upper portion, a lower portion and at least a flexible central portion, the longitudinal dimension of said member being oriented in a spanwise direction along said flap, the upper portion of said member being affixed to the underside of said flap, the lower portion of said member being

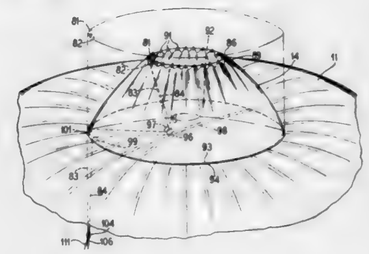


positioned adjacent and normally spaced from the leading edge portion of said wing when said flap is extended, the central portion of said member being sufficiently flexible so that when air flows from the underside of said flap upwardly past said member and through said slot, said central portion of said member will flex to allow said lower portion of said member to move toward and contact the leading edge portion of said wing in sealing engagement.

4,042,192
BALLOON WITH DEFLATION AND MANEUVERING PORTS

Forrest L. Walter, S. 4323 Locust Road, Spokane, Wash. 99206

Filed July 19, 1976, Ser. No. 707,770
Int. Cl.[2] B64B *1/62*
U.S. Cl. 244—99 **3 Claims**



1. A balloon having an envelope and a basket with a deflation port formed in said envelope comprising an opening formed in said envelope, a deflation panel attached to said envelope to cover said opening, a line attached to said deflation panel and extending to said basket so as to selectively allow said deflation panel to move relative to said opening to cover it by varying amounts, wherein said opening in said envelope is circular and is formed in an upper portion thereof, wherein said deflation panel is cylindrical in shape and has its lower edge connected to said envelope about said opening and said line is engageable with the upper edge of said cylindrical deflation panel and is arranged to open and close it, wherein said upper edge of said cylindrical deflation panel is formed with a plurality of spaced opening through which said line extends so as to open it and close it like a draw string, comprising a plurality of pulleys attached to said balloon so as to guide said line, wherein said plurality of spaced openings are formed by rings attached about said upper edge of said cylindrical deflation panel, and wherein a holding member is connected to said line and second and third lines extending downwardly from said holding member such that said second line is attached to said

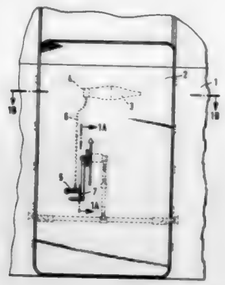
balloon where it is available for manual operation, and an automatic disconnect connected to said third line and operable from said basket.

4,042,193

SAFETY DEVICE FOR AIRCRAFT DOORS OR HATCHES

Gerd Cerne, Bremen, Germany, assignor to Vereinigte Flugtechnische Werke-Fokker GmbH, Bremen, Germany

Filed July 8, 1976, Ser. No. 703,599
Claims priority, application Germany, July 19, 1975, 2532350
Int. Cl.[2] B64C *1/14*
U.S. Cl. 244—129.1 **6 Claims**



1. In a device for securing door or hatch locks in aircrafts having manually operable means for unlocking and opening the door or hatch, the combination comprising:

transducer means including a piston means disposed to be displaced in response to dynamic pressure developed upon movement of the craft;

a bolt disposed for selectively securing and releasing the manually operable means, thereby respectively impeding and permitting manual unlocking and opening of the door or hatch;

a piston connected to said bolt for operating same; and

control means including a hydraulic connection connected to the transducer means to be responsive to presence or absence of a dynamic pressure as sensed by the transducer means, and as displacing the piston means, thereby displacing hydraulic fluid in said hydraulic connection which then operates said piston thereby operating said bolt in response to said presence and absence of the dynamic pressure as sensed.

4,042,194

PARACHUTE HARNESS RELEASE MECHANISM

Richard H. Frost, Littleton, and Ronald L. Criley, Lake City, both of Colo., assignors to Frost Engineering Development Corporation, Englewood, Colo.

Filed June 1, 1976, Ser. No. 691,351
Int. Cl.[2] B64D *17/32*
U.S. Cl. 244—151 A **22 Claims**

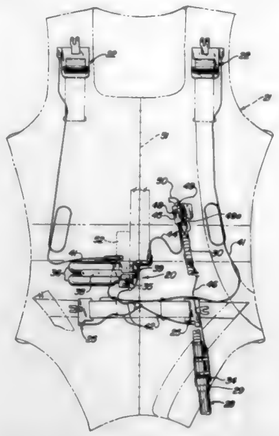
1. A parachute harness release mechanism for use on a parachute harness embodying releasable couplings for connection with parachute riser straps, releasable couplings for connection with survival kit lap belts, and an oxygen mask hose terminating in a releasable coupling for connection with an oxygen supply conduit, said mechanism comprising, in combination:

a. a single restraint free multi-positional control means mounted on said harness for selectively releasing said releasable couplings and having

1. a first operational position selectable for releasing only the riser strap couplings,

2. a second operational position selectable for releasing all of the harness mounted couplings simultaneously,

b. and means operative in response to said second position



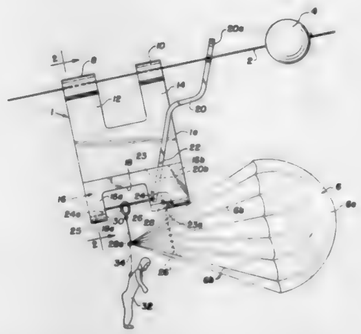
operation of said selectively releasing means for supplying air to said oxygen mask hose.

4,042,195

MECHANISM FOR RELEASING A TOY PARACHUTE FROM A KITE STRING

Hubert M. Howard, 741 Havenhill Lane, Dallas, Tex. 75217

Filed Aug. 2, 1976, Ser. No. 710,589
Int. Cl.[2] A63H *27/08*
U.S. Cl. 244—155 R **5 Claims**



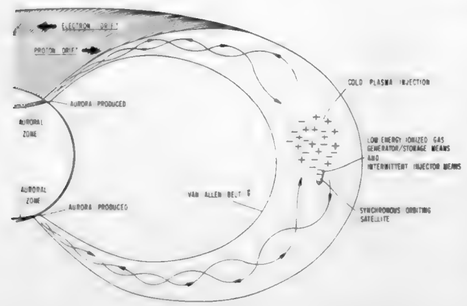
1. A toy parachute release device attachable to a kite string comprising: a body having at least one loop formed on the upper end, the end of said loop being spaced from the body to allow passage of the kite string into the loop, said body further having a recess formed in the lower end thereof; a lever arm; means pivotally securing said lever arm to said body; a retaining member having one end pivotally secured to the lever arm; a U-shaped channel formed on the lower end of said body; said channel having a groove formed in the lower portion thereof to receive and guide the free end of the retaining member whereby it can slide free of the body; a parachute; means to slideably secure said parachute to the retaining member; actuating means secured to the kite string such that as the air currents carry the parachute and body upwardly along the kite string to a predetermined height the lever arm engages the actuating means to pivot the lever arm, causing the end of the lever arm attached to the retaining member to move the retaining member from engagement with the body such that the free end of the retaining member pivots downwardly to release the parachute therefrom.

4,042,196

METHOD AND APPARATUS FOR TRIGGERING A SUBSTANTIAL CHANGE IN EARTH CHARACTERISTICS AND MEASURING EARTH CHANGES

Neil M. Brice, McLean, Va., assignor to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed July 21, 1971, Ser. No. 164,793
Int. Cl.[2] B64G *1/10*
U.S. Cl. 244—158 **4 Claims**



1. Apparatus for triggering substantial change in a selected ionospheric characteristic of the earth comprising in combination

an earth orbital satellite,

a source of low energy ionized gas on said satellite, and

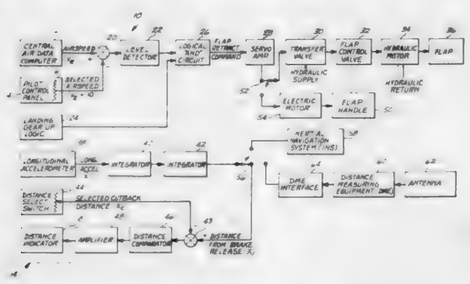
means for causing the release of said gas from said satellite at selected time intervals determined by the location of said satellite, when in earth orbit, in a high intensity radiation field trapped by the earth's magnetic field.

4,042,197

AUTOMATIC CONTROLS FOR AIRPLANE TAKE-OFF AND LANDING MODES

James Alfred Boyle, Bellevue; Peteris Adams Galins, Renton; Mark Charles Gregoire, Issaquah, and Peter L. M. O'Toole, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sept. 29, 1975, Ser. No. 617,621
Int. Cl.[2] G05D *1/12*
U.S. Cl. 244—183 **13 Claims**



1. A device for controlling a flight pattern of an aircraft during take-off comprising: means for automatically retracting flaps in response to a sensed predetermined airspeed after stowing landing gear, said means comprising: means for comparing a voltage proportional to a preselected airspeed with a voltage proportional to airspeed from a central air data computer to impart a command voltage, and means for retracting the flaps upon the command voltage being received by the servo-amplifier, wherein the means for retracting the flaps in response to command voltage being received by the servo-amplifier comprises: a transfer valve controlled by the servo-amplifier, and a hydraulic motor driven by hydraulic fluid from the transfer valve; and means for determining and for indicating airplane position over a predetermined ground location at which point engine thrust is cut back to reduce the noise of climb-out.

13. A method of controlling a flight pattern of an aircraft during take-off and approach modes, the steps comprising: extending the flaps for take-off; entering a predetermined speed in a control panel; engaging an automatic flap mode to compare actual speed with the predetermined speed to retract the flaps with landing gear stowed and predetermined speed reached; arming an automatic signalling device to indicate reaching a preselected distance from the start of the take-off; cutting back on the throttle, during climbout, upon receiving the distance signal; selecting a distance interval from touchdown for a decelerating approach during the approach mode; arming the automatic flap control to extend the flaps in response to distance from touchdown; entering a predetermined lower limit of speed for the end of the decelerating approach; arming the automatic decelerating throttle controls to reduce thrust in response to sensed flap position; entering a bias to stabilizer position at point of initial deceleration, and arming an automatic trim control system to respond to sensed flap position in combination with bias modified initial stabilizer position.

4,042,198

PIPE HANGER

Kazuaki Takeuchi, Hita, Japan, assignor to Chuo Hatsujo Kogyo Co., Ltd., Hita, Japan

Filed Mar. 29, 1976, Ser. No. 671,249
Claims priority, application Japan, Mar. 31, 1975, 50-044315
Int. Cl.[2] E21F *17/02*
U.S. Cl. 248—62 **4 Claims**



1. A pipe hanger for suspending a pipe from a ceiling comprising a pipe holder made from an integral strip of sheet material, said pipe holder having a lower pipe supporting portion for receiving and supporting a pipe, said pipe supporting portion being circular over an arc of more than 180° and less than 360° thereby leaving an opening for the insertion of a pipe through said opening into said pipe supporting portion, said pipe holder having an upper mounting portion extending from said lower pipe supporting portion, said mounting portion having a generally horizontal section in which an aperture is formed, a generally vertical section extending downwardly from said horizontal section, and an oblique section extending at an obtuse angle from said vertical section in a direction generally underlying said horizontal section such that the center of said circular pipe supporting portion generally underlies the center of said aperture, and a fitting element having an internal thread adapted to threadedly receive a threaded bolt extending from the ceiling, said fitting element having a generally cylindrical portion, said cylindrical portion having a section of reduced diameter, said aperture in said horizontal section of said mounting portion of said pipe holder being defined by a peripheral edge, said peripheral edge being accommodated and rotatably disposed in said reduced diameter section of said fitting element to thereby rotatably suspend said pipe holder from said fitting element in a position such that the

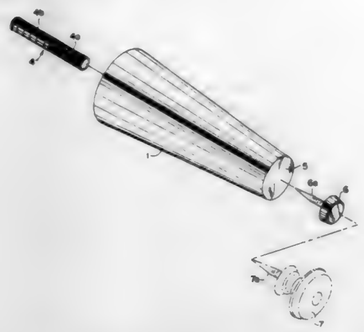
center of said circular pipe supporting portion underlies the axis of said cylindrical portion of said fitting element.

4,042,199

MOLDED FURNITURE LEG

Clifford Wilbur Winkler, Rte. 2, Box 561, Houghton Lake, Mich. 48629

Filed Dec. 19, 1975, Ser. No. 642,251
Int. Cl.² B60B *33/02*; F16B *12/00*
U.S. Cl. 248—188.8 **2 Claims**



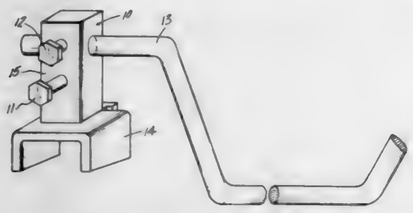
1. A molded hollow furniture leg comprising an outer wall having an inverted tapered configuration, a bottom wall, a centrally located hollow core extending from the top of said outer wall to said bottom wall, the internal opening through said hollow core progressively decreasing in size from the top down to provide for insertion of a stud in the upper end by which to attach the leg to furniture, a driving fit in the lower end for insertion of a nail shank of a furniture glide adjacent said bottom wall and a progressively increasing thickness of the core wall, and a plurality of equally spaced reinforcing ribs interconnecting said core and outer wall and which progressively increase in thickness from the top of said outer wall to said bottom wall.

4,042,200

UNIVERSAL MOUNT FOR SPLICING TOOL

Bob Eugene Overall, Santa Barbara, Calif., assignor to Margaret Mae Cooke, Santa Barbara, Calif.

Filed May 6, 1976, Ser. No. 683,710
Int. Cl.² A47B *96/06*
U.S. Cl. 248—223.1 **11 Claims**



1. A support for mounting a splicing tool and holder in a substantially horizontally aligned plane on a vertical structure comprising:

A. a substantially horizontal splicing bar to which the holder and splicing tool are capable of being fixedly attached; and

B. a mount for securing said splicing bar to said vertical structure comprising:

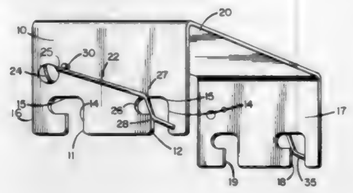
1. attachment means for securing said mount to said vertical structure comprising a protruding key capable of securing the mount to a standard keyhole slot support;
2. clamping means for fixedly securing said horizontal splicing bar; and
3. stabilizing means for maintaining the mount in a substantially vertical plane.

4,042,201

RADIO MOUNTING BRACKET

James S. O'Callaghan, Gilford, N.H., assignor to Tram/-Diamond Corporation, Winnisquam, N.H.

Filed July 27, 1976, Ser. No. 709,228
Int. Cl.² B60R *11/02*
U.S. Cl. 248—309 R **8 Claims**



1. A bracket for mounting electronic equipment in a vehicle comprising:

a. a U-shaped bracket having a first slot and a second slot in each upright of the U for receiving mounting studs attached to opposite sides of an equipment unit, each slot having an entrance at one end of an entrance leg and a foot formed substantially perpendicular to the other end of said leg so as to form an L shape;

b. at least one wire spring element having an eyelet at a first end and a double bend at a second end secured to each upright of said bracket with said second end blocking said first slot; and,

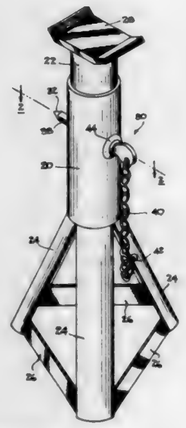
c. a pin mounted adjacent said first end to restrict rotation of said spring element, all whereby said spring element resists passage of equipment mounting studs into said first slot and then snaps behind it as it moves into the "foot" of the first slot to secure said equipment unit in place.

4,042,202

JACK STAND WITH SAFETY LOCKING DEVICE

Delmo C. Molinari, 10820 Ambazac Way, Los Angeles, Calif. 90024

Filed May 13, 1976, Ser. No. 686,169
Int. Cl.² E04G *25/00*
U.S. Cl. 248—352 **5 Claims**



4. A jack stand comprising:

a generally upright tubular member, said first tubular member having means for defining a base for resting on a horizontal surface, and having a horizontally disposed through hole adjacent the upper end thereof;

a second generally upright tubular member coaxial with and slideable within said first tubular member, said second tubular member having adjacent the upper end thereof means for engaging and supporting a part of an automobile, said second tubular member further having a plurality of horizontally disposed through holes, each at one of a plurality of elevations and each generally alignable with said through hole in said first tubular member;

a pin for extending through said horizontally disposed hole in said first tubular member and any of said horizontally disposed holes in said second tubular member to retain said first and second tubular members in a selected relative axial disposition; and

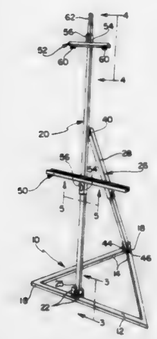
at least one region of said pin and said horizontally disposed hole in said first tubular member having cooperatively disposed sections deviating from a circular section, wherein a portion of the region surrounding said horizontally disposed hole in said first tubular member is spaced apart from said second tubular member, whereby said pin may be inserted and the non-circular region of said pin may be rotated therebetween so as to resist direct axial withdrawal thereof.

4,042,203

EASEL

Verona D. Warkentin, 1776 Alta Vista, Sarasota, Fla. 33577

Filed Oct. 7, 1975, Ser. No. 620,331
Int. Cl.² A47B *97/04*
U.S. Cl. 248—449 **21 Claims**



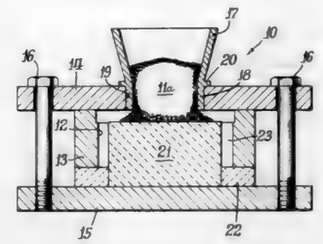
1. An easel comprising, a base, and column and brace members, means pivotally securing said members to each other and each to spaced apart portions of said base for swinging movement about substantially parallel axes between an erect operative position and a folded position, the securing means including a bifurcated part secured to said base and embracing an end of a first of said members with the first member pivoted to said part for said swinging movement, and when in said folded position the base, column and brace are generally parallel to each other and the bifurcation of the part embraces the other of said members to hold said members against movement transversely of each other, and means for mounting a workpiece on the column.

4,042,204

APPARATUS FOR BONDING A BRONZE BUSHING ON A METALLIC MEMBER

Richard G. Loebs, Peoria, and Richard C. Ostrowski, Dunlap, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 494,970, Aug. 5, 1974, Pat. No. 3,937,268.
This application Sept. 2, 1975, Ser. No. 609,644
Int. Cl.² B22C *9/06, 9/24*
U.S. Cl. 249—57 **5 Claims**



1. An apparatus for bonding a bearing on an annular member comprising

a cover plate having a single bore formed centrally therethrough,

a support plate spaced axially downwardly from said cover plate,

fastening means extending through said cover plate and releasably attached to said support plate for releasably attaching said cover and support plates together,

single funnel means attached to said cover plate to extend through the bore formed centrally therethrough and communicating internally of said apparatus for communicating a meltable material therein, and

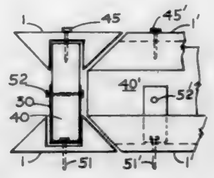
a non-metallic core mounted on said support plate to extend upwardly therefrom in close proximity to and below a lower end of said funnel means to define a space therebetween which extends laterally beyond a lower end of said funnel means.

4,042,205

MOLD ELEMENT FOR HORIZONTALLY FORMING PANELS

Flavel Deloyd Herrell, 2310 S. Cathy, Tucson, Ariz. 85710

Filed Dec. 8, 1975, Ser. No. 638,624
Int. Cl.² B28B *7/22*
U.S. Cl. 249—189 **15 Claims**



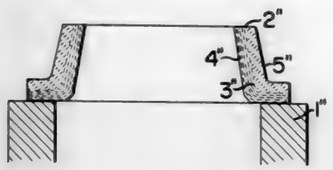
1. Apparatus for horizontally forming concrete wall panels for tilt-up wall buildings comprising a first elongated base plate means having at least one elongated triangular shaped cross-sectioned chamfer means attached thereto; a side wall form having a first end juxtaposed said first base plate means and one side of said elongated triangular chamfer means; a second elongated base plate means secured to the other end of said side wall form, said second elongated base plate means having at least one elongated triangular shaped cross-sectioned chamfer means attached thereto with one side of said triangular shaped chamfer means which is attached to said second base plate means juxtaposed said other end of said side wall form; and

strap means fixedly attached to the first end of said side wall form; and pin-type fastening means including nail means securing said strap means to said first base plate means and said first base plate means to an associated floor, whereby said apparatus is arranged to form part of the wall panel perimeter.

4,042,206
MONOBLOCK HOT TOPS WITH ALIGNED FIBROUS MATERIAL

Shigeru Matsuyama, Utsunomiya, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 348,338, April 5, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,903
Claims priority, application Japan, Apr. 10, 1972, 47-35237
Int. Cl.[2] B22D *7/10*
U.S. Cl. 249—197 **4 Claims**

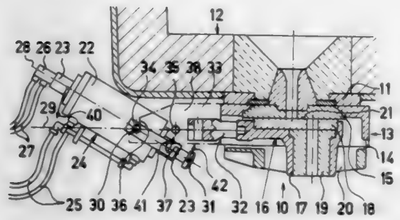


1. A heat-insulating and retaining molding for hot tops of a hollow cylindrical monoblock type with the continuous wall of said hollow cylinder having a generally L-shaped cross section and being formed of a composition comprising, by weight, 25 to 35 percent inorganic fibrous material, 1 to 5 percent organic fibrous material, 50 to 70 percent refractory material and 5 to 10 percent binder, with the fibrous material at the inner surface of said hollow cylinder being aligned essentially parallel to said surface.

4,042,207
VALVE OPERATING MEANS FOR A MOLTEN METAL CONTAINER

Friedrich Nehrlich, Volketswil, and Franz Ruckstuhl, Schwerzenbach, both of Switzerland, assignors to Metacon AG, Zurich, Switzerland

Filed Jan. 26, 1976, Ser. No. 652,057
Claims priority, application Switzerland, Jan. 28, 1975, 1011/75
Int. Cl.[2] F16K *31/122*
U.S. Cl. 251—62 **6 Claims**



1. The combination comprising gate-type slide valve means for a molten metal container having an outlet opening and means for operating said valve means,

said valve means including a valve member slidably mounted to move between an open and closed position transversely with respect to the opening of the container, said valve member having coupling means fixed thereon to be movable therewith, said valve means further including support means for pivotably supporting said valve operating means and stop means defining a pivoting end position for said valve operating means,

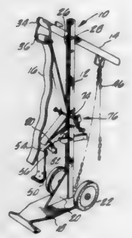
said valve operating means including an actuating member movable in a forward and a rearward direction and having means for coupling with said coupling means of said valve member to permit transmission of movement to said valve member in both of said directions when said respective coupling means are engaged and said valve operating means are in said pivoting end position,

said valve operating means further having a center of gravity disposed to pivot said valve operating means toward said pivoting end position and maintain engagement thereof with said support means and said stop means independent of the position of said actuating member of said valve operating member.

4,042,208
AUTOMOBILE BUMPER AND DOOR LIFTING AND POSITIONING ASSEMBLY

Tom S. Arakaki, 1563 S. Harvard, Los Angeles, Calif. 90006

Filed Jan. 26, 1976, Ser. No. 652,295
Int. Cl.[2] B66F *5/00*
U.S. Cl. 254—8 B **5 Claims**



1. An automobile component lifting and positioning assembly comprising a base member, a vertical support carried by said base member, lifting means pivotally secured to said vertical support, adjustable means carried by said lifting means for holding and positioning an automobile bumper, said holding and positioning means comprising an elongated strap, means for adjustably securing said strap to said lifting means, means carried by said strap for holding the upper edge of said bumper, a rigid gripping member secured to one end of said strap for holding the lower edge of said bumper, means slidably mounted on said vertical support for drawing said strap toward said support to vary the tension exerted on the upper edge of said bumper by said holding means and means for locking said lifting means in place upon said bumper being lifted thereby, whereby the angular orientation of said bumper with respect to said automobile can be varied about a horizontal axis to position the bumper for attachment to said automobile.

4,042,209
NAIL-EXTRACTING APPARATUS

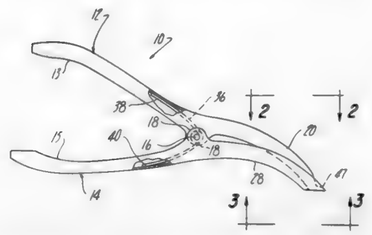
Anthony S. Rowinski, 2635 Rambling Way, Bloomfield Hills, Mich. 48013

Filed June 18, 1976, Ser. No. 697,487
Int. Cl.[2] B66F *15/00*
U.S. Cl. 254—21 **4 Claims**

1. In an apparatus for extracting an embedded nail from a surface, said apparatus being of the type comprising a pair of spaced apart lever arms having cooperating claw-like terminal ends, the improvement comprising:

a first lever having at its forward end a pair of claw-like fingers, the inner opposing surfaces of which terminate in a nail shank receiving slot, the fingers having inclined surfaces extending from the projecting ends of said fingers rearwardly toward said slot;

a second lever complemental to said first lever and having at its forward end a pair of spaced parallel support members, the lower edges of which are adapted to abuttingly engage said nail-carrying surface when said nail is positioned in said shank receiving slot and said claw-like fingers are disposed between said support members; and

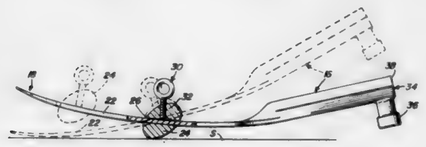


means pivotally connecting said levers to each other such that, when the rear ends of said levers are brought together, the forward ends of said levers are spread apart for exerting a force against said nail and extracting said nail from the surface within which said nail is embedded.

4,042,210
ADJUSTABLE LEVERAGE PRY BAR

William F. Feldmann, R.R. No. 1, O'Fallon, Ill. 62269

Filed June 29, 1976, Ser. No. 700,855
Int. Cl.[2] B66F *3/00*
U.S. Cl. 254—26 R **3 Claims**



1. An adjustable leverage pry tool, comprising, in combination:

a. a lever including a pry portion and a handle portion;

b. a claw provided on the pry portion; and

c. a fulcrum member adjustably, slidably mounted on the pry portion and arranged movable between the handle portion and the claw for varying the amount of leverage exerted by the lever, the fulcrum member having a substantially elliptical transverse cross section for enhancing the leverage of the lever, the pry portion extending longitudinally from the handle portion to the claw, and being in the form of a longitudinal arcuate member arranged for varying the angle of leverage as well as the amount of leverage by movement of the fulcrum member between the handle portion and the claw, the fulcrum member including, in combination:

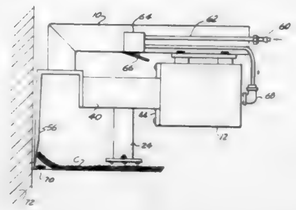
1. an elongated member provided with a slot in which the arcuate member of the pry portion is slidably received; and

2. clamp means attached to the elongated element for releasably securing the elongated element to the arcuate member, the clamp means including a thumbscrew, and a threaded bore provided in the elongated element, the thumbscrew disposed movably threadingly engaged in the bore and releasably gripping the arcuate member.

4,042,211
PORTABLE DEVICE FOR STRETCHING AND INSTALLING CARPET

John M. Hammond, P.O. Box 248, Lugoff, S.C. 29078, and Haskell R. Brown, Jr., 93D Georgetown Apt., 1476 Orange Grove Road, Charleston, S.C. 29401

Continuation of Ser. No. 555,936, March 6, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,293
Int. Cl.[2] A47G *27/04*
U.S. Cl. 254—57 **11 Claims**



1. A portable carpet stretching device for stretching carpet and the like over a floor surface for attachment to a fastening member secured to the floor surface closely adjacent a vertical wall comprising:

a. an elongated member positioning said device over said floor surface;

b. cylinder means carried by said elongated member having a piston assembly slideably carried therein for being actuated by a source of pressurized fluid;

c. said piston assembly including a piston and a piston rod carried thereby, said piston rod extending through an end of said cylinder means having a leg member depending therefrom,

d. carpet engaging means carried by said leg member for engaging carpet to be installed,

e. a support member depending from said elongated member being receivable behind said fastening member to which the carpet is to be attached,

f. a supply line for connecting said pressurized fluid source with said cylinder means, and

g. adjustable control means connected in said supply line controlling the admission and venting of pressurized fluid in said cylinder means so as to adjustably control the movement of said piston assembly,

said piston assembly being moved towards said support member during admission of pressurized fluid to said cylinder means so as to stretch the carpet engaged by said leg member a controlled amount towards said support member.

4,042,212
CABLE HAULING APPARATUS

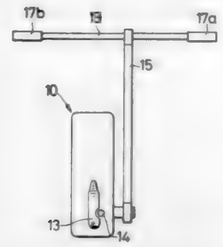
Johannes Augustus Rinio, 5, Promenade Venesia, Grand Siede, 7800 Versailles, France

Continuation of Ser. No. 490,977, July 23, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,441
Int. Cl.[2] A63B *61/04*
U.S. Cl. 254—164 **3 Claims**

1. In a cable hauling apparatus having oppositely movable clamp jaws mounted in two blocks that are oppositely longitudinally movable by at least one generally vertically extending lever connected to a laterally extending drive shaft to alternatively clamp a cable normally extending longitudinally through the apparatus and advance same longitudinally with respect to the apparatus, the improvement comprising:

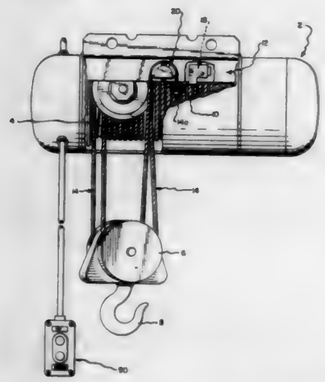
said drive shaft having at least one end extending beyond one side of the apparatus, said hand lever being rigidly secured to said one end of the drive shaft on one side of the apparatus and extending generally vertically beyond the top of the apparatus at its distal end, the hand lever being pivotally movable in a vertical, longitudinal plane to

actuate the drive shaft about its axis; a transverse rod secured to the lever intermediate the ends of the rod adjacent the distal end of the lever, the transverse rod extending generally parallel to the drive shaft transversely of the apparatus, one end of the rod extending substantially beyond the side of the apparatus opposite the side beyond which the one end of the drive shaft extends, the



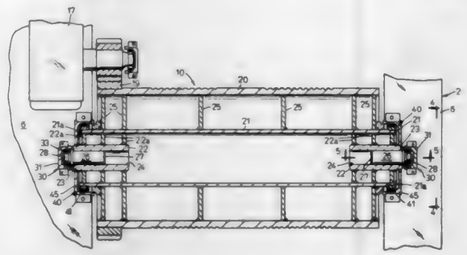
opposite end of the rod extending substantially beyond the lever in the opposite direction; and handle grip means at each end of the transverse rod, whereby two individual operators standing on opposite sides of the apparatus can simultaneously apply full manual actuating force to the drive shaft of the apparatus through the grips, rod and lever without interfering with each other.

4,042,213
ELECTRIC HOIST
Kenneth D. Schreyer, Clarence; Earl T. Leverentz, North Tonawanda, and Thomas R. Nusz, Amherst, all of N.Y., assignors to Columbus McKinnon Corporation, Tonawanda, N.Y.
Filed June 4, 1976, Ser. No. 692,963
Int. Cl.² B66D *1/00*
U.S. Cl. 254—168 **6 Claims**



1. In a multiple-reeved electric hoist having a frame and wherein dead end of the load carrying cable or chain is attached to said hoist frame, an improved combination overload snubbing and overload sensing and motor control mechanism;
said overload snubbing mechanism including a load snubbing spool positionally affixed to a first portion of said hoist frame and having a generally arcuate shaped slipper shoe frictionally journaled thereon for retarded oscillation thereabout, the hoisting cable or chain being arranged in training relation around said slipper shoe, and a first spring device mounted in association with said slipper shoe and operable to resiliently bias said slipper shoe to remain in a normal centralized position relative to said spool;
said overload motor control mechanism comprising a motor power supply control switch unit positionally affixed to said hoist frame;
said overload sensing mechanism comprising a second spring device which is bottomed against a second portion of said hoist frame;
the extreme dead end portion of said cable or chain being arranged to terminate in operable connection with the displaceable portion of said second spring device; and
a switch actuating arm rigidly extending from the displaceable portion of said second spring device and operatively associated with said control switch unit so as to actuate the latter to deenergize the hoist motor whenever a hoist overload is transmitted to the mechanism through the hoist cable or chain.

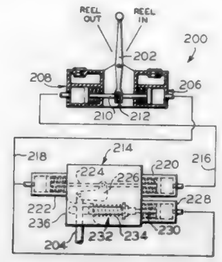
4,042,214
OVERHEAD CRANE INCLUDING AN IMPROVED HOIST DRUM AND REDUNDANT HOIST DRUM SUPPORT MEANS
Richard F. Brener, Wauwatosa, Wis., assignor to Harnischfeger Corporation, West Milwaukee, Wis.
Filed Apr. 26, 1976, Ser. No. 680,133
Int. Cl.² B66D *1/00*
U.S. Cl. 254—186 R **8 Claims**



1. In an overhead crane:
a frame;
a hoist drum having opposite ends;
first anti-friction bearing means supported by said frame and rotatably supporting each of said opposite ends of said hoist drum;
second anti-friction bearing means rotatably supported on said hoist drum and axially spaced from said anti-friction bearing means in which said opposite ends of said hoist drum are journalled, said first anti-friction bearing means supporting said second anti-friction bearing means out of supporting engagement with said frame, and means supported by said frame for supporting said second anti-friction bearing means upon failure of said first anti-friction bearing means, said means for supporting said second anti-friction bearing means including a supporting surface spaced below said second anti-friction bearing means when said hoist drum is supported by said first anti-friction bearing means and for receiving said second anti-friction bearing means in supporting engagement upon downward movement of said hoist drum upon failure of said first anti-friction bearing means.

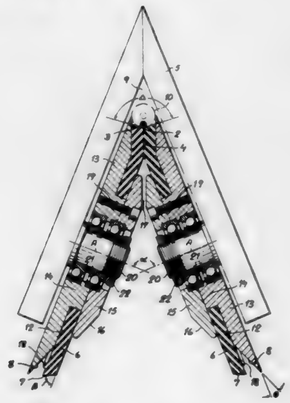
4,042,215
WINCH CONTROL MECHANISM
Dewey R. Hakes, Geneseo, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Feb. 24, 1975, Ser. No. 552,091
Int. Cl.² B66D *1/00*
U.S. Cl. 254—187.4 **2 Claims**

1. A pilot control mechanism for a power train including interrelated first and second hydraulically operable motor means, said first motor means operable to permit reeling out of a cable around a drum, and said second motor means operable to reel in said drum the pilot control mechanism comprising
a pilot controlled lever being pivotably movable in a first direction for actuating the first motor means and in a second direction for actuating the second motor means,
a manual control lever also being pivotably movable in first and second directions,
first and second master cylinder means being coupled with the manual control lever,
first and second slave cylinder means being coupled with the pilot controlled lever and being in direct fluid communication with the first and second master cylinder means, and



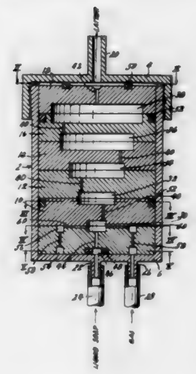
accumulator means, also being in direct fluid communication with only one of the master cylinder means, to produce a resilient load upon movement of the manual control lever in its first direction, the accumulator means providing increased resistance to movement of the control lever in the first direction in relation to movement of the lever in the second direction so that a differential modulated control is provided over the first and second motor means with proportional feedback forces being developed in the manual control lever.

4,042,216
CABLE GUIDE
Jean Maraux, Saint-Amand-Montrond, France, assignor to Willy Habegger, Hunibach bei Thun, Switzerland
Filed July 16, 1975, Ser. No. 596,251
Claims priority, application France, July 18, 1974, 74.25011
Int. Cl.² B66D *1/36*
U.S. Cl. 254—190 R **9 Claims**



1. A cable guide comprising:
a support defining a pair of intersecting pivot axes inclined to the horizontal;
a pair of spaced-apart wheels each rotatable on said support about a respective one of said axes and each having an inside face turned toward the inside face of the other wheel, said inside faces approaching each other most closely at a location above the intersection of said axes and being spaced apart at said location by a predetermined distance, said wheels defining a gap adapted to clear a load-supporting arm suspended by a cable at said location; and
an elastomeric disk secured to the inside face of each wheel and having an outer rim of a thickness equal to at least half said predetermined distance, said disks being resiliently compressed together at said location by said wheels and said outer rims forming at said location an upwardly open cable-receiving groove, each of said faces having a frusto-conical outer region centered on the respective axis and parallel to the outer region of the other face at said location.

4,042,217
LATHER GENERATOR
John H. Snider, 506 S. 3rd St., Clinton, Mo. 64735, and Harold H. Snider, Rte. 2, Osceola, Mo. 64776
Filed Aug. 18, 1976, Ser. No. 715,524
Int. Cl.² B01F *15/00*
U.S. Cl. 259—4 AB **8 Claims**



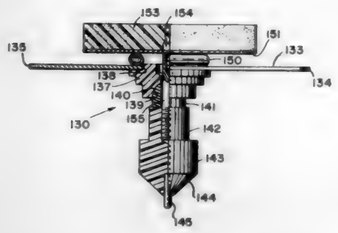
1. A lather generator comprising:
a. a housing having a pair of inlets respectively for liquid soap and gas, and an outlet for lather generated therein, and
b. means carried in said housing and forming a series of open chambers, the first chamber of said series being of smaller volume than any other of said chambers, means operable to direct soap and gas delivered under pressure to said inlets into said first chamber of said series, and to intermix them thoroughly in said first chamber, under substantially elevated pressure whereby to inhibit growth of the size of the gas bubbles thereby formed in said liquid soap, restricted passageways interconnecting said chambers in series, and a passageway interconnecting the final chamber of said series to said housing outlet.

4,042,218
APPARATUS FOR MIXING FLUIDS HELD IN TUBES
Robert R. Moore, Glenview, and Vincent E. Eitzen, Evanston, both of Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.
Division of Ser. No. 407,809, Oct. 19, 1973, Pat. No. 3,975,001.
This application Apr. 5, 1976, Ser. No. 673,602
Int. Cl.² B01F *9/02*
U.S. Cl. 259—72 **2 Claims**

1. In combination, apparatus for varying the intensity of stirring motion of a fluid in a container such as a test tube including outer casing means; a generally upright tubular housing; cup means slidably recieved in said housing; spring means resiliently urging said cup means to an upper position within said housing; drive means for driving the lower portion of said

housing in orbital motion; and gimbal mounting means for mounting the upper portion of said housing; and

an appliance removably attachable to said apparatus and comprising bracket means (for movably attaching to said apparatus) removably secured to said casing means; an insert carried by said bracket means and universally mov-



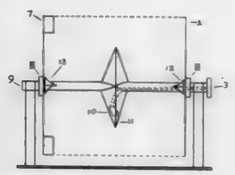
able relative thereto for insertion into said cup means when said bracket means is assembled to said (apparatus) casing means; and a platform connected to said insert and (rotated thereby, as said insert is rotated when said cup is driven in rotary motion) vibrated by said insert as said housing is driven.

4,042,219

MECHANICAL AEROBIC COMPOSTER

Morris B. Terry, R.D. No. 1, Gilbertsville, N.Y. 13776

Filed Feb. 18, 1976, Ser. No. 636,940
Int. Cl.² B01F 9/02
U.S. Cl. 259—88 **4 Claims**



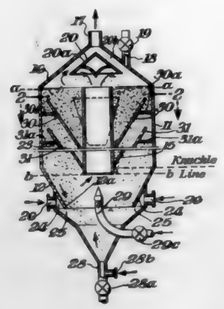
1. Composting apparatus comprising: a rotatable enclosure means of generally elongated shape and including side walls and end walls defining a general cylindrical internal space, said enclosure means having one closeable access aperture, and said enclosure means being perforated with a plurality of holes; agitation means within said enclosure means consisting of a hollow shaft to which are secured three vanes, said vanes consisting of a central, octahedral vane and two tetrahedral vanes which tetrahedral vanes are affixed, respectively, to each end of said shaft, said vanes positioned so that the central, octahedral vane is perpendicular to the tetrahedral vanes, said shaft being journally supported by said enclosure means end walls axially through said cylindrical internal space.

4,042,220

APPARATUS FOR SOLIDS BLENDING

Robert Garnett Humkey; Donald Raymond Marshall, both of Orange, and Donald James Ryan, Nederland, all of Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 618,888, Oct. 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 439,847, Feb. 6, 1974, abandoned, which is a division of Ser. No. 267,200, June 28, 1972, Pat. No. 3,807,705. This application Aug. 17, 1976, Ser. No. 714,997
Int. Cl.² B01F 13/02
U.S. Cl. 259—95 **10 Claims**



1. A particulate solids blending apparatus comprising, in combination, a vessel containing a settled bed of particulate solids to be blended consisting of an upright top section to which is joined a funnel type bottom section, a draft tube vertically disposed with respect to said top section with lower end in open communication with said funnel type bottom section and upper end in open communication with the top of said top section, means fluidizing a well-mixed fraction of about 0.01 to 0.20 of said solids in the region adjacent said lower end of said draft tube, means entraining solids upwardly through said draft tube, and solids flow-constricting means spaced inwardly from the inside wall of said upright top section disposed in the gravity flow paths of solids contained within said bed maintaining different residence times of separate weight fractions of said solids within said settled bed having residence time ratios in the range of about 1.5 to 5.0 while withdrawing said solids in downward gravity flow from said settled bed to said region adjacent said lower end of said draft tube provided with said means fluidizing solids.

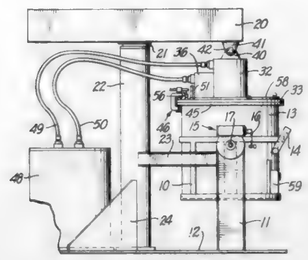
2. A particulate solids blending apparatus comprising, in combination, a vessel containing a settled bed of particulate solids to be blended consisting of an upright cylindrical top section to which is joined an inverted frusto-conical bottom section, a draft tube disposed substantially coaxially with respect to said cylindrical section with lower end in open communication with said frusto-conical bottom section and upper end in open communication with the top of said cylindrical section, means fluidizing a well-mixed fraction of about 0.01 to 0.20 of said solids in the region adjacent said lower end of said draft tube, means entraining solids upwardly through said draft tube, and solids flow-constricting means spaced inwardly from the inside wall of said upright top section disposed in the gravity flow paths of solids contained within said bed maintaining different residence times of separate weight fractions of said solids within said settled bed having residence time ratios in the range of about 1.5 to 5.0 while withdrawing said solids in downward gravity flow from said settled bed to said region adjacent said lower end of said draft tube provided with said means fluidizing solids.

4,042,221

TILT MIXER

Claude K. Myers; Gary A. Myers, and Phillip C. Myers, all of 8376 Salt Lake Ave., Bell, Calif. 90201

Filed Apr. 22, 1974, Ser. No. 463,109
Int. Cl.² B01F 7/00
U.S. Cl. 259—119 **6 Claims**



1. In an impeller type mixer, the combination of:

a cylindrical container having an axis and an open top and being supported on a first support means;

said first support means for said container mounted on a flat horizontally extending base plate;

said first support means comprising a pivotally mounted cradle type member connected to an upright base member and having at least one pair of parallel, horizontal, circular bands connected together at intervals around the circumference thereof by vertical connecting straps with a clamp thereon holding said container upright in place in said cradle member, said container being positionable in and laterally removable from said first support means;

a cover for said container for closing said open top;

at least one impeller and hydraulic drive motor mounted on said cover, with said impeller projecting into said container when said cover is mounted thereon;

a second support means for said cover, said second support comprising a vertical telescopic, hydraulic cylinder and piston having attached at the top thereof a horizontal elongate frame member, said cover, impeller and drive motor being suspended from and connectible to and disconnectible from said frame member of said second support;

said hydraulic cylinder and piston being capable of moving between upper and lower positions when said container axis is in the vertical position, with said impeller lifted clear of said container when said cover is connected to said second support and said second support is in said upper position;

a tilting mechanism connected between said base member and said first support means and being capable of tilting said first support means with said container therein and with said cover on said container and without said cover, said cover when on said tilted container being disconnected from said frame member to permit tilting of said frame member and cover, and said cover when not on said tilted container being connected to said frame member and lifted clear of said container by said cylinder and piston, said motor and impeller being operable when said cover is on said container both when said container axis is vertical and tilted; and

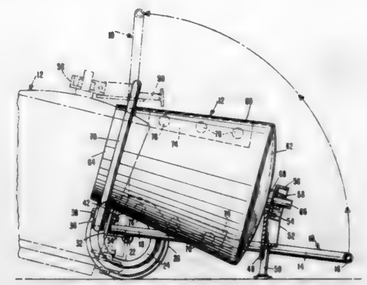
a hydraulic power source mounted on said base plate with flexible hydraulic conduits leading from said power source and supplying power to said drive motor.

4,042,222

MIXER

Andrew B. Clement, 1623 Stonecliff Drive, Decatur, Ga. 30033

Continuation-in-part of Ser. No. 616,371, Sept. 24, 1975. This application Sept. 2, 1976, Ser. No. 719,971
Int. Cl.² B28C 5/20
U.S. Cl. 259—176 **16 Claims**



1. A mixer comprising:

frame means having first and second ends and a longitudinal frame axis,

a pair of frame wheels for transporting the mixer mounted at said first end of said frame means parallel to said frame axis,

handle means mounted on said second end of said frame means,

a pair of mixing barrel support wheels rotatably mounted on said frame means at said first end thereof, said pair of support wheels being spaced from one another laterally flanking said frame axis and being generally vertically oriented, said mixing barrel support wheels having annular grooves extending around the entire periphery thereof,

bearing means mounted on said frame means along said frame axis spaced from said first end, said bearing means having a bearing opening for receiving a mixing barrel shaft,

a mixing barrel of generally frustoconical shape having side walls, a base, and an opening opposite said base, a mixing barrel shaft attached to said base along a mixing barrel axis and engageable with said bearing means,

a circular handle ring mounted on said mixing barrel surrounding said mixer opening, said handle ring being mounted on arm means attached to said mixing barrel and spacing said handle ring radially from said mixing barrel, the axis of said ring being coincident with the axis of said mixing barrel, said ring being engageable with said grooves in said mixing barrel support wheels and functioning to support said mixing barrel and to be grasped by the operator to rotate said mixing barrel.

4,042,223

ARRANGEMENT FOR AND A METHOD OF INTRODUCING PARTICULATE MATERIAL INTO MOLTEN BATHS

Hans Jürgen Langhammer, Platjenwerbe; Horst Abratis, Hagen; Klaus Schäfer, Georgsmarienhütte; Klaus-Jürgen Rendel, Georgsmarienhutte, and Horst Lotze, Georgsmarienhutte, all of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed June 24, 1976, Ser. No. 699,640
Claims priority, application Germany, June 27, 1975, 2528672
Int. Cl.² C21C 7/00
U.S. Cl. 266—47 **19 Claims**

1. An arrangement for introducing particulate materials into molten baths comprising, in combination, means for containing a molten bath; a source of a suspension of a particulate material in a carrier medium; means for conveying the suspension from said source toward said containing means; and an elongated

lance partially immersed in the molten bath and including a metallic tube having an inlet port communicating with said conveying means outside of the molten bath, an outlet port longitudinally spaced from said inlet port, having a first flow-through cross-sectional area and communicating with the molten bath, an annular recess around said outlet port, and a passage communicating said inlet port with said outlet port and having a second flow-through cross-sectional area which is



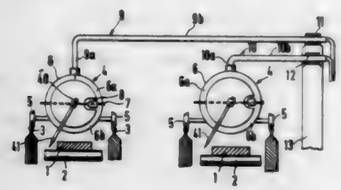
larger than said first area, said lance further including a layer of refractory material surrounding said metallic tube, and a discrete tubular element of ceramic material having an annular shoulder portion received in said annular recess of said metallic tube, said tubular element forming an extension of said metallic tube at said outlet port and bounding an opening having said first area and communicating with said outlet port and said molten bath.

4,042,224

THERMAL CUTTING MACHINE FOR CUTTING UP CAST INGOTS DURING THE OPERATION OF CONTINUOUS CASTING PLANT

Juan Adalberto Zeley, Caracas, Venezuela, assignor to I.P.U. Limited, Nassau, Bahamas

Filed Dec. 16, 1975, Ser. No. 641,345
Claims priority, application Germany, Dec. 16, 1974, 2459410
Int. Cl.² B23K 7/00
U.S. Cl. 266—50 **9 Claims**



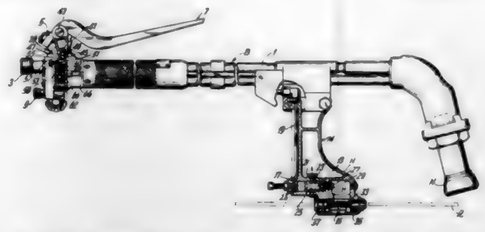
1. A thermal cutting machine for cutting a continuously cast ingot moving in a longitudinal direction comprising:
- rail means for longitudinally movably supporting said machine at a position spaced from and parallel to said ingot;
- means for clamping said machine to said ingot whereby said machine moves along said rail means in unison with said ingot;
- a cutting burner;
- means for moving said cutting burner transversely across said ingot to thereby cut said ingot;
- an outer cooling shroud substantially enclosing said cutting machine, said cooling shroud having double walls in a spaced relation and adapted to receive a cooling fluid therebetween; and
- articulated pipe means coupled at one end to said cooling shroud and adapted both to supply a cooling fluid from an external source between said walls and to remove cooling fluid already present between said walls.

4,042,225

TORCH WITH GAS ACTUATED STARTING ROD FEED DEVICE

Richard Calvin Jones, Scio, Ohio, and Clifford Charles Anthes, Tucson, Ariz., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 17, 1976, Ser. No. 724,359
Int. Cl.² B23K 7/10
U.S. Cl. 266—75 **4 Claims**



1. A hand holdable gas torch, comprising a torch body having a first gas passage therein providing communication between a source of gas and a torch nozzle mounted at one end of said torch body, a starting rod feed mechanism mounted on said torch body and comprising a housing having an exhaust port therein; a piston in said housing sealing said exhaust port; a rod gripper connected to said piston for parallel movement therewith; second gas passage means providing communication between one side of said piston and said first gas passage; valve means located in said second gas passage for providing a pulse of gas to said piston, said valve means having a valve stem for opening said valve; means for operating said valve means in one direction only, including a torch lever pivotally mounted to the torch body, a lever arm extension pivotally mounted to said torch lever; a cam operator pivotally and resiliently mounted at one end of said lever arm extension; a cam lever pivotally mounted to the torch body and in operable relationship to said cam operator so that only when said torch lever is depressed the cam operator drives the cam lever into contact with said valve stem causing a pulse of gas to flow through said second gas passage to one side of said piston thereby driving said piston until said exhaust port is opened whereupon said pulse of gas is exhausted to atmosphere so that the rod advances the starting rod a distance equal to the stroke of the piston and the rod gripper is immediately reset for another stroke.

4,042,226

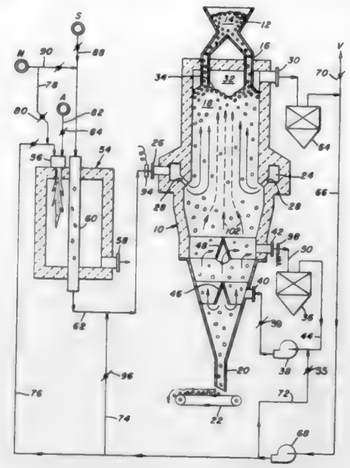
METHOD AND APPARATUS FOR PRODUCING METALLIC IRON PELLETS

Donald Beggs, Charlotte, N.C., assignor to Midrex Corporation, Charlotte, N.C.

Filed May 19, 1975, Ser. No. 578,477
Int. Cl.² F27B 9/00
U.S. Cl. 266—88 **5 Claims**

1. Apparatus for reducing a metal oxide, comprising:
- a. a generally vertical shaft furnace adapted to receive a bed of metal oxide and having a gas inlet and a gas outlet, with at least a portion of said bed being positioned intermediate said inlet and said outlet and forming a reduction zone therebetween;
- b. means for cooling gas removed from said furnace via said gas outlet;
- c. a passageway communicating between said gas outlet and said cooling means;
- d. a cooling gas system connected to said cooling means by a second passageway, said cooling gas system including:

1. a cooling gas inlet for introducing a cooling gas to said furnace below said reduction zone;
2. means including a cooling gas outlet for removing part of said cooling gas from said furnace above said cooling gas inlet, the portion of said furnace between said cooling gas inlet and said cooling gas outlet forming a cooling zone;
3. means for cooling said cooling gas removed from said furnace;



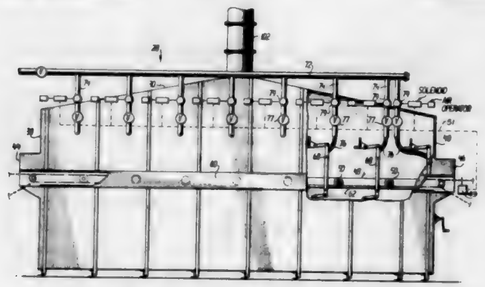
4. a third passageway communicating between said cooling gas outlet and said means for cooling said cooling gas; and
5. a fourth passageway communicating between said means for cooling said cooling gas, said second passageway and said cooling gas inlet.

4,042,227

METHOD AND APPARATUS FOR CONTINUOUSLY HOMOGENIZING AND QUENCHING ALUMINUM BILLETS

Howard E. Niehaus; Winfield M. Hass; Homer G. Alpha, all of Owensboro, Ky.; Sidney B. Hall, Tiburon, Calif., and Frederick O. Traenkner, Pittsburgh, Pa., assignors to Southwire Company, Carrollton, Ga. and National Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 344,626, March 26, 1973, abandoned. This application July 23, 1975, Ser. No. 598,236
Int. Cl.² C21D 9/08
U.S. Cl. 266—93 **14 Claims**



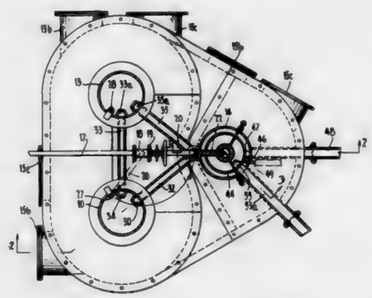
1. Apparatus for homogenizing and quenching cast metal billets comprising a furnace and a quench chamber disposed in contiguous relation thereto, conveyor means defining a path of travel for billets through said quench chamber, spray cooling means including a plurality of concentrically arranged continuously annular spray rings disposed in spaced relation along and surrounding said path of travel and adapted to have billets pass therethrough, said spray rings being connected to a manifold pipe adapted to supply cooling fluid to said spray rings, said conveyor means including a plurality of support rollers fixedly mounted in said chamber between successive ones of each of said plurality of annular spray rings for supporting the billets during quenching to thereby inhibit warpage thereof, and means for simultaneously adjusting the vertical position of each of said spray rings independently of said quench chamber and said support rollers so as to position said spray rings concentrically with respect to the axes of billets of different diameters supported on said support rollers and adapted to pass through said spray rings.

4,042,228

APPARATUS FOR DEBISMUTHISING LEAD

Denby Harcourt Ward, and James Dixon Iley, both of Port Pirie, Australia, assignors to The Broken Hill Associated Smelters Proprietary Limited, Melbourne, Australia

Filed Aug. 18, 1976, Ser. No. 715,298
Claims priority, application Australia, Aug. 19, 1975, 2844/75
Int. Cl.² C22B 13/06
U.S. Cl. 266—215 **14 Claims**



1. Apparatus for debismuthising lead containing one or more alkaline earth metals or alloys thereof, which comprises a separation vessel having an upper liquation zone and a lower separation zone, means for independently controlling the temperature of each zone, means for adding a reagent selected from the group consisting of antimony, arsenic and alloys containing antimony and/or arsenic, to the input lead to form a crust/bullion mixture, means for continuously introducing the crust/bullion mixture directly into the lower separation zone of the vessel, at a point below the upper liquation zone, the crust particles being separated from the bullion in the lower separation zone and moving upwardly in the vessel, the entrained lead being separated from the crust particles in the upper liquation zone and moving downwardly in the vessel, means for removing the enriched crust from the upper surface of the material in the vessel, and means for withdrawing debismuthised product lead from near the lower end of the lower separation zone.

4,042,229

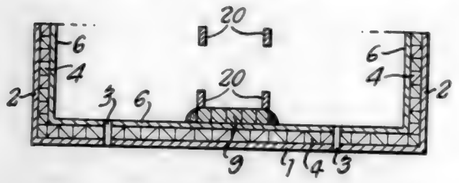
TUNDISH WITH WEIRS

Kenneth Thomas Eccleston, Birmingham, England, assignor to Foseco Trading A.G., Chur, Switzerland

Filed June 8, 1976, Ser. No. 693,958
Claims priority, application United Kingdom, June 17, 1975, 25858/75
Int. Cl.² C21C 5/00
U.S. Cl. 266—275 **9 Claims**

1. A tundish comprising
- a casing having a floor including an impact area and upstanding sidewalls including two sidewalls at either end of said impact area;
- a permanent refractory lining for said casing;
- a pair of expendable preformed slabs of refractory heat-insulating material disposed on said two sidewalls at either end of said impact area,
- means for providing a weir at said impact area and for supporting said preformed expendable slabs to hold them on

said two sidewalls, said means comprising at least one expendable beam of refractory heat insulating material



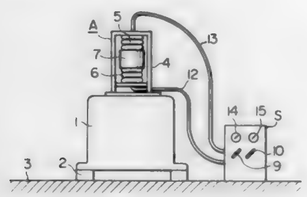
extending between opposite sides of said casing adjacent said impact area and abutting each of said preformed slabs.

4,042,230

DYNAMIC ABSORBER WITH PNEUMATIC SPRINGS

Masao Akimoto, Hiratsuka, Japan, assignor to The Yokohama Rubber Company Ltd., Tokyo, Japan

Filed Oct. 22, 1975, Ser. No. 624,909
Int. Cl.² F16F 9/02
U.S. Cl. 267—136 **12 Claims**



1. A dynamic absorber adaptd for use in cancelling a vibration of a machine which is caused by a vibration excitation force generated in the machine, comprising:

a pair of pneumatic means each including an elastically variable volume container disposed to be spaced apart from one another and effecting a spring action along a predetermined line, respectively;

a weight means supported between said pair of pneumatic means and capable of vibrating between said pair of pneumatic means along said predetermined line;

an air pipeline circuit connectable to a pressurized air source for supplying pressurized air from said pressurized air source to said pneumatic means, and;

at least one pressure regulating valve disposed in the air pipeline circuit for remotely and adjustably regulating the pressure of the pressurized air supplied to said pneumatic means.

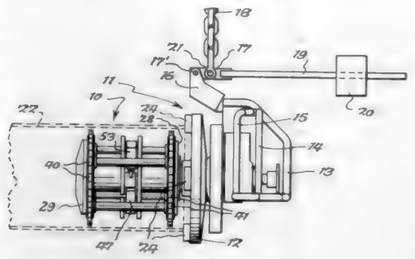
4,042,231

PIPE CLAMPING DEVICE

John F. Kopczynski, and Paul F. Kluczynski, both of North Tonawanda, N.Y., assignors to CRC - Automatic Welding, Division of Crutcher Resources Corporation, Houston, Tex.

Filed May 21, 1976, Ser. No. 688,676
Int. Cl.² B23P 19/00
U.S. Cl. 269—48.1 **18 Claims**

1. A device for clamping into engagement with the inside of a pipe comprising a continuous central supporting shaft, first and second axially spaced rotatable actuator means having first and second cylindrical portions, respectively, journalled on said shaft, first and second frame means fixedly secured to said shaft proximate said first and second rotatable actuator means, respectively, a plurality of first and second plunger means spaced circumferentially about said shaft, mounting means mounting said first and second plunger means on said first and second frame means, respectively, for movement toward and away from said inside of said pipe, first and second linkage means coupling said first and second plunger means, respectively, to said first and second rotatable actuator means, respectively, and motor means coupled to said first and second rotatable actuator means for rotating said first and second



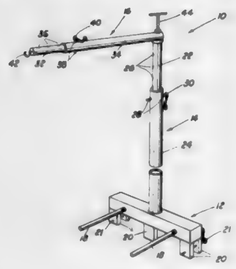
rotatable acutator means relative to said first and second frame means, respectively, to thereby cause said linkage means to move said first and second plunger means, respectively, toward and away from said inside of said pipe.

4,042,232

EXTREMITY HOLDER FOR MOUNTING ON AN OPERATING TABLE

Barbara A. Lile; Robert M. Lane, both of Wichita, and Louise A. Everhart, Derby, all of Kans., assignors to L. E. L., Inc., Wichita, Kans.

Filed Oct. 12, 1976, Ser. No. 731,320
Int. Cl.² A61G 13/00
U.S. Cl. 269—328 **2 Claims**



1. An extremity holder for mounting on an operating table, the holder comprising:

a base;

a pair of rods having threaded ends, said rods threadably mounted to one side of said base, said rods received in apertures in the end of the operating table for securing the holder to the end of the operating table;

a plurality of downwardly extending lugs attached to the bottom of said base, said lugs received adjacent the side of an accessory rail mounted along the side of the operating table, said lugs pinned to the rail of the operating table for securing the holder to the side of the operating table;

a vertical standard having an inner tube slidably mounted inside an outer tube, said tubes having a plurality of apertures therethrough for receiving a pin therein for adjusting the vertical heighth of said standard;

a horizontal arm having an outer tube and an inner tube, said inner tube slidably mounted inside said outer tube, said tubes having a plurality of apertures therethrough for receiving a pin therein for adjusting the horizontal length of said arm; and

a hook attached to one end of said arm, said hook used for holding a sling attached to a patient on the operating table.

4,042,233

INSTALLATION FOR COLLECTING IDENTICALLY SHAPED, LARGE AND DIFFERENT TYPES OF SHEETS FROM A PLURALITY OF DISPENSING STATIONS AT A COLLATING STATION

Hilmar Vits, Leichlingen, Germany, assignor to VITS-Maschinenbau GmbH, Langenfeld, Germany

Continuation-in-part of Ser. No. 466,258, May 2, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,737
Claims priority, application Germany, May 9, 1973, 2323339
Int. Cl.² B65H 39/055
U.S. Cl. 270—58 **9 Claims**



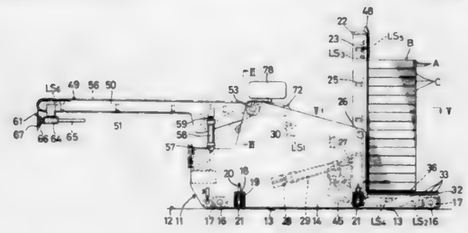
2. Apparatus for collecting and stacking a plurality of identically shaped sheets comprising: a collating station for collecting and stacking the sheets; at least one pair of sheet dispensing stations positioned on each of two opposite sides of said collating station, each of said sheet dispensing stations being adapted to store sheets identical in size and weight, said dispensing stations and said collating station being located in a row uniformly spaced relative to each other; movable sheet-conveying carriage positioned above said dispensing and collating stations and driving means for incrementally reciprocating said carriage to and fro above said row of stations at an incremental amplitude corresponding to the spatial distances between said stations for transporting said sheets in a direction toward said collating station; individually controllable gripper elements mounted on said carriage at predetermined locations and having means for simultaneously gripping one sheet from at least one of each of said pair of opposed dispensing stations at an edge of the sheet leading in the direction of motion toward the collating station; means lowering said gripper elements for gripping the sheets, whereby the sheets thus gripped are conveyed sequentially from the dispensing stations towards said collating station for stacking thereon, each of said gripper elements being controlled individually for building up stacks of different order, the sheets being collated by transporting the sheets from one dispensing station to the other, the sheets being transported step-by-step in the direction toward said collating station.

4,042,234

BLANK FEEDING MACHINE

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Kabushiki Kaisha, (Rengo Co. Ltd.), Osaka, Japan

Filed June 18, 1976, Ser. No. 697,733
Int. Cl.² B65H 1/30
U.S. Cl. 271—151 **8 Claims**



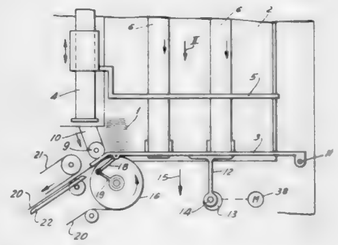
1. A blank feeding machine delivering blanks in bundles on a belt conveyor to a feed hopper of a printer comprising a truck movable on at least one pair of rails, a pivoting frame mounted to said truck in the rear thereof to be pivoted forward from its upright position by at least one driving means and provided with a table at the bottom thereof to stack blanks thereon, at least one kicker vertically movably mounted on said pivoting frame for pushing up the stack of blanks intermittently according to the rate at which blanks are fed to the feed hopper, when said pivoting frame is in its pivoted position, a first belt conveyor provided in front of said truck to extend forward therefrom with the rear end thereof adjacent to the front end of said pivoting frame in its pivoted position for delivering the blanks transferred in bundles from said pivoting frame with one side thereof held by the worker, and a second belt conveyor mounted to the pivoting frame to be disposed outside of the boundary between the front end of the pivoting frame in its pivoted position and the rear end of said first belt conveyor for carrying the bundles of blanks forward with only the outer side thereof supported thereon when they are transferred from the pivoting frame to said first belt conveyor.

4,042,235

METHOD OF AN APPARATUS FOR UNSTACKING A PILE OF SHEETS

Rudolf Wanner, Aystetten, and Robert Eckl, Augsburg, both of Germany, assignors to Fa. Bowe, Bohler & Weber KG Maschinenfabrik, Augsburg, Germany

Filed Aug. 20, 1975, Ser. No. 606,206
Claims priority, application Germany, Aug. 21, 1974, 2440104
Int. Cl.² B65H 3/08, 3/10
U.S. Cl. 271—94 **10 Claims**



1. A method of unstacking a pile of sheets comprising the steps of:

a. urging said pile continuously toward a flat rigid unperforated plate covering substantially the entire surface of a sheet at an end of the pile so that said end sheet of the pile presses against said plate;

b. pulling said plate away from said end sheet of said pile with a speed sufficient to separate said end sheet from the next sheet of said pile by an adhesion created only by the contact of said plate with said end sheet and the movement of said plate away from the pile, said speed being in excess of the speed at which said pile is urged toward said plate;

c. thereafter withdrawing said end sheet laterally parallel to said plate from said pile;

d. thereafter displacing said plate back against said pile whereby the next sheet of said pile becomes the end sheet; and

e. repeating steps (b), (c), and (d) with the subsequently uncovered end sheets.

4,042,236

TENNIS GAME METHOD AND APPARATUS

Dale Alan LePrevost, 4 Silver Terrace, Ocala, Fla. 32670

Filed May 21, 1975, Ser. No. 579,412
Int. Cl.² A63B 61/00
U.S. Cl. 273—29 R **9 Claims**

3. A game tracking apparatus for a moving projectile for playing a game in the darkness comprising:

a generally retro-reflective projectile for providing the gaming projectile,

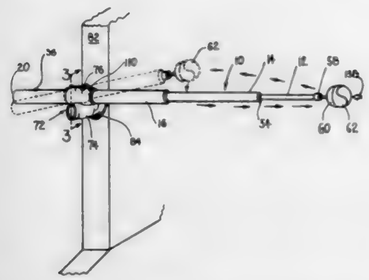
a visual output means for producing a visual output, said visual output means includes an output element for producing the visual output, a power source connected to

said element, and a supporting means connected to said element and power source, said supporting means positioned adjacent a player, said visual output means positionable by the player in relation to said retro-reflective projectile as the projectile moves in flight to provide a



retroreflective beam, whereby said visual output is intense enougn to provide a visible retro-reflective beam from said retro-reflective projectile back to the player's eyes to allow the player to track the movement of said retro-reflective projectile in the darkness for gaming purposes.

4,042,237
TENNIS TRAINER
Cornel Moraru, 19 W. 55 St. PH-1, New York, N.Y. 10019
Filed June 24, 1976, Ser. No. 699,603
Int. Cl.[2] A63B *69/38*
U.S. Cl. 273—29 A **21 Claims**

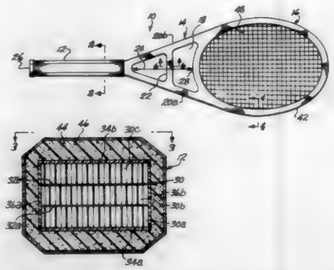


17. A tennis trainer comprising a telescoping shaft assembly having first, second and third shafts, said first shaft telescoping into said second shaft and said second shaft telescoping into said third shaft, a tennis ball mounted on said first shaft, resilient means mounted internally of said third shaft for receiving the force of said first and second shafts when the tennis ball is struck and for returning the first and second shafts towards their fully extended positions, and means for supporting said third shaft.

4,042,238
RACKET
Maurice N. Therisault, Renton, Wash., assignor to Composite Structures Corporation, Kent, Wash.
Filed Jan. 27, 1975, Ser. No. 544,299
Int. Cl.[2] A63B *51/10*
U.S. Cl. 273—73 C **12 Claims**

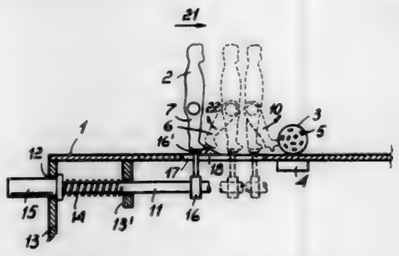
3. A racket with a handle, a throat and an open oval frame having netting stretched therein, the racket comprising: a handle; an oval frame; a throat section connecting the handle and the oval frame formed with a pair of arms extending from the handle to merge into opposite sides of the oval frame, said throat having a depth extending at least a third of the distance from the end of the handle to the closest part of the oval frame; a structural section extending across the throat between the two arms; a core integral to all structural members, said core of a metallic honeycomb material with cell openings in the honeycomb extending toward each face of the racket; a structurally reinforced resin encasing the honeycomb core; and the honeycomb core comprises at least two layers of honeycomb with a layer of structurally reinforced resin therebetween.

9. In an improved racket having an oval head, a handle and a throat between the handle and the oval head wherein the improvement comprises: a recess forming a U-shape to extend



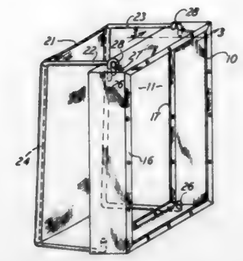
around the exposed part of the outer periphery, a plurality of grommets to extend normal to the outer periphery and through the oval head, said grommets integral to at least one plastic strip seated in the recess, and the plastic strip has an S-shaped area between each grommet of a thin transverse member joined at opposite ends to alternate grommet sections.

4,042,239
GAME PLAYING STRUCTURE PARTICULARLY SOCCER GAME STRUCTURE
Claudio Cecchetti, Via Verdi, 54, Cernusco sul Naviglio (Milan), Italy
Filed July 19, 1976, Ser. No. 706,856
Claims priority, application Italy, July 21, 1975, 25607/75
Int. Cl.[2] A63F *7/10*
U.S. Cl. 273—85 F **19 Claims**



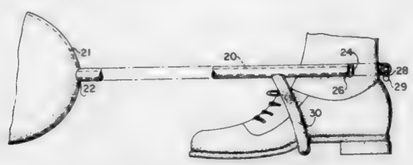
1. A game playing structure, particularly a soccer game, where the ball, or similar, disposed on the surface of a playing field at a given distance from a player figure, is thrown away by the movement of the player, a movement of the person taking part in the game being transferred to the player figure through mechanical means, characterized in that to the figure a throwing portion is connected, particularly in the form of a leg, in a swingable manner against a biasing spring, that the figure is movable across the surface of the playing field through the mechanical means, that an obstacle is arranged on the surface of the playing field in the path of motion of the throwing portion, which obstacle during the figure movement initially holds back the throwing portion and rotates the same against the biasing spring and then releases it as the figure moves further, and that in the figure direction of motion at the throwing portion area during the return stroke after its release caused by the spring action the ball or similar support is located.

4,042,240
ARCHERY TARGET
Gregory John Kinart, 7020 Packer Drive, Wausau, Wis. 54401
Filed Dec. 17, 1975, Ser. No. 641,546
Int. Cl.[2] F41J *3/00*
U.S. Cl. 273—102 B **6 Claims**



1. An archery target comprisinng a supporting member having an opening therein, two arrow-penetrating screens supported on said supporting member in spaced apart parallel planes and spanning said opening and consisting of woven strands of elastic material and having a mesh which permits penetration by an archery arrow and with said screens being adapted and arranged to hold the arrow at the position and angle of penetration of said screens, said strands being woven in a taut cross-strand pattern and with the strands being free of physical attachment to each other and thereby being free to slide on each other and move apart when contacted by the arrow and to elastically return to said pattern when the arrow is removed from said screens, and an archery arrow back stop material supported from said supporting member in a plane parallel to and aligned with said screens and being adapted to intercept the arrow penetrating said screens.

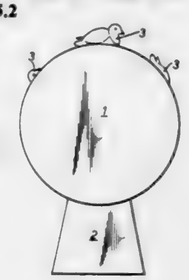
4,042,241
ELASTIC CORD-ATTACHED RETURNING SOCCER BALL
Copp Collins, 1225 Martha Custis Drive, Alexandria, Va. 22302
Continuation of Ser. No. 468,460, May 9, 1974, abandoned. This application July 28, 1975, Ser. No. 599,857
Int. Cl.[2] A63B *69/00, 69/26*
U.S. Cl. 273—95 A **4 Claims**

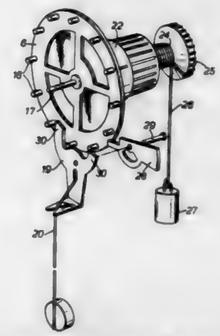


1. An inflated athletic ball resembling a ball used in the playing of soccer, provided with an elastic cord secured at one end thereto and extending therefrom and provided at its other end with at least one loop which receives a member of the human body such as the leg, calf, thigh, waist, neck or head, and whereby the ball, after being propelled, is enabled, upon rebound, to strike a part of the body of the user so as to drive the ball outwardly again to the elastic limit of the cord, said cord including an internal passage forming an airway extending into the ball and a normally closed valve at the opposite end of the cord which is opened while inflating the ball.

4. A practice device for soccer comprising an inflated athletic ball resembling a ball used in the playing of soccer, and an elongate elastic cord, which is secured at one end to said ball and which includes at least one loop at the other end thereof for receiving a portion of the body of a user, for enabling automatic return of the ball to the user after the ball has been propelled away from the user, said at least one loop comprising an adjustable loop having first and second free ends, and first and second annular elements attached to the loop adjacent said first free end of the loop for receiving the second free end of the loop whereby the second free end is inserted through the first and second annular elements, looped around the annular element furthest from the first free end and inserted back through the other annular elements, and means for fixing the second free end in place, a portion of said loop including a series of holes spaced along the length thereof and said fixing means comprising a pin which is adapted to be selectively fit into one of said series of holes.

4,042,242
RESILIENTLY MOUNTED TARGETS ROTATED BY ESCAPEMENT DEVICE
Bryan Frederick Nicholls, and Peter John Marshall, both of Northants, England, assignors to The Mettoy Company Limited, Northampton, England
Filed Oct. 14, 1975, Ser. No. 622,380
Int. Cl.[2] F41J *9/02*
U.S. Cl. 273—105.2 **4 Claims**





1. A toy target comprising a target figure, a support structure supporting said figure for rotation about a horizontal axis remote from said figure, and drive means for rotating said figure about said axis at a controlled speed, said support structure comprising a wire element on which said figure is supported for pivotal movement between an upright position and a knocked down position, and return means for returning said figure automatically to said upright position after it has been moved into said knocked down position, said return means including a spring member comprising a first part rigidly connected to said figure to retain said figure on said wire element and a second part resiliently connected to said first part and arranged to produce a return force on said figure to pivot the figure to said upright position when said figure is knocked down, said drive means further comprising a gravitationally driven escapement mechanism in driving relationship with said figure, said escapement mechanism comprising an escapement

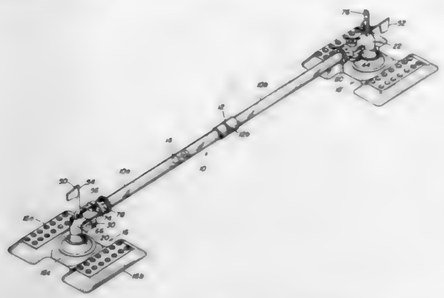
wheel mounted for rotation about said axis and having a plurality of circumferentially spaced projections, and a pawl lever pivotally mounted beneath said wheel for cooperation with said projections and having a pendulum rigidly suspended therefrom, a winding drum being mounted for rotation about said axis, and a flexible cord being wound upon said drum and suspending a driving weight, said drum being axially movable between a first position in which it is keyed for rotation with said wheel, whereby the escapement controls unwinding of said cord from said drum under the influence of said weight, and a second position in which said drum is free to rotate relative to said wheel for winding up said cord onto said drum.

4,042,243

PNEUMATIC SKILL GAME

Per O. Hoel, Plainsboro; Erkki Pekka Korpijaakko, Princeton, and Matthew A. Moustakas, Mercerville, all of N.J., assignors to CBS Inc., New York, N.Y.

Filed June 1, 1976, Ser. No. 691,414
Int. Cl.[2] A63B *71/04*; A63F *9/14*
U.S. Cl. 273—108 **7 Claims**



1. Game apparatus comprising, in combination:
a section of transparent, rigid tubing of uniform diameter throughout its length, and having an air vent therein at about the midpoint of its length,
a projectile of a diameter slightly less than the inner diameter of said tubing disposed within said tubing and movable therealong,
a pair of bellows units connected one to each end of said section of tubing, each of which includes a compressible bladder shaped to be stably supported on a supporting surface, and an elbow connector for carrying air from said bladder to one end of said section of tubing and for supporting said tubing at a level above said supporting surface, whereby air displaced from one end of said bellows units will move said projectile toward the other of said bellows units, which movement will be resisted by air displaced from said other one of said bellows units, each of said elbow connectors having vents therein and a one-way valve for allowing air to enter the bellows unit when the air pressure therein is below atmospheric pressure, and
a pair of indicator means operatively connected one to each of said elbow connectors for indicating entry of said projectile into the respective elbow connector.

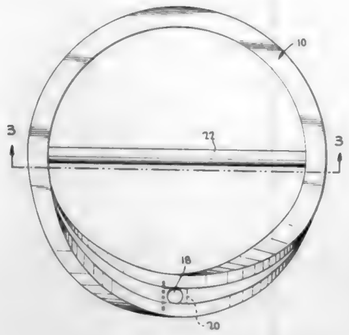
4,042,244

MOBIUS TOY

Thomas S. Kakovitch, 561 S. Hampton, Silver Spring, Md. 20903

Filed Apr. 27, 1976, Ser. No. 680,808
Int. Cl.[2] A63B *71/04*; A63F *7/00*
U.S. Cl. 273—109 **6 Claims**

1. A hand-held toy for challenging the manual dexterity and concentration of the user, said toy comprising:
an elongated band having grooves disposed in both sides thereof defining a raceway for a rolling ball-like playing piece said band being twisted about its longitudinal axis through an odd number of turns and having its ends permanently joined together to define a continuous Mobius ring;
an aperture disposed in said band communicating with the grooves to either side of said band and having a diameter sufficiently large to receive said ball-like playing piece therein;
door means positioned in said aperture to selectively open and close same;



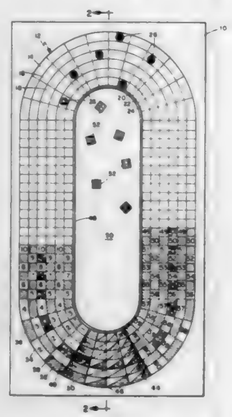
an arcuate arched cover disposed over the groove along a selected distance on one side of said band at the region of said door; and
handle means disposed on the Mobius ring coupled to said band for providing an area to be gripped by the user and from which the toy can be manipulated by hand to selectively allow the ball-like playing piece to roll in said grooves over an angular distance of up to 720° and through said door to opposite sides of said band.

4,042,245

GAME BOARD WITH CODED DICE AND GAME PIECES

Louis Yacoub Zarour, 3848 Boren St., San Diego, Calif. 92115

Filed Oct. 9, 1975, Ser. No. 621,010
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 CH **7 Claims**



1. Game apparatus for use with incrementally movable playing pieces, the game involving the advancement of the playing pieces in a field of play which comprises:
a game board defining a field of play for use with at least two playing pieces,

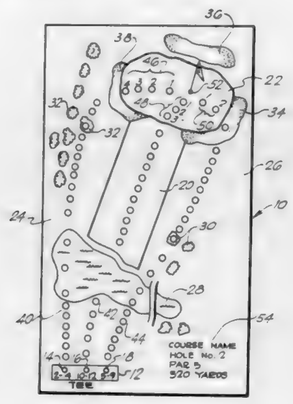
the field of play comprising a track having a plurality of uniquely identified lanes, one for each playing piece, each lane being divided into individual segments, alternating segments of each land being identified by a selected one of identical visual indicia and the other segments being identified by numerals, the numerical difference between successive numerals in a lane being two,
a playing piece being assigned to an individual lane and each playing piece confined to incremental movements from segment to segment within the assigned lane only,
and game control means for determining the number of increments the playing pieces are to progress along the assigned lanes, the playing pieces being moved that number of segments corresponding to each signal of the game control means and play continuing until at least one of the playing pieces traverses its entire lane.

4,042,246

BOARD GOLF GAME

Larry W. Strandgard, 336 Elgin Ave., Forest Park, Ill. 60130

Filed Dec. 1, 1975, Ser. No. 636,755
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 CG **5 Claims**



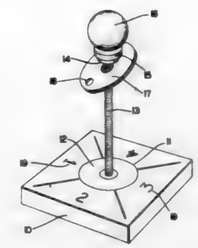
1. A golf game comprising a game board having a simulated golf course hole depicted thereon; the golf course including areas simulating a tee, fairway, green, water hazards, sand traps, trees and roughs; a plurality of paths to said green; each path simulated drive and and approach shots to said green and having a plurality of positions on said green; at least one of said paths being arranged to lead down said fairway and at least one of said paths being arranged to lead into and out of at least one of said water hazards, sand traps, trees and roughs; each of said paths beginning at a starting point at one of a plurality of tee positions on said tee and joining one another at a point of intersection on said green; each of said paths comprising a plurality of pre-marked and pre-determined positions representative of the position of a golf ball during play; chance means for operation by a player for randomly signifying travel of a respective token along one of said paths through randomly selectable indicia on said chance means; each of said tee positions having thereon a different plurality of indicia each of which may be chosen individually by operation of said chance means; a plurality of tokens where each token represents a golf ball for a respective player during a play; each of said tokens adapted to be moved manually to one of said path positions according to the indicia a player obtains on said chance means, said simulated golf course comprising an aerial photograph of a golf course having said tee positions imposed on said photograph in the area of the tee depicted on said photograph, said paths being imposed on said photograph in the area of the fairway, green, roughs, sand traps, trees and water hazards depicted on said photograph.

4,042,247

SPIN TOY

Robert W. Harrington, 1884 Oakridge Drive, Akron, Ohio 44313

Filed Feb. 25, 1976, Ser. No. 661,407
Int. Cl.[2] A63F *5/04*
U.S. Cl. 273—141 A **4 Claims**



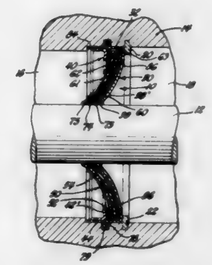
1. A gravity operated spin toy comprising:
a. a base with a horizontal surface,
b. a vertical circular post on the base,
c. the post having a helical groove of such pitch that several turns occur in a vertical distance equal to the diameter of the post,
d. an annular spinner of thin non-magnetic but magnetically attractable material loosely surrounding the post,
e. the diameter of the spinner hole being such that it can engage the post in an inclined position at an angle of about 45°,
f. a non-magnetic ring smaller than the spinner, fixed on the post near its top,
g. a magnet on the post above the fixed ring and projecting beyond the ring sufficiently to attract the spinner in an inclined position, and with a magnetic strength sufficient to hold the spinner with a force permitting easy manual disengagement,
whereby a flick of a finger will separate the spinner from the magnet and start the spinner on a gyratory motion down the post.

4,042,248

HIGH PRESSURE SHAFT SEALS

Victor A. Williamitis, Kettering, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 16, 1976, Ser. No. 723,763
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—138 **4 Claims**



1. In an improved shaft seal for separating the high interior and low exterior pressures of a refrigerant compressor, the combination of a wall assembly comprising a wall having a circular bore, a shaft member passing through said bore so as to be aligned on the axis thereof, an axially stationary bore-engaging outer cup, means sealing said cup in said bore, a retainer ring fixedly telescoped within said outer cup, said outer cup

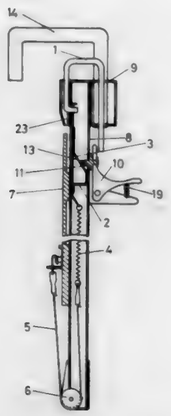
having a radial portion formed in an inward arcuate concave frustoconical section defining an opening which surrounds and closely approaches said shaft, the concavity of said outer cup section adapted to face the high interior pressure of said compressor, a plurality of substantially identical annular resilient plastic washers sandwiched between said outer cup and said retainer ring so that high interior pressure during operation of the compressor is operative to force said washers into layered conformity with the concavity of said outer cup section such that an inner edge of each washer is positioned in line-sealing engagement with said shaft, a resilient disc member on the high interior pressure side of said washers having integral radial spring fingers conforming to the concavity of said outer cup section and pressing said washer toward said outer cup section thereby to substantially maintain said layered conformity of said washers irrespective of said interior pressures when the compressor is not operating, and means including a bank of lubricant-containing capillary channels intermediate said washers whereby lubricant stored in said channels is available for substantially instant lubrication of said shaft upon start-up of said compressor, and whereby lubricant removed by high pressure-induced leakage past the inner edges of said washers may be replaced by lubricant moving from the capillary channels toward the shaft to insure continuous lubrication between said inner edges and said shaft during operation of the compressor.

4,042,249

OPENING SYSTEM FOR FOLDING BABY CARRIAGE

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Sept. 16, 1976, Ser. No. 724,063
Claims priority, application Japan, July 17, 1976, 51-85379
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—38 **2 Claims**



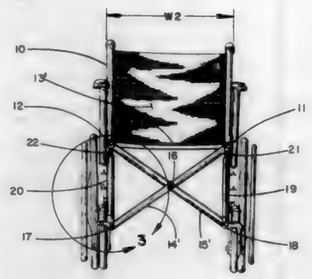
1. A folding baby carriage comprising, in combination:
a backrest having a bottom portion and a back;
front and rear legs pivotally connected to said bottom portion of said backrest;
a support having a bottom, being made of tubing material, and slidably provided at said back of said backrest;
connecting rods, said bottom of said support being connected with said front and rear legs by said connecting rods so that said front and rear legs are opened and folded in accompaniment with sliding of said support;
a stopper integrally provided at said back of said backrest engageable in apertures provided in said support to maintain alternatively an opened and folded state; and
a U-shaped operating rod having a first end and a second end slidably provided at a handle attachment extending to said stopper at said first end and being provided with a slider having an inclined upper portion in contact with a projection of said stopper at said second end, and said slider being connected through a spring with a flexible connecting means extending over a guide wheel provided at said bottom of said support, to said bottom of said backrest.

4,042,250

WIDE SEAT WHEELCHAIR

Keith S. Rodaway, Santa Monica, Calif., assignor to Everest & Jennings, Inc., Los Angeles, Calif.

Filed July 26, 1976, Ser. No. 708,711
Int. Cl.[2] B62B *11/00*
U.S. Cl. 280—42 **2 Claims**



1. A wide seat wheelchair having left and right seat supports and centrally pivoted cross bracing extending between the upper left seat support and lower right side frame of the wheelchair and the upper right seat support and lower left side frame of the wheelchair, respectively, adapted to scissor together upon movement of the seat supports and side frames towards each other to fold the wheelchair, and wherein there are provided left and right vertical front posts normally receiving vertical front post slides secured to said seat supports to accommodate the increased height of the seat supports when the wheelchair is folded, and telescoping means for each of said front posts and front post slides to enable longer cross bracing to be utilized to provide a wider seat and permit folding of the wheelchair without disconnection of said front post slides with said front posts, each telescoping means including, in combination:
a. a vertical intermediate tube having its lower end telescopically received in a front post and its upper end telescopically receiving the associated front post slide;
b. a first cross-pin in the upper interior portion of said front post slide;
c. a second cross-pin in the lower interior portion of said intermediate tube;
d. a third cross-pin in the lower portion of said front post;
e. interconnecting means interior of said front post slide and intermediate tube connected between said first and second cross-pins for limiting the telescoping action of said front post slide and intermediate tube to a distance preventing separation of the same; and
f. lost motion coupling means interior of said front post and intermediate tube between said second cross-pin and said third cross-pin, for limiting the telescoping extent of said intermediate tube and front post to a distance preventing separation of the same.

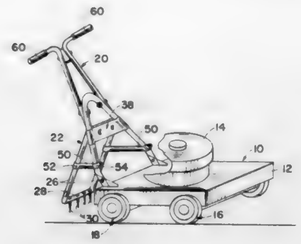
4,042,251

SAFETY DEVICE FOR LAWN MOWERS

Clifford S. Rutan, 24 Lake Road, Morristown, N.J. 07960

Filed July 19, 1976, Ser. No. 706,181
Int. Cl.[2] B62B *1/00*
U.S. Cl. 280—47.33 **5 Claims**

1. A safety device for attachment to a lawn mower comprising in combination:
an elongated frame assembly including at least two laterally spaced leg elements connected across one end of each of said leg elements;
at least one ground anchoring element depending from said frame assembly at the end thereof where said leg elements are connected;
and clamping means extending transversely across the free ends of said leg elements, said clamping means including first and second clamp plates, said first clamp plate being integral with said frame assembly and said second clamp plate being separate from and cooperable with said first clamp plate to clamp the handle of a lawn mower therebetween;
a pair of elongated reinforcement members being provided each of which is rotatably secured at one end thereof to



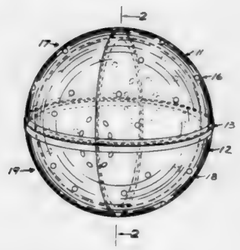
one of said leg elements and adapted at the other end thereof to be fixedly secured to the handle of a lawn mower at a location spaced from the point of securement of said clamp plates and the handle of the mower;
said clamping means being thus adapted to fixedly secure said frame assembly to the handle of the lawn mower in angular relation thereto and at a location such that the ground anchoring elements are out of contact with the ground during normal operation of the lawn mower, the mower being pivotable about its rear wheels to thereby shift said leg elements into a substantially vertical orientation and simultaneously secure the ground anchoring elements into the ground to support the lawn mower in a stable nonrollable position.

4,042,252

INFLATABLE SPHERICAL VEHICULAR DEVICE

Richard D. Winter, 10237 Park Ave., Bellflower, Calif. 90706

Filed Aug. 13, 1975, Ser. No. 604,435
Int. Cl.[2] B60F *3/00*
U.S. Cl. 280—206 **2 Claims**



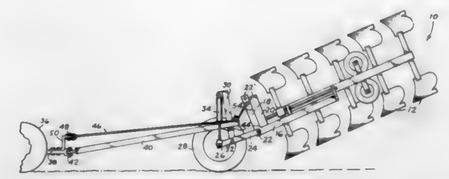
1. A spherical device comprising:
a pair of hemispherical sections and each of said sections comprising:
an outer flexible skin;
an inner flexible skin;
a flat annular member bonded to the periphery of both said outer skin and said inner skin;
said outer skin having a plurality of apertures;
said inner skin having a plurality of apertures, each of which is radially aligned with respective ones of said apertures in said outer skin;
a plurality of flexible tubes, each of which is respectively bonded to one aperture of said outer skin and to the radially aligned aperture of said inner skin;
a zipper means releasably fastening said hemispherical sections together so that a person may have access to the interior.

4,042,253

WEIGHT TRANSFER SYSTEM FOR COUPLING A GANG PLOW TO A TOWING VEHICLE

Glen A. Watts, P.O. Box 462, Jerome, Idaho 83338

Filed Sept. 2, 1976, Ser. No. 719,964
Int. Cl.[2] B62D *53/00*
U.S. Cl. 280—405 B **6 Claims**



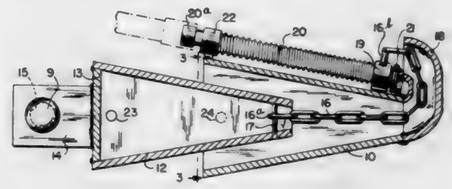
1. In a coupling assembly for interconnecting a ground-working implement and a towing vehicle, wherein the coupling assembly includes a frame, a pair of laterally spaced transport wheels therefor, a pair of lifting levers connected pivotally to the frame and arranged for connection to laterally spaced positions on the implement for raising and lowering the implement, a towing tongue attached at its rearward end to the frame and arranged at its forward end for connection to a towing vehicle, and extensible power means operatively interconnecting each lever and the frame for pivoting the lever, the combination therewith of a weight transfer system comprising an elongated flexible connector having one end arranged for operative connection to a ground-working implement vertically above the connection of the levers to the implement and having its opposite end arranged for connection to a towing vehicle, the connector being proportioned to be tensioned as the levers lift the implement from the ground, whereby the weight of the implement creates a downward force at the point of connection of the connector to the towing vehicle, to counteract the upward force created by the weight of the implement to the point of connection of the tongue to the towing vehicle.

4,042,254

AUTOMOBILE HITCH COUPLER AID

Gordon L. Allen, 12994 Cherry Lane, Chesterland, Ohio 44026

Filed Apr. 29, 1976, Ser. No. 681,578
Int. Cl.[2] B60D *1/14*
U.S. Cl. 280—478 B **2 Claims**



1. An automobile hitch coupler aid comprising a female hollow pyramidal member, means for mounting said member on a vehicle, a male pyramidal member having an outer surface substantially complementary to the inner surface of said female

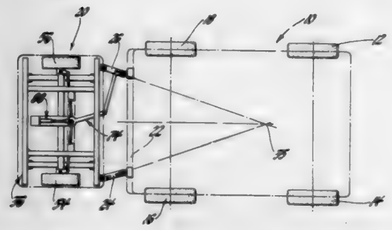
pyramidal member, an elongated flexible member having one end fixed to the narrower end of said male pyramidal member and passing outwardly through the narrower end of said female pyramidal member, and means comprising a nut attached to said other end of said flexible member and a linear screw on which said nut is threaded, said screw mounted on said outer wall of said female pyramidal member for rotation about the axis of said screw carried on the outer wall of said female pyramidal member connected with the other end of said flexible member for winding up and paying out said flexible member, and said attachment between said nut and said flexible member preventing any substantial rotation of said nut, the parts being so proportioned as to permit movement of said pyramidal members between a closely nested position and a separated position permitting movement of said male pyramidal member relative to said female pyramidal member in any direction.

4,042,255

STEERABLE TRAILER FOR A SMALL VEHICLE

David F. Drewek, Sterling Heights, and Dickie D. Hoffman, Utica, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1976, Ser. No. 741,804
Int. Cl.² B62D *13/06*
U.S. Cl. 280—445 **4 Claims**



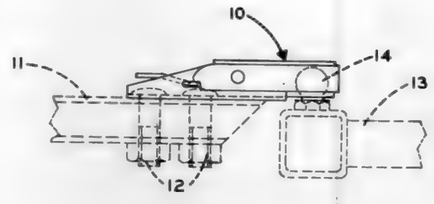
1. A trailer adapted to be closely coupled to the rear end of a vehicle having a transmission provided with a manually operable lever for selectively conditioning said transmission for forward and reverse drives, said trailer comprising a frame, a transverse axle mounted to said frame and having a pair of wheels supported by the opposite ends thereof for steering movement, a mechanism for causing steering movement of said wheels when said vehicle is driven rearwardly in a turn and for maintaining said wheels in a straight-ahead position when the vehicle is driven forwardly, said mechanism including a steering member supported by said frame for pivotal movement about a vertical axis and having an arm extending forwardly for connection with said vehicle so that turning movement of the vehicle causes said steering member to pivot about said vertical axis, a pin carried by said steering member for movement between a first position wherein the center of said pin is coaxially aligned with said vertical axis and a second position wherein the center of said pin is offset from said vertical axis so that pivotal movement of said steering member about the vertical axis causes movement of the pin only when the latter is in the second position, a pair of tie rods interconnecting said pin with said wheels for causing steering movement of the wheels when said pin is in said second position and said steering member is pivoted about said vertical axis, and an actuator carried by the trailer for moving said pin to said second position when the transmission is conditioned for reverse drive.

4,042,256

HITCH ASSEMBLY

David Lepp, 4817 E. Turner, Fresno, Calif. 93727

Filed May 7, 1976, Ser. No. 684,285
Int. Cl.² B60D *1/06*
U.S. Cl. 280—512 **6 Claims**



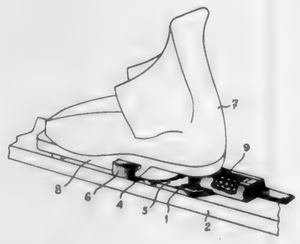
1. A hitch assembly comprising a frame having a path of travel extending therethrough, a shaft mounted on the frame for movement about an axis substantially transverse to the path of travel, a pair of grasping members received on said frame in juxtaposition for movement along the path of travel and having cam ways through which the shaft is extended, a lever borne by the shaft and being movable to cause rotation of the shaft, and cam means affixed on the shaft for engagement with the cam ways of the grasping members to cause movement of the grasping members along said path of travel between extended opened positions and retracted closed positions upon movement of the lever.

4,042,257

SKI BINDING

Georges Pierre Joseph Salomon, Annecy, France, assignor to Etablissements Francois Salomon et Fils, Annecy, France

Continuation-in-part of Ser. No. 607,615, Aug. 25, 1975, Pat. No. 3,988,841, said Ser. No. 611,419. This application May 24, 1976, Ser. No. 689,200
Claims priority, application France, May 22, 1975, 75.15967
Int. Cl.² A63C *9/08*
U.S. Cl. 280—624 **15 Claims**



1. A safety binding for a ski boot comprising:
a baseplate mounted upon a ski,
two arms hinged in relation to said baseplate,
arranged symmetrically in relation to the longitudinal axis of said ski;
each comprising a boot-holding jaw co-operating with lateral edges of said boot,
a resilient element mounted upon said baseplate actuating said hinged arms, causing them to bear against said lateral edges of said boot;
each of the jaws comprising:
at one end a first ramp
substantially parallel with the plane of said ski,
at an angle to the longitudinal axis of said ski,
at the other end a second ramp
located substantially in a vertical plane,

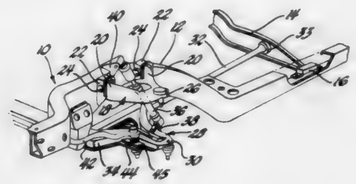
each of said lateral edges of said boot comprising:
a first ramp
at an angle to the plane of support of the sole of the boot upon said baseplate,
a second ramp
substantially perpendicular to the plane of support of the sole of the boot upon said baseplate,
said first ramps of the jaw and the boot co-operating with each other under the action of said resilient element in such a manner as to apply the second ramp of the boot against the second ramp of the jaw.

4,042,258

TORSION BAR MOUNTING ARRANGEMENT

Casimer J. Cislo, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed June 25, 1976, Ser. No. 699,794
Int. Cl.² B60G *11/18*
U.S. Cl. 280—664 **5 Claims**



1. For use with an automotive front suspension system, a torsion bar mounting arrangement comprising a lower control arm having a central trunk portion and a pair of spaced-apart leg members extending from one end of said central trunk portion, an open-ended trough formed in said central trunk portion, a preloaded torsion bar mounted so as to have one end thereof positioned opposite said open-ended trough, and a load-reaction member secured at one end thereof to said one end of said torsion bar substantially normal to the axis thereof and extending therefrom into said open-ended trough so as to be maintained in engagement therewith by said preloaded torsion bar, said open-ended trough being wider than said load-reaction member for permitting some fore-and-aft movement of said trough relative to said load-reaction member in response to load inputs into said suspension system, thereby improving ride characteristics and minimizing bending of said torsion bar.

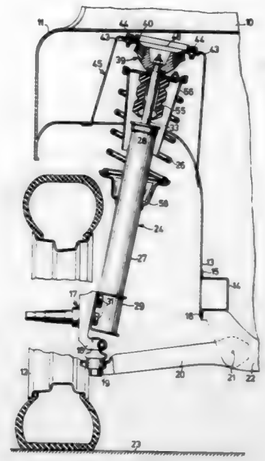
4,042,259

SUSPENSION STRUT ASSEMBLIES FOR MOTOR VEHICLE SUSPENSIONS

Kurt H. Fiedler, Geinsheim, and Adolf Draisbach, Kelsterbach, both of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed July 17, 1975, Ser. No. 596,715
Claims priority, application Germany, July 25, 1974, 2435723
Int. Cl.² B60G *11/50*
U.S. Cl. 280—701 **7 Claims**

1. A suspension assembly for a vehicle having a body with an aperture therein, said assembly comprising: a telescopic damper including a protective tube, a damper tube removably mounted within said protective tube, and a piston rod telescopically received in said damper tube; a wheel mounting means connected to said protective tube; an intermediate member connected to said piston rod, said member being releasably mounted to said body at the periphery of said aperture; a spring surrounding said protective tube; a lower spring seat mounted on said protective tube; and an upper spring thrust plate abutting said intermediate member; the relative size of said aperture and said intermediate member, being such that upon release of said intermediate member, at least said intermediate member, said piston rod and said damper tube can be removed upwardly



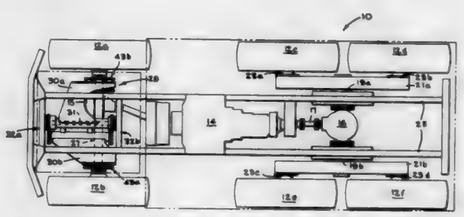
through said aperture without removing said thrust plate, spring, seat and protective tube.

4,042,260

VEHICLE WHEEL SUSPENSION WITH ROLL FREEDOM

Donald W. Youmans, San Clara, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed May 4, 1976, Ser. No. 683,133
Int. Cl.² B60G *11/18*
U.S. Cl. 280—721 **9 Claims**



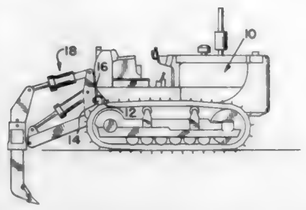
1. A suspension system for use with a motor vehicle having a frame and a plurality of supporting wheels, said suspension system comprising:
a torsion bar extending longitudinally of said vehicle at one end thereof and generally along the centerline thereof;
a pair of control arms with each arm extending transversely of said vehicle from one side of said torsion bar;
means for rigidly connecting the inner end of one of said control arms to one end of said torsion bar;
means for rigidly connecting the inner end of the other of said control arms to the other end of said torsion bar;
mounting means for connecting said torsion bar to said frame of said vehicle so that said frame may rotate about the axis of said bar; and
means for rotationally mounting a corresponding one of a pair of said wheels to the outer end of each of said control arms.

4,042,261

MOUNTING FOR SECURING TOOLS TO VEHICLES

John H. Babbitt, Jr., Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed May 5, 1976, Ser. No. 683,567
Int. Cl.[2] B60R *27/00*
U.S. Cl. 280—762 **12 Claims**



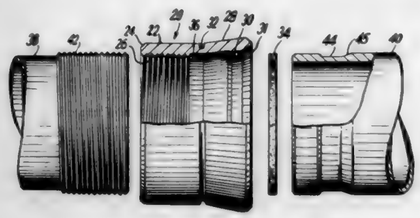
1. In a vehicle construction including at least two, nominally aligned, apertured ears extending from a side of the vehicle for mounting a work-performing device, the combination of:
- a pair of shaft means, one for receipt in each of said apertured ears;
- a base connected to said work-performing device disposable adjacent said ears;
- a pair of wedge means carried by said base and interposed between said base and a side of a respective one of said shaft means; and
- means for effecting movement of said wedge means on said base to tightly frictionally wedge said wedge between said base and said shaft means.

4,042,262

SWIVEL COUPLING MEANS FOR ELECTRICAL CONDUITS AND THE LIKE

Thomas C. Mooney, Mount Sinai, and Padej Gajajiva, Elmhurst, both of N.Y., assignors to I-T-E Imperial Corporation EFCOR Division, East Farmingdale, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,444
Int. Cl.[2] F16L *17/06*
U.S. Cl. 285—98 **8 Claims**



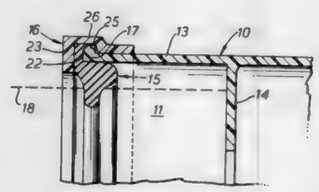
1. An assembly adapted to be joined to a first elongated tubular member having external threads provided on one end thereof, said assembly comprising:
- a. a second elongated tubular member, said second tubular member having an annular groove provided on an outside surface thereof proximate one end thereof;
- b. an elongated hollow tubular sleeve;
- c. axially extending, internal threads provided within one end of said sleeve for engaging the externally threaded end of the first tubular member;
- d. a section integral with said sleeve at an opposite end thereof spaced from said internal threads;
- e. connecting means for engaging said annular groove provided on said section of said second tubular member to permit relative rotational movement between said sleeve and said second tubular member, whereby relative rotational movement is permitted between said first and second tubular members; said connecting means further permitting axial movement of said sleeve relative to said second tubular member along width of said annular groove;
- f. said connecting means including a lip extending radially inward from said section of said sleeve, said lip being disposed in said annular groove of said second tubular member, said lip having an axial width smaller than said width of said annular groove to permit said axial movement, said lip extending completely around an inside surface of said section of said sleeve;
- g. said section of said sleeve including means for permitting said section to be deformed from an initially flared outward condition into engagement with said groove, said section being maintained in a deformed condition absent an application of a further deforming force in an opposite direction so that said lip is prevented from leaving said groove after assembly;
- h. a second annular groove provided on an inside surface of said sleeve proximate an axially inner end of said internal threads, said section of said sleeve extending from proximate an axially inner end of said second groove adjacent to said internal threads;
- i. an annular end portion proximate said first-mentioned groove at said one end of said second tubular member extending radially outward into said second groove to permit said relative rotational movement, said annular end portion having an axial width smaller than width of said second groove to permit said axial movement; and
- j. interface means disposed between said sleeve and said second tubular member for temporarily locking said sleeve and said second tubular member together when a surface of said lip is disposed adjacent to a wall of said annular groove of said second tubular member so that said sleeve does not rotate while said first tubular member is being engaged therewith, whereby after engagement of said sleeve and said first tubular member has been completed, said sleeve is axially moved relative to said second tubular member so that said surface of said lip is spaced from said wall of said annular groove of said second tubular member to thereby permit the relative rotational movement between said first and said second tubular members.

4,042,263

PIPE COUPLINGS

Geoffrey Harrison, Brymar, Manley Road, Ilkley, West Yorkshire, England

Filed June 20, 1975, Ser. No. 588,872
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—110 **5 Claims**



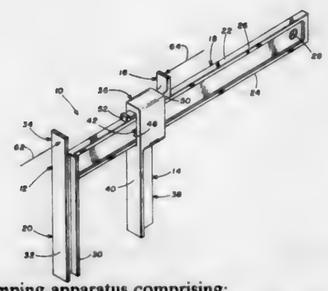
1. A flexible-joint pipe coupling comprising:
- a. a cylindrical coupling sleeve having at least one annular abutment member positioned within said sleeve to define a pipe receiving socket and at least one rib circumferentially positioned and having a bevel at the end of the sleeve;
- b. an annular locking ring having an inner diameter less than the inner diameter of said sleeve and including a planar radial abutment surface axially spaced apart from said rib level, and an axially extending portion having at least one first and second inner surface, said radial abutment surface extending from the inner diameter of said ring to said first surface, said first surface having an inner diameter substantially the same as the outer diameter of said rib and extending from the radial abutment surface to the edge of the rib away from the sleeve end and said second surface having an inner diameter substantially the same as the outer surface of said sleeve and an interface between said first and second surface in locking contact with at least a portion of the edge of the rib away from the sleeve end; and
- c. an annular resilient seal comprising a radial outer portion having a shape substantially the same as and positioned within the annular space defined by said bevel, first inner surface and radial abutment surface; a deflectable radial inner portion which has an outer diameter substantially the same as the inner diameter of the socket and an inner diameter which is less than the inner diameter of the locking ring, said inner portion having along said outer diameter of said deflectable radial inner portion a first axially extending cylindrical sealing surface engaging the inner surface of the socket adjacent the end of the sleeve and a deflectable second sealing surface adapted for engagement with the outer surface of a pipe positioned in the pipe receiving socket; and an intermediate portion having a smaller radial and axial extent than said inner or outer portions and interconnecting said outer and inner portions, said intermediate portion being in substantial axial compression between the radial abutment surface and the end of the sleeve whereby the axial loading from the locking ring is transmitted through the intermediary of the intermediate portion.

4,042,264

CLAMPING APPARATUS

James E. Shumer, 332 W. Broadway, Maumee, Ohio 43537

Continuation of Ser. No. 648,116, abandoned. This application Nov. 29, 1976, Ser. No. 745,859
Int. Cl. B25b *1/02*
U.S. Cl. 269—88 **10 Claims**



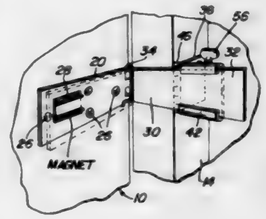
1. Clamping apparatus comprising:
- a molded plastic, generally L-shaped frame member including an elongate bar portion and a jaw portion formed integrally with the bar portion and extending substantially perpendicularly with respect thereto;
- the jaw portion of the frame member being substantially H-shaped in cross section at least adjacent its distal end to provide opposed inwardly facing and outwardly facing jaw surfaces;
- said inwardly and outwardly facing jaw surfaces extending substantially parallel to each other and substantially perpendicularly to the bar portion of the frame member;
- a molded plastic slider member including an aperture portion defining an axis and a jaw portion formed integrally with the aperture portion and depending therefrom substantially perpendicularly to the axis;
- the jaw portion of the slider member being substantially T-shaped in cross section throughout its length to define a jaw surface;
- said jaw surface of the slider member extending substantially parallel to the inwardly and outwardly facing jaw surfaces of the jaw portion of the free member;
- the slider member being normally positioned on the bar portion of the frame member with the jaw surface of the slider member facing the inwardly facing jaw surface of the frame member to apply inwardly directed forces therebetween and the positioning of the slider member on the bar portion of the frame member being reversible so that the jaw surface of the jaw portion of the slider member cooperates with the outwardly facing jaw surface of the jaw portion of the frame member to apply outwardly directed forces therebetween;
- the aperture portion of the jaw member defining an inclined camming surface on an inside surface thereof;
- a molded plastic locking member comprising a camming portion and an actuator portion formed integrally therewith;
- the camming portion of the locking member extending through the aperture of the aperture portion of the slider member and engaging the bar portion of the frame member along substantially the entire length of said bar portion when said slider member is normally positioned or reversibly positioned on the bar portion of the frame member, such that the inwardly and outwardly directed forces between the jaw surface of said frame member and the jaw surface of said slider member are selectively positioned along substantially the entire length of said bar portion;
- the camming portion of the locking member defining an outwardly facing camming surface for cooperation with the inwardly facing camming surface of the aperture portion of the slider member to lock the slider member against movement along the bar portion of the frame member and extending to an outwardly projecting tip for preventing disengagement of the locking member from the aperture of the slider member; and
- the actuator portion of the locking member extending substantially perpendicularly to the camming portion thereof to first advance the slider member along the bar portion of the frame member and then lock the slider member either in engagement with an object situated between the jaw surface of the jaw portion of the slider member and the inwardly facing jaw surface of the frame member, or in separating objects by the outwardly directed forces of the jaw surface of the jaw portion of the slider member cooperating with the outwardly facing surface of the jaw portion of the frame member.

4,042,265

WEDGE-TYPE LIMIT STOP FOR OUTWARD OPENING DOOR

Jimmie A. Chezem, Rte. 9, Box 164A, Sparta, Tenn. 38583

Filed Oct. 27, 1976, Ser. No. 736,195
Int. Cl.[2] E05C *17/06*
U.S. Cl. 292—262 **8 Claims**



1. In combination, a door jamb defining an opening, a door horizontally swingably supported from said jamb for movement between open and closed positions, said jamb and door including corresponding inner and outer sides, an elongated wedge member pivotally supported at its minor dimension end

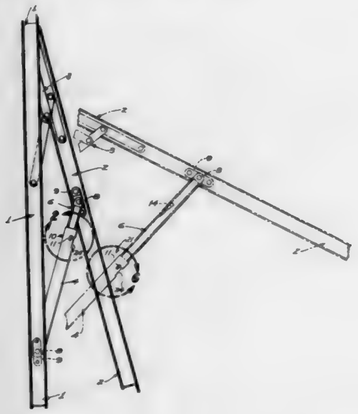
on the free swinging edge of said door for swinging between first and second active and inactive positions with said wedge projecting outwardly of said inner side of said door and swung toward the hinged edge of said door overlying the inner side thereof, respectively, an elongated, tapered and open-sided channel member having its minor dimension end pivotally supported from said jamb for swinging between first and second active and inactive positions with said channel member projecting outwardly of the inner side of said jamb and swung away from said door overlying the inner side of said jamb, respectively, said wedge and channel member paralleling and being registered with each other when said door is in said closed position and said wedge and channel member are in their active positions with said wedge being swingable into said channel member through the open side thereof, said wedge being seatingly engageable in said channel member upon movement of said door toward an open position and longitudinal shifting of said wedge toward the minor dimension end of said channel member.

4,042,266

EXTENSIBLE SAFETY LATCH MEANS FOR PIVOTABLE WINDOWS

Axel W. Anderberg, Los Angeles, and George A. Taylor, LaCrescenta, both of Calif., assignors to A. W. Anderberg Manufacturing Co., Los Angeles, Calif.

Filed July 16, 1976, Ser. No. 705,802
Int. Cl.[2] E05C *17/06*
U.S. Cl. 292—267 **3 Claims**



1. The combination with a window having a fixed window frame, a pivoted window frame, and hinge means joining the frames, of an extensible safety latch means, comprising:

a. a pair of telescopable bar members including confronting portions defining an elongated chamber;

b. means of pivotally attaching the remote ends of the bars members to the fixed and pivotal window frames;

c. a latch assembly including mutually engagable latch elements carried by the bar members for limiting movement of the pivotable window frame to a preselected position, a stop projecteing into the chamber, and a lever pivotally mounted in the chamber and movable between a position engaging the stop, and a position clearing the stop;

d. and a key member engagable with one of the latch elements to separate the latch elements thereby to permit further movement of the pivotal window;

e. one of the members having a key opening providing access to the lever, and dimensioned to receive the key member for effecting disengagement of the lever from the top.

4,042,267

SEALS

Colin W. F. Clinch; Peter A. R. James, both of Woodley, and John H. Tibbett, Stansted, all of England, assignors to ITW Limited, Slough, England

Filed Nov. 24, 1975, Ser. No. 634,963
Claims priority, application United Kingdom, Nov. 29, 1974, 51700/74; Aug. 30, 1975, 35842/75
Int. Cl.[2] B65D *27/30*
U.S. Cl. 292—318 **11 Claims**



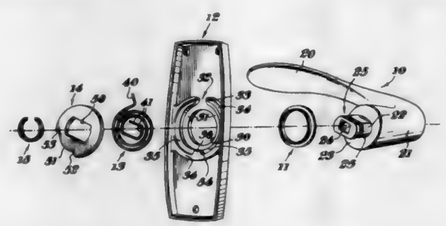
1. A tamper-proof security seal for sealing the open end of garment bags in transit, said seal having two strip-like portions and a plurality of pairs of complimentary male and female latching portions, said latching portions being formed at positions spaced along the lengths of said strip-like portions and extending perpendicularly to said strip-like portions, said latching portions being adapted so that when said strip-like portions are brought together in juxtaposed relation that at least one of said pairs of said latching portions engages to form a non-return restraint, said male latching portions including a stem and an enlarged head with said stem at its end remote from said enlarged head being connected to said strip-like portion by a frangible weakened section, said section having a predetermined strength capable of withstanding the forces necessary to latch the male portion within the female portion but which will break if said latching portions are urged out of engagement, thereby preventing the two strip-like portions of said seal from being separated undamaged without detection.

4,042,268

LATCH OR LOCK SET AND METHOD OF MANUFACTURE THEREOF

George Albert Carl Coglan, Astral Works, Wilden, Stourport-on-Severn, Worcestershire, DY13 9LH, England

Filed Apr. 30, 1975, Ser. No. 573,028
Int. Cl.[2] E05C *19/00*
U.S. Cl. 292—347 **7 Claims**



1. A latch or lock set which comprises, in combination:

a. a back plate and a lever or handle which has an integral barrel projecting laterally from one end thereof, the back plate being apertured to permit the extension therethrough of said barrel;

b. a spring means having one end portion snugly encircling and connected to said barrel and the other end portion engaging a fixed anchorage on said back plate;

c. a right cylindrical recess formed in said barrel from the free end thereof and an insert in said recess, the insert being hollow and of square section and having tongues projecting laterally therefrom into slots formed in the free end of the barrel;

d. a locking washer mounted on said barrel and having lugs which also project into said slots and overlie said tongues, said locking washer additionally having internal tab portions in resilient engagement with said barrel so as substantially to prevent any movement of said locking washer relative to said barrel after the lugs on the washer have been correctly positioned in relation to said tongues;

e. a stop element on the back plate in the plane of said washer; and

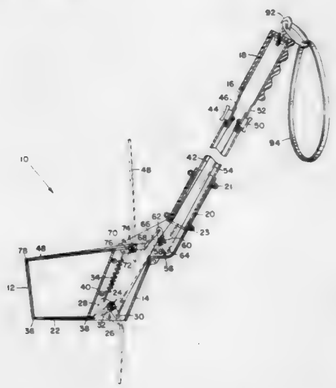
f. said locking washer also incorporating angularly spaced opposed abutments which coact one at a time with said stop element to limit the extent of angular movement of said lever about the axis of rotation of said barrel either against or under the influence of said spring means.

4,042,269

SANITARY DEVICE FOR REMOVING ANIMAL DROPPINGS

Geraldine J. Skermetta, San Antonio, Tex., assignor to Skermetta, Inc., San Antonio, Tex.

Filed June 16, 1976, Ser. No. 696,482
Int. Cl.[2] A01K *29/00*
U.S. Cl. 294—19 R **5 Claims**



1. A sanitary device for removing animal droppings comprising:

base structure;

handle means attached to and extending upwardly from said base structure;

container means attached to and extending generally horizontal from said base structure, said container means having a hinged top and hinged bottom pivotally mounted inside said base structure;

opening means in said handle means operatively connected to said hinged top and hinged bottom, said opening means causing said hinged top to pivot open to receive animal droppings in said container means and said hinged bottom to pivot open to remove animal droppings from said container means, said opening means also being adapted for operation by a single hand for simultaneous opening of said hinged top and said hinged bottom to facilitate cleaning;

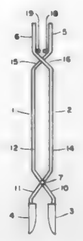
biasing means connected to said hinged top and said hinged bottom to urge said hinged top and said hinged bottom toward a closed position.

4,042,270

POST HOLE DIGGER

Edward E. Weiland, 8768 Buffalo, Union Lake, Mich. 48085

Filed Apr. 15, 1976, Ser. No. 677,250
Int. Cl.[2] A01B *1/16*
U.S. Cl. 294—50.8 **4 Claims**



1. A post hole digger adapted for digging deep holes comprising a pair of arm members each having a spade end, a central segment and a handle end, each of said arm members having spade means connected at said spade end, said spade end and said handle end of each of said arm members being on substantially the same longitudinal axis, each of said central segments being offset from the axis through its respective spade end and handle end, each of said central segments being connected to its respective spade end by a lower angle segment and to its respective handle end by an upper angle segment, said arm members being pivotably connected at a location in said lower angle segments, said pivotable connection being of the scissor type such that said central segments of said arm members are on the opposite side of the central longitudinal axis of said digger from their respective spade ends, said central segments being alligned such that when said handle ends are pivoted to their closest approach the upper ends of said central segments are spaced from each other at least about as far apart as their lower ends, said upper angle members crossing each other such that said spade end and said handle end of each of said arm members are on the same side of said central longitudinal axis.

4,042,271

DEVICE FOR AUTOMATICALLY GRASPING PIECES OF FABRIC

Costantino Vinciguerra, Florence, Italy, assignor to Nuovo Pignone, S.p.A., Florence, Italy

Filed Mar. 19, 1976, Ser. No. 668,806
Claims priority, application Italy, Mar. 20, 1975, 21454/75
Int. Cl.[2] B65H *3/22*
U.S. Cl. 294—61 **5 Claims**

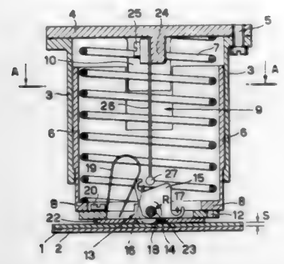
1. A device for automatically grasping pieces of fabric comprising:

a movable body including a head with a slit therein,

an oscillating member having substantially the shape of a triangle with at least one point mounted near the lower vertex of said oscillating member, side grooves at the ends of the upper base side of said member, said member being pivotally mounted on said lower vertex to said head in the middle zone of said slit,

a resilient element shaped substantially in the form of an inverted U supported by said head of said movable body, which constantly bears on said oscillating member,

said point depending from said oscillating member and extending through said slit when said member is oscillated in



a predetermined manner for automatically grasping a piece of fabric.

4,042,272
HYDRAULIC GRAB
Heinrich Götzen, Bolberg 79, D 5802 Wetter 1, Germany
Filed June 13, 1975, Ser. No. 586,659
Claims priority, application Germany, June 14, 1974, 2428566
Int. Cl.[2] B66C *13/14*
U.S. Cl. 294—88 **12 Claims**



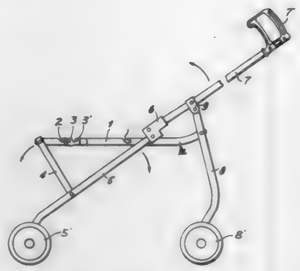
1. An hydraulic octopus grab comprising a rotary head, means fixed to the top of said rotary head for suspending said grab, a vertical shaft rotatably mounted within said rotary head, pressure chambers formed within said rotary head and adapted to be supplied with hydraulic pressure through connectors in a housing wall of said rotary head, each chamber being at least partly defined by relatively movable parts fixed to said housing wall and said shaft respectively whereby said shaft may be rotated in said housing in one direction or the other by application of hydraulic pressure to appropriate ones of said chambers, a distributor head carried at the lower end of said shaft and rotatable therewith, grab blades and corresponding hydraulic operating cylinders pivotally mounted on said distributor head, and said distributor head incorporating ducts for supplying hydraulic fluid to said cylinders and leading to external connectors for connecting said ducts with hydraulic fluid flow and return lines.

4,042,273
RAIL WHEEL
Wilhelm Heller, Rheinhausen, and Walter Knorr, Bochum, both of Germany, assignors to Fried. Krupp Huttenwerke AG, Bochum, Germany
Filed May 20, 1975, Ser. No. 579,188
Int. Cl.[2] B60B *17/00*
U.S. Cl. 295—30 **15 Claims**

1. A rail wheel comprising a wheel rim, wheel disc, and wheel hub wherein at least the wheel rim consists essentially of a steel whose composition consists essentially of:

0.07 to 0.12 weight percent carbon
0.20 to 0.50 weight percent silicon
4.0 to 5.0 weight percent manganese
0.04 to 0.12 weight percent niobium
0.007 to 0.012 weight percent nitrogen
0.005 to 0.025 weight percent metallic aluminum,
the balance being iron with the usual impurities.

4,042,274
COLLAPSIBLE FRAME FOR CARRIAGES
Ramon Jane Cabagnero, 49-53 Nena Casas, Barcelona, Spain
Filed Jan. 26, 1976, Ser. No. 652,148
Claims priority, application Spain, June 3, 1975, 213229
Int. Cl.[2] B62D *23/00*; B62B *7/00*
U.S. Cl. 296—1 B **3 Claims**



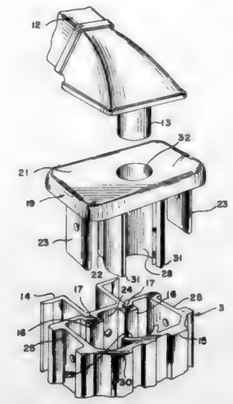
1. An improved collapsible frame for carriages with said frame having an open condition and a folded condition and comprising a front leg member having a first end and a second end, a tie bar having a first end pivotally connected to said front leg member intermediate the ends thereof and a second end, a side member for supporting a basket-bassinet or the like and having a first end pivotally connected to said second end of said tie bar and a second end, a rear leg member having a first end and a second end, said second end of said side member being pivotally connected to said rear leg member intermediate the ends thereof, and a handlebar having a first end and a second end with the second end being pivotally connected to said second end of said front leg member, said second end of said rear leg member also being pivotally connected to said handlebar at a position intermediate said ends of said handlebar.

4,042,275
STAKE POST AND CAP ARRANGEMENT FOR TRAILER
John J. Glassmeyer, Covington, Ky., and Howard W. Hughes, Cincinnati, Ohio, assignors to Pullman Incorporated, Chicago, Ill.
Filed Apr. 21, 1975, Ser. No. 570,156
Int. Cl.[2] B60P *7/06*
U.S. Cl. 296—43 **6 Claims**

4. For a highway vehicle having a removable cargo container including tarpaulin roof supporting bows;

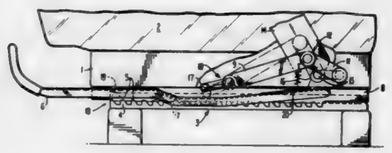
a vertically extending hollow stake including longitudinally spaced transverse wall portions, inboard and outboard longitudinal wall portions extending between said transverse wall portions and a vertically extending stake bow socket portion formed on the interior of the outboard longitudinal wall intermediate said transverse wall portions, and

a replaceable stake protector cap adapted to overlie the stake and including a cap bow socket portion depending from the protector cap into the stake between said stake bow socket portion and said inboard longitudinal wall portion for vertical sliding coupling with said stake bow socket portion to define a vertically extending bow socket for receiving and supportably coupling a tarpaulin bow portion extendable through the protector cap, said stake bow socket portion having outer edge portions, and said cap bow socket portion having outer edge portions interlocking in anti-rotational fashion with the outer edge portions of the stake bow socket portion consequent upon vertical



sliding coupling of the cap bow socket portion with respect to the stake bow socket portion preventing destructive rotational oscillation between the bow, protector cap and the stake.

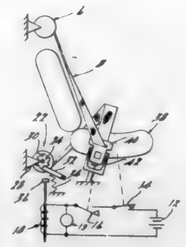
4,042,276
SEAT, ESPECIALLY CO-DRIVER SEAT IN A MOTOR VEHICLE
Werner Breitschwerdt, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany
Filed Aug. 17, 1972, Ser. No. 281,281
Claims priority, application Germany, Aug. 17, 1971, 2141147
Int. Cl.[2] B60R *21/10*
U.S. Cl. 297—216 **17 Claims**



1. A seat for a vehicle equipped with safety belts operatively associated with the seat, characterized in that adjusting means are provided for permitting selective adjustment of the seat in the vehicle, means are connected to the seat-adjusting means and at least one of the safety belts for automatically initiating a predetermined displacement movement of the seat by a predetermined amount upon exceeding a predetermined load effective on the seat in the displacement direction if the seat is occupied by a person whose safety belt is not fastened.

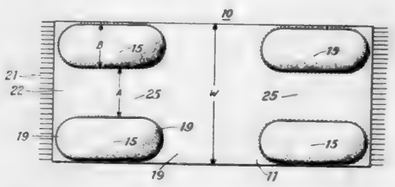
4,042,277
SEAT BELT SYSTEM
Robert C. Fisher, 4210 N. Dixie, West Palm Beach, Fla. 33407
Continuation of Ser. No. 605,667, Aug. 18, 1975, abandoned. This application Nov. 29, 1976, Ser. No. 745,663
Int. Cl.[2] A47B *35/00*
U.S. Cl. 297—388 **1 Claim**

1. A seat belt system for a vehicle comprising: a seat belt having a tongue thereon, a seat belt buckle, a seat belt retractor having a spool with a ratchet thereon and adapted to have one end of said seat belt wound thereupon, first resilient means normally biasing the spool of said retractor and said seat belt toward the retracted condition, a pawl engageable with the ratchet on said spool to effect locking thereof against protraction of said belt, second resilient means normally biasing said pawl toward engagement with the ratchet on said spool, an electromagnet, an electromagnet control circuit, means responsive to substantially full retraction of said belt for biasing said pawl out of engagement with the ratchet on said spool and into mechanical engagement with the said electromagnet while said electromagnet is in the deenergized condition, said electromagnet being energizable upon closure of a normally open switch connected in electrical series relation in said control circuit with said electromagnet for holding said pawl out of



engagement with the ratchet on said spool, closure of said normally open switch being independent of the condition of said retractor, and a normally closed switch in said control circuit connected in electrical series relation with said normally open switch and electromagnet and movable to the open condition upon insertion of said belt tongue into said buckle whereby said electromagnet is deenergized permitting said pawl to move to the locked condition with respect to the ratchet on said spool retractor under the bias of said second resilient means.

4,042,278
DROWSING CHAIR PILLOW
Frank L. Jensen, Woods Cross, Utah, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Apr. 12, 1976, Ser. No. 676,311
Int. Cl.[2] A47C *1/10*
U.S. Cl. 297—397 **1 Claim**



1. A pillow unit that may be draped over a chair back to serve as a headrest, comprising

a flexible sheet fitted with a pair of padded bolster sections that project beyond a first side of aid sheet, with the opposed second side of said sheet being a generally flat surface with the sheet in a draped mode, in which

the bolster sections are spaced apart by a distance that permits each bolster to contact the head of a user resting against both bolsters.

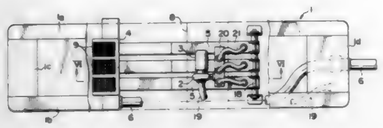
said sheet fitted with two pairs of said spaced bolster sections mounted on the said first side of the sheet so that each pair of bolster sections balance the other when the mid-section of the sheet is draped over the back of a chair, with each pair of bolster sections mounted at opposed end sections of the sheet, so that either pair of said bolster sections are alternately useable as head rests, dependent upon the orientation of the sheet when draped over the back of a chair.

4,042,279

APPARATUS FOR RECOVERING MINERALS, IN PARTICULAR MANGANESE NODULES, FROM THE BOTTOM OF THE WATER

Yoshio Asakawa, Koganei, Japan, assignor to Sumitomo Metal Mining Company Limited, Tokyo, Japan

Filed Sept. 14, 1976, Ser. No. 723,180
Claims priority, application Japan, Oct. 2, 1975, 50-119224
Int. Cl.² E02F *3/94*
U.S. Cl. 299—8 **14 Claims**



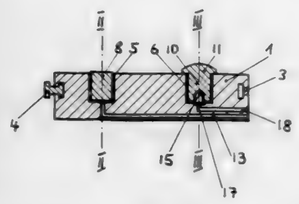
1. An apparatus for recovering minerals from the bottom of the water comprising a frame which is almost rectangular and has slide bodies on the bottom surface thereof, and at least one mineral floating means which is universally rotatably supported on the frame at an end thereof and is inserted the other end into a side opening of a collection chamber fixed to the frame, and said mineral floating means having the bottom surface projected from the bottom surface of the frame and being integrally constructed with a cylindrical surface member accommodated therewithin, a nozzle provided in adjacent with the outside of the cylindrical surface member for jetting the water along the bottom surface of said mineral floating means and a duct opened to both ends of the downstream of the water jetted from the nozzle and of the collection chamber, respectively, and provided at an angle, said collection chamber being connected to a suction pipe.

4,042,280

METHOD OF BREAKING UP OBJECTS

Louis K. Garbini, Abtwil, Switzerland, assignor to Kubatec Kunststoff- & Bautechnik AG, Eschen, Switzerland

Filed Nov. 12, 1974, Ser. No. 523,135
Claims priority, application Switzerland, Nov. 13, 1973, 15920/73
Int. Cl.² E21C *45/00*
U.S. Cl. 299—13 **15 Claims**



1. An installation for breaking up an object, comprising a carrier, a hydraulically operated thrust piston mounted in the carrier, and an explosive-operated thrust piston mounted in the carrier.

4,042,281

SERVICE AND EMERGENCY TRAILER VALVE

John M. Ury, Hazelwood, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Apr. 15, 1976, Ser. No. 677,405
Int. Cl.² B60T *15/48*
U.S. Cl. 303—29 **4 Claims**

1. A valve comprising:

a. a housing having first and second chambers formed therein;

b. a first inlet port in the valve;

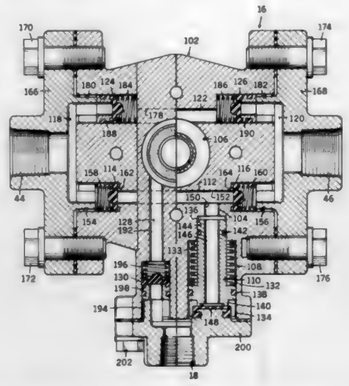
c. a second port in the valve;

d. a third port in the valve;

e. first passageway means in the valve for interconnecting the first, second and third ports with the first chamber;

f. a plurality of one-way check valve means in the first passageway for permitting fluid under pressure to pass from the first port to the second and third ports, from the first port to the first chamber and from the second and third ports to the first chamber;

g. second passageway means in the valve for interconnecting the first port and the first chamber bypassing the first passageway;



h. one-way check valve means in the second passageway for permitting fluid under pressure to pass from the first port to the first chamber;

i. pressure responsive valve means in the second chamber for sealingly separating a first portion of the second chamber from a second portion thereof;

j. a fourth port for inlet in the valve;

k. a fifth port for inlet in the valve;

l. third passageway means in the valve for interconnecting the fourth and fifth ports with the first portion of the second chamber; and

m. pressure responsive means in the third passageway for selectively admitting relatively higher fluid pressure from either of the fourth or fifth ports into the first portion of the second chamber

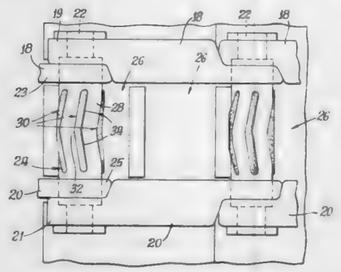
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4,042,282

TRACK BUSHING PROVIDING EXTERNAL DEPOSITS OF WEAR RESISTANT MATERIAL

Glenn M. Haslett, Peoria, and Dennis L. Blunier, Danvers, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 24, 1975, Ser. No. 644,370
Int. Cl.² B60S *1/68*; B62D *55/20*
U.S. Cl. 305—11 **6 Claims**



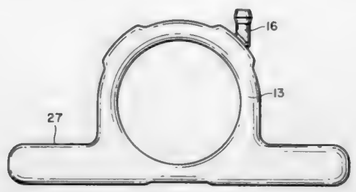
1. For use with a sprocket of a track-type vehicle, a track pin bushing seatable in a recess defined by the sprocket, said track pin bushing defining a track pin bushing outer surface, and a protrusion extending outwardly from said outer surface, the protrusion acting to force foreign material from the recess of the sprocket as the bushing seats in the recess, wherein the protrusion defined by the track pin bushing is an elongated protrusion angled relative to the longitudinal axis of the track pin bushing.

4,042,283

PILLOW BLOCK

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and George E. Goodrich, San Carlos, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed Mar. 5, 1976, Ser. No. 664,163
Int. Cl.² F16C *35/12*
U.S. Cl. 308—15 **10 Claims**



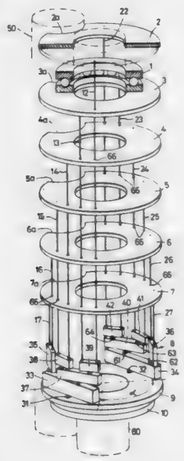
1. A pillow block including a bearing receiving flange extending outwardly from one face of a plate and adapted to receive and hold a bearing, the outer edges of said plate being bent to extend in the same direction as said flange, one portion of said bent outer edges forming a mounting surface generally parallel to the axis of the flange to provide a mounting base and other portions extending adjacent to said flange with spaced portions of said adjacent extending portions bent inwardly toward said flange to engage and support the flange.

4,042,284

THRUST BEARING ASSEMBLY

Norbert Coster, Luxembourg, Luxembourg, assignor to SOFISA (Societe Financiere S.A.), Luxembourg

Filed Apr. 16, 1976, Ser. No. 677,821
Claims priority, application Switzerland, Apr. 22, 1975, 5099/75; Mar. 26, 1976, 3817/76
Int. Cl.² F16C *27/08*
U.S. Cl. 308—219 **18 Claims**



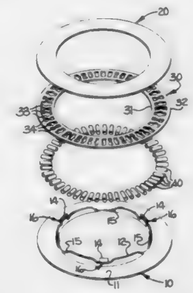
1. A thrust bearing assembly intended to support a rotating shaft, especially in a multiscrew extruder, comprising a support, two rows of coaxial bearing elements cooperating in pairs and thereby forming a line of bearings in tandem, said elements of one said row being rotating and integral with a first member consisting of said shaft, and said elements of the other said row being stationary and integral with a second member consisting of said support, and means acted upon by axial thrust exerted by said shaft for axially adjusting said elements of one of said rows to distribute said thrust equally on said bearings, wherein said adjusting means comprise a plurality of tilt means disposed between said row of adjustable elements and said member with which said elements are integral, each said tilt means being directly or indirectly biased by at least two said adjustable bearing elements respectively acting upon it one on each side of its tilting axis.

4,042,285

THRUST BEARING

Hans H. Dorsch, Cheraw, S.C., assignor to INA Bearing Company, Inc., Cheraw, S.C.

Filed Apr. 12, 1976, Ser. No. 676,242
Int. Cl.² F16C *33/38*
U.S. Cl. 308—235 **19 Claims**



1. A thrust bearing assembly comprising an annular cage, a plurality of rolling elements positioned in said cage, first and second bearing races positioned on opposite sides of said cage and having opposing surface portions defining respective annular raceways cooperating with said rolling elements, and latching means formed integrally with said first bearing race on the inner circumferential periphery thereof and extending therefrom and engagingly retaining said second bearing race to thereby maintain the components of the thrust bearing assembly in assembled relation.

4,042,286

APPARATUS FOR PROTECTION AND STORAGE OF PHOTOTYPESETTING EQUIPMENT

Richard S. Olson, deceased, late of Canby, Minn., and John E. Qualley, executor, P.O. Box 146, Canby, Minn. 56220

Filed Oct. 20, 1975, Ser. No. 623,598
Int. Cl.² A47F *3/06*
U.S. Cl. 312—129 **6 Claims**

1. An apparatus for the protection and storage of phototypesetting equipment including fonts and the protective sheaths in which fonts are carried comprising:

an enclosure having an access opening and an interior storage chamber fronting on said opening and extending rearwardly therefrom;

a generally upright panel having obverse and reverse sides and positioned within said chamber;

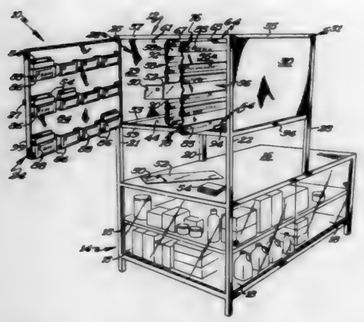
means movably mounting said panel to said enclosure for movement of said panel between a retracted position wherein said panel is wholly within said enclosure and an extended position wherein said panel protrudes from said enclosure through said access opening, said movable

mounting means retaining said panel in a generally upright plane during movement between extended and retracted positions;

font retaining means fixed to said panel and in cooperation with said panel defining a plurality of distinct, narrow, elongated, sheath receiving compartments closely adjacent said panel and extending in a front-to-rearward direction in said chamber, each compartment being constructed and arranged to receive and closely confine a single sheath and font in a generally upright plane substantially parallel to said panel and between said retaining means and said panel and to substantially inhibit lateral movement and bending of the sheath and the font;

said font retaining means including a plurality of elongated strips positioned in pairs on said panel and extending from front to rear on said panel, each said strip having a mounting flange fixed to said panel and a font retaining web connected to said mounting flange and spaced laterally outwardly from said panel, a first strip of each pair of strips having its font retaining web extending downwardly and the second strip of each pair of strips being positioned below said first strip and having its font retaining web extending upwardly toward and confronting said font retaining web of said first strip so said font retaining webs of said first and second strips of each pair of strips cooperate to retain a font and protective sheath therebetween; and

a door movably mounted to said enclosure for movement between an open position wherein said door is clear of said access opening and a closed position wherein said door fully obstructs said access opening to prevent dust from entering said chamber.



4,042,287

SERVICE UNIT, PARTICULARLY FOR A DOCTOR'S OR A DENTIST'S OFFICE

Jan-Ake Hallen, Brinketorpsvagen 3, Partille, Sweden (43300)

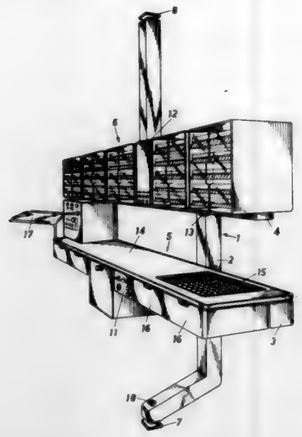
Filed Mar. 21, 1975, Ser. No. 560,648

Claims priority, application Sweden, Mar. 25, 1974, 7403958

Int. Cl.[2] A47B *53/00, 49/00*

U.S. Cl. 312—209 **4 Claims**

1. A dental service unit comprising in combination a U-shaped pillar stand, a workbench and at least one upper cupboard arranged above said workbench, each of said workbench and said one cupboard being fixedly-mounted on intermediate portions of said U-shaped pillar stand, the pillar stand including a vertical rotation axis located at outer ends of vertically spaced legs of said pillar stand, said vertical rotation axis extending generally through forward portions of said workbench and cupboard, said pillar stand including an intermediate portion substantially parallel to said vertically spaced legs and connected thereto by vertically spaced, lateral support portions, said work table projecting forwardly from said last-mentioned intermediate portion and said cupboard being mounted on the upper-most lateral portion, said vertically spaced legs of said pillar stand including support elements for respectively engaging vertically spaced support surfaces for maintaining said pillar stand in a relatively fixed position with respect to the vertically spaced support surfaces, said pillar stand being tubular and said vertically spaced lateral portions comprising hollow sections, inside which sections and pillar stand are arranged distrubution service ducts for water, drainage, and supply lines for air, electricity, telephone service, and the like.



4,042,288

EXTRUDED PLASTIC PANEL DRAWERS

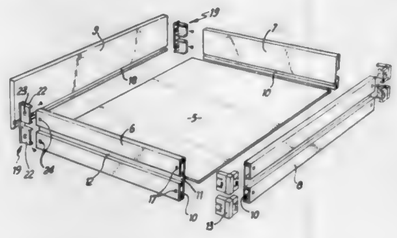
Leon G. Litchfield, Youlgreave, England, assignor to L. B. (Plastics) Limited, England

Division of Ser. No. 364,710, May 29, 1973, Pat. No. 3,901,572. This application May 19, 1975, Ser. No. 578,382

Claims priority, application United Kingdom, Dec. 8, 1972, 56752/72

Int. Cl.[2] A47B *88/00*

U.S. Cl. 312—330 R **3 Claims**



1. A drawer construction in which at least the sides and back are formed from extruded plastics panels of identical section, the section of each panel being uniform throughout its length, each panel comprising a vertical sheet, said vertical sheets forming the inner walls of the drawer, intersecting at the corners of the drawer, and having a groove to receive a drawer bottom, each vertical sheet having a pair of hollow sections of rectangular cross-section formed on its outer side and defining a channel therebetween, which are identical except for the groove in the inner face of the lower section, the back of which channel is defined by the portion of the outer surface of said sheet disposed between said box-like sections and the panels being interconnected at each corner by identical upper and lower corner pieces engaged in the open ends of the respective upper and lower box-like sections, means to retain the corner pieces securely in engagement with said open ends, and a front panel connected to the drawer sides by connecting members secured to the front panel and adapted to engage within the side panels.

4,042,289

PLUG CONTACT DEVICE INTENDED FOR MOUNTING ON CIRCUIT CARDS

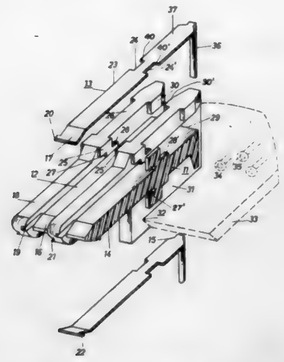
Stig Teodor Heinonen, Järfälla, and Gustav Gunnar Johansson, Huddinge, both of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

Filed Mar. 31, 1976, Ser. No. 672,448

Claims priority, application Sweden, Apr. 25, 1975, 7504816

Int. Cl.[2] H05K *1/10*

U.S. Cl. 339—17 LC **6 Claims**



1. A plug contact device comprising: a body of insulating material, said body being provided with a plurality of elongated parallel grooves and ridges between the grooves, a pair of projections transversely extending from said ridges and straddling and protruding into each groove at an intermediate point along the groove, said projections having a given length along the axial direction of the groove, and a given thickness in the transverse direction, the edge at one end of each projection being provided with a slot extending along the projection in the axial direction of the groove and from the base of the groove a given height upward from said base, the edge at the other end of each projection having a lock shoulder extending from said ridges and protruding into each groove for a distance substantially equal to said given thickness, the distance along the axial direction of the groove from the base of the slot to the end of the lock shoulder being substantially equal to said given length; and a plurality of contact springs of conductive material each of said contact springs being positioned in one of said parallel grooves, each of said contact springs having a thickness less than the height of the slot in said projection, each of said contact springs being provided with a pair of axially extending notches for mating engagement by said projections, the depth of said notches being substantially equal to the thickness of the projections and the length of said notches being substantially equal to said given length along the axial direction of the grooves, whereby said contact springs are lockingly held against axial movement by one edge of the contact spring at a notch resting against the base of the slot in a projection and an opposite edge of the contact spring at the same notch abutting the locking shoulder of the same projection.

4,042,290

LIGHTING DEVICE

Georg Czitrom, Vaxjo, Sweden, assignor to Aneta Belysning AB, Vaxjo, Sweden

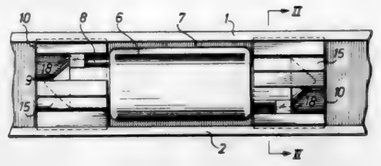
Filed Mar. 24, 1976, Ser. No. 669,969

Claims priority, application Sweden, Apr. 14, 1975, 7504278

Int. Cl.[2] H01R *33/04*

U.S. Cl. 339—52 R **5 Claims**

1. Lighting device comprising an elongated support having a generally U-shaped cross-section, said support including electrically conductive surfaces extending respectively along the inside of the legs of said support, a pair of lamp holders made from an electrically insulating material displaceably arranged with respect to each other in said support, co-engaging releaseable means on said support and lamp holders for retaining said lamp holders in said support, an incandescent lamp of the type comprising a tubular section and an electrically conductive cap at each end thereof having a cylindrical section, each said cylindrical section being received in a corresponding one of said pair of lamp holders, and a contact spring on each said lamp holder connecting one cylindrical section of an end cap on said lamp with a corresponding one of said conductive surfaces extending along the inside of said support.



4,042,291

PIPE CONNECTING APPARATUS

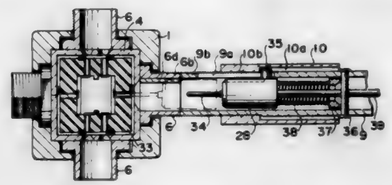
Hideo Moriyama, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 3, 1975, Ser. No. 538,263

Claims priority, application Japan, Feb. 2, 1974, 49-13917; Mar. 6, 1974, 49-25148; Mar. 14, 1974, 49-28502; Apr. 10, 1974, 49-39889

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—89 M **12 Claims**



1. An electrical pipe connecting apparatus of a multiple structure adapted to contain electrical wiring for illumination facilities therein, comprising:

a. a hollow outer frame member of a polyhedral structure including at least two mating elements and serving as a branch base of the multiple piping, each face of the polyhedral structure having an opening defined therein;

b. a plurality of projecting pipes, having flanges formed thereon, extending from the interior of the outer frame and through said openings to the exterior of said outer frame;

c. an insulative core member, including electrical contacts fixedly mounted thereon, having a polyhedral configuration corresponding to that of said outer frame member and disposed within said outer frame member so as to simultaneously maintain said projecting pipes within said outer frame member by said flanges which are interposed between said core member and the interior walls of said outer frame member;

d. communication pipes, coupled with said projecting pipes, within which electrical conductors are provided so as to be connected to said electrical contacts of said core member; and

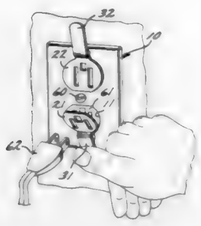
e. sleeves for coupling and fixing said projecting pipes to said communication pipes.

4,042,292

WALL PLATE STRUCTURE

Frank T. Chensky, 20013 Thornlake, Cerritos, Calif. 90701

Filed Aug. 11, 1975, Ser. No. 603,716
Int. Cl.² H01R *13/62*
U.S. Cl. 339—45 R 1 Claim



1. In combination with a wall mounted receptacle that includes first and second spaced, prong receiving outlets, each of said outlets capable of removably receiving a pair of electrical conducting prongs that project from an insulated plug mounted on a free end of an electrical conducting cord, a wall plate assembly, said assembly including:

a. a cover plate molded from a polymerized resin, said cover plate at least as great in transverse cross-section as that of said receptacle and adapted to conceal the latter when said cover plate overlies said receptacle, said cover plate having first and second openings that are aligned with said first and second outlets, said cover plate including first and second pairs of spaced tabs extending outwardly from said plate adjacent said first and second openings, said cover plate having a slot formed between each of said pair of tabs;

b. first and second release plates that in first positions overlie said openings and are conformed in plan form to the dimensions of said openings, said first and second plates each having a pair of spaced openings therein through which said pair of prongs of one of said plugs may extend to removably engage one of said prong receiving outlets; first and second handles that extend outwardly in opposite directions from said first and second plates; and first and second cylindrical fulcrums that extend outwardly from said first and second plates adjacent said first and second handles, said first and second cylindrical fulcrums pivotally and removably engaging said first and second pairs of tabs, said fulcrums being conformed for receipt between said tabs, said tabs having parallel surfaces extending vertically from said cover plate, each of said surfaces terminating at a free edge thereof in a turned extension, the respective extensions being directed toward each other to form a gap less than the sectional dimension of a respective fulcrum for insert of said fulcrums between said tabs and adjacent a respective slot; and,

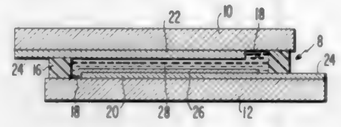
c. first means for removably securing said cover plate to said receptacle for said cover plate and first and second release plates to conceal said receptacle and first and second outlets when said first and second cover plates are in said first position, with said first and second plates when manually moved from said first position to a second position displacing the one of said plugs most adjacent thereto from engagement with one of said outlets, and said release plates being removable from said cover plate without removing the latter from said receptacle.

4,042,293

LIQUID CRYSTAL DEVICES HAVING DIODE CHARACTERISTICS

Joseph John Hanak, Princeton; Ronald Norman Friel, Hamilton Square, and Lawrence Alan Goodman, East Windsor, all of N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 430,595. This application July 14, 1975, Ser. No. 595,836
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC 3 Claims



1. The method of operating a liquid crystal device of the type comprising a pair of spaced apart electrodes, a liquid crystal between said electrodes, and a semiconductor material disposed between and in contact with one of said electrodes and said liquid crystal material, the contact between said semiconductor material and said one of said electrodes being ohmic and the contact between said semiconductor material and said liquid crystal material being non-ohmic, The resistance associated with said semiconductor material being greater or less than that of said liquid crystal material depending upon the polarity of voltage applied between said electrodes,

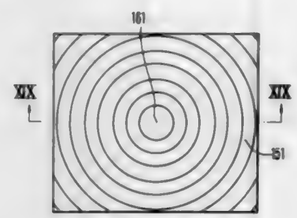
said method comprising selectively activating and deactivating said liquid crystal material by selectively applying one or the opposite polarity voltages between said electrodes.

4,042,294

ILLUMINATED ELECTRO-OPTICAL DISPLAY APPARATUS

Lawrence A. Billings, Jr., Richardson; Daniel E. Evanicky, V. Joseph Hull, and Charles V. Ristagno, Dallas, all of Tex., assignors to Micro-Display Systems, Inc., Dallas, Tex.

Filed Mar. 17, 1976, Ser. No. 667,484
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC 11 Claims



1. In an electro-optical display apparatus having front and rear optically-transmissive panels for viewing from the front, said front and rear optically-transmissive panels being in spaced-apart relationship with a liquid crystal composition occupying the space therebetween and with means to impress a voltage between selected portions of said front and rear optically-transmissive panels, the improvements comprising:

(a) an illuminating means having a front surface and a rear surface positioned behind said rear optically-transmissive panel with the front surface of said illuminating means being adjacent the rear optically-transmissive panel, said illuminating means being adapted to uniformly distribute light across the front surface of said illuminating means; and

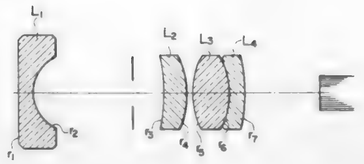
(b) a multi-cellular light diffusing panel intermediate said rear optically-transmissive panel and said front surface of said illuminating means, said light diffusing panel being adapted to diffuse and uniformly distribute light across at least a portion of said rear optically-transmissive panel.

4,042,295

RETROFOCUS-TYPE OBJECTIVE FOR ENDOSCOPES

Nobuo Yamasita, Tama, and Toshihiro Imai, Hachiouji, both of Japan, assignors to Olympus Optical Co., Inc., Japan

Filed Oct. 14, 1975, Ser. No. 622,115
Claims priority, application Japan, Oct. 15, 1974, 49-117749
Int. Cl.² G02B *13/04*
U.S. Cl. 350—202 2 Claims



1. A retrofocus-type objective for endoscopes comprising a front diverging lens group and rear converging lens group, said front diverging lens group comprising a negative lens, said rear converging lens group comprising a positive lens and a positive cemented doublet lens, said retrofocus-type objective for endoscopes being arranged to be focused on an object to be observed by keeping said front diverging lens group fixed and by moving said rear converging lens groups toward said front diverging lens group when the distance from said objective to the object to be observed becomes shorter, said retrofocus-type objective for endoscopes having numerical values as given below:

$r_1 = \infty$		
$d_1 = 0.6$	$n_1 = 1.51633$	$\nu_1 = 64.1$
$r_2 = 1.685$		
$d_2 = 5.36$		
$r_3 = -7.54$		
$d_3 = 1.0$	$n_2 = 1.69680$	$\nu_2 = 55.7$
$r_4 = -3.2$		
$d_4 = 0.2$		
$r_5 = 3.127$		
$d_5 = 1.6$	$n_3 = 1.62041$	$\nu_3 = 60.3$
$r_6 = -2.483$		
$d_6 = 0.55$	$n_4 = 1.84666$	$\nu_4 = 23.9$
$r_7 = -8.619$		

$f = 1.465$, $f_B = 2.961$, $f_F = +3.263$
$F_{NO} = 3.5$, $2\omega = 88°40'$
$m = 2.227$, $n = 2.021$

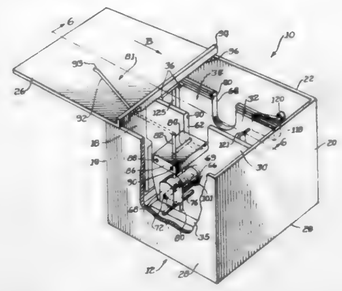
wherein reference symbols r_1 through r_7 respectively represent radii of curvature of respective surfaces of respective lenses, reference symbols d_1 through d_6 respectively represent thicknesses of respective lenses and airspaces between respective lenses, reference symbols n_1 through n_4 respectively represent refractive indices of respective lenses, reference symbols ν_1 through ν_4 respectively represent Abbe's numbers of respective lenses, reference symbol f represents the focal length of the lens system as a whole, reference symbol f_F represents the total focal length of the front lens group and reference symbol f_B represents the total focal length of the rear lens group.

4,042,296

FILM CARTRIDGE

Thomas R. Wells, Des Plaines, and Donald R. Jacobs, Niles, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jan. 28, 1976, Ser. No. 653,190
Int. Cl.² G03B *23/02*
U.S. Cl. 352—78 R 10 Claims



1. A cassette for removably mounting a reel containing a flexible strip of material, said cassette being adapted for use with a projector having an automatic feedout means, comprising:

a reel receptacle frame having an open top and an opening in one side thereof;

a slidably mounted cover adapted to close said open top to permit access to the interior of the receptacle frame for inserting or removing a reel of flexible material;

reel support means including a spindle mounted on the frame for rotatably mounting said reel, said spindle being movable between a first position for supporting the reel within the receptacle for feeding the strip material to said projector and a second position for releasing the reel; and

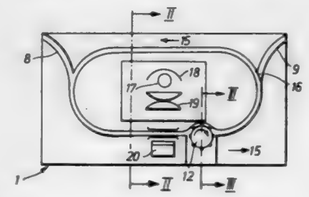
selectively operable cam means including an oblique cam slot on said cover in engagement with a protrusion on said spindle for moving said reel spindle between said positions in response to movement of said cover whereby the reel may be inserted into the receptacle and supported on the spindle in response to closure of the cover so that the flexible strip material may be removed from the reel through said opening by said automatic feedout means.

4,042,297

FILM STRIP PROJECTION EQUIPMENT

Reinhard Freisleben, Neubaldham, Germany, assignor to Soding TV GmbH & Co. Bild & Ton International, Munich, Germany

Filed Feb. 23, 1976, Ser. No. 659,985
Claims priority, application Germany, Apr. 17, 1975, 2516988
Int. Cl.² G03B *23/08, 23/02, 21/00*
U.S. Cl. 353—109 5 Claims

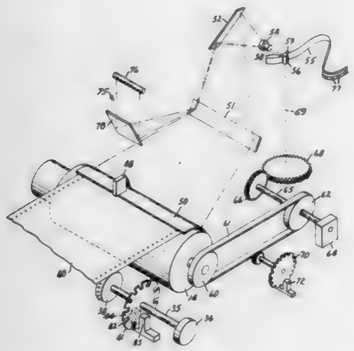


1. A film strip projection device for the projection of an endless running film strip comprising:

a projection optics system having a film trap through which said film strip passes, said film strip being open ended and flexible;

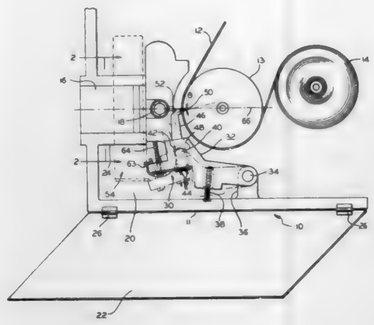
a closed substantially circular track formed in said projection device for guiding said film strip;
a transport device for engaging and driving said film strip around said track;
said film strip including first and second longitudinal edges;
a pair of spaced-apart wall plates disposed in said device, said wall plates being perpendicular to the flat faces of said film strip; and
said track including a guiding groove formed on each of said wall plates with only said first and second longitudinal edges of said film strip being arranged to travel in said respective guiding grooves and be guided thereby about said track.

4,042,298
DOCUMENT FILMING CAMERA
John A. Herrmann, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 19, 1976, Ser. No. 659,235
Int. Cl.² G03B *27/52*; G01D *9/42*; G03B *27/70*
U.S. Cl. 355—40 **13 Claims**



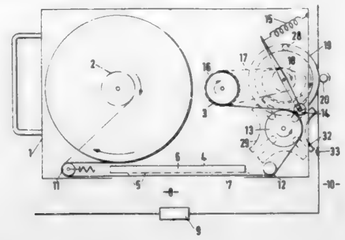
1. A continuous document-handling attachment for a document microfilm camera having a document feed roll, means for projecting images of the document as it moves past a photographic station on the document feed roll to a focal plane, means for advancing a film synchronously with the movement of the document feed roll, and an indexing mark exposure device for exposing a frame mark on the film as each document is filmed, said attachment comprising
a support for supporting a document to be photographed,
at least one wheel supported by a rotatable shaft to be driven from a said document to rotate said shaft,
document sensor means to produce electrical pulses as said wheel is rotated to indicate incremental movement of the document,
first counter means responsive to a predetermined number of pulses from said document sensor means for energizing said exposure device,
feed roll sensor means for generating pulses upon rotation of said feed roll through given increments, and
second counter means for counting said generated pulses from said feed roll sensor means, said second counter means being connected to said document sensor means and being reset to 0 when a pulse is generated from said document sensor means and said second counter means pulsing said first counter means when pulses are not produced by said document sensor means.

4,042,299
PHOTOGRAPHIC RECORDING MACHINE WITH IMAGE DESIGNATOR MARK OPTICAL SYSTEM AND ADJUSTING MEANS THEREFOR
Adolph J. Gawin, Skokie, and Robert F. Porazinski, Norridge, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.
Filed Apr. 28, 1975, Ser. No. 572,575
Int. Cl.² G03B *27/52*
U.S. Cl. 355—40 **9 Claims**



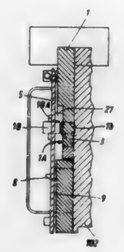
2. In a photographic recording machine;
means for sequentially exposing images onto a photosensitive web;
removable access means associated with said machine whereby said web is inserted in or removed from said machine when said access means is in an open position;
an optical system for forming an image designator mark on said photosensitive web in a predetermined position in relation to each said image;
said optical system including a light source projecting means moveable from a first position adjacent said web to a second position removed from said web;
said light source projecting means including;
mounting means pivotally attaching said projecting means to said machine, whereby said projecting means pivots between said first and second positions;
spring bias means disposed between said machine and said projecting means to bias said projecting means toward said first position;
actuator means operatively connected between said access means and said light source projecting means to move said projecting means from said first position to said second position when said access means is open, and to move said projecting means from said second position to said first position when said access means is closed;
said actuator means including lever arm means pivotally attached to said machine at one end and disposed in abutting contact with said projecting means at the other end;
said lever arm means abutting and being moved by said access means,
whereby when said access means are in said closed position, said projecting means is in said first position; and when said access means are in said open position, said lever arm means is enabled to move said projection means to said second position.

4,042,300
SELF-CONTAINED SINGLE OR MULTIPLE CASSETTES AND DRIVES
Harry Arthur Hele Spence-Bate, 1 Cheam Place, Morely, Australia (6062)
Filed July 14, 1975, Ser. No. 595,780
Claims priority, application Australia, July 18, 1974, 71404/74
Int. Cl.² G03B *27/60*
U.S. Cl. 355—73 **3 Claims**



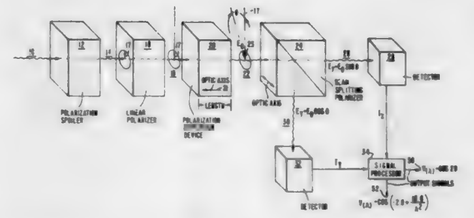
3. A cassette comprising a light excluding case, an unexposed film retaining means and an exposed film retaining means both mounted within said case, said unexposed and exposed film retaining means comprising a first reel and a second reel respectively, each reel adapted to hold roll film; a suction platen positioned between said first and second reels, said platen being movable in a back-and-forth manner in a direction perpendicular to the axes of said reels, guide means adapted to direct a roll film from said first reel over said platen to said second reel and roller means cooperating with clamp means and adapted to withdraw a length of roll film from said first reel to form a loop containing a length of film equal to the maximum back-and-forth travel of said platen whereby movement of said platen accomplishes film stepping without movement of the film relative to the platen.

4,042,301
APPARATUS FOR SUPPORTING AND POSITIONING WEBS OF PHOTOGRAPHIC MATERIAL IN COPYING MACHINES
Günter Heidrich, and Christian Götze, both of Munich, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Sept. 23, 1975, Ser. No. 616,073
Claims priority, application Germany, Sept. 26, 1974, 2445997
Int. Cl.² G03B *27/62*
U.S. Cl. 355—75 **11 Claims**



5. Apparatus for supporting and positioning manually insertable perforated webs of photographic material having data carrying strips in a copying machine, comprising a base; web advancing means installed in said base; a holder movable with respect to said base between a first and second position and having means for rendering said advancing means operative in said first position of said holder; web positioning means installed in said base to extend into the perforations of a web which is inserted and advanced by hand, said positioning means being movable between extended and retracted positions; means for retracting said positioning means in response to movement of said holder to said first position; a pressure plate normally overlying an exposure window in said base; additional positioning means movable with respect to said base between extended and retracted positions to enter the perforations of a manually inserted web having a strip when in said extended position; first resilient means for biasing said additional positioning means to said retracted position with a first force; second resilient means actuatable to bias said additional positioning means to said extended position with a greater second force; and means for actuating said second resilient means when said pressure plate overlies said window.

4,042,302
BROADBAND WAVELENGTH DISCRIMINATOR
John L. Wentz, Ellicott City, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Mar. 10, 1976, Ser. No. 665,463
Int. Cl.² G01J *3/00*
U.S. Cl. 356—74 **10 Claims**

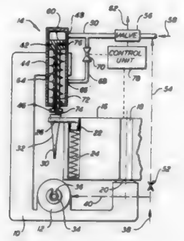


5. Apparatus for determining the wavelength of incident narrow band radiation comprising:
means for randomizing the orientation of the polarization of incident radiation;
a linear polarizer for passing a portion of said randomized incident radiation through said linear polarizer;
a polarization dispersion device coupled to receive radiation from said linear polarizer in the direction of the optic axis of said polarization dispersion device;
a beam splitting polarizer to form a first and second output beam coupled to receive radiation from said polarization dispersion device;
means for detecting said first and second output beam to provide a first and second signal respectively indicative of the intensity of said first and second output beam; and
means for processing said first and second signals to provide a third signal indicative of the wavelength of said incident radiation.

4,042,303
METHOD AND APPARATUS FOR AUTOMATED SAMPLING WITH AN ATOMIC ABSORPTION SPECTROMETER
Bernhard Werner Huber, Uberlingen, Germany, assignor to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Germany
Filed May 10, 1976, Ser. No. 685,007
Int. Cl.² G01J *3/30*; G01N *21/16*
U.S. Cl. 356—85 **20 Claims**

1. A method of introducing a sample to be analyzed through an introduction aperture into a graphite tube of a graphite tube cell of an atomic absorption spectrometer, comprising the steps of arranging a plurality of sample containers containing the samples to be analyzed in a row in a sample holding device, said sample containers being open at both ends, successively transporting said sample containers to an introduction device, inserting said sample container into the introduction aperture

of the graphite tube by means of said introduction device, transferring the sample into the graphite tube from said sample container, removing the sample container from the introduc-



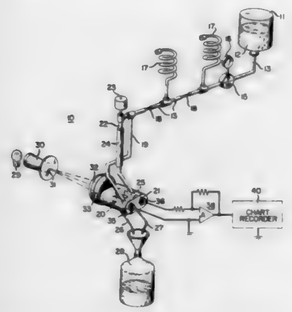
tion aperture and returning it to the sample holding device after the introduction of the sample into the graphite tube, and then transporting the next subsequent sample container to the introduction device.

4,042,304

CHRISTIANSEN EFFECT DETECTOR

Archer J. P. Martin, Abbotsbury, Barnet Lane, Elstree, England; James M. Miller, 8 Oxford Lane, Madison, N.J. 07940; Robert J. Mathieu, 249 Morris Avenue, Mountain Lakes, N.J. 07046, and Alexander E. Lawson, Jr., 150 Rte. 24, Mendham, N.J. 07945, assignors to GOW-MAC Instruments, Inc., Madison, N.J.

Filed Nov. 6, 1972, Ser. No. 304,096
Int. Cl.² G01N *21/46*
U.S. Cl. 356—128 **1 Claim**



1. A Christiansen effect detector comprising means for directing collimated light along a line through particulate matter immersed in a liquid, means for detecting intensity of the light transmitted through the matter and the liquid, cell means filled with the particulate matter and arranged for retaining the particulate matter and the liquid in a fixed length along the line of light wherein light emerging from the cell means forms a center beam and a halo, said detecting means positioned to determine intensity of light in the halo, means for blocking the center beam from impinging upon the detecting means, and means for flowing the liquid through the cell.

4,042,305

QUICK CHANGE SNAP LOCK CONNECTOR

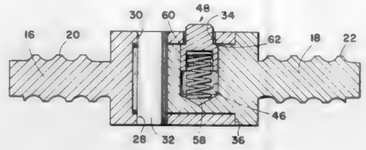
George E. Vincent, 110 N. 153rd East Ave., Tulsa, Okla. 74116

Filed Aug. 28, 1975, Ser. No. 608,459
Int. Cl.² F16B *7/00*; F16D *1/10*
U.S. Cl. 403—14 **7 Claims**

1. A connector for a flexible rotating shaft comprising:

a. a sleeve member having one end closed, a shaft connector means secured to the outer side of the closed end of the sleeve member, a transversely disposed torque bar secured inside the sleeve member adjacent the closed end thereof;

b. an elongated solid cylindrical segment having outside diameter substantially equal to the inside diameter of said sleeve number for selective insertion therein, a flange member secured to one end of the cylindrical segment, shaft connector means secured to the outside of the flange member opposite the cylindrical segment, a transversely disposed slot provided in the opposite end of the cylindrical segment for slidably receiving the torque bar therein when the cylindrical segment is inserted into the sleeve



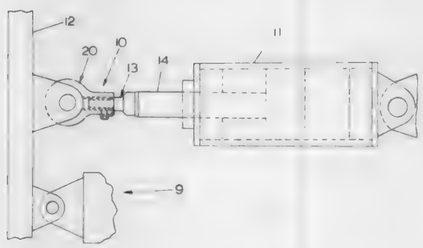
member to prevent rotation of said cylindrical segment with respect to said sleeve member, spring loaded depressable latch pin carried by the cylindrical segment, between said slot and said flange member, a transversely disposed bore provided in the sleeve member for receiving said latch pin therein when the cylindrical segment is fully inserted into the sleeve member with said torque bar disposed in the said transverse slot and transversely disposed bore provided in the sleeve member for receiving the latch pin is of greater diameter than said latch pin sufficient to prevent said latch from taking torqueloads when the connector is rotated.

4,042,306

CONTROLLABLE CONNECTING APPARATUS

Kenneth R. Murray, Mentor, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed Aug. 24, 1976, Ser. No. 717,056
Int. Cl.² F16B *7/18*
U.S. Cl. 403—118 **8 Claims**



1. Connecting apparatus providing a pivotal connection for controllably securing an actuating element at a preselected attitude, comprising:

said actuating element having an end portion, threads on said end portion, and at least one slot extending through the threads and longitudinally along the end portion;

an eye element having a longitudinal axis and first and second end portions and first and second ends, said first end portion having an opening extending therethrough substantially perpendicularly to the axis and said second end portion having a first threaded opening mateable with the threads of the actuating element and extending along the eye element axis, a second threaded opening at the second end portion and extending substantially perpendicularly to the eye element axis, and a slot at the eye element second end extending substantially perpendicularly to the eye element axis;

a holding element of general "U" configuration having first and second legs and a middle portion in the installed position of the eye element on the actuating element, said first leg being of a size sufficient for extending along the actuating element slot, said middle portion being of a size sufficient for positioning in the slot of the eye element second end, and said second leg being of a construction sufficient for substantially completely encompassing the second threaded opening; and

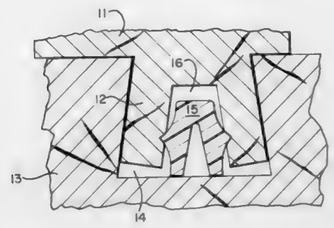
threaded means for mating with the threads of the second threaded opening of the eye element, extending over at least a portion of the second leg of the holding element and maintaining said second leg relative to said eye element.

4,042,307

JOINING

Arthur B. Jarvis, Andover, Mass., assignor to Bose Corporation, Framingham, Mass.

Filed Sept. 2, 1976, Ser. No. 719,942
Int. Cl.² F16B *2/14*
U.S. Cl. 403—290 **4 Claims**



1. A joint comprising,

a first piece of material having a projection with a groove,

a second piece of material having a slot embraced by angled walls with the width of the slot opening slightly greater than the width of said projection and less than the slot width at its base,

and wedge means located within said slot and said groove, for expanding said groove and urging said projection into engagement with the walls beside said slot,

said wedge means being formed with a slit having an opening adjacent to the base of said slot.

4,042,308

MODULAR ROADWAY FOR A TRANSPORTATION SYSTEM

Mark Freedman, Cinnaminson, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

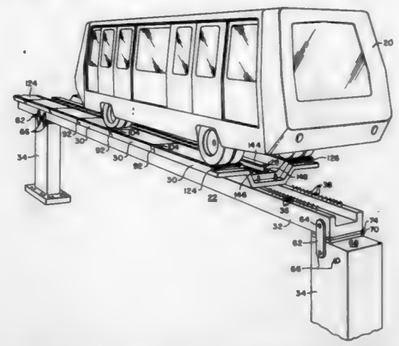
Filed Feb. 18, 1976, Ser. No. 658,947
Int. Cl.² E01C *1/00*
U.S. Cl. 404—1 **10 Claims**

9. In roadway apparatus for a transportation vehicle for carrying passengers and directed by guide wheels depending from said vehicle and engaging a guide member, the combination of;

a spinal beam having a channel formed between two side members;

a plurality of cantilevered deck modules successively supported along said spinal beam to provide a pair of running surfaces for the transportation vehicle,

with each deck module having a web section for supporting the guide member between the pair of running surfaces and having a cavity within said web section, and;



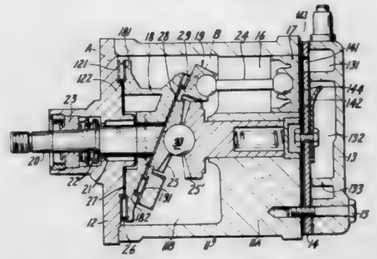
means filled within each said cavity for attaching the deck module associated with that cavity to the spinal beam.

4,042,309

REFRIGERANT COMPRESSOR

Masaharu Hiraga, Isesaki, Japan, assignor to Sankyo Electric Company, Limited, Isesaki, Japan

Filed Aug. 26, 1975, Ser. No. 608,002
Claims priority, application Japan, Aug. 26, 1974, 49-102116[U]; Aug. 26, 1974, 49-102117[U]
Int. Cl.² F04B *1/12*; F16C *33/46, 33/58*
U.S. Cl. 417—269 **9 Claims**



1. A refrigerant compressor in which pistons are reciprocated within respective cylinders by a wobble plate member driven by a wedge-shaped rotor member secured on a drive shaft, a generally cylindrical housing which contains said wobble plate member and said wedge-shaped rotor, a first end plate defining a discharge chamber having inlet and outlet means mounted on one end of said housing, a second end plate mounted on, and closing, an opposite end of said housing, said drive shaft being rotatably borne in said second end plate and extending from the exterior to interior of said housing, said wedge-shaped rotor member being mounted and fixed on an inner end portion of said drive shaft to be rotated together with said drive shaft, a first anti-friction thrust bearing assembly being mounted between an inner end surface of said second end plate and one end surface of said wedge-shaped rotor member and within a first annular space defined by a first annular recess formed in said inner end surface of said end plate and a second annular recess formed in said one end surface of said wedge-shaped rotor member, said wobble plate member being closely mounted, and relatively rotatably borne, on the other end surface of said wedge-shaped rotor member, said other end surface being formed to incline to said drive shaft, and a second anti-friction thrust bearing assembly mounted between said inclining end surface of said wedge-shaped rotor member and an end surface of said wobble plate member facing said inclining end surface and within a second annular space which is defined by a third annular recess

formed in said inclining surface of said wedge-shaped rotor member and a fourth annular recess formed in said end surface of said wobble plate member, the improvement which comprises: each of said first and second anti-friction thrust bearing assemblies comprising first and second race members and a rolling element cage assembly, one of said first and second race members and said rolling element cage assembly of said first bearing assembly being mounted in one of said first and second annular recesses, said one of said first and second recesses being formed of a sufficient depth such that radial displacement of said race member and said rolling element cage assembly mounted therein is prevented, a first ring member of a wear-resistant material provided in said one of said first and second annular recesses and covering a radial inner wall defining said one of said annular recesses, the other of said first and second race members of said first bearing assembly being mounted in the other of said first and second annular recesses which is formed of a relatively shallow depth such that radial displacement of said other race member mounted therein is prevented, first means for preventing said other race member of said first bearing assembly from rotation in said other annular recess, one of said first and second race members and said rolling element cage assembly of said second bearing assembly being mounted in one of said third and fourth annular recesses which is formed of a sufficient depth such that radial displacement of said race member and rolling element cage assembly mounted therein is prevented, a second ring member of a wear-resistant material therein which covers a radial inner wall defining said one annular recess, said other race member of said second bearing assembly being mounted in the other of said third and fourth annular recesses which is formed of a relatively shallow depth such that radial displacement of said other race member mounted therein is prevented, and second means for preventing said other race member of said second bearing assembly from rotation in said other of said annular recesses, said first and second rotation-preventing means comprising projections axially extending from said other race members of said first and second bearing assemblies, respectively, said projections being respectively received in first and second grooves respectively formed in said other of said annular recesses in which said other race members of said first and second bearing assemblies are respectively mounted and which extend from said other of said annular recesses, respectively.

4,042,310

SCREW COMPRESSOR CONTROL MEANS

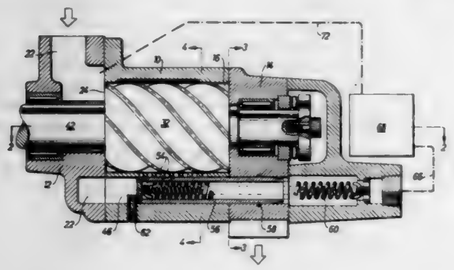
Hjalmar Schibbye, Saltsjo-Boo, and Arnold Englund, Vallingby, both of Sweden, assignors to Svenska Rotor Maskiner Aktiebolag, Nacka, Sweden

Filed June 23, 1975, Ser. No. 589,021

Claims priority, application United Kingdom, June 21, 1974, 27616/74

Int. Cl.² F04B *49/00*; F01C *1/16*

U.S. Cl. 417—310 **10 Claims**



1. In a screw compressor comprising a casing with a working space disposed therein in the shape of two intersecting cylindrical bores with parallel axes, a high pressure end wall at one end thereof, a low pressure end wall at the other end thereof, intermeshing male and female rotors disposed in said working space in sealing engagement with said casing and the end walls thereof and having helical lands and intervening grooves with a wrap angle of less than 360°, said male rotor having the major portion of its lands and grooves outside the pitch circle thereof and with its flanks substantially convex, and said female rotor having the major portion of its lands and grooves inside the pitch circle thereof and with its flanks substantially concave, a low pressure port adjacent said low pressure end wall, a high pressure port at the end of said working space opposite from said low pressure port and with said ports being located substantially on opposite sides of a plane through the axes of said bores, an inlet channel in said casing in flow communication with said low pressure port and an outlet channel in said casing in flow communication with said high pressure port,

means for varying the volumetric capacity of the screw compressor, comprising:

at least one valve bore parallel to the axes of the rotors and disposed on the high pressure side of said plane through the axes of the rotor bores;

a plurality of axially spaced overflow channels in said casing and in communication with the working space;

an axially adjustable valve body disposed in said at least one valve bore and sealingly cooperating with the barrel walls of the at least one valve bore to divide said valve bore into two valve chambers;

one of said valve chambers of said at least one valve bore being completely out of communication with the outlet channel of the compressor and in flow communication with the working space through said axially spaced overflow channels and being further in communication with a low pressure channel, the other of said valve chambers being selectively in communication with a pressure liquid source; and

means for axially adjusting the position of said valve body so as to selectively block said overflow channels for variation of the communication between the working space and the at least one valve bore through said overflor channels.

4,042,311

PUMP FLUID MOTOR CARRYING SPOOL VALVE FOR DISTRIBUTOR VALVE ACTUATION

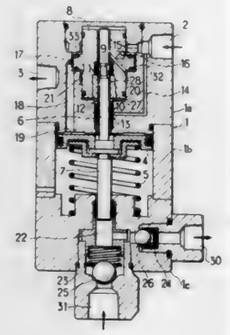
Keitaro Yonezawa, Amagasakishi, Japan, assignor to Aioi Seiki Kabushiki Kaisha, Japan

Filed Feb. 26, 1976, Ser. No. 661,549

Claims priority, application Japan, Mar. 8, 1975, 50-28210

Int. Cl.² F04B *17/00, 35/00*; F01L *25/06*

U.S. Cl. 417—401 **7 Claims**



1. In a fluid engine having a single acting cylinder for converting the pressure energy of an operating fluid to reciprocating actuation of a piston in a cylinder chamber, a directional control valve which alternately connects the cylinder chamber to an operating fluid inlet port, to force the piston downward by the pressure of the operating fluid against a spring biasing force, and to an operating fluid outlet, to permit return of the piston upwardly by the spring biasing force, and a master valve to operate the directional control valve, the improvement comprising:

a. a piston rod on said piston,

b. a spool on said piston rod,

c. a reciprocably movable disc comprising said control valve, and said piston rod passing through said disc, and

d. a pair of valve seats in said master valve additionally forming packings, one of said valve seats being in said disc and the other exterior of said disc, said pair of valve seats cooperating with said piston rod and its spool to alternately perform simultaneous respective sealing and unsealing of operating fluid to effect a reciprocation of the disc, thereby either permitting operating fluid to enter the cylinder chamber or venting operating fluid from the cylinder chamber, so as to cause movement of said piston.

4,042,312

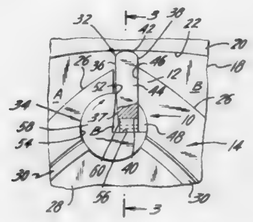
APEX SEAL ASSEMBLY

Edmund Douglas Betts, Gurnee, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Aug. 16, 1976, Ser. No. 714,564

Int. Cl.² F04C *27/00*

U.S. Cl. 418—121 **12 Claims**



1. An improved apex seal assembly for each of the apex portions of a rotary piston having opposite wall surfaces and contiguous peripheral surfaces intersecting each other at the apex portions, the apex seal assembly comprising:

a. a slot in the apex portion extending axially through the piston side wall surfaces and radially inwardly from the peripheral surfaces of the piston;

b. a cylindrical-shaped bore in the apex portion disposed radially inwardly relative to the slot and extending axially through the piston side wall surfaces to intersect and communicate with said slot;

c. a seal blade means having a sealing end surface and a bottom surface receivable in said slot and dimensioned to extend at least to the planes of the opposite side wall surfaces of the piston and with the bottom surface lying in the slot and the sealing end surface lying outwardly of the slot;

d. an elongated cylindrical-shaped intermediate seal means receivable in said bore for rotative movement about its longitudinal axis relative to the bore and seal blade means;

e. said intermediate seal means having a cut-out portion in communication with said slot and forming at least one sealing arris; and

f. a spring disposed in the cut-out portion and between the bottom surface of said seal blade means and a wall of the cut-out portion to exert a force on said seal blade means and on the intermediate seal means at a point offset from the latter's rotational axis to thereby urge the intermediate seal means to rotate about said axis relative to the seal blade means and maintain the sealing arris in engagement with the seal blade means.

4,042,313

METHOD OF IMPARTING COLOR TO FIRES

Richard H. Pierce, Broomall, Pa., assignor to Philadelphia Quartz Company, Valley Forge, Pennsylvania

Filed Mar. 19, 1976, Ser. No. 668,387

Int. Cl.² C10L *10/00*; C06B *43/00*

U.S. Cl. 431—4 **4 Claims**

1. In the burning of combustible materials, a method of imparting color to the flames, comprising; adding granules to burning combustible materials whereby the granules soften and become bonded to the combustibles and upon burning impart color to the flames; said granules consisting essentially of metal salt(s), one or more of which is selected from the group of metals that produce colored flames on decomposing in a fire, potassium or lithium silicate solids water, and a bulking agent selected from the group consisting of sand, amorphous silica and microcrystalline silica.

4,042,314

APPARATUS FOR THE CONTINUOUS MANUFACTURE OF PHENOLIC RESIN FOAM IN ENDLESS SHEETS

Klaus Brüning; Hans Jünger; Wolfgang Pungs; Peter Rheinfeld, all of Troisdorf; Franz Weissenfels, and Michael Wienand, both of Siegburg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

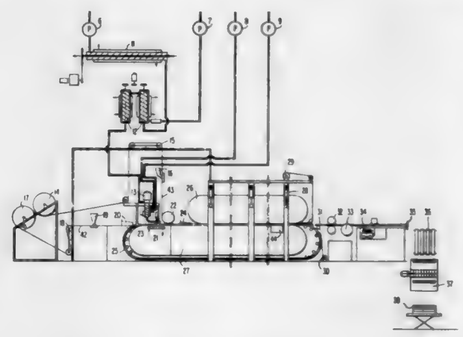
Division of Ser. No. 311,913, Dec. 4, 1972, Pat. No. 3,885,010.

This application Oct. 9, 1974, Ser. No. 513,404

Claims priority, application Germany, Dec. 2, 1971, 2159726

Int. Cl.² B29D *27/04*

U.S. Cl. 425—89 **13 Claims**



1. In an apparatus for the continuous manufacture of phenolic resin foam wherein the components of the foam are stored in storage means operatively associated with means for mixing the components and for distributing the resulting mixture to a temperature-controllable double belt press having an upper and a lower belt defining a molding zone therebetween, the improvement which comprises means for cooling the phenolic resin component to a desired premix temperature operatively associated with said storage means, a first mixer means downstream of the cooling means for premixing the cooled phenolic resin component with a blowing agent, a second mixer means downstream of the first mixer means for mixing the premix of phenolic resin and blowing agent with foam additives and a curing agent; distributing means including means operatively associated with said double belt press for directing the foamable resin-containing reaction mixture from the second mixer means onto a substrate of the lower belt of the double belt press, means operatively associated with said double belt press for measuring the foaming pressure between the lower belt and the upper belt of the press and means for adjusting the foaming pressure in response to the measured foaming pressure by varying the vertical spacing between the upper and the lower belt of said double belt press.

4,042,315

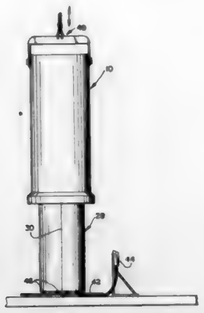
APPARATUS FOR MAKING CONCRETE PIPE

Norman Ottmann, Simsbury, and Walter Strever, Cromwell, both of Conn., assignors to Atlantic Pipe Corporation, Plainville, Conn.

Division of Ser. No. 547,333. This application Nov. 28, 1975, Ser. No. 635,980

Int. Cl.² B28B *21/14, 21/18*

U.S. Cl. 425—392 **3 Claims**



1. Apparatus for the vibration treatment of green concrete pipe comprising:

a. a cylindrical jacket within which the pipe is formed,

b. a vertically split upright and hollow cylinder operatively associated with said jacket and expandable and contractable radially and having a diameter approximating the internal diameter of the pipe, upwardly and radially inwardly projecting guide means mounted at an upper end portion of said cylinder for guiding a pipe downwardly on and about the cylinder, means attached to and supporting said cylinder for rotation relative to a pipe thereabout,

c. lift means operatively associated with the jacket for transporting the jacket and a green pipe therewithin to a position above said cylinder and for thereafter lowering and raising the jacket and pipe to and from a position about the cylinder with the latter contracted,

d. means connected with the cylinder adjacent and on opposite sides of the vertical split for expanding the cylinder into engagement with the internal surface of a green pipe thereabout and for contracting the cylinder for vertical pipe movement relative to the cylinder as aforesaid by said lift means,

e. at least one vibrator operatively associated with said cylinder for vibrating the same in an expanded condition and thereby vibrating a green pipe thereabout whereby to compact, to eliminate voids, and to relieve residual forming stresses in the latter, and horizontal support means operatively associated with the cylinder for engaging a pipe positioned about the cylinder at its lower end surface and for supporting the same independently of the cylinder and for thus accommodating incremental cylinder rotation relative to the pipe during said vibration.

4,042,316

GAS LIGHTER BURNER

Peter Rabe, Muhlheim (Main), Germany, assignor to Rowenta-Werke, GmbH, Germany

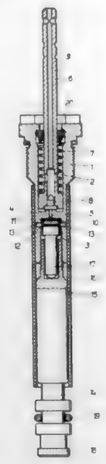
Filed Jan. 19, 1976, Ser. No. 650,206

Claims priority, application Germany, Jan. 21, 1975, 2502138

Int. Cl.² F23Q *2/16*

U.S. Cl. 431—344 **2 Claims**

1. A gas lighter burner comprising an elongated burner housing having an axially extending fuel passage formed therein, a porous, compressible throttle disc seated against the entrance end of said fuel passage, the periphery of said throttle disc being exposed to a fuel supply of liquid gas under pressure, an elongated pressure device retained in said housing and having one end disposed against said throttle disc, and an adjustment screw threadedly engaged in said housing for adjusting the position of said pressure device relative to said throttle disc, the surfaces of said pressure device, burner housing and adjustment screw being exposed to said liquid gas whereby to provide good heat transmission between said surfaces and said fuel supply of liquid gas, said pressure device being at least partially formed of a different material than said



housing, said adjustment screw, and said throttle disc and having a different temperature coefficient of expansion whereby a desired flow of fuel through said fuel passage is maintained despite atmospheric and vaporization temperature variations as a result of relative changes in the axial dimension of said pressure device in response to said temperature variations and the resulting pressure changes applied by said pressure device to said porous compressible throttle disc.

4,042,317

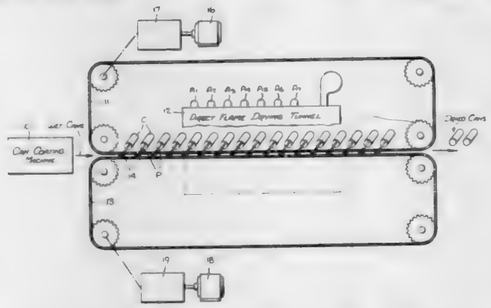
DIRECT FLAME APPARATUS FOR DRYING CAN COATINGS

Edward S. Flynn, New Rochelle, N.Y., assignor to Flynn Burner Corporation, New Rochelle, N.Y.

Filed Nov. 10, 1975, Ser. No. 630,350

Int. Cl.² F27D *3/12*

U.S. Cl. 432—124 **11 Claims**



1. Apparatus for drying wet coatings applied to the outer surface of cylindrical cans comprising:

A. a drying tunnel having a series of assemblies mounted therein at spaced positions; and

B. conveyor means to advance the cans through said tunnel in a continuous train, whereby each can passes the series of assemblies, said conveyor means being constituted by an endless chain having upwardly tilted pins extending

therefrom from which said cans are hung whereby the bottom of each can occupies a higher position in said tunnel than the mouth thereof, each of said assembles including a direct flame burner element supplied with a combustible air-gas mixture to project a main flame in sheet form which impinges across the outer surface of an advancing can and means including a source of secondary air to project air curtains with sufficient velocity to flank both sides of said flame and to impinge across said surface to confine the intense heat of said flame to a limited sector on the advancing can and to prevent ignition of the coating despite said intense heat, said assemblies being arranged to apply more heat to the bottom end of the cans than to the mounts thereof to compensate for the temperature gradient created by the heat sink effect produced by the bottom end.

4,042,318

APPARATUS FOR THE CONTINUOUS MELTING OF SALTS USED FOR MODIFYING THE PROPERTIES OF ARTICLES OF GLASS OR SIMILAR MATERIALS

Johannes Franke; Kurt Kessler, both of Jena; Wolfgang Muller, Berlin; Heinz Sauerbier, Camburg; Kurt Schneider, and Karl Unbehaun, both of Jena, all of Germany, assignors to VVB Haushalts- und Verpackungsglas, Weisswasser OL, Germany

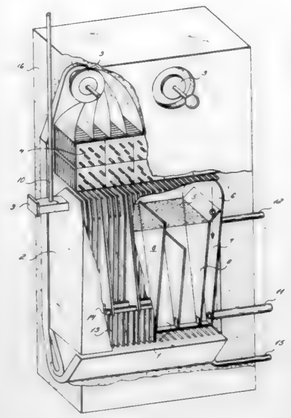
Filed July 18, 1975, Ser. No. 597,052

Claims priority, application Germany, July 31, 1974, 0318021

Int. Cl.² F27B *14/08*

U.S. Cl. 432—210 **3 Claims**

1. Apparatus for the continuous melting of salts which are to be used to modify properties of objects of glass or similar materials, the apparatus comprising an outer vessel, an inner vessel nested in the outer vessel with an annular chamber for heat exhange fluid being formed between the outer vessel and the inner vessel, ribs on the outer walls of the inner vessel for guiding the heat exchange fluid and assisting heat exchange from the heat exchange fluid to the inner vessel, means for transferring heat to the heat exchange fluid, means for circulating the heat exchange fluid through said chamber, means for admitting into the inner vessel the salt to be melted, the inner vessel having an upper portion of a semi-circular profile defining a radiant heating surface for radiating heat downwardly onto the salt and having a lower portion of approximately triangular to parabolic profile defining a conduction heating surface for transferring heat to the salt by conduction, the



upper surface of the lower portion to be formed by the salt charged to the inner vessel defining a melting surface and the ratio of the area of the radiant heating surface of the upper portion to the melting surface defined by the upper surface of the lower portion being in the range of 1:4:1 to 1.57:1 and the ratio of the area of the conduction heating surface to the melting surface being in the range of 2.5:1 to 4:1.

4,042,319

DYE-BATH OXIDANTS

Elliot H. Baum, Spring Valley, N.Y., and Gerald R. Ferrante, Edison, N.J., assignors to Kewanee Industries, Bryn Mawr, Pa.

Filed Oct. 12, 1976, Ser. No. 731,117

Int. Cl.[2] C09B *9/00, 49/00;* **D06P** *1/22;* **A61L** *13/00*

U.S. Cl. 8—35 **3 Claims**

1. A dye bath oxidant for leuco sulfur or vat dyes after said dyes have been adsorbed on fibers, said oxidant consisting essentially of about 40–80 parts by weight alkali bromate and about 20–60 parts by weight alkali iodate, the alkali in each instance being selected from the group consisting of sodium and potassium.

2. A method of oxidizing leuco sulfur or vat dyes after said dyes have been adsorbed on fibers which comprises applying to said dyes, in acid dye bath, an oxidizingly effective amount of an oxidizing agent consisting essentially of about 40–80 parts by weight alkali bromate and about 20–60 parts by weight alkali iodate, the alkali in each instance being selected from the group consisting of sodium and potassium.

4,042,320

ANIONIC AND NONIONIC EMULSIFIED DYE SUSPENSION WITH FORMALDEHYDE AND HYDROTROPIC AGENT

Carl Becker, Basel; Jacques Wegmann, Bettingen, and Andres Schaub, Biel-Benken, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Continuation-in-part of Ser. No. 506,775, Sept. 17, 1974, Pat. No. 3,997,828. This application May 2, 1975, Ser. No. 574,042

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

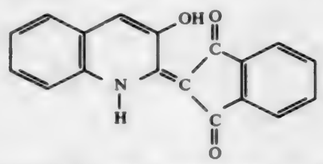
Claims priority application Switzerland May 9, 1974, 6374/74; Sept. 2, 1974, 11869/74; Dec. 18, 1974, 16894/74

Int. Cl.[2] D06P *1/613*

U.S. Cl. 8—39 C **7 Claims**

1. A composition consisting essentially of

40 to 60 percent by weight of the dyestuff of the formula



0.1 to 5 percent by weight of the sodium salt of an anion-active condensation product of naphthalenesulphonic acid with formaldehyde, 1 to 3 percent by weight of cetyl-stearly alcohol, etherified with 25 moles of ethylene oxide,

a fungicidal amount of a 35% aqueous formalin solution,

an effective amount of 1,2-propylene glycol as an antifrost agent,

5 to 20 percent by weight of urea, and

20 to 30 percent by weight of water.

4,042,321

TANNING OF HIDES

Klaus Bäcker, Leverkusen; Helga Heinze, Cologne; Wolfhard Luck, Leverkusen, and Heinrich Spahrkäs, Bergisch-Neukirchen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 29, 1975, Ser. No. 573,282

Claims priority, application Germany, May 18, 1974, 2424301; May 18, 1974, 2424300

Int. Cl.[2] C14C *3/06*

U.S. Cl. 8—94.26 **11 Claims**

1. In the chrome-tanning of hides to produce leather wherein a hide is pickled, pretanned with a chromium (III) salt, and full tanned with a tanning mixture containing a chromium (III) salt, an acid-binding agent and a polycarboxylic acid or salt thereof, the improvement which comprises employing as said polycarboxylic acid or salt thereof at least 1.6 moles per mole of Cr_2O_3 in the chromium (III) salt employed for full tanning of an aliphatic dicarboxylic acid of 4 to 6 carbon atoms or an aromatic dicarboxylic or tricarboxylic acid containing 8 to 13 carbon atoms or an alkali metal salt thereof, the total quantity of Cr_2O_3 employed in pretanning and full tanning ranging from 1.2 to 2% by weight of the hide, full tanning being carried out with up to 100% of the tanning liquor based on the weight of the hide to a final pH of the liquor of at least 3.6.

4,042,322

PROCESS FOR DYEING ANIONICALLY MODIFIED SYNTHETIC FIBER MATERIALS

Hans-Peter Kühlthau, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

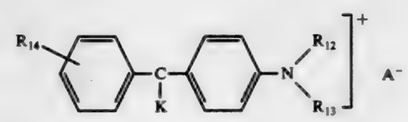
Division of Ser. No. 564,104, is a division of Ser. No. 299,658, Oct. 24, 1972, Pat. No. 3,925,015. This application June 29, 1976, Ser. No. 700,893

Claims priority, application Germany, Oct. 23, 1971, 2152948

Int. Cl.[2] D06P *5/00*

U.S. Cl. 8—168 R **3 Claims**

1. In the process of dyeing an anionically modified fiber material by exhaustion from a dyebath consisting essentially of a cationic dyestuff dissolved in halogenated hydrocarbon the improvement comprising the use as said cationic dyestuff a dyestuff soluble in said halogenated hydrocarbon and having the formula



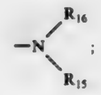
in which

A^- is a non-lipophilic anion;

R_{12} is hydrogen, alkyl, aralkkyl, cycloalkyl or aryl;

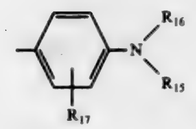
R_{13} is hydrogen, alkyl, cycloalkyl or aralkyl, or R_{12} and R_{13} together with the nitrogen atom form a heterocyclic ring which can contain further hetero-atoms;

R_{14} is hydrogen, halogen, alkoxy, aralkoxy, aryloxy, acyloxy, alkyl, aralkyl, aryl, nitro, CN, trifluoromethyl, carboxylic acid ester, carbonamide, N-substituted carbonamide, acyl, alkysulphonyl or arylsulphonyl or

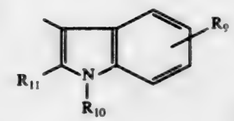


;

K is



or



in which

R_9 is hydrogen, alkyl, alkoxy or halogen;

R_{10} is hydrogen, alkyl, aralkyl, cycloalkyl or aryl;

R_{11} is alkyl, aryl, carboxylic acid ester, carbonamide or substituted carbonamide;

R_{15} is hydrogen, alkyl, cycloalkyl or aralkyl;

R_{16} is hydrogen, alkyl, aralkyl, cycloalkyl or aryl; or
R_{15} and R_{16}, together with the nitrogen atom, form a heterocyclic ring which can contain further hetero-atoms;
R_{17} is hydrogen, halogen, alkyl or alkoxy, and in which the aromatic carbocyclic rings of the dyestuff cation can be condensed with carbocyclic rings and additionally the substituents R_9, R_{14} and R_{17} can contan further non-ionic substituents;
with the proviso that at least one of the substituents R_9, R_{11}, R_{14} or R_{17} is a C_3-C_{13}-alkyl, C_3-C_{12}-alkoxy or C_5-C_6-cycloalkyl group or R_{10} is a C_3-C_{12}-alkyl or C_5-C_6-cycloalkyl group.

4,042,323

PROCESS OF INHIBITING CORROSION OF METAL IN AN AQUEOUS ENVIRONMENT WITH MIXTURES OF THIO-, OXYGEN AND THIO- OXYGEN PHOSPHATES AND PYROPHOSPHATES

Derek Redmore, Ballwin, and Alfred E. Woodson, Festus, both of Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 272,626, July 17, 1972, Pat. No. 3,909,447. This application June 26, 1975, Ser. No. 590,517
Int. Cl.² C02B 5/06; C23F 11/16
U.S. Cl. 21—2.7 A **14 Claims**

1. A process of inhibiting corrosion of a metal in an aqueous environment consisting essentially of adding to such environment a corrosion inhibiting amount of a composition comprising a mixture of thiophosphate, pyrophosphate containing both oxygen and sulfur, and oxygen phosphate esters of alcohols selected from the group consisting of alkanols having at least seven carbon atoms and alcohols of the formula $R'(OA)_nOH$, where R' is alkyl, cycloalkyl, alkenyl, aryl, aralkyl, alkaryl or heterocyclic, A is an alkylene moiety and *n* is from 1 to 100, said pyrophosphate esters being the major part of the combined thiophosphate and pyrophosphate esters and the weight ratio of said combined esters to the oxygen phosphate esters being from about 10:1 to 1:10.

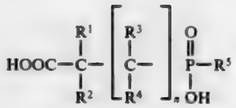
4,042,324

PROCESS FOR INHIBITING THE CORROSIONS AND DEPOSITION OF BOILER SCALE IN WATER-CONVEYiNG SYSTEMS

Theodor Auel; Hannsjorg Ulrich, both of Erftstadt; Horst-Dieter Wasel-Nielen, Hurth-Hermulheim, and Gero Heymer, Erftstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Feb. 3, 1976, Ser. No. 654,885
Claims priority, application Germany, Feb. 8, 1975, 2505435
Int. Cl.² C02B 5/06; C23F 11/16
U.S. Cl. 21—2.7 A **2 Claims**

1. A process for inhibiting the phenomena of corrosion and deposition of boiler scale in water-conveying systems, which comprises admixing the water with at least one carboxy-alkane compound of phosphorus of the general formula:



in which each of the substituents R^1, R^2, R^3 and R^4 stands for hydrogen or an alkyl group having from 1 to 4 carbon atoms, R^5 stands for hydrogen, an OH—group or an alkyl group having from 1 to 3 carbon atoms, and *n* stands for 0 or 1, or with at least one water-soluble salt thereof.

4,042,325

METHOD OF KILLING MICROORGANISMS IN THE INSIDE OF A CONTAINER UTILIZING A PLASMA INITIATED BY A FOCUSED LASER BEAM AND SUSTAINED BY AN ELECTROMAGNETIC FIELD

Lowell G. Tensmeyer, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 21, 1976, Ser. No. 699,010
Int. Cl.² A61L 1/00
U.S. Cl. 21—54 R **17 Claims**

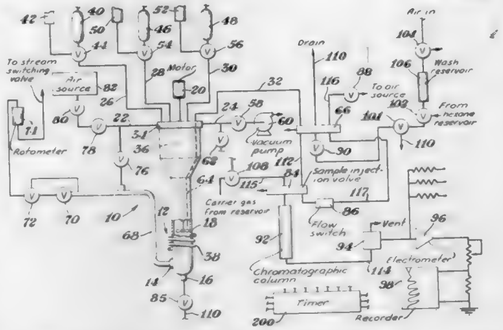
1. A method of killing microorganisms in the inside of a container comprising directing into the container an electromagnetic field having sufficient energy therein to sustain a plasma, focussing a high power laser beam at a focal point in the inside of the container, the focal point being at a sufficient distance from the inside surface of the container to avoid contacting the surface with the spark resulting from the convergence of the laser beam at the focal point thereof, pulsing the laser beam once and thereby initiating a plasma in the electromagnetic field, and sustaining the plasma for a sterilizing period with the energy in the electromagnetic field.

4,042,326

METHOD OF QUANTITATIVELY DETECTING CHLOROMETHYL METHYL ETHER AND/OR BIS-CHLOROMETHYL ETHER WITH IMPROVED SENSITIVITY

George J. Kallos, Saginaw, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 536,709, Dec. 26, 1974, abandoned. This application Sept. 10, 1975, Ser. No. 611,939
Int. Cl.² G01N 31/08
U.S. Cl. 23—230 R **26 Claims**



1. The improved method of quantitatively determining the presence of chloromethyl methyl ether or bis-chloromethyl ether in a fluid which comprises:
bringing a sample of said fluid into intimate admixture, in lower alcohol medium, with an alkali metal salt of a lower alcohol and with a readily detectable organic hydroxy compound selected from
1. a compound of the formula R-OH wherein R is a halo-lower alkyl, a halophenyl, unsubstituted phenyl, an alkoxy halophenyl, an alkoxy phenyl, an alkyl halophenyl, an alkylphenyl or
2. a halothiophenol or thiophenol or
3. a halopyridinol or unsubstituted pyridinol, the molar ratio of said salt to said hydroxy compound being in the range of from about 0.2:1 to about 5:1, the total moles of said salt present in said lower alcohol medium being at least equal to the sum of the moles of chloromethyl methyl ether plus two times the moles of bis-chloromethyl ether present, and the total moles of said hydroxy compound present in said lower alcohol medium being at least equal to the sum of the moles of chloromethyl methyl ether and bis-chloromethyl ether present;
adding to the admixture, (1) an aqueous medium selected from the group consisting of (a) water and (b) an aqueous solution of a salt former, and (2) an immiscible organic solvent;
agitating the admixture and allowing the phases to separate;
drawing off at least a portion of the solvent phase containing ether derivative;
directing said solvent portion onto a suitable gas chromatographic column;
eluting with inert gas the solvent portion from the column and into an electron capture detector capable of detecting the said ether derivative;
and displaying the output of said detector on a readout device.

4,042,327

ION-PAIRING CHROMATOGRAPHY

William G. Haney, Shawnee Mission, Kans., and Douglas P. Wittmer, Milford, Mass., assignors to Waters Associates, Inc., Milford, Mass.

Filed Jan. 15, 1976, Ser. No. 649,365
Int. Cl.² G01N 31/08
U.S. Cl. 23—230 R **17 Claims**

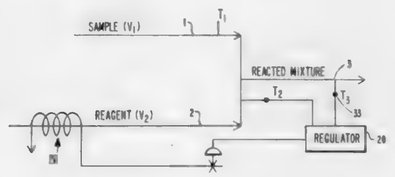
1. In liquid chromatographic processing of compositions containing ionizable compounds, wherein the sample to be processed is carried in a mobile liquid phase which is passed through a porous packing material, in intimate physical contact therewith, and wherein said packing material has a chemical group chemically bonded onto the surface of said packing, the improvement comprising the steps of:
1. dissolving a counter ion, to a characterizing radical of at least one of said ionizable compounds, in a polar mobile liquid;
2. forming a reversible complex between said counter ion and at least one said characterizing radical, said complex being soluble in said polar liquid;
3. passing said complex through said packing for a time sufficient that chemical attraction between said complex and chemically-bonded group causes substantial retardation of the complex through the column; and
4. analyzing the effluent of said column.

4,042,328

ON-LINE ANALYZER

George W. Seymour, 2841 Parkwood Drive, Brunswick, Ga. 31520

Filed Apr. 6, 1976, Ser. No. 674,261
Int. Cl.² D21C 7/12; G01N 25/48
U.S. Cl. 23—230 R **7 Claims**



1. A process for continuously determining the concentration of at least one chemical substance in a moving fluid sample stream which comprises:
mixing an excess of a reagent stream with said fluid sample stream to form a final reacted mixture stream, said reagent stream being reactive with said chemical substance to produce either an exothermic or endothermic reaction;
regulating the temperature of said reagent stream so that the temperature of the final reacted mixture stream approximates the temperature of the reagent stream, or regulating the temperature of the sample so that the temperature of the final reacted mixture stream approximates the temperature of the reagent stream; and then
determining the concentration of the chemical substance in accordance with the following equation:

$$X = \frac{V_1(T_3 - T_1) + V_2(T_3 - T_2)}{C\,V_1}$$

where
X is said concentration of at least one chemical substance, in said sample stream;
T_1, T_2 and T_3 represent the temperatures of said sample stream, reagent stream and final reacted mixture stream, respectively;
V_1 represents the flow rate of said sample stream;
V_2 represents the flow rate of said reagent stream; and
C is a factor which equals

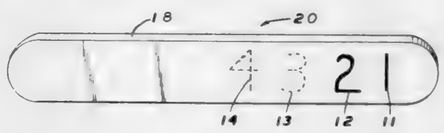
$$\frac{(\Delta H_{Reaction})\ (\text{heat capacity of the sample stream})}{\text{molecular weight of the chemical substance being determined.}} \times \%\ \text{completion}$$

4,042,329

METHOD AND DEVICE FOR DETECTING CHOLESTEROL

Harry T. Hochstrasser, Hastings-on-Hudson, N.Y., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Continuation-in-part of Ser. No. 533,972, Dec. 18, 1974, Pat. No. 3,964,871. This application Apr. 14, 1976, Ser. No. 676,662
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.² G01N 33/16
U.S. Cl. 23—230 B **14 Claims**



9. A method of determining the concentration of cholesterol in a biological solution which comprises;
immersing in said solution an indicator which comprises;
a support member; and
a plurality of indicating reagents for said cholesterol, each of which is located in a separate zone of said member and at least two of which indicate the presence of a different concentration of said cholesterol in solution;
removing said indicator from said solution; and observing the indicia registered.

4,042,330

IN A METHOD FOR CHECKING THE ACCURACY OF A TEST USING AN ENZYMATICALLY HYDROLYZABLE, SERUM-SOLUBLE CHOLESTEROL COMPOUND

Arvind D. Deshmukh, 1011 Pearl St., Santa Monica, Calif. 90405

Filed Aug. 23, 1976, Ser. No. 716,616
Int. Cl.² G01N 33/16
U.S. Cl. 23—230 B **9 Claims**

1. In a method for checking the accuracy of a test for the quantitative determination of the cholesterol content of a biological fluid wherein said test is conducted on a standard comprising a solution in said biological fluid of a known quantity of a serum-soluble cholesterol compound, the improvement in accordance with which said cholesterol compound is at least one ester of cholesterol reactively combined with a solubilizing agent selected from the group consisting of peptides, proteins, water-soluble polycarboxylic acids, organic and inorganic water-soluble salts of said polycarboxylic acids, and cis-vicinal water-soluble polysaccharides, said ester of choles-

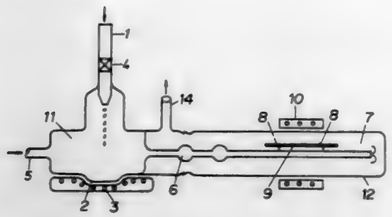
terol being selected from the (a) esters of an acid having at least six carbon atoms in its longest chain, and (b) amino esters.

4,042,331

PROCESS FOR THE DETERMINATION OF THE BORON CONTENTS OF PURE HALOGENSILANES

Dietrich Schmidt, Burghausen; Johann Hofer, Kirchdorf; Winfried Lang, Burghausen, and Erich Bildl, Holzoster, all of Austria, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Germany

Filed Nov. 1, 1976, Ser. No. 737,307
Claims priority, application Germany, Dec. 23, 1975, 2558183
Int. Cl.² G01N *31/12*
U.S. Cl. 23—230 PC **8 Claims**



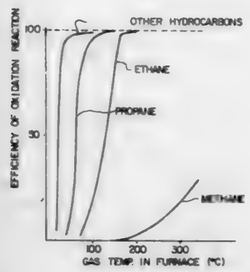
1. A process for the determination of the boron content of pure halogen-silanes which contain up to 0.1% of atoms of acceptors and donors, which comprises the steps of converting the halogen silanes into the gaseous state in a testing apparatus by contacting said halogensilanes with an evaporator surface heated to a temperature ranging from 80°C to 350°C, passing the generated gases to a silicon support heated to the decomposition temperature of the gases whereby the released silicon is deposited on the support, removing the support and the deposit thereon from the testing apparatus and determining the boron content by calculation from the measured value of the specific resistance of the support plus the deposited silicon, with the proviso that all parts of the testing apparatus which come into contact with the gas should be at a temperature above 80°C, but below the decomposition temperature of the halogensilane, with the exception of the support heated to the required deposition temperature.

4,042,332

SEPARATION METHOD OF METHANE FROM OTHER HYDROCARBONS THAN METHANE

Osamu Saitoh; Masakatu Imaki, both of Kyoto, and Huzime Asami, Higashiosaka, all of Japan, assignors to Horiba, Ltd., Japan

Filed Feb. 10, 1976, Ser. No. 643,952
Claims priority, application Japan, Dec. 23, 1974, 49-50178
Int. Cl.² G01N *31/10, 31/12*; B01D *53/16*
U.S. Cl. 23—232 R **7 Claims**



1. A method for the separation of methane from a gaseous mixture containing methane and at least one of ethane and propane which comprises

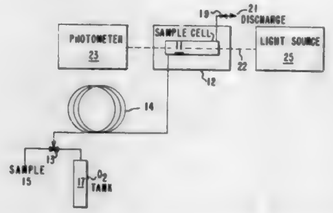
a. simultaneously passing said gaseous mixture and oxygen over a catalyst comprising platinum on an active carbon carrier;
b. selectively oxidizing the ethane and propane in said gaseous mixture at a temperature of about 170° C and
c. recovering methane from said mixture.

4,042,333

APPARATUS AND METHOD FOR GAS ANALYSIS

Curtis G. Dell, and James A. Williamson, Jr., both of Newark, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 448,690, March 6, 1974, abandoned.
This application Feb. 11, 1976, Ser. No. 657,046
Int. Cl.² G01N *1/22, 21/24*
U.S. Cl. 23—232 R **8 Claims**



1. A method for analyzing a sample gas, comprising the steps of:

a. introducing the sample gas into a high pressure sample cell through a long narrow holding tube having a volume greater than the volume of the sample cell;
b. adjusting the pressure of the sample gas in the sample cell and the holding tube to a known value;
c. closing off the sample cell at the end opposite the holding tube;
d. introducing a second gas, which will not interfere with the analysis, into the holding tube, behind the sample gas, at a pressure sufficient to force all of the sample gas contained in the holding tube into the sample cell adding to the sample gas originally contained in the sample cell so that the pressure of the sample gas in the sample cell is increased; and
e. detecting the presence of at least one component of the sample gas.

4,042,334

HIGH TEMPERATURE CHEMICAL REACTOR

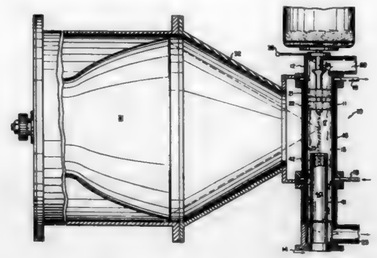
Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

Division of Ser. No. 271,560, July 13, 1972, Pat. No. 3,933,434.
This application June 30, 1975, Ser. No. 591,950
Int. Cl.² B01J *1/00*
U.S. Cl. 23—252 R **18 Claims**

1. A high temperature reactor wherein substantially all of the heat is supplied by radiation coupling comprising:

a. a reactor tube having an inlet end and an outlet end, the interior of the tube defining a reactor chamber, the reactor tube being made of a material which is substantially transparent to radiation and including an inner wall and an outer wall which define an annular channel therebetween throughout which a fluid medium which is substantially transparent to radiation can be circulated to cool the reactor tube;
b. a diffuser disposed adjacent the inlet end of the reactor tube through which an inert gas which is substantially transparent to radiation is directed under pressure, and thereafter in substantially laminar flow axially through the

reactor chamber to provide a protective blanket for the inner wall of the reactor tube;
c. means for introducing at least one reactant into the reactor chamber through the inlet end of the reactor tube in a predetermined path axially of the reactor tube, the reactants being confined substantially centrally within the reactor chamber and out of contact with the inner wall of the reactor tube by the protective blanket; and



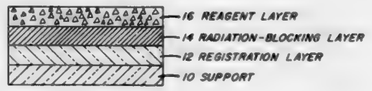
d. a radiant energy source located externally of the outer wall of the reactor tube and disposed within a reflector, the reflector being configured and positioned to focus radiant energy generated by the source to at least a portion of the predetermined path of the reactants within the reactor chamber.

4,042,335

INTEGRAL ELEMENT FOR ANALYSIS OF LIQUIDS

Pierre L. Clément, Paris, France, assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 598,462, July 23, 1975, abandoned. This application June 25, 1976, Ser. No. 691,265
Int. Cl.² G01N *31/22*
U.S. Cl. 23—253 TP **20 Claims**



1. An integral element for analysis of liquids, the element comprising,

a reagent layer comprising a composition that is interactive in the presence of a predetermined analyte to provide a diffusible, detectable species,
a non-fibrous radiation-blocking layer, permeable to the detectable species and comprising an opacifying agent,
a radiation-transmissive registration layer, permeable to the detectable species, within which said species can be detected and comprising a non-fibrous material,

wherein the radiation-blocking layer is interposed between the registration layer and the reagent layer.

4,042,336

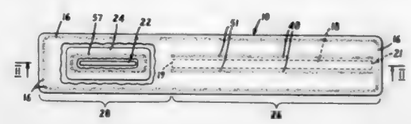
TIME TEMPERATURE INTEGRATING INDICATOR

Raymond P. Larsson, Denville, N.J., assignor to Bio-Medical Sciences Inc., Fairfield, N.J.

Continuation-in-part of Ser. No. 469,851, May 14, 1974, Pat. No. 3,946,611. This application Sept. 22, 1975, Ser. No. 615,300
The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.
Int. Cl.² G01N *21/06*
U.S. Cl. 23—253 TP **11 Claims**

1. A temperature time integrating indicator device which comprises:

a. an elongated envelope having generally co-extensive upper and lower walls each of a gas impermeable material, the walls being sealed together in a continuous course extending about the periphery of each, a first longitudinal portion of said envelope comprising a gas generation section within said envelope and a second longitudinal portion of said envelope comprising an indicating section within said envelope;
b. a gas generating material disposed in the gas generation section of said envelope;
c. an elongated wick disposed longitudinally of the envelope with one end thereof in said gas generation section, said



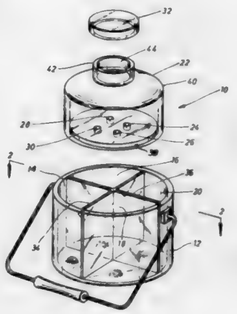
wick extending a distance along said envelope indicating section and the other end thereof being remote from said gas generating section;
d. a rate controlling film separating said wick from the gas generating material;
e. an indicator composition deposited on said wick, said indicator composition producing a color change in the presence of gas generated by said gas generating material; and
f. a quantifier incorporated into the indicator composition.

4,042,337

URINE COLLECTION DEVICE

Donald P. Griffith, 1200 Moursund, Houston, Tex. 77025

Filed Feb. 17, 1977, Ser. No. 769,693
Int. Cl.² G01N *33/16, 1/10*; A61B *10/00*
U.S. Cl. 23—259 **1 Claim**



1. A urine collection device comprising:

a receptacle for holding liquid urine having a bottom and sides,
said receptacle being divided into separate, noncommunicating bins defined by walls extending from the bottom to the upper edge of the sides, one or more of said bins containing a chemical compound for effecting desired characteristics in urine introduced into the respective receptacle bins; and
a manifold for attachment atop the sides of said receptacle, said manifold including a base plate having at least one opening formed therein for each bin of said receptacle, with each of said openings being positioned to register with a respective one of said bins when said manifold is placed on said receptacle, and
an upper cover disposed a distance away from said base plate at its center and attached at its periphery to said base plate, said upper cover and said base plate in combination forming a chamber, and

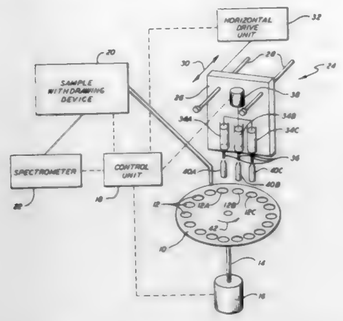
a closeable inlet in the upper end of said manifold communicating with the chamber formed therein for introducing liquid urine into said chamber.

4,042,338

AUTOMATIC SAMPLE PREPARATION DEVICE

Bernhard Werner Huber, Uberlingen, Germany, assignor to Bodenseewerk Perkin-Elmer & Co. GmbH, Uberlingen, Germany

Filed July 30, 1976, Ser. No. 710,015
Claims priority, application Germany, Sept. 13, 1975, 2540969
Int. Cl.² G01N *1/14*
U.S. Cl. 23—259 **18 Claims**



1. An automatic sample preparation device for use in flameless atomic absorption spectroscopy or the like, wherein samples to be examined for a particular element are successively mixed with graduated, metered additions of the element to be determined, comprising, in combination:

controlled delivery pump means,

storage vessel means containing dilution agents connected to the inlet side of said delivery pump means,

a plurality of dosing probes connected to the outlet side of said delivery pump means,

stepwise movable carrier means,

a plurality of sample containers mountable on said carrier means,

a sample withdrawing device for withdrawing samples from said sample containers,

means for jointly moving said dosing probes with respect to said carrier means so that one group of at least two successive sample containers on said carrier means can be simultaneously mixed with graduated, metered additions of the element to be determined prior to sample withdrawal.

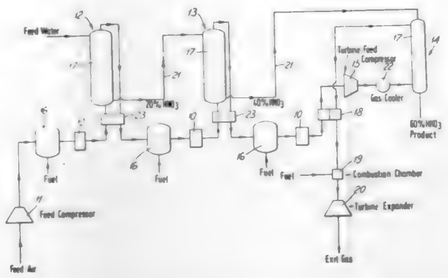
4,042,339

PRODUCTION OF NITRIC ACID

Geoffrey Gordon Haselden, and Douglas Handley, both of Leeds, England, assignors to University of Leeds Industrial Services Limited, England

Filed May 9, 1975, Ser. No. 576,123
Claims priority, application United Kingdom, May 20, 1974, 22448/74
Int. Cl.² B01J *7/00*; C01B *21/40*; F23L *15/02*; F28D *17/02*
U.S. Cl. 23—262 **9 Claims**

1. A reactor to be operated at superatmospheric pressure and on the regenerative principle with flow reversal comprising a stationary steel pressure vessel capable of withstanding an internal pressure of a plurality of atmospheres, a stationary refractory gas-permeable regenerator wall enclosed by said pressure vessel and in turn surrounding a cylindrical furnace chamber, burner means for introducing and burning fuel in said furnace chamber, a stationary gas-impermeable dividing wall dividing said cylindrical furnace chamber into sections, said dividing wall having a gap for intercommunication between the sections of said furnace chamber, and a respective gas inlet/outlet in the pressure vessel wall communicating with



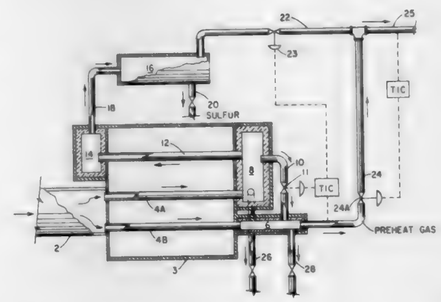
each furnace chamber section through a respective portion of the gas-permeable refractory wall.

4,042,340

APPARATUS FOR USING REHEAT GAS IN SULFUR RECOVERY SYSTEMS

John W. Palm, Tulsa, Okla., assignor to Amoco Production Company, Tulsa, Okla.

Continuation of Ser. No. 467,348, May 6, 1974, abandoned, which is a division of Ser. No. 277,421, Aug. 2, 1972, Pat. No. 3,833,716. This application Nov. 17, 1975, Ser. No. 632,325
Int. Cl.² B01J *1/00*; F22B *7/12*
U.S. Cl. 23—262 **5 Claims**



1. An apparatus for use in the production of sulfur from H_2S-containing acid gases by first converting said H_2S into a mixture of approximately one-third SO_2 and two-thirds H_2S, said apparatus comprising the combination of an elongated metal vessel closed at both ends, a first, second and third series of generally parallel tubes defining a heat exchange section in said vessel, first and second chambers exterior of said vessel and affixed to one of said ends, a third chamber exterior of said vessel affixed to the other of said ends, one end of said first and second series of tubes communicating with said first and second chambers, respectively, means for supplying said mixture to the other end of said first and second series of tubes, said third series of tubes communicating with both said second and third chambers, valve means for withdrawing and controlling the flow of a gas stream from said second chamber and mixing said stream with the contents of said first chamber, the control of said flow from said second chamber to said first chamber varying inversely with the flow rate of said mixture, a first conduit means for withdrawing and controlling the flow of a gas stream from said first chamber, and a second conduit means communicating with said third chamber and with said first conduit means.

4,042,341

MAGNETIC FILMS OF TRANSITION METAL-RARE EARTH ALLOYS

John G. Smeggil, Elnora, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 406,310, Oct. 15, 1973, abandoned. This application Oct. 10, 1975, Ser. No. 621,639
Int. Cl.² B32B *15/04, 9/04*
U.S. Cl. 428—678 **6 Claims**

1. A magnetic member consisting essentially of a non-magnetic solid substrate carrying a magnetically anisotropic film consisting of a transition metal-rare earth alloy, wherein the transition metal component is selected from the group consisting of cobalt, iron, nickel, manganese and alloys thereof, and wherein the rare earth metal component is selected from the group consisting of the 15 elements of the lanthanide series having atomic numbers 57 to 71 and the element yttrium and mixtures thereof, said alloy flim being continuous coherent and substantially uniform, said alloy film having a thickness ranging from about 100 Angstroms to about 10,000 Angstroms and having an easy axis of magnetization significantly aligned perpendicular to the plane of the substrate, and said substrate being substantially inert only at temperatures ranging up to 1000° C.

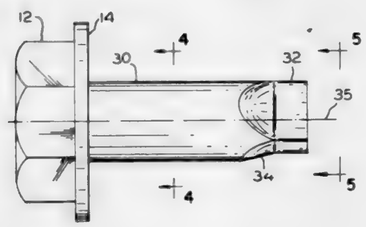
5. A magnetic member according to claim **1** wherein said alloy film has a coating of an inert non-magnetic material which prevents oxidation and deterioration of the magnetic properties of the alloy film.

4,042,342

BLANKS FOR MAKING SELF-THREAD FORMING THREADED FASTENERS

Herman G. Muenchinger, 459 Mount Pleasant St., New Bedford, Mass. 02742

Division of Ser. No. 432,957, Jan. 14, 1974, Pat. No. 3,978,760, which is a continuation-in-part of Ser. No. 3,985, Jan. 19, 1970, Pat. No. 3,681,963, and Ser. No. 253,974, May 17, 1972, Pat. No. 3,803,889. This application June 15, 1976, Ser. No. 696,477
Int. Cl.² B21H *3/00*; F16B *35/00*
U.S. Cl. 428—585 **3 Claims**



1. A blank for making a thread-forming screw fastener comprising a cylindrical shank portion, a head at one end of the shank, a cylindrical lead portion at the other end of the shank having a diameter smaller than the diameter of the shank portion, and an intermediate portion diverging from the lead portion to the shank portion in a substantially conical configuration, the axis of a cone circumscribing the intermediate portion being offset from and parallel with the axis of the lead portion whereby the intermediate portion and the lead portion are eccentric relative to one another to provide a lobe on a portion of the periphery of the intermediate portion, the intermediate portion and the lead portion intersecting along a line which extends at an acute angle with respect to the axis of the lead portion whereby all planes transverse to the axis of the lead portion and extending through said line intersect both the lead portion and the intermediate portion.

4,042,343

FIRE LOG PROCESS AND APPARATUS

Brian C. Bernard, Oakland, Calif., assignor to The Clorox Company, Oakland, Calif.

Filed Sept. 26, 1975, Ser. No. 616,950
Int. Cl.² C10L *5/00, 5/22*
U.S. Cl. 44—10 B **16 Claims**

1. A process for continuously producing fire logs comprising the steps of:

providing a combustible starting ingredient in the form of sawdust,

providing a binder in the form of wax,

heat said wax binder to a liquid state,

mixing said combustible starting ingredient in the form of said wax binder with said sawdust in a mixer to produce a hot mixture,

cooling said hot mixture in a cooler to produce a cool mixture at substantially ambient temperature suitable for forming, and forming said cool mixture into a log shape, wherein the step of cooling the hot mixture of sawdust and hot wax to substantially ambient temperature comprises,

continuously adding said hot mixture at a first temperature to a cooler,

continuously adding inlet air at a temperature lower than that of said hot air mixture to said cooler so that it is in intimate contact with said hot mixture, so as to transfer heat from said hot mixture to said inlet air, and

exhausting the inlet air from said cooler as exhaust air at a temperature higher than the temperature of said inlet air.

10. A cooler for cooling a hot product comprising a generally elongated hollow body defining a pair of side walls, a pair of end walls, top and bottom walls, and further defining inlet and outlet ends, means defining an air inlet opening in said inlet end, means defining an air outlet opening adjacent said outlet end, means defining a hot product opening adjacent said inlet end, means defining a cool product opening in said outlet end, means defining a cool product opening adjacent said outlet end, a conveyor means within said body for conveying said product from said hot product opening to said cool product opening whereby air flow from said air inlet opening to said air outlet opening cools the hot product entering said hot product opening so that a cool product is discharged from said cool product opening wherein said conveyor means comprises a first conveyor in the form of a plurality of spaced, generally parallel rollers rotatably mounted on said side walls intermediate and spaced from said top and bottom walls and motor means for driving said rollers, and wherein said conveyor means further comprises a second conveyor intermediate said first conveyor and said bottom wall, said second conveyor being spaced from said first conveyor, and motor means for driving said second conveyor, whereby product passing between said rollers of said first conveyor falls onto said second conveyor for subsequent transfer to said cool product opening.

4,042,344

PROCESS FOR THE PRODUCTION OF GASEOUS MIXTURES

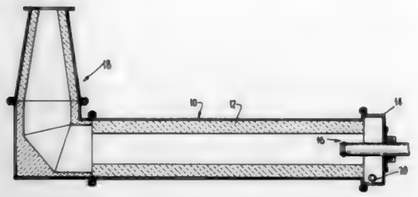
Thomas George Callcott, Mayfield, and Terrence Kevin Deague, Kotara, both of Australia, assignors to The Broken Hill proprietary Company Limited, Victoria, Australia

Filed May 7, 1976, Ser. No. 684,003
Claims priority, application Australia, May 9, 1975, 1532/75
Int. Cl.² C10J *1/12*
U.S. Cl. 48—197 R **9 Claims**

1. A process for the production of a gaseous mixture containing substantial amounts of carbon monoxide and hydrogen, comprising the steps of:

1. blending an oxidizing gas and a primary fuel within a combustion chamber having a combustion zone, said combustion chamber being substantially free of baffles in said combustion zone, to produce a compressible gas or gas-like mixture,

2. causing said mixture to assume a highly turbulent compact and self-contained configuration, provided that, however, when said self-contained configuration is achieved by causing the mixture to swirl, then the swirl number is greater than 0.5 and no greater than about 1.5, and igniting said mixture when in said configuration to achieve total combustion of said primary fuel to produce hot gaseous products, and



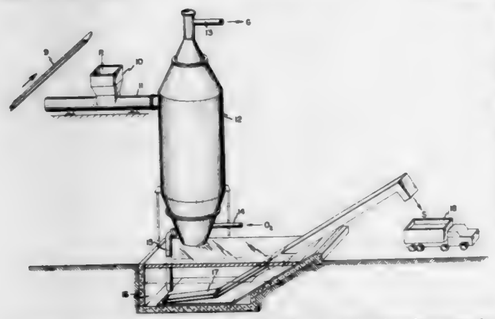
3. thereafter mixing and reacting the hot gaseous products of said combustion process with a gas-like secondary fuel in said combustion chamber, wherein the secondary fuel is introduced into said combustion chamber adjacent to the wall thereof and in physical contact with said self-contained configuration, to produce a gaeous mixture containing substantial amounts of CO and H_2.

4,042,345

PROCESS FOR CONVERSION OF SOLID REFUSE TO FUEL GAS USING PELLETIZED REFUSE FEED

John Erling Anderson, Katonah, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed Apr. 12, 1976, Ser. No. 675,935
Int. Cl.[2] C10J *3/00*
U.S. Cl. 48—209 **5 Claims**



1. In a process for disposing of refuse while simultaneously producing a useful gaseous product and an inert solid residue, comprising the steps of (a) feeding refuse into the top portion of a vertical shaft furnace and forming a bed of said refuse within the furnace, (b) feeding an oxygen containing gas into the base of said furnace, (c) pyrolysing the organic portion of the refuse, (d) fluidizing the inorganic portion of the refuse, (e) discharging the gaseous products from the top of said furnace, and (f) tapping the fluidized inorganic material from the base of said furnace, the improvement comprising:

feeding the refuse into the furnace in the form of pellets of compacted refuse, said pellets being of sufficient structural strength to remain coherent at least within the drying and pyrolysis zones of the furnace, in order to inhibit channeling and to provide a porous structure throughout the height of the refuse bed, said pellets having:

1. a density greater than that given by the equation:

$$D = 2{,}000/(100-0.8A)$$

where:

D = the density of the pellet (lbs./ft.^{3}), and

A = percent inorganics in the refuse pellet, and

2. a surface to volume ratio greater than that given by the equation:

$$R = 15(G/H)^{0.625}$$

where:

R = the ratio of the surface area to the volume of the pellet (ft.^{2}/ft.^{3})

H = the height of the refuse bed in the furnace (ft.)

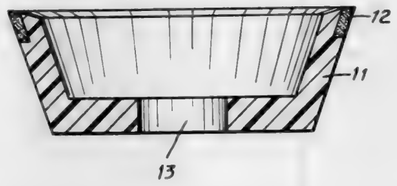
G = the refuse feed rate (tons/day/ft.^{2} of furnace cross-sectional area).

4,042,346

DIAMOND OR CUBIC BORON NITRIDE GRINDING WHEEL WITH RESIN CORE

Richard H. Sioui, Holden, and Edgar B. Carver, South Sutton, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed Dec. 24, 1975, Ser. No. 644,161
Int. Cl.[2] C09K *3/14*
U.S. Cl. 51—298 A **3 Claims**



1. In a grinding wheel comprising a grinding section including an abrasive selected from the group consisting of diamond and cubic boron nitride, said grinding section being bonded to the outer periphery of a non-abrasive core, the improvement comprising the core having a composition consisting essentially of from 5 to 20% by volume of a resin selected from the group consisting of phenol aldehyde, urea aldehyde, and melamine aldehyde resins, from 0 to 90% by volume of fillers selected from the group consisting of aluminum powder, copper powder, and graphite, and from 5 to 80% by volume of cured reaction products of resin molding powders selected from the group consisting of epoxy resins, unsaturated polyester resins, urethane resins, and thermosetting polyimide resins.

4,042,347

METHOD OF MAKING A RESIN-METAL COMPOSITE GRINDING WHEEL

Richard H. Sioui, Holden, Mass., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 460,827, April 15, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,792
Int. Cl.[2] C09K *3/14*
U.S. Cl. 51—298 R **6 Claims**

1. A method of making grinding wheels containing premium abrasives selected from the group consisting of diamond and abrasive boron nitride having a bond matrix consisting of two interlocked continuous phases, one of metal and one of an organic polymer which remains solid at 250° C and below, said metal matrix consisting of a least two metals at least one selected from the group consisting of tin, bismuth, and indium and at least one selected from the group consisting of iron, cobalt, tantalum, manganese, nickel, titanium, silver, and copper and including a phase melting above 250° C, comprising mixing powdered metal, including at least one metal melting below the temperature stability limit of the resin, with abrasive grits, and with an organic resin or resin precursor in powdered form, subjecting such mixture to heat and pressure in a mold such that the metal and resin individually coalesce to form

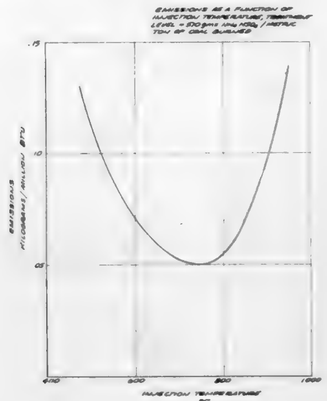
continuous separate interlocked phases throughout which the abrasive particles are uniformly distributed.

4,042,348

METHOD OF CONDITIONING FLUE GAS TO ELECTROSTATIC PRECIPITATOR

Robert P. Bennett, Bridgewater; Matthew J. O'Connor, Flanders; Alfred E. Kober, Hopatcong, and Ira Kukin, West Orange, all of N.J., assignors to Apollo Chemical Corporation, Whippany, N.J.

Filed Aug. 2, 1976, Ser. No. 710,582
Int. Cl.[2] B03C *1/00*
U.S. Cl. 55—5 **28 Claims**



1. A method of improving the collection characteristics of particles entrained in a stream of particle-laden gas formed by the burning of coal for collection by an electrostatic precipitator, comprising forming a mixture of

A. the particle-laden gas at a temperature of 590°–900° C., and

B. finely divided ammonium sulfate; said mixture containing 75–1250 grams of ammonium sulfate per metric ton of coal burned to form said gas, and

C. after forming said mixture, directing said gas stream through a heat exchange means and into an electrostatic precipitator to collect said particles therein.

4,042,349

METHOD OF FRACTIONATION OF A GASEOUS MIXTURE BY ADSORPTION

Yvonne Baudouin, Palaiseau; Guy Simonet, Paris; Robert Eluard, Paris, and Claude Pivard, Paris, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Oct. 18, 1972, Ser. No. 298,774
Int. Cl.[2] B01D *53/04*
U.S. Cl. 55—25 **16 Claims**

1. A method of fractionation of a gaseous mixture by adsorption, utilizing at least one adsorption line including in an adsorption direction at least a first adsorber and a second adsorber, each adsorber comprising at least one adsorbent mass which preferentially adsorbs at least one constituent of said gaseous mixture, said method comprising at least one adsorption cycle carried out with at least one adsorption line, said adsorption cycle comprising successively:

1. in a constant-pressure extraction stage, introducing said gaseous mixture successively into the inlet of said adsorption line in which it circulates in said first adsorber in the adsorption direction under a first pressure and then is expanded between said first adsorber and said second adsorber down to a second lower pressure and then circulates in said second adsorber still in the adsorption direction under said second pressure, and withdrawing a gaseous fraction impoverished in at least said one constituent from the outlet of said adsorption line, under a constant pressure,

2. in a stage of pressure reduction during which the outlet of said adsorption line is closed and the inlet of said second adsorber is in fluid communication with the outlet of said first adsorber, withdrawing from the inlet of said adsorption line, countercurrently to the adsorption direction, at least one gaseous fraction enriched in at least said one constituent, while reducing the pressure in said first and second adsorbers down to a low pressure lower than said second pressure,

3. in a pressure-increase stage, increasing the pressure existing in said first adsorber and said second adsorber from said low pressure up to the first pressure and up to the second pressure respectively.

16. A method of fractionation of a gaseous mixture by adsorption, utilizing at least two adsorption lines, each line including at least one adsorber comprising at least one adsorbent mass which preferentially adsorbs at least one constituent of the gaseous mixture, said method comprising at least one adsorption cycle carried out with at least one adsorption line, said adsorption cycle comprising successively:

1. in a constant-pressure extraction stage, introducing said gaseous mixture into the inlet of said adsorption line, under a high pressure, in an adsorption direction, and

withdrawing a gaseous fraction impoverished in at least said one constituent from the outlet of said adsorption line, in said adsorption direction, under a constant pressure,

2. in a regeneration stage comprising:

2.1. in a balancing period, withdrawing at least a gaseous fraction from the outlet of said adsorber, in said adsorption direction, while reducing at least the pressure existing in said adsorber from a pressure at most equal to the high pressure down to an intermediate pressure,

2.2. in a period of pressure reduction during which the outlet of said adsorption line is closed, withdrawing from the inlet of said adsorption line, countercurrently to the adsorption direction, at least one gaseous fraction enriched in at least said one constituent, while reducing at least the pressure existing in said adsorber, from said intermediate pressure down to a low pressure,

3. in a pressure-increase stage including successively:

3.1. in another balancing period carried out during at least part of the balancing period of the regeneration stage of the other adsorption line, introducing into at least the inlet of said adsorber, in the adsorption direction, a gaseous fraction withdrawn also in said adsorption direction from at least the outlet of a corresponding other adsorber in said adsorption direction of the other adsorption line, while increasing at least the pressure in said adsorber up to another intermediate pressure,

3.2. in a front-rise period, introducing a gaseous fraction impoverished in at least said one constituent into at least

the outlet of said adsorber, countercurrently to the adsorption direction, while increasing at least the pressure existing in said adsorber from said another intermediate pressure up to a final pressure lower than said high pressure,

3.3. in an inflation period, introducing said gaseous mixture into at least the inlet of said adsorber, in the adsorption direction, while increasing at least the pressure existing in said adsorber from said final pressure, up to a pressure at most equal to said high pressure,

each adsorption line comprising, in the direction of adsorption, at least one first adsorber and one second adsorber, said another balancing period of the pressure-increase stage comprising:

in a first balancing period, placing the inlet of the first adsorber into communication with the outlet of the corresponding other first adsorber of the other adsorption line,

in a second balancing period, placing the inlet of the second adsorber into communication with the outlet of the corresponding other second adsorber of the other adsorption line.

4,042,350

METHODS AND APPLICATIONS OF PREPARATIVE SCALE CHROMATOGRAPHY

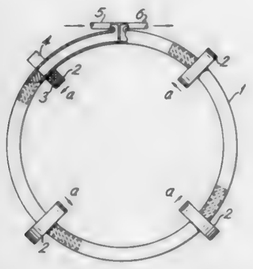
Courtenay Stanley Goss Phillips, Oxford, England, assignor to National Research Development Corporation, London, England

Filed June 20, 1975, Ser. No. 588,908

Claims priority, application United Kingdom, July 3, 1974, 29491/74

Int. Cl.[2] B01D *15/08*

U.S. Cl. 55—28 **10 Claims**



1. A chromatographic method for fractionating a mixture of sorbate components in a continuous operation comprising:

providing a flow path of sorbent having different affinities for the sorbate components of said mixture;

feeding said mixture into said flow path of sorbent; and

thermally displacing a sorbate through said sorbent in advance of a substantially uniform heat zone of limited width to fractionate said sorbate components into an abutting succession of components in accordance with the affinities of said components for said sorbent by relative movement between the sorbent and the heat zone, the mixture being fractionated into sorbate components in the advancing relatively cool area of sorbent ahead of said heat zone, the amount of all sorbate components falling into said heat zone being relatively insignificant.

4,042,351

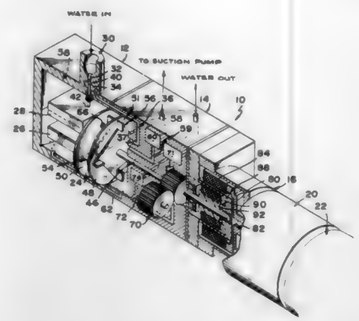
LIQUID DEGASIFIER SYSTEM AND METHOD

Robert L. Anderson, Boulder, Colo., assignor to Halbert (NMI) Fischel, Encino, Calif.

Filed Jan. 28, 1976, Ser. No. 653,229

Int. Cl.[2] B01D *19/00*

U.S. Cl. 55—52 **23 Claims**



1. A system for removing gases from a liquid stream on a continuous basis comprising:

means providing a liquid to be degassed;

means, including rotating impeller means rotating about a central axis and means for defining a chamber about the impeller means providing a hollow annular volume having an at least partially curvilinear cross section concentric with the central axis and extending about the periphery of the impeller means, the rotating impeller means receiving the liquid and centrifugally directing the liquid into a helical liquid flow with interior cavitation within the hollow annular volume as well as along the outer periphery, as the impeller means rotates;

settling chamber means coupled to receive liquid from the periphery of the hollow annular flow at a bottom region thereof;

means coupled to said settling chamber means and to said chamber about the impeller means for maintaining low gas pressures therein to remove gases from both of said means; and

means coupled to said settling chamber means for extracting liquid therefrom.

3. The method of continually degasifying a liquid comprising the steps of:

centrifugally inducing a toroidal vortex flow pattern about and along an axis circumferential to a central axis with internal cavitation at the circumferential axis while drawing a suction interior to the toroidal flow to provide a first extraction of gases;

withdrawing liquid from the periphery of the toroidal flow;

storing a volume of the withdrawn liquid;

drawing off entrapped gases from the withdrawn liquid under suction to provide a second extraction of gases; and

removing the degasified liquid from the volume under suction.

4,042,352

METHOD FOR THE REMOVAL OF THE DUSTS FROM COMBUSTION EXHAUST GASES

Shujiro Shiga, Chiba; Takeshi Katsumata, Ichihara; Yasushi Okamoto, Ichihara, and Takashi Nakata, Ichihara, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 22, 1976, Ser. No. 679,447

Claims priority, application Japan, Apr. 22, 1975, 50-49249

Int. Cl.[2] B01D *43/30*

U.S. Cl. 55—98 **4 Claims**

1. A method for the removal of the dusts from combustion exhaust gases by a fixed packed bed, which comprises passing a dust-containing combustion exhaust gas through a fixed packed bed filled with a spherical, cylindrical or annular filler material containing pores having a pore diameter which ranges from 100–70,000A and a pore volume of not less than 0.1 cm^3/g at least 20% of said pores having a diameter of not less than 1,000A, said filler material making up said bed having a minimum of 1 to 15mm.

4,042,353

METHOD AND APPARATUS FOR FILTERING THROUGH PARTICULATE MATERIAL

Richard D. Warda, Fort Saskatchewan; Robert K. Buhr, Kanata, and John E. Rehder, Montreal, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Jan. 27, 1975, Ser. No. 544,623

Claims priority, application Canada, Feb. 22, 1974, 193274

Int. Cl.[2] B01D *46/32*

U.S. Cl. 55—99 **6 Claims**



1. A method of treating a solid particulate material with a gas, comprising:

a. feeding, as a major portion of the particulate material to be treated, a first feed comprising coarse particles predominantly in the range 30 mesh to ½ inch into an upper portion of an upwardly extending, elongated casing,

b. feeding a particulate material treating gas into the casing at a position below the first feed thereto and below a gas outlet therefrom,

c. feeding, as a minor portion of the particulate material to be treated, a second feed comprising at least 50% by weight of fines predominantly in the range 140 mesh to 30 mesh, the remainder being superfines, into the upwardly extending elongated casing at a position at least as high as the level at which the treating gas is fed thereto,

d. allowing the coarse particles of the first feed, and at least a major portion of the fines, and a minor portion of the superfines, of the second feed to freely gravitate downwardly in the casing in counterflow to the flow of substantially all of the gas to the gas outlet, and accumulate as a packed particulate bed in a container sealed to the lower end of the casing and above means controlling the exit flow rate of particulate material from the container,

e. maintaining, by the means controlling the exit flow rate of the particulate material from the container, the height of the packed bed so that it:

i. covers a louvered, packed particulate bed retaining, gas inlet to one side of the container for passage of gas, fines and superfines to the packed bed therein,

ii. covers a louvered, packed particulate bed retaining, gas outlet facing the louvered, packed particulate bed retaining, gas inlet from another side of the container for passage of gas from the packed bed therein, and

iii. causes substantially all of the treating gas to flow upwardly as a gas stream along the casing so that the remaining superfines and any remaining fines are entrained in the gas stream and are carried thereby upwardly along the casing as entrained particles to the gas outlet from the casing,

f. conveying the entrained particles solely by means of the gas stream pressure in the casing, from the casing gas outlet, downwardly by a pipe having a substantially unobstructed bore and finally extending along a curved path to the louvered packed particulate bed retaining, gas inlet,

g. conveying at least a fraction of the entrained particles finer than the remainder thereof through the louvered, packed particulate bed retaining, gas inlet by the gas stream,

h. filtering a substantial portion of the entrained particles, conveyed by the gas stream through the packed particulate bed retaining, gas inlet, by passage of these entrained particles and at least a substantial portion of the gas stream through the packed particulate bed, in a transverse direction to the direction of flow of the packed particulate bed, towards the louvered, packed particulate bed retaining, gas outlet, and

i. conveying gas of the gas stream escaping from the container through the louvered, packed particulate bed retaining, gas outlet and upwardly and away therefrom and wherein,

j. the particulate material gravitating downwardly in the casing is directed by means of an inclined baffle towards a portion of the container interior adjacent the louvered, packed particulate bed retaining, gas inlet, so that the packed particulate bed has a predominance of the relatively finer particles therein adjacent the louvered, packed particulate bed retaining gas inlet, and a predominance of the relatively coarser particles therein adjacent the louvered, packed particulate bed retaining, gas outlet.

4,042,354

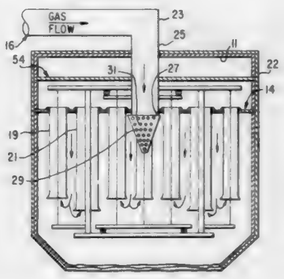
ELECTROSTATIC PRECIPITATOR HAVING AN IMPROVED DISCHARGE AND COLLECTOR ELECTRODE SYSTEM AND GAS DISTRIBUTION MEANS

William Howard Tully, Cockeysville, Md., assignor to Environmental Elements Corporation, Baltimore, Md.

Continuation-in-part of Ser. No. 440,132, Feb. 5, 1974, abandoned. This application May 30, 1975, Ser. No. 582,393

Int. Cl.[2] B03C *3/40*

U.S. Cl. 55—129 **6 Claims**



1. An improved electrostatic precipitator for removal of corrosive particles from a corrosive particle laden gas passing therethrough comprising:

a shell having a corrosive resistant lining secured thereto;

a corrosive resistant support plate secured to said shell of said precipitator;

first and second sets of juxtaposed corrosive resistant collector electrode tubes suspended from said support plate, said collector tubes of said second set being of larger diameter than those of said first set;

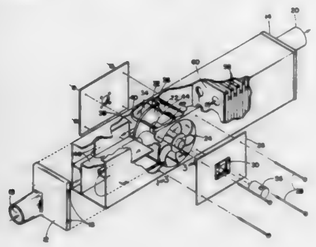
a corrosive resistant top support grid spaced above said support plate and insulated from said shell;

a corrosive resistant bottom guide grid spaced below said first and second sets of collector electrode tubes;

corrosive resistant discharge wires secured to said top sup-

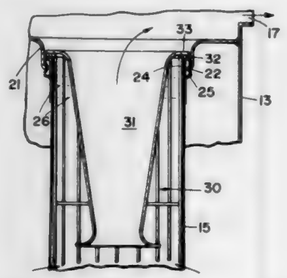
port grid and said bottom guide grid and passing through the center of each collector electrode tube in said first set;
corrosive resistant discharge support members secured to said top support grid and said bottom guide grid and passing through the center of each collector electrode tube in said second set for supporting said bottom grid;
inlet port means for supplying said corrosive particle laden gas to the interior of said precipitator; and
outlet port means for removing the treated gas from said precipitator;
wherein the improvement comprises:
including in said electrostatic precipitator a pressure relief means having a one end connected between said shell and said lining below said support plate and having another end connected to the interior of said precipitator above said support plate for maintaining negative atmosphere pressure between said shell and said lining to prevent positive pressure between said shell and lining thereby maintaining said lining against said shell said pressure relief means being corrosive resistant.

4,042,355
POLLUTION CONTROL DEVICE
Paul W. Pearson, 7735 Mission Gorge Road, Santee, Calif. 92071
Filed Oct. 15, 1974, Ser. No. 514,829
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—319 **3 Claims**



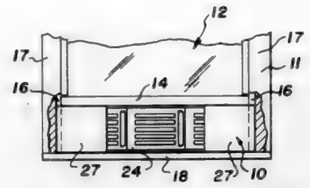
1. A smog arrester comprising:
a. an enclosure having an inlet for attachment to a source of polluted air and an outlet;
b. a generally cylindrical wall disposed in said enclosure and having side plates covering the ends thereof and a generally circular wall orthogonally mounted in said cylindrical wall to define a first chamber and a second chamber larger than said first chamber and substantially sealed therefrom by said circular wall;
c. a coaxial shaft rotationally mounted in said cylindrical sidewall and having a first rotor and a second rotor mounted on said shaft in said first and second chamber respectively, each of said rotors having a pluraiity of blades radially extending from, and parallel to the axis of, said shaft, the blades of both of said rotors being of substantially the same length and extending substantially to said cylindrical wall and the blades of the second rotor being wider in the axial direction than the blades of the first rotor such that the second rotor is capable of moving more gas than the first rotor when both rotors have the same angular velocity;
d. means defining a complete passageway within said enclosure from said inlet to said outlet via said rotors, comprising:
i. said circular wall having an entry aperture into said first chamber and ducting connecting said inlet thereto to deliver gas from said first rotor;
ii. said circular wall having an exit aperture in said first chamber and an entry aperture in said second chamber, and including means mounted in said enclosure defining a gas expansion passageway from said first chamber exit to said second chamber entry aperture; and
iii. a baffle housing portion in said enclosure communicating with said enclosure outlet and including an exit aperture in said circular wall leading from said second chamber and communicating with said baffle housing portion; and
e. a plurality of baffles disposed in the baffle housing portion of said enclosure, whereby gas forced into said inlet enters said first chamber to cause rotation of said first rotor directly and said second rotor indirectly, thus causing a reduced gas pressure in said expansion passageway, and said gas then passes through said expansion passageway and said second chamber and through said baffles and through said outlet such that impingement of said gas on said baffles causes the precipitation of suspended particulates thereon.

4,042,356
BAG HOUSE CELL PLATE AND FILTER BAG ATTACHMENT THERETO
Edward M. Miller, San Rafael, Calif., assignor to Industrial Clean Air, Inc., Berkeley, Calif.
Filed Mar. 3, 1976, Ser. No. 663,554
Int. Cl.[2] B01D *46/02*
U.S. Cl. 55—341 R **7 Claims**



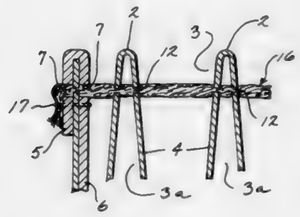
1. In an enclosed bag house having a horizontal cell plate dividing the interior of said house into upper and lower compartments, said bag house having means forming a gas inlet into one of said compartments and means forming a gas outlet from the other of said compartments, said cell plate being of metal sheet material and having a plurality of circular openings therethrough between said compartments and a plurality of vertically disposed tubular filter bags in one of said compartments, said bags each being open at one end and closed at the other end, said bags being attached to said cell plate with the open end of each bag being in communication with one of said cell plate openings, the improvement wherein:
each of said cell plate openings is formed by an annular wall integral with said cell plate and drawn therefrom, said wall extending vertically from the plane of said cell plate and terminating in an inwardly facing lip, said lip lying in a plane parallel to the plane of said cell plate and spaced a substantial distance vertically therefrom,
and wherein at least one of said bags includes a hoop-shaped resilient spring at its open end and means forming an outwardly facing groove around the periphery of said open end of said one bag, and wherein said groove has received therewithin the lip of the annular wall forming the cell plate opening in communication with the open end of said at least one bag.

4,042,357
AIR FILTER UNIT FOR SLIDING SASH WINDOWS
Rose Eleanor Gysi, 637 Linden Ave., Victoria, British Columbia, Canada (V8V 4G6)
Filed Apr. 28, 1976, Ser. No. 681,059
Int. Cl.[2] B01D *45/00*
U.S. Cl. 55—417 **2 Claims**



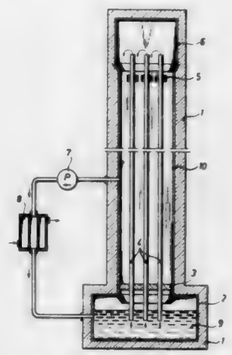
1. A filter unit to be fitted in the frame of a sliding sash window between the sash and the bottom or the top of the frame, comprising a central member of substantially rectangular cross section, two end members of substantially rectangular cross section, each of said end members being dimensioned to receive and slidably fit over an adjacent end of the central member; each of said end members having front and rear walls and upper and lower edges, said upper and lower edges lying over upper and lower edges of the central member; ventilating apertures in front and rear walls of the central member through which air can flow through said central member, a filter pad in the central member through which said air must flow, said central member having a vertical slot in the rear wall thereof through which said filter pad can be inserted and removed from the central member, an air impervious sheet removably mounted in the central member extending longitudinally thereof and between the apertures of the front and rear walls selectively to prevent air from flowing therethrough, an end portion of said impervious sheet normally projecting through said vertical slot and by means of which the sheet can be grasped and partially or completely withdrawn through said vertical slot, and filler strips on and extending the length of said upper and lower edges of the central member and having outer surfaces facing away from the central member, said upper and lower edges of the end members having slots therein to accommodate the filler strips of the central member, the outer surfaces of said filler strips and the upper and lower edges of the end members being in upper and lower common planes and forming continuous upper and lower edges for said filter unit and extending the full length thereof whereby, when said unit is placed between a window sash and the frame thereof, there is no space between the sash and the frame of air to flow through.

4,042,358
FILTER MEDIA
Stanley H. Frohmader, Madison, Wis., assignor to Research Products Corporation, Madison, Wis.
Filed May 14, 1976, Ser. No. 686,386
Int. Cl.[2] B01D *46/52*
U.S. Cl. 55—497 **7 Claims**



1. An air filter comprising, in combination:
a. a collapsible expandible accordian-shaped filter body having reverse folds forming pockets having common walls therebetween,
b. said walls having at least one row of aligned holes disposed therein,
c. and an elongated string-like member threaded through said holes and with said string-like member forming means which frictionally engages the edges of said holes so that said walls are fixedly held in place along said member by said frictional engagement when said filter body is expanded.

4,042,359
PROCESS FOR PRODUCTION OF POROUS GLASS MEMBRANE TUBES
Roland Schnabel, Hofheim; Alexander Hölzel, Mainz-Finthen, and Kurt Gotter, Mainz, all of Germany, assignors to Jenaer, Glaswerk, Schott & Gen., Mainz, Germany
Filed Nov. 13, 1975, Ser. No. 631,471
Claims priority, application Germany, Nov. 14, 1974, 2454111
Int. Cl.[2] C03B *37/02;* **C03C** *25/00*
U.S. Cl. 65—2 **13 Claims**



1. A process for the production of a microporous tubular glass self-supporting membrane in the form of a hollow fiber comprising the steps of:
I. drawing a hot endless thin walled glass hollow fiber from a melt of an alkali borosilicate glass, and then immediately,
II. directly cooling the hot hollow fiber by cooling devices which are arranged directly beneath the tip sufficient to fix its external shape and internal structure the walls of the separate fibers being free, and then
III. heating the hollow fiber to a temperature sufficient to effect phase separation into
A. a coherent, silicon dioxide phase, which is substantially insoluble in mineral acid, and,
B. a boron oxide phase rich in alkali borate and then
IV. extracting the hollow fiber with mineral acid by circulating the acid along the inside wall and the outside wall of the hollow fiber thereby dissolving out the boron oxide phase, thereby forming a microporous tubular glass membrane of the substantially insoluble silicon dioxide phase,
wherein the hollow fiber has initial pore sizes between 11 A and 50 A and
wherein the glass has the following composition by weight:
A. B_2O_3 20–35% by weight.
B. Alkali metal oxide 4–12% by weight.
SiO_2 balance essentially.

4,042,360

PRODUCTION OF INORGANIC FIBERS WITH INORGANIC CORES

John L. Kane, and George R. Machlan, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 557,721, March 12, 1975, Pat. No. 4,013,435. This application Oct. 29, 1975, Ser. No. 626,952
Int. Cl.² C03B *37/02*
U.S. Cl. 65—11 W **19 Claims**



1. Apparatus for coating filaments comprising an applicator having an elongate body with a central supply chamber extending therethrough, a plurality of transverse grooves positioned in a common plane on an outer surface of said body, said body having a plurality of transverse passages, each of said passages connecting said chamber with one of said grooves, means for supplying liquid coating material to said chamber under pressure, a bushing having a bottom with a predetermined number of orifices from which the filaments are attenuated, said orifices being staggered so that lines taken centrally through the orifices and perpendicular to a line parallel to the longitudinal extent of the bushing bottom are equally spaced.

6. Apparatus for coating fibers comprising an applicator for applying coating material to a plurality of the fibers located in a common plane, means spaced from said applicator for collecting the coated fibers, and an oven, said oven comprising a housing, heating panels within said housing and forming a passage extending from one end of the housing to the other and having an elongate transverse cross-sectional shape, said housing having a slot communicating with said passage substantially over the length of said housing, and means for movably supporting said oven between a position in which said passage is located between substantially aligned with said applicator and said collecting means and a position in which said housing is to one side of said applicator and said collecting means.

4,042,361

METHOD OF DENSIFYING METAL OXIDES

Peter P. Bihuniak, Corning; Lewis H. Brandes, Campbell, and Donald L. Guile, Horseheads, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,061
Int. Cl.² C03B *23/20, 19/10*
U.S. Cl. 65—18 **3 Claims**

1. A method of producing a fused silica glass article from fumed silica which comprises,

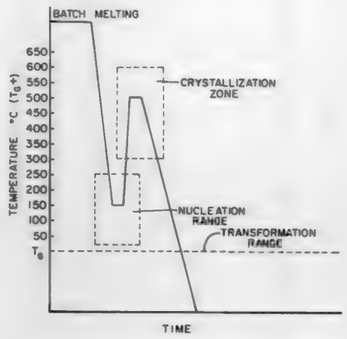
a. mixing fumed silica with a polar liquid to form a flowable silica sol containing up to 45% solids content,
b. removing the liquid from the sol to produce a fragmented solid,
c. calcining the fragmented solid within the temperature range of 1150° C. to 1500° C. to densify the fragments,
d. milling the densified particles with a casting medium to form a casting slip wherein the particles are essentially in the range of one to ten microns,
e. casting the slip in a mold to form a "cast" body, and firing said cast body at a temperature on the order of 1800° C. to 1900° C.

4,042,362

PRODUCTION OF GLASS-CERAMIC ARTICLES

John F. MacDowell, Painted Post, and Hermann L. Rittler, Horseheads, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed May 18, 1976, Ser. No. 687,591
Int. Cl.² C03B *32/00*; C03C *3/22*
U.S. Cl. 65—33 **6 Claims**



1. A method for making a fine-grained glass-ceramic article comprising the steps of:

a. melting a batch for a thermally crystallizable glass;
b. cooling the melt to a temperature between about 25°–250° C. above the transformation range to form a glass body and holding said glass body within that range of temperatures for about 1–30 minutes to develop nuclei therein;
c. heating the nucleated glass body at a rate of at least 10° C./minute to a temperature about 100°–500° C. above the nucleation temperature and holding said nucleated glass body within that range of temperatures for about 1–30 minutes to cause the growth of crystals on the nuclei;
d. cooling the crystallized body to room temperature.

4,042,363

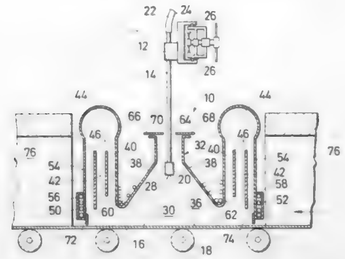
METHOD AND APPARATUS FOR COATING GLASS

Takeshi Maeda, and Seiki Okino, both of Matsusaka, Japan, assignors to Central Glass Co., Ltd., Ube, Japan

Filed Apr. 23, 1976, Ser. No. 679,708
Claims priority, application Japan, Apr. 25, 1975, 50-50517
Int. Cl.² C03C *17/10*
U.S. Cl. 65—60 R **8 Claims**

1. A process for fabricating heat-reflecting glass comprising the steps of spraying a solution of a metal compound onto one side of a hot glass sheet in a spraying zone enclosed by a hood having exhaust gas passages for discharging and removing the exhaust which is generated by the decomposition of the sprayed metal compound; cooling the inner wall surfaces of said hood which surrounds said spraying zone and the atmosphere adjoining said inner wall surfaces to a temperature of between the melting point and the decomposition temperature of said metal compound, and maintaining said temperature during the continuation of the spraying of said solution whereby the said metal compound that is present in said atmosphere adjacent said inner wall surfaces remains in an undecomposed state and is allowed to evaporate and be entrained in said exhaust gas leaving the said spraying zone.

3. An apparatus for fabricating heat-reflecting glass sheets comprising spraying means supported over a transfer line of a hot elongated glass sheet, said spraying means being reciprocating movable in a transverse direction for spraying a solution of a metal compound onto the upper surface of the glass sheet entering a spraying zone; a hood having a downwardly diverging intermediate portion enclosing said spraying zone and upright end portions forming exhaust gas passages on the front and rearward sides of said spraying zone for the exhaust gas to be purged from said spraying zone; temperature control means



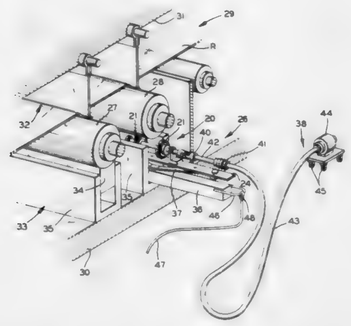
mounted in operable association with said hood to maintain the temperatures of said inner wall surfaces of said downwardly divering intermediate portions and said upright end portions and the atmosphere adjoining said innerwall surfaces at temperatures of between the melting point and the decomposition temperature of said metal compound whereby the said metal compound that is present in the said atmosphere adjacent said inner wall surfaces remains in an undecomposed state and evaporates and is entrained in the exhaust gas leaving said exhaust gas passages.

4,042,364

CLEANING APPARATUS FOR CONVEYOR ROLLS

Roger P. King, Waterville; John W. Grosskopf, Jr., and Francis C. Bondelier, Jr., both of Perrysburg, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Apr. 8, 1976, Ser. No. 674,834
Int. Cl.² C03B *13/18, 18/02*
U.S. Cl. 65—168 **15 Claims**



1. A cleaning apparatus for removing uneven and crusty deposits from and burnishing the cylindrical surfaces of conveyor rolls which support and convey a ribbon of glass in a direction transverse to the axes of the rolls, said apparatus comprising:

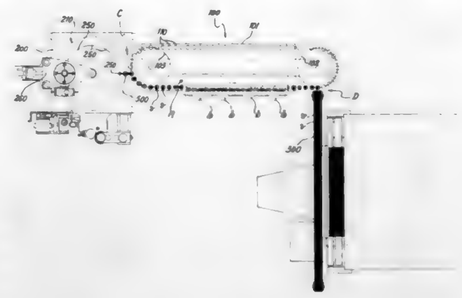
a. a support plate;
b. an annular cleaning device mounted on said support plate and engageable with the cylindrical surfaces of said conveyor rolls;
c. means for rotating said annular cleaning device; and
d. means for yieldingly urging said support plate in a direction perpendicularly to said conveying rolls and said annular cleaning device into engagement with the conveying surfaces of said rolls.

4,042,365

CONVEYOR INSTALLATION FOR THE TREATMENT AND TRANSPORT OF GLASS ARTICLES

Paul Champenois, Guignicourt, France, assignor to Verreries Mecaniques Champenoises, Reims, France

Filed Mar. 18, 1976, Ser. No. 667,979
Claims priority, application France, Dec. 19, 1975, 75.39083
Int. Cl.² C03B *29/04*
U.S. Cl. 65—260 **10 Claims**



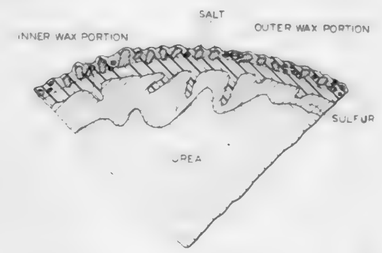
1. An installation for the flame treatment of articles, comprising a chain, a supply means, a loading point and an unloading point, a flame treatment zone comprising a series of burners, and a plurality of rotatable turntables driven linearly and cyclically by said chain between said loading point, at which said articles are loaded onto said turntables by said supply means, and said unloading point, passing through said flame treatment zone; wherein said supply means comprises a molding press, at least one intermediate point, and transfer means for transferring one of said articles from said intermediate point to one of said turntables while the following article is transferred from said press to said intermediate point.

4,042,366

CONTROLLED RELEASE FERTILIZER

Kenneth Eugene Fersch, Marysville, and Wayne Eugene Stearns, West Mansfield, both of Ohio, assignors to The O.M. Scott & Sons Company, Marysville, Ohio

Filed Apr. 5, 1976, Ser. No. 673,791
Int. Cl.² C05B *15/00*; C05C *9/00*
U.S. Cl. 71—29 **11 Claims**



1. A controlled release fertilizer composition in particulate form, each of said particles comprising nitrogen in a form which is slowly released and an inorganic water soluble additive in a form which is quickly released, each of said particles comprising

a core of water soluble nitrogen nutrient source,
a coating of sulfur surrounding said core, and
a coating surrounding said sulfur coating of wax, said coat-

ing comprising an inner portion free of water soluble additives and an outer water soluble additive-containing portion, the inner portion completely covering said sulfur coating and forming a water barrier separating said outer portion from said sulfur coating, the outer portion containing embedded therein particles of at least one inorganic water soluble solid additive of from 325 to 30 mesh size, the ratio by weight of the solid additive to the total weight of said wax being less than 8.

4,042,367

METHOD FOR CONTROLLING THE GROWTH OF AQUATIC PLANTS

Charles G. Wilson, Milwaukee, Wis., assignor to Aquashade, Inc., Dobbs Ferry, N.Y.

Filed Jan. 14, 1972, Ser. No. 217,952
Int. Cl.[2] A01N *9/14*
U.S. Cl. 71—66 **7 Claims**

1. A method for controlling the growth of aquatic plants in a body of water, said method comprising coloring said water with a pigment of a predominantly blue color which absorbs predominantly light of a wavelength around 6500 Angstroms used by said plants for photosynthesis, at a time prior to maturity of said plants, by applying said pigment to said water in an amount sufficient to effectively arrest the growth of said plants, and repeating said coloring step, during the growing season for said plants, with a frequency directly related to the length of the growing season for said plants.

4,042,368

ADDITIVE FOR QUATERNARY AMINE BACTERICIDES AND ALGICIDES, COMPOSITIONS CONTAINING SAME AND METHOD OF MANUFACTURE

Andrew A. Argiriardi, Brooklyn, N.Y., assignor to Epic Chemical Inc., Brooklyn, N.Y.

Filed June 27, 1975, Ser. No. 590,977
Int. Cl.[2] A01N *9/20*
U.S. Cl. 71—67 **5 Claims**

1. A composition useful as a bactericide and an algicide, comprising a mixture of tris (2-hydroxyethyl) benzyl ammonium chloride, and an n-alkyl dimethyl benzalkonium chloride, wherein said n-alkyl group is 10 to 18 carbon atoms in length, the ratio of said tris (2-hydroxyethyl)benzyl ammonium chloride to said benzalkonium chloride being such that the phenol coefficient of the mixture is substantially higher than the weighted average of the components.

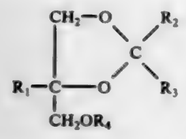
4,042,369

COMPOSITIONS AND METHODS OF COMBATTING WEEDS IN CROPS WITH 2,6-DIHALOBENZYL ETHER

Michael D. Barker, Maidstone; Eirlys R. Isaac, Sittingbourne; Peter Kirby, Maidstone, and Graham C. Smith, Ramsgate, all of England, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 481,723, June 21, 1974, Pat. No. 3,919,252.
This application Apr. 28, 1975, Ser. No. 572,535
Int. Cl.[2] A01N *9/28*; C07D *317/16*
U.S. Cl. 71—88 **8 Claims**

1. A method of combatting weeds in crops at a locus which comprises applying to the locus a selectively herbicidal amount of a 2,6-dihalobenzyl ether of the formula



wherein R_1 and R_2 each is methyl or ethyl; R_3 is hydrogen, methyl or ethyl and R_4 is 2,6-dichlorobenzyl, 2-chloro-6-fluoro-benzyl or 2,6-difluorobenzyl.

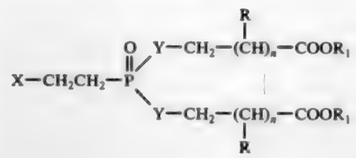
4,042,370

DI-(ACYLOXYALKYL)-β-HALOETHANE-PHOSPHONATES AND DITHIOPHOSPHONATES AND USE AS PLANT GROWTH REGULATORS

Werner Trueb, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 11, 1975, Ser. No. 612,501
Claims priority, application Switzerland, Sept. 18, 1974, 12677/74
Int. Cl.[2] A01N *9/36*; C07F *9/40*
U.S. Cl. 71—86 **14 Claims**

1. A compound of the formula:



wherein

X is chlorine or bromine,

Y is oxygen or sulfur,

R is hydrogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, unsubstituted phenyl or phenyl substituted by one or more members selected from the group consisting of fluoro, chloro, bromo, cyano, carboxy, C_2–C_8 alkoxycarbonyl, C_2–C_8 alkylcarbamoyl, trihaloalkyl, C_1–C_8 alkylsulphinyl, unsubstituted phenylsulphinyl, phenylsulphinyl substituted by a methyl or ethyl group or two methyl groups, C_1–C_8 alkylsulphonyl, unsubstituted phenylsulphonyl, phenylsulphonyl substituted by a methyl or ethyl group or two methyl groups, and nitro,

R_1 is C_1–C_8 alkyl, C_3–C_6 cycloalkyl, unsubstituted phenyl or phenyl substituted by one or more members selected from the group consisting of fluoro, chloro, bromo, cyano, carboxy, C_2–C_8 alkoxycarbonyl, C_2–C_8 alkylcarbamoyl, trihaloalkyl, C_1–C_8 alkylsulphinyl, unsubstituted phenylsulphinyl, phenylsulphinyl substituted by a methyl or ethyl group or two methyl groups, C_1–C_8 alkylsulphonyl, unsubstituted phenylsulphonyl, phenylsulphonyl substituted by a methyl or ethyl group or two methyl groups, and nitro, and

n is 0, 1 or 2.

4,042,371

SULFIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHOD OF USE

Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 394,230, Sept. 4, 1973, abandoned. This application June 27, 1975, Ser. No. 591,257
Int. Cl.[2] A01N *9/00*
U.S. Cl. 71—88 **11 Claims**

1. An herbicide composition comprising an effective amount of a mixture of a thiocarbamate herbicide and an antidotally effective amount of an antidote compound corresponding to the formula

$$R_1—S—R_2$$

in which R_1 is 3,3-dichloroallyl and R_2 is 3,3-dichloroallyl.

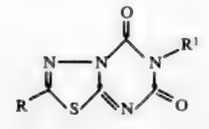
4,042,372

SUBSTITUTED THIADIAZOLOTRIAZINEDIONES AND METHOD OF PREPARATION

Richard W. Harper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Nov. 19, 1976, Ser. No. 743,439
Int. Cl.[2] C07D *513/04*; A01N *9/12*
U.S. Cl. 71—90 **12 Claims**

1. A compound of the formula



wherein

R is selected from the group consisting of methyl, chlorodifluoromethyl, difluoromethyl, trifluoromethyl, pentafluoroethyl, t-butyl, $(CH_3)_2NSO_2$, and morpholinosulfonyl; and

R^1 is hydrogen, methyl, ethyl, ally, phenyl, p-nitrophenyl, or 3,5-dichlorophenyl.

7. A method of controlling unwanted vegetation which comprises the application to the locus of the vegetation of an herbicidally-effective amount of a compound selected from the group consisting of 6-methyl-2-(trifluoromethyl)-5H-1,3,4-thiadiazolo[3,2-a]-s-triazine-5,7(6H)-dione, 2-(dimethylsulfamoyl)-6-methyl-5H-1,3,4-thiadiazolo[3,2-a]-s-triazine-5,7(6H)-dione, 2-(difluoromethyl)-6-methyl-5H-1,3,4-thiadiazolo[3,2-a]-s-triazine-5,7(6H)-dione, 6-methyl-2-(morpholinosulfonyl)-5H-1,3,4-thiadiazolo[3,2-a]-s-triazine-5,7(6H)-dione, and 6-ethyl-2-(trifluoromethyl)-5H-1,3,4-thiadiazolo[3,2-a]-s-triazine-5,7(6H)-dione.

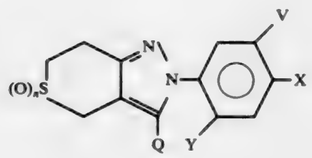
4,042,373

2-ARYL-3-CHLORO-2,4,6,7-TETRAHYDROTHIOPYRANO[4,3-C]-PYRAZOLES

Steven William Moje, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 2, 1976, Ser. No. 692,052
Int. Cl.[2] A01N *9/14*; C07D *495/04*
U.S. Cl. 71—91 **25 Claims**

1. A compound of the formula



where

n is 0, 1, or 2;

Q is chlorine or bromine;

X is fluorine, chlorine, bromine, or cyano;

Y is hydrogen, fluorine, or chlorine; and

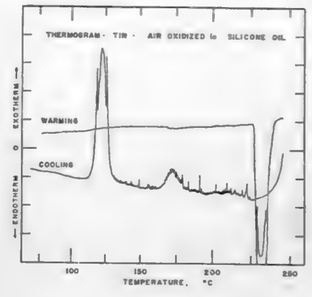
V is hydrogen, fluorine, chlorine or alkoxy of 1 to 3 carbon atoms.

4,042,374

MICRON SIZED SPHERICAL DROPLETS OF METALS AND METHOD

Don H. Rasmussen, and Carl R. Loper, Jr., both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 20, 1975, Ser. No. 560,478
Int. Cl.[2] B22D *23/08*
U.S. Cl. 75—.5 B **23 Claims**



1. The method of preparing micron sized spherical droplets of metals comprising the steps of emulsifying the metal in a molten state in an inert carrier fluid and reacting the molten metal while in the emulsified state in the fluid to form a reaction product on the surface while stabilizes the metal droplets in the emulsion.

4,042,375

ROASTING PROCESS FOR THE DIRECT REDUCTION OF ORES

Anwyn Margaret Martin, Prahran; Donald Ferguson Stewart, Doncaster, and Andrew Baikie Swanson, North Melbourne, all of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Oct. 6, 1975, Ser. No. 620,047
Claims priority, application Australia, Oct. 14, 1974, 9267/74
Int. Cl.[2] C22B *1/08, 1/24*
U.S. Cl. 75—4 **6 Claims**

1. In a process for the direct reduction of ores containing iron oxides by the reductive roasting of pellets containing the ore, the improvement whereby the pellets retain their pellet form during reduction and have a reduced tendency to coalesce, said improvement comprising using for said reduction pellets which have been prepared by the following steps in sequence;

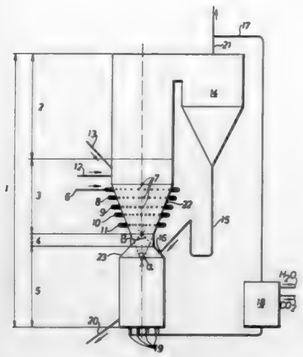
1. forming core pellets consisting essentially of finely ground ore or a mixture of finely ground ore and solid carbonaceous material;
2. coating the core pellets with a coke precursor so that the ratio of skin thickness of coke precursors to the diameter of the coke pellets is in the range from 1:20 to 1:2;
3. heating the coated pellets in a substantially non oxidizing atmosphere to a temperature below 1200° C but high enough to cause the coke precursor to form a coke skin around the coke pellet; the coke precursor comprising from 5 to 25% of a halide salt chosen from the group consisting of chlorides, alkaline earth metal chlorides and fluorides and ammonium chloride.

4,042,376

METHOD FOR CARRYING OUT ENDOTHERMIC REDUCTION PROCESSES IN A CIRCULATING FLUID BED AND AN APPARATUS THEREFOR

Per Harald Collin, Falun, Sweden, assignor to Stora Kopparbergs Bergslags Aktiebolag, Falun, Sweden

Filed Jan. 21, 1976, Ser. No. 650,882
Claims priority, application Sweden, Jan. 24, 1975, 75007971
Int. Cl.[2] C22B *1/10*
U.S. Cl. 75—26 **3 Claims**



1. A method for carrying out endothermic reduction of a finely divided reducible solid material in a circulating fluid bed, comprising,

maintaining fluidization of said solid material in a vertically elongated reaction zone, said vertically elongated zone comprising an upper zone, an intermediate zone, a transport zone and a lower zone, the intermediate and lower zones of which are separated by said transport zone, wherein a gas velocity in said transport zone is so high as to transport essentially all materials entering said transport zone from the lower to the intermediate zone,

generating the heat necessary for the endothermic reduction process in the intermediate zone by partial combustion therein, with molecular oxygen, oxidic and carbonaceous materials, said oxidic and carbonaceous materials also being introduced into said intermediate zone,

transferring part of heat generated by the partial combustion in said intermediate zone to the lower zone of the verticaly elongated reaction zone by withdrawing gases and solid material from said upper zone and separating gases from solid material, the solid material being introduced in the lower zone,

after dust precipitation and elimination of the major part of H_2O and CO_2, utilizing a partial stream of said gases which were separated for the purpose of fluidization and reduction, in the lower zone of the reaction zone, said solid material introduced therein, and

discharging a reduced material preferably from the bottom part of said lower zone.

4,042,377

METHOD OF AND COMPOSITION FOR THE DESULFURIZATION OF STEEL

Gerard Bienvenu, Annemasse, France, and Claude Gentaz, Grand-Lancy, Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Geneva, Switzerland

Filed Dec. 16, 1974, Ser. No. 532,860
Claims priority, application Switzerland, Dec. 14, 1973, 17528/73
Int. Cl.[2] C21C *7/02*
U.S. Cl. 75—53 **23 Claims**

1. A process for treating a molten metal which includes contacting said molten metal with a mixture comprising at least one first compound selected from the group consisting of the halides and oxides of the metallic elements of groups Ia, IIa and IIIb of the periodic classification of the elements and at least one second compound capable of reducing said first compound to the corresponding metallic element in said molten metal, wherein said mixture is in the form of a single liquid homogeneous phase at the temperature of said molten metal.

4,042,378

CONTROLLING PIG IRON REFINING

Daniel Leon Ramelot, Saint-Nicolas, Belgium, assignor to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie, Brussels, Belgium

Filed May 3, 1976, Ser. No. 682,668
Claims priority, application Belgium, May 7, 1975, 828855
Int. Cl.[2] C21C *5/30*
U.S. Cl. 75—60 **7 Claims**

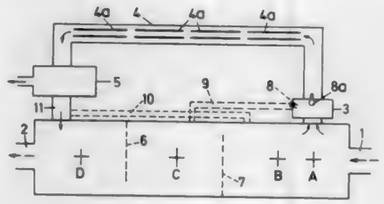
1. In a pig iron refining process in which industrially pure oxygen is blown into molten pig iron surmounted by a layer of slag in a converter by means of at least one tuyere located below the upper surface of the molten metal, in order to obtain steel of a desired quality, the improvement comprising the steps of: continuously measuring movement of the converter in the direction of an axis common to a pair of pivot pins on which the converter is pivotably mounted while the oxygen is blown in; detecting an instant at which the movement measurement undergoes a sudden and considerable decrease; and, from that instant onwards, blowing in only that amount of oxygen, which is necessary and sufficient to provide the steel with the desired quality at the end of the refining operation, the amount of oxygen being determined from an empirical relationship, determined from previous refining operations in the converter, between the amount of oxygen blown in after the instant and at least one of the phosphorus content of the steel and the iron content of the slag.

4,042,379

CONDENSATION OF ZINC VAPOR

Colin Frank Harris, and Michael William Gammon, both of Bristol, England, assignors to Metallurgical Processes Ltd. and I.S.C. Smelting Limited, both of Nassau, Bahamas

Filed Sept. 25, 1975, Ser. No. 616,634
Claims priority, application United Kingdom, Oct. 11, 1974, 44066/74
Int. Cl.[2] C22B *19/04*
U.S. Cl. 75—88 **7 Claims**



1. A method of condensing zinc vapor comprising, in combination, the steps of: continuously passing hot gases containing zinc vapor successively through at least three condensation chambers from a first chamber to a last chamber; continuously passing molten lead countercurrently to the hot gases successively through the condensation chambers from the last chamber to the first chamber; continuously generating a spray of molten lead droplets in each of the condensation chambers by rotating at least one impeller immersed in molten lead in each of the condensation chambers to condense the zinc vapor; continuously recycling molten lead from the first chamber to the last chamber comprising the steps of exiting molten lead containing condensed zinc from the first chamber, cooling the exiting molten lead containing the condensed zinc, separating the condensed zinc from the cooled molten lead and feeding the cooled molten lead to the last condensation chamber; and continuously recycling to a chamber intermediate the first chamber and the last chamber, molten lead at a temperature greater than the temperature of the molten lead in the intermediate chamber, to increase the temperature of the molten lead in the intermediate chamber to within the range of from 475° to 515° C.

4,042,380

GRAIN REFINED FREE-MACHINING STEEL

Yoshihiro Yamaguchi, Ashiya; Takashi Shimohata, Akashi; Sodai Kita, and Yoshihide Fuchino, both of Kobe, Tsugio Kaneda, Akashi; Masashi Kawauchi; Sadayashi Furusawa; Shuzi Iwata, all of Japan, assignors to Kobe Steel, Ltd., Kobe, Japan

Filed May 14, 1976, Ser. No. 686,576
Claims priority, application Japan, May 14, 1975, 50-57698
Int. Cl.[2] C22C *38/14, 38/60*
U.S. Cl. 75—124 **5 Claims**

1. A grain-refined free-machining steel consisting essentially of 0.08 to 0.6 percent carbon, 0.35 percent or less silicon, 0.3 to 1.5 percent manganese, 0.04 to 0.15 percent sulfur, 0.01 to 0.05 percent aluminum, 0.01 to 0.08 percent niobium, 0.0035 to 0.008 percent oxygen, 0.008 percent or less nitrogen, zirconium, and the balance iron wherein the ratio of the effective zirconium to sulfur is from 0.2 to 1.2 and the amount of effective zirconium is:

$$\text{effective zirconium} = Zr\% - 2.9 \times 0\% - 6.5 \times N\%$$

and wherein the ratio length to width of the sulfides in said steel averages 6.0 or less and the size of said sulfides in terms of length X width averages from 40 to 200 square microns.

4,042,381

CONTROL OF INCLUSION MORPHOLOGY IN STEEL

Jerry D. Thomas, North Royalton, Ohio; William F. Hladio, Homewood, Ill., and Leo V. Scott, Warren, Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Filed July 6, 1976, Ser. No. 702,427
Int. Cl.[2] C21C *7/00;* C22C *33/00*
U.S. Cl. 75—129 **9 Claims**

1. A method of producing steel characterized by shaped sulfide inclusions comprising the steps of preparing a steel melt containing in amounts by weight:

at least 0.020% aluminum
no more than 0.010% nitrogen
no more than 0.025% sulfur
no more than 0.70% manganese

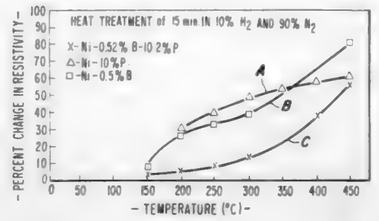
and incorporating in said melt from 0.020–0.080% titanium and from 0.020–0.060% of at least one rare earth metal.

4,042,382

TEMPERATURE-STABLE NON-MAGNETIC ALLOY

Nathan Feldstein, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 531,396, Dec. 10, 1974, Pat. No. 3,953,654, which is a division of Ser. No. 387,601, Aug. 13, 1973, abandoned. This application Jan. 23, 1976, Ser. No. 651,797
Int. Cl.[2] C22C *19/03*
U.S. Cl. 75—170 **1 Claim**



1. An alloy consisting essentially of 5 – 16 wt. % phosphorus, 0.1 to 0.7 wt. % boron and the balance nickel.

4,042,383

WROUGHT FILLER METAL FOR WELDING HIGHLY-CASTABLE, OXIDATION RESISTANT, NICKEL-CONTAINING ALLOYS

Walter Adrian Petersen, Ridgewood, N.J., and Robin Mackay Forbes Jones, Suffern, N.Y., assignors to The International Nickel Company, Inc., New York, N.Y.

Continuation of Ser. No. 487,316, July 10, 1974, abandoned. This application May 17, 1976, Ser. No. 686,721
The portion of the term of this patent subsequent to July 1, 1992, has been disclaimed.
Int. Cl.[2] C22C *19/05, 30/00*
U.S. Cl. 75—171 **4 Claims**

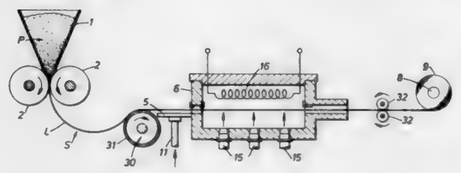
1. A hot-workable, cold-workable welding filler metal characterized by a capability for producing sound, oxidation-resistant weld deposits consisting essentially of (by weight) up to about 0.1% carbon, up to about 2% manganese, up to about 1% silicon, from about 19% to about 24% chromium, from about 15% to about 25% iron, from about 0.12% to about 0.4% boron, from about 4% to about 8% molybdenum, and the balance essentially nickel.

4,042,384

PRODUCTION OF METAL STRIP FROM POWDER

George Jackson, Sheffield, and Terence Fieldsend, Rotherham, both of England, assignors to British Steel Corporation, London, England

Continuation of Ser. No. 462,991, April 22, 1974, abandoned. This application May 13, 1976, Ser. No. 686,249
Claims priority, application United Kingdom, Jan. 31, 1974, 4500/74; May 3, 1973, 21103/73
Int. Cl.[2] B22F *1/00, 7/00;* B65G *53/04;* B22F *3/18*
U.S. Cl. 75—214 **20 Claims**



1. A method of continuously producing metal strip from metal powder comprising the steps of continuously compacting the powder to form a continuous green strip, transporting the green strip to the entrance of a sinter furnace, isolating the

green strip from tensile stresses imposed in the strip upstream of the entrance of the sinter furnace, propelling the strip through the furnace and sintering it while supporting it on a gaseous cushion, isolating the strip during sintering from stresses imposed in the sintered strip downstream of the furnace, and correlating the speed at which the sintered strip is drawn from the furnace with the speed at which the strip enters the furnace to permit the strip to shrink during sintering, the speed at which the sintered strip is drawn from the furnace being less than that at which it is transported to the furnace by an amount substantially corresponding to the linear reduction of the strip as it shrinks on its passage through the furnace.

4,042,385

SINTERING METHOD FOR MAKING A HIGH CARBON FERROUS SLIDING ELEMENT

Kenji Miyake; Hiroshi Kumon; Yoshimaru Zitukane, and Shigeru Akutsgawa, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Japan

Filed Nov. 7, 1975, Ser. No. 629,906
Claims priority, application Japan, Nov. 9, 1974, 49-129326
Int. Cl.² B22F *3/00*
U.S. Cl. 75—224 **12 Claims**

1. A sintering method for making a high-carbon ferrous sliding element which comprises:

a. preparing a mixture of 2 to 5% by weight of carbon powder and the remainder being essentially iron powder;
b. subjecting said mixture to a compacting pressure of 4 to 8 ton/cm², thereby to form a green compact;
c. loading said green compact into a sintering box;
d. placing said sintering box containing the green compact into a furnace box;
e. heating said green compact within the furnace box for 10 to 60 minutes at an elevated temperature within the range of from 1000° C to eutectic temperature of the principal components of said green compact; and
f. holding the thus-heated compact in said sintering box within the furnace box for 10 to 30 minutes at a temperature of 800° to 1000° C within said furnace box for the restoration of carbon which has been decarburized during said heating step (e), said sintering box serving to enhance the carburization of the compact within the furnace at least during the holding step.

4,042,386

PHOTOSENSITIVE COMPOSITIONS

Sakuo Okai, and Koichi Kimoto, both of Kyoto, Japan, assignors to Napp Systems, San Marcos, Calif.

Filed June 7, 1976, Ser. No. 693,306
Int. Cl.² G03C *1/68*
U.S. Cl. 96—35.1 **18 Claims**

1. A water-developable photopolymerizable composition, comprising: a monomer component including at least one water soluble monofunctional unsaturated ethylenic monomer, and at least one polyfunctional unsaturated ethylenic monomer selected from the group consisting of an acrylic or methacrylic ester of a polyethylene glycol having the structural formula $[HO(CH_2CH_2O)_nH]$ wherein *n*, the number of ethylene oxide units in said polyethylene glycol ester, is one to eight, said monomers capable of forming a polymer by photoinitiated polymerization in the presence of a polymerization initiator activatable by actinic light; a polymer component including a partially saponified, water-soluble, polyvinyl acetate polymer compatible with said monomers, containing both acetyl and hydroxy groups, and having a polymerization degree of about 300 to 2,000, and a saponification degree of about 65 to 99 mole percent; and a photopolymerization initiator, compatible with said monomers and said polyvinyl acetate polymer, and activatable by actinic light; the ratio, by weight, of polyfunctional monomer to monofunctional monomer being in the range of from about 0.2 to about 0.6; and the ratio, by weight, of said monomer component to said polymer component being in the range of from about 0.7 to about 1.2.

16. A process for developing a photopolymer plate which includes a layer of photosensitive resin composition comprising a mixture of a polyfunctional ethylenically unsaturated monomer selected from the group consisting of an acrylic or methacrylic ester of a polyethylene glycol having the structural formula $[HO(CH_2CH_2O)_nH]$ wherein *n* is the number of ethylene oxide units in said polyethylene glycol ester, is one to eight and at least one water soluble monofunctional ethylenically unsaturated monomer, said mixture of monomers being capable of forming polymer by photoinitiated polymerization in the presence of a polymerization initiator activatable by actinic light, a partially saponified polyvinyl acetate having a degree of polymerization of about 300 to 2,000 and a degree of saponification of about 65 to 99 mole percent, and a benzoin alkylate initiator activatable by actinic light; the ratio, by weight, of polyfunctional monomer to monofunctional monomer being in the range of from about 0.2 to about 0.6, and the ratio of said mixture of monomers to said polyvinyl acetate being in the range of from about 0.7 to about 1.2, said process comprising the steps of:

subjecting said plate to a single exposure of actinic light having an intensity at the plate surface of from about 0.1 to about 0.2 watt per square inch and a wave length of about 360 nm;
removing the unexposed resin composition from said plate by washing with water; and
drying said plate.

4,042,387

PHOTOLITHOGRAPHIC METHOD OF MAKING MICROCIRCUITS USING GLYCERINE IN PHOTORESIST STRIPPING SOLUTION

Umit Tarakci, Oxnard, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed May 5, 1976, Ser. No. 683,553
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36 **25 Claims**

1. An improvement in a method for providing a metallization pattern on a substrate, which method includes depositing a photoresist layer on the substrate;

photographing a pattern on the layer;
developing the exposed layer and removing portions of the layer to expose the substrate underneath;
metallizing the remaining portion of the photoresist layer as well as the exposed substrate; and
dissolving the said remaining portions of the photoresist layer in a photoresist-solving agent, while lifting off the metallization thereon, the improvement comprising the additional step of
lubricating the metallization as well as any portion of the substrate which becomes exposed upon dissolution of the photoresist material during the lifting step utilizing glycerine added to said photoresist-solving agent, so tht lubricated metallization flakes will be prevented from adhering to the substrate.

4,042,388

PROCESS FOR THE PREPARATION OF SENSITIZED MATERIAL FOR ELECTROPHOTOGRAPHY

Eiichi Inoue; Ichiro Endo, both of Tokyo, and Teruo Yamanouchi, Fujisawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 234,988, March 15, 1972, abandoned, which is a continuation of Ser. No. 858,539, Sept. 16, 1969, abandoned. This application Apr. 2, 1973, Ser. No. 347,075
Int. Cl.² G03G *5/06*
U.S. Cl. 96—1.6 **7 Claims**

1. A process for producing a sensitized photosensitive material for electrophotography which comprises applying radiation to a solution of an organic photoconductive substance, a free radical former and a dye base said radiation being capable of generating free radicals from said free radical former.

4,042,389

METHOD OF RECORDING IMAGE ON LENTICULATED MICROFICHE

George J. Yevick, Leonia, N.J., assignor to Personal Communications, Inc., Stamford, Conn.

Division of Ser. No. 474,790, May 30, 1974, Pat. No. 3,967,289. This application July 9, 1975, Ser. No. 594,350
Int. Cl.² G03C *5/04*
U.S. Cl. 96—27 R **6 Claims**

1. A method of recording optical intelligence on a microfiche for subsequent readout, the microfiche including a transparent support coated with a photographic emulsion on one surface thereof, the other surface of the microfiche carrying a plurality of lenses integral with the transparent support, the improvement comprising, the step of directing optical intelligence onto discrete, spaced apart regions on said emulsion from the emulsion side of said microfiche, without passing through the transparent support, each said discrete region optically aligned with one of said integral lenses.

4,042,390

CATHODE RAY STORAGE TUBE HAVING A TARGET DIELECTRIC PROVIDED WITH COLLECTOR ELECTRODE SEGMENTS EXTENDING THERETHROUGH

Edward R. Steele, Beaverton, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Division of Ser. No. 599,620, July 28, 1975, Pat. No. 3,978,366. This application May 27, 1976, Ser. No. 690,450
Int. Cl.² G03C *5/00*
U.S. Cl. 96—36.1 **3 Claims**

1. A method of fabricating a storage target for use in conjunction with a cathode ray tube comprising the steps of:

applying a layer of photopolymerizable material having a dispersion of glass beads and vitreous frit therethroughout onto a surface of a dielectric support member;
transmitting light through a pattern of openings in a photomask which activates the photopolymerizable material to polymerize same in the areas the light engages;
washing the photopolymerizable material which removes the material not polymerized and leaving in position a pattern of segments of glass beads and vitreous frit baking the dielectric support member and pattern of segments of glass beads and vitreous frit with said vitreous frit securing the glass beads together and in position on said surface of said dielectric support member;
depositing a coating of conductive material onto said surface and said pattern of secured glass bead segments;
applying a layer of photopolymerizable material having phosphor particles dispersed therein onto said conductive coating and conductively-coated glass bead segments;
transmitting light into said photopolymerizable material with said light activating the photopolymerizable material in the areas to polymerize same except where said conductively-coated glass bead segments are located; and
washing the photopolymerizable material which removes the material not polymerized and leaving in position layer means of phosphor.

4,042,391

PROCESS FOR FORMING VESICULAR PHOTOGRAPHIC IMAGES BY EMPLOYING SIMULTANEOUS ACTINIC LIGHT AND INFRA-RED REFLEX EXPOSURE

Hideo Fukutani, Tokyo; Hiroshi Oba; Akane Okada, both of Yokohama, and Atsuko Shimizu, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 24, 1975, Ser. No. 571,051
Claims priority, application Japan, Apr. 25, 1974, 49-46882; July 24, 1974, 49-84894; Sept. 18, 1974, 49-107339
Int. Cl.² G03C *5/10, 5/20*
U.S. Cl. 96—47 **9 Claims**

1. A process for forming a vesicular image which is the same sign as that of the original, which comprises contacting an original with a supported vesicular photographic element comprising a photosensitive material which generates a gas when irradiated by light to which it is sensitive, said material dispersed or dissolved in a thermoplastic or thermosettable resin, wherein the vesicular photographic element while in contact with the original is reflex exposed simultaneously to both infrared rays and light of wavelengths to which said photosensitive material is sensitive through the vesicular element to the original so as to effect decomposition of the photosensitive marerial to generate a gas and formation of the vesicular image simultaneously.

4,042,392

FORMAZAN IMAGES BY PHYSICAL DEVELOPMENT OF CATALYTIC METAL NUCLEI IMAGE

Henry James Gysling, and Mark Lelental, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,667
Int. Cl.² G03C *5/24, 1/40*
U.S. Cl. 96—48 PD **17 Claims**

1. A process of preparing a formazan dye image comprising forming an image comprising nuclei of one or more metals from Groups VIIIB and/or IB of the periodic table and catalytically reducing a terazolium salt in contact with said nuclei, a reducing agent that does not spontaneously reduce said tetrazolium salt.

2. A process of preparing a formazan dye image comprising imagewise exposing to electromagnetic radiation a photographic element comprising a photographic layer comprising one or more light sensitive complexes of metals from Groups VIIIB and/or IB of the periodic table to form a latent image of catalytic metal nuclei in said layer and catalytically reducing a tetrazolium salt in contact with said nuclei, a reducing agent that does not spontaneously reduce said tetrazolium salt or said light sensitive complexes.

14. A photographic element comprising a photosensitive layer comprising one or more light sensitive complexes of metals from Group VIIIB and/or IB of the periodic table said complexes being capable of forming catalytic metal nuclei on exposure, to electromagnetic radiation and a layer comprising a tetrazolium salt said layers being in reactive association.

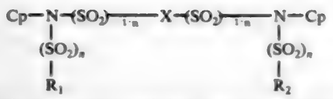
4,042,393

SILVER HALIDE EMULSION CONTAINING TWO EQUIVALENT TYPE COUPLER FOR USE IN PHOTOGRAPHY

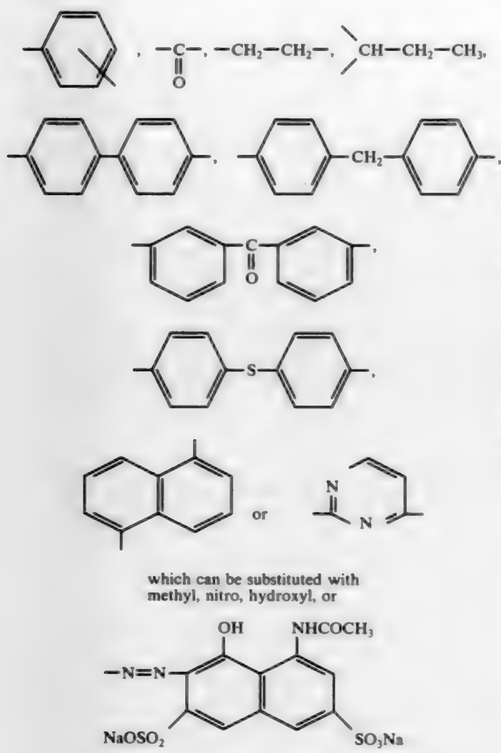
Hajime Wada; Shouji Kikuchi; Haruo Hori, and Takaya Endo, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 482,748, June 24, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,825
Claims priority, application Japan, June 22, 1973, 48-69866
Int. Cl.² G03C *7/00, 1/40*
U.S. Cl. 96—55 **7 Claims**

1. A method for developing an exposed silver halide color photosensitive material which comprises conducting the development in the presence of the following compound:



wherein C_p is a phenol or naphthol cyan coupler residue haing one hydrogen atom removed from the active methylene of said coupler; R_1 and R_2 are individually hydrogen, halogen, and aliphatic hydrocarbon residue, carbamoyl, aromatic hydrocarbon residue, cyano, formyl and acyl; X is pyridyl, quinolyl, thiethyl, piperidyl, imidazolyl, oxydiazolyl,



and n is 0 or 1; provided that, when n is 1, X is a carbonyl group.

4,042,394

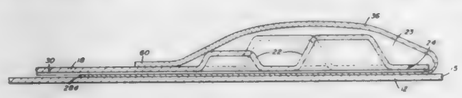
PHOTOGRAPHIC DYE IMAGE STABILIZATION

Wendell F. Smith, Jr., Fairport; Kenneth L. Eddy, Canadaigua, and Donald P. Harnish, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 357,563, May 7, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,659

Int. Cl.² G03C *7/00*

U.S. Cl. 96—56 **27 Claims**



1. A method of forming an image having improved stability in a photographic element containing a photosensitive silver halide emulsion layer, comprising

associating in the element (i) a photographic coupler capable of reacting with the oxidized form of a pre-selected primary aromatic amine developing agent to form an imaging dye having an absorption peak below 590 nm, and (ii) a photographic coupler capable of reacting with the oxidized form of the pre-selected developing agent to form an azomethine dye having an absorption peak above 700 nm,

imagewise exposing the element,

developing the element with the pre-selected developing agent to form the imaging dye and the azomethine dye.

4,042,395

INTEGRAL FILM UNIT WITH INTERMEDIATE SHEET FORMING A FLUID RESERVOIR WITH ONE END PORTION THEREOF

Frederick F. Tone, Holley, N.Y., and Robert J. Borel, Columbus, Ohio, assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 570,898, April 23, 1975, abandoned. This application Apr. 28, 1975, Ser. No. 572,541

Claims priority, application United Kingdom, May 6, 1974, 19880/74

Int. Cl.² G03C *1/48;* **G03D** *9/02*

U.S. Cl. 96—76 C **24 Claims**

1. In a photographic film unit having lateral and transverse edges comprising a first sheet having thereon a layer of photosensitive material capable of recording an image when exposed to actinic radiation, a second sheet arranged in superposition with said first sheet with said photosensitive layer located between said sheets, and a container carrying a quantity of a fluent processing composition, said container having a discharge passage adapted to be opened in response to generation of pressure within said composition to discharge said composition from said container to between the sheets, the improvement comprising:

an intermediate sheet disposed between said first and second sheets and coupled to both of them at the lateral marginal portions thereof and separating said lateral marginal portions by a predetermined amount; and

said intermediate sheet having an end portion extending from between said first and second sheets at one end thereof and being folded around that end of one of said first and second sheets to overlie the outside surface thereof, said end portion of said intermediate sheet being coupled to the outside surface of said one sheet to form a fluid receiving reservoir between said folded around portion of said intermediate sheet and said outside surface of said one sheet.

4,042,396

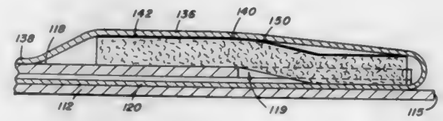
FLUID RECEIVING TRAP WITH AIR RELEASING MEANS COMPRISING A PROCESSING COMPOSITION IMPERVIOUS LAYER

Robert A. Sylvester, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed July 11, 1975, Ser. No. 595,451

Int. Cl.² G03C *1/48;* **G03D** *9/02*

U.S. Cl. 96—76 C **8 Claims**



1. In a film unit comprising a photosensitive sheet and a second sheet, means securing the sheets together in superposed relationship, means for containing a processing composition disposed at one end of the film unit, and means for trapping excess processing composition disposed at the other end of the film unit, said trapping means comprising trap spacing means, trap cover means of sheet material overlying the spacing means, and trap venting means comprising a plurality of holes through said trap cover means, the improvement comprising:

processing-composition-impervious means disposed between said trap spacing means and said holes through said trap cover means.

4,042,397

LIGHT-ABSORBING DYE FOR USE IN PHOTOGRAPHY

Felix Jan Moelants, Wilrijk; Jozef Aimé Dierckx, Hove, and Henri Depoorter, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Morstel Belgium

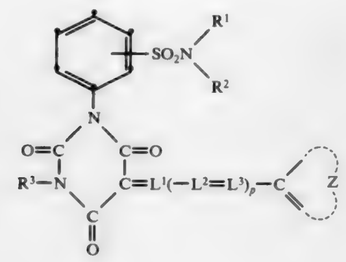
Filed Apr. 12, 1976, Ser. No. 676,007

Claims priority, application United Kingdom, Apr. 30, 1975, 18068/75

Int. Cl.² G03C *1/84*

U.S. Cl. 96—84 R **13 Claims**

1. A light-sensitive photographic element comprising a support, at least one light-sensitive silver halide emulsion layer and a colloid layer containing a dye corresponding to the formula :



wherein :

Z represents the atoms necessary to form :

1. a barbituric acid nucleus so that a symmetrical oxonol dye is obtained,
2. a phenyl group so that a benzylidine or cinnamylidene dye is obtained, or
3. a pyrrole ring,

each of L^1, L^2 and L^3 represents a methine group,

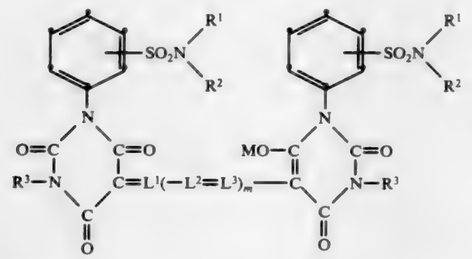
p represents 0 for Z having significance (3), 0 or 1 for Z having significance (2), or 1 or 2 for Z having significance (1),

R^3 represents an aliphatic or aromatic hydrocarbon group,

R^1 represents hydrogen, an alkyl group, an acyl group or an amino group, and

R^2 represents hydrogen, an alkyl group or an aryl group, or R^1 together with R^2 represents the atoms necessary to complete a heterocycle.

6. An element according to claim **1**, wherein the dye corresponds to the formula :



wherein :

m represents 1 or 2,

R^1, R^2, R^3, L^1, L^2 and L^3 are defined as in claim **2**, and M is a cation.

4,042,398

POLYOLEFIN COATED PHOTOGRAPHIC BASE AND METHOD OF PRODUCING

Peter H. Holm, Osnabrueck, Germany, and William L. Quartz, Pulaski, N.Y., assignors to Schoeller Technical Papers, Inc., Pulaski, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,679

Int. Cl.² G03C *1/86*

U.S. Cl. 96—85 **24 Claims**

1. A process for the preparation of a photographic base comprising the steps of

a. applying an aqueous coating composition to at least one surface of a paper substrate, said coating composition containing aluminum oxide particles, said aluminum oxide particles having a particle size of from about 1 millimicron to about 60 millimicrons,

b. drying said coated substrate,

c. applying a molten film of a polyolefin over at least one of said coated surfaces of said coated substrate,

d. adhering said polyolefin film to said coated surface, and

e. cooling said polyolefin film to a temperature below the melt point of said polyolefin.

4,042,399

PHOTOGRAPHIC ELEMENT WITH IMPROVED SLIP

Günther Kiesslich, Dietzenbach, Germany, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

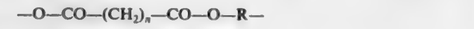
Filed July 15, 1975, Ser. No. 596,192

Claims priority, application Germany, July 26, 1974, 2435983

Int. Cl.² G03C *1/78, 1/96, 1/76*

U.S. Cl. 96—87 R **13 Claims**

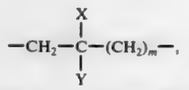
1. In a photographic film comprising a film support and a photosensitive silver halide emulsion layer on at least one side of said support, the improvement wherein at least one outer layer of said photographic film is a dispersion of a polyester slip agent in gelatin in an amount of 0.1 to 50 grams per 100 grams of gelatin, said polyester slip agent having repeating units of the formula:



in which:

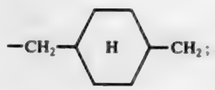
n = 1–8, and R is a member selected from the group consisting of

(a)



wherein m = 0–4, and X and Y are each selected from the group consisting of H and $-CH_3$;

(b)



c. $-C_2H_4-O-C_2H_4-$.

4,042,400

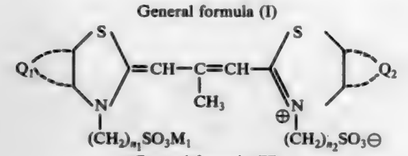
LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shigeji Baba; Bunji Okubo, and Eiichi Sakamoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

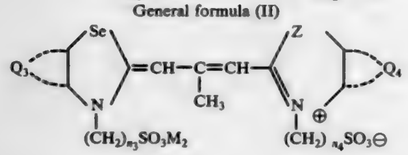
Filed Jan. 12, 1976, Ser. No. 648,743
Claims priority, application Japan, Jan. 14, 1975, 50-7208
Int. Cl.² G03C *1/14*
U.S. Cl. 96—124 **5 Claims**

1. A light-sensitive silver halide photographic material comprising a silver halide emulsion containing a compound having the below-mentioned general formula (I) and a compound having the below-mentioned general formula (II),

General formula (I)



General formula (II)



wherein Q_1, Q_2, Q_3 and Q_4 are individually a non-metal atom grouping necessary to complete an unsubstituted or alkyl-, alkoxyl-, phenyl-, hydroxyl-, carboxyl- or halogen-substituted benzene ring, or a non-metal atom grouping necessary to complete a naphthalene ring; Z is a sulfur or selenium atom; n_1, n_2 n_3 and n_4 are individually 2, 3 or 4; and M_1 and M_2 are individually a hydrogen atom, an alkali metal atom or H-Q (where Q is an organic base).

4,042,401

HECTOGRAPH PRODUCTS AND PROCESS

Douglas A. Newman, Glen Cove, and Robert T. Emerson, Manhasset, both of N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 312,736, Dec. 6, 1972, abandoned. This application Feb. 26, 1975, Ser. No. 553,134
Int. Cl.² B41M *1/12*; C09K *3/00*
U.S. Cl. 106—14.5 **9 Claims**

1. Thixotropic semi-solid hectograph printing ink which is substantially free of dissolved hectograph coloring matter comprising from about 30% to 80% by weight of a liquid vehicle consisting of at least one volatile organic liquid vehicle having a boiling point between about 200° F and 460° F and having a solids content of from about 70% to 20% by weight comprising:

a. from about 50% to 85% by weight of the solids content of dispersed, finely-divided, undissolved spirit-soluble hectograph coloring matter which is substantially completely insoluble in said liquid vehicle,

b. from about 5% to 20% by weight of the solids content of dispersed, finely-divided, hard wax particles having a melting temperature between about 140° F and 300° F,

c. from about 2% to 15% by weight of the solid content of film-forming binder material which is at least partially soluble in said liquid vehicle, the weight of said film-forming binder material present being less than the weight of said hard wax particles present in said ink, and

d. from about 5% to 20% by weight of the solids content of a non-drying, semi-solid, oleaginous material which is at least partially incompatible with the hard wax and which has a melting point below about 185° F, substantially all of the dispersed solids in said ink being less than 10 microns in size and said ink being capable of being printed and dried and fused at elevated temperatures to provide a clean, rub-resistant, stable duplicating composition.

4,042,402

BIOCIDAL GLASS MATERIALS

Cyril Francis Drake, Harlow, and Robert Walter James Amos, New Barnet, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,484
Claims priority, application United Kingdom, Jan. 7, 1975, 600/75
Int. Cl.² C09D *5/14*; C03C *3/14, 3/30*
U.S. Cl. 106—15 R **1 Claim**

1. In a $CuO—B_2O_3—Al_2O_3$ glass anti-foulant of the type used for the controlled release of liquid soluble metal ions into solution in seawater, the improvement wherein: the molar ratio of CuO to B_2O_3 is from about 2 to 1 to about 1 to 1, the remainder is Al_2O_3 at about 5 mole percent to provide a dissolution rate of about 0.02 to 0.06 milligrams per hour per square centimeter of copper ions on contact with seawater.

4,042,403

THERMALLY STABLE GLASS-CERAMIC ARTICLES

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed May 19, 1975, Ser. No. 578,379
Int. Cl.² B26B *7/28*; C03B *32/00*
U.S. Cl. 106—39.7 **3 Claims**



1. A method for making a glass-ceramic article exhibiting an average coefficient of thermal expansion (R.T. to 1000° C.) between about 0–15 × 10^{-7}/° C. and a change in length of less than about 1000 PPM after an exposure of 2000 hours to temperatures up to 950° C. consisting essentially of a fine-grained crystal phase uniformly dispersed within a glassy matrix, said crystal phase being essentially free from cristobalite, cordierite, and spinel and consisting essentially of beta-spodumene solid solution, said crystals constituting at least 90% by volume of the article which comprises:

a. melting a batch for a glass consisting essentially, by weight on the oxide basis, of about 3–5% Li_2O, 0.25–2.5% MgO, 15–20% Al_2O_3, 68–75% SiO_2, and 2–5.5% TiO_2, wherein the molar ratio of Li_2O:MgO is at least 2:1;

b. simultaneously cooling the melt to at least within the transformation range and shaping a glass article of a desired configuration therefrom;

c. heating said glass article to a temperature between about 1050°–1250° C. to cause the crystallization in situ of beta-spodumene solid solution crystals; and then

d. cooling the crystallized article to room temperature.

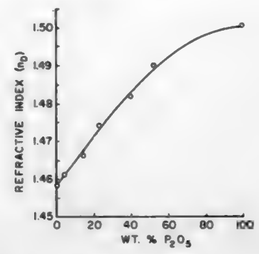
3. A glass-ceramic article made in accordance with the method of claim **1**.

4,042,404

FUSED P_2O_5 TYPE GLASSES

Peter C. Schultz, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 321,109, Jan. 4, 1973, abandoned. This application Apr. 12, 1976, Ser. No. 675,959
Int. Cl.² C03C *3/04*; C03B *25/00, 23/20*
U.S. Cl. 106—52 **2 Claims**



1. A method for making a transparent fused oxide type glass exhibiting a refractive index between about 1.46–1.49 and a coefficient of thermal expansion (0°–300° C.) of about 5–40 × 10^{-7}/° C. consisting essentially, by weight, of 2–50% P_2O_5 and the remainder SiO_2, and having a cation impurity level not exceeding 10 PPM, which comprises the steps

a. entraining a vaporizable compound capable of being converted by flame hydrolysis and decomposition to P_2O_5 and a vaporizable compound capable of being converted by flame hydrolysis and decomposition to SiO_2 in a gas stream;

b. passing said gas stream into the flame of a combustion burner to cause the interbonding of P_2O_5 and SiO_2 into vitreous particles of fused $P_2O_5—SiO_2$ such that volatilization of P_2O_5 and SiO_2 is limited;

c. collecting said vitreous particles at a temperature below the minimum consolidation temperature as a porous preform body; and then

d. heating said porous preform body to a temperature within the range of minimum consolidation temperature of said vitreous particles and 200° C. thereabove, but not in excess of 1450° C., to consolidate said porous preform body to a non-porous glass body.

2. A fused oxide type glass produced in accordance with claim **1**.

4,042,405

HIGH STRENGTH OPHTHALMIC LENS

David A. Krohn; Robert E. Graf, both of Southbridge, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Filed Mar. 18, 1976, Ser. No. 668,174
Int. Cl.² C03C *21/00, 3/04, 3/30*
U.S. Cl. 106—52 **3 Claims**

1. A chemically-strengthened ophthalmic glass lens made from a phospho-silicate glass having the following chemical analysis:

Ingredient	Percent by Weight
sodium oxide	about 4 to about 15
potassium oxide	about 3 to about 15
Other Alkali Metal Oxides:	
lithium oxide	up to about 5
rubidium oxide	up to about 5
cesium oxide	up to about 5
lanthanum oxide	up to about 15
aluminum oxide	up to about 5
zirconium oxide	up to about 5
zinc oxide	up to about 15
calcium oxide	up to about 10
titanium oxide	up to about 5
magnesium oxide	up to about 4
boron oxide	up to about 2
phosphorus pentoxide	about 3 to about 15
Total Na_2O + K_2O and other alkali metal oxides	about 12 to about 20
Total ZnO + La_2O_3 + CaO + MgO	about 8 to about 15
Total MgO + Al_2O_3	about 0.2 to about 5
Fining Agents (antimony oxide, cerium oxide, arsenic oxide and mixtures thereof)	up to about 2
silica	balance

said lens characterized by an index of refraction in the range of about 1.50 to 1.52 having a minimum depth of penetration of potassium ions of 120 microns and a compressively-stressed surface layer having a strength of at least 25,000 psi.

4,042,406

BUILDING MATERIAL

Benjamin Gray, 167 Grandview Ave., Nanuet, N.Y. 10954

Continuation-in-part of Ser. No. 606,375, Aug. 20, 1975, abandoned. This application Sept. 8, 1976, Ser. No. 721,618
Int. Cl.² C04B *7/02*
U.S. Cl. 106—88 **9 Claims**

1. In the process of producing an extra lightweight concrete block for non-load bearing interior partitions of buildings consisting of intermixing portions of a single aggregate, expanded perlite, with cement in a mixing machine, and gradually adding water thereto while mixing the same until the required amount of water has been supplied, the improvement which consists in using a single aggregate, expanded perlite, and in adding to the preceding mixture 50% solids concentrate of triethanolamine salt of P-dodecyl benzene sulfonic acid and 50% water and continuing the mixing until a tractable mixture is obtained, after which the mixture is fed into a block forming machine.

4,042,407

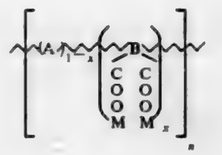
HYDRAULIC COMPOSITION

Tadao Natsuume, Yokosuka, Japan, assignor to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed July 15, 1975, Ser. No. 596,150
Claims priority, application Japan, July 17, 1974, 49-81870; Mar. 4, 1975, 50-26197
Int. Cl.² C04B *7/35*
U.S. Cl. 106—90 **22 Claims**

1. A hydraulic composition comprising 100 parts by weight of a hydraulic substance and as a water-reducing admixture 0.01 to 2.0 parts by weight of a water-soluble polymer, said polymer being selected from the group consisting of:

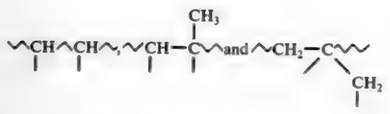
1. the water-soluble olefin-ethylenically unsaturated dicarboxylic acid salt copolymers represented by the following structure:



wherein

A is an olefin unit selected from the group consisting of an acyclic olefin having 5 to 6 carbon atoms, a cyclic olefin having 5-10 carbon atoms and derivatives of said cyclic olefin,

B is selected from the group consisting of



M is selected from the group consisting of an alkali metal atom, an alkaline earth metal atom and ammonium ion,
x is from 0.4 to 0.6, and
n is an integer from 2 to 300; and

2. derivatives of said copolymer wherein M in the copolymer is replaced by an alkyl group having 1–8 carbon atoms in an amount of not more than 30% thereof.

4,042,408

HYDRAULIC CEMENTS

Ransom James Murray, Gravesend, and Arthur William Brown, London, both of England, assignors to The Associated Portland Cement Manufacturers Limited, England

Filed Apr. 5, 1976, Ser. No. 674,034

Claims priority, application United Kingdom, Apr. 17, 1975, 15878/75

Int. Cl.² C04B *7/02*

U.S. Cl. 106—100 **30 Claims**

1. In a method of making a high strength cement of the Portland type wherein argillaceous and calcareous materials are combined to form clinker by heating in a kiln and the resulting clinker is ground to form a cement, the improvement wherein the hydraulic activity attributable to the alite content is improved by introducing into the kiln a combination of mineralisers which contains fluorine and sulphur in which the mineralisers contain 0.1 to 2.0 percent fluorine by weight and 1 to 10 percent SO_3 by weight based on the clinker, provided that an alkali metal compound which can be a component of the aforesaid combination of mineralisers is included so that at least 0.5 percent sulphate is retained in the clinker as alkali metal sulphate at least when the condition that the lime saturation factor be at least 0.98 and the silica ratio be at least 4 is not met.

4,042,409

WATER REPELLENT GYPSUM COMPOSITION

Ichiro Terada, Kamakura; Tadashi Yamada, Tokyo; Michio Nishi, Tokyo; Mitsuo Uchida, Tokyo; Naomasa Sugiyama; Mamoru Kaneko, both of Yokohama, and Nobuhiko Takeda, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Limited and Yoshino Gypsum Co., Ltd., both of Tokyo, Japan

Filed Apr. 1, 1976, Ser. No. 672,540

Claims priority, application Japan, Apr. 3, 1975, 50-41041

Int. Cl.² C04B *11/14*

U.S. Cl. 106—111 **11 Claims**

1. A water repellent gypsum composition, which consists essentially of:

a mixture of 100 parts by weight of a gypsum material per 1–20 parts by weight based on the solids content of a paraffin emulsion prepared by emulsifying

A. a paraffin hydrocarbon having a melting point of 40°–80° C and

b. an oxidized paraffin having an acid value of 10–70 at a ratio of from 97:3 to 50:50 by weight, respectively in the presence of a water soluble alkali or ammonium ion base.

6. A water repellent gypsum composition, which consists essentially of:

a mixture of said gypsum, and said paraffin emulsion of claim 1 and a polymer emulsion or solution, wherein the weight ratio of the solid components of said paraffin emulsion to said polymer emulsion or solution ranges from 95:5 to 40:60, and wherein said polymer of said polymer emulsion is an acrylic acid ester polymer, a vinyl acetate homopolymer or copolymer, a urea polymer or an asphalt emulsion.

4,042,410

METHOD FOR DEFOAMING MOLTEN SLAG

Haruo Ito, Imaichi, Japan, assignor to Aikoh Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1975, Ser. No. 631,068

Int. Cl.² C04B *7/14*

U.S. Cl. 106—117 **3 Claims**

1. A method for defoaming molten slag by throwing onto the bubbling surface of the slag a moulding consisting of 17 to 72 percent by weight of organic material selected from the group consisting of wood chips, wood powder, rice hulls, coal, tar and pitch and mixtures thereof; 20 to 80 percent by weight of a refractory material selected from the group consisting of silica, grog, clay, olivine, lime stone, dolomite, magnesite, bauxite, alumina and mixtures thereof; and 3 to 15 percent by weight of a binder selected from the group consisting of starches, resins, sugars, proteins, water glass, aluminum phosphate, colloidal silica and mixtures thereof, whereby said moulding disintegrates to cause bubbles present in said molten slag to dissipate.

4,042,411

METHOD OF PROCESSING FOOD PARAFFINS AND USES OF OBTAINED PRODUCTS

Ljudmila Petrovna Kazakova, ulitsa Butlerova, 20, kv. 277; Alexei Alexandrovich Gundyrev, Leninsky prospekt, 69, korpus 2, kv. 280, both of Moscow; Nina Yakovlevna Rudakova, ulitsa Krylova, 22, kv. 10, Lvov; Fridrikh-Leopold Khaskelevich Sharf, ulitsa Zhupnaya, 11, kv. 3; Yaroslav Evstavievich Garun, ulitsa Zhupnaya, 27, both of Drogobych Lvovskoi oblasti; Lidia Ivanovna Belyashina, ulitsa Nagornaya, 33, korpus 22, kv. 52, Moscow, and Zoya Vasilievna Kocheva, ulitsa Gogolya, 1, kv. 30, Drogobych Lvovskoi oblasti, all of U.S.S.R.

Filed Apr. 22, 1975, Ser. No. 570,424

Int. Cl.² C08L *91/08*

U.S. Cl. 106—270 **2 Claims**

1. A method of processing food paraffins into a mixture of paraffins of normal structure, iso-structure, and naphthenes with side chains of normal structure and iso-structure, containing from 20 to 32 carbon atoms, and high-melting paraffins of normal structure, which comprises reacting a food paraffin at a temperature of 42°–45° C with carbamide taken in the weight ratio of 1.1, in the presence of a solvent consisting of 60 percent by volume of benzine and 40 percent by volume of acetone, taken in the paraffin:solvent weight ratio of 1:3–3.5, thus forming a reaction mixture consisting of a crystalline mass containing high-melting paraffins of normal structure in the form of their complex with carbamide, and of a solution of a mixture of paraffins of normal structure, iso-structure, and naphthenes with side chains of normal and iso-structure, containing from 20 to 32 carbon atoms, in said solvent; separating said crystalline mass and the solution of said mixture; washing the solution of said mixture with water at a temperature of 80°–90° C and removing the solvent and water by distillation, the thus obtained mixture of paraffins of normal structure, iso-structure and naphthenes with side chains of normal and iso-structure being useful as an additive to protective coatings for canning tins; mixing said crystalline mass with water at a temperature of 80°–90° C to form an aqueous solution of carbamide and a solution of high-melting paraffins of normal structure, in said solvent; separating said solutions, and removing the solvent from the solution of high-melting paraffins of normal stucture by distillation.

4,042,412

HIGH SOLIDS CONTENT ACTIVE CLAY COATING FORMULATIONS AND METHODS FOR PRODUCING AND APPLYING THE SAME

Rodney E. Williams, Williamsville, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Filed June 20, 1975, Ser. No. 588,800

Int. Cl.² C09C *1/42;* **B41M** *5/22*

U.S. Cl. 106—306 **11 Claims**

1. A coatable formulation comprising water, an active bentonite-type clay, an inactive clayey material selected from the group consisting of chalk and mixtures of chalk and kaolin and a binder, said inactive clayey material being present in the formulation in an amount sufficient to provide a total solids content in the formulation of from about 43 to about 60% by weight and a viscosity of from about 700 to about 7,000 cps.

4,042,413

DISPERSING AGENTS

Frank Hauxwell; James Frederick Stansfield, and Arthur Topham, all of Manchester, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 330,882, Feb. 8, 1973, abandoned. This application Dec. 11, 1974, Ser. No. 531,787

Claims priority, application United Kingdom, Feb. 28, 1972, 9033/72

Int. Cl.² C08J *3/20;* **C09B** *67/00;* **C09C** *3/08;* **C09D** *3/00*

U.S. Cl. 106—308 N **7 Claims**

1. Compositions of matter comprising a finely divided dispersion containing between 5 and 70% by weight based on the total weight of the composition of a solid dyestuff or pigment in an inert liquid hydrocarbon or an inert chlorinated hydrocarbon containing dissolved therein between 5% and 100% by weight based on the weight of the pigment or dyestuff of a dispersing agent which is an adduct of 80:20 mixture of 2:4 and 2:6 diisocyanatotoluent, 1:6 hexanediol and a compound of the formula:

Z—X—E—Q

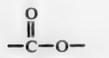
wherein

Z represents —OH;

X is a divalent aliphatic hydrocarbon, or a chloro substituent thereof, containing from 10 to 17 carbon atoms;

Q is alkyl or alkenyl containing from 12 to 18 carbon atoms or a hydroxy substituent thereof; and

E is



4,042,414

PROCESSING OF STARCH

Kenneth Justin Goering, and Robert Freeman Eslick, both of Bozeman, Mont., assignors to Research Corporation, New York, N.Y.

Filed Sept. 17, 1974, Ser. No. 506,759

Int. Cl.² C13L *1/08*

U.S. Cl. 127—32 **8 Claims**

1. A method for the simultaneous production of a waxy, small granule starch of high spreadability, and a large granule, waxy starch which is capable of forming an exceptionally clear and bright paste, which comprises:

a. steeping waxy barley grain for a period of at least 12 hours in an aqueous solution containing sulfur dioxide at a temperature of 45°–55° C so as to swell the grain and extract soluble protein contained within said grain,

b. water washing and milling said steeped grain,

c. separating fiber and protein from the starch granules in said grain,

d. suspending said starch granules in water to form a suspension containing less than 15% wt solids,

e. permitting larger granules to settle for a period of at least 2 hours and recovering a larger granule fraction, said larger granules being characterized by an average particle size of greater than 10μ, and

f. breaking the remaining suspension and recovering therefrom a smaller granule fraction, said small granules being characterized by an average particle size of from 2.5 to 10μ.

4,042,415

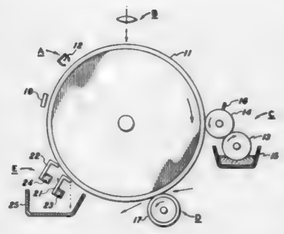
METHOD FOR SCRAPING LIQUIDS FROM A MOVING SURFACE

Stephen C. P. Hwa, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conr..

Division of Ser. No. 473,535, May 28, 1974, Pat. No. 3,918,807. This application July 23, 1975, Ser. No. 598,446

Int. Cl.² B08B *1/02*

U.S. Cl. 134—6 **1 Claim**



1. A method of deflecting liquid developer from a support surface movable in a given direction comprising engaging at least two scraper blades in succession in contact with the uphill portion of the support surface, so that a second scraper blade is downstream from a first scraper blade, at least the first scraper blade having an upper stem portion extending opposite said given direction to a point of contact of the upper stem portion with said surface, said point of contact on the upper stem portion being a cutting tip, and a lower stem portion extending towards the upper stem portion in said given direction until it intersects and forms an angle with the upper stem portion, the upper portion having a drip tip adjacent the point of contact of the upper stem portion with said surface; and moving the support surface in a given direction, whereby both blades scrape liquid developer from the support surface, and liquid developer accumulated by said second scraper blade collects at the downstream side of said first scraper blade and is removed by flowing over the lower stem portion of said first scraper blade.

4,042,416

METHOD FOR TREATING CUP-SHAPED WORKPIECES

Peter Miskech, Warren, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

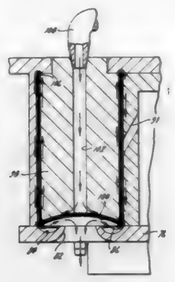
Division of Ser. No. 572,166, April 28, 1975, Pat. No. 3,969,136. This application Mar. 17, 1976, Ser. No. 667,574

Int. Cl.² B08B *3/02, 7/04*

U.S. Cl. 134—10 **4 Claims**

1. A method of treating the surfaces of cup-shaped workpieces each comprising a cylindrical side wall closed at one of its ends by a bottom wall which comprises the steps of positioning a shape conforming nozzle within the interior of each workpiece in clearance-spaced relationship relative to the interior surface of the side wall and bottom wall thereof and enclosing the exterior of the workpiece within a chamber disposed in clearance-spaced relationship to the exterior surface of the side wall thereof in a manner to define in combination with the walls of the workpiece a communicating radial

passage, annular inner passage and annular outer fluid flow passage; discharging a high pressure fluid from the inner end of said nozzle against the central portion of the interior surface of the bottom wall of the workpiece to effect a high velocity radial outward flow of said fluid across the interior bottom surface thereof through said radial passage and sequentially



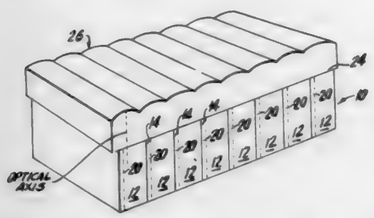
into and through said annular inner passage and into and through said annular outer passage and beyond the closed end of the workpiece, deflecting the fluid flow upon emergence from the annular outer passage in impinging relationship against the exterior surface of the bottom wall of the workpiece and in intimate contact therewith, and thereafter draining the treating fluid from the chamber.

4,042,417

PHOTOVOLTAIC SYSTEM INCLUDING A LENS STRUCTURE

Roy Kaplow, Newton, and Robert I. Frank, Cambridge, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 26, 1976, Ser. No. 690,056
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 PC **10 Claims**



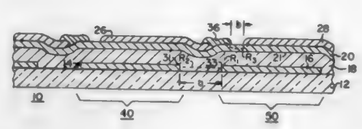
1. Photovoltaic means for producing an electrical output from incident solar radiation, said photovoltaic means comprising a plurality of unit semiconductor solar cells each having at least one p-n junction, said p-n junctions being arranged in planes lying substantially parallel to the direction of the incoming radiation on the light-receiving surfaces of said cells, and optical radiation-focussing means comprising a corresponding plurality of optical elements having their optical axes arranged in spaced parallel relation in planes parallel to the planes of said p-n junctions, said optical axes being spaced by a distance substantially equal to *n* times half of the width of each of said unit solar cells, where *n* is an integer of one or two, each of said optical axes being respectively offset with respect to the planes of said p-n junctions, said radiation-focussing means thereby being effective to focus incident radiation onto said light-receiving surfaces as spaced narrow beams which are parallel to, and in primary adjacency to but offset from the planes of each of said p-n junctions, whereby radiation incident upon said light-receiving surface is directed essentially in the vicinity of each of said p-n junctions.

4,042,418

PHOTOVOLTAIC DEVICE AND METHOD OF MAKING SAME

William J. Biter, Murrysville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 2, 1976, Ser. No. 710,971
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 P **6 Claims**



1. A photovoltaic device comprising:
a substrate;
at least first and second conductors spaced apart on said substrate, said conductors having adjacent facing edges;
a layer of a first semiconductor material overlying said conductors and said substrate between said adjacent facing edges;
a layer of a second semiconductor material overlying said first semiconductor layer and forming a photovoltaic junction with said first semiconductor layer;
current conducting means disposed on said second semiconductor layer over said first conductor, said current conducting means extending to a point in operative proximity to said adjacent facing edge of said second conductor; and
means for providing a low resistance path between said current conducting means and said second conductor through said second semiconductor layer, said low resistance path means disposed above said adjacent facing edge of said second conductor; whereby said first conductor and portions of said semiconductor layers in juxtaposition over said first conductor define a first solar cell, said second conductor and portions of said semiconductor layers in juxtaposition over said second conductor define a second solar cell, and said solar cells are electrically connected in series by virtue of said low resistance path.

4,042,419

PROCESS FOR THE REMOVAL OF SPECIFIC CRYSTAL STRUCTURE DEFECTS FROM SEMICONDUCTOR DISCS AND THE PRODUCT THEREOF

Wolfgang Heinke, Mehring-Oed; Helmut Kirschner, Burghausen, and Detlef Reimann, Engelsberg, all of Germany, assignors to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH, Burghausen, Germany

Filed July 23, 1976, Ser. No. 708,235
Claims priority, application Germany, Aug. 22, 1975, 2537464
Int. Cl.² H01L *21/322, 21/324*
U.S. Cl. 148—1.5 **7 Claims**

1. A process for the removal of point defects and point defect agglomerates from semiconductor discs, comprising the steps of providing one side of the semiconductor discs with a mechanical stress field and then subjecting the discs to a heat treatment.

7. A semiconductor disc free of point defects and point defect agglomerates when made by the process defined in claim **1.**

4,042,420

METHOD OF PRODUCING MANGANESE OXIDE SOLID ELECTROLYTE CAPACITOR

Atsushi Nishino; Akihiko Yoshida, and Hayashi Hayakawa, all of Osaka, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 18, 1975, Ser. No. 633,151
Claims priority, application Japan, Nov. 20, 1974, 49-134055; Nov. 20, 1974, 49-134056; Nov. 20, 1974, 49-134057
Int. Cl.² C23F *17/00;* H01G *9/16*
U.S. Cl. 148—6 **14 Claims**

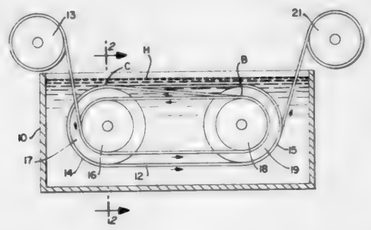
1. A method of producing a solid electrolyte capacitor having a layer of manganese dioxide as the electrolyte, the method comprising the steps of:
a. preparing a substrate by forming a dielectric oxide coating on a surface of a valve metal member;
b. immersing said substrate in an aqueous solution consisting of water and manganese nitrate;
c. heating the wet substrate to cause pyrolytic decomposition of manganese nitrate to manganese dioxide;
d. immersing said substrate subsequently to said step (c) in an aqueous solution consisting of water and manganese nitrate; and
e. heating the wet substrate subsequently to said step (d) to cause pyrolytic decomposition of manganese nitrite to manganese dioxide, one of said steps (c) and (e) being carried out in a furnace of a hot air circulation type by flowing a heated air around said substrate, the other being carried out in a heating chamber of a radiant furnace, said chamber being semi-closed and in communication with the atmosphere exclusively through at least one vent formed in the wall of said chamber, heat for said pyrolytic decomposition in said radiant furnace being transferred from the wall of said chamber dominantly by radiation, said at least one vent having a predetermined area such that said pyrolytic decomposition proceeds under a positive pressure of a small magnitude due to a relatively prolonged retention of gaseous decomposition products in said chamber.

4,042,421

METHOD FOR PROVIDING STRONG TOUGH METAL ALLOYS

Jaak Stefaan Van Den Sype, Mount Kisco; William Alphonse Kilinskas, Cortlandt, both of N.Y.; Richard Benedict Mazzarella, Indianapolis, Ind., and John Bernard Lightstone, White Plains, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,452
Int. Cl.² C21O *9/52*
U.S. Cl. 148—12 E **14 Claims**



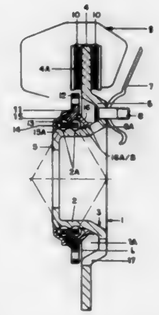
1. A process for improving the strength-toughness characteristics of an austenitic metal alloy selected from the group consisting of stainless steel alloys of the AISI 200 and 300 series and non-stainless steel alloys containing iron, manganese chromium, and carbon, said alloy having an Md temperature of no higher than about 100° C and an Ms temperature of no higher than about minus 100° C comprising the following steps:
a. deforming the alloy at a strain of at least about 10 percent and at a temperature in the range of about Md minus 50° C to about Md plus 50° C, said Md temperature being that of the alloy undergoing deformation, in such a manner that the material has a martensite phase of no greater than about 10 percent by volume and an austenite phase of at least about 90 percent by volume; and
b. deforming the material produced in step (a) at a strain of at least about 10 percent and at a temperature no higher than about minus 75° C in such a manner that the material has a martensite phase of at least about 50 percent by volume and an austenite phase of at least about 10 percent by volume.

4,042,422

METHOD FOR FORMING BEARING UNIT

Sture L. Åsberg, Partille, Sweden, assignor to SKF Industries, Inc., King of Prussia, Pa.

Division of Ser. No. 411,855, Nov. 1, 1973, Pat. No. 3,884,331.
This application Mar. 17, 1975, Ser. No. 559,094
Claims priority, application Netherlands, Nov. 9, 1972, 7215139; Nov. 28, 1972, 7216088
Int. Cl.² C21D *9/40*
U.S. Cl. 148—12 R **14 Claims**



1. In a method for forming a rotary element for a wheel, the wheel having a bearing race, a brake portion including a brake disc or drum, and a flange, wherein each of the portions of the rotary element are heat treated; the improvement comprising forming said rotary element as a single homogeneous steel forging, including said bearing race, brake portion and flange, said step of heat treating comprises heat treating said steel forging as a unit, and further comprising surface treating said bearing race.

4,042,423

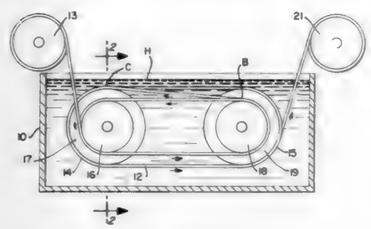
METHOD FOR PROVIDING STRONG WIRE AND STRIP

Jaak Stefaan Van den Sype, Mount Kisco; William Alphonse Kilinskas, Cortlandt, both of N.Y., and Richard Benedict Mazzarella, Indianapolis, Ind., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,392
Int. Cl.² C21D *9/52*
U.S. Cl. 148—12 B **8 Claims**

1. A process for improving the strength characteristics of wire or strip having a composition consisting essentially of an austenitic metal alloy selected from the group consisting of stainless steel alloys of the AISI 200 and 300 series and non-stainless steel alloys containing iron, manganese, chromium, and carbon, said alloy having an Md temperature of no higher than about 100° C and an Ms temperature of no higher than about minus 100° C comprising the following step:
a. stretching the wire or strip uniaxially at a strain of at least about 10 percent and at a temperature no higher than

about minus 75° C in such a manner that the wire or strip has a martensite phase of at least about 50 percent by



volume and an austenite phase of at least about 10 percent by volume.

4,042,424

ELECTRICAL CONDUCTORS OF ALUMINUM-BASED ALLOYS

Jean-Claude Nicoud, Saint-Egreve, France, assignor to Societe de Vente de l'Aluminium, Paris, France

Filed May 28, 1976, Ser. No. 691,009
Claims priority, application France, May 28, 1975, 75.17201
Int. Cl.[2] C22F *1/04*
U.S. Cl. 148—12.7 A **5 Claims**

1. In a process for producing electrical cables from aluminum-based alloys consisting by weight from 0.15% to 0.35% of iron, from 0.30% to 0.70% of silicon, from 0.30% to 0.80% of magnesium, less than 0.40% of copper, and the remainder being aluminum and usual impurities, comprising the sequential steps of forming said alloy into a wire rod, subjecting said rod to solution heat treatment, quenching of said heat treated rod, drawing the rod into thin wire and artificially aging said wire at a temperature of from 130° to 240° C the improvement comprising said drawing comprising tepid drawing at a temperature of from about 110° C to about 180° C with an elongation of at least 350%, the ultimate tensile strength of the conductors being at least 37 kg/mm², having an elongation at the breaking point of at least 4% and an electrical resistivity of at most 3.28 micro-ohms/centimeter.

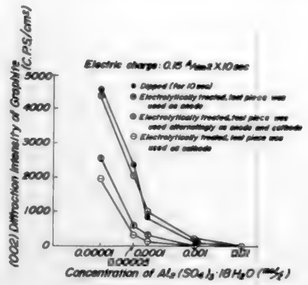
4,042,425

PROCESS OF PRETREATING COLD-ROLLED STEEL SHEET FOR ANNEALING

Nobuo Ohashi; Motoyuki Konishi; Minoru Nishida, and Yukio Inokuchi, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Division of Ser. No. 295,721, Oct. 6, 1972, abandoned. This application May 19, 1975, Ser. No. 578,937
Claims priority, application Japan, Oct. 11, 1971, 46-79432; Oct. 23, 1971, 46-83664; Oct. 23, 1971, 46-83665; Nov. 5, 1971, 46-87551
Int. Cl.[2] C21D *1/44*; C22B *35/00*; C25D *5/50*
U.S. Cl. 148—13.1 **15 Claims**

1. A method for the suppression of graphite carbon formation on the surface of a cold-rolled, low carbon steel sheet due to carbon separation from the interior of the steel and for the suppression of nitrogenization of said steel sheet during annealing for recrystallization of said steel sheet, comprising coating the surface of said steel sheet before annealing with a mixture containing at least one compound in a concentration of 0.00001 to 0.001 mol/1, said at least one compound containing one or more of the elements selected from the group consisting of sulfur, aluminum, antimony, lead, bismuth, arsenic, tin, selenium and tellurium, said mixture being coated on said steel sheet electrolytically by passing said steel sheet through an



electrolytic bath containing said mixture, said bath having a charge density of 1 to 20 coulombs/dm².

4,042,426

CHROMIZED STEEL SUBSTRATE

Carl Adolph Beiser, Coraopolis, Pa., assignor to National Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 557,177, March 10, 1975, Pat. No. 3,969,550, which is a continuation-in-part of Ser. No. 387,627, Aug. 13, 1973, abandoned. This application June 21, 1976, Ser. No. 698,111
Int. Cl.[2] B32B *15/18*
U.S. Cl. 428—667 **26 Claims**

1. A chromized ferrous metal substrate prepared by a process wherein a ferrous metal substrate is heat treated at an elevated chromizing temperature in a protective chromizing atmosphere in the presence of a source of chromium and a chromizing energizer until a corrosion resistant chromized coating is produced thereon, such process including the improvement in combination therewith which comprises emloying as the said ferrous metal substrate a plain low carbon columbium treated steel substrate initially having a total carbon content of at least 0.03% and containing about 0.03–0.15% of columbium, the carbon content of the steel being partially stabilized by the columbium whereby a portion of the carbon content is free to diffuse upon heating the steel substrate to the said elevated chromizing temperature, the steel substrate being heat treatable at the said elevated chromizing temperature in the protective chromizing atmosphere in the presence of the source of chromium and the chromizing energizer to produce a carbon-containing chromized coating thereon having a metallographically measured thickness of about 1–3 mils, the said chromized coating containing about 0.2–1% carbon from the steel substrate which is free to diffuse, and the said carbon content which is free to diffuse, the columbium content and the thickness of the steel substrate being correlated to satisfy the equation

$$A = Y \times Z,$$

where A is the percent carbon content of the said chromized coating and varies between 0.2 and 1%, Y is the percent carbon content of the steel substrate which is free to diffuse and is determined by the following equation

$$\%\text{Diffusible Carbon} = \%\text{ Total Carbon} - \frac{\%\text{Columbium Content}}{8} + \frac{0.01\%}{1}$$

and Z is a multiplication factor determined by the equation

$$\text{Multiplication Factor} =$$

-continued

$$\frac{\text{The steel substrate thickness in mils}}{\text{The total chromized coating thickness of the steel substrate in mils}}$$

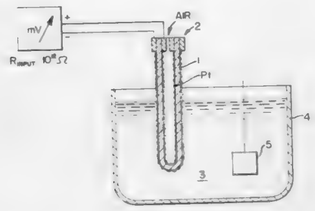
where the total chromized coating thickness of the steel substrate is equal to twice the metallographically measured diffusion layer of the said chromized coating plus one mil.

4,042,427

PROCESS FOR CONTROLLING FUSED SALT NITRIDATION OF METALS WITH A SOLID ELECTROLYTE ELECTRODE

Claus Razim; Csaba Lovasz, both of Stuttgart, and Kurt Baier, Fellbach, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Mar. 21, 1975, Ser. No. 560,822
Claims priority, application Germany, Mar. 21, 1974, 2413643
Int. Cl.[2] C21D *1/48*
U.S. Cl. 148—15.5 **15 Claims**



1. A process for controlling the nitriding effect of a nitriding bath of a salt melt containing alkali cyanate, for the nitridation of iron and iron alloys, which comprises providing a nitriding bath comprising a salt melt, said salt melt consisting essentially of 60–100% by weight of alkali cyanate, calculated as KOCN, 0–40% by weight of alkali metal chloride, alkaline earth chloride or mixture of said chlorides, calculated as NaCl, and a balance comprised of by-products of the cyanate or chlorides and the decomposition products thereof, determining the voltage established on an electrode of an oxygen ion-conducting solid electrolyte immersed in said salt melt, said electrolyte being capable of yielding well measurable voltages in said salt melt, and adjusting the voltage established by said solid electrolyte to be within a range of between **0.7** and **1.1** volt at a temperature of the salt melt that is between 500° and 650° C.

4,042,428

PROCESS FOR HARDENING IRON-CONTAINING SURFACES WITH ORGANIC SOLVENT AND AMMONIA

Takeji Asai, and Kaishu Yamazumi, both of Toyama, Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama, Japan

Filed Sept. 8, 1975, Ser. No. 611,079
Claims priority, application Japan, Feb. 28, 1975, 50-25265
Int. Cl.[2] C21D *1/48*
U.S. Cl. 148—16.5 **3 Claims**

1. A method for carbonitriding an iron containing metal structure comprising the steps of:

heating a furnace to the transformation point of steel, said transformation point being below about 650° C;

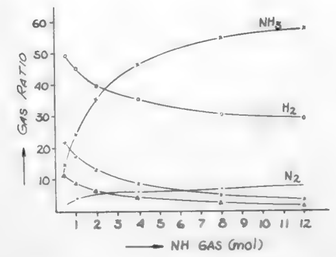
placing said metal structure in said furnace;

supplying said furnace with a carbonitriding atmosphere comprising a mixture of ammonia gas and a vaporized and decomposed oxygen containing liquid organic solvent wherein the ratio of carbon atoms to oxygen atoms in the liquid organic solvent is from 0.5 to 1.5 and wherein the ratio of moles of liquid organic solvent to moles of ammonia gas is from 1:1 to 1:12;

maintaining said article in said carbonitriding atmosphere until at least the surface of said iron-containing article has increased its carbon and nitrogen content a predetermined amount;

removing said carbonitriding atmosphere from said furnace;

mixing said removed carbonitriding atmosphere with a fuel gas;



burning said mixture of fuel gas and said removed carbonitriding atmosphere; and

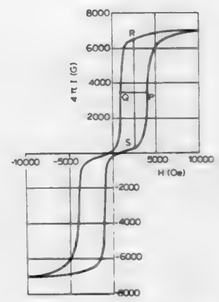
removing said structure from said furnace.

4,042,429

MAGNETIC ALLOYS HAVING WASP-WAISTED MAGNETIC HYSTERESIS LOOP

Shigeru Kojima, Kyoto; Kiyoshi Kojima, Hirakata; Tadao Ohtani; Nobuyuki Kato, both of Katano; Yoichi Sakamoto, Hirakata; Isago Konno; Masaharu Tsukahara, both of Neyagawa, and Takao Kubo, Kawachinagano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 1, 1974, Ser. No. 511,476
Claims priority, application Japan, Oct. 3, 1973, 48-111804
Int. Cl.[2] C04B *35/00*; H01F *1/04*; C22C *28/00*
U.S. Cl. 148—31.55 **3 Claims**



1. A worked and heat-treated alloy product having a wasp-waisted magnetic hysteresis loop prepared by tempering an alloy composition consisting essentially of 68.0 to 73.0% by weight of manganese, (1/10 Mn - 6.6)% to (¼ Mn - 22.2)% by weight of carbon and the remainder aluminum, said alloy having a hexagonal crystalline structure, at a temperature of from 530° to 750° C under an anisotropic stress of from 15 to 50 kg/mm² until the hexagonal crystalline structure of the alloy is transformed into a tetragonal crystalline structure; said alloy product thus-prepared, exhibiting a magnetic hysteresis loop in a wasp-waisted form such that the $4\pi I_{10000}$ value is at least 5800 G wherein $4\pi I_{10000}$ represents the intensity of magnetization in a magnetizing force of 10000 Oe and such that the value of the ratio $Id/2Ir$ is more than 2 wherein Id represents the value of $[4\pi I(R) - 4\pi I(S)]/4\pi$; $4\pi I(R)$ and $4\pi I(S)$ represent the intensity of magnetization at the intersecting points R and S of the wasp-waisted hysteresis loop and the perpendicular bisector of the line PQ, respectively as shown in the graph of the drawing; P and Q each represent points which give a half value of

$4\pi I_{10000}$ and I_r represents the residual magnetization divided by 4π.

4,042,430

TEMPERATURE RESISTANT EXPLOSIVE CONTAINING DIAMINOTRINITROBENZENE

Charles W. Falterman, China Lake, Calif.; William J. Griffith, Chemult, Oreg., and Harold J. Gryting, Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 10, 1972, Ser. No. 242,795
Int. Cl.[2] C06B *45/10*
U.S. Cl. 149—19.3 **1 Claim**

1. An explosive composition comprising the following

Ingredients	Percent by Weight
Aluminum	24
Potassium perchlorate	46
Diaminotrinitrobenzene	25
Copolymer of vinylidene flouride and perflouropropene	5

4,042,431

TWO COMPONENT FIELD MIX HYDRAZINE BASE EXPLOSIVE

James E. Friant, and Marshall E. Klopich, both of Renton, Wash., assignors to Rocket Research Corporation, Redmond, Wash.

Filed July 17, 1975, Ser. No. 596,763
Int. Cl.[2] C06B *47/08*
U.S. Cl. 149—36 **38 Claims**

1. A two component field mix explosive composition, comprising:

a. a first solid component selected from a group consisting of:
   1. ammonium nitrate,
   2. mixtures of ammonium nitrate with ammonium perchlorate or the like, with the amount of ammonium nitrate being at least about half the total weight of the first component,

b. a second liquid component comprising:
   1. hydrazine in an amount between about two-fifths to two-thirds of the total weight of the second component,
   2. a second ingredient selected from a group consisting of water, a compatible liquid fuel and mixtures thereof in an amount between about half the amount of hydrazine to an amount by weight moderately greater than the hydrazine, and
   3. ammonium nitrate in an amount no greater than about one-sixth of the total weight of the second component,

with the proportion of said second component to the first component being between about one to two parts by weight to about fifteen parts by weight of the solid component and present in an amount adequate to form an explosive composition.

4,042,432

DESENSITIZER FOR N-PROPYL NITRATE

B. Arthur Breslow, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 13, 1976, Ser. No. 749,935
Int. Cl.[2] C06B *25/36*
U.S. Cl. 149—89 **7 Claims**

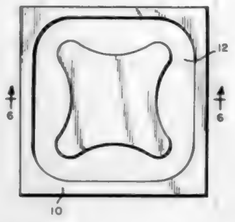
1. A composition of matter comprising a solution of low gamma gas in n-propyl nitrate,, said low gammma gas having a gamma value of 1.15 or less.

4,042,433

APPLIQUEING SYNTHETIC RESINS ON SHEET MATERIAL

Henry Hardy, Cambridge, and Adrian E. Balfour, Framingham, both of Mass., assignors to Compo Industries, Inc., Waltham, Mass.

Filed July 7, 1975, Ser. No. 593,715
Int. Cl.[2] B32B *31/00*; B29C *19/04*; B29H *5/26*
U.S. Cl. 156—87 **2 Claims**



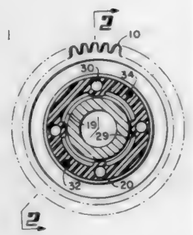
1. The method of bonding an applique of thermoplastic synthetic resin to a permeable substrate of woven material comprising depositing the applique to be applied to the woven material in the cavity of a silicone rubber mold containing a cavity corresponding in configuration to the applique, superimposing upon the surface of the mold across the cavity therein and in engagement with the applique situated in the cavity, the woven material, a porous release sheet, and an open cell absorbent sheet, placing the assembly comprising the mold containing the applique, the woven sheet, the release sheet, and the absorbent sheet between the platens of a high frequency press and while maintaining the platens at a temperature below the fusion temperature of the synthetic resin of the applique, applying pressure to the assembly and simultaneously subjecting the assembly to high frequency heating at a pressure level such as to fuse the synthetic resin, drive such vapors as are generated in the woven material through the release sheet and induce penetration of the fused synthetic resin into the woven material and while subjecting the assembly to heating between the platens, trapping the generated vapors penetrating the release sheet within the absorbent sheet.

4,042,434

BONDED GEAR ASSEMBLY

Theodore Ivanko, Fairfield, Conn., assignor to Avco Corporation, Stratford, Conn.

Filed Apr. 12, 1976, Ser. No. 675,752
Int. Cl.[2] B32B *7/04*
U.S. Cl. 156—91 **3 Claims**



1. A method of interconnecting driving and driven gear members by combination mechanical fastener and resinous bonding means, comprising the steps of:

forming complementary mating faces on adjoining web portions of the driving and driven gears;

removing an annulus of material from selected portions of said complementary faces to form a cavity between said faces;

forming an access orifice in the web portion of one of said gears, said orifice providing communication with the between-web cavity formed when mating faces of said driving and driven geared are joined;

fastening together by mechanical means the driving and driven gears, said fastening means serving to coaxially secure the driven gear to the driving gear, said fastening means providing a transfer of torque from the web of said driving gear to the web of said driven gear;

injecting thermal setting resin through said access office and filling said cavity between said faces of said gears;

curing said resin to its hardened state; and

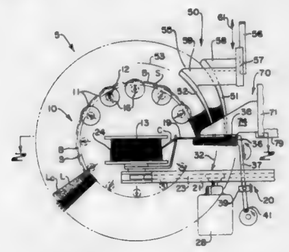
readjusting said mechanical fasteners to prescribed torque values whereby load carrying capabilities between gear members are optimized.

4,042,435

CLOSED TORUS WOUND CARCASS FOR A CLOSED TORUS TIRE

Stanley J. Houck, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Jan. 5, 1976, Ser. No. 646,718
Int. Cl.[2] B29H *15/00, 17/02*
U.S. Cl. 156—121 **22 Claims**



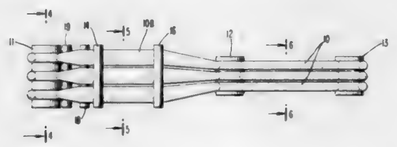
1. A method of building a cord wound torus carcass for a closed torus tire, the method comprising mounting a bead ring-spacer ring assembly and a carcass liner for rotation about a common axis, wrapping a cord spirally around a plurality of cord control fingers disposed closely about said liner to form a plurality of turns of cord, and transferring successive turns of cord from the control fingers to the liner, the cord in successive turns so transferred being substantially free of tension.

4,042,436

METHODS AND APPARATUS FOR PRODUCING SHEATHS FOR BATTERY ELECTRODES

Erik Sundberg, Yardley, Pa., and Erik Westberg, Lidingo, Sweden, assignors to Aktiebolaget Tudor, Sundbyberg, Sweden

Filed Dec. 20, 1976, Ser. No. 752,257
Claims priority, application Sweden, Dec. 23, 1975, 7514580
Int. Cl.[2] B32B *1/08*; H01M *2/02*
U.S. Cl. 156—182 **12 Claims**



1. A method for producing interconnected, multi-layer sheaths for electrodes of electrical batteries comprising:

introducing an inner layer of fibrous material around a plurality of adjacent mandrels;

introducing an outer layer of material around the inner layer;

passing the inner and outer layers along connector sections of said mandrels having elongate cross-sectional configurations;

connecting said inner and outer layes together and bonding sheaths on adjacent mandrels while on the elongate cross-sectional configuration sections of the mandrels to form interconnected tubes and thereafter passing the connected inner and outer layers along re-shaping sections of the mandrels having a different cross-sectional configuration than that of said connector sections to reshape the sheaths to the desired final cross-sectional configuration of said sheaths.

10. Apparatus for producing multi-layer sheaths for electrodes of electrical batteries, said sheaths being of the type having interconnected tubes, said apparatus comprising:

a plurality of adjacently disposed mandrels over which are introduced inner and outer layers of sheath material to be connected together, said mandrels each including a connector section along which the layers are bonded to form tubes and along which adjacent tubes are bonded and a downstream re-shaping section;

said connector sections having a cross-sectional configuration which is elongate;

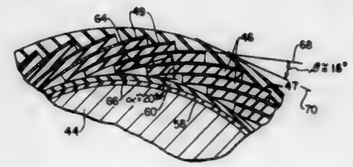
said re-shaping sections having a cross-sectional configuration which is different from that of said connector sections to reshape the sheaths to the desired final cross-sectional configuration of said tubes.

4,042,437

METHOD OF MANUFACTURING NIP ROLL FOR TREATING WEB MATERIALS

Ernest J. Groome, Covington, Va., assignor to Clupak, Inc., New York, N.Y.

Division of Ser. No. 582,105, May 30, 1975, Pat. No. 3,995,354. This application Apr. 14, 1976, Ser. No. 676,910
Int. Cl.[2] B32B *31/04*
U.S. Cl. 156—212 **4 Claims**



1. A method of producing a nip roll which comprises:

a. taking a substantially cylindrical member constructed of a substantially rigid material;

b. securing successive strips of substantially incompressible and resilient elastomer material along the length of said roll with the lengths of the strips being parallel to the axis of the roll and in a manner such that the strip has an arcuate configuration and extends generally at an acute angle to a plane tangent to said rigid cylindrical roll passing through the line of contact between the strip of elastomer material and the cylindrical roll, the arcuate configuration being such that the angle formed between the strip of elastomer material and said tangent plane being greater than the corresponding angle that the free end of the strip of elastomeric material makes with the intersecting plane tangent to the outer surface of the roll;

c. laminating a section of reinforcing fabric on said elastomer section so as to cause the fabric to assume the arcuate configuration of the elastomer section;

d. repeating the steps of alternating laminating elastomer sections configured substantially identically to said first elastomer section sufficiently to produce a fabric cover

surrounding substantially the entire peripheral surface portions of said cylindrical roll;

e. placing the entire reinforcing elastomer covered roll in an air impervious enclosure;

f. drawing vacuum in said air impervious enclosure; and

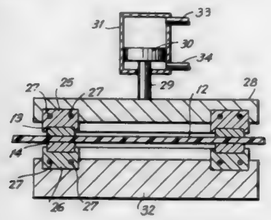
g. subjecting said covered roll to an elastomer curing process while simultaneously maintaining a vacuum within said impervious closure to at least partially soften the elastomer material and thereafter causing it to become cured to thereby form a substantially uniform continuous cylindrical cover member having a cross-section of alternating arcuate elastomer sections alternating with arcuate reinforcing fabric sections positioned therebetween.

4,042,438

METHOD OF ASSEMBLING A DIAPHRAGM ASSEMBLY FOR AN ELECTRO-ACOUSTIC TRANSDUCER

Hirotake Kawakami; Kantaro Takada, and Toru Fukumoto, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed July 14, 1975, Ser. No. 595,438
Claims priority, application Japan, July 16, 1974, 49-81499
Int. Cl.[2] C09J *7/02;* H04R *7/06*
U.S. Cl. 156—272 **2 Claims**



1. The method of assembling at least one metal frame member in abutting supporting relation to a diaphragm member to form an electret assembly for an electro-acoustic transducer, comprising the steps of forming said diaphragm member as a lamination of a film of polytetrafluoroethylene and a layer of fluorinated ethylene-propylene at each side of said film which, in said abutting supporting relation, faces toward a surface of each said frame member, pressing together said frame and diaphragm members in said abutting supporting relation while heating each said metal frame member so that heat transmitted through the latter causes said fluorinated ethylene-propylene to melt at the portion thereof engaged by each said metal frame member, halting the heating of each said frame member so that said fluorinated ethylene-propylene hardens to bond said frame and diaphragm members to each other in said abutting supporting relation, and electrically charging said diaphragm member so that the latter and each said frame member bonded thereto provides an electret assembly.

4,042,439

METHOD OF MAKING KEYBOARD ASSEMBLIES

Walter R. Pounds, Lafayette, Colo., assignor to KB-Denver, Inc., Loveland, Colo.

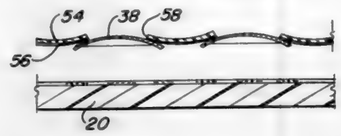
Division of Ser. No. 576,694, May 12, 1975, Pat. No. 3,967,084.
This application Feb. 27, 1976, Ser. No. 662,037
Int. Cl.[2] B29H *7/04;* B32B *31/00*
U.S. Cl. 156—292 **8 Claims**

1. In the assembly of a plurality of dome-shaped resilient contact elements in a predetermined pattern to overlie a similar pattern of spaced-conductor regions carried upon an insulating substrate, so that said elements may be centrally depressed to bridge spaced conductor portions, the steps of:

stocking a plurality of said elements in each of a plurality of wells disposed in a plate in a pattern corresponding to said predetermined pattern;

positioning a layer of flexible insulating material, adhesively coated on its undersurface, over the stacks of said elements in said plate with said layer including a plurality of apertures arranged in said predetermined pattern and individually of a diameter smaller than the width of said elements;

pressing said layer against the uppermost one of said elements in each of said stacks with said apertures in registry with said uppermost ones of said elements;



downwardly depressing all of said uppermost ones of said elements;

removing said layer, with said uppermost ones of said elements thereto adhesively affixed, to a position overlying said substrate with said uppermost ones of said elements in registry with said corresponding pattern of regions;

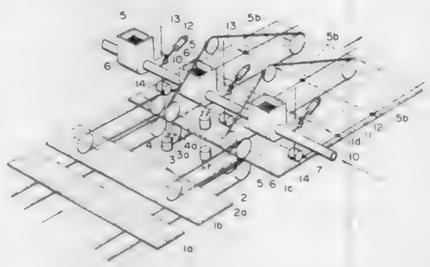
and pressing said layer against said substrate, while maintaining said registry, to adhesively secure said layer in a position mounted upon said substrate.

4,042,440

METHOD AND APPARATUS FOR SPLICING OF VENEER SHEETS

Katsuji Hasegawa; Yukio Takagi, both of Nagoya; Sachio Naito, Ohbu; Kenichi Hiraiwa, Nagoya, and Eiji Takasu, Nagoya, all of Japan, assignors to Meinan Machinery Works, Inc., Ohbu, Japan

Filed Feb. 19, 1976, Ser. No. 659,476
Claims priority, application Japan, Feb. 20, 1975, 50-21665
Int. Cl.[2] B32B *31/12, 31/18*
U.S. Cl. 156—304 **15 Claims**



1. In a method of splicing veneer sheets which comprises, feeding spaced-apart veneer sheets in a predetermined direction, bringing the veneer sheets into substantially tight end-to-end abutment against each other, cold pressing at least one strand against said veneer sheets and simultaneously applying a thermoplastic adhesive onto the surface of a preceding veneer sheet by means of a cooling means supported at a first position, the improvement which comprises the steps of: stopping the feed of a preceding veneer sheet at the moment the rear-end of said preceding veneer sheet arrives at a second position on the infeed side which is spaced from said first position by a predetermined distance; feeding a succeeding veneer sheet until the front-end of said succeeding veneer sheet arrives at said second position and abuts the rear-end of said preceding veneer sheet; applying a thermoplastic adhesive bead in a molten state onto said strand at a localized portion thereof which is maintained out of engagement with the sheets and is on the infeed side of the cooling means, the length of the strand between said first position and the localized portion of the strand being equal to the distance between said first and second positions; and feeding said preceding veneer sheet and said succeeding veneer sheet in a horizontal direction to cause said length of the strand to be cold pressed against said preceding sheet and to cause said thermoplastic adhesive bead to pass through said first position so that said thermoplastic adhesive bead is cold pressed and applied onto the abutting end portions of said preceding and succeeding veneer sheets in the form of an adhesive film containing part of said strand therein and covering a substantial area which spans the preceding and succeeding veneer sheets.

4,042,441

MECHANICAL-CHEMICAL LINKAGE BETWEEN POLYMER LAYERS

Bernard Wasserman, Ridgecrest, and Martin H. Kaufman, China Lake, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 6, 1976, Ser. No. 683,996
Int. Cl.[2] C09J *5/00*
U.S. Cl. 156—306 **6 Claims**

1. A method of bonding a polymeric hydrocarbon to an incompatible rubber comprising the steps of:

forming a long chain polymer containing at least one group insoluble in and non-reactive with said rubber but reactive with said polymeric hydrocarbon;

forming a mixture of said long chain polymer and said rubber while the rubber is uncured;

allowing said long chain polymer to migrate to a surface of said rubber; curing said rubber; and

placing said polymeric hydrocarbon on said surface of the mixture, thereby reacting the reactive with the polymeric hydrocarbon and thereby bonding the rubber to the polymeric hydrocarbon; and

curing said polymeric hydrocarbon on said incompatible rubber.

4,042,442

2-CYANOACRYLATE ADHESIVE COMPOSITION

John R. Dombroski, Kingsport, and Doyle A. Weemes, Greeneville, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 29, 1976, Ser. No. 745,757
Int. Cl.[2] B32B *7/00*
U.S. Cl. 156—310 **18 Claims**

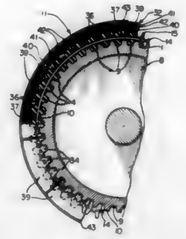
13. A method of bonding the surfaces of articles together by the use of a monomeric ester of 2-cyanoacrylic acid adhesive composition, comprising moistening at least one of the surfaces to be bonded with a solution consisting of from 0.1 to 10 parts by weight of a compound selected from caffeine and theobromine and from 90 to about 99.9 parts by weight of a solvent having a boiling point of 100° C. or below selected from the group consisting of water, saturated monohydroxy aliphatic alcohols containing from 1 to 4 carbon atoms, an ester of said alcohol with a saturated monobasic fatty acid containing from 1 to 3 carbon atoms, acetone, methyl ethyl ketone, methylene chloride, chloroform, diethyl ether, dimethyl ether, methyl chloroform, and mixtures thereof, and thereafter applying to the surface of at least one of the surfaces to be bonded a film of an adhesive composition comprising a monomeric ester of 2-cyanoacrylic acid and maintaining said surfaces in contact.

4,042,443

FLEXIBLE MATRIX FOR FORMING A PORTION OF A TOOTHED POWER TRANSMISSION BELT

Ronald D. Hoback, and Joseph C. Geist, both of Lincoln, Nebr., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 337,056, March 1, 1973, Pat. No. 3,897,291.
This application Mar. 24, 1975, Ser. No. 560,763
Int. Cl.[2] B32B *31/06;* B29H *1/22*
U.S. Cl. 156—349 **16 Claims**



1. A flexible grooved matrix used in combination with a rigid grooved mandrel for forming and retaining the tooth configuration of belt driving teeth of a previously formed toothed belt portion of a toothed power transmission belt, said matrix comprising:

A. a generally cylindrical body of flexible polymeric material;

B. reinforcing means including at least one circumferentially disposed reinforcing member embedded in said body;

C. an inwardly facing surface having a plurality of tooth-forming and retaining grooves disposed therein, said grooves extending generally axially of said matrix and having a plurality of lands alternating therewith with said grooves being of an opposite configuration to that of the teeth of the toothed belt portion so as to register therewith; and

D. means at each axial end for registering and aligning said matrix grooves with the teeth of said previously formed toothed belt portion, said means comprising a plurality of teeth disposed in outer rows at each axial outer end of the matrix extending circumferentially thereof with each tooth extending axially thereof on said inwardly facing surface, said teeth being of an opposite configuration to that of the grooves of the mandrel so as to register therewith and protruding radially inwardly beyond the surface of said lands and said grooves and said lands extending axially between said outer rows.

7. In the manufacture of a toothed power transmission belt having transversely extending teeth on opposite surfaces thereof, the combination of:

A. a rigid cylindrical mandrel having a plurality of grooves in its outer peripheral surface extending axially thereof;

B. a first preformed belt portion of flexible polymeric material having a plurality of driving teeth on one surface thereof, said first belt portion surrounding said mandrel to form an endless belt sleeve with the teeth of said first portion lying within the grooves of the mandrel, said belt sleeve having a width less than the axial length of the mandrel so that a portion of the outer peripheral surface of the mandrel at each end is exposed;

C. a second preformed belt portion of flexible polymeric material having a plurality of driving teeth in one surface thereof, said second belt portion surrounding said first belt portion to form an endless belt sleeve with the teeth of said second portion facing outwardly of the mandrel, said belt sleeve having a width less than the axial length of the mandrel so that a portion of the outer peripheral surface at each end of the mandrel is exposed;

D. a flexible grooved generally cylindrical matrix surrounding said second portion, said matrix having a plurality of

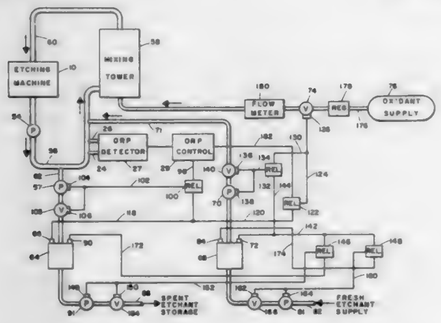
teeth provided in one surface thereof, said teeth disposed in outer rows at each axial end of the matrix with the teeth of each row extending axially of the matrix and facing inwardly of the mandrel, and a plurality of lands and grooves on the inwardly facing surface thereof extending axially between said rows of teeth, the teeth of said matrix having an opposite configuration to that of the grooves of the mandrel and the grooves of the matrix having an opposite configuration to that of the teeth of said second belt portion, said matrix having a greater axial length than the first and second belt portions and the teeth of said matrix protrude radially inwardly beyond the surface of said lands so that the teeth of said matrix face inwardly of the mandrel and mesh with the grooves of the mandrel in the exposed surface thereof and the grooves of said matrix mesh with the teeth of said second belt portion.

4,042,444

ETCHANT REJUVENATION CONTROL SYSTEM

H. Ben Snyder, Upland, Calif., assignor to General Dynamics, Pomona, Calif.

Filed Apr. 26, 1976, Ser. No. 680,027
The portion of the term of this patent subsequent to June 22, 1993, has been disclaimed.
Int. Cl.² C23F *1/02*
U.S. Cl. 156—345 **14 Claims**



1. An etchant rejuvenation control system for use in an etching machine having a quantity of working etchant for etching metal from a workpiece comprising:

means for detecting a variation of the ORP of a working etchant,

means for withdrawing a predetermined volume of etchant upon a predetermined change in said detected ORP,

means for sensing completion of the withdrawing of etchant,

means responsive to said withdrawing of etchant for initiating the injection into the working etchant of an oxidizer at a predetermined flow rate,

means for terminating the injection of said oxidizer when said detected ORP returns to the initial level,

means responsive to the withdrawal of etchant for adding fresh etchant,

means for terminating the addition of fresh etchant after a predetermined volume has been added.

4,042,445

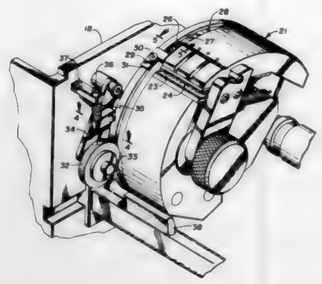
STAMP AND LEGEND APPLICATING MACHINE

Robert N. Klund, Stillwater, and James S. Weidenbach, Anoka, both of Minn., assignors to Delkor Industries, Inc., Minneapolis, Minn.

Filed May 17, 1976, Ser. No. 686,742
Int. Cl.² B43M *13/00*
U.S. Cl. 156—385 **9 Claims**

1. In a postage stamp applying machine including a frame, a stamp roll holder mounted on said frame, a driven stamp metering mechanism carried by said frame for withdrawing stamps from said stamp roll holder and metering the same, means connected to said mechanism for driving the same, and means carried by said frame for moistening and severing such stamps after they have been metered by said mechanism, the improvement comprising:

a. a postage stamp applying wheel rotatably mounted on said frame and constructed and arranged to receive postage stamps from said metering mechanism and having an axially extending slot formed in its circumferential surface through which stamps are metered by said metering mechanism, said wheel having a circumferentially extending groove adjacent said slot formed in its circumferential surface,



b. a printer member mounted within said groove and extending slightly radially outwardly therebeyond,

c. inking means mounted adjacent the groove of said wheel in position to engage and apply ink to said printer member as said wheel rotates said member thereby, and

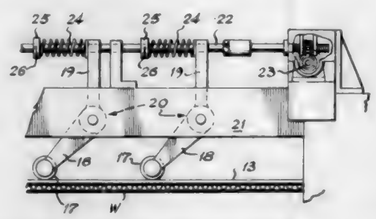
d. means carried by said frame and synchronized with said stamp metering mechanism for rotating said wheel to cause stamps to be applied to envelopes as they pass below said wheel.

4,042,446

CORRUGATED BOARD-MAKING MACHINERY

Bernard Gaskell Lawton, Stockport, England, assignor to Henry Simon Limited, Stockport, England

Filed Aug. 14, 1975, Ser. No. 604,549
Int. Cl.² B32B *31/00*
U.S. Cl. 156—359 **5 Claims**



1. Apparatus for supplying heat and pressure to a corrugated paper board comprising heated means for supporting a web of the board as it is drawn thereover, an endless belt whose lower flight is adpated to overlie the web while it is drawn over said heated means and a plurality of freely rotatable transversely extending parallel longitudinally spaced rolls engaging the upper surface of the lower flight of said belt, a plurality of intermediately pivoted levers each having one of said rolls mounted on a downwardly extending arm, a reciprocable rod passing freely through apertures in upwardly extending arms on said levers, there being for each said lever a resilient compression spring surrounding said rod and disposed between the lever and abutment means secured to the rod, each said spring biasing its associated lever in a direction tending to reduce the roll weight pressure exerted on said board, an actuator for controllably varying the position of said rod axially, whereby the force applied by each said spring to its associated lever may be controllably varied to vary the roll weight pressure exerted on said board, said actuator comprising a reversible motor driven mechanism connected to said rod and means automatically responsive to a condition of said board for controlling operation of said actuator.

4,042,447

CRYSTALLIZING A LAYER OF SILICON ON A SODIUM THALLIUM TYPE CRYSTALLINE ALLOY SUBSTRATE

Norman E. Reitz, Redwood City, Calif., assignor to Sotec Corporation, Redwood City, Calif.

Filed Nov. 1, 1976, Ser. No. 737,389
Int. Cl.² B01J *17/30, 17/32;* C01B *33/02*
U.S. Cl. 156—610 **16 Claims**

1. A method for producing solar cell quality crystalline silicon comprising:

providing a sodium thallium type crystalline alloy substrate selected from the group consisting of LiZn, LiAl, LiGa, LiCd, LiIn and NaTl

gradually applying silicon atoms thereto from the vapor state at a rate which allows said silicon atoms to arrange themselves for oriented crystal overgrowth on said substrate; and

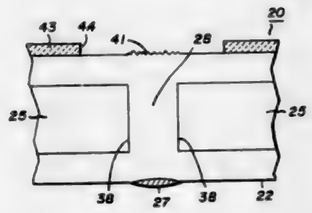
recovering a product comprising solar cell quality crystalline silicon upon a sodium thallium type crystalline substrate.

4,042,448

POST TGZM SURFACE ETCH

Mike F. Chang, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,327
Int. Cl.² H01L *21/306*
U.S. Cl. 156—650 **18 Claims**



1. In the process of manufacturing a semiconductor device, the steps of:

thermally migrating a quantity of an impurity through a body of semiconductor material from a first surface to a second surface at an elevated temperature so as to provide in said body a region containing said impurity in a uniform distribution in an amount equal to the solid solubility limit of said impurity in said semiconductor material at said elevated temperature;

masking a part of said first surface, leaving exposed the portion of said first surface where said impurity entered; and

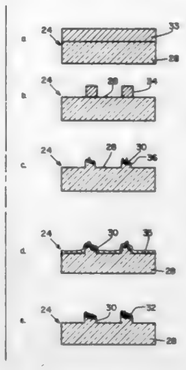
exposing said first surface to an etchant to remove about 1 mil of material from the non-masked portions thereof to substantially smooth said first surface at said non-masked portions.

4,042,449

METHOD OF MAKING A RETICLE-LENS

Robert E. Hunt, China Lake, and Kenneth L. Moore, Ridgecrest, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 598,896, July 24, 1975, Pat. No. 3,999,301.
This application Sept. 20, 1976, Ser. No. 724,448
Int. Cl.² C03C *15/00, 17/00*
U.S. Cl. 156—651 **3 Claims**



1. In a method for producing a reticle having a sapphire substrate underlying a titanium reticle pattern, the improvement which comprises:

depositing a layer of aluminum onto said sapphire substrate;

forming said aluminum to define a reticle pattern;

oxidizing said aluminum reticle pattern;

placing a film of titanium upon said sapphire substrate and said aluminum oxide to form an opague reticle pattern; and

removing said titanium film from other portions of said sapphire substrate than the oxidized reticle pattern portion.

4,042,450

METHOD FOR THE PRODUCTION OF FILMS HAVING THE DESIRED CONFIGURATION

Igor Danilovich Voltovich, Zadorozhny pereulok, 4, kv. 61; Maxim Timofeevich Kostyshin, ulitsa Melnikova, 46, kv. 40; Ekaterina Vasilievna Mikhailovskaya, ulitsa Nikolsko-Botanicheskaya, 27-29, kv. 10; Vyacheslav Vasilievich Petrov, ulitsa Kapitanovskaya, 28, kv. 15; Petr Fedorovich Romanenko, prospekt Nauki, 120, kv. 51, and Vladimir Petrovich Skuridin, prospekt 40 let Oktyabrya, 82, kv. 53, all of Kiev, U.S.S.R.

Continuation of Ser. No. 136,877, April 23, 1971, abandoned.
This application Dec. 7, 1973, Ser. No. 422,925
Int. Cl.² C23F *1/02*
U.S. Cl. 156—652 **6 Claims**



1. A method for the production of films of desired configuration comprising the steps: of coating a film, or substrate, with a system sensitive to electromagnetic radiation and consisting of a layer of metal and a layer of an inorganic substance capable of entering into a reaction with said layer of metal under the effect of electromagnetic radiation to form reaction products; irradiating the system in accordance with the required configuration; removing by etching the layer of inorganic substance that has not entered into reaction with said layer of metal; removing by etching the layer of metal in areas that

have not been irradiated; and etching said film or substrate in areas that have not been irradiated.

4,042,451

SELECTED STRIPPING OF NICKEL-IRON ALLOYS FROM FERROUS SUBSTRATES

Ronald J. Lash, Warren, and Edward P. Harbulak, Allen Park, both of Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Aug. 5, 1975, Ser. No. 602,140
Int. Cl.[2] C09K *13/00*; C23F *1/00*
U.S. Cl. 156—664 **19 Claims**

1. A process for selectively removing nickel-iron alloys or nickel-iron-cobalt alloys, said alloys containing from 5 percent to 90 percent iron, from the surface of a ferrous metal substrate which comprises contacting iron alloys with an aqueous alkaline bath containing:

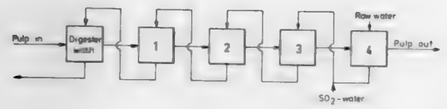
a. at least one nitro substituted organic compound containing at least one solubilizing group;
b. at least one organic amine or polyamine or substituted amine or polyamine; and
c. at least one phosphorus oxo acid or organic phosphorus oxo acid or salts thereof or alkyl phosphonate substituted amines.

4,042,452

PROCESS FOR WASHING CELLULOSE PULP FROM ALKALI DIGESTION WHEREIN ACID IS ADDED TO THE WASHING SOLUTION

Bengt Arhippainen, and Johan Gullichsen, both of Helsinki, Finland, assignors to A. Ahlstrom Osakeyhtio, Finland

Filed Aug. 27, 1975, Ser. No. 608,034
Claims priority, application Finland, Sept. 3, 1974, 742578
Int. Cl.[2] D21C *9/02*
U.S. Cl. 162—60 **4 Claims**



1. A process for washing a cellulose pulp from alkali digestion, prior to the bleaching stage wherein the pulp is fed into a multistage washing system comprising at least three countercurrently coupled washers/in sequence, acid is added directly to a washing solution thus lowering the pH of said solution to a value of 3 or lower at a stage immediately preceding the last washing stage when the concentration of dissolved organic substances is at a value that detrimental precipitation of the organic substances is prevented, the acidified fiber suspension is fed further to the last stage wherein the acidified solution is displaced from the fiber suspension by washing water, and the solution obtained form the last stage is used at least partially as a washing solution at the said stage immediately preceding the last stage.

4,042,453

TUFTED NONWOVEN FIBROUS WEB

Bernard W. Conway, Holyoke, Mass., and James Moran, Simsbury, Conn., assignors to The Dexter Corporation, Windsor Locks, Conn.

Continuation-in-part of Ser. No. 489,411, July 17, 1974, Pat. No. 3,960,652, which is a continuation-in-part of Ser. No. 341,699, March 15, 1973, Pat. No. 3,834,983. This application Apr. 2, 1976, Ser. No. 673,192
The portion of the term of this patent subsequent to Sept. 10, 1991, has been disclaimed.
Int. Cl.[2] D21F *11/00*
U.S. Cl. 162—108 **7 Claims**

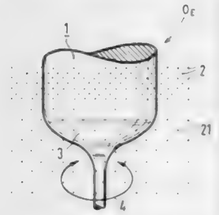
1. A tufted nonwoven water-laid fibrous web material exhibiting high loft, bulk, softness and absorbency comprised of a planar main body member of randomly arranged water dispersable fibers and a plurality of spaced unlooped fiber tufts integral with the main body member and extending freely from the surface thereof, the fibers within said planar body member exhibiting an orientation that is undisturbed from its as formed water-laid random configuration, said tufts being comprised of a puff-like head portion of consolidated fibers and a stem portion of substantially aligned fibers anchoring the head portion to the main body member, the fibers forming said stem portion having first ends extending into the main body member of the web material and opposite ends free of the main body and extending toward said head portion, the puff-like head portion being comprised of fibers spirally consolidated into a compressively resilient intorted and entangled bundle similar in appearance to a French knot.

4,042,454

METHOD OF PRODUCING HOMOGENEOUSLY DOPED n-TYPE Si MONOCRYSTALS BY THERMAL NEUTRON RADIATION

Ernst Haas; Joachim Martin, both of Erlangen; Konrad Reuschel, Vaterstetten, and Manfred Schnoeller, Haimhausen, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 6, 1974, Ser. No. 521,388
Claims priority, application Germany, Nov. 12, 1973, 2356376
Int. Cl.[2] G21G *1/06*
U.S. Cl. 176—10 **1 Claim**



1. A method of producing a homogeneously n-doped Si rod having a specific resistivity greater than 30 ohm × cm wherein a Si rod is subjected to radiation by thermal neutrons and a nuclear reaction occurs within such rod in accordance with:

$$Si^{30}(n, \gamma)\, Si^{31}\, \beta \rightarrow P^{31}$$

comprising:

subjecting a polycrystalline Si rod having a specific resistivity of 550 ohm × cm, n-type to at least one crucible-free zone melting process in a suitably protective environment so as to free said rod of any donor material present therein;
converting the so-attained polycrystalline rod into a monocrystalline state in a conventional manner;
measuring the specific resistivity of the so-produced monocrystalline rod; and
subjecting said monocrystalline rod to controlled radiation by thermal neutrons in accordance with the measured resistivity, the intensity of such controlled radiation comprising 8×10^{13} neutrons/cm^2 × sec. and the radiation duration comprising about one hour whereby an n-doped Si rod having a concentration of about 4×10^{13} atoms of phosphorous/cm^3 of silicon therein is produced.

4,042,455

PROCESS FOR DISSOLVING RADIOACTIVE CORROSION PRODUCTS FROM INTERNAL SURFACES OF A NUCLEAR REACTOR

William W. Brown, Monroeville, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 8, 1975, Ser. No. 575,664
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—37 **5 Claims**

1. The process for dissolving radioactive corrosion products from the internal surfaces of a nuclear reactor comprising the steps of:

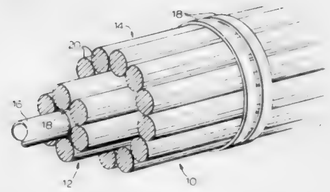
reducing the pressure and temperature of coolant circulating in a closed nuclear reactor steam supply system to about atmospheric pressure and 140° F respectively;
continuing the circulation of said coolant to permit the release of fission gases and fission products into the circulating coolant and until the hydrogen concentration in the coolant is reduced to less than about 4cc per kg;
increasing the pressure of said coolant to several atmospheres of pressure;
adding a solution having an oxygen content greater than water to said circulating coolant to further cause the release of radioactive products from the reactor internal surfaces into said coolant;
reducing the pressure of the circulating coolant to atmospheric pressure;
passing said coolant containing said radioactive products through a demineralizer to remove said products; and
returning the thus decontaminated coolant to the reactor steam supply system.

4,042,456

NUCLEAR FUEL STRING ASSEMBLY

Anthony Kwok-Chun Ip; Ken Koyanagi, and Walter Renald Tarasuk, all of Peterborough, Canada, assignors to Canadian General Electric Company Limited, Toronto, Canada

Filed Mar. 16, 1976, Ser. No. 667,419
Int. Cl.[2] G21C *3/30*
U.S. Cl. 176—78 **10 Claims**



1. A nuclear fuel bundle for use in a nuclear reactor, comprising a first fuel rod sub-assembly having a first set of axially spaced annular rings with a first plurality of nuclear fuel rods integrally attached to radially inner surfaces of said first rings in annular array therein and extending in mutual parallel relation between the rings, a second fuel rod sub-assembly having a second set of axially spaced annular rings, with a second plurality of nuclear fuel rods integrally attached to radially outer surfaces of said second rings in annular array thereabout and extending in mutual parallel relation between the rings, said second sub-assembly being of smaller diameter than said first sub-assembly, having a radial clearance therefrom, and assembled coaxially in telescoped relation within the other said sub-assembly, and a plurality of hollow thimble means interposed between and supported by said first and second sub-assembly in contacting relation with the ends of said rods to locate said first fuel rods in radially and angularly spaced relation from said second fuel rods, to permit relative differentive axial expansion between said sub-assemblies.

4,042,457

PREPARATION OF TISSUE INVASION INHIBITOR AND METHOD OF TREATMENT UTILIZING THE INHIBITOR

Klaus E. Kuettner, Chicago; Reuben Eisenstein, Lincolnwood, both of Ill., and Nino Sorgente, Los Angeles, Calif., assignors to Rush-Presbyterian-St. Luke's Medical Center, Chicago, Ill.

Filed Nov. 10, 1975, Ser. No. 630,275
Int. Cl.[2] C12B *3/00*; C12K *9/00*; A61K *35/12*
U.S. Cl. 195—1.8 **10 Claims**

1. The method of preparing a composition of matter having activity as an inhibitor of cell proliferation comprising the steps of providing connective tissue having a high content of collagen or proteoglycans in condition for extraction, extracting said inhibitor from said tissue with an aqueous extraction medium which includes a solute which does not irreversibly denature the proteinaceous matter to be extracted, separating the resultant aqueous extract from the tissue, recovering from the aqueous extract substances having a molecular weight below about 50,000, treating the fraction of aqueous extract having a molecular weight below about 50,000 to remove salts therefrom, and dehydrating the resultant material.

4,042,458

PROCESS FOR THE PRODUCTION OF MICRO-ORGANISMS

David E. F. Harrison, and Harmannus J. Doddema, both of Faversham, England, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 10, 1976, Ser. No. 665,641
Claims priority, application United Kingdom, Mar. 14, 1975, 10745/75
Int. Cl.[2] C12B *1/00*
U.S. Cl. 195—28 R **9 Claims**

1. A process for the production of micro-organisms comprising culturing, under aerobic conditions in a liquid growth medium comprising assimilable sources of nitrogen and essential mineral salts in the presence of methane gas, a methane-utilising micro-organism which is a strain of Methylococcus 999 having the NCIB Accession No. 11083 in the presence of (a) methanol-utilising micro-organisms which are capable of metabolising methanol produced by the growing methane-utilising micro-organism, and (b) non-methylotrophic micro-organisms which are capable of metabolising organic substances produced by the methane- and/or methanol-utilising micro-organisms, and recovering the micro-organisms from the liquid growth medium.

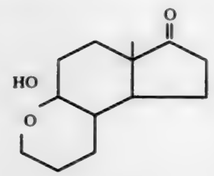
4,042,459

COMPOSITION OF MATTER AND PROCESS

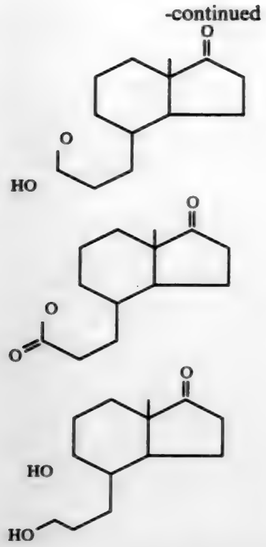
John C. Knight, Kalamazoo Township, Kalamazoo County, and Merle G. Wovcha, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 17, 1975, Ser. No. 632,650
Int. Cl.[2] C07B *29/00*
U.S. Cl. 195—51 S **40 Claims**

37. A process for preparing a fermentation beer containing compounds of the formulae



-continued



which comprises cultivating a *Mycobacterium* mutant which is characterized by its ability to selectively degrade steroids with or without a 17-alkyl side chain of from 2 to 10 carbon atoms, inclusive, and accumulate 3aα-H-4α-[3′-propanol]-7aβ-methylhexahydro-1,5-indandione hemiketal; 3aα-H-4α-[3′-propanal]-5α-hydroxy-7aβ-methylhexahydro-1-indanone hemiacetal; 3aα-H-4α-[3′-propionic acid]-5α-hydroxy-7aβ-methylhexahydro-1-indanone-δ-lactone; and 3aα-H-4α-[3′-propanol]-5α-hydroxy-7aβ-methylhexahydro-1-indanone in the fermentation beer, in an aqueous nutrient medium under aerobic conditions in the presence of a steroid with or without a 17-alkyl side chain containing from 2 to 10 carbon atoms, inclusive.

4,042,460

METHOD FOR PRODUCING GLUCOSE ISOMERASE

Ivan Verner Diers, Lille Vaerlose, Denmark, assignor to Novo Industri A/S, Bagsvaerd, Denmark

Filed July 20, 1976, Ser. No. 706,991

Claims priority, application United Kingdom, July 22, 1975, 30693/75

Int. Cl.² C12D *13/10*

U.S. Cl. 195—65 **9 Claims**

1. Process for production of a glucose isomerase product by fermentation, which process comprises the fermentation of a facultative aerobic, glucose isomerase producing microorganism with a supply of oxygen which is growth-limiting, and with a source of carbon and energy which represses glucose isomerase synthesis yet is readily converted anaerobically to non repressing degradation products added in slight excess and all other nutrients are added in sufficient amounts, and thereafter recovering the glucose isomerase product.

4,042,461

METHOD FOR PURIFYING CHOLESTEROL ESTERASE

Theodore Walter Eaders, Webster; James Robert Schaeffer, Penfield, and Harry Wayne Harris, Hamlin, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Sept. 10, 1976, Ser. No. 722,231

Int. Cl.² C07G *7/028*

U.S. Cl. 195—66 R **10 Claims**

1. A method for purifying a microbial enzyme preparation having separable cholesterol esterase and lipase activities, said method comprising:

treating the enzyme preparation by hydrophobic chromatography using carboxylated polysaccharide material having attached thereto lower alkylamine with less than 8 carbon atoms to remove the separable lipase from the enzyme preparation to yield a purified cholesterol esterase preparation.

4,042,462

CREATINE PHOSPHOKINASE DETERMINATION METHOD

John H. Johnson, Kirkwood, and Lloyd E. Weeks, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 24, 1975, Ser. No. 644,203

Int. Cl.² G01N *31/14*

U.S. Cl. 195—103.5 R **8 Claims**

1. The method of determining creatine phosphokinase in blood serum or plasma comprising reacting a sample of said blood serum or plasma with an oxygenated aqueous solution containing creatine phosphate, ADP, glucose, HK, G-6-PDH, NADP and diaphorase or phenazine methosulfate electron acceptor at a temperature of from about 25° to about 40° C and a pH of from about 6 to about 7 and measuring the uptake of oxygen by the oxidation of the resulting NADPH with an oxygen sensing electrode.

4,042,463

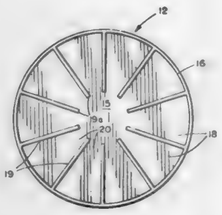
METHOD OF SIMULTANEOUSLY CULTIVATING MULTIPLE COLONIES OF MICROORGANISMS

Riaz-ul Haque, Glen Ellyn, and Richard A. Murphy, Oak Park, both of Ill., assignors to International Foundation of Microbiology, Chicago, Ill.

Continuation of Ser. No. 233,023, March 9, 1972, abandoned, which is a division of Ser. No. 412,479, Nov. 2, 1973, Pat. No. 3,912,596. This application July 25, 1975, Ser. No. 598,754

Int. Cl.² C12B *1/02*

U.S. Cl. 195—120 **2 Claims**



1. The method of simultaneously cultivating multiple colonies of microorganisms which comprises providing a culture dish having compartments opening into the center portion of the dish, pouring a solidifiable liquid culture medium onto the dish so that the culture medium flows through the center portion of the dish and into each of the dish compartments, allowing the liquid culture medium to solidify, contacting the solidified culture medium in each of the compartments with a colony of microorganisms, and incubating the contents of the culture dish to thereby simultaneously cultivate the multiple colonies of microorganisms.

4,042,464

METHOD FOR THE DETECTION AND MEASUREMENT OF NOXIOUS GASES

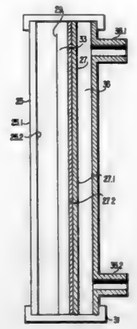
Keith F. Blurton, Yorktown, N.Y., and John M. Sedlak, Norwalk, Conn., assignors to Energetics Science, Inc., Elmsford, N.Y.

Filed Oct. 10, 1975, Ser. No. 621,554

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **4 Claims**

1. A method for electrochemically detecting a noxious gas selected from the group consisting of nitric oxide, nitrogen dioxide, sulfur dioxide, mercaptans and hydrogen sulfide in the presence of carbon monoxide which comprises the steps of (1) feeding a gaseous sample containing said gas to the sensing electrode of an electrochemical cell comprising a sensing electrode, a counterelectrode, and an aqueous electrolyte in contact with said sensing electrode and counterelectrode, said sensing electrode comprising a carbon supported gold catalyst;



(2) maintaining said sensing electrode at a fixed potential of about 0.4 volt to 1.5 volts with respect to the potential of the reversible hydrogen couple in the electrolyte of said cell; and (3) measuring the current flowing between said sensing electrode and counterelectrode of said cell to quantitatively determine the amount of said noxious gas in said gaseous sample.

4,042,465

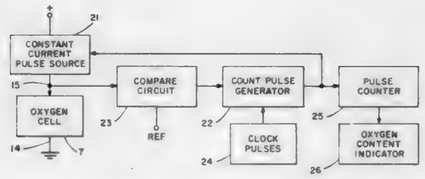
MEASUREMENT OF OXYGEN IN A FLUID SAMPLE AND APPARATUS THEREFOR

William H. Morong, III, Perry, Maine, and Thomas E. Lawson, Denver, Colo., assignors to Lexington Instrument Corporation, Waltham, Mass.

Filed Aug. 25, 1976, Ser. No. 717,645

Int. Cl.² G01N *27/46*

U.S. Cl. 204—1 T **11 Claims**



1. In apparatus for measuring the oxygen content of a fluid sample including a galvanic cell that absorbs the oxygen from the sample, means for measuring the oxygen absorbed by the cell comprising,

a. electrical means connected to the cell for detecting the voltage across the cell, herein called the cell voltage, and for controlling electric current to the cell, herein called the cell current, so that the cell voltage does not exceed a standard voltage,

b. means for integrating the values of the cell currents, and

c. means for indicating the value of said integration as representative of the oxygen absorbed by the cell.

11. In a method of measuring the oxygen content of a fluid sample using a galvanic cell that absorbs the oxygen from the sample, the steps of:

a. generating clock pulses of uniform interval between pulses;

b. providing a controlled source of constant current for the cell;

c. comparing cell voltage with a reference voltage producing a feedback signal when cell voltage exceeds the reference voltage;

d. combining clock pulses with the feedback signal producing cell current count pulses of uniform duration;

e. applying the cell current count pulses to the controlled source of constant current; whereby a pulse of constant current for the uniform duration is conducted by the cell for each applied cell current count pulse; and

f. counting the cell current count pulses.

4,042,466

METHOD FOR MANUFACTURING A METALIZED SCREEN GAUZE

Lodewijk Anselrode, St. Anthonis, Netherlands, assignor to Stork Brabant B.V., Boxmeer, Netherlands

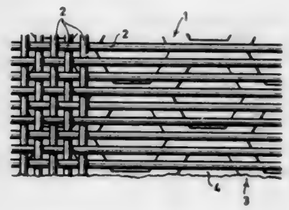
Filed Jan. 2, 1976, Ser. No. 646,414

Claims priority, application Netherlands, Dec. 27, 1974, 7416897

The portion of the term of this patent subsequent to Aug. 1, 1989, has been disclaimed.

Int. Cl.² C25D *1/08*

U.S. Cl. 204—11 **8 Claims**



1. A method of manufacturing a seamless tubular metalized screen gauze comprising the steps of providing a matrix with an electrically conductive surface upon which is a pattern of dots of non-conductive material, tensioning a seamless tubular textile product built up of threads upon the matrix, precipitating metal upon the matrix by a galvano plastic process to anchor the threads in the precipitated metal, and removing the metal reinforced tubular product from the matrix to provide a thin tubular screen capable of use in printing while retaining its form and providing a high proportion of open area.

4,042,467

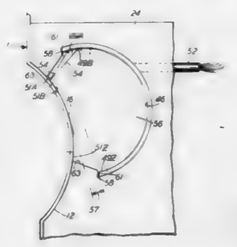
ELECTROLYTICALLY TREATING A SELECTED CYLINDRICAL SURFACE OF AN ARTICLE

Duane E. Bacon; J. David Gattermeir, both of Lee's Summit; Spencer S. Hecox, Raytown, and John J. Robb, Independence, all of Mo., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 4, 1976, Ser. No. 729,437

Int. Cl.² C25D *5/02, 17/12, 17/14*

U.S. Cl. 204—15 **10 Claims**



1. A method of electrolytically treating a cylindrical surface portion of an article with a controlled distributional profile of electrolytic treating action along a section perpendicular to a cylindrical axis of the surface portion, which comprises:

placing the article opposite an electrode of the treating apparatus; locating with respect to a surface of the electrode, typical unit areas of the surface of the article lying adjacent each other along the section in accordance with influence numbers for each of the unit areas, the influence numbers having magnitudes in proportion to the desired extent of the treating action on the unit areas to which such numbers relate, each number being the sum of ratios of incremental areas of the surface of the electrode divided by the respective distances from such incremental areas to the one unit areas associated with the number, summed over the surface of the electrode;

introducing a electrolyte in the space between the article and the electrode; and

applying a voltage between the electrode and the surface portion of the article to initiate the desired treating action.

4,042,468

PROCESS FOR ELECTROLYTICALLY COLORING ALUMINUM AND ALUMINUM ALLOYS

Mutsuo Hasegawa, Uozu; Kazuo Aikawa, and Shinji Hayashi, both of Toyama, all of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,561
Claims priority, application Japan, Mar. 6, 1975, 50-26519
Int. Cl.² C25D *11/22*
U.S. Cl. 204—42 **6 Claims**

1. A process for electrolytically coloring aluminum or aluminum alloy which comprises anodizing a desired basis metal, electrolyzing the anodized basis metal by use of substantially direct current with the basis metal made anodic in an acidic aqueous electrolyte containing at least two coloring metallic salts in an amount of about 5 to 500 grams per liter, and further electrolyzing the basis metal in the same electrolyte by use of alternating current.

4,042,469

PROCESS FOR ELECTROLYTICALLY COLORING ALUMINUM AND ALUMINUM ALLOYS IN GOLD

Mutsuo Hasegawa, Uozu; Toshikazu Imaoka, Kurobe, and Kazuo Aikawa, Toyama, all of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,625
Claims priority, application Japan, Mar. 5, 1975, 50-26066
Int. Cl.² C25D *11/22*
U.S. Cl. 204—42 **5 Claims**

1. A process for electrolytically coloring aluminum or aluminum alloy a gold color which comprises anodizing a basis metal, and electrolyzing the anodized basis metal in an acidic aqueous electrolyte by use of alternating current, said electrolyte beng prepared by adding formaldehyde in a concentration of about 3 to 50 grams per liter, and a thiosulfate in a concentration of about 0.3 to 10 grams per liter to an acid solution of stannous sulfate in a concentration of at least about 1.5 grams per liter.

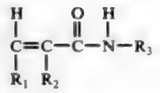
4,042,470

BRASS PLATING

Edward P. Harbulak, Allen Park, and Ronald J. Lash, Warren, both of Mich., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Oct. 4, 1976, Ser. No. 729,024
Int. Cl.² C25D *3/56, 3/58*
U.S. Cl. 204—44 **8 Claims**

5. A composition for electrodepositing semi-bright to bright brass which comprises an aqueous alkaline cyanide brass electroplating bath containing at least one copper compound providing copper ions, at least one zinc compound providing zinc ions, and as a cooperating additive 0.1 to 10 grams per liter of at least one compound exhibiting the following generalized structural formula:



where

R_1 and R_2 are each independently selected from the group consisting of hydrogen, alkyl groups exhibiting from one to ten carbon atoms and hydroxy alkyl groups exhibiting from one to ten carbon atoms and R_3 is hydrogen or a straight or branched chain alkyl sulfonic or carboxylic acid from one to ten carbon atoms, or salts thereof, or a straight or branched chain hydroxy alkyl group of from one to five carbon atoms.

4,042,471

PROCESS FOR ELECTROLYTICALLY COLORING ALUMINUM AND ALUMINUM ALLOYS

Mutsuo Hasegawa, Uozu; Kazuo Aikawa, Toyama, and Katsuyuki Nagata, Uozu, all of Japan, assignors to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,551
Claims priority, application Japan, Mar. 5, 1976, 51-26065
Int. Cl.² C25D *11/22*
U.S. Cl. 204—58 **2 Claims**

1. A process for electrolytically coloring aluminum or an aluminum alloy which comprises electrolyzing anodized aluminum or an aluminum alloy in an acidic, aqueous electrolyte containing at least two coloring metallic salts in the range of from about 5 to 500 grams per liter and a strong reducing compound selected from the group consisting of dithionites, thiosulfates, thioglycolic acid, and thioglycolates in the range of from about 0.05 to 10 grams per liter at an alternating current potential of up to 15 volts.

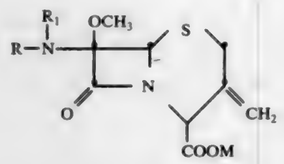
4,042,472

ELECTROLYTIC PROCESS FOR 7-METHOXY-3-EXOMETHYLENECEPHAM COMPOUNDS

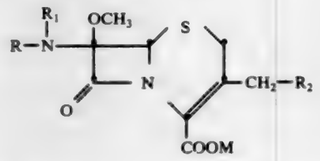
David A. Hall, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 12, 1976, Ser. No. 676,183
Int. Cl.² C25B *3/00*
U.S. Cl. 204—73 R **1 Claim**

1. In the process for preparing a 7-α-methoxy-3-exomethylenecepham compound of the formula



which comprises the electrolysis at a temperature between 5° and 45° C. of an aqueous solution of a 7-α-methoxy-substituted-cephalosporin compound of the formula



wherein said electrolysis is carried out at a cathode selected from the group consisting of mercury and zinc, and

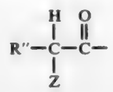
wherein R is C_1–C_4 alkanoyl, 5-amino-5-carboxyvaleryl, or benzoyl, or an aralkanoyl or aryloxyalkanoyl group of the formula



wherein R′ is phenyl, phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, amino, hydroxy; or R′ is thienyl, furyl, imidazolyl, oxazolyl, thiazolyl, triazolyl, or tetrazolyl;

and wherein n is 0 or 1; with the limitation that when n is 1, R′ is phenyl or substituted phenyl;

or R is an α-substituted aralkanoyl group of the formula



wherein R″ is phenyl, phenyl substituted by C_1–C_4 alkyl, C_1–C_4 alkoxy, halogen, amino, or hydroxy, or R″ is thienyl or furyl;

Z is amino, hydroxy, formyloxy, or C_2–C_4 alkanoyloxy,

R_1 is hydrogen or R_1 and R taken together with the nitrogen atom to which they are attached are succinimido or phthalimido;

R_2 is acetoxy, halogen, pyridinium, carbamoyloxy, or a group of the formula



wherein R_3 is C_1–C_4 alkyl, C_1–C_4 alkoxythionocarbonyl, C_1–C_4 alkanoyl, benzoyl, thiocarbamoyl, amidino or a 5- or 6-membered nitrogen containing heterocyclic ring;

and M is hydrogen, an alkali metal cation, and a unit negative charge when R_2 is pyridinium or when R_3 is amidino;

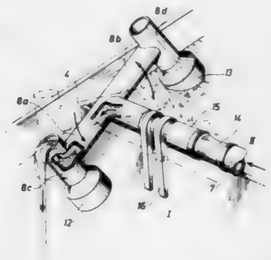
the improvement which comprises carrying out the electrolysis at a pH of about 7.5 to about 8.5 at a potential above the reduction potential of said cephalosporin compound.

4,042,473

PROCESS FOR RECOVERY OF RE-USABLE SUBSTANCES FROM A FIXING BATH IN PROCESSES FOR DEVELOPMENT AND FIXING OF PHOTOGRAPHIC FILMS AND X-RAY FILMS

Osten Lindgren, Solna, Sweden, assignor to AB Metall- & Bergprodukter, Solna, Sweden

Filed Nov. 17, 1975, Ser. No. 632,274
Claims priority, application Sweden, Dec. 4, 1974, 7415216
Int. Cl.² C25C *1/20*
U.S. Cl. 204—109 **5 Claims**



1. A process for electrolytic recovery of silver from fixing bath solution obtained by development of photographic films and X-ray films in a recovery apparatus having separate first and second chambers, said process being performed alternatively in two modes, each mode respectively occurring in said first and second chambers, said process comprising the steps of:

feeding fixing bath solution to said first chamber;

electrolytically recovering silver from said solution in the first chamber while simultaneously directing additional solution from the fixing bath to said second chamber which functions as a holding tank;

automatically discharging the liquid from said first chamber to a sewer upon completion of the recovery of silver from the fixing bath solution;

electrolytically recovering silver from the fixing bath solution in said second chamber by subjecting the solution in said second chamber to a shorter and weaker electrolysis than that to which the solution in the first chamber is subjected, while simultaneously directing additional solution from the fixing bath to said first chamber which now functions as a holding tank; and

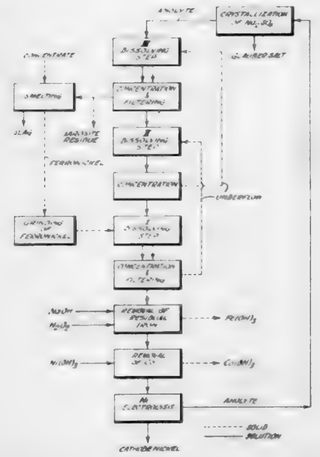
automatically discharging the liquid from said second chamber to a chemicals tank upon completion of the recovery cycle, such that the chemicals in the solution discharged from said second chamber to said chemicals tank are not extensively decomposed, and such that said solution discharged from said second chamber to said chemicals tank still contains some silver.

4,042,474

SEPARATING NICKEL, COBALT AND CHROMIUM FROM IRON IN METALLURGICAL PRODUCTS

Heimo Unto August Saarinen, Huovintie, Finland, assignor to Pako Corporation, Minneapolis, Minn.

Continuation of Ser. No. 385,183, Aug. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 334,870, Feb. 22, 1973, abandoned. This application June 26, 1975, Ser. No. 590,478
Int. Cl.² C25C *1/06*
U.S. Cl. 204—112 **6 Claims**



1. A process for separating one or more non-ferrous metals selected from the group consisting essentially of nickel, cobalt and chromium from iron by treatment of a metallurgical product consisting essentially of at least one of ferronickel, ferrocobalt and ferrochromium in addition to sulfur, carbon or silicon, comprising in combination:

leaching the metallurgical product counter-currently in at least two steps with dilute sulfuric acid to a final pH in a last one of said leaching steps of 5.5 to 6.2 in admixture with oxygen for oxidizing iron to form ferric hydroxide and dissolve the non-ferrous metals to form a pregnant leach solution in the first of said leaching steps and separating solid material containing undissolved non-ferrous

metal or metals and said ferric hydroxide from said last leaching step;

b. then adding to the solid material from said last leaching step of (a) sulfuric acid solution to dissolve the non-ferrous metal or metals and the ferric hydroxide and precipitating iron as alkali jarosite in the presence of alkali metal ions at elevated temperature under oxidizing conditions, using copper as an oxidation catalyst;

c. maintaining the temperature of the acid solution formed in step (b) above about 90° C and the pH for step (b) between 1 and 3.5; and

d. finally separating the alkali jarosite precipitate from the solution containing the non-ferrous metal or metals and feeding said solution to the last leaching step of (a).

5. The process of claim **1** wherein the non-ferrous metal is nickel and including purification of the solution from step (d), treating the purified solution by nickel electrolysis and recirculating acid electrolyte from said electrolysis to step (a).

4,042,475

PICKLING OF ALUMINUM

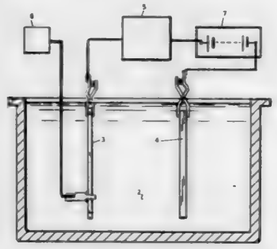
Paul Frederik A. Bijlmer, Nieuw-Vennep, Netherlands, assignor to Fokker-VFW B.V., Schiphol, Netherlands

Filed Apr. 7, 1976, Ser. No. 674,445

Claims priority, application Netherlands, Apr. 9, 1975, 7504244

Int. Cl.² C25F *1/00, 1/04, 7/00*

U.S. Cl. 204—141.5 **8 Claims**



1. The method of pickling aluminum articles which comprises the steps of:

a. providing a pickling bath containing sulfuric acid without any chromic acid or bichromate oxidizing agent;

b. positioning the aluminum article in the bath of step (a) and measuring the potential between said article and the bath;

c. imposing a control voltage between said article and a cathode positioned in said bath in spaced relation to the article, said control voltage having a value at least sufficient to raise the potential of said article near to zero volts but said control voltage having a value less than 1 volt;

d. maintaining said control voltage substantially constant for a time sufficient to produce microscopic pits of about 200μ in diameter in the surface of said article; and then

e. recovering said article from the bath.

4,042,476

POLYMERIZED TITANIUM DIOXIDE FOR ULTRAVIOLET COATINGS

George L. Collins, Murray Hill, and John R. Costanza, North Plainfield, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Feb. 18, 1975, Ser. No. 550,383

Int. Cl.² C08F *8/00;* **C08L** *7/00;* **B01J** *1/10*

U.S. Cl. 204—159.15 **9 Claims**

1. A process for ultraviolet coating which comprises:

a. forming an aqueous polymer emulsion of alpha beta ethylenically unsaturated vinyl polymerizable monomers utilizing a free radical initiator and up to about 20 percent, by weight, based on the solids content of the formed emulsion, of titanium dioxide;

b. precipitating the resulting polymer emulsion utilizing an organic solvent having a boiling point of less than about 70° C;

c. removing water and solvent from the precipitate;

d. mixing the dried precipitate with an ultraviolet curable binder in the precipitate to binder ratio, by weight, of about 2–1 to 1–5, wherein said binder contains about 40 to about 100 percent, by weight, of an alpha beta ethylenically unsaturated vinyl polymerizable compound containing at least two sites of alpha beta ethylenic unsaturation and up to about 60 percent, by weight, of an alpha beta ethylenically unsaturated vinyl polymerizable monomer containing no more than one site of alpha beta ethylenic unsaturation, and about 0.1 to about 15 percent, by weight, based upon the ultraviolet curable components, of an ultraviolet photoinitiator;

e. applying a coating of the ultraviolet curable mixture; and

f. subjecting the coating to ultraviolet light.

4,042,477

METHOD OF CONTINUOUS AND DISCONTINUOUS ELECTROCHEMICAL CLEANING OF ALLOYED STEEL WITH SURFACES CONTAMINATED WITH MINERAL OILS AND SYNTHETIC OILS

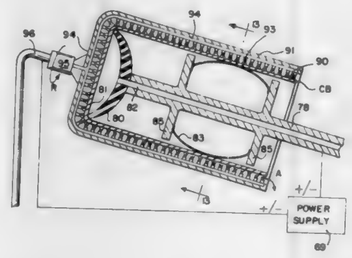
Bengt Ivar Andersson, Karlstad, Sweden, assignor to C. J. Wennberg AB, Karlstad, Sweden

Filed May 10, 1976, Ser. No. 684,887

Claims priority, application Sweden, May 13, 1975, 054791

Int. Cl.² C25F *1/00, 1/06*

U.S. Cl. 204/145 R **10 Claims**



1. Method of continuous and discontinuous electrochemical cleaning of alloyed steel, contaminated with mineral oils and synthetic oils while preserving or improving the finish, characterized in that the steel surface is subjected to a combined degreasing and surface degradation by means of a direct current electrochemical treatment in an aqueous solution containing more than 25 g./l. potassium sulphate with a pH exceeding 10, said surface being made alternately anodic and then cathodic.

4,042,478

PROCESS FOR ELECTROCOATING AN AQUEOUS COMPOSITION OF THE REACTION PRODUCT OF AN EPOXY ESTER RESIN AND A MALEINIZED DRYING OIL BLENDED WITH A CROSS-LINKING AGENT

Isidor Hazan, Clementon, N.J., and Robert N. Iacona, Newtown Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 493,067, July 30, 1974, Pat. No. 3,954,688.

This application Dec. 22, 1975, Ser. No. 643,389

Int. Cl.² C25D *13/06*

U.S. Cl. 204—181 **6 Claims**

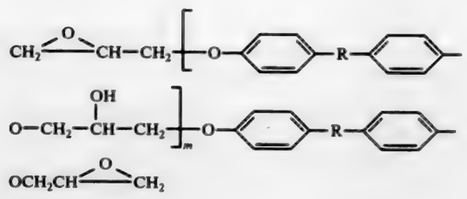
1. In the process for electrocoating a film-forming polymer composition on the anode of an electrocoating cell, said anode consisting of a metal article, by immersing said anode in a coating bath containing uniformly dispersed constituents, passing direct current through said cell to deposit a coating on the anode, removing the coated anode from the bath and baking the coated anode to form a continuous film thereon, the improvement therewith comprises utilizing a coating bath of

an aqueous coating composition having a pH of about 7.2–10 comprising 5–50% by weight of film-forming constituents uniformly dispersed in an aqueous medium;

wherein the film-forming constituents consist essentially of

a. 50–97% by weight, based on the weight of the film-forming constituents, of a polymer which is the reaction product of

1. an epoxy ester resin of an epoxy resin of the formula



where R is an alkylene group having 1–4 carbon atoms and m is a positive integer sufficiently large to provide a Gardner Holdt viscosity of A to Z_5 measure at 25° C. on a 40% weight solids polymer solution using ethylene glycol monobutyl ether solvent; and drying oil fatty acids selected from the group consisting of linseed oil fatty acids, tung oil fatty acids, dehydrated castor oil fatty acids, soya oil fatty acids and tall oil fatty acids; and

2. a malenized drying oil which is the reaction product of maleic anhydride and a drying oil selected from the group consisting of linseed oil, tung oil, dehydrated caster oil, soya oil and tall oil; and

b. 3–50% by weight, based on the weight of the film-forming constituents, of a water dispersible cross-linking agent selected from the group consisting of phenol formaldehyde, urea formaldehyde, methylated urea formaldehyde, melamine formaldehyde, alkylated melamine formaldehyde having 1–4 carbon atoms in the alkyl group and benzoguanamine formaldehyde;

wherein the composition contains sufficient basic compound to have said pH and wherein the basic compound is selected from the group consisting of an alkali metal hydroxide, an amine or a polyamine.

4,042,479

THIN FILM RESISTOR AND A METHOD OF PRODUCING THE SAME

Jun'ichiro Yamazaki; Takeshi Kamo, and Yoshiichi Saito, all of Kawasaki, Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Continuation of Ser. No. 532,680, Dec. 13, 1974, abandoned.

This application Sept. 14, 1976, Ser. No. 723,310

Claims priority, application Japan, Dec. 27, 1973, 48-1927

Int. Cl.² C23C *15/00;* **H01B** *1/00;* **H01C** *7/00*

U.S. Cl. 204—192 F **3 Claims**

1. A thin film resistor of essentially Ta—Al—N composition having a specific resistivity in the range of from 400 to 1000$\mu\Omega$cm, a temperature coefficient of resistivity in the range of from 0 to −300 ppm/° C, and a characteristic of resistivity change in ageing of less than 2000 ppm, wherein said thin film resistor is produced by a process comprising the steps of:

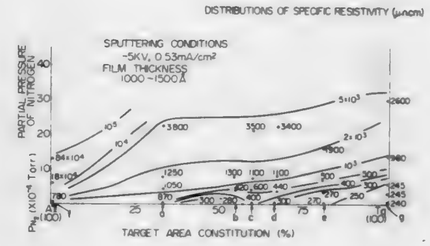
providing an atmosphere consisting essentially of nitrogen at a partial pressure in the range from 2×20^{-4} to 10×10^{-4} Torr. and an inert gas;

placing a substrate within said atmosphere;

providing a target having a composition consisting essentially of tantalum and aluminum, said target composition including said tantalum covering the surfaces of said target within the range of from 30 to 80%, and;

performing a sputtering process on said target within said atmosphere to form said thin film resistor having a thickness in the range from 300 to 1500A under conditions which cause said formed thin film resistor to have said specific resistivity and said temperature coefficient or resistivity within said corresponding ranges; and

heat treating said formed thin film resistor at a temperature of not more than 250° C to cause said thin film resistor to have said characteristic of resistivity change in ageing within said range.



2. A method of producing a thin film resistor, with a high degree of reproductivity, of essentially Ta—Al—N composition having a specific resistivity in a range of from 400 to 1000$\mu\Omega$cm, a specific temperature coefficient of resistance in a range of from 0° to −300 ppm/° C, comprising the steps of:

providing an atmosphere consisting essentially of an inert gas, and nitrogen, wherein said nitrogen is at a partial pressure in the range from 2×10^{-4} to 10×10^{-4} Torr;

placing a substrate within said atmosphere;

providing a target having a composition consisting essentially of tantalum and aluminum, said target composition including said tantalum covering the surface of said target within the range of from 30 to 80%;

performing a sputtering process on said target within said atmosphere to form said thin film resistor having a thickness in the range of from 300 to 1500A under the sputtering condition so that said thin film resistor exhibits a plateau characteristic in a plot of said temperature coefficient of resistance versus nitrogen partial pressure in said nitrogen partial pressure range; and

heat treating said formed thin film resistor at a temperature of not more than 250° C to provide said thin film resistor with a stabilized specific resistance change in ageing characteristic of less than 2000 ppm.

4,042,480

APPARATUS FOR SELECTIVELY APPLYING A METAL COATING TO THE METALLIC PARTS OF ELEMENTS WHICH PASS THROUGH AN INSULATOR

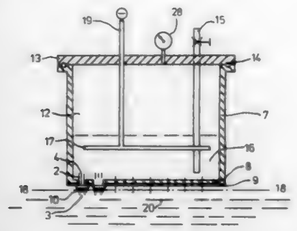
Francis X. Noz, Matachils 400, Triesen, Switzerland

Division of Ser. No. 512,398, Oct. 4, 1974, Pat. No. 4,007,097. This application Apr. 6, 1976, Ser. No. 674,269

Claims priority, application Switzerland, Oct. 4, 1973, 14213/73

Int. Cl.[2] **C25D** *17/06, 17/18, 17/28*

U.S. Cl. 204—224 R **5 Claims**



1. An apparatus for selectively applying a coating of a precious metal such as gold, to the metal parts of electrical components of a type having a housing in which electrical connectors have ends protruding through the sides thereof, comprising:

an electrically insulated template having apertures therein for receiving said components in fluid-tight fashion whereby the parts to be coated project outwardly on one side, and the parts not to be coated project outwardly on the other side of the template, said template comprising the wall of a container and the parts not to be coated project inwardly of said container and the parts to be coated project exteriorly thereof, a chemically inactive first electrolyte partially filling said container,

means for rendering said container substantially airtight,

vacuum means for evacuating sufficient air from said container to produce a vacuum to hold said connectors to said template while said container is in said first position such that the first elctrolyte is not in contact with said connectors,

said container being invertible from a first position to a second position,

whereby when said container is inverted to said second position the first electrolyte comes into contact with said parts not to be coated,

a second electrolyte which partially receives the parts to be coated when said container is in said second position,

a first electrode in electrical contact with said second electrolyte, a second electrode in electrical contact with said first electrolyte, and means for connecting said first and second electrodes to a current source.

4,042,481

PRESSURE-ELECTROLYSIS CELL-UNIT

Donald A. Kelly, 58-06 69th Place, Maspeth, N.Y. 11378

Filed Dec. 24, 1974, Ser. No. 536,268

Int. Cl.[2] **C25B** *1/02, 1/12, 11/03*

U.S. Cl. 204—270 **9 Claims**

1. An advanced pressure electrolysis cell and unit comprising a sealed rectangular process tank containing a top insulation plate,

securing and sealing means for said sealed rectangular process tank and said top insulation plate,

multiple equal sets of anode and cathode porous tubular electrodes uniformly secured and sealed at right angles within said top insulation plate, each set comprising one anode and one cathode,

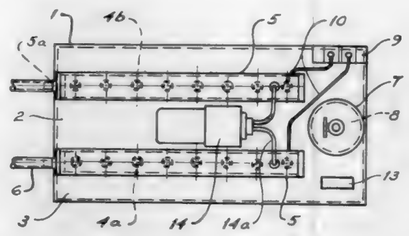
a sub-surface plastic hydrophobic layer uniformly disposed over each of said multiple equal sets of anode and cathode porous tubular electrodes,

two horizontal gas manifold tubes secured and sealed to the tops of each said multiple equal sets of anode and cathode porous electrodes, one of said manifold tubes being sealed to the anodes and the other of said manifold tubes being sealed to the cathodes,

sealing means uniformly provided for each of said multiple equal sets of anode and cathode porous tubular electrodes between said top insulation plate and said two horizontal gas manifold tubes.

plug sealing means at one end of said two horizontal gas manifold tubes, sealing and gas connection plugs secured to the opposite ends of said two horizontal gas manifold tubes,

tubing connection means disposed between said two sealing and gas connection plugs and the hydrogen and oxygen gas application use,



a vertical cylinder secured and sealed at one end of said top insulation plate in fluid communication with said sealed rectangular process tank,

a vertically movable piston-weight closely fitted within said vertical cylinder secured and sealed at one end of said top insulation plate, a vertical extension tube centrally located within said vertically movable piston-weight,

a fluid control valve located at the top of said vertical extension tube,

a drain petcock built into the lower side of said sealed rectangular process tank,

a pressure gauge fitted and sealed into said top insulation plate,

electrical connections from an external low-voltage D. C. power supply source to a terminal block secured to the top of said top insulation plate,

insulated electrical connection leads from the positive and negative terminals on said terminal block to the tops of each of said multiple equal sets of anode and cathode porous tubular electrodes-respectively.

4,042,482

SUBSTITUTED LITHIUM ORTHOSILICATES AND SOLID ELECTROLYTES THEREFROM

Robert Day Shannon, Wilmington, and Barry Edward Taylor, Claymont, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 651,585, Jan. 22, 1976, abandoned. This application Aug. 26, 1976, Ser. No. 718,031

Int. Cl.[2] **C25B** *9/00;* **C01B** *33/26;* **H01M** *10/36*

U.S. Cl. 204—242 **13 Claims**

1. A composition having

a. the formula

$$Li_{4+w-x-2y}Si_{1-w-x-y}Al_wP_xS_yO_4$$

wherein

w is 0 to about 0.45,

x is 0 to about 0.5, and

y is 0 to about 0.35,

with the proviso that one or both of w or $x+2y$ is at least about 0.1, and

b. the monoclinic Li_4SiO_4 crystal structure.

4,042,483

ELECTROLYSIS CELL ELECTRODE AND METHOD OF PREPARATION

Pierre Bouy, Enghien-les-Bains, and Guy Cheradame, Pont-de-Claix, both of France, assignors to Rhone-Progil, Paris, France

Continuation of Ser. No. 486,052, July 5, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,140

Claims priority, application France, July 20, 1973, 73.26693; May 13, 1974, 74.16409

Int. Cl.[2] **C25B** *11/08;* **C25C** *7/02;* **C25D** *17/10*

U.S. Cl. 204—290 F **13 Claims**

1. A process for preparing an electrode for an electrolysis cell by the direct depositing on a film-forming metal substrate, a compound of perovskite structure, characterized by directly depositing on the said substrate the said compound of perovskite structure consisting of a rare earth cobaltite having the formula $LnCoO_3$, in which Ln is at least one rare earth metal, said compound being suspended in a solution of cobalt nitrate, which, by thermolysis, may be converted to cobalt oxide, and then subjecting the said substrate and the resulting deposit thereon to a heat treatment in an oxidizing atmosphere at a temperature of at least about 300° C.

12. An electrode for an electrolysis cell produced by the process of claim **1**.

4,042,484

METAL ANODE FOR ELECTRO-CHEMICAL PROCESSES

Gerhard Thiele, Uttenreuth; Dieter Zollner, Schwaig, and Konrad Koziol, Rothenbach, all of Germany

Continuation-in-part of Ser. No. 299,140, Oct. 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 98,227, Dec. 15, 1970, abandoned. This application Jan. 10, 1975, Ser. No. 540,173

Int. Cl.[2] **C25B** *11/08*

U.S. Cl. 204—290 F **16 Claims**

1. In an anode structure for use in electrochemical processes comprising a basis metal and a cover layer thereon the improvement wherein said cover layer comprises a compound having the empirical formula

$$M_nPt_3O_4$$

where M is selected from the group of monovalent elements consisting of lithium, sodium, potassium, silver, and copper and wherein n is a number in the range of about 0.4 to about 0.6.

4,042,485

COMBUSTON METHOD OF OIL SHALE RETORTING

John B. Jones, Jr., 300 Enterprise Building, Grand Junction, Colo. 81501, and Adam A. Reeves, P.O. Box 781, Anvil Points, Rifle, Colo. 81650

Filed Apr. 16, 1976, Ser. No. 677,556

Int. Cl.[2] **C10G** *1/02*

U.S. Cl. 208—11 R **5 Claims**

1. A process for retorting oil shale in a direct combustion heating mode in a vertical vessel for producing shale oil and gas above 95% liquid recovery efficiency based on a Fischer Assay comprising:

a. forming a bed of shale under a gravity flow in a closed, vertical kiln in a mass flow rate of 450–500 pounds per square foot per hour in a continuous flow, said raw shale being in a particulate size range consist of + ¾ inch to −3 inch;

b. feeding particulate raw shale at ambient temperatures onto the top of the shale bed at said mass flow rate and withdrawing sufficient retorted shale from the bottom of the bed so as to maintain a bed of about 26' in depth, said retorted shale being withdrawn at a temperature of about 300°–400° F.;

c. injecting air heated to about 180°–200° F. into said bed at a rate of about 4,000 to 4,800 standard cubic feet per shale ton, said air being introduced at two positions across the lateral extent of said bed, the first said position being at about 6–7 feet below the top surface of the bed, and the second position being at about 12–13 feet below the surface of the bed and the two positions being in a ratio of about **2–1** to **5–1** volumes of air respectively of said first to said second positions;

d. injecting an essentially inert gas at a temperature of about 150°–240° F. into said bed at a rate of 13,000 to 16,000 standard cubic feet per shale tone, said gas being injected into said first position being mixed with air therein, into said second position being mixed with air therein and through the bottom of said bed as a third position for passing upwardly through the shale bed, and the ratio being about **1** to **1** to **8** volumes respectively;

e. the heat for the retorting of the shale being provided by combustion at temperatures of from 900°–1100° F. in a zone about 1–3 feet above the first position and about 900°–1050° F. about 1–2 feet above the second position; and

f. withdrawing a mixture of gas and shale oil mist from an upper part of the bed for recovery of liquid and gas therefrom.

4,042,486

PROCESS FOR THE CONVERSION OF PITCH INTO CRYSTALLOIDAL PITCH

Kiro Asano, Kakizaki; Humio Tamura, Hino; Tsuyoshi Saito, Tokyo, and Yoshio Kawai, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 588,024, June 18, 1975, abandoned, Continuation-in-part of Ser. No. 589,592, June 23, 1975, abandoned. This application Mar. 10, 1976, Ser. No. 665,620

Claims priority, application Japan, June 24, 1974, 49-71257

Int. Cl.[2] **C10C** *3/00*

U.S. Cl. 208—44 **22 Claims**

1. A process for converting pitch to a crystalloid, which process comprises:

a. providing a bed of solid amorphous pitch particles, said particles being not more than 5 mm in cross-sectional equivalent diameter, said bed having a gas void space of not less than 30% by volume;

b. treating the surfaces of said pitch particles in said bed by coating, oxidation or solvent extraction to reduce susceptibility to cohesion; and

c. contacting said particles in said bed with a hot non-oxidative gas to heat said particles to a temperature within the range of from 350°–550° C and convert the pitch to the crystalloidal state.

4,042,487

METHOD FOR THE TREATMENT OF HEAVY PETROLEUM OIL

Koji Seguchi, Hino; Minoru Sugita; Kazuyoshi Inada, both of Tokyo; Kiyoshi Tagaya, Funabashi, and Yuji Nakamura, Tokyo, all of Japan, assignors to Kureha Kagako Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1976, Ser. No. 683,925

Claims priority, application Japan, May 8, 1975, 50-55749

Int. Cl.[2] **C10G** *9/16*

U.S. Cl. 208—48 R **8 Claims**

6. In a process for the thermal cracking, in a tubular type heating furnace, of a heavy petroleum oil having an API specific gravity of not more than 25, the improvement comprising:

a. mixing the heavy petroleum oil feed to the furnace with 0.5 to 5% by weight of a particulate inorganic substance

having a surface area of not less than $30m^2/g$ and an average particle diameter of not more than 30 microns, said inorganic substance being obtained by alkali treatment of an inorganic material containing, as its principal components, a high melting oxide and an iron oxide; and

b. applying a magnetic field of from 1,000 to 5,000 gausses transversely to the flow of the mixed feed of the heavy petroleum oil and particulate substance being introduced into the furnace and simultaneously applying a direct current of 50 mA to 3A parallel to said mixed feed flow.

4,042,488

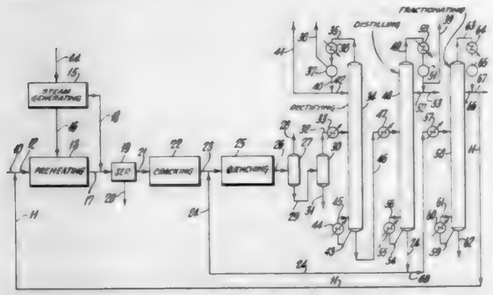
THERMAL CRACKING WAX TO NORMAL ALPHA-OLEFINS

Jerry C. Perciful, Groves, Tex., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 411,550, Oct. 31, 1973, abandoned. This application Oct. 23, 1975, Ser. No. 625,351

Int. Cl.[2] C07C *3/30*; C10G *9/36*

U.S. Cl. 208—102 **14 Claims**



1. The method of preparing n-alpha olefins containing 6-18 carbon atoms which comprises

preheating and vaporizing a charge hydrocarbon wax stock to thermal cracking temperature;

passing said charge hydrocarbon wax stock during said preheating and vaporizing operation through the intermediate temperature range of 625° F–800° F in a time less than about 8 seconds whereby the desired product contains a decreased porportion of paraffin impurities;

thermally cracking said preheated charge wax stock in vapor phase at inlet temperatue of 600° F–800° F in the presence of steam at thermal cracking conditions thereby forming a product stream cracking effluent containing desired product n-alpha olefins containing 6–18 carbon atoms together with decreased proportion of paraffin impurities;

withdrawing said product stream cracking effluent at 1050° F–1250° F;

separating said desired product n-alpha olefins containing 6–18 carbon atoms from said product stream cracking effluent; and

maintaining the Severity Value of said product stream cracking effluent during said separating less than about 66.5.

4,042,489

METHOD FOR REDUCING CATALYST PARTICLE EMISSIONS IN FLUIDIZED CATALYTIC CRACKING PROCESSING

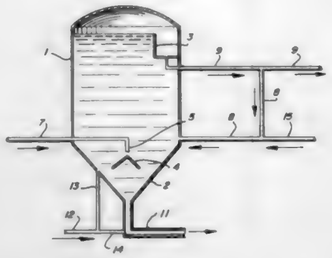
Robert J. Fahrig, Lansing, and Terry W. Timm, Libertyville, both of Ill., assignors to Standard Oil Company, Chicago, Ill.

Filed Sept. 2, 1976, Ser. No. 719,891

Int. Cl.[2] C10G *11/18*

U.S. Cl. 208—152 **7 Claims**

1. In a process for fluidized catalytic cracking wherein feed and a finely divided catalyst are contacted in a reaction zone at fluidized cracking conditions to effect formation of cracked products, wherein cracked products containing entrained catalyst are separated from spent catalyst and passed into a fractionation column wherein a high boiling bottoms stream from said column containing said entrained catalyst is passed to a settling zone from which is recovered an overhead decanted oil and a bottoms slurry oil the latter containing at least a portion of said entrained catalyst wherein said slurry oil is recycled to the reaction zone, and where said spent catalyst is contacted at regeneration conditions with an oxygen containing gas in a regeneration zone to burn coke off said catalyst



forming effluent regeneration gases wherein an improvement comprises reducing emission of catalyst fines from said effluent regeneration gases while minimizing total catalyst losses in the process by recycling to said settling zone at least a portion of said decanted oil at conditions including regulation of rate of recycle of decanted oil to maintain the upward velocity of fluid in said settling zone at a rate so as to reject from said settling zone in said decanted oil catalyst particles of less than about 20 microns diameter.

4,042,490

HYDROCARBON UPGRADING PROCESS

Robert M. Suggitt, Wappingers Falls, and Walter C. Gates, Jr., Newburg, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 26, 1973, Ser. No. 428,638

Int. Cl.[2] C10G *23/02, 23/04*

U.S. Cl. 208—264 **21 Claims**

1. In a process for selectively converting a mixture of n-paraffin and oxygenated n-paraffin by-products, said n-paraffin and by-products having from 6 to 30 carbon atoms, to a substantially pure n-paraffin recycle feedstock by catalytically hydrogenating said mixture and converting said oxygenated n-paraffin by-products to the corresponding n-paraffin, the improvement which comprises catalytically hydrogenating said mixture in the absence of substantial isomerization and hydrocracking at a temperature of from about 600° to 750° F. in the presence of a catalyst composed of alumina, from about 0.1 to 5.0 weight percent of a Group VIII metal and from about 0.05 to 2.0 weight percent of an alkali metal oxide or alkaline earth metal oxide or thallous oxide or mixtures thereof impregnated on said alumina to convert said by-products to n-paraffins.

4,042,491

COLOR RECOGNITION SYSTEM

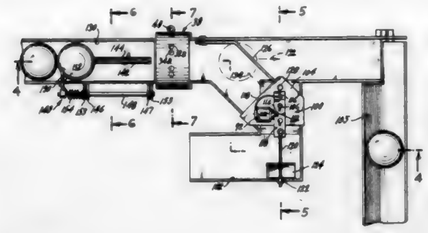
Barrett Hazeltine; Edgar De Meo, both of Providence, R.I., and Richard M. Simon, Dix Hill, N.Y., assignors to U.S. Billiards, Inc., Amityville, N.Y.

Filed Oct. 6, 1975, Ser. No. 619,896

Int. Cl.[2] B07C *5/342*

U.S. Cl. 209—74 R **6 Claims**

1. In combination with a pool table, a ball separating system for distinguishing between an entirely white cue ball and object balls, and for separating the cue balls from the object ball comprising a housing having a sensing station, at least two collecting stations positioned downstream of said sensing station and a diverting station positioned between said sensing station and said collecting stations, a plurality of light-emitting devices mounted at the sensing station for directing light toward a ball as the ball passes the sensing station, a plurality of light detectors mounted at the sensing station in cooperation with said light-emitting devices for receiving light reflected from the ball as the ball passes the sensing station and providing an output signal indicative of the amount of reflected light,



means coupled to receive the output from said light detectors for providing a first electrical signal when a cue ball passes the sensing station, and a second electrical signal when an object ball passes the sensing station, a pivot member positioned in the diverting station and operative in response to said electrical signals to divert a cue ball into a first collecting station and the object ball into a second collecting station.

4,042,492

APPARATUS FOR THE SEPARATION OF MAGNETIZABLE PARTICLES FROM A FINE GRANULAR SOLID

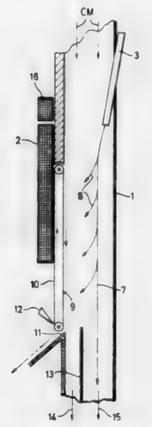
Hanns Decker, Cologne-Rath; Roland Pfeiffer, Bensberg-Frankenforst; Lothar Wenz, Cologne, and Horst Cordes, Troisdorf-Eschmar, all of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Continuation of Ser. No. 461,723, April 17, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,585

Claims priority, application Germany, Apr. 27, 1973, 2321281

Int. Cl.[2] B03C *1/14*

U.S. Cl. 209—223 R **1 Claim**



1. Apparatus for separating magnetizable particles from a flowing stream of material, comprising:

a channel including a plurality of vertical walls for directing the stream of material along a predetermined path, one wall of said plurality of walls including a vertically travelling conveyor belt, said channel including an inlet for receiving a stream of carrier medium;

means for introducing a carrier medium into said inlet of said channel;

at least one magnet system outside said channel adjacent said one wall creating a magnetic field within said channel in a portion of the path having a field strength of at least 15,000 Gauss and a magnetic gradient directed across the path to define a separating zone;

injecting means for injecting a charging material, including magnetizable particles to be separated therefrom, into the stream of carrier medium at a point within said channel oppositely spaced from said one wall and downstream of said inlet, the magnetizable particles being drawn toward said one wall by the force of said magnetic field;

means for removing at least a part of the carrier medium, together with non-drawn material, downstream of the sparating zone and spaced from said one wall; and

means for removing from said one wall those particles which adhere to said one wall including a member for doctoring particles from said conveyor belt.

4,042,493

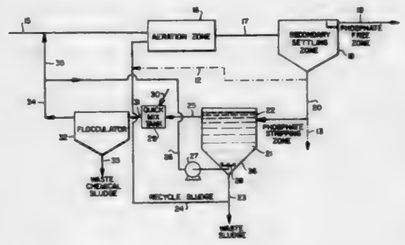
PHOSPHATE REMOVAL FROM BOD-CONTAINING WASTEWATER

Ladislas Charles Matsch, Amherst, and Raymond Francis Drnevich, Clarence, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,459

Int. Cl.[2] C02C *1/17*

U.S. Cl. 210—6 **12 Claims**



1. In an activated sludge wastewater treatment process for removing phosphate from BOD-containing wastewater which comprises: mixing phosphate-containing influent wastewater with activated sludge and oxygen-containing gas in an aeration zone and simultaneously circulating one fluid against the other fluid for sufficient duration to reduce the BOD content of said wastewater and cause the microorganisms present in said activated sludge to take up phosphate to form an aerated mixed liquor containing phosphate-enriched sludge; separating said phosphate-enriched sludge from said aerated mixed liquor to provide a substantially phosphate-free effluent; passing said phosphate-enriched sludge to a phosphate stripping zone and maintaining at least a major portion of the sludge therein under anaerobic conditions to release phosphate from the phosphate-enriched sludge and form a phosphate-lower sludge and phosphate-enriched liquid; and withdrawing said phosphate-enriched liquid from an upper section of said stripping zone and said phosphate-lower sludge from a lower section of said stripping zone, recycling at least part of said phosphate-lower sludge to said aeration zone as said activated sludge; the improvement of countercurrently stripping released phosphate from the sludge in said stripping zone by the steps of: maintaining a sludge residence time in said stripping zone of from 2 to 10 hours; introducing a low phosphate, low solids aqueous stripping medium into said stripping zone lower section for upflow through at least part of the settling solids to said stripping zone upper section, whereby the phosphate released from the descending settling sludge solids is transferred to the countercurrently upflowing liquid to provide said phosphate-enriched liquid in said stripping zone upper section, said stripping medium having a suspended solids concentration of less than 200 mg./liter; and maintaining the volumetric flow rate of

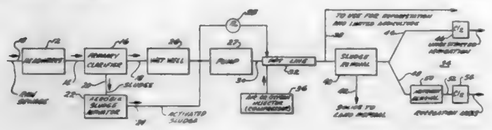
said stripping medium introduced into said stripping zone between 0.7 and 2.0 times the volumetric flow rate of said phosphate-enriched liquid withdrawn therefrom.

4,042,494

PRESSURE PIPE TREATMENT FOR SEWAGE

Ray L. Stoyer, Irvine, Calif., assignor to Irvine Ranch Water District, Irvine, Calif.

Continuation-in-part of Ser. No. 151,096, June 8, 1971, abandoned. This application Dec. 3, 1973, Ser. No. 421,421
Int. Cl.[2] C02C *1/08*
U.S. Cl. 210—7 **17 Claims**



1. A system for simultaneously treating and transporting raw liquid waste material from a point of collection to a location where treated effluent from the raw waste material can be economically used, the system comprising an elongated pressure pipe treatment line having an inlet end and an outlet end, the pressure pipe treatment line being inclined upwardly toward its outlet end so the static head of the waste material in the pressure pipe treatment line due to the difference in elevation between the inlet and outlet of the pressure pipe treatment line is at least several atmospheres; a pump having an inlet to receive raw waste and an outlet connected to the pressure pipe treatment line inlet for delivering the raw waste material under a pressure of at least several times atmospheric to the inlet end of the pressure pipe treatment line and producing a sufficiently high pressure at the inlet end of the pressure pipe treatment line to force the raw waste material toward the outlet end of the pressure pipe treatment line; means for injecting oxygen under a pressure of at least several atmospheres into the raw waste material at the high pressure end of the pressure pipe treatment line so the oxygen substantially reduces the biological oxygen demand of the raw waste material; and means at the outlet end of the pressure pipe treatment line for withdrawing the treated waste material.

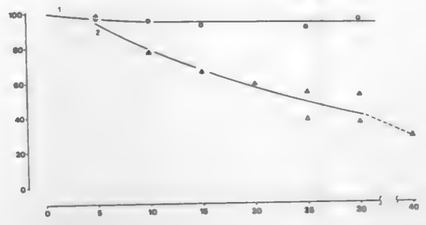
7. A method of delivering raw waste material from a downwardly extending trunk sewer pipe to a sewage treatment plant at the lower end of an upwardly inclined elongated pressure pipe treatment line for treatment of the raw waste material, the raw waste material including waste water and raw sewage solids, the method comprising the steps of removing a portion of the waste water from the raw waste material at a point upstream of the lower end of the trunk sewer pipe; delivering the remaining waste water and the raw sewage solids via the trunk sewer to the headworks; converting at least a portion of the raw sewage solids to activated sludge; delivering the activated sludge and the remaining waste water to the lower end of the pressure pipe treatment line at a sufficiently high pressure to force the activated sludge and waste water up the pressure pipe treatment line; injecting the removed portion of the waste water into the activated sludge and waste water flowing up the pressure pipe treatment line at a point spaced from the lower end of the pressure pipe treatment line; injecting a sufficient amount of oxygen under pressure into the activated sludge and waste water in the pressure pipe treatment line such that the oxygen substantially reduces the biological oxygen demand of the waste material in the pressure pipe treatment line; and withdrawing the treated waste material from the upper end of the pressure pipe treatment line.

4,042,495

METHOD FOR CONDITIONING FRESH AND SEA WATERS FROM OIL

Walter Marconi, San Donato Milanese; Nicola Oddo, and Ludwig Degen, both of Rome, all of Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 460,224, April 11, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,670
Claims priority, application Italy, Apr. 13, 1973, 22951/73
Int. Cl.[2] C02B *9/02*
U.S. Cl. 210—11 **3 Claims**



1. The method of removing oily hydrocarbons from the surface of water which is polluted thereby and which contains aqueous microorganisms capable of metabolizing said oily hydrocarbons, which comprises dispersing over said polluted surface particles comprised of one or more solid nutrient salts selected from the group consisting of ammonium salts, ammonium nitrates, urea, sodium phosphates, potassium phosphates, ammonium phosphates, superphosphate, magnesium ammonium phosphate, and mixtures thereof, said particles having a surface coating of paraffin sufficient to cause the salts to be slowly soluble and to render the particles buoyant in water and lipophilic.

4,042,496

PROCESS FOR PREPARING IMPROVED CATION-EXCHANGE MEMBRANES

Sakae Tsushima; Teruyuki Misumi, both of Yokohama, and Masahiko Murakoshi, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 28, 1975, Ser. No. 581,491
Claims priority, application Japan, May 29, 1974, 49-59779
Int. Cl.[2] B01D *13/00*
U.S. Cl. 210—23 R **8 Claims**

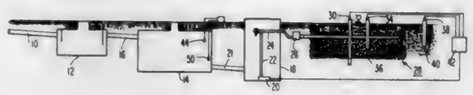
1. A process for improving a cation-exchange membrane in specific permselectivity for monovalent ions which comprises contacting the cation-exchange membrane with a suspension, in water or in an aqueous solution of a salt containing said monovalent ions, of particles of a crosslinked high molecular weight substance having an anion-exchange group.

4,042,497

SEPTIC SYSTEM WITH LEVEL CONTROL

Frederick L. Maltby, 780 Glen Road, Jenkintown, Pa. 19046

Filed Dec. 11, 1975, Ser. No. 639,797
Int. Cl.[2] C02C *1/00*
U.S. Cl. 210—25 **19 Claims**



1. A waste disposal system comprising:
means for treating waste and storing liquid thereof;
drain means for draining the liquid into the adjacent soil;

transfer means for transferring the liquid from said means for treating and storing to said drain means; and
sensor means for sensing the liquid saturation of said soil;
said transfer means being coupled to said sensor means and being activated in response thereto to transfer said liquid waste material to said drain means when the liquid saturation is below a predetermined threshold.

4,042,498

SEPARATION OF ORGANIC COMPOUNDS BY ADSORPTION PROCESSES

David C. Kennedy, St. Louis, Mo., assignor to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 365,006, May 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 172,795, Aug. 18, 1971, abandoned. This application Aug. 18, 1975, Ser. No. 605,780
Int. Cl.[2] C02B *1/14*
U.S. Cl. 210—26 **12 Claims**

1. A method of ecological improvement, which involves separating a relatively insoluble non-ionogenic, hydrophobic chlorinated pesticidal organic compound from an aqueous medium containing the same at extremely low levels, which comprises:

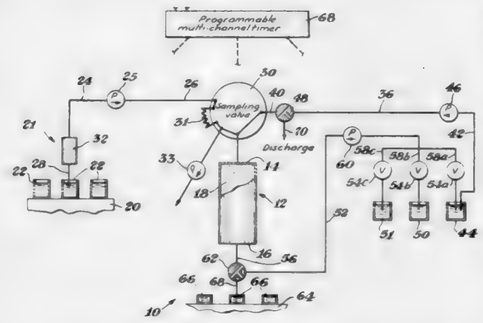
a. passing the medium through a bed of particles of an essentially non-ionogenic, macroreticular, water-insoluble crosslinked polymer of polymerizable ethylenically unsaturated monomers comprising about 2 to 100 weight percent of at least one poly(vinyl)benzene monomer selected from the group consisting of divinylbenzene, trivinylbenzene, alkyldivinylbenzenes having from 1 to 4 alkyl groups of 1 to 2 carbon atoms substituted in the benzene nucleus, and alkyl trivinylbenzenes having from 1 to 3 alkyl groups of 1 to 2 carbon atoms substituted in the benzene nucleus, which polymer has a porosity of at least 30% ranging up to 70% by volume, a surface area of 800 ± 20% square meters per gram, and pores of an average diameter of at least 20 A ranging up to 200 A; and
b. flowing a volatile organic solvent, selected from the group consisting of volatile ketones of 3 to 10 carbons, linear and branced alkanols having 1 to 10 carbons, alkyl esters of aliphatic acids from 1 to 10 carbons, aromatics to 10 carbons, and mono- and poly-halogenated alkanes up to 3 carbon atoms, through the loaded polymer bed to release substantially all of the adsorbed compound.

4,042,499

LIQUID ADSORPTION CHROMATOGRAPHIC APPARATUS AND METHOD

Tore Ramstad; Nels H. Mahle, and Ralph Matalon, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 2, 1976, Ser. No. 710,986
Int. Cl.[2] H01D *15/08*
U.S. Cl. 210—31 C **19 Claims**



1. In a liquid adsorption chromatographic process for the separation of a first solute from at least one second solute of differing polarity said solutes being commingled in a sample solution, by the preferential adsorption of the first solute on a chromatographic column with a solid particulate stationary phase consisting essentially of a charge of porous adsorbent material selected from the group consisting of silica gel, alumina and magnesium silicates, the improvement comprising sequentially:

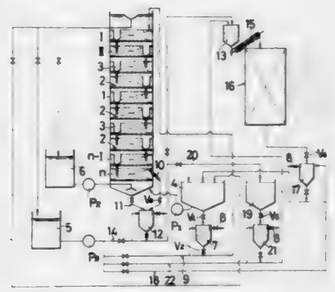
a. passing a first eluant through the stationary phase at a rate sufficient to selectively elute the second solute from the stationary phase;
b. passing a second eluant through the stationary phase in a direction countercurrent to the direction of the first eluant to selectively elute the first adsorbed solute from the stationary phase;
c. passing a stripping fluid through the stationary phase in a direction cocurrent to the direction of the second eluant to remove second eluant retained on the stationary phase; and
d. passing additional first eluant through the stationary phase in a direction cocurrent to the direction of the stripping fluid to re-equilibrate the stationary phase for introduction of a subsequent sample solution into the column.

4,042,500

FLUIDIZED-BED TYPE MULTISTAGE SOLID-LIQUID CONTACT APPARATUS

Yasunao Misaka; Ikuo Tanaka, both of Yokohama; Hirro Okada, Sagamihara; Chuichi Goto; Moriyuki Hirota, both of Yamato; Masaaki Uesugi, and Mitsuru Tsuchiya, both of Yokohama, all of Japan, assignors to Kurita Water Industries Limited, Osaka, Japan

Filed May 28, 1975, Ser. No. 581,657
Claims priority, application Japan, June 3, 1974, 49-61796; June 3, 1974, 49-61797; June 3, 1974, 49-61799
Int. Cl.[2] B01D *33/30*
U.S. Cl. 210—189 **6 Claims**



1. An improved fluidized-bed type multistage solid-liquid contact apparatus, comprising in combination:

a contact column consisting of a vertical column, support plates disposed horizontally in a plurality of stages within said column, possessed of a multiplicity of perforations and, with the exception of the particular support plate in the lowermost stage, each having a downcomer adapted to permit communication between the upper side and the lower side of the support plate, and solid particles piled up on each of said support plates,
a crude liquid storage tank for accommodating a crude liquid to be supplied to said contact column,
means for delivering said crude liquid from said crude liquid storage tank to the space below the lowermost support plate within said contact column,
a treated liquid tank for accommodating the liquid to be discharged from said contact column.
means for forwarding the treated liquid from the space

above the uppermost support plate within said contact column to the treated liquid tank, and

solid particles supply means for delivering solid particles onto the support plate on the uppermost stage in said contact column and solid particles withdrawal means for withdrawing solid particles out of the lower portion of said contact column,

said solid particles supply means incorporating therein a solid particles storage tank which is provided with a metering tank for metering solid particles for delivery to said contact column,

said support plates are each made up of a plurality of component plates spaced by a fixed distance, said component plates containing perforations of a diameter greater than that of the solid particles piled up thereon, said perforations in the upper component plates and those in the lower component plate being in staggered relationship,

said perforations bored in each support plate each having a diameter not exceeding 20 percent of the inside diameter of said contact column but falling in the range of from 10 to 150 mm,

the upper half portion of said downcomers each having a greater inside cross-sectional area than that of the lower half portion, and

said downcomer of each support plate has its lower aperture at a level lower than the upper aperture of the downcomer of the next lower support plate.

4,042,501

PURIFICATION OF IRON CONTAINING ACIDIC SOLUTIONS

William R. King, San Carlos, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 2, 1976, Ser. No. 702,301
Int. Cl.² C02C *5/02*
U.S. Cl. 210—51 **5 Claims**

1. A process for removing dissolved iron salts from aqueous, acidic stripping solutions which result from the stripping of organic, iron-laden extractants with an aqueous acid solution comprising subjecting the aqueous acidic stripping solution containing a dissolved iron salt selected from the group consisting essentially of ferric sulfate ($Fe_2(SO_4)_3$) and ferric chloride ($FeCl_3$) to a hydrothermal treatment at a temperature in excess of about 100° C in the presence of an aluminous compound of the formula $Al_2O_3.xH_2O$, where x is 0.01 to 3.0, the compound being added in an amount within the range of about 20% of the stoichiometric to about the stoichiometric quantity capable of being dissolved by the total free and liberated acid content of the acidic stripping solution being treated for a time sufficient to dissolve said aluminous compound and to convert at least about 50% of the dissolved iron salt to the acid insoluble solid Fe_2O_3 form, followed by separation of the solid Fe_2O_3 and recovery of an acidic solution depleted in dissolved iron content.

4,042,502

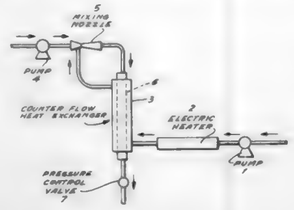
DETOXIFICATION OF CYANIDES AND CYANIDE-CONTAINING SOLUTIONS

Joachim Schmidt; Wolfgang Bamberg; Hartmut Grunert; Erhard Schorm, and Christian Weigelt, all of Jena, Germany, assignors to VEB Jenapharm Jena

Division of Ser. No. 443,013, Feb. 15, 1974, abandoned. This application Mar. 21, 1975, Ser. No. 560,989
Claims priority, application Germany, May 10, 1973, 170844
Int. Cl.² C02C *5/02*
U.S. Cl. 210—59 **11 Claims**

1. A continuous process of detoxifying aqueous cyanide solutions comprising the steps of,

starting the process cycle by heating a counterflow heat exchanger, then, in successive steps, passing the cyanide solution through a first flow path of said heat exchanger in order to preheat the solution, then, after passing the solution out of the heat exchanger, raising its temperature to a peak of about 200° to 250° C so as to effect a detoxifying hydrolysis of the solution, the solution being heated in said preheating step to more than half of the temperature reached as said peak temperature, and thereafter passing the detoxified solution through a second flow path of the



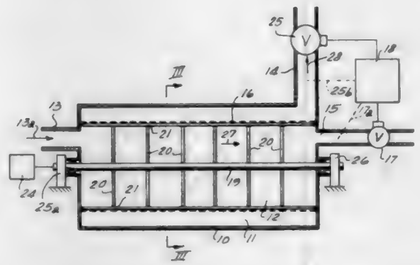
heat exchanger in heat exchange contact with fresh cyanide solution passed into said first flow path of the heat exchanger in order to effect said preheating of the solution, and maintaining a pressure of about 40 to 140 atm. during the hydrolysis reaction and in said second flow path of the heat exchanger.

4,042,503

CLASSIFIER AND PROCESS FOR RECYCLED FIBER SEPARATION

Edgar J. Justus, Beloit, Wis., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 423,277, Dec. 10, 1973, abandoned.
This application Feb. 19, 1975, Ser. No. 551,066
Int. Cl.² B01D *33/38*
U.S. Cl. 210—65 **8 Claims**



1. A recycled paper fiber classifying mechanism comprising, in combination:

a first cylindrical chamber having an inlet for receiving a mixture of acceptable fibers and reject fibers carried in a fluid suspension to be classified, said first chamber having an acceptable fiber outlet;

a delivery pump connected to said first chamber inlet for delivering a flow of said fibers under pressure in a fluid suspension to said first chamber;

a second chamber concentrically surrounding and in communication with said first chamber for receiving reject fibers from said first chamber, said second chamber having a reject fiber outlet;

a cylindrical screen means separating said chambers and having openings of a size in the range of 0.010 to 0.090 inch to pass reject fibers; and

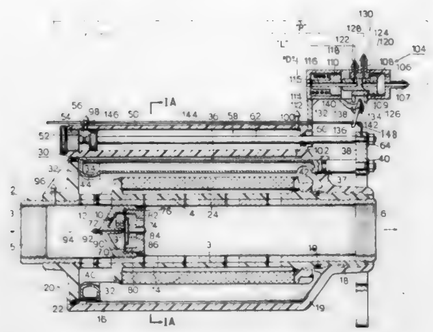
valve means in said acceptable fiber outlet, and valve means in said reject fiber outlet, each of said valve means being variable for controlling the flow of fluid passing through each of said outlets and thereby controlling the pressure in said first and second chambers for maintaining a predetermined pressure drop across the screen means so as to control the apportionment of fluid through the screen means and through the acceptable fiber outlet and the reject fiber outlet and thereby control the classification of fibers.

4,042,504

SELF CLEANABLE FILTERS

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Sept. 29, 1976, Ser. No. 727,860
Claims priority, application Israel, May 23, 1976, 49635; June 23, 1976, 49875; Aug. 20, 1976, 50317
Int. Cl.² B01D *29/38*
U.S. Cl. 210—107 **32 Claims**



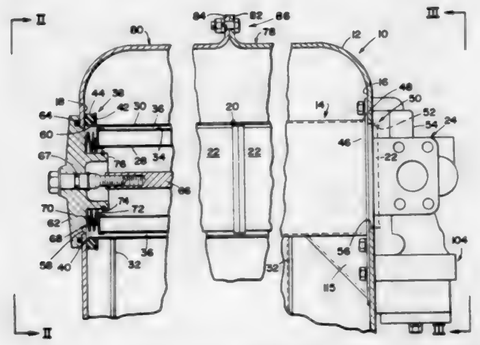
1. A self-cleanable filter, comprising: a housing having a fluid inlet, a fluid outlet, and a dirt purging opening; a filter body within the housing and having a surface facing the inlet side of the housing; and a cleaning body within the housing and movable from a home position along said cylindrical surface of the filter body for cleaning same; said cleaning body comprising a first section defining an internal chamber having an inlet opening facing the surface of the filter body to be cleaned and movable along said surface for cleaning same; and a second section closing the dirt purging opening when the cleaning body is in its home position, said second section having an outlet opening communicating with said internal chamber and located within said housing in the home position of the cleaning body but movable through the housing purging opening to a position externally of the housing upon the movement of the cleaning body for cleaning the filter.

4,042,505

FILTER ARRANGEMENT WITH BAFFLES

John B. Waggoner, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 719,005
Int. Cl.² B01D *27/10*; E03B *11/00*
U.S. Cl. 210—132 **5 Claims**



1. In a hydraulic reservoir which comprises a tank having internally thereof filter means attached longitudinally between a first and a second generally parallel side thereof, said filter means including generally tubular filter element means extending generally longitudinally between said first and second sides of said tank and means for introducing a hydraulic fluid from an exterior of said tank to an interior of said element means from adjacent said first side of said tank, an improvement comprising:

a tube within said tank in an upper portion thereof surrounding said element means and extending longitudinally generally the length thereof, said tube including exit means therethrough through which said hydraulic fluid passes into said reservoir after passage thereof from the interior to an exterior of said element means, a first end of said tube sealing adjacent said second side of said tank and a second end of said tube sealing adjacent said first side of said tank; and

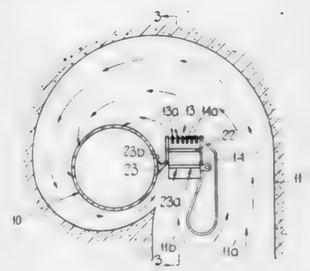
first conduit means with a first open end surrounding said exit means and in fluid communication therewith, and a second end located in a lower portion of said reservoir, said second end having egress means therefrom to said reservoir lower portion.

4,042,506

APPARATUS FOR REMOVING SOLID MATERIAL FROM SEWAGE OR OTHER LIQUID

Reginald Albert Edward Wilson, Stourbridge, England, assignor to Jones & Attwood Limited, Stourbridge, England

Filed Apr. 9, 1976, Ser. No. 675,455
Claims priority, application United Kingdom, Apr. 24, 1975, 16979/75
Int. Cl.² B01D *33/06*
U.S. Cl. 210—155 **7 Claims**



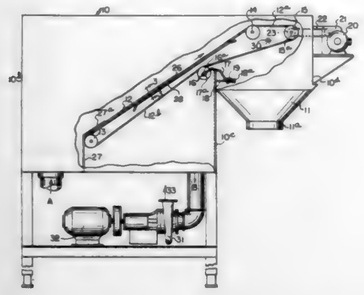
1. Apparatus for removing solid material from a flow of sewage or other liquid, said apparatus comprising a duct through which sewage is to flow, a first screen located in said duct and adapted to filter solid material from the sewage flowing through the duct, said first screen being of generally cylindrical form with its axis extending in a vertical direction and being rotatable about said axis, a second, vertically extending, screen located adjacent to said first screen and adapted to receive solid material filtered from the sewage flow by the first screen, a lifting plate reciprocable in a vertical or substantially vertical direction over said second screen, said lifting plate collecting solid material from said second screen and lifting it to a position which in use is above the upper surface of the flow of sewage, and a generally horizontally extending compression chamber having means for removing solid material from said lifting plate when the latter is in its upper position.

4,042,507

WASTE LIQUID RENOVATOR

Charles E. Langmack, Cleveland, Ohio, assignor to Niagara Bottle Washer Mfg. Company, Cleveland, Ohio

Filed Aug. 19, 1976, Ser. No. 715,858
Int. Cl.[2] B01D *33/04*
U.S. Cl. 210—158 **5 Claims**



1. In a waste liquid renovator, a tank having an input side and an output side, means for introducing waste liquid containing floating refuse at said input side into a waste liquid portion of said tank, a movable filtering conveyor of wire mesh having cross-wise roller supports guiding said conveyor in an upward inclined run moving from a zone nearer the bottom of said tank on the input side to a zone nearer the top of said tank on the output side, said conveyor having a generally horizontal run downstream from said upper zone, said conveyor then having a return run inclined downwardly to said lower zone and there transversing a bottom support roller, means for driving said conveyor, an impervious baffle extending entirely across said tank and extending between said waste liquid portion and a renovated liquid portion of said tank, said baffle extending from the bottom of said tank to a zone above said bottom support roller and on the waste liquid side of said last named roller, said baffle being bent over closely on top of said upward inclined run for a short distance, means for pumping renovated liquid from said renovated liquid portion of said tank beneath said return run of said conveyor and out of said tank, a refuse collector beneath said conveyor horizontal run on the output side of said tank communicating with said tank only from just beneath said conveyor and outward therefrom, a cleaning spray above said collector above said return run of said conveyor and below said horizontal run, whereby renovated liquid is pumped out of said renovated liquid portion of said tank beneath said two conveyor runs while waste liquid enters said waste liquid portion of said tank at said input side, refuse is collected on both of said conveyor runs and washed off into said collector.

4,042,508

FILTER HOLDING MEANS

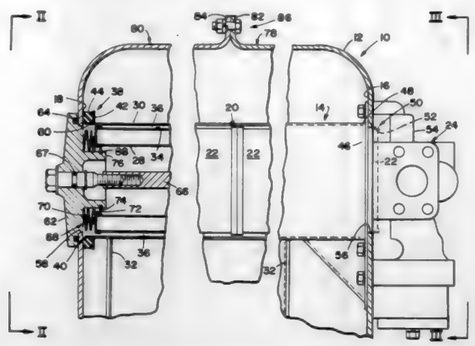
Eugene E. Latimer, Wilmington, and John B. Waggoner, Joliet, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 719,004
Int. Cl.[2] E03B *11/00*
U.S. Cl. 210—172 **5 Claims**

1. In a hydraulic reservoir which comprises a tank having internally thereof filter means attached longitudinally between a first and a second generally parallel side thereof, said filter means including generally tubular filter element means extending generally longitudinally between said first and second side of said tank and means for introducing a hydraulic fluid from an exterior of said tank to an interior of said element means from adjacent said first side of said tank, an improvement comprising:

a tube within said tank surrounding said element means and extending longitudinally generally the length thereof, said tube including exit means therethrough through which said hydraulic fluid passes into said reservoir after passage thereof from the interior to an exterior of said element means, a first end of said tube sealing adjacent said second side of said tank and a second end of said tube sealing adjacent said first side of said tank;

an opening through said second side of said tank to an interior of said tube adjacent said first end thereof, said opening being sized to allow entry of said element means to the interior of said tube;



cover means sealingly attachable over said opening by rod means attached longitudinally through said tube to said first side of said tank;

a collar generally coaxially surrounding said rod means and extending from said cover means towards said first side of said tank within said tube;

compressible spring means surrounding said collar and compressing said element means towards said first side of said tank; and

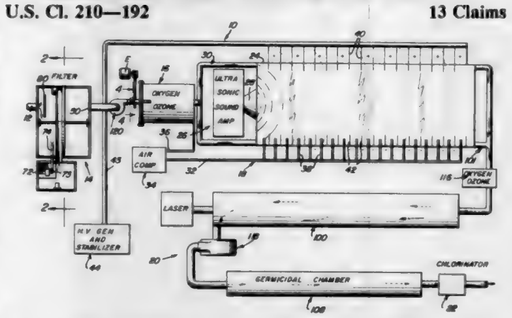
retaining means for holding said spring means on said collar.

4,042,509

WATER TREATMENT SYSTEM

James H. Bowen, Adger, Ala., assignor to BDH, Inc.(Entire), Rome, Ga.

Substitute application for Ser. No. 539,908, Jan. 9, 1975, abandoned.
Filed Mar. 11, 1976, Ser. No. 665,870
Int. Cl.[2] B01D *33/02, 35/22;* **C02B** *1/80;* **C02C** *5/04*
U.S. Cl. 210—192 **13 Claims**



1. A water treatment system, comprising, in combination:

a. a conduit connected to a supply of effluent;

b. a self-cleaning filter assembly connected to the conduit for receiving effluent from the conduit and filtering the effluent for removing solids from the effluent;

c. an ozone and oxidation assembly connected to the filter assembly for receiving filtered effluent from the filter assembly;

d. ozonizing means connected to the ozone and oxidation assembly for changing the condition and character of the filtered and oxidized effluent; and

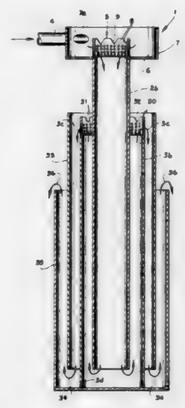
e. sterilizing means connected to the ozonizing means for decontaminating the filtered, oxidized, and ozonized effluent; and the ozonizing means includes; a casing connected to the ozone and oxidation assembly for receiving effluent from the ozone and oxidation assembly; an ultra-sonic sound generating system including a speaker arranged in the casing for breaking down particles in the effluent by subjecting the effluent to ultra-sonic waves; an air line connected to the casing and arranged for injecting air into the casing and aerating the effluent passing through the casing; and electrodes connected to a source of electrical energy and to the casing for passing an electrical current through the effluent in the casing and creating ozone in the presence of the air and effluent in the casing.

4,042,510

LIQUID AERATION DEVICE

John K. Sullins, Kingsport, Tenn., assignor to Canton Textile Mills, Inc., Canton, Ga.

Filed Sept. 2, 1976, Ser. No. 719,996
Int. Cl.[2] C02B *1/34;* **B01F** *3/04*
U.S. Cl. 210—220 **8 Claims**



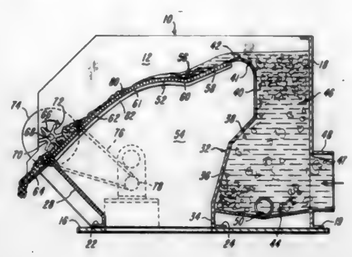
1. A liquid aeration device comprising a receiver chamber for receiving liquid to be aerated and having a vertically disposed aerator wall, aerator orifices formed in said aerator wall, a main vertically disposed downcomer conduit with its upper end arranged to receive liquid from said aerator orifices via free fall from said aerator orifices through atmospheric air, a main riser conduit of larger transverse dimensions than said main downcomer conduit and disposed about said main downcomer conduit, the upper end of said main riser conduit constituting discharge means including a plurality of orifices formed in said main riser conduit and the lower ends of said main downcomer and of said main riser conduits being in fluid tight communication with each other so that liquid which flows downwardly in said main downcomer conduit and which has dissolved and entrapped air therein is caused to flow upwardly in said main riser conduit without escape of liquid or of air except at said discharge means, an auxiliary downcomer conduit of larger transverse dimensions than said main riser conduit disposed about said main riser conduit and arranged to receive liquid by free fall through atmospheric air from said discharge means formed in the upper end of said main riser conduit, and an auxiliary riser conduit of larger transverse dimensions than said auxiliary downcomer conduit disposed about said auxiliary downcomer conduit and arranged with its lower end in communication with the lower end of said auxiliary downcomer conduit.

4,042,511

LOW PROFILE STATIC SCREEN

Marvin E. Ginaven, Springfield, Ohio, assignor to The Bauer Bros. Co., Springfield, Ohio

Continuation of Ser. No. 404,765, Oct. 9, 1973, abandoned. This application Sept. 26, 1975, Ser. No. 617,186
Int. Cl.[2] B07B *1/04*
U.S. Cl. 210—386 **18 Claims**



1. Apparatus for separating and classifying the contents of a flowing slurry including a descending flow surface defined, at least in part, by static screen structure sections of which form longitudinally extending parts of said flow surface, said screen sections being formed to influence liquid to separate from a slurry in the course of its movement across said flow surface, an upper of said sections providing a part of said flow surface which is downwardly inclined to form an angle not substantially greater than 35° with an intersecting horizontal plane, a further of said screen sections providing another part of said flow surface having an arcuately formed generally convex profile, and another of said screen sections being located between said upper and said further screen sections to provide an additional part of said flow surface which has a generally horizontal orientation and provides an impact surface interposed in the path of a slurry flowing down said upper part of said flow surface at a position to create therein reactant forces which influence a substantial separation of liquid from the flow, said impact surface being constructed and arranged for influencing solids in the impacting portion of the slurry flow to lift away from said screen structure as the remaining liquid content of the slurry is caused to move from said impact surface and downwardly of said further screen section providing said part of said flow surface having a convex profile.

4,042,512

OIL WATER SEPARATOR

Patrick M. McCarthy, 486 Sayville Blvd., Sayville, Long Island, N.Y. 11782; Gilbert T. McTighe, 804 N. Windsor, Apt. 10, and Robert T. McTighe, 804 N. Windsor, Apt. 6, both of Mitchell, S. Dak. 57301

Filed Oct. 27, 1976, Ser. No. 736,247
Int. Cl.[2] B03D *3/00*
U.S. Cl. 210—519 **6 Claims**

1. An oil-water separator comprising:

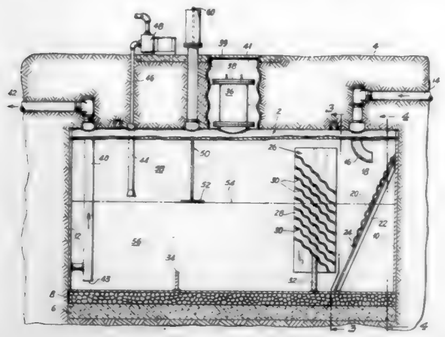
a tank;

an oil-water mixture inlet at one end of said tank adjacent the top thereof;

a baffle member in said one end of said tank, sloping downwardly and inwardly from adjacent the top thereof toward the bottom of said tank adjacent said one end and having an upper surface defining transverse corrugations, said inlet being arranged to direct the incoming oil-water mixture onto the upper portion of said surface;

a plurality of parallel, transversely corrugated and spaced baffle plates in said tank sloping upwardly and away from said one end from a region adjacent but spaced from the lowermost portion of said baffle member;

outlet means at the other end of said tank adjacent the bottom thereof for withdrawing clarified water therefrom; and



further means in said tank, adjacent said other end, for withdrawing separated oil from the upper portion of said tank.

4,042,513

CONCENTRATES OF N-SUBSTITUTED MORPHOLINES

Norman Anthony Meinhardt, Lyndhurst, and Robert Widmer, Painesville, both of Ohio, assignors to The Lubrizol Corporation, Wickliffe, Ohio

Continuation-in-part of Ser. No. 480,767, June 19, 1974, and Ser. No. 562,732, March 27, 1975, abandoned. This application July 24, 1975, Ser. No. 598,961

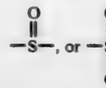
Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—47.5 **7 Claims**

1. An additive concentrate comprising an inert solvent/diluent containing about 20% to about 90% of at least one N-substituted morpholine of the formula

$$O(CH_2CH_2)_2NR'YR''$$

wherein R′ is a hydrocarbyl or hydrocarbyl interrupted with *Y* group of at least one to about thirty carbon atoms, Y is —O—,



R″ being a hydrocarbyl radical of at least 15 carbon atoms.

4,042,514

NOVEL LUBRICATING COMPOSITIONS CONTAINING DERIVATIVES OF 1,2-DITHIOL-3-THIONES OR 1,2-DITHIOL-3-ONES

Francois Giolito, Lyon, and Georges Rivier, Bron, both of France, assignors to Orogil, Paris, France

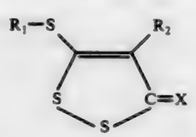
Filed Feb. 5, 1976, Ser. No. 655,482

Claims priority, application France, Feb. 17, 1975, 75.04796

Int. Cl.[2] C10M *1/38*

U.S. Cl. 252—48.6 **5 Claims**

1. A novel lubricating composition comprising a major proportion of at least one lubricating oil and between about 0.2 and 10% by weight of at least one additive which is a derivative of a 1,2-dithiol-3-thione or a 1,2-dithiol-3-one, characterized in that the said derivative has the formula:



in which formula R_1 is a member selected from the class consisting of alkyl and alkylaromatic hydrocarbon radicals, R_2 is a member selected from the class consisting of a hydrogen atom, alkyl radicals, a halogen atom, or a carboxyalkyl radical COOR in which R is an alkyl radical containing from about 1 to 12 carbon atoms, R_1 and R_2 together having a total of from about 3 to 24 carbon atoms when R_2 is a hydrogen atom, an alkyl or carboxyalkyl radical, and R_1 having from about 2 to 22 carbon atoms when R_2 is a halogen atom, and X is a sulphur or oxygen atom, but when an oxygen atom, R_2 is a halogen atom.

3. A novel lubricating composition according to claim 1, characterized in that the derivative of the 1,2-dithiol-3-thiones or 1,2-dithiol-3-ones is a member selected from the class consisting of: 5-n-butylthio-4-methyl-1,2-dithiol-3-thione, 5-heptylthio-4-methyl-1,2-dithiol-3-thione, 5-dodecylthio-4-methyl-1,2-dithiol-3-thione, 5-dodecylbenzylthio-4-neopentyl-1,2-dithiol-3-thione, 5-n-pentylthio-4-H-1,2-dithiole-3 -thione, 5-para-dodecylbenzylthio-4-H-1,2-dithiol-3-thione, 5-t-butylthio-4-chloro-1,2-dithiol-3-thione, 5-dodecylthio-4-chloro-1, 2-dithiol-3-thione, =-p-methylbenzylthio-4-chloro-1,2-dithio-3-thione, 5-n-hexylthio-4-carbonhyxoxy-1,2-dithio-3-thione, 5-hexylbenzylthio-4-carbohexoxy-1,2-dithiol-3-thione, 5-t-butylthio-4-chloro-1,2-dithiol-3-one, 5-isopropylthio-4-chloro-1,2-dithiol-3-one and 5-hexylbenzylthio-4-chloro-1,2-dithio-3-one.

4,042,515

ANHYDROUS DEEP-DRAWING LUBRICANT

Fredericus Bastiaan van Zalm, Beverwijk, Netherlands, assignor to B. V. Beverolfabrieken, Beverwijk, Netherlands

Filed Aug. 15, 1975, Ser. No. 605,014

Claims priority, application Netherlands, Aug. 16, 1974, 7411032

Int. Cl.[2] C10M *1/24, 3/18, 5/12, 7/26*

U.S. Cl. 252—56 R **5 Claims**

1. An anyhydrous deep-drawing agent consisting essentially of a deep-drawing mineral oil having dissolved therein 1–50% by weight, based on the mineral oil, of dimeric carboxylic acids prepared by oligomerization of unsaturated fatty acids of 16–26 carbon atoms under pressure at a temperature of 180°–360° C. for about 3 to 10 hours.

4,042,516

BONDED MAGNETS CONTAINING SINGLE CRYSTALLINE FERRITE PARTICLES

Seiji Matsumoto, and Kiyoshi Fukai, both of Sakai, Japan, assignors to Sakai Chemical Industry Co., Ltd., Sakai, Japan

Division of Ser. No. 472,740, May 23, 1974. This application Nov. 18, 1975, Ser. No. 633,085

Claims priority, application Japan, Mar. 1, 1977, 49-23938; Apr. 16, 1974, 49-42916

Int. Cl.[2] H01F *1/117;* C04B *35/26*

U.S. Cl. 252—62.54 **4 Claims**

1. In an anisotropic magnet comprising ferrite particles dispersed in a plastic or rubber binder, the improvement wherein:

said ferrite particles consist essentially of single-domain crystal strontium or barium ferrite particles having the stoichiometric composition $Mo.6Fe_2O_3$ wherein M is divalent strontium or barium, in the form of fine, well-defined, hexagonal plates about 0.5μ to 2.0μ in diameter and less than about one-fourth of said diameter in thickness, produced by:

a. reacting an admixture of

i. about 4.3 to 6.5 moles, expressed as ferric oxide, of an iron compound selected from the group consisting of ferric hydroxide, ferric oxyhydroxide, calcined porous ferric oxide and ferric oxide having a particle size less than about 0.8μ;

ii. about one mole, expressed as metal oxide, of at least one metal compound selected from the group consisting of the oxides, hydroxides, carbonates and carboxylates of strontium and barium; and

iii. about 0.05-2 moles of a metal chloride flux selected from the group consisting of strontium chloride, barium chloride and mixtures thereof,

at a temperature between the melting point of said metal chloride flux and 1300° C. to form said strontium ferrite or barium ferrite particles;

b. cooling the resultant reaction mixture to form a cake comprising said single crystal ferrite particles and water soluble flux intervened therebetween; and

c. extracting said water soluble flux from said particles.

4,042,517

ELECTROSTATOGRAPHIC DEVELOPER MIXTURE CONTAINING A THERMOSET ACRYLIC RESIN COATED CARRIER

Joseph H. Moriconi, and Louis H. Burrows, Jr., both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 315,958, Dec. 18, 1972, Pat. No. 3,916,065. This application Apr. 18, 1975, Ser. No. 569,341

Int. Cl.[2] G03G *9/08, 13/08*

U.S. Cl. 252—62.1 P **6 Claims**

1. An electrostatographic developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles having an average particle diameter of between about 50 microns and about 1,000 microns, said carrier particles consisting essentially of a metallic core coated with a thermoset crosslinked acrylic resin to form an adherent durable film of said resin on said core, said acrylic resin consisting essentially of esters of acrylic and methacrylic acids selected from the group consisting of a hydroxyl-functional resin crosslinked with nitrogen resins.

4,042,518

STOICHIOMETRIC FERRITE CARRIERS

Lewis O. Jones, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 394,604, Sept. 5, 1973, Pat. No. 3,929,657. This application July 7, 1975, Ser. No. 593,401

Int. Cl.[2] G03G *9/00;* C04B *35/30*

U.S. Cl. 252—62.6 **1 Claim**

1. Humidity-insensitive magnetically attractable, semi-conductive, uncoated electrostatographic ferrite carrier material useful for development of electrostatic latent images, said carrier material having an average particle diameter of between about 50 microns and about 500 microns and consisting essentially of a sintered mixture of metal oxides of the formulation $NiO_{0.176}ZnO_{0.45}MgO_{0.3}MnO_{0.05}CuO_{0.06}(Fe_2O_3)_{1.0}$.

4,042,519

FERRIMAGNETIC GLASS-CERAMICS

Edward A. Weaver, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Feb. 16, 1973, Ser. No. 333,286

Int. Cl.[2] C04B *35/14, 35/30, 35/38*

U.S. Cl. 252—62.59 **13 Claims**

1. A homogeneous thermally crystallizable glass composition consisting essentially of:

COMPONENT	WEIGHT %
K_2O	2 - 20
SiO_2	30 - 60
Fe_2O_3	15 - 45
ZnO	0 - 20
MgO	0 - 10
MO	3 - 25
wherein MO is	
NiO	0 - 20
MnO	0 - 20

wherein Fe_2O_3, ZnO, NiO, MnO and MgO are present in the proportions defined by $ZnO_{1-x}MO_xFe_2O_3$, wherein *x* is a whole or fractional number ranging from 0.1 to 1 inclusively; or $MgO_{0.5}MnO_{0.5}Fe_2O_3$.

4,042,520

THERMOGENIC SYSTEM

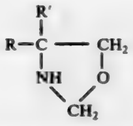
John Adams Frump, and Jerry Hoyt Hunsucker, both of Terre Haute, Ind., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Feb. 5, 1976, Ser. No. 655,321

Int. Cl.[2] C09K *3/00, 3/18, 5/00*

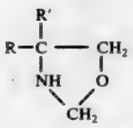
U.S. Cl. 252—70 **35 Claims**

1. A thermogenic system for generating heat comprising hydrogen peroxide in reaction with an oxazolidine thermogen having the general formula



wherein R and R′ may be the same or different and are selected from the group consisting of hydrogen, alkyl of from 1 to 4 carbon atoms, and hydroxymethyl in an effective amount sufficient to produce a sensible temperature rise.

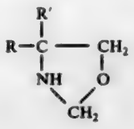
16. A two part thermogenic system arranged in a dispensing package with consumer-type compositions, the parts to be mixed at the time of dispensing from the package in relative amounts sufficient to effect a sensible temperature rise in the dispensed mixture; comprising one part consisting essentially of hydrogen peroxide; said other part consisting of the consumer-type composition and a thermogen having the general formula



wherein R and R′ may be the same or different and are selected from the group consisting of hydrogen, alkyl of from 1 to 4 carbon atoms, and hydroxymethyl.

23. A method of heating a material selected from shaving cream, cleansing cream, hand cleanser and windshield de-icer comprising the steps of

a. combining with the material to be heated an oxazolidine thermogen of the general formula



wherein R and R′ may be the same or different and are selected from the group consisting of hydrogen, alkyl of from 1 to 4 carbon atoms, and hydroxymethyl, and

b. mixing therewith hydrogen peroxide, in an amount sufficient to produce a sensible temperature rise in the mixture.

4,042,521

FIRE EXTINGUISHING COMPOSITION

Byron G. Dunn, 6831 Orchid Lane, Dallas, Tex. 75230

Continuation-in-part of Ser. No. 400,623, Sept. 25, 1973, Pat. No. 3,889,754, which is a continuation-in-part of Ser. No. 131,333, April 5, 1971, Pat. No. 3,733,111. This application Nov. 26, 1973, Ser. No. 400,640

Int. Cl.[2] A62D *1/00*

U.S. Cl. 252—5 **8 Claims**

1. A dry chemical fire-extinguishing composition, comprising; a fire extinguishing agent consisting essentially of about 50 to 95% by weight of a solid, particle-form metal carbonate, selected from the group consisting of alkali metal carbonates, alkali metal bicarbonates, alkaline earth metal carbonates, alkaline earth metal bicarbonates and mixtures thereof and about 50 to 5% by weight of a solid, particle-form synthetic metal silicate.

4,042,522

AQUEOUS WETTING AND FILM FORMING COMPOSITIONS

Robert A. Falk, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

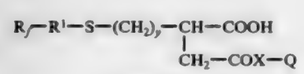
Filed Mar. 24, 1975, Ser. No. 561,393

Int. Cl.[2] A62D *1/00*; B27K *3/00*; B01F *17/30*

U.S. Cl. 252—8.05 **6 Claims**

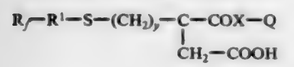
1. An aqueous film forming concentrate composition for extinguishing or preventing fires by suppressing the vaporization of flammable liquids, said composition consisting essentially of

A. 0.5 to 25% by weight of an amphoteric fluorinated surfactant represented by the formulae

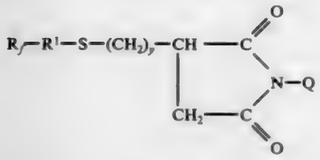


I

and its isomer



II and



III

wherein

R_f is straight or branched chain perfluoroalkyl of 1 to 18 carbon atoms or said perfluoroalkyl substituted by perfluoroalkoxy of 2 to 6 carbon atoms,

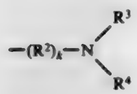
R^1 is branched or straight chain alkylene of 1 to 12 carbon atoms, alkylenethioalkylene of 2 to 12 carbon atoms, alkyleneoxyalkylene of 2 to 12 carbon atoms or alkyleneiminoalkylene of 2 to 12 carbon atoms wherein the nitrogen atom contains as a third substituent, hydrogen or alkyl of 1 to 6 carbon atoms,

y is 1 zero,

X is oxygen or –NR, wherein R is hydrogen, lower alkyl of 1 to 6 carbon atoms, hydroxy-alkyl of 1 to 6 carbon atoms, or R together with Q forms a piperazine ring, and

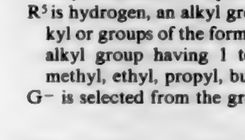
Q is a nitrogen containing group selected from

1. an aliphatic amino group selected from



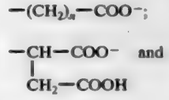
(1a)

-continued



(1b)

and



(1c)

wherein

R^2 is a linear or branched alkylene of 2 to 12 carbon atoms, oxygen or sulfur interrupted linear or branched alkylene of up to 60 carbon atoms, or hydroxyl substituted alkylene. Preferably R^2 is a straight chain or branched alkylene of 2 to 5 carbon atoms;

k is 1 or zero, with the provision that if X is oxygen, *k* is 1;

R^3 and R^4 are independently of each other hydrogen, alkyl group, substituted alkyl group of 1 to 20 carbon atoms; phenyl group, alkyl or halogen substituted phenyl group of 6 to 20 carbon atoms, polyethoxy or polypropoxy group of 2 to 20 alkoxy units with the proviso that if X is oxygen, R^3 and R^4 are not hydrogen. The alkyl substituents can be alkyl of 1 to 5 carbon atoms, dienyl, hydroxyl, carboxyl, halogen, alkylene dialkylphosphonate such as methylene-diethylphosphonate or a group



Phenyl substituents can be methyl, halogen or hydroxyl. Preferably R^3 and R^4 are alkyl groups of 1 to 4 carbons.

A^- is any anion which forms an ammonium salt of the formula $NH_4^+A^-$ having a solubility in water of at least about 1%.

Anion A^- is derived from alkyl halides, benzene or chlorobenzene sulfonate esters of alkyl alcohols and methyl and ethyl sulfates. A^- is preferably Cl^- or $CH_3CH_2OSO_3^-$.

R^5 is hydrogen, an alkyl group or hydroxyalkyl group, aralkyl or groups of the formula $-(CH_2)_n-COO-$alkyl, said alkyl group having 1 to 18 carbons. Preferably, R^5 is methyl, ethyl, propyl, butyl or benzyl.

G^- is selected from the groups

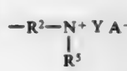
$-(CH_2)_n-COO^-$; $-(CH_2)_3SO_3^-$;



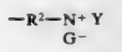
where *n* is 1 to 5;

2. cyclic amino groups selected from

(2a)



(2b)



(2c)

wherein Y is a diradical group of the formulae:

$-(CH_2)_4-$

$-(CH_2)_5-$

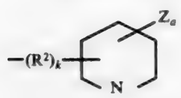
$-(CH_2)_2-O-(CH_2)_2-$



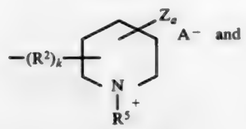
wherein R^2, R^5, A^- and G^- are as defined above,

R^7 and R^8 are independent hydrogen, a lower alkyl or hydroxy-lower alkyl group of 1 to 6 carbon atoms, with the provision, that if X is oxygen, R^8 cannot be hydrogen.

3. aromatic amino groups selected from

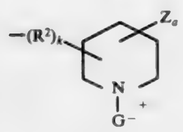


(3a)



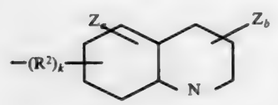
(3b)

and

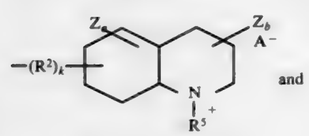


(3c)

4. fused-ring aromatic amino group selected from

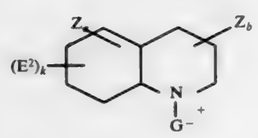


(4a)



(4b)

and



(4c)

wherein

Z is halogen or methyl,

a + *b* is an integer from 0–3; and

5. a heterocyclic amino group of the formula

5a. $-(R^2)_k-E$

5b. $-(R^2)_k-E^+-R^5A^-$

5c. $-(R^2)_k-E^+-G^-$

where *k* is one or zero and

E is selected from N-hydroxyalkyl or N-amino-alkyl, substituted pyrrole, pyrazole, imidazole, triazole, indole or indazole, hydroxyalkyl and aminoalkyl ring-substituted pyridazine, pyrimidino, pyrazino or quinoxalino; B. 0.1 to 5% by weight of an anionic fluorinated surfactant represented by the formula

R_fQ_mZ

wherein

R_f is a fluorinated saturated monovalent non-aromatic radical containing from 3 to 20 carbon atoms in which the carbon atoms of the chain are substituted only by fluorine, chlorine or hydrogen atoms with no more than one hydrogen or chlorine atom for every two carbon atoms, and in which a divalent oxygen or trivalent nitrogen atom, bonded only to carbon atoms, can be present in the skeletal chain;

Q_m, where *m* is an integer of 0 to 1, is a multivalent linking group comprising alkylene, sulfonamido alkylene and carbonamido alkylene radicals; and Z is a water solubilizing polar group comprising anionic radicals;

C. 0.1 to 25% by weight of an ionic non-fluorochemical water soluble surfactant selected from anionic, cationic and amphoteric surfactants wherein

1. anionic surfactants are selected from carboxylic acids, sulfuric esters, alkane sulfonic acids and alkylaromatic sulfonic acids,
2. cationic surfactants are selected from amine salts and quaternary ammonium compounds, and
3. amphoteric surfactants which contain in the same molecule an amino group and a group selected from carboxy, sulfuric ester, alkane sulfonic acid and aromatic sulfonic acid group or aminimides;

D. 0.1 to 40% by weight of a nonionic nonfluorochemical surfactant selected from polyoxyethlylene derivatives of alkylphenols, linear or branched alcohols, glucosides and block polymers of polyoxytheylene and polyoxypropylene;

E. 0 to 70% by weight of a solvent selected from ether alcohols or alcohols, and

F. water in the amount to make up the balance of 100%, said concentrate, upon dilution with water, being capable of forming a foam which drains to form a tough, durable, film on the surface of a flammable liquid thereby inhibiting the release of vapors therefrom.

4,042,523

OLEFIN-THIONOPHOSPHINE SULFIDE REACTION PRODUCTS, THEIR DERIVATIVES AND USE THEREOF AS OIL AND FUEL ADDITIVES

Stanley J. Brois, Westfield, N.J., assignor to Exxon Research and Engineering Co., Linden, N.J.

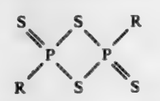
Continuation of Ser. No. 452,955, March 20, 1974, abandoned. This application Oct. 14, 1975, Ser. No. 622,161

Int. Cl.[2] C10M *1/48*

U.S. Cl. 252—32.7 HC **10 Claims**

1. An oleaginous composition comprising a major amount of an oleaginous material selected from the group consisting of lubricating oil and normally liquid petroleum fuel, and a minor amount, in the range of about 0.001 to 10 wt. %, of a sludge dispersant which is the reaction product of:

I. an oil soluble olefin-thionophosphine sulfide adduct of (1) an olefin having at least six carbon atoms and at least one double bond, and (2) a dimeric thionophosphine sulfide having the structure:



wherein, R is an organic radical selected from the group consisting of anisyl, thienyl, C_1 to C_{18} alkyl, C_6 to C_{18} cycloalkyl, and C_6 to C_{18} aryl radicals which may be unsubstituted or hydroxy substituted; said adduct being formed by heating said olefin and said sulfide together, under anhydrous conditions, at a temperature in the range of about 100° to 250° C., with the evolution of H_2S, said olefin being selected from the group consisting of:

a. short chain hydrocarbon mono-olefin of 8 to 50 carbon atoms;

b. long chain unsaturated hydrocarbon polymers of C_2 to C_5 mono-olefins, said polymers having a molecular weight in the range of 400 to 100,000; and

c. copolymers of about 30 to 85 mole % ethylene, about 15 to 70 mole % C_3 to C_5 mono-alpha olefin, and about 2 to 15 mole % of C_4 to C_{14} non-conjugated diene; and wherein said adduct is the reaction to product of sub-

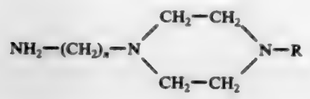
stantially equimolar proportions of said sulfide with said olefins of group (a) and group (b) above; and wherein said adduct is the reaction product formed by reacting in the range of about 0.05 to 1.0 molar proportion of said sulfide per molar proportion of said diene, when reacted with the olefin of group (c) above; with either

II. a polyamine, in a relative proportion of about 0.1 to 0.5 mole of polyamine per atom of phosphorus in said adduct, said polyamine containing 2 to 12 nitrogen atoms wherein pairs of nitrogen atoms are joined by alkylene groups of 2 to 4 carbon atoms, and are selected from the group consisting of polyamines defined by the formulae:

$$NH_2(CH_2)_n - [NH(CH_2)_n]_m - NH_2 \quad (a)$$

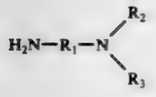
wherein: n is 2 to 4 and m is 0 to 10;

(b)



wherein *n* is 2 to 3 and R is selected from the group consisting of hydrogen and aminoalkyl radicals of 2 to 3 carbon atoms; and

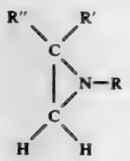
(c)



wherein R_1 is a C_2 to C_4 alkylene radical, and R_2 and R_3 are C_1 to C_5 alkyl radicals;

wherein a molar proportion of said adduct has been reacted, at a temperature in the range of 0° to 100° C., with said polyamine; or

III. an aziridine having the formula:

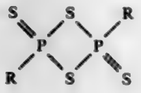


wherein each of said R, R′ and R″ are selected from the group consisting of hydrogen, alkyl groups of 1 to 18 carbon atoms and aryl groups of 6 to 12 carbon atoms,

wherein a molar proportion of said adduct has been reacted at a temperature in the range of 0° to 100° C., with said aziridine in a relative proportion of about 0.5 to 1.0 mole of aziridine per atom of phosphorus in said adduct.

10. An oil concentrate comprising 35 to 90 wt. % of a mineral oil and 10 to 65 wt. % of a sludge dispersant which is the reaction product of:

I. an oil soluble additive comprising principally olefin-thionophosphine sulfide adduct of (1) an olefin having at least six carbon atoms and at least one double bond, and (2) a dimeric thionophosphine sulfide having the structure:



wherein, R is an organic radical selected from the group consisting of anisyl, thienyl, C_1 to C_{18} alkyl, C_6 to C_{18} cycloalkyl, and C_6 to C_{18} aryl radicals which may be unsubstituted or hydroxy substituted; said adduct being formed by heating said olefin and said sulfide together, under anhydrous conditions, at a temperature in the range of about 100 to 250° C., with the evolution of H_2S, said olefin being selected from the group consisting of:

a. short chain hydrocarbon mono-olefin of 8 to 50 carbon atoms;

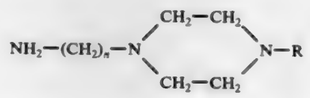
b. long chain unsaturated hydrocarbon polymers of C_2 to C_5 mono-olefins, said polymers having a molecular weight in the range of 400 to 100,000; and

c. copolymers of about 30 to 85 mole % ethylene, about 15 to 70 mole % C_2 to C_5 monp-alpha olefin, and about 2 to 15 mole of C_4 to C_{14} non-conjugated diene; and wherein said adduct is the reaction product of substantially equimolar proportions of said sulfide with said olefins of group (a) and group (b) above; and wherein said adduct is the reaction product formed by reacting in the range of about 0.05 to 1.0 molar proportion of said sulfide per molar proportion of said diene, when reacted with the olefin of group (c) above; and

II. a polyamine in a relative proportion of about 0.1 to 0.5 mole of polyamine per atom of phosphorus in said adduct, said polyamine containing 2 to 12 nitrogen atoms wherein pairs of nitrogen atoms are joined by alkylene groups of 2 to 4 carbon atoms, and being selected from the group consisting of polyamines defined by the formulae:

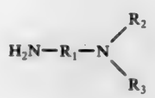
$$NH_2(CH_2)_n - [NH(CH_2)_n]_m - NH_2 \quad (a)$$

(b)



wherein: *n* is 2 to 4 and R is selected from the group consisting of hydrogen and aminoalkyl radicals of 2 to 3 carbon atoms; and

(c)



wherein R_1 is a C_2 to C_4 alkylene radical, and R_2 and R_3 are C_1 to C_5 alkyl radicals,

wherein a molar proportion of said adduct has been reacted, at a temperature in the range of 0° to 100° C., with said polyamine.

4,042,524

METHODS FOR ABSORPTION HEATING

Henry R. Nychka, East Aurora; Richard E. Eibeck, Orchard Park, and Chien C. Li, Williamsville, all of N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 10, 1975, Ser. No. 567,044
Int. Cl.[2] C09K *5/04*
U.S. Cl. 252—69 **1 Claim**

1. In a heating method wherein a gaseous solute is dissolved in a solvent to release heat of solution in the vicinity of an area to be heated, the resulting solution is heated to release gaseous solute from the solvent, the released solute is condensed to form liquid solute and to release heat of condensation in the vicinity of the area to be heated and evaporating the resulting liquid solute at a location removed from the area to be heated, the improvement comprising using a fluorocarbon selected from the group consisting of dichloromonofluoromethane, monochlorodifluoromethane, trifluoromethane and monochloromonofluoromethane as the solute and 2-(t-butoxymethyl) tetrahydrofuran as the solvent.

4,042,525

IODOPHOR SOLUTION CONTAINING GLYCIDE POLYMER

Rolf Ackermann; Gerhard Morlock, and Gerhard Stehlik, all of Hanau, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed June 16, 1976, Ser. No. 696,669
Claims priority, application Germany, June 21, 1975, 2527701
Int. Cl.[2] C11D *3/48, 7/26*
U.S. Cl. 252—106 **26 Claims**

1. An iodophor solution comprising:

a. iodine in an amount of about 0.5 to about 4% by weight;

b. a glycide polymer in an amount of about 1.6 to about 15% by weight;

c. phosphoric acid in an amount of about 0 to about 30% by weight;

d. water in an amount sufficient so that said solution comprises 100% by weight; and

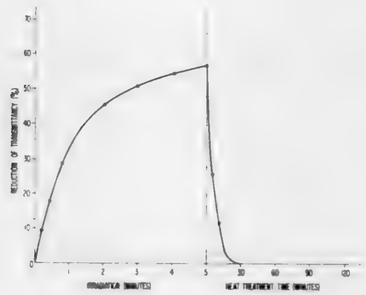
wherein the quotient of the weight of said glycide polymer to the weight of said iodine is at least 3.33.

4,042,526

NON-CRYSTALLINE SUBSTANCE HAVING AN OPTICAL MEMORY EFFECT

Yoshiyuki Asahara, Kawasaki, and Tetsuro Izumitani, Hino, both of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation of Ser. No. 362,123, May 21, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,577
Claims priority, application Japan, May 23, 1972, 47-50906
Int. Cl.[2] G11B *7/00*
U.S. Cl. 252—300 **13 Claims**



1. A method of storing information in an optically sensitive non-crystalline substance which comprises:

a. irradiating the non-crystalline substance with a high intensity light source to change its transmittance from one value to a second value, said non-crystalline substance comprising 25–65 atomic % of As, 25–65 atomic % of Se and additionally at least one of 0.1–10 atomic % of Zn, 0.1–8 atomic % of Au, and 0–32 atomic % of Ag and 0–25 atomic % of Cu, the total amount of Cu + Ag being 0.1–35 atomic %; the total being 100 atomic % in all;

b. discontinuing the irradiation of Step (a) so that said non-crystalline substance can retain said second value of transmittance and thereby act as a memory device for storing information, and

c. heating said non-crystalline substance to a temperature of 170°–200° C. to cause said second value of transmittance to return to said first value and thereby erase said stored information.

4,042,527

PROCESS OF PREPARING INFRARED-EXCITABLE SODIUM RARE EARTH FLUORIDE LUMINESCENT MATERIALS

Tsuyoshi Kano, Tokyo; Masaki Nakako, Hachioji; Hajime Yamamoto, Tokyo, and Yoshiro Otomo, Mitaka, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 22, 1972, Ser. No. 255,639
Claims priority, application Japan, May 21, 1971, 46-34480; Nov. 10, 1971, 46-89019
Int. Cl.[2] C09K *11/46*
U.S. Cl. 252—301.4 H **6 Claims**

1. A method for producing a luminescent material consisting essentially of a sodium rare earth fluoride having a hexagonal crystal structure and a composition expressed by the following general formula:

$$NaLn_{1-y-z}Yb_yEr_zF_4$$

wherein Ln represents at least one element selected from the group consisting of yttrium, lanthanum, gadolinium and lutetium, and *y* and *z* are numerical values defined by the following relationship:

$$0.09 \leqq y \leqq 0.99,$$
$$0.01 \leqq z = 0.10, \text{ and}$$
$$y + z \leqq 1,$$

said method comprising the steps of

a. preparing an acidic aqueous solution containing rare earth ions in a composition expressed by the following general formula:

$$Ln_{1-y-z}Yb_yEr_z$$

wherein Ln represents at least one element selected from the group consisting of yttrium, lanthanum, gadolinium and *y* and *z* are numerical values defined by the following relationships:

$$0.09 \leqq y \leqq 0.99,$$
$$0.01 \leqq z \leqq 0.10, \text{ and}$$
$$y + z \leqq 1,$$

b. adding a fluorine ion as a precipitant to said acidic aqueous solution and thereby coprecipitating said rare earth ions in the form of fluorides to form a first raw material consisting of a rare earth fluoride coprecipitate having a composition expressed by the following general formula:

$$Ln_{1-y-z}Yb_yEr_zF_3$$

wherein Ln, *y* and *z* are as defined above,

c. mixing the first raw material with sodium silicofluoride Na_2SiF_6 as a second raw material, the molar ratio of said second raw material to said first raw material being in the range of from 0.4 to 1.5, and

d. packing the resultant mixture in a crucible at the bottom of which powder of sodium silicofluoride Na_2SiF_6 has been charged in advance, in a manner such that the mixture of the raw materials is placed above the powder of sodium silicofluoride, and firing the contents of the crucible at a temperature of from 600° to 950° C. for a period of time of at least 1 hour in an oxygen-free atmosphere.

4,042,528

WATER-SOLUBLE DEFOAMING AGENTS

Akira Abe, Annaka, Japan, assignor to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Mar. 25, 1975, Ser. No. 561,686
Claims priority, application Japan, Mar. 29, 1974, 49-35215
Int. Cl.[2] B01D *19/04*
U.S. Cl. 252—358 **11 Claims**

1. A water-soluble defoaming agent for use in high temperature dyeing operations consisting essentially of

i. from 20 to 94% by weight of an organopolysiloxane-polyoxyalkylene copolymer represented by the general formula $G_aR_b^1SiO_{4-a-b/2}$

where G is a polyoxyalkylene group represented by the general formula $—R'+OR''+_nA_1$ where R' is a divalent alkylene group having 1 to 10 carbon atoms, R'' is a divalent alkylene group having 2 to 10 carbon atoms, A^1 is a hydroxy group or a monovalent organic group selected from the class consisting of monovalent hydrocarbon groups, alkoxy groups, acyl groups, acyloxy groups and isocyanate groups, and *m* is a positive number; R^1 is a substituted or unsubstituted monovalent hydrocarbon group having 1 to 3 carbon atoms and halogen-substituted derivatives thereof, and *a* and *b* each are positive numbers with the proviso that $(a+b) = 1.9$ to 2.1, the ratio of said polyoxyalkylene groups denoted by G to said organopolysiloxane-polyoxyalkylene copolymer being in the range of from 0.3 to 0.8 by weight,

ii. from 5 to 50% by weight of a polyoxyalkyleneglycol derivative represented by the general formula

$$R^3+OR^2+_nA^2$$

where R^2 is a divalent alkylene group having 2 to 10 carbon atoms, R^3 is a saturated or unsaturated monovalent hydrocarbon group having 2 to 20 carbon atoms, A^2 is a hydroxy group or a monovalent organic group selected from the class consisting of monovalent hydrocarbon groups, alkoxy groups, acyl groups, acyloxy groups, and isocyanate groups, and *n* is a positive number, and

iii. from 1 to 30% by weight of a nonionic surface active agent having the polyoxyalkylene structure in its molecule and selected from the group consisting of polyoxyethylene sorbitan fatty acid esters, polyoxyethylene sorbitol fatty acid esters, polyoxyethylene fatty acid esters, polyoxyethylene aryl ethers, polyoxyethylene alkaryl ethers, castor oil modified with polyoxyethylenes, and polyoxyethylene-polyoxypropylene ethers with higher alcohols.

4,042,529

COMPOSITION AND METHOD FOR ENHANCING DISPERSIBILITY OF WATER SOLUBLE POLYMERS

Kenneth H. Nimerick, and Benny E. Simpson, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

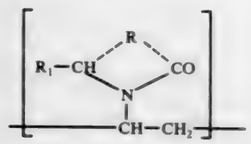
Filed July 11, 1974, Ser. No. 487,512
Int. Cl.² E21B *43/26*; B01F *3/20, 1/00*
U.S. Cl. 252—363.5 **8 Claims**

1. A water soluble polymeric composition comprising: a particulate mass of a water soluble organic polymer,

said water soluble organic polymer being a natural gum, a derivative of a natural gum, a cellulosic derivative, a starch derivative, or a polyacrylamide, of the type which tends to agglomerate when wetted with water but which, once dissolved in an aqueous liquid in an effective amount, thickens said aqueous liquid,

the individual particles of which are coated with a water-dispersibility and water-solubility affecting amount of a water soluble copolymer having a molecular weight ranging from about 300 to 2,000,000 containing

a. at least about 20 percent by weight polyvinyl lactam units selected from the group consisting of units corresponding to the formula



wherein R is an alkylene group containing a sufficient number of carbon atoms to form a heterocyclic ring containing from 5 to 7 members, and R_1 is hydrogen or a lower alkyl group, and

b. units of at least one other organic monomer, the polyvinyl lactam units being present in an amount sufficient to increase the dispersibility of the water soluble organic polymer in water, and the nature and proportion of the other organic monomer units being selected so as to modify the rate at which said dispersed organic polymer is dissolved in water.

4,042,530

OXYCHLORINATION SOURCES FOR REGENERATING DISPERSIONS OF LIGAND-STABILIZED, PALLADIUM (II) HALIDE COMPLEXES USED AS CARBONYLATION CATALYSTS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 581,320, May 27, 1975. This application Nov. 28, 1975, Ser. No. 636,238
Int. Cl.² B01J *31/40, 27/32*; C07C *51/00*; C11C *3/02*
U.S. Cl. 252—415 **1 Claim**

1. A process for regenerating spent carbonylation catalyst of ligand-stabilized palladium(II) halide complexes in quaternary ammonium, phosphonium and arsonium salts of trihalostannate(II) or trihalogermanate(II), the spent catalyst being obtained from the carbonylation of olefins, wherein said ligand stabilized catalysts are selected from the group consisting of:

$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(p\text{-}CH_3.C_6H_4)_3]_2$
$[ClCH_2(C_6H_5)_3P][SnCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$[(n.C_4H_9)\ N][SnCl_3]$-$PdCk_2[P(C_6H_5)_3]_2$
$[(C_6H_5)_4As][SnCl_3]$-$PdCl_2[P\ (C_6H_5)_3]_2$
$[(C_2H_5)_4N][GeCl_3]$-$PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][SnCl_3]$-$PdCl_2[P(p\text{-}CH_3I.C_6H_4)_3]_2$, and
$[(C_7H_{15})_4N][GeCl_3]$-$PdCl_2[As(C_6H_5)_3]_2$, by the

a. mixing said spent palladium carbonylation catalyst with inert solvent selected from the group consisting of chlorinated aliphatics, chlorinated aromatics, aromatics and carboxylic acid esters to form a reaction mixture,

b. heating said reaction mixture at temperatures ranging from 20° to 200° C for a time of 0.1 to 48 hours, in a stream of hydrogen chloride plus a source of oxygen selected from the group consisting of oxygen and air, said volume ratio of hydrogen chloride to oxygen or varying from 10:1 to 1:10,

c. removing excess solvent under reduced pressure until a dried palladium catalyst is obtained, and

d. adding additional stabilizing ligand to the dried catalyst wherein the stabilizing ligand is selected from the group consisting of tri henylphosphine, triphenylarsine, tri-p-tolylphosphine, and tri-p-methoxyphenylphosphine, said mole ratio of ligand added per gram atom of palladium varies from 1 to 10 moles of ligand per gram atom of palladium, until said spent ligand catalyst is regenerated.

4,042,531

OXIDATION CATALYST AND PROCESS

Ellis K. Fields, River Forest, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 28, 1976, Ser. No. 736,564
Int. Cl.² B01J *27/24, 27/08*
U.S. Cl. 252—438 **8 Claims**

1. An oxidation catalyst comprising a milled reaction product of an anhydrous transition metal halide with silver nitrite, the mole ratio of said metal halide to said silver nitrite being in the ratio of 1:1 to 1:5.

4,042,532

THERMALLY STABLE NICKEL-ALUMINA CATALYSTS USEFUL FOR METHANATION AND OTHER REACTIONS AND METHOD FOR THE MANUFACTURE OF SAID CATALYSTS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 586,946, June 16, 1975, abandoned. This application Jan. 23, 1976, Ser. No. 651,645
Int. Cl.² B01J *21/04, 23/74*
U.S. Cl. 252—466 J **9 Claims**

1. A method for the manufacture of a thermally stable nickel oxide-alumina catalyst which comprises:

1. slurrying a powdered alumina hydrate in an aqueous solution of a nickel salt for a sufficient time to effect pore-saturation of said alumina hydrate with said solution, sufficient of said nickel salt being in the form of an ammino complex with ammonia to provide at least 2 moles of ammino ligands per mole of said nickel salt;
2. heating the resulting slurry with agitation at a temperature and for a time sufficient to bring about a gradual decomposition of substantially all of said ammino complex with resultant liberation of ammonia and precipitation of substantially all of said nickel salt in the form of nickel hydroxide intimately composited with said powdered alumina hydrate; and
3. drying and calcining the resulting composite at a temperature sufficiently high to convert said alumina hydrate to gamma alumina.

4,042,533

PRODUCING UNSATURATED ALIPHATIC ACIDS

Wilfrid G. Shaw, Lyndhurst; David B. Terrill, Bedford, and David R. Woodbury, Bedford Hts., all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed June 7, 1976, Ser. No. 693,256
Int. Cl.² B01J *23/22, 23/28, 23/30, 27/18*
U.S. Cl. 252—437 **5 Claims**

1. A catalyst having the empirical formula:

$$Mo_aV_bW_cX_dY_eO_f$$

wherein

X is one or more of the elements selected from the group consisting of rhenium and titanium; and

Y is one or more of the elements selected from the group consisting of manganese, iron, copper, tin, zinc, aluminum, cobalt, nickel, phosphorus, cadmium, bismuth, silver, niobium, arsenic, chromium, the alkali and the alkaline earth elements, and

wherein the number of atoms of each element present is represented by *a* through *f*,

wherein

a is a number from 6 to 18;
b is a number from 0.1 to 10;
c is a number from 0.1 to 6;
d is a number from 0.01 to 5;
e is a number from 0 to 5; and
f is a number that satisfies the valence requirements of the other elements present.

4,042,534

CONDUCTING ANISOTROPIC POLYMER MATERIAL

Kuzma Andrianovich Andrianov, Vystavochny pereulok, 3, kv. 9, Moscow; Mikhail Izmailovich Topchiashvili, ulitsa Tashkentskaya, 27/12, pod'ezd, 3, Tbilisi; Lotary Mikhailovich Khananashvili, ulitsa Sumskaya, 6, korpus 2, kv. 244, Moscow; Dali Georgievna Pagava, ulitsa Tskhvedadze, 30, and Nikolai Alexandrovich Shermazanashvili, ulitsa Cheljuskintsev, 11, both of Tbilisi, all of U.S.S.R.

Filed Feb. 28, 1974, Ser. No. 447,051
Int. Cl.² H01B *1/06*
U.S. Cl. 252—511 **2 Claims**

1. A method of producing a conductive anisotropic polymer material comprising 20–50 weight parts of conductive black and 100 weight parts of the reaction product of perchlorovinyl resin and phenylaminomethyl-methyldiethoxysilane, comprising the steps of dissolving 100 weight parts of perchlorovinyl resin in 40–80 weight parts of dichloroethane; adding successively 10–100 weight parts of phenylaminomethyl-methyldiethoxysilane and 40–100 weight parts of conductive black to the resulting solution; stirring the mixture thus obtained, and rolling it at a temperature of 15° to 50° C.

4,042,535

METAL OXIDE VARISTOR WITH IMPROVED ELECTRICAL PROPERTIES

John E. May, Skaneateles, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,854
Int. Cl.² H01B *1/06*
U.S. Cl. 252—518 **8 Claims**

1. A metal oxide varistor body comprising a plurality of grains which consist primarily of zinc oxide base material and are separated by a cellular intergranular region which consists primarily of a plurality of preselected additives wherein at least one of said additives is bismuth oxide, said varistor being characterized by a relatively high percentage of said bismuth oxide in being a body centered cubic phase.

4,042,536

INORGANIC-ORGANIC PLASTIC

Dieter Dieterich, Leverkusen; Peter Markusch, Cologne, both of Germany, and Helmut Reiff, New Martinsville, W. Va., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 26, 1974, Ser. No. 527,386
Claims priority, application Germany, Nov. 30, 1973, 2359606
The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.
Int. Cl.² C08G *18/38, 18/32*
U.S. Cl. 260—2.5 AK **14 Claims**

1. A process for producing an inorganic-organic plastic with high strength, elasticity, dimensional stability under heat, and flame resistance, which is a composite material of a polymer/-polysilicic acid gel, said composite being in the form of a solid/solid xerosol, said process comprising mixing and reacting:

A. an organic polyisocyanate,

B. a silica composition selected from the group consisting of:

i. an aqueous alkali metal silicate containing about 20 – 70% by weight of said alkali metal silicate;

ii. an aqueous silica sol having a solids content from 20 to 50%, and

iii. mixtures thereof,

C. an organic compound which contains

i. at least one hydrogen atom capable of reacting with an isocyanate group, and

ii. at least one group selected from the group consisting of:

a. an ionic group,

b. a group capable of forming an ionic group in the presence of an alkali metal silicate, and

c. non-ionic hydrophilic groups, said non-ionic hydrophilic groups being polyether groups which are built

up from ethylene oxide to an extent of at least 10% by weight, with the proviso that if said organic compound contains non-ionic hydrophilic groups, said organic compound contains only one hydrogen atom capable of reacting with an isocyanate group,

said mixing being carried out in such a way that either components (B) and (C) are mixed prior to mixing with (A), or components (A), (B) and (C) are mixed simultaneously.

14. The product of the process produced by claim **1.**

4,042,537

PROCESS FOR THE PRODUCTION OF POLYURETHANE FOAMS

Manfred Dahm, Bergisch Neukirchen, and Alberto Carlos Gonzalez-Dorner, Leverkusen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 15, 1975, Ser. No. 578,051

Claims priority, application Germany, May 17, 1974, 2423984; Mar. 27, 1975, 2513816

Int. Cl.² C08G *18/14, 18/28*

U.S. Cl. 260—2.5 AP **18 Claims**

1. A process for the production of polyurethane foam comprising reacting in the presence of a blowing agent:

a. an organic polyisocyanate, and

b. a dispersion of a polyurea and/or a polyhydrazodicarbonamide in a relatively high molecular weight organic compound containing at least one hydroxyl group, wherein the concentration of the polyureas and/or polyhydrazodicarbonamide is from 1 to 40% by weight of the dispersion based on 100 parts by weight of said organic compound.

4,042,538

SUGAR P-VINYLBENZOYL ESTER AND COPOLYMERS THEREOF

Timothy John Lucas, London, England, assignor to Tate & Lyle Limited, London, England

Filed Apr. 11, 1975, Ser. No. 567,140

Claims priority, application United Kingdom, Apr. 16, 1974, 16579/74

Int. Cl.² C07H *15/00*; C08L *5/00*

U.S. Cl. 260—17.4 SG **8 Claims**

1. A derivative of a sugar selected from the group consisting of monosaccharides and disaccharides, in which at least one of the hydroxy groups of said sugar has been replaced by a p-vinylbenzoyloxy group.

8. A copolymer of an ethylenically unsaturated sugar derivative with another ethylenically unsaturated monomer, where in the sugar derivative is selected from the group of monosaccharides and disaccharides having at least one of their hydroxy groups replaced by a p-vinyl benzoyloxy group, and wherein the sugar derivative is present in the copolymer in an amount not greater than 5 mole percent when it is a derivative of a disaccharide and not greater than 10 mole percent when it is a derivative of a monosaccharide, and where in said another ethylenically unsaturated monomer is styrene or methyl methacrylate and wherein the copolymer has a glass transition temperature of 90.3° to 126° C.

4,042,539

PRIMER-SURFACER COMPOSITION OF AN ACRYLIC POLYMER, A POLYESTER RESIN AND AN ORGANIC DISPERSANT

Herbert H. Fanning, Bryn Mawr, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 350,645, April 12, 1973, abandoned. This application Oct. 30, 1975, Ser. No. 627,461

Int. Cl.² C08K *5/01, 5/04*; C08L *1/14, 67/02*

U.S. Cl. 260—16 **11 Claims**

1. A primer-surfacer composition comprising 10–60% by weight of a binder and 40–90% by weight of a solvent for the binder; wherein the binder consists essentially of

A. 75.0–95.0% by weight, based on the weight of the binder, of an acrylic polymer in solution consisting essentially of

1. 70–90% by weight of methyl methacrylate,

2. 9–19% by weight of an alkyl methacrylate having 2–8 carbon atoms in the alkyl group or an alkyl acrylate having 2–12 carbon atoms in the alkyl group, and

3. 1–11% by weight of either acrylic acid or methacrylic acid that is reacted with 1-8% by weight of an alkylene imine;

b. 4.9–24.9% by weight, based on the weight of the binder, of a polyester resin in solution which is the esterification product of

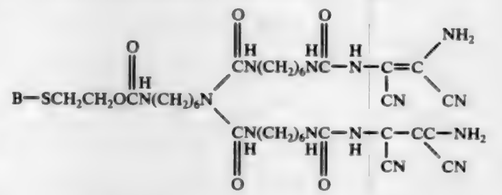
25 to 48 mole percent of a saturated aliphatic dicarboxylic acid selected from the group consisting of adipic acid, succinic acid, malonic acid, glutaric acid, sebacic acid, and azelaic acid;

40 to 50 mole percent of a glycol selected from the group consisting of ethylene glycol and neopentyl glycol; and

2 to 35 mole percent of an aromatic carboxylic acid constituent selected from the group consisting of benzoic acid, paratertiary butyl benzoic acid, phthalic acid, phthalic anhydride or mixtures thereof;

wherein the polyester has a hydroxyl number of not greater than 15 and an acid number of not greater than 10;

C. 0.1–5.0% by weight, based on the weight of the binder, of an organic pigment dispersant consisting essentially of a material represented by the structure



where B is a methyl methacrylate/2-ethylhexyl acrylate copolymeric segment having a number average molecular weight of about 3,000 to 10,000 and

containing pigment in a pigment to binder weight ratio of about 100:100 to about 600:100.

11. The primer surfacer composition of claim **6** containing in addition to the binder constituent up to 20% by weight of cellulose acetate butyrate, based on the weight of the binder; wherein the cellulose acetate buryrate has a butyryl content of about 30–60% by weight and a viscosity of about 2–25 seconds measured at 25° C. determined according to ASTM-D-1343-56.

4,042,540

PROCESS FOR THE MANUFACTURE OF HIGHLY ELASTIC SOFT POLYURETHANE FOAMS

Helmut Lammerting, Herbede; Rolf-Dieter Langenhagen, Hattingen-Niederwenigern; Gerd Rossmy, Haltern, and Peter Zäske, Essen-Bredeney, all of Germany, assignors to Th. Goldschmidt AG, Essen, Germany

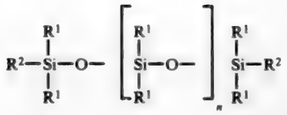
Filed Aug. 26, 1975, Ser. No. 607,913

Claims priority, application Switzerland, Aug. 30, 1974, 11814/74

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AH **13 Claims**

1. In a process of producing cold cure soft polyurethane foams, wherein polyethers having at least two hydroxy groups per molecule, water and organic polyisocyanate are foamed in the presence of catalysts, the foaming system optionally comprising cross-linkers, blowing agents and/or other auxiliaries, the improvement which comprises adding to the foaming system organopolysiloxane of the formula I



wherein

R^1 represents the same of different unsubstituted or substituted hydrocarbon groups which are devoid of groups that have a tendency to enter addition reactions with isocyanate;

R^2 has the same meaning as R^1 or is OR^3, wherein

R^3 represents alkyl, aryl, alkaryl or $[C_mH_{2m}O]_pR^4$,

R^4 being lower alkyl,

m = 2 to 4 and

p being selected such that the mole weight of the total R^3 group does not exceed 400; and

n = 2–10 and wherein essentially none of the individual components of the mixtures possess a value of n>10, the amount of the compound of formula I being between about [0,003] 0.003 to 2% by weight calculated on the amount of polyether in the foaming system.

4,042,541

EXPANDABLE POLYSTYRENE PARTICLES

Harry Watts, Sarnia, Canada, assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 13, 1976, Ser. No. 750,068

Int. Cl.² C08J *9/22*

U.S. Cl. 260—2.5 B **3 Claims**

1. In a mass of expandable polystyrene particles of a size suitable for molding, the particles containing 3 to 10 parts per hundred parts of polystyrene, a volatile fluid-foaming agent selected from the group consisting of n-pentane, isopentane and mixtures thereof and generally uniformly dispersed within the particles from about 100 to 300 parts per million of stearic acid based on total weight of the resinous composition and calcium stearate in a proportion of from about 40 to 120 parts per million based on the total weight of the composition.

4,042,542

PROCESS FOR REMOVING POLYMER FROM REACTION MIXTURE

Ki Soo Kim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 15, 1975, Ser. No. 613,143

Int. Cl.² C08L *89/00*

U.S. Cl. 260—6 **8 Claims**

1. A process for removing a polymer formed by reacting an organo-phosphonic dichloride or dibromide, a dihydroxy aromatic compound, and, optionally, a crosslinking monomer in an inert organic solvent to form a reaction mixture of said inert solvent and said polymer product which comprises:

a. combining said reaction mixture with an aqueous slution containing an effective amount of a suspending agent for later precipitation of said polymer product in granular form;

b. removing said organic solvent from the mixture resulting from step (a) while said mixture is being agitated to thereby affect precipitation of the polymer product in solid granular form; and

c. separating the precipitated polymer product and the supernatant formed thereby.

4,042,543

MATERIAL FOR STOPPERS

Robert L. Strickman, 729 Handwerg Drive, River Vale, N.J. 07675, and Melvyn B. Strickman, Academy St., Shiloh, N.J. 08353

Filed Feb. 13, 1976, Ser. No. 658,019

Int. Cl.² C08L *5/00*

U.S. Cl. 260—17.4 R **15 Claims**

1. A composition for forming stoppers for bottles, containing 1 part by weight of natural cork particles and from about 0.1 to 10 parts by weight of a polymer powder composed of particles of a polymer selected from a group consisting of polyethylene, ethylene-vinyl acetate copolymer, and a mixture of the polyethylene and the ethylene-vinyl acetate copolymer, the particles of the natural cork ranging in size from about 0.2 to 10 mm.

4,042,544

CHROMATED POLYAMIDE RESINS AS CURING AGENTS FOR EPOXY RESINS, AND THEIR CURED CORROSION-RESISTANT REACTION PRODUCTS

Eli Simon, 7175 Little Harbor Drive, Huntington Beach, Calif. 92648

Filed Apr. 8, 1976, Ser. No. 675,066

Int. Cl.² C08G *69/26*

U.S. Cl. 260—18 PN **3 Claims**

1. Curing agents for epoxy resins which are prepared at a temperature not to exceed 50° C by mechanically mixing for about 5 minutes an aqueous solution of 1 mole of chromium trioxide to 5–75 moles water with 2–4 amine values of a fluid reactive polyamide having an amine value of between 230–400.

4,042,545

NOVEL PRINTING INKS FOR SUBLIMATION TRANSFER PRINTING

Raymond Défago, Riehen; Arnulf Ruediger Läpple, Arlesheim, and Carl Becker, Basel, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed June 11, 1975, Ser. No. 586,131

Claims priority, application Switzerland, June 13, 1974, 8083/74; Feb. 13, 1975, 1789/75

Int. Cl.² C09D *11/06, 11/08, 11/14, 11/10*

U.S. Cl. 260—13 **9 Claims**

1. Printing inks for sublimation transfer printing which contain

a. at least one sublimable cationic dye or a mixture of cationic dyes the cationic character of which is derived from a carbonium, ammonium, oxonium or sulphonium group, the solubility of the cationic dyes in the printing ink being not more than 10g/l and said cationic dyes being present in the form of a fine dispersion;

b. a soluble resin component which comprises at least one soluble resin said component functioning as stabilizer, film former and thickener, which component stabilizes the dyestuff dispersion so that no sedimentation or creaming occurs, ensures the reversibility of the dispersion in case small amounts of printing ink dry out and fall back into the ink, gives the colour sufficient body and ensures a good film quality without increasing the viscosity above the level still permissible for printing, rapidly releases the solvent and does not become tacky, does not retain the dye during transfer and withstands the requisite transfer printing temperatures of up to 230° C without undergoing modification or decomposition;

c. a low viscosity, low molecular organic solvent or solvent mixture in which the cationic dye or dyes are only slightly soluble at room temperature and the resin component is at least 5% soluble selected from the group of low molecular aliphatic hydrocarbons and chlorinated hydrocarbons with a boiling point between 80° and 180° C, the first members of the aliphatic alcohols and ether alcohols, and mixtures of these types of solvent;

d. at least one inorganic acid acceptor selected from the group of hydroxides, oxides, carbonates and alcoholates of alkali metals and alkaline earth metals, or organic acid acceptor selected from the group of amines and tetraalkylammonium hydroxides; and

e. about 0.1 to 10 percent by weight, based on the cationic dye of at least one indicator dye or dyestuff mixture which is inert to inorganic or organic acid acceptors, which has the same shade as that of the cationic dyes and which does not itself transfer into the textile material.

4,042,546

REACTIVE POLYESTER-AMIDE POLYMERS AS CO-REACTANTS OR CURING AGENTS FOR POLYEPOXIDES AND POLYISOCYANATES

Eli Simon, 7175 Little Harbor Drive, Huntington Beach, Calif. 92648

Filed May 3, 1976, Ser. No. 682,474
Int. Cl.[2] C08G *69/44;* C09D *3/70, 3/72*
U.S. Cl. 260—22 R **3 Claims**

1. Reactive polyester-amide polymers having an acid number of 25–100, as co-reactants for polyepoxides and polyisocyanates, prepared from reactants consisting of: 1-mol of a triol selected from the group consisting of glycerol, tris(2-hydroxyethyl)isocyanurate, 1-2-4-hexanetriol, trimethylol propane, and trimethylol ethane; 1-mol of an amino-alcohol selected from the group consisting of 2-amino-1-butanol, and 2-amino-2-methyl-1-propanol; and 2-moles of an aliphatic dibasic acid selected from the group consisting of adipic, pimelic, suberic, azelaic, and sebacic acids.

4,042,547

ENVIRONMENTALLY HARMLESS STOVING LACQUER SYSTEMS BASED ON ALKYD RESINS CONTAINING CONDENSED MONOHYDRIC ALCOHOLS

Bernd-Ulrich Kaiser; Rolf Dhein; Hans Rudolph, and Rolf Kuchenmeister, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 659,251, Feb. 19, 1976, abandoned, which is a continuation of Ser. No. 460,991, April 15, 1977, abandoned. This application Aug. 16, 1976, Ser. No. 714,784
Claims priority, application Germany, Apr. 18, 1973, 2319635; Sept. 13, 1973, 2346130; Feb. 19, 1974, 2407791
Int. Cl.[2] C09D *3/64, 3/66*
U.S. Cl. 260—22 R **6 Claims**

1. A water-insoluble product consisting essentially of the condensation product of an aliphatic or cycloaliphatic polyalcohol having 2 to 15 carbon atoms, an aromatic, cycloaliphatic or aliphatic dicarboxylic acid, from 0 to 40% by weight of a monocarboxylic acid and from 5 to 35% by weight of a saturated monohydric alcohol having from 1 to 3 carbon atoms, said condensation product having a molecular weight of between 500 and 2000, an acid number of 3 to 40 and an OH number of 40 to 300 and being soluble in lacquer solvents selected from the group consisting of hydrocarbons, alcohols, esters and ketones.

4,042,548

HIGHLY WEATHER-RESISTANT, THERMOFORMABLE SHEETING

Mitsuo Abe; Masaki Nagata, and Masafumi Kikuchi, all of Yokkaichi, Japan, assignors to Japan Synthetic Rubber Company Limited, Tokyo, Japan

Filed Oct. 15, 1975, Ser. No. 622,513
Claims priority, application Japan, Oct. 21, 1974, 49-121174
Int. Cl.[2] C08K *5/12, 5/15*
U.S. Cl. 260—23 XA **10 Claims**

1. A highly weather-resistant, thermoformable sheeting prepared by mixing (a) from 45 to 70 parts by weight of a rigid thermoplastic resin selected from the group consisting of polyvinyl chlorides and copolymers each of which is composed mostly of vinyl chloride and a small amount of a monoolefinic monomer copolymerizable with the vinyl chloride, from 20 to 50 parts by weight of a thermoplastic resin obtained by a graft polymerization of from 20 to 40 parts by weight of an ethylene-propylene copolymer rubber or ethylene-propylene-diene terpolymer with from 60 to 80 parts by weight of a vinyl monomer mixture consisting of from 40 to 90 percent by weight of an alkenyl aromatic compound and from 10 to 60 percent by weight of at least one monomer copolymerizable with the alkenyl aromatic compound, and from 5 to 35 parts by weight of an acrylonitrile-butadiene rubber, with (b) from 5 to 50 parts by weight of a plasticizer or plasticizers for polyvinyl chloride added to 100 parts by weight of the resinous mixture (a).

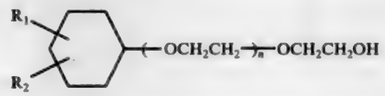
4,042,549

STABILIZERS FOR VINYL HALIDE RESINS CONTAINING A METAL HALIDE AND AN ETHOXYLATED ALKYLPHENOL

Robert L. Ahr, and Philip H. Rhodes, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Sept. 30, 1975, Ser. No. 618,256
Int. Cl.[2] C08J *3/20*
U.S. Cl. 260—23 XA **11 Claims**

1. An improved liquid stabilizer for vinyl halide resins which comprises 0.5 to 18% by weight of (a) a Group II metal halide; 0.25 to 6% by weight of (b) sufficient water to dissolve said metal halide; and 44.25 to 99.25% by weight of (c) an ethoxylated alkylphenol of the formula



wherein R_1 is an alkyl radical containing from 6 to 18 carbon atoms, R_2 is hydrogen or an alkyl radical as defined for R_1 and n is an integer from 1 to 5.

4,042,550

ENCAPSULANT COMPOSITIONS BASED ON ANHYDRIDE-HARDENED EPOXY RESINS

Harold W. Tuller, Long Valley, and Ralph W. Nussbaum, West Orange, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Nov. 28, 1975, Ser. No. 636,189
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—280 P **14 Claims**

1. An epoxy molding composition, suitable for use as an encapsulant having improved high temperature wet electrical properties, comprising:

a. an epoxide compound having at least two 1,2-epoxide groups;

b. a hardener therefor selected from the group consisting of (1) a polyanhydride having a molecular weight below about 1,000 and being the reaction product of a maleic monomer and at least one alkyl styrene monomer and (2) prepolymers of said polyanhydride with said epoxide compound;

c. a catalyst to promote the curing thereof;

d. about 55 to 75% by weight, based on the weight of the composition, of a silica filler;

e. about 10 to 20% by weight, based on the weight of the composition, of an additional filler selected from the group consisting of calcined clay, antimony trioxide, antimony tetraoxide, calcium silicate, titanium dioxide, calcium carbonate, zinc oxide, magnesium oxide, or mixtures thereof;

f. about 0.05 to 2% by weight, based on the weight of the composition, of a silane coupling agent; and

g. about 0.01 to 2% by weight, based on the weight of the composition, of a lubricant selected from the group consisting of carnauba wax, montanic acid ester wax, polyethylene wax, polytetrafluoroethylene wax and mixtures thereof,

said composition, when heat cured, exhibiting improved high temperature wet electrical properties as indicated by a decreased percent change of the Dielectric Loss Index measured after exposure to 15 psig steam for 16 hours from the Dielectric Loss Index measured under dry conditions at 25° C.

4,042,551

POLYMERIC POLYBLENDS HAVING IMPROVED MELT FLOW

Robert L. Kruse, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 19, 1976, Ser. No. 678,268
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 B **13 Claims**

1. A polymeric polyblend having high melt flow comprising, based on the total weight of the polyblend:

A. about 80 to 98.5 weight percent of a mono-alkenyl aromatic polymer, comprising at least one monoalkenyl aromatic monomer of the formula:



where Ar is selected from the group consisting of phenyl, halophenyl alkylphenyl, alkylhalophenyl and mixtures thereof and X is selected from the group consisting of hydrogen, halogen and an alkyl radical of less than three carbon atoms and mixtures thereof,

B. about 1 to 15 percent by weight of a diene rubber moiety dispersed as grafted diene rubber particles, said rubber particles being grafted with and having occluded said monovinylidene aromatic polymer, wherein said grafted diene rubber particles has said grafted and occluded polymer present in an amount of 0.5 to 4 parts to 1 part of rubber, are crosslinked having a swelling index of 5–25 and a weight average particle size diameter of 0.1 to 20.0 microns, and

C. about 0.5–5 percent by weight of a polyethylene wax having a molecular weight of from about 500 to 2400 and a dispersion index of from 1–5.

4,042,552

COMPOSITION FOR HYDROPHILIC LENS BLANK AND METHOD OF CASTING

Bernard J. Grucza, Buffalo, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.

Continuation of Ser. No. 419,228, Nov. 27, 1973, abandoned, which is a division of Ser. No. 290,376, Sept. 19, 1972, Pat. No. 3,807,398. This application Nov. 14, 1975, Ser. No. 631,997
The portion of the term of this patent subsequent to Apr. 30, 1991, has been disclaimed.
Int. Cl.[2] C08L *33/10*
U.S. Cl. 260—29.6 RB **1 Claim**

1. A contact lens composition which can be subjected to cutting and thereafter hydrated in a buffered saline solution to provide a dimensionally-stable contact lens and also suitable for medicament delivery to the eye having from 50 to 65% water after hydration, said composition in dry form consisting essentially of polymerized random graft copolymer containing:

1. from 67.2% to 79.3% hydroxy ethyl methacrylate;
2. 14.25% to 28% polyvinyl pyrrolidone;
3. from 0.1% to 4.04% ethylene glycol dimethacrylate;
4. from 0.1% to 2.5% methacrylic acid;
5. from about 0.1% up to 5.0% water, and
6. from 50 to 100 ppm of hydroquinone stabilizer;

said composition having been polymerized in two stages;

the first stage being carried out with a low temperature peroxide initiator effective at 40° to 60° C after an induction period modified by said hydroquinone stabilizer at 15° to 30° C for a period of 2.5 to 6 hours;

said second stage being carried out with a high temperature peroxide initiator effective at 90° to 120° C;

each of said low temperature initiator and high temperature initiators being present in concentrations of 0.05% to 0.15%; and

said two stages of polymerization being carried out for a total period of at least 4 hours or longer.

4,042,553

THERMOSETTING VINYL ESTER EMULSION COPOLYMERS

Martin K. Lindemann, Greenville, S.C., assignor to Chas. S. Tanner Co., Greenville, S.C.

Continuation-in-part of Ser. No. 142,406, May 11, 1971, abandoned. This application Mar. 12, 1973, Ser. No. 340,535
Int. Cl.[2] C08L *33/04*
U.S. Cl. 260—29.6 H **7 Claims**

1. An aqueous emulsion comprising an aqueous medium having colloidally suspended therein an aqueous emulsion copolymer consisting essentially of at least 85% of the copolymer of vinyl ester with a saturated aliphatic monocarboxylic acid containing up to 18 carbon atoms, and from 0.5–15% of the copolymer of monomers providing thermosetting characteristics and consisting essentially of mono N-methylol allyl carbamate.

4,042,554

PROCESS FOR THE PREPARATION OF A STORAGE STABLE MASTIC ADHESIVE

Ralph Leroy Poskitt, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 3, 1975, Ser. No. 609,996
Int. Cl.[2] C08L *11/02*
U.S. Cl. 260—29.7 NR **10 Claims**

1. A process for the preparation of a mastic adhesive having improved storage stability which comprises (A) blending a high solids content polychloroprene latex having toluene-insoluble gel content of at least 60% and a polychloroprene latex in which the polymer is at least almost completely soluble in toluene, the polychloroprene of the latex which is at least almost completely soluble in toluene having a Mooney viscosity (ML — 2½, 100° C.) of 30 to 45, the ratio of polychloroprene from latex which is at least almost completely soluble in toluene to the ratio of polychloroprene from latex that has a toluene insoluble gel content of at least 60% being from 60/40 to 40/60, to form blend having a solids content of between about 50 and 65% by weight, (B) mixing said blend with an organic water-immiscible polychloroprene solvent containing an inert filler and dissolved adhesion promoting resin until the mixture has increased in viscosity to the mastic range and a water-in-oil dispersion is obtained.

4,042,555

BINDER COMPOSITION FOR ADHESIVES AND SEALANTS

Victor V. Raimondi, Naperville; Roy A. Fox, Bollingbrook, and Casey E. Piorkowski, Orland Park, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 12, 1975, Ser. No. 576,389
Int. Cl.[2] C08L *53/02*
U.S. Cl. 260—29.6 RB **9 Claims**

1. A water emulsified composition containing 100 phr of a styrene/elastomer block copolymer in which an elastomer midblock comprises 60 to 90% of the copolymer and is isoprene or ethylene-butylene, about 20 to 80 phr of a poly(alpha-methylstyrene) having a softening point between about 200°

and 300° F. and about 40 to 900 phr of a butylene polymer comprising 85–98% of mono-olefins.

4,042,556

PROCESS FOR THE PRODUCTION OF HARD VINYL CHLORIDE FOAMS

Mituji Yoshinaga, Tokyo, Japan, assignor to Central Glass Co., Ltd., Japan

Filed Apr. 29, 1975, Ser. No. 572,704
Claims priority, application Japan, May 23, 1974, 49-57317; May 31, 1974, 49-60767
Int. Cl.² C08J *9/10*
U.S. Cl. 260—2.5 P **7 Claims**

1. A process for the production of hard vinyl chloride resin foams, which comprises mixing a vinyl chloride resin foam forming composition comprising 100 parts by weight of vinyl chloride resin, 0.1 to 10 parts by weight of a stabilizer and 0.1 to 1.0 by weight of a foaming agent of organic decomposition type with at least one uniformly blended mixture comprising 100 parts by weight of vinyl chloride resin and 10 to 100 parts by weight of a foaming agent of organic decomposition type in a proportion of 1 to 30 parts by weight of the latter composition to 100 parts by weight of the former composition and then subjecting the resulting mixture to foaming.

4,042,557

PROCESS FOR PREPARING A HIGH CONCENTRATION OF TITANIUM DIOXIDE SLURRY IN DIMETHYLACETAMIDE OR DIMETHYLFORMAMIDE

William Leonard Dills, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 2, 1975, Ser. No. 609,714
Int. Cl.² C08K *3/22, 5/09, 5/20*; C09C *1/36*
U.S. Cl. 260—32.6 NR **9 Claims**

1. A process for producing a slurry comprising:

a. dissolving an acid selected from citric, tartaric, adipic, fumaric and maleic in a solvent selected from dimethylacetamide and dimethylformamide, and

b. dispersing titanium dioxide in the acid-solvent solution,

wherein the amount of titanium dioxide is about 60–83 weight percent based on the titanium dioxide and solvent, and the amount of acid is about 0.2–0.6 weight percent based on the titanium dioxide.

9. A process for producing a pigmented segmented polyurethane spinning solution comprising

a. making the slurry of claim **5**, and

b. adding the slurry of claim **5** to the segmented polyurethane spinning solution containing about 10–40 parts by weight of a segmented polyurethane polymer and about 60–90 parts by weight of dimethylacetamide so that about 0.5–10 weight percent titanium dioxide is present based on the weight of the segmented polyurethane polymer.

4,042,558

FILLED POLYMERIZATION PRODUCTS BASED ON CARBODIIMIDE COPOLYMERS

Wulf von Bonin, Leverkusen; Lothar Preis, Cologne; Ulrich von Gizycki, and Manfred Dahm, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 26, 1976, Ser. No. 708,805
Claims priority, application Germany, Aug. 16, 1975, 2536493
Int. Cl.² C08F *283/04*; C08L *79/08, 75/00*
U.S. Cl. 260—37 N **18 Claims**

1. A process for the production of polymerization products comprising subjecting solutions of the reaction products of polycarbodiimides and α, β-unsaturated carboxylic acids in about 5 to 95 weight percent vinyl monomers to free-radical polymerization.

4,042,559

ABRASION RESISTANT COATED ABRASIVE PIPE LINING SHEET

Paul N. Abelson, Lewiston; Halsey W. Buell, Niagara Falls, and William E. Hallatt, Lewiston, all of N.Y., assignors to The Carborundum Company, Niagara Falls, N.Y.

Continuation of Ser. No. 237,314, March 23, 1972, abandoned. This application Nov. 29, 1974, Ser. No. 527,986
Int. Cl.² C08K *3/14, 3/22, 3/28, 3/38*
U.S. Cl. 260—38 **12 Claims**

1. An abrasion resistant, coated and abrasion containing, pipe lining sheet having a thickness of not less than about 0.75 mm, a backing side with a relatively uneven surface, and being sufficiently flexible to be wound backing side inward around a mandrel in building a pipe or within a pre-existing pipe, said sheet including a backing, and a composite layer on said backing and consisting essentially if: (1) from about 30 to about 70% by volume of abrasive granules selected from the group consisting of the refractory metal borides, carbides, nitrides, oxides, and mixtures thereof, and (2) from about 70 to about 30% by volume of an at least partially cured organic resin binder, said composite layer being formed by a first binder coat on said backing and forming said smooth surface, a coating of said abrasive granules deposited on said first binder coat in a non-aligned orientation and compacted in said first binder coat under pressure, and a second binder coat covering said granules, merging with said first binder coat and forming said uneven surface, said granules having a minimum particle size of about 50 microns with most of said granules being somewhat larger, a maximum dimension of not more than about twice their minimum dimension and somewhat smaller than the thickness of said sheet, and such diverse size that all of the largest 50% by weight of said granules have at least 30% greater maximum dimension than all of the smallest 10% by weight thereof.

4,042,560

METHOD OF PREPARING HOMOGENEOUS THERMOSETTING POWDER PAINT COMPOSITIONS

Stephen Chung-Suen Peng, Rochester, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 389,844, Aug. 20, 1973, abandoned. This application Nov. 5, 1975, Ser. No. 629,161
Int. Cl.² C08J *3/14*
U.S. Cl. 260—42.28 **17 Claims**

1. A method of preparing a powder paint composition comprising:

A. passing a liquid paint composition comprising a solution of

1. a copolymer containing cross-linkable functional groups and having a glass transition temperature in the range of 40° C to 90° C and a number average molecular weight of between about 1000 and about 15,000;

2. pigment; and

3. inert solvent through an evaporating zone comprising a tortuous path of relatively narrow cross-section, elongated in a direction lateral to the direction of flow of said solution through said zone;

B. heating said solution while it is confined within said evaporating zone to a temperature

1. above the melting point of said copolymer, but below the point at which degradation occurs;

2. above the temperature at which said inert solvent begins to vaporize thus inducing turbulent flow of said solution within said evaporating zone and thereby maintaining an intimate homogeneous mixture of the vapors of the volatile components of said solution and dispersed particles of nonvolatile components of said solution;

C. passing said homogeneous mixture from said evaporating zone into a separating zone and, while maintaining the temperature within said separating zone above the melting point of said copolymer, causing said solvent vapor to be removed from said separating zone and allowing said non-volatile components to collect in a molten state;

D. removing said nonvolatile components from said separating zone;

E. cooling said nonvolatile components to form a solid material;

F. granulating said solid material to form uniformly pigmented particles;

G. blending a crosslinking agent for said copolymer with said particles;

H. mixing said blend at a temperature greater than the melting point of said particles and said crosslinking agent but below the point at which crosslinking occurs so as to form a molten mass having crosslinking agent uniformly dispersed therein;

I. cooling said molten mass to form a solid material; and

J. pulverizing said solid material to form a powder.

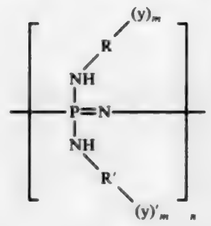
4,042,561

FLAME RETARDANT COMPOSITIONS CONTAINING POLYPHOSPHAZENES

Andrew H. DeEdwardo, Parsippany; Fred Zitomer, Livingston; Robert W. Stackman, Morristown, and Charles E. Kramer, Florham Park, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed May 20, 1976, Ser. No. 688,363
Int. Cl.² C08K *5/49*
U.S. Cl. 260—45.9 NP **25 Claims**

1. A flame retardant composition comprising a normally flammable organic material selected from the group consisting of polyester resins, polyamide resins, cellulosic resins, polyolefins and their substituted derivatives, vinyl aryl polymers, polycarbonate resins, polyurethane resins and mixtures of the foregoing, and a flame retardant amount of a polyphosphazene compound corresponding to the formula:



when *n* is at least 10, R and R′ may be the same or different and represent aryl groups, *y* and *y*′ may be the same or different and represent halogen and halogen substituted and unsubstituted alkyl, aryl, alkoxy, aryloxy groups, and $m = 0$ to 10, which compound exerts a flame retardant effect in the gas phase and the bulk phase.

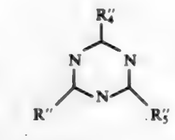
4,042,562

NITROGEN-CONTAINING AROMATIC HETEROCYCLIC COMPOUNDS AS ANTI-OXIDANTS

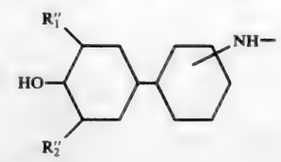
Kurt Hofer, Munchenstein, and Guenther Tscheulin, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 415,368, Nov. 13, 1973, abandoned. This application Oct. 6, 1975, Ser. No. 620,535
Claims priority, application Switzerland, Nov. 15, 1972, 16602/72
Int. Cl.² C08K *5/35*; C07D *413/14, 413/04*
U.S. Cl. 260—45.8 NT **6 Claims**

1. A compound of the formula



wherein R″ is a group of the formula



wherein R_1'' and R_2'' are each tert.butyl,

R_4'' is piperidino, morpholino or pyrrolidino, or has one of the significances of R″, and

R_5'' has one of the significances of R_4'',

with the proviso that the —NH— function of any group R″ is in a position ortho or para to the diphenyl bond.

5. A method of stabilizing a natural or synthetic polymeric material susceptible to oxidation which comprises treating said material with a compound of claim **1**, in sufficient amount to impart an anti-oxidant effect.

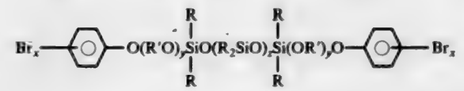
4,042,563

ENHANCING FLAME RETARDANCY WITH ARYLORGANOBROMOSILICONE COMPOUNDS

Terence J. Swihart, Essexville, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Sept. 22, 1976, Ser. No. 725,218
Int. Cl.² C08K *5/54*
U.S. Cl. 260—45.9 K **7 Claims**

1. A method for enhancing the flame-retardant characteristics of a substrate which comprises adding to said substrate about 0.1 to 5.0 percent by weight of an arylorganobromosilicone compound having the general formula



wherein

x has an average value of from 2 to 3,

R′ is selected from the group consisting of ethylene, propylene and butylene radicals,

y has a value from 1 to 10,

R is selected from the group consisting of hydrocarbon radicals containing from 1 to 18 carbon atoms, fluorinated hydrocarbon radicals containing from 1 to 18 carbon atoms, chlorinated hydrocarbon radicals containing from 1 to 18 carbon atoms and cyanohydrocarbon radicals containing from 1 to 18 carbon atoms, and

z has a value of from 0 to 25.

4,042,564

METHOD FOR PREPARING POLYPHENYLENE ETHERS

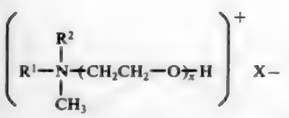
James Gordy Bennett, Jr., and Glenn Dale Cooper, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 11, 1975, Ser. No. 631,191
Int. Cl.² C08G *65/44*
U.S. Cl. 260—47 ET **16 Claims**

1. In a process for the preparation of a high-molecular weight polyphenylene ether having a degree of polymerization

of at least 50 by oxidatively coupling a monovalent phenol having substitution in at least the two ortho positions and hydrogen or halogen in the para-position, using an oxygen-containing gas, a solvent and a complex catalyst comprising a metal salt and an amine as an oxidizing agent, the improvement which comprises adding to the reaction mixture from 0.001 to 0.2 percent by weight of reaction mixture a compound of the formula:

(I)



wherein R^1 and R^2 may both be alkyl of from 6–22 carbon atoms or alkenyl of from 10–22 carbon atoms or one of R^1 and R^2 may be $-(CH_2CH_2\text{-}o\text{-})_xH$; x is an integer of from 1 to 40.

4,042,565

STRETCHED TUBULAR FILM OF POLYETHYLENE TEREPHTHALATE

Klaus Hoheisel, Wiesbaden, and Siegfried Janocha, Wiesbaden-Biebrich, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Dec. 18, 1975, Ser. No. 641,912
Claims priority, application Germany, Dec. 20, 1974, 2460395
Int. Cl.² C08G *63/66, 63/16*
U.S. Cl. 260—47 C **5 Claims**

1. An oriented, shrinkable, tubular film of polyethylene terephthalate which has a lower initial point of shrinkage, a shrinkage of more than 5 percent at 80° C, and improved weldability, in which part of the ethylene glycol component is replaced by about 0.5 to 10 mole percent of bis-phenol-A-bis-(2-hydroxyethyl)-ether.

4,042,566

POLYETHYLENIC POLYETHERS AND SOLVENT SOLUBLE COPOLYMERS THEREOF

Edward J. Murphy, Hoffman Estates, Ill., assignor to DeSoto, Inc., Des Plaines, Ill.

Filed June 11, 1976, Ser. No. 695,186
Int. Cl.² C07C *33/06;* C08F *16/00*
U.S. Cl. 260—47 EP **13 Claims**

1. A method of producing a polyethylenically unsaturated polyether comprising reacting a polyepoxide having a plurality of epoxy groups with about one mole of a bisphenol per epoxy equivalent in said polyepoxide to consume the epoxy functionality by reaction with the phenolic OH group in said bisphenol and provide an intermediate carrying phenolic OH terminal groups, and then reacting phenolic OH terminal groups in said intermediate with the epoxy group in a molar excess of an ethylenically unsaturated monoepoxide to provide a polyethylenic polyether.

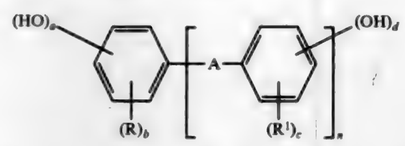
4,042,567

S-TRIAZINE PREPOLYMERS AND A PROCESS FOR THEIR PRODUCTION

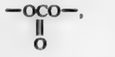
Rudolf Sundermann, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Nov. 28, 1975, Ser. No. 635,589
Claims priority, application Germany, Dec. 4, 1974, 2457154
Int. Cl.² C08G *65/40*
U.S. Cl. 260—49 **5 Claims**

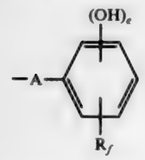
1. A process for producing an s-triazine prepolymer which comprises condensing an aromatic polyhydroxy compound with 0.01 to less than ½ mol of a 4,6-dichloro-s-triazine per hydroxy group of said polyhydroxy compound and subsequently reacting the product of said condensation with a halogen cyanide in the presence of a base, the molar ratio of hydroxy groups to cyanogen halide to base being about 1:1:1, said condensation being carried out in the melt at a temperature of 100° to 250° C. or in solution or suspension in the presence of about 1 mol of base per mol of hydrogen chloride to be eliminated at a temperature of from about 0° to 150° C., said reaction of said condensation product with cyanogen halide in the presence of a base being carried out at a temperature of from −40° to 65° C., each of said bases being selected from the group consisting of tertiary amines, alkali metal hydroxides, alkali metal carbonates and alkali metal alcoholates, said polyhydroxy compound being of the formula



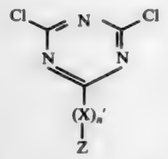
wherein a is 1, 2 or 3, b is 5 - a; c is 5 - d; d is 1, 2 or 3 with the proviso that $a + d$ is from 2 to 4 if n is 0 and is 2 to 6 if n is 1; n is 0, 1, 2 or 3; R is hydrogen, halogen, alkyl or phenyl; A is —O—, —SO_2—, —CO—,



a CH_2 chain having up to 6 carbon atoms, a CH_2 chain having up to 6 carbon atoms substituted by lower alkyl, a CH_2 chain having up to 6 carbon atoms substituted by phenyl, a divalent cycloaliphatic or aromatic 5- or 6-membered ring or a single bond and R^1 is the same as R or



wherein A and R are as defined above, e is 1, 2 or 3 and f is 5-e and said 4,6-dichloro-s-triazine is of the formula



wherein n' is 0 or 1; Z is hydrogen, alkyl or aryl; X is —O—, —S—, —NH— or —NZ'— and Z and Z' are alkyl, cycloalkyl or aryl.

4,042,568

PHOTODEGRADABLE POLYAMIDE COMPOSITIONS

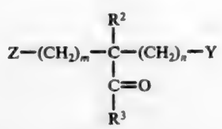
James Edwin Guillet, 31 Sagebrush Lane, Don Mills, Ontario, and Dan Ervin, 376 Brunswick Avenue, Apartment 502, Toronto 4, Ontario, both of Canada

Division of Ser. No. 245,176, April 18, 1972, Pat. No. 3,878,169, which is a continuation-in-part of Ser. No. 135,426, April 19, 1971, abandoned. This application Mar. 3, 1975, Ser. No. 554,451
Claims priority, application United Kingdom, Apr. 27, 1970, 20102/70; July 15, 1970, 34238/70
Int. Cl.² C08G *16/00*
U.S. Cl. 260—65 **9 Claims**

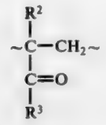
1. A condensation copolymer obtained by reacting together

at least one diamine of general formula $H_2N - R - NH_2$ wherein R is a divalent hydrocarbon radical selected from the group consisting of aliphatic, alicyclic, aromatic and araliphatic, at least one dibasic acid of formula HOOC — R^1 — COOH or a functional derivative thereof, said functional derivative being selected from the group consisting of acid halides, ester and salts which react in the same manner as acids, where R^1 is a divalent hydrocarbon radical selected from the group consisting of aliphatic, alicyclic, aromatic and araliphatic, and a monomer of formula A:

(A)



where m is an integer from 0 – 6, n is an integer from 1 – 6, R^2 is hydrogen or an alkyl group of 1 – 6 carbon atoms, R^3 is an alkyl, aryl, alkaryl, or alkenyl group of 1 – 12 carbon atoms, and Y and Z are independently selected from the group consisting of — NH_2, — COOH and functional derivatives thereof, said functional derivative being selected from the group consisting of acid halides, esters and salts which react in the same manner as acids, the monomer of formula A providing a unit of structure



in the backbone of the copolymer, the number of said units in the backbone chain being sufficient to provide from about 0.01 wt. % to about 3 wt. % of ketone carbonyl based upon the total copolymer.

4,042,569

HEAT-SETTING PROCESS FOR POLYESTER FILM

Robert Glenn Bell, Florence, S.C.; Emile Gillyns, Sandweiler, Luxembourg, and Olin Kilpatrick McDaniel, Jr., Florence, S.C., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 494,981, Aug. 5, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,492
Int. Cl.² C08G *63/12;* B29D *7/24*
U.S. Cl. 260—75 T **2 Claims**



1. In a process for production of an asymmetrically oriented, heat-set polyethylene terephthalale film, oriented more in the machine direction than in the transverse direction, the film having a machine direction tensile strength at 5% elongation (F5) of at least 20,000 psi (14.1 kg/mm²) and a machine direction shrinkage of not more than 2% at 105° C., by stretching the film in the transverse direction and in the machine direction, heat setting the biaxially oriented film in successive stages by contacting it in a first stage with a heat set roll at 150° to 210° C. and in a second stage with a roll at least 5° C. below the temperature of the first stage heat setting roll, but above the second order transition temperature, and thereafter contacting the film with a roll to quench it to below the second order transition temperature, the improvement comprising:

relaxing the film in the machine direction up to 2% between the first and second stage heat setting;

heat setting the film in a third stage following quenching by contacting it with a heat setting roll at the same temperature to 5° C. below the temperature of the second stage heat setting roll; then

quenching the film to less than 40° C. after the third stage heat setting by contacting with a second quench roll; and

relaxing the film in the machine direction from 0.5 to 6.5% between the third heat set roll and the second quench roll;

whereby a film having less than 0.7% shrinkage at 105° C. in the transverse direction and a reduced tear tendency is produced without significant loss of machine direction tensile strength at 5% elongation (F5) or increase in machine direction shrinkage.

4,042,570

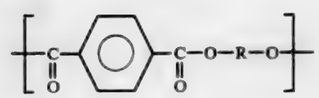
TEREPHTHALIC ACID COPOLYESTERS WHICH CAN BE DYED IN THE ABSENCE OF CARRIERS

Claus-Rüdiger Bernert, Bomlitz, Cordingen; Eduard Radlmann, and Günther Nischk, both of Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 26, 1975, Ser. No. 607,945
Claims priority, application Germany, Aug. 30, 1974, 2441537
Int. Cl.² C08G *63/18*
U.S. Cl. 260—75 M **7 Claims**

1. A high molecular weight linear terephthalic acid copolyester, which comprises recurring structural elements corresponding to the general formula (I):

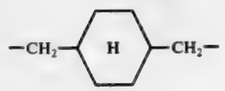
(I)



in which

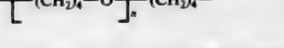
R, in a proportion of from 95 to 99.99 mol %, represents a radical corresponding to the formula:

(II)



and R, in a proportion of from 0.01 to 5 mol %, represents a radical corresponding to the formula:

(III)



in which n is an integer from 5 to 70, the terephthalic acid copolyester having a relative solution viscosity $\eta_{rel.}$ of from 1.1 to 4.0 (as measured on a solution of 1.0 g of copolyester in 100 ml of o-chlorophenol at 25° C).

4,042,571

FIRE-RETARDANT POLYAMIDES FROM NAPHTHALENE DICARBOXYLIC REACTANT AND HALOGENATED CARBOXYLIC REACTANT

Shoji Kawase; Takeo Shima, and Keiichi Moriyama, all of Iwakuni, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Aug. 7, 1974, Ser. No. 495,417
Claims priority, application Japan, Aug. 10, 1973, 48-89205; Aug. 27, 1973, 48-95115; July 18, 1974, 49-81677
Int. Cl.² C08G *69/26*
U.S. Cl. 260—78 R **10 Claims**

1. A film- or fiber-forming fire retardant polyamide consist-

ing essentially of the polymeric condensation product of (A) a carboxylic acid component consisting essentially of (1) at least one naphthalene dicarboxylic acid selected from the group consisting of naphthalene-2,7-dicarboxylic acid, naphthalene-2,6-dicarboxylic acid and its amide-forming derivative, and (2) at least one halogen-substituted dicarboxylic acid selected from the group consisting of a, halogen-substituted aliphatic di-carboxylic acid, halogen-substituted alicyclic dicarboxylic acid, and halogen-substituted carbocyclic aromatic dicarboxylic acid or their amide-forming derivatives these acids and derivatives being such that at least one hydrogen atom attached to a carbon atom in the dicarboxylic acid molecule is substituted by halogen atom and (B) an aliphatic diamine having 2 to 18 carbon atoms, the amount of said naphthalene dicarboxylic acid (1) being at least 70 mol% of the total acid component (A), and the amount of said halogen-substituted carboxylic acid being such that the halogen atom content of the polyamide is 1.0 to 10% by weight of the polyamide.

4,042,572

PREPARATION OF POLYAMIDES BY ANIONIC POLYMERIZATION WITH SUBSTITUTED TRIAZINE TRIONES AS COCATALYST

Zbynek Bukac, and Jan Sebenda, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

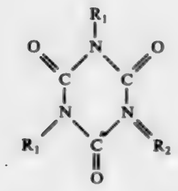
Continuation-in-part of Ser. No. 275,156, July 26, 1972, abandoned. This application Nov. 17, 1975, Ser. No. 632,210

Claims priority, application Czechoslovakia, July 27, 1971, 5479/71; July 27, 1971, 5480/71

Int. Cl.[2] C08G *69/18*

U.S. Cl. 260—78 L **9 Claims**

1. Method of preparing a solid polyamide by anionic polymerization of at least one cyclic lactam containing from 6 to 12 carbon atoms in the lactam ring comprising the steps of dissolving in a lactam a catalyst comprising 0.3–1.0 mol % of an alkali metal hydride or alkali metal salt of a lactam and 0.1–0.49 mol % of at least one cyclic co-catalyst and having the formula



wherein R_1 and R_2 are each an aryl group having 1 or 2 benzene rings, an alkoxyaryl, dialkylaminoaryl, alkylated aryl or arylated alkyl, and heating at 40°–175° C. for from 0.5 to 24 hours.

4,042,573

SULFONIC ACID DERIVATIVES AS PROMOTERS FOR THE POLYMERIZATION OF 2-PYRROLIDONE

Robert Bacskai, Kensington, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 25, 1975, Ser. No. 607,843

Int. Cl.[2] C08G *69/24*

U.S. Cl. 260—78 P **5 Claims**

1. A process for polymerizing 2-pyrrolidone to fiber-forming polypyrrolidone which comprises forming a mixture of 2-pyrrolidone, an alkaline polymerization catalyst, carbon dioxide polymerization activator, and trifluoromethane sulfonic acid anhydride polymerization promoter, and subjecting said mixture to a temperature of about 15°–100° C under substantially anhydrous conditions.

4,042,574

PURIFICATION OF TUBERCULOPROTEINS

Jacques Augier, and Solange Augier-Gibory, both of Paris, France, assignors to Institut Pasteur, Paris, France

Filed May 28, 1974, Ser. No. 473,475

Claims priority, application France, May 28, 1973, 73.19351

Int. Cl.[2] C07G *7/00*

U.S. Cl. 260—112 R **9 Claims**

1. A method of purification of tuberculoprotein C in which tuberculoprotein C is prepared by a precipitation of tuberculoproteins carried out in an acid medium in the presence of substances which break the hydrogen bonds, the formed precipitate is removed, the supernatant liquid is precipitated by acetone and then redissolved, filtration is carried out through a column of cellulose modified by chemical groups which introduce weakly basic functions and a tuberculoprotein C is precipitated by addition of trichloroacetic acid, wherein the improvements comprises purifying said tuberculoprotein C by subjecting an aqueous solution thereof in a neutral medium to the action of an ionized mineral or organic substance which does not affect the tuberculoprotein C or the solubility thereof to produce (1) a closely aggregated tuberculoprotein fraction and (2) a loosely and nonaggregated tuberculoprotein fraction; separating said two fractions from one another and recovering said second loosely and non-aggregated fraction.

4,042,575

EXTRACTION OF GLYCOPROTEINS AND SIALIC ACID FROM WHEY

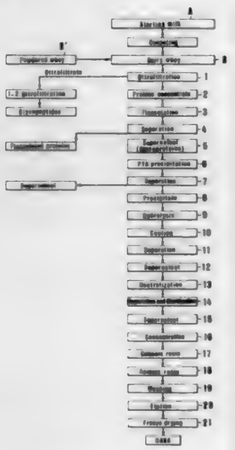
Jean-Marie Eustache, Martinvast, France, assignor to Union Cooperative Agricole Laitiere de la Manche, Sottevast, Brix, France

Filed Oct. 20, 1975, Ser. No. 624,305

Claims priority, application France, Oct. 22, 1974, 74.35495

Int. Cl.[2] A23J *1/20;* B01D *13/00;* C07G *7/00*

U.S. Cl. 260—112 R **34 Claims**



1. A method for the treatment of dairy or casein factory whey comprising the steps of:

a. ultrafiltering the whey through membranes having a cut-off of about 10,000 to about 50,000 in molecular weight, providing an ultrafiltrate comprising lactose, mineral salts and glycopeptides, and a retentate comprising proteins and sialic acid;

b. flocculating the proteins of said retentate providing a first protein precipitate and a first supernatent, which is separated and recovered;

c. treating the first supernatent with phosphotungstic acid under conditions capable of forming a second supernatent and a second protein precipitate, which is separated and recovered;

d. hydrolyzing the second precipitate, providing a third precipitate and a third supernatent, which is separated and recovered;

e. extracting sialic acid from said third supernatent.

4,042,576

EXTRACTION OF GLYCOPROTEINS AND SIALIC ACID FROM WHEY

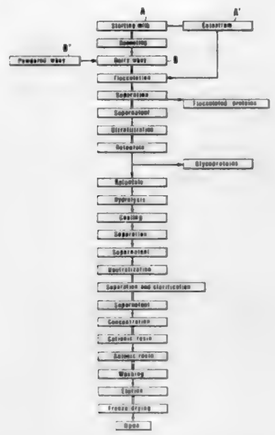
Jean-Marie Eustache, Sideville, Martinvast, France, assignor to Union Cooperative Agricole Laitiere de la Manche, Sottevast, Brix, France

Filed Oct. 20, 1975, Ser. No. 624,306

Claims priority, application France, Oct. 22, 1974, 74.35496

Int. Cl.[2] A23J *1/20;* B01D *13/00;* C07G *7/00*

U.S. Cl. 260—112 R **28 Claims**



1. A process for separating glycoproteins and/or sialic acid from whey comprising the steps of:

a. flocculating the whey proteins, other than the sialoglycoproteins, providing a first precipitate of flocculated proteins and a first supernatent, which is separated and recovered;

b. ultrafiltrating the first supernatent on membranes having a cut-off of between about 1000 and about 15,000 in molecular weight, providing a retentate containing glycoproteins and sialic acid;

c. hydrolyzing said retentate;

d. treating said hydrolysate to extract the sialic acid therefrom.

4,042,577

AZO DYES HAVING ONE OR TWO TRIAZINYL-OR PYRIMIDYL-ACETIC ACID ESTER OR AMIDE COUPLING COMPONENT RADICALS

Bansi Lal Kaul, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

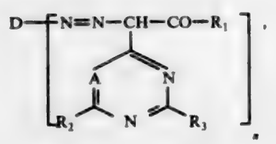
Filed Sept. 30, 1974, Ser. No. 510,476

Claims priority, application Switzerland, Oct. 5, 1973, 14255/73

Int. Cl.[2] C09B *29/36, 35/18;* D06P *1/04*

U.S. Cl. 260—153 **29 Claims**

1. A compounds of the formula



wherein

D is phenyl, substituted phenyl, naphthyl, substituted naphthyl, quinolyl, substituted quinolyl, benzimidazolonyl, substituted benzimidazolonyl, quinoxalyl, substituted quinoxalyl, anthraquinonyl or substituted anthraquinonyl when n is 1, wherein any substituted phenyl, substituted naphthyl, substituted quinolyl, substituted benzimidazolonyl, substituted quinoxalyl or substituted anthraquinonyl has 1 to 3 substituents each of which is independently fluoro, chloro, bromo, C_{1-8}alkyl, C_{1-8}alkoxy, cyano, nitro, (C_{1-8}alkoxy)carbonyl, C_{1-8}alkylsulfonyl, trifluoromethyl, carbamoyl, sulfamoyl, (C_{1-8}alkyl)carbamoyl, C_{1-8}alkylsulfamoyl, di-(C_{1-8}alkyl)carbamoyl, di-(C_{1-8}alkyl)sulfamoyl, phenylcarbamoyl, (monosubstituted phenyl)carbamoyl, guanidinosulfonyl, benzamido, (monosubstituted phenyl)-carbonylamino, phenylazo, monosubstituted phenylazo, phenoxycarbonyl or monosubstituted phenoxycarbonyl, wherein the substitutent of any (monosubstituted phenyl)-carbomoyl, (monosubstituted phenyl)carbonylamino, monosubstituted phenylazo or monosubstituted phenoxycarbonyl is chloro, bromo, C_{1-8}alkyl, trifluoromethyl, cyano, nitro, carbamoyl, (C_{1-8}-alkoxy)carbonyl or (C_{1-8}alkyl)carbamoyl, with the proviso that the maximum number of each substituent selected from the group consisting of cyano, nitro, (C_{1-8}alkoxy)carbonyl and C_{1-8}-alkylsulphonyl is two and the maximum number of each substituent selected from the group consisting of trifluoromethyl, carbamoyl, sulfamoyl, (C_{1-8}alkyl)carbamoyl, C_{1-8}alkylsulfamoyl, di-(C_{1-8}alkyl)carbamoyl, di-(C_{1-8}alkyl)-sulfamoyl, phenylcarbamoyl, (monosubstituted phenyl)-carbamoyl, guanidinosulfonyl, benzamido, (monosubstituted phenyl)carbonylamino, phenylazo, monosubstituted phenylazo, phenoxycarbonyl and monosubstituted phenoxycarbonyl is one, or

D is 4,4′-diphenylene substituted by 1–4 substituents each of which is independently chloro, bromo, nitro, cyano, methyl or C_{1-8}alkoxy when n is 2,

R_1 is $—NH_2$, $—NHR_4$ or $—OR_4$,

wherein R_4 is C_{1-8}alkyl, C_{5-8}-cycloalkyl, phenyl, substituted phenyl, naphthyl, substituted naphthyl, phthalimidyl, substituted phthalimidyl, phthalazinyl, substituted phthalizinyl, quinazolonyl, substituted quinazolonyl, quinoxalinyl, substituted quinoxalinyl, quinoxaline-2,3substituted quinoxaline-2,3-dion-yl, benzimidazolonyl, substituted benzimidazolonyl, pyridyl, substituted pyridyl, thienyl, substituted thienyl, 2-thiazolyl or substituted 2-thiazolyl,

wherein any substituted phenyl, substituted naphthyl, substituted phthalimidyl, substituted phthalizinyl, substituted quinaolonyl, substituted quinoxalinyl, substituted quinoxaline-2,3-dion-yl, substituted benzimidazolonyl, substituted pyridyl, substituted thienyl or substituted 2-thiazolyl has 1–3 substituents each of which is independently chloro, bromo, C_{1-8}alkyl, C_{1-8}alkoxy, trifluoromethyl, guanidinosulfonyl, nitro, cyano, $—CO—NH—R_5$ or $—SO_2—NH—R_5$,

with the proviso that the maximum number of each substituent selected from the group consisting of chloro, bromo, C_{1-8}alkyl and C_{1-8}alkoxy is two and the maximum number of each substituent selected from the group consisting of trifluoromethyl, guanidinosulfonyl, nitro, cyano, $—CO—NH—R_5$ and $—SO_2NH—R_5$ is one,

wherein R_5 is C_{1-8}alkyl, C_{5-8}cycloalkyl, phenyl, substituted phenyl, naphthyl or substituted naphthyl, wherein any substituted phenyl or substituted naphthyl has 1–3 substituents each of which is independently halo, C_{1-4}-alkyl, C_{1-8}alkoxy, trifluoromethyl, nitro, cyano, phenylcarbamoyl or phenylsulfamoyl, with the proviso that the maximum number of each substituent selected from the group consisting of halo, C_{1-8}alkyl and C_{1-8}alkoxy is two and the maximum number of each substituent selected

from the group consisting of trifluoromethyl, nitro, cyano, phenylcarbamoyl, and phenylsulfamoyl is one,
each of R_2 and R_3 is independently hydrogen, hydroxy, C_{1-8}alkoxy, amino, C_{5-8}cycloalkylamino, C_{1-8}alkylamino, di-(C_{1-8}alkyl)amino, phenylamino, naphthylamino or N-phenyl-N-C_{1-8}alkylamino,
A is N or R_6—C,
wherein R_6 is hydrogen, halo or C_{1-8}-alkyl, and
n is 1 or 2,
wherein each halo is independently fluoro, chloro or bromo.

4,042,578

AZO DYES HAVING 2,6-DIAMINOPYRIDINE DERIVATIVES AS COUPLING COMPONENTS

Johannes Dehnert, and Gunther Lamm, both of Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Mar. 7, 1973, Ser. No. 338,859

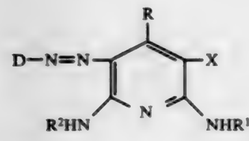
Claims priority, application Germany, Mar. 10, 1972, 2211663; June 2, 1972, 2226933; Oct. 21, 1972, 2251702; Dec. 2, 1972, 2259103; Dec. 1, 1972, 2258823; Dec. 6, 1972, 2259684

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

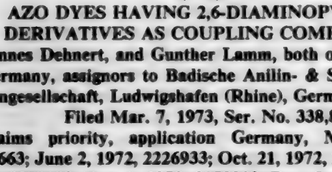
Int. Cl.[2] C09B *29/36*

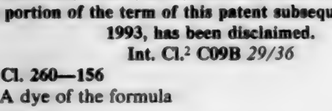
U.S. Cl. 260—156 **8 Claims**

1. A dye of the formula



wherein:
D is phenyl substituted by chlorine, bromine, trifluoromethyl, methyl, methoxy, nitro, cyano, methylsulfonyl, phenylsulfonyl, carbalkoxy of a total of 2 to 5 carbon atoms, carbo-β-alkoxy-ethoxy, said alkoxy having 1 to 4 carbon atoms, or N,N-dialkyl- or N-monoalkyl-substituted sulfamoyl, each alkyl having 1 to 4 carbon atoms; phenylazophenyl; phenylazophenyl substituted by methyl, chlorine, bromine or nitro; benzthiazolyl; benzthiazolyl substituted by nitro, cyano, methylsulfonyl or ethylsulfonyl; benzisothiazolyl substituted by chlorine, bromine, cyano or nitro; thiazolyl substituted by cyano or nitro; thienyl substituted by methyl, cyano, nitro or carbalkoxy of a total of 2 to 5 carbon atoms; or thiadiazolyl substituted by phenyl, methyl, chlorine, bromine, methylmercapto, ethylmercapto or alkoxycarbonylethylmercapto, said alkoxy having 1 to 4 carbon atoms;
R is alkyl of 1 to 3 carbon atoms;
X is carbamoyl or cyano;
R^1 and
R^2 may be the same or different with the proviso that one of R^1 and R^2 is C_6H_5;





4,042,583

IMIDAZO[2,1-B]THIAZOLE AND THIAZOLO[3,2-a]-BENZIMIDAZOLE QUATERNARY SALTS AS HYPOGLYCEMIC AGENTS AND GROWTH PROMOTANTS

Richard M. Acheson, Oxford; John K. Stubbs, Deal; Charles A. R. Baxter, Sandwich, all of England, and Donald E. Kuhla, Gales Ferry, Conn., assignors to Pfizer Inc., New York, N.Y.

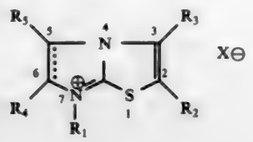
Division of Ser. No. 594,109, July 8, 1975, Pat. No. 4,008,245, which is a division of Ser. No. 507,384, Sept. 19, 1974, Pat. No. 3,954,784. This application June 9, 1976, Ser. No. 694,247

Claims priority, application United Kingdom, Sept. 20, 1973, 44199/73

Int. Cl.[2] C07D *513/04*

U.S. Cl. 542—458 **2 Claims**

1. A compound of the formula



wherein

X is a pharmaceutically acceptable anion;

R_1 is styryl;

R_2 is selected from the group consisting of hydrogen and alkyl having from 1 to 3 carbon atoms;

R_3 is selected from the group consisting of hydrogen, alkyl having from 1 to 3 carbon atoms, adamantyl, phenyl and substituted phenyl wherein said substitutent is selected from the group consisting of dimethyl and dimethoxy;

R_2 and R_3 when taken together are tetramethylene;

R_4 is selected from the group consisting of hydrogen, alkyl having from 1 to 3 carbon atoms, phenyl, dimethylphenyl, and chlorophenyl and

R_5 is hydrogen.

4,042,584

ETHYNYLARYL PHENYL CYCLOPROPYL THIAZINES AND MORPHOLINES

David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

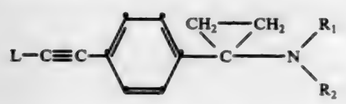
Division of Ser. No. 498,829, Aug. 19, 1974, Pat. No. 3,903,165. This application Apr. 8, 1975, Ser. No. 566,584

Int. Cl.[2] C07D *295/02*

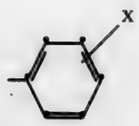
U.S. Cl. 544—59 **6 Claims**

1. A compound selected from the group consisting of

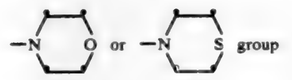
a. a substituted cyclopropylamine having the formula



wherein L is selected from the group consisting of phenyl and



wherein X is Cl, Br, I, F, $-CF_3$, $-C_1$-C_4alkyl, $-C_1$-C_4 alkoxy or phenyl and R_1 and R_2 are joined forming a



and

b. a non-toxic, pharmaceutically acceptable salt of (a).

4,042,585

PROCESS FOR PREPARATION OF 3-HALOMETHYLCEPHEMS

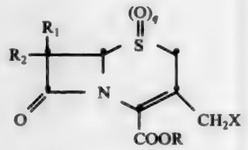
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 22, 1976, Ser. No. 669,365

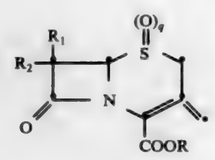
Int. Cl.[2] C07D *501/04*; A61K *31/545*

U.S. Cl. 544—22 **31 Claims**

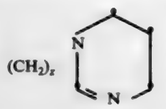
1. A process for preparing a 3-halomethylcephem compound of the formula



which comprises reacting a 3-methylenecepham of the formula



with from about 3 to about 6 equivalents of an alkali metal salt of a secondary C_1-C_7 alcohol or with from about 1 to about 3 equivalents of an alkali metal salt of a primary or tertiary C_1-C_7 alcohol or a bicyclic amidine base of the formula



in the presence of about 1 to about 6 equivalents of a positive halogenating agent selected from the group consisting of tert-butyl hypochlorite, bromine, tert-butyl hypobromite, idoine monobromide, 1,5-diazabicyclo[5.4.0]undec-5-ene (DBU) hydrobromide perbromide, iodine, iodine monochloride, tert-butyl hypoiodite and perchloryl fluoride in an inert organic solvent at a temperature of about −80° to about 20° C. wherein in the above formulae

X is fluoro, chloro, bromo or iodo;

z is 3, 4, or 5;

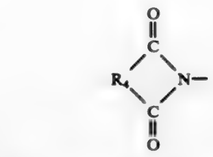
q is 1 or 0;

R is a carboxylic acid protecting group;

R_1 is hydrogen or methoxy;

R_2 is

1. an imido group of the formula



wherein R_4 is C_2-C_4 alkenylene, 1,2-phenylene, or 1,2-cyclohexenylene;

2. an amido group of the formula



wherein R_3 is

a. hydrogen, C_1-C_3 alkyl, halomethyl, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl or 4-protected amino-4-protected carboxybutyl;

b. benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, or 4-methoxybenzyloxy;

c. the group —R″ wherein R″ is 1,4-cyclohexadienyl, phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of halo, protected hydroxy, nitro, cyano, trifluoromethyl, C_1-C_3 alkyl, and C_1-C_7 alkoxy;

d. an arylalkyl group of the formula

$$R''-(O)_m-CH_2-$$

wherein R″ is as defined above, and *m* is 0 or 1;

e. a substituted arylalkyl group of the formula



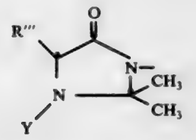
wherein R‴ is R″ as defined above, 2-thienyl or 3-thienyl, and W is protected hydroxy or protected amino; or

f. a heteroarylmethyl group of the formula

$$R''''-CH_2-$$

wherein R‴‴ is 2-thienyl, 3-thienyl, 2-furyl, 2-thiazolyl, 5-tetrazolyl, 1-tetrazolyl; or R_2 is

3. an imidazolidinyl group of the formula



wherein R‴ is as defined above and Y is acetyl or nitroso; with the limitations that when a C_1-C_7 primary alkoxide base is employed in conjunction with tert-butyl hypochlorite, R_1 is methoxy; and when a brominating agent is employed and R‴ or R‴‴ is 2-thienyl, 3-thienyl or 2-furyl, additionally, a halogen quenching agent is added to the reaction mixture.

4,042,586

2-(3-SUBSTITUTED AMINO-2-HYDROXYPROPOXY)-3-SUBSTITUTED PYRAZINES

Burton Kendall Wasson, Valois, Canada, and Leonard M. Weinstock, Belle Mead, N.J., assignors to Merck Sharp & Dohme (I.A.) Corporation, Rahway, N.J.

Division of Ser. No. 408,032, Oct. 19, 1973, Pat. No. 3,946,009, which is a continuation-in-part of Ser. No. 341,421, March 15, 1973, abandoned. This application June 6, 1975, Ser. No. 584,439

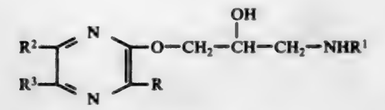
Claims priority, application Canada, May 5, 1972, 141471

Int. Cl.[2] C07D *417/04*

U.S. Cl. 544—60 **9 Claims**

1. A pyrazine compound having the structure

I



or a pharmacologically acceptable salt thereof wherein R represents morpholino or thiomorpholino;

R^1 represents a straight or branched chain C_{3-6} alkyl, a straight or branched chain hydroxy substituted C_{3-6}alkyl, a straight or branched chain C_{3-6}alkinyl, phenyl-C_{1-6}alkyl or iodolyl-C_{1-6}alkyl;

R^2 and R^3 can represent the same or different substituents and represent hydrogen, C_{1-3}alkyl, C_{5-7}-cycloalkyl, C_{1-3}alkoxy, phenoxy, phenyl, substituted phenyl wherein the substituent is C_{1-3}alkyl, C_{1-3}alkoxy, amino, acetylamino, nitro or halo; or morpholino or thiomorpholino.

4,042,587

1,2,4-DIHYDROTRIAZINE-4-OXIDES AND A PROCESS FOR THEIR PRODUCTION

Hans-Martin Weitz, Bad Durkheim; Rolf Fischer, Heidelberg, and Dieter Lenke, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed June 1, 1976, Ser. No. 691,225

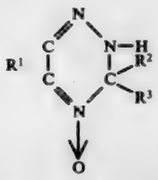
Claims priority, application Germany, June 20, 1975, 2527490

Int. Cl.[2] C07D *253/08*

U.S. Cl. 544—183 **7 Claims**

1. 1,2,4-Dihydrotriazine-4-oxides of the formula

I,



wherein R^1 is an alkylene of 2 to 10 carbon atoms, R^2 and R^3 are identical or different and each is alkyl of 1 to 8 carbon atoms cycloalkyl of 5 to 8 carbon atoms, aralkyl of 7 to 12 carbon atoms or phenyl or R^2 and R^3 together with the adjacent carbon are members of a 5-membered to 13 membered alicyclic ring.

4,042,588

MANUFACTURE OF 1,2,4-DIHYDROTRIAZINE-4-OXIDE-SPIRO-(3,1')-[OXIMINO-(2')-CYCLOALKANES]

Hans-Martin Weitz, Bad Duerkheim; Rolf Fischer, Heidelberg, and Dieter Lenke, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

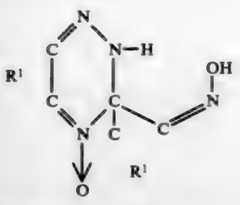
Filed June 1, 1976, Ser. No. 691,226

Claims priority, application Germany, June 25, 1975, 2528285

Int. Cl.[2] C07D *253/08*

U.S. Cl. 544—183 **7 Claims**

1. 1,2,4-Dihydrotriazine-4-oxide-spiro-(3,1')-[oximino-(2')-cycloalkanes] of the formula



I,

where R^1 is an alkylene of 2 to 10 carbon atoms.

4,042,589

PTERIDINE COMPOUNDS

Hamish Christopher Swan Wood, Bearsden, Scotland, and Kyuji Ohta, Tokyo, Japan, assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

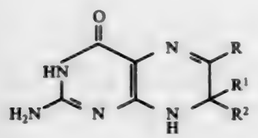
Division of Ser. No. 383,699, July 30, 1973, Pat. No. 3,933,820. This application Oct. 14, 1975, Ser. No. 621,661

Claims priority, application United Kingdom, Aug. 1, 1972, 35816/72; Feb. 1, 1973, 5190/73

Int. Cl.[2] C07D *475/04*

U.S. Cl. 260—251.5 **16 Claims**

1. A compound of formula (I), or a tautomeric form thereof,



(I)

wherein R is a phenoxyloweralkyl group or phenoxyloweralkyl which is substituted by one or more loweralkoxy, loweralkyl, amino, hydroxyl or halogen and R^1 and R^2 are the same or different and each is a lower alkyl group or R^1 and R^2, together with the carbon atom in the pteridine ring structure, form a spriocycloalkyl ring system having 4 to 6 carbon atoms outside the pteridine ring structure.

4,042,590

DIAMINOPROPANOLS

Robert R. Jacquier, Montpellier, France, assignor to Centre d'Etudes Pour l'Industrie Pharmaceutique, Toulouse, France

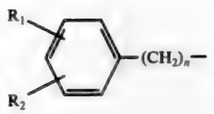
Continuation-in-part of Ser. No. 490,495, July 22, 1974, Pat. No. 3,957,789. This application Jan. 19, 1976, Ser. No. 650,194

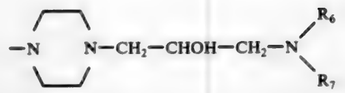
Claims priority, application France, July 24, 1973, 73.27016

Int. Cl.[2] C07D *295/08, 401/12, 403/12*

U.S. Cl. 260—268 R **7 Claims**

1. A compound of the formula:





wherein R_1 and R_2 are hydrogen, fluorine, chlorine, methyl, methoxy, trifluoromethyl or, where taken together, represent a methylenedioxy group, and



represents piperidino or azepino, N is zero or one, or the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

4,042,591

NAPHTHOQUINONE COMPOUNDS

Bansi Lal Kaul, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

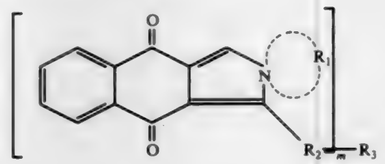
Filed May 23, 1974, Ser. No. 472,853

Claims priority, application Switzerland, May 30, 1973, 7813/73; June 15, 1973, 8715/73

Int. Cl.[2] C07D *471/04*

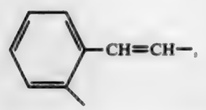
U.S. Cl. 260—272 **48 Claims**

1. A compound of formula I,



in which

R_1 is a group —CH=CH—CH=CH— or

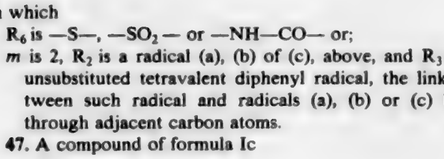


which group is unsubstituted or substituted by up to two substituents selected from chlorine bromine, methyl and C_{1-4}alkoxy or by one substituent selected from aminocarbonyl, C_{1-4}alkylaminocarbonyl, phenylaminocarbonyl, carboxyl, C_{1-4}alkoxycarbonyl and phenoxycarbonyl, either *m* is 1 and R_2 and R_3, together are cyano; 2- or 4-pyridyl; 2-quinolyl; 2,4-dihydroxy-1,3,5-triazinyl; phenyl, unsubstituted or substituted by up to two substituents selected from chlorine, bromine, methyl, C_{1-4}alkoxy, nitro and cyano; or —CO—R_5, where

R_5 is hydroxy, methyl, C_{1-4}alkoxy, phenyl or phenoxy, which phenyl or phenoxy is unsubstituted or substituted by up to two substituents selected from chlorine, bromine, methyl, nitro and cyano, provided that only one cyano is borne thereby, or

m is 1, R_2 is —CO—NR_4—, in which R_4 is hydrogen or C_{1-4}alkyl, and R_3 is hydrogen; C_{1-4}alkyl; carbazolyl; thiazole anthronyl; anthraquinonyl which is unsubstituted or substituted by up to two substituents selected from chlorine, bromine, methyl, C_{1-4}alkoxy, amino, hydroxy, phenylamino, phenylmercapto, nitro, benzoylamino, mono- or dichloro- benzoylamino, mono- or dibromobenzoylamino and nitrobenzoylamino; pyridyl; naphthyl; benzimidazolonyl; phenyl, unsubstituted or substituted by up to three substituents selected from up to three substituents selected from chlorine and bromine, up to two substituents selected from nitro, methyl and C_{1-4} alkoxy and one substituent selected from benzoylamino, mono- or dichlorobenzoylamino, mono- or dibromobenzoylamino, nitrobenzoylamino, C_{1-4}alkylcarbonylaminobenzoylamino, aminocarbonyl, C_{1-4}alkylaminocarbonyl, phenylaminocarbonyl, mono-, di- or trichlorophenylaminocarbonyl, mono-, di- or tribromophenylaminocarbonyl, C_{1-4}alkylcarbonylaminophenylaminocarbonyl and C_{1-4}alkoxycarbonyl, or

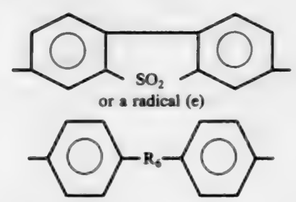
m is 1, R_2 is a radical (a), (b) or (c)



(a) (b) (c)

in which R_4 is as defined above, and

R_3 is C_{1-4}alkylene; divalent pyridyl; divalent naphthyl; divalent benzimidazolonyl; divalent benzene, unsubstituted or substituted by up to two substituents selected from chlorine, bromine, methyl, C_{1-4}alkoxy and nitro; any aromatic radical as R_3 is bound to R_2 through adjacent carbon atoms; or *m* is 2, R_2 is —$CONR_4$—, where R_4 is as defined above, and R_3 is C_{1-4}alkylene; divalent anthraquinonyl, unsubstituted or substituted by up to two substituents selected from chlorine, bromine, methyl, C_{1-4}alkoxy, amino, hydroxy, phenylamino, phenylmercapto, nitro, benzoylamino, mono- or di-chlorobenzoylamino, mono- or di-bromobenzoylamino and nitrobenzoylamino; divalent pyridyl; divalent napththyl; divalent benzimidazolonyl; divalent benzene, unsubstituted or substituted by up to two substituents selected from chlorine, bromine, methyl, C_{1-4}alkoxy and nitro; divalent diphenyl, unsubstituted or substituted by up to two substitutents selected from chlorine, bromine, methyl, C_{1-4}alkoxy and nitro; a radical (d)



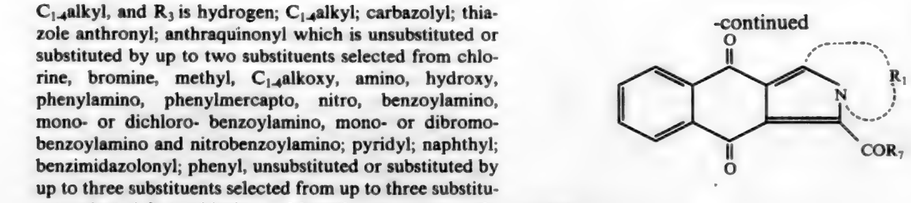
or a radical (e)

in which

R_6 is —S—, —SO_2— or —NH—CO— or;

m is 2, R_2 is a radical (a), (b) of (c), above, and R_3 is an unsubstituted tetravalent diphenyl radical, the links between such radical and radicals (a), (b) or (c) being through adjacent carbon atoms.

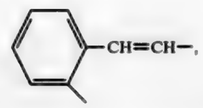
47. A compound of formula Ic



-continued

in which

R_1' is a group —CH=CH—CH=CH— or



which group isunsubstituted or substituted by up to two substituents selected from chlorine, bromine, methyl and C_{1-4}alkoxy, or by a C_{1-4}alkylcarbonyl or benzoyl group,

R_7 is a hydroxyl, C_{1-4}alkoxy or phenoxy group.

4,042,592

NOVEL DIBENZO[a,g]QUINOLIZINIUM COMPOUNDS

Yoshio Sawa, Nishinomiya, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed May 1, 1975, Ser. No. 573,786

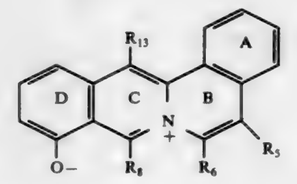
Claims priority, application Japan, May 8, 1974, 49-51459; May 8, 1974, 49-51460; May 9, 1974, 49-51804; May 9, 1974, 49-51805; May 9, 1974, 49-51806; May 11, 1974, 49-52575; May 11, 1974, 49-52576; May 11, 1974, 49-52577; May 11, 1974, 49-52578; May 11, 1974, 49-52579; May 14, 1974, 49-54008; May 14, 1974, 49-54009; May 14, 1974, 49-54010; May 14, 1974, 49-54011; May 14, 1974, 49-54012

Int. Cl.[2] C07D *215/10*

U.S. Cl. 260—286 Q **16 Claims**

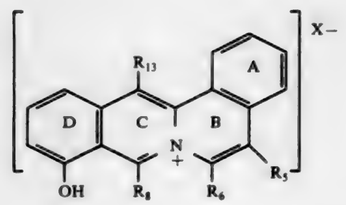
1. A dibenzo(a,g) quinolizinium compound selected from the group consisting of a betaine of the formula:

I



; an anionide of the formula:

II

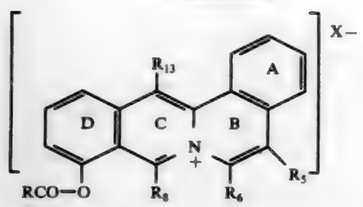


; and an O-acylate of the formula:

III

Ic

-continued



wherein R_5, R_6, R_8 and R_{13} are each hydrogen atom or lower alkyl; positions 1 to 4 and 10 to 12 on ring A and ring D respectively are each substituted with 0 to several substituents selected from the group consisting of lower alkyl, hydroxy, lower alkoxy, lower alkylenedioxy, amino and lower alkylamino; with the proviso that when R_8 is hydrogen atom and ring D is substituted only at position 10 with alkoxy, ring A cannot be substituted only at positions 2 and 3 with alkoxy or alkylenedioxy; X is a pharmaceutically acceptable anion; and RCO is an acyl group derived from an aliphatic or araliphatic carboxylic acid.

4,042,593

1H-IMIDAZOL(4,5-B)PYRIDINE DERIVATIVES

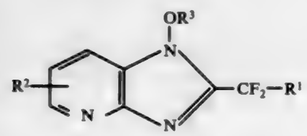
George O. P. O'Doherty, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 615,312, Sept. 22, 1975, Pat. No. 4,000,145, which is a division of Ser. No. 447,116, March 1, 1974, Pat. No. 3,932,428, which is a division of Ser. No. 236,195, March 20, 1972, Pat. No. 3,818,022, which is a continuation-in-part of Ser. No. 181,638, Sept. 17, 1971, abandoned, which is a continuation-in-part of Ser. No. 100,410, Dec. 21, 1970, abandoned. This application Sept. 23, 1976, Ser. No. 725,818

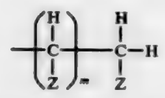
Int. Cl.[2] C07D *471/04*

U.S. Cl. 260—294.8 C 2 Claims

1. A compound of the formula

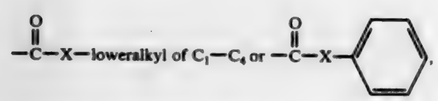


wherein R^1 represents hydrogen, chlorine, fluorine, difluoromethyl, perfluoroalkyl of C_1-C_6, or radical of the formula:



wherein each Z independently represents hydrogen or halogen and m represents 0 or 1; R^2 represents halogen, nitro, $-CF_3$, $-CF_2Cl$, $-CF_2H$, or loweralkylsulfonyl of C_1-C_4; and R^3 represents

1. radical of the formulae



wherein X is oxygen or sulfur; or

2. $-SO_2-R^7$ wherein R^7 is loweralkyl as above defined, cycloalkyl of C_5-C_6, phenyl, substituted phenyl or benzyl, wherein substituted phenyl is a phenyl radical bearing from 1-3 substituents, each of which is independently amino, nitro, chloro, methyl, or methoxy.

4,042,594

THE HYPOLIPIDEMIC AGENT, 4-(4-CHLOROBENZYLOXY)-BENZYL NICOTINATE AND PREPARATION THEREOF

Tsutomu Irikura, Tokyo, Japan, assignor to Kyorin Pharmaceutical Co., Ltd., Tokyo, Japan

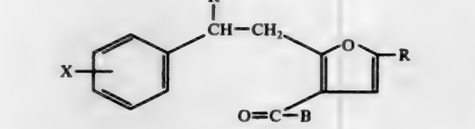
Filed June 30, 1976, Ser. No. 701,015

Claims priority, application Japan, Nov. 8, 1975, 50-134445

Int. Cl.[2] C07D *213/55*

U.S. Cl. 260—295.5 R 2 Claims

1. 4-(4'-Chlorobenzyloxy)benzyl nicotinate having the following formula:



4,042,595

PROCESSES FOR THE PRODUCTION OF HETEROCYCLIC COMPOUNDS

Paolo Koch, San Giuliano Milanese, and Emilio Perrotti, San Donato Milanese, both of Italy, assignors to Snam Progetti S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 491,863, July 25, 1974, abandoned. This application Feb. 4, 1976, Ser. No. 655,052

Claims priority, application Italy, Aug. 1, 1973, 27389/73

Int. Cl.[2] C07D *339/06, 263/22*

U.S. Cl. 260—307 C 3 Claims

1. A process for the preparation of ethylenedithiocarbonate which comprises reacting 1,2-dimercaptoethane with carbon monoxide and oxygen in the presence of a selenium catalyst.

2. A process for the preparation of 1,3-dithiolan-2-one-4-hydroxymethyl which comprises reacting 2,3-dimercaptopropanol-1 with carbon monoxide and oxygen in the presence of a selenium catalyst.

3. A process for the preparation of 2-oxazolidone which comprises reacting ethanolamine with carbon monoxide and oxygen in the presence of a cuprous chloride catalyst.

4,042,596

2-ALKYL-5-PHENETHYL-4-OXAZOLECARBOXYLIC ACIDS AND DERIVATIVES

William G. Salmond, Mount Arlington, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 538,887, Jan. 6, 1975, Pat. No. 3,994,915, which is a continuation of Ser. No. 267,899, June 30, 1972, abandoned. This application Sept. 1, 1976, Ser. No. 719,679

Int. Cl.[2] C07D *263/32*

U.S. Cl. 260—307R 7 Claims

1. A compound of the formula

wherein

1 is either $-OR^1$, $-OH$ or $-Y$,

R is alkyl having from 1 to 4 carbon atoms;

Y is chloro, bromo or iodo;

X is a hydrogen atom or fluoro, chloro or bromo;

R^1 is alkyl having from 1 to 6 carbon atoms;

R^* is either a hydrogen atom or phenyl; provided that when R^* is phenyl, then X is a hydrogen atom.

4,042,597

PREPARATION OF 2-(2-HYDROXY-2-PROPYL)-1-METHYL-5-NITROIMIDAZOLE

Werner Hofheinz, Bottmingen, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Mar. 22, 1976, Ser. No. 668,899

Claims priority, application Switzerland, Apr. 4, 1975, 4291/75; Jan. 23, 1976, 826/76

Int. Cl.[2] C07D *233/94*

U.S. Cl. 548—339 6 Claims

1. A process for the preparation of 2-(2-hydroxy-2-propyl)-1-methyl-5-nitroimidazole which comprises autoxidizing 1-methyl-2-isopropyl-5-nitroimidazole in a dipolar aprotic solvent in the presence of a strong base and a reducing agent comprising triethylphosphite.

4,042,598

DISUBSTITUTED AZABICYCLOALKANES

Laszlo Beregi, Boulogne; Pierre Hugon, Rueil-Malmaison; Xavier Pascaud, Paris, and Jean-Claude Poignant, Bures, Yvette, all of France, assignors to Science Union et Cie, Societe Francaise de Recherche Medicale, Suresnes, France

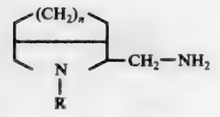
Division of Ser. No. 525,623, Nov. 20, 1974, Pat. No. 3,972,994. This application May 13, 1976, Ser. No. 685,757

Claims priority, application United Kingdom, Dec. 14, 1973, 58034/73

Int. Cl.[2] C07D *209/44*

U.S. Cl. 260—326.1 2 Claims

1. A compound selected from the group consisting of bicycloalkanes derivatives of the formula:



wherein *n* is 2, and where in R is selected from the group consisting of saturated and unsaturated aliphatic hydrocarbon radicals having 1 to 5 carbon atoms inclusive in the form of a straight or branched chain.

4,042,599

PROCESS FOR PRODUCING 2-PYRROLIDONE

Janice L. Greene, Chagrin Falls, Ohio, assignor to The Standard Oil Company, Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,882

Int. Cl.[2] C07D *207/26*

U.S. Cl. 260—326.5 FN 3 Claims

1. In the process for the preparation of 2-pyrrolidone by contacting an aqueous mixture of succinonitrile with hydrogen at an elevated temperature in the presence of a hydrogenation catalyst, the improvement comprising conducting the reaction at a hydrogen pressure within the range of from 300 to 490 psi.

4,042,600

PYROLYSIS OF 2-SULFOCHLORIDE BENZOATES

Carmine A. DiPippo, Longmeadow, Mass., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 298,226, Oct. 17, 1972, abandoned. This application Oct. 7, 1975, Ser. No. 620,281

Int. Cl.[2] C07D *327/04*; C07C *19/02, 25/14*

U.S. Cl. 260—327 S 10 Claims

1. The method for the synthesis of ortho-sulfobenzoic anhydride which comprises pyrolyzing a 2-sulfochloride benzoate at elevated temperatures.

4,042,601

SIX MEMBERED HETEROCYCLIC OXATHIO COMPOUNDS

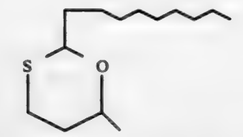
Richard A. Wilson, Westfield; John V. Pascale, Jackson, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 594,310, July 8, 1975. This application Apr. 12, 1976, Ser. No. 676,390

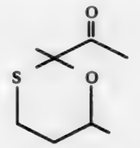
Int. Cl.[2] C07D *327/06*

U.S. Cl. 260—327 M 2 Claims

1. An oxathio heterocyclic compound which is 2-n-nonyl-6-methyl-1,3-oxathiane having the structure:



2. An oxathio heterocyclic compound which is 2,6-dimethyl-2-acetyl-1,3-oxathiane having the structure:



4,042,602

SYNTHESIS OF DIDEOXYZEARALANE AND RELATED COMPOUNDS

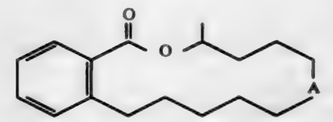
Donald Edwin Robertson, Terre Haute, Ind.; Wilbert Herbert Urry, Chicago, Ill., and Frank Kavka, St. Louis, Mo., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Nov. 4, 1976, Ser. No. 738,930

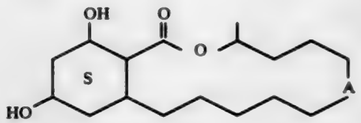
Int. Cl.[2] C07D *313/00*

U.S. Cl. 260—343.41 5 Claims

1. A method for preparing a dideoxyzearalane type compound of the formula



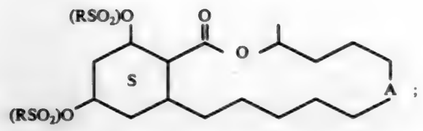
comprising the steps of reacting a hexahydrozearalin of the formula



with an organic sulfonyl chloride of the formula

$R\,SO_2\,Cl$

under esterifying conditions to form a sulfonate ester derivative of the formula



recovering the sulfonate ester derivative; and catalytically dehydrosulfonyloxylating and aromatizing the sulfonate ester derivative by heating it to a temperature of from about 75° C to about 250° C in the presence of an organic base and a palladium catalyst under a substantially inert atmosphere to form the dideoxyzearalane type compound; wherein A is $—CH_2—$, or $>CHOR_1$; R_1 is lower alkyl of from 1 to about 6 carbon atoms, lower alicyclic of from about 4 to about 8 carbon atoms; lower alkanoyl of from 1 to about 6 carbon atoms, monocyclic aryl of about 6 to 8 carbon atoms, or monocyclic aralkyl, wherein the alkyl group has from 1 to about 5 carbon atoms and the aryl group has about 6 to 8 carbon atoms; and R is selected from the group consisting of lower alkyl of from 1 to about 10 carbon atoms, phenyl, p-tolyl, and p-bromophenyl.

4,042,603

INTRAMOLECULAR CYCLIZATION IN A FATTY ACID ESTER SOLVENT

Hiroshi Itatani; Mikito Kashima; Akinori Shiotani; Hataaki Yoshimoto, and Tetuo Kato, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Mar. 17, 1975, Ser. No. 559,065
Claims priority, application Japan, Mar. 29, 1974, 49-34618
Int. Cl.² C07D *307/91*
U.S. Cl. 260—346.71 **20 Claims**

1. A process for preparing a compound having the formula:

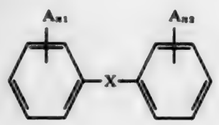


(2)

wherein

A represents an alkyl, alkoxyl, nitro, halogen, alkanoyloxy, alkoxycarbonyl, phenyl or alkyl radical which is substituted with alkoxy, nitro, halogen, alkoxycarbonyl, phenyl or nitrile radical, n_1 and n_2 are zero or an integer from 1 to 4, and $n_1 + n_2$ is an integer from 1 to 8; **and X represents oxygen or carbonyl,**

which comprises contacting a substituted aromatic compound having the formula



(1)

wherein

A, n_1, n_2 and X have the same meanings as above and the above compound has at least two hydrogen atoms at both the 2- and 2'-positions with at least one of a carboxylic acid salt of palladium and a palladium organic complex as a catalyst under pressure of an oxygen-containing atmosphere and in a fatty acid ester solvent whereby said compound (1) is cyclized intramolecularly.

4,042,604

ISOLATION OF DINITROANTHRAQUINONE HAVING A HIGH CONTENT OF α,α-DINITRO COMPOUNDS

Heinz Eilingsfeld, Frankenthal, and Dietrich Lach, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 14, 1976, Ser. No. 686,365
Claims priority, application Germany, June 4, 1975, 2524747
Int. Cl.² C09B *1/00*; C07C *79/37*
U.S. Cl. 260—369 **8 Claims**

1. A process for the isolation of a mixture of 1,5-dinitroanthraquinone and 1,8-dinitroanthraquinone having a high content of α,α'-isomers from a crude dinitroanthraquinone mixture which process comprises first suspending the crude dinitroanthraquinone mixture in from one to thirty times its own weight of xylene, heating the suspension to a temperature within the range of from 60° to 200° C mixing the suspension until solution equilibrium has been established, and then separating the undissolved material from the suspension at the same temperature used for said mixing.

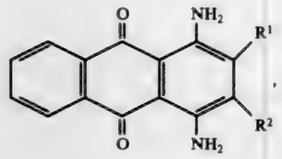
4,042,605

PROCESS FOR THE PRODUCTION OF 1,4-DIAMINOANTHRAQUINONE-2,3-DINITRILE

Ernst Hartwig, Heidelberg, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed May 14, 1976, Ser. No. 686,366
Claims priority, application Germany, June 4, 1975, 2524748
Int. Cl.² C09B *1/00, 1/36*
U.S. Cl. 260—378 **17 Claims**

1. A process for the production of 1,4-diaminoanthraquinone-2,3-dinitrile which comprises reacting a 1,4-diaminoanthraquinone of the formula



in which each of R^1 and R^2 is hydrogen, chloro or bromo with the proviso that at least one of R^1 and R^2 is chloro or bromo, at a temperature of from 60° up to about 160° C. in a polar aprotic solvent with at least the stoichiometrically required amount of an ionic cyanide.

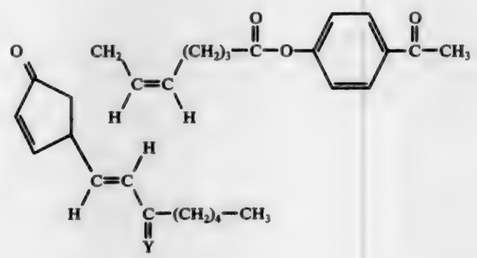
4,042,606

SUBSTITUTED PHENYL ESTERS OF PGA_2

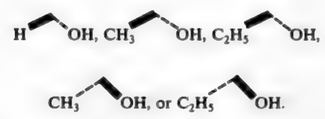
Walter Morozowich, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 531,991, Dec. 12, 1974, which is a division of Ser. No. 431,598, Jan. 8, 1974, Pat. No. 3,931,281.
This application July 12, 1976, Ser. No. 704,263
Int. Cl.² C07C *177/00*
U.S. Cl. 260—390 **12 Claims**

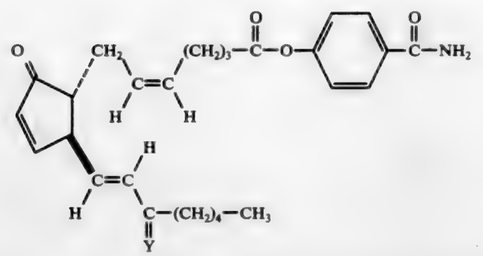
1. An optically active compound of the formula:



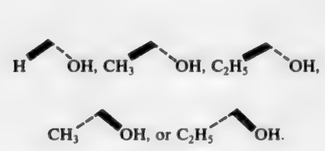
or a racemic compound of that formula and the mirror image thereof, wherein Y is



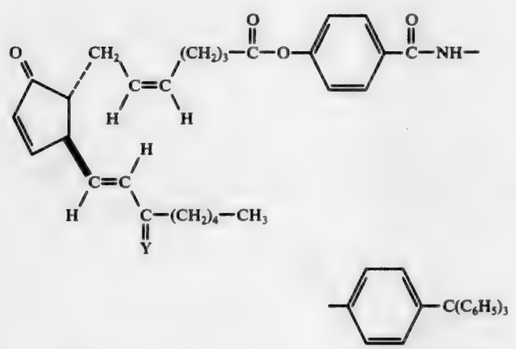
5. An optically active compound of the formula:



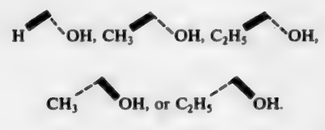
or a racemic compound of that formula and the mirror image thereof, wherein Y is



9. An optically active compound of the formula:



or a racemic compound of that formula and the mirror image thereof, wherein Y is



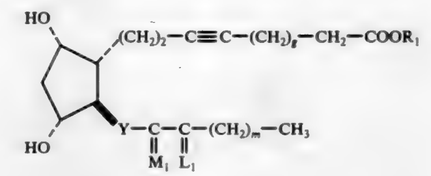
4,042,607

4,4,5,5-TETRADEHYDRO-$PGF_{1\alpha}$ ANALOGS

Chiu-Hong Lin, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 619,077, Oct. 2, 1975, Pat. No. 4,013,695.
This application Nov. 4, 1976, Ser. No. 738,719
Int. Cl.² C07C *177/00*
U.S. Cl. 260—410.9 R **32 Claims**

1. A prostaglandin analog of the formula



wherein *g* is one, 2, or 3;
wherein Y is trans—CH=CH—;
wherein M_1 is



or



wherein R_5 is hydrogen or methyl;
wherein *m* is one to 5, inclusive;
wherein L_1 is



or a mixture of



and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

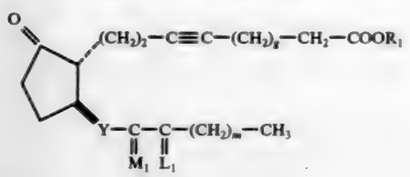
4,042,608

4,4,5,5-TETRADEHYDRO-11-DEOXY-PGE$_1$ ANALOGS

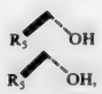
Chiu-Hong Lin, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 619,077, Oct. 2, 1975, Pat. No. 4,013,695.
This application Nov. 4, 1976, Ser. No. 738,676
Int. Cl.^{2} C07C *177/00*
U.S. Cl. 260—410.9 R **32 Claims**

1. A prostaglandin analog of the formula



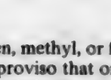
wherein *g* is one, 2, or 3;
wherein *Y* is trans—CH=CH—;
wherein M_1 is



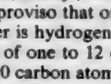
wherein R_5 is hydrogen or methyl;
wherein m is one to 5, inclusive;
wherein L_1 is



or a mixture of



and



wherein
R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro; and wherein
R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,042,609

σ AND π ORGANIC COMPLEXES OF TRANSITION METALS AND PROCESS FOR THE PREPARATION THEREOF

Emilio Perrotti, and Mario Clerici, both of San Donato Milanese, Italy, assignors to Snam Progetti S.p.A., Milan, Italy

Continuation of Ser. No. 419,374, Nov. 27, 1973, abandoned.
This application Feb. 2, 1976, Ser. No. 654,350
Claims priority, application Italy, Nov. 29, 1972, 32211/72
Int. Cl.^{2} C07F *15/00, 13/00*
U.S. Cl. 260—429 R **22 Claims**

1. A process for the preparation of a σ complex of a transition metal having catalytic properties and represented by the formula

$$M(C_2H_4)_2(L\text{-}C)(L)$$

in which M is Ir or Re; L is an alkyl or aryl phosphine of formula PR_3 wherein R is an isopropyl, tert-butyl, or phenyl radical; and L-C is an alkyl or aryl phosphine ligand of formula PR_2R^-, in which R is as defined above R^- represents the R radical less one hydrogen, said ligand being in coordination with the M atom, which comprises:
reacting a hydride complex of formula

$$MH_xL_2$$

in which M and L are as defined above *x* is 5 if M is Ir or 7 if M is Re, with ethylene.

4,042,610

PROCESS FOR PREPARING HYDROCARBYL AND SILAHYDROCARBYL TRANSITION METAL DIHYDROCARBYLAMIDES

Leo Ernest Manzer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 22, 1975, Ser. No. 615,494
Int. Cl.^{2} C07F *7/00*
U.S. Cl. 260—429.3 **15 Claims**

1. The process of reacting a poly(dihydrocarbylamide) of a transition metal having the formula $M(NR_2)_x$ with $yR'Li$ in a solvent in which both reactants are soluble to produce a compound of the formula $R'_yM(NR_2)_{x-y}$ and a by-product of the formula $LiNR_2$ which in insoluble in the solvent wherein
M is titanium, zirconium, hafnium, vanadium, niobium, tantalum, chromium, molybdenum or tungsten;
R is alkyl, aryl or aralkyl;
R′ is alkyl, silaalkyl in which the silicon is bonded solely to carbon, aralkyl or diarylmethyl;
x is the valence of the metal and is at least 3;
y is 1 to 5; and
x-y is at least 1.

4,042,611

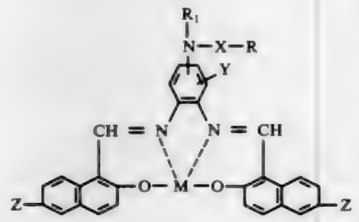
WATER-IN-SOLUBLE DISAZO METHINE COMPOUNDS

Theodor Papenfuhs, Frankfurt am Main, and Heinrich Volk, Bad Vilbel, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Dec. 16, 1975, Ser. No. 641,260
Claims priority, application Germany, Dec. 20, 1974, 2460490
Int. Cl.^{2} C07F *15/02*
U.S. Cl. 260—439 R **8 Claims**

1. Compounds of the general formula

(I)



wherein R is hydrogen, an alkyl, aralkyl, cycloalkyl, aryl, an amino group which may be substituted by alkyl or aryl radicals, or a guanidino group, X is a -CO- or -SO_2-group, Y is hydrogen, a halogen atom, an alkyl, alkoxy or nitro group, R_1 is hydrogen or an alkyl radical, Z is hydrogen, a halogen atom, an alkoxy, nitro or cyano group and M is nickel or copper.

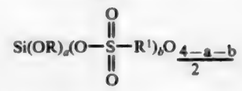
4,042,612

POLYMERIC ALKOXYSILANES

Walter L. Magee, Jr., Norwalk, Conn., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 3, 1977, Ser. No. 756,310
Int. Cl.^{2} C07F *7/18*
U.S. Cl. 260—448.8 R **6 Claims**

1. A polymeric alkoxysilane having the average formula



wherein each R is an independently selected hydrocarbon radical or hydrocarbon ether radical free of aliphatic unsaturation, each R^1 is an independently selected hydrocarbon radical free of aliphatic unsaturation, a has a value from 1 to 3 and b has a value from 0.001 to 1.0.

4,042,613

BENZOPHENONE DERIVATIVES AND THEIR PREPARATION AND APPLICATION

Minoru Takamizawa; Yasushi Yamamoto; Yoshio Inoue, all of Annaka; Atsumi Noshiro, Chiba, and Hitoshi Fujii, Tokyo, all of Japan, assignors to Dai Nippon Printing Co., Ltd. and Shin-Etsu Chemical Co., Ltd., both of Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 569,756
Claims priority, application Japan, Apr. 23, 1974, 49-45711; July 31, 1974, 49-87612
Int. Cl.^{2} C07F *7/08*
U.S. Cl. 260—448.2 B **32 Claims**

1. A benzophenone derivative represented by the general formula

$$R_m^1 - C_6H_{5-m} - CO - C_6H_{5-n} - R_n^2$$

where R^1 is selected from the group consisting of a halogen atom, a monovalent $C_{1\text{-}10}$ hydrocarbon group, an alkoxy group, a thioalkoxy group, an amino group, and a dialkylamino group, R^2 is an unsubstituted or organosiloxy-substituted organosilyl group, and each of *m* and *n* is an integer of from 1 to 5.

4,042,614

HYDROCARBON SYNTHESIS FROM CO AND H_2 USING RU SUPPORTED ON A TITANIUM OXIDE

M. Albert Vannice, Plainfield, and Robert L. Garten, Summit, both of N.J., assignors to Exxon Research and Engineering Co., Linden, N.J.

Filed Apr. 5, 1976, Ser. No. 673,356
Int. Cl.^{2} C07C *1/04*
U.S. Cl. 260—449 R **23 Claims**

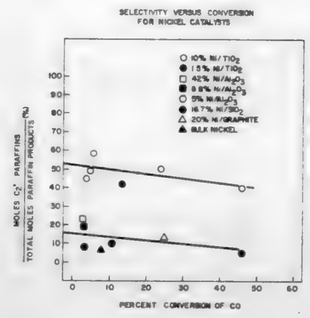
1. A process for the selective synthesis of olefins from C_2 to C_{10} chain length inclusive, said process comprising the steps of passing H_2 and CO at a H_2/CO ratio of 0.1 to 10 over a catalyst comprising ruthenium on a titanium-containing oxide support, wherein said titanium-containing oxide support is selected from the group consisting of TiO_2, $ZrTiO_4$, TiO_2-carbon, TiO_2-Al_2O_3, TiO_2-SiO_2, alkaline earth titanates, alkali titanates, rare earth titanates and mixtures thereof, at a space velocity of from 100 to 50,000 V/V/Hr. at a temperature of from 100° to 500° C., at a pressure of from 100 to 10^5kPa for a time sufficient to effect the generation of the desired olefinic products in the desired ratio wherein the concentration of said ruthenium in said catalyst is from 0.01 to 15% by weight.

4,042,615

HYDROCARBON SYNTHESIS FROM CO AND H_2 USING Ni SUPPORTED ON A TITANIUM OXIDE

M. Albert Vannice, Plainfield, and Robert L. Garten, Summit, both of N.J., assignors to Exxon Research and Engineering Co., Linden, N.J.

Filed Apr. 5, 1976, Ser. No. 673,357
Int. Cl.^{2} C07C *1/04*
U.S. Cl. 260—449.6 R **21 Claims**



1. A process for the synthesis of higher molecular weight paraffins comprising the steps of passing CO and H_2 in a CO/H_2 ratio of 10 to 0.1 over a catalyst comprising nickel on a titanium-containing oxide support, wherein said titanium-containing oxide support is selected from the group consisting of TiO_2, $ZrTiO_4$, TiO_2—carbon, TiO_2—Al_2O_3, TiO_2—SiO_2, alkaline earth titanates, alkali titanates, rare earth titanates and mixtures thereof, at a space velocity of from 100 to 50,000 V/V/Hr. and a temperature of from 100° to 500° C and at pressures of from 103 to 1.03×10^5 kPa for a time sufficient to effect the generation of the desired paraffinic products in the desired ratio, wherein the concentration of said nickel in said catalyst is from 0.01 to 75% by weight.

4,042,616

PREPARATION OF CYCLOPROPANECARBOXYLATES

Pieter A. Verbrugge, and Elisabeth W. Uurbanus, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Oct. 29, 1974, Ser. No. 518,855
Claims priority, application United Kingdom, Nov. 2, 1973, 51005/73
Int. Cl.^{2} C07C *67/30*
U.S. Cl. 260—468 G **10 Claims**

1. A process or the production of a tertalkyl 1-hydrogen-2-alkylcyclopropanecarboxylate in which process (A) a tert-alkyl 1-hydrogen-2-halocyclopropanecarboxylate in which the halogen atom(s) has (have) an atomic number of at least 17 and the tert-alkyl group is a tert-alkyl group of from 4 to 7 carbon atoms or a tert-cycloalkyl group of from 7 to 9 carbon atoms, is contacted in solution with an alkylmagnesium halide in which the halogen atom has an atomic number of at least 17, or with a dialkylmagnesium, in which each of said alkyl groups contains up to 20 carbon atoms and (B) adding a proton donor to the reaction product thus produced.

4,042,617

PROCESS FOR PREPARING A 2-METHYL-(SUBSTITUTED ARYL)-PYRUVIC ACID COMPOUND

Katsura Kogure, Kawagoe; Noriyoshi Sueda, Tokyo; Sizuo Himoto, Kawagoe; Youziro Yoshino, Tokyo, and Kunio Nakagawa, Kawagoe, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed July 28, 1975, Ser. No. 599,773

Claims priority, application Japan, July 27, 1974, 49-85620; July 29, 1974, 49-86003

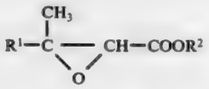
Int. Cl.[2] C07C *51/09, 63/333, 67/30, 69/76*

U.S. Cl. 260—469 **3 Claims**

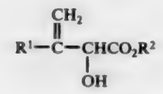
1. A process for preparing a 3-methyl-3-(substituted aryl)-pyruvic acid compound of the general formula,



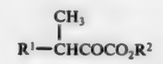
wherein R^1 represents 4-biphenylyl, 4-cyclohexylphenyl, 3-phenoxyphenyl, 4'-fluoro-4-biphenylyl, 2-fluoro-4-biphenylyl or 3-benzoylphenyl group, and R^2 represents a lower alkyl group or its corresponding free acid, which comprises treating a glycidic acid ester compound of the general formula,



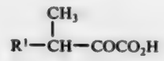
wherein R^1 and R^2 are individually as defined above with a Lewis acid, thereby to form a compound of the general formula,



wherein R^1 and R^2 are individually as defined above; treating the thus resulted compound in an alchohol with an alkali metal alcoholate thereby to form 3-methyl-3-(substituted aryl)-pyruvic acid ester of the general formula,



wherein R^1 and R^2 are individually as defined above and, if desired, saponifying said ester to yield a compound of the general formula,



wherein R^1 is as defined previously.

4,042,618

AROMATIC SULFONATES

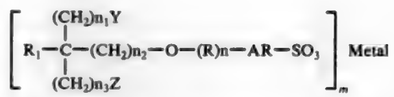
Gerald A. Davis, Charlotte, N.C., and Robert W. Stackman, Morristown, N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 27,942, April 13, 1970, Pat. No. 3,706,712, which is a continuation-in-part of Ser. No. 833,729, June 16, 1969, abandoned. This application June 15, 1972, Ser. No. 263,086

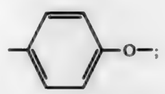
Int. Cl.[2] C07C *143/42*

U.S. Cl. 260—470 **6 Claims**

1. The metallic salt of the structure

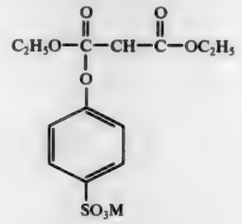


wherein R_1 represents either hydrogen or an alkyl radical containing from 1 to 6 carbon atoms; n_1, n_2, and n_3 each independently represent an integer from 0 to about 6 and $n_1 + n_2 + n_3$ is equal to or greater than 2 if Y and Z both are hydroxy; Y and Z are selected independently from the group consisting of hydroxy, carboxy and alkoxycarbonyl, the alkoxy portion of which contains from 1 to 6 carbon atoms; Ar represents an unsubstituted divalent aromatic hydrocarbon radical containing from 6 to about 12 carbon atoms; m is an integer equal to the valency of the metal; R represents a divalent radical selected from the group consisting of alkylene and



and n is an integer, either 0 or 1, and when n is 0, Metal is lithium.

6. An ester having the formula:



wherein M is lithium.

4,042,619

DERIVATIVES OF CARBOXY-TERMINATED POLYBUTADIENES

Ralph E. Miegel, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 3, 1965, Ser. No. 453,892

Int. Cl.[2] C07C *101/26, 69/52*

U.S. Cl. 260—482 P **7 Claims**

1. Polybutadiene terminated with —C(O)OR groups, R being hydroxyalkyl.

2. A difluoramino derivative of a polymer of claim **1,** said derivative having a difluoramino content of at least about 20% by weight and having the difluoramino groups appended to the polymer chain.

4,042,620

CONTINUOUS PROCESS FOR THE PRODUCTION OF MAEAMIC ACIDS

Jean Laforest, St. Cyr au Mont d'Or; Louis Silhol, St. Genis Laval, and Pierre Renard, Villeurbanne, all of France, assignors to Rhone-Poulenc, S.A., Paris, France

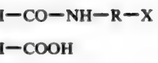
Continuation of Ser. No. 432,646, Jan. 11, 1974, abandoned. This application Apr. 24, 1975, Ser. No. 571,108

Claims priority, application France, Jan. 16, 1973, 73.01405

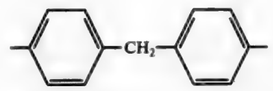
Int. Cl.[2] C07C *51/00*

U.S. Cl. 260—518 R **7 Claims**

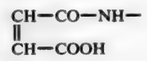
1. A continuous process for the preparation of a maleamic acid of the formula:



in which R represents the radical



and X represents the radical:



which comprises passing a solution of a primary diamine and a solution of maleic anhydride in amounts such that there is a 5 to 20 mol % excess of anhydride, at a temperature of from 40° to 130° C. and at a rate greater than 7 m/second through an injection nozzle into a twin screw reactor, the solvent for the primary amine being the same as, or miscible with, the solvent for the maleic anhydride.

4,042,621

OXIDATION OF N-SUBSTITUTED METHYLAMINES TO N-SUBSTITUTED FORMAMIDES

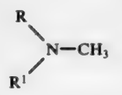
John Carl Sauer, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 22, 1975, Ser. No. 615,497

Int. Cl.[2] C07C *103/36*

U.S. Cl. 260—561 R **24 Claims**

1. The process of reacting in a liquid homogeneous system molecular oxygen with a compound of the formula



wherein

R is alkyl of 1–8 carbons, aryl of 6–10 carbons, aralkyl of 7–10 carbons or alkaryl of 7–10 carbons;

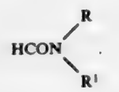
R^1 is aryl of 6–10 carbons, aralkyl of 7–10 carbons, alkaryl of 7–10 carbons, alkyl of 1–8 carbons or such alkyl containing $—N(CH_3)R^2$

in which R^2 is hydrogen, alkyl of 1–8 carbons, aryl of 6–10 carbons, aralkyl of 7–10 carbons or alkaryl of 7–10 carbons;

with the provisos that

R and R^1 can be joined together to form an alkylene or azaalkylene group of 3–8 carbons; and

when R is alkyl or aralkyl, R^1 can be hydrogen; in the presence of a catalytically effective amount of a soluble chloride, bromide or iodide of a metal selected from the group consisting of cobalt, copper, gold, iron, manganese, mercury, nickel, palladium, platinum, rhenium, silver and zinc; at a temperature in the range 25°–160° C and at an oxygen pressure in the range atmospheric to 500 pounds per square inch gauge; and recovering an N-substituted formamide of the formula



4,042,622

PROCESS FOR THE PREPARATION OF N-ACETOACETYL-2,5-DIMETHOXY-4-CHLOROANILIDE

Emmerich Paszthory, Hofheim, Taunus; Ernst Hille, Rossert, Taunus; Karl-Gerhard Seifert, Frankfurt am Main, and Vincenz Zimmermann, Nauheim, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 27, 1976, Ser. No. 680,670

Claims priority, application Germany, Apr. 29, 1975, 2518984

Int. Cl.[2] C07C *102/00*

U.S. Cl. 260—562 K **8 Claims**

1. A process for the preparation of N-acetoacetyl-2,5-dimethoxy-4-chloroanilide which comprises suspending 2,5-dimethoxy-4-[chloroanilide] chloroaniline in water and adding at least one molar equivalent of diketene at the beginning of the reaction, said reaction being conducted at a temperature not in excess of 50° C.

4,042,623

METHOD OF MANUFACTURING METHACRYLIC ACID AND AN OXIDATION CATALYST

Masanobu Ogawa, Takasaki, Japan, assignor to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 16, 1975, Ser. No. 613,921

Claims priority, application Japan, Sept. 24, 1974, 49-108889; Sept. 24, 1974, 49-108890

Int. Cl. C07C *51/32;* **B01J** *27/14*

U.S. Cl. 260—530 N **10 Claims**

1. A catalyst having the following composition:

$$Pd_aP_bSb_cX_dO_e$$

wherein, Pd, P, Sb and O denote palladium, phosphorus, antimony and oxygen, respectively, X denotes at least one element selected from the group consisting of bismuth, lead, chromium, iron, nickel, cobalt, manganese, tin, uranium and barium, the subscripts *a, b, c, d* and *e* denote the numbers of the Pd, P, Sb, X and O atoms with the proviso that the elements are present in a ratio so that when *a* is 1, then *b* is 1 to 42, *c* is 0.1 to 15, *d* is 0 to 15 and *e* is automatically determined from the valencies of the other elements.

4,042,624

ANTIDEPRESSANT 2-[(SUBSTITUTED-1-NAPHTHYLMETHYL)AMINO]-1-PHENYLPROPANOLS

Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed May 12, 1975, Ser. No. 576,448

Int. Cl.[2] C07C *91/22*

U.S. Cl. 260—570.6 **2 Claims**

1. The compound 2-(5,8-dichloro-1-naphthylmethylamino)-1-phenyl-1-propanol hydrochloride.

2. The compound 2-(2-methoxy-1-naphthylmethylamino)-1-phenyl-1-propanol hydrochloride.

4,042,625

PROCESS AND CATALYST FOR PREPARING UNSATURATED CARBOXYLIC ACID

Hideo Matsuzawa; Masato Otani; Hiromichi Ishii, all of Ohotake; Kantaro Yamada, Yokohama, and Hasao Kobayashi, Ohotake, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Filed June 25, 1975, Ser. No. 590,505

Claims priority, application Japan, July 3, 1974, 49-76593

Int. Cl.[2] C07C *51/24;* **B01J** *27/02, 27/14*

U.S. Cl. 260—530 N **7 Claims**

1. In a process for preparing acrylic acid or methacrylic acid by the vapor-phase catalytic oxidation of the corresponding unsaturated aldehyde with molecular oxygen at a temperature of from 240° – 450° C, the improvement comprising:

reacting said unsaturated aldehyde over a catalyst consisting essentially of molybdenum, phosphorus, magnesium, element Q, element R, element T and oxygen represented by the formula:

$$Mo_{12}P_aMg_bQ_{b'}R_cT_dO_e$$

wherein Mo is molybdenum, P is phosphorus, Mg is magnesium, O is oxygen, Q is at least one metal selected from the group consisting of calcium, strontium and barium, R is at least one metal selected from the group consisting of potassium, rubidium, cesium and thallium, T is at least one metal selected from the group consisting of vanadium, tungsten and nickel, *a*, *b*, *b'*, *c*, *d* and *e* are atomic ratios of the respective elements, wherein $a = 0.5–6$, $b = 0.2–6$, $b + b' = 0.2–6$, b' ranges from 0 to a value determined by the magnesium content of the catalyst and the limits of $b + b'$, $c = 0.2–6$, $d = 0–6$, and e is a value dependent upon the oxidation state of the catalyst.

4,042,626

INTEGRATED TWO-STAGE UREA SYNTHESIS

Lucien H. Cook, Port Washington, N.Y., assignor to Chemical Construction Corporation, New York, N.Y.

Filed July 12, 1972, Ser. No. 271,072
Int. Cl.² C07C *126/00*
U.S. Cl. 260—555 A **7 Claims**

1. A process for urea synthesis which comprises combining carbon dioxide and primary ammonia feed streams with recycled aqueous ammonium carbamate solution to form a synthesis feed stream having an overall ammonia to carbon dioxide molar ratio in the range of 2.3:1 to 3.0:1, reacting said synthesis feed stream at elevated pressure to form further ammonium carbamate and generate heat in a first reaction zone and in indirect heat exchange with a urea synthesis reaction stream, heating secondary ammonia by indirect heat exchange with said urea synthesis reaction stream, adding the resulting heated secondary ammonia to the reacted synthesis feed stream principally containing ammonium carbamate, whereby said urea synthesis reaction stream is formed with a molar ammonia to carbon dioxide ratio above 3.0:1, reacting said urea synthesis reaction stream during said indirect heat exchanges with ammonia and synthesis feed stream in a second reaction zone, said second reaction zone being at substantially the same elevated pressure as said first reaction zone, whereby a major portion of the ammonium carbamate in said urea synthesis reaction stream is dehydrated to synthesize urea, and processing the resulting synthesis effluent stream at reduced pressure to recover aqueous urea solution and form said aqueous ammonium carbamate solution.

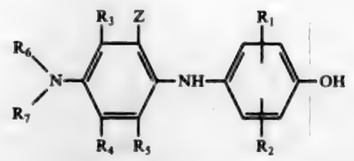
4,042,627

DIPHENYLAMINES FOR DYEING KERATINOUS FIBERS

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Continuation of Ser. No. 396,296, Sept. 11, 1973, abandoned, which is a division of Ser. No. 270,650, July 11, 1972, Pat. No. 3,787,174, which is a continuation-in-part of Ser. No. 61,833, Aug. 6, 1970, Pat. No. 3,792,090. This application Sept. 30, 1975, Ser. No. 618,244
Claims priority, application Luxembourg, July 14, 1971, 63527; Aug. 11, 1969, 59265
Int. Cl.² C07C *91/42*
U.S. Cl. 260—571 **3 Claims**

1. A diphenylamine of the formula



wherein R_1 is selected from the group consisting of methyl and chlorine,
R_2 is selected from the group consisting of hydrogen and methyl,
R_3 is selected from the group consisting of hydrogen and methyl,
R_4 is selected from the group consisting of hydrogen, methyl and methoxy,
R_5 is hydrogen,
R_6 is selected from the group consisting of hydrogen and methyl,
R_7 is selected from the group consisting of hydrogen and methyl, and
Z is amino.

4,042,628

2,6-DINITRO-4-TRIFLUOROMETHYLANILINES

Karl Kiehs; Karl-Heinz Koenig, both of Ludwigshafen, and Adolf Fischer, Mutterstadt, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 174,158, Aug. 23, 1971, abandoned, and a continuation-in-part of Ser. No. 784,247, Dec. 16, 1968, Pat. No. 3,681,425. This application Mar. 20, 1975, Ser. No. 560,122
Claims priority, application Germany, Dec. 21, 1967, 1643719
Int. Cl.² C07C *87/62, 91/06, 93/14*; A01N *9/20*
U.S. Cl. 260—577 **2 Claims**

1. 2,6-dinitro-4-trifluoromethyl-N-propyl-N-β-chloroethylaniline.

4,042,629

PREPARATION OF HEXAMETHYLENE DIAMINE FROM 2-CYANOCYCLOPENTANONE AND ADIPONITRILE

Bernard John Kershaw, Kingston, Canada, assignor to Du Pont of Canada, Montreal, Canada

Filed June 4, 1976, Ser. No. 693,115
Int. Cl.² C07C *87/14*
U.S. Cl. 260—583 P **8 Claims**

1. A process for the manufacture of hexamethylene diamine comprising contacting 2-cyanocyclopentanone with a mixture comprising ammonia and hydrogen in the presence of a catalyst selected from the group consisting of promoted and unpromoted reduced iron oxide, at a temperature in the range 100° to 275° C and at a pressure in the range of 300 to 600 kg/cm², while maintaining the mole ratio of ammonia to 2-cyanocyclopentanone at at least 4:1 and providing sufficient hydrogen to prevent substantial conversion of the reduced catalyst to iron oxide.

4,042,630

PROCESS FOR THE PREPARATION OF CYCLOALKANONES AND CYCLOALKANOLS

Jan Wolters, Limbricht, and Jan L. J. P. Hennekens, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation-in-part of Ser. No. 408,048, Oct. 19, 1973, Pat. No. 3,987,101. This application June 1, 1976, Ser. No. 691,300
Claims priority, application Netherlands, June 7, 1975, 7506790
Int. Cl.² C07C *27/04*
U.S. Cl. 260—586 R **8 Claims**

1. In a process for preparing cycloalkanones and cycloalkanols by conversion of cycloalkylhydroperoxides in a liquid hydrocarbon vehicle under the influence of a solid heterogeneous chromium oxide catalyst, the improvement which comprises stripping the reaction mixture of said cycloalkylhydroperoxides with a stripping gas during said conversion so as to maintain the water content of the reaction mixture at or below the saturation concentration.

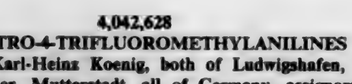
4,042,631

TELOMERS FROM β-DIKETONES AND VINYL CHLORIDE

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Apr. 9, 1975, Ser. No. 566,544
Int. Cl.² C07C *49/76*
U.S. Cl. 260—593 H **10 Claims**

1. Vinyl chloride telomers having the formula



wherein R and R_2 are selected from the group consisting of alkyl radicals containing from 1 to about 20 carbon atoms, aromatic radicals containing 6 to 10 carbon atoms, and alkyl substituted aromatic radicals, wherein the alkyl constituent contains from 1 to about 6 carbon atoms and wherein the aromatic moiety is phenyl or naphthyl; wherein R_1 is selected from the group consisting of hydrogen, alkyl radicals containing from 1 to about 20 carbon atoms, and halogen substituted alkyl radicals containing 1 to about 20 carbon atoms and wherein the halogen is chlorine, bromine, or fluorine; and n is an integer of from 1 to about 200.

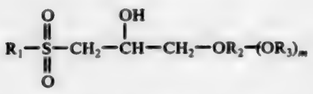
4,042,632

POLYOXY SULFOXIDES AND SULFONES AS ANTISTATIC AGENTS

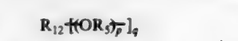
Kurt Hofer, Sr., and Kurt Hofer, Jr., both of Munchenstein, Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 508,421, Sept. 23, 1974, abandoned. This application Aug. 6, 1975, Ser. No. 602,323
Int. Cl.² C07C *147/02*
U.S. Cl. 260—607 AL **16 Claims**

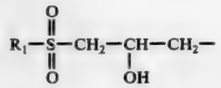
1. A compound of the formula,



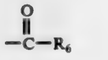
wherein R_1 is alkyl (C_1-C_{22}) or alkyl (C_2-C_{22}) containing 1 or 2 alkylenethioalkylene, alkylenesulphinylalkylene or alkylenesulphonylalkylene functions, any alkyl or alkylene being unsubstituted or substituted by —OH; cycloalkyl (C_5 or C_6) or alkyl (C_1-C_6) cycloalkyl (C_5 or C_6); or a radical $-(R_5O)_x-R_4$, wherein R_4 is alkyl (C_1-C_{22}), phenyl, phenyl substituted by 1 or 2 alkyl (C_1-C_{12}) radicals, or phenylalkyl (C_7-C_9), each R_5 is, independently, $-(CH_2)_2-$, $-(CH_2)_3-$ or $-CH(CH_3)CH_2-$ and x is an integer 1 to 180, m is an integer 1 to 7, R_2 is a group R_{12}, wherein R_{12} is an $(m + 1)$ valent saturated aliphatic hydrocarbon (C_2-C_{15}) radical or an $(m + 1)$ valent saturated aliphatic hydrocarbon (C_2-C_{15}) radical containing 1 or 2 alkyleneoxyalkylene, alkylenethioalkylene, alkylenesulphinylalkylene or alkylenesulphonylalkylene functions; a bivalent radical of benzene, cyclohexane, biphenyl, diphenyloxide, diphenylsulphide, diphenylsulphoxide, diphenylsulphone, diphenylmethane, 2,2-diphenylpropane, bis-cyclohexylmethane or 2,2-bis-cyclohexylpropane, or a group R_{12}



wherein R_{12} and R_5 are as defined above, p is an integer 1 to 500, and q is an integer 1 to $(m + 1)$, provided that when q is greater than 1, each moiety in square brackets is independent of each other such moiety, and the total number, y, of radicals OR_5 does not exceed 500,and each R_3 has, independently, one of the significances of R_1 or is hydrogen, phenyl, naphthyl or phenylalkyl (C_7-C_{12}), or phenyl, naphthyl or phenylalkyl (C_7-C_{12}) substituted on the aromatic nucleus thereof by 1 to 3 alkyl (C_1-C_{12}), 1 cycloalkyl (C_5 to C_{12}), 1 or 2 alkoxy (C_1-C_{18}), 1 or 2 halogen, 1 phenyl and/or 1 phenoxy substituent, with 1 to 3 substituents and 1 to 18 carbon atoms in the aggregate thereof, a group



wherein R_1 is as defined above, or a group



wherein R_6 is alkyl (C_1-C_{21}), perfluoroalkyl (C_3-C_{10}), phenyl or naphthyl, or phenyl or naphthyl substituted by 1 to 3 halogen, 1 or 2 alkyl (C_1-C_{12}) or 1 or 2 alkoxy (C_1-C_{12}) substituents, with 1 to 3 substituents and 1 to 18 carbon atoms in the aggregate thereof with the proviso that the sum of x and y is a maximum of 500.

4,042,633

PROCESS FOR PREPARING DIISOPROPYL ETHER

Hanbury John Woods, Campbellville, Canada, assignor to Gulf Oil Canada Limited, Toronto, Canada

Filed June 7, 1976, Ser. No. 693,579
Int. Cl.² C07C *41/10, 41/06*
U.S. Cl. 260—614 R **7 Claims**

1. A process for the preparation of diisopropyl ether which comprises continuously feeding isopropanol, and optionally propylene, in the liquid phase under pressure into a reactor in which the feed material comes into effective contact with a solid catalyst, continuously withdrawing a mixture of reaction products and unreacted isopropanol and propylene from the reactor, and recovering diisopropyl ether from the mixture, said solid catalyst comprising acidic, sulfuric acid treated, Montmorilonite clay containing sufficient residual acidity to impart a pH below 4 thereto, said reactor being heated to maintain a temperature in the reactor in the range from substantially 120° C to substantially 250° C.

4,042,634

FLUOROCARBON SEPARATION PROCESS

Charles S. Cope, and Maurice J. Couture, both of Parkersburg, W. Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 15, 1976, Ser. No. 667,278
Int. Cl.² C07C *41/12*
U.S. Cl. 210—616 **15 Claims**

1. A process for separating vapors of tetrafluoroethylene and a fluoro(alkyl vinyl ether) of the formula $XCF_2(CF_2)_nO—CF=CF_2$ wherein X is F or H and *n* is an integer of 1-3, which comprises:

1. contacting a vapor comprising tetrafluoroethylene, and the fluoro(alkyl vinyl ether) with a liquid coolant solution consisting essentially of water and a solute selected from the group consisting of a) ethylene glycol present in an amount between about 50 and 85 percent by weight of water and solute and b) Ca Cl_2 present in an amount between about 22 and 33 percent by weight of the water and solute;

said liquid coolant solution on one hand and the fluoro(alkyl vinyl ether), on the other hand, being substantially immiscible; said contact being carried out at a temperature between about −40° C. and about 0° C.,

2. removing the liquid obtained from the contacting step,
3. separating the layer of ether from the layer of liquid coolant solution.

4,042,635

SPIRO COMPOUNDS

Paul Rys, Zurich, and Rolf Vogelsanger, Zumikon, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 528,620, Dec. 2, 1974, Pat. No. 3,950,403. This application Dec. 8, 1975, Ser. No. 638,573
Claims priority, application Switzerland, July 28, 1971, 11176/71
Int. Cl.² C07C *39/26*
U.S. Cl. 260—623 D **2 Claims**

1. A compound which contains a group of the formula,

$$—(CH_2)_n—X \quad (1)$$

which is bonded directly to an aromatic nucleus of an at least bicyclic, aromatic six-membered naphthalene ring system, wherein *n* is a positive integer havng a value of 2 and X represents a halogen atom.

4,042,636

METHOD FOR THE PREPARATION OF ALCOHOL-FREE ALKALI AND ALKALINE EARTH METAL ALCOHOLATES

Arnold Lenz, Cologne-Stammheim, and Walter Rogler, Bonn, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 482,977, June 25, 1974, Pat. No. 3,971,833. This application Nov. 12, 1975, Ser. No. 631,263
Claims priority, application Germany, July 2, 1973, 2333634
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.² C07C *29/00*
U.S. Cl. 260—632 A **1 Claim**

1. A process for the preparation of an alcohol-free alkali or alkaline earth metal alcoholate in an inert hydrocarbonaceous solvent which comprises contacting at least an equimolar amount of an alkali radical or alkaline earth metal in an inert hydrocarbonaceous solvent, which solvent is inert to said alkali or alkaline earth metal, with a monovalent C_1-C_{24} alkanol at an elevated pressure in a closed vessel and at a temperature of at least that at which crystal alcohol split off from the corresponding alkali or alkaline earth metal alcoholate under normal pressure and below the temperature at which alkali or alkaline earth metal alcoholate decomposes under the prevailing pressure.

4,042,637

PROCESS OF PURIFYING VINYL CHLORIDE

Emmett Jean Glazer, Stow, and Edwin Studley Smith, Cuyahoga Falls, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 15, 1976, Ser. No. 677,642
Int. Cl.² C07C *21/00*
U.S. Cl. 260—652 P **5 Claims**

1. The method which consists of contacting monomeric vinyl chloride with the zinc metal for a time sufficient for impurities in the vinyl chloride to react with said zinc metal to form an zinc compound and remove the impurity from the vinyl chloride.

4,042,638

PROCESS FOR PREPARING OLIGOMERS OF HEXAFLUOROPROPENE

Masahiro Ozawa, Kamifukuoka; Tadaaki Komatsu, Saitama, and Kimiaki Matsuoka, Kawagoe, all of Japan, assignors to Central Glass Co., Ltd., Ube, Japan

Filed Apr. 13, 1976, Ser. No. 676,494
Claims priority, application Japan, Apr. 17, 1975, 50-45818
Int. Cl.² C07C *21/18*; C08F *14/28*
U.S. Cl. 260—653.1 R **19 Claims**

1. A process for preparing oligomers of hexafluoropropene comprising subjecting hexafluoropropene to an oligomerization reaction in the presence of an alkali metal halide and a crown ether at a reaction temperature of about from −20° C. to 200° C., said oligomerization reaction being carried out in an organic solvent which is inert under the oligomerization reaction conditions, said alkali metal halide being present in an amount greater than 0.001 mol per liter of said organic solvent and said crown ether being present in an amount greater than 1/50 time that of said alkali metal halide on a mol basis.

4,042,639

OXYCHLORINATION PROCESS

Theodore H. Gordon, and Herman Fred Kummerle, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 703,301, Feb. 6, 1968, abandoned. This application Nov. 20, 1974, Ser. No. 525,550
Int. Cl.² C07C *21/02*
U.S. Cl. 260—656 R **2 Claims**

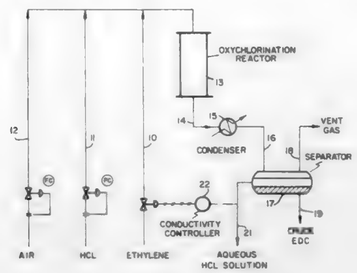
1. In the process for the vapor phase oxychlorination of ethane with oxygen and available chlorine at elevated temperatures in the presence of a catalyst comprising at least one compound of a multivalent metal to produce a vapor product comprising vinyl chloride, ethylene, hydrogen chloride and water which entrains some catalyst; the improvement which comprises condensing and absorbing from said vapor product inorganic constituents comprising said catalyst, hydrogen chloride and water, by intimately contacting said vapor product with a relatively cold, liquid, aqueous hydrogen chloride stream to form a resulting absorbate having a hydrogen chloride concentration greater than the azeotropic concentration at atmospheric pressure and a vapor stream containing vinyl chloride and ethylene and being substantially free of entrained catalyst, distilling at least a portion of said absorbate at a first pressure greater than atmospheric pressure to form an overhead of hydrogen chloride and a first stream of aqueous hydrogen chloride bottoms at substantially azeotropic concentration at said first pressure, recycling a first portion of said first stream of aqueous hydrogen chloride bottoms to said contacting step, distilling a second portion of said first stream of aqueous hydrogen chloride bottoms at a second pressure which is atmospheric pressure to form an overhead of water and a second stream of aqueous hydrogen chloride bottoms of substantially azeotropic concentration at said second pressure and recycling said second stream of aqueous hydrogen chloride bottoms to said distillation at said first pressure.

4,042,640

OXYCHLORINATION OF HYDROCARBONS

Utah Tsao, Jersey City, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Nov. 6, 1975, Ser. No. 629,361
Int. Cl.² C07C *17/15*
U.S. Cl. 260—659 A **7 Claims**



1. In a process for oxychlorinating a hydrocarbon by direct contact of a hydrocarbon, oxygen and hydrogen chloride feed to produce a gaseous effluent, containing chlorinated hydrocarbon, water vapor and hydrogen chloride, the improvement comprising:

recovering aqueous hydrogen chloride from said gaseous effluent;

determining the hydrogen chloride concentration of said recovered aqueous hydrogen chloride; and

controlling at least one of the hydrogen chloride and hydrocarbon feeds to increase and decrease the proportion of hydrogen chloride to hydrocarbon in response to changes in the hydrogen chloride concentration of said recovered aqueous hydrogen chloride from a predetermined hydrogen chloride concentration to thereby maintain said predetermined hydrogen chloride concentration which corresponds to a predetermined desired hydrogen chloride to hydrocarbon feed ratio.

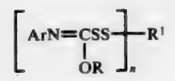
4,042,641

INHIBITING PREMATURE VULCANIZATION OF RUBBERS WITH N-ARYL-HYDROCARBYLDITHIO-FORMIMIDATE

John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 12, 1976, Ser. No. 666,286
Int. Cl.² C08C *11/54*; C08D *9/00*
U.S. Cl. 260—780 **10 Claims**

1. A rubber composition comprising vulcanizable diene rubber containing, in an amount effective to inhibit premature vulcanization thereof, a compound having the following structural formula



wherein Ar is an aryl radical derived from a benzenoid aromatic nucleus having 6 to 10 carbon atoms which is unsubstituted or substituted on the nucleus with one or two groups selected from the group consisting of chloro, nitro, alkyl and alkoxy groups, the alkyl and alkoxy groups containing 1 to 4 carbon atoms; wherein R is selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, cycloalkyl radicals having 5 to 20 carbon atoms and being unsubstituted or substituted with 1 or 2 alkyl radicals having 1 to 4 carbon atoms, aryl radicals having 6 to 10 carbons atoms and aralkyl radicals having 7 to 20 carbon atoms; wherein when n is 1, R^1 is selected from the same group of radicals as described for R and wherein when n is 2, R^1 is selected from the group consisting of straight chain or branched alkylene radicals having 2 to 10 carbon atoms and cycloalkylene radicals having 5 to 20 carbon atoms.

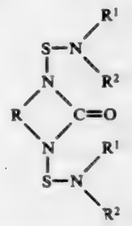
4,042,642

UREA ADDITIVES FOR SULFUR VULCANIZABLE POLYMERS

John P. Lawrence, Stow, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 266,040, June 26, 1972, Pat. No. 3,960,857. This application Jan. 26, 1976, Ser. No. 652,438
Int. Cl.² C08C *11/60*; C08D *9/00*
U.S. Cl. 260—780 **9 Claims**

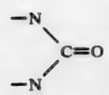
1. A sulfur vulcanizable rubber selected from the group consisting of natural rubber and synthetic homopolymers and copolymers of conjugated dienes having incorporated therein 0.25 to 10 parts by weight per 100 parts by weight of rubber of a urea having the following structural formula



wherein R is selected from the group consisting of saturated or olefinic divalent aliphatic radicals having 1 to 7 carbon atoms, saturated or olefinic divalent cyclic aliphatic radicals having 5 to 7 carbon atoms, arylene radicals having 6 to 10 carbon atoms and the radical



which together with the



radical forms a hydantoin ring wherein R^3 and R^4 are selected from the group consisting of hydrogen, alkyl radicals having 1 to 4 carbon atoms, cycloalkyl radicals having 5 to 6 carbon atoms, aralkyl radicals having 7 to 10 carbon atoms and aryl radicals having 6 to 10 carbon atoms or R^3 and R^4 can be joined to form with the attached carbon atom a hydrocarbon ring containing 5 to 6 carbon atoms, and wherein R^1 and R^2 are selected from the group consisting of alkyl radicals having 1 to 20 carbon atoms, cyanoalkyl radicals having 2 to 21 carbon atoms, cycloalkyl radicals having 5 to 20 carbon atoms, aralkyl radicals having 7 to 20 carbon atoms and aryl radicals having 6 to 20 carbon atoms and wherein R^1 and R^2 can be joined through a member of the group consisting of $—CH_2—$, —O— and —S— to constitute with the attached nitrogen atom a heterocyclic ring.

4,042,643

ORGANOPOLYSILOXANE COMPOSITIONS

Norman Geoffrey Creasey, and Leslie Clark Pike, both of Manchester, England, assignors to Imperial Chemical Industries Limited, England

Filed Nov. 4, 1975, Ser. No. 628,764

Claims priority, application United Kingdom, Nov. 15, 1974, 49485/74; June 27, 1975, 27290/75

Int. Cl.[2] B32B 9/04; C08L 83/04

U.S. Cl. 428—447 **13 Claims**

1. A composition suitable for conferring release properties on substrates comprising 100 parts by weight of a curable linear diorganopolysiloxane, a cross-linking agent therefore and/or a catalyst therefore and 0.1 to 50 parts by weight of a copolymer of the average general formula

$$A_3SiO(Me_2SiO)_x(MeRSiO)_y(MeHSiO)_zSiA_3$$

where R is selected from (a) alkyl groups having at least four carbon atoms, alkaryl, aralkyl and cycloalkyl groups; (b) groups $-R^1-QR^2$ where R^1 is a divalent group containing at least two carbon atoms and joined to silicon by a C-Si linkage, R^2 is a monovalent hydrocarbon group and W is either oxygen or sulphur; and (c) hydrocarbonoxy groups having at least four carbon atoms and joined to silicon by a C-Si linkage, A is selected from the groups R, lower alkyl groups, phenyl groups, alkenyl groups, alkoxy groups, hydroxy groups and hydrogen, *x* and *z*, which will not normally be the same, are O or a number not greater than 950, *y* is a number from 1 to 1000, x + y + z is not less than 20 and not greater than 1000, y/(x + y + z) is not less than 0.05 and the total ratio of R:Si in the composition is not less than 1:2000.

4,042,644

PROCESS FOR PRODUCING OF POLYMERS BY CONNECTING OF POLYMERIC MOLECULES

Frantisek Hrabak; Vlasta Hynkova, both of Prague, and Jan Lokaj, Letonice by Vyskov, all of Czechoslovakia, assignors to Czechoslovenska akademie ved, Prague, Czechoslovakia

Continuation-in-part of Ser. No. 186,799, Oct. 5, 1971, abandoned. This application Aug. 17, 1972, Ser. No. 281,286

Int. Cl.[2] C08F 8/06; C08G 73/00, 85/00

U.S. Cl. 260—849 **4 Claims**

1. A process for connecting polymers wherein at least one of said polymers contains at least one tertiary amino group in the chain thereof comprising admixing said polymers in the presence of an oxidizing agent at ambient temperature for a period of time sufficient to cause substantial crosslinking of said polymers wherein said tertiary amino groups are present in a major proportion and the product formed is a crosslinked material.

4,042,645

PROCESS FOR PRODUCING THERMOSETTING FINISHING POWDERS

Kuniomi Hirota, Kamakura; Akio Masumoto, Yokohama; Hiroshi Ozawa, Yokohama; Nobuki Kobayashi, Yokohama, and Teruo Honda, Hiratsuka, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 91,197, Nov. 19, 1970, abandoned. This application Dec. 13, 1973, Ser. No. 426,954

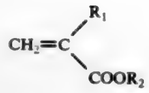
Claims priority, application Japan, Nov. 27, 1969, 44-94624; Dec. 29, 1969, 45-988; Feb. 12, 1970, 45-11482

Int. Cl.[2] C08F 2/20, 6/00; C08L 33/04

U.S. Cl. 260—830 P **6 Claims**

1. A process for producing a solid copolymer having a glass transition point of from 5° to 60° C and a number average molecular weight of from 1,500 to 30,000 which comprises copolymerizing a mixture of:

A. at least 30% by weight of total monomers of a monomer having the formula:



wherein R_1 is selected from the group consisting of H and CH_3 and R_2 is an alkyl radical containing from 1 to 14 carbon atoms;

B. a member selected from the group consisting of

1. from 3 to 20% by weight of total monomers of a monomer selected from the group consisting of ethylenic α,β unsaturated mono and dicarboxylic acids and anhydrides thereof,
2. from 3 to 40% by weight of total monomers of a monomer selected from glycidyl acrylate and glycidyl methacrylate; and

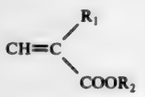
c. from 0 to 67% by weight of total monomers of an ethylenically monounsaturated monomer copolymerizable with said monomers (A) and (B),

the mixture being first bulk-polymerized until conversion to the copolymer is from 10% to 80% by weight and polymerization then being completed by suspension-polymerization in the presence of an effective amount of a polymerization initiator.

5. A thermosetting solid coating composition which comprises a powdery mixture prepared by mixing together and then crushing or grinding at a temperature of 0° to 30° C. to a powder:

a. 60 to 97% by weight of total mixture of a solid copolymer having a glass transition point of from 5° to 60° C. and a number average molecular weight of from 1,500 to 30,000 which comprises the copolymer of:

A. at least 30% by weight of total monomers of a monomer having the formula:



wherein R_1 is selected from the group consisting of H and CH_3 and R_2 is an alkyl radical containing from 1 to 14 carbon atoms;

B. from 3 to 40% by weight of total monomers of a monomer selected from glycidyl acrylate and glycidyl methacrylate; and

C. from 0 to 67% by weight of total monomers of an ethylenically monounsaturated monomer copolymerizable with said monomers (A) and (B), said solid copolymer being obtained by first bulk polymerizing said monomers until conversion to the copolymer is from 10% to 80% by weight and then completing polymerization by suspension-polymerization in the presence of an effective amount of a polymerization initiator; and

b. 40 to 3% by weight of total mixture of a cross-linking compound consisting of a compound containing in the molecule at least two radicals selected from the group consisting of carboxyl radicals and carboxylic acid anhydride radicals, said cross-linking compound being compatible with said solid copolymer when rendered molten by heating but not reacting with said solid copolymer to cause cross-linking before both said solid copolymer and said cross-linking agent are rendered molten,

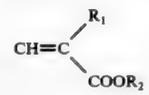
said powdery mixture being free of stickiness, high in thermal fluidity during baking when applied as a coating to a base material, and high in thermal stability, resistance to solvents, adhesion, mechanical strength and durability against weathering when it has been thermoset.

6. A thermosetting solid coating composition which comprises a powdery mixture prepared by mixing together and

then crushing or grinding at a temperature of 0° to 30° C. to a powder:

a. 60 to 97% by weight of total mixture of a solid copolymer having a glass transition point of from 5° to 60° C. and a number average molecular weight of from 1,500 to 30,000 which comprises the copolymer of:

A. at least 30% by weight of total monomers of a monomer having the formula:



wherein R_1 is selected from the group consisting of H and CH_3 and R_2 is an alkyl radical containing from 1 to 14 carbon atoms;

B. from 3 to 40% by weight of total monomers of a monomer selected from glycidyl acrylate and glycidyl methacrylate; and

C. from 0 to 67% by weight of total monomers of an ethylenically monounsaturated monomer copolymerizable with said monomers (A) and (B), said solid copolymer being obtained by first bulk polymerizing said monomers until conversion to the copolymer is from 10% to 80% by weight and then completing polymerization by suspension-polymerization in the presence of an effective amount of a polymerization initiator; and

b. 40 to 3% by weight of total mixture of a cross-linking compound consisting of a compound containing in the molecule at least two nitrogen atoms each having adjacent thereto at least one active hydrogen atom, said cross-linking compound being compatible with said solid copolymer when rendered molten by heating but not reacting with said solid copolymer to cause cross-linking before both said solid copolymer and said cross-linking agent are rendered molten,

said powdery mixture being free of stickiness, high in thermal fluidity during baking when applied as a coating to a base material, and high in thermal stability, resistance to solvents, adhesion, mechanical strength and durability against weathering when it has been thermoset.

4,042,646

PROCESS FOR CURING UNSATURATED RESINS

Koji Edamura; Yoshimasa Nakagawa, and Yoshitaka Ikeda, all of Aichi, Japan, assignors to Nihon Yushi Co., Ltd., Tokyo, Japan

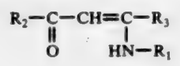
Filed Aug. 27, 1975, Ser. No. 608,041

Claims priority, application Japan, Sept. 2, 1974, 49-99969

Int. Cl.[2] C08L 67/06

U.S. Cl. 260—864 **12 Claims**

1. In a process for hardening unsaturated polyester resins which comprises contacting a mixture of an unsaturated polyester resin and a vinyl monomer copolymerizable therewith, with a hardening agent, the improvement which comprises; said hardening agent is a mixture of a peroxide containing a hydroperoxy group and a β-amino-α,β-unsaturated ketone having the formula



wherein

R_1 is hydrogen, alkyl having one to 6 carbon atoms, cyanoalkyl or hydroxyalkyl having one to 6 carbon atoms, cycloalkyl having 3 to 12 carbon atoms or aralkyl,

R_2 and R_3 each are hydrogen, alkyl having one to 6 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, aryl, alkoxy or amino.

4,042,647

LATEX SUSPENSION PROCESS AND GRAFT POLYBLEND COMPOSITION USING SMALL PARTICLE SIZE SPINE

Robert J. Cornell, Naugatuck, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Filed Mar. 21, 1975, Ser. No. 560,988

Int. Cl.[2] C08L 25/10

U.S. Cl. 260—880 R **9 Claims**

1. A composition consisting essentially of a polyblend of

a. a matrix of a copolymer of from about 60–80% of a monovinylidenic aromatic hydrocarbon and from about 20–40% of an ethylenically unsaturated nitrile monomer; and

b. a graft copolymer comprising a graftable rubber substrate made up of a cross-linked small particle size spine of a styrene/butadiene rubber wherein the ratio of styrene to butadiene is from about 31 to 69 to 0 to 100, and grafted onto said substrate, a superstrate which is a copolymer comprising a monovinylidene aromatic hydrocarbon and an ethylenically unsaturated nitrile, the degree of grafting, which is defined as the ratio of the weight of the grafted copolymer to the weight of the substrate, being between about 0.3 and 1.3; said substrate constituting about 5 to 45% by weight of the total composition and being in the form of particles at least 85% of which have a number average particle size less than 0.14μ, said composition being formed by suspension polymerizing said substrate with from 55–95% of at least one monoethylenically unsaturated monomer in a suspending solution in an oxygen free atmosphere at a temperature of about 105°–250° F. in the presence of a catalytically effective amount of at least one polymerization initiator selector from the group consisting of peroxide initiators and azo initiators, at least one chain transfer agent and an antioxidant.

4,042,648

OLEFIN-ACRYLIC ESTER COPOLYMER-THERMOPLASTIC RESIN COMPOSITION

Shuji Kitamura, Toyonaka; Takashi Kato, Amagasaki, and Masaaki Hirooka, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed May 4, 1973, Ser. No. 357,181

Claims priority, application Japan, May 10, 1972, 47-46675

Int. Cl.[2] C08L 23/14

U.S. Cl. 260—896 **21 Claims**

1. An olefin-acrylic ester copolymer-thermoplastic resin composition comprising

one part by weight of an aliphatic olefin-acrylic ester copolymer, said aliphatic olefin having at least three carbon atoms and

0.01 to 100 parts by weight of at least one thermoplastic resin having a modulus of elasticity of 10^3 to 10^5 kg/cm^2 at room temperature, and selected from the group consisting of crystalline vinyl resins and non-crystalline vinyl resins having a second order transition point of at least 10° C, said vinyl resins being homopolymers or copolymers of ethylene, propylene, butene-1, 4-methylpentene-1, styrene, vinyl toluene, α-methylstyrene, monochlorostyrene, vinyl chloride, vinylidene chloride, acrylonitrile, methacrylonitrile, vinyl acetate, vinyl propionate and methacrylic esters.

4,042,649

1,2-OXAPHOSPHOLANES

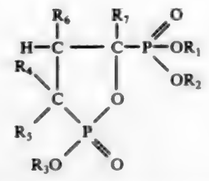
Roland A. E. Winter, Armonk, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,403

Int. Cl.[2] C07F 9/15; C08K 5/53

U.S. Cl. 260—927 R **11 Claims**

1. A compound of the formula



wherein each of R_1, R_2 and R_3 independently denotes alkyl of 1 to 18 carbon atoms; each of R_4, R_5 and R_6 independently denotes hydrogen or methyl; and R_7 denotes alkyl of 1 to 8 carbon atoms or when R_4 is methyl, R_6 is hydrogen, R_5 together with R_7 can denote 2,2-dimethyl-1,3-trimethylene.

4,042,650

CARBOXYPHOSPHONATE BRUSH CONTROL AGENTS

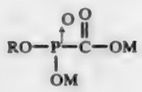
Colin Leslie McIntosh, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 590,374, June 25, 1975, which is a continuation-in-part of Ser. No. 381,619, July 23, 1973, abandoned. This application Aug. 31, 1976, Ser. No. 719,166

Int. Cl.² C07F *9/32;* A01N *9/36*

U.S. Cl. 260—924 **1 Claim**

1. A compound of the formula:

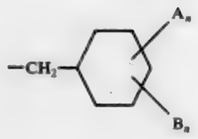


wherein

M is chosen from



R is alkyl of 1 to 8 carbons, optionally substituted with a chlorine, a bromine, a fluorine, or an iodine; alkenyl of 3 to 8 carbon atoms, or



where

A is chlorine or methyl, B is chlorine or methyl, *n* is 0 or 1, *m* is 0 or 1;

R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;

R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms; and

R_4 is hydrogen or alkyl of 1 to 12 carbon atoms, provided that the total number of carbon atoms in R_1, R_2, R_3 and R_4 is less than 16.

4,042,651

SUPPORTING FRAMEWORK FOR HEAT TRANSFER SURFACES FOR COOLING TOWER

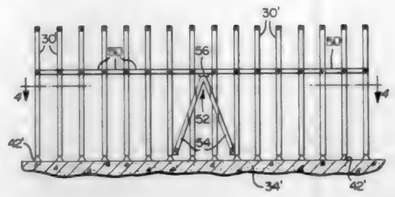
Raphael Emile Gaurois, Brussels, Belgium, assignor to Hamon Sobelco S.A., Belgium

Filed May 25, 1976, Ser. No. 689,835

Claims priority, application Luxembourg, May 28, 1975, 72596

Int. Cl.² B01F *3/04*

U.S. Cl. 261—111 **9 Claims**



1. An atmospheric cooling tower assembly comprising:

a foundation,

an upwardly extending peripheral wall defining a tower structure supported by said foundation, said wall having an air inlet opening adjacent its lower end communicating with an open upper end for the flow of atmospheric air through the tower structure,

a sump at the lower end of the tower structure below the air inlet opening,

liquid distribution pipes in said tower structure between the upper end of the air inlet and the open upper end of the tower structure,

cooling tower fill comprising heat exchange surfaces positioned below the liquid distribution pipes,

supporting framework for said heat exchange surfaces,

said supporting framework comprising a plurality of primary generally vertically directed support members extending upwardly from said sump, means hingedly interconnecting the said plurality of primary support members, further support members having stationary bearings, means connecting the said further support members to said primary support members via elastic members having a high modulus of compression and a low modulus of elasticity relative to the primary support members and said further support members forming the supporting framework.

4,042,652

METHOD FOR THE PRODUCTION OF SILICONE ELASTOMER-CONTAINING ARTICLES

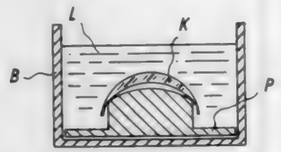
Paul Feneberg, Planegg, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Continuation of Ser. No. 561,674, March 25, 1975, abandoned. This application Aug. 24, 1976, Ser. No. 717,203

Claims priority, application Germany, Mar. 28, 1974, 2414928

Int. Cl.² B29D *11/00*

U.S. Cl. 264—1 **9 Claims**



1. In the making of contact lenses the steps of shaping a silicone elastomer lens by means of a pressure-die comprising two complementary die members, the shaped lens at the end of the shaping step adhering to one of the die members, applying a swelling agent to the lens after shaping which agent is adapted to penetrate the silicone elastomer of the lens whereby the lens spontaneously separates from the said die member, thereafter removing the swelling agent from the lens so as to cause the lens to become deswollen to the shape it had adopted prior to application of said swelling agent and recovering the shaped lens.

4,042,653

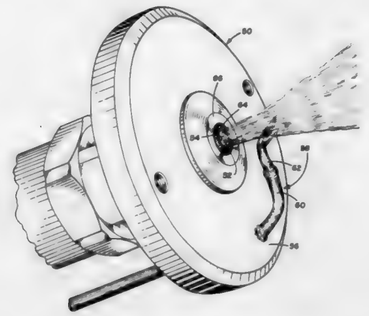
PROCESS FOR SPRAY FORMING OF DISCRETE PARTICLES

Edgar Joachim Beyn, Annapolis, Md., assignor to SCM Corporation, New York, N.Y.

Filed July 31, 1974, Ser. No. 493,323

Int. Cl.² B01J *2/02*

U.S. Cl. 264—7 **13 Claims**



1. In a process for forming and collecting aggregate particles from a sprayable substance which comprises a fraction of normally solid particulate matter and a fraction of a fluent bonding agent in addition to the solid matter, said process including the steps of:

a. atomizing said sprayable substance into a conversion zone;

b. said sprayable substance during said atomizing step forming a pattern of droplets of various sizes including a first group of droplets of solid particulate matter and bonding agent having a droplet size within a range and a second group of droplets of finer size less than the sizes in said range;

c. establishing in said conversion zone conditions for hardening said bonding agent and forming discrete aggregates of said first group of droplets having an ostensibly dry surface, said bonding agent on hardening having sufficient strength to bond the particulate matter to form said aggregates;

the improvement comprising:

1. intercepting said pattern of droplets with a spray of an auxiliary fluent binder also hardenable under conditions of the conversion zone;

2. maintaining said auxiliary binder and said pattern of droplets in an agitated state to mutually engage said second group of droplets of finer size and said auxiliary binder prior to hardening of the auxiliary binder forming additional aggregates of said second group of droplets of finer size and said auxiliary binder; and

3. removing said resulting aggregates from said zone.

4,042,654

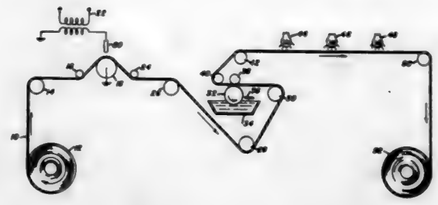
MANUFACTURE OF PLASTIC PARTS BY RADIATION MOLDING

Gerald M. Leszyk; Edward D. Morrison, and Robert F. Williams, Jr., all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 13, 1975, Ser. No. 558,031

Int. Cl.² B29C *13/04*

U.S. Cl. 264—22 **15 Claims**



14. A method of making plastic parts which is especially adapted to the manufacture of small thin parts of complex shape having precise tolerances, said method comprising the steps of:

1. advancing a polymeric web into a casting zone,

2. casting onto the surface of said web within said casting zone a succession of discrete bodies of a viscous composition which is radiation-curable to a solid plastic without undergoing significant shrinkage, said discrete bodies having a predetermined shape corresponding to the shape of the plastic part which it is desired to form and a thickness in the range of from about 2 to about 20 mils, and said viscous composition having a viscosity in the range from about 200 to about 10,000 centipoises whereby said discrete bodies maintain the shape in which they are cast while supported only by said web during subsequent travel of said web,

3. advancing said web bearing said discrete bodies of radiation-curable composition into a curing zone while maintaining said discrete bodies in the shape in which they were cast,

4. irradiating said discrete bodiesof radiation-curable composition within said curing zone to effect curing of said composition and form thereby solid plastic bodies having the desired shape and precise tolerances which are strippable from said web,

5. withdrawing said web bearing said discrete bodies of solid plastic from said curing zone, and

6. stripping said discrete bodies of solid plastic from said web to thereby obtain the desired plastic part.

15. A method of making plastic parts which is especially adapted to the manufacture of small thin part of complex shape having precise tolerances, said method comprising the steps of:

1. advancing a polymeric web into a casting zone,

2. casting onto the surface of said web within said casting zone a succession of discrete bodies of a viscous composition which is radiation-curable to a solid plastic without undergoing significant shrinkage, said discrete bodies have a predetermined shape corresponding to the shape of the plastic part which it is desired to form and a thickness in the range of from about 2 to about 20 mils, and said viscous composition having a viscosity in the range from about 200 to about 10,000 centipoises whereby said discrete bodies maintain the shape in which they are cast while supported only by said web during subsequent travel of said web,

3. advancing said web bearing said discrete bodies of a radiation-curable composition into a curing zone while maintaining said discrete bodies in the shape in which they were cast,

4. irradiating said discrete bodies of radiation-curable composition within said curing zone to effect curing of said composition and form thereby solid plastic bodies having

the desired shape and precise tolerances which are bonded to said web,

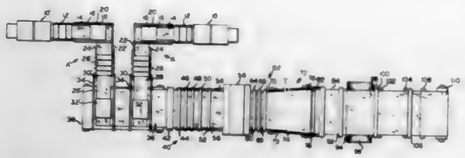
5. withdrawing said web bearing said discrete bodies of solid plastic from said curing zone, and
6. cutting said web into portions each of which includes at least one of said discrete bodies of solid plastic to thereby obtain the desired plastic part.

4,042,655

METHOD FOR THE PRODUCTION OF A NONWOVEN FABRIC

Louis Platt, Seneca; Marvin Wishman, Greenville, both of S.C.; David R. Gentry, Chamblee, Ga., and Jake E. Williams, Rockwall, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sept. 5, 1975, Ser. No. 610,899
Int. Cl.² B29D *27/00*; D04H *18/00*
U.S. Cl. 264—25 **13 Claims**



1. A method for the production of a nonwoven fabric comprising, in combination, the steps of:

a. forming a batt comprising staple fibers wherein said staple fibers are positioned primarily in a first direction;
b. passing said batt to a first drafting zone;
c. drafting said batt in said first drafting zone in a second direction, said second direction being primarily perpendicular to said first direction;
d. needling said drafted batt;
e. drafting said needled batt in a second drafting zone in said second direction; and
f. drafting said batt in a third drafting zone in said first direction.

4,042,656

GRAPHITE-BASE FILLING MATERIAL FOR THE DECOMPOSITION OF ALKALI METAL AMALGAMS AND METHOD OF PRODUCING SAME

Vladimir Petrovich Chviruk, ulitsa Tampere, 1, kv. 79; Nina Vasilievna Koneva, prospekt Nauki, 142/1, korpus 14, kv. 35/7; Alexandr Afanasievich Kilkinov, ulitsa Nikolaya Lebedeva, 3, kv. 38, all of Kiev; Alexandr Viktorovich Demin, ulitsa Pljuscheva, 18, korpus 2, kv. 105; Nikolai Nikolaevich Shipkov, ulitsa Moldogulovoi, 18, korpus 2, kv. 157, both of Moscow; Konstantin Alexeevich Kosinsky, ulitsa Uritskogo, 8, kv. 29, Ljubertsy; Georgy Mikirtychevich Kamarian, Kotelnicheskaya naberezhnaya, 25, korpus 8, kv. 45, Moscow; Ernest Elizarovich Nemirovsky, Zeleny prospekt, 11-a, kv. 19, Moscow, and Igor Nikolaevich Samokhin, I Vladimirskaya, 8, kv. 7, Moscow, all of U.S.S.R.

Filed Apr. 21, 1975, Ser. No. 569,618
Int. Cl.² B29C *25/00*
U.S. Cl. 264—29.5 **10 Claims**

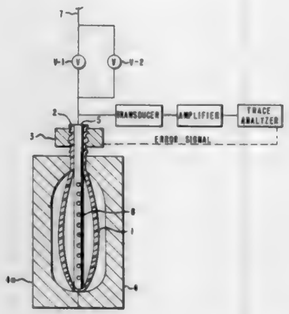
1. A method of producing a graphite-base filling material for the decomposition of alkali metal amalgams and containing between 69 and 35 weight percent of graphite and between 31 and 65 weight percent of titanium carbide, comprising forming a mixture at a temperature of about 100° C containing a carbon filler in powder form, selected from the group consisting of petroleum coke, shale coke, and graphite, and in an amount ranging between 15 and 45.2 weight percent, a carbon-containing binding agent selected from the group consisting of coal pitch, petroleum pitch, and phenol-formaldehyde resin in an amount ranging between 18 and 30 weight percent, and a titanium substance selected from the group consisting of titanium, titanium carbide, and titanium oxide, said titanium substance being in the form of a powder having a particle size of about from 40 to 250 microns and being employed in an amount ranging between 24.8 and 52.0 weight percent based on the amount of titanium present, moulding the resulting mixture into blanks of a desired size and shape, firing the thus-moulded blanks at a temperature of about from 500° to 1200° C for a period of time between 30 and 400 hours, and graphitizing the resulting fired blanks at a temperature of about from 1700° to 1800° C for a period of time between 10 and 50 hours.

4,042,657

PROCESS FOR THE AUTOMATIC INSPECTION OF BLOW-MOLDED ARTICLES

George Joseph Ostapchenko, Wilmington, Del., and Terrance Duane Phillips, Aiken, S.C., assignors to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Feb. 20, 1976, Ser. No. 659,934
Int. Cl.² B29C *17/07*
U.S. Cl. 264—40.1 **6 Claims**



1. In a blow-molding process wherein a heated thermoplastic preform having a prefinished neck, sidewall, and closed bottom is (1) placed in a mold, (2) is axially stretched by an inserted mandrel while partially inflating the preform, and (3) is then completely inflated against the mold under increased pressure to form a hollow thermoplastic article, the improvement wherein the hollow thermoplastic article is produced while

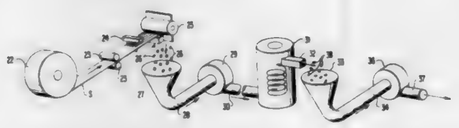
a. measuring fluid pressure variations in the preform as it is inflated,
b. comparing the measured fluid pressure variations with a standard pressure trace representative of commercial quality, hollow thermoplastic articles, and
c. rejecting hollow thermoplastic articles having fluid pressure measurements which deviate substantially from the standard pressure trace.

4,042,658

METHOD FOR MAKING PACKAGING PARTICLES AND RESULTING PRODUCT

Frederick H. Collins, Thousand Oaks, Calif., assignor to Valcour Imprinted Papers, Inc., Glens Falls, N.Y.

Filed Nov. 14, 1975, Ser. No. 632,073
Int. Cl.² B29D *27/00*
U.S. Cl. 264—45.5 **16 Claims**



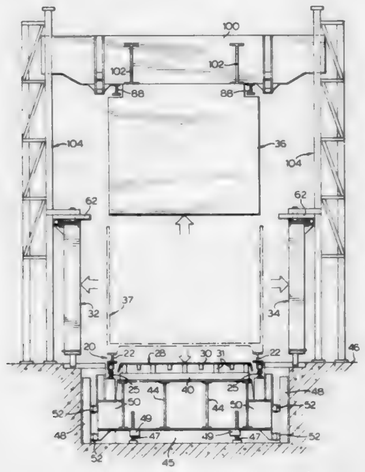
1. Method of making foamed, distorted sheet particles suitable for use as packaging particles from an extrudable, expandable synthetic plastic material capable of being oriented upon stretching, comprising, extruding a foamed sheet of said material while orienting said sheet and chilling one surface thereof more rapidly than the other surface thereof as it is extruded to form thereon an integral skin of higher density material on said one surface than on said other surface and the remaining portions of said sheet, said foamed sheet comprising a foamed portion and said skin; cutting said sheet into a plurality of smaller sheet-like pieces; and subjecting said smaller pieces to heat at a foaming temperature to cause further expansion of said foamed portion and shrinkage of said skin to result in distortion of said pieces to form a curved configuration.

4,042,659

METHOD OF MOLDING MODULAR BUILDINGS

Alden Joseph Botting, 97 Westhumber Boulevard, Rexdale, Ontario; John Michael Mulcahy, 1500 Eglinton Avenue W., Apt. 409, and William James Hannah, 376 O'Connor Drive, both of Toronto, Ontario, all of Canada

Filed May 6, 1974, Ser. No. 467,365
Int. Cl.² B28B *1/08, 1/10*
U.S. Cl. 264—71 **5 Claims**



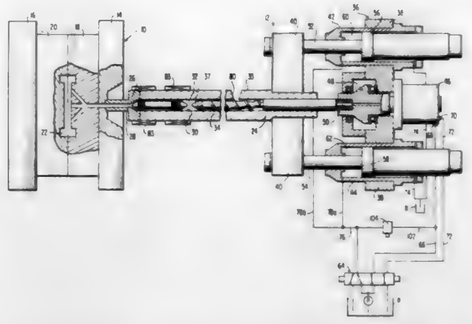
1. A method of manufacturing a monolithic reinforced concrete modular building unit comprising the steps: horizontally moving and introducing a steel reinforcing mesh assembly supported on a pallet to a moulding position between an upwardly retracted closed-bottom interior core, adapted to be vertically reciprocal with a pair of opposed exterior end walls, and a downwardly retracted exterior mould floor; elevating said mould floor vertically upwardly into tight abutment with the pallet and extending said interior core vertically downwardly towards said floor mould into rigid alignment and near abutment therewith for defining a floor space therebetween, said end walls moving vertically downwardly with said core; extending said pair of opposed exterior end walls horizontally inwardly towards each other into tight abutment with the pallet and into near abutment with the core for defining end wall spaced therebetween; extending a pair of opposed exterior side walls horizontally towards each other into tight abutment with the pallet and into near abutment with the core for defining side wall spaces therebetween, said floor space and said end and side wall spaces forming a continuous moulding cavity; introducing concrete into the moulding cavity; permitting said concrete to partially cure; retracting the opposed mould end and side walls outwardly from each other, retracting the interior core vertically upwardly with the said retracted end walls, and retracting the mould floor downwardly from the partially cured concrete; and removing the resulting building unit on the pallet from the moulding position.

4,042,660

MOTTLED APPEARANCE INJECTION MOLDING METHODS

Thomas G. Bishop, Mount Gilead, Ohio, assignor to HPM Corporation, Mount Gilead, Ohio

Division of Ser. No. 382,500, July 25, 1973, Pat. No. 3,945,786.
This application Jan. 14, 1976, Ser. No. 649,063
Int. Cl.² B29F *1/12*
U.S. Cl. 264—77 **1 Claim**



1. A method of molding an article of mottled appearance comprising the steps of:

introducing molding materials of different coloration into an injector housing bore containing a rotatable screw;
rotating said screw to advance said materials and discharge said materials from said screw in a softened condition which is short of a fully blended condition so that distinct color patterns are present;
heating a portion of said housing located ahead of said screw;
translating said screw forwardly to advance said softened materials toward said heated housing portion containing a spreader, so that the softened materials are spread outwardly and travel through a passage formed by said spreader in a direction parallel to the axis of said bore to facilitate melting and minimize mixing of said materials;
discharging said materials from a discharge opening of said housing in a fully melted condition but short of a fully mixed condition, so that distinct color patterns are present.

4,042,661

METHOD AND APPARATUS FOR FORMING TUBULAR MULTILAMINATE PLASTIC FILM

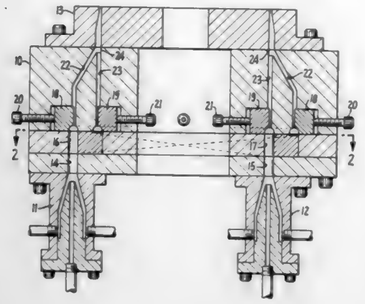
Stephen Olney Cook, Mill Valley, Calif., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed Jan. 23, 1976, Ser. No. 651,983
Int. Cl.² B29F *3/10*
U.S. Cl. 264—173 **1 Claim**

1. A method of producing a tubular plastic film having four or more resin layers comprising

a. combining at least two resin streams into a first stream of parallel layers of the resins and continuously feeding said first stream into a first annular space without compressing the stream in a direction perpendicular to the plane of the layers such that the first stream divides into two substreams which flow in opposite directions about the axis of the annular space and then join to form a first annular stream in which the layers are coaxial, the height of each substream being reduced as it flows through the annular space,
b. combining the other resin streams into a second stream of parallel layers of the resins and continuously feeding the

second stream into a second annular space substantially concentric with the first annular space without compressing the stream in a direction perpendicular to the plane of the layers such that the stream divides into two substreams which flow in opposite directions about the axis of the second annular space and then join to form a second annular stream in which the layers are coaxial, the height of each substream being reduced as it flows through the annular space, the second stream of parallel layers being fed into the second annular space at a location offset from



the location at which the first stream of parallel layers is fed into the first annular space,

c. regulating the flow of the first annular stream from the first annular space and, independently, regulating the flow of the second annular stream from the second annular space,

d. combining the first and second annular streams into a composite annular stream, and

e. expressing the composite stream through an annular orifice to form the tubular film.

4,042,662

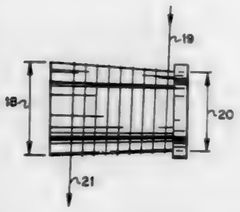
CONTINUOUS MELT SPINNING AND DRAWING OF NYLON 6 YARN, WHILE REDUCING THE LIVELINESS OF THE YARN

Thomas F. Corbin, Jr.; Brewster B. Eskridge, and Boyce M. Lyon, all of Asheville, N.C., assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 36,743, May 13, 1970, abandoned. This application Mar. 18, 1974, Ser. No. 452,041

Int. Cl.[2] B29C *25/00;* **D01F** *6/60;* **D06M** *15/12*

U.S. Cl. 264—210 F **2 Claims**



1. A process for continuously melt spinning and drawing nylon 6 to form a yarn comprising the steps of melt extruding said yarn, applying an aqueous emulsion finish to said yarn immediately after extrusion, thereby causing lengthening of and liveliness in said yarn, passing said yarn while in an undrawn state through at least two stages of a substantially unheated winding zone, increasing the rate of speed of the yarn at least between the first and second stages of passage within said winding zone an amount sufficient to compensate for said yarn lengthening and to thereby reduce the yarn liveliness resulting therefrom, and drawing said yarn away from the last stage of said winding zone.

4,042,663

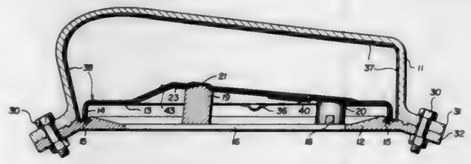
MONOLITHIC SEAT CUSHION AND METHOD FOR PRODUCING SAME

Arthur J. Harder, Jr., Franklin Park, Ill., assignor to Coach and Car Equipment Corporation, Elk Grove Village, Ill.

Filed Dec. 16, 1974, Ser. No. 533,253

Int. Cl.[2] B29C *5/07;* **B29D** *27/04*

U.S. Cl. 264—45.7 **6 Claims**



1. A process for manufacturing a seat cushion having a rigid pan, a flexible plastic seat cover, and a resilient, foamed plastic interior, said process comprising the steps of:

providing a rotational casting mold having a first part and a second part with an opening therein;

providing, on said second mold part, a continuous, elongated seal located outside the periphery of said opening and conforming substantially to the periphery of said rigid pan;

placing said rigid pan in said second mold part over said opening and against said continuous seal and engaging said pan with said continuous seal along the periphery of said pan;

assembling said first mold part, said second mold part and said pan to define a closed mold cavity at least one wall of which is at least partly defined by said pan;

introducing, into said cavity, rotationally castable raw plastic material for said flexible plastic seat cover;

heating and rotating said mold, with said raw plastic material within the mold, to form a closed, hollow seat cushion shell having at least one wall defined at least in part by said rigid pan and having its remaining wall portions composed of said flexible plastic material rotationally cast integral with said pan;

said last recited step comprising bonding said flexible plastic wall parts integrally with said rigid pan along the periphery of said pan adjacent said continuous seal;

holding said pan against said seal during said heating and rotating steps to prevent leakage of said plastic material outside said mold cavity at the periphery of said pan;

introducing, into said hollow cushion shell, unfoamed ingredients capable of foaming to produce said resilient, foamed plastic interior;

and foaming said last recited ingredients within said shell to completely fill the shell's interior with resilient foamed plastic.

4,042,664

METHOD FOR SEPARATING METAL CONSTITUENTS FROM OCEAN FLOOR NODULES

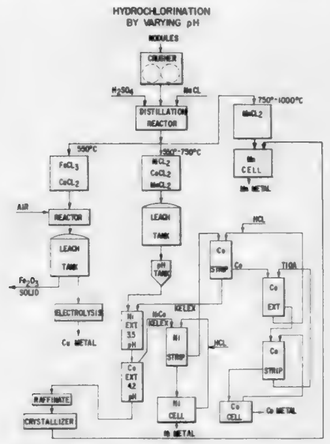
Paul H. Cardwell, Zanoni, and William S. Kane, Wicomico, both of Va., assignors to Deepsea Ventures, Inc., Gloucester Point, Va.

Continuation of Ser. No. 247,554, April 26, 1972, Pat. No. 3,950,486, which is a continuation-in-part of Ser. No. 40,564, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 40,565, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 40,587, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 40,590, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 40,730, May 26, 1970, abandoned, which is a continuation-in-part of Ser. No. 184,770, Sept. 29, 1971, abandoned, which is a continuation-in-part of Ser. No. 142,697, May 12, 1971, Pat. No. 3,752,745, which is a continuation-in-part of Ser. No. 184,771, Sept. 29, 1971, Pat. No. 3,773,635. This application June 11, 1975, Ser. No. 586,139

The portion of the term of this patent subsequent to Aug. 14, 1990, has been disclaimed.

Int. Cl.[2] C01G *3/04, 51/08, 53/08, 45/06*

U.S. Cl. 423—24 **24 Claims**



1. A process for the recovery of pure metal halides from ocean floor nodule ore, the ore comprising, as major components, the oxides of manganese and iron and as secondary components, compounds of copper, cobalt and nickel, the weight ratio of manganese-to-nickel-plus cobalt being at least about 9, the process comprising the steps of (1) reacting the nodule ore with a halide salt-forming reagent, selected from the group consisting of hydrogen halides and combinations of an elemental halogen with a selective reducing reagent, to form a mixture comprising the corresponding water-soluble halide salts of divalent manganese, trivalent iron, copper, nickel and cobalt, the reducing reagent being selected from the group consisting of carbon, hydrocarbons and carbon monoxide; (2) converting the ferric halide to water-insoluble ferric oxide; (3) dissolving the remaining metal halide salts in water to form an iron-free pregnant aqueous solution of the water-soluble halides, containing concentration of manganese and concentration of nickel, cobalt plus copper proportional to the concentrations in the nodule ore and separating the solution from the insoluble ferric oxide; and (4) contacting the pregnant aqueous solution with a water-immiscible organic extracting solution comprising an extraction agent selective for copper and selected from the group consisting of alpha-hydroxyoximes and hydrocarbon-substituted-**8-hydroxy** quinolines, the aqueous solution having a pH not greater than about 2.5.

4,042,665

COBALT ION EXCHANGE PROCESS

William Ronald Hatch, Bolton, Canada, assignor to Falconbridge Nickel Mines Limited, Toronto, Canada

Filed Sept. 27, 1976, Ser. No. 726,994

Int. Cl.[2] C22B *23/04*

U.S. Cl. 423—139 **22 Claims**

1. A method of recovering cobalt from ammoniacal solution comprising bringing the solution into contact with carbonaceous material, the solution redox potential being in the range +20 to −150 mV as measured by a platinum-calomel standard electrode pair, extracting the cobalt from the leach solution with a cationic ion exchange reagent, and, recovering substantially all the cobalt from the ion exchange reagent by elution.

4,042,666

METHOD OF TREATING PHOSPHATE-CONTAINING MATERIAL TO REDUCE PROBLEM WITH CLAY SWELLING

Herbert L. Rice, Fort Worth, and Roy A. Wilkins, Arlington, both of Tex., assignors to Petrochemicals Company, Inc., Fort Worth, Tex.

Filed Feb. 2, 1976, Ser. No. 654,185

Int. Cl.[2] C01F *1/00, 5/00, 11/00;* **C22B** *26/20*

U.S. Cl. 423—167 **23 Claims**

1. In a process for treating clay-containing phosphate rock that includes the hydraulic transportation of finely divided phosphate rock wherein the phosphate rock is prepared in the form of an admixture of the phosphate rock in an aqueous slurry for handling; the improvement comprising the step of adding to said admixture a chemical selected from the class consisting of an aliphatic hydroxy acid containing 2–6 carbon atoms, inclusive; a water-soluble, inorganic salt of said aliphatic acid; and a blend of one of said aliphatic hydroxy acid and said salt of said aliphatic hydroxy acid with an alkali metal hydroxide; said chemical being added in at least an amount effective to reduce viscosity of said admixture at a predetermined time interval after addition below the viscosity of said admixture alone and such that said admixture can be pumped after 4 hours storage at concentrations of solids therein in excess of 65 percent by weight.

4,042,667

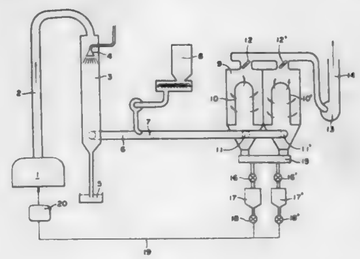
METHOD OF CLEANING WASTE GAS CONTAINING A FLUORINE COMPONENT

Shosuke Ishiwata, Ibaragi, and Kaoru Ozaki, Chigasaki, both of Japan, assignors to Asahi Fiber Glass Company Limited, Tokyo, Japan

Filed Apr. 17, 1975, Ser. No. 569,144

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 **26 Claims**



1. In a method of cleaning a fluorine-containing waste gas evolved from a furnace, by contacting said gas with a fluorine-reactive powder and filtering the fluorine-reactive powder by a filter, an improvement which comprises cooling the waste gas to 150°–400° C with a water spray;

feeding a fluorine-reactive powder into the cooled waste gas;
passing the cooled waste gas through a filter on which the fluorine-reactive powder is deposited so as to react with the fluorine component of the waste gas; and
removing the deposited powder layer from the filter.

4,042,668
SO_2 REMOVAL PROCESS
Jean Louis Balmat, Kennett Square, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 15, 1975, Ser. No. 622,749
Int. Cl.[2] C01B *17/00, 17/72, 17/68*
U.S. Cl. 423—243 **8 Claims**

1. A process for the removal of SO_2 from an oxygen-containing gas stream comprising contacting the gas stream with liquid water containing dispersed therein a catalytic amount of a chelate of manganese^{+2} and a β-diketone whereby the SO_2 is oxidized to SO_3 which is absorbed into the water thus forming sulfuric acid, the concentration of sulfuric acid dissolved in the water being less than about 40% by weight, basis total solution, and the β-diketone corresponding to the structure

$$R_1-\overset{O}{\overset{\|}{C}}-R_2-\overset{O}{\overset{\|}{C}}-CH_3, \text{ in which}$$

in which R_1 is a $C_{1\text{-}10}$ hydrocarbyl radical selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl, alkaryl and $C_{2\text{-}4}$ alkylene which when covalently bonded to a carbon atom from R_2 forms a cycloalkyl ring and R_2 is a bivalent hydrocarbyl radical selected from the group consisting of methylene and ethylidene and separating the unabsorbed gas from the absorbent.

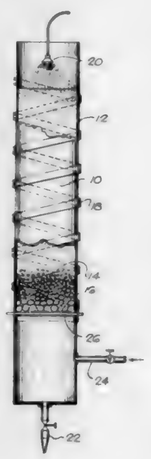
4,042,669
PROCESS FOR SEPARATION AND RECOVERY OF CARBON MONOXIDE
Marvin M. Johnson, and Donald C. Tabler, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Oct. 1, 1975, Ser. No. 618,721
Int. Cl.[2] C01B *31/18;* **C10K** *1/00;* **C01B** *21/00;* **B01D** *19/00*
U.S. Cl. 423—246 **22 Claims**

1. A process for the separation of carbon monoxide from a gas mixture containing same which comprises contacting said gas mixture in a contacting zone with an absorbent consisting essentially of an inert diluent and at least one copper (I) salt selected from the group consisting of:
a. the copper (I) salt of an alkane sulfonic acid having from 4 to 20 carbon atoms per molecule;
b. the copper (I) salt of an aromatic sulfonic acid having from 6 to 22 carbon atoms per molecule;
c. the copper (I) salt of a petroleum sulfonic acid; and
d. the copper (I) salt of a dialkyl phosphate having from 1 to 12 carbon atoms per alkyl member, said copper (I) salt being present in said diluent in an amount sufficient to complex at least a portion of said carbon monoxide in said gas mixture, and said diluent being a normally liquid hydrocarbon having a boiling point in the range of 60°–150° C.

4,042,670
PROCESS OF MAKING OXYGEN ENRICHED PLUTONIUM DIOXIDE (PuO_2)
Owen Lee Kruger, Columbus, Ohio, assignor to Nuclear Battery Corporation, Columbia, Md.
Continuation of Ser. No. 303,085, Nov. 2, 1972, abandoned. This application Oct. 1, 1974, Ser. No. 511,089
Int. Cl.[2] C01G *56/00;* **C09K** *3/00*
U.S. Cl. 423—251 **9 Claims**

1. Process for enriching $^{238}PuO_2$ with ^{16}O and forming sintered fuel pellets therefrom comprising
1. compressing a mass of $^{238}PuO_2$ into a pellet, the oxygen atoms of the $^{238}PuO_2$ mass having a natural distribution of the ^{16}O, ^{17}O and ^{18}O isotopes;
2. exposing said pellet to an atmosphere of oxygen enriched in the ^{16}O isotope and an inert carrier gas and gradually heating said pellet to a temperature of about 1400° C to obtain an exchange of ^{17}O and ^{18}O by ^{16}O and the simultaneous sintering of said pellet; and
3. cooling said sintered and exchanged pellet.

4,042,671
PROCESS FOR LEACHING SAND OR OTHER PARTICULATE MATERIAL
Frank W. Bowdish, 2440 Eleventh St., Sparks, Nev. 89431
Filed July 10, 1975, Ser. No. 594,857
Int. Cl.[2] C01B *33/12*
U.S. Cl. 423—340 **15 Claims**

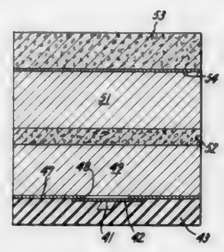


1. A process for leaching iron and other metallic compounds from sand with a series of aqueous solutions of differing compositions differing in concentrations of leaching component in the form of an acid, in which the aqueous solutions are fed to the top of the mass of the sand and permitted to drain through gravitationally with appropriate periods of time between solutions for reaction, said solutions of differing compositions forming series which begin with solutions low in concentration of the leaching component and continue with solutions of higher concentration of the leaching component until the solution of highest strength in the series has been reached at about midway through the leaching operation, after which solutions of progressively lower concentrations follow until the series of solutions terminate with one low in concentration of the leaching component, ending with a wash water, said solutions, except for the wash water, being made up largely of the drainage from a previous batch leach, to some of which leaching component is added to increase the concentration.

4,042,672
PROCESS FOR PREPARING CARBONATED ZIRCONIUM OXIDE HYDRATE
Wilhelm Brugger, Hosel, and Ekkehard Greinacher, Essen, both of Germany, assignors to Th. Goldschmidt AG, Germany
Filed Sept. 12, 1975, Ser. No. 612,855
Claims priority, application Germany, Oct. 30, 1974, 2451489
Int. Cl.[2] C01B *31/24;* **C01G** *25/00*
U.S. Cl. 423—419 R **4 Claims**

1. A process for preparing carbonated zirconium oxide hydrate which comprises adding zirconium oxychloride · 8 H_2O to a saturated aqueous ammonium chloride and/or alkali chloride solution which, based upon zirconium oxychloride · 8 H_2O, contains at least equimolecular amounts of ammonium carbonate and/or alkali carbonate,
separating the resulting precipitated reaction product, and washing said product chloride-free with water.

4,042,673
NOVEL DIAMOND PRODUCTS AND THE MANUFACTURE THEREOF
Herbert M. Strong, Schenectady, N.Y., assignor to General Electric Company, Columbus, Ohio
Filed Nov. 2, 1973, Ser. No. 412,332
Int. Cl.[2] C01B *31/06*
U.S. Cl. 423—446 **17 Claims**



1. A high quality diamond crystal symmetrical about a cube axis displaying a relatively colorless or white pair of three-dimensional linear bands in crossed relationship when said crystal is viewed along said cube axis, the balance of the crystal contiguous with said bands having a blue color due to the presence of boron, the overall pattern being symmetrical.

5. In a reaction vessel for introduction into the reaction volume of a high pressure, high temperature apparatus, said reaction vessel constituting an assembly of interfitting elements for enclosing at least one diamond seed and a source of substantially pure carbon separated by a mass of metallic catalyst-solvent for the diamond-making reaction disposed therebetween so as to provide a predetermined temperature gradient between said diamond seed and said source of carbon under operating conditions of pressure and temperature in the diamond stable region of the phase diagram of carbon, said diamond seed and said source of carbon being located in separate regions of said reaction vessel such that under said operating conditions said diamond seed will be at a temperature near the minimum value of temperature for said temperature gradient and simultaneously said source of carbon will be at a temperature near the maximum value of temperature for said temperature gradient, the improvement comprising:
a. a layer of isolating material disposed in contact with the diamond seed and between said diamond seed material and the mass of catalyst-solvent material, said isolating material being selected from the group consisting of platinum, molybdenum, titanium, tantalum, tungsten, iridium, osmium, rhodium, palladium, vanadium, ruthenium, chromium, hafnium, rhenium, niobium and zirconium and alloys thereof and in any given reaction vessel construction said isolating material having a melting point, when in contact with diamond, that is higher than the melting point of the metallic catalyst-solvent saturated with carbon dissolved therein when in contact with diamond,
b. the interfitting element additionally enclosing a concentration of boron and a concentration of aluminum, said boron and aluminum concentrations being, respectively, in excess of about 1 ppm and about 2500 ppm of the weight of the catalyst-solvent, and
c. said diamond seed having a cube face exposed to and in contact with said layer of isolating material.

4,042,674
PROCESS FOR TREATING THE MOTHER LIQUOR BY COOLING IN THE PRODUCTION OF ANHYDROUS SODIUM DITHIONITE
Kousuke Yamamoto; Shinji Takenaka, and Kazuo Maeda, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals Inc., Tokyo, Japan
Filed May 18, 1976, Ser. No. 687,447
Claims priority, application Japan, May 21, 1975, 50-59570
Int. Cl.[2] C01B *17/66*
U.S. Cl. 423—515 **10 Claims**

1. In the process for the production of anhydrous sodium dithionite by reacting sodium formate, an alkaline sodium compound and sulfurous acid anhydride in hydrous methanol and recycling the mother liquor left after separation of anhydrous sodium dithionite product from the reaction mixture to the production of anhydrous sodium dithionite be said reaction between sodium formate, an alkaline sodium compound, an sulfurous acid anhydride in hydrous methanol, said mother liquor containing acid sodium sulfite, sodium thiosulfate, sodium formate, methanol and water the improvement comprising:
1. cooling the mother liquor after said separation to a temperature in the range of +5° to −30° C to precipitate sodium thiosulfate,
2. removing the precipitated thiosulfate by filtration, and
3. recycling the filtrate to said production of anhydrous sodium dithionite.

4,042,675
PROCESS FOR TREATING THE MOTHER LIQUOR BY pH ADJUSTING IN THE PRODUCTION OF ANHYDROUS SODIUM DITHIONITE
Kousuke Yamamoto; Shinji Takenaka; Kazuo Maeda, and Michio Mituta, all of Ohmuta, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan
Filed May 18, 1975, Ser. No. 687,448
Claims priority, application Japan, May 21, 1975, 50-59569
Int. Cl.[2] C01B *17/66*
U.S. Cl. 423—515 **10 Claims**

1. In the process for the production of anhydrous sodium dithionite by reacting sodium formate, an alkaline sodium compound and sulfurous acid anhydride in hydrous methanol and recycling the mother liquor left after separation of anhydrous sodium dithionite product from the reaction mixture to the production of anhydrous sodium dithionite, by said reaction between sodium formate, an alkaline sodium compound and sulfurous acid anhydride in hydrous methanol, said mother liquor containing acid sodium sulfite, sodium thiosulfate, sodium formate, methanol and water
the improvement comprising
1. adding an alkali to the mother liquor after said separation to adjust its pH to at least 8 to thereby coprecipitate sodium sulfite and sodium thiosulfate;
2. separating the coprecipitate solids by filtration;
3. oxidizing the resulting filtrate at a temperature of 20° to 60° C with an oxidizing agent selected from the group consisting of sodium hypochlorite, chlorine, ozone and hydrogen peroxide in an amount sufficient to oxidize sodium sulfite and sodium thiosulfate dissolved in the filtrate into sodium sulfate; and

4. recycling the oxidized filtrate to said production of anhydrous sodium dithionate.

10. In the process for the production of anhydrous sodium dithionite by reacting sodium formate, an alkaline sodium compound and sulfurous acid anhydride in hydrous methanol and recycling the mother liquor left after separation of anhydrous sodium dithionite product from the reaction mixture to the production of anhydrous sodium dithionite by said reaction between sodium formate, an alkaline sodium compound and sulfurous acid anhydride in hydrous methanol, said mother liquor containing acid sodium sulfite, sodium thiosulfate, sodium formate, methanol and water

the improvement comprising

1. adding an alkali to the mother liquor after said separation to adjust its pH to at least 8 to thereby coprecipitate sodium sulfite and sodium thiosulfate;
2. separating the coprecipitate solids by filtration;
3. oxidizing the resulting filtrate at a temperature of 20° to 60° C with an oxidizing agent selected from the group consisting of sodium hypochlorite, chlorine, ozone and hydrogen peroxide in an amount sufficient to oxidize sodium sulfite and sodium thiosulfate dissolved in the filtrate into sodium sulfate;
4. distilling the entire oxidized filtrate from step (3) to distill out and recover methanol;
5. thereafter further concentrating the distillation residue by distillation under reduced pressure to crystallize out and recover sodium formate; and,
6. recycling the recovered methanol and sodium formate to said production of anhydrous sodium dithionite.

4,042,676

TECHNETIUM-99m LABELED RADIODIAGNOSTIC AGENTS FOR LIVER AND BONE MARROW SCANNING AND METHOD OF PREPARATION

Victor Joseph Molinski, Ridgewood, N.J., and Frank Raymond Peacock, Newburgh, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 9, 1975, Ser. No. 621,087
Int. Cl.² A61K *29/00, 43/00*
U.S. Cl. 424—1 **24 Claims**

1. A stable, non-radioactive carrier suitable for liver scanning when labeled with ^{99m}Tc, said carrier comprising sodium phytate; and stannous ion chelated with oxalate, the ratio by weight of said phytate to chelate being at least about 1 to 1.

22. A radiodiagnostic agent suitable for liver scanning and having a pH between about 3 and about 7, said agent comprising sodium phytate; stannous ion chelated with oxalate, and a saline solution of $Na^{99m}TcO_4$, the ratio by weight of said phytate to said chelate being at least about 1 to 1.

4,042,677

TECHNETIUM-99M LABELED RADIODIAGNOSTIC AGENTS AND METHOD OF PREPARATION

Victor Joseph Molinski, Ridgewood, N.J., and Joseph Arthur Wilczewski, Newburgh, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 501,704, Aug. 29, 1974, Pat. No. 3,987,157. This application Dec. 1, 1975, Ser. No. 636,372
Int. Cl.² A61K *29/00, 43/00;* G01T *1/161;* G21H *5/02*
U.S. Cl. 424—1 **19 Claims**

1. A stable, non-radioactive carrier suitable for cardiac studies, blood pool and brain scanning when labeled with ^{99m}TC, said carrier comprising human serum albumin (HSA) and strannous tartrate, the ratio by weight of said HSA to stannous tartrate being between about 50 to 1 and about 150 to 1.

18. A radiodiagnostic agent suitable for cardiac studies, blood pool and brain scanning and having a pH between about 2 and about 4, said agent comprising a mixture of stannous tartrate, human serum albumin and a saline solutin of $Na^{99m}TcO_4$, the ratio by weight of said human serum albumin to said stannous tartrate being between about 50 to 1 and about 150 to 1.

4,042,678

WATER-SOLUBLE AGENTS HAVING MITOGENIC PROPERTIES OBTAINED FROM NOCARDIA CELLS, AND PROCESSES FOR THE PREPARATION THEREOF

Rita, born Sfartz Ciorbaru, Fontenay aux Roses; Arlette, born Chosson Adam, Palaiseau; Jean-Francois Petit, Paris; Edgar Lederer, Sceaux; Chantal, born Rousselot Damais, Le Vesinet; Louis Chedid, and Constantin Bona, both of Paris, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 24, 1975, Ser. No. 571,384
Claims priority, application France, Apr. 25, 1974, 74.14500
Int. Cl.² A61K *39/02*
U.S. Cl. 424—12 **22 Claims**

1. In the process for preparing a water-soluble agent which comprises treating an aqueous suspension of delipidated Nocardia cells with a muramidase to free the mitogenic agent and immunological non-specific adjuvant peptidoglycane and other adjuvant fragments that were contained therein, separating the solid fraction from the mixture, recovering the aqueous mixture containing the mitogenic agent and immunological non-specific adjuvant peptidoglycane fragments, the improvement comprising:

separating from the aqueous mixture the portion containing the adjuvant peptidoglycane fragments, which adjuvant is soluble in concentrated acetic acid, and recovering the remaining fraction which contains the mitogenic agent, said agent being insoluble in concentrated acetic acid.

10. A mitogenic agent from delipidated Nocardia cells which is free of peptidoglycane fragments which have adjuvant activity, are soluble in concentrated acetic acid and which agent is active in vivo, water-soluble concentrated acetic acid-insoluble and which is capable of stimulating B-lymphocytes and the proliferation of stem cells.

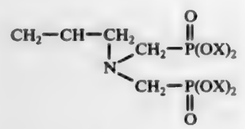
4,042,679

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Nov. 7, 1975, Ser. No. 629,749
Int. Cl.² A61K *7/22*
U.S. Cl. 424—54 **10 Claims**

1. An oral composition comprising an oral vehicle, a quaternary ammonium antibacterial antiplaque agent and a water soluble polymeric polyphosphonic compound having the recurring group:



wherein X is selected from the group consisting of hydrogen and an orally acceptable cation and said compound has a molecular weight of at least about 2,000.

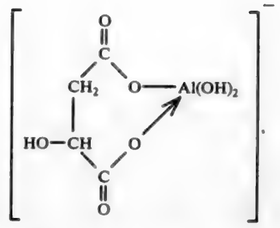
4,042,680

ANTICARIOGENIC MALOALUMINATE COMPLEXES

Joseph C. Muhler, Howe; Mark S. Putt; Carl J. Kleber, both of Forth Wayne, Ind., and Clayton W. Yoho, Racine, Wis., assignors to Indiana University Foundation, Bloomington, Ind.

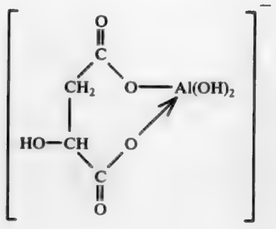
Filed Aug. 2, 1975, Ser. No. 710,443
Int. Cl.² A61K *7/24*
U.S. Cl. 424—55 **8 Claims**

1. Aqueous anionic maloaluminate complexes of the structure:



2. Oral compositions for dental caries prophylaxis comprising:

an anticariogenically effective and non-toxic amount of an aqueous anionic maloaluminate complex of the structure:



and

a carrier suitable for use in the oral cavity,

the pH of such composition lying in the range of about 7.0 – 9.0.

4,042,681

COMPOSITE ATTRACTANT FOR BERTHA ARMYWORM MOTH

Edward W. Underhill; Melvin D. Chisholm; Warren F. Steck; Berton K. Bailey; Peter M. Lamb, all of Saskatoon; Dean L. Struble, and G. Edward Swailes, both of Lethbridge, all of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Dec. 22, 1975, Ser. No. 643,597
Int. Cl.² A01N *17/14*
U.S. Cl. 424—84 **8 Claims**

1. A composite insect attractant for male Bertha Armyworm moths (*Mamestra configurata*) comprising:

A. Z-11-hexadecen-1ol acetate, and

B. Z-9-tetradecen-1-ol acetate wherein the proportions of A and B are within about 90–99% of A and about 10-1% of B.

4,042,682

ENDOGENOUS MORPHINE-LIKE COMPOUND

Sidney Spector, Livingston, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 7, 1976, Ser. No. 674,467
Int. Cl.² A61K *35/30, 31/485;* C07D *489/00*
U.S. Cl. 424—95 **2 Claims**

1. A morphine-like compound endogenous in mammalian brain tissue having the following physical, chemical and biological properties:

a. effectively binds to morphine specific antibodies;

b. non-peptidic as indicated by resistance to peptidases, acid hydroylysis and heat;

c. has the same R_f as morphine by thin layer chromatography;

d. exhibits opiate agonist activity as indicated by the guinea pig ileum and mouse vas deferens assays, which activity is not blocked by pretreatment with naloxone or naltrexone;

e. produces a blue color when treated with a ferric chloride-ferricyanide mixture indicating the presence of a phenolic moiety;

f. is filterable through a filter having a one thousand molecular weight cutoff, said morphine-like compound being essentially free of other substances normally present in mammalian brain tissue.

2. A morphine-like compound endogenous in mammalian brian tissue prepared by the following process:

a. treating a methanol extract of mammalian brain tissue with morphine specific antibody so as to form a conjugate between said morphine-like compound and said antibody;

b. separating said conjugate from said extract by precipitating said conjugate by addition of ammonium sulphate;

c. separating said morphine-like compound from said antibody by heat denaturization followed by ultrafiltration through a filter having a cutoff of molecular weight one thousand; and

d. recovering said morphine-like compound from the ultrafiltration filtrate.

4,042,683

RIFAMYCINS P, Q AND U

Richard J. White, High Wycombe, England; Giancarlo Lancini, Pavia, and Piero Antonini, Arluno, both of Italy, assignors to Gruppo Lepetit S.p.A., Milan, Italy

Filed Aug. 4, 1975, Ser. No. 601,559
Claims priority, application United Kingdom, Aug. 30, 1974, 37913/74
Int. Cl.² A61K *35/00*
U.S. Cl. 424—117 **3 Claims**

1. A rifamycin compound defined as rifamycin P having the following characteristics:

1. Elemental analysis (%): C=60.6; H=6.2; N=3.8; O=25.2; S=4.1
2. U.V. and visible absorption bands (FIG. **1**):

methanol		0.1 N HCl	
$\lambda_{max(m\mu)}$	$E^{1\%}_{1cm}$	$\lambda_{max(m\mu)}$	$E^{1\%}_{1cm}$
406	197	416	183
350	(shoulder)	300	319
297	344	225	521
257	423		
224	550		

3. The most significant infrared absorptiion peaks in Nujol at the following frequencies (cm.$^{-1}$) (FIG. **2**):
3700–3150 (m, br); 3100 (w); 3060–2800 (vs); 1465 (s); 1380 (b): Nujol; 1722 (m); 1645 (m, br); 1580 (m); 1510 (m); 1325 (m); 1250 (s br); 1160 (m); 1130 (w); 1070 (m, br) 1030 (w); 982 (m); 960 (m); 925 (w); 890 (m); 818 (w); 770 (w); 735 (w),
4. A mass spectrum at 70 ev showing the molecular ion peak M^+ at the following m/e value: 738,
5. A complete figure of N.M.R. spectrum at 100 MH_z in $CDCl_3$ as in FIG. **3**,
6. Rf value of 0.57 on silicagel plate using chloroform:methanol (95:5) as a solvent system.

4,042,684

DIETETIC BEVERAGE

Annika Britt Kahm, 930 Fifth Ave No. 4F, New York, N.Y. 10021

Filed Mar. 23, 1976, Ser. No. 669,564
Int. Cl.² A23L *2/00;* A61K *27/00*
U.S. Cl. 424—153 **3 Claims**

1. Beverage for supplementing the dietetic requirements of sugars and essential salts in a mammalian body depletable through vigorous physical activity, thereby enhancing the

level of available, utilizable energy stores within the body, comprising the composition by weight:

Fructose	0.4–0.7%
Glucose	1.6–2.8%
Sodium Chloride	0.16–0.33%
Potassium Chloride	0.03–0.13%
Free Citric Acid	0.026–0.26%
Water	balance.

4,042,685

MILK OF MAGNESIA

Walton John Smith, P.O. Box 461, Wilton, Conn. 06897

Continuation of Ser. No. 470,026, May 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 301,596, Oct. 27, 1972, abandoned, and Ser. No. 131,559, April 5, 1971, abandoned. This application Sept. 22, 1975, Ser. No. 615,507

Int. Cl.[2] A61K *33/08*

U.S. Cl. 424—158 **4 Claims**

1. An article of manufacture comprising a desiccated mixture of magnesium hydroxide magma and dextrin in an amount of from 1 to 3 parts by weight per part of magnesium hydroxide in said magma, said desiccated mixture being produced by spray or freeze drying.

4,042,686

FUNGICIDAL COMPOSITIONS

Ernst-Heinrich Pommer, Limburgerhof; Rudolf Polster, Frankenthal, and Friedrich Loecher, Limburgerhof, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 13, 1976, Ser. No. 676,571

Claims priority, application Germany, May 14, 1975, 2521405

Int. Cl.[2] A01N *13/00, 9/20, 9/24*

U.S. Cl. 424—164 **4 Claims**

1. A synergistic fungicidal composition consisting essentially of

a. wettable sulfur and

b. diisopropyl 3-nitroisophthalate, the weight ratio of *a:b* being from 2:1 to 5:1.

4,042,687

METHOD OF TREATING OBESITY BY THE ORAL ADMINISTRATION OF A PREDIGESTED PROTEIN COMPOSITION

Arnold M. Gans, Closter; Alvin J. Goren, North Bergen, and Eli M. Gorenberg, Fair Lawn, all of N.J., assignors to Control Drug, Inc., Port Reading, N.J.

Division of Ser. No. 634,857, Nov. 24, 1975, abandoned. This application June 22, 1976, Ser. No. 698,354

Int. Cl.[2] A01N *9/20;* **A61K** *37/00*

U.S. Cl. 424—177 **4 Claims**

1. A method of treating obesity which comprises administering by ingestion to a patient in need of said treatment a nutritionally effective amount, in lieu of other foods, of a composition comprising about 5 to about 75 parts by weight of hydrolyzed gelatin, about 0.02 to about 0.75 parts by weight of tryptophane, about 0.1 to about 2 parts by weight of a sweetener, and about 5 to about 100 parts by weight of an ingestible carrier, said nutritional composition containing essentially the following amino acids in parts by weight: about 13 parts L-alanine, about 12 parts L-arginine, about 9 parts L-aspartic acid, about 0.1 parts L-cystine, about 15 parts L-glutamic acid, about 35 parts glycine, about 1.1 parts L-histidine, about 10 parts L-hydroxyproline, about 4.5 parts L-leucine, about 2 parts L-isoleucine, about 6.5 parts L-lysine, about 1.5 parts hydroxylysine, about 1.1 parts L-methionine, about 3.5 parts L-phenylalanine, about 23 parts L-proline, about 10 parts L-serine, about 3 parts L-threonine, about 0.65 parts L-tryptophane, about 1 part L-tyrosine, and about 3.5 parts L-valine.

4,042,688

METHOD OF PROVIDING HIGH-PROTEIN NUTRITION BY THE ORAL ADMINISTRATION OF A PREDIGESTED PROTEIN COMPOSITION

Arnold M. Gans, Closter; Alvin J. Goren, North Bergen, and Eli M. Gorenberg, Fair Lawn, all of N.J., assignors to Control Drug, Inc., Port Reading, N.J.

Division of Ser. No. 634,857, Nov. 24, 1975. This application June 22, 1976, Ser. No. 698,352

Int. Cl.[2] A01N *9/20;* **A61K** *37/00*

U.S. Cl. 424—177 **7 Claims**

1. A method of providing rapid body build-up which comprises administering by ingestion to a patient in need of such body buildup a nutritionally effective amount of a composition comprising about 5 to about 75 parts by weight of hydrolyzed gelatin, about 0.02 to about 0.75 parts by weight of tryptophane, about 0.1 to about 2 parts by weight of a sweetener, and about 5 to about 100 parts by weight of an ingestible carrier, said nutritional composition containing essentially the following amino acids in parts by weight: about 13 parts L-alanine, about 12 parts L-arginine, about 9 parts L-aspartic acid, about 0.1 parts L-cystine, about 15 parts L-glutamic acid, about 35 parts glycine, about 1.1 parts L-histidine, about 10 parts L-hydroxyproline, about 4.5 parts L-leucine, about 2 parts L-isoleucine, about 6.5 parts L-lysine, about 1.5 parts hydroxylysine, about 1.1 parts L-methionine, about 3.5 parts L-phenylalanine, about 23 parts L-proline, about 10 parts L-serine, about 3 parts L-threonine, about 0.65 parts L-tryptophane, about 1 part L-tyrosine, and about 3.5 parts L-valine.

4,042,689

ALKYLATED ORGOTEIN

Wolfgang Huber, Atherton; Mark G. Saifer, Berkeley, and Lewis D. Williams, Menlo Park, all of Calif., assignors to Diagnostic Data, Inc., Mountain View, Calif.

Filed Sept. 9, 1975, Ser. No. 611,657

Int. Cl.[2] A61K *37/02, 37/14;* **C07G** *7/04*

U.S. Cl. 424—177 **15 Claims**

1. Alkylated orgotein wherein an alkyl group of up to 8 carbon atoms is present on at least one lysine ε-amino group thereof.

14. A pharmaceutical composition having antiinflammatory activity comprising, in admixture with a pharmaceutically acceptable carrier, an antiinflammatorily effective unit dosage amount of an alkylated orgotein of claim **1**.

4,042,690

METHOD OF COMBATTING BLOWFLY LARVAE

Wolfgang Hofer; Fritz Maurer; Hans-Jochem Riebel, and Wilhelm Stendel, all of Wuppertal-Elberfeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

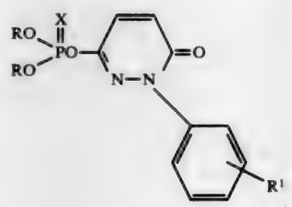
Filed Aug. 2, 1976, Ser. No. 710,680

Claims priority, application Germany, Aug. 22, 1975, 2537486

Int. Cl.[2] A61K *31/675*

U.S. Cl. 424—200 **5 Claims**

1. The method of combatting infestation of animals by blowfly larvae which comprises applying to the infested animal a blowfly larvae biocidal amount of a compound of the formula:



wherein

R is alkyl of 1 to 4 carbon atoms;
R^1 is hydrogen or nitro; and
X is oxygen or sulfur.

4,042,691

SUCCINIC ACID OXIMIDOPHOSPHORIC ESTER INSECTICIDES

Karl Kiehs, Lampertheim; Heinrich Adolphi, Limburgerhof, and Rolf Huber, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

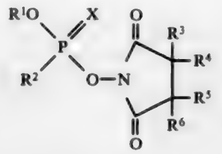
Division of Ser. No. 523,665, Nov. 14, 1974, Pat. No. 3,960,885. This application Jan. 2, 1976, Ser. No. 646,180

Claims priority, application Germany, Dec. 5, 1973, 2360493

Int. Cl.[2] A01N *9/36*

U.S. Cl. 424—200 **9 Claims**

1. A process for combatting insects which comprises treating the insects with an insecticidally effective amount of a succinic acid oximidophosphoric ester of the formula



wherein: X is sulfur; R^1 is lower alkyl; R^2 is lower alkoxy or phenyl; R^3 is lower alkyl or phenyl; R^4 is hydrogen or lower alkyl; R^5 and R^6 are hydrogen; and R^3 and R^4 when taken together form a hydrocarbon ring of five to six members.

4,042,692

SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHEMIC AGENTS

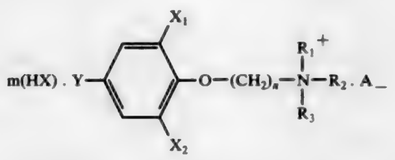
Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664, which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application Jan. 12, 1976, Ser. No. 648,546

Int. Cl.[2] A61K *31/33*

U.S. Cl. 424—244 **8 Claims**

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula



wherein Y represents amino, loweralkylamino or diloweralkylamino; R_1 and R_2 taken together represent an aliphatic hydrocarbon moiety of 6 carbon atoms substituted with zero, one or two lower alkyl substitutents; R_3 independently is selected from the group consisting of lower alkenyl, phenacyl, mono-, di-, or trihalophenacyl, lower alkynyl, substituted lower alkyl, substituted lower alkenyl and substituted lower alkynyl substituted with a substituent selected from the group consisting of halogen, phenyl, halophenyl, dihalophenyl, trihalophenyl, nitrilo and hydroxy; X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; *n* represents one of the integers 2, 3 or 4; HX represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers zero and one.

4,042,693

DERIVATIVES OF 1,2,4-THIADIAZINE

Jacques E. Delarge, Dolembreux; Charles L. Lapiere, Tongeren, and André H. Georges, Ottignies, all of Belgium, assignors to A. Christiaens Societe Anonyme, Brussels, Belgium

Continuation-in-part of Ser. No. 568,759, April 16, 1975. This application June 9, 1976, Ser. No. 694,422

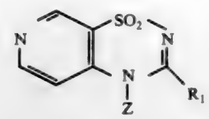
Claims priority, application United Kingdom, Apr. 14, 1975, 16836/75

Int. Cl.[2] C07D *285/24;* **A61K** *31/54*

U.S. Cl. 424—246 **6 Claims**

1. A compound of the formula:

(I)



in which R_1 represents an unsubstituted phenyl group or a phenyl group substituted by a halogen atom, and Z represents an unsubstituted phenyl group or a phenyl group substituted by one or two halogen atoms or by a C_1–C_4 alkyl or alkoxy group or by the trifluoromethyl group, and the pharmaceutically acceptable base and acid addition salts of said compounds.

6. Pharmaceutical compositions containing at least one compound according to claim **1** as active ingredient in an anti-inflammatory effective amount, together with a pharmaceutical carrier or vehicle.

4,042,694

NOVEL HETEROCYCLIC ESTERS OF BENZOPYRANOPYRIDINES

Louis Selig Harris, Richmond, Va.; Harry George Pars; John Clark Sheehan, both of Lexington, Mass., and Raj Kumar Razdan, Belmont, Mass., assignors to Sharps Associates, Cambridge, Mass.

Continuation-in-part of Ser. No. 311,953, Dec. 4, 1972, Pat. No. 3,991,194, which is a continuation-in-part of Ser. No. 212,819, Dec. 27, 1971, abandoned. This application Mar. 8, 1976, Ser. No. 664,907

The portion of the term of this patent subsequent to Nov. 9, 1993, has been disclaimed.

Int. Cl.[2] C07D *491/04*

U.S. Cl. 424—248.55 **13 Claims**

1. A compound named 5,5-dimethyl-10-[2-methyl-4-(2-methylpiperidino) butyryloxy]-8-(3-methyl-2-octyl)-2-(2-propynyl)-1,2,3,4-tetrahydro-5H-[1]benzopyrano[3,4-d]pyridine or a pharmaceutically acceptable acid addition salt thereof.

4,042,695

THIAXANTHENE DERIVATIVES, COMPOSITIONS THEREOF AND METHODS OF TREATING THEREWITH

Jorn Lasse Martin Buus, Bjaeverskov; Niels Lassen, Gentofte, and Allan Johan Bigler, Copenhagen, all of Denmark, assignors to Kefalas A/S, Copenhagen-Valby, Denmark

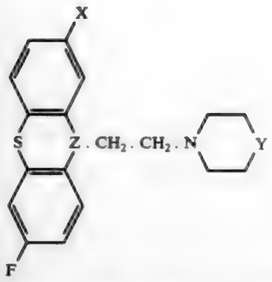
Continuation-in-part of Ser. No. 593,559, July 7, 1975, which is a continuation-in-part of Ser. No. 421,279, Dec. 3, 1973, abandoned. This application Aug. 13, 1975, Ser. No. 604,462

Claims priority, application United Kingdom, Dec. 8, 1972, 56910/72

Int. Cl.[2] A61K *31/445, 31/495;* **C07D** *409/06*

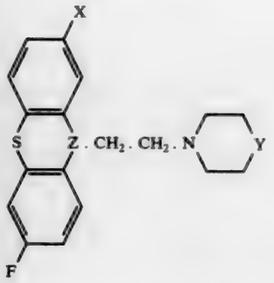
U.S. Cl. 424—250 **31 Claims**

1. A compound selected from the group consisting of (1) a fluoro-substituted thiaxanthene of the formula



wherein X is selected from the group consisting of —Cl, $—CF_3$ and $—SO_2N(CH_3)_2$, Z is selected from the group consisting of >CH·CH₂— and >C═CH—, and Y is selected from the group consisting of >NH, >N·CH₃, >N·CH₂·CH₂OH, >N·CH₂·CH₂OAc, >CH·CH₃, >CH·CH₂·CH₂OH and >CH·CH₂·CH₂OAc, wherein —Ac is an acyl radical of an aliphatic carboxylic acid having from one to 30 carbon atoms inclusive, and (2) and acid addition salt thereof with a pharmaceutically acceptable acid.

17. A pharmaceutical composition useful as a neuroleptic and anti-psychotic in unit dosage form consisting essentially of a major quantity of a pharmaceutical carrier and as an active ingredient a pharmaceutically effective dose of a compound selected from the group consisting of (1) a fluoro-substituted thiaxanthene of the formula:



wherein X is selected from the group consisting of —Cl, $—CF_3$ and $SO_2N(CH_3)_2$, Z is selected from the group consisting of > CH·CH₂— and > C═CH—, and Y is selected from the group consisting of > NH, > N·CH₃, > N·CH₂·CH₂OH, > N·CH₂·CH₂OAc, > CH·CH₂·CH₂OH and > CH·CH₂·CH₂OAc, wherein —Ac is an acyl radical of an aliphatic carboxylic acid having from one to thirty carbon atoms inclusive, and (2) an acid addition salt thereof with a pharmaceutically acceptable acid.

4,042,696

INSECTICIDAL SULFONIUM SALTS

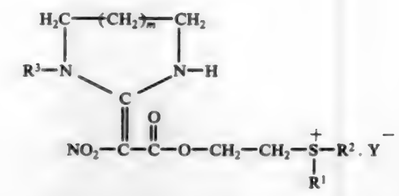
Alvin Clifford Boyer, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 582,577, June 2, 1975, abandoned. This application Feb. 20, 1976, Ser. No. 659,886

Int. Cl.² A01N *9/22*; C07D *239/02*

U.S. Cl. 424—251 **5 Claims**

1. A sulfonium salt of the formula:



wherein *m* is 0 or 1, R^1 is alkyl of from 1 to 3 carbon atoms, R^2 is alkyl of from 1 to 10 carbon atoms, R^3 is alkyl or cyanoalkyl of from 1 to 3 carbon atoms, or is allyl, 3-chloroallyl or 2-propynyl and Y is chloride, bromide or iodide.

4. An insecticidal composition adapted to controlling insects of the genus Heliothis comprising an insecticidal amount of a salt of claim **1** together with an insecticidal adjuvant therefor.

4,042,697

ISOQUINOLIUM COMPOUNDS FOR TREATING DIABETES

Peter Garside, and Michael John Dimsdale, both of London, England, assignors to Allen & Hanburys Limited, London, England

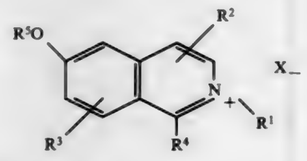
Continuation of Ser. No. 405,120, Oct. 10, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 632,577

Claims priority, application United Kingdom, Oct. 19, 1972, 48211/72

Int. Cl.² A61K *31/47*

U.S. Cl. 424—258 **13 Claims**

1. A method of treatment of diabetes which comprises administering to a patient an effective amount of a compound of the formula:



in which R^1 represents C_{1-4} alkyl; aminoethyl; dimethylaminoethyl; 2-ethoxyethyl; allyl; propynyl; benzyl, p-methoxybenzyl; phenoxyethyl; phenacyl or 4-methoxyphenacyl; R^2 represents hydrogen or C_{1-4} alkyl; R^3 represents hydrogen; R^4 represents hydrogen; methyl, ethyl; benzyl; or p-methoxyphenyl; R^5 represents C_{1-5} alkyl; 2-aminoethyl; 2-hydroxyethyl; 2-ethoxyethyl, 2-methoxyethyl, 3-methoxypropyl, ethoxymethyl; allyl, dimethylallyl; cyclopentyl; benzyl; phenoxyethyl or 3-tetrahydrofuranyl; X represents iodide, bromide, chloride, toluene sulphonate or hydrogen sulphate.

4,042,698

TREATMENT OF MYASTHENIA GRAVIS AND ORAL MEDICATION THEREFOR

Joseph Francis Zappia, 118 N. Gibson St., Indianapolis, Ind. 46219

Continuation of Ser. No. 357,657, May 7, 1973, abandoned, which is a continuation of Ser. No. 75,277, Sept. 24, 1970, abandoned. This application July 18, 1975, Ser. No. 597,302

Int. Cl.² A61K *31/475*

U.S. Cl. 424—262 **8 Claims**

1. The method of treating a human being having the condition known as myasthenia gravis which comprises: administering strychnine to the said human being in at least an effective amount to ameliorate the symptoms of the condition but less than the amount which will cause persistent fasciculation of facial muscles of said human being.

4,042,699

METHOD FOR REDUCING SERUM GLUCOSE LEVELS

Shreekrishna M. Gadekar, Trenton, N.J., assignor to Affiliated Medical Research, Inc., Princeton, N.J.

Division of Ser. No. 530,684, Dec. 9, 1974, Pat. No. 3,976,281, which is a continuation-in-part of Ser. No. 380,655, July 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 315,836, Dec., 1872, Pat. No. 3,839,376. This application May 14, 1976, Ser. No. 686,648

Int. Cl.² A61K *31/44*

U.S. Cl. 424—263 **6 Claims**

1. A method for reducing the glucose level in the serum of a mammal which comprises administering to said mammal a therapeutically effective amount of 5-methyl-1-phenyl-2-(1H)-pyridone.

4,042,700

QUATERNARY N-β-SUBSTITUTED N-ALKYL-NORTROPINE BENZILATES

Rolf Banholzer, Ingelheim am Rhein; Rudolf Bauer, Wiesbaden; Alex Heusner, Gau-Algesheim, and Werner Schulz, Ingelheim, Rhein, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

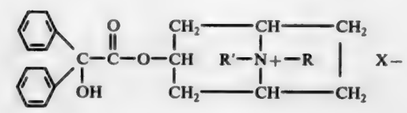
Filed Sept. 3, 1976, Ser. No. 720,245

Claims priority, application Germany, Sept. 12, 1975, 2540633

Int. Cl.² A61K *31/46*; C07D *471/08*

U.S. Cl. 424—265 **11 Claims**

1. A compound of the formula



wherein

one of R and R′ is alkyl of 1 to 4 carbon atoms,

the other of R and R′ is β-haloethyl or β-hydroxyethyl, and

X is a pharmacologically acceptable anion.

8. A spasmolytic or bronchospasmolytic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective spasmolytic or bronchospasmolytic amount of a compound of claim **1.**

4,042,701

7,7-DIPHENYL-1,4-OXAZEPINOALKYL-DICARBOXIMIDES

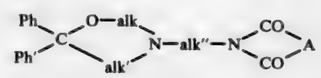
Robert Mathews Bowman, Summit, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,259

Int. Cl.² C07D *413/6*

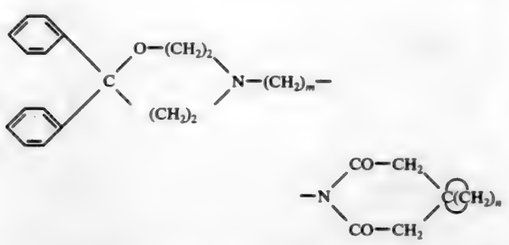
U.S. Cl. 424—267 **8 Claims**

1. An N-(7,7-diphenyl-hexahydro-1,4-oxazepin-4-yl-alkyl)-dicarboximide corresponding to the formula



wherein each of alk and alk′ is lower alkylene separating the adjacent atoms by 2 carbon atoms, alk″ is lower alkylene separating the adjacent atoms by at least 2 carbon atoms, each of Ph and Ph′ is phenyl, unsubstituted or substituted by up to three members of lower alkyl, lower alkoxy, lower alkylmercapto, hydroxy, halogeno or trifluoromethyl, and A is lower alkylene, lower alkenylene, 5 to 7 ring-membered mono- or bicyclic 1,2- or 1,3-(cycloalkylene or cycloalkenylene), 5 to 7 ring-membered spirocycloalkane-lower alkylene or 1,2-phenylene, said mono- or bicyclic 1, 2- or 1,3-(cycloalkylene or cycloalkenylene) are unsubstituted or substituted by up to three lower alkyls, and said 1,2-phenylene radical is substituted in the same manner as Ph, or a therapeutically acceptable acid addition salt thereof.

4. A compound as claimed in claim **1** and corresponding to the formula



wherein *m* is an integer from 2 to 4 and n such from 4 to 5, or a therapeutically acceptable acid addition salt thereof.

7. A pharamaceutical composition for treating asthmatic, allergic and inflammatory conditions in mammals comprising a pharmacologically effective amount of a compound as claimed in claim **1**, together with a pharmaceutical excipient.

4,042,702

HALOGEN PYRAZOLE DERIVATIVES, A METHOD FOR PRODUCING THESE HALOGEN PYRAZOLE DERIVATIVES, MEDICAMENTS CONTAINING AND METHODS OF USING THEM

Georg Rainer, Constance, Germany, assignor to Byk Gulden Lomberg Chemische Fabrik GmbH, Germany

Continuation of Ser. No. 497,380, Aug. 14, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,707

Claims priority, application Luxembourg, Aug. 16, 1973, 68238

Int. Cl.² A61K *31/415, 31/535*; C07D *231/10*

U.S. Cl. 424—273 P **18 Claims**

1. A pharmaceutically-acceptable member selected from the group consisting of a 1,3-diaryl-5-halopyrazole-4-acetic acid and a salt thereof; the 5-halo being 5-fluoro, 5-chloro or 5-bromo, and each aryl being, independently, a) phenyl or b) phenyl substituted by a substituent selected from the group consisting of halo, p-(lower)alkoxy and p-(lower)alkyl.

18. A therapeutic method for treating a mammal suffering fron one or more systems of inflammation, pain or fever which comprises administering to the mammal a sympton-reducing-effective, pharmacologically-compatible dose of composition according to claim **11.**

4,042,703

METHOD OF TREATING AND PREVENTING COCCIDIOSIS

Urs Burckhardt, and Alfred Meyer, both of Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

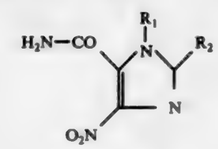
Filed Jan. 2, 1976, Ser. No. 646,315

Claims priority, application Switzerland, Jan. 8, 1975, 167/75; Nov. 27, 1975, 15389/75

Int. Cl.² A61K *31/415*

U.S. Cl. 424—273 R **2 Claims**

1. A method for the treatment and prevention of coccidiosis in poultry, which comprises feeding the poultry an effective amount of a compound of the formula



wherein each of R_1 and R_2 represents hydrogen or alkyl of from 1 to 4 carbon atoms.

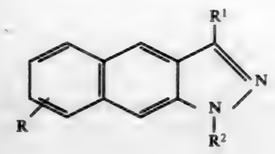
4,042,704

BENZINDAZOLES

Robert V. Coombs, Chatham, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Mar. 18, 1976, Ser. No. 668,266
Int. Cl.² C07D *231/56*
U.S. Cl. 424—273 P **41 Claims**

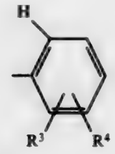
1. A compound which is a benz[f]indazole of the formula:



wherein

R is a hydrogen atom, fluoro, chloro, bromo, alkyl having from 1 to 4 carbon atoms or alkoxy having from 1 to 4 carbon atoms;

R^1 is substituted or unsubstituted phenyl of the structure:



in which R_3 and R_4 are selected independently from the group consisting of a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkoxy having from 1 to 4 carbon atoms, fluoro, chloro or bromo; and

R^2 is a hydrogen atom, alkyl having from 1 to 4 carbon atoms, alkenyl having from 2 to 4 carbon atoms, or alkynyl having from 2 to 4 carbon atoms, provided that:

1. when R^3 and R^4 are on adjacent carbons, they are not both branched alkyl or alkoxy; and
2. when R is bromo and when R^3 is chloro or bromo, then R^4 is not chloro or bromo; or a pharmaceutically acceptable acid addition salt thereof.

38. A pharmaceutical composition suitable for parenteral administration to terminate pregnancy comprising as the active ingredient an effective amount of the compound of claim **1** and a pharmaceutically accceptable liquid carrier therefor.

4,042,705

1-METHYL-2-(PHENYL-OXYMETHYL)-5-NITRO-IMIDAZOLES AND PROCESS FOR THEIR MANUFACTURE

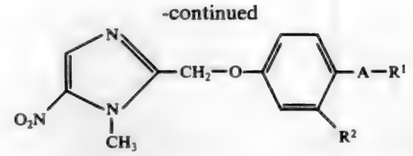
Erhardt Winkelmann, Kelkheim, Taunus, and Wolfgang Raether, Dreieichenhain, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 9, 1976, Ser. No. 704,100
Claims priority, application Germany, July 12, 1975, 2531303; Feb. 11, 1976, 2605222
The portion of the term of this patent subsequent to June 2, 1994, has been disclaimed.
Int. Cl.² C07D *233/94*; A61K *31/415*
U.S. Cl. 424—273 R **3 Claims**

1. A 1-methyl-2-(phenyl-oxymethyl)-5-nitro-imidazole of the formula I

(I)

-continued



in which A stands for a sulfur atom or a sulfoxide (—SO—) group, R^1 stands for methyl or ethyl, and R^2 for hydrogen methyl or halogen.

3. A method of treating protozoal diseases as well as diseases caused by bacteria and fungi, by administering to the infected organism and effective amount of a compound as claimed in claim **1**.

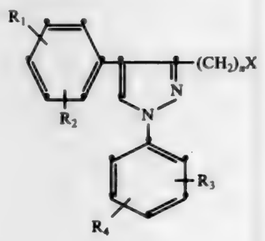
4,042,706

NOVEL ANTI-INFLAMMATORY PYRAZOLE DERIVATIVES AND PREPARATION THEREOF

Hanns Ahrens; Henning Koch; Eberhard Schröder; Helmut Biere, and Joachim-Friedrich Kapp, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Aug. 9, 1976, Ser. No. 712,659
Claims priority, application Germany, Aug. 8, 1975, 2536003
Int. Cl.² A61K *31/415*; C07D 231/12
U.S. Cl. 424—273 P **22 Claims**

1. A pyrazole compound of the formula



wherein

n is 1, 2, 3, or 4;

R_1, R_2, R_3, and R_4 each are hydrogen, halogen, alkyl of up to 6 carbon atoms, alkoxy of up to 6 carbon atoms, trifluoromethyl, nitro or amino; and

X is cyano, carbamoyl, carbalkoxy of up to 6 carbon atoms in the alkoxy or carboxy and, when X is carboxy, physiologically acceptable salts thereof.

22. A method of treating an inflammatory condition, comprising administering to a patient afflicted therewith an anti-inflammatorily effective daily dosage of a compound of claim **1**, in admixture with a pharmaceutically acceptable carrier.

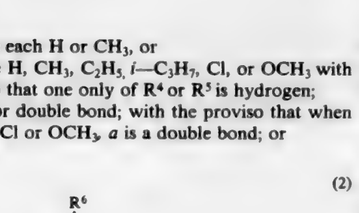
4,042,707

3α-ARYLHYDROISOINDOLES

William Charles Ripka, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 19, 1976, Ser. No. 659,510
Int. Cl.² A61K *31/40*; C07D *209/44*
U.S. Cl. 424—274 **63 Claims**

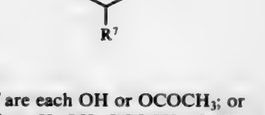
1. A compound of the group (A) having the general formula



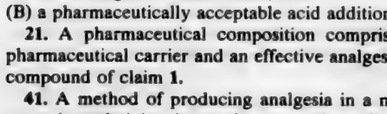
wherein

R is H, alkyl of 1–8 carbons,

$—CH_2Y$ where Y is alkenyl or alkynyl of 2–6 carbons,



where *m* is 1 or 2, *a* is 0 or 1 and X is F, Cl, Br, CF_3, OCH_3, CH_3, C_2H_5, C_3H_7, C_4H_9 —NH_2 or $N(CH_3)_2$,

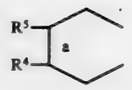


where *m* is 1 or 2 and *n* is 2–5.

R^2 is H, OH, OCH_3, F, or $OCOR^3$ where R^3 is alkyl or 1–3 carbons; and

Q is:

(1)



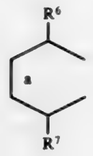
in which

R^4 and R^5 are each H or CH_3, or

R^4 and R^5 are H, CH_3, C_2H_5, *i*—C_3H_7, Cl, or OCH_3 with the proviso that one only of R^4 or R^5 is hydrogen;

a is a single or double bond; with the proviso that when R^4 or R^5 is Cl or OCH_3, *a* is a double bond; or

(2)



in which

R^6 and R^7 are each OH or $OCOCH_3$; or

R^6 and R^7 are H, OH, $OCOCH_3$, OCH_3 or CH_3 with the proviso that one only of R^6 or R^7 is H;

a is a single or double bond; and

(B) a pharmaceutically acceptable acid addition salt of (A).

21. A pharmaceutical composition comprising a suitable pharmaceutical carrier and an effective analgesic amount of a compound of claim **1**.

41. A method of producing analgesia in a mammal which comprises administering to the mammal an effective analgesic amount of a compound of claim **1**.

4,042,708

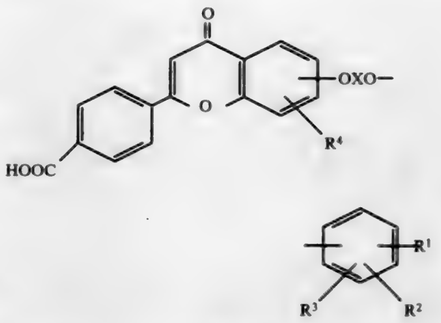
PHARMACEUTICAL COMPOSITIONS CONTAINING 4-CARBOXY-FLAVONES

Thomas Brian Lee, Loughborough; David Norman Hardern, Sutton Bonington, and John Raymond Bantick, Burton-on-the-Wolds, all of England, assignors to Fisons Limited, London, England

Continuation-in-part of Ser. No. 522,590, Nov. 11, 1974, Pat. No. 3,948,955. This application Jan. 14, 1976, Ser. No. 648,887
Claims priority, application United Kingdom, Dec. 2, 1975, 49547/75
Int. Cl.² A61K *31/35*
U.S. Cl. 424—283 **15 Claims**

1. A pharmaceutical composition comprising a pharmaceutically acceptable adjuvant, diluent or carrier and an effective amount of one or more compounds of formula I

(I)



wherein R^1, R^2, R^3 and R^4, which may be the same or different, each represent hydrogen, hydroxy, alkenyl, alkanoyl or alkyl, and

X represents a hydrocarbon chain containing from 2 to 10 carbon atoms, optionally substituted by a hydroxy group or pharmaceutically acceptable salts thereof.

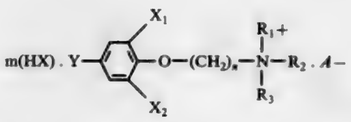
4,042,709

SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHMIC AGENTS

Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664, which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215. This application Jan. 12, 1976, Ser. No. 648,550
Int. Cl.² A61K *31/275*
U.S. Cl. 424—304 **8 Claims**

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula:



wherein Y represents amino, loweralkylamino or diloweralkylamino; R_1 and R_2 represent lower alkyl; R_3 independently represents substituted lower alkyl, substituted lower alkenyl or substituted lower alkynyl substituted with nitrilo X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; *n* represents one of the integers 2, 3 or 4; HX represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers 0 and 1.

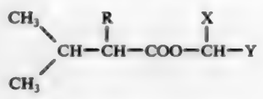
4,042,710

ALPHA-CYANO-PHENOXYBENZYL-ISOVALERATES

Michael J. Bull, Lower Halstow, and Robert J. G. Searle, Sittingbourne, both of England, assignors to Shell Oil Company, Houston, Tex.

Filed May 18, 1976, Ser. No. 687,483
Claims priority, application United Kingdom, May 23, 1975, 22662/75; Dec. 22, 1975, 52342/75
Int. Cl.[2] A01N *9/20*; C07C *121/66*
U.S. Cl. 424—304 12 Claims

1. A 2-substituted isovalerate of the formula



wherein R represents an alkyl group of 1–16 carbon atoms, an alkenyl group of up to 6 carbon atoms, or a benzyl group optionally substituted by one or more halogen atoms of atomic number 9 to 35, inclusive, or alkyl groups of 1 to 6 carbon atoms; X represents a cyano group; and Y represents a phenoxyphenyl group.

12. Method of combating tick, insect and/or acarid pests at a locus which comprises applying to the locus a pesticidally effective amount of an isovalerate as claimed in claim 1 or a composition thereof.

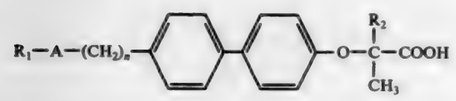
4,042,711

DERIVATIVES OF BIPHENYLOXY-LOWER ALKANOIC ACIDS, SALTS THEREOF AND THEIR USE AS ANTIHYPERLIPIDEMICS

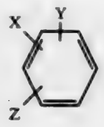
Gerhart Griss, Biberach an der Riss; Wolfgang Grell, Biberach an der Riss; Rudolf Hurnaus, Biberach an der Riss; Robert Sauter, Laupheim; Bernhard Eisele, Biberach an der Riss; Nikolaus Kaubisch, Biberach an der Riss, and Matyas Leitold, Biberach an der Riss, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation-in-part of Ser. No. 643,700, Dec. 23, 1975, Pat. No. 4,010,279. This application Nov. 11, 1976, Ser. No. 740,829
Claims priority, application Germany, Jan. 9, 1975, 2500692; Oct. 25, 1975, 2547872
Int. Cl.[2] C07C *103/46, 103/737, 103/84*
U.S. Cl. 424—319 7 Claims

1. A compound of the formula



wherein R_1 is alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 6 carbon atoms, phenylalkyl, phenylalkenyl or



where

X, Y and Z are each hydrogen, halogen, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms,

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms,

A is —CO—NH— or —NH—CO—, and *n* is 1, 2 or 3,

or a non-toxic salt thereof formed with an inorganic or organic base.

7. The method of lowering the level of lipids in the blood of a warm-blooded animal in need of such treatment, which comprises perorally, parenterally or rectally administering to said animal an effective antihyperlipidemic amount of a compound of claim 1.

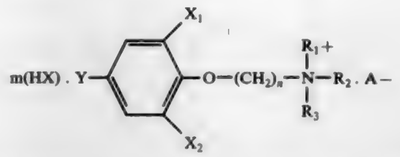
4,042,712

SUBSTITUTED PHENOXYALKYL QUATERNARY AMMONIUM COMPOUNDS AS ANTIARRHYTHEMIC AGENTS

Stanley J. Strycker, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 484,525, July 1, 1974, Pat. No. 3,932,664. Which is a division of Ser. No. 164,086, July 19, 1971, Pat. No. 3,875,215
This application Jan. 12, 1976, Ser. No. 648,551
Int. Cl.[2] A61K *31/14*
U.S. Cl. 424—329 8 Claims

5. A method for combatting cardiac arrhythmias which comprises administering to an animal a cardiac antiarrhythmic amount of a quaternary ammonium compound corresponding to the formula:



wherein Y represents amino, loweralkylamino or diloweralkylamino; R_1 and R_2 represent lower alkyl; R_3 independently represents substituted lower alkyl, substituted lower alkenyl or substituted lower alkynyl substituted with hydroxy. X_1 and X_2 both represent halogen; A^- represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable anion; *n* represents one of the integers 2, 3 or 4; HX represents a stoichiometric equivalent quantity of a pharmaceutically-acceptable acid; and *m* represents one of the integers zero and one.

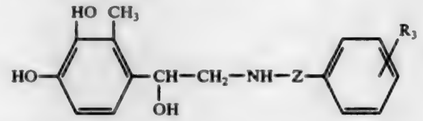
4,042,713

PHARMACEUTICAL COMPOSITIONS CONTAINING A 1-(2-ALKYL-3,4-DIHYDROXY-PHENYL)-2-(PHENYLALKYL-AMINO)-ALKANOL-(1) AND METHOD OF USE

Anton Mentrup; Kurt Schromm; Otto Thomä, and Karl Zeile, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Division of Ser. No. 485,348, July 3, 1974, Pat. No. 3,969,410, which is a continuation-in-part of Ser. No. 217,291, Jan. 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 713,265, Oct. 16, 1967, Pat. No. 3,657,244. This application Apr. 20, 1976, Ser. No. 678,612
Claims priority, application Germany, Oct. 18, 1966, 89417; Oct. 20, 1966, 89476; Nov. 29, 1966, 90062
Int. Cl.[2] A61K *31/135*
U.S. Cl. 424—330 14 Claims

1. A sympatomimetic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective sympathomimetic amount of a racemic mixture of a compound of the formula



wherein

R_3 is hydrogen or hydroxyl, and

Z is alkylene of 2 to 5 carbon atoms;

a pure stereoisomer thereof; a diastereoisomeric antipode pair thereof; or a non-toxic, pharmacologically acceptable acid addition salt of said racemic mixture, stereoisomer or diastereoisomeric antipode pair.

4,042,714

POLYDEXTROSE-BASED FARINACEOUS COMPOSITIONS

Anibal Torres, Waterford, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 624,026, Oct. 20, 1975, abandoned. This application July 23, 1976, Ser. No. 707,983
Int. Cl.[2] A21D *2/06*
U.S. Cl. 426—62 7 Claims

1. A low-calorie farinaceous composition comprising from about 20 to 75% by weight of modified polydextrose, from about 2 to 20% by weight of proteinaceous material selected from egg white, milk solids, sodium caseinate, calcium caseinate, soybean isolate, gluten and yeast, from about 10 to 40% by weight of cellulose derivative selected from alpha cellulose and micro-crystalline cellulose and from about 5 to 20% by weight of flour selected from wheat, corn, rice, rye and soya bean flour; said polydextrose being a water-soluble highly-branched polydextrose wherein the linkage of 1 → 6 predominates having a number average molecular weight between about 1,500 and 18,000 and containing (a) from about 0.5 to 5 mole percent of polycarboxylic acid ester group wherein the acid is selected from the group consisting of citric, fumaric, tartaric, succinic, adipic, itaconic and malic acids and (b) from about 5 to 20% by weight of a food-acceptable polyol selected from the group consisting of sorbitol, glycerol, erythritol, xylitol, mannitol, and galactitol which is chemically bonded thereto, said composition being prepared by intimately mixing said polydextrose with said proteinaceous material in aqueous dispersion, adding and mixing said cellulose derivative and said flour, and drying the resulting mixture.

4,042,715

DENSE, UNIFORMLY LAYERED VEGETABLE PROTEIN MEAT ANALOGUE

La Von G. Wenger, Sabetha; Elmer J. Osterhaus, Seneca, and Oak B. Smith, Shawnee Mission, all of Kans., assignors to Wenger Manufacturing, Sabetha, Kans.

Division of Ser. No. 581,111, May 27, 1975, Pat. No. 3,970,761. This application Dec. 19, 1975, Ser. No. 642,547
Int. Cl.[2] A23J *3/00*; A23L *1/20*
U.S. Cl. 426—104 11 Claims

1. A dense, extruded, layered meat analogue product comprising a plurality of juxtaposed, generally rectilinear, generally uniform layers which are substantially untwisted relative to each other, said layers being manually separable and are comprised of an admixture including a vegetable protein and moisture, said meat analogue product having a density prior to drying thereof of from about 20 to 40 lbs./cu.ft., and being prepared by a process which comprises the steps of:

heating and agitating an admixture comprising a vegetable protein and moisture to an extent sufficient to render the same hot, flowable and substantially unoriented;

moving said admixture under pressure through an elongated processing zone along a generally helical path of travel while simultaneously subjecting the admixture to displacement forces in an axial direction relative to the zone and also transversely of the longitudinal axis thereof, said displacement forces being of a magnitude to assure stretching and working of the protein for permitting subsequent orientation thereof in said product;

thereafter moving said admixture into an elongated processing area without substantially restricting the flow of admixture thereinto and subjecting the latter to displacement forces in said area which are primarily axial relative to the area;

causing the layering of said admixture by maintaining the axial movement thereof in said area while controlling the temperature and pressure therewithin at levels permitting said layering; and

extruding said admixture from said area as a dense, layered meat analogue product.

4,042,716

PRESERVATIVE FOR FODDER, MIXED FODDER AND SILAGE

Heidrun Bertram, Hanau; Rudolf Fahnenstich, Mombris; Helmut Junkermann, Frankfurt; Gerhard Pohl, and Herbert Tanner, both of Hanau, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation-in-part of Ser. No. 558,686, March 17, 1975, abandoned. This application Mar. 18, 1975, Ser. No. 559,493
Claims priority, application Germany, Mar. 16, 1974, 2412801
Int. Cl.[2] A23L *3/34*; A23B *7/14*; A23K *3/00*
U.S. Cl. 426—335 24 Claims

1. Silage containing acrylic acid, methacrylic acid or an ester or salt of acrylic acid or methacrylic acid in an amount effective to preserve the silage.

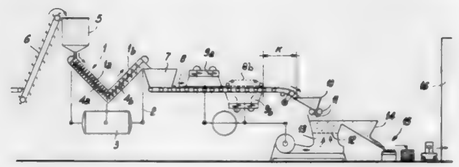
24. Fodder, mixed fodder or silage containing alfalfa as a constituent thereof and also containing acrylic acid, methacrylic acid or an ester or salt of acrylic acid or methacrylic acid in an amount effective to preserve said alfalfa containing fodder, mixed fodder or silage.

4,042,717

FREEZING RICE

Michel Gayte, 6, rue des Tournelles, 75004 Paris, France

Filed Apr. 22, 1975, Ser. No. 570,459
Claims priority, application France, Apr. 23, 1974, 74.13983
Int. Cl.[2] A23B *7/04*
U.S. Cl. 426—508 2 Claims



1. A method of processing rice grains comprising the steps of sequentially:

a. cooking said rice grains in water to cook and hydrate the interior cores and exterior peripheries of said grains;

b. directing a current of gas at a temperature below 0° C at the hydrated rice grains for a time only sufficient to freeze and dehydrate said exterior peripheries of said grains and thereby reduce the weight of said grains by approximately 5%;

c. mechanically shelling the partially dehydrated grains to separate same; and

d. freezing the separated grains completely so that both the dehydrated peripheries and hydrated cores are frozen.

4,042,718

METHOD FOR MANUFACTURING RUMINANT FEED SUPPLEMENTS COMPRISING A PROTEIN-ALDEHYDE COMPLEX

Robert M. Rawlings, and Donald Procter, both of Boise, Idaho, assignors to Commonwealth Scientific and Industrial Research Organization, Australia

Filed Dec. 22, 1975, Ser. No. 642,998
Int. Cl.[2] A23K *1/18*
U.S. Cl. 426—573 17 Claims

1. A process for producing lipid feed supplements for ruminant animals comprising:

a. forming an aqueous emulsion by admixing in an aqueous solution having the pH of at least 7.0, a proteinaceous material and a lipid material wherein the lipid material and proteinaceous material are present in a weight ratio of from about 1:1 to about 6:1;

b. contacting the emulsion with from about 0.5 to about 6

weight percent of an aldehyde, based upon the weight of the proteinaceous material, to encapsulate the lipid material within an aldehyde-protein complex, and allowing formation of a gel;

c. contacting the gel with an effective amount of acid to provide a gel having a pH of less than 6.5 for a period of time effective to allow syneresis of the gel; and

d. recovering a granular gel.

4,042,719

COMPOSITIONS OF LOW CALORY CONTENT

Zsuzsanna Zimmermann nee Ignácz, and Robert Gépész, both of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

Continuation of Ser. No. 335,714, Feb. 26, 1973, abandoned.
This application Sept. 16, 1975, Ser. No. 613,796
Claims priority, application Hungary, Feb. 25, 1972, ZI 167; Feb. 9, 1973, CI 1340
Int. Cl.² A23L *1/04*
U.S. Cl. 426—573 **5 Claims**

1. A process for the preparation of a nutriment having a low caloric value and adapted, upon ingestion, to be highly filling to the eater, said process comprising the steps of:

a. combining an edible-carbohydrate component and a cellulose ether in a ratio by weight of substantially 0.1 to 12:1;

b. swelling the carbohydrate component and cellulose ether in water to form a swelled composition; and

c. drying the swelled composition, said cellulose ether being selected from the group which consists of methyl ethers, ethyl ethers, carboxy methyl ethers and hydroxy-substituted ethers of cellulose and mixtures thereof, the cellulose ether having a viscosity of 1000 to 3000 centipoise in a 2% aqueous solution at 20° C, said carbohydrate component and said cellulose ether being swelled in the presence of water in step (b) at a temperature of 20° to 40° C, the swelled mixture being dried at a temperature up to about 300° C.

4,042,720

CACTUS TREATMENT PROCESS AND PRODUCT

John H. Forkner, 2116 Mayfair Drive West, Fresno, Calif. 93703

Filed July 12, 1976, Ser. No. 704,537
Int. Cl.² A23L *1/06, 1/212*
U.S. Cl. 426—573 **15 Claims**

1. A process for the treatment of dry cactus pulp containing cellulosic fiber and gritty hard grain material, comprising comminuting the dry pulp to free heavier grain material from cellulosic fiber, and then separating grain material from cellulosic fiber.

4,042,721

FAST CONCHED CANDY COATING

Salvatore F. Ziccarelli, Downers Grove, Ill., assignor to Beatrice Foods Co., Chicago, Ill.

Division of Ser. No. 628,559, Nov. 3, 1975, Pat. No. 3,976,806. This application Aug. 23, 1976, Ser. No. 716,795
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.² A23G *1/16, 1/00*
U.S. Cl. 426—613 **7 Claims**

1. A conched candy coating composition comprising the ingredients of:

a. 30 to 65 parts fat; b. 40 to 65 parts sugar; c. 0 to 8 parts milk and or whey solids; d. 0 to 1 part emulsifier; e. 0 to 12 parts cocoa; f. 0 to 2 parts flavor;

wherein the ingredients have been heated to at least 150° F and mixed to a conched form by a high speed shearing and mixing wherein the shearing is by shear forces having an average shear component of 75° or greater, the particle sizes of solids in the composition are 40 microns or less and the conching time has been 30 seconds or less and thereafter cooled to prevent deterioration thereof.

4,042,722

ADDITIVES FOR ANIMAL FEEDS

Gerald J. Dunne, and John D. Harvey, both of Baie d' Urfe, Canada, assignors to Delmar Chemicals Limited, Ville La-Salle, Canada

Filed Nov. 11, 1974, Ser. No. 522,871
Int. Cl.² A23K *1/00*
U.S. Cl. 426—648 **5 Claims**

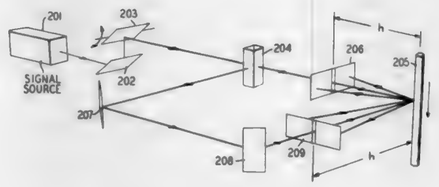
1. Process for the production of a solid livestock feed supplement comprising admixing a starch carrier in a solid form and a concentrated aqueous solution of a selenium-containing component for a period sufficient to produce a substantially homogeneous mixture, said feed supplement having a selenium content of not more than 5,000 ppm.

4,042,723

METHOD FOR MONITORING THE PROPERTIES OF PLASTIC COATINGS ON OPTICAL FIBERS

Herman Melvin Presby, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 12, 1976, Ser. No. 685,527
Int. Cl.² G01B *9/02*; B32B *17/04*
U.S. Cl. 427—8 **10 Claims**



1. A method for monitoring the properties of a coating on a coated optical fiber, said coating being substantially transparent, comprising the steps of:

illuminating said coated fiber with a beam of light incident to a cross-sectional axis of said fiber at a first angle;

illuminating said fiber with a beam of light incident to said cross-sectional axis at a second angle;

observing the first backscattered light pattern generated by said beam incident to said coated fiber at said first angle;

observing the backscattered light pattern generated by said beam incident to said coated fiber at said second angle;

comparing the spatial location of at least one intensity maxima in the first backscattered light pattern with the spatial location of a corresponding intensity maxima in the second backscattered light pattern; and

determining the concentricity of said fiber within said coating from said comparison.

4,042,724

METHOD FOR THE SELECTIVE ON-LINE MEASURING AND CONTROLLING OF A GEOMETRICAL PARAMETER OF ELONGATED ARTICLES

Dennis J. Nawracaj, Chicago, Ill., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 23, 1974, Ser. No. 535,599
Int. Cl.² B05D *5/00*
U.S. Cl. 427—9 **13 Claims**

1. A method of controlling a geometrical dimension related to coating thickness of each of a plurality of continuously advancing elongated articles, comprising the steps of:

coating said aarticles with a layer of coating material having a thickness that is responsively controlled by at least one adjustable operating parameter;

measuring said geometrical dimension of at least certain ones of said plurality of coated articles fluidically by respectively passing them through different substantially confined and pressurized areas that each establishes a detectable back-pressure in the presence of an article, the magnitude of which back-pressure is correlated with said geometrical dimension of the article passed therethrough;

determining fluidically whether said measured geometrical dimension of each coated article is within a predetermined acceptable tolerance range, and producing a separate process signal having a magnitude correlated with and for every measurement, and whenever any process signal indicative of any measurement is outside said tolerance range, at least momentarily substituting a reference signal representative of a nominal geometrical dimension for any such process signal;

averaging all of said process signals and any reference signals fluidically so as to form a composite control signal representative of the average of at least all of the measured geometrical dimensions that have been found to be within said tolerance range;

utilizing said composite control signal to change at least said one adjustable operating parameter, as required, to maintain said measured geometrical dimension and, thereby, the coating thickness of at least the majority of said articles within said acceptable tolerance range during said coating operation, and

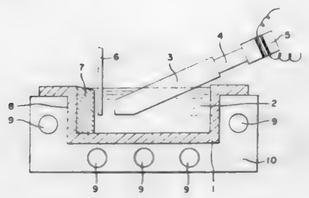
sensing each advancing coated article upstream from the point at which it is being measured for any region therealong having an abnormally large cross-sectional area, and in response to such a sensed abnormally large condition, enlarging said confined pressurized area downstream so as to allow said article region having an abnormally large cross-sectional area to freely pass therethrough, and after a pedetermined time delay re-establishing said confined area.

4,042,725

SOLDER ALLOY AND SOLDERING PROCESS

Koji Nomaki, and Yoshihito Saoyama, both of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed May 24, 1976, Ser. No. 689,527
Claims priority, application Japan, May 27, 1975, 50-62467
Int. Cl.² C23C *1/04*
U.S. Cl. 427—57 **3 Claims**



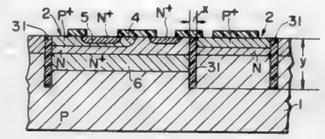
1. In a process for soldering difficulty solderable metal of iron, nickel, copper or an alloy thereof having an oxide surface, the improvement which consists essentially of preparing a bath of molten solder alloy which consists essentially of 18–80% by weight of Zn, 20–72% by weight of Sn, 0.01–0.03% by weight of Al and 0.5–3% by weight of Ag and dipping the difficulty solderable metal in the bath of molten solder alloy while applying ultrasonic vibration to the bath of molten solder alloy whereby the solder layer is formed on the surface of the difficulty solderable metal.

4,042,726

SELECTIVE OXIDATION METHOD

Tadao Kaji, Kokubunji; Tsuneaki Kamei, Mitaka, and Keiji Miyamoto, Hinode, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 8, 1975, Ser. No. 611,206
Claims priority, application Japan, Sept. 11, 1974, 49-103928
Int. Cl.² H01L *21/306, 21/312*
U.S. Cl. 427—93 **4 Claims**



1. A method of manufacturing a semiconductor device which comprises the steps of:

1. forming an insulating film on the principal surface of a semiconductor substrate having at least one semiconductor layer thereon,

2. forming a metallic layer on said insulating film,

3. selectively forming a mask on said metallic layer;

4. applying an etchant to the selectively formed mask and metallic layer to etch said metallic layer beneath an edge of said mask,

5. forming further metallic layer on part of the exposed insulating film so as to leave a gap between areas of metallic material on said insulating film beneath said mask,

6. removing said mask to expose said gap,

7. selectively etching said insulating film and said substrate by way of the gap in the metallic material in the surface of said insulating film to form a groove in said insulating film and said substrate which extends through said layer into said substrate and which has a width smaller than the thickness of said layer, and

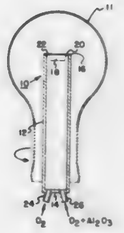
8. selectively oxidizing the semiconductor material of said substrate to form an oxide insulator layer in said groove that isolates a portion of the semiconductor layer from adjacent portions of the substrate.

4,042,727

ALUMINA COATINGS FOR AN ELECTRIC LAMP

David C. Henderson, Chagrin Falls, and Kenneth M. Maloney, Shaker Heights, both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 471,192, May 20, 1974, abandoned, which is a division of Ser. No. 372,069, May 21, 1973, Pat. No. 3,842,306. This application Sept. 29, 1975, Ser. No. 617,293
The portion of the term of this patent subsequent to Feb. 25, 1992, has been disclaimed.
Int. Cl.² B05D *5/12*
U.S. Cl. 427—107 **6 Claims**



1. A method of depositing a light diffusion coating upon the

internal untreated surface of a lamp glass envelope of an electric lamp which comprises:

a. converting a solid aluminum alkoxide compound in an oxidizing atmosphere to form a vapor of spherical alumina particles having an individual particle size range from approximately 400 Angstroms to 5,000 Angstroms in diameter,

b. suspending said vapor formed spherical alumina particles with heating in a moving gas stream, and

c. controlling the velocity flow rate of the moving gas stream within the lamp glass envelope to uniformly deposit the alumina particles upon said untreated internal surface and form a light diffusion layer scattering at least 99% of the incident visible radiation with minor lumen loss.

4,042,728

VINYL MODIFIED LIGNOCELLULOSIC PARTICLES FOR COATING PANELS

Shui Tung Chiu, New Westminster, and Tatsuhei Kaneko, Vancouver, both of Canada, assignors to Borden, Inc., Columbus, Ohio

Filed Dec. 10, 1975, Ser. No. 639,327
Int. Cl.² B05D *3/10, 7/02, 1/18*
U.S. Cl. 427—212 **5 Claims**

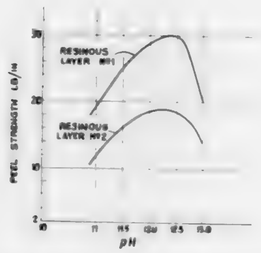
1. A process for polymerizing vinyl monomer on lignocellulosic particles including the steps of adding to an aqueous slurry of said lignocellulosic particles and aqueous solution of a salt to deposit metal ions of said salt on the surfaces and sub-surfaces of said lignocellulosic particles, the pH of the salt and slurry mixture being from 3 to 6.5 which is conducive to metal ion absorption, adjusting upwardly the pH of the salt and slurry mixture to one favorable to polymerization, adding a monomer of an alkyl ester of methacrylic acid to the mix with agitation, adding a sulfoxy compound to the mix to react with said metal ions and form free radicals which initiate polymerization of said monomer, and continuing to stir the mix at a sufficiently elevated temperature to accomplish add-on polymerization of the monomer on said lignocellulosic particles.

4,042,729

PROCESS FOR THE ACTIVATION OF RESINOUS BODIES FOR ADHERENT METALLIZATION

Joseph Polichette, South Farmingdale; Edward J. Leech, Oyster Bay, and John G. Branigan, Smithtown, all of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Division of Ser. No. 314,748, Dec. 13, 1972, abandoned. This application June 18, 1975, Ser. No. 587,831
Int. Cl.² C23C *3/02*
U.S. Cl. 427—304 **9 Claims**



1. In a process for producing a securely bonded layer of metal on a resinous surface by electroless metal deposition the improvement which comprises contacting the resinous surface, prior to electroless metal deposition, with a composition comprising water, permanganate ion and manganate ion in the molar ratio of manganate ion to permanganate ion of up to 1.2, said composition having a pH in the range of 11 to 13.

4,042,730

PROCESS FOR ELECTROLESS PLATING USING SEPARATE SENSITIZATION AND ACTIVATION STEPS

Richard Lewis Cohen, Berkeley Heights, N.J., and Ronald Lee Meek, Naperville, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 29, 1976, Ser. No. 671,034
Int. Cl.² C23C *3/02*
U.S. Cl. 427—305 **10 Claims**

1. A process for electroless deposition of copper on nonmetallic surfaces comprising the steps of:

a. preconditioning the nonmetallic surface so as to prepare the surface for a sensitizing and activating procedure;

b. exposing the preconditioned surface to a sensitizing solution consisting essentially of an acidified aqueous solution of tin ions;

c. activating the sensitized surface by exposing the surface to an acidified solution of palladium ions so as to produce a catalytically active surface;

d. exposing the catalytically active surface to an aqueous post-activation solution; and

e. exposing said surface to an alkaline electroless copper plating solution;

characterized in that the aqueous post activation solution consists essentially of a nonreducing alkaline agent with dissociation constant for the liberation of one hydroxyl ion greater than 10^{-5} and concentration range from 0.07 to 0.2 molar.

4,042,731

FOAMING AGENTS FOR GALVANIZING FLUXES

Dong Myung Chay, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 6, 1975, Ser. No. 629,548
Int. Cl.² C23C *1/12*
U.S. Cl. 427—311 **6 Claims**

1. A galvanizing flux consisting essentially of a fluxing material selected from zinc ammonium chloride double salt and a mixture of zinc chloride and ammonium chloride and sorbitol, the sorbitol being 0.2 to 1.0% by weight of the fluxing material.

4. In a galvanizing process which comprises dipping a metal article into a molten bath of zinc covered by a flux composition consisting essentially of a fluxing material selected from a mixture of zinc chloride and ammonium chloride and zinc ammonium chloride double salt the improvement wherein the fluxing materials also contain as a foaming agent sorbitol in an amount of from 0.2 to 1.0% by weight of the fluxing material.

4,042,732

COHESIVE COATING COMPOSITIONS

Andrew Nicholas Ferrar, Bridgewater, England, assignor to British Cellophane Limited, England

Continuation of Ser. No. 417,406, Nov. 19, 1973, Pat. No. 3,937,683. This application Sept. 25, 1975, Ser. No. 616,696
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.² C08J *3/20*; C08K *3/34*
U.S. Cl. 427—385 R **5 Claims**

1. A cohesive coating composition comprising in dispersion in a liquid a mixture of between 70 and 90% by weight of natural rubber and between 10 and 30% by weight of poly-n-butyl methacrylate in which dispersion there is incorporated between 10% and 35% by weight, based on the weight of the solids, of an inert particulate mineral material selected from the group consisting of glass and hydrated aluminum silicate having a mean particle size lying in the range between 2.0 and 20 microns.

4,042,733

FORMING SOLID, ADHESIVE-FREE COMPOSITE OF MEMBRANE FILTERS AND CELLULOSIC CARDBOARD

Karl Buchta; Mohamed Abdou, both of Ingelheim am Rhein, and Harald Woltersdorf, Konigslutter, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

Continuation of Ser. No. 592,184, July 1, 1975, abandoned. This application May 25, 1976, Ser. No. 689,792
Claims priority, application Germany, July 4, 1974, 2432049
Int. Cl.² B05D *3/02*
U.S. Cl. 427—391 **5 Claims**

1. The method of forming a solid, adhesive-free, layered composite material composed of two clearly defined layers consisting of a membrane filter layer and a porous backing layer, comprising the steps of depositing on cellulosic cardboard a layer of a gelatinized polymeric membrane-forming substance between onset of synerisis and final solidification thereof, and allowing said membrane-forming substance to solidify on said cellulosic cardboard.

3. The method of claim **1**, where said cellulosic cardboard is impregnated with a nutrient solution for microorganisms.

4,042,734

METHOD FOR SPRAY COATING

Richard F. Wiggins, Fairfield, Conn., assignor to The Gyromat Corporation, Stratford, Conn.

Filed Dec. 2, 1975, Ser. No. 637,019
Int. Cl.² B05D *1/02*
U.S. Cl. 427—424 **17 Claims**

1. A process for spray coating of irregularly shaped articles, which comprises

a. progressively conveying the articles along a conveying axis through a substantially enclosed spray chamber,

b. directing one or more spray fans of coating material toward said article,

c. rotating said spray fans about a rotational axis disposed at a large angle to the conveyance axis,

d. said spray fans being directed at a substantial angle with respect to the axis of rotation thereof,

e. reciprocating said spray fans along a reciprocation axis at a substantial augle to said conveying axis,

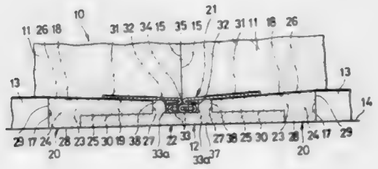
f. said spray fans being rotated at a rate such, in relation to the speed of reciprocation and the speed of conveyance, that said spray fans described tight prolate cycloids in which the effective ratio of rolling circle radius to tracing point radius (a/b) is 1 to at least about 5.

4,042,735

CARPET CONSTRUCTION

Kiyoo Yoneya, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Sept. 20, 1976, Ser. No. 724,650
Claims priority, application Japan, Sept. 30, 1975, 50-134214
Int. Cl.² D04H *11/00*
U.S. Cl. 428—33 **5 Claims**



1. A carpet construction comprising:

a. A pair of sheet materials having their opposed ends disposed in abutting engagement with each other;

b. a pair of undercushioning members secured respectively to reverse surfaces of said sheet materials, said undercushioning members terminating short of said abutting ends to provide a longitudinal recess therebetween;

c. a sliding clasp fastener having a pair of stringer tapes carrying along their inner longitudinal edges rows of interengageable fastener elements, said stringer tapes being secured to the reverse surfaces of said sheet materials immediately adjacent to the abutting ends thereof, said rows of fastener elements being coupled together, and said coupled rows of fastener elements being located in said longitudinal recess; and

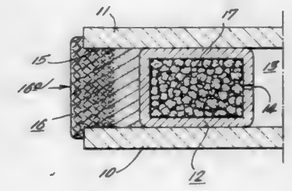
d. a protective member extending along the length of said sliding clasp fastener and covering said coupled rows of fastener elements, and said protective member having a longitudinal groove snugly receiving said coupled rows of fastener elements therein, thereby preventing the same from displacement in a direction transverse to the longitudinal axis of said sliding clasp fastener.

4,042,736

INSULATING GLASS UNITS

Theodore R. Flint, Jug Hollow Road, Valley Forge, Pa. 19481

Division of Ser. No. 626,230, Oct. 28, 1975, Pat. No. 3,998,680. This application Oct. 1, 1976, Ser. No. 728,873
Int. Cl.² E06B *3/24, 3/26, 3/28*
U.S. Cl. 428—34 **2 Claims**



1. An insulating glass unit comprising glass panes held in a predetermined spaced relation by a spacing member disposed between the panes of glass adjacent to the edges thereof and cooperating to provide a channel about the periphery of the assembly and a partially crosslinked hot-melt butyl rubber sealant composition in said channel in contact with said glass panes and spacing member, sufficient heat having been applied to the exterior face of the sealant composition to raise the temperature of the outermost portion of the sealant composition to above from about 325° F. to about 425° F. while the innermost portion of the sealant composition remained at a temperature substantially below from about 325° F. to about 425° F. to cause substantially complete crosslinking of that portion of the sealant composition heated above from about 325° F. to about 425° F. thereby forming a high-strength thermoset adhesive bond about the outer periphery of the channel, while the innermost portion of the sealant composition adjacent the spacing member remained uncrosslinked and provides a high tack, thermoplastic adhesive bond about the inner periphery of the channel.

4,042,737

PROCESS FOR PRODUCING CRIMPED METAL-COATED FILAMENTARY MATERIALS, AND YARNS AND FABRICS OBTAINED THEREFROM

Klane F. Forsgren, Yardley; Sidney Melamed, Elkins Park, both of Pa., and Robert S. Weiner, Marietta, Ga., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 415,916, Nov. 14, 1973, abandoned, which is a continuation of Ser. No. 263,808, June 19, 1973,
abandoned, which is a continuation of Ser. No. 76,246, Sept. 28, 1970, abandoned. This application Apr. 1, 1975, Ser. No. 564,186
Int. Cl.² B05D *5/12*; D02G *1/00*
U.S. Cl. 428—96 **16 Claims**

1. A process for producing a textured multi-filament yarn

suitable for use in the production of textiles having an enhanced resistance to the accumulation of electrostatic charges, said process comprising:

knitting a continuous filamentary material, suitable for use in carpet fiber or carpet yarn, to form a knitted fabric therefrom,

depositing an electrically conductive oxidatively stable and non-toxic metal coating on said knitted fabric,

deknitting the coated fabric to provide a textured, coated filamentary material, and

incorporating said textured, coated filamentary material in a textured multifilament yarn,

and wherein, after the metal coating step, the knitted fabric, deknitted filamentary material, or textured multifilament yarn is heat-treated such that shrinkage of the filamentary material according to the Leesona Skein Shrinkage test is no more than 1–5% measured after one hour.

9. A textured multifilament yarn, suitable for use in the manufacture of textiles having an enhanced resistance to the accumulation of electrostatic charge, produced in accordance with the process of claim **1.**

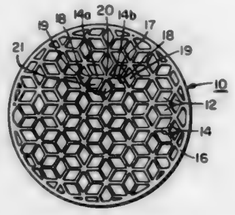
13. In a carpet characterized by a static electrical buildup of substantially less than 10,000 volts, the improvement comprising forming at least a portion of the pile thereof with the textured multifilament yarn of claim **9.**

4,042,738

HONEYCOMB STRUCTURE WITH HIGH THERMAL SHOCK RESISTANCE

Suresh T. Gulati, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 28, 1975, Ser. No. 599,624
Int. Cl.² B32B *3/12*
U.S. Cl. 428—116 **8 Claims**



1. A ceramic honeycomb structure having improved thermal shock resistance comprising, a plurality of interconnected partitions extending longitudinally along the longitudinal extent of said honeycomb structure within a bounding wall portion and forming a plurality of cells or passageways extending longitudinally therethrough, said cells having a diamond shape when viewed in a plane transverse to the longitudinal extent of said honeycomb structure, and said interconnected partitions being discontinuous in any one direction within said plane such that no continuous unidirectional partition extends transversely across said honeycomb structure within such plane.

4,042,739

JOINT TAPE FOR DRY WALL CONSTRUCTION HAVING WATER-INITIATED ADHESIVE WHICH ONCE ACTIVATED, ATTACHED TO, AND DRIED ON A SURFACE RESISTS REMOVAL UNDER REMOISTENING CONDITIONS

Earl A. Emal, P.O. Box 377, Commerce City, Colo. 80022, and Jack L. Lambert, 114 S. 12th St., Brighton, Colo. 80601

Filed Nov. 3, 1976, Ser. No. 738,307
Int. Cl.² B32B *3/24, 3/26;* **C09J** *7/04*
U.S. Cl. 428—137 **3 Claims**

1. A joint tape for covering and sealing the joints between adjacent wall board panels comprising:

a thin, parallel sided, elongated strip of water absorbing paper tape; and

a dried, water moistenable, polyvinyl acetate-based adhesive layer applied to completely cover the surface area of one side of said tape whereby the adhesive layer may be moistened with water to activate the adhesive layer so that the tape may be applied directly to the wall board joint to seal adjacent wall board panels together, said joint tape being further characterized in that after being moistened and applied to said panels and dried, the tape cannot be removed by remoistening the adhesive layer.

2. A joint tape as defined in claim **1,** wherein:

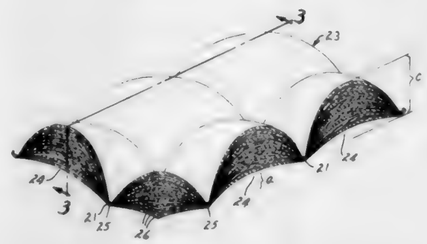
said paper tape is perforated with a series of holes in longitudinal rows along the central portion of the strip.

4,042,740

REINFORCED PILLOWED MICROFIBER WEBS

Dennis L. Krueger, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, St.Paul, Minn.

Filed Sept. 20, 1974, Ser. No. 507,878
Int. Cl.² B32B *3/10*
U.S. Cl. 428—138 **16 Claims**



1. A low-density web comprising 1) a mesh of filaments and 2) a coherent mass of blown microfibers arranged into a network of compacted high-density regions and pillowed low-density regions, the compacted regions being in registration and engagement with the filaments of said mesh, and the pillowed regions spanning the space between adjacent compacted regions, with microfibers arching outwardly from their level in a compacted region into a pillowed region, whereby in a free-standing condition of the mass the pillowed regions are displaced to one side of a plane defined by the base of the compacted regions and have an expanded and arched configuration in which the span length from compacted region to compacted region of the most highly arched microfibers is greater than that of less highly arched microfibers.

4,042,741

CHANNEL-SHAPED FLEXIBLE SEALING STRIPS

Robert G. Bright, Viersen, Germany, assignor to Draftex Development AG, Switzerland

Filed Nov. 3, 1975, Ser. No. 628,201
Claims priority, application United Kingdom, Nov. 20, 1974, 50239/74
Int. Cl.² E06B *7/18, 7/22;* **E04F** *19/02;* **B32B** *15/06*
U.S. Cl. 428—217 **17 Claims**

1. A channel-shaped sealing strip, comprising

a channel-shaped carrier member made of relatively rigid material but designed so as to be flexible about the length of the channel,

a covering of flexible material over the outside surface of the carrier member and extending over the distal edges of the side walls of the carrier member and over at least part of the inside surfaces thereof,

the said flexible material defining gripping ribs extending longitudinally along the inside surface of the channel and projecting toward each other from the opposite side walls thereof,

at least part of the said material on one side wall of the carrier member being of relatively hard flexible material which is placed directly onto the carrier member,

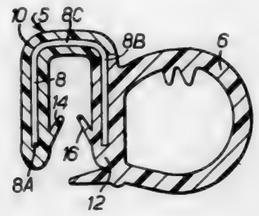
at least part of the flexible material on the other side wall of the carrier member being of relatively softer flexible material which is placed directly onto the carrier member,

the relatively hard and relatively softer materials not overlapping each other, and

a beading running along the outside of the channel and defined by the relatively softer flexible material.

10. A method of making a channel-shaped sealing strip, comprising the steps of

extruding flexible covering material in relatively hard and relatively soft forms directly onto different regions of a longitudinally extending carrier member so as together they completely cover one surface thereof and join along a line extending longitudinally of that surface, the lateral edges of the carrier member and at least the marginal



regions of the other surface of the carrier member being also directly covered by the extruded flexible covering material, at least part of this material being in the relatively soft form,

the material in the relatively soft form on the said one surface additionally being extruded to provide a beading extending longitudinally of the carrier member parallel to the said line,

the material on the said other surface additionally being extruded to provide ribs extending longitudinally of the carrier member parallel to the said line,

the said regions being such that, with the carrier member shaped into channel form, the outside surface of one side wall of the channel so formed is covered by the material in the relatively soft form, the beading runs along this outside surface, the outside surface of the other side wall of the channel is covered by the material in the relatively hard form, and the gripping ribs run along the inside surfaces of the side walls of the channel.

4,042,742

REINFORCING ELEMENT FOR FLEXIBLE STRUCTURES, IN PARTICULAR PNEUMATIC TIRES

Luciano Bergomi, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Mar. 30, 1971, Ser. No. 129,613
Claims priority, application Italy, Mar. 31, 1970, 22692/70
Int. Cl.² D04H *1/74*
U.S. Cl. 428—295 **11 Claims**

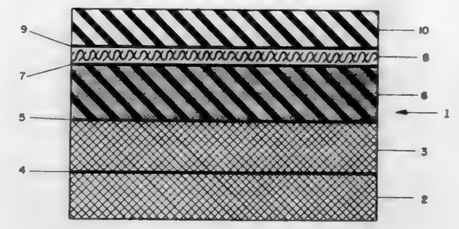
1. An elongated rubber base element designed for forming part of and reinforcing pneumatic tires, and consisting of a rubber compound matrix and of individual fibers evenly dispersed therein, wherein said fibers consist of a mineral material having a tensional modulus of elasticity of at least 5,000 Kg/mm² and have a diameter comprised between 0.002 and 0.02 mm, the diameter to length ratio of said individual fibers being comprised between 1/10 and 1/100, their length being in any case not less than 0.1 mm, the amount of said fibers being comprised between 2 and 30 percent by weight of the weight of said matrix, the major part of said fibers being embedded and arranged in said matrix in essentially parallel relationship to one another in a direction essentially perpendicular to the smallest dimension of said element, the resistance of said element to compressional stress in said direction being substantially higher than that of a like element consisting solely of the said rubber compound matrix.

4,042,743

COMPRESSIBLE OFFSET PRINTING BLANKET

Charles E. Larson, Attleboro, Mass., assignors to Uniroyal, Inc., New York, N.Y.

Continuation of Ser. No. 45,469, June 11, 1970, abandoned. This application Feb. 2, 1976, Ser. No. 654,190
Int. Cl.² B41N *9/00*
U.S. Cl. 428—306 **7 Claims**



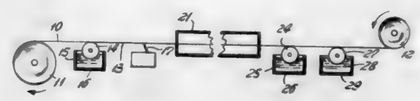
1. A laminated printers' blanket comprising a layer having a printing surface, at least one strengthening layer, and a compressible layer of a cellular resilient polymer between the layer having the printing surface and the strengthening layer, the cells of the cellular resilient polymer including resinous hollow microspheres in the polymer matrix, each surface of said compressible layer having a substantially planar surface when said blanket is in a flat position.

4,042,744

MULTIPLE-COLOR TRANSFER ELEMENTS AND PROCESS

Douglas A. Newman, and Allan T. Schlotzhauer, both of Glen Cove, N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.

Continuation-in-part of Ser. No. 213,534, Dec. 29, 1971, abandoned. This application May 14, 1973, Ser. No. 360,334
Int. Cl.² B41C *1/06*
U.S. Cl. 428—307 **11 Claims**



1. Process for producing a pressure-sensitive multicolor liquid ink-releasing transfer element comprising the steps of:

a. preparing a composition comprising a heat-activatable solid blowing agent, a dispersed granulated solid which is soluble in a volatile liquid, a synthetic thermoplastic film-forming resin and a volatile liquid solvent for said resin which is a non-solvent for said dispersed granulated solid;

b. coating said composition as a thin layer and evaporating said solvent to form a solidified layer of said resin containing said blowing agent and dispersed granulated solid;

c. heating said solidified layer to activate and remove said blowing agent from said layer to form a dry microporous layer of said resin containing said dispersed granulated solid;

d. treating and dry microporous layer with a volatile liquid which is a solvent for said dispersed granulated solid but is a non-solvent for said resin, to dissolve and remove said dispersed granulated solid and form a microporous layer of said resin containing empty, interconnected pores capable of absorbing a liquid ink;

e. impregnating one area of said microporous layer with a liquid ink having one color and comprising a non-drying oil and coloring matter; and

f. impregnating another area of said microporous layer adjacent said one area with a liquid ink having a different color and comprising a non-drying oil and coloring matter, to provide a transfer element capable of exuding said different colored inks under the effects of imaging pressure applied to said different areas.

4,042,745

CEMENTITIOUS SOUND ABSORBING PANELS AND SOUND ABSORBING SPRAYED WALL STRUCTURES

Charles E. Cornwell, 7104 Marlan Drive, and Mark Plunguian, 6912 Columbia Drive, both of Alexandria, Va. 22307

Filed July 14, 1976, Ser. No. 705,335
Int. Cl.² B32B *3/26*
U.S. Cl. 428—310 **8 Claims**

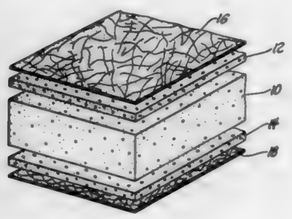
1. An acoustical sound-absorbing cementitious product composed of hydraulic cement, selected from the group comprising portland cement, calcium aluminate cement, and gypsum cement, of lightweight aggregate and of foamed air cells, with a range of dry densities of 20–40 pounds per cubic foot, having an interior interconnecting cellular structure and an impervious surface with perforations providing open space accounting for at least 10% of the surface area, giving the sound waves access to the interior open cell structure.

4,042,746

COMPOSITE MATERIAL AND METHOD OF FORMING

Peter H. Hofer, Grosse Pointe Farms, Mich., assignor to The John Z. DeLorean Corporation, Bloomfield Hills, Mich.

Filed Nov. 7, 1975, Ser. No. 630,056
Int. Cl.² B32B *3/26*
U.S. Cl. 428—311 **4 Claims**



1. A composite structure comprising a rigid closed-cell core element, an initially resilient open-cell foam material overlaying at least one face of said core element, a layer of high-strength reinforcing material overlaying said open-cell foam material, a polymerizable resinous material impregnating the open-cell material, said resinous material having been cured while maintaining the structure under sufficient compression to substantially reduce the thickness of the initially resilient foam to thereby substantially fill the open cells and extrude excess resinous material from the compressed layer to bond the high-strength reinforcing material to the rigid closed-cell core element without significant permeation of the closed-cell core element.

4,042,747

GASKET AND SEALING STRUCTURES OF FILLED POLYTETRAFLUOROETHYLENE RESINS

Ernest J. Breton, Wilmington; Dexter Worden, Newark, and Melville E. Pugh, Jr., Wilmington, all of Del., assignors to Joseph A. Teti, Jr. and William C. Teti, both of Philadelphia, Pa., part interest to each

Filed Mar. 14, 1975, Ser. No. 558,344
Int. Cl.² B32B *5/16, 27/00*
U.S. Cl. 428—323 **6 Claims**



1. A self-sustaining, flexible, non-woven material consisting essentially of from about 65 to 95 percent by volume of a solid particulate material and from about 5 to 35 percent by volume of polytetrafluoroethylene resin, said volume percentages being based upon the amount of particulate material and polytetrafluoroethylene present, said particulate material being interconnected and intertwined by fibrils of said polytetrafluoroethylene to impart a self-sustaining condition and flexibility to the non-woven material, and additionally containing from about 40 to 60 percent by volume of the non-woven material to grease, said grease having a viscosity between about 10 to 1000 poises at temperatures between about 10 and 150° C. and being uniformly distributed throughout the non-woven material, said non-woven material having been prepared by mechanically working a mixture of said particulate material, polytetrafluoroethylene and grease until fibrillation of the polytetrafluoroethylene occurs and the resulting fibrils interconnect and intertwine the particulate material.

4,042,748

PROCESS FOR IMPROVING COATING COMPOSITIONS FOR PAPER AND PAPER SUBSTITUTES BY USE OF POLY(HYDROXYALDEHYDOCARBOXYLATE) DISPERSING AGENT

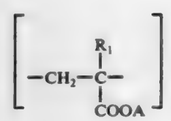
Gerhard Hebbel, Traisa; Horst Krueger, Darmstadt; Heinz Haschke, and Gerhard Morlock, both of Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Filed July 24, 1973, Ser. No. 382,225
Claims priority, application Germany, July 26, 1973, 2236595
Int. Cl.² C08L *81/00;* **B32B** *5/16;* **C09C** *3/10*
U.S. Cl. 428—323 **16 Claims**

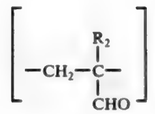
1. Process for coating paper or paper substitutes, said process comprising applying to said paper or paper substitutes a composition containing solid, organic or inorganic coloring particles or mixtures thereof, in a system comprised mainly of water, wherein at least about 50% of weight of said particles or mixtures thereof have a maximum diameter of about 50μm, said composition containing about 0.05–5.0% by weight of a dispersing agent, related to the weight of solid substance in said composition, said dispersing agent consisting essentially of at least one polymer having an average degree of polymerization of about 10–500, said polymer derived from:

a. Y + W/2 mole percent units of the formula

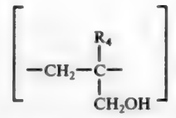
(I)



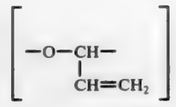
b. U − W mole percent units of the formula



c. W/2 mole percent units of the formula



d. V mole percent units of the formula



in which U is 12 – 47, V is 1 – 25, W is O – U and Y is [100 – (U + V)]; A is an alkali metal, hydrogen or ammonium ion; R_1 signifies hydrogen, methyl, hydroxy methyl, ethyl, chlorine or bromine, R_2 and R_4 are the same or different and signify hydrogen or hydroxy methyl; and further, when W is not equal to zero, the quotient of mole percent carboxyl or carboxylate groups to mole percent hydroxyl groups is 2 – 16.

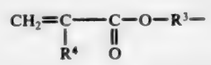
4,042,749

ARTICLE HAVING ABRASION RESISTANT SURFACE FORMED FROM THE REACTION PRODUCT OF A SILANE AND A METAL ESTER

Timothy C. Sandvig, Woodville, Wis., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 513,116, Oct. 8, 1974, abandoned. This application Oct. 4, 1976, Ser. No. 728,932
Int. Cl.² B32B *27/36*
U.S. Cl. 428—412 **18 Claims**

1. An insoluble, abrasion-resistant, film consisting of the reaction product of (a) a reactive silane of the formula R_n^1—Si—R_{4-n}, wherein R^1 is selected from the group consisting of CH_2=CH—, an alkyl group of from 2 to 10 carbon atoms containing an epoxy group, an alkyl ether epoxide group containing up to 10 carbon atoms, and



wherein R^3 is an alkylene group having from 1 to 8 carbon atoms, and R^4 is hydrogen or an alkyl radical having from 1 to 8 carbon atoms; R^2 is an alkoxy or acetoxy group, n is a positive integer of 1 to 3; and (b) a metal ester of the formula $M(OR)_x$, wherein M is selected from the group consisting of titanium, aluminum, and zirconium; R is an alkyl radical having from 1 to 8 carbon atoms, and x is equal to the number of valence bonds of M.

4,042,750

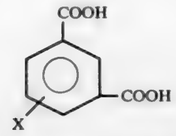
PRODUCTS AND PROCESS FOR PREPARATION OF POLYAMIDES AND SHAPED ARTICLES THEREFROM

Robert B. Hanson, Aurora, and James R. Stephens, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 348,869, April 9, 1973, Pat. No. 3,959,233. This application May 29, 1975, Ser. No. 581,818
Int. Cl.² B32B *15/02, 15/08, 27/34*
U.S. Cl. 428—423 **26 Claims**

(II)

(IV) **12.** A process for preparing high moluecular weight polyamide polymers having film forming properties which process comprises condensing an aromatic diacid of the formula



(V)

where X is hydrogen, nitro, or an alkyl or alkenyl radical having about six or less carbon atoms, with a diamine in a mole ratio of about 1:0.5 to about 1:0.9 at a temperature of about 210° to about 250° C., to give a low molecular weight polymer having an excess of carboxylic acid moieties and then further condensing this polymer with about 0.1 up to about 0.75 moles of diisocyanate for each diacid moiety in an inert solvent at a temperature of about 25° to about 150° C.

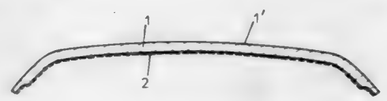
25. A laminate having a plurality of layers bonded together with the polyamide prepared according to the process of claim **12.**

4,042,751

MOULDED PANEL AND THE METHOD OF ITS MANUFACTURE

Jacques Roth, 13, quai Mullenheim, Strasbourg (Bas-Rhin), France

Filed Jan. 6, 1976, Ser. No. 646,929
Claims priority, application France, Feb. 5, 1975, 75.05063
Int. Cl.² B32B *27/40, 3/26*
U.S. Cl. 428—425 **6 Claims**



1. A method of manufacturing shaped panels, comprising impregnating selected portions of a flexible sheet of foamed polyurethane with a polymerizable mixture of isocyanate, polyol, catalyst and a diluent, placing said sheet in a mold, closing the mold in order to impart to the sheet a predetermined desired shape, opening the mold and removing the sheet from the mold when the polymerizable mixture has polymerized, thereby to produce a flexible sheet having different degrees of flexibility over different areas of the sheet.

6. A shaped panel of varying flexibility produced by the method of claim **1.**

4,042,752

MULTIPLE METALLIC LAYERS INCLUDING TIN-COBALT CONTAINING ALLOY LAYER, WITH PLASTIC SUBSTRATE

Jacob M. Hage, Farmington, Mich., assignor to M.C.P. Industries, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 432,862, Jan. 14, 1974, Pat. No. 3,926,569, which is a division of Ser. No. 249,850, May 3, 1972, Pat. No. 3,884,116, which is a continuation-in-part of Ser. No. 208,080, Dec. 15, 1971, abandoned. This application Dec. 15, 1975, Ser. No. 640,713

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.[2] B32B *15/08*

U.S. Cl. 428—626 **18 Claims**

1. A product means for use in interior as well as exterior applications, such as in the automotive field and the like, and operative to provide good corrosion resistance properties, and being of satin-like lustrous or shiny appearance, comprising in sequence,

a. a plastic substrate means for generally supporting the product means and being operative to receive and support a plurality of metallic layers thereon,

b. zero up to about 0.0005 inches thickness of a layer means of a material selected from the group consisting of copper and copper alloys.

c. layer means selected from at least one material of the group consisting of nickel, cobalt, and nickel-cobalt alloys, having a thickness between about 0.0001 and about 0.001 inches,

d. layer means of at least one material selected from the group consisting of a tin/nickel alloy, a tin/cobalt-nickel alloy, or a tin/cobalt alloy, said layer means having a thickness between about 0.000005 and about 0.00020 inches,

said layer means being for the most part applied by electrolytic coating process and being operative to enable good corrosion resistance properties and good adhesion properties.

4,042,753

COMPOSITE CONDUCTOR

Frank Smith, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 395,595, Sept. 10, 1973, Pat. No. 3,991,929. This application Sept. 16, 1976, Ser. No. 723,897

Claims priority, application United Kingdom, Sept. 22, 1972, 43897/72

Int. Cl.[2] B32B *15/20*

U.S. Cl. 428—651 **17 Claims**

1. A conductor comprising a tubular sheath of titanium, zirconium or tantalum or an alloy of one of these metals, said sheath having at least one core element of another metal inserted therein and bonded thereto and having a coating of tinning metal or alloy thereon.

4,042,754

BATTERY

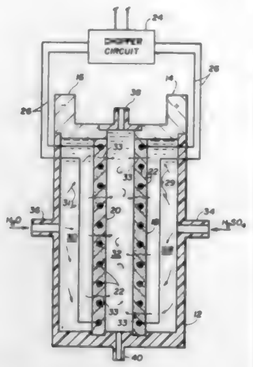
Domenic Borello, 142 Nyack Ave., Pelham, N.Y. 10803

Filed Oct. 20, 1976, Ser. No. 734,316

Int. Cl.[2] H01M *10/04, 10/06*

U.S. Cl. 429—10 **4 Claims**

1. An improved battery comprising an outer housing bounding an internal battery compartment, and a cooperating negative and positive pair of battery plates disposed in spaced apart relation in said battery compartment so as to subdivide same into a central electrolyte mixing compartment and separate first and second electrolyte inlet compartments on opposite sides thereof, each said negative and positive battery plate being comprised of a porous construction material for permitting the continuous flow of electrolyte components from said inlet compartments into said mixing compartment in accordance with a selected specific gravity of the electrolyte mixture in said central compartment optimum for electrical conductivity, whereby the maintaining of said elecrolyte mixture



at said selected optimum specific gravity promotes effective charging and discharging of said battery plates.

4,042,755

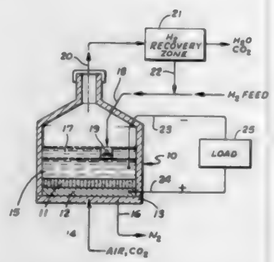
METHOD AND APPARATUS FOR ELECTROCHEMICAL GENERATION OF POWER FROM HYDROGEN

Michael Anbar, 960 Ilima Way, Palo Alto, Calif. 94306

Filed Nov. 10, 1975, Ser. No. 630,337

Int. Cl.[2] H01M *8/18*

U.S. Cl. 429—16 **8 Claims**



1. An apparatus for the continuous generation of an electromotive force from hydrogen which comprises in combination, an enclosed electrochemical vessel, a silver screen cathode disposed along a lower surface of the vessel, conduit means disposed for passing air and carbon dioxide from outside the vessel to the silver screen cathode, nitrogen conduit means disposed for discharging from the vessel nitrogen from the introduced air, a porous sintered alumina disk impregnated with molten salt, said molten salt being immobilized by capillary forces in said alumina disk, the said alumina disk being disposed over the silver screen cathode, a layer of molten metal supported on the upper surface of the alumina disk, a free-flowing molten alkali metal carbonate layer supported over the molten metal layer, hydrogen conduit means disposed for passing hydrogen fuel to the molten alkali metal carbonate layer, a vent for passage of gases from the vessel to a hydrogen recovery zone, a first electrical connection leading from the molten metal layer serving as an anode, and a second electrical connection leading from the silver screen cathode, said first and second electrical connections being electrically joined to a load.

4,042,756

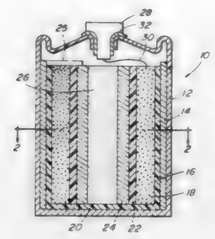
ELECTROCHEMICAL CELLS

Franz Goebel, Ashland, and Nikola Marincic, Winchester, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 12, 1976, Ser. No. 676,073

Int. Cl.[2] H01M *6/14*

U.S. Cl. 429—94 **17 Claims**



1. An electrochemical cell comprising a first, central electrode of one polarity; a second electrode of the same polarity as said first, central electrode, said second electrode being disposed around said first, central electrode but not in mechanical contact therewith; a third electrode of a polarity opposite to said first and second electrodes, said third electrode being disposed between said first and second electrodes but not in mechanical contact therewith; and an electrolytic solution between and in contact with said first, second and third electrodes, said first and second electrodes of the same polarity being greater in number than the number of electrodes of the polarity opposite to the first polarity.

4,042,757

THERMO-ELECTRIC GENERATORS

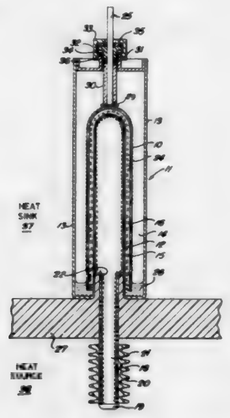
Ivor Wynn Jones, Chester, England, assignor to Chloride Silent Power Limited, England

Filed Apr. 5, 1976, Ser. No. 673,556

Claims priority, application United Kingdom, Apr. 10, 1975, 14863/75

Int. Cl.[2] H01M *4/36*

U.S. Cl. 429—104 **19 Claims**



1. A thermo-electric generator comprising outer and inner tubes formed of metal and constituting a first electrode, the inner tube having a closed end within the outer tube and, remote from the closed end being secured to the outer tube to form an annular region between the two tubes, sodium in this annular region, which sodium, when the generator is operating, is partly liquid and partly vapor, a beta alumina ceramic electrolyte tube having a closed end positioned within the outer tube and over the inner tube so that the open end of the ceramic tube dips into the liquid sodium in said annular region when the tubes are in an upright position with the closed end of the inner tube above the point where the inner and outer tubes are joined, the ceramic tube thereby separating two regions containing sodium liquid and vapor, a heat source and heat sink, the heat sink being arranged to cool either the inner tube or the outer tube and to cool also the region where the two tubes are joined and the heat source being arranged to heat the other of these two tubes, whereby a temperature difference is maintained between the regions inside and outside the electrolyte tube, the electrolyte tube, on part of its surface exposed to sodium vapor and facing the cooled tube, having a conductive coating which is porous to sodium and which constitutes a second electrode, a current output lead connected to said conductive coating, and means for recirculating condensed sodium from the region between the electrolyte and the cooled tube to the surface of the electrolyte facing the heated tube, whereby an electric potential is developed between said output lead and the metal inner and outer tubes which constitute a second electrical output conductor.

4,042,758

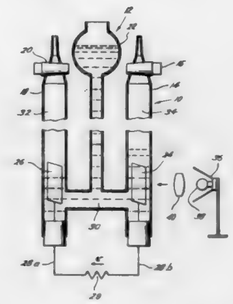
PHOTOCHEMICAL CELL

David H. Weinstein, Brookshire; Joe W. Keeney, Houston, both of Tex., and Gregory M. Haas, McLean, Va., assignors to The Superior Oil Company, Houston, Tex.

Filed Nov. 3, 1975, Ser. No. 628,083

Int. Cl.[2] H01M *6/30*; C25B *1/02*

U.S. Cl. 429—111 **7 Claims**



1. In a photochemical cell of the type utilizing an alkaline electrolyte solution, a cathode in contact with said electrolyte, and an anode of titanium dioxide in contact with said electrolyte to produce electric current from light energy, the improvement which comprises:

said cathode bieng selected from a group consisting of platinum and gold and being partially immersed in said electrolyte and partially exposed to an oxygen-containing gas.

2. A photochemical electric cell comprising:

a container;

an electrolyte of approximately five normal aqueous potassium hydroxide solution in said container;

an anode of titanium metal at least partially immersed in said electrolyte and having formed thereon a surface film of titanium dioxide;

a cathode selected from the group consisting of platinum and gold, said cathode being partially immersed in said electrolyte and partially exposed to an oxygen-containing gas whereby oxygen gas is evolved at said anode during operation of said cell;

conductor means attached to said anode and said cathode for forming an electric circuit therebetween; and

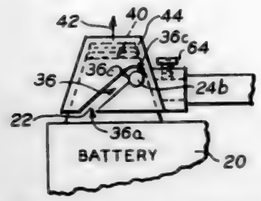
means for exposing the titanium dioxide film on said anode to light.

4,042,759

BATTERY QUICK DISCONNECT SYSTEM

Alexander Cella, Robinwood Drive, Great Notch, N.J. 07013

Filed Aug. 25, 1975, Ser. No. 607,098
Int. Cl.² H01M *2/30*
U.S. Cl. 429—121 **7 Claims**



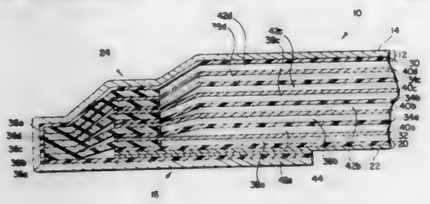
1. In a disconnect system having a battery cable and an existing unthreaded battery terminal post to which said battery cable is removably connected; the improvement comprising a threaded hollow sleeve member fixedly secured about said existing terminal post to convert said existing unthreaded terminal post into a threaded terminal post, said threaded terminal post having an electrically conductive exterior portion electrically connected to said existing unthreaded terminal post, and a molded hollow socket body having interior threads therein complimentary to the threads on said fixedly secured threaded sleeve and lockably threadably engageable therewith, said hollow socket body being threadably removably mounted on said fixedly secured threaded sleeve with said interior threads engaging said complimentary threads, said socket body further having an electrically conductive interior portion adjacent said interior threads, said battery cable extending from said socket body electrically conductive interior portion and being electrically connected thereto, said electrically conductive interior portion being disposed in electrically conductive contact with said converted threaded terminal post electrically conductive exterior portion and electrically therethrough to said existing unthreaded terminal post when said socket body is threadably mounted on said converted threaded post, said socket body interior threads and said sleeve threads comprising locking threads for releasably locking said socket body to said converted threaded post by a 90° rotation of said hollow socket body onto said fixedly secured threaded sleeve in a first direction and quickly disconnecting said socket body from said fixedly secured threaded sleeve by 90° rotation in a second direction opposite to said first direction, whereby an existing battery terminal post may be converted into a system in which said battery cable may be quickly connected to and disconnected from said existing terminal post.

4,042,760

FLAT BATTERY

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 2, 1975, Ser. No. 564,227
Int. Cl.² H01M *6/46*
U.S. Cl. 429—162 **24 Claims**



1. In a planar battery of a variety having at least one cell including positive and negative electrodes and a planar electrolyte ion permeable separator positioned therebetween, the improvement wherein at least one of said electrodes is formed comprising:

a planar current collector having a surface for association with active electrode material; and

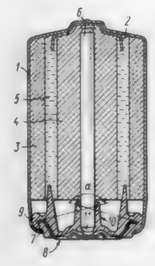
an aqueous slurry of active electrode material particles in aqueous electrolyte, said slurry including an inorganic substantially nonconductive particulate dispersant.

4,042,761

CHEMICAL SOURCE OF CURRENT AND METHOD FOR ITS ASSEMBLY

Faat Khatovich Nabiullin, 3 Mytischinskaya ulitsa, 14a, kv. 90, Moscow, U.S.S.R.

Filed Dec. 17, 1975, Ser. No. 641,575
Claims priority, application U.S.S.R., Dec. 24, 1974, 2082916; Dec. 24, 1974, 2082915
Int. Cl.² H01M *6/02*
U.S. Cl. 429—165 **5 Claims**



1. A chemical source of current, comprising: a casing with a bottom;

a first insulating gasket placed on said bottom of said casing;

a positive electrode arranged in said casing;

an axial through cavity in said positive electrode;

a negative electrode disposed in said axial through cavity of said positive electrode on said first insulating gasket;

an axial through cavity in said negative electrode;

an ion-conducting diaphragm arranged between said positive and negative electrodes and manufactured simultaneously with said negative electrode;

a tap for said negative electrode, disposed in said axial through cavity of said negative electrode;

a metal lid which is in contact with said tap of said negative electrode;

holes provided in said metal lid;

a second insulating gasket under said metal lid;

a sealing coupling which is integral with said insulating gasket and fitted over said tap of said negative electrode;

said sealing coupling having an internal surface engaging said tap;

at least one groove provided in said tap to receive said sealing coupling.

4,042,762

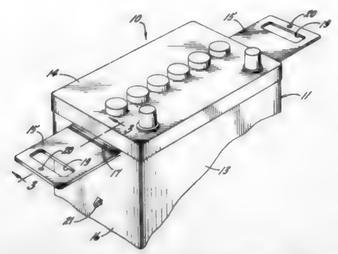
HANDLE FOR PLASTIC BATTERIES

Duane D. Hakarine, Minneapolis, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Continuation of Ser. No. 549,153, Feb. 12, 1975, abandoned. This application Nov. 11, 1975, Ser. No. 630,804
Int. Cl.² H01M *2/02*
U.S. Cl. 429—187 **4 Claims**

1. A storage battery having a box-like case made of plastic, straps molded integrally with opposite upright walls of said case and an integral hinge located adjacent the junction of the inner end of each strap and the associated wall of the case and supporting said strap for upward swinging to a position in which said strap may serve as a handle for facilitating carrying

of the battery, each strap including a first retainer and a second retainer being molded integrally with the associated wall of said case, each hinge also permitting its associated strap to



swing downwardly to a storage position alongside said case, and said retainers being sized to interfit with one another to releasably hold said straps in said storage position.

4,042,763

PHOTODEGRADABLE RESIN COMPOSITIONS

Bert Howard Clampitt, Katy, and Richard Harry Haveas, Hockley, both of Tex., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 8, 1976, Ser. No. 730,901
Int. Cl.² C08J *3/20*
U.S. Cl. 526—4 **4 Claims**

1. A photodegradable resin composition consisting essentially of an intimate, physical admixture of:

a. At least 90 weight % of a film forming ethylene polymer,

b. From about 1 to about 10 weight % of a polyethylene-like polymer containing about 0.8 to about 75 trans carbon-to-carbon double bonds per 1,000 carbon atoms, and

c. A minor amount of cobalt salt whose cobalt metal content is equivalent to about 1 – 3000 ppm of the total composition;

said polyethylene-like polymer having been prepared by subjecting an ethylene-vinyl acetate copolymer containing about 0.5 to 35 percent by weight of vinyl acetate comonomer to a temperature from about 275° C to about 400° C in an inert atmosphere for a time period varying with temperature from about 1 hour to about 8 hours at 275° C to from about 0.5 to about 10 minutes at 400° C, thereby cracking said ethylene-vinyl acetate copolymer to acetic acid and forming trans carbon-to-carbon double bonds in the polymer chain.

4,042,764

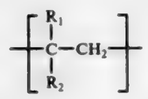
PHOTODEGRADABLE POLYMERIC COMPOSITIONS HAVING HIGH THERMAL STABILITY CONTAINING A HALOGENATED QUINONE AND A TRANSITION METAL COMPOUND

Francesco Gratani, Sesto S. Giovanni (Milan), and Marco Binaghi, Milan, both of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed June 24, 1975, Ser. No. 589,891
Claims priority, application Italy, July 3, 1974, 24765/74
Int. Cl.² C08J *3/20*
U.S. Cl. 526—4 **10 Claims**

1. A photodegradable and thermostable polymeric composition consisting essentially of

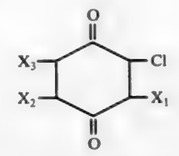
a. a polymer consisting of monomeric units of the formula



wherein R_1 and R_2 are independently selected from the group consisting of hydrogen, C_1–C_3 alkyl, C_6–C_{12} aryl, C_6–C_{12} cycloalkyl and chlorine;

b. 0.001 to 5% by weight, based on the weight of the polymer of at least one compound of a transition metal having an atomic number between 21 and 30, 40 and 47 and 57 and 79, inclusive and which is soluble in said polymer and endowed with photodegrading properites with respect to the polymer; and

0.05 to 5% by weight, based on the weight of the polymer of at least one quinonic compound of the formula.



wherein: X_1, X_2 and X_3 are independently selected from the group consisting of hydrogen, Cl, a C_1–C_{18} alkyl group, or a C_1–C_{21} thioalkyl, alkoxy, aryloxy, alkylcarboxy, arylcarboxy and arylsulfonoxy group.

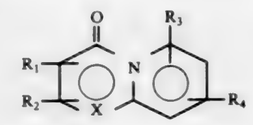
4,042,765

PHOTODEGRADABLE PLASTIC COMPOSITIONS CONTAINING NITROGEN HETEROCYCLIC COMPOUNDS

Joseph C. Floyd, Baytown, Tex., and Don A. Plank, Sarnia, Canada, assignors to Exxon Research and Engineering Co., Linden, N.J.

Continuation-in-part of Ser. No. 562,577, March 27, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,653
Int. Cl.² C08J *3/20*
U.S. Cl. 526—6 **16 Claims**

1. A plastic composition containing polyolefin having incorporated therein an effective amount of a photodegradation accelerating agent which is a substituted nitrogen heterocyclic compound having the formula:



wherein X is nitrogen or CH, and R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen; a straight or branched chain alkyl group having from 1 to 6 carbon atoms; cyano, nitro; lower alkoxy; fluorine, dialkylamino; phenyl; halo-phenyl; benzyl; or halo-benzyl.

4,042,766

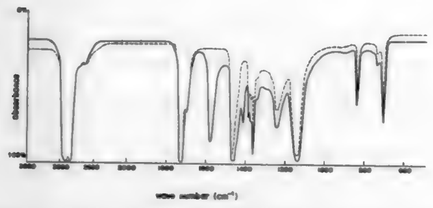
METHOD FOR PREPARATION OF IONICALLY CROSSLINKED ETHYLENE COPOLYMERS

Yoshiharu Tatsukami; Mitsuyuki Okada, and Tsutomu Takahashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

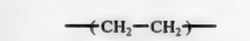
Filed Mar. 18, 1976, Ser. No. 668,242
Claims priority, application Japan, Mar. 18, 1975, 50-33206
Int. Cl.² C08F *8/42, 8/00*
U.S. Cl. 526—47 **2 Claims**

1. A method for preparation of ionically crosslinked ethylene copolymers, which comprises melt blending a copolymer comprising as the essential monomer unit components (a) ethylene and (b) at least one α,β-ethylenically unsaturated carboxylic acid ester selected from the group consisting of isoproyl acrylate, isopropyl methacrylate, tert-butyl acrylate and tert-butyl methacrylate with (c) at least one metal compound selected from the group consisting of the acetates, formates and oxides of zinc, magnesium, calcium and sodium,

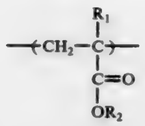
and maintaining the resulting molten blend at a temperature of about 200° to 320° C to give in one step an ionically crosslinked



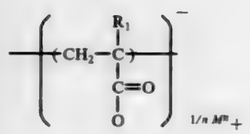
ethylene copolymer which comprises the monomer unit components of the formulae:



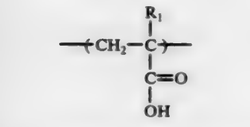
[W]



[X]



[Y]



[Z]

wherein R_1 is a hydrogen atom or a methyl group, R_2 is an isopropyl group or a tert-butyl group, M is a metal atom from said metal compound (c), and n is an integer corresponding to the valence of the metal represented by M in a molar proportion of $w : x : y : z$ which satisfy the relationships of the equations:

$$\frac{x + y + z}{w + x + y + z} \times 100 = 3 \text{ to } 10$$

$$\frac{y}{x + y + z} \times 100 = 10 \text{ to } 70$$

wherein either one of x and z can be zero.

4,042,767

PROCESS FOR POLYMERIZATION OF ETHYLENE

Wolfgang Payer; Volker Riepe, and Wilhelm Zoller, all of Oberhausen, Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Germany

Filed Feb. 9, 1976, Ser. No. 656,133

Claims priority, application Germany, Feb. 26, 1975, 2508284

Int. Cl.² C08F *10/02, 10/00*

U.S. Cl. 526—64 **3 Claims**

1. In a process for the polymerization of ethylene in a tube form reactor having side branches opening into the reactor, the side branches having a diameter of not more than about 12 mm, and wherein polymerization is carried out at a pressure between about 500 and 5,000 bar and a temperature between about 100° and 350° C, the improvement comprising maintaining the flow number at a value not less than about 0.20 m^2/sec, said flow number being defined as the product of reactor internal diameter and the rate of flow of the reaction through the reactor.

4,042,768

CONTINUOUS SOLVENT-FREE POLYMERIZATION OF VINYL DERIVATIVES

Ernst-Willi Müller, Leverkusen, and Manfred Wicke, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 11, 1975, Ser. No. 603,367

Claims priority, application Germany, Aug. 16, 1974, 2439341

Int. Cl.² C08F *2/02, 6/26, 220/42, 220/14*

U.S. Cl. 526—65 **4 Claims**

1. A process for the polymerization of at least one aromatic vinyl monomer which comprises the steps of:

1. in a first stage, continuously introducing monomer feed under elevated pressure into a first reaction zone which is flooded and is always kept completely filled with liquid phase mixture of monomer and polymer thereof and polymerizing said monomer to a degree of conversion, based on total monomer feed, of from 5 to 40% by weight at a temperature of from 80° to 170° C.;
2. in a second stage, conducting the reaction mixture from the first stage at the same pressure into a second reaction zone which is also completely filled with said liquid phase mixture and operated under conditions of over-pumping and which is adapted to conduct highly viscous melts therethrough, the mixture flowing through the second reaction zone at a rate which if from 1.1 to 5 times the intrinsic rate, and polymerizing the mixture in the second reaction zone to a degree of conversion, based on total monomer feed, of from 40 to 95% by weight at a temperature of from 120° to 250 ° C., the pressure in the first and second stages being selected so that the monomer feed is liquid, and continuously removing polymer from the second reaction zone by passing it to a zone of reduced pressure and
3. in a third stage, removing unreacted monomer from the removed polymer by evaporation.

4,042,769

CATALYSTS FOR THE POLYMERIZATION OF ETHYLENE

Thomas J. Lynch, Orange, Tex., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Mar. 12, 1975, Ser. No. 557,498

Int. Cl.² C08F *110/02*

U.S. Cl. 526—106 **4 Claims**

1. In a Particle Form Process for the manufacture of an ethylene polymer in which ethylene is contacted with a chromium catalyst supported on silica; the improvement which consists essentially of employing as the polymerization initiator an olefin polymerization catalyst consisting essentially of a chromium polyerization catalyst supported on a silica aerogel having a surface area of at least about 300 square meters per gram and a pore volume of at least about 2 milliliters per gram, said values being determined by isothermal liquid nitrogen desorption analysis; said silica aerogel having been prepared by a modified Kistler process consisting essentially of the steps of:

a. preparing a silica hydrogel,
b. treating the silica hydrogel with an oranic solvent that will dissolve at least least 10 weight % water to free the silia hydrogel of water, at least the final contact being with a rigorously anhydrous organic solvent so that the organic solvent, after reaching equilibrium with the silica hydrogel, contains less than about 200 ppm of water,
c. removing the organic solvent from the organic solvent-silica hydrogel mixture of step (b) by heating the mixture to above the critical point in a pressure-resistant vessel and releasing the organic solvent therefrom at a pressure at least equal to the critical pressure of the organic solvent,
d. cooling the silica aerogel from step (c) to ambient temperature and pressure under rigorously ahydrous conditions, and
e. calcining the silica aerogel from step (d) at an elevated temperature in a rigorously anhydrous environment;

said ethylene polymerization catalyst having been prepared by contacting said chromium polymerization catalyst with said silica aerogel under rigorously anhydrous conditions.

4,042,770

MANUFACTURE OF OLEFIN POLYMERS

Robert Bachl, Worms; Hans Frielingsdorf, Bad Duerkheim; Wolfgang Gruber, Frankenthal; Heinz Mueller-Tamm, and Leonhard Gonsior, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Nov. 13, 1975, Ser. No. 631,642

Claims priority, application Germany, Nov. 23, 1974, 2455535

Int. Cl.² C08F *4/02, 4/24, 10/00*

U.S. Cl. 526—106 **1 Claim**

1. A process for the manufacture of olefin polymers by polymerization of C_{2-8} α-monoolefins at temperatures of from 60° to 160° C and olefin pressures of from 0.5 to 40 bars by means of a silicic xerogel/chromium trioxide catalyst obtained by (1) synthesizing a particulate silicic xerogel having a particle diameter of from 10 to 2000 μm, (2) doping said xerogel with from 0.1 to 10 percent by weight (based on the xerogel and calculated as chromium) of chromium trioxide or a chromium compound capable of conversion to chromium trioxide under the conditions of stage (3) and (3) finally maintaining the resulting product at a temperature of from 400° to 1100° C for 10 to 1000 minutes in a water-free stream of gas containing oxygen in a concentration of more than 10% v/v, wherein the silicic xerogel/chromium trioxide catalyst used is one which has been obtained by

1. synthesizing the silicic xerogel in the first stage by
   1.1. taking an aqueous solution of a sodium silicate (water glass) which contains from 0.1 to 20% by weight of solids (calculated as silicon dioxide, SiO_2),
   1.2. exchanging the sodium ions contained in said solution for hydrogen ions by means of an ion exchanger so that the sodium content (calculated as sodium oxide, Na_2O) in the silicic xerogel is not more than 0.2%,
   1.3. introducing a water-soluble aluminum salt and, if necessary, water into the resulting aqueous silicic acid solution such that the ratio of water to silicic acid (calculated as silicon dioxide, SiO_2), by weight, is from 100:0.05 to 100:24 and the ratio of silicic acid (calculated as silicon dioxide) to aluminum salt (calculated as aluminum oxide, Al_2O_3), by weight, is from 100:100 to 100:2,
   1.4. adjusting, if necessary, the pH of the solution obtained in stage (1.3) to from 0.1 to 3.5 by means of a water-soluble inorganic acid such that the ratios of water to silicic acid and silicic acid to aluminum salt, by weight, remain in the ranges given under (1.3),
   1.5. adjusting the pH of the solution obtained in (1.3) or (1.4) to from 4 to 12 by means of a water-soluble nitrogen-base compound having a neutralizing action,
   1.6. extracting the resulting product in the solid phase obtained under (1.5) (silicic hydrogel) by means of an organic liquid selected from the series of C_{1-4} alkanols and/or C_{3-5} alkanones until the organic liquid absorbs no more water, and, finally,
   1.7. drying the dehydrated gel obtained in (1.6) and saturated with organic liquid for a period until no further loss of weight occurs at 120° C (xerogel formation).

4,042,771

POLYMERIZATION OF OLEFINS WITH PRE-ACTIVATED CATALYSTS

Michel Avaro, and Pierre Mangin, both of Martigues, France, assignors to Naphtachimie, Paris, France

Continuation of Ser. No. 398,161, Sept. 17, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,501

Int. Cl.² C08F *210/00, 212/00*

U.S. Cl. 526—124 **18 Claims**

1. In a method for polymerizing olefins at low pressures, the improvement comprising contacting the olefin with a catalyst comprising (1) a solid compound of a trivalent titanium compound, with the trivalent titanium compound being subjected before polymerization to a pre-activation treatment by being brought into contact simultaneously with magnesium and one or more alkyl halides, the transition metal compound remaining in the solid state when contacted with the magnesium and alkyl halides and (2) one or more organo-metallic compounds of Groups II and III of the Periodic Table of elements.

17. In a method for the polymerization of olefins at low pressures, the improvement comprising contacting the olefin with a catalyst comprising (1) a solid compound of trivalent titanium having the formula

$$Ti(OR)_mX_{3-m}$$

where R is C_2 to C_8 alkyl, X is halogen and m ranges from 0 to 3, said compound having been pretreated for 30 minutes to 3 hours by contacting the compound simultaneously with a halogenated hydrocarbon of the formula $C_yH_{2y+1}X$ where y is an integer from 1 to 12 and X is halogen and finely divided magnesium metal, the titanium compound remaining in the solid state when contacted with the magnesium and halogenated hydrocarbon, and (2) an organoaluminum compound of the formula

$$Al\,R'_nX_{3-n}$$

where R' is C_2 to C_8 alkyl, X is halogen and n ranges from 1 to 3.

4,042,772

UREA AS AN ADDITIVE TO IMPROVE THE VISCOSITY AND ACTIVITY OF ACRYLAMIDE—ACRYLAMIDE ACRYLIC ACID POLYMERS PREPARED FROM POOR QUALITY ACRYLAMIDE

Edward G. Ballweber, Glenwood, and Wood E. Hunter, Lombard, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 8, 1976, Ser. No. 739,770

Int. Cl.² C08F *2/00, 4/00, 20/70, 120/54*

U.S. Cl. 526—220 **3 Claims**

1. A method for making good quality acrylamide and acrylamide acrylic acid polymers which contain at least 50% by weight of acrylamide from contaminated acrylamide which comprises polymerizing acrylamide to form a water-soluble acrylamide polymer in the presence of at least 20% by weight based on acrylamide of urea.

4,042,773

PEROXIDE FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

Chester S. Sheppard, and Ronald E. MacLeay, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 435,622, Jan. 22, 1974, abandoned, which is a continuation of Ser. No. 98,893, Dec. 16, 1970, abandoned. This application Apr. 27, 1976, Ser. No. 680,546

Int. Cl.² C08F *4/36, 4/34, 12/08*

U.S. Cl. 526—208 **7 Claims**

1. In the process of preparing a polymer containing an ultraviolet light stabilizer chemically bound to said polymer comprising polymerizing an ethylenically unsaturated monomer capable of being polymerized by free radicals in the presence of a free radical initiator the improvement comprising polymerizing said monomer in the presence of a free radical initia-

tor containing ultraviolet light stabilizing groups and having the formula:

$(R\text{-}O\text{-}O)_nR'$

wherein

n is 1 to 4 with provisos (a) through (f) recited below,

a. when *n* is 1, R and R′ are the same or different and are selected from the group consisting of hydrogen, acyl of 2–20 carbons, aroyl of 7–20 carbons, tert-alkyl of 4–12 carbons, tert-cycloalkyl of 4–12 carbons, tertaralkyl of 9–15 carbons, alkoxycarbonyl of 2–20 carbons, cycloalkoxylcarbonyl of 4–20 carbons, carbamoyl, phenylcarbamoyl, alkylcarbamoyl of 2–13 carbons, cycloalkylcarbamoyl of 4–13 carbons, α-hydroxyalkyl of 2–10 carbons, α-hydroxycycloalkyl of 3–10 carbons, α-hydroperoxyalkyl of 2–10 carbons, α-hydroperoxycycloalkyl of 3–10 carbons, alkylsulfonyl of 4–10 carbons, cycloalkylsulfonyl of 3–12 carbons, tert-(alkyloxyalkyl) of 4–20 carbons, tert-(alkoxycycloalkyl) of 4–20 carbons, Q_3M, Q_2M', diethylphosphate, dimethylphosphate, diphenylphosphinic, di-n-octylphosphate, and dibutyl phosphinic;

wherein

M is selected from silicon, germanium, or tin;

M′ is boron; and

Q is alkyl of 1–11 carbons, phenyl, benzyl, or cyclohexyl;

b. when *n* is 2, R is selected from any of the radicals listed under (a) and R′ is selected from the group consisting of carbonyl, alkylidene, of 2–20 carbons, cycloalkylidene of 3–2 carbons, di-tert-alkylene of 6–20 carbons, di-tert-cycloalkylene of 6–20 carbons, di-tert-aralkylene of 12–20 carbons, $Q_2M<$, $QM'<$

wherein

M is selected from silicon, germanium or tin;

M′ is boron; and

Q is alkyl of 1–11 carbons, phenyl, benzyl, or cyclohexyl;

c. when *n* is 3, R is selected from any of the radicals listed under (a) and R′ is selected from the group consisting of tert-aralkyl-di-tert-aralkylene of 15–20 carbons, tert-alkylalkylidene of 4–20 carbons, tert-cycloalkylalkylidene of 4–20 carbons, tert-alkylcycloalkylidene of 4–20 carbons, tert-cycloalkylcycloalkylidene of 6–20 carbons, tert-alkyl-di-tert-alkylene of 10–19 carbons, tert-alkyl-di-tert-cycloalkylene of 10–19 carbons, tert-cycloalkyl-di-tert-alkylene of 10–19 carbons, tert-cycloalkyl-di-tert-cycloalkylene of 10–19 carbons, and QM═wherein

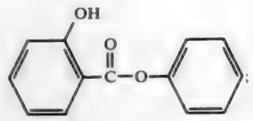
M is selected from silicon, germanium or tin; and

Q is selected from alkyl of 1–11 carbons, phenyl, benzyl or cyclohexyl;

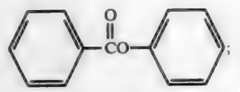
d. when *n* is 4, R is selected from any of the radicals listed under (a) and R′ is dialkylidene of 5–16 carbons;

e. only one of R and R′ can be hydrogen; and

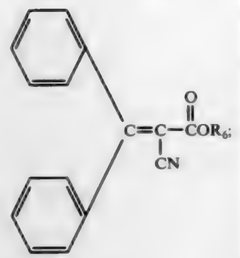
f. at least one of R and R′ contains an ultraviolet light stabilizing radical of a compound selected from the group consisting of



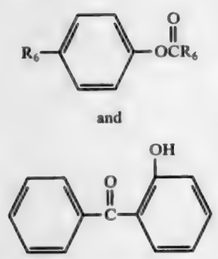
;



;



and



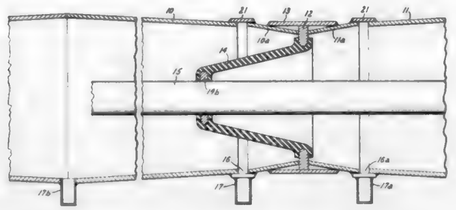
wherein R_6 is alkyl of 1–6 carbon atoms.

4,042,774

PARTICLE TRAPPING SHEATH COUPLING FOR ENCLOSED ELECTRIC BUS APPARATUS

Roy Nakata, Pittsfield, Mass., and William Joseph Johenning, Wallingford, Pa., assignors to General Electric Company, Philadelphia, Pa.

Filed Apr. 8, 1976, Ser. No. 675,009
Int. Cl.[2] H01B *9/04*
U.S. Cl. 174—14 R **6 Claims**



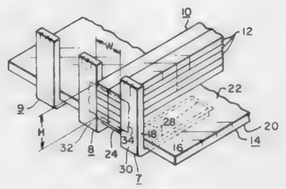
1. High voltage electric bus apparatus adapted for disposition with its longitudinal axis substantially horizontal and including a high voltage conductor disposed in coaxial radially spaced relation within a sectionalized tubular metallic enclosing sheath comprises, a pair of tubular sheath members disposed in axially spaced apart end-to-end relation, a coupling band enveloping axially juxtaposed ends to said sheath members and having an axial width greater than the space between said ends, said band being split axially along said sheath and peripherally juxtaposed ends of said band defining an elongate transverse particle trapping aperture in a bottom wall of said sheath between said coupled sheath members, and a particle trapping receptacle fixedly mounted over said aperture externally of said sheath.

4,042,775

ELECTRICAL CONNECTIONS OF CONDUCTORS TO A BUS BAR

Kou Chi Lin, Sharon, and LeRoy E. Dobson, Jamestown, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 28, 1975, Ser. No. 636,282
Int. Cl.[2] H01R *5/04*; H01F *15/10*
U.S. Cl. 174—94 R **10 Claims**



1. An electrical conductor connection, comprising:

a plurality of conductors assembled with their ends aligned to form a substantially rectangularly shaped composite end portion having dimensions W and H,

first and second connector conductors each having a plurality of flat surfaces,

a bus bar having first and second major opposed sides and connecting edge portions,

means connecting first portions of each of said first and second connector conductors to a common side of said bus bar, with second portions of each of said first and second connector conductors extending outwardly from the opposing side of said bus bar, said second portions being spaced by the dimension W,

said assembled conductors being disposed only between the second portions of said first and second connector conductors, with like orientations of their W dimensions and with the surface of the composite end portion substantially aligned with selected flat surfaces of the first and second connector conductors,

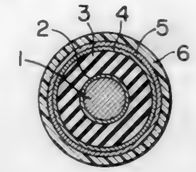
and a fusion of metal across the surface of the composite end portion of the assembled conductors and at least a portion of each of the flat surfaces of the first and second connector conductors aligned therewith.

4,042,776

WATER TREE FREE POWER CABLE

Hironori Matsuba, Kawasaki, and Kazumi Satou, Ichihara, both of Japan, assignors to The Furukawa Electric Company, Ltd., Tokyo, Japan

Filed Aug. 21, 1975, Ser. No. 606,601
Int. Cl.[2] H01B *3/30*
U.S. Cl. 174—110 R **11 Claims**



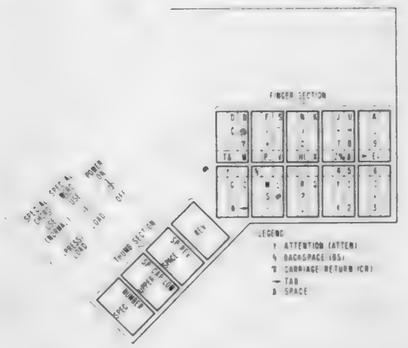
1. A water tree free electric power cable comprising a conductor enclosed in a sheath of insulation selected from the group consisting of a polyethylene compound, cross-linked polyethylene compound, ethylenepropylene rubber compound and butyl rubber compound, said insulation containing a substantially homogeneously dispersed water soluble strong electrolyte capable of increasing the conductivity of the water in an amount of 10^{-7} to 1 percent by weight.

4,042,777

ONE-HANDED KEYBOARD AND ITS CONTROL MEANS

Frank Charles Bequaert, Lexington, and Nathaniel Rochester, Duxbury, both of Mass., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 619,867, Oct. 6, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,638
Int. Cl.[2] H04L *15/04, 17/02*; B41J *7/54*
U.S. Cl. 179—79 **31 Claims**



7. A keyboard for one-handed typing of chords, such chords being formed by the simultaneous pressing of one or more keys on the keyboard to produce one or more characters, the keyboard comprising

a row of keys for being operated by the thumb, electrical switch means being connected to the keys in the row of keys, a row of thumb positions located on the row of keys,

a thumb position being located on a single key or on the boundary across adjacent keys in the row of keys pressable by the thumb,

a particular switch combination of closed and open switching paths in the electrical switch means being provided for each chord pressable on the row of keys,

means for interpreting chords, comprising first means to generate coded signals representing members of a set of characters, switching and logical circuit means to sense the particular switch combinations of closed and open switching paths for a chord to select one set from among several sets of coded representations of characters, the selected set corresponding to the thumb position,

an array of keys for being operated by the fingers of the same hand having the thumb for operating the row of keys, the electrical switch means also being connected to the keys in the array of keys, an array of finger positions located on the array of keys, a finger position being located on each key and across the boundary of adjacent keys pressable by any one finger on the array of keys, a particular switch combination of closed and open switching paths in the electrical switch means being provided for each chord pressable on the array of keys,

means for interpreting chords, comprising second means to generate coded signals representing members of the set of characters selected by first means, switching and logical circuit means to sense the particular switch combinations of closed and open switching paths of a chord to select the coded representations of the characters that correspond to the finger positions that correspond to the respective chord, and output circuit means to issue the coded representations of characters.

4,042,778

COLLAPSIBLE SPEAKER ASSEMBLY

Henry H. Clinton, R.F.D. No. 1, Ivoryton, Conn. 06442

Filed Apr. 1, 1976, Ser. No. 672,730
Int. Cl.[2] H04R *1/02, 1/40*
U.S. Cl. 179—1 E 13 Claims



1. A collapsible speaker assembly comprising:

a split case formed by two mating shells pivotally connected to one another at one side for folding between open and closed positions, the shells at their interface being similar in shape to mate in the closed position and elongated in a longitudinal direction, each shell also defining a plurality of sound compartments arranged serially in the longitudinal direction, each compartment having a forward opening at the interface of the shells and being closed at the rear;

a plurality of speakers mounted to the split case at the forward openings of the serially arranged sound compartments, the speakers being positioned relative to the interface of the shells to permit the pivotal shells to be brought together in mating relationship and thereby close the split case; and

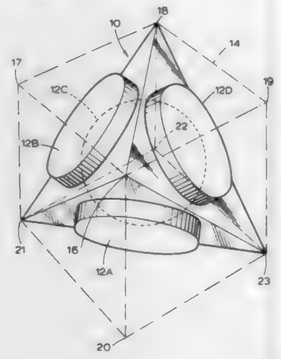
releasable means for holding the split case closed when the pivotal shells are brought together in mating relationship.

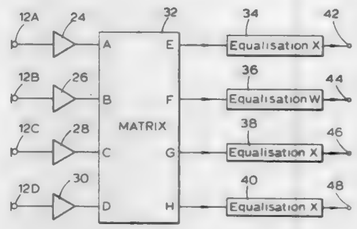
4,042,779

COINCIDENT MICROPHONE SIMULATION COVERING THREE DIMENSIONAL SPACE AND YIELDING VARIOUS DIRECTIONAL OUTPUTS

Peter Graham Craven, Headington, and Michael Anthony Gerzon, Oxford, both of England, assignors to National Research Development Corporation, London, England

Filed July 7, 1975, Ser. No. 593,244
Claims priority, application United Kingdom, July 12, 1974, 30977/74
Int. Cl.[2] H04R *1/20*
U.S. Cl. 179—1 DM 8 Claims





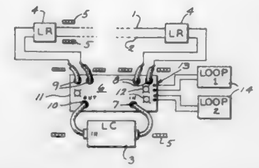
1. A microphone assembly for providing outputs corresponding to at least zero order and first order harmonics equivalent to the outputs which would be obtained from a plurality of coincident microphones, the directional response curve of each coincident microphone being a respective spherical harmonic, said microphone assembly comprising at least four microphone units mutually disposed at the integration points of an integration rule for the surface of a sphere, as hereinbefore defined, matrix means having a respective combining means for each desired spherical harmonic including a first combining means for said zero order harmonics and a second combining means for said first order harmonics, means for applying the output of each microphone unit to said combining means with a gain proportional to the weight of said integration rule corresponding to the integration point at which said microphone unit is located and a further gain equal to the magnitude of said spherical harmonic in the direction of maximum response of said microphone unit, first equalisation means connected to said first combining means for applying an equalisation to the output thereof and a second equalisation means connected to said second combining means for applying an equalisation to the output thereof, the equalisation being such that all outputs of each said equalisation means have substantially the same frequency response to sounds from all directions up to a limiting frequency and are substantially identical to the outputs obtained from a plurality of coincident microphones.

4,042,780

MULTIPLE MESSAGE FRAME ADAPTOR APPARATUS FOR LOOP COMMUNICATION SYSTEM

Frederick J. Wolters, Whitefish Bay, Wis., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed July 23, 1975, Ser. No. 598,377
Int. Cl.[2] H04J *3/14*
U.S. Cl. 179—15 AL 30 Claims



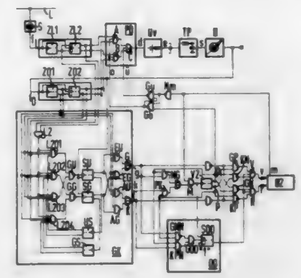
1. In a loop communication system having a controller station having a controller output means adapted to generate time spaced multiple bit message frames and having a controller input means adapted to receive said message frames, a plurality of remote stations, a first transmission trunk line for connecting said controller means and said remote stations in a series conducting loop including a first remote station and a second remote station, a second tramsission trunk line for producing a parallel conducting branch in said loop, a message converting adaptor apparatus for connecting the first and second transmission line in said loop comprising a first converting means having a single message frame input and a pair of signal transmitting means each one connected to one of a pair of message frame outputs, a signal logic means connected to said input and said outputs and transmitting said message frame from said frame input to both of said transmitting means and thereby producing the same message frame on said outputs as the message frame received at said frame input, means for connecting of the first trunk line to said frame message inputs and to one of said pair of message frame outputs, means for connecting of the second trunk line to the second of said pair of message frame outputs and thereby providing duplicate transmission of said message frames from said one message frame input, a second converting means having a pair of message frame inputs and a single message frame output, a message frame transmitting means connected to said single message frame output, a selector means connected to said pair of message frame inputs and directly transmitting each bit of the message frame from one of said inputs, means for connecting the first trunk line to one of said pair of message frame inputs and to said single message frame output and connecting the second trunk line to the second of said message frame inputs, and one of said stations including means for connecting the first trunk line to a first of said pair of outputs of said first converting means to a first of said pair of inputs of said second converting means and connecting the second of said pair of outputs of said first converting means to the second of said pair of inputs of said second converting means and thereby provide a simultaneous flow of said message frame in the same direction relative to said controller means and said remote stations, and wherein said signal logic means of said first converting section includes a receiver connected to said inputs, a pair of transmitters connected to said outputs, said transmitters having signal input means for receiving the bit signals and a strobe means for activating the transmitters, a bit transmitting means connected between said receivers and both of said transmitters, a disable timing means connected to said receiver and operable to disable and receiver, and a delay timing means connected to said receiver and activated thereby, and establishing an output after a predetermined period, said delay timing means being connected to said strobe means and to said disable timing means for simultaneous operation thereof.

4,042,781

APPARATUS FOR SYNCHRONIZING OSCILLATORS IN THE NETWORK NODES OF A DIGITAL TELECOMMUNICATIONS NETWORK

Alexander Dragotinov, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 23, 1976, Ser. No. 708,009
Claims priority, application Germany, July 25, 1975, 2533463
Int. Cl.[2] H04J *3/06*
U.S. Cl. 179—15 BS 7 Claims



1. A circuit for mutually snychronizing a plurality of exchange pulse train oscillators in a PCM t.d.m. digital telecommunications network wherein one of said exchange pulse train oscillators is arranged in each of the network nodes of said telecommunications network, said circuit comprising in each network node:

a first frequency reducer connected to the incoming digital telecommunication lines for generating a first pulse sequence according to a given frequency reduction factor; said first pulse sequence corresponding to the line pulse train of said incoming digital telecommunication lines;

a second frequency reducer connected to the output of said exchange pulse train oscillator for generating a second pulse sequence according to said given frequency reduction factor, said second pulse sequence corresponding to the exchange pulse train generated by said exchange pulse train oscillator;

a phase discriminator connected to receive said first pulse sequence from said first frequency reducer and said second pulse sequence from said second frequency reducer, said phase discriminator comprising logic-linking circuits, whereby said phase discriminator generates a phase difference signal in response to the phase difference between said first pulse sequence and said second pulse sequence;

means connected to said phase discriminator for generating a frequency regulating signal in response to the phase difference signal generated by said phase discriminator, whereby said frequency regulating signal is used to frequency regulate said exchange pulse train oscillator contained in said network node;

means connected to said first and second frequency reducers for comparing said first and second pulse sequences and digitally counting each overshooting and each undershooting of a $-n2\pi$ ($n = 0, 1, 2, 3, \ldots N$) stage of the phase difference between said first pulse sequence and said second pulse sequence, said counting means having a counting volume N, said comparing and counting means providing said phase discriminator with a first special control input signal for maintaining said phase discriminator in a starting state corresponding to a phase difference of $+2\pi$ and a second special control input signal for maintaining said phase discriminator in a starting state corresponding to a phase difference of -2π, said first special control signal being generated by said counting

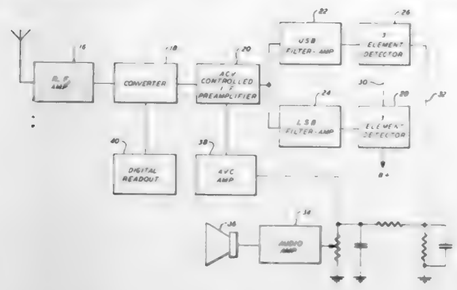
means when the count of the overshooting of $+n2\pi$ stages of the phase difference exceeds the count of the undershooting of $+n2\pi$ stages, said second special control signal being generated by said counting means when the count of the undershooting of $-n2\pi$ stages of the phase difference exceeds the count of the overshooting of $-n2\pi$ stages, whereby the output phase difference signal of said phase discriminator enables said means for generating a regulating signal to generate a regulating signal within a constant zone on both sides of a linear range.

4,042,782

HIGH SELECTIVITY RADIO RECEIVER

Joseph A. Worcester, R.D. 1, Frankfort, N.Y. 13340

Filed Apr. 28, 1976, Ser. No. 681,161
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—15 BT **21 Claims**



1. A superheterodyne radio receiver for reception of signals having upper and lower sidebands containing audio program materials, said receiver comprising:

a. means for translating a desired signal to a fixed intermediate frequency;

b. first and second selective filters each connected to receive input signals from said translating means, said filters providing equal attenuation of input signals at said fixed frequency and unequal attenuation of input signals at other than said fixed frequency; and

c. demodulation means providing audio output signals in response to inputs from said filters, said output signals being attenuated by the greater of the attenuations of said input signals by said filters.

4,042,783

METHOD AND APPARATUS FOR BYTE AND FRAME SYNCHRONIZATION ON A LOOP SYSTEM COUPLING A CPU CHANNEL TO BULK STORAGE DEVICES

Abraham M. Gindi, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 11, 1976, Ser. No. 713,453
Int. Cl.[2] H04J *3/08*; H04L *7/08*
U.S. Cl. 179—15 AL **7 Claims**

1. A method for resynchronizing a primary terminal and a plurality of secondary terminals in a loop communication system, each terminal being adapted to receive and transmit frame delimited bit stream messages from and to the loop, each terminal being further adapted to detect synchronization and synchronization anomalies, the method comprising the steps of:

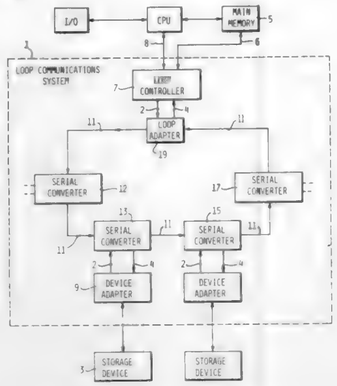
detecting at any terminal the existence of a synch anomaly and immediately inhibiting all bit stream message transmission;

transmitting on the loop a first unique pattern by the terminal detecting the anomaly;

resynchronizing to the first unique pattern as a reference by each terminal downstream to the terminal detecting the anomaly and including the primary terminal;

transmitting on the loop a second unique pattern by the primary terminal responsive either to the first pattern or a synch anomaly;

resynchronizing of all terminals upstream from the terminal detecting the synch anomaly to the second pattern as a reference; and



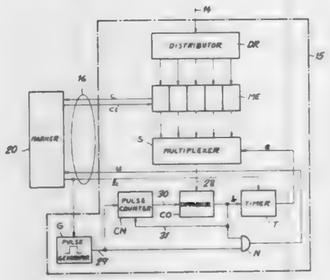
resuming reception and transmission of bit stream messages upon the extinction of the synch anomaly as when the terminal detecting the anomaly has resynched to the second pattern.

4,042,784

DIGIT STORER FOR TELECOMMUNICATION SYSTEM

Carlo Lupattelli, and Alfredo Miotti, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni SIEMENS, S.p.A., Milan, Italy

Filed Oct. 29, 1975, Ser. No. 626,876
Claims priority, application Italy, Oct. 29, 1974, 28899/74
Int. Cl.[2] H04Q *1/30*
U.S. Cl. 179—18 EB **4 Claims**



1. In a telecommunication system including a multiplicity of lines adapted to initiate outgoing calls to destinations identified by multidigit call numbers, said destinations being reachable through remote junctions served by a multiplicity of transmission paths and identified by a characteristic initial portion of a call number, switch means for temporarily connecting one of said transmission paths to a calling line, and a marker responsive to said characteristic portion for controlling said switch means,

the combination therewith of storage means for the digits of a call number, said storage means comprising:

a register with a plurality of stages accommodating at least some of the digits in a call number.

distributing means for loading the digits of a call number, received from one of said lines, into respective stages of said register;

circuitry for the transfer of said characteristic portion of said

call number from said register to said marker, with retention of the remaining digits in said register;

a generator of a train of readout pulses activatable by said marker upon reception of said characteristic portion and establishment of a connection between said one of said lines and a selected transmission path, said generator having an output lead extending to the connection so established for transmitting said readout pulses thereover;

counting means connected to said generator for receiving said readout pulses therefrom and registering a count thereof;

comparison means with a first input connected to said counting means and with a second input connectible to the stages of said register containing said remaining digits;

multiplexing means for sequentially connecting said second input to said stages;

gating means in said output lead controlled by said comparison means for blocking the transmission of said readout pulses in the presence of a match between said count and the contents of a stage of said register connected to said second input by said multiplexing means; and

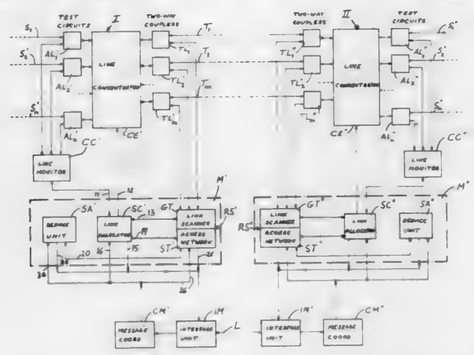
timing means responsive to said comparison means for deactivating said counting means during a predetermined interdigit pause and thereupon actuating said multiplexing means for connecting another stage of said register to said second input with concurrent unblocking of said output lead for transmission of the next digit over said connection.

4,042,785

MARKER FOR TELECOMMUNICATION SYSTEM

Gualtiero Rigo, Settimo Milanese (Milan), and Carlo Alberto Manghi, Rosate (Milan), both of Italy, assignors to Societa Italiana Telecommunicazioni SIEMENS S.p.A., Milan, Italy

Filed Feb. 11, 1976, Ser. No. 657,389
Claims priority, application Italy, Feb. 12, 1975, 20179/75
Int. Cl.[2] H04Q *3/42*
U.S. Cl. 179—18 FC **5 Claims**



1. In a telecommunication system with at least two terminals interconnected by a plurality of links, each terminal serving a number of local lines larger than said plurality and being provided with a line concentrator for selectively connecting any local line to any link under the control of a marker communicating via a signal path with a marker of the other terminal, the improvement wherein each marker comprises:

a link allocator responsive to signals from said local lines and from said signal path for controlling said line concentrator for engaging a link to be connected to a local line; and

a signalization unit communicating with said link allocator and with said signal path for exchanging signals in a time-division mode with all links engaged by said line concentrator;

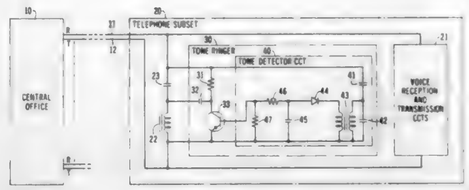
said link allocator and said signalization unit including each a read-only memory and an ancillary memory, said read-only memory being jointly controlled by received instructions and data stored in said ancillary memory for reading out information and updating the contents of said ancillary memory.

4,042,786

TELEPHONE RINGER CIRCUIT

Laimons Freimanis, Chicago, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 26, 1976, Ser. No. 680,363
Int. Cl.[2] H04M *1/26*
U.S. Cl. 179—84 R **4 Claims**



1. A telephone set ringing circuit responsive to conventional high voltage low frequency ringing signals and low voltage high frequency tone alerting signals on a two-wire telephone line comprising:

an electromechanical ringer connected across said two-wire telephone line responsive to conventional high voltage low frequency ringing signals;

energy storage menas connected to said telephone line for storing electrical energy present on said two-wire telephone line; and

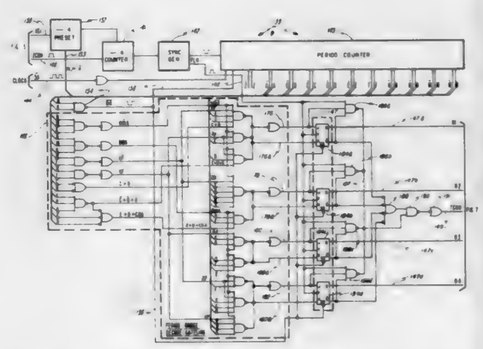
tone detector means connected across said two-wire telephone line for connecting said energy storage means to said electromechanical ringer responsive to low voltage high frequency tone alerting signals.

4,042,787

OUTPUT PROCESSING AND OUTPUT COUPLING CIRCUIT FOR A DIGITAL TONE RECEIVER

Glenn L. Richards, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed May 17, 1976, Ser. No. 686,772
Int. Cl.[2] H04M *1/50*
U.S. Cl. 179—84 VF **11 Claims**



1. For use in a tone signal system of a type in which a valid signal is characterized by the concurrent presence in first and second frequency channels of a selectively signalled first tone and a selectively signalled second tone, respectively, said first and second selectively signalled tones being one of a first tone set which may be present in said first channel and one of a second tone set which may be present in said second channel, respectively, the combination including:

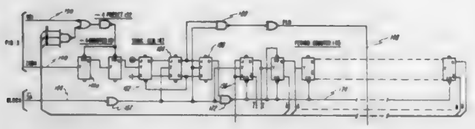
a. first and second channel tone detectors operative to detect said first and second selectively signalled tones, respectively, said detectors each having a set of outputs corresponding to the tone set which may be present in the respective channel, each output of each set having two output states comprising an output state indicating presence of the corresponding tone and an output indicating absence of the corresponding tone,
b. a set of tone combination detector gates, said set of detector gates corresponding in number and individual associations to a predetermined set of combinations of one individual tone of the first tone set and of another individual tone of the second tone set, each detector gate of said set having first and second gate inputs connected to a distinct output of the first channel tone detector and to a distinct output of the second channel tone detector, respectively, each detector gate of said set being operative to propogate an ASSERTION state to its output when an ASSERTION state is simultaneously received at both of its gate inputs,
c. output buffer means for providing an output signal representing a detected tone combination of one individual tone of said first tone set and another individual tone of said second tone set,
d. means operatively connecting the outputs of the detector gates and the output buffer means, and
e. means for enabling said output signal of said output buffer means in response to presence of an ASSERTION state among the outputs of said set of detector gates and for interrupting an enablement of said output signal of said output buffer means in response to each new appearance at the output of any detector gate of an ASSERTION state, the operation to enable said output signal of said output buffer means being subordinate to the operation to interrupt said output signal of said output buffer means.

4,042,788

TONE DETECTOR

Glenn L. Richards, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed May 17, 1976, Ser. No. 686,774
Int. Cl.² H04M *1/50*
U.S. Cl. 179—84 VF **8 Claims**



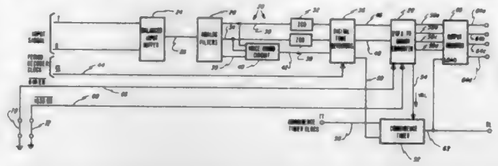
1. For use in a signal system in which a frequency band may carry any one of a predetermined set of tones of differing frequencies, a tone detector comprising:
a. zero-crossing detector means having an input connected to receive the signal in said frequency band, said zero-crossing detector means providing a train of pulses representing analog excursions of a tone signal across the nominal axis of oscillation of the tone signal,
b. counter means for timing tone signal cycle intervals having a reset input and a count stepping input,
c. a source of a high speed clock signal drivingly connected to the count stepping input of the counter means,
d. a corresponding set of frequency range decoder gates responsive to predetermined ranges of output count conditions, said set of decoder gates being responsive to said output count conditions of the counter means as they exist at a time in a predetermined timed relationship to the time when the counter means reset input is actuated, and
e. a ÷ N pulse frequency divider, the output of said zero-crossing detector means being propagated to the reset input of said counter means through the ÷ N pulse frequency divider, whereby the interval timed by the counter means is N times the interval of an individual cycle of a received tone signal.

4,042,789

TONE COMBINATION DETECTOR AND COINCIDENCE TIMER CIRCUIT

Glenn L. Richards, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed May 17, 1976, Ser. No. 686,773
Int. Cl.² H04M *1/50*
U.S. Cl. 179—84 VF **7 Claims**



1. For use in a tone signal system of a type in which a valid signal is characterized by the concurrent presence in each of first and second frequency channels of a selectively signalled first tone and a selectively signalled second tone, respectively, said first and second selectively signalled tones each being of first and second predetermined sets of tones, respectively, a tone receiver including the combination:
a. first and second channel tone detectors operative to detect said first and second selectively signalled tones, respectively, said detectors each having a set of outputs corresponding to the set of tones of the respective channel, each output of each set having two output states comprising an output state indicating presence of the corresponding tone and an output state indicating absence of the corresponding tone, p1 b. coincidence timer means operative to provide a validity confirmation signal upon substantially sustained existence for a predetermined duration of a state indicating presence of the corresponding tone at each of two outputs, one of said two outputs being of the set of outputs of the first channel tone detector, and the other of said two outputs being of the set of outputs of the second channel tone detector,
c. said coincidence timer means having a reset input, and upon the application of a reset signal to said reset input said coincidence timer means being operative to restart the timing of said predetermined duration, and
d. means responsive to a change in the output state of any of the individual outputs of both said channel tone detectors from a predetermined one of said two output states to the other state of said two output states, said latter means being operative to apply a reset signal to the reset input of the coincidence timer means.

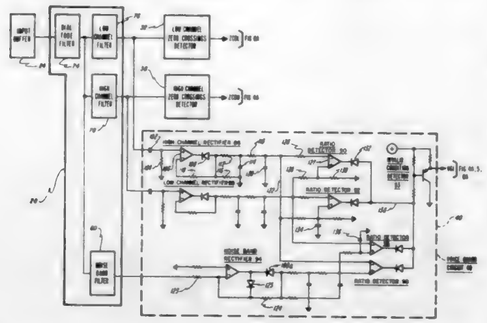
4,042,790

VOICE GUARD CIRCUIT FOR A TONE RECEIVER

Glenn L. Richards, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed May 17, 1976, Ser. No. 686,771
Int. Cl.² H04M *1/50*
U.S. Cl. 179—84 VF **12 Claims**

9. For use in a tone receiver of a type for the detection in an input signal of concurrent presence in each of first and second frequency bands of first and second selectively signalled tones, respectively, said first selectively signalled tone being a tone of any of a first predetermined set of tones, said second selectively signalled tone being a tone of any of a second predetermined set of tone, a voice guard circuit comprising:
a. first means, said first means being for deriving from said input signal a first derivative signal representing the input signal component which is in said first frequency band,
b. second means, said second means being for deriving from said input signal a second derivative signal representing the input signal component which is in said second frequency band,
c. third means, said third means being for determining whether the ratio of the first derivative signal to the second derivative signal exceeds a predetermined upper limit which represents a threshold beyond which the input signal is deemed nonvalid,



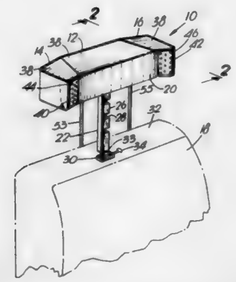
d. fourth means, said fourth means being for determining whether the ratio of the second derivative signal to the first derivative signal exceeds a predetermined upper limit which represents a threshold beyond which the input signal is deemed nonvalid, and
e. fifth means, said fifth means being for producing a tone receiver output inhibit signal in response to either of said third and fourth means determing that its respective ratio exceeds the corresponding predetermined upper limit.

4,042,791

STEREOPHONIC HEAD REST

Murriel L. Wiseman, Santa Clara, Calif., assignor to Murriel L. Wiseman, Santa Clara, Calif.

Filed Feb. 27, 1975, Ser. No. 553,579
Int. Cl.² H04R *5/02*
U.S. Cl. 179—146 H **3 Claims**



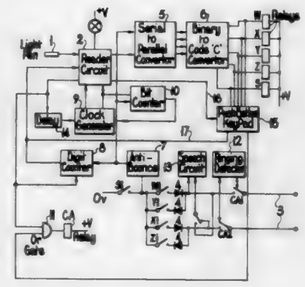
1. A stereophonic head rest adjustably supported on a back rest of an automobile seat, which comprises:
a. a central back portion having a pair of distal ends and a front face;
b. a pair of side wing portions having a front face and a top surface, said front face of each said side wing portion having a plurality of openings therethrough;
c. a speaker unit affixed in each said side wing portion;
d. one said side wing portion hingedly attached onto each said distal end of said central back portion, said front face of each said side wing portion intersecting said front face of said central back portion at an obtuse angle; and
e. means for locking in position each said wing portion to said central back portion at prescribed obtuse angle, said means comprising pin members extending upwardly from said top surface of each said wing portion, a pair of elongated horizontal bar members having a plurality of evenly spaced holes therethrough adapted to receive said pin member, and means for rotatably attaching each said bar member onto said top surface of said central back portion at each said distal end thereof.

4,042,792

TELEPHONE SUBSCRIBER'S APPARATUS FOR SIGNALLING DECIMAL DIGIT VALUES REPRESENTED IN PRINTED FORM

William Edward Pakenham, Wellingborough, and Leonard Mayor Davis, Great Doddington, both of England, assignors to The General Electric Company Limited, London, England

Continuation-in-part of Ser. No. 517,922, Oct. 25, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,088
Claims priority, application United Kingdom, Oct. 25, 1973, 49697/73
Int. Cl.² H04M *1/45*
U.S. Cl. 179—90 R **2 Claims**



1. Apparatus at a telephone subscriber's station for signalling over an associated telephone line decimal digit values which are each represented on a generally planar surface as a series of adjacent areas of detectably differing light reflecting properties, comprising
A. a set of ten push-buttons, one for each decimal digit valve,
B. signalling means for signalling the identity of a wanted subscriber, said signalling means being arranged to be connected to said associated telephone line,
C. means to apply to said signalling means electric signals representing decimal digit values in response to operation of respective ones of said push-buttons,
D. manually-operable light pen means to illuminate a series of said areas in turn and to derive a series of signal voltages of values representing decimal digits, dependent upon the respective levels of light reflected from said series of areas,
E. means temporarily to store said signal voltages, and
F. convertor means to apply to said signalling means electric signals in respect of the decimal digit value represented by said stored signal voltages.

4,042,793

TELEPHONE MOUTHPIECE KEYBOARD

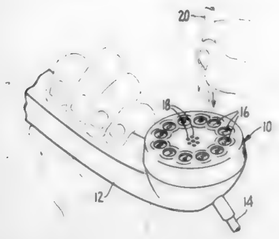
Donald M. Bellenger, San Francisco, Calif., assignor to Telephone Electronics Corporation, San Francisco, Calif.

Filed Dec. 29, 1975, Ser. No. 644,375
Int. Cl.² H04M *1/50*
U.S. Cl. 179—90 K **17 Claims**

1. Apparatus for providing tone operating capability to a dial telephone in which the standard mouthpiece including the microphone normally electrically coupled to one or more transmitter connections in the telephone is removed, said apparatus comprising a replacement mouthpiece attachable to said telephone in place of the standard mouthpiece, said replacement mouthpiece including:
a relatively small microphone having a sound receiving

element, said relatively small microphones being electrically coupled to the transmitter connections upon attachment of the mouthpiece to said telephone;

a plurality of keyboard elements located generally around the sound receiving elements of the relatively small microphone, said keyboard elements corresponding to respective telephone operating digits and symbols and adapted to be individually actuated by a user of the telephone; and



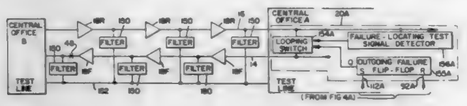
means for generating an electrical output signal representing a tone signal responsive to the actuated keyboard elements, said generating means being electrically coupled to the transmitter connections upon attachment of the replacement mouthpiece to said telephone to provide tone operating capability to said telephone.

4,042,794

METHOD AND MEANS FOR DETECTING AN OUTGOING FAILURE IN A BIDIRECTIONAL COMMUNICATIONS SPAN AND LOOPING THE SAME IN RESPONSE THERETO

Paul J. Lima, and Todd V. Townsend, both of Washoe County, Nev., assignors to Lynch Communication Systems, Reno, Nev.

Division of Ser. No. 544,483, Jan. 27, 1975, Pat. No. 3,983,340.
This application Sept. 25, 1975, Ser. No. 616,654
Int. Cl.[2] H04B *3/46*
U.S. Cl. 179—175.3 R **3 Claims**



3. In a communication system in which information is conveyed between first and second spatially separated terminals over a span which includes a first communication path over which information is transmitted from said first to said second terminal, and a second communication path over which information is transmitted from said second terminal to said first terminal, the improvement comprising:

a. means at said first terminal for detecting a failure of said span;

b. means at said first terminal for detecting whether said failure is in said first or said second communication path; and

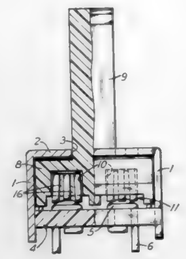
c. means at said first terminal for looping said first and second paths at said first terminal, said looping means being inoperative unless a failure is detected in said first communication path.

4,042,795

SLIDE SWITCH CONTACT HAVING PLURAL FLEXIBLE SLATS PROVIDING MAKE BEFORE BREAK CONTACT ENGAGEMENT

Allan J. Sykora, Cary, N.C., assignor to Stackpole Components Company, Raleigh, N.C.

Filed June 28, 1976, Ser. No. 700,393
Int. Cl.[2] H01H *15/00, 1/50*
U.S. Cl. 200—16 D **8 Claims**



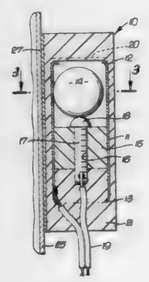
1. An electric slide switch comprising a row of at least three fixed electric contacts, a slide movable back and forth along said row and having a recess therein facing the contacts and extending lengthwise of said row, and a shorting contact disposed in said recess and movable by the slide along the row of fixed contacts, said shorting contact being formed from a spring metal strip having an elongated central body between a pair of end portions, said body having a contact surface for sliding engagement with the fixed contacts and being long enough to bridge three fixed contacts simultaneously, said end portions extending toward the back wall of said slide recess and toward each other to form legs inclined to said body with their free ends pressing against said back wall to press said contact surface against the fixed contacts, said central body being provided with at least one slot extending the full length thereof and into said legs to separate said body into laterally spaced contact bands integrally connected at said free ends of said legs, and said bands being bowed lengthwise toward said legs before the shorting contact is inserted in the slide recess.

4,042,796

INERTIA SWITCH FOR SENSING VIBRATION FORCES

Henry R. Zink, Lake Arrowhead, Calif., assignor to Zink Enterprises Security Systems, San Bernardino, Calif.

Filed Oct. 15, 1975, Ser. No. 622,474
Int. Cl.[2] H01H *35/14*
U.S. Cl. 200—61.45 R **3 Claims**



1. In a security monitoring vibration sensor, the combination of:

a metal ball;

an axial metallic electrode means providing a tangential supporting contact with said ball from beneath, the area of said contact being concentrated approximately at the nadir of the vertical axis of said ball, said axial electrode means thus making a constantly good electrical connection with said ball, while shifting slideably horizontally relative to said ball, in responding rapidly to external vibrations, without substantially overcoming the inertia of said ball as to disturb its position of rest in which it is slideably supported on said axial electrode means by said contact;

a tubular metallic electrode means insulated from but rigidly attached to said axial electrode means and closely surrounding said ball to limit movements of said ball laterally, in any direction within said tubular metallic electrode means, to a relatively minute distance thereby producing, in response to minute lateral external vibration forces being imposed on said axial and tubular electrode means, a rapid oscillation of said ball with the latter rebounding from opposite sides of said tubular metallic electrode means, to produce a strong warning electric signal at each terminal point of said oscillation;

means providing opposite phase terminals leading respectively from said axial and tubular electrode means;

means providing an insulating enclosing structure for said sensor; and

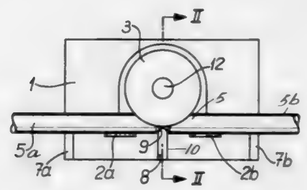
means for securing the sensor in vertical position on a building the security of which is being monitored.

4,042,797

ELECTRIC SAFETY SWITCH WITH POSITIVE-ACTION MECHANISM

Manuel Alexandre Vincent De Araujo, Chamoux-sur-Gelon, and Marcel Vouthier, Chateauneuf, both of France, assignors to Manuel Alexandre Vincent De Araujo, Chamoux-sur-Gelon, France

Filed Sept. 4, 1975, Ser. No. 610,396
Claims priority, application France, Sept. 4, 1974, 74.30949
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—153 R **7 Claims**



1. An electric switch, comprising:

an electrically insulating switch body carrying electric switch terminal means;

an electrically conductive rod disposed to permit movements thereof, along and across and angularly to the extension of the rod, into and out lateral surface contact of the rod with the terminal means;

a retaining member mounted on the switch body and movable between a rod-releasing position and rod-holding position of the member, for releasably holding the rod in said contact in the rod-holding position of the retaining member;

means for elastically biasing the retaining member to its rod-holding position;

manually-actuable handle means releasably engageable for moving the retaining member from the rod-holding to the releasing position to permit manual placing of the rod into said contact, whereby the biasing means positively but releasing maintains said contact when the handle means is released; and

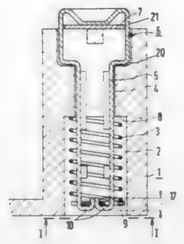
means on the switch body defining a bearing surface for lateral contact and cooperation with the rod to release the rod from the holding thereof by the retaining member is response to any of the movements of the rod.

4,042,798

MOUNTING DEVICE FOR COMPRESSION SPRING

Heinz Seidenbusch, Sulzbach Rosenberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed July 14, 1975, Ser. No. 595,495
Claims priority, application Germany, July 31, 1974, 2436885
Int. Cl.[2] H01H *1/20*
U.S. Cl. 200—243 **2 Claims**



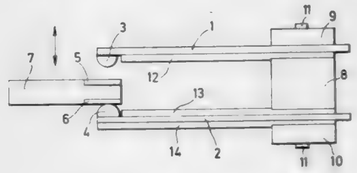
1. In an electrical switching apparatus, a mounting device for a contact pressure spring, said apparatus including a contact bridge carrier including first and second openings, and a breakthrough opening connecting said first opening to said second opening, each of said openings being disposed about the longitudinal axis of said carrier, and a pull bracket including a main portion and a plurality of arms extending longitudinally from the main portion, said main portion being disposed in said first opening, said plurality of arms extendng through said breakthrough opening into said second opening, the spring being disposed in said second opening, and said plurality of arms being disposed within and extending beyond the coils of the spring, the improvement comprising a washer including a plurality of crosspieces describing a plurality of cutouts correspondingly aligned with each of said plurality of arms, said plurality of arms passing through said cutouts and being bent back around a corresponding one of said crosspieces, locking said washer in place and retaining said spring.

4,042,799

DAMPING OF CONTACTS

Hans Werner Reuting, Peine, Germany, assignor to ELMEG Elektro-Mechanik GmbH, Peine, Germany

Filed Sept. 15, 1975, Ser. No. 613,362
Claims priority, application Germany, Sept. 21, 1974, 2445176
Int. Cl.[2] H01H *3/60*
U.S. Cl. 200—288 **8 Claims**



1. Contact arrangement in switching devices having at least one movable contact and a stationary contact mounted on a contact spring;

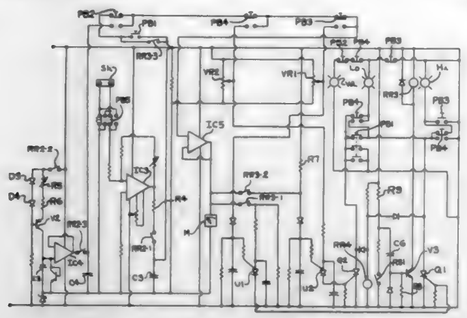
means for clamping one end of the contact spring, the contact spring having at least one of its flat surfaces at least partially covered individually by a plastic foil, being bonded thereto and extending into a zone of clamping as between said means and the one spring end for offsetting positioning tolerances, said foil having low cold flow characteristics and high reversible elasticity such as exhibited by a polysulfonic plastic.

4,042,800

WELDING APPARATUS

Paul A. Glorioso, Amherst, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 9, 1976, Ser. No. 656,188
Int. Cl.[2] B23K *9/20*
U.S. Cl. 219—98 **5 Claims**



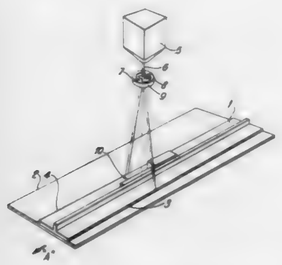
1. Apparatus for end welding a stud to a workpiece comprising means for holding a stud, an electrically operated retraction coil for retracting the stud-holding means away from the workpiece, means including a conductor for supplying electrical power to said retraction coil, current means including a conductor for supplying welding current to said stud-holding means, a shunt associated with said current means for effecting an electrical signal responsive to the magnitude of the welding current, a first capacitor, means responsive to the signal for charging said first capacitor, a second capacitor, a constant source of current for charging said second capacitor, means associated with one of said conductors for connecting said shunt to said first capacitor and for connecting said constant source of current to said second capacitor while current is flowing through the associated conductor, a meter, means for selectively connecting said first capacitor and said second capacitor to said meter, means for preventing an additional weld cycle if the welding current for the previous cycle was below a predetermined minimum, and means for preventing an additional weld cycle if the welding current for the previous cycle was above a predetermined maximum.

4,042,801

ELECTRON BEAM APPARATUS

Cecil Arthur Joseph Gay, and Leslie George Henry Rockey, both of Bristol, England, assignors to British Aircraft Corporation Limited, London, England

Filed Aug. 19, 1975, Ser. No. 605,882
Claims priority, application United Kingdom, Aug. 31, 1974, 38163/74; Aug. 31, 1974, 38164/74
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 EB **5 Claims**



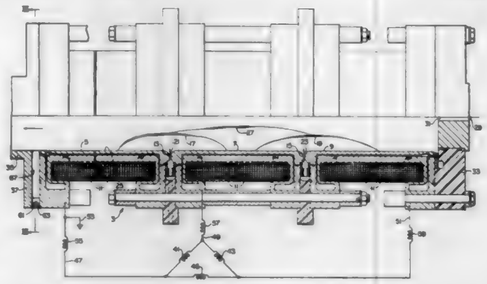
1. Electron beam welding apparatus including, in combination, an electron gun for generating an electron welding beam, means for traversing a workpiece relative to the beam, an annular ferro-magnetic yoke having diametrically opposed internal poles thereon, a pair of beam deflecting coils on each pole for deflecting the beam transversely relative to the direction of movement of the workpiece, one coil of each pair being connected in series with a coil of the other pair in a sense such that the voltage induced in one pair of series connected coils by a collapsing deflection current in the other pair of series connected coils assists the rising deflection current in the first mentioned pair of series connected coils, and vice versa, and supply means for supplying the two pairs of series connected coils alternately with energizing current of substantially square waveform to deflect the beam alternately between two transversely spaced welding positions.

4,042,802

THREE-PHASE ARC HEATER

Maurice G. Fey, Plum Borough, and Charles B. Wolf, Irwin, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 11, 1975, Ser. No. 603,611
Int. Cl.[2] B23K *9/00*
U.S. Cl. 219—121 P **4 Claims**



1. A three-phase heater system as a high energy heat source, comprising an arc heater having two axially spaced, substantially cylindrical electrodes forming a first intermediate gap therebetween, one electrode comprising a downstream electrode and the other electrode comprising an upstream electrode, a thrid electrode disposed upstream of the intermediate gap, a second intermediate gap between the upstream the electrode and the third electrode, first and second means spacing an elecrically insulating the downstream and upstream electrodes and the upstream and third electrodes, respectively, and comprising means for channeling gas to be heated at a high velocity to the gaps, a three-phase delta-connected power source comprising one conductor for each phase and connected separately to the electrodes, a ground conductor connected to the downstream electrode, a ground conductor connected to the dowsntream electrode, and a gas inlet port disposed at the exit end of the arc heater and having a plurality of peripherally spaced gas inlets extending tangentially to the periphery of a product material flowing from the arc heater, whereby a swirling movement is imparted to the product material.

4,042,803

BODY HEATING AND STRETCH SUPPORT DEVICE

Edgar P. Bickford, Danbury, Conn., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

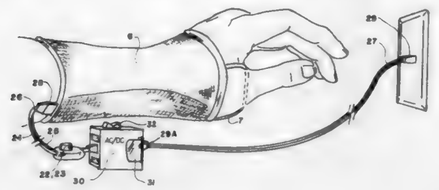
Filed Jan. 28, 1976, Ser. No. 653,138
Int. Cl.[2] H05B *1/00*
U.S. Cl. 219—211 **2 Claims**

1. A body heating and stretch support device, comprising

a sheet of stretch support material adapted to be supported on a part of a human body in contact therewith, said sheet of material having an elastic band for adjusting the size thereof to fit different sized people and a plurality of zippers for fastening selected segments of the sheet to each other;

electric heating means embedded in the material; and

energizing means for releasably electrically connecting the heating means to a source of electrical energy for selectively heating the part of the body contacted by the sheet of material, said energizing means including electric switch means, electric resistance means, electrically conductive means connecting the switch means and resistance



means in series, said conductive means having spaced opposite ends, a housing having fastening means thereon for removably affixing it to clothing of a user, electric power supply means in the housing, and a pair of electrical connector plugs each connected to a corresponding end of the conductive means for making electrical contact with the heating means and with a source of electrical energy via the power supply means and an AC/DC switch in the housing for connection to either an AC or a DC source of electrical energy.

4,042,804

ROLL FUSER APPARATUS

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Sept. 24, 1975, Ser. No. 616,452
Int. Cl.[2] H05B *1/00;* **G03G** *15/00*
U.S. Cl. 219—216 **11 Claims**



1. Fuser apparatus for fixing toner images to substrate material, said apparatus comprising:

a fuser roll member;

a backup roll member;

means for effecting engagement of said roll members to apply a force between said roll members to thereby form a nip therebetween through which said substrate material passes with said toner images contacting said fuser roll said means also effecting disengagement to remove said force;

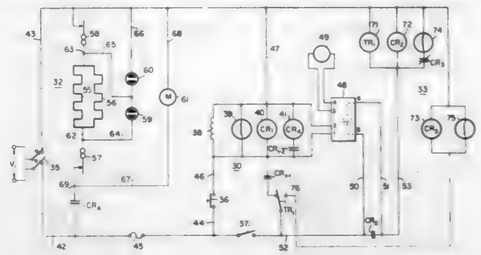
one of said roll members comprising a rigid thermally stable core and an outer layer which has a substantially uniform circumference along its longitudinal axis when said force is not applied and when said force is applied has a non-uniform circumference along its longitudinal axis whereby portions thereof adjacent its ends have a longer surface length than the center portion thereof whereby the edges of said substrate material are moved through said nip at a faster speed than the center thereof.

4,042,805

STERILIZING APPARATUS

Bernard F. Kopacz, Little Falls, N.J., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed Dec. 18, 1974, Ser. No. 533,830
Int. Cl.[2] H05B *1/02*
U.S. Cl. 219—492 **7 Claims**



1. Sterilizing apparatus comprising:

a chamber for receiving objects to be subjected to elevated temperatures for predetermined intervals, said chamber including door means and means for sensing the opened and closed condition of said door means;

heater means in fluid communication with said chamber;

heater control means for selectively energizing said heater means, said heater control means exhibiting temperature sensitive characteristics and active, when enabled, to maintain the operation of said heater means in the vicinity of a predetermined temperature by the selective energizing and de-energizing thereof, said heater control means comprising first and second temperature controller means disposed in a primary and back-up relationship with respect to said heater means, each of said first and second temperature controller means controlling the application of operating potential to said heater means and being capable of selectively energizing or de-energizing said heater means;

program initiation means for starting a cycle of operation of said sterilizing apparatus, said program initiation means including cycle controlling means, means for sensing the temperature within said chamber and means for momentarily applying potential to said cycle controlling means, said program initiation means being operatively connected to said heater control means and said door condition sensing means and operative upon an enabling of said means for momentarily applying potential to said cycle controlling means to momentarily apply operating potential to said heater control means and said means for sensing the temperature within said chamber means, said cycle controlling means active upon a momentary application of operating potential thereto to continue an application of operating potential to said heater control means and said means for sensing the temperature within said chamber means if a closed door condition is sensed by said means for sensing the condition of said door means, said cycle controlling means being responsive to the disruption in a supply of operating potential to cause a resetting of said sterilizing apparatus whereupon a new cycle of programmed operation must be initiated;

automatic timer means for defining said predetermined intervals during which said objects are to be subjected to said elevated temperature, said automatic timer means being connected to said cycle controlling means and said means for sensing the temperature within said chamber, said automatic timer means being active to initiate a timing of said predetermined interval upon a detection of a selected temperature within said chamber by said means for sensing the temperature within said chamber and further active upon an expiration of a predetermined interval for de-energizing said cycle controlling means whereupon the application of operating potential to said heater control

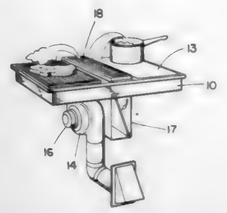
means and said means for sensing temperatures within said chamber is terminated.

4,042,806

VENTILATED RANGE WITH PLUG-IN COOKING UNITS

Edward O. McCartney, Greenfield, Ind., assignor to Jenn Air Corporation, Indianapolis, Ind.

Filed Jan. 19, 1977, Ser. No. 760,621
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—447 **2 Claims**



1. A range of the type having a recessed upper surface receiving a plug-in electrical broiling element and a plug-in surface cooking cartridge having a plurality of electrical heating units, an electric motor driven fan disposed below the recessed upper surface for drawing air across said surface to ventilate the upper surface area, manualy operable control switches for setting the power input to said broiling element and to each of the heating units in said cartridge, a single one of said switches controlling either said broiling element if it is in place in said recessed surface and one of said heating units if the cartridge is in place in said recessed surface, a receptacle disposed in said recessed upper surface, said cartridge and said broiling element each having a pronged plug adapted to be received in the receptacle, circuit means connecting said receptacle across an electrical power source through said control switches and connecting the fan driving motor to one side of said power source and to said receptacle, said range being characterized by the pronged plug associated with said broiling element having power input prongs connecting said element across the power source when inserted in the receptacle and an additional prong electrically connected to that one of said power input prongs having electrical continuity to the other side of said power source, said additional prong connecting, through said receptacle, to the fan motor, said pronged plug of the cartridge element being characterized by an absence of a counterpart of said additional prong, whereby said fan motor is energized whenever said broil element is energized through said one single control switch but is not energized through said receptacle when said one of the heating units of the cartridge is energized through said one single control switch.

4,042,807

APPARATUS FOR THE PROCESSING OF DOCUMENTS

Claude Jules Donabin, Angers, and Denis L. J. G. Mercier, St. Georges, Loire, both of France, assignors to Compagnie Honeywell Bull, Paris, France

Filed Nov. 14, 1975, Ser. No. 631,998
Claims priority, application France, Nov. 12, 1974, 74.40830
Int. Cl.[2] G06K *1/12, 13/00;* **B65H** *3/44*
U.S. Cl. 235—61.11 R **8 Claims**

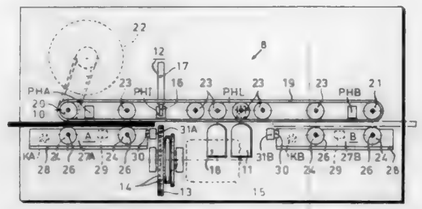
1. In an apparatus for handling rectangular documents, said apparatus being of a type having a reading device, first and second stations respectively arranged at each of two ends of the reading device to contain only one document to be handled, each of said stations including means to feed in and receive said document, and a conveyor means to transport said document between said two stations so that said document passes adjacent the reading device, said reading device reading information carried by said document only when said document is moved in a direction running from the first station to the second;

first feed-controlling means coupled to said conveyor means and controlling said feed means for feeding said document continuously in a direction from the first station to the second station;

second feed-controlling means coupled to said conveyor means and controlling said feed means for feeding said document continuously in a direction from the second station to the first;

first triggering means associated with the first station and connected to said first control means for generating a first excitation signal to said first station;

second triggering means associated with the first station and connected to said first control means for generating a second excitation signal to said second station;



detector means located along a path followed by the document at said reading device for generating a control signal in response to the document passing said reading device; and

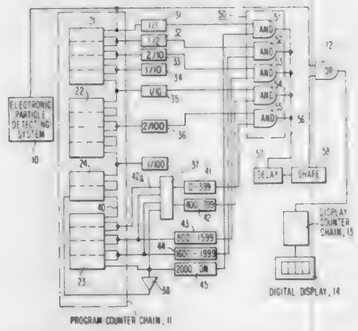
change over means connected to said first and second control means, said first and second triggering means and said detector means, said change over means responsive to an excitation signal generated by one of said triggering means for directing said control signal generated by said detector means to (1) the control means associated with said one of said triggering means to halt the movement of the document, and (2) the control means associated with the other triggering means to return the document to the station into which it was originally placed.

4,042,808

PARTICLE COUNT CORRECTION

James W. Hennessy; Henry R. Angel, both of Trumbull, and Bernard O. Bachenheimer, Fairfield, all of Conn., assignors to Angel Engineering Corporation, Stratford, Conn.

Filed Aug. 11, 1975, Ser. No. 603,586
Int. Cl.[2] G06M *11/00*
U.S. Cl. 235—92 PC **16 Claims**



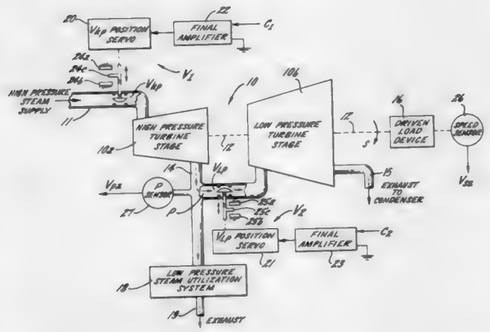
1. In apparatus for counting, said apparatus having detector means to emit a pulse for each detection, thereby generating a sequence of counting pulses, said apparatus having a display counter device for providing a read-out of the pulses generated by the detector means; the improvement comprising means to correct the count to compensate for errors introduced by the mode of detection and recording, comprising a program counting device, means to feed said counting pulses into the input of said program counting device, said program counting device having a plurality of output means, one group of said output means each providing a train of pulses at different frequencies, a second group of said output means each for providing in sequence a gating signal during an interval spanning selected numbers of said counting pulses, gate means responsive to application of a gating signal from said second group of output means to transmit a train of pulses from said first group of output means to produce correction signals at a frequency which varies in accordance with a pre-selected program controlled by said second group of said output means, and adding means to add the pulses from said gate means to the sequence of counting pulses from said detector means to generate a corrected count which is read out in said display counter device.

4,042,809

SYSTEM FOR CONTROLLING TWO VARIABLES

Terry A. Shetler, Fort Collins, Colo., assignor to Woodward Governor Company, Rockford, Ill.

Filed Aug. 23, 1976, Ser. No. 717,007
Int. Cl.[2] G05B *6/02*
U.S. Cl. 235—150.1 **14 Claims**



1. In a system for controlling first and second variables (S and P) by variably exciting first and second control elements (V_1 and V_2), said first element (V_1) directly affecting both variables as its excitation is increased or decreased, and said second element (V_2) directly affecting one variable but oppositely affecting the other variable, said system including:

a. means for creating a first error function signal (E_s) which varies according to the error between set point and actual values of one controlled variable,

b. means for creating a second error function signal (E_p) which varies according to the error between set point and actual values of the other controlled variable,

c. means for combining said first and second error function signals to create a first command signal (C_1) which varies with a cumulative effect of changes in such function signals,

d. means for combining said first and second error function signals to create a second command signal (C_2) which varies with a differential or opposite effect of changes in the respective function signals,

e. means for exciting the first control element (V_1) with said first command signal to increase or decrease said two variables, and

f. means for exciting the second control element (V_2) with said second command signal, thereby to increase or decrease one of said variables while respectively decreasing or increasing the other variable,

the improvement which comprises

g. means responsive to one of said error function signals (E_s or E_p) for creating a threshold signal (T) which varies as a predetermined function of such one signal, and

h. means for supplying to one of said means (c) or said means (d) either (i) the other of the function signals (E_p or E_s) or, in lieu thereof, (ii) said threshold signal, —whenever said other function signal lies respectively (i) within or (ii) without a boundary represented by the magnitude of the threshold signal.

4,042,810

METHOD AND APPARATUS FOR FACILITATING CONTROL OF A RAILWAY TRAIN

John E. Mosher, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of Ser. No. 436,700, Jan. 25, 1975. This application July 25, 1975, Ser. No. 599,043
Int. Cl.[2] B61G *1/08;* **G06F** *15/20*
U.S. Cl. 235—150.2 **82 Claims**

1. A method for facilitating control of a railway train having at least one locomotive in a locomotive set and a plurality of cars successively linked thereto proceeding on a track over a predetermined route of travel, wherein each car of said plurality of cars has a coupler transmitting a coupling force between said car and that portion of the train which precedes said car over the predetermined route of travel, comprising:

the step of

providing said train with a means for processing data including a memory for storing data, and a control system for transferring data received by said data processing means into said memory and for combining said data in said memory in accordance with a predetermined sequence of operations including performing predetermined calculations for determining a representation of said coupling force for each car;

the step of

locating the position of each car in said train on said track over the predetermined route of travel and storing said positions in said memory;

the step of

storing in said memory the coupling force representation of each car in said train calculated by said control system responsive to said located position of each car; and

the step of

displaying to the operator of said locomotive set, as the train proceeds along said predetermined route of travel, the coupling force representation stored for each car.

4,042,811

TOMOGRAPHY SYSTEM HAVING AN ULTRAHIGH-SPEED PROCESSING UNIT

Carl J. Brunnett, Mayfield Heights, Ohio, and Vernon W. Gerth, Jr., Kirkwood, Mo., assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 636,217
Int. Cl.[2] G01T *1/16;* **G06F** *15/52*
U.S. Cl. 235—151.3 **19 Claims**

1. A transverse section tomography system for providing a reconstructed image of a planar section of a subject, comprising:

a. a movably supported radiation detector for detecting radiation which has passed through the planar section of the subject and for generating a sequence of scan data signals indicative of the intensity of the radiation after it has passed through the subject, said scan data signals being generated at predetermined orientations and positions whereby detection of the radiation at a given orientation and position defines a scan element and detection of the radiation at all predetermined orientations and positions defines a scan cycle; and,

b. control apparatus responsive to the sequence of scan data signals for generating a set of repeatedly updated, elemental image signals characterizing structure of the planar section of the subject, said control apparatus including:

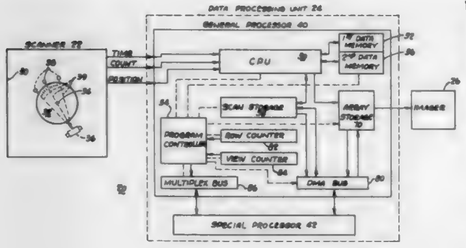
i. input storage means for storing the respective scan data signals in particular input storage locations;

ii. filter processing means coupled to the input storage for retrieving the scan data signals from the input storage means and for producing filtered scan signals from the retrieved scan data signals which filtered scan signals each respectively represent the contribution to the reconstructed image of each of the corresponding retrieved scan data signals;

iii. a scan storage apparatus having multiple storage locations for retrievably storing the filtered scan signals in locations corresponding to the contribution to the image of the stored filtered scan signals and corresponding to scan elements occurring at predetermined orientations of the scan cycle during which the stored signals are produced;

iv. array storage means for storing as they are generated, elemental image signals which are to be repeatedly updated; the elemental image signals being stored in successive array storage locations each array storage location respectively corresponding to a preselected point of an array of points of said planar section;

v. an array storage address calculator for addressing a



selected array storage location containing the elemental image signal corresponding to a selected one of said preselected points of the planar section;

vi. a scan storage address calculator for addressing at least one of a predetermined range of selected scan storage locations adjacent a selected location corresponding to a said preselected point, said range of locations containing at least one of a set of filtered scan signals each representing radiation detected in a given scan element which contributed to the representation of the reconstruction of the image at said preselected point;

vii. a processing unit for combining the addressed filtered scan signal with the addressed elemental image signal to provide one of the updated, elemental image signals;

viii. said scan storage address calculator including a first storage means for storing the address of a said selected scan storage location and a second storage means for storing an incremental value indicative of the number of scan storage locations separating said selected scan storage location and a scan storage location corresponding to a next subsequent preselected point to be updated; and,

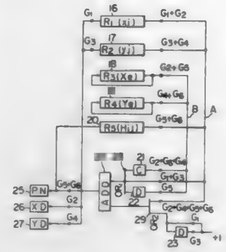
ix. means coupling the processing unit to the first and second storage means, whereby the processing unit combines said address with said incremental value to provide the address of said next point.

4,042,812

PULSE DISTRIBUTION METHOD AND APPARATUS

Yoshihiro Hashimoto, Hachioji, and Shinichi Isobe, Tachikawa, both of Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,762
Claims priority, application Japan, Oct. 12, 1974, 49-117435
Int. Cl.[2] G05B *19/18*
U.S. Cl. 235—151.11 **13 Claims**



1. A pulse distribution method for a numerically controlled machine tool having two control axes which include a first control axis having a smaller resolution and a second control axis having a larger resolution by a given ratio, wherein said method comprises transmitting one pulse of said machine tool for moving said machine tool in a direction along said first and second control axis, respectively, in accordance with whether a distributing point of the pulse distributing operation is above or below a locus to be followed, and by a given amount so as to establish a new distributing point which differs from said distributing point by said given amount, and then, determining whether the next one pulse is to be supplied to said first or second control axis in accordance with whether said new distributing point is above or below said locus said method further comprising:

defining said locus to be followed by means of a corresponding, related discrimination function;

computing a value of said discrimination function so as to derive a polarity thereof;

transmitting said one pulse for first or second control axis movement of said tool in accordance with said sign of said computed value being positive or negative, respectively;

shifting said distributing point in the first control axis direction by the smaller resolution when said one pulse is transmitted for said first control axis movement; and

when said one pulse is supplied to said second control shifting said distributing point in the second control axis direction by said larger resolution when said one pulse is transmitted for said second control axis movement.

4,042,813

SECONDARY SYSTEM MODELING AND METHOD FOR A NUCLEAR POWER PLANT TRAINING SIMULATOR

Steven J. Johnson, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 335,293, Feb. 23, 1973, abandoned.
This application Oct. 31, 1974, Ser. No. 519,722
Int. Cl.[2] G09B *9/00*; G06F *15/06*
U.S. Cl. 235—151.21 **40 Claims**

1. An automated training simulator for the real-time dynamic operation of a power plant having a secondary system including a heat exchanger which increases the temperature of reheatable steam between stages of a steam turbine with reheat steam from a steam generating means, comprising:

a console having a plurality of command devices to generate input data;

calculating means including sequencing means having the following components;

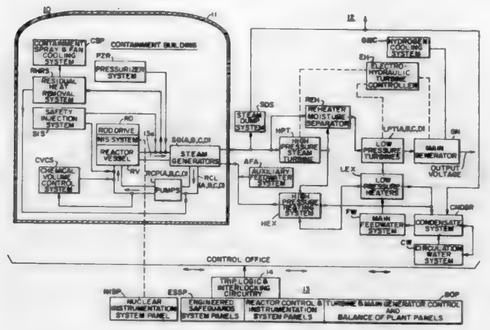
a. means to generate a data value relating to the mass of reheatable steam in the heat exchanger in accordance with

data values relating to inlet flow and outlet flow and heat transfer,

b. means to generate a data value relating to the specific volume of steam in the heat exchanger in accordance with generated data values relating to mass and volume,

c. means to generate a data value relating to the temperature of the reheatable steam in the heat exchanger in accordance with data values relating to enthalpy and specific volume of the reheatable steam,

d. means to generate a data value relating to enthalpies of the reheatable and the reheat steam in accordance with an instantaneous energy balance equation for each enthalpy,



e. means including means to generate a data value relating to the temperature of the reheat steam at the outlet of the heat exchanger in accordance with a constant and a data value related to generated enthalpy of the reheat steam,

f. means to generate a data value relating to heat transfer in the heat exchanger between the reheat and the reheatable steam in accordance with the generated data values relating to the temperature of the reheat and reheatable steam,

g. means to generate a data value relating to inlet and outlet flow in accordance with the input data values including input data from the operation of the console control devices; and

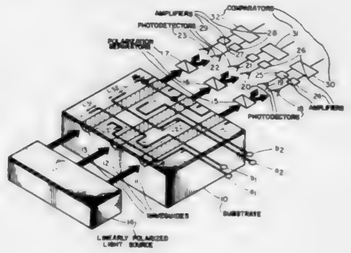
indicating means governed by predetermined generated data values of the reheatable steam.

4,042,814

ELECTRO-OPTIC BINARY ADDER

Henry F. Taylor, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,683
Int. Cl.[2] G06F *7/56*
U.S. Cl. 235—175 **9 Claims**



1. An electro-optic adder for summing binary addends having N bits comprising:

an electrically non-conductive substrate;

N + 1 optical waveguides supported by said substrate,

said waveguides being of electro-optic material exhibiting linear change of refractive index in response to an electric field impressed thereacross;

a source of linearly polarized light adapted to transmit its output light energy along each of said waveguides;

a plurality of electrodes connectable to a source of electrical potential representative of a binary bit and having discrete lengths L contiguous to said waveguides for impressing electric fields thereacross,

said lengths L in the jth waveguide corresponding to the nth bit in each addend being determined by the relationship

$L_{jn} = 2^{n-j}1_{\pi}$, when $n \leq j$, and

$L = 0$, when $n > j$

where 1_{π} is the length required for a pi-radian phase retardation of light propagation in the waveguides upon application of said electrical potential;

a polarization separator receiving the output of each waveguide for producing signals commensurate with the orthogonally polarized components of said output;

a photodetector responsive to each of said signals representing said components for producing an electrical signal representative thereof;

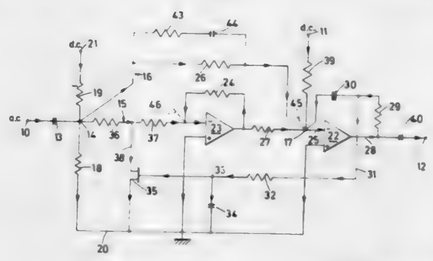
means for amplifying each said electrical signal; and an analog comparator for receiving the amplified electric signals derived from the orthogonally polarized components of light energy output of each of said waveguides for producing a binary output signal representative of the relative amplitudes of its received signals.

4,042,815

ELECTRONIC MULTIPLIERS

Kenneth Robson Brown, Beamish, and Colin Keith Sharp, Edinburgh, both of Scotland, assignors to Ferranti Limited, Lancashire, England

Division of Ser. No. 507,422, Sept. 19, 1974, Pat. No. 3,963,912.
This application Jan. 16, 1976, Ser. No. 649,838
Claims priority, application United Kingdom, Sept. 22, 1973, 44550/73
Int. Cl.[2] G06G *7/16*
U.S. Cl. 235—194 **11 Claims**



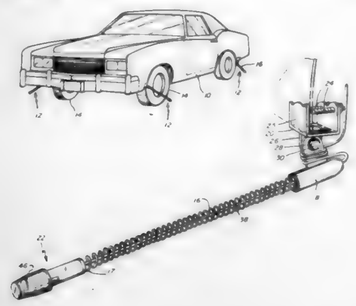
1. An electronic multiplier circuit comprising a first input terminal to which an a.c. signal is applied, a junction point, two parallel paths connected between the input terminal and the junction point, signal level adjusting means included in one of said parallel paths, a second input terminal to which a d.c. signal is applied, a third path connected to said second input terminal, an output terminal, and control means connected between the junction point and the output terminal and responsive to any imbalance of d.c. components in said parallel paths and to a d.c. signal in the third path to produce a control signal for varying the signal level adjusting means so as to reduce said d.c. imbalance, whereby a.c. components in said two parallel paths are unbalanced to an extent proportional to the d.c. signal applied to the second input terminal.

4,042,816

ILLUMINATED CURB FEELER

Joseph Smoot, 127 Alexander St., Dorchester, Mass. 02125

Filed Feb. 2, 1976, Ser. No. 654,412
Int. Cl.[2] B60Q *1/00*
U.S. Cl. 240—8.1 R **13 Claims**



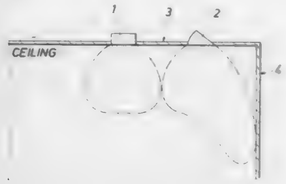
1. An illuminated curb feeler for use with a motor vehicle comprising;
an elongated member,
means at one end of the member for supporting the member from the vehicle extending outwardly from the vehicle to position said curb feeler to contact a curb,
a lamp socket,
means for securing the socket to the other end of the member,
a lighting assembly received by the socket and including a bulb when said assembly contacts a curb and means encapsulating the bulb to protect the bulb,
and means for coupling power to the socket to illuminate the bulb.

4,042,817

QUASI-INDIRECT MONOSYMMETRICAL LIGHTING SYSTEM

Albert C. McNamara, Jr., 210 E. Mimosa Circle, San Marcos, Tex. 78666

Continuation-in-part of Ser. No. 376,320, July 5, 1973, abandoned. This application June 24, 1975, Ser. No. 589,947
Int. Cl.[2] F21S *3/02*
U.S. Cl. 240—9 R **14 Claims**



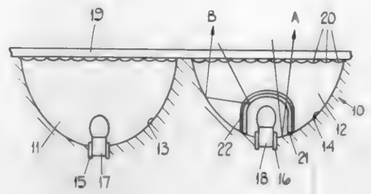
1. In combination with a room ceiling and an adjoining vertical light-reflective wall, a peripheral lighting arrangement, comprising at least one flush-mounted light fixture for producing monosymmetrical light distribution recessed in said ceiling, spaced in close proximity apart from said wall; said spacing beng .3 to .5 of the distance from said ceiling to the elevation below at which the optimum illumination is desired, said elevation below said ceiling at which the optimum illumination is desired being located in the lower vertical one-half of the room, and having a main light distribution pattern directed downward from said fixture toward said wall, said light distribution pattern being at an angle between 30° and 70° to said ceiling, the impinging and reflected light to and from said wall producing an average contrast rendition factor in the work task area of the room in excess of that produced by a substantially identical peripheral lighting arrangement involving one or more light fixtures producing axially symmetrical light distribution.

4,042,818

LAMP ASSEMBLY

Stanley Green, Warley, England, assignor to The Lucas Electrical Company Limited, England

Filed Mar. 16, 1976, Ser. No. 667,336
Claims priority, application United Kingdom, Apr. 1, 1975, 13307/75
Int. Cl.[2] F21V *13/14*
U.S. Cl. 240—41.3 **12 Claims**



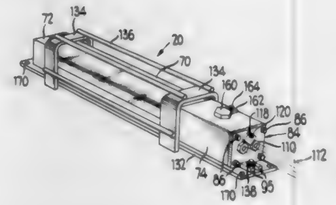
1. A lamp assembly comprising a hollow body, a reflector in said hollow body, a colorless lens overlying said reflector, a bulbholder disposed in said hollow body, a bulb mounted in said bulbholder, a colored filter element mounted in said hollow body and completely covering said bulb, and a neutrally colored light-absorbing material completely covering a surface of said colored filter element remote from said bulb, said light-absorbing material reducing the intensity of externally incident light passing therethrough said colored filter element and thereby causing the color of said colored filter element visible externally of said light-absorbing material to be subdued.

4,042,819

FLUORESCENT LAMP FOR USE IN EXPLOSIVE ATMOSPHERES SUCH AS MINES

Perfecto Dacal, Beckley, W. Va., assignor to Control Products Inc., Beckley, W. Va.

Filed July 9, 1976, Ser. No. 704,061
Int. Cl.[2] H05B *33/02*
U.S. Cl. 240—51.11 R **8 Claims**



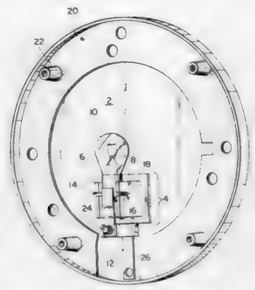
1. A lamp permissible for use in explosive atmospheres such as mines comprising:
a lighting assembly and inner and outer guard assemblies therefor;
said lighting assembly including an elongated bulb with starter and ballast members removably connected to opposite ends thereof, and grounding means interconnecting said starter and ballast members;
said inner guard assembly including a transparent cylindrical housing enclosing said bulb, and end housings at the ends of said cylindrical housing enclosing said starter and ballast members respectively, electrical power outlet means in one of said end housings electrically connected to said starter and ballast members, electrical power conductors extending through a wall of said one end housing and means in said wall for sealing said conductors; and
said outer guard assembly including an elongated support plate, means for mounting said end housings on opposite ends of said support plate, a plurality of hoops fastened to said support plate at spaced intervals therealong, and a plurality of rods fastened to said hoops extending parallel to and exteriorly of said bulb housing and providing cage-like protection therefor.

4,042,820

MOLDED LAMP HOUSING

Joseph E. Baader, 333 Holiday Drive, Springfield, Ohio 44505, and Edward J. Baader, 711 E. Cecil, Springfield, Ohio 45503

Filed July 1, 1976, Ser. No. 701,716
Int. Cl.[2] F21V *21/00*
U.S. Cl. 240—52 R **16 Claims**



1. A molded lamp housing operable for vehicular mounting comprising, in combination:
A. A housing base of electrically insulating material comprising a first surface having an integrally formed bulb support extending outwardly therefrom, wherein;
B. said bulb support further comprises a concave channel recess, substantially parallel to said first surface, and defined by a pair of oppositely disposed extensions, said channel being outwardly open relative to said first surface, and;
C. an outwardly open aperture extending inwardly from an outer surface on each of said pair of extensions, said apertures being oppositely disposed and operable to receive pins on a bayonet base light bulb inserted partially into said channel, and;
D. a resilient, electrically conductive ground strap comprising a cantilevered portion extending above and in substantial parallel alignment with said concave channel recess, and;
E. an electrically conductive contact strap, extending in a substantial normal fashion from said first surface, and cantilevered into said channel at a point laterally disposed with respect to said pair of apertures, whereby said bulb support is operable to urge a portion of the base of a bayonet base light bulb into contact with said cantilevered ground strap, while maintaining further electrical contact between a bottom electrical contact on said bulb and said contact strip for various rotative orientations of said so held bulb about said pins.

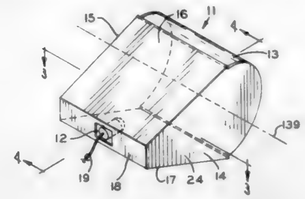
4,042,821

REMOTE CONTROL LIGHT RECEIVER

Eugene P. Mierzwinski, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Oct. 28, 1975, Ser. No. 626,165
Int. Cl.[2] H01J *3/14*
U.S. Cl. 250—216 **12 Claims**

1. A receiver for receiving light comprising a lens formed of optical material having a front light receiving surface, said front light receiving surface being cylindrical about an axis, said axis being located rearwardly of said front surface; side surfaces, said side surfaces being substantially parallel and mutually perpendicular to said axis of curvature, said side surfaces being at least partially coated with a reflective coating; a top surface; a bottom surface; and further comprising a photodetector located within said optical material.

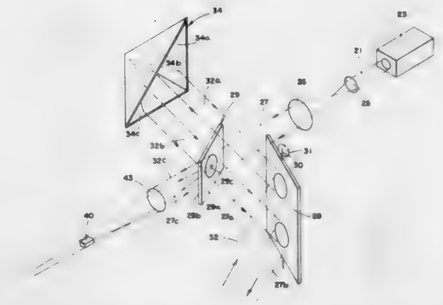


4,042,822

LASER RADAR DEVICE UTILIZING HETERODYNE DETECTION

Richard A. Brandewie, Laguna Beach; Walter C. Davis, Tustin, and John A. Macken, Santa Rosa, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed July 24, 1975, Ser. No. 598,957
Int. Cl.[2] H01J *3/14*; G01C *3/08, 3/36*
U.S. Cl. 250—216 **10 Claims**

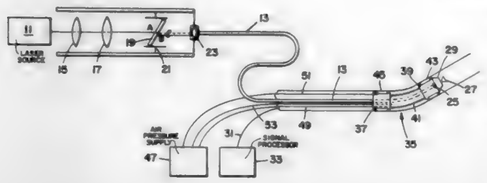


1. A heterodyning light beam radar device comprising
means for emitting a light beam,
mixing mirror means having aperture means formed therein,
said light beam being directed towards said mixing mirror means, a portion of the light energy of said beam being reflected by said mixing mirror means and a portion of said energy passing through said aperture means,
scanner mirror means receiving the light energy reflected by said mixing mirror means for providing a light beam from said light energy for scanning targets to be detected, target reflections of said light energy being received by said scanner mirror means, the target reflections being reflected from the scanner mirror means and onto a portion of said mixing mirror means encompassing the aperture means,
detector means for detecting the target reflections, and
means for focusing the portion of the light energy passing through the aperture means and the target reflections from the scanner mirror means onto said detector means where the light energy is detected with heterodyning action.

4,042,823
OPTICAL SCANNER

Louise A. Decker, Sunnyvale, and Gary O. Langford, Palo Alto, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 17, 1976, Ser. No. 667,806
Int. Cl.[2] G02B 5/14
U.S. Cl. 250—227 8 Claims

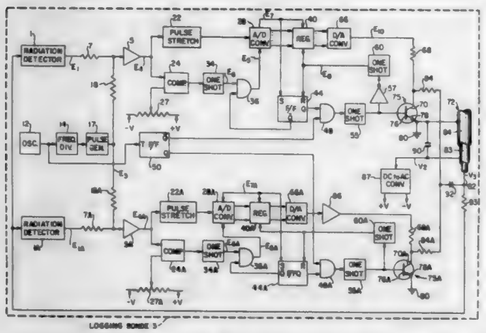


1. A scanner which comprises:
a. a laser beam source;
b. a relay lens to adjust the diameter of a beam emergent from said source to a predetermined dimension;
c. an inclined plate of transparent material, said plate located in the path of said beam to cause an emerging beam to be shifted a predetermined amount in a direction parallel to said beam;
d. rotation means to cause said plate to rotate about the point at which said beam impinges upon said plate;
e. optical transfer means located beyond said inclined plate to intercept and transmit said emerging beam; and
f. a reflecting cone located beyond said optical transfer means to deflect a beam emerging from said optical transfer means to the surrounding environment.

4,042,824
DUAL SPECTRA WELL LOGGING SYSTEM AND METHOD

Robert W. Pitts, Jr., and Houston A. Whatley, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,261
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—263 15 Claims

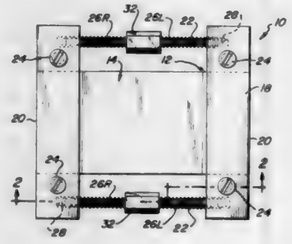


1. A nuclear well logging system for providing outputs corresponding to at least one condition relative to an earth formation sensed in a borehole, comprising a logging instrument adapted to be passed through a borehole, said instrument including at least two detecting means being responsive to penetration radiation corresponding to the condition in the borehole for providing data pulses corresponding in number and peak amplitude to the detected penetration radiation, at least one reference pulse means for providing reference pulses and two pulse signal means, each pulse signal means being connected to a corresponding detecting means and receiving a reference pulse for providing a pulse signal having reference pulses and data pulses, and pulse output means connected to all the pulse signal means for periodically sampling the pulse signals from each pulse signal means and providing output pulses corresponding in amplitude and polarity to the sample in a manner so that output pulses of one polarity are provided during first predetermined time intervals and output pulses of another polarity are provided during second predetermined time intervals, said pulse output means including two network means, each network means including means connected to corresponding pulse signal means for stretching the pulses in the pulse signal from the pulse signal means, sampling means connected to the pulse stretching means for periodically sampling the stretched pulses and providing an output voltage corresponding to the first stretched pulse occurring during each sampling; and circuit means connected to each sampling means for providing the output pulses of the one polarity in accordance with the output voltage from one sampling means and for providing the output pulses of the other polarity in accordance with the output voltage from the other sampling means; conductive means connected between said output pulse means in the logging instrument and surface electronics adjacent the borehole for transmitting the output pulses from the logging instrument to the surface electronics, and said surface electronics comprising means connected to the conductive means for separating the transmitted pulses by polarity, first processing means coupled to the separating means for providing an output corresponding to the sensed condition in accordance with the transmitted pulses of one polarity, and second processing means connected to the pulse separating means for providing a second output corresponding to the sensed condition in accordance with the transmitted pulses of the other polarity.

4,042,825
STRESSED-UNSTRESSED STANDARD FOR X-RAY STRESS ANALYSIS AND METHOD OF MAKING SAME

Clayton O. Ruud, Englewood, Colo., assignor to Colorado Seminary, Denver, Colo.

Filed July 9, 1976, Ser. No. 703,845
Int. Cl.[2] G01N 23/20
U.S. Cl. 250—272 6 Claims

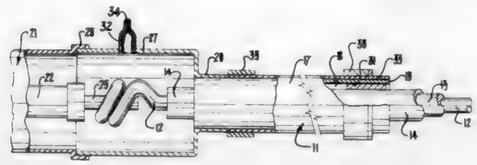


1. Apparatus for use with a position-sensitive X-ray detection device in the determination of the sample to detector distance and the angle between the surface normal and the incident X-ray beam preparatory to analyzing the stresses within an unknown sample which comprises: a sheet of stressable material; a film of strain-free material coated upon the stressable sheet; means detachably fastened to the stressable sheet in opposed spaced relation to one another; and means interposed between said opposed means operative upon actuation to change the spacing therebetween and place the stressable sheet under stress without stressing the strain-free film coated thereon.

4,042,826
ELECTRICAL CABLE

Harold A. Thomas, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed June 19, 1975, Ser. No. 588,232
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—336 4 Claims

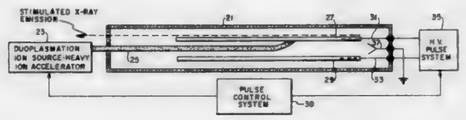


1. An electrical cable comprising, a flexible inner conductor, at least one flexible layer of radiation resistant organic insulation surrounding said inner conductor in contact therewith and coextensive therewith, a metal sleeve coextensive with said inner conductor and said insulation layer and having an inner diameter which is sufficiently greater than the outer diameter of said insulation layer or layers as to leave a substantial space between said insulation layer or layers and said sleeve with maximum thermal expansion of said insulation layer or layers, said metal sleeve being of an electrically conductive material and a thickness such that it is manually bendable, said sleeve being sealed at both ends, and said space being filled with a non-reacting gas.

4,042,827
STIMULATED EMISSION X-RAY GENERATOR

Richard A. McCorkle, South Salem, N.Y., and James M. Joyce, Greenville, N.C., assignors to Research Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 402,900, Oct. 3, 1973, abandoned. This application May 29, 1975, Ser. No. 581,945
Int. Cl.[2] G21G 4/00
U.S. Cl. 250—493 6 Claims



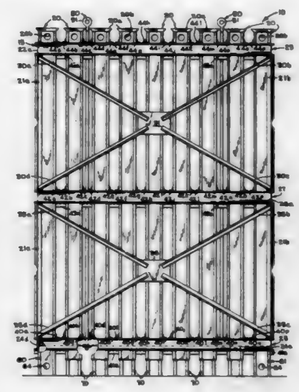
1. An X-ray wavelength generator comprising:
a volume of material capable of a high energy density interaction to produce particles capable of emitting radiation at X-ray wavelength; and
means for causing a swept high energy density interaction in a continuous path along said material traveling at approximately the speed of light to cause excited particles to be present in a region in convergence with said material;
thereby producing in the region a medium for non-isotropic X-ray generation through said region.

4,042,828
RACK FOR NUCLEAR FUEL ELEMENTS

Herbert J. Rubinstein, Los Gatos; Clark B. Gordon, San Jose; Albert Robison, Los Gatos, and Philip M. Clark, San Jose, all of Calif., assignors to Nuclear Services Corporation, Campbell, Calif.

Filed Nov. 17, 1975, Ser. No. 632,387
Int. Cl.[2] G21F 5/00
U.S. Cl. 250—507 16 Claims

8. A rack for spent nuclear fuel elements comprising:
a. a frame;
b. enclosures for containing respectively spent nuclear fuel elements, said enclosures being supported by said frame in an upright position; and
c. a support for each of said enclosures resting on a supporting surface and disposed below the fuel element contained by the associated enclosure for supporting the load of the fuel element while the associated enclosure retains the fuel element in an upright position, each of said supports comprising:

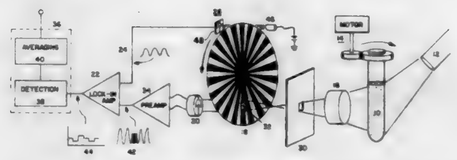


a. a first base on which rests an associated fuel element; and
b. swivel means connected to its associated first base and disposed on a supporting surface to support the associated first base for self-aligning movement to accommodate an uneven supporting surface while supporting the fuel element in the upright position.

4,042,829
FREQUENCY DOMAIN DISCRIMINATION AND COUNTING TECHNIQUE

E. Ronald Atkinson, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1975, Ser. No. 628,706
Int. Cl.[2] G06M 7/00; G02B 27/38
U.S. Cl. 250—550 11 Claims



1. A system for counting the number of objects in a selected sample by automatic measurement of spatial frequency components in the system's field-of-view comprising;
a sample of interest that includes therein an undetermined number of objects to be counted by the system;
means for interrogating said sample and providing an electrical output responsive to the spatial frequency components in said field of view wherein said spatial frequency components are definitive of said number of objects;
said interrogating means including a light source for illuminating said sample;
a movable reticle means having alternating opaque and transmissive portions positioned in the optical path between said light source and said photodetector means;
drive means coupled to said movable reticle to cause said

alternate opaque and transmissive portions to pass between said light source and photodetector means at a predetermined frequency;

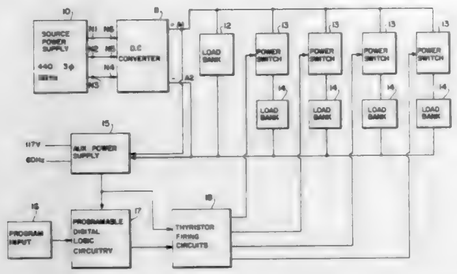
the width of said alternate opaque and transmissive portions on said reticle being chosen to provide a predetermined ratio of object size to the width of said alternating opaque and transmissive portions.

4,042,830

SOLID STATE PROGRAMMABLE DYNAMIC LOAD SIMULATOR

Carl W. Kellenbenz, Baltimore; James P. Goodman, and Randall C. Rector, both of Annapolis, all of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 25, 1975, Ser. No. 635,021
Int. Cl.[2] H02J *4/00*
U.S. Cl. 307—40 **13 Claims**



1. A dynamic load simulator for providing simulated dynamic loads to power sources comprising:

input means for receiving input power from a power source and for providing a voltage output;

means, coupled to receive said voltage output for providing a variable load to draw current from said power source, said means comprising a plurality of resistive loads;

electronic switch means coupled to each of said resistive loads and operable when energized to cause selected ones of said resistive loads to draw current;

logic means coupled to said switch means for energizing said switch means in response to program signals; and

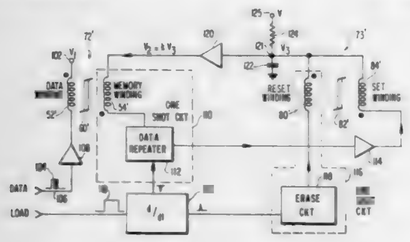
program means coupled to said logic means for providing program signals to said logic means at selected intervals to energize said electronic switch means and produce a dynamic load on the power source.

4,042,831

CORE MEMORY PHASER DRIVER

John G. Lenhoff, Jr., Linthicum, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1976, Ser. No. 650,992
Int. Cl.[2] H01P *1/32*
U.S. Cl. 307—88 R **14 Claims**



1. In a circuit for controlling a latching phaser in a phased array antenna system wherein the phaser includes a set and reset winding wound on a phaser core having a relatively high permeability and square type hysteresis loop, the improvement comprising, in combination:

a first and a second supply potential;

a memory core also having a relatively high permeability and square type hysteresis loop and including a pair of windings wound thereon, namely a data winding and a memory winding;

means coupling a data pulse signal of predetermined pulse width to said data winding causing said memory core to be coupled across said first supply potential and being energized thereby to cause said memory core to assume a predetermined flux remnant state;

first one-shot circuit means coupled to said reset winding, being responsive to a first control signal applied thereto to cause said reset winding to be coupled across said second supply potential and being energized thereby to cause said phaser core to be driven to a respective reference remnant state and thereby erase any previous remnant state;

second one-shot circuit means coupled to said memory winding being responsive to a second control signal applied thereto to cause said memory winding to be coupled across a third supply potential proportional to said second supply potential, said memory winding being energized by said third supply potential to cause said memory core to assume a respective reference remnant state and thereby generate a set signal in said memory winding having a pulse width proportional to said predetermined pulse width of said data signal;

circuit means coupling said set signal to said set winding causing said set winding to be coupled across said second supply potential and being energized thereby to cause said phaser core to assume a flux remnant state adapted to provide a selected phase shift for said phaser; and

circuit means coupled to said second supply potential for providing said third supply potential, said third supply potential thereby being adapted to change in magnitude in response to any change in the magnitude of said second supply potential

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4,042,832

LOGIC BOARD INTERLOCK INDICATION APPARATUS

Frank V. Cassarino, Jr., Weston, and George J. Barlow, Tewksbury, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Dec. 29, 1975, Ser. No. 644,653
Int. Cl.[2] H02J *13/00*
U.S. Cl. 307—149 **16 Claims**

1. Apparatus comprising:

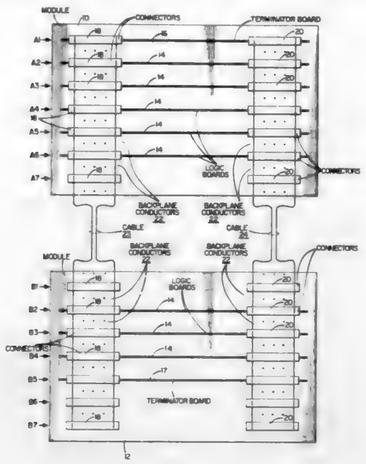
A. a first plurality of logic boards;

B. at least one electrical connector included for each of said logic boards, each said connector having a plurality of terminals;

C. first means for electrically coupling each of said connectors, said means for electrically coupling including means for connecting an electrical circuit through each of said logic boards in a daisy chained arrangement by means of a pair of electrically independent ones of said terminals in each of said connectors so that a continuous electrical circuit is established from a first one of said boards to a last one of said boards, said means for coupling further comprising means, included in at least one of said logic boards, for signalling whether the associated one of said logic boards is capable of operating in a satisfactory manner, said means for signalling comprising means for inhibiting a first signal state from being received at said last one of said logic boards if said associated one of said logic boards is not capable of operating in a satisfactory manner;

D. means for coupling said first signal state for receipt by one of said terminals of a one of said connectors included on a first one of said logic boards; and

E. means for indicating that said first signal state has been received at a last one of said connectors, which said last one of said connectors is included in a last one of said logic boards, whereby the proper connection of said boards with said connectors is indicated.

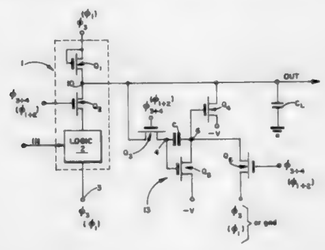


4,042,833

IN-BETWEEN PHASE CLAMPING CIRCUIT TO REDUCE THE EFFECTS OF POSITIVE NOISE

Mark B. Lesser, Laguna Niguel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 25, 1976, Ser. No. 717,713
Int. Cl.[2] H03K *17/16, 19/08, 17/60, 5/08*
U.S. Cl. 307—200 B **8 Claims**



1. A circuit to reduce the effects of positive noise at the output terminal of a signal supply means, said circuit including:

source means to provide a plurality of reference potentials;

clock terminal means;

electrical junction means;

a first multi-terminal semiconductor device having conduction path terminals connected between said source means and said output terminal and a control terminal connected to said electrical junction means;

a second multi-terminal semiconductor device having conduction path terminals connected between said source means and said electrical junction means to selectively control the conductivity of said first semiconductor device; and

a third multi-terminal semiconductor device having conduction path terminals connected between said output terminal and a control terminal of said second semiconductor device to control the conductivity of said second device, and a control terminal thereof connected to said clock terminal means;

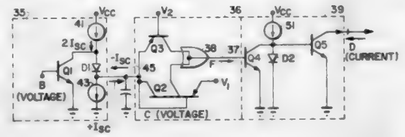
said first semiconductor device responsive to a signal at said electrical junction means to drive said output terminal to a first of said plurality of reference potentials via the conduction path of said first device during a first clock time interval when said third semiconductor device is enabled and to clamp said output terminal at said first reference potential during a second clock time interval when said third semiconductor device is disabled and said output terminal is susceptible to positive noise.

4,042,834

FREQUENCY DOUBLER CIRCUIT

W. David Pace, Tempe, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Division of Ser. No. 586,471, June 12, 1975. This application July 22, 1976, Ser. No. 707,809
Int. Cl.[2] H03B *19/14*
U.S. Cl. 307—220 R **6 Claims**



1. A frequency doubler circuit comprising:

means for providing a capacitance;

means for charging and discharging said capacitance in response to input pulses;

means for providing a first reference potential of a first predetermined magnitude and a second reference potential of a second predetermined magnitude;

ORing means;

first transistor means having main electrodes and a control electrode, said main electrodes being directly coupled between said means for providing a capacitance and said ORing means, said control electrode being adapted to receive said first reference potential; and

second transistor means having main electrodes and a control electrode, said main electrodes of said second transistor means being directly coupled between said means for providing a capacitance and said ORing means, said control electrode of said second transistor means being adapted to receive said second reference potential.

4,042,835

CHARGE COUPLED DEVICE

James T. Fulton, Stamford, Conn., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,822
Int. Cl.[2] H03K *5/15*
U.S. Cl. 307—221 D **1 Claim**

1. A charge coupled semiconductor device comprising:

sources of high and low potentials and three phase clock signals:

a semiconductor substrate;

a layer of insulating material disposed on a first surface of said semiconductor substrate;

a plurality of electrodes disposed on the surface of said layer of insulating material;

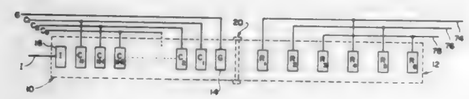
a gate electrode disposed on the surface of said layer of insulating material after said plurality of electrodes;

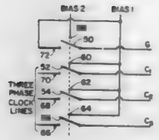
a circuit connected to said plurality of electrodes and said gate electrode including,

a first switch means for connecting together the plurality of electrodes, said first switch means having switch arms operable between contacts connected to one of the sources of high and low potentials and poles connected to the three phase clock signals such that in one position of said switch arms on the contacts a common charge is applied and in another position of the switch arms on the poles the three phase clock signals operate the plurality of

electrodes to sequentially control signals to the plurality of electrodes in progession from one of the plurality of electrodes to another toward the gate electrode and

a second switch means having a switch arm operable between a contact connected with the other source of high and low potentials and a pole connected with said one source of high and low potentials said switch arm of said second switch means being operatively linked to the first switch means switch arms to provide said other source at the gate electrode during the time said first switch means





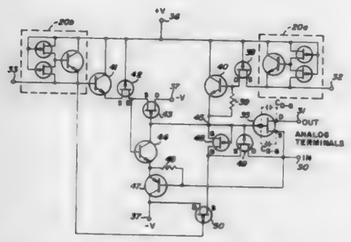
switch arms are in said one position connecting the said one source of high and low potentials to the plurality of electrodes to block transfer via said gate electrode and in said another position with said first switch means switch arms to permit transfer via said gate electrode when the switch arm of said second switch means and said first switch means switch arms are on said poles thereby connecting said one source to the gate to open same and placing the plurality of electrodes under control of the three-phase clocking signals.

4,042,836

FIELD EFFECT TRANSISTOR SWITCH

James B. Compton, Los Gatos, and Sam S. Ochi, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 12, 1976, Ser. No. 676,096
Int. Cl.² H03K *17/16, 17/60, 17/72*
U.S. Cl. 307—251 **9 Claims**



1. A FET switch circuit having a switching cycle including an off state, an on state, and a transient state which exists between said off and on state, said circuit having a switching FET including a gate and a source to drain circuit, said source to drain circuit being coupled to an input terminal and an output terminal, said input and output terminals to be interconnected by said switching FET in said on state and disconnected by said FET in said off state; first and second control terminals whereby current flowing in said first terminal turns said switching FET off and current flowing in said second terminal turns said switching FET on; and a driver circuit coupled between said switching FET and said control terminals to control the off and on states of said switching FET in response to said currents in said terminals; said driver circuit comprising:

first transistor means responsive to said current in said first terminal and coupled to said gate of said switching FET to switch to said off state; and

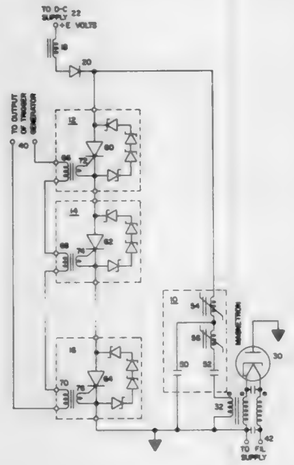
second transistor means responsive to said current in said second terminal and coupled to said gate of said switching FET to switch to said on state, said second transistor means including means for coupling said gate of said switching FET to a current sink during said transient when said switching FET is being switched from the off state to the on state and means for holding said switching FET in said on state under steady state conditions.

4,042,837

SHORT PULSE SOLID STATE-MAGNETIC MODULATOR FOR MAGNETRON TRANSMITTER

Reuben E. Nyswander, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 15, 1976, Ser. No. 741,904
Int. Cl.² H03K *1/18, 3/57*
U.S. Cl. 307—265 **6 Claims**



1. A magnetic modulator for generating short pulses for a magnetron transmitter comprising:

an electrical charge source having a voltage E;

storage means coupled to said source adapted to store a charge with a resultant voltage **2E**;

said storage means having at least two conductive paths;

a storage element in each of said conductive paths adapted to be charged to a voltage **2E**;

switching means coupled across said storage means including means in one of said at least two conductive paths for providing discharge path for one of said at least two storage elements so that discharge takes place in a relatively short time resulting in an overshoot whereby said one of said at least two storage elements after discharge has a voltage thereon negative in polarity to that originally thereon;

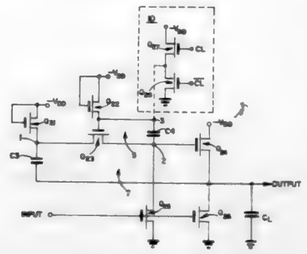
means included in the other of said at least two conductive paths for providing the resulting negative charge on said at least one storage element to be additive with the charge on the other of said at least two storage elements thereby resulting in a resultant output pulse for said magnetron transmitter having a value approximately **4E**.

4,042,838

MOS INVERTING POWER DRIVER CIRCUIT

Dana C. Street, Placentia, and Clarence W. Padgett, Westminster, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed July 28, 1976, Ser. No. 709,464
Int. Cl.² H03K *17/60*
U.S. Cl. 307—270 **10 Claims**



1. A high-speed circuit having signal source means, an input terminal, an output terminal, and utilization means connected to said output terminal to be driven therefrom by a signal substantially equivalent to that of said source means, said circuit including:

a plurality of multi-terminal semiconductor means having respective conduction path terminals and a control terminal and interconnected between said input and output terminals;

first and second capacitance means;

a first and second of said plurality of semiconductor means respectively connected between said source means and said first and second capacitance means to precharge said first and second capacitance means;

a third of said plurality of semiconductor means connected between said source means and said output terminal to supply a signal to said output terminal;

a first feedback path connected between said output terminal and the control terminal of said third semiconductor means, said first feedback path comprising the first of said capacitance means and the conduction path of a fourth of said semiconductor means; and

a second feedback path connected between the control terminal of said third semiconductor means and a control terminal of said fourth semiconductor means, said second feedback path comprising the second of said capacitance means;

said second feedback path substantially boosting the signal applied to the control electrode of said fourth semiconductor means to thereby enable said fourth semiconductor means and said first feedback path;

said first feedback path substantially boosting the signal applied to the control terminal of said third semiconductor means to enable said third semiconductor means and thereby supply said output terminal with a signal via the conduction path of said third semiconductor means to drive said utilization means, which signal is substantially equivalent to that of said source means.

4,042,839

LOW POWER DISSIPATION COMBINED ENHANCEMENT DEPLETION SWITCHING DRIVER CIRCUIT

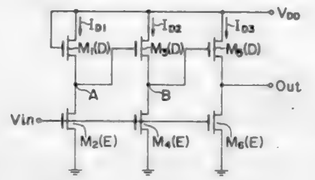
Yoshikazu Araki, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 24, 1976, Ser. No. 660,777
Claims priority, application Japan, Feb. 26, 1975, 50-22933
Int. Cl.² H03K *19/08, 19/40, 17/04, 17/10*
U.S. Cl. 307—270 **5 Claims**

1. A push-pull inverter circuit comprising in combination: first and second inverters, each including at least one depletion-type load field-effect transistor and one enhancement type driving field-effect transistor;

a third inverter having an extremely small load impedance with respect to those of said first and second inverters and including at least one depletion-type load field-effect transistor and one enhancement-type driving field-effect transistor;

input terminals of the respective inverters being connected to a common input line;



the gate and drain of the load field-effect transistor of said first inverter being short-circuited;

an output terminal of said first inverter being connected to the gate of the load field-effect transistor of said second inverter;

an output terminal of said second inverter being connected to the gate of the load field-effect transistor of said third inverter; and

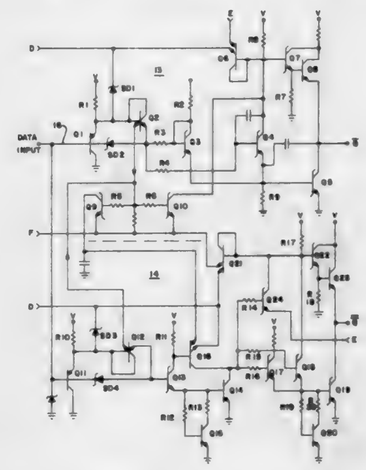
an output terminal of said third inverter providing an output of the circuit.

4,042,840

UNIVERSAL DIFFERENTIAL LINE DRIVER INTEGRATED CIRCUIT

Louis Yc. Chan, Sunnyvale, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Sept. 2, 1975, Ser. No. 609,174
Int. Cl.² H03K *17/00*
U.S. Cl. 307—270 **5 Claims**



1. In a line driver circuit of the type having a single polarity binary signal input and having two binary signal outputs capable of selectively assuming one of four conditions, said circuit comprising:

a. first logic means responsive to said binary signal input for providing an inverted binary signal output at a first output terminal;

b. second logic means responsive to said binary signal input for providing a non-inverted binary signal output at a

second output terminal electrically isolated from said first output terminal, each of said logic means including current sourcing and sinking means at its respective output terminal; and

c. control logic means connected to said first and second logic means for selectively operating on said current sourcing and sinking means so that they assume one of the following alternative conditions:

1. a first condition in which the current sourcing and current sinking means of both said first and second logic means are disabled whereby each binary signal output exhibits a high impedance state;
2. a second condition in which both of said current sourcing and current sinking means are enabled whereby each signal output provides, respectively, non-inverted and inverted single polarity replicas of the binary signal input;
3. a third condition in which the current sourcing means of said first logic means and the current sinking means of said second logic means are enabled while the respective current sinking and current sourcing means thereof are disabled; or
4. a fourth condition which is the inverse of said third condition;

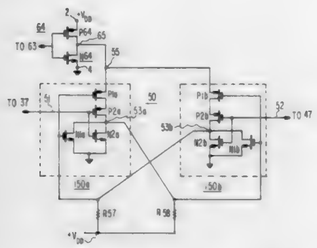
d. said third and fourth conditions resulting in an operational mode in which both binary signal outputs in combination provide a two polarity differential output.

4,042,841

SELECTIVELY POWERED FLIP-FLOP

Vernon Elton Hills, Hightstown, and Leesui Wu, Cherry Hill, both of N.J., assignors to RCA Corporation, New York, N.Y.

Division of Ser. No. 507,780, Sept. 20, 1974, Pat. No. 4,001,613.
This application Nov. 12, 1975, Ser. No. 631,328
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—272 **5 Claims**



1. A comparator circuit for producing an output signal indicative of which one of two signals has the greater amplitude during a sampling interval comprising:

a flip-flop having first and second inputs, an output, and two terminals for the application therebetween of an operating potential;

means for applying one of said two signals to said first input;

means for applying the other of said two signals to said second input; and

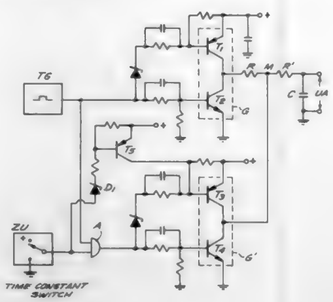
means for applying, during said sampling interval, an increasing operating potential across said two terminals for causing said flip-flop to pass through a linear range of operation, said flip-flop assuming a condition determined by the difference between said first and second signals while passing through said linear range.

4,042,842

MULTIPLE-TIME-CONSTANT INTEGRATOR OR DIFFERENTIATOR

Max Hegendorfer, Forchheim, Germany, assignor to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig, Furth, Bayern, Germany

Filed Dec. 6, 1974, Ser. No. 530,343
Claims priority, application Germany, Dec. 15, 1973, 2362414
Int. Cl.[2] H03K *5/13, 17/60*
U.S. Cl. 307—293 **6 Claims**



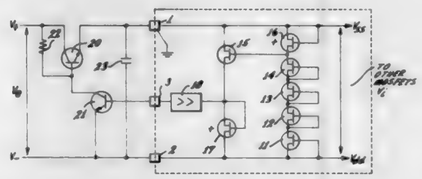
1. A multiple-time-constant time-constant circuit, comprising, in combination, a first, a second and a third time-constant-determining impedance, at least one of the impedances including at least one energy-storing circuit element, the first, second and third impedances being connected in series, one end of the third impedance constititing one end of the series-connected impedances and being connected to a first reference potential; first and second signal-generating means each having an output respectively connected to one and the other end of the first impedance and operative for producing at their outputs voltages varying substantially identically between the first reference potential and a different second reference potential; the time-constant-selecting means connected to said first and second signal-generating means and operable for selecting a shorter time constant by causing both signal-generating means to operate in unison and alternatively operable for selecting a longer time constant by effectively disconnecting the second signal-generating means and causing the first signal-generating means to operate alone.

4,042,843

VOLTAGE LEVEL ADAPTION IN MOSFET CHIPS

Wayne Alan Sikes, Northridge, Calif., assignor to Electronic Arrays, Inc., Mountain View, Calif.

Filed June 5, 1975, Ser. No. 583,863
Int. Cl.[2] H03K *17/00*
U.S. Cl. 307—297 **4 Claims**



1. In an integrated circuit chip of the MOS variety and which includes a plurality of individual, active FET elements each having a particular conduction threshold defined by a particular threshold voltage and each needing a bias voltage for operation, the chip including a pair of busses to which particular potentials applied from external sources, the operating voltage for these FET elements being taken from these busses, the improvement of a plurality of FET elements having their drain-to-gate capacitances effectively connected serially between said busses;

first circuit means included in the chip and connected to monitor whether the voltage on said busses is sufficient to place all of the FET elements of the plurality to the verge of conduction; and

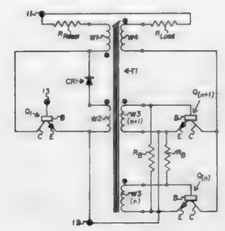
second circuit means external to the chip and connected to the first circuit means and receiving the potentials as applied from said external source, to control the voltage on said busses in response to deviations from near-conduction of all said FET elements of the plurality as monitored by the first circuit means.

4,042,844

POWER TRANSISTOR SWITCH

Fred O. Barthold, 1410 B Hygeia, Leucadia, Calif. 92024

Filed Apr. 19, 1976, Ser. No. 678,239
Int. Cl.[2] H03K *3/45*
U.S. Cl. 307—314 **5 Claims**



1. A power transistor switch comprising:

a plurality of power transistors, each of said plurality of power transistors having an emitter element, a base element, and a collector element, all of said emitter elements and collector elements being connected together effecting a paralleling of collector currents; and

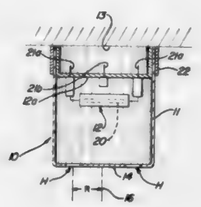
a transformer having a pllurality of secondary windings and at least one primary winding, each of said secondary windings being multifilar wound in the same voltage phase relationship, having substantially the same electrical characteristics and coupled directly across separate base and emitter elements of a separate one of said plurality of transistors for simultaneously providing a base drive signal of substantially the same amplitude thereto, said at least one primary winding being coupled to a switching signal.

4,042,845

TRANSDUCER ASSEMBLY AND METHOD FOR RADIATING AND DETECTING ENERGY OVER CONTROLLED BEAM WIDTH

Kenneth R. Hackett, Boulder, Colo., assignor to Sontrix Division of Pittway Corporation, Boulder, Colo.

Filed Mar. 25, 1976, Ser. No. 670,275
Int. Cl.[2] H01L *41/04*
U.S. Cl. 310—322 **29 Claims**



1. A transducer assembly for generating and/or detecting acoustical energy at a predetermined frequency over a controlled beam width around a selected axis, said assembly comprising:

a hollow, closed cylindrical resonant chamber having planar end walls and a predetermined resonant frequency, said chamber having a longitudinal axis defined by the center axis of the cylinder which it forms, said longitudinal axis defining said selected axis and said planar end walls being disposed normal to said selected axis, one of said planar end walls having a single aperture ring formed therein through which acoustical energy can be emitted out from and into said chamber, said single aperture ring being symmetrically disposed around said selected axis at a given radial offset distance therefrom; and

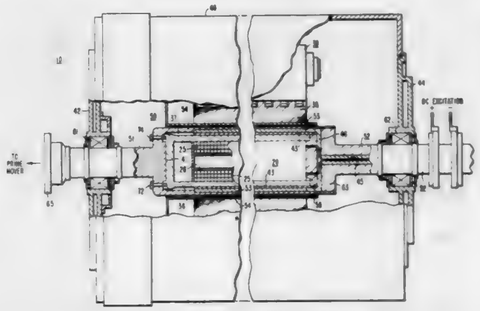
transducer means mounted within said chamber for generating therein along said selected axis a spherical radiation pattern of acoustical energy at said predetermined frequency.

4,042,846

UNITARY SUPPORTING STRUCTURE FOR SUPERCONDUCTING FIELD ASSEMBLY

Charles C. Sterrett, Pittsburgh, and Cecil J. Mole, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed July 14, 1975, Ser. No. 595,981
Int. Cl.[2] H02K *9/00*
U.S. Cl. 310—52 **5 Claims**



1. In a dynamoelectric machine having an annular stator member and a rotor having a field assembly including a core member with a superconducting winding disposed thereon, an improved arrangement for supporting said field assembly comprising:

a unitary structure for enclosing said field assembly, said unitary structure having a drive shaft portion for transmitting torque from a prime mover to said field assembly and a tubular portion integrally formed with said drive shaft portion, said tubular portion having a circumferentially extending annulus which in combination with said drive shaft portion defines a chamber having a closed end with which said drive shaft portion is integrally formed and an opened end for receiving said field assembly;

means for securing said field assembly to said unitary supporting structure within said chamber, said field assembly being enclosed within said chamber and being secured to the closed end of said tubular portion in a cantilever mounting arrangement therewith;

an end plate secured to the opened end of said tubular portion to seal said chamber;

a support shaft secured to said end plate, said support shaft cooperating with said drive shaft portion to support said unitary structure for rotational movement within said annular stator member;

a dewar vessel in the form of a generally concentric annulus having thermally insulating portions, said dewar vessel being concentrically disposed within said chamber, said field assembly being enclosed within said dewar vessel

which thermally isolates said superconducting winding from said unitary supporting structure;

an eddy current damper shield formed of conducting material concentrically disposed intermediate of said circumferentially extending tubular portion and said dewar vessel; and

a radiation shield concentrically disposed intermediate of said eddy current damper shield and said dewar vessel.

4,042,847

LIQUID-FILLED SUBMERSIBLE ELECTROMOTOR

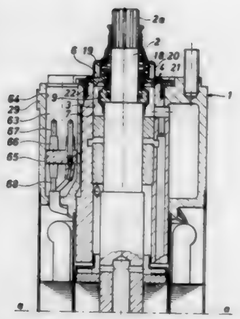
Poul Due Jensen, Wahlstedt, Holstein, Germany, assignor to Grundfos A/S, Bjerringbro, Denmark

Filed July 7, 1975, Ser. No. 593,864

Claims priority, application Germany, July 10, 1974, 2433045; July 10, 1974, 2423420; July 10, 1974, 2423431

Int. Cl.[2] H02K *5/12*

U.S. Cl. 310—87 **4 Claims**



1. A submersible electromotor of the kind being lodged in a totally closed, substantially vertically disposed casing, there being a compartment defined within the electromotor and within said casing, surrounding the electromotor; said casing containing an amount of water which serves to lubricate bearings for a shaft of the electromotor, which extends through a wall of said casing; the electromotor being fitted with shaft seal means in said casing wall, consisting of a stationary slide ring connected with said wall, and a rotatable slide ring connected with said shaft; said slide rings having radial sliding surfaces that abut each other and define a gap therebetween; said stationary slide ring mounted on, and connected with said casing by means of an elastic supporting member that is subjected to the pressure inside said casing, and against movable biasing means, so that said stationary slide ring is moved away from said rotatable slide ring; said supporting member being further defined by a resilient diaphragm connected at its periphery with said casing wall and also with said rotatable slide ring in such a manner as to form a passage for the water between said sliding surfaces and a surface of said diaphragm that faces away from said rotatable slide ring; the pressure in said compartment being capable of acting directly on a substantial area of said supporting member so that said compartment is effectively vented of possible over pressure as a result of air and water escaping therefrom by communication through said gap between the slide rings.

4,042,848

HYPOCYCLOIDAL PINCH DEVICE

Ja Hyun Lee, 37 E. Governer Drive, Newport News, Va. 23602

Filed May 17, 1974, Ser. No. 471,166

Int. Cl.[2] H05B *31/22*

U.S. Cl. 313—231.6 **6 Claims**

1. A hypocycloidal pinch device comprising

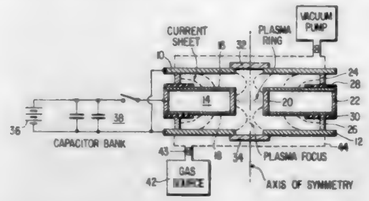
three spaced apart, coaxially aligned, annular electrodes where a middle electrode is disposed between two outer electrodes;

means for containing said spaced apart electrodes;

a first ring disposed between said middle electrode and one of said outer electrodes at the approximate outer edges thereof;

a second ring disposed between said middle electrode and the other one of said outer electrodes at the approximate outer edges thereof, said first and second rings being respectively connected to said outer electrodes;

means for insulating the first and second rings from the middle electrode, said insulating means comprising first and secnd insulative annular discs respectively disposed on the upper and lower surfaces of said middle electrode at the approximate outer edge thereof, said first and second rings respectively contacting said first and second insulative annular discs, the inner diameter of said discs



being less than the inner diameter of said rings and greater than the inner diameter of said middle electrode;

means for charging said containing means with a working gas; and

means for applying pulsed electrical energy between (a) said outer electrodes and (b) said middle electrode to thereby initially produce a first plasma of said working gas in the vicinity of the inner edge of said first annular insulative disc across said first ring and the approximate outer edge of the upper surface of said middle electrode and a second plasma of said working gas in the vicinity of the inner edge of said second annular insulative disc across said second ring and the approximate outer edge of the lower surface of said middle electrode, said first and second plasmas being radially transferred and compressed to the inner edge of said middle electrode where they are brought together along the axis of said electrodes and further compressed into a single dense plasma.

4,042,849

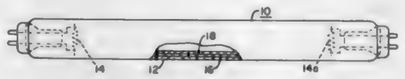
DISCHARGE LAMP WITH BLACK LIGHT TRANSMITTING FILTER LAYER

Anselm Wachtel, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 20, 1976, Ser. No. 734,070

Int. Cl.[2] H01J *61/40, 61/44;* G02B *5/22*

U.S. Cl. 313—489 **4 Claims**



1. A low-pressure mercury discharge device for generating black light radiation and comprising, an elongated radiation-transmitting envelope enclosing a discharge-sustaining filling comprising mercury and a low-pressure of an inert ionizable starting gas, electrodes operatively positioned proximate the ends of said envelope and operable to sustain a short-wavelength ultraviolet-generating discharge therebetween, a filter means carried as a layer on the interior surface of said envelope and substantially comprising finely divided magnesium orthophosphate doped with a small amount of cobalt and nickel sufficient to absorb a substantial portion of any visible radiation generated within said device, and a finely divided black light generating phosphor means carried on said layer of said filter means and operable to convert said short-wavelength ultraviolet radiation generated by said discharge into black light radiation.

4,042,850

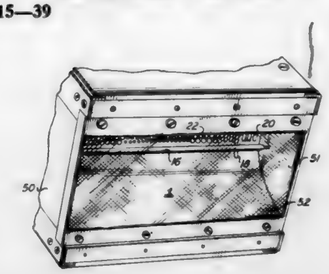
MICROWAVE GENERATED RADIATION APPARATUS

Michael Gerson Ury, Bethesda; Bernard John Eastlund, Olney; Ray S. Braden, Gaithersburg, and Charles H. Wood, Rockville, all of Md., assignors to Fusion Systems Corporation, Rockville, Md.

Filed Mar. 17, 1976, Ser. No. 667,759

Int. Cl.[2] H01J *7/46, 19/80*

U.S. Cl. 315—39 **13 Claims**



1. An apparatus for efficiently coupling microwave energy to a load which becomes highly dissipative upon absorbing microwave energy, comprising, a longitudinally extending non-resonant microwave chamber, a longitudinally extending load which becomes highly dissipative upon absorbing microwave energy disposed in said chamber in the longitudinal direction, a pair of microwave energy generating means, said chamber having a pair of coupling slots therein, said slots being parallel to each other and disposed with their long dimensions perpendicular to said longitudinal direction, and means for coupling microwave energy from each of said generating means to a respective coupling slot.

4,042,851

MAGNETRON

Yoshio Yasuoka, Hirakata; Fumihiko Ito, Otsu; Kunitada Tsuboi; Kaori Jinno, both of Daito, and Masaru Yamano, Hirakata, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan

Filed Aug. 27, 1975, Ser. No. 608,402

Claims priority, application Japan, July 30, 1975, 50-93626

Int. Cl.[2] H01J *25/50*

U.S. Cl. 315—39.51 **11 Claims**

1. A magnetron having a substantially evacuated interior region and comprising:

an anode cylinder of magnetic material;

a plate of magnetic material at each end of the anode cylinder cooperating therewith to form a magnetic circuit and at least a portion of a vacuum container, said vacuum container enclosing said evacuated region,

permanent magnet means mounted to each of said plates and extending partially into the anode cylinder leaving a space between their opposing ends,

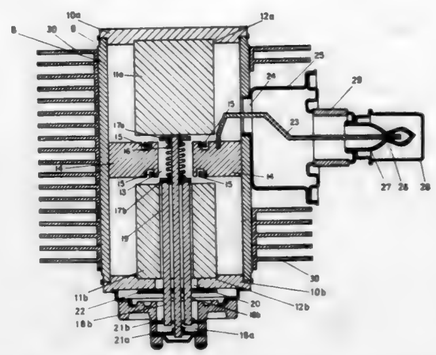
cathode means located in the space between said permanent magnet means,

anode circuit means surrounding said cathode,

an electrically conductive supporting means for holding said cathode means, said supporting means extending through a hole in one of said permanent magnets and the plate to which it is attached,

antenna means extending through a sealed hole in the wall of the anode cylinder,

heat radiator fins directly attached to the external wall of said anode cylinder, and



choke means disposed in said evacuated region and comprising means in proximity to one of said end plates and forming a capacitor therewith for preventing leakage of electromagnetic energy from the magnetron.

4,042,852

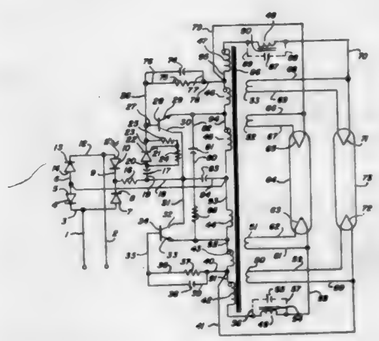
FLUORESCENT LAMPS WITH HIGH FREQUENCY POWER SUPPLY WITH INDUCTIVE COUPLING AND SCR STARTER

George Zaderej, and Andrew Zaderej, both of South Bend, Ind., assignors to Unitron Corporation, Elkhart, Ind.

Filed June 28, 1976, Ser. No. 700,578

Int. Cl.[2] H05B *41/04, 41/29*

U.S. Cl. 315—97 **10 Claims**



1. A high frequency power supply with inductive coupling and a SCR starter to light a fluorescent lamp, comprising:

a. a full wave rectifier;

b. a SCR starter;

c. a ferrite core autotransformer

d. an inverter consisting of two NPN transistors whose collectors are tied together and whose emitters are connected to the primary windings of the said ferrite core autotransformer;

e. a fluorescent lamp connected through an inductive coupling to the output of the said high frequency power supply; and

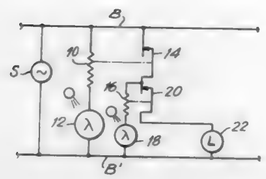
f. the electrodes of the said fluorescent lamp connected to the secondary windings of the said ferrite core autotransformer, for heating.

4,042,853

FAIL-OFF PHOTO CONTROL CIRCUIT FOR NIGHT LIGHTING

George Duve, Washington, N.J., assignor to Area Lighting Research, Inc., Hackettstown, N.J.

Filed Jan. 28, 1976, Ser. No. 653,143
Int. Cl.[2] H05B *37/02*
U.S. Cl. 315—155 9 Claims



1. A light-sensitive fail-off control circuit for a night lighting load, said circuit comprising

A. a source of electric energy;

B. a main photo sensitive element for varying flow of electrical current in response to change in ambient light intensity;

C. a main electrically motivated actuation means;

D. a main momentary off/on means responsive to said main electrically motivated actuation means for controlling electrical current flow;

E. said main photosensitive element and said main actuation means being connected in series across said source of electric energy;

F. said main actuation means actuating said main off/on means at a first ambient light intensity when said main photosensitive means is new;

G. an auxiliary photosensitive element for varying flow of electric current in response to change in ambient light intensity;

H. an auxiliary electrically motivated actuation means;

I. an auxiliary off/on latched-when-actuated means responsive to said auxiliary electrically motivated actuation means for controlling electrical current flow;

J. said auxiliary photosensitive element and said auxiliary actuation means deriving power in series from said source of electrical energy when said main off/on means is closed;

K. said auxiliary actuation means actuating said auxiliary latched-when-actuated means at a second ambient light intensity somewhat in excess of the first ambient light intensity;

L. said night lighting load and said off/on means being series connected in circuit across said source of electric energy whereby during normal nighttime operation of the circuit said load is energized and during normal daytime operation of the circuit the load is deenergized; and

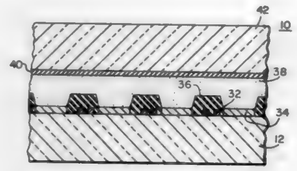
M. circuit means to connect said auxiliary latched-when-actuated means to permanently interrupt the load energizing circuit when the light intensity required to energize the main photosensitive element sufficient to close the main off/on means exceeds the second light intensity after long aging of the main photosensitive element.

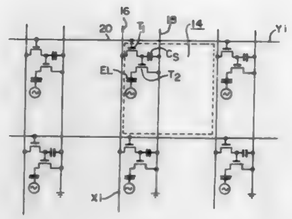
4,042,854

FLAT PANEL DISPLAY DEVICE WITH INTEGRAL THIN FILM TRANSISTOR CONTROL SYSTEM

Fang-Chen Luo, Turtle Creek, and Thomas P. Brody, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 21, 1975, Ser. No. 634,216
Int. Cl.[2] H05B *33/08*
U.S. Cl. 315—169 TV 4 Claims





1. An electroluminescent display panel comprising;

a. a planar substrate;

b. an array of spaced apart thin film transistor control circuitry disposed on the substrate;

c. an orthogonal matrix of rows and columns of switching signal, information signal, and power bus bars disposed on the substrate interconnecting and defining an array of unit display cells, each unit display cell including an individual thin film transistor control circuit;

d. a first electroluminescent electrode disposed on the substrate as part of each unit display cell and interconnected with the transistor control circuit;

e. a relatively thick laminated polymerized in place photoresist insulator layer disposed over the thin film transistor control circuitry and over interconnecting bus bars but not over the first electroluminescent electrodes;

f. a layer of electroluminescent material disposed over the entire area of the display panel over the insulator layer and in intimate contact with the individual first electroluminescent electrodes, which electroluminescent layer has a planar, smooth top surface;

g. a light transmissive common electrode deposited atop the electroluminescent layer and in intimate contact therewith.

4,042,855

HIGH FREQUENCY TRANSISTOR BALLAST

Charles W. Buenzli, Jr., Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

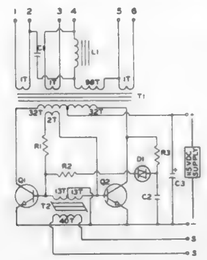
Filed June 12, 1975, Ser. No. 586,149
Int. Cl.[2] H05B *41/29*
U.S. Cl. 315—219 10 Claims

1. A power source for supplying low pressure discharge lamps comprising:

a. ballasting means connected to said lamps and to windings of a transformer,

b. a direct current source,

c. inverting means connected to said direct current source to produce high frequency alternating current including a plurality of active devices connected to other windings of said transformer, a frequency controlling device and a low voltage energy limited remote control means magnetically coupled to said inverting means for disabling said inverting means.

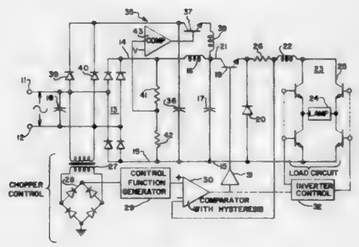


4,042,856

CHOPPER BALLAST FOR GASEOUS DISCHARGE LAMPS WITH AUXILIARY CAPACITOR ENERGY STORAGE

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 28, 1975, Ser. No. 626,306
Int. Cl.[2] H05B *41/16, 41/24*
U.S. Cl. 315—246 11 Claims



1. A solid state ballast for gaseous discharge lamps comprising

full wave rectifying means for energization by low frequency alternating-current line voltage and supplying rectified pulsating voltage to a pair of chopper input terminals,

chopper circuit means including a main controlled switch device for controlling the operation thereof and a load circuit for supplying lamp current to a gaseous discharge lamp, said chopper circuit means being energized by a sufficiently high voltage during peak regions of the rectified pulsating voltage to maintain lamp discharge,

auxiliary capacitive energy storage means for storing energy during the peak regions and discharging said stored energy during low voltage valley regions of the rectified pulsating voltage to supply augmented voltage to said chopper circuit means and maintain lamp ionization during the valley regions, and

control means for operating said main controlled switch device at a high frequency switching rate to generate a preselected lamp current waveshape at least during the peak regions of the rectified pulsating voltage,

said auxiliary capacitive energy storage means being comprised by an auxiliary capacitor effectively connected in series with an auxiliary controlled switch device between said chopper input terminals to supply augmented chopper input voltage, means for charging said auxiliary capacitor from the alternating-current line voltage, and means for sensing the rectified pulsating voltage and rendering conductive said auxiliary controlled switch device when the rectified pulsating voltage falls below a predetermined low voltage,

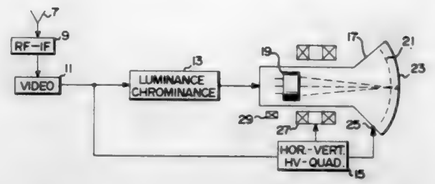
said control means further operating said main controlled switch device to generate a preselected lamp current waveshape in the valley regions of the rectified pulsating voltage.

4,042,857

CATHODE RAY TUBE CONVERGENCE SYSTEM

Frederick A. Hovey, and Charles E. Torsch, both of Geneva, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Apr. 26, 1976, Ser. No. 680,091
Int. Cl.[2] H01J *29/70, 29/76*
U.S. Cl. 315—368 6 Claims



1. A cathode ray tube convergence system comprising:

a color cathode ray tube having a viewing screen and a plurality of electron beam sources, said viewing screen having corners and a horizontal axis with a center and outer ends and said electron beam sources formed to provide electron beam underconvergence interior of and convergence exterior to the center of the horizontal axis of said viewing screen; and

a deflection yoke affixed to said color cathode ray tube and including horizontal, vertical, and quadrupole windings on a core of magnetic material, said horizontal winding having a distribution selected to respond to energization to effect convergence of said electron beams from said electron beam sources at said outer ends of said horizontal axis of said viewing screen and said quadrupole windings having a distribution selected to respond to energization to effect convergence of said electron beams at said corners and said center of said horizontal axis of said viewing screen.

4,042,858

TELEVISION RECEIVER PROTECTION CIRCUIT

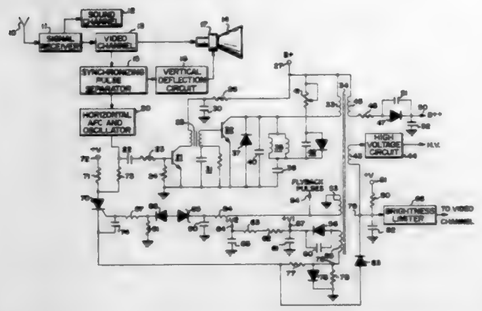
Robert P. Collette, and Robert C. Wheeler, both of Elba, N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed July 8, 1976, Ser. No. 703,613
Int. Cl.[2] H01J *29/52*
U.S. Cl. 315—379 6 Claims

1. In a television receiver having an image display device, a horizontal deflection winding associated therewith, a horizontal delfection circuit connected to said winding, an output transformer connected to said deflection circuit, a low voltage supply including a first winding of said output transformer, and a high voltage supply including a second winding of said output transformer, an improved protection circuit comprising a switching means connected to said horizontal deflection circuit for disabling said horizontal deflection circuit in response to fault conditions and plural sensing means including a first sensing means connected to said low voltage supply and to said switching means for providing a disablement signal to said switching means in response to current flow through said low voltage supply in excess of a predetermined magnitude wherein said improvement comprises:

a second sensing means connected to said high voltage supply and to said switching means for providing a disable-

ment signal to said switching means in response to current flow through said high voltage supply in excess of a predetermined magnitude; and



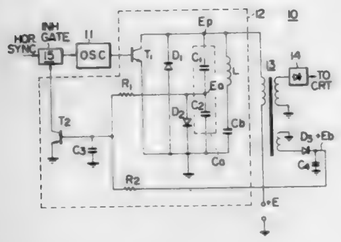
a third sensing means connected to said switching means and including a third winding of said output transformer for providing a disablement signal to said switching means in response to voltage pulses across said third winding in excess of a predetermined magnitude.

4,042,859

HORIZONTAL DEFLECTION CIRCUIT OF A TELEVISION RECEIVER WITH MEANS TO ELIMINATE GENERATION OF DANGEROUS HIGH POTENTIAL UNDER FAULTY CONDITION

Shigeru Kashiwagi, Yokohama, Japan, assignor to Victor Company of Japan, Limited, Japan

Filed May 28, 1976, Ser. No. 690,794
Claims priority, application Japan, May 31, 1975, 50-72765
Int. Cl.² H04N *1/38*
U.S. Cl. 315—411 **5 Claims**



1. A horizontal deflection circuit for a television receiver adapted to receive television signals including a horizontal synchronization signal, the deflection circuit comprising:

a resonant circuit including a deflection coil, a first capacitor substantially tuned therewith to provide a first oscillating current during the trace interval, and series-connected second and third capacitors substantially tuned with said coil to provide a second oscillating current during the retrace interval;

a first gate-controlled switching device;

a unidirectional conducting device inversely parallel-connected to the first gate-controlled switching device;

means for applying gating-on pulses to said first gate-controlled switching device to trigger same into conduction in response to said synchronization signal to allow said first oscillating current to pass therethrough during one half of the trace period and then through said unidirectional conducting device during the other half of the trace period;

means for smoothing a voltage developed across said third capacitor of the resonant circuit to generate a first DC voltage;

means including a transformer connected to said resonant circuit to generate a second DC potential of opposite polarity to said DC voltage; and

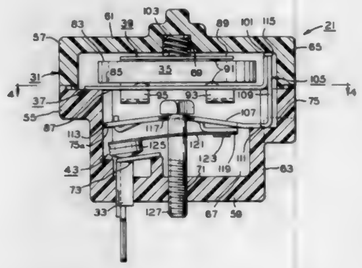
a second gate-controlled switching device arranged to be triggered by the difference in potential between said first and second DC voltages to prevent the application of said gating-on pulses to the first switching device when said potential difference reaches a predetermined conducting threshold level of the second gate-controlled switching device.

4,042,860

COMBINATION STARTER-PROTECTOR DEVICE

Lee O. Woods, Morrison, and James P. Frank, Rock Falls, both of Ill., assignors to General Electric Company, Fort Wayne, Ind.

Filed Oct. 21, 1975, Ser. No. 624,381
Int. Cl.² H02H *7/085*
U.S. Cl. 361—25 C **43 Claims**



1. A combination starter-protector device for a winding circuit of a dynamoelectric machine adapted to be energized from a power source comprising a housing, a solid state component in said housing adapted to control starting of the dynamoelectric machine, a pair of means mounted generally in stationary positions in said housing for electrical contact and positioning engagement with said solid state component, respectively, said engagement means including means integrally formed therewith and adapted for connection in circuit relation with the winding circuit, respectively, and circuit means electrically connected with one of said engagement means and adapted to be connected in circuit relation with the power source and including means disposed in said housing generally in spaced relation adjacent said solid state component and operable generally in response to a predetermined thermal condition occasioned upon winding circuit overload for interrupting said circuit means.

4,042,861

MOUNTING ARRANGEMENT FOR AN INTEGRATED CIRCUIT UNIT IN AN ELECTRONIC DIGITAL WATCH

Tetuya Yasuda, Tokyo; Yoshio Iinuma, Higashimurayama, and Yuzo Maekawa, Fuchu, all of Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Nov. 6, 1974, Ser. No. 521,532
Claims priority, application Japan, Nov. 8, 1973, 48-128590; Nov. 8, 1973, 48-128591; Nov. 8, 1973, 48-129592; Apr. 1, 1974, 49-36734; Jan. 31, 1974, 49-12480
Int. Cl.² H05K *1/04*
U.S. Cl. 361—400 **3 Claims**

1. A time piece structure comprising:

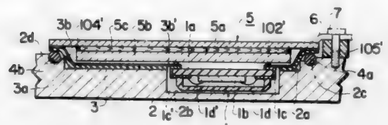
a base plate including first means defining a recess thereon, said first means including second means defining a second recess within said first means;

a insulated board of rectangular dimensions having upper and lower surfaces;

an I.C.-chip with a plurality of electrodes, said chip being of rectangular dimensions less than said rectangular dimensions of said board and mounted on said lower surface of said board;

film element means for providing a plurality of conducting paths along said lower surface of insulated boards, along said upper surface of said board corresponding to said lower surface paths, and for interconnecting electrically said corresponding upper and lower surface conducting paths;

wire means for interconnecting each of said plurality of electrodes of said I.C.-chips with individual conducting paths of said film element means;



cover means, affixed to the lower surface of said insulated board, for completely covering said I.C.-chip and said wire means and for at least partially covering said lower film element means;

a liquid crystal display cell, mounted on said base plate over said I.C.-chip, having electrodes; and

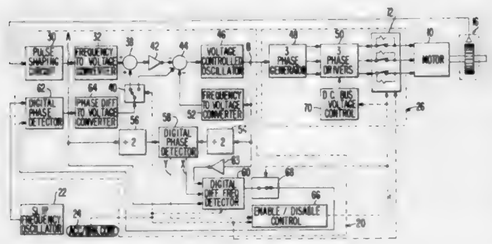
a flexible non-conducting sheet mounted on said base plate sandwiching said insulated board into said first means with said cover means extending into said second means, said sheet including means for interconnecting said film element means with said liquid crystal display cell electrodes, said sheet bearing on said first means.

4,042,862

POWER CONTROL FOR VARIABLE SPEED INDUCTION MOTORS

Robert C. Franklin, 914 Bicknell Road, Los Gatos, Calif. 95030

Filed Nov. 28, 1975, Ser. No. 636,195
Int. Cl.² H02P *5/40*
U.S. Cl. 318—231 **9 Claims**



1. A closed-loop power control for a variable speed induction motor comprising:

means for providing a first pulse train having a frequency proportional to the actual rotational frequency of said motor;

means for providing a second pulse train having a frequency proportional to a desired slip of said motor;

means operative in response to an input signal from at least said first pulse train providing means for providing a third pulse train output signal to control said motor speed;

means operative to compare the phase of said first pulse train with the phase of said third pulse train for providing a fourth pulse train having a frequency proportional to the actual slip of said motor;

means operative to compare the phase of said fourth pulse train with the phase of said second pulse train for generating a correction signal proportional to the difference frequency therebetween; and

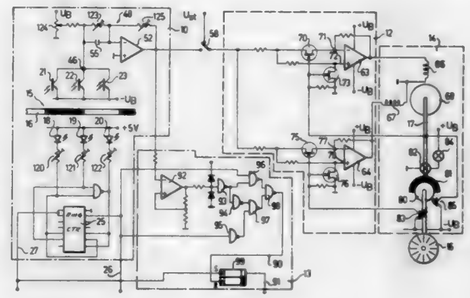
means operative to combine said correction signal and an input signal from at least said first pulse train providing means in a close phase-locking loop for maintaining said third pulse train output signal in proportion to the algebraic sum of said actual motor rotational velocity and said desired motor slip.

4,042,863

INCREMENTALLY CONTROLLABLE MOTOR DRIVE SYSTEM

Johann von der Heide, St. Georgen, Germany, assignor to Papst-Motoren KG, St. Georgen, Germany

Filed Oct. 9, 1975, Ser. No. 620,912
Claims priority, application Switzerland, Oct. 10, 1974, 13537/74; Feb. 11, 1975, 1655/75
Int. Cl.² G05B *1/06*
U.S. Cl. 318—254 **47 Claims**



1. System for controlling a motor to execute steps each having a preselected step length, comprising, in combination, displacement transducer means coupled to said motor for furnishing a displacement signal having a constant first predetermined value during motor movement by a predetermined fraction of said step length and changing to a second predetermined value during motor movement by the remainder of said step length; proportional circuit means connected to said displacement transducer means, for furnishing a proportional signal having an amplitude proportional to the amplitude of said displacement signal; differentiating circuit means connected to said displacement transducer means for differentiating said displacement signal and furnishing a differential signal corresponding to the so-differentiated displacement signal; control signal furnishing means connected to said proportional circuit means and said differentiating circuit means for furnishing a control signal varying as a function of both said proportional and said differential signal; and means for applying said control signal to said motor to control the movement thereof.

4,042,864

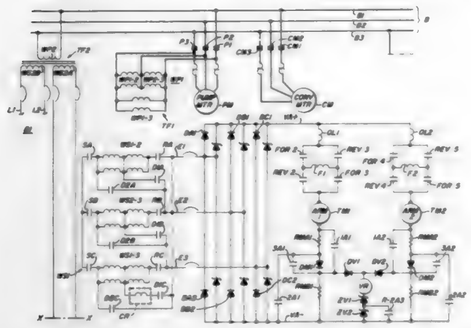
AC-DC TRACTION DRIVE CONTROL SYSTEM

Melvin N. Norris, Franklin, Pa., assignor to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 278,665, July 31, 1972, abandoned, which is a continuation of Ser. No. 16,309, Mar. 4, 1970, abandoned. This application June 9, 1975, Ser. No. 585,210
Int. Cl.² H02D *7/00*
U.S. Cl. 318—301 **18 Claims**

1. A mobile machine comprising, a machine body, a plurality of surface engaging means carried by said body and relatively movable with respect thereto and continuously engaging the ground, at least one DC traction motor carried by said body and cooperable with at least some of said surface engaging means to cause movement thereof, steering means carried by said body for selectively controlling said surface engaging means to move said machine body in a selected path, conversion means carried by said body for converting a three phase AC input to an electrical DC output, control means carried by

said body for controllably applying said DC output to said DC traction motor, and a flexible trailing cable connected to said



conversion means for selectively supplying said three phase AC input to said conversion means.

4,042,865

SEPARATELY EXCITED D.C. MOTORS

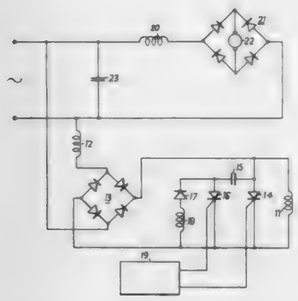
David Gurwicz, Gateshead, England, assignor to Sevcon Limited, Gateshead, England

Continuation-in-part of Ser. No. 339,181, March 8, 1973, abandoned. This application July 12, 1974, Ser. No. 488,255

Claims priority, application United Kingdom, June 21, 1974, 27708/74

Int. Cl.[2] H02P *5/16*

U.S. Cl. 318—338 **20 Claims**



1. A separately excited speed controlled D.C. motor having an armature, regulator means connected to the armature and including voltage-dropping means to permit connection of the armature with a source of supply voltage substantially greater in magnitude than the rated supply voltage of the armature and to maintain the armature current at a substantially constant level during such connection, a field winding, and controllable static switching means connected to the field winding and operable to vary the current through the field winding when the field winding is connected with the supply voltage source or other source of excitation, thereby to control the armature torque and therefore the speed in dependence on the magnitude of the current in the field winding.

4,042,866

METHOD OF PREPARING NC TAPES

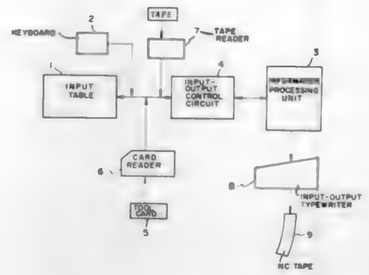
Eiichi Morita; Hisayuki Sato, and Toru Kobayashi, all of Ikeda, Japan, assignors to Daihatsu Motor Company, Limited, Osaka, Japan

Filed Sept. 17, 1975, Ser. No. 614,228

Claims priority, application Japan, Sept. 20, 1974, 49-108955; Sept. 20, 1974, 49-108956; Feb. 13, 1975, 50-18597

Int. Cl.[2] G05B *19/42*

U.S. Cl. 318—568 **3 Claims**



1. A method of preparing a NC tape for use in a NC machine tool operation, said method comprising obtaining particular machine item information, transferring such machine item information to tape means, transferring the machine item information from the tape means to an information processing unit, obtaining particular tool item information, transferring such tool item information to tape means or card means, transferring the tool item information from tape means or card means to an information processing unit, providing a particular design drawing containing machining and processing coordinates thereon, transferring the particular information on said design drawing directly to an information processing unit, processing the three types of information in the information processing unit, transferring the processed information to typewriter means and actuating said typewriter means to produce an NC tape therefrom.

4,042,867

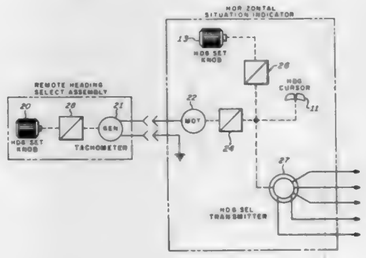
REMOTE SELECTOR FOR FLIGHT INSTRUMENTS

Richard Earl Schaffer, Scottsdale, and Paul Allen Rauschelbach, Phoenix, both of Ariz., assignors to Sperry Rand Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,559

Int. Cl.[2] G05B *11/01*

U.S. Cl. 318—580 **11 Claims**



1. Apparatus for remotely adjusting display indicia of an instrument display comprising:

manually operable rotatable means disposed remotely from said instrument,

d.c. generator means coupled to said rotatable means for producing a d.c. generator signal dependent upon the speed and direction of rotation of said rotatable means,

d.c. motor means coupled to said display indicia and responsive to said d.c. generator signal for adjusting said display indicia in accordance with the rotation of said rotatable means, and

means responsive to a predetermined low value of said generator signal for providing a substantially larger signal to said d.c. motor means for overcoming the inherent breakaway voltage characteristic of said d.c. motor means.

4,042,868

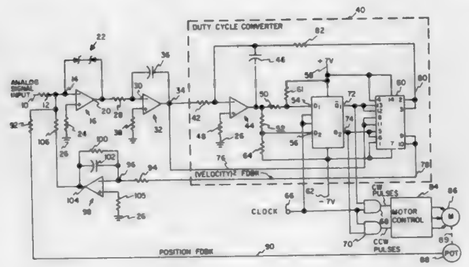
STEPPER MOTOR CONTROL APPARATUS

Melvin H. Rhodes, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 22, 1975, Ser. No. 615,754

Int. Cl.[2] G05B *5/01*

U.S. Cl. 318—615 **6 Claims**



1. Apparatus for controlling a position indicating motor means comprising, in combination:

limiting means, including input means and output means;

first signal supplying means for supplying a control signal connected to said input means of limiting means;

integrating means, including input means and output means, said input means thereof connected to said output means of said limiting means;

signal converting means, including input means and first, second and third output means, a signal appearing at said first output means being representative of the square of a signal being supplied to said input means thereof and pulse signals appearing at said second and third output means being representative in frequency of the amplitude of the signal being supplied to said input means thereof and respectively representing the polarity of the signal being supplied to said input means thereof;

means connecting said output means of said integrating means to said input means of said signal converting means;

motor means including input means connected to said second and third output means of said signal converting means, said motor means being actuated a prescribed amount upon receipt of each pulse and in a direction corresponding to which of said second and third means is supplying pulse signals;

position feedback signal means connected to said motor means and supplying a signal indicative of the position of said motor means with respect to a reference; and

summing means for summing signals from said position feedback signal means and said first output means of signal converting means to said input means of said limiting means.

4,042,869

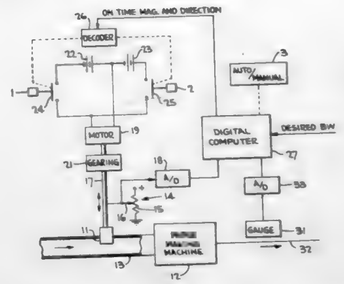
BACKLASH COMPENSATION

John E. Eickelberg, and James S. Rice, both of Columbus, Ohio, assignors to Industrial Nucleonics Corporation, Columbus, Ohio

Filed Mar. 29, 1971, Ser. No. 128,718

Int. Cl.[2] G05B *11/01*

U.S. Cl. 318—630 **11 Claims**



1. A system for compensating for the backlash known between backlash limits of a drive mechanism for an actuator comprising a position transducer for the actuator, means for energizing the drive mechanism in a first direction, a certain amount of the energization of the drive mechanism not being necessarily coupled to the actuator because of the backlash, means for terminating energization of the drive mechanism in the first direction in response to a change in the actuator position being sensed by the position transducer, means responsive to the position transducer for deriving an indication of the amount of movement of the actuator in response to the drive mechanism being energized, and means responsive to a change in the actuator position being sensed for energizing the drive mechanism in a direction opposite to the first direction through a distance equal to the sum of the indicated amount of actuator movement and a predetermined magnitude equal to the drive mechanism known backlash.

4,042,870

TRANSISTOR OSCILLATOR POWER CONVERTER

Jan Van Valkenburg Schaefer, 2345 Seabreeze Drive, San Diego, Calif. 92139

Continuation of Ser. No. 229,804, Feb. 28, 1972, Pat. No. 3,820,001. This application Oct. 1, 1973, Ser. No. 402,325

The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.

Int. Cl.[2] H02M *3/335*

U.S. Cl. 363—37 **19 Claims**

1. A transistor oscillator power converter for use with an electrical energy source and an electrical load and a source of potential for supplying bias current, said power converter including in combination:

a transistor having a base electrode, a collector circuit, and a base circuit,

a transformer having a ferromagnetic core, a primary winding positioned in said collector circuit, and a secondary winding positioned in said base circuit,

tuning capacity means operative to cause oscillatory electric currents in said transformer,

bypass capacitor means positioned in parallel with the electrical load,

bias current conductor means for conducting bias current to said transistor base electrode for providing bias means for causing said oscillatory electric currents in said transformer to be sustained oscillatory electric currents,

rectifier means in said base circuit for causing a first average value of rectified current to be conducted by the electrical

load and a second average value of rectified current to be conducted by said transistor base electrode,

said power converter having conductor means for connection of the electrical energy source in said collector circuit for supplying collector voltage through said primary winding to said transistor,

said collector circuit and said base circuit having interactivity for causing interaction of electric currents in said base circuit and said collector circuit for further causing electric oscillations in said power converter,

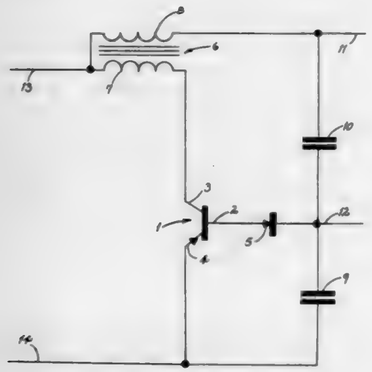
said interactivity including productivity of changes in voltage across said tuning capacity means by said transformer for producing said changes in voltage across said tuning capacity means from similar changes in transistor collector current,

the capacity of said tuning capacity means and the inductance of said secondary winding being substantially determinative of the frequency of said electric oscillations,

said tuning capacity means resonating said transformer,

said tuning capacity means being in said base circuit for producing changes in base current from said changes in voltage across said tuning capacity means,

said bypass capacitor means being in said base circuit further being subtantially preventative of appearance of said electric oscillations across the electrical load,



said power converter including conductor means for connection of the electrical load,

said bias current providing sufficient base current for said transistor to cause said electric oscillations to be sustained electric oscillations,

which sustained electric oscillations include said sustained oscillatory electric currents,

said rectifier means being operative to conduct current for only part of each cycle of said electric oscillations for causing said first average value of rectified current and said second average value of rectified current to be conducted in said power converter,

whereby said first average value of rectified current produces a voltage across the electrical load substantially different in magnitude from the voltage of the electrical energy source,

said rectifier means including rectifier means not provided by said transistor,

substantially all said second average value of rectified current conducted by said transistor base electrode being conducted by said rectifier means,

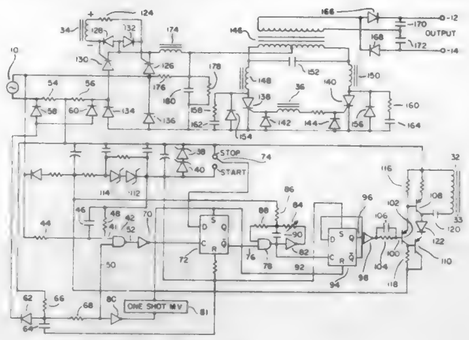
substantially all oscillatory electric currents conducted by said transistor base electrode being conducted by said rectifier means.

4,042,871

CONVERSION SYSTEM WITH OVERCURRENT PROTECTION AND START-UP CIRCUITRY

Calvin E. Grubbs, Garland, and Jack B. Harwell, Euless, both of Tex., assignors to ECC Corporation, Euless, Tex.

Filed Nov. 14, 1975, Ser. No. 631,813
Int. Cl.² H02H *7/122, 7/127*
U.S. Cl. 363—28 **10 Claims**



1. Inverter circuitry comprising:

means for receiving low frequency AC power including fault detector means responsive to current in said receiving means above a predetermined level for providing a fault signal;

control means for generating a high frequency control signal synchronized with a low current point of said low frequency AC power and responsive to said fault signal for terminating the generation of said control signal;

full wave rectifier means coupled to said receiving means and responsive to said control signal for converting said low frequency AC power to full wave rectified pulsating DC power;

inverter circuit means coupled to said full wave rectifier means and responsive to said high frequency control signal for providing an AC signal at said high frequency from said DC power output of said full wave rectifier means;

a capacitor connected across the input to said inverter circuit means; and

means for precharging said capacitor to a preselected voltage;

said capacitor providing sufficient energy to the inverter circuit means when said high frequency control signal is initially applied to said inverter circuit means to permit commutation under steady state conditions without generation of a fault signal.

4,042,872

STATIC CONVERTER HAVING PARTIALLY GAPPED TRANSFORMER

James A. McLeod, 224 N. Red Oak Drive East, Sunnyvale, Calif. 94086

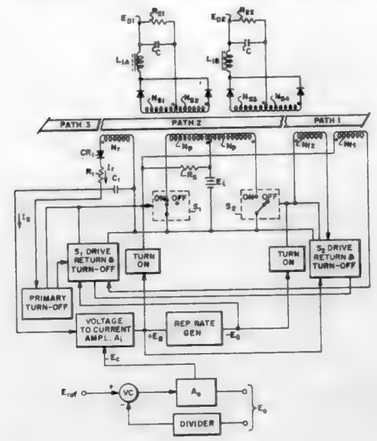
Filed Dec. 29, 1975, Ser. No. 644,444
Int. Cl.² H02M *3/335*
U.S. Cl. 363—20 **13 Claims**

1. Static converter apparatus comprising:

transformer means including a unitary ferromagnetic core of uniform permeability having portions forming first, second and third flux paths, said portions being arranged so that the flux flowing in said first path and said third path flows through the portion of said core forming said second path, the portion of said core forming said third path having a gap for causing the reluctance of said third path to be greater than the reluctance of said first path, a primary winding wound about the portion of said core forming said second path, sense winding means wound about

the portion of said core forming said first path, and a plurality of secondary windings wound about the portion of said core forming said second path;

input circuit means including a DC power source, and switching means for alternately causing current supplied by said source to flow in opposite directions through said primary winding, said switching means being controlled



by the voltage developed across said sense winding means; and

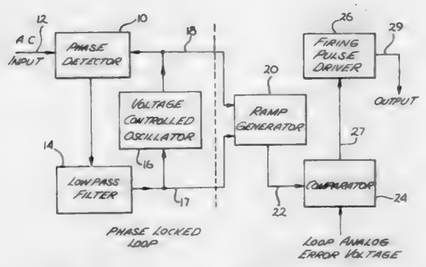
output circuit means including means for rectifying current developed in said secondary windings to provide DC outputs and filter means associated with each said secondary winding, each said filter means including a choke coil, at least some of said choke coils being wound about a common core.

4,042,873

PHASE LOCKED FIRING CIRCUIT FOR SCR'S, OR THE LIKE

Jay Ashton Cox, Rolling Hills Estates, Calif., assignor to Guldon Industries, Inc., Metuchen, N.J.

Filed Nov. 26, 1976, Ser. No. 745,085
Int. Cl.² H02M *7/00*
U.S. Cl. 363—129 **9 Claims**



1. In a rectifier means for rectifying an alternating current power signal with silicon controlled rectifiers, or the like, where said rectifiers are controlled by a firing circuit which is responsive to said power signal, an improvement comprising:

an oscillator means for providing an oscillator signal, said oscillator coupled to said firing circuit;

a phase detection means for comparing the phase of said oscillator means with the phase of said power signal, said phase detection means coupled in a closed loop with said oscillator means;

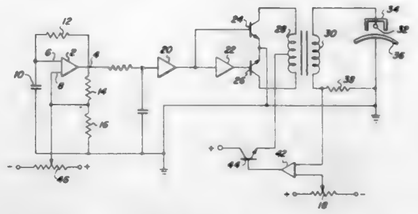
whereby an undistorted signal from said oscillator means is coupled to said firing circuit.

4,042,874

HIGH-VOLTAGE A.C. POWER SUPPLY WITH AUTOMATICALLY VARIABLE D.C. BIAS CURRENT

H. Quinn, Rancho Palos Verdes, Calif., and Nicholas M. Soures, Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 26, 1975, Ser. No. 617,132
Int. Cl.² H01T *19/00;* **H02M** *7/515*
U.S. Cl. 323—4 **8 Claims**



1. An a.c. and d.c. power supply for driving a non-linear load in which current over the operating voltage range increases faster or slower than applied voltage comprising:

generating means for generating an a.c. waveshape,

a transformer for coupling said a.c. waveshape from said generating means to said load such that the sum of all instantaneous positive and negative a.c. voltages at said load will be approximately zero, and

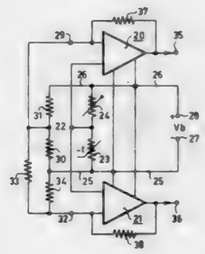
d.c. adjustment means coupled to said generating means for adjusting the symmetry of said a.c. waveshape so that the d.c. current through said load will vary under operating conditions in accordance with a predetermined plan.

4,042,875

TEMPERATURE TRANSDUCER ARRANGEMENT WHICH SUPPLIES THRESHOLD VOLTAGES WITH THE AID OF A SINGLE SENSOR

Jean-Pierre Rene Coulmance, Osny, and Jean-Claude Gerard Six, Sevres, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 22, 1975, Ser. No. 624,725
Claims priority, application France, Oct. 25, 1974, 74.35841
Int. Cl.² F24D *13/02;* **G01K** *7/20*
U.S. Cl. 323—75 N **11 Claims**



1. A temperature transducer arrangement which supplies threshold voltages by means of a single sensor comprising, a first resistor bridge including one sensor resistor having a high temperature coefficient, a voltage source, at least two high gain differential amplifiers arranged to provide on/off control of a mains-powered electrical load, means connecting two interconnected first inputs of the differential amplifiers to a common junction point of the first resistor bridge, means connecting the first resistor bridge to the terminals of the voltage

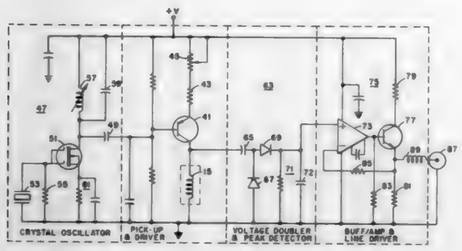
source, means connecting the second inputs of the two differential amplifiers to a second resistor bridge, one directly and the other via a voltage divider, and means connecting the second resistor bridge between the terminals of the voltage source.

4,042,876

EDDY CURRENT GAUGE FOR MONITORING DISPLACEMENT USING PRINTED CIRCUIT COIL

Armando J. Visioli, Jr., Dover, N.J., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 29, 1976, Ser. No. 681,644
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 D **3 Claims**



1. An improved eddy current type proximity gauge for measuring the displacement of an electrically conductive member from a probe head of said gauge, and generating an output signal whose amplitude is proportional to said displacement, comprising:

a probe coil spiral wound in a single plane, said coil being disposed in said probe head for parallel displacement of the coil winding plane relative to said conductive member, said probe head being formed of a molded non-electrically conductive housing having a front portion adapted to receive said coil;

an electrically conductive back plane shield molded in the back surface of said housing parallel and adjacent to the plane of said coil but electrically insulated from said coil;

a probe head mounting tube connected to the back of said probe housing, said tube and said back plane shield having a central coaxial passageway communicating with a central passageway in said probe head housing for receiving a coaxial extension cable having a central conductor of one end connected to the central end of said spiral wound coil and a shield conductor of said one end of said cable connected to the outer end of said spiral wound coil;

a fixed frequency oscillator for generating an AC drive signal, said oscillator including an insulated gate field effect transistor (F.E.T.) having a gate, source, and drain electrodes, a frequency control cystal connected between said gate electrode of said F.E.T. and ground potential, an inductor connected between the drain electrode of said F.E.T. and a positive voltage source, a capacitor connected in parallel with said inductor, a resistor connected between said source electrode of said F.E.T. and ground and a capacitor connected in parallel with said resistor, said drain electrode of said F.E.T. forming the output of said oscillator producing said AC drive signal;

a transistor having a base emitter and collector electrodes, said collector electrode of said transistor connected to the central conductor of the extended end of said coaxial cable, said shield conductor of said extended end of said cable connected to ground;

a coupling capacitor connected between said drain electrode of said F.E.T. and said base electrode of said transistor;

biasing circuit means connected to the base electrode of said transistor for producing a linear voltage output over the coil voltage operating range;

a potentiometer connected between said emitter electrode of said transistor and said positive supply voltage source for setting the AC drive signal current supplied to said probe coil for the desired gauge sensitivity;

a cascaded voltage doubler and peak detector circuit means connected to the collector of said transistor for generating a DC signal at an output thereof which follows the peak-to-peak AC signal voltage developed across said probe coil which is proportional to the displacement of said probe head coil relative to said electrically conductive member; and

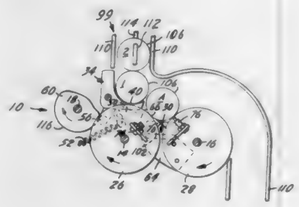
an output circuit means including a linear wideband buffer amplifier having an input connected to the output of said voltage doubler and peak detector circuit means for buffering the detected DC signal from the system output.

4,042,877

INSPECTION APPARATUS AND METHOD FOR DETECTING FLAWS IN SERIALLY FED SUBSTANTIALLY CYLINDRICAL OBJECTS

Walter J. Sieverin, Buffalo Grove, Ill., assignor to American Can Company, Greenwich, Conn.

Filed Oct. 1, 1975, Ser. No. 618,425
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—37 **32 Claims**



1. An inspection apparatus for inspecting and detecting flaws in each of a plurality of serially fed substantially cylindrical objects, which comprises:

rotatable first and second shafts parallel to and spaced from each other,

a pair of drive wheels spaced from each other and freewheelingly mounted on the first shaft,

a pair of discharge wheels spaced from each other and fixedly mounted on the second shaft, the drive and discharge wheels being positioned on the respective shafts in a manner that arcs of their respective circumferences cooperate to form a notch-shaped inspection station for seating a substantially cylindrical first object therein, the drive wheels being for driving the object into the inspection station and for imparting a rotary motion to the object during the driving and while the object is seated in the inspection station,

an infeed cradle mounted above the drive wheels for initially receiving and cradling the infed first object, prior to its being seated in the inspection station,

sending means synchronized with the rotation of the second shaft, for positively sending the cradled first object from the infeed cradle to the inspection station,

rotation imparting and deaccelerating means connected to the second shaft and synchronized with the sending means for cooperating with the driving of the drive wheels for imparting a rotary motion to, while simultaneously controlledly deaccelerating the translational motion of, and easing the entry of, the positively sent first object into the inspection station,

discharge means synchronized with the rotation of the second shaft such that, with each rotation of the second shaft, the discharge means passes through the inspection station and, without use of intermittent motion mechanisms, removes a substantially cylindrical object therefrom and then discharges it from the apparatus,

means connected to the first and second shafts for rotating them at a constant speed and in time such that the first shaft rotates faster than the second,

coupling means adjustably mounted on the first shaft and communicating with the drive wheels for connecting them to the first shaft, the coupling means being adjustable to impart certain pre-set desired limited torque driving capabilities to either or both drive wheels in a manner that allows either or both drive wheels to slip with respect to the first shaft when either or both is subjected to a torque whose value exceeds the pre-set limit, and

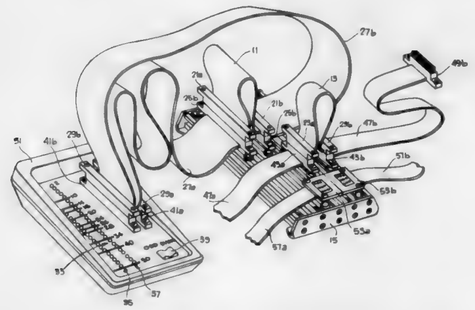
detecting means for detecting flaws in each serially fed substantially cylindrical object while it is seated and being rotated in the inspection station.

4,042,878

MULTI-CONDUCTOR CABLE TESTING SYSTEM WITH TRACK-MOUNTED SOCKETS FOR ACCOMMODATING THE CABLE CONNECTORS

Roger W. Peterson, and Arthur W. Kordes, both of Los Altos, Calif., assignors to Fasttest Company, Mountain View, Calif.

Filed Oct. 15, 1976, Ser. No. 732,583
Int. Cl.[2] G01R *31/02*
U.S. Cl. 324—51 **11 Claims**



1. A cable testing system for testing multi-conductor cables of selected width comprising,

a test fixture having mechanical stability and having a plurality of tracks therein adapted for mounting cable connectors of selected width and having at least a first pair of sockets mounted in and moveable along said tracks for mating to a test pair of connectors of a multi-conductor cable to be tested, and

a control box having a multiplicity of test lamps therein, means for energizing said test lamps on command, electrical jumper means connecting said test lamps to said first pair of sockets whereby conductors of a multi-conductor cable to be tested may be energized and tested for continuity through said lamps.

4,042,879

MICROWAVE AEROSOL WATEROMETER

William W. Ho, Thousand Oaks, and Ronald M. Govan, Camarillo, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 3, 1975, Ser. No. 628,694
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 C **11 Claims**

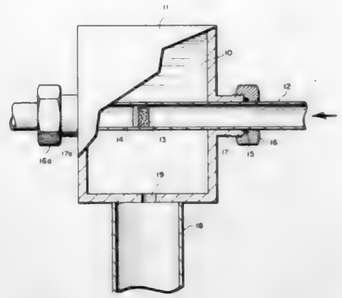
1. A method for determining the mass concentration of water in the liquid phase entrained as an aerosol in a gaseous medium, utilizing a cavity with a known resonant frequency when irradiated with microwave energy, means for generating a microwave signal adapted to irradiate said cavity, and means for determining the instantaneous resonant frequency of said cavity, comprising the steps of:

drawing said gaseous medium through said cavity at a predetermined volumetric rate;

entrapping the particulate content in said gaseous medium centrally in said cavity;

irradiating said cavity with a signal produced in said means for generating a microwave signal;

monitoring the variation with time of the instantaneous resonant frequency of the cavity, as excited by said irradiating signal and modified by the presence of said particulate;



determining the mass of said particulate fraction in a given volume of said gaseous medium;

determining the dielectric constant of the solid constituents of said particulate fraction; and

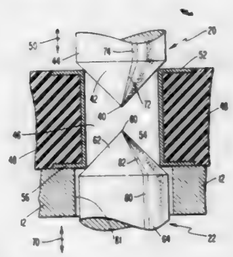
computing the mass rate of accretion of liquid water in said cavity from the monitored variation of its resonant frequency with time and the accretion rate of total particulate content within said cavity.

4,042,880

ELECTRODE ASSEMBLY FOR MEASURING THE EFFECTIVE THICKNESS OF THRU-HOLE PLATING CIRCUIT BOARD WORKPIECES

Jacques J. Weinstock, Flushing, N.Y., assignor to Unit Process Assemblies, Inc., Syosset, N.Y.

Division of Ser. No. 431,396, Jan. 7, 1974, Pat. No. 3,885,215.
This application Dec. 2, 1974, Ser. No. 528,993
Int. Cl.[2] G01R *27/14*
U.S. Cl. 324—64 **1 Claim**



1. In the measurement of the conductivity of a plated coating on a thru-hole of circular cross section in a circuit board workpiece the steps of

uniformly feeding current through said plating through line electrode contact with over 80% of the circumference of the defining marginal perimetric edges of said thru-hole,

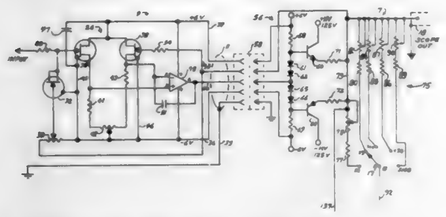
and sensing the voltage drop across said plating effected thereby through line electrode contact with the remaining portion of the circumference of the defining marginal perimetric edges of said thru-hole.

4,042,881

VOLTAGE MEASURING DEVICE HAVING AN AMPLIFIER IN THE PROBE

William Webb, Jr., Denver, Colo., assignor to Unitec, Inc., Denver, Colo.

Filed June 23, 1975, Ser. No. 589,297
Int. Cl.[2] G01R *1/30, 15/08, 1/06*
U.S. Cl. 324—123 R **6 Claims**



1. A voltage measuring device, comprising:

a probe unit having input means, output means, and means including a plurality of field effect transistors and an operational amplifier electrically connected with said input means and presenting a high impedance, said input means including a contactor for contacting an element the voltage of which is to be measured, and said output means providing an output voltage indicative of a voltage measured during contact of said contactor of said input means with said element;

conductor means connected with said output means of said probe unit; and

electrical signal processing means receiving said output voltage from said probe unit through said conductor means and providing an output suitable for use at a utilization means to indicate signal voltage measured, said electrical processing means including a pair of transistors connected in series with one another with the output of said electrical signal processing means being taken from a junction receiving the outputs from said transistors, said output from said electrical signal processing means also being fed back through said conductor means and providing an output suitable for use at a utilization means to indicate said voltage measured, said output from said electrical signal processing means also being fed back through said conductor means to said high impedance means of said probe unit.

4,042,882

RADIO-BALLOON DISTRESS SIGNAL

Gustavo G. Camacho, 308 E. Broadway, and Edward J. Shackleford, 125 E. Victory, both of Phoenix, Ariz. 85040

Filed Oct. 18, 1976, Ser. No. 733,438
Int. Cl.[2] H04B *1/04, 1/38*
U.S. Cl. 325—118 **8 Claims**

1. In apparatus for identifying the location of a person in distress:

a. a gas-tight tank comprising rectangular top and bottom walls, side walls and end walls, and a lighter than air nonflammable gas in the tank,

b. a neck protruding from one of said end walls having a conduit section communicating therewith,

c. valve in said neck held in closed position by a locking device and spring forced to open position when said locking device is rendered ineffective,

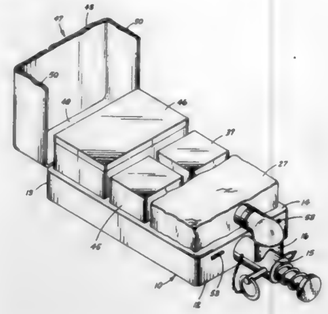
d. a balloon package comprising a collapsed balloon enclosed in a casing of metallic foil, said package being positioned on the top wall of said tank adjacent to the end wall having the neck protruding therefrom,

e. said balloon having a neck with a one way check valve therein and a conduit section extending therefrom and communicating with the conduit section on the tank neck by way of a breakable connection,

f. a radio transmitter resting on and releasably clamped to the top wall of said tank adjacent to said balloon package and includes a trigger, which activates the transmitter when it pulls free of said top wall,

g. a cable having one end secured to the neck of said balloon and its other end to said transmitter,

h. a reel secured to the top wall of said tank adjacent to said transmitter,



i. a tether taken up on said reel and having one end anchored thereto and its other end secured to said transmitter, and

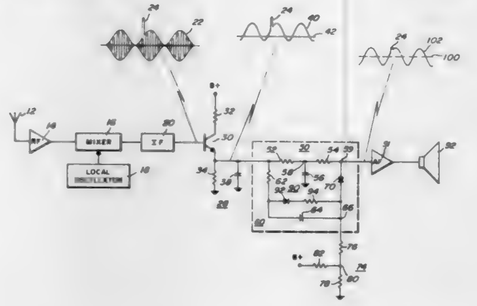
j. a cover hinged to the upper edge of a tank wall and in closed position covering the elements on the top wall of said tank.

4,042,883

AUTOMATIC NOISE LIMITER

James Wilson Rae, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,503
Int. Cl.[2] H04B *1/10*
U.S. Cl. 325—477 **5 Claims**



1. An automatic noise limiter circuit for use in a radio frequency receiver, the receiver producing a high frequency signal which is amplitude modulated by an audio signal, the automatic noise limiter comprising:

peak detector means for rectifying and filtering the amplitude modulated high frequency signal to recovere the audio signal therefrom and produce a direct current signal representative of the magnitude of the high frequency signal;

low pass filter means for processing the recovered audio signal and the direct current signal from the peak detector means and producing at its output a representative direct current level;

high pass filter means for passing to its output a predetermined portion of the recovered audio signal from the peak detector means, the high pass filter means preventing the peak detector means produced direct current level from passing to its output;

a noise limiter output terminal;

switch means comprising a semiconductor rectifier coupled between the output of the low pass filter and the output of the high pass filter, the rectifier exhibiting a low impedance response to the low filter output exceeding the high pass filter output by a predetermined threshold level, the rectifier otherwise exhibiting a high impedance;

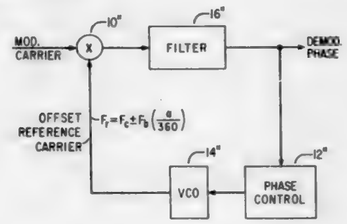
a bias means coupled to the semiconductor rectifier for producing zero bias across said rectifier in the absence of a high frequency signal from the receiver said bias means comprising temperature compensating means for maintaining said rectifier at zero bias over a temperature range in the absence of a high frequency signal from the receiver.

4,042,884

PHASE DEMODULATOR WITH OFFSET FREQUENCY REFERENCE OSCILLATOR

Lester R. Querry, Laurel, Md., assignor to Rixon, Inc., Silver Spring, Md.

Filed Feb. 20, 1975, Ser. No. 551,079
Int. Cl.[2] H03D *3/06;* **H04L** *27/22*
U.S. Cl. 329—122 **2 Claims**



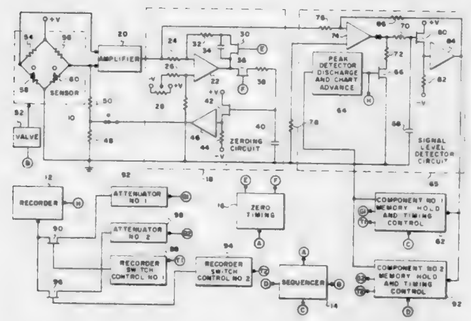
1. A method of demodulating a phase-difference modulated carrier signal having a carrier frequency Fc and a repeated phase offset increment angle α generated at a baud rate Fb, said method comprising the steps of generating a reference carrier having a frequency $Fr = Fc \pm Fb[(\alpha/360)]$, applying the received modulated carrier to one input of a mixer, and applying said reference carrier to a second input to said mixer so as to substantially cancel the repeated phase offset increment and produce a 2-level demodulated signal.

4,042,885

ZEROING CIRCUIT

Charles F. Rhodes, Jr., Richardson, Tex., assignor to Sun Oil Company, Dallas, Tex.

Division of Ser. No. 494,249, Aug. 2, 1974, Pat. No. 3,937,062.
This application Oct. 30, 1975, Ser. No. 627,329
Int. Cl.[2] H03F *1/02*
U.S. Cl. 330—9 **3 Claims**



1. An offset compensating circuit for automatically adjusting the input signal level of an electronic circuit having an input and an output to produce an output signal of a predetermined level in response to a predetermined input signal condition, said offset compensating circuit comprising:

A. an amplifier having an input and an output, said input being coupled to receive the output signal from the electronic circuit;

B. a first feedback loop, said first feedback loop being connected between said output of said amplifier and the input to the electronic circuit, said first feedback loop including:

1. a first capacitor having first and second plates;
2. first electronic switch means connected between said output of said amplifier and said first plate of said first capacitor;
3. means connecting said second plate of said first capacitor to a voltage reference; and
4. coupling means electrically disposed between said first plate of said first capacitor and the input to the electronic circuit;

C. a second feedback loop, said second feedback loop being connected between said output and said input of said amplifier, said second feedback loop including:

1. a resistor; and
2. a second electronic switch disposed in series with said resistor; and

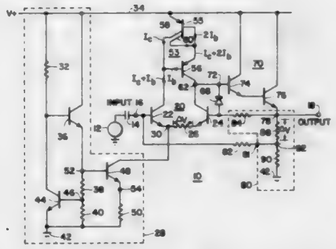
D. means for intermittently generating switching signals to switch said first and second electronic switch means to be alternatively closed in a timed relationship.

4,042,886

HIGH INPUT IMPEDANCE AMPLIFIER CIRCUIT HAVING TEMPERATURE STABLE QUIESCENT OPERATING LEVELS

John Edward Hanna, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Filed Aug. 18, 1975, Ser. No. 605,492
Int. Cl.[2] H03F *3/45*
U.S. Cl. 330—23 **16 Claims**



1. A high input impedance amplifier having a quiescent output voltage with a predetermined temperature coefficient including in combination:

differential amplifier means including first and second electron control devices, each having a control electrode and first and second main electrodes, said differential amplifier means further having a first input terminal, a second input terminal and an output terminal;

offset voltage supply means coupled between said first main electrodes of said first and second electron control devices, said offset voltage supply means causing an offset voltage to be developed between said control electrodes of said first and second electron control devices having a selected temperature coefficient;

feedback means coupled between said control electrode of said second electron control device, said output terminal of said differential amplifier means and the output terminal of the high input impedance amplifier; and

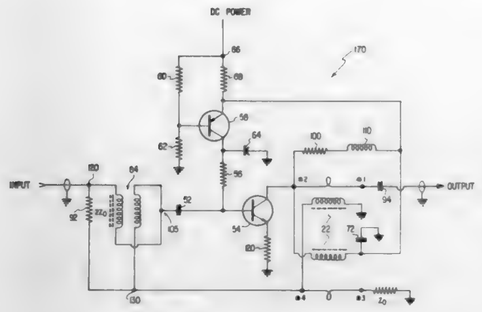
bias means connected between said feedback means and said control electrode of said first electron control device for providing a positive feedback path for increasing the input impedance at said control electrode of said first electron control device, said bias means and said feedback means

being responsive to said offset voltage to provide the quiescent voltage having said predetermined temperature coefficient at the output terminal of the high input impedance amplifier.

4,042,887
BROAD BAND AMPLIFIER

Hansel B. Mead, Melbourne, and Gary R. Callaway, Indian Harbor Beach, both of Fla., assignors to Q-Bit Corporation, Melbourne, Fla.

Continuation of Ser. No. 524,759, Nov. 18, 1974, abandoned.
This application Mar. 19, 1976, Ser. No. 668,574
Int. Cl.² H03F *3/60*
U.S. Cl. 330—53 **9 Claims**

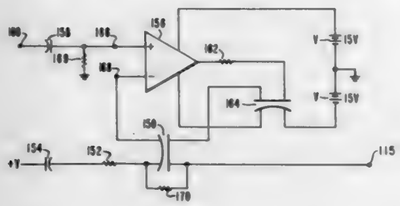


1. A broad band amplifier comprising an input terminal and an output terminal, an amplifying stage coupled between said input and output terminals, a first ferrite directional coupler coupled to the output of said amplifying stage, said first directional coupler having a first output coupled to said output terminal and a second output, and a second ferrite directional coupler coupling said second output of said first directional coupler to the input of said amplifying stage, one of said directional couplers comprising a broad band 0° to 180° coupler, said second directional coupler applying said second output of said first coupler to the input of said amplifying stage as RF negative feedback whereby both said ferrite directional couplers are in the negative feedback loop of said amplifying stage.

4,042,888
SIGNAL AMPLIFIER APPARATUS WITH FAIL-SAFE LIMITED GAIN

Arun P. Sahasrabudhe, Monroeville, and Thomas C. Matty, N. Huntingdon Township, Westmoreland County, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1976, Ser. No. 661,460
Int. Cl.² H03F *1/34*
U.S. Cl. 330—109 **6 Claims**



4. A signal amplifier apparatus having a limited gain characteristic in response to an input signal and in relation to a provided output signal, the combination comprising:

amplifier means having first and second inputs and an output, with said input signal being applied to said first input,

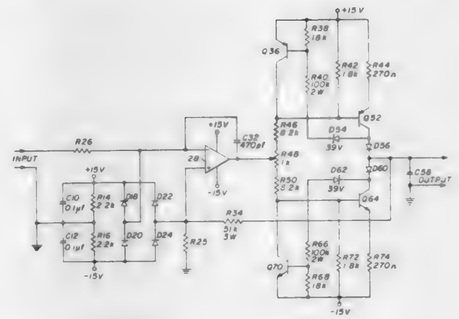
feedback means connected between said output and said second input and including a first four terminal capacitor, and

signal attentuation means connected between said output and said four terminal capacitor to establish a predetermined maximum level of said output signal, with said signal attenuation means including a second four terminal capacitor having a predetermined impedance characteristic for establishing said maximum level of said output signal.

4,042,889
OVERVOLTAGE PROTECTION CIRCUIT FOR GENERAL PURPOSE AMPLIFIER

Roxton Elliott Baker, Ellington, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed May 14, 1976, Ser. No. 686,627
Int. Cl.² H03F *21/00*
U.S. Cl. 330—207 P **5 Claims**



1. In a buffer-amplifier circuit including an amplifier having an output terminal and a plus and a minus input terminal, an output stage following the amplifier for driving a load and protecting the amplifier comprising:

a. a transistor amplifier circuit including a first transistor having a base, a collector, an emitter, and a collector-base junction, and a bias circuit, having a first node communicating with the outlet terminal of the amplifier, for biasing the first transistor;

b. an output circuit connecting a load to the collector of the first transistor and including a first diode whose junction is oriented opposite the collector-base junction of the transistor;

c. a first current path connecting the output circuit to an input terminal of the amplifier;

d. a clamping circuit, connected to the plus terminal of the amplifier, for clamping the signal at the plus terminal between two threshold voltages;

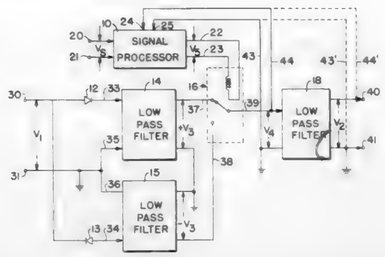
e. a second transistor having a collector, an emitter, and a base, the collector of the second transistor communicating with the base of the first transistor and the emitter of the second transistor communicating with the emitter of the first transistor; and

f. a second current path connecting the output circuit to the base of the second transistor and comprising a zener diode.

4,042,890
HIGH EFFICIENCY ELECTRICAL POWER CONDITIONER

Joseph S. Eckerle, Star Route 2, La Honda, Calif. 94020

Filed May 14, 1976, Ser. No. 686,332
Int. Cl.² H03F *21/00*
U.S. Cl. 330—207 A **16 Claims**



1. A high efficiency power conditioner for providing power amplification of relatively low power input signals, said power conditioner comprising:

power input terminal means adapted to be coupled to an AC voltage source of electrical power;

high power signal output terminal means adapted to be coupled to a utilization device;

means coupled to said power input terminal means for converting AC voltages supplied thereto to first and second relatively high DC voltages of different levels, said converting means having first and second output terminals for said first and second relatively high DC voltages, respectively;

controllable switch means having first and second power input terminals coupled respectively to said first and second output terminals of said converting means, an output terminal coupled to said high power signal output terminal means and a control input terminal, said switch means including means responsive to signals present on said control input terminal for alternately coupling said first and second DC voltages of different levels to said output terminal thereof; and

signal processing means having a first input adapted to be coupled to a source of said relatively low power input control signals, a second input coupled to said high power signal output terminal as a feedback signal path, and an output terminal coupled to said control input terminal of said switch means, said signal processor including means for generating relatively low power control signals from said input control signals and a portion of those signals present on the feedback signal path for controlling the state of said switch means, said switch means alternately coupling said first and second DC voltages of different levels to said output terminal thereof in response to said relatively low power control signals from said signal processing means.

4,042,891
FREQUENCY SYNTHESIZER HAVING FREQUENCY CONTROL LOOP INCLUDING FIBER OPTIC DELAY LINE

Arnold M. Levine, Chatsworth, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

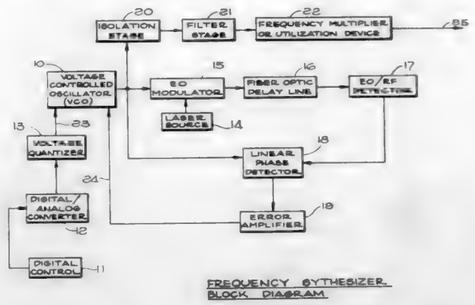
Filed July 30, 1976, Ser. No. 710,165
Int. Cl.² H03B *3/04*
U.S. Cl. 331—1 R **10 Claims**

1. A frequency synthesizer for generating a program of discrete radio frequencies as a function of a characteristic of a control signal, said frequencies in said program each being a predetermined frequency corresponding to a predetermined condition of said control signal characteristic, comprising:

an oscillator for generating said radio frequencies, said oscillator being signal controllable;

means responsive to said control signal to control said oscillator frequency approximately to said predetermined frequency during each of said corresponding predetermined control signal conditions;

a frequency control loop including an optical delay line with a source of light energy and input electric-to-light and output light-to-electric transducers, said input transducer modulating the output of said source of light energy at



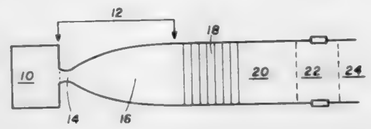
FREQUENCY SYTHESIZER BLOCK DIAGRAM

said oscillator frequency, said optical delay line having a delay time which is a function of the frequency separation between adjacent ones of said predetermined frequencies in said program, said loop also including means for comparing the period of said oscillator frequency with that of a precise frequency which is a function of a multiple of said delay time to generate and apply a second control signal to said oscillator thereby constraining said oscillator to provide an output frequency at said precise frequency with a high degree of accuracy.

4,042,892
HYPERSONIC GAS LASER

David B. Fenneman, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 22, 1976, Ser. No. 707,806
Int. Cl.² H01S *3/00*
U.S. Cl. 331—94.5 G **5 Claims**



1. A hypersonic gas laser comprising:

means for heating a suitable mixture of gases to a high temperature in a pressure chamber;

a nozzle having a throat and an expansion region connected to said pressure chamber configured so that hot gases exiting said pressure chamber through said nozzle attain a hypersonic velocity;

means in an interaction region adjacent said nozzle for converting the kinetic energy of said gases flowing at said hypersonic velocity into vibrational energy; and

a lasing region adjacent said interaction region where said vibrationally energized gases emit optical radiation.

4,042,893

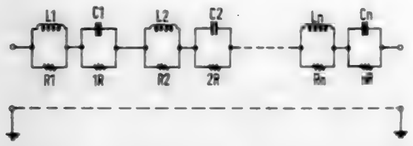
METHOD AND APPARATUS FOR IMPROVING TRANSMISSION LINE CHARACTERISTICS

Ernst Hofer, and Max Schlichte, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 11,681, Feb. 16, 1970, abandoned, which is a continuation of Ser. No. 562,864, July 5, 1966, abandoned. This application Apr. 10, 1972, Ser. No. 242,751

Int. Cl.[2] H03H *7/14;* **H04B** *3/14, 3/10*

U.S. Cl. 333—28 R **17 Claims**



1. A method for compensating a transmission line used for time multiplex transmissions, which transmits messages from different channels on a sampled basis in the form of time spaced pulses for each such channel, wherein the transmission line is shorter than the width of the pulses supplied thereto resulting from the time duration and the propogation speed of said pulses and wherein pulses of one channel can overlap to pulses of an adjoining channel due to the influence of skin effect, comprising the step of:

reducing the frequency dependence of the impedance of said transmission line by connecting to said line at least one compensating network having an impedance which varies oppositely with frequency to the variations of the impedance of said transmission line caused by skin effect, but by the same amount.

4,042,894

MULTI-POLE CIRCUIT BREAKER SYSTEM WITH COMMON TRIP MEANS

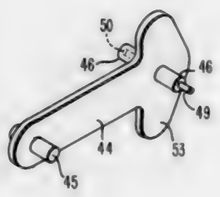
Edward Coleman, Inkpen, England, assignor to Ottermill Limited, England

Filed Aug. 15, 1975, Ser. No. 605,137

Claims priority, application United Kingdom, Sept. 20, 1974, 41035/74

Int. Cl.[2] H01H *77/00*

U.S. Cl. 335—9 **8 Claims**



1. A device as for effecting simultaneous tripping operation of adjacently mounted circuit breakers, comprising:

a frame structure disposed between the housings of said circuit breakers;

a lever contained within said frame structure and adapted for pivotal mounting at one end to said circuit breaker housings; and

a transfer member supported at the other end of said lever and extending into the interior of said circuit breaker housings, said transfer member comprising a spigot at one end thereof and a socket at the other end thereof, said spigot and socket adapted to cooperate with corresponding spigots and sockets of transfer members of other of said devices to form spigot joints therewith;

said transfer member engaging the mechanism of said circuit breakers so that a tripping operation of one of said circuit breakers operates said transfer member to pivot said lever and operate the mechanism of said other circuit breakers to effect simultaneous tripping thereof.

4,042,895

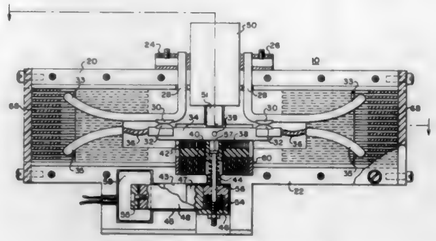
COMBINATION MOTOR-STARTER AND CIRCUIT BREAKER

John A. Wafer, Monroeville, and Paul G. Slade, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 16, 1975, Ser. No. 613,840

Int. Cl.[2] H01H *77/10, 73/00*

U.S. Cl. 335—16 **18 Claims**



1. A mofor starter current limiting circuit breaker combination comprising:

a housing;

separable contacts disposed within said housing and supported for relative movement between a closed position completing an electrical circuit therethrough and an open position interrupting an electric circuit therethrough;

electromagnet means supported within said housing and connected to said contacts for moving said contacts to the open position or closed position; and

current tripping means supported within said housing and connected to said contacts for moving said contacts to the open position in response to an overcurrent condition above a first predetermined value, said current tripping means comprising first operating means for moving said contacts to the open position when current flow therethrough exceeds said first predetermined value, and second operating means for rapidly moving said contacts to the open position and providing current limiting when current flow therethrough exceeds a second predetermined value greater than said first predetermined value;

said electromagnet means, said first operating means, and said second operating means being connected to the same set of said contacts.

4,042,896

MANUAL AND MOTOR OPERATED CIRCUIT BREAKER

David B. Powell, Burlington; Roger N. Castonguay, Terryville, and Donald F. Aitken, Plainville, all of Conn., assignors to General Electric Company, New York, N.Y.

Filed Apr. 1, 1976, Ser. No. 672,728

Int. Cl.[2] H01H *73/12*

U.S. Cl. 335—17 **27 Claims**

1. In a circuit breaker having a spring powered operating mechanism for articulating movable contacts between open and closed circuit positions with respect to stationary contacts, apparatus for charging the breaker operating mechanism and then releasing the energy stored therein pursuant to forcibly closing the breaker contacts, said apparatus comprising, in combination:

A. an electric motor;

B. a first drive element;

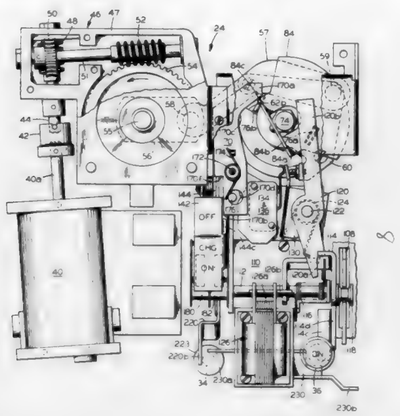
C. first means drivingly connecting said motor to said first drive element;

D. a second drive element drivingly connected to the breaker operating mechanism;

E. second means selectively drivingly interconnecting said first and second drive elements to accommodate a motor-driven breaker operating mechanism charging cycle;

F. a first control element responsive to the breaker operating mechanism for sensing its charged and discharged conditions;

G. a second control element responsive to the breaker movable contacts for sensing their open and closed circuit positions;



H. a third control element responsive to said second means for sensing a charging cycle in progress;

I. a closing mechanism including

1. a hook releasably latching engaging the breaker movable contacts to retain the contacts in their open circuit position during a charging cycle, and

2. means actuating said hook to release the breaker movable contacts for closure upon completion of a charging cycle; and

J. indicator means controllably positioned by said first, second and third control elements to variably display indicia identifying various breaker conditions produced by the apparatus.

4,042,897

A-C MAGNET WITH A SHORTING RING

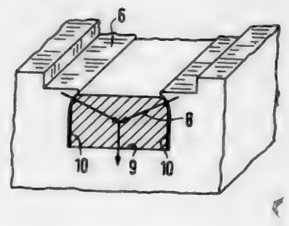
Siegfried Seidel, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed May 15, 1975, Ser. No. 577,872

Claims priority, application Germany, May 22, 1974, 2424983

Int. Cl.[2] H01F *7/10, 7/12*

U.S. Cl. 335—245 **4 Claims**



1. An a-c magnet including at least one pole comprised of laminations and having first and second slots running transversely to said laminations, each of said slots opening onto the upper surface of said pole and being defined by opposing side walls extending downwardly from said upper surface; a shorting ring having longitudinally extending first and second long sides arranged in said first and second slots; said upper surface having depressions therein extending from and running along the length of the edges of each of said first and second slots whereby said sidewalls defining said first and second slots, respectively, are caused to exert downward forces on said first and second long sides of said ring which push said ring toward the bottom of said slots.

4,042,898

POLE PIECE FOR USE IN MAGNET DEVICE AND METHOD FOR MANUFACTURING SAME

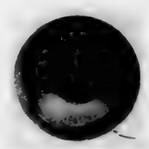
Sadami Tomita, Katsuta, and Akio Chiba, Hitachi, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 10, 1975, Ser. No. 556,887

Claims priority, application Japan, Mar. 13, 1974, 49-28071

Int. Cl.[2] H01F *3/00*

U.S. Cl. 335—297 **17 Claims**



x 1/2

1. A pole piece for use in a magnet device, characterized in that the crystal structure of the surface of said pole piece is different depending on the center portion and the outer circumferential portion of said pole piece.

4,042,899

VACUUM SERVO ACTUATED VARIABLE INDUCTANCE TRANSDUCER

Lawrence William Tomczak, Sterling Heights; Frederick William Crall, Farmington; LaVerne Andrew Caron, Sterling Heights, and Walter Joseph Campau, Grosse Pointe Woods, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Division of Ser. No. 559,204, March 17, 1975, Pat. No. 4,024,483. This application Mar. 11, 1976, Ser. No. 665,999

Int. Cl.[2] H01F *21/02*

U.S. Cl. 336—30 **8 Claims**

1. In a vacuum-servo-actuated variable inductance transducer, the combination comprising:

a one-piece molded plastic element integrally forming both a bobbin on which an inductive coil is wound and a portion of the chamber of said vacuum servo, said chamber portion terminating in a free peripheral edge portion;

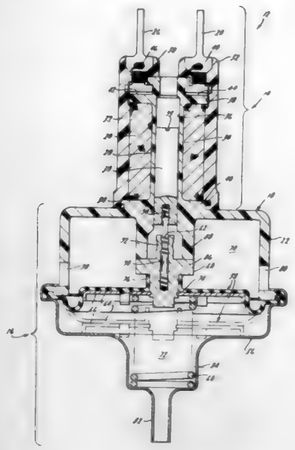
a metal shell separate from said element but cooperating therewith in forming the remainder of said vacuum servo chamber, said shell having a peripheral edge portion;

a movable diaphragm having a peripheral edge portion and disposed within said vacuum servo chamber to divide same into a vacuum chamber portion adapted to be communicated to a source of vacuum and another chamber portion, said peripheral edge portion of said shell engaging said peripheral edge portion of said diaphragm and wrapping around said peripheral edge portion of said element such that said diaphragm is peripherally held between said peripheral edge portions of said element and shell, said vacuum chamber portion being defined by said diaphragm and said shell and said another chamber portion being defined by said diaphragm and said element;

a bore within said bobbin containing a core arranged for displacement therein to vary the inductance of said coil;

connection means connecting said core and diaphragm such that movement of said diaphragm causes displacement of said core within said bore;

a spring seat formed in said metal shell; and



a helical coil spring in said vacuum chamber portion having one end thereof disposed within said seat and the other end thereof biased into engagement with said diaphragm to bias same toward said another chamber portion.

4,042,900

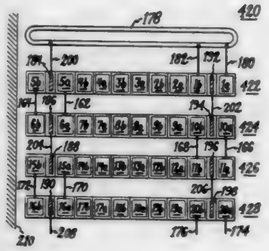
ELECTROSTATIC SHIELDING OF DISC WINDINGS

Reginald A. Hinton, Middlesbrough, England; Kenneth W. Doughty, Guelph, Canada, and William N. Kennedy, Pittsfield, Mass., assignors to General Electric Company

Continuation of Ser. No. 475,522, June 3, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,555

Int. Cl.[2] H01F *15/04*

U.S. Cl. 336—70 **13 Claims**



1. An electrostatic shielding device for inductive apparatus of the type having,

a coil, including a plurality of generally coaxially disposed annular disc coil sections,

each of said coil sections having a plurality of single strand insulated conductor turns;

spirally wound, in the same direction, alternately radially outward and radially inward, beginning with an initial coil section at one end of said coil and terminating with a final coil section,

a finish-end of a coil section being connected to the start-end of an immediately adjacent coil section to form a coil connected in an electrical series circuit relation,

the start-end of the initial coil section being for connection to a high potential source and the finish-end of the final coil section being for connection to a low potential point,

wherein the improvement comprises:

an electrostatic shield-conductor between the two innermost turns only of coil sections of said coil,

the shield-conductor in said initial coil section being for connection to said high potential source, a shield-conductor in one coil section being electrically connected to a correspondingly positioned shield-conductor in an immediately adjacent coil section only,

said shield connections being made between the ends of adjacent coil sections having the greatest potential difference between coil section ends.

4,042,901

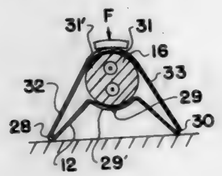
TEMPERATURE SENSING RESISTANCE PROBE AND METHOD OF MAKING A RESISTANCE ELEMENT THEREFOR

Jon H. Bechtel, Wayne, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 16, 1976, Ser. No. 649,612

Int. Cl.[2] H01C *3/04*

U.S. Cl. 338—28 **6 Claims**



1. A temperature sensing resistance probe comprising:

an insulating casing;

a temperature sensitive resistance element positioned within said insulating casing;

an elongated heat conductive sheaf having a continuous sidewall around the longitudinal axis thereof, said sheaf being substantially uniformly expandible along the length upon the application of an external force thereto to receive said insulating casing; and thereafter grippingly engaging said insulating casing upon the removal of said external force; and

means for connecting said temperature sensitive resistance element into an electrical circuit.

4,042,902

APPARATUS FOR CONTROLLING TWO CROSSED PROPORTIONAL ADJUSTING DEVICES BY MEANS OF A SINGLE CONTROL STICK

Hans Meyer; Werner Kaseberg; Horst Eisendick, all of Harsewinkel, and Willi Lucke, Greffen-Harsewinkel, all of Germany, assignors to Firma Simprop-Electronic Walter Claas, Harsewinkel, Germany

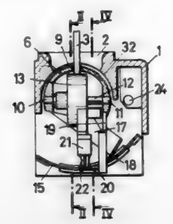
Filed Jan. 20, 1976, Ser. No. 650,666

Claims priority, application Germany, Feb. 1, 1975, 2504240

Int. Cl.[2] H01C *10/16*

U.S. Cl. 338—128 **17 Claims**

1. Apparatus for controlling two crossed proportional setting devices comprising a housing (1) having an open bottom, a top whose inner surface is in the form of a cylindrical half shell (32) and is provided with a square opening (2) and two opposed sidewalls (14), a bearing means (4, 5) in each of said two opposed sidewalls, a frame (6), said frame including pivot means (7, 8) engaging said bearing means for constraining the frame to pivot about a first swivel axis, bearing and shaft means (10, 11, 12) rotating about a second swivel axis orthogonal to said first swivel axis, and coincident with the axis of the cylindrical half shell, said first and second swivel axes being parallel to the top of said housing, a first strip resistor (15) formed in a circular sector about said first swivel axis, said first strip resistor being mounted on one of said opposed sidewalls, a second strip resistor (20) formed in a circular sector about said second swivel axis, said second strip resistor being mounted on said frame, a first radial extension element (17) extending from said pivot means (7, 8), a first electrical wiper contact (18) at the end thereof for brushing against said first strip resistor (15), a



second radial extension element (21) extending from said shaft means (12), a second electrical wiper contact (22) at the end thereof for brushing against said second strip resistor (20), and a control stick (3) fixed to said shaft means (12) at a point which is defined by the intersection of the first and second swivel axes, said control stick extending upward through the opening in said housing and orthogonal to both of the swivel axes.

4,042,903

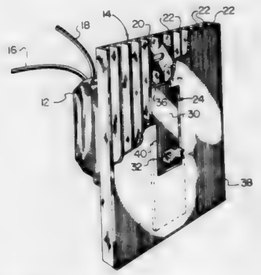
POWER CONTROL SLIDE SWITCH

John J. Finegan, Jr., Richardson, Tex., assignor to Hunt Electronics Company, Dallas, Tex.

Filed Mar. 15, 1976, Ser. No. 667,203

Int. Cl.[2] H01C *10/00*

U.S. Cl. 338—159 **4 Claims**



1. In combination with a power control device including parallel finned heat sink means and a control shaft extending through said heat sink means, said power control device including means responsive to the angular position of said control shaft for effecting a power transfer function:

gear means mounted on said control shaft;

a slidable control handle member having teeth adapted to engage said gear means and product rotation of said control shaft responsive to linear movement of said control handle member; and

means supporting said handle member on said control device for linear movement with said teeth in engagement with said gear.

4,042,904

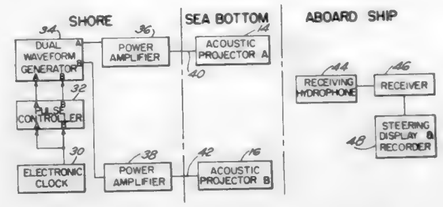
HYDROWAYS

A. Donn Cobb, New London, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 1, 1976, Ser. No. 719,493

Int. Cl.[2] G01S *5/18*

U.S. Cl. 340—6 R **6 Claims**



1. A marine acoustic navigation system comprising:

timing means for generating a first plurality of electrical signals of predetermined duration and spacing and for generating a second plurality of electrical signals of predetermined duration with members of said second plurality of electrical signals spaced a fixed period of time both before and after each of said first plurality of electrical signals;

first acoustic projector means connected to said timing means for converting only said first plurality if electrical signals into a first plurality of acoustic signals;

second acoustic projector means connected to said timing means for converting only said second plurality of electrical signals into a second plurality of acoustic signals;

receiving means for receiving said first and second plurality of acoustic signals and converting said first and second plurality of acoustic signals into a third plurality of electrical signals; and

display means connected to said receiving means for receiving said third plurality of electrical signals and displaying them in time sequence.

4,042,905

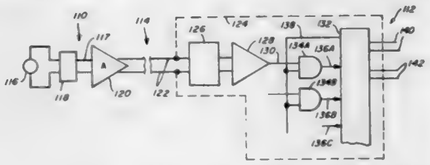
DATA ACQUISITION, TRANSPORT AND STORAGE SYSTEM

J. Robert Fort; James A. Westphal, both of Altadena, and C. Hewitt Dix, Pasadena, all of Calif., assignors to Geophysical Systems Corporation, Pasadena, Calif.

Continuation-in-part of Ser. No. 358,077, May 7, 1973. This application Oct. 28, 1975, Ser. No. 626,129

Int. Cl.[2] G01V *1/22*

U.S. Cl. 340—15.5 DP **20 Claims**



1. In a seismic prospecting system in which a series of sequential elastic wave signals are impressed on the earth and detected at a plurality of spaced geophones as a plurality of separate received signals, after being transmitted through the earth, the improvement in method of acquisition, transport and storage of said signals comprising:

a. in an array terminal (AT) amplifying each of the plurality of separate received signals at constat gain to obtain a plurality of separate amplified analog signals;

b. at first selected equally spaced digitizing times simultaneously sampling each of said plurality of amplified analog

signals and producing a plurality of discrete single bit digital signals, temporarily storing said plurality of single bit digital signals in a register means; and

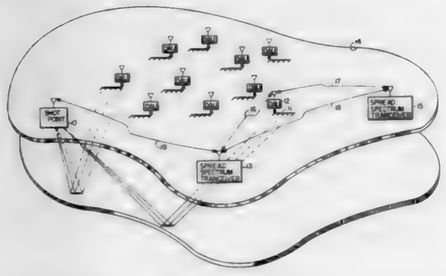
c. at second selected intervals of time, reading out in series, said temporarily stored plurality of single bit digital signals and transmitting them in series to a distant storage means over a two conductor cable means as a train of discrete single bit digital signals.

4,042,906

AUTOMATIC DATA ACQUISITION METHOD AND SYSTEM

George D. Ezell, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 29, 1973, Ser. No. 410,676
Int. Cl.² G01V *1/22*
U.S. Cl. 340—15.5 TS **15 Claims**



1. In seismic data acquisition from a seismic prospect area, the method of:

a. establishing a slave station at a known location with respect to said area,

b. establishing data acquistion units at each of a plurality of unknown locations in said area, which units sense ground motion and convert the same to a digital representation of such motion,

c. setting a different response code into each of said units and said slave station,

d. from a master station at a known location relative to said area periodically transmitting a spread sepctrum RF freeze signal followed by a series of channel sync pulses,

e. at each of said units freezing the binary representation of motion in response to receipt of each of said freeze signal,

f. receiving and counting said channel sync pulse at each said unit and at said slave station following each freeze signal,

g. decoding the count of said channel sync pulses at each said unit and at said slave station,

h. comparing the decoded count with said response codes,

i. in response to coincidence between said decoded count and said response codes transmitting the frozen signal as spread spectrum RF pulses from each said unit followed by a like transmission of a signal from said slave station representing travel time from said master station to said unit to said slave station back to said master station, and

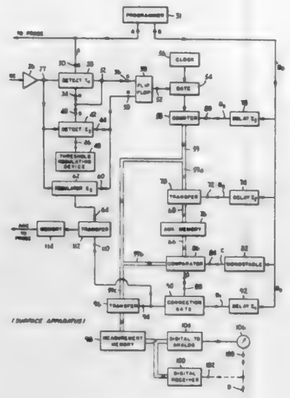
j. at said master station multiplexing the responses received from said units and said slave station to a common data channel.

4,042,907

APPARATUS FOR PREVENTING CYCLE SKIPPING IN PROCESSING ACOUSTIC WELL-LOGGING SIGNALS

Jean Claude Trouiller, Hauts de Seine, and Guy Lafont, Paris, both of France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 332,926, Feb. 16, 1973, Pat. No. 3,900,824.
This application Apr. 9, 1975, Ser. No. 566,281
Claims priority, application France, Feb. 17, 1972, 72.05300
Int. Cl.² G01V *1/40*
U.S. Cl. 340—15.5 BH **6 Claims**



1. Acoustic well-logging apparatus comprising a probe adapted to be moved within a borehole, transducer means in the probe for transmitting and for receiving acoustic measurement waves during successive measurement sequences and for generating a composite electric signal corresponding thereto, and apparatus responsive to said composite electric signal and comprising means for generating time measurement signals representative of the transit time of said acoustic waves between given points closely spaced in the borehold during successive measurement sequences, the apparatus further comprising

auxiliary memory means,

means for introducing into the auxiliary memory means, prior to beginning a given measurement sequence, a time measurement signal generated during a preceding measurement sequence, regardless of whether said time measurement signal is determined to be valid,

comparator means for comparing the time measurement signal generated during said given measurement sequence with the time measurement signal generated during said preceding measurement, sequence as introduced into the auxiliary memory means, said comparator generating a given logic signal only when the absolute value of the difference between said time measurement signals is less than a given threshold, said given logic signal therefore indicating that the time measurement signal generated during said given measurement sequence is determined to be valid,

memory means,

means operative only in the case where said given logic signal appears for introducing into the memory means the time measurement signal generated during said given measurement sequence, said memory means otherwise remaining in its former state, and

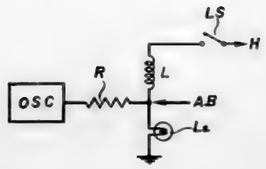
recording means for recording the contents of said memory means as a function of the depth of the probe, each invalid time measurement signal therefore being rejected for the purpose of recording but accepted for the purpose of determining the validity of a succeeding measurement.

4,042,908

APPARATUS FOR SAFETY AND DETECTION OF ILLUMINATING CIRCUIT

Shin Amano, Shizuoka, and Takeshi Tanga, Shimizu, both of Japan, assignors to Koito Seisakusho Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 333,843, Feb. 20, 1973, abandoned, which is a continuation of Ser. No. 258,745, June 1, 1972, abandoned, which is a continuation of Ser. No. 23,171, March 27, 1970, abandoned. This application Dec. 5, 1975, Ser. No. 638,270
Claims priority, application Japan, Mar. 28, 1969, 44-23347; June 30, 1969, 44-51349; June 30, 1969, 44-51350; Dec. 3, 1969, 44-97718
Int. Cl.² G08B *21/00*; B60Q *9/00*
U.S. Cl. 340—46 **6 Claims**



1. Monitoring apparatus for lighting circuits, comprising:

a power source for said lighting circuits;

oscillating means having an oscillating frequency output higher than the frequency of said power source;

inductor means connected in series with said lighting circuits and said power source;

said means for oscillating being non-inductively coupled to a junction of said inductor means with said lighting circuit through an impedance;

means for detecting failure of at least one of said monitored lighting circuits by detecting the presence of said oscillating frequency output at said junction, said means for detecting including means for rectifying said oscillating frequency output; and

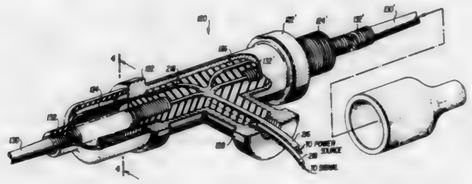
means for indicating the presence of said oscillator output, whereby a failure of said lighting circuits is determined.

4,042,909

VEHICULAR DUAL TIRE OBSTRUCTION DETECTOR

Artemio R. Perez, 15771 SW. 297 St., Leisure City, Fla. 33030

Filed Oct. 6, 1975, Ser. No. 620,225
Int. Cl.² B60Q *9/00*; H01H *3/16*
U.S. Cl. 340—52 R **1 Claim**



1. A vehicular tandem dual tire obstruction signal detector for mounting upon the chassis of a wheeled vehicle wherein said vehicle has an instrument panel and is supported by tandem dual tires, comprising:

A. electrical circuit within the vehicle, including an instrument panel signal therein; and

B. mechanical switch means in the circuit, said switch means comprising plural flexible deflector spokes secured in opposed coaxial relation to each other, each being held within corresponding flexible conductor helices, conductive nipples concentrically disposed with respect to the helices, the respective opposed helices and nipples being adapted to mounting upon the chassis of the vehicle whereby to dispose the respective spokes adjacent inner walls of the tandem duals,

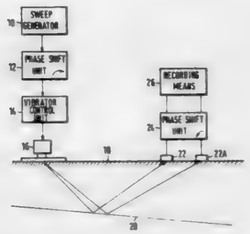
C. said switch means being normally in the off position, said deflector spokes being disposed oppositely between the tandem dual tires, adjacent the walls thereof, whereby upon movement of the vehicle and lodgment of a foreign obstruction between dual tire walls, at least one said deflector spoke is intermittently deflected to close the switch via the conductive nipples to on and thereby activate the signal.

4,042,910

METHOD OF SEISMIC EXPLORATION

Eike Rietsch, Celle, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Filed Oct. 9, 1975, Ser. No. 621,093
Claims priority, application Germany, Oct. 9, 1974, 2448007
Int. Cl.² G01V *1/14, 1/36*
U.S. Cl. 340—15.5 TA **5 Claims**



1. Method of seismic exploration comprising:

generating a sweep signal of frequency changing monotonously with time

supplying said sweep signal to a transducer whose mechanical output is positioned to transmit a mechanical vibratory signal to the earth in response to receipt of said sweep signal by said transducer,

receiving said mechanical vibratory signal transmitted through the earth,

recording the received mechanical vibratory signal,

repeating the foregoing steps at least three times in sequence with the entire phase of each generated signal shifted relative to the prior signal by a fixed phase angle which is a fraction of two pi, and

transforming said recorded signals by inverting said fixed phase shifts in order to rephase the recorded series of signals prior to adding them together to produce a composite record.

4,042,911

OUTER AND ASYNCHRONOUS STORAGE EXTENSION SYSTEM

Donall Garraid Bourke, and Frederic John Puttlitz, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,223
Int. Cl.² G06F *13/00*
U.S. Cl. 364—900 **6 Claims**

1. An extendable main memory comprised of physically addressable blocks, any program and its operands being assignable to one or more address keys when the program uses logical block addressing, each key identifying an addressability assigned to the main memory, any program using up to a full range of addresses determined by the number of bits in each address within each addressability assigned in the main memory, the extendable main memory comprising

an inner storage unit being an essential part of the main memory, the inner storage unit having a size not greater

than one full range of program addresses, the inner storage unit being useable by a program which provides either logical or physical addresses as input addresses,

a translator unit for translating a logical address into a translated address to be accessed in the main memory, a logical address provided by a program being executed by a processor or by a channel, the translator containing a plurality of segmentation registers loadable with physical block addresses, any segmentation registers being selectable by a high-order part of a logical address,

a main memory bus connecting the inner storage unit to the translator unit and to a processor, the memory bus including address, data, and control lines, the memory bus communicating address keys and logical block addresses from the processor to the translator unit, translated physical block addresses from the translator to the inner storage unit, and physical addresses from the processor to the inner storage unit,

inner storage interface circuits in the translator for generating an inner storage cycle for communicating a translated address to the inner storage unit,

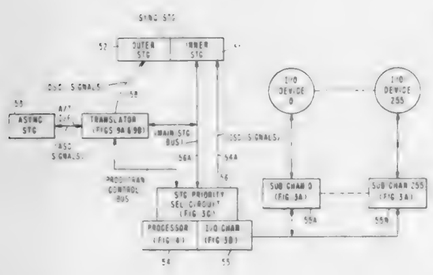
outer storage interface circuits provided within the translator unit for attaching an outer storage unit as a part of the main memory, the outer storage interface circuits generating an outer storage cycle for each storage access to be made in the outer storage unit,

asynchronous unit interface circuits provided within the translator unit for attaching an asynchronous storage unit as another extended part of the main memory, the asynchronous unit interface circuits generating an asynchronous storage cycle for each storage access to be made in the asynchronous storage unit, the asynchronous storage cycle having a time period which is longer than the inner storage cycle or outer storage cycle when the asynchronous storage unit is the slowest operating unit in the main memory,

a processor to translator control bus being connected at one end in the translator to the inner storage interface circuits, the outer storage interface circuits, and the asynchronous unit interface circuits, and being connected at the other end to the processor storage priority circuit,

storage unit selection circuits in the translator unit to determine the existence of an outer or asynchronous storage unit in the main memory and for activating a respective cycle for accessing each translated address in an addressed storage unit if it exists,

whereby the translator unit provides interfaces which provide for the attachment of either or both of the outer and asynchronous storage units.

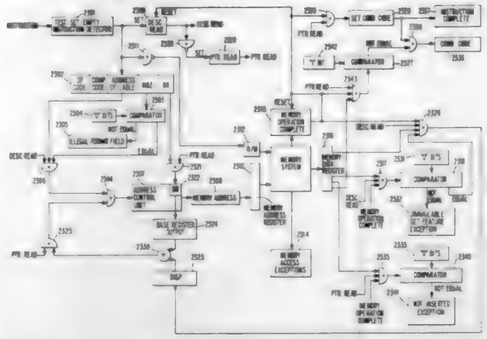


4,042,912

DATABASE SET CONDITION TEST INSTRUCTION

Charles W. Bachman, Lexington, and Benjamin S. Franklin, Cambridge, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed June 19, 1975, Ser. No. 588,436
Int. Cl.[2] G06F *9/10, 9/16, 9/20, 13/00*
U.S. Cl. 364—200 **8 Claims**



1. In an internally programmed data processing apparatus having a memory comprised of a plurality of segments of addressable space each segment having a segment number, each of said segments delineated by upper and lower variable bounds, with predetermined ones of said segments storing a plurality of files of database records grouped in sets of database records, each set having at least one owner database record, each of said database records having at least one pointer address for linking predetermined ones of said database records to predetermined others of said database records and to predetermined ones of said sets, each of said database records also being associated with one each of a record descriptor for describing said associated database record, said record descriptors being stored in predetermined sections of said segments; said data processing apparatus also having an arithmetic and logic unit (ALU) for performing arithmetic and logic operations on any data or address of said segments, database records, and descriptors, said data processing apparatus further having a system base from which absolute addresses of said segments, database records and descriptors are referenced, said data processing apparatus having a plurality of base registers, each base register for storing signals for referencing said segments;

instruction hardware responsive to a test-set instruction for determining whether or not a selected one of said database records is linked to predetermined others of said database records, said test-set instruction having a first base register address (BR) for identifying a first of said plurality of base registers storing signals indicative of a first segmented address of a first of said database records and said test-set instruction further including a first address syllable for identifying a second one of said base registers storing signals for referencing the set descriptor associated with said first of said database records, said instruction hardware comprising:

first means responsive to signals corresponding to said first address syllable identifying said second base register to convert said signals of said second base register into an absolute address for fetching the associated set descriptor of said selected one of said database records from one of said predetermined sections of said segments;

b. second means coupled to said first means and responsive to signals indicative of the displacement address in said set descriptor for generating an absolute address for fetching said pointer address of said pointers in said first of said database records;

c. third means coupled to said first and second means and responsive to said first and second means for storing signals representative of said pointer address fetched from one of said segments; and

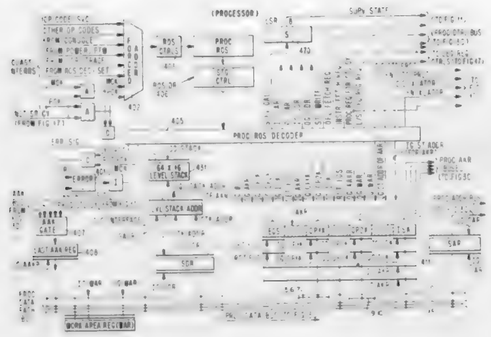
d. fourth means coupled to said third means and responsive to said signals from said third means for determining whether or not said selected one of said database records is linked to selected others of said database records.

4,042,913

ADDRESS KEY REGISTER LOAD/STORE INSTRUCTION SYSTEM

Richard Eugene Birney; Michael Ian Davis; Lynn Allan Graybiel; Robert Allen Hood, all of Boca Raton, Fla.; Samuel Kahn, Mount View, Calif., and William Steese Osborne, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,982
Int. Cl.[2] G06F *9/00*
U.S. Cl. 364—200 **3 Claims**



1. Addressability definition control for a data processor for executing an address key register (AKR) load instruction for loading address keys into an address key register (AKR) from a general register or a main memory location, the address keys contained in the address key register determining the addressability currently available to the processor, the addressability definition control including

a plurality of bistable storage positions for each of plural key sections in the AKR for registering an address key in each section, the registered keys in the AKR defining the current addressability of the processor,

a plurality of single key ingates separately connected to inputs of each of the key sections in the AKR, a multiple key ingate connected to inputs of all of the single key sections, a plurality of single key signal lines respectively connected to the plurality of single key ingates, and all of the single key signal lines also connected to the multiple key ingate,

a control store decoder having as outputs single and multiple key ingate control lines for connecting control signals activated by microcode received from a control store to the respective ingates, the decoder activating one of the control lines selected by the instruction,

means for outputting address signals from the instruction for selecting a general register or a main memory location containing required address key signals, means for connecting the selected general register or memory location to a processor data path, and

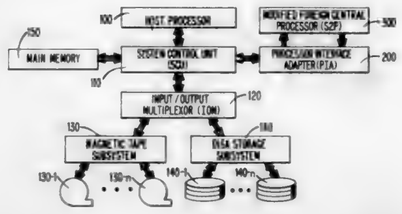
any ingate control line activated by the decoder in response to the instruction to select any single key section or all key sections for transferring one or multiple address key signals into the AKR from the processor data path, which is currently connected to a selected general register or memory location to load the processor with one or plural addressabilities.

4,042,914

MICROPROGRAMMED CONTROL OF FOREIGN PROCESSOR CONTROL FUNCTIONS

John L. Curley, Sudbury; C. William Dawson, East Bridgewater; Arthur A. Parmet, Waltham, and Donald R. Taylor, Framingham, all of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 17, 1976, Ser. No. 687,282
Int. Cl.[2] G06F *9/16, 16/16, 15/38, 15/18*
U.S. Cl. 364—200 **39 Claims**



1. A system for executing instructions of a target syste program, said system including a host processor, a main memory and a system control unit coupled to said host processor and to said main memory, said main memory including a plurality of memory areas, a first area storing said instructions of said target system program and a second area storing a plurality of channel commands, said plurality including at least one channel control command coded to specify a number of functions required for initiating the execution of said target system program by said system, said system further including an emulator coupled to said system control unit for fetching said commands and said instructions from said memory, said emulator comprising:

a microprogrammed adapter for executing said plurality of said channel commands fetched from said second area, said adapter comprising:

an addressable control store for storing a plurality of sequences of microinstructions;

branch and test control means for controlling the addressing of said control store during the execution of each said channel command, and for testing the presence of operations coded in the control portion of said one channel control command for establishing next microinstruction sequences to be referenced;

decoder circuits coupled to said control store for generating command control signals in response to the read out of said plurality of microinstruction sequences;

control logic circuits coupled to said decoder circuits;

an input/output processing section coupled to said control store, said decoder circuits, and said system control unit for receiving information from said main memory, including said one channel control command; and

a control interface coupled to said decoder circuits and to said control logic circuits;

said processing apparatus further including:

a processing unit for processing said instructions, said processing unit being coupled to said input/output processing section and to said control interface, said processing unit comprising:

control circuits;

an arithmetic and logic unit; and

a control memory;

said control circuits, said arithmetic and logic unit and said control memory being coupled to said control interface,

said control store being operative in response to receipt of said one channel command to reference a first one of said microinstruction sequences, said decoder circuits generating a set of said command control signals for conditioning said control logic circuits to apply signals to said control interface for presetting said arithmetic and logic unit, said control memory, and said control circuits to the proper

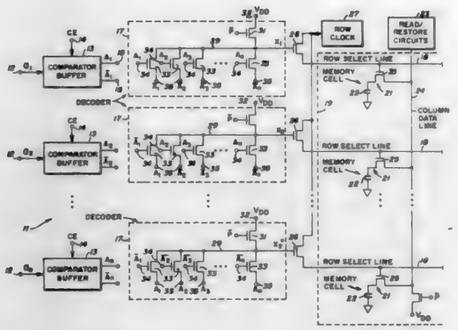
operational states specified by said coded functions within said one channel command for proper execution of sid instructions of said target system program.

4,042,915

MOS DYNAMIC RANDOM ACCESS MEMORY HAVING AN IMPROVED ADDRESS DECODER CIRCUIT

John A. Reed, Los Altos, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 15, 1976, Ser. No. 677,461
Int. Cl.² G11C *8/00*
U.S. Cl. 340—173 R **2 Claims**



1. In an MOS dynamic random access memory:

memory means providing a matrix of individually selectable memory cells for storing data therein and for reading out data therefrom;

address input terminal means for receiving address input signals for addressing said memory means;

buffer means responsive to said input address signals on individual ones of said address input terminal means for generating pairs of complementary address signals in response to respective ones of said input address signals;

address decoder means responsive to said pairs of complementary address signals for producing a decoded memory accessing output signal for accessing an addressed cell in said memory means;

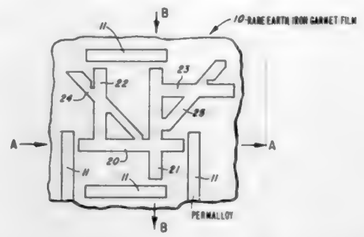
said address decoder means including, a decoder output line means on which said memory accessing decoder output signal is generated, means for precharging said decoder output line means to a predetermined electrical potential, a plurality of decoder transistor means coupled in parallel to said decoder output line means for selectively changing the potential of said decoder output line in response to said pairs of said complementary address signals, and wherein individual ones of said decoder transistor means includes first and second terminal means and a gate terminal means for gating current flow between said first and second terminal means, said first terminal means being coupled to said decoder output line means, and said gate and second terminal means of respective ones of said decoder transistor means being coupled to the output of respective ones of said buffer means to receive a respective one of said pair of complementary address signals thereon for controlling the conduction of current through respective ones of said decoder transistor means in response to the pair of complementary address signals applied between said gate and second terminals of respective ones of said decoder transistor means, whereby the timing of the conduction of current through respective ones of said decoder transistors is controlled by the generation of said pair of complementary address signals.

4,042,916

MAGNETIC BUBBLE TRACK CROSSOVER ELEMENT

Christopher Teh-Min Chang, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 15, 1975, Ser. No. 613,730
Int. Cl.² G11C *11/02*
U.S. Cl. 340—174 TF **5 Claims**



1. In a magnetic bubble domain system including a layer of magnetic material in which magnetic bubble domains can be propagated, and a magnetizable overlay pattern on one surface of said layer and having a magnetization in the plane of said overlay pattern for defining propagation paths for magnetic bubble domains,

at least a pair of magnetic bubble domain propagation paths included in said magnetizable overlay pattern,

said pair of magnetic bubble domain propagation paths intersecting with each other, and

magnetic bubble domain crossover means included in said magnetizable overlay pattern and disposed at the intersection of said pair of propagation paths for regulating the flow of individual bubbles from the respective propagation paths in crossing the intersection to travel along the respective propagation paths free from interference with each other in response to an in-plane rotating magnetic field, said magnetic bubble domain crossover means comprising

first and second L-shaped members arranged in orthogonally offset relationship with respect to each other and including respective leg portions extending at right angles to each other and intersecting intermediate the ends thereof,

said first and second L-shaped members having other leg portions disposed in spaced orthogonal relation with respect to each other and integral with the one of said first-mentioned leg portions corresponding thereto, and

magnetic bubble domain retention means associated with each of said L-shaped members controlling movement of magnetic bubble domains along the said pair of propagation paths of magnetizable material included in said magnetizable overlay pattern.

4,042,917

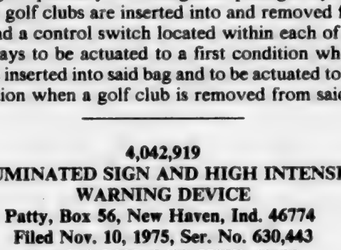
MAGNETO-RESISTIVE DOMAIN DETECTOR FOR CYLINDER-DOMAIN-TRANSPORT MEMORY

Arnulf Lill, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 21, 1975, Ser. No. 606,477
Claims priority, application Germany, Aug. 27, 1974, 2440997
Int. Cl.² G11C *11/02*
U.S. Cl. 340—174 TF **6 Claims**

1. A magneto-resistive domain detector for reading the stored information of a cylinder-domain transport memory comprising:

a layer-shaped detector strip disposed on the memory perpendicularly to the cylinder domain path and being formed of a magneto-resistive material and having a do-



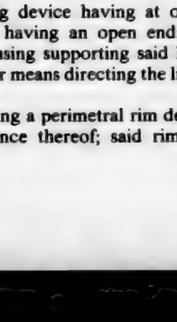
main stretcher adjacent to but galvancially decoupled from the detector strip.

4,042,918

APPARATUS INDICATING AN ABSENT GOLF CLUB

Charles B. Klitzman, 211 Parker Ave., Deal Park, N.J. 07723

Filed May 4, 1976, Ser. No. 683,165
Int. Cl.² G08B *13/14, 21/00*
U.S. Cl. 340—280 **7 Claims**



1. Apparatus for a golf bag to indicate the absence of a golf club, comprising:

power supply means;

alarm means; and

switch means coupling said power supply means and said alarm means in series circuit;

and wherein said switch means includes a body section having a plurality of elongated passageways through which golf clubs are inserted into and removed from said bag and a control switch located within each of said passageways to be actuated to a first condition when a golf club is inserted into said bag and to be actuated to a second condition when a golf club is removed from said bag.

4,042,919

ILLUMINATED SIGN AND HIGH INTENSITY WARNING DEVICE

Richard L. Patty, Box 56, New Haven, Ind. 46774

Filed Nov. 10, 1975, Ser. No. 630,443
Int. Cl.² G08B *5/00;* H05B *41/00*
U.S. Cl. 340—321 **5 Claims**

1. An illuminated sign comprising:

a frame having a perimetral wall to define a frame opening;

a perimetral frame flange formed on each wall edge and extending inwardly from the wall;

a first panel connected at its circumferential edge to one perimetral flange and a second panel connected at its circumferential edge to the other perimetral flange, at least one of said panels being of a light transmissive material;

an elongate lighting device having at one end thereof a bulbous housing having an open end; a light emitting element; said housing supporting said light emitting element and reflector means directing the light emission from said element;

an annular cap having a perimetral rim depending from the outer circumference thereof; said rim having an edge defining an opening for receiving the open end of said housing in close-fitting relation; a wall portion of said frame having a wall opening therein for receiving said open end in close-fitting relation;

said rim and said housing being in threadedly removable and adjustable engagement; said cap being threadedly tightened against said wall portion;



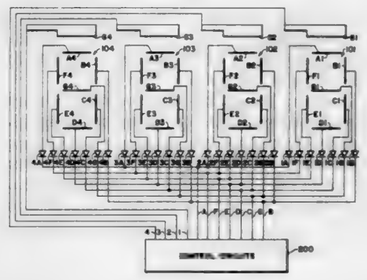
an annular wall receiving step being axially displaced from said housing open end; said step receiving and supporting said wall portion adjacent said wall opening and said wall portion adjacent said wall opening being firmly clamped between said step and said rim edge when said rim is threadedly tightened on said housing.

4,042,920

MULTIPLEXING CIRCUIT FOR LIQUID CRYSTAL DISPLAY

Thomas B. Harsch, Stow, and Edd Dems, Parma, both of Ohio, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 320,581, Jan. 2, 1973. This application Aug. 12, 1976, Ser. No. 713,755
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **6 Claims**



1. In an optical display system wherein electrical intelligence is converted into optical images through the use of a liquid crystal display, the combination of a layer of liquid crystal material sandwiched between a pair of transparent parallel plates, the inner surface of one of the plates in contact with the liquid crystal material having sets of mutually-insulated transparent conductive segments thereon which are arranged in essentially identical patterns, the inner surface of the other of said plates in contact with the liquid crystal material having patches of transparent conducting material thereon directly opposite cooperating sets of segments whereby establishment of an electrical potential between a segment and its cooperating patch on the opposite plate will change the optical appearance of that segment, there being *n* sets of segments and *n* patches on the opposite plate with *x* segments in each set, *x* conductors each connected to a corresponding one of the segments in each set, *n* conductors connected to the respective patches, means for applying pulses through the *x* conductors to the segments of all sets simultaneously in a sequence wherein the pulse sequence on the *x* conductors is adapted to change *n*

times during a complete cycle, and means for applying during said cycle n pulses to said n conductors and the conducting patches, said n pulses being applied to the n conductors in succession and simultaneously with application of pulses to the x conductors whereby different configurations can be made to appear to the eye at successive segment locations.

4,042,921

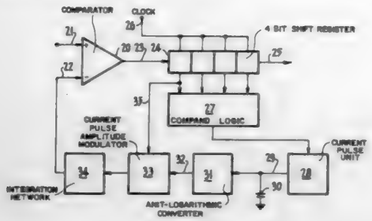
DIGITAL ENCODER/DECODER

Peter Leslie Smith, Northcote, Australia, assignor to L.M. Ericsson Pty Ltd., Victoria, Australia

Continuation-in-part of Ser. No. 423,813, Dec. 11, 1973, abandoned. This application Sept. 17, 1974, Ser. No. 506,777

Int. Cl.[2] H03K *13/22*

U.S. Cl. 340—347 AD **11 Claims**



1. An average peak slope companded delta codec for converting an analog signal to a digital signal comprising:

comparator means receiving said analog signal and a variable construction signal for converting said analog signal to a digital bit stream,

detecting means for detecting the presence of at least one preselected sequence of bits in the digital bit stream,

means responsive to said detecting means for generating an attack/decay signal which increase upon the occurrence of said preselected sequence and decreases upon the non-occurrence of said preselected sequence,

converter means receiving said attack/decay signal for providing a compand signal which is substantially an anti-logarithmic function of said attack/decay signal,

means for accumulating said compand signal to form said variable reconstruction signal, and

polarity inverting means for inverting the polarity of said compand signal when said reconstruction signal exceeds said analog signal, thereby causing said reconstruction signal to change in value toward the value of said analog signal during each bit period, said companding adjusting to the average of the high slope regions of said analog input signal.

4,042,922

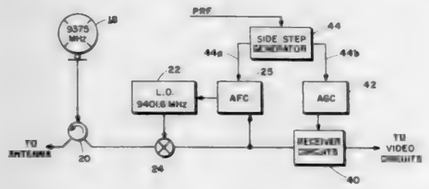
MULTI-MODE RADAR SYSTEM

Eckard F. Natter, Coral Springs; George E. Weant, Fort Lauderdale, and James R. Lobsinger, North Lauderdale, all of Fla., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sept. 3, 1976, Ser. No. 720,338

Int. Cl.[2] G01S *7/40, 9/60*

U.S. Cl. 343—5 W **2 Claims**



1. A multi-mode radar system having a high power source operating at a first frequency wherein said radar system periodically transmits signals at said first frequency to thereby elicit beacon replies at a second frequency and radar returns essentially at said first frequency, said replies and said returns being subsequently intercepted by said radar system and comprising;

a local oscillator referred to said first frequency for generating a local frequency;

a mixer for generating the frequency products of said local frequency with said replies and said radar returns intercepted by said radar system;

a plurality of tuned devices, a first of which is tuned to the difference frequency of said local frequency and said second frequency and another of which is tuned to the difference frequency of said first frequency and said local frequency;

means for selecting one of said tuned devices to receive said frequency products; and,

side step generator means comprising a timer which is reset to an initial time by each of said periodically transmitted signals and which thereafter side steps said local oscillator a predetermined time after being so reset.

4,042,923

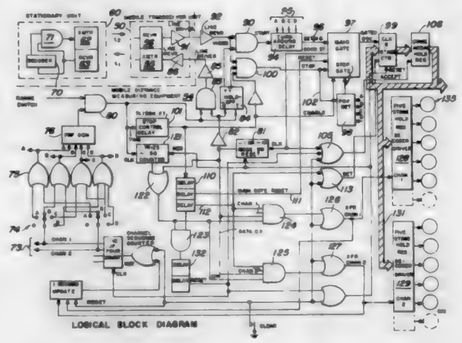
RADAR TRILATERALIZATION POSITION LOCATORS

James W. Merrick, El Paso, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Continuation of Ser. No. 420,448, Nov. 30, 1973, Pat. No. 3,918,056, which is a continuation of Ser. No. 195,687, Nov. 4, 1971, Pat. No. 3,810,179. This application Oct. 16, 1975, Ser. No. 622,841

Int. Cl.[2] G01S *9/02*; G06F *11/00*

U.S. Cl. 343—6.5 LC **8 Claims**



1. Means for validating timed radar signals comprising means for repeatedly storing initial data responsive to transmitting radar signals, data accumulation means, means for transferring said initially stored data to said data accumulator means whereby said accumulator means stores an average of previously received data which was initially stored and then transferred to said accumulator, means in said accumulator for accepting the transferred data which is consistent with previously accumulated data and rejecting data which is non-consistent therewith, means responsive to the receipt of non-consistent data for returning said initial data storage means to a condition wherein it stores the last previously received consistent data, and means responsive to the accumulation of a predetermined amount of said accepted data for giving a read out of the average of said accumulated data.

4,042,924

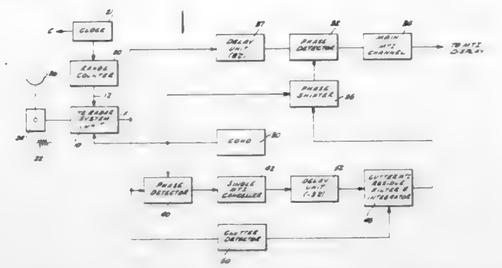
MTI CLUTTER TRACKING AND CANCELLING SYSTEM

Norol T. Evans, San Pedro, and Francis J. Wunderlich, Placentia, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 25, 1970, Ser. No. 17,992

Int. Cl.[2] G01S *9/42*

U.S. Cl. 343—7 A **16 Claims**



8. In a moving target indication radar system of the type including means for transmitting energy of a predetermined frequency which is reflected by targets including clutter, means for receiving said reflected energy, a coherent source of energy of a fixed frequency, means for converting the reflected energy into intermediate frequency signals from each of a succession of range bins from which said energy was reflected, a main phase detector to which said intermediate frequency signals and the energy from said coherent source are applied and a main canceller for providing an output representing moving-target-indication residue from one transmission to the next, a clutter detection and cancelling system comprising:

a moving target indication clutter channel responsive to said intermediate frequency signals and to said coherent energy for providing a clutter moving target indication residue for each range bin from transmission to transmission; and

control means responsive to said clutter residue for controlling the phase of the energy from said coherent source which is applied to the main phase detector.

4,042,925

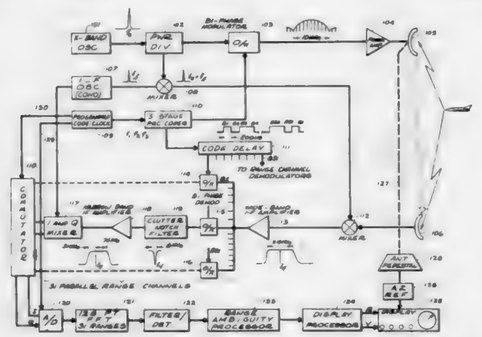
PSEUDO-RANDOM CODE (PRC) SURVEILANCE RADAR

Damian F. Albanese, Chatsworth; Frank J. O'Farrell, Valencia; David E. Hammers, and Henry R. Kennedy, both of Los Angeles, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,890

Int. Cl.[2] G01S *9/23, 9/24*

U.S. Cl. 343—14 **15 Claims**



1. A CW pseudo-random coded radar system including transmitting means for generating a CW carrier transmission modulated by a maximal length code PRC code and including receiving means responsive to echo signal energy reflected from objects illuminated by said transmitting means, comprising:

first means for generating said code as a repetitive pseudo-random digital code word of L bits each τ_b in duration, said first means also including a modulator for applying said code word as a bi-phase code to said carrier;

clock means connected to control said first means, the frequency of said clock being programmed in at least two predetermined clock frequency periods;

second means responsive to said first means for delaying said code by L τ_b and having L taps spaced τ_b to provide L delay outputs;

third means comprising L demodulation channels, each of said channels arranged to correlated signals from said receiving means against a corresponding one of said demodulator channels;

and fourth means responsive to the outputs of said L channels for producing a composite signal comprised of successive samplings of the outputs of said L channels.

4,042,926

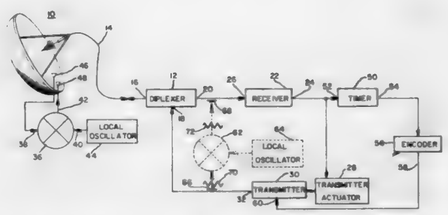
AUTOMATIC TRANSPONDER

Roy E. Anderson, Schenectady; Alex F. Brisken, Ballston Lake, and James R. Lewis, Schenectady, all of N.Y., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 27, 1975, Ser. No. 562,499

Int. Cl.[2] G01S *7/40*

U.S. Cl. 343—17.7 **11 Claims**



7. A method for determining the internal delay time of a transponder of the type adapted to generate a first transmit signal in response to a first receive signal comprising:

detecting said first transmit signal, generating a second receive signal in response to said first transmit signal, said second receive signal characterized by a frequency the same as said first receive signal whereby said transponder generates a second transmit signal delayed in time from said first transmit signal by said delay time of said transponder,

measuring the time between said first and second transmit signals and transmitting a signal indicative of said time.

4,042,927

ABILITY OF A MONOPULSE RADAR TO RESOLVE AND TRACK JAMMERS PASSIVELY

Howard D. Helms, Brookside, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

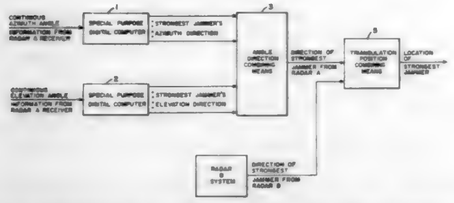
Filed June 25, 1971, Ser. No. 160,075

Int. Cl.[2] G01S *7/36, 9/02, 9/22*

U.S. Cl. 343—18 E **1 Claim**

1. A detector comprising an input means having an input which receives continuous information and a plurality of outputs; a control means connected to said input means so as to cause the input means to sample the continuous information at discrete intervals and present the sampled information at its outputs; a plurality of counters; steering means connected between outputs of the input means and the inputs of the count-

ers so as to cause a predetermined counter to count one each time a corresponding predetermined range of sample information is sampled by the input means; each of said counters having an output when it over-flows; and an output means connected to said counters so as to indicate which counter has overflowed; said control means is a pulse generator which is further connected to the steering means so as to provide a pulse



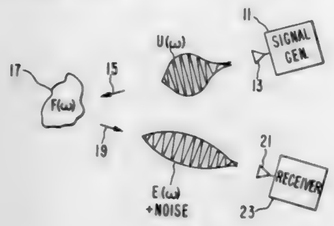
to be delivered to the proper counter; and further comprising an OR gate having a plurality of inputs connected to the overflow outputs of the plurality of counters; and a flip-flop means having an input connected to the output of the OR gate and an output connected to the pulse generator so as to turn off said pulse generator when an overflow of one counter is sensed by the OR gate.

4,042,928

TECHNIQUE OF CHARACTERIZING THE NATURE OF A RADIATION PATH TRANSFER FUNCTION BY A FEW CONSTANTS

Richard A. Altes, Palo Alto, Calif., assignor to ESL Incorporated, Sunnyvale, Calif.

Continuation-in-part of Ser. No. 453,799, March 22, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,315
Int. Cl.² G01S *9/02, 9/66*
U.S. Cl. 343—5 SA **9 Claims**



1. A method of determining characteristics of a radiation path comprising the steps of:

transmitting a radiation signal through said radiation path, thereby modifying said radiation according to the characteristics of said path, said transmitted radiation signal comprising a chirped burst of energy with a known frequency domain distribution such that when multiplied by the frequency raised to an integer power the new frequency domain distribution is a scaled version of the transmitted signal and decorrelated therefrom, and

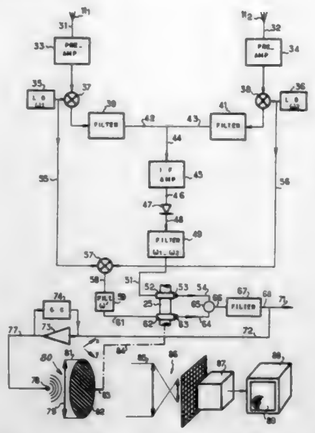
comparing characteristics of the transmitted radiation signal and the modified radiation signal in a manner to determine Taylor series coefficients of a transfer function of said radiation path, whereby said coefficients are characteristic of a transfer function of said radiation path.

4,042,929

HELICOPTER NAVIGATION SYSTEM

Jacques A. Dorey, Combs-la-Ville, France, assignor to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.), Chatillon, France

Filed Apr. 25, 1975, Ser. No. 571,764
Claims priority, application France, Apr. 26, 1974, 74.14671
Int. Cl.² G01S *5/02*
U.S. Cl. 343—113 DE **13 Claims**



1. A navigation system for a helicopter having a body provided with rotor blades turning about an axis of a rotor shaft, comprising:

two antennas carried by said blades at points remote from said axis for receiving electromagnetic waves radiated by a beacon of predetermined location;

processing means on said body including two generators of local oscillations, two mixers for respectively heterodyning received waves from said antennas with said local oscillations to produce two intermediate-frequency signals, nonlinear impedance means connected to said mixers for multiplying said intermediate-frequency signals with each other to produce a resulting signal, and detector means connected to said impedance means for deriving a phase-modulated output signal from said resulting signal;

evaluation means connected to said detector means for correlating said output signal with a set of spatial coordinates; and

integrating display means connected to said evaluation means for indicating the spatial coordinates associated with said output signal.

4,042,930

DEVICE FOR FORMING CHANNELS USING DETECTORS SPACED OUT ON A CIRCULAR BASE

Guy Parent, Le Plessis Robinson, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, Paris, France

Filed Dec. 2, 1975, Ser. No. 636,857
Claims priority, application France, Dec. 10, 1974, 74.40457
Int. Cl.² G01S *3/06, 3/82*
U.S. Cl. 343—113 R **9 Claims**

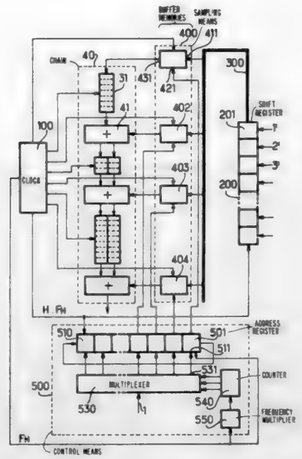
1. Device for forming channels using detectors spaced out on a circular base comprising a sequency of H detectors evenly spaced out on the said base within an arc of the circle;

H coders, each coder being connected to the output of a detector and being used for transcoding the analog output signal of the detector into a signal having s bits ($s \geqq 1$);

a chain constituted by an alternate sequence of (N−1) delay devices and by (N−1) main adders (N <H), each adder comprising an input A connected to the output of a delay device and a lateral input B, each delay device comprising at least an elementary delay cell;

distributing means for the signals sent out by the coders to the input of the chain and to the lateral inputs of the (N−1) adders;

a clock used for controlling the said distributing means at the frequency F_H, the data staying only during a period $1/F_H$ in an elementary cell and for controlling the transfer of the



signals along the chain characterized in that the said distribution means (20) comprise: means (200) for sampling and memorizing the signals coming from the H coders;

a bus bar system (300) on which the signals memorized as a whole pass; means (400) for sampling at the frequency F_H, the said signals on the bus bar system (300) used for feeding the input of the chain (40) and the lateral inputs of the (N−1) adders (41, 42, 43);

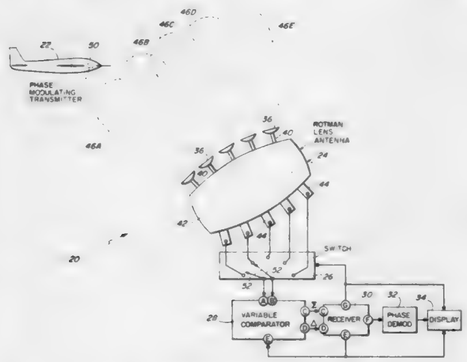
controls means (500) for the sampling means (400).

4,042,931

TRACKING SYSTEM FOR MULTIPLE BEAM ANTENNA

Sven G. Gustafsson, Billdal, Sweden, assignor to Raytheon Company, Lexington, Mass.

Filed May 17, 1976, Ser. No. 687,051
Int. Cl.² G01S *5/02*
U.S. Cl. 343—117 R **8 Claims**



1. A tracking system comprising:

comparator means having first and second hybrid couplers and first and second phase shifters, the phase shift of said first phase shifter occurring in increments which are of equal magnitude to and of opposite sign to increments in the phase shift of said second phase shifter, said first phase shifter being connected between one output port of said first coupler and one input port of said second coupler, said second phase shifter being connected between a second output port of said first coupler and a second input port of said second coupler, said first coupler having a plurality of input ports for coupling to an antenna system having a multiple beam radiation pattern;

means coupled to said second hybrid coupler for sensing a direction relative to said radiation pattern of radiant energy incident upon said antenna, said sensing means providing signals to said first phase shifter and said second phase shifter for controlling the magnitudes of said shifts whereby a null between two beams of said radiation is positioned along the direction of said incident radiant energy;

a switch for sequentially coupling said first hybrid coupler to pairs of beam output signals of said antenna system; and wherein

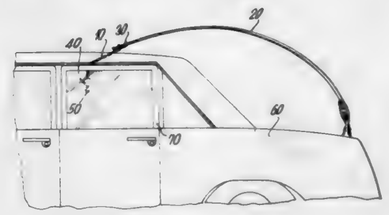
said sensing means further provides a first signal indicating that the magnitude of one of said shifts is greater than a predetermined amount, and a second signal indicating a sign of said first signal, said sensing means further comprising a counter responsive to said second signal for counting occurrences of said first signal, a count of said counter being coupled to said switch for operating said switch to a different position thereof corresponding to said count.

4,042,932

ANTENNA ANCHOR FOR AUTOMOBILES

Guy Thomas Amodeo, 202 Jefferson St., East Islip, N.Y. 11730

Filed July 13, 1976, Ser. No. 704,918
Int. Cl.² H01E *1/32*
U.S. Cl. 343—715 **2 Claims**



1. An anchor for a whip antenna comprising a flexible line means for connecting said line to an end portion of a whip antenna for automobiles and arranged to bow the antenna to a lowered position when downwardly drawn, a cushioned abutment mounted at the lead end of the flexible line and adapted to hold the antenna in a lowered position when the flexible line is clamped by a vehicle door, the flexible line extending exteriorly of the vehicle over the door gasket when the antenna is so anchored.

4,042,933

ANTENNA LINE SCAN SYSTEM FOR HELICOPTER WIRE DETECTION

Roger H. Lapp, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 19, 1976, Ser. No. 668,776
Int. Cl.² H01Q *3/12, 19/18*
U.S. Cl. 343—761 **12 Claims**

1. A line scan antenna system comprising:

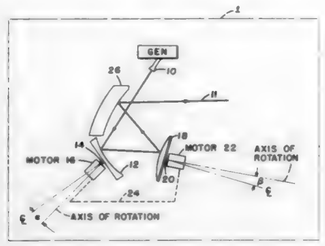
means for generating a radar ray,

a tertiary curved generally spherical concave reflector positioned to receive and reflect the radar ray generated by the ray generating means,

a secondary curved reflector of curvature opposite that of the tertiary curved reflector positioned to receive and

reflect the rays coming from the tertiary curved reflector, and

means for rotating the secondary curved reflector in a tilted fashion with respect to its optical centerline in one direc-



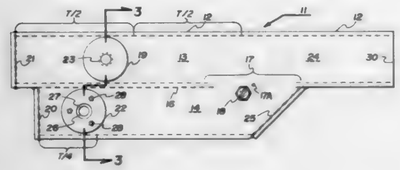
tion and for rotating the tertiary curved reflector in a tilted fashion with respect to its optical centerline synchronously and in phase but in the opposite direction of the secondary reflector to effect cancellation of reflection in one plane.

4,042,934

DOPPLER RADAR MODULE EMPLOYING COUPLED RECTANGULAR WAVEGUIDES

John W. Davis, San Diego, Calif., assignor to Radar Control Systems Corporation, San Diego, Calif.

Filed June 5, 1975, Ser. No. 584,109
Int. Cl.[2] G01S *9/42*; H01Q *13/06*
U.S. Cl. 343—786 **7 Claims**



1. A doppler radar module comprising:

a rectangular transmitting wave guide and a rectangular receiving wave guide in side by side relationship with a common wall therebetween, said transmitting wave guide having a shorted end, transmitter means based from said shorted end and an open end coupled to free space, said receiving wave guide having a shorted end and a receiver means spaced therefrom; and

an aperture disposed in said common wall, said aperture operable for coupling a portion of any transmitted energy into said receiving wave guide.

4,042,935

WIDEBAND MULTIPLEXING ANTENNA FEED EMPLOYING CAVITY BACKED WING DIPOLES

James S. Ajioka, and George I. Tsuda, both of Fullerton, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

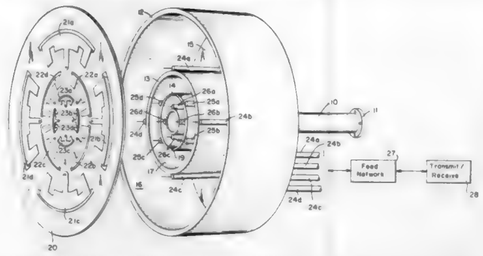
Continuation-in-part of Ser. No. 493,791, Aug. 1, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,896
Int. Cl.[2] H01Q *9/16, 21/26*
U.S. Cl. 343—795 **11 Claims**

1. An antenna feed system comprising, in combination:

a plurality of coaxially disposed conductive cylinders of progressively larger diameters, each having first and second end regions, the first end regions of said cylinders being in substantial transverse alignment;

a plurality of annular conductive members, one of said conductive members being conductively joined between adjacent cylinders across the second end regions thereof;

at least one pair of thin conductive wings extending outwardly in a generally radial direction from opposite sides of each inner cylinder toward the next adjacent outer cylinder, said conductive members being insulated from said cylinders and being substantially parallel to the plane formed by said first end regions; and



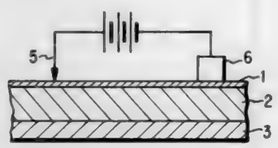
means for coupling rf energy between each of said conductive wings and a point on the first end region of the cylinder next adjacent said wing.

4,042,936

ELECTROSENSITIVE RECORDING METHOD

Akira Yoshikawa, Ebina, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed July 29, 1975, Ser. No. 600,160
Int. Cl.[2] G01D *15/06*
U.S. Cl. 346—1 **2 Claims**



1. A recording method comprising the steps of

selectively applying electric current or discharge to an electrosensitive member comprising

a substrate;

an electrically conductive, light colored intermediate layer disposed on said substrate, the color of said intermediate layer being convertible to a darker color in response to the application of said electrical current or discharge thereto; and

a white surface layer disposed directly on said intermediate layer, said white surface layer being no greater than approximately 10 microns thick;

said electric current or discharge destroying said white surface layer to selectively expose said intermediate layer in accordance with an image to be recorded, said image resulting from the color contrast between the exposed and nonexposed portions of the intermediate layer,

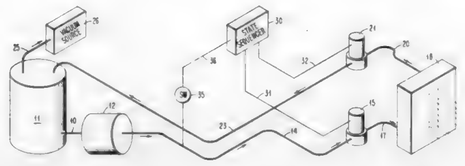
said electric current being selectively applied to said recording member by a stylus having a small contact area with said white layer, said electric current passing through said intermediate layer to a counter electrode in contact with said white layer, the contact area of said counter electrode with said white layer being substantially greater than the said contact area of said stylus with said white layer so that the white layer is not destroyed as current passes back to said counter electrode from said intermediate layer through said white layer.

4,042,937

INK SUPPLY FOR PRESSURIZED INK JET

Francis James Perry, Morgan Hill, and Anthony Vesci, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1976, Ser. No. 691,699
Int. Cl.[2] G01D *15/18*
U.S. Cl. 346—1 **14 Claims**



1. In a constant flow pressurized ink jet system including an ink jet head for forming at least one ink jet and having an inlet, an inlet valve, and a constant flow source of pressurized fluid connected to said inlet by said inlet valve, the method of attaining startup of said ink jet system with said head initially filled with fluid comprising the steps of:

closing said inlet valve;

said constant flow source increasing the pressure of said fluid upstream of said inlet valve to a pressure substantially greater than required for operation; and

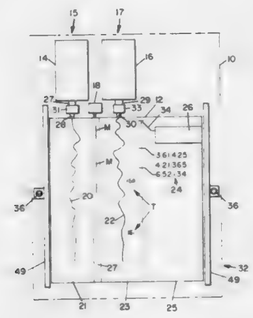
opening said inlet valve to transmit said increased pressure to said head for starting said at least one ink jet, said presure decaying to that required for operation, sustaining said at least one ink jet.

4,042,938

ANALOG AND DIGITAL DATA RECORDER

Frank Germanowski, and John A. Kazura, both of Pittsfield, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,386
Int. Cl.[2] G01D *9/30*
U.S. Cl. 346—61 **21 Claims**



1. A data recording device, which comprises:

a housing which includes a chart paper platen adjacent on which said strip chart paper is movable positioned by said transporting means;

strip chart paper movable positioned within said housing and having at least two channels for recording data information;

a data sensing means for detecting analog data signals;

a second data sensing means for detecting discrete navigational information signals and producing digital data representative thereof;

means responsive to said analog sensing means for printing said analog data on one of said channels of said strip chart paper;

means responsive to said digital sensing means for simultaneously printing said digital data on another of said channels of said strip chart paper, wherein said means for printing digital data comprises a plurality of printing modules adjacently arranged within said housing, each of said modules having a printing wheel associated therewith, each of said printing wheels having a plurality of digital indicia positioned thereon and rotatably mounted in one end of their respective printing modules, and a control means responsive to a serial train of electrical input pulses for stepping said printing wheel in proportion thereto and for continuously processing said digital data wherein said control means further comprises print control means responsive to an electrical print command signal for actuating said plurality of printing modules and includes means responsive to a reset pulse for resetting said printing wheels to an initial position, and also wherein said chart paper platen has an aperture formed therein adjacent the location of said digital data recording means; and

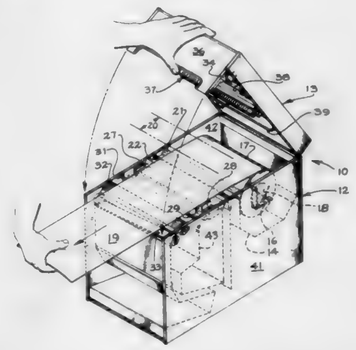
means for transporting said strip chart paper past said means for printing analog data and said means for printing digital data, wherein swift and accurate simultaneous digital and analog data correlation is obtained.

4,042,939

PRINTER/PLOTTER STYLE SYSTEM FOR CONFINED INSTALLATION AND METHOD

William A. Lloyd, San Jose; Salvatore Barone, Boulder Creek; Gerald E. Hooper, Los Altos Hills, and Keith E. McFarland, Woodside, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Sept. 12, 1975, Ser. No. 612,689
Int. Cl.[2] G01D *15/28*; G03G *15/00*
U.S. Cl. 346—153 **17 Claims**



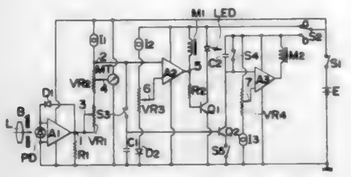
1. In a recorder system of the kind wherein a plurality of component parts are employed to produce information on a record material and including an elongate web of record material to be moved along a predetermined path, the combination comprising a housing having spaced confronting side walls, means functioning in the system as a component part of the system and extending between the confronting surfaces of said side walls, the confronting surfaces including slots formed therein in a configuration serving to receive therein end portions of said functioning means, means for affixing said end portions in said slot to employ said functioning means additionally as cross-bracing between said confronting walls of said housing, and means for forming a direct electric coupling between said walls and said component part to minimize generation of radio frequency interference and electromagnetic interference externally of said housing.

4,042,940

AUTOMATICALLY CONTROLLED EXPOSURE INDICATING DEVICE FOR A CAMERA

Motonobu Matsuda, Izumi, and Norio Beppu, Sennan, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed June 24, 1975, Ser. No. 589,859
Claims priority, application Japan, June 26, 1974, 49-72227
Int. Cl.² G03B 7/06
U.S. Cl. 354—39 **5 Claims**



1. An automatically controlled exposure indicating means in a camera having an objective lens and an adjustable diaphragm, comprising:

means for stopping-down the diaphragm from its fully open condition to the smallest diaphragm aperture prior to the exposure initiation in conjunction with the release operation;

first diaphragm aperture determining means for restraining said means stopping-down the diaphragm at a preadjusted diaphragm aperture;

a light measuring circuit for measuring the object scene light passing through the objective lens and the diaphragm;

a first circuit for generating an output corresponding to preselected shutter speed;

second diaphragm aperture determining means for restraining said means for stopping-down the diaphragm by comparing the output of said light measuring circuit with said output of said first conduit;

means for controlling the shutter speed in accordance with the output of said light measuring circuit with the diaphragm aperture determined by either said first or second diaphram determining means;

a second circuit for generating an output obtained by subtraction of *a* voltage proportional to the step numbers of diaphragm apertures to which the diaphragm can be stopped-down from the fully open condition by means of said first diaphragm aperture determining means from the output of said light measuring circuit; and

a meter circuit for indicating the shutter speed, in accordance with the output of said second circuit.

4,042,941

VEHICLE FOR TRANSPORTING AND ELEVATING ARTICLES IN RESTRICTED AREAS

Ernest E. Campbell, 1282 Mulvane, Topeka, Kans. 66604, and William H. Wells, 1317 Kallam, Topeka, Kans. 66616

Filed Dec. 29, 1975, Ser. No. 644,735
Int. Cl.² B66C 23/40
U.S. Cl. 254—139.1 **4 Claims**

1. A vehicle for transporting electrical pole mounted equipment such as a transformer to a supporting upright utility pole and hoisting said equipment to an emplacement at the top of said pole, said vehicle including:

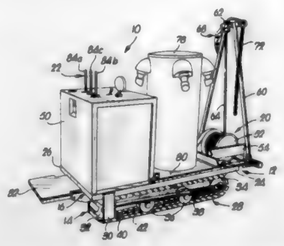
a chassis that has a narrower overall width and a shorter overall length than a standard road vehicle for rendering the vehicle maneuverable in restricted areas,

said chassis including a ground-engaging, direction controllable running gear and an elongate frame supported by said running gear;

power means carried by said frame, and operably coupled with said running gear to render said vehicle self-propelled;

hoisting mechanism mounted on said frame and operably coupled with said power means;

said mechanism including a block and tackle assembly that is releasably supportable on said pole near the top of the latter when the vehicle is hoisting said equipment;



said mechanism further including a snubber assembly for releasably securing said frame to said pole during said hoisting, so that the frame is positively restrained against vertical movement relative to the pole; and

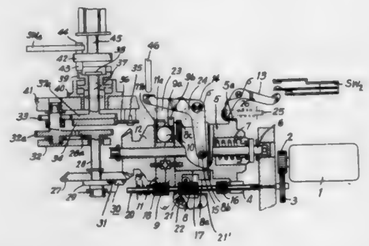
control means interconnecting said power means with said running gear and said hoisting mechanism for selectively operating the same.

4,042,942

CAMERA WITH MOTOR DRIVE

Keisuke Haraguchi, Saitama, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Filed Dec. 23, 1975, Ser. No. 643,815
Claims priority, application Japan, Dec. 28, 1974, 50-3833
Int. Cl.² G03B 1/18
U.S. Cl. 354—171 **16 Claims**



1. In a camera, combined film-transporting and shutter-cocking means having an end position in which a shutter of the camera is cocked and film in the camera has been advanced to be in position for the next exposure, said combined means also having a starting position displaced from said end position thereof and assumed by said combined means for enabling an exposure to be made, transmission means operatively connected with said combined means for displacing the latter from said starting to said end position thereof with said combined means transporting film and cocking the shutter while being displaced by said transmission means from said starting to said end position, said transmission means having the capability of releasing said combined means after the latter has reached said end position thereof and said combined means responding to release from said transmission means for automatically returning to said starting position, operating means operatively connected with said transmission means for operating the same both to displace said combined means from said starting to said end position and to release said combined means for return from said end position to said starting position thereof, said operating means having only a one-way drive connection with said transmission means for operating the latter in one direction only, and said operating means including a motor-driven drive means for responding automatically to reaching of said end position by said combined means for terminating the operation of said transmission means, and for acting on said transmission means to disconnect the latter from said combined means so as to release the latter for automatic return to said starting position thereof, so that an exposure may be made prior to the next connection of said transmission means to said combined means and the next operation of said operating means for displacing said combined means from said starting to said end position thereof.

4,042,943

STOPPING DEVICE FOR BELLOWS AND CLOSE PHOTOGRAPHY RING

Kunihiro Fukino, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 15, 1975, Ser. No. 622,518
Claims priority, application Japan, Oct. 21, 1974, 49-127166[U]
Int. Cl.² G03B 9/02
U.S. Cl. 354—272 **5 Claims**

1. A stopping device to be positioned between a camera body and a phototaking lens, the lens having a stop and a stop lever actuating the stop for stopping down the stop at an optional predetermined position, which stop has been in the fully opened position when the lens is mounted, the device comprising:

a stop interlocking member is engagement with the stop lever at its fully open stop position and movable in a first direction a distance corresponding to the moving distance of the stop lever from its fully open stop position to its minimum stop position;

a stopping member in engagement with the stop interlocking member and operable to move the stop interlocking member in said first direction; and

means to stop the movement of the stopping member at the minimum open stop position of the stop lever.

4,042,944

MONOSTABLE MULTIVIBRATOR

Tadao Yoshida, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 25, 1975, Ser. No. 571,792
Claims priority, application Japan, May 7, 1974, 49-50515
Int. Cl.² 357 34; H01L 29/78
U.S. Cl. 357—23 **5 Claims**

1. A monostable multivibrator circuit comprising:

a semiconductor device having a first semiconductor region of one conductivity type,

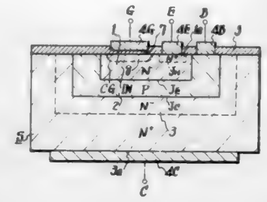
a second semiconductor region of the opposite conductivity type adjacent said first region with a first semiconductor junction therebetween,

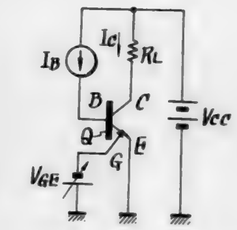
a third semiconductor region of the same conductivity type of said first region adjacent said second region with a second semiconductor junction therebetween, first, second and third terminals coupled to said first, second and third regions, respectively;

a fourth terminal connected to said semiconductor device and having at least a portion thereof located adjacent to said first region at a position which is spaced from the said first terminal, and an insulating layer separating said fourth terminal from said first region,

an emitter grounded current amplification of said device being adjustable from a relatively high value to a relatively low value by changing a voltage on said fourth terminal,

means for applying a trigger signal to the second terminal of said semiconductor device,





a circuit branch containing a capacitor, which branch connects the third and fourth terminals,

a predetermined bias being applied to said fourth terminal which is chosen such that in the absence of the trigger signal and in a steady state condition said current amplification is substantially at said relatively low value,

means for applying a power source across said first and third terminals of said device, and

second means coupled to said second terminal for biasing said device into a conducting state when said current amplification is substantially at said relatively high value.

4,042,945

N-CHANNEL MOS TRANSISTOR

Hung C. Lin, Silver Spring, and Marvin H. White, Laurel, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 447,178, Feb. 28, 1974, which is a continuation of Ser. No. 257,585, May 30, 1972, abandoned. This application July 14, 1975, Ser. No. 595,458
Int. Cl.² H01L 29/78, 27/02, 29/34
U.S. Cl. 357—23 **4 Claims**

1. An N-channel enhancement mode field effect transistor comprising:

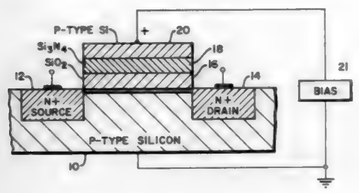
a. a substrate of P-type semiconductor material having an impurity concentration less than 10^{15} atoms per cubic centimeter;

b. first and second N-type regions within said substrate, said region respectively forming the drain and source regions of said transistor;

c. a first layer of dielectric material formed on the surface of said substrate and covering area of said substrate between said drain and source regions;

d. a second layer of insulating material overlying said first layer;

e. a layer of P-type silicon deposited on said second insulating layer, said silicon layer forming the gate of said transistor; wherein:



f. the characteristics and dimension of said substrate, said first and second insulating layers and said layers of P-type silicon are selected to cause the threshold voltage of said transistor, as calculated from the following equation:

$$V_{TN} = 2\,\phi_F + \phi_{GS} - \frac{(Q_{SS} + Q_S)}{\epsilon_o}\left(\frac{X_o}{K_o} + \frac{X_I}{K_I}\right) - \frac{X_I Q_I}{K_I \epsilon_o}$$

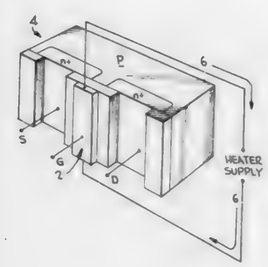
to have a selected positive value.

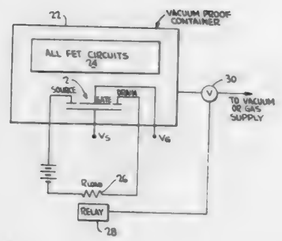
4,042,946

RADIATION HARDENED FIELD EFFECT DEVICE

Martin M. Sokoloski, Columbia, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1976, Ser. No. 748,586
Int. Cl.² H01L *29/78, 29/66, 23/36;* **G01T** *1/24*
U.S. Cl. 357—25 **10 Claims**





1. A solid state device which remains resistant to degradation generally caused by exposure to a hostile radiation environment which comprises:

a field-effect device whose gate electrodes comprise materials whose work function can be changed; and

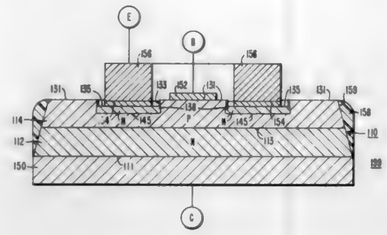
means for changing the amount of hydrogen interstitially present in the materials such that the work function of the electrode gate is varied upon a sensed change in the semiconductor's threshold voltage, whereby the degrading effects on the semiconductors threshold voltage are cancelled.

4,042,947

HIGH VOLTAGE TRANSISTOR WITH HIGH GAIN

Chang K. Chu, Pittsburgh; Philip L. Hower, Churchill Boro, and George W. Vomish, Ruffsdale, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 6, 1976, Ser. No. 646,794
Int. Cl.² H01L *29/72*
U.S. Cl. 357—34 **1 Claim**



1. A transistor comprising a wafer of semiconductor material and contacting means for making thermal and electrical contact to said wafer;

said wafer comprising a collector zone of a first type of semiconductivity disposed along a first major surface of said wafer, a base zone of a second type of semiconductivity disposed adjacent to said collector zone, a collector-base PN junction formed between said collector zone and said base zone, an emitter zone of said first type of semiconductivity disposed adjacent to said base zone, an emitter-base PN junction formed between said emitter zone and said base zone, portions of said base zone extending past said emitter zone to a second major surface of said wafer, said second major surface being parallel to said first major surface, a beveled edge surface joins the periphery of said first and said second major surfaces, said beveled edge surface forming an acute angle with said first major surface and forming an obtuse angle with said second major surface, said beveled edge surface being separated from said emitter zone by portions of said base zone, said collector-base PN junction being parallel to said major surfaces and terminating at said beveled edge surface, a recessed surface bordering said emitter zone and parallel to said major surfaces, said recessed surface located at a predetermined depth from about 1 to 20 microns in said wafer from said second major surface;

said contacting means comprising a collector electrode affixed to said collector zone at said first major surface, a base electrode affixed to said base zone at said second major surface, a first emitter electrode affixed to said emitter zone at said recessed surface, and a second emitter electrode contacting said first emitter electrode and extending past said second major surface.

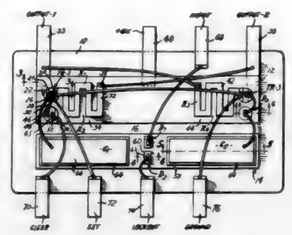
4,042,948

INTEGRATED CIRCUIT ISOLATION WITH MESAS AND/OR INSULATING SUBSTRATE

Jack S. Kilby, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 218,206, Aug. 14, 1962, abandoned, which is a continuation of Ser. No. 811,476, May 6, 1959, abandoned. This application May 20, 1974, Ser. No. 471,634
Int. Cl.² H01L *27/04, 27/12*
U.S. Cl. 357—49 **13 Claims**

1. A device comprising an insulative substrate having relatively thin overlying extrinsic single crystal semiconductor material affixed on one major surface thereof, said overlying material being shaped to provide a plurality of regions therein said regions being electrically isolated from each other by substantial electrical impedance through said substrate and



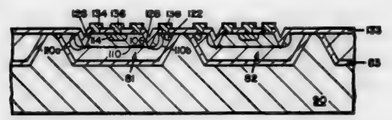
between said regions, said regions having pluralities of P-N junctions defined therein to establish independent electronically functional structures for the performance of resistive, reactive and active signal modification functions.

4,042,949

SEMICONDUCTOR DEVICES

Uryon S. Davidsohn, Scottsdale, Ariz., assignor to Motorola, Inc., Chicago, Ill.

Continuation of Ser. No. 467,964, May 8, 1974, abandoned, which is a continuation of Ser. No. 296,641, Oct. 11, 1972, abandoned, which is a division of Ser. No. 66,164, Aug. 24, 1970, Pat. No. 3,738,877. This application July 14, 1975, Ser. No. 595,948
Int. Cl.² H01L *27/12, 29/04*
U.S. Cl. 357—49 **6 Claims**



1. A transistor comprising:

a body of semiconductor material having a planar upper surface, a lower surface and sidewalls extending between said upper surface and said lower surface;

a first layer of dielectric material formed upon at least said sidewalls of said body;

said body of semiconductor material having alternate stripe like regions of opposite conductivity, one overlying the other, with a junction between adjacent regions, and said regions forming emitter, base and collector portions respectively, and each region having an individual planar surface terminating on said common upper planar surface of said body;

said base collector junction having first and second edges located substantially parallel with each other and terminating on said common planar surface and each extending transversely across said body, and the remaining edges located substantially parallel with each other and terminating against said dielectric layer beneath said upper surface;

said body being formed with a pair of grooves and each of said grooves extending vertically into said body from said base planar surface and terminating at a first end located within said collector region and extending transversely across said surface substantially parallel with each of said first and second edges;

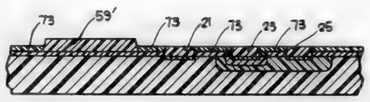
a surface layer of dielectric material adherent to said upper surface and formed within said grooves and joined with said first dielectric layer.

4,042,950

PLATINUM SILICIDE FUSE LINKS FOR INTEGRATED CIRCUIT DEVICES

William Louis Price, Saratoga, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Mar. 1, 1976, Ser. No. 662,340
Int. Cl.² H01L *27/04*
U.S. Cl. 357—51 **4 Claims**



1. A semiconductor integrated circuit comprising,

a semiconductor integrated circuit,

a plurality of spaced apart metal interconnection means integrated into said integrated circuit for linking circuit elements in said semiconductor integrated circuit, and

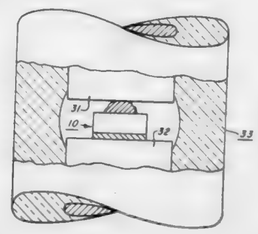
at least one metal silicide fuse link integrated into said integrated circuit having a generally elongated shape with opposite ends electrically connected to two selected of said metal interconnections, said fuse link having a cross sectional dimension which will electrically open by application of electrical power greater than a preselected threshold power.

4,042,951

GOLD-GERMANIUM ALLOY CONTACTS FOR A SEMICONDUCTOR DEVICE

John Thomas Robinson, Dallas, and Richard A. Edwards, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 25, 1975, Ser. No. 616,718
Int. Cl.² H01L *23/48, 29/46, 29/62, 29/64*
U.S. Cl. 357—67 **11 Claims**



1. A packaged semiconductor device comprising a semiconductor body having at least one ohmic contact on each of opposite sides thereof, sandwiched between the ends of two coaxial nickel-alloy plugs surrouned by a glass envelope sealed to said plugs, an alloy bond of one plug with one contact, and an alloy bond of the other plug with the other contact; each of said alloy bonds comprising a gold-germanium alloy.

4,042,952

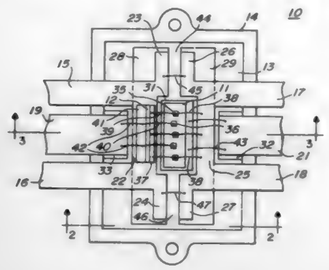
R. F. POWER TRANSISTOR DEVICE WITH CONTROLLED COMMON LEAD INDUCTANCE

Albert Victor Kraybill, Arlington Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 9, 1976, Ser. No. 694,252
Int. Cl.² H01L *23/48, 27/02, 39/02*
U.S. Cl. 357—68 **11 Claims**

1. In a high frequency transistor device including a transistor chip having emitter, base and collector areas, a relatively large area input ground lead conductor means, a relatively large area output ground lead conductor means and at least two short,

small wire leads extending from one of said emitter and base areas to separate points on said input and output ground lead conductor means, means for controlling the common lead



inductance from said one of said emitter and base areas to said input and output ground lead conductor means comprising a gap in said input and output ground lead conductor means between said separate points.

4,042,953

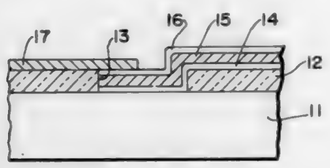
HIGH TEMPERATURE REFRACTORY METAL CONTACT ASSEMBLY AND MULTIPLE LAYER INTERCONNECT STRUCTURE

John H. Hall, Saratoga, Calif., assignor to Micro Power Systems, Inc., Santa Clara, Calif.

Continuation of Ser. No. 384,640, Aug. 1, 1973, abandoned. This application June 10, 1975, Ser. No. 585,612

Int. Cl.[2] H01L *23/48, 29/78, 27/02, 29/04*

U.S. Cl. 357—71 **13 Claims**



1. An integrated circuit interconnection structure comprising.

a silicon body having a surface,

a first insulating layer having at least one aperture formed on the surface to expose portions of the surface of said silicon body,

a refractory metal sandwich formed on the upper surface of portions of the insulating layer and at least one portion of the exposed body portion, and extending through at least one aperture to contact the silicon body,

said sandwich including solely the combination of a silicon layer formed on a body portion and on the insulating layer, a refractory metal layer formed on the silicon layer and a second silicon layer formed on the upper surface of the refractory metal layer,

a second insulating layer formed at least on portions of the upper surface of the refractory metal sandwich and on portions of the first insulating layer

at least one opening formed in said second insulating layer at said portions to expose the underlying portion of the refractory metal sandwich, and

a metal layer formed on the upper surface of portions of said second insulating layer and extending through at least one opening formed in the second insulating layer to contact said refractory metal sandwich.

4,042,954

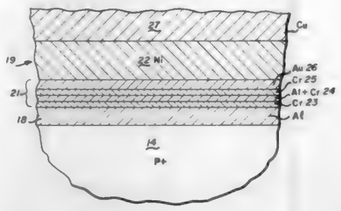
METHOD FOR FORMING GANG BONDING BUMPS ON INTEGRATED CIRCUIT SEMICONDUCTOR DEVICES

James M. Harris, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 19, 1975, Ser. No. 578,653

Int. Cl.[2] B05D *5/12;* **H01L** *23/48*

U.S. Cl. 357—71 **10 Claims**



1. The method of forming gang bonding bumps on integrated circuit semiconductive devices of the type having a metallic intraconnect pattern formed on the semiconductive device, such metallic pattern to be interconnect to other structure via the intermediary of metallic gang bonding bumps adhered to and rising above the metallic intraconnect pattern, the steps of:

vacuum vapor depositing a layer of chromium within the range of 40 to 200 anstroms thickness overlaying the selected areas of the metallic intraconnect layer which are to receive the gang bonding bumps;

vacuum vapor depositing a layer of aluminun amd chromium within the range of 3,000 to 20,000 angstroms thickness over said chromium layer, such aluminum and chromium layer having a preponderance of aluminum therein;

vacuum depositing a second layer of chromium within the range of 50 to 3,000 angstroms thickness overlaying the aluminum and chrominum layer; and

depositing the gang bnding bump overlaying the second chromium layer.

6. In a semiconductive device of the type having gang bonding bumps adhered to an underlaying metallic intraconnect pattern via the intermediary of a multilayered transistion region, the transition region including:

a layer of chromium within the range of 40 to 200 angstroms thickness overlaying the selected areas of the metallic intraconnect lyer which are to receive the gang bonding bumps;

a layer of aluminum and chromium within the range of 3,000 to 20,000 angstroms thickness overlaying the chromium layer, such aluminum and chromium layer having a preponderance of aluminum therein; and

a second layer of chromium within the range of 50 to 3,000 angstroms thickness overlying said chromium layer.

4,042,955

RESIN-SEALED ELECTRICAL DEVICE

Takeshi Imai, Oobu; Tsutomu Niwa, Kariya, and Kenji Motani, Kagoshima, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Continuation of Ser. No. 480,580, June 18, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 668,813

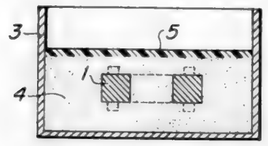
Claims priority, application Japan, June 22, 1973, 48-70917

Int. Cl.[2] H01L *23/28, 23/30, 23/36*

U.S. Cl. 357—72 **3 Claims**

1. In a resin sealed electrical device comprising a case, a layer of finely divided insulating material and electrical elements both retained within said case and a resinous cover layer sealing said case,

the improvement of providing a weather-resistant and shock-resistant device comprising using a finely divided insulating layer having a grain size between about 61 and 4760 microns in size, in combination with a low viscosity resin cover layer which resin is at least partially impregnated into the finely divided insulating layer securing and



retaining the insulating layer within said case and forming a weather-resistant cover layer sealing said case and the insulating layer and electrical elements contained therein.

4,042,956

SOLID STATE TELEVISION CAMERA HAVING A SPECIAL COLOR FILTER ARRANGEMENT

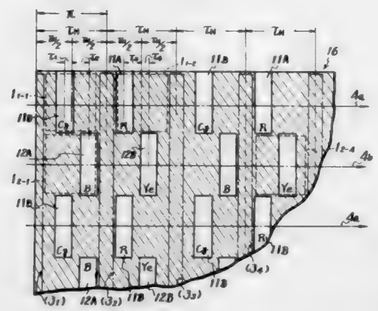
Seisuke Yamanaka, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 21, 1975, Ser. No. 606,479

Claims priority, application Japan, Aug. 22, 1974, 49-96367

Int. Cl.[2] H04N *9/04*

U.S. Cl. 358—41 **6 Claims**



4. In a television camera the combination of a photo sensitive array comprised of individual photo sensing cells for producing a signal in relation to the light intensity projected thereon,

a temporary storage array for storing electric charges generated by the light input to said photo sensing cells, a read out register for reading out signals from said temporary storage array, a filter array disposed in front of the photo sensitive array and having filter elements aligned with individual ones of said photo sensing cells, the filter elements being disposed in horizontal rows with the filter characteristics of alternate horizontal rows being alike and the filter characteristics of adjacent horizontal rows being dissimilar.

4,042,957

DISPLAY SYSTEMS

Stafford Malcolm Ellis, Maidstone, England, assignor to Elliott Brothers (London) Limited, Chelmsford, England

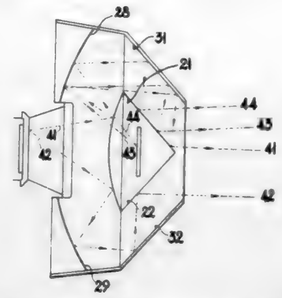
Filed Nov. 19, 1975, Ser. No. 633,501

Claims priority, application United Kingdom, Nov. 29, 1974, 51842/74

Int. Cl.[2] H04N *5/74;* **G02B** *5/04*

U.S. Cl. 358—109 **7 Claims**

1. A head-up display unit having: at least a part so disposed, when in used in a vehicle, as to intercept the line of sight of an observer using the unit to view a scene lying ahead of him; a light deflecting arrangement which enables the observer to see said scene substantially as if said part of the display unit were absent; a source of luminous signals; and optical means for projecting light rays from the source of luminous signals into the light deflecting arrangement so as to be deflected by said light deflecting apparatus thereby to be coincident with, and thence to follow substantially the same optical path through



the light deflecting arrangement as rays originating from said scene so to present to the observer using the unit a collimated display of said luminous signal source within his angular field of view of the said scene.

4,042,958

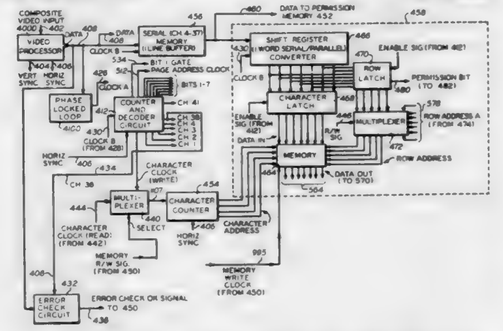
ROW GRABBING SYSTEM

Richard Saylor, Monsey, and Robert H. Nagel, New York, both of N.Y., assignors to IDR, Inc., Farmingdale, N.Y.

Filed Sept. 10, 1975, Ser. No. 611,843

Int. Cl.[2] H04N *1/02*

U.S. Cl. 358—141 **25 Claims**



1. A real time frame grabbing system for substantially instantaneously providing a continuous video display of a selectable predetermined video frame of information on a video display means from continuously transmittable video information comprising means for transmitting said video information as a plurality of pseudo video scan lines, each of said pseudo video scan lines having a television video scan line format and capable of comprising a complete self-contained packet of digital information sufficient to provide an entire displayable row of video data characters, said pseudo video scan line having an associated transmission time equivalent to said television video scan line, said packet of digital information comprising at least address information for said displayable row and data information for said displayable characters in said displayable row, each of said pseudo video scan lines further comprising a horizontal sync signal at the beginning thereof and a start bit pulse between said horizontal sync signal and said packet of digital information, said horizontal sync signal providing a record separator between adjacent pseudo video scan lines, said transmitting means further comprising means for providing a vertical sync signal signal after a predetermined plurality of pseudo video scan lines have been transmitted, said pseudo video scan line being a composite video signal, said system further comprising television signal distribution means for distributing said transmitted composite pseudo video scan line signals to said video display means for providing said continuous video display and receiver means operatively connected

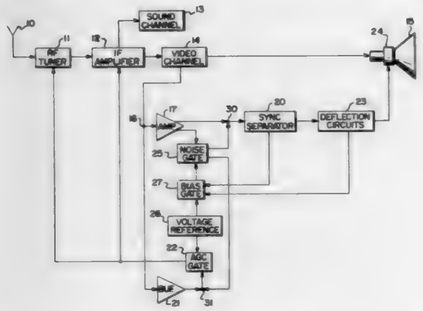
between said television signal distribution means and said video display means for processing said distributed composite pseudo video scan line signals and capable of providing a displayable video row signal to said video display means from each of said pseudo video scan line signals pertaining to said selected frame for providing said containing video display, a predetermined plurality of displayable video rows comprising a displayable video frame of information, said start bit pulse providing a unique synchronizing pulse for each transmitted pseudo video scan line for enabling precise determination of a sampling time for the received distributed pseudo video scan line to enable accurate determination of the binary state of the bits comprising said digital information packet, said receiver signal processing means comprising means responsive to the occurrence of said start bit for each distributed pseudo video scan line for providing a reset signal for resetting said processing means in response to detection of said start bit, whereby noise immunity and accurate signal information detection are enhanced.

4,042,959

NOISE SUPPRESSION CIRCUIT

Arthur H. Klein, Oakfield, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed May 7, 1976, Ser. No. 684,245
Int. Cl.² H04N *5/44, 5/21*
U.S. Cl. 358—167 **2 Claims**



1. In a television receiver having a gain controlled signal receiver for providing a composite video signal, an automatic gain control circuit for providing a gain control signal to said signal receiver, and a synchronizing pulse separator, a noise suppression circuit comprising:

first and second video signal coupling means each connected to said signal receiver for coupling at least the synchronizing pulses contained in said composite video signal to said synchronizing pulse separator and to said automatic gain control circuit, respectively;

noise detecting means connected to one of said first and second video signal coupling means for detecting noise contained in said composite video signal which has a predetermined amplitude relationship with said synchronizing pulses and for providing a noise signal representation thereof;

direct current coupling means connected to said noise detecting means and to said first video signal coupling means for coupling said noise signal to said first video signal coupling means for cancelling said moise contained in said composite video signal;

alternating current coupling means connected to said noise detecting means and to said second video signal coupling means for coupling said noise signal to said second video signal coupling means for cancelling said noise contained in said composite video signal, said alternating current coupling means coupling a noise signal of less than a predetermined duration; and

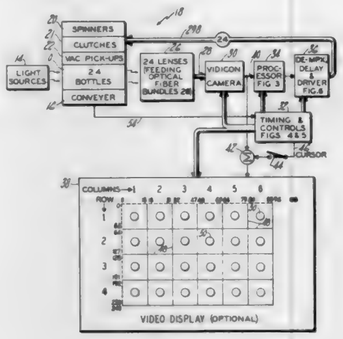
a voltage reference circuit for providing a first reference voltage to said automatic gain control circuit and a second reference voltage to said noise detecting means, said second reference voltage having a predetermined relationship to said first reference voltage for establishing a noise detecting level that exceeds the level of said synchronizing pulses by a predetermined amount, wherein said voltage reference circuit includes means for altering said second reference voltage during synchronizing pulse intervals of said composite video signal for increasing the predetermined amount by which said noise detecting level exceeds the level of said synchronizing pulses.

4,042,960

THRESHOLD SAMPLING OF VIDICON CAMERA

Harold C. Wooding, Jr., Trumbull, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Dec. 31, 1975, Ser. No. 645,577
Int. Cl.² H04N *5/30*
U.S. Cl. 358—217 **6 Claims**



1. Apparatus for threshold sampling a plural image video pattern within the field of view of a vidicon camera comprising:

a vidicon camera;

a plurality of optical means for presenting patterns of light disposed within the field of view of said vidicon camera in mutually dispersed relationship to provide independent images to said vidicon camera, each optical means providing a corresponding unitary image dispersed over a related one of a plurality of finite regions of said vidicon camera;

digital clock means for providing a plurality of time-related sequences of controlling signals, said digital clock means providing horizontal and vertical synchronizing signals to said vidicon camera to cause horizontal and vertical scanning thereof synchronized with said controlling signals, said controlling signals including a plurality of bit time signals dividing each horizontal scan of said vidicon camera into increments less than said finite regions, and including a plurality of column signals relating to the horizontal scan time of corresponding ones of said finite regions; and

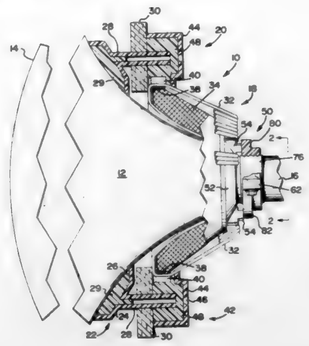
sampling means responsive to said vidicon camera and to said digital clock means for sampling the signal output of said vidicon camera a plurality of times during each horizontal scan of each of said unitary images in the field of view of said vidicon camera in response to said controlling signals and for providing separate signal manifestations of the number of times that the video output of said vidicon camera is of a magnitude exceeding a threshold magnitude for each of said finite regions.

4,042,961

ELECTRO-OPTICAL TRANSDUCER SYSTEM

Francis J. Kraft, Waterloo, and Peter G. Puhak, Seneca Falls, both of N.Y., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Feb. 13, 1976, Ser. No. 657,712
Int. Cl.² H04N *5/645*
U.S. Cl. 358—248 **8 Claims**



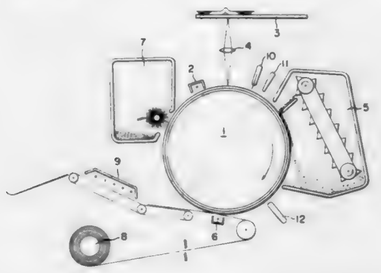
1. In an electro-optical transducer system employing a cathode ray tube having a substantially frusto-conical body terminating at its wide end in a viewable face plate and at its narrow end in a cylindrical neck and having a deflection yoke substantially permanently bonded thereto adjacent to the junction of said neck to said body by intermediate mounting means in a manner which inherently provides unwanted stresses upon said yoke, theimprovement comprising: yoke stress relief means mounted upon said neck and in contact with said yoke.

4,042,962

COMPOSITE INFORMATION OPERATING METHOD AND APPARATUS

Keizo Yamaji, Tokyo, and Akira Kurahashi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 229,356, Feb. 25, 1972, abandoned. This application Aug. 26, 1975, Ser. No. 607,960
Claims priority, application Japan, Mar. 1, 1971, 46-10826; Mar. 5, 1971, 46-12090; Mar. 6, 1971, 46-12014
Int. Cl.² G03G *15/22*
U.S. Cl. 358—300 **5 Claims**



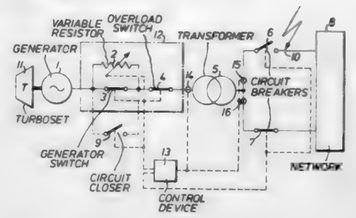
1. A method of recording composition information on an endless photosensitive member as said member is rotated, wherein said member is incorporated into a device further including means for charging said member, means for supporting an original to be copied, optical means between the supporting means and said member for projecting a light image of the original onto said member, an electrostatic recording head, and a separate charge detecting scanner and transmission head, said method comprising the steps of first uniformly charging a portion of said member with said charging means, then forming an electrostatic latent image of the original on said portion with said optical means, then forming a further electrostatic latent image on said portion from information received by said recording head, and detecting and transmitting the electrostatic latent images formed on said portion with said charge detecting scanner and transmission head, wherein all of the method stops are completed during a single rotation of said member.

4,042,963

REDUCTION OF MECHANICAL STRESSES ON TURBOSETS UPON OCCURRENCE OF THREE-POLE MAINS SHORT CIRCUITS NEAR GENERATORS

Karl Kriechbaum, Kassel-Ki, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Jan. 20, 1976, Ser. No. 650,757
Claims priority, application Germany, Jan. 25, 1975, 2503034
Int. Cl.² H02H *7/06*
U.S. Cl. 361—20 **6 Claims**



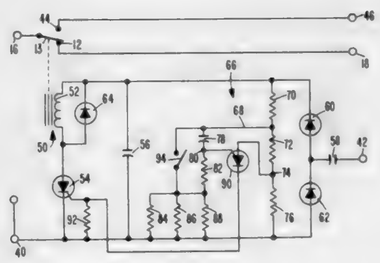
1. A method for reducing mechanical stresses on the shaft of turbosets and on the shaft of the generator coupled to the shaft of the turboset upon the occurrence of a three-pole mains short circuit near the generator and upon the subsequent elimination of the short circuit, comprising the steps of: providing a normally closed generator switch having a parallelly connected resistor, which has a size equal to approximately 80% of the full load value for the generator, between the output of the generator and the mains; opening the generator switch upon the occurrence of a short circuit to switch the resistor into the load circuit of the generator; and bridging the resistor when the short circuit is switched off of the mains by a switch provided later on in the mains.

4,042,964

MOTOR PROTECTION CIRCUIT

Richard K. Nurnberg, Norristown, and Charles H. Perkins, Newtown Square, both of Pa., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 15, 1975, Ser. No. 640,676
Int. Cl.² H02H *7/08*
U.S. Cl. 361—28 **9 Claims**



1. A protection circuit unit for controlling an energization circuit for a motor, the protection circuit unit comprising

a relay having a winding, contact means for controlling the energization circuit, means responsive only to a current in

the winding greater than a predetermined current for operating the contact means, latching means for maintaining the contact means in a operated position after termination of the predetermined current, and resetting means for returning the contact means to the unoperated position;

a first capacitor;

a pair of AC voltage input terminals;

one of said pair of AC voltage terminals connected to one side of the first capacitor;

a pair of diodes serially connected with the same polarity across the first capacitor;

a second capacitor having one side connected to the junction between the pair of diodes;

said second capacitor having its other side connected to the other of the pair of AC voltage terminals and having an impedance value sufficient to limit current through the input terminals to substantially less than the predetermined current;

switch means connected in series with the winding across the first capacitor;

said first capacitor having a capacitance value greater than the second capacitor and sufficient to produce a momentary current through the winding exceeding the predetermined current at a minimum supply voltage when the switch means is closed; and

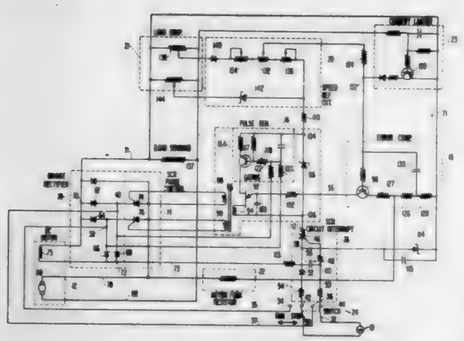
condition sensing means for operating the switch means.

4,042,965

POWER INTERRUPTION SAFEGUARD APPARATUS

Franklin O. Wisman, Chambersburg, Pa., assignor to T. B. Wood's Sons Company, Chambersburg, Pa.

Filed May 6, 1976, Ser. No. 683,758
Int. Cl.² H02H *7/08*
U.S. Cl. 361—29 **26 Claims**



1. In electrical apparatus wherein power is supplied from a power source to a load through power conversion means which has its operation controlled in accordance with control signals applied thereto from control circuit means powered by a supply potential generated from said power source, said control circuit means producing said control signals when operative, the improvement comprising:

circuit interrupter means, having controlled conductive and non-conductive operating states, coupled to said control circuit means for rendering said control circuit means operative when in said conductive operating state; and

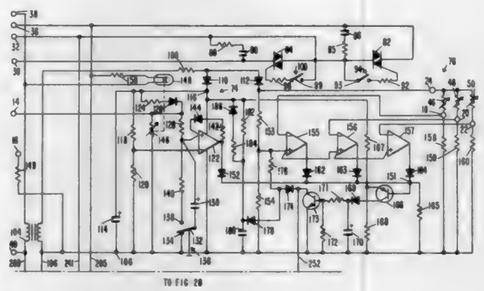
circuit means coupled to said circuit interrupter means and being operable to first apply said power source to said circuit interrupter means for causing said interrupter means to assume said conductive operating state and then subsequently disconnect said power source from said circuit interrupter means and apply said power source to said power conversion means, said circuit interrupter means assuming said non-conductive operating state in the event of a power outage from said power source to render said control circuit means inoperative until said circuit means reapplies said power source to said circuit interrupter means.

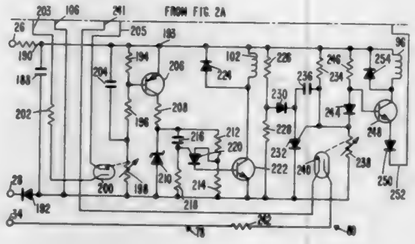
4,042,966

MOTOR CONTROL CIRCUIT

Dennis E. Newell, El Segundo, and Hugh J. Tyler, Santa Ana, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 15, 1976, Ser. No. 649,432
Int. Cl.² H02H *5/04*
U.S. Cl. 361—27 **21 Claims**





7. In a control circuit adapted for use with a motor having a set of main windings and a set of start-up windings, the combination comprising

an oil pressure responsive circuit responsive to the lubricant pressure in the motor,

a thermal protection circuit responsive to the temperature of the motor,

a first transistor controlled by both the oil pressure responsive circuit and the thermal protection circuit,

a second transistor,

first switching means controlled by said first and second transistors to selectively energize the start-up windings of the motor,

a limit switch responsive to a limit condition on the motor operation,

a lock-out circuit responsive to the actuation of the limit switch to inhibit conduction of the second transistor to prevent operation of the motor,

reset means to reset the lock-out circuit,

a time delay circuit actuated by the energization of the start-up motor windings by the first switching means, and

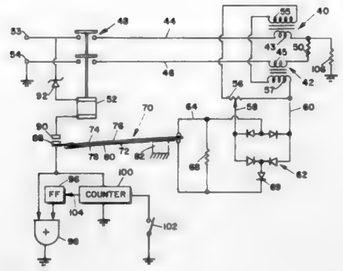
second switching means operated by the time delay circuit to energize the main motor windings after a predetermined time delay.

4,042,967

GROUND FAULT SENSOR

Yujiro Yamamoto, 1880 Park Newport, Newport Beach, Calif. 92660

Filed Oct. 28, 1975, Ser. No. 625,922
Int. Cl.² H02H *3/16*
U.S. Cl. 361—45 **13 Claims**



1. A ground fault detector for connection in a pair of electrical power lines and comprising:

a switch connected in series in one of said lines;

actuating means in the form of a piezo-electric element of the kind that changes dimensions when subjected to an electric field for actuating said switch;

electrically chargeable means chargeable to create an electric field in said piezo-electric element sufficient for rendering said actuating means operable to actuate said switch; and

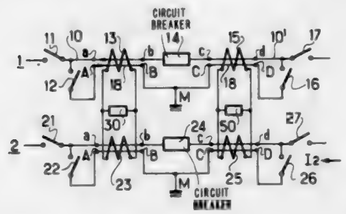
charging means responsive to differences between the electrical state of the lines of said pair of lines for charging said electrically chargeable means.

4,042,968

HIGH-VOLTAGE ELECTRICAL INSTALLATION

Georges Kypréos, Ste. Foy les Lyon, and Lucien Orgeret, Lyon, both of France, assignors to Delle-Alsthom, Villeurbanne, France

Filed Mar. 8, 1976, Ser. No. 664,638
Claims priority, application France, Mar. 14, 1975, 75.08648
Int. Cl.² H02H *3/26*
U.S. Cl. 361—60 **7 Claims**



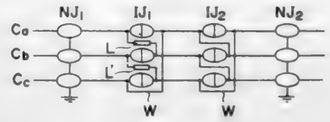
1. A multi-phase high-voltage electrical installation comprising, for each phase, at least two circuit fields, each field including, along a phase conductor, a circuit breaker arranged between first and second isolating switches; a first current transformer arranged between said first switch and said circuit breaker; a second current transformer arranged between said circuit breaker and said second switch; said first transformers of said circuit fields being connected to a first common load, said second transformers being connected to a second common load; a first ground isolator connected to said phase conductor between said first transformer and said first switch; a second ground isolator connected to said phase conductor between said second transformer and said second switch; wherein the magnetic circuit of each said current transformers, which are connected to the same load, is crossed simultaneously by said phase conductor of the circuit field to which that transformer belongs; and an auxiliary conductor connecting said ground isolator of the same circuit field at least temporarily to ground.

4,042,969

ELECTRIC CABLE POWER TRANSMISSION LINES

Teruji Nikaido, Ichihara; Kaoru Haga, Tokyo, and Yasutaka Fujiwara, Yokohama, all of Japan, assignors to Tokyo Electric Power Co. Ltd., Tokyo and Showa Electric Wire & Cable Co. Ltd., Kawasaki, both of, Japan

Filed June 26, 1975, Ser. No. 590,564
Claims priority, application Japan, June 27, 1974, 49-76379[U]
Int. Cl.² H02H *7/22*
U.S. Cl. 361—107 **9 Claims**



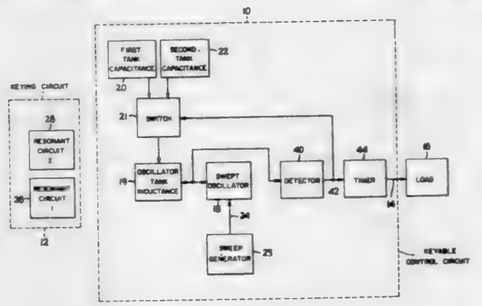
1. An electric cable power transmission line of the class wherein three phase metal sheath single core power cable sections are interconnected by junction boxes comprising, three single core power cables having metal sheaths, two sets of ordinary junction boxes each at opposite ends of a cable section, means for grounding each set of ordinary junction boxes, two sets of insulating junction boxes in each cable section between each set of ordinary junction boxes, cross-connecting wire means for connecting the metal sheaths of one power cable on one side of the insulating junction boxes to the metal sheaths of another power cable on the other side of the insulating junction boxes, thereby forming three loop circuits, each loop circuit including the grounding connections of the ordinary junction boxes, the metal sheaths of the cable sections, and the cross-connecting wire means, and no more than two saturable reactors, each connected in series with no more than two cross-connecting wire means thus providing no more than two loop circuits with saturable reactors.

4,042,970

DUAL FREQUENCY NARROW-BAND FREQUENCY MODULATED KEYABLE CONTROL CIRCUIT AND KEYING CIRCUIT THEREFOR

Carl E. Atkins, Montclair, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Feb. 13, 1976, Ser. No. 657,760
Int. Cl.² E05B *49/00*
U.S. Cl. 361—172 **9 Claims**



1. A keyable control circuit and keying circuit therefor comprising:

a. an rf oscillator operating at a first mean frequency;

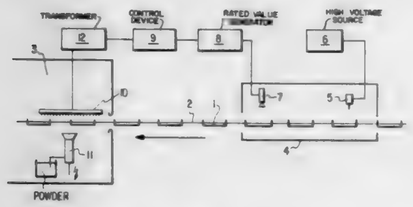
b. means for cyclically varying the frequency of said rf oscillator about its mean frequency;
c. means for producing a first signal each time said oscillator is swept past some frequency within said cyclic frequency variation about said first mean frequency;
d. means for detecting said first signal;
e. means, operative in response to detection of said first signal, for shifting the mean frequency of said rf oscillator to a second mean frequency, the magnitude of said mean frequency shift being greater than twice the peak-to-peak amplitude of said cyclic variation imposed on said first and second mean frequencies;
f. means for producing a second signal each time said oscillator is swept past some frequency within said cyclic frequency variation about said second mean frequency;
g. means for detecting said second signal; and
h. means operative in response to detection of said second signal to generate a control signal.

4,042,971

ELECTROSTATIC CHARGE NEUTRALIZATION

Hermann Brennecke, Schwambstrasse 37, D-6100 Darmstadt, and Horst Liere, Sandweg, D-6116 Eppertshausen, both of Germany

Continuation-in-part of Ser. No. 511,307, Sept. 30, 1974, abandoned. This application May 10, 1976, Ser. No. 684,555
Int. Cl.[2] H01T *19/00*
U.S. Cl. 361—213 **2 Claims**



1. In a process for applying, to a conductive workpiece arranged to move through a coating installation, a layer of material by spray means providing a spray of such material which is applied to the workpiece with the aid of an electrostatic field, the improvement comprising conducting electrostatic charges on the workpiece to ground, at least while such layer is being applied to the workpiece, by ionizing the air adjacent a portion of the workpiece by means of a discharging device maintained out of contact with the workpiece and disposed near the path of travel of the workpiece through the installation so that the effective range of the discharging device communicates with the workpiece while being outside of the spray range of the spray means.

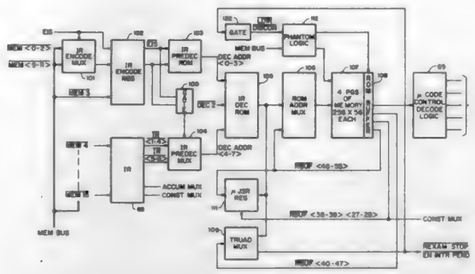
4,042,972

MICROPROGRAM DATA PROCESSING TECHNIQUE AND APPARATUS

Ronald Hans Gruner, Framingham, and Carl Justin Alsing, Hopkinton, both of Mass., assignors to Data General Corporation, Westboro, Mass.

Filed Sept. 25, 1974, Ser. No. 509,182
Int. Cl.[2] G06F *9/16, 13/00*
U.S. Cl. 364—200 **14 Claims**

1. In a microprogrammed data processing system including instruction register means, a microprogrammed processor used for processing microinstructions that facilitate the generation of system control signals comprising in combination:
control storage means having said microinstructions stored therein;
means for addressing said control storage means to select one of said microinstructions;
microinstructions decode means connected from said control storage means for deriving a set of decode control signals from said one of said microinstructions;
pre-decode ROM means, connected from said instruction register means for receiving a first group of signals from op code stored in said instruction register means and for providing one set of signals corresponding thereto;
pre-decode multiplexer means, connected from said instruction register means for receiving a second group of signals from said op code and for providing a second set of signals corresponding thereto; and
ROM decode means, connected directly from both said pre-decode ROM means and said pre-decode multiplexer means, for receiving said one set and said second set of signals and responsive thereto for controlling said addressing means.

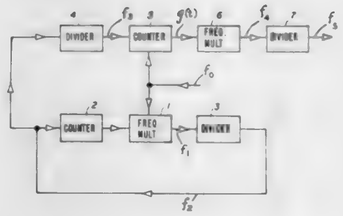


4,042,973

CLOSED LOOP FEEDBACK DIGITAL SYSTEM FOR EXPONENTIALLY VARYING SIGNAL FREQUENCY

Patrick J. Caulfield, Wayzata; Robert E. Diesch, Rogers, and Gerald R. Strunc, Maple Grove, all of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Apr. 5, 1976, Ser. No. 673,368
Int. Cl.[2] G06F *15/20;* G01R *23/02;* H03K *21/00*
U.S. Cl. 235—150.3 **3 Claims**



1. An electronic closed loop digital feedback system for producing square wave type output signal of essentially exponentially varying frequency from a constant frequency square wave type input signal, the system comprising:
first frequency multiplier means for generating a first signal, the frequency of which is equal to the frequency of the input signal multiplied by a first multiplication factor,
first frequency divider means for receiving the first signal and producing a second signal with a frequency directly proportional to the frequency of said first signal,
first counter means connected to the first frequency multiplier means for determining the first multiplication factor thereof, the first counter means being responsive to the cycles of the second signal, the frequency of the second signal increasing when the first counter means is being incremented and decreasing when the first counter means is being decremented,

second frequency divider means for receiving the second signal and producing a third signal of a frequency directly proportional to the frequency of the second signal,
second frequency multiplier means for receiving the input signal and generating an output signal of a frequency equal to the frequency of the input signal multiplied by a second multiplication factor, and
second counter means connected to the second frequency multiplier means for determining the second multiplication factor, the second counter means being responsive to the cycles of the third signal, the frequency of the output signal increasing when the second counter means is being incremented and the first counter means is being decremented and decreasing when the second counter means is being decremented and the first counter means is being incremented.

DESIGN PATENTS

GRANTED AUGUST 16, 1977

ERRATA

For CLASS	See PATENT NO.
013–001	245,432
014–028	245,433
024–017	245,434
024–054	245,451
024–041	245,452
028–018	245,453
028–051	245,459
028–046	245,460

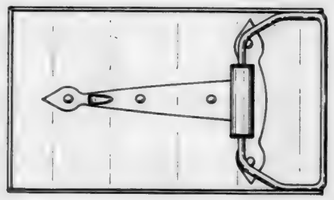
DESIGNS

AUGUST 16, 1977

245,376
CHILD'S LIFE JACKET
Maurice H. O'Link, St. Cloud, Minn., assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Nov. 5, 1975, Ser. No. 628,947
Term of patent 14 years
Int. Cl. D2—*02*
U.S. Cl. D2—27



245,377
BELT BUCKLE
Paul A. Romano, Lane 1, Brookville, N.Y. 11753
Filed Mar. 22, 1976, Ser. No. 668,959
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—447



245,378
CHAIR
Hans Roericht, Ulm, Germany, assignor to Wilkhahn Wilkening & Hahne, Germany
Filed Nov. 19, 1975, Ser. No. 633,593
Claims priority, application Germany, June 6, 1975, 22368
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



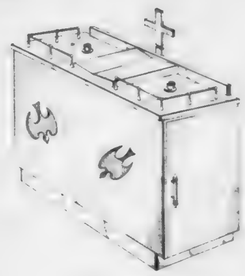
245,379
OTTOMAN
Lester Beall, Jr., High Point, N.C., assignor to Trend Line Furniture Corporation, Amsterdam, N.Y.
Filed Apr. 21, 1976, Ser. No. 678,835
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



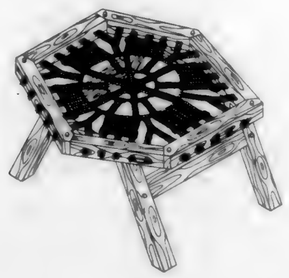
245,380
ARM CHAIR
Henry Olko, Chicken Valley Road, Locust Valley, N.Y. 11560
Filed Nov. 7, 1975, Ser. No. 630,076
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—57



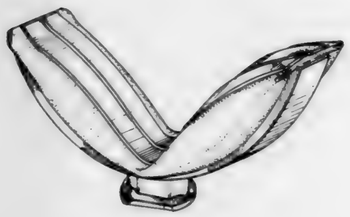
245,381
FAMILY PRAYER ALTAR
Ebert Lee Lilley, Rte. No. 1, Box 182, High Point, N.C. 27260
Filed Sept. 18, 1974, Ser. No. 506,975
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D6—155



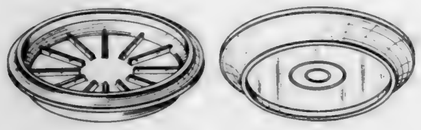
245,382
TABLE
Larry L. Hughes, 2923 Winter St., Fort Wayne, Ind. 46806; Don E. Lutz, 9314 Kress Road, Fort Wayne, Ind. 46809, and Mark A. Hade, R.R. No. 1, Grabill, Ind. 46741
Filed Feb. 27, 1976, Ser. No. 661,944
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



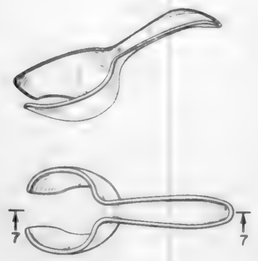
245,383
HOLDER FOR PHOTOGRAPHIC LENSES
George O. Stanley, Sunland, Calif., assignor to The Kalt Corporation, Santa Monica, Calif.
Filed Mar. 1, 1976, Ser. No. 662,424
Term of patent 7 years
Int. Cl. D6—*04*
U.S. Cl. D6—188



245,384
COMBINED COASTER AND COVER OR THE LIKE
Harold P. Ashton, Province, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Jan. 26, 1976, Ser. No. 652,455
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—45



245,385
EGG SCOOP OR THE LIKE
Harold P. Ashton, Providence, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed May 19, 1976, Ser. No. 687,959
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—104



245,386
SPOON OR SIMILAR ARTICLE
Ellen B. Manderfield, Syracuse, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 15, 1975, Ser. No. 640,407
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



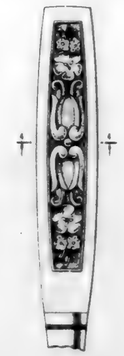
245,387
FRUIT SCOOP OR THE LIKE
Roger P. Beauchamp, Harrisville, RI, assignor to Dart Industries Inc., Los Angeles, Calif.
Filed Apr. 21, 1976, Ser. No. 678,841
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—149



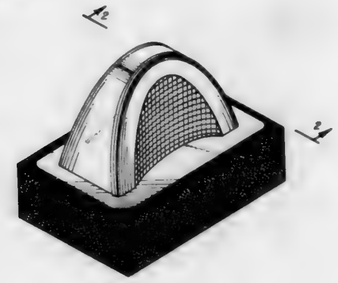
245,388
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 15, 1975, Ser. No. 640,406
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—150



245,389
SPOON OR SIMILAR ARTICLE
Colin B. Richmond, II, Oneida, N.Y., assignor to Oneida Ltd., Oneida, N.Y.
Filed Dec. 15, 1975, Ser. No. 640,405
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—151



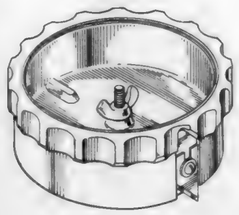
245,390
SCRUB SPONGE OR SIMILAR ARTICLE
Earl E. Hoyt, Ramsey, N.J., assignor to American Cyanamid Company, Stamford, Conn.
Filed July 28, 1976, Ser. No. 709,575
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



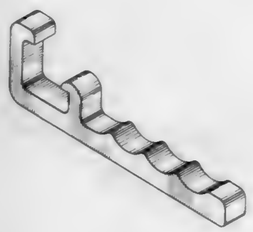
245,391
GARBAGE BAG HOLDER
Norman Thorpe, 616 S. Monroe St., Stoughton, Wis. 53589
Filed Feb. 26, 1976, Ser. No. 661,723
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—189



245,392
CARPET REPAIR TOOL
Hollis H. Bascom; John J. Greci, both of Livermore, and Merle R. Hoopengardner, Lafayette, all of Calif., assignors to Orcon Corporation, Union City, Calif.
Filed June 9, 1976, Ser. No. 694,214
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—15



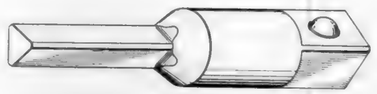
245,393
FOOD CARTON OPENER
Dean J. Madsen, 21 Middleridge Lane North, Rolling Hills, Calif. 90274; Robert G. Madsen, 6801 Lawn Haven Drive, Huntington Beach, Calif. 92648, and Gordon W. Nichols, 13241 Rutgers Ave., Downey, Calif. 90241
Filed Nov. 12, 1975, Ser. No. 630,978
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—18



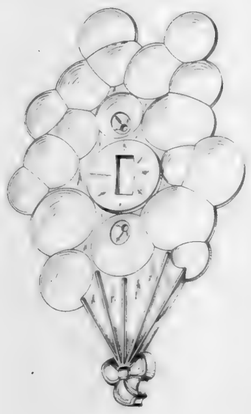
245,394
TOOL FOR PRESSING SICKLE BUSHINGS
Larry J. Knecht, P.O. Box G, Paola, Kans. 66071
Filed May 6, 1976, Ser. No. 683,890
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—51



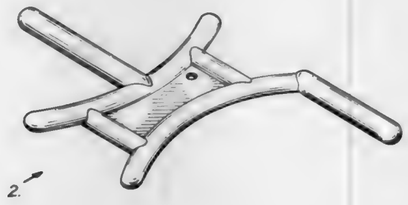
245,395
DRIVE ADAPTOR FOR SOCKETS OR THE LIKE
George Cognevich, 502 Moncla Ave., Belle Chasse, La. 70037
Filed June 14, 1976, Ser. No. 695,433
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70



245,396
WALL PLATE
Joan Klatil Creamer, Warwick, R.I., assignor to General Electric Company
Filed Aug. 30, 1971, Ser. No. 502,300
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—351



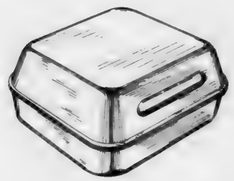
245,397
STRING REEL
Alfred D. Duncan, 792 Cambridge, Elmhurst, Ill. 60126
Filed Mar. 8, 1976, Ser. No. 664,746
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D8—359



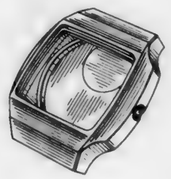
245,398
BOTTLE OR SIMILAR ARTICLE
Adam J. Grodin, Forrest Hills, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Apr. 24, 1975, Ser. No. 571,168
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—71



245,399
PACKAGING CONTAINER FOR LIGHT BULBS OR THE LIKE
Stephen F. Walker, Denver, Colo., assignor to Alan P. McGregor, Denver, Colo.
Filed Dec. 3, 1975, Ser. No. 637,150
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—183



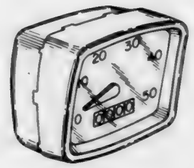
245,400
WRISTWATCH CASE
Eiichi Osawa; Midori Miyata, both of Tokyo, and Susumu Karibe, Matsudo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan
Filed Aug. 7, 1975, Ser. No. 602,721
Claims priority, application Japan, Feb. 14, 1975, 50-6308
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30



245,401
GAUGE FOR CHECKING THE HEIGHT OF TENNIS NETS
William L. Kahn, Sarasota, Fla., assignor to Net Check, Inc., Sarasota, Fla.
Filed May 13, 1976, Ser. No. 685,776
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



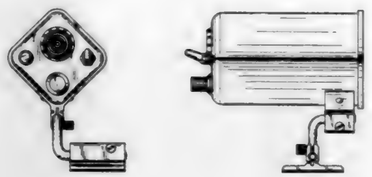
245,402
SPEEDOMETER
Howard J. Rasmussen, Fox River Grove, Ill., assignor to Stewart-Warner Corporation, Chicago, Ill.
Filed Jan. 7, 1976, Ser. No. 647,115
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—98



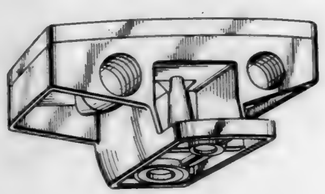
245,403
SPOKE-MOUNTED BICYCLE REFLECTOR
Yuzuru Kagayama, Osaka, Japan, assignor to Tsuyama Manufacturing Company, Ltd., Japan
Filed July 18, 1975, Ser. No. 597,386
Claims priority, application Japan, Jan. 24, 1975, 50-3362
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—111



245,404
POLICE RADAR DETECTOR
James David Koncak, Dallas, and Joseph T. Spaits, Plano, both of Tex., assignors to Autotronics, Inc.
Filed July 28, 1976, Ser. No. 709,454
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—116



245,405
VEHICLE HORN
James J. Nelson, Toledo, Ohio, assignor to Midland-Ross Corporation, Cleveland, Ohio
Filed Mar. 23, 1976, Ser. No. 669,739
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—120

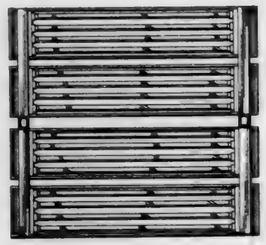


245,406
CLOCK FACE
Mayfield K. Webb, 5668 Thicket Lane, Columbia, Md. 21044
Continuation of Ser. No. 478,984, June 13, 1974, which is a continuation of Ser. No. 489,699, July 18, 1974, which is a continuation of Ser. No. 489,703, July 18, 1974, which is a continuation of Ser. No. 489,721, July 18, 1974. This application Aug. 21, 1975, Ser. No. 606,714
Term of patent 14 years
Int. Cl. D10—*07*
U.S. Cl. D10—126

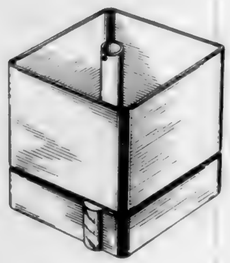


245,407
PLANT GROWTH APPARATUS
R. Louis Ware, 2108 Middle Fork Road, Northfield, Ill. 60093
Filed Oct. 2, 1975, Ser. No. 618,893
Term of patent 14 years
Int. Cl. D6—*06*; D11—*02*
U.S. Cl. D11—144

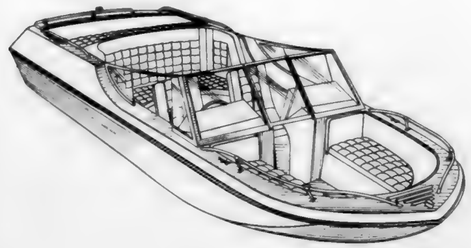




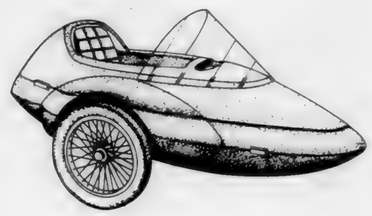
245,408
HYDRO-CULTURE CONTAINER
Gerhard Baumann, Bumpliz-Bern, and Heinz Gerber, Kirchberg, both of Switzerland, assignors to Interhydro AG, Bern, Switzerland
Filed Oct. 6, 1975, Ser. No. 620,190
Claims priority, application Switzerland, Apr. 9, 1975, 107680/75
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—155



245,409
BOAT
James Bostic, Lansing, Mich.; Schuyler P. Brown, Jr., Treasure Island, Fla., and Emerson Purkapile, Chicago, Ill., assignors to Bangor Punta Operations, Inc., Greenwich, Conn.
Filed July 29, 1975, Ser. No. 600,039
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—62



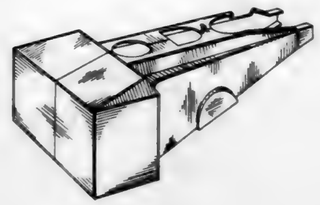
245,410
MOTORCYCLE SIDECAR
Thomas W. Kellogg, Newport Beach, Calif., assignor to Spirit of America, Incorporated, Gardena, Calif.
Filed Oct. 17, 1975, Ser. No. 623,423
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—116



245,411
MOTOR GLIDER
Kiyoshi Sohda, Yokohama, and Hisao Kitada, Yokosuka, both of Japan, assignors to Japan Aircraft Manufacturing Co., Ltd., Yokohama, Japan
Filed Oct. 18, 1976, Ser. No. 733,148
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—71



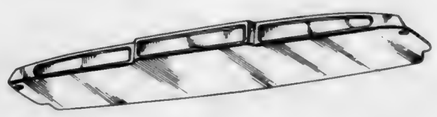
245,412
COVER FOR ELECTRIC BICYCLE MOTOR AND BATTERY
Lawrence L. Ray, San Jose, Calif., assignor to Bolt Vehicles, Inc., Palo Alto, Calif.
Filed Sept. 11, 1975, Ser. No. 612,235
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—126



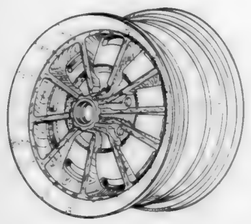
245,413
TIRE FOR A VEHICLE WHEEL
David Lyndon Buck, Sutton Coldfield, England, assignor to Dunlop Limited, London, England
Filed Jan. 27, 1976, Ser. No. 652,850
Claims priority, application United Kingdom, Aug. 2, 1975, 972058/75
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—145

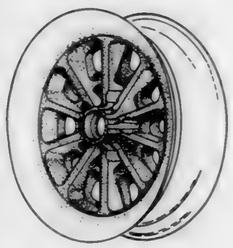


245,414
OVERHEAD CONSOLE FOR VANS
Fredrick A. Ashbaugh, 302 Prairie Lane, Belton, Mo. 64012, and Rodney L. Wickwar, 12734 Overhill Ave., Grandview, Mo. 64030
Filed Mar. 4, 1976, Ser. No. 663,719
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—155

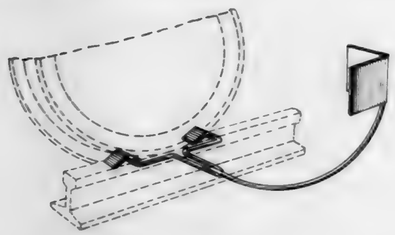


245,415
WHEEL
Millard Fillmore Harty, Jr., Bloomfield Hills, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.
Division of Ser. No. 381,177, July 20, 1973, Pat. No. Des. 239,268, which is a continuation-in-part of Ser. No. 140,014, May 3, 1971, abandoned. This application Feb. 19, 1976, Ser. No. 659,546
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—209

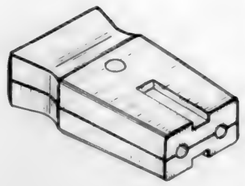




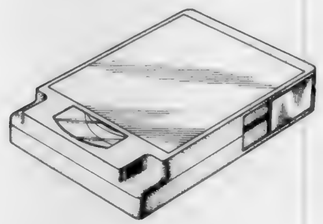
245,416
COMBINED WHEEL CHOCK AND FLAG
Robert Ray Carpenter, Gastonia, N.C., assignor to Uniroyal, Inc.
Filed June 21, 1976, Ser. No. 692,603
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—217



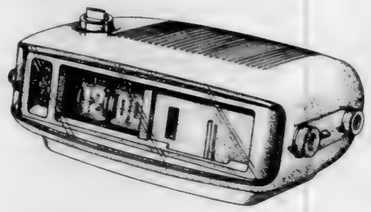
245,417
ELECTRICAL PLUG
William J. Kneller, Jay-Cee Industrial Park bldg. 8, Fox Drive & Main St., Tullytown, Pa. 19007
Filed May 10, 1976, Ser. No. 684,856
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—28



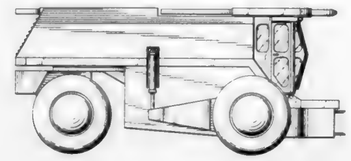
245,418
VIDEO TAPE RECORDER CARTRIDGE
Masaharu Katayama, and Hideo Takahashi, both of Saijo, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Mar. 2, 1976, Ser. No. 663,026
Claims priority, application Japan, Sept. 3, 1975, 50-36013
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—6

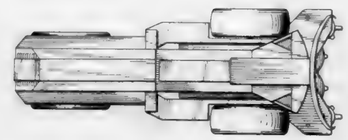


245,419
DIGITAL CLOCK RADIO
Isshin Miyamoto, Fukuoka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed July 29, 1975, Ser. No. 600,025
Claims priority, application Japan, Feb. 20, 1975, 50-6903
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—73

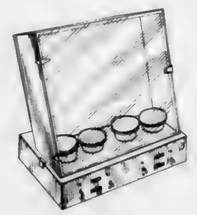


245,420
CHIPPING COMBINE
Walter H. Maucher, Rte. No. 2, Postal Rte. Box 146, Cantonment, Fla. 32533
Filed Jan. 26, 1976, Ser. No. 652,502
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—26

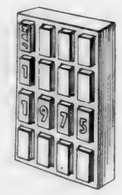




245,421
LIQUOR DISPENSER
George W. Bayers, Jr., 152 Del Mar Circle, Aurora, Colo. 80011
Filed Sept. 2, 1975, Ser. No. 609,396
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—115



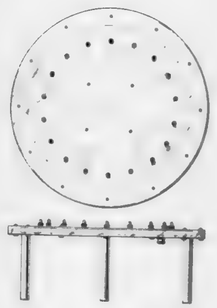
245,422
BLOCK CALENDAR
Philip K. Vanderhyden, Jr., 925 N. Bluemound Drive, Appleton, Wis. 54911
Filed Mar. 27, 1975, Ser. No. 562,570
Term of patent 14 years
Int. Cl. D19—*03*
U.S. Cl. D19—25



245,423
GROUND SUPPORTED FISHING POLE SUPPORT
Oscar N. Tentler, 409 Arlington Road, Newton Falls, Ohio 44444
Filed July 26, 1976, Ser. No. 708,567
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—13



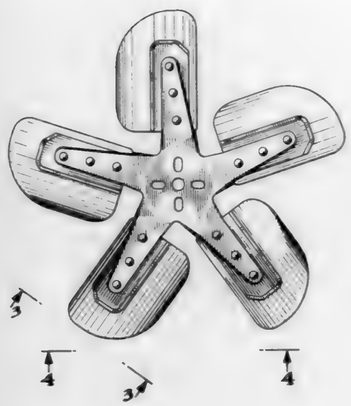
245,424
FOUNTAIN
Charles A. Mount, P.O. Box 10333, Wilton Manors, Fla. 33305
Filed Dec. 10, 1976, Ser. No. 749,708
Term of patent 3½ years
Int. Cl. D23—*01*
U.S. Cl. D23—13



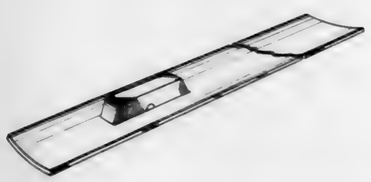
245,425
URINAL SHIELD FOR TOILET SEATS
Sterling Le Roy Annis, 4026 Sacramento St., Concord, Calif. 94521
Filed Dec. 1, 1976, Ser. No. 746,384
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—69



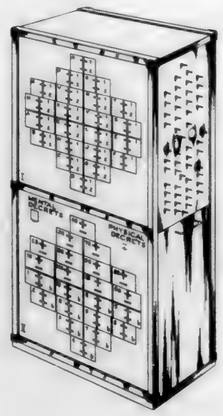
245,426
FAN
Bern M. Bonifant, Tacoma, Wash., assignor to Flex-A-Lite Corporation, Tacoma, Wash.
Filed Apr. 7, 1975, Ser. No. 565,391
The portion of the term of this patent subsequent to Mar. 18, 1989, has been disclaimed.
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—165

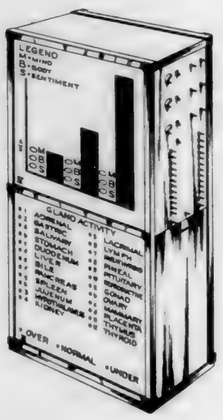


245,427
WHEELED PADDLE FOR USE IN FURNACE HEAT TREATING OF ARTICLES
John Kudla, Colonia, N.J., assignor to Codi Corporation, Fair Lawn, N.J.
Filed Mar. 10, 1976, Ser. No. 665,517
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—167

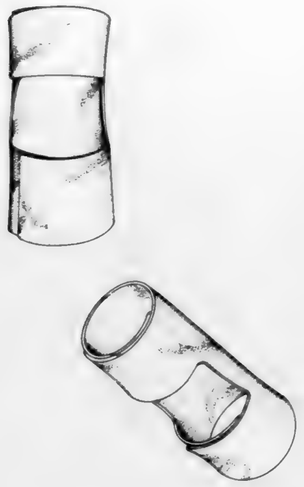


245,428
CABINET FOR DISPLAYING THE RESULTS OF BEHAVIORAL AND BIOLOGICAL EVALUATION
Peter Campione, 2026 Fairmount Ave., Philadelphia, Pa. 19130
Filed Apr. 19, 1976, Ser. No. 678,022
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17

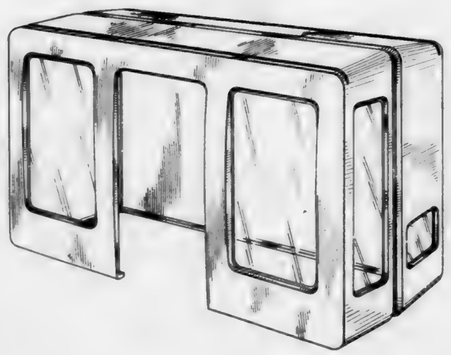




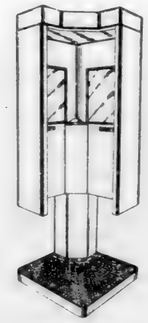
245,429
ORTHOPEDIC BRACE
Elmer M. Arluck, New York, N.Y., assignor to Thermo-Mold Medical Products, Inc., New York, N.Y.
Filed July 29, 1975, Ser. No. 600,081
Term of patent 14 years
Int. Cl. D24—*04*; D21—*02*
U.S. Cl. D24—64



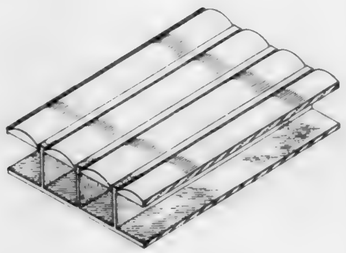
245,430
PASSENGER SHELTER
Peter J. Commins, Suite 304, 47 Colborne St., Toronto, Ontario, Canada (M5E 1E3)
Filed Mar. 22, 1976, Ser. No. 669,300
Term of patent 3½ years
Int. Cl. D25—*99*
U.S. Cl. D25—1



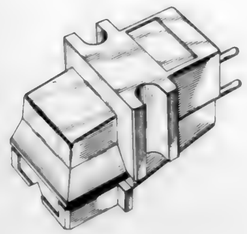
245,431
TELEPHONE BOOTH
Edward Kent, Hatfield, England, assignor to The Post Office, London, England
Filed Aug. 4, 1976, Ser. No. 711,531
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—16

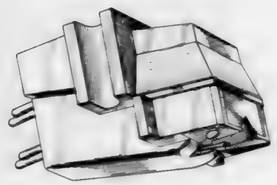


245,432
INTERCHANGEABLE ONE DIMENSIONAL CONVERGENCE LENS SOLAR RADIATION INTENSIFICATION PLATE
Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752
Filed Dec. 1, 1975, Ser. No. 636,520
Term of patent 14 years
Int. Cl. D13—*02*
U.S. Cl. D13—1



245,433
PHONOGRAPH CARTRIDGE
James P. Thomsen, Mount Prospect, and Ronald G. Theilmann, Arlington Heights, both of Ill., assignors to Shure Brothers Incorporated
Filed Sept. 2, 1976, Ser. No. 719,966
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—28

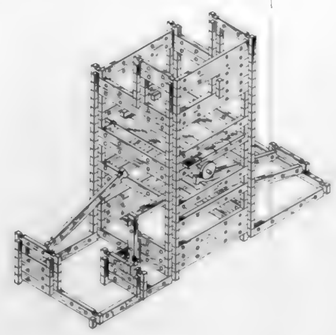




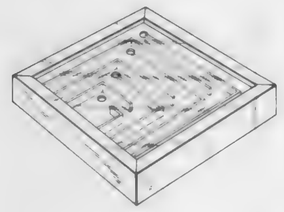
245,434
REAGENT STRIP REFLECTANCE PHOTOMETER
Glenn S. Beidler, and Kenneth D. Collister, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.
Filed Aug. 10, 1976, Ser. No. 713,293
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17



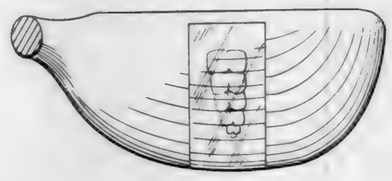
245,435
RECREATIONAL STRUCTURE
Charles H. Gnehm, 2707 68th SE., Mercer Island, Wash. 98040
Filed Oct. 6, 1975, Ser. No. 619,829
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 H



245,436
MAZE GAME BOARD, OR SIMILAR ARTICLE
Harry Zelenko, 240 E. 61st St., New York, N.Y. 10021
Filed Nov. 3, 1975, Ser. No. 627,951
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 KK



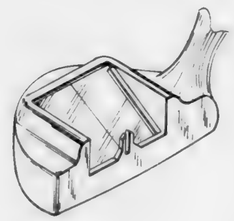
245,437
PUTTER
Joseph W. Thiel, 7416 W. 74th Place, Arvada, Colo. 80003
Filed Feb. 17, 1976, Ser. No. 658,166
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



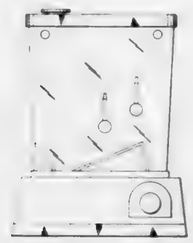
245,438
DETACHABLE SIGHTING MIRROR FOR GOLF PUTTERS
Joseph W. Thiel, 7416 W. 74th Place, Arvada, Colo. 80003
Filed Feb. 17, 1976, Ser. No. 658,274
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 CB



245,439
PUTTER
Joseph W. Thiel, 7416 W. 74th Place, Arvada, Colo. 80003
Filed Feb. 23, 1976, Ser. No. 660,159
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC



245,440
WATER GAME CASE
Shizuka Kojima, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Mar. 12, 1976, Ser. No. 666,483
Claims priority, application Japan, Dec. 12, 1975, 50-49254
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 JJ



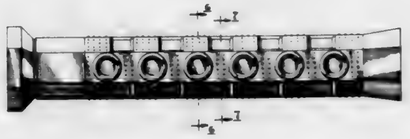
245,441
GOLF PUTTER
Marvin G. Middlestadt, 2843 Northville Drive, Grand Rapids, Mich. 49505
Filed Mar. 26, 1976, Ser. No. 671,012
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC



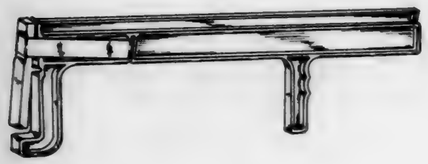
245,442
GOLF PUTTER HEAD
Jerome E. Becker, 3285 Woodbine, Los Angeles, Calif. 90064
Filed May 19, 1976, Ser. No. 687,651
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GH



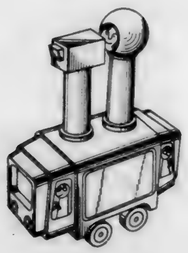
245,443
HAND GRIP FOR A TENNIS RACKET
Alvin H. Sweet, 5168-B Wood St., South Gate, Calif. 90280
Filed July 19, 1976, Ser. No. 706,467
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



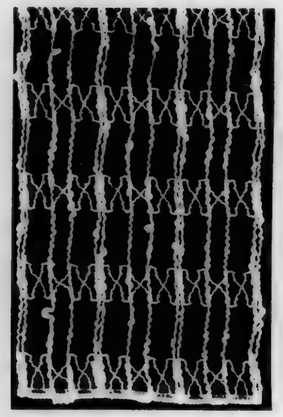
245,444
TOY RIFLE
Robert William Hotchkiss, 8861 W. Albain Road, Ida, Mich. 48140
Filed Aug. 20, 1974, Ser. No. 499,056
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 TT



245,445
TOY CAMERA TRUCK
Matthew A. Moustakas, Mercerville, N.J., assignor to CBS Inc., New York, N.Y.
Filed Mar. 1, 1976, Ser. No. 662,478
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



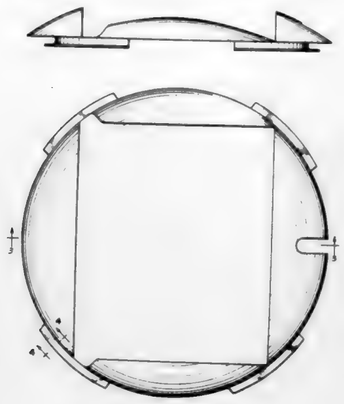
245,446
CURTAIN MATERIAL
Peter E. Schroeder, Lucerne, Switzerland, assignor to Gardisette International AG, Lucerne, Switzerland
Filed May 28, 1975, Ser. No. 581,557
Claims priority, application Germany, Dec. 5, 1974, 806
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 D



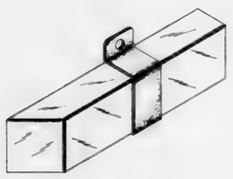
245,447
LENS FOR A REVOLVING LAMP
Peter E. Brudy, 111 Angus Drive, Willowdale, Ontario, Canada, and John Smith, 381 Shirley Road, Southampton, England (S09 1HB)
Filed July 23, 1974, Ser. No. 491,003
Claims priority, application Canada, Jan. 24, 1974, 45645
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 A



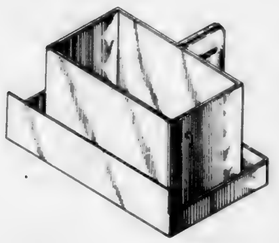
245,448
SHIELD FOR AN AUTOMOBILE HEADLIGHT
Herbert L. Babcock, 8005 Postal Way, Okolona, Ky. 40219
Filed Sept. 8, 1975, Ser. No. 611,159
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 C



245,449
TRAILER LIGHT INDICATOR
Richard J. Wright, 7054 Bothwell Road, Reseda, Calif. 91335
Filed Nov. 28, 1975, Ser. No. 635,960
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D48—32 D



245,450
PAINT CONTAINER
Joseph J. Donlon, 1240 Dauphine St., New Orleans, La. 70116
Filed June 8, 1976, Ser. No. 693,914
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D64—18



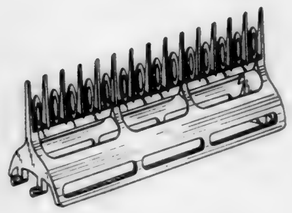
245,451
CATHETER
Ronald W. Wortley, Salt Lake City, Utah, assignor to Vital Assists, Inc.
Filed Sept. 24, 1975, Ser. No. 616,282
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—54



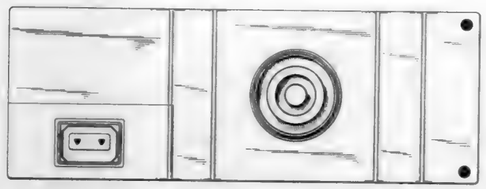
245,452
INFANT NURSING BOTTLE
Paul K. Meeker, 412 Park St., Kent, Ohio 44240
Filed Aug. 16, 1976, Ser. No. 714,528
Term of patent 14 years
Int. Cl. D7—*01*; D9—*01*
U.S. Cl. D83—8 A



245,453
HAIR STYLER ATTACHMENT
Morison S. Cousins, Plainview; Michael A. Cousins, Huntington, both of N.Y., and Greydon A. Rhodes, III, Noroton, Conn., assignors to The Gillette Company, Boston, Mass.
Filed Feb. 23, 1976, Ser. No. 660,621
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D26—18

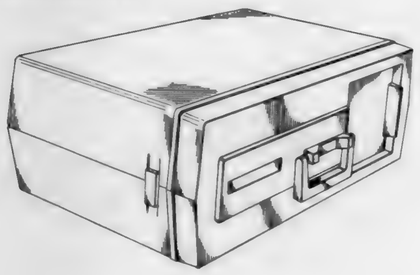


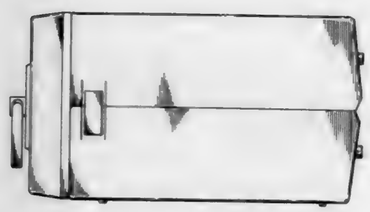
245,454
AUDIO-VISUAL STORAGE CASE
Irene B. Feingold, and Stanley Z. Feingold, both of 420 Pitts Colony Drive, Rochester, N.Y. 14623
Filed Nov. 14, 1975, Ser. No. 632,064
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 D



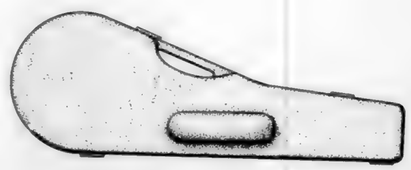


245,455
PORTABLE ENCLOSURE FOR ELECTRONIC EQUIPMENT
Wayne Carl Cathey, Bedford, Tex., assignor to Xerox Corporation, Stamford, Conn.
Filed Nov. 20, 1975, Ser. No. 633,721
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R





245,456
CARRYING CASE FOR A TENNIS RACQUET OR THE LIKE
Carl Elwood Barrett, 3500 Rivere Du Chien, Mobile, Ala. 36619
Filed Feb. 6, 1976, Ser. No. 655,700
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R



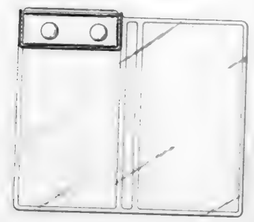


245,457
CARRYING CASE FOR A TENNIS RACQUET OR THE LIKE
Carl Elwood Barrett, 3500 Rivere Du Chien, Mobile, Ala. 36619
Filed Feb. 6, 1976, Ser. No. 655,765
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D87—1 R





245,458
CARD CASE
Winfried Josepf Paul Hauss, Kaiserring 46, 68 Mannheim 1, and Andre Christian Haas, Saarlandstrasse 1, 6806 Viernheim, both of Germany
Filed Oct. 29, 1975, Ser. No. 626,866
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 A

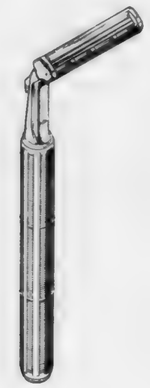




245,459
COMBINED ELECTRIC SHAVER AND COVER THEREFOR
Shima Ito, Osaka, Japan, assignor to Matsushita Electric Works, Ltd., Kadoma, Japan
Filed Mar. 3, 1976, Ser. No. 663,602
Claims priority, application Japan, Dec. 16, 1975, 50-49858
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—51



245,460
RAZOR
Norman D. Poisson, Andover, Mass., assignor to The Gillette Company, Boston, Mass.
Filed Mar. 11, 1976, Ser. No. 666,168
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—46



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TO WHOM

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Bacskai, Robert, to Chevron Research Company. Sulfonic acid derivatives as promoters for the polymerization of 2-pyrrolidone. 4,042,573, Cl. 260-78.00P.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Dehnert, Johannes; and Lamm, Gunther, 4,042,578, Cl. 260-156.000.
Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, 4,042,628, Cl. 260-577.000.

Baier, Kurt: *See—*
Razim, Claus; Lovasz, Csaba; and Baier, Kurt, 4,042,427, Cl. 148-15.500.

Bailey, Berton K.: *See—*
Underhill, Edward W.; Chisholm, Melvin D.; Steck, Warren F.; Bailey, Berton K.; Lamb, Peter M.; Struble, Dean L.; and Swailes, G. Edward, 4,042,681, Cl. 424-84.000.

Baker, Don R.: *See—*
Arneklev, Duane R.; and Baker, Don R., 4,042,371, Cl. 71-88.000.

Baker Oil Tools, Inc.: *See—*
Shurtleff, George S., 4,041,762, Cl. 73-422.00R.

Baker, Roxton Elliott, to Combustion Engineering, Inc. Overvoltage protection circuit for general purpose amplifier. 4,042,889, Cl. 330-207.00P.

Baker, William C.; and Chapman, John J., to Teledyne, Inc. Fluid flowmeter. 4,041,757, Cl. 73-202.000.

Balfanz, Glenn F., Jr.: *See—*
Jahn, Martin D.; and Balfanz, Glenn F., Jr., 4,041,668, Cl. 52-489.000.

Balfour, Adrian E.: *See—*
Hardy, Henry; and Balfour, Adrian E., 4,042,433, Cl. 156-87.000.

Balke-Durr AG: *See—*
Fickelscher, Kurt Gerhard, 4,041,808, Cl. 74-800.000.

Ballendux, Gerardus M.: *See—*
Hoepfl, Joseph R.; and Ballendux, Gerardus M., 4,041,972, Cl. 137-269.000.

Ballweber, Edward G.; and Hunter, Wood E., to Nalco Chemical Company. Urea as an additive to improve the viscosity and activity of acrylamide-acrylamide acrylic acid polymers prepared from poor quality acrylamide. 4,042,772, Cl. 526-220.000.

Balmat, Jean Louis, to Du Pont de Nemours, E. I., and Company. SO_2 removal process. 4,042,668, Cl. 423-243.000.

Bamberg, Wolfgang: *See—*
Schmidt, Joachim; Bamberg, Wolfgang; Grunert, Hartmut; Schorm, Erhard; and Weigelt, Christian, 4,042,502, Cl. 210-59.000.

Banholzer, Rolf; Bauer, Rudolf; Heusner, Alex; and Schulz, Werner, to Boehringer Ingelheim GmbH. Quaternary N-β-substituted N-alkylnortropine benzilates. 4,042,700, Cl. 424-265.000.

Bantick, John Raymond: *See—*
Lee, Thomas Brian; Hardern, David Norman; and Bantick, John Raymond, 4,042,708, Cl. 424-283.000.

Barber-Colman Company: *See—*
Boyer, George C.; and Fermanich, Raymond J., 4,042,173, Cl. 236-49.000.

Barcan, Donald S., to C. R. Bard, Inc. Medical procedure package. 4,042,109, Cl. 206-440.000.

Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., to Shell Oil Company. Compositions and methods of combatting weeds in crops with 2,6-dihalobenzyl ether. 4,042,369, Cl. 71-88.000.

Barlow, George J.: *See—*
Cassarino, Frank V., Jr.; and Barlow, George J., 4,042,832, Cl. 307-149.000.

Barone, Salvatore: *See—*
Lloyd, William A.; Barone, Salvatore; Hooper, Gerald E.; and McFarland, Keith E., 4,042,939, Cl. 346-153.000.

Barrick, Robert R., to Cowen, John F. Bowstring release device. 4,041,925, Cl. 124-35.00A.

Barry-Wehmiller Company: *See—*
Babunovic, Momir, 4,041,963, Cl. 134-104.000.

Bartell, Maurice James. Device for moving a rock at the entrance of a rock crusher. 4,042,121, Cl. 214-1.00R.

Barthold, Fred O. Power transistor switch. 4,042,844, Cl. 307-314.000.

Barton, William R. Medicated member for pierced ears. 4,041,946, Cl. 128-260.000.

BASF Aktiengesellschaft: *See—*
Bachl, Robert; Frielingsdorf, Hans; Gruber, Wolfgang; Mueller-Tamm, Heinz; and Gonsior, Leonhard, 4,042,770, Cl. 526-106.000.
Eilingsfeld, Heinz; and Lach, Dietrich, 4,042,604, Cl. 260-369.000.
Hartwig, Ernst, 4,042,605, Cl. 260-378.000.
Kiehs, Karl; Adolphi, Heinrich; and Huber, Rolf, 4,042,691, Cl. 424-200.000.
Pommer, Ernst-Heinrich; Polster, Rudolf; and Loecher, Friedrich, 4,042,686, Cl. 424-164.000.
Weitz, Hans-Martin; Fischer, Rolf; and Lenke, Dieter, 4,042,587, Cl. 544-183.000.
Weitz, Hans-Martin; Fischer, Rolf; and Lenke, Dieter, 4,042,588, Cl. 544-183.000.

Bass, Edward W.: *See—*
Bresnahan, Robert A.; Bass, Edward W.; and Mader, William G., 4,041,609, Cl. 32-22.000.

Battelle Memorial Institute: *See—*
Bienvenu, Gerard; and Gentaz, Claude, 4,042,377, Cl. 75-53.000.
Baudouin, Yvonne; Simonet, Guy; Eluard, Robert; and Pivard, Claude, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Method of fractionation of a gaseous mixture by adsorption. 4,042,349, Cl. 55-25.000.

Bauer Bros. Co., The: *See—*
Ginaven, Marvin E., 4,042,511, Cl. 210-386.000.

Bauer, Rudolf: *See—*
Banholzer, Rolf; Bauer, Rudolf; Heusner, Alex; and Schulz, Werner, 4,042,700, Cl. 424-265.000.

Baugh, Benton F., to Vetco Offshore Industries, Inc. Method and apparatus for connecting submarine pipelines. 4,041,719, Cl. 61-110.000.

Baum, Elliot H.; and Ferrante, Gerald R., to Kewanee Industries. Dye-bath oxidants. 4,042,319, Cl. 8-35.000.

Baxter, Charles A. R.: *See—*
Acheson, Richard M.; Stubbs, John K.; Baxter, Charles A. R.; and Kuhla, Donald E., 4,042,583, Cl. 542-458.000.

Bayer Aktiengesellschaft: *See—*
Backer, Klaus; Heinze, Helga; Luck, Wolfhard; and Spahrkas, Heinrich, 4,042,321, Cl. 8-94.260.
Bernert, Claus-Rudiger; Radlmann, Eduard; and Nischk, Gunther, 4,042,570, Cl. 260-75.00M.
Dahm, Manfred; and Gonzalez-Dorner, Alberto Carlos, 4,042,537, Cl. 260-2.5AP.
Dieterich, Dieter; Markusch, Peter; and Reiff, Helmut, 4,042,536, Cl. 260-2.5AK.
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; and Stendel, Wilhelm, 4,042,690, Cl. 424-200.000.
Kaiser, Bernd-Ulrich; Dhein, Rolf; Rudolph, Hans; and Kuchenmeister, Rolf, 4,042,547, Cl. 260-22.00R.
Kuhlthau, Hans-Peter, 4,042,322, Cl. 8-168.00R.
Muller, Ernst-Willi; and Wicke, Manfred, 4,042,768, Cl. 526-65.000.
Sundermann, Rudolf, 4,042,567, Cl. 260-49.000.
von Bonin, Wulf; Preis, Lothar; von Gizycki, Ulrich; and Dahm, Manfred, 4,042,558, Cl. 260-37.00N.

Bayly, Peter Kingsley, to Wiltshire Cutlery Company Proprietary Ltd. Knife sharpener. 4,041,651, Cl. 51-214.000.

BBC Brown, Boveri & Company, Limited: *See—*
Akyuerek, Altan; and Meyer, Eckhard, 4,041,602, Cl. 29-588.000.

BDH, Inc.(Entire): *See—*
Bowen, James H., 4,042,509, Cl. 210-192.000.

Beatrice Foods Co.: *See—*
Ziccarelli, Salvatore F., 4,042,721, Cl. 426-613.000.

Bechtel, Jon H., to Robertshaw Controls Company. Temperature sensing resistance probe and method of making a resistance element therefor. 4,042,901, Cl. 338-28.000.

Beck, Nicholas Robert; Leonard, Gordon C.; and Prince, Jack A., to Meat Separator Corporation. Deboning apparatus and method. 4,042,176, Cl. 241-24.000.

Becker, Carl; Wegmann, Jacques; and Schaub, Andres, to Ciba-Geigy AG. Anionic and nonionic emulsified dye suspension with formalin, hydrotropic agent. 4,042,320, Cl. 8-39.00C.

Becker, Carl: *See—*
Defago, Raymond; Lapple, Arnulf Ruediger; and Becker, Carl, 4,042,545, Cl. 260-13.000.

Beckley, Addison S. Motor vehicle injury and damage prevention system. 4,042,057, Cl. 180-90.000.

Becton, Dickinson and Company: *See—*
Ehrlich, Stephen Jeffrey, 4,042,145, Cl. 221-94.000.
Hochstrasser, Harry T., 4,042,329, Cl. 23-230.00B.
Kopacz, Bernard F., 4,042,805, Cl. 219-492.000.

Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., to Manitowoc Company, Inc., The. Rotary counterweight crane with a removal track section. 4,042,115, Cl. 212-48.000.

Beggs, Donald, to Midrex Corporation. Method and apparatus for producing metallic iron pellets. 4,042,226, Cl. 266-88.000.

Beiser, Carl Adolph, to National Steel Corporation. Chromized steel substrate. 4,042,426, Cl. 428-667.000.

Bell & Howell Company: *See—*
Gawin, Adolph J.; and Porazinski, Robert F., 4,042,299, Cl. 355-40.000.
Wells, Thomas R.; and Jacobs, Donald R., 4,042,296, Cl. 352-78.00R.

Bell, Robert Glenn; Gillyns, Emile; and McDaniel, Olin Kilpatrick, Jr., to Du Pont de Nemours, E. I., and Company. Heat-setting process for polyester film. 4,042,569, Cl. 260-75.00T.

Bell Telephone Laboratories, Incorporated: *See—*
Cohen, Richard Lewis; and Meek, Ronald Lee, 4,042,730, Cl. 427-305.000.
Freimanis, Laimons, 4,042,786, Cl. 179-84.00R.
Presby, Herman Melvin, 4,042,723, Cl. 427-8.000.

Bellenger, Donald M., to Telephone Electronics Corporation. Telephone mouthpiece keyboard. 4,042,793, Cl. 179-90.00K.

Beloit Corporation: *See—*
Justus, Edgar J., 4,042,503, Cl. 210-65.000.

Belot, Michel; and Perucchi, Norberto, to Ebauches S.A. Mechanism of transmission. 4,041,794, Cl. 74-460.000.

Belyashina, Lidia Ivanovna: *See—*
Kazakova, Ljudmila Petrovna; Gundyrev, Alexei Alexandrovich; Rudakova, Nina Yakovlevna; Sharf, Fridrikh-Leopold Khaskelevich; Garun, Yaroslav Evstavievich; Belyashina, Lidia Ivanovna; and Kocheva, Zoya Vasilievna, 4,042,411, Cl. 106-270.000.

Bendix Corporation, The: *See—*
Espy, Donald M.; and Henry, James L., 4,042,122, Cl. 214-1.0CM.
Natter, Eckard F.; Weant, George E.; and Lobsinger, James R., 4,042,922, Cl. 343-5.00W.
Tang, Louis S.; Runkle, Dean E.; and Bach, Lloyd G., 4,041,990, Cl. 138-31.000.

Bennett, James Gordy, Jr.; and Cooper, Glenn Dale, to General Electric Company. Method for preparing polyphenylene ethers. 4,042,564, Cl. 260-47.0ET.

Bennett, Robert P.; O'Connor, Matthew J.; Kober, Alfred E.; and Kukin, Ira, to Apollo Chemical Corporation. Method of conditioning flue gas to electrostatic precipitator. 4,042,348, Cl. 55-5.000.

Benzakein, Morris. Method and apparatus for weaving an elongated fabric. 4,041,988, Cl. 139-116.000.

Beppu, Norio: *See—*
Matsuda, Motonobu; and Beppu, Norio, 4,042,940, Cl. 354-39.000.

Bequaert, Frank Charles; and Rochester, Nathaniel, to International Business Machines Corporation. One-handed keyboard and its control means. 4,042,777, Cl. 179-79.000.

Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, to Science Union et Cie, Societe Francaise de Recherche Medicale. Disubstituted azabicycloalkanes. 4,042,598, Cl. 260-326.100.

Berger, Joan P.: *See—*
Berger, Phill R.; Berger, Joan P.; and Magnani, Margery L., 4,041,585, Cl. 28-149.000.

Berger, Phill R.; Berger, Joan P.; and Magnani, Margery L. Hand loom construction. 4,041,585, Cl. 28-149.000.

Bergomi, Luciano, to Industrie Pirelli S.p.A. Reinforcing element for flexible structures, in particular pneumatic tires. 4,042,742, Cl. 428-295.000.

Bernard, Brian C., to Clorox Company, The. Fire log process and apparatus. 4,042,343, Cl. 44-10.00B.

Bernert, Claus-Rudiger; Radlmann, Eduard; and Nischk, Gunther, to Bayer Aktiengesellschaft. Terephthalic acid copolyesters which can be dyed in the absence of carriers. 4,042,570, Cl. 260-75.00M.

Berry, Thomas: *See—*
Foster, Peter William; Ferrier, Duncan Cameron; Berry, Thomas; and Murenbeeld, Karel, 4,041,586, Cl. 28-254.000.

Bertin & Cie: *See—*
Bertin, Jean Henri; Guienne, Paul; and Lafont, Andre, 4,042,060, Cl. 180-127.000.

Bertin, Jean Henri; Guienne, Paul; and Lafont, Andre, to Bertin & Cie; and Societe d'Etudes et de Developpement des Aeroglisseurs Marins, Terrestrea et Amphibies S.E.D.A.M. Air-lift vehicles. 4,042,060, Cl. 180-127.000.

Bertolasi, Robert B., to Kelsey-Hayes Company. Anti-spin control system. 4,042,059, Cl. 180-103.00R.

Bertolino, Giorgio M., to Fiat-Allis Construction Machinery, Inc. Track laying tractor with movable boom which can be tilted laterally. 4,042,116, Cl. 212-140.000.

Bertram, Heidrun; Fahnenstich, Rudolf; Junkermann, Helmut; Pohl, Gerhard; and Tanner, Herbert, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Preservative for fodder, mixed fodder and silage. 4,042,716, Cl. 426-335.000.

Betts, Edmund Douglas, to Outboard Marine Corporation. Apex seal assembly. 4,042,312, Cl. 418-121.000.

Beyn, Edgar Joachim, to SCM Corporation. Process for spray forming of discrete particles. 4,042,653, Cl. 264-7.000.

Bianchetta, Donald L., to Caterpillar Tractor Co. Pressure controlled swing valve with safety feature. 4,041,983, Cl. 137-625.630.

Bickford, Edgar P., to Raymond Lee Organization, Inc., The, a part interest. Body heating and stretch support device. 4,042,803, Cl. 219-211.000.

Bienvenu, Gerard; and Gentaz, Claude, to Battelle Memorial Institute. Method of and composition for the desulfurization of steel. 4,042,377, Cl. 75-53.000.

Biere, Helmut: *See—*
Ahrens, Hanns; Koch, Henning; Schroder, Eberhard; Biere, Helmut; and Kapp, Joachim-Friedrich, 4,042,706, Cl. 424-273.00P.

Biggins, Robert B. Double seal container. 4,042,143, Cl. 220-256.000.

Bigler, Allan Johan: *See—*
Buus, Jorn Lasse Martin; Lassen, Niels; and Bigler, Allan Johan, 4,042,695, Cl. 424-250.000.

Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., to Corning Glass Works. Method of densifying metal oxides. 4,042,361, Cl. 65-18.000.

Bijlmer, Paul Frederik A., to Fokker-VFW B.V. Pickling of aluminum. 4,042,475, Cl. 204-141.500.

Bildl, Erich: *See—*
Schmidt, Dietrich; Hofer, Johann; Lang, Winfried; and Bildl, Erich, 4,042,331, Cl. 23-230.0PC.

Billings, Lawrence A. Jr.; Evanicky, Daniel E.; Hull, V. Joseph; and Ristagno, Charles V., to Micro-Display Systems, Inc. Illuminated electro-optical display apparatus. 4,042,294, Cl. 350-60LC.

Bilz, Reiner, to Otto Bilz Werkzeugfabrik. Overland coupling device. 4,041,729, Cl. 64-29.000.

Binaghi, Marco: *See—*
Gratani, Francesco; and Binaghi, Marco, 4,042,764, Cl. 526-4.000.

Bio-Medical Sciences Inc.: *See—*
Larsson, Raymond P., 4,042,336, Cl. 23-253.0TP.

Birney, Richard Eugene; Davis, Michael Ian; Graybiel, Lynn Allan; Hood, Robert Allen; Kahn, Samuel; and Osborne, William Steese, to International Business Machines Corporation. Address key register load/store instruction system. 4,042,913, Cl. 364-200.000.

Bishop, Dale F. Hydrostatic level instrument. 4,041,613, Cl. 33-367.000.

Bishop, Thomas G., to HPM Corporation. Mottled appearance injection molding methods. 4,042,660, Cl. 264-77.000.

Biter, William J., to Westinghouse Electric Corporation. Photovoltaic device and method of making same. 4,042,418, Cl. 136-89.00P.

BJ-Hughes Inc.: *See—*
Scott, Lyle Burnell, 4,042,014, Cl. 166-.500.

Bjerk, Roger O.; Brandon, William D.; Engleking, Frederick S.; and Jero, John P., to Caterpillar Tractor Co. Friction coupling. 4,042,085, Cl. 192-57.000.

Black, Richard William, to Du Pont de Nemours, E. I., and Company. Bobbin lugger. 4,041,589, Cl. 29-33.00M.

Blanchard, Clarence E., to Outboard Marine Corporation. Marine propulsion device steering assembly. 4,041,889, Cl. 115-18.00R.

Blauvelt, Lon; Dickson, J. Douglas; and Russell, Robert C., to Simplicity Pattern Co. Inc. Methods and apparatus for retrieval of stored articles from a stack. 4,042,126, Cl. 214-8.50A.

Blevins, Theodore J., to General Electric Company. Fastening device and method for hingedly assembling members. 4,041,571, Cl. 16-128.00R.

Blomberg, Bengt Ture Hubertus: *See—*
Johansson, Erik Gunnar; Blomberg, Bengt Ture Hubertus; and Elmquist, Bernt Holger, 4,041,962, Cl. 132-91.000.

Blunier, Dennis L.: *See—*
Haslett, Glenn M.; and Blunier, Dennis L., 4,042,282, Cl. 305-11.000.

Blurton, Keith F.; and Sedlak, John M., to Energetics Science, Inc. Method for the detection and measurement of noxious gases. 4,042,464, Cl. 204-1.00T.

Bodenseewerk Perkin-Elmer & Co. GmbH: *See—*
Huber, Bernhard Werner, 4,042,303, Cl. 356-85.000.
Huber, Bernhard Werner, 4,042,336, Cl. 23-259.000.

Boehringer Ingelheim GmbH: *See—*
Banholzer, Rolf; Bauer, Rudolf; Heusner, Alex; and Schulz, Werner, 4,042,700, Cl. 424-265.000.
Buchta, Karl; Abdou, Mohamed; and Woltersdorf, Harald, 4,042,733, Cl. 427-391.000.
Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, 4,042,711, Cl. 424-319.000.
Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, 4,042,713, Cl. 424-330.000.

Boeing Company, The: *See—*
Boyle, James Alfred; Galins, Peteris Adams; Gregoire, Mark Charles; and O'Toole, Peter L. M., 4,042,197, Cl. 244-183.000.
Johnson, Kirby William, 4,042,191, Cl. 244-214.000.

Bohman, Carl E.; Durling, Hubert R., Jr.; Susman, Leon; and Rolfe, Norman F., to Sperry Rand Corporation. Spout control apparatus for agricultural machines. 4,042,132, Cl. 214-42.00A.

Boileau, Jacques: *See—*
Thevenin, Michel J.; Brun, Michel; Boileau, Jacques; and Pegoud, Joseph, 4,041,866, Cl. 102-24.0HC.

Bomar, Scott Lewis: *See—*
Troncoso, Fernando, Jr.; and Bomar, Scott Lewis, 4,041,926, Cl. 124-35.00A.

Bona, Constantin: *See—*
Ciorbaru, Rita, born Sfartz; Adam, Arlette, born Chosson; Petit, Jean-Francois; Lederer, Edgar; Damais, Chantal, born Rousselot; Chedid, Louis; and Bona, Constantin, 4,042,678, Cl. 424-12.000.

Bondelier, Francis C., Jr.: *See—*
King, Roger P.; Grosskopf, John W., Jr.; and Bondelier, Francis C., Jr., 4,042,364, Cl. 65-168.000.

Bonin, Jean Claude, to Roto Diesel. Fuel injection pump for internal combustion engines, in particular for diesel engines. 4,041,919, Cl. 123-139.00P.

Bonsack, Francois, to Les Fabriques d'Assortiments Reunies. Escapement for a timepiece. 4,041,693, Cl. 58-116.00R.

Boochever, Evelyn; and Munk, Michael. Environmental humidification and cooling system. 4,042,016, Cl. 165-20.000.

Borden, Inc.: *See—*
Chiu, Shui Tung; and Kaneko, Tatsuhei, 4,042,728, Cl. 427-212.000.

Borel, Robert J.: *See—*
Tone, Frederick F.; and Borel, Robert J., 4,042,395, Cl. 96-76.00C.

Borello, Domenic. Battery. 4,042,754, Cl. 429-10.000.

Borg-Warner Corporation: *See—*
Coy, Merle Dalton, 4,041,791, Cl. 74-325.000.
Maudlin, Eugene Wendell, 4,041,727, Cl. 62-290.000.
Schulz, Willis Lorenz, 4,042,083, Cl. 192-3.310.

Bose Corporation: *See—*
Jarvis, Arthur B., 4,042,307, Cl. 403-290.000.

Bose, Edward B.: *See—*
Graven, Andrew A.; Ronyak, David M.; and Bose, Edward B., 4,041,652, Cl. 51-241.00R.

Botting, Alden Joseph; Mulcahy, John Michael; and Hannah, William James. Method of molding modular buildings. 4,042,659, Cl. 264-71.000.

Bourke, Donall Garraid; and Puttlitz, Frederic John, to International Business Machines Corporation. Outer and asynchronous storage extension system. 4,042,911, Cl. 364-900.000.

Bouy, Pierre; and Cheradame, Guy, to Rhone-Progil. Electrolysis cell electrode and method of preparation. 4,042,483, Cl. 204-290.00F.

Bowdish, Frank W. Process for leaching sand or other particulate material. 4,042,671, Cl. 423-340.000.

Bowdry, William Perrin, III; and Wickam, Irwin Edward, to Stewart Engineering & Equipment Co. Pan unstacking and stacking system. 4,042,124, Cl. 214-6.0DS.

Bowen, James H., to BDH, Inc.(Entire). Water treatment system. 4,042,509, Cl. 210-192.000.

Bowles, Bobby K.: *See—*
Anderson, Buddy W.; Bowles, Bobby K.; Murphey, Joseph R.; Totty, Kenneth D.; and Young, Bill M., 4,042,032, Cl. 166-276.000.

Bowman, Robert Mathews, to Ciba-Geigy Corporation. 7,7-Diphenyl-1,4-oxazepinoalkyl-dicarboximides. 4,042,701, Cl. 424-267.000.

Boyer, Alvin Clifford, to Shell Oil Company. Insecticidal sulfonium salts. 4,042,696, Cl. 424-251.000.

Boyer, George C.; and Fermanich, Raymond J., to Barber-Colman Company. Method and apparatus for controlling volume air flow. 4,042,173, Cl. 236-49.000.

Boyer, Jean Jacques, to Societe Anonyme Secmafer. Apparatus for removing, cleaning and replacing railroad ballast. 4,042,035, Cl. 171-16.000.

Boyle, James Alfred; Galins, Peteris Adams; Gregoire, Mark Charles; and O'Toole, Peter L. M., to Boeing Company, The. Automatic controls for airplane take-off and landing modes. 4,042,197, Cl. 244-183.000.

Brada, Pavel; Kucera, Jaromir; Chladek, Otokar; Voda, Gustav; Novacek, Jindrich; and Kollmann, Jan, to Elitex. Yarn guide control. 4,041,733, Cl. 66-138.000.

Braden, Ray S.: *See—*
Ury, Michael Gerson; Eastlund, Bernard John; Braden, Ray S.; and Wood, Charles H., 4,042,850, Cl. 315-39.000.

Brandenstein, Manfred: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 4,042,086, Cl. 192-98.000.

Brandes, Lewis H.: *See—*
Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., 4,042,361, Cl. 65-18.000.

Brandewie, Richard A.; Davis, Walter C.; and Macken, John A., to Rockwell International Corporation. Laser radar device utilizing heterodyne detection. 4,042,822, Cl. 250-216.000.

Brandon, William D.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engleking, Frederick S.; and Jero, John P., 4,042,085, Cl. 192-57.000.

Branigan, John G.: *See—*
Polichette, Joseph; Leech, Edward J.; and Branigan, John G., 4,042,729, Cl. 427-304.000.

Breitschwerdt, Werner, to Daimler-Benz Aktiengesellschaft. Seat, especially co-driver seat in a motor vehicle. 4,042,276, Cl. 297-216.000.

Brener, Richard F., to Harnischfeger Corporation. Overhead crane including an improved hoist drum and redundant hoist drum support means. 4,042,214, Cl. 254-186.00R.

Brennecke, Hermann; and Liere, Horst. Electrostatic charge neutralization. 4,042,971, Cl. 361-213.000.

Breslow, B. Arthur, to United States of America, Navy. Desensitizer for n-propyl nitrate. 4,042,432, Cl. 149-89.000.

Bresnahan, Robert A.; Bass, Edward W.; and Mader, William G., to Dentsply Research & Development Corporation. Foot control for dental equipment. 4,041,609, Cl. 32-22.000.

Brethauer, Dale M., to Du Pont de Nemours, E. I., and Company. Stackable yarn support. 4,042,108, Cl. 206-392.000.

Breton, Ernest J.; Worden, Dexter; and Pugh, Melville E., Jr., to Teti, Joseph A., Jr.; and Teti, William C., part interest to each. Gasket and sealing structures of filled polytetrafluoroethylene resins. 4,042,747, Cl. 428-323.000.

Brey, Robert J.: *See—*
Rayle, Roy E.; Brey, Robert J.; and Woodruff, Wilbur John, 4,041,868, Cl. 102-43.00F.

Brian, Michael: *See—*
Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., 4,041,554, Cl. 4-10.000.

Brice, Neil M., to Cornell Research Foundation, Inc. Method and apparatus for triggering a substantial change in earth characteristics and measuring earth changes. 4,042,196, Cl. 244-158.000.

Bright, Robert G., to Draftex Development AG. Channel-shaped flexible sealing strips. 4,042,741, Cl. 428-217.000.

Brisken, Alex F.: *See—*
Anderson, Roy E.; Brisken, Alex F.; and Lewis, James R., 4,042,926, Cl. 343-17.700.

British Aircraft Corporation Limited: *See—*
Gay, Cecil Arthur Joseph; and Rockey, Leslie George Henry, 4,042,801, Cl. 219-121.0EB.

British Cellophane Limited: *See—*
Ferrar, Andrew Nicholas, 4,042,732, Cl. 427-385.00R.

British Steel Corporation: *See—*
Jackson, George; and Fieldsend, Terence, 4,042,384, Cl. 75-214.000.

Broadwin, Alan: *See—*
Weiss, Steven N.; and Broadwin, Alan, 4,041,947, Cl. 128-276.000.

Brody, Thomas P.: *See—*
Luo, Fang-Chen; and Brody, Thomas P., 4,042,854, Cl. 315-169.0TV.

Brois, Stanley J., to Exxon Research and Engineering Co. Olefin-thionophosphine sulfide reaction products, their derivatives and use thereof as oil and fuel additives. 4,042,523, Cl. 252-32.7HC.

Broken Hill Associated Smelters Proprietary Limited, The: *See—*
Ward, Denby Harcourt; and Iley, James Dixon, 4,042,228, Cl. 266-215.000.

Broken Hill proprietary Company Limited, The: *See—*
Callcott, Thomas George; and Deague, Terrence Kevin, 4,042,344, Cl. 48-197.00R.

Brooke, Arthur Alan; and Loben, Rudy, to Delamere & Williams Company Limited. Method and apparatus for flattening and sealing pouch tops. 4,041,673, Cl. 53-39.000.

Brossia, Charles Edward, to Adolph Coors Company. Slip pallet and divider sheet. 4,042,127, Cl. 214-10.50R.

Brotman, Morley: *See—*
High, Cliff, 4,041,814, Cl. 83-18.000.

Brown, Arthur William: *See—*
Murray, Ransom James; and Brown, Arthur William, 4,042,408, Cl. 106-100.000.

Brown, Haskell R., Jr.: *See—*
Hammond, John M.; and Brown, Haskell R., Jr., 4,042,211, Cl. 254-57.000.

Brown, Kenneth Robson; and Sharp, Colin Keith, to Ferranti Limited. Electronic multipliers. 4,042,815, Cl. 235-194.000.

Brown, Paul C.: *See—*
Kasel, Richard G.; and Brown, Paul C., 4,042,168, Cl. 229-40.000.

Brown, William W., to Westinghouse Electric Corporation. Process for dissolving radioactive corrosion products from internal surfaces of a nuclear reactor. 4,042,455, Cl. 176-37.000.

Brownell, Roy D., to Caterpillar Tractor Co. Single lever control arrangement for actuating multiple valves. 4,041,976, Cl. 137-351.000.

Brugger, Wilhelm; and Greinacher, Ekkehard, to Th. Goldschmidt AG. Process for preparing carbonated zirconium oxide hydrate. 4,042,672, Cl. 423-419.00R.

Brun, Michel: *See—*
Thevenin, Michel J.; Brun, Michel; Boileau, Jacques; and Pegoud, Joseph, 4,041,866, Cl. 102-24.0HC.

Brundler, Hans Josef. Gear unit for the transformation of a uniform rotary movement to a step or stroke movement. 4,041,787, Cl. 74-117.000.

Bruning, Klaus; Junger, Hans; Pungs, Wolfgang; Rheinfeld, Peter; Weissenfels, Franz; and Wienand, Michael, to Dynamit Nobel Aktiengesellschaft. Apparatus for the continuous manufacture of phenolic resin foam in endless sheets. 4,042,314, Cl. 425-89.000.

Brunnett, Carl J.; and Gerth, Vernon W., Jr., to Picker Corporation. Tomography system having an ultrahigh-speed processing unit. 4,042,811, Cl. 235-151.300.

Bucher, Robert, to Sulzer Brothers Limited. Jacquard machine equipped with lifting wires and stationary arresting blades. 4,041,987, Cl. 139-59.000.

Buchta, Karl; Abdou, Mohamed; and Woltersdorf, Harald, to Boehringer Ingelheim GmbH. Forming solid, adhesive-free composite of membrane filters and cellulosic cardboard. 4,042,733, Cl. 427-391.000.

Buckeye International, Inc.: *See—*
McClurg, Carl D., 4,042,117, Cl. 213-50.500.

Buell, Halsey W.: *See—*
Abelson, Paul N.; Buell, Halsey W.; and Hallatt, William E., 4,042,559, Cl. 260-38.000.

Buenzli, Charles W., Jr., to Armstrong Cork Company. High frequency transistor ballast. 4,042,855, Cl. 315-219.000.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,042,627, Cl. 260-571.000.

Buhr, Robert K.: *See—*
Warda, Richard D.; Buhr, Robert K.; and Rehder, John E., 4,042,353, Cl. 55-99.000.

Bukac, Zbynek; and Sebenda, Jan, to Ceskoslovenska akademie ved. Preparation of polyamides by anionic polymerization with substituted triazine triones as cocatalyst. 4,042,572, Cl. 260-78.00L.

Bull, Michael J.; and Searle, Robert J. G., to Shell Oil Company. Alpha-cyano-phenoxybenzyl-isovalerates. 4,042,710, Cl. 424-304.000.

Buller, J. Stanley, to Santa Barbara Research Center. Quick cooling cryostat valve. 4,041,968, Cl. 137-74.000.

Burckhardt, Urs; and Meyer, Alfred, to Ciba-Geigy Corporation. Method of treating and preventing coccidiosis. 4,042,703, Cl. 424-273.00R.

Burdyn, Ralph F.: *See—*
Savins, Joseph George; Burdyn, Ralph F.; and Waite, Jerry M., 4,042,030, Cl. 166-273.000.

Burgdorf, Joseph Louis, to Corrugated Drum of Michigan, Inc. Container cover. 4,042,169, Cl. 229-43.000.

Burgoon, Jack L., to Scott & Fetzer Company, The. Combination sweeping-scrubbing apparatus. 4,041,567, Cl. 15-320.000.

Burroughs Wellcome Co.: *See—*
Wood, Hamish Christopher Swan; and Ohta, Kyuji, 4,042,589, Cl. 260-251.500.

Burrows, Louis H., Jr.: *See—*
Moriconi, Joseph H.; and Burrows, Louis H., Jr., 4,042,517, Cl. 252-62.10P.

Butterworth Systems Inc.: *See—*
Hatley, Kenneth John, 4,041,565, Cl. 15-200.000.

Buttke, Frederic P., to Caterpillar Tractor Co. Swingable bucket for excavators. 4,042,131, Cl. 214-138.00R.

Buus, Jorn Lasse Martin; Lassen, Niels; and Bigler, Allan Johan, to Kefalas A/S. Thiaxanthene derivatives, compositions thereof and methods of treating therewith. 4,042,695, Cl. 424-250.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*
Rainer, Georg, 4,042,702, Cl. 424-273.00P.

C.A.V. Limited: *See—*
Skinner, Robert Thomas John, 4,041,920, Cl. 123-139.0AM.

C.J. Wennberg AB: *See—*
Andersson, Bengt Ivar, 4,042,477, Cl. 204/145R.

C. R. Bard, Inc.: *See—*
Barcan, Donald S., 4,042,109, Cl. 206-440.000.

Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., to Tribotech. Pillow block. 4,042,283, Cl. 308-15.000.

Cale, Roland E., to Schaefer Manufacturing, Inc. Railway car brake rigging fulcrum lever mounting. 4,042,078, Cl. 188-231.000.

Califano, Frank L., deceased: *See—*
Stepien, George, Jr.; Califano, Frank L., deceased; DeLorenzo, William, Jr., co-executor; Gillard, G. Bruce, co-executor; Russell, Thomas E., deceased; and Russell, Florence P., executrix, 4,041,712, Cl. 61-36.00R.

California Progressive Products, Inc.: *See—*
Nininger, Nathan Vivien, Jr., 4,041,788, Cl. 74-217.00B.

Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., to Standard Oil Company. Liquid dropping device. 4,042,153, Cl. 222-207.000.

Callaway, Gary R.: *See—*
Mead, Hansel B.; and Callaway, Gary R., 4,042,887, Cl. 330-53.000.

Callcott, Thomas George; and Deague, Terrence Kevin, to Broken Hill proprietary Company Limited, The. Process for the production of gaseous mixtures. 4,042,344, Cl. 48-197.00R.

Camacho, Gustavo G.; and Shackleford, Edward J. Radio-balloon distress signal. 4,042,882, Cl. 325-118.000.

Cameron, James F.: *See—*
Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., 4,041,554, Cl. 4-10.000.

Campau, Walter Joseph: *See—*
Tomczak, Lawrence William; Crall, Frederick William; Caron, LaVerne Andrew; and Campau, Walter Joseph, 4,042,899, Cl. 336-30.000.

Campbell, Ernest E.; and Wells, William H. Vehicle for transporting and elevating articles in restricted areas. 4,042,941, Cl. 254-139.100.

Camps, Roger: *See—*
Gibert, Alain; and Camps, Roger, 4,041,768, Cl. 73-28.000.

Canadian General Electric Company Limited: *See—*
Ip, Anthony Kwok-Chun; Koyanagi, Ken; and Tarasuk, Walter Renald, 4,042,456, Cl. 176-78.000.

Canadian Patents and Development Limited: *See—*
Underhill, Edward W.; Chisholm, Melvin D.; Steck, Warren F.; Bailey, Berton K.; Lamb, Peter M.; Struble, Dean L.; and Swailes, G. Edward, 4,042,681, Cl. 424-84.000.
Warda, Richard D.; Buhr, Robert K.; and Rehder, John E., 4,042,353, Cl. 55-99.000.

Canon Kabushiki Kaisha: *See—*
Hasebe, Sadao; Ono, Hiromitsu; Murata, Minoru; and Harada, Yuji, 4,042,090, Cl. 197-102.000.
Inoue, Eiichi; Endo, Ichiro; and Yamanouchi, Teruo, 4,042,388, Cl. 96-1.600.
Yamaji, Keizo; and Kurahashi, Akira, 4,042,962, Cl. 358-300.000.

Canton Textile Mills, Inc.: *See—*
Sullins, John K., 4,042,510, Cl. 210-220.000.

Capoccia, Anastasio, to Richmond Manufacturing Company, The. Directional control mechanism for underground driven pipes and conduits. 4,042,046, Cl. 175-73.000.

Carborundum Company, The: *See—*
Abelson, Paul N.; Buell, Halsey W.; and Hallatt, William E., 4,042,559, Cl. 260-38.000.

Carden, Edward, to Medical Engineering Corporation. Bronchoscopy tube. 4,041,936, Cl. 128-6.000.

Cardiac Pacemakers, Inc.: *See—*
Anderson, Jon A.; and Kramp, Richard W., 4,041,953, Cl. 128-419.0PG.

Cardwell, Paul H.; and Kane, William S., to Deepsea Ventures, Inc. Method for separating metal constituents from ocean floor nodules. 4,042,664, Cl. 423-24.000.

Carl Schnicks & Co.: *See—*
Hammerstein, Gerd, 4,042,005, Cl. 160-220.000.

Carlson, Jerome A.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,042,283, Cl. 308-15.000.

Caron, LaVerne Andrew: *See—*
Tomczak, Lawrence William; Crall, Frederick William; Caron, LaVerne Andrew; and Campau, Walter Joseph, 4,042,899, Cl. 336-30.000.

Carver, Edgar B.: *See—*
Sioui, Richard H.; and Carver, Edgar B., 4,042,346, Cl. 51-298.00A.

Cascade Corporation: *See—*
Olson, John E., 4,041,839, Cl. 91-189.00R.

Casper, William J.: *See—*
Ostrander, William M.; and Casper, William J., 4,042,068, Cl. 187-29.00R.

Cassarino, Frank V., Jr.; and Barlow, George J., to Honeywell Information Systems Inc. Logic board interlock indication apparatus. 4,042,832, Cl. 307-149.000.

Castonguay, Roger N.: *See—*
Powell, David B.; Castonguay, Roger N.; and Aitken, Donald F., 4,042,896, Cl. 335-17.000.

Caterpillar Tractor Co.: *See—*
Babbitt, John H., Jr., 4,042,261, Cl. 280-762.000.
Bianchetta, Donald L., 4,041,983, Cl. 137-625.630.
Bjerk, Roger O.; Brandon, William D.; Engleking, Frederick S.; and Jero, John P., 4,042,085, Cl. 192-57.000.
Brownell, Roy D., 4,041,976, Cl. 137-351.000.
Buttke, Frederic P., 4,042,131, Cl. 214-138.00R.
Clark, Ralph B., 4,041,804, Cl. 74-711.000.
Fisher, George A.; and Richardson, Warner G., 4,041,625, Cl. 37-126.0AE.
Fryrear, Max Dennis, 4,041,624, Cl. 37-117.500.
Goloff, Alexander; and Sommars, Mark Frederick, 4,041,803, Cl. 74-574.000.
Habiger, Cyril W., 4,041,702, Cl. 60-431.000.
Hakes, Dewey R., 4,042,215, Cl. 254-187.400.
Haslett, Glenn M.; and Blunier, Dennis L., 4,042,282, Cl. 305-11.000.
Herr, Charles H., 4,041,807, Cl. 74-752.00C.
Latimer, Eugene E.; and Waggoner, John B., 4,042,508, Cl. 210-172.000.
Loebs, Richard G.; and Ostrowski, Richard C., 4,042,204, Cl. 249-57.000.
Miller, Calvin L., 4,041,792, Cl. 74-405.000.
Waggoner, John B., 4,042,505, Cl. 210-132.000.

Caulfield, Patrick J.; Diesch, Robert E.; and Strunc, Gerald R., to Pako Corporation. Closed loop feedback digital system for exponentially varying signal frequency. 4,042,973, Cl. 235-150.300.

Cavitron Corporation: *See—*
Weiss, Steven N.; and Broadwin, Alan, 4,041,947, Cl. 128-276.000.

CBS Inc.: *See—*
Hoel, Per O.; Korpijaakko, Erkki Pekka; and Moustakas, Matthew A., 4,042,243, Cl. 273-108.000.

Cecchetti, Claudio. Game playing structure particularly soccer game structure. 4,042,239, Cl. 273-85.00F.

Celanese Corporation: *See—*
Collins, George L.; and Costanza, John R., 4,042,476, Cl. 204-159.150.
Davis, Geraid A.; and Stackman, Robert W., 4,042,618, Cl. 260-470.000.
DeEdwardo, Andrew H.; Zitomer, Fred; Stackman, Robert W.; and Kramer, Charles E., 4,042,561, Cl. 260-45.9NP.

Cella, Alexander. Battery quick disconnect system. 4,042,759, Cl. 429-121.000.

Central Glass Co., Ltd.: *See—*
Maeda, Takeshi; and Okino, Seiki, 4,042,363, Cl. 65-60.00R.
Ozawa, Masahiro; Komatsu, Tadaaki; and Matsuoka, Kimiaki, 4,042,638, Cl. 260-653.10R.
Yoshinaga, Mituji, 4,042,556, Cl. 260-2.50P.

Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie: *See—*
Ramelot, Daniel Leon, 4,042,378, Cl. 75-60.000.

Centre d'Etudes Pour l'Industrie Pharmaceutique: *See—*
Jacquier, Robert R., 4,042,590, Cl. 260-268.00R.

Cerne, Gerd, to Vereinigte Flugtechnische Werke-Fokker GmbH. Safety device for aircraft doors or hatches. 4,042,193, Cl. 244-129.100.

Ceskoslovenska akademie ved: *See—*
Bukac, Zbynek; and Sebenda, Jan, 4,042,572, Cl. 260-78.00L.

Cestaro, John P.; Hebbar, Ranna K.; and Sokolov, Uriel S., to N L Industries, Inc. Recovery of metallic lead, lead compounds and plastic material from scrap storage batteries. 4,042,177, Cl. 241-20.000.

Champenois, Paul, to Verreries Mecaniques Champenoises. Conveyor installation for the treatment and transport of glass articles. 4,042,365, Cl. 65-260.000.

Champion International Corporation: *See—*
Ashbrook, Walter L., 4,041,823, Cl. 83-478.000.
D'Alessio, Joseph R., 4,042,167, Cl. 229-34.0HW.

Chan, Louis Yc., to Signetics Corporation. Universal differential line driver integrated circuit. 4,042,840, Cl. 307-270.000.

Chaney, Emsley M.: *See—*
Chaney, Ray Owen; and Chaney, Emsley M., 4,041,678, Cl. 56-10.700.

Chaney, Ray Owen; and Chaney, Emsley M. Short turn vehicle. 4,041,678, Cl. 56-10.700.

Chang, Chi-Haung: *See—*
Hauldren, H. Morris; Claycomb, Jack R.; Chang, Chi-Haung; and DeKerlegand, Deke E., 4,041,773, Cl. 73-67.80S.

Chang, Christopher Teh-Min, to Texas Instruments Incorporated. Magnetic bubble track crossover element. 4,042,916, Cl. 340-174.0TF.

Chang, Mike F., to General Electric Company. Post TGZM surface etch. 4,042,448, Cl. 156-650.000.

Chapa, Lucio, III. Corn detasseler. 4,041,681, Cl. 56-63.000.

Chapman, John J.: *See—*
Baker, William C.; and Chapman, John J., 4,041,757, Cl. 73-202.000.

Chappel, Barry H. Jewelry clasp and method of making same. 4,041,579, Cl. 24-230.0AK.

Charles, James H. Pivoted guide means for selective immersion of web feed. 4,041,900, Cl. 118-419.000.

Chas. S. Tanner Co.: *See—*
Lindemann, Martin K., 4,042,553, Cl. 260-29.60H.

Chartet, Andre, to Societe Anonyme des Usines Chausson. Brazed core radiator in aluminum alloy and added header boxes. 4,041,594, Cl. 29-157.30C.

Chay, Dong Myung, to Du Pont de Nemours, E. I., and Company. Foaming agents for galvanizing fluxes. 4,042,731, Cl. 427-311.000.

Chayes, Norman Chanine, to Combustion Engineering, Inc. Spacer arrangement for steam generator. 4,041,907, Cl. 122-510.000.

Chedid, Louis: *See—*
Ciorbaru, Rita, born Sfartz; Adam, Arlette, born Chosson; Petit, Jean-Francois; Lederer, Edgar; Damais, Chantal, born Rousselot; Chedid, Louis; and Bona, Constantin, 4,042,678, Cl. 424-12.000.

Chemical Construction Corporation: *See—*
Cook, Lucien H., 4,042,626, Cl. 260-555.00A.

Chensky, Frank T. Wall plate structure. 4,042,292, Cl. 339-45.00R.

Cheradame, Guy: *See—*
Bouy, Pierre; and Cheradame, Guy, 4,042,483, Cl. 204-290.00F.

Chevron Research Company: *See—*
Bacskai, Robert, 4,042,573, Cl. 260-78.00P.

Chezem, Jimmie A. Wedge-type limit stop for outward opening door. 4,042,265, Cl. 292-262.000.

Chiba, Akio: *See—*
Tomita, Sadami; and Chiba, Akio, 4,042,898, Cl. 335-297.000.

Chicago Metallic Corporation: *See—*
Jahn, Martin D.; and Balfanz, Glenn F., Jr., 4,041,668, Cl. 52-489.000.

Chicago Pneumatic Tool Company: *See—*
Tooley, Earl C., 4,042,062, Cl. 181-36.00A.

Chihara, Hiroyuki; and Okada, Yasushi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece battery monitoring circuit. 4,041,691, Cl. 58-23.0BA.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT: *See—*
Zimmermann nee Ignacz, Zsuzsanna; and Gepesz, Robert, 4,042,719, Cl. 426-573.000.

Chisholm, Melvin D.: *See—*
Underhill, Edward W.; Chisholm, Melvin D.; Steck, Warren F.; Bailey, Berton K.; Lamb, Peter M.; Struble, Dean L.; and Swailes, G. Edward, 4,042,681, Cl. 424-84.000.

Chiu, Shui Tung; and Kaneko, Tatsuhei, to Borden, Inc. Vinyl modified lignocellulosic particles for coating panels. 4,042,728, Cl. 427-212.000.

Chladek, Otokar: *See—*
Brada, Pavel; Kucera, Jaromir; Chladek, Otokar; Voda, Gustav; Novacek, Jindrich; and Kollmann, Jan, 4,041,733, Cl. 66-138.000.

Chlorella Industry Co., Ltd.: *See—*
Itanami, Kojiro; and Ishizaki, Masanori, 4,041,640, Cl. 47-1.400.

Chloride Silent Power Limited: *See—*
Jones, Ivor Wynn, 4,042,757, Cl. 429-104.000.

Christ, Alfred: *See—*
Dolenc, Anton; Christ, Alfred; and Lehmann, Rolf, 4,041,752, Cl. 72-201.000.

Chrysler Corporation: *See—*
Tomczak, Lawrence William; Crall, Frederick William; Caron, LaVerne Andrew; and Campau, Walter Joseph, 4,042,899, Cl. 336-30.000.

Chu, Chang K.; Hower, Philip L.; and Vomish, George W., to Westinghouse Electric Corporation. High voltage transistor with high gain. 4,042,947, Cl. 357-34.000.

Chu, Paul; Weiskopf, Gunther; and Saunders, Lawrence J., to S&S Corrugated Paper Machinery Co., Inc. Lead-in device for bi-level slitter. 4,041,819, Cl. 83-302.000.

Chuo Hatsujo Kogyo Co., Ltd.: *See—*
Takeuchi, Kazuaki, 4,042,198, Cl. 248-62.000.

Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich. Graphite-base filling material for the decomposition of alkali metal amalgams and method of producing same. 4,042,656, Cl. 264-29.500.

Ciaraldi, Anthony: *See—*
Wilder, Leslie N.; and Ciaraldi, Anthony, 4,041,890, Cl. 116-114.00R.

Ciba-Geigy AG: *See—*
Ade, Frank, 4,041,897, Cl. 118-300.000.
Becker, Carl; Wegmann, Jacques; and Schaub, Andres, 4,042,320, Cl. 8-39.00C.
Defago, Raymond; Lapple, Arnulf Ruediger; and Becker, Carl, 4,042,545, Cl. 260-13.000.

Ciba-Geigy Corporation: *See—*
Bowman, Robert Mathews, 4,042,701, Cl. 424-267.000.
Burckhardt, Urs; and Meyer, Alfred, 4,042,703, Cl. 424-273.00R.
Falk, Robert A., 4,042,522, Cl. 252-8.050.
Rys, Paul; and Vogelsanger, Rolf, 4,042,635, Cl. 260-623.00D.
Winter, Roland A. E., 4,042,649, Cl. 260-927.00R.

Cintron, Carlos U. Automobile trunk guard. 4,041,741, Cl. 70-417.000.

Ciorbaru, Rita, born Sfartz; Adam, Arlette, born Chosson; Petit, Jean-Francois; Lederer, Edgar; Damais, Chantal, born Rousselot; Chedid, Louis; and Bona, Constantin, to Agence Nationale de Valorisation de la Recherche (ANVAR). Water-soluble agents having mitogenic properties obtained from nocardia cells, and processes for the preparation thereof. 4,042,678, Cl. 424-12.000.

Cislo, Casimer J., to General Motors Corporation. Torsion bar mounting arrangement. 4,042,258, Cl. 280-664.000.

Citelli, Charles. Braking system. 4,042,076, Cl. 188-80.000.

Citizen Watch Company Limited: *See—*
Yasuda, Tetuya; Iinuma, Yoshio; and Maekawa, Yuzo, 4,042,861, Cl. 361-400.000.

Clampitt, Bert Howard; and Havens, Richard Harry, to Gulf Research & Development Company. Photodegradable resin compositions. 4,042,763, Cl. 526-4.000.

Clark, Leonard R.; and Meehl, David W., to Standard Pressed Steel Co. Storage system. 4,042,097, Cl. 211-182.000.

Clark, Philip M.: *See—*
Rubinstein, Herbert J.; Gordon, Clark B.; Robison, Albert; and Clark, Philip M., 4,042,828, Cl. 250-507.000.

Clark, Ralph B., to Caterpillar Tractor Co. Limited slip differential with clutch control means. 4,041,804, Cl. 74-711.000.

Clarke, Peter Alec: *See—*
Molins, Desmond Walter; Hinchcliffe, Dennis; Clarke, Peter Alec; and Heybourn, Frank, 4,042,112, Cl. 209-73.000.

Claycomb, Jack R.: *See—*
Hauldren, H. Morris; Claycomb, Jack R.; Chang, Chi-Haung; and DeKerlegand, Deke E., 4,041,773, Cl. 73-67.80S.

Clement, Andrew B. Mixer. 4,042,222, Cl. 259-176.000.

Clement, Pierre L., to Eastman Kodak Company. Integral element for analysis of liquids. 4,042,335, Cl. 23-253.0TP.

Clerici, Mario: *See—*
Perrotti, Emilio; and Clerici, Mario, 4,042,609, Cl. 260-429.00R.

Clinch, Colin W. F.; James, Peter A. R.; and Tibbett, John H., to ITW Limited. Seals. 4,042,267, Cl. 292-318.000.

Clinton, Henry H. Collapsible speaker assembly. 4,042,778, Cl. 179-1.00E.

Clorox Company, The: *See—*
Bernard, Brian C., 4,042,343, Cl. 44-10.00B.

Clupak, Inc.: *See—*
Groome, Ernest J., 4,042,437, Cl. 156-212.000.

Coach and Car Equipment Corporation: *See—*
Harder, Arthur J., Jr., 4,042,663, Cl. 264-45.700.

Coal Industry (Patents) Ltd.: *See—*
Haskew, Francis Anthony, 4,041,841, Cl. 91-421.000.

Cobb, A. Donn, to United States of America, Navy. Hydroways. 4,042,904, Cl. 340-6.00R.

Cockrell, Charles R., to Combustion Engineering, Inc. Schnabel-type car. 4,041,879, Cl. 105-366.00R.

Codorniu, Francisco Lorente: *See—*
Johansson, Arne Boris; Codorniu, Francisco Lorente; and Strandly, Ingvald, 4,041,989, Cl. 139-425.00A.

Coffinberry, George A.; and Kast, Howard B., to United States of America, National Aeronautics and Space Administration. Oil cooling system for a gas turbine engine. 4,041,697, Cl. 60-39.28R.

Coglan, George Albert Carl. Latch or lock set and method of manufacture thereof. 4,042,268, Cl. 292-347.000.

Cohen, Morris. Waistband. 4,041,551, Cl. 2-236.000.

Cohen, Richard Lewis; and Meek, Ronald Lee, to Bell Telephone Laboratories, Incorporated. Process for electroless plating using separate sensitization and activation steps. 4,042,730, Cl. 427-305.000.

Cole, David F.; and Sutcliffe, Walter. Marine holding tank. 4,041,555, Cl. 4-10.000.

Cole, Kenneth I. Spare wheel carrier. 4,042,158, Cl. 224-42.230.

Coleman, Edward, to Ottermill Limited. Multi-pole circuit breaker system with common trip means. 4,042,894, Cl. 335-9.000.

Colgate-Palmolive Company: *See—*
Gaffar, Abdul, 4,042,679, Cl. 424-54.000.

Collette, Robert P.; and Wheeler, Robert C., to GTE Sylvania Incorporated. Television receiver protection circuit. 4,042,858, Cl. 315-379.000.

Collin, Per Harald, to Stora Kopparbergs Bergslags Aktiebolag. Method for carrying out endothermic reduction processes in a circulating fluid bed and an apparatus therefor. 4,042,376, Cl. 75-26.000.

Collins, Copp. Elastic cord-attached returning soccer ball. 4,042,241, Cl. 273-95.00A.

Collins, Frederick H., to Valcour Imprinted Papers, Inc. Method for making packaging particles and resulting product. 4,042,658, Cl. 264-45.500.

Collins, George L.; and Costanza, John R., to Celanese Corporation. Polymerized titanium dioxide for ultraviolet coatings. 4,042,476, Cl. 204-159.150.

Collins Machinery Corporation: *See—*
Elkin, Robert D., 4,041,747, Cl. 72-105.000.

Colorado Seminary: *See—*
Ruud, Clayton O., 4,042,825, Cl. 250-272.000.

Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
Newman, Douglas A.; and Emerson, Robert T., 4,042,401, Cl. 106-14.500.
Newman, Douglas A.; and Schlotzhauer, Allan T., 4,042,744, Cl. 428-307.000.

Columbia Ribbon and Manufacturing Co., Inc.: *See—*
Newman, Douglas A., 4,042,092, Cl. 197-171.000.

Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D.; Leverentz, Earl T.; and Nusz, Thomas R., 4,042,213, Cl. 254-168.000.

Columbus, Richard L., to Eastman Kodak Company. Gas pressure-activated drop dispenser. 4,041,995, Cl. 141-275.000.

Combotronics, Inc.: *See—*
Main, Don R., 4,042,149, Cl. 222-40.000.

Combustion Engineering, Inc.: *See—*
Baker, Roxton Elliott, 4,042,889, Cl. 330-207.00P.
Chayes, Norman Chanine, 4,041,907, Cl. 122-510.000.
Cockrell, Charles R., 4,041,879, Cl. 105-366.00R.

Commonwealth Scientific and Industrial Research Organization: *See—*
Rawlings, Robert M.; and Procter, Donald, 4,042,718, Cl. 426-573.000.

Compagnie Honeywell Bull: *See—*
Donabin, Claude Jules; and Mercier, Denis L. J. G., 4,042,807, Cl. 235-61.11R.

Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
Parent, Guy, 4,042,930, Cl. 343-113.00R.

Compax Corporation: *See—*
Diggle, Edmund A., Jr., 4,041,581, Cl. 26-18.600.

Compo Industries, Inc.: *See—*
Hardy, Henry; and Balfour, Adrian E., 4,042,433, Cl. 156-87.000.

Composite Structures Corporation: *See—*
Theriault, Maurice N., 4,042,238, Cl. 273-73.00C.

Compton, James B.; and Ochi, Sam S., to National Semiconductor Corporation. Field effect transistor switch. 4,042,836, Cl. 307-251.000.

Consumer Tire & Supply Co., Inc.: *See—*
Taich, Albert; and Gill, Theodore, 4,041,772, Cl. 73-45.600.

Conti, Jack, to Dresser Industries, Inc. Prepackaged guard device sub-assembly for pressure responsive instruments. 4,041,761, Cl. 73-420.000.

Continental Can Co., Inc.: *See—*
Rarey, Kenneth W.; Higgins, Edward D.; Hungerford, Donald L.; and Kennedy, John B., Jr., 4,041,901, Cl. 118-621.000.

Continental Oil Company: *See—*
Starks, Charles M., 4,042,631, Cl. 260-593.00H.
Waters, Kenneth H., 4,042,063, Cl. 181-119.000.

Control Drug, Inc.: *See—*
Dewas, Raymond, 4,041,991, Cl. 139-449.000.
Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., 4,042,687, Cl. 424-177.000.
Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., 4,042,688, Cl. 424-177.000.

Control Products Inc.: *See—*
Dacal, Perfecto, 4,042,819, Cl. 240-51.11R.

Conway, Bernard W.; and Moran, James, to Dexter Corporation, The. Tufted nonwoven fibrous web. 4,042,453, Cl. 162-108.000.

Cook, Harold L., Jr.; and Geer, Ernest C., to Transco Energy Company. Method for increasing the recovery of natural gas from a geo-pressured aquifer. 4,042,034, Cl. 166-314.000.

Cook, Lucien H., to Chemical Construction Corporation. Integrated two-stage urea synthesis. 4,042,626, Cl. 260-555.00A.

Cook, Stephen Olney, to Crown Zellerbach Corporation. Method and apparatus for forming tubular multilaminate plastic film. 4,042,661, Cl. 264-173.000.

Cooksey, Jonathan Norton. Composite fireplace construction. 4,041,929, Cl. 126-120.000.

Coombs, Robert V., to Sandoz, Inc. Benzindazoles. 4,042,704, Cl. 424-273.00P.

Coons, Robert Arthur: *See—*
Johnson, Robert Richard; Coons, Robert Arthur; and Zwald, John Andrew, 4,041,766, Cl. 72-402.000.

Cooper, Glenn Dale: *See—*
Bennett, James Gordy, Jr.; and Cooper, Glenn Dale, 4,042,564, Cl. 260-47.0ET.

Cooper, Jack A., to Lear Siegler, Inc. Easily accessible switches for manual control of an automatically controlled vehicle. 4,042,058, Cl. 180-98.000.

Cope, Charles S.; and Couture, Maurice J., to Du Pont de Nemours, E. I., and Company. Fluorocarbon separation process. 4,042,634, Cl. 210-616.000.

Coratomic, Inc.: *See—*
Purdy, David L.; Speicher, Vernon L.; Shipko, Frederick J.; and Johnson, William L., 4,041,956, Cl. 128-419.00P.

Corbin, Thomas F., Jr.; Eskridge, Brewster B.; and Lyon, Boyce M., to Akzona Incorporated. Continuous melt spinning and drawing of nylon 6 yarn, while reducing the liveliness of the yarn. 4,042,662, Cl. 264-210.00F.

Corco, Inc.: *See—*
Croley, Thomas E., 4,042,164, Cl. 229-23.0BT.

Cordes, Horst: *See—*
Decker, Hanns; Pfeiffer, Roland; Wenz, Lothar; and Cordes, Horst, 4,042,492, Cl. 209-223.00R.

Cornell Research Foundation, Inc.: *See—*
Brice, Neil M., 4,042,196, Cl. 244-158.000.

Cornell, Robert J., to Uniroyal, Inc. Latex suspension process and graft polyblend composition using small particle size spine. 4,042,647, Cl. 260-880.00R.

Corning Glass Works: *See—*
Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., 4,042,361, Cl. 65-18.000.
Folmar, Robert G.; and Weetman, Ronald J., 4,041,597, Cl. 29-423.000.
Gulati, Suresh T., 4,042,738, Cl. 428-116.000.
Kelm, Everett F., 4,041,592, Cl. 29-157.30R.
MacDowell, John F.; and Rittler, Hermann L., 4,042,362, Cl. 65-33.000.
Noll, Dale A.; Piazza, Giacomo J.; and Young, Robert L., 4,041,591, Cl. 29-157.30R.
Reade, Richard F., 4,042,403, Cl. 106-39.700.
Schultz, Peter C., 4,042,404, Cl. 106-52.000.

Cornwell, Charles E.; and Plunguian, Mark. Cementitious sound absorbing panels and sound absorbing sprayed wall structures. 4,042,745, Cl. 428-310.000.

Corrugated Drum of Michigan, Inc.: *See—*
Burgdorf, Joseph Louis, 4,042,169, Cl. 229-43.000.

Costanza, John R.: *See—*
Collins, George L.; and Costanza, John R., 4,042,476, Cl. 204-159.150.

Coster, Norbert, to SOFISA (Societe Financiere S.A.). Thrust bearing assembly. 4,042,284, Cl. 308-219.000.

Coulmance, Jean-Pierre Rene; and Six, Jean-Claude Gerard, to U.S. Philips Corporation. Temperature transducer arrangement which supplies threshold voltages with the aid of a single sensor. 4,042,875, Cl. 323-75.00N.

Coulter Electronics, Inc.: *See—*
Drbal, Vladimir J., 4,042,152, Cl. 222-137.000.

Couture, Maurice J.: *See—*
Cope, Charles S.; and Couture, Maurice J., 4,042,634, Cl. 210-616.000.

Cowen, John F.: *See—*
Barrick, Robert R., 4,041,925, Cl. 124-35.00A.

Cox, Clyde H. Sludge dewatering. 4,041,854, Cl. 100-112.000.

Cox, Jay Ashton, to Guldon Industries, Inc. Phase locked firing circuit for SCRS, or the like. 4,042,873, Cl. 363-129.000.

Coy, Merle Dalton, to Borg-Warner Corporation. Method of manufacturing a transmission. 4,041,791, Cl. 74-325.000.

Crall, Frederick William: *See—*
Tomczak, Lawrence William; Crall, Frederick William; Caron, LaVerne Andrew; and Campau, Walter Joseph, 4,042,899, Cl. 336-30.000.

Craven, Peter Graham; and Gerzon, Michael Anthony, to National Research Development Corporation. Coincident microphone simulation covering three dimensional space and yielding various directional outputs. 4,042,779, Cl. 179-1.0DM.

CRC - Automatic Welding, Division of Crutcher Resources Corporation: *See—*
Kopczynski, John F.; and Kluczynski, Paul F., 4,042,231, Cl. 269-48.100.

Creasey, Norman Geoffrey; and Pike, Leslie Clark, to Imperial Chemical Industries Limited. Organopolysiloxane compositions. 4,042,643, Cl. 428-447.000.

Criley, Ronald L.: *See—*
Frost, Richard H.; and Criley, Ronald L., 4,042,194, Cl. 244-151.00A.

Croley, Thomas E., to Corco, Inc. Container end structure. 4,042,164, Cl. 229-23.0BT.

Crown Zellerbach Corporation: *See—*
Cook, Stephen Olney, 4,042,661, Cl. 264-173.000.

Crum, Robert L., to Fiat-Allis Construction Machinery, Inc. Track link hinge joint lubricating system. 4,042,065, Cl. 184-1.00E.

Cueman, Glenn F.: *See—*
Frankel, S. Arthur; and Cueman, Glenn F., 4,041,940, Cl. 128-80.00C.

Cumpston, Edward H. Rotor for mixer-refiner-reactor. 4,042,183, Cl. 241-292.100.

Cunningham, James D.: *See—*
Smith, James E.; and Cunningham, James D., 4,042,036, Cl. 173-13.000.

Curley, John L.; Dawson, C. William; Parmet, Arthur A.; and Taylor, Donald R., to Honeywell Information Systems Inc. Microprogrammed control of foreign processor control functions. 4,042,914, Cl. 364-200.000.

Cuvilly, Jean-Pierre, to Kalinna, E. Ceiling equipment for demonstration equipment. 4,041,658, Cl. 52-39.000.

Czechoslovenska akademie ved: *See—*
Hrabak, Frantisek; Hynkova, Vlasta; and Lokaj, Jan, 4,042,644, Cl. 260-849.000.

Czitrom, Georg, to Aneta Belysning AB. Lighting device. 4,042,290, Cl. 339-52.00R.

Dacal, Perfecto, to Control Products Inc. Fluorescent lamp for use in explosive atmospheres such as mines. 4,042,819, Cl. 240-51.11R.

Daglis, Nicholas T. Tone enhancing device for reed type musical instruments. 4,041,827, Cl. 84-383.00R.

D'Agnolo, Armando; and Minto, Luigi, to Officine Savio, S.p.A. Intermediate storage points for cops, and the intermediate storage points thus improved. 4,042,098, Cl. 198-393.000.

Dahlgren, Harold P.; and Dahlgren, Harvey W., to Dahlgren Manufacturing Company. Method and apparatus for inking printing plates. 4,041,864, Cl. 101-350.000.

Dahlgren, Harvey W.: *See—*
Dahlgren, Harold P.; and Dahlgren, Harvey W., 4,041,864, Cl. 101-350.000.

Dahlgren Manufacturing Company: *See—*
Dahlgren, Harold P.; and Dahlgren, Harvey W., 4,041,864, Cl. 101-350.000.

Dahlin, Rolf Brorsson. Balancing apparatus, preferably for grinding wheel. 4,041,802, Cl. 74-573.000.

Dahm, Manfred; and Gonzalez-Dorner, Alberto Carlos, to Bayer Aktiengesellschaft. Process for the production of polyurethane foams. 4,042,537, Cl. 260-2.5AP.

Dahm, Manfred: *See—*
von Bonin, Wulf; Preis, Lothar; von Gizycki, Ulrich; and Dahm, Manfred, 4,042,558, Cl. 260-37.00N.

Dai Nippon Printing Co., Ltd.: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,042,613, Cl. 260-448.20B.

Daihatsu Motor Company, Limited: *See—*
Morita, Eiichi; Sato, Hisayuki; and Kobayashi, Toru, 4,042,866, Cl. 318-568.000.

Daimler-Benz Aktiengesellschaft: *See—*
Breitschwerdt, Werner, 4,042,276, Cl. 297-216.000.
Razim, Claus; Lovasz, Csaba; and Baier, Kurt, 4,042,427, Cl. 148-15.500.
Wiegard, Klaus, 4,042,015, Cl. 165-8.000.

Daiwa Boseki Kabushiki: *See—*
Motobayashi, Kozo; Shimizu, Takeshi; and Miyamoto, Noriaki, 4,041,687, Cl. 57-56.000.

D'Alessio, Joseph R., to Champion International Corporation. Die cut blank and tray assembled therefrom. 4,042,167, Cl. 229-34.0HW.

Damais, Chantal, born Rousselot: *See—*
Ciorbaru, Rita, born Sfartz; Adam, Arlette, born Chosson; Petit, Jean-Francois; Lederer, Edgar; Damais, Chantal, born Rousselot; Chedid, Louis; and Bona, Constantin, 4,042,678, Cl. 424-12.000.

Dana Corporation: *See—*
Dickenson, William D., 4,042,073, Cl. 188-72.900.
Kress, Robert F., 4,041,730, Cl. 64-30.00D.

D'Angelo, Joseph J.; and D'Angelo, Joseph J., Jr. Pneumatically operated stapling apparatus and method. 4,041,598, Cl. 29-432.000.

D'Angelo, Joseph J., Jr.: *See—*
D'Angelo, Joseph J.; and D'Angelo, Joseph J., Jr., 4,041,598, Cl. 29-432.000.

Darling, Reyi: *See—*
Darling, Stanley N.; and Darling, Reyi, 4,041,556, Cl. 4-52.000.

Darling, Stanley N.; and Darling, Reyi. Flushing method and apparatus. 4,041,556, Cl. 4-52.000.

Dart Industries, Inc.: *See—*
Stenberg, Nyyrikki K., 4,041,758, Cl. 73-207.000.

Data General Corporation: *See—*
Gruner, Ronald Hans; and Alsing, Carl Justin, 4,042,972, Cl. 364-200.000.

Data Packaging Corporation: *See—*
Lyman, George F., 4,041,627, Cl. 40-97.000.

Davidsohn, Uryon S., to Motorola, Inc. Semiconductor devices. 4,042,949, Cl. 357-49.000.

Davis, Duane A.; and Krenick, Michael P., to GAF Corporation. Method for perforating roofing sheet material. 4,041,815, Cl. 83-30.000.

Davis, George Bradley, Jr. Joist, structural element and devices used in making same. 4,041,664, Cl. 52-223.00R.

Davis, Gerald A.; and Stackman, Robert W., to Celanese Corporation. Aromatic sulfonates. 4,042,618, Cl. 260-470.000.

Davis, James W.; and Hilton, Garrett H., to Fischer & Porter Co. Ejector assembly. 4,041,981, Cl. 137-604.000.

Davis, John W., to Radar Control Systems Corporation. Doppler radar module employing coupled rectangular waveguides. 4,042,934, Cl. 343-786.000.

Davis, Leonard Mayor: *See—*
Pakenham, William Edward; and Davis, Leonard Mayor, 4,042,792, Cl. 179-90.00R.

Davis, Michael Ian: *See—*
Birney, Richard Eugene; Davis, Michael Ian; Graybiel, Lynn Allan; Hood, Robert Allen; Kahn, Samuel; and Osborne, William Steese, 4,042,913, Cl. 364-200.000.

Davis, Walter C.: *See—*
Brandewie, Richard A.; Davis, Walter C.; and Macken, John A., 4,042,822, Cl. 250-216.000.

Dawson, C. William: *See—*
Curley, John L.; Dawson, C. William; Parmet, Arthur A.; and Taylor, Donald R., 4,042,914, Cl. 364-200.000.

De Laval Separator Company, The: *See—*
Yang, Denis C., 4,041,904, Cl. 119-14.410.

Deague, Terrence Kevin: *See—*
Callcott, Thomas George; and Deague, Terrence Kevin, 4,042,344, Cl. 48-197.00R.

De Araujo, Manuel Alexandre Vincent; and Vouthier, Marcel, to De Araujo, Manuel Alexandre Vincent. Electric safety switch with positive-action mechanism. 4,042,797, Cl. 200-153.00R.

Decker, Hanns; Pfeiffer, Roland; Wenz, Lothar; and Cordes, Horst, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for the separation of magnetizable particles from a fine granular solid. 4,042,492, Cl. 209-223.00R.

Decker, Louise A.; and Langford, Gary O., to United States of America, Navy. Optical scanner. 4,042,823, Cl. 250-227.000.

DeEdwardo, Andrew H.; Zitomer, Fred; Stackman, Robert W.; and Kramer, Charles E., to Celanese Corporation. Flame retardant compositions containing polyphosphazenes. 4,042,561, Cl. 260-45.9NP.

Deeg, Emil W.: *See—*
Krohn, David A.; Graf, Robert E.; and Deeg, Emil W., 4,042,405, Cl. 106-52.000.

Deep Sea Grouting Packers, Inc.: *See—*
Stone, William Bundy, 4,041,718, Cl. 61-86.000.

Deepsea Ventures, Inc.: *See—*
Cardwell, Paul H.; and Kane, William S., 4,042,664, Cl. 423-24.000.

Deere & Company: *See—*
Honnold, Darrel Lee, 4,042,044, Cl. 172-311.000.

Defago, Raymond; Lapple, Arnulf Ruediger; and Becker, Carl, to Ciba-Geigy AG. Novel printing inks for sublimation transfer printing. 4,042,545, Cl. 260-13.000.

Defibrator AB: *See—*
Falkinger, Willard; and Asberg, Per Anders, 4,042,125, Cl. 214-6.0BA.

Degen, Ludwig: *See—*
Marconi, Walter; Oddo, Nicola; and Degen, Ludwig, 4,042,495, Cl. 210-11.000.

Degen, Norbert: *See—*
Simon, Michael; and Degen, Norbert, 4,041,877, Cl. 104-242.000.

Dehnert, Johannes; and Lamm, Gunther, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Azo dyes having 2,6-diaminopyridine derivatives as coupling components. 4,042,578, Cl. 260-156.000.

DeKerlegand, Deke E.: *See—*
Hauldren, H. Morris; Claycomb, Jack R.; Chang, Chi-Haung; and DeKerlegand, Deke E., 4,041,773, Cl. 73-67.80S.

Del Norte Technology, Inc.: *See—*
Merrick, James W., 4,042,923, Cl. 343-6.5LC.

Delamere & Williams Company Limited: *See—*
Brooke, Arthur Alan; and Loben, Rudy, 4,041,673, Cl. 53-39.000.

Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., to A. Christiaens Societe Anonyme. Derivatives of 1,2,4-thiadiazine. 4,042,693, Cl. 424-246.000.

Delkor Industries, Inc.: *See—*
Klund, Robert N.; and Weidenbach, James S., 4,042,445, Cl. 156-385.000.

Dell, Curtis G.; and Williamson, James A., Jr., to Du Pont de Nemours, E. I., and Company. Apparatus and method for gas analysis. 4,042,333, Cl. 23-232.00R.

Delle-Alsthom: *See—*
Kypreos, Georges; and Orgeret, Lucien, 4,042,968, Cl. 361-60.000.

Delmar Chemicals Limited: *See—*
Dunne, Gerald J.; and Harvey, John D., 4,042,722, Cl. 426-648.000.

DeLorenzo, William, Jr., co-executor: *See—*
Stepien, George, Jr.; Califano, Frank L., deceased; DeLorenzo, William, Jr., co-executor; Gillard, G. Bruce, co-executor; Russell, Thomas E., deceased; and Russell, Florence P., executrix, 4,041,712, Cl. 61-36.00R.

Demaray, Merlin E.; and Attridge, Russell G., Jr., to Ranco Incorporated. Method and apparatus for controlling air-conditioning systems. 4,042,013, Cl. 165-2.000.

De Meo, Edgar: *See—*
Hazeltine, Barrett; De Meo, Edgar; and Simon, Richard M., 4,042,491, Cl. 209-74.00R.

Demin, Alexandr Viktorovich: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.

Dems, Edd: *See—*
Harsch, Thomas B.; and Dems, Edd, 4,042,920, Cl. 340-324.00M.

de Munck, Eduard H. L., to Vredestein N.V. Injection sealable waterstop and method of installing same. 4,041,665, Cl. 52-396.000.

Dench, Robert H.; and Dervin, Victor J., to Mobile Product Services, Inc. Produce warmer. 4,042,017, Cl. 165-63.000.

Dentsply Research & Development Corporation: *See—*
Bresnahan, Robert A.; Bass, Edward W.; and Mader, William G., 4,041,609, Cl. 32-22.000.

Depoorter, Henri: *See—*
Moelants, Felix Jan; Dierckx, Jozef Aime; and Depoorter, Henri, 4,042,397, Cl. 96-84.00R.

Dervin, Victor J.: *See—*
Dench, Robert H.; and Dervin, Victor J., 4,042,017, Cl. 165-63.000.

Des Champs Laboratories Incorporated: *See—*
Zebuhr, William Henry, 4,042,018, Cl. 165-166.000.

Deshay, Harry W.: *See—*
Doolittle, Donald B.; and Deshay, Harry W., 4,042,079, Cl. 188-290.000.

Deshmukh, Arvind D. In a method for checking the accuracy of a test using an enzymatically hydrolyzable, serum-soluble cholesterol compound. 4,042,330, Cl. 23-230.00B.

DeSoto, Inc.: *See—*
Murphy, Edward J., 4,042,566, Cl. 260-47.0EP.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Ackermann, Rolf; Morlock, Gerhard; and Stehlik, Gerhard, 4,042,525, Cl. 252-106.000.
Bertram, Heidrun; Fahnenstich, Rudolf; Junkermann, Helmut; Pohl, Gerhard; and Tanner, Herbert, 4,042,716, Cl. 426-335.000.
Hebbel, Gerhard; Krueger, Horst; Haschke, Heinz; and Morlock, Gerhard, 4,042,748, Cl. 428-323.000.

Deutsche Texaco Aktiengesellschaft: *See—*
Pusch, Gunter; Klatt, Heinz Jurgen; and Frohlich, Walter, 4,042,026, Cl. 166-258.000.
Rietsch, Eike, 4,042,910, Cl. 340-15.5TA.

Dewas, Raymond, to Control Drug, Inc. Weaving machine with external weft supply. 4,041,991, Cl. 139-449.000.

Dexter Corporation, The: *See—*
Conway, Bernard W.; and Moran, James, 4,042,453, Cl. 162-108.000.

Dhein, Rolf: *See—*
Kaiser, Bernd-Ulrich; Dhein, Rolf; Rudolph, Hans; and Kuchenmeister, Rolf, 4,042,547, Cl. 260-22.00R.

Diagnostic Data, Inc.: *See—*
Huber, Wolfgang; Saifer, Mark G.; and Williams, Lewis D., 4,042,689, Cl. 424-177.000.

Diaz, Marcellina. Medical implement. 4,041,937, Cl. 128-15.000.

Dick, Heinrich; and Kobinger, Erhard, to Voith Getriebe KG. Multiple-transmission-ratio transmission arrangement with gear-shift overlap action of automatically varied duration. 4,041,809, Cl. 74-866.000.

Dickenson, William D., to Dana Corporation. Disc brake mechanism actuating means. 4,042,073, Cl. 188-72.900.

Dickson, J. Douglas: *See—*
Blauvelt, Lon; Dickson, J. Douglas; and Russell, Robert C., 4,042,126, Cl. 214-8.50A.

Dictaphone Corporation: *See—*
Wilder, Leslie N.; and Ciaraldi, Anthony, 4,041,890, Cl. 116-114.00R.

Dierckx, Jozef Aime: *See—*
Moelants, Felix Jan; Dierckx, Jozef Aime; and Depoorter, Henri, 4,042,397, Cl. 96-84.00R.

Dierckx, Peter Gerard, to AGFA-GEVAERT N.V. Apparatus for incinerating non-halogenated waste liquids. 4,041,882, Cl. 110-7.00B.

Diers, Ivan Verner, to Novo Industri A/S. Method for producing glucose isomerase. 4,042,460, Cl. 195-65.000.

Diesch, Robert E.: *See—*
Caulfield, Patrick J.; Diesch, Robert E.; and Strunc, Gerald R., 4,042,973, Cl. 235-150.300.

Dieterich, Dieter; Markusch, Peter; and Reiff, Helmut, to Bayer Aktiengesellschaft. Inorganic-organic plastic. 4,042,536, Cl. 260-2.5AK.

Dietz, Albert Louis. Process of growing plants within an enclosure. 4,041,641, Cl. 47-17.000.

Diggle, Edmund A., Jr., to Compax Corporation. Method for compacting woven gauze bandages. 4,041,581, Cl. 26-18.600.

Dills, William Leonard, to Du Pont de Nemours, E. I., and Company. Process for preparing a high concentration of titanium dioxide slurry in dimethylacetamide or dimethylformamide. 4,042,557, Cl. 260-32.6NR.

Dimsdale, Michael John: *See—*
Garside, Peter; and Dimsdale, Michael John, 4,042,697, Cl. 424-258.000.

DiPippo, Carmine A., to Scott Paper Company. Pyrolysis of 2-sulfochloride benzoates. 4,042,600, Cl. 260-327.00S.

Dively, Charles R.; and Peterson, Russell K., to Ingersoll-Rand Company. Raise boring head having fluid traversing means. 4,042,047, Cl. 175-340.000.

Dix, C. Hewitt: *See—*
Fort, J. Robert; Westphal, James A.; and Dix, C. Hewitt, 4,042,905, Cl. 340-15.5DP.

Doane, J. Chalmers. Teaching ukelele. 4,041,830, Cl. 84-305.000.

Dobson, LeRoy E.: *See—*
Lin, Kou Chi; and Dobson, LeRoy E., 4,042,775, Cl. 174-94.00R.

Doddema, Harmannus J.: *See—*
Harrison, David E. F.; and Doddema, Harmannus J., 4,042,458, Cl. 195-28.00R.

Dolenc, Anton; Christ, Alfred; and Lehmann, Rolf, to Escher Wyss Limited. Rolling mills having hydraulic forces exerted on the exterior roll surfaces. 4,041,752, Cl. 72-201.000.

Dolida, Roger Joseph: *See—*
Acomb, Byron Hillen; and Dolida, Roger Joseph, 4,041,969, Cl. 137-88.000.

Dombroski, John R.; and Weemes, Doyle A., to Eastman Kodak Company. 2-Cyanoacrylate adhesive composition. 4,042,442, Cl. 156-310.000.

Donabin, Claude Jules; and Mercier, Denis L. J. G., to Compagnie Honeywell Bull. Apparatus for the processing of documents. 4,042,807, Cl. 235-61.11R.

Doolittle, Donald B.; and Deshay, Harry W., to All American Industries, Inc. Variable energy absorber for aircraft arresting system. 4,042,079, Cl. 188-290.000.

Dorey, Jacques A., to Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.). Helicopter navigation system. 4,042,929, Cl. 343-113.0DE.

Dorsch, Hans H., to INA Bearing Company, Inc. Thrust bearing. 4,042,285, Cl. 308-235.000.

Dougan, Ramon C.; and Rudtke, Helen T., to American Hospital Supply Corporation. Surgical drape. 4,041,942, Cl. 128-132.00D.

Doughty, Kenneth W.: *See—*
Hinton, Reginald A.; Doughty, Kenneth W.; and Kennedy, William N., 4,042,900, Cl. 336-70.000.

Dow Chemical Company, The: *See—*
Kallos, George J., 4,042,326, Cl. 23-230.00R.
Nimerick, Kenneth H.; and Simpson, Benny E., 4,042,529, Cl. 252-363.500.
Ramstad, Tore; Mahle, Nels H.; and Matalon, Ralph, 4,042,499, Cl. 210-31.00C.
Strycker, Stanley J., 4,042,692, Cl. 424-244.000.
Strycker, Stanley J., 4,042,709, Cl. 424-304.000.
Strycker, Stanley J., 4,042,712, Cl. 424-329.000.
Watts, Harry, 4,042,541, Cl. 260-2.50B.

Dow Corning Corporation: *See—*
Swihart, Terence J., 4,042,563, Cl. 260-45.90K.

Downs Surgical Limited: *See—*
Hall, John Emmett, 4,041,939, Cl. 128-69.000.

Draftex Development AG: *See—*
Bright, Robert G., 4,042,741, Cl. 428-217.000.

Dragotinov, Alexander, to Siemens Aktiengesellschaft. Apparatus for synchronizing oscillators in the network nodes of a digital telecommunications network. 4,042,781, Cl. 179-15.0BS.

Draisbach, Adolf: *See—*
Fiedler, Kurt H.; and Draisbach, Adolf, 4,042,259, Cl. 280-701.000.

Drake, Cyril Francis; and Amos, Robert Walter James, to International Standard Electric Corporation. Biocidal glass materials. 4,042,402, Cl. 106-15.00R.

Drbal, Vladimir J., to Coulter Electronics, Inc. Diluting apparatus. 4,042,152, Cl. 222-137.000.

Dressel, Edwin J.; and Hunter, Houston W., to J. Ray McDermott & Co., Inc. Sand shield jet sled. 4,041,717, Cl. 61-72.400.

Dresser Industries, Inc.: *See—*
Angehrn, Jorg August, 4,041,780, Cl. 73-151.000.
Conti, Jack, 4,041,761, Cl. 73-420.000.

Drewek, David F.; and Hoffman, Dickie D., to General Motors Corporation. Steerable trailer for a small vehicle. 4,042,255, Cl. 280-445.000.

Driver, K. Dwight. Means for and method of removing a cast. 4,041,941, Cl. 128-91.00A.

Drnevich, Raymond Francis: *See—*
Matsch, Ladislas Charles; and Drnevich, Raymond Francis, 4,042,493, Cl. 210-6.000.

Drori, Mordeki. Self cleanable filters. 4,042,504, Cl. 210-107.000.

Du Pont of Canada: *See—*
Kershaw, Bernard John, 4,042,629, Cl. 260-583.00P.

Dubois, Guy. Slenderizing ladies' roll-on belt of improved comfort. 4,041,957, Cl. 128-540.000.

Duncan, Leroy A.; and Aksamit, Steve M., to Standard Alliance Industries, Inc. Sorting device for magazine or the like. 4,042,113, Cl. 209-74.00R.

Duncan, Patrick Joseph; and Scrivener, Francis Edward, Jr., to Du Pont de Nemours, E. I., and Company. Multilobal polyester yarn. 4,041,689, Cl. 57-140.00J.

Dunn, Byron G. Fire extinguishing composition. 4,042,521, Cl. 252-5.000.

Dunne, Gerald J.; and Harvey, John D., to Delmar Chemicals Limited. Additives for animal feeds. 4,042,722, Cl. 426-648.000.

Dunne, Liam: *See—*
Ellis, John; and Dunne, Liam, 4,041,626, Cl. 40-86.00R.

Du Pont de Nemours, E. I., and Company: *See—*
Balmat, Jean Louis, 4,042,668, Cl. 423-243.000.
Bell, Robert Glenn; Gillyns, Emile; and McDaniel, Olin Kilpatrick, Jr., 4,042,569, Cl. 260-75.00T.
Black, Richard William, 4,041,589, Cl. 29-33.00M.
Brethauer, Dale M., 4,042,108, Cl. 206-392.000.
Chay, Dong Myung, 4,042,731, Cl. 427-311.000.
Cope, Charles S.; and Couture, Maurice J., 4,042,634, Cl. 210-616.000.
Dell, Curtis G.; and Williamson, James A., Jr., 4,042,333, Cl. 23-232.00R.

Dills, William Leonard, 4,042,557, Cl. 260-32.6NR.

Duncan, Patrick Joseph; and Scrivener, Francis Edward, Jr., 4,041,689, Cl. 57-140.00J.

Fanning, Herbert H., 4,042,539, Cl. 260-16.000.

Hart, Marvin Sumner; and Powers, William James, Jr., 4,041,583, Cl. 28-254.000.

Hazan, Isidor; and Iacona, Robert N., 4,042,478, Cl. 204-181.000.

Humkey, Robert Garnett; Marshall, Donald Raymond; and Ryan, Donald James, 4,042,220, Cl. 259-95.000.

Kiesslich, Gunther, 4,042,399, Cl. 96-87.00R.

Manzer, Leo Ernest, 4,042,610, Cl. 260-429.300.

McIntosh, Colin Leslie, 4,042,650, Cl. 260-924.000.

Miegel, Ralph E., 4,042,619, Cl. 260-482.00P.

Moje, Steven William, 4,042,373, Cl. 71-91.000.

Ostapchenko, George Joseph; and Phillips, Terrance Duane, 4,042,657, Cl. 264-40.100.

Poskitt, Ralph Leroy, 4,042,554, Cl. 260-29.7NR.

Ripka, William Charles, 4,042,707, Cl. 424-274.000.

Sauer, John Carl, 4,042,621, Cl. 260-561.00R.

Shannon, Robert Day; and Taylor, Barry Edward, 4,042,482, Cl. 204-242.000.

Shearon, Michael Hillas, 4,041,816, Cl. 83-100.000.

Williamson, Thomas Donald, 4,041,584, Cl. 28-269.000.

Durant, Walter F. Torque limiting driver. 4,041,811, Cl. 81-52.40R.

Durling, Hubert R., Jr.: *See—*
Bohman, Carl E.; Durling, Hubert R., Jr.; Susman, Leon; and Rolfe, Norman F., 4,042,132, Cl. 214-42.00A.

Duve, George, to Area Lighting Research, Inc. Fail-off photo control circuit for night lighting. 4,042,853, Cl. 315-155.000.

Dvorak, Vernon B. Means of measuring a puppy's tail for surgically docking the same. 4,041,611, Cl. 33-174.00D.

Dynamit Nobel Aktiengesellschaft: *See—*
Bruning, Klaus; Junger, Hans; Pungs, Wolfgang; Rheinfeld, Peter; Weissenfels, Franz; and Wienand, Michael, 4,042,314, Cl. 425-89.000.
Lenz, Arnold; and Rogler, Walter, 4,042,636, Cl. 260-632.00A.

Eastlund, Bernard John: *See—*
Ury, Michael Gerson; Eastlund, Bernard John; Braden, Ray S.; and Wood, Charles H., 4,042,850, Cl. 315-39.000.

Eastman Kodak Company: *See—*
Clement, Pierre L., 4,042,335, Cl. 23-253.0TP.
Columbus, Richard L., 4,041,995, Cl. 141-275.000.
Dombroski, John R.; and Weemes, Doyle A., 4,042,442, Cl. 156-310.000.
Esders, Theodore Walter; Schaeffer, James Robert; and Harris, Harry Wayne, 4,042,461, Cl. 195-66.00R.
Gysling, Henry James; and Lelental, Mark, 4,042,392, Cl. 96-48.0PD.
Leszyk, Gerald M.; Morrison, Edward D.; and Williams, Robert F., Jr., 4,042,654, Cl. 264-22.000.
Smith, Wendell F., Jr.; Eddy, Kenneth L.; and Harnish, Donald P., 4,042,394, Cl. 96-56.000.
Sylvester, Robert A., 4,042,396, Cl. 96-76.00C.
Tone, Frederick F.; and Borel, Robert J., 4,042,395, Cl. 96-76.00C.

Eaton Corporation: *See—*
Knapp, Kenneth K., 4,041,703, Cl. 60-464.000.

Ebauches S.A.: *See—*
Belot, Michel; and Perucchi, Norberto, 4,041,794, Cl. 74-460.000.

ECC Corporation: *See—*
Grubbs, Calvin E.; and Harwell, Jack B., 4,042,871, Cl. 363-28.000.

Eccleston, Kenneth Thomas, to Foseco Trading A.G. Tundish with weirs. 4,042,229, Cl. 266-275.000.

Eckerle, Joseph S. High efficiency electrical power conditioner. 4,042,890, Cl. 330-207.00A.

Eckert, Konrad; and Eheim, Franz, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,041,921, Cl. 123-140.00R.

Eckl, Robert: *See—*
Wanner, Rudolf; and Eckl, Robert, 4,042,235, Cl. 271-94.000.

Edamura, Koji; Nakagawa, Yoshimasa; and Ikeda, Yoshitaka, to Nihon Yushi Co., Ltd. Process for curing unsaturated resins. 4,042,646, Cl. 260-864.000.

Eddy, Kenneth L.: *See—*
Smith, Wendell F., Jr.; Eddy, Kenneth L.; and Harnish, Donald P., 4,042,394, Cl. 96-56.000.

Edwards, Raymond S. Energy system producing electricity, hot water and steam from combustible refuse. 4,041,906, Cl. 122-2.000.

Edwards, Richard A.: *See—*
Robinson, John Thomas; and Edwards, Richard A., 4,042,951, Cl. 357-67.000.

Effic Trading and Services Ltd.: *See—*
Egosi, Isaac, 4,041,855, Cl. 100-138.000.

Egosi, Isaac, to Effic Trading and Services Ltd. Opposed box baling press. 4,041,855, Cl. 100-138.000.

Eheim, Franz: *See—*
Eckert, Konrad; and Eheim, Franz, 4,041,921, Cl. 123-140.00R.

Ehrlich, Stephen Jeffrey, to Becton, Dickinson and Company. Sensitivity disc dispenser with tamper mechanism. 4,042,145, Cl. 221-94.000.

Eibeck, Richard E.: *See—*
Nychka, Henry R.; Eibeck, Richard E.; and Li, Chien C., 4,042,524, Cl. 252-69.000.

Eickelberg, John E.; and Rice, James S., to Industrial Nucleonics Corporation. Backlash compensation. 4,042,869, Cl. 318-630.000.

Eilingsfeld, Heinz; and Lach, Dietrich, to BASF Aktiengesellschaft. Isolation of dinitroanthraquinone having a high content of α,α-dinitro compounds. 4,042,604, Cl. 260-369.000.

Eisele, Bernhard: *See—*
Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, 4,042,711, Cl. 424-319.000.

Eisen -und Drahtwerk Erlau Aktiengesellschaft: *See—*
Muller, Anton, 4,042,001, Cl. 152-243.000.

Eisendick, Horst: *See—*
Meyer, Hans; Kaseberg, Werner; Eisendick, Horst; and Lucke, Willi, 4,042,902, Cl. 338-128.000.

Eisenstein, Reuben: *See—*
Kuettner, Klaus E.; Eisenstein, Reuben; and Sorgente, Nino, 4,042,457, Cl. 195-1.800.

Eitzen, Vincent E.: *See—*
Moore, Robert R.; and Eitzen, Vincent E., 4,042,218, Cl. 259-72.000.

Ekman, Bjorn; and Tyrefors, Lars, to AB Svenska Dental Instrument. Sterile package. 4,042,170, Cl. 229-62.500.

Elder, Jerome Earl, to International Paper Company. Reinforced paperboard box. 4,042,165, Cl. 229-33.000.

Elder Laboratories: *See—*
MacArthur, J. Roderick, 4,041,575, Cl. 24-73.0HH.

Electric Power Research Institute: *See—*
Perry, Elijah R.; and Rabinowitz, Mario, 4,042,012, Cl. 165-1.000.

Electronic Arrays, Inc.: *See—*
Sikes, Wayne Alan, 4,042,843, Cl. 307-297.000.

Eli Lilly and Company: *See—*
Guernsey, Richard H., 4,042,110, Cl. 206-459.000.
Hall, David A., 4,042,472, Cl. 204-73.00R.
Harper, Richard W., 4,042,372, Cl. 71-90.000.
Koppel, Gary A., 4,042,585, Cl. 544-22.000.
O'Doherty, George O. P., 4,042,593, Cl. 260-294.80C.
Tensmeyer, Lowell G., 4,042,325, Cl. 21-54.00R.

Elitex: *See—*
Brada, Pavel; Kucera, Jaromir; Chladek, Otokar; Voda, Gustav; Novacek, Jindrich; and Kollmann, Jan, 4,041,733, Cl. 66-138.000.

Elitex Koncern textilniho strojirenstvi: *See—*
Resch, Josef; Kadlec, Miloslav; Zahradnik, Stanislav; and Parizek, Josef, 4,041,986, Cl. 139-58.000.

Elkin, Robert D., to Collins Machinery Corporation. Pipe grooving apparatus. 4,041,747, Cl. 72-105.000.

Elliott Brothers (London) Limited: *See—*
Ellis, Stafford Malcolm, 4,042,957, Cl. 358-109.000.

Elliott, Donald P.; and Halseth, William L. Radiopaque anastomosis marker. 4,041,931, Cl. 128-1.00R.

Ellis, John; and Dunne, Liam. Apparatus for presenting reading matter as a linear book. 4,041,626, Cl. 40-86.00R.

Ellis, Stafford Malcolm, to Elliott Brothers (London) Limited. Display systems. 4,042,957, Cl. 358-109.000.

ELMEG Elektro-Mechanik GmbH: *See—*
Reuting, Hans Werner, 4,042,799, Cl. 200-288.000.

Elmquist, Bernt Holger: *See—*
Johansson, Erik Gunnar; Blomberg, Bengt Ture Hubertus; and Elmquist, Bernt Holger, 4,041,962, Cl. 132-91.000.

Eluard, Robert: *See—*
Baudouin, Yvonne; Simonet, Guy; Eluard, Robert; and Pivard, Claude, 4,042,349, Cl. 55-25.000.

Emal, Earl A.; and Lambert, Jack L. Joint tape for dry wall construction having water-initiated adhesive which once activated, attached to, and dried on a surface resists removal under remoistening conditions. 4,042,739, Cl. 428-137.000.

Emerson, Robert T.: *See—*
Newman, Douglas A.; and Emerson, Robert T., 4,042,401, Cl. 106-14.500.

Emery Industries, Inc.: *See—*
Ahr, Robert L.; and Rhodes, Philip H., 4,042,549, Cl. 260-23.0XA.

Endo, Ichiro: *See—*
Inoue, Eiichi; Endo, Ichiro; and Yamanouchi, Teruo, 4,042,388, Cl. 96-1.600.

Endo, Takaya: *See—*
Wada, Hajime; Kikuchi, Shouji; Hori, Haruo; and Endo, Takaya, 4,042,393, Cl. 96-55.000.

Energetics Science, Inc.: *See—*
Blurton, Keith F.; and Sedlak, John M., 4,042,464, Cl. 204-1.00T.

Engl, Alfred; and Heim, Guenther, to Siemens Aktiengesellschaft. Pyrolytic process for producing a band-shaped metal layer on a substrate. 4,042,006, Cl. 164-46.000.

Engleking, Frederick S.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engleking, Frederick S.; and Jero, John P., 4,042,085, Cl. 192-57.000.

English, David C.: *See—*
Reichow, Keith W.; English, David C.; and McCauley, Jerry L., 4,042,049, Cl. 177-137.000.

Englund, Arnold: *See—*
Schibbye, Hjalmar; and Englund, Arnold, 4,042,310, Cl. 417-310.000.

Ennes, John P.: *See—*
Ennes, John W.; and Ennes, John P., 4,042,028, Cl. 160-263.000.

Ennes, John W.; and Ennes, John P. Adjustable tube shade roller. 4,042,028, Cl. 160-263.000.

Enoksson, Bertil Petrus, to Nitro Nobel AB. Conductor containing explosive gas mixture for initiation of ignition element and explosive charge. 4,041,867, Cl. 102-27.00R.

Environmental Elements Corporation: *See—*
Tully, William Howard, 4,042,354, Cl. 55-129.000.

Epic Chemical Inc.: *See—*
Argiriardi, Andrew A., 4,042,368, Cl. 71-67.000.

Eppendorf Geratebau Netheler & Hinz GmbH: *See—*
Sabloewski, Horst; Schurbrock, Klaus; and Solter, Dieter, 4,041,764, Cl. 73-425.600.

Eremin, Vladimir Fedorovich: *See—*
Itin, Artur Markovich; and Eremin, Vladimir Fedorovich, 4,042,087, Cl. 192-99.00S.

Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, to SKF Industrial Trading and Development Company B.V. Apparatus for connecting a clutch release bearing to a clutch release actuating element. 4,042,086, Cl. 192-98.000.

Ernst Winter & Sohn: *See—*
Sawluk, Wlodzimierz, 4,041,650, Cl. 51-206.00R.

Ervin, Dan: *See—*
Guillet, James Edwin; and Ervin, Dan, 4,042,568, Cl. 260-65.000.

Escher Wyss Limited: *See—*
Dolenc, Anton; Christ, Alfred; and Lehmann, Rolf, 4,041,752, Cl. 72-201.000.

Eskers, Theodore Walter; Schaeffer, James Robert; and Harris, Harry Wayne, to Eastman Kodak Company. Method for purifying cholesterol esterase. 4,042,461, Cl. 195-66.00R.

Eskridge, Brewster B.: *See—*
Corbin, Thomas F., Jr.; Eskridge, Brewster B.; and Lyon, Boyce M., 4,042,662, Cl. 264-210.00F.

ESL Incorporated: *See—*
Altes, Richard A., 4,042,928, Cl. 343-5.0SA.

Eslick, Robert Freeman: *See—*
Goering, Kenneth Justin; and Eslick, Robert Freeman, 4,042,414, Cl. 127-32.000.

Espy, Donald M.; and Henry, James L., to Bendix Corporation, The. Reorientation device for an object manipulator. 4,042,122, Cl. 214-1.0CM.

Establissements Francois Salomon et Fils: *See—*
Salomon, Georges Pierre Joseph, 4,042,257, Cl. 280-624.000.

Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,042,627, Cl. 260-571.000.

Etat Francais: *See—*
Thevenin, Michel J.; Brun, Michel; Boileau, Jacques; and Pegoud, Joseph, 4,041,866, Cl. 102-24.0HC.

Ettel, Godwin, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Circuit arrangement for supplying clock pulses to a projectile fuze. 4,041,870, Cl. 102-70.2GA.

Eustache, Jean-Marie, to Union Cooperative Agricole Laitiere de la Manche. Extraction of glycoproteins and sialic acid from whey. 4,042,575, Cl. 260-112.00R.

Eustache, Jean-Marie, to Union Cooperative Agricole Laitiere de la Manche. Extraction of glycoproteins and sialic acid from whey. 4,042,576, Cl. 260-112.00R.

Evanicky, Daniel E.: *See—*
Ristagno, Charles V., to Micro-Display Systems, Inc. Illuminated electro-optical display apparatus. 4,042,294, Cl. 350-60LC.

Evans, Norol T.; and Wunderlich, Francis J., to Hughes Aircraft Company. MTI clutter tracking and cancelling system. 4,042,924, Cl. 343-7.00A.

Evans, Seth F.; and Hall, Jairus Donn, to Evans, Seth F. Method and apparatus for detonating explosives. 4,041,865, Cl. 102-20.000.

Everest & Jennings, Inc.: *See—*
Rodaway, Keith S., 4,042,250, Cl. 280-42.000.

Everhart, Louise A.: *See—*
Lile, Barbara A.; Lane, Robert M.; and Everhart, Louise A., 4,042,232, Cl. 269-328.000.

Exclusive Envelope Corporation: *See—*
Ross, Martin I.; and Rogers, Arthur M., 4,042,171, Cl. 229-72.000.

Exxon Production Research Company: *See—*
Holland, Warren E.; and True, Martin E., 4,042,033, Cl. 166-310.000.

Exxon Research and Engineering Co.: *See—*
Brois, Stanley J., 4,042,523, Cl. 252-32.7HC.
Floyd, Joseph C.; and Plank, Don A., 4,042,765, Cl. 526-6.000.
Vannice, M. Albert; and Garten, Robert L., 4,042,614, Cl. 260-449.00R.
Vannice, M. Albert; and Garten, Robert L., 4,042,615, Cl. 260-449.60R.

Ezell, George D., to Texas Instruments Incorporated. Automatic data acquisition method and system. 4,042,906, Cl. 340-15.5TS.

Fa. Bowe, Bohler & Weber KG Maschinenfabrik: *See—*
Wanner, Rudolf; and Eckl, Robert, 4,042,235, Cl. 271-94.000.

Fahnenstich, Rudolf: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Junkermann, Helmut; Pohl, Gerhard; and Tanner, Herbert, 4,042,716, Cl. 426-335.000.

Fahrig, Robert J.; and Timm, Terry W., to Standard Oil Company. Method for reducing catalyst particle emissions in fluidized catalytic cracking processing. 4,042,489, Cl. 208-152.000.

Fairbanks, Philip R., to Idaho Concrete Pipe Co., Inc., a part interest. Mobile loading apparatus for large articles. 4,042,136, Cl. 214-146.500.

Falconbridge Nickel Mines Limited: *See—*
Hatch, William Ronald, 4,042,665, Cl. 423-139.000.

Falk, Robert A., to Ciba-Geigy Corporation. Aqueous wetting and film forming compositions. 4,042,522, Cl. 252-8.050.

Falkinger, Willard; and Asberg, Per Anders, to Defibrator AB. Method and apparatus for stacking and feeding blanks to a tiered multi-opening press for the production of pressed board. 4,042,125, Cl. 214-6.0BA.

Falterman, Charles W.; Griffith, William J.; and Gryting, Harold J., to United States of America, Navy. Temperature resistant explosive containing diaminotrinitrobenzene. 4,042,430, Cl. 149-19.300.

Famolare, Inc.: *See—*
Famolare, Joseph P., Jr., 4,041,618, Cl. 36-25.00R.

Famolare, Joseph P., Jr., to Famolare, Inc. Contoured sole for high heeled shoes. 4,041,618, Cl. 36-25.00R.

Fanning, Herbert H., to Du Pont de Nemours, E. I., and Company. Primer-surfacer composition of an acrylic polymer, a polyester resin and an organic dispersant. 4,042,539, Cl. 260-16.000.

Farmhand, Inc.: *See—*
McFarland, Douglas F., 4,042,140, Cl. 214-518.000.

Fasttest Company: *See—*
Peterson, Roger W.; and Kordes, Arthur W., 4,042,878, Cl. 324-51.000.

Fastway Fasteners, Inc.: *See—*
Schuplin, Jerome T., 4,041,657, Cl. 52-39.000.

Feldmann, William F. Adjustable leverage pry bar. 4,042,210, Cl. 254-26.00R.

Feldstein, Nathan, to RCA Corporation. Temperature-stable non-magnetic alloy. 4,042,382, Cl. 75-170.000.

Feneberg, Paul, to AGFA-Gevaert, A.G. Method for the production of silicone elastomer-containing articles. 4,042,652, Cl. 264-1.000.

Fenneman, David B., to United States of America, Navy. Hypersonic gas laser. 4,042,892, Cl. 331-94.50G.

Ferdelman, Donald C.: *See—*
Weibel, John, Jr.; and Ferdelman, Donald C., 4,041,723, Cl. 62-126.000.

Fermanich, Raymond J.: *See—*
Boyer, George C.; and Fermanich, Raymond J., 4,042,173, Cl. 236-49.000.

Ferrante, Gerald R.: *See—*
Baum, Elliot H.; and Ferrante, Gerald R., 4,042,319, Cl. 8-35.000.

Ferranti Limited: *See—*
Brown, Kenneth Robson; and Sharp, Colin Keith, 4,042,815, Cl. 235-194.000.

Ferrar, Andrew Nicholas, to British Cellophane Limited. Cohesive coating compositions. 4,042,732, Cl. 427-385.00R.

Ferrier, Duncan Cameron: *See—*
Foster, Peter William; Ferrier, Duncan Cameron; Berry, Thomas; and Murenbeeld, Karel, 4,041,586, Cl. 28-254.000.

Fersch, Kenneth Eugene; and Stearns, Wayne Eugene, to O.M. Scott & Sons Company, The. Controlled release fertilizer. 4,042,366, Cl. 71-29.000.

Fey, Maurice G.; and Wolf, Charles B., to Westinghouse Electric Corporation. Three-phase arc heater. 4,042,802, Cl. 219-121.00P.

Fiat-Allis Construction Machinery, Inc.: *See—*
Bertolino, Giorgio M., 4,042,116, Cl. 212-140.000.
Crum, Robert L., 4,042,065, Cl. 184-1.00E.
Koch, George Paul, 4,042,052, Cl. 180-6.700.

Fickelscher, Kurt Gerhard, to Balke-Durr AG. Planetary gearing. 4,041,808, Cl. 74-800.000.

Fiedler, Kurt H.; and Draisbach, Adolf, to General Motors Corporation. Suspension strut assemblies for motor vehicle suspensions. 4,042,259, Cl. 280-701.000.

Fields, Ellis K., to Standard Oil Company (Indiana). Oxidation catalyst and process. 4,042,531, Cl. 252-438.000.

Fieldsend, Terence: *See—*
Jackson, George; and Fieldsend, Terence, 4,042,384, Cl. 75-214.000.

Finegan, John J., Jr., to Hunt Electronics Company. Power control slide switch. 4,042,903, Cl. 338-159.000.

Fischel, Halbert: *See—*
Anderson, Robert L., 4,042,351, Cl. 55-52.000.

Fischer, Adolf: *See—*
Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, 4,042,628, Cl. 260-577.000.

Fischer & Porter Co.: *See—*
Davis, James W.; and Hilton, Garrett H., 4,041,981, Cl. 137-604.000.
Head, Victor P.; and Herzl, Peter J., 4,041,756, Cl. 73-194.00E.

Fischer, Rolf: *See—*
Weitz, Hans-Martin; Fischer, Rolf; and Lenke, Dieter, 4,042,587, Cl. 544-183.000.
Weitz, Hans-Martin; Fischer, Rolf; and Lenke, Dieter, 4,042,588, Cl. 544-183.000.

Fisher Controls Company: *See—*
Rice, Donald D.; and Walton, Herbert H., 4,041,973, Cl. 137-315.000.

Fisher, George A.; and Richardson, Warner G., to Caterpillar Tractor Co. Guide rail assembly for the ejector of a scraper and method. 4,041,625, Cl. 37-126.0AE.

Fisher, Milton W.: *See—*
Henson, Glen E.; and Fisher, Milton W., 4,041,760, Cl. 73-379.000.

Fisher, Robert C. Seat belt system. 4,042,277, Cl. 297-388.000.

Fisons Limited: *See—*
Lee, Thomas Brian; Hardern, David Norman; and Bantick, John Raymond, 4,042,708, Cl. 424-283.000.

Flam, Eric; and Partyka, Doris Phyliss, to Johnson & Johnson. Digital tampon. 4,041,948, Cl. 128-285.000.

Flannelly, William George, to Kaman Aerospace Corporation. Remote resonator apparatus and method. 4,042,070, Cl. 188-1.00B.

Flint, Theodore R. Insulating glass units. 4,042,736, Cl. 428-34.000.

Flintkote Company, The: *See—*
Stepien, George, Jr.; Califano, Frank L., deceased; DeLorenzo, William, Jr., co-executor; Gillard, G. Bruce, co-executor; Russell, Thomas E., deceased; and Russell, Florence P., executrix, 4,041,712, Cl. 61-36.00R.

Floyd, Joseph C.; and Plank, Don A., to Exxon Research and Engineering Co. Photodegradable plastic compositions containing nitrogen heterocyclic compounds. 4,042,765, Cl. 526-6.000.

Flynn Burner Corporation: *See—*
Flynn, Edward S., 4,042,317, Cl. 432-124.000.

Flynn, Edward S., to Flynn Burner Corporation. Direct flame apparatus for drying can coatings. 4,042,317, Cl. 432-124.000.

FMC Corporation: *See—*
McCarthy, Richard H., 4,042,077, Cl. 188-171.000.
Roberts, Thomas E., Jr., 4,041,781, Cl. 73-483.000.
Youmans, Donald W., 4,042,260, Cl. 280-721.000.

Fokker-VFW B.V.: *See—*
Bijlmer, Paul Frederik A., 4,042,475, Cl. 204-141.500.

Folker, John F. Trolling accessory for fishing. 4,041,636, Cl. 43-42.310.

Folmar, Robert G.; and Weetman, Ronald J., to Corning Glass Works. Method of manufacturing a die for extruding honeycomb articles. 4,041,597, Cl. 29-423.000.

Forbes Jones, Robin Mackay: *See—*
Petersen, Walter Adrian; and Forbes Jones, Robin Mackay, 4,042,383, Cl. 75-171.000.

Ford Motor Company: *See—*
Peng, Stephen Chung-Suen, 4,042,560, Cl. 260-42.280.

Ford, Norman F. Paint brush bristle shaping device. 4,041,566, Cl. 15-257.00R.

Forkner, John H. Cactus treatment process and product. 4,042,720, Cl. 426-573.000.

Forsell, Bror Ingvar, to RP Rorprodukter AB. Connection between water tubes. 4,042,021, Cl. 166-85.000.

Forsgren, Klane F.; Melamed, Sidney; and Weiner, Robert S., to Rohm and Haas Company. Process for producing crimped metal-coated filamentary materials, and yarns and fabrics obtained therefrom. 4,042,737, Cl. 428-96.000.

Fort, J. Robert; Westphal, James A.; and Dix, C. Hewitt, to Geophysical Systems Corporation. Data acquisition, transport and storage system. 4,042,905, Cl. 340-15.5DP.

Foseco Trading A.G.: *See—*
Eccleston, Kenneth Thomas, 4,042,229, Cl. 266-275.000.

Foster, Peter William; Ferrier, Duncan Cameron; Berry, Thomas; and Murenbeeld, Karel, to John Heathcoat & Company Limited. Textile fluid bulking process. 4,041,586, Cl. 28-254.000.

Fostick, Moshe A. Method for monitoring blood gas tension and pH from outside the body. 4,041,932, Cl. 128-2.00G.

Fox, Anthony. Baling machine with improved platen drive and guide assembly. 4,041,856, Cl. 100-214.000.

Fox, Roy A.: *See—*
Raimondi, Victôr V.; Fox, Roy A.; and Piorkowski, Casey E., 4,042,555, Cl. 260-29.6RB.

Fox, Roy Kelvin Noel, to Weatherford Oil Tool Co., Inc. Control line protector. 4,042,023, Cl. 166-241.000.

Frank, James P.: *See—*
Woods, Lee O.; and Frank, James P., 4,042,860, Cl. 361-25.00C.

Frank, Pierre: *See—*
Arsac, Aime Joseph; and Frank, Pierre, 4,042,579, Cl. 260-178.000.

Frank, Robert I.: *See—*
Kaplow, Roy; and Frank, Robert I., 4,042,417, Cl. 136-89.0PC.

Franke, Johannes; Kessler, Kurt; Muller, Wolfgang; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, to VVB Haushalts- und Verpackungsglas. Apparatus for the continuous melting of salts used for modifying the properties of articles of glass or similar materials. 4,042,315, Cl. 432-210.000.

Frankel, S. Arthur; and Cueman, Glenn F. Contoured knee immobilizer. 4,041,940, Cl. 128-80.00C.

Franklin, Benjamin S.: *See—*
Bachman, Charles W.; and Franklin, Benjamin S., 4,042,912, Cl. 364-200.000.

Franklin, Robert C. Power control for variable speed induction motors. 4,042,862, Cl. 318-231.000.

Frazier, Calvin H. Artificial patella and method of repairing a natural patella. 4,041,550, Cl. 3-1.910.

Freedman, Mark, to Westinghouse Electric Corporation. Modular roadway for a transportation system. 4,042,308, Cl. 404-1.000.

Fregeolle, Oscar, to Pilot Research Corporation. Lower body garment and method of making same. 4,041,736, Cl. 66-177.000.

Freimanis, Laimons, to Bell Telephone Laboratories, Incorporated. Telephone ringer circuit. 4,042,786, Cl. 179-84.00R.

Freisleben, Reinhard, to Soding TV GmbH & Co. Bild & Ton International. Film strip projection equipment. 4,042,297, Cl. 353-109.000.

Friant, James E.; and Klopich, Marshall E., to Rocket Research Corporation. Two component field mix hydrazine base explosive. 4,042,431, Cl. 149-36.000.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Muller, Peter, 4,041,574, Cl. 19-159.00R.

Fried. Krupp Huttenwerke AG: *See—*
Heller, Wilhelm; and Knorr, Walter, 4,042,273, Cl. 295-30.000.

Friedrich Deckel Aktiengesellschaft: *See—*
Kuhnert, Hans, 4,041,588, Cl. 29-26.00R.

Friel, Ronald Norman: *See—*
Hanak, Joseph John; Friel, Ronald Norman; and Goodman, Lawrence Alan, 4,042,293, Cl. 350-160.0LC.

Frielingsdorf, Hans: *See—*
Bachl, Robert; Frielingsdorf, Hans; Gruber, Wolfgang; Mueller-Tamm, Heinz; and Gonsior, Leonhard, 4,042,770, Cl. 526-106.000.

Frigo, Vito, to Ausatuft S.p.A. Machine for stripping from frames, particularly pin frames, materials restrained to said frames. 4,042,120, Cl. 214-1.0BB.

Frohlich, Walter: *See—*
Pusch, Gunter; Klatt, Heinz Jurgen; and Frohlich, Walter, 4,042,026, Cl. 166-258.000.

Frohmader, Stanley H., to Research Products Corporation. Filter media. 4,042,358, Cl. 55-497.000.

Frontier Machinery Company: *See—*
Ames, Kenneth R., 4,041,975, Cl. 137-344.000.

Frost Engineering Development Corporation: *See—*
Frost, Richard H.; and Criley, Ronald L., 4,042,194, Cl. 244-151.00A.

Frost, Richard H.; and Criley, Ronald L., to Frost Engineering Development Corporation. Parachute harness release mechanism. 4,042,194, Cl. 244-151.00A.

Frump, John Adams; and Hunsucker, Jerry Hoyt, to IMC Chemical Group, Inc. Thermogenic system. 4,042,520, Cl. 252-70.000.

Fryrear, Max Dennis, to Caterpillar Tractor Co. Integral rippers for hydraulic excavator bucket. 4,041,624, Cl. 37-117.500.

Fuchino, Yoshihide: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Fuji Shoten Co. Ltd.: *See—*
Ikinobu, Hiroaki, 4,041,778, Cl. 73-119.00A.

Fuji Xerox Co., Ltd.: *See—*
Yoshikawa, Akira, 4,042,936, Cl. 346-1.000.

Fujii, Hitoshi: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,042,613, Cl. 260-448.20B.

Fujii, Masakatsu; and Yasufuku, Toshio, to Kabushikikaisha Hara Shokki Seisakusho. Textile sliver can changing and storage apparatus. 4,042,093, Cl. 198-339.000.

Fujitsu Fanuc Limited: *See—*
Hashimoto, Yoshihiro; and Isobe, Shinichi, 4,042,812, Cl. 235-151.110.

Fujitsu Ltd.: *See—*
Yamazaki, Jun'ichiro; Kamo, Takeshi; and Saito, Yoshiichi, 4,042,479, Cl. 204-192.00F.

Fujiwara, Yasutaka: *See—*
Nikaido, Teruji; Haga, Kaoru; and Fujiwara, Yasutaka, 4,042,969, Cl. 361-107.000.

Fukai, Kiyoshi: *See—*
Matsumoto, Seiji; and Fukai, Kiyoshi, 4,042,516, Cl. 252-62.540.

Fukino, Kunihiro, to Nippon Kogaku K.K. Stopping device for bellows and close photography ring. 4,042,943, Cl. 354-272.000.

Fukumoto, Toru: *See—*
Kawakami, Hirotake; Takada, Kantaro; and Fukumoto, Toru, 4,042,438, Cl. 156-272.000.

Fukutani, Hideo; Oba, Hiroshi; Okada, Akane; and Shimizu, Atsuko, to Mitsubishi Chemical Industries Ltd. Process for forming vesicular photographic images by employing simultaneous actinic light and infra-red reflex exposure. 4,042,391, Cl. 96-47.000.

Fulton, James T., to Grumman Aerospace Corporation. Charge coupled device. 4,042,835, Cl. 307-221.00D.

Funk, Eldon E. Game call with peg guided at fixed angle to striking plate. 4,041,639, Cl. 46-189.000.

Furlette, James L.; and Stadler, Donald. Conveyor. 4,042,104, Cl. 198-774.000.

Furukawa Electric Company, Ltd., The: *See—*
Matsuba, Hironori; and Satou, Kazumi, 4,042,776, Cl. 174-110.00R.

Furusawa, Sadayashi: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Fusion Systems Corporation: *See—*
Ury, Michael Gerson; Eastlund, Bernard John; Braden, Ray S.; and Wood, Charles H., 4,042,850, Cl. 315-39.000.

Gabel, Floyd S. Sausage slicing machine. 4,041,822, Cl. 83-409.200.

Gadekar, Shreekrishna M., to Affiliated Medical Research, Inc. Method for reducing serum glucose levels. 4,042,699, Cl. 424-263.000.

GAF Corporation: *See—*
Davis, Duane A.; and Krenick, Michael P., 4,041,815, Cl. 83-30.000.

Gaffar, Abdul, to Colgate-Palmolive Company. Antibacterial oral composition. 4,042,679, Cl. 424-54.000.

Gajajiva, Padej: *See—*
Mooney, Thomas C.; and Gajajiva, Padej, 4,042,262, Cl. 285-98.000.

Galins, Peteris Adams: *See—*
Boyle, James Alfred; Galins, Peteris Adams; Gregoire, Mark Charles; and O'Toole, Peter L. M., 4,042,197, Cl. 244-183.000.

Galt Equipment Limited: *See—*
Garside, David, 4,041,725, Cl. 62-223.000.

Galter, Hellmut, to Lindemann Maschinenfabrik GmbH. Scrap shearing machine. 4,041,821, Cl. 83-382.000.

Gammon, Michael William: *See—*
Harris, Colin Frank; and Gammon, Michael William, 4,042,379, Cl. 75-88.000.

Ganias, Fotios. Artificial lens. 4,041,552, Cl. 3-13.000.

Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., to Control Drug, Inc. Method of treating obesity by the oral administration of a predigested protein composition. 4,042,687, Cl. 424-177.000.

Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., to Control Drug, Inc. Method of providing high-protein nutrition by the oral administration of a predigested protein composition. 4,042,688, Cl. 424-177.000.

Garbe, Dietmar Rudolf, to Vitalograph (Ireland) Limited. Device for breathing measurement. 4,041,935, Cl. 128-2.080.

Garbini, Louis K., to Kubatec Kunststoff- & Bautechnik AG. Method of breaking up objects. 4,042,280, Cl. 299-13.000.

Garcia, Emilio C. Apparatus for and method of stabilizing a marine vessel in pitch. 4,041,885, Cl. 114-126.000.

Gardner, Willis Howard: *See—*
Jioio, Joseph F.; and Gardner, Willis Howard, 4,041,812, Cl. 82-34.00R.

Garrett Corporation, The: *See—*
Harper, John Everett; and Kell, Louis H., 4,041,695, Cl. 60-39.020.
Schelp, Helmut R., 4,041,699, Cl. 60-39.550.

Garrone, Franco, to AMF Incorporated. Braid forming method and apparatus. 4,041,959, Cl. 131-84.00B.

Garside, David, to Galt Equipment Limited. Control system for refrigeration unit. 4,041,725, Cl. 62-223.000.

Garside, Peter; and Dimsdale, Michael John, to Allen & Hanburys Limited. Isoquinolium compounds for treating diabetes. 4,042,697, Cl. 424-258.000.

Garten, Robert L.: *See—*
Vannice, M. Albert; and Garten, Robert L., 4,042,614, Cl. 260-449.00R.
Vannice, M. Albert; and Garten, Robert L., 4,042,615, Cl. 260-449.60R.

Garun, Yaroslav Evstavievich: *See—*
Kazakova, Ljudmila Petrovna; Gundyrev, Alexei Alexandrovich; Rudakova, Nina Yakovlevna; Sharf, Fridrikh-Leopold Khaskelevich; Garun, Yaroslav Evstavievich; Belyashina, Lidia Ivanovna; and Kocheva, Zoya Vasilievna, 4,042,411, Cl. 106-270.000.

Gaskill, Gerald E.; and Woodlee, James E., to Goodyear Tire & Rubber Company, The. Tire bead retainer. 4,042,003, Cl. 152-381.200.

Gates, Walter C., Jr.: *See—*
Suggitt, Robert M.; and Gates, Walter C., Jr., 4,042,490, Cl. 208-264.000.

Gattermeir, J. David: *See—*
Bacon, Duane E.; Gattermeir, J. David; Hecox, Spencer S.; and Robb, John J., 4,042,467, Cl. 204-15.000.

Gaurois, Raphael Emile, to Hamon Sobelco S.A. Supporting framework for heat transfer surfaces for cooling tower. 4,042,651, Cl. 261-111.000.

Gavrilenko, Jury Alexandrovich: *See—*
Mischenko, Vladimir Petrovich; Oxenenko, Anatoly Yakovlevich; Mischenko, Vladimir Alexandrovich; Vasiliev, Georgy Konstantinovich; Gavrilenko, Jury Alexandrovich; Povelitsa, Vladimir Vasilievich; and Kosenko, Ivan Vasilievich, 4,041,843, Cl. 91-499.000.

Gawin, Adolph J.; and Porazinski, Robert F., to Bell & Howell Company. Photographic recording machine with image designator mark optical system and adjusting means therefor. 4,042,299, Cl. 355-40.000.

Gay, Cecil Arthur Joseph; and Rockey, Leslie George Henry, to British Aircraft Corporation Limited. Electron beam apparatus. 4,042,801, Cl. 219-121.0EB.

Gayte, Michel. Freezing rice. 4,042,717, Cl. 426-508.000.

Geer, Ernest C.: *See—*
Cook, Harold L., Jr.; and Geer, Ernest C., 4,042,034, Cl. 166-314.000.

Geist, Joseph C.: *See—*
Hoback, Ronald D.; and Geist, Joseph C., 4,042,443, Cl. 156-349.000.

General Atomic Company: *See—*
Thomas, Harold A., 4,042,826, Cl. 250-336.000.

General Dynamics: *See—*
Snyder, H. Ben, 4,042,444, Cl. 156-345.000.

General Electric Company: *See—*
Bennett, James Gordy, Jr.; and Cooper, Glenn Dale, 4,042,564, Cl. 260-47.0ET.
Blevins, Theodore J., 4,041,571, Cl. 16-128.00R.
Chang, Mike F., 4,042,448, Cl. 156-650.000.
Henderson, David C.; and Maloney, Kenneth M., 4,042,727, Cl. 427-107.000.
Hinton, Reginald A.; Doughty, Kenneth W.; and Kennedy, William N., 4,042,900, Cl. 336-70.000.
May, John E., 4,042,535, Cl. 252-518.000.
Nakata, Roy; and Johenning, William Joseph, 4,042,774, Cl. 174-14.00R.
Powell, David B.; Castonguay, Roger N.; and Aitken, Donald F., 4,042,896, Cl. 335-17.000.
Smeggil, John G., 4,042,341, Cl. 428-678.000.
Steigerwald, Robert L., 4,042,856, Cl. 315-246.000.
Strong, Herbert M., 4,042,673, Cl. 423-446.000.
Woods, Lee O.; and Frank, James P., 4,042,860, Cl. 361-25.00C.

General Electric Company Limited, The: *See—*
Pakenham, William Edward; and Davis, Leonard Mayor, 4,042,792, Cl. 179-90.00R.

General Motors Corporation: *See—*
Cislo, Casimer J., 4,042,258, Cl. 280-664.000.
Drewek, David F.; and Hoffman, Dickie D., 4,042,255, Cl. 280-445.000.
Fiedler, Kurt H.; and Draisbach, Adolf, 4,042,259, Cl. 280-701.000.
Greb, William H., 4,041,779, Cl. 73-144.000.
Harmon, Kenneth B.; and McQuinn, Ted M., 4,041,810, Cl. 74-868.000.
Meginnis, George B.; and Sodeberg, Earl W., 4,042,162, Cl. 228-106.000.
Morel, Thomas, 4,041,984, Cl. 137-842.000.
Morrison, Donald E., 4,041,696, Cl. 60-39.140.
Nelson, Richard P., 4,042,080, Cl. 188-361.000.
Thune, Robert H., 4,041,603, Cl. 29-623.100.
Weibel, John, Jr.; and Ferdelman, Donald C., 4,041,723, Cl. 62-126.000.
Williamitis, Victor A., 4,042,248, Cl. 277-138.000.

Genese, Joseph Nicholas, to Abbott Laboratories. Arterial blood sampling unit. 4,041,934, Cl. 128-2.00F.

Gentaz, Claude: *See—*
Bienvenu, Gerard; and Gentaz, Claude, 4,042,377, Cl. 75-53.000.

Gentry, David R.: *See—*
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,042,655, Cl. 264-25.000.

Geophysical Systems Corporation: *See—*
Fort, J. Robert; Westphal, James A.; and Dix, C. Hewitt, 4,042,905, Cl. 340-15.5DP.

Georges, Andre H.: *See—*
Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., 4,042,693, Cl. 424-246.000.

Gepesz, Robert: *See—*
Zimmermann nee Ignacz, Zsuzsanna; and Gepesz, Robert, 4,042,719, Cl. 426-573.000.

Gerben, Ralph D., to Solo Cup Company. Cup filling and capping apparatus. 4,042,148, Cl. 221-222.000.

Germanowski, Frank; and Kazura, John A., to United States of America, Army. Analog and digital data recorder. 4,042,938, Cl. 346-61.000.

Gernon, Clarke J., Sr. Apparatus for rotating and indexing miniature train turntables. 4,041,874, Cl. 104-38.000.

Gerth, Vernon W., Jr.: *See—*
Brunnett, Carl J.; and Gerth, Vernon W., Jr., 4,042,811, Cl. 235-151.300.

Gerzon, Michael Anthony: *See—*
Craven, Peter Graham; and Gerzon, Michael Anthony, 4,042,779, Cl. 179-1.0DM.

GF Business Equipment, Inc.: *See—*
Textoris, Melvin A.; and Wahl, William, 4,041,881, Cl. 108-159.000.

Gibert, Alain; and Camps, Roger, to Societe Nationale des Petroles d'Aquitaine. Device for measuring the mass of particles of an aerosol per volume unit. 4,041,768, Cl. 73-28.000.

Gill, Theodore: *See—*
Taich, Albert; and Gill, Theodore, 4,041,772, Cl. 73-45.600.

Gillard, G. Bruce, co-executor: *See—*
Stepien, George, Jr.; Califano, Frank L., deceased; DeLorenzo, William, Jr., co-executor; Gillard, G. Bruce, co-executor; Russell, Thomas E., deceased; and Russell, Florence P., executrix, 4,041,712, Cl. 61-36.00R.

Gillstrom, Uno K. Marking machine. 4,041,859, Cl. 101-111.000.

Gillyns, Emile: *See—*
Bell, Robert Glenn; Gillyns, Emile; and McDaniel, Olin Kilpatrick, Jr., 4,042,569, Cl. 260-75.00T.

Ginaven, Marvin E., to Bauer Bros. Co., The. Low profile static screen. 4,042,511, Cl. 210-386.000.

Gindi, Abraham M., to International Business Machines Corporation. Method and apparatus for byte and frame synchronization on a loop system coupling a CPU channel to bulk storage devices. 4,042,783, Cl. 179-15.0AL.

Giolito, Francois; and Rivier, Georges, to Orogil. Novel lubricating compositions containing derivatives of 1,2-dithiol-3-thiones or 1,2-dithiol-3-ones. 4,042,514, Cl. 252-48.600.

Glassmeyer, John J.; and Hughes, Howard W., to Pullman Incorporated. Stake post and cap arrangement for trailer. 4,042,275, Cl. 296-43.000.

Glazer, Emmett Jean; and Smith, Edwin Studley, to Goodyear Tire & Rubber Company, The. Process of purifying vinyl chloride. 4,042,637, Cl. 260-652.00P.

Glorioso, Paul A., to TRW Inc. Welding apparatus. 4,042,800, Cl. 219-98.000.

Gluhlampenfabrik A.G.: *See—*
Heimlicher, Peter, 4,041,683, Cl. 57-18.000.

Goebel, Franz; and Marincic, Nikola, to GTE Laboratories Incorporated. Electrochemical cells. 4,042,756, Cl. 429-94.000.

Goering, Kenneth Justin; and Eslick, Robert Freeman, to Research Corporation. Processing of starch. 4,042,414, Cl. 127-32.000.

Goloff, Alexander; and Sommars, Mark Frederick, to Caterpillar Tractor Co. Rubber torsional vibration damper with cooling means. 4,041,803, Cl. 74-574.000.

Gomann, Jurgen: *See—*
Wahle, Gunter; Ludszeweit, Dieter; Gomann, Jurgen; and Zessin, Horst, 4,041,958, Cl. 131-84.00B.

Gonsior, Leonhard: *See—*
Bachl, Robert; Frielingsdorf, Hans; Gruber, Wolfgang; Mueller-Tamm, Heinz; and Gonsior, Leonhard, 4,042,770, Cl. 526-106.000.

Gonzalez-Dorner, Alberto Carlos: *See—*
Dahm, Manfred; and Gonzalez-Dorner, Alberto Carlos, 4,042,537, Cl. 260-2.5AP.

Goodman, James P.: *See—*
Kellenbenz, Carl W.; Goodman, James P.; and Rector, Randall C., 4,042,830, Cl. 307-40.000.

Goodman, Lawrence Alan: *See—*
Hanak, Joseph John; Friel, Ronald Norman; and Goodman, Lawrence Alan, 4,042,293, Cl. 350-160.0LC.

Goodrich, George E.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,042,283, Cl. 308-15.000.

Goodyear Tire & Rubber Company, The: *See—*
Alsobrook, Clarence B., 4,042,002, Cl. 152-354.000.

Gaskill, Gerald E.; and Woodlee, James E., 4,042,003, Cl. 152-381.200.

Glazer, Emmett Jean; and Smith, Edwin Studley, 4,042,637, Cl. 260-652.00P.

Graven, Andrew A.; Ronyak, David M., and Bose, Edward B., 4,041,652, Cl. 51-241.00R.

Hoback, Ronald D., 4,041,789, Cl. 74-229.000.

Hoback, Ronald D.; and Geist, Joseph C., 4,042,443, Cl. 156-349.000.

Houck, Stanley J., 4,042,435, Cl. 156-121.000.

Klar, Kenneth K., 4,041,806, Cl. 73-159.000.

Lawrence, John P., 4,042,641, Cl. 260-780.000.

Lawrence, John P., 4,042,642, Cl. 260-780.000.

Gordon, Clark B.: *See—*
Rubinstein, Herbert J.; Gordon, Clark B.; Robison, Albert; and Clark, Philip M., 4,042,828, Cl. 250-507.000.

Gordon, Theodore H.; and Kummerle, Herman Fred, to Owens-Illinois, Inc. Oxychlorination process. 4,042,639, Cl. 260-656.00R.

Goren, Alvin J.: *See—*
Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., 4,042,687, Cl. 424-177.000.
Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., 4,042,688, Cl. 424-177.000.

Gorenberg, Eli M.: *See—*
Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., 4,042,687, Cl. 424-177.000.
Gans, Arnold M.; Goren, Alvin J.; and Gorenberg, Eli M., 4,042,688, Cl. 424-177.000.

Goto, Chuichi: *See—*
Misaka, Yasunao; Tanaka, Ikuo; Okada, Hiroo; Goto, Chuichi; Hirota, Moriyuki; Uesugi, Masaaki; and Tsuchiya, Mitsuru, 4,042,500, Cl. 210-189.000.

Goto, Isamu; Nishimura, Sadanori; and Kawahara, Eiichiro, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic torque converter with a lockup clutch between pump and turbine. 4,041,701, Cl. 60-347.000.

Gotoh, Miyuki, to Nissan Motor Company, Limited. Weft sensor system of sensing malfunction of a weaving loom. 4,041,985, Cl. 139-370.200.

Gotter, Kurt: *See—*
Schnabel, Roland; Holzel, Alexander; and Gotter, Kurt, 4,042,359, Cl. 65-2.000.

Gotze, Christian: *See—*
Heidrich, Gunter; and Gotze, Christian, 4,042,301, Cl. 355-75.000.

Gotzen, Heinrich. Hydraulic grab. 4,042,272, Cl. 294-88.000.

Gould Inc.: *See—*
Hakarine, Duane D., 4,042,762, Cl. 429-187.000.

Gould, Robert A.: *See—*
Stayton, Leroy M.; and Gould, Robert A., 4,041,871, Cl. 102-95.000.

Govan, Ronald M.: *See—*
Ho, William W.; and Govan, Ronald M., 4,042,879, Cl. 324-58.50C.

GOW-MAC Instruments, Inc.: *See—*
Martin, A. J. P.; Miller, James M.; Mathieu, Robert J.; and Lawson, Alexander E., Jr., 4,042,304, Cl. 356-128.000.

Graf, Robert E.: *See—*
Krohn, David A.; Graf, Robert E.; and Deeg, Emil W., 4,042,405, Cl. 106-52.000.

Gratani, Francesco; and Binaghi, Marco, to Montedison S.p.A. Photodegradable polymeric compositions having high thermal stability containing a halogenated quinone and a transition metal compound. 4,042,764, Cl. 526-4.000.

Grau, Gerhard; and Mayer, Otto, to Zinser Textilmaschinen GmbH. Process and apparatus for reattachment of a thread in an open-end spinning machine. 4,041,685, Cl. 57-34.00R.

Graven, Andrew A.; Ronyak, David M.; and Bose, Edward B., to Goodyear Tire & Rubber Company, The. Apparatus for engraving the sidewall of a tire. 4,041,652, Cl. 51-241.00R.

Gray, Benjamin. Building material. 4,042,406, Cl. 106-88.000.

Graybiel, Lynn Allan: *See—*
Birney, Richard Eugene; Davis, Michael Ian; Graybiel, Lynn Allan; Hood, Robert Allen; Kahn, Samuel; and Osborne, William Steese, 4,042,913, Cl. 364-200.000.

Greb, William H., to General Motors Corporation. Pneumatic tension gauge. 4,041,779, Cl. 73-144.000.

Green, Stanley, to Lucas Electrical Company Limited, The. Lamp assembly. 4,042,818, Cl. 240-41.300.

Greene, Janice L., to Standard Oil Company, The. Process for producing 2-pyrrolidone. 4,042,599, Cl. 260-326.5FN.

Gregoire, Mark Charles: *See—*
Boyle, James Alfred; Galins, Peteris Adams; Gregoire, Mark Charles; and O'Toole, Peter L. M., 4,042,197, Cl. 244-183.000.

Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., to Jered Industries, Inc. Vacuum flush water closet. 4,041,554, Cl. 4-10.000.

Greinacher, Ekkehard: *See—*
Brugger, Wilhelm; and Greinacher, Ekkehard, 4,042,672, Cl. 423-419.00R.

Grell, Wolfgang: *See—*
Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, 4,042,711, Cl. 424-319.000.

Griffith, Cecil B.: *See—*
Zavaras, Alexander A.; Sobolewski, Robert; and Griffith, Cecil B., 4,042,007, Cl. 164-49.000.

Griffith, Donald P. Urine collection device. 4,042,337, Cl. 23-259.000.

Griffith, William J.: *See—*
Falterman, Charles W.; Griffith, William J.; and Gryting, Harold J., 4,042,430, Cl. 149-19.300.

Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, to Boehringer Ingelheim GmbH. Derivatives of biphenyloxy-lower alkanoic acids, salts thereof and their use as antihyperlipidemics. 4,042,711, Cl. 424-319.000.

Groebke, Wolfgang, to Sandoz Ltd. Phenylazophenyl dyes having an alkoxyacylamino group on the coupling component radical. 4,042,580, Cl. 260-207.000.

Groome, Ernest J., to Clupak, Inc. Method of manufacturing nip roll for treating web materials. 4,042,437, Cl. 156-212.000.

Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Reciprocating internal combustion engine. 4,041,924, Cl. 123-193.0CP.

Grosskopf, John W., Jr.: *See—*
King, Roger P.; Grosskopf, John W., Jr.; and Bondelier, Francis C., Jr., 4,042,364, Cl. 65-168.000.

Grotloh, Karlheinz, to Sulzer Brothers Limited. Control valve having independently driven valves. 4,041,979, Cl. 137-599.200.

Grotloh, Karlheinz, to Sulzer Brothers Limited. Control valve having two independently driven valves. 4,041,980, Cl. 137-599.200.

Grover, Ross D., to Ram Industries, Inc. Stump eradicator. 4,041,996, Cl. 144-2.00N.

Grubbs, Calvin E.; and Harwell, Jack B., to ECC Corporation. Conversion system with overcurrent protection and start-up circuitry. 4,042,871, Cl. 363-28.000.

Gruber, Wolfgang: *See—*
Bachl, Robert; Frielingsdorf, Hans; Gruber, Wolfgang; Mueller-Tamm, Heinz; and Gonsior, Leonhard, 4,042,770, Cl. 526-106.000.

Grucza, Bernard J., to Warner-Lambert Company. Composition for hydrophilic lens blank and method of casting. 4,042,552, Cl. 260-29.6RB.

Grumman Aerospace Corporation: *See—*
Fulton, James T., 4,042,835, Cl. 307-221.00D.

Grundfos A/S: *See—*
Jensen, Poul Due, 4,042,847, Cl. 310-87.000.

GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig: *See—*
Hegendorfer, Max, 4,042,842, Cl. 307-293.000.

Gruner, Ronald Hans; and Alsing, Carl Justin, to Data General Corporation. Microprogram data processing technique and apparatus. 4,042,972, Cl. 364-200.000.

Grunert, Hartmut: *See—*
Schmidt, Joachim; Bamberg, Wolfgang; Grunert, Hartmut; Schorm, Erhard; and Weigelt, Christian, 4,042,502, Cl. 210-59.000.

Gruppo Lepetit S.p.A.: *See—*
White, Richard J.; Lancini, Giancarlo; and Antonini, Piero, 4,042,683, Cl. 424-117.000.

Gryting, Harold J.: *See—*
Falterman, Charles W.; Griffith, William J.; and Gryting, Harold J., 4,042,430, Cl. 149-19.300.

GTE Laboratories Incorporated: *See—*
Goebel, Franz; and Marincic, Nikola, 4,042,756, Cl. 429-94.000.
Krugler, Joel I.; and Nelson, William F., 4,041,642, Cl. 47-58.000.

GTE Sylvania Incorporated: *See—*
Collette, Robert P.; and Wheeler, Robert C., 4,042,858, Cl. 315-379.000.
Hovey, Frederick A.; and Torsch, Charles E., 4,042,857, Cl. 315-368.000.
Johnson, Robert Richard; Coons, Robert Arthur; and Zwald, John Andrew, 4,041,766, Cl. 72-402.000.
Klein, Arthur H., 4,042,959, Cl. 358-167.000.
Kraft, Francis J.; and Puhak, Peter G., 4,042,961, Cl. 358-248.000.

Gueritee, Nicolas. Nicotinic derivatives of estriol. 4,042,581, Cl. 260-239.500.

Guernsey, Richard H., to Eli Lilly and Company. Carton display device. 4,042,110, Cl. 206-459.000.

Guienne, Paul: *See—*
Bertin, Jean Henri; Guienne, Paul; and Lafont, Andre, 4,042,060, Cl. 180-127.000.

Guile, Donald L.: *See—*
Bihuniak, Peter P.; Brandes, Lewis H.; and Guile, Donald L., 4,042,361, Cl. 65-18.000.

Guillet, James Edwin; and Ervin, Dan. Photodegradable polyamide compositions. 4,042,568, Cl. 260-65.000.

Guiney, Aeneas C. Mixing syringe. 4,041,945, Cl. 128-218.00M.

Gularte, David L. Apparatus for bunching broccoli and a method therefor. 4,041,672, Cl. 53-3.000.

Gulati, Suresh T., to Corning Glass Works. Honeycomb structure with high thermal shock resistance. 4,042,738, Cl. 428-116.000.

Guldon Industries, Inc.: *See—*
Cox, Jay Ashton, 4,042,873, Cl. 363-129.000.

Gulf Oil Canada Limited: *See—*
Woods, Hanbury John, 4,042,633, Cl. 260-614.00R.

Gulf Research & Development Company: *See—*
Clampitt, Bert Howard; and Havens, Richard Harry, 4,042,763, Cl. 526-4.000.
Lynch, Thomas J., 4,042,769, Cl. 526-106.000.

Gullichsen, Johan: *See—*
Arhippainen, Bengt; and Gullichsen, Johan, 4,042,452, Cl. 162-60.000.

Gullick Dobson Limited: *See—*
Allen, Archelaius Dawson, 4,041,714, Cl. 61-45.00D.

Gundyrev, Alexei Alexandrovich: *See*—
Kazakova, Ljudmila Petrovna; Gundyrev, Alexei Alexandrovich; Rudakova, Nina Yakovlevna; Sharf, Fridrikh-Leopold Khaskelevich; Garun, Yaroslav Evstavievich; Belyashina, Lidia Ivanovna; and Kocheva, Zoya Vasilievna, 4,042,411, Cl. 106-270.000.

Gurwicz, David, to Sevcon Limited. Separately excited D.C. motors. 4,042,865, Cl. 318-338.000.

Gustafsson, Berth Ulrik, to Projectus Industriprodukter AB. Installation for heating a fluid, preferably water, in a conventional central heating system, using the waste heat produced by a number of refrigerators. 4,041,724, Cl. 62-175.000.

Gustafsson, Sven G., to Raytheon Company. Tracking system for multiple beam antenna. 4,042,931, Cl. 343-117.00R.

Gustavsson, John Kenneth Crister, to Aktiebolaget Electrolux. Household compactor for waste materials. 4,041,858, Cl. 100-229.00A.

Gutkowski, Robert F.: *See*—
Horwitz, Norman H.; and Gutkowski, Robert F., 4,041,994, Cl. 141-1.000.

Gygli, Walter, to Haemmerle, A. G. Maschinenfabrik. Stop mechanism for a bending press, plate shear or the like machines. 4,041,704, Cl. 60-473.000.

Gyromat Corporation, The: *See*—
Wiggins, Richard F., 4,042,734, Cl. 427-424.000.

Gysi, Rose Eleanor. Air filter unit for sliding sash windows. 4,042,357, Cl. 55-417.000.

Gysling, Henry James; and Lelental, Mark, to Eastman Kodak Company. Formazan images by physical development of catalytic metal nuclei image. 4,042,392, Cl. 96-48.0PD.

Haas, Ernst; Martin, Joachim; Reuschel, Konrad; and Schnoeller, Manfred, to Siemens Aktiengesellschaft. Method of producing homogeneously doped n-type Si monocrystals by thermal neutron radiation. 4,042,454, Cl. 176-10.000.

Haas, Gregory M.: *See*—
Weinstein, David H.; Keeney, Joe W.; and Haas, Gregory M., 4,042,758, Cl. 429-111.000.

Habegger, Willy: *See*—
Maraux, Jean, 4,042,216, Cl. 254-190.00R.

Habiger, Cyril W., to Caterpillar Tractor Co. Control system for a fluid drive vehicle. 4,041,702, Cl. 60-431.000.

Hackett, Kenneth R., to Sontrix Division of Pittway Corporation. Transducer assembly and method for radiating and detecting energy over controlled beam width. 4,042,845, Cl. 310-322.000.

Haemmerle, A. G. Maschinenfabrik: *See*—
Gygli, Walter, 4,041,704, Cl. 60-473.000.

Haga, Kaoru: *See*—
Nikaido, Teruji; Haga, Kaoru; and Fujiwara, Yasutaka, 4,042,969, Cl. 361-107.000.

Hage, Jacob M., to M.C.P. Industries, Inc. Multiple metallic layers including tin-cobalt containing alloy layer, with plastic substrate. 4,042,752, Cl. 428-626.000.

Hakarine, Duane D., to Gould Inc. Handle for plastic batteries. 4,042,762, Cl. 429-187.000.

Hake, Kenneth A., to Kent Manufacturing Co., Inc. Multiple section farm implement with biased swinging arm structure for attaching reinforcing member to main frame. 4,042,045, Cl. 172-311.000.

Hakes, Dewey R., to Caterpillar Tractor Co. Winch control mechanism. 4,042,215, Cl. 254-187.400.

Hall, David A., to Eli Lilly and Company. Electrolytic process for 7-methoxy-3-exomethylenecepham compounds. 4,042,472, Cl. 204-73.00R.

Hall, Jairus Donn: *See*—
Evans, Seth F.; and Hall, Jairus Donn, 4,041,865, Cl. 102-20.000.

Hall, John Emmett, to Downs Surgical Limited. Surgical implant spinal screw. 4,041,939, Cl. 128-69.000.

Hall, John H., to Micro Power Systems, Inc. High temperature refractory metal contact assembly and multiple layer interconnect structure. 4,042,953, Cl. 357-71.000.

Hall, Sidney B.: *See*—
Niehaus, Howard E.; Hass, Winfield M.; Alpha, Homer G.; Hall, Sidney B.; and Traenkner, Frederick O., 4,042,227, Cl. 266-93.000.

Hallatt, William E.: *See*—
Abelson, Paul N.; Buell, Halsey W.; and Hallatt, William E., 4,042,559, Cl. 260-38.000.

Hallen, Jan-Ake. Service unit, particularly for a doctor's or a dentist's office. 4,042,287, Cl. 312-209.000.

Halliburton Company: *See*—
Anderson, Buddy W.; Bowles, Bobby K.; Murphey, Joseph R.; Totty, Kenneth D.; and Young, Bill M., 4,042,032, Cl. 166-276.000.
Mosher, John E., 4,042,810, Cl. 235-150.200.

Halprin, Robert W.: *See*—
McCown, Thomas E.; McClymonds, Ken A.; and Halprin, Robert W., 4,041,872, Cl. 102-105.000.

Halseth, William L.: *See*—
Elliott, Donald P.; and Halseth, William L., 4,041,931, Cl. 128-1.00R.

Hamblett, Victor Hugh, to B & G Hydraulics Limited. Circuit design apparatus. 4,041,616, Cl. 35-19.00R.

Hammers, David E.: *See*—
Albanese, Damian F.; O'Farrell, Frank J.; Hammers, David E.; and Kennedy, Henry R., 4,042,925, Cl. 343-14.000.

Hammerstein, Gerd, to Carl Schnicks & Co. Rolling shutters. 4,042,005, Cl. 160-220.000.

Hammond, John M.; and Brown, Haskell R., Jr. Portable device for stretching and installing carpet. 4,042,211, Cl. 254-57.000.

Hamon Sobelco S.A.: *See*—
Gaurois, Raphael Emile, 4,042,651, Cl. 261-111.000.

Hampton, Robert K. Refuse reclaiming apparatus. 4,042,129, Cl. 214-17.0DB.

Hanak, Joseph John; Friel, Ronald Norman; and Goodman, Lawrence Alan, to RCA Corporation. Liquid crystal devices having diode characteristics. 4,042,293, Cl. 350-160.0LC.

Handley, Douglas: *See*—
Haselden, Geoffrey Gordon; and Handley, Douglas, 4,042,339, Cl. 23-262.000.

Hanemann, Horst J.: *See*—
Loveland, Winton; and Hanemann, Horst J., 4,041,675, Cl. 53-76.000.

Haney, William G.; and Wittmer, Douglas P., to Waters Associates, Inc. Ion-pairing chromatography. 4,042,327, Cl. 23-230.00R.

Hanna, John Edward, to Motorola, Inc. High input impedance amplifier circuit having temperature stable quiescent operating levels. 4,042,886, Cl. 330-23.000.

Hannah, William James: *See*—
Botting, Alden Joseph; Mulcahy, John Michael; and Hannah, William James, 4,042,659, Cl. 264-71.000.

Hanson, Robert B.; and Stephens, James R., to Standard Oil Company (Indiana). Products and process for preparation of polyamides and shaped articles therefrom. 4,042,750, Cl. 428-423.000.

Haque, Riaz-ul; and Murphy, Richard A., to International Foundation of Microbiology. Method of simultaneously cultivating multiple colonies of microorganisms. 4,042,463, Cl. 195-120.000.

Harada, Yuji: *See*—
Hasebe, Sadao; Ono, Hiromitsu; Murata, Minoru; and Harada, Yuji, 4,042,090, Cl. 197-102.000.

Haraguchi, Keisuke, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera with motor drive. 4,042,942, Cl. 354-171.000.

Harbulak, Edward P.; and Lash, Ronald J., to M&T Chemicals Inc. Brass plating. 4,042,470, Cl. 204-44.000.

Harbulak, Edward P.: *See*—
Lash, Ronald J.; and Harbulak, Edward P., 4,042,451, Cl. 156-664.000.

Harder, Arthur J., Jr., to Coach and Car Equipment Corporation. Monolithic seat cushion and method for producing same. 4,042,663, Cl. 264-45.700.

Hardern, David Norman: *See*—
Lee, Thomas Brian; Hardern, David Norman; and Bantick, John Raymond, 4,042,708, Cl. 424-283.000.

Hardy, Henry; and Balfour, Adrian E., to Compo Industries, Inc. Appliqueing synthetic resins on sheet material. 4,042,433, Cl. 156-87.000.

Harmon, Kenneth B.; and McQuinn, Ted M., to General Motors Corporation. Transmission shift control device system. 4,041,810, Cl. 74-868.000.

Harnischfeger Corporation: *See*—
Brener, Richard F., 4,042,214, Cl. 254-186.00R.

Harnish, Donald P.: *See*—
Smith, Wendell F., Jr.; Eddy, Kenneth L.; and Harnish, Donald P., 4,042,394, Cl. 96-56.000.

Harper, John Everett; and Kell, Louis H., to Garrett Corporation, The. Fuel system pneumatic purge apparatus and method. 4,041,695, Cl. 60-39.020.

Harper, Richard W., to Eli Lilly and Company. Substituted thiadiazolotriazinediones and method of preparation. 4,042,372, Cl. 71-90.000.

Harrington, Robert W. Spin toy. 4,042,247, Cl. 273-141.00A.

Harris, Colin Frank; and Gammon, Michael William, to Metallurgical Processes Ltd.; and I.S.C. Smelting Limited. Condensation of zinc vapor. 4,042,379, Cl. 75-88.000.

Harris, Harry Wayne: *See*—
Esders, Theodore Walter; Schaeffer, James Robert; and Harris, Harry Wayne, 4,042,461, Cl. 195-66.00R.

Harris, James M., to National Semiconductor Corporation. Method for forming gang bonding bumps on integrated circuit semiconductor devices. 4,042,954, Cl. 357-71.000.

Harris, Louis Selig; Pars, Harry George; Sheehan, John Clark; and Razdan, Raj Kumar, to Sharps Associates. Novel heterocyclic esters of benzopyranopyridines. 4,042,694, Cl. 424-248.550.

Harrison, David E. F.; and Doddema, Harmannus J., to Shell Oil Company. Process for the production of micro-organisms. 4,042,458, Cl. 195-28.00R.

Harrison, Geoffrey. Pipe couplings. 4,042,263, Cl. 285-110.000.

Harrison, Michael R.: *See*—
Keeler, Eugene R.; and Harrison, Michael R., 4,041,767, Cl. 73-6.000.

Harsch, Thomas B.; and Dems, Edd, to Hoffmann-La Roche Inc. Multiplexing circuit for liquid crystal display. 4,042,920, Cl. 340-324.00M.

Hart, Marvin Sumner; and Powers, William James, Jr., to Du Pont de Nemours, E. I., and Company. Yarn texturing jet. 4,041,583, Cl. 28-254.000.

Hart, Vincent Joseph: *See*—
Robeson, Robert Ogden; and Hart, Vincent Joseph, 4,041,829, Cl. 84-225.000.

Hartwig, Ernst, to BASF Aktiengesellschaft. Process for the production of 1,4-diaminoanthraquinone-2,3-dinitrile. 4,042,605, Cl. 260-378.000.

Harvey, John D.: *See*—
Dunne, Gerald J.; and Harvey, John D., 4,042,722, Cl. 426-648.000.

Harwell, Jack B.: *See*—
Grubbs, Calvin E.; and Harwell, Jack B., 4,042,871, Cl. 363-28.000.

Haschke, Heinz: *See*—
Hebbel, Gerhard; Krueger, Horst; Haschke, Heinz; and Morlock, Gerhard, 4,042,748, Cl. 428-323.000.

Hasebe, Sadao; Ono, Hiromitsu; Murata, Minoru; and Harada, Yuji, to Canon Kabushiki Kaisha; and K.K. Chiyoda Gurabiya Insatsusha. Key top. 4,042,090, Cl. 197-102.000.

Hasegawa, Katsuji; Takagi, Yukio; Naito, Sachio; Hiraiwa, Kenichi; and Takasu, Eiji, to Meinan Machinery Works, Inc. Method and apparatus for splicing of veneer sheets. 4,042,440, Cl. 156-304.000.

Hasegawa, Mutsuo; Aikawa, Kazuo; and Hayashi, Shinji, to Yoshida Kogyo Kabushiki Kaisha. Process for electrolytically coloring aluminum and aluminum alloys. 4,042,468, Cl. 204-42.000.

Hasegawa, Mutsuo; Imaoka, Toshikazu; and Aikawa, Kazuo, to Yoshida Kogyo Kabushiki Kaisha. Process for electrolytically coloring aluminum and aluminum alloys in gold. 4,042,469, Cl. 204-42.000.

Hasegawa, Mutsuo; Aikawa, Kazuo; and Nagata, Katsuyuki, to Yoshida Kogyo Kabushiki Kaisha. Process for electrolytically coloring aluminum and aluminum alloys. 4,042,471, Cl. 204-58.000.

Haselden, Geoffrey Gordon; and Handley, Douglas, to University of Leeds Industrial Services Limited. Production of nitric acid. 4,042,339, Cl. 23-262.000.

Hashimoto, Yoshihiro; and Isobe, Shinichi, to Fujitsu Fanuc Limited. Pulse distribution method and apparatus. 4,042,812, Cl. 235-151.110.

Haskew, Francis Anthony, to Coal Industry (Patents) Ltd. Methods of and apparatus for controlling hydraulic equipment. 4,041,841, Cl. 91-421.000.

Haslett, Glenn M.; and Blunier, Dennis L., to Caterpillar Tractor Co. Track bushing providing external deposits of wear resistant material. 4,042,282, Cl. 305-11.000.

Hass, Winfield M.: *See*—
Niehaus, Howard E.; Hass, Winfield M.; Alpha, Homer G.; Hall, Sidney B.; and Traenkner, Frederick O., 4,042,227, Cl. 266-93.000.

Hassan, Javathu Kutikaran; and Rabstejnek, Carl Vincent, to International Business Machines Corporation. Workpiece positioning apparatus. 4,042,119, Cl. 214-1.0CM.

Hatch, William Ronald, to Falconbridge Nickel Mines Limited. Cobalt ion exchange process. 4,042,665, Cl. 423-139.000.

Hatley, Kenneth John, to Butterworth Systems Inc. Rotatable brushes. 4,041,565, Cl. 15-200.000.

Hauldren, H. Morris; Claycomb, Jack R.; Chang, Chi-Haung; and DeKerlegand, Deke E., to W. C. Lamb. Ultrasonic inspection apparatus for well operations. 4,041,773, Cl. 73-67.80S.

Hauni-Werke Korber & Co. KG: *See*—
Wahle, Gunter; Ludszeweit, Dieter; Gomann, Jurgen; and Zessin, Horst, 4,041,958, Cl. 131-84.00B.

Hauxwell, Frank; Stansfield, James Frederick; and Topham, Arthur, to Imperial Chemical Industries Limited. Dispersing agents. 4,042,413, Cl. 106-308.00N.

Havens, Richard Harry: *See*—
Clampitt, Bert Howard; and Havens, Richard Harry, 4,042,763, Cl. 526-4.000.

Hayakawa, Hayashi: *See*—
Nishino, Atsushi; Yoshida, Akihiko; and Hayakawa, Hayashi, 4,042,420, Cl. 148-6.000.

Hayashi, Shinji: *See*—
Hasegawa, Mutsuo; Aikawa, Kazuo; and Hayashi, Shinji, 4,042,468, Cl. 204-42.000.

Hayashi, Yoshimasa: *See*—
Sugihara, Kunihiko; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,041,914, Cl. 123-119.00A.

Hazan, Isidor; and Iacona, Robert N., to Du Pont de Nemours, E. I., and Company. Process for electrocoating an aqueous composition of the reaction product of an epoxy ester resin and a maleinized drying oil blended with a cross-linking agent. 4,042,478, Cl. 204-181.000.

Hazeltine, Barrett; De Meo, Edgar; and Simon, Richard M., to U.S. Billiards, Inc. Color recognition system. 4,042,491, Cl. 209-74.00R.

Head, Victor P.; and Herzl, Peter J., to Fischer & Porter Co. Force-type flowmeter. 4,041,756, Cl. 73-194.00E.

Heath, Allan Burkett: *See*—
Wolfe, Eugene Earl; and Heath, Allan Burkett, 4,041,899, Cl. 118-323.000.

Hebbar, Ranna K.: *See*—
Cestaro, John P.; Hebbar, Ranna K.; and Sokolov, Uriel S., 4,042,177, Cl. 241-20.000.

Hebbel, Gerhard; Krueger, Horst; Haschke, Heinz; and Morlock, Gerhard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for improving coating compositions for paper and paper substitutes by use of poly(hydroxyaldehydocarboxylate) dispersing agent. 4,042,748, Cl. 428-323.000.

Hecox, Spencer S.: *See*—
Bacon, Duane E.; Gattermeir, J. David; Hecox, Spencer S.; and Robb, John J., 4,042,467, Cl. 204-15.000.

Hegendorfer, Max, to GRUNDIG E.M.V. Elektro-Mechanische Versuchsanstalt Max Grundig. Multiple-time-constant integrator or differentiator. 4,042,842, Cl. 307-293.000.

Hehl, Klaus, to Riloga-Werk Julius Schmidt. Mounting and brake assembly for roller blind. 4,042,075, Cl. 188-75.000.

Hehr International Inc.: *See*—
Kwan, Gerald A., 4,042,004, Cl. 160-91.000.

Heiberger, Ernst. Tumbling and polishing machine with planetary rotating drums. 4,041,648, Cl. 51-164.000.

Heidrich, Gunter; and Gotze, Christian, to AGFA-Gevaert, A.G. Apparatus for supporting and positioning webs of photographic material in copying machines. 4,042,301, Cl. 355-75.000.

Heim, Guenther: *See*—
Engl, Alfred; and Heim, Guenther, 4,042,006, Cl. 164-46.000.

Heim, Thomas M., executor: *See*—
Turner, James Wesley, deceased; and Spinks, Ray E., 4,041,580, Cl. 24-265.0AL.

Heimlicher, Peter, to Gluhlampenfabrik A.G. Machine for coiling lamp filaments. 4,041,683, Cl. 57-18.000.

Heinke, Wolfgang; Kirschner, Helmut; and Reimann, Detlef, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the removal of specific crystal structure defects from semiconductor discs and the product thereof. 4,042,419, Cl. 148-1.500.

Heinonen, Stig Teodor; and Johansson, Gustav Gunnar, to Telefonaktiebolaget L M Ericsson. Plug contact device intended for mounting on circuit cards. 4,042,289, Cl. 339-17.0LC.

Heinze, Helga: *See*—
Backer, Klaus; Heinze, Helga; Luck, Wolfhard; and Spahrkas, Heinrich, 4,042,321, Cl. 8-94.260.

Heller, Wilhelm; and Knorr, Walter, to Fried. Krupp Huttenwerke AG. Rail wheel. 4,042,273, Cl. 295-30.000.

Hellmiss, Otto E.; and Simon, Heinrich, to RHEINSTAHL Aktiengesellschaft. Device for receiving, from a fixed electric connection, adapting to length, and holding conductors for the electric current supply of movable consumers. 4,042,082, Cl. 191-12.20A.

Helms, Howard D., to United States of America, Army. Ability of a monopulse radar to resolve and track jammers passively. 4,042,927, Cl. 343-18.00E.

Henderson, David C.; and Maloney, Kenneth M., to General Electric Company. Alumina coatings for an electric lamp. 4,042,727, Cl. 427-107.000.

Hennekens, Jan L. J. P.: *See*—
Wolters, Jan; and Hennekens, Jan L. J. P., 4,042,630, Cl. 260-586.00R.

Hennessy, James W.; Angel, Henry R.; and Bachenheimer, Bernard O., to Angel Engineering Corporation. Particle count correction. 4,042,808, Cl. 235-92.0PC.

Henning, George J.; McKinney, Lynn B.; and Scalia, Joseph, to Van Dorn Company. Pull tab construction for full panel pull-out ends for easy opening cans. 4,042,144, Cl. 220-273.000.

Henning, Jack A. Wireline actuated tubing cutter. 4,042,019, Cl. 166-55.000.

Henry, James L.: *See*—
Espy, Donald M.; and Henry, James L., 4,042,122, Cl. 214-1.0CM.

Henry Simon Limited: *See*—
Lawton, Bernard Gaskell, 4,042,446, Cl. 156-359.000.

Henson, Glen E.; and Fisher, Milton W., to Robar Mini-Gym, Inc. Exercise apparatus. 4,041,760, Cl. 73-379.000.

Herkes, Daniel Joseph; and Reinwall, Ernest William, Jr., to Illinois Tool Works Inc. Plastic headed fastener assembly. 4,041,834, Cl. 85-45.000.

Herr, Charles H., to Caterpillar Tractor Co. Control system for a modular transmission. 4,041,807, Cl. 74-752.00C.

Herrell, Flavel Deloyd. Mold element for horizontally forming panels. 4,042,205, Cl. 249-189.000.

Herrmann, John A., to Minnesota Mining and Manufacturing Company. Document filming camera. 4,042,298, Cl. 355-40.000.

Herzl, Peter J.: *See*—
Head, Victor P.; and Herzl, Peter J., 4,041,756, Cl. 73-194.00E.

Heusner, Alex: *See*—
Banholzer, Rolf; Bauer, Rudolf; Heusner, Alex; and Schulz, Werner, 4,042,700, Cl. 424-265.000.

Heybourn, Frank: *See*—
Molins, Desmond Walter; Hinchcliffe, Dennis; Clarke, Peter Alec; and Heybourn, Frank, 4,042,112, Cl. 209-73.000.

Heymer, Gero: *See*—
Auel, Theodor; Ulrich, Hannsjorg; Wasel-Nielen, Horst-Dieter; and Heymer, Gero, 4,042,324, Cl. 21-2.70A.

Higgins, Edward D.: *See*—
Rarey, Kenneth W.; Higgins, Edward D.; Hungerford, Donald L.; and Kennedy, John B., Jr., 4,041,901, Cl. 118-621.000.

High, Cliff, to Brotman, Morley. Method and device for dispensing portions of a chain. 4,041,814, Cl. 83-18.000.

Hille, Ernst: *See*—
Paszthory, Emmerich; Hille, Ernst; Seifert, Karl-Gerhard; and Zimmermann, Vincenz, 4,042,622, Cl. 260-562.00K.

Hills, Vernon Elton; and Wu, Leesui, to RCA Corporation. Selectively powered flip-flop. 4,042,841, Cl. 307-272.000.

Hilton, Garrett H.: *See*—
Davis, James W.; and Hilton, Garrett H., 4,041,981, Cl. 137-604.000.

Himoto, Sizuo: *See*—
Kogure, Katsura; Sueda, Noriyoshi; Himoto, Sizuo; Yoshino, Youziro; and Nakagawa, Kunio, 4,042,617, Cl. 260-469.000.

Hinchcliffe, Dennis: *See*—
Molins, Desmond Walter; Hinchcliffe, Dennis; Clarke, Peter Alec; and Heybourn, Frank, 4,042,112, Cl. 209-73.000.

Hingst, Elmer J. Hood-mountable digital speedometer. 4,041,782, Cl. 73-493.000.

Hinton, Reginald A.; Doughty, Kenneth W.; and Kennedy, William N., to General Electric Company. Electrostatic shielding of disc windings. 4,042,900, Cl. 336-70.000.

Hiraga, Masaharu, to Sankyo Electric Company, Limited. Refrigerant compressor. 4,042,309, Cl. 417-269.000.

Hiraiwa, Kenichi: *See—*
Hasegawa, Katsuji; Takagi, Yukio; Naito, Sachio; Hiraiwa, Kenichi; and Takasu, Eiji, 4,042,440, Cl. 156-304.000.

Hirooka, Masaaki: *See—*
Kitamura, Shuji; Kato, Takashi; and Hirooka, Masaaki, 4,042,648, Cl. 260-896.000.

Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, to Mitsui Toatsu Chemicals, Incorporated. Process for producing thermosetting finishing powders. 4,042,645, Cl. 260-830.00P.

Hirota, Moriyuki: *See—*
Misaka, Yasunao; Tanaka, Ikuo; Okada, Hiroo; Goto, Chuichi; Hirota, Moriyuki; Uesugi, Masaaki; and Tsuchiya, Mitsuru, 4,042,500, Cl. 210-189.000.

Hirsch, Arie L. Composition and method for forming dental restorations. 4,041,607, Cl. 32-8.000.

Hitachi, Ltd.: *See—*
Ando, Shimon, 4,042,161, Cl. 228-102.000.
Araki, Yoshikazu, 4,042,839, Cl. 307-270.000.
Kaji, Tadao; Kamei, Tsuneaki; and Miyamoto, Keiji, 4,042,726, Cl. 427-93.000.
Kano, Tsuyoshi; Nakako, Masaki; Yamamoto, Hajime; and Otomo, Yoshiro, 4,042,527, Cl. 252-301.40H.
Ohira, Takeshi; and Watanabe, Akinori, 4,042,069, Cl. 187-29.00R.
Tomita, Sadami; and Chiba, Akio, 4,042,898, Cl. 335-297.000.

Hitachi Metals, Ltd.: *See—*
Katakura, Hiroshi; and Yamashita, Keitaro, 4,041,903, Cl. 118-658.000.

Hix, Alfred G. O. Press brake attachment for forming and cutting metal. 4,041,753, Cl. 72-332.000.

Hladio, William F.: *See—*
Thomas, Jerry D.; Hladio, William F.; and Scott, Leo V., 4,042,381, Cl. 75-129.000.

Ho, William W.; and Govan, Ronald M., to Rockwell International Corporation. Microwave aerosol waterometer. 4,042,879, Cl. 324-58.50C.

Hoback, Ronald D., to Goodyear Tire & Rubber Company, The. Belt drive including toothed belts and toothed pulleys of improved tooth configurations. 4,041,789, Cl. 74-229.000.

Hoback, Ronald D.; and Geist, Joseph C., to Goodyear Tire & Rubber Company, The. Flexible matrix for forming a portion of a toothed power transmission belt. 4,042,443, Cl. 156-349.000.

Hochstrasser, Harry T., to Becton, Dickinson and Company. Method and device for detecting cholesterol. 4,042,329, Cl. 23-230.00B.

Hoechst Aktiengesellschaft: *See—*
Auel, Theodor; Ulrich, Hannsjorg; Wasel-Nielen, Horst-Dieter; and Heymer, Gero, 4,042,324, Cl. 21-2.70A.
Hoheisel, Klaus; and Janocha, Siegfried, 4,042,565, Cl. 260-47.00C.
Papenfuhs, Theodor, 4,042,582, Cl. 106-288.00Q.
Papenfuhs, Theodor; and Volk, Heinrich, 4,042,611, Cl. 260-439.00R.
Paszthory, Emmerich; Hille, Ernst; Seifert, Karl-Gerhard; and Zimmermann, Vincenz, 4,042,622, Cl. 260-562.00K.
von der Eltz, Hans-Ulrich, 4,041,559, Cl. 8-149.100.
Winkelmann, Erhardt; and Raether, Wolfgang, 4,042,705, Cl. 424-273.00R.

Hoel, Per O.; Korpijaakko, Erkki Pekka; and Moustakas, Matthew A., to CBS Inc. Pneumatic skill game. 4,042,243, Cl. 273-108.000.

Hoepfl, Joseph R.; and Ballendux, Gerardus M., to Allis-Chalmers Corporation. Hydraulic stack valve assembly. 4,041,972, Cl. 137-269.000.

Hofer, Ernst; and Schlichte, Max, to Siemens Aktiengesellschaft. Method and apparatus for improving transmission line characteristics. 4,042,893, Cl. 333-28.00R.

Hofer, Johann: *See—*
Schmidt, Dietrich; Hofer, Johann; Lang, Winfried; and Bildl, Erich, 4,042,331, Cl. 23-230.0PC.

Hofer, Kurt; and Tscheulin, Guenther, to Sandoz Ltd. Nitrogen-containing aromatic heterocyclic compounds as anti-oxidants. 4,042,562, Cl. 260-45.8NT.

Hofer, Kurt, Jr.: *See—*
Hofer, Kurt, Sr.; and Hofer, Kurt, Jr., 4,042,632, Cl. 260-607.0AL.

Hofer, Kurt, Sr.; and Hofer, Kurt, Jr., to Sandoz Ltd. Polyoxy sulfoxides and sulfones as antistatic agents. 4,042,632, Cl. 260-607.0AL.

Hofer, Peter H., to John Z. DeLorean Corporation, The. Composite material and method of forming. 4,042,746, Cl. 428-311.000.

Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; and Stendel, Wilhelm, to Bayer Aktiengesellschaft. Method of combatting blowfly larvae. 4,042,690, Cl. 424-200.000.

Hoffman, Dickie D.: *See—*
Drewek, David F.; and Hoffman, Dickie D., 4,042,255, Cl. 280-445.000.

Hoffmann-La Roche Inc.: *See—*
Harsch, Thomas B.; and Dems, Edd, 4,042,920, Cl. 340-324.00M.
Hofheinz, Werner, 4,042,597, Cl. 548-339.000.
Spector, Sidney, 4,042,682, Cl. 424-95.000.

Hofheinz, Werner, to Hoffmann-La Roche Inc. Preparation of 2-(2-hydroxy-2-propyl)-1-methyl-5-nitroimidazole. 4,042,597, Cl. 548-339.000.

Hoheisel, Klaus; and Janocha, Siegfried, to Hoechst Aktiengesellschaft. Stretched tubular film of polyethylene terephthalate. 4,042,565, Cl. 260-47.00C.

Holbrook, R. Patrick, to Album Frames Inc. Frame for exhibiting albums and the like. 4,041,630, Cl. 40-152.100.

Holder, Otis W., to Oakdale Knitting Company. Auxiliary knitting station for hosiery knitting machine. 4,041,735, Cl. 66-133.000.

Holland, Warren E.; and True, Martin E., to Exxon Production Research Company. Combination subsurface safety valve and chemical injector valve. 4,042,033, Cl. 166-310.000.

Hollander, James Fisher. Apparatus and method for indication and measurement of simulated emotional levels. 4,041,617, Cl. 35-22.00R.

Holm, Peter H.; and Quartz, William L., to Schoeller Technical Papers, Inc. Polyolefin coated photographic base and method of producing. 4,042,398, Cl. 96-85.000.

Holzel, Alexander: *See—*
Schnabel, Roland; Holzel, Alexander; and Gotter, Kurt, 4,042,359, Cl. 65-2.000.

Honath, Harold F.: *See—*
Terlesky, John; Muller, Hugh Emil; Murphy, John C.; and Honath, Harold F., 4,041,722, Cl. 62-45.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Goto, Isamu; Nishimura, Sadanori; and Kawahara, Eiichiro, 4,041,701, Cl. 60-347.000.
Shinozaki, Takashi; and Asai, Susumu, 4,041,798, Cl. 74-512.000.
Tsukisaka, Tsuneo, 4,041,967, Cl. 137-39.000.

Honda, Teruo: *See—*
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, 4,042,645, Cl. 260-830.00P.

Honeywell Information Systems Inc.: *See—*
Bachman, Charles W.; and Franklin, Benjamin S., 4,042,912, Cl. 364-200.000.
Cassarino, Frank V., Jr.; and Barlow, George J., 4,042,832, Cl. 307-149.000.
Curley, John L.; Dawson, C. William; Parmet, Arthur A.; and Taylor, Donald R., 4,042,914, Cl. 364-200.000.

Honnold, Darrel Lee, to Deere & Company. Rear folding implement. 4,042,044, Cl. 172-311.000.

Hood, Robert Allen: *See—*
Birney, Richard Eugene; Davis, Michael Ian; Graybiel, Lynn Allan; Hood, Robert Allen; Kahn, Samuel; and Osborne, William Steese, 4,042,913, Cl. 364-200.000.

Hooper, Gerald E.: *See—*
Lloyd, William A.; Barone, Salvatore; Hooper, Gerald E.; and McFarland, Keith E., 4,042,939, Cl. 346-153.000.

Hooper, Ralph W.; MacLeod, Douglas A.; and Murray, Clarence G., to Interstate and Ocean Transport Company. Push tug-barge thrust transmittal means. 4,041,888, Cl. 114-248.000.

Hopp, Philip; and Allen, Mort M., to Hopp Press, Inc., The. Signal device. 4,041,629, Cl. 40-130.00R.

Hopp Press, Inc., The: *See—*
Hopp, Philip; and Allen, Mort M., 4,041,629, Cl. 40-130.00R.

Hori, Haruo: *See—*
Wada, Hajime; Kikuchi, Shouji; Hori, Haruo; and Endo, Takaya, 4,042,393, Cl. 96-55.000.

Horiba, Ltd.: *See—*
Saitoh, Osamu; Imaki, Masakatu; and Asami, Hazime, 4,042,332, Cl. 23-232.00R.

Horstman, Wilhelm; Meyer, Werner; and Polizzano, Fred F., deceased (by Polizzano, Anita, executrix), to Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft. Strip for covering an elongated mold cavity in a continuous casting machine. 4,042,009, Cl. 164-278.000.

Horwinski, Elwood R., to Automobile Corporation of America. Hybrid powered automobile. 4,042,056, Cl. 180-65.00A.

Horwitz, Norman H.; and Gutkowski, Robert F. Dose dispenser for radioactive gas. 4,041,994, Cl. 141-1.000.

Hosho, Kozo: *See—*
Inaba, Mitugu; Kouguchi, Noriyuki; Kagawa, Masao; Hosho, Kozo; and Teraoka, Yoshiaki, 4,041,686, Cl. 57-34.00R.

Houck, Stanley J., to Goodyear Tire & Rubber Company, The. Closed torus wound carcass for a closed torus tire. 4,042,435, Cl. 156-121.000.

Houdaille Industries, Inc.: *See—*
Nelson, Paul Chris, 4,041,817, Cl. 83-139.000.

Houseman, John, to United States of America, National Aeronautics and Space Administration. Combustion engine. 4,041,910, Cl. 123-59.0EC.

Hovey, Frederick A.; and Torsch, Charles E., to GTE Sylvania Incorporated. Cathode ray tube convergence system. 4,042,857, Cl. 315-368.000.

Howard, Hubert M. Mechanism for releasing a toy parachute from a kite string. 4,042,195, Cl. 244-155.00R.

Hower, Philip L.: *See—*
Chu, Chang K.; Hower, Philip L.; and Vomish, George W., 4,042,947, Cl. 357-34.000.

Hoya Glass Works, Ltd.: *See—*
Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,042,526, Cl. 252-300.000.

HPM Corporation: *See—*
Bishop, Thomas G., 4,042,660, Cl. 264-77.000.

Hrabak, Frantisek; Hynkova, Vlasta; and Lokaj, Jan, to Czechoslovenska akademie ved. Process for producing of polymers by connecting of polymeric molecules. 4,042,644, Cl. 260-849.000.

Huber, Bernhard Werner, to Bodenseewerk Perkin-Elmer & Co. GmbH. Method and apparatus for automated sampling with an atomic absorption spectrometer. 4,042,303, Cl. 356-85.000.

Huber, Bernhard Werner, to Bodenseewerk Perkin-Elmer & Co. GmbH. Automatic sample preparation device. 4,042,338, Cl. 23-259.000.

Huber, Gene A.; and Knartzer, Jon A., to SWECO, Incorporated. Lead angle controlling mechanism. 4,042,181, Cl. 241-175.000.

Huber, Rolf: *See—*
Kiehs, Karl; Adolphi, Heinrich; and Huber, Rolf, 4,042,691, Cl. 424-200.000.

Huber, Wolfgang; Saifer, Mark G.; and Williams, Lewis D., to Diagnostic Data, Inc. Alkylated orgotein. 4,042,689, Cl. 424-177.000.

Hudson, Sharon J., Jr.: *See—*
Morse, Robert L.; and Hudson, Sharon J., Jr., 4,041,728, Cl. 62-503.000.

Hughes Aircraft Company: *See—*
Ajioka, James S.; and Tsuda, George I., 4,042,935, Cl. 343-795.000.
Evans, Norol T.; and Wunderlich, Francis J., 4,042,924, Cl. 343-7.00A.

Hughes, Howard W.: *See—*
Glassmeyer, John J.; and Hughes, Howard W., 4,042,275, Cl. 296-43.000.

Hughes, Thomas Philip; and Sherrill, Clark Alexander. Municipal refuse collection system. 4,042,137, Cl. 214-302.000.

Hugon, Pierre: *See—*
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,042,598, Cl. 260-326.100.

Hull, V. Joseph: *See—*
Ristagno, Charles V., to Micro-Display Systems, Inc. Illuminated electro-optical display apparatus. 4,042,294, Cl. 350-60LC.

Humkey, Robert Garnett; Marshall, Donald Raymond; and Ryan, Donald James, to Du Pont de Nemours, E. I., and Company. Apparatus for solids blending. 4,042,220, Cl. 259-95.000.

Humphrey, Richard V. Fiber-reinforced plastic unitized boat hull frame. 4,041,561, Cl. 9-6.00P.

Hungerford, Donald L.: *See—*
Rarey, Kenneth W.; Higgins, Edward D.; Hungerford, Donald L.; and Kennedy, John B., Jr., 4,041,901, Cl. 118-621.000.

Hunsucker, Jerry Hoyt: *See—*
Frump, John Adams; and Hunsucker, Jerry Hoyt, 4,042,520, Cl. 252-70.000.

Hunt Electronics Company: *See—*
Finegan, John J., Jr., 4,042,903, Cl. 338-159.000.

Hunt, Robert E.; and Moore, Kenneth L., to United States of America, Navy. Method of making a reticle-lens. 4,042,449, Cl. 156-651.000.

Hunter, Houston W.: *See—*
Dressel, Edwin J.; and Hunter, Houston W., 4,041,717, Cl. 61-72.400.

Hunter, Wood E.: *See—*
Ballweber, Edward G.; and Hunter, Wood E., 4,042,772, Cl. 526-220.000.

Hurnaus, Rudolf: *See—*
Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, 4,042,711, Cl. 424-319.000.

Hurwitz, Myron Stuart. Single family townhouse units. 4,041,661, Cl. 52-169.400.

Hwa, Stephen C. P., to Xerox Corporation. Method for scraping liquids from a moving surface. 4,042,415, Cl. 134-6.000.

Hydril Company: *See—*
Mott, James D., 4,042,024, Cl. 166-243.000.

Hynkova, Vlasta: *See—*
Hrabak, Frantisek; Hynkova, Vlasta; and Lokaj, Jan, 4,042,644, Cl. 260-849.000.

I.P.U. Limited: *See—*
Zeley, Juan Adalberto, 4,042,224, Cl. 266-50.000.

I.S.C. Smelting Limited: *See—*
Harris, Colin Frank; and Gammon, Michael William, 4,042,379, Cl. 75-88.000.

I-T-E Imperial Corporation EFCOR Division: *See—*
Mooney, Thomas C.; and Gajajiva, Padej, 4,042,262, Cl. 285-98.000.

Iacona, Robert N.: *See—*
Hazan, Isidor; and Iacona, Robert N., 4,042,478, Cl. 204-181.000.

ICI Australia Limited: *See—*
Martin, Anwyn Margaret; Stewart, Donald Ferguson; and Swanson, Andrew Baikie, 4,042,375, Cl. 75-4.000.

ICI United States Inc.: *See—*
Kendig, Robert N., 4,042,107, Cl. 206-386.000.

Ickes, John C. Fireplace form. 4,042,160, Cl. 126-121.000.

Idaho Concrete Pipe Co., Inc.: *See—*
Fairbanks, Philip R., 4,042,136, Cl. 214-146.500.

IDR, Inc.: *See—*
Saylor, Richard; and Nagel, Robert H., 4,042,958, Cl. 358-141.000.

Ihara, Susumu: *See—*
Uesugi, Minoru; Ihara, Susumu; and Mizuuchi, Katsumi, 4,041,610, Cl. 33-127.000.

Iida, Hiroshi; and Sasaki, Kenichi, to Nissan Motor Company, Limited. Internal combustion engine and method of operating same. 4,041,916, Cl. 123-119.00A.

Iinuma, Yoshio: *See—*
Yasuda, Tetuya; Iinuma, Yoshio; and Maekawa, Yuzo, 4,042,861, Cl. 361-400.000.

Ikeda, Yoshitaka: *See—*
Edamura, Koji; Nakagawa, Yoshimasa; and Ikeda, Yoshitaka, 4,042,646, Cl. 260-864.000.

Ikinobu, Hiroaki, to Fuji Shoten Co. Ltd. Fuel injection valve testing apparatus. 4,041,778, Cl. 73-119.00A.

Iley, James Dixon: *See—*
Ward, Denby Harcourt; and Iley, James Dixon, 4,042,228, Cl. 266-215.000.

Illinois Tool Works Inc.: *See—*
Herkes, Daniel Joseph; and Reinwall, Ernest William, Jr., 4,041,834, Cl. 85-45.000.

Imai, Takeshi; Niwa, Tsutomu; and Motani, Kenji, to Nippondenso Co., Ltd. Resin-sealed electrical device. 4,042,955, Cl. 357-72.000.

Imai, Toshihiro: *See—*
Yamasita, Nobuo; and Imai, Toshihiro, 4,042,295, Cl. 350-202.000.

Imaki, Masakatu: *See—*
Saitoh, Osamu; Imaki, Masakatu; and Asami, Hazime, 4,042,332, Cl. 23-232.00R.

Imaoka, Toshikazu: *See—*
Hasegawa, Mutsuo; Imaoka, Toshikazu; and Aikawa, Kazuo, 4,042,469, Cl. 204-42.000.

IMC Chemical Group, Inc.: *See—*
Frump, John Adams; and Hunsucker, Jerry Hoyt, 4,042,520, Cl. 252-70.000.
Robertson, Donald Edwin; Urry, Wilbert Herbert; and Kavka, Frank, 4,042,602, Cl. 260-343.410.

Imperial Chemical Industries Limited: *See—*
Creasey, Norman Geoffrey; and Pike, Leslie Clark, 4,042,643, Cl. 428-447.000.
Hauxwell, Frank; Stansfield, James Frederick; and Topham, Arthur, 4,042,413, Cl. 106-308.00N.
Smith, Frank, 4,042,753, Cl. 428-651.000.

INA Bearing Company, Inc.: *See—*
Dorsch, Hans H., 4,042,285, Cl. 308-235.000.

Inaba, Mitugu; Kouguchi, Noriyuki; Kagawa, Masao; Hosho, Kozo; and Teraoka, Yoshiaki, to Toray Industries, Inc. Method of and arrangement for transporting yarn packages. 4,041,686, Cl. 57-34.00R.

Inada, Kazuyoshi: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,042,487, Cl. 208-48.00R.

Incom International Inc.: *See—*
Paul, William T., 4,041,790, Cl. 74-258.000.

Indiana University Foundation: *See—*
Muhler, Joseph C.; Putt, Mark S.; Kleber, Carl J.; and Yoho, Clayton W., 4,042,680, Cl. 424-55.000.

Industrial Clean Air, Inc.: *See—*
Miller, Edward M., 4,042,356, Cl. 55-341.00R.

Industrial Nucleonics Corporation: *See—*
Eickelberg, John E.; and Rice, James S., 4,042,869, Cl. 318-630.000.

Industrie Pirelli S.p.A.: *See—*
Bergomi, Luciano, 4,042,742, Cl. 428-295.000.

Ingersoll-Rand Company: *See—*
Dively, Charles R.; and Peterson, Russell K., 4,042,047, Cl. 175-340.000.

Inokuchi, Yukio: *See—*
Ohashi, Nobuo; Konishi, Motoyuki; Nishida, Minoru; and Inokuchi, Yukio, 4,042,425, Cl. 148-13.100.

Inoue, Eiichi; Endo, Ichiro; and Yamanouchi, Teruo, to Canon Kabushiki Kaisha. Process for the preparation of sensitized material for electrophotography. 4,042,388, Cl. 96-1.600.

Inoue, Yoshio: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,042,613, Cl. 260-448.20B.

Institut de Recherches de la Siderurgie Francaise: *See—*
Alberny, Robert; and Vedda, Louis, 4,042,008, Cl. 164-147.000.

Institut Pasteur: *See—*
Augier, Jacques; and Augier-Gibory, Solange, 4,042,574, Cl. 260-112.00R.

Instytut Obrobki Plastycznej: *See—*
Rut, Tadeusz, 4,041,755, Cl. 72-353.000.

Interdyne Company: *See—*
Lewis, Richard A., 4,042,189, Cl. 242-195.000.

International Business Machines Corporation: *See—*
Bequaert, Frank Charles; and Rochester, Nathaniel, 4,042,777, Cl. 179-79.000.
Birney, Richard Eugene; Davis, Michael Ian; Graybiel, Lynn Allan; Hood, Robert Allen; Kahn, Samuel; and Osborne, William Steese, 4,042,913, Cl. 364-200.000.
Bourke, Donall Garraid; and Puttlitz, Frederic John, 4,042,911, Cl. 364-900.000.
Gindi, Abraham M., 4,042,783, Cl. 179-15.0AL.
Hassan, Javathu Kutikaran; and Rabstejnek, Carl Vincent, 4,042,119, Cl. 214-1.0CM.
Perry, Francis James; and Vesci, Anthony, 4,042,937, Cl. 346-1.000.

International Flavors & Fragrances Inc.: *See—*
Wilson, Richard A.; Pascale, John V.; and Vock, Manfred Hugo, 4,042,601, Cl. 260-327.00M.

International Foundation of Microbiology: *See—*
Haque, Riaz-ul; and Murphy, Richard A., 4,042,463, Cl. 195-120.000.

International Nickel Company, Inc., The: *See—*
Petersen, Walter Adrian; and Forbes Jones, Robin Mackay, 4,042,383, Cl. 75-171.000.

International Paper Company: *See—*
Elder, Jerome Earl, 4,042,165, Cl. 229-33.000.

International Standard Electric Corporation: *See—*
Drake, Cyril Francis; and Amos, Robert Walter James, 4,042,402, Cl. 106-15.00R.
Kimmich, Klaus, 4,041,894, Cl. 118-7.000.

International Telephone and Telegraph Corporation: *See—*
Albanese, Damian F.; O'Farrell, Frank J.; Hammers, David E.; and Kennedy, Henry R., 4,042,925, Cl. 343-14.000.
Levine, Arnold M., 4,042,891, Cl. 331-1.00R.
November, Milton H., 4,041,769, Cl. 73-32.00A.

Interstate and Ocean Transport Company: *See—*
Hooper, Ralph W.; MacLeod, Douglas A.; and Murray, Clarence G., 4,041,888, Cl. 114-248.000.

Ip, Anthony Kwok-Chun; Koyanagi, Ken; and Tarasuk, Walter Renald, to Canadian General Electric Company Limited. Nuclear fuel string assembly. 4,042,456, Cl. 176-78.000.

Irikura, Tsutomu, to Kyorin Pharmaceutical Co., Ltd. The hypolipidemic agent, 4-(4-chlorobenzyloxy)-benzyl nicotinate and preparation thereof. 4,042,594, Cl. 260-295.5OR.

Irvin Industries, Inc.: *See—*
Rain, Lloyd H., 4,041,653, Cl. 52-2.000.

Irvine Ranch Water District: *See—*
Stoyer, Ray L., 4,042,494, Cl. 210-7.000.

Isaac, Eirlys R.: *See—*
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 4,042,369, Cl. 71-88.000.

Ishihara, Yosuke, to Sumitomo Electric Industries, Ltd. Pin connection for a floating type disc brake. 4,042,074, Cl. 188-73.300.

Ishii, Hiromichi: *See—*
Matsuzawa, Hideo; Otani, Masato; Ishii, Hiromichi; Yamada, Kantaro; and Kobayashi, Hasao, 4,042,625, Cl. 260-530.00N.

Ishiwata, Shosuke; and Ozaki, Kaoru, to Asahi Fiber Glass Company Limited. Method of cleaning waste gas containing a fluorine component. 4,042,667, Cl. 423-240.000.

Ishizaki, Masanori: *See—*
Itanami, Kojiro; and Ishizaki, Masanori, 4,041,640, Cl. 47-1.400.

Isler, Ernst R., to Isler, Helena A. M. Torque transmitting apparatus. 4,041,835, Cl. 74-751.000.

Isler, Helena A. M.: *See—*
Isler, Ernst R., 4,041,835, Cl. 74-751.000.

Isobe, Shinichi: *See—*
Hashimoto, Yoshihiro; and Isobe, Shinichi, 4,042,812, Cl. 235-151.110.

Itanami, Kojiro; and Ishizaki, Masanori, to Chlorella Industry Co., Ltd. Chlorella-culturing apparatus. 4,041,640, Cl. 47-1.400.

Itatani, Hiroshi; Kashima, Mikito; Shiotani, Akinori; Yoshimoto, Hataaki; and Kato, Tetuo, to UBE Industries, Ltd. Intramolecular cyclization in a fatty acid ester solvent. 4,042,603, Cl. 260-346.20M.

Itin, Artur Markovich; and Eremin, Vladimir Fedorovich. Clutch control device for a machine tool. 4,042,087, Cl. 192-99.00S.

Ito, Fumihiko: *See—*
Yasuoka, Yoshio; Ito, Fumihiko; Tsuboi, Kunitada; Jinno, Kaori; and Yamano, Masaru, 4,042,851, Cl. 315-39.510.

Ito, Haruo, to Aikoh Co., Ltd. Method for defoaming molten slag. 4,042,410, Cl. 106-117.000.

ITW Limited: *See—*
Clinch, Colin W. F.; James, Peter A. R.; and Tibbett, John H., 4,042,267, Cl. 292-318.000.

Ivanko, Theodore, to Avco Corporation. Bonded gear assembly. 4,042,434, Cl. 156-91.000.

Iwamitsu, Yasuyuki; and Taira, Kataro, to Tekken Construction Co. Ltd. Method and apparatus for starting a tunneling machine from an initial placement within a vertical shaft sunk into the ground and provided with a starting port. 4,041,713, Cl. 61-42.000.

Iwata, Shuzi: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Izumitani, Tetsuro: *See—*
Asahara, Yoshiyuki; and Izumitani, Tetsuro, 4,042,526, Cl. 252-300.000.

J. Bobst & Fils S.A.: *See—*
Risse, Jean-Claude, 4,042,185, Cl. 242-71.700.

J. I. Case Company: *See—*
Schulz, John Carl, 4,042,084, Cl. 192-13.00R.

J. Ray McDermott & Co., Inc.: *See—*
Dressel, Edwin J.; and Hunter, Houston W., 4,041,717, Cl. 61-72.400.

Jackson, George; and Fieldsend, Terence, to British Steel Corporation. Production of metal strip from powder. 4,042,384, Cl. 75-214.000.

Jackson, Leigh F.: *See—*
Mean, Jean-Marie L.; Kraft, Joseph K.; and Jackson, Leigh F., 4,041,845, Cl. 92-85.00A.

Jacobs, Donald R.: *See—*
Wells, Thomas R.; and Jacobs, Donald R., 4,042,296, Cl. 352-78.00R.

Jacobsen, Finn, to Kamry AB. Method and device for dewatering of suspensions in movement. 4,041,560, Cl. 8-156.000.

Jacquier, Robert R., to Centre d'Etudes Pour l'Industrie Pharmaceutique. Diaminopropanols. 4,042,590, Cl. 260-268.00R.

Jahn, Martin D.; and Balfanz, Glenn F., Jr., to Chicago Metallic Corporation. Clip structure for a concealed grid structure of a suspended ceiling. 4,041,668, Cl. 52-489.000.

James, Peter A. R.: *See—*
Clinch, Colin W. F.; James, Peter A. R.; and Tibbett, John H., 4,042,267, Cl. 292-318.000.

Jane Cabagnero, Ramon. Collapsible frame for carriages. 4,042,274, Cl. 296-1.00B.

Janocha, Siegfried: *See—*
Hoheisel, Klaus; and Janocha, Siegfried, 4,042,565, Cl. 260-47.00C.

Japan Synthetic Rubber Company Limited: *See—*
Abe, Mitsuo; Nagata, Masaki; and Kikuchi, Masafumi, 4,042,548, Cl. 260-23.0XA.

Jarvis, Arthur B., to Bose Corporation. Joining. 4,042,307, Cl. 403-290.000.

Jean Walterscheid GmbH: *See—*
Schibrowski, Jurgen, 4,041,590, Cl. 29-95.100.

Jenaer, Glaswerk, Schott & Gen.: *See—*
Schnabel, Roland; Holzel, Alexander; and Gotter, Kurt, 4,042,359, Cl. 65-2.000.

Jenn Air Corporation: *See—*
McCartney, Edward O., 4,042,806, Cl. 219-447.000.

Jensen, Frank L., to Raymond Lee Organization, Inc., The, a part interest. Drowsing chair pillow. 4,042,278, Cl. 297-397.000.

Jensen, Poul Due, to Grundfos A/S. Liquid-filled submersible electromotor. 4,042,847, Cl. 310-87.000.

Jentsch, Hans G. Method for making plastic bags. 4,041,851, Cl. 93-35.0SB.

Jered Industries, Inc.: *See—*
Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., 4,041,554, Cl. 4-10.000.

Jero, John P.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engleking, Frederick S.; and Jero, John P., 4,042,085, Cl. 192-57.000.

Jinno, Kaori: *See—*
Yasuoka, Yoshio; Ito, Fumihiko; Tsuboi, Kunitada; Jinno, Kaori; and Yamano, Masaru, 4,042,851, Cl. 315-39.510.

Jioio, Joseph F.; and Gardner, Willis Howard. Shield element. 4,041,812, Cl. 82-34.00R.

Jiruse, Jaroslav, to Adamovske Strojirny, narodni podnik. Tripping device for printing cylinders. 4,041,862, Cl. 101-218.000.

Jochmann, Dieter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Change gear transmission in group arrangement for motor vehicles, especially for use in agriculture and in the construction field. 4,041,805, Cl. 74-740.000.

Johansson, Arne Boris; Codorniu, Francisco Lorente; and Strandly, Ingvald, to Nordiska Maskinfilt Aktiebolaget. Forming fabric and a method for its manufacture. 4,041,989, Cl. 139-425.00A.

Johansson, Erik Gunnar; Blomberg, Bengt Ture Hubertus; and Elmquist, Bernt Holger. Implement to facilitate removing bacterial coating from the interstitial areas of adjacent teeth and cleaning the crevices therebetween. 4,041,962, Cl. 132-91.000.

Johansson, Gustav Gunnar: *See—*
Heinonen, Stig Teodor; and Johansson, Gustav Gunnar, 4,042,289, Cl. 339-17.0LC.

Johenning, William Joseph: *See—*
Nakata, Roy; and Johenning, William Joseph, 4,042,774, Cl. 174-14.00R.

John Heathcoat & Company Limited: *See—*
Foster, Peter William; Ferrier, Duncan Cameron; Berry, Thomas; and Murenbeeld, Karel, 4,041,586, Cl. 28-254.000.

John Z. DeLorean Corporation, The: *See—*
Hofer, Peter H., 4,042,746, Cl. 428-311.000.

Johnson Controls, Inc.: *See—*
Wolters, Frederick J., 4,042,780, Cl. 179-15.0AL.

Johnson, Iver L. Apparatus and method for dispensing and reinforcing cementitious materials. 4,042,175, Cl. 239-420.000.

Johnson, John H.; and Weeks, Lloyd E., to Monsanto Company. Creatine phosphokinase determination method. 4,042,462, Cl. 195-103.50R.

Johnson & Johnson: *See—*
Flam, Eric; and Partyka, Doris Phyliss, 4,041,948, Cl. 128-285.000.

Johnson, Kirby William, to Boeing Company, The. Slot seal for leading edge flap. 4,042,191, Cl. 244-214.000.

Johnson, Marvin M.; and Tabler, Donald C., to Phillips Petroleum Company. Process for separation and recovery of carbon monoxide. 4,042,669, Cl. 423-246.000.

Johnson, Robert Richard; Coons, Robert Arthur; and Zwald, John Andrew, to GTE Sylvania Incorporated. Swaging device for use within a die apparatus. 4,041,766, Cl. 72-402.000.

Johnson, Steven J., to Westinghouse Electric Corporation. Secondary system modeling and method for a nuclear power plant training simulator. 4,042,813, Cl. 235-151.210.

Johnson, William L.: *See—*
Purdy, David L.; Speicher, Vernon L.; Shipko, Frederick J.; and Johnson, William L., 4,041,956, Cl. 128-419.00P.

Jones & Attwood Limited: *See—*
Wilson, Reginald Albert Edward, 4,042,506, Cl. 210-155.000.

Jones, Ivor Wynn, to Chloride Silent Power Limited. Thermo-electric generators. 4,042,757, Cl. 429-104.000.

Jones, John B., Jr.; and Reeves, Adam A. Combuston method of oil shale retorting. 4,042,485, Cl. 208-11.00R.

Jones, John Leslie, Sr. Fluffed pulp urine trap diaper. 4,041,950, Cl. 128-287.000.

Jones, Lewis O., to Xerox Corporation. Stoichiometric ferrite carriers. 4,042,518, Cl. 252-62.600.

Jones, Richard Calvin; and Anthes, Clifford Charles, to Union Carbide Corporation. Torch with gas actuated starting rod feed device. 4,042,225, Cl. 266-75.000.

Jones, Vercoe C., to Si Handling Systems, Inc. Driverless vehicle turntable system. 4,041,873, Cl. 104-35.000.

Joy Manufacturing Company: *See—*
Norris, Melvin N., 4,042,864, Cl. 318-301.000.

Joyce, James M.: *See—*
McCorkle, Richard A.; and Joyce, James M., 4,042,827, Cl. 250-493.000.

Jugle, Don B.; and Lipani, Anthony F., to Xerox Corporation. Filter apparatus. 4,041,902, Cl. 118-653.000.

Junger, Hans: *See—*
Bruning, Klaus; Junger, Hans; Pungs, Wolfgang; Rheinfeld, Peter; Weissenfeis, Franz; and Wienand, Michael, 4,042,314, Cl. 425-89.000.

Junkermann, Helmut: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Junkermann, Helmut; Pohl, Gerhard; and Tanner, Herbert, 4,042,716, Cl. 426-335.000.

Justus, Edgar J., to Beloit Corporation. Classifier and process for recycled fiber separation. 4,042,503, Cl. 210-65.000.

Justus, Marvin W.: *See—*
Skinner, David R.; Sowell, Miles L.; and Justus, Marvin W., 4,042,025, Cl. 166-250.000.

Kabel-und Metallwerke Gutehoffnungshutte Aktiengesellschaft: *See—*
Horstman, Wilhelm; Meyer, Werner; and Polizzano, Fred F., deceased, 4,042,009, Cl. 164-278.000.

K.K. Chiyoda Gurabiya Insatsusha: *See—*
Hasebe, Sadao; Ono, Hiromitsu; Murata, Minoru; and Harada, Yuji, 4,042,090, Cl. 197-102.000.

Kabushiki Kaisha Daini Seikosha: *See—*
Ohara, Yuichi, 4,041,954, Cl. 128-419.0PT.

Kabushiki Kaisha Fujikoshi: *See—*
Asai, Takeji; and Yamazumi, Kaishu, 4,042,428, Cl. 148-16.500.

Kabushiki Kaisha Keihinseiki Seisakusho: *See—*
Mito, Shigeo, 4,041,797, Cl. 74-501.00R.

Kabushiki Kaisha Suwa Seikosha: *See—*
Chihara, Hiroyuki; and Okada, Yasushi, 4,041,691, Cl. 58-23.0BA.

Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Motobayashi, Kozo; Shimizu, Takeshi; and Miyamoto, Noriaki, 4,041,687, Cl. 57-56.000.

Kabushikikaisha Hara Shokki Seisakusho: *See—*
Fujii, Masakatsu; and Yasufuku, Toshio, 4,042,093, Cl. 198-339.000.

Kadlec, Miloslav: *See—*
Resch, Josef; Kadlec, Miloslav; Zahradnik, Stanislav; and Parizek, Josef, 4,041,986, Cl. 139-58.000.

Kagawa, Masao: *See—*
Inaba, Mitugu; Kouguchi, Noriyuki; Kagawa, Masao; Hosho, Kozo; and Teraoka, Yoshiaki, 4,041,686, Cl. 57-34.00R.

Kahler, Richard W. Liquid filtered smoking device. 4,041,960, Cl. 131-173.000.

Kahm, Annika Britt. Dietetic beverage. 4,042,684, Cl. 424-153.000.

Kahn, Samuel: *See—*
Birney, Richard Eugene; Davis, Michael Ian; Graybiel, Lynn Allan; Hood, Robert Allen; Kahn, Samuel; and Osborne, William Steese, 4,042,913, Cl. 364-200.000.

Kaiser Aluminum & Chemical Corporation: *See—*
King, William R., 4,042,501, Cl. 210-51.000.

Kaiser, Bernd-Ulrich; Dhein, Rolf; Rudolph, Hans; and Kuchenmeister, Rolf, to Bayer Aktiengesellschaft. Environmentally harmless stoving lacquer systems based on alkyd resins containing condensed monohydric alcohols. 4,042,547, Cl. 260-22.00R.

Kaji, Tadao; Kamei, Tsuneaki; and Miyamoto, Keiji, to Hitachi, Ltd. Selective oxidation method. 4,042,726, Cl. 427-93.000.

Kakovitch, Thomas S. Mobius toy. 4,042,244, Cl. 273-109.000.

Kalinna, E.: *See—*
Cuvilly, Jean-Pierre, 4,041,658, Cl. 52-39.000.

Kallos, George J., to Dow Chemical Company, The. Method of quantitatively detecting chloromethyl methyl ether and/or bis-chloromethyl ether with improved sensitivity. 4,042,326, Cl. 23-230.00R.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Diphenylamines for dyeing keratinous fibers. 4,042,627, Cl. 260-571.000.

Kaman Aerospace Corporation: *See—*
Flannelly, William George, 4,042,070, Cl. 188-1.00B.

Kamarian, Georgy Mikirtychevich: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.

Kamei, Tsuneaki: *See—*
Kaji, Tadao; Kamei, Tsuneaki; and Miyamoto, Keiji, 4,042,726, Cl. 427-93.000.

Kamo, Takeshi: *See—*
Yamazaki, Jun'ichiro; Kamo, Takeshi; and Saito, Yoshiichi, 4,042,479, Cl. 204-192.00F.

Kamp, Heinz, to W. Schlafhorst & Co. Device for automatically joining a thread for spinning. 4,041,684, Cl. 57-34.00R.

Kamry AB: *See—*
Jacobsen, Finn, 4,041,560, Cl. 8-156.000.

Kane, John L.; and Machlan, George R., to Owens-Corning Fiberglas Corporation. Production of inorganic fibers with inorganic cores. 4,042,360, Cl. 65-11.00W.

Kane, William S.: *See—*
Cardwell, Paul H.; and Kane, William S., 4,042,664, Cl. 423-24.000.

Kanebo, Ltd.: *See—*
Sawa, Yoshio, 4,042,592, Cl. 260-286.00Q.

Kaneda, Tsugio: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Kaneko, Mamoru: *See—*
Terada, Ichiro; Yamada, Tadashi; Nishi, Michio; Uchida, Mitsuo; Sugiyama, Naomasa; Kaneko, Mamoru; and Takeda, Nobuhiko, 4,042,409, Cl. 106-111.000.

Kaneko, Tatsuhei: *See—*
Chiu, Shui Tung; and Kaneko, Tatsuhei, 4,042,728, Cl. 427-212.000.

Kano, Tsuyoshi; Nakako, Masaki; Yamamoto, Hajime; and Otomo, Yoshiro, to Hitachi, Ltd. Process of preparing infrared-excitable sodium rare earth fluoride luminescent materials. 4,042,527, Cl. 252-301.40H.

Kaplan, Richard D. Building blocks. 4,041,670, Cl. 52-591.000.

Kaplow, Roy; and Frank, Robert I., to Massachusetts Institute of Technology. Photovoltaic system including a lens structure. 4,042,417, Cl. 136-89.0PC.

Kapp, Joachim-Friedrich: *See—*
Ahrens, Hanns; Koch, Henning; Schroder, Eberhard; Biere, Helmut; and Kapp, Joachim-Friedrich, 4,042,706, Cl. 424-273.00P.

Karl Weiss - Giessen, Fabrik Elektrophysikalischer Geraete, Werk Lindenstruth: *See—*
Leunig, Ernst; Schultze, Hans A.; and Pfeifer, Christian, 4,041,777, Cl. 73-118.000.

KARMA division of BRANDT, Inc.: *See—*
Uttech, Raymond, 4,042,151, Cl. 222-129.200.

Kaseberg, Werner: *See—*
Meyer, Hans; Kaseberg, Werner; Eisendick, Horst; and Lucke, Willi, 4,042,902, Cl. 338-128.000.

Kasel, Richard G.; and Brown, Paul C., to Minnesota Mining and Manufacturing Company. Packaging container blank. 4,042,168, Cl. 229-40.000.

Kashima, Mikito: *See—*
Itatani, Hiroshi; Kashima, Mikito; Shiotani, Akinori; Yoshimoto, Hataaki; and Kato, Tetuo, 4,042,603, Cl. 260-346.20M.

Kashiwagi, Shigeru, to Victor Company of Japan, Limited. Horizontal deflection circuit of a television receiver with means to eliminate generation of dangerous high potential under faulty condition. 4,042,859, Cl. 315-411.000.

Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,042,249, Cl. 280-38.000.

Kassai, Kenzou, to Kassai Kabushikikaisha. Opening system for folding baby carriage. 4,042,249, Cl. 280-38.000.

Kast, Howard B.: *See—*
Coffinberry, George A.; and Kast, Howard B., 4,041,697, Cl. 60-39.28R.

Katakura, Hiroshi; and Yamashita, Keitaro, to Konishiroku Photo Industry Co., Ltd.; and Hitachi Metals, Ltd. Developing device for use in electrophotography. 4,041,903, Cl. 118-658.000.

Kato, Nobuyuki: *See—*
Kojima, Shigeru; Kojima, Kiyoshi; Ohtani, Tadao; Kato, Nobuyuki; Sakamoto, Yoichi; Konno, Isago; Tsukahara, Masaharu; and Kubo, Takao, 4,042,429, Cl. 148-31.550.

Kato, Takashi: *See—*
Kitamura, Shuji; Kato, Takashi; and Hirooka, Masaaki, 4,042,648, Cl. 260-896.000.

Kato, Tetuo: *See—*
Itatani, Hiroshi; Kashima, Mikito; Shiotani, Akinori; Yoshimoto, Hataaki; and Kato, Tetuo, 4,042,603, Cl. 260-346.20M.

Katona, Joseph W., to Mills Products, Inc. Window unit for oven doors. 4,041,930, Cl. 126-198.000.

Katsumata, Takeshi: *See—*
Shujiro, Shiga; Katsumata, Takeshi; Okamoto, Yasushi; and Nakata, Takashi, 4,042,352, Cl. 55-98.000.

Kaubisch, Nikolaus: *See—*
Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, 4,042,711, Cl. 424-319.000.

Kaufman, Martin H.: *See—*
Wasserman, Bernard; and Kaufman, Martin H., 4,042,441, Cl. 156-306.000.

Kaul, Bansi Lal, to Sandoz Ltd. Azo dyes having one or two triazinyl- or pyrimidyl-acetic acid ester or amide coupling component radicals. 4,042,577, Cl. 260-153.000.

Kaul, Bansi Lal, to Sandoz Ltd. Naphthoquinone compounds. 4,042,591, Cl. 260-272.000.

Kavka, Frank: *See—*
Robertson, Donald Edwin; Urry, Wilbert Herbert; and Kavka, Frank, 4,042,602, Cl. 260-343.410.

Kawahara, Eiichiro: *See—*
Goto, Isamu; Nishimura, Sadanori; and Kawahara, Eiichiro, 4,041,701, Cl. 60-347.000.

Kawai, Yoshio: *See—*
Asano, Kiro; Tamura, Humio; Saito, Tsuyoshi; and Kawai, Yoshio, 4,042,486, Cl. 208-44.000.

Kawakami, Hirotake; Takada, Kantaro; and Fukumoto, Toru, to Sony Corporation. Method of assembling a diaphragm assembly for an electro-acoustic transducer. 4,042,438, Cl. 156-272.000.

Kawasaki Steel Corporation: *See—*
Ohashi, Nobuo; Konishi, Motoyuki; Nishida, Minoru; and Inokuchi, Yukio, 4,042,425, Cl. 148-13.100.

Kawase, Shoji; Shima, Takeo; and Moriyama, Keiichi, to Teijin Limited. Fire-retardant polyamides from naphthalene dicarboxylic reactant and halogenated carboxylic reactant. 4,042,571, Cl. 260-78.00R.

Kawauchi, Masashi: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Kazakova, Ljudmila Petrovna; Gundyrev, Alexei Alexandrovich; Rudakova, Nina Yakovlevna; Sharf, Fridrikh-Leopold Khaskelevich; Garun, Yaroslav Evstavievich; Belyashina, Lidia Ivanovna; and Kocheva, Zoya Vasilievna. Method of processing food paraffins and uses of obtained products. 4,042,411, Cl. 106-270.000.

Kazura, John A.: *See—*
Germanowski, Frank; and Kazura, John A., 4,042,938, Cl. 346-61.000.

KB-Denver, Inc.: *See—*
Pounds, Walter R., 4,042,439, Cl. 156-292.000.

Keating, Richard T. Deep fat fryer fat saver. 4,041,852, Cl. 99-403.000.

Keeler, Eugene R.; and Harrison, Michael R. Testing apparatus for use in calibrating wristwatches. 4,041,767, Cl. 73-6.000.

Keeney, Joe W.: *See—*
Weinstein, David H.; Keeney, Joe W.; and Haas, Gregory M., 4,042,758, Cl. 429-111.000.

Kefalas A/S: *See—*
Buus, Jorn Lasse Martin; Lassen, Niels; and Bigler, Allan Johan, 4,042,695, Cl. 424-250.000.

Keiser, Keril M. Mobile tower. 4,041,974, Cl. 137-344.000.

Kell, Louis H.: *See—*
Harper, John Everett; and Kell, Louis H., 4,041,695, Cl. 60-39.020.

Kellenbenz, Carl W.; Goodman, James P.; and Rector, Randall C., to United States of America, Navy. Solid state programmable dynamic load simulator. 4,042,830, Cl. 307-40.000.

Kelly, Donald A. Pressure-electrolysis cell-unit. 4,042,481, Cl. 204-270.000.

Kelly, Frank L.; and Tan, Jozef I. Kie Sioe, to Pacesetter Systems Inc. Implantable living tissue stimulator with an improved hermetic metal container. 4,041,955, Cl. 128-419.00P.

Kelly, Robert R.: *See—*
Sheldon, Loren B.; Tomashek, James R.; Kelly, Robert R.; Thale, James S.; Shah, Jashwant C.; and Ward, Donald H., 4,042,123, Cl. 214-2.500.

Kelm, Everett F., to Corning Glass Works. Manufacture of multiple flow path body. 4,041,592, Cl. 29-157.30R.

Kelsey-Hayes Company: *See—*
Bertolasi, Robert B., 4,042,059, Cl. 180-103.00R.
Rozmus, Walter J., 4,041,742, Cl. 72-38.000.

Kemper, Morton L. Press brake guard. 4,041,765, Cl. 72-389.000.

Kendig, Robert N., to ICI United States Inc. Returnable roll shipping container. 4,042,107, Cl. 206-386.000.

Kennedy, David C., to Rohm and Haas Company. Separation of organic compounds by adsorption processes. 4,042,498, Cl. 210-26.000.

Kennedy, Henry R.: *See—*
Albanese, Damian F.; O'Farrell, Frank J.; Hammers, David E.; and Kennedy, Henry R., 4,042,925, Cl. 343-14.000.

Kennedy, John B., Jr.: *See—*
Rarey, Kenneth W.; Higgins, Edward D.; Hungerford, Donald L.; and Kennedy, John B., Jr., 4,041,901, Cl. 118-621.000.

Kennedy, William N.: *See—*
Hinton, Reginald A.; Doughty, Kenneth W.; and Kennedy, William N., 4,042,900, Cl. 336-70.000.

Kent Manufacturing Co., Inc.: *See—*
Hake, Kenneth A., 4,042,045, Cl. 172-311.000.

Kershaw, Bernard John, to Du Pont of Canada. Preparation of hexamethylene diamine from 2-cyanocyclopentanone and adiponitrile. 4,042,629, Cl. 260-583.00P.

Kessler, Kurt: *See—*
Franke, Johannes; Kessler, Kurt; Muller, Wolfgang; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,042,318, Cl. 432-210.000.

Kewanee Industries: *See—*
Baum, Elliot H.; and Ferrante, Gerald R., 4,042,319, Cl. 8-35.000.

Khananashvili, Lotary Mikhailovich: *See—*
Andrianov, Kuzma Andrianovich; Topchiashvili, Mikhail Izmailovich; Khananashvili, Lotary Mikhailovich; Pagava, Dali Georgievna; and Shermazanashvili, Nikolai Alexandrovich, 4,042,534, Cl. 252-511.000.

Kidd, Earl H., to Outboard Marine Corporation. Mounting arrangement for rotary mower chute extension. 4,041,682, Cl. 56-320.200.

Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. 2,6-Dinitro-4-trifluoromethylanilines. 4,042,628, Cl. 260-577.000.

Kiehs, Karl; Adolphi, Heinrich; and Huber, Rolf, to BASF Aktiengesellschaft. Succinic acid oximidophosphoric ester insecticides. 4,042,691, Cl. 424-200.000.

Kieley & Mueller, Inc.: *See—*
Lindner, Henry Paul, 4,041,982, Cl. 137-625.300.

Kiesslich, Gunther, to Du Pont de Nemours, E. I., and Company. Photographic element with improved slip. 4,042,399, Cl. 96-87.00R.

Kikuchi, Masafumi: *See—*
Abe, Mitsuo; Nagata, Masaki; and Kikuchi, Masafumi, 4,042,548, Cl. 260-23.0XA.

Kikuchi, Shouji: *See—*
Wada, Hajime; Kikuchi, Shouji; Hori, Haruo; and Endo, Takaya, 4,042,393, Cl. 96-55.000.

Kilby, Jack S., to Texas Instruments Incorporated. Integrated circuit isolation with mesas and/or insulating substrate. 4,042,948, Cl. 357-49.000.

Kilinskas, William Alphonse: *See—*
Van Den Sype, Jaak Stefaan; Kilinskas, William Alphonse; Mazzarella, Richard Benedict; and Lightstone, John Bernard, 4,042,421, Cl. 148-12.00E.
Van den Sype, Jaak Stefaan; Kilinskas, William Alphonse; and Mazzarella, Richard Benedict, 4,042,423, Cl. 148-12.00B.

Kilkinov, Alexandr Afanasievich: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.

Kim, Ki Soo, to Stauffer Chemical Company. Process for removing polymer from reaction mixture. 4,042,542, Cl. 260-6.000.

Kimmich, Klaus, to International Standard Electric Corporation. Electronic arrangement for generating two alternating voltages whose phases are shiftable. 4,041,894, Cl. 118-7.000.

Kimoto, Koichi: *See—*
Okai, Sakuo; and Kimoto, Koichi, 4,042,386, Cl. 96-35.100.

Kinart, Gregory John. Archery target. 4,042,240, Cl. 273-102.00B.

King, Roger P.; Grosskopf, John W., Jr.; and Bondelier, Francis C., Jr., to Libbey-Owens-Ford Company. Cleaning apparatus for conveyor rolls. 4,042,364, Cl. 65-168.000.

King, William R., to Kaiser Aluminum & Chemical Corporation. Purification of iron containing acidic solutions. 4,042,501, Cl. 210-51.000.

Kirby, Peter: *See—*
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 4,042,369, Cl. 71-88.000.

Kirschner, Helmut: *See—*
Heinke, Wolfgang; Kirschner, Helmut; and Reimann, Detlef, 4,042,419, Cl. 148-1.500.

Kita, Sodai: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Kitamura, Shuji; Kato, Takashi; and Hirooka, Masaaki, to Sumitomo Chemical Company, Limited. Olefin-acrylic ester copolymer-thermoplastic resin composition. 4,042,648, Cl. 260-896.000.

Klar, Kenneth K., to Goodyear Tire & Rubber Company, The. Testing cord-to-elastomer adhesion. 4,041,806, Cl. 73-159.000.

Klatt, Heinz Jurgen: *See—*
Pusch, Gunter; Klatt, Heinz Jurgen; and Frohlich, Walter, 4,042,026, Cl. 166-258.000.

Kleber, Carl J.: *See—*
Muhler, Joseph C.; Putt, Mark S.; Kleber, Carl J.; and Yoho, Clayton W., 4,042,680, Cl. 424-55.000.

Klein, Arthur H., to GTE Sylvania Incorporated. Noise suppression circuit. 4,042,959, Cl. 358-167.000.

Klitzman, Charles B. Apparatus indicating an absent golf club. 4,042,918, Cl. 340-280.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*
Decker, Hanns; Pfeiffer, Roland; Wenz, Lothar; and Cordes, Horst, 4,042,492, Cl. 209-223.00R.
Jochmann, Dieter, 4,041,805, Cl. 74-740.000.

Klockner-Werke AG: *See—*
Langhammer, Hans Jurgen; Abratis, Horst; Schafer, Klaus; Rendel, Klaus-Jurgen; and Lotze, Horst, 4,042,223, Cl. 266-47.000.
Watermann, Willy; and von der Linden, Walter, 4,041,715, Cl. 61-45.00D.

Klopich, Marshall E.: *See—*
Friant, James E.; and Klopich, Marshall E., 4,042,431, Cl. 149-36.000.

Kluczynski, Paul F.: *See—*
Kopczynski, John F.; and Kluczynski, Paul F., 4,042,231, Cl. 269-48.100.

Klund, Robert N.; and Weidenbach, James S., to Delkor Industries, Inc. Stamp and legend applicating machine. 4,042,445, Cl. 156-385.000.

Knapp, Kenneth K., to Eaton Corporation. Hydrostatic transmission with integral auxiliary pump. 4,041,703, Cl. 60-464.000.

Knapp, Randolph H., to Shell Oil Company. Plugging subterranean earth formations with aqueous epoxy emulsions containing fine solid particles. 4,042,031, Cl. 166-276.000.

Knartzer, Jon A.: *See—*
Huber, Gene A.; and Knartzer, Jon A., 4,042,181, Cl. 241-175.000.

Knibbs, Robin Keith. Model figures. 4,041,638, Cl. 46-127.000.

Kniel, Ludwig, to Lummus Company, The. Vessel having natural gas liquefaction capabilities. 4,041,721, Cl. 62-45.000.

Knifton, John F., to Texaco Inc. Oxychlorination sources for regenerating dispersions of ligand-stabilized, palladium (II) halide complexes used as carbonylation catalysts. 4,042,530, Cl. 252-415.000.

Knight, John C.; and Wovcha, Merle G., to Upjohn Company, The. Composition of matter and process. 4,042,459, Cl. 195-51.00S.

Knight, Lynn E. Tennis ball holder. 4,042,156, Cl. 224-5.00D.

Knipp, Francis. Time lapse steering controls for self propelled models. 4,041,886, Cl. 114-144.00R.

Knorr-Bremse GmbH: *See—*
Pollinger, Hans, 4,042,071, Cl. 188-18.00A.

Knorr, Walter: *See—*
Heller, Wilhelm; and Knorr, Walter, 4,042,273, Cl. 295-30.000.

Kobayashi, Hasao: *See—*
Matsuzawa, Hideo; Otani, Masato; Ishii, Hiromichi; Yamada, Kantaro; and Kobayashi, Hasao, 4,042,625, Cl. 260-530.00N.

Kobayashi, Nobuki: *See—*
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, 4,042,645, Cl. 260-830.00P.

Kobayashi, Toru: *See—*
Morita, Eiichi; Sato, Hisayuki; and Kobayashi, Toru, 4,042,866, Cl. 318-568.000.

Kobe Steel, Ltd.: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Kober, Alfred E.: *See—*
Bennett, Robert P.; O'Connor, Matthew J.; Kober, Alfred E.; and Kukin, Ira, 4,042,348, Cl. 55-5.000.

Kobinger, Erhard: *See—*
Dick, Heinrich; and Kobinger, Erhard, 4,041,809, Cl. 74-866.000.

Koch, George Paul, to Fiat-Allis Construction Machinery, Inc. Steering clutch and single pedal brake control system for crawler tractor. 4,042,052, Cl. 180-6.700.

Koch, Henning: *See—*
Ahrens, Hanns; Koch, Henning; Schroder, Eberhard; Biere, Helmut; and Kapp, Joachim-Friedrich, 4,042,706, Cl. 424-273.00P.

Koch, Paolo; and Perrotti, Emilio, to Snam Progetti S.p.A. Processes

for the production of heterocyclic compounds. 4,042,595, Cl. 260-307.00C.

Kocheva, Zoya Vasilievna: *See—*
Kazakova, Ljudmila Petrovna; Gundyrev, Alexei Alexandrovich; Rudakova, Nina Yakovlevna; Sharf, Fridrikh-Leopold Khaskelevich; Garun, Yaroslav Evstavievich; Belyashina, Lidia Ivanovna; and Kocheva, Zoya Vasilievna, 4,042,411, Cl. 106-270.000.

Koenig, Karl-Heinz: *See—*
Kiehs, Karl; Koenig, Karl-Heinz; and Fischer, Adolf, 4,042,628, Cl. 260-577.000.

Kogure, Katsura; Sueda, Noriyoshi; Himoto, Sizuo; Yoshino, Youziro; and Nakagawa, Kunio, to Nisshin Flour Milling Co., Ltd. Process for preparing a 2-methyl-(substituted aryl)-pyruvic acid compound. 4,042,617, Cl. 260-469.000.

Koito Seisakusho Co., Ltd.: *See—*
Amano, Shin; and Tanga, Takeshi, 4,042,908, Cl. 340-46.000.

Kojima, Kiyoshi: *See—*
Kojima, Shigeru; Kojima, Kiyoshi; Ohtani, Tadao; Kato, Nobuyuki; Sakamoto, Yoichi; Konno, Isago; Tsukahara, Masaharu; and Kubo, Takao, 4,042,429, Cl. 148-31.550.

Kojima, Shigeru; Kojima, Kiyoshi; Ohtani, Tadao; Kato, Nobuyuki; Sakamoto, Yoichi; Konno, Isago; Tsukahara, Masaharu; and Kubo, Takao, to Matsushita Electric Industrial Co., Ltd. Magnetic alloys having wasp-waisted magnetic hysteresis loop. 4,042,429, Cl. 148-31.550.

Kollmann, Jan: *See—*
Brada, Pavel; Kucera, Jaromir; Chladek, Otokar; Voda, Gustav; Novacek, Jindrich; and Kollmann, Jan, 4,041,733, Cl. 66-138.000.

Kollmorgen Technologies Corporation: *See—*
Polichette, Joseph; Leech, Edward J.; and Branigan, John G., 4,042,729, Cl. 427-304.000.

Komatsu, Tadaaki: *See—*
Ozawa, Masahiro; Komatsu, Tadaaki; and Matsuoka, Kimiaki, 4,042,638, Cl. 260-653.10R.

Komma, Gerhard; and Schrewe, Hans, to Mannesmann Aktiengesellschaft. Apparatus for withdrawal of continuously cast ingots. 4,042,010, Cl. 164-282.000.

Kommanditbolaget United Stirling (Sweden) AB & Co.: *See—*
Moritz, Mats Inge, 4,041,698, Cl. 60-39.520.

Koneva, Nina Vasilievna: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.

Konishi, Hideki, to Nissan Motor Company Limited. Apparatus to control the recirculation of exhaust gases into the intake passage in an internal combustion engine. 4,041,915, Cl. 123-119.00A.

Konishi, Masami; and Oono, Eishi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine of lean air-fuel mixture combustion type. 4,041,923, Cl. 123-191.00S.

Konishi, Motoyuki: *See—*
Ohashi, Nobuo; Konishi, Motoyuki; Nishida, Minoru; and Inokuchi, Yukio, 4,042,425, Cl. 148-13.100.

Konishiroku Photo Industry Co., Ltd.: *See—*
Baba, Shigeji; Okubo, Bunji; and Sakamoto, Eiichi, 4,042,400, Cl. 96-124.000.
Katakura, Hiroshi; and Yamashita, Keitaro, 4,041,903, Cl. 118-658.000.
Wada, Hajime; Kikuchi, Shouji; Hori, Haruo; and Endo, Takaya, 4,042,393, Cl. 96-55.000.

Konno, Isago: *See—*
Kojima, Shigeru; Kojima, Kiyoshi; Ohtani, Tadao; Kato, Nobuyuki; Sakamoto, Yoichi; Konno, Isago; Tsukahara, Masaharu; and Kubo, Takao, 4,042,429, Cl. 148-31.550.

Koo, Tuh-Kai; and van Velthoven, Armand J., to NCR Corporation. Microelectronic circuit coating system. 4,041,896, Cl. 118-48.000.

Kopacz, Bernard F., to Becton, Dickinson and Company. Sterilizing apparatus. 4,042,805, Cl. 219-492.000.

Kopczynski, John F.; and Kluczynski, Paul F., to CRC - Automatic Welding, Division of Crutcher Resources Corporation. Pipe clamping device. 4,042,231, Cl. 269-48.100.

Koppel, Gary A., to Eli Lilly and Company. Process for preparation of 3-halomethylcephems. 4,042,585, Cl. 544-22.000.

Kordes, Arthur W.: *See—*
Peterson, Roger W.; and Kordes, Arthur W., 4,042,878, Cl. 324-51.000.

Korpijaakko, Erkki Pekka: *See—*
Hoel, Per O.; Korpijaakko, Erkki Pekka; and Moustakas, Matthew A., 4,042,243, Cl. 273-108.000.

Kosenko, Ivan Vasilievich: *See—*
Mischenko, Vladimir Petrovich; Oxenenko, Anatoly Yakovlevich; Mischenko, Vladimir Alexandrovich; Vasiliev, Georgy Konstantinovich; Gavrilenko, Jury Alexandrovich; Povelitsa, Vladimir Vasilievich; and Kosenko, Ivan Vasilievich, 4,041,843, Cl. 91-499.000.

Kosinsky, Konstantin Alexeevich: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.

Kostyshin, Maxim Timofeevich: *See—*
Voitovich, Igor Danilovich; Kostyshin, Maxim Timofeevich; Mikhailovskaya, Ekaterina Vasilievna; Petrov, Vyacheslav Vasilievich; Romanenko, Petr Fedorovich; and Skuridin, Vladimir Petrovich, 4,042,450, Cl. 156-652.000.

Kouguchi, Noriyuki: *See—*
Inaba, Mitugu; Kouguchi, Noriyuki; Kagawa, Masao; Hosho, Kozo; and Teraoka, Yoshiaki, 4,041,686, Cl. 57-34.00R.

Koyanagi, Ken: *See—*
Ip, Anthony Kwok-Chun; Koyanagi, Ken; and Tarasuk, Walter Renald, 4,042,456, Cl. 176-78.000.

Kozak, Theodore Frederick, to Union Carbide Corporation. Flexible waistband diaper. 4,041,949, Cl. 128-287.000.

Koziol, Konrad: *See—*
Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad, 4,042,484, Cl. 204-290.00F.

Kraft, Derald H., to Aspro, Inc. Method of making V-grooved sheet metal pulleys. 4,041,746, Cl. 72-83.000.

Kraft, Francis J.; and Puhak, Peter G., to GTE Sylvania Incorporated. Electro-optical transducer system. 4,042,961, Cl. 358-248.000.

Kraft, Joseph K.: *See—*
Mean, Jean-Marie L.; Kraft, Joseph K.; and Jackson, Leigh F., 4,041,845, Cl. 92-85.00A.

Kramer, Charles E.: *See—*
DeEdwardo, Andrew H.; Zitomer, Fred; Stackman, Robert W.; and Kramer, Charles E., 4,042,561, Cl. 260-45.9NP.

Krammer, Robert; and McClellan, Michael T., to Standard Conveyor Company. Accumulating conveyor. 4,042,101, Cl. 198-460.000.

Kramp, Richard W.: *See—*
Anderson, Jon A.; and Kramp, Richard W., 4,041,953, Cl. 128-419.0PG.

Kraus, Edmund Josef: *See—*
Kraus, Robert August; and Kraus, Edmund Josef, 4,041,710, Cl. 60-673.000.

Kraus, Hubert, to Siemens Aktiengesellschaft. Method of producing layer capacitors. 4,041,587, Cl. 29-25.420.

Kraus, Robert August; and Kraus, Edmund Josef. Hydraulic prime mover device. 4,041,710, Cl. 60-673.000.

Krause, Erich, to Universal Maschinenfabrik Dr. Rudolf Schieber KG. Straight and circular knitting machine. 4,041,732, Cl. 66-75.200.

Kraybill, Albert Victor, to Motorola, Inc. R. F. power transistor device with controlled common lead inductance. 4,042,952, Cl. 357-68.000.

Krenick, Michael P.: *See—*
Davis, Duane A.; and Krenick, Michael P., 4,041,815, Cl. 83-30.000.

Kreske, Walter J.: *See—*
Masci, Saturno Angelo, 4,041,737, Cl. 68-242.000.

Kress, Robert F., to Dana Corporation. Marine propeller bushing coupling. 4,041,730, Cl. 64-30.00D.

Kriechbaum, Karl, to Licentia Patent-Verwaltungs-GmbH. Reduction of mechanical stresses on turbosets upon occurrence of three-pole mains short circuits near generators. 4,042,963, Cl. 361-20.000.

Krohn, David A.; Graf, Robert E.; and Deeg, Emil W., to American Optical Corporation. High strength ophthalmic lens. 4,042,405, Cl. 106-52.000.

Kroy Knitting Developments Ltd.: *See—*
York, Herbert, 4,041,731, Cl. 66-50.00B.

Krueger, Dennis L., to Minnesota Mining and Manufacturing Company. Reinforced pillowed microfiber webs. 4,042,740, Cl. 428-138.000.

Krueger, Horst: *See—*
Hebbel, Gerhard; Krueger, Horst; Haschke, Heinz; and Morlock, Gerhard, 4,042,748, Cl. 428-323.000.

Kruger, Owen Lee, to Nuclear Battery Corporation. Process of making oxygen enriched plutonium dioxide (PuO_2). 4,042,670, Cl. 423-251.000.

Krugler, Joel I.; and Nelson, William F., to GTE Laboratories Incorporated. Process for improving the yield of sugar beets using low intensity light. 4,041,642, Cl. 47-58.000.

Kruse, Robert L., to Monsanto Company. Polymeric polyblends having improved melt flow. 4,042,551, Cl. 260-28.50B.

Kubatec Kunststoff- & Bautechnik AG: *See—*
Garbini, Louis K., 4,042,280, Cl. 299-13.000.

Kubo, Takao: *See—*
Kojima, Shigeru; Kojima, Kiyoshi; Ohtani, Tadao; Kato, Nobuyuki; Sakamoto, Yoichi; Konno, Isago; Tsukahara, Masaharu; and Kubo, Takao, 4,042,429, Cl. 148-31.550.

Kucera, Jaromir: *See—*
Brada, Pavel; Kucera, Jaromir; Chladek, Otokar; Voda, Gustav; Novacek, Jindrich; and Kollmann, Jan, 4,041,733, Cl. 66-138.000.

Kuchenmeister, Rolf: *See—*
Kaiser, Bernd-Ulrich; Dhein, Rolf; Rudolph, Hans; and Kuchenmeister, Rolf, 4,042,547, Cl. 260-22.00R.

Kuettner, Klaus E.; Eisenstein, Reuben; and Sorgente, Nino, to Rush-Presbyterian-St. Luke's Medical Center. Preparation of tissue invasion inhibitor and method of treatment utilizing the inhibitor. 4,042,457, Cl. 195-1.800.

Kuhla, Donald E.: *See—*
Acheson, Richard M.; Stubbs, John K.; Baxter, Charles A. R.; and Kuhla, Donald E., 4,042,583, Cl. 542-458.000.

Kuhlthau, Hans-Peter, to Bayer Aktiengesellschaft. Process for dyeing anionically modified synthetic fiber materials. 4,042,322, Cl. 8-168.00R.

Kuhnert, Hans, to Friedrich Deckel Aktiengesellschaft. Machine tool provided with a tool magazine. 4,041,588, Cl. 29-26.00R.

Kukin, Ira: *See—*
Bennett, Robert P.; O'Connor, Matthew J.; Kober, Alfred E.; and Kukin, Ira, 4,042,348, Cl. 55-5.000.

Kummerle, Herman Fred: *See—*
Gordon, Theodore H.; and Kummerle, Herman Fred, 4,042,639, Cl. 260-656.00R.

Kumon, Hiroshi: *See—*
Miyake, Kenji; Kumon, Hiroshi; Zitukane, Yoshimaru; and Akutagawa, Shigeru, 4,042,385, Cl. 75-224.000.

Kurahashi, Akira: *See—*
Yamaji, Keizo; and Kurahashi, Akira, 4,042,962, Cl. 358-300.000.

Kureha Kagako Kogyo Kabushiki Kaisha: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,042,487, Cl. 208-48.00R.

Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Asano, Kiro; Tamura, Humio; Saito, Tsuyoshi; and Kawai, Yoshio, 4,042,486, Cl. 208-44.000.

Kurita Water Industries Limited: *See—*
Misaka, Yasunao; Tanaka, Ikuo; Okada, Hiroo; Goto, Chuichi; Hirota, Moriyuki; Uesugi, Masaaki; and Tsuchiya, Mitsuru, 4,042,500, Cl. 210-189.000.

Kwan, Gerald A., to Hehr International Inc. Window assembly. 4,042,004, Cl. 160-91.000.

Kyorin Pharmaceutical Co., Ltd.: *See—*
Irikura, Tsutomu, 4,042,594, Cl. 260-295.50R.

Kypreos, Georges; and Orgeret, Lucien, to Delle-Alsthom. High-voltage electrical installation. 4,042,968, Cl. 361-60.000.

L. B. (Plastics) Limited: *See—*
Litchfield, Leon G., 4,042,288, Cl. 312-330.00R.

L. E. L., Inc.: *See—*
Lile, Barbara A.; Lane, Robert M.; and Everhart, Louise A., 4,042,232, Cl. 269-328.000.

L.M. Ericsson Pty Ltd.: *See—*
Smith, Peter Leslie, 4,042,921, Cl. 340-347.0AD.

Lach, Dietrich: *See—*
Eilingsfeld, Heinz; and Lach, Dietrich, 4,042,604, Cl. 260-369.000.

Lafont, Andre: *See—*
Bertin, Jean Henri; Guienne, Paul; and Lafont, Andre, 4,042,060, Cl. 180-127.000.

Lafont, Guy: *See—*
Trouiller, Jean Claude; and Lafont, Guy, 4,042,907, Cl. 340-15.5BH.

Laforest, Jean; Silhol, Louis; and Renard, Pierre, to Rhone-Poulenc, S.A. Continuous process for the production of maeamic acids. 4,042,620, Cl. 260-518.00R.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See—*
Baudouin, Yvonne; Simonet, Guy; Eluard, Robert; and Pivard, Claude, 4,042,349, Cl. 55-25.000.

Lamb, Peter M.: *See—*
Underhill, Edward W.; Chisholm, Melvin D.; Steck, Warren F.; Bailey, Berton K.; Lamb, Peter M.; Struble, Dean L.; and Swailes, G. Edward, 4,042,681, Cl. 424-84.000.

Lambert, Jack L.: *See—*
Emal, Earl A.; and Lambert, Jack L., 4,042,739, Cl. 428-137.000.

Lambert, John Wesley, Jr., to Tuscarora Cotton Mill. Novelty yarn and method for making same. 4,041,690, Cl. 57-144.000.

Lamm, Gunther: *See—*
Dehnert, Johannes; and Lamm, Gunther, 4,042,578, Cl. 260-156.000.

Lammerting, Helmut; Langenhagen, Rolf-Dieter; Rossmy, Gerd; and Zaske, Peter, to Th. Goldschmidt AG. Process for the manufacture of highly elastic soft polyurethane foams. 4,042,540, Cl. 260-2.5AH.

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Land, Edwin H., to Polaroid Corporation. Flat battery. 4,042,760, Cl. 429-162.000.

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Langenhagen, Rolf-Dieter: *See—*
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Langenohl, Willard J. Pump hose retriever. 4,042,184, Cl. 242-47.500.

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Langhammer, Hans Jurgen; Abratis, Horst; Schafer, Klaus; Rendel, Klaus-Jurgen; and Lotze, Horst, to Klockner-Werke AG. Arrangement for and a method of introducing particulate material into molten baths. 4,042,223, Cl. 266-47.000.

Langmack, Charles E., to Niagara Bottle Washer Mfg. Company. Waste liquid renovator. 4,042,507, Cl. 210-158.000.

Lapiere, Charles L.: *See—*
Delarge, Jacques E.; Lapiere, Charles L.; and Georges, Andre H., 4,042,693, Cl. 424-246.000.

Lapp, Roger H., to United States of America, Navy. Antenna line scan system for helicopter wire detection. 4,042,933, Cl. 343-761.000.

Lapple, Arnulf Ruediger: *See—*
Defago, Raymond; Lapple, Arnulf Ruediger; and Becker, Carl, 4,042,545, Cl. 260-13.000.

Larson, Carl T. Attachment device. 4,041,576, Cl. 24-156.000.

Larson, Charles E.; and Nojiri, Richard T., to Uniroyal, Inc. Compressible offset printing blanket. 4,042,743, Cl. 428-306.000.

Larsson, Hans Gunnar, to ASEA Aktiebolag. High pressure press. 4,041,743, Cl. 72-60.000.

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Latimer, Eugene E.; and Waggoner, John B., to Caterpillar Tractor Co. Filter holding means. 4,042,508, Cl. 210-172.000.

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Lawrence, John P., to Goodyear Tire & Rubber Company, The. Urea additives for sulfur vulcanizable polymers. 4,042,642, Cl. 260-780.000.

Lawson, Alexander E., Jr.: *See—*
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Lawson, Jack M. Drapery marking apparatus. 4,042,154, Cl. 223-28.000.

Lawson, Thomas E.: *See—*
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Lawton, Bernard Gaskell, to Henry Simon Limited. Corrugated board-making machinery. 4,042,446, Cl. 156-359.000.

Lear Siegler, Inc.: *See—*
Cooper, Jack A., 4,042,058, Cl. 180-98.000.

Lebourg, Maurice P. Method and apparatus for installing a spool between two misaligned pipe sections. 4,041,720, Cl. 61-110.000.

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Lee, Ja Hyun. Hypocycloidal pinch device. 4,042,848, Cl. 313-231.600.

Lee, Thomas Brian; Hardern, David Norman; and Bantick, John Raymond, to Fisons Limited. Pharmaceutical compositions containing 4-carboxy-flavones. 4,042,708, Cl. 424-283.000.

Lee, Young Yee. Tissue paper take-out device. 4,042,147, Cl. 221-225.000.

Leech, Edward J.: *See—*
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Leemann, Karl, to Scubapro EU. Pressure regulator for breathing apparatus. 4,041,978, Cl. 137-494.000.

Legille, Edouard; and Mailliet, Pierre, to S.A. des Anciens Etablissements Paul Wurth. Charging device for shaft furnace. 4,042,130, Cl. 214-35.00R.

Lehmann, Rolf: *See—*
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Leitold, Matyas: *See—*
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Lelental, Mark: *See—*
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Lenhoff, John G., Jr., to Westinghouse Electric Corporation. Core memory phaser driver. 4,042,831, Cl. 307-88.00R.

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Weitz, Hans-Martin; Fischer, Rolf; and Lenke, Dieter, 4,042,588, Cl. 544-183.000.

Lenz, Arnold; and Rogler, Walter, to Dynamit Nobel Aktiengesellschaft. Method for the preparation of alcohol-free alkali and alkaline earth metal alcoholates. 4,042,636, Cl. 260-632.00A.

Leonard, Gordon C.: *See—*
Beck, Nicholas Robert; Leonard, Gordon C.; and Prince, Jack A., 4,042,176, Cl. 241-24.000.

Leonard, Verna M. Chord fingering coordinator. 4,041,828, Cl. 84-471.00R.

Lepp, David. Hitch assembly. 4,042,256, Cl. 280-512.000.

LePrevost, Dale Alan. Tennis game method and apparatus. 4,042,236, Cl. 273-29.00R.

Lerner, Bernard, to Automated Packaging Systems, Inc. Method of making container strips. 4,041,846, Cl. 93-35.0PC.

Les Fabriques d'Assortiments Reunies: *See—*
Bonsack, Francois, 4,041,693, Cl. 58-116.00R.

Lesser, Mark B., to Rockwell International Corporation. In-between phase clamping circuit to reduce the effects of positive noise. 4,042,833, Cl. 307-200.00B.

Leszyk, Gerald M.; Morrison, Edward D.; and Williams, Robert F., Jr., to Eastman Kodak Company. Manufacture of plastic parts by radiation molding. 4,042,654, Cl. 264-22.000.

Leunig, Ernst; Schultze, Hans A.; and Pfeifer, Christian, to Karl Weiss - Giessen, Fabrik Elektrophysikalischer Geraete, Werk Lindenstruth. Method and apparatus for testing carburetors. 4,041,777, Cl. 73-118.000.

Leverentz, Earl T.: *See—*
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Levine, Arnold M., to International Telephone and Telegraph Corporation. Frequency synthesizer having frequency control loop including fiber optic delay line. 4,042,891, Cl. 331-1.00R.

Levinson, Leo; and Wong, Andrew, to Xerox Corporation. Record material feed apparatus. 4,042,091, Cl. 197-138.00R.

Lewis, George D., to United Technologies Corporation. Combustion temperature control. 4,041,694, Cl. 60-39.020.

Lewis, James R.: *See—*
Anderson, Roy E.; Brisken, Alex F.; and Lewis, James R., 4,042,926, Cl. 343-17.700.

Lewis, Richard A., to Interdyne Company. Tape leader characterized by differential bending stiffness. 4,042,189, Cl. 242-195.000.

Lexington Instrument Corporation: *See—*
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Li, Chien C.: *See—*
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Libbey-Owens-Ford Company: *See—*
King, Roger P.; Grosskopf, John W., Jr.; and Bondelier, Francis C., Jr., 4,042,364, Cl. 65-168.000.

Licentia Patent-Verwaltungs-GmbH: *See—*
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Lightstone, John Bernard: *See—*
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Lile, Barbara A.; Lane, Robert M.; and Everhart, Louise A., to L. E. L., Inc. Extremity holder for mounting on an operating table. 4,042,232, Cl. 269-328.000.

Lill, Arnulf, to Siemens Aktiengesellschaft. Magneto-resistive domain detector for cylinder-domain-transport memory. 4,042,917, Cl. 340-174.0TF.

Lima, Paul J.; and Townsend, Todd V., to Lynch Communication Systems. Method and means for detecting an outgoing failure in a bidirectional communications span and looping the same in response thereto. 4,042,794, Cl. 179-175.30R.

Lin, Chiu-Hong, to Upjohn Company, The. 4,4,5,5-tetrahydro-$PGF_{1\alpha}$ analogs. 4,042,607, Cl. 260-410.90R.

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Lin, Hung C.; and White, Marvin H., to Westinghouse Electric Corporation. N-channel MOS transistor. 4,042,945, Cl. 357-23.000.

Lin, Kou Chi; and Dobson, LeRoy E., to Westinghouse Electric Corporation. Electrical connections of conductors to a bus bar. 4,042,775, Cl. 174-94.00R.

Lindemann, Martin K., to Chas. S. Tanner Co. Thermosetting vinyl ester emulsion copolymers. 4,042,553, Cl. 260-29.60H.

Lindemann Maschinenfabrik GmbH: *See—*
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Lindgren, Osten, to AB Metall- & Bergprodukter. Process for recovery of re-usable substances from a fixing bath in processes for development and fixing of photographic films and X-ray films. 4,042,473, Cl. 204-109.000.

Lindner, Henry Paul, to Kieley & Mueller, Inc. Double wall plug control valve. 4,041,982, Cl. 137-625.300.

Lindner, Robert L.; and Marshall, Luther E. Wall assembly. 4,041,667, Cl. 52-483.000.

Liner Concrete Machinery Company Limited, The: *See—*
Pugh, Stuart; and Stokoe, Ridley, 4,042,135, Cl. 214-141.000.

Lipani, Anthony F.: *See—*
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Litchfield, Leon G., to L. B. (Plastics) Limited. Extruded plastic panel drawers. 4,042,288, Cl. 312-330.00R.

Lloyd, William A.; Barone, Salvatore; Hooper, Gerald E.; and McFarland, Keith E., to Xerox Corporation. Printer/plotter style system for confined installation and method. 4,042,939, Cl. 346-153.000.

Lobb, George W. Platform structure. 4,042,064, Cl. 182-115.000.

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Lobsinger, James R.: *See—*
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Loebs, Richard G.; and Ostrowski, Richard C., to Caterpillar Tractor Co. Apparatus for bonding a bronze bushing on a metallic member. 4,042,204, Cl. 249-57.000.

Loecher, Friedrich: *See—*
Pommer, Ernst-Heinrich; Polster, Rudolf; and Loecher, Friedrich, 4,042,686, Cl. 424-164.000.

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Lokaj, Jan: *See—*
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Loper, Carl R., Jr.: *See—*
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L'Oreal: *See—*
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Lotze, Horst: *See—*
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Loveland, Winton; and Hanemann, Horst J., to Loveshaw Corporation, The. Carton sealing machine carton setting up and loading equipment. 4,041,675, Cl. 53-76.000.

Loveshaw Corporation, The: *See—*
Loveland, Winton; and Hanemann, Horst J., 4,041,675, Cl. 53-76.000.

Lubrizol Corporation, The: *See—*
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Lucas Electrical Company Limited, The: *See—*
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Lucas, Joseph E., to Marine Engineering Co., C.A. Method and apparatus for quickly erecting off-shore platforms. 4,041,711, Cl. 61-91.000.

Lucas, Timothy John, to Tate & Lyle Limited. Sugar p-vinylbenzoyl ester and copolymers thereof. 4,042,538, Cl. 260-17.4SG.

Luck, Wolfhard: *See—*
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Lucke, Willi: *See—*
Meyer, Hans; Kaseberg, Werner; Eisendick, Horst; and Lucke, Willi, 4,042,902, Cl. 338-128.000.

Ludszeweit, Dieter: *See—*
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Lummus Company, The: *See—*
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Tsao, Utah, 4,042,640, Cl. 260-659.00A.

Lundin, Sven Vilhelm Emanuel, to Avenska Utvecklingsaktiebolaget (SU). Connecting lead supports. 4,041,608, Cl. 32-22.000.

Luo, Fang-Chen; and Brody, Thomas P., to Westinghouse Electric Corporation. Flat panel display device with integral thin film transistor control system. 4,042,854, Cl. 315-169.0TV.

Lupattelli, Carlo; and Miotti, Alfredo, to Societa Italiana Telecomunicazioni SIEMENS, S.p.A. Digit storer for telecommunication system. 4,042,784, Cl. 179-18.0EB.

Lyman, George F., to Data Packaging Corporation. Sequential display device. 4,041,627, Cl. 40-97.000.

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Lynch, Thomas J., to Gulf Research & Development Company. Catalysts for the polymerization of ethylene. 4,042,769, Cl. 526-106.000.

Lynn, Paul R. Wire tightening device. 4,041,992, Cl. 140-123.500.

Lyon, Boyce M.: *See—*
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M.C.P. Industries, Inc.: *See—*
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M&T Chemicals Inc.: *See—*
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Lash, Ronald J.; and Harbulak, Edward P., 4,042,451, Cl. 156-664.000.

Maasberg, Wolfgang: *See—*
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MacArthur, J. Roderick, to Elder Laboratories. Hook assemblage. 4,041,575, Cl. 24-73.0HH.

MacDonald, John P. Marine burial container. 4,041,582, Cl. 27-2.000.

MacDowell, John F.; and Rittler, Hermann L., to Corning Glass Works. Production of glass-ceramic articles. 4,042,362, Cl. 65-33.000.

Machlan, George R.: *See—*
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Macken, John A.: *See—*
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MacLeay, Ronald E.: *See—*
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MacLeod, Douglas A.: *See—*
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Mader, William G.: *See—*
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Maeda, Kazuo: *See—*
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Yamamoto, Kousuke; Takenaka, Shinji; Maeda, Kazuo; and Mituta, Michio, 4,042,675, Cl. 423-515.000.

Maeda, Naoyuki: *See—*
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Maeda, Takeshi; and Okino, Seiki, to Central Glass Co., Ltd. Method and apparatus for coating glass. 4,042,363, Cl. 65-60.00R.

Maekawa, Yuzo: *See—*
Yasuda, Tetuya; Iinuma, Yoshio; and Maekawa, Yuzo, 4,042,861, Cl. 361-400.000.

Magee, Walter L., Jr., to Stauffer Chemical Company. Polymeric alkoxysilanes. 4,042,612, Cl. 260-448.80R.

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Magnavox Company, The: *See—*
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Main, Don R., to Combotronics, Inc. Liquid pump and metering system. 4,042,149, Cl. 222-40.000.

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Maltby, Frederick. Septic system with level control. 4,042,497, Cl. 210-25.000.

Mandel, Alan F., to Westinghouse Electric Corporation. Elevator system. 4,042,067, Cl. 187-29.00R.

Manghi, Carlo Alberto: *See—*
Rigo, Gualtiero; and Manghi, Carlo Alberto, 4,042,785, Cl. 179-18.0FC.

Mangin, Pierre: *See—*
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Manitowoc Company, Inc., The: *See—*
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Mannesmann Aktiengesellschaft: *See—*
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Manzer, Leo Ernest, to Du Pont de Nemours, E. I., and Company. Process for preparing hydrocarbyl and silahydrocarbyl transition metal dihydrocarbylamides. 4,042,610, Cl. 260-429.300.

Maraux, Jean, to Habegger, Willy. Cable guide. 4,042,216, Cl. 254-190.00R.

Marconi, Walter; Oddo, Nicola; and Degen, Ludwig, to Snam Progetti S.p.A. Method for conditioning fresh and sea waters from oil. 4,042,495, Cl. 210-11.000.

Margaret Mae Cooke: *See—*
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Marine Engineering Co., C.A.: *See—*
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Marker, John R., Jr.: *See—*
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Markusch, Peter: *See—*
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Marshall, Donald Raymond: *See—*
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Marshall, Luther E.: *See—*
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Marshall, Peter John: *See—*
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Marshino, James B., to Amelect Incorporated. Electronic clock having time indicating light display. 4,041,692, Cl. 58-50.00R.

Martin, A. J. P.; Miller, James M.; Mathieu, Robert J.; and Lawson, Alexander E., Jr., to GOW-MAC Instruments, Inc. Christiansen effect detector. 4,042,304, Cl. 356-128.000.

Martin, Anwyn Margaret; Stewart, Donald Ferguson; and Swanson, Andrew Baikie, to ICI Australia Limited. Roasting process for the direct reduction of ores. 4,042,375, Cl. 75-4.000.

Martin, Eugene G.; and Risser, Dale M., to Victor F. Weaver, Inc. Anatomical section de-boning machine. 4,041,572, Cl. 17-46.000.

Martin, Joachim: *See—*
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Martinez, Anastacio. Release of fishing hook. 4,041,634, Cl. 43-17.200.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See—*
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Masci, Saturno Angelo, to Kreske, Walter J. Clothes water extracting machine. 4,041,737, Cl. 68-242.000.

Massachusetts Institute of Technology: *See—*
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Masumoto, Akio: *See—*
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Matalon, Ralph: *See—*
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Mathieu, Robert J.: *See—*
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Matovich, Edwin, to Thagard Technology Company. High temperature chemical reactor. 4,042,334, Cl. 23-252.00R.

Matsch, Ladislas Charles; and Drnevich, Raymond Francis, to Union Carbide Corporation. Phosphate removal from BOD-containing wastewater. 4,042,493, Cl. 210-6.000.

Matsuba, Hironori; and Satou, Kazumi, to Furukawa Electric Company, Ltd., The. Water tree free power cable. 4,042,776, Cl. 174-110.00R.

Matsuda, Motonobu; and Beppu, Norio, to Minolta Camera Kabushiki Kaisha. Automatically controlled exposure indicating device for a camera. 4,042,940, Cl. 354-39.000.

Matsuda, Yoshio, to Yoshida Kogyo Kabushiki Kaisha. Stringer for sliding clasp fastener. 4,041,577, Cl. 24-205.16C.

Matsumoto, Seiji; and Fukai, Kiyoshi, to Sakai Chemical Industry Co., Ltd. Bonded magnets containing single crystalline ferrite particles. 4,042,516, Cl. 252-62.540.

Matsuno, Takayoshi. Breathing apparatus flow regulator. 4,041,977, Cl. 137-494.000.

Matsuoka, Kimiaki: *See—*
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Nishino, Atsushi; Yoshida, Akihiko; and Hayakawa, Hayashi, 4,042,420, Cl. 148-6.000.

Matsuyama, Shigeru, to Aikoh Co., Ltd. Monoblock hot tops with aligned fibrous material. 4,042,206, Cl. 249-197.000.

Matsuzawa, Hideo; Otani, Masato; Ishii, Hiromichi; Yamada, Kantaro; and Kobayashi, Hasao, to Mitsubishi Rayon Company, Ltd. Process and catalyst for preparing unsaturated carboxylic acid. 4,042,625, Cl. 260-530.00N.

Matty, Thomas C.: *See—*
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Maudlin, Eugene Wendell, to Borg-Warner Corporation. Evaporator assembly. 4,041,727, Cl. 62-290.000.

Maurer, Fritz: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; and Stendel, Wilhelm, 4,042,690, Cl. 424-200.000.

May, John E., to General Electric Company. Metal oxide varistor with improved electrical properties. 4,042,535, Cl. 252-518.000.

Mayer, Otto: *See—*
Grau, Gerhard; and Mayer, Otto, 4,041,685, Cl. 57-34.00R.

Maytag Company, The: *See—*
Mellinger, John C., 4,042,089, Cl. 194-102.000.

Mazel Holdings Limited: *See—*
Williamson, Arthur Gerard, 4,042,182, Cl. 241-207.000.

Mazzarella, Richard Benedict: *See—*
Van Den Sype, Jaak Stefaan; Kilinskas, William Alphonse; Mazzarella, Richard Benedict; and Lightstone, John Bernard, 4,042,421, Cl. 148-12.00E.
Van den Sype, Jaak Stefaan; Kilinskas, William Alphonse; and Mazzarella, Richard Benedict, 4,042,423, Cl. 148-12.00B.

Mazzoni, Renato J., to PPG Industries, Inc. Reducing solar radiation transmittance of installed glazing. 4,041,663, Cl. 52-203.000.

McArthur, Dennis P., to Union Oil Company of California. Thermally stable nickel-alumina catalysts useful for methanation and other reactions and method for the manufacture of said catalysts. 4,042,532, Cl. 252-466.00J.

McCabe, Francis J. Resettable, heat actuatable fire link. 4,041,570, Cl. 16-48.500.

McCarthy, Patrick M.; McTighe, Gilbert T.; and McTighe, Robert T. Oil water separator. 4,042,512, Cl. 210-519.000.

McCarthy, Richard H., to FMC Corporation. Caliper disc brake or the like. 4,042,077, Cl. 188-171.000.

McCartney, Edward O., to Jenn Air Corporation. Ventilated range with plug-in cooking units. 4,042,806, Cl. 219-447.000.

McCauley, Jerry L.: *See—*
Reichow, Keith W.; English, David C.; and McCauley, Jerry L., 4,042,049, Cl. 177-137.000.

McClellan, Michael T.: *See—*
Krammer, Robert; and McClellan, Michael T., 4,042,101, Cl. 198-460.000.

McClurg, Carl D., to Buckeye International, Inc. Wear plate. 4,042,117, Cl. 213-50.500.

McClymonds, Ken A.: *See—*
McCown, Thomas E.; McClymonds, Ken A.; and Halprin, Robert W., 4,041,872, Cl. 102-105.000.

McCorkle, Richard A.; and Joyce, James M., to Research Corporation. Stimulated emission X-ray generator. 4,042,827, Cl. 250-493.000.

McCown, Thomas E.; McClymonds, Ken A.; and Halprin, Robert W., to United States of America, Army. Wrapper, structural shielding device. 4,041,872, Cl. 102-105.000.

McCulloch Corporation: *See—*
Thompson, Stephen E., 4,041,606, Cl. 30-381.000.

McDaniel, Olin Kilpatrick, Jr.: *See—*
Bell, Robert Glenn; Gillyns, Emile; and McDaniel, Olin Kilpatrick, Jr., 4,042,569, Cl. 260-75.00T.

McElhoe, Hubert L. Metal building structure. 4,041,659, Cl. 52-93.000.

McFarland, Douglas F., to Farmhand, Inc. Self-loading and unloading hay bale trailer. 4,042,140, Cl. 214-518.000.

McFarland, Keith E.: *See—*
Lloyd, William A.; Barone, Salvatore; Hooper, Gerald E.; and McFarland, Keith E., 4,042,939, Cl. 346-153.000.

McGee, David L., to Plymak Company, Inc. Veneer clipper. 4,041,820, Cl. 83-356.200.

McIntosh, Colin Leslie, to Du Pont de Nemours, E. I., and Company. Carboxyphosphonate brush control agents. 4,042,650, Cl. 260-924.000.

McKinney, Lynn B.: *See—*
Henning, George J.; McKinney, Lynn B.; and Scalia, Joseph, 4,042,144, Cl. 220-273.000.

McLean, Daniel C.: *See—*
Shaler, Amos J.; and McLean, Daniel C., 4,041,961, Cl. 132-40.000.

McLeod, James A. Static converter having partially gapped transformer. 4,042,872, Cl. 363-20.000.

McNamara, Albert C., Jr. Quasi-indirect monosymmetrical lighting system. 4,042,817, Cl. 240-9.00R.

McNamee, James Arthur, to RCA Corporation. Vibrometer. 4,041,775, Cl. 73-70.200.

McQuinn, Ted M.: *See—*
Harmon, Kenneth B.; and McQuinn, Ted M., 4,041,810, Cl. 74-868.000.

McReynolds, Boone K.: *See—*
Mullen, James W.; McReynolds, Boone K.; and Pace, Herbert D., 4,041,863, Cl. 101-269.000.

McTighe, Gilbert T.: *See—*
McCarthy, Patrick M.; McTighe, Gilbert T.; and McTighe, Robert T., 4,042,512, Cl. 210-519.000.

McTighe, Robert T.: *See—*
McCarthy, Patrick M.; McTighe, Gilbert T.; and McTighe, Robert T., 4,042,512, Cl. 210-519.000.

Mead, Hansel B.; and Callaway, Gary R., to Q-Bit Corporation. Broad band amplifier. 4,042,887, Cl. 330-53.000.

Mean, Jean-Marie L.; Kraft, Joseph K.; and Jackson, Leigh F., to Westinghouse Electric Corporation. Hydraulic elevator apparatus. 4,041,845, Cl. 92-85.00A.

Meat Separator Corporation: *See—*
Beck, Nicholas Robert; Leonard, Gordon C.; and Prince, Jack A., 4,042,176, Cl. 241-24.000.

Medical Engineering Corporation: *See—*
Carden, Edward, 4,041,936, Cl. 128-6.000.

Meehl, David W.: *See—*
Clark, Leonard R.; and Meehl, David W., 4,042,097, Cl. 211-182.000.

Meek, Ronald Lee: *See—*
Cohen, Richard Lewis; and Meek, Ronald Lee, 4,042,730, Cl. 427-305.000.

Meginnis, George B.; and Sodeberg, Earl W., to General Motors Corporation. Airfoil fabrication. 4,042,162, Cl. 228-106.000.

Meinan Machinery Works, Inc.: *See—*
Hasegawa, Katsuji; Takagi, Yukio; Naito, Sachio; Hiraiwa, Kenichi; and Takasu, Eiji, 4,042,440, Cl. 156-304.000.

Meinhardt, Norman Anthony; and Widmer, Robert, to Lubrizol Corporation, The. Concentrates of N-substituted morpholines. 4,042,513, Cl. 252-47.500.

Melamed, Sidney: *See—*
Forsgren, Klane F.; Melamed, Sidney; and Weiner, Robert S., 4,042,737, Cl. 428-96.000.

Mellinger, John C., to Maytag Company, The. Coin slide apparatus. 4,042,089, Cl. 194-102.000.

Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, to Boehringer Ingelheim GmbH. Pharmaceutical compositions containing a 1-(2-alkyl-3,4-dihydroxy-phenyl)-2-(phenylalkyl-amino)-alkanol-(1) and method of use. 4,042,713, Cl. 424-330.000.

Meratti, Gianattilio. Process and plant for the manufacture of sewn books. 4,041,883, Cl. 112-21.000.

Mercier, Denis L. J. G.: *See—*
Donabin, Claude Jules; and Mercier, Denis L. J. G., 4,042,807, Cl. 235-61.11R.

Merck & Co., Inc.: *See—*
Remy, David C., 4,042,584, Cl. 544-59.000.

Merck Sharp & Dohme (I.A.) Corporation: *See—*
Wasson, Burton Kendall; and Weinstock, Leonard M., 4,042,586, Cl. 544-60.000.

Mercurio, Leonard. Multiple axial pin tumbler lock. 4,041,739, Cl. 70-363.000.

Merrick, James W., to Del Norte Technology, Inc. Radar trilateralization position locators. 4,042,923, Cl. 343-6.5LC.

Metacon AG: *See—*
Nehrlich, Friedrich; and Ruckstuhl, Franz, 4,042,207, Cl. 251-62.000.

Metallurgical Processes Ltd.: *See—*
Harris, Colin Frank; and Gammon, Michael William, 4,042,379, Cl. 75-88.000.

Mettoy Company Limited, The: *See—*
Nicholls, Bryan Frederick; and Marshall, Peter John, 4,042,242, Cl. 273-105.200.

Meyer, Alfred: *See—*
Burckhardt, Urs; and Meyer, Alfred, 4,042,703, Cl. 424-273.00R.

Meyer, Eckhard: *See—*
Akyuerek, Altan; and Meyer, Eckhard, 4,041,602, Cl. 29-588.000.

Meyer, Hans; Kaseberg, Werner; Eisendick, Horst; and Lucke, Willi, to Simprop-Electronic Walter Claas, Firma. Apparatus for controlling two crossed proportional adjusting devices by means of a single control stick. 4,042,902, Cl. 338-128.000.

Meyer, Werner: *See—*
Horstman, Wilhelm; Meyer, Werner; and Polizzano, Fred F., deceased, 4,042,009, Cl. 164-278.000.

Michel, Robert, to Transports-Recherches-Etudes et Groupement d'Interet Economique (Tregie). Vehicle guiding system. 4,041,876, Cl. 104-130.000.

Micro-Display Systems, Inc.: *See—*
Billings, Lawrence A. Jr.; Evanicky, Daniel E.; Hull, V. Joseph; and Ristagno, Charles V., 4,042,294, Cl. 350-60LC.

Micro Power Systems, Inc.: *See—*
Hall, John H., 4,042,953, Cl. 357-71.000.

Midrex Corporation: *See—*
Beggs, Donald, 4,042,226, Cl. 266-88.000.

Miegel, Ralph E., to Du Pont de Nemours, E. I., and Company. Derivatives of carboxy-terminated polybutadienes. 4,042,619, Cl. 260-482.00P.

Mierzwinski, Eugene P., to Magnavox Company, The. Remote control light receiver. 4,042,821, Cl. 250-216.000.

Mikhailovskaya, Ekaterina Vasilievna: *See—*
Voitovich, Igor Danilovich; Kostyshin, Maxim Timofeevich; Mikhailovskaya, Ekaterina Vasilievna; Petrov, Vyacheslav Vasilievich; Romanenko, Petr Fedorovich; and Skuridin, Vladimir Petrovich, 4,042,450, Cl. 156-652.000.

Miller, Arthur F.: *See—*
Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,042,153, Cl. 222-207.000.

Miller, Bruce B. Control apparatus for variable regulation of lung inflation hold time. 4,041,943, Cl. 128-145.800.

Miller, Calvin L., to Caterpillar Tractor Co. Drive disconnect device. 4,041,792, Cl. 74-405.000.

Miller, Charles P.: *See—*
Miller, David J.; and Miller, Charles P., 4,041,623, Cl. 37-108.00R.

Miller, David J.; and Miller, Charles P., to Miller Formless Co., Inc. Grade cutting machine. 4,041,623, Cl. 37-108.00R.

Miller, Edward M., to Industrial Clean Air, Inc. Bag house cell plate and filter bag attachment thereto. 4,042,356, Cl. 55-341.00R.

Miller Formless Co., Inc.: *See—*
Miller, David J.; and Miller, Charles P., 4,041,623, Cl. 37-108.00R.

Miller, James M.: *See—*
Martin, A. J. P.; Miller, James M.; Mathieu, Robert J.; and Lawson, Alexander E., Jr., 4,042,304, Cl. 356-128.000.

Miller, Richard E. Vehicle protector. 4,041,999, Cl. 150-52.00K.

Mills Products, Inc.: *See—*
Katona, Joseph W., 4,041,930, Cl. 126-198.000.

Mink, George. Fastening device. 4,041,596, Cl. 29-243.530.

Minnesota Mining and Manufacturing Company: *See—*
Herrmann, John A., 4,042,298, Cl. 355-40.000.
Kasel, Richard G.; and Brown, Paul C., 4,042,168, Cl. 229-40.000.
Krueger, Dennis L., 4,042,740, Cl. 428-138.000.
Sandvig, Timothy C., 4,042,749, Cl. 428-412.000.

Minolta Camera Kabushiki Kaisha: *See—*
Matsuda, Motonobu; and Beppu, Norio, 4,042,940, Cl. 354-39.000.

Minto, Luigi: *See—*
D'Agnolo, Armando; and Minto, Luigi, 4,042,098, Cl. 198-393.000.

Miotti, Alfredo: *See—*
Lupattelli, Carlo; and Miotti, Alfredo, 4,042,784, Cl. 179-18.0EB.

Misaka, Yasunao; Tanaka, Ikuo; Okada, Hiroo; Goto, Chuichi; Hirota, Moriyuki; Uesugi, Masaaki; and Tsuchiya, Mitsuru, to Kurita Water Industries Limited. Fluidized-bed type multistage solid-liquid contact apparatus. 4,042,500, Cl. 210-189.000.

Mischenko, Vladimir Alexandrovich: *See—*
Mischenko, Vladimir Petrovich; Oxenenko, Anatoly Yakovlevich; Mischenko, Vladimir Alexandrovich; Vasiliev, Georgy Konstantinovich; Gavrilenko, Jury Alexandrovich; Povelitsa, Vladimir Vasilievich; and Kosenko, Ivan Vasilievich, 4,041,843, Cl. 91-499.000.

Mischenko, Vladimir Petrovich; Oxenenko, Anatoly Yakovlevich; Mischenko, Vladimir Alexandrovich; Vasiliev, Georgy Konstantinovich; Gavrilenko, Jury Alexandrovich; Povelitsa, Vladimir Vasilievich; and Kosenko, Ivan Vasilievich. Axial-piston variable-delivery pump with valve directional control of pressure fluid. 4,041,843, Cl. 91-499.000.

Miskech, Peter, to Oxy Metal Industries Corporation. Method for treating cup-shaped workpieces. 4,042,416, Cl. 134-10.000.

Misumi, Teruyuki: *See—*
Tsushima, Sakae; Misumi, Teruyuki; and Murakoshi, Masahiko, 4,042,496, Cl. 210-23.00R.

Mito, Shigeo, to Kabushiki Kaisha Keihinseiki Seisakusho. Throttle-valve operating device for a carburetor. 4,041,797, Cl. 74-501.00R.

Mitsubishi Chemical Industries Ltd.: *See—*
Fukutani, Hideo; Oba, Hiroshi; Okada, Akane; and Shimizu, Atsuko, 4,042,391, Cl. 96-47.000.
Terada, Ichiro; Yamada, Tadashi; Nishi, Michio; Uchida, Mitsuo; Sugiyama, Naomasa; Kaneko, Mamoru; and Takeda, Nobuhiko, 4,042,409, Cl. 106-111.000.

Mitsubishi Rayon Company, Ltd.: *See—*
Matsuzawa, Hideo; Otani, Masato; Ishii, Hiromichi; Yamada, Kantaro; and Kobayashi, Hasao, 4,042,625, Cl. 260-530.00N.

Mitsui Toatsu Chemicals, Incorporated: *See—*
Hirota, Kuniomi; Masumoto, Akio; Ozawa, Hiroshi; Kobayashi, Nobuki; and Honda, Teruo, 4,042,645, Cl. 260-830.00P.
Yamamoto, Kousuke; Takenaka, Shinji; and Maeda, Kazuo, 4,042,674, Cl. 423-515.000.
Yamamoto, Kousuke; Takenaka, Shinji; Maeda, Kazuo; and Mituta, Michio, 4,042,675, Cl. 423-515.000.

Mittag, Douglas C., to Aurora Equipment Company. Gate. 4,041,646, Cl. 49-385.000.

Mitter & Co.: *See—*
Mitter, Mathias, 4,041,860, Cl. 101-122.000.

Mitter, Mathias, to Mitter & Co. Screen printing machine. 4,041,860, Cl. 101-122.000.

Mituta, Michio: *See—*
Yamamoto, Kousuke; Takenaka, Shinji; Maeda, Kazuo; and Mituta, Michio, 4,042,675, Cl. 423-515.000.

Miyake, Kenji; Kumon, Hiroshi; Zitukane, Yoshimaru; and Akutagawa, Shigeru, to Toyo Kogyo Co., Ltd. Sintering method for making a high carbon ferrous sliding element. 4,042,385, Cl. 75-224.000.

Miyamoto, Keiji: *See—*
Kaji, Tadao; Kamei, Tsuneaki; and Miyamoto, Keiji, 4,042,726, Cl. 427-93.000.

Miyamoto, Noriaki: *See—*
Motobayashi, Kozo; Shimizu, Takeshi; and Miyamoto, Noriaki, 4,041,687, Cl. 57-56.000.

Mizuuchi, Katsumi: *See—*
Uesugi, Minoru; Ihara, Susumu; and Mizuuchi, Katsumi, 4,041,610, Cl. 33-127.000.

Mobil Oil Corporation: *See—*
Savins, Joseph George; Burdyn, Ralph F.; and Waite, Jerry M., 4,042,030, Cl. 166-273.000.
Mobile Product Services, Inc.: *See—*
Dench, Robert H.; and Dervin, Victor J., 4,042,017, Cl. 165-63.000.
Modulus Corporation: *See—*
Payne, William J., 4,041,776, Cl. 73-88.00F.
Moelants, Felix Jan; Dierckx, Jozef Aime; and Depoorter, Henri, to AGFA-Gevaert N.V. Light-absorbing dye for use in photography. 4,042,397, Cl. 96-84.00R.
Moje, Steven William, to Du Pont de Nemours, E. I., and Company. 2-Aryl-3-chloro-2,4,6,7-tetrahydrothiopyrano[4,3-c]-pyrazoles. 4,042,373, Cl. 71-91.000.
Mole, Cecil J.: *See—*
Sterrett, Charles C.; and Mole, Cecil J., 4,042,846, Cl. 310-52.000.
Molinari, Delmo C. Jack stand with safety locking device. 4,042,202, Cl. 248-352.000.
Molins, Desmond Walter; Hinchcliffe, Dennis; Clarke, Peter Alec; and Heybourn, Frank, to Molins Limited. Conveying cigarettes and other rod-like articles. 4,042,112, Cl. 209-73.000.
Molins Limited: *See—*
Molins, Desmond Walter; Hinchcliffe, Dennis; Clarke, Peter Alec; and Heybourn, Frank, 4,042,112, Cl. 209-73.000.
Molinski, Victor Joseph; and Peacock, Frank Raymond, to Union Carbide Corporation. Technetium-99m labeled radiodiagnostic agents for liver and bone marrow scanning and method of preparation. 4,042,676, Cl. 424-1.000.
Molinski, Victor Joseph; and Wilczewski, Joseph Arthur, to Union Carbide Corporation. Technetium-99m labeled radiodiagnostic agents and method of preparation. 4,042,677, Cl. 424-1.000.
Monsanto Company: *See—*
Johnson, John H.; and Weeks, Lloyd E., 4,042,462, Cl. 195-103.50R.
Kruse, Robert L., 4,042,551, Cl. 260-28.50B.
Montedison S.p.A.: *See—*
Gratani, Francesco; and Binaghi, Marco, 4,042,764, Cl. 526-4.000.
Mooney, Thomas C.; and Gajajiva, Padej, to I-T-E Imperial Corporation EFCOR Division. Swivel coupling means for electrical conduits and the like. 4,042,262, Cl. 285-98.000.
Moore Business Forms, Inc.: *See—*
Williams, Rodney E., 4,042,412, Cl. 106-306.000.
Moore, Keith William. Method and apparatus for producing serrated metal bars. 4,041,750, Cl. 72-187.000.
Moore, Kenneth L.: *See—*
Hunt, Robert E.; and Moore, Kenneth L., 4,042,449, Cl. 156-651.000.
Moore, Robert R.; and Eitzen, Vincent E., to American Hospital Supply Corporation. Apparatus for mixing fluids held in tubes. 4,042,218, Cl. 259-72.000.
Moorhead Machinery & Boiler Co.: *See—*
Rasinski, Edward, 4,041,908, Cl. 122-479.00R.
Moorley, George, to Wadkin Limited of Green Lane Works. End-jointing of timber. 4,041,998, Cl. 144-315.00R.
Moosberg, Borje Sigurd, to ABU Aktiebolag. Fishing reel with bearing for level wind shaft. 4,042,186, Cl. 242-84.420.
Moran, James: *See—*
Conway, Bernard W.; and Moran, James, 4,042,453, Cl. 162-108.000.
Moraru, Cornel. Tennis trainer. 4,042,237, Cl. 273-29.00A.
Moreau, Marc, to Trefimetaux. Apparatus for continuous extrusion. 4,041,745, Cl. 72-60.000.
Morel, Thomas, to General Motors Corporation. Jet-driven helmholtz fluid oscillator. 4,041,984, Cl. 137-842.000.
Moriconi, Joseph H.; and Burrows, Louis H., Jr., to Xerox Corporation. Electrostatographic developer mixture containing a thermoset acrylic resin coated carrier. 4,042,517, Cl. 252-62.10P.
Morita, Eiichi; Sato, Hisayuki; and Kobayashi, Toru, to Daihatsu Motor Company, Limited. Method of preparing NC tapes. 4,042,866, Cl. 318-568.000.
Moritz, Mats Inge, to Kommanditbolaget United Stirling (Sweden) AB & Co. External combustion engine with exhaust gas recirculation of constant mass flow rate. 4,041,698, Cl. 60-39.520.
Moriyama, Hideo, to Moriyama Sangyo Kabushiki Kaisha. Pipe connecting apparatus. 4,042,291, Cl. 339-89.00M.
Moriyama, Keiichi: *See—*
Kawase, Shoji; Shima, Takeo; and Moriyama, Keiichi, 4,042,571, Cl. 260-78.00R.
Moriyama Sangyo Kabushiki Kaisha: *See—*
Moriyama, Hideo, 4,042,291, Cl. 339-89.00M.
Morlock, Gerhard: *See—*
Ackermann, Rolf; Morlock, Gerhard; and Stehlik, Gerhard, 4,042,525, Cl. 252-106.000.
Hebbel, Gerhard; Krueger, Horst; Haschke, Heinz; and Morlock, Gerhard, 4,042,748, Cl. 428-323.000.
Morong, William H., III; and Lawson, Thomas E., to Lexington Instrument Corporation. Measurement of oxygen in a fluid sample and apparatus therefor. 4,042,465, Cl. 204-1.00T.
Morozowich, Walter, to Upjohn Company, The. Substituted phenyl esters of PGA_2. 4,042,606, Cl. 260-390.000.
Morris, Winfred L.; and Thompson, Donald O., to Rockwell International Corporation. Acoustic data acquisition device. 4,041,774, Cl. 73-67.900.
Morrison, Charles F., Jr.; and Puszman, Alan Z., to Valleylab, Inc. Electrosurgical forceps. 4,041,952, Cl. 128-303.130.
Morrison, Donald E., to General Motors Corporation. Vehicle turbine manual control. 4,041,696, Cl. 60-39.140.
Morrison, Edward D.: *See—*
Leszyk, Gerald M.; Morrison, Edward D.; and Williams, Robert F., Jr., 4,042,654, Cl. 264-22.000.
Morrone, Ross, to Otto Niederer Sons, Inc. Apparatus for arranging articles. 4,042,100, Cl. 198-446.000.
Morrow, James G., Sr.: *See—*
Beduhn, Daniel E.; Morrow, James G., Sr.; and Pech, David J., 4,042,115, Cl. 212-48.000.
Morse, Robert L.; and Hudson, Sharon J., Jr., to Tecumseh Products Company; and Sharon Manufacturing Company. Suction accumulator. 4,041,728, Cl. 62-503.000.
Morton-Norwich Products, Inc.: *See—*
Schwan, Thomas J., 4,042,624, Cl. 260-570.600.
Moser, Rabin, to Xerox Corporation. Roll fuser apparatus. 4,042,804, Cl. 219-216.000.
Moser, Robert: *See—*
Staheli, Paul; and Moser, Robert, 4,041,770, Cl. 73-37.500.
Mosher, John E., to Halliburton Company. Method and apparatus for facilitating control of a railway train. 4,042,810, Cl. 235-150.200.
Motani, Kenji: *See—*
Imai, Takeshi; Niwa, Tsutomu; and Motani, Kenji, 4,042,955, Cl. 357-72.000.
Motobayashi, Kozo; Shimizu, Takeshi; and Miyamoto, Noriaki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho; and Daiwa Boseki Kabushiki. Device for removing impurities separated from fibers in open end spinning unit. 4,041,637, Cl. 57-56.000.
Motorola, Inc.: *See—*
Davidsohn, Uryon S., 4,042,949, Cl. 357-49.000.
Hanna, John Edward, 4,042,886, Cl. 330-23.000.
Kraybill, Albert Victor, 4,042,952, Cl. 357-68.000.
Pace, W. David, 4,042,834, Cl. 307-220.00R.
Rae, James Wilson, 4,042,883, Cl. 325-477.000.
Sessions, Douglas Charles, 4,041,912, Cl. 123-117.00R.
Mott, James D., to Hydril Company. Subsurface well apparatus having flexing means and method of using same. 4,042,024, Cl. 166-243.000.
Moustakas, Matthew A.: *See—*
Hoel, Per O.; Korpijaakko, Erkki Pekka; and Moustakas, Matthew A., 4,042,243, Cl. 273-108.000.
Mueller, Paul; and Prine, Ray A., to Paul Mueller Company. Hot water system. 4,041,726, Cl. 62-238.000.
Mueller-Tamm, Heinz: *See—*
Bachl, Robert; Frielingsdorf, Hans; Gruber, Wolfgang; Mueller-Tamm, Heinz; and Gonsior, Leonhard, 4,042,770, Cl. 526-106.000.
Muenchinger, Herman G. Blanks for making self-thread forming threaded fasteners. 4,042,342, Cl. 428-585.000.
Muhler, Joseph C.; Putt, Mark S.; Kleber, Carl J.; and Yoho, Clayton W., to Indiana University Foundation. Anticariogenic maloaluminate complexes. 4,042,680, Cl. 424-55.000.
Mulcahy, John Michael: *See—*
Botting, Alden Joseph; Mulcahy, John Michael; and Hannah, William James, 4,042,659, Cl. 264-71.000.
Mullen, James W.; McReynolds, Boone K.; and Pace, Herbert D., to Vidac Corporation. Precision hand label imprinter and dispenser. 4,041,863, Cl. 101-269.000.
Muller, Anton, to Eisen -und Drahtwerk Erlau Aktiengesellschaft. Wear-resistant link for tire chains. 4,042,001, Cl. 152-243.000.
Muller, Ernst-Willi; and Wicke, Manfred, to Bayer Aktiengesellschaft. Continuous solvent-free polymerization of vinyl derivatives. 4,042,768, Cl. 526-65.000.
Muller, Hugh Emil: *See—*
Terlesky, John; Muller, Hugh Emil; Murphy, John C.; and Honath, Harold F., 4,041,722, Cl. 62-45.000.
Muller, Peter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Coiling device for depositing sliver in canisters. 4,041,574, Cl. 19-159.00R.
Muller, Wolfgang: *See—*
Franke, Johannes; Kessler, Kurt; Muller, Wolfgang; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,042,318, Cl. 432-210.000.
Mulloy, Edward B. Medical reference chart. 4,041,893, Cl. 116-131.000.
Munk, Michael: *See—*
Boochever, Evelyn; and Munk, Michael, 4,042,016, Cl. 165-20.000.
Murakami, Norio, to Showa Koji K. K. Cell-box-type noise barrier having large magnitude of transmission loss and noise insulating method. 4,042,061, Cl. 181-33.0HE.
Murakoshi, Masahiko: *See—*
Tsushima, Sakae; Misumi, Teruyuki; and Murakoshi, Masahiko, 4,042,496, Cl. 210-23.00R.
Murata, Hikaru. Open circuit type acceleration/deceleration device. 4,041,836, Cl. 91-29.000.
Murata, Minoru: *See—*
Hasebe, Sadao; Ono, Hiromitsu; Murata, Minoru; and Harada, Yuji, 4,042,090, Cl. 197-102.000.
Murenbeeld, Karel: *See—*
Foster, Peter William; Ferrier, Duncan Cameron; Berry, Thomas; and Murenbeeld, Karel, 4,041,586, Cl. 28-254.000.
Murphey, Joseph R.: *See—*
Anderson, Buddy W.; Bowles, Bobby K.; Murphey, Joseph R.; Totty, Kenneth D.; and Young, Bill M., 4,042,032, Cl. 166-276.000.
Murphy, Edward J., to DeSoto, Inc. Polyethylenic polyethers and solvent soluble copolymers thereof. 4,042,566, Cl. 260-47.0EP.
Murphy, John C.: *See—*
Terlesky, John; Muller, Hugh Emil; Murphy, John C.; and Honath, Harold F., 4,041,722, Cl. 62-45.000.

Murphy, Richard A.: *See—*
Haque, Riaz-ul; and Murphy, Richard A., 4,042,463, Cl. 195-120.000.
Murray, Clarence G.: *See—*
Hooper, Ralph W.; MacLeod, Douglas A.; and Murray, Clarence G., 4,041,888, Cl. 114-248.000.
Murray, Kenneth R., to Towmotor Corporation. Controllable connecting apparatus. 4,042,306, Cl. 403-118.000.
Murray, Ransom James; and Brown, Arthur William, to Associated Portland Cement Manufacturers Limited, The. Hydraulic cements. 4,042,408, Cl. 106-100.000.
Musser, Earl C.: *See—*
Sieren, Gerald E.; and Musser, Earl C., 4,042,053, Cl. 180-51.000.
Myers, Claude K.; and Myers, Gary A. Mixer with screen valve. 4,042,179, Cl. 241-46.110.
Myers, Claude K.; Myers, Gary A.; and Myers, Phillip C. Tilt mixer. 4,042,221, Cl. 259-119.000.
Myers, Earl D., to Ohaus Scale Corporation. Balance beam scale. 4,042,050, Cl. 177-198.000.
Myers, Gary A.: *See—*
Myers, Claude K.; and Myers, Gary A., 4,042,179, Cl. 241-46.110.
Myers, Claude K.; Myers, Gary A.; and Myers, Phillip C., 4,042,221, Cl. 259-119.000.
Myers, Phillip C.: *See—*
Myers, Claude K.; Myers, Gary A.; and Myers, Phillip C., 4,042,221, Cl. 259-119.000.
N L Industries, Inc.: *See—*
Cestaro, John P.; Hebbar, Ranna K.; and Sokolov, Uriel S., 4,042,177, Cl. 241-20.000.
Nabiullin, Faat Khatovich. Chemical source of current and method for its assembly. 4,042,761, Cl. 429-165.000.
Nagata, Katsuyuki: *See—*
Hasegawa, Mutsuo; Aikawa, Kazuo; and Nagata, Katsuyuki, 4,042,471, Cl. 204-58.000.
Nagata, Masaki: *See—*
Abe, Mitsuo; Nagata, Masaki; and Kikuchi, Masafumi, 4,042,548, Cl. 260-23.0XA.
Nagel, Robert H.: *See—*
Saylor, Richard; and Nagel, Robert H., 4,042,958, Cl. 358-141.000.
Naito, Sachio: *See—*
Hasegawa, Katsuji; Takagi, Yukio; Naito, Sachio; Hiraiwa, Kenichi; and Takasu, Eiji, 4,042,440, Cl. 156-304.000.
Nakagawa, Kunio: *See—*
Kogure, Katsura; Sueda, Noriyoshi; Himoto, Sizuo; Yoshino, Youziro; and Nakagawa, Kunio, 4,042,617, Cl. 260-469.000.
Nakagawa, Yoshimasa: *See—*
Edamura, Koji; Nakagawa, Yoshimasa; and Ikeda, Yoshitaka, 4,042,646, Cl. 260-864.000.
Nakajima, Yasuo: *See—*
Sugihara, Kunihiko; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,041,914, Cl. 123-119.00A.
Nakako, Masaki: *See—*
Kano, Tsuyoshi; Nakako, Masaki; Yamamoto, Hajime; and Otomo, Yoshiro, 4,042,527, Cl. 252-301.40H.
Nakamura, Norihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal-combustion engine having a sub-combustion chamber. 4,041,909, Cl. 123-32.0SP.
Nakamura, Yuji: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,042,487, Cl. 208-48.00R.
Nakata, Masahiro: *See—*
Sato, Ryuichi; Oikawa, Teruo; and Nakata, Masahiro, 4,041,800, Cl. 74-571.00R.
Nakata, Roy; and Johenning, William Joseph, to General Electric Company. Particle trapping sheath coupling for enclosed electric bus apparatus. 4,042,774, Cl. 174-14.00R.
Nakata, Takashi: *See—*
Shujiro, Shiga; Katsumata, Takeshi; Okamoto, Yasushi; and Nakata, Takashi, 4,042,352, Cl. 55-98.000.
Nalco Chemical Company: *See—*
Ballweber, Edward G.; and Hunter, Wood E., 4,042,772, Cl. 526-220.000.
Naphtachimie: *See—*
Avaro, Michel; and Mangin, Pierre, 4,042,771, Cl. 526-124.000.
Napp Systems: *See—*
Okai, Sakuo; and Kimoto, Koichi, 4,042,386, Cl. 96-35.100.
National Research Development Corporation: *See—*
Craven, Peter Graham; and Gerzon, Michael Anthony, 4,042,779, Cl. 179-1.0DM.
Phillips, Courtenay Stanley Goss, 4,042,350, Cl. 55-28.000.
Ward, Gerald Frank; and Wray, Gordon Richard, 4,041,884, Cl. 112-79.00R.
National Semiconductor Corporation: *See—*
Compton, James B.; and Ochi, Sam S., 4,042,836, Cl. 307-251.000.
Harris, James M., 4,042,954, Cl. 357-71.000.
Reed, John A., 4,042,915, Cl. 340-173.00R.
National Steel Corporation: *See—*
Beiser, Carl Adolph, 4,042,426, Cl. 428-667.000.
Niehaus, Howard E.; Hass, Winfield M.; Alpha, Homer G.; Hall, Sidney B.; and Traenkner, Frederick O., 4,042,227, Cl. 266-93.000.
Natsuume, Tadao, to Nippon Zeon Co., Ltd. Hydraulic composition. 4,042,407, Cl. 106-90.000.
Natter, Eckard F.; Weant, George E.; and Lobsinger, James R., to Bendix Corporation, The. Multi-mode radar system. 4,042,922, Cl. 343-5.00W.
Nawracaj, Dennis J., to Western Electric Company, Inc. Method for the selective on-line measuring and controlling of a geometrical parameter of elongated articles. 4,042,724, Cl. 427-9.000.
NCR Corporation: *See—*
Koo, Tuh-Kai; and van Velthoven, Armand J., 4,041,896, Cl. 118-48.000.
Nealy, Robert B. Surfboard leash. 4,041,562, Cl. 9-310.0AA.
Nedila, Walter. Cover for baled hay and the like. 4,041,654, Cl. 52-3.000.
Nehrlich, Friedrich; and Ruckstuhl, Franz, to Metacon AG. Valve operating means for a molten metal container. 4,042,207, Cl. 251-62.000.
Neilsen, Hildaur L. Burring device with oppositely acting deburring elements. 4,041,751, Cl. 72-199.000.
Nejtek, George: *See—*
Steele, William Henry; and Nejtek, George, 4,041,911, Cl. 123-103.00B.
Nelson, Paul Chris, to Houdaille Industries, Inc. Punch holder and stripper combination. 4,041,817, Cl. 83-139.000.
Nelson, Richard P., to General Motors Corporation. Wheel cylinder piston construction. 4,042,080, Cl. 188-361.000.
Nelson, William F.: *See—*
Krugler, Joel I.; and Nelson, William F., 4,041,642, Cl. 47-58.000.
Nemirovsky, Ernest Elizarovich: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.
Newell, Dennis E.; and Tyler, Hugh J., to Robertshaw Controls Company. Motor control circuit. 4,042,966, Cl. 361-27.000.
Newman, Douglas A., to Columbia Ribbon and Manufacturing Co., Inc. Duplicating method. 4,042,092, Cl. 197-171.000.
Newman, Douglas A.; and Emerson, Robert T., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Hectograph products and process. 4,042,401, Cl. 106-14.500.
Newman, Douglas A.; and Schlotzhauer, Allan T., to Columbia Ribbon and Carbon Manufacturing Co., Inc. Multiple-color transfer elements and process. 4,042,744, Cl. 428-307.000.
Newsteder, Robert. Siphon starting device. 4,041,971, Cl. 137-148.000.
Niagara Bottle Washer Mfg. Company: *See—*
Langmack, Charles E., 4,042,507, Cl. 210-158.000.
Nicholls, Bryan Frederick; and Marshall, Peter John, to Mettoy Company Limited, The. Resiliently mounted targets rotated by escapement device. 4,042,242, Cl. 273-105.200.
Nichols, Mary V. Book marker employing endless elastic band. 4,041,892, Cl. 116-119.000.
Nicholson, William I. Construction method. 4,041,671, Cl. 52-741.000.
Nicoud, Jean-Claude, to Societe de Vente de l'Aluminium. Electrical conductors of aluminum-based alloys. 4,042,424, Cl. 148-12.70A.
Niehaus, Howard E.; Hass, Winfield M.; Alpha, Homer G.; Hall, Sidney B.; and Traenkner, Frederick O., to Southwire Company; and National Steel Corporation. Method and apparatus for continuously homogenizing and quenching aluminum billets. 4,042,227, Cl. 266-93.000.
Nihon Technical Kabushiki Kaisha: *See—*
Ohashi, Tamaki, 4,041,784, Cl. 74-10.330.
Nihon Yushi Co., Ltd.: *See—*
Edamura, Koji; Nakagawa, Yoshimasa; and Ikeda, Yoshitaka, 4,042,646, Cl. 260-864.000.
Nikaido, Teruji; Haga, Kaoru; and Fujiwara, Yasutaka, to Tokyo Electric Power Co. Ltd.; and Showa Electric Wire & Cable Co. Ltd. Electric cable power transmission lines. 4,042,969, Cl. 361-107.000.
Nikkiso Co., Ltd.: *See—*
Sato, Ryuichi; Oikawa, Teruo; and Nakata, Masahiro, 4,041,800, Cl. 74-571.00R.
Nimerick, Kenneth H.; and Simpson, Benny E., to Dow Chemical Company, The. Composition and method for enhancing dispersibility of water soluble polymers. 4,042,529, Cl. 252-363.500.
Nininger, Nathan Vivien, Jr., to California Progressive Products, Inc. Electrical control for derailleur drive. 4,041,788, Cl. 74-217.00B.
Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Oya, Akiyoshi, 4,041,826, Cl. 84-1.010.
Shimauchi, Minoru; and Onoda, Takashi, 4,041,783, Cl. 73-552.000.
Nippon Kayaku Kabushiki Kaisha: *See—*
Ogawa, Masanobu, 4,042,623, Cl. 260-530.00N.
Nippon Kogaku K.K.: *See—*
Fukino, Kunihiro, 4,042,943, Cl. 354-272.000.
Nippon Zeon Co., Ltd.: *See—*
Natsuume, Tadao, 4,042,407, Cl. 106-90.000.
Nippondenso Co., Ltd.: *See—*
Imai, Takeshi; Niwa, Tsutomu; and Motani, Kenji, 4,042,955, Cl. 357-72.000.
Nischk, Gunther: *See—*
Bernert, Claus-Rudiger; Radlmann, Eduard; and Nischk, Gunther, 4,042,570, Cl. 260-75.00M.
Nishi, Michio: *See—*
Terada, Ichiro; Yamada, Tadashi; Nishi, Michio; Uchida, Mitsuo; Sugiyama, Naomasa; Kaneko, Mamoru; and Takeda, Nobuhiko, 4,042,409, Cl. 106-111.000.
Nishida, Minoru: *See—*
Ohashi, Nobuo; Konishi, Motoyuki; Nishida, Minoru; and Inokuchi, Yukio, 4,042,425, Cl. 148-13.100.
Nishimura, Sadanori: *See—*
Goto, Isamu; Nishimura, Sadanori; and Kawahara, Eiichiro, 4,041,701, Cl. 60-347.000.
Nishino, Atsushi; Yoshida, Akihiko; and Hayakawa, Hayashi, to Matsu-

shita Electric Industrial Co., Ltd. Method of producing manganese oxide solid electrolyte capacitor. 4,042,420, Cl. 148-6.000.
Nissan Motor Company, Limited: *See—*
Gotoh, Miyuki, 4,041,985, Cl. 139-370.200.
Iida, Hiroshi; and Sasaki, Kenichi, 4,041,916, Cl. 123-119.00A.
Konishi, Hideki, 4,041,915, Cl. 123-119.00A.
Sugihara, Kunihiko; Nakajima, Yasuo; and Hayashi, Yoshimasa, 4,041,914, Cl. 123-119.00A.
Nisshin Flour Milling Co., Ltd.: *See—*
Kogure, Katsura; Sueda, Noriyoshi; Himoto, Sizuo; Yoshino, Youziro; and Nakagawa, Kunio, 4,042,617, Cl. 260-469.000.
Nitro Nobel AB: *See—*
Enoksson, Bertil Petrus, 4,041,867, Cl. 102-27.00R.
Niwa, Tsutomu: *See—*
Imai, Takeshi; Niwa, Tsutomu; and Motani, Kenji, 4,042,955, Cl. 357-72.000.
Nohira, Hidetaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculating system. 4,041,913, Cl. 123-119.00A.
Nojiri, Richard T.: *See—*
Larson, Charles E.; and Nojiri, Richard T., 4,042,743, Cl. 428-306.000.
Noll, Dale A.; Piazza, Giacomo J.; and Young, Robert L., to Corning Glass Works. Method of fabricating a multiple flow path body. 4,041,591, Cl. 29-157.30R.
Nomaki, Koji; and Saoyama, Yoshihito, to Asahi Glass Company Ltd. Solder alloy and soldering process. 4,042,725, Cl. 427-57.000.
Noone, Martin J. Portable emergency fire fighting and rescue elevator. 4,042,066, Cl. 187-6.000.
Nordgren, Gunnar, to Oy. Suomen Vanutehdas - Finnwad Ltd. Feeding and rationing equipment for mechanical wood pulp, production waste and equivalent. 4,042,180, Cl. 241-79.000.
Nordiska Maskinfilt Aktiebolaget: *See—*
Johansson, Arne Boris; Codorniu, Francisco Lorente; and Strandly, Ingvald, 4,041,989, Cl. 139-425.00A.
Norris Industries, Inc.: *See—*
Weeks, Charles B., 4,041,857, Cl. 100-215.000.
Norris, Melvin N., to Joy Manufacturing Company. AC-DC Traction drive control system. 4,042,864, Cl. 318-301.000.
Norton Company: *See—*
Robinson, Franklin E., 4,041,928, Cl. 125-13.0SS.
Sioui, Richard H.; and Carver, Edgar B., 4,042,346, Cl. 51-298.00A.
Sioui, Richard H., 4,042,347, Cl. 51-298.00R.
Noshiro, Atsumi: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,042,613, Cl. 260-448.20B.
Nourse, Jack T. Window control devices. 4,041,645, Cl. 49-347.000.
Novacek, Jindrich: *See—*
Brada, Pavel; Kucera, Jaromir; Chladek, Otokar; Voda, Gustav; Novacek, Jindrich; and Kollmann, Jan, 4,041,733, Cl. 66-138.000.
November, Milton H., to International Telephone and Telegraph Corporation. Densitometer. 4,041,769, Cl. 73-32.00A.
Novo Industri A/S: *See—*
Diers, Ivan Verner, 4,042,460, Cl. 195-65.000.
Noz, Francis X. Apparatus for selectively applying a metal coating to the metallic parts of elements which pass through an insulator. 4,042,480, Cl. 204-224.00R.
Nozdrovsky, Andrei Stepanovich. Bowl centrifuge rotor. 4,042,172, Cl. 233-7.000.
Nuclear Battery Corporation: *See—*
Kruger, Owen Lee, 4,042,670, Cl. 423-251.000.
Nuclear Services Corporation: *See—*
Rubinstein, Herbert J.; Gordon, Clark B.; Robison, Albert; and Clark, Philip M., 4,042,828, Cl. 250-507.000.
Nuovo Pignone, S.p.A.: *See—*
Vinciguerra, Costantino, 4,042,271, Cl. 294-61.000.
Nurnberg, Richard K.; and Perkins, Charles H., to Robertshaw Controls Company. Motor protection circuit. 4,042,964, Cl. 361-28.000.
Nussbaum, Ralph W.: *See—*
Tuller, Harold W.; and Nussbaum, Ralph W., 4,042,550, Cl. 260-280.00P.
Nusz, Thomas R.: *See—*
Schreyer, Kenneth D.; Leverentz, Earl T.; and Nusz, Thomas R., 4,042,213, Cl. 254-168.000.
Nutter, Jack W. Map vending machine. 4,042,146, Cl. 221-152.000.
Nychka, Henry R.; Eibeck, Richard E.; and Li, Chien C., to Allied Chemical Corporation. Methods for absorption heating. 4,042,524, Cl. 252-69.000.
Nylund, Kare Jorgen. Device for tire chains. 4,042,000, Cl. 152-213.00A.
Nyswander, Reuben E., to United States of America, Navy. Short pulse solid state-magnetic modulator for magnetron transmitter. 4,042,837, Cl. 307-265.000.
O.M. Scott & Sons Company, The: *See—*
Fersch, Kenneth Eugene; and Stearns, Wayne Eugene, 4,042,366, Cl. 71-29.000.
Oakdale Knitting Company: *See—*
Holder, Otis W., 4,041,735, Cl. 66-133.000.
Oba, Hiroshi: *See—*
Fukutani, Hideo; Oba, Hiroshi; Okada, Akane; and Shimizu, Atsuko, 4,042,391, Cl. 96-47.000.
O'Callaghan, James S., to Tram/Diamond Corporation. Radio mounting bracket. 4,042,201, Cl. 248-309.00R.
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Compton, James B.; and Ochi, Sam S., 4,042,836, Cl. 307-251.000.
O'Connor, Matthew J.: *See—*
Bennett, Robert P.; O'Connor, Matthew J.; Kober, Alfred E.; and Kukin, Ira, 4,042,348, Cl. 55-5.000.
Oda, Kiyoshi, to Yoshida Kogyo K.K. Automatic lock slider for slide fasteners. 4,041,578, Cl. 24-205.14R.
Oddo, Nicola: *See—*
Marconi, Walter; Oddo, Nicola; and Degen, Ludwig, 4,042,495, Cl. 210-11.000.
O'Doherty, George O. P., to Eli Lilly and Company. 1H-imidazol(4,5-b)pyridine derivatives. 4,042,593, Cl. 260-294.80C.
O'Farrell, Frank J.: *See—*
Albanese, Damian F.; O'Farrell, Frank J.; Hammers, David E.; and Kennedy, Henry R., 4,042,925, Cl. 343-14.000.
Offeringa, Jan, to Shell Oil Company. Carbon-dioxide-assisted production from extensively fractured reservoirs. 4,042,029, Cl. 166-272.000.
Office National d'Etudes et de Recherches Aerospatiales (O.N.E.R.A.): *See—*
Dorey, Jacques A., 4,042,929, Cl. 343-113.0DE.
Officine Savio, S.p.A.: *See—*
D'Agnolo, Armando; and Minto, Luigi, 4,042,098, Cl. 198-393.000.
Offterdinger, Hermann Freidrich. Linear motion devices. 4,041,786, Cl. 74-29.000.
Ogawa, Masanobu, to Nippon Kayaku Kabushiki Kaisha. Method of manufacturing methacrylic acid and an oxidation catalyst. 4,042,623, Cl. 260-530.00N.
Ohara, Yuichi, to Kabushiki Kaisha Daini Seikosha. System for detecting information in an artificial cardiac pacemaker. 4,041,954, Cl. 128-419.0PT.
Ohashi, Nobuo; Konishi, Motoyuki; Nishida, Minoru; and Inokuchi, Yukio, to Kawasaki Steel Corporation. Process of pretreating cold-rolled steel sheet for annealing. 4,042,425, Cl. 148-13.100.
Ohashi, Tamaki, to Nihon Technical Kabushiki Kaisha. Actuator for push button tuner. 4,041,784, Cl. 74-10.330.
Ohaus Scale Corporation: *See—*
Myers, Earl D., 4,042,050, Cl. 177-198.000.
Ohira, Takeshi; and Watanabe, Akinori, to Hitachi, Ltd. AC Elevator control system. 4,042,069, Cl. 187-29.00R.
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Ohtani, Tadao: *See—*
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Okada, Akane: *See—*
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Okai, Sakuo; and Kimoto, Koichi, to Napp Systems. Photosensitive compositions. 4,042,386, Cl. 96-35.100.
Okamoto, Takamitsu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Manifold reactor. 4,041,700, Cl. 60-278.000.
Okamoto, Yasushi: *See—*
Shujiro, Shiga; Katsumata, Takeshi; Okamoto, Yasushi; and Nakata, Takashi, 4,042,352, Cl. 55-98.000.
Okino, Seiki: *See—*
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Olschewski, Armin: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 4,042,086, Cl. 192-98.000.
Olson, John E., to Cascade Corporation. Telescopic ram. 4,041,839, Cl. 91-189.00R.
Olson, Richard S., deceased; and Qualley, John E., executor. Apparatus for protection and storage of phototypesetting equipment. 4,042,286, Cl. 312-129.000.
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Ono, Hiromitsu: *See—*
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Onoda, Takashi: *See—*
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Osborne, William Steese: *See—*
Birney, Richard Eugene; Davis, Michael Ian; Graybiel, Lynn Allan; Hood, Robert Allen; Kahn, Samuel; and Osborne, William Steese, 4,042,913, Cl. 364-200.000.
Ostapchenko, George Joseph; and Phillips, Terrance Duane, to Du Pont de Nemours, E. I., and Company. Process for the automatic inspection of blow-molded articles. 4,042,657, Cl. 264-40.100.
Osterhaus, Elmer J.: *See—*
Wenger, La Von G.; Osterhaus, Elmer J.; and Smith, Oak B., 4,042,715, Cl. 426-104.000.
Ostrander, William M.; and Casper, William J., to Westinghouse Electric Corporation. Elevator system. 4,042,068, Cl. 187-29.00R.
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Otani, Masato: *See—*
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Otani, Shoichi. Process for preparing a pole piece for the rotor of a generator. 4,041,754, Cl. 72-356.000.
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O'Toole, Peter L. M.: *See—*
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Ottermill Limited: *See—*
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Ottmann, Norman; and Strever, Walter, to Atlantic Pipe Corporation. Apparatus for making concrete pipe. 4,042,315, Cl. 425-392.000.
Otto Bilz Werkzeugfabrik: *See—*
Bilz, Reiner, 4,041,729, Cl. 64-29.000.
Otto Niederer Sons, Inc.: *See—*
Morrone, Ross, 4,042,100, Cl. 198-446.000.
Outboard Marine Corporation: *See—*
Betts, Edmund Douglas, 4,042,312, Cl. 418-121.000.
Blanchard, Clarence E., 4,041,889, Cl. 115-18.00R.
Kidd, Earl H., 4,041,682, Cl. 56-320.200.
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Kane, John L.; and Machlan, George R., 4,042,360, Cl. 65-11.00W.
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Gordon, Theodore H.; and Kummerle, Herman Fred, 4,042,639, Cl. 260-656.00R.
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Miskech, Peter, 4,042,416, Cl. 134-10.000.
Oy. Suomen Vanutehdas - Finnwad Ltd.: *See—*
Nordgren, Gunnar, 4,042,180, Cl. 241-79.000.
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Mullen, James W.; McReynolds, Boone K.; and Pace, Herbert D., 4,041,863, Cl. 101-269.000.
Pace, W. David, to Motorola, Inc. Frequency doubler circuit. 4,042,834, Cl. 307-220.00R.
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Kelly, Frank L.; and Tan, Jozef I. Kie Sioe, 4,041,955, Cl. 128-419.00P.
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Caulfield, Patrick J.; Diesch, Robert E.; and Strunc, Gerald R., 4,042,973, Cl. 235-150.300.
Saarinen, Heimo Unto August, 4,042,474, Cl. 204-112.000.
Palm, John W., to Amoco Production Company. Apparatus for using reheat gas in sulfur recovery systems. 4,042,340, Cl. 23-262.000.
Palmer, Thomas Y.; and Auvil, Clifford J., to United States of America, Agriculture. Environmentally-resistant anemometer. 4,041,759, Cl. 73-231.00R.
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Spencer, Harvey J., 4,041,813, Cl. 83-14.000.
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Pari, Vincent Anthony, to Universal Bleacher Company. Telescoping seating systems. 4,041,655, Cl. 52-9.000.
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Paszthory, Emmerich; Hille, Ernst; Seifert, Karl-Gerhard; and Zimmermann, Vincenz, to Hoechst Aktiengesellschaft. Process for the preparation of N-acetoacetyl-2,5-dimethoxy-4-chloroanilide. 4,042,622, Cl. 260-562.00K.
Patentes Talgo, S.A.: *See—*
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Patty, Richard L. Illuminated sign and high intensity warning device. 4,042,919, Cl. 340-321.000.
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Mueller, Paul; and Prine, Ray A., 4,041,726, Cl. 62-238.000.
Paul, William A. Docking apparatus for boats. 4,041,887, Cl. 114-230.000.
Paul, William T., to Incom International Inc. Roller chain connecting link spring clip. 4,041,790, Cl. 74-258.000.
Payer, Wolfgang; Riepe, Volker; and Zoller, Wilhelm, to Ruhrchemie Aktiengesellschaft. Process for polymerization of ethylene. 4,042,767, Cl. 526-64.000.
Payne, William J., to Modulus Corporation. Strain indicator. 4,041,776, Cl. 73-88.00F.
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Molinski, Victor Joseph; and Peacock, Frank Raymond, 4,042,676, Cl. 424-1.000.
Pearson, Paul W. Pollution control device. 4,042,355, Cl. 55-319.000.
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Pegoud, Joseph: *See—*
Thevenin, Michel J.; Brun, Michel; Boileau, Jacques; and Pegoud, Joseph, 4,041,866, Cl. 102-24.0HC.
Peng, Stephen Chung-Suen, to Ford Motor Company. Method of preparing homogeneous thermosetting powder paint compositions. 4,042,560, Cl. 260-42.280.
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Smith, Rush B., 4,042,111, Cl. 206-508.000.
Pennwalt Corporation: *See—*
Sheppard, Chester S.; and MacLeay, Ronald E., 4,042,773, Cl. 526-208.000.
Perciful, Jerry C., to Texaco Inc. Thermal cracking wax to normal alpha-olefins. 4,042,488, Cl. 208-102.000.
Perez, Artemio R. Vehicular dual tire obstruction detector. 4,042,909, Cl. 340-52.00R.
Perkins, Charles H.: *See—*
Nurnberg, Richard K.; and Perkins, Charles H., 4,042,964, Cl. 361-28.000.
Pernsteiner, Harold R.; and Streckert, Ernest H. Vehicle wheel-removing and handling device. 4,042,139, Cl. 214-331.000.
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Koch, Paolo; and Perrotti, Emilio, 4,042,595, Cl. 260-307.00C.
Perry, Elijah R.; and Rabinowitz, Mario, to Electric Power Research Institute. Heat pump system with improved heat transfer. 4,042,012, Cl. 165-1.000.
Perry, Francis James; and Vesci, Anthony, to International Business Machines Corporation. Ink supply for pressurized ink jet. 4,042,937, Cl. 346-1.000.

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Peters, Clifford M., to ACF Industries, Incorporated. Quick bleed exhaust valve. 4,041,970, Cl. 137-102.000.

Petersen, Arne G. Separator system. 4,041,569, Cl. 15-353.000.

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Petit, Jean-Francois: *See—*
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Petrochemicals Company, Inc.: *See—*
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Petrolite Corporation: *See—*
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Petrov, Vyacheslav Vasilievich: *See—*
Voitovich, Igor Danilovich; Kostyshin, Maxim Timofeevich; Mikhailovskaya, Ekaterina Vasilievna; Petrov, Vyacheslav Vasilievich; Romanenko, Petr Fedorovich; and Skuridin, Vladimir Petrovich, 4,042,450, Cl. 156-652.000.

Pfeifer, Christian: *See—*
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Decker, Hanns; Pfeiffer, Roland; Wenz, Lothar; and Cordes, Horst, 4,042,492, Cl. 209-223.00R.

Pfizer Inc.: *See—*
Acheson, Richard M.; Stubbs, John K.; Baxter, Charles A. R.; and Kuhla, Donald E., 4,042,583, Cl. 542-458.000.
Torres, Anibal, 4,042,714, Cl. 426-62.000.

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Johnson, Marvin M.; and Tabler, Donald C., 4,042,669, Cl. 423-246.000.
Platt, Louis; Wishman, Marvin; Gentry, David R.; and Williams, Jake E., 4,042,655, Cl. 264-25.000.
Richards, Frank P., 4,041,848, Cl. 93-36.50R.
Schneider, Julius E., 4,042,011, Cl. 165-1.000.

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Ostapchenko, George Joseph; and Phillips, Terrance Duane, 4,042,657, Cl. 264-40.100.

Piazza, Giacomo J.: *See—*
Noll, Dale A.; Piazza, Giacomo J.; and Young, Robert L., 4,041,591, Cl. 29-157.30R.

Picker Corporation: *See—*
Brunnett, Carl J.; and Gerth, Vernon W., Jr., 4,042,811, Cl. 235-151.300.

Pier, Jerome R., to Westinghouse Air Brake Company. Manual control of third rail power knockout. 4,042,081, Cl. 191-8.000.

Pierce, Richard H. Method of imparting color to fires. 4,042,313, Cl. 431-4.000.

Pike, Leslie Clark: *See—*
Creasey, Norman Geoffrey; and Pike, Leslie Clark, 4,042,643, Cl. 428-447.000.

Pilot Research Corporation: *See—*
Fregeolle, Oscar, 4,041,736, Cl. 66-177.000.

Piorkowski, Casey E.: *See—*
Raimondi, Victor V.; Fox, Roy A.; and Piorkowski, Casey E., 4,042,555, Cl. 260-29.6RB.

Pitts, Robert W., Jr.; and Whatley, Houston A., Jr., to Texaco Inc. Dual spectra well logging system and method. 4,042,824, Cl. 250-263.000.

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Terlesky, John; Muller, Hugh Emil; Murphy, John C.; and Honath, Harold F., 4,041,722, Cl. 62-45.000.

Pivard, Claude: *See—*
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Plunguian, Mark: *See—*
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Plymak Company, Inc.: *See—*
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Pneumatic Scale Corporation: *See—*
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Pohl, Gerhard: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Junkermann, Helmut; Pohl, Gerhard; and Tanner, Herbert, 4,042,716, Cl. 426-335.000.

Poignant, Jean-Claude: *See—*
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Polaroid Corporation: *See—*
Land, Edwin H., 4,042,760, Cl. 429-162.000.
Wolff, Otto E., 4,041,708, Cl. 60-649.000.

Polichette, Joseph; Leech, Edward J.; and Branigan, John G., to Kollmorgen Technologies Corporation. Process for the activation of resinous bodies for adherent metallization. 4,042,729, Cl. 427-304.000.

Polizzano, Anita, executrix: *See—*
Horstman, Wilhelm; Meyer, Werner; and Polizzano, Fred F., deceased, 4,042,009, Cl. 164-278.000.

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Pollinger, Hans, to Knorr-Bremse GmbH. Wheel and axle assembly for railway vehicles having disc brakes. 4,042,071, Cl. 188-18.00A.

Polster, Rudolf: *See—*
Pommer, Ernst-Heinrich; Polster, Rudolf; and Loecher, Friedrich, 4,042,686, Cl. 424-164.000.

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Gawin, Adolph J.; and Porazinski, Robert F., 4,042,299, Cl. 355-40.000.

Poskitt, Ralph Leroy, to Du Pont de Nemours, E. I., and Company. Process for the preparation of a storage stable mastic adhesive. 4,042,554, Cl. 260-29.7NR.

Pounds, Walter R., to KB-Denver, Inc. Method of making keyboard assemblies. 4,042,439, Cl. 156-292.000.

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Mischenko, Vladimir Petrovich; Oxenenko, Anatoly Yakovlevich; Mischenko, Vladimir Alexandrovich; Vasiliev, Georgy Konstantinovich; Gavrilenko, Jury Alexandrovich; Povelitsa, Vladimir Vasilievich; and Kosenko, Ivan Vasilievich, 4,041,843, Cl. 91-499.000.

Powell, David B.; Castonguay, Roger N.; and Aitken, Donald F., to General Electric Company. Manual and motor operated circuit breaker. 4,042,896, Cl. 335-17.000.

Powers, Raymond P.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; and Smith, Frederick W., 4,041,679, Cl. 56-11.300.

Powers, William James, Jr.: *See—*
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PPG Industries, Inc.: *See—*
Mazzoni, Renato J., 4,041,663, Cl. 52-203.000.

Practical Systems, Inc.: *See—*
Stewart, Robert H., 4,041,649, Cl. 51-165.740.

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Verwey, William G. A.; and Stanton, Stephen, 4,041,853, Cl. 100-4.000.

Preis, Lothar: *See—*
von Bonin, Wulf; Preis, Lothar; von Gizycki, Ulrich; and Dahm, Manfred, 4,042,558, Cl. 260-37.00N.

Presby, Herman Melvin, to Bell Telephone Laboratories, Incorporated. Method for monitoring the properties of plastic coatings on optical fibers. 4,042,723, Cl. 427-8.000.

Price, William Louis, to Advanced Micro Devices, Inc. Platinum silicide fuse links for integrated circuit devices. 4,042,950, Cl. 357-51.000.

Prince, Jack A.: *See—*
Beck, Nicholas Robert; Leonard, Gordon C.; and Prince, Jack A., 4,042,176, Cl. 241-24.000.

Prine, Ray A.: *See—*
Mueller, Paul; and Prine, Ray A., 4,041,726, Cl. 62-238.000.

Procter, Donald: *See—*
Rawlings, Robert M.; and Procter, Donald, 4,042,718, Cl. 426-573.000.

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Sanford, Lawrence H., 4,041,951, Cl. 128-287.000.

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Projectus Industriprodukter AB: *See—*
Gustafsson, Berth Ulrik, 4,041,724, Cl. 62-175.000.

Pugh, Melville E., Jr.: *See—*
Breton, Ernest J.; Worden, Dexter; and Pugh, Melville E., Jr., 4,042,747, Cl. 428-323.000.

Pugh, Stuart; and Stokoe, Ridley, to Liner Concrete Machinery Company Limited, The. Load handling vehicle. 4,042,135, Cl. 214-141.000.

Puhak, Peter G.: *See—*
Kraft, Francis J.; and Puhak, Peter G., 4,042,961, Cl. 358-248.000.

Pullman Incorporated: *See—*
Glassmeyer, John J.; and Hughes, Howard W., 4,042,275, Cl. 296-43.000.

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Bruning, Klaus; Junger, Hans; Pungs, Wolfgang; Rheinfeld, Peter; Weissentels, Franz; and Wienand, Michael, 4,042,314, Cl. 425-89.000.

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Pusch, Gunter; Klatt, Heinz Jurgen; and Frohlich, Walter, to Deutsche Texaco Aktiengesellschaft. Method for initiating an in-situ recovery process by the introduction of oxygen. 4,042,026, Cl. 166-258.000.

Puszman, Alan Z.: *See—*
Morrison, Charles F., Jr.; and Puszman, Alan Z., 4,041,952, Cl. 128-303.130.

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Puttlitz, Frederic John: *See—*
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Q-Bit Corporation: *See—*
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Qualley, John E., executor: *See—*
Olson, Richard S., deceased; and Qualley, John E., executor, 4,042,286, Cl. 312-129.000.

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Holm, Peter H.; and Quartz, William L., 4,042,398, Cl. 96-85.000.

Querry, Lester R., to Rixon, Inc. Phase demodulator with offset frequency reference oscillator. 4,042,884, Cl. 329-122.000.

Quinn, H.; and Soures, Nicholas M., to Xerox Corporation. High-voltage a.c. power supply with automatically variable d.c. bias current. 4,042,874, Cl. 323-4.000.

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Radar Control Systems Corporation: *See—*
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Radlmann, Eduard: *See—*
Bernert, Claus-Rudiger; Radlmann, Eduard; and Nischk, Gunther, 4,042,570, Cl. 260-75.00M.

Rae, James Wilson, to Motorola, Inc. Automatic noise limiter. 4,042,883, Cl. 325-477.000.

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Winkelmann, Erhardt; and Raether, Wolfgang, 4,042,705, Cl. 424-273.00R.

Raimondi, Victor V.; Fox, Roy A.; and Piorkowski, Casey E., to Standard Oil Company (Indiana). Binder composition for adhesives and sealants. 4,042,555, Cl. 260-29.6RB.

Rain, Lloyd H., to Irvin Industries, Inc. Stress relieved air supported structure. 4,041,653, Cl. 52-2.000.

Rainer, Georg, to Byk Gulden Lomberg Chemische Fabrik GmbH. Halogen pyrazole derivatives, a method for producing these halogen pyrazole derivatives, medicaments containing and methods of using them. 4,042,702, Cl. 424-273.00P.

Rajakovics, Gundolf E., to Vereinigte Edelstahlwerke Aktiengesellschaft. Thermal power plants and method of operating a thermal power plant. 4,041,709, Cl. 60-655.000.

Ram Industries, Inc.: *See—*
Grover, Ross D., 4,041,996, Cl. 144-2.00N.

Ramelot, Daniel Leon, to Centre de Recherches Metallurgiques-Centrum voor Research in de Metallurgie. Controlling pig iron refining. 4,042,378, Cl. 75-60.000.

Ramstad, Tore; Mahle, Nels H.; and Matalon, Ralph, to Dow Chemical Company, The. Liquid adsorption chromatographic apparatus and method. 4,042,499, Cl. 210-31.00C.

Ranco Incorporated: *See—*
Demaray, Merlin E.; and Attridge, Russell G., Jr., 4,042,013, Cl. 165-2.000.

Rarey, Kenneth W.; Higgins, Edward D.; Hungerford, Donald L.; and Kennedy, John B., Jr., to Continental Can Co., Inc. Apparatus for electrostatic printing or coating and developer mix circulating system. 4,041,901, Cl. 118-621.000.

Rasinski, Edward, to Moorhead Machinery & Boiler Co. Super heater. 4,041,908, Cl. 122-479.00R.

Rasmussen, Don H.; and Loper, Carl R., Jr., to Wisconsin Alumni Research Foundation. Micron sized spherical droplets of metals and method. 4,042,374, Cl. 75-.50B.

Rauenhorst, Gerald A. Hollow-core concrete slabs. 4,041,669, Cl. 52-576.000.

Rauschelbach, Paul Allen: *See—*
Schaffer, Richard Earl; and Rauschelbach, Paul Allen, 4,042,867, Cl. 318-580.000.

Rawlings, Robert M.; and Procter, Donald, to Commonwealth Scientific and Industrial Research Organization. Method for manufacturing ruminant feed supplements comprising a protein-aldehyde complex. 4,042,718, Cl. 426-573.000.

Rayle, Roy E.; Brey, Robert J.; and Woodruff, Wilbur John, to Amron Corporation. Thin walled steel cartridge case. 4,041,868, Cl. 102-43.00F.

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Bickford, Edgar P., 4,042,803, Cl. 219-211.000.
Jensen, Frank L., 4,042,278, Cl. 297-397.000.

Raytheon Company: *See—*
Gustafsson, Sven G., 4,042,931, Cl. 343-117.00R.

Razdan, Raj Kumar: *See—*
Harris, Louis Selig; Pars, Harry George; Sheehan, John Clark; and Razdan, Raj Kumar, 4,042,694, Cl. 424-248.550.

Razim, Claus; Lovasz, Csaba; and Baier, Kurt, to Daimler-Benz Aktiengesellschaft. Process for controlling fused salt nitridation of metals with a solid electrolyte electrode. 4,042,427, Cl. 148-15.500.

RCA Corporation: *See—*
Feldstein, Nathan, 4,042,382, Cl. 75-170.000.
Hanak, Joseph John; Friel, Ronald Norman; and Goodman, Lawrence Alan, 4,042,293, Cl. 350-160.0LC.
Hills, Vernon Elton; and Wu, Leesui, 4,042,841, Cl. 307-272.000.
McNamee, James Arthur, 4,041,775, Cl. 73-70.200.

Reade, Richard F., to Corning Glass Works. Thermally stable glass-ceramic articles. 4,042,403, Cl. 106-39.700.

Rector, Randall C.: *See—*
Kellenbenz, Carl W.; Goodman, James P.; and Rector, Randall C., 4,042,830, Cl. 307-40.000.

Redmore, Derek; and Woodson, Alfred E., to Petrolite Corporation. Process of inhibiting corrosion of metal in an aqueous environment with mixtures of thio-, oxygen and thio- oxygen phosphates and pyrophosphates. 4,042,323, Cl. 21-2.70A.

Reed, John A., to National Semiconductor Corporation. MOS dynamic random access memory having an improved address decoder circuit. 4,042,915, Cl. 340-173.00R.

Reeves, Adam A.: *See—*
Jones, John B., Jr.; and Reeves, Adam A., 4,042,485, Cl. 208-11.00R.

Regie Nationale des Usines Renault: *See—*
Rivere, Jean-Pierre, 4,041,918, Cl. 123-139.0AW.

Rehder, John E.: *See—*
Warda, Richard D.; Buhr, Robert K.; and Rehder, John E., 4,042,353, Cl. 55-99.000.

Reichenberger, Helmut, to Siemens Aktiengesellschaft. Electrode for polarographic measurements in physiological media. 4,041,933, Cl. 128-2.00E.

Reichert, Donald G., to ABC Packaging Machine Corporation. Method of erecting carton blanks. 4,041,850, Cl. 93-53.00M.

Reichow, Keith W.; English, David C.; and McCauley, Jerry L., to Structural Instrumentation, Inc. Vehicle load measuring system. 4,042,049, Cl. 177-137.000.

Reid, Laurie M., to Anderson Bros. Mfg. Co. Apparatus for packing articles, such as bottles. 4,041,674, Cl. 53-61.000.

Reid, Laurie M., to Anderson Bros. Mfg. Co. Packaging apparatus. 4,041,677, Cl. 53-159.000.

Reiff, Helmut: *See—*
Dieterich, Dieter; Markusch, Peter; and Reiff, Helmut, 4,042,536, Cl. 260-2.5AK.

Reimann, Detlef: *See—*
Heinke, Wolfgang; Kirschner, Helmut; and Reimann, Detlef, 4,042,419, Cl. 148-1.500.

Reinwall, Ernest William, Jr.: *See—*
Herkes, Daniel Joseph; and Reinwall, Ernest William, Jr., 4,041,834, Cl. 85-45.000.

Reitz, Norman E., to Sotec Corporation. Crystallizing a layer of silicon on a sodium thallium type crystalline alloy substrate. 4,042,447, Cl. 156-610.000.

Rekoff, Michael George, Jr., to Teledyne Brown Engineering. Mechanism for converting rotary motion into precise low speed linear motion. 4,041,795, Cl. 74-424.80B.

Remy, David C., to Merck & Co., Inc. Ethynylaryl phenyl cyclopropyl thiazines and morpholines. 4,042,584, Cl. 544-59.000.

Renard, Pierre: *See—*
Laforest, Jean; Silhol, Louis; and Renard, Pierre, 4,042,620, Cl. 260-518.00R.

Rendel, Klaus-Jurgen: *See—*
Langhammer, Hans Jurgen; Abratis, Horst; Schafer, Klaus; Rendel, Klaus-Jurgen; and Lotze, Horst, 4,042,223, Cl. 266-47.000.

Rengo Kabushiki Kaisha: *See—*
Tokuno, Masateru, 4,042,234, Cl. 271-151.000.

Repay, Laszlo N.; and Young, Thomas A., to Tenna Corporation. Electrically adjustable vehicle accessory. 4,041,793, Cl. 74-424.80R.

Republic Steel Corporation: *See—*
Overton, Harold C.; and Page, Theodore L., 4,041,895, Cl. 118-7.000.
Thomas, Jerry D.; Hladio, William F.; and Scott, Leo V., 4,042,381, Cl. 75-129.000.
Zavaras, Alexander A.; Sobolewski, Robert; and Griffith, Cecil B., 4,042,007, Cl. 164-49.000.

Resch, Josef; Kadlec, Miloslav; Zahradnik, Stanislav; and Parizek, Josef, to Elitex Koncern textilniho strojirenstvi. Device for forming a shed in a weaving machine. 4,041,986, Cl. 139-58.000.

Research Corporation: *See—*
Goering, Kenneth Justin; and Eslick, Robert Freeman, 4,042,414, Cl. 127-32.000.
McCorkle, Richard A.; and Joyce, James M., 4,042,827, Cl. 250-493.000.

Research Products Corporation: *See—*
Frohmader, Stanley H., 4,042,358, Cl. 55-497.000.

Reuschel, Konrad: *See—*
Haas, Ernst; Martin, Joachim; Reuschel, Konrad; and Schnoeller, Manfred, 4,042,454, Cl. 176-10.000.

Reuting, Hans Werner, to ELMEG Elektro-Mechanik GmbH. Damping of contacts. 4,042,799, Cl. 200-288.000.

Rheinfeld, Peter: *See—*
Bruning, Klaus; Junger, Hans; Pungs, Wolfgang; Rheinfeld, Peter; Weissenfels, Franz; and Wienand, Michael, 4,042,314, Cl. 425-89.000.

RHEINSTAHL Aktiengesellschaft: *See—*
Hellmiss, Otto E.; and Simon, Heinrich, 4,042,082, Cl. 191-12.20A.

Rhodes, Charles F., Jr., to Sun Oil Company. Zeroing circuit. 4,042,885, Cl. 330-9.000.

Rhodes, Melvin H., to Rockwell International Corporation. Stepper motor control apparatus. 4,042,868, Cl. 318-615.000.

Rhodes, Philip H.: *See—*
Ahr, Robert L.; and Rhodes, Philip H., 4,042,549, Cl. 260-23.0XA.

Rhodes, William A. Vacuum cleaner. 4,041,568, Cl. 15-344.000.

Rhodes, William A. Body fluid transfusion and displacement apparatus and method. 4,041,944, Cl. 128-214.00B.

Rhone-Poulenc, S.A.: *See—*
Laforest, Jean; Silhol, Louis; and Renard, Pierre, 4,042,620, Cl. 260-518.00R.

Rhone-Progil: *See—*
Bouy, Pierre; and Cheradame, Guy, 4,042,483, Cl. 204-290.00F.

Ricciardi, Ronald J. Flexibly mounted container system. 4,042,051, Cl. 177-255.000.

Rice, Donald D.; and Walton, Herbert H., to Fisher Controls Company. Quick change valve trim assembly. 4,041,973, Cl. 137-315.000.

Rice, Herbert L.; and Wilkins, Roy A., to Petrochemicals Company, Inc. Method of treating phosphate-containing material to reduce problem with clay swelling. 4,042,666, Cl. 423-167.000.

Rice, James S.: *See—*
Eickelberg, John E.; and Rice, James S., 4,042,869, Cl. 318-630.000.

Richards, Frank P., to Phillips Petroleum Company. Method of making container. 4,041,848, Cl. 93-36.50R.

Richards, Glenn L., to Stromberg-Carlson Corporation. Output processing and output coupling circuit for a digital tone receiver. 4,042,787, Cl. 179-84.0VF.

Richards, Glenn L., to Stromberg-Carlson Corporation. Tone detector. 4,042,788, Cl. 179-84.0VF.

Richards, Glenn L., to Stromberg-Carlson Corporation. Tone combination detector and coincidence timer circuit. 4,042,789, Cl. 179-84.0VF.

Richards, Glenn L., to Stromberg-Carlson Corporation. Voice guard circuit for a tone receiver. 4,042,790, Cl. 179-84.0VF.

Richards, Michael S., to Shawn Products Company. Yarn package support bearing. 4,042,188, Cl. 242-129.510.

Richardson, Warner G.: *See—*
Fisher, George A.; and Richardson, Warner G., 4,041,625, Cl. 37-126.0AE.

Richmond Manufacturing Company, The: *See—*
Appleman, William S., 4,042,043, Cl. 173-152.000.
Capoccia, Anastasio, 4,042,046, Cl. 175-73.000.

Riebel, Hans-Jochem: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; and Stendel, Wilhelm, 4,042,690, Cl. 424-200.000.

Riepe, Volker: *See—*
Payer, Wolfgang; Riepe, Volker; and Zoller, Wilhelm, 4,042,767, Cl. 526-64.000.

Rieter Machine Works, Ltd.: *See—*
Staheli, Paul; and Moser, Robert, 4,041,770, Cl. 73-37.500.

Rietsch, Eike, to Deutsche Texaco Aktiengesellschaft. Method of seismic exploration. 4,042,910, Cl. 340-15.5TA.

Rigo, Gualtiero; and Manghi, Carlo Alberto, to Societa Italiana Telecommunicazioni SIEMENS S.p.A. Marker for telecommunication system. 4,042,785, Cl. 179-18.0FC.

Riloga-Werk Julius Schmidt: *See—*
Hehl, Klaus, 4,042,075, Cl. 188-75.000.

Ringler, Robin L., to Aluminum Plumbing Fixture Corporation. Toilet flushing device with overflow inhibitor. 4,041,557, Cl. 4-75.000.

Rinio, Johannes Augustus. Cable hauling apparatus. 4,042,212, Cl. 254-164.000.

Ripka, William Charles, to Du Pont de Nemours, E. I., and Company. 3α-Arylhydroisoindoles. 4,042,707, Cl. 424-274.000.

Risch, Douglas M. Tuning aids. 4,041,832, Cl. 84-454.000.

Risse, Jean-Claude, to J. Bobst & Fils S.A. Device for receiving a tape of material. 4,042,185, Cl. 242-71.700.

Risser, Dale M.: *See—*
Martin, Eugene G.; and Risser, Dale M., 4,041,572, Cl. 17-46.000.

Ristagno, Charles V.: *See—*
Ristagno, Charles V., to Micro-Display Systems, Inc. Illuminated electro-optical display apparatus. 4,042,294, Cl. 350-60LC.

Rittler, Hermann L.: *See—*
MacDowell, John F.; and Rittler, Hermann L., 4,042,362, Cl. 65-33.000.

Rivere, Jean-Pierre, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Fuel injection system. 4,041,918, Cl. 123-139.0AW.

Rivier, Georges: *See—*
Giolito, Francois; and Rivier, Georges, 4,042,514, Cl. 252-48.600.

Rixon, Inc.: *See—*
Querry, Lester R., 4,042,884, Cl. 329-122.000.

Roark, Thomas J. Mechanical drive system for a remote area. 4,041,785, Cl. 74-11.000.

Robar Mini-Gym, Inc.: *See—*
Henson, Glen E.; and Fisher, Milton W., 4,041,760, Cl. 73-379.000.

Robb, John J.: *See—*
Bacon, Duane E.; Gattermeir, J. David; Hecox, Spencer S.; and Robb, John J., 4,042,467, Cl. 204-15.000.

Robert Bosch GmbH: *See—*
Eckert, Konrad; and Eheim, Franz, 4,041,921, Cl. 123-140.00R.
Zirps, Wilhelm, 4,041,840, Cl. 91-416.000.

Roberts, Thomas E., Jr., to FMC Corporation. Self-leveling static wheel balancer. 4,041,781, Cl. 73-483.000.

Robertshaw Controls Company: *See—*
Bechtel, Jon H., 4,042,901, Cl. 338-28.000.
Newell, Dennis E.; and Tyler, Hugh J., 4,042,966, Cl. 361-27.000.
Nurnberg, Richard K.; and Ferkins, Charles H., 4,042,964, Cl. 361-28.000.

Robertson, Donald Edwin; Urry, Wilbert Herbert; and Kavka, Frank, to IMC Chemical Group, Inc. Synthesis of dideoxyzearalane and related compounds. 4,042,602, Cl. 260-343.410.

Robeson, Robert Ogden; and Hart, Vincent Joseph. Piano pedal assembly. 4,041,829, Cl. 84-225.000.

Robinet, Norman A. Clothes dryer. 4,041,614, Cl. 34-92.000.

Robinson, Franklin E., to Norton Company. Masonry saw. 4,041,928, Cl. 125-13.0SS.

Robinson, John Thomas; and Edwards, Richard A., to Texas Instruments Incorporated. Gold-germanium alloy contacts for a semiconductor device. 4,042,951, Cl. 357-67.000.

Robison, Albert: *See—*
Rubinstein, Herbert J.; Gordon, Clark B.; Robison, Albert; and Clark, Philip M., 4,042,828, Cl. 250-507.000.

Rochester, Nathaniel: *See—*
Bequaert, Frank Charles; and Rochester, Nathaniel, 4,042,777, Cl. 179-79.000.

Rocket Research Corporation: *See—*
Friant, James E.; and Klopich, Marshall E., 4,042,431, Cl. 149-36.000.

Rockey, Leslie George Henry: *See—*
Gay, Cecil Arthur Joseph; and Rockey, Leslie George Henry, 4,042,801, Cl. 219-121.0EB.

Rockwell International Corporation: *See—*
Brandewie, Richard A.; Davis, Walter C.; and Macken, John A., 4,042,822, Cl. 250-216.000.
Ho, William W.; and Govan, Ronald M., 4,042,879, Cl. 324-58.50C.
Lesser, Mark B., 4,042,833, Cl. 307-200.00B.
Morris, Winfred L.; and Thompson, Donald O., 4,041,774, Cl. 73-67.900.
Rhodes, Melvin H., 4,042,868, Cl. 318-615.000.
Street, Dana C.; and Padgett, Clarence W., 4,042,838, Cl. 307-270.000.
Tarakci, Umit, 4,042,387, Cl. 96-36.000.

Rodaway, Keith S., to Everest & Jennings, Inc. Wide seat wheelchair. 4,042,250, Cl. 280-42.000.

Rogers, Arthur M.: *See—*
Ross, Martin I.; and Rogers, Arthur M., 4,042,171, Cl. 229-72.000.

Rogler, Walter: *See—*
Lenz, Arnold; and Rogler, Walter, 4,042,636, Cl. 260-632.00A.

Rohm and Haas Company: *See—*
Forsgren, Klane F.; Melamed, Sidney; and Weiner, Robert S., 4,042,737, Cl. 428-96.000.
Kennedy, David C., 4,042,498, Cl. 210-26.000.

Rolfe, Norman F.: *See—*
Bohman, Carl E.; Durling, Hubert R., Jr.; Susman, Leon; and Rolfe, Norman F., 4,042,132, Cl. 214-42.00A.

Romanenko, Petr Fedorovich: *See—*
Voitovich, Igor Danilovich; Kostyshin, Maxim Timofeevich; Mikhailovskaya, Ekaterina Vasilievna; Petrov, Vyacheslav Vasilievich; Romanenko, Petr Fedorovich; and Skuridin, Vladimir Petrovich, 4,042,450, Cl. 156-652.000.

Ronyak, David M.: *See—*
Graven, Andrew A.; Ronyak, David M.; and Bose, Edward B., 4,041,652, Cl. 51-241.00R.

Roos, Hans Walter. Water gravity plant feeder. 4,042,150, Cl. 222-70.000.

Rosaen, Nancy Helen: *See—*
Rosaen, Nils O., 4,041,891, Cl. 116-117.00R.

Rosaen, Nils O., to Rosaen, Nancy Helen, a part interest. Flow indicator with improved biasing assembly. 4,041,891, Cl. 116-117.00R.

Rosenberg, Jeffrey P. Pool cleaning device. 4,041,965, Cl. 134-167.00R.

Ross, Martin I.; and Rogers, Arthur M., to Exclusive Envelope Corporation. Travel envelope construction having integrally formed elongated baggage identification tags. 4,042,171, Cl. 229-72.000.

Rossmy, Gerd: *See—*
Lammerting, Helmut; Langenhagen, Rolf-Dieter; Rossmy, Gerd; and Zaske, Peter, 4,042,540, Cl. 260-2.5AH.

Roth, Jacques. Moulded panel and the method of its manufacture. 4,042,751, Cl. 428-425.000.

Roto Diesel: *See—*
Bonin, Jean Claude, 4,041,919, Cl. 123-139.00P.

Rowenta-Werke, GmbH: *See—*
Rabe, Peter, 4,042,316, Cl. 431-344.000.

Rowinski, Anthony S. Nail-extracting apparatus. 4,042,209, Cl. 254-21.000.

Rozmus, Walter J., to Kelsey-Hayes Company. Apparatus and method for cold working metal powder. 4,041,742, Cl. 72-38.000.

RP Rorprodukter AB: *See—*
Forsell, Bror Ingvar, 4,042,021, Cl. 166-85.000.

Ruano, Robert W. Beer keg cooling container. 4,042,142, Cl. 220-4.00B.

Rubinstein, Herbert J.; Gordon, Clark B.; Robison, Albert; and Clark, Philip M., to Nuclear Services Corporation. Rack for nuclear fuel elements. 4,042,828, Cl. 250-507.000.

Ruckstuhl, Franz: *See—*
Nehrlich, Friedrich; and Ruckstuhl, Franz, 4,042,207, Cl. 251-62.000.

Rudakova, Nina Yakovlevna: *See—*
Kazakova, Ljudmila Petrovna; Gundyrev, Alexei Alexandrovich; Rudakova, Nina Yakovlevna; Sharf, Fridrikh-Leopold Khaskelevich; Garun, Yaroslav Evstavievich; Belyashina, Lidia Ivanovna; and Kocheva, Zoya Vasilievna, 4,042,411, Cl. 106-270.000.

Rudolph, Hans: *See—*
Kaiser, Bernd-Ulrich; Dhein, Rolf; Rudolph, Hans; and Kuchenmeister, Rolf, 4,042,547, Cl. 260-22.00R.

Rudtke, Helen T.: *See—*
Dougan, Ramon C.; and Rudtke, Helen T., 4,041,942, Cl. 128-132.00D.

Ruediger, Frederick, to Standard Pressed Steel Co. Method of assembling storage system. 4,041,600, Cl. 29-513.000.

Ruhrchemie Aktiengesellschaft: *See—*
Payer, Wolfgang; Riepe, Volker; and Zoller, Wilhelm, 4,042,767, Cl. 526-64.000.

Rummer, Jurgen. Apparatus for cutting carpet samples. 4,041,818, Cl. 83-256.000.

Runkle, Dean E.: *See—*
Tang, Louis S.; Runkle, Dean E.; and Bach, Lloyd G., 4,041,990, Cl. 138-31.000.

Rush-Presbyterian-St. Luke's Medical Center: *See—*
Kuettner, Klaus E.; Eisenstein, Reuben; and Sorgente, Nino, 4,042,457, Cl. 195-1.800.

Ruspa, Bernardino, to Sant'Andrea Novara Officine Meccaniche E Fonderie S.p.A. Machine for combing and grading textile fibers. 4,041,573, Cl. 19-65.00R.

Russell, Florence P., executrix: *See—*
Stepien, George, Jr.; Califano, Frank L., deceased; DeLorenzo, William, Jr., co-executor; Gillard, G. Bruce, co-executor; Russell, Thomas E., deceased; and Russell, Florence P., executrix, 4,041,712, Cl. 61-36.00R.

Russell, Robert C.: *See—*
Blauvelt, Lon; Dickson, J. Douglas; and Russell, Robert C., 4,042,126, Cl. 214-8.50A.

Russell, Thomas E., deceased: *See—*
Stepien, George, Jr.; Califano, Frank L., deceased; DeLorenzo, William, Jr., co-executor; Gillard, G. Bruce, co-executor; Russell, Thomas E., deceased; and Russell, Florence P., executrix, 4,041,712, Cl. 61-36.00R.

Rut, Tadeusz, to Instytut Obrobki Plastycznej. Method and devices for forging single crank throws of semi-built up crankshafts. 4,041,755, Cl. 72-353.000.

Rutan, Clifford S. Safety device for lawn mowers. 4,042,251, Cl. 280-47.330.

Ruud, Clayton O., to Colorado Seminary. Stressed-unstressed standard for X-ray stress analysis and method of making same. 4,042,825, Cl. 250-272.000.

Ryan, Donald James: *See—*
Humkey, Robert Garnett; Marshall, Donald Raymond; and Ryan, Donald James, 4,042,220, Cl. 259-95.000.

Rys, Paul; and Vogelsanger, Rolf, to Ciba-Geigy Corporation. Spiro compounds. 4,042,635, Cl. 260-623.00D.

S&S Corrugated Paper Machinery Co., Inc.: *See—*
Chu, Paul; Weiskopf, Gunther; and Saunders, Lawrence J., 4,041,819, Cl. 83-302.000.

S/V Tool Company, Inc.: *See—*
Schlicher, Charles W., 4,041,564, Cl. 15-111.000.

Saarinen, Heimo Unto August, to Pako Corporation. Separating nickel, cobalt and chromium from iron in metallurgical products. 4,042,474, Cl. 204-112.000.

Sabloewski, Horst; Schurbrock, Klaus; and Solter, Dieter, to Eppendorf Geratebau Netheler & Hinz GmbH. Pipette device. 4,041,764, Cl. 73-425.600.

Sahasrabudhe, Arun P.; and Matty, Thomas C., to Westinghouse Electric Corporation. Signal amplifier apparatus with fail-safe limited gain. 4,042,888, Cl. 330-109.000.

Saifer, Mark G.: *See—*
Huber, Wolfgang; Saifer, Mark G.; and Williams, Lewis D., 4,042,689, Cl. 424-177.000.

Saito, Tsuyoshi: *See—*
Asano, Kiro; Tamura, Humio; Saito, Tsuyoshi; and Kawai, Yoshio, 4,042,486, Cl. 208-44.000.

Saito, Yoshiichi: *See—*
Yamazaki, Jun'ichiro; Kamo, Takeshi; and Saito, Yoshiichi, 4,042,479, Cl. 204-192.00F.

Saitoh, Osamu; Imaki, Masakatu; and Asami, Hazime, to Horiba, Ltd. Separation method of methane from other hydrocarbons than methane. 4,042,332, Cl. 23-232.00R.

Sakai Chemical Industry Co., Ltd.: *See—*
Matsumoto, Seiji; and Fukai, Kiyoshi, 4,042,516, Cl. 252-62.540.

Sakamoto, Eiichi: *See—*
Baba, Shigeji; Okubo, Bunji; and Sakamoto, Eiichi, 4,042,400, Cl. 96-124.000.

Sakamoto, Yoichi: *See—*
Kojima, Shigeru; Kojima, Kiyoshi; Ohtani, Tadao; Kato, Nobuyuki; Sakamoto, Yoichi; Konno, Isago; Tsukahara, Masaharu; and Kubo, Takao, 4,042,429, Cl. 148-31.550.

Sakurai, Seiya. One hand operated umbrella capable of self-opening. 4,041,966, Cl. 135-22.000.

Salmond, William G., to Sandoz, Inc. 2-Alkyl-5-phenethyl-4-oxazolecarboxylic acids and derivatives. 4,042,596, Cl. 260-307.00R.

Salomon, Georges Pierre Joseph, to Etablissements Francois Salomon et Fils. Ski binding. 4,042,257, Cl. 280-624.000.

Samokhin, Igor Nikolaevich: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.

Sandoz, Inc.: *See—*
Coombs, Robert V., 4,042,704, Cl. 424-273.00P.
Salmond, William G., 4,042,596, Cl. 260-307.00R.

Sandoz Ltd.: *See—*
Groebke, Wolfgang, 4,042,580, Cl. 260-207.000.
Hofer, Kurt; and Tscheulin, Guenther, 4,042,562, Cl. 260-45.8NT.
Hofer, Kurt, Sr.; and Hofer, Kurt, Jr., 4,042,632, Cl. 260-607.0AL.
Kaul, Bansi Lal, 4,042,577, Cl. 260-153.000.
Kaul, Bansi Lal, 4,042,591, Cl. 260-272.000.
Trueb, Werner, 4,042,370, Cl. 71-86.000.

Sandvig, Timothy C., to Minnesota Mining and Manufacturing Company. Article having abrasion resistant surface formed from the reaction product of a silane and a metal ester. 4,042,749, Cl. 428-412.000.

Sanford, Lawrence H., to Procter & Gamble Company, The. Absorptive structure having improved surface dryness and improved resistance to rewetting in-use. 4,041,951, Cl. 128-287.000.

Sankyo Electric Company, Limited: *See—*
Hiraga, Masaharu, 4,042,309, Cl. 417-269.000.

San Miguel, Anthony, to United States of America, Navy. Cook-off liner component. 4,041,869, Cl. 102-56.00R.

Santa Barbara Research Center: *See—*
Buller, J. Stanley, 4,041,968, Cl. 137-74.000.

Sant'Andrea Novara Officine Meccaniche E Fonderie S.p.A.: *See—*
Ruspa, Bernardino, 4,041,573, Cl. 19-65.00R.

Santen, Salomon, to Stork Amsterdam B.V. Installation for the treatment of container-packed commodities. 4,042,103, Cl. 198-645.000.

Sanyo Electric Co., Ltd.: *See—*
Yasuoka, Yoshio; Ito, Fumihiko; Tsuboi, Kunitada; Jinno, Kaori; and Yamano, Masaru, 4,042,851, Cl. 315-39.510.

Saoyama, Yoshihito: *See—*
Nomaki, Koji; and Saoyama, Yoshihito, 4,042,725, Cl. 427-57.000.

Sapper, Peter. Shoe. 4,041,619, Cl. 36-25.00R.

Sargent Industries, Inc.: *See—*
Smith, Fred T., 4,042,133, Cl. 214-83.300.
Smith, Fred T., 4,042,134, Cl. 214-83.300.

Sargis, Sargis E. Modular concrete building components for a lightweight structure system. 4,041,666, Cl. 52-405.000.

Sarkisian, Robert. Art frame. 4,041,632, Cl. 40-156.000.

Sasaki, Kenichi: *See—*
Iida, Hiroshi; and Sasaki, Kenichi, 4,041,916, Cl. 123-119.00A.

Sasson, Eli. Apparatus for visually registering indicia. 4,041,628, Cl. 40-111.000.

Sato, Hisayuki: *See—*
Morita, Eiichi; Sato, Hisayuki; and Kobayashi, Toru, 4,042,866, Cl. 318-568.000.

Sato, Ryuichi; Oikawa, Teruo; and Nakata, Masahiro, to Nikkiso Co., Ltd. Stroke length adjusting devices. 4,041,800, Cl. 74-571.00R.

Satou, Kazumi: *See—*
Matsuba, Hironori; and Satou, Kazumi, 4,042,776, Cl. 174-110.00R.

Sauer, John Carl, to Du Pont de Nemours, E. I., and Company. Oxidation of N-substituted methylamines to N-substituted formamides. 4,042,621, Cl. 260-561.00R.

Sauerbier, Heinz: *See—*
Franke, Johannes; Kessler, Kurt; Muller, Wolfgang; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,042,318, Cl. 432-210.000.

Saunders, Lawrence J.: *See—*
Chu, Paul; Weiskopf, Gunther; and Saunders, Lawrence J., 4,041,819, Cl. 83-302.000.

Sauter, Robert: *See—*
Griss, Gerhart; Grell, Wolfgang; Hurnaus, Rudolf; Sauter, Robert; Eisele, Bernhard; Kaubisch, Nikolaus; and Leitold, Matyas, 4,042,711, Cl. 424-319.000.

Savage, Robert M. Fishing pole leverage device. 4,041,635, Cl. 43-25.000.

Savins, Joseph George; Burdyn, Ralph F.; and Waite, Jerry M., to Mobil Oil Corporation. Oil recovery by viscous waterflooding. 4,042,030, Cl. 166-273.000.

Sawa, Yoshio, to Kanebo, Ltd. Novel dibenzo[a,g]quinolizinium compounds. 4,042,592, Cl. 260-286.00Q.

Sawluk, Wlodzimierz, to Ernst Winter & Sohn. Material removal tool with multiple cutting edges. 4,041,650, Cl. 51-206.00R.

Sawyer, George M. High density merchandise display and rack. 4,042,095, Cl. 211-49.00D.

Saylor, Richard; and Nagel, Robert H., to IDR, Inc. Row grabbing system. 4,042,958, Cl. 358-141.000.

Scalia, Joseph: *See—*
Henning, George J.; McKinney, Lynn B.; and Scalia, Joseph, 4,042,144, Cl. 220-273.000.

Schaefer, Jan Van Valkenburg. Transistor oscillator power converter. 4,042,870, Cl. 363-2.000.

Schaefer Manufacturing, Inc.: *See—*
Cale, Roland E., 4,042,078, Cl. 188-231.000.

Schaeffer, James Robert: *See—*
Esders, Theodore Walter; Schaeffer, James Robert; and Harris, Harry Wayne, 4,042,461, Cl. 195-66.00R.

Schafer, Klaus: *See—*
Langhammer, Hans Jurgen; Abratis, Horst; Schafer, Klaus; Rendel, Klaus-Jurgen; and Lotze, Horst, 4,042,223, Cl. 266-47.000.

Schaffer, Richard Earl; and Rauschelbach, Paul Allen, to Sperry Rand Corporation. Remote selector for flight instruments. 4,042,867, Cl. 318-580.000.

Schankman, Milton, to Stakmore Co., Inc. Convertible poker table. 4,041,880, Cl. 108-112.000.

Schaub, Andres: *See—*
Becker, Carl; Wegmann, Jacques; and Schaub, Andres, 4,042,320, Cl. 8-39.00C.

Schelp, Helmut R., to Garrett Corporation, The. High temperature gas turbine. 4,041,699, Cl. 60-39.550.

Schering Aktiengesellschaft: *See—*
Ahrens, Hanns; Koch, Henning; Schroder, Eberhard; Biere, Helmut; and Kapp, Joachim-Friedrich, 4,042,706, Cl. 424-273.00P.

Schibbye, Hjalmar; and Englund, Arnold, to Svenska Rotor Maskiner Aktiebolag. Screw compressor control means. 4,042,310, Cl. 417-310.000.

Schibrowski, Jurgen, to Jean Walterscheid GmbH. Broaching device. 4,041,590, Cl. 29-95.100.

Schiff, Daniel: *See—*
Allan, Donald S.; and Schiff, Daniel, 4,041,771, Cl. 73-40.50R.

Schimanski, Freddie G., to Wells Manufacturing Corporation. Machine tool with an automatic tool changer. 4,041,601, Cl. 29-568.000.

Schladitz, Hermann Johannes. Method for the manufacture of a heat exchanger or heat transfer element. 4,042,163, Cl. 228-198.000.

Schlicher, Charles W., to S/V Tool Company, Inc. Combination scraper and brush with extensible handle. 4,041,564, Cl. 15-111.000.

Schlichte, Max: *See—*
Hofer, Ernst; and Schlichte, Max, 4,042,893, Cl. 333-28.00R.

Schlotzhauer, Allan T.: *See—*
Newman, Douglas A.; and Schlotzhauer, Allan T., 4,042,744, Cl. 428-307.000.

Schlumberger Technology Corporation: *See—*
Trouiller, Jean Claude; and Lafont, Guy, 4,042,907, Cl. 340-15.5BH.

Schmermund, Alfred. Conveying and storing apparatus. 4,042,094, Cl. 198-347.000.

Schmidt, Dietrich; Hofer, Johann; Lang, Winfried; and Bildl, Erich, to Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH. Process for the determination of the boron contents of pure halogensilanes. 4,042,331, Cl. 23-230.0PC.

Schmidt, Hans V. Combination roller conveyor and cross-conveyor system. 4,042,118, Cl. 214-1.0BB.

Schmidt, Joachim; Bamberg, Wolfgang; Grunert, Hartmut; Schorm, Erhard; and Weigelt, Christian, to VEB Jenapharm Jena. Detoxification of cyanides and cyanide-containing solutions. 4,042,502, Cl. 210-59.000.

Schmidt, William M.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; and Smith, Frederick W., 4,041,679, Cl. 56-11.300.

Schmohe, James S., to Sundstrand Corporation. Low speed disconnect. 4,042,088, Cl. 192-114.00R.

Schnabel, Roland; Holzel, Alexander; and Gotter, Kurt, to Jenaer, Glaswerk, Schott & Gen. Process for production of porous glass membrane tubes. 4,042,359, Cl. 65-2.000.

Schneider, Julius E., to Phillips Petroleum Company. Refrigeration control. 4,042,011, Cl. 165-1.000.

Schneider, Kurt: *See—*
Franke, Johannes; Kessler, Kurt; Muller, Wolfgang; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,042,318, Cl. 432-210.000.

Schnoeller, Manfred: *See—*
Haas, Ernst; Martin, Joachim; Reuschel, Konrad; and Schnoeller, Manfred, 4,042,454, Cl. 176-10.000.

Schoeller Technical Papers, Inc.: *See—*
Holm, Peter H.; and Quartz, William L., 4,042,398, Cl. 96-85.000.

Schonbrun, David M. Snowshoe. 4,041,622, Cl. 36-124.000.

Schorm, Erhard: *See—*
Schmidt, Joachim; Bamberg, Wolfgang; Grunert, Hartmut; Schorm, Erhard; and Weigelt, Christian, 4,042,502, Cl. 210-59.000.

Schrewe, Hans: *See—*
Komma, Gerhard; and Schrewe, Hans, 4,042,010, Cl. 164-282.000.

Schreyer, Kenneth D.; Leverentz, Earl T.; and Nusz, Thomas R., to Columbus McKinnon Corporation. Electric hoist. 4,042,213, Cl. 254-168.000.

Schroder, Eberhard: *See—*
Ahrens, Hanns; Koch, Henning; Schroder, Eberhard; Biere, Helmut; and Kapp, Joachim-Friedrich, 4,042,706, Cl. 424-273.00P.

Schromm, Kurt: *See—*
Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, 4,042,713, Cl. 424-330.000.

Schultz, Peter C., to Corning Glass Works. Fused P_2O_5 type glasses. 4,042,404, Cl. 106-52.000.

Schultze, Hans A.: *See—*
Leunig, Ernst; Schultze, Hans A.; and Pfeifer, Christian, 4,041,777, Cl. 73-118.000.

Schulz, John Carl, to J. I. Case Company. Vehicle clutch control assembly. 4,042,084, Cl. 192-13.00R.

Schulz, Werner: *See—*
Banholzer, Rolf; Bauer, Rudolf; Heusner, Alex; and Schulz, Werner, 4,042,700, Cl. 424-265.000.

Schulz, Willis Lorenz, to Borg-Warner Corporation. Torque convertor with centrifugal lock up clutch. 4,042,083, Cl. 192-3.310.

Schuplin, Jerome T., to Fastway Fasteners, Inc. Fixture support for grid type ceiling. 4,041,657, Cl. 52-39.000.

Schurbrock, Klaus: *See—*
Sabloewski, Horst; Schurbrock, Klaus; and Solter, Dieter, 4,041,764, Cl. 73-425.600.

Schwabe, Willie Carl. Drilling technique. 4,042,048, Cl. 175-380.000.

Schwan, Thomas J., to Morton-Norwich Products, Inc. Antidepressant 2-[(substituted-1-naphthylmethyl)amino]-1-phenylpropanols. 4,042,624, Cl. 260-570.600.

Schweigert, James R. Bucket attachment for garden tractors. 4,042,141, Cl. 214-766.000.

Science Union et Cie, Societe Francaise de Recherche Medicale: *See—*
Beregi, Laszlo; Hugon, Pierre; Pascaud, Xavier; and Poignant, Jean-Claude, 4,042,598, Cl. 260-326.100.

SCM Corporation: *See—*
Beyn, Edgar Joachim, 4,042,653, Cl. 264-7.000.

Scott & Fetzer Company, The: *See—*
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Scott, Leo V.: *See—*
Thomas, Jerry D.; Hladio, William F.; and Scott, Leo V., 4,042,381, Cl. 75-129.000.

Scott, Lyle Burnell, to BJ-Hughes Inc. Multiple stage cementing of well casing in subsea wells. 4,042,014, Cl. 166-.500.

Scott Paper Company: *See—*
DiPippo, Carmine A., 4,042,600, Cl. 260-327.00S.

Scrivener, Francis Edward, Jr.: *See—*
Duncan, Patrick Joseph; and Scrivener, Francis Edward, Jr., 4,041,689, Cl. 57-140.00J.

Scrufari, Pascal. Dual-barrel pistol. 4,041,633, Cl. 42-65.000.

Scubapro EU: *See—*
Leemann, Karl, 4,041,978, Cl. 137-494.000.

Searle, Robert J. G.: *See—*
Bull, Michael J.; and Searle, Robert J. G., 4,042,710, Cl. 424-304.000.

Sebenda, Jan: *See—*
Bukac, Zbynek; and Sebenda, Jan, 4,042,572, Cl. 260-78.00L.

Sedlak, John M.: *See—*
Blurton, Keith F.; and Sedlak, John M., 4,042,464, Cl. 204-1.00T.

Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, to Kureha Kagako Kogyo Kabushiki Kaisha. Method for the treatment of heavy petroleum oil. 4,042,487, Cl. 208-48.00R.

Seidel, Siegfried, to Siemens Aktiengesellschaft. A-C magnet with a shorting ring. 4,042,897, Cl. 335-245.000.

Seidenbusch, Heinz, to Siemens Aktiengesellschaft. Mounting device for compression spring. 4,042,798, Cl. 200-243.000.

Seifert, Karl-Gerhard: *See—*
Paszthory, Emmerich; Hille, Ernst; Seifert, Karl-Gerhard; and Zimmermann, Vincenz, 4,042,622, Cl. 260-562.00K.

Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; and Smith, Frederick W., to Seifert, Lester H. Self-propelled rotary lawn mower. 4,041,679, Cl. 56-11.300.

Selfe, Barry David. Routing apparatus. 4,041,997, Cl. 144-136.00C.

Selfridge, Eugene W.: *See—*
Selfridge, Leroy K., 4,041,605, Cl. 30-293.000.

Selfridge, Leroy K., to Selfridge, Eugene W. Wallpaper trimmer. 4,041,605, Cl. 30-293.000.

Selin, Howard; and Marker, John R., Jr., to Stone Container Corporation. Paperboard carton. 4,042,166, Cl. 229-33.000.

Seller, John J.: *See—*
Prager, Charles H.; and Seller, John J., 4,041,905, Cl. 119-103.000.

Sessions, Douglas Charles, to Motorola, Inc. Solid-state ignition system and method for linearly regulating and dwell time thereof. 4,041,912, Cl. 123-117.00R.

Sevcon Limited: *See—*
Gurwicz, David, 4,042,865, Cl. 318-338.000.

Seymour, George W. On-line analyzer. 4,042,328, Cl. 23-230.00R.

Shackleford, Edward J.: *See—*
Camacho, Gustavo G.; and Shackleford, Edward J., 4,042,882, Cl. 325-118.000.

Shah, Jashwant C.: *See—*
Sheldon, Loren B.; Tomashek, James R.; Kelly, Robert R.; Thale, James S.; Shah, Jashwant C.; and Ward, Donald H., 4,042,123, Cl. 214-2.500.

Shaler, Amos J.; and McLean, Daniel C. Hair curler with sintered desiccant body. 4,041,961, Cl. 132-40.000.

Shamoon, Ellis. Kitchen cuttingboard. 4,041,964, Cl. 134-115.00R.

Shannon, Robert Day; and Taylor, Barry Edward, to Du Pont de Nemours, E. I., and Company. Substituted lithium orthosilicates and solid electrolytes therefrom. 4,042,482, Cl. 204-242.000.

Sharf, Fridrikh-Leopold Khaskelevich: *See—*
Kazakova, Ljudmila Petrovna; Gundyrev, Alexei Alexandrovich; Rudakova, Nina Yakovlevna; Sharf, Fridrikh-Leopold Khaskelevich; Garun, Yaroslav Evstavievich; Belyashina, Lidia Ivanovna; and Kocheva, Zoya Vasilievna, 4,042,411, Cl. 106-270.000.

Sharon Manufacturing Company: *See—*
Morse, Robert L.; and Hudson, Sharon J., Jr., 4,041,728, Cl. 62-503.000.

Sharp, Colin Keith: *See—*
Brown, Kenneth Robson; and Sharp, Colin Keith, 4,042,815, Cl. 235-194.000.

Sharps Associates: *See—*
Harris, Louis Selig; Pars, Harry George; Sheehan, John Clark; and Razdan, Raj Kumar, 4,042,694, Cl. 424-248.550.

Shaw, Wilfrid G.; Terrill, David B.; and Woodbury, David R., to Standard Oil Company, The. Producing unsaturated aliphatic acids. 4,042,533, Cl. 252-437.000.

Shaw, Wilfrid G.: *See—*
Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,042,153, Cl. 222-207.000.

Shawn Products Company: *See—*
Richards, Michael S., 4,042,188, Cl. 242-129.510.

Shearon, Michael Hillas, to Du Pont de Nemours, E. I., and Company. Rotary web chopper. 4,041,816, Cl. 83-100.000.

Sheehan, John Clark: *See—*
Harris, Louis Selig; Pars, Harry George; Sheehan, John Clark; and Razdan, Raj Kumar, 4,042,694, Cl. 424-248.550.

Sheldon, Loren B.; Tomashek, James R.; Kelly, Robert R.; Thale, James S.; Shah, Jashwant C.; and Ward, Donald H. Automated pipe handling system. 4,042,123, Cl. 214-2.500.

Shell Oil Company: *See—*
Anderson, Victor F., 4,041,620, Cl. 36-32.00R.
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 4,042,369, Cl. 71-88.000.
Boyer, Alvin Clifford, 4,042,696, Cl. 424-251.000.
Bull, Michael J.; and Searle, Robert J. G., 4,042,710, Cl. 424-304.000.
Harrison, David E. F.; and Doddema, Harmannus J., 4,042,458, Cl. 195-28.00R.
Knapp, Randolph H., 4,042,031, Cl. 166-276.000.
Offeringa, Jan, 4,042,029, Cl. 166-272.000.
Verbrugge, Pieter A.; and Uurbanus, Elisabeth W., 4,042,616, Cl. 260-468.00G.

Sheppard, Chester S.; and MacLeay, Ronald E., to Pennwalt Corporation. Peroxide free radical initiators containing ultraviolet light stabilizing groups. 4,042,773, Cl. 526-208.000.

Shermazanashvili, Nikolai Alexandrovich: *See—*
Andrianov, Kuzma Andrianovich; Topchiashvili, Mikhail Izmailovich; Khananashvili, Lotary Mikhailovich; Pagava, Dali Georgievna; and Shermazanashvili, Nikolai Alexandrovich, 4,042,534, Cl. 252-511.000.

Sherrill, Clark Alexander: *See—*
Hughes, Thomas Philip; and Sherrill, Clark Alexander, 4,042,137, Cl. 214-302.000.

Shetler, Terry A., to Woodward Governor Company. System for controlling two variables. 4,042,809, Cl. 235-150.100.

Shima, Takeo: *See—*
Kawase, Shoji; Shima, Takeo; and Moriyama, Keiichi, 4,042,571, Cl. 260-78.00R.

Shimauchi, Minoru; and Onoda, Takashi, to Nippon Gakki Seizo Kabushiki Kaisha. System for measuring vibration frequency of vibrating object. 4,041,783, Cl. 73-552.000.

Shimizu, Atsuko: *See—*
Fukutani, Hideo; Oba, Hiroshi; Okada, Akane; and Shimizu, Atsuko, 4,042,391, Cl. 96-47.000.

Shimizu, Takeshi: *See—*
Motobayashi, Kozo; Shimizu, Takeshi; and Miyamoto, Noriaki, 4,041,687, Cl. 57-56.000.

Shimohata, Takashi: *See—*
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, 4,042,380, Cl. 75-124.000.

Shin-Etsu Chemical Co., Ltd.: *See—*
Abe, Akira, 4,042,528, Cl. 252-358.000.
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,042,613, Cl. 260-448.20B.

Shinozaki, Takashi; and Asai, Susumu, to Honda Giken Kogyo Kabushiki Kaisha. Parking brake. 4,041,798, Cl. 74-512.000.

Shiotani, Akinori: *See—*
Itatani, Hiroshi; Kashima, Mikito; Shiotani, Akinori; Yoshimoto, Hataaki; and Kato, Tetuo, 4,042,603, Cl. 260-346.20M.

Shipko, Frederick J.: *See—*
Purdy, David L.; Speicher, Vernon L.; Shipko, Frederick J.; and Johnson, William L., 4,041,956, Cl. 128-419.00P.

Shipkov, Nikolai Nikolaevich: *See—*
Chviruk, Vladimir Petrovich; Koneva, Nina Vasilievna; Kilkinov, Alexandr Afanasievich; Demin, Alexandr Viktorovich; Shipkov, Nikolai Nikolaevich; Kosinsky, Konstantin Alexeevich; Kamarian, Georgy Mikirtychevich; Nemirovsky, Ernest Elizarovich; and Samokhin, Igor Nikolaevich, 4,042,656, Cl. 264-29.500.

Shishido, Yoshio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fastening device for tiltable steering wheel assembly. 4,041,796, Cl. 74-493.000.

Showa Electric Wire & Cable Co. Ltd.: *See—*
Nikaido, Teruji; Haga, Kaoru; and Fujiwara, Yasutaka, 4,042,969, Cl. 361-107.000.

Showa Koji K. K.: *See—*
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Shrader, Robert L., to Airco, Inc. Substrate transfer apparatus for a vacuum coating system. 4,042,128, Cl. 214-17.00B.

Shujiro, Shiga; Katsumata, Takeshi; Okamoto, Yasushi; and Nakata, Takashi, to Sumitomo Chemical Company, Limited. Method for the removal of the dusts from combustion exhaust gases. 4,042,352, Cl. 55-98.000.

Shumer, James E. Clamping apparatus. 4,042,264, Cl. 269-88.000.

Shurtleff, George S., to Baker Oil Tools, Inc. Swing chute sampler. 4,041,762, Cl. 73-422.00R.

Si Handling Systems, Inc.: *See—*
Jones, Vercoe C., 4,041,873, Cl. 104-35.000.

Siegel, Israel. Low temperature engine. 4,041,705, Cl. 60-497.000.

Siemens Aktiengesellschaft: *See—*
Dragotinov, Alexander, 4,042,781, Cl. 179-15.0BS.
Engl, Alfred; and Heim, Guenther, 4,042,006, Cl. 164-46.000.
Haas, Ernst; Martin, Joachim; Reuschel, Konrad; and Schnoeller, Manfred, 4,042,454, Cl. 176-10.000.
Hofer, Ernst; and Schlichte, Max, 4,042,893, Cl. 333-28.00R.
Kraus, Hubert, 4,041,587, Cl. 29-25.420.
Lill, Arnulf, 4,042,917, Cl. 340-174.0TF.
Reichenberger, Helmut, 4,041,933, Cl. 128-2.00E.
Seidel, Siegfried, 4,042,897, Cl. 335-245.000.
Seidenbusch, Heinz, 4,042,798, Cl. 200-243.000.

Sieren, Gerald E.; and Musser, Earl C., to Allis-Chalmers Corporation. Four-wheel drive tractor. 4,042,053, Cl. 180-51.000.

Sieverin, Walter J., to American Can Company. Inspection apparatus and method for detecting flaws in serially fed substantially cylindrical objects. 4,042,877, Cl. 324-37.000.

Signetics Corporation: *See—*
Chan, Louis Yc., 4,042,840, Cl. 307-270.000.

Signode Corporation: *See—*
Angarola, Barry R., 4,041,993, Cl. 140-123.600.

Sikes, Wayne Alan, to Electronic Arrays, Inc. Voltage level adaption in MOSFET chips. 4,042,843, Cl. 307-297.000.

Silhol, Louis: *See—*
Laforest, Jean; Silhol, Louis; and Renard, Pierre, 4,042,620, Cl. 260-518.00R.

Simon, Eli. Chromated polyamide resins as curing agents for epoxy resins, and their cured corrosion-resistant reaction products. 4,042,544, Cl. 260-18.0PN.

Simon, Eli. Reactive polyester-amide polymers as co-reactants or curing agents for polyepoxides and polyisocyanates. 4,042,546, Cl. 260-22.00R.

Simon, Heinrich: *See—*
Hellmiss, Otto E.; and Simon, Heinrich, 4,042,082, Cl. 191-12.20A.

Simon, Michael; and Degen, Norbert, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Lateral guidance device for wheel sets of rail vehicles. 4,041,877, Cl. 104-242.000.

Simon, Richard M.: *See—*
Hazeltine, Barrett; De Meo, Edgar; and Simon, Richard M., 4,042,491, Cl. 209-74.00R.

Simonet, Guy: *See—*
Baudouin, Yvonne; Simonet, Guy; Eluard, Robert; and Pivard, Claude, 4,042,349, Cl. 55-25.000.

Simplicity Pattern Co. Inc.: *See—*
Blauvelt, Lon; Dickson, J. Douglas; and Russell, Robert C., 4,042,126, Cl. 214-8.50A.

Simprop-Electronic Walter Claas, Firma: *See—*
Meyer, Hans; Kaseberg, Werner; Eisendick, Horst; and Lucke, Willi, 4,042,902, Cl. 338-128.000.

Simpson, Benny E.: *See—*
Nimerick, Kenneth H.; and Simpson, Benny E., 4,042,529, Cl. 252-363.500.

Sioui, Richard H.; and Carver, Edgar B., to Norton Company. Diamond or cubic boron nitride grinding wheel with resin core. 4,042,346, Cl. 51-298.00A.

Sioui, Richard H., to Norton Company. Method of making a resin-metal composite grinding wheel. 4,042,347, Cl. 51-298.00R.

Six, Jean-Claude Gerard: *See—*
Coulmance, Jean-Pierre Rene; and Six, Jean-Claude Gerard, 4,042,875, Cl. 323-75.00N.

Skermetta, Geraldine J., to Skermetta, Inc. Sanitary device for removing animal droppings. 4,042,269, Cl. 294-19.00R.

Skermetta, Inc.: *See—*
Skermetta, Geraldine J., 4,042,269, Cl. 294-19.00R.

SKF Industrial Trading and Development Company B.V.: *See—*
Ernst, Horst M.; Brandenstein, Manfred; and Olschewski, Armin, 4,042,086, Cl. 192-98.000.

SKF Industries, Inc.: *See—*
Asberg, Sture L., 4,042,422, Cl. 148-12.00R.

Skinner, David R.; Sowell, Miles L.; and Justus, Marvin W., to Standard Oil Company (Indiana). Hydraulic control system underflow valve control method and apparatus. 4,042,025, Cl. 166-250.000.

Skinner, Robert Thomas John, to C.A.V. Limited. Fuel injection pumping apparatus. 4,041,920, Cl. 123-139.0AM.

Skubic, Robert P. Jaw tensioning device. 4,041,612, Cl. 33-181.00R.

Skuridin, Vladimir Petrovich: *See—*
Voitovich, Igor Danilovich; Kostyshin, Maxim Timofeevich; Mikhailovskaya, Ekaterina Vasilievna; Petrov, Vyacheslav Vasilievich; Romanenko, Petr Fedorovich; and Skuridin, Vladimir Petrovich, 4,042,450, Cl. 156-652.000.

Slade, Paul G.: *See—*
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Smeggil, John G., to General Electric Company. Magnetic films of transition metal-rare earth alloys. 4,042,341, Cl. 428-678.000.

Smith, Daniel F. Shelf aid. 4,042,096, Cl. 211-49.00D.

Smith, Derek Reginald, to Union Carbide Corporation. Method of concentric bonding of a rod in a tubular shaft. 4,041,599, Cl. 29-451.000.

Smith, Edwin Studley: *See—*
Glazer, Emmett Jean; and Smith, Edwin Studley, 4,042,637, Cl. 260-652.00P.

Smith, Frank, to Imperial Chemical Industries Limited. Composite conductor. 4,042,753, Cl. 428-651.000.

Smith, Fred T., to Sargent Industries, Inc. Refuse compactor. 4,042,133, Cl. 214-83.300.

Smith, Fred T., to Sargent Industries, Inc. Refuse collection apparatus. 4,042,134, Cl. 214-83.300.

Smith, Frederick W.: *See—*
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Smith, Graham C.: *See—*
Barker, Michael D.; Isaac, Eirlys R.; Kirby, Peter; and Smith, Graham C., 4,042,369, Cl. 71-88.000.
Smith, James E.; and Cunningham, James D. Electric impact tool. 4,042,036, Cl. 173-13.000.
Smith, Oak B.: *See—*
Wenger, La Von G.; Osterhaus, Elmer J.; and Smith, Oak B., 4,042,715, Cl. 426-104.000.
Smith, Paul W. Record protector. 4,042,106, Cl. 206-313.000.
Smith, Peter Leslie, to L.M. Ericsson Pty Ltd. Digital encoder/decoder. 4,042,921, Cl. 340-347.0AD.
Smith, Rush B., to Pennsylvania Pacific Corporation. Container for bulk material. 4,042,111, Cl. 206-508.000.
Smith, Walton John. Milk of magnesia. 4,042,685, Cl. 424-158.000.
Smith, Wendell F., Jr.; Eddy, Kenneth L.; and Harnish, Donald P., to Eastman Kodak Company. Photographic dye image stabilization. 4,042,394, Cl. 96-56.000.
Smithers, James P., to Armour and Company. Apparatus for packing strips of material. 4,041,676, Cl. 53-123.000.
Smoot, Joseph. Illuminated curb feeler. 4,042,816, Cl. 240-8.10R.
Snam Progetti S.p.A.: *See—*
Koch, Paolo; and Perrotti, Emilio, 4,042,595, Cl. 260-307.00C.
Marconi, Walter; Oddo, Nicola; and Degen, Ludwig, 4,042,495, Cl. 210-11.000.
Perrotti, Emilio; and Clerici, Mario, 4,042,609, Cl. 260-429.00R.
Snider, Harold H.: *See—*
Snider, John H.; and Snider, Harold H., 4,042,217, Cl. 259-4.0AB.
Snider, John H.; and Snider, Harold H. Lather generator. 4,042,217, Cl. 259-4.0AB.
Snyder, Gene J. Reeled wire holder. 4,042,187, Cl. 242-86.50R.
Snyder, H. Ben, to General Dynamics. Etchant rejuvenation control system. 4,042,444, Cl. 156-345.000.
Sobolewski, Robert: *See—*
Zavaras, Alexander A.; Sobolewski, Robert; and Griffith, Cecil B., 4,042,007, Cl. 164-49.000.
Societa Italiana Telecommunicazioni SIEMENS S.p.A.: *See—*
Rigo, Gualtiero; and Manghi, Carlo Alberto, 4,042,785, Cl. 179-18.0FC.
Societa Italiana Telecomunicazioni SIEMENS, S.p.A.: *See—*
Lupattelli, Carlo; and Miotti, Alfredo, 4,042,784, Cl. 179-18.0EB.
Societe Anonyme Automobiles Citroen: *See—*
Grosseau, Albert, 4,041,924, Cl. 123-193.0CP.
S.A. des Anciens Etablissements Paul Wurth: *See—*
Legille, Edouard; and Mailliet, Pierre, 4,042,130, Cl. 214-35.00R.
Societe Anonyme des Usines Chausson: *See—*
Chartet, Andre, 4,041,594, Cl. 29-157.30C.
Societe Anonyme Secmafer: *See—*
Boyer, Jean Jacques, 4,042,035, Cl. 171-16.000.
Societe de Vente de l'Aluminium: *See—*
Nicoud, Jean-Claude, 4,042,424, Cl. 148-12.70A.
Societe d'Etudes et de Developpement des Aeroglisseurs Marins, Terrestrea et Amphibies S.E.D.A.M.: *See—*
Bertin, Jean Henri; Guienne, Paul; and Lafont, Andre, 4,042,060, Cl. 180-127.000.
Societe Nationale des Petroles d'Aquitaine: *See—*
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Societe Nationale des Poudres et Explosifs: *See—*
Thevenin, Michel J.; Brun, Michel; Boileau, Jacques; and Pegoud, Joseph, 4,041,866, Cl. 102-24.0HC.
Sodeberg, Earl W.: *See—*
Meginnis, George B.; and Sodeberg, Earl W., 4,042,162, Cl. 228-106.000.
Soding TV GmbH & Co. Bild & Ton International: *See—*
Freisleben, Reinhard, 4,042,297, Cl. 353-109.000.
SOFISA (Societe Financiere S.A.): *See—*
Coster, Norbert, 4,042,284, Cl. 308-219.000.
Sokoloski, Martin M., to United States of America, Army. Radiation hardened field effect device. 4,042,946, Cl. 357-25.000.
Sokolov, Uriel S.: *See—*
Cestaro, John P.; Hebbar, Ranna K.; and Sokolov, Uriel S., 4,042,177, Cl. 241-20.000.
Solo Cup Company: *See—*
Gerben, Ralph D., 4,042,148, Cl. 221-222.000.
Solter, Dieter: *See—*
Sabloewski, Horst; Schurbrock, Klaus; and Solter, Dieter, 4,041,764, Cl. 73-425.600.
Sommars, Mark Frederick: *See—*
Goloff, Alexander; and Sommars, Mark Frederick, 4,041,803, Cl. 74-574.000.
Sommerville, Robert E. Planter box. 4,041,643, Cl. 47-66.000.
Sontrix Division of Pittway Corporation: *See—*
Hackett, Kenneth R., 4,042,845, Cl. 310-322.000.
Sony Corporation: *See—*
Kawakami, Hirotake; Takada, Kantaro; and Fukumoto, Toru, 4,042,438, Cl. 156-272.000.
Yamanaka, Seisuke, 4,042,956, Cl. 358-41.000.
Yoshida, Tadao, 4,042,944, Cl. 357-23.000.
Sorgente, Nino: *See—*
Kuettner, Klaus E.; Eisenstein, Reuben; and Sorgente, Nino, 4,042,457, Cl. 195-1.800.
Sotec Corporation: *See—*
Reitz, Norman E., 4,042,447, Cl. 156-610.000.
Soures, Nicholas M.: *See—*
Quinn, H.; and Soures, Nicholas M., 4,042,874, Cl. 323-4.000.
Southwire Company: *See—*
Niehaus, Howard E.; Hass, Winfield M.; Alpha, Homer G.; Hall, Sidney B.; and Traenkner, Frederick O., 4,042,227, Cl. 266-93.000.
Sowell, Miles L.: *See—*
Skinner, David R.; Sowell, Miles L.; and Justus, Marvin W., 4,042,025, Cl. 166-250.000.
Spahrkas, Heinrich: *See—*
Backer, Klaus; Heinze, Helga; Luck, Wolfhard; and Spahrkas, Heinrich, 4,042,321, Cl. 8-94.260.
Spector, Donald. Underwater thermal energy conversion unit. 4,041,707, Cl. 60-641.000.
Spector, Sidney, to Hoffmann-La Roche Inc. Endogenous morphine-like compound. 4,042,682, Cl. 424-95.000.
Speicher, Vernon L.: *See—*
Purdy, David L.; Speicher, Vernon L.; Shipko, Frederick J.; and Johnson, William L., 4,041,956, Cl. 128-419.00P.
Spence-Bate, Harry Arthur Hele. Self-contained single or multiple cassettes and drives. 4,042,300, Cl. 355-73.000.
Spencer, Harvey J., to Paper Converting Machine Company. Method and apparatus for transverse cutting. 4,041,813, Cl. 83-14.000.
Spengler, Ernst M., to Stanztechnik GmbH Roeder & Spengler. Apparatus for separating punched-out workpieces from the surrounding waste material. 4,041,847, Cl. 93-36.00A.
Sperry Rand Corporation: *See—*
Bohman, Carl E.; Durling, Hubert R., Jr.; Susman, Leon; and Rolfe, Norman F., 4,042,132, Cl. 214-42.00A.
Schaffer, Richard Earl; and Rauschelbach, Paul Allen, 4,042,867, Cl. 318-580.000.
Spinks, Ray E.: *See—*
Turner, James Wesley, deceased; and Spinks, Ray E., 4,041,580, Cl. 24-265.0AL.
Sprong, Edmund Jay. Fabric pleater guide including a pleat former. 4,042,155, Cl. 223-34.000.
Stackman, Robert W.: *See—*
Davis, Gerald A.; and Stackman, Robert W., 4,042,618, Cl. 260-470.000.
DeEdwardo, Andrew H.; Zitomer, Fred; Stackman, Robert W.; and Kramer, Charles E., 4,042,561, Cl. 260-45.9NP.
Stackpole Components Company: *See—*
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Stadler, Donald: *See—*
Furlette, James L.; and Stadler, Donald, 4,042,104, Cl. 198-774.000.
Staheli, Paul; and Moser, Robert, to Rieter Machine Works, Ltd. Method and apparatus for sensing the thickness of a fiber layer on a moving surface. 4,041,770, Cl. 73-37.500.
Stahlecker, Fritz: *See—*
Stahlecker, Hans. 4,041,688, Cl. 57-104.000.
Stahlecker, Hans, to Stahlecker, Fritz; and Stahlecker, Hans. Bearing means for spinning rotors of an open-end spinning machine. 4,041,688, Cl. 57-104.000.
Stakmore Co., Inc.: *See—*
Schankman, Milton, 4,041,880, Cl. 108-112.000.
Stamicarbon B.V.: *See—*
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Standard Alliance Industries, Inc.: *See—*
Duncan, Leroy A.; and Aksamit, Steve M., 4,042,113, Cl. 209-74.00R.
Standard Conveyor Company: *See—*
Krammer, Robert; and McClellan, Michael T., 4,042,101, Cl. 198-460.000.
Standard Oil Company: *See—*
Callahan, James L.; Miller, Arthur F.; and Shaw, Wilfrid G., 4,042,153, Cl. 222-207.000.
Fahrig, Robert J.; and Timm, Terry W., 4,042,489, Cl. 208-152.000.
Greene, Janice L., 4,042,599, Cl. 260-326.5FN.
Shaw, Wilfrid G.; Terrill, David B.; and Woodbury, David R., 4,042,533, Cl. 252-437.000.
Standard Oil Company (Indiana): *See—*
Fields, Ellis K., 4,042,531, Cl. 252-438.000.
Hanson, Robert B.; and Stephens, James R., 4,042,750, Cl. 428-423.000.
Raimondi, Victor V.; Fox, Roy A.; and Piorkowski, Casey E., 4,042,555, Cl. 260-29.6RB.
Skinner, David R.; Sowell, Miles L.; and Justus, Marvin W., 4,042,025, Cl. 166-250.000.
Standard Pressed Steel Co.: *See—*
Clark, Leonard R.; and Meehl, David W., 4,042,097, Cl. 211-182.000.
Ruediger, Frederick, 4,041,600, Cl. 29-513.000.
Stansfield, James Frederick: *See—*
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Stanton, Stephen: *See—*
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Stanztechnik GmbH Roeder & Spengler: *See—*
Spengler, Ernst M., 4,041,847, Cl. 93-36.00A.
Starks, Charles M., to Continental Oil Company. Telomers from β-diketones and vinyl chloride. 4,042,631, Cl. 260-593.00H.
Stauffer Chemical Company: *See—*
Arneklev, Duane R.; and Baker, Don R., 4,042,371, Cl. 71-88.000.
Kim, Ki Soo, 4,042,542, Cl. 260-6.000.
Magee, Walter L., Jr., 4,042,612, Cl. 260-448.80R.
Stayton, Leroy M.; and Gould, Robert A., to United States of America, Navy. Shock buffer for liquid propellant gun projectile. 4,041,871, Cl. 102-95.000.
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Steck, Warren F.: *See—*
Underhill, Edward W.; Chisholm, Melvin D.; Steck, Warren F.; Bailey, Berton K.; Lamb, Peter M.; Struble, Dean L.; and Swailes, G. Edward, 4,042,681, Cl. 424-84.000.
Steele, Edward R., to Tektronix, Inc. Cathode ray storage tube having a target dielectric provided with collector electrode segments extending therethrough. 4,042,390, Cl. 96-36.100.
Steele, William Henry; and Nejtek, George. Carburettors and associated components. 4,041,911, Cl. 123-103.00B.
Steeves, Claire L. Scouring sleeve for use with swimming pool cleaner. 4,041,563, Cl. 15-1.700.
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Ackermann, Rolf; Morlock, Gerhard; and Stehlik, Gerhard, 4,042,525, Cl. 252-106.000.
Steiger, Anton, to Sulzer Brothers Limited. Hydrostatic piston machine. 4,041,844, Cl. 92-58.000.
Steigerwald, Robert L., to General Electric Company. Chopper ballast for gaseous discharge lamps with auxiliary capacitor energy storage. 4,042,856, Cl. 315-246.000.
Stenberg, Nyyrikki K., to Dart Industries, Inc. Linear response flow meter. 4,041,758, Cl. 73-207.000.
Stendel, Wilhelm: *See—*
Hofer, Wolfgang; Maurer, Fritz; Riebel, Hans-Jochem; and Stendel, Wilhelm, 4,042,690, Cl. 424-200.000.
Stephens, James R.: *See—*
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Stepien, George, Jr.; Califano, Frank L., deceased; DeLorenzo, William, Jr., co-executor; Gillard, G. Bruce, co-executor; Russell, Thomas E., deceased; and by Russell, Florence P., executrix, to Flintkote Company, The. Method for reducing water loss through soil by seepage. 4,041,712, Cl. 61-36.00R.
Sterling, Walter S., to Pneumatic Scale Corporation. Air controlled switch. 4,042,099, Cl. 198-393.000.
Sterrett, Charles C.; and Mole, Cecil J., to Westinghouse Electric Corporation. Unitary supporting structure for superconducting field assembly. 4,042,846, Cl. 310-52.000.
Stevens, Arthur William. Visual display board or panel. 4,041,631, Cl. 40-124.200.
Stewart, Donald Ferguson: *See—*
Martin, Anwyn Margaret; Stewart, Donald Ferguson; and Swanson, Andrew Baikie, 4,042,375, Cl. 75-4.000.
Stewart Engineering & Equipment Co.: *See—*
Bowdry, William Perrin, III; and Wickam, Irwin Edward, 4,042,124, Cl. 214-6.0DS.
Stewart, Robert H., to Practical Systems, Inc. Alignment device. 4,041,649, Cl. 51-165.740.
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Pugh, Stuart; and Stokoe, Ridley, 4,042,135, Cl. 214-141.000.
Stone Container Corporation: *See—*
Selin, Howard; and Marker, John R., Jr., 4,042,166, Cl. 229-33.000.
Stone, William Bundy, to Deep Sea Grouting Packers, Inc. Sealing devices. 4,041,718, Cl. 61-86.000.
Stora Kopparbergs Bergslags Aktiebolag: *See—*
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Stork Brabant B.V.: *See—*
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Stoyer, Ray L., to Irvine Ranch Water District. Pressure pipe treatment for sewage. 4,042,494, Cl. 210-7.000.
Strandgard, Larry W. Board golf game. 4,042,246, Cl. 273-134.0CG.
Strandly, Ingvald: *See—*
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Streckert, Ernest H.: *See—*
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Street, Dana C.; and Padgett, Clarence W., to Rockwell International Corporation. MOS inverting power driver circuit. 4,042,838, Cl. 307-270.000.
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Ottmann, Norman; and Strever, Walter, 4,042,315, Cl. 425-392.000.
Strickman, Melvyn B.: *See—*
Strickman, Robert L.; and Strickman, Melvyn B., 4,042,543, Cl. 260-17.40R.
Strickman, Robert L.; and Strickman, Melvyn B. Material for stoppers. 4,042,543, Cl. 260-17.40R.
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Richards, Glenn L., 4,042,787, Cl. 179-84.0VF.
Richards, Glenn L., 4,042,788, Cl. 179-84.0VF.
Richards, Glenn L., 4,042,789, Cl. 179-84.0VF.
Richards, Glenn L., 4,042,790, Cl. 179-84.0VF.
Strong, Herbert M., to General Electric Company. Novel diamond products and the manufacture thereof. 4,042,673, Cl. 423-446.000.
Struble, Dean L.: *See—*
Underhill, Edward W.; Chisholm, Melvin D.; Steck, Warren F.; Bailey, Berton K.; Lamb, Peter M.; Struble, Dean L.; and Swailes, G. Edward, 4,042,681, Cl. 424-84.000.
Structural Instrumentation, Inc.: *See—*
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Strunc, Gerald R.: *See—*
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Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythemic agents. 4,042,692, Cl. 424-244.000.
Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythemic agents. 4,042,709, Cl. 424-304.000.
Strycker, Stanley J., to Dow Chemical Company, The. Substituted phenoxyalkyl quaternary ammonium compounds as antiarrhythemic agents. 4,042,712, Cl. 424-329.000.
Stubbs, John K.: *See—*
Acheson, Richard M.; Stubbs, John K.; Baxter, Charles A. R.; and Kuhla, Donald E., 4,042,583, Cl. 542-458.000.
Stunkel, Barry A. Dual-solenoid safety valve. 4,041,842, Cl. 91-448.000.
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Suggitt, Robert M.; and Gates, Walter C., Jr., to Texaco Inc. Hydrocarbon upgrading process. 4,042,490, Cl. 208-264.000.
Sugihara, Kunihiko; Nakajima, Yasuo; and Hayashi, Yoshimasa, to Nissan Motor Company, Limited. Exhaust gas recirculation system with control apparatus for exhaust gas flow control valve. 4,041,914, Cl. 123-119.00A.
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Sullins, John K., to Canton Textile Mills, Inc. Liquid aeration device. 4,042,510, Cl. 210-220.000.
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Grotloh, Karlheinz, 4,041,979, Cl. 137-599.200.
Grotloh, Karlheinz, 4,041,980, Cl. 137-599.200.
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Sumitomo Chemical Company, Limited: *See—*
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Sumitomo Electric Industries, Ltd.: *See—*
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Uesugi, Minoru; Ihara, Susumu; and Mizuuchi, Katsumi, 4,041,610, Cl. 33-127.000.
Sumitomo Metal Mining Company Limited: *See—*
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Sun Oil Company: *See—*
Rhodes, Charles F., Jr., 4,042,885, Cl. 330-9.000.
Sundberg, Erik; and Westberg, Erik, to Aktiebolaget Tudor. Methods and apparatus for producing sheaths for battery electrodes. 4,042,436, Cl. 156-182.000.
Sundermann, Rudolf, to Bayer Aktiengesellschaft. s-Triazine prepolymers and a process for their production. 4,042,567, Cl. 260-49.000.
Sundstrand Corporation: *See—*
Schmohe, James S., 4,042,088, Cl. 192-114.00R.
Superior Oil Company, The: *See—*
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Susman, Leon: *See—*
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Sussman, Sy. Hygienic jet. 4,041,553, Cl. 4-7.000.
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Cole, David F.; and Sutcliffe, Walter, 4,041,555, Cl. 4-10.000.
Suzuki, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas recirculation system. 4,041,917, Cl. 123-119.00A.
Svenska Rotor Maskiner Aktiebolag: *See—*
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Swihart, Terence J., to Dow Corning Corporation. Enhancing flame retardancy with arylorganobromosilicone compounds. 4,042,563, Cl. 260-45.90K.
Sykora, Allan J., to Stackpole Components Company. Slide switch contact having plural flexible slats providing make before break contact engagement. 4,042,795, Cl. 200-16.00D.
Sylvester, Robert A., to Eastman Kodak Company. Fluid receiving trap with air releasing means comprising a processing composition impervious layer. 4,042,396, Cl. 96-76.00C.

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Tabler, Donald C.: *See—*
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Tagaya, Kiyoshi: *See—*
Seguchi, Koji; Sugita, Minoru; Inada, Kazuyoshi; Tagaya, Kiyoshi; and Nakamura, Yuji, 4,042,487, Cl. 208-48.00R.

Taich, Albert; and Gill, Theodore, to Consumer Tire & Supply Co., Inc. Apparatus for locating punctures in tires. 4,041,772, Cl. 73-45.600.

Taira, Kataro: *See—*
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Taishin Kohgyo Co., Ltd.: *See—*
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Tajima, Akiyoshi, to Osaka Welding Industrial Co., Ltd. Metal spraying apparatus. 4,041,898, Cl. 118-301.000.

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Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, to Dai Nippon Printing Co., Ltd.; and Shin-Etsu Chemical Co., Ltd. Benzophenone derivatives and their preparation and application. 4,042,613, Cl. 260-448.20B.

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Yamamoto, Kousuke; Takenaka, Shinji; Maeda, Kazuo; and Mituta, Michio, 4,042,675, Cl. 423-515.000.

Takeuchi, Kazuaki, to Chuo Hatsujo Kogyo Co., Ltd. Pipe hanger. 4,042,198, Cl. 248-62.000.

Tamura, Humio: *See—*
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Tan, Jozef I. Kie Sioe: *See—*
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Tang, Louis S.; Runkle, Dean E.; and Bach, Lloyd G., to Bendix Corporation, The. Accumulator for use in a hydraulic system. 4,041,990, Cl. 138-31.000.

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Tanner, Herbert: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; Junkermann, Helmut; Pohl, Gerhard; and Tanner, Herbert, 4,042,716, Cl. 426-335.000.

Tarakci, Umit, to Rockwell International Corporation. Photolithographic method of making microcircuits using glycerine in photoresist stripping solution. 4,042,387, Cl. 96-36.000.

Tarasuk, Walter Renald: *See—*
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Tate & Lyle Limited: *See—*
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Tatsukami, Yoshiharu; Okada, Mitsuyuki; and Takahashi, Tsutomu, to Sumitomo Chemical Company, Limited. Method for preparation of ionically crosslinked ethylene copolymers. 4,042,766, Cl. 526-47.000.

Taylor, Barry Edward: *See—*
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Taylor, Clarence R. Safety closure for a container and method for opening the closure. 4,042,105, Cl. 206-1.500.

Taylor, Donald R.: *See—*
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Taylor, George A.: *See—*
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Taylor, Henry F., to United States of America, Navy. Electro-optic binary adder. 4,042,814, Cl. 235-175.000.

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Teijin Limited: *See—*
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Tekken Construction Co. Ltd.: *See—*
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Tektronix, Inc.: *See—*
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Telefonaktiebolaget L M Ericsson: *See—*
Heinonen, Stig Teodor; and Johansson, Gustav Gunnar, 4,042,289, Cl. 339-17.0LC.

Telephone Electronics Corporation: *See—*
Bellenger, Donald M., 4,042,793, Cl. 179-90.00K.

Tenna Corporation: *See—*
Repay, Laszlo N.; and Young, Thomas A., 4,041,793, Cl. 74-424.80R.

Tensmeyer, Lowell G., to Eli Lilly and Company. Method of killing microorganisms in the inside of a container utilizing a plasma initiated by a focused laser beam and sustained by an electromagnetic field. 4,042,325, Cl. 21-54.00R.

Terada, Ichiro; Yamada, Tadashi; Nishi, Michio; Uchida, Mitsuo; Sugiyama, Naomasa; Kaneko, Mamoru; and Takeda, Nobuhiko, to Mitsubishi Chemical Industries Limited; and Yoshino Gypsum Co., Ltd. Water repellent gypsum composition. 4,042,409, Cl. 106-111.000.

Teraoka, Yoshiaki: *See—*
Inaba, Mitugu; Kouguchi, Noriyuki; Kagawa, Masao; Hosho, Kozo; and Teraoka, Yoshiaki, 4,041,686, Cl. 57-34.00R.

Terlesky, John; Muller, Hugh Emil; Murphy, John C.; and Honath, Harold F., to Pittsburgh-Des Moines Steel Company. Impact resistant tank for cryogenic fluids. 4,041,722, Cl. 62-45.000.

Terrill, David B.: *See—*
Shaw, Wilfrid G.; Terrill, David B.; and Woodbury, David R., 4,042,533, Cl. 252-437.000.

Terry, Morris B. Mechanical aerobic composter. 4,042,219, Cl. 259-88.000.

Teti, John J. Power actuated lazy-tongs arrangement. 4,041,799, Cl. 74-521.000.

Teti, Joseph A., Jr.: *See—*
Breton, Ernest J.; Worden, Dexter; and Pugh, Melville E., Jr., 4,042,747, Cl. 428-323.000.

Teti, William C.: *See—*
Breton, Ernest J.; Worden, Dexter; and Pugh, Melville E., Jr., 4,042,747, Cl. 428-323.000.

Texaco Inc.: *See—*
Allen, Joseph C.; and Woodward, Charles D., 4,042,027, Cl. 166-260.000.
Knifton, John F., 4,042,530, Cl. 252-415.000.
Perciful, Jerry C., 4,042,488, Cl. 208-102.000.
Pitts, Robert W., Jr.; and Whatley, Houston A., Jr., 4,042,824, Cl. 250-263.000.
Suggitt, Robert M.; and Gates, Walter C., Jr., 4,042,490, Cl. 208-264.000.

Texas Instruments Incorporated: *See—*
Chang, Christopher Teh-Min, 4,042,916, Cl. 340-174.0TF.
Ezell, George D., 4,042,906, Cl. 340-15.5TS.
Kilby, Jack S., 4,042,948, Cl. 357-49.000.
Robinson, John Thomas; and Edwards, Richard A., 4,042,951, Cl. 357-67.000.

Textoris, Melvin A.; and Wahl, William, to GF Business Equipment, Inc. Furniture article. 4,041,881, Cl. 108-159.000.

Th. Goldschmidt AG: *See—*
Brugger, Wilhelm; and Greinacher, Ekkehard, 4,042,672, Cl. 423-419.00R.
Lammerting, Helmut; Langenhagen, Rolf-Dieter; Rossmy, Gerd; and Zaske, Peter, 4,042,540, Cl. 260-2.5AH.

Thagard Technology Company: *See—*
Matovich, Edwin, 4,042,334, Cl. 23-252.00R.

Thale, James S.: *See—*
Sheldon, Loren B.; Tomashek, James R.; Kelly, Robert R.; Thale, James S.; Shah, Jashwant C.; and Ward, Donald H., 4,042,123, Cl. 214-2.500.

Theriault, Maurice N., to Composite Structures Corporation. Racket. 4,042,238, Cl. 273-73.00C.

Thevenin, Michel J.; Brun, Michel; Boileau, Jacques; and Pegoud, Joseph, to Societe Nationale des Poudres et Explosifs; and Etat Francais. Process for the manufacture of a bimetallic facing for hollow charges. 4,041,866, Cl. 102-24.0HC.

Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad. Metal anode for electro-chemical processes. 4,042,484, Cl. 204-290.00F.

Thoma, Otto: *See—*
Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, 4,042,713, Cl. 424-330.000.

Thomas, Harold A., to General Atomic Company. Electrical cable. 4,042,826, Cl. 250-336.000.

Thomas, Jerald F.: *See—*
Gregory, Charles E.; Brian, Michael; Thomas, Jerald F.; and Cameron, James F., 4,041,554, Cl. 4-10.000.

Thomas, Jerry D.; Hladio, William F.; and Scott, Leo V., to Republic Steel Corporation. Control of inclusion morphology in steel. 4,042,381, Cl. 75-129.000.

Thompson, Donald O.: *See—*
Morris, Winfred L.; and Thompson, Donald O., 4,041,774, Cl. 73-67.900.

Thompson, Stephen E., to McCulloch Corporation. Chain saw with flexible skid and vibration and resonance reducing means. 4,041,606, Cl. 30-381.000.

Thompson, Thomas L. Support structure for a floatable marine dock. 4,041,716, Cl. 61-48.000.

Thorwaldsen, Stanley E.: *See—*
Seifert, Lester H.; Powers, Raymond P.; Schmidt, William M.; Thorwaldsen, Stanley E.; and Smith, Frederick W., 4,041,679, Cl. 56-11.300.

Thune, Robert H., to General Motors Corporation. Rib trimming of universally molded battery container. 4,041,603, Cl. 29-623.100.

Tibbett, John H.: *See—*
Clinch, Colin W. F.; James, Peter A. R.; and Tibbett, John H., 4,042,267, Cl. 292-318.000.

Timm, Terry W.: *See—*
Fahrig, Robert J.; and Timm, Terry W., 4,042,489, Cl. 208-152.000.

Tokai TRW & Co. Ltd.: *See—*
Abe, Michio; and Maeda, Naoyuki, 4,041,922, Cl. 123-191.00S.

Tokuno, Masateru, to Rengo Kabushiki Kaisha. Blank feeding machine. 4,042,234, Cl. 271-151.000.

Tokyo Electric Power Co. Ltd.: *See—*
Nikaido, Teruji; Haga, Kaoru; and Fujiwara, Yasutaka, 4,042,969, Cl. 361-107.000.

Tomashek, James R.: *See—*
Sheldon, Loren B.; Tomashek, James R.; Kelly, Robert R.; Thale, James S.; Shah, Jashwant C.; and Ward, Donald H., 4,042,123, Cl. 214-2.500.

Tomczak, Lawrence William; Crall, Frederick William; Caron, LaVerne Andrew; and Campau, Walter Joseph, to Chrysler Corporation. Vacuum servo actuated variable inductance transducer. 4,042,899, Cl. 336-30.000.

Tomita, Sadami; and Chiba, Akio, to Hitachi, Ltd. Pole piece for use in magnet device and method for manufacturing same. 4,042,898, Cl. 335-297.000.

Tone, Frederick F.; and Borel, Robert J., to Eastman Kodak Company. Integral film unit with intermediate sheet forming a fluid reservoir with one end portion thereof. 4,042,395, Cl. 96-76.00C.

Tooley, Earl C., to Chicago Pneumatic Tool Company. Air pulse noise damper for a pneumatic tool. 4,042,062, Cl. 181-36.00A.

Topchiashvili, Mikhail Izmailovich: *See—*
Andrianov, Kuzma Andrianovich; Topchiashvili, Mikhail Izmailovich; Khananashvili, Lotary Mikhailovich; Pagava, Dali Georgievna; and Shermazanashvili, Nikolai Alexandrovich, 4,042,534, Cl. 252-511.000.

Topham, Arthur: *See—*
Hauxwell, Frank; Stansfield, James Frederick; and Topham, Arthur, 4,042,413, Cl. 106-308.00N.

Toran, Angel, to Patentes Talgo, S.A. Speed and track curvature suspension control system. 4,041,878, Cl. 105-164.000.

Toray Industries, Inc.: *See—*
Inaba, Mitugu; Kouguchi, Noriyuki; Kagawa, Masao; Hosho, Kozo; and Teraoka, Yoshiaki, 4,041,686, Cl. 57-34.00R.

Torres, Anibal, to Pfizer Inc. Polydextrose-based farinaceous compositions. 4,042,714, Cl. 426-62.000.

Torsch, Charles E.: *See—*
Hovey, Frederick A.: and Torsch, Charles E., 4,042,857, Cl. 315-368.000.

Totty, Kenneth D.: *See—*
Anderson, Buddy W.; Bowles, Bobby K.; Murphey, Joseph R.; Totty, Kenneth D.; and Young, Bill M., 4,042,032, Cl. 166-276.000.

Towmotor Corporation: *See—*
Murray, Kenneth R., 4,042,306, Cl. 403-118.000.

Townsend, Todd V.: *See—*
Lima, Paul J.; and Townsend, Todd V., 4,042,794, Cl. 179-175.30R.

Toyo Kogyo Co., Ltd.: *See—*
Miyake, Kenji; Kumon, Hiroshi; Zitukane, Yoshimaru; and Akutagawa, Shigeru, 4,042,385, Cl. 75-224.000.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Baba, Takashi, 4,042,072, Cl. 188-71.800.
Konishi, Masami; and Oono, Eishi, 4,041,923, Cl. 123-191.00S.
Nakamura, Norihiko, 4,041,909, Cl. 123-32.0SP.
Nohira, Hidetaka, 4,041,913, Cl. 123-119.00A.
Okamoto, Takamitsu, 4,041,700, Cl. 60-278.000.
Shishido, Yoshio, 4,041,796, Cl. 74-493.000.
Suzuki, Yukio, 4,041,917, Cl. 123-119.00A.

Traenkner, Frederick O.: *See—*
Niehaus, Howard E.; Hass, Winfield M.; Alpha, Homer G.; Hall, Sidney B.; and Traenkner, Frederick O., 4,042,227, Cl. 266-93.000.

Tram/Diamond Corporation: *See—*
O'Callaghan, James S., 4,042,201, Cl. 248-309.00R.

Transco Energy Company: *See—*
Cook, Harold L., Jr.; and Geer, Ernest C., 4,042,034, Cl. 166-314.000.

Transports-Recherches-Etudes et Groupement d'Interet Economique (Tregie): *See—*
Michel, Robert, 4,041,876, Cl. 104-130.000.

Trefimetaux: *See—*
Moreau, Marc, 4,041,745, Cl. 72-60.000.

Tribotech: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,042,283, Cl. 308-15.000.

Troncoso, Fernando, Jr.; and Bomar, Scott Lewis. Bowstring release device. 4,041,926, Cl. 124-35.00A.

Trouiller, Jean Claude; and Lafont, Guy, to Schlumberger Technology Corporation. Apparatus for preventing cycle skipping in processing acoustic well-logging signals. 4,042,907, Cl. 340-15.5BH.

True, Martin E.: *See—*
Holland, Warren E.; and True, Martin E., 4,042,033, Cl. 166-310.000.

Trueb, Werner, to Sandoz Ltd. Di-(acyloxyalkyl)-β-haloethane-phosphonates and dithiophosphonates and use as plant growth regulators. 4,042,370, Cl. 71-86.000.

TRW Inc.: *See—*
Glorioso, Paul A., 4,042,800, Cl. 219-98.000.

Tsao, Utah, to Lummus Company, The. Oxychlorination of hydrocarbons. 4,042,640, Cl. 260-659.00A.

Tscheulin, Guenther: *See—*
Hofer, Kurt; and Tscheulin, Guenther, 4,042,562, Cl. 260-45.8NT.

Tsuboi, Kunitada: *See—*
Yasuoka, Yoshio; Ito, Fumihiko; Tsuboi, Kunitada; Jinno, Kaori; and Yamano, Masaru, 4,042,851, Cl. 315-39.510.

Tsuchiya, Mitsuru: *See—*
Misaka, Yasunao; Tanaka, Ikuo; Okada, Hiroo; Goto, Chuichi; Hirota, Moriyuki; Uesugi, Masaaki; and Tsuchiya, Mitsuru, 4,042,500, Cl. 210-189.000.

Tsuda, George I.: *See—*
Ajioka, James S.; and Tsuda, George I., 4,042,935, Cl. 343-795.000.

Tsukahara, Masaharu: *See—*
Kojima, Shigeru; Kojima, Kiyoshi; Ohtani, Tadao; Kato, Nobuyuki; Sakamoto, Yoichi; Konno, Isago; Tsukahara, Masaharu; and Kubo, Takao, 4,042,429, Cl. 148-31.550.

Tsukasaki, Yasuhiro. Apparatus for folding carton sheet. 4,041,849, Cl. 93-52.000.

Tsukisaka, Tsuneo, to Honda Giken Kogyo Kabushiki Kaisha. Apparatus for preventing fuel from leaking on turnover of a vehicle. 4,041,967, Cl. 137-39.000.

Tsushima, Sakae; Misumi, Teruyuki; and Murakoshi, Masahiko, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing improved cation-exchange membranes. 4,042,496, Cl. 210-23.00R.

Tucky, Jane M., to Lofstedt, Ben E. Toilet roll tissue dispenser. 4,042,159, Cl. 225-15.000.

Tuller, Harold W.; and Nussbaum, Ralph W., to Allied Chemical Corporation. Encapsulant compositions based on anhydride-hardened epoxy resins. 4,042,550, Cl. 260-280.00P.

Tully, William Howard, to Environmental Elements Corporation. Electrostatic precipitator having an improved discharge and collector electrode system and gas distribution means. 4,042,354, Cl. 55-129.000.

Turner, James Wesley, deceased (by Heim, Thomas M., executor); and Spinks, Ray E., to United States of America, Navy. Separable link connector. 4,041,580, Cl. 24-265.0AL.

Tuscarora Cotton Mill: *See—*
Lambert, John Wesley, Jr., 4,041,690, Cl. 57-144.000.

Tyler, Hugh J.: *See—*
Newell, Dennis E.; and Tyler, Hugh J., 4,042,966, Cl. 361-27.000.

Tyrefors, Lars: *See—*
Ekman, Bjorn; and Tyrefors, Lars, 4,042,170, Cl. 229-62.500.

UBE Industries, Ltd.: *See—*
Itatani, Hiroshi; Kashima, Mikito; Shiotani, Akinori; Yoshimoto, Hataaki; and Kato, Tetuo, 4,042,603, Cl. 260-346.20M.

Uchida, Mitsuo: *See—*
Terada, Ichiro; Yamada, Tadashi; Nishi, Michio; Uchida, Mitsuo; Sugiyama, Naomasa; Kaneko, Mamoru; and Takeda, Nobuhiko, 4,042,409, Cl. 106-111.000.

Ueno, Eijiro, to Ueno Kohgyo Ltd.; and Taishin Kohgyo Co., Ltd. Conveyance truck with movable seal plates. 4,042,190, Cl. 243-32.000.

Ueno Kohgyo Ltd.: *See—*
Ueno, Eijiro, 4,042,190, Cl. 243-32.000.

Uesugi, Masaaki: *See—*
Misaka, Yasunao; Tanaka, Ikuo; Okada, Hiroo; Goto, Chuichi; Hirota, Moriyuki; Uesugi, Masaaki; and Tsuchiya, Mitsuru, 4,042,500, Cl. 210-189.000.

Uesugi, Minoru; Ihara, Susumu; and Mizuuchi, Katsumi, to Sumitomo Electric Industries, Ltd. Apparatus for precise measurement of the length of long length materials. 4,041,610, Cl. 33-127.000.

Ugo, John Walter, to Uniroyal, Inc. Apparatus for improving tire uniformity. 4,041,647, Cl. 51-106.00R.

Ulrich, Hannsjorg: *See—*
Auel, Theodor; Ulrich, Hannsjorg; Wasel-Nielen, Horst-Dieter; and Heymer, Gero, 4,042,324, Cl. 21-2.70A.

Unbehaun, Karl: *See—*
Franke, Johannes; Kessler, Kurt; Muller, Wolfgang; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,042,318, Cl. 432-210.000.

Underhill, Edward W.; Chisholm, Melvin D.; Steck, Warren F.; Bailey, Berton K.; Lamb, Peter M.; Struble, Dean L.; and Swailes, G. Edward, to Canadian Patents and Development Limited. Composite attractant for Bertha Armyworm moth. 4,042,681, Cl. 424-84.000.

Union Carbide Corporation: *See—*
Acomb, Byron Hillen; and Dolida, Roger Joseph, 4,041,969, Cl. 137-88.000.
Anderson, John Erling, 4,042,345, Cl. 48-209.000.
Jones, Richard Calvin; and Anthes, Clifford Charles, 4,042,225, Cl. 266-75.000.
Kozak, Theodore Frederick, 4,041,949, Cl. 128-287.000.
Matsch, Ladislas Charles; and Drnevich, Raymond Francis, 4,042,493, Cl. 210-6.000.
Molinski, Victor Joseph; and Peacock, Frank Raymond, 4,042,676, Cl. 424-1.000.
Molinski, Victor Joseph; and Wilczewski, Joseph Arthur, 4,042,677, Cl. 424-1.000.
Smith, Derek Reginald, 4,041,599, Cl. 29-451.000.
Van Den Sype, Jaak Stefaan; Kilinskas, William Alphonse; Mazzarella, Richard Benedict; and Lightstone, John Bernard, 4,042,421, Cl. 148-12.00E.

Van den Sype, Jaak Stefaan; Kilinskas, William Alphonse; and Mazzarella, Richard Benedict, 4,042,423, Cl. 148-12.00B.
Union Cooperative Agricole Laitiere de la Manche: *See—*
Eustache, Jean-Marie, 4,042,575, Cl. 260-112.00R.
Eustache, Jean-Marie, 4,042,576, Cl. 260-112.00R.
Union Oil Company of California: *See—*
McArthur, Dennis P., 4,042,532, Cl. 252-466.00J.
Uniroyal, Inc.: *See—*
Cornell, Robert J., 4,042,647, Cl. 260-880.00R.
Larson, Charles E.; and Nojiri, Richard T., 4,042,743, Cl. 428-306.000.
Ugo, John Walter, 4,041,647, Cl. 51-106.00R.
Unit Process Assemblies, Inc.: *See—*
Weinstock, Jacques J., 4,042,880, Cl. 324-64.000.
Unitec, Inc.: *See—*
Webb, William, Jr., 4,042,881, Cl. 324-123.00R.
U.S. Billiards, Inc.: *See—*
Hazeltine, Barrett; De Meo, Edgar; and Simon, Richard M., 4,042,491, Cl. 209-74.00R.
United States of America
Agriculture: *See—*
Palmer, Thomas Y.; and Auvil, Clifford J., 4,041,759, Cl. 73-231.00R.
Army: *See—*
Germanowski, Frank; and Kazura, John A., 4,042,938, Cl. 346-61.000.
Helms, Howard D., 4,042,927, Cl. 343-18.00E.
McCown, Thomas E.; McClymonds, Ken A.; and Halprin, Robert W., 4,041,872, Cl. 102-105.000.
Sokoloski, Martin M., 4,042,946, Cl. 357-25.000.
Energy Research and Development Administration: *See—*
Visioli, Armando J., Jr., 4,042,876, Cl. 324-34.00D.
National Aeronautics and Space Administration: *See—*
Anderson, Roy E.; Brisken, Alex F.; and Lewis, James R., 4,042,926, Cl. 343-17.700.
Coffinberry, George A.; and Kast, Howard B., 4,041,697, Cl. 60-39.28R.
Houseman, John, 4,041,910, Cl. 123-59.0EC.
Navy: *See—*
Atkinson, E. Ronald, 4,042,829, Cl. 250-550.000.
Breslow, B. Arthur, 4,042,432, Cl. 149-89.000.
Cobb, A. Donn, 4,042,904, Cl. 340-6.00R.
Decker, Louise A.; and Langford, Gary O., 4,042,823, Cl. 250-227.000.
Falterman, Charles W.; Griffith, William J.; and Gryting, Harold J., 4,042,430, Cl. 149-19.300.
Fenneman, David B., 4,042,892, Cl. 331-94.50G.
Hunt, Robert E.; and Moore, Kenneth L., 4,042,449, Cl. 156-651.000.
Kellenbenz, Carl W.; Goodman, James P.; and Rector, Randall C., 4,042,830, Cl. 307-40.000.
Lapp, Roger H., 4,042,933, Cl. 343-761.000.
Nyswander, Reuben E., 4,042,837, Cl. 307-265.000.
San Miguel, Anthony, 4,041,869, Cl. 102-56.00R.
Stayton, Leroy M.; and Gould, Robert A., 4,041,871, Cl. 102-95.000.
Taylor, Henry F., 4,042,814, Cl. 235-175.000.
Turner, James Wesley, deceased; and Spinks, Ray E., 4,041,580, Cl. 24-265.0AL.
Wasserman, Bernard; and Kaufman, Martin H., 4,042,441, Cl. 156-306.000.
U.S. Philips Corporation: *See—*
Coulmance, Jean-Pierre Rene; and Six, Jean-Claude Gerard, 4,042,875, Cl. 323-75.00N.
United Technologies Corporation: *See—*
Lewis, George D., 4,041,694, Cl. 60-39.020.
Wooding, Harold C., Jr., 4,042,960, Cl. 358-217.000.
Unitron Corporation: *See—*
Zaderej, George; and Zaderej, Andrew, 4,042,852, Cl. 315-97.000.
Universal Bleacher Company: *See—*
Pari, Vincent Anthony, 4,041,655, Cl. 52-9.000.
Universal Maschinenfabrik Dr. Rudolf Schieber KG: *See—*
Krause, Erich, 4,041,732, Cl. 66-75.200.
University of Leeds Industrial Services Limited: *See—*
Haselden, Geoffrey Gordon; and Handley, Douglas, 4,042,339, Cl. 23-262.000.
Upjohn Company, The: *See—*
Knight, John C.; and Wovcha, Merle G., 4,042,459, Cl. 195-51.00S.
Lin, Chiu-Hong, 4,042,607, Cl. 260-410.90R.
Lin, Chiu-Hong, 4,042,608, Cl. 260-410.90R.
Morozowich, Walter, 4,042,606, Cl. 260-390.000.
Urry, Wilbert Herbert: *See—*
Robertson, Donald Edwin; Urry, Wilbert Herbert; and Kavka, Frank, 4,042,602, Cl. 260-343.410.
Ury, John M., to Wagner Electric Corporation. Service and emergency trailer valve. 4,042,281, Cl. 303-29.000.
Ury, Michael Gerson; Eastlund, Bernard John; Braden, Ray S.; and Wood, Charles H., to Fusion Systems Corporation. Microwave generated radiation apparatus. 4,042,850, Cl. 315-39.000.
Uttech, Raymond, to KARMA division of BRANDT, Inc. Beverage mixing and dispensing machine. 4,042,151, Cl. 222-129.200.
Uurbanus, Elisabeth W.: *See—*
Verbrugge, Pieter A.; and Uurbanus, Elisabeth W., 4,042,616, Cl. 260-468.00G.
Valcour Imprinted Papers, Inc.: *See—*
Collins, Frederick H., 4,042,658, Cl. 264-45.500.
Valleylab, Inc.: *See—*
Morrison, Charles F., Jr.; and Puszman, Alan Z., 4,041,952, Cl. 128-303.130.
Van Dorn Company: *See—*
Henning, George J.; McKinney, Lynn B.; and Scalia, Joseph, 4,042,144, Cl. 220-273.000.
Van Den Sype, Jaak Stefaan; Kilinskas, William Alphonse; Mazzarella, Richard Benedict; and Lightstone, John Bernard, to Union Carbide Corporation. Method for providing strong tough metal alloys. 4,042,421, Cl. 148-12.00E.
Van den Sype, Jaak Stefaan; Kilinskas, William Alphonse; and Mazzarella, Richard Benedict, to Union Carbide Corporation. Method for providing strong wire and strip. 4,042,423, Cl. 148-12.00B.
van der Lely, Cornelis. Rotary harrows with supporting member positioned to protect soil working members. 4,042,038, Cl. 172-59.000.
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van der Lely, Cornelis. Soil cultivating machines. 4,042,042, Cl. 172-91.000.
Van House, Robert M. Archery bow with pivoted bow limbs having rotational synchronizer and adjustable draw force mechanisms. 4,041,927, Cl. 124-61.000.
Vann, Stephen R. Locking device for outboard motor. 4,041,738, Cl. 70-212.000.
Vannice, M. Albert; and Garten, Robert L., to Exxon Research and Engineering Co. Hydrocarbon synthesis from CO and H_2 using Ru supported on a titanium oxide. 4,042,614, Cl. 260-449.00R.
Vannice, M. Albert; and Garten, Robert L., to Exxon Research and Engineering Co. Hydrocarbon synthesis from CO and H_2 using Ni supported on a titanium oxide. 4,042,615, Cl. 260-449.60R.
van Velthoven, Armand J.: *See—*
Koo, Tuh-Kai; and van Velthoven, Armand J., 4,041,896, Cl. 118-48.000.
van Zalm, Fredericus Bastiaan, to B. V. Beverolfabrieken. Anhydrous deep-drawing lubricant. 4,042,515, Cl. 252-56.00R.
Vasiliev, Georgy Konstantinovich: *See—*
Mischenko, Vladimir Petrovich; Oxenenko, Anatoly Yakovlevich; Mischenko, Vladimir Alexandrovich; Vasiliev, Georgy Konstantinovich; Gavrilenko, Jury Alexandrovich; Povelitsa, Vladimir Vasilievich; and Kosenko, Ivan Vasilievich, 4,041,843, Cl. 91-499.000.
Vaughn, Alvie G. Nozzle adapter. 4,042,174, Cl. 239-286.000.
VEB Jenapharm Jena: *See—*
Schmidt, Joachim; Bamberg, Wolfgang; Grunert, Hartmut; Schorm, Erhard; and Weigelt, Christian, 4,042,502, Cl. 210-59.000.
Vedda, Louis: *See—*
Alberny, Robert; and Vedda, Louis, 4,042,008, Cl. 164-147.000.
Veitl, Giswalt, to Vereinigte Osterreichische Eisen- und Stahlwere-Alpine Montan Aktiengesellschaft. Method of producing sheet or plate from rolling stock. 4,041,749, Cl. 72-187.000.
Veltrup, Elmar Michael; and Maasberg, Wolfgang, to Woma-Apparatebau Wolfgang Maasberg & Co. GmbH. Shutoff valve construction particularly for high pressure. 4,042,178, Cl. 251-44.000.
Verbrugge, Pieter A.; and Uurbanus, Elisabeth W., to Shell Oil Company. Preparation of cyclopropanecarboxylates. 4,042,616, Cl. 260-468.00G.
Vereinigte Edelstahlwerke Aktiengesellschaft: *See—*
Rajakovics, Gundolf E., 4,041,709, Cl. 60-655.000.
Vereinigte Flugtechnische Werke-Fokker GmbH: *See—*
Cerne, Gerd, 4,042,193, Cl. 244-129.100.
Vereinigte Osterreichische Eisen- und Stahlwere-Alpine Montan Aktiengesellschaft: *See—*
Veitl, Giswalt, 4,041,749, Cl. 72-187.000.
Verreries Mecaniques Champenoises: *See—*
Champenois, Paul, 4,042,365, Cl. 65-260.000.
Verwey, William G. A.; and Stanton, Stephen, to Precision Industries, Inc. Apparatus for organizing and arranging bundles into stacks. 4,041,853, Cl. 100-4.000.
Vesci, Anthony: *See—*
Perry, Francis James; and Vesci, Anthony, 4,042,937, Cl. 346-1.000.
Vetco Offshore Industries, Inc.: *See—*
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Victor Company of Japan, Limited: *See—*
Kashiwagi, Shigeru, 4,042,859, Cl. 315-411.000.
Victor F. Weaver, Inc.: *See—*
Martin, Eugene G.; and Risser, Dale M., 4,041,572, Cl. 17-46.000.
Victor, Harvey. Sheetrock hole puncher and nail setter. 4,041,558, Cl. 7-14.10R.
Vidac Corporation: *See—*
Mullen, James W.; McReynolds, Boone K.; and Pace, Herbert D., 4,041,863, Cl. 101-269.000.
Villazon, Francisco, to AMP Incorporated. Hand tool. 4,041,740, Cl. 72-410.000.
Vincent, George E. Quick change snap lock connector. 4,042,305, Cl. 403-14.000.
Vinciguerra, Costantino, to Nuovo Pignone, S.p.A. Device for automatically grasping pieces of fabric. 4,042,271, Cl. 294-61.000.
Visioli, Armando J., Jr., to United States of America, Energy Research and Development Administration. Eddy current gauge for monitoring displacement using printed circuit coil. 4,042,876, Cl. 324-34.00D.
Vitalograph (Ireland) Limited: *See—*
Garbe, Dietmar Rudolf, 4,041,935, Cl. 128-2.080.
Vits, Hilmar, to VITS-Maschinenbau GmbH. Installation for collecting identically shaped, large and different types of sheets from a plurality of dispensing stations at a collating station. 4,042,233, Cl. 270-58.000.
VITS-Maschinenbau GmbH: *See—*
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Vock, Manfred Hugo: *See—*
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Voda, Gustav: *See—*
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Dick, Heinrich; and Kobinger, Erhard, 4,041,809, Cl. 74-866.000.
Voitovich, Igor Danilovich; Kostyshin, Maxim Timofeevich; Mikhailovskaya, Ekaterina Vasilievna; Petrov, Vyacheslav Vasilievich; Romanenko, Petr Fedorovich; and Skuridin, Vladimir Petrovich. Method for the production of films having the desired configuration. 4,042,450, Cl. 156-652.000.
Volk, Heinrich: *See—*
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Vomish, George W.: *See—*
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von Bonin, Wulf; Preis, Lothar; von Gizycki, Ulrich; and Dahm, Manfred, to Bayer Aktiengesellschaft. Filled polymerization products based on carbodiimide copolymers. 4,042,558, Cl. 260-37.00N.
von der Eltz, Hans-Ulrich, to Hoechst Aktiengesellschaft. Process for the continuous wet treatment of textile material in rope form. 4,041,559, Cl. 8-149.100.
von der Heide, Johann, to Papst-Motoren KG. Incrementally controllable motor drive system. 4,042,863, Cl. 318-254.000.
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von Bonin, Wulf; Preis, Lothar; von Gizycki, Ulrich; and Dahm, Manfred, 4,042,558, Cl. 260-37.00N.
Voorhes, William G., to Wanskuck Company. Extrusion process. 4,041,595, Cl. 29-420.000.
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VVB Haushalts- und Verpackungsglas: *See—*
Franke, Johannes; Kessler, Kurt; Muller, Wolfgang; Sauerbier, Heinz; Schneider, Kurt; and Unbehaun, Karl, 4,042,318, Cl. 432-210.000.
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W. Schlafhorst & Co.: *See—*
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Wachtel, Anselm, to Westinghouse Electric Corporation. Discharge lamp with black light transmitting filter layer. 4,042,849, Cl. 313-489.000.
Wacker-Chemitronic Gesellschaft fur Elektronik-Grundstoffe mbH: *See—*
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Schmidt, Dietrich; Hofer, Johann; Lang, Winfried; and Bildl, Erich, 4,042,331, Cl. 23-230.0PC.
Wada, Hajime; Kikuchi, Shouji; Hori, Haruo; and Endo, Takaya, to Konishiroku Photo Industry Co., Ltd. Silver halide emulsion containing two equivalent type coupler for use in photography. 4,042,393, Cl. 96-55.000.
Wadensten, Theodore S. Vibratory cleaner for an endless conveyor belt. 4,042,102, Cl. 198-494.000.
Wadkin Limited of Green Lane Works: *See—*
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Wafer, John A.; and Slade, Paul G., to Westinghouse Electric Corporation. Combination motor-starter and circuit breaker. 4,042,895, Cl. 335-16.000.
Waggoner, John B., to Caterpillar Tractor Co. Filter arrangement with baffles. 4,042,505, Cl. 210-132.000.
Waggoner, John B.: *See—*
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Wagner, Adolph A. Cap assembly for a nut and bolt. 4,041,833, Cl. 85-35.000.
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Wallace, Bernard E., to B. E. Wallace Products Corporation. Adjustable single-beam gantry. 4,041,875, Cl. 104-126.000.
Wallman, Knut Olof Lennart. Method of making impellers for cross-flow fans. 4,041,593, Cl. 29-156.8CF.
Walter, Forrest L. Balloon with deflation and maneuvering ports. 4,042,192, Cl. 244-99.000.
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Wanner, Rudolf; and Eckl, Robert, to Fa. Bowe, Bohler & Weber KG Maschinenfabrik. Method of an apparatus for unstacking a pile of sheets. 4,042,235, Cl. 271-94.000.
Wanskuck Company: *See—*
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Ward, Denby Harcourt; and Iley, James Dixon, to Broken Hill Associated Smelters Proprietary Limited, The. Apparatus for debismuthising lead. 4,042,228, Cl. 266-215.000.
Ward, Donald H.: *See—*
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Ward, Donald Leslie, to Wards Construction (Overseas) Ltd. Staircases. 4,041,662, Cl. 52-187.000.
Ward, Eugene T. Vehicle and battery pack. 4,042,054, Cl. 180-60.000.
Ward, Eugene T. Battery powered vehicle and drive system. 4,042,055, Cl. 180-60.000.
Ward, Gerald Frank; and Wray, Gordon Richard, to National Research Development Corporation. Apparatus for inserting seams in base fabric. 4,041,884, Cl. 112-79.00R.
Warda, Richard D.; Buhr, Robert K.; and Rehder, John E., to Canadian Patents and Development Limited. Method and apparatus for filtering through particulate material. 4,042,353, Cl. 55-99.000.
Wards Construction (Overseas) Ltd.: *See—*
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Warren, Glenn B. Valve arrangements for reciprocating piston machines. 4,041,838, Cl. 91-273.000.
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Wasserman, Bernard; and Kaufman, Martin H., to United States of America, Navy. Mechanical-chemical linkage between polymer layers. 4,042,441, Cl. 156-306.000.
Wasson, Burton Kendall; and Weinstock, Leonard M., to Merck Sharp & Dohme (I.A.) Corporation. 2-(3-Substituted amino-2-hydroxypropoxy)-3-substituted pyrazines. 4,042,586, Cl. 544-60.000.
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Waters, Kenneth H., to Continental Oil Company. Air cushion shear wave vibrator. 4,042,063, Cl. 181-119.000.
Watts, Glen A. Weight transfer system for coupling a gang plow to a towing vehicle. 4,042,253, Cl. 280-405.00B.
Watts, Harry, to Dow Chemical Company, The. Expandable polystyrene particles. 4,042,541, Cl. 260-2.50B.
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Weatherford Oil Tool (U.K.) Limited: *See—*
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Weaver, Edward A., to Owens-Illinois, Inc. Ferrimagnetic glass-ceramics. 4,042,519, Cl. 252-62.590.
Webb, William, Jr., to Unitec, Inc. Voltage measuring device having an amplifier in the probe. 4,042,881, Cl. 324-123.00R.
Weeks, Charles B., to Norris Industries, Inc. Trash compactor. 4,041,857, Cl. 100-215.000.
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Weinstein, David H.; Keeney, Joe W.; and Haas, Gregory M., to Superior Oil Company, The. Photochemical cell. 4,042,758, Cl. 429-111.000.
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Weitz, Hans-Martin; Fischer, Rolf; and Lenke, Dieter, to BASF Aktiengesellschaft. Manufacture of 1,2,4-dihydrotriazine-4-oxide-spiro-(3,1')-[oximino-(2')-cycloalkanes]. 4,042,588, Cl. 544-183.000.
Welch, James M. Cotton boll gleaner. 4,041,680, Cl. 56-28.000.
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Lin, Kou Chi; and Dobson, LeRoy E., 4,042,775, Cl. 174-94.00R.
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Whiteley, William Bede, to Whiteley, Marie Ellen. Lawn edging device. 4,042,037, Cl. 172-13.000.
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Williamson, Thomas Donald, to Du Pont de Nemours, E. I., and Company. Loading apparatus for crimper rolls. 4,041,584, Cl. 28-269.000.
Wills, Stephen Francis Edmund; and Pledger, Henry Edward, to Weatherford Oil Tool (U.K.) Limited. Devices for centralizing pipes in borings. 4,042,022, Cl. 166-241.000.
Wilson, Charles G., to Aquashade, Inc. Method for controlling the growth of aquatic plants. 4,042,367, Cl. 71-66.000.
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Wilson, Richard A.; Pascale, John V.; and Vock, Manfred Hugo, to International Flavors & Fragrances Inc. Six membered heterocyclic oxathio compounds. 4,042,601, Cl. 260-327.00M.
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Woods, Lee O.; and Frank, James P., to General Electric Company. Combination starter-protector device. 4,042,860, Cl. 361-25.00C.
Woodson, Alfred E.: *See—*
Redmore, Derek; and Woodson, Alfred E., 4,042,323, Cl. 21-2.70A.
Woodward, Charles D.: *See—*
Allen, Joseph C.; and Woodward, Charles D., 4,042,027, Cl. 166-260.000.
Woodward Governor Company: *See—*
Shetler, Terry A., 4,042,809, Cl. 235-150.100.
Worcester, Joseph A. High selectivity radio receiver. 4,042,782, Cl. 179-15.0BT.
Worden, Dexter: *See—*
Breton, Ernest J.; Worden, Dexter; and Pugh, Melville E., Jr., 4,042,747, Cl. 428-323.000.
Wovcha, Merle G.: *See—*
Knight, John C.; and Wovcha, Merle G., 4,042,459, Cl. 195-51.00S.
Wray, Gordon Richard: *See—*
Ward, Gerald Frank; and Wray, Gordon Richard, 4,041,884, Cl. 112-79.00R.
Wu, Leesui: *See—*
Hills, Vernon Elton; and Wu, Leesui, 4,042,841, Cl. 307-272.000.
Wunderlich, Francis J.: *See—*
Evans, Norol T.; and Wunderlich, Francis J., 4,042,924, Cl. 343-7.00A.
Wynn, Gordon Williams. Location apparatus. 4,041,824, Cl. 83-763.000.
Xerox Corporation: *See—*
Hwa, Stephen C. P., 4,042,415, Cl. 134-6.000.
Jones, Lewis O., 4,042,518, Cl. 252-62.600.
Jugle, Don B.; and Lipani, Anthony F., 4,041,902, Cl. 118-653.000.
Levinson, Leo; and Wong, Andrew, 4,042,091, Cl. 197-138.00R.
Lloyd, William A.; Barone, Salvatore; Hooper, Gerald E.; and McFarland, Keith E., 4,042,939, Cl. 346-153.000.
Moriconi, Joseph H.; and Burrows, Louis H., Jr., 4,042,517, Cl. 252-62.10P.
Moser, Rabin, 4,042,804, Cl. 219-216.000.
Quinn, H.; and Soures, Nicholas M., 4,042,874, Cl. 323-4.000.
Yamada, Kantaro: *See—*
Matsuzawa, Hideo; Otani, Masato; Ishii, Hiromichi; Yamada, Kantaro; and Kobayashi, Hasao, 4,042,625, Cl. 260-530.00N.
Yamada, Tadashi: *See—*
Terada, Ichiro; Yamada, Tadashi; Nishi, Michio; Uchida. Mitsuo; Sugiyama, Naomasa; Kaneko, Mamoru; and Takeda, Nobuhiko, 4,042,409, Cl. 106-111.000.
Yamaguchi, Yoshihiro; Shimohata, Takashi; Kaneda, Tsugio; Kita, Sodai; Fuchino, Yoshihide; Kawauchi, Masashi; Furusawa, Sadayashi; and Iwata, Shuzi, to Kobe Steel, Ltd. Grain refined free-machining steel. 4,042,380, Cl. 75-124.000.
Yamaji, Keizo; and Kurahashi, Akira, to Canon Kabushiki Kaisha. Composite information operating method and apparatus. 4,042,962, Cl. 358-300.000.
Yamamoto, Hajime: *See—*
Kano, Tsuyoshi; Nakako, Masaki; Yamamoto, Hajime; and Otomo, Yoshiro, 4,042,527, Cl. 252-301.40H.
Yamamoto, Kousuke; Takenaka, Shinji; and Maeda, Kazuo, to Mitsui Toatsu Chemicals Inc. Process for treating the mother liquor by cooling in the production of anhydrous sodium dithionite. 4,042,674, Cl. 423-515.000.
Yamamoto, Kousuke; Takenaka, Shinji; Maeda, Kazuo; and Mituta, Michio, to Mitsui Toatsu Chemicals, Incorporated. Process for treating the mother liquor by pH adjusting in the production of anhydrous sodium dithionite. 4,042,675, Cl. 423-515.000.
Yamamoto, Yasushi: *See—*
Takamizawa, Minoru; Yamamoto, Yasushi; Inoue, Yoshio; Noshiro, Atsumi; and Fujii, Hitoshi, 4,042,613, Cl. 260-448.20B.
Yamamoto, Yujiro. Ground fault sensor. 4,042,967, Cl. 361-45.000.
Yamanaka, Seisuke, to Sony Corporation. Solid state television camera having a special color filter arrangement. 4,042,956, Cl. 358-41.000.
Yamano, Masaru: *See—*
Yasuoka, Yoshio; Ito, Fumihiko; Tsuboi, Kunitada; Jinno, Kaori; and Yamano, Masaru, 4,042,851, Cl. 315-39.510.
Yamanouchi, Teruo: *See—*
Inoue, Eiichi; Endo, Ichiro; and Yamanouchi, Teruo, 4,042,388, Cl. 96-1.600.
Yamashita, Keitaro: *See—*
Katakura, Hiroshi; and Yamashita, Keitaro, 4,041,903, Cl. 118-658.000.
Yamasita, Nobuo; and Imai, Toshihiro, to Olympus Optical Co., Inc. Retrofocus-type objective for endoscopes. 4,042,295, Cl. 350-202.000.
Yamazaki, Jun'ichiro; Kamo, Takeshi; and Saito, Yoshiichi, to Fujitsu Ltd. Thin film resistor and a method of producing the same. 4,042,479, Cl. 204-192.00F.
Yamazumi, Kaishu: *See—*
Asai, Takeji; and Yamazumi, Kaishu, 4,042,428, Cl. 148-16.500.
Yang, Denis C., to De Laval Separator Company, The. Pneumatic pulsator for teat cups. 4,041,904, Cl. 119-14.410.
Yasuda, Tetuya; Iinuma, Yoshio; and Maekawa, Yuzo, to Citizen Watch Company Limited. Mounting arrangement for an integrated circuit unit in an electronic digital watch. 4,042,861, Cl. 361-400.000.
Yasufuku, Toshio: *See—*
Fujii, Masakatsu; and Yasufuku, Toshio, 4,042,093, Cl. 198-339.000.
Yasuoka, Yoshio; Ito, Fumihiko; Tsuboi, Kunitada; Jinno, Kaori; and Yamano, Masaru, to Sanyo Electric Co., Ltd. Magnetron. 4,042,851, Cl. 315-39.510.
Yensen, William A. Self-aligning blocks. 4,041,660, Cl. 52-100.000.
Yevick, George J., to Personal Communications, Inc. Method of recording image on lenticulated microfiche. 4,042,389, Cl. 96-27.00R.
Yoho, Clayton W.: *See—*
Muhler, Joseph C.; Putt, Mark S.; Kleber, Carl J.; and Yoho, Clayton W., 4,042,680, Cl. 424-55.000.
Yoichi, Inamoto. Device for supporting and guiding knitting needles for knitting machines. 4,041,734, Cl. 66-115.000.
Yokohama Rubber Company Ltd., The: *See—*
Akimoto, Masao, 4,042,230, Cl. 267-136.000.
Yoneya, Kiyoo, to Yoshida Kogyo Kabushiki Kaisha. Carpet construction. 4,042,735, Cl. 428-33.000.
Yonezawa, Keitaro, to Aioi Seiki Kabushiki Kaisha. Pump fluid motor carrying spool valve for distributor valve actuation. 4,042,311, Cl. 417-401.000.
York, Herbert, to Kroy Knitting Developments Ltd.; and B.Y. (Simulated Furs) Limited. Patterning units for circular knitting machines. 4,041,731, Cl. 66-50.00B.
Yoshida, Akihiko: *See—*
Nishino, Atsushi; Yoshida, Akihiko; and Hayakawa, Hayashi, 4,042,420, Cl. 148-6.000.
Yoshida Kogyo K.K.: *See—*
Oda, Kiyoshi, 4,041,578, Cl. 24-205.14R.
Yoshida Kogyo Kabushiki Kaisha: *See—*
Hasegawa, Mutsuo; Aikawa, Kazuo; and Hayashi, Shinji, 4,042,468, Cl. 204-42.000.
Hasegawa, Mutsuo; Imaoka, Toshikazu; and Aikawa, Kazuo, 4,042,469, Cl. 204-42.000.
Hasegawa, Mutsuo; Aikawa, Kazuo; and Nagata, Katsuyuki, 4,042,471, Cl. 204-58.000.
Matsuda, Yoshio, 4,041,577, Cl. 24-205.16C.
Yoneya, Kiyoo, 4,042,735, Cl. 428-33.000.
Yoshida, Tadao, to Sony Corporation. Monostable multivibrator. 4,042,944, Cl. 357-23.000.
Yoshikawa, Akira, to Fuji Xerox Co., Ltd. Electrosensitive recording method. 4,042,936, Cl. 346-1.000.
Yoshimoto, Hataaki: *See—*
Itatani, Hiroshi; Kashima, Mikito; Shiotani, Akinori; Yoshimoto, Hataaki; and Kato, Tetuo, 4,042,603, Cl. 260-346.20M.
Yoshinaga, Mituji, to Central Glass Co., Ltd. Process for the production of hard vinyl chloride foams. 4,042,556, Cl. 260-2.50P.
Yoshino Gypsum Co., Ltd.: *See—*
Terada, Ichiro; Yamada, Tadashi; Nishi, Michio; Uchida, Mitsuo; Sugiyama, Naomasa; Kaneko, Mamoru; and Takeda, Nobuhiko, 4,042,409, Cl. 106-111.000.
Yoshino, Youziro: *See—*
Kogure, Katsura; Sueda, Noriyoshi; Himoto, Sizuo; Yoshino, Youziro; and Nakagawa, Kunio, 4,042,617, Cl. 260-469.000.
Youmans, Donald W., to FMC Corporation. Vehicle wheel suspension with roll freedom. 4,042,260, Cl. 280-721.000.
Young, Bill M.: *See—*
Anderson, Buddy W.; Bowles, Bobby K.; Murphey, Joseph R.; Totty, Kenneth D.; and Young, Bill M., 4,042,032, Cl. '66-276.000.
Young, Robert L.: *See—*
Noll, Dale A.; Piazza, Giacomo J.; and Young, Robert L., 4,041,591, Cl. 29-157.30R.
Young, Thomas A.: *See—*
Repay, Laszlo N.; and Young, Thomas A., 4,041,793, Cl. 74-424.80R.
Zaderej, Andrew: *See—*
Zaderej, George; and Zaderej, Andrew, 4,042,852, Cl. 315-97.000.

Zaderej, George; and Zaderej, Andrew, to Unitron Corporation. Fluorescent lamps with high frequency power supply with inductive coupling and SCR starter. 4,042,852, Cl. 315-97.000.
Zahradnik, Stanislav: *See—*
Resch, Josef; Kadlec, Miloslav; Zahradnik, Stanislav; and Parizek, Josef, 4,041,986, Cl. 139-58.000.
Zappia, Joseph Francis. Treatment of myasthenia gravis and oral medication therefor. 4,042,698, Cl. 424-262.000.
Zarour, Louis Yacoub. Game board with coded dice and game pieces. 4,042,245, Cl. 273-134.0CH.
Zaske, Peter: *See—*
Lammerting, Helmut; Langenhagen, Rolf-Dieter; Rossmy, Gerd; and Zaske, Peter, 4,042,540, Cl. 260-2.5AH.
Zavaras, Alexander A.; Sobolewski, Robert; and Griffith, Cecil B., to Republic Steel Corporation. Continuous casting of metal using electromagnetic stirring. 4,042,007, Cl. 164-49.000.
Zebuhr, William Henry, to Des Champs Laboratories Incorporated. Packaging for heat exchangers. 4,042,018, Cl. 165-166.000.
Zeile, Karl: *See—*
Mentrup, Anton; Schromm, Kurt; Thoma, Otto; and Zeile, Karl, 4,042,713, Cl. 424-330.000.
Zeley, Juan Adalberto, to I.P.U. Limited. Thermal cutting machine for cutting up cast ingots during the operation of continuous casting plant. 4,042,224, Cl. 266-50.000.
Zessin, Horst: *See—*
Wahle, Gunter; Ludszeweit, Dieter; Gomann, Jurgen; and Zessin, Horst, 4,041,958, Cl. 131-84.00B.
Ziccarelli, Salvatore F., to Beatrice Foods Co. Fast conched candy coating. 4,042,721, Cl. 426-613.000.
Zimmermann nee Ignacz, Zsuzsanna; and Gepesz, Robert, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara RT. Compositions of low calory content. 4,042,719, Cl. 426-573.000.
Zimmermann, Vincenz: *See—*
Paszthory, Emmerich; Hille, Ernst; Seifert, Karl-Gerhard; and Zimmermann, Vincenz, 4,042,622, Cl. 260-562.00K.
Zink Enterprises Security Systems: *See—*
Zink, Henry R., 4,042,796, Cl. 200-61.45R.
Zink, Henry R., to Zink Enterprises Security Systems. Inertia switch for sensing vibration forces. 4,042,796, Cl. 200-61.45R.
Zinser Textilmaschinen GmbH: *See—*
Grau, Gerhard; and Mayer, Otto, 4,041,685, Cl. 57-34.00R.
Zirps, Wilhelm, to Robert Bosch GmbH. Control system. 4,041,840, Cl. 91-416.000.
Zitomer, Fred: *See—*
DeEdwardo, Andrew H.; Zitomer, Fred; Stackman, Robert W.; and Kramer, Charles E., 4,042,561, Cl. 260-45.9NP.
Zitukane, Yoshimaru: *See—*
Miyake, Kenji; Kumon, Hiroshi; Zitukane, Yoshimaru; and Akutagawa, Shigeru, 4,042,385, Cl. 75-224.000.
Zoller, Wilhelm: *See—*
Payer, Wolfgang; Riepe, Volker; and Zoller, Wilhelm, 4,042,767, Cl. 526-64.000.
Zollner, Dieter: *See—*
Thiele, Gerhard; Zollner, Dieter; and Koziol, Konrad, 4,042,484, Cl. 204-290.00F.
Zwald, John Andrew: *See—*
Johnson, Robert Richard; Coons, Robert Arthur; and Zwald, John Andrew, 4,041,766, Cl. 72-402.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 16TH DAY OF AUGUST, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See—*
Tomcufcik, Andrew Stephen, Re. 29,358, Cl. 542-417.000.
Bennett, John D., to Sun Oil Company (Delaware). System for chipping and moving ice. Re. 29,356, Cl. 299-25.000.
Bequette, Robert J.: *See—*
Mercer, Neil H.; and Bequette, Robert J., Re. 29,359, Cl. 424-253.000.
Bickmore, J. T.; and Goffe, William L., to Xerox Corporation. Image formation and development. Re. 29,357, Cl. 96-1.00R.
Electro-Speed Tool Corporation: *See—*
Malkin, Bruce, Re. 29,354, Cl. 227-132.000.
Goffe, William L.: *See—*
Bickmore, J. T.; and Goffe, William L., Re. 29,357, Cl. 96-1.00R.
Kobayashi, Kazuhiko: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Takagi, Shigeru, Re. 29,361, Cl. 219-69.00C.
Lefevre, Andre; and Lefevre, Rosemary Loweth. Board game apparatus. Re. 29,355, Cl. 273-134.0AF.
Lefevre, Rosemary Loweth: *See—*
Lefevre, Andre; and Lefevre, Rosemary Loweth, Re. 29,355, Cl. 273-134.0AF.
Malkin, Bruce, to Electro-Speed Tool Corporation. Electric nailer. Re. 29,354, Cl. 227-132.000.
Mead Johnson & Company: *See—*
Mercer, Neil H.; and Bequette, Robert J., Re. 29,359, Cl. 424-253.000.
Mercer, Neil H.; and Bequette, Robert J., to Mead Johnson & Company. Bronchodilator expectorant composition containing theophylline and a guaiacol. Re. 29,359, Cl. 424-253.000.
Metcalf, John M., to Vought Corporation. Switching system for a transportation system employing a guideway. Re. 29,353, Cl. 104-130.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Takagi, Shigeru, Re. 29,361, Cl. 219-69.00C.
Newton, Richard C., to Phillips Petroleum Company. Non-twisted, heather yarn and method for producing same. Re. 29,352, Cl. 57-140.00R.
Phillips Petroleum Company: *See—*
Newton, Richard C., Re. 29,352, Cl. 57-140.00R.
Saito, Nagao; Kobayashi, Kazuhiko; and Takagi, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Process for shaping workpiece by electrical discharge and apparatus therefor. Re. 29,361, Cl. 219-69.00C.
Sun Oil Company (Delaware): *See—*
Bennett, John D., Re. 29,356, Cl. 299-25.000.
Takagi, Shigeru: *See—*
Saito, Nagao; Kobayashi, Kazuhiko; and Takagi, Shigeru, Re. 29,361, Cl. 219-69.00C.
Takahashi, Nobuaki, to Victor Company of Japan, Ltd. System for recording and/or reproducing four channel signals on a record disc. Re. 29,360, Cl. 179-100.4ST.
Tomcufcik, Andrew Stephen, to American Cyanamid Company. 1,5-Bis substituted-1,4-pentadien-3-one substituted amidino hydrazone salts and method of preparing the same. Re. 29,358, Cl. 542-417.000.
Victor Company of Japan, Ltd.: *See—*
Takahashi, Nobuaki, Re. 29,360, Cl. 179-100.4ST.
Vought Corporation: *See—*
Metcalf, John M., Re. 29,353, Cl. 104-130.000.
Xerox Corporation: *See—*
Bickmore, J. T.; and Goffe, William L., Re. 29,357, Cl. 96-1.00R.

LIST OF PLANT PATENTEES

Danielson, Robert E., to Pan American Plant Company. Chrysanthemum plant named Copper Hostess. 4,092, 8-16-77, Cl. 79.000.
Moore, Ralph S.: *See—*
Williams, Ernest D., 4,091, Cl. 7.000.
Pan American Plant Company: *See—*
Danielson, Robert E., 4,092, Cl. 79.000.
Williams, Ernest D., to Moore, Ralph S., a part interest. Miniature rose plant. 4,091, 8-16-77, Cl. 7.000.

LIST OF DESIGN PATENTEES

Alan P. McGregor: *See—*
Walker, Stephen F., 245,399, Cl. D9-183.000.
Annis, Sterling Le Roy. Urinal shield for toilet seats. 245,425, 8-16-77, Cl. D23-69.000.
Arluck, Elmer M., to Thermo-Mold Medical Products, Inc. Orthopedic brace. 245,429, 8-16-77, Cl. D24-64.000.
Ashbaugh, Fredrick A.; and Wickwar, Rodney L. Overhead console for vans. 245,414, 8-16-77, Cl. D12-155.000.
Ashton, Harold P., to Dart Industries Inc. Combined coaster and cover or the like. 245,384, 8-16-77, Cl. D7-45.000.
Ashton, Harold P., to Dart Industries Inc. Egg scoop or the like. 245,385, 8-16-77, Cl. D7-104.000.
Autotronics, Inc.: *See—*
Koncak, James David; and Spaits, Joseph T., 245,404, Cl. D10-116.000.
Babcock, Herbert L. Shield for an automobile headlight. 245,448, 8-16-77, Cl. D48-32.00C.
Bangor Punta Operations, Inc.: *See—*
Bostic, James; Brown, Peter; and Purkapile, Emerson, 245,409, Cl. D12-62.000.
Barrett, Carl Elwood. Carrying case for a tennis racquet or the like. 245,456, 8-16-77, Cl. D87-1.00R.
Barrett, Carl Elwood. Carrying case for a tennis racquet or the like. 245,457, 8-16-77, Cl. D87-1.00R.
Bascom, Hollis H.; Greci, John J.; and Hoopengardner, Merle R., to Orcon Corporation. Carpet repair tool. 245,392, 8-16-77, Cl. D8-15.000.
Baumann, Gerhard; and Gerber, Heinz, to Interhydro AG. Hydro-culture container. 245,408, 8-16-77, Cl. D11-155.000.
Bayers, George W., Jr. Liquor dispenser. 245,421, 8-16-77, Cl. D15-115.000.
Beall, Lester, Jr., to Trend Line Furniture Corporation. Ottoman. 245,379, 8-16-77, Cl. D6-36.000.
Beauchamp, Roger P., to Dart Industries Inc. Fruit scoop or the like. 245,387, 8-16-77, Cl. D7-149.000.
Becker, Jerome E. Golf putter head. 245,442, 8-16-77, Cl. D34-5.0GH.
Beidler, Glenn S.; and Collister, Kenneth D., to Miles Laboratories, Inc. Reagent strip reflectance photometer. 245,434, 8-16-77, Cl. D24-17.000.
Bolt Vehicles, Inc.: *See—*
Ray, Lawrence L., 245,412, Cl. D12-126.000.
Bonifant, Bern M., to Flex-A-Lite Corporation. Fan. 245,426, 8-16-77, Cl. D23-165.000.
Bostic, James; Brown, Peter; and Purkapile, Emerson, to Bangor Punta Operations, Inc. Boat. 245,409, 8-16-77, Cl. D12-62.000.
Brown, Peter: *See—*
Bostic, James; Brown, Peter; and Purkapile, Emerson, 245,409, Cl. D12-62.000.
Brudy, Peter E.; and Smith, John. Lens for a revolving lamp. 245,447, 8-16-77, Cl. D48-32.00A.
Buck, David Lyndon, to Dunlop Limited. Tire for a vehicle wheel. 245,413, 8-16-77, Cl. D12-145.000.
Campione, Peter. Cabinet for displaying the results of behavioral and biological evaluation. 245,428, 8-16-77, Cl. D24-17.000.

Carpenter, Robert Ray, to Uniroyal, Inc. Combined wheel chock and flag. 245,416, 8-16-77, Cl. D12-217.000.
Cathey, Wayne Carl, to Xerox Corporation. Portable enclosure for electronic equipment. 245,455, 8-16-77, Cl. D87-1.00R.
CBS Inc.: *See—*
Moustakas, Matthew A., 245,445, Cl. D34-15.0AJ.
Codi Corporation: *See—*
Kudla, John, 245,427, Cl. D23-167.000.
Cognevich, George. Drive adaptor for sockets or the like. 245,395, 8-16-77, Cl. D8-70.000.
Collister, Kenneth D.: *See—*
Beidler, Glenn S.; and Collister, Kenneth D., 245,434, Cl. D24-17.000.
Commins, Peter J. Passenger shelter. 245,430, 8-16-77, Cl. D25-1.000.
Cousins, Michael A.: *See—*
Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, 245,453, Cl. D26-18.000.
Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, to Gillette Company, The. Hair styler attachment. 245,453, 8-16-77, Cl. D26-18.000.
Creamer, Joan Klatil, to General Electric Company. Wall plate. 245,396, 8-16-77, Cl. D8-351.000.
Dart Industries Inc.: *See—*
Ashton, Harold P., 245,384, Cl. D7-45.000.
Ashton, Harold P., 245,385, Cl. D7-104.000.
Beauchamp, Roger P., 245,387, Cl. D7-149.000.
Donlon, Joseph J. Paint container. 245,450, 8-16-77, Cl. D64-18.000.
Duncan, Alfred D. String reel. 245,397, 8-16-77, Cl. D8-359.000.
Dunlop Limited: *See—*
Buck, David Lyndon, 245,413, Cl. D12-145.000.
England, Will Clarke. Interchangeable one dimensional convergence lens solar radiation intensification plate. 245,432, 8-16-77, Cl. D13-1.000.
Feingold, Irene B.; and Feingold, Stanley Z. Audio-visual storage case. 245,454, 8-16-77, Cl. D87-1.00D.
Feingold, Stanley Z.: *See—*
Feingold, Irene B.; and Feingold, Stanley Z., 245,454, Cl. D87-1.00D.
Flex-A-Lite Corporation: *See—*
Bonifant, Bern M., 245,426, Cl. D23-165.000.
Gardisette International AG: *See—*
Schroeder, Peter E., 245,446, Cl. D47-6.00D.
General Electric Company: *See—*
Creamer, Joan Klatil, 245,396, Cl. D8-351.000.
Gerber, Heinz: *See—*
Baumann, Gerhard; and Gerber, Heinz, 245,408, Cl. D11-155.000.
Gillette Company, The: *See—*
Cousins, Morison S.; Cousins, Michael A.; and Rhodes, Greydon A., III, 245,453, Cl. D26-18.000.
Poisson, Norman D., 245,460, Cl. D28-46.000.
Gnehm, Charles H. Recreational structure. 245,435, 8-16-77, Cl. D34-5.00H.
Greci, John J.: *See—*
Bascom, Hollis H.; Greci, John J.; and Hoopengardner, Merle R., 245,392, Cl. D8-15.000.
Grodin, Adam J. Bottle or similar article. 245,398, 8-16-77, Cl. D9-71.000.
Haas, Andre Christian: *See—*
Hauss, Winfried Josepf Paul; and Haas, Andre Christian, 245,458, Cl. D87-3.00A.
Hade, Mark A.: *See—*
Hughes, Larry L.; Lutz, Don E.; and Hade, Mark A., 245,382, Cl. D6-175.000.
Harty, Millard Fillmore, Jr., to Motor Wheel Corporation. Wheel. 245,415, 8-16-77, Cl. D12-209.000.
Hauss, Winfried Josepf Paul; and Haas, Andre Christian. Card case. 245,458, 8-16-77, Cl. D87-3.00A.
Hoopengardner, Merle R.: *See—*
Bascom, Hollis H.; Greci, John J.; and Hoopengardner, Merle R., 245,392, Cl. D8-15.000.
Hotchkiss, Robert William. Toy rifle. 245,444, 8-16-77, Cl. D34-15.0TT.
Hoyt, Earl E. Scrub sponge or similar article. 245,390, 8-16-77, Cl. D7-178.000.
Hughes, Larry L.; Lutz, Don E.; and Hade, Mark A. Table. 245,382, 8-16-77, Cl. D6-175.000.
Interhydro AG: *See—*
Baumann, Gerhard; and Gerber, Heinz, 245,408, Cl. D11-155.000.
Ito, Shima, to Matsushita Electric Works, Ltd. Combined electric shaver and cover therefor. 245,459, 8-16-77, Cl. D28-51.000.
Japan Aircraft Manufacturing Co., Ltd.: *See—*
Sohda, Kiyoshi; and Kitada, Hisao, 245,411, Cl. D12-71.000.
Kabushiki Kaisha Daini Seikosha: *See—*
Osawa, Eiichi; Miyata, Midori; and Karibe, Susumu, 245,400, Cl. D10-30.000.
Kagayama, Yuzuru, to Tsuyama Manufacturing Company, Ltd. Spoke-mounted bicycle reflector. 245,403, 8-16-77, Cl. D10-111.000.
Kahn, William L., to Net Check, Inc. Gauge for checking the height of tennis nets. 245,401, 8-16-77, Cl. D10-64.000.
Kalt Corporation, The: *See—*
Stanley, George O., 245,383, Cl. D6-188.000.
Karibe, Susumu: *See—*
Osawa, Eiichi; Miyata, Midori; and Karibe, Susumu, 245,400, Cl. D10-30.000.
Katayama, Masaharu; and Takahashi, Hideo, to Matsushita Electric Industrial Co., Ltd. Video tape recorder cartridge. 245,418, 8-16-77, Cl. D14-6.000.
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Middlestadt, Marvin G. Golf putter. 245,441, 8-16-77, Cl. D34-5.0GC.
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Ray, Lawrence L., to Bolt Vehicles, Inc. Cover for electric bicycle motor and battery. 245,412, 8-16-77, Cl. D12-126.000.
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Tomy Kogyo Co., Inc.: *See—*
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Webb, Mayfield K. Clock face. 245,406, 8-16-77, Cl. D10-126.000.
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CLASSIFICATION OF PATENTS

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625.63 4,041,983
642 4,041,984

CLASS 138

31 4,041,990

CLASS 139

56 4,041,986
59 4,041,987
116 4,041,988
370.2 4,041,985
425 A 4,041,989
449 4,041,991

CLASS 140

123.5 4,041,992
123.6 4,041,993

CLASS 141

1 4,041,994
275 4,041,995

CLASS 144

2 N 4,041,996
136 C 4,041,997
315 R 4,041,998

CLASS 148

1.5 4,042,419
6 4,042,420
12 B 4,042,423
12 E 4,042,421
12 R 4,042,422
12.7 A 4,042,424
13.1 4,042,425
15.5 4,042,427
16.5 4,042,428
31.55 4,042,429

CLASS 149

19.3 4,042,430
36 4,042,431
89 4,042,432

CLASS 150

52 K 4,041,999

CLASS 152

213 A 4,042,000
243 4,042,001
354 4,042,002
381.2 4,042,003

CLASS 156

87 4,042,433
91 4,042,434
121 4,042,435
182 4,042,436
212 4,042,437
272 4,042,438
292 4,042,439
304 4,042,440
306 4,042,441
310 4,042,442
345 4,042,444
349 4,042,443
359 4,042,446
385 4,042,445
610 4,042,447
650 4,042,448
651 4,042,449
652 4,042,450
664 4,042,451

CLASS 160

91 4,042,004
220 4,042,005
263 4,042,028

CLASS 162

60 4,042,452
108 4,042,453

CLASS 164

46 4,042,006
49 4,042,007
147 4,042,008
278 4,042,009
282 4,042,010

CLASS 165

1 4,042,011
4,042,012
2 4,042,013
8 4,042,015
20 4,042,016
63 4,042,017
166 4,042,018

CLASS 166

.5 4,042,014
55 4,042,019
85 4,042,020
4,042,021
241 4,042,022
4,042,023
243 4,042,024
250 4,042,025
258 4,042,026
260 4,042,027
272 4,042,029
273 4,042,030
276 4,042,031
4,042,032
310 4,042,033
314 4,042,034

CLASS 171

16 4,042,035

CLASS 172

13 4,042,037
59 4,042,038
4,042,039
4,042,040
70 4,042,041
91 4,042,042
311 4,042,044
4,042,045

CLASS 173

13 4,042,036
152 4,042,043

CLASS 174

14 R 4,042,774
94 R 4,042,775
110 R 4,042,776

CLASS 175

73 4,042,046
340 4,042,047
380 4,042,048

CLASS 176

10 4,042,454
37 4,042,455
78 4,042,456

CLASS 177

137 4,042,049
198 4,042,050
255 4,042,051

CLASS 179

1 DM 4,042,779
1 E 4,042,778
15 AL 4,042,780
4,042,783
15 BS 4,042,781
15 BT 4,042,782
18 EB 4,042,784
18 FC 4,042,785
79 4,042,777
84 R 4,042,786
84 VF 4,042,787
4,042,788
4,042,789
4,042,790
90 K 4,042,793
90 R 4,042,792
100.4 ST Re.29,360
146 H 4,042,791
175.3 R 4,042,794

CLASS 180

6.7 4,042,052
51 4,042,053
60 4,042,054
4,042,055
65 A 4,042,056
90 4,042,057
98 4,042,058
103 R 4,042,059
127 4,042,060

CLASS 181

33 HE 4,042,061
36 A 4,042,062
119 4,042,063

CLASS 182

115 4,042,064

CLASS 184

1 E 4,042,065

CLASS 187

6 4,042,066
29 R 4,042,067
4,042,068
4,042,069

CLASS 188

1 B 4,042,070
18 A 4,042,071
71.8 4,042,072
72.9 4,042,073
73.3 4,042,074
75 4,042,075
80 4,042,076
171 4,042,077
231 4,042,078
290 4,042,079
361 4,042,080

CLASS 191

8 4,042,081
12.2 A 4,042,082

CLASS 192

3.31 4,042,083
13 R 4,042,084
57 4,042,085
98 4,042,086
99 S 4,042,087
114 R 4,042,088

CLASS 194

102 4,042,089

CLASS 195

1.8 4,042,457
28 R 4,042,458
51 S 4,042,459
65 4,042,460
66 R 4,042,461
103.5 R 4,042,462
120 4,042,463

CLASS 197

102 4,042,090
138 R 4,042,091
171 4,042,092

CLASS 198

339 4,042,093
347 4,042,094
393 4,042,098
4,042,099
446 4,042,100
460 4,042,101
494 4,042,102
645 4,042,103
774 4,042,104

CLASS 200

16 D 4,042,795
61.45 R 4,042,796
153 R 4,042,797
243 4,042,798
288 4,042,799

CLASS 204

1 T 4,042,464
4,042,465
11 4,042,466
15 4,042,467
42 4,042,468
4,042,469
44 4,042,470
58 4,042,471
73 R 4,042,472
109 4,042,473
112 4,042,474
141.5 4,042,475
159.15 4,042,476
181 4,042,478
192 F 4,042,479
224 R 4,042,480
242 4,042,482
270 4,042,481
290 F 4,042,483
4,042,484

CLASS 206

1.5 4,042,105
313 4,042,106
386 4,042,107
392 4,042,108
440 4,042,109
459 4,042,110
508 4,042,111

CLASS 208

11 R 4,042,485
44 4,042,486
48 R 4,042,487
102 4,042,488
152 4,042,489
264 4,042,490

CLASS 209

73 4,042,112
74 R 4,042,113
4,042,491
111.7 R 4,042,114
223 R 4,042,492

CLASS 210

6 4,042,493
7 4,042,494
11 4,042,495
23 R 4,042,496
25 4,042,497
26 4,042,498
31 C 4,042,499
51 4,042,501
59 4,042,502
65 4,042,503
107 4,042,504
132 4,042,505
155 4,042,506
158 4,042,507
172 4,042,508
189 4,042,500
192 4,042,509
220 4,042,510
386 4,042,511
519 4,042,512
616 4,042,634

CLASS 211

49 D 4,042,095
4,042,096
182 4,042,097

CLASS 212

48 4,042,115
140 4,042,116

CLASS 213

50.5 4,042,117

CLASS 214

1 BB 4,042,118
4,042,120
1 CM 4,042,119
4,042,122
1 R 4,042,121
2.5 4,042,123
6 BA 4,042,125
6 DS 4,042,124
8.5 A 4,042,126
10.5 R 4,042,127
17 B 4,042,128
17 DB 4,042,129
35 R 4,042,130
42 A 4,042,132
83.3 4,042,133
4,042,134
138 R 4,042,131
141 4,042,135
146.5 4,042,136
302 4,042,137
314 4,042,138
331 4,042,139
518 4,042,140
766 4,042,141

CLASS 219

69 C Re.29,361
98 4,042,800
121 EB 4,042,801
121 P 4,042,802
211 4,042,803
216 4,042,804
447 4,042,806
492 4,042,805

CLASS 220

4 B 4,042,142
256 4,042,143
273 4,042,144

CLASS 221

94 4,042,145
152 4,042,146
222 4,042,148
225 4,042,147

CLASS 222

40 4,042,149
70 4,042,150
129.2 4,042,151
137 4,042,152
207 4,042,153

CLASS 223

28 4,042,154
34 4,042,155

CLASS 224

5 D 4,042,156
42.21 4,042,157
42.23 4,042,158

CLASS 225

15 4,042,159

CLASS 227

132 Re.29,354

CLASS 228

102 4,042,161
106 4,042,162
198 4,042,163

CLASS 229

23 BT 4,042,164
33 4,042,165
4,042,166
34 HW 4,042,167
40 4,042,168
43 4,042,169
62.5 4,042,170
72 4,042,171

CLASS 233

7 4,042,172

CLASS 235

61.11 R 4,042,807
92 PC 4,042,808
150.1 4,042,809
150.2 4,042,810
150.3 4,042,973
151.11 4,042,812
151.21 4,042,813
151.3 4,042,811
175 4,042,814
194 4,042,815

CLASS 236

49 4,042,173

CLASS 239

286 4,042,174
420 4,042,175

CLASS 240

8.1 R 4,042,816
9 R 4,042,817
41.3 4,042,818
51.11 R 4,042,819
52 R 4,042,820

CLASS 241

20 4,042,177
24 4,042,176
46.11 4,042,179
79 4,042,180
175 4,042,181
207 4,042,182
292.1 4,042,183

CLASS 242

47.5 4,042,184
71.7 4,042,185
84.42 4,042,186
86.5 R 4,042,187
129.51 4,042,188
195 4,042,189

CLASS 243

32 4,042,190

CLASS 244

99 4,042,192
129.1 4,042,193
151 A 4,042,194
155 R 4,042,195
158 4,042,196
183 4,042,197
214 4,042,191

CLASS 248

62 4,042,198
188.8 4,042,199
223.1 4,042,200
309 R 4,042,201
352 4,042,202
449 4,042,203

CLASS 249

57 4,042,204
189 4,042,205
197 4,042,206

CLASS 250

216 4,042,821
4,042,822
227 4,042,823
263 4,042,824
272 4,042,825
336 4,042,826
493 4,042,827
507 4,042,828
550 4,042,829

CLASS 251

44 4,042,178
62 4,042,207

CLASS 252

5 4,042,521
8.05 4,042,522
32.7 HC 4,042,523
47.5 4,042,513
48.6 4,042,514
56 R 4,042,515
62.1 P 4,042,517
62.54 4,042,516
62.59 4,042,519
62.6 4,042,518
69 4,042,524
70 4,042,520
106 4,042,525
300 4,042,526
301.4 H 4,042,527
358 4,042,528
363.5 4,042,529
415 4,042,530
437 4,042,533
438 4,042,531
466 J 4,042,532
511 4,042,534
518 4,042,535

CLASS 254

8 B 4,042,208
21 4,042,209
26 R 4,042,210
57 4,042,211
139.1 4,042,941
164 4,042,212
168 4,042,213
186 R 4,042,214
187.4 4,042,215
190 R 4,042,216

CLASS 259

4 AB 4,042,217
72 4,042,218
88 4,042,219
95 4,042,220
119 4,042,221
176 4,042,222

CLASS 260

2.5 AH 4,042,540
2.5 AK 4,042,536
2.5 AP 4,042,537
2.5 B 4,042,541
2.5 P 4,042,556
6 4,042,542
13 4,042,545
16 4,042,539
17.4 R 4,042,543
17.4 SG 4,042,538
18 PN 4,042,544
22 R 4,042,546
4,042,547
23 XA 4,042,548
4,042,549
28.5 B 4,042,551
29.6 H 4,042,553
29.6 RB 4,042,552
4,042,555
29.7 NR 4,042,554
32.6 NR 4,042,557
37 N 4,042,558
38 4,042,559
42.28 4,042,560
45.8 NT 4,042,562
45.9 K 4,042,563
45.9 NP 4,042,561
47 C 4,042,565
47 EP 4,042,566
47 ET 4,042,564
49 4,042,567
65 4,042,568
75 M 4,042,570
75 T 4,042,569
78 L 4,042,572
78 P 4,042,573
78 R 4,042,571
112 R 4,042,574
4,042,575
4,042,576
153 4,042,577
156 4,042,578
178 4,042,579
207 4,042,580
239.5 4,042,581
251.5 4,042,589
268 R 4,042,590
272 4,042,591
280 P 4,042,550
286 Q 4,042,592
294.8 C 4,042,593
295.5 R 4,042,594
307 C 4,042,595
307R 4,042,596
326.1 4,042,598
326.5 FN 4,042,599
327 M 4,042,601
327 S 4,042,600
343.41 4,042,602
346.2 M 4,042,603
369 4,042,604
378 4,042,605
390 4,042,606
410.9 R 4,042,607
4,042,608
429 R 4,042,609
429.3 4,042,610
439 R 4,042,611
448.2 B 4,042,613
448.8 R 4,042,612
449 R 4,042,614
449.6 R 4,042,615
468 G 4,042,616
469 4,042,617
470 4,042,618
482 P 4,042,619
518 R 4,042,620
530 N 4,042,623
4,042,625
555 A 4,042,626
561 R 4,042,621
562 K 4,042,622
570.6 4,042,624
571 4,042,627
577 4,042,628
583 P 4,042,629
586 R 4,042,630
593 H 4,042,631
607 AL 4,042,632
614 R 4,042,633
623 D 4,042,635
632 A 4,042,636
652 P 4,042,637
653.1 R 4,042,638
656 R 4,042,639
659 A 4,042,640
780 4,042,641
4,042,642
830 P 4,042,645
849 4,042,644
864 4,042,646
880 R 4,042,647
896 4,042,648
924 4,042,650
927 R 4,042,649

CLASS 261

111 4,042,651

CLASS 264

1 4,042,652
7 4,042,653
22 4,042,654
25 4,042,655
29.5 4,042,656
40.1 4,042,657
45.5 4,042,658
45.7 4,042,663
71 4,042,659
77 4,042,660
173 4,042,661
210 F 4,042,662

CLASS 266

47 4,042,223
50 4,042,224
75 4,042,225
88 4,042,226
93 4,042,227
215 4,042,228
275 4,042,229

CLASS 267

136 4,042,230

CLASS 269

48.1 4,042,231
88 4,042,264
328 4,042,232

CLASS 270

58 4,042,233

CLASS 271

94 4,042,235
151 4,042,234

CLASS 273

29 A 4,042,237
29 R 4,042,236
73 C 4,042,238
85 F 4,042,239
95 A 4,042,241
102 B 4,042,240
105.2 4,042,242
108 4,042,243
109 4,042,244
134 AF Re.29,355
134 CG 4,042,246
134 CH 4,042,245
141 A 4,042,247

CLASS 277

138 4,042,248

CLASS 280

38 4,042,249
42 4,042,250
47.33 4,042,251
206 4,042,252
405 B 4,042,253
445 4,042,255
478 B 4,042,254
512 4,042,256
624 4,042,257
664 4,042,258
701 4,042,259
721 4,042,260
762 4,042,261

CLASS 285

98 4,042,262
110 4,042,263

CLASS 292

262 4,042,265
267 4,042,266
318 4,042,267
347 4,042,268

CLASS 294

19 R 4,042,269
50.8 4,042,270
61 4,042,271
88 4,042,272

CLASS 295

30 4,042,273

CLASS 296

1 B 4,042,274
43 4,042,275

CLASS 297

216 4,042,276
388 4,042,277
397 4,042,278

CLASS 299

8 4,042,279
13 4,042,280
25 Re.29,356

CLASS 303

29 4,042,281

CLASS 305

11 4,042,282

CLASS 307

40 4,042,830
88 R 4,042,831
149 4,042,832
200 B 4,042,833
220 R 4,042,834
221 D 4,042,835
251 4,042,836
265 4,042,837
270 4,042,838
4,042,839
4,042,840
272 4,042,841
293 4,042,842
297 4,042,843
314 4,042,844

CLASS 308

15 4,042,283
219 4,042,284
235 4,042,285

CLASS 310

52 4,042,846
87 4,042,847
322 4,042,845

CLASS 312

129 4,042,286
209 4,042,287
330 R 4,042,288

CLASS 313

231.6 4,042,848
489 4,042,849

CLASS 315

39 4,042,850
39.51 4,042,851
97 4,042,852
155 4,042,853
169 TV 4,042,854
219 4,042,855
246 4,042,856
368 4,042,857
379 4,042,858
411 4,042,859

CLASS 318

231 4,042,862
254 4,042,863
301 4,042,864
338 4,042,865
568 4,042,866
580 4,042,867
615 4,042,868
630 4,042,869

CLASS 323

4 4,042,874
75 N 4,042,875

CLASS 324

34 D 4,042,876
37 4,042,877
51 4,042,878
58.5 C 4,042,879
64 4,042,880
123 R 4,042,881

CLASS 325

118 4,042,882
477 4,042,883

CLASS 329

122 4,042,884

CLASS 330

9 4,042,885
23 4,042,886
53 4,042,887
109 4,042,888
207 A 4,042,890
207 P 4,042,889

CLASS 331

1 R 4,042,891
94.5 G 4,042,892

CLASS 333

28 R 4,042,893

CLASS 335

9 4,042,894
16 4,042,895
17 4,042,896
245 4,042,897
297 4,042,898

CLASS 336

30 4,042,899
70 4,042,900

CLASS 338

28 4,042,901
128 4,042,902
159 4,042,903

CLASS 339

17 LC 4,042,289
45 R 4,042,292
52 R 4,042,290
89 M 4,042,291

CLASS 340

6 R 4,042,904
15.5 BH 4,042,907
15.5 DP 4,042,905
15.5 TA 4,042,910
15.5 TS 4,042,906
46 4,042,908
52 R 4,042,909
173 R 4,042,915
174 TF 4,042,916
4,042,917
280 4,042,918
321 4,042,919
324 M 4,042,920
347 AD 4,042,921

CLASS 343

5 SA 4,042,928
5 W 4,042,922
6.5 LC 4,042,923
7 A 4,042,924
14 4,042,925
17.7 4,042,926
18 E 4,042,927
113 DE 4,042,929
113 R 4,042,930
117 R 4,042,931
715 4,042,932
761 4,042,933
786 4,042,934
795 4,042,935

CLASS 346

1 4,042,936
4,042,937
61 4,042,938
153 4,042,939

CLASS 350

160 LC 4,042,293
202 4,042,295

CLASS 352

78 R 4,042,296

CLASS 353

109 4,042,297

CLASS 354

39 4,042,940
171 4,042,942
272 4,042,943

CLASS 355

40 4,042,298
4,042,299
73 4,042,300
75 4,042,301

CLASS 356

74 4,042,302
85 4,042,303
128 4,042,304

CLASS 357

23 4,042,944
4,042,945
25 4,042,946
34 4,042,947
49 4,042,948
4,042,949
51 4,042,950
67 4,042,951
68 4,042,952
71 4,042,953
4,042,954
72 4,042,955

CLASS 358

41 4,042,956
109 4,042,957
141 4,042,958
167 4,042,959
217 4,042,960
248 4,042,961
300 4,042,962

CLASS 361

20 4,042,963
25 C 4,042,860
27 4,042,966
28 4,042,964
29 4,042,965
45 4,042,967
60 4,042,968
107 4,042,969
172 4,042,970
213 4,042,971
400 4,042,861

CLASS 363

2 4,042,870
20 4,042,872
28 4,042,871
129 4,042,873

CLASS 364

200 4,042,912
4,042,913
4,042,914
4,042,972
900 4,042,911

CLASS 403

14 4,042,305
118 4,042,306
290 4,042,307

CLASS 404

1 4,042,308

CLASS 417

269 4,042,309
310 4,042,310
401 4,042,311

CLASS 418

121 4,042,312

CLASS 423

24 4,042,664
139 4,042,665
167 4,042,666
240 4,042,667
243 4,042,668
246 4,042,669
251 4,042,670
340 4,042,671
419 R 4,042,672
446 4,042,673
515 4,042,674
4,042,675

CLASS 424

1 4,042,676
4,042,677
12 4,042,678
54 4,042,679
55 4,042,680
84 4,042,681
95 4,042,682
117 4,042,683
153 4,042,684
158 4,042,685
164 4,042,686
177 4,042,687
4,042,688
4,042,689
200 4,042,690
4,042,691
244 4,042,692
246 4,042,693
248.55 4,042,694
250 4,042,695
251 4,042,696
253 Re.29,359
258 4,042,697
262 4,042,698
263 4,042,699
265 4,042,700
267 4,042,701
273 P 4,042,702
4,042,704
4,042,706
273 R 4,042,703
4,042,705
274 4,042,707
283 4,042,708
304 4,042,709
4,042,710
319 4,042,711
329 4,042,712
330 4,042,713

CLASS 425

89 4,042,314
392 4,042,315

CLASS 426

62 4,042,714
104 4,042,715
335 4,042,716
508 4,042,717
573 4,042,718
4,042,719
4,042,720
613 4,042,721
648 4,042,722

CLASS 427

8 4,042,723
9 4,042,724
57 4,042,725
93 4,042,726
107 4,042,727
212 4,042,728
304 4,042,729
305 4,042,730
311 4,042,731
385 R 4,042,732
391 4,042,733
424 4,042,734

CLASS 428

33 4,042,735
34 4,042,736
96 4,042,737
116 4,042,738
137 4,042,739
138 4,042,740
217 4,042,741
295 4,042,742
306 4,042,743
307 4,042,744
310 4,042,745
311 4,042,746
323 4,042,747
4,042,748
412 4,042,749
423 4,042,750
425 4,042,751
447 4,042,643
585 4,042,342
626 4,042,752
651 4,042,753
667 4,042,426
678 4,042,341

CLASS 429

10 4,042,754
16 4,042,755
94 4,042,756
104 4,042,757
111 4,042,758
121 4,042,759
162 4,042,760
165 4,042,761
187 4,042,762

CLASS 431

4 4,042,313
344 4,042,316

CLASS 432

124 4,042,317
210 4,042,318

CLASS 526

4 4,042,763
4,042,764
6 4,042,765
47 4,042,766
64 4,042,767
65 4,042,768
106 4,042,769
4,042,770
124 4,042,771
208 4,042,773
220 4,042,772

CLASS 542

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CLASSIFICATION OF DESIGNS

D2—	27	245,376		189	245,391		120	245,405	D14—	6	245,418		64	245,429		5 ST	245,443
	447	245,377	D8—	15	245,392		126	245,406		28	245,433	D25—	1	245,430		15 AJ	245,445
D6—	31	245,378		18	245,393	D11—	144	245,407		73	245,419		16	245,431		15 TT	245,444
	36	245,379		51	245,394		155	245,408	D15—	26	245,420	D26—	18	245,453	D47—	6 D	245,446
	57	245,380		70	245,395	D12—	62	245,409		115	245,421	D28—	46	245,460	D48—	32 A	245,447
	155	245,381		351	245,396		71	245,411	D19—	25	245,422		51	245,459		32 C	245,448
	175	245,382		359	245,397		116	245,410	D22—	13	245,423	D34—	5 CB	245,438		32 D	245,449
	188	245,383	D9—	71	245,398		126	245,412	D23—		245,424		5 GC	245,439	D64—	18	245,450
D7—	45	245,384		183	245,399		145	245,413		69	245,425			245,441	D83—	8 A	245,452
	104	245,385	D10—	30	245,400		155	245,414		165	245,426		5 GH	245,437	D87—	1 D	245,454
	137	245,386		64	245,401		209	245,415		167	245,427			245,442		1 R	245,455
	149	245,387		98	245,402		217	245,416	D24—	17	245,428		5 H	245,435			245,456
	150	245,388		111	245,403	D13—	1	245,432			245,434		5 JJ	245,440			245,457
	151	245,389		116	245,404		28	245,417		54	245,451		5 KK	245,436		3 A	245,458
	178	245,390															

CLASSIFICATION OF PLANTS

P.—	7	4,091		79	4,092			

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,041,674		4,041,926		4,042,544		4,042,036		4,042,747		4,042,059
	4,041,677		4,041,929		4,042,546		4,042,127	12 :	4,041,582		4,042,065
	4,041,795		4,041,932		4,042,573		4,042,194		4,041,613		4,042,085
	4,041,895		4,041,936		4,042,658		4,042,351		4,041,649		4,042,088
	4,042,509		4,041,950		4,042,661		4,042,439		4,041,694		4,042,131
4 :	4,041,568		4,041,955		4,042,689		4,042,485		4,041,850		4,042,158
	4,041,695		4,041,968		4,042,696		4,042,739		4,041,892		4,042,166
	4,041,906		4,041,974		4,042,720		4,042,809		4,041,893		4,042,173
	4,041,912		4,041,999		4,042,755		4,042,825		4,041,965		4,042,204
	4,041,944		4,042,004		4,042,783		4,042,845		4,042,104		4,042,210
	4,042,205		4,042,012		4,042,791	9 :	Re.29,354		4,042,152		4,042,215
	4,042,834		4,042,014		4,042,793		4,041,579		4,042,203		4,042,218
	4,042,867		4,042,017		4,042,796		4,041,761		4,042,236		4,042,246
	4,042,882		4,042,028		4,042,814		4,041,811		4,042,277		4,042,261
	4,042,886		4,042,081		4,042,822		4,041,831		4,042,887		4,042,282
	4,042,949		4,042,091		4,042,823		4,041,907		4,042,909		4,042,296
6 :	4,041,550		4,042,095		4,042,826		4,041,949		4,042,911		4,042,299
	4,041,557		4,042,114		4,042,828		4,042,056		4,042,913		4,042,312
	4,041,562		4,042,128		4,042,833		4,042,070		4,042,922		4,042,457
	4,041,576		4,042,146		4,042,836		4,042,155	13 :	4,042,176		4,042,463
	4,041,580		4,042,156		4,042,837		4,042,315		4,042,222		4,042,489
	4,041,585		4,042,157		4,042,838		4,042,434		4,042,328		4,042,505
	4,041,605		4,042,159		4,042,840		4,042,612	16 :	4,042,136		4,042,508
	4,041,606		4,042,179		4,042,843		4,042,647		4,042,253		4,042,531
	4,041,607		4,042,181		4,042,844		4,042,685		4,042,718		4,042,555
	4,041,628		4,042,189		4,042,862		4,042,714	17 :	4,041,575		4,042,566
	4,041,630		4,042,200		4,042,870		4,042,734		4,041,611		4,042,593
	4,041,643		4,042,202		4,042,872		4,042,778		4,041,623		4,042,663
	4,041,660		4,042,208		4,042,873		4,042,803		4,041,624		4,042,721
	4,041,667		4,042,221		4,042,874		4,042,808		4,041,625		4,042,724
	4,041,671		4,042,245		4,042,878		4,042,835		4,041,636		4,042,750
	4,041,672		4,042,250		4,042,879		4,042,881		4,041,646		4,042,772
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	4,041,710		4,042,266		4,042,905		4,042,960		4,041,702		4,042,883
	4,041,716		4,042,283		4,042,915	10 :	4,041,583		4,041,772		4,042,952
	4,041,738		4,042,292		4,042,924		4,041,816		4,041,782	18 :	Re.29,359
	4,041,747		4,042,330		4,042,925		4,042,079		4,041,792		4,041,603
	4,041,753		4,042,334		4,042,928		4,042,107		4,041,803		4,041,692
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	4,041,767		4,042,355		4,042,935		4,042,333		4,041,807		4,041,791
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	4,041,774		4,042,387		4,042,939		4,042,482		4,041,842		4,042,073
	4,041,781		4,042,430		4,042,950		4,042,554		4,041,852		4,042,110
	4,041,788		4,042,432		4,042,953		4,042,557		4,041,861		4,042,162
	4,041,828		4,042,441		4,042,954		4,042,610		4,041,901		4,042,325
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1 :	245,456		245,421		245,434	29 :	245,414		245,453		245,385
	245,457		245,437	20 :	245,394	34 :	245,390		245,454		245,387
6 :	245,383		245,438	21 :	245,448		245,427	37 :	245,379		245,396
	245,392		245,439	22 :	245,395		245,445		245,381	48 :	245,404
	245,393	12 :	245,401		245,450	36 :	245,377		245,416		245,432
	245,410		245,420	24 :	245,406		245,380	39 :	245,405		245,455
	245,412		245,424	25 :	245,460		245,386		245,423	49 :	245,451
	245,425	17 :	245,397	26 :	245,409		245,388		245,452	53 :	245,426
	245,442		245,402		245,415		245,389	42 :	245,417		245,435
	245,443		245,407		245,441		245,398		245,428	55 :	245,391
	245,449		245,433		245,444		245,429	44 :	245,384		249,422
8 :	245,399	18 :	245,382	27 :	245,376		245,436				

PLANT PATENTS

17 :	4,092	48 :	4,091				

U. S. GOVERNMENT PRINTING OFFICE : O - 1977

OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

August 23, 1977 Volume 961 Number 4

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PATENT AND TRADEMARK OFFICE NOTICES

Extensions of Time To Submit Affidavits After Final Rejection

Not infrequently, applicants request an extension of time, stating as a reason therefor that more time is needed in which to submit an affidavit. When such a request is filed after final rejection, the granting of the request for extension of time is without prejudice to the right of the examiner to question why the affidavit is now necessary and why it was not earlier presented. If applicant's showing is insufficient, the examiner may deny entry of the affidavit, notwithstanding the previous grant of an extension of time to submit it. The grant of an extension of time in these circumstances serves merely to keep the case from becoming abandoned while allowing the applicant the opportunty to present the affidavit or to take other appropriate action. Moreover, prosecution of the application to save it from abandonment must include such timely, complete and proper action as required by 37 CFR 1.113. The admission of the affidavit for purposes other than allowance of the application, or the refusal to admit the affidavit, and any proceedings relative thereto, shall not operate to save the application from abandonment.

Implicit in the above practice is the fact that affidavits submitted after final rejection are subject to the same treatment as amendments submitted after final rejection. *In re Affidavit Filed After Final Rejection,* 152 USPQ 292, 1966 C.D. 53.

WILLIAM FELDMAN.
July 25, 1977. *Deputy Assistant Commissioner for Patents.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,906,875, E. T. Molinaro, STATION SAMPLING RADIO, **filed** Dec. 20, 1973, D.C. Del. (Wilmington) Doc. 4780, *Anthony P. Catanzaro* v. *International Telephone & Telegraph et al.* Final judgment, it is ordered, with respect to the complaint, defendants' motion for summary judgment is granted and judgment is entered in favor of defendants. Counterclaims do not infringe said patent, Apr. 1, 1977.

2,959,374, I. R. Laskowitz, JET-POWERED ROTORLESS CONVERTIBLE AIRCRAFT, **filed** Mar. 17, 1977, *United* States Court of Claims (District of Columbia) Doc. 149–77, *Isidor B. Laskowitz* v. *The United States.*

3,032,345, J. H. Lemelson, TARGET GAME; **3,917,271,** Lemelson and Elfman, BALL FOR TARGET GAMES, **filed** Nov. 17, 1976, D.C., S.D.N.Y., Doc. 76–C–5146 TPG, *Jerome H. Lemelson and Synergistics Research Corporation* v. *Centsable Toys, Inc. and M. W. Kasch Company, Inc.*

3,032,345, J. H. Lemelson, TARGET GAME, **filed** Dec. 17, 1975, D.C.N.J. (Trenton) Doc. 75–2168, *Gammon, Inc., doing business as Gammon Games* v. *Jerome H. Lemelson and Synergistics Research Corporation.* Default judgment on counterclaim in favor of defendants and against plaintiff. Defendants' causes for action on damages and amended and supplemental complaint dismissed without prejudice, Mar. 1, 1977.

3,032,345, J. H. Lemelson, TARGET GAME; **3,857,566,** Lemelson and Elfman, ADHESIVE SURFACE DART AND SHOCK ABSORBING TARGET; **3,917,271,** same, BALL FOR TARGET GAMES, **filed** Mar. 21, 1977, D.C.N.J. (Trenton) Doc. 77–0553, *Synergistics Research Corp.* v. *S. S. Kresge Co.*

3,037,178, H. Plen, LOAD CELL, **filed** Mar. 16, 1973, D.C. Ariz. (Phoenix) Doc. C–73–171–Phx WEC, *BLH Electronics, Inc.* v. *Interface, Inc.* Stipulation for dismissal and order, Mar. 23, 1977.

3,047,196, Levine and Phillips, GARMENT HANGER, **filed** Nov. 11, 1976, D.C., S.D.N.Y., Doc. 76–C–5241DBB, *A & E Warbern Inc.* v. *Carter Industries, Inc.* Judgment, defendants is hereby restrained and enjoined from directly or indirectly infringing said patent, Mar. 30, 1977.

3,049,399, Gamson and Kuehner, COMPOSITION AND METHOD FOR DEODORIZING AIR, **filed** Apr. 11, 1977, D.C., S.D. Tex (Houston) Doc. CA H–77–571, *H. E. Burroughs & Associates, Inc.* v. *Stay-Fresh Corporation.* **Same,** **filed** Apr. 11, 1977, D.C., N.D. Tex. (Dallas) Doc. CA3–77–0472, *H. E. Burroughs & Associates, Inc.* v. *Gunter & Associates.*

3,090,605, Copeland and Neier, FEED MIXER **filed** Mar. 28, 1977, D.C. Colo. (Denver) Doc. 77–M–308 *B/J Manufacturing Co., Inc.* v. *Mohrlang Manufacturing, Inc.*

3,139,731, O. E. Liddell, BAND-TYPE BARRIER ENCASEMENT FOR PROTECTING TIMBERS AGAINST MARINE BORER ATTACK, **filed** Feb. 14, 1975, D.C., N.D. Calif. (San Francisco) Doc. C–75–330 SAW, *Osmose Wood Preserving Co. of America, Inc. and Harry W. Stiritz, Jr., trustee* v. *City of Redwood City and The Zipper Tubing Co.* Claims 4 and 9 of said patent are good and valid in law; defendants have not infringed said claims, Apr. 15, 1977.

3,223,252, C. A. Mikus, TREATMENT OF GLASS; **3,223,501,** Fredley and Sleighter, METHOD AND APPARATUS FOR TREATING GLASS ON A PRESSURIZED FLUID BED; **3,281,229,** H. A. McMaster, THERMALLY COMPENSATED BED FOR SUPPORTING GLASS SHEETS; **3,282,447,** same, CONVEYING APPARATUS; **3,291,590,** same, APPARATUS FOR BENDING GLASS SHEETS; **3,293,015,** Fredley and Sleighter, METHOD AND APPARATUS FOR TEMPERING GLASS SHEETS ON A GAS SUPPORTED BED; **3,332,759,** McMaster and Nitschke, METHOD OF AND APPARATUS FOR MANUFACTURING GLASS SHEETS ON A GAS SUPPORT BED; **3,332,760,** McMaster and Van Zee, APPARATUS PROVIDING A GASEOUS SUPPORT BED AND METHOD FOR TREATING GLASS OR THE LIKE THEREON; **3,332,762,** McMaster and Nitschke, METHOD OF AND APPARATUS FOR HEAT TREATING GLASS SHEETS ON A GAS SUPPORT BED; **3,338,697,** McMaster and Nitschke, GASEOUS SUPPORT BED FOR CONVEYING AND HEAT TREATING GLASS SHEETS; **3,399,042,** same, METHOD AND APPARATUS FOR CONVEYING AND HEAT TREATING GLASS SHEETS OVER A GAS SUPPORT BED; **3,402,036,** D. H. McMaster, METHOD AND APPARATUS FOR CONVEYING AND CURVING GLASS SHEET MATERIAL ON A GAS SUPPORT BED; **3,497,340,** Dennison and Rigby, METHOD OF TEMPERING AND RESHAPING GLASS SHEETS; **3,526,490,** G. W. Misson, METHOD OF BENDING GLASS ON FLUID SUPPORT, **filed** Mar. 7, 1972, D.C., N.D. Ohio (Toledo) Doc. 72–71, *PPG Industries, Inc.* v. *Guardian Industries Corporation.* Action dismissed on the merits, Jan. 26, 1977.

3,223,501. (See 3,332,252.)

3,263,678, J. H. Everston, THERAPEUTIC BATHTUB HAVING PLURAL ASPIRATING FITTINGS, **filed** June 15, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c2219, *The Celotex Corporation* v. *The Jacuzzi Research, Inc.* Defendant's motion for summary judgment is hereby granted and the instant action is ordered dismissed, Mar. 18, 1977.

3,281,229. (See 3,223,252.)

3,282,447. (See 3,223,252.)

3,291,590. (See 3,223,252.)

3,293,015. (See 3,223,252.)

3,332,759. (See 3,223,252.)

3,332,760. (See 3,223,252.)

3,332,762. (See 3,223,252.)

3,338,697. (See 3,223,252.)

3,399,042. (See 3,223,252.)

3,402,036. (See 3,223,252.)

3,403,868, W. P. Lear, MAGNETIC TAPE CARTRIDGE SYSTEM, **filed** Mar. 25, 1977, D.C. Mass. (Boston) Doc. 76–863–T, *Entec Plastics Engineering Corp.* v. *Gates Rubber Company.*

3,447,479, D. Rosenberg, SYRINGE PUMP, **filed** Mar. 22, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1064–R, *Imed Corporation* v. *Pall Corporation.*

3,497,340. (See 3,223,252.)

3,526,490. (See 3,223,252.)

3,665,477, Budrow and Reed, ELEVATABLE AND FOLDABLE ANTENNA, **filed** Aug. 15, 1974, D.C., N.D. Ind. (South Bend), Doc. S74–174, *Barker Manufacturing Company, Inc.* v. *Cobra Industries, Inc.* The issues have been withdrawn from the court by stipulation of the parties, the plaintiff's complaint and the counterclaim of the defendant are dismissed without prejudice, Mar. 28, 1977.

3,713,926, L. L. Speer, METHOD FOR PATCHING MATERIALS, **filed** Oct. 8, 1976, D.C., N.D. Ohio (Toledo) Doc. 76–129, *Vyna-Chem (Canada), Ltd.* v. *Lawrence L. Speer et al.* Defendants are hereby permanently restrained and enjoined from making, using and selling said patching kits, Apr. 12, 1977.

3,758,098, M. Vrilakas, MACHINE FOR WORKING ON DRIVE SHAFTS, **filed** Mar. 30, 1976, D.C., N.D. Calif. (San Francisco) Doc. C–76–636–SAW, *Drive Line Service Inc.* v. *Robert F. Gaffney, doing business as Drive Shaft Repair and Edward W. Hobgood, Jr.* Consent judgment, patent is valid; defendant, Drive Shaft licensed by plaintiff; Hobgood dismissed, Mar. 30, 1977.

3,776,095, M. G. Atchisson, WEAPON CONVERSION BOLT ASSEMBLY DEVICE, **filed** Sept. 15, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–1518A, *Bingham, Ltd.* v. *J. P. Foote & Company.* **Same,** **filed** Feb. 25, 1977, D.C., N.D. Ga. (Atlanta) Doc. C77–342A, *Bingham Ltd. and Maxwell G. Atchisson* v. *J. P. Foote & Company, J. P. Foote and U.S. Armament Corporation.*

3,857,566, Lemelson and Elfman, ADHESIVE SURFACE DART AND SHOCK ABSORBING TARGET; **3,917,271,** same, BALL FOR TARGET GAMES, **filed** Nov. 24, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c4371, *Centsable Prod. et al. and Centsable Toys* v. *Jerome H. Lemelson and Synergistics Research Corp.*

3,911,892, G. H. Harris, STOVE CONSTRUCTION, **filed** Mar. 21, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1050–RMT, *Lakewood Manufacturing Co.* v. *Hearth Craft, Inc. et al.*

3,917,271. (See 3,032,345.)

3,917,271. (See 3,857,566.)

3,999,756, H. Head, TENNIS RACKET, **filed** Feb. 14, 1977, D.C.N.J. (Trenton) Doc. 77–0285, *Prince Manufacturing, Inc.* v. *J. C. Penney Company, Inc.* Permanent injunction for the plaintiff, Apr. 5, 1977.

4,000,620, M. M. Burge, GRAVITATIONAL IRRIGATION SYSTEM AND METHOD OF INSTALLING, **filed** Feb. 23, 1977, D.C. N. Dak. (Bismarck) Doc. A77–1015, *Blumhardt Manufacturing, Inc.* v. *Nu-Flex Irrigation, Inc. and Merle M. Burge.*

4,004,552, G. Levin, EGG INCUBATING TRAY WITH RACK AND SLIDE, **filed** Apr. 6, 1977, D.C., S.D. Ga. (Savannah) Doc. CV477–83, *Gerd Levin* v. *Glennville Hatchery, Inc.* **Same,** **filed** Apr. 7, 1977, D.C., E.D. Ky. (Lexington) Doc. 77–41, *Gerd Levin* v. *Hinton Hatchery, Inc.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,193,402, Re. S.N. 801,089, Filed May 27, 1977, Cl. 106/58, REFRACTORY COMPOSITION FOR REPAIRING FURNACES, Samuel Rusoff, et al., Owner of Record: *Basic Incorporated, Cleveland, Ohio,* Attorney or Agent: Armand P. Boisselle, et al., Ex. Gp.: 115

3,710,000, Re. S.N. 805,259, Filed June 10, 1977, Cl. 174/15 C, HYBRID SUPERCONDUCTING MATERIAL, Walter J. Shattes, et al., Owner of Record: *Air Reduction Company, Incorporated, New York, N.Y.,* Attorney or Agent: Michael M. De Angeli, et al., Ex. Gp.: 213

3,728,480, Re. S.N. 810,538, Filed June 27, 1977, Cl. 178/6.8, TELEVISION GAMING AND TRAINING APPARATUS, Ralph H. Baer, Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Louis Etlinger, Ex. Gp.: 233

3,769,040, Re. S.N. 807,054, Filed June 16, 1977, Cl. 426/65, SUBSTITUTED THIAZOLES AND FLAVORING PROCESSES AND PRODUCTS PRODUCED THEREBY, Alan O. Pittet, et al., Owner of Record: *International Flavors & Fragrances, Inc., New York, N.Y.,* Attorney or Agent: Arthur L. Liberman, Ex. Gp.: 172

3,829,095, Re. S.N. 810,542, Filed June 27, 1977, Cl. 273/101.1, METHOD OF EMPLOYING A TELEVISION RECEIVER FOR ACTIVE PARTICIPATION, Ralph H. Baer, Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Louis Etlinger, Ex. Gp.: 334

3,853,128, Re. S.N. 808,982, Filed June 22, 1977, Cl. 128/275, VALVED UNDERWATER DRAINAGE APPARATUS, Leonard D. Kurtz, et al., Owner of Record: *Deknatel, Inc., Queens Village, N.Y.,* Attorney or Agent: Roberts B. Larson, et al., Ex. Gp.: 335

3,892,481, Re. S.N. 811,460, Filed June 29, 1977, Cl. 355/10, AUTOMATIC DEVELOPMENT ELECTRODE BIAS CONTROL SYSTEM, Louis F. Schaefer, et al., Owner of Record: *Savin Business Machines Corporation, Valhalla, N.Y.,* Attorney or Agent: Henry L. Shenier, et al., Ex. Gp.: 212

3,904,098, Re. S.N. 810,263, Filed June 27, 1977, Cl. 226/97, LOOP ERECTING DEVICE, Sam Kupperman, et al., Owner of Record: *R B Toy Development Company, Skokie, Ill.,* Attorney or Agent: Edward U. Dithmar, et al., Ex. Gp.: 313

3,929,215, Re. S.N. 810,440, Filed June 27, 1977, Cl. 197/1 R, PRINTING MECHANISM, Toshio Hayakawa, Owner of Record: *Matsushita Electric Industrial Company Limited, Kadoma City, Osaka, Japan,* Attorney or Agent: Robert E. Burns, et al., Ex. Gp.: 337

3,967,158, Re. S.N. 811,341, Filed June 29, 1977, Cl. 315/169 TV, CIRCUIT FOR OPERATING A BAR GRAPH DISPLAY PANEL, Richard A. Saxon, Owner of Record: *Inventor,* Attorney or Agent: Robert A. Green, Ex. Gp.: 256

3,986,569, Re. S.N. 809,708, Filed June 24, 1977, Cl. 175/52, DRILL STRING ELEMENT HANDLING APPARATUS, Jonas Olof Anders Hilding, et al., Owner of Record: *Atlas Copco Aktiebolag, Nacka, Sweden,* Attorney or Agent: Robert D. Flynn, et al., Ex. Gp.: 354

3,994,454, Re. S.N. 809,405, Filed June 23, 1977, Cl. 244/153 R, CONTROLLABLE STUNT KITE HAVING A PAIR OF SYMMETRICAL BRIDLES, Lynn M. Worsham, Owner of Record: *Inventor,* Attorney or Agent: Robert W. Keller, Ex. Gp.: 315

4,019,244, Re. S.N. 807,314, Filed June 16, 1977, Cl. 29/520, SPIRAL WOUND GASKET ASSEMBLY METHOD, A. B. Owen, et al., Owner of Record: *Lamons Metal Gasket Company, Houston, Tex.,* Attorney or Agent: B. R. Pravel, et al., Ex. Gp.: 321

PATENT NOTICES

Certificates of Correction for the Week of Aug. 23, 1977

Re. 28,850	4,013,021	4,020,839	4,026,249
Re. 29,075	4,013,032	4,021,253	4,026,303
3,679,705	4,013,214	4,021,375	4,026,558
3,776,941	4,013,755	4,021,500	4,026,632
3,779,917	4,013,804	4,021,623	4,026,667
3,901,861	4,014,491	4,021,774	4,026,671
3,910,231	4,014,556	4,021,933	4,026,709
3,929,811	4,014,664	4,021,990	4,026,712
3,938,260	4,014,839	4,022,018	4,026,841
3,940,415	4,015,445	4,022,140	4,027,097
3,948,674	4,015,538	4,022,192	4,027,141
3,951,268	4,016,003	4,022,382	4,027,162
3,952,164	4,016,225	4,022,788	4,027,192
3,958,225	4,016,686	4,022,805	4,027,206
3,958,431	4,016,706	4,022,901	4,027,280
3,961,658	4,016,711	4,023,036	4,027,289
3,965,082	4,016,860	4,023,098	4,027,293
3,967,721	4,017,019	4,023,418	4,027,312
3,968,136	4,017,289	4,023,482	4,027,436
3,972,828	4,017,314	4,023,583	4,027,442
3,974,233	4,017,320	4,023,696	4,027,476
3,975,196	4,017,335	4,023,725	4,027,538
3,983,158	4,017,338	4,023,872	4,027,551
3,983,312	4,017,475	4,023,912	4,027,660
3,986,935	4,017,625	4,024,061	4,027,670
3,988,634	4,017,747	4,024,128	4,027,826
3,989,676	4,017,789	4,024,145	4,027,898
3,989,801	4,018,053	4,024,189	4,027,954
3,990,970	4,018,130	4,024,281	4,028,108
3,992,916	4,018,177	4,024,468	4,028,117
3,993,472	4,018,605	4,024,522	4,028,209
3,997,618	4,018,903	4,024,699	4,028,444
3,998,669	4,018,928	4,024,742	4,028,467
3,999,075	4,018,988	4,024,789	4,028,529
4,002,635	4,019,375	4,024,910	4,028,575
4,004,023	4,019,760	4,024,975	4,028,787
4,005,223	4,019,789	4,025,028	4,028,862
4,006,145	4,019,821	4,025,092	4,028,903
4,006,722	4,019,884	4,025,424	4,029,305
4,006,984	4,020,107	4,025,468	4,029,422
4,007,764	4,020,124	4,025,795	4,029,565
4,008,191	4,020,317	4,025,814	4,029,600
4,008,337	4,020,452	4,025,854	4,029,610
4,008,338	4,020,529	4,025,907	4,029,696
4,009,181	4,020,762	4,026,011	4,029,742
4,010,469	4,020,773	4,026,193	
4,012,238	4,020,820	4,026,223	

Dedications

3,398,879.—*Brian David James,* Menlo Park, and *Theodore K. Tom,* Sunnyvale, Calif. ASYMMETRIC ION PUMP AND METHOD. Patent dated Aug. 27, 1968. Dedication filed June 17, 1977, by the assignee, *The Perkin-Elmer Corporation.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,412,858.—*Spencer A. Stone,* Fort Wayne, Ind. HYDRAULIC CLASSIFIER HAVING AUTOMATIC UNDERFLOW DISCHARGE CONTROL. Patent dated Nov. 26, 1968. Dedication filed June 16, 1977, by the assignee, *The Desiter Concentrator Company, Inc.*

Hereby dedicates to the Public the remaining term of said patent.

3,438,586.—*Vincent W. Cancilla,* Pittsfield, Mass. TWO-PIPE DISC REFINER. Patent dated Apr. 15, 1969. Dedication filed May 6, 1977, by the assignee, *Beloit Corporation.*

Hereby dedicates to the Public the entire term of said patent.

3,561,887.—*Leo C. Reeve,* Lombard, Ill. PUMP CONSTRUCTION FOR PUMPING ABRASIVE MATERIALS. Patent dated Feb. 9, 1971. Dedication filed June 16, 1977, by the assignee, *Portland Cement Association.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,667,878.—*Leo C. Reeve,* Lombard, Ill. PUMP CONSTRUCTION. Patent dated June 6, 1972. Dedication filed June 16, 1977, by the assignee, *Portland Cement Association.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,829,730.—*Clair W. Reash,* Fairview Park, and *Vincent Pietrasz,* Cleveland, Ohio. GETTER ASSEMBLY. Patent dated Aug. 13, 1974. Dedication filed June 29, 1977, by the assignee, *Union Carbide Corporation.*

Hereby dedicates to the Public the remaining term of said patent.

3,857,931.—*Hans Jacob Hager,* New York, N.Y. LATEX POLYMER REAGENTS FOR DIAGNOSTIC TESTS. Patent dated Dec. 31, 1974. Dedication filed July 20, 1977, by the assignee, *Hoffmann-La Roche Inc.*

Hereby dedicates to the Public the entire remaining term of said patent.

3,959,022.—*Lutgard C. De Jonghe* and *Harish Chandan,* Ithaca,, N.Y. METHOD FOR PRODUCING SODIUM-BETA-ALUMINA SOLID ELECTROLYTES. Patent dated May 25, 1976. Dedication filed June 27, 1977, by the assignee, *Cornell Research Foundation, Inc.*

Hereby dedicates to the Public the entire term of said patent.

Disclaimers

Reissue No. 29,234.—*Richard H. Heeren,* Palatine, Ill. FET LOGIC GATE CIRCUITS. Patent dated May 24, 1977. Disclaimer filed July 7, 1977, by the assignee, *Teletype Corporation.*

Hereby enters this disclaimer to claim 3 of said patent.

Reissue No. 29,248.—*Wayne Congleton,* Walnut, Calif. CONTAINER. Patent dated June 7, 1977. Disclaimer filed July 9, 1977, by the assignee, *Dolco Packaging Corporation.*

The term of this patent subsequent to Sept. 10, 1991 has been disclaimed.

3,498,746.—*Roy G. Smaltz,* Valrico, *William A. Satterwhite,* Lakeland, and *Paul R. Roberts,* Plant City, Fla. RECOVERY OF FLUOSILICIC ACID AND P_2O_5 FROM RECYCLE STREAMS AND POND WATER. Patent dated Mar. 3, 1970. Disclaimer filed June 24, 1977, by the assignee, *United States Steel Corporation.*

Hereby enters this disclaimer to all of the claims therein of said patent.

3,531,368.—*Miyoshi Okamoto,* Ohtsu-shi, *Koji Watanabe,* Sonoyama, *Yasuhiko Nukushina,* Kyoto, and *Tsuneo Azawa,* Ohtsu-shi, Japan. SYNTHETIC FILAMENTS AND THE LIKE. Patent dated Sept. 29, 1970. Disclaimer filed June 20, 1977, by the assignee, *Toray Industries, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3,588,844.—*Alton O. Christensen,* Houston, Tex. SENSE AMPLIFIER FOR SINGLE DEVICE PER BIT MOSFET MEMORIES. Patent dated June 28, 1971. Disclaimer filed June 20, 1977, by the assignee, *Shell Oil Company.*

Hereby enters this disclaimer to claims 1–14 of said patent.

3,847,638.—*George O. Suman, Jr.* and *Edwin A. Richardson,* Houston, and *Ronald F. Scheuerman,* Bellaire, Tex. HYDRATED METAL OXIDE DEPOSITION. Patent dated Nov. 12, 1974. Disclaimer filed July 6, 1976, by the assignee, *Shell Oil Company.*

Hereby enters this disclaimer to all of the claims of said patent.

3,864,091.—*Ivo Mavrovic,* New York, N.Y. APPARATUS FOR THE DECOMPOSITION OF AMMONIUM CARBAMATE. Patent dated Feb. 4, 1975. Disclaimer filed June 15, 1977, by the inventor.

Hereby enters this disclaimer to claims 1 through 3 of said patent.

3,908,657.—*Avinoam Kowarski,* Baltimore, Md. SYSTEM FOR CONTINUOUS WITHDRAWAL OF BLOOD. Patent dated Sept. 30, 1975. Disclaimer filed July 5, 1977, by the assignee, *The Johns Hopkins University.*

Hereby enters this disclaimer to all claims of said patent.

4,006,743.—*Avinoam Kowarski,* Baltimore, Md. SYSTEM FOR CONTINUOUS WITHDRAWAL OF BLOOD. Patent dated Feb. 8, 1977. Disclaimer filed July 6, 1977, by the assignee, *The Johns Hopkins University.*

Hereby enters this disclaimer to all claims of said patent.

BUDAPEST MICROORGANISM TREATY

The Diplomatic Conference for the Conclusion of a Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure was held in Budapest, Hungary from April 14 to 28, 1977. Some 31 States, one intergovernmental organization and 11 international non-governmental organizations were represented in the Diplomatic Conference. Following two weeks of negotiations, the Treaty was adopted by the Diplomatic Conference on April 27, 1976 and signed the following day by 13 States, including the United States. The Treaty will enter into force three months after ratification or accession by five States.

The ratification of the Treaty by the United States would give certain advantages to an inventor of a microbiological invention seeking patent protection in a number of countries. An inventor would be able to rely on a single deposit of the microorganism in an approved depositary to satisfy the disclosure requirements of all the member countries of the Union established by the Treaty. Each country will be able to nominate depositaries in its territory for approval, if the depositaries meet the scientific standards required by the Treaty. The public release of a deposit will be governed by the patent laws of the country or countries under which the deposit was :nade.

We are seeking the views of the public on the advisability of ratification by the United States. Views on the ratification of the Treaty should be submitted to this Office prior to October 14, 1977. If you have any questions or wish further information, please write or call Mr. Michael K. Kirk, Director, Office of Legislation and International Affairs, c/o The Commissioner of Patents and Trademarks, Washington, D.C. 20231 (telephone (703) 557-3065).

C. Marshall Dann

C. MARSHALL DANN
Commissioner of Patents and Trademarks

August 1, 1977

(The Treaty and Regulations below are reproduced from the May, 1977 issue of *Industrial Property*, published by the World Intellectual Property Organization, Geneva, Switzerland.)

Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure*

Done at Budapest on April 28, 1977

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* *Official English title.*
Source: International Bureau of WIPO.
Note: This Treaty was signed on April 28, 1977, at Budapest, by the following States: Bulgaria, Denmark, Finland, France, Germany (Federal Republic of), Hungary, Italy, Netherlands, Norway, Spain, Switzerland, United Kingdom, United States of America; it will remain open for signature at Budapest until December 31, 1977.
** This Table of Contents is added for the convenience of the reader *(Editor's Note)*.

INTRODUCTORY PROVISIONS

Article 1

Establishment of a Union

The States party to this Treaty (hereinafter called "the Contracting States") constitute a Union for the international recognition of the deposit of microorganisms for the purposes of patent procedure.

Article 2

Definitions

For the purposes of this Treaty and the Regulations:

(i) references to a "patent" shall be construed as references to patents for inventions, inventors' certificates, utility certificates, utility models, patents or certificates of addition, inventors' certificates of addition, and utility certificates of addition;

(ii) "deposit of a microorganism" means, according to the context in which these words appear, the following acts effected in accordance with this Treaty and the Regulations; the transmittal of a microorganism to an international depositary authority, which receives and accepts it, or the storage of such a microorganism by the international depositary authority, or both the said transmittal and the said storage;

(iii) "patent procedure" means any administrative or judicial procedure relating to a patent application or a patent;

(iv) "publication for the purposes of patent procedure" means the official publication, or the official laying open for public inspection, of a patent application or a patent;

(v) "intergovernmental industrial property organization" means an organization that has filed a declaration under Article 9(1);

(vi) "industrial property office" means an authority of a Contracting State or an intergovernmental industrial property organization competent for the grant of patents;

(vii) "depositary institution" means an institution which provides for the receipt, acceptance and storage of microorganisms and the furnishing of samples thereof;

(viii) "international depositary authority" means a depositary institution which has acquired the status of international depositary authority as provided in Article 7;

(ix) "depositor" means the natural person or legal entity transmitting a microorganism to an international depositary authority, which receives and accepts it, and any successor in title of the said natural person or legal entity;

(x) "Union" means the Union referred to in Article 1;

(xi) "Assembly" means the Assembly referred to in Article 10;

(xii) "Organization" means the World Intellectual Property Organization;

(xiii) "International Bureau" means the International Bureau of the Organization and, as long as it subsists, the United International Bureaux for the Protection of Intellectual Property (BIRPI);

(xiv) "Director General" means the Director General of the Organization;

(xv) "Regulations" means the Regulations referred to in Article 12.

CHAPTER I

SUBSTANTIVE PROVISIONS

Article 3

Recognition and Effect of the Deposit of Microorganisms

(1) *(a)* Contracting States which allow or require the deposit of microorganisms for the purposes of patent procedure shall recognize, for such purposes, the deposit of a microorganism with any international depositary authority. Such recognition shall include the recognition of the fact and date of the deposit as indicated by the international depositary authority as well as the recognition of the fact that what is furnished as a sample is a sample of the deposited microorganism.

(b) Any Contracting State may require a copy of the receipt of the deposit referred to in subparagraph *(a)*, issued by the international depositary authority.

(2) As far as matters regulated in this Treaty and the Regulations are concerned, no Contracting State may require compliance with requirements different from or additional to those which are provided in this Treaty and the Regulations.

Article 4

New Deposit

(1) *(a)* Where the international depositary authority cannot furnish samples of the deposited microorganism for any reason, in particular,

(i) where such microorganism is no longer viable, or

(ii) where the furnishing of samples would require that they be sent abroad and the sending or the receipt of the samples abroad is prevented by export or import restrictions,

that authority shall, promptly after having noted its inability to furnish samples, notify the depositor of such inability, indicating the cause thereof, and the depositor, subject to paragraph (2) and as provided in this paragraph, shall have the right to make a new deposit of the microorganism which was originally deposited.

(b) The new deposit shall be made with the international depositary authority with which the original deposit was made, provided that:

(i) it shall be made with another international depositary authority where the institution with which the original deposit was made has ceased to have the status of international depositary authority, either entirely or in respect of the kind of microorganism to which the deposited microorganism belongs, or where the international depositary authority with which the original deposit was made discontinues, temporarily or definitively, the performance of its functions in respect of deposited microorganisms;

(ii) it may be made with another international depositary authority in the case referred to in subparagraph *(a)* (ii).

(c) Any new deposit shall be accompanied by a statement signed by the depositor alleging that the newly deposited microorganism is the same as that originally deposited. If the allegation of the depositor is contested, the burden of proof shall be governed by the applicable law.

(d) Subject to subparagraphs *(a)* to *(c)* and *(e)*, the new deposit shall be treated as if it had been made on the date on which the original deposit was made where all the preceding statements concerning the viability of the originally deposited microorganism indicated that the microorganism was viable and where the new deposit was made within three months after the date on which the depositor received the notification referred to in subparagraph *(a)*.

(e) Where subparagraph *(b)* (i) applies and the depositor does not receive the notification referred to in subparagraph *(a)* within six months after the date on which the termination, limitation or discontinuance referred to in subparagraph *(b)* (i) was published by the International Bureau, the three-month time limit referred to in subparagraph *(d)* shall be counted from the date of the said publication.

(2) The right referred to in paragraph (1)*(a)* shall not exist where the deposited microorganism has been transferred to another international depositary authority as long as that authority is in a position to furnish samples of such microorganism.

Article 5

Export and Import Restrictions

Each Contracting State recognizes that it is highly desirable that, if and to the extent to which the export from or import into its territory of certain kinds of microorganisms is restricted, such restriction should apply to microorganisms deposited, or destined for deposit, under this Treaty only where the restriction is necessary in view of national security or the dangers for health or the environment.

Article 6

Status of International Depositary Authority

(1) In order to qualify for the status of international depositary authority, any depositary institution must be located on the territory of a Contracting State and must benefit from assurances furnished by that State to the effect that the said institution complies and will continue to comply with the requirements specified in paragraph (2). The said assurances may be furnished also by an intergovernmental industrial property organization; in that case, the depositary institution must be located on the territory of a State member of the said organization.

(2) The depositary institution must, in its capacity of international depositary authority:

(i) have a continuous existence;

(ii) have the necessary staff and facilities, as prescribed in the Regulations, to perform its scientific and administrative tasks under this Treaty;

(iii) be impartial and objective;

(iv) be available, for the purposes of deposit, to any depositor under the same conditions;

(v) accept for deposit any or certain kinds of microorganisms, examine their viability and store them, as prescribed in the Regulations;

(vi) issue a receipt to the depositor, and any required viability statement, as prescribed in the Regulations;

(vii) comply, in respect of the deposited microorganisms, with the requirement of secrecy, as prescribed in the Regulations;

(viii) furnish samples of any deposited microorganism under the conditions and in conformity with the procedure prescribed in the Regulations.

(3) The Regulations shall provide the measures to be taken:

(i) where an international depositary authority discontinues, temporarily or definitively, the performance of its functions in respect of deposited microorganisms or refuses to accept any of the kinds of microorganisms which it should accept under the assurances furnished;

(ii) in case of the termination or limitation of the status of international depositary authority of an international depositary authority.

Article 7

Acquisition of the Status of International Depositary Authority

(1)*(a)* A depositary institution shall acquire the status of international depositary authority by virtue of a written communication addressed to the Director General by the Contracting State on the territory of which the depositary institution is located and including a declaration of assurances to the effect that the said institution complies and will continue to comply with the requirements specified in Article 6(2). The said status may be acquired also by virtue of a written communication addressed to the Director General by an intergovernmental industrial property organization and including the said declaration.

(b) The communication shall also contain information on the depositary institution as provided in the Regulations and may indicate the date on which the status of international depositary authority should take effect.

(2)*(a)* If the Director General finds that the communication includes the required declaration and that all the required information has been received, the communication shall be promptly published by the International Bureau.

(b) The status of international depositary authority shall be acquired as from the date of publication of the communication or, where a date has been indicated under paragraph (1)*(b)* and such date is later than the date of publication of the communication, as from such date.

(3) The details of the procedure under paragraphs (1) and (2) are provided in the Regulations.

Article 8

Termination and Limitation of the Status of International Depositary Authority

(1)*(a)* Any Contracting State or any intergovernmental industrial property organization may request the Assembly to terminate, or to limit to certain kinds of microorganisms, any authority's status of international depositary authority on the ground that the requirements specified in Article 6 have not been or are no longer complied with. However, such a request may not be made by a Contracting State or intergovernmental industrial property organization in respect of an international depositary authority for which it has made the declaration referred to in Article 7(1)*(a)*.

(b) Before making the request under subparagraph *(a)*, the Contracting State or the intergovernmental industrial property organization shall, through the intermediary of the Director General, notify the reasons for the proposed request to the Contracting State or the intergovernmental industrial property organization which has made the communication referred to in Article 7(1) so that that State or organization may, within six months from the date of the said notification, take appropriate action to obviate the need for making the proposed request.

(c) Where the Assembly finds that the request is well founded, it shall decide to terminate, or to limit to certain kinds of microorganisms, the status of international depositary authority of the authority referred to in subparagraph *(a)*. The decision of the Assembly shall require that a majority of two-thirds of the votes cast be in favor of the request.

(2)*(a)* The Contracting State or intergovernmental industrial property organization having made the declaration referred to in Article 7(1)*(a)* may, by a communication addressed to the Director General, withdraw its declaration either entirely or in respect only of certain kinds of microorganisms and in any event shall do so when and to the extent that its assurances are no longer applicable.

(b) Such a communication shall, from the date provided for in the Regulations, entail, where it relates to the entire declaration, the termination of the status of international depositary authority or, where it relates only to certain kinds of microorganisms, a corresponding limitation of such status.

(3) The details of the procedure under paragraphs (1) and (2) are provided in the Regulations.

Article 9

Intergovernmental Industrial Property Organizations

(1)*(a)* Any intergovernmental organization to which several States have entrusted the task of granting regional patents and of which all the member States are members of the International (Paris) Union for the Protection of Industrial Property may file with the Director General a declaration that it accepts the obligation of recognition provided for in Article 3(1)*(a)*, the obligation concerning the requirements referred to in Article 3(2) and all the effects of the provisions of this Treaty and the Regulations applicable to intergovernmental industrial property organizations. If filed before the entry into force of this Treaty according to Article 16(1), the declaration referred to in the preceding sentence shall become effective on the date of the said entry into force. If filed after such entry into force, the said declaration shall become effective three months after its filing unless a later date has been indicated in the declaration. In the latter case, the declaration shall take effect on the date thus indicated.

(b) The said organization shall have the right provided for in Article 3(1)*(b)*.

(2) Where any provision of this Treaty or of the Regulations affecting intergovernmental industrial property organizations is revised or amended, any intergovernmental industrial property organization may withdraw its declaration referred to in paragraph (1) by notification addressed to the Director General. The withdrawal shall take effect:

(i) where the notification has been received before the date on which the revision or amendment enters into force, on that date;

(ii) where the notification has been received after the date referred to in (i), on the date indicated in the notification or, in the absence of such indication, three months after the date on which the notification was received.

(3) In addition to the case referred to in paragraph (2), any intergovernmental industrial property organization may withdraw its declaration referred to in paragraph (1)*(a)* by notification addressed to the Director General. The withdrawal shall take effect two years after the date on which the Director General has received the notification. No notification of withdrawal under this paragraph shall be receivable during a period of five years from the date on which the declaration took effect.

(4) The withdrawal referred to in paragraph (2) or (3) by an intergovernmental industrial property organization whose communication under Article 7(1) has led to the acquisition of the status of international depositary authority by a depositary institution shall entail the termination of such status one year after the date on which the Director General has received the notification of withdrawal.

(5) Any declaration referred to in paragraph (1)*(a)*, notification of withdrawal referred to in paragraph (2) or (3), assurances furnished under Article 6(1), second sentence, and included in a declaration made in accordance with Article 7(1)*(a)*, request made under Article 8(1) and communication of withdrawal referred to in Article 8(2) shall require the express previous approval of the supreme governing organ of the intergovernmental industrial property organization whose members are all the States members of the said organization and in which decisions are made by the official representatives of the governments of such States.

CHAPTER II

ADMINISTRATIVE PROVISIONS

Article 10

Assembly

(1)*(a)* The Assembly shall consist of the Contracting States.

(b) Each Contracting State shall be represented by one delegate, who may be assisted by alternate delegates, advisors, and experts.

(c) Each intergovernmental industrial property organization shall be represented by special observers in the meetings of the Assembly and any committee and working group established by the Assembly.

(d) Any State not member of the Union which is a member of the Organization or of the International (Paris) Union for the Protection of Industrial Property and any intergovernmental organization specialized in the field of patents other than an intergovernmental industrial property organization as defined in Article 2(v) may be represented by observers in the meetings of the Assembly and, if the Assembly so decides, in the meetings of any committee or working group established by the Assembly.

(2)*(a)* The Assembly shall:

(i) deal with all matters concerning the maintenance and development of the Union and the implementation of this Treaty;

(ii) exercise such rights and perform such tasks as are specially conferred upon it or assigned to it under this Treaty;

(iii) give directions to the Director General concerning the preparations for revision conferences;

(iv) review and approve the reports and activities of the Director General concerning the Union, and give him all necessary instructions concerning matters within the competence of the Union;

(v) establish such committees and working groups as it deems appropriate to facilitate the work of the Union;

(vi) determine, subject to paragraph (1)*(d)*, which States other than Contracting States, which intergovernmental organizations other than intergovernmental industrial property organizations as defined in Article 2(v) and which international non-governmental organizations shall be admitted to its meetings as observers and to what extent international depositary authorities shall be admitted to its meetings as observers;

(vii) take any other appropriate action designed to further the objectives of the Union;

(viii) perform such other functions as are appropriate under this Treaty.

(b) With respect to matters which are of interest also to other Unions administered by the Organization, the Assembly shall make its decisions after having heard the advice of the Coordination Committee of the Organization.

(3) A delegate may represent, and vote in the name of, one State only.

(4) Each Contracting State shall have one vote.

(5)*(a)* One-half of the Contracting States shall constitute a quorum.

(b) In the absence of the quorum, the Assembly may make decisions but, with the exception of

decisions concerning its own procedure, all such decisions shall take effect only if the quorum and the required majority are attained through voting by correspondence as provided in the Regulations.

(6)*(a)* Subject to Articles 8(1)*(c)*, 12(4) and 14(2)*(b)*, the decisions of the Assembly shall require a majority of the votes cast.

(b) Abstentions shall not be considered as votes.

(7)*(a)* The Assembly shall meet once in every third calendar year in ordinary session upon convocation by the Director General, preferably during the same period and at the same place as the General Assembly of the Organization.

(b) The Assembly shall meet in extraordinary session upon convocation by the Director General, either on his own initiative or at the request of one-fourth of the Contracting States.

(8) The Assembly shall adopt its own rules of procedure.

Article 11

International Bureau

(1) The International Bureau shall:

(i) perform the administrative tasks concerning the Union, in particular such tasks as are specifically assigned to it under this Treaty and the Regulations or by the Assembly;

(ii) provide the secretariat of revision conferences, of the Assembly, of committees and working groups established by the Assembly, and of any other meeting convened by the Director General and dealing with matters of concern to the Union.

(2) The Director General shall be the chief executive of the Union and shall represent the Union.

(3) The Director General shall convene all meetings dealing with matters of concern to the Union.

(4)*(a)* The Director General and any staff member designated by him shall participate, without the right to vote, in all meetings of the Assembly, the committees and working groups established by the Assembly, and any other meeting convened by the Director General and dealing with matters of concern to the Union.

(b) The Director General, or a staff member designated by him, shall be ex officio secretary of the Assembly, and of the committees, working groups and other meetings referred to in subparagraph *(a)*.

(5)*(a)* The Director General shall, in accordance with the directions of the Assembly, make the preparations for revision conferences.

(b) The Director General may consult with intergovernmental and international non-governmental organizations concerning the preparations for revision conferences.

(c) The Director General and persons designated by him shall take part, without the right to vote, in the discussions at revision conferences.

(d) The Director General, or a staff member designated by him, shall be ex officio secretary of any revision conference.

Article 12

Regulations

(1) The Regulations provide rules concerning:

(i) matters in respect of which this Treaty expressly refers to the Regulations or expressly provides that they are or shall be prescribed;

(ii) any administrative requirements, matters or procedures;

(iii) any details useful in the implementation of this Treaty.

(2) The Regulations adopted at the same time as this Treaty are annexed to this Treaty.

(3) The Assembly may amend the Regulations.

(4)*(a)* Subject to subparagraph *(b)*, adoption of any amendment of the Regulations shall require two-thirds of the votes cast.

(b) Adoption of any amendment concerning the furnishing of samples of deposited microorganisms by the international depositary authorities shall require that no Contracting State vote against the proposed amendment.

(5) In the case of conflict between the provisions of this Treaty and those of the Regulations, the provisions of this Treaty shall prevail.

CHAPTER III

REVISION AND AMENDMENT

Article 13

Revision of the Treaty

(1) This Treaty may be revised from time to time by conferences of the Contracting States.

(2) The convocation of any revision conference shall be decided by the Assembly.

(3) Articles 10 and 11 may be amended either by a revision conference or according to Article 14.

Article 14

Amendment of Certain Provisions of the Treaty

(1)*(a)* Proposals under this Article for the amendment of Articles 10 and 11 may be initiated by any Contracting State or by the Director General.

(b) Such proposals shall be communicated by the Director General to the Contracting States at least six months in advance of their consideration by the Assembly.

(2)*(a)* Amendments to the Articles referred to in paragraph (1) shall be adopted by the Assembly.

(b) Adoption of any amendment to Article 10 shall require four-fifths of the votes cast; adoption of any amendment to Article 11 shall require three-fourths of the votes cast.

(3)*(a)* Any amendment to the Articles referred to in paragraph (1) shall enter into force one month after written notifications of acceptance, effected in accordance with their respective constitutional processes, have been received by the Director General from three-fourths of the Contracting States members of the Assembly at the time the Assembly adopted the amendment.

(b) Any amendment to the said Articles thus accepted shall bind all the Contracting States which were Contracting States at the time the amendment was adopted by the Assembly, provided that any amendment creating financial obligations for the said Contracting States or increasing such obligations shall bind only those Contracting States which have notified their acceptance of such amendment.

(c) Any amendment which has been accepted and which has entered into force in accordance with subparagraph *(a)* shall bind all States which become Contracting States after the date on which the amendment was adopted by the Assembly.

CHAPTER IV

FINAL PROVISIONS

Article 15

Becoming Party to the Treaty

(1) Any State member of the International (Paris) Union for the Protection of Industrial Property may become party to this Treaty by:

(i) signature followed by the deposit of an instrument of ratification, or

(ii) deposit of an instrument of accession.

(2) Instruments of ratification or accession shall be deposited with the Director General.

Article 16

Entry Into Force of the Treaty

(1) This Treaty shall enter into force, with respect to the first five States which have deposited their instruments of ratification or accession, three months after the date on which the fifth instrument of ratification or accession has been deposited.

(2) This Treaty shall enter into force, with respect to any other State three months after the date on which that State has deposited its instrument of ratification or accession unless a later date has been indicated in the instrument of ratification or accession. In the latter case, this Treaty shall enter into force with respect to that State on the date thus indicated.

Article 17

Denunciation of the Treaty

(1) Any Contracting State may denounce this Treaty by notification addressed to the Director General.

(2) Denunciation shall take effect two years after the day on which the Director General has received the notification.

(3) The right of denunciation provided for in paragraph (1) shall not be exercised by any Contracting State before the expiration of five years from the date on which it becomes party to this Treaty.

(4) The denunciation of this Treaty by a Contracting State that has made a declaration referred to in Article 7(1)*(a)* with respect to a depositary institution which thus acquired the status of international depositary authority shall entail the termination of such status one year after the day on which the Director General received the notification referred to in paragraph (1).

Article 18

Signature and Languages of the Treaty

(1)*(a)* This Treaty shall be signed in a single original in the English and French languages, both texts being equally authentic.

(b) Official texts of this Treaty shall be established by the Director General, after consultation with the interested Governments and within two months from the date of signature of this Treaty, in the other languages in which the Convention Establishing the World Intellectual Property Organization was signed.

(c) Official texts of this Treaty shall be established by the Director General, after consultation with the interested Governments, in the Arabic, German, Italian, Japanese and Portuguese languages, and such other languages as the Assembly may designate.

(2) This Treaty shall remain open for signature at Budapest until December 31, 1977.

Article 19

Deposit of the Treaty; Transmittal of Copies; Registration of the Treaty

(1) The original of this Treaty, when no longer open for signature, shall be deposited with the Director General.

(2) The Director General shall transmit two copies, certified by him, of this Treaty and the Regulations to the Governments of all the States referred to in Article 15(1), to the intergovernmental organizations that may file a declaration under Article 9(1)*(a)* and, on request, to the Government of any other State.

(3) The Director General shall register this Treaty with the Secretariat of the United Nations.

(4) The Director General shall transmit two copies, certified by him, of any amendment to this Treaty and to the Regulations to all Contracting States, to all intergovernmental industrial property organizations and, on request, to the Government of any other State and to any other intergovernmental organization that may file a declaration under Article 9(1)*(a)*.

Article 20

Notifications

The Director General shall notify the Contracting States, the intergovernmental industrial property organizations and those States not members of the Union which are members of the International (Paris) Union for the Protection of Industrial Property of:

(i) signatures under Article 18;

(ii) deposits of instruments of ratification or accession under Article 15(2);

(iii) declarations filed under Article 9(1)*(a)* and notifications of withdrawal under Article 9(2) or (3);

(iv) the date of entry into force of this Treaty under Article 16(1);

(v) the communications under Articles 7 and 8 and the decisions under Article 8;

(vi) acceptance of amendments to this Treaty under Article 14(3);

(vii) any amendment of the Regulations;

(viii) the dates on which amendments to the Treaty or the Regulations enter into force;

(ix) denunciations received under Article 17.

Regulations

Under the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure

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*This Table of Contents is added for the convenience of the reader *(Editor's note)*.

Rule 1

Abbreviated Expressions and Interpretation of the Word "Signature"

1.1 *"Treaty"*

In these Regulations, the word "Treaty" means the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure.

1.2 *"Article"*

In these Regulations, the word "Article" refers to the specified Article of the Treaty.

1.3 *"Signature"*

In these Regulations, whenever the word "signature" is used, it shall be understood that, where the law of the State on the territory of which an international depositary authority is located requires the use of a seal instead of a signature, the said word shall mean "seal" for the purposes of that authority.

Rule 2

International Depositary Authorities

2.1 *Legal Status*

Any international depositary authority may be a government agency, including any public institution attached to a public administration other than the central government, or a private entity.

2.2 *Staff and Facilities*

The requirements referred to in Article 6(2)(ii) shall include in particular the following:

(i) the staff and facilities of any international depositary authority must enable the said authority to store the deposited microorganisms in a manner which ensures that they are kept viable and uncontaminated;

(ii) any international depositary authority must, for the storage of microorganisms, provide for sufficient safety measures to minimize the risk of losing microorganisms deposited with it.

2.3 *Furnishing of Samples*

The requirements referred to in Article 6(2)(viii) shall include in particular the requirement that any international depositary authority must furnish samples of deposited microorganisms in an expeditious and proper manner.

Rule 3

Acquisition of the Status of International Depositary Authority

3.1 *Communication*

(a) The communication referred to in Article 7(1) shall be addressed to the Director General, in the case of a Contracting State, through diplomatic channels or, in the case of an intergovernmental industrial property organization, by its chief executive officer.

(b) The communication shall:

(i) indicate the name and address of the depositary institution to which the communication relates;

(ii) contain detailed information as to the said institution's capacity to comply with the requirements specified in Article 6(2), including information on its legal status, scientific standing, staff and facilities;

(iii) where the said depositary institution intends to accept for deposit only certain kinds of microorganisms, specify such kinds;

(iv) indicate the amount of any fees that the said institution will, upon acquiring the status of international depositary authority, charge for storage, viability statements and furnishing of samples of microorganisms;

(v) indicate the official language or languages of the said institution;

(vi) where applicable, indicate the date referred to in Article 7(1)*(b)*.

3.2 *Processing of the Communication*

If the communication complies with Article 7(1) and Rule 3.1, it shall be promptly notified by the Director General to all Contracting States and intergovernmental industrial property organizations and shall be promptly published by the International Bureau.

3.3 *Extension of the List of Kinds of Microorganisms Accepted*

The Contracting State or intergovernmental industrial property organization having made the communication referred to in Article 7(1) may, at any time thereafter, notify the Director General that its assurances are extended to specified kinds of microorganisms to which, so far, the assurances have not extended. In such a case, and as far as the additional kinds of microorganisms are concerned, Article 7 and Rules 3.1 and 3.2 shall apply, *mutatis mutandis*.

Rule 4

Termination or Limitation of the Status of International Depositary Authority

4.1 *Request; Processing of Request*

(a) The request referred to in Article 8(1)*(a)* shall be addressed to the Director General as provided in Rule 3.1*(a)*.

(b) The request shall:

(i) indicate the name and address of the international depositary authority concerned;

(ii) where it relates only to certain kinds of microorganisms, specify such kinds;

(iii) indicate in detail the facts on which it is based.

(c) If the request complies with paragraphs *(a)* and *(b)*, it shall be promptly notified by the Director General to all Contracting States and intergovernmental industrial property organizations.

(d) Subject to paragraph *(e)*, the Assembly shall consider the request not earlier than six and not later than eight months from the notification of the request.

(e) Where, in the opinion of the Director General, respect of the time limit provided for in paragraph *(d)* could endanger the interests of actual or potential depositors, he may convene the Assembly for a date earlier than the date of the expiration of the six-month period provided for in paragraph *(d)*.

(f) If the Assembly decides to terminate, or to limit to certain kinds of microorganisms, the status of international depositary authority, the said decision shall become effective three months after the date on which it was made.

4.2 *Communication; Effective Date; Processing of Communication*

(a) The communication referred to in Article 8(2)*(a)* shall be addressed to the Director General as provided in Rule 3.1*(a)*.

(b) The communication shall:

(i) indicate the name and address of the international depositary authority concerned;

(ii) where it relates only to certain kinds of microorganisms, specify such kinds;

(iii) where the Contracting State or intergovernmental industrial property organization making the communication desires that the effects provided for in Article 8(2)*(b)* take place on a date later than at the expiration of three months from the date of the communication, indicate that later date.

(c) Where paragraph *(b)*(iii) applies, the effects provided for in Article 8(2)*(b)* shall take place on the date indicated under that paragraph in the communication; otherwise, they shall take place at the expiration of three months from the date of the communication.

(d) The Director General shall promptly notify all Contracting States and intergovernmental industrial property organizations of any communication received under Article 8(2) and of its effective date under paragraph *(c)*. A corresponding notice shall be promptly published by the International Bureau.

4.3 *Consequences for Deposits*

In the case of a termination or limitation of the status of international depositary authority under Articles 8(1), 8(2), 9(4) or 17(4), Rule 5.1 shall apply, *mutatis mutandis*.

Rule 5

Defaults by the International Depositary Authority

5.1 *Discontinuance of Performance of Functions in Respect of Deposited Microorganisms*

(a) If any international depositary authority temporarily or definitively discontinues the performance of any of the tasks it should perform under the Treaty and these Regulations in relation to any microorganisms deposited with it, the Contracting State or intergovernmental industrial property organization which, in respect of that authority, has furnished the assurances under Article 6(1) shall:

(i) ensure, to the fullest extent possible, that samples of all such microorganisms are transferred promptly and without deterioration or contamination from the said authority ("the defaulting authority") to another international depositary authority ("the substitute authority");

(ii) ensure, to the fullest extent possible, that all mail or other communications addressed to the defaulting authority, and all files and other relevant information in the possession of that authority, in respect of the said microorganisms are promptly transferred to the substitute authority;

(iii) ensure, to the fullest extent possible, that the defaulting authority promptly notifies all depositors affected of the discontinuance of the performance of its functions and the transfers effected;

(iv) promptly notify the Director General of the fact and the extent of the discontinuance in question and of the measures which have been taken by the said Contracting State or intergovernmental industrial property organization under (i) to (iii).

(b) The Director General shall promptly notify the Contracting States and the intergovernmental industrial property organizations as well as the industrial property offices of the notification received under paragraph *(a)*(iv); the notification of the Director General and the notification received by him shall be promptly published by the International Bureau.

(c) Under the applicable patent procedure it may be required that the depositor shall, promptly after receiving the receipt referred to in Rule 7.5, notify to any industrial property office with which a patent application was filed with reference to the original deposit the new accession number given to the deposit by the substitute authority.

(d) The substitute authority shall retain in an appropriate form the accession number given by the defaulting authority, together with the new accession number.

(e) In addition to any transfer effected under paragraph *(a)*(i), the defaulting authority shall, upon request by the depositor, transfer a sample of any microorganism deposited with it to any international depositary authority indicated by the depositor other

than the substitute authority, provided that the depositor pays any expenses to the defaulting authority resulting from the transfer of that sample. The depositor shall pay the fee for the storage of the said sample to the international depositary authority indicated by him.

(f) On the request of any depositor affected, the defaulting authority shall retain, as far as possible, samples of the microorganisms deposited with it.

5.2 *Refusal To Accept Certain Kinds of Microorganisms*

(a) If any international depositary authority refuses to accept for deposit any of the kinds of microorganisms which it should accept under the assurances furnished, the Contracting State or intergovernmental industrial property organization which, in respect of that authority, has made the declaration referred to in Article 7(1)*(a)* shall promptly notify the Director General of the relevant facts and the measures which have been taken.

(b) The Director General shall promptly notify the other Contracting States and intergovernmental industrial property organizations of the notification received under paragraph *(a)*; the notification of the Director General and the notification received by him shall be promptly published by the International Bureau.

Rule 6

Making the Original Deposit or New Deposit

6.1 *Original Deposit*

(a) The microorganism transmitted by the depositor to the international depositary authority shall, except where Rule 6.2 applies, be accompanied by a written statement bearing the signature of the depositor and containing:

(i) an indication that the deposit is made under the Treaty;

(ii) the name and address of the depositor;

(iii) details of the conditions necessary for the cultivation of the microorganism, for its storage and for testing its viability and also, where a mixture of microorganisms is deposited, descriptions of the components of the mixture and at least one of the methods permitting the checking of their presence;

(iv) an identification reference (number, symbols, etc.) given by the depositor to the microorganism;

(v) an indication of the properties of the microorganism which the international depositary authority cannot be expected to foresee but which are dangerous to health or the environment, particularly in the case of new microorganisms.

(b) It is strongly recommended that the written statement referred to in paragraph *(a)* should contain the scientific description and/or proposed taxonomic designation of the deposited microorganism.

6.2 *New Deposit*

(a) Subject to paragraph *(b)*, in the case of a new deposit made under Article 4, the microorganism transmitted by the depositor to the international depositary authority shall be accompanied by a copy of the receipt of the original deposit, a copy of the most recent statement concerning the viability of the microorganism originally deposited indicating that the microorganism is viable and a written statement bearing the signature of the depositor and containing:

(i) the indications referred to in Rule 6.1*(a)*(i) to (v);

(ii) a declaration stating the reason relevant under Article 4(1)*(a)* for making the new deposit, the statement required under Article 4(1)*(c)*, and, where applicable, an indication of the date relevant under Article 4(1)*(e)*;

(iii) where a scientific description and/or proposed taxonomic designation was/were indicated in connection with the original deposit, the most recent scientific description and/or proposed taxonomic designation as existing on the date relevant under Article 4(1)*(e)*.

(b) Where the new deposit is made with the international depositary authority with which the original deposit was made, paragraph *(a)*(i) shall not apply.

6.3 *Requirements of the International Depositary Authority*

(a) Any international depositary authority may require that the microorganism be deposited in the form and quantity necessary for the purposes of the Treaty and these Regulations and be accompanied by a form established by such authority and duly completed by the depositor for the purposes of the administrative procedures of such authority.

(b) Any international depositary authority shall communicate any such requirements and any amendments thereof to the International Bureau.

Rule 7

Receipt

7.1 *Issuance of Receipt*

The international depositary authority shall issue to the depositor, in respect of each deposit of microorganism effected with it or transferred to it, a receipt in attestation of the fact that it has received and accepted the microorganism.

7.2 *Form; Languages; Signature*

(a) Any receipt referred to in Rule 7.1 shall be established on a form called an "international form," a model of which shall be established by the Director General in those languages which the Assembly shall designate.

(b) Any words or letters filled in in the receipt in characters other than those of the Latin alphabet shall also appear therein transliterated in characters of the Latin alphabet.

(c) The receipt shall bear the signature of the person or persons having the power to represent the international depositary authority or that of any other official of that authority duly authorized by the said person or persons.

7.3 *Contents in the Case of the Original Deposit*

Any receipt referred to in Rule 7.1 and issued in the case of an original deposit shall indicate that it is issued by the depositary institution in its capacity of international depositary authority under the Treaty and shall contain at least the following indications:

(i) the name and address of the international depositary authority;

(ii) the name and address of the depositor;

(iii) the date of receipt of the microorganism by the international depositary authority;

(iv) the identification reference (number, symbols, etc.) given by the depositor to the microorganism;

(v) the accession number given by the international depositary authority to the deposit;

(vi) where the written statement referred to in Rule 6.1*(a)* contains the scientific description and/or proposed taxonomic designation of the microorganism, a reference to that fact.

7.4 *Contents in the Case of the New Deposit*

Any receipt referred to in Rule 7.1 and issued in the case of a new deposit effected under Article 4 shall be accompanied by a copy of the receipt of the original deposit and a copy of the most recent statement concerning the viability of the microorganism originally deposited indicating that the microorganism is viable, and shall at least contain:

(i) the indications referred to in Rule 7.3(i) to (v);

(ii) an indication of the relevant reason and, where applicable, the relevant date as stated by the depositor in accordance with Rule 6.2*(a)*(ii);

(iii) where Rule 6.2*(a)*(iii) applies, a reference to the fact that a scientific description and/or a proposed taxonomic designation has/have been indicated by the depositor;

(iv) the accession number given to the original deposit.

7.5 *Receipt in the Case of Transfer*

The international depositary authority to which samples of microorganisms are transferred under Rule 5.1*(a)*(1) shall issue to the depositor, in respect of each deposit in relation with which a sample is transferred, a receipt indicating that it is issued by the depositary institution in its capacity of international depositary authority under the Treaty and containing at least:

(i) the indications referred to in Rule 7.3(i) to (v);

(ii) the name and address of the international depositary authority from which the transfer was effected;

(iii) the accession number given by the international depositary authority from which the transfer was effected.

7.6 *Communication of the Scientific Description and/or Proposed Taxonomic Designation*

On request of any party entitled to receive a sample of the deposited microorganism under Rules 11.1, 11.2 or 11.3, the international depositary authority shall communicate to such party the scientific description and/or proposed taxonomic designation referred to in Rules 7.3(vi) or 7.4(iii).

Rule 8

Later Indication or Amendment of the Scientific Description and/or Proposed Taxonomic Designation

8.1 *Communication*

(a) Where, in connection with the deposit of a microorganism, the scientific description and/or taxonomic designation of the microorganism was/were not indicated, the depositor may later indicate or, where already indicated, may amend such description and/or designation.

(b) Any such later indication or amendment shall be made in a written communication, bearing the signature of the depositor, addressed to the international depositary authority and containing:

(i) the name and address of the depositor;

(ii) the accession number given by the said authority;

(iii) the scientific description and/or proposed taxonomic designation of the microorganism;

(iv) in the case of an amendment, the last preceding scientific description and/or proposed taxonomic designation.

8.2 *Attestation*

The international depositary authority shall, on the request of the depositor having made the communication referred to in Rule 8.1, deliver to him an attestation showing the data referred to in Rule 8.1*(b)*(i) to (iv) and the date of receipt of such communication.

Rule 9

Storage of Microorganisms

9.1 *Duration of the Storage*

Any microorganism deposited with an international depositary authority shall be stored by such authority, with all the care necessary to keep it viable and uncontaminated, for a period of at least five years after the most recent request for the furnishing of a

sample of the deposited microorganism was received by the said authority and, in any case, for a period of at least 30 years after the date of the deposit.

9.2 *Secrecy*

No international depositary authority shall give information to anyone whether a microorganism has been deposited with it under the Treaty. Furthermore, it shall not give any information to anyone concerning any microorganism deposited with it under the Treaty except to an authority, natural person or legal entity which is entitled to obtain a sample of the said microorganism under Rule 11 and subject to the same conditions as provided in that Rule.

Rule 10

Viability Test and Statement

10.1 *Obligation to Test*

The international depositary authority shall test the viability of each microorganism deposited with it:

(i) promptly after any deposit referred to in Rule 6 or any transfer referred to in Rule 5.1;

(ii) at reasonable intervals, depending on the kind of microorganism and its possible storage conditions, or at any time, if necessary for technical reasons;

(iii) at any time, on the request of the depositor.

10.2 *Viability Statement*

(a) The international depositary authority shall issue a statement concerning the viability of the deposited microorganism:

(i) to the depositor, promptly after any deposit referred to in Rule 6 or any transfer referred to in Rule 5.1;

(ii) to the depositor, on his request, at any time after the deposit or transfer;

(iii) to any industrial property office, other authority, natural person or legal entity, other than the depositor, to whom or to which samples of the deposited microorganism were furnished in conformity with Rule 11, on his or its request, together with or at any time after such furnishing of samples.

(b) The viability statement shall indicate whether the microorganism is or is no longer viable and shall contain:

(i) the name and address of the international depositary authority issuing it;

(ii) the name and address of the depositor;

(iii) the date of the deposit of the microorganism and of the transfer, if any;

(iv) the accession number given by the said authority;

(v) the date of the test to which it refers;

(vi) information on the conditions under which the viability test has been performed, provided that the said information has been requested by the party to which the viability statement is issued and that the results of the test were negative.

(c) In the cases of paragraph *(a)* (ii) and (iii), the viability statement shall refer to the most recent viability test.

(d) As to form, languages and signature, Rule 7.2 shall apply, *mutatis mutandis*, to the viability statement.

(e) In the case of paragraph *(a)* (i) or where the request is made by an industrial property office, the issuance of the viability statement shall be free of charge. Any fee payable under Rule 12.1*(a)* (iii) in respect of any other viability statement shall be chargeable to the party requesting the statement and shall be paid before or at the time of making the request.

Rule 11

Furnishing of Samples

11.1 *Furnishing of Samples to Interested Industrial Property Offices*

Any international depositary authority shall furnish a sample of any deposited microorganism to the industrial property office of any Contracting State or of any intergovernmental industrial property organization, on the request of such office, provided that the request shall be accompanied by a declaration to the effect that:

(i) an application referring to the deposit of that microorganism has been filed with that office for the grant of a patent and that the subject matter of that application involves the said microorganism or the use thereof;

(ii) such application is pending before that office or has led to the grant of a patent;

(iii) the sample is needed for the purposes of a patent procedure having effect in the said Contracting State or in the said organization or its member States;

(iv) the said sample and any information acco n-panying or resulting from it will be used only for the purposes of the said patent procedure.

11.2 *Furnishing of Samples to or with the Authorization of the Depositor*

Any international depositary authority shall furnish a sample of any deposited microorganism:

(i) to the depositor, on his request;

(ii) to any authority, natural person or legal entity (hereinafter referred to as "the authorized party"), on the request of such party, provided that the request is accompanied by a declaration of the depositor authorizing the requested furnishing of a sample.

11.3 *Furnishing of Samples to Parties Legally Entitled*

(a) Any international depositary authority shall furnish a sample of any deposited microorganism to any authority, natural person or legal entity (hereinafter referred to as "the certified party"), on the request of such party, provided that the request is made on a form whose contents are fixed by the Assembly and that on the said form the industrial property office certifies:

(i) that an application referring to the deposit of that microorganism has been filed with that office for the grant of a patent and that the subject matter of that application involves the said microorganism or the use thereof;

(ii) that, except where the second phrase of (iii) applies, publication for the purposes of patent procedure has been effected by that office;

(iii) *either* that the certified party has a right to a sample of the microorganism under the law governing patent procedure before that office and, where the said law makes the said right dependent on the fulfillment of certain conditions, that that office is satisfied that such conditions have actually been fulfilled *or* that the certified party has affixed his signature on a form before that office and that, as a consequence of the signature of the said form, the conditions for furnishing a sample to the certified party are deemed to be fulfilled in accordance with the law governing patent procedure before that office; where the certified party has the said right under the said law prior to publication for the purposes of patent procedure by the said office and such publication has not yet been effected, the certification shall expressly state so and shall indicate, by citing it in the customary manner, the applicable provision of the said law, including any court decision.

(b) In respect of patents granted and published by any industrial property office, such office may from time to time communicate to any international depositary authority lists of the accession numbers given by that authority to the deposits of the microorganisms referred to in the said patents. The international depositary authority shall, on the request of any authority, natural person or legal entity (hereinafter referred to as "the requesting party"), furnish to it a sample of any microorganism where the accession number has been so communicated. In respect of deposited microorganisms whose accession numbers have been so communicated, the said office shall not be required to provide the certification referred to in Rule 11.3*(a)*.

11.4 *Common Rules*

(a) Any request, declaration, certification or communication referred to in Rules 11.1, 11.2 and 11.3 shall be

(i) in English, French, Russian or Spanish where it is addressed to an international depositary authority whose official language is or whose official languages include English, French, Russian or Spanish, respectively, provided that, where it must be in Russian or Spanish, it may be instead filed in English or French and, if it is so filed, the International Bureau shall, on the request of the interested party referred to in the said Rules or the international depositary authority, establish, promptly and free of charge, a certified translation into Russian or Spanish;

(ii) in all other cases, it shall be in English or French, provided that it may be, instead, in the official language or one of the official languages of the international depositary authority.

(b) Notwithstanding paragraph *(a)*, where the request referred to in Rule 11.1 is made by an industrial property office whose official language is Russian or Spanish, the said request may be in Russian or Spanish, respectively, and the International Bureau shall establish, promptly and free of charge, a certified translation into English or French, on the request of that office.

(c) Any request, declaration, certification or communication referred to in Rules 11.1, 11.2 and 11.3 shall be in writing, shall bear a signature and shall be dated.

(d) Any request, declaration or certification referred to in Rules 11.1, 11.2 and 11.3*(a)* shall contain the following indications:

(i) the name and address of the industrial property office making the request, of the authorized party or of the certified party, as the case may be;

(ii) the accession number given to the deposit;

(iii) in the case of Rule 11.1, the date and number of the application or patent referring to the deposit;

(iv) in the case of Rule 11.3*(a)*, the indications referred to in (iii) and the name and address of the industrial property office which has made the certification referred to in the said Rule.

(e) Any request referred to in Rule 11.3*(b)* shall contain the following indications:

(i) the name and address of the requesting party;

(ii) the accession number given to the deposit.

(f) The container in which the sample furnished is placed shall be marked by the international depositary authority with the accession number given to the deposit and shall be accompanied by a copy of the receipt referred to in Rule 7.

(g) The international depositary authority having furnished a sample to any interested party other than the depositor shall promptly notify the depositor in writing of that fact, as well as of the date on which the said sample was furnished and of the name and address of the industrial property office, of the authorized party, of the certified party or of the requesting party, to whom or to which the sample was furnished. The said notification shall be accompanied by a copy of the pertinent request, of any declarations submitted under Rules 11.1 or 11.2(ii) in connection with the said request, and of any forms or requests bearing the signature of the requesting party in accordance with Rule 11.3.

(h) The furnishing of samples referred to in Rule 11.1 shall be free of charge. Where the

furnishing of samples is made under Rule 11.2 or 11.3, any fee payable under Rule 12.1*(a)*(iv) shall be chargeable to the depositor, to the authorized party, to the certified party or to the requesting party, as the case may be, and shall be paid before or at the time of making the said request.

Rule 12
Fees

12.1 *Kinds and Amounts*

(a) Any international depositary authority may, with respect to the procedure under the Treaty and these Regulations, charge a fee:

(i) for storage;

(ii) for the attestation referred to in Rule 8.2;

(iii) subject to Rule 10.2*(e)*, first sentence, for the issuance of viability statements;

(iv) subject to Rule 11.4*(h)*, first sentence, for the furnishing of samples.

(b) The fee for storage shall be for the whole duration of the storage of the microorganism as provided in Rule 9.1.

(c) The amount of any fee shall not vary on account of the nationality or residence of the depositor or on account of the nationality or residence of the authority, natural person or legal entity requesting the issuance of a viability statement or furnishing of samples.

12.2 *Change in the Amounts*

(a) Any change in the amount of the fees charged by any international depositary authority shall be notified to the Director General by the Contracting State or intergovernmental industrial property organization which made the declaration referred to in Article 7(1) in respect of that authority. The notification may, subject to paragraph *(c)*, contain an indication of the date from which the new fees will apply.

(b) The Director General shall promptly notify all Contracting States and intergovernmental industrial property organizations of any notification received under paragraph *(a)* and of its effective date under paragraph *(c)*; the notification of the Director General and the notification received by him shall be promptly published by the International Bureau.

(c) Any new fees shall apply as of the date indicated under paragraph *(a)*, provided that, where the change consists of an increase in the amounts of the fees or where no date is so indicated, the new fees shall apply as from the thirtieth day following the publication of the change by the International Bureau.

Rule 13
Publication by the International Bureau

13.1 *Form of Publication*

Any publication by the International Bureau referred to in the Treaty or these Regulations shall be made in the monthly periodical of the International Bureau referred to in the Paris Convention for the Protection of Industrial Property.

13.2 *Contents*

(a) At least in the first issue of each year of the said periodical, an up-to-date list of the international depositary authorities shall be published, indicating in respect of each such authority the kinds of microorganisms that may be deposited with it and the amount of the fees charged by it.

(b) Full information on any of the following facts shall be published once, in the first issue of the said periodical published after the occurrence of the fact:

(i) any acquisition, termination or limitation of the status of international depositary authority, and the measures taken in connection with that termination or limitation;

(ii) any extension referred to in Rule 3.3;

(iii) any discontinuance of the functions of an international depositary authority, any refusal to accept certain kinds of microorganisms, and the measures taken in connection with such discontinuance or refusal;

(iv) any change in the fees charged by an international depositary authority;

(v) any requirements communicated in accordance with Rule 6.3*(b)* and any amendments thereof.

Rule 14
Expenses of Delegations

14.1 *Coverage of Expenses*

The expenses of each delegation participating in any session of the Assembly and in any committee, working group or other meeting dealing with matters of concern to the Union shall be borne by the State or organization which has appointed it.

Rule 15
Absence of Quorum in the Assembly

15.1 *Voting by Correspondence*

(a) In the case provided for in Article 10(5)*(b)*, the Director General shall communicate any decision of the Assembly (other than decisions relating to the Assembly's own procedure) to the Contracting States which were not represented when the decision was made and shall invite them to express in writing their vote or abstention within a period of three months from the date of the communication.

(b) If, at the expiration of the said period, the number of Contracting States having thus expressed their vote or abstention attains the number of Contracting States which was lacking for attaining the quorum when the decision was made, that decision shall take effect provided that at the same time the required majority still obtains.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures: Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the ran; of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

AUGUST 23, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,362

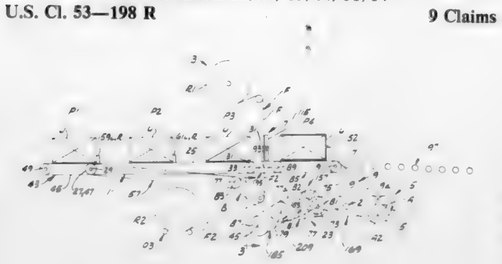
PACKAGING APPARATUS

Laurie M. Reid, Birmingham, Ala., assignor to Anderson Bros. Mfg. Co., Rockford, Ill.

Original No. 3,927,507, dated Dec. 23, 1975, Ser. No. 435,731, Jan. 23, 1974. Application for reissue June 29, 1976, Ser. No. 700,797

Int. Cl.[2] **B65B** *11/10, 13/04, 51/14*

U.S. Cl. 53—198 R **9 Claims**



1. Packaging apparatus comprising means for feeding forward units to be wrapped and flexible packaging material for wrapping the units, with the units spaced apart in the direction of feed, means for effecting intermittent operation of the feeding means intermittently to feed forward the units and the packaging material, with a dwell interval between successive feed cycles, and means for forming a seal across the width of the material between two successive units during each dwell interval, wherein said means for operating the feeding means comprises a chain and sprocket drive including a crank rotatable about a predetermined axis, means for continuously rotating the crank in one direction about its said axis, a first sprocket secured to the crank with the axis of said first sprocket offset from the crank axis for rotation of said first sprocket about the crank axis without rotation of said first sprocket about its own axis, a second sprocket connected to said feeding means, a chain trained around said first and second sprockets, said first sprocket acting to pull a reach of the chain in a forward direction to effect rotation of the second sprocket in a forward direction for driving said feed means during a first portion of a revolution of said first sprocket about the crank axis, and to discontinue [froward] *forward* drive of the chain during a second portion of said revolution for a feed and dwell of the feed means during each revolution of the crank, means for maintaining the chain relatively taut around said sprockets, and means driven in timed relation to said first sprocket for operating said seal forming means to form a seal as the first sprocket rotates through said second portion of a revolution.

Re. 29,363

FALSE-TWIST TEXTURING YARN OF POLYESTER FILAMENTS HAVING MULTILOBAL CROSS SECTIONS

Jerry Bruce McKay, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

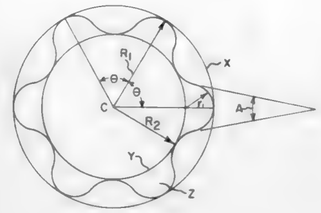
Original No. 3,846,969, dated Nov. 12, 1974, Ser. No. 393,167, Aug. 30, 1973. Continuation-in-part of Ser. No. 243,795, April 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 99,446, Dec. 18, 1970, abandoned. Application for reissue Nov. 11, 1975, Ser. No. 631,128.

The portion of the term of this patent subsequent to Sept. 19, 1989, has been disclaimed.

Int. Cl.[2] **D02G** *3/02, 1/02*

U.S. Cl. 57—140 J **10 Claims**

1. An improvement in multifilament polyester yarn for false-twist texturing [at a maximum ratio (R) of output-to-input of up to 6:1,] wherein the improvement comprises yarn composed of polyester filaments of multilobal cross-section characterized by a total number (N) of 6 to 10 essentially symmetric lobes of substantially equal length, equispaced radially about



the center of the filament, and having between 1.17 and 1.85 modification ratio (M), the filaments having a denier per filament between 3.8[(R)] and (5.88M − 10 + N)[(R).] *at M = 1.85.*

Re. 29,364

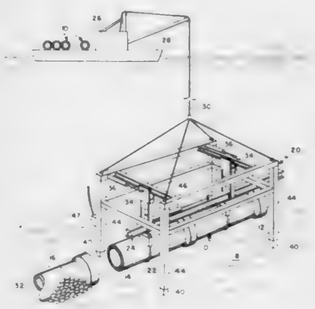
METHOD OF SUBMARINE PIPE LAYING

Spencer H. Robley, deceased, late of La Crescenta, Calif., assignor to Underwater Devices, Inc., Sherman Oaks, Calif.

Original No. 3,267,682, dated Aug. 23, 1966, Ser. No. 419,693, Dec. 21, 1964. Continuation-in-part of Ser. No. 319,126, Oct. 28, 1963, Pat. No. 3,204,417. Application for reissue Dec. 14, 1976, Ser. No. 752,241

Int. Cl.[2] **F16L** *1/00*

U.S. Cl. 61—111 **5 Claims**



1. The method of laying pipe on the floor under a body of water, comprising the steps of: releasably securing a length of pipe to a mobile frame; lowering said frame and pipe in said body of water to a stable position wherein said frame is supported securely by and in fixed relation to said floor with said length of pipe generally aligned with but spaced from the end of a pipeline already on said floor; moving at least a portion of said length of pipe, laterally of its length and relative to said frame, while holding the same secured thereto and supported thereby to bring the axis of said length of pipe into a desired and stable relation to the axis of said pipeline; and then moving said length of pipe axially, relative to said frame while holding the same secured thereto and supported thereby, into engagement with the end of said pipeline to form a continuation thereof.

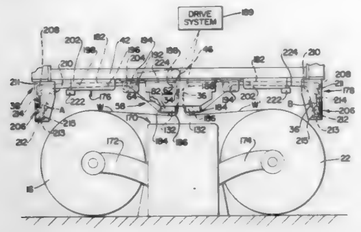
Re. 29,365
WEB SUPPLY APPARATUS

Richard A. Butler Jr., Chestnut Hill, Mass., assignor to Butler Automatic, Inc., Canton, Mass.

Original No. 3,858,819, dated Jan. 7, 1975, Ser. No. 299,713, Oct. 24, 1972. Application for reissue May 17, 1976, Ser. No. 687,260

Int. Cl.² B65H *19/14, 19/20*

U.S. Cl. 242—58.3 **22 Claims**



20. Web supply apparatus comprising

A. a web accumulator;

B. a splicing station located directly underneath the accumulator that is not readily accessible to an operator;

C. a pair of roll stands of the roll-out type for supporting a pair of web rolls one of which is expiring into the accumulator, the other of which is at the ready, each said stand being movable generally parallel to the axes of the rolls between said splicing station and a loading station adjacent the accumulator that is readily accessible to the operator,

D. positioning means supported on each roll stand for positioning the leading edge of the ready web when the roll stand supporting the ready web is located at its loading station;

E. means supporting the roll stand containing the ready web for movement to the splicing station so that the leading edge of the ready web is positioned directly opposite the expiring web, and

F. means permanently suspended from the overhead accumulator at the splicing station for pressing the expiring web and ready web together to splice them so that web can proceed continuously into the overhead accumulator.

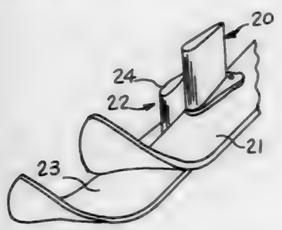
Re. 29,366
SKI ANTI-CROSSING DEVICE

Hugo V. Giannotti, E. Patchogue, N.Y., assignor to Ski Dynamics, Inc., Bellport, N.Y.

Original No. 3,863,943, dated Feb. 4, 1975, Ser. No. 400,027, Sept. 24, 1973. Application for reissue May 14, 1976, Ser. No. 686,504

Int. Cl.² A63C *11/00*

U.S. Cl. 280—11.37 E **6 Claims**



7. Means for attachment to the upper surfaces adjacent an end of skis comprising a first base plate, mounted on a first ski, a first member pivotally mounted on said first base plate,

a second base plate mounted on a second ski, a second member pivotally mounted on said second base plate, said members being pivoted about an axis generally parallel to the upper surfaces of said skis and generally longitudinally thereof,

said members being spring loaded to the vertical position, each said member being adapted to block the other ski from crossing it but yielding in the direction that will unblock the other ski if the other ski has cross a member.

Re. 29,367
FLUOROALKOXYPHENYL-SUBSTITUTED NITROGEN HETEROCYCLES AS PLANT STUNTING AGENTS

Robert Lee Benefiel, Manilla, and Eriks Viktors Krumkalns, Indianapolis, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Original No. 3,967,949, dated July 6, 1976, Ser. No. 371,106, June 18, 1973. Application for reissue Dec. 13, 1976, Ser. No. 750,060

Int. Cl.² A01N *5/00*

U.S. Cl. 71—76 **9 Claims**

1. A method of inhibiting the internodal growth of plants which comprises contacting the plants selected from the group consisting of crop plants, ornamental plants, and turf, with an effective growth-inhibiting amounts of a compound of the formula



wherein

R is 5-pyrimidinyl;

R^1 is isopropyl;

R^2 is trifluoromethoxyphenyl, tetrafluoroethoxyphenyl or pentafluoroethoxyphenyl;

X is hydroxy;

and the nonphytotoxic acid addition salts thereof.

Re. 29,368
METAL-ORGANO COMPOUNDS WITH STERICALLY EXPOSED METAL-METAL BONDS, AND A METHOD FOR THEIR PRODUCTION

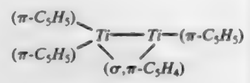
Guido P. Pez, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Original No. 3,776,932, dated Dec. 4, 1973, Ser. No. 180,144, Sept. 13, 1971. Application for reissue Nov. 13, 1975, Ser. No. 631,777

Int. Cl.² C07F *7/00, 7/28*

U.S. Cl. 260—429.3 **16 Claims**

25. A metal-organo complex having the structural formula



and giving the infrared spectrum represented by the upper curve of the accompanying drawing and giving the X-ray diffraction data shown in the herein table of Bragg spacing and relative intensity.

27. A method for preparing a metal-organo complex having at least one sterically exposed metal-metal bond having the structure:

$$R_nM \quad M'R_n$$

wherein R represents the cyclopentadienyl ligand; n is an integer of from 1 to 3; M and M' each represent the same or a different transition metal selected from the group consisting of titanium, zirconium, hafnium, molybdenum and tungsten; and the symbol represents a single or multiple, sterically exposed metal-metal bond, which comprises:

(a) admixing a halogenide of the metal-organo compound selected to supply the desired ligand, with a cold substantially dry, oxygen-free ethereal solvent solution of potassium, sodium or lithium naphthalene at a temperature between −200° C. and −25° C. in a reaction vessel from which air or oxygen has been removed or replaced with an inert atmosphere, and agitating the mixture for at least 2 hours;

(b) gradually warming the reaction mixture during a period of at least one hour to substantially ambient temperature;

(c) removing the ethereal solvent and excess naphthalene at temperatures under 40° C.; and

(d) extracting the residue at a temperature not exceeding 40° C. to obtain the metal-organo complex.

Re. 29,369
METHOD FOR PREPARING ACYLATED PRODUCTS

Yasuo Fujimoto, Tokyo, and Nobuhiro Nakamizo, Machida, both of Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Original No. 3,867,424, dated Feb. 18, 1975, Ser. No. 49,918, June 25, 1970. Application for reissue Feb. 13, 1976, Ser. No. 658,039

Claims priority, application Japan, June 30, 1969, 44-51061

Int. Cl.² C07C *125/06*

U.S. Cl. 260—471 C **5 Claims**

1. In the process for preparing a carboxylic acid amide wherein a primary or secondary amine selected from alkylamines, arylamines and substituted arylamines is acylated with an ester derived from aliphatic or aromatic carboxylic acid, the improvement which comprises carrying out said acylation in the presence of an alkali-metal salt, an alkaline earth metal salt [of] *or* a quaternary ammonium salt of a compound containing a pyridine nucleus directly substituted by a hydroxy group [.] *or*a mercapto group, [or a group selected from] *and optionally by at least one member selected from the group consisting of* alkyl groups having 1 to 6 carbon atoms, aryl groups, aralkyl groups, *lower* alkoxy groups [having 1 to 6 carbon atoms] , nitro groups, [and] cyano groups *and an unsubstituted benzene ring which is fused to the pyridine nucleus.*

Re. 29,370
THERMOPLASTIC FILM PRODUCTION

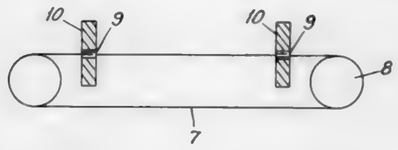
Denis James Henry Sandiford, Welwyn, and John Alan Elliott Kail, Harpenden, both of England, assignors to Imperial Chemical Industries Limited, London, England

Original No. 3,470,274, dated Sept. 30, 1969, Ser. No. 568,958, July 29, 1966. Application for reissue July 21, 1971, Ser. No. 164,755

Claims priority, application United Kingdom, July 30, 1965, 32703/65; Jan. 24, 1966, 3101/66

Int. Cl.² B29F *3/06*

U.S. Cl. 264—22 **10 Claims**



1. A process for quenching a freshly extruded thermoplastic composition which comrises extruding a molten thermoplastic film forming polymeric composition on to a moving casting surface, depositing on the upper surface of the film an electrostatic charge from a wire electrode situated near to said film surface and maintained at a large electrostatic potential difference from the casting surface so that the film is caused to adhere to said casting surface, and maintaining said wire electrode substantially free from deposit arising from condensed vapors of volatile matter present in said film forming composition or the decomposition products of said volatile matter by continuously unwinding said wire electrode from a first reel positioned at one side of the die orifice from which the thermoplastic film is extruded, winding said wire on to a second reel positioned at the other side of the die orifice at a speed which prevents the dwell time of the wire electrode above the extruded film from being sufficient for substantially any deposit to accumulate on the said wire.

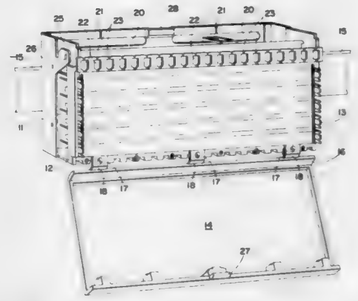
Re. 29,371
CONNECTING BLOCK

George De Bortoli, Ottawa, and Helmut Hans Lukas, Carleton Place, both of Canada, assignors to Northern Electric Company Limited, Montreal, Canada

Original No. 3,784,728, dated Jan. 8, 1974, Ser. No. 308,054, Nov. 20, 1972. Application for reissue Jan. 8, 1976, Ser. No. 647,538

Int. Cl.² H01R *13/46*

U.S. Cl. 174—60 **8 Claims**



1. A connecting block for a telephone system, comprising:

a housing having a back member and two spaced apart side members extending forwardly from said back member, parallel to each other;

pivot means on forward ends of said side members;

a support member positioned between said side members, the support member having front and back faces;

pivot means on said support member at each end thereof and pivotally engaged with said pivot means on said side members, said support [members] *member* adapted to present said front and back faces alternatively in a forward facing direction;

a plurality of terminal clips extending through said support member, front ends of the terminal clips extending through the front face of the support member and back ends of the terminal clips extending through the back face of the support member;

a cover hingedly attached at its lower edge to a lower edge of said front face of said support member;

resilient clip means on an upper edge of said cover and engagement means on an upper edge of said front face of said support [means] *member*, the arrangement such that said resilient clip means engage with said engagement means when said front face of said support member is presented forward to retain said cover in position over said terminal clips;

stop means on said side members and said support [members] *member*, said stop means positioned to locate said support member in a predetermined position, said back face of the support member present in a forward direction; and

interengaging means on said cover and said housing adapted to retain said support member in said predetermined position.

PLANT PATENTS

GRANTED AUGUST 23, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,093

NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to The Burchell Nursery, Inc., Modesto, Calif.

Filed Oct. 1, 1976, Ser. No. 728,622
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is large, vigorous, upright to spreading, medium in size and texture of the trunk and branches, foliated with large to medium size, medium thick, lanceolate, acutely pointed leaves having a crenate margin and globose glands, blooms mid-season with large flowers, and a regular and very productive bearer of large, symmetrical, globose, freestone fruit having yellow skin substantially overspread with red, and yellow flesh; the variety being particularly characterized by fruit embracing both the bright red exterior color and the firm flesh of the fruit of the Red Diamond nectarine, the seed parent, and the very firm flesh of the fruit of the Sun Grand nectarine, the pollen parent, but ripening about ten days earlier than said Sun Grand nectarine.

4,094

DOYLE'S BLACKBERRY

Thomas E. Doyle, 1600 Bedford Road, Washington, Ind. 47501

Filed Nov. 11, 1976, Ser. No. 741,115
Int. Cl.[2] A01H *5/03*
U.S. Cl. Plt.—46 **1 Claim**

1. A new and distinct variety of Blackberry plant most nearly resembling the Wild Blackberry substantially as shown and described, characterized particularly as to novelty by the unique combination of (1) an absence of thorns or prickles, (2) the common occurrence of palmately compound leaves having five leaflets, (3) sturdy canes which support an unusually large upright-arching plant, (4) unusually long trailing stems, and (5) substantially round berries which form in an unusually abundant quantity and ripen over an unusually extended period.

PATENTS

GRANTED AUGUST 23, 1977

ERRATA

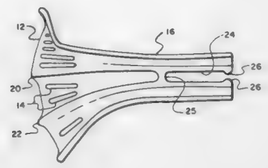
For CLASS	See PATENT NO.
066–170	4,043,142
073–486	4,043,218
081–177 A	4,043,239
038–102.91	4,043,270
138–031	4,043,352
273–138 R	4,043,406
181–117	4,043,420
350–162 SF	4,043,674
106–053	4,043,852
544–016	4,044,002
542–426	4,044,005
544–067	4,044,006
544–185	4,044,019
548–303	4,044,020
548–312	4,044,021
548–369	4,044,022
269–321 F	4,044,093
364–900	4,044,331
364–900	4,044,332
364–200	4,044,333
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364–900	4,044,338

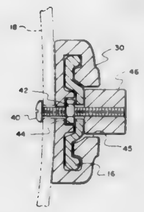
PATENTS

GRANTED AUGUST 23, 1977

GENERAL AND MECHANICAL

4,042,974
HELMET FACE GUARD ACCESSORY FOR MOTORCYCLE RIDERS
Clyde R. Morgan, Boring, and David C. Blocksom, Portland, both of Oreg., assignors to Wheelsport Distributing Co., Portland, Oreg.
Filed Oct. 14, 1975, Ser. No. 622,392
Int. Cl.[2] A41D *13/00*
U.S. Cl. 2—9 **6 Claims**





1. A face guard accessory adapted to be adjustably, removably and rigidly attached to a protective helmet for motorcycler's and the like for protecting and shielding the lower portions of the face of the user from airborne particles comprising:

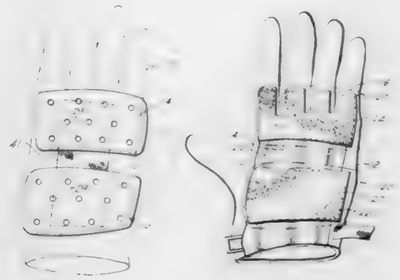
a. a perforated shield portion of substantially rigid material having multiple apertures formed therein for covering the lower portion of the face of said user while permitting comfortable access to breathing air through said apertures;

b. a pair of elongate substantially rigid side members connected to said shield portion and extending rearwardly therefrom for supporting said shield portion, each said side member having a longitudinal slot formed therein having an open end at the rearmost end of said side member, said slot extending forwardly from said open end a predetermined distance;

c. a pair of anchoring clamps for fastening said side members to the respective sides of said helmet, each said clamp having mating means for slidably engaging a slotted end of a respective one of said side members and constraining the movement of said side member to rectilinear sliding movement in a predetermined direction with respect to said helmet and including an outwardly protruding threaded post positioned so as to extend through said slot when said respective side member is slidably engaged with said mating means; and

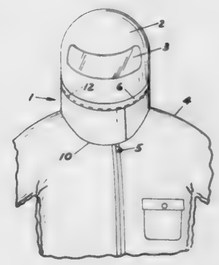
d. a respective manually-tightenable threaded securing means attached to the outer end of each of said threaded posts for selectively rigidly fastening said side members to said clamps at any of a plurality of sliding positions by the tightening of said securing means into engagement with the portions of said side members located on either side of said slot when said side members are slidably engaged with said mating means and, by the loosening of said securing means, for releasing said side members to permit said sliding movement and removal of said side members from said mating means.

4,042,975
MEANS FOR PROTECTING BATTERS FROM HAND INJURIES
Albert Winslow Elliott, Jr., Costa Mesa, and Albert W. Elliott, III, Long Beach, both of Calif., assignors to New Products Development, Inc., Downey, Calif.
Filed Apr. 1, 1976, Ser. No. 672,651
Int. Cl.[2] A41D *13/08*
U.S. Cl. 2—19 **41 Claims**



1. The combination comprising a pair of gloves for covering the right and left hands, in which each glove has a rear surface covering the back side of the hand and the rear surface has a lower portion covering the metacarpal area of the hand and an upper portion covering the lower portions of the fingers, first attachment means secured to the lower portion of one of said gloves for releasably attaching a first protective device to that portion of the glove; second attachment means secured to the upper portion of said one glove for releasably attaching a second protective device to that portion of the glove; third attachment means secured to the lower portion of the other of said gloves for releasably attaching a third protective device to that portion of the glove; and fourth attachment means secured to the upper portion of said other glove for releasably attaching a fourth protective device to that portion of the glove.

4,042,976
PROTECTIVE COLLAR
Jay Carter Reynolds, 134 E. Columbia, Shreveport, La. 71104
Filed Feb. 12, 1976, Ser. No. 657,574
Int. Cl.[2] A41B *3/16*
U.S. Cl. 2—135 **8 Claims**



1. A protective collar comprising:

a. A length of protective material for encircling the neck of

a wearer and having closure means on the inside perimeter of the top, the front side of one end, and the rear side of the opposite end thereof for mating said front side and said rear side; and

b. A water seal flap fastened to and encircling a head covering and having a cooperating flap closure means facing outwardly of said head covering for mating with said closure means on said inside perimeter of the top of said protective material and securing said protective collar to said water seal flap when said head covering is worn and said protective collar is fitted around the bottom of said head covering and the neck of a wearer.

4,042,977

GLOVE

Anthony J. Antonious, 7005 Lachlan Circle, Baltimore, Md. 21239

Filed Aug. 7, 1975, Ser. No. 602,709
Int. Cl.² A41D *19/00*
U.S. Cl. 2—161 A **6 Claims**



1. In a glove comprising a flexible body with a palm portion, a back portion covering the entire back of the hand, finger stalls, and a thumb stall, the improvement comprising:

a. a first elastic means secured to the glove fabric at or in proximity to the base of the thumb stall;

b. a first tab attached directly to the first elastic means at the end thereof remote from the thumb stall and having a hook and pile fastener undersurface; and

c. a mating hook and pile fastener surface on the glove in position to unite with the hook and pile fastener undersurface on the first tab when the first elastic means is stretched, whereby, when the first elastic means is stretched and the hook and pile fastener surfaces are united, the thumb stall is maintained taut and thumb droop is prevented.

4,042,978

PROSTHETICS

Michael Edward Benet Jones; Eileen Jones, and Joseph Franciszek Jaworzyn, all of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 368,199, June 8, 1973, Pat. No. 3,908,201. This application June 11, 1975, Ser. No. 585,868
Claims priority, application United Kingdom, June 30, 1972, 30766/72
The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.
Int. Cl.² A61F *1/24, 1/00*; C08G *63/18*; C08L *63/10*
U.S. Cl. 3—1 **17 Claims**

1. A prosthetic device having a shape suitable for insertion into a human or animal body to replace a part thereof, said device having at least part of the surface thereof made of a plastic, water-soluble, non-toxic material having a surface energy in the range 50 erg cm^{-2} to 100 erg cm^{-2} whereby said device is capable of being bonded more strongly to collagenous body tissue than corresponding devices which do not have such a surface energy, said plastic material being a copolymer of poly(ethylene) glycol and bis(β-hydroxy) isophthalate, the copolymer comprising at least 10% by weight of units having the structure $CH_2—CH_2—O$ and no more than 95% by weight of said units and having a reduced viscosity measured on a 1% weight/volume solution in o-chlorphenol at 25° C in the range 0.4 $dl.g^{-1}$ to 2.0 $dl.g^{-1}$, wherein said polymeric material being stable in water to the extent that a film of material 0.5 mm. thick which has been immersed in water at 37° C for 24 hours does not break when flexed through 180°.

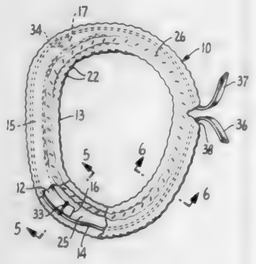
8. A prosthetic device having a shape suitable for insertion into a human or animal body to replace a part thereof, said device having at least part of the surface thereof made of a plastic, water-soluble, non-toxic material having a surface energy in the range 50 erg cm^{-2} to 100 erg cm^{-2} whereby said device is capable of being bonded more strongly to collagenous body tissue than corresponding devices which do not have such a surface energy, said plastics materal comprising a polymeric structure containing from 10 to 95% by weight of units of solid polyethylene oxide and from 90 to 5% of units of a polymerized methacrylate monomer wherein said plastics material being stable in water to the extent that a film of material 0.5 mm thick which has been immersed in water at 37+ C for 24 hours does not break when flexed through 180°.

4,042,979

VALVULOPLASTY RING AND PROSTHETIC METHOD

William W. Angell, 19174 De Haviland, San Jose, Calif. 95070

Filed July 12, 1976, Ser. No. 704,542
Int. Cl.² A61F *1/22*
U.S. Cl. 3—1.5 **13 Claims**



1. Adjustable valvuloplasty ring for an atrioventricular orifice comprising:

a. a frame that is sized and shaped to extend about a significant portion of the circumference of the orifice;

b. an expandable member extending from the ends of the frame that is sized and shaped to extend about at least a substantial portion of the remainder of the circumference of the orifice; and

c. means for expanding and contracting the expandable member whereby the size of the ring and orifice may be adjusted.

4,042,980

ENDOPROSTHETIC SHOULDER JOINT DEVICE

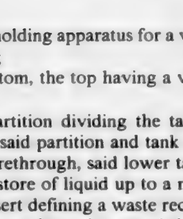
Sydney Alan Vasey Swanson, Carshalton, and Brian Arnold Roper, London, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 10, 1976, Ser. No. 665,574
Claims priority, application United Kingdom, Mar. 13, 1975, 10540/75
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.91 **8 Claims**

1. An endoprosthetic shoulder joint device, comprising:

a humeral component including a bearing part defining a substantially part-spherical, convex bearing surface

and a scapular component including a generally L-shaped member having one arm of said L-shaped member longer than the other such arm, having its inner face formed to define a substantially part-spherical, concave bearing surface of which at least part lies in said one arm, and having said one arm of cranked form at least in its outer face;



said bearing surfaces being engaged for mutual articulation between said components;

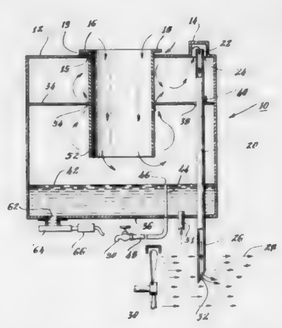
and said part and said member being adapted remotely from said bearing surfaces for respective securement to the humerus and scapular.

4,042,981

TOILET WASTE HOLDING APPARATUS

John Walter Cook, Garner, N.C., assignor to North American Philips Corporation, New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,988
Int. Cl.² E03D *9/04*
U.S. Cl. 4—10 **5 Claims**



1. A toilet waste holding apparatus for a vehicle comprising:

a tank comprising

a top and a bottom, the top having a vent opening therethrough,

a horizontal partition dividing the tank into upper and lower tanks, said partition and tank top having aligned openings therethrough, said lower tank being arranged to receive a store of liquid up to a normal liquid level,

a removable insert defining a waste receiving passage and extending above the tank top and through said aligned openings into said lower tank above the normal liquid level, said insert fitting loosely into said partition and tank top openings so as to permit air flow around the outside of said insert, and

means for positioning the insert with respect to the tank top,

means for allowing an overflow of liquid within the tank to flow onto the tank top,

a vent pipe connected to the tank so as to pass through the vent opening in the top, said opening being sufficiently large to permit air and gases to flow around the vent pipe, the vent pipe having first and second ends, the first end being disposed above said tank top for carrying away air and gases released from any waste material in the tank and passing through said opening in the top between the top and the pipe, the second end extending below said tank bottom and having an angle cut in the end,

means, independent of vehicle motion, for blowing a stream of air past said second end so as to suck air and gases from within said vent pipe, and

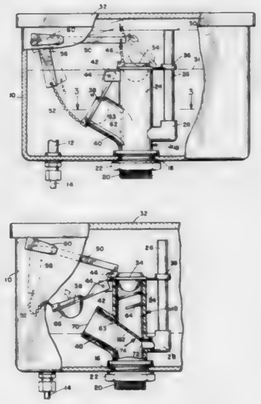
a vent pipe cap mounted over said first end and connected to the tank top around the vent opening such that suction in the vent pipe will pull air and gases flowing through the top opening around the pipe into the pipe while allowing any overflow of liquid to run across the tank top without entering the vent pipe.

4,042,982

FLUSH TOILET WATER CONSERVATION VALVE ASSEMBLY

Albert Contreras, 2230 Prospect St., National City, Calif. 92050

Filed Dec. 6, 1976, Ser. No. 748,119
Int. Cl.² E03D *1/34, 5/02*; A61B *19/00*
U.S. Cl. 4—67 A **9 Claims**



1. A flush toilet water conservation valve assembly for being connected in a water closet of a water closet type toilet bowl flushing system, comprising:

a flush valve body having a lower discharge connector end for being connected to the discharge opening of the flush tank,

said flush valve body having a first upwardly positioned water conduit and a second upwardly positioned water conduit,

said first and second conduits being joined at an intersection adjacent the connector end of the flush body,

said first conduit extending upwardly a greater distance than said second conduit, with each conduit having an open upper end, whereby a greater amount of flush water in the flush tank will flow into said first conduit than into said second conduit,

a centrally positioned upwardly extending overflow pipe connected to said flush valve body at a point adjacent the intersection of said first and second conduits,

first valve means selectively operable to open said first and second conduits at separate selective times,

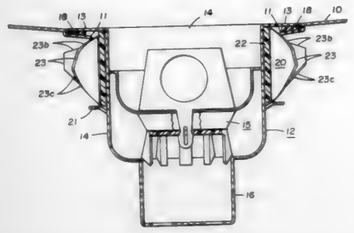
and second flapper valve means positioned in said first and second conduits at said intersection for selectively closing off reverse water flow from one of said conduits to the other of said conduits.

4,042,983

DRAIN ASSEMBLY FOR SINKS AND THE LIKE

John H. Carpentier, Fort Atkinson, Wis., assignor to Beatrice Foods Co., Chicago, Ill.

Filed May 26, 1976, Ser. No. 690,149
Int. Cl.[2] E03C 1/122
U.S. Cl. 4—291 **15 Claims**



1. In a drain assembly for installation in the wall of a sink or the like, the assembly including a body having an annular portion with a retaining flanged portion at one end thereof and connectable at the other body end to a drain line, the body being insertable through a sink wall from one side of an aperture therein so that the flanged portion is engageable with a first area surrounding said aperture, the improvement comprising: drain assembly retaining means located on and around the body annular portion, the retaining means including at least two sets of discrete retaining portions, the retaining portions of each set being spaced around an outer periphery of the body annular portion, each retaining portion extending generally outwardly from said periphery and being resilient and flexible relative to the body annular portion in circumferential directions about its axis, the respective retaining portions of each set thereof taken successively in one of said circumferential directions having marginal portions in opposed relation to the body flanged portion at respectively increasing distances therefrom, the retaining means being insertable together with the body annular portion through said aperture as aforesaid upon a twisting movement of the drain assembly in one of said circumferential directions, the sets of retaining portions being disposed relative to each other about said periphery so that said marginal portions of at least some of the retaining portions in each set thereof are thereupon engageable with a second area surrounding said aperture effective to sealingly clamp the sink wall between the body flanged portion and said some of the retaining portions.

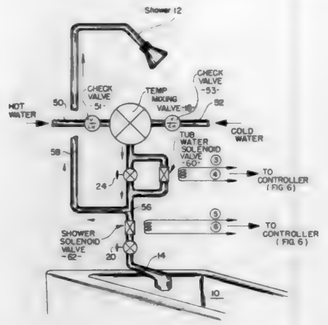
4,042,984

AUTOMATIC BATHTUB WATER LEVEL CONTROL SYSTEM

James L. Butler, Westlake Village, Calif., assignor to American Bath and Shower Corporation, Los Angeles, Calif.

Filed Dec. 31, 1975, Ser. No. 645,569
Int. Cl.[2] E03C 1/242
U.S. Cl. 4—200 **9 Claims**

1. In combination: a bathtub; a water inlet pipe for supplying water to the bathtub; a temperature mixing valve coupling the water inlet pipe to hot water and to cold water supply pipes; a solenoid-operated valve coupled to the water inlet pipe to control the flow of water into the bathtub; a manually-operated valve coupled to the water inlet pipe in parallel with the solenoid-operated valve to control the flow of water into the bathtub independently of the solenoid-operated valve; a drain plug for draining water out of the bathtub; a solenoid-operated control mechanism mechanically coupled to the drain plug to open and close the drain plug; a manually-operated mechanism coupled to the drain plug to open and close the drain plug independently of the solenoid-operated control mechanism; and an electric control circuit connected to said solenoid-operated valve and to said solenoid-operated drain plug control mechanism, said electric control circuit including first switching means electrically connected to an energizing source and to said solenoid-operated drain plug mechanism selectively to connect said solenoid-operated drain plug mechanism to said energizing source to cause said solenoid-operated drain plug mechanism selectively to open and close the drain plug as said first switching means is operated between a first and second operating position, a second switching means electrically connected to said solenoid-operated valve to cause said solenoid-operated valve selectively to close and open as said second switching means is selectively operated between a first and a second operating position, electric timing means, a third switching means electrically connected



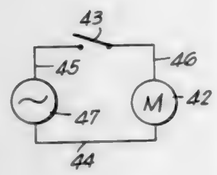
to said electric timing means selectively to de-energize and energize said electric timing means when said third switching means is selectively operated between a first and a second operating position, and a manually settable control member mechanically coupled to the first, second and third switching means and to the timing means and manually operable to set the first, second and third switching means to their second operating positions as said control member is manually moved to a selected setting and subsequently operated by said timing means to set the second and third switching means to their first operating position after a predetermined time interval established by the setting of said control member.

4,042,985

AUTOMATIC BED MAKING DEVICE

Mark B. Raczkowski, 55c Bruan Place, Clifton, N.J. 07012

Filed Nov. 13, 1975, Ser. No. 631,628
Int. Cl.[2] A47C 21/02
U.S. Cl. 5—317 R **2 Claims**



1. A bed-making device for a bed having a bed frame supporting a mattress and bed spring, both the mattress and the bed springs having spaced opposite first and second ends, said mattress having an upper surface and said bed spring and mattress being supported by the bed frame in substantially horizonal positions, said bed-making device comprising:

a supporting structure affixed to the bed frame and positioned at the first and second ends of the mattress;

a first roller means rotatably mounted on the side of the supporting structure at the first end of the mattress, said first roller means having an axis substantially perpendicular to said supporting structure and being positioned with a part thereof, a maximum distance above a bed frame supporting structure, said part being substantially coplanar with the upper surface of the mattress and a second roller means rotatably mounted on the side of the supporting structure at the second end of the mattress, said second roller means being parallel to the first roller means and substantially coplanar therewith;

coupling means coupling the first and second roller means to each other for conjoint rotations about their axes;

a bed sheet having spaced opposite first and second ends;

a bed spread having spaced opposite first and second ends;

first fastener means affixed to the first end of the bed sheet and the second end of the bed spread, for affixing the first end of the bed sheet to the second end of the bed spread;

second fastener means affixed to the second end of the bed sheet and the first end of the bed spread, for affixing the second end of the bed sheet to the first end of the bed spread;

an endless loop formed by the bed sheet and bed spread affixed to each other by the first and second fastener means, being mounted on the roller means in a manner whereby part of said loop is on the upper surface of the mattress and part of said loop is beneath the bed springs;

a pillow removably affixed to the bed sheet in the area of one of the ends thereof;

a blanket removably affixed to the bed sheet and covering most of the said bed sheet;

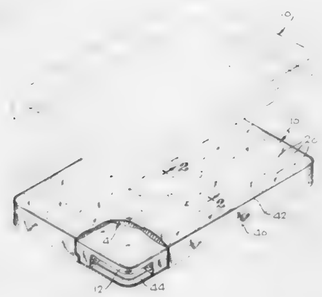
motive means drivingly coupled to the roller means for selectively rotating said roller means to selectively move the bed sheet and the affixed pillow and blanket to the upper surface of the mattress and simultaneously move the bed spread beneath the bed springs thereby selectively dressing the bed for non-use and preparing it for use.

4,042,986

BODY SUPPORTING AND CUSHIONING SURFACE FOR BEDDING

Steven J. Goodman, San Clemente, and Angel M. Echevarria, La Crescenta, both of Calif., assignors to Angel M. Echevarria, La Crescenta, Calif.

Filed Mar. 5, 1976, Ser. No. 664,252
Int. Cl.[2] A47G 9/00
U.S. Cl. 5—335 **8 Claims**



1. A cushioning and support buffer surface having a quilted appearance for placement on the superior surface of a mattress to enhance uniformity, conformability response, and support for a user, comprising:

cellular foam panel means having a thickness of approximately ¾ to 1¾ inches and a density of from 0.5 to 2.0 lbs/cu. ft., said foam panel having a forcibly impacted structure and comprising a pair of cyclically impacted closed cell foam sheets of different densities, the lower sheet being of lesser thickness and greater density and the indentation load deflections of said sheets being less than 35;

superior surface ticking means and inferior surface porous backing means disposed on opposite sides of said panel means;

quilting stitch means areally unifying said ticking means and backing means to said panel means, and compressing said panel means along stitch lines; and

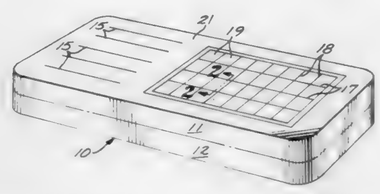
side border means coupled to said panel means and providing marginal restraint of said panel means to the associated mattress.

4,042,987

RESILIENT SUPPORT

John E. Rogers, Anaheim, Calif., assignor to Ronald J. P. Evans, Bushey Heath, England

Filed Apr. 16, 1976, Ser. No. 677,552
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—345 R **7 Claims**



1. In a resilient support pad adapted to support a human torso in a prone or reclining state the improvements comprising:

a plurality of first slits longitudinally formed in the surface of said pad subjacent the upper section of said torso;

a plurality of second slits formed in the surface of said pad subjacent the lower section of said torso, selected ones of said second slits being aligned to intersect selected other ones thereof; and

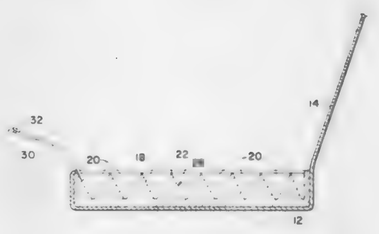
said first and second slits terminating within a predetermined distance of the periphery of said pad each extending into the interior of said pad to a predetermined depth for interrupting the transfer of stresses within said pad at the surfaces thereof.

4,042,988

AIR MATTRESS

Odell Holliday, 415 Washington Ave., Brooklyn, N.Y. 11238

Filed Nov. 2, 1976, Ser. No. 738,246
Int. Cl.[2] A47C 27/08
U.S. Cl. 5—349 **8 Claims**



1. An air mattress construction comprising:

a. a hollow mattress enclosure including a planar top and means for releasably opening and closing same;

b. a plurality of elongated inflatable air tubes each having a first planar surface when inflated; and

c. a resilient support member insertable in said mattress enclosure and having the upper surface thereof corresponding to the top of the mattress and including means defining a plurality of elongated widthwise grooves

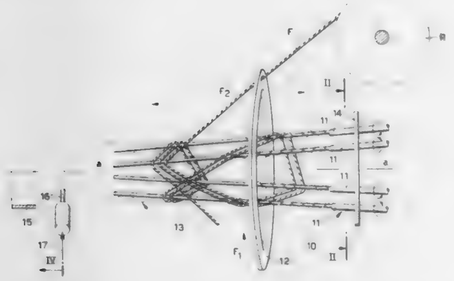
therein each receptive of one air tube to position the first planar surface thereof in the plane of the top of the mattress and means for releasably retaining the air tubes in their positions in the support member.

4,042,989

METHOD FOR PACKAGING AND DYEING YARNS AND YARN PACKAGING OBTAINED THEREBY

Leo Drago, Schio, Italy, and Edmond Ries, Luxembourg, Luxembourg, assignors to Robreli Holding S.A., Germany

Filed Apr. 8, 1976, Ser. No. 675,126
Claims priority, application Italy, Apr. 8, 1975, 22125/75
Int. Cl.[2] D06B *1/02, 23/04;* **B65H** *51/20*
U.S. Cl. 8—149 **8 Claims**



1. A method for packaging yarns, said method comprising the steps of providing a provisional core having an axis, winding at last one yarn onto said provisional core while simultaneously imparting to said yarn a continuous combined rotational movement about said provisional core and reciprocating movement longitudinally of said core axis, and continuously advancing the wound yarn along said core so that said yarn moves longitudinally of said core axis and comes off the end of said core remote from where said winding is effected.

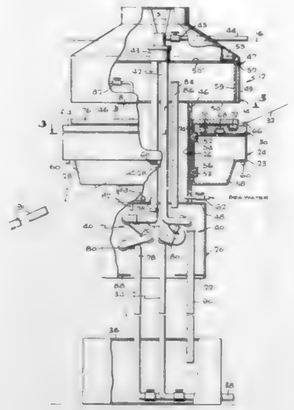
4,042,990

SINGLE POINT MOORING TERMINAL

Glenn B. Donaldson, Jr., 6952 Grovespring Drive, Rancho Palos Verdes, Calif. 90274

Continuation-in-part of Ser. No. 633,972, Nov. 21, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 726,631
Int. Cl.[2] B63B *21/52, 35/44*
U.S. Cl. 9—8 P **48 Claims**

1. A single point mooring system which comprises a first floating buoy having a downwardly depending elongated portion submerged in the water, a second submerged buoy positioned around said elongated portion of said first buoy, means anchoring said second buoy to the marine bottom, and means permitting vertical motion of said first buoy but restraining rotary motion thereof, said anchored second buoy also restraining said first buoy from lateral motion.

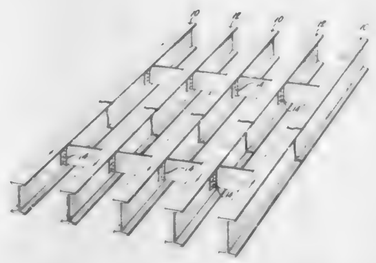


4,042,991

PARALLELOGRAM STRUCTURE

Robert L. Macy, and Joseph E. Zupanick, both of Richardson, Tex., assignors to Suntech, Inc., St. Davids, Pa.

Filed June 21, 1976, Ser. No. 698,443
Int. Cl.[2] E01D *15/2*
U.S. Cl. 14—1 **5 Claims**



1. A portable structure which may be folded together for transporation or storage and then unfolded for use, and comprising:

a. a plurality of I beams positioned side by side and having a first plurality of alternate I beams and a second plurality of alternate I beams, with each second alternate I beam being positioned adjacent to first alternate I beams; and

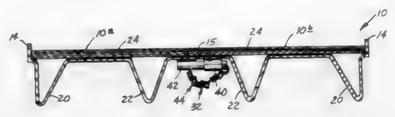
a. inclined pivot means for securing said plurality of I beams together such that the I beams may be folded together by having said first plurality of alternate I beams move relative to said second plurality of alternate I beams causing the top and bottom flanges of said first plurality of alternate I beams to rise over the top and bottom flanges of said adjacent plurality of second alternate I beams, and the same may be unfolded to form a structure wherein the tops of all of the plurality of I beams lie in the same plane, whereby the structure may be used as a load carrying structure.

4,042,992

PORTABLE REINFORCED LOADING RAMP

Robert C. Hyslop, Spokane, Wash., assignor to Herbert Management Co., Inc., Spokane, Wash.

Filed Aug. 30, 1976, Ser. No. 718,761
Int. Cl.[2] E01D *15/00*
U.S. Cl. 14—69.5 **2 Claims**



1. A portable reinforced loading ramp capable of being transversely expanded to load an automobile through a wide opening and of being transversely contracted to load dolly-supported freight through a narrow opening, comprising:

a first elongated body section having an outer raised side edge and an inner side face and integral reinforcing support ribs;

a second elongated body section having an outer raised side edge and an inner side face complementary to the inner side face of the first elongated body section and integral reinforcing supporting ribs;

interconnecting means operatively interconnecting the first and second body section with the inner side faces engaging when the ramp is in the contracted position;

said interconnecting means includes at least two alignment and locking assemblies mounted to the body section adjacent the inner side faces at longitudinally spaced locations for longitudinally aligning the body sections with respect to each other and for locking the body sections together with the inner side faces engaging when the ramp is in the contracted position;

wherein the interconnecting means includes parallel elongated mounting plates mounted to respective elongated body section adjacent the inner side faces and extending between the longitudinally spaced locations for supporting the alignment and locking assemblies rigidly to the body section;

each of said alignment and locking assemblies comprising;

1. a male shaft element mounted to one of the mounting plates and projecting therefrom transversely to the longitudinal direction of the one body section;
2. a female open-ended cylinder element mounted to the other mounting plate and directed transversely to the longitudinal direction of the other body section for receiving the male shaft element therein when the ramp is contracted to longitudinally align the body sections and prevent longitudinal movement therebetween; and
3. locking means for releasably securing the male shaft element in the cylinder element when the ramp is contracted.

4,042,993

POULTRY SHACKLE SCRUBBER

Curtis M. Cervin, 5253 Xerxes Ave. South, Minneapolis, Minn. 55410

Filed Oct. 5, 1976, Ser. No. 729,808
Int. Cl.[2] B65G *45/00;* **A46B** *13/02*
U.S. Cl. 15—21 D **10 Claims**

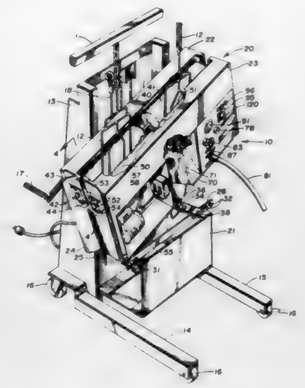
1. A scrubbing mechanism constructed and arranged for use with an overhead poultry or animal shackle conveying mechanism for continuously moving the shackles, said scrubbing mechanism comprising:

a. a vertical hoisting mechanism having a base member for supporting the same and having a platform extending therefrom operable to a selectable vertical position;

b. an elongated bifurcated frame secured to said hoisting mechanism platform at a predetermined incline with respect thereto, said bifurcated frame having a pair of elongated members spatially disposed from each other;

c. first rotary brush means with abrasive bristles having its axis of rotation extending substantially parallel to one of said pair of elongated members;

d. second rotary brush means with abrasive bristles substantially parallel to said first rotary brush means, said first and second rotary brush means rotating in opposite directions and disposed with respect to each other for a downward pulling engagement of at least one of such overhead shackles therebetween;



e. first and second guide bar means disposed beneath, and cooperating with, said first and second rotary brush means for aiding the movement of such shackles;

f. a plurality of output conduits disposed adjacent at least one of said first and second rotary brush means;

g. a plurality of liquids;

h. a liquid dispensing mechanism connected between said plurality of liquids and said plurality of output conduits;

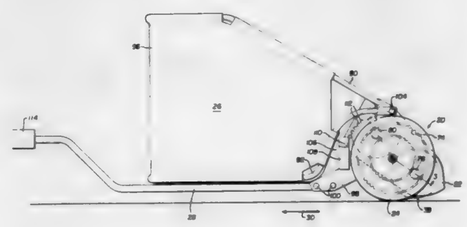
i. and a control mechanism operably connected to said liquid dispensing mechanism for controlling the selection of said plurality of liquids and intermittently controlling the quantity of each of said plurality of liquids dispensed through said plurality of output conduits.

4,042,994

SWEEPER ASSEMBLY

David S. Sassaman, Oshkosh, and Raymond F. McDonald, Winneconne, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Jan. 30, 1976, Ser. No. 654,248
Int. Cl.[2] E01H *1/04*
U.S. Cl. 15—83 **8 Claims**



1. A sweeper assembly, comprising:

a downwardly opening housing enclosure, a rotary sweeper brush rotatably mounted within said housing, a second rotary brush rotatably mounted within said housing generally parallel to said sweeper brush located adjacent and above said sweeper brush, means rotating said brushes to

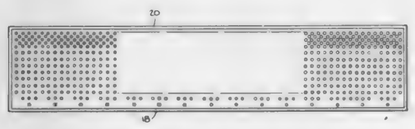
lift particulate material swept by said sweeper brush and propelled by said second brush through an opening said housing, a lower baffle means having an arcuate face spaced from and confronting said sweeper brush defining a throat between said sweeper brush and said housing directing particulate material collected by said sweeper brush into said housing enclosure, toward said secondary brush, and said lower baffle having a lower edge fixed relative to said housing and spaced below the rotational axis of said sweeper brush with said rotary brush spaced below said lower end, said baffle means lower end adapted to lift said sweeper assembly and lower brush upon engaging accumulated particulate material to limit the material received through said throat into said housing and prevent clogging of said sweeper assembly.

4,042,995

TOOL FOR REMOVING ANIMAL HAIR FROM CARPETING

Hyman Varon, 136 E. 76th St., New York, N.Y. 10021

Filed May 24, 1976, Ser. No. 688,958
Int. Cl.² A47L *13/00*
U.S. Cl. 15—142 **10 Claims**



1. A tool for removing animal hairs from carpet material comprising:
- a head having a backboard, said head having a leading edge and a trailing edge, and
- a field of bristles depending from said head,
- a zone of said bristles along said trailing edge of said head being substantially more densely packed than the rest of said bristles in said field,
- the ones of said bristles in a predetermined zone adjacent the leading edge of said head arranged such that the leading edge of said bristles has a saw tooth configuration, each of the bristles in the forwardmost row of bristles being substantially spaced from one another and defining the apex of a separate triangular wedge-like section of said saw tooth configuration.

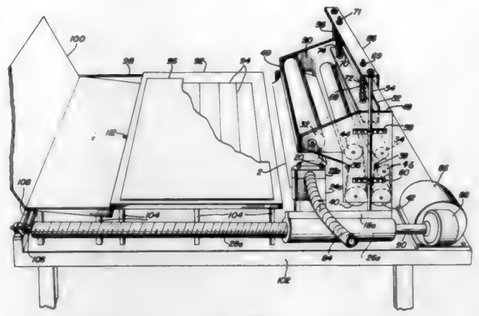
4,042,996

AIR ETCHING OF POLYMERIC PRINTING PLATES

Forrest A. Wessells, Baltimore, and John E. Pickard, Ellicott City, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 388,234, Aug. 14, 1973, Pat. No. 3,922,751, which is a continuation-in-part of Ser. No. 351,415, April 16, 1973, abandoned, which is a continuation-in-part of Ser. No. 316,253, Dec. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 178,723, Sept. 8, 1971, abandoned. This application June 25, 1975, Ser. No. 590,349
Int. Cl.² A47L *5/38*
U.S. Cl. 15—306 R **11 Claims**

1. Apparatus comprising, in combination
1. a first frame;
2. an air knife assembly comprising
   a. a second frame affixed to the first frame,
   b. an air knife carried in said second frame, said air knife consisting of an elongated hollow chamber containing a slit adapted to deliver air under pressure as a thin sheet;
   c. means to deliver air under pressure to the air knife; and
3. A platen carried movably on said first frame and adapted to hold a relief letterpress plate having liquid polymer thereon; said platen carrying a sink on at least one of its sides to collect liquid blown from said plate by said air knife;



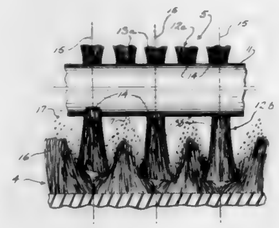
4. drive means adapted to move the platen under the air knife assembly in a work direction and to return the platen to its starting position.

4,042,997

VACUUM CLEANER WITH IMPROVED BRUSH

David E. McDowell, Grand Rapids, and Robert A. Yonkers, Grandville, both of Mich., assignors to Bissell, Inc., Grand Rapids, Mich.

Filed Oct. 29, 1976, Ser. No. 737,153
Int. Cl.² A47L *5/30*
U.S. Cl. 15—366 **5 Claims**



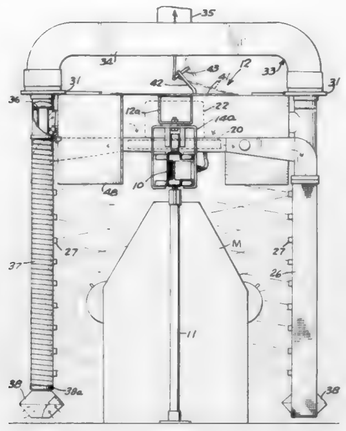
1. A vacuum cleaner comprising:
- a. a head member adapted for reciprocable movement over a carpet,
- b. an elongated carpet engaging nozzle disposed in said head member,
- c. means for creating suction at the nozzlecarpet interface to move debris through said nozzle,
- d. a handle on said head member,
- e. and a rotatably driven brush disposed in said nozzle and engageable with the carpet, said brush comprising:
  1. an elongated cylindrical core,
  2. and a plurality of generally longitudinally extending circumferentially spaced rows of flexible brush bristle tufts extending radially outwardly from said core,
  3. said tufts being of the same height and strength,
  4. at least a portion of the tufts in alternate rows being equally and closely spaced a selected distance to form a substantially continuous line,
  5. the tufts disposed circumferentially from said closely spaced tufts being widely and equally spaced at twice said selected distance,
- f. said widely spaced tufts forming means to penetrate the carpet in a discontinuous line during driven brush rotation to loosen deeply embedded debris and prepare the carpet surface for subsequent debris removal by said closely spaced tufts as said vacuum cleaner is moved across the carpet.

4,042,998

TEXTILE CLEANING

Ronald S. Blough, Sun City Center, Fla.; Virgil W. Cook, Charlotte, N.C., and Charles D. Spates, Fairfield, Iowa, assignors to American Chain & Cable Company, Inc., Bridgeport, Conn.

Filed Aug. 4, 1975, Ser. No. 601,658
Int. Cl.² A47L *9/20*
U.S. Cl. 15—312 A **7 Claims**



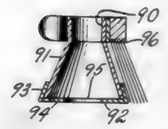
1. In a textile cleaning apparatus, the combination comprising
- a track,
- a carrier movable along said track adapted to extend along a row of textile machines,
- means for driving said carrier along said track,
- said carrier including blower means for directing a stream of air outwardly,
- conduit means associated with said blower means for directing at least one stream of air onto the textile machines as the carrier moves along said track,
- said carrier including air intake means associated with said blower means,
- said air intake means including a chamber,
- a connecting conduit communicating with said chamber and extending generally vertically alongside a row of machines,
- said conduit having an outer wall,
- a tubular filter within and spaced from said conduit with means associated with the lower end of the filter for closing the space between said filter and said conduit such that air and material drawn upwardly through the conduit pass along the inner periphery of the filter,
- valve means associated with the upper end of the filter,
- means associated with the upper end of the filter for closing the space between the filter and the conduit and cooperating with the valve means so that the air flowing upwardly through the interior of the filter must pass through the filter in order to move out of the conduit into said chamber,
- stationary means along the path of the track including a clean-out station connected to a source of vacuum such that as the carrier moves past the clean-out station, the upper end of the conduit associated with said clean-out station is brought into register with the clean-out station and the valve means at the upper end of the filter is actuated to permit the material deposited on the interior of the filter to be sucked upwardly into the clean-out station.

4,042,999

MINIATURIZED VACUUM CLEANER DEVICE

Demetrios Triantafyllou, 585 West End Ave., New York, N.Y. 10024

Filed Jan. 17, 1975, Ser. No. 541,763
Int. Cl.² A47L *9/02*
U.S. Cl. 15—422 **1 Claim**



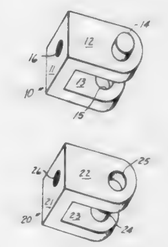
1. A nozzle for a vacuum cleaning device comprising: a relatively rigid tubular coupling member having a flared free end, a resilient flexible membrane of rubber-like material, said membrane including a peripherally-located contractal flange surrounding said free end, and a centrally disposed portion placed under tension by such engagement, there being a concentrially disposed opening in said last mentioned portion resiliently distortable in the plane of the membrane to conform sufficiently to an engaged object to at least partially seal said opening and maintain a sufficient pressure differential to allow said object to be retrieved; said membrane being removable for purposes of replacement with a similar membrane having a differently sized opening.

4,043,000

KNEE JOINT COUPLING

James W. Bunker, Saugus, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed June 14, 1976, Ser. No. 695,574
Int. Cl.² E05D *9/00*
U.S. Cl. 16—128 R **5 Claims**



1. A knee joint coupling comprising:
- a first link and a second link;
- each of said links having:
- a base;
- two legs extending from the base providing space therebetween;
- a pin protruding from a first of said legs; and
- a hole through the second of said legs aligned with said pin;
- the pin of each link being inserted into the hole of the other link.

4,043,001

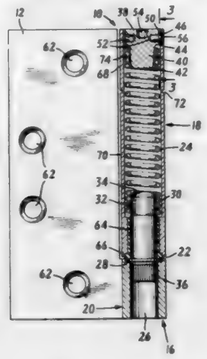
ADJUSTABLE SPRING HINGE

John S. Parsons, West Hartford, Conn., assignor to The Stanley Works, New Britain, Conn.

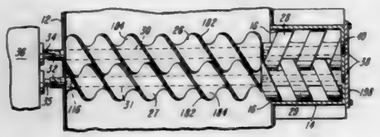
Filed Apr. 19, 1976, Ser. No. 678,435
Int. Cl.² E05F *1/12*
U.S. Cl. 16—189 **26 Claims**

1. A spring hinge comprising a pair of adjacent hinge leaves; first and second hinge knuckles formed respectively on adjacent edges of the hinge leaves, the first hinge knuckle having

an aperture extending radially therethrough; a pintle extending into the hinge knuckles for mounting the knuckles in axial alignment; a torsion spring mechanism in the first hinge knuckle for urging the hinge leaves together, one end of the torsion spring mechanism being fixed for rotation relative to the first hinge knuckle; a capstan in the first hinge knuckle for non-rotatably fixing the other end of the torsion spring mechanism relative to the first hinge knuckle, the other end of the torsion spring mechanism having an anchoring turn wrapped substantially circumferentially about the capstan, the capstan having at least one radially extending cavity capable of being aligned with the aperture in the first hinge knuckle, a multiplicity of asperities disposed along an axial surface of the capstan, the anchoring turn of the torsion spring mechanism extending across and frictionally engaging the asperities to prevent rotation of the other end of the torsion spring mechanism relative to the capstan, and an annular channel forming a shoulder extending circumferentially around the capstan; and a ring secured in the aperture in the first hinge knuckle and extending into the first hinge knuckle for engaging the shoulder of the capstan to prevent axial movement of the capstan out of the first hinge knuckle and permit axial alignment of the aperture and cavity, the ring having an inner diameter of sufficient size to receive a pin for securing the capstan against rotation relative to the first hinge knuckle.



4,043,002
PATTY MACHINE AND METHOD OF FORMING PATTIES
Donald A. Brackman, Dayton, Ohio, assignor to Hobart Corporation, Troy, Ohio
Filed July 2, 1975, Ser. No. 592,530
Int. Cl.[2] A22C *11/08*
U.S. Cl. 17—32 **17 Claims**



1. In a machine for delivering in patty form controlled portions of a bulk product, including a feed hopper, a patty mold and means for charging said patty mold with said product to provide controlled portions thereof, product conveying means for conveying product from said hopper to said charging means comprising:

a plurality of conveyor screws positioned in said hopper and communicating with said charging means,

means mounting said conveyor screws for rotation about longitudinal axes thereof in a direction to convey product to said charging means,

each of said conveyor screws consisting of multiple flights of screw threads of substantially uniform size throughout the lengths of said screws,

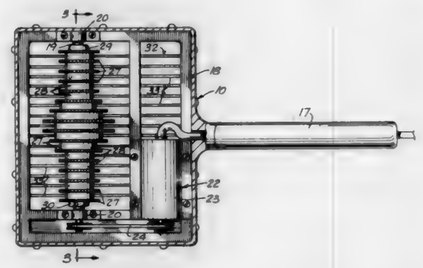
said multiple flights of uniformly sized threads consisting of face portions and crest portions defined substantially by the intersections of said face portions,

said conveyor screws being intermeshed throughout their lengths, and

said crest portions of said conveyor screws being disposed in wiping relationship to said face portions of said conveyor screws,

whereby said conveyor screws are substantially self-wiping throughout their lengths and thereby minimize accumulation along said face portions of said conveyor screws of the product being conveyed thereby or components of said product.

4,043,003
BONE SECTIONING TOOL FOR VERTEBRATE FISH
George H. Lemmon, Hagerman, Idaho 83332
Filed Aug. 4, 1976, Ser. No. 711,510
Int. Cl.[2] A22C *25/16*
U.S. Cl. 17—67 **4 Claims**



1. A bone sectioning tool for severing the rib bones of vertebrate fish without damaging the flesh, comprising:

a frame;

an elongated arbor shaft rotatably mounted to the frame;

a plurality of circular saw blades mounted to the arbor shaft for coaxial rotation therewith;

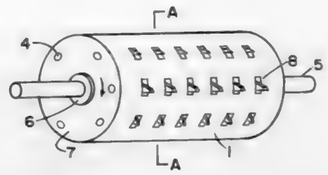
spacer discs on the shaft between adjacent saw blades for spacing the blades substantially equally apart, and wherein each disc has a diameter slightly less than the diameters of adjacent saw blades;

wherein the saw blades and discs are of varying diameters and are arranged on the arbor shaft increasing in diameter toward the longitudinal center of the arbor shaft to complement the cross-sectional curvature of the splayed sides of an eviscerated vertebrate fish and to substantially limit the depth of cut of the blades;

leaf spring members between adjacent blades and adjacent the blade periphery for preventing binding of rib bones between adjacent blades and for preventing the blades from substantially penetrating into the flesh while severing the bones; and

drive means for rotating the shaft and blades to cut the rib bones into short ingestible sections of lengths equal to the spacing between the saw blades.

4,043,004
RETRACTING TOOTH PROCESSING CYLINDER APPARATUS
Craig L. Folk, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed Feb. 6, 1976, Ser. No. 656,031
Int. Cl.[2] D02J *7/00*
U.S. Cl. 19—200 **6 Claims**



1. An apparatus for opening and cleaning textile stock comprising the following:

a. a horizontal rotatable retractable tooth cylinder comprising in combination:

1. a stationary cam;

2. a rotatable cylinder, said cylinder housing said stationary cam;

3. a plurality of teeth caged by said rotatable cylinder each tooth comprising:

a. a working part to comb textile stock;

b. a return arm which rides the surface of the cam and limits the travel of the tooth;

c. an inside peripheral surface of each tooth which critically matches the surface of the cam thus forming an interface between said inside peripheral surface of said tooth and said surface of said cam;

4. said plurality of teeth caged in a plurality of slots in said rotatable cylinder, each slot caging an individual tooth, and said teeth designed to turn freely on a pin,

5. said pin acting as a journal or pivot for each tooth;

6. said pin also acts as a retainer for a set of end caps which are retained by said pins and close the ends of the rotatable retractable tooth cylinder, each end cap comprising in combination:

a. a bearing in the center of said end cap to allow for rotational movement;

7. a shaft affixed to the ends of the stationary cam, said shaft passing through and supported by said bearing in said end caps, said shaft off-set equally on each end from the center of the cam thereby producing the desired critical interval or working conditions resulting from the outer rotational cylinder turning around the stationary internal cam and the freely turning teeth rotating on the pivot pin thus resulting in protraction and retraction of the teeth into and out of the rotatable cylinder slots as the tooth return arm and the critical tooth peripheral surface rides the outer surface of the stationary cam;

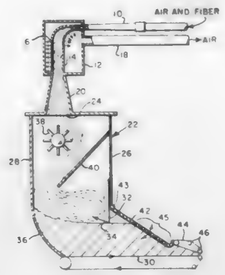
b. a horizontal feed roller and a pressure plate, in substantial horizontal proximity to said horizontal rotatable retractable tooth cylinder;

c. a feed chute, which deposits textile stock between said roller, said pressure plate, and said rotatable retractable tooth cylinder, where said textile stock is combined, opened, and extracted by said teeth of said rotatable retractable tooth cylinder;

d. a trash collection hopper into which trash falls from said opened textile stock, said hopper located adjacent to and below said rotatable cylinder to receive and collect said trash;

e. a chute into which said clean textile stock falls after being transported thereto by said retractable teeth and said retractable teeth retract.

4,043,005
PROCESS FOR FORMING A STAPLE FIBER BATT
R. shmikant Maganlal Contractor, Wilmington, and Sang-Hak Hwang, Newark, both of Del., assignors to E. I. Du Pont de Nemours & Company, Wilmington, Del.
Division of Ser. No. 577,056, May 13, 1975, Pat. No. 3,981,047.
This application June 22, 1976, Ser. No. 698,590
Int. Cl.[2] D01G *25/00*
U.S. Cl. 19—155 **2 Claims**



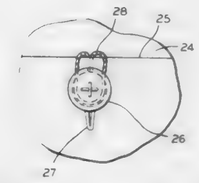
1. A process for forming a staple fiber batt of improved uniformity comprising

a. depositing the fibers on a moving conveyor to form a batt, the deposition of said fibers being by the falling of said fibers onto said conveyor,

b. directing a flow of air across the top of said batt in the opposite direction to the movement of said conveyor to skim off the top layer of fibers therefrom, the flow of air thereby determining the level of said batt, and to cause the skimmed off fibers and falling fibers to swirl around across the top of the batt, thereby improving the uniformity of the batt, and

c. redepositing the skimmed off fibers onto said batt along with the falling fibers.

4,043,006
BUTTON LOCKING DEVICE
Ben Williams, and George H. Miller, both of 3955 N. Murray Ave., Shorewood, Wis. 53211
Filed Mar. 17, 1975, Ser. No. 553,158
Int. Cl.[2] A44B *1/00, 1/18*
U.S. Cl. 24—90 R **10 Claims**



1. In the combination of a first fabric with a button permanently fastened thereto and a second fabric with an edge and a button hole adjacent said edge for receiving said button therethrough and to expose said button beyond said second fabric whereby to releasably button the two fabrics together, the improvement for locking the two fabrics together notwithstanding release of the button from the button hole and comprising a flexible link, means permanently securing one end of the flexible link to the first fabric, said flexible link extending between said fabrics from said button and being looped over the edge of the second fabric and said other end of the flexible link encircling exposed button whereby to lock the two fabrics

together notwithstanding release of the button from the button hole.

4,043,007

WARP-KNIT SLIDE-FASTENER SUPPORT TAPE AND STRINGER

Helmut Heimberger, Locarno, Switzerland, assignor to OPTI Patent-, Forschungs- und Fabrikations-AG, Glarus, Switzerland

Filed Sept. 30, 1976, Ser. No. 728,133
Claims priority, application Germany, June 15, 1976, 2626661
Int. Cl.[2] A44B *19/00*
U.S. Cl. 24—205.1 C **12 Claims**



1. A support tape for a slide-fastener stringer half, said tape having a pair of longitudinally extending edges and a pair of opposite faces and being warp knit with:

an intermediate warp yarn spaced from said edges and forming a longitudinally extending double wald projecting on both faces of said tape and subdividing same transversely into an attachment strip and an edge strip;

a plurality of first warp yarns in only said attachment strip forming a plurality of longitudinally extending single wales projecting only on one face of said tape;

a plurality of second warp yarns in only said edge strip forming a plurality of longitudinally extending single wales projecting only on the other face of said tape; and

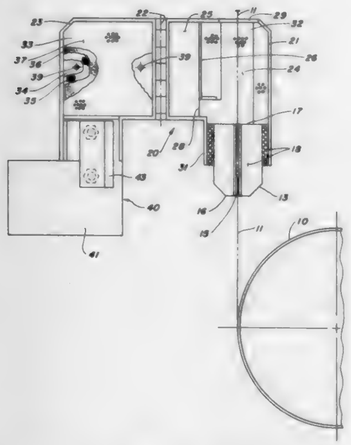
a multiplicity of weft yarns laid into said warp yarns and each extending tranversely over at least one of said wales.

4,043,008

NOISE REDUCTION SYSTEM

William Robert Weiss, Walnut Creek, Calif.; James Judson Cooksey, Colonial Heights, and Phillip Leroy Mullins, Matoaca, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 8, 1976, Ser. No. 721,262
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—271 **28 Claims**



1. In combination with a draw point localizing jet wherein advancing yarn is subjected to pressurized, superheated fluid flow, and wherein said draw point localizing jet has at least one yarn passage passing therethrough and defining yarn entrance and exit ends thereof, said yarn passage having an adjacent access slot to facilitate string-up and having at least one fluid conduit per yarn passage for admitting treating fluid thereinto, the improvements comprising:

A. an exhaust muffler, said muffler comprising:

i. a boxlike metal housing, said housing being located at said exit end of said jet, one corner of said housing being hinged so as to provide a door which pivots to an open position for access to said jet during string-up and to a closed position for treatment during operation, said door being located on the side of said housing corresponding to the side of said jet having said access slot therein, said housing comprising two chambers separated by baffle means connected to and extending inward from the exit of said housing towards said exit end of said jet, said baffle means extending to a point just short of said jet exit so that a gap is left between said baffle means and said exit end of said jet, said gap providing a sight line for an operator, the first of said chambers substantially surrounding said exit end of said jet and surrounding said yarn to a point downstream thereof and with an opening for passage of yarn therethrough, the second of said chambers being positioned contiguous to said first chamber;

ii. means for mounting said housing on said jet;

iii. two metal sound absorbing inserts, said inserts comprising a metal frame, a metallic honeycomb sheet, a sintered metal sheet, a perforated metal sheet, and means for sandwiching these elements, the first of said inserts having a U-shape and being mounted opening towards said door in said first chamber, the second of said inserts having a shape corresponding to the interior portion of said door and being mounted thereon, said inserts being adapted for removable connection to said housing and said interior portion of said door so as to line said first chamber without blocking the passage of said yarn therethrough, said metal frame of said inserts being adjacent said housing and said perforated metal sheet being furthest away from said housing, said honeycomb sheet being adjacent said frame, said sintered metal sheet being adjacent said perforated metal sheet, the cells of said honeycomb sheet opening in a plane transverse to that of said yarn passage if extended through said first chamber, the distance between said sintered metal sheet and said metal frame which is occupied by said honeycomb sheet being approximately 0.25 sound wavelength which corresponds to sound frequencies of 8,000 and 16,000 cycles per second, the open area of said perforated metal sheet ranging from 30 to 45%;

iv. means for mounting said inserts to said walls defining said first chamber and to said interior of said door, and

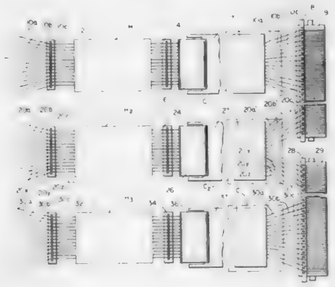
B. access slot silencing means, said access slot silencing means comprising a projection of said housing, a mounting plate, a silencing plate, a pin, and a compression spring, said projection being an extension of said housing door in the direction of said jet entrance, said projection pivoting with said door into an open and a closed position, said projection blocking access to said side of said jet having said access slot therein when in said closed position, said projection having said mounting plate spaced therefrom and attached thereto on the side closer to said jet when in said closed position, said mounting plate having a slot with said pin passing therethrough, said pin being connected on the end located closer to said jet to said silencing plate and being connected at its other end to stopping means which prohibits its passing completely through said slot, said compression spring surrounding the portion of said pin located between said projection and said slot, said silencing plate corresponding in length and being slightly wider than said access slot in said jet; whereby the noise level of said jet is changed from a continuous source to an intermittent source, emitting high level noise only during string-up and alignment, by: (1) the automatic closure of said access slot by said silencing plate when said jet is operational and said projection is pivoted along with said housing door to within 1.5 inches of said access slot, said closure resulting from the vacuum-like action induced by said treating fluid; and (2) the closure of said access slot simultaneously closing said housing door to close said first chamber of said exhaust muffler thereby reducing noise at the yarn exit, and whereby the noise level of said jet is reduced by up to 16 ± 1.5 Δ dB(A) when said housing door and said projection are in said closed position.

4,043,009

STRAND TREATMENT

Robert K. Stanley, Media, and Ira Schwartz, Philadelphia, both of Pa., assignors to Textured Yarn Co., Inc., Kennett Square, Pa.

Continuation-in-part of Ser. No. 222,135, Jan. 31, 1972, Pat. No. 3,722,042. This application Mar. 14, 1973, Ser. No. 341,320
Int. Cl.[2] D02G *1/12*
U.S. Cl. 28—221 **13 Claims**



9. Strand-crimping apparatus comprising a plurality of laterally confining stuffing chambers, each having an entrance and an exit, means for feeding strands into the respective entrances, means for withdrawing strands through the respective exits, and multiple strand-traversing means juxtaposed to the feeding means and having multiple spaced positions for guiding spaced strands and for traversing a multiplicity of laterally spaced strands to and fro along the entrances.

4,043,010

PROCESS FOR PRODUCING TEXTURED POLYESTER YARN

Adly Abdel-Moniem Gorrafa, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 497,489, Aug. 14, 1974, Pat. No. 3,973,386. This application June 21, 1976, Ser. No. 697,945
Int. Cl.[2] D02G *1/16*
U.S. Cl. 28—220 **4 Claims**

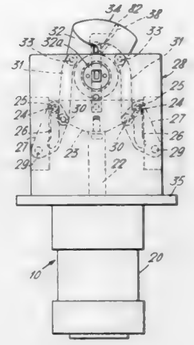
1. In a process for producing textured textile yarn fron undrawn continuous filament yarn by first drawing the yarn without texturing the yarn and then air-jet texturing the drawn yarn to form a bulky yarn having crunodal surface loops; the improvement for producing polyester textured yarn having a boil-off shrinkage of less than 3.5 percent without heating the yarn after the yarn is drawn, which comprises continuously feeding to the drawing step a spin-oriented polyester yarn characterized by a break elongation of 70 to 180 percent, a birefringence value of at least 0.025, a crystallinity of less than 30 percent, and a relative viscosity of at least 18, drawing the spin-oriented polyester yarn at 1.3 to 2.0 draw ratio while heating the yarn with a heater at a temperature from 180° to about 210° C and feeding the drawn yarn directly to an air jet at 8 to 35 percent overfeed without additional heating, jet texturing the yarn with the air jet to form crunodal surface loops in the yarn, and packaging the resulting textured yarn at a package speed (P) greater than the take-off speed (T) from the air jet, the value of (T−P)/P (100) being from −1 to −10 percent.

4,043,011

PACKAGING MACHINES

Giorgio Aldo Maria Giraudi, and Nino Imperiale, both of Milan, Italy, assignors to W. R. Grace & Co., Duncan, S.C.

Filed June 23, 1976, Ser. No. 699,023
Claims priority, application United Kingdom, June 30, 1975, 27562/75
Int. Cl.[2] B65B *51/05*; B23P *11/00*
U.S. Cl. 29—33.5 **12 Claims**



1. A gathering and clipping head for closing bags or the like comprising:

a. opposed gathering members,

b. a common hub rotatably supporting said gathering members,

c. arcuate gathering surfaces formed on said gathering members and arranged to be convex towards said common hub and to overlap in the closed configuration of the gathering members to gather together the neck of a bag to define a tightly gathered neck configuration for clipping,

d. a clip guide slot defined by said gathering members when in their closed positions;

e. a clip-leg deforming die carried by one of said gathering members,

f. means for axially guiding a supply of clips to a location within said hub, and

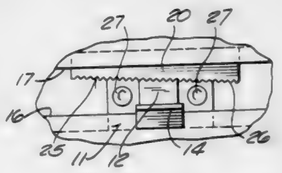
g. means for driving individual clips radially outwardly from the said location within the hub to be deformed around a bag neck gathered by said gathering members.

4,043,012

AXIALLY AND RADIALLY ADJUSTABLE CUTTER INSERT FOR ROTARY CUTTING TOOL

Peter C. Rowlson, Eugene, Oreg., and Thomas J. Kuhl, Santa Claus, Ind., assignors to North American Products Corporation, Atlanta, Ga.

Filed Nov. 17, 1975, Ser. No. 632,681
Int. Cl.[2] B26D *1/28*
U.S. Cl. 29—105 R **8 Claims**



1. A cutter insert for a cutting tool head that has an axis and

is rotatable about the same, said head also having an axially extending radially outwardly opening slot that defines a radially outwardly facing bottom surface and opposite side surfaces which extend parallel to said axis and which are undercut so that the slot is substantially narrower at its mouth than radially inwardly thereof, one of said side surfaces being flat from near said bottom surface to near the mouth of the slot, said cutter insert having a lower base portion receivable in said slot for adjustment therealong and an upper cutter portion which projects radially out of the slot and has a cutting edge that is intended to be spaced a predetermined distance from said axis, said cutter insert being characterized by:

A. the base portion of the cutter insert
   1. having a length dimension which can be oriented lengthwise of the slot,
   2. having a lengthwise extending flat front surface that is flatwise engageable with said one side surface of the slot, and
   3. having a rear inclined surface which is in such lengthwise oblique relation to said front surface that the base portion has a taper in width in one direction along its length, said inclined surface also being in upwardly convergent oblique relation to said front surface;

B. a wedging element complementary to said base portion and having a length dimension which can be oriented lengthwise of the slot, said wedging element
   1. having lengthwise extending rear surface portions that are formed to matingly engage the opposite undercut side surface of the slot, such engagement confining the wedging element against upward movement in the slot, and
   2. having a front inclined surface which is in such lengthwise oblique relation to its said surface portions that the wedging element has a taper in width which is opposite and complementary to said taper of the base portion, so that upon flatwise engagement of said inclined surfaces the distance between said front surface on the base portion and said rear surface portions on the wedging element can be adjusted by lengthwise movement of the wedging element relative to the base portion;

C. cooperating means on the base portion and on the wedging element, rendered operative by flatwise engagement of their said inclined surfaces, for confining the wedging element against lengthwise movement relative to the base portion in any of a plurality of positions of such movement; and

D. means for producing a relievable reaction force between the bottom surface of said slot and the base portion of the cutter insert whereby the latter is urged radially outwardly in the slot and is wedged between the wedging element and said one side surface of the slot to maintain the cutting edge at a distance from said radius that depends upon the lengthwise position of the wedging element relative to the base portion.

4,043,013

TRANSFER ROLLER

Friedrich Zeppernick, Cologne, and Klaus-Peter Dotzel, Bad Homburg, both of Germany, assignors to Firma Felix Bottcher, Cologne, Germany

Filed July 9, 1975, Ser. No. 594,483
Claims priority, application Germany, July 13, 1974, 2433749
Int. Cl.² B21B *31/08*
U.S. Cl. 29—132 **11 Claims**

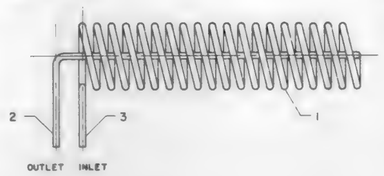
1. A roller for transferring a liquid-based medium, comprising a foundation body non-affinitive for said medium, an intermediate layer firmly bonded to said foundation body, and an uninterrupted very thin elastic coating firmly bonded to said intermediate layer and chemically different therefrom, said coating having an affinity for said medium and non-affinitive for said foundation body.

4,043,014

METHOD OF MAKING A WASTE FLUE HEAT RECOVERY DEVICE

John C. Wilson, 44 Eagle St., Greenville, Pa. 16125

Filed Nov. 11, 1975, Ser. No. 630,796
Int. Cl.² F22D *1/02*; B21D *53/02*
U.S. Cl. 29—157.4 **2 Claims**



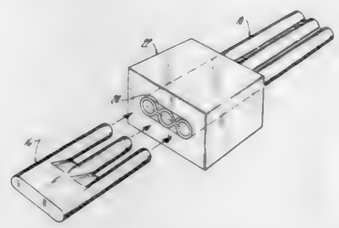
1. A method of manufacturing a heat recovery unit which consists of providing a flue pipe blank, forming a pair of Longitudinally aligned holes which are located at one end of said blank, forming a water heating coil by forming a plurality of coil turns, forming one end of the coil with a straight portion of tubing extending therefrom, forming the other end of the coil with a second straight portion that extends through the middle of the coil and then bending the second straight portion at the right angles to extend parallel to the first straight portion, inserting the ends of said portions through said aligned holes, wrapping the flue pipe blank around the coil and joining the edges of the flue pipe blank together.

4,043,015

METHOD OF FORMING A HEADER ASSEMBLY

Charles E. Hickman, and William G. Hastings, both of Adrian, Mich., assignors to Brazeway, Inc., Adrian, Mich.

Filed Aug. 18, 1976, Ser. No. 715,557
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.4 **7 Claims**



1. A method of forming a header consisting of a plurality of passage elements transitioning into a common header passage, the method comprising:

forming a blank comprised of a plurality of juxtaposed passage elements with the juxtaposed passage elements integrally interconnected with respective web sections;

splitting the inside of said blank through thickness of said integral web sections and the wall portions of said passage elements connected by said web sections for a portion of the length of said blank;

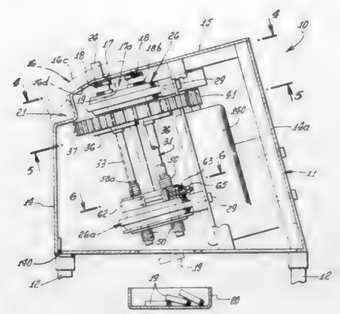
forcing said split web portions outwardly away from each other to cold form said header passage without splitting through said portions, whereby said transition is provided without welding of said portions.

4,043,016

APPARATUS TO REMOVE RINGS FROM TELEPHONE HAND SET

Robert D. Elkin, Claremont, Calif., assignor to Collins Machinery Corporation, Monterey Park, Calif.

Filed June 7, 1976, Ser. No. 693,135
Int. Cl.² B23P *19/04*
U.S. Cl. 29—240 **10 Claims**



1. In apparatus to release securing rings from a telephone receiver, the rings having thread connection to the receiver earpiece and mouthpiece bodies, the bodies connected by a handle,

a. a receiver carrier having a first well to receive the earpiece or mouthpiece body of the receiver,

b. a chuck exposed to the interior of said well to extend about one securing ring when one of said bodies is removably placed in the well, and

c. means for causing said chuck to grip and to rotate said one securing ring in a direction to remove the ring from its associated body,

d. structure to block rotation of the receiver in response to said rotation of the securing ring, and

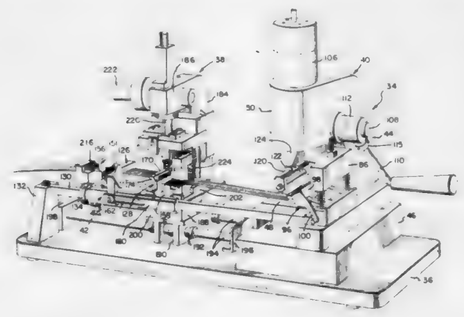
e. carrier means for the chuck forming a through passage in alignment with said one well and opening downwardly to freely pass removed rings for collection below the level of the carrier means.

4,043,017

APPARATUS FOR INSERTING WIRES INTO TERMINALS AND FOR MANUFACTURING ELECTRICAL HARNESSES

Kenneth Foster Folk; Milton Dean Ross, and Walter Clifton Shatto, Jr., all of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 11, 1976, Ser. No. 657,138
Int. Cl.² H01R *43/04*
U.S. Cl. 29—749 **14 Claims**



1. Apparatus for inserting wires into the wire-receiving portions of electrical contact terminals, said terminals being contained in an electrical connector or the like, each terminal having wire-receiving portions which receive a wire upon movement of said wires laterally of its axis and into said wire receiving portions, said wire receiving portions being in side-by-side relationship, said wire receiving portions facing in a common direction, said apparatus comprising:

a wire guiding templet comprising a plate-like member having oppositely facing first and second surfaces, a plurality of wire guiding slots extending across said member from one edge thereof, each of said slots extending entirely through said surface from said first surface thereof to said second surface thereof, each of said slots having a width which is sufficient to permit passages therethrough of one of said wires, each of said slots having a dead end,

connector locating and supporting means proximate to said second surface for locating said connector adjacent to said second surface with each of said wire-receiving portions being proximate to one of said dead ends,

wire insertion means normally spaced from said first surface, said wire insertion means being movable towards said first surface and through said dead ends of slots, said wire insertion means being effective to move wires disposed in said slots through said slots, beyond said second surface and into said wire-receiving portions of said terminals and,

wire pressing means, said wire pressing means being moveable across said one surface from a location adjacent to said one edge thereof to a location which is proximate to, but spaced from, said dead ends of said slots, said wire pressing means being effective during movement across said surface to move wires positioned thereon progressively into said slots until end portions of said wires are adjacent to said dead ends of said slots and in alignment with wire receiving portions of terminals in a connector located on said connector locating and supporting means whereby,

upon locating said connector is said connector locating and supporting means, locating portions of said wires proximate to said first surface and proximate to said one edge of said plate like member, and upon locating each of said wires in one of said slots, and upon applying a pressing force against said wires by said pressing means and moving said pressing means across said surface from said one edge, said wires are progressively moved into said slots until portions of said wires are adjacent to said dead ends and are in alignment with said wire receiving portions of said terminals, and upon movement of said wire inserting means towards said first surface and through said slots, said wires are inserted into said wire-receiving portions of said terminals.

4,043,018

METHOD AND TOOL FOR REMOVING TUBES FROM MULTI-TUBE FINNED HEAT EXCHANGE COIL

Edward C. Neff, Norman, Okla., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 18, 1975, Ser. No. 642,094
Int. Cl.² B23P *19/02*
U.S. Cl. 29—427 **6 Claims**

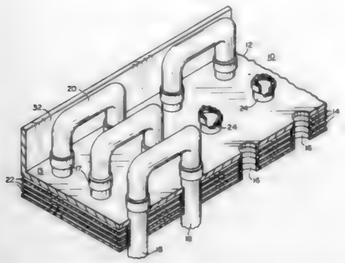
1. The method of removing a tube from a multi-tube finned heat exchanger coil of the type in which the tubes are expanded into the fins comprising cutting a helix in the tube wall for the length of the tube and then pulling the tube out by collapsing the helix formed in the tube wall.

4. A tool for removing an expanded tube of given length, internal diameter, and external diameter from a multitube finned coil heat exchanger comprising:

a cutting end portion and a shank,

said cutting end portion having a succession of cutting teeth arranged in a helical array in one rotative direction, the tips of the cutting teeth successively along the length of the cutting end portion generally progressing radially outwardly from about the internal diameter of the tube to about the external diameter of the tube, the cutting end

portion being adapted to cut a helix into the wall of the tube upon being rotated in the tube, and



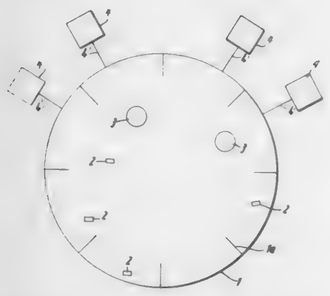
a series of flutes extending along the cutting end portion to receive the chips generated by cutting the helix.

4,043,019

METHOD AND ARRANGEMENT FOR SEPARATING THE MATERIAL FORMING ONE PART OF AN ARTICLE FROM THAT FORMING ANOTHER PART THEREOF, PARTICULARLY FOR USE WITH METAL-SYNTHETIC RESIN COMPOSITES

Helmut Schröder, Bonn-Bad Godesberg, Germany, assignor to Vereinigte Aluminium-Werke Aktiengesellschaft, Germany

Continuation of Ser. No. 506,733, Sept. 17, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 666,004
Claims priority, application Germany, Sept. 19, 1973, 2347108
Int. Cl.[2] B02C *19/12*
U.S. Cl. 29—427 **7 Claims**



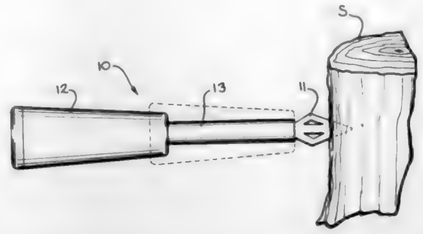
1. A method of preparing a metallo-plastic bottle cap for recycling by separating the plastic component which is confined in the recessed interior of the metallic cap component, comprising the steps of confining a plurality of said caps in a perforated drum having an inner circumferential surface provided with projections, together with a plurality of impacting members; cooling said caps so as to cause said plastic component to become substantially more brittle than said metallic component; and rotating said drum so that said projections entrain and agitate said caps and said impacting members to cause the latter to impact said caps and to thereby break up the brittle plastic components without breaking up the metallic components, so that the plastic components can fall out of the recessed interior of said metallic components and be removed, leaving the metallic components free of the plastic components and ready to be recycled without contamination by the plastic components.

4,043,020

ARROWHEAD EXTRACTOR

Anthony J. Hoggard, Merrill, Mich., assignor to Tomar Corporation, Indian River, Mich.

Filed July 16, 1976, Ser. No. 705,764
Int. Cl.[2] B23P *19/02*
U.S. Cl. 29—427 **5 Claims**



1. The method for extracting an arrowhead which comprises:

a. removing an arrow shaft from a detachable type of arrowhead having sharp edges for hunting embedded in an object such that the head is exposed;

b. attaching a slide percussion tool with a linearly slidable housing mounted on a shaft with a percussion stop to the arrowhead;

c. repeatedly sliding the housing in a direction which approximates the direction of entry of the arrowhead into the object in order to remove the arrowhead from the object by hammering the housing against the stop; and

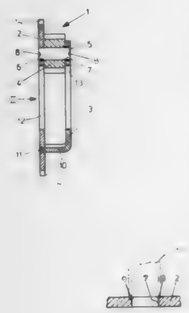
d. inserting the arrowhead into the object where it was embedded in order to detach the arrowhead from the tool.

4,043,021

PROCESS FOR MAKING SHEET-METAL PLANET CARRIER

Rudolf Mosbacher, Mariabrunn, and Hans Ruppik, Friedrichshafen, both of Germany, assignors to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Germany

Filed Jan. 28, 1976, Ser. No. 653,001
Claims priority, application Germany, Jan. 29, 1975, 2503518
Int. Cl.[2] B23P *11/00*
U.S. Cl. 29—437 **1 Claim**



1. A process for manufacturing a planet carrier for an epicyclic gear train, comprising the steps of :

stamping two sheet-metal disks, each having a central aperture, from sheet-metal blanks;

punching , simultaneously with the stamping step, a plurality of generally circular mounting holes in each of said disks around the central aperture thereof;

accompanying the punching of said holes by a partial penetration of said blanks with formation of at least one peripheral notch adjacent each mounting hole;

assembling said disks parallel to each other into a unitary body with their central apertures coaxially disposed and with their mounting holes aligned;

interposing a planet pinion between said disks in line with each pair of aligned mounting holes;

passing a shaft through each pair of aligned mounting holes and the interposed planet pinion; and

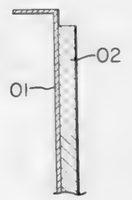
deforming the ends of said shaft to extrude portions thereof into said notches whereby said shaft is firmly anchored to said body.

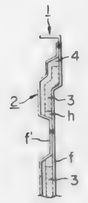
4,043,022

METHOD OF MANUFACTURING DOUBLE-STRUCTURE SOUND ABSORBING WALL FOR MOTOR VEHICLE

Keiichi Kisuna; Satoru Toyama, and Hiroshi Kimura, all of Nagoya, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1976, Ser. No. 736,482
Claims priority, application Japan, Nov. 17, 1975, 50-137247; Jan. 9, 1976, 51-104523; Jan. 9, 1976, 51-104524; Feb. 9, 1976, 51-105642
Int. Cl.[2] B23P *3/00, 19/04*
U.S. Cl. 29—460 **12 Claims**





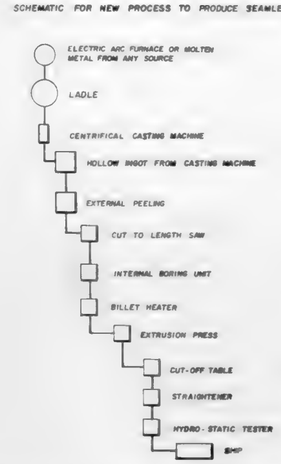
1. A method of manufacturing a double-structure sound absorbing wall for a vehicle, said sound absorbing wall having a cavity defined by joining peripheral edges of first and second plate members, said method comprising the steps of providing said first and second plate members with gas bleeding holes and recesses depressed toward the inside of said cavity to abut the members to each other, providing a heat-foamable sound insulating member received in said cavity with relief holes for spot-welding corresponding to said recesses, holding said heat-foaming sound insulating member by said recesses upon abutting of said plate members, abutting said peripheral edges to each other, spot-welding said recesses to each other to close said cavity, and foaming said heat-foamable sound insulating member by heating to fill said cavity therewith.

4,043,023

METHOD FOR MAKING SEAMLESS PIPE

Daniel L. Lombard, 121 W. Boardman St., P. O. Box 177, Youngstown, Ohio 44501

Continuation-in-part of Ser. No. 577,029, May 13, 1975, abandoned. This application Jan. 5, 1977, Ser. No. 757,015
Int. Cl.[2] B22D *11/126, 11/128*
U.S. Cl. 29—527.6 **2 Claims**



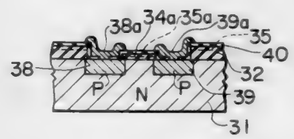
1. The method of making seamless pipe from molten metal, comprising centrifugally casting said molten metal to form a hollow ingot, externally peeling said hollow ingot and internally boring said ingot and cutting it to the desired length, thereafter heating the billet and subjecting the billet to a hot extrusion press for hot extruding the pipe for a period of seconds to enable high magnitude reduction ratios of about 5 to 1 to about 60 to 1, thereby considerably reducing grain size.

4,043,024

METHOD OF MANUFACTURING A SEMICONDUCTOR STORAGE DEVICE

Seiichi Iwamatsu, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 21, 1975, Ser. No. 634,187
Claims priority, application Japan, Nov. 22, 1974, 49-133654
Int. Cl.[2] B01J *17/00*
U.S. Cl. 29—571 **2 Claims**



1. A method of manufacturing a semiconductor storage device comprising the steps of

a. forming an oxide film on a surface of a semiconductor substrate of a first conductivity type;

b. selectively removing said oxide film and thus exposing part of said surface of said semiconductor substrate;

c. forming a gate oxide film thinner than the first-mentioned oxide film on the exposed part of said surface of said semiconductor substrate;

d. implanting ions of an electrically conductive element into at least said gate oxide film, thus forming a floating gate;

e. selectively removing part of the resultant gate oxide film thus forming therein window portions for forming source and drain regions spaced apart from each other;

f. doping said semiconductor substrate with an impurity of a second conductivity type opposite said first conductivity

type through said window portions for forming source and drain regions, thus forming said source and drain regions;

g. forming a chemical vapor deposition oxide film so as to cover said gate oxide film; and

h. leading out source and drain electrodes from said source and drain regions, respectively.

4,043,025

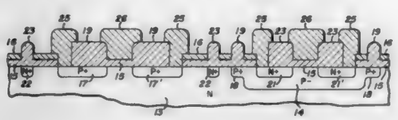
SELF-ALIGNED CMOS PROCESS FOR BULK SILICON AND INSULATING SUBSTRATE DEVICE

Gregorio Spadea, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Division of Ser. No. 575,655, May 8, 1975, Pat. No. 3,983,620. This application June 17, 1976, Ser. No. 697,291

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 **3 Claims**



1. The method for manufacture of a silicon semiconductor device comprising the steps of:

forming a first semiconductor layer of a first conductivity type over the surface of an insulating substrate,

forming an oxide layer over the surface of said first semiconductor layer,

forming a silicon nitride layer over the surface of said oxide layer,

masking and etching said silicon nitride and said oxide layer to form openings therein at first regions of said first semiconductor layer,

diffusing a dopant through said latter openings to form source and drain regions of said conductivity type in said first regions of said first semiconductor layer with a gate region extending between the source and drain regions, a thick oxide layer being formed over said source and drain regions during said diffusion,

masking said gate region and a portion of the oxide layer at the source and drain regions adjacent said gate region,

forming a thin layer channel region of a second conductivity type in a second region of said first semiconductor layer removed from said first region,

etching both the thick oxide layer and the underlying first semiconductor layer in the outer portions of said first region to isolate the diffused source and drain regions in said first region of said first semiconductor layer from said second region of said first semiconductor layer,

forming an insulating oxide layer over the exposed surfaces of said first semiconductor layer, and simultaneously driving said thin layer channel region into said first semiconductor layer,

masking and etching openings through said silicon nitride layer and said underlying silicon oxide layer to define source and drain regions separated by a gate region in said second region of said first semiconductor layer,

diffusing a dopant through said latter openings to form source and drain regions in said second region of said first semiconductor layer,

masking and etching openings in the oxide layer over said source and drain regions in said first and second regions of said first semiconductor layer to form connect openings thereto,

etching away the silicon nitride layer remaining over the gate regions,

depositing a metallization layer over the device,

masking said metal layer to define the metal connect and interconnect openings to the various source, drain, and gate regions, and

etching the metal to form the gate electrodes and the source and drain connects.

4,043,026

METHOD OF MAKING CONNECTOR FOR LIGHT-CONDUCTIVE FIBERS

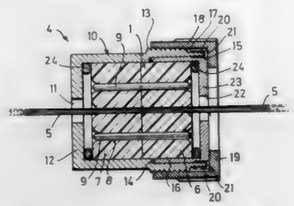
Wolfgang Weidhaas, Cologne, and Hans-Joachim Trappenberg, Langenfeld, both of Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Filed Apr. 30, 1976, Ser. No. 682,172

Claims priority, application Germany, June 25, 1975, 2528270

Int. Cl.² G02B *5/14, 7/00*

U.S. Cl. 29—592 **13 Claims**



1. A method of coaxially connecting light-conductive fibers, comprising the steps of forming a connecting body with at least one receiving passage and at least two aligning passages axially parallel to said receiving passage; subdividing said connecting body along a plane substantially normal to the axes of said passages into two connecting members which have contact surfaces at said plane; introducing the end portions of the light-conductive fibers into the receiving passages of the connecting members so that the end faces of the fibers are flush with said contact surfaces; and alignedly connecting said connecting members with one another so that said contact surfaces abut one another, including accommodating aligning elements in said aligning passages.

4,043,027

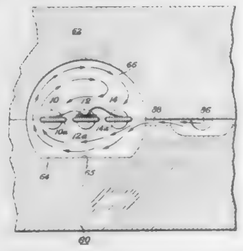
PROCESS FOR ENCAPSULATING ELECTRONIC COMPONENTS IN PLASTIC

Robert O. Birchler, Dallas, Tex., and E. R. Williams, Jr., Scottsdale, Ariz., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 768,311, Oct. 17, 1968, abandoned, which is a division of Ser. No. 331,006, Dec. 16, 1963, Pat. No. 3,439,238. This application July 30, 1973, Ser. No. 384,768

Int. Cl.² B01J *17/00*

U.S. Cl. 29—588 **17 Claims**



1. A process for encapsulating a miniaturized semiconductor device having a multiplicity of electrical terminals comprising the steps of:

electrically connecting each of the electrical terminals of the device to an intermediate point of a conductor and mechanically attaching each component of the device to at least one of the conductors for support,

disposing the device and the adjacent intermediate portions of the conductors in a mold cavity with the opposite ends of each of the conductors extending from generally opposite sides of the mold cavity, and

holding the opposite ends of the conductors extending from the mold cavity while injecting a fluid insulating material into the mold cavity which will subsequently solidify, the fluid insulating material being injected into a portion of the mold cavity remote from the device and the means electrically connecting the terminals of the device to the conductors,

whereby the fluid will not directly engage the device and electrical connection means at a high velocity and the conductors will be secured against appreciable displacement by the fluid which would be likely to break or displace a connection means in such a manner to cause a failure of the device.

4,043,028

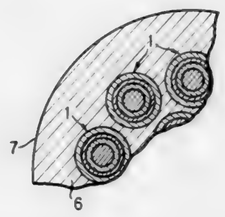
METHOD OF FABRICATING COMPOSITE SUPERCONDUCTORS

Yoshiyasu Koike, Chigasakishi; Hachio Shiraki, Komukai-Nishimachi; Eigen Suzuki, and Makoto Yoshida, both of Yokohamashi, all of Japan, assignors to Showa Electric Wire and Cable Company, Japan

Filed May 10, 1976, Ser. No. 685,903

Int. Cl.² H01V *11/00*

U.S. Cl. 29—599 **10 Claims**



1. A method of fabricating composite superconductors comprising the steps of:

forming a stock product comprising a tin based alloy core surrounded by a copper jacket which is cladded with a niobium tube;

embedding at least one of said stock products in a good thermal and electrical matrix in order to make a composite structure;

coreducing said composite structure until a desired size is obtained; and,

submitting said coreduced composite structure to a heat treatment.

4,043,029

WAVEGUIDE AND PROCESS FOR MAKING THE SAME

Jacques Allanic, Sceaux, and Guerchon Georges Fuchs, Paris, both of France, assignors to Societe Anonyme de Telecommunications and Etat Francais represente par le Secretaire des Postes et Telecommunications (Centre National D'Etudes des Telecommunications), both of, France

Filed Dec. 24, 1975, Ser. No. 644,146

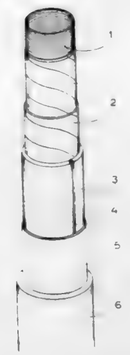
Claims priority, application France, Jan. 17, 1975, 75.01430

Int. Cl.² H01P *11/00, 3/12*

U.S. Cl. 29—600 **5 Claims**

1. A method for the manufacture of a circular waveguide having an inner wall formed by a helically wound insulated metallic wire covered with a wound and wrapped barrier layer which barrier layer is in turn covered by a cylindrical metallic screen of sufficient longitudinal and transverse rigidity as to render the waveguide self supportive, which comprises winding said metallic wire into a helix and covering said helix with said wound and wrapped barrier layer, separately forming a metal band into a tubular cross section and joining the contiguous edges of the band by high frequency welding, the internal diameter of the shaped and welded tube being a few millimeters greater than the external diameter of the wound and wrapped helix, positioning said tube around said wound and wrapped helix and shaping said tube into said cylindrical metallic screen so that the nominal internal diameter of the shaped screen is only a few hundredths of a millimeter greater than the nominal outside diameter of said wound and wrapped helix.

2. In a circular waveguide having an inner wall formed by a helically wound insulated metallic wire covered with a wound and wrapped barrier layer, the improvement which comprises a metallic screen about said wound and wrapped helix, said screen being of sufficient longitudinal and transverse rigidity to render the waveguide self supportive and consisting of a metal band formed into a tube with a high frequency weld joining the contiguous edges of the band, which welded tube is shaped about said wound and wrapped helix so that the nominal internal diameter of said screen is only a few hundredths of a millimeter greater than the nominal outside diameter of said wound and wrapped helix.



4,043,030

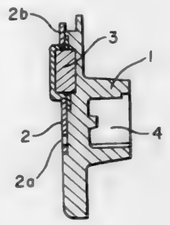
PROCESS FOR PREPARING DISTRIBUTION ROTOR

Masayoshi Onishi, Himeji, and Yoshinobu Aiyama, Johana, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1976, Ser. No. 710,329

Int. Cl.² H01H *11/00*

U.S. Cl. 29—622 **1 Claim**



1. A process for preparing a distribution rotor comprising:

forming an electrode having an outer electrode part and a central electrode part joined together by a connecting part,

joining through the application of heat a first end of a resistor to the central electrode part and joining through the application of heat a second end of the resistor to the outer electrode part, the connecting part absorbing the thermal strain and non-uniform stress caused by the application of heat,

severing and removing the connecting part, and

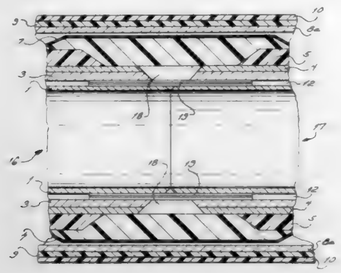
molding the assembly of the electrode and the resistor with a resin so as to form a one piece resin block.

4,043,031

METHOD OF MANUFACTURING INTERNALLY COOLED HIGH-ENERGY CABLE

Jürgen Friedrich; Engelbert Friesenhagen, and Werner Rasquin, all of Cologne, Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Division of Ser. No. 545,036, Jan. 29, 1975, Pat. No. 3,989,884. This application July 1, 1975, Ser. No. 592,253
Claims priority, application Germany, Aug. 2, 1974, 2372790
Int. Cl.[2] H01R *43/02*
U.S. Cl. 29—628 **7 Claims**



1. A method of manufacturing a high-voltage high-energy cable of a plurality of cable lengths, comprising the steps of providing an inner tubular member of metallic corrosion-resistant material for each of the cable lengths; providing an elongated blank member of metallic electrically conductive material for each of the cable lengths; forming one of said members with at least one longitudinally extending groove in the region of one surface thereof; mechanically shrinking said blank member around said tubular member so that said one surface comes into contact with the other member and said blank member forms a tubular element around said tubular member, said groove being located at the interface between said tubular element and said tubular member; winding a plurality of elongated trapezoid elements around said tubular element to obtain a cable length core; insulating and sheathing said core to obtain a cable length; juxtaposing end portions of respective cable lengths with one another so that said grooves of said cable lengths are aligned with one another; inserting end portions of a tube of highly temperature-resistant material into said grooves of said cable lengths so as to establish communication between said grooves across the interface between said end portions of said cable lengths; and connecting said end portions of said cable lengths to one another.

4,043,032

TERMINAL APPLICATOR APPARATUS FOR TERMINALS IN STRIP FORM

Paul Joseph Spangler, Novelty, Ohio, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed May 12, 1976, Ser. No. 685,794
Int. Cl.[2] H01R *43/04*; B21F *15/00*
U.S. Cl. 29—628 **11 Claims**

1. Apparatus for crimping electrical terminal devices onto wires, said terminal devices being secured to a belt in side-by-side relationship with their axes extending laterally of said belt, said apparatus comprising:

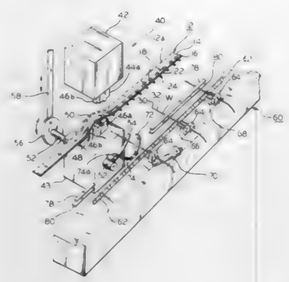
a pair of cooperable crimping dies, said dies being movable relatively towards and away from each other to crimp a terminal device located therebetween onto one end of a wire;

belt feeding means fixedly mounted on one side of said dies, said belt feeding means being effective to guide and index said belt along a path extending past said dies on said one side thereof thereby to locate the leading uncrimped terminal on said belt between said dies;

first means on the other side of said dies for holding said wire substantially fixed at a point thereof which is spaced apart from said one end of said wire; and

means located between said first means and said dies for moving said wire adjacent said one end relatively away from said dies and prior to completion of a subsequent indexing of said belt, to break a crimped terminal away from said belt.

4. A method for crimping terminal devices onto wire, said terminal devices being secured to a belt in side-by-side relationship with their axes extending laterally of the belt, said method comprising the steps of:



moving a pair of cooperating crimping dies relatively towards and away from each other to crimp a terminal device located therebetween onto one end of a wire;

guiding said belt along a fixed path extending past said dies and on one side thereof;

indexing said belt toward said dies and between successive crimping operations thereby to locate the next leading terminal on said belt between said dies;

holding said wire at a fixed point thereof which is spaced-apart from said one end; and

moving at least the portion of said wire which is adjacent said one end relative to said fixed point, thereby to break the crimped terminal away from said belt.

4,043,033

MACHINE FOR INSERTING ELECTRICAL CONTACTS INTO ELECTRICAL INTERCONNECTION BOARDS

Herbert G. Yeo, Lincoln, R.I., assignor to Augat Inc., Attleboro, Mass.

Filed Apr. 22, 1976, Ser. No. 679,174
Int. Cl.[2] H05K *3/30*
U.S. Cl. 29—739 **1 Claim**

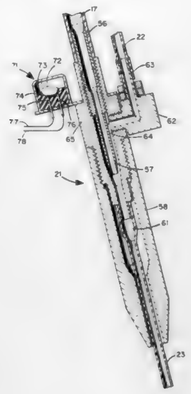
1. Safety means in combination with a machine for inserting elongated electrical contacts into holes in electrical interconnection boards, said machine comprising; means for holding a multiplicity of said contacts, means for feeding said contacts in tandem fashion from said holding means, means extending from said feeding means for arranging a plurality of said contacts in at least one closely adjacent row, escapement means mounted to said arranging means, insertion means having an exhaust nozzle, said insertion means normally operating in a vertical orientation, means for flexibly connecting said insertion means to said escapement means, said escapement means removing said contacts individually from said arranging means and feeding them to said insertion means through said flexible connecting means, and means for controlling the operation of said escapement means to eject said contacts individually from said exhaust nozzle at a predetermined rate, wherein said safety means comprises:

a safety switch mounted to said insertion means and operatively connected to said controlling means to stop operation of said escapement means when said insertion means is tilted at a predetermined angle with respect to the vertical, said switch comprising:

a housing having a top and walls extending therefrom forming a cup shaped enclosure;

a receptacle having a concave configuration within said housing, said concave surface of said receptacle extending outwardly to intersect the interior walls of said housing thereby forming a closed cavity between the interior surfaces of said top and sides of said housing and the concave surface of said receptacle;

a pair of contacts terminating substantially at the concave surface of said receptacle and extending externally of said switch;



wires for connecting said contacts to said controlling means; and

a pool of mercury residing at all times within said cavity and normally in said receptacle, said mercury normally bridging and electrically interconnecting both of said contacts when said insertion tool is in an upright orientation, said mercury moving out of engagement with at least one of said contacts when said insertion tool is tilted to between 30° and 45° with respect to the vertical, thereby opening the circuit to said controlling means and stopping the operation of said escapement means, said mercury returning freely to its operative position bridging said contacts when said insertion tool is returned to normal position within 30° to 45° with respect to the vertical.

4,043,034

METHOD AND APPARATUS FOR CONNECTING CONDUCTORS TO TERMINALS IN CONNECTORS

Matthew Michael Sucheski, Harrisburg, and Earl William Wagner, Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 26, 1976, Ser. No. 679,961
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—749 **14 Claims**

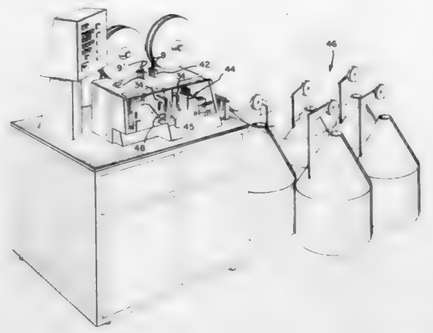
1. Apparatus for manufacturing a multi-circuit electrical connecting means of the type comprising at least one multi-contact electrical connector having a plurality of contact terminals therein and wires connected to, and extending from, said terminals, said terminals having wire-receiving portions which are arranged in side-by-side parallel relationship in a row, said wires being received in said wire-receiving portions, said apparatus comprising:

a wire insertion zone,

a wire feed means for feeding a plurality of wires from endless sources along a predetermined wire feed path which extends through, and beyond, said zone, said wire feed means comprising feed roll means and separate pressure roll means for each of said wires, feed roll means, feed roll motor means for rotating said feed roll means, said pressure roll means being in side-by-side spaced apart relationship and being normally spaced from said feed roll means, said pressure roll means and said feed roll means being on parallel spaced apart axes,

connector holding and locating means for locating a connector on one side of said wire feed path with said wire receiving portions of said terminals in alignment with wires which have been fed along said wire feed path,

wire inserter means in said insertion zone on the side of said wire feed path which is opposite to the side of said connector holding and locating means, said wire inserter means being normally spaced from said path and having means thereon for moving wires laterally of their axes and into said wire-receiving portions of terminals in a connector in said holding and locating means,



wire feed control means comprising means for moving said pressure rolls relatively towards said feed roll means selectively and in unison, for starting and stopping said feed roll means, and for operating said feed roll means for a preselected time interval, and

inserter actuating means for moving said inserter and a connector in said connector holding and locating means towards said path

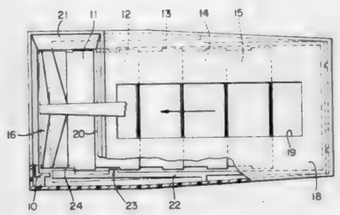
whereby, a predetermined length of each of said wires can be fed from said sources through said insertion zone by said wire feed means and said wires can thereafter be inserted, by said wire inserter means, into said wire-receiving portions of terminals in a connector in said holding and locating means.

4,043,035

SHAVING UNIT DISPENSER

Harry Pentney, Reading, England, assignor to The Gillette Company, Boston, Mass.

Filed May 3, 1976, Ser. No. 682,324
Claims priority, application United Kingdom, May 29, 1975, 23499/75
Int. Cl.[2] B26B *21/24*; A45D *27/24*
U.S. Cl. 30—40.2 **6 Claims**



1. A container for storing and dispensing a replaceable shaving unit, comprising means for locating a razor handle in a loading position in which said shaving unit can be transferred from a storage position in the container into a position of operative engagement with the handle, and latch means which

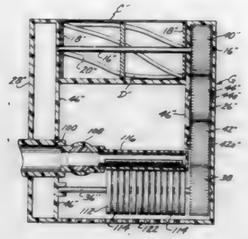
prevents movement of the shaving unit from its storage position, the latch means being operated to release the shaving unit by location of the razor handle in the loading position.

4,043,036

POWER DRIVEN SHAVER

Richard N. Stevens, Sr., Placentia; Clarence R. Possell, San Diego, and Robert J. Winkler, Santa Ana, all of Calif., assignors to Alpha Nova Development Corporation, Santa Ana, Calif.

Filed Jan. 27, 1977, Ser. No. 763,001
Int. Cl.[2] B26B *19/16*
U.S. Cl. 30—43.6 **2 Claims**



1. A power driven shaver of the type that includes a housing that has a first closed end and a second open end, said housing including a pair of side walls and first and second end walls; a semi-cylindrical thin shield mounted on said housing and closing said second end, said shield having a plurality of longitudinally spaced, circumferentially extending slots therein; a prime mover mounted in said housing adjacent said first end; said prime mover being a plurality of turbine discs that rotate in said housing on a common longitudinal axis, said discs having a plurality of circumferentially spaced longitudinally aligned openings therein; a driving gear in said housing that is rotated by said prime mover; said power driven shaver being characterized by including:

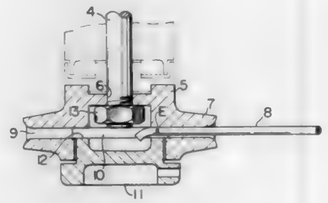
a. a cutting reel assembly that comprises:
   1. a first shaft that has first and second end portions;
   2. a plurality of circular plates rigidly secured to said first shaft and occupying longitudinally spaced positions between said first and second end portions;
   3. a plurality of elongate resilient cutting blades of helical shape that are removably supported in longitudinally extending, circumferentially spaced relationship on said plates in a plurality of slots formed in said plate; and
   4. a driven gear mounted on said first end portion of said first shaft,
b. first means in said housing adjacent said first and second walls for rotatably supporting said first and second end portions of said shaft, with said cutting blades when said reel is rotated sequentially moving circumferentially relative to said shield and adjacently disposed to the interior surface thereof;
c. idling gear means in said housing disposed between said driving gear and driven gear and in toothed engagement therewith;
d. second means for rotatably supporting said idling gear means in said housing;
e. third means manually adjustable from the exterior of said housing for controlling the speed of said prime mover and reel driven thereby, with said shaver when said shield is moved across the face of a user shaving said user due to whiskers of said user sequentially moving through said slots and being severed by slicing rotatable contact with said blades as said reel rotates;
f. a header disposed in said housing adjacent said turbine discs, said header having a plurality of apertures therein through which jets of water discharge into spaces between said discs, said jets of water losing velocity due to the frictional drag on said discs as the latter are rotated, with the pressure on said water increasing to force said water inwardly to flow through said openings, and said water after discharging from said openings flowing through openings in said housing;
g. a flexible hose connected to said header; and,
h. connection means for connecting said hose to a source of pressurized water.

4,043,037

CORD-TYPE MOWING TOOL

Tatsuo Okamoto, Yokosuka; Masat Nogawa, Yokohama, and Nobuyoshi Okabe, Musashino, all of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Oct. 14, 1976, Ser. No. 732,588
Claims priority, application Japan, Oct. 15, 1975, 50-139406[U]
Int. Cl.[2] A01D *55/18*; B27B *27/00*
U.S. Cl. 30—276 **1 Claim**



1. A cord-type mowing tool comprising:

a cutter body formed in the center of its top wall with an upper opening for connecting the mowing tool to a mowing machine, said cutter body being further formed with a flange for forming therein at least one cord inserting bore extending radially of the cutter body and with an internally threaded central bottom opening disposed below said upper opening to provide an inwardly extending annular ledge on an inner wall surface of the cutter body;

a clamping member having an externally threaded portion and an upper end portion; and

at least one cord inserted in said at least one cord inserting bore in a manner such that an end portion thereof is forced by the upper end portion of the clamping member tightly against the inwardly extending annular ledge of the cutter body when the clamping member is threadably fitted in the threaded central bottom opening, whereby the cord can be held in place in the cutter body to serve as a blade.

4,043,038

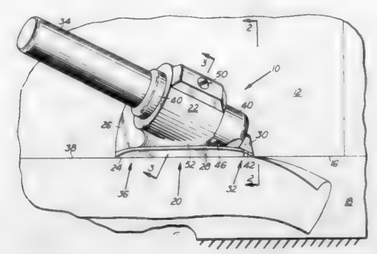
SYMMETRICAL WALLPAPER TRIMMER

Leroy K. Selfridge, Vista, Calif., assignor to Eugene W. Selfridge, Portland, Oreg.

Continuation-in-part of Ser. No. 704,500, July 12, 1976. This application Jan. 3, 1977, Ser. No. 756,287
Int. Cl.[2] B26B *29/00*
U.S. Cl. 30—293 **9 Claims**

1. A wallpaper trimming device for cutting wallpaper at a joint between a wall being papered and an adjacent structural member, said trimming device comprising:

a. a body member for positioning said trimming device against said adjacent structural member and guiding said wallpaper gradually into said joint, said body member having a portion thereof in the shape of a portion of the lateral surface of the cone, an apex end and a base end;
b. a first substantially flat flange attached along one edge thereof to said body member such that the plane of said flange is substantially tangent to said conically-shaped portion of said body member, said flange extending outwardly therefrom for positioning said trimming device against said wall being papered and pressing said wallpaper against said wall;
c. a second substantially flat flange attached along one edge thereof to said body member such that the plane of said flange is substantially tangent to said conically-shaped portion of said body member, said flange extending outwardly therefrom for positioning said trimming device against said wall being papered and pressing said wallpaper against said wall, the respective planes of said first and said second flanges converging upon one another toward



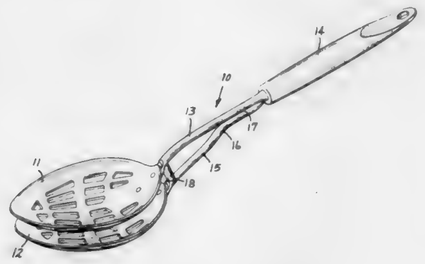
an imaginary line located beyond said edges of attachment of said flanges to said body member in directions opposite the directions of outward extension of said flanges from said body member;
d. a handle attached to said body member for manipulating said trimming device; and
e. a cutting member attached to said body member at said apex end for cutting said wallpaper at said joint, said cutting member being positioned by said body member and one of said flanges selected to position said trimming device against said wall being papered.

4,043,039

STIRRING DEVICE WITH DUAL HEAD

Britton A. Goetze, Jr., 1785 Black Oaks Lane, Wayzata, Minn. 55391

Filed Feb. 2, 1976, Ser. No. 654,607
Int. Cl.[2] A47J *43/28*
U.S. Cl. 30—325 **9 Claims**



1. A stirring utensil, in combination:

first and second spoon bowl elements; said bowl elements being unconnected to each other;

a handle;

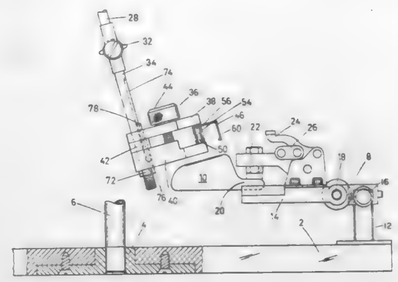
and means fixedly mounting said bowl elements on said handle in mutually spaced relation so that all like points on said bowl elements are everywhere substantially equidistant, and said mutually spaced bowl elements are immovable with respect to each other.

4,043,040

DENTAL DOWEL PIN SETTING APPARATUS

Alfonzo Diez de Aux, 74 James Gray Drive, Willowdale, Ontario, Canada

Filed Apr. 14, 1975, Ser. No. 568,112
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—11 **5 Claims**



1. Dental apparatus for setting the shank end of dowel pins in tooth dies made in an impression comprising:

a base;

securing means mounted on said base adapted to clamp said impression upward facing in a selected position;

a column spaced from said securing means and upstanding from said base;

a support arm mounted to extend from said column and directionally adjustable relative to said column;

a holder mounted on said support arm, and adjustable as to spacial orientation thereby, said holder having an upper plate, a lower plate, a rod extending between said plates substantially normal thereto, and means for tightening said plates towards each other;

a plurality of prongs mounted on said holder each prong having a first portion extending outwardly and a second portion extending downwardly from said first portion substantially normal thereto, said first portion of said prong having an elongated slot receiving said rod therethrough;

said upper plate and lower plate of said holder being positioned apart to form an adjustable space therebetween and being adapted to clamp said prongs therebetween upon operation of said tightening means;

means adapted to suspend a dowel pin downwardly extending from said second portion of said prong.

4,043,041

DENTAL TREATMENT CONTROL UNIT

John Robert Hornick, 24961 Whisler Drive, El Toro, Calif. 92630

Filed May 6, 1976, Ser. No. 683,936
Int. Cl.[2] A61C *19/02*
U.S. Cl. 32—22 **11 Claims**

1. A dental treatment control unit for controlling the flow of air and water to dental treatment instruments, comprising,

flexible lines for supplying air and/or water to said instruments,

means for regulating the flow of air and/or water in said lines to selected ones of said instruments, and

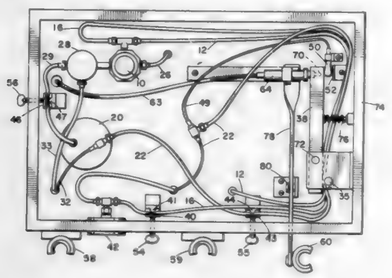
foot-controlled means for controlling said regulating means characterized by

said regulating means comprising

means that are normally biased for squeezing said flexible lines to prevent the flow of air and/or water therethrough, and means for unsqueezing those of said lines that are connected to a selected dental treatment instrument; and

said foot-controlled means comprising

a closed hydraulic system including a hydraulic actuator



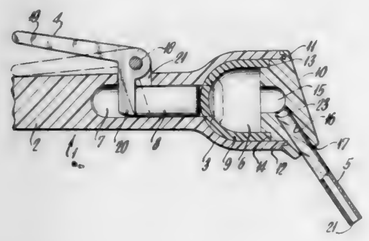
that controls said unsqueezing means in response to opertion of a foot pedal.

4,043,042

APPLICATOR FOR TOOTH SEALANT

Alan J. Perfect, Allentown, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Oct. 7, 1975, Ser. No. 620,435
Int. Cl.[2] A61C *17/00*
U.S. Cl. 32—40 R **7 Claims**



1. An applicator for dispensing a small amount of a polymerizable fluid on tooth surfaces comprising:

an elongated member,

a first bore formed in the forward end of said elongated member,

a first chamber formed in the forward end of said elongated member and in direct communication with said first bore,

a resilient diaphragm positioned in said first chamber,

movable means in said first bore positioned with respect to said resilient diaphragm as to maintain positive pressure thereon,

a closure for said first chamber,

a second chamber in said closure said second chamber being in communication with said first chamber,

a second bore in said closure said second bore extending from said second chamber and through said closure at an angle to the longitudinal axis of said elongated member and adapted to have a disposable tube inserted therein, and

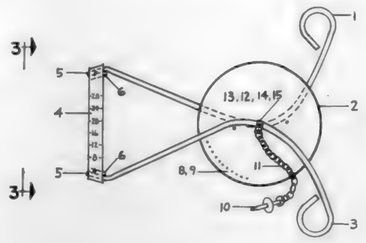
operating means for moving said movable means towards said resilient diaphragm to increase the pressure thereon and expel air from said first chamber, the relative size of said first chamber and the distance of movement of said movable means is such that the change in volume of the first chamber on movement of the movable means away from said resilient diaphragm is such that only a few drops of liquid are drawn into the tube and no liquid is allowed to enter the chambers.

4,043,043

DEVICE FOR MEASURING THE AMOUNT OF PRODUCT IN BOTTLES, JARS AND CONTAINERS

Aylmer Raymond Pace, 2418 Otis Drive, Alameda, Calif. 94501

Filed Nov. 3, 1975, Ser. No. 628,610
Int. Cl.[2] G01F *19/00*; G01B *3/10*
U.S. Cl. 33—137 L **3 Claims**



1. A combination comprising:

a. a pair of elongated members having one end of each member bent to form a handle portion, the opposite end of each member forming a leg, said members being pivotally attached to one another at a point intermediate the ends of each member, and each member being bent such that as the handle portions's are closed toward each other the leg portions are moved apart;

b. an elastic stretchable elongated member connected at its ends to the ends of said legs, said elastic member having a scale thereon so that as the legs are moved apart the scale on said elastic member is stretched;

c. locking means having predetermined locking positions to lock the elongated members in predetermined locked positions, each of said predetermined locked positions providing a predetermined separation distance for the ends of said legs; and

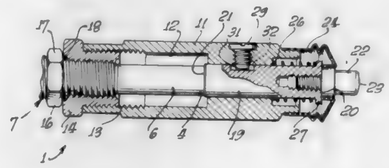
d. second adjustment means which provide an additional predetermined adjustment of the separation distance so that upon locking of said legs in one of said locked positions by said locking means, said second adjustment means can add the distance of said predetermined adjustment to the separation distance of the ends of said legs, said locking means having reference characters adjacent each of said locking positions.

4,043,044

SURFACE-FOLLOWING CARTRIDGE FOR USE WITH LINEAR MEASUREMENT TRANSDUCER SYSTEMS

Jan Valgene Whitehead, Montclair; Frederick J. Reininger, Ontario, and Arthur Lawrence, Upland, all of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 24, 1975, Ser. No. 634,576
Int. Cl.[2] G01B *3/22, 5/00*
U.S. Cl. 33—172 E **7 Claims**



1. Surface-contacting electronic micrometer gage apparatus for linearly measuring surface contours, comprising:

a transducing measuring system including an elongate transducer member having an active element providing an electrical output proportional to variations in the displacement of the element from the surface of a conductive material

an elongate tubular casing having one of its end portions detachably receiving (adapted to retainably receive) said active element,

means for adjusting the received length of said transducer member (portion),

a plunger reciprocably mounted in the other end portion of said casing, said plunger having an inner end portion formed of a conductive material and an outer end portion adapted to contact and follow a surface to be measured,

resilient means reciprocably urging said plunger outwardly of said casing, and

abutment means carried by the casing for physically limiting the extent of the resiliently-urged (limiting the) outward travel of said plunger,

whereby said transducer member can be adjustably disposed in said casing with its active element fixed a spaced distance from said conductive material at the inner end of the plunger for physically limiting its inward reciprocal movement, said outer end of the plunger projecting outwardly of said casing at said inward limit for resiliently following contacted surface contours,

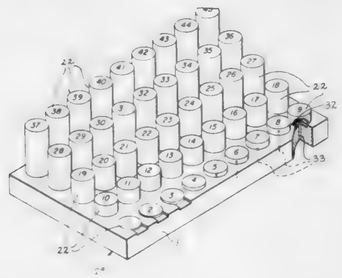
said spacing of said (transducer) active element being fixed in accordance with the displacement range of the transducer member and said electrical output of said (transducer) active element varying responsively to the variations in said spacing produced by said surface following plunger.

4,043,045

SINE BAR GAGE SET AND ASSEMBLY WITH DIRECT-READING ANGLE INDICIA

Joseph M. Rodriguez, San Jose, Calif., assignor to Select Metal Products Inc., Santa Clara, Calif.

Filed Mar. 29, 1976, Ser. No. 671,566
Int. Cl.[2] G01B *3/32*
U.S. Cl. 33—174 S **3 Claims**



2. A carrying tray for holding each of a predetermined number of gage bar elements forming a set thereof, said tray including a base of predetermined thickness, openings formed into said base to snugly receive each of the gage elements of the set, and vent openings coupling the bottoms of said first named openings to the surrounds when the elements are disposed within said first named openings to prevent the gage elements from being retained by vacuum within the first named openings.

4,043,046

EDGE FINDER PROBE

Charles F. Thomas, 1016 Bahama Drive, Orlando, Fla. 32806

Filed Mar. 25, 1976, Ser. No. 670,147
Int. Cl.[2] G01B *5/25*; B27G *23/00*
U.S. Cl. 33—185 R **9 Claims**

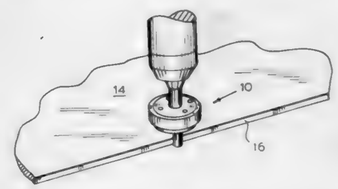
1. An edge indexing device for locating an edge surface of an article positioned adjacent thereto, said edge indexing device comprising:

a housing having a cylindrical bore therein, said bore being defined by a bore axis centered therein and a bore radius;

a cylindrical shaft having a circumferential surface for communicating within and protruding from said bore of said housing, with said cylindrical shaft being defined by a shaft axis centered therein and a shaft diameter equal to said bore radius, with a protruding section of said circumferential surface of said cylindrical shaft communicating with said edge surface of said article positioned adjacent thereto; and

parallel means for movably coupling said cylindrical shaft within said bore with said shaft axis parallel to said bore axis for permitting lateral movement of said cylindrical shaft within said bore, whereby said circumferential surface of said cylindrical shaft locates said edge surface about a line defined by an extension of said bore axis.

3. An edge indexing device for locating an edge surface of an article positioned adjacent thereto, said edge indexing device comprising:



a housing having a first cylindrical cavity therein defined by a first cavity axis coaxially therethrough and a first cavity radius;

locating means having a first cylinder defining a first circumferential surface for circumferentially communicating within said first cylindrical cavity of said housing, said locating means having a second cylinder defining a second circumferential surface for circumferentially communicating with said edge surface of said article positioned adjacent thereto, said first circumferential surface having a first radius and said second circumferential surface having a second radius, with said first and second cylinders being coaxially coupled about a common longitudinal axis therethrough, and with the sum of said first radius and said second radius being equal to said first cavity radius; and

parallel means for movably coupling said first cylinder within said first cylindrical cavity with said common longitudinal axis being parallel to said first cavity axis for permitting lateral movement of said locating means with respect to said first cavity axis, whereby said locating means moves to locate said edge surface of said article positioned adjacent thereto along an extension of said first cavity axis of said housing.

4,043,047

PROCESS AND APPARATUS FOR THE TREATMENT OF WATER-CONTAINING SUBSTANCES AND APPLICATION OF THIS METHOD FOR THE PREPARATION OF PASTEURIZED DRIED SLUDGE

Joseph Galliker, Wettingen, Switzerland, assignor to Patelhold Patentverwertungs- & Elektro-Holding AG., Glarus, Switzerland

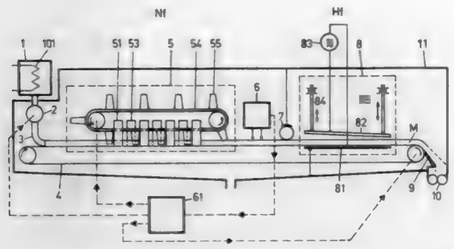
Filed Feb. 6, 1976, Ser. No. 656,008
Claims priority, application Switzerland, Mar. 3, 1975, 3417/75
Int. Cl.[2] F26B *3/34*
U.S. Cl. 34—1 **14 Claims**

1. Process for the treatment of a water-containing substance which comprises

conveying the substance to a first treatment station;

extracting a portion of the water from the substance within said first station by electrolytically heating the substance in such manner that the substance is guided through elongated electrodes which are energized by alternating current for heating purposes;

conveying the so pre-desiccated material to a second treatment station;



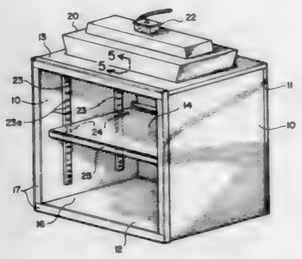
dielectrically heating the substance through all but a few percent of the original water content of the water-containing substance the dielectric heating being effected by passing the substances between plates of a condenser energized by a high-frequency source.

4,043,048

LABORATORY DRYING OVEN AND METHOD

Vallon C. Veater, 264 E. First North, Salina, Utah 84654

Filed Jan. 28, 1976, Ser. No. 653,231
Int. Cl.² F26B *3/30, 19/00*
U.S. Cl. 34—4 **10 Claims**



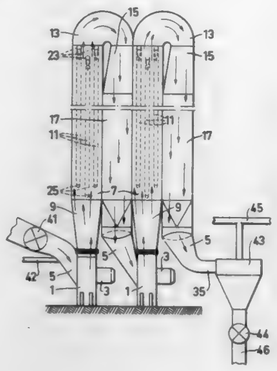
7. A method of drying a mass of discrete matter constituting a test sample, comprising placing said mass on material-supporting means of the nature of a shelf below one or more infrared heat lamps in a drying oven having side, back, bottom, and top walls defining a heating chamber with its front entirely and permanently open over the area extending between said side, bottom, and top walls and with ventilation openings disposed in said back wall at spaced intervals and comprehending a substantial portion of the area of said back wall rearwardly of the open front; energizing said heat lamps so a draft of air will sweep through said chamber from and substantially throughout the area of the open front thereof across the test sample and out of the chamber through said ventilation openings rearwardly of said open front; and removing the test sample from the drying oven through said open front following the drying thereof.

4,043,049

PROCESS AND APPARATUS FOR FLASH DRYING FLUFFED CELLULOSE PULP

Bengt Olof-Arvid Hedstrom, 4, Hultgrensgatan, S-412 59 Goteborg, Sweden

Continuation-in-part of Ser. No. 559,278, March 17, 1975, abandoned. This application Sept. 18, 1975, Ser. No. 614,568
Claims priority, application Sweden, Mar. 22, 1974, 7403903
Int. Cl.² F26B *3/08, 3/10, 17/00*
U.S. Cl. 34—10 **15 Claims**



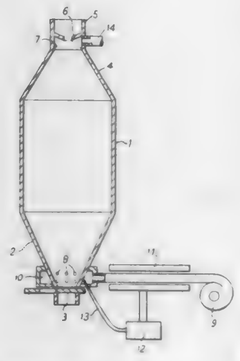
1. In the process for the flash drying of particulate cellulose pulp, comprising the steps (1) entraining the pulp particles in a gas, (2) establishing and maintaining a flow of the gas-particulate cellulose pulp mixture along a confined path, (3) transferring heat into the gas-particulate cellulose pulp mixture in a heat-transfer zone along the path, and (4) repeating step (3) in a successive series of heat-transfer zones, the improvement which comprises employing as the carrier gas steam under a pressure of at least 0.12 to 0.15 MPa; supplying heat to the heat-transfer zone as heating steam whose saturation pressure exceeds the pressure of the carrier steam; and then separating the fluffed cellulose pulp and carrier steam.

4,043,050

DRYING PLASTICS

Frank John Thompson Hancock, Wilmslow, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 484,936, July 1, 1974, Pat. No. 3,986,269. This application Aug. 16, 1976, Ser. No. 714,808
Claims priority, application United Kingdom, July 4, 1973, 31768/73
Int. Cl.² F26B *19/00, 3/34*
U.S. Cl. 34—48 **8 Claims**



1. Apparatus comprising

a. a hopper having (i) a vertical cylindrical portion, and connected therebeneath, (ii) a conical base portion provided with (iii) an outlet orifice, said conical base portion being provided with a plurality of perforations adjacent the outlet orifice,

b. means to supply air to said perforations,

c. electric heaters arranged to heat the air supplied to said perforations,

d. a proportional temperature controller having an integral term and a derivative term,

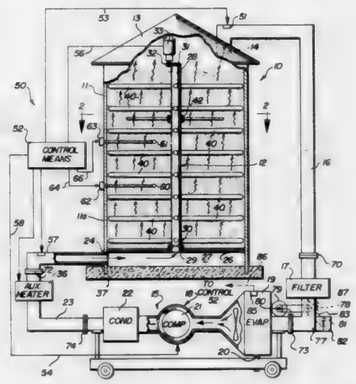
e. a thermocouple positioned to respond to the temperature of the air after passage past the heaters and connected to actuate the controller which is arranged to control the electrical heaters.

4,043,051

METHOD AND APPARATUS FOR DRYING GRAIN

Delbert Lussenden, 2307 Gideon Ave., Zion, Ill. 60099

Filed Feb. 24, 1975, Ser. No. 552,360
Int. Cl.² F26B *21/08*
U.S. Cl. 34—77 **13 Claims**



1. Apparatus for drying and aerating grain comprising: a grain storage bin having top and bottom walls and side wall means, a refrigeration system including an evaporator, compressor and condensor, a first conduit means positioned about said refrigeration system for providing an air flow path from an inlet adjacent said evaporator, over said compressor and through an outlet adjacent said condensor, second conduit means between said top wall of said grain storage bin and said inlet of said first conduit means for providing an air flow path for moisture-laden air removed from said grain storage bin to be directed through said evaporator where moisture is condensed and removed to dry the air, and third conduit means between said outlet of said first conduit means and said bottom wall of said grain storage bin for directing dry air, which has been heated while passing through said first conduit means, into said grain storage bin for drying and aerating the grain stored therein, and said second conduit means including air flow control means for venting said moisture-laden air into the atmosphere prior to entering said inlet and for drawing outside air into said evaporator.

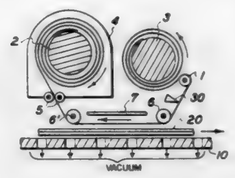
4,043,052

METHOD AND APPARATUS FOR FIXING TONER IMAGES

Satoru Honjo, and Osamu Fukushima, both of Tokyo, Japan, assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 344,383, March 5, 1973, Pat. No. 3,942,266. This application Nov. 20, 1975, Ser. No. 633,897
Int. Cl.² F26B *11/02*
U.S. Cl. 34—122 **4 Claims**

1. Apparatus for the solvent vapor fixing of toner images, comprising a web formed of absorbent material, means for traversing said web over a predetermined path, a first roll for storing a supply of said web material, a second roll for receiving said web material after traversing said path, means for wetting said web with solvent during said traversing, means for locating a toner image in closely spaced juxtaposition to said web over a portion of said predetermined path, means for guiding said web material over said portion of said predetermined path, means for wetting said web with said solvent in its



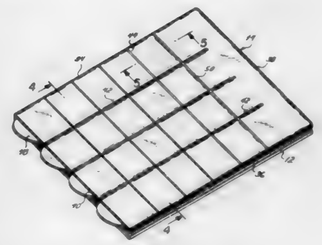
traverse from said first roll to said guiding means, said web being wet with a volatile solvent for said toner during its traverse over said portion of said path, and a housing containing said web material when wet with solvent, said second roll being located within said housing, and said first roll and guiding means being outside said housing, whereby a toner image is fixed by solvent vapors emanating from said web material during the passage of the toner image past said portion of said web material path.

4,043,053

EDUCATIONAL GAME

Steven Kaye, 66 Empress Pines Drive, Ronkonkoma, N.Y. 11779

Filed Oct. 16, 1975, Ser. No. 622,839
Int. Cl.² G09B *5/02*
U.S. Cl. 35—8 R **1 Claim**



1. An educational game comprising:

a transparent sleeve formed of front and rear sheets of transparent plastic secured to each other along two spacedly opposed side edges thereof and along at least one visible line intermediate with and substantially parallel to said joined side edges, said at least one intermediate line, in combination with said side edges, defining at least two separate column-forming compartments in said sleeve;

a transparency being adjustable beneath and being juxtaposed with said sleeve and having a plurality of legends arranged thereon in columns, each said column being adjustable by the adjustment of said transparency for substantial alignment with a respective one of said sleeve column-forming compartments;

an opaque slide removably contained in each said columnar compartment and movable therewithin, each said column of legends on said transparency being adjustable for registry with one said slide such that movement of said slide withdrawing the same from within said sleeve columnar-compartment exposes the legend on said transparency adjusted for registry with said corresponding column;

said sleeve having two spacedly opposed end edges, one of

which is open for receiving said slides, and an additional visible line sealing said front and rear sheets to each other, said additional line being substantially perpendicular to and extending between said side edges and spaced inwardly of said other end edge to thereby define stop means for the inward insertion of said slides and further defining a heading margin for each said column of legends of said transparency, there being a heading on said transparency corresponding to the subject matter for each said column of legends with said heading being in registry with a heading margin on said sleeve when said transparency is in juxtaposition with and beneath said sleeve;

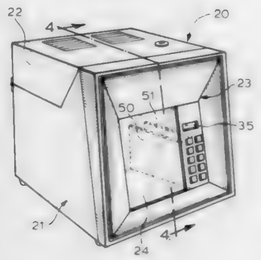
said sleeve being provided with a least one further visible line on at least one surface thereof substantially perpendicular to and extending between said side edges and being disposed between said additional line and said open end edge, said at least one further line cooperating with said at least one intermediate line and said additional line to define a grid so sized with respect to the legends on said transparency that said transparency can be adjusted to expose individual legends through individual squares of said grid;

and means for projecting one of said legends in any one of said columns onto a viewing surface when said slide that is in registry with the projected legend is at least partially withdrawn from its respective compartment;

said transparency being unconnected with and free of guidance by the sleeve, yet adjustable beneath the sleeve with the transparency being movable relative to the sleeve so as to position the legends on said sleeve in substantial alignment with respective columns of said sleeve in which the slide moves to expose the legends of said transparency for viewing and for light transmission by said projecting means;

whereby said transparent sleeve is reusable with another changed transparency having a plurality of different legends arranged thereon in columns by adjusting said other transparency in juxtaposition with and beneath said sleeve.

4,043,054
TEACHING MACHINE
Norman A. Crowder, Fort Worth, Tex., assignor to Sargent-Welch Scientific Company, Skokie, Ill.
Filed Feb. 13, 1974, Ser. No. 442,087
Int. Cl.[2] G09B *7/08*
U.S. Cl. 35—9 A **3 Claims**



1. In a teaching machine of the type which displays selected frames from a multiple frame film strip wherein instructional material is contained on first portions of said frames and code indicia, including an excursion instruction for proceeding to a subsequent frame to be displayed, is contained on second portions of said frames, a film transport comprising:

means including a projection gate for displaying the first portion of individual ones of said frames when aligned in said projection gate;

a supply reel for storing said film strip in a rewound position;

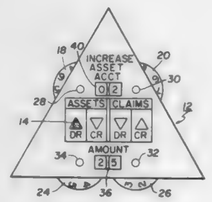
a take-up reel for receiving said film strip;

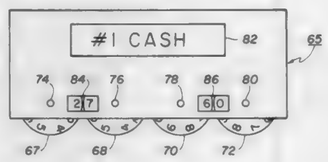
film drive means for advancing said film strip from said supply reel, through said projection gate, and onto said take-up reel;

a permanent leader comprising in length a plurality of frames and extending in a home position from a point of engagement with said film strip through said projection gate to said take-up reel, the frame of said leader then in said projection gate being a predetermined number of frames from the first viewing frame of said film strip and having a related initial excursion instruction on said leader; and

automatic loading means responsive to said initial excursion instruction for causing said film drive means to advance said leader said predetermined number of frames from said home position to position said first viewing frame of said film strip in said projection gate.

4,043,055
TEACHING AID FOR ACCOUNTING
Snyder M. Zegel, 108 Monell Ave., Islip, N.Y. 11751
Filed Oct. 20, 1975, Ser. No. 624,005
Int. Cl.[2] G09B *19/18*
U.S. Cl. 35—24 R **3 Claims**





1. A teaching device useful as an aid in teaching the rudimentary principles of accounting comprising:

a. a plurality of account ledger recording devices;

b. means for labeling each account ledger recording device;

c. a triangular journal device bearing accounting indicia thereon;

d. a plurality of disks bearing numerals thereon and rotatably attached to said journal device; and

e. window means on said journal device for displaying therethrough the numerals on said disks representing the amount to be posted to a particular account ledger recording device.

4,043,056
MAKE A FACE GAME
Jerry D. Savage, 95 Fountain Lane, Apt. No. 3, S. Weymouth, Mass. 02190
Filed Nov. 2, 1976, Ser. No. 738,378
Int. Cl.[2] G09B *1/28*
U.S. Cl. 35—28 **2 Claims**

1. A game for forming a variety of designs such as faces, scenes, etc., said game comprising:

a. a frame having oppositely disposed outer ends with a vertically extending channel therebetween with an upper edge and lower edge and an opening extending transversely therethrough for viewing a design therein.

b. a stand connected to said frame at the lower end thereof for vertically supporting same,

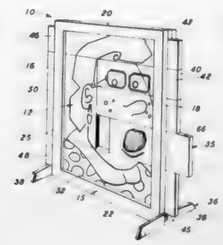
c. said stand includes a leg at each end of said frame extending transversely thereto,

d. a set of inserts having a rectangular configuration which when assembled in proper orientation to each other forms a single design thereon on each of the opposite sides thereof, said inserts being of a width to slide horizontally within said channel and between said upper and lower edges thereof and extending beyond said outer ends of said frame when assembled,

e. said set of inserts includes:

1. an upper insert and lower insert extending the width of said frame and beyond said outer ends,

2. a middle insert extending between said upper and lower inserts, and

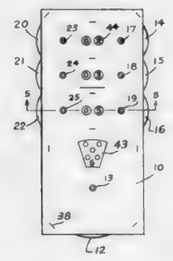


3. a plurality of intermediate inserts extending between said upper and lower inserts in abutting relationship to said middle insert,

f. means for coupling said assembled inserts in fixed position to each other when properly positioned in said frame, and

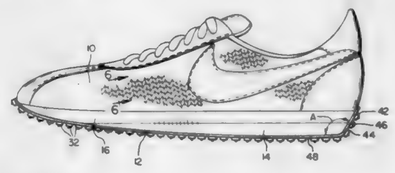
g. said coupling means includes a vertically extending pin having a shaft and head at one end thereof, said pin adapted to be received adjacent each end of said inserts in aligned apertures for assembling same in fixed relationship to each other, the top insert having an aperture with a counterbore for receiving said head of said pin therein, and a plurality of apertures in said other inserts for receiving said shaft therein.

4,043,057
TEACHING AID
Gerald W. Guswiler, Box 282, Penney Farms, Fla. 32079
Filed July 23, 1976, Ser. No. 708,273
Int. Cl.[2] G09B *1/22*
U.S. Cl. 35—74 **1 Claim**



1. An arithmetic teaching aid comprising a front and a back sheet of sheet material, said sheets being of the same size and of the same rectangular shape and in superposed alignment, a respective spacing lug disposed between said sheets at each of the four corners thereof, a first disc of sheet material having a diameter equal to substantially the width dimension of said sheets and disposed therebetween and centered with respect to the side edges of said sheets and having an edge portion projecting from one end edge of said sheets for manual rotation thereof, two series of smaller sheet material discs, each series comprising three such smaller discs and said smaller discs having equal diameters equal to substantially one half of said width dimension, said smaller discs of each said series being disposed between said sheets and along a respective said side edge of said sheets and with an edge portion of each said smaller disc exposed for manual rotation thereof at the respective said side edge, respective mounting means passing through the center of each said disc and rotatively mounting each respective disc to said sheets, the centers of the three discs of each said series being spaced equally inwardly of the respective said side edge of said sheets and being spaced apart each to the next disc of the series by a distance less than the diameter and greater than the radius of such discs and the center one of the three discs of each said series being disposed in a plane closer to one of said sheets than the other two discs of the respective series whereby said one disc of each said series laps with said other two discs, each said disc of each said series being aligned opposite to a corresponding said disc of the other said series, the centers of said corresponding discs being located apart by slightly more than the diametrical dimension of said smaller discs to provide a small clearance distance between their perimetrical edges midway between said side edges of said sheets, said front sheet being provided with a column of window openings which, when said sheets are in upright position with the end edge opposite said one end edge at the top, is upright, extends downwardly from adjacent said top edge and is centered between said side edges and which said column comprises three pairs of window openings, the openings of each said pair being closely adjacent each other and aligned side-by-side between said centers of respective said corresponding discs, each of said smaller discs having numerals from 0 to 9 thereon arranged in a ring adjacent its periphery and said numerals of each disc being located alignably with a respective said window opening to be visible individually seriatim through the respective window opening with rotation of the disc, whereby, when viewing said front face in such upright position, one pair of side-by-side digital numerals appear in an upper pair of said window openings aligned above another pair of such numerals in an intermediate pair of said window openings and a third pair of such side-by-side ditigal numerals appear alignedly below said other pair of such numerals through the third said pair of window openings, said first disc being provided with a plurality of arithmetic indicia disposed in a ring adjacent its periphery, said front sheet being provided with a further window opening aligned with said last ring for exposing said indicia individually seriatim with rotation of said first disc, said first disc and said further window opening being disposed below said third pair of window openings when said sheets are so oriented in said upright position.

4,043,058
ATHLETIC TRAINING SHOE HAVING FOAM CORE AND APERTURED SOLE LAYERS
Geoffrey L. Hollister, and Dennis E. Vixie, both of Eugene, Oreg., assignors to BRS, Inc., Beaverton, Oreg.
Filed May 21, 1976, Ser. No. 688,843
Int. Cl.[2] A43B *1/10, 13/18;* **A43C** *15/00*
U.S. Cl. 36—102 **26 Claims**



1. An athletic shoe comprising:

a shoe upper;

an outer sole including a ground engaging bottom surface under the heel, toe and arch portions of said shoe;

an intermediate sole layer provided between said outer sole

and said upper, said intermediate sole layer including an outer border portion of resilient material surrounding an inner core portion of softer and less dense resilient synthetic foam material than said border portion provided within an opening through said intermediate layer and extending along the length of the shoe so that said foam core is positioned beneath the heel, arch and toe portions of said shoe;

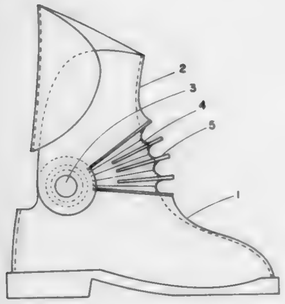
an apertured heel lift sole layer of resilient material provided between said outer sole and said upper and positioned beneath the heel portion, said heel lift layer including a plurality of apertures extending completely through the heel lift layer, said apertures being of a width greater than the maximum thickness of said heel lift layer, and having at least some of said apertures in alignment with said inner core in said intermediate sole layer.

4,043,059

SKI BOOT-IMPROVED MEANS TO CHANGE FLEXIBILITY

Richard Kenneth Rathmell, 12 Pinetree Road, Ramsey, N.J. 07446

Filed May 3, 1976, Ser. No. 682,291
Int. Cl.[2] A43B *5/04*
U.S. Cl. 36—121 **8 Claims**



1. A ski boot which by itself is relatively flexible in the forward-backward direction, but can be stiffened by the addition of a removable stiffening member, said boot having elements that include:

a. a foot-covering section,

b. a leg-holding section,

c. hinges or flexible elements on each side of the boot connecting the leg-holding section to the foot-covering section,

d. a flexible corrugated section across the front of the boot between the leg-holding section and the foot-covering section, wherein the lines of the corrugations extend across the front of the boot in planes that intersect approximately along the axis of the hinges or flexible elements,

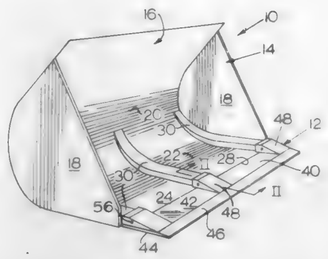
and the boot can be identifed by the presence of relatively rigid fins projecting from the external crease lines of the corrugations in the flexible section, said fins being in planes that intersect approximately along the said axis, wherein the fins themselves do not interfere with the flexibility of the flexible corrugated section when the leg-holding section is strained forward relative to the foot-covering section, but the fins are useful in association with a removable stiffening member that may be positioned between the fins to stiffen the boot.

4,043,060

COMBINATION STRENGTHENED LOADER BUCKET AND REPLACEABLE CUTTING EDGE

Visvaldis A. Stepe, Willow Springs, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 718,734
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 R **5 Claims**



1. A combination strengthened loader bucket and replaceable cutting edge comprising:

a bucket shell including a floor having an upper surface, a lower surface, and a leading edge;

at least two strengthening members weldably secured to said upper surface of the floor in longitudinally extending and laterally spaced apart relation and individually having a nose portion thereon, said nose portions extending forwardly of said leading edge and being elevationally disposed fully above said upper surface of the floor; and

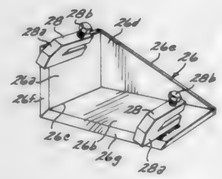
a replaceable cutting edge having a blade with an upper surface and a lower surface and including at least two housing elements weldably secured to said upper surface of the blade and providing therewith at least two sockets individually adapted to receive said nose portions of said strengthening members interlockingly therein and so constructed and arranged that said upper and lower surfaces of the blade are generally coplanar respectively with said upper and lower surfaces of the floor.

4,043,061

GROUND-SHAPING SYSTEMS FOR A BACKHOE BUCKET

LeRoy Marvin Heitman, 28900 Ironwood, Sunnymead, Calif. 92388

Filed Apr. 21, 1976, Ser. No. 678,870
Int. Cl.[2] E02F *5/02*
U.S. Cl. 37—141 R **7 Claims**



1. A detachable ground-shaping system for use with a backhoe bucket, comprising in combination,

a main body formed with at least two ground-cutting members and a back plate engaging each of said ground-cutting members along the length thereof,

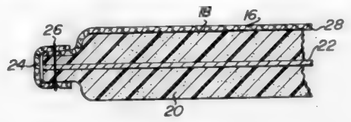
and a pair of clamps fixed to said main body to be firmly secured to said bucket to retain said back plate there against throughout its length.

4,043,062

IRONING PAD

David Lehrman, Cheltenham, Pa., assignor to The Ironees Company, Philadelphia, Pa.

Filed May 26, 1976, Ser. No. 690,228
Int. Cl.[2] D06F *81/14*
U.S. Cl. 38—140 **10 Claims**



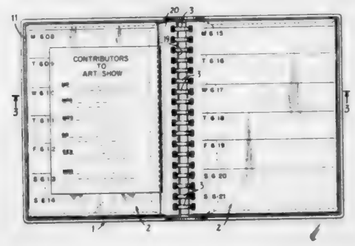
10. An ironing pad adapted to be placed on a support surface for ironing, comprising an upper surface of a layer of heat resistant fabric, a first layer of foam polymeric material underlying said fabric and being adhesively bonded thereto by a thermoplastic adhesive such that during ironing, softening of said adhesive occurs at about 200°–250° F, allowing the pad to be maintained in a wrinkle free condition, a vapor and heat barrier layer of metal foil underlying said first layer of foam polymeric material, a second layer of foam polymeric material underlying said metal foil and providing a skid resistant bottom for said pad for preventing the pad from moving on said support surface during ironing and means joining the peripheral edges of all of said layers of said pad together.

4,043,063

APPOINTMENT CALENDAR BOOK

Emilio Ambasz, New York, N.Y., assignor to Center for Design Research and Development N.V., Curacao, Netherlands Antilles

Filed Mar. 30, 1976, Ser. No. 671,832
Int. Cl.[2] G09D *3/04*
U.S. Cl. 40—119 **2 Claims**



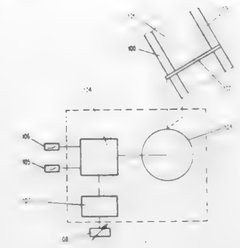
1. In an appointment calendar book having a multiplicity of pages bearing indicia of dates thereon and ring-type binder means having elements passing through the pages for securing the pages to form a book, the improvement comprising as at least one page of the book a page-like structure having a pocket closed along its margins except along an opening that is closely adjacent the edge of the structure through which said elements of the binder means pass ahd having a flap joined intergrally to said edge and folded to overlie a portion of said page-like structure adjacent said edge, the flap being of a width such that it is adapted to be partially received in the pocket through said opening, and the elements of the binding means passing through the flap and a part of the structure which is non-pocketed but not passing through the pocket, and an insertion received in the pocket of the page-like structure.

4,043,064

COPYHOLDER

Gershon Friedman, Seestrasse 34, 8803 Ruschlikon, Switzerland

Filed Sept. 19, 1975, Ser. No. 615,090
Claims priority, application Switzerland, Sept. 26, 1974, 13017/74
Int. Cl.[2] B41J *11/44, 29/00*
U.S. Cl. 40—343 **6 Claims**



2. A copyholder comprising

an indicator extending transversely over a copy surface,

means for effecting movement of said indicator relative to said copy surface, said means including electrical driving means,

a control unit for effecting operation of said electrical driving means,

a first actuating means for initiating actuation of said control unit and stopping means for automatic delivery of a stopping signal to said control unit,

a second actuating means for initiating and stopping actuation of said control unit independent of said first actuating means and stopping means,

means for supplying an actual-value signal analogous to the position of said indicator associated with said indicator,

means for supplying a predetermined rated-value signal, and

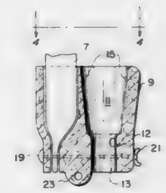
means associated with said stopping means for comparing said actual-value signal supplied by said actual-value signal supplier with the predetermined rated-value signal for issuing a stopping order if said actual-value and said rated-value correspond.

4,043,065

PISTOL CHARGING SOCKET

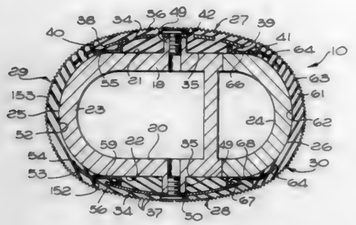
Daniel Dennis Musgrave, 8201 Caraway St., Cabin John, Md. 20731

Filed Oct. 13, 1976, Ser. No. 732,070
Int. Cl.[2] F41C *27/00, 33/02*
U.S. Cl. 42—1 R **6 Claims**



1. A charging device for a pistol charged by relative motion between a frame and a slide, comprising: a holster; external socket means on said holster positionally adapted for enclosing a portion of said slide and for blocking movement of said slide toward the lower extremity of said holster; and passage means in said socket means positionally adapted to accommodate a barrel protruding through the front of said slide during charging.

4,043,066
PISTOL GRIP
Frank A. Pachmayr, Los Angeles, and Jack R. Farrar, Whittier, both of Calif., assignors to Pachmayr Gun Works, Inc., Los Angeles, Calif.
Filed June 7, 1976, Ser. No. 693,424
Int. Cl.[2] F41C *23/00*
U.S. Cl. 42—71 P **19 Claims**



1. A pistol grip comprising:
two side panels to be recieved at opposite sides of a pistol handle and each including a boy of elastomeric material having an outer surface to be gripped by a user; and
a cross strap adapted to extend laterally between said side panels adjacent the handle and including elastomeric material presenting an exposed gripping surface;
said cross strap having a connector portion which extends to a location at the inner side of one of said panels and which has an interlocking projection extending laterally outwardly away from the pistol handle and toward said one panel;
said one panel having a shoulder at its inner side which extends inwardly toward the pistol handle to a position opposite said projection in generally a front to rear direction and in a relation positively blocking separating movement of said connector portion of the cross strap from said one panel.

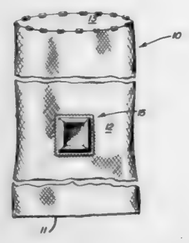
4,043,067
SUPER FROG GIG
George J. Konucik, P.O. Box No. 9482, Richmond, Va. 23228; Thomas B. Robertson, 1206 Arnoka Road, Mechanicsville, Va. 23111, and Robert Davis, Rte. 5, Box 1588, Powhatan, Va. 23139
Filed Mar. 4, 1976, Ser. No. 663,920
Int. Cl.[2] A01K *81/04*
U.S. Cl. 43—6 **2 Claims**

1. A super frog gig, comprising, in combination, an elongated, straight drill rod having one end thereof tapered to a conical point and inserted into an end of a wooden handle, an opposite end of said drill rod incorporating a means for piercing through a frog during a frog hunt; said means comprising said opposite end having a flat face on opposite sides thereof so as to form a relatively flat blade, said flat blade having a tapered point upon an end thereof and a sidewardly extending offset hook, said drill rod being retractable within said end of said handle, said end of said handle having an elongated opening that is equal to a length of said drill rod, a transverse set screw threaded in said handle having a conical point which selectively engages a notch in a side of said drill rod when said drill rod is in an extended position, and said conical point of



said set screw engaging a knurled surface of said drill rod when said drill rod is in a retracted position.

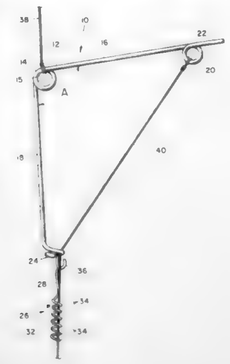
4,043,068
ESCAPE HATCH FOR FISH NET
Forest J. Savoie, Rte. 1, Box 365, Cut Off, La. 70345
Filed Apr. 20, 1976, Ser. No. 678,684
Int. Cl.[2] A01K *73/02*
U.S. Cl. 43—9 **10 Claims**



1. An escape hatch for a fish net, and the like comprising; a single piece main support structure of buoyant material having a center opening extending therethrough, first means for attaching the main support structure to an opening in the upper side of a fish net, the buoyant material keeping the main support structure in an uppermost position in the water as attached to the upper side of a fish net and second means for semi-automatically closing the central opening in the main support structure when the fish net is being trolled to catch marine life therein, including a closure cover attached to the main support structure by mounting means which will permit the desired closure action to take place.

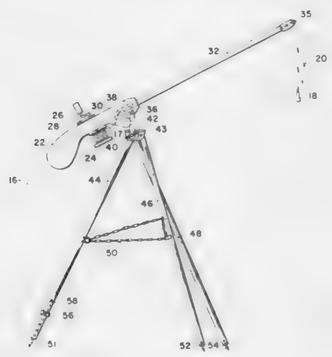
4,043,069
FISH HOOK SETTING DEVICE
Marvin L. Zahner, 421 N. Osage Drive, Skiatook, Okla. 74070
Filed June 25, 1976, Ser. No. 699,715
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—15 **8 Claims**

1. A fish hook setting device comprising an elongated tempered wire formed into two elongated leg members joined by a spring loop, said leg members extending radially outwardly from said spring loop in a relaxed position, an eye formed in the first leg member adjacent the outer end thereof and having a short end piece extending beyond said eye, an elongated trigger member being pivotally attached at one end to the outer end of the second leg member, said trigger member comprising



latch means secured adjacent said pivot attachment and engageable with the short end piece when the leg members are compressed together, the free end portion of the trigger member having a plurality of longitudinally spaced fishing line carrying means therealong.

4,043,070
ICE FISHING ROD
Aimé Lamothe, Cap de la Madeleine, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed Apr. 5, 1976, Ser. No. 673,747
Int. Cl.[2] A01K *97/10*
U.S. Cl. 43—21.2 **7 Claims**



1. An ice fishing rod, comprising:
a handle,
a fishing reel crank attached through the handle,
a fishing reel attached to a distal end of the fishing reel crank,
means of locking the fishing reel in a specific position attached to the crank handle near a proximal end of the crank handle,
a hollow rod attached to the handle,
means of conveying a line attached to the reel through the handle and through the hollow rod and retractably extensible through a distal tip of the hollow rod,
a tripod, and
means of attaching the handle and rod to the tripod.

4,043,071
FISHING ROD ASSEMBLY
Joseph A. Lando, Long Grove, Ill., assignor to Land-O-Tackle, Harwood Heights, Ill.
Filed June 11, 1976, Ser. No. 695,249
Int. Cl.[2] A01K *87/02*
U.S. Cl. 43—23 **4 Claims**

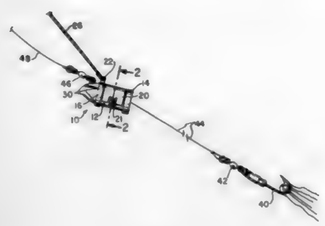


1. A grip, handle and adapter assembly for a fishing rod which includes, in combination,
a handle portion having a well for a reel, a forward end and a rear end, a grip portion fixed to said rear end of the handle portion,
a cylindrical mounting socket in the forward end of said handle portion, said mounting socket having an annular edge at the end of the handle portion,
an adapter member having a body portion and a cylindrical plug portion of reduced diameter relative to said body portion, a continuous shoulder between said body portion and said plug portion, said plug portion having an end wall remote from said continuous shoulder and said body portion having a face remote from said continuous shoulder, a rod passageway extending inwardly from said face to receive a rod in bonding relationship,
said rod passageway extending along the length of said body portion and into said cylindrical plug portion but terminating short of a threaded bore which extends inwardly from an end wall of said cylindrical plug portion, said cylindrical mounting socket having dimensions complementary to said cylindrical plug portion to allow said cylindrical plug portion to be closely inserted within said cylindrical mounting socket,
a threaded shank extending upwardly from the bottom of said cylindrical mounting socket and threadedly received within said threaded bore to removably secure said adapter member to said handle portion, and
said cylindrical plug portion having a dimension so that said end wall of said cylindrical plug portion does not contact the bottom of said mounting socket when said continuous shoulder of said adapter member abuts said annular edge of said mounting socket, thereby assuring a tight, substantially unbroken junction between the adapter member and the handle portion.

4,043,072
FISH AND LURE RETRIEVER
Letterio Dominic Condurso, 1472 Dwight Place, Bronx, N.Y. 10465
Filed Mar. 10, 1976, Ser. No. 665,431
Int. Cl.[2] A01K *97/00*
U.S. Cl. 43—17.2 **5 Claims**

1. A fish lure retriever comprising a hollow core having a slot therealong, a sleeve also having a slot rotatable with respect to said core, said slots of said core and sleeve admitting a fishing line into the center of the core when aligned and locking the line in the core when offset from each other, means attached to said retriever for connecting an auxiliary line thereto, said core having an open front end to permit the retriever to move along the fishing line and over connecting tackle and a plurality of prongs formed around the entire periphery of the rear end thereof and converging inwardly

toward the center of the core, said slot of said core extending through the area of said prongs, said prongs defining spaced



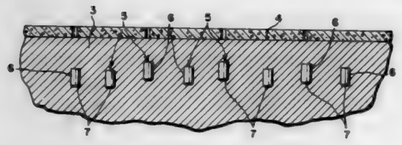
therebetween to catch the connecting tackle as the retriever is pulled upwardly by the auxiliary line.

4,043,073

METHOD OF TREATING SOIL FOR CONTROLLING TERMITES AND THE LIKE

Mario J. Basile, 85-12 Fifth Ave., Brooklyn, N.Y. 11209

Continuation-in-part of Ser. No. 496,363, Aug. 9, 1974, Pat. No. 3,940,875. This application July 24, 1975, Ser. No. 598,655
The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.
Int. Cl.[2] A01M *1/20*
U.S. Cl. 43—124 **17 Claims**



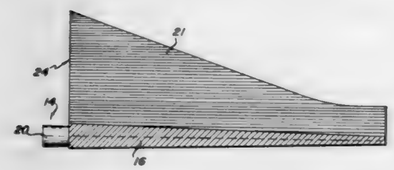
1. The method of providing a signal that insect or rodent pests are present in a localized area comprising dispersing contiguous to said area, a volatile odor forming material enveloped in an imperforate enclosure substantially impermeable to said material, making a portion of said enclosure of a material attractive to and edible by said pest, placing that portion in the area so that any pest in the area adjacent said enclosure would consume said portion and free said odor forming material to produce an odor detectable in said area.

4,043,074

GRAPHITE FIBER FISHING ROD

Tom P. Airhart, Hurst, Tex., assignor to Skyline Industries, Inc., Fort Worth, Tex.

Filed Dec. 31, 1975, Ser. No. 645,650
Int. Cl.[2] A01K *87/00*
U.S. Cl. 43—18 GF **7 Claims**



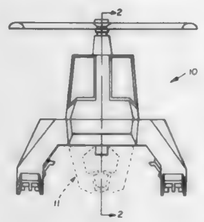
1. A fishing rod having a hollow tapered rod body of generally circular exterior cross-section which tapers from a large diameter handle end to a small diameter tip end, the rod having a hollow interior extending along the rod axis which tapers in the same direction as the exterior of the rod, said rod body being constituted by laminations of a plurality of plies of fiber reinforced resin in which the fibers in each ply have an average tensile strength above 300×10^3 p.s.i., and an average modulus of elasticity greater than 18×10^6 p.s.i. and are parallel to one another, said plies including at least one inner ply having its fibers oriented at an angle of at least 30° to the axis of the rod, and a plurality of outer plies having their fibers generally parallel to the axis of the rod, said outer plies at the large diameter end of the rod having their fibers disposed at a progressively increasing angle to the axis of the rod as they approach the rod exterior.

4,043,075

TOY VEHICLE WITH GRIPPING TONGS

Jack L. Breneman, Orchard Park, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

Filed Feb. 3, 1976, Ser. No. 654,924
Int. Cl.[2] A63H *27/12*
U.S. Cl. 46—202 **10 Claims**



1. A toy vehicle having gripping tongs and comprising:
a. a pair of tong arms having free ends movable in one plane between a normal open position and a closed position;
b. a movable pivot connecting said tong arms for pivotal motion between said open and closed positions;
c. spring means for biasing said free ends of said tong arms apart into said normal open position in which said free ends can be positioned over an object;
d. said toy vehicle having a housing for supporting said tong arms;
e. at least one fixed cam surface located in said housing for engaging portions of said tong arms on opposite sides of said pivot; and
f. a lever manually operable for engaging and moving said pivot relative to said housing causing said portions of said tong arms to engage said cam surface which pivots said free ends of said tong arms together into said closed position against the bias of said spring means for gripping the object.

4,043,076

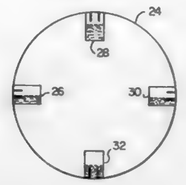
ELECTRICAL SIGNAL MECHANISM ACTUATED IN RESPONSE TO ROTATION ABOUT ANY OF THREE AXES

Stanley G. Potrzuski, 452 Elrino St., and Walter J. Potrzuski, 9 N. Montford Ave., both of Baltimore, Md. 21224

Continuation-in-part of Ser. No. 476,038, June 3, 1974, Pat. No. 3,935,669. This application Jan. 14, 1976, Ser. No. 649,218
The portion of the term of this patent subsequent to Feb. 3, 1993, has been disclaimed.
Int. Cl.[2] A63H *33/26*
U.S. Cl. 46—228 **16 Claims**

1. A wheeled object which generates a signal only when in rotation and when in rotation generates a continuous signal, comprising:
wheel support structure;
circuitry mounted upon said wheel support structure including a power source;
switch means including a first switch which can assume its ON position in response to centrifugal force;

said switch means further including a second switch which assumes it ON position in response to centrifugal force;
means for generating a signal;
means connecting electrically in series said power source, said first switch, said second switch, and said means for generating a signal;
said first switch being mounted upon said wheel support structure in a position such that it is in its ON position as a result of centrifugal force generated when said support structure is in rotation about a given axis; and



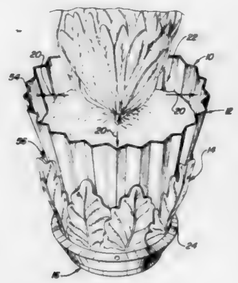
said second switch is mounted upon said wheel support structure in a position such that it is in its ON position as a result of centrifugal force generated when said support structure is in rotation about said axis and so that it is in its OFF position when said support structure is not in rotation and when said first switch is in its ON position due to gravity rather than to rotation,
whereby said means for generating a signal is actuated only when said wheel support structure is in rotation and whereby when said support structure is in rotation said means for generating a signal is actuated continuously.

4,043,077

EXPANDABLE POT FOR CONTAINING PLANTS AND METHOD THEREFOR

Clara Francis Stonehocker, 10260 W. 12th Ave., Lakewood, Colo. 80215

Filed May 10, 1976, Ser. No. 684,581
Int. Cl.[2] A01G *9/02*
U.S. Cl. 47—66 **5 Claims**



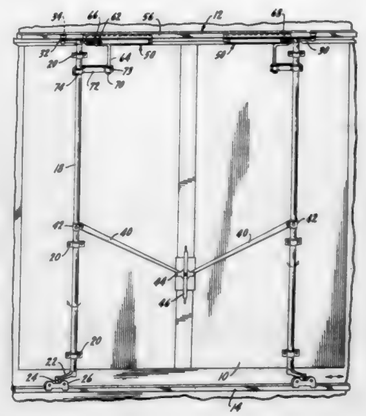
1. A portable container for holding the roots of a plant, said container comprising:
a bottom surface,
flexible side walls attached at one end to said bottom surface, said flexible side walls being open at the end opposing said attached end and being responsive to the growth of said roots for flexing outwardly, said open end being of greater diameter upon expansion than said attached end,
means cooperative with said flexible side walls for stopping the expansion of said container at a predetermined volume in said container, said stopping means including means cooperatve with said flexible side walls for slowing the rate of said expansion prior to said stopping, and
means attached to said bottom surface for collecting excess water in said container.

4,043,078

PLUG DOOR FOR A RAILROAD FREIGHT CAR

Kenneth I. Dyche, 2120 S. Pleasant Valley Road, Srpingfield, Mo. 65804; J. Paul Knox, 5249 Clayhill Drive, Springfield, Mo. 65804, and Ronald I. Swearengin, 4806 S. Fremont, Springfield, Mo. 65807

Filed Mar. 11, 1976, Ser. No. 665,905
Int. Cl.[2] E05D *15/10*
U.S. Cl. 49—220 **1 Claim**



1. In a railroad freight car plug door and supporting structure which includes a door adapted to plug a door opening in the side of the car and wherein the door is moved outward and inward of the door opening by means of cranks fixed to the opposite ends of crank operating rods rotatably supported by brackets mounted on the door, the cranks having arms pivotally supported on means travelling on tracks located above and below the door opening, the upper track being of rectangular cross-section, whereby rotation of the rods swings the cranks which pivot at the tracks to move the door in or out, the improvement characterized by a pair of elongated slide members located in the upper track to travel therein, each slide being a tubular member having a cross-section complemental to that of the upper track, and a linkage pivotally attached at one end to each slide and pivotally secured at the other end to the upper portion of a related operating rod, each linkage being so secured beneath a bracket supporting the related rod on the door.

4,043,079

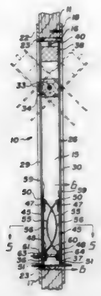
AUTOMATIC LATCH DOOR APPARATUS

Walter E. Smith, 3773 Casey Drive, Vancouver, British Columbia, Canada (V8Z 4J6)

Filed Dec. 2, 1976, Ser. No. 746,846
Int. Cl.[2] E05B *65/06*; E05C *19/02*
U.S. Cl. 49—394 **11 Claims**

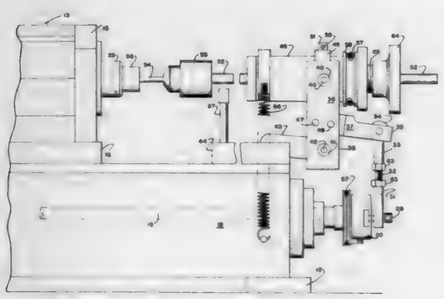
1. Automatic latch door apparatus comprising
spaced panels forming a closure normally located in a closing position in vertical planes and having adjacent edges movable out of said planes on either side thereof,
latch means on each of said panels near said edge thereof and normally preventing movement thereof in the direction away from the other of said panels while permitting movement in the direction towards said other panel, and
operating means on each panel operatively connected to the latch means on said each panel,
the operating means of each panel being positioned to be

engaged and operated by the other panel when said other panel is moved towards said each panel thereby operating



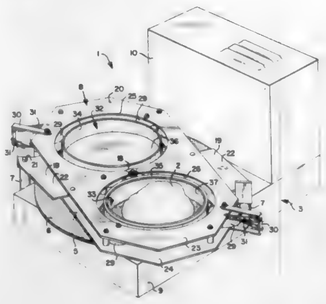
the latch means of and consequently releasing said each panel to permit the latter to move with said other panel.

4,043,080
DIE LAPPING APPARATUS
Thomas H. Maxwell, Carnegie, Pa., assignor to Die-Quip Corporation, Carnegie, Pa.
Filed Oct. 6, 1975, Ser. No. 619,962
Int. Cl.[2] B24B *33/02*
U.S. Cl. 51—33 W **2 Claims**



1. A die lapping apparatus which includes a base having a drive shaft extending therefrom with power means for driving the said shaft in one direction and having a headstock mounted on the base and having a rotating die holding chuck extending therefrom rotating in the same direction as the aforesaid drive shaft and wherein a die lapping tool is mounted on a shaft which is simultaneously rotated and reciprocated, the rotation of the shaft having the lapping tool mounted thereon rotating in a different direction opposite the direction of rotation of said drive shaft and die holding chuck, the improvement comprising, a hub mounted for rotation on said drive shaft, a slot extending through said hub, a plate mounted off center the axis of rotation of said drive shaft, said plate adjustably mounted in said slot, a linkage secured to said plate and to a lapping tool carrying shaft to effect a reciprocating motion to said tool carrying shaft, said linkage including a pair of plates pivotally mounted on said base and on a housing in which the lapping tool carrying shaft is mounted for rotation therein and to be simultaneously reciprocated when said hub and plate mounted therein is rotated, and means to effect a rotary motion to said tool carrying shaft while the same is simultaneously reciprocated.

4,043,081
DRY LAP POLISHER
Donald E. DeTray, 10430 Truman Road, Independence, Mo. 64052
Filed Aug. 19, 1976, Ser. No. 716,064
Int. Cl.[2] B24B *37/04*
U.S. Cl. 51—129 **7 Claims**



7. An apparatus for dry polishing a flat face on a rock section comprising:

a. a support structure;

b. a circular planar table rotatably mounted on said support structure, said table having an upper surface with a center and outer edge;

c. drive meams mounted on said support structure and operatively connected to said table for rotating same; and

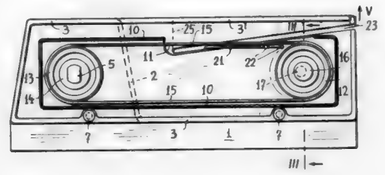
d. a polishing member mounted on the upper surface of said table and rotatable therewith for receiving a rock with a face to be polished in contact therewith;

e. means supported on said support structure outwardly of said planar table and having portions extending thereover for restricting area of movement of said rock whereby said rock is retained on the polishing member between the table center and outer edge and is free to rotate relative to said table and polishing member thereon; and

f. said polishing member being a mesh material having abrasive grit in particles adhered thereto with interstices therebetween for receiving dust removed from said rock being polished, said dust and said grit cooperating as said rock is progressively polished whereby the polishing operation is characterized by the cutting by said grit being coarse during initial stages and being gradually finer as said interstices receive and fill with said dust reducing exposure of the grit to provide a fine polishing member when said interstices are substantially filled.

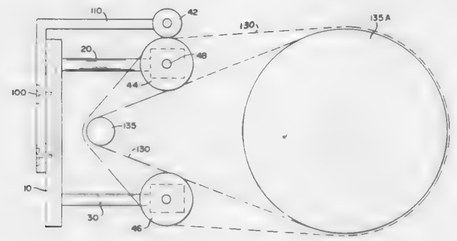
4,043,082
KNIFE SHARPENING MACHINE WITH AN ABRASIVE BELT
Enrico Ferroglio, Viale Catullo 12, I-10.090 Bardassano di Gassino, Italy
Filed Jan. 26, 1976, Ser. No. 652,313
Claims priority, application Italy, Mar. 21, 1975, 67707/75; Sept. 19, 1975, 69335/75
Int. Cl.[2] B24B *21/06*; B24D *17/00*
U.S. Cl. 51—135 R **12 Claims**

1. In a knife sharpening machine comprising a casing, two guide pulleys mounted for rotation on said casing, drive means for rotating at least one of said guide pulleys, an endless abrasive belt extending around said guide pulleys, tautening means for applying tension to said abrasive belt, said abrasive belt forming between said guide pulleys an operative linear run; the improvement comprising a guide slot for knives, of substantial length and defined by opposite rectilinear parallel side edges of said casing forming an acute angle with said operative run of the abrasive belt, said casing being substantially entirely closed except for said guide slot, whereby in operation a knife to be sharpened is angularly guided by said slot against said operative run of the abrasive belt, and the abrasive belt yields elasti-



cally under the pressure exerted by the knife, spontaneously adapting itself to the profile of the knife in course of sharpening, thereby to reduce the danger of injury to a user of the machine and to reduce the escape of dust from the machine.

4,043,083
SANDING TOOL
Nicholas Paul Rosdil, 4550 Overlook Drive, NE., St. Petersburg, Fla. 33703
Continuation-in-part of Ser. No. 557,359, March 11, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,223
Int. Cl.[2] B24B *23/06*
U.S. Cl. 51—170 EB **5 Claims**



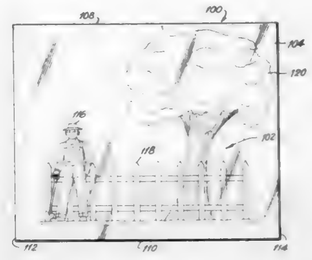
1. An endless belt sander for sanding or polishing a workpiece comprising an external power source, a support structure, a single drive pulley mounted on said support structure and disposed in power receiving relationship to said external power source, a single idle pulley mounted on said support structure, an endless sanding or polishing belt having a length greater than the minimum length necessary to surround said drive pulley and said idle pulley, said belt being slack and extending only about said pulleys pressure pulley means attached to said support structure and established relative to said drive pulley to be in biasing engagement with that portion of said endless belt which is at any instant disposed in engaging relationship with said drive pulley to prevent slippage of said endless belt relative to said drive pulley, said endless belt disposed in looped-around relationship to the workpiece to provide sanding of the workpiece upon establishing tension on said endless belt by the position of said endless belt sander relative to the workpiece.

4,043,084
ULTRASONIC PERSPECTIVE CARVING
Arthur Kuris, 3725 Henry Hudson Parkway, Riverdale, N.Y. 10463
Filed Feb. 23, 1976, Ser. No. 660,412
Int. Cl.[2] B24B *1/00*
U.S. Cl. 51—318 **49 Claims**

1. The method of carving a design in an object with ultrasonic energy comprising:

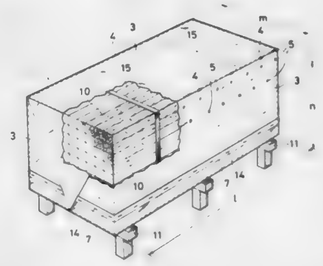
A. providing cooperating tools each having a different working surface configuration for carving sections of the design on a surface of the object in partially overlapping relation to each other,

B. carving a first section of the design with one of said tools utilizing ultrasonic energy to a first depth, and



C. carving a second section of the design in partially overlapping relation to the first section with the other of said tools utilizing ultrasonic energy to a second depth different from said first depth, whereby the combined first and second carved sections creates a design of a single totality in perspective on the object.

4,043,085
LUMBER COVER
Fukuzo Ochiai, Okayama, Japan, assignor to Morishita Chemical Industry Co. Ltd., Japan
Filed July 2, 1976, Ser. No. 701,988
Claims priority, application Japan, Aug. 6, 1975, 50-109724
Int. Cl.[2] B62D *63/04*; E04B *1/12*
U.S. Cl. 52—3 **9 Claims**



1. A lumber cover for a stack of lumber comprising a cover structure consisting of a base sheet woven from polyolefin resin flat yarns as warps and wefts and a polyolefin film bonded to at least one face of said base sheet, said cover structure when mounted on the stack having a widthand length to cover the horizontal top and vertical sides of the stack, the vertical sides of said cover structure adapted to extend down from the top edges of the lumber stack and being provided with a number of air holes through the cover in at least one line disposed parallel to and below the top edge and means providing aligned nailing seats parallel to and below said air holes.

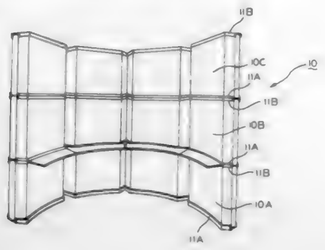
4,043,086
STRUCTURE FOR EXHIBITION PURPOSES
William P. Kaulfuss, Wilmette, and Robert H. Kaulfuss, Northbrook, both of Ill., assignors to Container Corporation of America, Chicago, Ill.
Filed Apr. 21, 1976, Ser. No. 679,003
Int. Cl.[2] E04B *1/346*
U.S. Cl. 52—71 **3 Claims**

1. In a module for erected wall elements for exhibition purposes wherein said wall elements are formed from a sheet of

light weight fibrous material capable of being folded along score lines therein and having spaced planar front, rear and end wall portions, the improvement in said module comprising:

a. upper and lower wall element confining devices arranged individually to support said wall elements and to surmount and undermount the same for such confinement;

b. each of said devices having a base with spaced flanges standing therefrom to confine edge portions of the front and rear planar portions of said wall elements;



c. each of said devices having certain spaced flanges at the ends thereof continuous with the first named flanges to receive the returns from said front wall portions for confinement of said return;

d. each of the ends of said devices being provided with a discontinuity in one of the spaced flanges thereof portion elements;

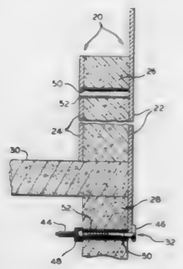
e. each of said discontinuous portions in said devices being constructed and arranged to accommodate extensions from said rear planar portions and portions of said returns in overlapping relation.

4,043,087

METHOD AND MEANS FOR SUPPORTING AN ELEVATED CONCRETE WALL PANEL FORM

Frank T. Connors, Deerfield, Ill., assignor to Symons Corporation, Des Plaines, Ill.

Filed Dec. 8, 1975, Ser. No. 638,642
Int. Cl.[2] E04G *11/08*
U.S. Cl. 52—127 **9 Claims**



1. In combination with a wall of an elevated concrete wall panel form, support means therefor which comprises:

a first concrete wall panel having an opening extending horizontally therethrough,

a bolt member removably inserted through said opening and projecting axially from opposite sides of said first wall panel and adapted for rotative movement about its axis,

said form wall being seated on one projecting end of said bolt member for use in forming a second concrete wall panel in superposed relation to said first wall panel, the opposite end of said bolt member being accessible, said form wal: having a lower edge abutting on said one end of the bolt member for vertically removably seating the form wall thereon,

a retaining member captive on said one end of the bolt member, and

means mounting said retaining member on said bolt member for movement thereon between a position in which the retaining member is in substantial longitudinal alignment with the bolt member and a position in which the retaining member projects laterally from the bolt member, said retaining member being moved between said positions by rotative movement of said bolt member and gravitational force,

said bolt member and said retaining member when in said aligned position being movable for insertion and withdrawal together through said first wall panel and from said opposite end of the bolt member,

said retaining member being disposed in said laterally projecting position in spaced relation to said first wall panel and clamping said form wall therebetween,

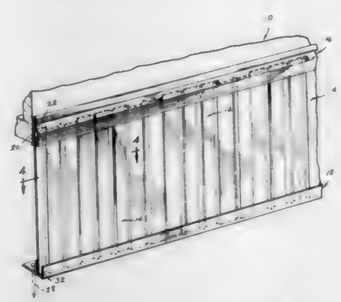
whereby said form wall may be vertically removed from its seat on said bolt member after forming said second wall panel and before withdrawing said bolt member, and thereafter said withdrawal of the bolt member may be effected.

4,043,088

TRAILER SKIRTING

Edward L. Payton, South Bend, Ind., assignor to Mastic Corporation, South Bend, Ind.

Filed Mar. 6, 1974, Ser. No. 448,523
Int. Cl.[2] E04C *2/32;* **E02D** *27/00*
U.S. Cl. 52—169.9 **4 Claims**



1. Skirting for a trailer statically supported upon a foundation and having a lower peripheral edge spaced above said foundation, said skirting including a plurality of vertically oriented panels each having parallel side edges and upper and lower marginal portions, an upper retainer means secured to said trailer lower edge, a lower retainer means secured to said foundation and located under said retainer means, said upper marginal portions of the panels anchored by said upper retainer means, said lower marginal portions of the panels anchored by said lower retainer means, the improvement wherein each panel has front and back faces and is formed of a flexible shape-retaining material, an arcuate bend extending from one side edge of each panel, said bend being formed over said front face of the panel and terminating adjacent said front face in an outturned lip, said bend forming a part-circular channel in conjunction with said front face which extends the length of said one side edge of the panel, said lip defining a restricted opening into said channel at said front face, a flange extending from the other side edge of each panel, said flange projecting rearwardly of the panel and spacedly overlying the rear face thereof, said flange terminating in a return bent lip located between said flange and rear face, said return bent lip projecting at an acute angle to said flange, the flange of one said panel at the other side edge thereof overlying the front face of an adjacent panel at the one side edge thereof and extending through the channel opening and under the bend at said adjacent panel one side edge, the return bent lip of said one panel

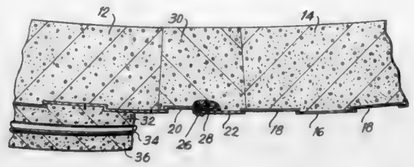
projecting forwardly of the front face of said adjacent panel and terminating within the channel and forwardly of the connection of the outturned lip to such channel of said adjacent panel to interlock said one panel and adjacent panel together against lateral separation.

4,043,089

OVERLAP CLOSURE SYSTEM FOR PRECAST PRESTRESSED WATER TANKS

Bill R. Bush, West Babylon, and Jack Hornstein, Old Bethpage, both of N.Y., assignors to Preload Company, Inc., Garden City, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,729
Int. Cl.[2] E04D *1/00;* **E04C** *3/10*
U.S. Cl. 52—516 **3 Claims**



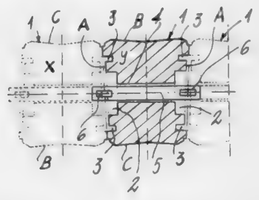
1. A prestressed concrete tank having a core wall comprising elongated panels of precast concrete assembled in spaced, side-by-side relationship, each of said panels having on its outer face a sheet of sheet metal presenting parallel longitudinal undercut channels and two, lateral, sheet metal flanges extending parallel with the elongated sides of said panels and laterally outwardly therefrom, the sheet metal flanges overlapping the flanges of adjacent panels and being fastened thereto to form a joint between the side-by-side, spaced panels.

4,043,090

ASSEMBLY OF PREFABRICATED ELEMENTS FOR FORMING WALLS OF PLANAR AND/OR NON-PLANAR CONFIGURATION

Ugo Viapiano, Centro Residenziale Parco Lambro, Stabile 6, 20090-Segrate (Milan), and Odoardo Andreoni, Via dei Gelsi, 10-20094 Corsico (Milan), both of Italy

Filed Sept. 26, 1975, Ser. No. 616,947
Int. Cl.[2] E04C *1/30, 2/06*
U.S. Cl. 52—583 **5 Claims**



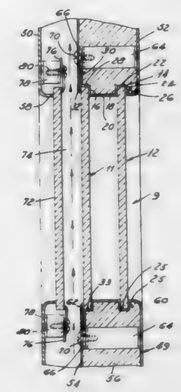
1. An assembly for making walls, comprising prefabricated elements, each of which is in the form of a prism having a substantially isosceles trapezoid cross- section, with each element having opposed parallel sides and opposed non-parallel sides, so that by approaching a plurality of said elements to one another at their non-parallel sides and by selecting the orientation of the trapezoidal cross-sections thereof, both planar and non-planar walls canbe provided, all of said elements being formed in said non-parallel sides thereof with recesses all of which are situated at the same elevation with pairs of said recesses adjoining each other at pairs of said non-parallel sides of said elements which are situated next to each other, and each of said adjoining pairs of recesses defining a space at a junction between adjoining elements where a pair of non-parallel sides thereof are situated, and each element being formed with a hole interconnecting and communicating with the recesses respectively situated at opposed non-parallel sides of each element, a plurality of connection members respectively extending with clearance through and beyond said holes into said recesses and forming pairs of adjoining connection members each having a pair of adjoining end regions situated in one of said spaces, and a plurality of pulling means respectively situated in said spaces with each pulling means operatively connected with a pair of adjoining end regions of a pair of adjoining connection members situated in each space for pulling said connection members toward each other and placing them in tension in a manner pressing adjoining, non-parallel sides of said elements against each other.

4,043,091

FLANGE MOUNT OVEN DOOR WINDOW

Joseph W. Katona, Walled Lake, Mich., assignor to Mills Products, Inc., Farmington, Mich.

Filed June 4, 1976, Ser. No. 693,082
Int. Cl.[2] F23M *7/00*
U.S. Cl. 52—616 **7 Claims**



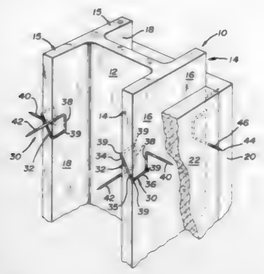
1. A self-contained flange mount window unit adapted to be assembled into an oven door having front and back door panels with aligned window openings, comprising a pair of glass panes, and retaining means for said panes comprising a substantially continuous frame-spacer extending along the top, bottom and side peripheral edge portions of said panes and holding the same in spaced parallel relation, said frame-spacer having a laterally outwardly projecting mounting flange by means of which said window unit may be mounted in the oven door, said frame-spacer including its flange being of unitary one-piece construction having a spacer portion engaging the inner peripheral surfaces of said panes and frame portions engaging the peripheral edges and outer peripheral surfaces of said panes, said mounting flange extending laterally outwardly from that part of one of said frame portions which engages the peripheral edge of one of said panes and being folded upon itself so as to extend laterally inwardly beyond the peripheral edge of said one pane to provide that part of said one frame portion which engages the outer peripheral surface of said one pane, and means engaging the folded portions of said mounting flange to mount the same to the oven door.

4,043,092

CLIP FOR ATTACHING INSULATION AND THE ASSEMBLY THEREOF

George W. Paul, Des Plaines; Henry A. Balinski, Hoffman Estates; Paul S. Quigg, Barrington, and John H. Crumbaugh, Des Plaines, all of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Oct. 2, 1973, Ser. No. 402,881
Int. Cl.[2] E04B *1/38*
U.S. Cl. 52—712 11 Claims



1. A unitary clip formed of a single piece of metal for attaching layers of preformed insulation to a structural member having a projecting edge, the clip comprising

a generally U-form edge gripping portion having a back portion and two legs extending therefrom,

and two elongate pointed impaling projections operatively connected thereto, said projections being angled with respect to each other, one of said projections being doubled back with respect to the leg to which it is operatively connected and extending substantially parallel and oppositely directed with respect thereto, and the other of said projections extending substantially perpendicular to an imaginary plane passing through the leg to which it is operatively connected and completely to one side of said plane, whereby the clip may secure a plurality of sheets of preformed insulation about a structural member by gripping the edge thereof without the use of any additional fastening means.

4,043,093

ARTICLE HOLDER FOR A SLOPING ROOF

Louis C. Riggs, 1705 Youngland, Shively, Ky. 40216

Filed June 18, 1976, Ser. No. 697,459
Int. Cl.[2] E04D *15/00*
U.S. Cl. 52—749 12 Claims



1. A device for holding articles on a sloping roof comprising:

a. a holding portion having a structural configuration to contain said articles,

b. an attaching portion including an insertion section having a structural configuration effective to slide between successive courses of roofing shingles fixed to said roof,

c. said attaching portion including a bent end flange effective to hook downwardly over the top edge of the lower course of said successive courses of shingles when the insertion section is inserted therebetween, and

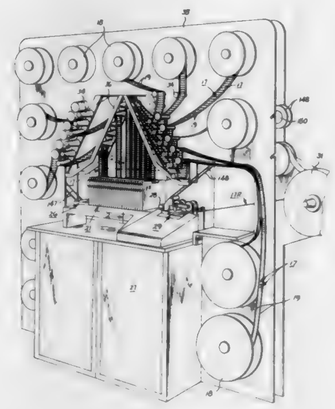
d. means for disengaging the bent end flange from said top edge to cause the insertion section to move away from said roof when the holding portion is pushed toward said roof.

4,043,094

METHOD AND APPARATUS FOR PROCESSING TAPED COMPONENTS

William D. Bohannon, Jr., Winston-Salem, N.C., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Sept. 29, 1975, Ser. No. 617,765
Int. Cl.[2] B65B *19/34*
U.S. Cl. 53—3 27 Claims



1. A method of processing taped components onto preselected center-to-center spacings, wherein leads of the components are joined in spaced relationship by interconnecting tapes secured to the leads, which comprise the steps of:

advancing the taped components along a preselected linear path;

cutting the interconnecting tapes between the leads of the taped components at a first position on the linear path;

engaging the leads of each of the taped components with a first cutting means which is linearly reciprocable along the linear path;

moving the first cutting means along the linear path to advance each of the taped components and cut portions of the tapes secured to the leads of the component further along the linear path away from the tape cutting first position and to move the leads of the component past a second cutting means at a second position on the linear path;

cutting the leads of each component to length from the cut portions of the tapes in the second position on the linear path by the first and second cutting means; and

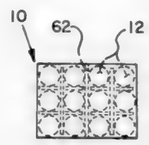
feeding each component from the second position on the linear path into a respective position on the preselected center-to-center spacings after the leads of the component have been cut to length from the cut portions of the tapes.

4,043,095

METHOD OF PACKAGING IN CARRIER WITH DROP DOWN PARTITION

Earl J. Graser, Monroe, La., assignor to Olinkraft, Inc., West Monroe, La.

Division of Ser. No. 510,681, Sept. 30, 1974, Pat. No. 3,974,911.
This application Feb. 27, 1976, Ser. No. 661,909
Int. Cl.[2] B65B *5/06, 21/14*
U.S. Cl. 53—26 2 Claims



1. A method of assembling twelve fragile articles into a carrier comprising the steps of

arranging the twelve articles into two separate groups of six articles in separate assembly lines wherein each group has two adjacent parallel rows of three articles with the articles in the parallel rows being abreast,

positioning respective dividers between the articles of the two groups in the separate assembly lines,

unfolding a carrier blank from a flat condition to an open condition, said carrier blank having an inside partition hinged to an inside top panel such that when the carrier is opened from a flat condition the partition drops under the force of gravity into a position extending sufficiently vertically to form separated portions within the carrier,

inserting the separate groups of six articles with dividers sideways simultaneously into respective opposite open ends of the carrier such that adjacent rows of articles in the respective groups of six articles abut the opposite sides of the partition, and

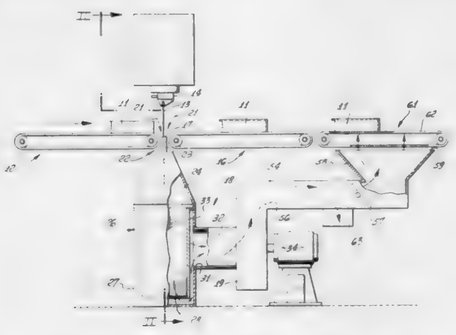
closing the open ends of the carrier to secure the articles in the carrier.

4,043,096

AUTOMATIC PACKAGING METHOD AND APPARATUS

Marvin E. Wallis, 20741 Horace St., Chatsworth, Calif. 91311

Filed Aug. 31, 1975, Ser. No. 285,140
Int. Cl.[2] B65B *7/16*
U.S. Cl. 53—41 3 Claims



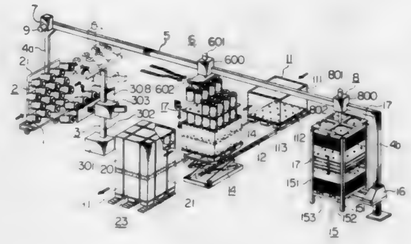
1. In a packaging process in which a molten sheet of resin material is extruded and projected from a film forming head through an opening in a conveyor and the articles to be packaged are conveyed so as to intercept such sheet above the opening and be at least partially wrapped thereby, the improvement in combination therewith comprising: the steps of developing a partial vacuum, while the molten sheet is extruded and projected, by the rapid withdrawal of air from beneath unsupported portions of said articles at a location aligned with said projected sheet as the articles intercept said sheet, to cause said sheet to wrap about and form a seal with each article, and breaking and trimming away excess film from said articles by said rapid withdrawal of air and carrying it away therein.

4,043,097

APPARATUS FOR PACKAGING A PLURALITY OF YARN PACKAGES IN A CARDBOARD BOX OR A LIKE CONTAINER

Kinyu Ishida, Takatsuki; Kenji Gose, Ashiya; Shigeo Matsunami, Matsuyama; Miyoyuki Sigeoka, Matsuyama, and Teruichi Matsumura, Matsuyama, all of Japan, assignors to Teijin Limited and Teijin Seiki Co., Ltd., both of Osaka, Japan

Filed Oct. 4, 1976, Ser. No. 729,293
Claims priority, application Japan, Oct. 3, 1975, 50-118934
Int. Cl.[2] B65B *5/08, 35/36, 57/00*
U.S. Cl. 53—52 13 Claims



1. An apparatus for packaging a plurality of yarn packages in a cardboard box or a like container, comprising:

an over head guide rail disposed at a position above stations for carrying out the packaging operation;

a lift provided with means for supporting a plurality of yarn packages in upright condition and transporting said supported yarn packages to an uppermost predetermined position adjacently below said guide rail;

a pallet lifting device for displacing said cardboard box to a predetermined position for receiving said packages into said cardboard box;

a feeder capable of moving along said guide rail between a position right above said uppermost predetermined position of said lift and one of a plurality of predetermined position substantially above said pallet lifting device;

means for displacing said feeder along said guide rail;

means for displacing said cardboard box from said pallet lifting device;

means for sealing said cardboard box after completion of the transfer motion of cheeses from said feeder into said cardboard box and displacing said cardboard box from said pallet lifting device;

means for binding said sealed cardboard box;

said feeder being provided with members supporting said yarn packages in vertical condition, means for changing the arrangement of the supported yarn packages into a square lattice arrangement and means for displacing said supporting members to vertical direction;

whereby, yarn packages received by said lift are firstly displaced to said uppermost position of said lift and, then, said supporting members of said feeder are displaced downward to receive said yarn packages by means of said displacing means of said feeder, and after said supporting members completely receive said yarn packages from said lift, said feeder is displaced to one of said predetermined position right above a position of said cardboard box where said yarn packages are desired to be positioned, said means for changing the arrangement of the supported yarn packages is actuated so as to correctly arrange said supported yarn packages in a square lattice arrangement before releasing said supporting members from the respec-

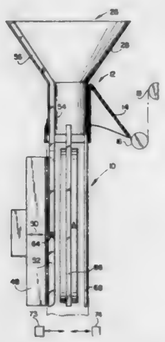
tive yarn packages and said pallet lifting device displaces said cardboard box upward to a predetermined uppermost position thereof, then, said displacing means of said feeder is actuated to displace siad supporting members toward said cardboard box, and thereafter, said supporting members are actuated to release these yarn packages, and after repeating the above-mentioned operations, if necessary, and when the space in said cardboard box is occupied by a predetermined number of yarn packages, said pallet lifting device is actuated to displace said cardboard box downward and, thereafter, the operations of said sealing means and binding means are carried out.

4,043,098

VERTICAL FORM, FILL AND SEAL PACKAGING MACHINE WITH IMPROVED BACK-UP BAR FOR LONGITUDINAL SEALING

Roger L. Putnam, Jr., East Longmeadow, and Edward F. O'Brien, Northampton, both of Mass., assignors to Package Machinery Company, East Longmeadow, Mass.

Filed Aug. 26, 1976, Ser. No. 718,072
Int. Cl.[2] B65B *9/12*
U.S. Cl. 53—180 M **11 Claims**



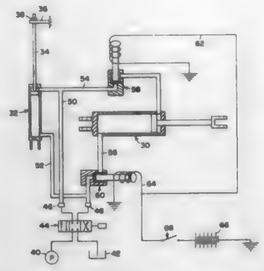
1. In a vertical form, fill and seal packaging machine, having a source of packaging material in the form of an elongated thin flat strip comprising successive package blanks as integral contiguous sections thereof, a tube former adapter to receive said strip material and progressively to form the same to a depending and upwardly open tubular configuration in passage therethrough, opposite longitudinal edge portions of the material being progressively juxtaposed by said former in overlapping and in parallel vertically extending relationship, a product dispensing means associated with said former and operable intermittently for the gravity discharge of measured quantities of product to the tube interior space through its said upwardly open end, a longitudinal seam sealing station disposed beneath said former, intermittently operable tube advancing means to draw said tube downwardly whereby successively to present intergral blanks in tubular form at said seam sealing station, an elongated seam sealing bar extending vertically at said sealing station adjacent a tubular blank at the station and intermittently movable generally horizontally toward and away from and into and out of sealing engagement with the overlapped edge portions of the blank, the improvement comprising an elongated back-up bar for said sealing bar extending vertically relative to the tubular blank at the sealing station adjacent said overlapped edge portions and in approximate horizontal registry with said sealing bar, a support member for said back-up bar, bar-up bar mounting means associated with said support member adapted pivotally to support said bar approximately at its mid point whereby to provide for free angular bar adjustment, precise parallelism, and uniform pressure distribution between and throughout the length of said sealing and back-up bar during each longitudinal seam sealing operation, at least one narrow elongated tube spreader fixedly supported within said tubular blank, and end sealing apparatus subadjacent said longitudinal sealing station and operable intermittently to seal transversely end portions of said tubular blanks whereby to form product bearing packages.

4,043,099

AGRICULTURAL IMPLEMENT HYDRAULIC SYSTEM

Leo George Cheatum, Ottumwa, Iowa, assignor to Deere & Company, Moline, Ill.

Filed July 1, 1976, Ser. No. 701,839
Int. Cl.[2] A01D *75/22*
U.S. Cl. 56—10.9 **9 Claims**



1. In an agricultural machine having a mobile main frame connected to and towed by a tractor having a fluid pressure source, a reservoir and a first control valve means having first and second outlets and operative to control the flow of pressurized fluid between said outlets and the fluid pressure source and the reservoir, the machine having first and second shiftable elements and first and second hydraulic motor means respectively operative to control the position of said elements, the combination therewith of improved connecting means for connecting said motor means to the outlets comprising: a first hydraulic conduit means including first and second conduits respectively connecting the opposite ends of the first motor means to the first and second outlets respectively; a second hydraulic conduit means including third and fourth conduits respectively connecting the first and second conduits to the opposite sides of the second motor means so that the motor means are connectible in parallel to the outlets; a second control valve means disposed in the second conduit means and shiftable between alternate conditions to control the flow of fluid between the first conduit means and the second motor means; and control means actuatable from the tractor and operatively connected to the second control valve means for controlling the condition of the second control valve means.

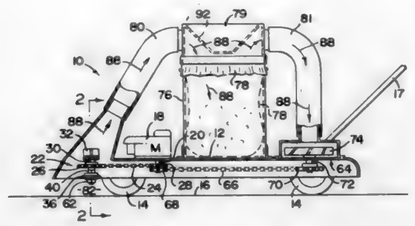
4,043,100

CUTTING MACHINE

Richard F. Aumann, 1390 Gulf Blvd., and Robert J. Aumann, 223 Dolphin Point, both of Clearwater, Fla. 33515

Filed Oct. 24, 1975, Ser. No. 625,690
Int. Cl.[2] A01D *55/262*
U.S. Cl. 56—16.5 **13 Claims**

1. A cutting machine for grass or like substance, said cutting machine comprising: a housing movably supported relative to a surface being cut, a cutting assembly mounted on said housing and including prime mover means; said cutting assembly further comprising cutting blade means connected in driven relation to said prime mover means, said cutting blade means movably attached to said housing independent of said prime mover means so as to move relative to said housing in a non-rotational manner upon activation of said prime mover means, and bias means including a spring element interconnected between said housing and said cutting blade means and disposed to normally bias said cutting blade means into original,



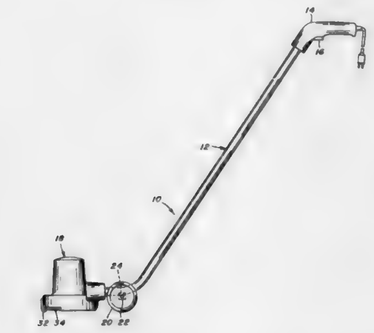
non-operative position during activation of said prime mover means.

4,043,101

EDGER-TRIMMER HEAD INDEXING MECHANISM

Fred H. Lahr, Humboldt, and Roger W. Murley, Medina, both of Tenn., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 21, 1974, Ser. No. 434,869
Int. Cl.[2] A01G *3/06*
U.S. Cl. 56—17.1 **3 Claims**



1. In a combination grass trimmer and edger having a housing mounted for selective rotation about one end of an elongated handle, an electric motor in said housing, a shaft-mounted rotatable blade operatively connected to said motor, ground-engaging wheels mounted near said one end of said elongated handle, switch means in the other end of said handle, means for connecting said motor to a source of electric power through said switch means, the improvement comprising: notches in said one end of said handle and internal bosses in said housing, said handle and said housing being spring biased into engagement with each other.

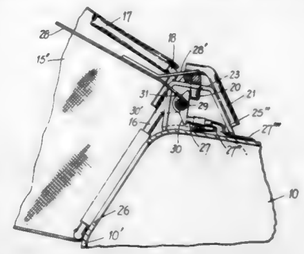
4,043,102

SAFETY FEATURES FOR REAR BAGGING MOWER

Charles E. Uhlinger, Des Moines, and Clair D. Splittstoesser, Ankeny, both of Iowa, assignors to AMF Incorporated, White Plains, N.Y.

Filed May 7, 1976, Ser. No. 684,027
Int. Cl.[2] A01D *35/26*
U.S. Cl. 56—17.4 **9 Claims**

1. In a rotary lawn mower having a deck, a grass cutting blade below said deck, power means on said deck for rotating said blade, a rear discharge opening in said deck, a rearwardly extending mower handle connected to said deck, and a removable grass catcher positioned behind said mower between said mower handle and opening to collect grass clippings expelled through said opening; improved safety means for said mower, said safety means comprising a door for said opening, means constantly biasing said door to closed position, means for locking said grass catcher on said mower, means for locking said door open after said grass catcher is first locked on said mower, and means for automatically turning said power means



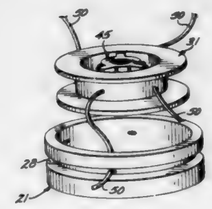
off in response to opening of said door unless said grass catcher is first positioned on said mower, a handle for opening said door, and each of said last mentioned three means being operable in response to movement of said handle.

4,043,103

LAWN EDGER ACCESSORY

George W. Lakin, 14312 Harrington St., and Robert L. Lakin, 10592 Barbett, both of Garden Grove, Calif. 92643

Filed Mar. 15, 1976, Ser. No. 661,837
Int. Cl.[2] A01D *55/18*
U.S. Cl. 56—295 **8 Claims**



1. A rotary cutter assembly adapted for attachment to an arbor driven in rotation, comprising:

a circular spool adapted for mounting on said arbor and including a storage groove around the periphery thereof, a circular cavity concentrically disposed on the interior of said groove, and a plurality of openings disposed to radially communicate between said cavity and said storage groove;

a plurality of plastic filaments each terminating in one enlarged bulbous end, each said filament being conformed in section for receipt in said openings with said bulbous end disposed in said circular cavity; and

an annular retainer adapted for mounting on said arbor in concentric alignment around said spool including a stress relief groove formed on the exterior periphery thereof and a plurality of filament receiving bores communicating between said stress relieving groove and said spool for conveying said filaments from said spool to the exterior of said retainer.

4,043,104

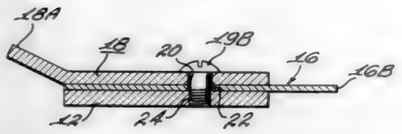
MOWER BLADE ASSEMBLY FOR A LAWN MOWER

Kenneth R. Jones, Thiensville, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation of Ser. No. 600,781, July 31, 1975, abandoned. This application Dec. 29, 1976, Ser. No. 755,155

Int. Cl.[2] A01D *55/18*

U.S. Cl. 56—295 **6 Claims**



1. A mower blade assembly comprising a blade bar adapted to be rotated by the output shaft of a lawn mower, and a cutter blade subassembly secured to each of the opposite ends of said blade bar, each subassembly comprising a detachable thin metal cutter blade member made of a metal having a thickness no greater than about 0.0625 inch, said cutter blade member being provided with a plurality of cutting edges only one of which is in use in a given assembled position of said subassembly, said cutter blade member being orientable by reassembly of said subassembly to position any one of said cutting edges of said cutter blade member in cutting position, said cutter blade member being so positioned in said subassembly that the cutting edge of said cutter blade member which is in use in a given assembled position of said subassembly lies forwardly in a leading direction of the leading edge of said blade bar relative to the direction of rotation of said blade bar, and a detachable interchangeable propeller lift cap distinct from said cutter blade member and in retaining relation to said cutter blade member whereby said cutter blade member is sandwiched between said blade bar and said lift cap, said propeller lift cap including an upwardly bent body portion contiguous the trailing end of said lift cap relative to the direction of rotation of said blade bar, whereby to provide a lifting action on the grass, and means securing said cutter blade member and said lift cap in detachably assembled relation with respect to each other and with respect to said blade bar.

4,043,105

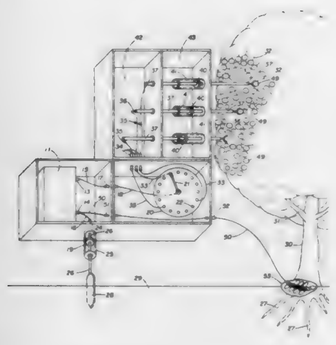
ELECTRO-PNEUMATIC FRUIT PICKER

Robert W. Cochran, 152 Bonny Shores Drive, Lakeland, Fla. 33801

Filed July 16, 1975, Ser. No. 596,504

Int. Cl.[2] A01D *46/24*

U.S. Cl. 56—328 R **11 Claims**



4. A fruit picker device of the type primarily intended for use in picking citrus fruit, said device comprising: boom means; pneumatic head means operatively attached to one end of said boom means for engaging said fruit; and electrical severing means operatively disposed in fruit-contacting relation on said head means whereby electricity may be directed through said fruit to remove said fruit from its stem, wherein said pneumatic head means comprises pressure chamber means disposed in fluid communication with a source of fluid; vacuum chamber means disposed in fluid communication with a vacuum pump; and at least one slide rod means movably disposed in interconnecting relation between said pressure chamber means and said vacuum chamber means, whereby said slide rod means may be extended and retracted in response to predetermined pressure changes in said pressure chamber means and, further, whereby at least a partial vacuum may be drawn on said slide rod means to graspingly engage said fruit to be picked.

4,043,106

OPEN-END SPINNING MACHINE WITH A TRAVELLING MAINTENANCE UNIT

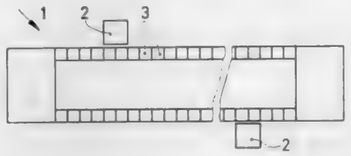
Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of Germany

Filed July 22, 1975, Ser. No. 598,071

Claims priority, application Germany, Aug. 8, 1974, 2438168

Int. Cl.[2] D01H *1/12, 13/16*

U.S. Cl. 57—34 R **18 Claims**



1. An open-end spinning machine having a plurality of spinning points each including a sliver supply means, and at least one maintenance unit travelling to said spinning points, said at least one maintenance unit including a detector means for detecting an operating position of the respective sliver supply means, each of said spinning points including a means for switching off said sliver supply means in the event of a malfunction and a signal transmitter, said signal transmitter being directly responsive to the operation of said sliver supply means and providing a signal of the operating position of the sliver supply means to the detector means located at said maintenance unit.

4,043,107

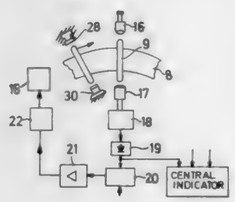
ARRANGEMENT FOR AUTOMATICALLY CONTROLLING THE TRAVEL SPEED OF YARNS, FILAMENTS, AND THE LIKE IN MACHINES PROCESSING THE SAME

Gerhard Günther, Muhlhausen, and Josef Stillig, Owen-Teck, both of Germany, assignors to Leuze-Electronic KG, Owen-Teck, Germany

Filed Apr. 1, 1975, Ser. No. 564,142

Int. Cl.[2] D01H *13/32*

U.S. Cl. 57—34 R **16 Claims**



1. In an apparatus for processing yarns, filaments or other such elongated elements, an arrangement for controlling the travel of such elongated elements, comprising, in combination, means for determining the number of element breakages occurring per unit time and for generating a corresponding breakage-frequency signal; means for establishing a reference breakage frequency; and means operative for automatically varying the speed of travel of the element as a function of the discrepancy between said reference breakage frequency and the breakage frequency indicated by said breakage-frequency signal, the apparatus being a ring spinning machine comprised of a winding spindle and a cooperating ring and ring traveller for guiding the elongated element onto a holding member mounted on the winding spindle, and wherein said means for determining the number of element breakages comprises means operative for monitoring travel of the elongated element indirectly by monitoring the operation of the ring traveller.

4,043,108

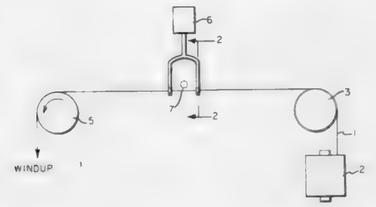
YARN PROCESS

Cecil Everett Reese, Kinston, N.C., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 16, 1976, Ser. No. 723,959

Int. Cl.[2] D02G *3/24;* **D02J** *1/06;* **D01D** *5/20*

U.S. Cl. 57—157 R **7 Claims**



1. In the process of producing spin-oriented polyester feed yarn for draw-texturing processes, the yarn treatment for providing a programmed distribution of deeper-dyeing sections along false-twist textured yarn resulting from draw-texturing the treated feed yarn; which comprises passing spin-oriented polyester yarn in a substantially undrawn condition past a source of heat and intermittently heating the yarn to provide a programmed distribution of heat-treated sections corresponding to the desired distribution of deeper-dyeing sections, said heating being sufficient for the heat-treated sections to have a force to draw value which is at least 1.12 times the force to draw of adjacent sections along the yarn and a density at least 0.005 gram per cubic centimeter greater than the density of the adjacent sections.

4,043,109

ELECTRONIC TIMEPIECE

Hitomi Numabe, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

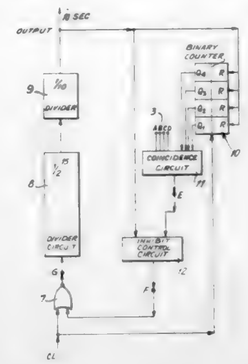
Filed Jan. 11, 1974, Ser. No. 432,719

Claims priority, application Japan, Jan. 11, 1973, 48-5532

Int. Cl.[2] G04C *3/00*

U.S. Cl. 58—23 R **9 Claims**

1. In an electronic wristwatch having a quartz crystal oscillator circuit adapted to oscillate at a predetermined frequency and produce a high frequency time standard signal, divider circuit means including a multi-stage divider chain for producing low frequency timekeeping signals in response to said high frequency time standard signal and means for the display of time in response to said timekeeping signals, the improvement which comprises said oscillator circuit including means for compensating for changes in temperature to render said high frequency time standard signal produced thereby substantially unaffected by temperature changes; and frequency regulating means coupled to said divider circuit means intermediate said oscillator circuit and divider circuit means for selectively regulating the frequency of said timekeeping signals by effecting continuous adjustment of said high frequency signal without changing the frequency at which said oscillator circuit oscillates, said divider frequency regulating means including inhibit means for inhibiting at least one period of said high frequency signal, said inhibit means including switch means for selecting a coincident count, said inhibit means further including a multi-bit binary counter having one bit for each setting switch means, means for applying said high frequency signal to be inhibited to said binary counter for counting thereby, means for applying a low frequency signal from said divider chain to



said binary counter for resetting same, coincident circuit means for receiving the output of said binary counter and the coincidence count from said setting switch means and in response to the coincident states thereof, producing an output pulse; and inhibit circuit means for receiving the output pulse of said coincident circuit means and the low frequency signal and in response thereto inhibiting the transmission to the next divider stage of a number of periods of the high frequency signal corresponding to said coincidence count.

4,043,110

ELECTRONIC TIMEPIECE BATTERY-POTENTIAL DETECTING CIRCUIT

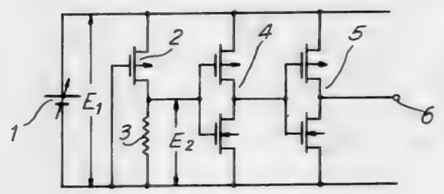
Hiroyuki Chihara, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 2, 1975, Ser. No. 609,459

Claims priority, application Japan, Aug. 30, 1974, 49-99576

Int. Cl.[2] G04C *3/00;* **G08B** *21/00*

U.S. Cl. 58—23 BA **38 Claims**



1. In an electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider means for producing a low frequency timekeeping signal in response to said high frequency time standard signal, and display means for displaying time in response to the said timekeeping signal, the improvement comprising a DC power source for energizing said oscillator, divider and display means, said power source means being adapted to produce an effective voltage for such energizing, and electronic switching means for detecting the effective voltage produced by said power source means, said electronic switching means having a predetermined threshold voltage including a control electrode

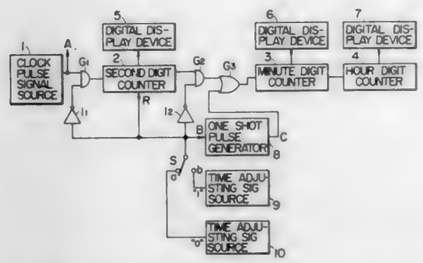
coupled to said power source for detecting the effective voltage thereof, and two further electrodes adapted to define a closed current circuit in response to said control electrode being referenced above a predetermined detecting voltage, said two further electrodes defining an open circuit in response to said control electrode detecting a drop in the effective potential of said power source below said predetermined detecting voltage, said control electrode being referenced to one of a voltage above and below said predetermined threshold voltage to define a current temperature coefficient of zero when the control electrode is referenced to a voltage above said predetermined detecting voltage.

4,043,111

INDICATED TIME-CORRECTING DEVICE OF DIGITAL DISPLAY TIMEPIECE

Minoru Fujita, Kodaira, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 10, 1975, Ser. No. 621,559
Claims priority, application Japan, Oct. 18, 1974, 49-119356
Int. Cl.[2] G04C *3/00*
U.S. Cl. 58—23 R **8 Claims**



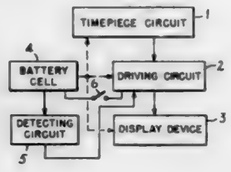
1. A digital display timepiece comprising a clock pulse signal source, counter means for counting the output pulses of said clock pulse signal source including a second counter, a minute counter and an hour counter connected in series, display means for digitally displaying the state of said counter means, and indicated time-correcting means for adjusting the state of said counter means including first means for disconnecting the output of said second counter from the input of said minute counter, second means for incrementing said minute counter, and selectively operable third means for simultaneously operating said first and second means.

4,043,112

ELECTRONIC TIMEPIECE HAVING A BATTERY VOLTAGE MONITOR

Kojiro Tanaka, Yachiyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 28, 1976, Ser. No. 653,256
Claims priority, application Japan, Jan. 29, 1975, 50-13109[U]
Int. Cl.[2] G04B *47/06;* **G04C** *3/00*
U.S. Cl. 58—23 BA **3 Claims**



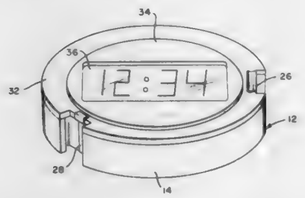
1. In an electronic timepiece of the type including a timepiece circuit for developing time signals representative of time; a driving circuit receptive of the time signals for developing display driving signals in response thereto; a time display receptive of the display driving signals for displaying, in response to the display driving signals, time represented by the time signals; and a battery for energizing the timepiece circuit, the driving circuit, and the display circuit; the improvement which comprises a battery voltage level monitor, for indicating when the voltage of the battery falls below a certain value, and which comprises: a voltage detector operative to detect the voltage of said battery and to develop a detector signal when the battery voltage is less than said certain value, a display restoring switch manually operable to ON and OFF conditions from an exterior of the timepiece, and wherein said driving circuit includes display signal control means responsive to the setting of said display restoring switch and the detector signal for interrupting the display driving signals applied to said display in response to the detector signal in order to de-energize said display and extinguish the time displayed to indicate that the battery voltage is below said certain level, and for applying said display driving signals to said display under control of said display restoring switch even in the presence of said detector signal thereby to enable the display of time after a low battery voltage condition has been detected.

4,043,113

ELECTRIC WATCH BATTERY RETAINER

William D. Hart, Santa Ana, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Mar. 25, 1976, Ser. No. 670,292
Int. Cl.[2] G04C *3/00;* **G04B** *19/30*
U.S. Cl. 58—23 BA **9 Claims**



1. An electric watch module, said module being comprised of a battery block having at least one battery opening therein, mounting means adjacent to said battery block for carrying horological electronics and for carrying a display for displaying horological information, the improvement comprising:

first and second hook recesses in said module for engagement with respect to said module; and

a battery retaining spring extending over said battery opening in said battery block and having first and second hooks thereon resiliently snapped into and engaged in said hook recesses for releasably resiliently holding a battery in said battery opening in said battery block.

4,043,114

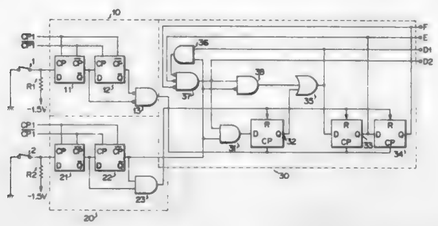
CIRCUITS FOR SETTING THE DISPLAY MODE AND THE CORRECTION MODE OF ELECTRONIC TIMEPIECES

Tsuneo Takase, and Tetsuo Yamaguchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 20, 1975, Ser. No. 633,833
Claims priority, application Japan, Nov. 21, 1974, 49-133132
Int. Cl.[2] G04B *11/24, 19/30, 27/00*
U.S. Cl. 58—23 R **8 Claims**

1. A circuit for setting the display mode and the correction mode of an electronic timepiece comprising first and second switches each having first and second switching positions; a first signal generating circuit which generates a pulse signal each time the first switch is set to the second position; a second signal generating circuit responsive to the switching positions

of the second switch for producing an output signal having binary logical levels at a first output terminal and for producing a pulse signal at a second output terminal each time the second switch is set to the first position; and a ring counter circuit comprising a plurality of serially connected shift registers which are driven by the pulse signal from the first signal generating circuit and cleared by the pulse signal from the second output terminal of the second signal generating circuit and a bypass circuit which is connected across at least one of



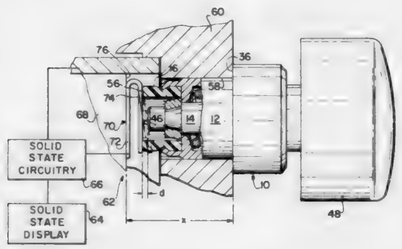
the serially connected shift registers and which is made nonactive depending on the binary level of the output signal from the first output terminal of the second signal generating circuit so that the ring counter circuit is operated in different modes according to the switching position of the second switch, and the control signals for time display and time correction are determined by the output signal from the first output terminal of the second signal generating circuit and from at least one of the output terminals of the ring counter circuit.

4,043,115

PUSH BUTTON ASSEMBLY AND ELECTRONIC WATCH INCLUDING THE SAME

Maurice Cyril Bryceland, Dover, N.J., assignor to Waldman Corporation, Parsippany, N.J.

Filed Sept. 29, 1975, Ser. No. 617,589
Int. Cl.[2] G04B *19/30;* **H01H** *3/12*
U.S. Cl. 58—50 R **14 Claims**



14. A digital watch comprising:

a. a metallic case having a display and an apertured wall;

b. a push button assembly including:

1. a metallic body mounted in the aperture in electrical contact with the case and having an axial bore colinear with the aperture;

2. a metallic stem slideable in the bore, the length of the stem being not less than the length of the body;

3. a spring member urging the stem rearwardly to a rear terminal position;

4. a head on the rearward end of the stem for selectively forwardly displacing the stem against the action of the spring member; and

5. an insulating locator sleeve mounted on the forward end of the body in coaxial relationship with the stem, the sleeve having a forward free end axially spaced forwardly of the forward end of the stem a fixed distance when the latter is in its rear terminal position, the forward end of the stem being positioned within the locator sleeve in said rear terminal position; and

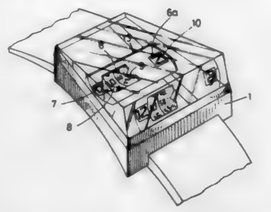
c. a module within the case containing electronic circuitry for driving said display and having a yieldable conductor in resilient engagement with the forward free end of the locator sleeve of the push button assembly.

4,043,116

TIMEPIECE COMPRISING A FLAT DISPLAY DEVICE EXPOSED THROUGH AN OPENING IN A CASE

Hans Schläppi, Bettlach, Switzerland, assignor to Metallprodukte A.G. Grenchen, Grenchen, Switzerland

Filed Jan. 29, 1976, Ser. No. 653,367
Int. Cl.[2] G04B *19/06, 37/00, 39/00*
U.S. Cl. 58—88 R **8 Claims**



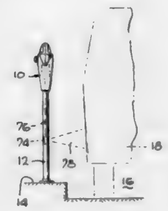
1. A timepiece comprising a case having an opening therein, an operating assembly disposed within said case, a flat display device exposed through said opening, and a crystal closing off said opening, wherein said crystal comprises two partially reflective surfaces enclosing between them an angle of less than 45°, and a third surface through which said display device is visible by means of a double reflection of light from said two partially reflective surfaces.

4,043,117

SELF-CANCELLING PARKING METER

Michele Maresca, Pasadena, and Thomas Ross Welch, Los Angeles, both of Calif., assignors to Michele Maresca, Pasadena and Thomas Ross Welch, Los Angeles, both of, Calif., part interest to each

Filed Oct. 8, 1975, Ser. No. 620,762
Int. Cl.[2] G07C *1/30;* **G08G** *1/14*
U.S. Cl. 58—142 **5 Claims**



1. A self-cancelling parking meter comprising:

a reset shaft in said meter;

a coin acceptor for advancing said reset shaft in accordance with the coinage received by said coin acceptor;

a timer connected through a reset clutch to said reset shaft, said timer being for returning said reset shaft at a timed rate;

reset means connected to open said reset clutch for resetting said reset shaft to its nonadvanced, zero position independently of said timer when the need for resetting is sensed, said reset means comprising a movable latch for maintaining said reset clutch engaged and including a spring for urging said reset clutch to a disengaged position when said latch is actuated to permit clutch disengagement;

a cam mounted on said reset shaft and a cam follower engag-

ing said cam, said clutch disengagement spring being stressed by said cam when said reset shaft is in an advanced position and being less stressed by said cam when said reset shaft is in its zero position; and

a clutch setting spring stressed by said cam follower to engage said reset clutch when said reset shaft is in its zero position.

4,043,118

PENDULUM DEVICE FOR BATTERY-POWERED CLOCKWORK MECHANISM

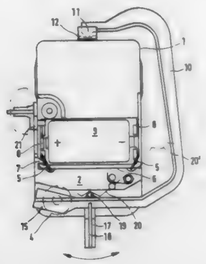
Albrecht Haag, Dauchingen, and Roland Siefert, Bad Durrheim, both of Germany, assignors to Kienzle Uhrenfabriken GmbH, Germany

Filed Nov. 6, 1975, Ser. No. 629,434

Claims priority, application Germany, Nov. 27, 1974, 7439474[U]

Int. Cl.[2] G04B *37/00, 17/00, 37/12*

U.S. Cl. 58—152 R **4 Claims**



1. An electrically operated clockwork mechanism having a pendulum comprising:

a first housing comprising a battery supporting means and time-keeping means energized by a battery,

a second housing detachably connected to said first housing and including a pendulum, a permanent magnet supported on the pendulum and a fixed electrical coil means,

said pendulum including a pendulum clip which is U-shaped and embraces within its open mouth the assembled combination of said first and second housings, with a first leg thereof supported pivotally adjacent one end thereof on an upper surface of said first housing and with the second leg thereof underlying said second housing which is positioned below said first housing,

and connecting means effective in response to the connection of said second housing to said first housing to connect said battery to said electrical coil,

said time-keeping means on said first housing operating independently of said pendulum.

4,043,119

ACCELERATION AND SPEED CONTROL CIRCUIT FOR JET ENGINE ACCESSORY EQUIPMENT

Dennis T. Faulkner, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Feb. 20, 1976, Ser. No. 660,198

Int. Cl.[2] F02C *7/26, 7/32*

U.S. Cl. 60—39.14 **21 Claims**

1. In a jet aircraft having at least one jet engine, a starter for starting the engines, and means for connecting the starter to the jet engine, a system for applying power to accessory equipment associated with a selected one of the jet engines from the starter comprising:

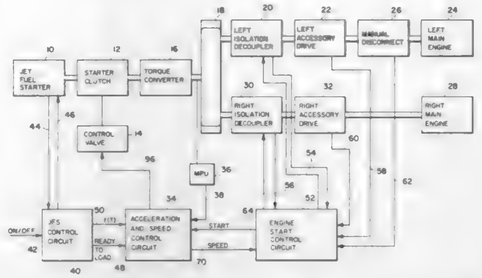
means for disconnecting the accessory equipment from the selected engine in order to permit the accessory equipment to operate independently of the selected engine;

means for controlling the starter;

means for connecting the starter to the accessory equipment;

means for measuring the speed of rotation of the accessory equipment;

means, responsive to said starter controlling means and said speed measuring means, for limiting the acceleration of



said accessory equipment when it is connected to the starter and disconnected from the engine wherein said acceleration limiting means includes an electronic circuit for generating a reference signal representing a predetermined rate of acceleration.

4,043,120

STARTING ARRANGEMENT FOR COMBINED AIR AND GAS TURBINE POWER PLANT

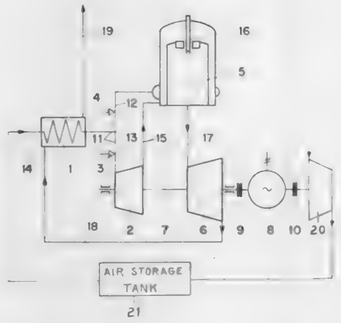
Hans Hoffeins, Viernheim, Germany, assignor to Brown Boveri-Sulzer Turbomaschinen AG, Zurich, Switzerland

Continuation of Ser. No. 514,102, Oct. 11, 1974, abandoned. This application May 28, 1976, Ser. No. 690,899

Claims priority, application Germany, Oct. 25, 1973, 2353493

Int. Cl.[2] F02C *7/26, 3/18*

U.S. Cl. 60—39.14 **1 Claim**



1. A gas turbine plant of the air storage type for generating electrical power to satisfy peak load demand comprising: high and low pressure stage turbines arranged on a common shaft; a compressed air storage tank, a compressor for supplying said storage tank with compressed air, a dynamo-electric machine selectively operable as a motor receiving power for driving said compressor and as a generator driven by said turbines for delivering power to satisfy peak load demand, a heat exchanger located in the flow path of the compressed air from said storage tank for heating said compressed air in advance of its delivery to said turbines, said heat exchanger being supplied with exhaust heat from the outlet from said low pressure stage turbine, first pipe means including a first valve means therein for connecting the air outlet from said heat exchanger to the high pressure stage turbine, a heating device for the compressed air interposed in the air flow path between the outlet from said high pressure stage turbine and the inlet to said low pressure stage turbine, second pipe means including a second valve means therein for connecting the air outlet from said heat

exchanger directly to the air inlet to said heating device, said first valve means being initially completely closed and said second valve means being initially completely open during a start-up of said plant whereby only said low pressure turbine stage is charged with compressed air flowing through the intially cold heat exchanger and said second valve means and thence through said heating device, and said first and second valve means being thereafter actuated to completely open and closed positions respectively after said heat exchanger has been heated to between 50 and 100% of its mean operating temperature whereby the compressed air now heated therein is passed through said first valve means and said high pressure turbine stage prior to delivery to said heating device for re-heating and delivery to said low pressure turbine stage.

4,043,121

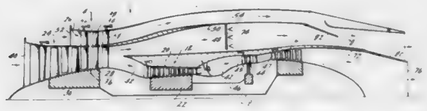
TWO-SPOOL VARIABLE CYCLE ENGINE

William W. Thomas, and Elmore V. Sprunger, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Continuation of Ser. No. 538,167, Jan. 2, 1975, abandoned. This application Apr. 22, 1976, Ser. No. 679,097

Int. Cl.[2] F02K *3/06*

U.S. Cl. 60—204 **14 Claims**



1. A variable cycle gas turbofan engine comprising:

a core engine including a compressor, a combustor and a core turbine;

a stage or rotatable fan blades for pressurizing a motive fluid, a first portion of which enters said core engine and is discharged therefrom in a hot gas stream, and a second portion of which passes as a bypass stream through a first substantially annular duct generally surrounding said core engine;

auxiliary compression means comprising a radial extension of said fan blades for pressurizing an auxiliary motive fluid stream;

means for modulating the flow rate of the auxiliary fluid stream between a high flow rate during a subsonic operating mode and an essentially zero flow rate during a supersonic operating mode;

fan turbine means driven by said hot gas stream for rotationally driving both said fan blades and said auxiliary compression means in the subsonic and supersonic operating modes;

auxiliary combustion means to which fuel and the bypass stream are delivered for combustion therein during the supersonic operating mode; and

first variable area nozzle means for exhausting the hot gas stream.

4,043,122

FLUID CAM ASSEMBLY

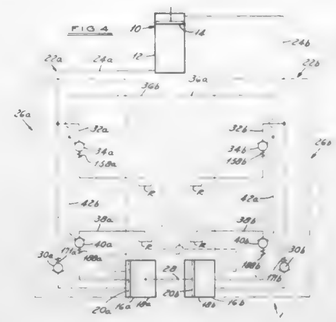
James T. Graham, Birmingham, Mich., assignor to Android International, Inc., Birmingham, Mich.

Filed Apr. 2, 1976, Ser. No. 673,289

Int. Cl.[2] F15B *13/09*

U.S. Cl. 60—375 **17 Claims**

1. Means for imparting alternating motion to a hydraulic motor assembly comprising a first hydraulic system for driving said motor assembly in one direction and a second hydraulic system for driving said motor assembly in the opposite direction, a reservoir for hydraulic fluid, each system having a pump assembly, each system having a suction line from said reservoir to its pump assembly, each system having a hydraulic pressure line from its pump assembly to said motor assembly, each system having a discharge line from said motor assembly to said reservoir, the pressure and discharge lines of one system communicating with one side of said motor assembly and the pressure and discharge lines of the other system communicating with the other side thereof, means for operating said pump assemblies alternately to deliver pressure fluid to one side of



said motor assembly and then to the other side thereof to drive said motor assembly in opposite directions, a valve in each suction line permitting flow only in a direction away from said reservoir, a normally closed valve in each discharge line, and means responsive to the build up of pressure in the pump assembly of each system for opening the valve in the discharge line of the other system.

4,043,123

NEGATIVE PRESSURE GENERATING SYSTEM FOR INTERNAL COMBUSTION ENGINE POWERED VEHICLES

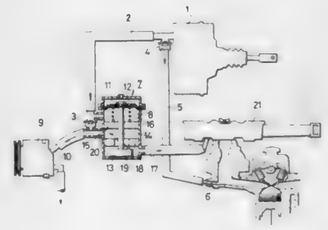
Hiromu Konishi, Toyota; Mitsuyuki Horie, Susono, and Tadahide Toda, Mishima, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 21, 1976, Ser. No. 688,536

Claims priority, application Japan, Dec. 9, 1975, 50-146702; Dec. 10, 1975, 50-146306; Dec. 19, 1975, 50-152154

Int. Cl.[2] F15B *3/00*

U.S. Cl. 60—397 **21 Claims**



1. A negative pressure generating system for an internal combustion engine powered vehicle, comprising:

a brake booster incorporated in the vehicle and adapted to cause an increase in braking power;

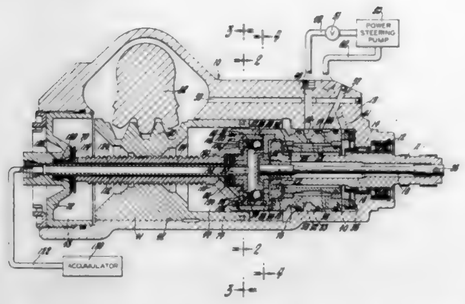
an air cleaner for cleaning air to be supplied to the internal combustion engine;

an air pump which receives air from said air cleaner and delivers the air to said internal combustion engine; and

a selector valve disposed among said brake booster, said air cleaner and said air pump and operative in response to a booster pressure in said brake booster on receiving said pressure as an input signal, thereby interrupting air communication between said air pump and said air cleaner,

with the result that the negative pressure arising on the suction side of said air pump is used as a negative pressure source for operating said brake booster.

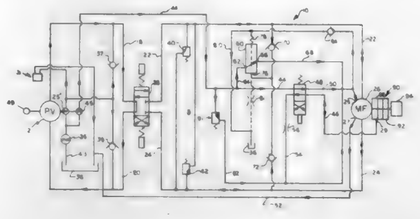
4,043,124
POWER STEERING GEAR
Thomas W. Weisgerber, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 29, 1976, Ser. No. 671,026
Int. Cl.[2] B62D *5/08*
U.S. Cl. 60—404 **5 Claims**



1. A power steering gear for a vehicle comprising a housing, rotatable input means rotatably mounted in said housing, output means rotatably mounted in said housing and extending outwardly therefrom, piston means mounted for sliding movement in said housing and drivingly connected to said output means for rotating said output means, threaded means drivingly connecting said input means to said piston means to permit said input means to move said piston means in said housing, said piston means dividing said housing into first and second fluid pressure chambers, a first source of fluid pressure, first valve means in said housing operatively connected to said first source of fluid pressure and actuated by said input means to selectively charge said first and second chambers to provide the hydraulically powered movement of said piston means and the resultant turning of said output means, exhaust passage means connecting said first valve means to said first source of fluid pressure, an auxiliary source of fluid pressure, second valve means in said housing and axially aligned with said first valve means drivingly connected to said first valve means for controlling the flow of pressure fluid from said auxiliary source to said fluid pressure chambers, said second valve means being hydraulically connected to said auxiliary source of fluid pressure and actuated by said input means when said first valve means is moved to a predetermined position in response to lowered pressure from said first source to selectively charge said chambers to provide for the auxiliary powered movement of said piston means and the resultant turning of said output means.

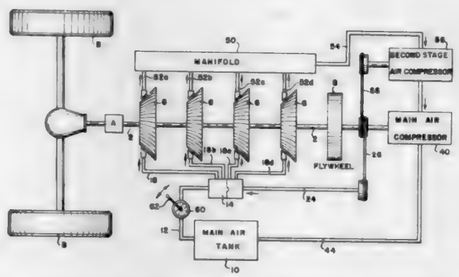
4,043,125
FLUID SYSTEM
Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich. 48010
Filed July 19, 1976, Ser. No. 706,584
Int. Cl.[2] F15B *20/00*
U.S. Cl. 60—406 **5 Claims**

1. A fluid system comprising:
a fluid pump having an outlet;
a fluid motor having an inlet;
a winch driven by said fluid motor;
conduit means fluidly connecting said pump outlet with said motor inlet, said winch having a pressure responsive brake normally set to brake said winch and prevent the same from operating, said brake being operable upon communication with a source of pressure to release said brake and permit said winch to operate;
a source of fluid pressure separate from said fluid pump;
a source of low-pressure fluid;
first valve means operable upon actuation to selectively connect said brake to either said source of fluid pressure or to said source of low-pressure fluid for selectively setting and releasing said brake; and



second valve means operable in response to a predetermined drop in the pressure of the fluid in said conduit means for connecting said source of fluid pressure to said source of low pressure whereby said brake is set irrespective of the position of said first valve means.

4,043,126
TURBINE ENGINE FOR AUTOMOTIVE VEHICLES
Jaime Rios Santos, Calle Jose H. Aldrey, 1442, Santiago Iglesias, Rio Piedras, P.R. 00921
Filed June 29, 1976, Ser. No. 700,810
Int. Cl.[2] F15B *13/07*
U.S. Cl. 60—407 **2 Claims**

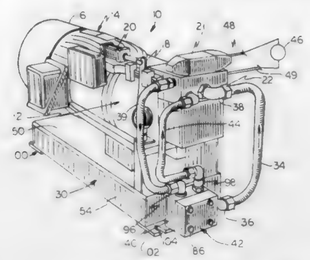


1. A turbine engine for an automotive vehicle, comprising a rotatable drive shaft, a plurality of turbine rotors mounted on the shaft, a main compressed air tank, a compressor driven by the drive shaft and connected to supply compressed air to the main air tank, a distributor valve, means for supplying compressed air from the main tank to the distributor valve, connections for transmitting compressed air from the distributor valve to the drive side of each rotor, means operated by the drive shaft for continuously operating the distributor valve to cause compressed air to flow to the rotors in sequence, a manifold, connections between the delivery side of each rotor and the manifold, and a connection for supplying second stage compressed air from the manifold to the main air compressor.

4,043,127
RESERVOIR HOUSING
Philip A. Kubik, 6809 Spruce Drive, Birmingham, Mich. 48010
Division of Ser. No. 592,414, July 2, 1975, Pat. No. 3,973,189.
This application Mar. 11, 1976, Ser. No. 666,084
Int. Cl.[2] F15B *15/18, 21/04*
U.S. Cl. 60—453 **1 Claim**

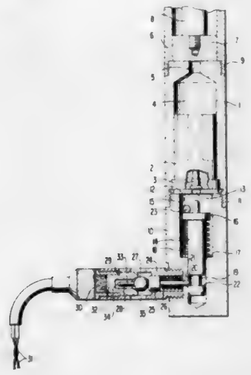
1. A hydrostatic drive unit of the type adapted to be connected in a closed-loop fashion to a fluid motor, said drive comprising:
a reservoir housing having an upper support surface;

a pump;
conduit means for connecting said pump to said motor in a closed-loop fashion;
fastening means for attaching said pump to said upper surface such that said housing supports said pump;
said reservoir housing having an enclosed chamber beneath said support surface, said chamber defining a reservoir for storing fluid at a low pressure;
means for communicating the fluid in said chamber to said closed-loop conduit means; and
a high-pressure filter for filtering fluid in said closed-loop conduit means as said fluid is returned to the inlet of said



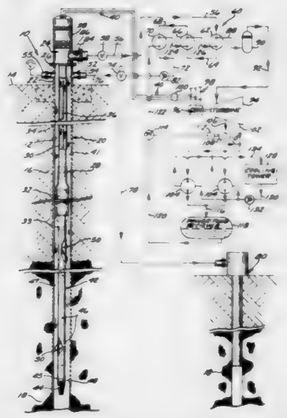
pump, said reservoir housing storing said high-pressure filter beneath said housing support surface; said housing having a lower surface that is connected to the ends of said upper surface by side walls and end walls which completely enclose said housing in a fluid-type manner and which define said enclosed chamber; said high-pressure filter comprising a filter housing and a filter element disposed therein, said housing of said fluid filter being disposed within said enclosed chamber, whereby said high-pressure filter is stored directly within said low-pressure fluid chamber and said filter element is not in direct fluid communication with said enclosed chamber.

4,043,128
COMPRESSED-GAS CARTRIDGE FOR FIRE PROTECTION PURPOSES
Hellmut Bendler, Stein, and Anton Bretfeld, Nurnberg, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany
Filed Feb. 27, 1976, Ser. No. 662,290
Claims priority, application Germany, Mar. 5, 1975, 2509496
Int. Cl.[2] F01B *29/08;* **F24F** *7/02;* **L05F** *15/20;* **F02N** *13/00*
U.S. Cl. 60—636 **29 Claims**



1. Apparatus for fire protection purposes comprising compressed-gas cartridge means having thermally responsive triggering means, said triggering means including striker means for forcibly being driven toward said compressed-gas cartridge means, locking means for maintaining said striker means at a spacing from said compressed-gas cartridge means, said locking means having a first end portion engaging a portion of said striker means for maintaining said striker means at the spaced position, first biasing means for biasing a second end portion of said locking means against a blocking means, said blocking means being disposed between said second end portion of said locking means and an abutment member, said blocking means being responsive to the exceeding of a predetermined temperature for enabling displacement of said locking means under the force of said first biasing means out of engagement with said striker means thereby permitting movement of said striker means toward said compressed-gas cartridge means.

4,043,129
HIGH TEMPERATURE GEOTHERMAL ENERGY SYSTEM
Barkman C. McCabe, Los Angeles, and Edward Zajac, Hollywood, both of Calif., assignors to Magma Energy, Inc., Los Angeles, Calif.
Filed May 5, 1976, Ser. No. 683,506
Int. Cl.[2] F03G *7/04*
U.S. Cl. 60—641 **90 Claims**



1. The method of obtaining energy from a well which provides access to an underground source of high temperature geothermal liquid, comprising the steps of:
introducing cooler liquid into said well,
establishing a column of said cooler liquid in the well above said high temperature liquid of sufficient height to prevent flashing of said high temperature liquid into vapor,
mixing said cooler liquid with said high temperature liquid in the well to produce a mixture having a temperature intermediate the temperatures of said high temperature liquid and said cooler liquid, and
conducting a stream of said mixture from the well.

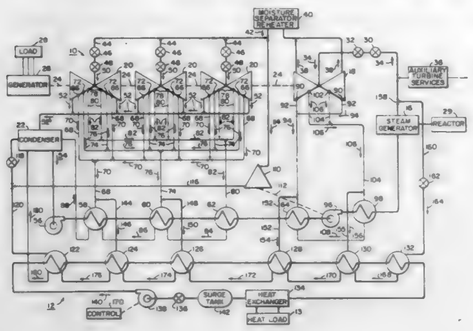
4,043,130
TURBINE GENERATOR CYCLE FOR PROVISION OF HEAT TO AN EXTERNAL HEAT LOAD
Robert O. Brown, and Albert E. Becker, both of Media, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 548,710, Feb. 10, 1975, abandoned.
This application June 25, 1976, Ser. No. 699,771
Int. Cl.[2] F01K *23/02, 3/00*
U.S. Cl. 60—655 **8 Claims**

1. A steam turbine power plant comprising, in series, a steam generator element, a high pressure turbine element, a low pressure turbine element, a condenser element, a high pressure feedwater heater extracting steam from a predetermined location within said high pressure turbine element, a low pressure feedwater heater extracting steam from a predetermined loca-

tion within said low pressure turbine element, said steam extracted from said high pressure turbine having associated therewith a heating capacity different from the heating capacity of said steam extracted from said low pressure turbine element,

a closed loop flow arrangement disposed only in heat transfer relationship with said power plant to extract heat therefrom to supply a heat load, said flow arrangement confining and guiding a heat transfer medium therewithin,

a first and a second heater element connected within said flow arrangement, said first heater element extracting heat from said power plant by extracting steam from said predetermined location within said low pressure turbine element and disposed in parallel with said low pressure feedwater



heater, said second heater element extracting heat from said power plant by extracting steam from said predetermined location within said high pressure turbine element and disposed in parallel with said high pressure feedwater heater, said heater elements transferring said extracted heat to said heat transfer medium,

a heat exchange element connected within said flow arrangement for exchanging said extracted heat in said heat transfer medium to said heat load, and,

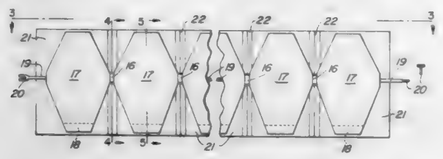
means for controlling the rate of flow of said heat transfer medium within said closed loop flow arrangement, the magnitude of said heat extracted from said power plant being directly controlled by said flow rate of said heat transfer medium.

4,043,131

OIL SLICK RETAINING BOOM FOR OFF-SHORE OIL WELLS

Byron J. Sessions, 4939 Havasu Way, Salt Lake City, Utah 84120

Filed Apr. 9, 1976, Ser. No. 675,253
Int. Cl.[2] E02B *15/04*
U.S. Cl. 61—1 F **8 Claims**



1. An oil slick-retaining boom structure for disposition upon a body of water comprising in combination a plurality of floats moveably connected together through cable means extending through the interior of said floats, each float comprising in combination:

an elongate water-tight housing for floating in a body of water;

weights attached to one end of said housing for retaining said weighted end downward in the body of water;

a pair of apertures disposed respectively on either lateral side of said housing through which said connecting cable means extends; and

sheet means interconnecting said floats to be held substantially perpendicular to the water surface said sheet means being constructed of metal and having hinged pleats disposed between adjacent floats to permit lateral movement of said sheet means.

4,043,132

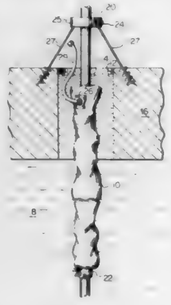
METHOD AND APPARATUS FOR PREVENTING FLUID SOLIDIFICATION IN AN APERTURE

Joseph E. Zupanick, Richardson, Tex., assignor to Sun Oil Company Limited, Toronto, Canada

Filed July 9, 1976, Ser. No. 703,865
Int. Cl.[2] E02B *9/02*
U.S. Cl. 61—1 R **13 Claims**

1. Apparatus for displacing a fluid within a cavity and preventing the solidification thereof around a removable structure disposed within the cavity, said apparatus comprising:

an inflatable bladder positioned within the cavity, said bladder having a passage therethrough adapted to encompass the removable structure, said bladder being further adapted for inflation to a size and shape within the cavity for substantially filling the void thereof;



means for inflating said bladder into a fluid displacement configuration to substantially displace fluid thereto disposed within the cavity;

means for retaining said bladder within the cavity for maintaining the fluid displacement configuration therethrough and preventing the formation of solidified fluid therein; and

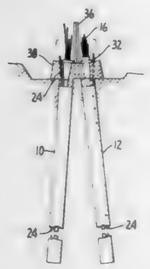
means for deflating said bladder within the cavity to permit the retrieval of said bladder therefrom.

4,043,133

STRUCTURE AND METHOD OF CONSTRUCTING AND TEST-LOADING PILE ANCHORED FOUNDATIONS

Lawrence R. Yegge, 139 Via de Tesoros, Los Gatos, Calif. 95030

Filed July 21, 1976, Ser. No. 707,184
Int. Cl.[2] E02D *5/74*
U.S. Cl. 61—50 **7 Claims**



1. A method of making a pre-tested anchored foundation structure in which the anchor members carry compressive loads and resist upward loads including the steps of:

boring at least one pile hole into the sub-surface soil;

inserting into each pile hole a sheath containing one or more tendons, said tendons extending from the lower end of said sheath into the bottom end of said pile hole, and extending from the top end of said sheath above the surface of the soil;

forming a pile by pouring a concrete mixture into said hole to the exterior of said sheath, whereby the tendons extending from the lower end of said sheath become anchored to the bottom end of said pile but remain free for movement within said sheath;

mounting a tensioning jack to a jacking pad supported on the soil surface out of bearing engagement with the pile to position the jack in spaced relationship above the top of said pile, and connecting said jack to said tendons extending from the top end of said sheath; and

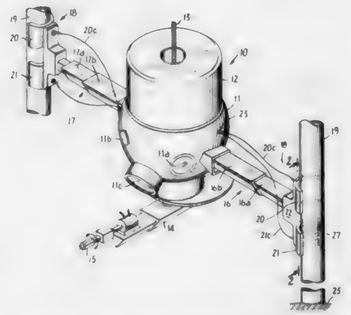
actuating said tensioning jack to apply a tension to said tendons, whereby said pile and its surrounding soil is pre-tested to withstand a measured force thus applied, and whereby the soil beneath the bottom surface of said jacking pad is loaded.

4,043,134

GUIDE ARM CLAMP MECHANISM FOR SUBMERGIBLE CHAMBER

Burton Hoster Mason, Box 54, Covington, La. 70433

Filed May 13, 1976, Ser. No. 686,088
Int. Cl.[2] B63C *11/40*
U.S. Cl. 61—69 R **16 Claims**



1. A guide arm clamp for a submergible chamber comprising a flange, means to mount said flange to a work arm of the submergible chamber, said flange being formed so as to be engageable, when submerged, with a submerged, positioned guide bar, and means on said flange to permit sliding engagement with the guide bar in a first mode, and means on said flange to hold the clamp to the guide bar to prevent sliding in a second mode further comprising roller means mounted to the flange and extending away from the flange surface so as to contact the guide bar, means to retract the roller means in the second mode, whereby in the first mode the roller means slidingly engages the guide bar and in a second mode the flange contacts the guide bar.

4,043,135

TRENCH CUTTER FOR EXCAVATING TRENCHES AND FOR LAYING WATER PIPES AND DRAINAGE PIPES

Klaus Gerd Hoes, Oberlethe, and Gerold Wöbken, Elsfleth, both of Germany, assignors to Firma Klaus-Gerd Hoes, Oldenburg, Germany

Filed June 3, 1976, Ser. No. 692,252
Claims priority, application Germany, Nov. 12, 1975, 2550735
Int. Cl.[2] E02F *5/10, 5/22*
U.S. Cl. 61—72.5 **4 Claims**

1. A trench cutter for excavating trenches and for laying water pipes and drainage pipes into the trenches, said cutter having an output drive shaft comprising:

a travelling cutter chain for digging an excavation;

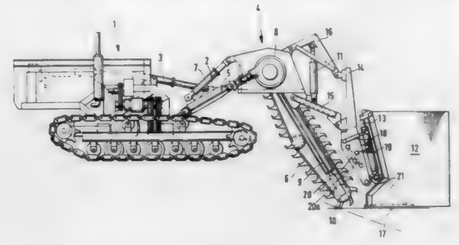
a jib supporting said cutter chain, said jib being pivotable in a vertical plane;

a pipe laying duct for entering the excavation, and sliding on the bottom of the excavated trench, said pipe laying duct being pivotably connected to the jib;

a duct guide arm extending parallel to the back surface of said pipe laying duct for supporting the pipe laying duct vertically so that it faces said cutter chain;

a plurality of parallel guide rockers having one end pivotably connected to said duct guide arm, said rockers being connected at their opposite end to said output drive shaft of the trench cutter, the drive shaft being pivotably connected to the free end of said jib; and

at least one work cylinder, and guide rod linkages connected thereto for adjusting the angle of inclination between the



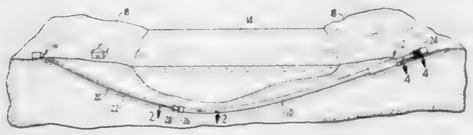
cutter chain and the duct wherein a change of the clearance between said duct and cutter chain causes said duct to describe a curved path so that the lower edge of said duct is substantially tangential to the outer turning radius of the lower cutter chain.

4,043,136

SYSTEM AND METHOD FOR INSTALLING PRODUCTION CASINGS

Martin D. Cherrington, Sacramento, Calif., assignor to Tidril Corporation, Sacramento, Calif.

Filed July 14, 1975, Ser. No. 595,830
Int. Cl.[2] F16L *1/02;* **E02D** *29/10*
U.S. Cl. 61—72.7 **14 Claims**



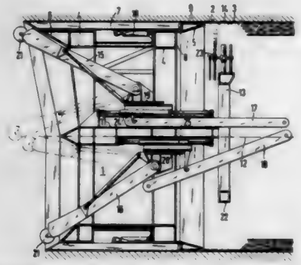
1. A method of emplacing a cylindrical casing beneath an obstacle along an underground inverted arcuate path between first and second ground level locations along the corresponding path of a pilot hole, said method comprising the steps of: placing a pilot string along an invert arcuate path under said obstacle; reaming an annulus about the pilot string with a reaming apparatus to a pre-selected diameter greater than the diameter of said casing, thereby to establish a reamed pilot hole including an annular void in the ground; introducing a casing behind said reamed pilot hole; providing a substantially sealing contact between the outside surface of said casing and the inside surface of said circumscribing ground of said reamed pilot hole at a location between the reaming site and the annular void; introducing a transport fluid at the reaming site; entraining the cuttings from said reaming step in the transport fluid; advancing said casing into and along said reamed pilot

hole in following relation to said reaming apparatus along the inverted arcuate path; and impelling transport fluid and entrained cuttings into the leading portion of said casing and through said casing toward the trailing portion thereof to remove said transport fluid and entrained cuttings, whereby cuttings are prevented from settling in the case-circumscribing annular void between the outside surface of said casing and the inside surface of said circumscribing ground of said reamed pilot hole.

4,043,137
APPARATUS FOR AND A METHOD OF CONSTRUCTING A TUNNEL

Hans Jütte, Dortmund-Brechten; Siegmund H.F.L.M. Babendererde, Bad Vilbel; Adolf Foik, Munich, and Reinhard E. J. Bokemeyer, Offenbach, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia and Hochtief AG, Frankfurt, both of Germany

Filed July 2, 1975, Ser. No. 592,701
Claims priority, application Germany,
Int. Cl.² E01G *3/02*
U.S. Cl. 61—85 **14 Claims**



1. An apparatus for constructing a tunnel; said apparatus comprising a drive shield composed of a plurality of elongate cutter plank members arranged side-by-side in parallel configuration and forming a cylindrical array extending generally around the axis of the tunnel in contact with the tunnel wall, a frame for supporting and guiding the cutter plank members for longitudinal displacement, means for causing relative displacement between the frame and the members in the direction of the axis of the tunnel to effect driving of the tunnel a movable rear shield positioned rearwardly of said frame to support the tunnel wall rearwardly of the frame relative to the direction of tunnel driving and at a distance with respect to said frame, with sealing of said tunnel wall occurring behind the rear shield and wherein said cutter plank members of the drive shield have rear end portions peripherally overlying the rear shield such that regardless of the position of the movable rear shield with respect to the frame and the position of the longitudinally displaceable cutter plank members relative to said rear shield, the rear end portions of the drive shield peripherally overlie the rear shield at all times during operation of the apparatus.

4,043,138
OFFSHORE FOUNDATION STRUCTURE

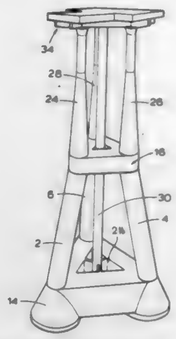
Jan Stageboe, Oslo, and Tomas Berge Einstabland, Asker, both of Norway, assignors to Ingenior F. Selmer A/S, Oslo, Norway

Filed Mar. 17, 1976, Ser. No. 667,923
Claims priority, application Norway, Mar. 21, 1975, 750982
Int. Cl.² E02B *17/00*; F02D *23/02*
U.S. Cl. 61—88 **9 Claims**

1. An open frame offshore foundation structure made of concrete to be firmly but removably located on a working site on the sea floor, comprising,

a lower set of bouyant but ballastable columns inclined towards each other in direction upwards and provided at their lower ends with laterally enlarged footings to be biased on the sea floor, said footings being rigidly interconnected with lateral stiffeners,

a bouyant but ballastable intertie box structure rigidly receiving the tops of said inclined columns, and comprising an integral unit of closed box girders, each having a width greater than the cross-section of the lower columns where they are connected to the intertie box structure, said intertie box structure defining a through-going opening in its center, and

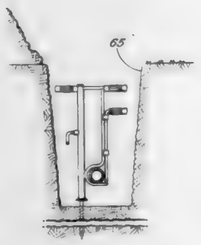


an upper vertical bouyant but ballastable column unit, the lower end of which is rigidly supported on said intertie box structure and the upper end of which is for supporting a working platform above sea level, the width of said closed box girders being greater then the cross-section of the columns of said column unit where they are connected to the intertie box structure.

4,043,139
PIPE HOLDING TOOL

Winfield B. Scott, 58 Rough Creek Estate, Granbury, Tex. 76048

Filed Nov. 19, 1975, Ser. No. 633,255
Int. Cl.² B63B *35/04*
U.S. Cl. 61—105 **6 Claims**



1. A pipe holding tool comprising:

an elongated tubular member,

a rod having a pointed end adapted to be inserted in the ground,

said rod being located in said tubular member with its pointed end extending out of one end of said tubular member,

said tubular member and said rod being movable relative to each other along their axes,

means for preventing said rod from extending out of the opposite end of said tubular member,

handle means connected to said opposite end of said tubular member,

means for securing said rod and said tubular member at a desired position relative to each other,

pipe supporting means carried by said tool and fixed in place relative to said tubular member,

said pipe supporting means being connected to said tubular member and extending sidewardly therefrom,

pipe locking means supported for movement, in a direction generally parallel with said axes of said rod and said tubular member, between a closed position and an open position,

said pipe locking means when in said closed position forming an enclosed or partially enclosed configuration with said pipe supporting means for holding a pipe in a position such that its axis is generally transverse with said axes of said rod and said tubular member,

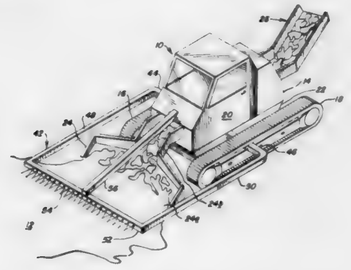
said pipe locking means comprising rod means having an end extending to a position near but spaced from said handle means when said pipe locking means is in its closed position, and

a handle connected to said end of said rod means.

4,043,140
CRYOGENIC BEACH CLEANER

Robert F. Wendt, 2649 Mason St., Madison, Wis. 53705; Jan R. Acker, 4402 Dwight Drive, No. B, Madison, Wis. 53704, and Norman R. Braton, 457 Agnes Drive, Madison, Wis. 53711

Filed May 12, 1975, Ser. No. 576,687
Int. Cl.² F25C *1/00*
U.S. Cl. 62—66 **4 Claims**



1. A method for cleaning a sandy beach which has been contaminated with oil from an oil spill mixing with beach sand, by selective removal of the contaminated portions, said method comprising the steps of:

providing a source of a liquid cryogen which is movable along said beach and into said contaminated area, said source constructed for spraying said liquid cryogen onto the area forward of said source;

moving said source along the beach and into said area;

spraying the oil and sand mixture in the contaminated area forwardly of said movable source with said liquid cryogen for a length of time effective to solidify the mixture; and thereafter separating the solidified mixture from the beach.

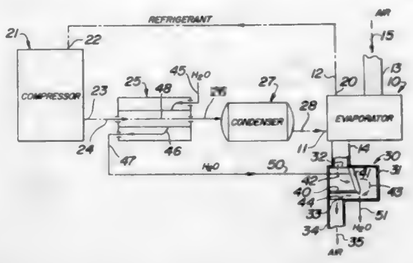
4,043,141
AIR CONDITIONING METHOD AND APPARATUS WITH HUMIDIFIER

Hans Levy, and John Alan Schade, both of Cherry Hill, N.J., assignors to A. C. Manufacturing Company, Cherry Hill, N.J.

Filed Feb. 26, 1976, Ser. No. 661,722
Int. Cl.² F25D *17/06*; F28C *1/00*; B01D *47/00*; C10T *1/10*
U.S. Cl. 62—91 **7 Claims**

1. In an air conditioning system with humidifier including a refrigerant compressor, condenser and evaporator connected in fluid communication; the improvement comprising a humidifier having water inlet and discharge means and located in an air stream being conditioned to humidify the latter, a separate heat exchanger connected in fluid communication with and between said compressor and condenser downstream of the compressor and upstream of the condenser for passing hot refrigerant therebetween and having water passage means in heat receiving relation with hot refrigerant, water supply means connected to one end of said water passage means, and water conduit means connected between the other end of said water passage means and the inlet of said humidifier for passing heated water to said humidifier for enhanced humidification by removed heat.

5. In the method of air conditioning and humidifying the medium of a zone, the steps which comprise: evaporating a refrigerant in heat transferring relation with the medium of said zone to absorb the heat from the medium of said zone, pressuring the evaporated refrigerant out of heat transferring

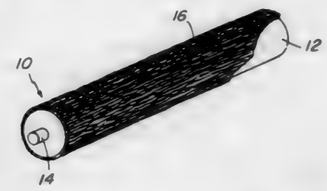


relation with the medium of the zone to heat the refrigerant, condensing the pressurized refrigerant out of heat transferring relation with the medium of the zone to prepare for repeated evaporation, passing water in heat receiving relation with the pressurized refrigerant to heat the water, and passing the heated water to the medium of the zone to humidify the medium of the zone.

4,043,142
DAMPENING ROLL COVER

Preston F. Marshall, Walpole, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Feb. 24, 1975, Ser. No. 552,514
Int. Cl.² D04B *1/00*
U.S. Cl. 66—170 **1 Claim**



1. An elastic dampening roll cover knitted in the form of a tubular sleeve comprising:

knitted courses and wales of inelastic absorbent yarn, said inelastic absorbent yarn comprising a substantially inelastic bulked yarn having a plurality of substantially continuous filaments which are individually convoluted into coils, crunodal loops and whorls at random intervals along their length and having a multiplicity of crunodal loops irregularly spaced along the yarn surface; said inelastic absorbent yarn is an air-bulked filament, core and effect yarn comprising nylon and rayon; and,

an elastic yarn interlaced with said courses and wales around the circumference of said tubular sleeve, said elastic yarn comprising an elastic core strand and an absorbent wrapping strand associated with said core strand in the form of doubled-back loops wound with false twist for a multiplicity of turns around the circumference of said elastic core strand.

4,043,143
LOCOMOTIVE ENVIRONMENTAL SYSTEM

Chester Henry Fluder, Wheeling, and Nick J. Yohanna, Chicago, both of Ill., assignors to Vapor Corporation, Chicago, Ill.

Filed Aug. 31, 1976, Ser. No. 719,200
Int. Cl.² B60H *3/04*
U.S. Cl. 62—243 **7 Claims**

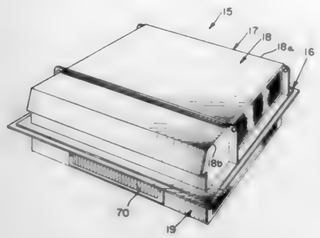
1. An air conditioning system for a locomotive cab to be mounted in the roof of the locomotive cab, said system com-

prising a frame including a centrally and horizontally arranged panel, upper and lower covers on the top and bottom sides of the panel defining upper and lower chambers, the upper chamber being generally positioned above the roof and exposed to the atmosphere, the lower chamber being generally positioned below the roof and within the cab, said upper chamber being divided into first and second side-by-side compartments,

a pair of spaced heat exchanger condensing units in said first compartment one at each of the front and back ends thereof and extending vertically and perpendicular to the longitudinal axis of and the path of movement of the locomotive, means connecting the condenser units in parallel, a compressor unit in said second compartment,

air inlet openings in the upper cover at the front and back walls aligning with the condenser units,

a first air discharge opening in a side wall of the upper cover for communicating said first compartment to the atmo-



sphere and a second air discharge opening for said first compartment to connect same to said second compartment, a third air discharge opening in a side wall of the upper cover for communicating said second compartment to the atmosphere, whereby the compressor unit is cooled,

a blower unit in said first compartment between the spaced condenser units arranged to draw air into said compartment through the condenser units and expel air through said air discharge openings,

a heat exchanger evaporator unit in the lower chamber, an air inlet opening in the lower cover for the lower chamber aligned with said evaporator unit to allow air to move from the cab through the evaporator unit and into the lower chamber, air discharge opening means in the lower cover, and a blower in the lower chamber to draw air through the evaporator unit and expel it through the discharge opening means into the cab.

4,043,144

HOT GAS DEFROST SYSTEM

Michael C. Klotz, Chicago, and Viung C. Mei, Mount Prospect, both of Ill., assignors to Dole Refrigerating Company, Chicago, Ill.

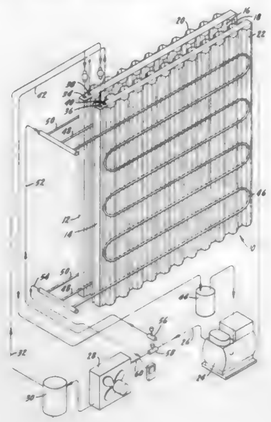
Filed June 17, 1976, Ser. No. 696,886

Int. Cl.[2] F25B *47/00, 41/00;* F25D *11/04*

U.S. Cl. 62—277 **7 Claims**

1. In an eutectic plate refrigeration system, an eutectic plate, refrigerant conduit means within said plate and having an inlet and a discharge, a compressor connected to said discharge and a condenser connected to said inlet, a hot gas line connecting said compressor and condenser,

a defrost coil positioned exterior to said plate and having an inlet and a discharge connected, respectively, to the compressor and condenser sides of said hot gas line, valve means connected between said defrost coil inlet and the compressor side of said hot gas line, valve means connected in said hot gas line between the defrost coil inlet and discharge connections thereto, in one position of said valve means refrigerant from said compressor passing successively through said defrost coil, through said con-



denser, through said plate refrigerant conduit means and back to said compressor.

4,043,145

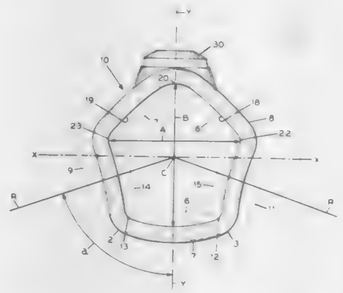
FINGER RING WITH MEANS FOR LOCKING BEHIND THE KNUCKLE

André Chervin, 7 Old Lyme Road, Chappaqua, N.Y. 10514

Filed Sept. 18, 1975, Ser. No. 614,765

Int. Cl.[2] A44C *9/00*

U.S. Cl. 63—15 **6 Claims**



1. A finger ring which locks on the finger and resists turning having a finger receiving aperture symmetrical with respect to the dorsal-palmar axis of the aperture and assymetrical with respect to the lateral axis, the dorsal-palmar axial dimension of the aperture accommodating the lateral dimension of the finger knuckle and being greater than the maximum lateral dimension of the aperture, said maximum lateral dimension accommodating the dorsal-palmar dimension of said finger knuckle, said aperture being bounded by five approximately equal length sides, said sides having surfaces which define the shape of said aperture and which comprise two straight to slightly outwardly curved dorsal surfaces which intersect in a central dorsal peak, each of said dorsal surfaces having a mid-portion, a laterally extending generally straight to slightly outwardly curved palmar surface, and a pair of inwardly curved side surfaces, said mid-portions, palmar surface, and side surfaces bearing against the corresponding surfaces of the finger when the ring is properly fitted thereon, said side and palmar surfaces intersecting in a pair of interior corners into which the palmar portion of the finger is adapted to be displaced as said side and palmar surfaces bear against the palmar portion of the finger.

4,043,146

SHAFT COUPLING

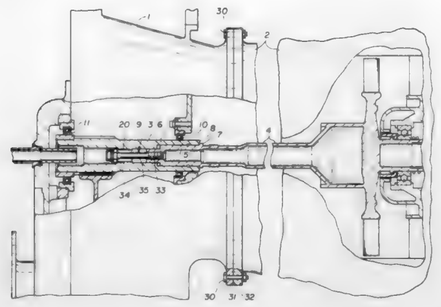
Rudolf Stegherr, Guending, and Gerhard Ruecker, Karlsfeld, both of Germany, assignors to Motoren- und Turbinen-Union Muenchen GmbH M.A.N. Maybach Mercedes-Benz, Munich, Germany

Filed July 22, 1975, Ser. No. 598,043

Claims priority, application Germany, July 27, 1974, 2436270

Int. Cl.[2] F16D *3/24*

U.S. Cl. 64—1 V **7 Claims**



1. In an apparatus having first and second rigidly interconnected assemblies, each of which includes a respective rotatable shaft, and bearing means supporting said shafts, the improvement comprising force transmitting coupling means operatively arranged for rigidly but releasably interconnecting adjacent ends of said shafts to transmit torque therebetween, said bearing means comprising two bearings supporting one of said shafts at two axially spaced apart positions, said bearing means including a further bearing mounted to support the other of said shafts only at the end thereof away from said coupling means, wherein one of said shafts is hollow with a non-circular inner surface portion toward one end of the hollow shaft, and the other of said shafts has a correspondingly non-circular outer surface portion adapted for engaging the non-circular inner surface portion of said hollow shaft to positively interlock said shafts for rotation and torque transmission when the shafts are coupled, said hollow shaft further having an inner thrust threading **(20)** toward the other end of the hollow shaft for separating the coupling means.

4,043,147

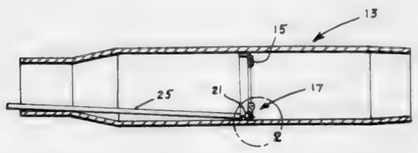
INTERSHAFT BALANCE WEIGHT

David J. Wiebe, Palm Beach Gardens, Fla., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 15, 1976, Ser. No. 696,344

Int. Cl.[2] F16C *1/00*

U.S. Cl. 64—1 V **2 Claims**



1. An intershaft balance weight for use on the low turbine shaft of a jet engine and the like, comprising, a hollow shaft having an open forward end, an anti-oval plug of annular configuration fixedly attached near the longitudinal center of the shaft and in contact with the inner surface thereof, said anti-oval plug including a right angled portion extending upwardly from one edge thereof, said inwardly extending right angled portion forming a wall inside said hollow turbine shaft, and means for attaching the balance weight to a predetermined position on said anti-oval plug through the open forward end of said hollow shaft without substantial disassembly of the jet engine thereby trim balancing the turbine shaft.

4,043,148

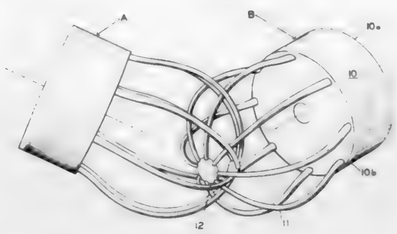
UNIVERSAL DRIVE JOINT

Philip B. Knapp, 40 Reyam Road, Lynbrook, N.Y. 11563

Filed Mar. 5, 1976, Ser. No. 664,195

Int. Cl.[2] F16D *3/26*

U.S. Cl. 64—17 R **4 Claims**



1. A universal joint comprising two intermeshed rotatable assemblies in driving and driven relationship with each other, each of said assemblies comprising:

a. a base having an axis of rotation, an attachment end, and an adjacent end, wherein said attachment end is adapted to be connected to a rotatable device; and

b. a plurality of yoke arms fixed at one end in said adjacent end of said base in spaced relationship to each other and said axis of rotation, said yoke arms being fixedly attached at their other end by a means of common joinder through the center of which the axis of rotation of said base passes, each of said yoke arms extending in a plane including the axis of rotation of said base and curving outwardly from said means of common joinder and thence inwardly toward said axis of rotation, said means of common joinder of each assembly being spaced from the means of common joinder of the other assembly and being intermediate the means common of joinder and the base of said other assembly to provide a bulbous cage-like structure loosely intermeshed with said other assembly.

4,043,149

UNIFORM-LOAD CLUTCH DEVICE PARTICULARLY ADAPTED FOR APPLICATION IN MAGNETIC-TAPE RECORDERS

Domenico Tuninetti, Rome, Italy, assignor to SPEM: Societa Prodotti Elettronici Meccanici, Rome, Italy

Filed Jan. 8, 1976, Ser. No. 647,520

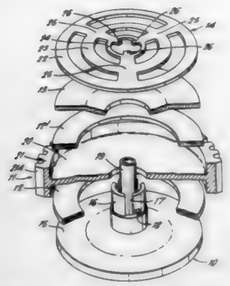
Claims priority, application Italy, Jan. 15, 1975, 47700/75

Int. Cl.[2] F16D *7/02*

U.S. Cl. 64—30 C **6 Claims**

1. A uniform load clutch device for transmitting a motion from a driving member to a driven member while permitting friction slippage between the two members should the driven member be stopped, wherein one of said members has a circular base and a first cylindrical part for receiving and guiding the other member, and there is provided first and second flat annular felt friction pads freely mounted on said first cylindrical part with said other member interposed therebetween and resilient biasing means mounted on said first cylindrical part for exerting a force to bring into firm engagement said members and friction pads, said first cylindrical part having a number of L-shaped slots, each slot comprising a long portion

parallel to the direction of the base axis and a short portion perpendicular thereto having a bayonet-joint indentation, said slots cooperating with matching locking means on said resilient biasing means to lock said resilient biasing means in operational position on said one member, so that the reaction thereof will



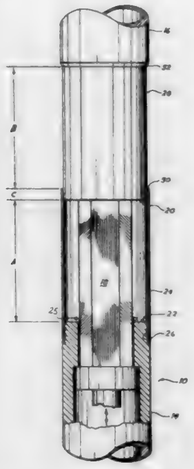
unload on said slots of said one member, and therefore no relative movement will take place between said resilient biasing means and said one member during the transmission of said motion, and a second cylindrical part concentric to said first cylindrical part of a lesser diameter and a longer length than said first cylindrical part.

4,043,150

SAFETY SLEEVE

August B. Baumstimler, P.O. Box 832, Odessa, Tex. 79760

Filed Feb. 26, 1976, Ser. No. 661,691
Int. Cl.[2] F16D *3/84*
U.S. Cl. 64—32 R **5 Claims**



1. In a clean out well tool for removing debris from a well, said tool having

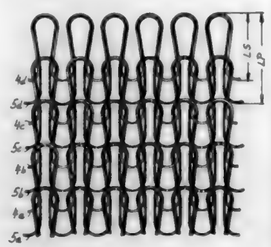
a. an elongated tubular body member,
b. a tubular head member,
c. said members slidingly telescoped together,
d. a body shoulder on the body member,
e. a head shoulder on the head member,
f. said shoulders coming together to form a stop to limit the sliding telescoping movement between the members;
g. THE IMPROVED SAFETY DEVICE COMPRISING IN COMBINATION WITH THE ABOVE:
h. a sleeve attached to one of said members,
i. holes in the sleeve,
j. said sleeve telescoped over the other member.

4,043,151

METHOD OF PRODUCING PILE OR PLUSH GOODS ON DOUBLE-BED CIRCULAR KNITTING MACHINES BY MEANS OF PLUSH HOOKS

Walter Richared Schmidt, Breisach, Germany, assignor to Burlington AG, Switzerland

Filed May 14, 1974, Ser. No. 469,875
Claims priority, application Germany, May 23, 1973, 2326235; Mar. 25, 1974, 2414217
Int. Cl.[2] D04B *9/12*
U.S. Cl. 66—9 R **7 Claims**



1. A method of producing pile fabrics on circular knitting machines including dial needles and pile hooks in the cylinder, wherein the pile loops are released from said hooks by raising the pile hooks to a position beneath the dial and the cylinder, the improvement comprising maintaining said pile hooks in a raised first position, advancing the dial needles between the pile hooks, thereby preventing the stitches formed last from moving together with the needles, further advancing a first set of pile hooks to a raised second position, retracting a second set of pile hooks which are not selected for the formation of pile loops, feeding a pile yarn to the dial needles and the raised pile hooks and a base yarn to the dial needles, forming pile loops with the pile yarn by partially retracting the raised first set of pile hooks to position the pile yarn on the dial needles and holding the pile hooks in their partially retracted position after the knitting of the pile yarn as stitches or tuck stitches into the base yarn stitches until the dial needles are moved from a cast-off position into an idle position.

4,043,152

INLAY WHEEL AND METHOD

David J. J. Bryars, Leicester, England, assignor to Austen Bryars of London, Inc., United Kingdom

Filed Dec. 15, 1975, Ser. No. 640,945
Claims priority, application United Kingdom, May 3, 1975, 18622/75
Int. Cl.[2] D04B *9/16*
U.S. Cl. 66—9 R **3 Claims**



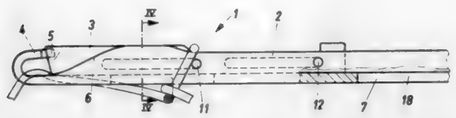
1. A method of laying in a yarn during knitting of a double knit fabric wherein said fabric is formed from fine denier yarn and said inlay is a relatively coarse yarn, said method comprising part gauging one needle bed of the machine by removal of certain needles and replacing at least some of the removed needles with drive elements each including butts corresponding with the butts on the removed needles but said drive elements being devoid of any knitting instrumentalities, providing at least one inlay wheel at one of a plurality of yarn feed stations on said machine, delivering the inlay yarn from a source of supply to the inlay wheel and hence to selected needles in the needle bed containing said drive elements while rotating the inlay wheel by means other than the needles in synchronization with rotation of the needle bed.

4,043,153

SLIDING LATCH NEEDLE

Heinz Lindner, Geyer, Erzg, and Dieter Happel, Karl-Marx-Stadt, both of Germany, assignors to VEB Wirkmaschinenbau Karl-Marx-Stadt, Karl-Marx-Stadt, Germany

Filed Aug. 7, 1975, Ser. No. 602,621
Claims priority, application Germany, Sept. 4, 1974, 4180887
Int. Cl.[2] D04B *35/06*
U.S. Cl. 66—120 **5 Claims**



1. A loop-controlled slide needle for the forming of loops in loop forming textile machines, comprising a shaft, a hook integral with one end of the shaft, the hook having a rearwardly tapered free end, the shaft forwardly tapering in the plane of the hook at the juncture of the shaft and the hook and providing a rearwardly and upwardly extending surface from below said tapered free end, a longitudinal groove formed in the shaft, and a slide bar slidably mounted in the groove for movement between one position in which the slide bar closes the hook and another position in which the slide bar leaves the hook open, said slide bar having an end extending from the bottom of the groove when positioned therein to above said tapered free end of said hook and which faces the rearwardly tapering free end of the hook and which has a hook receiving recess at the upper portion of its forwardly facing end for receiving the rearwardly tapered end of the hook when the hook is closed by the slide bar, said slide bar having at least one longitudinal slot therein, a pin fixed to the shaft and received in the slot for limiting the sliding of the slide bar in the groove, at least part of the length of the slide bar protruding above the groove, said slide bar, at a location remote from the end of the slide bar facing the tapered end of the hook, providing a loop receiving recess extending along its upper surface for receiving the last formed loop when the slide bar is retracted and the hook is therefore open, thereby to prevent premature closing of the hook by the slide bar, said slide bar comprising at least two flat-sided longitudinal members connected together with a flat side of each juxtaposed to a flat side of each other the respective forwardly facing ends of the members at the upper portions thereof nearer the hook being formed to diverge forwardly from each other thereby to define the recess in the slide bar and means are provided in the shaft above the slide bar for guiding the slide.

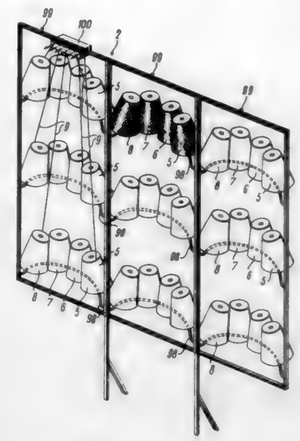
4,043,154

SPOOL RACK

Eberhard Merkle, Stuttgart, Germany, assignor to Wilh. Bleyle KG, Stuttgart, Germany

Filed Apr. 20, 1976, Ser. No. 678,677
Claims priority, application Germany, Aug. 7, 1974, 2438006
Int. Cl.[2] D04B *15/40*
U.S. Cl. 66—125 R **4 Claims**

1. A spool frame for wound spools for transmission of thread to circular knitting machines comprising, an upstanding framework generally confined to a single plane subdivided into separated open section areas, each said open section area including a plurality of superposed semi-circular supporting elements the ends of which are finedly attached to said frame, a thread guide associated with the top thereof, and said semi-circular supporting elements provided with spool carrier means, each said spool carrier means being inclined inwardly of said semi-circular supporting elements and directed toward the thread guide means associated with the top of said section



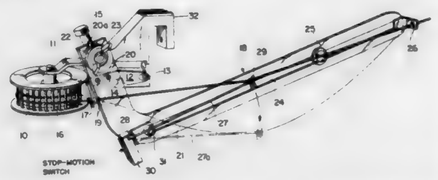
area and said thread guide means disposed substantially medially of said semi-circular supporting elements.

4,043,155

POSITIVE FEED DEVICE FOR KNITTING MACHINE

Robert Steinberg, Neponsit, N.Y., and Joseph Scotto di Carlo, Cornwells Heights, Pa., assignors to Scorpio Industries, Inc., Neponsit, N.Y.

Filed Sept. 27, 1976, Ser. No. 727,089
Int. Cl.[2] D04B *15/48, 35/14*
U.S. Cl. 66—132 T **6 Claims**



1. In a knitting machine positive feed device of the type comprising a rotatable roller, a bracket adjacent said roller mounted for free pivotal movement through a limited arc about a pivot axis extending transverse to the axis of rotation of the roller, counterbalance means attached to said bracket and comprising a pair of weighted arms located on opposite sides of said pivot axis, at least one of said arms being of elongated configuration and oriented in a generally horizontal direction, said one of said arms having a pair of opposing ends one of which is a free end, and a pair of yarn guides disposed respectively adjacent the said opposing ends of said one of said arms for guiding a length of yarn from the running surface of said roller in the generally horizontal direction of extension of said one arm toward the said free end of said one arm and thence to a feeding station in said knitting machine, the improvement comprising further yarn guide means in engagement with said length of yarn at a position between said pair of yarn guides, said further yarn guide means comprising an elongated wire member one end of which engages said length of yarn and the other end of which is pivotably attached to said one of said arms, said elongated wire member extending in a generally horizontal direction from its point of pivotal attachment generally along the direction of extension of said one of said arms to its point of engagement with said length of yarn, the weight of said elongated wire member being operative, upon the occurrence of slack in said length of yarn due to overfeed of said

yarn by said roller, to effect free movement of said wire member about its point of pivotal attachment and relative to said pair of yarn guides under the influence of gravity for taking up said slack

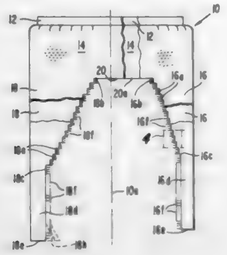
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4,043,156

METHOD OF KNITTING A GARMENT BLANK

David Pernick, 1020 Shore Blvd., Brooklyn, N.Y. 11235

Division of Ser. No. 650,443, Jan. 19, 1976, Pat. No. 4,010,627.
This application Nov. 15, 1976, Ser. No. 741,762
Int. Cl.[2] A41B *9/02, 9/04*
U.S. Cl. 66—177 **4 Claims**



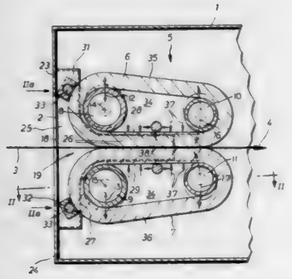
1. A method of knitting a garment blank by rotary knitting upon the circle of needles of a circular knitting machine including the steps of operating the circle of needles for rotary knitting of suitable yarn thereon to form wales and courses of a seamless, knitted tubular portion, for said blank, discontinuing knitting upon spaced groups of the needles, operating other spaced groups of needles of the circle of needles for rotary knitting of suitable yarn thereon thereby to form the wales and courses of spaced, seamless, knitted non-tubular first and second panels for the blank in continuation of the body portion, and cutting the last-named yarn after the knitting of each course of the panels, such yarn cutting resulting in each course of each of the panels being formed of an individual length of yarn during the knitting of the panels.

4,043,157

SEALING ARRANGEMENT FOR PRESSURE CONTAINERS, ESPECIALLY FOR THE TREATMENT OF WEBS OF TEXTILE GOODS

Günter Schiffer, Krefeld, Germany, assignor to Kleinewefers Industrie-Companie GmbH, Krefeld, Germany

Filed Nov. 10, 1975, Ser. No. 630,134
Claims priority, application Germany, Nov. 8, 1974, 2453059
Int. Cl.[2] D06B *23/18*
U.S. Cl. 68—5 E **10 Claims**



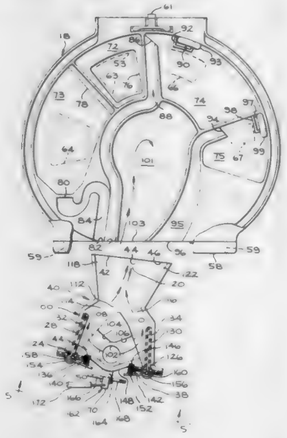
1. In combination with a container for treating webs of textile goods at above and below atmospheric pressure which is provided with an inlet opening and an outlet opening for respectively passing such webs through said inlet and outlet openings into and out of said container in a gas-tight manner, a pair of sealers including a first sealer and a second sealer respectively arranged at said inlet and outlet openings, each of said sealers comprising: a first pair of rollers each having an axis of rotation and arranged in spaced relationship to each other with the axes of rotation of said rollers substantially parallel to each other, a first endless belt looped around said first pair of rollers so as to define between said rollers a first and second straight belt section, a second pair of rollers each having an axis of rotation and arranged in spaced relationship to each other with the axes of rotation of the rollers of said second pair of rollers substantially parallel to each other, a second endless belt looped around said second pair of rollers so as to define between the rollers of said second pair of rollers a third and a fourth straight belt section, each of said first and second endless belts of each sealer having one of their straight belt sections define with each other a sealing passage for the web of textile goods to be passed therethrough on its way into and out of said container, driving means operatively connected with at least one roller of said first pair and second pair of rollers of said first and second sealer to establish synchronous movement of the belt sections which define the sealing passage of said first and second sealer respectively, at least one roller of each of said first pair of rollers being adjustable relatively toward and away from the rollers of said second pair of rollers, said first and second belts of each sealer sealingly engaging said container, said first and second pairs of rollers defining therebetween a space in which pressure remains effective.

4,043,158

LIQUID FLOW MECHANICAL DIVERTER VALVE

John Bochan, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed June 30, 1976, Ser. No. 701,215
Int. Cl.[2] D06F *39/02*
U.S. Cl. 68—17 R **11 Claims**



1. In a liquid flow mechanical diverter valve of the stream interaction type including a housing having an inlet for receiving a flow of liquid from a liquid source, a pair of first channels communicating with the inlet, said channels each having an exit port, an interaction chamber in the valve housing, a pair of converging second channels between the exit ports of the first channels and the interaction chamber, three exit areas directed away from the interaction chamber, means associated with the ports of the first channels for effecting opening and closing thereof at predetermined times for controlling the flow of liquid therethrough, the improvement comprising:

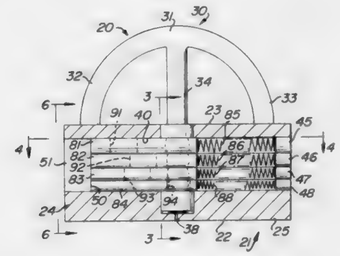
the diverter valve having two flapper assemblies each having a first portion large enough to seat against and cover a first channel exit port, a second portion at an angle to the first portion and rigidly secured thereto, a pivot at the junction of the first and second portions, the second portions being spaced from and directed toward each other, a spring associated with the second portion to urge the second portion away from the valve housing a sufficient distance to have the first portion seated against the first channel exit port, said spring having a force insufficient to prevent the flow of liquid through the exit port, a pivotal arm assembly having a pivot, two tangs radially outward of the pivot and a mechanical push-pull actuator secured to the arm assembly to pivot the arm assembly to three positions, only two of said positions selectively register one of the tangs with one of the second portions to act as a stop to retain the first portion seated against the exit port during a predetermined period of time of liquid flow through the inlet.

4,043,159

PADLOCK CONSTRUCTION

Joseph J. Malacheski, 28 E. Division St., and Richard J. Zenda, 21 O'Neill Ave., both of Wilkes-Barre, Pa. 18702

Filed Nov. 5, 1976, Ser. No. 739,068
Int. Cl.[2] E05B *67/22*
U.S. Cl. 70—38 R **9 Claims**



1. A padlock comprising a body having at least a pair of generally parallel tine-receiving holes, a shackle having at least a pair of generally parallel tines inserted in said holes and shiftable therein between shackle locked and unlocked positions, a plurality of spring biased tumbler pins shiftable in said body transversely intersecting one of said tines to retain the latter in its shackle locked position, said tumblers having notches at selected locations to release said one tine for shifting to its shackle unlocked position upon alignment of the tumbler notches, said body having a key slot for end access to said tumblers to shift the latter and effect said alignment, and a keeper mounted in said body extending between said holes and into said tines to positively retain the latter in said shackle locked position against tampering, said keeper being movably mounted in said body, and coacting tine and keeper surfaces simultaneously urging the keeper on one side and providing clearance on the other side to move the keeper and release said tines to shackle unlocked position.

4,043,160

INTERNAL TOOLING FOR SWAGING APPARATUS

Charles Marvin Baker, Kirkland, and Gene Bruce Foster, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Dec. 18, 1975, Ser. No. 641,956
Int. Cl.[2] B21D *22/10*
U.S. Cl. 72—61 **11 Claims**

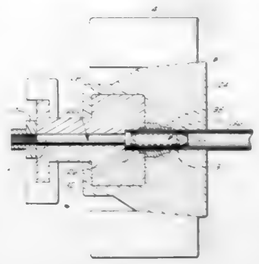
1. Internal tooling for a swaging apparatus comprising:

a draw bolt having a shank and an enlarged coaxial head located at one end of the shank,

a shoulder extension on the end surface of the head facing the shank, said shoulder defining a seat extending a predetermined distance from the draw bolt head axially of the shank,

a sleeve of a resilient material coaxially disposed on the shank adjacent the draw bolt head,

a bushing coaxially disposed on the shank on the side of the resilient sleeve opposite the head, the bushing end surface



facing the sleeve having a shoulder extension defining a seat extending a predetermined distance from the bushing axially of the shank, and

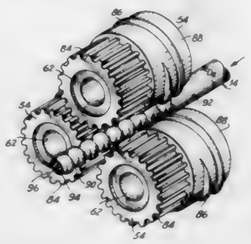
a pair of radially expandable anti-extrusion rings disposed in and axially overlapping the seats in the head and bushing respectively and abutting the respective adjacent ends of the sleeve.

4,043,161

APPARATUS FOR FORMING CORRUGATIONS OF "ZERO" PITCH IN COAXIAL CABLE

Joseph R. Toma, Colonia, and Oliver C. Johnson, Irvington, both of N.J., assignors to Astrolab, Inc., Linden, N.J.

Filed Nov. 7, 1975, Ser. No. 630,035
Int. Cl.[2] B21J *15/12;* **B21D** *15/06*
U.S. Cl. 72—78 **10 Claims**



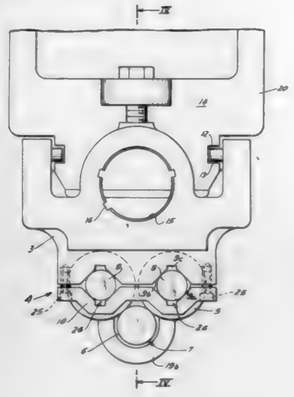
1. An apparatus for forming parallel corrugations in a circular member comprising a head, means including a takeup drum for pulling the circular member through the head, drive means for rotating the head and the takeup drum, said head including a plurality of forming dies mounted for rotation relative to said circular member, each of said forming dies including a single turn helical die thread adapted to indent said circular member, means for synchronizing movement of said forming dies in unison about said circular member, said takeup drum pulling said member through said head such that the linear displacement of the circular member through the head is substantially equal to the linear displacement of the helical thread relative to said circular member thereby enabling said forming dies to form parallel corrugations in said circular member.

4,043,162

ROLLER ASSEMBLY FOR SHEET-BENDING HEAD AND METHOD OF MAKING ROLLER BEARINGS THEREFOR

Oskar Noé, Mulheim (Ruhr), and Wolfgang Skrober, Moers, both of Germany, assignors to BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H., Duisburg, Germany

Filed Aug. 13, 1976, Ser. No. 714,277
Claims priority, application Germany, Aug. 16, 1975, 2536582
Int. Cl.[2] B21D *1/02*
U.S. Cl. 72—163 **10 Claims**



1. A bending head for stretching a tensioned sheet-metal strip, comprising:

an elongate deflecting roller extending across a path of a strip to be stretched;

two sets of back-up rollers, shorter and heavier than said deflecting roller, contacting said deflecting roller at locations remote from said path, the back-up rollers of each set being aligned along a common axis parallel to the deflecting-roller axis and being each provided with a pair of stub shafts on opposite ends; and

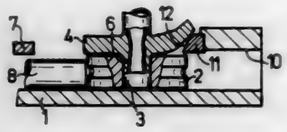
a frame forming journals for the extremities of said deflecting roller and bearings for said back-up rollers, said bearings including members provided with notches diverging toward said path, said stub shafts being cradled in said notches.

4,043,163

DEVICE FOR REMOVING THE PRESS REST FROM THE FRONT SIDE OF A DISC FOR EXTRUDING TUBES

Richard Raab, Rothenbach, Peg., Germany, assignor to DIEHL, Nuremberg, Germany

Filed Feb. 6, 1976, Ser. No. 655,941
Claims priority, application Germany, Feb. 7, 1975, 2505160
Int. Cl.[2] B21C *35/00*
U.S. Cl. 72—255 **2 Claims**



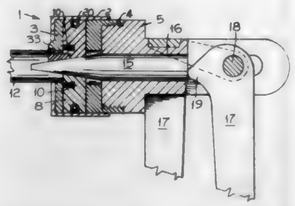
1. A device for removing the press rest from the front side of a press disc for extruding tubes, which press disc also has a substantially plane rear surface opposite said front side, said device comprising in combination supporting means having a supporting surface for supporting the disc, also comprising separating means having a separating surface defining with said supporting surface an angle for lifing the press rest from the press disc, and a framework providing a passage for the disc, said separating surface being provided on said framework adjacent said passage.

4,043,164

BRANCH TOOL

Anthony Haldane Fay Brookman, Wattle Park, Australia, assignor to Rast Patent Manufacturers Pty. Ltd., North Plympton, Australia

Filed June 9, 1976, Ser. No. 694,478
Claims priority, application Australia, June 18, 1975, 2025/75
Int. Cl.[2] B21D *19/00, 39/08*
U.S. Cl. 72—332 **5 Claims**



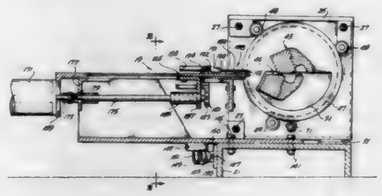
1. A tool for shaping the end of a branch tube which is to be engaged in a socket in the side of a main tube, comprises a die having an aperture to neatly receive the end of a branch tube to be shaped and encircle the end of the said tube when inserted into the die, and a bore in the die intersecting the said aperture, a pair of cutters disposed within the said bore in the said die on diametrically opposed sides thereof and extending into the said aperture, slits in each cutter which face the opening of the said aperture in the said die into which the branch tube may be inserted, the slits having their outer walls coextensive with the walls of the said aperture and being shaped to engage the end of the branch tube to notch out diametrically opposed segments from the branch tube against the said die when the said cutters are outwardly displaced, means to displace the said cutters outwardly, and means to return the said cutters after displacement.

4,043,165

THREE-POINT, AIR-BENDING SHEET METAL BENDER

Douglas V. Badger, Federal Way, and Ralph Y. Lewis, Kent, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sept. 15, 1976, Ser. No. 723,321
Int. Cl.[2] B21D *5/00*
U.S. Cl. 72—307 **19 Claims**



1. A three-point, air-bending sheet metal bender comprising:

a first elongate, U-shaped finger die, one leg of said U-shape forming a finger region and the aperture of said U-shape forming a palm region;

a second elongate, U-shaped finger die, one leg of said U-shape forming a finger region and the aperture of said U-shape forming a palm region; and,

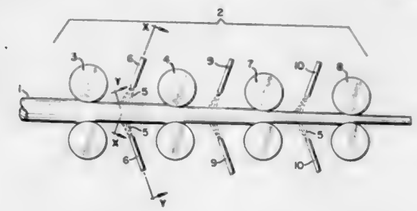
support and rotation means for: (i) supporting said first and second elongate, U-shaped finger dies in parallel, spaced relationship such that the finger regions of said finger dies generally face one another, and such that the finger region of one of said first and second finger dies is aligned with the palm region of the other of said first and second finger dies, said first and second finger dies being spaced such that a sheet of metal can be positioned between the finger and palm regions of said first and second finger dies such that the finger and palm region of one of said dies lie on one side of said sheet of metal in close proximity thereto and the finger and palm region of the other of said dies lie on the other side of said sheet of metal in close proximity thereto; and, (ii) rotating said die whose palm region is aligned with the finger region of the other die in a manner such that said palm region rotates about said finger region.

4,043,166

REMOVING CRUST OF OXIDE FROM PROFILED WIRE ROD

Jean Leroy, Hoboken-Anvers, Belgium, assignor to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Continuation of Ser. No. 439,811, Feb. 5, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,569
Claims priority, application Luxembourg, Feb. 12, 1973, 67008
Int. Cl.[2] B08B *3/02;* **B21B** *45/02*
U.S. Cl. 72—39 **10 Claims**



1. In the known process for the direct and continuous manufacture of copper wire rod starting from liquid metal, in which a bar is produced by continuous casting and conveyed while still hot to a rolling mill where the bar is rolled down into a wire rod in a plurality of roll passes, including a few early roll passes and several later roll passes, and in which process a crust of oxide is present on the surface of the rod being rolled down, the improvement which comprises removing the crust of oxide in at least one cleaning operation between the early roll passes by projecting a liquid selected from the group consisting of water and a rolling emulsion under a pressure of between 20 and 60 atmospheres against the periphery of the rod being rolled down, the flow of said liquid under pressure being less than 50 liters/minute per cleaning operation so as to avoid an appreciable cooling of the rod being rolled down between the early roll passes, and after the cleaning operation abruptly cooling the rod being rolled down before one of the later roll passes.

4,043,167

PROCESS AND MACHINE FOR FINISHING A 15° TO 180° PIPE BEND WHICH HAS BEEN PREFORMED ON A PIPE BENDING PRESS

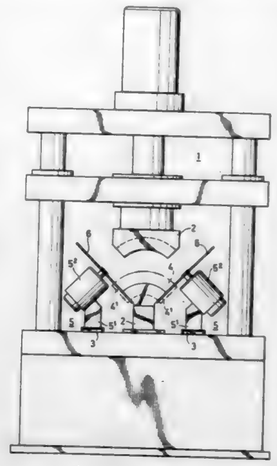
Rolf Koser, Bunde, Germany, assignor to Sidro KG Ludwig Moller Fabrik fur Rohrbogen, Bunde, Germany

Filed Aug. 13, 1976, Ser. No. 714,161
Claims priority, application Germany, Jan. 23, 1976, 2602415
Int. Cl.[2] B21D *7/16*
U.S. Cl. 72—340 **8 Claims**

1. A process for finishing a 15° to 180° pipe bend which has been preformed on pipe press, comprising

a. sizing said preformed pipe bend between coacting dies while said pipe bend is at a temperature of 700°–900° C and

b. simultaneously trimming both ends of said pipe bend to precise dimensions while said pipe bend is retained between said dies whereby further finishing of said pipe bend is eliminated.

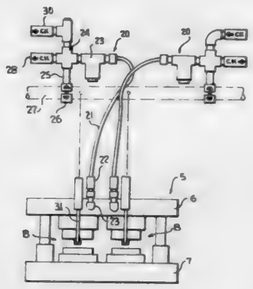


4,043,168

SHELL CONTROL MANIFOLD

Stanley L. Mazurek, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,501
Int. Cl.[2] B21D *45/00*
U.S. Cl. 72—345 **9 Claims**



1. For use in combination with a reciprocating die set, apparatus for holding a formed article relative to the die set against permature release, said apparatus comprising a manifold assembly for controlling air pressure within a sealed die of said die set closed by a formed article, said manifold assembly comprising an air line, means for coupling said air line in communication with the interior of a sealed die, and check valve means coupled to said air line for controlling the exhaust and intake of air, said check valve means including a first check valve permitting exhausting of air while preventing intaking of air and a second check valve for preventing exhausting while permitting limited intaking of air, said check valve means being cooperable to produce a limited vacuum with said sealed die after the forming of an article to retain a formed article thereon while preventing article damage due to a too great vacuum resistance to removal of a formed article from said die, and article removal means of a positive type cooperable with the movement of said die for removing a vacuum held formed article from said die.

8. A method of retaining a shell in a punch comprising the

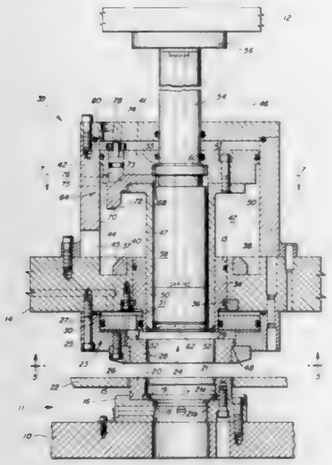
steps of providing a movable punch having a shell receiving cavity, utilizing said punch to form a shell with the shell sealing said cavity, moving said punch relative to a newly formed shell to pressurize air within said cavity while venting compressed air from said cavity, and then moving said punch relative to the shell to form a vacuum within said punch cavity, and restricting the vacuum to a predetermined value by venting said cavity after said predetermined vacuum is formed in said cavity to thereby provide for a limited vacuum holding of the shell relative to said punch, and mechanically removing the vacuum held shell from said punch.

4,043,169

TRIPLE ACTION CUPPING TOOL

Otto Gorgius, Mount Prospect, and Dietmar G. Quaas, Arlington Heights, both of Ill., assignors to Buhrke Industries, Inc., Arlington Heights, Ill.

Filed Oct. 14, 1976, Ser. No. 732,206
Int. Cl.² B21D *22/00*
U.S. Cl. 72—349 **5 Claims**



1. In a double-acting cupping press having a bed, an outer slide and an inner slide, the outer slide leading the stroke of the inner slide in degrees of slide-drive crankshaft rotation, the combination with said press of a triple-action blank, draw and redraw cupping tool having a stripper plate which is mounted on a die shoe supported by the press bed, a blanking-die-holder plate mounted on the outer slide of the press, and a draw and redraw punch-holder plate mounted on the innter slide thereof comprising:

a. a punch for blanking, a die for drawing and a redraw die for redrawing mounted on the die shoe on a common centerline in mutually orientated vertical configuration for cooperation thereon in the successive operations of blanking, drawing and redrawing;

b. a blanking die mounted on the blanking dieholder plate for cooperating with the blanking punch in the operation of blanking;

c. an annular draw punch slidingly mounted in the blanking die-holder plate for cooperating with the draw die in the operation of drawing;

d. a redraw punch depending from the draw and redraw punch-holder plate and sliding within the annulus of said draw punch therethrough for operationally cooperating with the redraw die in the operation of redrawing;

e. a latch mounted on said draw punch having biasing means for engaging said latch in a groove in said redraw punch and interlocking the draw punch with the redraw punch; and

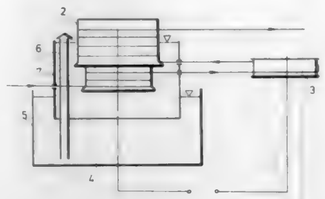
f. a cam means mounted on said latch and said blanking-die-holder plate for operationally disengaging said draw punch from said redraw punch.

4,043,170

PATENTING PROCESS AND APPARATUS COMBINED WITH A WIRE

György Erödi; István Gorondi; László Kovács, and György Takács, all of Miskole, Hungary, assignors to "December 4" Drotmuvek, Miskole, Hungary

Filed Feb. 19, 1976, Ser. No. 659,353
Claims priority, application Hungary, Feb. 20, 1975, DE 881
Int. Cl.² B21D *31/00, 37/16*
U.S. Cl. 72—364 **2 Claims**



1. A method of simultaneously patenting and hot-forming a metal wire comprising the steps of:

a. feeding said wire onto a small-diameter part of a stepped drum having a large-diameter cylindrical part and a small-diameter cylindrical part;

b. passing said wire around said small-diameter part in a plurality of turns;

c. leading said wire after it has passed in said plurality of turns around said small-diameter part around a guide drum spaced from said stepped drum;

d. passing said wire from said guide drum onto said large-diameter part;

e. passing said wire in a plurality of turns around said large-diameter part and thereafter leading said wire away from said stepped drum;

f. passing an electric current through the wire between said drums sufficient to heat said wire to a patenting and hot-forming temperature; and

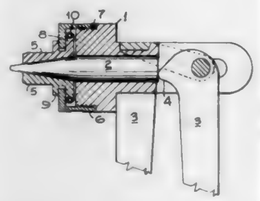
g. contacting said turns of wire on said stepped drum with a patenting bath.

4,043,171

BRANCH TOOL

Anthony Haldane Ray Brookman, Wattle Park, Australia, assignor to Rast Patent Manufacturers Pty. Ltd., North Plympton, Australia

Filed June 9, 1976, Ser. No. 694,477
Claims priority, application Australia, June 13, 1975, 1982/75
Int. Cl.² B21D *41/02*
U.S. Cl. 72—393 **8 Claims**



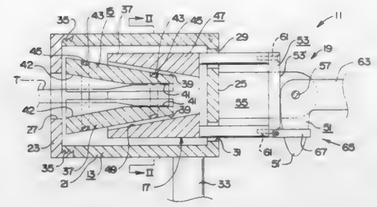
1. A device for forming a socket in the side of an apertured tube where a branch tube is to be joined to it comprising, a series of circularly arranged jaws, a body to hold the said jaws to be outwardly movable to expand the metal around an aperture in a tube positioned over said jaws, a former to engage said tube adjacent to said aperture, said former being carried by said jaws by tapered interengaging surfaces therebetween, and means to simultaneously expand the said jaws in a substantially radial direction and move said former in axial relationship to said jaws to draw the wall of the tube surrounding said aperture outwardly from said tube to form the said socket.

4,043,172

TUBE COMPRESSOR

Louis A. Schmittou, 1304 Latham, Memphis, Tenn. 38106

Filed June 10, 1976, Ser. No. 694,888
Int. Cl.² B21D *41/04*
U.S. Cl. 72—402 **10 Claims**



1. A portable device for compressing the end of a length of cylindrical tubing which has been expanded to a size greater than its normal diameter, said device comprising:

a. hollow housing means having an opening therethrough for allowing the expanded end of the length of tubing to be inserted into the interior of said housing means;

b. die means positioned in the interior of said housing means, said die means including a plurality of die members for being positioned around the length of tubing in said housing means, each of said plurality of die members having a sloping outer surface and having a curved inner surface for engaging the expanded end of the tubing, said curved inner surface of each of said plurality of die members having substantially the same curvature as the normal diameter of the tubing;

c. sleeve means positioned in the interior of said housing means for placement about said die means and for forcing said plurality of die members inwardly to compress the end of the length of the tubing, said sleeve means having a sloping inner surface; and

d. activating means for selectively causing said sleeve means to force said plurality of die members inwardly to uniformly compress the expanded end of the length of tubing, said activating means including cam means pivotally attached to said housing means and including cam follower means fixedly attached to said sleeve means for causing said sleeve means to force said plurality of die members inwardly to compress the expanded end of the length of tubing when said cam means is activated.

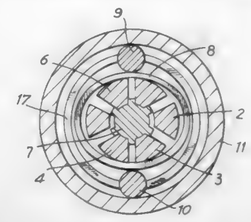
4,043,173

METHOD OF SHAPING THE OUTER SURFACES OF OBJECTS CONSISTING OF DEFORMABLE MATERIALS AND DEVICE FOR THE APPLICATION OF THE METHOD

Zdzislaw Marciniak; Mateusz Sklad, and Krzysztof Chodnikiewicz, all of Warsaw, Poland, assignors to Politechnika Warszawska, Warsaw, Poland

Continuation-in-part of Ser. No. 542,831, Jan. 21, 1975, abandoned. This application June 8, 1976, Ser. No. 693,909
Claims priority, application Poland, Jan. 21, 1974, 168236
Int. Cl.² B21K *1/30;* B21J *7/16*
U.S. Cl. 72—403 **4 Claims**

2. Apparatus for shaping the outer surface of a workpiece of a material which can be deformed, comprising a casing; a flywheel within said casing; a ring-shaped tool mounted within said casing and being adjustable in the axial direction, said tool having a plurality of forming segments interconnected directly with one another, said segments being firmly held at at least one corresponding end thereof, said segments being movable relative to one another in the radial direction, said segments being in the operative state initially in contact with said outer surface of said workpiece; a sleeve secured to the inside of said casing and extending coaxially within and in radially-spaced relationship from said flywheel, said sleeve being resiliently deformable in the radial direction and encompassing said segments; at least two rolls between the inner surface of said flywheel and the outer surface of said sleeve and pressing said sleeve onto said tool; and a cage mounting said rolls and determining the relative angular positions thereof, the roll diameters being relative to the annular space between said inner surface of said flywheel and said outer surface of said sleeve so that said sleeve is deformed and at least three of said segments are forced against said outer surface of said workpiece while the remaining said segments are with drawn from said outer surface of said workpiece.

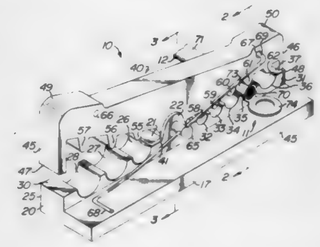


4,043,174

WIRE CONNECTOR CRIMPING DEVICE

Angelo J. Paolino, Waterbury, Conn., assignor to American Eyelet Co. Inc., Waterbury, Conn.

Filed Sept. 27, 1976, Ser. No. 726,581
Int. Cl.² B21D *9/08*
U.S. Cl. 72—412 **9 Claims**



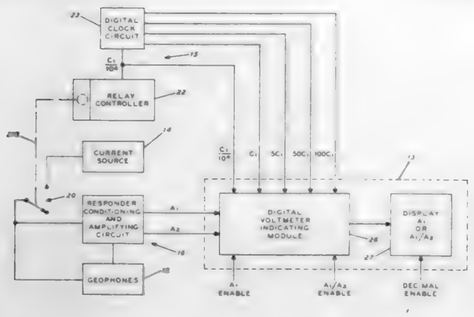
1. A wire connector crimping device for crimping a plurality of connector sizes, said device comprising an elongate base having a generally flat underside, a plurality of connector receivers disposed in side-by-side upwardly facing relation on said base and each extending generally transversely of said base, a rocker pivotally mounted intermediate its ends on said base and extending over said receivers for swinging movement of opposite rocker ends portions toward and away from respective receivers, stop means on said base and rocker to limit said swinging movement in opposite directions, a plurality of crimping formations depending from said rocker for movement into and out of crimping relation with respective receivers, for optimal crimping of a connector on a wire by placement in an appropriate receiver and swinging the rocker to move the appropriate crimping formation into its crimping relation.

4,043,175

AUTOMATIC METHOD AND APPARATUS FOR DIGITALLY INDICATING RESPONSE CHARACTERISTICS OF GEOPHONES OF A GEOPHYSICAL DATA ACQUISITION SYSTEM

Oke A. Fredriksson, and Elmer L. Thomas, both of Fullerton, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 1, 1975, Ser. No. 618,602
Int. Cl.² G01V *13/00*
U.S. Cl. 73—1 DV **18 Claims**



1. Circuit for testing a geophone of a data acquisition system by initially forcing a coil of said geophone from its natural rest position, then releasing said coil and monitoring damped coil vibration at an output of said geophone by digitally indicating response representations related to first and second adjacent, first occurring peak amplitudes of said vibration above and below a horizontal datum line, whereby geophone performance characteristics can be determined, comprising:

a generator for forcing said coil from its rest position and then releasing said coil;

means for generating and monitoring first and second response waveforms having peak amplitudes A_1 and A_2 related to said damped coil vibration peak amplitudes after said generator has released said coil of said geophone from its off-normal position, said A_1 and A_2 peak amplitudes being the first peak above (or below) a datum and the next-in-time peak below (or above) said datum, respectively;

said generating and monitoring means including (i) analog responder circuit means including first and second amplifying and conditioning circuits each in series with said geophone output; (ii) automated digital indicating and display means connected to said analog responder circuit means for separately generating binary digits, said automated digital indicating and display means including associated means for generating, storing and comparing counts proportional to a constant less than one times said A_2 response representation whereby counts proportional to and indicative of said A_1 response representation and an A_1/A_2 representation can be accurately generated and displayed so that geophone performance characteristics can be determined.

4,043,176

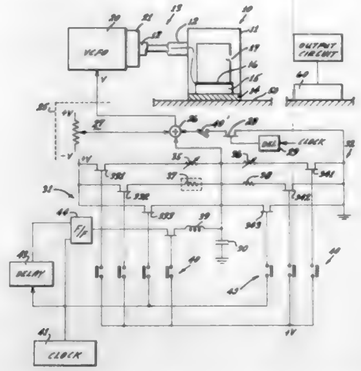
ACOUSTIC WHITE NOISE GENERATOR

Lloyd J. Graham, Newbury Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 21, 1976, Ser. No. 697,818
Int. Cl.² G01N *29/00*
U.S. Cl. 73—1 DV **5 Claims**

5. A method of subjecting structural parts to the influence of ultrasonic waves comprising the steps of:

generating with a single piezoelectric transducer a plurality of separate bursts of acoustic energy over a broad band, each of said separate acoustic bursts simulating the different frequency spectrum of a different acoustic emission, and coupling said bursts to said part at a selected first location thereof; and



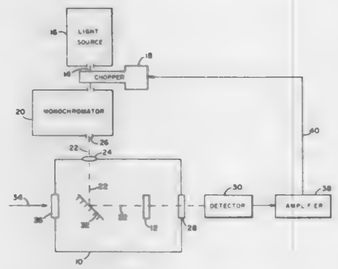
detecting at a second location remote from said first location the acoustic bursts received at the second location in order to determine the modifications in said bursts due to their propagation through the structural part.

4,043,177

METHOD TO OBSERVE DAMAGE INDUCED IN OPTICAL ELEMENTS BY INTENSE THERMAL RADIATION

Roderick D. Swift, Belmont, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 22, 1976, Ser. No. 679,309
Int. Cl.² G01N *25/00*
U.S. Cl. 73—15 R **1 Claim**



1. A process for detecting optical damage induced in optical elements by intense thermal radiation comprising:

projecting a monochromatic light beam onto a movable mirror;

folding the path of said monochromatic light beam onto an optical element, scanning the wavelength of said monochromatic light beam across the spectral bandpass of said optical element;

electrically converting the transmitted radiation into an electronic signal;

amplifying said electronic signal and displaying said signal as a strip-chart recording;

displacing said mirror from its original position;

exposing said optical element to a pulse of intense thermal radiation;

moving said mirror back to its original position;

projecting a monochromatic light beam onto said mirror;

folding the path of said monochromatic light beam onto said optical element scanning the wavelength of said monochromatic light beam across the spectral bandpass of said optical element;

electrically converting the transmitted radiation onto an electronic signal;

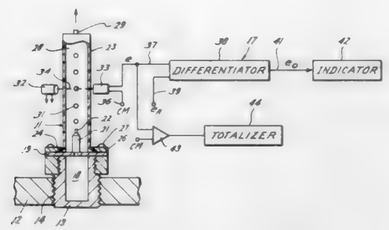
amplifying said electronic signal and displaying said signal as a strip-chart recording.

4,043,178

HYDROGEN PROBE SYSTEM

Joseph D. Winslow, Jr., Houston, Tex., assignor to Petrolite Corporation, St. Louis, Mo.

Filed May 6, 1976, Ser. No. 683,878
Int. Cl.² G01N *7/10*
U.S. Cl. 73—23 **17 Claims**



1. A hydrogen probe system comprising:

a. a ferrous metal probe body adapted to be exposed to a corrodant, said body having an enclosed fluid-tight internal cavity for collecting hydrogen gas produced by action of the corrodant on said body;

b. a sample cell containing a background liquid chemically inert and in which hydrogen has a relatively low solubility;

c. capillary port means in said sample cell connected by a fluid channel to said cavity, and said capillary port means precisely metering discrete uniform-dimensioned bubbles of hydrogen gas into said background liquid;

d. detector means sensing the release of hydrogen gas bubbles into said background liquid and providing an output signal representative thereof; and

e. output means receiving said output signal and providing a readout of the hydrogen gas bubbles being released from said capillary port means.

4,043,179

NON-DESTRUCTIVE TESTING OF BONDING LAMINATES

Harold R. Ingle, Jr., 2665 Jamerson Road, NE., Marietta, Ga. 30066

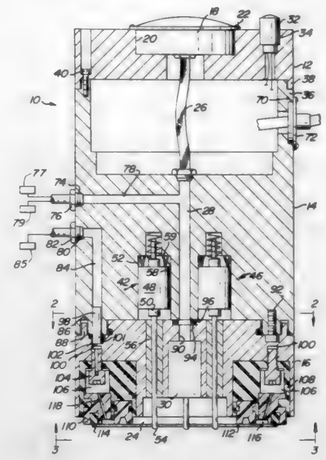
Filed July 9, 1976, Ser. No. 703,994
Int. Cl.² G01N *29/00*
U.S. Cl. 73—37 **15 Claims**

1. Apparatus for non-destructive tested of bonded laminates which include a substrate and a face sheet bonded thereto, comprising:

a vacuum chamber adapted to contact the surface of said face sheet as said apparatus is drawn across said face sheet;

means for applying a vacuum to said vacuum chamber thereby urging said face sheet into said vacuum chamber;

compressed air means for counteracting the normal force of said vacuum with respect to said face sheet to permit said apparatus to be drawn across said face sheet while said vacuum is maintained in said vacuum chamber; and



means for detecting the magnitude of the displacement of said face sheet into said chamber.

4,043,180

GATHERING LINE LEAK DETECTION SYSTEM TESTER

David A. Morris; Norman E. Flournoy, both of Richmond, and Thomas W. Langley, Bon Air, all of Va., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,547
Int. Cl.² G01M *3/00*; G08B *29/00*
U.S. Cl. 73—40.5 A **6 Claims**



6. In combination with a gathering line for petroleum products wherein said gathering line is subject to developing one or more leaks there along,

said gathering line having a plurality of acoustic leak detectors directly coupled thereto and spaced at predetermined intervals there along for detecting and locating a leak,

an acoustic oscillator permanently attached to said gathering line and associated with each of said leak detectors and coupled to said gathering line adjacent to each detector for testing whether said detector is operative, and

means for selectively activating each of said oscillators and identifying which of said oscillators is activated, comprising

means for producing a predetermined number of pulses, including a bistable multivibrator and a manual switch for shifting said multivibrator from one state to the other,

a binary counter associated with each of said oscillators for providing binary type output signals in accordance with said number of pulses,

binary encoded means associated with each of said oscilla-

tors including selectable alternative circuits for said binary type output signals,

first circuit means for connecting said binary type output signal producing means to said selectable alternative circuits, and

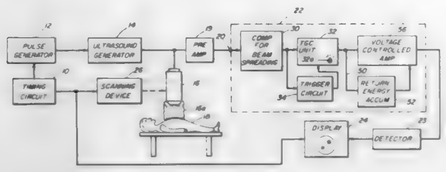
second circuit means for connecting said selectable alternative circuits to a pair of interconnected NAND gates for energizing said oscillator.

4,043,181

ULTRASONIC PULSE-ECHO APPARATUS

Anant K. Nigam, Fairfield, Conn., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Apr. 18, 1975, Ser. No. 569,185
Int. Cl.[2] G01N *29/00*
U.S. Cl. 73—67.8 R **14 Claims**



1. In ultrasonic pulse-echo apparatus of the type including a transducer for directing a beam of ultrasound pulses toward a multilayered object to be examined and for converting ultrasound echo pulses reflected from interfaces between the layers within the object into electrical pulses, and television-type display means responsive to the electrical pulses for displaying the image of said object, the improvement comprising:

signal processing means connected between said transducer and said display means for varying the gain of said electrical pulses and coupling the pulses to said display means, said signal-processing means including

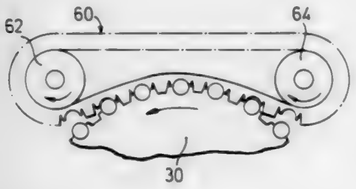
first means responsive to said electrical signals for varying the gain interactively to provide a gain value which at any instant of time following transmission of each ultrasound pulse from the transducer is substantially proportional to the cumulative energies of the echo pulses received by the transducer up to said instant of time for providing corrections for attenuation of the ultrasound beam due to reflections within said object.

4,043,182

TESTING OF CIGARETTES

Ivan Y. Hirsh, London, England, assignor to Molins Limited, England

Division of Ser. No. 466,839, May 3, 1974, Pat. No. 3,943,752. This application Aug. 22, 1975, Ser. No. 607,038
Claims priority, application United Kingdom, May 8, 1973, 22002/73
Int. Cl.[2] G01M *3/26*
U.S. Cl. 73—41 **3 Claims**



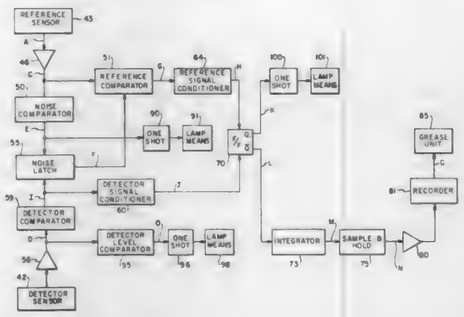
1. In a cigarette testing device for testing the joint between the wrapper and the filter of filter cigarettes, the improvement comprising a drum on which each cigarette is carried during testing and a belt extending around part of said drum and having a width considerably narrower than the length of a cigarette, said belt having integrally molded portions at regular intervals defining with the drum an annular space only around the area of the joint between the wrapper and the filter of each cigarette at a testing station whereby the cigarette is tested and integrally molded teeth in the belt which engage in recesses in said drum whereby the belt is driven by the drum.

4,043,183

CONSISTOMETER WITH SENSORS FAILURE AND SENSORS MISALIGNMENT INDICATING MEANS

Kenneth O. Higgs, Port Neches, and Lawrence F. Marsch, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,627
Int. Cl.[2] G01N *11/14*
U.S. Cl. 73—59 **6 Claims**



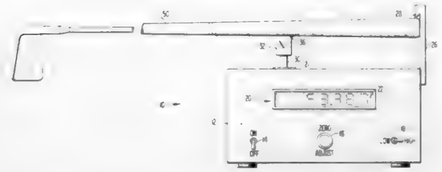
1. Apparatus for continuously measuring the consistency of a stream of material comprising a rotatable resilient member located in said stream so that the opposite surfaces about which said member is flexible are substantially parallel to the direction of flow in said stream, means for rotating said member at a constant rate about an axis which is parallel to the direction of flow in said stream, a reference member, means for rotating the reference member in synthronism with the resilient member, resilient member sensing means spatially related to the resilient member for providing a resilient member signal in accordance with the movement of the resilient member, reference member sensing means spatially related to the reference member for providing a reference member signal in accordance with the movement of the reference member, noise means connected to both sensing means for providing an enabling pulse in accordance with the reference member signal and the resilient member signal, first comparison means connected to the reference member sensing means and to the noise means for comparing the reference member signal with a predetermined voltage, corresponding to an acceptable reference member signal level, when enabled by an enabling pulse and providing a first comparison signal at one level when the reference member signal is an acceptable signal and at another level when it is not acceptable and for not making the comparison when the noise means does not provide an enabling pulse when not making the comparison; reference member pulse means connected to the first comparison means for providing a reference member pulse in response to the first comparison signal going from the other level to the one level; resilient member pulse means connected to the resilient member sensing means for providing a resilient member pulse in accordance with the resilient member signal; means connected to both pulse means for providing an output corresponding to the consistency of the material; and first and second display means, each display means being connected to a corresponding sensing means for providing a visual display indicating that the sensing means is providing a signal in accordance with the movement of its corresponding member.

4,043,184

APPARATUS FOR MEASURING THE SWING WEIGHT OF SPORTING IMPLEMENTS

Bernard Sayers, Sharp Lane, Newport, N.J. 08345

Filed Nov. 18, 1975, Ser. No. 632,948
Int. Cl.[2] G01M *1/10*
U.S. Cl. 73—65 **3 Claims**



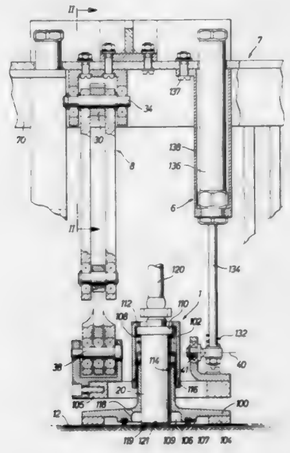
1. An apparatus for measuring the dynamic and dead weight of a golf club comprising, a housing having an opening in the top thereof, a bracket extending upwardly from said housing at a point spaced longitudinally of said housing from said opening, a flange at the upper end of said bracket, a lower surface forming a part of said flange, an electric weight measuring device in said housing, a standard having its lower end connected to said weight measuring device and extending upwardly through said opening, a fulcrum support affixed to the upper end of said standard and having a cradle transverse to said housing, a knife edge member defining one side of said cradle and parallel thereto, said edge member terminating in a plane spaced below the plane of said lower surface of said flange a distance equal to the diameter of the grip of said golf club whereby a golf club can be secured to said apparatus by placing the grip end under said lower surface and an intermediate portion of said shaft on said edge member and the moment measured by said device, and means on said housing to convert the moment measurement into a numerical readout.

4,043,185

DEVICE FOR NON-DESTRUCTIVE TESTING OF ROLLED STEEL PLATE AND THE LIKE

Hans-Werner Siebert, Oxelosund, Sweden, assignor to Granges Oxelosunds Jarnverk AB, Sweden

Filed Feb. 13, 1976, Ser. No. 658,100
Claims priority, application Germany, Feb. 13, 1975, 2506072
Int. Cl.[2] G01N *29/04*
U.S. Cl. 73—67.7 **23 Claims**



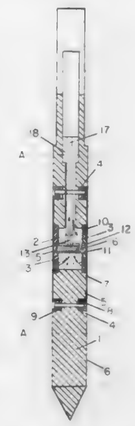
1. A device for the non-destructive testing of rolled steel plate and the like for the presence of internal flaws or defects, such as non-metallic inclusions, inhomogeneities and the like, comprising a carriage adapted to be traversed in relation to the surface of the plate to be tested and parallel thereto, said carriage having attached thereto, through the medium of connecting links, at least one ultrasonic test head including an ultrasonic transmitter and an ultrasonic receiver supported by a test head holder and adapted to be tilted about two mutually perpendicular tilting axes extending substantially parallel to the surface of the plate to be tested, the said connecting links comprising a number of elevating means the number of which corresponds to the number of test head holders present, each said elevating means cooperating with one of said test head holders, said elevating means being adapted individually to raise and lower said test head holders at right angles to said plate surface, characterized in that said connecting links associated with each test head holder comprise both an elevating cylinder and a separate guide means adapted positively to guide said test head holder in a direction extending at right angles to the raising and lowering direction, said guide means including two pairs of toggle lever means having first strut means proximal to said carriage and provided with toothed portions adapted to ensure positive symmetrical deflection of said first strut means in relation to the raising and lowering direction of said test head holders, and second strut means proximal to said test head holder, said second strut means and said elevating cylinder being coupled to said test head holder through pivotal joints having a common rotational axis constituting one of said two tilting axes of said test head holder.

4,043,186

FLAT EXPANSIBLE MEMBRANES ARRANGEMENT TO MEASURE ON LOCATION THE MODULE OF DEFORMABILITY OF TERRAINS NOT REQUIRING THE EXECUTION OF SOUNDING PERFORATIONS

Silvano Marchetti, Via Bracciano, 38-00159, Roma, Italy

Filed Oct. 29, 1975, Ser. No. 626,625
Claims priority, application Italy, Oct. 31, 1974, 53837/74
Int. Cl.[2] G01N *3/00*
U.S. Cl. 73—84 **8 Claim**



1. Probe to measure the modulous of terrain deformability in situ, comprising parallelipiped shaped probe rods tapering to a point for penetration into the terrain, a pressure chamber communicating with the outside through two circular openings situated on opposite faces of said probe body, two expansible metal membranes sealingly covering said circular openings said metal membranes becoming hemispheroidally shaped upon the introduction of compressed air to said chamber; means for introduction and removal of said air from said chamber and electrical contact means acting in response to the movement of said metal membrane.

4,043,187

METHOD OF MEASURING SURFACE ROUGHNESS

Kenichi Tomomatsu, Kawasaki, Japan, assignor to Doryokuro Kakunenryo Kaihatsu Jigyodan, Tokyo, Japan

Filed Oct. 15, 1976, Ser. No. 733,022
Claims priority, application Japan, Oct. 16, 1975, 50-124719
Int. Cl.² G01B *5/28*
U.S. Cl. 73—105 **3 Claims**

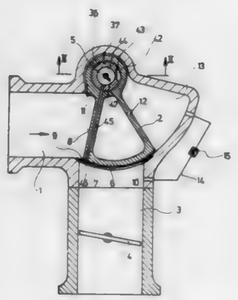
1. A method of measuring surface roughness comprising the steps of applying a replica material with good releasability on the surface of an object to be measured to form a replica film on said surface, stripping off said replica film to thereby form a first replica, applying on the surface of said first replica a layer on a non-hardened synthetic resin of the type which becomes high in hardness when hardened, separating said first replica after hardening of said resin to form a second replica, and measuring roughness of the surface of said second replica with a tracer.

4,043,188

AIR FLOW METER FOR INTERNAL COMBUSTION ENGINE

Volkhard Stein, Stuttgart, and Wolf Wessel, Oberriexingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Nov. 22, 1976, Ser. No. 743,736
Claims priority, application Germany, Dec. 5, 1975, 2554724
Int. Cl.² G01F *1/28*
U.S. Cl. 73—116 **5 Claims**



1. In an air flow rate meter for use in association with the air induction tube of an internal combustion engine, said air flow rate meter being pivotably disposed in said air induction tube and subjectd to a restoring force in opposition to the force of the air flow, the improvement comprising:

providing portions of the surface of said air flow rate meter with static mechanical features to impede air flow between said surface and the inside wall surface of said induction tube to thereby serve as a labyrinth seal.

4,043,189

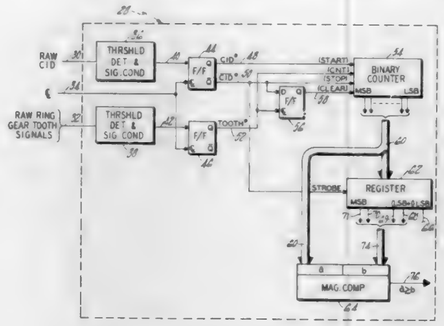
ENGINE, CYLINDER IDENTIFICATION (CID) TRANSDUCER

Rinaldo Robert Tedeschi, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 7, 1976, Ser. No. 684,221
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.3 **4 Claims**

3. In an engine diagnostic method of the type which monitors the operation of a combustion engine and provides signal information representative of the engine operating performance characteristics, the signal information including a series of sensed, periodic cylinder identification (CID) signal pulses representative of the stroke of an engine cylinder piston through a reference piston position as provided by a sensor in response to the cyclic displacement of an engine component member having a cyclic function directly related to the piston stroke of the cylinder, each CID pulse having a pulse width in dependence on the spatial distance between the sensor and the member during its cyclic displacement and on the period of the member displacement cycle which is related to the instantaneous revolutions per minute (RPM) of the engine, the signal information further including a series of tooth signal pulses, each representative of a corresponding one of a plurality of gear teeth disposed on the ring gear assembly of the engine flywheel housing the tooth signal pulse frequency tooth signal pulse being dependent on the engine RPM; the method of providing a CID signal manifestation of the stroke of an engine cylinder piston through a reference piston position which is not dependent on the spatial distance between the sensor and the engine component member or on the engine RPM, comprising the steps of:

detecting the series of sensed CID signals to provide a series of CID gate signals, one for each of the sensed CID sig-



nals, each having a time duration in dependence on the pulse width of a corresponding sensed CID signal, the time duration of each representing a CID interval;

counting the tooth signal pulses present within each of said CID intervals, to provide an instantaneous tooth count signal having a magnitude representative of the instant number of tooth signal pulses present within each of said CID intervals, and to provide a total tooth count signal having a magnitude representative of the total number of tooth signal pulses present within each of said CID intervals; and

providing a signal manifestation whenever the instantaneous tooth count signal magnitude from a present CID interval exceeds one-half of the total tooth count signal magnitude from an immediately preceeding CID interval, said signal manifestation being representative of the stroke of the cylinder piston through the reference piston position.

4,043,190

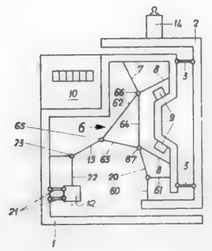
MASS AND FORCE METER

Mario Gallo, Zurich, Switzerland, assignor to Wirth, Gallo & Co., Switzerland

Filed May 28, 1976, Ser. No. 691,095
Claims priority, application Switzerland, Feb. 9, 1976, 001576/76
Int. Cl.² G01L *5/12*
U.S. Cl. 73—141 R **4 Claims**

1. Mass and force meter with a frame, a load-support and a measuring system, wherein the mass or force to be measured acts indirectly on the tension of two transversally vibrating, pre-loaded strings excited by electronic means, so that the resultant frequency changes serve for calculating the magnitude of said mass or force in a computing device, both strings, a first transmission element for the transmission of a pre-loading force and a second transmission element for the transmission of a force depending on the load to be measured being fixed to a force distributor guided in a statically determined way relative to the frame by means of the two strings and by means of at least one guide with respect to the pre-loading

force and with respect to the force depending on the load to be measured, characterized in that the force distributor comprises



three parts forming a triangle and that both strings, the guide and both transmission elements are fastened to the corners of the force distributor.

4,043,191

DYNANOMETER FOR A PUMP-OFF CONTROL

Manuel Dee Mills, 2808 Delano, Midland, Tex. 79701

Filed May 20, 1976, Ser. No. 688,130
Int. Cl.² G01L *5/04*
U.S. Cl. 73—151 **21 Claims**



1. Apparatus for measuring tension in a pair of spaced, elongated, parallel members, comprising, in combination, a discontinuous spring member having the distal ends thereof spaced from a midportion, clamp means by which said distal ends are attachable to the elongated members to cause each of said elongated members to be biased out of parallel relationship while said distal ends are springingly moved respective to one another in proportion to movement of said elongated members;

a sensor means connected to sense a change in the magnitude of the sprung relationship of said distal ends respective to one another and to said midportion;

said sensor means includes a scribe mounted to be moved in proportion to relative movement of said distal ends;

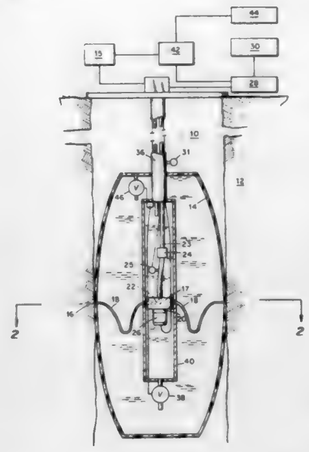
and a chart means connected to contact said scribe such that movement of said scribe respective to said chart means provides stored data related to the relative position of said distal ends.

4,043,192

APPARATUS FOR PROVIDING DIRECTIONAL PERMEABILITY MEASUREMENTS IN SUBTERRANEAN EARTH FORMATIONS

Lowell Z. Shuck, Morgantown, W. Va., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 8, 1976, Ser. No. 694,117
Int. Cl.² E21B *47/10*
U.S. Cl. 73—155 **3 Claims**



1. A device for providing in situ measurements indicative of the direction of maximum permeability and the magnitude of the permeability in a subterranean earth formation, comprising an inflatable housing containing a plurality of apertures penetrating the housing at circumferentially spaced-apart locations, means for selectively inflating said housing within a wellbore penetrating said earth formation to place said apertures in registry with said earth formation, a plurality of conduits within said housing coupled to said apertures and to a source of high-pressure fluid, means for selectively directing high-pressure fluid from said source through selected conduits to said earth formation, and means responsive to the pressure drop of the high-pressure fluid through said conduits for providing measurements indicative of the direction of maximum permeability and the magnitude of permeability in said subterranean earth formation.

4,043,193

METHOD AND APPARATUS FOR MEASURING VOLUME AND DENSITY OF FLUIDS IN A DRILLING FLUID SYSTEM

John M. Bailey, Houston, Tex., assignor to Bailey Mud Monitors Inc., Thibodaux, La.

Filed Aug. 3, 1976, Ser. No. 711,297
Int. Cl.² E21B *47/04*
U.S. Cl. 73—155 **8 Claims**

1. The method for measuring volume and density of mud in mud pits in a drilling fluid system comprising the steps of:

a. placing a first sensor a fixed distance above the bottom of the mud pit,

b. placing a second sensor a fixed distance above said first sensor in the mud pit,

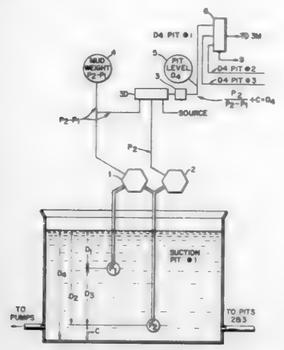
c. communicating the output of said first and said second sensors to a differential pressure transmitter,

d. communicating the output of said first sensor to an absolute pressure transmitter,

e. introducing the absolute pressure transmitter reading as an input to a Sorteberg bridge,

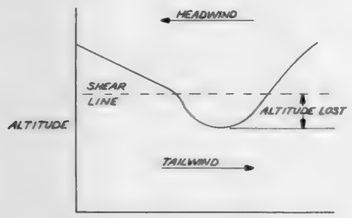
f. communicating the output of said differential pressure transmitter to a gauge displaying mud weight in units of

pounds per gallon, and as an input to said Sorteberg bridge, and



g. communicating the Sorteberg bridge output through a biasing relay for adding the constant C mud depth below said first sensor. The output of the biasing relay then represents true depth of fluid level.

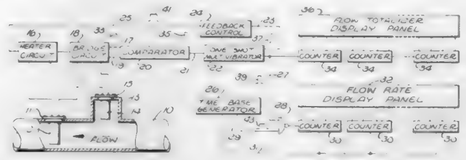
4,043,194
WIND SHEAR WARNING SYSTEM
Jesse H. Tanner, 3434 S. 144th, Seattle, Wash. 98168
Filed Aug. 20, 1976, Ser. No. 716,190
Int. Cl.[2] G01C *21/00*
U.S. Cl. 73—178 T **12 Claims**



1. A method of determining wind conditions along the projected flight path of an aircraft comprising the steps of:
measuring the in-line wind velocity and determining its direction at the threshold of a runway;
measuring the in-line wind velocity and determining its direction at the aircraft;
comparing the measured in-line wind directions to determine if a wind shear zone as indicated by oppositely moving wind currents will be crossed if the aircraft continues on the projected flight path;
calculating the velocity differential between the oppositely moving wind currents when a shear zone is determined to be present along the aircraft flight path; and
comparing the calculated velocity differential with known aircraft operating characteristics for various wind shear velocity differentials to determine if the aircraft can safely pass through the shear zone.

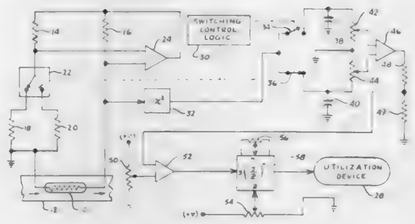
4,043,195
DIGITAL THERMODYNAMIC FLOW-METER
Curtis J. Hunting, 1808 E. Altenda Drive, Altadena, Calif. 91001
Filed Mar. 13, 1975, Ser. No. 552,500
Int. Cl.[2] G01F *1/68*
U.S. Cl. 73—204 **5 Claims**

1. A digital thermodynamic flowmeter for measuring and counting mass flow rate of a fluid comprising:
a. first and second temperature-sensitive electrical output transducers disposed in the flow path of said fluid; said first transducer being directly exposed to the main flow path of said fluid, said second transducer being shielded from the direct flow path but disposed to detect the ambient temperature of said fluid;
b. means for simultaneously maintaining said first and second transducers under reference thermal conditions while said first transducer is exposed to the thermal conditions to be measured, said reference thermal conditions being above fluid ambient temperature, said means having an input and an output;
c. means for detecting the magnitude of any deviation from reference condition of said first transducer with respect to said second transducer in response to said fluid flowing past said first transducer and removing heat therefrom and providing an output signal responsive thereto;



d. means for initiating a discrete electrical power pulse responsive to said output signal from said means for detecting said deviation, said power pulse having a constant width for varying flow rates;
e. means for applying said discrete power pulse to said first transducer, said discrete power pulse having sufficient power to return said transducer to said thermal reference condition irrespective of the volume of fluid flowing thereby;
f. counting means responsive to said output signal to reproduce a digital signal proportional to said mass flow; and
g. display means connected to said counting means for displaying the resulting counts.

4,043,196
METHOD AND APPARATUS FOR EFFECTING FLUID FLOW MEASUREMENT IN A SINGLE SENSOR
James H. Trageser, Dayton, Ohio, assignor to Technology Incorporated, Dayton, Ohio
Filed Feb. 9, 1976, Ser. No. 656,183
Int. Cl.[2] G01F *1/68*
U.S. Cl. 73—204 **11 Claims**

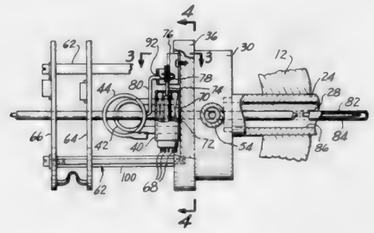


1. A method for measuring the mass flow rate of a fluid flowing in a conduit comprising the steps of:
A. disposing a single temperature sensitive resistive element in heat transfer communication with the fluid
B. causing the temperature sensitive resistive element to assume a first temperature (Ts_1) above that of the fluid by passing a current therethrough;
C. determining the power (P_1) necessary to maintain the temperature sensitive resistive element at the first temperature;
D. causing the temperature sensitive resistive element to assume a second temperature (Ts_2) above that of the fluid by passing a current therethrough;
E. determining the power (P_2) necessary to maintain the temperature sensitive resistive element at the second temperature; and
F. calculating the mass flow rate (m) by solving the equation:

$$\dot{m} = \left[\frac{\frac{P_2 - P_1}{Ts_2 - Ts_1} - A}{B}\right]^n = \text{mass flow rate}$$

wherein:
A = an empirically determined constant for zero flow (dependent on size of temperature sensitive resistive element and specific fluid properties)
B = an empirically determined constant for other than zero flow (also dependent on size of temperature sensitive resistive element and specific fluid properties)
n = an empirically determined constant dependent on physical size and shape of temperature sensitive resistive element.

4,043,197
FLOW RATE TRANSDUCER
Carl A. Mounteer, and Anthony T. Sizgorich, both of Irvine, Calif., assignors to Gulton Industries, Inc., Metuchen, N.J.
Filed Nov. 4, 1976, Ser. No. 740,934
Int. Cl.[2] G01F *1/38;* G01L *7/04*
U.S. Cl. 73—205 R **4 Claims**

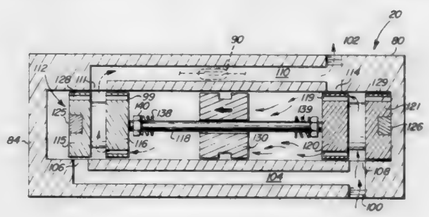


4. In a transducer for measuring the flow rate of a fluid, the combination of
a pressure differential sensor comprised by a helically configured Bourdon tube having a pressure inlet at each end thereof and a seal in the tube disposed equidistant from said inlets and dividing each tube into two separate pressure sensing portions;
a linear variable differential transformer associated with the pressure sensor, said linear variable differential transformer including a transformer core, a transformer input circuit and a transformer output circuit;
means for connecting said pressure sensor at the seal to the core of said transformer so that movement of the seal moves the core of the transformer;
first fluid pressure inlet means;
means for connecting said first fluid pressure inlet means to one pressure inlet of said pressure sensor for communicating the pressure at said first fluid inlet means to said sensor;
second fluid pressure inlet means for receiving a reduced pressure from a flow measuring device of the class comprised by orifices and venturis through which the flow to be measured flows;
means for connecting said second pressure inlet means to the other pressure inlet of the pressure transducer to communicate the pressure of said second pressure inlet means to said other sensor pressure inlet, whereby the position of the sensor transformer core is a function of the pressure differential across the sensor seal representing the pressure drop generated by the flow measuring device;
transformer actuation means operable to energize the transformer input circuits to produce a transformer output signal in the transformer output circuit, said output signal being a function of the position of the core and therefore of the pressure differential across the seal;
computation means operable in response to the output signal transformer output circuit to compute flow rate; and
means for applying the signal transformer output circuit to the computation means, in which the flow rate computation is based upon the equation:

$$Q_i = K_3[\Delta P]^{1/2}$$

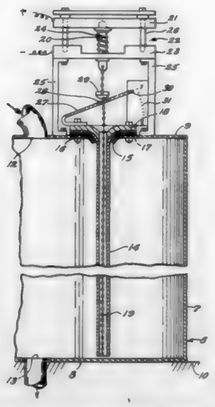
when
Q_i is the flow rate by weight or volume,
ΔP is the pressure differential across the sensor seal, and
K_3 is a constant for the device.

4,043,198
POSITIVE DISPLACEMENT FLUID FLOWMETER
Logan W. Stillwell, 1305 E. Second Place, Mesa, Ariz. 85203, and George K. Riffle, 2632 E. Pincho Ave., Phoenix, Ariz. 85016
Continuation-in-part of Ser. No. 648,865, Jan. 14, 1976, abandoned, which is a division of Ser. No. 579,507, May 21, 1975, abandoned. This application Nov. 19, 1976, Ser. No. 743,275
Int. Cl.[2] G01F *9/00*
U.S. Cl. 73—242 **10 Claims**



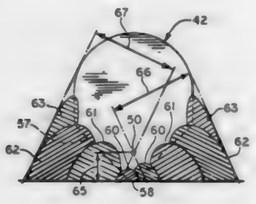
1. A positive displacement flowmeter for receiving fluid from a pressurized source thereof and for contnuously dispensing said fluid therefrom in precise volumetric increments, said flowmeter comprising:
a. a body defining an axial bore and having first and second opposite ends closing said bore;
b. an inlet port in said body for receiving said fluid;
c. an outlet port in said body for discharging said fluid:
d. metering means including:
i. a valving member axially shiftable within said body,
ii. a piston reciprocally slideable within said bore defining first and second volume chambers on respective sides thereof,
said valving member shiftable in response to said piston between a first position for establishing communication between said first chamber and said inlet port and between said second chamber and said outlet port, and a second position for establishing communication between said second chamber and said inlet port and between said first chamber and said outlet port; and
e. magnetic means exerting a predetermined force for alternately attracting and holding said valving member to said first position and said second position.

4,043,199
LEVEL INDICATOR FOR GRANULATE STORAGE TANKS
James H. Greer, 239 Thisbe Ave., Cincinnati, Ohio 45233
Filed June 1, 1976, Ser. No. 691,629
Int. Cl.² G01F *23/00*
U.S. Cl. 73—290 R **4 Claims**



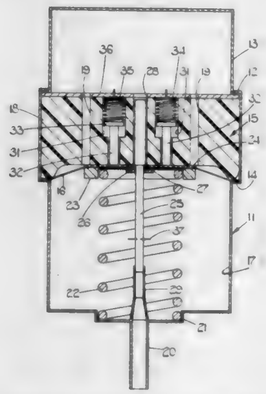
1. A device for indicating the level of flowable granulate in a storage tank, comprising a non-stretchable laterally collapsible sleeve disposed vertically within the tank for embedment in the granulate, a flexible, longitudinally contractile member freely hung inside and coextensive with the sleeve, a releasable means supporting the member within the sleeve, a weight sensing means adapted to support a portion of the member upon operation of the releasable means, and scale means associated with the weight sensing means to record the volume of granulate in the tank.

4,043,200
SURFACE THERMOCOUPLE
Philip F. Finney, Villa Park, Ill., assignor to Thermo-Couple Products Company, Inc., Winfield, Ill.
Division of Ser. No. 447,961, Mar. 4, 1974, Pat. No. 3,874,239, and Ser. No. 529,405, Dec. 4, 1974, Pat. No. 3,939,554. This application Oct. 2, 1975, Ser. No. 619,239
Int. Cl.² G01K *1/04*
U.S. Cl. 73—359 R **1 Claim**



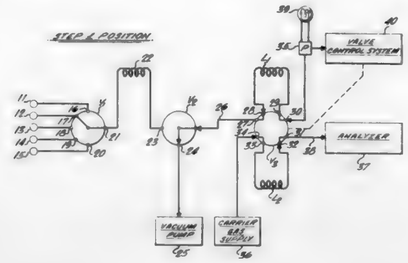
1. The method of mounting a thermocouple assembly on the surface of a furnace tube, wherein the tube is subjected externally to high temperature gases and flame and carries a fluid to be heated and wherein the thermocouple assembly includes an elongated tubular metal sheath, a pair of spaced thermocouple conductors within the sheath, electrical insulating material spacing and supporting said conductors within the sheath in insulating relation from each other and from the sheath, said conductors extending from the cold junction end for connection to the readout instrument, said conductors at the hot junction end being bent at substantially right angles to the sheath axis and extending through an opening in the sheath wall, a ceramic insulating plug in the opening receiving and holding said conductors in spaced and insulated relation from each other and from the sheath, a fusion wels at the ends of the conductors outside the plug defining the thermocouple hot junction, and a pad integral with the sheath and the hot junction, said pad having a substantially knife-shaped edge for direct engagement with the surface for which the temperature is to be monitored, which method comprises the steps of placing the knife-shaped edge of the assembly against the surface of the tube, and applying a void-free weldment between the pad and the tube such that the heat path between the hot junction and the outer tube surface is substantially less than the heat path between the hot junction and the nearest surface subjected to gases and flames.

4,043,201
FLUID PRESSURE TRANSDUCER
Michael Derek Cunnell, Salisbury, England, assignor to Lucas Electrical Limited, Birmingham, England
Filed May 3, 1976, Ser. No. 682,866
Int. Cl.² G01L *9/00*
U.S. Cl. 73—398 AR **9 Claims**



1. A fluid pressure transducer including a hollow body divided into first and second compartments which are sealed from one another, the first compartment being connected, in use, to a first source of fluid at a pressure to be monitored, while the second compartment is connected to a reference source, said compartments including a common wall which is deformable in response to variations in the pressure of said first fluid source as compared to that of said reference source, a carrier mounted in one of said compartments adjacent said common wall and secured to the body, a conductive contact member rigidly secured to said common wall and capable of linear movement towards and away from said carrier in response to deformation of said common wall, a plurality of electrically conductive plungers slidably mounted in respective bores in the carrier and resiliently urged to project from the carrier so as to become engaged with or disengaged from respective portions of said contact member at different positions respectively of said contact member relative to the carrier, whereby in use the number of said plungers engaging said contact member varies in accordance with variations in the pressure of said first fluid source as compared to that of said reference source, and means for producing an electrical output depending upon the number of said plungers engaging said contact member.

4,043,202
SAMPLE INJECTION SYSTEM FOR ANALYZERS
Jay D. Etheridge, Sand Springs, Okla., assignor to Sun Oil Company of Pennsylvania, Philadelphia, Pa.
Filed Mar. 19, 1976, Ser. No. 668,780
Int. Cl.² G01N *1/22*
U.S. Cl. 73—422 GC **6 Claims**



1. A vacuum loop sample injection system for injecting a predetermined amount of sample from a sample source into a system for analyzing said sample, and comprising:

a. a vacuum source;

b. means defining an enclosure having a predetermined volume;

c. means for detecting the pressure within the enclosure means and for producing a signal indicating that pressure within said enclosure means has reached a predetermined amount;

d. a source of carrier gas;

e. means for selectively connecting the enclosure means to be vacuum source, so that the fluid inside the enclosure means is evacuated;

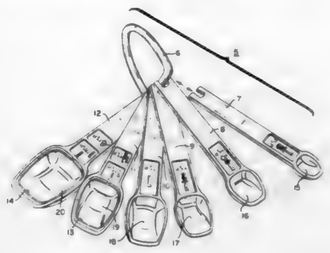
f. means for selectively connecting the enclosure means to the sample source, so that the vacuum created within the enclosure means causes a portion of said sample to fill the enclosure;

g. means for selectively placing the enclosure means in series with the carrier gas source and the sample analyzer system, so that the carrier gas forces the sample isolated in the enclosure into the analyzing system; and

h. means for actuating the means for selectively placing the enclosure means in series with the carrier gas source and the sample analyzing means in response to the signal from the pressure detecting means indicating that the predetermined pressure in the enclosure means has been reached, so that when the enclosure means is being filled with the sample and reaches a predetermined pressure, the enclosure means is switched in series with the carrier gas source so that the predetermined amount of sample is injected in the sample analyzer.

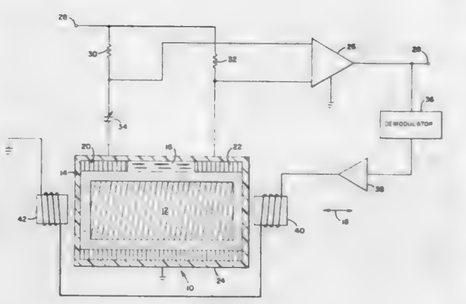
4,043,203
SPOON HOLDER AND MEASURING SPOON SET
Edward N. Montesi, Barrington, R.I., assignor to Dart Industries Inc., Los Angeles, Calif.
Filed June 23, 1976, Ser. No. 698,976
Int. Cl.² G01F *19/00*
U.S. Cl. 73—427 **10 Claims**

1. A measuring spoon set comprising a connecting rod and a plurality of spoons, each spoon having a handle and an integral bowl at one end thereof, each of said respective bowls having different maximum capacities, an inwardly extending slot at the end of each handle opposite the end to which the bowl is affixed said slot being partly circular in configuration and including an extension therebeyond that is wider than the circular part thereof to permit flexing of the portion of the handle on each side of the slot, and said connecting rod being substantially circular in cross-section and approximately the



same diameter as the circular part of the slot so that such can snap into the slot and be removably held therein.

4,043,204
MAGNETIC FLUID BEARING ACCELEROMETER
Joe S. Hunter, and Little J. Little, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Aug. 16, 1976, Ser. No. 714,881
Int. Cl.² G01P *15/08*
U.S. Cl. 73—516 R **3 Claims**



1. A fluid accelerometer including:

a. a non-magnetic housing having a cylindrical interior;

b. A magnetic cylinder carried in said housing;

c. a magnetic fluid carried in said housing about said magnetic cylinder;

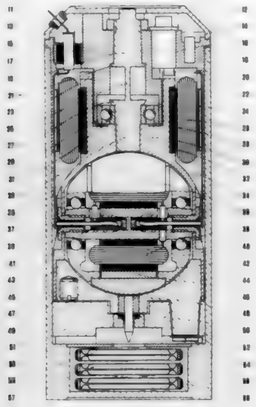
d. a capacitance bridge means cooperating with said magnetic cylinder for providing a voltage which is proportional in direction and magnitude to applied acceleration said bridge means including a first plate in the interior of said housing adjacent a first end thereof, a second plate in the interior of said housing adjacent a second end thereof, said first and second plates being disposed on one side of said magnetic cylinder, a common plate disposed in the interior of said housing substantially along the length thereof and on a second side of said magnetic cylinder which is opposite said first side; and,

e. means for providing closed loop operation of said accelerometer by aiding or opposing the magnetic field associated with the magnetic cylinder.

4,043,205
MINIATURIZED PRECISION SPEED GYROSCOPE
Michele Merlo, Via Domodossola 11, Milan, Italy
Filed June 4, 1976, Ser. No. 693,261
Claims priority, application Italy, Jan. 9, 1976, 19126/76
Int. Cl.² G01C *19/20*
U.S. Cl. 74—5.5 **1 Claim**

1. A miniaturized precision speed gyroscope comprising a

housing, on the outer surface of which two prismatic millings are formed, a bottom connected to said housing and carrying a moving element by means of a torsion bar fitted with an impact protecting device comprising a ball bearing carried on said bar with clearance between the inner ring and ball crown thereof, two end of stroke stop pins, which can be adjusted from outside and are accomodated within conical seatings in said bottom and provided with stop collars, teeth projecting from said stop pins in the rotational path of teeth projections, in turn, from said moving element, a differential transformer internally of said bottom and having a plurality of poles with only one coil for each of the poles and with a rotating core secured to said moving element including magnetic cores constituted as circular sectors magnetically independent of one another and half in number as the number of poles in the differential trans-



former, a motor including a shaft which is hollow and is secured to said moving element by hollow set screws, the two connections to the motor windings being provided with two connectors, including bushings which are located within the shaft and pins which pass through said hollow set screws and are connected to a power supply, a damping device comprising four fins secured to the moving element and rotating within four slots provided with four crossing bimetallic plates, located in pairs in different planes for varying the aperture of the slot bottom as the temperature varies, a liquid filling the free space in said housing, and three air bells enclosed within three resilient silver caps immersed in said liquid, the connection between different and interlocked parts of the gyroscope being effected by conical surfaces with stop collars for ensuring both axially and radially positive and simple positionings.

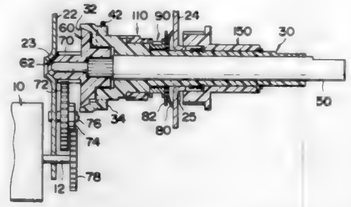
4,043,206

CHANNEL SELECTING SHAFT MOUNTING ARRANGEMENT FOR UHF TUNERS

Michiaki Narihiro, and Akira Nishimura, both of Ueno, Japan, assignors to New Nippon Electric Company, Ltd., Osaka, Japan

Filed Apr. 15, 1975, Ser. No. 568,302
Claims priority, application Japan, Apr. 18, 1974, 49-44524
Int. Cl.[2] F16H *35/18*
U.S. Cl. 74—10.54 **15 Claims**

1. A channel selecting device for a UHF tuner having a continuously variable main tuning shaft rotation of which is effective selectively to receive signals from all television stations in the UHF television band, which comprises; a selector shaft; a detent wheel secured to said selector shaft and having a series of lobes in the periphery thereof; spring detent means adapted to engage the lobes of said wheel for establishing a plurality of equally spaced detent positions for said selector shaft; a fine tuning shaft positioned inside said selector shaft; a drive gear secured to said fine tuning shaft; gear means for interconnecting said drive gear and said main tuning shaft; padless clutch means for transmitting rotation of said selector shaft to said drive gear while permitting rotation of said fine tuning shaft independently of said selector shaft when said selector is restrained by said detent means, said clutch means including a first padless taper portion on a hub member secured



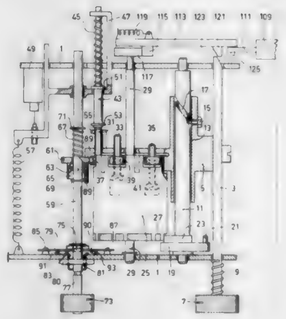
to said fine tuning shaft and a second padless taper portion on a hollow portion formed in said selector shaft; and clutch biasing means for exerting a force along the axes of said shafts to urge said first taper portion and said second taper portion to frictionally engage one another so as to align said selector shaft with said fine tuning shaft.

4,043,207

FREQUENCY SELECTOR COMPRISING A FREEWHEEL COUPLING

Eddy Johan Clarisse, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,297
Claims priority, application Netherlands, Oct. 14, 1974, 7413449
Int. Cl.[2] F16H *35/18*; H03J *5/02*
U.S. Cl. 74—10.15 **6 Claims**



1. In a frequency selector comprising a first control member mounted for operational movement; a tuning assembly with pre-selection capability, including a tuning device, a plurality of adjustable members, means for mounting said adjustable members and for selecting one of said members in response to operational movement of said control member, and coupling means comprising a coupling member for controlling the tuning device in response to displacement of said coupling member by a selected one of said adjustable members; a second control member; means for positioning said second control member for movement between first and second stable positions, in said first stable position said second control member being engaged with said selected one of said adjustable members for fine adjustment motion of said selected member, and in said second stable position said second control member being disabled from engaging any of said adjustable members; and means for moving said second control member from said first

to said second position in response to operational movement of said first control member,

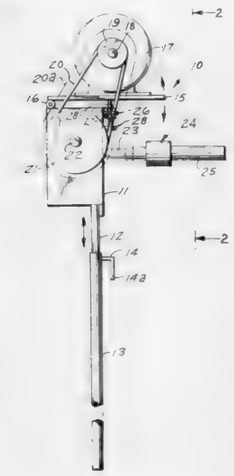
the improvement wherein said first and second control members and mounted for slidable translational movement along parallel paths for said operational movement and said movement between said first and second stable positions respectively, and said tuning assembly includes a coupling element slidable along a path parallel to said paths, said coupling element moving said second control member out of engagement in response to said operational movement of said first control member.

4,043,208

CRANKING DEVICE FOR A SILO UNLOADER

Duane A. Losing, R.F.D. No. 1, Hawick, Minn. 56246

Filed Sept. 1, 1976, Ser. No. 719,359
Int. Cl.[2] F16M *3/00*; F16H *7/10*
U.S. Cl. 74—16 **4 Claims**



1. A cranking device for a silo unloader, comprising a reduction gear box, adjustable leg means secured to said gear box, providing elevation means therefor, motor base plate means adjustably secured to said gear box, pulley and belt means secured to said device for driving the output shaft of said reduction gear box and clutch means secured to one of the shafts of said reduction gear box.

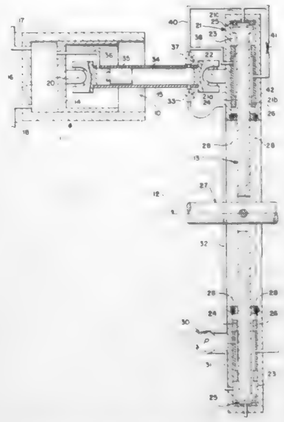
4,043,209

HYDROSTATIC BEARING LUBRICATION SYSTEM

Karl J. Bea, 128 Dewitt St., Syracuse, N.Y. 13203

Filed June 23, 1976, Ser. No. 698,837
Int. Cl.[2] F16H *23/00*; F04B *1/14*
U.S. Cl. 74—60 **9 Claims**

1. A hydrostatic bearing lubrication system for a swash plate compressor or engine in which the compressor or engine has a piston reciprocating in a cylinder with the piston connected to and reciprocating with a stator in which a rotating and oscillating rotor is mounted and with a hydrostatic bearing shoe mounted to the stator and between the stator and rotor at a position subject to continuously variable pressure loading of the piston and the stator on the rotor, said system comprising a lubricating fluid reservoir, a pump connected to deliver a lubricating fluid under substantially constant pressure to said reservoir, pressure means operating responsive to pressures within said cylinder to directly apply substantially corresponding pressures to said reservoir, conduit means connected between said reservoir and said bearing shoe to deliver lubricating fluid under pressure between said bearing shoe and said



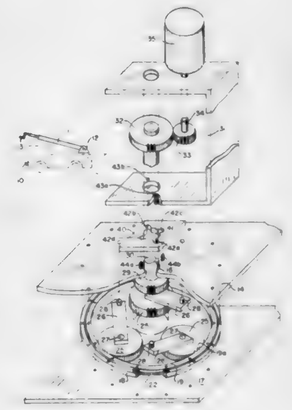
rotor, and means for returning lubricating fluid draining from between said bearing shoe and said rotor to said pump.

4,043,210

ROTATOR DRIVE SYSTEM

Walter C. Updegrave, Reading, Pa., assignor to Reading Techmatic Corporation, Reading, Pa.

Continuation of Ser. No. 464,075, April 25, 1974, abandoned.
This application Nov. 19, 1975, Ser. No. 634,302
Int. Cl.[2] F16H *3/44*
U.S. Cl. 74—750 R **21 Claims**



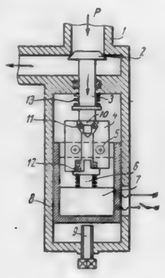
1. A drive system for a rotatable member comprising a shaft rotatably mounted relative to the rotatable member, a drive means for driving the shaft, a sun gear mounted on the shaft, a ring gear, a support, means for fixedly mounting the ring gear on the support, at least two rotatable planet gears in engagement with the sun gear and the ring gear, the axes of rotation of the planet gears, the sun gear and its shaft being substantially parallel, means mounting the planet gears on the rotatable member and coupling means interconnected between said drive means and said rotatable member for allowing the axis of rotation of the shaft to shift radially relative to the ring gear with motions which lie in a plane to which said axes of rotation of said planet gears are perpendicular with the axis of rotation

of said sun gear, said shaft and said planet gears remaining parallel as said axis of rotation of said shaft shifts radially.

4,043,211
APPARATUS FOR TRANSMITTING A COMMAND SIGNAL

Nikolai Trofimovich Romanenko, ulitsa Smolenskaya, 5/1, kv. 20, Kiev; Alexandr Vasilievich Chichin, prospekt Lenina, 1, kv. 201; Ivan Frantsevich Lyaskovsky, ulitsa Pobedy, 83, kv. 80, both of Kuibyshev; Vladimir Jurievich Melnik, ulitsa B.Lepse, 43a, kv. 54, Kiev; Nikolai Ivanovich Medinsky, ulitsa Mirnaya, 155, kv. 8, and Valentin Matveevich Yakunin, prospekt Lenina, 1, kv. 143, both of Kuibyshev, all of U.S.S.R.

Filed Oct. 28, 1974, Ser. No. 626,207
Claims priority, application U.S.S.R., Oct. 28, 1975, 2070141
Int. Cl.[2] F16H *21/44*
U.S. Cl. 74—110 **2 Claims**

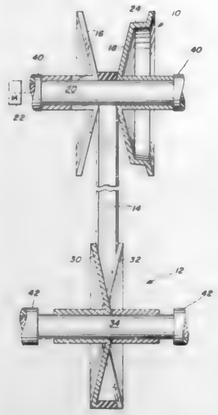


1. In an apparatus for transmitting a command signal from a linearly displaceable driving member to a driven member which is displaceable in response to the command signal, a command signal transmission assembly comprising two arms having pivotally mounted central portions and opposite end portions, one pair of the end portions of said arms straddling the driving member to be retained in a normal position, either spread apart or brought together, by said driving member, the opposite pair of the end portions of said arms being in operative engagement with said driven member to hold the same in position, said driven member having a wedge-shaped end piece, said arms engaging said wedge-shaped end piece in a wedged relation therewith, said driving member and said driven member being axially aligned and comprising axially displaceable rods with respective end pieces facing each other, said arm having pivot axes extending transversely of the axes of the rods, and resilient means acting on the driven member to urge the arms apart by said wedge-shaped end piece, said end piece of said driving member normally urging said opposite end portions of the arms apart, the driving member being displaceable by a command signal to produce pivoting of said arms and displacement of said driven member, intermediate rolling bodies interposed between the wedge-shaped surface of the end piece of the driven rod and the end portions of the arms adjacent thereto and further rolling bodies interposed between the engagement surfaces of the opposite end portions of the arms and the end piece of the driving rod, said rolling bodies cooperating with planar engagement surfaces of the arms of the end pieces of the rods, said rolling bodies being in the form of rollers extending transversely of the common axis of the rods and parallel to the pivot axes of the arms, and wherein in the area of the engagement between the driving rod and the adjacent end portions of the arms a single one of said rollers is located on one side of the end piece of said rod and two said rollers are located on the opposite side thereof.

4,043,212
VARIABLE DRIVE

John Craig Warner, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 12, 1976, Ser. No. 666,387
Int. Cl.[2] F16H *55/49, 55/56*
U.S. Cl. 74—230.17 A **5 Claims**

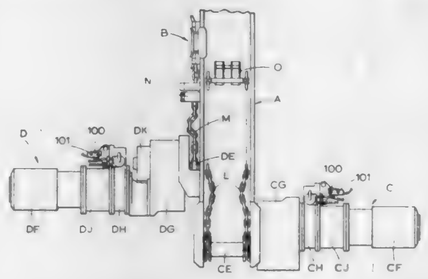


1. A variable drive system comprising driveR and driveN pulleys, each connected to a shaft, means connecting the pulleys, each pulley comprising a pair of flanges, the flanges of each pulley being axially movable toward and away from each other and relative to its respective shaft, one flange of one of said pulleys having an axially extending flat-surfaced outer rim to receive said pulley connecting means in the final drive ratios between said pulleys.

4,043,213
DRIVE ASSEMBLIES FOR MINING APPARATUS

John Gibson, Newton Aycliffe, England, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Germany

Filed Nov. 16, 1976, Ser. No. 742,323
Claims priority, application United Kingdom, Nov. 17, 1975, 47257/75
Int. Cl.[2] F16H *7/08, 7/10*
U.S. Cl. 74—242.8 **15 Claims**



1. A drive assembly for a mineral mining installation, said assembly comprising:
   a. a rotatable output member;
   b. a transmission;
   c. a main motor for driving said rotatable output member via said transmission; and
   d. a chain-tensioning device for driving said rotatable output member at a reduced speed:

said transmission comprising:

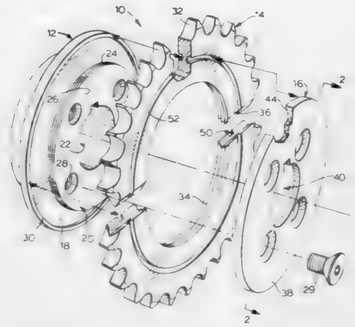
1. main gearing in driving connection with said rotatable output member;
2. a gear input shaft for said main gearing; and
3. a resilient coupling device in driving connection with said main gearing via said gear input shaft and in driven connection with said main motor;

wherein said chain-tensioning device and said resilient coupling device are mounted in the same housing.

4,043,214
SPROCKET, GEAR OR PULLEY WITH INTERCHANGEABLE RIM

Glen Edgar Westlake, 403 Bent Crescent, Richmond Hill, Ontario, Canada

Filed Apr. 13, 1976, Ser. No. 676,498
Int. Cl.[2] F16H *55/12, 55/30*
U.S. Cl. 74—243 DR **8 Claims**



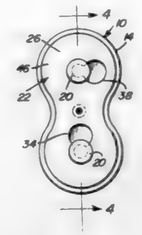
1. A sprocket, gear or pulley having a replaceable peripheral portion, comprising:
   a hub having an axial, cylindrical boss circumferentially threaded on its outer surface;
   an annular member having mechanical power transmission engagement means along the outer rim thereof and threaded along the inner rim thereof for engagement with the boss; and
   means removably secured to the hub to hold the annular member immovable therebetween, the annular member and the hub having interlocking annular flange and groove means and the annular member and the holding means having interlocking annular flange and groove means, whereby the annular member is retained immovably in engagement with the hub.

4,043,215
CHAIN MASTER LINK CONSTRUCTION

Walter J. Long, 1574 Iris Way, Upland, Calif. 91786; Stephen W. Long, 10016 Santa Anita, Montclair, Calif. 91763, and Robert P. Long, 1574 Iris Way, Upland, Calif. 91786

Filed May 4, 1976, Ser. No. 683,197
Int. Cl.[2] F16G *13/02*
U.S. Cl. 74—258 **7 Claims**

1. In combination, an elongated master link side link having a pair of transverse bores formed through its opposite end portions adapted to receive the free circumferentially grooved ends of a pair of master link pins therethrough, and an elongated retaining clip adapted for engagement over said side link and with the extended grooved ends of said pins for retaining said side link on said pins, one end of said clip including first means defining a first opening formed therethrough including communicated large and small width portions, said large width portions being adapted to axially receive one of said pin ends therethrough, said small width portion opening toward the other end of said clip into said large width portion and adapted to snugly and seatingly receive the grooved portion of said one pin therein, the other end of said clip including means defining a second opening formed therethrough including communicated greater and lesser width portions, said greater width portion being adapted to axially receive the other of said pin ends therethrough, said lesser width portion opening in a direction transverse to the longitudinal extent of said clip into said greater width portion, said second opening being spaced

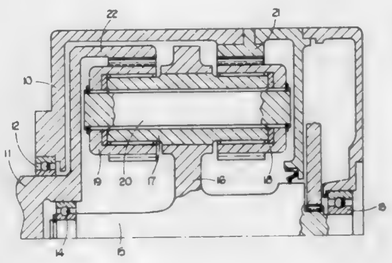


toward said other end of said clip from said first opening, said clip being positionable, relative to said link, in predetermined position with said small and lesser width portions registered with said bores, and said clip and link including coacting means releasably retaining said clip against angular displacement relative to said link about an axis extending centrally through said small width portion of said first opening.

4,043,216
COMPOUND PINIONS FOR USE IN EPICYCLIC GEAR BOXES

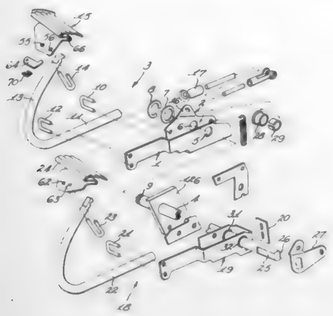
Ronald John Steer, Pudsey, England, assignor to Lucas Industries Limited, Great Britain

Filed Oct. 9, 1975, Ser. No. 620,928
Claims priority, application United Kingdom, Oct. 11, 1974, 44214/74
Int. Cl.[2] F16H *35/10*
U.S. Cl. 74—410 **7 Claims**



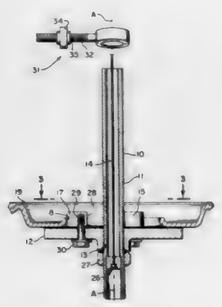
1. A compound pinion for use in an epicyclic gearbox, said pinion comprising a tubular shaft portion, a pair of pinion portions mounted on opposite ends of said shaft portion for free rotation relative thereto, the mounting of the pinion portions on the tubular shaft portion being relatively stiff and a resilient torsionally flexible member extending through said shaft portion and connected at its ends to the two pinion portions, the flexible member adapted to deflect and twist to ensure that the load is substantially evenly shared within prescribed tolerances by the pinion portions, and, thus, the pinion portions only having freedom to move portionally relative to one another.

4,043,217
BRAKE PEDAL
Earl F. Kleist, Milwaukee, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.
Filed Aug. 4, 1976, Ser. No. 711,650
Int. Cl.[2] G05G *1/14*
U.S. Cl. 74—470 **10 Claims**



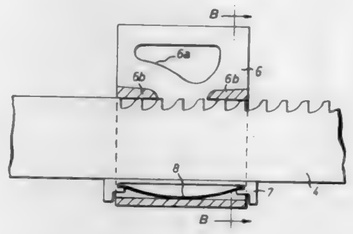
1. A pedal comprising, a base member, mounting means pivotally supporting said base member, a shank member forming an arcuate segment and radial arm for connection with said base member, means adjustably fastening said shank member on said base member to adjustably set the radial length of said radial arm to equal the radius of curvature of said arcuate segment of said shank, a food pad, means fastening said foot pad to the end of said arcuate segment, a mounting flange on said foot pad, a tread portion on said foot pad, a resilient fold in said foot pad between said tread portion and said mounting flange to provide a shock absorbing means for reducing the pedal forces transmitted from said pedal to pedal operated mechanisms.

4,043,218
PORTABLE WHEEL-BALANCER
Lawrence H. Groeper, 5223 Armida Drive, Woodland Hills, Calif. 91364
Filed Nov. 26, 1976, Ser. No. 745,395
Int. Cl.[2] G01M *1/12*
U.S. Cl. 73—486 **5 Claims**



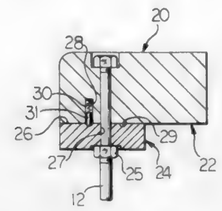
1. A portable wheel-balancer including, in combination:
a. a hollow vertical shaft having a suspending wire secured axially to the interior of said shaft and passing out the top thereof;
b. a flat plate centrally secured to the shaft at a level such that the point of securement of said wire is slightly above the center of gravity of a wheel carried on said plate;
c. at least three members on said plate equally circumferentially and radially spaced from the axis of said shaft to define three engagement points for the inside periphery of the hub opening in a wheel to be balanced so that said wheel itself is held in coaxial relationship with said shaft when resting on said plate, any imbalance of said wheel resulting in a tipping of the plate detectable by observing the extending portion of the suspending wire from the top of said shaft, each of said members being individually mounted on the surface of said plate so that the radial distance of the engaging portion of each member can be changed by individual movement of the members to accommodate center hub openings in wheels of different sizes; and
d. a fixture in the form of a threaded stud terminating at one end in a collar receivable over said shaft and at its other end in a threaded nut defining a flat surface facing said collar, threading of said nut changing the radial distance between said flat surface and the axis of said shaft when said collar is received over said shaft, said flat surface serving as an indexing means to enable adjustment of the engaged portions of said members at equal radial distances from said shaft by revolving said fixture about said shaft and positioning said members to have the radial distances of these radially most distant points grazed by said flat surface.

4,043,219
SLIDER FOR AN ANGLE ADJUSTER FOR RECLINING FURNITURE
Josef Schatti, Im Tschachen, 8762 Schwanden, Switzerland
Filed Apr. 11, 1975, Ser. No. 567,194
Claims priority, application Germany, Jan. 24, 1975, 2502963
Int. Cl.[2] G05G *5/06*
U.S. Cl. 74—536 **10 Claims**



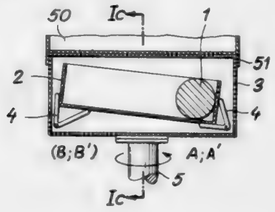
1. In an angle adjuster for reclining furniture having firstly a rack with a series of rack teeth along an upper face thereof and a smooth lower face extending substantially parallel to said series of rack teeth, secondly a lever pivoted about a first axis at one end of said series of rack teeth, and thirdly a strut which is pivoted about a second axis to said lever, carries a cam follower member, and is formed at an end remote from said second axis to engage any one of said rack teeth for the adjustment of the angle between said lever and said rack, a slide mounted to slide relatively to said rack and formed with a cam surface engaging said cam follower member for controlling the position of said strut in relation to the improvement comprising said series of rack teeth, said slide having a portion thereof beneath but spaced from said lower face of said rack, and inserted means interposed between said portion and said lower face providing a surface in sliding contact with said lower face and also providing resilient reaction on said slide maintaining said lower face and surface in contact, at least one of said lower face and said surface being formed of synthetic plastics material.

4,043,220
ADJUSTABLE CONTROLS OF A WORK VEHICLE
David L. Kolb, St. Charles, Mo., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed June 21, 1976, Ser. No. 697,882
Int. Cl.[2] G05G *1/06, 5/18*
U.S. Cl. 74—543 **5 Claims**



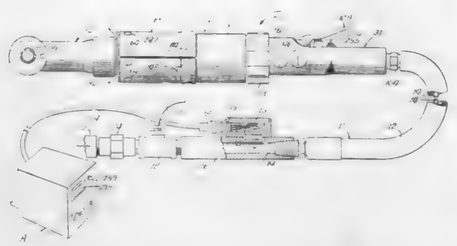
1. In the controls of a work vehicle having first and second shafts, each movable between first and second positions along pathways generally parallel one to the other, the improvement comprising:
a knob connected to each shaft, each of said knobs being eccentrically connected to the shaft with the largest overhanging portion of each knob being controllably movable to preselected positions about the center line of its respective shaft.

4,043,221
MASS-IMBALANCE OSCILLATION GENERATOR
Dieter Peschel, Schwalbach, and Dieter Funke, Bad Soden, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany
Filed Apr. 16, 1975, Ser. No. 568,734
Claims priority, application Germany, Apr. 18, 1974, 2418641
Int. Cl.[2] F16F *15/22*
U.S. Cl. 74—573 R **10 Claims**



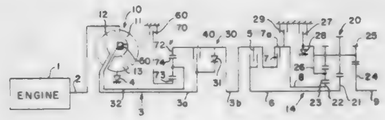
1. An oscillatory drive comprising a rotatable shaft, an imbalance mass entrained by said shaft and shiftable transversely to the axis of rotation thereof, and guide means for controlling the position of said mass to enable said mass to assume an eccentric rest position upon cessation of rotation of said shaft and against a restoring force to enable said mass to assume an end position different from said rest positions under the action of centrifugal force upon rotation of the shaft, said positions having substantially the same angular orientation with respect to said shaft, said guide means further defining an opposite rest position for said mass into which said mass is displaced by said restoring force upon a successive cessation of rotation of said shaft and another end position on the same side as said other rest position and into which said mass is displaced by the reapplication of centrifugal force thereto, said mass and said shaft having a combined center of gravity offset from the axis of said shaft in both of said end positions of said mass, the mass in each end position having a greater potential energy than the mass in the corresponding rest position, said guide means including an inner housing adapted to rock about an axis transverse to the axis of said shaft, an outer housing rotatable by said shaft and receiving said inner housing, and stabilizing levers at opposite sides of said inner housing for transforming lateral centrifugal force thereon to an elevation of the corresponding side of said inner housing.

4,043,222
HOUSING CONSTRUCTION FOR A POWER TOOL
Edmund C. Dudek, St. Charles, Ill., assignor to Thor Power Tool Company, Aurora, Ill.
Division of Ser. No. 359,640, May 14, 1973, Pat. No. 3,920,082. This application Oct. 6, 1975, Ser. No. 620,034
Int. Cl.[2] F16H *57/02*
U.S. Cl. 74—606 R **7 Claims**



1. A tool assembly, comprising; first housing means having first drive means therein, second housing means having output drive means therein, third housing means connecting said first and second housing means and having second drive means connecting said first drive means and said output drive means, said third housing means having two portions each releasably connected to said first housing means and said second housing means, whereby either of said housing portions may be disengaged from said first housing means and said second housing means to provide access to said second drive means.

4,043,223
OVERDRIVE MECHANISM FOR AUTOMATIC POWER TRANSMISSION
Kiyoshi Ohnuma, and Syuzi Nagano, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Mar. 12, 1976, Ser. No. 666,423
Claims priority, application Japan, Mar. 25, 1975, 50-34912
Int. Cl.[2] F16H *47/08*; F16N *57/10*
U.S. Cl. 74—688 **8 Claims**



1. An overdrive mechanism for automatic transmissions of the type including a change gear mechanism and a torque converter having an input element connected to an engine and an output element operatively connected to said change gear mechanism, said overdrive mechanism comprising:
an input shaft to said change gear mechanism having a first section connected to said output element of said torque converter and a separate second section connected to said change gear mechanism;
clutch means operatively connected to said second section of the input shaft and engaging said first section of the input shaft, said clutch means being disengaged from said first section in response to a predetermined operation of the change gear mechanism;
a planetary gear train including (i) a sun gear, (ii) a carrier

operatively responsive to the input element of said torque converter, and (iii) a ring gear operatively connected to said clutch means; and

overdrive brake means activated in response to said predetermined operation of the change gear mechanism for locking said sun gear against rotation whereby said ring gear is rotated by movement of said carrier in response to movement of said input element of said torque converter, said second section of said input shaft, said clutch means, said planetary gear train and said overdrive brake means all being positioned outside said torque converter.

4,043,224

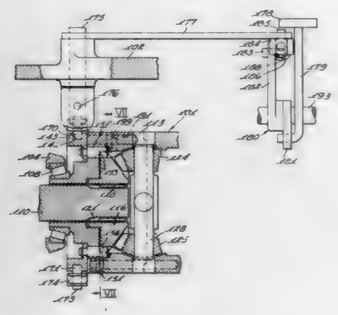
MECHANICAL DIFFERENTIAL LOCK

David C. Quick, New Berlin, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 478,737, June 12, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,480

Int. Cl.[2] F16H *1/44*

U.S. Cl. 74—710.5 **10 Claims**



1. A mechanical differential locking means on a differential in a drive mechanism of a motor vehicle comprising, a rear axle drive housing, a pair of drive axles, bearing means in said housing rotatably supporting said pair of drive axles on a common axis, a differential including a differential casing defining support bearing surfaces and a cylindrical collar bearing surface on its outer periphery, a ring gear connected to said differential casing for driving said differential, a pair of support bearings mounted in said housing and rotatably supporting said casing on said support bearing surfaces for rotation on said common axis, a pair of side gears mounted in said casing adapted for driving the pair of rear axles, bearing surfaces in said casing rotatably mounting said side gears or rotation on said common axis, one of said side gears defining a back surface engaging a mating surface on the internal portion of said casing, a pair of differential pinion gears rotatably mounted on an axis normal to said common axis and meshing with said side gears, a shift collar slidably mounted on said cylindrical collar bearing surface of said casing for slidable movement on said common axis, a plurality of cylindrical pins mounted on said collar with each pin defining an axis parallel to the said common axis, means defining a plurality of cylindrical openings of the same size as said cylindrical pins in said differential casing with each opening defining an axis parallel with said common axis and each of said openings extending to said back surface of said one of said side gears and around the outer periphery of said gear, said openings receiving said pins and contacting said pins over the entire portion of the pin extending into said casing, said one side gear defining peripheral semi-cylindrical grooves of the same curvature as said cylindrical pins for receiving said pins, an actuating mechanism including a resilient member biasing said collar and pins reciprocally for selectively engaging said pins from said peripheral grooves on said one side gear for synchronous operation of said side gears when said actuating mechanism is operated, a differential release means including means defining a plurality of holes in said differential casing, resilient means in each of said holes engaging said collar and resiliently biasing said collar with said pins from said peripheral grooves on said one side gear against any residual force in said resilient member for differential operation of said side gears.

4,043,225

POWER SHIFT TRANSMISSION FOR MOTOR VEHICLES

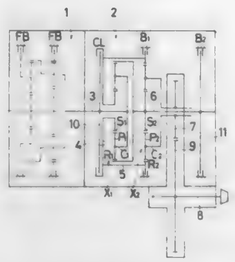
Yutaka Momose, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Continuation of Ser. No. 537,370, Dec. 30, 1974, abandoned. This application Aug. 25, 1976, Ser. No. 717,535

Claims priority, application Japan, Dec. 29, 1973, 49-365

Int. Cl.[2] F16H *57/10, 37/00*

U.S. Cl. 74—761 **4 Claims**



1. A power shift transmission for motor vehicles comprising:

a first planetary gear set having a first sun gear, a plurality of first planetary pinion gears engaged with said first sun gear, a first ring gear interengaged with said first planetary pinion gears, and a first carrier rotatably supporting said first planetary pinion gears and permanently directly connected with an input shaft so as to always be driven by said input shaft.

a second planetary gear set having a second sun gear, a plurality of a second planetary pinion gears engaged with said second sun gear, a second ring gear interengaged with said second planetary pinion gears, and a second carrier rotatably supporting said second planetary pinion gears and connected with an output gear member;

said first sun gear being connected with said second ring gear and said first ring gear being connected with said second sun gear;

a first brake means for simultaneously locking said first sun gear and said second gear to a gear casing; and

a clutch means for directly connecting said second ring gear and said first sun gear with said input shaft.

4,043,226

DISENGAGE MECHANISM FOR GEAR DRIVE

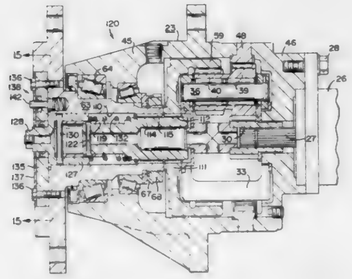
Dennis L. Buuck, Lafayette, Ind., assignor to Fairfield Manufacturing Company, Inc., Lafayette, Ind.

Continuation-in-part of Ser. No. 510,505, Sept. 30, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,836

Int. Cl.[2] B60K *17/14, 17/26;* **F16D** *23/14;* **F16H** *1/28*

U.S. Cl. 74—801 **13 Claims**

13. A gear drive and disengage mechanism including in combination a housing, a drive motor secured to said housing and having a drive shaft extending into said housing, a sun gear secured to said drive shaft, a planet carrier, a gear shaft carried by said planet carrier, first and second planet gears rotatively carried by said gear shaft with said first planet gear being in meshing engagement with said sun gear, said first and second planet gears being secured together, said housing including a stationary hub, a cover, a first ring gear interposed between said hub and cover and secured thereto, said first planet gear being in meshing engagement with said first ring gear, a second rotatable ring gear having a drive portion with first axial splines, said second planet gear being in meshing engagement with said second ring gear, an output spindle rotatably mounted on bearings carried by said stationary hub and positioned coaxial with said second rotatable ring gear, wall means defining a bore extending axially into said output spindle, a drive actuator located within said bore in said output spindle and having means connecting said drive actuator to said spindle and permitting axial movement of said drive actuator between first and second positions relative to said spindle, said drive actuator having second axial splines thereon engageable with said first axial splines in said first position of said drive actuator to connect said drive portion of said second ring gear to said spindle, said drive actuator in said second position disconnecting said spindle from said drive portion of said second ring gear, a cam member surrounding one portion of said drive actuator and having a cam surface thereon, a pin carried by said drive actuator and engageable with said cam surface, a spring engaging said drive actuator to at all times urge said drive actuator to its said first position, said cam member being rotatable between first and second positions and in moving to said first position removing camming force from said pin and permitting said spring to move said drive actuator to its said first position, said cam member in moving to its said second position causing said cam surface to engage said pin



with a camming force to positively move said drive actuator to its said second position against the urging of said spring, a cam actuator surrounding at least a portion of said cam member and extending exteriorly of said bore in a position to be manipulated by an operator of the gear drive and disengage mechanisms, a drive pin extending through said cam actuator and said cam member to connect the two together whereby rotation of said cam actuator causes rotation of said cam member between its said first and second positions, a retainer plate secured to said output spindle to close said bore and having an opening through which said cam actuator extends, a lock member carried by said retainer plate and movable between locked and unlocked positions, spring means constantly urging said lock member to locked position, wall means on the periphery of said cam actuator defining first and second angularly spaced detents with said lock member residing in said first detent in said first position of said cam member and residing in said second detent in said second position of said cam member, indicia on said retainer plate and said cam actuator to visually indicate the position of said cam actuator and said cam member, said cam surface of said cam member having a detent portion to receive said pin carried by said drive actuator in said first position of said cam member which insures against axial movement of said drive actuator from its said first position until initial rotation of said cam member to remove said pin from said detent portion of said cam surface.

4,043,227

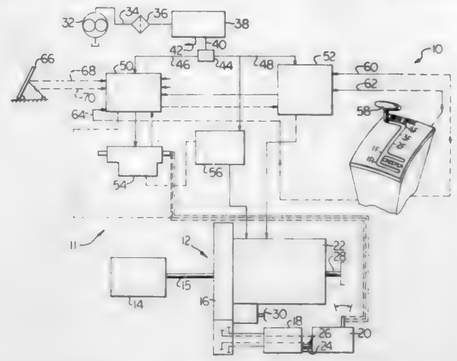
HYDROMECHANICAL TRANSMISSION

Charles E. Beals, Pekin, Ill.; Robert O. Chambers, Dorchester, Mass.; Edwin E. Hanson, Peoria, and Ronald L. Satzler, Princeville, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 23, 1975, Ser. No. 607,723

Int. Cl.[2] B60K *41/04*

U.S. Cl. 74—868 **15 Claims**



1. A hydromechanical transmission system for an engine driven-vehicle comprising:

a transmission;

a hydraulic control system;

and fluid pressure means for providing fluid under pressure to the transmission and the control system, the pressure of said fluid under pressure bearing a direct relation to the speed of the vehicle engine;

the transmission further comprising:

an input shaft driven by the engine;

an output shaft driving the vehicle;

a variable displacement hydrostatic pump-motor;

first drive means for selectively connecting the input shaft to the variable displacement hydrostatic pump-motor;

a fixed displacement hydrostatic pump-motor hydraulically coupled to the variable displacement hydrostatic pump-motor allowing the fixed displacement hydrostatic pump motor to act as a motor while the variable displacement hydrostatic pump-motor is acting as a pump, further allowing the fixed displacement hydrostatic pump-motor to act as a pump while the variable displacement hydrostatic pump-motor is acting as a motor;

a recycling planetary group comprising a recycling planetary carrier driven by the input shaft, a first sun gear, a plurality of first planet gears carried by the recycling planetary carrier and in intermeshing relation with the first sun gear, a plurality of second planet gears carried by the recycling planetary carrier overlapping with and in intermeshing relation with the first planet gears, a second sun gear in intermeshing relation with the second planet gears, and a recycling ring gear intermeshing with the second planet gears;

a primary planet carrier drivingly connected to the output shaft;

a first range planetary gear group having a first range sun gear, a plurality of first range planet gears carried by the primary planet carrier and a first range ring gear;

second drive means for drivingly connecting the fixed displacement hydrostatic pump-motor to the first sun gear of the recycling planetary group and to the first range sun gear;

a first range drive engagement means for selectively stopping rotation of the first range ring gear to provide a low range drive ratio;

a third range drive engagement means for selectively engag-

ing the recycling ring gear with the primary carrier to provide an intermediate range drive ratio; and

a fourth range drive engagement means for selectively engaging the second sun gear with the primary carrier to provide a high range drive ratio;

the control system further comprising:

sense means for sensing engine speed;

pedal means for selecting an engine speed;

pump actuator control means responsive to said sense means and said pedal means for varying the reduction ratio of the transmission so that engine speed increases when the selected engine speed is greater than the sensed engine speed, and engine speed decreases when the selected engine speed is less than the sensed engine speed; and,

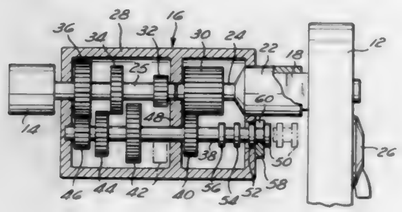
clutch control means responsive to said pump actuator control means for actuating one of the drive engagement means.

4,043,228

SOCKET WRENCH

William R. Venezio, 3078 McDonald Ave., Schenectady, N.Y. 12304

Filed Dec. 2, 1976, Ser. No. 746,960
Int. Cl.[2] B25B *17/00*
U.S. Cl. 81—57.3 **4 Claims**



1. In a socket wrench having a handle to be turned, a rotatable socket, a gear reduction acting between said handle and said socket, and means for selecting one of two or more different gear ratios in said gear reduction to select accordingly the mechanical advantage between said handle and said socket, the improvement wherein said gear reduction and said selecting means comprise:

an output shaft carrying said socket and carrying a plurality of driven gears of different diameters;

an axially adjustable intermediate shaft carrying a corresponding plurality of gears of different diameters which are drivingly engageable individually with corresponding driven gears on the output shaft in different axial positions of said intermediate shaft;

and means for selectively locking said intermediate shaft in said different axial positions while permitting rotation of said intermediate shaft in each of said different axial positons.

4,043,229

SELF-RETRACTING TOOL

Robert M. Ortlieb, Southfield, Mich., assignor to DeVlieg Machine Company, Royal Oak, Mich.

Filed Apr. 5, 1976, Ser. No. 673,642
Int. Cl.[2] B23B *21/00*
U.S. Cl. 82—24 A **29 Claims**

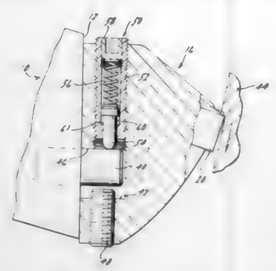
1. A tool holder assembly for mounting a tool on a machine in a predetermined location with respect to a workpiece to perform a machining operation on the workpiece, wherein the portion of the surface of the workpiece being machined and the work performing portion of the tool move relative to one another in a cutting direction and in a feed direction at right angles thereto, the tool holder assembly comprising:

a base member adapted to be affixed to the machine;

a tool holder having means for rigidly mounting the tool thereon;

mounting means for pivotally mounting said tool holder to said base member for pivotal movement of said portion of the tool between first and second positions,

said mounting means being operable to permit movement of said tool portion to said second position in response to the



forces created by the engagement of said tool portion and the surface to be machined,

said second position being spaced from said first position in the direction of movement of the tool with respect to the workpiece in said feed direction; and

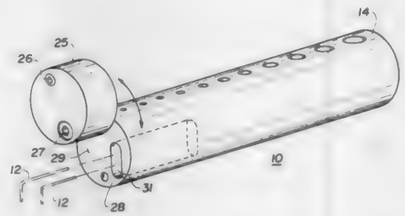
stop means for limiting further pivotal movement of said tool holder when said tool portion moves from said first position to said second position.

4,043,230

ALLEN WRENCH HOLDER

Eugene G. Scrivens, Shaftsbury, Vt., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 665,044
Int. Cl.[2] B25B *13/00*
U.S. Cl. 81—177 A **1 Claim**



1. A holder for retention of hexagonal section L-shaped wrenches comprising

a body member formed with a plurality of parallel through holes, each of a different cross-section from the others, with the center of each hole located substantially along a straight line, with positive fastening means for individual retention in each hole of a hexagonal wrench, in which the positive fastening means comprise a screw mounted in a threaded hole that intersects and is transverse to the axis of the through hole,

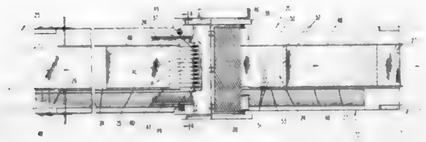
said body member fitted with a shaped internal recess, open at one end of the body member, together with a solid cap mounted by two cap screws to said end so as to serve as a closure for said recess, said cap screws each located a distance from the longtudinal axis of the body member, so that removal of one screw permits the cap to pivot about the other screw so as to uncover said recess, with said recess of non-circular cross-section, and of a length and cross-section to retain a bent L-shaped hexagonal wrench of a size smaller than that accommodated by the through holes of the body.

4,043,231

APPARATUS FOR TRIMMING AND SCORING CUT SOD TO PRODUCE SEPARABLE PLUGS

Herbert L. Friedberg, Baltimore, Md., assignor to The Shelburne Company, Baltimore, Md.

Filed Oct. 14, 1976, Ser. No. 732,522
Int. Cl.[2] B26D *3/08*
U.S. Cl. 83—9 **3 Claims**



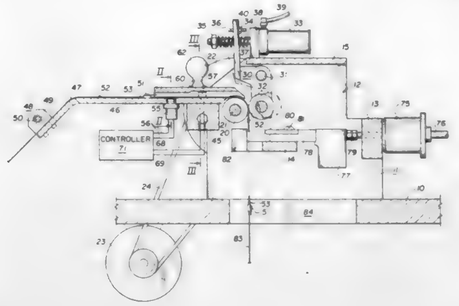
1. Apparatus for trimming and scoring cut sod sections to form attached readily separable plugs thereon comprising linear generally horizontal endless belt conveyor means for cut sod sections which are substantially rectangular and which have an accurately defined width between longitudinal edges and an inaccurate length between ends of the sod sections, the cut sod sections being initially placed on the conveyor means in succession with their longer dimensions transverse to the conveyor means and their narrower and more accurate dimensions longitudinal of the conveyor means, a first scoring and trimming means on the conveyor means intermediate the ends thereof, laterally spaced parallel sod squaring and guidance rails on the conveyor means at the upstream side of said first scoring and trimming means, the first scoring and trimming means comprising a pair of top and bottom superposed rolls, the top roll arranged above the upper run of said endless belt conveyor means and the bottom roll arranged between the upper and lower runs of the belt conveyor means and serving as an idling intermediate support roll for the belt conveyor means, power means coupled with the top roll to drive it, a plurality of axially spaced parallel sod scoring disc blades and a pair of end trimming blades on the top roll turning therewith, a single pair of end trimming blades only on the bottom roll and lying immediately outwardly of the end trimming blades of the top roll, the upper run of the belt conveyor means having its longitudinal edges disposed immediately inwardly of the trimming blades of the bottom roll and beneath the sod scoring blades of the top roll, whereby the cut sod sections on the upper run of the belt conveyor means receive plural parallel lines of scoring and have their opposite ends trimmed to accurate and uniform lengths as they pass between said top and bottom rolls of the first scoring and trimming means, and a second sod scoring means on the linear belt conveyor means downstream from the first scoring and trimming means for scoring the cut sod sections at right angles to said scoring lines produced at said first scoring and trimming means following rotation of the sod sections ninety degrees on the upper run of the belt conveyor means, said second sod scoring means comprising a single transverse axis roll above the upper run of the belt conveyor means, an opposing solid bed plate immediately below and supporting said upper run, power means coupled with said single transverse axis roll to drive it, and a plurality of axially spaced parallel sod scoring disc blades on the single transverse axis roll whereby the cut sod sections moving with said upper run receive plural parallel lines of scoring while passing through said second sod scoring means to thereby complete the formation of multiple rectangular plugs on each cut sod section which are uniformly sized and easily separable for usage.

4,043,232

AUTOMATIC CUTTING MACHINE FOR CONTINUOUS TAPES

Eudor Louis Jovin, Newport News, Va., assignor to Coats & Clark, Inc., Stamford, Conn.

Filed Aug. 19, 1976, Ser. No. 715,843
Int. Cl.[2] B26D *5/28, 5/30*
U.S. Cl. 83—13 **12 Claims**



1. An apparatus for cutting continuous tapes having distinguishable locations of first and second types regularly appearing thereon, comprising cutter means, control means for operating said cutter means, means for advancing said tape toward said cutter means at a determinable rate, first detecting means positioned to detect the passage of a location of said first type passed a first given position, second detecting means positioned to detect the passage of a location of the second type passed a second given position, first delay means responsive to detection of a location of said first type for enabling detection of a location of said second type for a second determined time period, and second delay means responsive to the detection of a location of said second type within said first determined period for energizing said control means a second predetermined time period after the detection of said location of said second type.

11. A method for cutting zippers to a determined length from a continuous length of meshed adjacent chains of common zipper tape having bottom stops and sliders regularly positioned thereon, said method comprising directing said common zipper tape to a cutter at a determined rate, detecting passage of a slider at a first position of said cutter, detecting passage of a bottom stop at a second position upstream of said cutter that occurs within a given time following said detection of a slider, and operating said cutter to sever said tape a determined time following said detection of a bottom stop.

4,043,233

METHOD OF PREVENTING MULTI-SHEET FEEDING

Masao Seki; Hidetoshi Kito, and Masaki Yoshino, all of Ebina, Japan, assignors to Rank Xerox Ltd., London, England

Filed Sept. 13, 1976, Ser. No. 722,891
Claims priority, application Japan, Dec. 3, 1975, 50-142842
Int. Cl.[2] B65H *3/00;* **B26D** *3/02*
U.S. Cl. 83—23 **4 Claims**

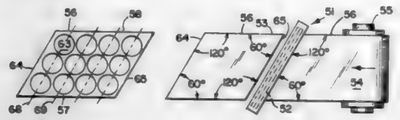
1. A method of preventing double-sheet feeding from a stack of sheets comprising the steps of: (a) cutting the sheets at an incline with respect to the plane of the stack of sheets; and (b) arranging offset ends of the sheets formed from the inclined cutting of the sheets approximately at right angles to the surface of the sheets.

4,043,234

APPARATUS AND METHOD FOR CUTTING CIRCLES FROM SHEET MATERIAL

Victor B. Godin, Reading, and Howard P. Bruck, Westford, both of Mass., assignors to Victor B. Godin, Trustee, Reading, Mass.

Filed Nov. 24, 1976, Ser. No. 744,524
Int. Cl.² B26D 9/00; B26F 1/44
U.S. Cl. 83—40 **8 Claims**



1. The method of cutting a piurality of circles of identical diameter from elongated sheets by means of a gang type die cutter, said method comprising the steps of

providing a plurality of said elongated sheets, each with a pair of longitudinal edges at a predetermined width apart and a pair of lateral edges each at a predetermined length apart, said predetermined width and length being substantially an exact multiple of the diameter of said circles plus trim, the lateral edges of each said sheet defining an acute angle of about sixty degrees with a longitudinal edge thereof to form the outline of said sheet into parallelogram, trapezoid, or equilateral triangle, configuration;

arranging the circular dies of said gang type die cutter in closely packed, laterally extending rows, juxtaposed successively lengthwise of said cutter, the centres of each successive lateral row of said circular dies being aligned at an acute angle of about sixty degrees from a longitudinal edge of said cutter and the overall width and length of said rows of cutters being substantially an exact multiple of the diameter of said circles plus trim spacing;

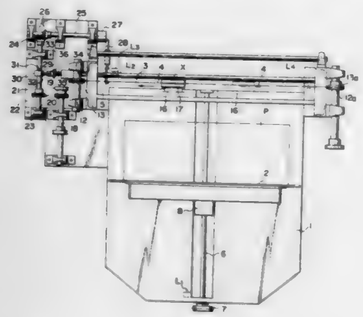
and then individually and successively die cutting lifts of superposed said sheets by means of said cutter to simultaneously form a plurality of circles of identical diameter with minimum waste.

4,043,235

BACK-SPLITTING APPARATUS IN THE PRODUCTION OF BROCHURES

Toshio Miyamoto, Fukuoka, Japan, assignor to Marumiya Shoko Co., Ltd, Fukuoka, Japan

Filed Aug. 30, 1976, Ser. No. 718,558
Int. Cl.² B26D 3/12
U.S. Cl. 83—207 **9 Claims**



1. Back-splitting apparatus in the production of a brochure, comprising:

a feeding mechanism which transfers laminated sheets of paper to a predetermined position, said laminated sheets of paper having front and rear covers arranged for each copy and having back fixation of a thickness corresponding to several copies;

first rotary shafts which are disposed on the right and left at said predetermined position in a manner to be suitably spaced from a rear part surface of said laminated sheets of paper and to have an interval greater than at least a width of said laminated sheets of paper;

first gears which are respectively secured to said first rotary shafts;

a main chain extending over said first gears;

a first limit switch arranged at said predetermined position, said first limit switch being connected to stop the operation of said feeding mechanism and simultaneously activate said main chain when said laminated sheets of paper have been transferred to said predetermined position;

back-splitting cutter knives secured to said main chain, each knife having a length reaching the rear part of said laminated sheets of paper;

a gear mechanism arranged by the side of said rotary shaft;

an open hook reciprocated by the drive of said gear mechanism so as to separate an end part of said laminated sheets of paper at said predetermined position into a thickness of one copy;

auxiliary chain elements secured to said main chain and meshing with said gear mechanism when said back-splitting cutter knife has moved to the vicinity of one end part of said main chain;

a second limit switch in the vicinity of the other end part of said main chain connected to stop the turning of said main chain and actuate said feeding mechanism when said back-splitting cutter knife has moved from said one end part to said other end part; and

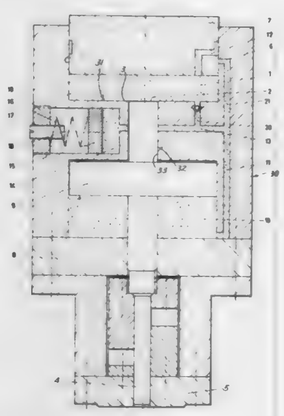
said back-splitting cutter knife being positioned to thrust from the end part of said laminated sheets of paper into said rear part thereof after said open hook has operated.

4,043,236

DEVICE FOR TRANSFORMING A SINGLE PRESSURE FORCE INTO SEPARATE PRESSURE FORCES

Arie de Jong, Zaltbommel, Netherlands, assignor to Perswerk de Jong B.V., Netherlands

Filed Feb. 10, 1976, Ser. No. 656,802
Claims priority, application Netherlands, Feb. 14, 1975, 7501729
Int. Cl.² B26D 5/12; B26F 1/14
U.S. Cl. 83—137 **6 Claims**



1. In a punching apparatus:

a main body having a first chamber and a second chamber connected by an axial bore, said axial bore opening on an end wall of said first chamber;

a power piston received in said first chamber, and movable toward and away from said end wall;

a piston rod received within said axial bore, and having a retraction piston thereon slidably received within said second chamber;

punch means arranged to be operated by said piston rod upon downward movement thereof, to engage a workpiece;

stripper means carried by said main body on the lower end thereof, and engageable with said workpiece;

means defining a buffer chamber, said buffer chamber containing a slidably mounted buffer piston, and means urging said buffer piston toward one end wall of said buffer chamber;

first passage means connected with the region of said second chamber beneath said retraction piston;

second passage means connecting said first passage means with the region of said buffer chamber beneath said buffer piston;

third passage means connecting said seond passage means with the region of said first chamber beneath said power piston, and including a one-way valve arrangement to permit flow only from said second passage means to said first chamber; and

fourth passage means connecting said first passage means with said first chamber, and including valve means arranged to open only after said power piston has moved a predetermined distance within said first chamber toward said end wall;

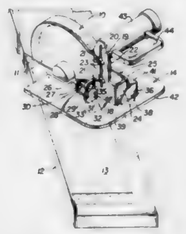
said first chamber beneath said power piston, said second chamber beneath said retraction piston, said buffer chamber beneath said buffer piston, and said passages being arranged to receive an operating fluid, whereby when pressure is initially placed on said power piston to move said power piston toward said end wall of said first chamber said punch means and said stripper means will be engaged with said workpiece with separate pressure forces that are directly dependent on each other and on the strength of said workpiece, said valve means of said fourth passage means opening in response to further movement of said power piston occurring after said punch means penetrates said workpiece to operate said retraction piston for retracting said punch means while said stripper means remains engaged with said workpiece.

4,043,237

GUARD FOR RADIAL ARM SAW

Stoddard H. Pyle, Corvallis, Oreg., assignor to Wayne R. Roberts, Corvallis, Oreg., a part interest

Filed Nov. 9, 1976, Ser. No. 740,309
Int. Cl.² B27B 5/20; B27G 19/04
U.S. Cl. 83—478 **12 Claims**



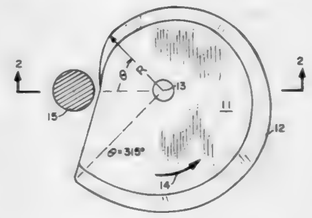
1. A guard for a radial arm saw or the like comprising a mounting bracket, means adjustably attaching the mounting bracket to an existing upper guard or to a member moving with the upper guard on a radial arm saw whereby the mounting bracket can be vertically adjusted relative to said upper guard, an awareness guard in the form of a perimeter member projecting forwardly of and beyond opposite sides of the saw blade of a radial arm saw, the area encompassed by said perimeter member formed substantially or material through which an object being sawed can be visually observed by a sawyer, a bracket carrying the awareness guard and being pivotally attached to the mounting bracket, whereby the awareness guard may be tilted relative to the mounting bracket and also raised and lowered bodily therewith, and a tilt shield secured to the awareness guard and movable therewith and serving to cover a gap which develops when the awareness guard is tilted relative to said upper guard thereby protecting a sawyer from contact with a saw blade at said gap.

4,043,238

CABLE CUTTER

Ernest E. van Ham, Lyndeboro, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 21, 1976, Ser. No. 678,806
Int. Cl.² B26D 4/42
U.S. Cl. 83—595 **18 Claims**



1. A cutting implement, comprising, a frame, said frame including means for defining a work support at a predetermined location at which a work piece to be cut is positioned during the cutting operation,

a plate having a curved sharpened edge and mounted on said frame for rotation about an axis,

said plate being shaped and said axis being positioned relative to said work support so that as said plate is rotated said edge traverses said location,

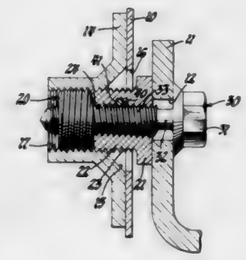
characterized in that said plate also is shaped so that the rate of advance of said edge through said location as a function of the angle of rotation of said plate decreases as the angle of rotation increases.

4,043,239

SHIM NUT AND SCREW BOLT ASSEMBLY

Ernest L. DeFusco, Clawson, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 16, 1976, Ser. No. 649,791
Int. Cl.² F16B 35/00
U.S. Cl. 85—1 R **4 Claims**



1. A shim nut and fastener device for retaining a first member having an aperture therein to a second member having an internally threaded aperture means therein extending from the surface thereof next adjacent the first member, with the first

member being retained in spaced apart relation to the second member by said shim nut and fastener device; said shim nut and fastener device including a shim nut of tubular configuration having an end surface facing said first member and having external threads thereon in rotatable, substantially fully, threaded engagement with the internally threaded aperture means of the second member and having internal threads of an opposite pitch to said external threads extending through said shim nut, said shim nut being threadedly engaged in said internally threaded aperture means so as to initially have said end surface spaced from said first member; and a screw fastener having a head with an externally threaded shank extending therefrom inserted through the aperture of the first member into threaded engagement with said internal threads in said shim nut; self-locking means operatively associated with said threaded shank and with said internal threads in said shim nut whereby as said screw fastener is driven into said shim nut, said shim nut is caused to back out of the internally threaded aperture means of the second member whereby said end surface is brought into abutment against the first member after which the screw fastener can be further threaded into said shim nut until said head of said screw fastener abuts against the first member which is then sandwiched between said end surface of said shim nut and the head of said screw fastener.

4,043,240

ELECTRIC INSTRUMENT COMPRISING A BINARY COUNTER CLEARED WHEN COUNTS THEREIN REACH INTEGERS REPRESENTATIVE OF A MELODY

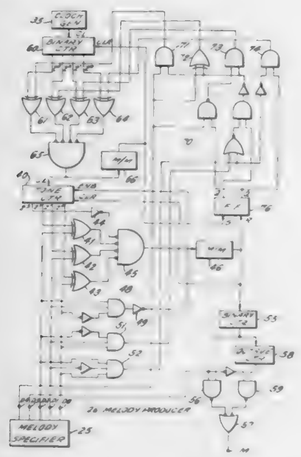
Fumio Ando, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Filed June 18, 1976, Ser. No. 697,398

Claims priority, application Japan, June 23, 1975, 50-77216; June 23, 1975, 50-77217

Int. Cl.[2] G10H *5/06*

U.S. Cl. 84—1.01 **6 Claims**



1. An instrument for electrically digitally producing a melody comprising musical sounds of a musical scale consisting of a plurality of tones within an octave, said tones having fundamental periods equal to a predetermined period multiplied by tone integers, said plurality in number, which comprises:

first means for producing, in compliance with said melody, pitch binary signals, each comprising a plurality of digits representative of pitch integers, the pitch integers being related to said tone integers to specify said musical sounds;

a tone clock generator for producing a train of tone clock pulses of a tone clock period equal to a rational multiple of said predetermined period;

second means responsive to said clock pulses and binary signals for producing electric pulse groups, the electric pulses in said pulse groups having repetition periods equal to said predetermined period multiplied by the tone integers to which the pitch integers said binary signals are representative of are related;

third means responsive to said pulse groups for producing said melody;

said second means further comprising controllable frequency divider means responsive to said clock pulses and binary signals for producing said electric pulses by successively multiplying said clock period by the tone integers to which the pitch integers said binary signals are representative of are related;

said tone integers comprising at least two first tone integers and at least one second tone integer, said first tone intergers being equal to a common measure multipled by integral factors, said second tone integer being equal to the algebraic sum of said common measure multiplied by an integral factor for said second tone integer plus a correction not greater in absolute value than about one-tenth of said second tone integer, said pitch binary signals comprising first and second binary signals, the pitch integers of said first binary signals being first pitch integers equal to the integral factors for said first tone integers, the pitch integers of said second binary signals being second pitch integers equal to said integral factor for said second tone integer, wherein said frequency divider means comprises:

a controllable binary counter responsive to tone pulses for successively producing tone count signals representative of counts of said tone pulses;

fourth means responsive to said clock and electric pulses and first and second binary signals for supplying said tone pulses to said binary counter;

means responsive to said electric pulses for clearing said binary counter; and

tone logic means responsive to said count and first and second binary signals for producing said electric pulses every time when the counts said count signals are representative of reach the integral factors which the plurality of digits of said first and second binary signals are representative of.

4,043,241

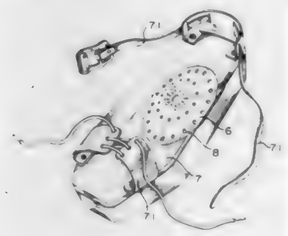
MUSICAL SHOE

Hsing-Ching Liu, 213, 3rd Floor, Section 4, Chung Ching North Road, Taipei, China /Taiwan

Filed Aug. 2, 1976, Ser. No. 710,381

Int. Cl.[2] G10H *1/00, 5/04*

U.S. Cl. 84—1.01 **5 Claims**



1. A musical shoe for children comprised of a separable upper and lower half, the upper half being flat and provided with straps for the purpose of securing the shoe to the foot and having a plurality of holes and a speaker provided thereunder; said lower half having a base portion and at least four inclining sides, said lower half also being hollow and provided internally with an electronic circuit including a power source, a plurality of switches which when closed cause the electronic circuit to produce various musical tones which are emitted from said speaker, and an on-off/volume control switch.

4,043,242

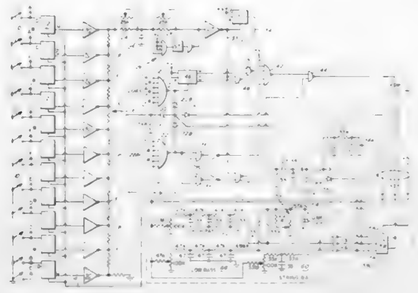
CIRCUIT FOR MUSICAL INSTRUMENT

Raymond A. Cavicchio, Rte. No. 1, Box 313, Sunapee, N.H. 03782

Filed Dec. 10, 1975, Ser. No. 639,460

Int. Cl.[2] G10H *1/00, 3/06*

U.S. Cl. 84—1.17 **11 Claims**



1. An electronic device for use with a musical instrument having bass buttons for simulating a bass string instrument comprising;

a plurality of switch means each operatively associated with a botton and responsive to actuation of its associated button,

means coupled from said plurality of switches for establishing a first octave audio signal of a frequency corresponding to the note played, and a second octave audio signal of a frequency corresponding to a note an octave adjacent the one played,

and logic means including first means responsive to the playing of notes of a first field of the octave, second means responsive to the playing of notes of a second field of the octave, and alternating means responsive to a note being played in said first field for passing in one state the first octave audio signal and in another state the second octave audio signal.

4,043,243

ELECTRONIC CHORUS AND TREMULANT SYSTEM

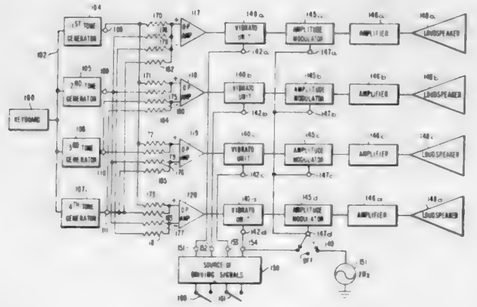
Richard H. Peterson, 11748 Walnut Ridge Drive, Palos Park, Ill. 60464

Continuation-in-part of Ser. No. 406,411, Oct. 15, 1973, Pat. No. 3,886,835, which is a continuation of Ser. No. 44,276, June 8, 1970, abandoned. This application Jan. 22, 1975, Ser. No. 543,095

The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.[2] G10H *1/04*

U.S. Cl. 84—1.25 **16 Claims**



1. A tremulant system for electrical musical instruments comprising:

a plurality of tone generators each capable of producing at least some of the notes of a musical scale;

n transmission channels each having an input and an output;

a plurality of loudspeakers connected respectively to the outputs of said transmission channels;

n vibrato units each connected between the input and output terminals of a respective one of said transmission channels;

each vibrato unit having a control terminal;

means for causing each of said vibrato units to modulate signals applied to its respective channel in response to a driving signal applied to its control terminal;

n driving signals applied respectively to said control terminals;

said driving signals having phase relationships that differ by approximately 360°/*n;*

first matrixing means for combining signals from each of said plurality of tone generators in one phase relationship and applying said matrixed signals to at least one of said *n* channels;

and second matrixing means for combining signals from each of said plurality of tone generators in a different phase relationship and applying said differently matrixed signals to at least a different one of said *n* channels.

4,043,244

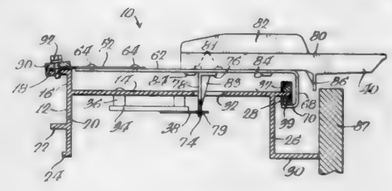
ELECTRONIC MUSICAL INSTRUMENT KEYBOARD

Ray B. Schrecongost, Park Ridge, and Edward J. Perutis, Chicago, both of Ill., assignors to Hammond Corporation, Chicago, Ill.

Continuation of Ser. No. 476,971, June 6, 1974, abandoned, which is a continuation of Ser. No. 339,628, March 12, 1973, abandoned. This application Dec. 13, 1974, Ser. No. 532,427

Int. Cl.[2] G10C *3/12*

U.S. Cl. 84—423 **10 Claims**



1. A key cluster for a musical instrument keyboard comprising a thin sheet of resilient material slit to define a plurality of spaced, parallel, relatively wide spring fingers, said fingers having black and white keys secured thereto to extend axially therefrom in chromatic order, the spring fingers associated with the black keys being formed with a smaller cross section over at least a portion of their length relative to that of the spring fingers associated with the white keys to equalize operating pressure as between the white and black keys, and means associated with each key for operating a switch.

8. A musical instrument keyboard assembly including means providing a mounting rail, a key cluster comprising a thin sheet of resilient material having slits extending from one edge toward the opposite edge thereof to define parallel, spaced, relatively wide spring fingers, black and white playing keys arranged in chromatic order mounted to each of said fingers to extend axially therefrom, said opposite edge of said sheet being secured rigidly against said rail, a flange extending from said mounting rail generally perpendicular to said fingers of said key cluster and having thereon a rib extending opposite said rail and situated under said fingers at about the line of maximum deflection thereof, and means associated with each key for controlling a signal source.

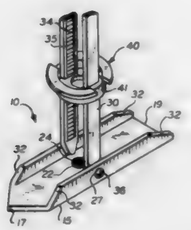
9. A musical instrument keyboard assembly including a keyboard frame having a rail generally inclined upwardly with respect to said frame, said rail having a transversely convex upper surface, a key cluster comprising a thin sheet of resilient material having slits extending from one edge toward the

opposite edge thereof to define parallel spaced relatively wide spring fingers, black and white playing keys arranged in chromatic order mounted to consecutive ones of said fingers to extend axially therefrom, said opposite edge of said sheet being secured rigidly against said convex surface by a clamping member for urging said keys upwardly, said clamping member having a surface complementary to said convex rail surface and being transversely adjustable with respect to said rail surface, and interengaging means on said keys and said frame to limit resilient restoration of said keys.

4,043,245
ANCHORING DEVICE

Stanley Kaplan, Universal Fastenings, 180 Marine St., Farmingdale, N.Y. 11735

Filed Feb. 6, 1976, Ser. No. 655,824
Int. Cl.² F16B *37/04*
U.S. Cl. 85—3 R **10 Claims**

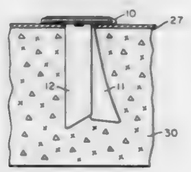


1. An anchoring device providing engaging means for an attaching member, said device comprising:
an elongate toggle plate dimensioned to fit into an opening in a wall member to which attachment is desired, said toggle plate having a plurality of longitudinally spaced, differently dimensioned attaching member engaging openings therein which are threaded, and a pair of bearing openings for each attaching member engaging openings, one of the openings of each pair of bearing openings lying on each diametrically opposed side of each attaching member opening;
a pair of elongate runners;
means for selectively coupling each one of said pair of runners to the bearing openings on the side of any selected attaching member openings; and
a washer having two spaced slide openings, one for each runner through which said runners pass, said washer having an attaching member opening between said runners.

4,043,246
SHEET METAL NAIL FOR SECURING COVERINGS TO CEMENTITIOUS MATERIALS

John L. Wright, Albuquerque, N. Mex., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Oct. 22, 1976, Ser. No. 734,894
Int. Cl.² E01B *9/12*
U.S. Cl. 85—11 **6 Claims**

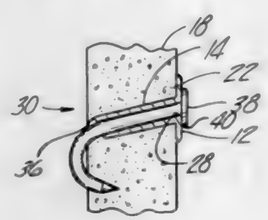


1. An improved sheet metal nail for attaching a covering material to a cementitious construction material, said nail comprising a generally flat planar head and an elongated hollow shank depending from said head at substantially a right angle thereto, said shank being narrower than said head and having a penetrating end remote from said head, said shank being comprised of a pair of legs, each said leg being substantially channel-shaped in transverse cross-section, one of said legs being rigidly connected to said head in order that the angle between said rigidly connected leg and said head is maintained when the nail is driven, the other of said legs being hingedly connected to said head, said hinged connection being the only manner in which said hinged leg is connected to said nail and the hinged movement of said leg being in no other manner restricted whereby said leg is able to easily spread when the nail is driven, said legs further being in overlapping relationship and defining a hollow enclosure prior to being driven, at least a portion of said enclosure intermediate the ends thereof having a cross-sectional area less than the cross-sectional area at said one end, said portion including means to cause at least a portion of said hinged leg to spread apart from said rigidly attached leg when driven into engagement with said cementitious construction material while other portions of said legs remain in overlapping relationship, whereby a plug of the construction material is retained between the spread apart legs which maintains them in spread position in order to increase the resistance to withdrawal of the nail from the said construction material.

4,043,247
WALL FASTENER

Anthony S. Rowinski, Bloomfield Hills, Mich., assignor to U.S. Engineering Company, Inc., Muncie, Ind.

Filed Nov. 28, 1975, Ser. No. 636,060
Int. Cl.² F16B *15/00*
U.S. Cl. 85—31 **6 Claims**



1. An anchor, comprising:
a. a driving surface,
b. a tubular element having an inlet and an outlet, the tubular element extending outwardly from the driving surface, the free end of the tubular element having an arcuate section such that the outlet is substantially perpendicular to the inlet, and
c. means to cause the angular deviation of the tubular element from the perpendicular upon the driving of the tubular element into a wall, the means comprising the terminal point of the arcuate section.

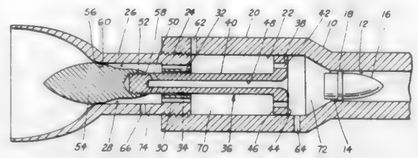
4,043,248
LIQUID PROPELLANT GUN (RECOILLESS REGENERATIVE PISTON)

Melvin John Bulman, Shelburne, and Alfred Rapp Graham, Burnt Hills, both of Vt., assignors to General Electric Company, Burlington, Vt.

Filed June 10, 1976, Ser. No. 694,870
Int. Cl.² F41F *15/00*
U.S. Cl. 89—1.703 **14 Claims**

1. A gun comprising:
a gun barrel;

a combustion chamber;
a liquid propellant supply chamber;
first means having a displacement which is a time function for injecting propellant from said supply chamber into said combustion chamber as a function of said displacement;

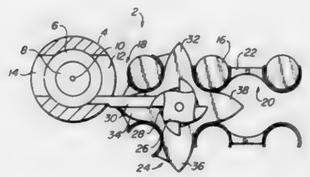


a balancing nozzle having a throat
valve means communicating between said combustion chamber and said balancing nozzle throat for providing a conduit for the flow of combustion gas, and coupled to said first means for controlling said flow as a function of said displacement of said first means.

4,043,249
AMMUNITION CONVEYOR DRIVE CAM

John G. Rocha, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed July 6, 1976, Ser. No. 702,542
Int. Cl.² F41D *9/02*
U.S. Cl. 89—33 CA **7 Claims**

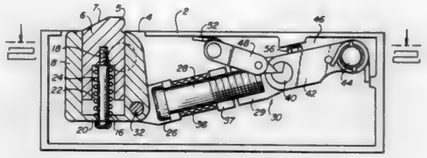


1. An ammunition feed conveyor drive assembly for automatic weapon systems including rotatable feed means for sequentially feeding rounds laterally and individually into a receiver opening of the weapon,
rotatable driven cam means for rotating said rotatable feed means and having a plurality of cam surfaces, and
rotatable cam driving means having a plurality of cam surfaces for engagement with selected cam surfaces of said driven cam means to rotate said driven cam means and thereby said feed means,
said driven cam means having a smaller diameter than said driving cam means, said cam surfaces of said driving and driven means coacting to rotate said driven means through a smaller angle of rotation than the angle of rotation of said driving means,
both said driving and driven cam means having interrupted upper and lower cam bearing surfaces, said upper cam bearing surfaces of the driving and driven cam means cooperating to rotate said driven cam means through a predetermined angle,
said lower cam bearing surfaces of the driving and driven means cooperating to rotate said driven means through a predetermined angle.

4,043,250
RECOILABLE GUN TUBE LATCH

Harold Herman Wiese, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,643
Int. Cl.² F41F *19/16*
U.S. Cl. 89—170 **3 Claims**



1. A recoilable gun tube latch for a gun tube mechanism mounted for reciprocal movement on a gun cradle on fire out of battery (soft recoil) artillery weapons, said latch comprising:
a first housing having an opening,
latch means in said housing including a plunger having a head with a sloped surface positionable to extend through said opening in a first latching position for latching of said gun tube mechanism in its rearward position on said cradle,
a pivotable plunger housing for said plunger located in said first housing,
release means for actuating said plunger said plunger housing to permit movement of said plunger and plunger housing from said first plunger latching position,
said release means including means for pivoting said plunger housing and said plunger from said first latching position to a second nonlatching position in said first housing,
means for resetting said release means to return said plunger housing and plunger to said first latching position in said opening after said gun tube mechanism has passed said opening in movement in a counterrecoil direction, and
means for biasing said plunger head from said second housing through said opening into said first latching position in the path of movement of said gun tube mechanism for engagement with and to latch said gun tube mechanism, said biasing means, when said plunger has returned to its latching position, being responsive to contact said gun tube mechanism with the head of said plunger during movement of said gun tube mechanism in a recoil direction to depress said plunger head into said plunger housing and thereby to permit said gun tube mechanism to pass the opening to complete movement in said recoil direction,
said means for pivoting said plunger including an articulated toggle assembly of a plurality of movable links, a first link being pivotally connected to said second housing and a second link having a pivot connection to said first link and to said first housing, a third link movably connected to said first housing and to said pivot connection between said first and second links, said third link being movably responsive to release means to collapse said links to permit pivotal movement of said plunger and plunger housing from said latching position to said unlatching position,
said resetting means including spring means acting on said second link adjacent the connection of the second link to said first housing to return and hold the toggle links in their uncollapsed position whereby the plunger and plunger housing are returned to said latching position,
said plunger including a recess and said biasing means including a shaft bottomed on said second housing at one end and engaging the plunger at its other end and a spring circumscribing said shaft for biasing of said plunger head from said second housing.

4,043,251

SERVOMOTOR

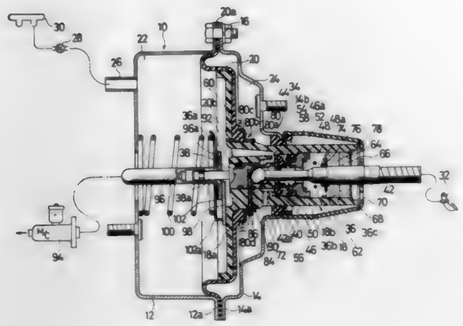
Atushi Ohmi, Anjo, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 12, 1976, Ser. No. 666,424

Claims priority, application Japan, Mar. 14, 1975, 50-35299[U]

Int. Cl.[2] F15B *9/10;* **F01B** *19/00;* **F16J** *3/02*

U.S. Cl. 91—376 R **5 Claims**



1. In a servomotor, the improvement comprising:

a. a housing;

b. an annular diaphragm having its outer periphery sealingly attached to said housing;

c. power piston means axially movable within said housing and having

i. a boss axially extending through said annular diaphragm, said boss including a bore and an opening radially-extending from said bore to the outer periphery of said boss adjacent said diaphragm; and

ii. an external flange extending radially from the outer periphery of said axially extending boss for positioning adjacent said diaphragm; and wherein said annular diaphragm and said power means form first and second pressure chambers in said housing;

d. valve means for regulating pressure in said first and second pressure chambers, said valve means including a valve member slidably and sealingly disposed in said bore and having an engaging groove in its outer periphery;

e. retaining means for coupling said diaphragm against said flange of said power piston means, said retaining means including

i. an axially extending cylindrical seat in which said boss is tightly positioned, and wherein said seat has a radial opening;

ii. an external flange radially extending from said seat for pressing an inner portion of said diaphragm against said flange of said power piston means when said retaining means is in a predetermined coupling position and wherein said radial opening of said seat coincides in a radial direction with said radially extending opening of said boss and said engaging groove of said valve member when said retaining means is in the predetermined coupling position;

f. pin means positioned in said openings of said retaining means and boss and said engaging groove of said valve member for locking said retaining means in the predetermined coupling position; and

g. means for maintaining said pin means in position.

4,043,252

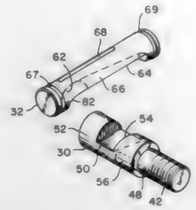
CYLINDER LOCK STRUCTURE

Walter W. Wawrzyniak, 39230 Gary, Mount Clemens, Mich. 48043

Filed Mar. 1, 1976, Ser. No. 662,350

Int. Cl.[2] F15B *15/26*

U.S. Cl. 92—24 **11 Claims**



1. In combination, a cylinder, a cylinder piston positioned within the cylinder for axial movement therein between a first and a second position, said cylinder piston including a piston rod connected thereto movable axially of the cylinder and a locking structure for releasably locking the piston in its first position, said locking structure comprising a housing, means for securing the housing to the cylinder, said housing having a first opening therethrough axially aligned with the piston rod when the housing is secured to the cylinder, a second opening through said housing extending transversely of the axis of the cylinder, means for passing an actuating medium into and out of the second opening of said housing, a cylindrical wedge member having a transverse slot extending approximately halfway through one side thereof, one side of which is a cam surface inclined with respect to the axis of the cylinder, means for securing the wedge member to the piston rod as an axial extension thereof, means for preventing rotation of said wedge member, a solid, cylindrical locking piston positioned within the transverse opening of said housing means for preventing rotation of said locking piston, said locking piston including a full cylindrical surface on each end thereof, sealing means surrounding the ends of the locking piston, a longitudinally extending and inclined recess in one side of the locking piston including a camming surface complementary to and engageable with the camming surface on the wedge member, a transversely extending slot at one end of the recess in said locking piston, said slot having a semicircular cross section for enabling the wedge member to be axially moved through the slot in one end position of the locking piston, said locking piston camming surface engaging the wedge member camming surface in another end position of the locking piston for preventing movement of said wedge member when in the first position, said axially extending and inclined cam surface on said locking piston extending transversely of the locking piston a distance approximately equal to the radius of the locking piston.

4,043,253

BOOM CYLINDER STOP FOR THE LIFT CYLINDERS OF A SKID STEER VEHICLE

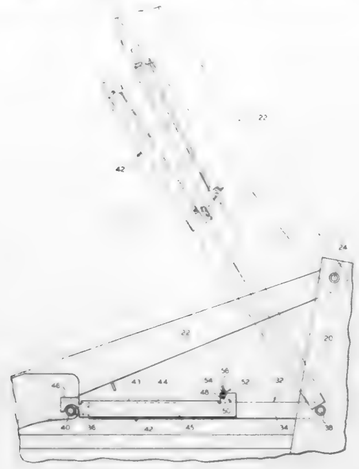
Larry E. Albright, and Dan A. Frederick, both of Gwinner, N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed July 2, 1976, Ser. No. 701,939

Int. Cl.[2] F15B *15/26*

U.S. Cl. 92—25 **4 Claims**

1. For an extensible hydraulic cylinder, a stop member for retaining the cylinder in an extended position comprising a tubular body portion receivable on the cylinder body of the hydraulic cylinder, a first end portion of the stop having means engageable with the rod end of the hydraulic cylinder and a second end portion of the stop comprising means engageable with the forward end of the cylinder body, the second end portion including an outwardly extending projection having means for disengaging the stop pivotally mounted thereon, said means operable to release the stop from an interference rela-



tionship between the rod end of the cylinder and the cylinder body when the cylinder is retracted.

4,043,254

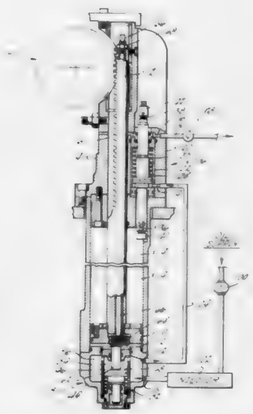
APPARATUS FOR CUSHIONING THE MOTION OF A RECIPROCATING MEMBER

Eginhard Jaeger, Oetwil an der Limmat, Switzerland, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Dec. 3, 1974, Ser. No. 529,208

Int. Cl.[2] F01B *11/02*

U.S. Cl. 92—85 B **7 Claims**



1. In a glassware forming machine, apparatus for hydraulically cushioning the motion of reciprocating means in both directions, comprising:

means for reciprocating the reciprocating means;

first hydraulic cushioning means disposed to be contactable by the reciprocating means to cushion the motion of the reciprocating means in one direction, said first cushioning means comprising a first housing, a cylinder disposed in said first housing, said cylinder having a plurality of metering orifices therein, a piston slidably disposed in said cylinder and forming with said cylinder a first chamber on one side of said piston and second chamber on the opposite side of said piston, a third chamber adapted to be filled with liquid, disposed between said first housing and said cylinder and in fluid communication with said first and second chambers, said piston adapted to be contacted by the reciprocating means near the end of the stroke of the reciprocating means in the direction of said first cushioning means;

second hydraulic cushioning means disposed to be contactable by the reciprocating means to cushion the motion of the reciprocating means in the opposite direction, said second cushioning means comprising a second housing, a cylinder disposed in said second housing, said cylinder having a plurality of metering orifices therein, a piston slidably disposed in said cylinder and forming with said cylinder a first chamber on one side of said piston and a second chamber on the opposite side of said piston, a third chamber adapted to be filled with liquid, disposed between said second housing and said cylinder and in fluid communication with said first and second chambers, said piston adapted to be contacted by the reciprocating means near the end of the stroke of the reciprocating means in the direction of said second cushioning means;

said metering orifices of said first and second hydraulic cushioning means each having a diameter which is greater than the dimension of the orifices in the direction of the flow of fluid therethrough, whereby said first and second hydraulic cushioning means each provide a cushion with substantially constant deceleration of the reciprocating means and which is independent of the viscosity of said liquid; and

means for adjusting the position at which the reciprocating means contacts at least one of said first and second hydraulic cushioning means.

4,043,255

CAM FOLLOWER PISTON

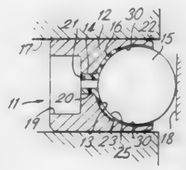
Sinclair Upton Cunningham, East Kilbride, Glasgow, Scotland, assignor to National Research Development Corporation, London, England

Continuation-in-part of Ser. No. 358,543, May 9, 1973, abandoned, which is a division of Ser. No. 177,266, Sept. 2, 1971, Pat. No. 3,783,748. This application July 22, 1975, Ser. No. 597,984

Claims priority, application United Kingdom, Sept. 2, 1970, 42010/70

Int. Cl.[2] F16J *1/08, 1/10*

U.S. Cl. 92—158 **1 Claim**



1. A piston for a hydrostatic machine comprising:

a freely rotating cam follower ball for following a cam surface in a hydrostatic machine by reciprocatory motion of said cam follower ball in a cylinder bore of the machine,

a piston body for reciprocatory travel along a cylinder bore, said piston body having at one end a working face to be acted on by the working fluid of a hydrostatic machine, and at the other end a bowl-shaped seating for said ball, said piston body exposing a portion of said ball protruding from said piston body to engage a cam surface, said piston body having an aperture extending from said seating to said working face of said piston body,

an insert of low-friction synthetic plastics material positioned between said cam follower ball and said seating in

a position at the rear of said ball to accept the bearing load of said ball when engaging a cam surface, said insert having an internal bearing surface for said ball and an external surface mating with and supported by said seating, said insert having an extension which extends into said aperture in said piston body and locates said insert in said piston body, said insert having an aperture extending from said bearing surface through said extension of said insert to said working face of said piston body to allow passage of working fluid to said bearing surface for lubrication purposes and for providing hydrostatic support for said cam follower ball,

said piston body encompassing said ball by a portion of said piston body which extends from said seating beyond the centre plane of the cam follower ball, said piston body having a lip extending around the entire perimeter of said bowl-shaped seating and projecting inwardly towards said cam follower ball for engaging said synthetic plastics insert.

4,043,256

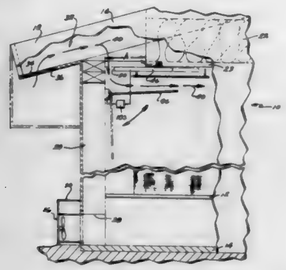
ANIMAL ENCLOSURE WITH PRESSURE CONTROLLED VENTILATION INLET AND DEFLECTION MEANS

Robert L. Van Huis, Zeeland, Mich., assignor to U.S. Industries, Inc., Zeeland, Mich.

Division of Ser. No. 449,625, March 11, 1974, Pat. No. 3,938,428, which is a continuation-in-part of Ser. No. 308,692, Nov. 22, 1972, Pat. No. 3,808,960. This application Oct. 14, 1975, Ser. No. 621,675

Int. Cl.² F24F *11/04*

U.S. Cl. 98—1.5 **8 Claims**



1. A ventilation system for a livestock house having spaced side walls, spaced end walls, a floor and ceiling and livestock cage means elevated above the floor comprising in combination: exhaust fans positioned for removing air from said house and drawing it through said cage means; an inlet duct above said cage means for admitting replacement air into said house and drawing said air through said cage means, said inlet duct including an opening defining a slot means extending lengthwise of at least one of said side and end walls of said house, said slot means being positioned at the transition of said ceiling and said one of said side and end walls; louver means adjacent said slot means and movable between a generally open and closed position to generally permit or block air flow through said opening, said louver means including deflection means adjustable relative said slot means for varying the direction of air flowing into said house; means supporting said louver means in front of said slot means, said louver means including an upper and lower margin, said lower margin being supported along said one of said side and end walls and being pivotal about said lower margin whereby said upper margin is movable into and out of abutment with said transition of said ceiling to vary the amount of air flow opening through said slot means providing automatic adjustment of the deflection of air flow into said house relative to the size of air flow opening; sensing means for sensing the pressure differential between the inside and outside of said house; and actuating means responsive to changes in said pressure differential to open or close said louver means and adjust said deflection means to maintain a preselected constant pressure differential and provide continuous and even distribution of air circulation through said house.

4,043,257

METHOD AND APPARATUS FOR EXHAUSTING AIR FROM A LIMITED ZONE

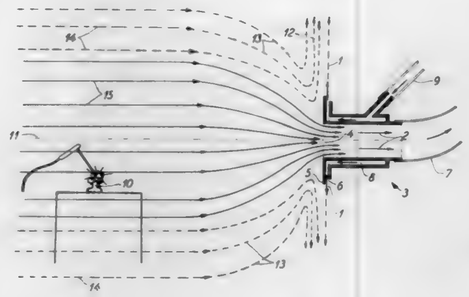
Carl Peter Noe Aaberg, Christiansgade 1, 7500 Holstebro, Denmark

Filed Dec. 3, 1975, Ser. No. 637,402

Claims priority, application Denmark, Dec. 4, 1974, 6301/74

Int. Cl.² F24F *7/00*

U.S. Cl. 98—43 R **5 Claims**



1. A method for exhausting fluid from a limited zone around an axis extending into an open space at right angles from the plane of an exhaust opening comprising:

sucking fluid from an open space through an unobstructed exhaust opening facing said space and

simultaneously injecting a circumferentially extending flow of fluid into the open space radially outward from a source surrounding and adjacent to the exhaust opening.

4,043,258

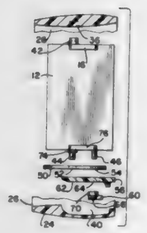
LOUVER LINKAGE SEAL

Ronald F. Zitko, and James R. Adams, both of Downers Grove, Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Aug. 19, 1976, Ser. No. 715,789

Int. Cl.² F24F *13/08*

U.S. Cl. 98—121 A **1 Claim**



1. An adjustable air distribution vent for use in directing a stream of air comprising:

a peripheral frame comprising a top portion, a bottom portion, and a pair of end wall portions, the top portion being provided with a plurality of blind holes opening towards the bottom portion and the botom portion equipped with a transverse trough opening towards the top portion of the peripheral frame;

a plurality of louvers having a protruding upper stub axle at the top portion thereof capable of being received by the blind holes of the top portion of the peripheral frame and a protruding lower stub axle at the lower portion thereof on the vertical axis in line with the upper stub axle, the louver further equipped with a linking rod offset from the vertical axis of the upper and lower stub axles;

a retaining cover having a plurality of circular apertures and a plurality of arcuate linkage guides, the circular apertures accommodating the lower stub axles of the louvers, the retaining cover bridging the transverse trough of the bottom portion of the peripheral frame;

a linkage bar residing a transverse trough below the retaining cover with a plurality of linking rod apertures and a plurality of linkage guide protrusions concentric with the linking rod apertures protruding into the arcuate linkage guides, the linking rod apertures accommodating the linking rod of the louvers;

a louver linkage seal having a pair of apertures therein including a central aperture accommodating the lower stub axle and an outboard aperture accommodating the linking rod of the louver whereby the arcuate linkage guides are covered preventing the passage of foreign material into the transverse trough of the bottom portion of the peripheral frame.

4,043,259

APPARATUS FOR CONTINUOUSLY ROLLING UP SHEETS OF BAKED COOKIES

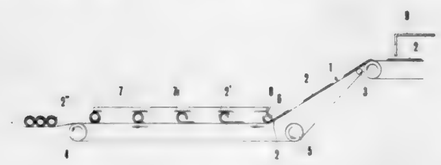
Fumio Sato, Zama, Japan, assignor to Morinaga & Co., Ltd., Japan

Filed July 12, 1976, Ser. No. 704,552

Claims priority, application Japan, July 19, 1975, 50-88955; May 19, 1976, 51-58429

Int. Cl.² A23L *3/00*

U.S. Cl. 99—353 **14 Claims**



1. An apparatus for forming rolled sheet articles, such as cookies, which are rolled after heating, comprising an endless conveyor having a surface on which a sheet article thereon is continuously advanced at a predetermined speed, a roll-up roller rotatably mounted alongside a portion of said conveyor spaced less than the sheet article thickness therefrom and being rotated at a slower speed than said surface so as to engage the sheet article and cause the bending of the article around the surface of the roll-up roller, stopper means overlying said roll-up roller surface at a location spaced from the sheet article material contact on the surface of said roll-up roller to cause the sheet article material to be discharged from said roll-up roller, and sheet article rotation means engageable with respective opposite sides of said roller and effective to move the opposite sides at distinct speeds so as to produce a rotational couple thereon to continue the rolling up of the sheet article material.

4,043,260

OPEN-FIRE ROTISSERIE STAND

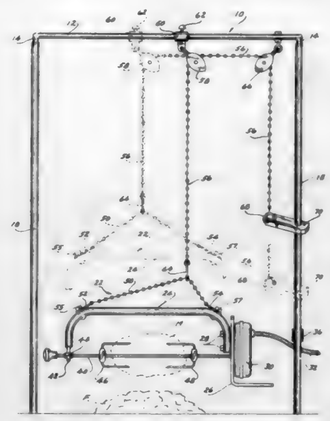
Robert H. LaPour, 6000 5-Mile Road, Racine, Wis. 53402, and Harold G. Liefbroer, 4717 Graceland Blvd., Racine, Wis. 53406

Filed June 11, 1976, Ser. No. 695,015

Int. Cl.² A47J *37/04*

U.S. Cl. 99—421 HH **2 Claims**

1. A means of supporting a rotisserie over a fire, said rotisserie having a beam, said means comprising a horizontal bar supported on downwardly-extending legs, a bail extending longitudinally relative to said beam and having spaced links, one end of said bail secured adjacent to each extremity of said beam, an upwardly-directed flexible member selectively engaged to one of said links, a first rotating member slidably secured to said bar, said flexible member being trained over



said first rotating member, a second rotating member spaced from said first rotating member and secured to said bar, said flexible member being trained over said second rotating member and directed downwardly, a height-adjusting arm axially adjustable on one of said legs, and said downwardly-directed flexible member being secured to said arm.

4,043,261

AUTOMATIC BANDING MACHINE

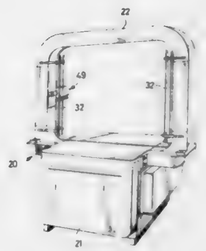
Shinroku Mae, Tokyo, Japan, assignor to Motosuke Umezu, Tokyo, Japan

Filed Aug. 26, 1976, Ser. No. 718,193

Claims priority, application Japan, May 19, 1976, 51-56653

Int. Cl.² B65B *13/04*

U.S. Cl. 100—26 **5 Claims**



1. An automatic banding machine for banding a package or the like, comprising a machine base, a band supplying means in said base, an arch on said machine base and projecting therefrom, said arch having a band running channel around the inside periphery thereof opening inwardly of said arch, said band supplying means supplying a band into said band running channel for running the band around said arch and back to said maching base, a band holding means around the inside periphery of said arch and normally covering said channel and movable laterally of said arch for uncovering said channel, driving means coupled to said band holding means for moving said band holding means between the position in which the band holding means covers said channel and the position in which the band holding means leaves said channel uncovered, and an auxiliary band feeder at a position at least halfway around the

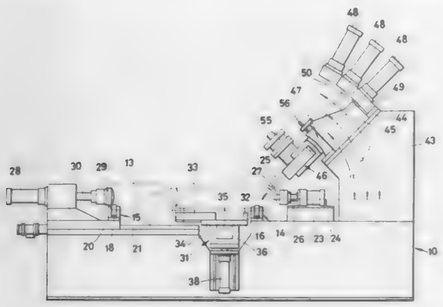
periphery of said arch in the running direction of the band and having a driving roll projecting toward the inside of said arch into said channel and rotating in the band running direction and a press roll on the band holding means opposed to and having the band pressed into contact therewith by said driving roll when said band holding means is in the position for covering said channel.

4,043,262

APPARATUS FOR IMPRINTING MARKINGS ON CYLINDRICAL VESSELS FOR COMPRESSED GASES OR THE LIKE

Isamu Kajimoto, Amagasaki, and Hideaki Morii, Gifu, both of Japan, assignors to Morii Chokoku Co., Ltd., Gifu and Sumikin-Kiko Co., Ltd., Amagasaki, both of Japan

Filed July 14, 1975, Ser. No. 595,964
Claims priority, application Japan, July 15, 1974, 49-80989
Int. Cl.[2] B44B *5/00*; B41F *17/18*
U.S. Cl. 101—7 **5 Claims**



1. An apparatus for engraving markings in a plurality of lines on each of metal cylinder articles for compressed gases, comprising in combination:

a frame having a rearward end and a forward end, said frame having notional lines extending in its transverse direction at constant spacings, said notional lines consisting of a loading line adjacent said rearward end of said frame and comprising a loading platform, an unloading line adjacent said forward end of said frame and comprising an unloading platform, and a plurality of marking lines between said loading and unloading lines;

work rest means comprising spaced rollers arranged at said marking lines on said frame, said articles each having a longitudinal axis, said spaced rollers receiving successive articles with said longitudinal axes of said articles being horizontally disposed, said articles received on said spaced rollers being rotatable about their longitudinal axes;

work transfer means for conveying the successive articles from said loading line to said unloading line through the successive marking lines, said work transfer means comprising a guide means, a carriage slidably mounted on said guide means, work rest elements extending from said guide means, first cylinder-piston means for raising and lowering said guide means between raised and lowered positions such that in said raised position said work rest elements engage said articles to raise the latter from said resting position on said spaced rollers and in said lowered position said work rest elements are disposed at an elevation lower than said articles such that the latter are free to be received on said spaced rollers, and second cylinder-piston means for sliding said carriage relative to said guide means between advanced and retracted positions, said second cylinder-piston means sliding said carriage from said retracted position to said advanced position when said guide means is in said raised position, said second cylinder-piston means sliding said carriage from said advanced to said retracted position when said guide means is in said lowered position;

work holding means for releasably holding the articles on said spaced rollers against longitudinal displacement while permitting the same to rotate about their own longitudinal axes;

marking means arranged over said frame in register with each of said marking lines, said marking means including an arcuate marking surface which has formed thereon a line of indicia to be engraved on the article at each said marking line;

means for moving said marking means back and forth to bring said marking surface into and out of pressure contact with the article rotatably held on each said marking line, said marking means being thus moved in a direction perpendicular to a plane tangent to the article on said marking line at a different point of contact with said marking surface; and

means for rotating said marking surface in rolling contact with the article on each said marking line to engrave the line of indicia thereon, said artical being rotated about its longitudinal axis by said rotating surface;

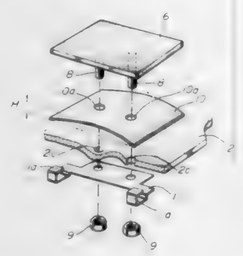
whereby a plurality of lines of indicia are engraved on each article as the same travels through the successive marking lines.

4,043,263

PRINTING MACHINE WITH VERTICALLY SHIFTABLE CREDIT CARD SUPPORTING PLATE

Tetsuo Nakada, Sagamihara, Japan, assignor to Janome Sewing Machine Co., Tokyo, Japan

Filed Feb. 5, 1974, Ser. No. 439,759
Claims priority, application Japan, Feb. 9, 1973, 48-16648
Int. Cl.[2] B41F *3/04*
U.S. Cl. 101—45 **5 Claims**



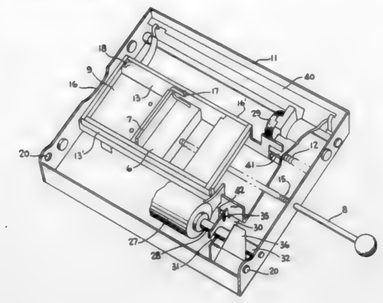
1. A printing machine comprising a printing bed having an upper face and a bottom face; a plurality of selectively settable type wheels projecting in part beyond said upper face of said printing bed; a flat credit card supporting plate having an upper face for supporting a selected one of a plurality of credit cards thereon; a carriage mounted on and movable across said printing bed; a platen roller rotatably carried by said carriage; and means mounting said credit card supporting plate on said printing bed adjustable in vertical direction relative to the latter during a printing operation so that information on the credit card supported on said credit card supporting plate may be properly printed together with types on said type wheels, regardless of the thickness of the credit card used, said mounting means comprising a curved leaf spring substantially of the same outline as said credit card supporting plate and located between said printing bed and said credit card supporting plate.

4,043,264

PRINTING DEVICE

Helmut August Michael Schöttle, and Karl-Heinz Harry Strobel, both of Berlin, Germany, assignors to Adrema Pitney Bowes GmbH, Heppenheim, Bergstrasse, Germany

Filed Jan. 23, 1976, Ser. No. 651,837
Claims priority, application Germany, Jan. 31, 1975, 2504018
Int. Cl.[2] B41F *3/04*
U.S. Cl. 101—269 **4 Claims**



1. In a portable, manual printer of the type wherein the printing operation is accomplished by a printing plate being impressed upon a print medium such as a sheet of paper or set of forms, the combination comprising:

a housing having an opening therein;

a longitudinally extending guide track received within said housing and having one end adjacent to said opening;

a printing anvil formed within said housing opposite said guide track;

means for holding a printing plate in registration with and intermediate to said guide track and said printing anvil;

means for supporting a print medium intermediate said guide track and said printing anvil;

a printing head having a non-rotatable, apex forming ridge extending therefrom slidingly supported by said guide track with said ridge directed toward said anvil;

biasing means disposed intermediate said housing and said guide track to bias said print head toward said anvil;

a rod secured to said printing head and extending outside said housing;

resilient means disposed about said rod intermediate said printing head and said housing for biasing said printing head toward said opening; and

means attached to said printing head for at least partially removing a printing plate from said housing upon completion of the printing operation comprising an engaging member attached to said printing head, means for holding said engaging member away from said printing plate holding means when said printing head is slid by said rod away from said opening and means for placing said engaging member within said printing plate holding means when said resilient means biases said print head toward said opening.

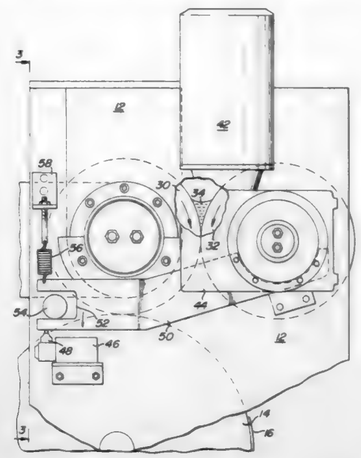
4,043,265

INK LEVEL WARNING SYSTEM

William Grobman, Philadelphia, Pa., assignor to Molins Macine Company, Inc., Camden, N.J.

Filed Jan. 29, 1976, Ser. No. 653,417
Int. Cl.[2] B41F *31/06*
U.S. Cl. 101—350 **10 Claims**

1. Apparatus comprising a transfer roll, a metering roll generally parallel to said transfer roll and cooperating therewith to define a trough therebetween along the length thereof for receiving a liquid printing medium which acts as a lubricant between contacting peripheral surfaces of said rolls, motor means for rotating said rolls about their axes in opposite directions including a separate drive motor coupled to each of said rolls so that said transfer roll has a surface speed greater than the surface speed of said metering roll, an alarm means, and



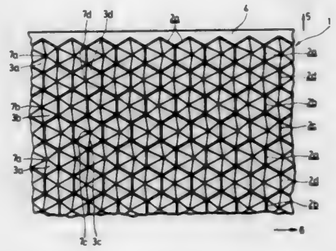
means for triggering said alarm means in response to the reaction torque on the drive motor for said metering roll when the amount of printing medium in said trough is below a predetermined amount.

4,043,266

HOLLOW CHARGE CONSTRUCTION AND METHOD OF FORMING A HOLLOW CHARGE LINING

Manfred Held, Aresing, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Germany

Filed Feb. 23, 1976, Ser. No. 660,178
Claims priority, application Germany, Feb. 26, 1975, 2508270
Int. Cl.[2] F42B *3/08*
U.S. Cl. 102—24 HC **13 Claims**



1. A method of forming a hollow charge lining for a hollow charge, comprising forming into a plate a multiplicity of multisided closed-form geometric impressions extending inwardly into said plate from all of the sides of each impression to an innermost geometrical axis point and arranged in longitudinally extending and transversely extending rows, and wherein the impressions of at least some of said rows are formed with geometrical axis points which are offset from the axis points of the other of said rows.

4,043,267

ROCKET BULLET

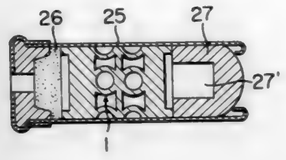
Hisao Hayashi, Tokyo, Japan, assignor to Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-Ten, Tokyo, Japan

Continuation-in-part of Ser. No. 404,200, Oct. 9, 1973, abandoned, which is a continuation of Ser. No. 116,482, Feb. 8, 1971, abandoned. This application July 15, 1974, Ser. No. 488,442

Claims priority, application Japan, Aug. 27, 1970, 45-42393

Int. Cl.[2] F42B *5/02*

U.S. Cl. 102—38 **6 Claims**



1. A firearm cartridge assembly comprising a cartridge casing closed at one end and open at the opposite end, said cartridge casing having an axially extending tubular configuration, a combustible charge contained within said casing at the closed end thereof, a single bullet mounted in and disposed in contact with said casing at the opposite open end thereof in axially spaced relationship with said combustible charge, and an integral wad member contained within said cartridge casing and extending between and in contact with said charge and said bullet, at least a portion of the axially extending lateral surfaces of said wad member being disposed in contact with said casing, said wad member formed of a flexible resilient synthetic resin material and comprising a first end located adjacent said charge and a second end located adjacent said bullet, said first end having a surface in engagement with said charge and said second end having a surface in engagement with said bullet, said charge engaging surface of said first end and said bullet engaging surface of said second end of said wad member each have a recess formed therein spaced radially inwardly from the outer periphery thereof, a disc-shaped section extending transversely of the axis of said casing and having the diameter of its outer peripheral edge conforming to the diameter of the interior of said casing and being located between and spaced in the axial direction of said casing from said first end and said second end, a first spring section disposed in contact with and located between said disc-shaped member and said first end and a second spring section disposed in contact with and located between said disc-shaped member and said second end, said first spring section and said first end located at one side of said disc-shaped member are symmetrical to said second spring section and said second end located on the opposite side of said disc-shaped member, said recess in said charge engaging surface wholly located within said first end and said recess in said bullet engaging surface wholly located within said second end, the base of said recess in said charge engaging surface spaced inwardly in said first end from said charge and the base of said recess in said bullet engaging surface spaced inwardly from said bullet and said recesses being similarly shaped and symmetrical about said disc-shaped section, means for retaining said charge and said bullet within said casing, said first and second spring sections arranged in compression in the axial direction of said casing for pressing said charge and said bullet against said means for retaining them in said casing, said bullet having a centrally arranged recess in the end thereof in contact with the bullet engaging surface of the second end of said wad with the recess in the bullet engaging surface extending axially away from the end of said bullet in contact wth the second end of said wad so that when the charge is exploded said bullet engaging surface is driven forwardly into the recess in said bullet forming a tightly fitting connection with said bullet due to the resilient character of the wad whereby said wad remains secured for said bullet acting as tailwing thereof over the trajectory of said bullet unti it contacts a target.

4,043,268

CONTAINER CONSTRUCTION FOR AN EJECTABLE BALLISTIC PAYLOAD

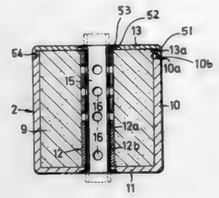
Siegmar Fischer, Dusseldorf-Kaiserswerth; Dietmar Karius, and Günter Sikorski, both of Dusseldorf, all of Germany, assignors to Rheinmetall GmbH, Dusseldorf, Germany

Filed June 2, 1976, Ser. No. 691,975

Claims priority, application Germany, June 7, 1975, 2525553

Int. Cl.[2] F42B *13/14*

U.S. Cl. 102—66 **9 Claims**



1. In an ejectable payload for a ballistic projectile, the payload comprising incendiary material arranged along and coaxially around a central ignition channel of the projectile and disposed within a plurality of hollow annular elongated containers, the containers being successively disposed axially in abutting relation between a front nose portion and a rear tail portion of the projectile, the inner boundary of each container including at least one apertuer extending radially therethrough for providing communication between the interior of the ignition channel and the incendiary material within the associated container, an improved construction for the container which comprises, in combination, an axially extending outer cylindrical jacket, a first radially disposed end plate integral with and extending inwardly from a lower end of the outer jacket, the inner portion of the first end plate having a first recess in its outer surface, an axially extending inner cylindrical jacket having first and second flanges extending radially outwardly from its upper and lower ends, respectively, a second radially disposed end plate, the inner portion of the second end plate having a second recess in its outer surface, and means for removably and threadedly connecting the second end plate to the upper end of the outer jacket, the first and second flanges of the inner jacket being received tightly within the first and second recesses of the respective end plates when the second end plate and the outer jacket are threadedly connected.

4,043,269

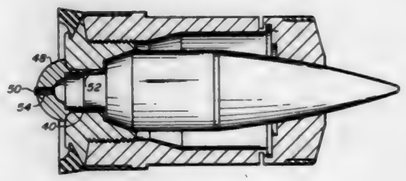
SEALED SABOT PROJECTILE

Leonard R. Ambrosini, Bettendorf, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 27, 1976, Ser. No. 691,048

Int. Cl.[2] F42B *13/34, 13/16*

U.S. Cl. 102—87 **4 Claims**



1. A sealed sabot projectile comprising:

a sabot having a cylindrical wall and a front face with an opening for insertion of the nose of a projectile therethrough,

a centering ring threadedly engageable with said wall and adapted to align and retain a projectile within said sabot, said ring having an opening therein to permit propulsion gases to impinge against said projectile in the separation thereof from said sabot, and

a seal within said opening having an orifice therein for controlled flow of propulsion gases therethrough,

said seal including a semi-spherical cap overlying said ring opening and a long tubular protrusion fitting snugly within said opening, said orifice extending through said cap.

4,043,270

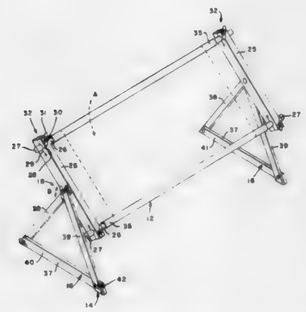
NEEDLEWORK FRAME

Antonia V. Miner, Londonderry, and Joseph Nichols, Newfane, both of Vt., assignors to Toni Totes of Vermont, Inc., South Londonderry, Vt.

Filed July 30, 1976, Ser. No. 710,159

Int. Cl.[2] D06C *3/08*

U.S. Cl. 38—102.91 **9 Claims**



1. As assembly for supporting needlework comprising

a. a needlework frame comprising a pair of side rails and a pair of dowels extending between said side rails and parallel to and spaced from each other,

b. a lap stand for supporting said needlework frame so that it is in a convenient workable position for someone in a sitting position with legs outstretched, said lap stand including a pair of distinct support brackets, each support bracket including a base member and a pair of support members extending upwardly from said base member to define, with said base member, a triangularly shaped support bracket, said base member of each of said lap stand supports having a pair of elongated faces thereof, and each support member of each support bracket being attached to an opposite face of said base member from the other support member of the support bracket,

c. means for pivotally mounting said needlework frame on said lap stand so that said lap stand supports said needlework frame yet the needlework frame is pivotal with respect thereto, said means comprising a slot formed at the end of each support member of each of said lap stand support brackets, said slots having an overlapping area providing an opening when defining a triangularly shaped support bracket, a bolt attached to said needlework frame and passing through each said opening formed by said slots in each of said support brackets, and a wingnut in operative association with each said bolt for releasably holding said support brackets to said needlework frame when tightened onto each of said bolts.

4,043,271

MOBILE TRACK TAMPING MACHINE

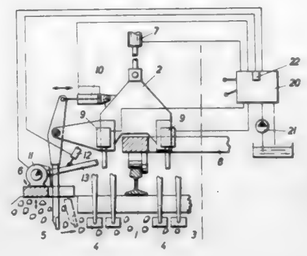
Josef Theurer, Vienna, Austria, assignor to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Filed Jan. 19, 1976, Ser. No. 650,022

Claims priority, application Austria, Feb. 27, 1975, 1536/75

Int. Cl.[2] E01B *27/16*

U.S. Cl. 104—12 **9 Claims**



1. In a mobile track tamping machine for compacting ballast supporting a track consisting of rails mounted on ties having two elongated edges extending transversely of the rails and two ends extending in the direction of the rails, the elongated tie edges of adjacent ones of the ties defining cribs therebetween, which comprises a frame; a tamping tool assembly vertically movably mounted on the frame for tamping a respective one of the ties, the tamping tool assembly including a pair of opposed vibratory tamping tools arranged for immersion in the cribs adjacent one tie and for reciprocation in the direction of the rails, with the one tie positioned between the opposed tools, and an additional non-vibratory tamping tool arranged for immersion in the ballast adjacent an end of the one tie and for reciprocation in a direction transversely of the rails; and a vibratory surface tamper for tamping the ballast adjacent the tie end: the improvement of associating the additional non-vibratory tamping tool and the vibratory surface tamper with each other in closely adjacent relationship next to the tie end, the vibratory tamping force of the surface tamper reaching at least to the reciprocatory path of the additional nonvibratory tamping tool.

4,043,272

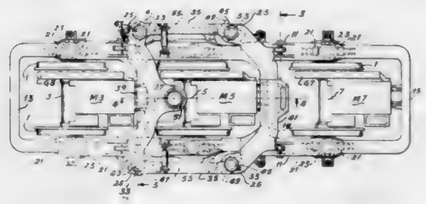
RAILWAY LOCOMOTIVE TRUCKS

William Clifford Jones, Jr., and Robert E. Long, both of Granite City, Ill., assignors to General Steel Industries, Inc., St. Louis, Mo.

Filed Oct. 15, 1975, Ser. No. 622,777

Int. Cl.[2] B61C *3/00;* **B61F** *3/06, 5/06, 5/16*

U.S. Cl. 105—136 **11 Claims**



1. In a railway truck, three wheeled axles including a first end axle, a middle axle and a second end axle, a truck frame resiliently supported on said axles and having longitudinally extending side members outboard of said wheels with portions elevated over said axles and depressed portions therebetween, first and second transverse transom members connecting said frame side member depressed portions intermediate said mid-

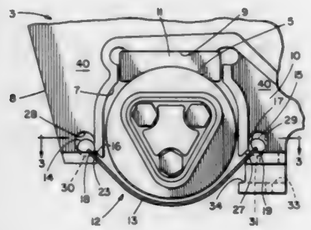
dle axle and the respective end axles, individual traction motors drivingly connected to said axles and having a reaction connection to said truck frame, a pair of outboard upright springs carried on each side member of said truck frame and spaced apart longitudinally thereof, the corresponding springs of each pair being aligned with each other transversely of the truck, a body-support bolster comprising transversely spaced apart longitudinally extending side members transversely outboard of said frame side members and longitudinally spaced apart end members extending over said depressed portions of said frame side members and the respective transom members defining a substantially unobstructed opening receiving the upper portion of said middle axle motor, said bolster being supported on said springs in the regions of the intersections of said bolster end and side members and having at least three vertically substantially rigid upwardly facing bearings spaced apart longitudinally and transversely of the truck for vertically substantially rigidly supporting a body on said bolster, all of said upwardly facing bearings being in alignment transversely of the truck with said transversely aligned springs, at least two of said upwardly facing bearings being in the region of the intersections between one of said bolster end members and said bolster side members, means forming a longitudinal force transmitting connection between said bolster and said frame at a level below said axle centers, and a vertical axis swivel bearing on the other bolster end member.

4,043,273

ALTERNATIVELY USABLE SLING AND KEY ROLLER BEARING RETAINERS

Franklin P. Adler, Michigan City, Ind., assignor to Pullman Transport Leasing Company, Chicago, Ill.

Filed Nov. 13, 1975, Ser. No. 631,756
Int. Cl.² B61F *5/26, 5/52, 15/2, 15/20*
U.S. Cl. 105—221 R **5 Claims**



1. In pedestal type side frame for a railway truck including an inner and outer depending legs spaced lengthwise of the frame forming,

a downwardly opening jaw for receiving an axle bearing,

each of said legs having a portion including a ledge and defining a enlarged chamber delineated by the ledge and a reduced slot opening into said jaw from said chamber,

said inner leg having a transverse bottom ledge portion spaced below said ledge of said chamber and opening into said jaw,

an elongated sling having enlarged inner and outer ends, means anchoring said ends to said leg portions within the chambers therein, adapted to be secured to said bottom ledge portion for selectively retaining the bearing within said jaw,

said sling extending through said slots and across said jaw below the bearing, and

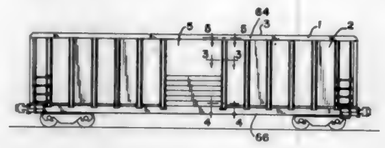
said inner leg having a passage being formed between said ledges adapted to receive a bearing retaining key.

4,043,274

RAILWAY CAR NAILABLE DOOR POST

Richard C. Snyder, Michigan City, Ind., assignor to Pullman Incorporated, Chicago, Ill.

Filed Aug. 27, 1975, Ser. No. 608,318
Int. Cl.² B61D *17/08, 45/00;* **E04B** *1/20, 1/32*
U.S. Cl. 105—409 **9 Claims**



1. In a freight car, a vertically extending nailable metal and wood door post for a door opening in the car side wall comprising:

inner and outer vertical metal post members,

means securing said members to the side wall, one of said members having a first transverse wall remote from the door opening,

a wooden nailing strip tightly interposed between said members and seated against said wall and spaced laterally away from the door opening,

means on one of said members for holding said strip within the post against said transverse wall, and

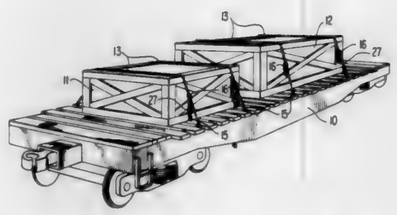
one of said members having a wall defining a side of said opening and deflectible longitudinally of the side wall and slidable along the other of said members.

4,043,275

CHAIN LENGTH ADJUSTER AND LOCKING DEVICE

William L. Rochester, Jr., P.O. Box 127, Aberdeen, N.C. 28315

Filed Dec. 3, 1975, Ser. No. 637,128
Int. Cl.² B61D *45/00, 49/00;* **F16G** *15/04, 15/14*
U.S. Cl. 105—477 **9 Claims**



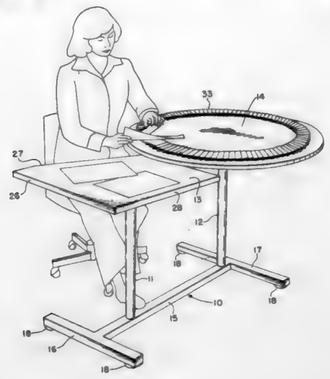
1. A cargo lashing means comprising a length of link chain adapted to have one end anchored near one side of a cargo transporting base and adapted to have its other end releasably attached near the other side of the base by a conventional securing and tightening means, and a length adjusting and locking means for said chain allowing a slack loop of any necessary length to be formed in the chain between its ends and to be positively secured, said length adjusting and locking means comprising a pair of plate elements each having a slot formed therein extending inwardly from one marginal edge thereof and having an end terminating in the plate element, and fastener means releasably securing said plate elements in overlapping relationship with the slots of the plate elements in lateral registry the width of each slot being sufficient only to freely receive a respective link of said chain when inserted transversely into each slot, the presence of the adjacent links causing the links received in said slots to be immobilized against movement out of a respective slot in any direction when said plate elements are secured in said overlapping relationship.

4,043,276

SORTING TABLE ARRANGEMENT

Robert M. Dahl, 633 Park Ave., Wilmette, Ill. 60091

Filed Nov. 17, 1976, Ser. No. 742,594
Int. Cl.² A47B *11/00*
U.S. Cl. 108—28 **10 Claims**



1. In a sorting table arrangement, a substantially circular table top member, a substantially quadrilateral table top member, a unitary table base supporting said circular table top member and said quardrilateral table top member in cooperation with each other for use by a seated person on one side of said table arrangement for sorting paper-like items, said table base comprising a base platform and two spaced apart upright posts, means on the upper end of one of said posts secured to the center underside of said circular table top member for rotatively carrying said circular table top member in a horizontal plane above the lap of said seated person, means on the upper end of the other of said posts secured to the underside of said quadrilateral table top member for fixedly carrying said quadrilateral table top member in a horizontal plane above the lap of said seated person ad spaced below the horizontal plane of said circular table top member, one edge of said quadrilateral table top member disposed beneath said circular table top member on a chord of the circle of said circular table top member, a second edge of said quadrilateral table top member disposed opposite to and substantially parallel to said first edge, a third edge of said quadrilateral table top member on said one side of said table arrangement and extending substantially between one end of each of said first and second edges and disposed substantially along a line parallel to a radius of said circle of said circular table top member, a fourth edge of said quadrilateral table top member extending substantially between the other end of each of said first and second edges, a plurality of paper sorting dividers pivotally secured at one end of each thereof to the upper side of said circular table top member, and said dividers being disposed in a partially overlapping relationship in a ring disposed concentrically to and radially inwardly of the edge of said circular table top member.

4,043,277

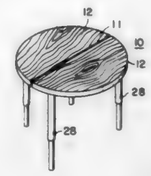
FOLDABLE STOOL

Doralee A. Wallace, Hollis, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Apr. 12, 1976, Ser. No. 676,313
Int. Cl.² A47B *3/00*
U.S. Cl. 108—35 **2 Claims**

1. A foldable stool formed with a platform of two panel members hinged together, with a plurality of telescopic legs hinged to the underside of the panels, the underside of said panels each fitted with spacer blocks along the outer edges of the panels for concealing the folded legs when the panels are folded together, with each telescopic leg formed of an inner member slidably mounted in a hollow outer member, said outer member formed with a through longitudinal slot extending for a portion of the length of said member in which slot rides the head of a key that is pivotally fixed to the said inner member,

said slot formed with an enlarged section of a size to accommodate the head of the key in a first position of rotation of said key, with the remainder of the slot of lesser width so as to block movement of the key in said first position, and



in the enlarged section of the slot, from travelling in said remainder of the slot, so as to latch the attached inner and outer members together when the key head is rotated to said first position in said enlarged section of the slot,

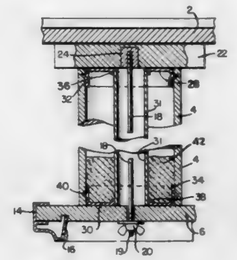
said key mounted in said inner section so as to project into the enlarged section of the slot of the outer section in the extended position of the legs.

4,043,278

KNOCK-DOWN LIGHT WEIGHT TABLE KIT

Milton Kessler, Youngstown, and Myron E. Ullman, Jr., Canfield, both of Ohio, assignors to Kessler Products, Inc., Youngstown, Ohio

Filed May 12, 1976, Ser. No. 685,803
Int. Cl.² A47B *13/02*
U.S. Cl. 108—150 **12 Claims**



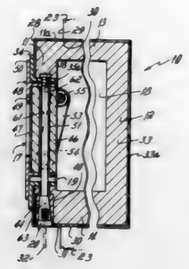
1. In a knock-down kit of light weight table components including a top, a base, a supporting column, trim and a tie rod for quick assembly without tools, in combination the improvement comprising: a centrally located blind hole in the underside of said top; fastener means in said hole to secure an end of said tie rod therein; said supporting column including an outer hollow columnar member, an inner hollow columnar member within said outer columnar member, a pair of end plates adapted to concentrically position said columnar members, means to concentrically secure said end plates between said columnar members, ballast means between said columnar members adjacent their lower ends, and means to secure said ballast means adjacent said lower ends; a hole centrally located in said base; said trim being adapted to snap on the periphery of said base and to extend beneath the underside thereof; the length of said tie rod being sufficient to extend through said hole in said base, and said inner columnar member with one end projecting into said blind hole in the underside of said top to be secured by said fastener means therein; and means to fasten the outer end of said tie rod adjacent the underside of said base, said trim extension providing clearance for said means to fasten the said other end of said tie rod.

4,043,279

SECURITY BOX

James M. Padgett, 1065 Reading Road, Mason, Ohio 45040

Filed Dec. 3, 1975, Ser. No. 637,376
Int. Cl.[2] E05G *1/04*
U.S. Cl. 109—50 14 Claims



1. A security box adapted to be mounted in a building wall, said box comprising

a box housing including an access opening in the front face of said housing, said housing defining two bores therein, each of said bores communicating with said access opening, and one of said bores being threaded,

a door selectively operable with said housing to open and close said access opening, said door defining a bore therethrough from one edge to another, one of said housing's two bores communicating with one end of said through bore when said door is closed, and the other of said housing's two bores communicating with the other end of said through bore when said door is closed,

a hinge arm pivotally mounted at one end to said housing on a fixed hinge line, and pivotally mounted at the other end to said door on a movable hinge line, said movable hinge line being movable relative to said housing when said door is opened relative to said access opening, said hinge lines being substantially parallel one to the other, and said fixed hinge line being located adjacent the bottom edge of said access opening, and said movable hinge line being located adjacent the top edge of said door, the location of said hinge lines causing said door to drop beneath said access opening when said door is opened, and

a lock device selectively engageable with said housing and said door to lock same in the closed attitude, said lock device including

an elongated rod extending through said door's through bore and into said two housing bores when said door is in locked relation with said housing, said elongated rod being positioned substantially normal to said door hinge lines when said door is closed and locked,

threads on one end of said elongated rod, said elongated rod being threadedly received in said threaded bore when said door is in locked relation with said housing, and

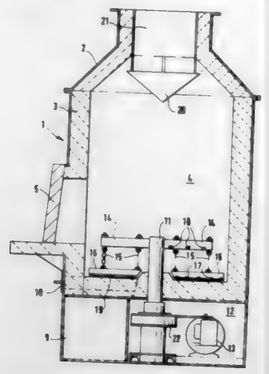
a lock cylinder fixed to the other end of said elongated rod, said lock cylinder's lug being selectively operable to prevent rotation of said rod when said door is in locked relation with said housing, thereby preventing disengagement of said rod from said threaded bore after locking relation has been established.

4,043,280

INCINERATOR

Stanley William Wray, Poole, and Michael George Warwick, Guildford, both of England, assignors to Hamworthy Engineering Limited, Poole and P.D. Pollution Control Limited, Rickfords Hill Aylesbury, both of England

Filed Feb. 12, 1976, Ser. No. 657,392
Claims priority, application United Kingdom, Feb. 18, 1975, 6788/75
Int. Cl.[2] F23G *7/00*; F23B *1/16*
U.S. Cl. 110—7 R 9 Claims



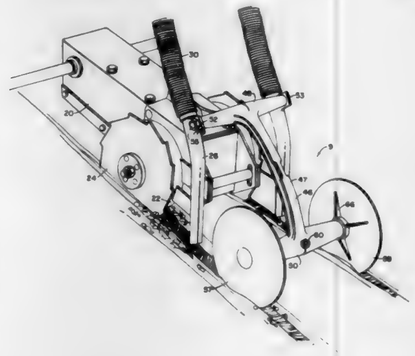
1. A waste incinerator, comprising a combustion chamber having a floor, at least one generally horizontal metal distributor bar adjacent to the floor, at least one support member spaced above the floor, non-rigid suspension means suspending at least one said distributor bar from an associated said support member, reversible driving means for moving the support member or members above the said floor to cause the distributor bar or bars to sweep at least part of the floor area, and a loading aperture for solid waste, at least one said non-rigidly suspended bar having a toothed edge and, opposite the toothed edge, a further edge forming a continuous blade.

4,043,281

DUAL PACKER WHEEL UNIT FOR TILLAGE APPARATUS

Donald Thomas Sorlie, Ankeny, and David Hoffer Bucher, Des Moines, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 15, 1976, Ser. No. 649,280
Int. Cl.[2] A01C *5/04*
U.S. Cl. 111—85 8 Claims



1. In a tillage unit having a pair of transversely spaced and driven cutter wheels capable of engaging and cutting a pair of spaced furrows and a pair of transversely spaced seed delivery tubes for discharging seed in the respective furrows, the improvement residing in a dual packer wheel assembly, comprising:

bracket means including an arcuate leg connected at opposite ends to the central portion of a pair of substantially equal length arms, one of which is connected at opposite ends to spaced pivot points on the respective tubes and the other of which is a packer wheel mounting arm; and

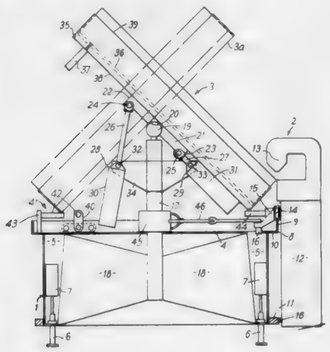
a pair of packer wheels mounted for free rotation at the opposite ends of said packer wheel mounting arm, whereby said wheels are spaced apart a distance sufficient to follow and be received in the spaced furrows cut by said tillage unit, said wheels being narrower than the respective furrows so that each rides on the bottom of the furrow.

4,043,282

TAPE EDGE CLOSING MACHINE

Peter Frederick Walter Fanghanel, Baldock, England, assignor to P. Fanghanel & Company Limited, Great Britain

Filed Mar. 30, 1976, Ser. No. 671,870
Claims priority, application United Kingdom, Apr. 1, 1975, 13222/75
Int. Cl.[2] D05B *11/00*
U.S. Cl. 112—3 R 8 Claims



1. A mattress tape edge closing machine comprising a mattress support disposed at an acute angle to the horizontal, said support having an edge region, a sewing head arranged to sew in or near the vertical mode and means for causing each part of said edge region of said support to be brought successively into register with said sewing head.

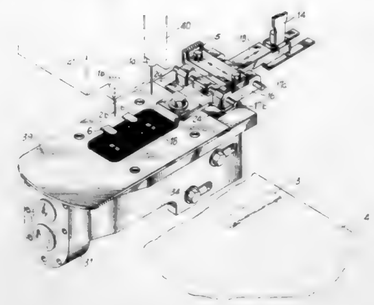
4,043,283

SEWING APPARATUS EMPLOYING TWIN NEEDLES

Wilhelm H. Jung, Mechanicsville, Va., assignor to AMF Incorporated, White Plains, N.Y.

Continuation-in-part of Ser. No. 596,324, July 17, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 750,037
Int. Cl.[2] D05B *1/08*
U.S. Cl. 112—163 6 Claims

1. An apparatus for use in a sewing machine employed in the manufacture of two simultaneous tacks formed by joining a first unit of material to a second unit of material, after both have been fed into a sewing station including: a sewing machine head; said sewing machine head being defined by first and second independently driven sewing needles spaced apart with respect to one another in a vertical plane, each of said needles depending from first and second supporting members, said needles being movable in concert with respect to one another and to first and second units of material in said sewing station; needle adjusting means adapted to longitudinally displace said first supporting member with respect to said second supporting member in accordance with a predefined needle-to-needle distance, material guide means supported about said pair of needles for positioning said first unit of material with respect to said second unit of material, prior to initiating the movement of said pair of spaced apart sewing needles; first and second bobbins having associated first and second shuttle means, being adapted to cooperatively act with said pair of spaced apart sewing needles to form a plurality of stitches for joining said first and second units of material; material feed means disposed in proximity to said sewing machine, being defined by interconnecting members driven to control longitudinal and lateral movement of first and second units of material during movement of said needles; and drive means interconnecting each of said bobbins through shaft means, for operating said first and second bobbin shuttle means in synchronization the respect to the movement of said needles.

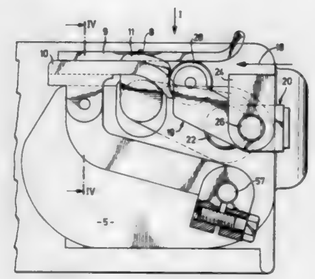


4,043,284

BLIND STITCH SEWING MACHINE

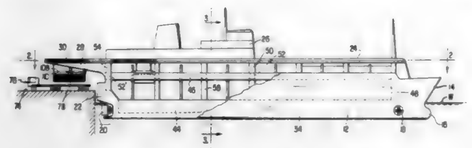
Winfried Rau, Turkenfeld, and Lothar Sommerschuh, Oberschleissheim, both of Germany, assignors to J. Strobel & Sohne GmbH & Co., Munich, Germany

Filed Feb. 17, 1976, Ser. No. 658,757
Claims priority, application Germany, Mar. 17, 1975, 2511568
Int. Cl.[2] D05B *1/24*
U.S. Cl. 112—178 32 Claims



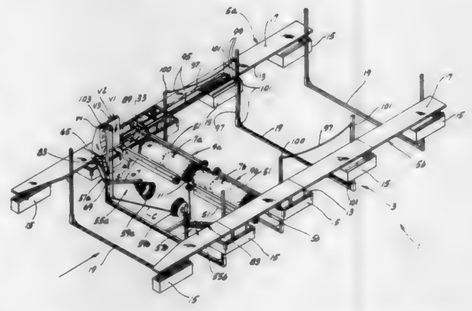
1. In a blind stitch sewing machine having a needle and a cloth carrying arm comprising a cloth bending means adjustable with respect to the needle, means for automatically adjusting the depth of penetration of the cloth by the needle by positioning the cloth bending means comprising a fabric feeler and a rod system through which the feeler cooperates with the cloth bender to set the highest position of the cloth bender.

4,043,285
CONTAINER SHIP
Immo R. Nordstrom, P.O. Box 305, Fair Haven, N.J. 07701
Filed Feb. 25, 1976, Ser. No. 661,140
Int. Cl.[2] B63B *25/22*
U.S. Cl. 114—72 **4 Claims**



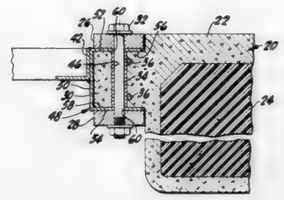
1. A marine vessel adapted for handling and transport of a plurality of containers, said vessel comprising:
a. an external hull;
b. a horizontal upper structure extending across said hull;
c. upper structure support means extending rearwardly of said hull;
d. said upper structure being supported by said support means and hence extending rearwardly of said hull;
e. a cargo supporting deck disposed within said hull in substantial alignment with the waterline of said vessel;
f. an internal support framework comprising:
a pair of opposed longitudinal structural members extending longitudinally along the interior of said hull;
said longitudinal structural members being disposed below said upper structure and above said cargo supporting deck and in parallel relation to said deck;
a plurality of upright structural members extending along the interior of said hull at longitudinally spaced locations therealong, said upright structural members being interconnected with said longitudinal structural members; and
a plurality of transverse structural members extending transversely across the interior of said hull, said transverse structural members being substantially coplanar with said longitudinal structural members;
each of said transverse structural members being longitudinally aligned with an opposed pair of upright structural members and being interconnected with said longitudinal structural members;
g. means for internally dividing said vessel into a plurality of cargo compartments, said means comprising:
a plurality of vertical structural members extending upwardly from said cargo supporting deck; and
upper support means to which said vertical structural members are attached;
said upper support means being connected with said upper structure support means;
said vertical structural members being longitudinally and transversely aligned to define therebetween a plurality of cargo compartments;
h. container handling and transporting means comprising:
access opening means at the stern of the vessel;
said access opening means comprising an enlarged access opening extending between the underside of said upper structure and the rearmost of said transverse structural members;
a plurality of spaced parallel longitudinally extending support rails disposed beneath and attached to said upper structure;
said support rails extending from substantially the forward end of the cargo compartments, through said enlarged access opening and substantially to the rear end of said upper structure;
said longitudinal support rails forming at least two sets of crane rails arranged side-by-side and extending longitudinally above and across said cargo compartments;
a travelling bridge crane means supported upon and movable along each of said sets of crane rails;
said travelling bridge crane means comprising a first trolley means movable longitudinally through said vessel along said support rails and a second trolley means coupled with and movable transversely across said first trolley means;
said second trolley means including hoisting cables adapted for attachment to containers and controllable winding drums for raising and lowering said hoisting cables and containers attached thereto;
each of said travelling bridge crane means being adapted to transfer containers into and out of said cargo compartments by use of said first trolley means to accomplish longitudinal movement of said containers and by use of said second trolley means to accomplish transverse movement and raising and lowering of said containers.

4,043,286
BOAT HULL SCRUBBING APPARATUS
Frederick L. Doty, Rte. 47 West, P.O. Box 152, Monticello, Ill. 61856
Filed May 17, 1976, Ser. No. 687,193
Int. Cl.[2] B63B *59/00*
U.S. Cl. 114—222 **13 Claims**



1. Apparatus for scrubbing the hull of a boat comprising a frame having two portions spaced a distance sufficient for a boat to be floated therebetween, a pair of power driven brushes extending generally transversely between said frame portions, means supporting each of said brushes for rotation about its longitudinal axis, means pivotally securing said supporting means together adjacent their inner ends for pivoting relative to one another about a substantially horizontal pivot axis extending generally perpendicular to the longitudinal axis of said brushes, means for mounting the outer end of each of said supporting means to its respective frame portion for vertical movement, for horizontal movement toward and away from its opposite frame portion, and for angular movement of each of said supporting means and its respective brush relative to its respective frame portion from a first position in which the brushes and the supporting means are generally horizontal for engagement of the brushes by the hull of a boat to be cleaned to a second position in which the brushes are angled downwardly from their said first positions and are disposed below the hull of the boat for scrubbingly engaging the latter with the pivotally connected inner ends of said supporting means being movable vertically downwardly and pivoting relative to one another and with the outer ends of the supporting means being movable vertically and angularly downwardly and horizontally inwardly relative to their respective frame portions as said brushes move from their said first positions to their said second positions to conform to the shape of the boat hull being cleaned, the position of the brushes being changeable to conform to the shape and depth of the boat hull and means for biasing the brushes upwardly toward their said first positions whereby the brushes are maintained in scrubbing engagement with the boat as the latter is floated over the brushes.

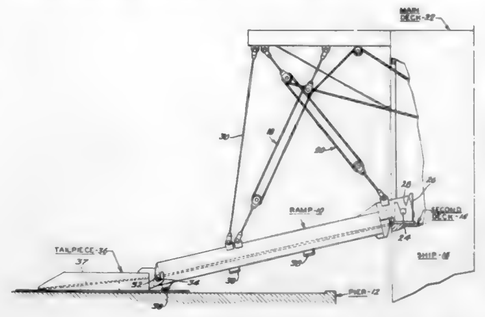
4,043,287
APPARATUS FOR CONNECTING FLOATING DOCKS
Myron L. Shorter, Jr., 81 Calypso Shores, Ignacio, Calif. 94947
Filed Jan. 29, 1976, Ser. No. 653,624
The portion of the term of this patent subsequent to July 6, 1993, has been disclaimed.
Int. Cl.[2] B63B *35/44*
U.S. Cl. 114—266 **11 Claims**



1. In a modular floating dock comprised of coupled individual float units each constructed with a substantially rectangular shell with opposed sidewalls and end walls, and top and a bottom, a means for connecting component apparatus to the modular floating dock comprising;
a. a flange structure projecting from one of the walls of the float units proximate the top of the float units, said flange structure having a horizontal top mounting surface and a horizontal bottom mounting surface displaced a predetermined distance from the top mounting surface;
b. at least one hole vertically extending through said flange structure from said top mounting surface to said bottom mounting surface;
c. at least one bracket element having a thin horizontal top plate and thin horizontal bottom plate displaced said predetermined distance from the top plate, said bracket element having at least one hole in said top plate and at least one hole in said bottom plate aligned with said hole in said top plate;
d. component apparatus connected to said bracket element, and;
e. interconnection means vertically extending through said hole in said top plate of said bracket elements, said hole in said flange structure, and said hole in said bottom plate when said bracket element is engaged on said flange structure for interconnecting said bracket element and said flange structure, said interconnection means including means for securing said bracket plates and said flange structure together in compression.

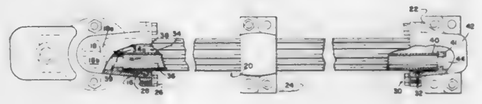
4,043,288
SHIP LOADING RAMP
Radoje Vulovic, Swarthmore, Pa., assignor to Sun Shipbuilding and Dry Dock Co., Chester, Pa.
Filed Oct. 23, 1975, Ser. No. 625,222
Int. Cl.[2] B63B *27/14*
U.S. Cl. 114—270 **13 Claims**

1. A ship loading ramp system designed to allow for a substantial change in tide by providing for automatic coupling and uncoupling to the ramp and comprising:
a. a ramp adapted to extend from a pier to the deck on a ship;
b. means for detachably coupling the ship end of said ramp to the ship such that the ramp may be vertically lifted out of the coupling means when the tide lowers the level of the ship's deck below the level of the pier, and the ramp may settle back into the coupling means when the tide raises the level of the ship's deck above the level of the pier;
c. means for supporting the ramp at a maximum positive angle as the tide raises the level of the ship above the level of the pier; and
d. means for detachably supporting the pier end of said ramp on the pier such that as the tide causes the level of the ship to rise, ship end of said ramp will be raised until the ramp reaches said maximum positive angle as defined by said ramp supporting means and the ramp will then proceed to



be lifted off the pier at said maximum positive angle until the tide recedes and the ramp end of the ramp is again supported by the pier.

4,043,289
MARINE KEEL COOLER
Gustave Walter, Jersey City, N.J., assignor to The Walter Machine Company, Inc., Jersey City, N.J.
Filed Aug. 22, 1975, Ser. No. 606,784
Int. Cl.[2] B61D *27/00*
U.S. Cl. 115—75 **3 Claims**

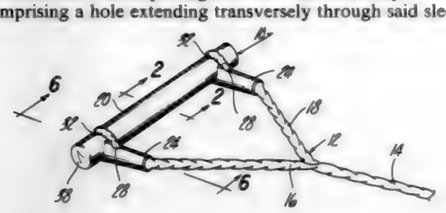


1. For use with a vessel having a hull and equipped internally with an engine or similar accessory having a water circulating pump; a keel cooler comprising a header unit attached to the underside of the hull and communicated through the bottom of the hull with the pump, said header unit being vertically divided by a partition into two chambers providing outflow and inflow of water relative to the pump, a return fitting attached to the underside of the hull and spaced longitudinally from the header unit and at least one cooling tube connected between the header unit and the return fitting, said tube having a longitudinal flat divider plate extending centrally thereof for the entire length of the tube and dividing it into two equal and separate flow compartments for the flow of water of the same volume from the header unit to the return fitting and then back from the return fitting to the header, said tube being longitudinally fluted and being provided with a series of diametrically opposing internal grooves extending the full length thereof and separated and defined by internal radial projections extending the full length of the tube and said longitudinal divider plate having opposing side edges sealingly fitted in a pair of diametrically opposing grooves.

4,043,290
WATER SKI TOW HANDLE
Dennis P. Holland, 3599 Orchard Lake Road, Orchard Lake, Mich. 48033
Filed Oct. 18, 1976, Ser. No. 733,413
Int. Cl.[2] B63B *21/56*
U.S. Cl. 115—6.1 **16 Claims**

1. In a tow rope arrangement for water skiing which includes an elongated hand grip having friction material thereon and at least one hole extending transversely therethrough, a tow line threaded through said hole and terminating in a loop

firmly encircling said hand grip and a protective sleeve having an axial bore encompassing said tow line, the improvement comprising a hole extending transversely through said sleeve,



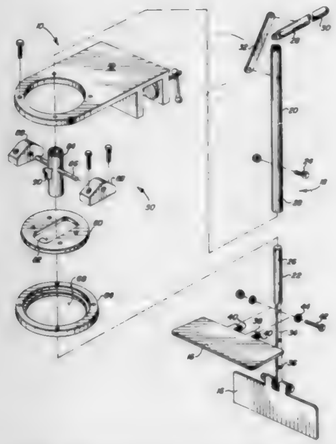
said loop encircling said hand grip through said hole in said sleeve such that said sleeve also encompasses a portion of said tow line loop directly adjacent said hand grip.

4,043,291

ROWING AND STEERING DEVICE FOR BOATS

Charles D. Bearup, Phoenix, Ariz., and Marvin F. Few, Socorro, N. Mex., assignors to Marvin F. Few, Socorro, N. Mex.

Filed Jan. 21, 1976, Ser. No. 651,134
Int. Cl.[2] B63H *1/32*
U.S. Cl. 115—29 **2 Claims**



1. A combination manual propulsion and steering device for a boat which comprises:

a. a bracket adapted to be attached to a boat, said bracket having a generally horizontal rearwardly extending flange, said flange defining an opening;

b. a collar secured to said flange, said collar defining an opening therein substantially concentric with the opening in said flange, an annular groove extending around said collar;

c. a bearing plate rotatively secured between said flange and said collar at said annular groove, said bearing plate having a slot therein;

d. a sleeve pivotally carried on a pivot shaft having an axis generally transverse of the axis of said sleeve, said pivot shaft mounted in bearing members on said bearing plate;

d. a vane shaft assembly longitudinally extending through said sleeve;

f. means for releasably securing said vane shaft assembly relative to said sleeve;

g. a vane carried on the lower end of said vane shaft assembly pivotal relative to said vane shaft assembly between a motive and a non-motive position; and

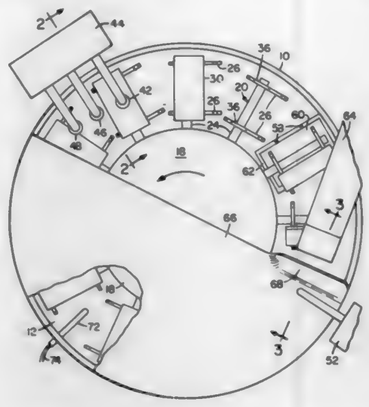
h. arm means located at the upper end of said vane shaft assembly for actuating the vane shaft whereby a boatman can propel said boat by manually reciprocating said arm means and whereby said boat can be steered by rotation of said vane shaft assembly and said bearing plate to position said vane relative to the boat to generate a force component in the desired direction.

4,043,292

MICROSCOPE SLIDE STAINING APPARATUS HAVING TEMPERATURE CONTROL

Charles H. Rogers, and Kevin J. Sullivan, both of Raleigh, N.C., assignors to Corning Glass Works, Corning, N.Y.

Filed July 21, 1975, Ser. No. 597,442
Int. Cl.[2] B05C *5/00, 15/00*
U.S. Cl. 118—5 **13 Claims**



1. An apparatus for staining biological specimen-containing microscope slides comprising

microscope slide support means having means for conveying a plurality of slides along a predetermined path,

means disposed along said predetermined path for introducing a metered amount of at least one staining reagent on only that surface of said slide on which said specimen is disposed to form a reagent film,

means disposed along said path for maintaining the temperature of said reagent film within a given range of temperature for a given period of time, and

means disposed along said path for removing said reagent film from said slides at the expiration of said given period of time.

4,043,293

DEVELOPABILITY REGULATING APPARATUS

Frederick R. Ruckdeschel, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,230
Int. Cl.[2] G03G *15/08*
U.S. Cl. 118—7 **16 Claims**

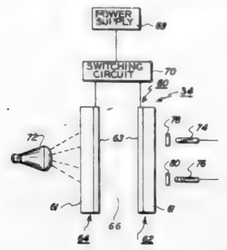
1. An apparatus for regulating the developability of a development system employing particles, including:

transparent electrode means electrically biased to attract particles thereto,

means for illuminating said electrode means having particles deposited thereon with light rays;

first means, having a peak transmittance corresponding to the peak transmittance of the particles, for detecting the intensity of the light rays transmitted through the particles adhering to said electrode means and generating a first electrical signal indicative thereof; and

second means, having a peak transmittance corresponding to the peak absorbence of the particles, for detecting the intensity of the light rays transmitted through the particles



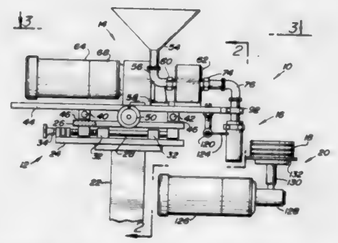
adhering to said electrode means and generating a second electrical signal indicative thereof.

4,043,294

CAKE ICING APPARATUS

Richard L. Morine, and James J. Hokes, both of Euclid, Ohio, assignors to Fedco Inc., Mentor, Ohio

Filed Feb. 3, 1976, Ser. No. 654,871
Int. Cl.[2] B05C *5/02*
U.S. Cl. 118—9 **7 Claims**



1. Apparatus for applying icing to the sides of cylindrical cakes comprising:

a. a rotatable support means for supporting a cylindrical cake in a generally horizontal position with the axis of the cake extending vertically;

b. power means for selectively rotating said support means to cause a cake positioned thereon to be rotated about said axis;

c. icing discharge nozzle means positioned closely adjacent said support means by means which permit selective adjustment of said nozzle means relative to said support means and including a closed chamber having a vertically-elongated discharge slot means and valve means operable to open and close said slot means;

d. a source of icing;

e. variable-speed, positive displacement pump means connected between said source of icing and said chamber for supplying icing to said chamber under a comparatively-lower pressure; and,

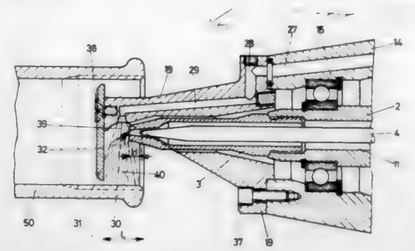
f. control means including a timer for energizing said pump means and opening said valve means for a period of time substantially equal to one revolution of said support means and thereafter substantially simultaneously stopping said pump means closing said valve means.

4,043,295

APPARATUS FOR SPRAY-COATING INTERNAL SURFACES OF TUBULAR ARTICLES

Reinhold Speck, and Stefan Forberger, both of Singen, Germany, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed July 14, 1975, Ser. No. 595,500
Claims priority, application Switzerland, July 22, 1974, 10050/74
Int. Cl.[2] B05B *13/06*
U.S. Cl. 118—317 **3 Claims**



1. Apparatus for applying a coating material to the internal threads of a fitting or tube end to a predetermined axial depth, comprising:

a fixed nozzle (3) arranged for directing a jet of coating material along the axis of said internal threads;

a revolving air jet nozzle (19) having its discharge orifice (30) radially offset and in front of the discharge orifice of said fixed nozzle (3) and arranged to revolve while remaining directed approxiamately at right angles to the axis of said fixed nozzle;

means for supplying air to said revolvig nozzle (19);

means for supplying coating material to said fixed nozzle (3), and

a spray cone limiting plate (31) mounted on the rotating end of the apparatus adjacent to said revolving air jet nozzle (19),

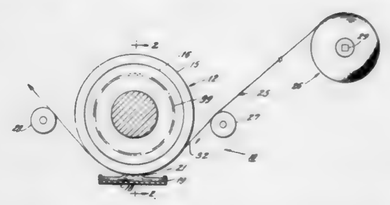
whereby a spray cone of said coating material is projected onto said internal threads, so that the coating thickness increases with axial distance from the open end of the threads to a maximum thickness axial location and the coating is caused to be thicker at the inner end than at the outer end due to the limiting of the spray cone by said plate (31).

4,043,296

ROLL CONSTRUCTION FOR COATING APPARATUS

Simon Long Chu, Dobbs Ferry, N.Y.; Peter Shu, Fogelsville, Pa., and Robert Sharowsky, Hastings-on-Hudson, N.Y., assignors to Polychrome Corporation, Yonkers, N.Y.

Filed Mar. 15, 1976, Ser. No. 666,859
Int. Cl.[2] B05C *3/12*
U.S. Cl. 118—419 **5 Claims**



1. Apparatus for applying a controlled film of coating material on a relatively non-porous web moving lengthwise; said apparatus including a backing roll including a central portion engaged with one surface of the web, and means in the vicinity

of said backing roll for applying coating material in liquid form to the other surface of the web by providing a meniscus supported solely by surface tension; said backing roll also including stepped-down portions at each end of said central portion; said central portion being substantially narrower than the web; the radius of said stepped-down portion being less than the radius of the central portion by a step height which is greater than deflection of the web which is the radial distance between those edges of the web that overlie the stepped-down portions of the backing roll and the web section engaged with the central portion; said edges of the web being far enough from said central portion to prevent coating material from migrating from the edges of the web to the backing roll.

4,043,297

DEVICE FOR THE MAGNETIC ORIENTATION OF MAGNETIC RECORDING MEDIA

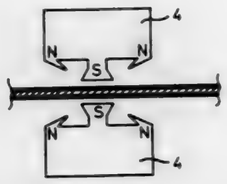
Job-Werner Hartmann, Ludwigshafen; Roland Falk; Aribert Krug, both of Achern; Georg Huber, Willstaett, all of Germany; Werner Balz, Stoneham, Mass., and Karl Mahler, Kehl, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 523,826, Nov. 14, 1974. This application Oct. 12, 1976, Ser. No. 731,140

Claims priority, application Germany, Nov. 17, 1973, 2357517

Int. Cl.[2] B05C *11/00*

U.S. Cl. 118—640 **2 Claims**



1. An apparatus for the manufacture of magnetic recording media comprising flat rigid discs of a non-magnetic metal and a coating, applied to one or both sides thereof, wherein at least two pairs of magnetic poles are arranged symmetrically opposite one another, one pair of poles flaring out in cross section toward the plane of symmetry between the pairs of poles, whereas the other pair of pairs of poles of opposite polarity, when viewed in cross section, taper toward the said plane of symmetry to a point and are spaced further apart than the flared poles.

4,043,298

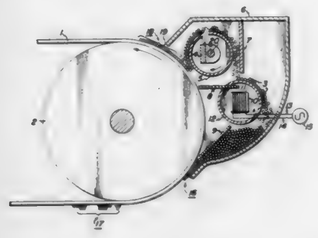
MAGNETIC TONER SCAVENGING SYSTEM

Stanley B. Swackhamer, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 26, 1976, Ser. No. 690,211

Int. Cl.[2] G03G *13/08*

U.S. Cl. 118—652 **3 Claims**



1. A magnetic toner recovery apparatus, comprising:

a. a non-alternating polarity magnetic field producing magnet within a first rotatable member, said magnet and rotatable member positioned relative to a magnetizable recording medium travel path so that the magnetic field of said magnet is of sufficient strength to magnetically attract airborne toner from the vicinity of a recording medium to said rotatable member but insufficient to prevent gravity fall of toner from said member after predetermined movement of toner by said rotatable member; and

b. an electromagnet within a second rotatable member, said second rotatable member being positioned below said first rotatable member and in the path of gravity fall of toner from said first rotatable member; said electromagnetic provided with windings in a direction which produces a magnetic field substantially parallel to the direction of gravity fall of toner; the magnetic field alternating in magnetic polarity.

4,043,299

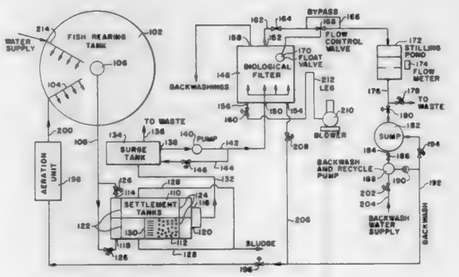
FISH REARING SYSTEM

Alexander E. Birkbeck, Delta, and Craig C. Walden, Vancouver, both of Canada, assignors to British Columbia Research Council, Vancouver, Canada

Filed May 1, 1975, Ser. No. 573,548

Int. Cl.[2] A01K *63/00*

U.S. Cl. 119—3 **12 Claims**



1. A fish rearing system in which water can be recycled, the system comprising the following components in combination: a tank containing fish, said tank having a water inlet and a water outlet, the outlet of said tank being in fluid communication with the inlet of a first gravitational separator tank means for the removal of large suspended debris with low retention time for the water in the separator tank means, said separator tank means having a sludge outlet, weir means spaced from said separator tank inlet means and located in an upper portion of the separator tank adjacent an outlet means for said separator tank, a second particulate media filter tank with its inlet connected to the outlet of said first separator tank and containing filter media particles in the size range of 0.5 to 10 mm. whereby biological water purification sites are provided on such particulate media, outlet means in said particulate media tank, water backwash means whereby backwash water can be forced through the particulate medium of the filter to clean the medium when required, air scour means whereby air can be forced through the particulate medium to lift and expand the medium and agitate the mediumm vigorously to permit adequate backwashing of the medium by the backwash water, pump means to move water through the filter tank, aeration means positioned between the filter tank outlet and the recycled water inlet of the fish tank whereby water in the system can be aerated and stripped of carbon dioxide, conduit means whereby water can be fed from the fish tank outlet through the other components of the system to the fish tank inlet, and means for feeding fresh water into the system.

4,043,300

APPARATUS FOR BALANCING THE FLOW OF TWO AGENTS, CAPABLE OF REACTING TOGETHER TO PROVIDE ENERGY, TO AN ENERGY GENERATOR

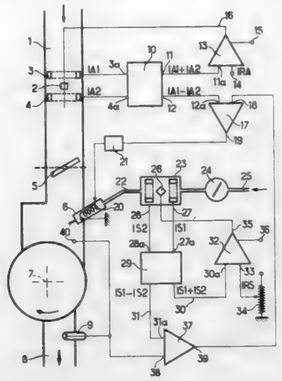
Claude Lombard, Le Chesnay, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of France

Filed Feb. 4, 1975, Ser. No. 546,893

Claims priority, application France, Feb. 8, 1974, 74.04384

Int. Cl.[2] F02B *3/00*

U.S. Cl. 123—32 EA **25 Claims**



1. A device for controlling the ratio between the flow rates of two agents capable of reacting together to provide energy to means for generating energy by the interaction of said agents, the device comprising:

means providing respective ducts for the flow of said agents,

a differential type detector in each said duct comprising a central ion generating electrode and two collecting electrodes symmetrically disposed with respect to the ion source,

means for processing the signals of each flow rate detector,

means for supplying current to said flow rate detectors,

means for regulating the current supplying means,

means for comparing the flow rates sensed by said flow rate detectors.

adjusting means for adjusting the flow rate of one of said agents through the respective duct, said adjusting means being connected to the output of the comparing means,

temperature sensing means for sensing the temperature of at least one said agent, and

means connecting said temperature sensing means with said comparing means for varying said ratio according to the temperature sensed.

4,043,301

INTERNAL COMBUSTION ENGINE

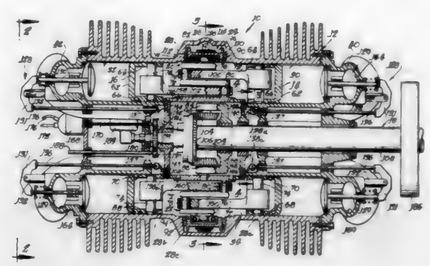
Lawrence M. Rheingold, Baldwin, N.Y., assignor to Templet Industries Incorporated, Plainview, N.Y.

Continuation-in-part of Ser. No. 588,876, June 20, 1975, abandoned. This application May 24, 1976, Ser. No. 686,211

Int. Cl.[2] F02B *75/18*

U.S. Cl. 123—52 B **28 Claims**

1. An internal combustion engine comprising, in combination, housing means defining a longitudinal axis, at least two axially aligned piston receiving chambers within said housing means, said piston receiving chambers having annular configurations and each chamber being substantially closed at one end and open at its opposite end such that the open ends of said chambers are in substantially axially opposed relation, an annular piston disposed within each of said piston receiving chambers means mounting said pistons for reciprocal and rotatable movement within said chambers, said pistons being rotatable about a common axis and each cooperating with its associated piston receiving chamber to define an annular combustion chamber, at least one connecting rod pivotally connected to each of said pistons and extending generally parallel to the axis of rotation of said pistons, drive shaft means supported by said housing means for rotation about an axis coincident with the common axis of said annular pistons, said drive shaft means extending outwardly of said housing means, means interconnecting said connecting rods to said drive shaft means so as to effect selective rotation of said drive shaft means upon reciprocating movement of said pistons, and means for introducing combustible fuel into said combustion chambers and effecting ignition of said fuel in a manner to effect reciprocating movement of said pistons.



4,043,302

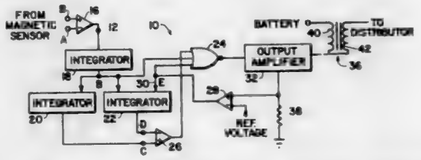
SOLID STATE IGNITION SYSTEM AND METHOD FOR LINEARLY REGULATING THE DWELL TIME THEREOF

Douglas Charles Sessions, Phoenix, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation-in-part of Ser. No. 607,402, Aug. 25, 1975. This application Dec. 19, 1975, Ser. No. 642,504

Int. Cl.[2] F02P *1/00*

U.S. Cl. 123—117 R **18 Claims**



1. A solid state ignition system for an internal combustion engine, which ignition system is responsive to successively applied alternating timing signals generated in timed relationship with the engine to charge and discharge an ignition coil to produce spark to operate the engine, comprising in combination:

first circuit means for varying the phase of the timing signals applied thereto by a predetermined amount which is a function of the engine rotational speed;

second circuit means responsive to the applied timing signals for processing the same to produce a first output signal, said second circuit means being operatively coupled to said first circuit means;

third circuit means responsive to said phase shifted timing signals for producing at an output terminal thereof a second output signal having a time duration which is dependent on said degree of phase shift effected to said phase shifted timing signals;

gating means responsive to either said first output signal or said second output signal for producing a control signal at an output thereof;

amplifier switching means responsive to said control signal from said gating means for conducting direct current through the coil to charge the same;

said first and second circuit means being responsive to the next one of the applied timing signals such that said first and second output signals are inhibited for a predetermined time to render said amplifier switching means nonconducting to discharge the ignition coil; and

said second circuit means further including;

a. fourth circuit means adapted to receive each successive timing signal for producing a monopulse signal and a reference signal at respective outputs thereof, said monopulse signal being produced during a predetermined half cycle of each successive timing signal for a predetermined duration thereof, said reference signal having first and second portions, said first portion being indicative of said predetermined duration when said monopulse is being produced, said second portion being indicative of the remainder of the duration of each successive applied timing signals;

b. feedback means responsive to said direct current conducted through said amplifier switching means reaching a predetermined magnitude for producing a feedback control signal at an output thereof;

c. fifth circuit means operatively coupled to said first circuit means and said feedback means and being responsive to said monopulse signal and said feedback control signal for producing a variable threshold signal at an output thereof so that the excess dwell current through the coil is maintained a substantially fixed percentage of the time duration of the timing signals, the magnitude of said variable threshold signal being linearly related over a predetermined dynamic range to the time duration of each successive timing signal and the time duration for charging the ignition coil; and

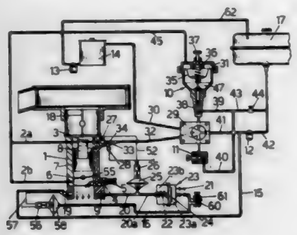
d. comparator-gating means responsive to said reference and said variable threshold signals applied thereto for producing said first output signal when the magnitude of said second portion of said reference signal reaches a predetermined value with respect to the magnitude of said variable threshold signals.

4,043,303

AIR-FUEL RATIO CONTROL SYSTEM FOR INTERNAL-COMBUSTION ENGINES WITH CONTROLLED IGNITION

Mariano Migliaccio, and Emilio Pisani, both of Napoli, Italy, assignors to Consiglio Nazionale Delle Ricerche, Italy

Filed June 20, 1975, Ser. No. 588,811
Claims priority, application Italy, June 24, 1974, 51712/74
Int. Cl.[2] F02M *7/00, 13/00*
U.S. Cl. 123—119 R **8 Claims**



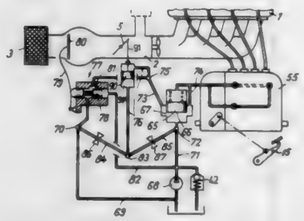
1. An air-fuel ratio control system operating in response to the running conditions of an internal-combustion engine, having an intake pipe, with controlled ignition and fed by a liquid fuel, continuously supplied through a main pump from a main fuel source and which liquid fuel, during operation, is at least partially deviated into a recycle circuit connected to the main fuel source and, as the throttle valve controlling the intake pipe is at least partially opened, is injected into the intake pipe into which the carburation air is drawn from the atmosphere under the control of a manually operable shut-off valve, said air-fuel ratio control system comprising in combination, a supply pipe supplying the fuel from said main fuel source through said main pump; a fluidistor having an inner chamber; at least three branch pipes branching from said supply pipe and communicating with said inner chamber; a first branch pipe supplying a jet of fuel at a constant delivery rate, a second branch pipe supplying a jet of fuel at a constant but adjustable delivery rate, and a third branch pipe supplying a jet of fuel at a variable delivery rate; a pressure sensitive diaphram valve controlling the delivery rate of said third branch pipe in response to the resultant value of the sub-atmospheric pressure in said intake pipe as sensed on the upstream and downstream sides of said throttle valve; said fluidistor chamber having two outlet orifices each having a respective predetermined cross-section; a recycle reservoir forming part of said recycle circuit; a first outlet pipe connecting one outlet orifice to said recycle reservoir; a second outlet pipe connected to the other outlet orifice and divided into two branches, the first of which terminates in a fuel injection nozzle positioned on the upstream side of said throttle valve and the second of which terminates in an adjustable injection nozzle supplying into the intake pipe the fuel required for slow running of the engine, the adjustable injection nozzle being arranged on the downstream side of said throttle valve; respective normally open electric valves controlling each of the branches from said second outlet pipe; a pressure transducer connected to said electric valves and operable to shut said electric valves responsive to the degree of vacuum in the interior of the fuel intake manifold, on the downstream side of the throttle valve, to close said electric valves, said pressure transducer operating to close said electric valves only when the degree of vacuum in the manifold is below a predetermined minimum value; and means operable to adjust said pressure sensitive diaphram valve and effective also during operation of the engine.

4,043,304

FUEL INJECTION SYSTEM FOR SELF-IGNITING INTERNAL COMBUSTION ENGINES

Gerhard Stumpp; Konrad Eckert, both of Stuttgart; Detlev Runge, Gerlingen, and Wolf Wessel, Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 30, 1974, Ser. No. 465,503
Claims priority, application Germany, May 2, 1973, 2321907; Mar. 1, 1974, 2409774
Int. Cl.[2] F02M *25/06*
U.S. Cl. 123—119 A **45 Claims**



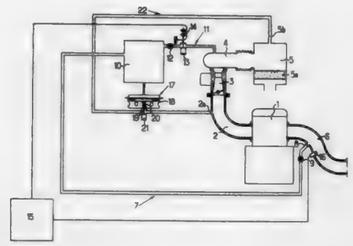
1. In a fuel injection system for an internal combustion engine, including a suction tube through which air for engine combustion is drawn, an exhaust gas line through which engine exhaust gas flows, an exhaust gas recycle line, a control mechanism including a throttle flap member mounted in any one of said suction tub, exhaust gas line and recycle line extending between and being connected to the suction tube and the exhaust line to thereby establish a flow path for a recycled portion of the exhaust gas flow through the exhaust gas line to the suction tube, with the connection of the recycle line to the suction tube being downstream of the location of the throttle flap member in the suction tube, and with the connection of the recycle line to the exhaust gas line being upstream of the location of the throttle flap member in the exhaust gas line, said throttle flap member controlling the pressure drop between the exhaust gas line and the suction tube for determining the flow rate of the recycled portion of the exhaust gas, fuel injection means, and regulating means for regulating the quantity of fuel injected by the fuel injection means, said regulating means including an air measuring member mounted within the suction tube and comparison means connected to the air measuring member and the fuel injection means, with the position of said throttle flap member in its respective tube or line defining a control parameter which is detected by the air measuring member and transmitted to the comparison means for adjusting the quantity of fuel injected by the fuel injection means.

4,043,305

CONTROL DEVICE FOR REGULATING THE COMPOSITIONS OF THE INLET AND EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Claude Henault, Chevilly Larue, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt and Automobiles Peugeot, Paris, both of France

Filed Oct. 14, 1975, Ser. No. 621,770
Claims priority, application France, Oct. 25, 1974, 74.35834
Int. Cl.[2] F02B *33/00;* **F02M** *23/04*
U.S. Cl. 123—119 A **5 Claims**



1. A control device useful in an internal combustion engine having a carburetor, an engine inlet, and an exhaust outlet, for regulating the composition of the inlet gases and hence the exhaust gases,

said control device having first passage means bypassing said carburettor for supplying extra air to said engine inlet, a control valve in said first passage means, second passage means for recirculating exhaust gases to said engine inlet, an electrically operated valve in said second passage means, an exhaust gas composition sensor installed in said exhaust outlet of said engine for providing signals dependent on the composition of the engine exhaust gases, and a controller responsive to said signals from said exhaust gas composition sensor to control said electrically operated valve and thereby the flow of exhaust gases through said second passage means,

the improvement wherein said control device further comprises

a pressure-sensitive device communicating with said second passage means upstream of said electrically operated valve, and

means connecting said pressure-sensitive device to said control valve in said first passage means

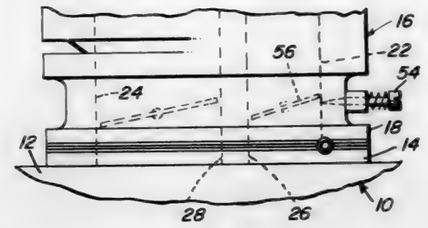
whereby said control valve is operated to regulate the supply of extra air to said engine inlet in response to the pressure in said second passage means.

4,043,306

CARBURETOR SPACER PLATE WITH VAPOR FUEL INLET

William G. Abbott, P.O. Box 1103, Hanford, Calif. 93230

Continuation-in-part of Ser. No. 476,285, June 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 335,570, Feb. 26, 1973, abandoned. This application Sept. 16, 1975, Ser. No. 613,802
Int. Cl.[2] F02M *13/08;* **F02B** *77/00;* **F02M** *23/04*
U.S. Cl. 123—121 **8 Claims**



1. In combination with a carburetor body and an attendant intake manifold, said body and manifold including registered air and fuel induction passages formed therethrough, a spacer plate mounted between said body and manifold, said plate having an opening formed therethrough registered with said passages and an outer periphery extending about said opening, a supplemental fuel vapor induction tube having an inlet end portion and an outlet end portion, said tube being supported from said plate with said outlet end portion embedded in said plate and said inlet end portion projecting outwardly through one outer peripheral edge of said plate, said outlet end portion including a vapor outlet section thereof extending along one periepheral portion of said opening and provided with a lateral outlet opening transversely into said opening, said outlet end portion being closed at its end remote from said inlet end portion, a first of said air and fuel passages of said body including a pivoted throttle plate controlling the flow of air therethrough and including a free swinging edge portion swingable in an upstream direction in said first of said air and fuel passages upon said throttle plate being pivoted toward its open position, said outlet in said vapor outlet section of said tube opening into the portion of said opening formed through said plate corresponding to the portion of said first of said air and fuel passages in which said free swinging edge portion is received when said throttle plate is at least substantially closed, said body including an idle fuel outlet port opening into the last mentioned portion of said first of said air and fuel passages.

4,043,307

FUEL INJECTION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Taro Tanaka, Chiryu, and Hideya Fujisawa, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of Japan

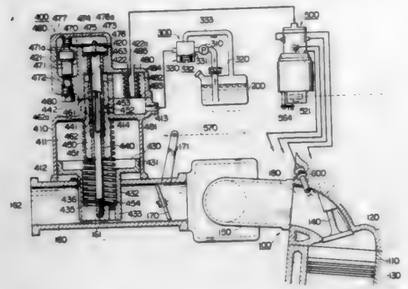
Filed Feb. 13, 1975, Ser. No. 549,806
Claims priority, application Japan, June 24, 1974, 49-72076
Int. Cl.[2] F02M *39/00;* **F02B** *3/00*
U.S. Cl. 123—139 AW **7 Claims**

1. A fuel injection system for an internal combustion engine having a plurality of cylinders, an intake pipe, intake ports interconnecting said intake pipe and said cylinders, and intake valves disposed in said intake ports, said system comprising:

fuel metering means mounted on said intake pipe and operating in response to the operating conditions of said enging to meter the flow of fuel supplied to said engine, said fuel metering means including:

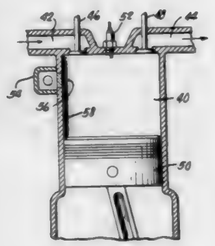
a suction piston mounted on said intake pipe and being axially movable in response to the variation in the flow of air passing through said intake pipe;

a first metering member connected to said suction piston for movement therewith;
a second metering member operatively associated with said first metering member to define therewith a fuel metering orifice;
a differential pressure regulator for maintaining constant the difference of the fuel pressure across said fuel metering orifice; and
a temperature compensation means engaged with said second metering member and operative in response to the variation of the temperature of the fuel to move said second metering member relative to said first metering member for controlling said fuel metering orifice;



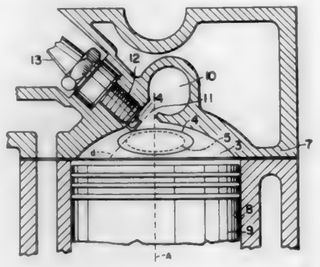
a plurality of fuel injection nozzles each disposed in one of said intake ports for injecting the metered fuel into said intake port;
a fuel distributor means connected to said fuel metering means and said nozzles for distributing the metered fuel to each of said fuel injection nozzles so that the fuel is injected from each of said nozzles into an associated intake port for a period of time extending from the time before an associated intake valve is closed to the time after the same intake valve is closed; and
an advancer connected to said distributor means and operative in response to the increase in the rotational speed of said engine to advance the fuel distribution timing of said distributor.

4,043,308
CONTROL OF THE INITIATION OF COMBUSTION AND CONTROL OF COMBUSTION
Anthony E. Cerkanowicz, Livingston, N.J., assignor to Photochem Industries, Inc., Fairfield, N.J.
Division of Ser. No. 468,543, May 9, 1974. This application Apr. 27, 1976, Ser. No. 680,867
Int. Cl.[2] F23H *5/20*
U.S. Cl. 123—143 R **4 Claims**



1. In a method of controlling the initiation of combustion and controlling combustion in a mixture that includes fuel and an oxidizer, the step comprising irradiating the mixture with ultraviolet energy sufficient to precondition the mixture by the photodissociative creation of a combustion intermediary species in a concentration below that required for the photochemical initiation of combustion at the temperature of the mixture but above the concentration of said species that would exist at the thermal ignition temperature of the mixture, in which said mixture is contained within the combustion chamber of an internal combustion engine.

4,043,309
INTERNAL COMBUSTION ENGINE HAVING AUXILIARY COMBUSTION CHAMBER
Takashi Kato; Koichi Hoshi, and Norihiko Nakamura, all of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Sept. 4, 1974, Ser. No. 503,178
Claims priority, application Japan, Apr. 25, 1974, 49-45513[U]
Int. Cl.[2] F02B *23/00*
U.S. Cl. 123—191 SP **7 Claims**

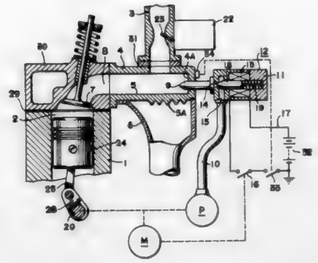


1. In an internal combustion engine operating with a lean fuel-air mixture for reducing harmful gas components in the exhaust, said engine comprising means defining a main combustion chamber, an intake valve, means for introducing a lean air-fuel mixture into said main combustion chamber through said intake valve, an exhaust valve, means defining an auxiliary combustion chamber without an intake valve in fluid communication with said main combustion chamber through a nozzle therein, and a spark plug for igniting the lean air-fuel mixture, the improvement comprising:
the spark gap of said spark plug being positioned adjacent to and substantially on the axis of said nozzle in the main combustion chamber.

4,043,310
AUXILIARY APPARATUS FOR HOT-STARTING INTERNAL COMBUSTION ENGINE
Touru Ichimiya, and Koichi Oosawa, both of Shizuoka, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed June 11, 1975, Ser. No. 586,032
Claims priority, application Japan, Feb. 18, 1975, 50-20233
Int. Cl.[2] F02N *17/00*
U.S. Cl. 123—179 G **6 Claims**

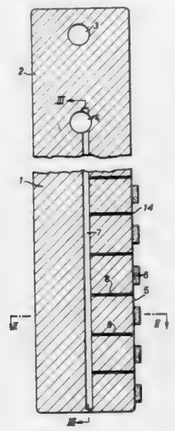
1. An auxiliary apparatus for hot-starting an engine comprising:
an intake manifold, said manifold having an opening in one end thereof and being directly connected to an intake port opening into a cylinder at the other end thereof;
an intake pipe opening into said intake manifold, at an intermediate portion thereof between and spaced from said ends thereof;
a secondary air injection nozzle having one end extending through said opening in said one end of said manifold and terminating in the space between said intake pipe and said one end of said manifold whereby said nozzle will not interfere with intake flow from said intake pipe;
an air pump for supplying pressurized secondary air to said secondary air injection nozzle;

a secondary air supply conduit for fluidly communicating said air pump and said secondary air injection nozzle;
an electromagnetic valve comprising:
a body having an opening in one end thereof, the other end of said nozzle being in direct fluid communication with said opening in said body;
a valve means disposed between said secondary air supply conduit and said secondary air injection nozle for opening and closing fluid communication between said conduit and said nozzle through said opening in said body, and



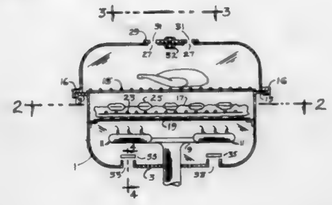
a solenoid coil for actuating said valve means; and
means for operating said solenoid coil to actuate said valve means only when the temperature of the intake passage exceeds a predetermined level and only at the time of cranking the engine, said operating means comprising:
an input circuit for said solenoid coil,
a thermoswitch electrically connected to said input circuit, and
a starter motor switch electrically connected to said input circuit in series with the thermoswitch.

4,043,311
JIG SAW BLADE WITH COOLING CHANNEL
Hans Bieri, Toedistrasse 9, 8330 Pfaeffikon, Switzerland
Filed Oct. 20, 1975, Ser. No. 623,895
Claims priority, application Switzerland, Oct. 24, 1974, 14227/74
Int. Cl.[2] B28D *1/06*
U.S. Cl. 125—18 **11 Claims**



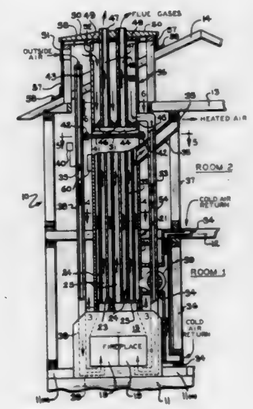
1. A cutting blade comprising an elongated blade shaft having a mounting end for mounting in a jig saw and a free end on the end thereof opposite said mounting end, said blade shaft having a pair of opposed longitudinally extending sides joined by at least one longitudinally extending edge, whereby said shaft has a neutral axis extending longitudinally in said blade with respect to bending loads, a channel exposed on only one side of said blade and extending substantially symmetrically along said neutral axis, cutting means comprising a plurality of longitudinally spaced apart cutting inserts secured to said one edge of said blade, a plurality of bores extending within said blade, said bores having outlet ports in said edge between pairs of adjacent inserts and extending to said channel, a cover sealingly inset in said one side of said blade and covering said channel, said channel being closed at the free end of said blade, and cooling medium supply means for directing a fluid into the end of said channel at said mounting end of said blade.

4,043,312
BARBECUE GRILL
Eugene F. Kern, 12115 Lake Meade Court, Creve Coeur, Mo. 63141
Filed Sept. 15, 1975, Ser. No. 613,571
Int. Cl.[2] A47J *37/00*
U.S. Cl. 126—41 R **8 Claims**



1. In a barbecue grill, a housing have an upwardly open fire box, a gas burner unit in said fire box, a grate for supporting meat mounted on said fire box above said burner unit, and a shield between said burner unit and said grate preventing cooking juices from dripping on said burner unit, said shield comprising a slab of refractory material reinforced with wire mesh and having lumps of refractory material permanently united with said slab and projecting upwardly from its top surface to simulate coals.

4,043,313
FIREPLACE CHIMNEY FURNACE
Larry P. Sherman, 430 East St., Muir, Mich. 48860
Filed Jan. 15, 1976, Ser. No. 649,401
Int. Cl.[2] F24B *7/04*
U.S. Cl. 126—121 **12 Claims**



1. In a building with a fireplace having a combustion cham-

ber, a front opening leading into a room and means for closing the opening and having a flue gas exit from the fireplace, the improvement as a replacement for a conventional fireplace chimney which comprises:

a. multiple heat exchanging tubes mounted above the flue gas exit of the fireplace such tht the flue gases vent upward through vertically oriented openings in the tubes, wherein the tubes extend substantially between at least the exit of the fireplace and a ceiling of a room of the building;

b. a housing surrounding, supporting and enclosing the tubes except for the openings with at least one conduit from a room of the building for cold air inlet into the housing and at least one conduit for hot air exit from the housing into at least one room of the building wherein the tubes and housing are in the form of a heat exchanger unit;

c. a chimney sealed in gaseous connection with the openings in the tubes and leading outside the building which provides an exit for the flue gases from the tubes of the heat exchanger; and

d. an air conduit leading from outside of the building to the bottom of the combustion chamber including a thermostatically controlled valve in the conduit which regulates the amount of air to the chamber.

4,043,314

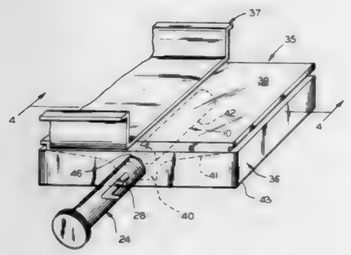
FOOD HEATERS

John H. Trumble, Elm Grove; Thomas C. Ehlert, Wauwatosa, and Akos Szekely, Colgate, all of Wis., assignors to Thermology, Inc., Milwaukee, Wis.

Continuation-in-part of Ser. No. 568,404, April 16, 1975, abandoned, which is a continuation-in-part of Ser. No. 545,206, Jan. 29, 1975, abandoned, and Ser. No. 562,352, March 26, 1975. This application Sept. 22, 1975, Ser. No. 615,518

Int. Cl.² F24J *1/02*

U.S. Cl. 126—263 **4 Claims**



1. A heating device comprising:

a thermo-conductive body having a heating surface, said surface having a pair of opposed parallel sides,

said body including a relatively thick elongate portion beneath said surface and oriented generally parallel to a first one of said pair of sides and substantially intermediate therebetween said body being generally thinner beneath said surface adjacent said first pairs of sides,

means defining an elongate cavity within said elongate portion of said body,

chemical heater means disposed within said cavity, said heater means comprises a cylindrical shell closed at a first end and closed at its second end by percussion ignition means, said shell containing a quantity of compressed alumino-thermic reactive material ignitable by the discharge of said ignition means, firing pin means for igniting said heater,

enclosure means enclosing substantially all but the heating surface of said body, said enclosure means comprising a generally planar wall disposed beneath said heating surface and parallel thereto and four side walls perpendicular to said planar wall, and

insulating means within said enclosure means and surrounding said body means beneath said heating surface for preventing substantial dissipation of heat from said body means other than through said heating surface.

4,043,315

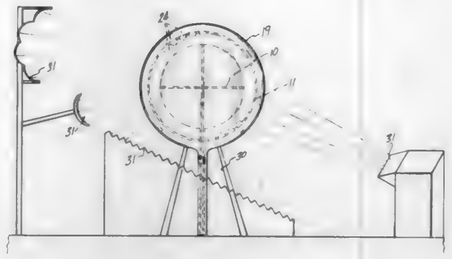
SOLAR HEAT COLLECTOR

Nathan E. Cooper, Brookside Drive, Woodbridge, Conn. 06525

Filed Feb. 3, 1976, Ser. No. 654,942

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **5 Claims**



1. A solar heat collector comprising: a transparent, spherical outer shell; a spherical inner shell within said outer shell and spaced therefrom containing a plurality of light intensification means spaced along the periphery thereof; a plurality of heat collecting elements within said inner shell spaced from the light intensification means; and inlet and outlet headers communicating with said heat collecting elements and passing through said inner and outer shells for circulation of a heat transfer medium through said heat collecting elements, wherein said heat collecting elements comprise a circuitous array of passageways contained within a plurality of metal plates intersecting within said inner shell, said passageways being connected to a common inlet and outlet header.

4,043,316

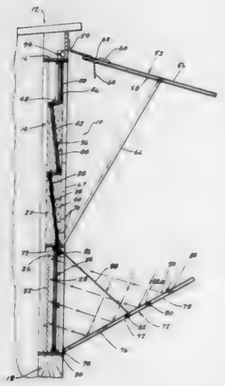
MODULAR DIRECT SOLAR HEAT WINDOW UNIT

Asa S. Arent, 700 - 15th St., North, Humboldt, Iowa 50548

Filed Mar. 5, 1976, Ser. No. 664,182

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **13 Claims**



1. In combination,

a building,

a modular direct solar heat window unit mounted in the side of the building,

said window unit comprising a vertically disposed frame means having upper and lower ends and spaced-apart sides,

a lower window unit at the lower end of said frame means,

at least one upper window unit mounted in said frame means above said lower window unit for visibility,

a first panel member hingedly secured at its lower end about a horizontal axis to said frame means at the lower end thereof and being movable from a closed position adjacent said lower window unit to an open position, said first panel member having a reflective inner surface,

first connection means for adjustably positioning said first panel member in various positions relative to said lower window unit whereby the rays of the sun striking said inner surface may be reflected onto said lower window unit,

and a second panel member operatively hingedly secured to the upper end of said frame means and being movable from a closed position adjacent said upper window unit to an open position, said second panel member protecting and insulating said upper window unit when in its closed position and providing shade for said upper window unit when in a partially open position, said second panel member permitting normal visibility through said upper window unit when in its open position,

second connection means for adjustably positioning said second panel member in various positions relative to said upper window unit,

and a solar heat collector means positioned inwardly of said lower window unit.

4,043,317

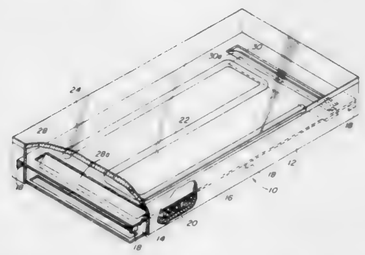
VENTED SOLAR COLLECTOR

Howard Scharfman, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed July 2, 1976, Ser. No. 702,179

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **8 Claims**



1. A solar energy collector comprising a solar radiation absorbing panel adapted to be positioned to intercept solar radiation and to be heated by absorption of such radiation, a fluid conduit disposed in heat-conductive relation to the panel, a cover transparent to solar radiation mounted over the panel in spaced relation with it, and temperature-responsive means at each end of the panel for providing controlled circulation of air over the surface of the panel to maintain the temperature thereof below a prescribed level, said means including apertures adjacent each end of the panel, and adjustable portions of the panel movable into and out of closing relation to the apertures.

4,043,318

SOLAR ENERGY COLLECTOR

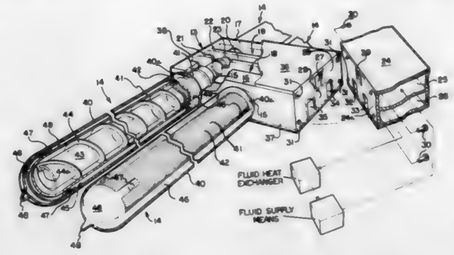
Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 482,092, June 24, 1974, Pat. No. 3,952,724. This application Jan. 26, 1976, Ser. No. 652,366

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.² F24J *3/02*

U.S. Cl. 126—271 **14 Claims**



1. A solar energy collector apparatus comprising an outer hollow, elongated tubular member of transparent glass, closed at its one end and open at its other end, a hollow, elongated tubular glass absorber member defining a glass wall of lesser O.D. than the I.D. of said outer member and closed at its one end and open at its other end, the absorber member having its exterior surface comprised of an energy absorbing coating applied thereon over a substantial portion of its axial length, said coating having high absorption and low emission properties, said absorber member being inserted within said outer member, resilient end support means engaging said closed end of the absorber member supporting it firmly in spaced relation to the interior surface of said outer member near the closed end of the latter and providing for expansion and contraction of the absorber member, an annular end portion of the glass at the open end of said absorber member being fused annularly onto the glass wall of the outer member, thereby sealing it to said outer member adjacent its other open end and closing an annular space therebetween, said space being evacuated, a heat exchange member communicating with the hollow interior of said absorber member, a fluid media supply means, and means connecting the supply means to the heat exchange member, whereby the fluid media absorbs the energy exchanged from the absorber member.

4,043,319

EXHAUST HOOD

Donald D. Jensen, 1141 Park Circle Drive, Fresno, Calif. 93727

Filed Sept. 18, 1975, Ser. No. 614,473

Int. Cl.² F24C *15/20*; F23J *11/00*

U.S. Cl. 126—299 D **5 Claims**

1. In combination with a hot cooking surface that has a forward and a rearward edge and from which surface fumes arise; a roof that is disposed above said cooking surface; first and second power-driven blowers mounted on said roof, each of said blowers including an air inlet opening and an air discharge opening; a stack that depends from said roof; a hood disposed above said cooking surface, said hood defined by a pair of side walls, a forwardly disposed portion, and rearward surface defining means, a fume control assembly, said fume control assembly including:

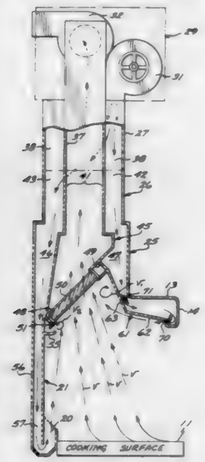
a. a duct longitudinally disposed in said stack and cooperating therewith to define a forward and rearward vertically extending cavity, said duct supported in a fixed position relative to said stack, said first and second cavities in communication with said discharge outlet of said first first blower, and said duct in communication with said air inlet opening of said second blower;

b. an air cleansing assembly operatively associated with said

duct, said air cleansing assembly removing grease from said fumes as the latter move upwardly therethrough;

c. a back wall that extends downwardly from said duct, said back wall cooperating with said rearward surface defining means to define a first vertical cavity in communication with said rearward cavity, and an upwardly directed elongate first opening longitudinally disposed relative to said rearward edge of said hot cooking surface and adjacent thereto; and

d. a downwardly and outwardly directed wall supported from said duct, said wall cooperating with said forward portion to define a second cavity and an inwardly directed second opening, said second cavity in communication with said forward cavity, said first blower when operating concurrently discharging air to said forward and rearward cavities for air to discharge concurrently from said first and second openings as first and second streams thereof,



said first stream discharging upwardly and forwardly of said back wall at a sufficient velocity as to create a negative pressure zone adjacent thereto to draw said fumes rearwardly and upwardly across said cooking surface to subsequently discharge through said air cleaning assembly, said second stream discharging rearwardly at an angle to said first stream to direct any fumes arising from said cooking surface not already moving upwardly and rearwardly in a rearwardly moving direction to mix with said first stream and subsequently flow through said air cleansing assembly, and said second blower when operating maintaining a negative air pressure in said duct above said air cleaning assembly to encourage the flow of said first and second streams mixed with said fumes through said air cleaning assembly to remove a substantial quantity of grease therefrom prior to the air in said duct being discharged through said air discharge outlet of said second blower.

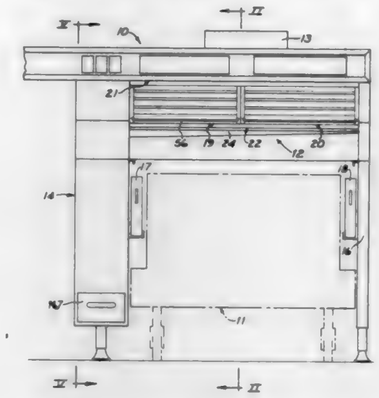
4,043,320

HOOD ASSEMBLY FOR COOKING RANGES

Mitchell Strew, Arlington Heights, Ill., assignor to Illinois Range Company, Mount Prospect, Ill.

Filed Mar. 26, 1976, Ser. No. 670,751
Int. Cl.[2] F23J *11/00*; B01D *47/06*
U.S. Cl. 126—299 E **15 Claims**

1. In a hood assembly for a range unit supported over a generally rectangular floor space and from which hot grease-containing vapors rise during operation thereof, a unitary structure adapted to be supported adjacent said floor space and comprising: a vapor treatment section for extending over a rearward portion of the range unit and including means defining a vapor treatment zone, spray means for spraying water into said zone, a supply pipe connected to said spray means and having an inlet end at one side of said vapor-treatment section in alignment with one side of said space, and trough means for receiving water sprayed into said treatment zone and having an outlet end at said one side of said vapor treatment section in alignment with said one side of said space, said unitary structure further comprising a water treatment section disposed along said one side of said space and including a generally rectangular housing having a front wall aligned with the front of said space, a pair of side walls with one being aligned with one side of said space and a top wall cover structure for approximate horizontal alignment with the upper surface of the range unit to provide a work surface adjacent thereto, tank means within said housing immediately below said top wall



cover structure and extending rearwardly from said front wall of said housing between said side walls thereof, first conduit means extending downwardly from said outlet end of said trough means to said tank means for gravity flow of grease-carrying water from said trough means down into said tank means for separation by flotation of lower density grease from higher density water, pump means having an inlet and an outlet, second conduit means coupling said pump means inlet to a lower point of said tank means below the level of grease therein, and third conduit means coupling said pump means outlet to said inlet end of said supply pipe for flow of water to said spray means, said top wall cover structure being movable for access to said tank means, removal of grease therefrom and cleaning and service thereof.

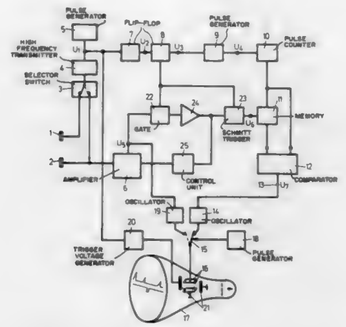
4,043,321

ARRANGEMENT FOR ULTRASONIC-ECHO ENCEPHALOGRAPHY

Richard Soldner, Erlangen, and Alfred Walz, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 17, 1975, Ser. No. 559,365
Claims priority, application Germany, Mar. 25, 1974, 2414218
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 V **12 Claims**

1. In an arrangement for the ultrasonic echo encephalography of a patient's skull, including at least two ultrasonic heads for providing the theoretical median echo, switching means **(3)** having a first switching condition providing for sounding operation between a first head **(1)** at one side of a patients skull and a second head **(2)** at the opposite side of the patients skull, and having a second switching condition providing for reflection operation, ultrasonic pulse means **(5, 4)** connected to the first head **(1)** in said first switching condition of said switching means **(3)** for energizing said first head **(1)** to transmit an ultrasonic pulse toward the second head **(2)**, receiving means **(6, 22, 24, 23)** coupled to the second head **(2)** in the first switching condition for receiving the output of the second head **(2)** and for generating an output pulse (U_6) representing the timepoint of receipt by the second head **(2)** of the ultrasonic pulse from the first head **(1)**, time measurement means **(9, 10)** comprising an impulse generator **(9)** having an output for supplying periodic pulses, and impulse counter means **(10)** having an input connected to the output of said impulse generator **(9)** and operable in both said first and second switching conditions for counting said periodic pulses, timing means **(7, 8)** coupled with said pulse means **(5)** and with said time measurement means **(9, 10)** and responsive to the energization of the first head **(1)** by said pulse means **(5, 4)** in said first switching condition to actuate said time measurement means **(9, 10)** so that the impulse counter means **(10)** counts the periodic pulses from the impulse generator **(9)**, storage means **(11)** coupled with said counter means **(10)** and responsive to the output pulse (U_6) from said receiving means **(6, 22, 24, 23)** to store a count equal to the counting position of said counter means **(10)** at the



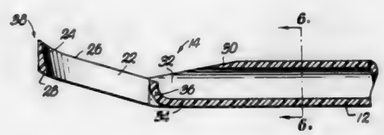
timepoint of receipt by the second head **(2)** of the ultrasonic pulse from the first head **(1)**, a count condition comparator **(12)** connected to the counter means **(10)** and to storage means **(11)** and being operable in the second switching condition of the switching means **(3)** to periodically compare the count of said counter means **(10)** with the stored count of said storage means **(11)** so as to deliver an output signal (U_7) at the balance of both count conditions, display means **(17)** for receiving echo signals from one of the heads in the second switching condition, said timing means **(7, 8)** being operative to initiate counting of said counter means **(10)** in each cycle of energization of one of the head during reflection operation, and means **(14, 15)** operable in the second switching condition for periodically connecting the output of the count condition comparator **(12)** with the display means **(17)** for supplying a marking signal (U_7) to the display means **(17)** each time the counter means **(10)** reaches a count equal to the stored count of said storage means **(11)** during reflection operation.

4,043,322

SURGICAL SCRAPING INSTRUMENT

Ralph R. Robinson, P.O. Box 668, Middlesboro, Ky. 40965

Filed May 13, 1976, Ser. No. 686,015
Int. Cl.[2] A61B *1/00, 17/22*; A61M *1/00*
U.S. Cl. 128—2 B **2 Claims**



1. A surgical scraping instrument, comprising:

an elongated, tubular, substantially rectilinear suction tube having a material-receiving end, with the remaining end thereof adapted for connection to means for producing a negative pressure within said tube,

said material-receiving end being obliquely cut relative to the longitudinal axis of said tube and only partially across the diameter of the latter, for presenting an obliquely disposed planar surface having a generally elliptical, material-receiving opening therein at said material-receiving end, along with cooperable material-catching structure defined at least in part by the uncut portion of said tube adjacent and opposite to said opening, said material-catching structure also including an end wall portion at the extreme end of said uncut portion remote from said remaining end which extends towards said opening; and

a scraping element including a unitary loop of material presenting a pair of converging legs respectively connected to the material-receiving end of said tube on opposite sides of said opening and with said end wall portion therebetween, and an arcuate bight segment in spaced relationship to said opening and interconnecting said legs,

said spaced legs being oriented such that a majority of the lengths of the upper edges of the legs, when said tube is positioned with said opening facing upwardly, lie in a reference plane oriented at an acute angle relative to the longitudinal axis of said tube and at an obtuse angle relative to said planar surface, and with a portion of the edges of said legs being located at a first level above said opening,

at least the central portion of said bight segment remote from said opening being oriented such that the uppermost section thereof, when said tube is positioned with said opening facing upwardly, presents a protruding portion which lies at a second level above said reference plane and opening,

at least the edge of said bight segment contiguous with said leg edges being configured to present a scraping surface,

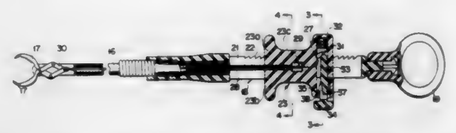
said scraping surface, opening and material-catching structure being cooperatively configured and oriented for catching material loosened by movement of said scraping surface along a uterine wall or the like.

4,043,323

MEDICAL INSTRUMENT ATTACHED TO AN ENDOSCOPE

Osamu Komiya, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

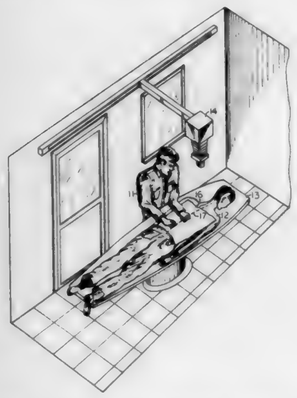
Filed Dec. 23, 1975, Ser. No. 643,861
Claims priority, application Japan, Dec. 27, 1974, 49-274
Int. Cl.[2] A61B *1/00*
U.S. Cl. 128—4 **6 Claims**



1. A medical instrument attached to an endoscope for insertion into a body cavity of a human being together with said endoscope, said instrument having a movable head attached to an elongate flexible tube; said movable head fitted to one end of said flexible tube; a base member disposed at the other end of the flexible tube and provided with a finger hook to be gripped by one of the fingers of an operator; an actuating wire inserted into the flexible tube so as to be slidable therethrough in the longitudinal direction and having its forward end operatively connected to the movable head, a slider fitted with the base end of the actuating wire, mounted on the base member so as to be slidable lengthwise of the base member, therby causing the sliding of said actuating wire and further provided with a finger-grip portion; and a manually operative locking mechanism for releasably locking the slider at a desired point on the

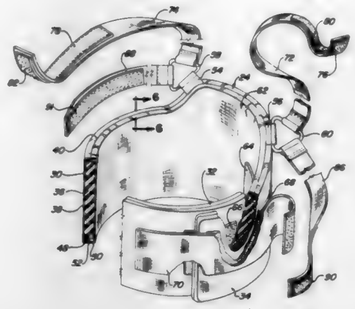
base member, the improvement being that the locking mechanism includes a toothed portion formed on one lateral edge of the base member in the longitudinal direction thereof; locking means received in a bore formed in the slider so as to be movable therein in a direction transverse to said longitudinal direction, said locking means having a knob portion extending outward from the bore of the slider and being designed to engage the toothed portion of the base member; and urging means supported on the slider so as to normally urge the locking means into engagement with the toothed portion of the base member, said locking means being disengaged from the toothed portion by depressing the knob portion against the action of said urging means; said locking means also being tiltable through an angle in a direction away from said transverse direction and having latch means for latching said locking means in a depressed position in which said locking means has been disengaged from the toothed portion of the base member when said locking means is tilted through said angle.

4,043,324
CHIROPRACTIC ANALYTIC TECHNIQUE WITH A LIQUID CRYSTAL SHEET
Alexander F. Shaw, IV, 329 E. 11th St., Davenport, Iowa
Filed Feb. 13, 1976, Ser. No. 657,914
Int. Cl.[2] A61B *10/00*
U.S. Cl. 128—2 H **7 Claims**



1. A method of chiropractic analysis of a patient using a liquid crystal sheet, said method comprising:
- positioning the patient upon a chiropractic table such that the doctor with his hands may reach the back of the patient;
- placing the liquid crystal sheet over the back of the patient;
- detecting the temperature patterns of different areas of the back of the patient by ascertaining the color patterns displayed by the liquid crystal sheet thereby to determine areas of trauma;
- palpating the back of the patient, the fingers of the doctor pressing through the liquid crystal sheet and against the body of the patient, thereby to determine areas of trauma; and
- adjusting the patient, the hands of the doctor pressing through the liquid crystal sheet and against the back of the patient to administer a chiropractic adjustment, the chiropractic adjustment being selected to treat the determined areas of trauma.

4,043,325
CERVICAL COLLARS
David J. Ochs, 707 W. Magnolia; James D. Behrens, 4101 W. Lakeview Drive, and John H. Stevens, 3425 Arapahoe Drive, all of Fort Collins, Colo. 80521
Filed Sept. 13, 1976, Ser. No. 722,717
Int. Cl.[2] A61H *1/02*
U.S. Cl. 128—75 **26 Claims**



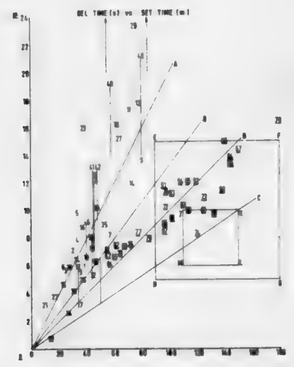
1. A cervical collar comprising:
- a strip of resistantly-resilient material having a length sufficient for its respective end portions to overlap when said strip is installed around the neck of the wearer, the nominal width of said strip approximating at least the minimum distance between the mandible and the clavicle of the wearer, and said material including a high-density unicellular foam encased within a flexible covering with said covering including at least one lengthwise seam formed with mutually-facing in-turned marginal edge portions secured together beneath the exterior surface of said covering;
- an intermediate lengthwise portion of said strip having an increased width, greater than the distance in normal posture between the underside of the chin and approximately the upper end of the sternum of the wearer, positionable beneath said chin;
- and means releasably fastening said end portions together in overlapping relationship with said strip disposed around the neck of said wearer and said increased-width portion positioned between said chin.

4,043,326
WATERPROOF CAST PROTECTOR
John D. Little, 25097 Champlain Road, Laguna Hills, Calif. 92653, and James Zeno Cloud, Jr., 25839 Marguerite Parkway, Apt. 103, Mission Viejo, Calif. 92675
Continuation of Ser. No. 530,959, Dec. 9, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,508
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—82 **1 Claim**



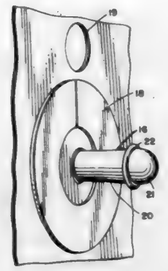
1. A unitary, flexible covering to seal a cast on an individual's arm or leg and adapted to accommodate limbs and casts of a considerable range of lengths, comprising:
- an elongate tube of resilient material for receiving said arm or leg and said cast, said tube being closed at one end and open at the other end;
- a considerable length of said elongate tube at said open end having a uniform, smooth inside relaxed diameter smaller than the diameter of that portion of said arm or leg over which said uniform diameter portion of said tube is adapted to extend, said uniform diameter portion forming a sealing portion of adjustable length;
- a resilient, solid ring having greater thickness than said tube formed at the open end of said elongate tube, said ring forming a base structure for a roll of said uniform diameter portion and being adapted to be rolled along said arm or leg to a selected longitudinal position a substantial distance above the cast but below the end of the limb, the size and position of said roll depending upon the length of said limb and said cast;
- said uniform diameter portion being of sufficient length that said roll is within the length of said uniform diameter portion for the entire range of limb and cast sizes on which it is adapted to be used, said ring being adapted to resiliently bias said uniform diameter portion at the location of said roll tightly against said arm or leg to seal the open end of said tube at any of its adjusted lengths; and
- a bulbous portion at the closed end of a diameter larger than said uniform diameter portion to accommodate the hand or foot of the user.

4,043,327
CURABLE COMPOSITIONS
William Duncan Potter, Ware; Andrew Conway Barclay, Harlow; Reginald Dunning, Parbold near Wigan, and Richard John Parry, Southport, all of England, assignors to Smith & Nephew Research Limited, Harlow, England
Filed May 11, 1976, Ser. No. 685,487
Claims priority, application United Kingdom, May 13, 1975, 20196/75; May 13, 1975, 20197/75; Aug. 15, 1975, 34128/75
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—89 R **61 Claims**



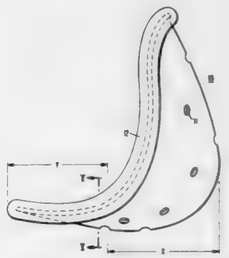
1. A curable composition comprising in admixture a particulate calcium fluoroaluminosilicate glass consisting essentially of from 25 to 35% by weight of silicon calculated as silica, from 30 to 40% by weight of aluminum calculated as alumina, from 20 to 35% by weight calcium, calculated as calcium oxide, and up to 9% by weight fluorine; and a solid particulate polymer chosen from the group consisting of poly(carboxylic acid)s and polymeric precursors thereof; the whole mixture being in association with a porous flexible carrier material.

4,043,328
UROLOGICAL DRAPE
Charles D. Cawood, Jr., Houston, Tex., and John S. Ziegler, Arlington Heights, Ill., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed June 1, 1976, Ser. No. 691,596
Int. Cl.[2] A61B *19/06*
U.S. Cl. 128—132 D **23 Claims**



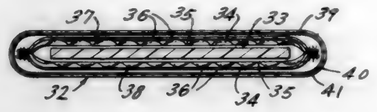
1. A urological drape for use in transurethral resections and similar operations, comprising a sheet of flexible material having a generally centrally-disposed opening therethrough, and a finger cot of flexible stretchable material extending from said sheet about said opening, said cot having an elongated neck portion and terminating in an enlarged closed free end portion, said neck portion gradually increasing in diameter towards said enlarged end portion.

4,043,329
PROTECTIVE DEVICE
Frank J. DiMatteo, Monroeville, Pa., assignor to Caspel Industries, Bridgeville, Pa., a part interest
Filed June 16, 1976, Ser. No. 696,740
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—132 R **6 Claims**



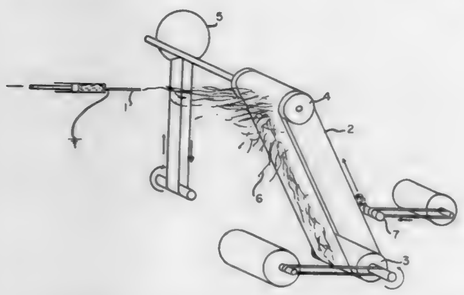
1. A protective device comprising:
- a rigid cup having sufficient volume to enclose the male genitals;
- resilient padding mounted on the edge of said cup said resilient padding adapted to contact the body at the lower portion thereof and absorb impact experienced by said cup;
- the resilient padding on the edge of said cup adapted to engage the body proximate to the superior ramii, the inferior ramii and the Ischial ramii of the pelvis with minimal contact with the upper thighs; and,
- wherein when an impact is experienced by said cup it is absorbed by the padding and the aforementioned portions of the pelvis.

4,043,330
ARM BOARD FOR INTRAVENOUS INFUSIONS
Surinder K. Bansal, Apt. 6, 33 E. Lakeshore Drive, Cincinnati, Ohio 45237
Filed Feb. 18, 1976, Ser. No. 659,116
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—133 **5 Claims**



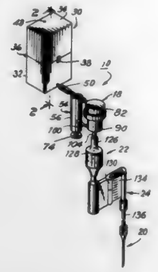
1. A medical restraining board comprising, in combination, a flat rigid support member having two opposed sides, means padding at least one side of said support member, said padding means including a generally flat sheet of resilient material having a plurality of spaced enclosed gas-filled pockets formed therein and wherein spaces between said pockets define a plurality of interconnected outwardly opening air-filled channels, a fluid pervious hydrophobic outer cover enclosing said support member and said padding, said outer cover being removable from said support member and padding, a microporous hydrophobic inner cover permanently enclosing said support member and padding, said inner cover being formed from a gas pervious and liquid impervious material, and moisture absorbing means positioned between said outer cover and said inner cover.

4,043,331
FIBRILLAR PRODUCT OF ELECTROSTATICALLY SPUN ORGANIC MATERIAL
Graham Ernest Martin, and Ian Derek Cockshott, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London, England
Filed Aug. 1, 1975, Ser. No. 600,943
Claims priority, application United Kingdom, Aug. 5, 1974, 34338/74
Int. Cl.[2] A61L *15/00*
U.S. Cl. 128—156 **16 Claims**



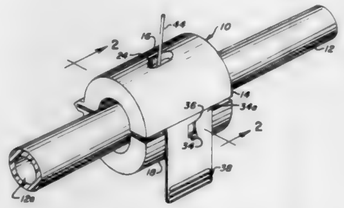
1. A product comprising a mat of organic fibers prepared by electrostatically spinning an organic material and collecting the spun fibers on a suitable receiver.

4,043,332
CONSTANT FLOW RATE LIQUID MEDICAMENT ADMINISTERING DEVICE
Harold J. Metcalf, Stony Brook, N.Y., assignor to Nathan Blumberg, Smithtown; Public Systems Research, Inc. and Harold J. Metcalf, both of Stony Brook, all of N.Y., part interest to each
Filed May 14, 1975, Ser. No. 577,294
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 E **6 Claims**



1. A constant flow rate liquid medicament administering device comprising:
a. a container for a liquid medicament,
i. said container having an outlet,
b. means for pressurizing the liquid in the container,
c. a constant flow rate throttling regulator having an inlet and an outlet,
d. means connecting the container outlet to the regulator inlet;
e. said regulator including means controlled as a function of the differential in the liquid pressures at the inlet and the outlet of the regulator and furnishing a throttled constant flow rate of liquid at the outlet of the regulator which is independent of the pressure of the liquid at the inlet and the outlet of the regulator,
f. means for coupling the device to a patient, and
g. means connecting the regulator outlet to the coupling means.

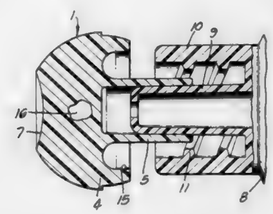
4,043,333
CLAMP-ON INJECTION SITE
John Michael Munsch, Libertyville, Ill., assignor to Baxter Laboratories, Inc., Deerfield, Ill.
Filed Sept. 15, 1975, Ser. No. 613,709
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—214 R **17 Claims**



1. A self-clamping injection site adapted to be positioned along a flexible, needle-penetrable, tubular conduit, comprising:
a. a sleeve member having a first section and a second section hinged together for moving each of said sections between an open position allowing the sleeve to be positioned along the tubular conduit and a closed position for fixing the sleeve on the conduit at a predetermined position;

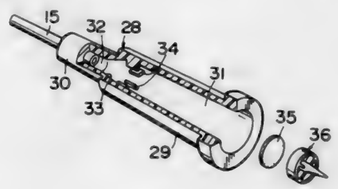
b. said first and second sections defining securing mean for locking said sleeve at said predetermined position;
c. said sleeve further defining at least one needle receiving aperture for allowing a needle to readily pass therethrough;
d. said sleeve carrying a self-sealing, needle-penetrable material in said open and said closed position and in communication with said aperture; and
e. said material being compressed between said sleeve and said conduit by said securing means when said sleeve is in the closed position thereby permitting a needle to be injected through the aperture, the self-sealing material and the tubular conduit.

4,043,334
SELF RIGHTING SYRINGE PROTECTOR
Tony Ray Brown, Northridge, and Leonard Sarkis Neresian, Canoga Park, both of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.
Filed June 29, 1976, Ser. No. 700,901
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—215 **14 Claims**



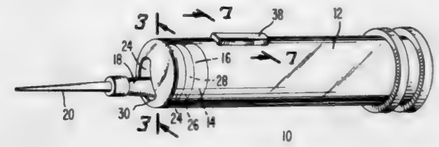
1. A self righting protector for a hypodermic syringe or the like comprising: a bulbous rocker having a base section; a connector joined to this rocker, said connector having an internally tapered section to wedgingly receive a tapered syringe tip or the like; and said rocker has a center of gravity adjacent its base section to orient the connector in an upward direction when the protector is on a flat horizontal surface, whereby a series of self righting protectors will be uniformly oriented.

4,043,335
NEEDLE HOLDER DEVICE OF MEDICAL ADMINISTRATING INJECTOR
Soji Ishikawa, No. 6-305-18, 1-chome, Utsukushiga-oka, Midori Yokohama, Kanagawa, Japan
Filed Aug. 13, 1976, Ser. No. 714,264
Claims priority, application Japan, Aug. 23, 1975, 50-116506; Mar. 11, 1976, 51-28087
Int. Cl.[2] A61M *5/32*
U.S. Cl. 128—218 N **36 Claims**



1. A needle holder device to form part of a medical administering liquid injector, comprising a generally tubular member formed with a longitudinal passageway extending between the opposite ends of the tubular member and consisting of a generally cylindrical first bore portion terminating at one end of the tubular member, a generally cylindrical second bore portion terminating at the other end of the tubular member and smaller in diameter than said first bore portion, the second bore portion being adapted to receive therein an end portion of an injection needle to be mounted on the holder device, and a generally frusto-conical third bore portion between the first and second bore portions and continuously reduced in diameter from its enlarged axial end adjacent the first bore portion toward its reduced axial end adjacent to the second bore portion, said first, second and third bore portions having respective center axes which are substantially in line with each other, and a filter assembly held in position within said first bore portion, said filter assembly including at least one filter element having its entire peripheral edge received on the inner peripheral surface of the tubular member and filter retaining means in contact with at least one end face of said filter element and formed with at least two open spaces providing communication between said first and third bore portions through said filter element, said filter retaining means including at least one generally tapered projection extending in a direction substantially parallel with the center axis of said first bore portion and passing through the center axis of said open spaces.

4,043,336
STERILE SYRINGE DEVICE
Robert J. Kreb, III, Rolling Hill Road, Skillman, N.J. 08558
Filed Apr. 21, 1976, Ser. No. 678,851
Int. Cl.[2] A61M *5/00*
U.S. Cl. 128—218 R **8 Claims**



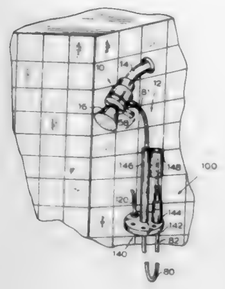
1. A sterile syringe device comprising:
a. a syringe housing of generally cylindrical shape including an opened and a closed end, said closed end defining a slot therein, said syringe housing defining a reservoir therein;
b. a plunger means positioned within said syringe housing and being slidably movable therein to vary the volume of said reservoir;
c. nipple means positioned protruding outwardly from said reservoir and extending through said slot means in said closed end of said syringe housing, said nipple means defining a flue therein to allow fluid flow communication outward from said reservoir; and
d. sealing means positioned in the interior of said syringe housing adjacent said closed end thereof to selectively prevent and allow fluid flow communication through said flue, said sealing means further comprising:
1. an inner seal fixedly secured to the interior walls of said housing adjacent said closed end thereof, said inner seal defining an aperture therethrough to allow fluid flow communication from said reservoir through said aperture of said inner seal to said flue within said nipple means; and
2. an outer seal rotatably mounted with respect to said syringe housing, said outer seal being positioned between said inner seal and said closed end within said syringe housing, said outer seal being fixedly secured to said nipple means to allow rotational movement of said outer seal responsive to movement of said nipple means within said slot means, said outer seal defining an opening therethrough, said flue of said nipple means and said opening being fixedly aligned with respect to one another and being selectively alignable with respect to said aperture responsive to movement of said nipple means within said slot means to allow fluid flow communication from said reservoir through said aperture and said opening to said flue.

4,043,337

DENTAL SYRINGE ATTACHMENT FOR SHOWER

Wilfred G. Baugher, 127 Yacht Haven Drive, Cocoa Beach, Fla. 32931

Filed July 12, 1976, Ser. No. 704,314
Int. Cl.[2] A61M *3/00*
U.S. Cl. 128—229 **14 Claims**



1. A dental syringe for coupling between a water outlet and a shower head, said apparatus comprising in combination:

adapter means having a main passageway therein for being coupled between the water outlet and the shower head for passing water therebetween;

a main diverter valve interposed along said adapter means for passing water therethrough when in a first position, and for diverting the water into a diverter passageway within said adapter means when said main diverter valve is in a second position, said main diverter valve having a first cylinder coaxially rotatable within a main valve cavity interposed along said main passageway, and said first cylinder having an axis of rotation generally parallel with but offset from said main passageway, with said first cylinder including therein a primary passageway for coupling the water under pressure therethrough when in said first position, and with said first cylinder further including a by-pass passageway therein for coupling the water under pressure from said main passageway to said diverter passageway when said first cylinder is in said second position;

conduit means having a first end coupled to said adaptor means to said diverter passageway for receiving water under pressure therefrom;

a manual syringe handle for coupling to a second end of said conduit means for passing water under pressure therefrom through a syringe passageway and an outlet port therein for forming a water jet; and

a secondary control valve interposed along said syringe passageway of said manual syringe handle for passing water therethrough when in a first position, for blocking the flow of water therethrough when in a second position, and for variably restricting the flow of water therethrough between said first and second positions, said secondary control valve having a second cylinder coaxially rotatable within a second valve cavity interposed along said syringe passageway, with said second cylinder having an axis of rotation generally parallel with but offset from said syringe passageway, said second cylinder including therein a control passageway for coupling with said syringe passageway when said second cylinder is in said first position, whereby said second cylinder blocks the flow of water therethrough when rotated into said second position.

4,043,338

PHARMACEUTICAL FORMULATION APPLICATOR DEVICE

Roger Homm, Neshanic, and Gilbert Katz, Boonton, both of N.J., assignors to Ortho Pharmaceutical Corporation, Raritan, N.J.

Continuation of Ser. No. 355,366, April 30, 1973, abandoned. This application Aug. 19, 1976, Ser. No. 715,791
Int. Cl.[2] A61M *31/00*
U.S. Cl. 128—260 **1 Claim**



1. A device for dispensing a pharmaceutical formulation into body cavities which comprises:

a tube having a plurality of lengthwise, elongated ribs at one end, said tube being disposed to incorporate said formulation on said ribs;

a cylindrical rod slidably positioned within said tube and connected to said tube at the end containing said elongated ribs, the distal end of said tube being essentially flat is shape and comprising thumb actuating means, the free end of said rod and the distal end of said tube containing two opposed slots for the receipt of finger actuating means comprising at least one moveable finger support means, said cylindrical rod being disposed in pressure responsive relation to said tube such that pressure applied between the thumb actuating means and said finger acutating means causes the elongated ribs to distend, thereby depositing the pharmaceutical formulation on the interior walls of the cavity.

4,043,339

METHOD OF AND VAGINAL INSERT FOR PROSTAGLANDIN ADMINISTRATION

Theodore J. Roseman, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Feb. 2, 1976, Ser. No. 654,486
Int. Cl.[2] A61M *7/00*; A61J *13/08, 27/00*; A61M *31/00*
U.S. Cl. 128—260 **73 Claims**

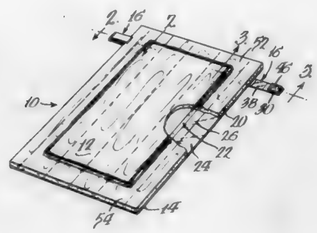
1. A vaginal device adapted for insertion and placement in the female human vaginal cavity and subsequent removal therefrom, for the administration of an abortifacient or oxytocic prostaglandin to the epithelial tissues of said cavity, said device consisting essentially of a flexible resilient non-toxic polysiloxane elastomer substantially uniformly impregnated except at the elastomer surface with at least an effective amount of said absortifacient prostaglandin to accomplish an abortion in a human during the first or second trimester or pregnancy or with at least an effective amount of said oxytocic prostaglandin to accomplish the induction of labor in a pregnant human at or near term, said prostaglandin being present in free acid form or in a more lipophilic ester form, said device having two substantially parallel relatively large elastomer surfaces with combined surface area at least 70 percent of the total elastomer surface area of the device, both of said parallel elastomer surfaces providing means for assuming a contour to be in substantial contact with the vaginal epithelial tissue, there being substantially no prostaglandin at said parallel elastomer surfaces of said device prior to vaginal insertion, the combination of the total elastomer surface area of said device and the concentration of prostaglandin in said device constituting a means for providing a medically acceptable release rate of said prostaglandin in the human vagina to accomplish said abortion of said induction of labor, and the combination of the resilience of said elastomer and the distance between said parallel elastomer surfaces being such that both of said parallel elastomer surfaces remain either in contact with said epithelial tissues or exposed to the fluids in said vaginal cavity when said device is in the vaginal cavity.

4,043,340

DIAPER WITH REPOSITIONABLE TAB FASTENER

Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1976, Ser. No. 661,918
Int. Cl.[2] A41B *13/02*
U.S. Cl. 128—287 **9 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a first tape segment having an inner face and an outer face and including a fixed end secured to the diaper, and a free end which includes a midportion of said first tape segment adjacent to said fixed end;

a transferable tape segment adhesively carried on the inner face of one portion of the free end and provided with an adhesive coating on opposing faces thereof, one adhesive-coated face being adhesively but releasably attached to said inner face of said one portion of the free end, and the other adhesive-coated face being adapted for adhesive attachment to said diaper; and

release means permanently attached to said first tape segment along the remaining portion of said free end;

said free end being folded over to releasably attach said release means to the other of said opposed faces of said transferable tape segment and to substantially envelop said transferable tape segment between said midportion and said remaining portion of the free end of said first tape segment;

the adhesive attachment of said one face of said transferable tape segment to said free working end having a relatively higher peel strength than the attachment of said other adhesive-coated face to said release means to enable said free end and said transferable tape segment to be moved from the folded-over position to a working position in which said free working end is adapted to secure said diaper about said infant by adhesive attachment to said diaper outside surface via said transferable tape segment;

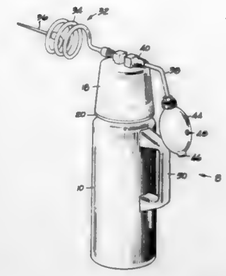
the adhesive attachment of said transferable tape segment to said diaper having a relatively higher peel strength than the adhesive attachment of said transferable tape segment to said free working end to enable said free working end to be detachable from and refastenable to said transferable tape segment for repositioning said diaper about said infant.

4,043,341

PORTABLE CRYOSURGICAL INSTRUMENT

Theodore A. Tromovitch, 1667 Escalante Way, Burlingame, Calif. 94010

Filed Dec. 9, 1975, Ser. No. 639,081
Int. Cl.[2] A61B *17/36*; B65D *47/34*
U.S. Cl. 128—303.1 **2 Claims**



1. A portable cryosurgical instrument suitable for one handed operation comprising:

an insulated container for holding a liquefied gas coolant;

closure means for said insulated container;

a pressure line communicating with the inside of said insulated container;

tubing means extending from near the bottom of said insulated container to the outside thereof;

heat exchange means attached to said tubing means outside said container for vaporizing said liquefied gas coolant passing therethrough;

application means attached to said heat exchange means for applying the vaporized gas coolant;

handle means on said insulated container;

a manual squeeze bulb connected to said pressure line and positioned adjacent said handle means in such position that when the fingers of a human hand grasp the handle, the thumb of the same hand is in a position to compress the bulb against the handle;

said squeeze bulb being connected to atmosphere through an opening in an intermediate portion of the bulb such that said opening must be covered before pressurization, wherein when said handle is gripped by the fingers of one hand of the operator, the bulb opening can be covered by the thumb of the same hand of the operator to stop venting before pressurization whereby the thumb compresses said bulb against said handle to cause pressurization.

4,043,342

ELECTROSURGICAL DEVICES HAVING SESQUIPOLAR ELECTRODE STRUCTURES INCORPORATED THEREIN

Charles F. Morrison, Jr., Boulder, Colo., assignor to Valleylab, Inc., Boulder, Colo.

Continuation-in-part of Ser. No. 501,224, Aug. 28, 1974, Pat. No. 3,987,795. This application Feb. 26, 1976, Ser. No. 661,555
Int. Cl.[2] A61B *17/32*; A61N *3/06*
U.S. Cl. 128—303.14 **2 Claims**

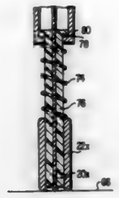
1. An electrosurgical device adapted for connection to an electrical generator having active and return output terminals, said device being used to cut, coagulate, or otherwise treat organic tissue or the like, said device comprising:

an insulative support means;

an active electrode having a distal end and being responsive to said active output terminal and a return electrode having a distal end and being responsive to said return output terminal, said electrodes being supported by said electrode support means, means for maintaining a fixed spacing between the active electrode and the return electrode, said return electrode being electrically insulated from and symmetrically disposed completely about said active elec-

trode, said active electrode extending at least as far as the distal end of said return electrode, both said electrodes being adapted for electrical connection to said tissue, the ratio of the return electrode area adapted to electrically connect to said tissue to the active electrode area adapted to electrically connect to said tissue being in the range of approximately 2 to 200;

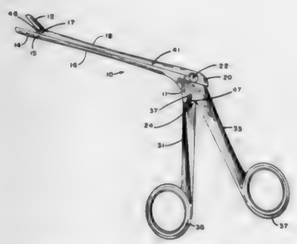
means for connecting said active electrode to said active



output terminal and said return electrode to said return output terminal; and

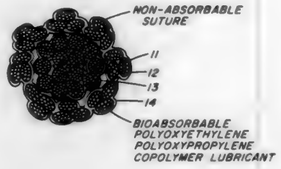
means for so biasing said return electrode with respect to the active electrode that the return electrode is normally disposed at a first position where the return electrode extends as far as the distal end of the active electrode and a retracted position where the return electrode is retracted from the distal end of the active electrode in response to said active electrode being inserted into said tissue.

4,043,343
FORCEPS
Robert W. Williams, 3201 S. Maryland Parkway, Las Vegas, Nev. 89109
Filed Aug. 1, 1975, Ser. No. 601,060
Int. Cl.[2] A61B *17/28, 17/32*
U.S. Cl. 128—321 **3 Claims**



1. In forceps having a stationary first handle and first arm integrally secured thereto, a movable second handle pivotally secured on said stationary handle, and having a projecting member thereon received in an open recess along one side of a reciprocally moveable second arm, said second arm slidably mounted on said first arm, whereby pivotal movement of said second handle reciprocates said second arm, and whereby said second arm is disengageable by lateral movement away from said projecting member, the improvement comprising a stop member secured on said stationary handle for engaging the side of said second arm opposite said recess and preventing said lateral movement and disengagement thereof.

4,043,344
NON-ABSORBABLE SURGICAL SUTURES COATED WITH POLYOXYETHYLENE-POLYOXYPROPYLENE COPOLYMER LUBRICANT
Henry Patrick Landi, Yorktown Heights, and Vincent Anthony Perciaccante, Long Island City, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.
Filed Sept. 20, 1976, Ser. No. 724,876
Int. Cl.[2] A61L *17/00*
U.S. Cl. 128—335.5 **17 Claims**



1. A non-absorbable surgical suture having improved knot run-down characteristics and reduced tissue drag comprising a polyfilamentary non-absorbable strand having thereon a thin lubricating coating of a lubricating absorbable co-polymer comprising polyoxyethylene blocks and polyoxypropylene blocks to aid run-down and handleability, said bioabsorbable copolymer having a molecular weight such that it is pasty to solid at 25° C.

4,043,345
CATHETER
Bernhard Kramann, Planegg, and Heinrich Tammen, Munich, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany
Filed Apr. 28, 1975, Ser. No. 571,984
Claims priority, application Germany, May 2, 1974, 2421294
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 R **12 Claims**



1. A catheter comprising a substantially rigid tube adapted to have fluid pressure introduced through one end thereof, a hose having a proximal end in fluid-tight engagement with the other end of said tube and a distal end, said hose being invaginated within said rigid tube, said hose being structured to be brought from an invaginated position into the exserted position by introduction of fluid pressure through said one end of said tube, and orifice means defined through wall portions of said hose at said distal end thereof, said wall portions having said orifice means defined therethrough being arranged in an overlapping abutting configuration to provide means creating a force to maintain said orifice means closed by maintaining said wall portions in said abutting relationship when said hose is in said invaginated position, said wall portions being configured to separate to release said abutting relationship thereby to open said orifice means when said hose is brought to said exerted position.

4,043,346
CATHETER
David F. Mobley, and Neil H. Baum, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.
Filed Mar. 10, 1976, Ser. No. 665,647
Int. Cl.[2] A61M *25/00*
U.S. Cl. 128—349 R **14 Claims**



1. A catheter comprising,

a flexible outer tubular member having open inner and outer ends,

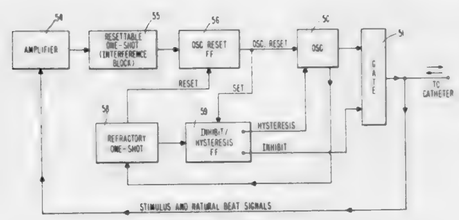
a flexible inner tubular member forming a flow duct snugly and slidably disposed within the outer tubular member, and

the inner tubular member having a rounded expansion tip at its inner end and being open at its outer end,

the expansion tip including a drain opening and being comprised of a plurality of prongs biased outwardly and operable to expand and open on inward movement of the inner tubular member in the outer tubular member to a position where the prongs are beyond the inner end of the outer member and to retract on movement of the inner tubular member outwardly in the outer tubular member to a position where at least a portion of the prongs are within the outer tubular member,

the outer end of the inner tubular member being extendable outwardly and inwardly of the outer end of the outer tubular member a distance sufficient for the movement of the inner tubular, member to expand and to retract the prongs.

4,043,347
MULTIPLE-FUNCTION DEMAND PACER WITH LOW CURRENT DRAIN
Alexis C. M. Renirie, Weezenhof, Netherlands, assignor to Vitatron Medical B.V., Dieren, Netherlands
Filed Aug. 28, 1975, Ser. No. 608,465
Int. Cl.[2] A61N *1/36*
U.S. Cl. 128—419 PG **3 Claims**



1. Demand pacing apparatus for normally delivering stimulus pulses, and adapted to inhibit such delivery upon the detection of natural beats and to operate in combination with electrode means for delivering said stimulus signals to a patient and for delivering signals representative of natural beats in said patient to said pacing apparatus, comprising:

a. stimulus signal generating means, for normally generating periodic stimulus signals, having an oscillator adapted to be reset upon receipt of a reset signal;

b. a stimulus signal gating circuit, for gating said generated stimulus signals, said gating circuit having a first input connected to the output of said stimulus signal means, a second input for receiving an inhibit signal, and an output for connection to said electrode means, whereby gating of said stimulus signals through said gating circuit is inhibited when said inhibit signal is received;

c. signal amplifier means for amplifying inputted signals thereto;

d. transmission means for delivering stimulus signals from said gating circuit to said electrode means, for receiving said natural beat signals from said electrode means, and for connecting said stimulus signals and natural beat signals to said amplifier means;

e. logic means having inputs from said amplifier and said oscillator for determining when signals outputted from said amplifier represent detected natural signals, and for producing a reset signal only when one of said amplified signals represents a natural signal;

f. connecting means for connecting said reset signals to said stimulus generator, thereby resetting said oscillator only upon the occurrence of a natural signal;

g. inhibit means connected to said logic means and said stimulus signal generating means for providing an inhibit signal whenever said stimulus signal generator means is reset, and having an output connected to said gating circuit whereby said inhibit signal inhibits gating of the generated stimulus signal upon the occurrence of a natural signal;

h. said logic means containing interference block-out means for blocking production of said reset signal upon the detection of amplified signals having interruptions shorter than a predetermined interference time period;

i. said interference block-out means comprising a continuously settable multivibrator, said multivibrator having means for producing an output pulse of a predetermined duration when it receives a signal at its input, said multivibrator being reset to re-commence timing out said predetermined duration when a subsequent input signal is received within said interference period;

j. said logic means containing refractory means for inhibiting production of a reset signal for a predetermined refractory period following production of a signal by said stimulus signal generator means; and

k. said logic means contains a first flip-flop connected to and driven by said multivibrator, and a second multivibrator being characterized by producing a refractory pulse of said refractory period when an input signal is received, the input of said second multivibrator being connected to said stimulus signal generating means to receive an input signal when said stimulus signal generating means produces a signal, said first flip-flop being connected to be reset for the duration of each said refractory pulse, thereby inhibiting triggering thereof during said refractory period.

4,043,348
SMOKING PIPE TAMPER MEANS
Garland Harold Kanady, 201 Community Bldg., Ponca City, Okla. 74601
Filed Aug. 13, 1975, Ser. No. 604,160
Int. Cl.[2] A24F *3/02*
U.S. Cl. 131—243 **4 Claims**

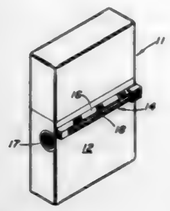
1. An extendible pipe tamper for use with a rectangular lighter mechanism case, said pipe tamper comprising

a. a guide means, said guide means comprising a generally rectangular box having one of its sides open, said open side being adapted to functionally mate with an end of said rectangular case;

b. a guide tube means longitudinally positioned through said rectangular box, said guide tube means being positioned near the side opposite the open side of said rectangular box;

c. a narrow longitudinal slot positioned on a side of said rectangular box, said slot being in open communication with said guide tube means from a first end of said rectangular box to near a second end of said rectangular box;

d. an elongated body means slideably positioned in said guide tube means;
e. a tamper head means positioned on a first end of said elongated body means; and,
f. a thumb-engageable means positioned on a second end of



said elongated body means and extending through said slot

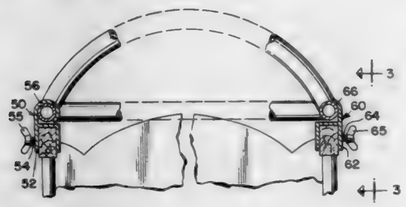
so that said tamper head means is extended by moving said thumb-engageable means toward said second end of said rectangular box and retracted by moving said thumb-engageable means toward said first end of said rectangular box.

4,043,349

REMOVABLE CRIB CANOPY

Susan Gays, 3198 Wilson St., and Anthony Romano, 3200 Wilson St., both of Hollywood, Fla. 33021

Filed Jan. 19, 1976, Ser. No. 650,511
Int. Cl.[2] A47C *29/00*
U.S. Cl. 135—5.3 **9 Claims**



1. Canopy apparatus for use in combination with a conventional child's crib, said apparatus comprising a frame including a plurality of support members interconnecting any two of said plurality of sides and a cover affixed to said sides and supported by said support members, said apparatus adapted to be mounted on and releasable secured to said crib by at least one pivot clamp, said pivot clamp including a generally U-shaped portion oppositely disposed from a generally semi-circular portion, said generally U-shaped portion adapted to grip on upper rail of one of a pair of opposed side walls of the crib and said generally semi-circular portion adapted to pivotally engage over one of said plurality of tubular sides of the frame, the portion of said tubular side being engaged by said semicircular portion capable of journaling therein along the longitudinal axis thereof.

4,043,350

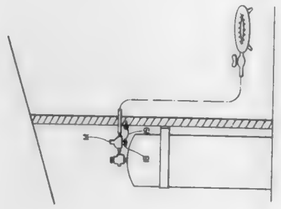
EMERGENCY GAS SHUT-OFF UNIT MOUNTED ON GAS PRESSURE ADJUSTING UNIT

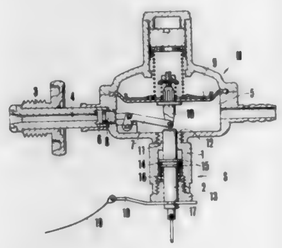
Shigeru Ichimi; Hideo Ichimi, and Kenjiro Funabashi, all of Aichi, Japan

Filed Oct. 23, 1975, Ser. No. 625,274
Claims priority, application Japan, Nov. 13, 1974, 49-13738
Int. Cl.[2] F16K *17/36*
U.S. Cl. 137—39 **2 Claims**

1. In the known combination of a gas cylinder and a gas pressure adjusting unit attached thereto which includes an adjusting unit housing, a gas inlet to said adjusting unit housing from said gas cylinder, a gas outlet from said adjusting unit housing, and a valve within said adjustment housing for controlling the admission of gas through said gas inlet into said adjustment unit housing, the improvement consisting of an emergency gas flow shut off device that will automatically cut off in the event the gas cylinder falls down because of an earthquake or other causes, said gas flow shut off device comprising in combination

a valve piston housing that is attached to and which opens into one side of said adjusting unit housing,
a valve piston mounted in said valve piston housing so as to extend through the end of the valve piston housing that is attached to said adjusting unit housing and into the adjusting unit housing itself,
spring means between the exterior of said valve piston and the interior of said valve piston housing, said spring being mounted with respect to said valve piston so as to urge





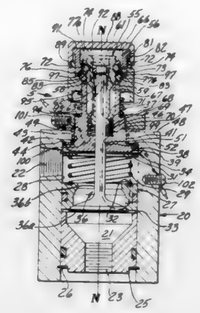
said valve piston into the interior of said adjusting unit housing and against the valve in said housing in such a way as to close said valve,
pin means engageable with the end of the valve piston that is opposite to the end of the valve piston that extends into the adjusting unit housing, and when said pin means is engaged with said end of the valve piston said spring means is in its compressed condition,
connector means connecting said pin means to a fixed wall, whereby, in the event that the gas cylinder falls down because of an earthquake or similar causes, the connector means will pull the pin means from engagement with the end of the valve piston and the thus released valve piston will move inwardly into the interor of said adjusting unit housing under the force exerted by said spring means and in moving inwardly will bear against the valve in the adjusting unit housing so as to close the gas inlet against further gas flow from said gas cylinder.

4,043,351

FLUID VALVE INCLUDING ELECTRICAL CIRCUIT CONTROL

Harold Durling, Elsie, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 26, 1975, Ser. No. 635,641
Int. Cl.[2] F16K *37/00*
U.S. Cl. 137—554 **6 Claims**



1. An electrical circuit controlling valve comprising:
a hollow body providing a passageway for fluid therethrough extending in its downstream direction from an inlet port to an outlet port;
valve seat means for a poppet valve member received in said body between said ports having its seating surface facing downstream of said passageway;
a poppet valve member comprising a head and a stem;
valve support and guide means in slidable engagement with said stem comprising electrically conductive means electrically connecting said valve and said support and guide means;
said body and said valve seat means comprising electrically conductive means electrically connecting one to the other;
means for attaching said body to said guide and support means to align said member for reciprocation effecting closed and opened positions of seating and spacing, respectively, of the head with respect to said seating surface;
latching mechanism in said valve support and guide means interacting with said stem to retain and release said valve member;
insulating means positioned between and separating said body and said support and guide means for preventing electrical connection thereof.

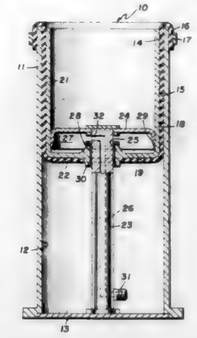
4,043,352

PRESSURE ACCUMULATOR

Alden H. Simpson, 54 Pine Grove St., Springfield, Mass. 01119

Filed Aug. 5, 1976, Ser. No. 712,035
Int. Cl.[2] F16L *55/04*
U.S. Cl. 138—31 **5 Claims**

1. A pressure accumulator, comprising
a. a main housing having a cylindrical inner surface, having a closure at one end and open at the other,
b. an elastomer bag lying within the housing with an edge fixed to the said open end thereof,
c. an open-ended vessel lying within the housing having a flat bottom extending across the housing and having a tubular side wall, substantial portions of the bag being located between the said cylindrical surface of the housing and the outer surface of the tubular side wall, the bottom of the bag lying against the outer surface of the bottom of the said vessel,
d. a post which is fixed to the closure at the said one end of the housing and which extends axially of the said cylindrical surface, the post extending through an aperture in the bottom of the bag and of the vessel,
e. a piston fixed to the free end of the post and having its outer periphery slideably engaging the inner surface of the vessel, and



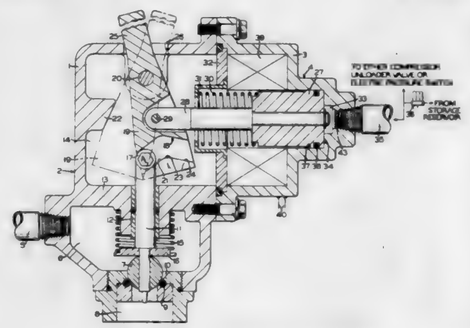
f. means for the passage of pressure fluid into the chamber defined by the said piston and the inner surface of the said vessel.

4,043,353

MANUALLY, PNEUMATICALLY, OR ELECTRICALLY OPERABLE DRAIN VALVE DEVICE

Frank W. Shirey, North Huntingdon Township, Westmoreland County, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Aug. 2, 1976, Ser. No. 710,555
Int. Cl.[2] F16T *1/00*; F16K *31/05*
U.S. Cl. 137—204 **10 Claims**



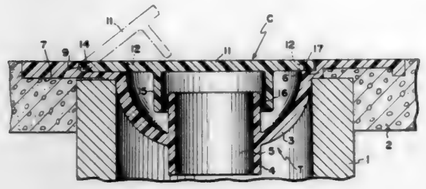
1. A drain valve device for collecting and expelling moisture condensate from a compressed air system, said drain valve device comprising:
a. a casing having formed therein a valve chamber connectable to the compressed air system for collecting moisture condensate therefrom;
b. valve means in said chamber normally occupying a seated disposition in which the chamber is closed to atmosphere, and being operable to an unseated disposition for opening the chamber and expelling the moisture condensate therein to atmosphere;
c. cam means connected to said valve means and alternately movable in opposite directions for operating said valve means to its said unseated disposition each time said cam means moves in each of said opposite directions; and
d. operating means normally biased toward a first position for moving said cam means in one of said opposite directions, and effective, when actuated, for moving said cam means in the other of said opposite directions.

4,043,354

DRAIN TRAP AND COVER CONSTRUCTION

Douglas S. Brown, Vassar, Mich., assignor to D & J Tool & Die, Inc., Vassar, Mich.

Filed May 17, 1976, Ser. No. 687,364
Int. Cl.[2] F16K *9/00*
U.S. Cl. 137—247.33 **4 Claims**



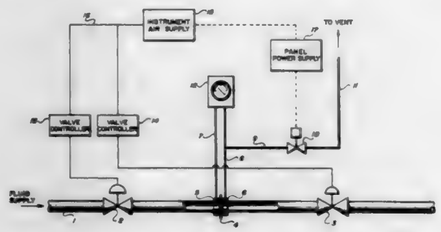
1. A drain trap and cover construction comprising an open top bowl having a central passage therein; a marginal flange formed of non-metallic material extending outwardly from the upper edge of said bowl, said flange having a substantially cylindrical socket formed therein with a throat opening leading thereinto from the upper surface of said flange, said throat opening having a length corresponding to that of said socket and having a normal width less than the diameter of said socket, said flange having a channel in its upper surface extending from said socket to the upper edge of said bowl, said channel having a width less than the length of said socket and said socket extending at both ends thereof beyond said channel; a non-metallic cover for said bowl; and an integral tongue extending from said cover and terminating in a substantially cylindrical pivot pin rotatably accommodated in said socket, said tongue having a length, width and thickness corresponding substantially to the length, width and depth of said channel and said pivot pin having a length and diameter corresponding to the length and diameter of said socket but having a diameter greater than the width of said throat opening, the material from which said flange is formed having sufficient resilience to enable said pivot pin to enlarge the width of said throat opening to permit passage of said pivot pin into said socket, following which said throat opening returns to its normal width to retain said pin in said socket, the upper surfaces of said flange, said cover, said tongue, said pivot pin being substantially flush when said cover is in its bowl-closing position.

4,043,355

COMBINED FLOW MEASURING AND VALVE LEAKAGE INDICATOR

Roger Anthony Cerruti; Thomas Ellsworth McWhorter, both of Whitehall, and David Russell Ruprecht, Laurys Station, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed June 22, 1976, Ser. No. 698,625
Int. Cl.[2] G01M *3/28*
U.S. Cl. 137—312 **6 Claims**



1. In an apparatus for controlling and measuring the flow rate of a fluid in a conduit of the type having first and second flow control valves with a flow sensing device of the differential pressure type located in the conduit between the control valves and flow indicating means of the differential pressure type connected to said flow sensing device through a high pressure conduit and a low pressure conduit, the improvement for detecting fluid leakage past the control valves into the conduit between the control valves when said first and second valves are in closed position comprising:

a vent conduit communicating with said low pressure conduit at a point between the connection of the low pressure conduit to the flow sensing device and the point of connection of the low pressure conduit to the flow indicating means;

said vent conduit discharging through a vent valve normally closed during fluid flow through said fluid conduit; and

means to open said vent valve in response to closing of said control valves,

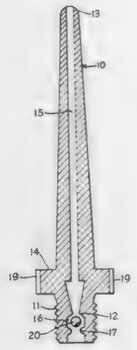
whereby fluid leakage past said control valves into the fluid conduit between said control valves discharges through the low pressure conduit causing a pressure drop between the point of connection of the low pressure conduit to the flow sensing means and the point of connection of the low pressure conduit to the vent conduit, said pressure drop causing a positive indication of flow on said flow indicating means.

4,043,356

INFLATING PROBE

Ralph Morris, Clontarf, and William Gordon Turner, Balgowlah, both of Australia, assignors to Morris Turner Pty. Limited, Balgowlah, Australia

Filed July 19, 1976, Ser. No. 706,788
Claims priority, application Australia, Aug. 20, 1975, 2870/75; Apr. 27, 1976, 13404/76
Int. Cl.[2] F16K *43/00*
U.S. Cl. 137—320 **4 Claims**



1. An inflator probe for filling gas containers and the like comprising

a. a one-piece body molded from a suitable plastic material,

b. said body providing a circumferentially extending shoulder having on one side an externally threaded cylindrical end piece for attachment to a pump,

c. an elongated probe extending from the other side of said shoulder tapered in the direction of its length and providing a center bore therethrough,

d. a chamber formed in and opening out of said cylindrical end piece,

e. a ball valve within said chamber having a diameter less than that of said chamber,

f. a non-circular restricted throat providing communication between said chamber and said center bore of said probe and of a size less than the diameter of said ball valve, and

g. an internal collar within said chamber between said open end thereof and said restricted throat forming a seat for said ball valve,

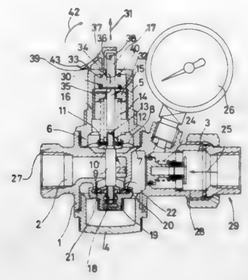
h. said collar having sufficient resiliency to permit insertion and retention of said ball valve in said chamber after said probe has been molded.

4,043,357

FILTER FITTING FOR HEATING INSTALLATIONS

Eberhard Wilhelm Gocke, Mosbach, Germany, assignor to Braukmann Armaturen AG, Rothrist, Switzerland

Filed Sept. 17, 1975, Ser. No. 614,247
Int. Cl.[2] F16K *31/14*
U.S. Cl. 137—495 **2 Claims**



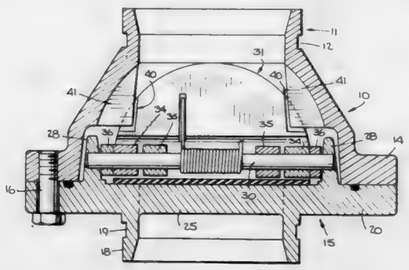
1. A filler fitting especially for heating installations having a housing, an inlet and an outlet to said housing, a pressure-reducer between said inlet and outlet, said pressure-reducer having a valve mechanism which is spring loaded towards an open position, means additionally loading said valve mechanism in the direction of opening and releasable means for disconnecting said additional means, said valve mechanism including a valve stem and said additional means comprises a pin with a spring biasing said pin against said valve stem the spring acting on said valve stem and the spring biasing said pin being co-axial, said pin having a non circular cross section, a plate in said housing adapted for threaded movement thereon, said plate having an aperture corresponding to said non circular section of said pin passing through said aperture, said plate serving to support the said spring acting on said valve stem.

4,043,358

FLAPPER CHECK VALVE

Chester Sliski, Trenton, N.J., assignor to Victaulic Company of America, South Plainfield, N.J.

Filed Feb. 2, 1976, Ser. No. 654,626
Int. Cl.[2] F16K *15/03*
U.S. Cl. 137—512.1 **12 Claims**



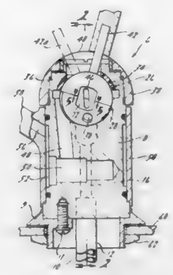
1. A check valve comprising a valve body formed in two parts, a downstream part of said valve body defining a generally bell-shaped flow chamber and an outlet from said flow chamber, and an upstream part of said valve body including an inlet and a shaft mounted transversely with respect to said inlet, said shaft carrying a pair of half-discs mounted for movement from a generally coplanar closed position with said half-discs in contact with a valve seat formed in said upstream valve part to a fully open position with said half-discs resting against stop means within said downstream part of the valve body and wherein said stop means comprise a pair of projections integrally formed with the downstream part of the valve body and said half-discs have recesses located to mate with said projection, and including means allowing said half-discs to move into back-to-back contact when the valve is in fully open condition.

4,043,359

WATER FAUCET

Christ Christo, Farmington Hills, Mich., assignor to Masco Corporation of Indiana, Greensburg, Ind.

Filed May 5, 1976, Ser. No. 683,264
Int. Cl.[2] F16K *11/087*
U.S. Cl. 137—625.41 **5 Claims**



1. A water faucet including a valve body having an inlet duct connectable to a source of water and an outlet duct, valve means within said body selectively movable to interconnect said inlet and outlet ducts and to isolate said inlet and outlet ducts, a manually operable handle extending from said body and connected to said valve means for movement of said valve means, stationary stop means connected to said valve body and limiting the range of movement of said valve means, the improvement comprising: said valve means being an arcuate valve member formed from plastic material and having a recess formed therein, said stop means protruding from said valve body and being received in said recess, and an insert member having an aperture therethrough mounted in said recess, said stop means extending through said aperture and into said recess, said insert being formed from a material having greater resistance to wear than said plastic material.

4,043,360

PRESSURE REDUCING DEVICE FOR FLUIDS

Baruch Yaron, Givatayim, Israel, assignor to Incontrol Ltd., Tel Aviv, Israel

Filed July 16, 1975, Ser. No. 596,455
Int. Cl.[2] F15D *1/02*
U.S. Cl. 138—42 **6 Claims**

1. A device for reducing pressure in a fluid flow directed in a path along the length of the device from an inlet end to an outlet end, said device comprising an elongated body, the length of said body being divided into a plurality of adjacent chambers formed about the periphery of said body, each chamber comprising a series of peripheral adjacent grooves formed in the periphery of said body transversely of the length of said body, the adjacent grooves being in communication with each other and advancing, by communicating steps, along the length of said body toward the outlet end, the grooves of each chamber, beyond a first groove closest to the inlet end, each being oriented at a propressively greater angle to the first groove about the periphery of said body with the grooves of each chamber defining a path for the flow of fluid about the periphery of the length of said body, the last groove of each chamber being closer to the inlet end than the preceding groove in the same chamber and communicating with the first

groove of the next adjacent chamber toward the outlet end with said first groove of the next adjacent chamber being



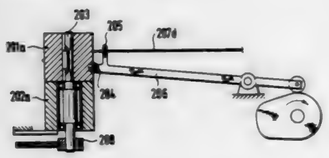
closer to said outlet end than said last groove of the previous chamber and at an angle thereto.

4,043,361

APPARATUS TO DELIVER WEFT TO FLUID WEFT INSERTING MEANS

Walter Scheffel, Industriestr. 53, 8832 Weissenburg, Germany

Division of Ser. No. 430,303, Jan. 2, 1974, abandoned. This application June 21, 1976, Ser. No. 697,782
Claims priority, application Germany, Apr. 4, 1973, 2316734; June 2, 1973, 2328135
Int. Cl.[2] D03D *47/34*
U.S. Cl. 139—452 **5 Claims**



1. Apparatus for the insertion of a weft thread in the shed of warp threads in a weaving machine having means to propel and decelerate the weft and a weft supply arranged outside the shed in which the weft is alternately guided around a rotating drum and a coaxial stationary drum in which a thread guide is movable in the axial direction of at least two coaxial drums arranged close together and in which at least one of the drums is imparted a constant rotation by a drive.

4,043,362

CUTTING AND INSULATION STRIPPING APPARATUS FOR TWISTED WIRE PAIR

Robert B. Senior, Grand Haven, and Frederick Karasinski, Grand Rapids, both of Mich., assignors to Gardner-Denver Company, Dallas, Tex.

Filed Feb. 9, 1976, Ser. No. 656,239
Int. Cl.[2] B21F *7/00*
U.S. Cl. 140—1 **20 Claims**

1. Apparatus for preparing a predetermined length of insulated and pretwisted electrical conductor wire pair and for cutting and stripping insulation from at least one set of adjacent end portions of said length of wire pair, comprising:

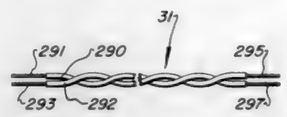
a frame;

a feed mechanism disposed on said frame engageable with said wire pair for feeding a predetermined length of wire pair substantially linearly with respect to said frame preparatory to cutting said wire and said insulation;

a wire gripping device supported on said frame beyond said feed mechanism in the direction of feeding of said wire pair and including movable jaw portions for releasably gripping said wire pair;

wire untwisting means disposed on said frame and spaced apart from said gripping device and including rotatable clamping means for clamping and rotating said wire pair to form an untwisted section of said wire pair between said rotatable clamping means and said gripping device;

a support disposed on said frame;



a wire cutting blade mechanism and at least a first insulation cutting blade mechanism mounted in spaced apart relationship on said support between said gripping device and said rotatable clamping means;

means for actuating said blade mechanisms to cut said wire and said insulation on said untwisted section of said wire pair; and,

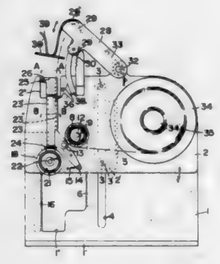
means for moving said adjacent end portions of said wire pair with respect to said insulation cutting blade mechanism after said insulation is cut to strip the insulation from said end portions.

4,043,363

BINDING DEVICE FOR BUNDLING OPENINGS OF BAGS OR THE LIKE

Fumiko Tange, 39-231, Aza Takane, Oaza Okehazama, Arimatsu-cho, Midori, Nagoya, Japan

Filed Dec. 6, 1976, Ser. No. 747,688
Claims priority, application Japan, Dec. 11, 1975, 50-148099
Int. Cl.[2] B21F *15/04*
U.S. Cl. 140—93 A **4 Claims**



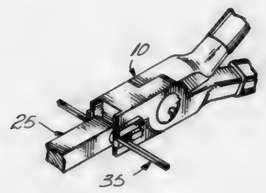
1. A binding device for bundling the openings of bags or the like which comprises: a vertically movable slidable plate which is fitted on a vertical support plate set up on a bed plate; a reel supporting a bundling material such as iron wire or wire-carrying cord and being attached to one side portion of said slidable plate; a feeding mechanism delivering said bundling material and being formed in the other side portion of said slidable plate; a twisting mechanism positioned in front of said feeding mechanism, said twisting mechanism holding said bundling material with supporting pawls and twisting said bundling material when said slidable plate is moved down; rocking arms the root ends of which are pivoted to the upper portion of said slidable plate above said twisting mechanism; U-shaped carriers attached to the free ends of said rocking arms to receive the material to be bound; a movable winding arm attached in the middle gap between said rocking arms, said winding arm guiding and winding said bundling material; a rack projected from said slidable plate and engaged with a sector gear formed at the pivoted end of said winding arm to rotate said winding arm; and an arcuate push rod attached at the lower portions of said rocking arms, the lower end of said push rod being in engagement with a cutting blade which is attached to the side of a supporting member attached to the upper end of said twisting mechanism; and said device being characterized in that a certain length of said bundling material delivered to said twisting mechanism is cut off by said cutting blade interlocked with the movement of said rocking arms when material to be bound in said U-shaped carriers is moved down, and with the pushing down of the upper side of said twisting mechanism, said slidable plate is moved down and in interlocked relation with the lowering of said slidable plate, said twisting mechanism is rotated, thereby said bundling material wound by said winding arm being twisted to bundle said material to be bound.

4,043,364

PLIER SET FOR MAKING TORQUING BENDS IN ORTHODONTIC ARCH WIRES

Larry A. Rose, Houston, Tex., assignor to E.T.M. Corporation, Monrovia, Calif.

Filed Nov. 24, 1976, Ser. No. 744,597
Int. Cl.[2] B21F *1/00, 7/00;* B21D *11/14;* A61C *7/00*
U.S. Cl. 140—106 **8 Claims**



1. A wire-bending plier set for use with orthodontic arch wire of non-circular cross section, comprising:

a plier with a pair of hinged arms having handles and opposed tip portions, the arms being pivotally movable with respect to each other about a hinge axis disposed between the handles and tip portions, each tip portion having a pair of gripping jaws which are spaced apart in a direction parallel to the hinge axis, the pairs of jaws being aligned so the arch wire can be gripped at two axially spaced positions between the jaw pairs with a central portion of the wire between the axially spaced positions being supported and exposed between the jaws; and

a bending member having an end portion shaped for removable insertion between the plier jaws and being rotatable about the axis of said wire, said end portion defining a slot configured to receive and engage the central portion of the arch wire whereby rotation of the bending member end portion about the wire axis, when said end portion is positioned between said jaws, will twist the central portion with respect to the axially spaced positions to form a torquing bend in the central portion of the arch wire.

4,043,365

AUTOMATIC SCREW DRIVER HAVING BRAKE RESPONSIVE BALL CLUTCH MEANS

George York, 1232C Sunset Lane, Martinsville, N.J. 08836

Filed May 18, 1976, Ser. No. 687,637
Int. Cl.[2] B25B *23/4;* F16D *7/00*
U.S. Cl. 144—32 R **11 Claims**

1. A screw driver apparatus comprising:

a. base support means;

b. rotational drive means including:

a drive motor,

a rotary spindle, and

transfer means for transmitting rotary motion of said drive motor to cause rotary motion in said rotary spindle;

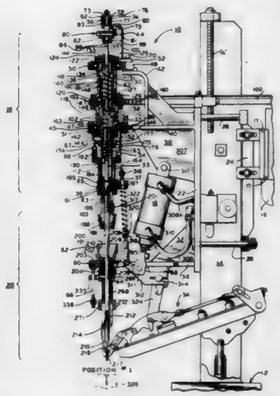
c. drive shaft means mounted for both rotational and reciprocating motion;

d. a driver bit rigidly mounted on said drive shaft means for rotating and reciprocating therewith, said drive bit for engaging a screw to be driven by said screw driver;

e. spline drive means connecting said drive shaft means with said rotational drive means whereby to permit transfer of rotational motion to said drive shaft means notwithstanding concurrent reciprocating of said drive shaft means;

f. ball clutch means disposed between said rotational drive means and said spline drive means, said ball clutch transmitting rotational motion from said rotational drive means to said spline drive means when engaged and permitting independent rotation of said rotational drive means with respect to said spline drive means when disengaged;

g. brake means rigidly secured to said drive shaft means, said brake means including a shoe mounting element and a brake shoe rigidly secured to said shoe mounting element, said shoe mounting element being selectively positionable on said drive shaft whereby to adjust the amount of advancement of said drive bit prior to the occurrence of



braking by said brake means, and further including a brake drum means mounted on said base support means for cooperating with said brake shoe to brake said drive shaft, said brake means for arresting rotational motion of said drive shaft means upon the occurrence of full advancement of said drive bit, said ball clutch means being disengageable in response to the arrest of rotational motion of said drive shaft means by said brake means; and

h. reciprocating motor means for imparting reciprocating motion to said drive shaft means and therewith said drive bit.

8. Clutch means for operationally connecting a first rotating member and a second rotating member, said second rotating member being supported for both rotational and reciprocating motion, said clutch means comprising:

a plurality of arcuately spaced radially extending bores formed in said first rotating member;

a plurality of arcuately spaced radially extending bores formed in said second rotating member, said arcuate spacing of said bores in said second member corresponding in arcuate displacement to said arcuate displacement of said bores formed in said first rotating member, thereby to permit alignment of said bores of said first and second rotating members;

a plurality of ball elements, said plurality of ball elements being equal in number to the number of radially extending

bores formed in said second rotating member, each of said ball elements being larger in diameter than the diameter of said bores formed in said first rotating member and smaller in diameter than said bores formed in said second rotating member; and

means for urging said plurality of balls radially outwardly through said bores in said second rotating member and into said bores in first rotatinng member.

4,043,366

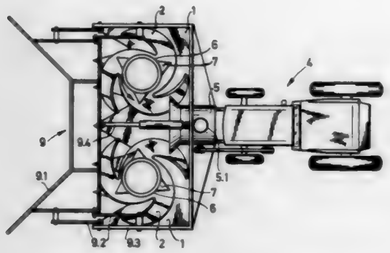
CLEARING MACHINE FOR BRUSHWOOD

Kyosti Pallari, 95385 Tervola, Finland

Continuation-in-part of Ser. No. 531,044, Dec. 9, 1974, Pat. No. 3,996,980. This application Apr. 21, 1976, Ser. No. 678,988

Int. Cl.² A01G *23/08*

U.S. Cl. 144—34 E **2 Claims**



1. Shearing means for a machine for clearing brushwood or the like comprising a stationary plate member and a rotor having rotary blade members, said stationary plate member having a plurality of circumferentially disposed cutter elements of generally triangular configuration and said rotary blade member having a plurality of circumferentially spaced sickle-shaped cutter elements cooperating with the cutter elements of the stationary plate member having a cutting edge, said sickle-shaped cutter elements having a leading edge coincident with said cutting edge and a trailing edge, said trailing edge being convexly curved to merge with the root end of the adjacent trailing cutter element, the joinder between said trailing edge and said cutting edge of the adjacent trailing sickle-shaped cutting element being a point at which said cutting edge and said trailing edge meet at an acute angle, said sickle-shaped cutting elements projecting in a circumferential direction in such a manner that they form with the generally triangular cutter elements enclosed areas, being arranged to progressively decrease in size as the sickle-shaped elements are rotated relative to the stationary plate with cutting points, defined by instantaneous points of contact between cutting edges of said sickle-shaped elements and the associated edges of the stationary plate members, moving from a location adjacent the tips of the stationary cutter elements toward their bases, each of said sickle-shaped cutter elements defining a concavely curved cutting edge extending in a generally radially-circumferential direction along a curve which is concave with respect to the center of rotation of said rotor, the angle between a tangent touching said curve at any tangent point thereof, and a radial line passing through the center of rotation of said rotor being 50° to 80°.

4,043,367

REMOVABLE CUTTING ELEMENTS

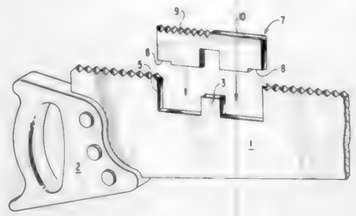
Eugene W. Knuth, Land O Lakes, Wis. 54540

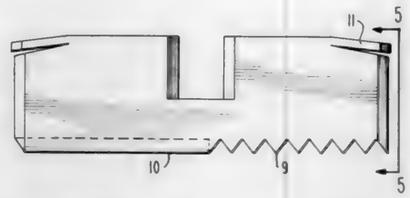
Filed Feb. 18, 1976, Ser. No. 659,118

Int. Cl.² B27B *21/00*

U.S. Cl. 145—31 R **2 Claims**

1. A saw body comprising parallel planar wall portions having at least one cutting surface along one edge thereof, said cutting surface having a recessed area of substantially rectangular configuration with a planar edge parallel to said cutting surface and V-shaped walls extending orthogonally from said planar edge to said cutting surface, an upwardly extending substantially rectangular tang medially disposed on said planar edge with V-shaped walls and a planar top portion, and a cutting element disposed in said recessed area overlying said





tang having a cutting surface on its top edge, V-shaped walls on its side edges to tangentially contact the V-shaped walls of said recessed area and said tang, and spring projections on its substantilly planar bottom edge to further grip the walls of said recessed area.

4,043,368

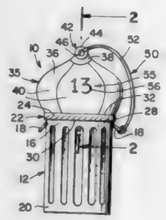
ADJUSTABLE GARBAGE CAN COVER

John M. Forte, Sr., 13 Colfax Drive, Pequannock, N.J. 07440

Filed May 12, 1976, Ser. No. 685,618

Int. Cl.² B65D *55/16*

U.S. Cl. 150—52 R **3 Claims**



1. A cover for use with a garbage can having a handle and an open upper end comprising:

A. elastic coupling means including an elastic band that is adapted to be stretched into surrounding circumferential relation with the open upper end of the garbage can and collapsed when the cover is removed and stored,

B. flexible hood means having a top end and a bottom end, said bottom end peripherally secured to said elastic means at one end thereof so that the open end of the garbage can is covered by said hood means,

C. said hood portion comprising an expandable body including circumferentially a plurality of elongate arcuate elastic interconnected panels that extend first generally axially and then mutually inwardly and joined at the upper edge to said top end, said hood adapted to be collapsed into a folded elongated position when the cover is removed from the can and into a dome in the open position extending above said elastic band,

D. gripping means connected to the upper end of said flexible hood means at said upper edge of said panels,

E. said gripping means including a ring adapted to be gripped in removing the cover from the can,

F. connecting means coupled to said gripping means at one end thereof and adapted to be secured to the handle of the can, and

G. said connecting means being in the form of an elongated flexible member extending from said ring of said gripping means and of a length for securement to the handle of the can.

4,043,369

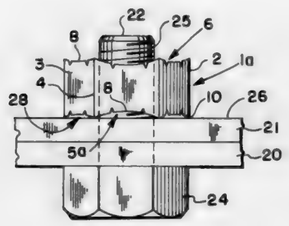
EDGE DEFORMABLE LOCK NUT

Robert R. Abernethy, 7295 Walton Road, Walton Hills, Ohio 44116

Filed Mar. 11, 1976, Ser. No. 665,918

Int. Cl.² F16B *39/12, 29/28*

U.S. Cl. 151—21 C **9 Claims**



1. A lock nut positionable on a male threaded member, comprising a body made of metal having a relatively soft interior core and a relatively hard exterior, threaded bore means through said body for securing said lock nut to a male threaded member, said body having a plurality of side faces and opposite end faces, adjacent pairs of said side faces joining at respective corners and defining a generally polygonal shape perimeter for at least one of said end faces of said body, said one end face of said body having a generally annular dished portion commencing at said corners as relatively high points and recessing into said body toward said bore means, said corner high points being relatively hard and thinned for biting and spreading into a confronting surface as said lock nut is tightened on such male threaded member and providing first fulcrum points at which force is applied by such confronting surface to yieldably deform said relatively soft interior core of said body to lock said nut substantially uniformly onto such member.

4,043,370

SEAL ARRANGEMENT FOR AN OVAL TIRE AND RIM

William B. Unwin; John J. Groezinger, and Charles E. Grawey, all of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 26, 1976, Ser. No. 652,260

Int. Cl.² B60C *19/00*

U.S. Cl. 152—354 **6 Claims**

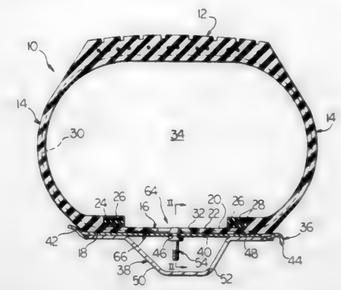
1. A seal arrangement for an oval tire and rim comprising:

a tubeless oval tire having an outer tread portion, a pair of sidewalls, and an annular base extending axially between said sidewalls, said annular base having a radially inner mounting surface and an air inlet passage therethrough leading to an internal air chamber;

a supporting rim having a substantially cylindrical body portion and a radially outer mounting surface on said body portion disposed in facing relation with said inner mounting surface of said tire and with a valve opening therethrough alignable with said passage;

a valve stem member extending through said valve opening and being sealed against the rim, said valve stem member being disposed substantially within said air inlet passage and spaced from said tire; and

a sealing ridge associated with said inner mounting surface of said tire and encompassing said air inlet passage and



being immediately adjacent thereto and of a construction sufficient for multiplying the effective unit loading between said tire and said rim caused by pressure in said chamber and for forming a seal therebetween immediately about said air inlet passage and said valve opening.

4,043,371

BEAD CORE FOR PNEUMATIC TIRES

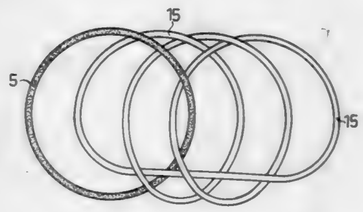
Henryk Pakur, Buckeburg, and Reinhard Tiemann, Hemmingen, both of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Apr. 27, 1976, Ser. No. 680,886

Claims priority, application Germany, Apr. 29, 1975, 2518934

Int. Cl.² B60C *15/04*

U.S. Cl. 152—362 R **4 Claims**



1. A tire having a bead core composed of thread-shaped strength carrier means closed in a looped manner and comprising a plurality of windings interlocking with each other to form the strength carrier means having as an improvement in combination therewith at least one annular member separately closed in itself and comprising winding ring means interlocked with said strength carrier means to fix the peripheral diameter by holding the windings together with a high degree of Precision with regard to the circular shape and dimension of the finished condition of the bead core.

4,043,372

PNEUMATIC TIRE FOR OFF-ROAD VEHICLES

Isao Miyoshi, Kodaira; Masaru Abe, Sayama; Toshiro Tezuka, Higashi-Murayama, and Toshio Yoshimoto, Akigawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,227

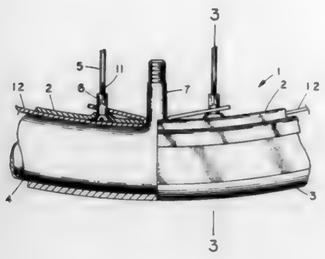
Claims priority, application Japan, Mar. 15, 1975, 50-31579

Int. Cl.² B60C *9/10, 9/18*

U.S. Cl. 152—354 **5 Claims**

1. A pneumatic tire for off-road vehicles, which is highly durable under heavy load conditions, comprising:

a carcass body composed of a plurality of rubberized ply layers superimposed one upon the other and each containing organic fiber cords embedded therein and assembled into a bias construction in which the organic fiber cords of substantially one-half of the carcass ply layers are extended in an opposite direction to the cords associated with the remaining carcass ply layers with respect to the equatorial line of the tire, a plurality of bead members, each having a bead core, at least one portion of the total ply layers extending from a crown portion of the tire through both side portions up to both bead members where at least one portion of the total ply layers are wound about bead cores, and



a breaker superimposed about the crown center portion of said carcass body and composed of at least one rubberized layer containing reinforcing elements embedded therein and formed of material having a tensile strength of at least 140 Kg/mm^2, the number of plies of said plurality of rubberized ply layers in said carcass body which extend from the crown portion of the tire through the side portions up to the bead members and which can substantially withstand internal pressure applied to the tire and external force subjected thereto determined on the basis of a fundamental safety factor ξ wherein:

$$\xi = \frac{2T_C \cdot R_M \sum_{i=1}^{n} (\sin^2\alpha_n \cdot Nn)}{5P(R_M^2 - R_V^2)} = 6 \text{ to } 8$$

and which lies within a range of a correction safety factor η; η governed by the use and type of the tire and the depth of tread groove and which is given by

$$\eta = K_1 \cdot K_2 \cdot K_3 \cdot \xi$$

where

T_C is a tensile strength of a cord (Kg/1 cord),

P is a standard internal pressure defined by JIS D6401 or an internal pressure recommended by TRA YEAR BOOK published in U.S.A. for tires with sizes not defined by JIS (Kg/cm^2),

Nn is number of cords per 5 cm of each ply (Number of cords/5 cm),

α_n is an angle of cords in each ply inclined with respect to the equatorial line of the tire (°),

R_M is a distance from the rotational axis of the tire to the innermost ply of the carcass body at the crown portion of the tire (cm),

R_V is $(R_M+R_R)/2$ where R_R is a radius of a rim (if the rim diameter in inch is odd number, (the rim diameter $-$ 1) $\times$ 2.54 $= 2R_R$) (cm),

n is number of the carcass plies which can withstand the internal pressure applied to the tire and the external force subjected thereto,

K_1 is a coefficient having a value in dependence with the use of the tire:
- The 1st kind of tire for construction vehicles defined by DIS 6401: 1.6
- The 3rd kind of tire for construction vehicles defined by DIS 6401: 1.0
- Tire for industrial vehicle defined by DIS 6401: 1.0

K_2 is a coefficient having a value in dependence with the type of tire:
- Ordinary tire: 1.0

An aspect ratio H/S=0.87 to 1.0 for regular tread,
- Wide base tire: 1.1

An aspect ratio H/S $<$0.87 for regular tread, and

K_3 is a coefficient having a value in dependence with the depth of tread groove:
- Regular tread: 1
- Extra tread: 1.1
- Extra deep tread: 1.1,

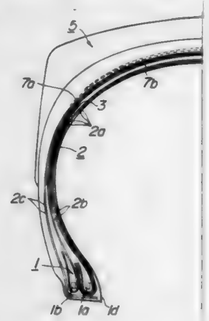
K_2 and K_3 being always 1 for tire for industrial vehicles.

4,043,373

RIM STRIP FOR BICYCLE WHEELS

Roger Owen Durham, 3944 Marathon St., Los Angeles, Calif. 90029

Filed Nov. 5, 1975, Ser. No. 629,139
Int. Cl.² B60C *19/00*
U.S. Cl. 152—365 **4 Claims**



1. In a wheel having spokes with threaded outward ends, a rim with spoke nipple holes, spoke nipples inserted through said spoke nipple holes in said rim and engaging said threaded outward ends of said spokes, and an inflatable tube with a tube valve stem the combination of:

a. a valve stem hole in said rim adaptable for insertion of said tube valve stem and the free ends of a flexible rim strip;

b. a flexible rim strip having two free ends with a rim strip securing means near each free end, said free ends adapted for insertion through said valve stem hole in said rim, with said rim strip securing means engaging said spoke nipples adjacent said valve stem hole in said rim.

4,043,374

WHEEL RIM ASSEMBLY AND METHOD FOR DEMOUNTING A TIRE THEREFROM

Duane R. Smith, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 17, 1975, Ser. No. 641,461
Int. Cl.² B60B *25/00;* **B60C** *5/00*
U.S. Cl. 152—405 **24 Claims**

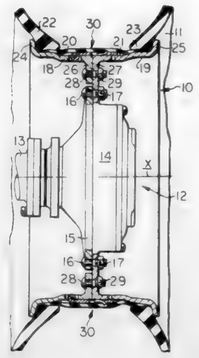
1. A rim assembly having an air-inflated tire mounted thereon and disposed for rotation about a longitudinal axis thereof, said rim assembly comprising

a pair of annular first and second rim sections defining coaxially aligned peripheral portions mounting said tire thereon,

a rim flange secured on an outboard end of each of said first and second rim sections to extend radially outwardly therefrom and away from said axis to retain said tire on said rim assembly,

first and second mounting flanges secured on an inboard end of said first and second rim sections, respectively, to extend radially inwardly therefrom and towards said axis,

fastening means releasably attaching said first and second mounting flanges together, and



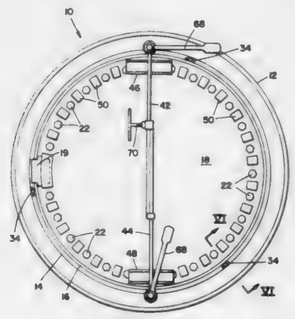
latch means mounted on and straddling the co-axially aligned peripheral portions of said first and second rim sections for normally releasably attaching them together under the influence of air pressure in said tire and releasable upon inflation of said tire to a predetermined level of air pressure therein, said latch means disposed on the outer periphery of said rim assembly and interiorly of said tire to be directly acted upon by air pressure in the said tire.

4,043,375

RIM CONSTRUCTION AND TOOL APPARATUS FOR SAFE TIRE INFLATION

Robert Casey, Tazewell County, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 626,422, Oct. 28, 1975, Pat. No. 3,995,676.
This application June 16, 1976, Ser. No. 696,656
Int. Cl.² B60C *25/00, 5/16*
U.S. Cl. 157—1 **2 Claims**



1. In combination with a multi-piece wheel assembly including a rim base member, a pair of flange members removably associated at either end thereof and formed to have an inflatable tire mounted therebetween, the rim base member defining first and second annular grooves circumferentially oriented adjacent one end, said first annular groove proximate said end, a lock ring removably adapted to fit and positionable in said first annular groove, a seal member positioned in said second annular groove, and a bead seat band formed to receive one flange member and mountable on said rim base member inwardly of said first annular groove and overlying said seal member, said lock ring for retaining said bead seat band on said rim base member; said bead seat band defining a plurality of radial ports to communicate the interior of a mounted and inflated tire with atmospheric air, said port sealed by said seal member to block said communication between the interior of said mounted tire and atmospheric air only while said bead seat band is urged against said lock ring with said lock ring seated in said first annular groove, a puller apparatus comprising:

a support structure engageable with said wheel assembly, and

puller means associated with said support structure,

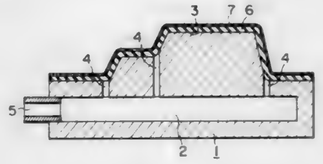
said puller means operatively engageable with the wheel assembly and cooperating with said support structure for urging said bead seat band outwardly against said lock ring.

4,043,376

CASTING PROCESS BY VACUUM MOLDING

Yuuji Kasai; Hironuri Ogura, and Atsushi Toyoda, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed June 16, 1976, Ser. No. 696,628
Int. Cl.² B22C *9/02, 3/00, 1/22*
U.S. Cl. 164—7 **11 Claims**



1. Improved casting process by vacuum molding comprising, in sequential combination, tightly covering a pattern surface of a pattern with a covering film by suction applied to said pattern surface, coating the exposed surface of said covering film with solution of an initial condensate of a thermosetting resin in order to form a thermosetting resin layer on said covering film, placing a molding box in position on said covered pattern surface, filling a center cavity of said molding box with a fluid refractory filler, closing the exposed surface of said refractory filler, solidifying said refractory filler by suction applied thereto, removing said pattern from the remainder in order to form one mold half, preparing the other mold half in similar way, coupling said mold halves to each other in order to form a mold having an inner cavity and casting molten metal into said cavity of said mold.

4,043,377

METHOD FOR CASTING METAL ALLOYS

Khodabakhsh S. Mazdiyasni, Xenia, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1976, Ser. No. 716,303
Int. Cl.² B22C *3/00, 9/10*
U.S. Cl. 164—7 **11 Claims**

1. A method for casting eutectic composition nickel base superalloys to form a hollow article which comprises introducing molten eutectic composition nickel base superalloy into a mold containing a core body fabricated from titanium nitride, the mold being maintained under a vacuum.

4,043,378

METHOD FOR FORMING CASTING MOLDS

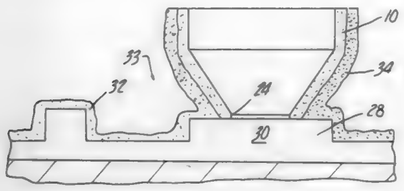
Reginald Alfred Pennington, Norton Shores, Mich., assignor to Westran Corporation, Muskegon, Mich.

Filed May 10, 1976, Ser. No. 684,874
Int. Cl.² B22C *1/22, 9/08*
U.S. Cl. 164—17 **6 Claims**

1. A method of forming a shell mold comprising the steps of: forming a tubular frusto-conical shrink bob of a first thermo-

setting material such that said shrink bob is open at its base and apex.

positioning the apex of said shrink bob onto a shell mold casting pattern, and



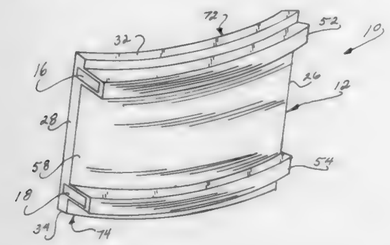
casting said shell mold casting pattern with a second thermosetting material whereby said second thermosetting material encases at least a portion of said shrink bob and forms the shell mold with the shrink bob joined thereto.

4,043,379

METHOD OF MAKING A MOLD

William S. Blazek, Valley City, Ohio, assignor to TRW Inc., Cleveland, Ohio

Filed Apr. 12, 1976, Ser. No. 676,227
Int. Cl.[2] B22C *9/04, 7/02*
U.S. Cl. 164—23 **14 Claims**



1. A method of making at least a portion of a ceramic mold having a cavity for accurately forming a cast product and gating through which material can flow toward the cavity during the casting of the product, said method comprising the steps of forming a pattern assembly which at least partially defines a surface of the mold cavity in which the cast product is to be formed, said step of forming the pattern assembly including the steps of providing relatively flexible and destructable pattern material and a pair of relatively rigid members for reinforcing at least a portion of the pattern material which at least partially defines the surface of the mold cavity, said step of providing pattern material including the step of providing a body of pattern material having a pair of spaced apart and relatively thick main sections which at least partially correspond to a pair of spaced apart and relatively wide sections of the mold cavity in which the cast product is formed, said main sections of pattern material being interconnected by a relatively thin web section which at least partially corresponds to a relatively narrow section of the mold cavity in which the cast product is formed, said step of providing a pair of reinforcing members including the steps of providing a first reinforcing member connected with a first one of the main sections of pattern material and providing a second reinforcing member connected with a second one of the main sections of pattern material, repetitively dipping the pattern assembly in liquid ceramic mold material to form a covering of ceramic mold material overlying at least a portion of the pattern assembly, retarding deflection of the relatively flexible pattern material with the rigid reinforcing member during said dipping steps, destroying the pattern material to expose a ceramic mold material surface which defines at least a portion of the surface of the mold cavity in which the cast product is formed, and removing the reinforcing members from the ceramic mold material.

4,043,380

PRODUCTION OF PLASTER MOLDS BY MICROWAVE TREATMENT

James M. Valentine, Vandalia, Ohio, assignor to Valentine Match Plate Company, Vandalia, Ohio

Continuation-in-part of Ser. No. 419,580, Nov. 28, 1973, abandoned, which is a continuation-in-part of Ser. No. 253,204, May 15, 1972, abandoned. This application Sept. 2, 1975, Ser. No. 609,617
Int. Cl.[2] B22C *9/12*
U.S. Cl. 164—41 **7 Claims**

1. The method of fabricating, from gypsum-containing plaster, a foundry casting component which is to be used in casting a metal part from molten casting metal at a temperature above the boiling point of water, and from which the water must be substantially completely eliminated to prevent its turning to steam upon contact with the molten metal, which method comprises the steps of,

a. forming a moldable suspension of the plaster and water,

b. molding a mass of said suspension into a predetermined configuration,

c. subjecting said molded mass to electromagnetic wave energy at microwave frequency until the internal temperature of said mass exceeds the calcining temperature of gypsum while exposing substantially all surface areas of said mass for free evaporation of water and passage of steam therefrom,

d. discontinuing said exposing step and cooling said mass until the internal temperature thereof is substantially less than said calcining temperature, and

e. again subjecting said mass to microwave energy until the internal temperature thereof exceeds said calcining temperature while exposing substantially all surface areas thereof for free evaporation of water and passage of steam therefrom.

4,043,381

SELF-DESTRUCTIVE CORE MOLD MATERIALS FOR METAL ALLOYS

Khodabakhsh S. Mazdiyasni, Xenia, and Roger R. Wills, Columbus, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 9, 1976, Ser. No. 713,090
Int. Cl.[2] B22D *23/00*; B22C *1/00*; B22D *29/00*
U.S. Cl. 164—65 **5 Claims**

1. A method for casting metal alloys to form a hollow article which comprises introducing molten metal alloy into a mold containing a core body fabricated from a silicon yttrium oxynitride or a silicon lanthanideoxynitride, the mold being under a vacuum or in an inert atmosphere.

4,043,382

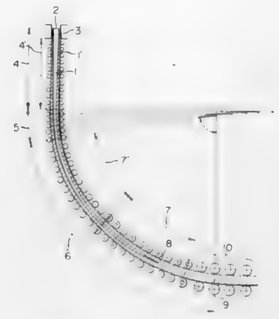
METHOD AND APPARATUS FOR CONTINUOUSLY CASTING STEEL

Katashi Saito; Toshio Matsumoto; Nobuhisa Hasebe, and Tatsuo Kobatake, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,064
Claims priority, application Japan, Jan. 13, 1975, 50-5549
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—76 **6 Claims**

1. In a method for continuously casting steel which comprises continuously teeming molten steel into a straight mold; guiding an unsolidified cast strand with a solidified shell formed on it substantially vertically downward along a vertical guide section; then, guiding said unsolidified cast strand in the vertical position along a curved multiple-point bending guide section comprising plural pairs of bending rollers while bending said unsolidified cast strand at multiple points by successively decreasing the radius of curvature of said unsolidified cast strand for each pair of said bending rollers; then, further guiding said unsolidified cast strand thus bent at multiple points along a constant curvature guide section comprising plural pairs of guide rollers, the radius of curvature of said constant curvature guide section being the same as that of the tail end of said multiple-point bending guide section; then, reducing the cast strand, near the solidification completing point thereof by at least a pair of reduction rolls at a draft of 0.1 to 2.0% per pair of reduction rolls; and then, straightening said cast strand thus reduced in a substantially horizontal direction at a single point at a spot-straightening point;

the improvement comprising:



setting the track length of said vertical guide within a range of from 3 to 7 m from the meniscus of molten steel in said straight mold;

setting the track length of said multiple-point bending guide within a range of from 1 to 4 m;

locating said at least one pair of reduction rolls to form the tail end of said constant curvature guide section, and the track length of said constant curvature guide being within a range of from 35 to 85% of the length from the meniscus of molten steel in said straight mold up to said spot-straightening point provided in succession to said constant curvature guide section; and

completing the solidification of said unsolidified cast strand within said constant curvature guide section.

4,043,383

CONTINUOUS CASTING STARTING BAR AND STOWAGE THEREOF

Don Eugene Isenberg, Pittsburgh; Irvin Lee Parker, Jr., Coraopolis, and Paul Allen Zelenski, Pittsburgh, all of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Filed Sept. 23, 1976, Ser. No. 725,729
Int. Cl.[2] B22D *11/08*
U.S. Cl. 164—274 **10 Claims**

1. A continuous metal casting machine of the type including a mold from which a cast strand is withdrawn through powered pinch rolls and a strand straightener and disconnect apparatus, wherein the improvement comprises:

a. an arcuate starting bar adapted for sealing said mold and for connection to said cast strand;

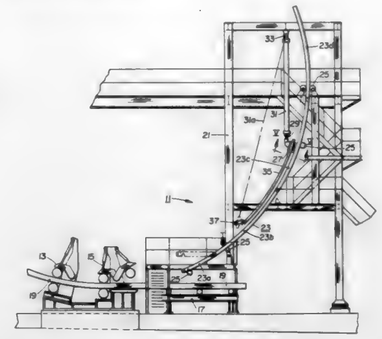
b. means supporting said starting bar in a position adjacent said machine from which position said bar can move into operative association with said machine;

c. guide means disposed parallely to said arcuate starting bar in said position; and

d. bar actuating means cooperating with said guide means and carrying means for moving said bar into and out of, and for holding said bar in, said position.

8. A continuous metal casting machine of the type comprising a mold from which a cast strand is withdrawn through powered pinch rolls and a strand straightener and disconnect apparatus, wherein the improvement comprises:

a. an arcuate starting bar comprising arcuate segments joined rigidly together by tongue and clevis with pin connection therethrough; and



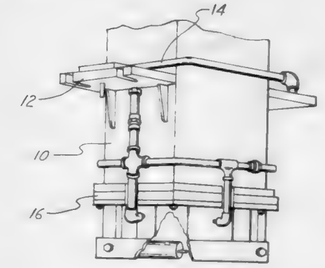
b. an arcuate end piece connected to one end of said bar so as to be pivotable only in the direction toward the center of curvature of said arcuate bar, and adapted for sealing mold and coacting with said cast strand.

4,043,384

SPRAY APPARATUS FOR CONTINUOUS CASTING MACHINE

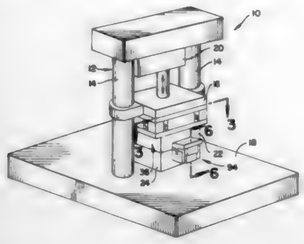
John H.K. Piepenhagen, and Michael J. Vanecek, both of Beaumont, Tex., assignors to Georgetown Texas Steel Corporation, Beaumont, Tex.

Filed Oct. 13, 1976, Ser. No. 731,615
Int. Cl.[2] B22D *11/12*
U.S. Cl. 164—282 **4 Claims**



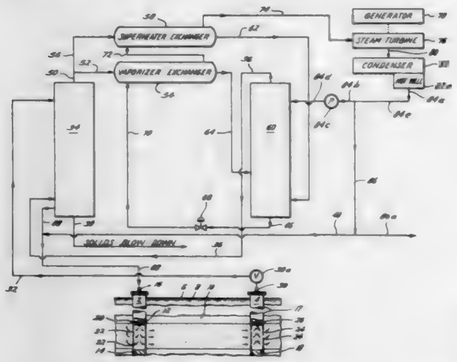
1. In a continuous casting machine which includes a tubular mold, a support for said mold and roller means beneath said mold for withdrawing a casting therefrom, the combination therewith of an improved mechanism for delivering spray water to all faces of a casting as it emerges from the bottom of said mold, said mechanism comprising: a water source communicating with said mold support, a first water distribution pipe depending from said mold support, a second water distribution pipe connected to said first pipe and extending generally in a horizontal plane and reaching each face of said mold, a multiplicity of downwardly extending water pipes communicating with said second distribution pipe, each downwardly extending pipe terminating beneath said mold and carrying a nozzle at its lower extremity, said nozzles being directed inwardly toward said mold whereby spray water delivered through said nozzles will contact the entire perimeter of a casting during withdrawal from said mold, and the entire spray mechanism with the exception of the nozzles is insulated from the casting by the vertical walls of the mold.

4,043,385
MOLDING APPARATUS
John R. Petrenchik, Pepper Pike, Ohio, assignor to Mercury Machine Co., Warrensville Heights, Ohio
Filed Aug. 23, 1976, Ser. No. 716,672
Int. Cl.² B22D *17/26*
U.S. Cl. 164—342 **9 Claims**



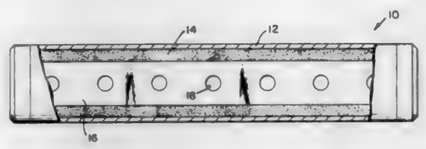
1. Apparatus comprising:
a pair of mold-defining members cooperating to form a mold chamber;
a pair of platens for selectively moving said mold-defining members toward and away from one another along a path;
mounting means for connecting said mold-defining members to said platens, said mounting means including means for permitting at least one of said mold-defining members to move freely in directions transverse to said path and rotate about an axis parallel to said path; and,
control means for causing said at least one mold-defining member to undergo a predetermined pattern of rotary and transverse movement during movement along said path.

4,043,386
ENERGY RECOVERY FROM GEOTHERMAL RESERVOIRS
William F. Franz, Gardiner, and Howard V. Hess, Glenham, both of N.Y., assignors to Texaco Inc., New York, N.Y.
Filed May 30, 1975, Ser. No. 582,330
Int. Cl.² F03G *7/00*
U.S. Cl. 165—45 **8 Claims**



1. The process for recovering heat from a hot geothermal brine which comprises:
a. passing the hot brine in direct countercurrent contact with a relatively cool hydrocarbon liquid (A) in a first heating zone whereby the said brine is cooled and the said hydrocarbon liquid is heated to an elevated temperature under sufficient pressure to maintain the said brine and said hydrocarbon in liquid phase,
b. withdrawing the said heated hydrocarbon liquid from said first heating zone and passing it through a second heating zone comprising a first and a second indirect heat exchanger, wherein the said heated hydrocarbon withdrawn from the first heating zone is split into two hot hydrocarbon streams of unequal portions, wherein the larger portion hot hydrocarbon stream is passed through the said first indirect heat exchanger in indirect heat exchange with steam whereby the steam is heated to form saturated steam and the said layer portion hot hydrocarbon stream is cooled to form a second hot hydrocarbon liquid (B), and wherein the smaller portion hot hydrocarbon stream is passed through the said second indirect heat exchanger whereby the said saturated steam is heated to form superheated steam and the said smaller portion hot hydrocarbon stream is cooled to form a third hot hydrocarbon stream (C),
c. withdrawing the said superheated steam from the said second indirect heat exchanger of the second heating zone,
d. withdrawing from said first indirect heat exchanger the said hot hydrocarbon liquid (B),
e. withdrawing from said second indirect heat exchanger the said third hot hydrocarbon liquid (C),
f. passing hot hydrocarbon liquid (B) and hot hydrocarbon liquid (C) through a third heating zone in direct countercurrent exchange with water whereby the said hydrocarbon liquids (B) and (C) are intermixed and cooled to form the relatively cool hydrocarbon liquid (A), wherein the said water is heated to an elevated temperature and pressure and wherein the operating step of (f) is carried out under sufficient pressure to maintain the hydrocarbon and water in liquid phase,
g. withdrawing the said hydrocarbon liquid (A) from the said third heating zone and passing it to the said first heating zone,
h. withdrawing the said water heated to an elevated temperature and pressure from the said third heating zone and expanding it through a suitable valve whereby steam is formed and passing the said steam to the said second heating zone.

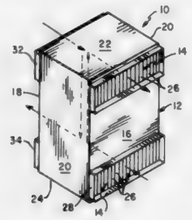
4,043,387
WATER HEAT PIPE WITH IMPROVED COMPATABILITY
Thomas R. Lamp, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Filed Nov. 26, 1976, Ser. No. 745,278
Int. Cl.² F28D *15/00*
U.S. Cl. 165—105 **6 Claims**

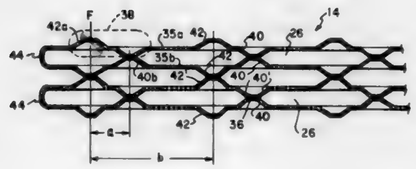


1. In a heat pipe including an enclosure and water as a working fluid in which the enclosure is formed of a material which combines with the water to generate hydrogen gas, the improvement comprising a getter selected from material having an affinity for hydrogen gas.

4,043,388
THERMAL TRANSFER CARE
William Henry Zebuhr, Nashua, N.H., assignor to Deschamps Laboratories, Inc., East Hanover, N.J.
Filed Aug. 18, 1975, Ser. No. 605,654
Claims priority, application Canada, Aug. 14, 1975, 224,549
Int. Cl.² F28F *3/02*
U.S. Cl. 165—166 **7 Claims**

1. A heat exchanger for transmitting thermal energy from one moving body of fluid to another comprising a casing of substantially constant cross-sectional area and a thermal transfer core within said casing, said core including a single, integrally formed, substantially continuous sheet of heat conductive material having a plurality of fold sections, separated by fold lines, the individual fold sections of said sheet dividing the interior of said casing into adjacent fluid flow passages, alternate ones of said passage defining first conduit means for conducting relatively warm fluids, the other passages defining second conduit means for conducting relatively cool fluids, said casing having first and second pairs of inlet and outlet openings formed therein, said first and second pairs of openings communicating with said first and second conduit means respectively, the individual fold sections of said sheet having a multiplicity of pairs of dimples formed therein, said dimple pairs being aligned longitudinally with respect to each other in at least two longitudinally extending zones, each said pair of dimples comprising a raised dimple and an adjacent depressed dimple wherein the spacing between the raised and depressed dimple in each dimple pair is small with respect to the spacing

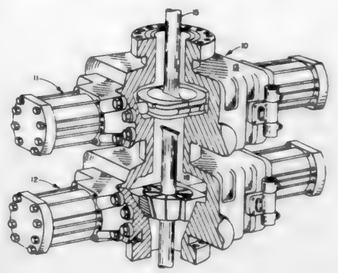




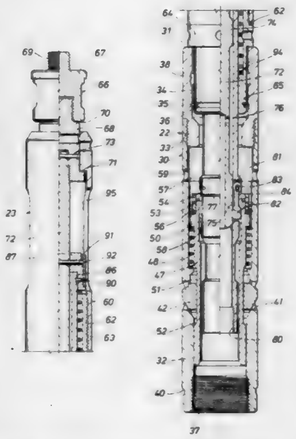
between adjacent, longitudinally aligned pairs of dimples, the height of each dimple being substantially equal to one-half the width of said fluid flow passages, the individual fold sections of said sheet each having longitudinally extending ridges formed therein, each ridge being formed between zones of aligned dimple pairs of extending over the substantial length of said fold section and each ridge terminating before the next adjacent fold section, the terminal ends of said ridges in each fold section defining a fold line between the adjacent fold sections, said dimple pairs being located in said fold sections so that upon folding said sheet of heat conductive material upon said fold lines in opposite directions alternately, raised and depressed dimples in each dimple pair are in opposed, abutting relationship with corresponding raised and depressed dimples in adjacent fold sections, whereby said opposed, abutting dimples provide spacing between and mutual support for adjacent fold sections, said spacing between adjacnt fold sections defining said fluid flow passages in a manner such that the fluid pressure drop through the heat exchanger is reduced.

4,043,389
RAM-SHEAR AND SLIP DEVICE FOR WELL PIPE
A. Tom Cobb, Seabrook, Tex., assignor to Continental Oil Company, Ponca City, Okla.
Filed Mar. 29, 1976, Ser. No. 671,464
Int. Cl.² E21B *29/00*
U.S. Cl. 166—55 **1 Claim**

1. Blowout prevention apparatus comprising:
a ram-shear forming a part of said apparatus and adapted to sever a pipe string extending therethrough into a wellbore; and
a slip device forming a part of said apparatus, said slip device being positioned below said ram-shear and being movable from a first position in which said pipe string is freely movable therethrough to a second position in which said pipe string is gripped and retained, said slip device comprising a pair of half-sections each movable toward and away from a pipe string extending therethrough and each of said half-sections comprising a bowl member and a plurality of gripping segments attached to said bowl member whereby upon movement of said half-sections toward a pipe string extending therethrough said gripping segments contact said pipe string and prevent downward travel thereof, said gripping segments being attached by strap connectors extending from the top of said bowl member to the top of a gripping segment.



4,043,390
ANCHORING DEVICE AND RUNNING TOOL FOR DOWNHOLE APPARATUS
Bernard Jean-Pierre Glotin, Saint Maur, France, assignor to Schlumberger Technology Corporation, New York, N.Y.
Filed Nov. 10, 1976, Ser. No. 740,648
Claims priority, application France, Nov. 19, 1975, 75.35272
Int. Cl.² E21B *23/00*
U.S. Cl. 166—215 **15 Claims**



1. Apparatus for use in anchoring a device in a well conduit, comprising: a tubular body member; anchoring means mounted on said body member for movement between retracted and extended positions; expander means movable longitudinally within said body member between first and second longitudinally spaced positions for respectively enabling retraction and causing extension of said anchoring means; detent

means releasably connected to said expander means and operative upon movement of said expander means to said second position for locking said expander means to said body member; and means for disconnecting said detent means from said expander means to enable return of said expander means to said first position.

4,043,391

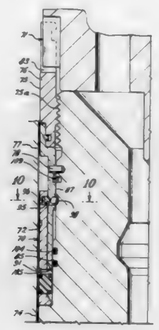
SLEEVE DETENT LATCH MEANS FOR WELL APPARATUS

James M. Weldon, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Division of Ser. No. 523,367, Nov. 13, 1974, Pat. No. 4,008,898, which is a continuation-in-part of Ser. No. 480,754, June 19, 1974, abandoned. This application Aug. 2, 1976, Ser. No. 710,653

Int. Cl.[2] E21B *23/00*

U.S. Cl. 166—217 **4 Claims**



1. Well apparatus, comprising a body lowerable into the bore of a well member, a first sleeve vertically slidable about the body, a second sleeve vertically slidable about the first sleeve, said body having a groove thereabout, said first and second sleeves having oppositely facing grooves about their outer and inner diameters, respectively, and said first sleeve having a plurality of holes therethrough connecting the groove thereabout with the inner diameter of said sleeve opposite the groove about the body, a detent radially slidable within each hole, and a split ring which is normally circumferentially contracted to a position in which it is disposed partly in the groove of each sleeve, so as to prevent relative vertical sliding between the first and second sleeves, said detents being forced inwardly by said split ring, when circumferentially contracted, to dispose their inner ends within the groove about the body, and thus in position to be forced outwardly by an edge of the groove about the body, in response to such relative sliding, to dispose them entirely within said holes, so as to permit relative sliding between the body and first sleeve, the outward movement of said detents forcing said split ring into a circumferentially expanded position in which it is disposed entirely within the groove about the inner diameter of the second sleeve, so as to permit relative vertical sliding between the sleeves.

4,043,392

WELL SYSTEM

Imre I. Gazda, Saginaw, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 413,617, Nov. 7, 1973, Pat. No. 3,874,634, and Ser. No. 542,117, Jan. 20, 1975. This application Oct. 31, 1975, Ser. No. 627,683

Int. Cl.[2] E21B *23/00*

U.S. Cl. 166—217 **11 Claims**

1. Locating and locking apparatus for selectively positioning and securing a well tool at a desired location along a flow conductor of a well bore comprising: means providing a landing section in said flow conductor having an internal locating and locking profile including a first internal stop shoulder facing a first longitudinal direction along said landing section and a second internal stop shoulder spaced from said first stop shoulder and facing in a second opposite longitudinal direction along said landing section; said first and second stop shoulders lying in planes substantially perpendicular to the longitudinal axis of said landing section along said flow conductor; and means providing an anchoring tool including at least one locating and locking key having an external locating and locking profile engageable in said internal profile of said landing section, including longitudinally spaced and longitudinally oppositely facing first and second external stop shoulders lying in planes substantially perpendicular to the longitudinal axis of said anchoring tool and co-engageable with said first and second stop shoulders in said landing section profile to arrest movement of said anchoring tool in either direction along said flow conductor.



4,043,393

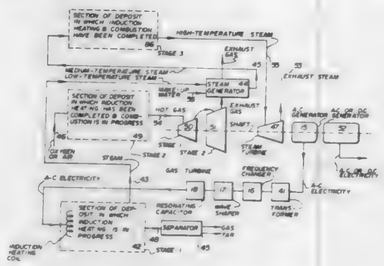
EXTRACTION FROM UNDERGROUND COAL DEPOSITS

Sidney T. Fisher, 53 Morrison Ave., and Charles B. Fisher, 2850 Hill Park Road, both of Montreal, Quebec, Canada

Filed July 29, 1976, Ser. No. 709,832

Int. Cl.[2] E21B *43/24, 43/25*

U.S. Cl. 166—248 **12 Claims**



1. A method of processing of an underground coal deposit in situ for the extraction of matter or energy therefrom comprising:

a. substantially encompassing a selected portion of said underground coal deposit with electrical conductor segments;

b. heating by electrical induction said selected portion of the deposit to a temperature sufficient to generate economically recoverable matter or energy; and

c. conveying said matter or energy to the surface of the ground.

4,043,394

PLUGGING OF ABANDONED DRY WELLS

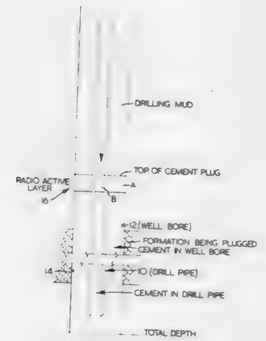
Douglas C. Campbell, 30 Sandpiper Drive, Sherwood Park, Alberta, Canada

Filed June 2, 1976, Ser. No. 692,189

Claims priority, application Canada, June 9, 1975, 228868

Int. Cl.[2] E21B *33/13, 47/04*

U.S. Cl. 166—253 **4 Claims**



1. In a method of plugging a potential producing zone or formation of known extent and elevation in a well bore with cement, including the steps of positioning a hollow pipe or stem at a selected location relative to the lower level of the formation and injecting cement through said pipe in an amount estimated to be sufficient to extend at least the full length of said formation to prevent seepage from the formation after the pipe has been withdrawn and the cement has hardened, the improvememt wherein a selected portion of the cement which is injected contains a radioactive tracer therein with said selected portion being injected such as to provide a layer of cement having said tracer therein at the top of the wet cement plug, and wherein said cement which contains the radioactive tracer therein is injected in two parts, one part being injected first, with the untreated cement being injected thereafter and displacing the treated cement upwardly thereby to form a ring of treated cement around said pipe, and the other part of the treated cement being injected last so that it is located within said pipe at about the same level as said one part, the pipe being thereafter withdrawn from the cement thus allowing the two parts of treated cement to flow together to form said layer with one of said parts flowing over the other part if there is a difference in the levels of said two parts of treated cement at the end of the injection step, and, after the pipe has been withdrawn from the wet cement, lowering into the well bore a detecting means sensitive to and emitting an output in response to the presence of the tracer material, and determining the elevation of the top of the wet cement plug by analyzing the output of the detecting means.

4,043,395

METHOD FOR REMOVING METHANE FROM COAL

Richard L. Every, Warrington, Pa., and Luino Dell'Ossc, Jr., Washington, D.C., assignors to Continental Oil Company, Ponca City, Okla.

Continuation-in-part of Ser. No. 558,089, March 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 252,072, May 10, 1972, abandoned. This application June 7, 1976, Ser. No. 693,561

Int. Cl.[2] E21B *43/00*

U.S. Cl. 166—263 **5 Claims**

1. A process for removing methane from a subterranean coal deposit comprising:

a. providing at least one injection well and at least one recovery well spaced therefrom, said wells extending from the surface to said coal deposit;

b. pressurizing said coal deposit by injecting a gaseous fluid containing at least about 20 percent by weight carbon dioxide through said injection well at a pressure not exceeding the cracking pressure of said deposit into said coal deposit while maintaining said recovery well closed;

c. stopping said injection and maintaining said deposit in a pressurized condition for a period of time sufficient to enable a substantial amount of methane which is adsorbed on said coal deposit to be desorbed therefrom;

d. opening said recovery well after step (c) to recover injected fluid and desorbed methane from said coal deposit;

e. closing said recovery well after step (d); and

f. repeating steps (b) through (e) until enough methane has been removed from said coal deposit to enable the deposit to be worked safely.

4,043,396

ALKOXYLATED ASPHALT AS SACRIFICIAL AGENTS IN OIL RECOVERY PROCESSES

Mohan Vaikunth Kudchadker, and Thad Oscar Walker, both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 612,118, Sept. 10, 1975, Pat. No. 3,978,927. This application June 16, 1976, Ser. No. 696,673

The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.

Int. Cl.[2] E21B *43/22*

U.S. Cl. 166—274 **9 Claims**

6. In a method for recovering oil from a subterranean formation containing oil and having an injection well and a production well wherein a surfactant solution is injected into the injection well in order to drive the oil to the production well where it is produced the improvement which comprises:

injecting into the injection well prior to the surfactant an aqueous solution of alkoxylated asphalts.

4,043,397

FIRE FIGHTING EQUIPMENT

Richard A. Glowienke, Rte. No. 1, Box 720, Necedah, Wis. 54646

Filed Sept. 22, 1975, Ser. No. 615,523

Int. Cl.[2] A62C *1/00, 31/00*; B05B *1/14*

U.S. Cl. 169—45 **4 Claims**

1. The method of preventing looping of billowing flames on a floor level of a building structure, locating a fluid flow pipe having a reverse bend of 180° at its discharge end on a floor level below said first mentioned floor level, connecting the other end of said pipe to a source of pressurized water, connecting a spray nozzle to the bent end of said pipe and at an angle thereto, extending the pipe through a wall opening to locate the nozzle outside the building structure, and discharg-

ing a substantially solid wall of water in the form of a spray from said nozzle without back pressure onto the building struc-



ture above the first mentioned floor level so as to overlie and contain the billowing flames and prevent their looping.

4,043,398

MOBILE BALLAST CLEANING MACHINE

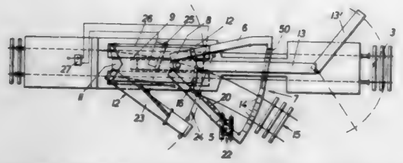
Karl Fölser, Linz-Urfahr, and Josef Theurer, Vienna, both of Austria, assignors to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H., Vienna, Austria

Continuation-in-part of Ser. No. 597,414, July 21, 1975. This application Dec. 18, 1975, Ser. No. 641,749

Claims priority, application Austria, Jan. 10, 1975, 135/75; Aug. 14, 1974, 6688/74

Int. Cl.[2] F01B *27/00*

U.S. Cl. 171—16 **13 Claims**



1. In a mobile track maintenance machine useful for work in track switches and crossings, which comprises an endless ballast excavation chain including a chain section mounted for extension transversely of, and below, the track for excavating ballast supporting the track on a subgrade, means mounted on the machine adjacent the excavation chain and remote from the chain section for separating the excavated ballast from fines to produce cleaned ballast, and means mounted on the machine and arranged to receive the cleaned ballast from the separating means for distributing the cleaned ballast and the fines, the improvement of

1. a transversely extending guide for the chain section mounted on the machine and adjustable to selected lengths for a corresponding change in the width of the ballast excavation effectuated by the chain section,
2. the distributing means being adjustable over the entire width of ballast excavation for selectively distributing the cleaned ballast within this width, and
3. mobile support means mounted to support the excavation chain during movement of the machine.

4,043,399

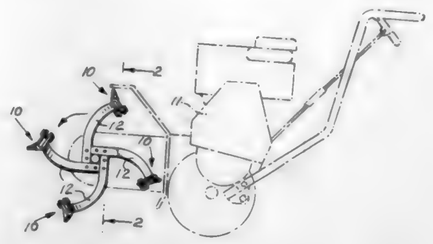
TOOTH FOR A ROTO TILLER

Burk Guy Morrison, 160A - W. 5th Ave., Sparks, Nev. 89431

Filed Aug. 11, 1976, Ser. No. 713,626

Int. Cl.[2] A01B *33/02*

U.S. Cl. 172—42 **4 Claims**



1. In combination with a roto tiller having a plurality of radially extending tines mounted to rotate about a generally horizontal axis and wherein each tine terminates in a generally axially extending earth working blade having a cutting edge thereon, the improvement comprising: A digging tooth assembly having a generally U-shaped mounting portion telescoped over at least one of said tines and including a leading portion positioned slightly forwardly of the cutting edge on said blade, a digging tooth having one end secured to said leading portion and having a surface projecting outwardly at an angle inclined forwardly to a radius from said axis, an angle support member between said tooth and said mounting portion, and means securing said tooth assembly to said tine.

4,043,400

HARROWS

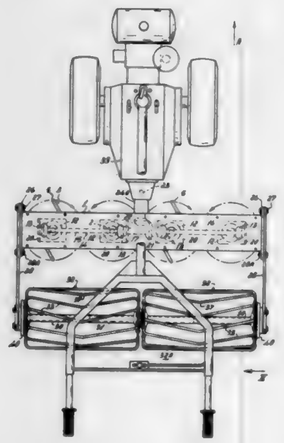
Cornelis van der Lely, Zug, Switzerland, and Ary van der Lely, Maasland, Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Continuation of Ser. No. 369,918, June 14, 1973, abandoned. This application Oct. 13, 1976, Ser. No. 732,093

Claims priority, application Netherlands, June 23, 1972, 7208617

Int. Cl.[2] A01B *33/06, 49/02, 33/08*

U.S. Cl. 172—43 **9 Claims**



1. A rotary harrow comprising a frame portion supporting at least four soil-working members rotatably mounted side-by-side in a row that extends transverse to the normal direction of travel on corresponding upwardly extending shafts, driving means supported by said frame portion and said driving means engaging said shafts to rotate same about axes defined by said shafts, a rotatable transversely extending supporting member being connected to said frame portion to the rear of said soil-working members, said supporting member comprising at least two portions and each of said portions having a periphery comprising ground engaging rods mounted on at least one elongated support, said rotatable portions being located adjacent one another and being rotatable about a common horizontal transverse axis, said rods extending in the same general direction as said common axis and having angular bends between their opposite ends, the points of said bends being located substantially in line with a plane that extends midway between two adjacent soil-working members and parallel to the direction of travel of the harrow.

4,043,401

SOIL CULTIVATING IMPLEMENTS

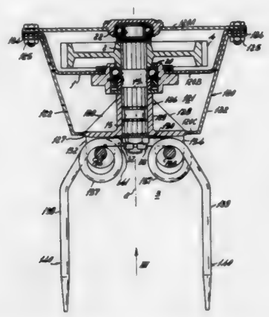
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed July 17, 1975, Ser. No. 596,826

Claims priority, application Netherlands, July 18, 1974, 7409705

Int. Cl.[2] A01B *33/06, 71/08*

U.S. Cl. 172—59 **14 Claims**



1. A soil-cultivating implement comprising a frame and at least one soil-working member supported on a hollow portion of said frame, said portion comprising three vertically spaced apart plates that define upper and lower chambers between a top and a central plate and between said central plate and a bottom plate, respectively, said soil-working member being rotatable about an upwardly extending shaft and driving means connected to said shaft to rotate same, said shaft being journalled within said portion and tool support means being connected to the shaft's lower portion, said support means including a hub that is substantially positioned entirely within the lower chamber, downwardly extending tool means connected to said support means and the lower side of said support means being flanged and fitted with minimal clearance in a hole in said bottom plate to exclude soil, said lower side being positioned at substantially the same level as the bottom plate and having connecting means fastened to at least one downwardly extending tine.

4,043,402

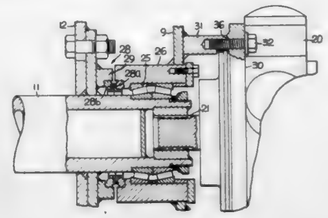
SOIL STABILIZER MACHINE WITH DETACHABLE HYDRAULIC MOTOR STRUCTURE DRIVING ROTATABLY MOUNTED CUTTING ELEMENTS

Albert W. Nelson, Springfield, Ohio, assignor to Koehring Company, Milwaukee, Wis.

Continuation of Ser. No. 561,225, March 24, 1975, abandoned, which is a division of Ser. No. 483,885, June 27, 1974, Pat. No. 3,907,038, which is a division of Ser. No. 398,315, Sept. 18, 1973, Pat. No. 3,865,195, which is a division of Ser. No. 269,228, July 5, 1972, Pat. No. 3,795,279. This application Mar. 3, 1976, Ser. No. 663,535

Int. Cl.[2] A01B *33/02*

U.S. Cl. 172—112 **8 Claims**



1. A soil working machine: a chassis, traction wheels for said chassis, an engine on said chassis, a hydraulic pump on said chassis driven by said engine, and a soil stabilizer unit connected to said chassis, said unit comprising: a supporting frame connected to said chassis and vertically movable with respect to said chassis, said supporting frame comprising a horizontally disposed cross tube and a pair of spaced apart rearwardly extending lifting arms rigidly connected to said cross tube, means for moving said supporting frame to fixed positions with respect to said chassis, a mixing chamber hood mounted on said supporting frame, a horizontally disposed rotor with cutting elements thereon rotatably mounted on said supported frame and located within said hood, said rotor being rotatably mounted between said lift arms, bearing means on said lift arms for rotatably supporting said rotor, at least one detachable hydraulic motor located exteriorly of said hood for driving said rotor, said hydraulic motor comprising a motor housing and a rotatable drive shaft, means for releasably connecting said motor housing to said supporting frame, means for releasably connecting said drive shaft to one end of said rotor, said releasable connecting means comprising said rotor and said drive shaft being formed such that an axial opening in one of said rotor and said drive shaft matingly and frictionally receives an axial projection extending from the other of said rotor and said drive shaft and means for supplying said motor with operating fluid from said pump to drive said motor and said rotor connected thereto.

4,043,403

AGRICULTURAL IMPLEMENT FRAME ELEVATING MECHANISM

Carl M. Anderson, and Charles W. Anderson, both of Kewanee, Ill., assignors to Chromalloy American Corporation, St. Louis, Mo.

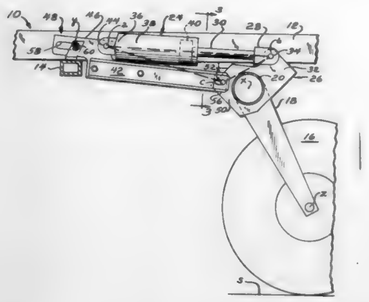
Filed Mar. 23, 1976, Ser. No. 669,485

Int. Cl.[2] A01B *65/06*

U.S. Cl. 172—413 **11 Claims**

1. In an agricultural implement having a frame, a wheel-supporting arm journalled on the frame for rotation on an axis extending transversely of said frame, and torque means actuatable to swing the wheel supporting arm on said axis and thereby to effectively raise or lower a wheel supported on said arm relative to the implement frame, said torque means comprising a pair of angularly displaced radial arms rigidly fixed to the wheel supporting arm to turn therewith on said axis, a cradle embodying a rigid member having one end pivotally connected to one of said radial arms at a location herein desig-

nated *c*, and mounting means pivotally connecting the other end of the cradle rigid member to the implement frame remote from said axis, and a length-adjustable member having one end pivotally connected to the other of said radial arms at a location herein designated *b* and its opposite end pivotally connected to the cradle rigid member at a location herein designated *a* which is spaced from said axis, the spacing of *a* from *c* and *c* from *b* remaining constant as the spacing of *a* from *b* changes in response to extension and retraction of said leng-



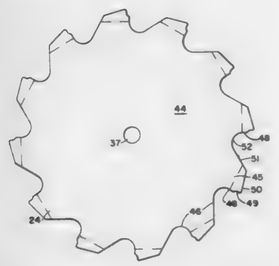
thadjustable member so as to apply torque to the wheel supporting arm through the other of said radial arms, and said mounting means accommodating movement of the cradle rigid member generally lengthwise of the implement frame in response to extension and retraction of the lengthadjustable member, said mounting means limiting displacement of the pivotal connection of the cradle rigid member to the implement frame in directions transversely of said generally lengthwise movement of the cradle rigid member.

4,043,404

TILLAGE APPARATUS HAVING IMPROVED CUTTING AND DRIVE STRUCTURE

Donald Thomas Sorlie, Ankeny; David Hoffer Bucher, and Gail Russell Sutherland, both of Des Moines, all of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 15, 1976, Ser. No. 649,279
Int. Cl.[2] A01B *21/02*
U.S. Cl. 172—555 **6 Claims**



1. In a tillage apparatus, a cutter wheel for cutting a trench in soil comprising:

a thin flat disc having a periphery and a body, the opposite faces of which define closely spaced parallel planes; and

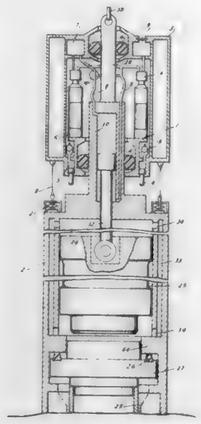
a plurality of teeth at the periphery of and integral with said disc and having alternate teeth offset in opposite axial directions with respect to the disc body, said teeth extending outwardly at the periphery of said disc and angularly spaced at least 15° apart, said teeth having radially extending leading cutting edges movable in a circular path, and inwardly extending rear edges, each of the latter being composed of a first portion that joins in a trailing relationship with and beginning at the respective cutting edge and is inclined inwardly for the entirety of its extent with respect to the aforesaid circular path, a second inclined portion that continues inwardly at a larger angle from said first portion, and an arcuate portion that joins said second portion and the cutting edge of an adjacent tooth.

4,043,405

PILE-DRIVING ARRANGEMENT

Hans Kühn, Hamburg, Germany, assignor to Koehring GmbH, Ellerau, Germany

Filed Nov. 17, 1975, Ser. No. 632,424
Claims priority, application Germany, Nov. 16, 1974, 2454488; Nov. 16, 1974, 2454521; Aug. 30, 1975, 2538642
Int. Cl.[2] B25D *9/00;* **E21B** *1/00*
U.S. Cl. 173—127 **51 Claims**



1. A pile-driving arrangement for driving piles both above and below water, comprising, in combination, a housing containing a gas-filled motion chamber; an impact body movable upward and downward in the motion chamber; a cylinder-and-piston mover comprised of a cylinder part and a piston part, one part being connected with the housing and the other part with the impact body for effecting relative movement between the impact body and the housing; a drive unit on the housing, the drive unit including a drive motor, a pressure fluid pump driven by the drive motor, and a pressure fluid tank; connecting means connecting the drive unit with the housing for limited movability relative to the housing, and including means for resisting movement of the drive unit relative to the housing in at least one vertical direction; and means interconnecting the cylinder part and the pressure fluid pump including flexible conduits leading from the pump to the opposite working chambers of the cylinder part and a direction-changing device for controlling fluid flow through the conduits.

4,043,406

CHANCE DEVICE FOR BOARD RACING GAME

Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055

Filed July 11, 1975, Ser. No. 595,328
Int. Cl.[2] A63F *9/00;* **A63H** *13/20*
U.S. Cl. 273—138 R **16 Claims**

1. A device for providing simultaneous circular and random radial action in a single plane to a toy which comprises,

a. a platen,

b. a base,

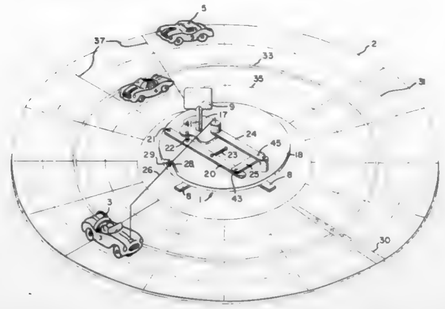
c. a toy,

d. a motor,

e. means secured to said base forming a first axis and first means rotatable about said first axis under power of said motor to rotate said platen about said first axis,

f. second means rotatable about a second axis different from said first axis,

g. third means coupled to said first and second means for rotating said second means, and



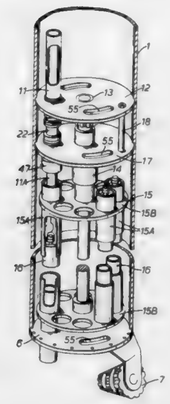
h. means including said platen responsive to rotation of said first and second means coupled to said toy to provide said circular and random radial movement in a single plane to said toy in said plane.

4,043,407

DRILLING SAMPLING/TESTING EQUIPMENT

John William Wilkins, Hounslow, England, assignor to Taywood Seltrust Offshore, England

Filed Feb. 6, 1976, Ser. No. 655,982
Claims priority, application United Kingdom, Feb. 6, 1975, 5173/75
Int. Cl.[2] E21B *7/12;* **E21C** *1/00*
U.S. Cl. 175—50 **8 Claims**



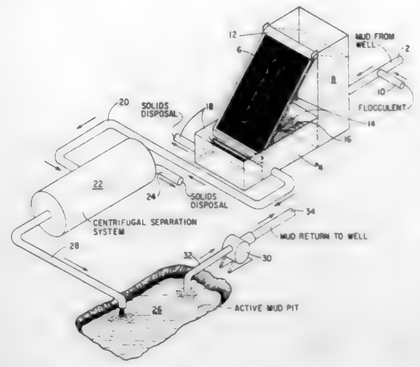
1. Drilling, sampling and testing equipment comprising a drill; a plurality of sample receivers and a testing means mounted for entering with the drill a bore being drilled by the drill, the sample receivers being movable so as successively to be disposed at a sampling station and the testing means being movable to be disposed at a testing station adjacent said sampling station; first means for operating that sample receiver disposed at said sampling station to obtain a sample therein; second means for operating the testing means to effect testing; and third means, arranged to be actuated in dependence upon sample receiver operation effected by said first means to move the so-operated sample receiver with its obtained sample away from said sampling station and to move the next successive sample receiver to said sampling station whereby samples can be obtained by successive sample receivers at successive levels in a bore hole during drilling of the bore hole; said second means being operable such that sampling and testing can be carried out at the same time.

4,043,408

APPARATUS FOR REMOVING CONCRETE AROUND EXPOSED REINFORCING ROD

William Dale Griffin, 3601 Jefferson Ave., Texarkana, Arkansas 75501

Filed June 18, 1976, Ser. No. 697,694
Int. Cl.[2] E21C *13/06*
U.S. Cl. 175—416 **2 Claims**



1. Apparatus for removing concrete around the exposed portion of a reinforcing rod or the like, said apparatus comprising:

an elongated drill shaft having a central opening adapted to be slidably positioned over the exposed portion of the rod,

a cutting head having a plurality of substantially radially outwardly extending teeth secured to the leading end of said drill shaft and adapted to surround the inner end of the exposed portion of the rod to remove the concrete surrounding said rod when said drill shaft is moved on said rod in a predetermined manner, and

one of said teeth extending outwardly a greater distance than the other teeth to cut an enlarged section in the concrete when said drill shaft is moved in a predetermined manner for accommodating a means for cutting the exposed portion of the rod beneath the surface of the concrete.

4,043,409

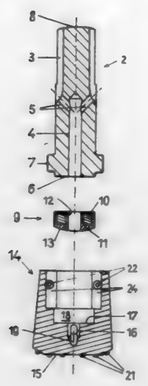
DRILL STEEL FOR DEEP DRILL HAMMERS

Hans-Philipp Walter, Fabrikant, deutscher Staatsangehoriger, Neissestrasse 1 D-3570, Stadt Allendorf 1, Germany

Filed Mar. 22, 1976, Ser. No. 669,119
Claims priority, application Germany, Mar. 22, 1975, 2512784
Int. Cl.[2] E21B *17/00;* **E21C** *15/00*
U.S. Cl. 175—321 **33 Claims**

1. A steel drill device for down-hole drills, with a bore crown widened out in the direction of the working surface and fitted with flush bores, cavities and hard metal inserts, especially X cutting edges, ribs and buttons, and having a shaft with longitudinal grooves on the outside, the cross-section of which is smaller in comparison with the bore crown, the bore crown being in the form of a wear bit interchangeably connected to the shaft with flexible cushioning, wherein the latter is a resil-

ient pad located under stress between the end of said shaft and an inner face of said wear bit, and wherein said resilient pad



and said wear bit are penetrated at least partly by a central passage.

4,043,410

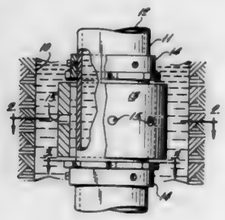
ANTI-STICKING TOOL FOR DRILL PIPE

John D. Bennett, Denton, and Thomas W. Gallier, Plano, both of Tex., assignors to Suntech, Inc., St. Davids, Pa.

Filed July 12, 1976, Ser. No. 704,711

Int. Cl.[2] E21B *17/10*

U.S. Cl. 175—323 **7 Claims**



1. An anti-sticking tool for use with a drill string in a wellbore subject to differential pressures from the pressurized drilling mud and the wellbore formation, great enough to cause a section or sections of a drill string to become stuck against the side of the wellbore, comprising:

a. means, rotatably mounted, for surrounding a predetermined portion of the drill string, so that upon rotation of the drill string section when it is resting against part of the inside of said surrounding means, drilling mud within the wellbore is displaced inside the space between the drill string section and the surrounding means to provide lubrication between the two objects and to maintain the drill string section away from the wellbore wall, thereby minimizing the effect of the differential pressures upon the drill string section;

b. said surrounding means also having a plurality of openings passing therethrough from its inside wall near the drill string section to its outside wall, so that when the drill string section is pressed against part of the inside wall of the surrounding means due to differential pressures in the wellbore, rotation of the drill string causes drilling mud to be pumped through these openings from the inside wall to the outside wall, thereby reducing the effects of differential pressures; and

c. means for restricting the movement of the surrounding means along the longitudinal axis of the drill string.

4,043,411

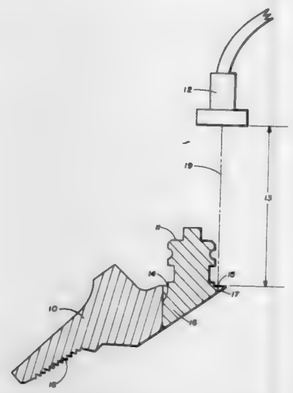
ROTARY ROCK BIT WITH THE BEARING PIN FUSED TO THE ROCK BIT ARM

Carl Laurent Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 12, 1976, Ser. No. 741,167

Int. Cl.[2] E21B *9/08*

U.S. Cl. 175—369 **13 Claims**



1. A method of constructing a rotary rock bit, comprising the steps of:

providing a rock bit arm, said rock bit arm having a side with a shirttail surface and a side with a cutter receiving surface;

providing a bearing pin, said bearing pin having a bearing section and a mounting section with at least a portion of said mounting section being larger in diameter than said bearing section;

providing a mounting passage in said rock bit arm, said mounting passage extending from said cutter receiving surface;

positioning said mounting section of said bearing pin in said mounting passage of said rock bit arm thereby forming a seam between said mounting section of said bearing pin and said mounting passage in said rock bit arm;

aligning a beam of energy with said seam and directing said beam of energy into said seam from the side of the rock bit arm having said cutter receiving surface;

causing relative movement between said beam of energy and said seam to fuse said bearing pin to said rock bit arm; and

mounting a cutter upon said bearing pin.

4,043,412

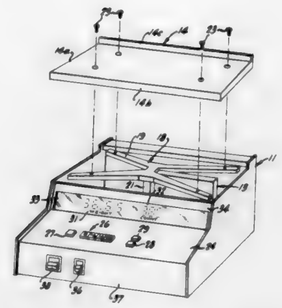
COUNTING SCALE AND METHOD

Frank C. Rock, Santa Rosa, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.

Continuation-in-part of Ser. No. 510,467, Sept. 30, 1974, Pat. No. 3,951,221. This application Mar. 22, 1976, Ser. No. 668,855

Int. Cl.[2] G01G *19/04*

U.S. Cl. 177—25 **15 Claims**



15. In an electronic counting scale: a base, a load cell mounted on the base for providing electrical signals corresponding to the forces applied thereto, a platform mounted on and supported by the load cell for successively receiving a sample consisting of a predetermined number of articles and a load consisting of an unknown number of the articles, and signal processing means including a microprocessor responsive to the load cell signals produced by the sample and the load for delivering an output signal corresponding to the number of articles in the load.

4,043,413

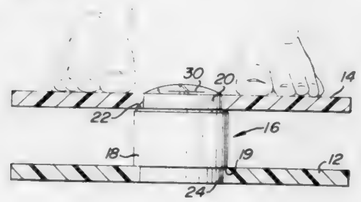
PORTABLE AND COLLAPSIBLE BATHROOM-TYPE SCALE

Susan M. Schaenen, 145 Central Park West, New York, N.Y. 10023

Filed May 7, 1976, Ser. No. 684,443

Int. Cl.[2] G01G *21/00, 21/22*

U.S. Cl. 177—126 **9 Claims**



1. A portable and collapsible scale, comprising a base plate adapted to rest on a support surface, a receptacle in said base plate, a weighing unit having a portion thereof complementally shaped with respect to said receptacle and adapted to be received therein when said scale is operatively disposed, and an upper plate removably engagable with said weighing unit and in spaced parallel relation to said base plate when said scale is operatively disposed, said weighing unit having weight readout means thereon readable from above said upper plate when said upper plate is operatively disposed.

4,043,414

WEIGHING SCALE WITH COMPENSATING WEIGHTS

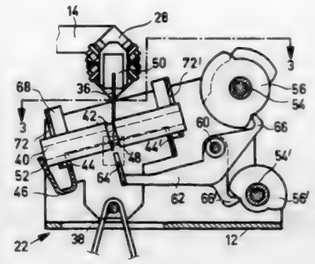
Andreas Stutz, Aathal, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed June 17, 1976, Ser. No. 697,026

Claims priority, application Switzerland, Aug. 15, 1975, 10649/75

Int. Cl.[2] G01G *21/26*

U.S. Cl. 177—248 **12 Claims**



1. In a weighing scale including a support; weighing pan means for receiving an object to be weighed; suspending means for suspending said weighing pan means from said support and for thereby transmitting gravitational force to said support; adjusting means for adjusting said force to a value similar to a predetermined value and including a carrier fastened to said weighing pan means, a plurality of compensating weights, and shifting means on the support for shifting each of said weights to and from a position of load transmitting engagement with said carrier; and indicating means for indicating a difference between said similar value and said predetermined value, the improvement in said adjusting means which comprises:

a. guide means on said carrier, each of said compensating weights being elongated, and said guide means defining respective paths of longitudinal sliding movement for said compensating weights, said paths being obliquely inclined relative to the horizontal when said pan means with the fastened carrier is suspended from said support by said suspending means; and

b. stop means on said carrier limiting said sliding movement of each compensating weight to a fixed, lowermost position of said load transmitting engagement.

4,043,415

PRECISION BALANCE WITH PAN ASSEMBLY GUIDED BY PARALLELOGRAM LINKAGE HAVING TWO FLEXIBLE MEMBERS

Paul Lüchinger, Greifensee, Switzerland, assignor to Mettler Instrumente AG, Greifensee-Zurich, Switzerland

Filed June 24, 1976, Ser. No. 699,492

Claims priority, application Switzerland, Oct. 10, 1975, 13207/75

Int. Cl.[2] G01G *21/24*

U.S. Cl. 177—255 **10 Claims**

1. A precision balance comprising:

a. a support assembly;

b. a weighing pan assembly;

c. guide means for guiding said weighing pan assembly relative to said support assembly in a path of movement having a predominant vertical component when said balance is in the operating position thereof, said guide means including

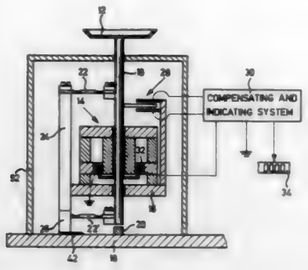
1. two elongated, transversely flexible link members transversely spaced in a vertical direction,

2. each link member having a first end portion secured to said support assembly and a second end portion secured to said weighing pan assembly; and

d. adjusting means for moving at least one of said link members toward and away from a position in which the respec-

tive directions of elongation of said link members are parallel, said adjusting means including

1. a first adjusting member and a second adjusting member, said adjusting members being mounted on said support assembly for movement by manual operation,
2. first and second motion transmitting means respectively interposed between said first and second adjusting members and said at least one end portion for moving the associated end portion in response to movement of the associated adjusting member,



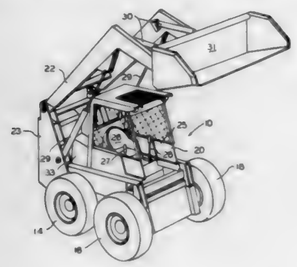
3. the movement of the end portion associated with said first motion transmitting means in response to a movement of predetermined magnitude of said first adjusting member being greater than the movement of the end portion associated with said second motion transmitting means in response to a movement of said second adjusting member of a magnitude identical with said predetermined magnitude.

4,043,416

SKID-STEERED TRACTOR VEHICLE COMBINED STEERING LEVER AND AUXILIARY CONTROL WITH SELF-CENTERING MECHANISM

Larry E. Albright, Gwinner; James J. Bauer, Lisbon, and Earl W. Cramton, Gwinner, all of N. Dak., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Nov. 26, 1975, Ser. No. 635,559
Int. Cl.[2] B62D *11/04*
U.S. Cl. 180—6.48 **6 Claims**



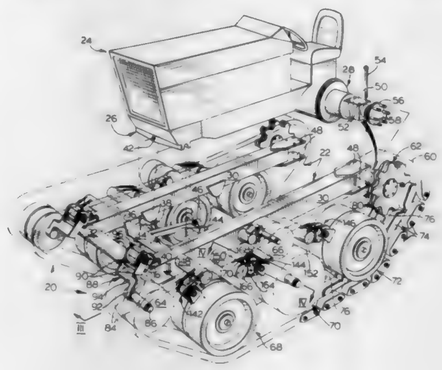
3. A skid-steered tractor vehicle propelled and steered by driving ground-engaging wheels on one side at different speeds or directions from ground-engaging wheels on the opposite side so as to effect skid turns having separate right and left hydrostatic drives propelling and maneuvering the vehicle in forward and reverse directions, each said hydrostatic drive comprising a variable displacement pump having a swash plate normally biased to a zero displacement position and which is variable from said zero displacement position to maximum displacement positions in either direction for producing forward and reverse drive, right and left steering levers, one on each side of the driver's compartment associated with the right and left hydrostatic drives, first and second rotatable shafts connected to the right and left steering levers and operatively connected to the swash plates of the variable displacement pumps of the right and left hydrostatic drives, the improvement comprising a drive shaft for driving the pumps in axially aligned relationship, a swash plate control arm associated with each pump swash plate, a shaft connecting each swash plate control arm and the associated swash plate projecting from each pump on one side of the common pump axis each being independently rotatable by the swash plate control arm for varying the displacement position of the swash plate, first and second links connected to the first and second rotatable shafts, a centering mechanism including an elongated centering element shiftable parallel to the common pump axis, yieldable means urging said element in one direction, and a pair of camming elements carried on said centering element in longitudinally spaced relationship so as to be engageable with each of the swash plate control arms, each said camming element having a pair of camming projections making engagement with each said swash plate control arm on opposite sides of the rotational axis thereof whereby the rotation in either direction from the zero displacement position of either swash plate control arm engages one of said camming projections forcing said centering element to a shifted position against the force of the yieldable means whereby the centering element returns to its predetermined centered position upon release of the steering lever restoring the swash plates to neutral position.

4,043,417

TRACKED VEHICLE SUSPENSION SYSTEMS

Robert J. Orpana, Ste. Foy, Canada, assignor to Panatrac Manufacturing Corporation Limited, Toronto, Canada

Filed June 9, 1976, Ser. No. 694,103
Int. Cl.[2] B60G *11/22;* **B62D** *55/00*
U.S. Cl. 180—9.54 **10 Claims**



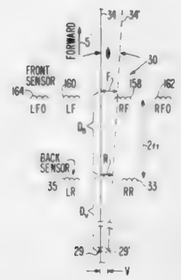
1. A tracked vehicle comprising:
a chassis supporting a power unit;
two track assemblies disposed at respectively opposite sides of said chassis and each including: an endless track; means for guiding the track in a closed path including a lower portion along which the track runs in contact with the ground; means drivably coupling the power unit and the track for driving the track in said path to propel the vehicle in use; and a plurality of ground wheels rotatable about axes normal to the forward direction of vehicle movement and arranged in rolling contact with the track along said ground-contacting portion of its path; and
a suspension system comprising:
in association with each of said track assemblies, a plurality of suspension arms, each rotatably supporting one of said ground wheels; and
a corresponding plurality of torsion cells, each coupling one of said arms to said chassis; each torsion cell comprising: an inner member having an outer surface which is of non-circular shape and which extends about a longitudinal axis of the member; an outer tubular member having an inner surface which is of non-circular shape and which extends about said longitudinal axis, said outer member extending around said inner member to define a space between said members; a resilient elastomeric material disposed in said space and torsionally coupling said members; and a plurality of elongate elements extending longitudinally of and spaced equally about said outer surface of the inner member of the cell to mechanically key the inner member to said elastomeric material and provide, on said inner member, spaced stress-distribution surfaces tending to equalize throughout the elastomeric material, stresses produced in said material in response to relative turning movement between said inner and outer members when the cell is in use;
each said torsion cell being coupled to the chassis of the vehicle by one of its said inner and outer members so that the longitudinal axis of the cell extends parallel to the axis of rotation of the associated wheel and the other member of each cell being coupled to the relevant wheel suspension arm so that said arm defines an obtuse angle with respect to the direction of vehicle movement, whereby vertical travels over obstructions in use causes relative turning movement between said inner and outer members of the associated torsion cells and torsionally stresses the elastomeric material of the cell.

4,043,418

REVERSE DIRECTION GUIDANCE SYSTEM FOR LIFT TRUCK

Thomas R. Blakeslee, Woodside, Calif., assignor to Logisticon Inc., Sunnyvale, Calif.

Continuation-in-part of Ser. No. 629,491, Nov. 6, 1975. This application Dec. 29, 1975, Ser. No. 644,549
Int. Cl.[2] B62D *1/28*
U.S. Cl. 180—98 **10 Claims**



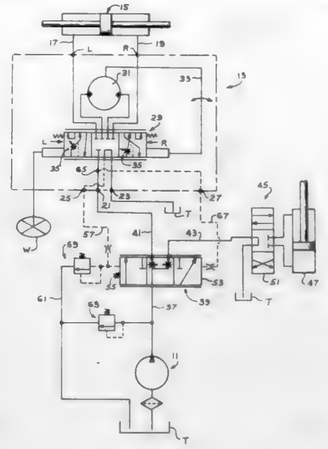
1. An improved, self-guided vehicle of the type which automatically follows an externally defined path in a forward direction and which has at least one ground engaging steerable wheel, sensor means mounted on the vehicle for generating a position error signal representative of the position of the vehicle with respect to the path, steering actuator means attached to the ground engaging steering wheel for steering the vehicle in response to a steering control signal to the steering actuator means, and steering circuit means supplied with the position error signal for generating a first steering control signal for the steering actuator means to cause the steering actuator means to automatically steer the vehicle along the external path, wherein the improvement comprises:
sensor means for generating the position error signal relative to a virtual sense point to the rear of the vehicle to guide the vehicle when it travels in a backward direction along the path.

4,043,419

LOAD SENSING POWER STEERING SYSTEM

Bernard J. Larson, New Hope; Oliver Wendell Johnson, Chaska, and James Kwok-fun Yip, Richfield, all of Minn., assignors to Eaton Corporation, Cleveland, Ohio

Filed June 4, 1976, Ser. No. 693,052
Int. Cl.[2] B62D *5/08;* **F15B** *11/16*
U.S. Cl. 180—132 **18 Claims**



1. A fluid control system for selectively effecting actuation of a power steering motor to steer vehicle wheels and an auxiliary device, said system comprising:
a. source of pressurized fluid;
b. a steering control valve disposed in series flow relationship between said fluid source and the steering motor, said steering control valve defining an inlet port and including valving movable selectively from a neutral position to right turn and left turn positions, a fluid meter including a metering element movable to measure the volume of fluid passing therethrough, and means coupling said metering member and said valving to impart follow-up movement thereto responsive to movement of said metering member;
c. said steering control valve and said valving defining fluid passage means including a first variable orifice operable to establish a fluid flow rate through said passage means, a second orifice operable to establish a fluid flow direction through said fluid meter, and a third orifice disposed between said fluid meter and the steering motor;
d. a flow control valve disposed in series flow relationship between said fluid source and said first variable orifice of said steering control valve, said fluid source comprising the sole source of pressurized fluid for actuation of the power steering motor and the auxiliary device, said flow control valve including an inlet port in fluid communication with said fluid source, a steering outlet port in fluid communication with said first variable orifice of said steering control valve, and an auxiliary outlet port in fluid communication with the auxiliary device;
e. said flow control valve including valve means disposed to control fluid flow from said inlet port to said outlet ports, and means biasing said valve means toward a position permitting substantially all of the system flow to pass from said inlet port to said steering outlet port;
f. meanns communicating a first pressure signal from immediately downstream of said first variable orifice to exert a biasing force on said valve means in the same direction as said biasing means; and
g. means communicating a second pressure signal from immediately upstream of said first variable orifice to exert a biasing force on said valve means in opposition to that of said biasing means to maintain a generally constant pres-

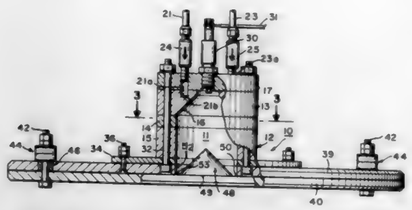
sure drop across said first variable orifice as said fluid flow rate varies between a minimum and a maximum.

4,043,420

HIGH FREQUENCY GAS DETONATOR

René Joseph Louis Zens, and William W. Horsman, both of Houston, Tex., assignors to William W. Horsman, Houston, Tex.

Filed May 5, 1975, Ser. No. 574,740
Int. Cl.[2] G01V *1/38*
U.S. Cl. 181—117 **2 Claims**



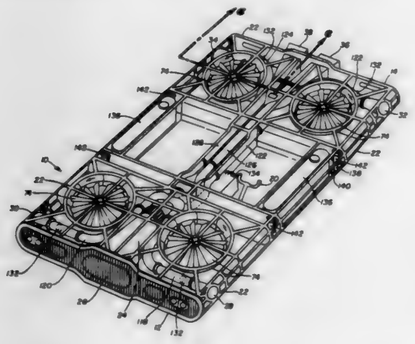
1. A detonator comprising:
a bottom plate adapted to be coupled to a medium,
a top plate positioned over said bottom plate, said top plate having a bore;
a plurality of springs interconnecting and resiliently urging the plates toward and against each other;
a housing defining a detonation chamber having a bottom vent port opposite to and communicating with said bore, said housing being mounted above said top plate, whereby said bore is normally closed by said bottom plate;
fluid inlet means communicating with said chamber for admitting a charge of detonating fluid into said chamber and
means for detonating the fluid inside said chamber, thereby causing a momentary separation of and the formation of a cavity between said plates, and said vent port exhausting the gaseous products of combustion from said chamber through said cavity to the ambient medium.

4,043,421

AIR CAR

Lonnell E. Smith, 613 E. 51st Pl. N., Tulsa, Okla. 74126

Filed Nov. 12, 1975, Ser. No. 631,109
Int. Cl.[2] B60V *1/00*
U.S. Cl. 180—117 **4 Claims**



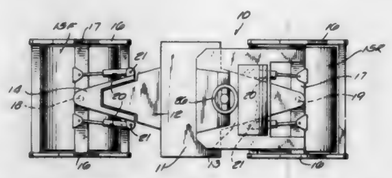
1. A vehicle capable of flying above the surface of the ground above the ground effect distance comprising a substantially rectangular frame structure defining a front end, a rear end, lateral side ends, a top and a bottom; a turbine engine mounted in the forward end of said vehicle and having an intake opening leading thereto at the forward end of said vehicle, a pair of rearwardly directed exhaust ports located adjacent the center of the rear of said vehicle and connected to the exhaust of said turbine, a pair of lateral exhaust openings adjacent the forward end of said vehicle and connected to the exhaust of said turbine, a pair of lateral exhaust ports located adjacent the rear of said vehicle and connected to the exhaust of said turbine, a pair of spaced fan assemblies mounted at the forward end of said vehicle and adjacent the sides thereof adapted to draw air from above said vehicle and force the same downwardly through openings at the bottom of said vehicle, a second pair of spaced fan assemblies mounted adjacent the rear of said vehicle and adjacent the sides thereof for drawing air from above the vehicle and forcing the same downwardly through openings at the bottom of said vehicle, means connected to the output of said turbine for driving said fan assemblies in unison, the fans adjacent one side of said vehicle rotating in a given rotary direction and the fans on the opposite side of said vehicle rotating in a direction opposite to said given rotary direction, each fan assembly including a plurality of horizontally and radially extending fan blades mounted for pivotal movement along a substantially horizontal pivot axis, each fan blade being pivotal around said horizontal pivot axis and means for pivoting the fan blades of the fan assemblies, and means for selectively restricting the flow from the exhaust ports of each diagonally opposite pair of exhaust ports, each fan assembly including a substantially vertical fan shaft, an inner hub mounted on said fan shaft, an outer hub spaced from said inner hub, each fan blade having an axle, one end of said axle being received in an opening in the inner hub and the opposite end of said axle being received in an opening in said outer hub, a yoke slidably mounted on said fan shaft above said inner hub, said yoke having a plurality of vertical rodes extending downwardly therefrom, each rod having an opening adjacent the lower end thereof, a pin received on the inner end of each fan blade adjacent the inner end of the axle thereof, each pin being adapted to be received in an opening at the lower end of an adjacent vertical rod, whereby, upon vertical reciprocation of said yoke, all of said fan blades can be turned around their axles in unison, and operator means for moving said yoke upwardly and downwardly along said fan shaft.

4,043,422

STEERING SYSTEM FOR ARTICULATED VEHICLES

John C. Barrett, Rogers, and Gerald T. Gfroerer, New Hope, both of Minn., assignors to Raygo, Inc., Minneapolis, Minn.

Filed Nov. 19, 1976, Ser. No. 743,394
Int. Cl.[2] B62D *5/08*
U.S. Cl. 180—140 **9 Claims**



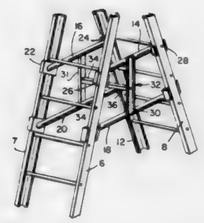
1. A fluid pressure responsive steering system for vehicles having transmission means by which the direction of travel of the vehicle is manually selectable, and having a steerable ground-engaging unit at each end of its chassis, so that by operator-controlled, power effected steering adjustment of said steerable units with respect to one another and the chassis, the progress of the vehicle over the ground in either a forward or a rearward direction can be steered, said system comprising:
A. reversible hydraulic motor means drivingly connected with each of said steerable units, operable to impart steering adjustment thereto;
B. manually operable steering valve means by which the functioning of said motor means may be commanded;
C. hydraulic circuit means having said manually operably steering valve means incorporated therein, for conducting pressure fluid to said motor means from a source thereof in response to and under control of manual actuation of said steering valve means;
D. disabling valve means for each of said motor means connected in said hydraulic circuit means, operable when in its operative condition to render its respective motor means unresponsive to fluid pressure in said hydraulic circuit means;
E. check valve means connected in said hydraulic circuit means between each of the disabling valve means therein and its respective motor means, operable as a consequence of said disabling valve means being in its operative condition to prevent the flow of fluid to or from the motor means and thereby lock said motor means in the position to which it moved in response to its last steering command; and
F. control means operatively connected with said disabling valve means for governing the condition thereof,
said control means being operatively connected with the vehicle transmission to automatically render one of said disabling valve means operative without affecting the other when the transmission is shifted to effect forward travel of the vehicle and vice versa when it is shifted into reverse, so that steering of the vehicle is effected by one of said motor means during travel of the vehicle in one direction and by the other of said motor means during travel of the vehicle in the opposite direction.

4,043,423

DEVICE FOR CONVERTING AN EXTENSION LADDER INTO A STEPLADDER

Norman Elias, 265-06, 80th Ave., Floral Park, N.Y. 11004, and Joseph Quinn, 326 Highland Ave., Kearny, N.J. 07032

Filed Aug. 24, 1976, Ser. No. 717,144
Int. Cl.[2] E06C *1/18, 1/24*
U.S. Cl. 182—22 **3 Claims**



1. A device for converting an extension ladder into a stepladder, comprising means for bracing a pair of spaced diverging top portions of a pair of extension ladder sections, said means comprising a pair of spaced clamping members having means for spacedly engaging opposite top portions of the extension ladder sections and adjustable means for securing said bracing means in rigid engagement with the opposite top portions of the extension ladder sections, wherein each of said pair of clamping members comprises a pair of spaced upper and lower bars, a channel securing each said pair of bars to one another midway of said bars and U-shaped clamp elements secured to each of the ends of said bars.

4,043,424

KNEELING APPARATUS FOR CEMENT MASONS

Auther Lee Crain, 9805 Anderson Mill Road, Austin, Tex. 78759

Filed June 7, 1976, Ser. No. 693,425
Int. Cl.[2] E04G *1/00;* A43B *3/00*
U.S. Cl. 182—230 **6 Claims**

1. A kneeling apparatus comprising
first and second platform means for independently supporting the knees and feet of a user;
first and second handle means fixedly attached to each of said platform means for relocating said platform means, one with respect to the other;
each of said platform means comprising a tray having upstanding peripheral side walls,



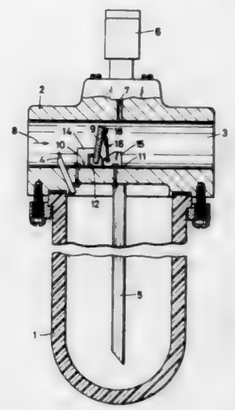
said trays being usable in spaced-apart relation such that one of said trays receives the knees of the user and the other receives the feet of the user,
each of said trays being generally trapezoidal in shape with said handle means being attached to the truncated end portion of each of said trays, respectively.

4,043,425

OIL SPRAYING DEVICE

Gerhard Schützer, Stuhr-Moordeich, Germany, assignor to Gustav F. Gerdts KG, Bremen, Germany

Filed Feb. 25, 1976, Ser. No. 661,181
Claims priority, application Germany, Apr. 4, 1975, 2515447
Int. Cl.[2] F01M *1/08;* F16N *7/34*
U.S. Cl. 184—55 A **8 Claims**



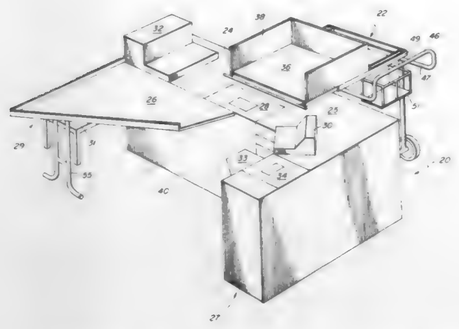
1. In an oil spraying device for the admixing oil with compressed air, said device including an oil container, a housing including an abutment, a passage line for the passage of the compressed air and a control flap including pivot prongs for pivotal support thereof in said passageway for automatically changing the free cross-sectional area of said passage line in dependence upon the pressure of the compressed air flowing therethrough, aid prongs defining a pivot axis, and a shank spring having two shank ends for loading said control flap in a locking direction, one of said shank ends being coupled with said control clap, and the other of said shank ends being coupled with said abutment, the improvement comprising:
means pivotally supporting and loosely coupling said one shank end on said control flap;
means pivotally supporting and loosely coupling said other shank end on said abutment; and
said shank spring including at least one spring winding connected with each said shank ends, said at least one spring winding being mounted outside of said pivot axis and being freely movable to change the effective leverage imparted by said shank spring onto said control flap.

4,043,426

COMBINATION CART-CHECKSTAND

David C. Verkler, 6 Nottingham Court, Montvale, N.J. 07645

Filed Oct. 26, 1976, Ser. No. 735,246
Int. Cl.[2] E04H *3/04*; B62B *11/00*
U.S. Cl. 186—1 AC **8 Claims**



1. A combination cart-checkstand for a merchandise checkout system in self-service stores comprising in combination:

a checkstand having a cash register, at least one bagging station, and having immediately adjacent to said cash register and bagging station provision for a cashier;

a merchandise cart comprising a frame having handles and having a merchandise basket slidably mounted on said frame such that said merchandise basket may be moved laterally toward said cashier's position;

said merchandise basket being substantially rectangular in shape and mounted by means of full suspension sliding rollers, and having one side which folds down and under said basket for easy removal of merchandise;

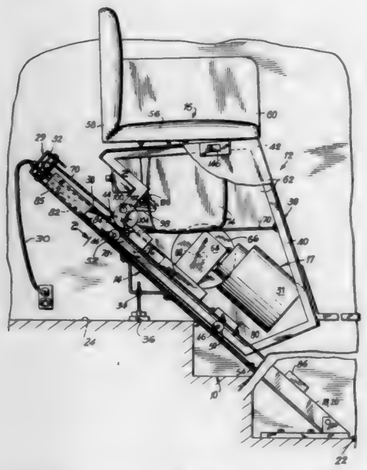
said merchandise basket when extended over said checkstand, serving as the merchandise holding and storage area of said checkstand during the checking and bagging operations.

4,043,427

STAIR ELEVATOR

Ray Ackerman, Rte. 292, Holmes, N.Y. 12531

Filed Mar. 19, 1976, Ser. No. 668,707
Int. Cl.[2] B66B *9/08*
U.S. Cl. 187—12 **4 Claims**



1. In a stair elevator, including a track having rails adapted for support on a stairway, a chair unit movable on the track, a reversible driving motor for moving said chair unit along the track, the improvement comprising:

a control switch mounted on the chair unit for operation by the user;

upper and lower limit switches automatically actuatable at the respective upper and lower ends of the track, and an emergency switch automatically actuatable at the upper end of said track;

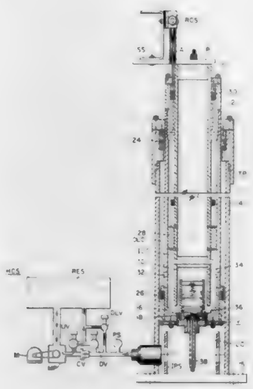
each of said limit and emergency switches comprising a switch contact assembly, and a cooperating individual magnet, the switch contact assembly or the cooperating individual magnet of both the upper limit switch and the emergency switch being mounted on said chair unit in closely spaced side-by-side staggered relationship and the other of said switch contact assembly or said cooperating individual magnet, being mounted on opposite sides of the switch contact assembly or the cooperating individual magnet mounted on said chair unit and between said rails, so that as the individual contact assemblies are moved relative to the individual cooperating magnets, the emergency switch is actuated after said upper limit switch has been actuated.

4,043,428

AUTOMATIC RECYCLE CONTROL FOR HYDRAULIC ELEVATORS WITH TELESCOPIC CYLINDERS

Lawrence Eugene White, Harrington Park, and Arthur Brantlyn Woolsey, Ridgewood, both of N.J., assignors to Otis Elevator Company, New York, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,520
Int. Cl.[2] F15B *11/18, 13/16*
U.S. Cl. 187—17 **5 Claims**



1. Apparatus for use with a hydraulic fluid elevator system operating an elevator car serving a plurality of landings and capable of causing the car to position itself at its lowest landing comprising:

a hydraulic telescoping piston arrangement having an outer cylinder, an intermediate piston and an inner piston supporting said car, said inner piston hydraulically sealed within and extendible from said intermediate piston and said intermediate piston hydraulically sealed within and extendible from said outer cylinder forming therein communicable longitudinal chambers containing a first body of hydraulic fluid;

hydraulic control means including a source of hydraulic fluid connected to said outer cylinder for transferring hydraulic fluid thereto from said source causing said intermediate piston and said inner piston to move relative to said outer cylinder;

a hydraulic valve assembly mounted on one end of said intermediate piston within said outer cylinder forming therein a lower chamber for receiving transferred hydraulic fluid from said source, said hydraulic valve assembly operable to a first position for separating said fluid containing communicable longitudinal chambers from said lower chamber thereby forming within said longitudinal chambers a closed fluid power transmission system operable to move said inner piston relative to said intermediate piston in response to the transfer of fluid between said hydraulic control means and said lower chamber, and said valve assembly operable to a second position for transferring hydraulic fluid between said fluid containing longitudinal chambers and said lower chamber; and

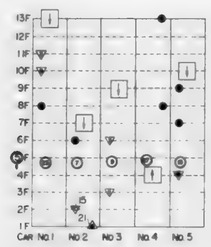
power control means responsive to the location of said car at its lowest landing actuating said hydraulic control means to cause said intermediate and inner piston to move downwardly relative to said outer cylinder to operate said hydraulic valve assembly to its second position to cause transferred hydraulic fluid to be supplied from said source through said lower chamber to said fluid containing longitudinal chambers when an insufficient amount of fluid exists within said longitudinal chambers, and to return said elevator car to its lowest landing when said fluid insufficiency no longer exists.

4,043,429

ELEVATOR CAR GROUP CONTROL SYSTEM

Kotaro Hirasawa; Soshiro Kuzunuki, both of Hitachi; Tatsuo Iwasaka, and Takashi Kaneko, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 30, 1975, Ser. No. 645,345
Claims priority, application Japan, Jan. 6, 1975, 50-43
Int. Cl.[2] B66B *1/18*
U.S. Cl. 187—29 R **7 Claims**



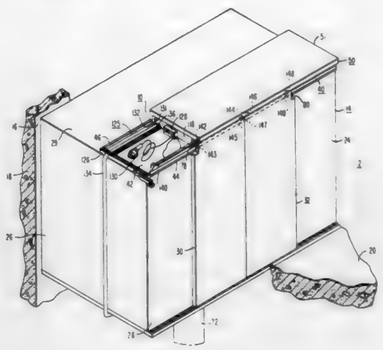
1. An elevator car group control system for controlling a plurality of elevator cars arranged for parallel operation for serving a plurality of service floor landings of a building, comprising hall call registering means disposed at the landing of each floor for originating hall calls, cage call registering means disposed in each said car for instructing target floors, waiting time display means disposed at the landing of each floor, means for selecting suitable ones of said cars for serving hall calls, means for allotting the hall calls to said selected cars, and means for forecasting the length of time required for each of said selected cars to arrive at the landing of each of the allotted hall call originating floors and displaying the forecast waiting time on each of said display means, said serving car selecting means comprising means for detecting for each said car the number of floors subject to change in forecast waiting time displayed at each of the already allotted floors when a new hall call is originated from one of the floors and one of the cars is selected to respond to the new hall call, and means for preferentically selecting the car detected to provide a smaller number of floors subject to change in displayed forecast waiting time than the others.

4,043,430

ELEVATOR SYSTEM HAVING COMMON ENCLOSURE FOR OPEN WIRING BETWEEN DOOR CONTROLS, CAR TOP INSPECTION STATION CONTROLS AND TRAVELING CABLE

Joseph K. Kraft; Robert A. Sette, both of Gettysburg, and Leigh F. Jackson, Fayetteville, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 608,481, Aug. 28, 1975, Pat. No. 4,004,655. This application May 6, 1976, Ser. No. 684,060
Int. Cl.[2] B66B *13/00*
U.S. Cl. 187—52 R **1 Claim**



1. An elevator system, comprising:

an elevator car having side, bottom and top portions with a passenger opening in a side portion thereof,

an enclosure on the top portion of said elevator car,

door operator controls in said enclosure,

said door operator controls including a drive motor, door position switches, and terminal blocks,

a traveling cable having a plurality of conductors, at least certain of which enter said enclosure,

and controls for a car top inspection station mounted on a wall of said enclosure,

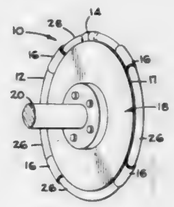
and open electrical wiring in said enclosure between said door operator controls, said controls for the car top inspection station, and said at least certain of the conductors of said traveling cable.

4,043,431

VIBRATION DAMPER AND METHOD OF MAKING THE SAME

Weldon B. Ellege, Conway, Ark., assignor to FMC Corporation, San Jose, Calif.

Continuation of Ser. No. 527,980, Nov. 29, 1974, which is a continuation of Ser. No. 446,565, Feb. 27, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,821
Int. Cl.[2] F16F *15/12*
U.S. Cl. 188—1 B **17 Claims**



1. A vibration damper for inhibiting resonant vibrations in a brake rotor during refacing, said damper comprising: an elastic band having a relaxed length less than the circumference of the

rotor; means for interconnecting the free ends of said band to form a loop; and a plurality of apertured weights strung on said elastic band, the outside diameter of said band in relaxed condition being larger than the apertures in said weights.

4,043,432

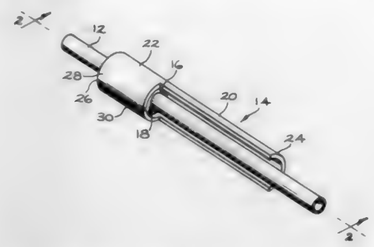
COMPACT VIBRATION DAMPER FOR A HERMETIC REFRIGERANT COMPRESSOR

Owen H. Scheldorf, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Continuation-in-part of Ser. No. 584,196, June 5, 1974, abandoned. This application Dec. 9, 1976, Ser. No. 748,910

Int. Cl.[2] F16F *7/10*

U.S. Cl. 188—1 B **1 Claim**



1. A compact, offset center of gravity type vibration damper for the exhaust conduit of a refrigerant compressor, which damper comprises:

an annular body of elastomeric material sized for encircling a portion of the conduit intermediate the ends thereof; and

a unitary element having clamping and mass portions, said clamping portion being generally cylindrical, deformable, and having a longitudinal slot to permit clamping about said elastomeric body without requiring access to the ends of the conduit, and said mass portion being longitudinally extended and semi-cylindrical with the cylindrical center of curvature substantially coincident with the longitudinal axis of the conduit;

whereby the center of gravity of said element is axially and radially offset from the point of attachment to said elastomeric body, and said damper is readily applied to the conduit.

4,043,433

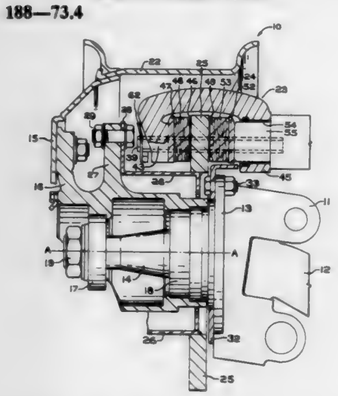
CALIPER BRAKE SLIDER SUPPORT

Jack D. Rainbolt, Troy, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Sept. 13, 1976, Ser. No. 722,985

Int. Cl.[2] F16D *55/224*

U.S. Cl. 188—73.4 **6 Claims**



1. A U-shaped slider support member for a caliper brake comprising spaced-apart, parallel, longitudinally extending rail members for sliding engagement with a transversely extending caliper member and transversely extending friction lining carriers, a separate tie bar connecting said rail members, said tie bar including a transversely extending plate member with a transversely extending first surface, the ends of said plate member having end flanges, said end flanges and said rail members extending generally perpendicular to said first surface in side-by-side relationship and each of said end flanges being fastened to one of said rail members.

4,043,434

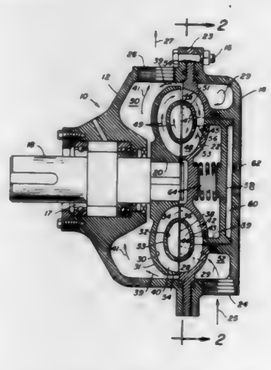
MECHANICALLY ADJUSTABLE DUAL POCKET HYDROMATIC BRAKE

Steve A. Braschler, Coffeyville, Kans., assignor to Parmac, Inc., Coffeyville, Kans.

Continuation-in-part of Ser. No. 501,772, Aug. 29, 1974, abandoned. This application Apr. 13, 1976, Ser. No. 676,487

Int. Cl.[2] F16D *57/04*

U.S. Cl. 188—296 **12 Claims**



1. In a hydro-kinetic brake means having at least a single rotor and a single stator each with an annular liquid pocket facing each other at the same circumferential distance from the axis of rotation and said rotor and stator spaced a selected distance apart, each pocket having a plurality of planar vanes extending radially across said pockets and tilted in said rotor in the direction of rotation of said rotor, and tilted in the opposite direction in the stator, the improvement comprising:

said annular pockets in said stator and said rotor each divided by walled surfaces into inner smaller and outer larger pockets the distance between the outer wall surface of said inner pocket and the inner wall surface of said outer pocket being constant, said inner and outer pockets having the same curved configuration, said vanes in said outer pockets continuing across said inner pockets;

conduit means in said vanes in said stator pockets, said conduit means having its liquid inlet at the back of said outer pockets in said stator and its liquid outlet radially located at the space between said rotor and stator within said inner pockets to provide initial continuous liquid flow into said inner pockets through the space between said stator and rotor, thence into each of said outer pockets during rotation of said rotor;

a cylindrical groove co-axial with the axis of rotation cut through the back of the stator and the vanes in the outer pocket, said groove being located such that the outer perimeter of said groove is within the radial location of said conduit outlets;

right circular cylindrical means, located within said groove, said cylindrical means being non-rotative and adapted to axially reciprocate in said groove;

said inner and outer pockets, said groove, and said cylindrical means located relative to each other such that a tangent to the curvature of the walled outer surface of said inner pocket and a tangent to the curvature of the walled inner surface of said outer pocket at their point of intersection with the outer surface of said cylindrical means will be perpendicular to said outer surface of said cylindrical means; and

means to reciprocate said cylindrical means.

4,043,435

ARRANGEMENT FOR ADJUSTING THE DAMPING FORCE OF A SHOCK ABSORBER

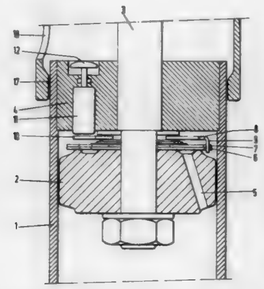
Cornelis DeKock, Oud-Beijerland, and Floris Hendrik Breure, Zuid-Beijerland, both of Netherlands, assignors to ITT Industries, Inc., New York, N.Y.

Filed May 6, 1976, Ser. No. 683,922

Claims priority, application Netherlands, June 2, 1975, 7506497

Int. Cl.[2] F16F *9/34*

U.S. Cl. 188—319 **6 Claims**



1. An arrangement for adjusting the damping force in the piston of a telescopic shock absorber comprising a cylinder having a cover enclosing a piston and a piston rod connected to said piston, said piston rod extending through said cylinder cover to be movable therethrough, the damping force of the shock absorber being determined by the position of an adjusting member rotatable about said piston, said adjusting member positioning closure members which regulate the size of a passage in the piston, said adjusting member being held in a position through engagement with a stop member in the end position of the piston near said cylinder cover, said stop member being movable axially in said cylinder cover and being engageable from outside said cylinder cover to assume an operative position through which by rotating said piston by means of said piston rod, rotation of the adjusting member is thereby prevented, the part of the piston rod extending outside said cylinder being surrounded by a coaxial protecting sleeve rotatable around said piston rod and connected at one end with said piston rod, said protecting sleeve completely surrounding the extending part of said piston rod when said piston is in the end position near said cylinder cover, and an opening in said protecting sleeve through which said stop member is accessible.

4,043,436

SUPPORT APPARATUS FOR ELECTRICALLY CONDUCTIVE RAIL

William R. Segar, and Robert A. Larson, both of Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

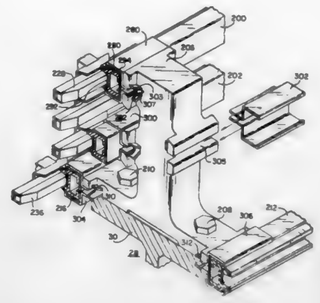
Filed May 6, 1976, Ser. No. 684,057

Int. Cl.[2] B60M *1/34*

U.S. Cl. 191—32 **7 Claims**

1. A support apparatus for a conductive rail operative with a vehicle moving along a roadway including spaced tracks and a guide beam having an upper flange and supported between those tracks, said vehicle having an electric motor connected to a collector shoe, the combination of:

rail support means positioned above and coupled to the upper flange of said guide beam for positioning said rail substantially parallel to said spaced tracks such that said collector shoe cooperates with said rail to energize said motor, with said rail support means including an insertion slot, and



rail mounting means coupled between said rail and said rail support means for holding said rail, with said rail mounting means including at least one fastener member having a predetermined shape operative with said insertion slot of said rail support means to fasten securely said rail to said rail support means.

4,043,437

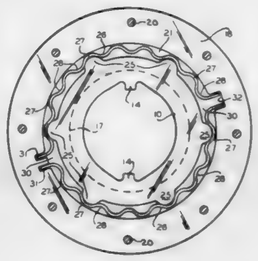
TORQUE LIMITING CLUTCH BRAKE

Frederick P. Taylor, Bridgeport, N.Y., assignor to Lipe-Rollway Corporation, Syracuse, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,350

Int. Cl.[2] F16D *3/66*

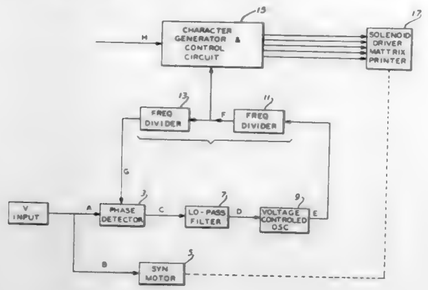
U.S. Cl. 192—13 R **5 Claims**



1. In a friction clutch for connecting driving and driven shafts, the clutch including a release mechanism for effecting disengagement of the clutch, the improvement comprising a clutch brake cooperable with the release mechanism and a stationary surface adjacent the clutch comprising an inner annular plate keyed to the driven shaft, means encircling the inner plate and arranged to be moved by the release mechanism into engagement with the stationary surface during disengagement of the clutch, the encircling means including friction facing material where it is engaged by the release mechanism and stationary surface, and means yieldably connecting the encircling means to the inner plate including a plurality of uniformly spaced arcuate projections on the outer periphery of the inner plate and spring means connected to the encircling means and releasably engaging at least some of the projections, the spring means comprising a plurality of fluted spring strips having fitted portions at least some of which mate with the plate arcuate projections, the spring means being arranged to release and then re-engage the projections to permit relative movement between the encircling means and inner plate when

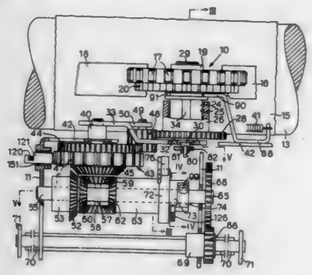
the force applied to the encircling means by the release mechanism exceeds a predetermined amount.

4,043,438
PRINTING CONTROL CIRCUIT
Lester Avant, Northbrook, Ill., assignor to Litton Business Systems, Inc., Morristown, N.J.
Filed Apr. 27, 1976, Ser. No. 680,848
Int. Cl.[2] H03K *17/74*
U.S. Cl. 197—1 R **5 Claims**



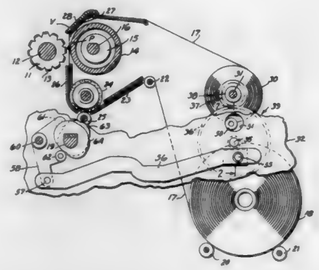
1. A printing control circuit comprising:
a means for transmitting line voltage,
a phase-lock loop circuit, the input of which is coupled to said means for transmitting line voltage,
printing means, coupled to the output of said phase-lock loop circuit, and
motor means, coupled to said printing means and said means for transmitting line voltage, for moving said printing means,
said phase-lock loop circuit including a first and second frequency divider means, the output of said phase-lock loop circuit being coupled from between said first and second frequency divider means.

4,043,439
SERIAL PRINTING DEVICE FOR TYPEWRITERS, ACCOUNTING MACHINES, TELEPRINTERS AND SIMILAR OFFICE MACHINES
Dante Daly, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed Feb. 24, 1976, Ser. No. 660,930
Claims priority, application Italy, Mar. 5, 1975, 67554/75
Int. Cl.[2] B41J *1/50, 23/04*
U.S. Cl. 197—18 **12 Claims**



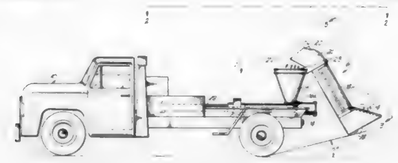
1. In a serial printing device for typewriters, accounting machines, teleprinters, and similar office machines, comprising a platen, a carriage mounted adjacent to said platen, a type head mounted on said carriage and carrying a plurality of characters thereon, said type head being rotatably movable and laterally movable between a rest position and a printing position, and continuously rotating driving means, the combination of:
first means for connecting said head to said driving means for continuously rotating said head to sequentially present said characters in front of said platen;
arresting means operatively interconnected to said first means for selectively operating said first means and operatively interconnected with said head for arresting the rotation of said head so as to position a selected character of said plurality of characters in front of said platen;
a striking mechanism connectable to said head and selectively actuatable for moving said head towards said platen to said printing position;
second means for connecting said driving means to said striking mechanism for the actuation thereof;
actuating means for alternately operating said first and said second connecting means for selectively actuating either said arresting means or said striking mechanism;
a first arrest element operated by said actuating means for normally keeping at rest said striking mechanism during the rotation of the head;
a second arrest element operated by said striking mechanism for keeping said head locked during the striking movement thereof in the position at which it was arrested by said arresting means; and
restoring means for releasing said arresting means upon operation of said second arrest element whereby said second arrest means replaces said arresting means until completion of the striking movement of the head.

4,043,440
PAPER FEED AND WEB REWIND MECHANISM
Richard E. Busch, La Puente, Calif., assignor to Addmaster Corporation, San Gabriel, Calif.
Filed Apr. 8, 1976, Ser. No. 674,900
Int. Cl.[2] B65H *17/04*; B41J *15/16*
U.S. Cl. 197—114 R **10 Claims**



1. In a printer having mechanism for printing characters onto a record strip at a printing station,
feed means for advancing said strip to carry said characters from said printing station to a viewing station and for thereafter retracting said strip, and
means forming a rewind roll for said strip;
a rewind drive mechanism for said roll comprising
an oscillating drive means,
means comprising a one-way drive device operable in an advancing direction to impel said rewind roll to take up a certain amount of slack in said strip resulting from advancement of said strip by said feed means, and
means operable by said drive means when moving in one direction for actuating said drive device in said advancing direction thereof,
the mass of said rewind roll being effective to cause said rewind roll to overtravel relative to said drive device whereby to take up any remaining slack in said strip.

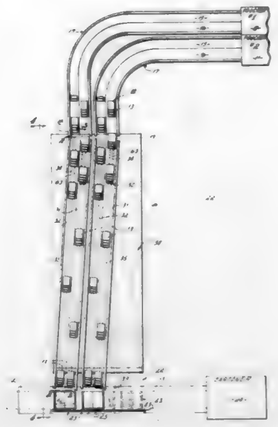
4,043,441
MOBILE PUMP
John R. Johnson, Arcadia, Calif., assignor to Royal Industries, Inc., Pasadena, Calif.
Filed Nov. 10, 1975, Ser. No. 630,207
Int. Cl.[2] B65G *33/14*
U.S. Cl. 198—317 **1 Claim**



1. As an article of commerce, conveying apparatus for conveying moist, compressible materials such as plaster, concrete, mortar and the like as received from a mobile material mixing device having material discharge means for conveyance to a material pump wherein the material inlet for the pump is at a height above the material discharge means of the mixing apparatus so that the material may not be readily discharged from the mixing device into the pump, the article of commerce comprising a pump for pumping moist compressible materials and having means integral therewith for receiving the material to be pumped and having a fixed, preselected height above the ground level of the pump, and conveying means mounted at one end to the material receiving means for the pump to be carried thereby and extendable outside of the pump for readily conveying the material from the mixing apparatus to the receiving means, the conveying means being constructed and defined to be rotatably extendable at an inclined relationship to the pump to a preselected point below the height of the pump receiving means and to be rotated to a position to facilitate receiving the material at the free end thereof from said mobile material mixing device, said material receiving means comprising an upstanding material hopper having means for rotatably mounting said conveying apparatus adjacent the upper rim of the hopper, said rotatable mounting means comprises swivel collar means mounted adjacent the upper rim of the hopper for rotatably mounting said conveying means to permit the conveying means to rotatably ride on the swivel collar means for permitting the conveying means to be positioned at various radial material loading positions with respect to the upper rim of the hopper.

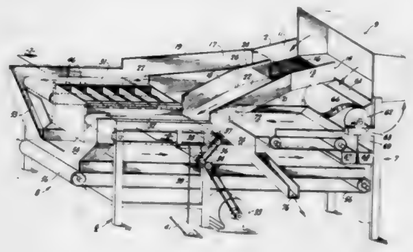
4,043,442
TRANSFER MECHANISM
Joseph Daniel Greenwell, Florence, Ky., and Eric W. Scarpa, Cincinnati, Ohio, assignors to R. A. Jones & Co. Inc., Covington, Ky.
Filed Aug. 18, 1975, Ser. No. 605,229
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—420 **9 Claims**

1. Transfer mechanism for pouches comprising:
a frame,
a plurality of slow upstream conveyors on said frame,
means for depositing shingled groups of pouches on said upstream conveyors in longitudinally staggered relation,
a plurality of fast downstream conveyors on said frame and having upstream ends overlapping at least the downstream ends of said slow conveyors,
first check and release means at the intersection of said fast and slow conveyors,
and second check and release means at the downstream ends of said fast conveyors,
said upstream and downstream conveyors each comprising a plurality of thin endless belts passing over spaced pulleys,
and means for selectively raising the belts for the slow conveyors when said first check and release means checks said pouches and raising said belts for said fast conveyors



when said first check and release means releases said pouches.

4,043,443
FRUIT SUB-SAMPLER AND GRADING TABLE
Michael O'Brien, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.
Filed Sept. 15, 1975, Ser. No. 613,251
Int. Cl.[2] B65G *47/26*
U.S. Cl. 198—525 **11 Claims**



1. A fruit sub-sampler and grading table comprising a frame having an entrance end and an exit end, means for delivering by gravity a randomly arranged supply of a plurality of fruit to said entrance end, means for dividing said supply into a continuously running first random stream and a continuously running second random stream, means for advancing said first stream on said table toward said exit end, means for splitting said advancing first random stream into a primary stream in a primary path and a secondary stream in a secondary path, said paths being separated by an intervening space, means on said frame for automatically segregating a fractional quantity of fruit from said second stream, and means for varying said fractional quantity, primary and secondary belt conveyors on said frame defining portions of said primary and secondary paths, means for advancing said belt conveyors, and plural container means in said space for receiving fruit.

4,043,444

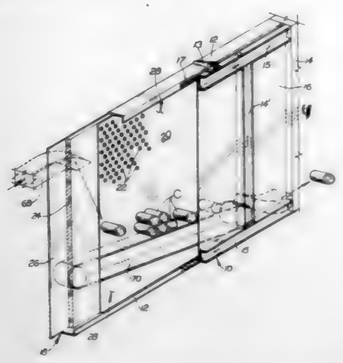
CUP ACCUMULATOR ASSEMBLY

Michael S. Bobeczko, Castro Valley, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 609,633, Sept. 2, 1975, abandoned. This application June 28, 1976, Ser. No. 700,439

Int. Cl.[2] B65G *47/08*

U.S. Cl. 198—557 **3 Claims**



1. An accumulator and storage device for metal containers that are provided with one open and one closed end, said device being comprised of a relatively sound-proof and enclosed container receiving and storage chamber, said chamber having a top, bottom, two end, and two side walls and said chamber having a width slightly in excess of but a depth and length both greater than the length of the containers to be stored, one of the sidewalls of the said chamber which faces the open ends of the containers and also constitutes a major wall area of the chamber comprising an acoustical wall that includes an inner perforated liner sheet and an outer backer sheet of sound absorptive material arranged and disposed adjacent the liner sheet, conveyor means for initially selectively depositing and orienting the containers in the said enclosed chamber with their open ends facing the said acoustical wall and said chamber also being provided with container outlet means in the lower portion thereof.

4,043,445

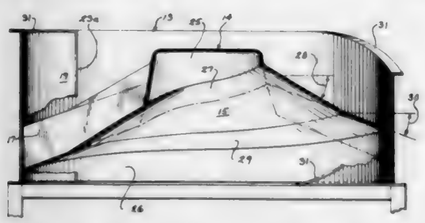
CENTRIFUGAL ROTARY TRANSFER APPARATUS

Gary J. Wirth, Milwaukee, and Kenneth M. Gelder, Germantown, both of Wis., assignors to S.I. Handling Systems Inc., Easton, Pa.

Filed Feb. 10, 1975, Ser. No. 548,297

Int. Cl.[2] B65G *37/00*

U.S. Cl. 198—611 **6 Claims**



1. A rotary transfer apparatus comprising a rotary member for discharging of a load by centrifugal force and having a vertical axis of rotation and at least one generally vertical planar transfer surface extending outwardly radially of said axis and having a lower edge, said rotary member having at least one load supporting surface extending circumferentially from the lower edge of said transfer surface to form a generally horizontal load support, said supporting surface extending along the lower edge of the transfer surface and projecting upwardly and around said axis in the direction of rotation from the lower edge of said vertical transfer surface and inclined downwardly from the central portion of the rotary member to define a substantially spiral-conical configuration, an outer guide wall means mounted in close encirclement about the rotary member and having a discharge opening, and a drive means coupled to the rotary member for rotating of the rotary member about said vertical axis.

4,043,446

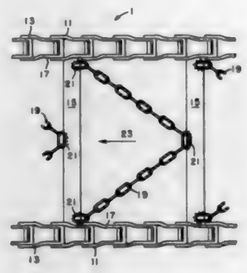
CONVEYOR

William P. Tarrant, Saratoga Springs, N.Y., assignor to Tarrant Manufacturing Company, Saratoga Springs, N.Y.

Filed Apr. 8, 1976, Ser. No. 675,132

Int. Cl.[2] B65G *19/00*

U.S. Cl. 198—728 **8 Claims**



1. A conveyor, adapted to be driven by drive means, for uniform, continuous and positive conveying of material, said conveyor comprising: first flexible means, a plurality of rigid means and a pluralty of second flexible means; said first flexible means being adapted to being driven by said drive means, said first flexible means carrying said rigid means, said rigid means being disposed substantially normal to said first flexible means, said rigid means carrying therebetween said second flexible means, each of said second flexible means being angularly disposed relative to said rigid means, each of said second flexible means being carried substantially at the lateral sides of said rigid means and substantially at intermediate portions of the next adjacent rigid means, and said rigid means and said second flexible means cooperating to uniformly, continuously and positivelt convey said material, and said second flexible means cooperating to clear away said material being conveyed from said first flexible means thereby preventing said material being conveyed from entering and packing into said first flexible means to thereby prevent malfunction of said conveyor, and said second flexible means cooperating with said rigid means respecting the spatial relationship of said rigid means to render said conveyor more flexible, and, respecting that part of said conveyor under its said load run and said second flexible means and rigid means of said part of said conveyor, said second flexible means of said part of said conveyor under its said load run cooperating to reinforce said rigid means of said part of said conveyor under its said load run by cooperatively sharing the loads and forces acting upon said part of said conveyor under its said load run.

4,043,447

QUICK RELEASE TROUGHING ROLL MOUNTING

Charles E. Donnelly, Rexdale, and Richard G. Sauve, Toronto, both of Canada, assignors to FMC Corporation, San Jose, Calif.

Filed Dec. 3, 1975, Ser. No. 637,447

Int. Cl.[2] B65G *15/08*

U.S. Cl. 198—827 **5 Claims**

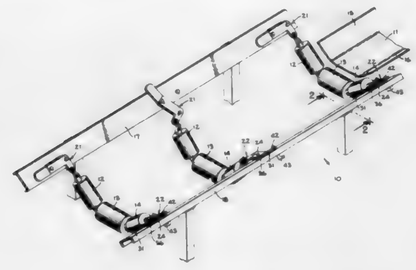
1. In a conveyor having a longitudinal extending endless belt with a conveying surface in the form of a trough, a series of rotatable troughing rolls that are coupled together in a chain-like manner for supporting the belt, said troughing rolls extending laterally of the belt beneath the same with the outermost rolls being inclined to provide lateral support for the sides of the belt thereby shaping the belt in the form of a trough, and a quick release mounting for securing one end of an inclined troughing roll to a fixed frame,

said mounting comprising:

a pivot bolt secured to the frame and a locking pin on said frame in longitudinally spaced relation therealong to said pivot bolt,

an arm having pivot means and locking means spaced longitudinally thereon for independent cooperation with said frame pivot bolt and said frame locking pin, respectively,

said arm pivot means cooperating with said frame pivot bolt to permit pivotal movement of said arm about the bolt in a plane that extends parallel with the adjacent inclined side of the belt,



and between a first position holding the troughing rolls in load-receiving contact with the belt and a second position wherein the troughing rolls are lowered from belt contact,

a coupling interconnecting one end of the inclined troughing roll and said arm, said inclined roll having an axis along which a line of force extends therefrom through said coupling and to said arm, with said force axis lying substantially in said pivotal plane of said arm,

the centerline of said locking pin being positioned on said line of force when said arm is in said first position thereby to apply the troughing roll load to said locking pin,

said locking means cooperating with said arm locking means for retaining said arm in said first position, said pivot bolt thereby being spaced laterally from said force axis when said arm is in said first position, and

means mounting said locking pin for movement with respect to said arm locking means to release the arm for pivotal movement about said spaced pivot bolt to said second position removing the troughing rolls from the belt contact.

4,043,448

CHILD-PROOF CONTAINER

Yoshinobu Tanaka, Toyonaka, Japan, assignor to Alpha Techno Company, Ibaraki, Japan

Filed June 23, 1976, Ser. No. 698,995

Claims priority, application Japan, June 24, 1975, 50-89414

Int. Cl.[2] B65D *43/16, 55/02*

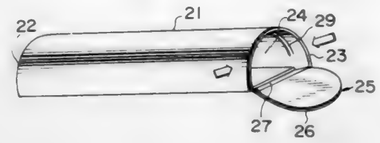
U.S. Cl. 206—1.5 **7 Claims**

1. A container defining an opening, said container including an integral cover for covering said opening, and being difficult for children to both recognize and open, said container comprising:

a tubularly-shaped main housing formed of a resilient material having internal and external surfaces and first and second end edges;

a bottom wall integrally formed with said tubularly-shaped main housing adjacent said first end edge of said main housing, said bottom wall permanently closing a first end of said tubularly-shaped main housing by being integrally attached to said housing about the bottom wall's perimeter,

a cover integrally formed with said tubularly-shaped main housing adjacent said second end edge of said main housing, said cover being integrally attached to said tubularly-shaped main housing adjacent said second end edge thereof, but inwardly spaced from said second end edge, said attachment being along a portion only of the outer perimeter of said cover so as to form a hinge means inwardly spaced from said second end edge for allowing



said cover to be selectively rotated between a closed position closing a second end of said main housing and an open position rotated outwardly from said main housing;

said internal surface of said tubularly-shaped main housing including a slot for receiving a free edge of said cover when said cover is in a closed position, said slot forming a shoulder located inwardly from said second end edge, for engaging an inner surface of said cover to prevent further inward rotation of said cover from said closed position such that an outer surface of said cover is spaced inwardly from said second end edge of said tubular main housing when said cover is in said closed position.

4,043,449

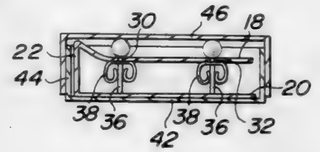
GIFT PACKAGE CONTAINING MESSAGE BEARING UNIT AND USEFUL ARTICLE IN ASSOCIATION THEREWITH

Michael Love, Philadelphia, Pa., assignor to Mida Mfg. Inc., Philadelphia, Pa.

Filed Sept. 19, 1975, Ser. No. 616,756

Int. Cl.[2] B65D *5/50, 73/00, 1/34*

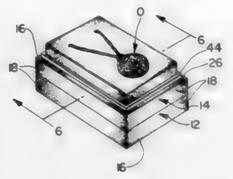
U.S. Cl. 206—45.14 **3 Claims**



1. A gift package comprising a card having decorative matter and message-bearing indicia thereon, means on said card for coupling a gift article thereto, a gift article removably coupled to said card and having a portion thereof juxtaposed to said decorative matter so that said decorative matter and said portion create an integrated visual effect, said card comprising first and second leaf members coupled to each other so as to be openable in book fashion, said gift article being coupled to said first leaf member, and a container for said card and said gift article, said container comprising a receptacle portion, said card being nestable within said receptacle portion, and a cover portion for enclosing said card and said gift article, said receptacle portion comprising bottom wall and spaced side walls, said second leaf member of said card overlying said bottom wall when said card is nested within said receptacle portion, and a portion of said gift article projecting into engagement with said second leaf member so as to maintain said first leaf member in spaced relation with respect to said second leaf

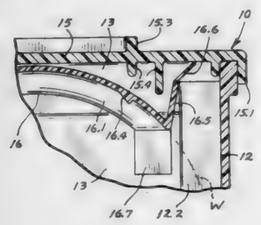
member when said card is nested within said receptacle portion.

4,043,450
DISPLAY BOX CONSTRUCTION
Owen G. Rielly, Lincoln, R.I., assignor to Frost Packaging Company, Pawtucket, R.I.
Filed Jan. 24, 1977, Ser. No. 762,464
Int. Cl.[2] B65D *5/50, 1/34*
U.S. Cl. 206—45.14 **10 Claims**



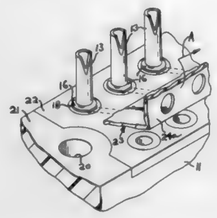
1. A box for the display of jewelry and the like in alternative open and closed positions comprising, generally open face cover and base sections adapted for face to face disposition to each other in a closed position and hingedly connected to each other along a common line for spaced apart disposition in an open position, an insert having a generally planar surface for the receipt and display of said jewelry and the like and sidewalls downwardly extending from said display surface, said insert adapted for disposition within said base section of said box for containment therein and display in said open position, said cover section having a top surface, said top surface including means for temporarily frictionally positioning said insert sidewalls whereby said insert may be positioned on said top surface of said cover for alternative display of said jewelry and the like when said box is in its closed attitude.

4,043,451
SHIPPING CONTAINER FOR SILICONE SEMICONDUCTOR WAFERS
Douglas M. Johnson, Waconia, Minn., assignor to Fluoroware, Inc., Chaska, Minn.
Filed Mar. 18, 1976, Ser. No. 668,204
Int. Cl.[2] B65D *73/02, 85/42, 81/02*
U.S. Cl. 206—334 **18 Claims**



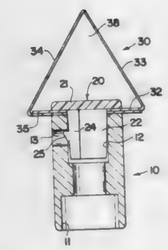
2. A shipping container for frangible wafers and the like, comprising:
an elongate receptacle having side and bottom walls and a removable lid to provide access into the interior chamber wherein such wafers are received and stored, the receptacle having wafer-locating means maintaining the wafers in spaced and confronting relation to each other and oriented transversely of such side walls; and
means in the receptacle and adjacent the lid to engage and restrain such wafers, and including an elongate wafer support adjacent the lid within the interior chamber and extending longitudinally thereof to overlie the wafers, said wafer support being formed of soft, springy plastic and having a lower wafer-engaging face with corrugations formed therein to receive and locate and retain the wafers in predetermined positions, each of said supports having a plurality of resiliently flexible spring leaves projecting outwardly away from the wafers and upwardly into engagement with the lid, and said leaves flexing against the lid and resiliently urging the wafer support inwardly of the interior chamber and against the peripheral edges of the wafers to restrain the wafers against movement in the receptacle during transport.

4,043,452
C-RING HOLDER
Milton I. Ross, 400 College Ave., Haverford, Pa. 19041
Filed Sept. 23, 1976, Ser. No. 725,962
Int. Cl.[2] B65D *85/24*
U.S. Cl. 206—343 **4 Claims**



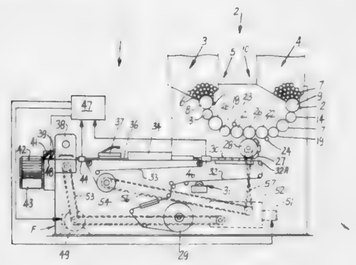
1. An article of manufacture comprising means defining a base, and a row of unidirectionally presented C-rings supported on said base, support of said C-rings being provided by frangible means, and the center-to-center spacing of said C-rings corresponding to like spacing of connector pins to which the former may be attached as a unit, said frangible means affording breaking away of said base upon relative movement between it and the C-rings.

4,043,453
HOLDER AND DISPLAY DEVICE FOR WRENCH SOCKETS
Hugh T. Greenlee, Gates Mills, Ohio, assignor to The Wright Tool & Forge Company, Barberton, Ohio
Filed May 11, 1976, Ser. No. 685,395
Int. Cl.[2] B65D *85/20, 73/00*
U.S. Cl. 206—349 **1 Claim**



1. In combination, an elongated flat cardboard strip folded along transverse fold lines to form three connected sides defining a triangular hanger loop with an aperture in one of said sides, a socket for a socket wrench tool and a fastening device for anchoring said socket to said triangular loop,
said socket having a rectangular recess at one end for receiving a socket wrench tool drive stud and a transverse detent hole in the sidewall of said recess, and
said fastening device having a head larger than said aperture and a male plug portion adapted to extend through said aperture inn said side of said loop and be snugly received in said recess, said male plug portion comprising a pair of spaced parallel legs that define in transverse section, a rectangle corresponding to said rectangular recess in said socket, and including a resilient arm located between said legs and adjacent a wall of said recess between said legs with a transversely extending catch adapted to latch in said opening, said resilient arm being movable between a flexed position and an unflexed latching position,
whereby when said male plug portion is moved through said aperture in said side of said loop from the inside out and inserted in said recess with said catch in alignment with said detent hole, said resilient arm is flexed until said catch enters said detent hole whereupon said resilient arm returns to its unflexed position to anchor said socket to said loop whereby said loop may be used to hang said socket for display.

4,043,454
METHOD AND APPARATUS FOR PRODUCING AND CONTROLLING THE PRODUCTION OF COMPOSITE FILTER PLUGS
Joachim Reuland, Neu Bornsen, Germany, assignor to Hauni-Werke Korber & Co. KG, Hamburg, Germany
Filed Oct. 31, 1975, Ser. No. 627,656
Claims priority, application Germany, Nov. 22, 1974, 2455271
Int. Cl.[2] B07C *5/344*
U.S. Cl. 209—81 R **26 Claims**

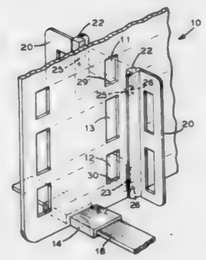


1. In an apparatus for producing and controlling the production of composite filter plugs for use in the manufacture of filter cigarettes or the like, a combination comprising means for assembling a continuous rod-like filler consisting of at least two types of alternating filter rod sections; means for conveying said filler along a predetermined path; means for draping said filler into a continuous web of wrapping material in a first portion of said path to form a continuous filter rod; means for severing said rod in a second portion of said path so that said rod yields discrete filter plugs each of which normally contains at least a portion of at least one section of each of said types; and control means including at least one capacitive detector having a plurality of electrodes adjacent to said path intermediate said assembling means and said severing means and means for establishing between said electrodes a high-frequency electric field which is at least partially traversed by successive sections in said path whereby the output of said detector transmits a series of signals in response to movement of successive sections past said electrodes, the signals of said series together constituting a continuous signal flow including a sequence of first signals of first intensity and a sequence of second signals of second intensity which said detector respectively transmits in response to movement of first and second types of sections past said electrodes, means for comparing the signals of said series with a reference signal, means for timing the occurrence of successive signals of one of said sequences, and means for producing additional signals in response to occurrence of successive signals of said one sequence.

4,043,455
BENEFICIATION OF FLUORSPAR ORE
Ernest R. Ground, Cd. M. Muzquiz, Coahuila, Mexico, assignor to International Minerals & Chemical Corporation, Libertyville, Ill.
Filed Oct. 20, 1976, Ser. No. 734,164
Int. Cl.[2] B03D *1/02*
U.S. Cl. 209—167 **8 Claims**

1. In a method for beneficiating a fluorspar concentrate, containing apatite as a gangue mineral, which includes further concentrating the fluorspar by a froth flotation process utilizing an acid flotation circuit, the improvement, which comprises
adding an apatite-collecting cationic reagent to the flotation circuit to collect and float substantially all of the apatite;
adding a source of fluoride ions to the flotation circuit to depress the fluorspar;
removing the floated apatite; and
recovering the fluorspar from the underflow.

4,043,456
DIVIDERS AND PARTITIONS FOR SAME
James B. Howell, Woodcliff Lake, N.J., assignor to Advertising Displays Corporation, Englewood, N.J.
Filed Aug. 12, 1976, Ser. No. 713,903
Int. Cl.[2] B65D *7/24, 25/04*
U.S. Cl. 211—184 **1 Claim**



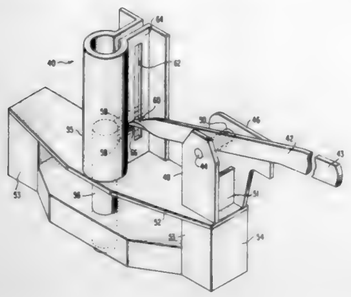
1. A straight wall substantially rectangular divider of uniform thickness for compartments, said divider comprising
a uniform series of upper and lower aligned openings along the major part of said divider,
at least one opening adjacent the base of said divider,
at least one strap for insertion at a 90° angle through said base opening for locking said divider to said strap and to permit stacking of goods against said divider and upon said strap to prevent removal of said divider from said compartment,
one or more partitions having means on one edge thereof for attaching said partition to said divider,
said attaching means on said partition comprising upper and lower projections,
said projections having extensions and a slot of about the thickness of said divider for passing said extensions through said upper and lower aligned openings in said divider and sliding said partition downwardly for attaching said partition to said divider,
said partition having a right angle narrow extention at one longitudinal edge thereof from which said upper and lower extensions project,
said extentions being slightly offset from the opposite face of said narrow extension to accommodate said similar upper and lower extensions of another partition of the same construction when placed in opposite position against the said upper and lower extensions of said first partition so that both opposed partitions may be attached to said divider and virtually locked within the openings of said divider.

4,043,457

SAFETY MINE CAR COUPLING AND UNCOUPLING APPARATUS

Joseph Miller, General Delivery, Amherstdale, W. Va. 25607, and Clinton Cline, General Delivery, Chapmanville, W. Va. 25508

Filed Oct. 23, 1975, Ser. No. 625,112
Int. Cl.² B61G *1/00*
U.S. Cl. 213—75 B **6 Claims**



1. An apparatus for safely coupling and uncoupling mine cars which are coupled by insertion of a pin into coupling hitches of two adjacent cars comprising:

an apertured base plate adapted to be horizontally affixed to a hitch of a mine car;

a lever arm, a distal portion of which engages the coupling pin, adapted for inserting and withdrawing the pin to couple and uncouple a railroad car responsive to application of force to a proximal portion of said lever arm to permit an operator to couple and uncouple the cars without standing between the cars;

means attached to said base plate for pivotably supporting said lever arm on said base plate;

means for guiding the travel of said lever arm and the travel of the coupling pin through the aperture in the base plate and the hitches comprising:

a guide member attached to said base plate and formed with a slot for retaining the distal portion of said lever arm and defining a path of travel of said lever arm, said slot being knotched to provide a detent for the distal portion of said lever arm; and,

a channel means for guiding the coupling pin through its range of movement incident to insertion and withdrawal; and spring means for urging said lever arm into engagement with a portion of the perimeter of the slot of said guide member and for urging the lever arm into the detent, thereby tending to retain said lever arm in a fixed position along the path of travel of said lever arm.

4,043,458

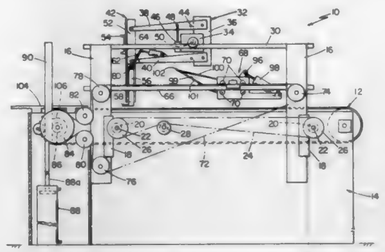
STACKER

Charles M. Schott, Jr., Gloucester, Mass., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.

Filed Mar. 2, 1976, Ser. No. 663,210
Int. Cl.² B65H *31/32*
U.S. Cl. 214—6 D **17 Claims**

1. A stacker for producing stacks of flat plastic bags and the like, said stacker being of the known type comprising an intermittently movable conveyor for receiving a series of forwardly projected bags, a fence positioned over said conveyor for stopping said bags so that they accumulate as a stack, means for raising the fence to allow forward movement of a completed stack and a clamp operable when the desired stack is formed for engaging the top of the stack, to press the stack downwardly against the conveyor, said conveyor and clamp thereupon movable together forwardly beneath the raised fence to advance the stack, that improvement comprising a receiver surface operative to lie over said conveyor and stack and extending to said fence when said fence is in raised position, said receiver surface adapted to receive bags thereupon while said clamp moves forwardly with the previously formed stack, said receiver surface movable forwardly beyond said fence whereby bags formed during forward motion of said clamp are released to fall by gravity upon said conveyor, and freeing said receiver surface to return above the next completed stack for repetition of the cycle.

17. In a bag stacker for plastic bags and the like having a fence for stopping forwardly projected bags so that they accumulate in a stack and raisable to permit completed stacks to



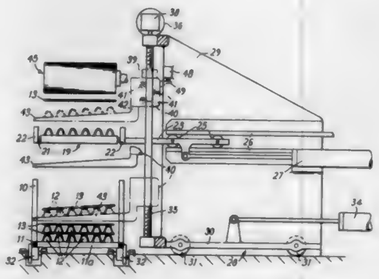
move forward, a movable conveyor passing beneath said fence, and a clamp for clamping completed stacks of bags against said conveyor and moving with said conveyor to draw completed stacks forward beneath said fence, the improvement wherein said conveyor comprises an endless conveyor belt including an upper segment arranged in a given path for conveying said stacks, said clamp mounted to travel in a path parallel to said upper segment, a drive belt associated with said clamp, sprockets for driving said conveyor and drive belts, an adjustable stroke rack for driving said sprockets in dependent motion in stack-conveying direction, and clutch means enabling reverse motion only of said drive belt driving return motion of said rack.

4,043,459

APPARATUS FOR LOADING STILLAGES

Alain Moreau, Morancez, France, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Aug. 31, 1976, Ser. No. 719,084
Claims priority, application United Kingdom, Sept. 3, 1975, 36346/75
Int. Cl.² B65G *57/18*
U.S. Cl. 214—6 DK **10 Claims**



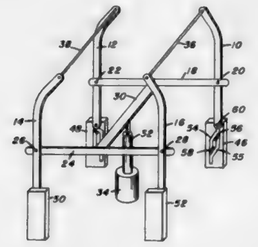
1. Apparatus for loading a stillage, comprising a main frame, a plurality of forwardly projecting sub-frames which are mounted horizontally in line with each other on the main frame for forward and rearward movement relative to the main frame and which are spaced apart, one or more horizontal rollers carried by each sub-frame and mounted for rotation about respective horizontal axes extending at right angles to the direction in which the sub-frames are spaced apart, a plurality of forwardly projecting tines interspersed with the sub-frames in said direction so as to be capable of being moved vertically to levels above and below the sub-frames, the tines being mounted for vertical movement in unison relative to the frame to levels above and below the sub-frames and being movable forwardly and rearwardly.

4,043,460

TRAY STACKING AND UNSTACKING APPARATUS

Bruce B. Steele, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 9, 1976, Ser. No. 647,843
Int. Cl.² B65G *60/00*
U.S. Cl. 214—6 BA **6 Claims**



5. Tray stacking apparatus for use with supply means supplying a succession of trays to a receiving station in said tray stacking apparatus, said apparatus comprising:

tray holding means for engaging and holding a tray supplied by the supply means, said tray holding means movable between a first position for engaging a tray and a second position for disengaging a tray;

moving means for reciprocally moving said tray holding means;

guide means for guiding a part of said tray holding means and defining a first and a second path along which said part of said tray holding means is sequentially moved by said moving means, movement of said part along said first path in one direction causing said tray holding means to deposit a first tray held thereby on a second tray supplied by said supply means to the receiving station, and movement of said part along said second path in the opposite direction causing said tray holding means to engage the second tray and to raise the stacked first and second trays thus allowing a third tray to be supplied to the receiving station by said supply means;

said first and second paths comprise first and second channels respectively, and said guide means include selector means at the junctions of said first and second channels for ensuring said part of said tray holding means moves along said first and second channels in proper sequence; and

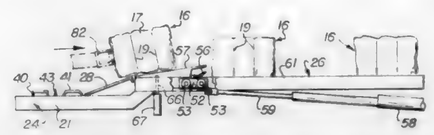
said selector means are movable between a first position for directing said part of said tray holding means along said first channel and then said second channel, and a second position for directing said part of said tray holding means along said second channel and then said first channel, thereby enabling said apparatus to be used as a tray stacking apparatus when said selector means occupy said first position and as a tray unstacking apparatus when said selector means occupy said second position.

4,043,461

STACK LOADER FOR BALES

Manuel A. Castro, P. O. Box 193, Banta, Calif. 95304

Continuation of Ser. No. 429,363, Dec. 28, 1973, abandoned. This application July 24, 1975, Ser. No. 598,701
Int. Cl.² B65G *57/32*
U.S. Cl. 214—6 B **2 Claims**



1. A bale stacking machine comprising a ground-support frame, a first table extending transversely of said frame, a loader on a first side of said frame having first means for lifting bales from the ground and depositing said bales one at a time on said machine extending transversely of said frame, a second table on said frame rearward of said first table, second means for moving bales longitudinally rearward from said first table onto the forward end of said second table, said second means being operable to move said bales so that the same surfaces of said bales that rest on said first table rest on said second table, restraining means adjacent each forward corner of said second table selectively operable to hold the forward outer corners of a pair of first bales on said second table, as a subsequent second bale deposited on the middle of the forward edge of said second table turns said pair of first bales from a transverse direction toward a longitudinal direction, and longitudinal conveying means on said second table to move a pattern of four bales longitudinally rearwardly on said second table from said forward end to the rearward end of said second table, said second means depositing said bales on said second table rearward of the foremost position of said longitudinal conveying means, said longitudinal conveying means comprising a rod extending transversely of said second table having upstanding bale-engaging tines to push bales on said second table rearwardly, guide means guiding said rod for reciprocation on said second table, actuating means for actuating movement of said rod, said rod located rearward of said restraining means, said guide means comprising a roller mounted on each end of said rod, an inward-facing channel mounted on each longitudinal side of said second table below the level of said second table, said rollers sliding in said channels and guiding said rod for horizontal reciprocation parallel to the top surface of said second table.

4,043,462

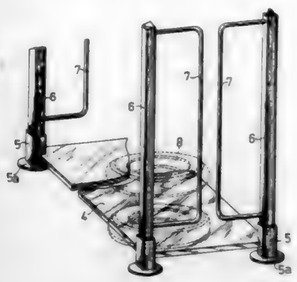
LOADING PLATE STRUCTURE ADAPTED TO BE STACKED

Dieter Schiron, Ahlem, Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany

Filed Jan. 19, 1976, Ser. No. 650,074
Claims priority, application Germany, Jan. 17, 1975, 2501689
Int. Cl.² A47F *5/10*
U.S. Cl. 214—10.5 R **7 Claims**

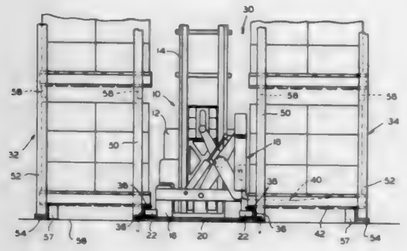
1. A loading plate structure adapted with other loading plate structures of the same design to form a stack of pneumatic tires with the least possible work and complexity upon a prescribed loading surface, which includes in combination: a loading plate having at least two pairs of oppositely located sides, two pairs of corner posts, each of said pairs of posts having one post connected to each end of one pair of oppositely located sides, and two pairs of U-shaped yokes, each yoke having two arms joined together by connecting means at one end of each arm, the two arms of each yoke at their free ends being connected to one post but each yoke being connected to a different post, the arms of the yokes of each pair of posts extending in a direction toward each other with the connecting means being spaced from each other, each of said posts having a bottom and

a top section, the arms of each yoke being respectively connected to the bottom and top sections of the pertaining posts,



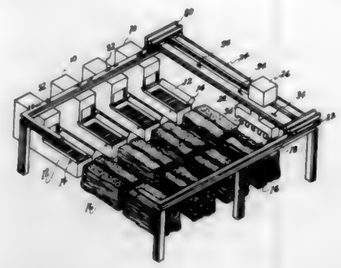
the yokes being respectively slidably detachably connected to the pertaining posts and non-rotatably secured thereto.

4,043,463
MATERIAL STORAGE FRAME SUPPORT AND VEHICLE GUIDE STRUCTURE
Howard C. Hansen, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed June 14, 1976, Ser. No. 695,666
Int. Cl.[2] B65G *1/06*
U.S. Cl. 214—16.4 A **3 Claims**



1. A material handling and storage system comprising a pair of material storage frames supported on the floor and forming an aisle therebetween, said storage frames forming a multiplicity of columns and rows of storage bins for material loads, the storage frame structure including a pair of confronting longitudinally extending continuous Z-rails forming guide tracks in said aisle adjacent the floor, each Z-rail having its lower horizontal flange secured to the floor and its upper horizontal flange extending towards the aisle and forming with the vertical web thereof a guide track, a plurality of longitudinally spaced vertical posts adjacent each side of said aisle forming a portion of said pair of storage frame structures, each post resting and being supported upon said lower horizontal flange of the adjacent Z-rail, the lower row of material loads being supported adjacent said aisle from the upper flange of the Z-rail, a substantial portion of the weight of the storage frame structure and material loads located in the bins above the first row of bins thereof being imposed upon the floor mounted flange of each Z-rail, and a substantial portion of the weight of the material loads stored in the lower rows of bins of each frame structure being imposed upon the continuous upper flange of the respective Z-rail and a wheeled vehicle operable in said aisle for depositing and retrieving material loads in said storage bins having front and rear pairs of side guide rollers constrained in the guide tracks formed by said Z-rails.

4,043,464
ANTI-CHOKE APPARATUS
Alex J. Keller, Gastonia; Joseph R. Williams, Kings Mountain, and James K. Mosteller, Mount Holly, all of N.C., assignors to Automatic Material Handling, Inc., Bessemer City, N.C.
Filed Aug. 20, 1976, Ser. No. 716,275
Int. Cl.[2] D01G *13/00*
U.S. Cl. 214—17 CA **10 Claims**



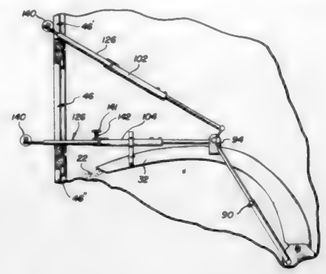
1. Anti-choke apparatus for use with equipment for automatically and selectively delivering fibers to a feeder unit in a preselected series of increments each including a predetermined quantity of fibers, said feeder being located adjacent a hopper which generate a signal when the quantity of fiber therein reaches a predetermined minimum level and which becomes choked when the quantity of fiber therein exceeds a predetermined maximum level, with the total quantity of fiber delivered to said feeder in said series of increments being greater than the quantity difference between said predetermined maximum and minimum quality levels of said hopper; said anti-choke apparatus comprising:

a. means for operating said feeder unit to cause the fiber therein to be fed to said hopper; and

b. control means for automatically energizing said feeder unit operating means after a predetermined number of said fiber increments have been delivered to said feeder unit, said predetermined number of said fiber increments being selected to assure that the total quantity of fiber delivered in said predetermined number of fiber increments is not greater than the difference between said predetermined maximum and minimum quantity levels of said hopper, and said control means acting to automatically de-energize said feeder unit operating means before any further fiber increments are delivered to said feeder unit.

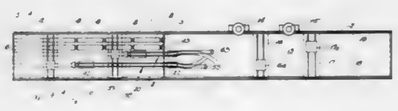
4,043,465
SILO DOOR CONSTRUCTION AND DISCHARGE CHUTE POSITIONING APPARATUS
James B. Rutten; Peter T. Rutten, both of Plainfield; Gordon G. Therrien, Oswego, and Richard S. Gaylord, Plainfield, all of Ill., assignors to Railoc Company, Inc., Plainfield, Ill.
Filed May 30, 1975, Ser. No. 582,135
Int. Cl.[2] B65G *65/38*
U.S. Cl. 214—17 DB **7 Claims**

1. In combination, a silo door system and automatic lowering silo unloader apparatus, said door system including a plurality of frame panel sections positioned in engagement with the interior wall of said silo in overlying relation to an elongate vertical opening or openings formed in the silo walls, each said frame panel section including an aperture bounded by upper, lower and side panel portions such that when in position, said upper and lower panel portions of adjacent frame sections cooperate to define a series of vertical cross frame portions and said unloader apparatus being of the type adapted to rest upon the top of the material in the silo and be lowered automatically in response to the discharge of silage, said unloader apparatus including a pivotal discharge chute which must be maintained in alignment with the apertures provided by said frame panel sections, and positioning means for said chute, said positioning means comprising upper and lower, spaced apart arm members, mounted upon said discharge chute, said upper arm member being pivotally mounted relative to said chute and said lower arm member while the degree of movement between said lower arm member and said chute is limited, said upper and lower arm members each including an end portion for disposition through said panel section apertures, such that when so disposed they are adapted to rest upon the cross frame portions provided by said frame panel sections and serve to



maintain the discharge chute in alignment with said panel section apertures, the pivoted connection of said upper arm, enabling said arm to be maintained in a discharge opening above that in which said lower arm is engaged, such as the unloader with the discharge chute moves downwardly, one of said arms will, at all times, be engaged in a discharge opening, thereby maintaining the chute in position, and precluding undesired rotation thereof, and roller means on the end portion of each said arm member to facilitate passage of said arm member from one aperture to the next.

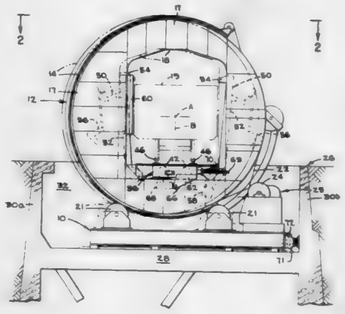
4,043,466
DUAL TRACK TRANSFER SYSTEM AND A TRANSFER CAR FOR USE THEREWITH
Earl C. Vice, Ashland, Ky., assignor to Armco Steel Corporation, Middletown, Ohio
Filed Apr. 16, 1976, Ser. No. 677,711
Int. Cl.[2] F27B *3/18*
U.S. Cl. 214—18 SC **10 Claims**



1. A dual track transfer system for shifting a transfer car between first and second stations and for turning in a minimum amount of space said transfer car at said second station at least 90° to its direction of travel immediately prior to its turning, said system comprising a transfer car having a body, a lead truck and a following truck both pivotally mounted on said body, said lead and following trucks each having at least four standard flanged wheels, a first set of parallel railroad-type rails, said wheels of said lead truck being mounted on said first set of rails, a second set of parallel railroad-type rails, said wheels of said following truck being mounted on said second set of rails, said first and second sets of rails being parallel to each other and overlapped with the right hand rails of each set lying in close proximity to each other and the left hand rails of each set lying in close proximity to each other, at a point near said second station where said transfer car is to begin said at least 90° turn said first set of rails having a curved portion turning laterally away from said second set of rails with the outside rail of said curved portion crossing that one of said rails of said second set which lies between said rails of said first set, said second set of rails continuing from said point where said transfer car is to begin said turn without direction change whereby said lead truck will follow said curved portion of said first rail set and said following truck will continue on said second rail set until said transfer car has turned said at least 90°, said curved portion of said first track set being of such radius and length that the centerline of said lead truck will lie at an angle of less than 90° to said rails of said second set when said car body has turned said at least 90° and means for shifting said transfer car between said first and second stations along said first and second rail sets.

5. The structure claimed in claim 1 wherein said first station is located in the scrap yard building of a steel mill, a scrap box with laterally extending trunnions being mounted on said transfer car, said first station comprising a loading station at which scrap is loaded into said scrap box, said second station being located on the charging floor of a steel mill building containing at least one melting furnace, at least one overhead crane within said furnace building, said second station comprising an unloading station at which said trunnions of said scrap box are engaged by said crane and said scrap box is lifted from said transfer car by said crane and shifted to said furnace for the charging of said scrap into said furnace.

4,043,467
ROTARY CAR DUMPER WITH SHIFTABLE FRAME
Arthur S. Hand, Jr., North Wales, Pa., assignor to FMC Corporation, San Jose, Calif.
Filed Oct. 7, 1976, Ser. No. 730,413
Int. Cl.[2] B65G *67/34*
U.S. Cl. 214—52 C **6 Claims**

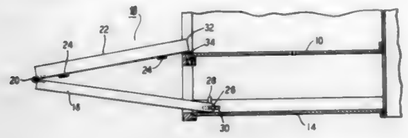


3. A car dumper to receive cars from and to discharge cars to an adjacent track, said dumper comprising in combination: a foundation, a base movably mounted in the foundation, a frame mounted on the base and invertible thereon about a longitudinal axis, said frame having an opening to pass cars therethrough, a carriage mounted in the frame and invertible therewith, said carriage movable laterally in the frame and having rails to receive cars from and to discharge cars to said adjacent tracks when the rails of the carriage are aligned with the adjacent tracks, means to shift the base on the foundation and thereby shift the opening in the frame laterally with respect to the adjacent tracks, a stop member mounted in the foundation to engage the carriage and to maintain the carriage stationary during said shift to maintain the rails on said carriage in alignment with the tracks.

4,043,468
RETRACTABLE RAMP FOR LIFTING OBJECTS INTO A VEHICLE
Frank Joseph Shea, 258 E. Shore Trail, Sparta, N.J. 07871
Filed Apr. 2, 1976, Ser. No. 673,254
Int. Cl.[2] B65G *67/02*
U.S. Cl. 214—85 **6 Claims**

1. A ramp for lifting objects up onto the floor of a vehicle comprising

a frame slidably mounted below said floor,
an incline pivotally connected near the exterior end of said frame and being folded down upon said frame when not in use,
a pair of spaced guides mounted below said floor for guiding said frame,
said guides each having a hole located near to the exterior end thereof,



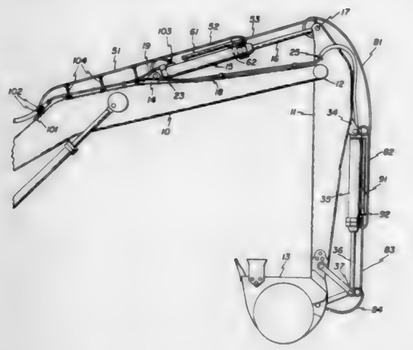
said frame having near its interior end a pair of spring-loaded pins which snap into said guide holes when said frame is slid from beneath said floor,
means on said frame for retracting said spring-loaded pins when said frame is to be moved out of said holes and
means located near the interior end of said incline for securing said incline to said floor when said frame is slid from beneath said floor and said incline is raised up onto said floor.

4,043,469

APPARATUS FOR PROTECTING OVERHEAD CABLES

Daniel D. Lewis, R.D. 1 Sunnyside, Glens Falls, N.Y. 12801

Filed Dec. 29, 1975, Ser. No. 644,503
Int. Cl.[2] E02F *3/32*
U.S. Cl. 214—138 R **11 Claims**



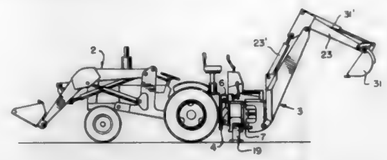
1. Apparatus for use in connection with material handling equipment having pivotably connected arm members and hydraulic members for moving said arm members, said hydraulic members having connection points on said arm members, said apparatus providing for protection of overhead cables from damage by said arm members and said hydraulic members, said apparatus comprising:
at least two smooth guard members, each said guard member having first and second ends;
means for attaching said first end of a first of said guard members to a first arm member;
means for attaching said first end of a second of said guard members to a second arm member; and means attached to one of said members slidably receiving at least one of said second ends for forming in co-operation with said guard members a substantially continuous bumper overlying said hydraulic means and at least a portion of said arm members.

4,043,470

HITCH FOR COUPLING ALIGNMENT OF TRACTOR AND BACKHOE

John S. Pilch, Ware, Mass., assignor to Ware Machine Service, Inc., Ware, Mass.

Filed June 1, 1976, Ser. No. 692,014
Int. Cl.[2] B66F *9/00*
U.S. Cl. 214—145 A **9 Claims**



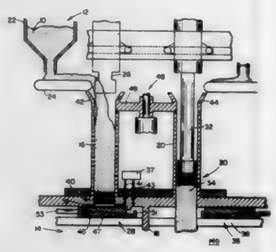
1. Hitch for coupling and alignment of tractor-type vehicle and backhoe wherein each has an end frame with coupling means carried thereon which are interengageable when the tractor and backhoe are positioned in coupling alignment, said backhoe including stabilizer means for raising and lowering its end frame, said hitch comprising guide means on one of said end frames and a guide member on the other of said end frames, said guide means including vertically inclined surfaces which extend laterally toward each other, each inclined surface terminating along an open edge disposed to engage said guide member in at least partially coextensive longitudinal relationship when said end frames are moved toward each other longitudinally for interengagement of their respective coupling means, said guide means and guide member being adapted when engaged along one of the open edges to provide a lateral component of force upon lowering by said stabilizers of the end frame of the backhoe from a raised position and lateral misalignment relative to the tractor, said component of force serving to move the coupling end frame of the backhoe laterally into coupling alignment with the tractor said coupling means includes means for supporting and pivotably interconnecting the end frame of the backhoe to the end frame of the tractor and being disposed to interengage upon said lowering of the end frame of the backhoe in coupling alignment.

4,043,471

METHOD OF PARTICLE FEEDING

Harold E. Trumbull, and Ronald F. Hartung, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Aug. 25, 1975, Ser. No. 607,336
Int. Cl.[2] B65G *65/30*
U.S. Cl. 214—152 **1 Claim**



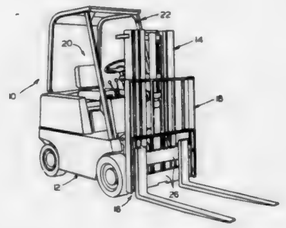
1. A method of feeding a material comprising solid particles from a first region at a first pressure to a second region at a substantially different second pressure, comprising
conveying the material from the first region into an elongate tube connected to communicate between the first region and the second region, whereby the material can be moved through the tube in a column,
providing a movable sealing zone in the tube comprising an annular layer around the periphery of the column, formed from a mixture of solid particles and an added liquid, contacting the inner wall of the tube,
providing a substantially fluid-tight seal between the second region and at least a substantial portion of the tube communicating with the first region while particles are being conveyed from the first region into the tube by closing a gate between the second region and the tube portion,
compressing the conveyed material while said gate is closed,
venting the tube while the material is being compressed,
opening the gate, and then
forcing the material from the tube into the second region.

4,043,472

LOAD BACK REST FOR LIFT TRUCK

Deryl R. Hoyt, Battle Creek, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Continuation-in-part of Ser. No. 636,501, Dec. 1, 1975, Pat. No. 3,995,891. This application Sept. 3, 1976, Ser. No. 720,285
Int. Cl.[2] B66F *9/14*
U.S. Cl. 214—750 **10 Claims**



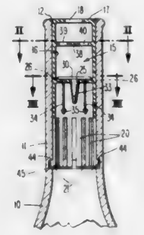
1. In a lift truck having a load back rest connected to an elevatable fork carriage and extending in a generally vertical plane above the carriage, a back rest structure generally rectangular in configuration comprising a pair of vertically spaced multi-sided hollow structural members having inner sides confronting, a plurality of openings in one inner side spaced longitudinally thereof and substantially aligned with similar openings in the other inner side, a grille bar extending through each confronting pair of openings and into the interiors of both hollow structural members in such a manner as to provide a plurality of restrained beams when said beams deflect under load.

4,043,473

DEVICE TO PREVENT REFILLING OF BOTTLES AND THE LIKE

Norma M. Webb, 1532 Alison Drive, West Chester, Pa. 19380

Filed Jan. 3, 1977, Ser. No. 755,956
Int. Cl.[2] B65D *49/02*
U.S. Cl. 215—21 **14 Claims**



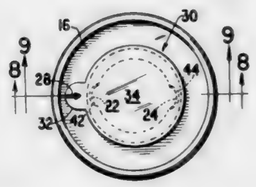
1. A device to prevent refilling of bottle-like liquid containers comprising
a. a hollow generally cylindrical body portion having axially spaced upper and lower ends;
b. a liquid discharge port adjacent the upper end of the body portion;
c. locking means adjacent the lower end of the body portion for retaining the device securely within a container;
d. a transverse valve seat disposed internally of the body portion intermediate the discharge port and the locking means, said valve seat having a liquid discharge opening therein;
e. a valve adapted to rest upon the valve seat when the container is not in use;
f. a nipple extending from the valve and adapted to engage within and close the opening in the valve seat; and
g. valve control means connecting the valve to the valve seat, said control means being operative to permit the valve to separate a selected distance from the valve seat, to disengage the valve nipple from the valve seat opening, during discharge of liquid from the container;
h. said valve control means comprising at least one elongated stem joined to the valve and extending slidably through the valve seat and having a protuberance formed adjacent its distal end.

4,043,474

CHILD RESISTANT CLOSURE FOR A CONTAINER

William F. McCord, Fanwood, N.J., assignor to American Home Products Corporation, New York, N.Y.

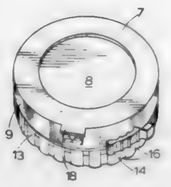
Continuation-in-part of Ser. No. 585,020, June 9, 1975, abandoned, which is a continuation of Ser. No. 405,372, Oct. 11, 1973, abandoned. This application June 17, 1976, Ser. No. 697,289
Int. Cl.[2] B65D *85/56, 55/02;* A61J *1/00*
U.S. Cl. 215—211 **4 Claims**



1. A child resistant dispensing package comprising:
A. A substantially cylindrical container having planar end members;
B. A dispensing orifice defined in one of said end members by a substantially circular rim;
C. At least one recess defined on the inner periphery of said rim;
D. A resistantly flexible snap-fit closure removably retained in said orifice by engagement with said rim further comprising:
1. A substantially round planar member;
2. An annular ring disposed in a plane parallel to said planar member;
3. An annular wall connecting said planar member to said ring;
4. An annular flange defined on the outer periphery of said planar member and lying in the same plane as said planar member and being of a predetermined size to be larger than the internal diameter of said rim of said container;
5. At least one lug defined on said flange in a position to cooperate with said recess defined on said rim, said lug being larger than said recess;
6. Said closure requiring a pull-off force of about 15 pounds for removal from said orifice when said recess and lug are not in orientation,
whereby said flexible closure may be pressed into said orifice

to close said container in any orientation, and a relatively small force is required to remove said closure when said lug and recess are oriented with each other.

4,043,475
CAPS AND CONTAINERS
Eric Charles Wheeler, Bexleyheath, England, assignor to Glyndon Plastics Limited, London, England
Filed Oct. 15, 1976, Ser. No. 732,896
Int. Cl.[2] B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—223 **7 Claims**



1. A cap and container assembly comprising a container having a cylindrical neck portion on the outside of which are provided first and second annular beads, said first bead being nearer to the rim of said neck than said second bead and extending only partially around the circumference of said neck, there being an outwardly projecting lug on said neck, at the level of said first bead, substantially midway between the ends of said first bead, and a cap having a top wall portion and a depending skirt, said skirt having near the lower edge thereof an inwardly directed third bead designed to engage, when said cap is fitted onto the neck to close said container, under said first bead on said neck of said container and under said lug, said third bead having therein a circumferential gap equal in length to slightly more than the circumferential length of said lug, the shape in profile of said first bead, said lug and said third bead and the resilience of the material of at least the skirt of said cap being such that when said cap is forcibly applied to the neck of said container in any relative angular position said third bead will snap over said first bead and said lug to retain said cap in position on said container, the cap being thereafter removable only if it is first turned to an angular position in which said gap in said third bead is aligned with said lug, in which position the adjacent region of the cap can be flexed upwards sufficiently to allow said third bead to be disengaged progressively from said first bead, the lower edge of the skirt of said cap being furthermore joined by frangible web means to a circumferentially extending tear-off strip which is connected directly or indirectly to an inwardly directed circumferentially extending shoulder which, when said cap is first fitted to said container, engages under said second bead on the neck of the container to prevent removal of said cap, regardless of the angular position thereof in relation to said container, until said tear-off strip is at least partially detached.

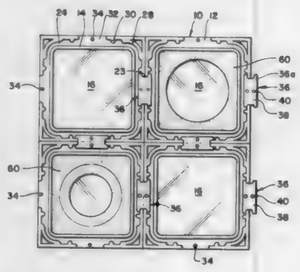
4,043,476
LOCKING DEVICE FOR GOODS TRANSPORTING CARTS AND LIKE RECEPTACLES
Raymond Joseph, Schiltigheim, France, assignor to Ateliers Reunis Societe Anonyme, Schiltigheim, France
Filed Nov. 5, 1976, Ser. No. 739,342
Claims priority, application France, Mar. 1, 1976, 76.05745
Int. Cl.[2] B65D *7/20, 7/32;* **E05C** *5/02, 1/10*
U.S. Cl. 220—19 **6 Claims**

1. In a goods transporting and handling cart, receptacle or the like, comprising at least one movable lateral wall and a hingedly mounted folding shutter disposed in an aperture formed in said lateral wall, a locking device comprising a sliding bolt mounted on one side of said wall, a keeper carried by the adjacent wall and adapted to be engaged by said sliding bolt in one position thereof, wherein said sliding bolt, in an intermediate position thereof, is capable of locking said movable wall, said shutter and said bolt against movement, said locking device further comprising a member for controlling said sliding bolt and a resilient clamp adapted to be engaged by, and to retain said sliding bolt in said intermediate position, said



folding shutter further comprising a shoulder adapted to be engaged by the adjacent end of said sliding bolt in said intermediate position to preclude any untimely release of said shutter even in case said cart or like receptacle were turned upside down.

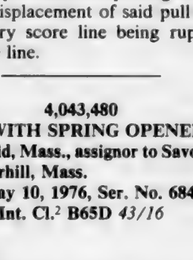
4,043,477
COIN DISPLAY
Raymond E. Deese, P.O. Box 1120, Placentia, Calif. 92670
Filed Feb. 17, 1976, Ser. No. 658,776
Int. Cl.[2] B65D *21/02*
U.S. Cl. 220—23.4 **13 Claims**



1. A display device comprising:
a base and cover which fit together to form a chamber for receiving the article to be displayed;
means on said base and cover formed on at least one edge of the device defining a recess;
interlocking means positioned in said recess for removably attaching the device to an adjacent, similar device so that a group of the devices may be readily joined to form a larger display assembly, said recess means being formed by both said base and said cover in a manner such that said interlocking means is initially positioned on said base in said recess and then captured in the recess when the cover is placed onto the base.

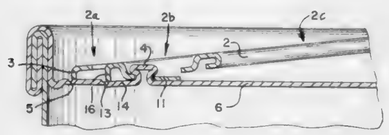
4,043,478
BEVERAGE CONTAINER WITH INTEGRAL STRAW
Richard D. Duncan, 1347 S. Meridian, Indianapolis, Ind. 46225
Continuation-in-part of Ser. No. 596,210, July 16, 1975, abandoned. This application Apr. 2, 1976, Ser. No. 673,198
Int. Cl.[2] A47G *19/22*
U.S. Cl. 220—90.2 **11 Claims**

1. In a beverage container having a side wall and a contiguous bottom wherein the side wall defines a passageway opening into the interior of the container near the bottom and extending to the top of the side wall, the improvement which comprises:
a generally tubular portion extending beyond the top of the side wall defining an extension of the passageway, having a first position in which said portion extends outwardly from the top of the side wall of the container and having a second position in which the end of said portion furthest from the top of the side wall is adjacent the outside of the side wall; and



a lid portion having a first position in which it generally covers the top of the container when the tubular portion is in its first position and having a second position releasably attached to the outside of the side wall covering the end of the tubular portion when the tubular portion is in its second position.

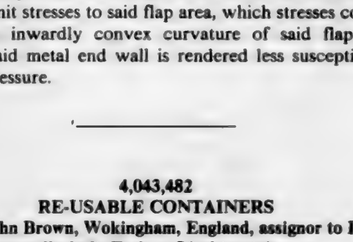
4,043,479
FRONT OPENING EASY-OPENING END CLOSURE WITH VENT
Nick S. Khoury, Worth, Ill., assignor to The Continental Group, Inc., New York, N.Y.
Continuation of Ser. No. 684,591, May 10, 1976, abandoned. This application Oct. 21, 1976, Ser. No. 734,579
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—271 **8 Claims**



1. An improved easy-open end closure of the type comprising an end panel with a score line defining an opening flap therein, and a pull tab non-removably attached to said end panel and having rupturing means for rupturing said score line consequent to a predetermined displacement of said pull tab to open said closure, the improvement comprising: an auxiliary score line formed in said opening flap and rupturable to form a vent opening therein, and panelwardly directed auxiliary rupturing means on said pull tab for rupturing said auxiliary score line consequent to displacement of said pull tab to open said closure, said auxiliary score line being rupturable prior to rupture of said score line.

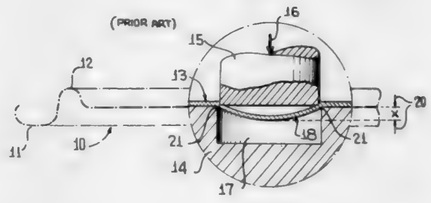
4,043,480
COVER WITH SPRING OPENED LID
Jerry Savoy, Lynnfield, Mass., assignor to Savoy Manufacturing Corporation, Haverhill, Mass.
Filed May 10, 1976, Ser. No. 684,903
Int. Cl.[2] B65D *43/16*
U.S. Cl. 220—334 **4 Claims**

1. In combination:
a case of generally cubical configuration having a tray-like bottom with a top lid hingedly connected thereto;
realeasable latch means on said bottom and lid, normally holding said lid in closed position on said bottom;
said tray-like bottom and top lid each having inside walls covered with a flexible fabric lining;
and a leaf spring, normally of S shape and independent of said hinge connection, said spring having a lower portion affixed to the inner wall of said bottom below, and an upper portion engaging the inner wall of said lid above,



said hinge connection, for automatically and resiliently raising said lid when said latch means is released.
said leaf spring being underneath said lining and not visible.

4,043,481
SCORED METAL FLAP AREAS
Edward J. Herbst, Posen, Ill., assignor to Continental Can Company, Inc., Chicago, Ill.
Division of Ser. No. 596,502, July 16, 1975, Pat. No. 4,027,612. This application Oct. 4, 1976, Ser. No. 729,463
Int. Cl.[2] B65D *41/32*
U.S. Cl. 220—266 **5 Claims**

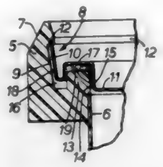


1. A metal panel of a container end susceptible to blowout pressure, said metal panel comprising a flap area surrounded by an external region with an intermediate region therebetween, said flap area being curved in an inwardly convex manner, said intermediate region including a scored web of reduced thickness immediately adjacent to said external region and a stressed portion so disposed between said scored web and said flap area as to transmit stresses to said flap area, which stresses contribute to the inwardly convex curvature of said flap area, whereby said metal end wall is rendered less susceptible to blowout pressure.

4,043,482
RE-USABLE CONTAINERS
Timothy John Brown, Wokingham, England, assignor to In. Da. Te. Aktiengesellschaft, Eschen, Liechtenstein
Filed Jan. 21, 1976, Ser. No. 651,016
Int. Cl.[2] B65D *39/00*
U.S. Cl. 220—307 **9 Claims**

1. In a combination of a re-usable container having an open-ended body with a mouth ring attached to an open end of the body and a closure, the improvement comprising: said ring being substantially thicker than the body wall of the container and the closure, a continuous internal surface of the mouth ring being shaped in a generally U-shaped configuration to receive and to lock in position an upstanding peripheral flange on said

closure for the open end of the container body, said closure and said ring having generally parallel sealing surfaces and a



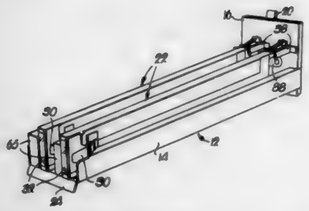
resilient seal disposed between said parallel sealing surfaces for compression therebetween.

4,043,483

DRAWER APPARATUS FOR ARTICLE DISPENSING MACHINE

LeRoy D. Gore, Independence, Mo.; William G. Gillett, Kansas City, Kans., and George F. Roberts, Independence, Mo., assignors to The Vendo Company, Overland Park, Kans.

Filed Sept. 7, 1976, Ser. No. 720,908
Int. Cl.[2] A47F *1/12*
U.S. Cl. 221—155 **8 Claims**



1. In an article dispensing machine:
drawer means adapted to be received in said dispensing machine;
cartridge means adapted to receive in an aligned successively abutting arrangement a plurality of articles to be dispensed,
said cartridge means including means for urging said articles therewithin toward one extremity thereof,
said cartridge means being provided with a pair of opposed lateral openings in upright sidewalls thereof and adjacent said one extremity thereof;
releasable means for removably securing said cartridge means upon said drawer means;
article displacing means including an article engaging element mounted on said drawer means for swinging movement from a standby position in which said element is disposed adjacent one of said lateral openings externally of said cartridge means to an operated position in which said element enters said cartridge means through said one lateral opening to engage one of said plurality of articles positioned between said opposed lateral openings and displace said article from said cartridge means through the other of said lateral openings for dispensing thereof.

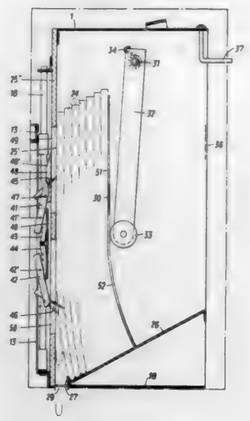
4,043,484

NEWSPAPER VENDING MACHINE

Benno Vanjo, Wehrweg 13 Klagenfurt, Kaernten, Austria

Filed Dec. 1, 1975, Ser. No. 636,421
Claims priority, application Austria, Dec. 3, 1974, 9671/74
Int. Cl.[2] G07F *11/16*; B65H *1/14*
U.S. Cl. 221—213 **5 Claims**

1. An automatic vending machine for papers having a receptacle for a stack of papers, said receptacle having a frontwall and a delivery slot, a delivery device arranged to remove a paper from the stack and feed it to the delivery slot, an operating handle for said delivery device, a rearwardly ascending slide track having an upstanding ledge at its forward edge, said delivery slot being defined between said front wall and said upstanding ledge, a pressure member for exerting forward pressure on a stack of papers placed on edge on the said slide track, said pressure member having an upper part whose pressure surface is parallel to the said front wall and a lower part whose pressure surface extends rearwardly and downwardly at an acute angle to said surface of said upper part, whereby the upper part of the foremost paper of the stack is pressed against the front wall while the lower part is pressed against the said



upstanding ledge, said delivery device having first carriers engageable with the said foremost paper of the stack to lift said foremost paper until its lower edge rises above the upstanding ledge and swings forward above the delivery slot, said first carriers comprising obliquely-upwardly-directed pointed members mounted on a carriage movable in a vertical direction by said operating handle, said pointed members being biassed toward said foremost paper by springs, and second carriers engageable with the said foremost paper to feed it downwards into the delivery slot, said second carriers comprising obliquely-downwardly-directed pointed members mounted on said carriage and biassed toward said foremost paper by springs.

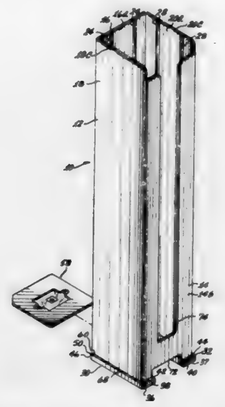
4,043,485

MAGAZINE FOR A PLURALITY OF FIXTURES HOLDING INTEGRATED CIRCUIT CHIPS

Kenneth Boyd Tippetts, Glendale, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Aug. 9, 1976, Ser. No. 712,564
Int. Cl.[2] B65G *1/08*
U.S. Cl. 221—312 R **8 Claims**

1. A magazine for a plurality of fixtures, each fixture being adapted to hold a segment of a film strip having a lead frame attached to the segment and an integrated circuit chip bonded to the lead frame, the outer surfaces of each fixture substantially defining congruent rectangular parallelipipeds, the distance between the top and bottom faces of said parallelipipeds being the height of the fixtures and the top faces of the parallelipipeds being rectangular, said magazine comprising:
a hollow tube having a front wall, a back wall and a pair of side walls, each of said walls having a substantially planar inner face, each wall having a length and a width;
a pair of ribs formed on the inner faces of each wall of the tube, said ribs being substantially parallel to the intersections of the inner faces of the walls of the tube, said ribs being spaced apart and the cross section of the ribs being substantially a segment of a circle;
the cross sectional area of the space defined by planes substantially tangent to the surfaces of the ribs being slightly greater than the area of the top face of a fixture so that a fixture loosely fits within said space;
a pair of rails having substantially planar and parallel upper and lower faces; the width of each rail being substantially less than one half of the width of the front wall and the length of each rail being greater than the length of a side wall; each of said rails having a front end and a back end; one of said rails being fixedly secured to one side wall and a portion of the back wall and the other of said rails being fixedly secured to the other side wall and another portion of the back wall so that the rails are substantially parallel to each other, so that they are uniformly spaced from each other, so that the back end of each rail projects beyond the back wall to form a pair of back ledges, and so that the front end of each rail extends beyond the inner surface of the front wall;



means forming an opening in the front wall, the minimum height of the opening measured from the upper faces of the rails being greater than the height of a fixture, the maximum height of the opening being less than twice the height of a fixture, and the width of the opening being substantially the complete width of the front wall;
means forming an opening in the back wall, the minimum height of the opening measured from the upper faces of the rails being at least a substantial portion of the height of a fixture and its width being substantially equal to the distance between the rails;
the front portion of the rails having means forming a step, the projecting portion of the step constituting front ledges; and
means forming a key slot in one of the front ledges.

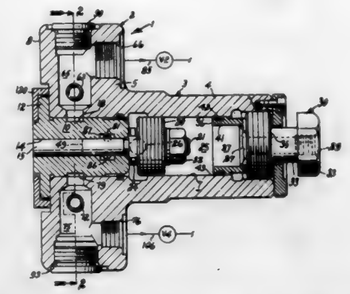
4,043,486

MIXING APPARATUS

Jerry Dale Wisbey, Cincinnati, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Feb. 2, 1976, Ser. No. 654,291
Int. Cl.[2] B67D *5/60*
U.S. Cl. 222—134 **16 Claims**

1. Apparatus for mixing a plurality of liquids and discharging the resulting mixture into a mold runner or cavity downstream thereof comprising:
a housing having walls;
a mounting bore through said housing;
a sleeve secured in one end of said mounting bore providing a fluid-tight seal between first and second regions within and both at the same end of said mounting bore and having a mixing chamber bore defined therewithin, first and second ports communicating through said sleeve directly into said chamber, respectively, from said first and second regions;
first and second passageways, each for a fluid, through said housing walls into communication with said respective first and second regions;
an elongated plunger slidably fitted in said mixing chamber bore and peripherally engaging with a hydraulic fit the continuous walls of said mixing chamber;
a drive means for reciprocating said plunger supported on said housing and including therein a driving fluid chamber within said mounting bore substantially coaxial with said plunger axis, a drive piston reciprocably fitted therein and secured to one end of said plunger, and fluid port means for communicating to said driving fluid chamber to admit



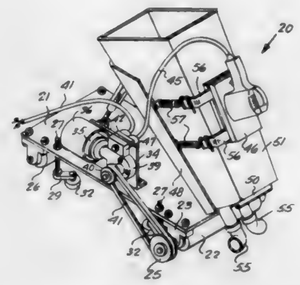
and remove driving fluid to at least one face of said piston, said piston being disposed between said mixing chamber and the hereafter said stroke adjusting means the three of which are substantially coaxial with said plunger; and
stroke adjusting means mounted on said drive means for adjusting the stroke of said piston hence to adjust the stroke of said plunger and being adjustable over a range to position the other end of said plunger sufficiently prior to a mixing procedure to block said first and second ports and during mixing at least partially to unblock said first and second ports.

4,043,487

MORTAR APPLYING MACHINE

Norris F. Price, Rte. 1, Surgoinsville, Tenn. 37873

Filed July 29, 1975, Ser. No. 600,071
Int. Cl.[2] B67D *5/64*
U.S. Cl. 222—166 **4 Claims**



1. A mortar applying machine including a generally rectangular horizontal base plate, a pair of rollers extending transversely across said base plate at each end thereof supporting said base plate on the top of a masonry wall, means on said base plate for rotating one of said rollers to move said base plate along the masonry wall, guide rollers secured to opposite sides of said base plate for engaging the sides of the masonry wall to guide the base plate along the masonry wall, a hopper, a hinged tray for removably mounting said hopper on said base plate at one end thereof, hinge means connecting said tray to said base plate, at least one discharge opening in the bottom of said

hopper positioned at one end of said base plate, and means extending upwardly from said base plate to adjustably secure the end of said tray remote from said hinge means for adjustably positioning said hopper at an angle to said base plate.

4,043,488

BIN WITH DISCHARGE DEVICE

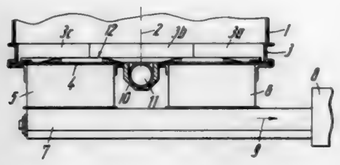
Tor Svein Halvorsen, and Oddmund Saxlund, both of Weinberg, Germany, assignors to Astrid Alice Saxlund nee Erichsen, Heidberg, Germany

Filed Nov. 7, 1974, Ser. No. 521,782

Claims priority, application Germany, Jan. 7, 1974, 2400547; Nov. 9, 1973, 2356161

Int. Cl.[2] G01F *13/00*

U.S. Cl. 222—233 **14 Claims**



1. A bin with a discharge worm device, especially for flour, shaving or chip-type goods, such as wood shavings, sawdust, wood-chips or the like, with a bin floor having at least one diameter and at least one discharge opening extending along the one diameter, a channel underneath the discharge opening containing the discharge worm device, and a drivable agitating discharge pusher above said bin floor drivable substantial distances in opposite directions in a horizontal plane characterized in that the agitating pusher comprises several rigid discharge rods being supported flatwise directly upon said bin floor and having a discharge face at one longitudinal side directed perpendicularly to said bin floor and a sloping face at the opposite longitudinal side extending backwardly and to the bin floor at an acute angle, and a reversing drive for driving the pusher alternately in opposite directions to such an extent that the agitating pusher on each stroke sweep generally along the total upper surface of the bin floor, the pusher comprising two groups of discharge rods with the discharge faces of different rods in each group being directed in opposite directions.

4,043,489

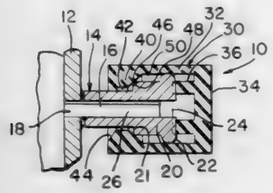
COMBINATION VENT AND SHUT OFF VALVE

Thomas P. Buckman, 11561 Shelly Vista Drive, Tujunga, Calif. 91042

Filed Jan. 15, 1976, Ser. No. 649,252

Int. Cl.[2] F16K *24/04*

U.S. Cl. 222—397 **3 Claims**



1. A combination vent and shut off valve adapted for use in conjunction with a vessel having pressurized fluid therein, said valve comprising a stem having a hollow cylindrical body portion with its inner end adapted for connection to an opening in the vessel whereby fluid communication is established between the inner portion of the pressure vessel and the hollow body portion of the stem, a stem head portion extending from the outer end of the stem body, said head portion having a hole extending therethrough in alignment with the hollow body, the head portion having an outer diameter greater than that of the hollow body so that a shoulder is formed where the stem body and stem head meet, the outer end of the head terminating in an annular guide member having a diameter greater than the head, said head having a fluid feed slot connecting the head hole with the outside of the head,

a cap assembled onto the stem for reciprocation thereon, said cap comprising a cylindrical hollow body sized to slidably fit over the stem head guide, said cap body having a closed end and an open end, a resilient annular flange extending from the inner face of the closed end of the cap body and resiliently engaging the top of the stem head guide, the open end of the body having an internal annular closure member fitting loosely around the stem body, the closure member snugly engaging the outer edge of the stem shoulder under the pressure created by the cap flange bearing against the top of the stem guide whereby upon the directing of pressure on the closed end of the cap toward the vessel, the flange will be compressed and allow the bevelled face of the cap closure to move away from the stem shoulder to create a space therebetween to allow flow from the vessel through the stem, out through the stem slot and then out through the aforesaid space.

4,043,490

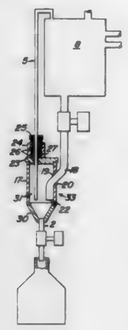
VOLUMETRIC FILLING SYSTEM APPARATUS

Harold D. McKinney, Rte. 4, Box 404, Pine Bluff, Ark. 71601

Filed Apr. 10, 1975, Ser. No. 567,047

Int. Cl.[2] G01F *11/28*

U.S. Cl. 222—442 **8 Claims**



1. An apparatus component for controllably regulating substantially liquid material in prescribed quantities for dispensing comprising: a cylinder means with at least one side to receive said material, a material feed means extending into said cylinder means and sealingly affixed thereto; and a return vent means sealingly extending into said cylinder means for controllably regulating the said material; said feed means extends a greater depth into said cylinder means than said vent means and is an offset substantially S-shaped pipe extending within and through a side of said cylinder so that the usable volume of said cylinder is increased.

4,043,491

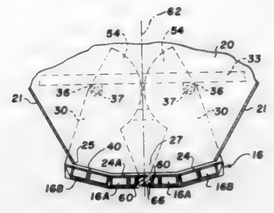
HOPPER BIN

Raymond A. Johnson, Grand Forks; John M. Lum, and Mike Kazakoff, both of Christina Lake, all of Canada, assignors to Interior Mill Equipment Ltd., British Columbia, Canada

Filed Sept. 7, 1976, Ser. No. 720,736

Int. Cl.[2] B65D *47/00*

U.S. Cl. 222—503 **4 Claims**



1. A hopper bin for particulate material comprising side and end walls having lower edges defining a discharge opening for the material, a pair of gates for controlling the flow of material through the discharge opening, mounting means supporting the pair of gates for movement between open and closed positions, power means for opening and closing the pair of gates, said pair of gates having inner side edges spaced apart to define a gap extending longitudinally when the pair of gates are closed, a material-gripping jaw secured to each inner side edge to extend longitudinally thereof, said jaws being vertically spaced apart and having free edges which overlap horizontally when the pair of gates are closed, said side and end walls having upper edges defining an infeed opening for the material, a screw conveyor mounted between the upper edges to extend longitudinally of the infeed opening, and drive means for rotating the screw conveyor to move material towards an end wall of the bin.

4,043,492

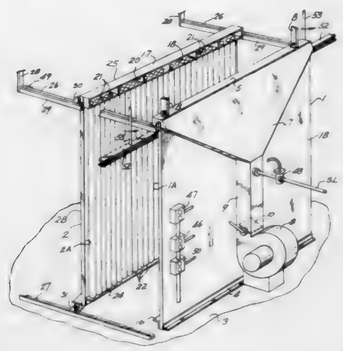
DRAPERY PRESSING APPARATUS

F. Grant Getchell, 510 Antelope Way, Eugene, Oreg. 97401

Filed Nov. 18, 1976, Ser. No. 736,748

Int. Cl.[2] A41H *43/00*

U.S. Cl. 223—30 **14 Claims**



1. An apparatus for pressing draperies and the like, said apparatus comprising,

upright structures each supporting a series of vertically disposed tubular pressing components, at least one of said structures adapted for movement toward and away from the remaining structure, said upright structures defining communicating ducts,

means supporting said one upright structure for opening and closing movement relative to the remaining structure,

motor means driving said one structure toward and away from the remaining structure, and

said series of tubular pressing components adapted to bias opposite surfaces of the drapery in a staggered manner to press same in serpentine folds.

4,043,493

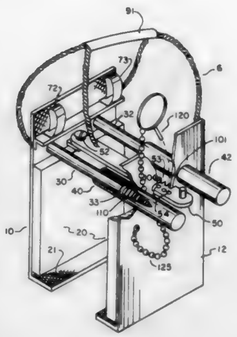
SKI CARRYING DEVICE AND METHOD

Joseph Robert Camelio, 38 Ward St., Randolph, Mass. 02368

Filed June 1, 1976, Ser. No. 691,599

Int. Cl.[2] B65D *71/00*

U.S. Cl. 224—45 S **6 Claims**



1. A ski-carrying device which comprises:

a. a pair of substantially parallel first and second plate elements, each element having an inward lateral extension at the one end, each extension adapted to support the side of a ski placed thereon;

b. a pair of substantially parallel rod elements extending inwardly from the other end of the plate elements;

c. a pair of substantially parallel tube elements extending inwardly from the opposite surface of the plate elements and over the respective rod elements;

d. tension biased means in the tube elements which bias the plate elements toward the open expandable position; and

e. the rod and tube elements positioned from the lateral extensions slightly above the width of the skis to be carried in the device.

f. a plate element characterized by an opening therein and which includes a locking element characterized by a plurality of saw teeth at the one end thereof and secured to and extending inwardly from the opposite plate element and through said opening in the said plate element, the saw teeth spring forward toward and adapted to engage in a locking manner the edge of the opening when the plate elements are in a closed carrying position and means to secure the locking element in the closed carrying position.

g. a handle means to carry the device with the skis secured therein.

4,043,494

APPARATUS FOR FEEDING A PLURALITY OF WIRES

David Edward Bickford, Harrisburg, Pa.; Robert Keith Southard, Largo, Fla.; Matthew Michael Sucheski, Harrisburg, and Earl William Wagner, Annville, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 660,565, Feb. 23, 1976, abandoned. This application Jan. 17, 1977, Ser. No. 760,219

Int. Cl.[2] B65H *51/10, 51/32*

U.S. Cl. 226—109 **7 Claims**

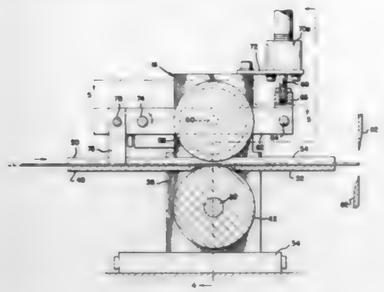
1. Wire feeding apparatus comprising:

a wire feed roll, said feed roll having a width which is sufficient to receive a plurality of wires in side-by-side parallel relationship, motor means for rotating said feed roll,

a plurality of pressure rolls, said pressure rolls being

mounted on axes which extend parallel to the axis of said feed roll, each of said pressure rolls having a non-feeding position, in which it is spaced from said feed roll, and being individually movable towards said feed roll to a wire feeding position,

wire guide means, said guide means being effective to guide wires from substantially endless source means towards said feed roll and position one wire between said feed roll and each of said pressure rolls and



control means for starting and stopping said motor means and for moving said pressure rolls selectively individually and selectively in unison from said nonfeeding positions to said wire feeding positions whereby, upon discriminative operation of said control means, said apparatus will produce groups of fed wires of varying predetermined lengths with the ends of each wire disposed at any desired location relative to the ends of the longest wire in the group.

4,043,495

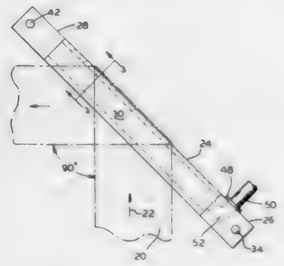
AIR CUSHIONED TURN BAR

Frank Sander, 4744 N. Kenneth, Chicago, Ill. 60630

Continuation of Ser. No. 554,635, March 3, 1975. This application Aug. 24, 1976, Ser. No. 717,178

Int. Cl.² B65H *23/32*

U.S. Cl. 226—197 **4 Claims**



1. A member for supporting and changing the direction of a continuously moving sheet of web material through a predetermined angle, comprising:

a hollow cylindrical bar over which said web material passes having a longitudinal axis;

a plurality of apertures having circular cross-sections disposed along said longitudinal axis of said bar;

said apertures extending between said hollow portion of said cylindrical bar and the exterior surface of said bar;

each said aperture including walls forming a continuously diverging curved surface extending in the direction from said hollow portion of said cylindrical bar to said exterior surface of said bar, the intersection of said walls and said exterior surface of said bar being smoothly curved with the exterior surface of the cylindrical bar to produce a laminar flow of fluid substantially coincident with the exterior surface of the cylindrical bar through approximately 180° of said exterior surface, thereby forming a fluid cushion for said sheet of web material.

4,043,496

FRICTION WELDING MACHINE

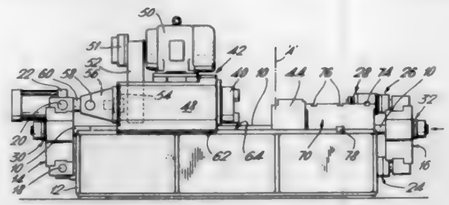
Emyr Jones, Bridgenorth, England, assignor to Clarke Chapman Limited, Tyne and Wear, England

Filed Sept. 30, 1976, Ser. No. 728,490

Claims priority, application United Kingdom, Oct. 10, 1975, 41536/75; May 5, 1976, 18310/76

Int. Cl. B23k *27/00*

U.S. Cl. 228—2 **12 Claims**



1. A friction welding machine of the kind in which first and second workpieces are relatively rotated about an axis of rotation comprising:

pressure-applying means operable to force said workpieces against one another to impose on one another load acting along said axis;

said pressure-applying means comprising first and second components relatively movable in the direction of said axis;

said first component of said pressure-applying means and a further support means providing reaction forces for said first and second workpieces respectively;

a strut member;

first and second beam elements;

each beam element adjacent a first end thereof being in force-transferring relationship with a respective end of said strut members;

said first beam element adjacent a second end thereof being in force-transferring relationship with said second component of said pressure-applying means;

said second beam element adjacent a second end thereof being in force-transferring relationship with said further support means;

tie means interconnecting said beam elements intermediate said ends thereof;

first and second gripping holders for holding said first and second workpieces, respectively;

means for producing relative rotation of said holders about said axis;

guide surface means on said strut member extending longitudinally thereof;

one of said holders being movably guided by said guide surface means longitudinally thereof relatively to said other holder and aligned therewith along said axis of rotation.

4,043,497

FRICTION WELDING MACHINE

Emyr Jones, Bridgenorth, England, assignor to Clarke Chapman Limited, England

Filed Sept. 30, 1976, Ser. No. 728,492

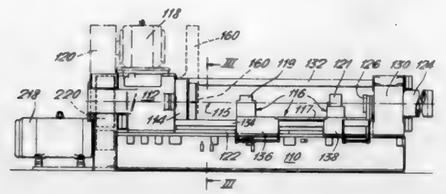
Claims priority, application United Kingdom, Nov. 12, 1975, 46790/75

Int. Cl.² B23K *27/00*

U.S. Cl. 228—2 **10 Claims**

1. A friction welding machine comprising a support, two

assemblies mounted on the support comprising respectively a first holder means and a second holder means, said first holder means being rotatable about a rotational axis, said first and second holder means being aligned on said rotational axis, means for relatively moving said assemblies along said support in the direction of said rotational axis, said assemblies together, in a relatively closest position, determining a finished weld zone there-between, a drive motor and drive means coupling said drive motor to said first holder means, flash removal means comprising shear tool means, mounting means movably supporting said shear tool means, and mechanism operable to



move said shear tool means into and out of a position in which said shear tool means are interposed between one of said assemblies and said finished weld zone axially with said rotational axis, said shear tool means having a width in a direction parallel to said rotational axis such that said shear tool means are movable into said position only after relative separating movement of said assemblies from said relatively closest position to relatively separate said finished weld zone from said one of said assemblies and said width being such that subsequent relative approach movement of said assemblies causes a relative traverse between said finished weld zone and said shear tool means.

4,043,498

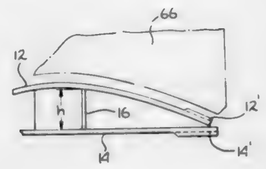
METHOD OF PLASTIC FLOW DIFFUSION BONDING

Charles E. Conn, Jr., Santa Ana, Calif., assignor to TRE Corporation, Beverly Hills, Calif.

Continuation-in-part of Ser. No. 441,441, Feb. 11, 1974, Pat. No. 3,950,841, and a continuation-in-part of Ser. No. 357,359, May 4, 1973, Pat. No. 3,936,920. This application Sept. 15, 1975, Ser. No. 613,223

Int. Cl.² B23K *19/00*

U.S. Cl. 228—265 **14 Claims**



1. A method for fabricating an internally stiffened, aerodynamically shaped shell structure comprising the steps of:

a. providing first and second metallic face sheets having an excess volume of metallic material on at least one of said face sheets;

b. Placing said first sheet in a die assembly which is configured to produce the desired basic aerodynamic shaped structure, said first face sheet having means to align said first face sheet in said die assembly;

c. placing at least one self-stable internal stiffener fabricated from metallic material upon said first face sheet, sand internal stiffener having a sufficient thickness to provide an adequate bonding area for joining the stiffener to the face sheets, a configuration which allows said self-stable member to provide sufficient support during the subsequent joining of said self-stable member to said face sheets, first and second ends which are received in said die assembly, and a height dimension which is greater than the net height requirement by approximately 0.01 to 0.08 inches to provide sufficient excess volume of said metallic material so as to provide positive fill in said die assembly for the desired amount of plastic flow of such material, and aligning said stiffener with respect to said first face sheet;

d. placing said second face sheet in said die assembly over said internal stiffener, said second face sheet having means to align said second face sheet in said die;

e. applying a forming an joining force to said internally stiffened structure for a sufficient duration at sufficient elevated temperature to cause intimate contact between opposed longitudinal edges of said face sheets and between said self-stable stiffener and adjacent areas of said face sheets by plastic flowing the excess volumes of material in the height of said self-stable internal stiffener and along the longitudinal edges of said face sheets, so as to join and bond said self-stable stiffener by solid state diffusion bonding to said face sheets and to join and bond said opposed longitudinal edges by homogeneous solid state diffusion bonding, thereby producing an aerodynamically shaped structure with leading and trailing edges, said forming and joining force being substantially localized in the to-be-joined areas and determined by the amount of excess material to be flowed and the plastic flow characteristics of the metal used.

4,043,499

METHOD OF MAKING HELICAL ASSEMBLY

Joseph Dix, Williston; Norman Campbell, and Ivar S. Tonseth, Jr., both of Burlington, all of Vt., assignors to General Electric Company, Burlington, Vt.

Division of Ser. No. 535,834, Dec. 23, 1974, Pat. No. 4,004,490, which is a continuation of Ser. No. 352,007, April 17, 1973, abandoned. This application Sept. 3, 1976, Ser. No. 720,325

Int. Cl.² B21D *11/06*

U.S. Cl. 228—173 D **4 Claims**



1. A process of making a helical assembly comprising:

folding a first continuous ribbon of stock material into a folded plate structure having a repeated cycle of four flat, substantially triangular plates, two extending substantially transversely and two extending substantially longitudinally, each plate bent with a substantially sharp fold from the next adjacent plate, to form a multiturn helical fin of substantially truncated isosceles triangular cross;

progressively disposing and fastening said fin in a multiturn helical spiral around and to a central cylinder; and

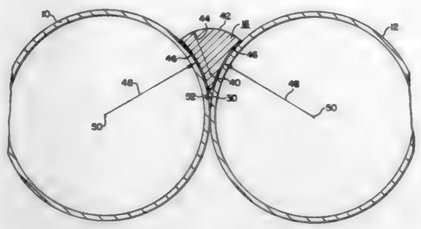
progressively rolling a second continuous ribbon of stock material into a multiturn helical spiral, and progressively coaxially interleaving said spiral with said fin and fastening said spiral to the first of the transversely extending plates in each cycle along an area intermediate the cylinder-distal and cylinder-distal ends of said first plate.

4,043,500

TUBE TO TUBE BRAZING

Thomas R. Padden, Greensburg; William J. Miller, Jr., Irwin, and Rockne L. Laubham, Trafford, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,514
Int. Cl.[2] B23K *1/04*
U.S. Cl. 228—175 **12 Claims**



1. A method of joining metals comprising:

abutting a first curved metal member to a second curved metal member, the curvature of said metal members forming a gap along the interface of said metal members;

placing in said gap an insert having surfaces complementary to surfaces of said metal members;

spacing said insert from the metal members a distance sufficiently small to establish a capillary space therebetween;

bonding said insert to said metal members at intervals along the metal members' length thus maintaining the capillary space;

applying braze metal compatible with said insert and said metal members to said insert and said metal members;

heating said braze metal causing said braze metal to flow into said capillary space; and

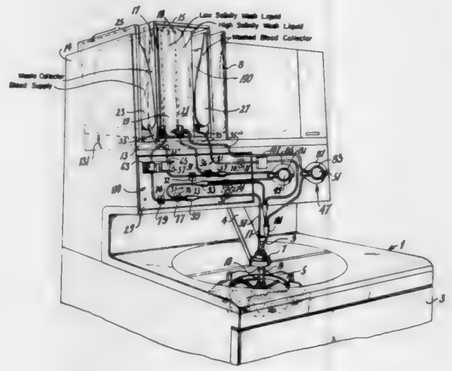
cooling said braze metal below the solidus temperature of said braze metal to thereby bond the insert and metal members into a strong cohesive assembly.

4,043,501

PORTABLE LIQUID PACKAGE CONTAINER FOR USE WITH BLOOD WASHING DEVICE

Edward Whittum Larrabee, Bronxville, N.Y.; Paul Olney Rawson, Easton, and Richard Hajime Yagami, Westport, both of Conn., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,605
Int. Cl.[2] B65D *5/40*
U.S. Cl. 229—14 BE **1 Claim**



1. A portable container arrangement for use with a blood washing device which comprises

i. an orthoganally shaped support member formed of corrugated cardboard enclosed at the top, bottom and sides and being open at the front

ii. a top extension member formed of corrugated cardboard being integral with the top of said support member at its open front and being folded back into said support member to fit tightly therein in a position parallel to the top of said support member, said top extension member having a slit like aperture located at a predetermined distance from the open front of said support member

iii. a first side extension member formed of corrugated cardboard being integral with a first side of said support member at its open front and being folded back into said support member to fit tightly therein in a position parallel to said first side of said support member, said first side extension member having a slit like aperature located at a predetermined distance from the open front of said support member

iv. a second side extension member formed of corrugated cardboard being integral with a second side of said support member at its open front and being folded back into said support member to fit tightly therein in a position parallel to said second side of said support member

v. a bottom extension member formed of corrugated cardboard being integral with the bottom of said support member at its open front and being folded back into said support member to fit tightly therein, said bottom extension member having a folded down end portion and a folded down side portion in contact with the bottom of said support member such that bottom extension member forms a small acute angle with the bottom of said support member

vi. a removable front closure member formed of corrugated cardboard having vertical front portion having a width which is less than the width of said support member and having a side portion integral therewith and folded into said support member to form a first enclosed compartment in said support member and a second open compartment in said support member which is open at the front of said support member, the side portion of said front closure member having a depth which is less than the depth of said support member and having a bottom edge slanted at said small acute angle formed by said bottom extension member and the bottom of said support member and having folded over integral edge members in contact with said support member such that said removable front closure member fits snugly in said support member and is recessed therein at a predetermined distance, the vertical front portion of said front closure member having integral tabs which engage said slit-like apertures in said top extension member and said side extension member of said support member.

vii. a pair of removable vertical partitions supported along their lower edges by said bottom extension member and loosely and moveably fitted in said first enclosed compartment in said support member and arranged to form three vertically extending sections in said enclosed compartment

viii. a first collapsible empty fluid container for collecting waste liquid in one of said three sections

ix. a pair of collapsible saline solution containers in each of the other of said three sections

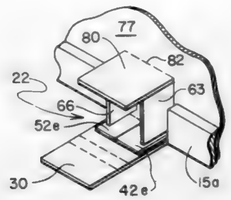
x. and a second collapsible empty fluid container in said open compartment in said support member

4,043,502

PACKING, SHIPPING, AND SIDE-DISPENSING CONTAINER FOR DENSE MATERIAL

Thomas E. Croley, Worthington, Ohio, assignor to Corco, Inc., Worthington, Ohio

Filed Aug. 30, 1976, Ser. No. 718,582
Int. Cl.[2] B65D *5/72, 5/48*
U.S. Cl. 229—17 B **4 Claims**



1. A container assembly of fiberboard or the like comprising a bottom tray of angular form having a flat bottom wall with an upstanding peripheral flange composed of a number of sides angularly disposed relatively, an upright material-receiving shell disposed within the flange of the tray and having upright side walls disposed inwardly of and adjacent to the sides of the flange, each of said sides of the tray flange being in the form of a double hinged flange consisting of an outer upright section hinged to the flat bottom and an inward depending insert section hinged to the outer section at a double hinge; each of said upright side walls of the shell adjacent the respective sides of the tray flange having a lower flange interlocking with the double hinged flange of the tray and consisting of a lower connector section hinged to the wall and extending outwardly and an upright insert section hinged to the connector section and extending upwardly between the outer upright section of the double hinged tray flange and its inner depending insert section; said interlocking double hinged flange of the tray and flange of the shell at one of said tray flange sides having cooperating outwardly-displaceable tabs to provide a dispensing passageway, when desired, which leads laterally through the tray flange and which comprises:

a tab structure of selected width hinged to the upright wall of the shell for outward displacement and located above said connector section of the wall flange, a tab formed in said inner depending insert section and outer upright section and double hinge of the side of the tray flange and being of no less width than the width of said shell upright wall tab structure to permit outward displacement of said wall tab structure, an outwardly displaceable tab in said upright inner section of the shell wall flange interlocked within the tab of the double hinged tray flange side and being of no greater width than that tab so as not to prevent outward displacement thereof but being of no less width than the shell upright wall tab to permit outward displacement of that tab; outward displacement of the tabs of the shell flange and interlocking tray flange causing outward extension of the tray tab with its double hinged flange horizontal and the tab of the upright insert section of the shell flange into horizontal position overlying it with the shell upright wall tab structure opening over the said overlying flanges; and securing means cooperating with said tray flange tab to maintain it in normal position,

and in which an outer shell is provided which surrounds the inner shell that serves as a liner shell, said outer shell having upright side walls with their lower ends disposed within the corresponding sides of the tray flange outwardly of the corresponding side walls of the liner shell and resting on said connector section of the liner shell lower flange:

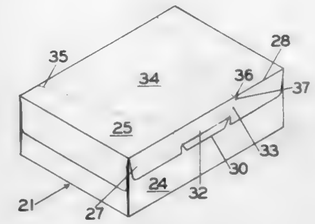
and an outwardly displaceable tab in the lower end of the outer shell side wall which is located within the side of the tray flange having the outwardly displaceable tab, said outer shell tab being hinged to the outer shell for outward movement and being of no less width than the tab structure of the upright liner shell wall to permit outward displacement of that tab structure and no greater width than the tab of the interlocking tray flange and shell flange to permit outward displacement of the outer shell tab through the opening provided by displacement of the tabs of the interlocking flanges.

4,043,503

RECLOSABLE CARTON

George Leroy Meyers, Menasha, and David Charles Mueller, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed July 14, 1976, Ser. No. 705,341
Int. Cl.[2] B65D *5/56;* **B56D** *17/00*
U.S. Cl. 206—613 **6 Claims**



1. A paperboard carton blank having an inside and an outside surface, said blank comprising:

a. hingedly connected bottom, top, front, back, and end panels,

b. a front glue flap having a top edge and a bottom edge, said glue flap being hingedly connected along its top edge to the front of said top panel along a fold line and being adapted to be glued to the outside of said front panel,

c. a first pair of laterally spaced cut score lines forming a front cover portion in said front glue flap and extending substantially from the bottom edge of said glue flap upwardly and outwardly to said fold line.

d. a second pair of laterally spaced cut score lines forming a top cover portion in said top panel and extending substantially from said fold line rearwardly toward the back of said top panel, said second pair of cut score lines being spaced laterally inward of said first pair of cut score lines at said fold line, and

e. a third pair of cut score lines formed in the outside surface of said blank along said fold line extending between the cut score lines of said first and second pairs of cut score lines to form a pair of arrow locking tabs on the sides of the front cover portion at the top edge of the glue flap, the arrow locking tabs of said front cover portion being adapted to be inserted inside of said front panel and under said top panel to lock said top cover portion closed when the carton formed from said carton blank is reclosed.

4,043,504

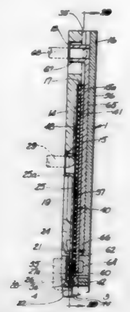
STAPLE CARTRIDGE AND FEED MEANS FOR USE WITH A SURGICAL STAPLING INSTRUMENT

J. Charles Hueil, Loveland, Ohio, and Robert G. Rothfuss, Bellevue, Ky., assignors to Senco Products, Inc., Cincinnati, Ohio

Filed Mar. 9, 1976, Ser. No. 665,294
Int. Cl.[2] B25C *5/02*
U.S. Cl. 227—116 **17 Claims**

1. A staple cartridge for use with a stapling instrument, said cartridge comprising a body having therein a staple forming track with a reciprocable staple former therein actuable by said instrument, a separate and distinct parallel staple feeding track for a stack of staples, a passage between said staple feeding and

forming tracks so sized as to permit the passage therethrough of one staple at a time from said staple feeding track to said staple forming track, means actuable by said instrument to shift one staple at a time from said staple feeding track through said



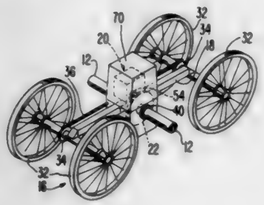
passage into said staple forming track, said staple shifting means closing said passage when a staple is not being shifted therethrough by said staple shifting means, and means to maintain a staple shifted into said staple forming track in proper position therein to be acted upon by said staple former.

4,043,505

METHOD AND APPARATUS FOR REVERSIBLY POWERING A MOBILE IRRIGATION SYSTEM

Roger M. Sherman, Los Altos, Calif., assignor to MAC Corporation, San Jose, Calif.

Continuation of Ser. No. 544,208, Jan. 27, 1975, abandoned. This application May 27, 1976, Ser. No. 690,414
Int. Cl.² B05B *3/18*
U.S. Cl. 239—11 **6 Claims**



1. An improved, mobile irrigating system of the type having a plurality of wheel mounted irrigating pipes coupled in line to a central, motorized power unit which turns the irrigating pipe wheels by turning the line of coupled pipes wherein the improvement comprises a reversible, internal combustion engine for operating the central, motorized power unit, the engine having a shaft which rotates in either of two directions depending upon the direction of rotation used to start the engine, reversible electric starter means for selectively rotating the engine shaft in one of the two directions to start the engine, and means for remotely controlling the starter means from one end of the line of pipes.

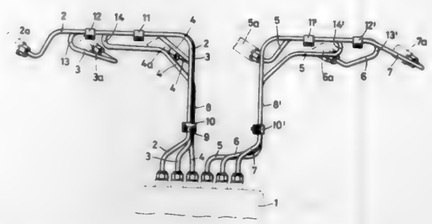
4,043,506

INJECTION LINE SYSTEM

Jurgen Guido, Borsigstrasse 4, and Robert Stock, Dresdener Strasse 1, both of 8402 Neutraubling, Germany

Filed June 28, 1976, Ser. No. 700,471
Int. Cl.² B05B *15/00*
U.S. Cl. 239—76 **2 Claims**

1. An injection line system for linking an injection pump with a series of associated injection nozzles and comprising a plurality of injection lines of the same cross-section and length for mounting to extend between respective connection points of said injection pump and said injection nozzles, means for bundling said injection lines together at predetermined points to suppress operational vibration movements in said lines with the formation of compensation bends in the injection lines leading to said injection nozzles, coupling means for retaining portions of two or more of said injection lines in the region of their associated injection nozzles in side-by-side relationship



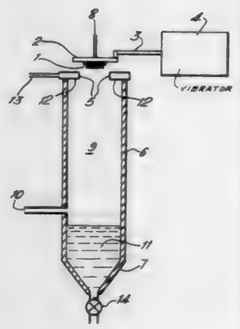
and in a first flow direction parallel to an imaginary line joining the connection points of said associated injection nozzles, at least another one of said injection lines being provided with a bent portion to define a section thereof extending in a second flow direction to its associated nozzle and opposite to said first flow direction, said section being in mutual overlap with respect to said injection lines disposed in side-by-side relationship and being coupled thereto by said coupling means.

4,043,507

APPARATUS FOR THE FORMATION OF LIQUID DROPLETS

Peter Frederick Wace, Oxford, England, assignor to United Kingdom Atomic Energy Authority, London, England

Continuation of Ser. No. 246,662, April 24, 1972, abandoned. This application Nov. 1, 1974, Ser. No. 520,091
Claims priority, application United Kingdom, May 5, 1971, 13373/71
Int. Cl.² G01D *15/18*
U.S. Cl. 239—102 **12 Claims**



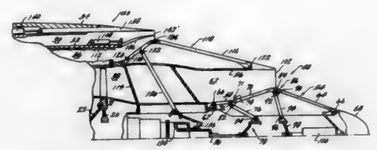
1. Apparatus for the formation of liquid droplets comprising:
ejection means for ejecting downwardly a plurality of continuously moving jets of liquid, said ejection means comprising a lightweight dropping head in the form of a spinnerette having a plurality of orifices of highly uniform and accurate orifice size and position,
and break-up means for breaking up the continuously moving jets leaving the orifices, into short lengths which then form into droplets subsequent to their formation into short lengths, said break-up means comprising a means for vibrating the spinnerette as the said continuously moving liquid jets are issuing therefrom.

4,043,508

ARTICULATED PLUG NOZZLE

Donald W. Speir, and Donald P. McHugh, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 1, 1975, Ser. No. 636,572
Int. Cl.² B64C *15/02*; B64D *33/04*
U.S. Cl. 239—265.19 **7 Claims**



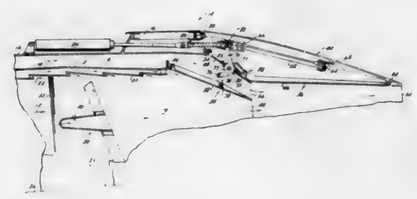
1. A propulsion nozzle comprising:
a nozzle shroud, and
an articulated plug mounted in spacial relationship, and cooperating, with said shroud to form a fluid flow path therebetween having a throat and an exit, and wherein said plug comprises first, second and third flap means serially connected by means of articulated joints which are positionable with respect to said shroud to permit the throat of the nozzle to be displaced axially and the throat-to-exit area ratio to be modulated without translating said shroud or said plug.

4,043,509

ACTUATION SYSTEM FOR A GAS TURBINE ENGINE EXHAUST DEVICE

Donald P. McHugh, Wyoming, and Donald F. Cook, Goshen, both of Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed May 13, 1976, Ser. No. 686,062
Int. Cl.² F02C *3/06*; F02K *1/12*
U.S. Cl. 239—265.41 **8 Claims**



1. In a gas turbine engine exhaust device including a first duct terminating in first variable position flap means defining a first throat; and a second duct exterior of the first duct terminating in second variable position flap means, the first and second flap means cooperating to define a second throat therebetween; the improvement comprising an actuation system characterized by:
a bell crank, having first and second arms, pivotably connected to the second flap means;
link means operatively connecting the first of said arms and the first flap means; and
means operatively connected to the second of said arms for positioning said second flap means and for pivoting said bell crank to simultaneously position said first flap means.

4,043,510

NON-AEROSOL TYPE DISPENSER

William E. Morris, 1831 N. Douglas, Appleton, Wis. 54911

Filed Nov. 21, 1975, Ser. No. 633,971
Int. Cl.² B05B *11/02*
U.S. Cl. 239—323 **2 Claims**



1. A portable, hand operated dispenser for spraying fluid composition under pressure comprising a container having an open mouth at the top and an inlet in the body portion below the top, means connecting the inlet with a source of high pressure fluid, a flexible, fluid impervious bag adapted to be filled with the fluid material to be dispensed and to be received within the container with an open upper end portion of the bag draped over and about the wall defining the open upper end of the container, a spray head including a cap portion, a spray portion and a handle portion, said cap portion having means for removably securing the spray head onto the open upper end of the container in sealing relation therewith and with the portion of the bag in between, said spray portion including a tubular section having a nozzle opening at one end and an inlet in communication with the interior of the container when the spray head is in the assembled relation on the container, a needle valve mounted in the tubular section for reciprocal movement in the direction towards and away from the nozzle to plug the nozzle opening when in closed position and to free the opening when in open position, and means for actuating the needle valve between open and closed positions, said handle portion being located immediately rearwardly of the nozzle and cap portions in which the cap portion is formed with an open ended downwardly extending cylindrical skirt and in which the means removably securing the cap portion onto the container comprises screw threads in the skirt and screw threads in the outer wall of the container adjacent the upper end to enable the cap portion to be screwed onto and off of the container, and in which the lowermost screw thread in the cap portion and container are formed with surface roughness or rack teeth in adjacent surfaces to militate against relative turning movement when pressure conditions exist within the container sufficient to urge the cap portion to lift off of the container.

4,043,511

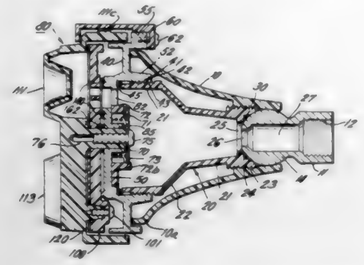
SHOWER HEAD

Toshio Nakamura, Mishima, Japan, assignor to Sanyei Corporation, Tokyo, Japan

Filed July 14, 1976, Ser. No. 705,354
Int. Cl.² A62C *31/02*
U.S. Cl. 239—394 **10 Claims**

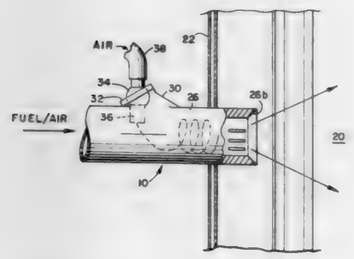
1. A shower head having a plurality of nozzles and comprising:

a holder;
an axial water flow passage through said holder;
a housing secured to said holder and having a wall transverse to said axial water flow passage;
a nozzle section rotatably mounted on said housing and having
a nozzle section wall parallel to said housing wall,
said nozzle section having a plurality of nozzles each radially spaced at the same distance from the center of rotation of said nozzle section with respect to said housing;
said housing wall having a water passage opening similarly radially spaced from the said center of rotation of the nozzle section with respect to said housing;



said nozzle section being rotatable to successively register one nozzle at a time with said water passage opening in said housing wall,
and a support disc bearing against said housing wall on the side thereof opposite the side on which said nozzle section is secured,
said support disc being connected to and rotatable with said nozzle section,
said support disc maintaining said nozzle section and housing wall parallel to each other and in contact with each other to prevent transverse leakage at the housing wall.

4,043,512
COAL BURNER
Norman K. Trozzi, West Caldwell, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.
Filed Jan. 23, 1976, Ser. No. 651,866
Int. Cl.² B05B *7/10*
U.S. Cl. 239—402.5 **6 Claims**



1. A burner comprising:
a cylindrical housing for receiving fuel and having an outlet for discharging said fuel;
a tube disposed upstream of said outlet and extending through a wall of said housing, said tube having one end connected to a source of combustion-supporting fluid and the other end communicating with the interior of said housing for discharging said fluid in a direction substantially tangential to the inner wall of said housing, said fluid imparting a swirl to the fuel discharging from said outlet; and
support means for adjustably mounting said tube relative to the wall of said housing for movement of said tube in two orthogonal planes, one of said planes being substantially parallel to the direction of fuel flow through said housing and the other of said planes being substantially perpendicular to the fuel flow direction.

4,043,513
PROCESS AND APPARATUS FOR SORTING REFUSE
Heinz Hoberg, Am Rosenhugel 21, Aachen-Laurensberg, and Erwin Schulz, Turmstr. 29, Raeren, Belgien, both of Germany
Filed Feb. 20, 1976, Ser. No. 659,854
Claims priority, application Germany, Mar. 6, 1975, 2509764
Int. Cl.² B02C *23/14*
U.S. Cl. 241—24 **23 Claims**

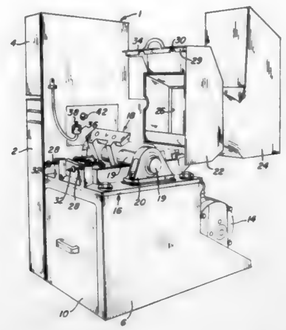


1. A process for sorting refuse into groups comprising the following consecutive steps:
a. sifting the refuse;
b. cutting the oversize obtained by step (a) to produce comminuted material;
c. separating the comminuted material obtained in step (b) by a gas stream into a light material fraction and a heavy material fraction;
d. separating the heavy material fraction obtained in step (c) by a liquid stream into components of relatively low and relatively high density;
e. magnetically separating the component of relatively high density into ferrous and non-ferrous parts; and
f. separating the non-ferrous part into a non-ferrous metal portion and a glass and ceramics portion.

4,043,514
COMMINUTION DEVICE
Russell I. Peterson, Jr., Bay City, Mich., assignor to Conair, Inc., Franklin, Pa.
Filed Mar. 16, 1976, Ser. No. 667,400
Int. Cl.² B02C *23/04*
U.S. Cl. 241—36 **9 Claims**

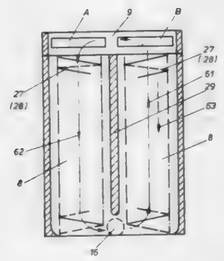
1. A comminution device comprising: a housing member, a comminution structure consisting of a stationary member and a rotatable knife means, said comminution structure being supported by said housing member with said comminution structure having an upwardly open extent, a rotatable flywheel supported by said housing and coupled to said rotatable knife means to cause rotation thereof upon rotation of said flywheel, enclosure means movably supported by one of said members for selectively enclosing said open extent of said comminution

structure, means supported by said housing member having a movable portion selectively engageable with said flywheel for applying a motion restraining force to said flywheel, and said



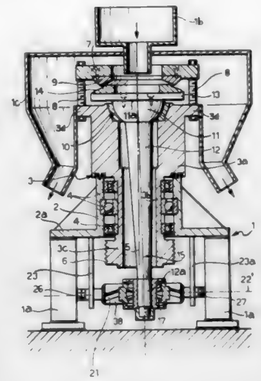
enclosure means being selectively movable into and out of engagement with said movable portion to control the application of said motion restraining force to said flywheel.

4,043,515
MACHINE FOR COMMINUTING AND MIXING MATERIALS
Hans Josef Bründler, Buttikon, Switzerland (CH-8863)
Filed Apr. 16, 1975, Ser. No. 568,417
Claims priority, application Germany, Apr. 25, 1974, 2420115
Int. Cl.² B02C *18/14*
U.S. Cl. 241—97 **16 Claims**



1. A machine, for use in continuously comminuting and mixing materials, especially animal and vegetable products, comprising in combustion,
a mixing chamber structure including adjacent first and second mixing chamber portions, a first connecting passage at one end of said mixing chamber and interconnecting said first and second mixing chamber portions, and an unobstructed second connecting passage at the other end of said mixing chamber interconnecting said first and second mixing chamber portions free from obstructions,
two comminuting devices disposed adjacent each other near said one end of said mixing chamber and a conveying and mixing means extending through the respective mixing chamber portion from each comminuting device, said comminuting devices and conveying and mixing means being operative to comminute and mix and convey said materials so as to convey them in an endless path throughout the first mixing chamber portion, thence through said second connecting passage into said second mixing chamber and thence through said comminuting devices and said first connecting passage and again into said first mixing chamber portion.

4,043,516
DISK MILL FOR MILLING CRUSHING OR GRINDING PEBBLES, GRAVEL, SMALL ROCKS AND THE LIKE
Tarcisio Pozzato; Mariano Pozzato, and Alberto Pozzato, all of Via Grattacavallo 2, Sandrigo, (Vincenza), Italy
Filed Mar. 23, 1976, Ser. No. 669,607
Claims priority, application Italy, Apr. 4, 1975, 22000/75
Int. Cl.² B02C *7/10, 7/14*
U.S. Cl. 241—252 **9 Claims**



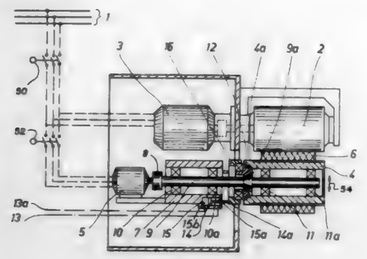
1. A disk mill for milling, crushing or grinding pebbles, gravel, small rocks and the like, the mill comprising:
a support structure;
a first mount for mounting a first grinding disk having a working face;
first rotary mounting means rotatably mounting the first mount with respect to the support structure for rotation about a first axis;
a second mount for mounting a second grinding disk having a working face opposing the working face of the first grinding disk;
second rotary mounting means rotatably mounting the second mount with respect to the support structure and with respect to the first mount, for permitting the second mount to rotate about a second axis, the second rotary mounting means also permitting said second axis to be inclined relative to said first axis;
an extended control arm fixed to the second mount and projecting along said second axis;
a retaining member;
means mounting the retaining member for at least a restricted angular movement about a third axis at right angles to but substantially spaced from said first axis and substantially spaced from the second mount, and for translatory movement in a direction parallel to said third axis;
rotary bearing means connecting the retaining member to the control arm at a position substantially spaced from the second mount, which rotary bearing means permits the control arm to rotate about said second axis with respect to the retaining member and permits some twisting movement between the control arm and the retaining member about an axis parallel to the third axis;
a double-acting fluid pressure actuator having a stationary part connected to the support structure of the mill and a movable part connected to the retaining member, for alternating the inclination of said second axis relative to said first axis; and
drive means for positively rotating at least one of the first and second mounts.

4,043,517

DEVICE FOR CONTROLLING THREAD SPOOLING DRIVES

Günter Jührig, Leopoldshafen, Germany, assignor to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft, Germany

Filed Dec. 5, 1975, Ser. No. 638,172
Claims priority, application Germany, Dec. 13, 1974, 2458996
Int. Cl.[2] B65H *54/40*
U.S. Cl. 242—18 DD **5 Claims**



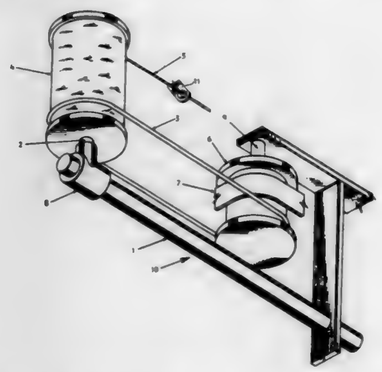
1. A device for controlling thead spooling drives in which the bobbin package and its associated carrier roller are frictionally driven by a motor driven drive roller, comprising a rotatable carrier roller shaft, means for continuously and rotatably driving said carrier roller shaft, a bobbin carrier roller freely rotatable on said carrier roller shaft and having a conical end portion, a conical portion formed on said carrier roller shaft adjacent to said conical end portion and having a conical shaft surface diverging in an opposite direction from said conical end portion, and a clutch cone having a double cone portion disposed between and engageable with said conical end portion and said conical shaft surface, means for shifting said clutch cone axially into engagement with said conical end portion of said bobbin carrier roller and said conical shaft surface of said carrier roller shaft.

4,043,518

POSITIVE YARN FEEDING DEVICE

Henry C. Gardner, Norge, Va., assignor to Dow Badische Company, Williamsburg, Va.

Filed Sept. 2, 1976, Ser. No. 719,781
Int. Cl.[2] B65H *59/00*
U.S. Cl. 242—45 **4 Claims**



1. A device for the positive feeding of yarn to a source of utilization of the yarn by rolling take-off from a yarn package of the type comprising a cylindrical support upon which the yarn is packaged by winding, which device comprises:

A. means for supporting the yarn package and permitting rotation thereof about the longitudinal axis thereof;

B. means for guiding the yarn from the package to the source of utilization of the yarn;

C. an drive roll positioned in proximity to, but spaced from the yarn package, and mounted for rotation about its longitudinal axis, the longitudinal axis of the drive roll being substantially parallel to the longitudinal axis of the yarn package;

D. a resilient circular band having an annular cross-section, the band being stretched over the package and the drive roll so that the inner surface of the band is urged against both the exterior surface of the drive roll and the yarn on the package; and

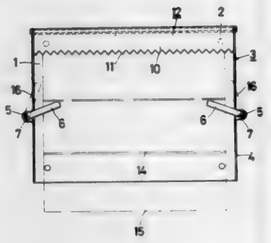
E. means for driving the drive roll at a rotational velocity corresponding to the rate of consumption of the yarn by the source of utilization of the yarn.

4,043,519

HOLDER FOR ROLL OF STRIPPED MATERIAL

Teiji Suzuki, 6-2, Hon-cho 4-chome, and Zenichiro Mizuno, 5-11, Sakura-Josui 3-chome, both of Tokyo, Japan

Filed Mar. 10, 1976, Ser. No. 665,542
Claims priority, application Japan, Nov. 5, 1975, 50-149934[U]
Int. Cl.[2] B65H *19/02*
U.S. Cl. 242—55.53 **2 Claims**



1. A holder for a roll of sheet material having a cylindrical center hole of a predetermined diameter, the holder comprising

a. a framework consisting of a rear wall and a pair of lateral side walls projecting from opposed ends of the rear wall, the walls of the framework enclosing a space for accommodating the roll;

b. a pair of support levers for the roll, each of the support levers being pivotally mounted in a respective one of the side walls for free pivoting movement in a common plane extending perpendicularly to the side walls, each support lever having a tail end and a forward end, the forward ends projecting towards each other into said space, and the side walls being formed with respective grooves, each groove defining an upper shoulder engaging the forward end of an associated support lever when the support levers are pivoted upwardly in the common plane into a retracted position, said grooves having respective lower portions, said tail ends being pivoted to said side walls in said lower portions respectively, the length of the support levers being in excess of that of the grooves whereby only a portion of the support levers is received in the grooves in the retracted position and being shorter than the diameter of the center hole whereby the support levers are freely pivoted from the retracted position into a support position within the center hole when the center hole is in alignment with the support levers; and

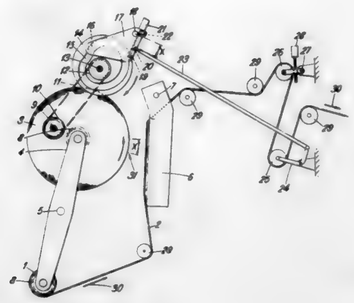
c. a cover for the roll, the lateral side walls having upper posterior portions and the cover having a rear edge pivotally attached to the posterior portions of the lateral side walls.

4,043,520

METHOD AND ARRANGEMENT FOR REGISTERED SPLICING OF A WEB OF MATERIAL WHILE IT IS IN MOTION

Willy John Olsson, and Harald Georg Swede, both of Malmo, Sweden, assignors to AB Ziristor, Lund, Sweden

Filed Oct. 7, 1975, Ser. No. 620,403
Claims priority, application Sweden, Oct. 11, 1974, 7412808
Int. Cl.[2] B65H *19/18, 21/02*
U.S. Cl. 242—58.1 **9 Claims**



1. A method for splicing a first web of material normally moving at a constant speed and having equally spaced indicia thereon to the leading end of a second web of material in roll form and having equally spaced indicia thereon with the same spacing as the indicia on the first web where the first indicia on the leading end of the second web and the last visible indicia on the second web adjacent the leading end thereof do not normally have the same spacing as between contiguous indicia, the first moving web passing adjacent the periphery of the roll of the second web, comprising, rotating the roll of the second web at a speed providing substantially the same peripheral speed as the speed of the first moving web, varying the speed of the first web during a part of each revolution of the roll of the second web to compensate for the uneven spacing between the first indicia and the last visible indicia on the roll of the second web and to provide a synchronized relation between the indicia on the first web and the indicia on the second web during the remaining part of each revolution of the roll of the second web, advancing or retarding the first moving web longitudinally of its length to provide exact registration between the indicia on the first moving web and the indicia on the second web during the remaining part of each revolution of the roll of the second web and finally splicing together the first moving web with the second web while the indicia are in exact registration.

4,043,521

CASTING REEL FOR FISHING

R. Dell Hull, Zebco, 6101 E. Apache St., Tulsa, Okla. 74101

Filed July 7, 1975, Ser. No. 593,461
Int. Cl.[2] A01K *89/04*
U.S. Cl. 242—84.41 **7 Claims**

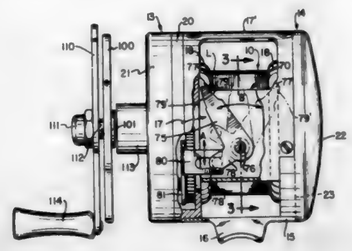
1. In a casting fishing reel including a line spool in spaced parallel relation, mounted on a spool shaft, end housings, pillar means supporting said end housing, bearings supported in said end housings and journaling the ends of said shaft, a drive mechanism selectively engageable with said shaft to rotate said spool in a predetermined line retrieval direction, a rotatable crankshaft for imparting torque to said drive mechanism, a reel with the improvement consisting of a level winding mechanism comprising

a. line guide wall means extending between said two end housings and having a shallow U-shaped opening defined at the upper edge thereof;

b. said U-shaped opening being of a width equal to the width of line supporting portions of said line spool;

c. pivot means mounted on said line guide wall means below said shallow U-shaped opening;

d. line distribution lever means pivotably mounted on said pivot means for swinging movement in a plane parallel to that of said line guide wall means and fully across and



beyond said U-shaped opening, whereby said U-shaped opening is totally unobstructed by said lever at the opposite ends of its travel;

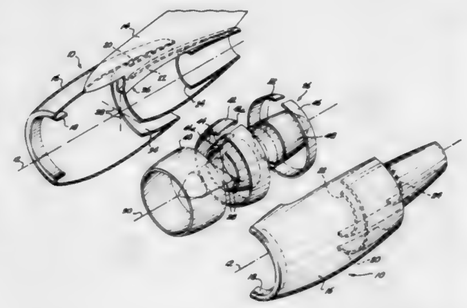
e. reciprocating drive means operatively interconnected between said drive mechanism and said line distribution lever means to reciprocate said line distribution means across said U-shaped opening during operation of said drive mechanism.

4,043,522

COMMON POD FOR HOUSING A PLURALITY OF DIFFERENT TURBOFAN JET PROPULSION ENGINES

Earl E. Vetter, Mercer Island, Wash., assignor to The Boeing Company, Seattle, Wash. and Aeritalia S.p.A., Naples, Italy

Filed Dec. 22, 1975, Ser. No. 642,787
Int. Cl.[2] B64D *29/00*
U.S. Cl. 244—54 **11 Claims**



1. A pod for housing a turbofan jet propulsion engine selected from a plurality of different turbofan engines, said engine having a fan casing, a fan, a turine engine a turbine engine casing and a turbine outlet, said fan casing having a forward end defining a fan entrance plane and a rearward end defining a fan exit plane, said pod comprising:

an outer, annularly shaped, cowl member having a center line and a predetermined datum plane oriented transversely to the center line of said cowl member, said cowl member surrounding said center line and extending longitudinally from its forward end located forwardly of said datum plane to a rearward end located rearwardly of said datum plane, the forward end of said cowl member being radially convergent as it extends forwardly,

an annular inlet throat adjacent the forward end of said cowl member and being disposed about said cowl center line, the forward end of said throat being radially divergent as

it extends forwardly and merging with the forward enf of said cowl member to form an inlet highlight, said throat terminating in a rearward edge defining a throat oriented transversely to the cowl center line and located forwardly of datum said plane and forwardly from said fan entrance plane when said engine is positioned in said pod,

an outer, angularly shaped, fan duct wall disposed about said cowl center line and being spaced radially inwardly from said cowl member, said outer fan duct wall having a forward end terminating in a forward edge defining a first plane oriented transversely to said center line, located rearwardly from said datum plane and spaced rearwardly from said fan exit plane when said engine is positioned in said pod, said outer fan wall having a rearward edge and being fixed to said cowl member adjacent the rearward end thereof,

an annular turbine nozzle disposed about said cowl center line and spaced radially inwardly from said cowl member, the rearward end of said turbine nozzle forming a nozzle opening defining a turbine nozzle exit plane located rearwardly from said datum plane, said nozzle extending forwardly from said turbine nozzle exit plane and terminating in a forward edge defining a turbine nozzle entrance plane oriented transversely to said center line and positioned rearwardly from said datum plane,

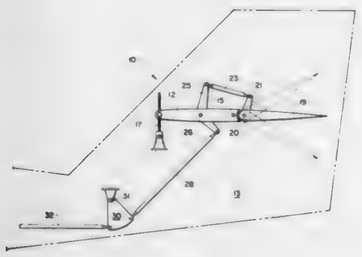
an inner, annularly spaced, fan duct wall spaced radially inwardly from said outer fan duct wall, the forward end of said inner fan duct wall terminating in a forward edge defining a second plane oriented transversely to said center line and located rearwardly from said datum plane, spaced rearwardly from said fan exit plane when said engine is positioned in said pool, and located forwardly of said turbine nozzle entrance, plane, said inner fan duct wall being located radially outwardly from said turbine engine casing when said engine is positioned in said pod, said inner fan duct wall converging toward said turbine nozzle as it extends rearwardly, and having a rearward end affixed to said turbine nozzle.

4,043,523

APPARATUS FOR AIRCRAFT PITCH TRIM

Otto E. Bartoe, Jr., Boulder, Colo., assignor to Ball Brothers Research Corporation, Boulder, Colo.

Filed Mar. 11, 1976, Ser. No. 665,833
Int. Cl.² B64C *13/30, 9/10*
U.S. Cl. 244—87 **4 Claims**



1. Apparatus for providing pitch trim and pitch control for an aircraft comprising:

an airframe having a longitudinal axis;

a horizontal stabilizer pivotally attached to the airframe around an axis transverse to the longitudinal axis of the airframe for movement from a neutral position relative to the airframe to up and down trim positions;

an elevator pivotally attached to the trailing edge of the horizontal stabilizer for movement from a neutral aligned position relative to the horizontal stabilizer to up and down control positions; a control horn extending from and above the elevator;

a bell crank pivotally attached to the horizontal stabilizer around an axis substanially parallel to the pivotal axis of the horizontal stabilizer, the bell crank having a first arm extending below the horizontal stabilizer and a second arm extending above the horizontal stabilizer;

a pivot member rotatably attached to the airframe;

primary control means connected to the pivot member;

a push tube extending between the control horn and the second arm of the bell crank, the push tube being pivotally connected to both the bell crank and the control horn;

an intermediate push tube extending between the pivot member the first arm of the bell crank and substantially longitudinally aligned with the pivot axis of the horizontal stabilizer when the horizontal stabilizer and elevator are both in the neutral position; and

means for rotating the horizontal stabilizer around the pivot axis of the horizontal stabilizer,

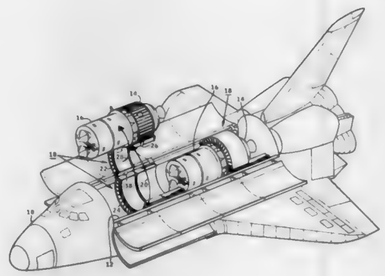
whereby the horizontal stabilizer may be rotated around its pivot axis to provide pitch trim while maintaining substantially constant orientation of the elevator relative to the horizontal stabilizer at a given setting of the pivot member throughout the movement of the horizontal stabilizer.

4,043,524

SUPPORT AND LOAD ALLEVIATION SYSTEM FOR SPACE VEHICLES

Wesley M. Dreyer, Encinitas, and Richard G. Huntington, San Diego, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 23, 1976, Ser. No. 716,418
Int. Cl.² B64D *9/00*
U.S. Cl. 244—118 R **4 Claims**



1. In a cradle system for supporting a space vehicle in a cargo bay of a reusable launch vehicle during launch and for deploying the space vehicle in outer space through a top bay opening, said cradle having a generally tubular configuration consisting of two longitudinally divided sections, hinged together so that an upper section can be rotated to deploy a space vehicle secured thereto, the lower section being secured to the space launch vehicle said cradle section constructed as closed box structures including inner and outer skins, radial frames and integrally machined edge closing beams; the improvement wherein said lower section is secured to said launch vehicle by six point support system comprising:

two lateral support fittings attached to the lower section at the lower centerline of said lower section, at the forward and aft edges, each lateral support fitting including a downwardly extending tongue fitting within a corresponding socket in the cargo bay surface, whereby loads in the transverse direction are reacted;

two aft attachment fittings located at the aft upper edges of said lower section include outwardly extending pins which engage corresponding sockets in the cargo bay surface, whereby loads in vertical and longitudinal directions are reacted; and

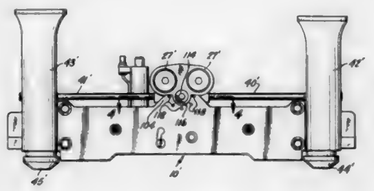
two forward attachment fittings located at the upper, forward edge of said lower section including trunnions mounting outwardly extending pins adapted to engage corresponding sockets in the cargo bay surface, said trunnions being hingedly mounted on said lower section for rotation about a line substantially perpendicular to the cradle centerline, said forward attachment fitting further including liquid spring means connected between said trunnions and said lower section to restrain said rotation; whereby loads in the vertical direction are reacted.

4,043,525

VARIABLE ORIFICING DEVICE

Thaddeus Jakubowski, Jr., Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 31, 1976, Ser. No. 672,526
Int. Cl.² B64D *1/12*
U.S. Cl. 244—137 R **8 Claims**



6. A store carrier for mounting a jettisonable store on an aircraft and for releasing the store with ejective force applied to the store at least at two different locations by medium actuated thrusters, wherein the improvement comprises:

a housing enclosing a pressure chamber having at least one inlet for the introduction of medium and an outlet for each thruster; and

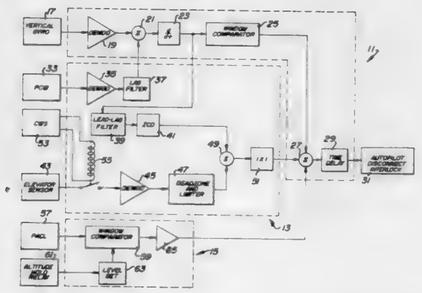
a member movable in said pressure chamber, said member having a plurality of orifices therein, said member orifices selectively cooperating with said outlets for the thrusters to selectively apportion the flow of medium thereto from a single location.

4,043,526

AUTOPILOT HARDOVER FAILURE PROTECTION SYSTEM

Shawn T. Donley, Richlandtown, Pa., and Valentine A. Freitag, Marlton, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,308
Int. Cl.² G05D *1/00*
U.S. Cl. 244—194 **48 Claims**



1. An autopilot failure protection system for an aircraft, comprising:

first signal processing means responsive to a signal indicative of the actual pitch attitude of the aircraft and for producing thereform a pitch rate signal and a warning signal;

nuisance disconnect inhibiting means for receiving the pitch rate signal and an aircraft elevator signal and for producing an inhibit signal; and

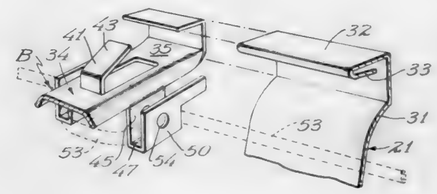
first summing means for receiving the warning signal and the inhibit signal, for producing a disengagement signal which represents the combination of the warning signal and of the inhibit signal, and for providing the disengagement signal to an aircraft autopilot.

4,043,527

HEATING CABLES

Alvin W. Franzmeier, 1042 E. Jenks, St. Paul, Minn. 55104

Filed May 13, 1976, Ser. No. 685,783
Int. Cl.² F16L *3/08*
U.S. Cl. 248—65 **4 Claims**



1. A heating cable support for use in combination with a rain gutter having an inner wall and an outer wall comprising:

a support member adaptable to be secured to at least one side of a rain gutter, said support member extending toward the other side of the rain gutter;

means located on said support member, said means adapted to accommodate portions of a heating cable in a predetermined location so that the heating cable can melt ice adjacent thereto, said means including an upwardly projecting hook directed toward the outer wall of the rain gutter;

further means adapted to accommodate portions of a heating cable, said further means including at least one strip extending downwardly from said support member, a bottom portion connected to the lower end of said downwardly extending portion of said strip, and an upwardly extending flange secured to said bottom portion in spaced relation to said downwardly extending portion, said further means being spaced from said support member so that the heating cable can melt ice adjacent thereto, said means and said further means being spaced from the inner wall, the outer wall and the bottom of said rain gutter to thereby provide support for a heating cable above the bottom of the rain gutter and within the inner and outer walls of the rain gutter.

4,043,528

RELEASABLE SUPPORT ROD

Roland Benoit, and John Polanski, both of Danielson, Conn., assignors to InterRoyal Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,398
Int. Cl.² A47H *1/14*
U.S. Cl. 248—251 **7 Claims**

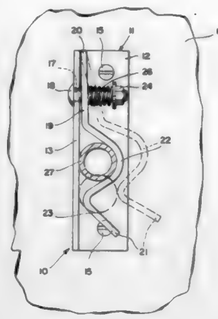
1. A releasable support rod structure comprising:

plate means disposed for securement in stationary relation to a wall structure and containing an exposed substantially flat vertically oriented face,

yieldable load-bearing means separate from and movably engageable with said flat face and having an upper portion abutting said flat face and a depending rod holding portion disposed in below said upper portion opposed facing relation to said flat face and selectively limitedly movably displaceable operatively toward and away from said flat face for holding an independent and separate rod engage-

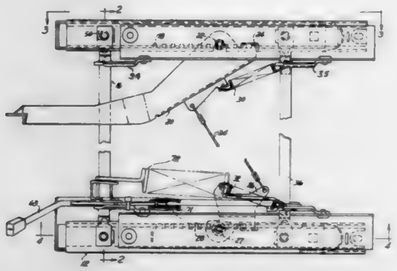
ably releasably insertable thereat, said yieldable load-bearing means including means for adjusting the tautness thereof for presetting the load-bearing capacity of said yieldable means

said rod holding portion being relatively U-shaped in cross-section and having the corresponding open portion of the U-shaped portion thereof disposed in opposed facing



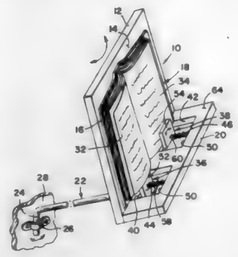
relation to said flat face and being selectively limitedly movably displaceable with respect to said flat face to disengage and release said rod under the weight of a downward overload relative to the selective load-bearing adjustment of said yieldable load-bearing means placed directly on said rod and transmitted through said rod to said yieldable load-bearing means.

4,043,529
SEAT ADJUSTING MECHANISM
Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.
Filed Oct. 20, 1976, Ser. No. 733,998
Int. Cl.[2] F16M *11/24*
U.S. Cl. 248—419 **8 Claims**



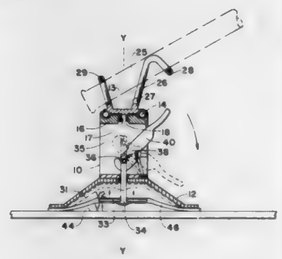
1. A manually operable four-way vehicle seat adjusting mechanism comprising a pair of stationary tracks, elongated carriages movable longitudinally of said tracks, rigid torsion bars having cylindrical intermediate portions and flattened end portions fixedly connected at the flattened end portions to said carriages to provide a rigid carriage assembly, torsion tubes mounted on the intermediate portions of said bars and journaled thereby for rotation thereon, lifting bell-cranks fixed to said tubes adjacent their ends, links extending longitudinally between the bell-cranks at each side of said mechanism, and a seat frame including longitudinally extending rigid frame bars pivotally connected at their ends to the bell-cranks at each side of the mechanism.

4,043,530
BOOK SUPPORT
Edward Eric May, R.D. 2, Box 242, Pine Bush, N.Y. 12566
Filed Nov. 10, 1976, Ser. No. 740,498
Int. Cl.[2] A47B *97/04*
U.S. Cl. 248—453 **2 Claims**



1. A support device for books and the like comprising: upright means having a front surface for receiving the back of an open book; ledge means projecting generally perpendicularly from said upright means, said ledge means having a top surface for supporting the bottom of said book; said ledge means having first and second spaced apart cutouts opening onto said front surface; and first and second clamp means respectively mounted in said first and second cutouts for holding said book open by respectively engaging side by side pages of said book; said first and second clamp means respectively comprising: first and second axles respectively mounted in said first and second cutouts directed generally perpendicular to said front surface; first and second apertured blocks respectively mounted about said first and second axles for sliding movement along said axles; first and second helical springs disposed respectively about said first and second axles; and first and second helical springs being located for respectively urging said first and second blocks toward said front surface; said first and second blocks being respectively selectively rotatable about said axles to first and second orientations, said blocks being shaped in a manner that said first orientation is characterized by said blocks extending above said top surface for engaging said pages and said second orientation is characterized by upper surfaces of said blocks being generally in line with the upper surface of said ledge means in order that said blocks do not engage said pages.

4,043,531
FISHING POLE HOLDER
Harvey L. Green, Scottsbluff, Nebr., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Mar. 8, 1976, Ser. No. 665,068
Int. Cl.[2] A01K *97/10;* A47G *25/12*
U.S. Cl. 248—537 **2 Claims**



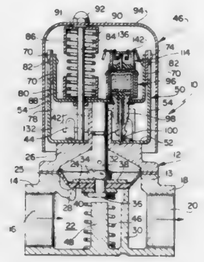
1. A holder unit fitted with loop means for attachment to a fishing pole and with suction means for attachment to a flat

surface, in which the suction means comprise an expandable flexible cup linked through its center by a pin to a pivotable lever, and in which the loop means comprise a pair of wire loops each shaped as a U-member, with both loops mounted to a base, wherein

the flexible suction cup is mounted within a semi-flexible cup that is fixed to a hollow frame, which frame extends about the pivotable lever, with the base of the loop means pivotally mounted to the said frame at a location in which the center of rotation of the base with relation to the frame is an extension of the axis of the pin of the suction cup, so that the base rotates about an imaginary line extending through the center of the suction cup, and in which

each of the wire loops of the base extends in an opposed direction to said center of rotation and the center of the suction cup.

4,043,532
VALVE WITH ELECTRICALLY OPERATED ACTUATOR
Helmut J. Draxler, Warwick, R.I., assignor to New England Union Co., West Warwick, R.I.
Filed Jan. 29, 1976, Ser. No. 653,535
Int. Cl.[2] F16K *31/04*
U.S. Cl. 251—11 **14 Claims**



1. An electrically operated valve comprising a body having inlet and outlet passages formed therein, a valve member located between said inlet and outlet passages for controlling the flow of a fluid therethrough, a valve stem operatively interconnected to said valve member for producing controlled movement thereof and extending outwardly relative thereto and said valve body, and an operating assembly mounted on said valve body and operatively engaging said stem for producing the controlled movement thereof, said operating assembly including a bracket through which said stem extends, an electrically operated heat motor operatively mounted on said bracket, the axis of said heat motor being offset with respect to the axis of said stem, and resilient means operatively mounted on said bracket and being offset relative to said stem and normally urging said stem inwardly to locate said valve member in a closed position, said operating assembly including a plate member mounted for substantial linear movement on said bracket and engaging said stem, and said resilient means being mounted on said plate member for normally urging said plate member inwardly to locate said stem in the closed position thereof, the axis of said resilient means also being offset relative to said heat motor.

4,043,533
AUXILIARY CLOSING FORCE FOR VALVES
John M. Cowley, North Reading, Mass., assignor to Atwood & Morrill Co., Salem, Mass.
Filed Aug. 14, 1975, Ser. No. 604,733
Int. Cl.[2] F16K *31/122*
U.S. Cl. 251—57 **2 Claims**

1. A system for closing a steam valve and maintaining said steam valve shut comprising;

an actuating rod connected with said valve and movable to open and close said valve;

an air cylinder;

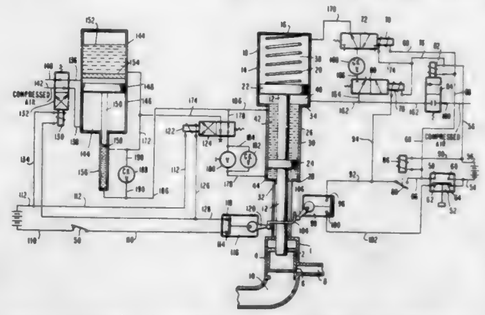
an air piston in said cylinder mounted on said actuator rod;

a spring connected with said actuator rod for urging said rod in a direction to close said steam valve;

a hydraulic cylinder;

a hydraulic piston mounted on said actuator rod between said air piston and said cylinder and slidably mounted in said hydraulic cylinder;

a power booster comprising; a pneumatic cylinder, an oil cylinder, a pneumatic piston slidably mounted in said pneumatic cylinder, an oil piston of substantially smaller area than said pneumatic piston, said oil piston being slidably mounted in said oil cylinder and connected with said pneumatic piston so that movement of said pneumatic piston will cause movement of said oil piston an oil line connecting said oil cylinder to said hydraulic cylinder at a location between said hydraulic piston and said air piston;



means to supply air under pressure to said air cylinder to hold said air piston and said actuating rod in a position whereby said steam valve is open;

means to place the opposite ends of said air cylinder in communication so that the air pressures on opposite sides of said air piston are substantially equal so that said spring urges said air piston and said actuator rod to move in a direction to begin an operation closing said steam valve;

means to exhaust the end of said air cylinder toward which said air piston is traveling to the atmosphere at a later portion of the closing operation so that the air pressure within said air cylinder exerts a force on said piston in the same direction as the force exerted on said piston by said spring; and

means to operate said power booster at a still later stage of the valve closing operation to supply oil to said hydraulic cylinder under pressure to urge said hydraulic piston in said direction to hold said steam valve shut.

4,043,534
SEALING MEANS FOR SLIDING GATE VALVE
Edward R. Gottshall, Bethlehem, Pa., assignor to Mosser Industries, Inc., Allentown, Pa.
Filed Sept. 13, 1976, Ser. No. 722,820
Int. Cl.[2] F16K *3/312, 3/316*
U.S. Cl. 251—174 **16 Claims**

1. A sliding gate valve for controlling the flow of a fluid comprising

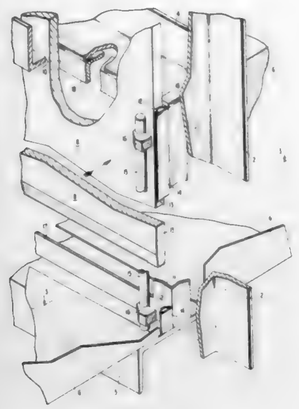
a. a frame having a bottom frame member a top frame member with an aperture therein generally transverse to the direction of fluid flow through the valve, and parallel, rectilinear side frame members;

b. a gate having parallel. rectilinear sides adapted for sliding movement through the aperture to a closed position within the frame to restrict the flow of fluid through the frame;

c. at least one of the frame members having fixedly mounted thereon, downstream of the aperture and in the interior of the frame, a flange which is parallel to the gate and

adapted to contact the downstream surface of the gate and limit the gate's downstream displacement when it is in the closed position and subjected to fluid pressure against its upstream surface; and

d. at least one of the side frame members having fixedly



mounted thereon, in the interior of the frame and in the plane of the gate, a longitudinal strip of resilient material having a curved transverse cross-section, said strip being adapted to effect compressed, sealing contact along the apex of its convex surface with the side edge of the gate when in the closed position.

4,043,535

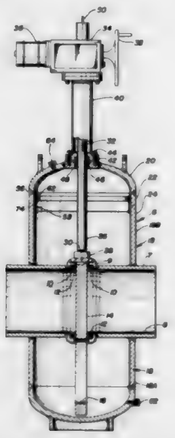
MEANS AND METHOD FOR REPAIR OF VALVES

John W. Freeman; Thomas M. Jones, and Harold D. Reagan, all of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Continuation of Ser. No. 548,308, Feb. 10, 1975, abandoned. This application June 30, 1976, Ser. No. 701,397

Int. Cl.[2] F16K *27/10*

U.S. Cl. 251—329 **5 Claims**



1. A valve structure comprising a longitudinal extending fluid conduit having a transverse opening therein, a valve body mounted about said conduit and transverse opening including a cylindrical upper body portion secured to said fluid conduit and extending in a perpendicular relation to the longitudinal axis of said conduit, a bonnet portion welded to the upper end of said upper body portion forming a continuation of and closing the upper body portion, a valve member mounted within the transverse opening and having a stem extending outwardly therefrom within the bonnet, means to move the valve member between open and closed positions relative to said fluid conduit, and a generally cylindrical sleeve mounted on the inner surface of the upper body portion generally adjacent the welded connection of the bonnet portion remote from the stem and having at least a portion thereof closely spaced from said inner surface a predetermined distance, said sleeve being welded along its lower marginal portion to the inner surface of the upper body portion and having its upper marginal portion free and unsecured in closely spaced relation to the inner surface of the upper body portion, said bonnet portion adapted to be cut circumferentially at a position laterally of said sleeve whereby the bonnet portion may be removed with an upper portion of the sleeve extending beyond the remaining upper body portion for repositioning of the removed bonnet portion.

4,043,536

DOOR DOLLY AND JACK

Lloyd T. Almond, 16005 N. 32nd St., Sp. 1316, Phoenix, Ariz. 85032

Filed Feb. 19, 1976, Ser. No. 659,272

Int. Cl.[2] B66F *3/00*

U.S. Cl. 254—2 R **4 Claims**



1. A device for elevating and supporting an object comprising:

a. an elongated, upright handle member;

b. support means fixedly mounted to said handle member providing underlying support for the object to be lifted;

c. floor engageable pivot means, said pivot means comprising roller means;

d. cable means having a foot insertable stirrup section, said cable means having a length such that upon insertion of the foot in said stirrup section and pressing of the foot on the floor, said pivot means are pivoted whereby said object supported by said support means is moved to an elevated position; and

e. releasable locking means for releasably locking said pivot means.

4,043,537

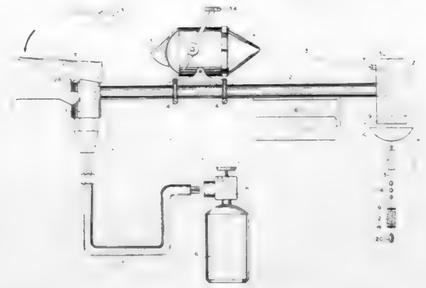
APPARATUS FOR INSTALLING PULL LINES IN CONDUIT

John Charles Russo, Jr., 2100 Gen. Collins, New Orleans, La. 70114

Filed Nov. 12, 1976, Ser. No. 741,356

Int. Cl.[2] B65H *59/00*

U.S. Cl. 254—134.4 **6 Claims**



1. An apparatus for installing a pull line in a section of conduit, comprising:

a. an elongated, tubular body provided with a central conduit, said conduit capable of transmitting pressurized fluids therethrough;

b. valve means attached to one end portion of said body, for transmitting pressurized fluid from a pneumatic source through said valve means into said tubular body;

c. reel means affixable to said body for dispensing a length of line said reel means being provided with an integral spool of line therein;

d. dispensing means attached at the opposite end portion of said body from said valve means for transmitting pressurized fluid into a section of conduit, said dispensing means provided with a reduced tip portion insertable into the opening of said conduit, said dispensing means being oriented at substantially right angles with said elongated body; and

e. tube means on said dispensing means for guiding the line from said reel means through said dispensing means;

4,043,538

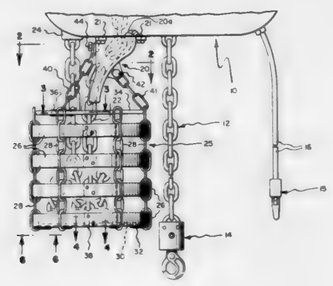
CHAIN HOIST

Kenneth D. Schreyer, Clarence, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Apr. 16, 1976, Ser. No. 677,770

Int. Cl.[2] B66D *1/00*

U.S. Cl. 254—168 **5 Claims**



1. In combination, a chain hoist including an enclosing body portion having a slack chain exit opening therethrough; a slack chain transport chute fixed to said hoist body portion in chain transport communication with said slack chain exit opening; a flexible slack chain carrier, said carrier comprising a plurality of hoops, a bottom member, and a plurality of vertically extending chain strands, said chain strands having their lower ends connected to said bottom member and being connected to said hoops above said lower ends to maintain said hoops relatively movable interconnected in a vertically spaced apart relationship and a lowermost of said hoops in a circumscribing relationship relative to said bottom member for confining said slack chain within said carrier while permitting vertical and horizontal flexures of said carrier as required to withstand without failure external blows occuring during use of said hoist; and flexible support means for suspending said carrier below said body portion in slack chain communication with said chute.

4,043,539

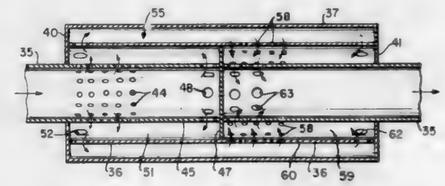
METHOD AND APPARATUS FOR STATIC TYPE FLUID MIXING

William N. Gilmer, Chesterfield, and Vernon M. Barnes, Jr., Richmond, both of Va., assignors to Texaco Inc., New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,048

Int. Cl.[2] B01F *15/00*

U.S. Cl. 259—4 AB **4 Claims**



1. A static-type plural fluids mixer, comprising in combination

an imperforate first conduit forming an inlet for carrying longitudinally separated batches of said fluids therein,

said batches forming a continuous stream of said fluids,

a plurality of relatively small passages through the walls of said first conduit at a predetermined location down stream from said inlet for laterally diverting a portion of said stream,

an imperforate section of said first conduit down stream from said predetermined location for carrying all of the remainder of said stream a relatively substantial distance down stream from said predetermined location,

means for reversing the direction of flow of said remainder of said stream back toward said predetermined location, comprising

a relatively large passage at the down stream end of said imperforate section,

an end wall on said first conduit adjacent to and down stream from said relatively large passage,

a second imperforate conduit concentric with said first conduit,

said end wall extending laterally and forming the end wall of said second imperforate conduit,

said second conduit extending back at least to said predetermined location for carrying said remainder back to join with said portion of said stream, and

means forming an outlet for carrying said mixed stream.

4,043,540

MIXER PADDLE ASSEMBLY AND DRIVE SYSTEM

Guthrie B. Stone, deceased, late of Honeoye, N.Y., by Alan J. Stone, administrator, assignor to Stone Construction Equipment, Inc., Honeoye, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,154

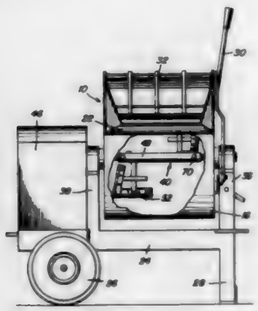
Int. Cl.[2] B28C *7/16, 5/14*

U.S. Cl. 259—171 **7 Claims**

1. In a mixer having a drum, a paddle shaft having a plurality

of paddles thereon, and means journaling the paddle shaft for rotation mixing material in the drum, that improvement comprising a rive assembly for driving said paddle shaft at a slow rotational speed including a large driven gear connected to the paddle shaft, a small driving gear meshed with the large gear, a power device having an output shaft driven at a high speed, and a speed reduction assembly interconnecting the output shaft and small driving gear, said speed reduction assembly including coplanar small and large pulleys and an encircling belt and coplanar small and large sprocket gears and an encircling chain arranged in series relationship.

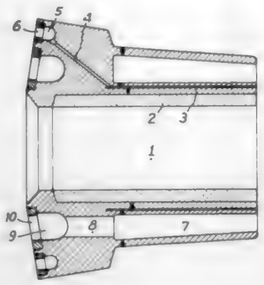
3. In a mixer having a pivotally supported drum, a paddle shaft extending longitudinally of the drum and including paddles thereon, means disposed exteriorly of the drum for driving the paddle shaft, that improvement comprising shaft means connected with the paddle shaft and forming longitudinal extensions thereof, said shaft means being journaled in the opposite walls of the drum and being accessible exteriorly of



the drum, and means detachably connecting the shaft means with the paddle shaft to enable separation of the shaft means from the paddle shaft and removal of the paddle shaft and paddles from the drum without removing the drum from its support, said shaft means being in the form of a pair of stub shafts, each of said stub shafts being connected with an end portion of the paddle shaft closely adjacent to but spaced from the opposite walls of the drum, said stub shafts extending exteriorly of the drum for longitudinal removal of the stub shafts when the inner ends of the stub shafts are disconnected from the end portions of the paddle shaft, said paddles being rigidly and permanently secured to the paddle shaft, the opposite walls of the drum having external bearing assemblies journaling the drum for pivotal movement about a longitudinal axis concentric with the rotational axis of the paddle shaft with the bearing assemblies enabling insertion and removal of the stub shafts longitudinally in relation to the end portions of the paddle shaft.

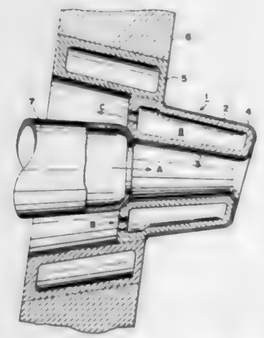
4,043,541
BLAST FURNACE TUYERE
Emile Sprunck, 57250 Moyeuvre Grande, France
Filed July 27, 1976, Ser. No. 709,117
Claims priority, application France, Aug. 13, 1975, 75.25195
Int. Cl.² C21B 7/16
U.S. Cl. 266—268 **3 Claims**

1. A blast furnace tuyere comprising a tuyere casing having an injection nose for insertion in a furnace and three separate injection chambers formed therein, said injection chambers each having open injection end portions located in the nose of the tuyere casing, said three injection chambers comprising a first chamber for hot blast to be supplied to the furnace, a second chamber for supplying combustible fuel to the furnace and a third chamber for supplying an auxiliary supporter of combustion to the furnace, said three chambers being isolated from each other in the casing with the combustible fuel injecting chamber being located between the other two chambers



whereby the combustible fuel serves as a cooling agent for the nose of the tuyere.

4,043,542
TUYERES FOR A BLAST FURNACE
Hiroshi Yamaoka, Hirakata; Morio Kawasaki, Nishinomiya; Hideyasu Kawanami, Wakayama; Toshihiro Shiino, Osaka, and Junichi Yamashita, Wakayama, all of Japan, assignors to Sumitomo Metal Industries Limited, Osaka, Japan
Filed Sept. 30, 1975, Ser. No. 618,248
Int. Cl.² C21B 7/16
U.S. Cl. 266—270 **7 Claims**

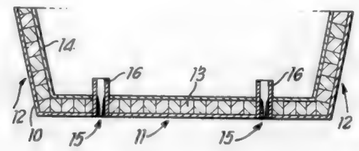


1. A tuyere structure for blasting a gas into a blast furnace wherein said tuyere is composed of copper and wherein the inner and outer peripherential surfaces of said copper tuyere include a calorized coating of alumina and aluminum in a thickness ranging from 0.5 to 5 mm directly contacting said surfaces of said copper tuyere.

4,043,543
TUNDISH WITH WEIRS
John Henry Courtenay, and Martin Bernard Peter Wardell, both of Birmingham, England, assignors to Foseco Trading A.G., Chur, Switzerland
Filed June 8, 1976, Ser. No. 693,959
Claims priority, application United Kingdom, May 19, 1976, 20701/76
Int. Cl.² C21C 5/00
U.S. Cl. 266—275 **10 Claims**

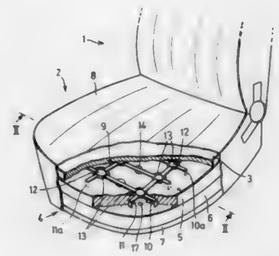
1. A tundish comprising a casing having a floor with at least one outlet nozzle located therein and upstanding sidewalls, the casing having a permanent refractory lining, and means for spacing any skull that is formed from at least one nozzle within the tundish and for minimizing extraneous material flow into

the nozzle, said means comprising an expendable consumable continuous partition of refractory heat insulating material



located adjacent the nozzle and dimensioned to stand proud of the adjacent portion of the tundish floor.

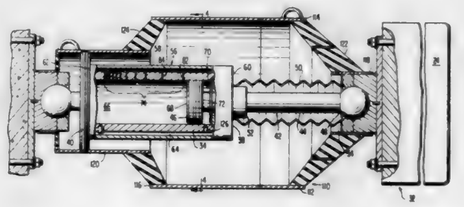
4,043,544
REINFORCED AND VENTILATED SEATS
Walter Ismer, Feldhausen 9, 4018 Langenfeld, Germany
Filed Mar. 8, 1976, Ser. No. 665,111
Claims priority, application Germany, Mar. 8, 1975, 2510182
Int. Cl.² A47C 27/12
U.S. Cl. 267—83 **9 Claims**



1. A pad for seats, back rests, mattresses and the like comprising a pad body of plastic material, recess means in said pad body, a covering layer overlying said pad body and the recess means therein, strips of reinforcing material sandwiched between said pad body and said covering layer, at least selected ones of said strips being in alignment with said recess means whereby heat is dissipated from the covering layer through said recess means and the pad is reinforced by said strips, said recess means being a plurality of aligned apertures passing through said pad body, said selected ones of said strips overlie said apertures, disc means at the intersection of said strips, and the area of each said disc means being less than the cross-sectional area of an aperture.

4,043,545
SEALED CUSHIONING UNIT
Darrell D. Dial, Fort Worth, and Robert J. von Bose, Arlington, both of Tex., assignors to Halliburton Company, Duncan, Okla.
Division of Ser. No. 453,980, March 22, 1974, Pat. No. 3,864,972. This application Jan. 6, 1975, Ser. No. 538,803
Int. Cl.² F16F 9/10
U.S. Cl. 267—116 **6 Claims**

1. An encapsulated shock absorber, comprising:
a. cylinder means having wall means including, side wall means, first end wall means, and second end wall means;
b. piston means slidably disposed within said hydraulic cylinder means and including,
i. piston body means, translatably mounted within said side wall means of said cylinder means, for defining a buff-end impedance zone between said second end wall means and said piston body means and a restored end impedance zone between said first end wall means and said piston body, and
ii. piston rod means translatably projecting through said first end wall means of said cylinder means and having a first end thereof connected to said piston body means;
c. impedance means associated with said hydraulic cylinder means and said piston means for cushioning translation of said piston body means from a normal position of adjacency to said first end wall wherein said apparatus is in an extended posture operably ready to dissipate energy imparted thereto to a position of adjacency to said second end wall wherein said apparatus is in a contracted posture operably following dissipation of energy imparted thereto including:
i. generally low pressure fluid tight return flow passage means surrounding at least a portion of said side wall means of said cylinder means and being operable to receive fluid expelled from said buff end impedance zone in response to movement of said piston body means toward said second end wall means;
ii. at least one buff means, extending through said cylinder means in the vicinity of said second end wall means, for providing fluid communication between said buff end impedance zone and said return flow passage means and being operable to impede the flow of fluid out of said buff end impedance zone in response to movement of said piston body means toward said second end wall means; and iii. at least another draft port means extending through said cylinder means for providing fluid communication between said restored end impedance zone and said return flow passage means and being operable to impede the flow of fluid out of said restored end impedance zone in response to restoring force induced movement of said piston body means toward said first end wall means;



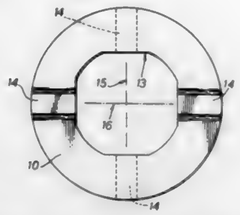
d. capsule means for encapsulating said hydraulic cylinder means, said impedance means and said piston means so as to isolate said hydraulic cylinder means, impedance means and said piston means from an ambient environment and for exerting a positive, outward bias upon said second, distal, end of said piston rod means away from said cylinder means for urging said piston body means toward a normal restored position adjacent to said first end wall of said cylinder means, including:
i. a longitudinally extending housing means surrounding said cylinder and passageway means;
ii. a first elastomeric annulus connected to and extending between one end of said housing means and one of said cylinder means generallly at the second end wall end thereof and a second distal end of said piston rod means;
iii. annular means connected to and extending between the other end of said housing and the other of said cylinder means generally at the second end wall thereof and a second distal end of said piston rod means;
e. normally closed valve means, associated with at least one of said buff port means, for providing a restricted hydraulic flowpath in response to all forces of less than a predetermined magnitude tending to move said first and second objects toward each other and for providing a less restricted hydraulic flowpath in response to all forces of at least said predetermined magnitude tending to move said first and second objects toward each other; and
f. a quantity of hydraulic fluid confined within said buff end impedance zone, restored end impedance zone and imped-

ance means and isolated from pressurized contact with said capsule means.

4,043,546
COMPRESSION SPRINGS

Herbert Edward Ashfield, and Harry Horsfall, both of Huddersfield, England, assignors to David Brown Tractors Limited, Huddersfield, England

Filed Jan. 9, 1976, Ser. No. 647,746
Claims priority, application United Kingdom, Jan. 16, 1975, 1951/75
Int. Cl.[2] F16F *1/34*
U.S. Cl. 267—162 **6 Claims**

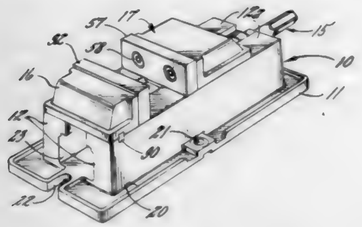


1. A compression spring comprising a support, a stack of separate coaxial washers surrounding said support and nonrotatably mounted on and along said support, each of said washers comprising an annular spring plate having a set of diametrically opposed projections on one side and another set of diametrically opposite projections on the other side, said sets being displaced at right angles, and the projections on each plate axially abutting the correspondingly oriented projections of the next adjacent plate in the stack.

4,043,547
PRECISION MACHINE VISE

Frank A. Glomb, Thornton, and William S. Griffith, Chicago, both of Ill., assignors to Chicago Tool and Engineering Company, Chicago, Ill.

Filed Dec. 10, 1976, Ser. No. 749,229
Int. Cl.[2] B23Q *3/02*
U.S. Cl. 269—136 **9 Claims**

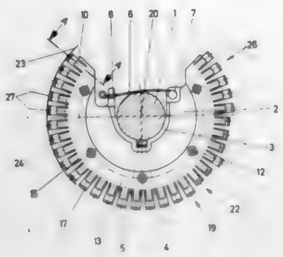


1. In a precision machine vise, the combination comprising a frame including a base and opposed horizontally extending rails having way surfaces, a cross member joining the rails at one end thereof, a fixed jaw bridging the rails at the opposite end, a movable jaw slideably superimposed on the rails for cooperating with the fixed jaw, a horizontal jack screw captively journaled in the cross member, a traveling nut on the jack screw between the rails, the movable jaw having a recess in its underside, the traveling nut having a rigid lug extending upwardly into the recess, the movable jaw and the lug having opposed force transmitting surfaces, a spring member interposed between the force transmitting surfaces, means interposed between the nut and the movable jaw for preloading the spring member, the spring member being oriented to apply a downward component of force between the movable jaw and the rails while permitting limited articulation between the movable jaw and the nut for self-alignment of the movable jaw with the presented surface of a work piece.

4,043,548
SHEET-CARRYING DISC FOR SHEET TRANSFER DRUMS

Gerhard Pollich, Heidelberg, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed Apr. 26, 1976, Ser. No. 680,049
Claims priority, application Germany, Apr. 25, 1975, 2518334
Int. Cl.[2] B65H *29/20*
U.S. Cl. 271—80 **8 Claims**

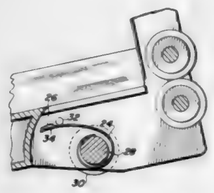


1. Sheet-carrying disc assembly for a sheet transfer drum carried by a shaft comprising a sheet-carrying disc mounted on the drum shaft, a multiplicity of sheet-carrying elements radially adjustable into operative and inoperative positions on said disc, said sheet-carrying elements being constructed as bar-shaped paper carriers disposed at the periphery of said disc, arresting means disposed on said sheet-carrying disc for releasably locking said sheet-carrying elements in said operative and inoperative positions thereof, first spring means yieldably biasing said sheet-carrying elements in axial direction of the drum shaft into locking engagement with said arresting means in said operative and inoperative positions of said sheet-carrying elements, each of said bar-shaped paper carriers having a longitudinal axis and being tiltable against the bias of said spring means out of said arresting means about a tilting axis extending in the plane of said sheet carrying disc transversely to said longitudinal axis, and second spring means yieldably biasing said sheet-carrying elements in radial direction of the drum shaft.

4,043,549
IMPACT FEEDER

Stephen A. Rinehart, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1975, Ser. No. 634,989
Int. Cl.[2] B65H *3/06, 3/48*
U.S. Cl. 271—118 **2 Claims**

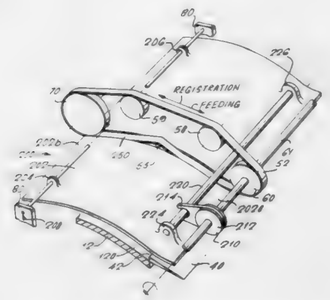


1. A sheet feeding and separating apparatus comprising:
perforated tray means adapted to support a stack of sheets thereon;
means forming a plenum associated with said tray means, said plenum being adapted for connection to a source of pressurized air, said plenum communicating with the perforations in said tray means for passage of pressurized air from said plenum through the perforations in said tray means to provide an air bearing between said tray means and the bottom sheet in the sheet stack, and between the bottom sheet and the adjacent sheets thereabove;
impact feed means disposed adjacent the edge of said tray means;
said impact feed means comprising a leaf spring member, one end of said spring member being mounted on a rotatable shaft, the other end of said spring member having a reduced portion with a friction pad mounted thereon; and,
abutment means disposed adjacent the bottom of the stack adapted for engagement with said spring member to maintain said spring member out of engagement with the bottom sheet in the stack, rotation of said rotatable shaft causing said spring member to wind therearound and move the spring member free of said abutment means, thereby allowing the end of said spring member having the friction pad thereon to impact the bottom sheet in the stack for feeding the sheet therefrom, the air bearing between the bottom sheet and the adjacent sheet thereabove cushioning the impact to prevent inter-locking of the bottom sheet and the adjacent sheet thereabove.

4,043,550
REGISTRATION MEANS FOR AUTOMATIC DOCUMENT HANDLING APPARATUS

Kenneth G. Phillips, Bream, near Lydney; Richard P. Walford, Lydbrook, and Clifford Knight, Mitcheldean, all of England, assignors to Xerox Corporation, Stamford, Conn.

Filed May 17, 1976, Ser. No. 687,059
Claims priority, application United Kingdom, Oct. 24, 1975, 43931/75
Int. Cl.[2] B65H *9/04*
U.S. Cl. 271—233 **11 Claims**

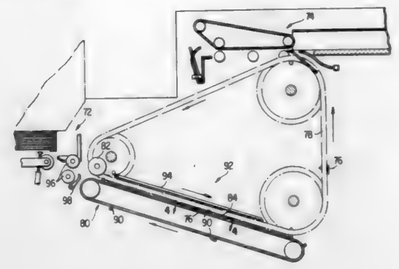


1. A document handling apparatus including document feed means for feeding documents one at a time past a registration means into a processing area, document transport means positioned over said processing area and adapted to contact a portion of each of said documents for controlling its movement, said transport means being adapted to move said document in a first direction into said processing area, to reverse said document to move it in a second direction to register said document in cooperation with said registration means and, after processing, to move the document again in said first direction to remove it from said processing area;
baffle means overlying said processing area adjacent said registration means; and,
lift means for moving said baffle means into and out of engagement with said registration means, said baffle means being arranged such that in use of the apparatus, it is moved out of engagement with said registration means during movement of a document in said first direction into said processing area, and is moved into engagement with the registration means during movement of a document in said second direction to prevent movement of said document past said registration means during registration of said document.

4,043,551
IN-LINE INSERTER

Wilbur J. Morrison, and Norwood E. Tress, both of Bath, Pa., assignors to Bell & Howell Company, Phillipsburg, N.J.

Continuation-in-part of Ser. No. 569,989, April 21, 1975. This application July 9, 1975, Ser. No. 594,255
Int. Cl.[2] B65H *9/06, 9/10*
U.S. Cl. 271—243 **4 Claims**



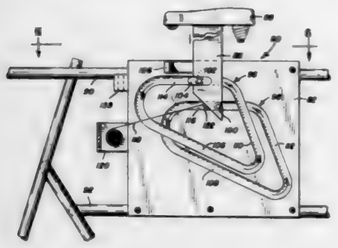
1. In a sheet feeding system comprising:
sheet supply means for supplying sheets one at a time; and
sheet transporting means for receiving said supplied sheets, transporting said sheets along an initial sheet path while simultaneously orienting said supplied sheets to have a predetermined attitude relative to said sheet transporting means, and thereafter transporting said supply sheets along a curved sheet path while maintaining said predetermined attitude relative to said sheet transporting means, said sheet transporting means comprising a curved endless conveyor having clamps mounted thereon for gripping and transporting said sheets in said curved path while maintaining said sheets in said predetermined attitude, said clamps including a means for opening said clamps at appropriate times to receive and to release said sheets and closing said clamps at appropriate times to grip said sheets;
the improvement wherein said sheet transporting means further includes a fast-speed endless conveyor, a low-speed endless conveyor, and an elongated brush positioned adjacent to said curved endless conveyor, said fast- and low-speed endless conveyors being adjacent to said initial sheet path and being positioned on the same side of said initial sheet-path following parallel, laterally spaced, paths, and said elongated brush being positioned on the opposite side of said initial sheet path from said fast- and low-speed conveyors for continuously urging sheets traveling along said initial sheet path against said fast speed conveyor, said fast- and low-speed conveyors and said brush receiving said supplied sheets and transporting them to said clamps, said low speed endless conveyor having pins thereon against which the fast-speed endless conveyor drives and, in cooperation with said brush, holds said supplied sheets to thereby orient said supplied sheets to have said predetermined attitude relative to said sheet transporting means, said fast- and low-speed endless conveyors and said brush being located relative to said clamps of said curved endless conveyor such that said sheets are held against said pins by said fast-speed endless conveyor and said brush as they enter and are clamped by said clamps of said curved endless conveyor to maintain said predetermined attitude.

3. In a sheet-feeding system comprising:
sheet supply means for supplying sheets one at a time; and
sheet transporting means for receiving said supplied sheets, transporting said sheets along an initial sheet path while simultaneously orienting said supplied sheets to have a

predetermined attitude relative to said sheet transporting means, and thereafter transporting said supplied sheets along a curved sheet path while maintaining said predetermined attitude relative to said sheet transpoting means, said sheet transporting means comprising a curved conveyor including a cylindrical drum and an endless belt pressing against said drum for gripping said sheets therebetween and transporting said sheets in a curved path while maintaining said sheets in said predetermined attitude;

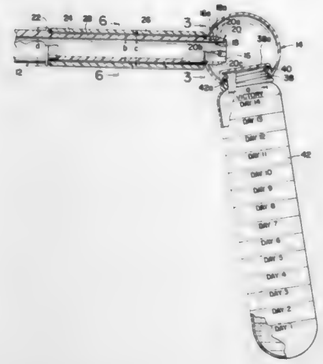
the improvement wherein said sheet transporting means further includes a fast-speed endless conveyor, a low-speed endless conveyor, and an elongated brush positioned upstream of said curved conveyor adjacent to said initial sheet path, said fast- and low-speed conveyors being positioned on the same side of said initial sheet path and following parallel, laterally-spaced, paths, and said elongated brush being positioned on the opposite side of said initial sheet path from said fast- and low-speed conveyors for urging sheets travelling along said initial sheet path continuously against said fast-speed conveyor, said fast- and low-speed conveyors and said brush receiving said supplied sheets and transporting them to said drum and said endless pressure belt, said low speed endless conveyor having pins thereon against which the fast-speed endless conveyor drives and, in cooperation with said brush, holds the supplied sheets to thereby orient the supplied sheets to have said predetermined attitude relative to said sheet transporting means, said fast- and low-speed endless conveyors and said brush being located relative to said drum and said endless pressure belt such that said sheets are held against said pins by said fast-speed endless conveyor and said brush as they enter a nip formed between said drum and said endles pressure belt in said predetermined orientation.

4,043,552
EXERCISER SEAT
Siragan K. Kerkonian, 6426 N. Ridge Ave., Apt. 2A, Chicago, Ill. 60626
Continuation-in-part of Ser. No. 587,213, June 13, 1975, abandoned. This application July 6, 1976, Ser. No. 703,102
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—120 **18 Claims**



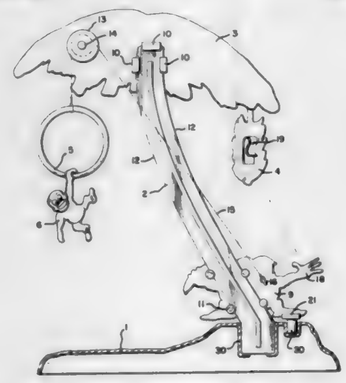
18. An exercise seat assembly for use with a supporting frame comprising:
a housing;
means for attaching said housing to said frame;
a seat for a rider;
a seat support post, said seat being attached to said post;
a first guide member on said post remote from said seat;
a second guide member on said post intermediate said seat and said first guide member; and
means associated with said housing for defining a trackway for each of said guide members, each of said trackways having a cross-sectional configuration substantially corresponding to the cross-sectional configuration of its respective guide member, each of said guide members being confined within its respective trackway thereby movably mounting said post to said housing for movement in response to the pushing and pulling by the rider.

4,043,553
ECCENTRIC ROTATABLE WEIGHT EXERCISING DEVICE
Richard A. Suarez, Canton, Ohio, assignor to Consumer Publishing Company, Inc., Canton, Ohio
Filed Jan. 23, 1976, Ser. No. 651,940
Int. Cl.[2] A63B *21/00*
U.S. Cl. 272—128 **11 Claims**



1. An exercise device for improving muscle tone comprising: a cross shaft; a pair of hand grips encircling the ends of said cross shaft positioned so as to maintain an exerciser's arms substantially parallel; means to eccentrically weight said cross shaft including a hollow elongated weight of deformable plastic non-rotatably secured to each end of said cross shaft by spherical connector members non-rotatably secured to the ends of said cross shaft and adapted to removably receive the ends of said elongated weights therein, each weight forming an obtuse angle with said cross shaft sufficient to clear the body of the exerciser.

4,043,554
WEIGHT GAME
Tobin Wolf, 285 Aycrigg Ave., Passaic, N.J. 07055
Filed Oct. 27, 1976, Ser. No. 735,997
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—1 M **18 Claims**



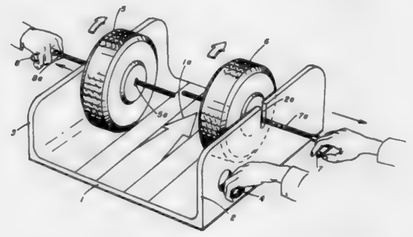
1. A game comprising:
a. a pulley,
b. a string passing over said pulley,

c. weighted means at one end of said string,
d. weight receiving means at the other end of said string,
e. means responsive to a predetermined weight on said weight receiving means for moving said weighted means along a predetermined path, and
f. means responsive to predetermined travel of said weighted means along said predetermined path for adding additional weight to said weighted means, whereby said weighted means retraces its travel path to substantially its original position.

4,043,555
RACQUET STRING AND METHOD
Bartley Russell Conn, Mountain View, Calif., assignor to Irradiated Strings, Inc., Mountain View, Calif.
Filed Feb. 26, 1976, Ser. No. 661,734
Int. Cl.[2] A63B *49/00*; D02G *3/02*
U.S. Cl. 273—73 D **4 Claims**

1. A tennis racquet having stretched and tensioned synthetic strings with resilience similar to that of natural gut strings, said strings being produced by providing a filament of a polymer material and irradiating the filament with a radiation dosage of about 7.5 to 12.5 megarads, thereby causing crosslinking of molecules and increasing the stretch resilience of the filament.

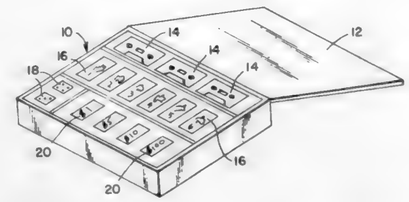
4,043,556
WHEEL ROLLING GAME
Cleto L. Lappa, 541 Torwood Lane, Pittsburgh, Pa. 15236
Filed Mar. 22, 1976, Ser. No. 668,847
Int. Cl.[2] A63F *9/14*
U.S. Cl. 273—86 R **1 Claim**



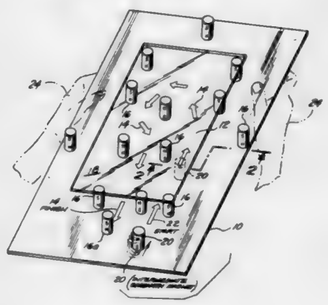
1. A game comprising a base having a pair of upstanding sidewalls, each having a slot on the top thereof, a pair of separate wheels each having a central slot, a pair of handles, each having an integral, helically twisted rod extending at right angles thereof, snugly fitting into one of said slots of each wheel, said rods being helically twisted in opposite directions, said handles extending outwardly of said sidewalls while said rods extend beyond the inward surfaces of said wheels while resting on said slots in a manner to hold the wheels slightly above the surface of said base, whereby as separate players pull the respective handles outwardly of said sidewalls, said wheels will spin by virtue of withdrawal of said rods so that upon complete withdrawal, said wheels will independently roll in the same direction without lateral movement.

4,043,557
APPARATUS AND METHOD INVOLVING THE CHANCE SELECTION OF SOUND RECORDED RACE RESULTS
Grant Johnston, 7722 Savannah Drive, Bethesda, Md. 20034
Filed Mar. 4, 1976, Ser. No. 664,023
Int. Cl.[2] A63F *9/00*
U.S. Cl. 273—86 R **3 Claims**

1. A simulated race game comprising at least one sound track having prerecorded thereon a plurality of accounts of races between a plurality of contestants, the race accounts having different finishing orders among the contestants, playback means for selectively audibly playing said race accounts, a plurality of betting cards for distribution to the game players, each of said cards being marked to indicate a contestant, at least one die for randomly selecting which of said race accounts is to be played, and simulated money to be bet by each player on the outcome of the race accounts selected for play with the betting cards distributed to each player indicating the contestants owned by the respective players.



4,043,558
MAGNETIC MAZE GAME
Scott Clifford Star, 60-33 61st St., Maspeth, N.Y. 11378
Filed Feb. 23, 1976, Ser. No. 660,454
Int. Cl.[2] A63F *3/00, 9/00*
U.S. Cl. 273—110 **11 Claims**

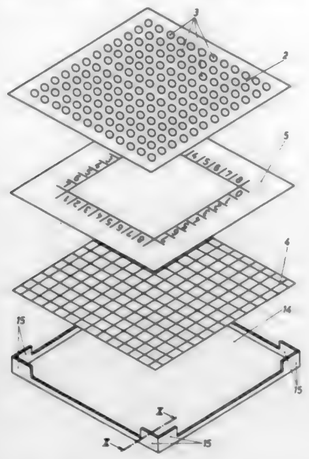


1. A magnetic game comprising:
a playing surface;
a plurality of magnets of varying strengths immovably positioned on said playing surface to define a predetermined maze or course; and
a magnetic playing piece movably placed on said surface, so that by turning and tilting the said playing surface the magnetic playing piece may be moved through the course without said playing piece being attracted to any of said immovable magnets.

4,043,559
EDUCATIONAL GAME
Manfred Eigen, Georg-Dehio-Weg 14, 34 Gottingen, and Winkler, Ruthild, 3431 Berlepsch, uber Witzenhausen, both of Germany
Filed Nov. 11, 1975, Ser. No. 630,793
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—130 R **14 Claims**

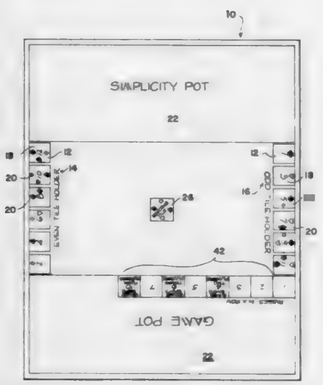
1. A game for education and entertainment comprising, in combination, a base plate having retaining means along the rim of said base plate; a plurality of templates on said base plate in superimposed position and retained on said base plate in predetermined position by said retaining means, said templates having coordinate markings along the rims thereof, said templates having different game markings, said templates being selectable for different games; a transparent covering plate over said

templates and said base plate and held in predetermined position by said retaining means, a selected template being on top of the remaining templates and being visible through said transparent cover plate, said cover plate having impression extending through at least part of the thickness of said cover plate, said impressions being arranged to correspond to a coordinate grid formed by said coordinate markings on said tem-



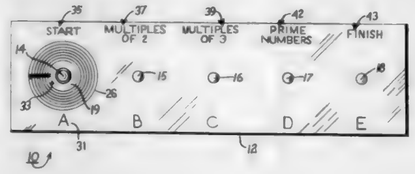
plates; movable position indicating elements insertable into said impressions and having different markings; random generator means for generating random numbers corresponding to the coordinate markings on said templates, said movable position indicating elements being insertable into predetermined impressions on said cover plate dependent on the number generated by said random number generator means.

4,043,560
BOARD GAME EMPLOYING PLAYING TILES AND COLOR CODED DICE
Irving L. Blackman, 180 N. La Salle St., Chicago, Ill. 60601
Filed Oct. 13, 1976, Ser. No. 732,167
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—135 AC **8 Claims**



1. A board game comprising in combination:
a game board having a series of areas provided with indicia therein keyable with identical indicia provided on a set of playing tiles, additional areas designated for the positioning therein of pre-valued elements, and a designated starting area having indicia therein keyable with like indicia carried by selected ones of said playing tiles;
a set of playing tiles subdivided into a series of sub-sets equal in number to the number of areas in said series of areas on the game board, each of said sub-sets comprising a plurality of playing tiles provided with identical indicia thereon, the indicia on the tiles of the respective sub-sets being identical to the indicia in a different one of the areas of said series of areas of the game board;
a set of three dice, a first of said dice carrying non-numerical indicia on each of the faces thereof, a second of said dice carrying a different even-numbered numeral on each of the faces thereof, and the third of said dice carrying different odd-numbered numeral on each of the faces thereof, said second and third dice each being color coded a different color, and said first dice having at least one of the faces thereof, color coded to correspond with the color on a different one of said second and third dice;
a set of pre-valued elements; and
at least two playing tiles carrying indicia thereon identical to the indicia carried by the starting area of said game board.

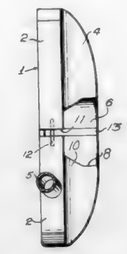
4,043,561
PUZZLE AND METHOD OF PLAYING SAME
Daniel Marion Stepansky, 9801 S. Winchester, Chicago, Ill. 60643
Filed Aug. 23, 1976, Ser. No. 716,743
Int. Cl.[2] A63F *9/08*
U.S. Cl. 273—153 P **10 Claims**



1. A puzzle, comprising:
a flat base having a face;
means defining a series of five positions on said face;
a set of N number of graduated size markers adapted to be stacked in a vertical pile at said positions on said base;
means defining different single number indicia including a group of whole numbers two through six individually on different ones of said markers to identify each marker individually; and
means defining limited indicia designating certain ones only of said whole numbers but not all of said whole numbers of said group being disposed at least one of said positions to indicate that only said markers having the same numerical indicia thereon may be moved to the last-mentioned position in accordance with the puzzle rules.

9. A method of playing a puzzle, comprising:
providing a set of graduated size markers, each one having a different whole number indicia thereon, said indicia including the numbers two through six;
providing a base having a set of five positions on the face thereof, one of said positions being a starting position and having starting indicia, another one of said positions being a finishing position and having finishing indicia, at least one other one of said positions being a limited position and having limited indicia designating certain ones only but not all of said whole numbers two through six;
stacking said markers in a vertical pile at the starting positions;
moving said markers seriatum from said pile to other positions with smaller markers always being placed above larger markers according to puzzle rules;
moving to the limited position only those markers having corresponding number indicia according to puzzle rules; and
moving markers from the limited position and the other positions to the finishing position with smaller markers always being placed above larger markers according to puzzle rules.

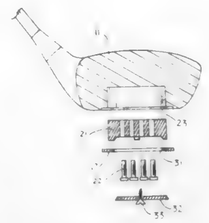
4,043,562
PUTTER ALIGNMENT SIGHT
Brian G. Shillington, 601 E. Anatamu Ave., Santa Barbara, Calif. 93101
Continuation-in-part of Ser. No. 539,793, Jan. 9, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 669,024
Int. Cl.[2] A63B *53/04*
U.S. Cl. 273—164 **5 Claims**



1. A golf ball putter comprising:
a. a putter blade having a forward putting face, a rear face and upper and lower faces;
b. a recess in said blade extending forwardly from said rear face, said recess having upper and lower surfaces adjacent to but spaced from said upper and lower faces, to define rearwardly extending upper and lower flanges respectively, and a forward surface parallel to said putting face;
c. a slot through said upper flange extending rearwardly from at least said forward surface of said recess perpendicular to said putting face and communicating with said recess and being of a depth no greater than said upper flange and defining a reference edge at its juncture with said forward surface, said reference edge being spaced upwardly from said lower surface substantially the full height of said recess; and
d. a reference line on said lower surfsce extending parallel to said putting face and being below said slot to be visible therethrough and spaced rearwardly from said forward surface of said recess a sufficient distance such that said reference line remains in full view and undergoes apparent forward-rearward displacement with respect to said slot and reference edge as the golfer moves his head, respectively, forwardly or rearwardly.

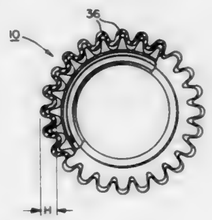
4,043,563
GOLF CLUB
Roy Alexander Churchward, 6444-19th Ave. S., Richfield, Minn. 55423
Continuation-in-part of Ser. No. 423,080, Dec. 10, 1973, which is a continuation-in-part of Ser. No. 277,739, Aug. 3, 1972, abandoned. This application Nov. 6, 1975, Ser. No. 629,277
Int. Cl.[2] A63B *53/08*
U.S. Cl. 273—171 **8 Claims**

1. A golf club sole plate comprising a thickened central portion and a thin plate-like portion surrounding said central portion, said central portion including a recess on the lower side thereof, said central portion further including a plurality of openings, at least some of said openings extending through said central portion from the upper surface to said recess, said sole plate further including weights and a removable cap, said



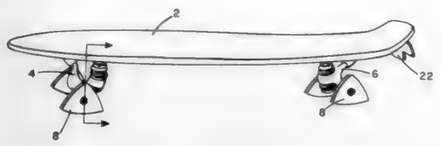
weights being slideably engaged in said openings, said removable cap providing access to at least some of said weights.

4,043,564
PITMAN SHAFT BOOT SEAL
David G. White, Phelps, N.Y., assignor to Garlock Inc., Palmyra, N.Y.
Continuation of Ser. No. 473,331, May 28, 1974, abandoned. This application Aug. 22, 1975, Ser. No. 607,065
Int. Cl.[2] F16J *15/50*
U.S. Cl. 277—212 FB **1 Claim**



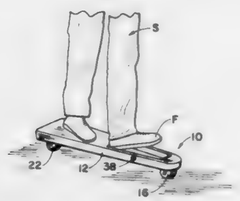
1. A seal for use between a pair of axially spaced-apart, coaxial members which are axially and arcuately relatively movable comprising:
a. a flexible, generally cylindrical, annular seal member having an axially extending opening therethrough concentric to said seal member, said seal member also having a single wall and having a first static sealing surface on an axially outer surface at one end thereof, and a second static sealing surface on an axially outer surface at the other end thereof,
b. annular compression spring means located inside of said seal member for forcing said two ends thereof away from each other and for providing a sealing force for said static sealing surfaces,
c. said seal member having a generally cylindrical portion including a plurality of spaced-apart, hollow, elongated, substantially straight ribs with their longitudinal direction being in a direction generally parallel to the axis of the seal member, said ribs extending in an axial direction substantially the entire length of said seal member, and
d. each of said hollow ribs having a pair of spaced-apart radial sidewalls and a single circumferential wall extending between the radially outer ends of each pair of sidewalls, and wherein each of said ribs tapers in a radial direction from a wider thickness at its proximal end to a narrower thickness at its distal end.

4,043,565
RECREATIONAL DEVICE
Paul Mogannam, 3220 Geary Blvd., San Francisco, Calif. 94118
Filed May 25, 1976, Ser. No. 689,744
Int. Cl.[2] A63C *1/30*; **B62B** *13/06*
U.S. Cl. 280—11.12 **4 Claims**



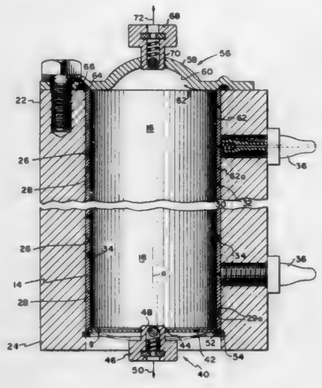
1. A recreational device for use on ice, comprising
an elongated board-like member for supporting a user;
runner mounting means affixed to the underside of said member, said mounting means comprising a first mount positioned proximal one end of said member and a second mount in tandem with said first mount and positioned proximal the other end of said member, each said mount including means for attaching a pair of ice runners thereto in spaced, parallel relationship and for providing for pivoting movement of such runners relative to the longitudinal axis of said member in response to a shift of weight of said user on said member; and
two pairs of ice runners attached to said runner mounting means by means providing for selective repositioning of said runners, one pair to each said mount, each said runner having a plurality of ice-contacting portions selectively positionable for ice contact by any selected one of said portions and each said runner being generally polygonal in profile with each side of said polygon being convexly arcuate, whereby one such ice contacting portion of each runner may be selected for ice contact until it has been dulled by usage and then the runners may be repositioned to bring another such portion into ice-contacting position to effect a renewal of the ice-contacting areas of the runners.

4,043,566
SKATEBOARD
Noel K. Johnson, 1370 Beryl, San Diego, Calif. 92109
Filed Apr. 27, 1976, Ser. No. 680,967
Int. Cl.[2] B62B *7/00*
U.S. Cl. 280—87.04 A **5 Claims**



1. A skateboard comprising:
a low elongated substantially horizontal body having a front and a rear end,
front and rear ground engaging support wheel means carried by corresponding end portions of said body, said support wheel means being adapted to support a load thereon, and
brake means on said body for slowing said body by engagement with the ground in response to pivotal movement thereof by the load supported on said body,
said brake means including
a substantially planar member having a front and rear portion pivotally mounted in an opening in said body, and
a depending stop member on the rear portion of said planar member,
the front end of said body including a rearwardly projecting shoulder for abutting engagement with a forwardly projecting lip on the front portion of said planar member when said planar member is in a substantially horizontal position.

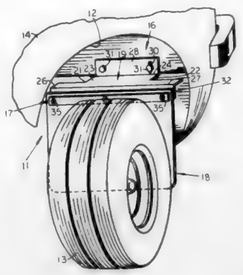
4,043,567
STEERING AXLE ASSEMBLY
Virgil W. Kaiser, deceased, late of Saginaw, Mich. (by William J. Kaiser, administrator, assignor to V. W. Kaiser Engineering, Inc., Millington, Mich.
Filed Mar. 18, 1974, Ser. No. 451,935
Int. Cl.[2] B62D *7/18*
U.S. Cl. 280—96.1 **7 Claims**



1. In a steerable axle assembly, a vehicle steering member having a generally vertical cylindrical bore open at both ends, a bushing provided within said bore and comprising a spirally wound bearing strip having an internal spiral groove and aperture means communicating the outer circumferential surface of said bushing with said groove for the passage of lubricant therebetween, said spiral bushing having an outside diameter greater than the internal diameter of said bore for being sprung into retained engagement therewithin, a king pin having a sinusoidal groove provided thereon and received in one end of said bore and within said bushing, means for introducing lubricant to said bore and externally of said bushing, and means for sealing the opposite end of said bore to preclude the passage of lubricant therethrough until said sinusoidal groove, bushing groove and aperture means have been fully packed.

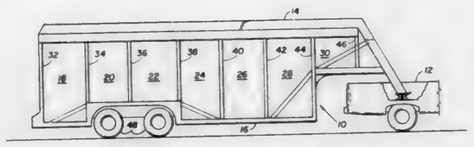
4,043,568
MUD FLAP ASSEMBLY
James F. Hollon, Box 533, Milan, Ill. 61264
Filed Sept. 22, 1976, Ser. No. 725,911
Int. Cl.[2] B62D *25/16*
U.S. Cl. 280—154.5 R **3 Claims**

1. A mud flap assembly, for attachment to a vehicle known as the Blazer, the Blazer having a body attached over a frame mounted on wheels, the body having fender wells formed therein about the wheels, said assembly comprising:
an elongated cover strap;
an elongated mud flap;
bracket means for supporting said mud flap, said bracket means including a base member and first and second flanges, said base member having front and rear longitudinal edges, said first flange being attached at said rear longitudinal edge normal to said base member, said second flange being attached at said front longitudinal edge normal to said base member, said first and second flanges extending to opposite sides of said base member, said base member having first and second cut-out portions formed therein, said base member having disposed at each end thereof one of said cut-out portions and directed toward the rear thereof both of said cut-out portions, whereby said rear longitudinal edge is made shorter than said front longitudinal edge, said first cut-out portion being longer than said second cut-out portion; and



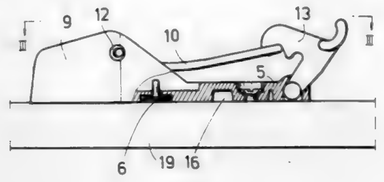
said first flange being detachably affixed within a fender well and behind a wheel of the vehicle, said first cut-out portion extending to the inside of the fender well toward the frame, said mud flap being placed against said second flange, said cover strap being detachably affixed to said second flange over said mud flap, said mud flap being held between said cover strap and said second flange and depending therefrom and behind the wheel.

4,043,569
TRANSPORT VEHICLE
Roger D. Ratliff, Irving, Tex., assignor to PepsiCo Inc., Purchase, N.Y.
Filed Mar. 29, 1976, Ser. No. 671,139
Int. Cl.[2] E62D *53/00*
U.S. Cl. 280—423 R **9 Claims**



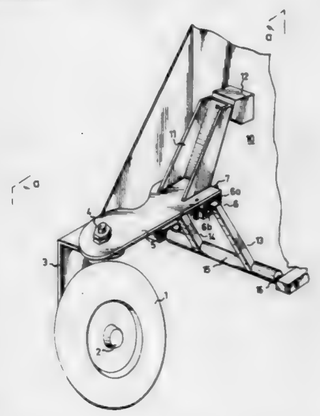
1. In a transport vehicle, an integrally joined frame assembly comprising, in combination:
a. an upper frame structure including at least one elongate generally horizontal beam extending in the direction of vehicle travel, said beam having a forwardly projecting and downwardly inclined portion joined to the first end thereof and conjointly forming a load-bearing backbone structure for said vehicle;
b. a lower frame structure including at least one elongate beam extending in the direction of vehicle travel and being fastened to said downwardly inclined portion of the upper elongate beam, said elongate beam of said lower frame structure being essentially constituted of at least one structural channel member;
c. a plurality of longitudinally spaced, transversely extending, vertical divider members being interposed between and interconnecting said upper and lower elongate beams and suspending said lower elongate beam from said upper horizontally-extending beam for forming a plurality of load-receiving bays in said vehicle;
d. and means for supporting the forward portion of said frame assembly, and means for supporting the rearward portion of said frame assembly.

4,043,570
SKI BINDING
Pentti Riikonen, Kiverionkatu 12 B48, Lahti, Finland
Filed May 5, 1976, Ser. No. 683,042
Claims priority, application Finland, Mar. 15, 1976, 760671
Int. Cl.[2] A63C *9/20*
U.S. Cl. 280—615 **4 Claims**



1. A ski binding comprising a one-piece toe part having a foot plate, screw holes formed in said foot plate for screws to attach the binding to a ski, a pair of lugs positioned on either side of said toe part, a bushing carried by each of said lugs, a forwardly directed clamping yoke having arms journaled in each of said bushings so as to be elastically urged against the upper surface of a welt of a sole of a boot to be clampingly held in said binding, a continuation portion extending from said toe part, said continuation portion having downwardly extending side walls and a top cover forming a downwardly open recess closed by the upper surface of the ski, said top cover having an opening, and a locking member having a journaling axle formed integral therewith pivotally carried in said downwardly open recess of said continuation portion and having means extending through said opening normal to said axle for releasably engaging said clamping yoke for locking said yoke against said welt to secure said boot in the binding.

4,043,571
SUSPENSION SYSTEM
Francois Guerbet, 6 rue de Vergennes, Versailles, France (78000)
Filed Apr. 9, 1976, Ser. No. 675,599
Claims priority, application France, Apr. 15, 1975, 75.11754
Int. Cl.[2] B60G *11/60*
U.S. Cl. 280—716 **5 Claims**



1. A suspension system for connecting an axle support for a wheel of a vehicle to the chassis of the vehicle comprising:
a. a hollow cross frame containing a bar maintained in said frame by means of elastic fittings;
b. a support for an axle to carry a wheel, said support being fixed to said hollow cross frame;
c. at least one connecting arm connecting said hollow cross

frame to the chassis of the vehicle through an elastic block;

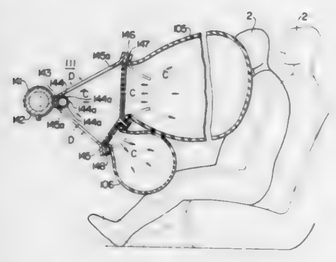
d. at least one connecting arm connecting said bar to the chassis of the vehicle through articulation means; said hollow cross frame being disposed at an intermediate height between the height of the elastic bar and the height of said articulation means, thereby to form, in projection on a vertical plane, a deformable triangulated suspension system.

4,043,572

AIR BAG DEVICE FOR VEHICLES

Yoshiyuki Hattori, Nagoya; Mikio Suzuki, Hekinan, and Masahiro Taguchi, Nishio, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed July 17, 1975, Ser. No. 595,742
Claims priority, application Japan, Aug. 21, 1974, 49-96314
Int. Cl.[2] B60R *21/08*
U.S. Cl. 280—738 **4 Claims**



1. An air bag device for vehicles comprising:

a. a gas supply source for supplying high pressure gas;

b. a gas discharging pipe communicated with said gas supply source and adapted to discharge high pressure gas therethrough;

c. a housing mounted to said gas discharging pipe and adapted to guide the high pressure gas discharged from said gas discharging pipe, said housing having means defining at least one large opening for introducing air from a passenger compartment in consequence of the gush of the discharged high pressure gas;

d. at least one supporting plate fixedly mounted to one end of said housing opposite to said gas discharging pipe, said supporting plate being gas permeable;

e. at least one valve member adapted to cover over said supporting plate, said valve member being directly opened by the gush of mixture gas constituted by mixing of high pressure gas discharged from said gas discharging pipe and air introduced from the passenger compartment so as to permit the mixture gas to pass from the inside of said housing, while blocking most counter-flow in the direction toward the inside of the housing, said valve member further having a discharge port means which allows part of the counterflow to pass therethrough; and

f. inflatable bag means adapted to cover over said valve member, and to be inflated by the mixture gas which opens said valve member to pass through the latter;

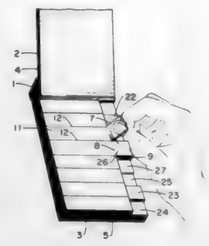
said valve member comprising an inner portion which is made of resilient material having discharge holes, and an outer portion of air permeable material surrounding said inner portion.

4,043,573

NOTE PAD CONSTRUCTION

Arthur F. Griffin, 1300 E. Fairhaven Ave., Apt. 6, Santa Ana, Calif. 92701

Filed July 5, 1974, Ser. No. 486,188
Int. Cl.[2] B42D *5/04*
U.S. Cl. 283—2 **3 Claims**



1. A note pad comprising:

a plurality of stacked pages, each said page including means to visually differentiate a given said page from other adjacent said pages, each said page including a plurality of separate vertically spaced sections, each said section being adapted to accommodate writing thereon;

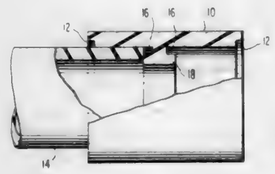
each said page having a series of detachable tabs laterally positioned in respect to said sections with there being a single said detachable tab for each said section, said tabs being detached from each other, whereby each said section being adapted to receive indicia in the form of writing to denote different tasks to be performed, upon a performing of the particular task for which an indicia within a given said section denotes the particular said tab for that section is removed and the absence of that said tab is prominently displayed against the contrasting visual background of the tab of the adjacent said page, thus permitting the rapid visual scanning of the remaining tabs to determine the status of all items listed on the page.

4,043,574

PIPE FITTING HAVING NOTCHES THEREIN FOR RECEIVING A BEAD

Teryoshi Asano, Kawagoe, Japan, assignor to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 18, 1975, Ser. No. 642,042
Claims priority, application Japan, Dec. 18, 1975, 49-154030[U]; Apr. 9, 1975, 50-48374[U]
Int. Cl.[2] F16L *13/10*
U.S. Cl. 285—21 **1 Claim**



1. In a cylindrical resin material pipe fitting for thermal fusion to a resin material pipe insertably received within one end of said cylindrical pipe fitting, said pipe fitting having an annular projection on the internal surface of said pipe fitting axially inward of the open end of said pipe fitting and serving as a stop for the inserted pipe, the improvement comprising the external diameter of said pipe being slightly greater than the internal diameter of said pipe fitting, and a first annular notch within the side wall of said projection facing said inserted pipe and a second annular notch within the edge of said cylindrical pipe fitting receiving said inserted pipe on the inner periphery thereof; whereby, during fusing operation some molten resin forced towards said annular projection due to the force fit of the pipe within the pipe fitting is received within said first annular notch to facilitate fusion of said cylindrical pipe fitting to said inserted pipe and is prevented from projecting radially inwardly beyond the edge of the inserted pipe and from becoming an impedent to the free flow of fluid through the pipe and pipe fitting, while other molten resin which escapes between said forced fit pipe and said pipe fitting adjacent the edge of said cylindrical pipe fitting receiving said inserted pipe, is received within said second annular notch to eliminate the formation of a ridge around the inserted pipe at the edge of the pipe fitting.

4,043,575

RISER CONNECTOR

Albert B. Roth, Lafayette, Calif., assignor to The Rucker Company, Oakland, Calif.

Filed Nov. 3, 1975, Ser. No. 628,531
Int. Cl.[2] F16L *39/00*
U.S. Cl. 285—90 **4 Claims**



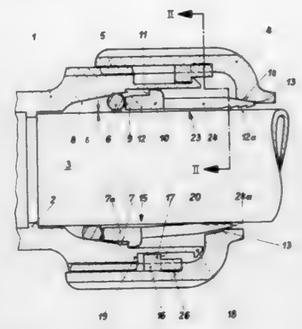
1. A riser connector for use between first and second pipe sections comprising a pin fitting adapted to be secured to the end of said first pipe section, said pin fitting including an end sleeve having a circular-cylindrical exterior surface, and said pin fitting including an outwardly projecting first peripheral flange having a planar first lower pin surface and a planar first upper pin surface, said first peripheral flange also having exterior peripheral cut-out portions leaving first intervening portions, a box fitting adapted to be secured to the end of said second pipe section, said box fitting including an end box having a circular-cylindrical interior surface adapted to telescope with said circular-cylindrical exterior surface, and said box fitting including an outwardly projecting second peripheral flange having a planar second lower box surface and a planar second upper box surface adapted directly to contact said first lower pin surface, and annular nut rotatable about said first and second peripheral flanges and having interior threads facing said box fitting, an inturned flange on said nut having an inwardly projecting planar lower nut surface adapted to contact said first upper pin surface, said inturned flange also having interior cut-out portions of an extent to pass said first intervening portions and leaving second intervening portions of said inturned flange of an extent to pass through said peripheral cut-out portions, an annular collar extending around and rotatable on said box fitting, said collar including a planar end surface adapted to abut said second lower box surface and also including exterior threads adapted to interengage said interior threads on said annular nut, and means engaging said collar and said box fitting in a predetermined relative rotated position thereof for preventing rotation of said collar on said box fitting.

4,043,576

THREADED PIPE COUPLING FOR SMOOTH PLASTIC JOINTS

Fritz Reich, Uhwiesen, and Ernesto Lehmann, Neuhausen, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Switzerland

Filed Aug. 9, 1976, Ser. No. 712,768
Claims priority, application Switzerland, Aug. 27, 1975, 11125/75
Int. Cl.[2] F16L *21/06*
U.S. Cl. 285—322 **6 Claims**



1. A threaded coupling for smooth pipe comprising

a housing member for receiving one pipe end;

a sleeve nut threadedly engaging said housing, said nut having an inner conical surface,

said nut being axially movable relative to said housing upon relative rotation thereof between a disengaged position and a fully engaged position;

an elastomeric gasket within said housing;

a thrust ring axially adjacent said gasket; and

elastically deformable gripping means abutting said conical surface and said thrust ring for gripping said pipe;

said sleeve nut and said thrust ring having cooperative surfaces to cause axial movement of said thrust ring during a first portion of the axial movement of said sleeve nut from said disengaged position toward said engaged position, said axial movement of said thrust ring causing an axial force on said gasket;

said cooperative surfaces being disengaged at a predetermined axial force to subsequently permit radial deformation of said gripping means by said conical surface to grip said pipe.

4,043,577

SANDING DEVICE FOR INCREASED VEHICLE TRACTION

Robbie B. Nettles, Poulsbo, Wash., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

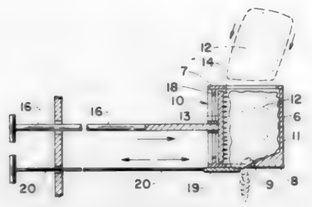
Filed Aug. 9, 1976, Ser. No. 712,475
Int. Cl.[2] B60B *39/06;* **B61C** *15/10*
U.S. Cl. 291—25 **1 Claim**

1. A vehicular accessory for an automotive vehicle having a cab, a chassis and a plurality of wheels rotatably mounted on the chassis, said vehicular accessory comprising

a box mounted on the chassis of a vehicle above and forward of a selected one of the wheels of the vehicle, said box having an open top, a bottom substantially parallel to the top and having an opening formed therethrough and two pairs of spaced parallel sides substantially perpendicular to the top and bottom, one of the sides being open, the top

admitting a bag of sand, ice-dissolving chemicals, and the like;

a side panel removably enclosing the open side of the box, said panel having a plurality of spikes extending from the inside surface thereof for puncturing a bag in the box and a control rod extending from the outside surface thereof to the cab of the vehicle to permit movement of said panel from within said cab; and



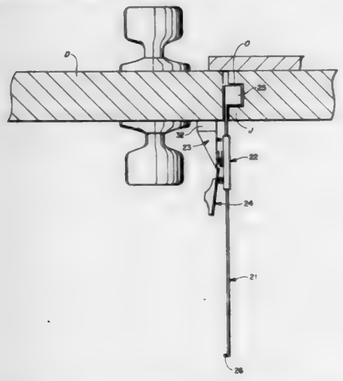
volume control means movably mounted at the bottom of the box and extending into the cab of the vehicle for controlling the volume of material passing from a bag in the box through the opening in the bottom of the box from the cab of the vehicle, said volume control means comprising a plate movably mounted over the opening in the bottom of the box for selectively uncovering a desired part of said opening and a control rod extending from the plate to the cab of the vehicle to permit movement of said plate from within said cab.

4,043,578

PORTABLE DOOR LOCK

Edgar S. Downs, 6530 Huntley Road, Worthington, Ohio 43085

Filed June 24, 1976, Ser. No. 699,476
Int. Cl.[2] E05C *19/18*
U.S. Cl. 292—290 **9 Claims**



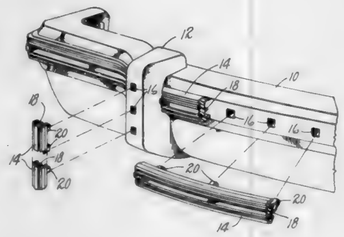
1. A portable lock in the form of a single assembly comprising an elongated relatively thin guide strip adapted to be inserted between the edge of a door and its cooperating jamb and having a latch-engaging lug adjacent the forward end thereof for engaging a latch portion on the jamb when so inserted, a carriage slidably mounted on the strip for movement longitudinally thereof relative to said lug, a locking lever and a releasing lever pivotally mounted on the carriage in cooperative relationship, said locking lever being pivoted intermediate its ends about a pivot transversely of the carriage and the guide strip to provide a forward and rearward lever arm, a transversely disposed door-face-engaging portion on the forward end of the locking lever ahead of said transverse pivot and parallel thereto in the form of a yieldable pad, a transversely disposed restraining shoulder on the rear end of the locking lever behind said transverse pivot and parallel thereto on a member passing through the carriage into engagement with the adjacent face of the strip, a spring cooperating with said locking lever for normally biasing it about said transverse pivot to cause said shoulder to engage said strip face, said pad engaging the door face to yield to a limited extent when the strip is inserted in locking position between the door and jamb and the carriage is moved forward on the strip as far as possible, any opening pressure against the door tending to swing the locking lever about its pivot to increase the engagement of the shoulder with the strip face, said releasing lever being pivoted intermediate its ends about a pivot transversely of the carriage and the guide strip to provide a forward and rearward lever arm, said pivot being located behind and parallel to the pivot for the locking lever, the forward end of the releasing lever being positioned beneath the rear end of the locking lever so that pressure on the rear end of the releasing lever will pivot the locking lever forwardly to cause the pad to yield sufficiently to disengage the releasing shoulder from said strip face thereby permitting rearward sliding movement of the carriage and movement of the pad away from the door face.

4,043,579

ELASTOMERIC BUMPER SECURING PRESS FIT CLIP

Engelbert A. Meyer, Bloomfield Hills, Mich., assignor to USM Corporation, Boston, Mass.

Continuation of Ser. No. 572,459, April 28, 1975, abandoned.
This application Apr. 6, 1976, Ser. No. 674,140
Int. Cl.[2] A44B *17/00, 21/00;* B60R *19/08;* F16B *13/04*
U.S. Cl. 293—71 R **3 Claims**



1. For securing a rib-carrying strip to an apertured member, the member being of material at least as hard as the material of the strip, a one-piece resilient sheet metal clip having opposed legs joined in a rounded nose portion receivable in the aperture of said member, the legs in localities nearer their free ends having inwardly projecting spaced prongs substantially directed toward said nose portion and engageable with opposite sides of the rib, the large intermediate said ends and the nose portion being bowed outwardly, and at least one pair of outwardly projecting prongs formed on the outwardmost intermediate bowed portions and substantially directed away from said nose portion whereby, upon engagement of the bowed portions with opposite walls of said aperture, the inwardly projecting prongs are yieldably urged together to bite into and grippingly engage said rib and the outwardly projecting prongs become embedded for securement in said walls to resist separation of the strip and the member.

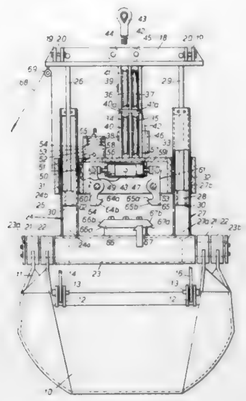
4,043,580

CABLE-CONTROLLED GRAB DEVICE

Birger Hellmann Thaule, Risoy, Norway, assignor to A/S Kongshavn Industri, Alvoy, Norway

Filed June 17, 1976, Ser. No. 697,215
Claims priority, application Norway, June 20, 1975, 752193
Int. Cl.[2] B66C *3/10*
U.S. Cl. 294—70 **5 Claims**

1. In a cable-controlled grab device which comprises support yoke means, a pair of scoops directly and linkably connected to said yoke means, a central shaft having said scoops pivotably mounted at opposite ends thereof, tackle means having upper and lower portions, said upper portion being secured to said yoke means and releaseable locking means arranged between said lower portion and said central shaft for indirectly connecting said scoops to said yoke means, said locking means comprising two locking arms urgeable by remotely controllable actuating means into a locking position in engagement with a locking member associated therewith, the



improvement consisting in actuating means in the form of a pressure medium cylinder linkably connected between said locking arms and inserted in a hydraulic circuit adapted to be pressure-loaded so as to force said locking arms into said locking position, remotely controllable valve means in said hydraulic circuit capable when closed of maintaining said arms in said locking position and when open of permitting said locking arms to slide out of engagement with said locking member due to the weight loading of said scoops.

4,043,581

SLING CONSTRUCTION

Dennis St. Germain, Aston, Pa., assignor to I & I Sling Co., Inc., Aston, Pa.

Filed Mar. 31, 1976, Ser. No. 672,470
Int. Cl.[2] B66C *1/18*
U.S. Cl. 294—74 **5 Claims**



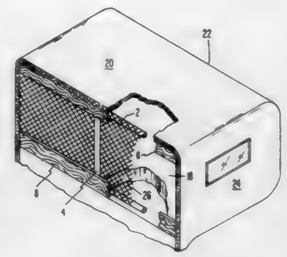
1. A sling for carrying loads which is made from a single length of cable, having ends thereof, which comprises: a body which includes three sections, loosely interwoven together, of said cable; a pair of loops formed from the cable, at each end of said body; wherein the loops of each pair are loosely woven together; wherein each pair of loops includes a first loop which is integrally connected to two of the three sections of cable forming said body and a closure loop; and wherein said closure loop is formed by the remaining section of the three sections of cable forming said body, doubled back upon, and secured to, itself only, by a metal sleeve which holds said end to said cable in a compressed relationship.

4,043,582

RESTRAINT DEVICE FOR RECREATIONAL VEHICLES

James T. Lyter, P.O. Box 724, Evergreen, Colo. 80439

Filed Nov. 17, 1975, Ser. No. 626,532
Int. Cl.[2] B62D *33/04*
U.S. Cl. 296—24 R **10 Claims**



1. A restraint device adapted to be positioned substantially completely across the open side of a compartment defined by a plurality of wall structures having upper, lower and side walls comprising:

a substantially flexible means having four end portions,

a first end portion affixed by a first securing means to one side wall structure,

a second end portion affixed by a second securing means to an upper wall structure permitting said flexible means to slide transverse of said compartment in a substantially perpendicular plane,

a third end portion affixed by a third securing means to a lower wall structure permitting said flexible means to slide transverse of said compartment in a substantially perpendicular plane,

a quick release means including a first quick release member integral with a fourth end portion of said flexible means and second quick release member integral with opposing wall structure normally cooperating in interlocking engagement to secure said flexible means to said wall structure in a closed position, said quick release means disengageable to permit separation whereby said quick release means is normally engaged to frustrate disengagement and opening of said flexible means by infants but is easily engageable by adults whereby forces received horizontal to said flexible means in preventing the occupant from being dislodged from said compartment are transmitted to said wall structures.

4,043,583

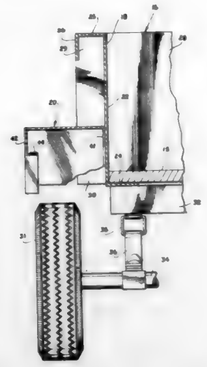
LIGHTWEIGHT TRAILER CONSTRUCTION

Carl E. Tidwell, Jr., 5858 Riverview Road, Mableton, Ga. 30059

Filed Apr. 8, 1976, Ser. No. 675,075
Int. Cl.[2] B62D *33/00*
U.S. Cl. 296—28 M **12 Claims**

1. A trailer having a vehicle body including a plurality of walls, said plurality of walls comprising a first side wall, a second side wall parallel to said first side wall and formed as a mirror image of said first side wall, and a front wall, said front wall extending from said first side wall to said second side wall,

each of said plurality of walls comprising a length of preformed member including a central web generally in the plane of the wall, a lower flange extending perpendicularly from the lower edge of said central web and inwardly of said vehicle



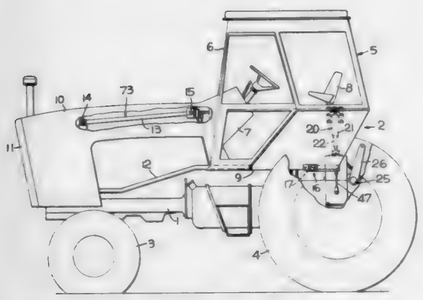
body, and an upper flange on the upper edge of said central web, said central web being of a height substantially greater than the width of said upper flange and said lower flange, means for supporting said walls, and a bottom resting on said lower flange extending from each of said walls.

4,043,584

VEHICLE SUSPENSION AND STABILIZER SYSTEM

Robert J. Wagner, and Ralph R. Atherton, both of Milwaukee, Wis., assignors to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Nov. 17, 1975, Ser. No. 632,856
Int. Cl.[2] B62D *23/00*
U.S. Cl. 296—35 R **15 Claims**



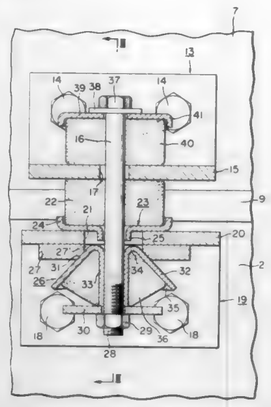
1. A tractor having a suspension system comprising, a tractor chassis mounted unsprung on the plurality of wheels, an operator station including means, resilient means mounted on said chassis supporting the operator station, a pitch and roll limiting mechanism connected between said operator station and vehicle chassis for limiting the pitch and the roll of the operator station, a stabilizer linkage means mounted on said vehicle chassis and pivotally connected to said operator station, said stabilizer linkage means including a pair of nonparallel links pivotally connected to said vehicle chassis, an arm pivotally connected to the opposite ends of said links, a pivotal connection pivotally connecting said arm to said operator station defining a pivotal axis, said stabilizer linkage means limiting the relative movement of said pivotal axis to essentially a vertical movement relative to said vehicle chassis as said operator station is moved relative to said vehicle chassis.

4,043,585

BUFFER FOR VEHICLE

Akira Yamanaka, Yokohama, Japan, assignor to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 5, 1976, Ser. No. 664,320
Claims priority, application Japan, Mar. 26, 1975, 50-41331; Oct. 22, 1975, 50-127805
Int. Cl.[2] B62D *23/00*
U.S. Cl. 296—35 R **12 Claims**



1. A buffer for normally preventing relative movement between a cab or body and a chassis frame of a vehicle, comprising a fixing member inserted through holes provided in flange portions of a first bracket fixed to said cab or rear body and of a second bracket fixed to said chassis frame, said fixing member being formed to fit loosely into at least one of said holes so as to tilt upon said relative movement, a buffer means being held on said fixing member and including a first buffer member provided between said flange portions of said first and second brackets and a second buffer member provided between one of said flange portions and either of a nut or a head of a bolt forming said fixing member, said first and second buffer members being passed through by said bolt, and a die having a die hole therein operatively positioned adjacent one of said buffer members, said first buffer member being made of resilient material, said second buffer member being plastically deformable and positioned adjacent said die hole to be pulled into the same upon the relative movement between said cab or body and said chassis frame by an impact force of more than a predetermined value applied to the vehicle.

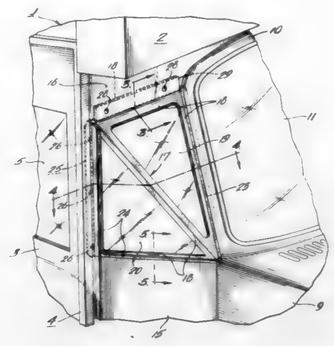
4,043,586

FLOATING WINDOW ASSEMBLY FOR VEHICLES

Paul R. Hafer, Boyertown, Pa., assignor to Boyertown Auto Body Works, Boyertown, Pa.

Filed Jan. 26, 1976, Ser. No. 652,509
Int. Cl.[2] B60J *1/10*
U.S. Cl. 296—84 C **2 Claims**

1. In a commercial vehicle such as a truck or a van the combination which comprises a chassis having a windshield, a non-integral body mounted on said chassis, a sub-assembly connecting the windshield to a transom on said body and a door post of said body, said sub-assembly having a frame, a relatively thick resilient seal in which the frame is mounted to provide a weather tight seal to permit limited relative movement of the frame, two transparent panes mounted in resilient seals secured to the frame said frame being removably secured to the door post of the body and the transom by fastening



means clamping said frame to the door post and transom through strips of elastomeric material.

4,043,587

BUG DEFLECTING DEVICES

Michael A. Giallourakis, 509-11 Pinellas Ave., Tarpon Springs, Fla. 33589, and Louis F. Mlecka, P.O. Box 908, Brooksville, Fla. 33512

Filed Apr. 9, 1976, Ser. No. 675,571
Int. Cl.[2] B60J *1/20*
U.S. Cl. 296—91 **2 Claims**

1. A deflecting device for deflecting air currents containing bugs, road grime and the like away from the windshield of a moving motor vehicle, said device adapted to be removably mountable at any position on the hood of any vehicle; said device comprising a generally vertically disposed transparent shield member and a horizontal base member; said shield member and base member being planar, flexible and semi-rigid; said base member comprising a pair of front and rear parallel, semi-rigid, flexible, strip permanent magnets and an upstanding member parallel to and disposed between said magnets and adjacent said rear magnet; said upstanding member having a front face canted backwardly; said shield member permanently secured to said front face of said upstanding member.

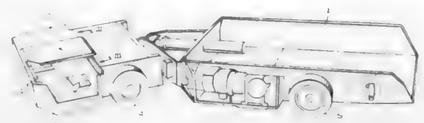
4,043,588

SHUTTLE CAR WITH OPERATOR PROTECTION

Paul F. Curry, Box 356, Raven, Va. 24639

Filed June 1, 1976, Ser. No. 691,485
Int. Cl.[2] B60J *7/00*
U.S. Cl. 296—102 **4 Claims**

1. A mine shuttle car comprising a tractor, a load-carrying trailer, a swivel interconnecting the tractor and trailer, said swivel being positioned so that the tractor and trailer can each horizontally turn through a range of angularities relative to each other, front and rear sets of running wheels supporting the tractor and trailer respectively, each of said sets comprising two wheels only so that the tractor and trailer can each horizontally pivot on its set of wheels, reversible wheel power means for powering at least one of said sets, steering means for controlling said angularities to steer the shuttle car, said tractor and trailer having a low profile so the shuttle car can run forwardly and reversingly through a mine haulway and into and from a mine crossout, and said tractor having a substantially flat top through which from one side of the tractor an opening extends transversely from that side for a part of the tractor's width and below which the tractor forms a cockpit having controllers for at least said wheel power and steering



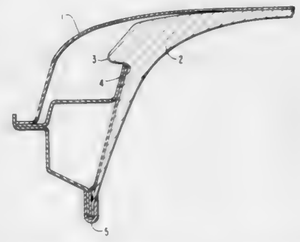
means and a support on which the operator can sit transversely on the tractor with at least his head above the tractor's top so he can look forwardly and backwardly, and a flat canopy for said opening and supported by the tractor's said top at a height forming open spaces through which the operator can look forwardly and backwardly, said canopy being horizontally movable transversely with respect to the tractor so as to cover and uncover said opening, the tractor's top and said canopy being made of steel plate.

4,043,589

AUTOMOTIVE VEHICLE-DOME

Franz-Werner Alfter, Siegburg; Hans-Ulrich Breitscheidel, and Heinz-Gerd Reinkemeyer, both of Troisdorf, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Germany

Filed Apr. 8, 1974, Ser. No. 459,181
Claims priority, application Germany, Apr. 7, 1973, 2317546
Int. Cl.[2] B60J *7/10*
U.S. Cl. 296—137 A **13 Claims**



1. An interior lining arrangement for vehicles having a roof structure, the arrangement comprising: means for mounting the interior lining in the vehicle including at least one mounting member secured to the roof structure, said mounting member terminating in a free end spaced from an inner surface of the roof structure to form between said free end and the roof structure at least one undercut portion disposed along at least a portion of at least one edge of the roof structure, a self-supporting lining means consisting of at least one panel of a cross-linked polyethelene foam, said lining means including at least one offset edge, and at least one outwardly extending elastically deformable clamping bead integrally formed along at least a portion of said at least one offset edge, said clamping bead including a lower surface overlying and extending beyond said free end of said mounting member, said lower surface of said at least one clamping bead engaging said free end of said at least one mounting member to clamp said self-supporting lining means in the vehicle in close proximity to the roof structure.

4,043,590

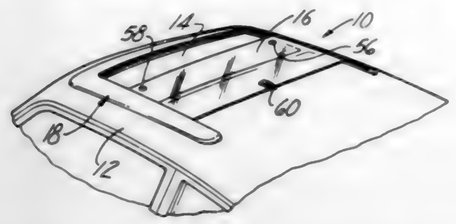
SLIDING ROOF ASSEMBLY

William J. Pizzuti, Bloomfield Hills, Mich., assignor to Skytrends, Inc., Detroit, Mich.

Continuation-in-part of Ser. No. 540,727, Jan. 13, 1975. This application May 6, 1976, Ser. No. 683,769

Int. Cl.[2] B60J 7/10

U.S. Cl. 296—137 H **6 Claims**



1. A sliding roof assembly for attachment to the top of a vehicle in proximity to an opening in the vehicle roof, the combination of; a frame member having a pair of longitudinally extending side members disposed at opposite sides of said opening and forward and rearward members disposed adjacent forward and rearward edges of said opening, said side members forming facing guide portions, a panel member mounted for sliding movement in said guide portions for movement between a forward position closing the opening in the vehicle roof to a rearward position in which said panel is disposed rearwardly of said opening, seal means mounted on said side and forward and rearward members for engagement with the underside of said panel when the latter is in its forward position, latch means associated with forward and rearward portions of said panel member and being operable to pull said panel member into sealing engagement with said seal member, said side members presenting rearward guide surfaces rearwardly of said rearward member elevated from said seal for engaging an underside of said panel upon rearward movement of the latter to raise said panel relative to said seal.

4,043,591

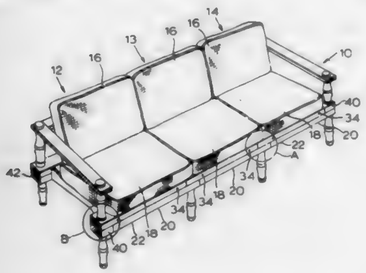
MODULAR FURNITURE CONSTRUCTION

Edmund J. Lehmann, New Hamburg, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Dec. 22, 1975, Ser. No. 642,911

Int. Cl.[2] A47C 15/00

U.S. Cl. 297—248 **6 Claims**



1. A modular furniture construction, comprising:

at least one seating module adapted for lateral alignment with others of its kind, each seating module including seat-support structure, back-support structure and leg means for supporting said structures above a floor;

each seat-support structure having, along one edge thereof adapted to be aligned with similar edges of other like modules, a horizontally elongated support member with a substantially rectangular transverse section, the support member having a downwardly facing stepped configuration at one end, and an upwardly facing stepped configuration at the other end; and

two filler blocks shaped to fit into and fill the stepped configurations.

4,043,592

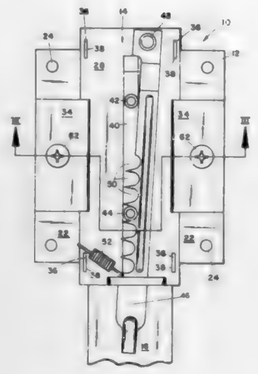
ADJUSTABLE SEAT BACK MECHANISM

Bernard J. Fries, Jenison, Mich., assignor to Steelcase Inc., Grand Rapids, Mich.

Filed Sept. 5, 1975, Ser. No. 610,832

Int. Cl.[2] A47C 3/00

U.S. Cl. 297—291 **21 Claims**



1. A backrest height adjustment apparatus for chairs of the type including a vertical support post and a back having a vertical slot therein, comprising:

a support plate having a generally channel shaped cross section including a base and spaced sides and further including means for mounting said support plate to the chair back within said vertical slot;

a housing slidably receiving said vertical support post of the chair, said housing disposed between said sides of said support plate and including a channel shaped housing plate having spaced side portions;

latching means including a first member supported by said housing and a second member supported by said post for permitting stepwise, vertical adjustment of the housing and support plate relative to the vertical support post, one of said members being a pivotally mounted latch bar having a series of spaced recesses formed in the surface thereof along one lateral edge, the other of said members being a stud receivable within one of said spaced recesses:

means engaging said latch bar for biasing said latch bar against said stud; and

resilient means interconnecting said housing and said support plate for biasing said support plate to a vertical position and for permitting limited pivotal movement of said support plate relative to said housing.

4,043,593

VEHICLE SEATS

Harold Roy Turner, Sutton Coldfield, England, assignor to L.C.P. Group Services Limited, Brierley Hill, England

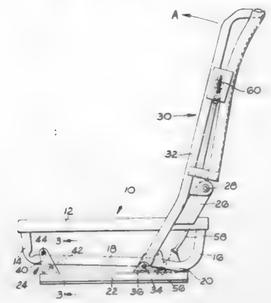
Filed Nov. 5, 1975, Ser. No. 629,097

Claims priority, application United Kingdom, Nov. 9, 1974, 48613/74

Int. Cl.[2] A47C 1/02

U.S. Cl. 297—341 **7 Claims**

1. A vehicle seat comprising a seat back pivoted intermediate its ends to a seat base, and further pivoted at its lower end below the seat base to the vehicle floor, in which the seat base is slidable forwardly and tipped when the seat back is pivoted forward, and vice versa, characterized in that the seat base comprises a frame including at least one element in slidable engagement with a guide which is located on the floor adjacent the front of the seat base when the seat is in normal use position, said guide including upper and lower guide elements which are spaced apart in the fore and aft direction, said frame element extending through the gap between said upper and lower guide elements, and said lower guide element being located nearer to said seat back than said upper guide element.



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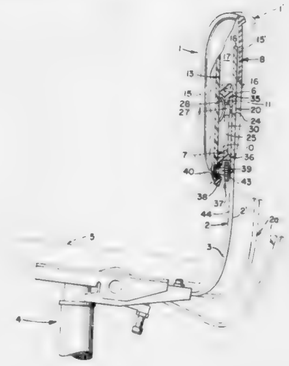
ADJUSTABLE CHAIR REST MEMBER

Douglas N. Cabell, Bloomfield Hills, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio

Filed Mar. 12, 1976, Ser. No. 666,208

Int. Cl.[2] A47C 1/00

U.S. Cl. 297—353 **10 Claims**



1. A chair including an upright back plate having an upper portion provided with a face and rear surface and a top edge, a rest member attached to said back plate upper portion and provided with means permitting both vertical and angular adjustment of said rest member relative said back plate upper portion, said rest member including a back frame provided with a central web including front and rear surfaces, said web having a vertical slot therethrough adapted to overlie said face of said back plate upper portion, said vertical adjustment means including a nut bracket adjustment assembly joining said back plate upper portion to said rest member central web, said nut bracket assembly provided with releasable fastener means carried by said back plate upper portion and projecting toward said web rear surface, mating fastener means disposed within said web slot and engaging said releasable fastener means, said mating fastener means including a pivotal member having a rear surface in overlying engagement with said web front surface, said pivotal member rear surface defining a convex surface when viewed in side elevation, said angular adjustment means including axially adjustable screw means carried by said rest member below said web slot and projecting rearwardly toward said back plate face to engage same, whereby vertical adjustment of said back rest is achieved by loosening said releasable fastening means to allow raising or lowering of said back rest as said mating fastener means is moved relative said web slot, and angular adjustment of said back rest is achieved by manipulating said screw means to axially displace same and cause tilting of said back rest about a horizontal axis passing through said back rest at a point above said mating fastener means.

4,043,595

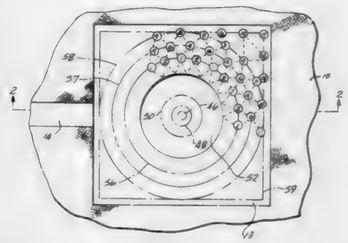
IN SITU RECOVERY OF SHALE OIL

Gordon B. French, Rifle, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 505,276, Sept. 12, 1974, abandoned, and Ser. No. 505,363, Sept. 12, 1974, and Ser. No. 505,457, Sept. 12, 1974, abandoned. This application Aug. 11, 1975, Ser. No. 603,704

Int. Cl.[2] E21B 43/24, 43/26; F21C 41/10

U.S. Cl. 299—2 **111 Claims**



1. A method of recovering shale oil from an in situ oil shale retort in a subterranean formation containing oil shale, said retort having top, bottom, and side boundaries of the formation and containing fragmented formation containing oil shale therein, comprising the steps of:

excavating a first portion of the formation from within the boundaries of the in situ oil shale retort being formed to form at least one vertically extending columnar void, the surface of the formation defining such a columnar void providing at least one free face extending vertically through the formation within said boundaries, and leaving a second portion of said formation, which is to be fragmented by expansion toward such a columnar void, within said boundaries and extending away from a said free face;

forming a plurality of blasting holes in said second portion extending substantially parallel to a said free face;

loading explosive into said blasting holes;

detonating said explosive for explosively expanding said second portion toward said columnar void; and

retorting the fragmented formation containing oil shale in the in situ retort to recover shale oil and gaseous products therefrom.

24. A method of recovering shale oil from in situ oil shale retorts in a subterranean formation containing oil shale, said retorts having top, bottom and side boundaries of unfragmented formation and containing fragmented formation containing oil shale therein, comprising the steps of:

excavating first portions of the subterranean formation to form an access and perimetric tunnel system leading to individual retort sites;

excavating second portions of the subterranean formation at the individual retort sites to form a plurality of workrooms in communication with said tunnel system, arranged in rows and columns, the floor plan of such workrooms having dimensions approximating the dimensions of the retorts to be built using such workrooms;

excavating a third portion of the formation from within the boundaries of the in situ oil shale retorts being formed to

form at least one vertically extending columnar void in each such retort being formed, the surface of the formation defining the columnar void providing at least one free face extending vertically through the formation within said boundaries, and leaving a fourth portion of said formation, which is to be fragmented by expansion towards said columnar void, within said boundaries and extending away from a said free face;

explosively expanding said fourth portion toward said columnar void in a single round of explosions in one or more segments, including at least one layer of formation parallel to a said free face to fragment said fourth portion and to fill with fragmented formation containing oil shale said columnar void and the space occupied by said fourth portion prior to the expansion;

retorting the fragmented formation containing oil shale in the retort by passing a retorting fluid therethrough; and

removing the retorting products from the bottom of the respective retorts.

66. The method of forming, in a subterranean formation containing oil shale, an in situ oil shale retort having boundaries of unfragmented formation and containing fragmented oil shale therein, comprising the steps of:

excavating a first portion of the formation contained within the boundaries of the retort being formed to leave at least one columnar void that has a first free face extending vertically through the oil shale in the retort being formed, the oil shale remaining within said boundaries including a second portion to be expanded adjacent said first free face;

excavating a third portion of the formation contained within the boundaries of the retort being formed adjacent one end of the first free face to leave a room having a floor plan with a perimeter coinciding approximately with the perimeter of the horizontal cross-sectional area of the retort being formed and a second free face extending transverse to the first free face, the oil shale remaining within said boundaries including a fourth portion to be expanded adjacent said second free face;

explosively expanding the second portion toward said first free face in a single round in one or more layers parallel to said first free face to fragment the second portion; and

explosively expanding the fourth portion toward said second free face in a single round to fragment said fourth portion.

4,043,596

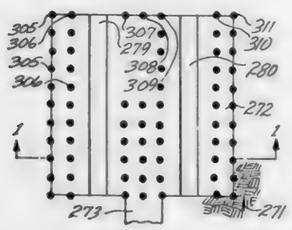
FORMING SHALE OIL RECOVERY RETORT BY BLASTING INTO SLOT-SHAPED COLUMNER VOID

Richard D. Ridley, Grand Junction, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Aug. 11, 1975, Ser. No. 603,705

Int. Cl.[2] E21C *41/10*

U.S. Cl. 299—2 **51 Claims**



1. A method of forming an in situ oil shale retort in a subterranean formation containing oil shale, said retort having top, bottom and side boundaries of the formation and containing fragmented formation containing oil shale therein, comprising the steps of:

excavating a first portion of the formation from within the boundaries of the in situ oil shale retort being formed to form at least one vertically extending slot-shaped columnar void, the surfaces of the formation defining such a columnar void providing at least a pair of parallel planar free faces extending vertically through the oil shale formation within said boundaries, and leaving a second portion of said formation which is adjacent the free faces and within the boundaries of the retort being formed;

forming a plurality of blasting holes in said second portion extending parallel to the free faces;

loading explosive into said blasting holes; and

detonating said explosive for explosively expanding said second portion toward such columnar void.

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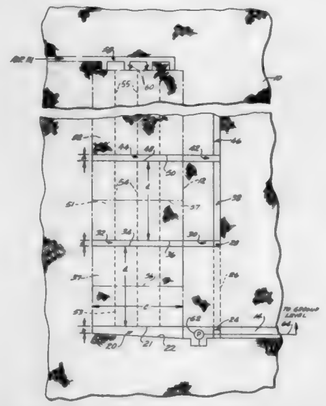
MULTIPLE LEVEL PREPARATION OF OIL SHALE RETORT

Gordon B. French, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 602,929, Aug. 8, 1975, abandoned, which is a continuation of Ser. No. 464,957, April 29, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,699

Int. Cl.[2] E21B *43/24, 43/26;* E21C *41/10*

U.S. Cl. 299—2 **31 Claims**



19. A method of forming an in situ oil shale retort containing a fragmented permeable mass of oil shale particles in a subterranean deposit, which comprises the steps of:

excavating a plurality of vertically spaced apart voids with a zone of unfragmented deposit between adjacent voids and within the boundaries of the in situ oil shale retort being formed;

explosively expanding at least one lower portion of such an unfragmented zone downwardly toward a lower void; and

thereafter explosively expanding an upper remaining portion of such an unfragmented zone at least partly toward an upper void to form a fragmented permeable mass of particles within the boundaries of the in situ oil shale retort being formed, wherein the void volume of the fragmented permeable mass of particles in the in situ oil shale retort is substantially equal to the total volume of the voids within the boundaries of the in situ oil shale retort being formed.

4,043,598

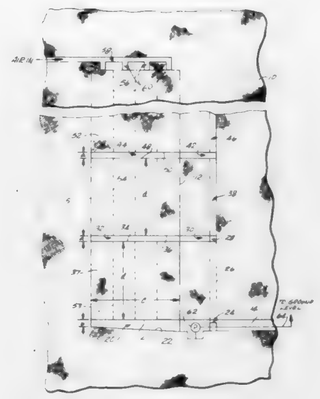
MULTIPLE ZONE PREPARATION OF OIL SHALE RETORT

Gordon B. French, Bakersfield, and Donald E. Garrett, Claremont, both of Calif., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation-in-part of Ser. No. 602,930, Aug. 8, 1975, abandoned, which is a continuation of Ser. No. 464,956, Aug. 29, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,899

Int. Cl.[2] E21B *43/26;* E21C *41/10*

U.S. Cl. 299—2 **71 Claims**



1. A method for fragmenting a subterranean deposit comprising the steps of excavating a plurality of vertically spaced apart voids of substantially similar horizontal cross section including a lower void and at least one void located substantially directly above said lower void, thereby leaving an intervening unfragmented zone of deposit between adjacent voids, and explosively expanding each unfragmented zone toward the previously excavated voids to produce a subterranean room containing a fragmented permeable mass of particles having an average void volume substantially equal to the total volume of the voids by detonating explosive in each unfragmented zone between adjacent voids and located sufficiently close to the free face between the unfragmented zone and adjacent voids to expand the unfragmented zone toward each void.

42. A method of recovering shale oil from a subterranean oil shale deposit which comprises the steps of:

excavating a plurality of vertically spaced apart voids with a zone of unfragmented deposit between adjacent vertically spaced apart voids wherein the horizontal cross section of each void is substantially similar to the horizontal cross section of the in situ oil shale retort being formed;

explosively expanding such an unfragmented zone between adjacent vertically spaced apart voids and oil shale above the top void toward the voids to form a fragmented permeable mass of particles in an in situ oil shale retort being formed;

supplying gas to the top of the fragmented permeable mass for establishing a retorting zone in the fragmented permeable mass and a downward flow of hot gas through the retorting zone; and

recovering shale oil produced in the in situ oil shale retort.

4,043,599

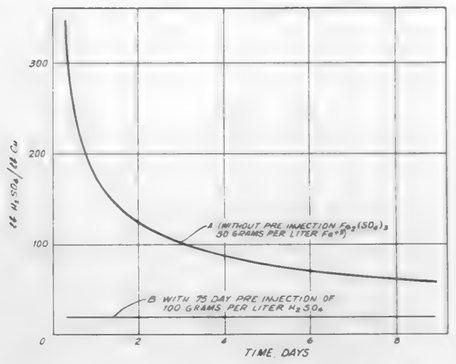
ACID PREINJECTION TO DECREASE INSTANTANEOUS ACID CONSUMPTION IN IN-SITU MINING

Peter James Lingane, Concord; Lawrence MacLagan Cathles, III, Cambridge, and Limin Hsueh, Bedford, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,429

Int. Cl.[2] E21B *43/28*

U.S. Cl. 299—4 **17 Claims**



1. In in-situ solution mining for metal values in a deep lying deposit, the process comprising sinking at least one hole in said deposit, injecting an oxidant containing acid lixiviant for said metal values into at least one hole in said deposit, and recovering a pregnant lixiviant containing metal values from at least one of said holes, the improvement comprising, prior to the injection of said lixiviant, injecting an acid solution into said deposit for pre-reaction with acid neutralizing minerals in said deposit and maintaining said acid solution in contact with said deposit for a sufficient period of time to stabilize a leached metal response into said deposit to said lixiviant.

4,043,600

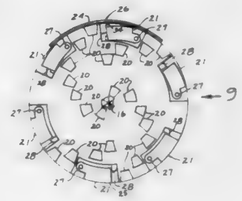
ADJUSTABLE BUCKET FOR AN EARTH BORING MACHINE

Norman Dean Dyer, Beaumont, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 615,319, Sept. 22, 1975, abandoned, which is a continuation of Ser. No. 465,192, April 29, 1974, abandoned. This application Oct. 18, 1976, Ser. No. 733,483

Int. Cl.[2] E21D *9/08*

U.S. Cl. 299—33 **3 Claims**



1. An earth boring machine for producing a bore by loosening material at the face of the bore wherein the loosened material falls to the bottom of the bore, comprising:

a machine body;

a rotary head connected to said machine body, said rotary head having a central axis;

cutter means on said rotary head for loosening material at the face of the bore;

a shield positioned over said machine body extending proxi-

mate said rotary head, said shield located at a first radial distance from the central axis of said rotary head;

at least one bucket connected to said rotary head for picking up the loosened material at the bottom of the bore; and

positioning means for positioning said bucket substantially at said first radial distance from the central axis of said rotary head when said bucket is in a first position picking up the loosened material at the bottom of the bore and for positioning said bucket at a second and shorter radial distance from the central axis of said rotary head when said bucket is in a second position spaced from said first position, said positioning means including track means in said machine body proximate said cutterhead, means connected to said bucket for traveling in said track means and hinge means between said bucket and said rotary head.

4,043,601

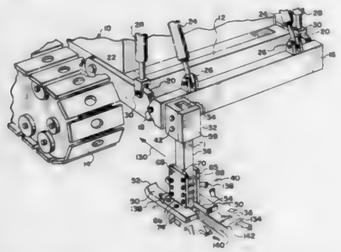
ASPHALT CUTTER

Raymond Paul Schiller, 905 N. Draper Road, McHenry, Ill. 60050

Continuation-in-part of Ser. No. 509,093, Sept. 25, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,545

Int. Cl.[2] E02D *17/13;* **E01C** *23/09*

U.S. Cl. 299—36 **18 Claims**



1. A cutter head for a cutting device for forming a narrow trench in a layer of asphalt-like material along a straight or curved path of travel comprising:

a lifter blade having an approximately flat upper surface engageable under and against said layer and extending, in use, at an angle downwardly in the direction of the path of travel;

said lifter blade having essentially vertical planar opposite side walls extending in the direction of the path of travel and intersecting with said flat upper surface at approximately right angles to define a pair of laterally spaced cutting edges;

a flat keeper member rigidly mounted on each side of said lifter blade;

said keeper members presenting essentially co-planar flat under surfaces intersecting with said upper surface of said lifter blade and positionable in use upon the top of said layer;

each of said keeper members having an inner cutting edge substantially in the plane of the associated side of said lifter blade and at least co-extensive with the associated cutting edge of said lifter blade;

and means for drivingly mounting said cutter head upon a prime mover.

4,043,602

METHOD AND APPARATUS FOR CONSTRUCTING A MOP

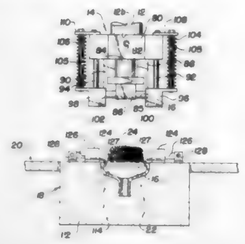
Audrey H. Ballew, Sweetwater, Tex., assignor to Dallas County Association for the Blind, Dallas, Tex.

Filed Apr. 27, 1976, Ser. No. 680,964

Int. Cl.[2] A46D *3/04*

U.S. Cl. 300—16 **15 Claims**

1. Apparatus for assembling a mop head comprising: support means arranged to support a mop head having cavity formed therein, said cavity having opposed shoulders in the outer end thereof, ram; support means arranged to support the ram, means to slideably support said ram; ram; a ram head adapted



to disengageably hold a spring wire; actuating means to urge said ram downwardly urging said spring wire into the cavity of the mop head such that the ends of said wire are engaged under the shoulders formed in the cavity to retain the wire therein.

4,043,603

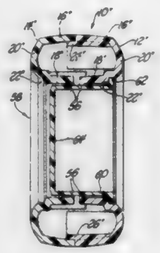
VEHICLE WHEEL ASSEMBLY FOR A TOY VEHICLE

Henry F. Bergmann, Sterling Heights, and Bernard J. Oswald, Fraser, both of Mich., assignors to AMT Corporation, Troy, Mich.

Division of Ser. No. 587,423, June 16, 1975, Pat. No. 3,985,392. This application June 1, 1976, Ser. No. 691,563

Int. Cl.[2] B60B *5/02;* **B60C** *7/24*

U.S. Cl. 301—63 PW **6 Claims**



1. A vehicle wheel assembly for a toy vehicle comprising: a substantially hollow tire portion including two structurally identical mating shells made of a relatively rigid plastic material, each of said shells including an outer annular wall, an inner annular wall generally concentric with said outer annular wall, and a side wall joining said outer and inner annular walls along their exterior edges, said shells including means for facilitating mutual alignment and support thereof and being in mating engagement along the outer peripheral center line of said tire portion; a wheel portion for receiving said tire portion; and retaining means for retaining said shell members in mating engagement on said wheel portion, said retaining means including a retainer lip extending generally radially inwardly from said inner annular walls of said mating shells for frictionally engaging said wheel portion; said wheel portion including a substantially cylindrical portion for receiving said shells and a flange extending radially from one end of said cylindrical portion for engaging one of said shells; the outer diameter of said cylindrical portion being slightly greater than the inner diameter of said retainer lip.

4,043,604

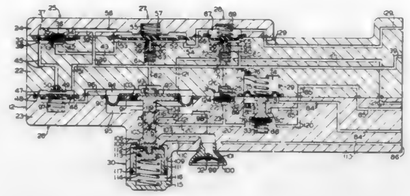
EMERGENCY PORTION FOR A BRAKE CONTROL VALVE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 11, 1976, Ser. No. 740,837

Int. Cl.[2] B60T *15/18*

U.S. Cl. 303—33 **10 Claims**



1. For use in a brake apparatus including a brake pipe, a quick action chamber, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application, said emergency valve device comprising:

a. a first restricted means enabling flow of fluid under pressure between the brake pipe and the quick action chamber to provide for charging the quick action chamber from the brake pipe, wherein the improvement comprises:

b. a second restricted means enabling flow of fluid under pressure between the brake pipe and the quick action chamber, said second means being so arranged with respect to said first means as to enable parallel flow of fluid under pressure between the quick action chamber and the brake pipe via said first and second restricted means,

c. a valve seat interposed between said first and second restricted means, and

d. a resilient valve member subject on its respective opposite sides to the pressure of the fluid in the brake pipe and in the quick action chamber and having said first restricted means so mounted thereon that, upon movement of said member into engagement with said valve seat in response to the pressure in the brake pipe exceeding that in the quick action chamber, flow of fluid under pressure between the brake pipe and the quick action chamber via said second restricted means is cut off so that, so long as the pressure in the brake pipe exceeds that in the quick action chamber, flow of fluid under pressure from the brake pipe to the quick action chamber is only via said first restricted means, said resilient valve member being movable out of engagement with said valve seat in response to equalization of the pressures on the respective opposite sides thereof thereby enabling flow of fluid under pressure from the quick action chamber to the brake pipe via said first and second restricted means in parallel in response to a reduction of pressure in the brake pipe.

4,043,605

EMERGENCY PORTION FOR A BRAKE CONTROL VALVE

James E. Hart, Trafford, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Jan. 10, 1977, Ser. No. 758,046

Int. Cl.[2] B60T *15/30*

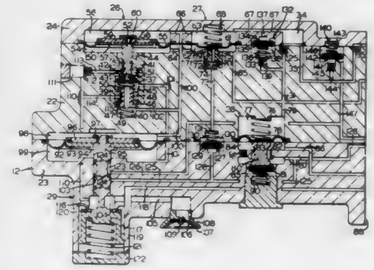
U.S. Cl. 303—37 **10 Claims**

1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application and comprising:

a. a casing having therein a plurality of chambers, bores and passageways, one of said bores connecting a pair of said chambers and having an annular valve seat at one end and a pair of passageways opening at one end into said bore and one of said pair of chambers respectively and cooperating therewith to provide a communication through which fluid under pressure may be released from another chamber, other than said plurality of chambers, to atmosphere via said one chamber,

b. a poppet-type valve which so cooperates with said annular valve seat as to control flow of fluid under pressure from said another chamber to atmosphere,

c. choke means enabling the release of fluid under pressure from said another chamber at a service rate of reduction of brake pipe pressure,



d. a movable abutment subject on its respective opposite sides to the pressure in said another chamber and the brake pipe,

e. fluid-pressure-operated combined emergency and brake pipe vent valve means for effecting the supply of fluid under pressure from the emergency reservoir to the brake cylinder and the release of fluid under pressure from the brake pipe at an emergency rate, and

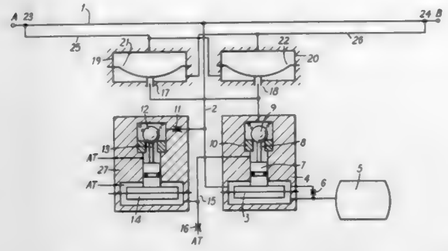
f. means enabling said movable abutment to so control operation of said poppet-type valve in response to a reduction of pressure in the brake pipe at a service rate as to effect the release of fluid under pressure from said another chamber to atmosphere via said choke means at said service rate without effecting operation of said combined emergency and brake pipe vent valve means, and in response to a reduction of pressure in the brake pipe at an emergency rate to cut off the release of fluid under pressure from said another chamber to atmosphere and effect operation of said combined emergency and brake pipe vent valve means to release fluid under pressure from the brake pipe at an emergency rate and supply fluid under pressure from the emergency reservoir to the brake cylinder to cause an emergency brake application.

4,043,606

RAIL VEHICLE BRAKE PIPE VALVE ARRANGEMENT HAVING A FLUID PRESSURE DROP DETECTOR AND A VENT VALVE CONTROLLED THEREBY FOR BRAKE PIPE PRESSURE GRADIENT REDUCTION

David John Wickham, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., Chippenham, England

Continuation-in-part of Ser. No. 513,398, Oct. 9, 1977, Pat. No. 3,966,272. This application Mar. 8, 1976, Ser. No. 664,873
Claims priority, application United Kingdom, Mar. 27, 1975, 13016/75
Int. Cl.[2] B60T *17/04*
U.S. Cl. 303—82 **8 Claims**



1. A rail vehicle brake pipe pressure gradient reducing valve arrangement comprising a first valve means functioning as a brake pipe fluid pressure-drop detector, a second valve means in the form of a relay valve and functioning as a brake pipe vent valve, and a third valve means functioning as a pressure signal deriving means, the first valve means being coupled to the brake pipe to sense a fluid pressure-drop therein due to a pressure reduction in the brake pipe, the third valve means being coupled to the brake pipe to derive a pressure signal from fluid flow therealong, the first valve means being coupled to the second valve means and to the third valve means so as in response to the sensed fluid-pressure drop to deliver the derived pressure signal from the third valve means to the second valve means, the second valve means being responsive to the delivered pressure signal to vent the brake pipe to atmosphere to augment the rate of pressure drop and to tend to reduce the pressure gradient therein, venting operation of the second valve means being inhibited by the first valve means sensing a steady pressure when a steady pressure gradient exists such as may be caused by leakage from the brake pipe or by sensing a rising pressure during re-charging of the brake pipe, venting operation of the second valve means also being inhibited by the third valve means being responsive to absence of a pressure gradient along the brake pipe to derive a zero pressure signal.

4,043,607

METHOD AND DEVICE FOR CONTROLLING DISC BRAKES

Louis Signorelli, and Alain Yves Louis Marcel Geoffroy, both of Toulouse, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Jan. 28, 1976, Ser. No. 652,990
Claims priority, application France, Feb. 7, 1975, 75.03835; Mar. 24, 1975, 75.09038
Int. Cl.[2] B60T *8/02*
U.S. Cl. 303—100 **10 Claims**

1. A method for controlling a hydraulic disc brake, particularly for aircraft, said brake being associated with at least one wheel and actuated by a mobile member, comprising the following steps:

detecting the braking torque actually exerted on the wheel;

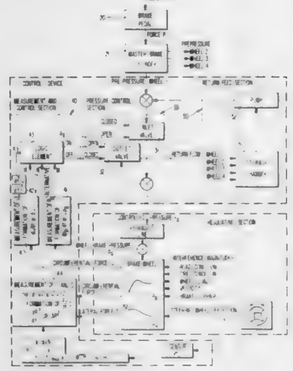
servo-controlling said actual braking torque by a reference braking torque such that a predetermined value of said reference torque corresponds to a determined displacement of said mobile member, the value of the reference torque increasing with the displacement of said mobile member up to a certain position, beyond which the reference torque takes a maximum threshold value indpendent of said displacement.

4,043,608

BRAKE FORCE CONTROL DEVICE FOR BACK-CONTROL

Guillaume Bourg, Karlsruhe; Hubertus Christ, Stuttgart; Tadäus Hausmann, Worth, and Louis Sales, Blankenloch, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Continuation of Ser. No. 280,189, Aug. 14, 1972, abandoned. This application Mar. 4, 1976, Ser. No. 664,031
Claims priority, application Germany, Aug. 13, 1971, 2140658
Int. Cl.[2] B60T *8/08*
U.S. Cl. 303—104 **21 Claims**



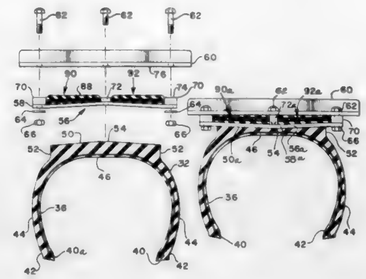
1. A brake force control device for vehicles with a back-control means reducing the brake pressure of the pressure control medium upon exceeding a maximum force acting at a wheel and with disengagement of the back-control means with a re-decreasing force after re-passing through the maximum value, characterized by further means for controlling the engagement and disengagement of said back-control means by signals including signal producing means for forming said signals, taking into consideration the hysteresis effect of the control operation, by the signs of the derivatives with respect to time of the force acting on the wheel and of the brake pressure, and characterized in that the back-control means causing a reduction of the brake pressure is initiated with an increasing brake pressure and a decreasing wheel force only if prior thereto both wheel force and brake pressure increased, and is turned-off with a decreasing brake pressure and a decreasing wheel force only if prior thereto the wheel force increased with a decreasing brake pressure.

4,043,609

ARMORED TIRE HAVING A FLEXIBLE TAPERED BELT ARRANGEMENT

Aleksandar Vidakovic, Libertyville, and Karl Salna, Mundelein, both of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Oct. 6, 1975, Ser. No. 619,757
Int. Cl.[2] B60C *27/20*; B62D *55/28*
U.S. Cl. 305—19 **6 Claims**



1. An armored peripheral track comprising:

first and second inextensible belts each having a first elastomer layer tapered in cross section from a first edge thereof to a second edge thereof; a first textile fabric breaker ply positioned on said first elastomer layer; an inextensible filament ply constructed of cables insulated in elastomer, said cables disposed longitudinally, spirally and circumferentially to present an endless ply; a second textile fabric breaker ply positioned on said inextensible filament ply; a cap of elastomer positioned on said second textile ply and presenting an outside diameter of said belts;

a plurality of anchor plates disposed circumferentially around the inside diameter of said first and said second tapered inextensible belts at spaced apart intervals, transversely oriented to said belts, said anchor plates being formed with channel portions to conform to and preserve said tapered cross section of said first and said second belts, said anchor plates further equipped with end spacers having apertures and center spacers being tapped;

a plurality of traction plates having a plurality of apertures, disposed circumferentially around the outside diameter of said first and said second tapered inextensible belts in an orientation transverse thereto at spaced apart intervals corresponding to the stated location of said anchor plates;

fastening means passing through said apertures in said anchor plates and said apertures in said traction plates for forming a couple therebetween which compresses said first and said second belts and provides, through the location of said traction plates, an armored peripheral track surface on the outside diameter of said belts and an interrupted surface on the inside diameter of said belts through the location of said anchor plates.

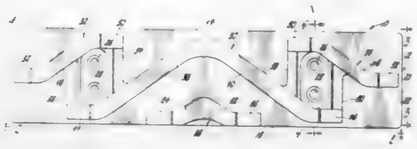
4,043,610

TRACK SHOE

Rudolph Halmosi, Hudson; Karl W. Schneider, Parma, and John F. Weidman, Willoughby Hills, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Aug. 23, 1976, Ser. No. 716,520
Int. Cl.[2] B62D *55/28*
U.S. Cl. 305—19 **3 Claims**

1. A ground engaging shoe for a cushioned track, said shoe comprising a flat base plate having a front edge, rear edge, and a pair of side edges, a V-shaped main grouser with the apex thereof located at the center of said plate adjacent the front edge and with each arm thereof extending rearwardly and terminating adjacent to said rear edge, a pair of identical secondary grousers located on the opposite sides of the main grouser adjacent said front edge, each of said secondary grousers having a pair of end portions interconnected by an intermediate portion that is substantially parallel to the adjacent arm of the main grouser and cooperates therewith for resisting lateral slippage of said shoe when engaging the ground, and a stub



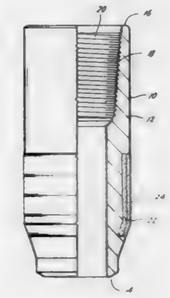
grouser located at said center of said plate adjacent said rear edge, said stub grouser having a V-shaped main body portion and having the ends thereof terminating with a pair of end portions which are adjacent to said rear edge, each of said grousers being of a uniform height and having the top surfaces thereof lying in a plane parallel to the plane of the base plate when viewed from the front edge and being curved when viewed from either of the side edges.

4,043,611

HARD SURFACED WELL TOOL AND METHOD OF MAKING SAME

Duane W. Wallace, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed Feb. 27, 1976, Ser. No. 661,900
Int. Cl.[2] F16C *29/00*
U.S. Cl. 308—4 A **3 Claims**



1. A tool joint comprising

a tubular body,

at least one band of coarse-grained hard metal in an alloy steel matrix extending circumferentially around the exterior of said tubular body, and

a continuous fine-grained cast tungsten carbide layer deposited to cover substantially all of said band.

4,043,612

BEARING STRUCTURE

Frederic K. Orcutt, San Jose, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed June 6, 1975, Ser. No. 584,270
Int. Cl.[2] F16C *7/04, 35/00*
U.S. Cl. 308—9 **10 Claims**

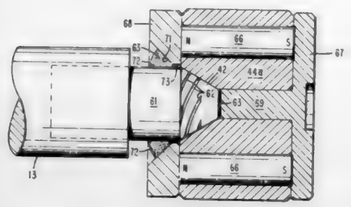
1. A bearing structure for a pair of relatively moving elements, characterized in that:

a magnetic lubricant is disposed between said elements; and

magnetic means are provided for retaining said lubricant between said pair of elements;

said magnetic means including means for establishing opposite magnetic polarities in at least two portions of said structure, said portions having confronting faces defining a primary magnetic air gap flux path therebetween for focussing said magnetic fluid between said elements;

said faces being inclined divergingly with respect to one another, adjacent said primary magnetic air gap flux path, to define a secondary magnetic air gap flux path serving as a reservoir, for receiving excess magnetic lubricant from said primary air gap when the volume defined between



said elements decreases or the volume of said lubricant increases, and for supplying magnetic lubricant to said primary air gap when the volume defined between said elements increases or the volume of said lubricant decreases; and

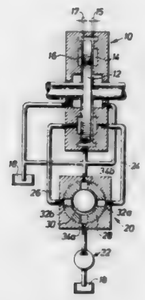
at least one of said elements is formed with pumping grooves for receiving magnetic lubricant from at least said secondary reservoir air gap and for pressurizing and distributing said lubricant between said elements during relative movement of the elements.

4,043,613

HYDROSTATIC BEARING

Lennart Werner Freese, Jarfalla, Sweden, assignor to New-Invent S.A., Geneva, Switzerland

Filed Sept. 26, 1975, Ser. No. 617,028
Claims priority, application Sweden, Oct. 4, 1974, 7412540
Int. Cl.² F16C *32/06*
U.S. Cl. 308—9 **11 Claims**



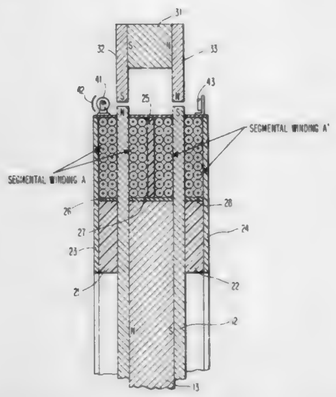
1. A hydrostatic bearing having at least one pair of bearing pockets formed between the coacting surfaces of the bearing and which are supplied with pressure fluid from a pressure source to develop a counteracting pressure to the bearing load in a manner known per se, wherein the bearing pockets are supplied with pressure fluid through a valve means for throttling and distributing the fluid, the valve means being adapted to distribute, under constriction, the pressure fluid from the pressure source between the pockets in such a way that the valve means (1) reduces its throttling effect on the flow to a pocket if the pressure caused by the bearing load in this pocket rises and (2) increases its throttling effect on the flow to a pocket if the pressure caused by the bearing load in this pocket decreases, comprising the improvement wherein the valve means includes a valve element in the shape of a cylindrical body or roller which is accomodated freely movable in a cylindrical valve chamber, the diameter of which somewhat exceeds that of the element, so that a clearance or gap is formed between the element and the chamber wall, in which the chamber has a set of four openings for coacting with the valve element, which is arranged to cover the openings to a varying degree with its curved surface, two opposing openings forming bearing ports each in communication with a bearing pocket while the two remaining openings form a pressure port and an outflow port respectively in communication with the pressure source and a low pressure area such as an outflow or a sump, so that the pressure fluid from the pressure port is distributed on either side of the valve element to the bearing ports through the gaps between the element and the chamber wall, which gaps are varied by the movement of the element, and thus the degree of constriction of the fluid as well as the pressure medium itself being distributed between the pockets.

4,043,614

MAGNETIC SUSPENSION APPARATUS

Frank Lyman, Cambridge, Mass., assignor to Cambridge Thermionic Corporation, Cambridge, Mass.

Filed Oct. 28, 1975, Ser. No. 626,527
Int. Cl.² F16C *39/00*
U.S. Cl. 308—10 **12 Claims**



1. Magnetic suspension apparatus comprising a wafer-like stator portion surrounded by a rotor portion,

said stator portion comprising:

two permeable discs and a permanent magnet therebetween,

said permanent magnet having a diameter substantially greater than its thickness and being polarized axially whereby one face is its north pole and the opposite face is its south pole,

said stator portion further including a plurality of sectoral windings in the peripheral regions of each of said permeable discs for inducing magnetic flux in respective sectors of each disc directed radially inwardly or radially outwardly accordingly as electric current is caused to flow in one direction or the opposite direction in a set of sectoral windings;

said rotor portion comprising:

means defining two inwardly-directed narrow annular pole faces spaced from each other in accordance with the spacing between the two permeable discs of the stator,

said pole faces being of greater radius than the radius of the permeable discs of the stator whereby they provide the necessary magnetic gap,

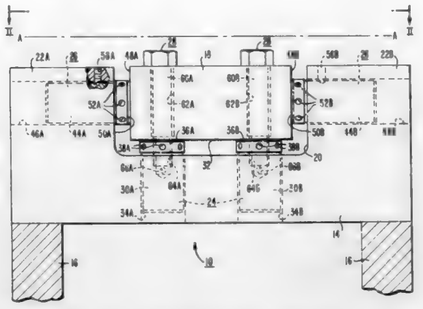
said annular pole faces being included in a magnetic flux path in the rotor which is directed outwardly from one annular pole face, thence axially, and thence inwardly to the other annular pole face.

4,043,615

THRUST BEARING LOCATING DEVICE AND A METHOD FOR LOCATING A THRUST BEARING WITHIN A TURBINE CASING

Lewis J. Miller, Nether Providence, and Casimir M. Klarman, Folsom, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 7, 1975, Ser. No. 620,440
Int. Cl.² F16C *23/00*
U.S. Cl. 308—32 **3 Claims**



1. In an axial flow turbine apparatus having a casing with an axis extending therethrough and having a rotor mounted for rotation therewithin, a thrust bearing member supporting said rotor in a position within said casing, wherein the improvement comprises a device for positioning said thrust bearing within said casing, said device comprising;

a first pair of threaded bolts displaceably mounted, one bolt of said first pair on each side of said axis, within said casing, said first bolts bearing against and engaging opposite sides of said bearing member and having access means on said first bolts for displacing said bolts relative to said casing to vary the transverse location of said bearing relative to said axis;

a second pair of bolts displaceably mounted, one bolt of said second pair on each side of said axis, within said casing, said second bolts bearing against and engaging opposite sides of said bearing member and having access means on said second bolts for displacing said second bolts relative to said casing to vary the axial location of said bearing relative to said casing; and

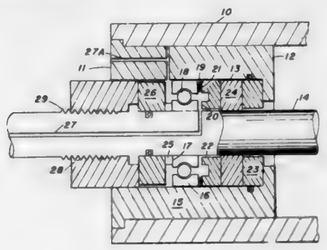
a third pair of bolts one bolt of said third pair on each side of said axis, said third bolts passing through said bearing member and being threaded into said first bolts to secure said bearing in an adjusted axial and transverse position and to lock said first bolts and said bearing in place within said casing.

4,043,616

BEARING CARTRIDGE ASSEMBLY

Aaron Zimmer, 6476 Monitor St., Pittsburgh, Pa. 15217

Filed May 27, 1976, Ser. No. 690,416
Int. Cl.² F16C *33/82*
U.S. Cl. 308—36.3 **15 Claims**



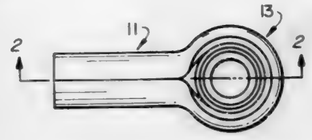
1. A bearing for conveyor roils or the like adapted to fit within a conveyor roll shell comprising coaxial inner and outer bearing elements spaced apart to provide a bearing cavity between their bearing surfaces, a fluid lubricant containing particles of magnetizable material disposed in the bearing cavity, and permanent magnet lubricating means disposed adjacent the bearing elements but separate therefrom and outside the bearing cavity to establish flux paths between the bearing elements and across the bearing cavity so as to distribute the lubricant uniformly over the bearing surfaces within the bearing cavity by magnetic attraction of the lubricant.

4,043,617

SELF-ALIGNING BEARING AND ROD END ASSEMBLY INCLUDING FORMED BALL MOUNT

Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and George E. Goodrich, San Carlos, all of Calif., assignors to Tribotech, Redwood City, Calif.

Filed Mar. 22, 1976, Ser. No. 669,345
Int. Cl.² F16C *23/04*
U.S. Cl. 308—72 **4 Claims**



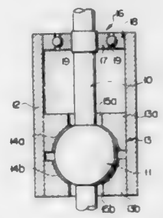
1. A self-aligning rod end bearing assembly including a bearing receiving flange extending outwardly from one face of a plate and adapted to receive and hold a bearing therein, outer portions of said plate serving to stiffen said flange, a bearing race formed in the inner surface of said flange, a bearing disposed in said race for movement therein, means for holding said bearing in said flange in cooperation with the race and a stem formed from the same plate as the bearing receiving flange for securing and self-aligning rod end bearing to an associated rod.

4,043,618

BEARING DEVICE

Tameyasu Tsukada, Tokyo; Yoshio Sumi, Yokohama; Yoshinaga Moriwaki, Yokohama; Hirosuke Oshio, Yokohama; Katsunobu Ueda, Yokohama, and Yoiti Umino, Fujisawa, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed May 24, 1976, Ser. No. 689,515
Claims priority, application Japan, May 26, 1975, 50-69676[U]; Mar. 25, 1976, 51-31936
Int. Cl.² F16C *19/14*
U.S. Cl. 308—174 **6 Claims**



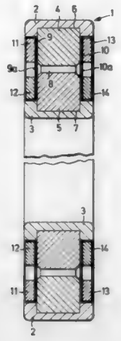
1. A bearing device comprising a rotatable shaft having a center axis, a spherical body fixed to said shaft to be rotated therewith so as to permit its center point to be brought to said center axis of said shaft, a bearing body having a concave bearing face supporting said spherical body so as to permit it to rotate about said center axis of said shaft, said bearing face having a number of supporting points situated on a spherical surface corresponding to said spherical body to support said spherical body, and a radial bearing for rotatably supporting said shaft at a position spaced apart from said spherical body.

4,043,619

SLIDING RING SEAL

Fritz Teske, Industriestr. 28, and Lothar Teske, Industriestr. 30, both of 505 Porz, Germany

Filed Aug. 16, 1974, Ser. No. 498,039
Int. Cl.² F16C *33/78*
U.S. Cl. 308—187.1 **15 Claims**



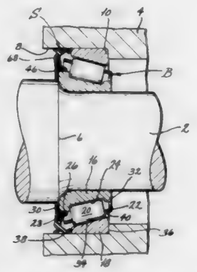
1. A sliding ring seal for bearings comprising a pair of annular members disposed in telescopic relationship with axes thereof coincident, a pair of annular rings constructed of magnetic material, a first ring being contiguous a first of said annular members and a second ring being contiguous a second of said annular members, said rings being in a generally common radial plane, a non-metallic flexible annular sealing disc bearing against said pair of rings and spanning an annular gap therebetween, a pair of annular retaining rings constructed of magnetically attractable material, a first of said retaining rings and the first of said megnetic rings having sandwiched therebetween a first peripheral portion of said sealing disc whereby the magnetic attraction between said last-mentioned two rings applies a gripping force therebetween upon said first peripheral disc portion, and a second of said retaining rings and the second of said magnetic rings having sandwiched therebetween a second peripheral portion of said sealing disc whereby the magnetic attraction between said last-mentioned two rings applies a gripping force therebetween upon said second peripheral disc portion.

4,043,620

RIB-MOUNTED BEARING SEAL

Dennis L. Otto, Malvern, Ohio, assignor to The Timken Company, Canton, Ohio

Filed May 26, 1976, Ser. No. 690,189
Int. Cl.² F16J *15/32*
U.S. Cl. 308—187.2 **15 Claims**



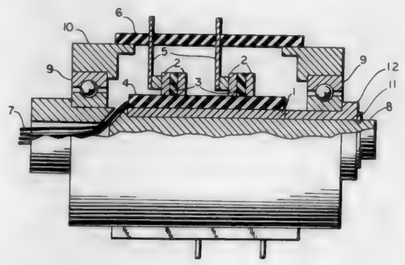
1. A seal for use on a bearing having an inner ring, an outer ring, and rolling elements between the rings, said seal comprising: a seal case formed from metal and having an axial portion and first and second radial flanges, the axial portion extending generally in the direction of the axis of rotation for the bearing and being doubled back upon itself so as to have first and second segments with one of the segments closely overlying the other segment, the first segment being sized to fit tightly in contact with one of the bearing rings, the first radial flange extending in one direction from the first segment of the axial portion such that it will be located along the ring onto which the axial portion is fitted, the second radial flange extending in the opposite direction from the second segment of the axial portion; and a flexible seal element attached to the seal case such that it will extend generally toward the other race of the bearing.

4,043,621

REPLACEABLE SLIP RING ROTOR

Richard A. Heinz, 76 Woodhaven Road, Glastonbury, Conn. 06033

Filed Apr. 2, 1975, Ser. No. 564,370
Int. Cl.² F16C *32/00*
U.S. Cl. 308—189 R **3 Claims**



1. A slip ring assembly for use with turbine engines and the like rotary devices, said assembly comprising a rotor assembly of metallic rings each connected to insulated leadwires and extending through said rotor assembly with said rings electrically isolated by bonding to insulating material between the axially spaced rings and between the rings and a cylindrical metallic supporting tube or sleeve which is designed to fit snugly over a metallic rotor structure but not bonded to said supporting rotor structure, said metallic rotor supporting structure provided with bearing means between said rotor assembly and a housing, housing means fully enclosing said rotor assembly and designed for assembly by inserting the said rotor assembly and supporting shaft axially into the housing with housing parts having electrically conductive brushes extending through insulated brush blocks to provide soldering terminals, said brushes positioned from diametrically opposed sides contacting alternate sets of said rings on the rotor assembly.

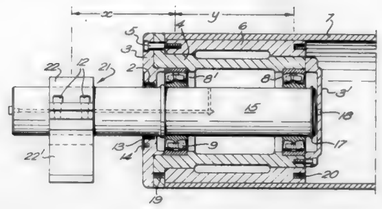
4,043,622

BEARING ASSEMBLY

John Devlin Hotchkiss, and William Henry Hotchkiss, both of Swanley Village, England, assignors to John D. Hotchkiss Limited, England

Filed Sept. 3, 1975, Ser. No. 609,904
Claims priority, application United Kingdom, Sept. 13, 1974, 40017/74
Int. Cl.² F16C *19/00*
U.S. Cl. 308—208 **11 Claims**

1. A bearing unit for a roll, said bearing unit comprising a cylindrical sleeve, a cylindrical housing received in said sleeve, a pair of spaced bearing assembles received in said housing and a stub shaft supported by said bearing assemblies; said housing and said sleeve having first and second end portions spaced by a mid-portion, the internal diameter of said first end portion of said sleeve being smaller than the internal diameter of said second end portion of said sleeve, the internal diameter of said mid-portion of said sleeve being larger than the internal diameter of said first end portion of said sleeve, the external diameter of said first and second end portions of said housing being such as to ensure a tight fit in the respective first and second end portions of said sleeve, and the external diameter of said mid-



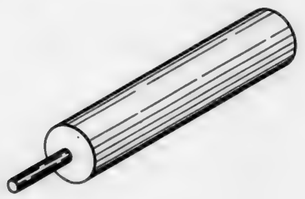
portion of said housing being smaller than the external diameter of said first end portion of said housing, said bearing assemblies being respectively fitted within said first and second end portions of the housing with said stub shaft extending beyond the bearing assembly in said second end portion of said housing.

4,043,623

WEAR RESISTANT FILAMENT WEAR GUIDES AND METHOD OF MAKING THE SAME

John J. Rausch, Antioch, and Ray J. Van Thyne, Oak Lawn, both of Ill., assignors to Surface Technology Corporation, Oak Lawn, Ill.

Continuation-in-part of Ser. No. 388,812, Aug. 16, 1973, abandoned. This application Aug. 22, 1975, Ser. No. 606,755
Int. Cl.² F16C *27/00*
U.S. Cl. 308—238 **5 Claims**



1. A filament wear guide consisting essentially of:
a. a substrate member in the form of a wear guide;
b. a chromium layer on said substrate member at least in the area thereof to be contacted by a filament passing thereover, said chromium layer ranging in thickness from **5** microinches to **5** mils; and
c. a composite structure on the surface of and an integral part of said chromium layer, said composite structure being nonparticulate and continuous and being the reaction product of said chromium and a material selected from the group consisting of nitrogen and oxygen and mixtures thereof.

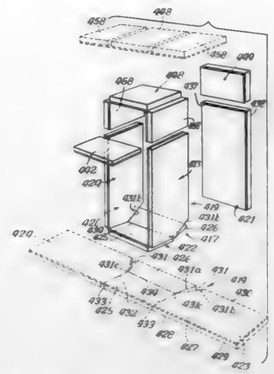
4,043,624

REFRIGERATION APPARATUS WALL STRUCTURE

Robert E. Lindenschmidt, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Continuation-in-part of Ser. No. 433,070, Jan. 14, 1974, Pat. No. 3,916,658. This application Aug. 7, 1975, Ser. No. 602,762
Int. Cl.² F25D *11/00;* **A47B** *81/00*
U.S. Cl. 312—214 **16 Claims**

1. A refrigerator apparatus wall structure comprising
a generally U-shaped wall formed of a unitary laminate panel defined by an inner sheet liner and an outer insulation, said panel having a first edge, a rear edge, a mid-portion defining the bight of the U-shaped wall, end portions defining the legs of the U-shaped wall, and connecting portions at opposite sides of the mid-portion connecting said mid-portion thereto, said insulation being parted at said connecting portion, said connecting portion being turned to define continuous sheet liner corners of said



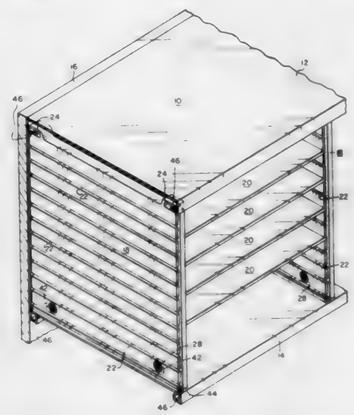
U-shaped wall, said panel further having notches in said rear edge at opposite sides of said mid-portion, said insulation being further parted along a line between the forward ends of said notches and said liner being turned along said liner to define an inclined rear portion of said bight extending substantially between said legs.

4,043,625

CAM SECURED SUPPORT PANEL

Raymond A. Bleeker, Grand Rapids, Mich., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 26, 1976, Ser. No. 661,459
Int. Cl.² A47B *88/00;* **F16M** *11/26*
U.S. Cl. 312—351 **4 Claims**



1. A support panel for supporting a plurality of shelves, trays or the like within a larger storage cavity, said support panel comprising:
a planar panel member having a length substantially equivalent to the depth of said cavity and a height approximately the height of said cavity, said panel including a plurality of horizontal slots in at least one side thereof adapted to receive said plurality of shelves, trays or the like;
means adjacent the top edge of said panel for supporting said panel within said cavity; and

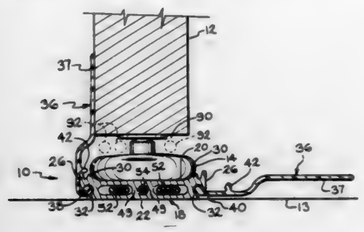
adjusting means associated with the bottom edge of said panel, said adjusting means including a pair of cam discs having a series of flat surfaces of progressively greater radial dimension from the center of said cam disc, journaled within said panel and extending through an opening in the bottom edge thereof, said cam discs adapted for rotation within said panel to thereby change the effective height of said panel.

4,043,626

POWER SUPPLY FOR MOVABLE OFFICE UNIT

Robert L. Propst, Ann Arbor; James O. Kelley, Spring Lake, and Terry L. Mitchell, Jenison, all of Mich., assignors to Herman Miller, Inc., Zeeland, Mich.

Filed June 24, 1976, Ser. No. 699,253
Int. Cl.[2] E04F *19/04*; H02G *3/28*
U.S. Cl. 339—23 **5 Claims**



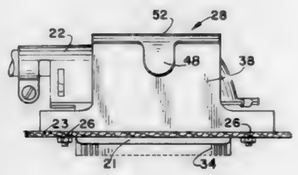
1. Electrical energy distributing apparatus comprising a longitudinally extending track having top and bottom surfaces and adapted for positioning on a supporting surface, a wall member having a lower end and depending leg members connected to and supporting said wall member on said track in a position in which said wall lower end is spaced above said track top surface to form a space, a cover member extending longitudinally of said track for covering said space between said wall lower end and said track top surface, means mounting said cover member on said track for movement between an upright closed position blocking access to said space and an angularly displaced position with respect to said upright position enabling access to said space, and coacting latch means on said cover member and said track operable to releasably maintain said cover member in said closed position.

4,043,627

DEVICES, METHODS, AND COMBINATIONS FOR SECURING ELECTRICAL CONNECTORS TOGETHER

George Edward Ayer, Endicott, N.Y., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Oct. 28, 1975, Ser. No. 626,023
Int. Cl.[2] H01R *13/54*
U.S. Cl. 339—75 R **35 Claims**



1. A device for releasably securing a pair of mating electrical connectors together and for retention by one of the connectors when said one connector is retained by a pair of spaced apart supporting surfaces of a supporting member, the one connector including spaced apart co-planar supporting surfaces for alignment with the supporting surfaces of said supporting member and an intermediate portion with contact terminal members arranged for electrical connection to a multiconductor cable, the other connector including a housing member with outer surfaces spaced apart from said one connector, said device comprising

a. a one piece flexible and sturdy planar member having a pair of spaced apart retention portions to co-align and be positioned between the supporting surfaces of the supporting member and one connector, an intermediate slot to permit said connection to said cable, and a pair of side members integrally and foldably joined to both of said retention portions so that said side members can be folded at right angles to said slot, said side members when folded forming a U shape and facing each other,

b. a first fastening means carried by one of the side members, and

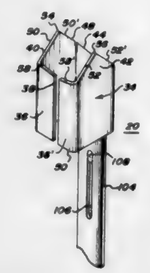
c. a second fastening means carried by the other of the side members, the first and second fastening means being arranged for cooperation with the housing surfaces of the other connector and with each other to retain the connectors together.

4,043,628

ELECTRICAL CONTACT

Ronald S. Narozny, Panorama City, Calif., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed June 18, 1976, Ser. No. 697,625
Int. Cl.[2] H01R *13/38*
U.S. Cl. 339—99 R **16 Claims**



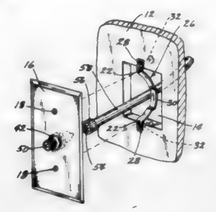
1. An electrical contact comprising: a head portion having a generally rectangular configuration in transverse section and having an upper end and a lower end; and a tail portion integral with and extending from said lower end of said head portion; said head portion being defined by a front wall, a rear wall, and a pair of spaced, opposing sidewalls, there being an elongate first slot extending along the length of and separating said front wall into two front wall portions, there being an elongate second slot extending a given distance along the length of said rear wall from said head portion upper end towards said head portion lower end, said front wall portions, said rear wall, and said sidewalls each terminating at a respective cutting edge adjacent said upper end of said head portion for piercing the insulation about an insulated conductor, the sides of said first and said second slots comprising additional cutting edges, at least one of said additional cutting edges being arranged to sever the insulation about an insulated conductor and engage such conductor, said rear wall having spaced side edges, each of said front wall portions and a respective sidewall connected thereto being hingedly joined to a respective side edge of said rear wall for cantilevered outward deflection of said sidewalls about a respective rear wall side edge upon the receipt of a conductor within said first slot.

4,043,629

RADIO-ANTENNA WALL PLATE ASSEMBLY

H. David Brannen, Carroll, Iowa, assignor to DB Electronics, Inc., Carroll, Iowa

Filed Oct. 29, 1976, Ser. No. 736,696
Int. Cl.[2] H01R *17/18*; H02B *1/02*
U.S. Cl. 339—126 J **8 Claims**



1. A radio-antenna wall plate assembly for coaxial cable comprising,

a cover wall plate for the room side of a wall opening,

a wall bracket for connecting the wall plate to a room wall, and

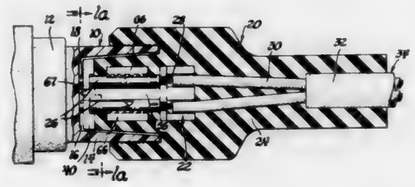
a coupling member integrally connected to said wall plate and having opposite ends on opposite sides of said plate for interconnecting radio and antenna cables.

4,043,630

MOLDED ELECTRICAL CONNECTOR

Lyle B. Suverison, Fowler, and William R. Beck, Warren, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1976, Ser. No. 730,932
Int. Cl.[2] H01R *13/58*
U.S. Cl. 339—218 M **6 Claims**



1. A preformed insert of insulating material for a molded electrical connector comprising:

a front plate having a plurality of spaced apertures extending therethrough,

an elongated turret attached to a rearward face of the front plate and disposed normal thereto,

said elongated turret having a plurality of spaced channels, each aligned with a respective aperture,

each of said channels having a lateral opening at the periphery of the turret which extends the length of the channel for laterally receiving an electrical terminal attached to the bared conductor of an insulated electrical lead,

each of said channels having a transverse yoke wall spaced from said front plate to define a terminal receiving portion in said channel, and

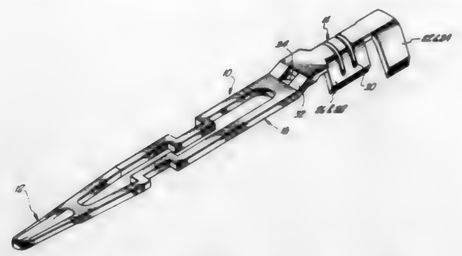
each of said terminal receiving portions of said channels being defined in part by a resiliently deflectable wall of the turret having a retention lip at a free end thereof for laterally retaining an electrical terminal snapped therepast into the terminal receiving portion of the channel.

4,043,631

ELECTRICAL TERMINAL STRUCTURE FOR CONNECTOR

Rubin Lapes, Los Angeles, Calif., assignor to Hollingsead-Pryor Enterprises, Los Angeles, Calif.

Filed Apr. 26, 1976, Ser. No. 679,986
Int. Cl.[2] H01R *13/06*
U.S. Cl. 339—252 R **6 Claims**



1. A contact element, for use in an electrical connector having a support member providing an internal passage, comprising:

an elongated, generally flat, resilient, unitary metal body, the first end of which is adapted to be in electrical contact with a wire and the second end of which is adapted to contact another contact element,

the second end of said body being brought into electrical contact by movement in a direction not in the plane of the body and having sufficient resilience to deflect away from said plane when in contact,

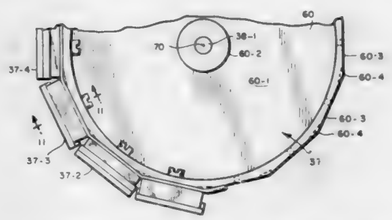
the intermediate portion of the body having two longitudinally extending side branches separated by a space therebetween and each having an externally facing indentation adapted to engage complementary projections provided in the passage in the support member, each indentation having a pair of oppositely facing shoulders, the indentations of the two branches being longitudinally spaced from one another, each of said side branches having sufficient resilience to deflect in the plane of the body toward the other wall to permit its longitudinal motion into the passage until its indentation coincides with the complementary projection, whereupon its resilience automatically causes its indentation to interlock with the projection.

4,043,632

SCANNING POLYGON WITH ADJUSTABLE MIRRORS

Edwin A. Jeffery, Natick, and Sigmund Hinlein, Sudbury, both of Mass., assignors to Data General Corporation, Southboro, Mass.

Filed May 27, 1975, Ser. No. 581,273
Int. Cl.[2] G02B *27/17*
U.S. Cl. 350—7 **4 Claims**



1. A rotatable polygon comprising a hub, said hub having a plurality of flat faces positioned about the circumference thereof, said faces intersecting each other at corners and each of said corners having a plurality of locating slots, a plurality of O rings of elastomeric material, each O ring positioned in a

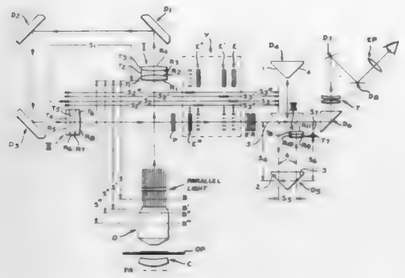
different locating slot of each of said corners, and lying over said faces, a plurality of supports each having a mirror coupled thereto, and adjustable means supported by said hub and coupled to said supports for urging said supports against said O rings, adjustment of said adjustable means orienting said mirrors with respect to the axis of rotation of said polygon.

4,043,633

OPTICAL RELAY FOR A MICROSCOPE AND A BACK APERTURE VIEWER THEREFOR

Ernest D. Park, Clarence, and Joseph C. Dianetti, East Aurora, both of N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed Feb. 9, 1976, Ser. No. 656,763
Int. Cl.[2] G02B *21/00*
U.S. Cl. 350—54 **1 Claim**



1. In a microscope having an observation system including in optical alignment along an axis, an objective, a telescope lens and an eyepiece, said objective having a back focal plane and said eyepiece having an image plane, a relay lens system to relay said back focal plane to an optically equivalent location in a station positioned between said objective and said telescope lens and an optical element at said station selectively positionable in said location for rendering said optical element operable in a manner equivalent to being positioned in said back focal plane, the improvement comprising, said relay lens system having first and second identical positive components, said components having parameters of lens radii ($R_1 - R_8$), wherein a minus sign (—) indicates a center of curvature on the objective side of the lens, lens thicknesses ($T_1 - T_6$), axial spaces among lens elements and back focal plane ($S - S_2$), refractive indices ($ND_1 - ND_6$) and Abbe numbers ($\nu_1 - \nu_6$), are determined by the following relationship, all radii, thicknesses, and spaces being in millimeters

Lens	Radius	Thickness	Spacing	Index of Refraction	Abbe Number
			$S = 149.09$		
			$S' = 156.50$		
			$S'' = 158.52$		
			$S''' = 166.42$		
	$R_1 = 128.461$				
		$T_1 = 5.22$		$ND_1 = 1.54739$	$\nu_1 = 53.63$
	$R_2 = -59.123$				
I		$T_2 = 4.00$		$ND_2 = 1.65332$	$\nu_2 = 39.71$
	$R_3 = 83.524$				
		$T_3 = 4.30$		$ND_3 = 1.65844$	$\nu_3 = 50.88$
	$R_4 = -175.509$				
			$S_1 = 327.11$		
	$R_5 = 175.509$				
		$T_4 = 4.30$		$ND_4 = 1.65884$	$\nu_4 = 50.88$
	$R_6 = -83.524$				
II		$T_5 = 4.00$		$ND_5 = 1.65332$	$\nu_5 = 39.71$
	$R_7 = 59.123$				
		$T_6 = 5.22$		$ND_6 = 1.5739$	$\nu_6 = 53.63$
	$R_8 = -128.461$				
			$S_2 = 177.85$		
			$S_2' = 170.60$		
			$S_2'' = 168.44$		

-continued

Lens	Radius	Thickness	Spacing	Index of Refraction	Abbe Number
			$S_2''' = 161.22$		

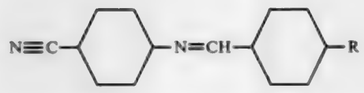
4,043,634

LIQUID CRYSTAL ELECTRO OPTICAL ELEMENT

Kenji Nakamura; Toshio Jinnai; Kazuo Totani, all of Kanagawa, and Shigetaro Furuta, Fujisawa, all of Japan, assignors to Dai Nippon Toryo Co., Ltd., Osaka, Japan

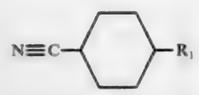
Filed Dec. 13, 1974, Ser. No. 532,602
Claims priority, application Japan, July 25, 1974, 49-84568; July 25, 1974, 49-84569; Aug. 31, 1974, 49-100137; Sept. 5, 1974, 49-101348; Sept. 5, 1974, 49-101349; Sept. 5, 1974, 49-101350
Int. Cl.[2] C09K *3/34*; G02F *1/13*
U.S. Cl. 350—160 LC **6 Claims**

1. A liquid crystal electro-optical display element which comprises a nematic liquid crystal composition having positive dielectric anisotropy which consists essentially of a p-n-alkylbenzylidene-p'-cyanoaniline having the formula



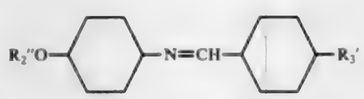
wherein R represents n-propyl or n-hexyl; or a mixture thereof; and an improver selected from the group consisting of:

1. 3 to 10 wt.% of a p-n-alkylcyanobenzene having the formula



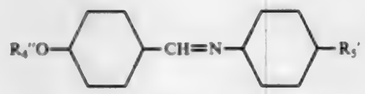
wherein R_1 represents n-propyl, n-butyl, n-pentyl or n-hexyl; or a mixture thereof;

2. 5 to 50 wt.% of a p-alkylbenzylidene-p'-alkoxyaniline having the formula



wherein R_2'' and R_3' are respectively methyl, ethyl, n-propyl, n-butyl, n-pentyl, n-hexyl, n-heptyl or n-octyl; or a mixture thereof; and

3. 5 to 50 wt.% of a p-alkoxybenzylidene-p'-n-alkylaniline having the formula



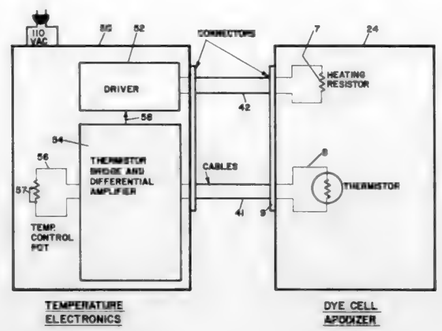
wherein R_4'' represents methyl or ethyl and R_5' represents n-butyl or n-heptyl; or a mixture thereof.

4,043,635

TEMPERATURE CONTROL FOR APODIZERS

Larry D. Siebert, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed Nov. 21, 1974, Ser. No. 525,829
Int. Cl.[2] G02F *1/32*
U.S. Cl. 350—160 R **6 Claims**



1. An apparatus for dye cell refractive index matching which comprises:

a. first means forming an optical aperture and a support therefor, each being formed of material having relatively high thermal conductivity,

b. optically transparent means supported in said aperture in thermal conductive relationship with and forming an annular cavity adjacent the inner periphery of said first means,

c. a liquid within said cavity in thermal conductive relationship with said first means and said transparent means having a characteristic of changing its refractive index with a change of liquid temperature and having a refractive index closely matched to that of said transparent means at a temperature above room temperature, and

d. heating means associated with said support for maintaining the temperature of said apparatus substantially uniform throughout said first means, said optically transparent means and said liquid and at said temperature above room temperature such that the refractive index of said liquid is closely matched to that of said transparent means.

4,043,636

ILLUMINATION-PANEL FOR LIQUID CRYSTAL DISPLAY OF SIMILAR DEVICE

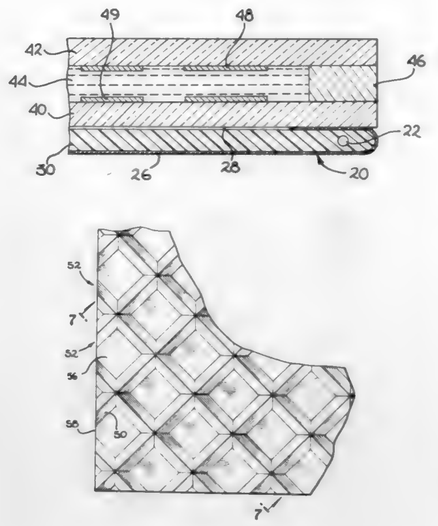
Noel H. Eberhardt, Cupertino, and Ron F. Keller, Aptos, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 535,188, Dec. 23, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 600,979
Int. Cl.[2] G02F *1/13*
U.S. Cl. 350—160 LC **5 Claims**

1. In a passive electro-optical display having a pair of substrates defining a volume, a liquid crystalline substance disposed in said volume, at least one of said substrates having electrodes disposed thereon to permit excitation of said liquid crystalline substance, the improvement comprising:

an edge lit light conductive body abutting one of said substrates to provide light conduction for illuminating said liquid crystalline substance, said light conductive body having a window with a surface formed into a plurality of subsurfaces, said plurality of subsurfaces forming a repetitive pattern of planar subsurfaces, and each subsurface being inclined with respect to at least one other subsurface of said plurality of subsurfaces;

a light source disposed adjacent to said light conductive body along an edge to provide illumination through said light conductive body generally parallel to said window and through said substrate to said liquid crystalline substance; and



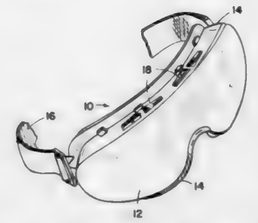
a specular layer disposed on said light conductive body, to reflect light from said light source incident upon said light conductive body through said window.

4,043,637

PHOTOCHROMIC LIGHT VALVE

Richard J. Hovey, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Continuation-in-part of Ser. No. 370,247, June 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 268,317, July 3, 1972, abandoned. This application Oct. 6, 1975, Ser. No. 619,749
Int. Cl.[2] G02F *1/17*
U.S. Cl. 350—160 P **19 Claims**



1. Ski goggles and the like comprised of frame means defining apertures arranged to support lens means, said frame means arranged to be positioned on the head of a wearer to hold said lens means in front of the eyes of such a wearer, there being lens means filling said aperture means and arranged to be looked through by the wearer, said lens means comprised of at least one lens of allyl diglycol carbonate imbibed with an effective quantity of a metal dithizonate; the metal dithizonate being imbibed in said allyl diglyciol carbonate by immersing in the form of a lens in a heated, saturated solution of the metal dithizonate in toluene for an extended period of time sufficient to substantially uniformly disperse the dye throughout the lens, the dyed lens so produced being resistant to dye removal in heated aqueous media.

4,043,638

LIQUID CRYSTAL DISPLAY MOUNTED BEHIND A FRONT GLASS

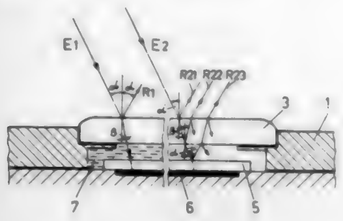
Meinolph Kaufmann, Fislisbach, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed June 4, 1976, Ser. No. 692,752

Claims priority, application Switzerland, Aug. 14, 1975, 10569/75

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **6 Claims**



1. A liquid crystal display structure comprising:

transparent cover plate means,

liquid crystal display means mounted behind said transparent cover plate means so as to define a cavity between said transparent cover plate means and said liquid crystal display means; and,

an immersion medium filling said cavity for improving the legibility of said liquid crystal display means.

4,043,639

FIELD EFFECT TYPE LIQUID CRYSTAL DISPLAY ELEMENTS PROVIDED WITH POLARIZING PLATES

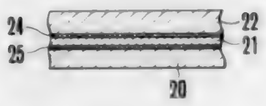
Sigeru Matsuyama; Hironari Tanaka; Masaharu Koyama, and Tadashi Ishibashi, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed June 25, 1976, Ser. No. 699,867

Claims priority, application Japan, July 7, 1975, 50-82739

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **4 Claims**



1. In a field effect type liquid crystal display element of the type wherein a field effect type liquid crystal is interposed between a pair of spaced substrates provided with electrodes and polarizing plates are disposed on the outside of respective substrates, the improvement wherein each one of said polarizing plates comprises a polarizing film consisting essentially of polyvinyl chloride and supporting members bonded to the opposite sides of said polarizing film by a bonding agent, said polarizing plates containing an ultraviolet ray absorbing agent.

4,043,640

LIQUID CRYSTAL TWIST CELL WITH GREY SCALE CAPABILITIES

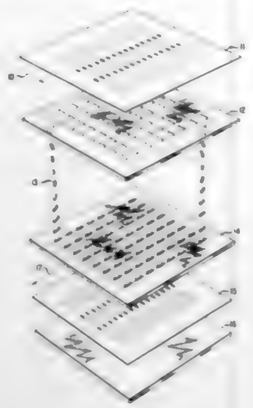
Dwight Winton Berreman, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 26, 1975, Ser. No. 617,074

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **4 Claims**

1. A liquid crystal twist cell device with improved grey scale capabilities, said device containing a liquid crystal material of positive dielectric anisotropy characterized in that the relationship between the elastic constants of the liquid crystal is given by



$$0.01 \leq \frac{k_{11}}{k_{33}} \leq 0.3 .$$

4,043,641

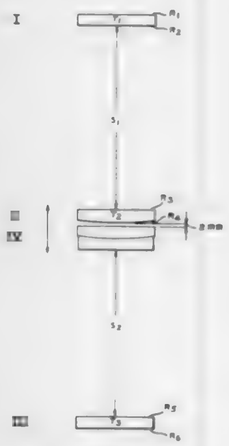
THREE-LENS SYSTEM PROVIDING A VARIABLE FOCAL POWER ALONG ONE PRINCIPAL MERIDIAN

Nathan Gottlieb, Kenmore, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed July 16, 1976, Ser. No. 705,852

Int. Cl.² G02B *13/08*

U.S. Cl. 350—181 **2 Claims**



1. An optical system for varying focal power along one principal meridian comprising, in alignment along an optical axis, two-spaced cylinder lenses I and II having their axis of cylinder in a plane passing through the optical axis and an axially-slidable cylindrical lens III having an axis of cylinder perpendicular to said plane, said lenses having values set forth in the following table wherein axial thicknesses of successive lenses are designated T_1 to T_3, successive axial spaces are designated S_1 to S_2, successive lens radii are designated R_1 to R_6 wherein the radius denotes cylinder curvature about a line lying on the side opposite the focal-plane side of the lenses, refractive indices and Abbe numbers of the glasses in the successive lenses are absolute values designated ND_1 to ND_3 and ν_1 to ν_3,

Lens	Cyl. Radius	Thickness(T)	Spacing(S)	Index of Refraction(ND)	Abbe No. (ν)
I	$R_1 = \infty$	T_1=5.0-mm		$ND_1 = 1.523$	$\nu_1 = 58$
	R_2=261.5mm		S_1= 28.3 to 139.4mm		
II	$R_3 = \infty$	T_2=5.0-mm		$ND_2 = 1.523$	$\nu_2 = 58$
	R_4=174.33mm		S_2=160.4S_1		
III	$R_5 = \infty$	T_3=5.0-mm		$ND_3 = 1.523$	$\nu_3 = 58$
	R_6=348.67mm				

4,043,642

ZOOM LENS SYSTEM HAVING ELECTRICAL CONTROL OF MOVING ELEMENTS

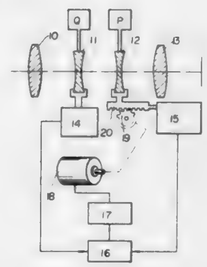
Ryusho Hirose, Machida, and Takao Tsuji, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 446,760, Feb. 28, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,867

Claims priority, application Japan, Mar. 6, 1973, 48-26343; Aug. 2, 1973, 48-87041; Aug. 6, 1973, 48-88149

Int. Cl.² G02B *15/18*

U.S. Cl. 350—184 **9 Claims**



1. A zoom lens system without a single focusing lens at the front part of the lens system comprising:

a variation movable lens group relating to the focal length of the whole optical system and being capable of moving along the optical axis;

a compensation movable lens relating to focusing and being capable of moving along the optical axis;

a fixed lens group in front of the movable lens groups;

a diaphragm;

a fixed lens group in front of a photosensitive material plane;

a first detecting means for detecting the distance, *c*, between the actual position of said variation movable lens group and the basic position of magnification variation in order to supply a magnification variation signal;

a second detecting means to detect the distance, *a*, between the actual position of said compensation movable lens group and the basic position of compensation in order to provide a compensation signal, wherein the basic position of compensation is determined as a position in which focus is on an object at an infinite position when said compensation movable lens group is at said basic position and variation movable lens group is fixed at said basic position of magnification variation;

an operation means responsive to said compensation signal and said magnification signal for providing a control signal corresponding to the desired distance, *b*, between the position of said compensation lens group and said basic position of compensation, said operation means providing said signal in accordance with a predetermined functional relationship of distances c and a of the variation movable lens group and said compensation movable lens group; and

a setting means to set said compensation movable lens group at a position on the optical axis in response to said control signal.

4,043,643

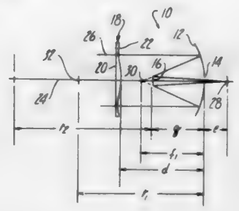
CATADIOPTIC TELESCOPE

Robert D. Sigler, Ann Arbor, Mich., assignor to KMS Fusion, Inc., Ann Arbor, Mich.

Filed May 14, 1976, Ser. No. 686,363

Int. Cl.² G02B *17/08*

U.S. Cl. 350—200 **16 Claims**



1. A telescopic objective comprising; in combination; a corrector plate, a first spherical mirror having a central hole therein, and a second spherical mirror all of which are constructed and arranged on a common geometric axis, the geometric centers of the radii of curvature of said first and second spherical mirrors are not coincident, the radius of curvature of said second spherical mirror is less than the radius of curvature of said first spherical mirror, the vertex of said corrector plate is positioned on the common geometric axis between and spaced from both the geometric center of the radius of curvature of said first spherical mirror and the focal point of said first spherical mirror, and the vertex of said second spherical mirror is positioned on the common geometric axis between and spaced from both the vertex of said first spherical mirror and the focal point of said first spherical mirror such that light passing through the corrector plate and collected by said first spherical mirror is reflected by said second spherical mirror to pass through said hole in said first spherical mirror and form an image on an image surface intersecting the geometric axis beyond the vertex of said first spherical mirror.

4,043,644

ELASTICALLY COMPENSATED OFF-AXIS MIRROR

William E. Humphrey, Orinda, Calif., assignor to Humphrey Instruments, Inc., San Leandro, Calif.

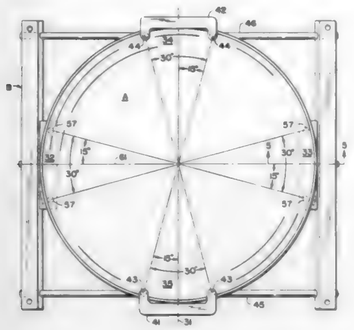
Filed July 15, 1976, Ser. No. 705,655

Int. Cl.² G02B *5/10*

U.S. Cl. 350—295 **13 Claims**

8. In the combination of a mirror and an elastic warping harness mounted to said mirror for warping said mirror for off-axis use, the improvement in said mirror comprising: a disk of elastically deformable glass with an active optical front surface on a side approximating a sphere; said sphere of said optical surface having a first and relatively large radius of curvature at least equal to or exceeding two and a half times the diameter of said mirror; said disk of glass having on the opposite and rear side thereof from said active optical surface a rough ground surface having a radius of curvature different than the radius of curvature of said active optical surface, said mirror having a thickness at a central point in the range of one fifth of one fifteenth of its diameter; and, the radius of curva-

ture of said opposite and rear side with respect to said front surface being selected to produce a decrease in mirror thick-



ness at the edges of said mirror in the range of 0.21 to 0.42 of the thickness of said mirror at said central point.

4,043,645

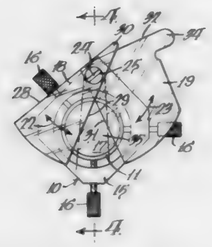
FILTER DEVICE WITH ADJUSTABLE SUPERIMPOSED FILTERS

Louis A. Fazzari, 6425 Durand Ave., Racine, Wis. 53406

Filed Aug. 8, 1975, Ser. No. 603,105

Int. Cl.[2] G02B *5/22*

U.S. Cl. 350—315 **1 Claim**



1. A filter device for correcting color deficiencies in a light beam projected from a color picture projector lens in which the light beam is noticeably dominant in a color, comprising: a pair of light transparent color filters, each of the color complementary to said dominant color; means for mounting said filters in superimposed relationship for arcuate movement about a pivot axis individually relative to each other and to said projector lens; means for moving each of said filters through intermediate positions between fully open light beam non-intercepting position and maximum closed light beam intercepting position thereby varying both the amount of overlap and thus the degree of filtering and the area of light beam intercept; and a spring member frictionally engaging said pair of filters selectively retaining each said filter in any said intermediate position as well as said fully open and said fully closed positions, each said filter having opposed straight edges on one side of the center of said light beam in fully open position and on opposite sides of the center of said light beam in maximum closed position.

4,043,646

FILTER MECHANISM WITH INTERCONNECTED HEAT AND COLOR FILTERS FOR OPTICAL EXAMINATION DEVICES

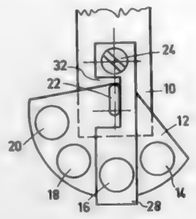
Helmut A. Heine; Otto H. Schmidt, and Hans J. Spitschan, all of Herrsching, Germany, assignors to Propper Manufacturing Co., Inc., Long Island City, N.Y.

Filed May 27, 1976, Ser. No. 690,423

Claims priority, application Germany, Sept. 17, 1975, 2541503

Int. Cl.[2] G02B *5/22, 7/00;* **A61B** *3/10, 3/07*

U.S. Cl. 350—315 **5 Claims**



1. A filter mechanism for use with a source of light, comprising:

at least one color filter;

first supporting means mounting said at least one color filter for movement in and out of the path of light emanating from said light source;

a heat protection filter;

second supporting means mounting said heat protection filter for movement between at least one active position in the path of light from said light source and at least one inactive position out of the path of light from said source; and

interconnecting means coupling said first and second supporting means for placing said heat protection filter in said active position when one of said at least one color filter is in the path of light and placing said heat protection filter in said inactive position when none of said at least one color filter is in the path of light.

4,043,647

METHOD OF FORMING ALIGNMENT FILM FOR LIQUID CRYSTAL DISPLAY CELL

Michio Oue; Osamu Asai, both of Hitachi; Kishiro Iwasaki, Hitachiota, and Hideaki Kawakami, Mito, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 11, 1976, Ser. No. 713,581

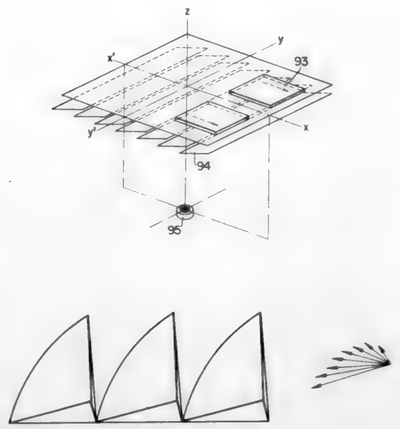
Claims priority, application Japan, Aug. 15, 1975, 50-98620

Int. Cl.[2] G02F *1/13*

U.S. Cl. 350—320 **14 Claims**

1. A method of forming an alignment film of biaxial anisotropy which comes into contact with liquid crystal molecules to orient the liquid crystal molecules, comprising the steps of disposing a louver consisting of a plurality of leaves between the surface of a substrate on which the alignment film is to be formed and an evaporation source serving as a material for the alignment film, said leaves being arranged in parallel with one another and spaced from the surface of the substrate at an angle

with respect thereto, and depositing particles evaporated from the evaporation source at reduced pressures on the surface of



the substrate at angles of incidence of 45° to 75° through said louver.

4,043,648

FILM COUNTER FOR USE WITH A PORTABLE CINE-CAMERA

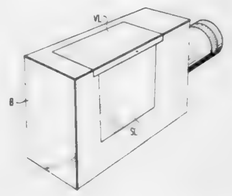
Katsuhide Takagi, Okaya, Japan, assignor to Sankyo Kogaku Kogyo Kabushiki Kaisha, Suwa, Japan

Filed Mar. 24, 1975, Ser. No. 561,503

Claims priority, application Japan, Mar. 23, 1974, 49-32260; Mar. 23, 1974, 49-32629[U]

Int. Cl.[2] G03B *23/02, 1.60*

U.S. Cl. 352—72 **14 Claims**



1. A film counter for use with a cine-camera capable of selectively using first and second cartridges respectively containing photographic films of first and second lengths, said film counter comprising:

a. counter indicator means;

b. gear train means for moving said counter indicator means at first and second speed ratios, corresponding to said first and second film lengths, coincidently with the movement to said film during photography, when said gear train means is in a first and second state, respectively;

c. figure indicator means having a first and second set of numbers thereon, said figure indicator means being positioned to display only one of said first and second sets of numbers, adjacent said counter indicator means, when said figure indicator means is in first and second positions, respectively; and

d. cartridge detecting means responsive to the loading of said first and second type cartridges for causing said gear train means to be in said first and second states, respectively, and for causing said figure indicator to be in said first and second positions, respectively, said cartridge detecting means comprising a detection lever having a detecting portion, actuated with a flat wall of a film cartridge of said second type and positioned to be moved from a normal position to second position.

4,043,649

FADE CONTROL FOR MOTION-PICTURE CAMERA

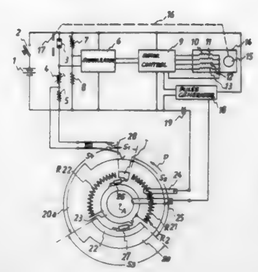
Helmut Mayr, Taufkirchen, Germany, assignor to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Mar. 8, 1976, Ser. No. 664,807

Claims priority, application Germany, Mar. 26, 1975, 2513374

Int. Cl.[2] G03B *21/36*

U.S. Cl. 352—91 C **18 Claims**



1. In a motion-picture camera capable of producing fadeover effects, in combination, an adjustable diaphragm; a stepper motor coupled to the diaphragm; a train or motor input pulses having a pulse-repetition frequency; a stepper motor control circuit connected to the pulse-generating means and the stepper motor and operative for causing the stepper motor to perform a step-by-step change of the diaphragm aperture size, one step per motor input pulse; fadeover means connected to the stepper motor control circuit and effecting a fade-out operation by causing the stepper motor to perform a step-by-step decrease of the diaphragm aperture size at a rate corresponding to said frequency, a film rewind operation, and a fade-in operation by causing the stepper motor to perform a step-by-step increase of the diaphragm aperture size at a rate corresponding to said frequency; and frequency-control means operative during the performance of the fade-out operation for progressively increasing said frequency and operative during the performance of the fade-in operation for progressively decreasing said frequency.

4,043,650

FILM HANDLING DEVICE

Kenyon A. Hapke, Libertyville, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 9, 1976, Ser. No. 647,803

Int. Cl.[2] G03B *31/00, 1/48, 23/02;* **G11B** *31/00*

U.S. Cl. 353—15 **9 Claims**

1. An improved film handling device for use with a projector having a film drive means, a projector gate, and including a tape cassette player for reproducing audible messages associated with the film frame image, the improvement comprising:

means for slidably mounting said tape cassette player for manual movement between a first loading position and a second playing position;

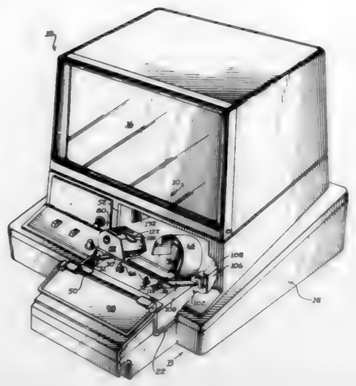
a support frame pivotally mounted to said tape cassette player, said support frame being adapted to removably mount a film strip and an audio tape cassette;

cam means on the projector for automatically moving said support frame relative to said tape cassette player from a first loading position, providing access to mount said audio cassette and said film strip thereon, to a second playing position generally within the projector, in conjunction with movement of said tape cassette player between its respective positions;

biasing means on the projector for automatically moving said support frame relative to the tape cassette player from

said second playing position to said first loading position in conjunction with movement of said tape cassette player between its respective positions;

means defining a film storage cavity on said support frame for receiving and storing a predetermined length of coiled film for movement of the stored film into a position in



alignment with the projector gate upon movement of the tape player to its playing position; and

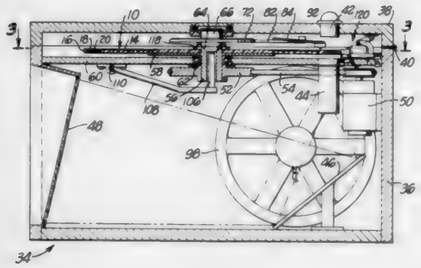
a film drive spool on the support frame associated with the film drive means for driving film from said storage cavity past the projector gate, said drive spool drivingly engaging said drive means when the tape player is moved to its playing position.

4,043,651

AUDIO-VISUAL DEVICE

Robert J. Livingston, 13075 Blairwood Drive, North Hollywood, Calif. 91604

Filed Apr. 8, 1966, Ser. No. 541,179
Int. Cl.[2] G03B *31/06*
U.S. Cl. 353—19 **16 Claims**



1. An audio-visual device which comprises:

means for holding a program unit stationary, said stationary program unit including means representing an audio signal and a plurality of visual representations,

optical system means for projecting a single one of said visual representations at a time,

rotatable audio reproduction pickup means for obtaining an audio signal from said means representing an audio signal,

means for rotating said pickup means with respect to said program unit when said stationary program unit is held by said means for holding so that said pickup means is capable of obtaining all of said audio signal during the use of said audio-visual reproducing device,

a control unit, said control unit being adapted to engage with a program unit within said audio-visual device so as to control the program unit so that the program unit incrementally advances within said audio-visual device so as to sequentially present successive visual indications to said optical system,

said control unit includes a finger adapted to engage in index notches in the program unit,

said means for rotating includes friction drive means, said friction drive means being adapted to apply a rotative drive torque to a program unit positioned within said audio-visual device,

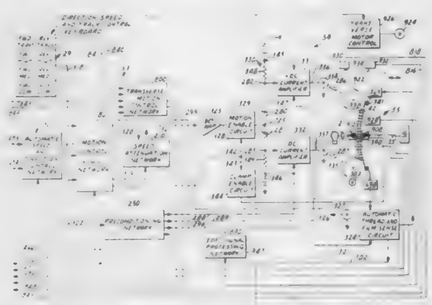
said finger on said control unit being adapted to restrain rotation of the program unit, said finger being momentarily retractable so that the program unit is permitted to rotate and said finger engages in a subsequent index notch in the program unit to restrain rotation of the program unit when the program unit is in a different rotative position within said audio-visual reproducing device.

4,043,652

AUTOMATIC MICROFILM HANDLING APPARATUS

Micheal J. Mickelson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 20, 1974, Ser. No. 525,402
Int. Cl.[2] G03B *23/12*
U.S. Cl. 353—26 A **8 Claims**



1. In a microfilm handling apparatus for controlling motion of microfilm webs having two parallel tracks of image frames, one track adjacent each edge of the web to position an image frame of said microfilm web in a viewing station, wherein said microfilm web contains optically detectable position markers corresponding to the image frames of each of said two parallel tracks, said apparatus comprising:

a. means for controllably driving said web in a given direction of travel along a transport path:

b. light detection means for optically detecting said position markers, such that a position signal is produced when a position marker is adjacent said light detection means; and

c. web position regulation means controlled by said position signal for stopping the driving means when a said position marker is positioned adjacent said light detection means,

the improvement wherein said light detection means comprises two sets of light detectors, a first set for optically detecting position markers corresponding to image frames of a track adjacent one edge of the web and the other set for optically detecting position markers corresponding to image frames of the other track adjacent the opposite edge of the web, each of said sets of light detectors comprising at least three light detectors, two of which are abutting each other and have an effecting sensing diameter at said focal plane which is not greater than one-half the dimension of a position marker parallel to the direction of motion of the web such that two separate detected signals are produced when a position marker is detected, and a third detector for producing a light level reference signal, wherein

said web position regulation means further comprises a position signal conditioning network means coupled to the outputs of said detectors of each set detectors for comparing a said light level reference signal and a said detected signal and for producing a position signal only when the difference between said reference signal and said detected signal exceeds a predetermined value to thereby automatically adjust the threshold sensitivity level at which a position signal is produced, and

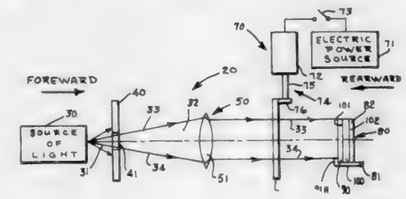
wherein means are provided for sensing the final image frame of one of said two parellel tracks at one end of the web and for providing and end-of-web signal thereupon, means for reversing the direction of travel of said web in response to said end-of-web signal and transverse drive means for shifting the microfilm web transversely with respect to the transport path in response to a said end-of-web signal whereby image frames of either of said two tracks may be positioned in said viewing station.

4,043,653

HOLOGRAPHIC HIGH RESOLUTION CONTACT PRINTER

Richard F. Croce, El Granada, Calif., and Gardner T. Burton, Danvers, Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,528
Int. Cl.[2] G03B *27/02, 27/32*
U.S. Cl. 355—2 **6 Claims**



1. A holographic high resolution contact printer for use with a transparency having a pattern thereon, and with a light-sensitive recording medium of the photoresist type having a light-sensitive front surface and a substrate rear surface, wherein said front surface has been previously exposed to a preselected diffraction grating, and wherein said photoresist has not been developed, and also wherein said transparency and said light-sensitive front surface of said recording medium are in abutting contact, comprising:

a. a source of light, with said source emitting a beam of light;

b. a light impervious member having a circular aperture, with said light impervious member so disposed forward of said light source that said emitted light beam impinges thereupon, and a portion of said emitted light beam enters into and passes through said aperture;

c. means for collimating and transmitting impinging light, with said means disposed so that said portion of said emitted light beam which passes through this aperture impinges upon said means;

d. a rotatable light diffuser disposed forward of, and in optical alignment with, said collimating and transmitting means;

e. means for selectively rotating said rotatable light diffuser;

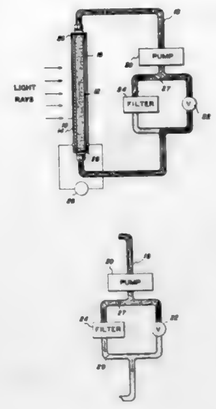
f. and, means, disposed forward of and in optical alignment with said rotatable light diffuser, for removably holding and supporting said transparency and said previously exposed light-sensitive recording medium in abutting contact, with said recording medium disposed forward of said transparency, and with said light-sensitive front surface of said recording medium facing rearwardly.

4,043,654

DISPLAY SYSTEM

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 114,794, Feb. 12, 1971, abandoned, which is a division of Ser. No. 746,177, July 19, 1968, Pat. No. 3,607,256. This application Apr. 9, 1973, Ser. No. 349,498
Int. Cl.[2] G03G *15/00, 17/04*
U.S. Cl. 355—3 P **6 Claims**



1. An electrophoretic light image display and/or recording device comprising an electrophoretic suspension layer inserted between two electrodes, one of which has a photoconductive layer coupled thereto and faced to said electrophoretic suspension layer means for applying an electric field between said two electrodes and means for irradiating light on said photoconductive layer so as to reduce the resistivity of said photoconductive layer, said electrophoretic suspension layer being selected from the group consisting of a suspension including at least one electrophoretic material suspended in a dark suspending medium the optical reflective property of said electrophoretic suspension layer being changeable with electrophoretic movement of said electrophoretic material upon application of said electric field during the reduction of the resistivity of said photoconductive layer.

4,043,655

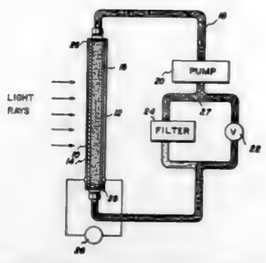
PHOTOELECTROPHORETIC IMAGE REPRODUCTION DEVICE

Morton Silverberg, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 349,498, April 9, 1973, which is a continuation of Ser. No. 114,794, Feb. 12, 1971, abandoned, which is a division of Ser. No. 746,177, July 19, 1968, Pat. No. 3,607,256. This application July 26, 1973, Ser. No. 382,809
Int. Cl.[2] G03G *15/00, 17/04*
U.S. Cl. 355—3 P **9 Claims**

1. A photoelectrophoretic image reproduction device comprising an electrophoretic suspension layer having a dark suspending medium and at least one photosensitive electrophoretic material in a finely divided powder form suspended in said dark suspending medium, said suspension layer having two opposite major surfaces; a substantially transparent first electrode and a second electrode which are spaced from and opposed to each other and are positioned on said two opposite major surfaces of said suspension layer, respectively; means coupled to said electrodes to apply a D.C. electric field across the suspension layer between said electrodes; means operatively associated with said first electrode to expose said suspension layer to an image of actinic electromagnetic radiation

through said first electrode, said electric field and said image electrophoretically changing the spatial distribution of said at least one photosensitive electrophoretic material so as to



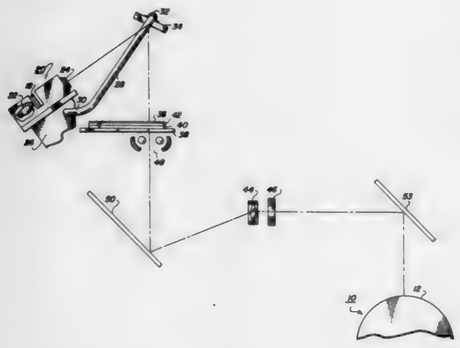
change the optical reflective property of the suspension layer in accordance with said image, whereby an image is reproduced.

4,043,656

TRANSPARENCY COPYING MACHINE

Abraham Cherian, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 3, 1976, Ser. No. 663,389
Int. Cl.² G03G *15/00*
U.S. Cl. 355—3 R **13 Claims**



1. An electrophotographic printing machine for reproducing a transparency or an opaque original document, including:

a receiving member;

a photoconductive member;

means for charging at least a portion of said photoconductive member to a substantially uniform level;

means for projecting a light image of the transparency;

means for modulating the light image of the transparency; and

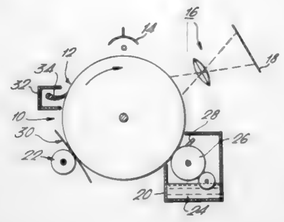
means for directing the light image of the transparency through said receiving member and said modulating means onto the charged portion of said photoconductive member selectively dissipating the charge thereon to record an electrostatic latent image thereof, said directing means being movable from a first position remote from the path of the transparency light image wherein the electrophotographic printing machine reproduces the opaque original document to a second position in the path of the transparency light image wherein the electrophotographic printing machine reproduces the transparency.

4,043,657

BLADE FOR METERING LIQUID DEVELOPER

Avinash R. Karnik, Welwyn, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,448
Claims priority, application United Kingdom, Mar. 24, 1975, 12172/75
Int. Cl.² G03G *15/10*
U.S. Cl. 355—10 **4 Claims**



1. An apparatus for development of electrostatographic patterns on an imaging surface comprising:

a. an imaging surface;

b. a means for creating a charge pattern on the imaging surface and maintaining a development threshold within a range of about 60 v at operating temperatures of from about 10° to about 40° C;

c. a liquid developer applicator for presenting the liquid developer to the charge pattern, said applicator having a surface pattern of raised and recessed portions, said recessed portions being adapted to contain liquid developer and said raised portions being adapted to set up a frequency of from about 300 Hz to about 6,000 Hz in a doctor blade edge when in moving contact therewith; and

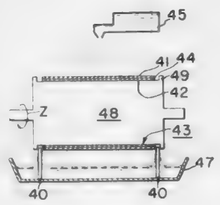
d. a blade for metering liquid developer in the applicator to the imaging surface, said blade being formed from a material having a complex modulus of elasticity value at 20° C and 700 Hz of from about 4 MN/m^2 to about 20 MN/m^2 which varies from that value by from about 3 MN/m^2 at temperature of about 40° C to about 7 MN/m^2 at temperatures of about 10° C but not less than a value of about 0.5 MN/m^2, said blade being urged against said applicator surface by a force of from about 25 gm/cm to about 250 gm/cm.

4,043,658

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER

Shozo Inoue, Fussa, and Tadashi Sato, Kokubunji, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 487,308, July 10, 1974, abandoned, which is a continuation of Ser. No. 72,589, Sept. 16, 1970, abandoned. This application Oct. 9, 1975, Ser. No. 621,230
Claims priority, application Japan, Sept. 25, 1969, 44-76685
Int. Cl.² G03G *15/00*
U.S. Cl. 355—10 **6 Claims**



1. An electrophotographic apparatus comprising:

a rotatable electrophotographic member having an electrophotographic photosensitive layer fixed on the periphery thereof, said electrophotographic photosensitive layer being for repeated use;

guiding means comprising a groove for preventing developing liquid from flowing outwardly of the laterial edges of said rotatable member and for guiding the developing liquid to a developing liquid reservoir, said groove being provided along at least one lateral end of said rotatable electrophotographic member;

means for forming an electrostatic latent image on said electrophotographic member;

means for developing an electrostatic latent image formed by said electrostatic latent image forming means;

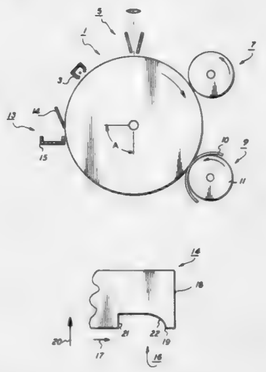
means for transferring the image developed by said developing means.

4,043,659

CLEANING BLADE TONER ARRESTOR

Lionel A. Wilson, AL, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 4, 1975, Ser. No. 565,319
Claims priority, application United Kingdom, May 24, 1974, 23707/74
Int. Cl.² G03G *21/00*
U.S. Cl. 355—15 **3 Claims**



1. An electrostatographic reproducing apparatus comprising: a movable support surface; means for forming a charge pattern on said surface; means for developing the charge pattern with liquid developer to form a developed image; means for transferring the developed image to a receiver member; said support surface being adapted to move in a given direction past each of said means in succession; and cleaning apparatus comprising a flexible cleaning blade having an edge positioned in contact with said surface, said cleaning blade having a recess solely in each of the ends of said edge, each of said recesses defining an opening which is arranged to face against the direction of support surface movement, and wherein edges formed by said recesses are positioned in contact with said surface.

4,043,660

DEVICE FOR CORRECTING POSITIVE FILM FOR PHOTOCOMPOSITION

Franz Adolf Wingerter, Berlin, Germany, assignor to H. Berthold AG, Berlin, Germany

Filed June 21, 1976, Ser. No. 697,989
Claims priority, application Germany, Aug. 19, 1975, 2537357
Int. Cl.² G03B *13/28, 27/32, 27/52*
U.S. Cl. 355—43 **10 Claims**

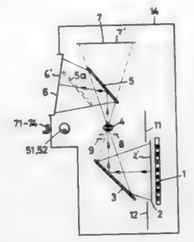
5. A device for correcting positive film for photocomposition comprising:

a housing, said housing containing means for holding an original film carrying a red-shaded area to delineate a defective area;

means for holding a final film in a recording plane;

means for manipulating a correction film to delineate a desired replacement character or characters to take the place of said red-shaded area in said final film; and

an optical system comprising two mirrors, a first convex lens



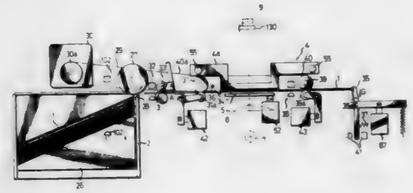
mirror and a second movable mirror, a single light source, an image plane where said original film and said correction film are alternately located, a focusing plane in which said original film is selectively located, and said recording plane, said optical system designed to project said desired replacement characters onto said final film by successive projections of first said original film and then said correction film.

4,043,661

ENLARGER-PRINTER

Hiroshi Yamada, Ichikawa; Yukio Shirai, Kawasaki, and Minolu Fukuda, Yokohama, all of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Apr. 23, 1976, Ser. No. 679,760
Claims priority, application Japan, May 1, 1975, 50-52015; Dec. 8, 1975, 50-145066
Int. Cl.² G03B *27/48, 27/50, 27/32, 27/52*
U.S. Cl. 355—50 **15 Claims**



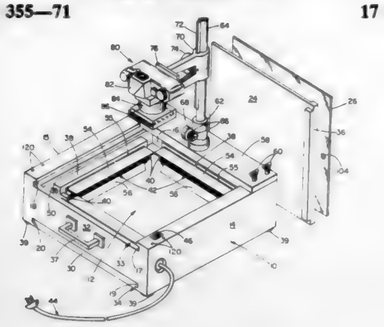
1. An enlarger-printer comprising, in combination, means operable to feed a card, standing on one of its major sides, in the direction in which the major sides of said card are oriented, said card mounting therein a film; a scanning device operable to effect scanning of said film in the direction in which the minor sides of said card are oriented, said scanning device comprising a scanner for carrying the card and scanner moving means operable to move said scanner in the direction in which the minor sides of the card are oriented; means operable to position the card in the scanning device after the card has been fed in the direction in which the major sides of the card are aligned; a film margin differences compensating device operable to move the card in the scanning direction for compensating for differences in the margins of films; a photosensitive member of a copying apparatus; an optical system operable to irradiate the film to form an enlarged image of the film on said photosensitive member; and a card ejection device operable to eject the card after the card has been scanned.

4,043,662

PHOTOGRAPHIC LIGHT SOURCE

Peter J. Garfall, 4 Greystone Road, Melrose, Mass. 02176

Filed Sept. 10, 1975, Ser. No. 612,012
Int. Cl.[2] G03B *27/76*
U.S. Cl. 355—71 **17 Claims**



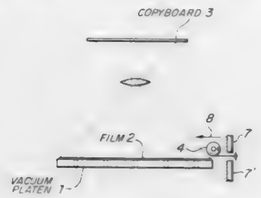
1. A photographic light source comprising:
a boxlike frame;
sockets for mounting and electrically connecting for continuous operation a plurality of fluorescent white light tubes distributed about the inner sides of said frame and extending longitudinally of said sides; and
reflectors with light diffusing reflecting surfaces mounted to extend between said sockets and about light tubes mounted therein and having a position relative to said tubes at which most of the light from the tubes is directed and reflected into the interior of said frame and mainly toward one face only thereof, so that an object to be photographed may disposed within and adjacent said one face of said frame and exposed to said directed and reflected light from the tubes and reflectors for photographing through the lens of a camera directed into the frame through the opposite face thereof;
said reflectors being at least in part adjustable about the axis of the light tubes with which they are associated and including reflector portions beyond said light tubes from said one face of said frame which are adjustable to a position in which their reflecting faces are substantially parallel to said one frame face.

4,043,663

DEVICE FOR APPLYING A FLEXIBLE HALFTONE SCREEN OVER A CAMERA VACUUM PLATEN

Juergen G. Lein, West Henrietta, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 28, 1975, Ser. No. 625,997
Int. Cl.[2] G03B *27/60*
U.S. Cl. 355—73 **10 Claims**



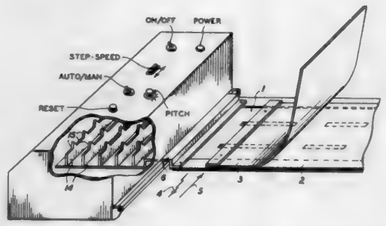
1. The device for applying and removing a flexible halftone screen from a vacuum platen portion of a camera comprising:
a. a roller having a first and second terminal portion;
b. a movable support frame for supporting rotatably said roller and having a first portion coupled to the first terminal portion of said roller and having a second portion coupled to the second terminal portion of said roller;
c. a flexible halftone screen wound about said roller a plurality of times when said roller is positioned at a first portion of said platen;
d. means for coupling a terminal portion of said screen to a fixed frame portion of said camera;
e. means for translating said movable support frame across said platen for causing said roller to rotate in a first direction to unwind said screen and cause it to be laid flat upon said platen; and
f. means for rotatably biasing said roller in a second direction opposite said first direction for causing said screen to be tightly wound about said roller.

4,043,664

INTERLINEAR FEEDER FOR COPYING MACHINE

Toshitsugu Kuwana, Mito, Japan, assignor to Rank Xerox Ltd., London, England

Filed June 21, 1976, Ser. No. 698,373
Claims priority, application Japan, July 16, 1975, 50-98589
Int. Cl.[2] G03B *27/62*
U.S. Cl. 355—75 **9 Claims**



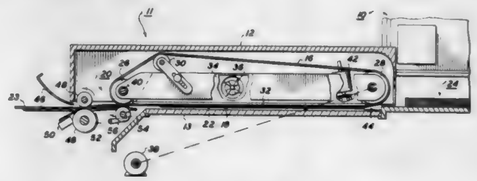
1. In an apparatus for advancing an image-bearing member in steps across the imaging area of a copying apparatus by drive means, the improvement comprising:
a plurality of step control members integrally movable with said image-bearing member,
each said step control member having a multiplicity of incrementally spaced switch actuating means thereon,
said switch actuating means being differently spaced on different said step control members;
a plurality of individual switch means positioned for actuation by said switch actuating means by movement of an individual said step control member past said individual switch means; and
selector means for selecting between said individual switch means and connecting the selected switch means with said drive means for controlling said drive means for a selected incremental step movement of said image-bearing member by said drive means.

4,043,665

COPIER DOCUMENT HANDLER

John R. Caldwell, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1975, Ser. No. 561,465
Int. Cl.[2] G03B *27/62, 27/64*
U.S. Cl. 355—76 **5 Claims**



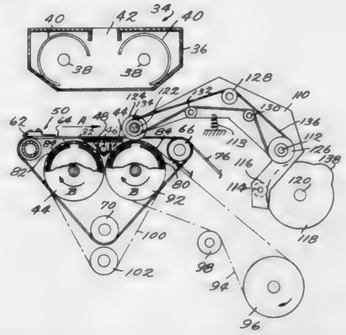
1. In a copying apparatus with a light-transmitting air-impervious document copying platen for copying of documents by manual placement of a document on a first side of said platen, and with optical imaging means for imaging of a document through said platen, and with an alternative mechanical document handling system for feeding documents onto and off of said first side of said platen for said imaging of a document, the improvement in said document handling system comprising:
vacuum belt means normally but removably overlying said first side of said platen for transporting and retaining a document on said vacuum belt means over said first side of said platen without slippage between the document and said vacuum belt means; and
spacing means for maintaining said vacuum belt means slightly but continuously spaced from and overlying said first side of said platen for holding the document spaced from but within a predetermined distance from said platen;
said vacuum belt means being continuously spaced above said platen by said spacing means by a spacing which is slightly greater than the predetermined maximum thickness of the document to be copied on said platen to prevent substantial frictional engagement between the document and said platen and to prevent any contact between said vacuum belt and said platen;
wherein said optical imaging means has a limited optical depth of field extending slightly beyond said first side of said platen;
wherein said spacing means maintains said vacuum belt means spaced above said first side of said platen within said depth of field; and
wherein said document handling system includes document pre-registration means positioned off of said platen for pre-registering the edge of a document prior to its transport over said platen by said vacuum belt means, and
means for advancing said vacuum belt means from said pre-registration means over said platen without slippage between said vacuum belt means and the document to provide registration positioning of the document over said platen without registration engagement of the document over said platen.

4,043,666

ORIGINAL SHEET CARRYING AND ILLUMINATING DEVICE FOR USE IN ELECTROPHOTOGRAPHIC COPYING MACHINE

Masayoshi Furuichi, Tokyo, Japan, assignor to Kabushiki-Kaisha KIP, Tokyo, Japan

Filed Mar. 24, 1976, Ser. No. 670,073
Claims priority, application Japan, Apr. 1, 1975, 50-40156
Int. Cl.[2] G03B *27/70, 27/62*
U.S. Cl. 355—76 **5 Claims**



1. In an electrophotographic copying device having means for carrying an original sheet and light source means for illuminating said sheet, the original sheet carrying means comprising:
a first movable carrying means having clipping means for grasping the sheet at an initial position and transporting the sheet past a location at which the sheet is subjected to illumination from the light source means, said first carrying means transporting the sheet a distance which is less than the length of the sheet before moving in a return path towards said initial position during which movement said first carrying means is stopped; and
a second movable carrying means for pneumatically attracting and supporting said sheet as it passes said location, the portion of said second carrying means supporting the sheet being shorter than said distance along which the sheet is transported by the first carrying means.

4,043,667

METHOD AND SYSTEM FOR PRINTING PHOTOGRAPHS

Masaaki Machida, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Apr. 21, 1975, Ser. No. 569,797
Claims priority, application Japan, Apr. 27, 1974, 49-47136
Int. Cl.[2] G03B *27/04*
U.S. Cl. 355—97 **2 Claims**

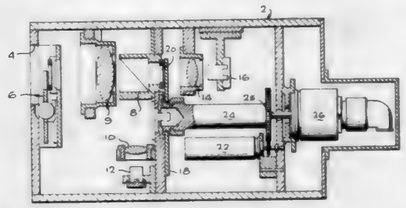
1. A system for printing photographs from a negative film in which each frame on said negative film is assigned a different frame number comprising,
a. a first memory for storing frame numbers of the frames to be printed and the quantity of photographs to be printed of each said frame number,
b. a second memory connected to the first memory, said second memory storing information comprising numbers of frames existing between a reference position of the negative film and the required frame or frames,
c. means for reading the information in said second memory,
d. means for printing a selected number of photos of selected frames based on the information contained in said second memory, and
e. means for generating a signal representing an end portion of the negative film and means for discriminating whether the information of said required frame numbers memorized in said first memory coincides with the numbers counted on the basis of said end potion representing signal.

4,043,668

PORTABLE REFLECTANCE SPECTROMETER

Alexander F. H. Goetz, Altadena; Richard A. Graham, La Crescenta, and Tetsuo Ozawa, Gardena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 24, 1975, Ser. No. 561,369
Int. Cl.[2] G01J *3/48*
U.S. Cl. 356—73 **10 Claims**



1. A reflectance spectrometer comprising:
optical means for detecting incident radiation reflected by a target area, said optical means including:
first detector means or providing signals indicative of total incident radiance:
second detector means for providing signals indicative of predetermined spectral radiance;
beam splitter means for directing a portion of said incident radiation towards said first and second detector means;
filter means for filtering the portion of said incident radiation directed on said second detector means, said filter means being a circular variable filter;
means for varying the position of said filter means with respect to incident radiation;
recording means for recording said signals provided by said first and second detectors, said recording means including:
first and second amplifying means respectively connected to said first and second detector means for amplifying said said signals provided therefrom;
automatic gain control means automatically controlling the gain of said first and second amplifiers as a function of the wavelength of spectral radiation passed through said filter means;
digital recorder means for recording in digital form data

represented by said signals from said first and second detectors;

voltage converter means for converting said signals from said first and second detectors from alternating current signals to direct current signals;

multiplexer means connected to said voltage converter means for selectively providing said signals from said first and second detectors for recordation by said digital recorder means; and

digital means connected to said multiplexer means for providing output signals therefrom to said digital recorder for recordation thereby; and

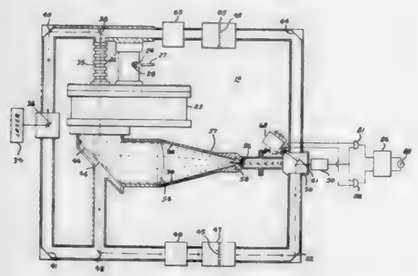
encoder means for providing encoder signals indicative of the position of said filter means with respect to incident radiation and the wavelength of spectral radiation passed through said filter means, said encoder signals being applied to said gain control means.

4,043,669

LIGHT SCATTERING TEST APPARATUS

Matatiahu Gehatia, and Donald R. Wiff, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 28, 1976, Ser. No. 691,162
Int. Cl.² G01N *21/00*
U.S. Cl. 356—104 **4 Claims**



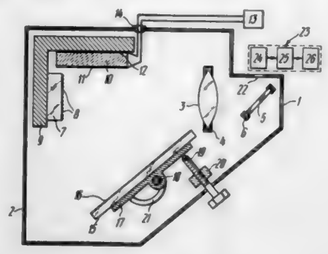
1. An apparatus for obtaining data for determining the ratio of scattered light intensity to unscattered light intensity from a sample of molecules in solution; comprising an elongated test cell containing the sample solution; means for maintaining said sample at a substantially constant temperature; means for passing a beam of monochromatic light in a longitudinal direction through said test cell; a photomultiplier; means for passing light scattered by said sample solution along a first light path toward said photomultiplier; means for passing unscattered light passing through said sample solution along a second path toward said photomultiplier; means for removing substantially all the scattered light from the sample solution, in said first path, except light scattered at a predetermined angle; means in said first and said second light paths for alternately passing light from the first and second light paths to said photomultiplier; a null indicating device connected to the output of said photomultiplier; means for attenuating the light in the unscattered light path to provide a null reading on said null meter; means for providing an indication of the attenuation needed to provide a null in the output of said photomultiplier, to thereby obtain data for determining the ratio of scattered light intensity to unscattered light intensity; said means for maintaining said sample at a substantially constant temperature including a constant temperature tank; a liquid coolant within said tank; a heat exchanger in the wall of said tank; means for supplying coolant to the heat exchanger; a turret assembly within said tank; a plurality of conical mirrors, each having a different cone angle, mounted on said turret assembly; means for rotating said turret assembly to selectively position one of said conical mirrors around the beam path of light passing through the test cell; each of said mirrors including means for holding the test cell.

4,043,670

SPECTROMETER AND METHOD OF EXAMINING SPECTRAL COMPOSITION OF LIGHT

Jury Georgievich Kozlov, Zheleznovodskaya ulitsa, 31, kv. 39, and Alexandr Iosifovich Lopatin, Aviagorodok, 10, kv. 9, both of Leningrad, U.S.S.R.

Filed June 11, 1975, Ser. No. 586,096
Claims priority, application U.S.S.R., June 13, 1974, 2033027
Int. Cl.² G01B *9/02*; G01J *3/00*
U.S. Cl. 356—106 S **10 Claims**



1. A spectrometer comprising: means defining an entrance aperture which permits passage of an incoming light beam to be examined; collimating means having a focal plane which is arranged so that said light beam being examined is incident thereon after passing through said entrance aperture; a diffraction grating having symmetrical rulings forming its working surface to define right and left diffraction orders, said diffraction grating being arranged so that the light beam being examined is incident thereon after passing through said collimating means, the light beam diffracting in said right and left diffraction orders into first and second light rays of a given wavelength; a first scanning mirror common to both said light rays, having a reflection surface and an axis of rotation, said first scanning mirror being arranged so that one of said light rays is incident thereon and, after having been reflected from said first scanning mirror, is incident again on said diffraction grating; a second mirror having a reflecting surface arranged generally orthogonal relative to said diffraction grating that its reflecting surface is parallel to said diffraction grating rulings, and the other one of said light rays is incident thereon, and after having been reflected from said second mirror, is incident on said first mirror and, after having been reflected from said first mirror, is incident on said second mirror and, after having been reflected from said second miror, is incident once again on said diffraction grating, said first and second light rays diffracting from said diffraction grating in the same direction to form interfering light rays which interfere with each other, and arrive at said collimating means in the form of the outgoing light beam to be examined; a modulator periodically changing the path difference of the interfering light rays; means defining an exit aperture which permits passage of an outgoing light beam to be examined; a device for recording said outgoing light beam located in said focal plane of said collimating means adapted to read the spectral composition of said light beam being examined.

4,043,671

LASER SYSTEM PRESET UNIT

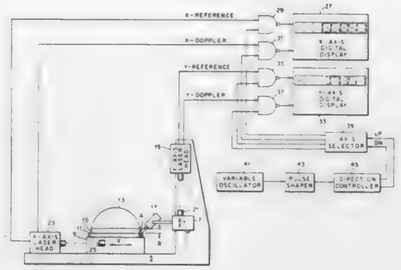
William L. Goodwin, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed July 13, 1976, Ser. No. 704,872
Int. Cl.² G01B *9/02*
U.S. Cl. 356—106 R **3 Claims**

1. In a Zeeman-effect laser interferometer system for measuring displacement of an object along an axis including a laser head having a reference signal output for producing pulses at a fixed rate and a Doppler signal output for producing pulses at a rate greater than the rate of said fixed rate pulses for displacement in a forward direction and less than the rate of said fixed rate pulses for displacement in a reverse direction and a digital display unit for detecting differences in the Doppler signal rate relative to the pulse rate of said reference signal for calculating and displaying the displacement of said object along said axis from a reference point, a display preset circuit, comprising:

a selectable frequency oscillator;

pulse-shaping means connected to the output of said oscillator for generating a fixed period pulse at an output thereof at a repetition rate equal to the frequency of said oscillator, said fixed period being substantially equal to the period of said reference signal and said Doppler signal;

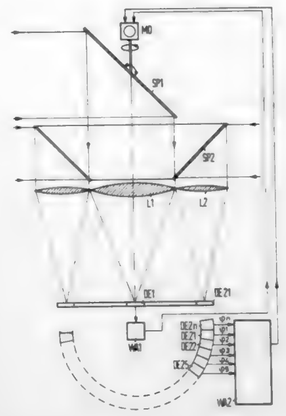


a first gating means having an enabling input for coupling the reference signal output of said laser head to the reference signal input of said display unit;

a second gating means having enabling input for coupling the Doppler signal output of said laser head to the Doppler signal input of said display unit; and

switching means for selectively applying said fixed period pulses to either the enabling input of said first gating means or the enabling input of said second gating means so that the selected gate is disabled for at least the period of one reference or Doppler pulse for each fixed period pulse until the valve to be preset into the display unit is obtained

directionally receiving and detecting the angle of incidence with the other receiving system; and



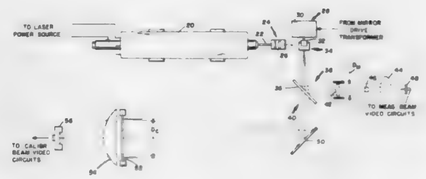
accurately positioning the other receiving system, as a fine adjustment, to the angle of incidence.

4,043,673

RETICLE CALIBRATED DIAMETER GAUGE

David E. Harris; Robert M. Watson, and John D. Redmyer, all of Columbus, Ohio, assignors to Autech Corporation, Worthington, Ohio

Filed Apr. 9, 1975, Ser. No. 566,413
Int. Cl.² G01B *11/10*
U.S. Cl. 356—160 **24 Claims**



1. An optical gauging system comprising: a laser; a mirror positioned in the path of the laser beam, and means for oscillating said mirror to periodically change the angle of incidence of the laser beam to produce a periodic scan; beam splitter means for splitting the scanned beam into a measuring beam and a calibration beam; a collimating lens in the path of said reflected beam to produce a beam, with a parallel scan said collimating lens positioned to direct said collimated parallel scanning beam onto an object with the beam scan in the direction of a dimension of the object which is to be measured; means for generating a measuring signal representative of the portion of the scan cycle during which the object occults the measuring beam; calibrating means including a reticle positioned in the path of the calibration beam for alternately occulting and transmitting said beam as it sweeps said reticle, wherein the distance swept by the calibration beam in the plane of the reticle is larger than the distance swept by the parallel scanning measuring beam in the plane of the object; a lens positioned beyond said reticle and a photodetector positioned at the focal point of said lens whereby the output of said photodetector is a spatially periodic electrical signal representative of the reticle band pattern; and means responsive to said measuring signal for counting the number of calibrating pulses generated while said measuring beam is occulted by the object under inspection.

4,043,672

METHOD AND APPARATUS FOR DETECTING THE DIRECTION OF INCIDENCE OF ELECTROMAGNETIC RADIATION

Viktor Baumgartner, Taufkirchen, Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed July 15, 1976, Ser. No. 705,707
Claims priority, application Germany, July 25, 1975, 2533214
Int. Cl.² G01B *11/26*
U.S. Cl. 356—152 **24 Claims**

1. A method of detecting the direction of incidence of electromagnetic radiation with the help of two coaxial optical receiving systems a first one of which is fixed and the other one of which is rotatable, comprising the steps of:

receiving and detecting the general angle of incidence of electromagnetic radiation with the first receiving system;

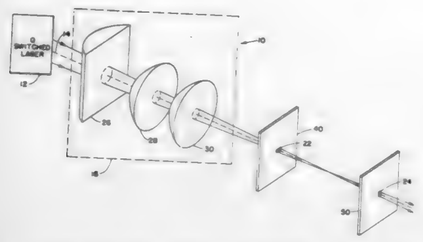
coarsely rotating the other receiving system to the general angle of incidence;

4,043,674

SPATIAL FILTER FOR Q-SWITCHED LASERS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Ralph F. Wuerker, Palos Verdes Estates, and Lee O. Heflinger, Torrance, both of Calif.

Filed Oct. 2, 1974, Ser. No. 511,334
Int. Cl.² G02B *27/00*
U.S. Cl. 350—162 SF **3 Claims**



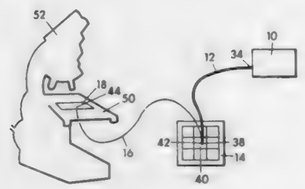
1. A Q-switched laser system comprising:
a. a Q-switched laser emanating a beam of light along an optical path,
b. means disposed in said optical path for producing an astigmatic focus of said beam of light wherein said beam is focused on a first line traverse to said beam at a first position along said beam and is focused on a second line traverse to said beam and perpendicular to said first line at a second position along said beam, and
c. a spatial filter comprising a first light-opaque plate having a slit therein and disposed traversely to said beam at said first position, said slit being substantially in register with said first line and a second light-opaque plate having a slit therein and disposed traversely to said beam at said second position, said slit of said second plate being substantially in register with said second line.

4,043,675

METHOD AND APPARATUS FOR COMPARING THE COLOR OF A STANDARD COLOR WITH THE COLOR OF A SAMPLE

Gottfried Kurt Guennel, and Fred Charles Trusell, both of Littleton, Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Apr. 26, 1976, Ser. No. 680,258
Int. Cl.² G01J *3/52*
U.S. Cl. 356—191 **8 Claims**



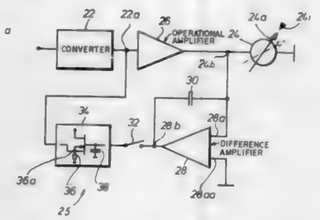
1. Apparatus for displaying the color of an individual standard color of a color standard adjacent a sample, for direct comparison of the color of the standard color with the color of a sample comprising:
a. a light source;
b. an optic fiber bundle for receiving light from the light source and projecting the light on an individual standard color of a color standard, the optic fiber bundle having a light receiving end positioned to receive light from the light source and a light projecting end positioned in close proximity with the individual standard color to project light from the light source thereon; and
c. an optic fiber for receiving light reflected from the standard color and transmitting the reflected light, the optic fiber having a light receiving end positioned in close proximity with the standard color of the color standard to receive light reflected therefrom and a light projecting end positioned adjacent the sample for direct comparison of the color of the light transmitted by the optic fiber with the color of the sample.

4,043,676

PHOTOMETER

Otto Holzinger, and Wilhelm Pross, both of Munich, Germany, assignors to Carl Zeiss Stiftung, Heidenheim (Brenz), Germany

Filed July 18, 1975, Ser. No. 597,291
Claims priority, application Germany, July 25, 1974, 2435908
Int. Cl.² G01J *1/44*
U.S. Cl. 356—226 **6 Claims**



1. A photometer having a light source for use with plural substance holding means for holding the same or different substances to facilitate a measuring of the light transparency of said substance or substances, comprising:
a photoelement having a characteristic of producing a variable signal proportional to the amount of light being received thereby and which is transmitted through a calibration substance;
converter means responsive to said signal for converting said signal to a logarithmated signal;
amplifier means responsive to said logarithmated signal for amplifying said logarithmated signal;
indicator means responsive to said amplified signal for indicating the magnitude of said amplified signal; and
control circuit means connected in parallel with said amplifier means and including storage means for storing a signal equal in magnitude but opposite in polarity, to said logarithmated signal, said control circuit means further including switching means for isolating said storage means from the output of said amplifier means while simultaneously supplying said stored signal to the input to said amplifier means to cause said indicator means to indicate a zero signal value indicative of the light transparency of said calibration substance whereby a second logarithmated signal produced by said converter means for another different substance will cause said indicator means to indicate the difference between said storage signal and said second logarithmated signal and thereby the difference in light transparency between said calibration substance and said different substance.

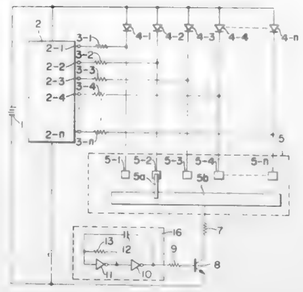
4,043,677

EXPOSURE METER

Kenji Toyoda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,176
Claims priority, application Japan, Dec. 28, 1974, 50-1295
Int. Cl.² G01J *1/42*; G03B *17/20*
U.S. Cl. 356—227 **14 Claims**

1. Exposure meter for camera comprising:
indicating means including a plurality of indicating elements, each of which indicates shutter time or stop value in the operative condition thereof;
photometric means for causing one of said indicating elements to be operative to indicate at least one exposure factor in correspondence with the intensity of light from an object to be photographed and with manually set exposure factors;



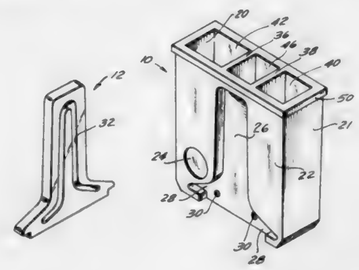
changeover means causing one of said indicating elements to be operative in correspondence with the manual setting of an exposure factor other than said exposure factors set in the photometric means; and
a power source connected with said indicating means, said photometric means and said changeover means.

4,043,678

CUVETTE

Gregory A. Farrell, and Abraham Gordon, both of Teaneck, N.J., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Mar. 1, 1976, Ser. No. 662,642
Int. Cl.² G01N *1/10*
U.S. Cl. 356—246 **18 Claims**



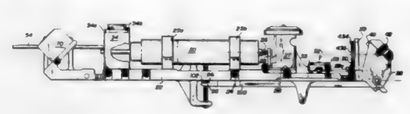
1. A cuvette body, comprising: means defining first and second upright laterally-spaced liguid-receiving chambers at least one of which has an inlet, passageway means interconnecting lower portions of said chambers, said passageway means having a horizontal cross-section of greatest dimension substantially less than the horizontal cross-section of smallest dimension of either of said chambers and sufficient to normally allow substantially free flow of liquid between said chambers, said passageway means being of inverted U-shape and having an effective height to normally isolate the contents of said chambers.

4,043,679

SELF-LEVELING CONSTRUCTION ALIGNMENT LASER

Lyndell J. C. George, and Robert S. Shelly, both of Jacksonville, Ark., assignors to AGL Corporation, Jacksonville, Ark.

Division of Ser. No. 624,238, Oct. 20, 1975. This application Aug. 30, 1976, Ser. No. 718,612
Int. Cl.² G01C *9/18*
U.S. Cl. 356—249 **2 Claims**



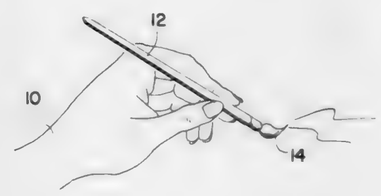
1. A system for projecting and utilizing a light beam as a reference line for laying conduit comprising:
a housing;
a light beam projecting device mounted in said housing;
light compensator means within said housing for intercepting said beam of light and automatically deflecting said beam of light through an angle of $n\phi$ when the longitudinal axis of the beam of light projected from the light projecting device is tilted at an angle of ϕ from true horizontal, said compensator having a liquid-air interface remaining parallel to true horizontal to provide compensation;
a shield member mounted within said housing on the opposite side of the light compensating means from said light beam projecting device and having an aperture therein aligned with the path of the undeflected beam of light projected from said light beam projecting device through said light compensator means, the aperture within said shield being of a predetermined size to prevent the passage of the beam of light therethrough when the beam of light projected by the light beam projecting device deviates a predetermined angle from true horizontal.

4,043,680

ARTIST'S BRUSH WITH DISPOSABLE CARTRIDGE

Lawrence V. Milano, Yonkers, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 15, 1976, Ser. No. 696,358
Int. Cl.² B43K *5/02*
U.S. Cl. 401—40 **8 Claims**



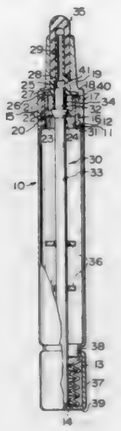
1. An artists brush with disposable cartridge, comprising:
a shaft,
a plunger slidingly insertable in a distal end of the shaft,
a first disk mounted in the shaft below the plunger and forming a medium storing chamber above the first disk,
a second disk mounted in the shaft below the first disk and forming a pigment storing chamber between the first disk and the second disk and forming a dispensing chamber below the other disk,
means for introducing the medium through the disk and into the pigment chamber,
means of dispensing the pigment and medium through the other disk into the dispensing chamber,

a tip removably attachable to a proximal end of the shaft, thereby closing the dispensing chamber, and
covering means removably attachable over the tip.

4,043,681
WRITING INSTRUMENT

Takaji Funahashi, No. 1, 2-chome, Kitatakasho, Nishi, Nagoya, Aichi, Japan

Filed Aug. 12, 1976, Ser. No. 713,913
Claims priority, application Japan, Sept. 22, 1975, 50-129866[U]
Int. Cl.² B43K *5/10*
U.S. Cl. 401—151 **1 Claim**

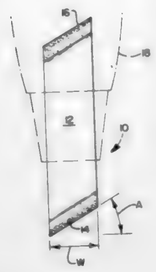


1. A writing instrument comprising (a) an ink tank having a flexible bellows portion and having an opening at one end and a bottom at the other end, (b) a neck member including a first cylinder closely fitted on the outside of said one end of the ink tank and a second cylinder connected to said first cylinder and having an inner diameter smaller than that of the first cylinder, (c) a lid member having a peripheral edge portion disposed in the first cylinder of said neck member and having a valve seat hole at the center thereof, (d) a cap member including a flange disposed in the first cylinder of said neck member, a third cylinder connected to said flange and fitted closely in the second cylinder of said neck member and a fine liquid discharge tube connected to said third cylinder and having an inner diameter smaller than that of said third cylinder, (e) a valve member including a valve to be seated in the valve seat hole of said lid member, a first rod portion connected to one end of said valve and loosely inserted in said third cylinder of said cap member and a second rod portion connected to the other end of said valve and having a free end contacted with the inner face of the bottom of said ink tank, (f) a compression spring interposed between the free end face of said third cylinder of said cap member and said one end of said valve to seat said valve in said valve seat hole, and (g) a tubular writing core composed of an ink-absorbing material and having one end fitted and inserted between said second cylinder of said neck member and the fine liquid discharge tube and having the other end closed, wherein the peripheral edge portion of said lid member and the flange of said cap member are supported and held by the open end portion of said ink tank and the first cylinder of said neck member, whereby a first chamber is formed among said lid member, the free end face of the third cylinder and the first rod portion of said valve member and a second chamber is formed between the free end face of the first rod portion of said valve member and the third cylinder of said cap member.

4,043,682
WRITING NIB STRUCTURE AND METHOD OF MANUFACTURE

John E. McDaniel, Douglasville, and Harold B. Morris, Newman, both of Ga., assignors to Glasrock Products, Inc., Fairburn, Ga.

Continuation of Ser. No. 586,593, June 13, 1975, abandoned. This application Sept. 8, 1976, Ser. No. 721,497
Int. Cl.² B43K *8/00*
U.S. Cl. 401—199 **3 Claims**



1. A writing nib comprising:
an elongated nib body of generally rectangular cross-sectional configuration to establish two pairs of opposite side surfaces extending between opposite ends of the body, said body having a layered construction to include a pair of relatively rigid reinforcing layers of plastic material coextensive with one of said pair of opposite side surfaces and a central layer of relatively soft wicking material of porous thermoplastic material sandwiched between and secured uniformly to said reinforcing layers and coextensive therewith, said wicking material being exposed along the length of said other pair of opposite side surfaces and projecting beyond said reinforcing layers on at least one end of said body to establish a writing tip.

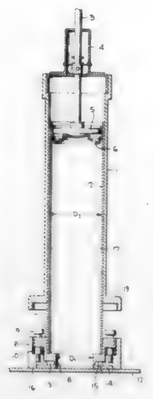
4,043,683
DISPENSING AND WIPING DEVICE

Charles R. Costa, Plainville, and Robert L. Smigel, Middletown, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation-in-part of Ser. No. 481,005, June 20, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,347
Int. Cl.² B41F *15/40*
U.S. Cl. 401—264 **10 Claims**

1. A device for dispensing viscous material, said device comprising a hollow tubular container containing the material to be dispensed; a hollow tubular sleeve mounted slidably over the container and which causes said material to be exuded when forced downwardly over the container; a feeding means to apply pressure to the viscous material in the container, said feeding means being mounted on one end of the sleeve and which applies said pressure by advancing into the container; an application means to dispense the viscous material onto an abutting surface and to seal against and wipe said surface, said application means being sealingly mounted on the container at the opposite end of the device from the feeding means, said application means containing a restorable expansion space having biasing means therein to relieve exuding forces in the viscous material, and said application means also having a flexible lower surface with at least one perforation therethrough which communicates with the interior of the container, which flexible surface is caused to be deflected downwardly in the area surrounding the perforation when the sleeve

is forced downwardly over the container, and wherein said expansion space is restored by action of said biasing means

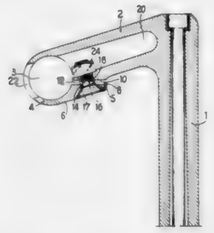


when the downward force on the sleeve is at least partially released.

4,043,684
HANDLE-BAR STEM

Bernard Lacroix, Montbeliard, France, assignor to Cycles Peugeot, Valentigney, France

Filed June 29, 1976, Ser. No. 700,926
Claims priority, application France, July 11, 1975, 75.21919
Int. Cl.² B62K *21/18*
U.S. Cl. 403—8 **4 Claims**

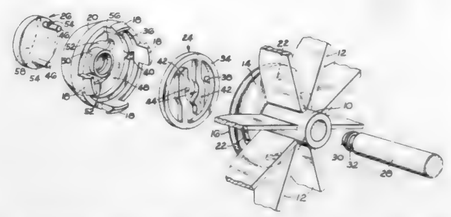


1. A handle-bar stem comprising a plunger tube for insertion in a fork tube of a wheeled vehicle, an extension extending laterally from the plunger tube, the extension carrying a collar defining a transverse aperture for receiving a handle-bar at an end of the extension remote from the plunger tube, a clamping lug extending from the collar toward the plunger tube and having an upper face, the extension having a lower face which defines with said upper face a slot extending through the collar into said aperture so that the collar is a split collar, the extension having an axial cavity and means defining an opening in the collar substantially in alignment with said cavity, and clamping means having a first end portion engaged in said cavity and an opposite second end portion engaged with said lug for urging said upper face and lower face toward each other and thereby clamping the collar around the handle-bar in said aperture.

4,043,685
FASTENERS

Joseph Edward Hyams, Solihull, England, assignor to Vic-Tree (Mouldings) Limited, Birmingham, England

Filed Oct. 10, 1975, Ser. No. 621,494
Claims priority, application United Kingdom, Oct. 22, 1974, 45752/74
Int. Cl.² F16D *1/00*
U.S. Cl. 403—19 **4 Claims**

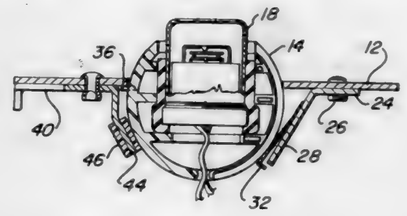


1. A fastener comprising a locking plate and a stud with a lateral recess, the plate including a frame and at least one post projecting from the frame to extend generally laterally of the stud and engage in the recess when the plate and stud are connected, said post being resilient so that when deflected out of the recess for release or disengagement, it will return to the engaged position; a cover in which the frame is located; a release plate having a number of pegs arranged to deflect the post when the release plate is turned, the release plate being secured to the cover by projections from the pegs; the cover having slots for movement of the pegs, and the slots having enlargements to allow the projections to pass through in assembly, the arrangement being such as to prevent the projections returning to the enlargements in normal use.

4,043,686
STABILIZED BALL JOINT

Kenneth R. Hackett, Boulder, Colo., assignor to Snotrix Division of Pittway Corporation, Boulder, Colo.

Filed June 3, 1976, Ser. No. 692,593
Int. Cl.² F16C *11/06*
U.S. Cl. 403—90 **3 Claims**

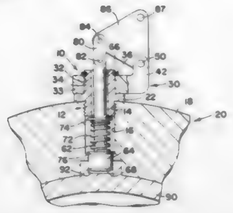


1. A ball joint mounting for a device to be selectively positioned and immobilized which comprises:
a base plate having a circular opening therein;
ball means positioned in said opening and having means for supporting a device thereon said ball being of a diameter enough larger than the opening to be retained thereby;
bias means attached to the base plate urging said ball means into said opening; and,
locking means pivotally mounted on said base plate and having a depending finger adapted to be pivotally moved into engagement with said ball means to lock said ball means against movement therebetween and said opening wherein said finger of said locking means is provided with resilient elastomeric means engaging said ball.

4,043,687
LATCHED TELESCOPING MEMBERS

William A. Van Dyke, Jr., Satellite Beach, Fla.; Frank S. Baker, Londonderry, N.H., and Robert McClintock, Framingham, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 12, 1976, Ser. No. 676,072
Int. Cl.[2] F16B *7/10*
U.S. Cl. 403—109 1 Claim

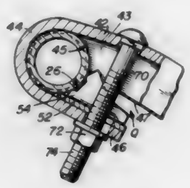


1. A locking mechanism for rigidly locking two telescoping members against relative movement comprising:
- a bushing threaded into a bore in one of said members,
- a pin having a stem portion slideably received within said bushing and a head portion adapted to project into a bore in the second of said members,
- spring means surrounding said stem portion of said pin and confined between said head portion and said bushing,
- a bracket rotatably mounted on the outer portion of said bushing,
- a triangular retracting plate pivotally mounted at one of its corners to said bracket and connected to another of its corners to the end of the stem portion of said pin, and
- means connected to the third corner of said plate for rotating the same about the corner pivoted to said bracket to retract said pin.

4,043,688
BICYCLE STEM

Robert F. Humlong, Maysville, Ky., assignor to Wald Manufacturing Company, Inc., Maysville, Ky.

Filed Sept. 24, 1975, Ser. No. 616,265
Int. Cl.[2] F16G *11/00*
U.S. Cl. 403—209 10 Claims

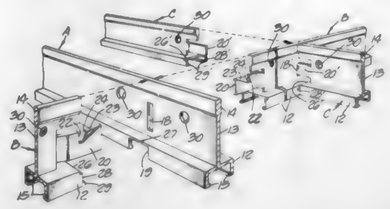


1. A bicycle stem comprising an elongate barrel, the upper end which terminates in a forwardly projecting, integral U-shaped loop defined by an upper, an outer, and a movable lower leg disposed in spaced relationship with said upper leg defining therewith an open throat through which a bicycle handlebar can pass, said upper leg having depending leg side walls thereon; a locking member removably seated on said lower leg to be spaced apart from said upper leg and disposed in said throat between said upper and lower legs; said locking member having a base and member side walls; said upper and lower legs and said locking member each having a bolt-receptive aperture therethrough; a bolt passing through said bolt-receptive apertures; and means for tightening the bolt to advance the lower leg toward the upper leg and simultaneously advance the locking member toward the outer leg of the loop with said locking member side walls loosely disposed between said leg side walls.

4,043,689
MODULAR CEILING SYSTEM

William H. Spencer, La Verne; John O. Dorius, Pasadena, both of Calif., and James D. Brown, Clarksville, Ark., assignors to Trend Ceilings Systems Co., Los Angeles, Calif.

Division of Ser. No. 221,143, Jan. 27, 1972, Pat. No. 3,949,533.
This application Feb. 17, 1976, Ser. No. 658,481
Int. Cl.[2] F16B *21/08*
U.S. Cl. 403—252 22 Claims



1. In combination, a ceiling grid joint assembly comprising a first continuous lightweight extruded stringer of T-shape in cross-section and characterized by a channel shaped T-head having an open side facing away from and lying in a plane normal to the T-stem portion thereof, said T-stem portion having rectangular opening therethrough with its longer dimension extending normal to the web of said channel shaped T-head and its shorter dimension corresponding to double the thickness of said T-stem portion, the sidewalls of said T-head having identical notches in direct alignment with one another crosswise of said T-head in an area opposite the adjacent end of said rectangular opening, said notches having a depth flush with the interior bottom surface of the web of said T-head and a width corresponding to the distance between the exterior sidewall surfaces of said T-head, second and third stringers of the same size and shape as said first stringer and interlocked therewith from the opposite sides of said first stringer, said second and third stringers each being formed in the T-stem portion thereof with a latching tongue inserted one from either side of said first stringer with said latching tongues lying side by said through rectangular opening and having tabs having interlocking engagement with a rim edge of the adjacent longer side of said rectangular opening and with the ends of the T-heads of said second and third stringers seated in an adjacent one of an associated one of said pair of identical notches in the T-head of said first stringer.

4,043,690
WIRE ROPE TERMINATION

William R. K. Browne, York, Maine, assignor to York Engineering, Inc., York Harbor, Maine

Continuation of Ser. No. 608,709, Aug. 28, 1975, abandoned.
This application Feb. 2, 1976, Ser. No. 654,036
Int. Cl.[2] B25G *3/34*
U.S. Cl. 403—268 9 Claims

1. A method of terminating a cable composed of a multiplicity of wires each preformed with a helical twist comprising the steps of
- A. gripping the cable at a selected point near as end portion thereof to be terminated,
- B. unlaying the end portion of the cable with a minimum of distortion of each unlaid wire from the laid shape so that the outermost cable wires each naturally reassumes its preformed helical twist about an axis that is different from those of the other wires whereby the wires in said portion together form an envelope that is symmetrical about the cable portion axis and has a radial bulge adjacent its inner end, a radial flare at its outer end and a radial constriction intermediate its ends,
- C. providing a sleeve with a tapered bore whose length and whose major and minor diameters are related to the envelope dimensions so that when the end portion is positioned in the sleeve with the envelope axis aligned with the bore axis
  1. the envelope bulge is positioned adjacent the smaller end of the bore,
  2. the envelope flare is positioned adjacent the larger end of the bore, and

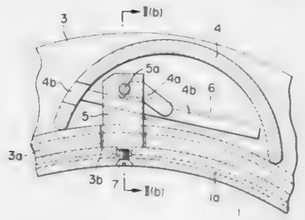


  3. the flaring wire ends lie against and are distributed around the bore wall,
- D. arranging the cable end portion inside the sleeve bore so that the envelope axis substantially coincides with the bore axis, and
- E. filling the sleeve bore with a settable resin material so that it surrounds the unlaid wires forming a solid tapered plug extending both inside and outside the entire length of the envelope formed by those wires that will wedge against the bore wall when a tensile force is applied between the sleeve and the cable.

4,043,691
DEVICE FOR LOCKING A BODY TO BE MOUNTED

Kunihiro Fukino, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Jan. 20, 1976, Ser. No. 650,785
Int. Cl.[2] F16B *21/00*; F16L *37/00*; G02B *7/02*
U.S. Cl. 403—322 6 Claims

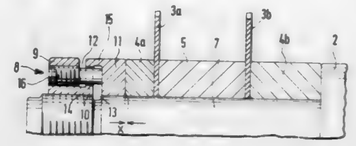


1. A locking device for releasably connecting a mounting body having a cylindrical end portion defined by a wall projected therefrom with a body having a projected end formed with a mating portion, the device comprising:
- a. an engaging member having an engaging portion engageable with the mating portion of the body, the engaging member being movable between a first position where the engaging member closely contacts a side of the wall so that the engaging portion is in engagement with the mating portion and a second position where the engaging portion is released from said mating portion so that the mounting body is disengageable from the body;
- b. a connecting member extending through said wall and mounted for sliding movement, one end of the connecting member being secured to said engaging member;
- c. a projecting pin provided at the other end of the connecting member; and
- d. an operating member slidably mounted relative to said wall, the operating member having a groove inclined relative to the sliding direction of the operating member and engageable with said projecting pin so as to move the engaging member between the first and second positions when the operating member slidably moves.

4,043,692
AXIAL THRUST COLLAR

Werner Hund, Esslingen, Germany, assignor to Spieth-Maschinenelemente GmbH & Co. Kg, Germany

Filed Oct. 4, 1976, Ser. No. 729,073
Claims priority, application Germany, Oct. 4, 1975, 2544498
Int. Cl.[2] F16B *7/04*
U.S. Cl. 403—373 3 Claims



1. A threaded collar for use with a cylindrical member having a smooth portion and a threaded end portion for axially clamping members carried by said smooth portion, said collar comprising
- a generally cylindrical body having an axial cylindrical bore therethrough and having inner and outer peripheral surfaces;
- means in said body for defining a radially inwardly extending annular groove and a radially outwardly extending groove,
- said grooves being axially spaced apart to define an attachment ring on said body, an intermediate ring between said grooves and an adjusting ring at an end of said body,
- said intermediate ring having an axial dimension which is significantly smaller than said attachment ring and said adjusting ring,
- said means including connecting portions at the inner and outer limits, respectively, of said inwardly and outwardly extending grooves interconnecting said rings,
- said adjusting ring having a distal end surface for contacting the members to be clamped and having a smooth peripheral surface facing the smooth portion of said cylindrical member dimensioned to axially pass the threads on the threaded end portion of said cylindrical member with clearance;
- substantially continuous thread means on the peripheral surface common to said attachment ring, said intermediate ring and the connecting portion therebetween for engaging the threaded end portion of said body;
- a plurality of screws having externally threaded portions;
- means in said attachment ring defining a plurality of internally threaded, circularly spaced, axially extending openings through said attachment ring for receiving said screws and engaging said threaded portions thereof; and
- means in said intermediate ring defining a plurality of openings axially aligned with said openings in said attachment ring for permitting passage therethrough of said screws,
- said screws being adjustable in said attachment ring to abut said adjusting ring and to elastically lengthen said body whereby adjustable axial clamping force can be exerted on the members carried by said cylindrical member.

4,043,693

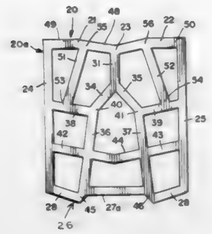
BRIDGE JOINT SEALS

Delmont D. Brown, North Baltimore, Ohio, assignor to The D. S. Brown Company, North Baltimore, Ohio

Continuation of Ser. No. 282,259, Aug. 21, 1972, abandoned, which is a division of Ser. No. 43,317, June 4, 1970, Pat. No. 3,687,022. This application Mar. 24, 1976, Ser. No. 669,843

Int. Cl.[2] E01C *11/10*

U.S. Cl. 404—64 **5 Claims**



1. A hollow, elongated elastomer seal useful for sealing pavement joints and bridge joints comprising an elongated, elastomer top wall; an elongated, substantially planar or shallow V-shaped, elastomer bottom wall; elongated, elastomer side walls joined at their longitudinal edges with said top and bottom walls; said top wall having a concave medial segment and substantially horizontal edge segments; and an internal, elastomer web structure characterized by a pair of transversely downwardly diverging, elongated, elastomer webs having their apex substantially vertically aligned with the longitudinal midportion of said bottom wall, means joining said apex with the longitudinal midportion of said top wall; a pair of transversely laterally extending, elongated elastomer webs joined at their longitudinal edges respectively with one of said diverging webs near said apex and one of said side walls; and an additional pair of webs extending respectively diagonally outwardly and downwardly between (a) intermediate portions of said top wall at the respective lines of juncture of said medial segment and said edge segments and (b) respective intermediate portions of said laterally extending internal webs with the respective intersections of said additional webs and said respective laterally extending internal webs being closer to the respective side walls than to the respective junctures of said last-mentioned internal webs and said diverging webs, the spacing ratio of the respective intersections of said additional webs and said intermediate portions, relative to said side walls and to said diverging webs, being in the range of 1:3 and 1:4, whereby the web structure and orientation of said webs provide resistance to inward rolling of the upper longitudinal corners of the seal away from the joint faces when the seal is seated under lateral compression in a joint, the bottom wall of said seal comprising a longitudinal midportion connected to the lower longitudinal edges of said side walls by elongated, respective V-shaped foot portions adapted to fold into substantially V-shaped transverse cross section when said seal is collapsed laterally, said foot portions respectively being composed of a first segment sloping downwardly from the respective lower longitudinal edges of said side walls and a second segment of more acute downward slope extending downwardly from the respective longitudinal edges of said longitudinal midportions.

4,043,694

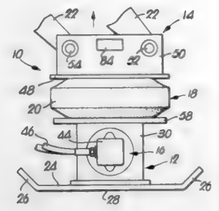
VIBRATORY COMPACTOR

Larry P. Mullen, Salina, Kans., assignor to Scientific Engineering, Inc., Salina, Kans.

Continuation-in-part of Ser. No. 587,218, June 16, 1975, abandoned. This application May 24, 1976, Ser. No. 688,968

Int. Cl.[2] E01C *19/34*

U.S. Cl. 404—133 **12 Claims**



1. Compacting apparatus, comprising:

compacting structure presenting a compacting foot;

attachment means spaced from said compacting structure for securing the apparatus to support structure therefor;

means operatively coupling said attachment means and compacting structure and supporting the latter and permitting cushioned, shock-absorbing relative motion therebetween,

said coupling and supporting means including a resilient, air-filled bag situated between said attachment means and compacting structure and in operative, shock-engaging engagement with the latter for absorbing at least a portion of the vibratory forces experienced during contact between said surface and an area being compacted,

there being valve means operatively connected with said bag for allowing self-inflation of said bag with atmospheric air and

means operatively coupled to said compacting structure for causing reciprocation of the same in a direction generally toward and away from said attachment means,

the volume of said bag, and the mass of said compacting structure, being of relative magnitudes for causing extension of the bag under the influence of said mass when the compacting structure is elevated above said area being compacted to permit air to pass into said bag from the atmosphere through said valve means, and for absorbing shocks when said compacting foot strikes said area being compacted.

4,043,695

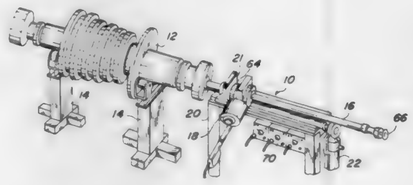
METHOD OF BOTTLE BORING

Herbert R. Gottelt, Mount Prospect, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Division of Ser. No. 337,671, March 2, 1973, Pat. No. 3,854,839. This application Aug. 1, 1974, Ser. No. 493,787

Int. Cl.[2] B23B *35/00*

U.S. Cl. 408—1 R **3 Claims**



1. A method of bottle boring comprising:

conveying bottle boring apparatus to the location of a stationary object having a bore:

mounting the bottle boring apparatus adjacent an open end of the bore, with the apparatus accurately positioned with respect to the axis of the bore;

inserting a cutting tool into an intermediate portion, which is to be enlarged, of the bore of the stationary object, while maintaining the open end portion of the bore at the original size;

extending a boring drive shaft, which rotates the cutting tool, from the bottle boring apparatus in a cantilever fashion;

supporting the boring drive shaft on a bearing in the portion of the bore at the original size to accurately position the cutting tool with respect to the axis of the bore at all points along the bore;

selecting a radial position of the cutting tool at a point external to the bore, while the cutting tool is in the bore;

controlling the radial position of the cutting tool with accuracy and precision in response to the selecting of the desired radial position thereof;

moving the cutting tool in an axial direction through a desired length of the intermediate portion of the bore; and

rotating the cutting tool with respect to the stationary object to selectively enlarge the intermediate portion of the bore up to more than twice the original size of the bore.

4,043,696

MICROMETER BORING HEAD

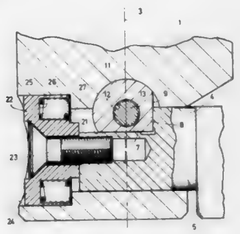
Gerhard Wohlhaupter, Frickenhausen, Germany, assignor to Emil Wohlhaupter u. Co., Frickenhousen, Germany

Filed Dec. 18, 1975, Ser. No. 641,942

Claims priority, application Germany, Dec. 19, 1974, 2460028

Int. Cl.[2] B23B *51/00*

U.S. Cl. 408—179 **3 Claims**



1. In a cutting tool rotatable about an axis of rotation wherein the position of a cutter holder is adjustably displaceable in a direction transverse to said axis of rotation by way of a wedge piece slidable in a direction transverse to said axis of rotation and to the direction of displacement of said cutter holder, said wedge piece having a first plane surface in sliding engagement with a corresponding wedge surface on said cutter holder adjustably displacing said cutter holder in an appropriate guiding and holding recess extending in said direction of displacement of the cutter holder, the improvement comprising said cutter holder having a circularly cylindrical body slidably disposed along its longitudinal axis in a generally circularly cylindrical recess of said cutting tool, a cutout portion in said cutter holder defining a second plane surface substantially parallel to the longitudinal axis of said cutter holder and to the sliding direction of said wedge piece, and a corresponding third plane surface on said wedge piece in sliding engagement with said second plane surface preventing rotation of said cutter holder about its longitudinal axis.

4,043,697

MOUNTINGS FOR BORING TOOL BITS

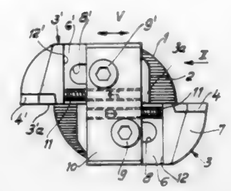
Otto Eckle, Loechgau, Germany, assignor to Komet Stahlhalter- und Werkzeugfabrik, Robert Breuning GmbH, Besigheim, Germany

Filed July 8, 1976, Ser. No. 703,430

Claims priority, application Germany, July 26, 1975, 7523920[U]

Int. Cl.[2] B23B *29/02*

U.S. Cl. 408—182 **12 Claims**



1. A mounting for a pair of boring tool cutting bits, the mounting being such that the two cutting bits, when present, project beyond a forward end of a mounting member and are displaced through 180° relative to each other, each being mounted on a respective cutting bit carrier which is radially adjustable relative to and guided on a toothing on the mounting member, the said toothing extending in the direction of adjustment at right angles to the rotary axis of the mounting member and having parallel teeth, by means of a similar toothing and which can be fixed relative to the mounting member by means of a clamping screw passing through an oblong hole in the cutting bit carrier and engaging with the mounting member, there also being provided for the radial adjustment of the cutting bit carrier, in each case, an adjusting screw engaging with the carrier and extending in the direction of the toothing, and wherein the toothing for the two cutting bit carriers is provided on the forward face of the mounting member in a common radial plane with continuous teeth running across the whole breadth of the forward face, and the cutting bit carriers have a similar toothing on their rear ends facing towards the said forward face, and that the clamping screws are arranged parallel to the said rotary axis.

4,043,698

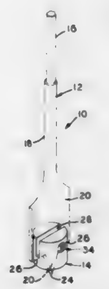
DRILL ATTACHMENT

Rodney Chelberg, 11721 Excelsior Blvd., Hopkins, Minn. 55343

Filed Nov. 2, 1976, Ser. No. 738,244

Int. Cl.[2] B23B *51/00*

U.S. Cl. 408—201 **3 Claims**



1. A boring follower for a standard flat drill bit of the type having a shank mountable in a drill brace, a bit stem issuing therefrom and having a substantially flat paddle blade connected thereto including an axially extending tapered cutting nose, said boring follower comprising a cylindrical section

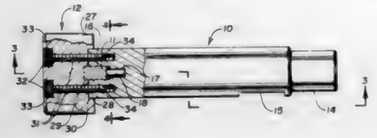
having an axially extending diametral slot therein, said paddle blade of said bit being matingly engageable in said diametral slot, said diametral slot terminating in a radially extending well-bottom in said follower, an axially extending tapered socket in said well-bottom said tapered socket extending through said follower, said socket having a taper corresponding to said taper of said nose of said paddle blade, said nose of said paddle blade being registrable in said tapered socket, and means releasably fixing said follower on said paddle blade.

4,043,699

COUNTERBORE TOOL

John M. Farrand, Burnsville, Minn., assignor to Design Mold Inc., Lakeville, Minn.

Filed June 9, 1976, Ser. No. 694,136
Int. Cl.[2] B23B *51/00*
U.S. Cl. 408—201 **7 Claims**



1. A counterbore tool comprising:

a shank to be mounted in a machine tool for rotation thereof, said shank having an open slot of uniform depth extending inwardly from the outer extremity of said shank,

a cutting tool having a body portion and an outer cutting portion, said body portion being disposed in said slot in engagement with the bottom of said slot completely across said shank portion, said body portion having a depth substantially equal to the width of the slot so as to prevent any relative lateral movement of said tool with respect to said shank and having a width greater than the depth of said slot so as to project beyond the open end of the slot,

said cutting tool and said shank having interfitting male and female portions to prevent any movement of said tool longitudinally thereof and transversely of said shank,

a pilot member disposed in telescoping engagement with and over the end of said shank in which said cutting tool is disposed and engaging said cutting tool and having a diameter greater than that of the shank but less than the length of said cutting tool, said pilot member having an open slot of substantially the same width as the depth of said cutting tool and into which said cutting tool extends,

and clamping means for holding said pilot member on said shank member and clamping said cutting tool therebetween in the open slots of said shank and said pilot member to prevent any movement of said cutting tool longitudinally of said shank, said cutting portion of said cutting tool extending radially a predetermined distance beyond the outer wall of said pilot member.

4,043,700

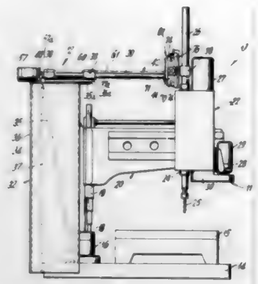
X—Y CONTROL FOR RADIAL ARM AND THE HEADSTOCK OF A RADIAL DRILLING MACHINE

Arrigo Singer, Bronx, N.Y., assignor to Toolmatic Corporation, Carlstadt, N.J.

Filed Nov. 15, 1976, Ser. No. 741,781
Int. Cl.[2] B23B *39/12, 39/04*
U.S. Cl. 408—237 **21 Claims**

15. In combination, a radial arm drilling machine comprising a base, a column rotatably mounted on said base, a radial arm mounted on said column and rotatable therewith, a drill headstock slidable back and forth on said radial arm, a drill spindle rotatably and slidably mounted on said headstock and disposed parallel to the axis of rotation of said column, and control means for moving the axis of the spindle of said headstock only along X—Y axes to bring the spindle from one drill position to another and thereby rotate said arm from the angular position of said arm in said one drilling position to the angular position of said arm in said another drilling position and to cause said headstock to slide on said arm during movement of said axis of said spindle only along said X—Y axes.

17. In combination, a machine comprising an arm pivoted about a fixed axis of rotation, a cutting tool carrier slidable on said arm, a cutting tool mounted on said carrier on an axis



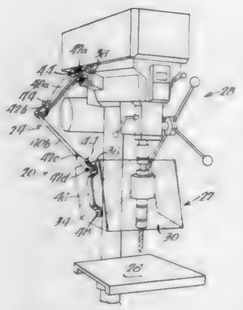
parallel to said fixed axis, and control means to move the axis of said tool from one axial and radial predetermined position relative to the axis of rotation of the arm, to another axial and radial predetermined position relative to said axis, said control means comprising means to move said axis of said tool only along X—X and Y—Y axes, to thereby slidably move said carrier along said arm and to simultaneously rotate said arm about its axis of rotation.

4,043,701

SAFETY SHIELD ASSEMBLY

Ben E. Jaeger, Rte. 2, Box 49, Plano, Ill. 60545

Filed May 19, 1976, Ser. No. 687,930
Int. Cl.[2] B23B *47/00*
U.S. Cl. 408—241 G **6 Claims**



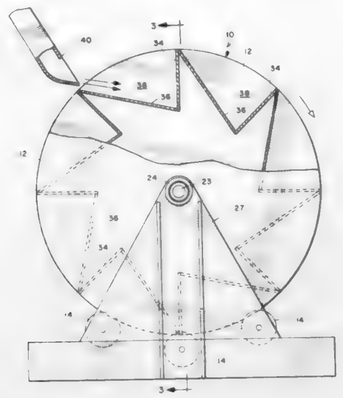
1. In a safety shield assembly for abrading of cutting tools and the like, a unitary, generally U-shaped transparent shield having a generally planar center portion and a pair of generally planar side leg portions extended out of the plane of said center portion; an arm having a plurality of movable joints, said arm being secured at one of its ends to one of said pair of side leg portions and being mountable at an opposite end to said machine remote from a work area thereof, said arm being movable to support said shield at a position in front of said work area with said center portion between said work area and an operator station and with said side leg portions extending away from said operator station toward opposite sides of said work area, and to support said shield at positions remote from said work area; and a handle fastened to said shield, grippable by an operator of said machine to move said shield on said arm to said positions.

4,043,702

WATER WHEEL ASSEMBLY

Lui Gotti, P.O. Box 333, El Centro, Calif. 92243

Filed Apr. 16, 1975, Ser. No. 568,611
Int. Cl.[2] F03B *7/00*
U.S. Cl. 415—202 **1 Claim**



1. A water wheel assembly comprising:

a. a water wheel having

i. a pair of spaced parallel circular side walls;

ii. a plurality of radially extended paddles mounted to and between peripheral portions of said side walls, each of said paddles having a radially inner edge and a panel mounted to and between said side walls and extending from the radially inner edge of the respective paddle substantially normally thereto and extending substantially to the circumference of said side walls;

b. means of supporting said water wheel for rotation on a horizontal axis comprising a plurality of flanged railroad car wheels rotationally mounted beneath and in supporting contact with said side walls and having flanges thereof mutually oppositely disposed to laterally secure said water wheel, said wheels each being non-translatory and having an axis parallel to the axis of said water wheel and the axes of said side walls;

c. a generally straight conduit extending upwardly to an elevated water supply and being open at the lower end, the lower end of said conduit being directed generally across the upper portion of said water wheel normal to the axis thereof such that water gushing from said conduit is directed generally toward consecutive ones of said paddles as said water wheel rotates;

d. said water wheel having an axle, and including mechanical linkage means coupling said axle to a power take-off shaft.

4,043,703

IMPACT RESISTANT COMPOSITE ARTICLE COMPRISING LAMINATED LAYERS OF COLLIMATED FILAMENTS IN A MATRIX WHEREIN LAYER-LAYER BOND STRENGTH IS GREATER THAN COLLIMATED FILAMENT-MATRIX BOND STRENGTH

Robert G. Carlson, Greenhills, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Dec. 22, 1975, Ser. No. 643,496
Int. Cl.[2] B23P *15/04*; B32B *7/04, 31/20*; F01D *5/14*
U.S. Cl. 416—230 **9 Claims**

1. A composite article comprising a plurality of bonded filament laminates, said laminates including a plurality of collimated filaments sandwiched between and bonded to two metallic foil layers comprising a matrix, wherein the degree of bonding between adjacent laminates is greater than the degree of bonding between the filaments and the matrix, and wherein the ultimate shear stress of the matrix occurs at a strain less than the ultimate shear strain of said filaments.

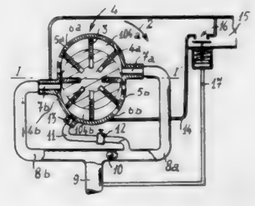
6. A blade for use in a fluid flow machine comprising a plurality of substantially parallel, bonded filament laminates, said laminates including a plurality of collimated filaments sandwiched between and bonded to two metallic foil layers comprising an aluminum-base matrix, wherein the degree of bonding between adjacent laminates is greater than the degree of bonding between the filaments and the matrix, and wherein the ultimate shear stress of the matrix occurs at a strain less than the ultimate shear strain of said filaments.

4,043,704

DOUBLE-ACTING ROTARY EXPANSIBLE CHAMBER PUMP ADAPTABLE TO SERIES OR PARALLEL OPERATION

Bernard Zimmern, Neuilly-sur-Seine, France, assignor to Uniscrew Limited, Hamilton, Bermuda

Filed July 15, 1975, Ser. No. 596,060
Claims priority, application France, Aug. 5, 1974, 74.27132
Int. Cl.[2] F04B *23/04*
U.S. Cl. 417—62 **8 Claims**



6. A regulated double acting rotary compressor comprising two compression spaces each constituted by at least one compression chamber provided with moving partition walls in cooperating relation with a casing, each of said spaces being respectively provided with at least one inlet orifice and a discharge orifice, wherein said casing is provided in the portion corresponding to one of said spaces with an additional orifice connected by a pipe to the discharge orifice of the other space, said pipe being provided with a shutoff valve, the dimension of said additional orifice being substantially inscribed within the contact area between said casing and one of the moving partition-walls aforesaid, and the position of said additional orifice being such that a compression chamber does not communicate simultaneously with said additional orifice and with any inlet orifice in any position of said moving partition-walls, thereby permitting the output flow of the first space to be added to the flow of the second space by operating said shutoff valve.

4,043,705

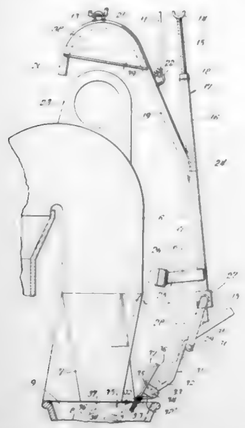
REACTOR JET PUMP PLUGS

Vernon I. Schlosser, 1009 N. 11th St., Clinton, Iowa 52732

Filed Nov. 24, 1975, Ser. No. 634,426
Int. Cl.[2] F04F *5/00*
U.S. Cl. 417—151 **10 Claims**

1. A tool of the class described for shutting off a boiling water reactor circulating jet pump which has a flat upwardly extending lug, comprising a vertically disposed tubular frame member **(16)** having a threaded longitudinal bore, an included longitudinally extending threaded actuating rod **(15)** threaded through said frame member and being rotatable on said threads to extend or retract the lower end of said rod **(15)**, a diagonally upwardly and laterally extending hook shaped suspension arm member **(19)** fixedly attached at its lower end to the upper part of the frame member **(16)** and having a downwardly open hooked portion **(19)** at its upper end, side bars on said hooked portion **(19)** adapted to embrace the flat upwardly extending lug **(23)** of a jet nozzle member **6**, a laterally projecting spacing

bracket (25) on the side of the tubular frame in alignment with the aforesaid hook shaped suspension portion, said threaded rod (15) having a manipulating eye at its upper end, laterally and downwardly extending diagonal bracket arms (28) fixed on opposite sides of the lower end of the frame member (16), a swinging closure lever (31) hinged intermediate its ends on and between the lower ends of said bracket arms (28), said hinged



closure member comprising a lever 31, one arm of which is engageable by said threaded actuating rod (15) and an upwardly facing closure pad (37) swiveled on the upper side of the other arm of the lever (31) for engaging a downwardly directed open jet pump nozzle member, the upper end portion of which member is adapted to be engaged by said hooked portion (20) of the suspension arm (19).

4,043,706

BEARING SUPPORT STRUCTURE FOR ELECTRO-MAGNET DRIVEN PUMP

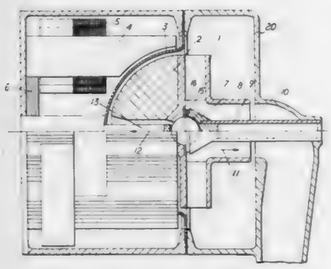
Alan John Walker, 3 Argyle Street, Dornoch, Sutherland, Scotland

Continuation of Ser. No. 476,293, June 4, 1974, abandoned. This application Apr. 30, 1976, Ser. No. 681,811

Claims priority, application United Kingdom, June 5, 1973, 26630/73

Int. Cl.[2] F04B *17/00, 35/04*

U.S. Cl. 417—353 **3 Claims**



3. An electromagnetically driven pump comprising:

a pump casing having first and second axially spaced end walls where said second wall comprises a substantially magnetically permeable material;

a fluid inlet coaxially positioned within said first wall;

a fluid outlet in said casing;

a rotor unit in said casing comprising a motor armature integral with a pump impeller and where said unit has a portion opposite said first wall and a portion opposite said second wall with substantially all of the portion opposite said second wall being under the influence of liquid pressure in the fluid outlet when said pump is operating;

a magnetic system exterior of said casing adjacent said second wall for providing a rotating magnetic force to rotate said rotor unit; and

a bearing structure coaxially mounted with respect to said first wall and extending within said casing towards said second wall with the bearing structure comprising a first spherical bearing surface mounted on said rotor unit and a pillar having a second bearing surface complimentary to said first spherical bearing surface coaxially mounted to said first wall to rotatably support said rotor unit against axial movement towards said first wall under the influence of liquid pressure in the fluid outlet when said pump is operating.

4,043,707

SUBMERSIBLE MOTOR-DRIVEN PUMP

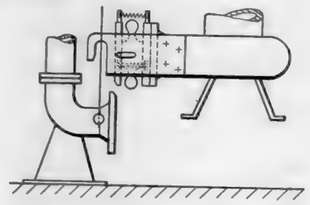
Anton Heumann, and Heinz Weibart, both of Nuremberg, Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed Oct. 14, 1975, Ser. No. 621,981

Claims priority, application Germany, Oct. 15, 1974, 2448540

Int. Cl.[2] F04B *39/14*

U.S. Cl. 417—360 **7 Claims**



1. An underwater pumping arrangement of the type including a submersible pump having a pump outlet conduit provided with a first connecting flange adapted to register with a second connecting flange of an outflow conduit permanently provided at the bottom of a liquid-filled pit or container so as to form with the second connecting flange a seal-tight conduit joint, and being of the type in which the pump as it is lowered into the liquid-filled pit or container towards the bottom thereof is guided by guiding means into a predetermined position in which the first connecting flange registers with the second connecting flange, the arrangement including supporting means at the underside of the pump for directly supporting the pump upon the bottom of the pit or container when the pump has been lowered into the predetermined position, and one of the conduits being provided with an expandable-contractable connecting chamber connected to one connecting flange and activatable for pressing the one connecting flange into seal-tight engagement with the other connecting flange to form the seal- tight conduit joint, whereby by virtue of the provision of the expandable-contractable connecting chamber and the supporting means there is established between the first and second connecting flanges a seal-tight engagement whose effectiveness is not mainly dependent upon the inherent weight of the pump itself, wherein the expandable-contractable connecting chamber assumes a certain installed-condition length when the connecting chamber is activated and maintains the connecting flanges pressed together, and further including biasing means operative for urging the connecting chamber and the one connecting flange connected thereto in direction towards the other connecting flange and operative when the pump is not yet in the predetermined position for urging the expandable-contractable connecting chamber into a position in which its length exceeds the installed-condition length by a predetermined distance, and further wherein the lower peripheral portion of the first connecting flange and the upper peripheral portion of the second connecting flange are complementarily

chamfered so that upon lowering of the pump into the predetermined position the chamfered portions engage each other causing the one connecting flange to be pushed back against the force of the biasing means by the other connecting flange, wherein the expandable-contractable connecting chamber is connected at one end of the connecting flange, and further including an additional flange connected to the other end of the connecting chamber and connected to the conduit provided with the connecting chamber, and where-in said biasing means comprises a plurality of compression springs located intermediate the one connecting flange and the additional flange and distributed around the periphery of the conduit provided with the connecting chamber.

4,043,708

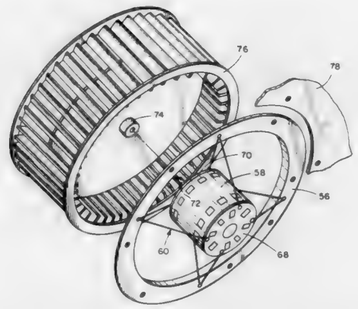
RESILIENT MOUNTING FOR FAN MOTOR

John B. Greenfield, Fort Smith, Ark., assignor to Rheem Manufacturing Company, New York, N.Y.

Filed Feb. 10, 1976, Ser. No. 656,783

Int. Cl.[2] F04B *17/00;* **F16F** *15/00;* **H02K** *5/24*

U.S. Cl. 417—363 **9 Claims**



1. An improved motor mount assembly for fan motors of the type having a housing with a generally cylindrical configuration, opposed end plates and a drive shaft extending outwardly from one end plate along the axis of rotation of the cylindrical housing, said assembly comprising, in combination:

a spaced, separate, generally circular bracket surrounding said motor housing, and forming a plane generally perpendicular to the axis of rotation generally intermediate the end plates;

a plurality of flexible cables for attaching the motor housing to the bracket, each cable having one end connected to the outer edge of one end plate and having the opposite end attached to the bracket, said cables being generally spaced in a radial direction outward from the center of the motor about the circumference of each motor end plate, and all connected to the bracket in the plane of the bracket to support the motor and prevent noise and vibration transmission from the motor, suspension and support of said motor being such that some rotational movement of the motor is permitted and rotational motor vibration transmission to the bracket is minimized.

4,043,709

ADJUSTABLE STOP ASSEMBLY

John J. Grevich, Star Prairie, Wis., assignor to Domain Industries, Inc., New Richmond, Wis.

Filed Aug. 21, 1975, Ser. No. 606,651

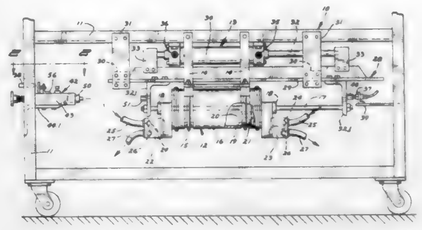
Int. Cl.[2] F04B *17/00, 35/00*

U.S. Cl. 417—404 **7 Claims**

1. A stop apparatus to provide an extension between the frame and slide of a reciprocating liquid product-measuring pump for operating the air control valve of the reciprocating air motor to actuate the pump, comprising:

an elongate mounting extending in the direction of movement of the slide and having a longitudinally extending recesss defining a seat;

an elongate adjustable stop snugly but removably fitted in said seat and having oppositely facing abutment surfaces adjacent its opposite ends, the abutment surfaces being interposed between the air valve and portions of the frame and slide to operate the valve at a predetermined slide position, the stop including an adjustment rod threadedly



mounted on the stop, one end of the rod comprising one of said abutment surfaces, the other end of the rod having a socket fitting, the end of the stop adjacent said socket fitting comprising the other of said abutment surfaces, an insert fitting slidable on the mounting and aligned with the rod for detachable telescopic union with the socket fitting for revolving the rod along the threads; and

readily releasable means retaining the adjustable stop on the mounting.

4,043,710

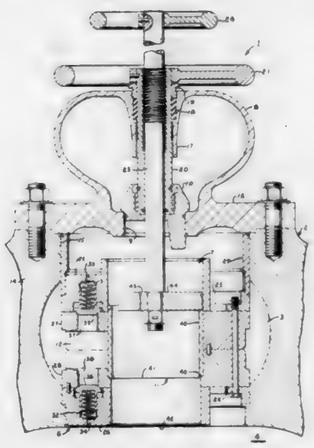
COMPRESSOR UNLOADER ASSEMBLY

Stuart E. Bunn, and Herbert B. Owsley, both of P. O. Box 388, Shawnee Mission, Kans. 66201

Filed Aug. 9, 1976, Ser. No. 712,927

Int. Cl.[2] F04B *23/00*

U.S. Cl. 417—440 **13 Claims**

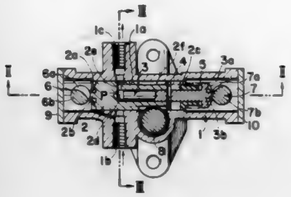


1. An unloader assembly for use in a gas compressor having a compressor cylinder and a compressor piston slideable therein, said unloader assembly comprising:

a. a suction valve communicating a compressor suction chamber and a compressor cylinder, said suction valve having an interior surface defining a central passage therethrough and a plurality of circumferentially spaced ports communicating the suction chamber and the suction valve central passage, said suction valve being adapted to permit one-way gas flow from said compressor suction chamber to said compressor cylinder with at least a portion of the flow being through said suction valve central passage;

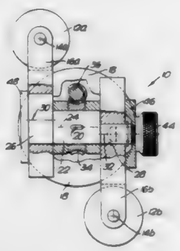
b. an unloader piston slideable in said suction valve central passage between a first position closing said suction valve ports and a second position opening said suction valve ports; and
c. means operatively connected to said unloader piston for selectively moving said piston between the first position and the second position.

4,043,711
LUBRICATING OIL PUMP
Tadashi Seino, Chigasaki, Japan, assignor to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Apr. 24, 1975, Ser. No. 571,400
Int. Cl.[2] F04B *19/02*
U.S. Cl. 417—469 **2 Claims**



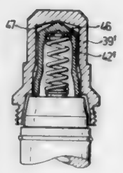
1. A lubricating oil pump comprising: a pump body having a cylinder chamber, suction port and at least one delivery port; a pair of plungers fitted rotatably and slidably in said cylinder chamber, having ridge-shaped cams formed along peripheral edge of respective outer end surfaces and connected with each other so as to be integrally rotatable in a rotating direction but relatively movable in a thrust direction; a pair of guiding column members positioned perpendicular to said pair of plungers and engaged respectively with said cams so that, when said pair of plungers are rotated, they may be respectively reciprocated in the thrust direction; a spring applied between said pair of plungers in order to bias them to be separated from each other; and a pump chamber defined by said pair of plungers therebetween and communicatable with said suction port and delivery port, a pumping action being carried out when either of said pair of plungers is driven.

4,043,712
ADJUSTABLE ROLLER PUMP ASSEMBLY
Graziano Azzolini, Cavezzo - MO., Italy, assignor to Sandoz Ltd., Basel, Switzerland
Filed Dec. 23, 1975, Ser. No. 643,678
Claims priority, application Italy, Dec. 17, 1975, 28990/75
Int. Cl.[2] F04B *43/08, 43/12, 45/06*
U.S. Cl. 417—477 **2 Claims**



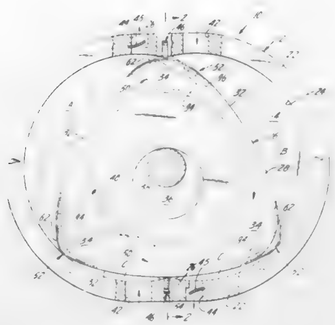
1. An adjustable roller pump assembly, comprising a pair of cylindrical rollers, a pair of arms at the end of which one of the pair of cylindrical rollers is rotatably mounted for rotation about their axis, a body rotatable about an axis in which the pair of arms are slideably mounted, the axes of the cylindrical rollers being parallel to and diametrically spaced away from the axis about which the body is rotatable so that sliding of the arms in the rotatable body adjusts the distance between the axes of the rollers, an adjustment shaft rotatably mounted in the body with its axis of rotation transverse to the axis about which the body is rotatable and carrying at each end a cylindrical locating element rotatable with rotation of the adjustment shaft, the axis of the cylindrical locating element at one end of the adjustment shaft being eccentric to one side of the adjustment shaft axis of rotation, and the axis of the cylindrical locating element at the other end of the shaft being equally eccentric to the other side of the adjustment shaft axis of rotation, the arms on which the rollers are mounted each being provided with a flattened cylindrical opening into which the cylindrical locating elements fit rotatably so that the axes of the rollers are equidistant from the axis of rotation of the body; whereby rotation of the adjustment shaft and locating elements causes displacement of the arms and corresponding displacement of the rollers.

4,043,713
FUEL INJECTION PUMP WITH SCREW CAP INSERT
Franz Eheim, Stuttgart, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany
Filed Oct. 21, 1975, Ser. No. 624,397
Claims priority, application Germany, Oct. 24, 1974, 2450521
Int. Cl.[2] F04B *7/04;* **F04b** *39/10;* **F16K** *15/00*
U.S. Cl. 417—499 **1 Claim**



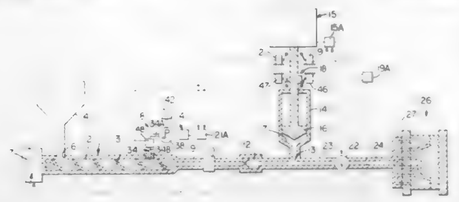
1. In a fuel injection pump for an internal combustion engine, said pump including a housing with a cylinder bore, a cylinder bushing within said bore, and a reciprocating and rotating pump piston moving within said cylinder bushing, and further includes a valve sleeve disposed coaxially with said cylinder bushing and containing a spring-loaded valve, a screw cap threadedly engaging said housing and serving as a fuel chamber and for compressing said valve sleeve against said cylinder bushing and against said housing; the improvement comprising:
a substantially cup-shaped elastic insert located coaxially within said screw cap and serving to transmit axial forces from said screw cap to said valve sleeve, said cylinder bushing and said housing and contained within said insert said spring, wherein:
i. said elastic insert has a closed end, remote from said valve sleeve, said closed end being at least partially conical; and
ii. said screw cap has an interior end region which is at least partially conical, for engagement with said conical end of said elastic insert, the slope of the conical surface of said screw cap being smaller than the slope of the conical end of said elastic insert.

4,043,714
SEAL GRID ASSEMBLY FOR ROTARY PISTON MECHANISM
Murray Berkowitz, Woodcliff Lake, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.
Filed May 24, 1976, Ser. No. 689,184
Int. Cl.[2] F01C *19/06, 19/04;* **F04C** *27/00*
U.S. Cl. 418—123 **13 Claims**



1. An improved seal grid assembly for rotary piston mechanisms, having a housing with axially spaced end walls and a peripheral wall interconnecting the end walls to form a multi-lobed cavity therebetween and having a rotor mounted within said cavity for rotation on an axis eccentric to the housing cavity axis, the rotor having opposite end faces adjacent the housing end walls and a plurality of flank surfaces converging with each other to form a plurality of circumferentially spaced apex portions so that the rotor defines with the housing walls a plurality of working chambers which vary in volumetric size and gaseous fluid pressure as the rotor rotates within the housing cavity, the improved seal grid assembly comprises, in combination with a seal blade means at each of the junctures of the housing cavity lobes;
a. a flexible plate seal carried in each of the apex portions of the rotor;
b. each of said flexible plate seals includes a sealing surface movable between a retracted position where it is out of engagement with the peripheral wall and an extended position where it is in engagement with the peripheral wall;
c. each of said flexible plate seals and its associated apex portion of the rotor defining a space therebetween;
d. a mechanical biasing means acting on the flexible plate seal to exert a force on the latter in a direction to urge the sealing surface in a retracted position; and
e. passage means in said rotor for each of said flexible plate seals communicating the associated space with the working chambers to conduct gaseous fluid to and from the working chambers and thereby allow movement of an associated flexible plate seal to the retracted position under the urging of the biasing means just prior to engagement with a non-rotating seal element at each of the lobe junctures and to effect movement to the extended position for re-engagement with the peripheral wall after such engagement with each of said non-rotating seal elements at the lobe junctures.

4,043,715
PUMPED INJECTION OF GAS FOR MAKING FOAMED PLASTIC
James W. Hendry, Holland, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.
Filed June 2, 1975, Ser. No. 582,631
Int. Cl.[2] B29D *27/00*
U.S. Cl. 425—4 R **12 Claims**



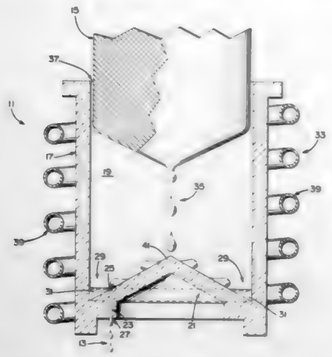
1. An apparatus for creating a foamed plastics material, the combination comprising:
a passageway comprising a wall bounding a chamber and plasticating means associated therewith for plasticating a plastics material while simultaneously causing same to travel through said passageway;
a source of gas inert to said plastics material having at least one gas outlet;
conduit means connected to said passageway through said at least one gas outlet for routing said gas to said passageway, said conduit means projecting beyond said wall into said chamber with said gas outlet offset from said wall into the path of plasticated material through said chamber;
a check valve in said conduit means and oriented to permit the passage of said gas to said passageway but prevent the passage of plasticated plastics material in the reverse direction;
means operatively associated with said conduit means for supplying a train of discrete gas pulses from said source through said conduit means to said passageway at a gas pulse pressure sufficiently exceeding the instantaneous plastics material pressure as to inject a discrete quantity of gas into said material travelling past said gas outlet, and at a gas pressure between pulses sufficiently lower as to stop gas entry into said material, said supplying means comprising an intermittent output, positive displacement pump and means operatively associated with said pump for repetitively cycling said pump at a gas pulse frequency which is high compared to the rate at which the passageway is refilled with fresh plastics material and synchronized with the desired rate of gas bubble ejection at said gas outlet, the gas bubble ejection rate being a function of the pulse frequency and number of gas outlets from said conduit means, and the quantity of gas per bubble is closely controllable, the volumetric capacity of the portion of said conduit means between said check valve and said passageway being less than the volumetric capacity of said pump.

4,043,716
APPARATUS FOR PROVIDING A STREAM OF MOLTEN METAL FROM A METALLIC INGOT
William Daniel Lafferty; James Thomas Smith, and Nicholas Wayne Rench, all of Towanda, Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.
Filed Dec. 4, 1975, Ser. No. 637,761
Int. Cl.[2] B22D *23/08*
U.S. Cl. 425—6 **11 Claims**

1. An apparatus for providing a stream of molten metal from a metallic ingot heated to melting within said apparatus, said apparatus comprising:
a substantially upright crucible member defining a chamber therein for receiving said metallic ingot and including a

lower base portion having at least one orifice therein, said orifice including a first open end having access to said chamber and an opposing second open end having access to the environment below said crucible member;

means within said crucible member for maintaining a quantity of molten metal from said metallic ingot at an established level within said chamber substantially below said first open end of said orifice; and



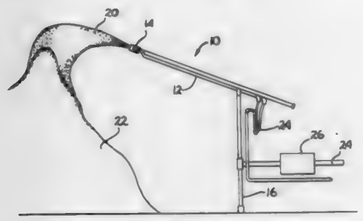
heating means positioned externally of said crucible member for heating said metallic ingot to a predetermined temperature sufficient to melt said ingot at a pre-established rate and for heating said quantity of molten metal within said maintaining means to an establishd temperature greater than said predetermined temperature of said ingot to facilitate passage of said molten metal through said orifice when said molten metal within said maintaining means exceeds said established level within said chamber.

4,043,717

SULPHUR GRANULATOR

Marcos D. Riano, Bakersfield, Calif., assignor to Valley Nitrogen Producers, Inc., Helm, Calif.

Filed Apr. 12, 1976, Ser. No. 675,905
Int. Cl.² B29C *23/00*
U.S. Cl. 425—7 **9 Claims**



1. A sulphur granulator for preparing granular sulphur from a stream of molten sulphur comprising:

a. a sulphur conduit having a uniquely designed spray head coupled at one end thereof, said spray head having a nozzle opening with a continuous cross-section configured orifice to discharge said sulphur in a deluge spray and a means for agitating said molten sulphur, said means for agitating disposed in said spray head adjacent said nozzle opening; and

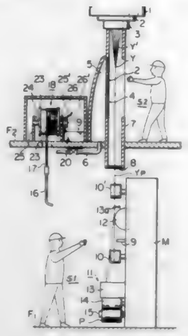
b. a water jacket circumferentially disposed about said sulphur conduit adjacent said spray head so as to form an annular orifice, said annular orifice terminating behind said nozzle opening.

4,043,718

SPINNING APPARATUS WITH RETRACTABLE SUCTION GUN

Yoshisuke Takenaka, and Kikuo Hori, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Sept. 30, 1975, Ser. No. 618,007
Claims priority, application Japan, Oct. 3, 1974, 49-113290; Oct. 3, 1974, 49-113291
Int. Cl.² D01D *7/00*
U.S. Cl. 425—72 S **7 Claims**



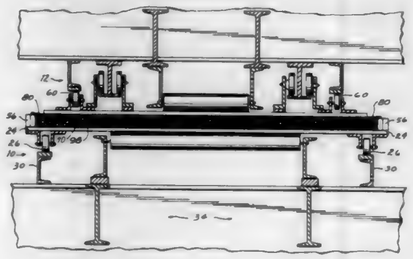
1. In a spinning apparatus for producing synthetic threads provided with at least one spinning unit including a spinneret for extruding a filamentary stream, a spinning duct below the spinneret for receiving said filamentary stream, a cooling chamber formed into said spinning duct for cooling and solidifying said filamentary stream into a thread, a take-up device mounted on a base floor below said spinning duct, a first work space for threading said thread onto the take-up device being provided on the base floor in front of said take-up device, and a hand-held aspirating type of suction gun disposed in said first work space for taking up the free end of said thread, an improvement comprising means located adjacent to the first work space for retractably retaining a conduit for supplying compressed air into said suction gun and a closely adjacent conduit for carrying exhaust air and waste threads from said suction gun in such a condition that said conduits are capable of being freely pulled out therefrom.

4,043,719

APPARATUS FOR PRODUCING RIGID FOAM PLASTIC LAMINATED BOARD

William R. Jones, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Filed Jan. 2, 1976, Ser. No. 646,334
Int. Cl.² B29D *27/04*
U.S. Cl. 425—115 **4 Claims**



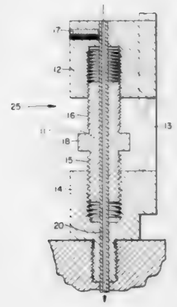
1. In an apparatus for making a foam plastic laminated board having a foam plastic core encased between an upper and a lower sheet member and in which said apparatus has a lower conveyor comprising abutting platens forming a continuous support surface in a horizontal plane, and an upper conveyor settably spaced from said lower conveyor, said conveyor having abutting platens forming a continuous limiting surface in a plane parallel to said horizontal plane of said lower conveyor and a pair of sheet unwind stations adjacent said conveyors adapted to provide said upper and said lower sheet members to said upper and lower conveyors, respectively, the improvement comprising having said platens of said upper conveyor shorter in a transverse direction than said platens of said lower conveyor, spaced limiting means attached along outer edges of each platen of said lower conveyor, said limiting means being located outwardly of the outer edges of said platens of said upper conveyor, said lower sheet having a width such that said lower sheet substantially spans the distance between said limiting means on said lower conveyor and said upper sheet having a width such that the outer edges of said upper sheet overlay said limiting means.

4,043,720

DEVICE FOR ADJUSTING STRAND CARRIER TUBE IN COMPOSITE YARN PRODUCING APPARATUS

Howard Alexander Mercer, Asheville, N.C., assignor to Akzona Incorporated, Asheville, N.C.

Filed July 11, 1975, Ser. No. 595,000
Int. Cl.² B29F *3/10*
U.S. Cl. 425—113 **5 Claims**



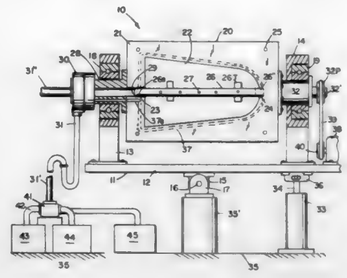
1. In an apparatus for forming a composite yarn comprising a carrier strand having an extruded polymer coating thereon, wherein the carrier strand is passed through a carrier tube positioned in a polymer extrusion die housing, said carrier tube functioning as a male die member to form an annular extrusion opening in the die housing, the improvement comprising: a support block attached to said die housing concentric with and surrounding a lower section of said carrier strand tube to thereby form a first channel, a portion of said first channel non-adjacent said die housing being spaced from said carrier tube and having a first pitch female screw thread; a longitudinally movable block concentric with, surrounding, and attached to an upper section of said carrier tube in spaced relationship to said support block; said movable block having a second channel concentric with and facing toward the first channel of said support block, a portion of said second channel being spaced from said carrier tube and having a second pitch female screw thread different from the first pitch screw thread facing axially toward the first pitch female screw thread of said support block and concentric with said carrier tube; means operatively associated with said movable block for preventing rotation of said movable block relative to said support block; and a longitudinal fitting concentric with and rotatable with respect to said carrier tube and interposed between said support block and said movable block, said longitudinal fitting having first and second pitch male screw threads mating respectively with the first and second pitch female screw threads so that rotation of the longitudinal fitting imparts relative movement between the movable block and the support block and between the carrier tube and the opening in the die housing as a function of the difference in pitch between the first and second screw threads.

4,043,721

COMPOSITE BODY MOLDING APPARATUS

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation of Ser. No. 300,248, Jan. 24, 1972, Pat. No. 3,875,273, which is a continuation of Ser. No. 744,048, July, 1968, abandoned. This application Feb. 6, 1975, Ser. No. 547,621
Int. Cl.² B29C *5/04, 27/00*
U.S. Cl. 425—116 **16 Claims**



1. A molding apparatus comprising:

a multiple-part mold defined by at least first and second mold members shaped to close together and to define a molding cavity therebetween in which cavity an article may be molded to shape,

first support means for rotatably supporting said multiple-part mold for rotation about a first axis,

means for varying the attitude of said first support means during the rotation of said mold thereon,

an elongated tubular member,

means for supporting said elongated tubular member fixed within said cavity of said multiple-part mold with said tubular member being detachably secured to said mold and extending from one wall of said mold,

supply means for a fluent molding material, said supply means being connected to said tubular member,

means for causing the flow of said fluent molding material to said tubular member from said supply means,

said tubular member having an opening therein to permit molding material to flow therefrom into said mold cavity, and

means for power rotating said mold about said first axis to distribute molding material about the surface of said mold cavity wall and the portion of said tubular member adjacent said wall of said mold to permit said molding material to solidify in situ on the wall of the mold and against said tubular member so as to form a composite molding defined by said hollow body with the tubular member integrally secured to the wall of said hollow body by the soldified molding material surrounding same near the mold wall and wherein both said hollow body and said tubular member are removeable from said mold.

4,043,722

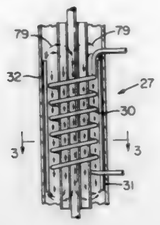
APPARATUS FOR HEAT CURING ELECTRICAL INSULATION PROVIDED ON A CENTRAL ELECTRICAL CONDUCTOR OF AN ELECTRICAL CABLE

John E. Baker, Wilmington, Del., and Charles C. Shackford, West Chester, Pa., assignors to Reynolds Metals Company, Richmond, Va.

Filed May 9, 1975, Ser. No. 575,943
Int. Cl.² B29C *25/00*
U.S. Cl. 425—174.8 R **12 Claims**

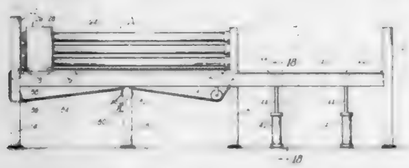
1. An apparatus for heat curing heat-curable electrical insulation provided on an electrical conductor of an electrical

cable by curing said insulation from its outer portion inwardly and substantially simultaneously therewith curing said insulation from its inner portion outwardly, said apparatus comprising, an outer housing made of a metallic material and adapted to contain steam under pressure, an electrical induction heating coil supported concentrically within said housing, said housing and coil being adapted to receive said conductor therethrough with its insulation thereon, said coil serving to heat said conductor within said housing which in turn transmits heat to said inner portion of said insulation to provide said heat curing thereof from said inner portion radially outwardly, a magnetic



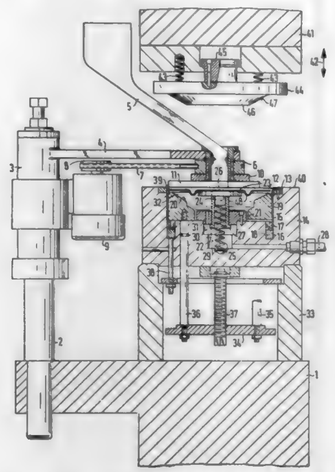
flux shield arranged within said housing and surrounding said induction coil, said shield providing a path of least resistance for lines for magnetic flux generated by said coil to thereby prevent said housing from being heated excessively during induction heating action provided by said induction heating coil, and means operatively connected to said housing for providing steam under pressure into said housing and against said insulation for providing said curing of said insulation from said outer portion inwardly, said substantially simultaneous curing of said insulation from its outer portion inwardly and from its inner portion outwardly being provided by said steam and said induction heating action respectively in said housing.

4,043,723
CONDUIT MOLDING MACHINE
Stewart E. Slaton, 2841 NE. 22nd Ave., Lighthouse Point, Pompano Beach, Fla. 33064
Filed Apr. 2, 1976, Ser. No. 672,998
Int. Cl.[2] B28B *7/18, 21/42*
U.S. Cl. 425—186 **10 Claims**



1. A conduit molding machine, comprising: an elongated supporting structure; a transversely extending bulkhead mounted on the upper part of the structure to form a mold receiving section and a mandrel operating section; said mandrel operating section including a travelling carriage having a plurality of mandrel driving sleeves disposed in parallel rows and in vertical tiers, said carriage including bearing means for rotatably supporting said sleeves; a mandrel disposed within each sleeve and mounted for rotative movement therein; a plurality of bearing sleeves carried by said bulkhead axially aligned with said sleeves in said carriage and adapted to receive said mandrels; a transversely extending plate fixed to said supporting structure adjacent said carriage, said plate including a plurality of openings therethrough aligned with said mandrels ian said carriage; means operatively associated with said carriage for reciprocating said carriage between said plate and said bulkhead whereby said mandrels traverse said mold receiving section; and means operatively associated with each mandrel for selectively connecting each mandrel to its surrounding driving sleeve or to an opening in said plate.

4,043,724
DEVICE FOR PRESSING ARTICLES SUCH AS PLATES FROM PULVERULENT PORCELAIN COMPOSITION
Rolf Egon Romnald Schubart, Kochel, Germany, assignor to Dorst-Keramikaschinen-Bau Otto Dorst U. Dipl. -Ing. Walter Schlegel, Kochel, Germany
Filed July 11, 1975, Ser. No. 595,235
Int. Cl.[2] B29C *3/00*
U.S. Cl. 425—218 **17 Claims**



1. A press for the pressing of articles such as plates with a rigid upper pressing punch shaped in accordance with the inner side of the article to be produced and with a space beneath the upper pressing punch which space is closed by an elastic membrane held in place by a filling web said membrane shaped on its edge in accordance with the peripheral shape and dimensions of the article to be produced, characterized in that the membrane is provided with an annular groove corresponding to the foot of the plate and has a height of filling amounting approximately to twice the foot height of the article to be produced and wherein the space closed by the membrane is filled with a pressure medium, and means for pressurizing the space closed by said membrane and filled with said pressure medium after the pressing punch is lowered to the pressing position and onto the pulverulent porcelain composition spread on the membrane within the limits given by the filling web.

4,043,725
APPARATUS FOR MOLDING PNEUMATIC VEHICULAR TIRES
Oskar Schmidt, Kittsee, Austria
Filed Sept. 30, 1976, Ser. No. 728,036
Claims priority, application Austria, Oct. 3, 1975, 7571/75
Int. Cl.[2] B29F *1/00;* **B29C** *6/00;* **B29H** *5/02, 5/08*
U.S. Cl. 425—542 **10 Claims**

1. An apparatus for molding a pneumatic tire with a body formed from a plurality of coaxial annular layers of elastomeric material, comprising:

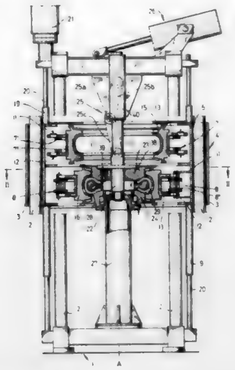
a frame;

a generally toroidal core on said frame centered on an axis;

a plurality of sets of mutually complementary ring segments with inner radii larger than the core radius, said inner radii being different for the several sets;

a plurality of carriers on said frame supporting the ring segments of respective sets with freedom of radial displacement, with reference to said axis, between an outwardly retracted position and a working position in which said segments complement one another to a continuous outer mold wall;

transport means coupled with said carriers for successively aligning the segments of sets with progressively larger inner radii with said core, the aligned segments in their

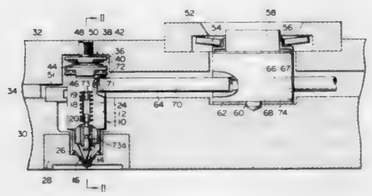


working position defining with said core an annular mold cavity;

closure means on said frame positionable to seal said mold cavity against the outside preparatorily to admission of elastomeric material into said mold cavity; and

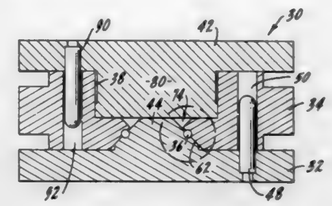
actuating means on said frame coupled with said ring segments for displacing same between said retracted and working positions thereof.

4,043,726
HOT RUNNER TYPE MOLD
Shiro Tsunemoto, Edosaki; Teruki Mizuguchi, and Eiichi Hirayama, both of Azuma, all of Japan, assignors to Fuji Plastic Co. Ltd., Japan
Filed July 23, 1975, Ser. No. 598,200
Claims priority, application Japan. May 21, 1975, 50-60632
Int. Cl.[2] B29F *1/03*
U.S. Cl. 425—563 **12 Claims**



1. A hot runner mold which comprises a nozzle assembly having a nozzle body supported floatingly between a fixed head die plate and a cavity plate and bored with a horizontal hole, a heat insulating spring washer provided between the nozzle assembly and the cavity plate and serving to prevent heat transmission from the nozzle assembly to the cavity plate and to absorb thermal deformation of the nozzle assembly in its axial direction, a sprue bush provided with a horizontal hole aligned with the horizontal hole of the nozzle body, a buffer mechanism provided at the opposite end of said nozzle assembly from said heat insulating spring washer and serving to floatingly support the nozzle body and to absorb a repeated load during an injection operation in cooperation with said heat insulating spring washer, and a straight runner pipe made of material having good heat conductivity and slidably fitted in the horizontal holes, the runner pipe having its inside surface concavely curved at both end portions such that the end portions are progressively thinner toward the tips so as to cause the inner diameter of the tips to approximate the outer diameter thereof whereby the end portions expand in the radial direction into tight sealing engagement with the walls of the horizontal holes.

4,043,727
O-RING MOLD
Jerry Henzl, Crystal Lake, Ill., assignor to Crane Packing Company, Morton Grove, Ill.
Filed May 3, 1976, Ser. No. 682,743
Int. Cl.[2] B29F *1/00*
U.S. Cl. 425—578 **8 Claims**



1. A mold for forming ring seals free of flash at their internal and external diameters comprising:

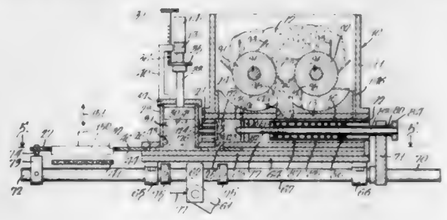
a. a first plate having at least one frustrum extending from a surface thereof; said frustrum having a circumferential groove formed therein to generally define one-half of a mold cavity for a ring seal;

b. a second plate having a recess for receiving said frustrum, said second plate having a circumferential groove therein extending about said recess to generally define another half of a mold cavity;

c. said frustrum and recess having mating surfaces on one side of said cavity to seal said cavity, and spaced surfaces on the opposite side of said cavity to define a ring-shaped orifice; and

d. plunger means for injecting a seal composition through said orifice into said cavity.

4,043,728
MOLDING APPARATUS
Harry H. Holly, Boca Raton, Fla., assignor to Hollymatic Corporation, Park Forest, Ill.
Continuation of Ser. No. 619,848, Oct. 6, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,434
Int. Cl.[2] A22C *7/00*
U.S. Cl. 425—256 **5 Claims**



1. Apparatus for pressure molding a shaped article from a tissue containing food material subject to shrinkage during cooking, comprising: supply means for said material; a pressure chamber communicating with said supply means to receive material therefrom; a movable pressure applying means in the pressure chamber; a receiver chamber; means providing a supply passage for flow of material between said pressure

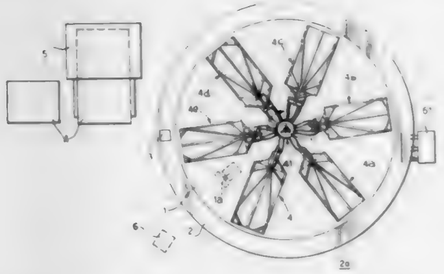
chamber and said receiver chamber communicating with said pressure chamber to receive pressurized material from said pressure chamber; means for moving said pressure applying means in said pressure chamber for exerting pressure on said material and thereby forcing the resulting said pressurized material into said receiver chamber; a movable mold plate having a cavity mold opening for registering with the said material in said receiver chamber; means for moving said mold opening into communication with said receiver chamber; means providing for flow of material from said receiver chamber to said mold opening; a piston in said receiver chamber; means for positioning said piston away from said mold plate to provide space for a preselected amount of said material between said piston and said mold plate opening; mold filling means for forcibly moving said piston to apply pressure to the said material in said receiver chamber thereby filling said mold opening with said material, said piston having a pressure applying end that is substantially flush with said mold plate at the completion of said filling; means for thereafter moving said mold and thereby said mold opening to a position where said mold opening is out of communication with said receiver chamber whereat said article is ejected from said mold opening; and means for maintaining said piston substantially flush with said mold at said opening during said moving of said mold opening thereby maintaining molding pressure on said material in said opening.

4,043,729

APPARATUS FOR SHAPING FLOOR COVERINGS FOR THE INTERIORS OF VEHICLES

Antonio Paracchi, Turin, Italy, assignor to Textilform S.A., Luxembourg

Filed Feb. 9, 1976, Ser. No. 656,110
Claims priority, application Italy, Feb. 17, 1975, 67400/75
Int. Cl.² B29C *17/00, 3/02*
U.S. Cl. 425—348 R **11 Claims**



1. On a factory floor, apparatus for shaping floor coverings for the interiors of vehicles, the apparatus comprising:

a turntable rotatable about a vertical axis, the turntable having a flat top surface for carrying operators, which top surface is not more than one step up or down from the factory floor;

means for rotating the turntable at a slow speed;

a plurality of operator-controlled presses mounted on the turntable, each press comprising a female die and a male die for hot-shaping the floor coverings to impart thereto a three-dimensional shape, and at least one pressure fluid actuator for closing the press;

supply pipes for supplying pressure fluid to the actuators of the presses; and

a rotary distributor on the axis of the turntable and connected to the pressure fluid supply pipes for the press actuators, for connecting the supply pipes to a stationary supply of pressure fluid;

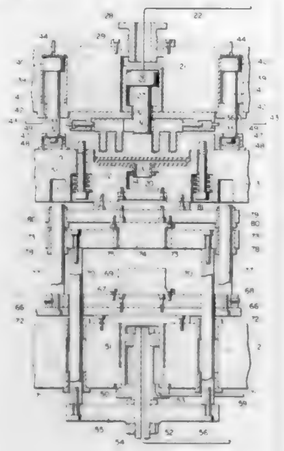
whereby unshaped floor coverings can be supplied to the turntable from one station, be shaped by the presses while the turntable rotates, and be removed from the turntable at another station.

4,043,730

HYDRAULIC PRESS FOR THE PRODUCTION OF TILES, DISHES, CUPS OF CERAMIC MATERIAL AND THE LIKE

Luigi Bettonica, Via Clusone, 3 Milan, Italy

Filed Apr. 28, 1976, Ser. No. 681,026
Claims priority, application Italy, May 13, 1975, 23241/75
Int. Cl.² B29B *5/02, 11/02*
U.S. Cl. 425—352 **4 Claims**



1. A press for the production of ceramic tiles and dishes, comprising in combination a pair of stationary top and bottom heads (1 and 2), columns (4) interconnecting said heads, a crosshead (3) mounted for vertical movement on said columns between said heads, a pressing plate (9), means (10,11) connecting said pressing plate to said crosshead (3) for limited vertical movement of said pressing plate relative to said crosshead, a bag of elastically flexible material between said pressing plate and said crosshead, means for supplying fluid under pressure to the interior of said bag, a die (73) having at least one die recess opening vertically therethrough, a movable punch (74) carried by said crosshead, a stationary mold (69) connected to one of said stationary heads, said punch (74) and mold (69) being receivable in opposite ends of said die recess, means (50,51) to move said die vertically relative to said stationary mold, hydraulic jack means (40,41) for moving said crosshead and punch vertically relative to said die independently from the pressure which is exerted by said elastically flexible bag, and means (30) for selectively restraining movement of said crosshead away from said die, whereby said supplying of fluid under pressure to said bag applies high pressure to said punch in the direction of said stationary mold.

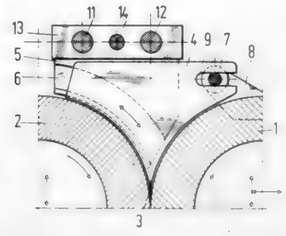
4,043,731

CALENDER WITH NIP BOUNDARY PLATES

Helmut Kratzmann, Altotting; Josef Heinik, Burgkirchen, Alz; Robert Obermaier, Burgkirchen, Alz; Erich Zentner, Burgkirchen, Alz, and Robert Redinger, Altotting, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 16, 1976, Ser. No. 742,138
Claims priority, application Germany, Nov. 20, 1975, 2552034
Int. Cl.² B29D *7/14*
U.S. Cl. 425—366 **1 Claim**

1. A calender with rollers forming nips in which the nip between a pair of rollers, of which one is obliquely adjustable, is bounded at the sides by plates adapted to the geometrical shape of the nip region, comprising boundary plates provided with slots, a control beam parallel to the obliquely adjustable roller, which beam engages into said slots and the ends of which join to the bearings of the obliquely adjustable roller,



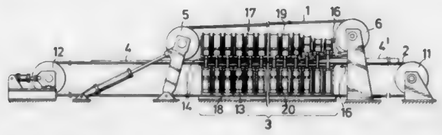
supporting plates on which the boundary plates are displaceably mounted by means of a guide device so that the plates on oblique adjustment of the adjustable roller are moved along a path which is concentric with the surface of the roller which is not obliquely adjustable.

4,043,732

PRESS FOR EXERTING FLAT PRESSURE

Karl-Heinz Ahrweiler, Krefeld, Germany, assignor to Eduard Kusters, Krefeld-Forstwald, Germany

Filed Dec. 22, 1975, Ser. No. 643,079
Claims priority, application Germany, Jan. 9, 1975, 2500706; Apr. 18, 1975, 2517204
Int. Cl.² B29C *15/00;* B29J *5/10*
U.S. Cl. 425—371 **9 Claims**



1. In continuous press which extends in the longitudinal direction including endless loops formed by longitudinally and transversely flexible conveyor belts which form opposed, substantially linear traveling spans moving in the longitudinal direction and defining a pressing zone, support structures applying pressure through said traveling spans to a strip of work carried therebetween and antifriction means in the form of multiplicity of endless loops of rotatively unpowered roller chains forming a bed of roller chain spans interposed between said support structures and said traveling spans, said roller chain spans extending in the longitudinal direction and being transversely packed together but each chain loop being individually free to travel independently with respect to the other loops of said multiplicity and said traveling spans, the improvement comprising said roller chains spans divided in the longitudinal direction of the press into a plurality of groups of closely following independent, endlessly circulating individual roller chain groups each having a plurality of transversely packed loops of roller chains individually free to travel independently.

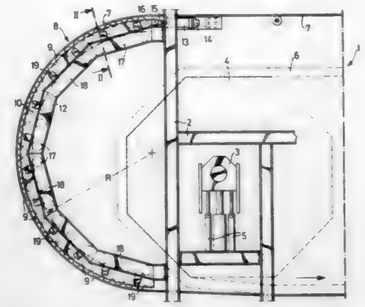
4,043,733

ENDLESS BELT GUIDE ARRANGEMENT FOR A CONTINUOUSLY OPERATING PRESS

Albert De Mets, Roeselaare, Belgium, assignor to Bison-werke Bahre & Greten GmbH & Co. KG, Germany

Filed June 29, 1976, Ser. No. 700,741
Claims priority, application Germany, July 2, 1975, 2529540
Int. Cl.² B29J *5/00*
U.S. Cl. 425—371 **22 Claims**

1. A guide arrangement for drivable endless belts associated with a manufacturing press which has an inlet zone and an outlet zone, the arrangement comprising: a plurality of guide roll means arranged on the press mutually parallel with respective axes thereof being arranged along a semicircle at at least one of the inlet zone and outlet zone of the press, means arranged on the press at at least one of the inlet zone and outlet



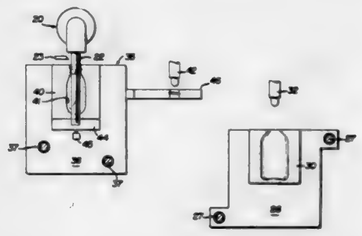
zone on respective sides of the endless belt for mounting said guide roll means, and means for selectively controlling displacement of at least one of said guide roll means mounting means along a semi-circular displacement path such that the endless belt is secured against lateral movement.

4,043,734

APPARATUS FOR BLOW MOLDING PLASTIC CONTAINER

Ambrose B. Dybala; Thomas J. Krall, and Albert R. Uhlig, all of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 490,713, July 22, 1974, Pat. No. 3,978,184.
This application Mar. 15, 1976, Ser. No. 666,990
Int. Cl.² A01J *21/00*
U.S. Cl. 425—532 **9 Claims**



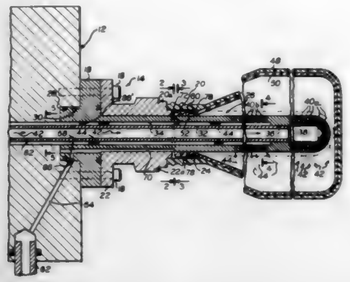
1. In a blow molding apparatus wherein a pre-form blow mold comprising a pair of mold sections shuttles between a parison-forming station and a pre-form blowing station, the pre-form blow mold sections being closed during movement to the pre-form blowing station and opened during return movement to the parison-forming station, and a final blow mold is permanently fixed at a final blowing station, the improvements of a clamping projection on each of said pre-form blow mold sections projecting toward said final blow station to be positioned at said pre-form blowing station when the pre-form blow mold is at said parison forming station and to be positioned at said final blow mold station when said pre-form blow mold is at said pre-form blowing station, said clamping projections being openable and closable with said pre-form blow mold sections and cooperably engaging therebetween a blown pre-form located at the pre-form blowing station when the pre-form blow mold sections are closed on a parison at the parison forming station and retaining the blown pre-form at the final blow molding station for blowing in said final blow mold as a parison is blown at the pre-form blowing station.

4,043,735

BALLOON BLOW MOLDING TOOLING

John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Green Brook, N.J.

Division of Ser. No. 419,510, Nov. 28, 1973, Pat. No. 3,955,908.
This application Mar. 29, 1976, Ser. No. 671,054
Int. Cl.[2] B29C *17/07*
U.S. Cl. 425—389 2 Claims



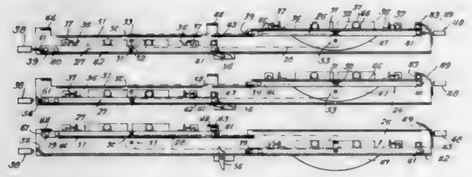
1. A core rod for blow molding comprising a rod having first passage means and first orifice means communicating with said first passage means and with a mold chamber exterior of said rod and into which said core rod extends, and having second passage means and second orifice means communicating with said second passage means and with said chamber, means to provide blowing fluid under pressure into said chamber through said first passage means and first orifice means and said blowing fluid is removed from said chamber through said second orifice means and second passage means and wherein said first passage means comprises a tube coaxially disposed within said rod and said first orifice means is disposed at the end of the rod extending into said chamber, and said second passage means comprises an annular space between the exterior surface of said tube and the interior surface of the rod, and the second orifice means being spacedly disposed from said first orifice means and being spaced from the end of the rod extending into the chamber, and further comprising means to provide a fluid tight connection between the portion of said tube disposed at said end of the rod and the interior surface of the rod.

4,043,736

TWO-SHUTTLE THERMOFORMING MACHINE

Philip J. Andres, IV; John E. Crisler, and Sol I. Kalmich, all of Wheaton, Ill., assignors to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Sept. 17, 1975, Ser. No. 614,339
Int. Cl.[2] B29C *3/04*
U.S. Cl. 425—397 8 Claims



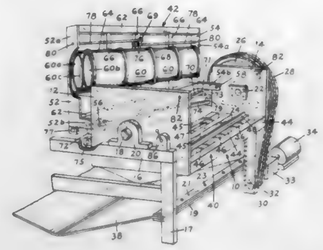
1. A two-shuttle apparatus for a thermoforming machine which includes only two stations, a heating station, and a forming and loading station spaced generally horizontally from the heating station; said apparatus including a pair, only, of sheet-carrying shuttles having sheet-clamps thereon; means for moving the shuttles in endless tandem, with each shuttle passing through the entire of a vertically looped circuit to pass directly between and stop only at said stations repeatedly in an uninterrupted continuous sequence, while maintaining the shuttles right-side up, said means moving the shuttle moving toward the heating station above the shuttle moving from the heating station.

4,043,737

APPARATUS FOR CASTING IN MOLDS FOR THE PRODUCTION OF CERAMIC HOLLOWWARE

Jerome S. Greenberg, Chicago, Ill., assignor to Regal China Corporation, Antioch, Ill.

Filed Mar. 17, 1975, Ser. No. 559,038
Int. Cl.[2] B28B *1/28*
U.S. Cl. 425—434 7 Claims



1. Apparatus for use in casting ceramic holloware in molds comprising a substantially fixed support structure, an elongated carriage rotatably mounted in said support structure, said carriage comprising an elongated first frame and an elongated second frame, said second frame being pivotally mounted for movement with respect to said first frame to and from an open position in which said second frame is disposed at an angle to said first frame and a closed position in which said second frame is substantially parallel with said first frame, said frames in their closed position being adapted to hold therebetween a plurality of molds, said first frame having secured thereto a restraining member for engagement with said molds to substantially prevent relative movement of said molds with respect to said first frame during the casting of holloware and the rotation of said carriage, said restraining member comprising a metal bar extending substantially the length of said first frame, a portion of said bar extending inwardly from said first frame throughout substantially the length thereof and toward said second frame which portion engages notches in said molds, and a dual inflatable member on the inner side of said second frame which in the closed position thereof faces toward said first frame, said inflatable member including at least two cells pneumatically interconnected for substantially simultaneous inflation thereof whereby said carriage may hold molds of varying sizes simultaneously.

4,043,738

VIBRATORY COMPACTING MACHINE

Narciso G. Modesto, 585 Crest Court, Lake Forest, Ill. 60045, and Robert J. Brejcha, 10657 Preston St., Westchester, Ill. 60153

Filed Oct. 29, 1975, Ser. No. 626,708
Int. Cl.[2] B28B *1/08*
U.S. Cl. 425—456 4 Claims

1. A machine for compacting and leveling a poured floor covering, comprising:

a generally horizontal frame having depending roller journal means on opposite sides thereof;

vibratory means securely connected to the frame; and

a plurality of elongated rollers rotatably mounted at their ends to said journal means and extending therebetween for contacting the floor covering and supporting the weight of the machine for movement thereover, said rollers being mounted on said journal means with their centerlines lying on a generally downwardly directed, convex line generally perpendicular to the centerlines of the rollers so that the centermost roller is lower than the two endmost rollers and the intermediate rollers are proportionately positioned therebetween.

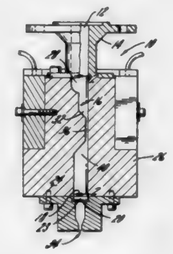


4,043,739

DISTRIBUTOR FOR THERMOPLASTIC EXTRUSION DIE

David W. Appel, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Apr. 21, 1975, Ser. No. 569,779
Int. Cl.[2] B29F *3/04*
U.S. Cl. 425—461 16 Claims



1. In an extrusion die for thermoplastic polymer,

an elongated orifice defining means,

an inlet for receiving molten polymer from an extruder, the axis of said inlet being normal to and intermediate the ends of said orifice defining means, and

distributor means defining a distributor cavity connected to and symmetrical laterally of the axis of the inlet and through which molten polymer flows axially from said inlet toward said orifice defining means,

said distributor cavity having axially connected sections including: (1) a distribution section having means defining channels for conveying polymer from the inlet laterally and in which the pressure loss and residence time of polymer flow varies across the full extent of said orifice defining means; (2) a pressure loss control section having, downstream of said distribution section, means defining passages of restricted substantially constant depth and of varying axial length in which the residence time is short and substantially constant, and; (3) a time lag control section having, downstream of said pressure loss control section, means defining passages of enlarged substantially constant depth compared with said pressure control section and of varying axial length in which the pressure loss is small and substantially constant,

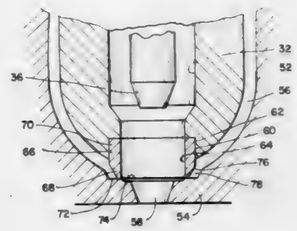
each of said sections having a pressure loss characteristic curve and a residence time characteristic curve the ordinates of which represent pressure loss and residence time of molten polymer flowing axially through each section at various lateral distances from the inlet axis, and wherein at any given lateral distance (1) the sum of the ordinates of the pressure loss characteristic curves of the distribution section and pressure loss control section is substantially a constant value, and (2) the sum of the ordinates of the residence time characteristic curves of the distribution section and time lag control section is substantially a constant value, such that the pressure loss control section compensates for the varying pressure loss in the distribution section and the time lag control section compensates for the varying residence time in the distribution section, and the pressure loss and residence time of molten polymer flowing from said inlet to all points along said orifice defining means is substantially constant.

4,043,740

INJECTION MOLDING NOZZLE SEAL

Jobst Ulrich Gellert, 11 Newton Road, Brampton, Ontario, Canada

Filed June 14, 1976, Ser. No. 695,659
Claims priority, application Canada, Mar. 25, 1976, 248836
Int. Cl.[2] B29F *1/03*
U.S. Cl. 425—567 6 Claims



1. In an injection molding valve-gated mechanism having a vertical valve pin which reciprocates in a bore in a heater cast located in a cavity plate to control flow of molten plastic from a molding machine to a cavity, the heater cast having a lower nozzle portion which is separated from the adjoining cavity plate by an air space and through which a valve pin projects to provide a valve in a gate in the cavity plate to a cavity adjacent the lower tip of the nozzle portion of the heater cast, the improvement wherein a hollow generally cylindrical thermally conductive metallic seal having an upper and a lower portion and a central bore is received in a radially inwardly open cylindrical recess provided in the bore of the nozzle portion of the heater cast, said recess being open axially downwardly and sized to snugly receive said seal so that the surface of the bore of said seal and the axially adjacent surface of the nozzle bore are contiguous, said seal projecting downwardly across the air space and having a horizontal surface received in bearing contact with an annular seat provided on said cavity plate upon vertical thermal expansion of the heater cast.

4,043,741

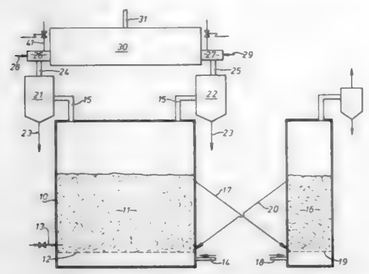
BURNER EQUIPMENT AND OPERATION THEREOF

Gerald Moss, Oxford; Graham Lloyd Johnes, Wantage, and John William Thomas Craig, East Hendred, all of England, assignors to The United States of America as represented by the Administrator, Environmental Protection Agency, Washington, D.C.

Filed Mar. 11, 1976, Ser. No. 665,831
Claims priority, application United Kingdom, Mar. 12, 1975, 10277/75
Int. Cl.[2] F23J *7/00*
U.S. Cl. 431—3 27 Claims

1. A method of removing deposits from fuel combustion equipment in which a fuel having a tendency to form deposits is passed from a source of the fuel to a plurality of fuel burners via flow paths comprising respective fuel conduits, comprising closing off the flow path of fuel gas to one burner at a time, and

passing a deposit-removing reactant into the closed off flow path, in a direction opposite to the normal direction of flow of



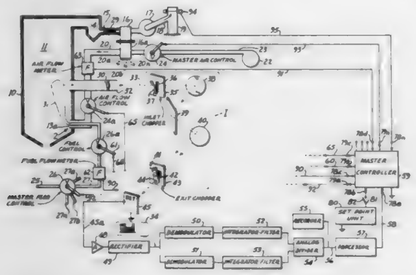
fuel, from a location adjacent to and upstream, of the position of closing off of the fuel flow path.

4,043,742

AUTOMATIC BURNER MONITOR AND CONTROL FOR FURNACES

Dale W. Egan, Covina; Lyman F. Gilbert, Arcadia; Harry C. Lord, West Covina; Alan E. Opel, Monrovia, and Geoffrey B. Holstrom, Claremont, all of Calif., assignors to Environmental Data Corporation, Monrovia, Calif.

Filed May 17, 1976, Ser. No. 687,227
Int. Cl.[2] F23N *5/08*
U.S. Cl. 431—12 **31 Claims**



1. In combination with a furnace of the type having a burner where fuel is burned in the presence of air to create a flame, means for delivering fuel to the burner, and means for delivering air to the burner;

means for viewing the flame and receiving radiation from it over a range of wave lengths radiated from the flame;

means for selecting radiations from the viewing means at the wave length regions of two wave length sets within the range;

means for detecting the intensity of radiations at the selected wave length regions;

means responsive to the detecting means for producing an output signal having a magnitude dependent upon the relationship of the radiation intensities at the selected wave length regions;

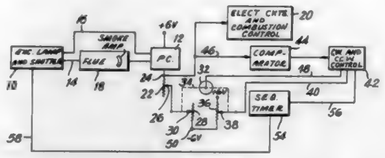
whereby the magnitude of said output signal provides an indication related to the quality of the flame and the fuel-air ratio at the burner.

4,043,743

COMBUSTION CONTROL SYSTEM

Seymour Seider, Hewlett Harbor, N.Y., assignor to B.S.C. Industries Corporation, Hewlett Harbor, N.Y.

Filed Aug. 9, 1976, Ser. No. 712,549
Int. Cl.[2] F23H *5/08*
U.S. Cl. 431—76 **20 Claims**



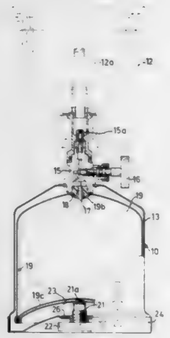
1. Combustion control apparatus comprising combustion means producing smoke incidental to the burning of fuel, combustion control means for controlling combustion in said combustion means as a result of which the density of said smoke is varied, smoke exhaust means defining a path along which said smoke is evacuated, adjustable electrical circuit means for operating said control means, a radiation source, detection means for detecting said radiation, and further means for guiding said radiation through and around the path along which said smoke is evacuated and for adjusting said electrical circuit means to provide a continuously adjustable reference against which measurements of smoke density are made for controlling said combustion, the measurements of smoke density being made by said detection means in accordance with the radiation being guided through said path and the adjustable reference being provided in accordance with the radiation being guided around said path.

4,043,744

BASE OR STAND FOR A CAMPING STOVE

Karl Ernst Svensson, Eskilstuna, Sweden, assignor to Aktiebolaget Optimus, Sweden

Filed Aug. 27, 1975, Ser. No. 608,107
Claims priority, application Sweden, Sept. 4, 1974, 74111873
Int. Cl.[2] F23Q *2/00;* **F24C** *5/20*
U.S. Cl. 431—142 **5 Claims**



1. A gas container housing for a camping stove, comprising:

a substantially cylindrical housing having a substantially closed upper part and an open lower part, said cylindrical housing adapted to enclose a gas container;

a valve unit rigidly attached to said upper part of said cylindrical housing and including an upwardly directed, threaded portion extending without said housing and an axially downwardly directed puncture means extending downwardly into said housing for puncturing an inserted expendable container;

a cover adapted to engage said open lower part of said housing such that when said housing and said cover are in operational engagement they form a substantially enclosed unit;

an axially extending screw threadably attached to said cover and having a first end extending into said substantially enclosed unit and a second end extending without said substantially enclosed unit;

a spreader plate rotatably connected to said first end of said screw and axially movable with said screw, said spreader plate being adapted to engage the underside of said container such that the container is centered relative to said housing by said spreader plate;

said axially extending screw being rotatable from a first position wherein said spreader plate supports said container a sufficient distance from said upper part of said housing such that said container is not engaged by said puncture means and a second position wherein said container is punctured by said puncture means;

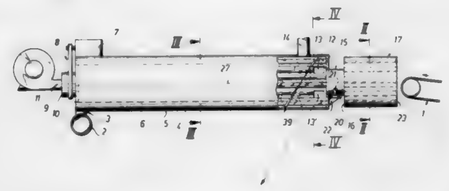
coupling means for selectively coupling said cover to said housing to form a substantially enclosed chamber, said coupling means both retaining said cover on said housing when said valve unit punctures said container and preventing said cover from being removed from said housing when said container is positioned within said housing and said screw is in said second position.

4,043,745

APPARATUS AND PROCESS FOR THE DRYING OF WET, LOOSE MATERIAL, IN PARTICULAR, COKE POWER OR FINES

Günther Unger, 186, Velberterstrasse, Heiligenhaus, Germany (5628)

Filed Feb. 5, 1976, Ser. No. 655,515
Claims priority, application Germany, Sept. 25, 1975, 2542670
Int. Cl.[2] F27B *7/30, 7/32*
U.S. Cl. 432—13 **21 Claims**



1. A process for the drying of wet, pulverulent material while avoiding the generation of air borne dust by means of a burner providing a flame and flue gases extending along an axis, said method comprising the steps of:

moving the wet, pulverulent material along the axis from a point spaced from said burner toward said burner while rotating the material about an axis aligned with the axis of the flame and gases for exposing the materials to the gases for predrying the material down to a predetermined moisture level at or above which dust generation does not occur, said movement and rotation entraining the removed moisture in discharged gases; thereafter

continuing the movement and rotation of the predried material along the axis while placing the material in closed heat transfer relationship with respect to the flame and gases to further dry the material to a terminal moisture level below the predetermined moisture level; and

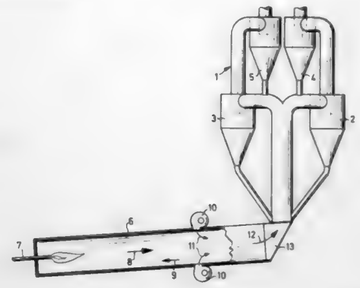
discharging the moisture produced by the further drying of the material.

4,043,746

METHOD FOR THE HEAT TREATMENT OF FINE-GRAINED MATERIALS CONTAINING ALKALI COMPOUNDS

Horst Ritzmann, Enniger, Germany, assignor to Polysius AG, Germany

Continuation-in-part of Ser. No. 507,388, Sept. 19, 1974, abandoned. This application Apr. 23, 1976, Ser. No. 679,806
Int. Cl.[2] F27B *7/20*
U.S. Cl. 432—14 **8 Claims**



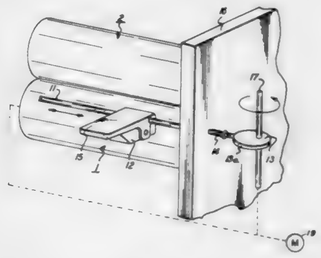
1. A two-stage method of sintering fine-grained raw cement meal containing a solid compound which at a critical temperature lower than the sintering temperature of said material tends to liquify and form deposits, said solid compound being from the group composed of SiO_2, Al_2O_3, TiO_2, Fe_2O_3, Mn_2O_3, CaO, MgO, SO_3, P_2O_5, Na_2O, K_2O, Cl, and mixtures thereof, said method comprising discharging said material from a preheater to one end of a sintering kiln; directing through said kiln from the other end thereof toward said one end hot gases at a temperature sufficiently high to sinter said material; exhausting the gases from said kiln to said preheater to preheat said material prior to its discharge to said one end of said kiln; and introducing cooling air into said kiln adjacent said one end thereof in sufficient quantity and at such temperature to ensure that the temperature of the gases exhausted from said kiln to said preheater is lower than that of said critical temperature.

4,043,747

PRESSURE HEAT FIXING DEVICE

Masuji Ogiwara, Ebina, Japan, assignor to Rank Xerox Ltd., London, England

Filed Sept. 27, 1976, Ser. No. 726,867
Claims priority, application Japan, Aug. 22, 1975, 50-114947
Int. Cl.[2] G01K *1/14*
U.S. Cl. 432—60 **1 Claim**



1. In a pressure heat fixing device comprising a pair of heated fixing rollers rotated in pressure contact with one another and at least one of said rollers having its surface temperature detected by a temperature detecting means in surface contact therewith, the improvement comprising,

temperature detection means pivotally mounted on a shaft

member to contact the surface of said roller, said shaft member extending parallel to the longitudinal axis of said roller,

drive means for imparting a reciprocating movement to said shaft member to move said temperature detection means in a first direction parallel to the axis of said roller and then a second direction opposite said first direction,

said drive means including an eccentric cam member drivingly coupled to said roller whereby upon rotation of said roller said cam member is rotated to effect movement in a first direction and spring means arranged between said shaft member and said cam member to effect movement in a second direction upon continued rotation of said roller and cam member.

4,043,748

EVAPORATION BOATS FOR USE IN VAPOR DEPOSITION

Kiyoshi Watanabe; Kazuo Sunahara, both of Mobara; Motoyasu Terao, Tokyo, and Tsutomu Fujita, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 19, 1976, Ser. No. 715,716
Claims priority, application Japan, Dec. 12, 1975, 50-150560
Int. Cl.[2] F27B *21/04*
U.S. Cl. 432—253 **8 Claims**

1. An evaporation boat comprising superposed upper and lower sheets, said upper sheet having a upwardly convexed central section and a pair of side sections connected to the transverse opposite ends of said central section and bent back toward said central section, said lower sheet having a downwardly convexed central section and a pair of side sections connection to the transverse opposite ends of said downwardly convexed central section and bent inwardly toward said upper sheet and said upper and lower sheets being superposed each other such that said central sections of said upper and lower sheets define a substantially closed chamber for accomodating source material to be evaporated, that slit shaped vapour passages are formed between said upper and lower sheets on the opposite sides of said chamber and that any straight line drawn between any point on the upper surface of the source material contained in said chamber and any point in said passages intersects the inner wall of said upper or lower sheet.



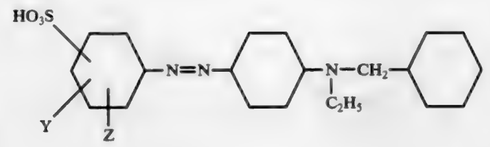
4,043,749

PROCESS FOR DYEING BLENDED NYLON CARPET MATERIAL

Allan M. Huffman, Lock Haven, Pa., assignor to American Color & Chemical Corporation, Charlotte, N.C.

Filed June 22, 1976, Ser. No. 698,754
Int. Cl.[2] D06P *1/38*
U.S. Cl. 8—1 XB **4 Claims**

1. In a process for dyeing nylon carpet material tufted or woven of cationic dyeable nylon yarn and acid dye dyeable nylon yarn wherein the nylon carpet material is contacted with a cationic dye and an acid dye in a dyebath, the improvement comprising employing as the acid dye, a monoazo dye of the formula:



or its water soluble sulfonic acid salt, in which Y and Z are independently selected from the group consisting of hydrogen, chlorine, bromine, methyl and methoxy.

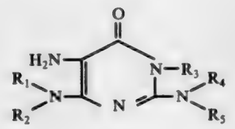
4,043,750

DEVELOPER-COUPLER HAIR DYES BASED ON TRIAMINO-PYRIMIDINONES

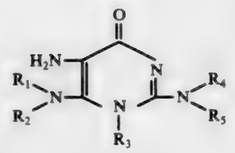
Hans Peter Kubersky, Solingen, and Erwin Weinrich, Haan, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf, Germany

Filed Apr. 5, 1976, Ser. No. 673,456
Claims priority, application Germany, Apr. 12, 1975, 2516118
Int. Cl.[2] A61K *7/13*
U.S. Cl. 8—10.2 **15 Claims**

1. A composition of the developer-oxidizer type for the dyeing of hair, consisting essentially of, as developer, a water-soluble substituted 2,5,6-triamino-4-pyrimidinone of the formulae:



or



wherein R_1-R_5 each represent hydrogen, C_{1-4} alkyl, C_{1-4} hydroxyalkyl, phenyl, phenyl C_{1-4} alkyl, C_{1-4} alkoxyphenyl, C_{1-4} alkyl, and di-(C_{1-4} alkyl) aminophenyl, and wherein either or both of the R_1-R_2 and R_4-R_5 pairs, together with the nitrogen atom to which they are respectively attached, form a 5- or 6-membered heterocyclic ring, optionally containing another nitrogen atom or an oxygen atom, and a water-soluble coupler therefor, said developer and said coupler being present in the molar range of about 2:1 to 1:2.

2. An aqueous emulsion for dyeing the hair having a content of 0.2% to 5% by weight of the developer-coupler composition of claim **1**.

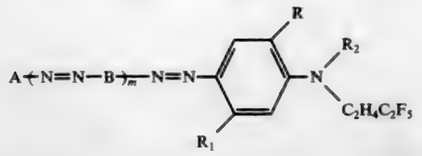
4,043,751

PROCESS FOR COLORING FIBERS WITH WATER-INSOLUBLE POLYFLUORO AZO DYESTUFFS

Jacques Pierre Edmond Pechmeze, Paris, and Robert Frederic Michel Sureau, Enghien les Bains, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Division of Ser. No. 416,913, Nov. 19, 1973, abandoned. This application Nov. 4, 1975, Ser. No. 628,722
Claims priority, application France, Nov. 17, 1972, 72.40827
Int. Cl.[2] C09B *27/00*; D06P *1/02*
U.S. Cl. 8—41 C **4 Claims**

1. Process for the coloration of fibers based on polyester, said process comprising coloring said fiber with a dyestuff of the formula:



in which R represents hydrogen, alkyl or alkoxy, R_1 represents hydrogen, chlorine, alkyl, alkoxy or acylamino or a diene grouping linked to the benzene nucleus to form a naphthalene nucleus, R_2 represents hydrogen, alkyl, hydroxyalkyl or cyanoethyl, B represents an aromatic radical, *m* is 0 or 1 and A represents a benzene or hetercyclic radical, the residues A and B being unsubstituted or substituted by substituents which do not give rise to an acid dissociation.

4,043,752

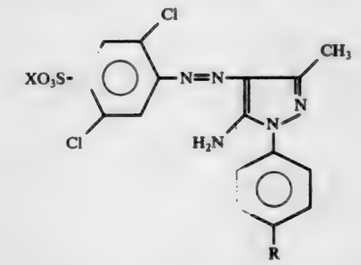
PHENYLAZOAMINOPHENYLPYRAZOLE ACID DYE SOLUTIONS CONTAINING TWO NONIONIC SURFACTANTS

Lindsay Kilmurry, Newark, Del., and Howard Kirby Urion, Woodstown, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 17, 1975, Ser. No. 641,373
Int. Cl.[2] D06P *1/06, 1/645, 3/24*
U.S. Cl. 8—41 B **14 Claims**

1. the dye solution comprising by weight,

i. 10% to 20% of a dye of the formula



wherein R is H or Cl, and X is a mixture of di- and tri- C_{1-4}alkanolammonium,

ii. 15% to 30% of n-butanol,

iii. 10% to 20% of ethyleneglycol,

iv. 10% to 20% of nonionic polyethylene oxide-polypropylene oxide copolymer surfactant,

v. 5% to 10% of nonionic polyethoxylated aliphatic amine surfactant, and

vi. 0 to 50% water.

4,043,753

GRAFTING PROCESS FOR PREPARING A POLYESTER FABRIC HAVING DESIRABLE STAIN-RELEASE, ANTISOIL-REDEPOSITION, ANTISTATIC AND HYDROPHILIC PROPERTIES

Robert B. Barbee, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 418,162, Nov. 21, 1973, now Defensive Publication No. T939,008. This application Mar. 1, 1976, Ser. No. 662,673

Int. Cl.[2] D06G *1/02*; C08G *63/12*

U.S. Cl. 8—115.5 **2 Claims**

1. A process comprising

A. preparing a textile fabric of fibers formed from a polyester of

1. terephthalic acid,
2. ethylene glycol, and
3. based on the moles of terephthalic acid, from 1 to 10 mole percent p-carboxycinnamic acid, and

B. contacting the textile fabric, under grafting reaction conditions, with acrylic acid and a free radical initiator.

4,043,754

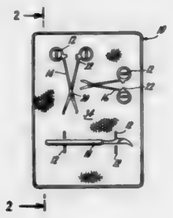
INSTRUMENT STERILIZING PIN

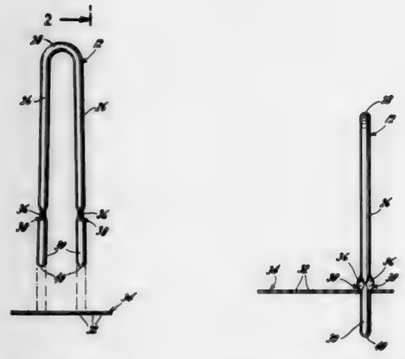
Alan L. Sklar, Hewlett Harbor, N.Y., assignor to J. Sklar Mfg. Co., Inc., Long Island City, N.Y.

Continuation of Ser. No. 528,982, Dec. 2, 1974, abandoned. This application June 28, 1976, Ser. No. 700,543

Int. Cl.[2] A61L *3/00, 3/02*

U.S. Cl. 21—82 R **1 Claim**





1. An apparatus for sterilizing surgical instruments comprising a sterilizing tray of the type containing a bottom surface of perforated metal and a plurality of instrument sterilizing pins engaged in said bottom surface wherein each instrument sterilizing pin is comprised of a body portion having a pair of substantially parallel straight segments connected by an intermediate segment having a bend occupying a plane formed by said straight segments, each of said straight segments including a stop means consisting of a widened portion of said straight segment and an engaging segment in coaxial alignment with said straight segment, said engaging segments are engagable in perforations in said bottom surface of said sterilizing tray in perforations spaced from each other such a distance that when said engaging segments are engaged in said bottom surface of said tray said sterilizing pins are maintained in a resiliently deflected state with the deflection of said body portion causing said engaging segments to apply a retention force on the sides of the perforations in said bottom surface of said sterilizing tray, said widened portion comprising a lateral ear extending from said substantially straight segment adjacent said engaging segment whereby the effective diameter of said stop means is greater than the diameter of said perforation in said bottom surface of said sterilizing tray.

4,043,755

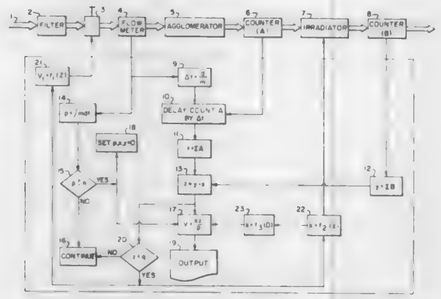
METHOD AND APPARATUS FOR DETERMINING URANIUM CONCENTRATION IN A MOVING STREAM

John Bartko, Monroeville, and James W. Wonn, Hemfield Township, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 29, 1976, Ser. No. 671,886

Int. Cl.[2] G01N *31/00*

U.S. Cl. 23—230 R **27 Claims**



14. Apparatus for determining uranium concentration in a moving liquid stream comprising:

A. an agglomerator for increasing the size of microbubbles in said stream which are about 6 to about 10 microns until they are larger than about 10 microns;

B. a first counter for counting microbubbles in a given volume of said stream which are about 6 to about 10 microns in size;

C. an irradiator for exposing said stream to a source of radiation which causes uranium fission fragments to produce microbubbles;

D. a second counter for counting microbubbles in said given volume of said stream which are about 6 to about 10 microns in size; and

E. calculating means for subtracting the number of microbubbles counted by said second counter from the number counted by said first counter and for multiplying the difference by a calibration constant.

4,043,756

CALIBRATION IN AN AUTOMATIC CHEMICAL TESTING APPARATUS

David E. Sommervold, Houston, Tex., assignor to Hycel, Inc., Houston, Tex.

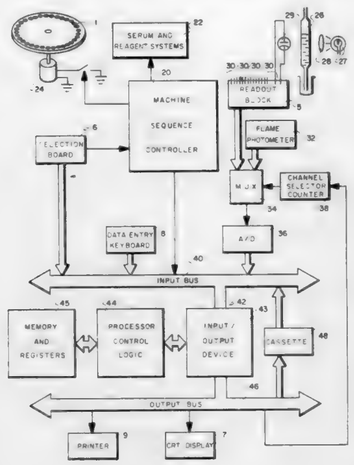
Filed Dec. 29, 1976, Ser. No. 758,055

Int. Cl.[2] G01N *33/16, 21/24, 21/58*

U.S. Cl. 23—230 R **22 Claims**

17. In an automatic chemical testing method comprising in each of a plurality of channels a readout signal indicative of optical density of an aliquot of a sample wherein the wavelength at which optical density of a sample aliquot is measured is selected in correspondence with a particular chemistry being performed and the optical density at that wavelength is a function of the concentration of a particular substance therein

for the particular chemistry, calculating in processing means a value of concentration units corresponding to the optical density indicated by each of the readout signals, wherein said processing means utilizes a predetermined curve function for each channel and wherein the predetermined curve function must be calibrated by the measurement of a blank sample and a reference sample each having a known concentration level of substance therein to provide calibration values indicative of a baseline and of a reference level for values of readout signals, and providing readout signals for a plurality of substantially identical blank samples and for a plurality of substantially identical reference samples, the improvement of a method for



providing calibration values for each channel to said processing means comprising: obtaining a blank readout signal for each blank sample having a blank value, supplying each said blank value to said processing means for obtaining a respective blank concentration value based on the use of the said blank value as a calibration value, comparing selected ones of said blank concentration values for measuring blank error between blank concentration values, comparing at least one of said blank concentration values to a known stored blank concentration value, and supplying a successful blank value to said processing means as a calibration value, where a successful value is one the use of which results in a blank error below a preselected level.

4,043,757

METHOD FOR DETECTION OF HUMAN MAMMARY CARCINOMA

Paul Arlen Wagstaff, Flemington, N.J., assignor to Ortho Pharmaceutical Corporation, Raritan, N.J.

Filed May 20, 1975, Ser. No. 579,105

Int. Cl.[2] G01N *21/08, 33/16*

U.S. Cl. 23—230 B **9 Claims**

1. A method for detecting human mammary carcinoma which comprises the steps of:

A. separating the leucocytes from a blood sample removed from a suspected mammary carcinoma host;

B. incubating said leucocytes at a temperature of from about 0° to about 25° C;

C. mixing said incubated leucocytes with mammary tumor extract; and

D. incubating said mixture while periodically measuring the pH of said mixture with a pH detecting means.

4,043,758

APPARATUS FOR THE MANUFACTURE OF METALLIC CHLORIDES

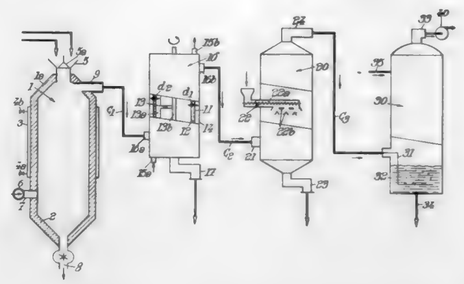
Constantin Tsirigotis, Athens, Greece, assignor to Larco Societe Miniere et Metallurgique de Larymna S.A., France

Division of Ser. No. 375,093, June 29, 1973, Pat. No. 3,935,293. This application Sept. 22, 1975, Ser. No. 615,508

Claims priority, application Luxembourg, Mar. 6, 1973, 67161

Int. Cl.[2] B01D *5/00*

U.S. Cl. 23—262 **1 Claim**



1. In an installation for the manufacture of metallic chlorides, starting from a raw material containing as an alloy at least two of the metals from the group Fe, Ni, Cr, Cu and Co, said installation including (i) a chlorinating enclosure in which said alloys are firstly subjected to a chlorination operation and (ii) at least one recovery enclosure for the chlorides formed comprising an externally cooled envelope at the inner surface of which are deposited the said chlorides in the form of a layer, the improvement wherein scraper means are provided within said recovery enclosure for controlling the thickness of said layer of chlorides at the inner surfaces of said externally cooled envelope such that a said thickness of between about 2 to 15 mm. remains on said surface.

4,043,759

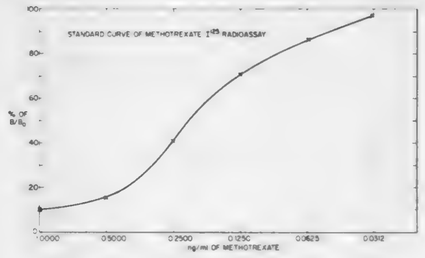
METHOD OF DETERMINING METHOTREXATE

Stanley E. Charm, and Henry E. Blair, both of 136 Harrison Ave., Boston, Mass. 02111

Filed Jan. 20, 1976, Ser. No. 650,690

Int. Cl.[2] G01N *33/16, 31/06*; A61K *43/00*

U.S. Cl. 23—230.6 **17 Claims**



1. A method for the quantitative determination of methotrexate in a sample containing at least about 0.03 nanograms per milliliter of free methotrexate, which method comprises:

a. mixing a known amount of the enzyme dihydrofolate reductase and a known amount of I^{125} labeled methotrexate to the sample and allowing the mixture to stand for a period of at least about 5 minutes to permit the competitive binding of the sample and labeled methotrexate;

b. removing free unbound methotrexate;

c. measuring the gamma ray count of the I^{125} labeled bound

methotrexate in the remaining sample which is essentially free of unbound methotrexate; and

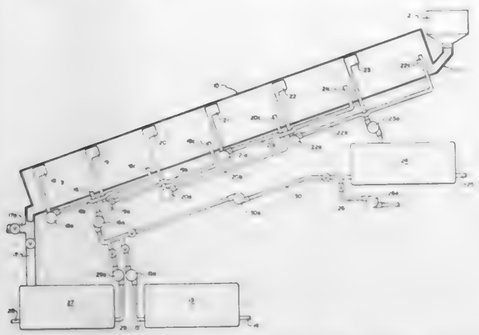
d. determining the amount of methotrexate in the sample by comparison of the measured gamma ray count with standard quantitative data.

4,043,760

COUNTER CURRENT DECANTATION APPARATUS

Martin H. Hiatt, 993 Vernon Ave., Venice, Calif. 90291

Filed Aug. 11, 1975, Ser. No. 603,695
Int. Cl.[2] B01D *11/00, 59/24*
U.S. Cl. 23—270 R **5 Claims**



1. A separation apparatus for the fluid counter current separation of products having different solvent absorptive capacities or densities which comprises:

a. a longitudinal separator housing mounted on an inclined plane,

b. a plurality of decantation pipes longitudinally spaced and extending through the separator housing in a fluid tight relationship, said pipes extending upwardly into the separator housing a distance and terminating in expanded openings sufficient to withdraw all of the fluid flowing over and into said openings,

c. pump means and piping connected to the lower end of each decantation pipe for removing the fluid flowing through each decantation pipe and pumping said fluid back through the separator housing at a point upstream of the next adjacent decantation pipe and at a distance above the separator housing floor with the exception that the pump means connected to the most forward decantation pipe removes the fluid and lighter density product thus recovered from the separator housing,

d. feed means contained in the upper inclined portion of the separator housing for introducing the material to be separated,

e. feed means contained in the separator housing in fluid tight relationship near the lower inclined portion of the separator housing for introducing a fluid into the separator housing, and

f. removal means contained in the separator housing floor at the lower end thereof for removing the heavier density product from which the lighter density product has been separated.

4,043,761

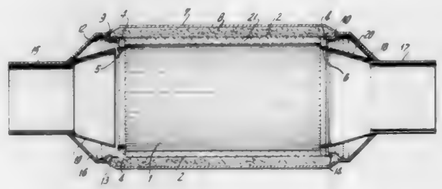
CATALYTIC CONVERTER HAVING RESILIENT MONOLITH-MOUNTING MEANS

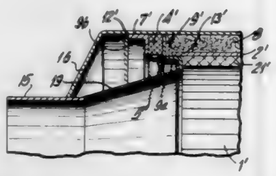
Gerhard Gaysert, Esslingen (Neckar), and Walter Ottle, Faurndau, both of Germany, assignors to J. Eberspacher, Germany

Continuation of Ser. No. 554,661, March 3, 1975, abandoned. This application Oct. 15, 1976, Ser. No. 732,877
Int. Cl.[2] F01N *3/15, 7/00*
U.S. Cl. 23—288 FC **5 Claims**

1. A device for the catalytic purification of exhaust gases of internal combustion engines, comprising a tubular metal housing having an exhaust gas supply connection at one end and an exhaust gas discharge connection at an opposite end and defining a gas flow passage therethrough, a tubular casing of sheet metal within said housing and spaced radially inwardly from the interior walls thereof, a substantially cylindrical monolithic catalyst carrier disposed in the exhaust gas flow passage within said housing and spaced radially inwardly from said casing, said carrier having axially extending passages therethrough for the flow of exhaust gases therethrough, a radially prestressed compacted metal mesh disposed between said carrier and said casing and forming an elastic support for said carrier, annular bearing member means having a first axially extending portion fixedly connected to a respective end of said tubular housing, a second axially extending portion offset radially inwardly from said first axially extending portion and slidably supporting said casing thereon, said second axially extending portion having a radially extending portion forming an end abutment for axially supporting said carrier, an elastic seal ring disposed in said housing bearing against said radially extending portion of said bearing member means and a respective end of said carrier.

5. A device for the catalytic purification of exhaust gases of internal combustion engines, comprising a tubular metal housing having an exhaust gas supply connection at one end and an exhaust gas discharge connection at an opposite end and defining a gas flow passage therethrough, a tubular casing of sheet metal within said housing and spaced radially inwardly from the interior walls thereof, a substantially cylindrical monolithic catalyst carrier disposed in the exhaust gas flow passage within said housing and spaced radially inwardly from said casing, said carrier having axially extending passages therethrough for the flow of exhaust gases therethrough, a layer of insulation disposed between said housing and said casing, a radially prestressed compacted metal mesh disposed between said carrier and said casing and forming an elastic support for said carrier, a first inner annular bearing member arranged at at least one end of said housing and having a first radially extending portion abutting an end of said layer of insulation, and having an axially extending first portion slidably supporting said casing and a second radially extending portion abutting against an end of said carrier, an elastic ring abutting against said first radially extending portion of said first annular member, a second annular member having a third radially extending portion abutting against the opposite end of said ring and a second axially extending portion fixedly secured to said tubular housing.



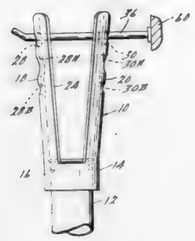


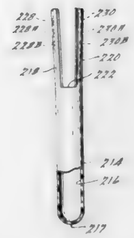
4,043,762

COUPLING MEANS FOR TEST TUBES AND THE LIKE

George Milton Olds, 3401 Glasgow Drive, Lansing, Mich. 48910

Filed Oct. 6, 1976, Ser. No. 729,964
Int. Cl.[2] B01L *9/06, 9/00, 3/14;* **B65D** *37/00*
U.S. Cl. 23—292 **18 Claims**





14. A unitary combined test tube and coupling means formed of flexible, resilient material and comprising a tubular body portion open at one end and closed at the opposite end thereof, said unitary combined test tube and coupling means also including a pair of equally circumferentially spaced, opposed flange portions formed integrally with said body portion and projecting longitudinally outwardly from said one end of said tubular body portion, said flange portions each defining a transverse opening disposed at a position near, but spaced from, the free end thereof, each of said openings being located along a plane that includes the longitudinal axis of said tubular body portion whereby the openings in said flange portions are located generally across from each other.

4,043,763

STABILIZATION OF DRIED COAL

Oscar L. Norman, Wilmington, Del., and Walter H. Seitzer, West Chester, Pa., assignors to Suntech, Inc., Wayne, Pa.

Continuation-in-part of Ser. No. 676,026, April 12, 1976, abandoned. This application Jan. 7, 1977, Ser. No. 758,890
Int. Cl.[2] C10L *5/00*
U.S. Cl. 44—1 R **7 Claims**

1. A process for stabilizing lignite and sub-bituminous coal against spontaneous combustion which comprises drying said coal to a moisture level of from 0 to about 10% by weight and mixing said dried coal at a temperature of from about 80° to about 300° C with as-mined coal in a weight ratio of dried coal to as-mined coal of from about 1:2 to about 10:1.

4,043,764

PROCESS FOR MANUFACTURING COMBUSTIBLE BRICKS FROM PLANT MATERIALS

Daniel Loas, Paris, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Apr. 16, 1976, Ser. No. 677,848
Claims priority, application France, Apr. 18, 1975, 75.12086
Int. Cl.[2] C10L *5/00, 5/22*
U.S. Cl. 44—10 A **11 Claims**

1. In a process for manufacturing combustible bricks from plant materials comprising pulverizing the plant materials, drying the pulverized plant materials and agglomerating the dried pulverized materials under pressure into bricks without using additional binders, the improvement comprising mixing the plant materials with other plant materials in an advanced stage of self fermentation and subjecting the materials in the course of the fermentation to a pulverisation treatment, while controlling said fermentation until particles having an expanded structure have been obtained without producing a separation of the lignin from the cellulosic tissues.

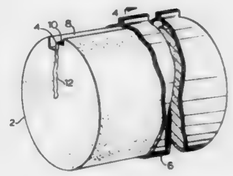
8. An installation for manufacturing combustible bricks from plant materials by agglomeration under pressure of said materials after a pulverization and drying thereof, comprising a first metering silo for mixing and initiating a fermentation of the plant materials, a device for shredding the materials issuing from the first silo, a second silo provided with a stirring and mixing device for effecting a fermentation of the materials issuing from the second silo, a device for pulverizing the materials issuing from the second silo, and a third silo for effecting a fermentation of the pulverized materials.

4,043,765

ARTIFICIAL FIREPLACE LOGS WITH IGNITION STRIPS

David John Tanner, Oshawa, Canada, assignor to Linwo Industries Ltd., Ontario, Canada

Continuation-in-part of Ser. No. 596,023, July 11, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 681,991
Int. Cl.[2] C10L *5/36, 11/00*
U.S. Cl. 44—14 **30 Claims**



1. An artificial fireplace log, comprising an elongated form retaining body having an outer surface and formed of a material capable of self-sustaining combustion, at least one groove on the outer surface of said body in longitudinal alignment therewith, at least one ignition strip integral with and disposed in at least one of said grooves.

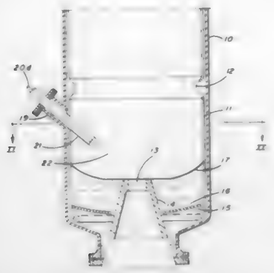
30. An artificial fireplace log, comprising an elongated form retaining body having an outer surface and formed of a material capable of self-sustaining combustion, said outer surface having deposited thereon a stream of combustible powder or solid particles.

4,043,766

SLAG BATH GENERATOR

Paul Gernhardt, Bochum; Wolfgang Grams, Wanne-Eickel; Wilhelm Danguillier, and Siegfried Pohl, both of Bochum, all of Germany, assignors to Dr. C. Otto & Comp. G.m.b.H., Bochum, Germany

Filed Oct. 26, 1976, Ser. No. 735,180
Claims priority, application Germany, Nov. 20, 1975, 2552077
Int. Cl.² C10J *3/30*
U.S. Cl. 48—73 **14 Claims**



1. A slag bath generator including the combination of:

a vessel defining a vertical and substantially cylindrical reactor shaft within a side wall of the vessel, said vessel including a base for maintaining a liquid slag bath at the bottom of the reactor shaft,

a slag bath overflow projecting centrally within said vessel to discharge liquid slag of the slag bath from the vessel,

a plurality of nozzles to introduce jet streams of fine-grain fuel and a gasification medium downwardly toward the surface of said slag bath, and

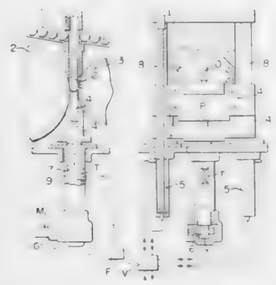
supports positioning said nozzles to direct said jet streams downwardly within the reactor shaft at an angle within the range of 35° to 40° with respect to the horizontal, the supports further positioning said nozzles to direct said jet streams of fine-grain fuel and gasification medium at points of impingement with the surface of the liquid slag bath defined on a plurality of concentric circles with respect to said overflow to circulate and produce a resulting movement of the liquid slag toward the overflow for maintaining a high temperature and homogeneous slag bath.

4,043,767

CENTERLESS GRINDING MACHINE USING TANGENTIAL-FEED METHOD

Minoru Suda, 220-1, Ohdo, Yono, Saitama, Japan

Filed Aug. 16, 1976, Ser. No. 714,989
Claims priority, application Japan, Sept. 20, 1975, 50-113132
Int. Cl.² B24B *5/22, 5/32*
U.S. Cl. 51—103 WH **11 Claims**



1. In a centerless grinding machine of tangential feed type including a grinding wheel adapted to rotate under high speed and a regulating wheel adapted to rotate under low speed in the same direction as said grinding wheel, in which said grinding wheel and regulating wheel are provided at the upper surface of a bed, and a work holder is moved in a tangential direction common to both of said grinding wheel and regulating wheel between said grinding wheel and regulating wheel, so as to give depth of cut to a workpiece, said machine characterized by a work holder which is divided into a workrest (4) adapted to move reciprocatively in the tangential direction for loading and unloading workpieces to and from grinding position and a workrest holder (4') adapted to support said workrest during grinding operation and give depth of cut to the workpiece, said workrest and workrest holder being reciprocatively moved under the same cycle by their independent driving mechanisms and adapted to be combined so that the workpiece held within said workrest is given depth of cut by the movement of said workrest holder in the tangential direction, said workrest being separated from said workrest holder upon completion of grinding operation and adapted to be returned upwardly in a short time and, after the workpiece held within said workrest is unloaded and the next workpiece is set, said workrest being moved into grinding position again in a short time, while said workrest holder being returned upwardly to the position to start grinding immediately after grinding operation is finished, said workrest and workrest holder being combined again as said workrest moves into grinding position and at the same time, said workrest holder being moved in the direction to give depth of cut to the workpiece as soon as said workrest holder is returned upwardly, so that the workpiece held within said workrest is given depth of cut as said workrest is moved in the tangential direction, thus giving centerless grinding to the workpiece repeatedly, whereby it becomes possible to provide centerless grinding with high aaccuracy, to shorten the idling time in the centerless grinding machine as well as to fully automatize the machine in an easy manner.

4,043,768

METHOD OF CONDITIONING FLUE GAS TO ELECTROSTATIC PRECIPITATOR

Robert P. Bennett, Bridgewater, and Matthew J. O'Connor, Flanders, both of N.J., assignors to Apollo Chemical Corporation, Whippany, N.J.

Filed Apr. 5, 1976, Ser. No. 673,364
Int. Cl.² B03C *1/00*
U.S. Cl. 55—5 **28 Claims**

1. A method of improving the collection characteristics of particles entrained in a stream of particle-laden gas formed by the burning of coal for collection by an electrostatic precipitator, comprising forming a mixture

A. the particle-laden gas at a temperature of 590°–900° C., and

B. finely divided ammonium bisulfate; said mixture containing 75–1,250 grams and ammonium bisulfate per metric ton of coal burned to form said gas, and

C. after forming said mixture, directing said gas stream through a heat exchange means and into an electrostatic precipitator to collect said particles therein.

4,043,769

PROCESS FOR RECOVERING A SOLVENT VAPOR

Mutsumi Nishino, Chigasaki; Hideo Sasaki, Tokyo; Kazumi Uda, Fukuyama; Motohiko Tamura, Mihara; Kunihiko Hiyama, Mihara, and Hiroshi Fujiike, Mihara, all of Japan, assignors to Mitsubishi Jukogyo Kabuskiki Kaisha and Shell Sekiyu Kabushiki Kaisha, both of Tokyo, Japan

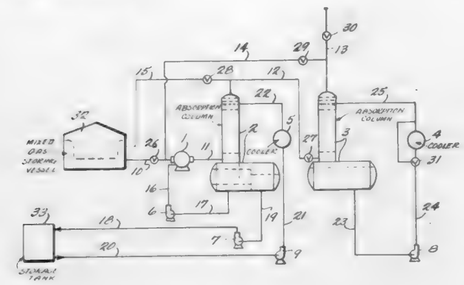
Filed Dec. 15, 1975, Ser. No. 640,564
Int. Cl.² B01D *53/16*
U.S. Cl. 55—25 **2 Claims**

1. A process for recovering a solvent vapor from a mixture of the solvent vapor and air comprising

a. passing a mixed gas taken from a storing vessel for a mixed gas of a solvent vapor and air through a compressor to compress the mixed gas to a low degree and introducing the lightly compressed mixed gas to a first absorption column, bringing the lightly compressed gas into vapor-liquid contact with a first absorbent to absorb and recover a greater part of the solvent vapor in said first absorption column, and

b. introducing a gas coming out of the first absorption column to a second absorption column and bringing said gas into vapor-liquid contact with a second absorbent circulating while being cooled in said second absorption column;

c. after saturation of the second absorbent, by the solvent vapor, stopping the flow of said mixed gas to a compressor and returning a gas coming out from said first absorption column to a vessel storing said mixed gas, and at the same time performing



d. causing said compressor to act as a vacuum pump and forwarding a gas from the second absorption column into the first absorption column to reduce the pressure inside the second absorption column, evaporating and gasifying a solvent component absorbed in substantially saturated state in the second absorbent, which is thereby cooled to regenerate the second absorbent;

e. subsequently introducing an evaporated and gasified gas consisting mainly of the solvent vapor to the first absorption column, bringing said gas into vapor-liquid contact with the first absorbent to absorb and recover the solvent vapor, returning a gas containing a trace of the solvent vapor, which has not been absorbed and recovered, to said mixed gas storing vessel or supplying a part of said gas to the second absorption column to exclude the solvent component in the second absorbent.

4,043,770

ABSORPTION-ADSORPTION SYSTEM FOR PURIFYING CRYOGENIC GASES

Fritz Jakob, Achmuhle, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Dec. 19, 1975, Ser. No. 642,602
Claims priority, application Germany, Dec. 20, 1974, 2460515
Int. Cl.² B01D *53/04;* **F25J** *3/06*
U.S. Cl. 55—62 **26 Claims**

1. In the purification of semi-pure gas containing a minor quantity of a gaseous impurity, the steps comprising:

a. passing said semi-pure gas at a temperature substantially above the condensation temperature of said gaseous impurity through a first adsorber loaded with said gaseous impurity to the extent of having a pressure of gaseous impurity emanating from the adsorbed impurity higher than the partial pressure of said gaseous impurity in the semi-pure gase, to desorb and entrain said gaseous impurity, thereby regenerating said first adsorber;

b. cooling resultant desorption gas containing said gaseous impurity to below the condensation temperature of said gaseous impurity to partially liquefy said gaseous impurity;

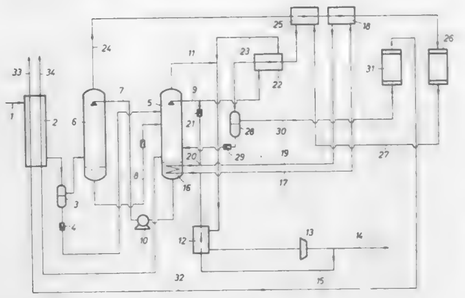
c. separating said liquefied gaseous impurity from equilibrium gas containing residual amounts of said gaseous impurity; and

d. passing said equilibrium gas, at a temperature below said condensation temperature of said gaseous impurity in step (b), through a second adsorber previously regenerated as in step (a), and removing at least a portion of said residual amounts of gaseous impurity to yield a purified gas.

17. In the purification of semi-pure gas containing a minor quantity of a gaseous impurity, the steps comprising:

a. scrubbing crude gas with liquid to yield scrubbed semi-pure gas containing said liquid in gaseous form as said gaseous impurity;

b. passing resultant semi-pure gas at a temperature substantially above the condensation temperature of said gaseous impurity through a first adsorber loaded with said gaseous



impurity to the extent of having a pressure of gaseous impurity emanating from the adsorbed impurity higher than the partial pressure of said gaseous impurity in the semi-pure gas;

c. cooling resultant desorption gas containing said gaseous impurity to below the condensation temperature of said gaseous impurity to partially liquefy said gaseous impurity;

d. separating said liquefied gaseous impurity from equilibrium gas containing residual amounts of said gaseous impurity; and

e. passing said equilibrium gas at a temperature below said condensation temperature of said gaseous impurity of step (c) through a second adsorber previously regenerated as in step (b), and removing at least a portion of said residual amounts of gaseous impurity to yield a purified gas.

4,043,771

METHOD OF AND APPARATUS FOR THE DISSOLUTION OF GASES IN LIQUIDS

Satish Kumar Anand, Deisenhofen, Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Germany

Filed Feb. 23, 1976, Ser. No. 660,511
Claims priority, application Germany, Feb. 22, 1975, 2507698
Int. Cl.² B01D *47/02;* **C02C** *1/02, 5/02, 5/10*
U.S. Cl. 55—93 BN **7 Claims**

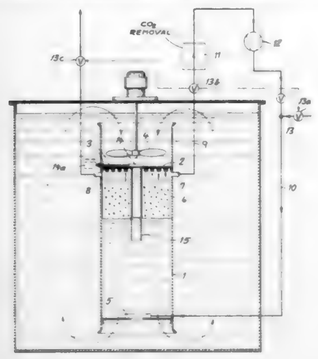
1. A process for the dissolution of gas in a liquid in a vessel, comprising the steps of:

circulating the liquid through an upright column occupying only a portion of the volume of said vessel;

subdividing the liquid flow in said column at an upper portion thereof into a multiplicity of partial streams and spraying said streams into a gas space maintained above a liquid level in said column;

supplying gas to said space for solubilization in the liquid by passing bubbles upwardly through a liquid continuum in said column from the bottom thereof and releasing a portion of said bubbles into said space at said liquid level within said column; and

maintaining the flow velocity of the liquid continuum in said column at a level sufficient to permit only a portion of the



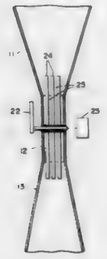
rising gas bubbles in said liquid continuum to reach said gas space.

4,043,772

VENTURI SCRUBBER WITH VARIABLE AREA THROAT

Alvin S. Lundy, West Bloomfield, Mich., assignor to Schneible Company, Holly, Mich.

Filed Nov. 7, 1975, Ser. No. 629,777
Int. Cl.[2] B01D *47/10*
U.S. Cl. 55—220 **8 Claims**



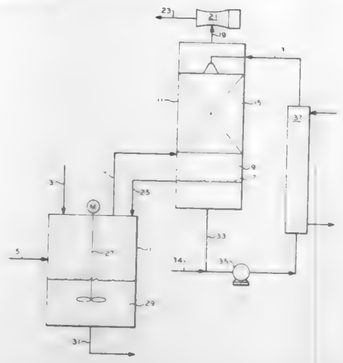
1. A wet gas venturi scrubber comprising a venturi tube having a gas inlet and a gas outlet and defining a narrowed throat therebetween, gas moving means for moving a stream of gas through said tube, and liquid injection means for injecting a cleansing liquid into said gas upstream of said throat, wherein the improvement comprises a rotor disposed in said throat and including a transverse pivot shaft extending between opposite sides of said throat and mounted for rotation about the axis thereof, said rotor also including a plurality of spaced parallel members being disposed within said throat and being perpendicular with and secured to said shaft, said rotor having spaces between said members of substantial width in relation to the width of said members and being rotatable into any selected angular position between a first position permitting a maximum flow through said throat wherein said members extend longitudinally of said throat and a second position permitting a minimum flow through said throat wherein said members extend transversely of said throat, said spaces permitting a substantial flow through said throat even when said rotor is in said second position.

4,043,773

RECOVERY OF POLYMER PARTICLES ENTRAINED IN TANK VENT

Jack S. Scoggin, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 10, 1976, Ser. No. 684,987
Int. Cl.[2] B01D *47/14*
U.S. Cl. 55—228 **4 Claims**



1. An apparatus for recovery of particles entrained in a vaporous vent comprising (1) a scrubber and (2) tankage with said scrubber comprising:

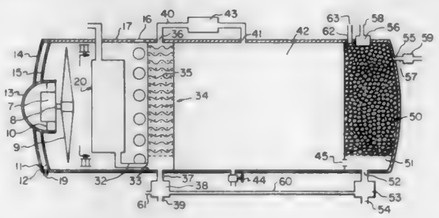
a. inlet for scrubbing liquid,
b. vent for vapor above the scrubbing liquid inlet,
c. liquid outlet at the base of the scrubber for removal of scrubbing liquid,
d. a second liquid outlet sufficiently above the scrubbing liquid outlet to maintain a liquid level in the base of the scrubber with overflow from the second outlet,
e. means for maintaining a liquid level in the scrubber base, and
f. inlet for vaporous vent containing entrained particles above second liquid outlet and below the scrubber liquid inlet and said tankage comprising:
g. a tank, connected by
h. a first conduit to permit venting through said conduit from the tank to the inlet for vaporous vent of the scrubber, and connected by
i. conduit from the second liquid outlet of the scrubber to the vent space of the tank, said tank positioned sufficiently lower than said scrubber to provide gravity flow of liquid from the second liquid outlet of the scrubber to the vent space of the tank.

4,043,774

APPARATUS FOR AIR PURIFICATION

Doyle Wayne McGrath, 135 Abbeyville Road, Abbeyville Apt. No. 204, Pittsburgh, Pa. 15228

Filed Apr. 26, 1976, Ser. No. 680,589
Int. Cl.[2] B01D *53/04, 53/26*
U.S. Cl. 55—269 **8 Claims**



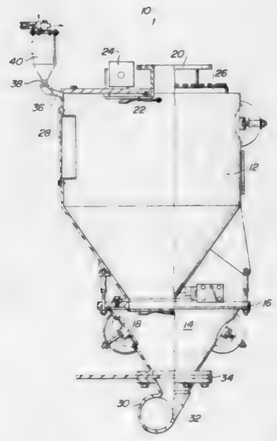
1. An air purification unit for use in a compressed air system including an air compressor, a discharge line from said air compressor, a filter in said discharge line and a compressed air service reservoir; said air purification unit comprising a unitary chamber means, closure means at the inlet end of said chamber means, said closure means formed with a plurality of air inlet openings; a plurality of serially connected sections located within said unitary chamber means; said sections including a heat transfer section spaced from said closure means, a filter and expansion section, a supply reservoir section and a drying section; inlet means and outlet means for each of said sections, the inlet means of said heat transfer section adapted to be connected to the discharge line from the air compressor downstream of the filter and the outlet means of said heat transfer section connected with the inlet means of said filter and expansion section, the outlet means of said filter and expansion section connected with the inlet means of said supply reservoir section, the outlet means of said supply reservoir section connected with the inlet means of said drying section, and the outlet means of said drying section adapted to be connected to the service reservoir in the compressed air system; and positively driven fan means located in said chamber means between said closure means and said heat transfer section and a plurality of air outlet openings in said chamber means downstream of said heat transfer section, said fan means moving atmospheric air through said air inlet openings into said chamber means, past said heat transfer section and through said air outlet openings; whereby compressed air from the air compressor flows through said air purification unit wherein the temperature of the compressed air is decreased and substantially all of the liquid and solid contaminants are removed from the compressed air.

4,043,775

AIR LOCK FILTER SYSTEM

Richard L. Solomon, Selinsgrove, Pa., assignor to Ecolaire Inc., Philadelphia, Pa.

Filed Dec. 29, 1975, Ser. No. 644,656
Int. Cl.[2] B01D *46/04*
U.S. Cl. 55—302 **11 Claims**



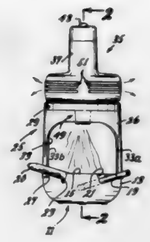
1. An air lock filter system comprising a pressure vessel having a materials inlet at an elevation above the elevation of a materials outlet from said pressure vessel, a housing supported adjacent the upper portion of said vessel and having a dirty gas inlet and a vent outlet, said dirty gas inlet communicating with the upper end of said vessel, a first valve means operatively connected to said housing by way of said vent outlet for selectively venting the housing and for connecting the housing to a source of gas under pressure, second valve means for controlling the inlet and outlet of said pressure vessel, a hollow filter tube in said housing arranged so that the interior of said tube communicates at one end with said vent outlet and thereby with said first valve means, means closing the other end of said tube, said tube being a rigid porous refractory, and means supporting said tube in said housing to prevent gas passing through said housing from by-passing said filter tube so that the outer periphery of said tube is exposed to gas entering the housing by way of said dirty gas inlet, whereby gas will be filtered through the outer periphery of said tube into the interior thereof.

4,043,776

SMOKE SORBING DEVICE

Jeannette V. Orel, 522 Warner Ave., Los Angeles, Calif. 90024

Continuation-in-part of Ser. No. 488,229, July 15, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,125
Int. Cl.[2] B01D *50/00*
U.S. Cl. 55—385 G **10 Claims**



1. A smoke sorbing and filtering ashtray device comprising an ashtray including a wall terminating in a rim for supporting an object having a smoke producing end such as a cigar or cigarette and the like such that the smoke producing end is positioned within the ashtray,

a shroud contacting the wall of the ashtray, said shroud including wall means extending above the ashtray and operative to confine within the shroud the smoke produced by the object positioned within the ashtray and including an aperture in the upper end thereof,

said shroud having an opening in the wall means thereof such that the shroud contacts only a portion of the wall of the ashtray such that the smoke producing object may be inserted through the opening to rest within the ashtray,

said opening defining spaced side walls of the shroud which are recessed back to expose a portion of the rim of the ashtray forward of said side walls,

housing means supported solely by said shroud,

said housing means having an opening generally vertically above the ashtray and said opening being in communication with said aperture,

said housing means including a discharge opening spaced from said opening of said housing means and cooperating with said opening in the wall means to form a passageway extending from outside and through said shroud to the outside environment,

power driven air moving means supported within said housing means and on said shroud and positioned over said opening in said housing means and within said passageway for drawing air through the opening in the wall means of said shroud and into said passageway for discharge through the opening in said housing means through the remainder of said passageway and through the discharge opening and into the environment, the movement of air through said shroud being operative to carry with it the smoke produced by said object within the confines of the shroud, and

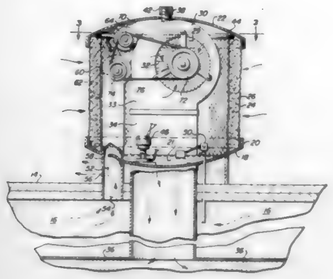
filter means supported between said shroud and said air moving means and within said passageway for filtering the air which is discharged from said shroud through said opening by the air moving means.

4,043,777

AIR HANDLING SYSTEM

Joseph R. Parren, 11212 N. 37th Drive, Phoenix, Ariz. 85029

Filed June 30, 1976, Ser. No. 701,281
Int. Cl.² F25D *23/12*; F28C *1/00*
U.S. Cl. 62—259 **3 Claims**



1. An air handling unit for cooling a building room and evacuating a dead air space located above the room, said air handling unit comprising:

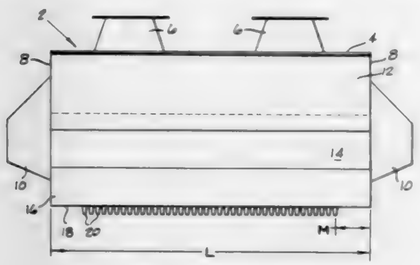
a. a base member adapted for attachment to the roof of the building;
b. a top member and a bottom member vertically spaced apart, said bottom member defining a sump;
c. an evaporative cooling pad interposed between said top and bottom members and defining an enclosure;
d. means for supplying water from said sump to said pad;
e. first blower means within said enclosure having a discharge connected to a delivery duct communicating with said room;
f. exhaust duct means communicating with the atmosphere and said dead air space;
g. second blower means associated with said exhaust duct means for inducing a flow of air from said dead air space; and
h. power transmission means drivingly connected to said first and second blower means.

4,043,778

ELECTRIC RESISTANCE BUSHING FOR MELTING INORGANIC MATERIALS

Walter William Harris, Toledo, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Continuation of Ser. No. 587,505, June 16, 1975, abandoned. This application Oct. 5, 1976, Ser. No. 729,914
Int. Cl.² C03B *37/02*
U.S. Cl. 65—1 **15 Claims**



1. In a refractory metal bushing for melting inorganic materials by passing electrical current through said metal, said bushing having a top wall and a bottom wall, an inlet for the inorganic material and a plurality of orifices in said bottom wall for exuding molten inorganic material therethrough, said bushing being elongated with an end wall located on each end transverse to the elongation and terminal lug attached to each of said end walls, the improvement comprising:

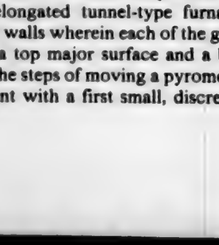
a bushing having at least 40 orifices located sequentially along said elongation;
said bushing having
a. a length sufficient to provide at each end thereof a space between each end of the bushing and the center of the closest tip of at least about 0.75 inch, and
b. a width of at least 1.75 inches, and
c. a height between the top wall and the bottom wall of the bushing of at least 3.5 inches.

4,043,779

APPARATUS FOR CHOPPING COATED GLASS FIBERS

William L. Schaefer, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 664,839, March 8, 1976, abandoned. This application Nov. 18, 1976, Ser. No. 742,807
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **10 Claims**



1. In an apparatus for forming and chopping glass fiber strand comprising: a glass fiber forming bushing from which continuous filaments are drawn, means for applying a binder and/or size to said filaments, means for consolidating said filaments into one or more continuous glass fiber strands, a first wheel having a smooth flexible surface, a second wheel juxtaposed and contacting said first wheel at the circumferential surfaces thereof, said first wheel and said second wheel providing attenuate forces to said glass fiber strand or strands and the filaments associated therewith, a third wheel having positioned thereon a plurality of cutting edges mounted in a plurality of grooves provided on the periphery of said third wheel, means for rotating said first, second and third wheels and means for collecting the particular glass fiber bundles formed, the improvement wherein said second wheel has a plurality of grooves oblique to the rotational surface of said second wheel at an acute angle with respect to one sidewall of said second wheel and an obtuse angle with respect to the other sidewall of said second wheel, the sum of the acute and obtuse angles equaling about 180°, said grooves being of sufficient width and depth to continuously eject binder from the surface of said second wheel by centrifugal force upon rotation of said second wheel and said acute angle being sufficient to prevent vibrations of said apparatus.

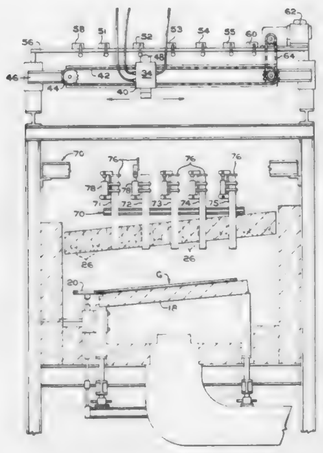
4,043,780

GLASS SHEET TEMPERATURE MONITORING SYSTEM

Jack A. Bricker, and John P. Durci, both of Tarentum, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 2, 1976, Ser. No. 692,156
Int. Cl.² C03B *29/04*
U.S. Cl. 65—29 **12 Claims**

1. A method of monitoring the temperatures of a series of glass sheets conveyed in a substantially horizontal path of travel through an elongated tunnel-type furnace enclosure formed by refractory walls wherein each of the glass sheets are oriented to provide a top major surface and a bottom major surface, comprising the steps of moving a pyrometer above the furnace into alignment with a first small, discrete opening in the top refractory wall of the furnace, opening normally closed closure means for said first opening, measuring the temperature of a portion of a top major surface of a sheet of glass passing beneath said first opening within the furnace by means of said pyrometer, closing said closure means for said first opening, conveying said pyrometer in a direction substantially horizontal and transverse to the path of the glass sheets, stopping the pyrometer in alignment with a second small, discrete opening in the top refractory wall of the furnace, opening a normally closed closure means for said second opening, measuring the temperature of a portion of a top major surface of a glass sheet passing beneath said second opening within the furnace, closing said closure means for said second opening, and repeating said steps periodically so as to maintain a measurement of the temperature profile across the top surface of the series of glass sheets conveyed through the furnace.



8. Apparatus for heating a series of glass sheets and monitoring the temperature thereof comprising: a tunnel-type furnace enclosure formed by refractory walls, means for conveying glass sheets along a longtidinal path through the furnace with the glass sheets supported in a generally horizontal orientation, a plurality of small, discrete openings through the top refractory wall of the furnace spaced from each other in a direction generally transverse to the path of glass conveyance, a pyrometer mounted above the furnace, means for transversely moving the pyrometer into vertical alignment with each of said openings in sequence so that a temperature measurement of a sheet of glass may be made through each opening, closure means associated with each of said openings for covering each respective opening, and control means responsive to the location of the pyrometer for opening the respective closure when the pyrometer is aligned with each of the openings.

4,043,781

METHOD FOR MAKING A BROWN PHOTOCHROMIC GLASS

Clark V. DeMunn; David J. Kerko; Ralph A. Westwig, and David B. Wrisley, Jr., all of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 520,249, Nov. 11, 1974, abandoned. This application May 24, 1976, Ser. No. 689,202
Int. Cl.² C03C *15/00*; C03B *32/00*; C03C *3/04*; G02B *5/23*
U.S. Cl. 65—30 R **1 Claim**

1. A method for making a photochromic glass article having a brown coloration in the faded and darkened state which comprises

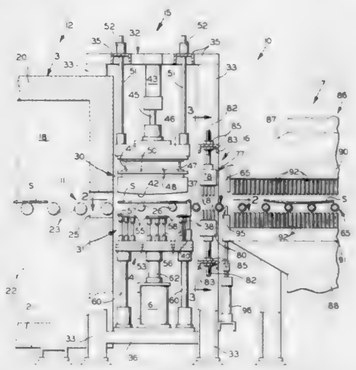
a. providing a potentially photochromic glass article having a composition consisting essentially, in weight percent, of about 53–60% SiO_2, 8–10% Al_2O_3, 15–18% B_2O_3, 1–3% Na_2O, 1.5–3.2% Li_2O, 5–9% BaO, 3.5–7% PbO, 0–4% ZrO_2, 0.012–0.040% CuO, 0.14–0.22% Ag, 0.22–0.36% Cl, 0.10–0.20% Br and 0–1% F;
b. heating the potentially photochromic glass article to a temperature in the temperature range of about 520°–580° C., and maintaining the article in that temperature range for a time of about 2–30 minutes;
c. further heating the potentially photochromic glass article to a temperature in the temperature range of about 600°–660° C. and maintaining the article in that temperature range for a time of about 5–60 minutes; and
d. cooling the article to room temperature; said brown coloration resulting from said method being present throughout the entire volume of said photochromic glass article.

4,043,782

METHOD OF AND APPARATUS FOR BENDING RELATIVELY THIN GLASS SHEETS

Robert P. Bamford, deceased, late of Toledo, Ohio, by Penelope R. Bamford, executrix; Richard A. Herrington, Walbridge, and Waldemar W. Oelke, Rossford, both of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed June 23, 1975, Ser. No. 589,008
Int. Cl.² C03B *27/00*
U.S. Cl. 65—104 **8 Claims**



1. A method of bending and tempering relatively thin glass sheets comprising: heating a glass sheet to the softening point thereof in a furnace, transferring said heated sheet from said furnace onto a shaping surface of a press member, moving said press member toward a complemental shaping surface of a second press member to press said sheet therebetween and impart the desired curvature to said sheet, removing said sheet from between said press members and advancing said sheet to a primary tempering section immediately downstream from said press members, advancing said sheet through said primary tempering section while applying a cooling fluid at a rapid flow rate through a multiplicity of small diameter orifices under relatively high pressure but of relatively small volume against the opposite surfaces of said sheet to initiate tempering by creating a maximum temperature differential between the opposite surfaces of the glass sheet and the core thereof and maintaining said maximum temperature differential until said core of the sheet passes through the strain point of the glass, advancing said sheet from said primary tempering section to and through a secondary tempering section immediately downstream of said primary tempering section while applying a cooling fluid under relatively low pressure but of a relatively large volume against the opposite surfaces of said sheet to complete the tempering thereof.

4. Apparatus for bending and tempering relatively thin glass sheets comprising: a conveyor for supporting and moving a thin glass sheet along a substantially horizontal path through a heating chamber, a bending area, and a tempering area including a primary tempering section and a secondary tempering

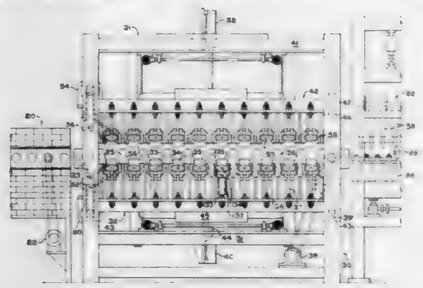
section; means in said heating chamber for heating the sheet to substantially the softening point of glass; opposed press members mounted in said bending area for press shaping said heated sheet into the desired curvature; said press members located immediately adjacent the exit end of said heating chamber in a substantially juxtaposed relation thereto; said primary tempering section being mounted immediately downstream of said press members in substantially juxtaposed relation thereto and including a multiplicity of relatively small diameter orifices for directing a plurality of streams of cooling fluid under relatively high pressure but of relatively small volume against the opposite surfaces of said bent sheet to initiate rapid chilling and tempering of the same while minimizing blow back into the bending area; said secondary tempering section located immediately downstream of said primary tempering section and including relatively large diameter orifices for directing a plurality of streams of cooling fluid under relatively low pressure but of relatively large volume against the opposite surfaces of said sheet to complete the tempering thereof.

4,043,783

PRESS SHAPING GLASS SHEETS

Robert G. Frank, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 5, 1976, Ser. No. 683,351
Int. Cl.² C03B *23/02*
U.S. Cl. 65—106 **15 Claims**



1. In the method of shaping glass sheets by the roll forming method wherein a series of hot glass sheets conveyed along rotating conveyor rolls is engaged and lifted above said conveyor rolls while moving between upper and lower sets of opposed rotating forming rolls having complementary shaping surfaces corresponding to the shape desired for each glass sheet in said series for sufficient time to impart a desired shape to each said glass sheet and then said glass sheet is disengaged from said upper set,

the improvement comprising lifting at least a portion of a preselected one of said rotating rolls into contact with a preselected portion of the lower surface of said glass sheet at a sufficient height above the level of the surface generated by the lower set of rotating forming rolls while the opposite portion of the upper surface of said glass sheet is disengaged, and continuing said lifting for sufficient time to modify the shape imparted to said preselected portion of said glass sheet by engagement between said upper and lower sets of opposed rotating forming rolls.

8. In apparatus for shaping glass sheets by the roll forming comprising a plurality of rotating conveyor rolls defining a path, upper and lower sets of opposed rotating forming rolls having complementary shaping surfaces corresponding to the shape desired for each glass sheet to be shaped, means for providing relative movement between said upper and lower sets to engage each glass sheet of a series of moving sheets in succession between said upper and lower sets of opposed rotating forming rolls and to separate said sets from one another, said conveyor rolls and said lower set of forming rolls disposed to face the lower surface of said glass sheets conveyed along said path, the improvement comprising means for automatically lifting at least a portion of a selected one of said so disposed rolls in response to preset timing means into a position slightly above the level of the surface generated by the lower set of opposed rotating forming rolls for sufficient time for said selected roll to contact a desired portion of the lower surface of said glass sheet for sufficient time to change the shape of said desired portion and for subsequently automatically lowering said selected roll to a position not higher than said level of said generated surface when said desired portion of said lower surface of said glass sheet passes over said selected roll.

4,043,784

SHAPING GLASS SHEETS

Thomas J. Reese, Sarver; Melvin W. Tobin, New Kensington, and James R. Mortimer, Natrona Heights, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 1, 1976, Ser. No. 701,465
Int. Cl.² C03B *23/02*
U.S. Cl. 65—107 **6 Claims**

1. A reusable mold for shaping glass sheets of soda-lime-silica composition by gravity sag bending to a complicated shape including a portion of concave elevation and a portion of convex elevation, comprising a rigid preformed sheet of a glassy composition having a lower coefficient of thermal expansion than soda-lime-silica glass, a heat capacity approximating that of soda-lime-silica glass and a deformation temperature at least 27° F. (15° C.) higher than the deformation temperature of soda-lime-silica glass and an upper major surface conforming to said complicated shape, a rigid metal frame of outline configuration having an upper edge surface conforming in elevation and outline to the shape of said sheet of glassy material disposed in supporting relation to said sheet, said sheet being substantially coextensive with the total area within said metal outline frame.

3. A method of shaping a glass sheet of soda-lime-silica composition to a complicated curvature having a portion of concave elevation and a portion of convex elevation by gravity sag bending comprising forming an assembly by supporting said soda-lime-silica sheet over a rigid preformed sheet of glassy composition having a lower coefficient of thermal expansion than said soda-lime-silica glass, a heat capacity approximating that of soda-lime-silica glass, a deformation temperature at least 27° F. (15° C.) higher than the deformation temperature of soda-lime-silica glass and an upper major surface conforming to said complicated shape and substantially coextensive with the area of said soda-lime-silica sheet, supporting said layer of glassy composition on a rigid metal frame of outline configuration having an upper edge surface conforming in elevation and outline to the shape of said rigid preformed sheet of glassy composition and a heat capacity per unit volume greater than that of said sheet of glassy composition, heating said assembly so formed to an elevated temperature at least equal to the deformation temperature of said soda-lime-silica glass sheet and below the deformation temperature of said sheet of glassy material until said soda-lime-silica sheet sags to conform to the complicated shape of said preformed sheet of said glassy composition, and cooling said assembly at a rate sufficiently rapid to impart a zone of compression stress around the marginal edge of said soda-lime-silica glass sheet and a zone of tension stress along a zone inward of said marginal edge approximately in alignment with said metal frame during said heating and cooling.

4,043,785

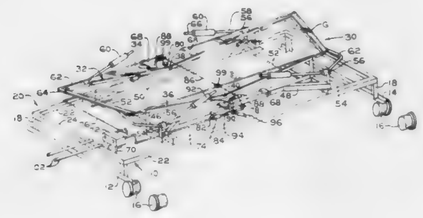
SHAPING GLASS SHEETS

Thomas J. Reese, Sarver, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 13, 1976, Ser. No. 714,067
Int. Cl.² C03B *23/02*
U.S. Cl. 65—107 **8 Claims**

1. Apparatus for shaping a flat glass sheet to a shape including a line of sharp curvature extending from one side edge to the other side edge of said sheet, said apparatus comprising an

outline mold of the skeleton type comprising an elongated metal rail disposed edgewise and having its upper edge forming a shaping surface conforming substantially to the shape desired for said glass sheet after bending, said rail including a pair of transversely spaced, longitudinally extending rail portions, each defining a generally V-shaped surface in elevation, the lowest portion of one of said V-shaped surfaces being aligned with the lowest portion of the other of said V-shaped surfaces along a transverse vertical plane of alignment, a first electrode located laterally outward of one side of said mold along said transverse plane of alignment and electrically insulated from said metal rail, a second electrode located laterally outward of the opposite side of said mold along said transverse plane of alignment, means adapted to couple said electrodes to a source of potential difference, a flexible electroconductive ribbon interconnected between said electrodes and extending therebetween along said transverse vertical plane of alignment, means disposed between at least one of said electrodes and said mold for engaging the undersurface of said ribbon and for urging said ribbon toward an upper position in said transverse vertical plane of alignment along a line below and adjacent to the plane occupied by the lower major surface of said flat glass sheet when the latter is mounted on said mold for bending, spacer means between the lower glass surface and said ribbon to limit said upper position to one spaced closely below said lower glass surface, said urging means providing an upward biasing force less than the mass of said glass sheet whereby said ribbon is urged to move to said upper position when a flat glass



sheet is mounted on said mold and said ribbon moves to a lower position below the lowest portion of said shaping surfaces when said glass sheet sags to conform to said shaping surface, and means to insulate said ribbon from said metal rail.

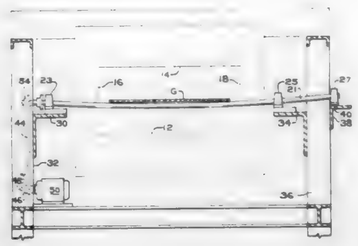
6. A method of shaping a flat glass sheet to a shape including a line of sharp bending extending completely across a dimension of said sheet comprising supporting said sheet over an outline shaping surface of a mold of the gravity sag type free of any overhead heating elements, applying spacing means to edge portions of the lower major surface of the sheet at opposite ends of the line of sharp bending, urging a ribbon of electroconductive material into close proximity to the lower major surface of said supported flat glass sheet along a line extending transversely of said supported sheet in a transverse vertical plane that intersects said line of sharp bending, heating said sheet over its entire area to a temperature approximating its deformation temperature, intensifying the heating of said ribbon when said sheet begins to sag, thereby intensifying the heating of said glass sheet along said transversely extending line of sharp bending and accelerating the sagging of said glass sheet along said transversely extending line, lowering said ribbon in closely spaced relation to said lower major surface as said glass sheet sags while maintaining an upward bias on said ribbon so that said ribbon contacts said spacing means and said spaced relation is maintained by said spacing means, discontinuing the intensified heating of said ribbon while continuing to heat said sheet over its entire area until the sagging of said glass sheet onto said outline shaping surface is completed.

4,043,786

GLASS SHEET CONVEYOR ROLLS AND PROCESS FOR CONVEYING THEREON

Dick T. Myers, Willard, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,477
Int. Cl.² C03B *27/00, 25/04*
U.S. Cl. 65—114 **6 Claims**



1. Apparatus for conveying glass sheets through a path defined by aligned portions of a series of conveyor rolls spaced from one another along the length of a hot atmosphere comprising a rigid, unitary, metal conveyor roll having an essentially cylindrical configuration when unstressed, a first bearing housing rotatably supporting said conveyor roll in a horizontal plane near one longitudinal end thereof and to one side of said path, a second bearing housing rotatably supporting said conveyor roll in said horizontal plane near the other longitudinal end thereof to the other side of said path, and a third bearing housing rotatably supporting said conveyor roll slightly above said horizontal plane longitudinally outward of one of said other bearing housings, said third bearing housing supporting said conveyor roll at a level sufficiently higher than the first and second bearing housings that the roll is stressed to be bowed slightly downward in the portion thereof aligned with said path whereby said roll has less tendency than an unstressed roll to whip when rotated and said stressed roll supports said conveyed glass sheets substantially entirely along their longitudinal side end portions.

4. A method of conveying a series of flat glass sheets in a longitudinal direction through an elongated heated furnace comprising:

positioning each sheet on a plurality of longitudinally spaced, transversely extending conveyor rolls, maintaining said conveyor rolls stressed so as to bow slightly downward, rotating said conveyor rolls in unison so as to propel each glass sheet in the longitudinal direction while each sheet contacts the rolls along only longitudinal edge portions of each sheet during at least a portion of its passage through the furnace, heating each sheet while supported on said conveyor rolls to a temperature at which each sheet remains substantially flat so that contact between the rolls and cen'er portions of each sheet is minimized, whereby optical distortion in the center portions of the sheets is reduced.

4,043,787

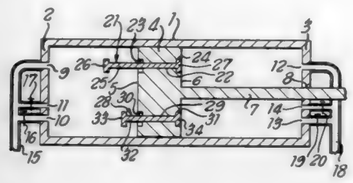
CYLINDER AND PISTON ASSEMBLIES IN GLASSWARE FORMING APPARATUS

Thomas Vincent Foster, Doncaster, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed June 15, 1976, Ser. No. 696,336
Claims priority, application United Kingdom, June 19, 1975, 26114/75
Int. Cl.² C03B *9/40*
U.S. Cl. 65—227 **12 Claims**

1. A glassware forming apparatus including a mechanism which is movable between first and second positions during the formation of glassware in the apparatus, and a cylinder and piston assembly for moving the mechanism between first and

second positions, the cylinder and piston assembly comprising a cylinder having opposed end walls, a piston slidably mounted in the cylinder for reciprocation between the end walls of the cylinder, at least three exhaust openings in each end wall of the cylinder, a plurality of members slidably carried by the piston, each one of said members cooperating with one associated exhaust opening in each of the opposed end walls of the cylinder, there being a greater number of exhaust openings in each end wall than there are slidable members, the slidable members



being of different lengths whereby, during reciprocation of the piston, the members are effective to produce a progressive cushioning effect by closure of corresponding exhaust openings when the piston reaches predetermined distances from the end of the piston stroke, each member closing a corresponding opening at a different predetermined distance, the members being slidably repositioned by contact with an end wall of the cylinder at the end of a piston stroke in one direction for effecting a progressive cushioning at the end of the piston stroke in the other direction.

4,043,788

CROP YIELD ADJUVANT

Lee Fryer, 11221 Markwood Drive, Silver Spring, Md. 20902

Filed Aug. 24, 1976, Ser. No. 717,276
Int. Cl.[2] C05B *15/00*
U.S. Cl. 71—29 **7 Claims**

1. A new composition of matter consisting of fish, hydrolysed with potassium hydroxide, neutralized with phosphoric acid, and augmented with urea to provide the major plant nutrients in the ratio of 2 parts nitrogen to 1 part P_2O_5 and 1 part K_2O, seaweed hydrolysates prepared by the action of Lactobacilli on seaweed and by the chemical hydrolysis of seaweed, and a source of chelated plant micronutrients for application to crop plants to enhance their yields.

4,043,789

PROCESS FOR MANUFACTURING OF PHOSPHORIC ACID

Rolf Steen Hansen; Ole Hannibal Lie; Henning Reier Nilsen, and Thor Sandal, all of Porsgrunn, Norway, assignors to Norsk Hydro a.s, Oslo, Norway

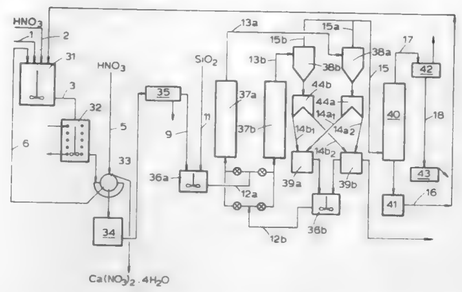
Filed Mar. 19, 1975, Ser. No. 560,089
Claims priority, application Norway, Mar. 19, 1974, 740983
Int. Cl.[2] C05B *7/00, 11/06;* C01B *25/32*
U.S. Cl. 71—34 **10 Claims**

1. In a process for the production of phosphoric acid containing calcium phosphates, i.e. Ca-containing phosphoric acid, by evaporating Ca-containing mother liquor from the Odda process and thereby removing substantially all remaining nitrate and fluorine in the form of HNO_3, HF and SiF_4, the improvement comprising:

maintaining the Ca/P weight ratio of said Ca-containing mother liquor below 0.45;

recycling and adding Ca-containing phosphoric acid to said Ca-containing mother liquor to form a liquid mixture which is evaporated; and

controlling the recycling of said Ca-containing phosphoric acid to maintain a liquid mixture phosphorus concentration during evaporation outside a concentration range of from approximately 15% by weight to approximately



22% by weight, thereby preventing said liquid mixture from becoming pasty.

4,043,790

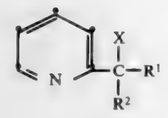
METHOD OF REGULATING THE GROWTH OF AQUATIC WEEDS WITH PYRIDINE DERIVATIVES

Eriks V. Krumkalns, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 2, 1976, Ser. No. 673,031
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—66 **10 Claims**

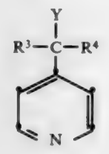
1. A method for inhibiting the growth of submerged and floating aquatic weeds which comprises adding to the water containing said weeds an amount sufficient to provide a growth-inhibiting and non-herbicidal concentration of a compound selected from the group consisting of compounds of the formulae:

(I)



and

(II)



wherein

X is hydrogen or hydroxyl;

R^1 is hydrogen, C_1–C_7 alkyl, C_3–C_6 cycloalkyl, cyclohexylmethyl, phenyl, or monohalophenyl;

R^2 is C_1–C_7 alkyl, cyclohexyl, phenyl, C_1–C_4 alkoxyphenyl, monohalophenyl, cyclohexylmethyl, trifluoromethylphenyl, phenoxybutyl, or 3,4-dimethylcyclohexyl;

R^1 and R^2, when taken together with the carbon atom to which they are attached, form 9-fluorenyl;

Y is hydrogen, hydroxyl or methoxy;

R^3 is hydrogen, cyclohexyl, phenyl, monohalophenyl, C_1–C_7 alkyl, or cyclohexylmethyl;

R^4 is C_1–C_7 alkyl, cyclohexyl, cyclohexylmethyl, monohalophenyl, phenoxybutyl, or methoxyphenyl;

R^3 and R^4, when taken together with the carbon atom to which they are attached, form 9-fluorenyl; and

the nonphytotoxic acid addition salts thereof.

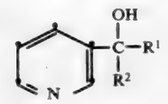
4,043,791

METHOD OF REGULATING THE GROWTH OF AQUATIC WEEDS WITH PYRIDINE DERIVATIVES

Eriks V. Krumkalns, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 2, 1976, Ser. No. 673,040
Int. Cl.[2] A01N *9/22*
U.S. Cl. 71—66 **4 Claims**

1. A method for inhibiting the growth of submerged and floating aquatic weeds which comprises adding to the water containing said weeds an amount sufficient to provide a growth inhibiting and non-herbicidal concentration of a compound of the formula



wherein

R^1 is C_1–C_6 alkyl, phenyl, or C_3–C_8 cycloalkyl;

R^2 is trifluoromethoxyphenyl, 1,1,2,2-tetrafluoroethoxyphenyl, pentafluoroethoxyphenyl, or 3,4-(difluoromethylenedioxy)phenyl; and

the nonphytotoxic acid addition salts thereof.

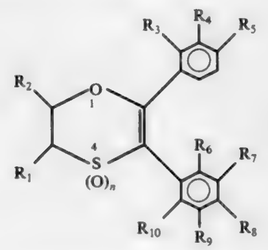
4,043,792

PLANT GROWTH REGULATION USING CERTAIN SUBSTITUTED 2,3-DIHYDRO-1,4-OXATHIINS

Bruce A. Graham; Michael A. Puttock, both of Guelph; Ethel E. Felauer, Arkell, all of Canada, and Robert W. Neidermyer, Cheshire, Conn., assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Canada

Division of Ser. No. 459,442, April 9, 1974, Pat. No. 3,947,264.
This application Oct. 30, 1975, Ser. No. 627,177
Int. Cl.[2] A01N *5/00*
U.S. Cl. 71—78 **7 Claims**

1. A method of inhibiting the axillary or intercalary growth of plants comprising applying to a locus at which it is desired to regulate the growth of plants, a substituted 2,3-dihydro-1, 4-oxathiin chemical of the formula



wherein the R's having the following values:

R_1 = H

R_2 = H, CH_3 or C_2H_5

R_3 = H, Cl or CH_3

R_4 = H, Cl or CH_3

R_5 = H, Cl, F, CH_3,



or SCH_3

R_6 = H, Cl or CH_3

R_7 = H, Cl, CH_3 or OCH_3

R_8 = H, Cl, Br, F, CH_3, C_2H_5, OCH_3 or NH_2

R_9 = H or CH_3

R_{10} = H

and n is zero, 1 or 2, the said plant growth regulant effect being a non-herbicidal plant growth regulant effect and the said chemical being applied in non-herbicidal amount sufficient to produce the said non-herbicidal axillary or intercalary plant growth inhibiting effect.

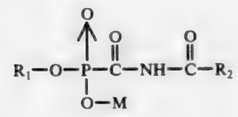
4,043,793

N-PHOSPHONOCARBONYL CARBAMIC ACID DERIVATIVES AS PLANT GROWTH REGULANTS

Richard Frank Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1976, Ser. No. 688,929
Int. Cl.[2] A01N *9/36;* C07F *9/40*
U.S. Cl. 71—86 **15 Claims**

1. A compound of the formula



where

M is sodium, lithium, potassium, or ammonium;

R_1 is methyl or ethyl; and

R_2 is methyl, ethyl, methoxy, or ethoxy, said methyl or ethyl groups optionally substituted with 1 to 3 chlorine atoms.

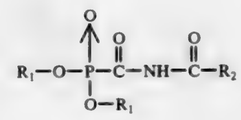
4,043,794

N-PHOSPHONOCARBONYL CARBAMIC ACID DERIVATIVES AS PLANT GROWTH REGULANTS

Richard Frank Sauers, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 21, 1976, Ser. No. 688,930
Int. Cl.[2] A01N *9/36;* C07F *9/40*
U.S. Cl. 71—86 **4 Claims**

1. A method for retarding the growth of plants which comprises applying a growth regulating amount of a compound of the formula:



where

R_1 is methyl or ethyl; and

R_2 is methyl, ethyl, methoxy, or ethoxy, said methyl or ethyl groups optionally substituted with 1 to 3 chlorine atoms.

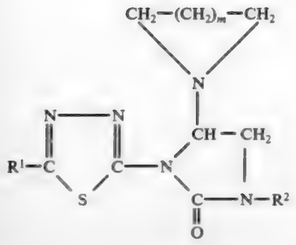
4,043,795

THIADIAZOLYL AND CYCLOIMINO IMIDAZOLIDINONES

John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 10, 1976, Ser. No. 665,466
Int. Cl.[2] C07D *417/14*
U.S. Cl. 71—90 **10 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower chloroalkyl, lower bromoalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl; and *m* is an integer from 0 to 4.

10. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim **1.**

4,043,796

SELECTIVE HERBICIDAL COMPOSITIONS

Daniel Hainaut, Villemomble; Jean-Pierre Demoute, Montreuil-sous-Bois, and Andre Teche, Nanterre, all of France, assignors to Roussel Uclaf, Paris, France

Filed Feb. 17, 1976, Ser. No. 658,331

Claims priority, application France, Feb. 18, 1975, 75.04978; Nov. 28, 1975, 75.36459

Int. Cl.[2] A01N *9/12;* **C07C** *119/00*

U.S. Cl. 71—98 **8 Claims**

1. A method of selectively killing weeds in cereal crops comprising applying to cereal crops an herbicidally effective amount of a compound selected from the group consisting of N-methyl-N-isopropylthio-N'-phenyl-urea, N-methyl-N-(2-chloroethylthio)-N'-(3,4-dichlorophenyl)-urea, N-methyl-N-n-butylthio-N'-(4-isopropylphenyl)-urea, N-methyl-N-isopropylthio-N'-(4-isopropylphenyl)-urea, N-methyl-N-isopropylthio-N'-(3,4-dimethylphenyl)-urea and N-methyl-N-n-butylthio-N'-(3,4-dimethylphenyl)-urea and an inert carrier.

8. N-methyl-N-(2-chloroethylthio)-N'-(3,4-dichlorophenyl)-urea.

4,043,797

SULFIDE HERBICIDE ANTIDOTE COMPOSITIONS AND METHOD OF USE

Duane R. Arneklev, Antelope, Mont., and Don R. Baker, Orinda, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 394,230, Sept. 4, 1973, abandoned. This application June 27, 1975, Ser. No. 591,238

Int. Cl.[2] A01N *9/12*

U.S. Cl. 71—98 **6 Claims**

1. The method of protecting a crop from injury due to a thiocarbamate herbicide, comprising applying to the habitat prior to planting from about 0.01 to about 15 parts by weight for each part by weight of the thiocarbamate herbicide an antidote compound corresponding to the formula

$$R_1—S—R_2$$

wherein R_1 is selected from the group consisting of di-p-chlorophenylmethyl, pentachlorophenyl, mono-chlorobenzamido-ethyl, dichlorobenzamidoethyl, and mono-bromobenzamido-ethyl; and R_2 is selected from the group consisting of p-chlorophenyl, haloalkyl having from 1 to 4 carbon atoms, mono-chlorobenzamido-ethyl, dichlorobenzamidoethyl, and mono-bromobenzamidoethyl.

4,043,798

PROCESS FOR PRODUCING STEEL HAVING IMPROVED LOW TEMPERATURE IMPACT CHARACTERISTICS

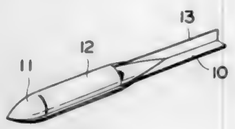
Hajime Nashiwa; Akiyoshi Mori, both of Wakayama, and Makoto Tokuda, Ibaragi, all of Japan, assignors to Sumitomo Metal Industries Limited, Japan

Filed June 6, 1975, Ser. No. 584,501

Claims priority, application Japan, Sept. 20, 1974, 49-109339; Oct. 24, 1974, 49-122927; Nov. 7, 1974, 49-129421

Int. Cl.[2] C21C *7/00, 7/10*

U.S. Cl. 75—53 **23 Claims**



1. A process for producing steel having improved low temperature impact characteristics comprising the steps of

forming a molten steel having the following quantities of elements present therein as expressed in weight percent unless otherwise specified:

Carbon	0.02 to 0.55
Silicon	Less than 0.50
Manganese	0.20 to 2.50
Sulfur	Less than 0.01
Oxygen	Less than 100 ppm

maintaining the molten steel at a temperature in the range between 1480° and 1800° C,

adding calcium to the molten steel in an amount of 0.1 to 2.0 kg per ton of molten steel to establish a calcium content in the molten steel whose ratio to the sulfur content therein is in the range of 0.05 to 0.8, the calcium being added in a form selected from the group consisting of metallic calcium and alloys thereof, and

recovering steel having improved low temperature impact characteristics.

4,043,799

METHOD AND DEVICE FOR BLOWING OXYGEN IN METAL REFINING CONVERTERS IN UNSTATIONARY MANNER

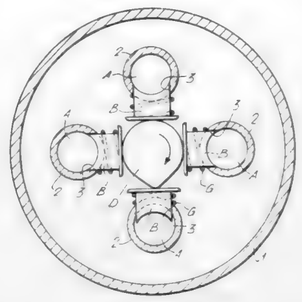
Giovanni Maria Carlomagno, and Bruno Costa, both of Naples, Italy, assignors to Italsider S.p.A., Genoa, Italy

Continuation-in-part of Ser. No. 590,227, June 25, 1975, which is a continuation of Ser. No. 391,382, Aug. 24, 1973, abandoned. This application July 29, 1976, Ser. No. 709,755

Int. Cl.[2] C21C *5/30*

U.S. Cl. 75—60 **12 Claims**

1. In a steel refining process in which jets or oxygen are blown onto the surface of the material in a converter, the step of positively inducing variations of the delivery of oxygen from the jets during at least a part of an oxygen blowing period to vary penetration of the jets into materials in the converter.



4,043,800

METHOD FOR MONITORING AND CONTROLLING THE REFINING OF CRUDE IRON

Gustav Mahn, Wolfenbuttel; Josef Schoop, Peine, and Jorg Kügler, Wolfenbuttel, all of Germany, assignors to Stahlwerke Peine-Salzgitter AG, Peine, Germany

Filed Oct. 24, 1974, Ser. No. 517,811

Claims priority, application Germany, Oct. 27, 1973, 2354003

Int. Cl.[2] C21C *5/30*

U.S. Cl. 75—60 **7 Claims**

1. In the refining of crude metal by blowing an oxygen-comprising gas into a molten crude metal bath contained within the interior of a converter so as to cause the formation atop the molten crude metal of a layer of metal-slag emulsion which increases in height during the course of the refining, a method of measuring the height of the rising metal-slag emulsion layer during the course of the refining, so as to be able to control the blowing of the oxygen-comprising gas into the metal bath during the course of the refining in dependence upon the height of the emulsion layer, the method comprising arranging at least one reactive circuit component outside of the boundary surface of the interior of the converter so that the reactive circuit component cannot physically contact the molten crude metal in the interior of the converter, with the reactive circuit component extending up along the height of the converter and the interior of the converter also constituting the interior of the reactive circuit component, the metal-slag emulsion layer atop the metal bath in the interior of the converter and accordingly in the interior of the reactive circuit component constituting a part of the reactive circuit component, with the height of the metal-slag emulsion layer within the interior of the reactive circuit component determining the reactance of the reactive circuit component; connecting the at least one reactive circuit component to at least one further circuit component to form a resonant electricl circuit the resonance of which is dependent upon the reactance of the reactive circuit component and accordingly upon the height of the metal-slag emulsion layer within the interior of the reactive circuit component; and indirectly measuring the height of the emulsion layer by measuring the effect of the height of the layer of metal-slag emulsion upon the resonance of the resonant electrical circuit.

4,043,801

METHOD OF SIMULTANEOUSLY CONTROLLING TEMPERATURE AND CARBON CONTENT OF MOLTEN STEEL AT THE END-POINT IN OXYGEN TOP-BLOWN CONVERTER

Eiichi Sakamoto, Kamakura; Masanobu Kubo, Yokohama; Takashi Yasui, Kamakura; Katsuya Suzuki, Yokohama, and Katsuhiko Tachibana, Kamakura, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 420,470, Nov. 30, 1973, abandoned. This application July 25, 1975, Ser. No. 598,756

Claims priority, application Japan, Dec. 11, 1972, 47-123417

Int. Cl.[2] C21C *5/30*

U.S. Cl. 75—60 **6 Claims**

1. A method of controlling the temperature and carbon content of a molten steel bath at the end-point in an oxygen top-blown converter comprising the steps of:

determining the temperature of the molten steel at the end point as a function of at least the material balance and heat balance, and then assembling raw materials including molten pig iron, carbon monoxide and oxygen, for the molten steel bath in such quantity and relative proportions that the temperature of the molten steel bath at the end-point attains a temperature higher than a target temperature at the end-point;

blowing oxygen to the converter in an amount sufficient to attain a predetermined bath carbon content which is a function of the desired carbon content of the end product steel to be produced;

simultaneously measuring the temperature and carbon content of the molten steel by a single sensor upon completing the blowing of oxygen;

operating on said measured temperature and carbon content and determining a "forecast heating factor" in accordance with the following:

$$A' = \alpha_o + \alpha_1 E_o + \alpha_2 E_B + \alpha_3 E_{EA} + \alpha_4 E_L + \alpha_5 \Delta W_C + \alpha_6 \Delta W_{FE}$$

where

A' = forecast heating factor (Ton.°C/Nm³ of oxygen);

E_O = calories possessed by initial charge (K cal);

E_B = calories possessed by the charge at the time of measuring (K cal);

E_{EA} = target calories possessed by the charge at the end point (K cal);

E_L = loss calories between measurement and end-point (K cal);

ΔW_C = amount of decarburization (Ton);

ΔW_{Fe} = amount of oxidized molten iron (Ton); and

α_o, α_1, α_2, α_3, α_4, α_5 and α_6 are constants

operating on said measured temperature and carbon content and determining decarburization parameters as follows:

V = decarburization rate during the maximum decarburization period (KgC/Nm³ of oxygen);

C_P = curve parameter(%); and

C_O = carbon content at critical decarburization (%);

further blowing in oxygen in a quantity derived from said forecast heating factor A' for raising the temperature of the molten steel bath up to a previously estimated temperature value after the measuring, the quantity of oxygen being further blown in being defined in accordance with the following:

$$\Delta Q = (W_T \cdot \Delta T)/A'$$

where

ΔQ = the quantity of oxygen further blown in for raising the temperature up to the estimated temperature value after the measuring (Nm³);

W_T = weight of total charge (Ton) at the time of the further blowing operation; and

ΔT = temperature rise after measuring (° C) at the time of the further blowing operation;

determining the carbon content at the end-point of the process as a function of said oxygen quantity after the measuring and said decarburization parameters in accordance with the following:

$$C_{EC} = C_O + C_P \ln[1 + \left\{ \exp\left(\frac{C_B - C_O}{C_P}\right) - 1 \right\} \cdot \exp\left(- \frac{100V - \Delta Q}{W_{ST} - C_P} \right)]$$

where

C_{EC} = calculated carbon content at the end-point (%);

C_O, C_P, V = decarburization parameters;

ΔQ = the quantity of oxygen blown in for raising the temperature up to an estimated level after the measuring (Nm^3); and

C_B = carbon content at the time of measuring (%); and

carrying out at least one of the following: (i) still further blowing in a given quantity of oxygen ΔQ_c at the end-point, (ii) supplying a requisite amount of coolant W_{Cr} and (iii) soft blowing in accordance with a given pattern of soft-blow, the given quantity of oxygen, the requisite amount of cooling and the soft-blow pattern being a function of the difference between said calculated carbon content at the end-point of the process and said target carbon content at the end-point, to simultaneously control the temperature and carbon content of said molten steel at the end-point of the process.

4,043,802

CONTINUOUS REFLUX REFINING OF METALS

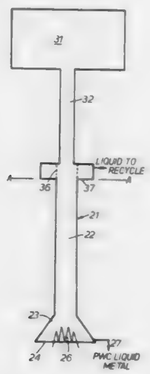
James Durie Esdaile, Glen Waverley, and Graeme William Walters, Mount Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Sept. 25, 1975, Ser. No. 616,816

Claims priority, application Australia, Sept. 30, 1974, 9067/74

Int. Cl.² C22B *7/00*

U.S. Cl. 75—63 **18 Claims**



1. A method for the continuous purification of an impure metal which is hypoeutectic with respect to the pure metal sought, said method comprising providing a column consisting of a slurry of metal crystals in liquid metal, said column having a relatively cool zone and a relatively hot zone at which almost all of the heat input into the column is supplied, and a continuous temperature gradient between said zones; the temperature of the cool zone being such as to permit coexistence of liquid and crystalline metal, and said hot zone being at a temperature sufficient to melt the crystals; chilling a portion of the column in the said cool zone to form a coherent mass of crystals of the metal then allowing incipient melting in the mass to occur to release crystals from the mass into the column of the crystals in the liquid metal in the cool zone of said column; transporting the crystals through the temperature gradient and into the hot zone, wherein melting of the crystals occurs and the hot zone thereby becomes enriched with the pure liquid metal; continuously supplying impure feed metal to the column and continuously withdrawing a portion of the pure liquid metal from the hot zone; the conditions being such that, over any given interval, the weight of crystals formed by chilling is greater than the weight of feed metal added.

4,043,803

PROCESS FOR THE MANUFACTURE OF A COMPACTED SYNTHETIC FLUX BASED ON CALCIUM FLUORIDE

Arankathu Skaria, Stafe, and Reiner Stark, Fallanden, both of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 11, 1975, Ser. No. 557,370

Claims priority, application Switzerland, Mar. 15, 1974, 3612/74

Int. Cl.² C22B *9/10;* **C01D** *3/02*

U.S. Cl. 75—257 **18 Claims**

1. A process for producing a compacted, calcium fluoride based, synthetic flux from an aqueous effluent containing dissolved fluoride ions,

the steps comprising:

precipitating the dissolved fluorine ions essentially as calcium fluoride by the addition of calcium compounds;

separating the precipitate from the effluent and reducing the free water content of said precipitate to a content of from about 10 percent to about 30 per cent by weight;

mixing the separated precipitate with a binding agent and with at least one alkaline earth metal compound selected from the group consisting of oxides and hydroxides;

compacting said mixture; and

subsequently drying the compacted mixture.

4,043,804

RECOVERY OF METAL VALUES FROM COPPER REVERBERATORY SLAG

Kenneth O. Lindblad, Anaconda, Mont., assignor to The Anaconda Company, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,728

Int. Cl.² C22B *15/00*

U.S. Cl. 75—117 **9 Claims**

1. A process for the recovery of metals from copper reverberatory slag containing iron in the form of silicates comprising:

forming a substantially homogeneous mixture of iron sulfate and slag having from greater than about one to about five parts by weight slag per part iron sulfate,

roasting said mixture in an oxidizing atmosphere at a temperature of at least about 550° C. for a time sufficient to effect decomposition of substantially all of the iron sulfate to iron oxide and the copper values to water soluble copper salts, and

separating the water soluble copper salts from the iron oxide and silica.

4,043,805

ISOTROPIC AND HIGH-STRENGTH HIGH SILICON STEEL SHEET

Satohiro Hayami; Jun Imamura; Hiroshi Hayakawa, and Tadatzugu Yabuta, all of Yokohama, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 477,098, June 6, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,692

Claims priority, application Japan, June 11, 1973, 48-65538

Int. Cl.² C22C *33/00;* **H01F** *1/04*

U.S. Cl. 75—123 L **7 Claims**

1. A high silicon steel composition consisting essentially of

0.03 to 0..15% carbon,

0.7 to 2.3% silicon,

0.7 to 2.0% manganese,

with the balance being iron and unavoidable impurities and wherein the ratio of Si/Mn is between 0.6 to 1.5 and the sulfur content is less than or equal to 0.02% as an unavoidable impurity, said composition being in the form of a rolled sheet having high ductility and thoughness in all directions independent of the rolling direction, said sheet having a total elongation measured in any direction of not less than 41%, a reduction of area measured in any direction of not less than 81%, and a tensile strength measured in any direction of not less than 50 kg/mm^2, and an n value of not less than 0.27, and wherein for a given sheet, each of said properties is substantially the same regardless of in which direction the property is measured.

4,043,806

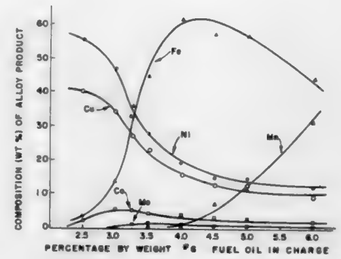
ALLOYS FROM MANGANESE NODULES

Thomas C. Wilder, Cambridge, Mass., and Walter E. Galin, Pawtucket, R.I., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 514,614, Oct. 15, 1974, Pat. No. 3,957,485. This application Nov. 17, 1975, Ser. No. 632,477

Int. Cl.² C22C *39/54*

U.S. Cl. 75—125 **8 Claims**



1. An alloy composed of several immiscible phases, a major phase being an iron-rich nickel phase, one minor phase containing 80–90% copper and another minor phase being a combination of manganese, molybdenum, nickel, cobalt and iron, the overall composition of the alloy having the following constituents in percent by weight:

Copper	22.9 %
Nickel	27.7 %
Cobalt	4.25 %
Molybdenum	1.23 %
Iron	44.3 %
Manganese	Balance

4,043,807

ALLOY STEELS

Ivor Kirman, Birmingham, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 420,112, Jan. 2, 1974, abandoned. This application Feb. 10, 1976, Ser. No. 656,984

Int. Cl.² C22C *38/04, 38/12, 38/16*

U.S. Cl. 75—125 **7 Claims**

1. A low alloy, high strength steel characterized by good toughness, weldability and cold formability and consisting of from about 0.01 to 0.09% carbon, about 0.4% to about 0.8% nickel, about 0.7% to about 1.1% copper, about 0.2 to about 0.1% niobium, about 1.1% to about 1.65% manganese, aluminum present up to 0.08%, up to 0.5% each of chromium and molybdenum, up to about 0.6% silicon, up to about 0.01% boron, up to about 0.1% of at least one metal selected from the group consisting of zirconium, magnesium, calcium, and rare earths, the balance being essentially iron, said steel being further characterized in that the carbon equivalent expressed by the formula:

$$C + \frac{Mn}{6} + \frac{Cr + Mo}{5} + \frac{Ni + Cu}{15}$$

is not more than 0.41, said steel being further characterized in that the strength level is at least about 450 MN/m^2 and the 70J longitudinal impact transition temperature is below about −10° C. over section thickness of at least 15 to 35 mm notwithstanding that the steel was finished hot rolled at a temperature up to 1050° C.

4,043,808

STEEL ALLOY

Thomas Watmough, Dolton, and Robert P. O'Shea, Lombard, both of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1972, Ser. No. 282,082

Int. Cl.² C22C *38/02, 38/04, 38/24*

U.S. Cl. 75—126 E **3 Claims**

1. A fragmentation type steel alloy consisting essentially of by weight about 0.029 to 0.082 percent phosphorus; about 0.5 percent carbon; about 1.5 percent manganese; about 1.5 percent chromium; about 0.15 percent vanadium; about 0.4 percent silicon; and the balance substantially all iron.

4,043,809

HIGH TEMPERATURE SUPERCONDUCTORS AND METHOD

John J. Ruvalds, 245 Colonnade Drive, Apt. 11, Charlottesville, Va. 22901

Filed May 24, 1976, Ser. No. 689,252

Int. Cl.² C22C *19/03, 30/02*

U.S. Cl. 75—134 N **12 Claims**

1. A superconductive compound having the formula:

$$Ni_{1-x}M_xZ_y$$

wherein M is a metal which will destroy the magnetic character of nickel; Z is hydrogen or deuterium; x is 0.1 to 0.9; and y, correspondingly 0.9 to 0.1.

2. A superconductive compound having the formula:

$$Ni_{1-x}M_xZ_y$$

wherein M is a metal selected from copper, silver, gold or mixtures thereof; Z is hydrogen or deuterium; x is 0.1 to 0.9; and y, correspondingly, 0.9 to 0.1.

W_T = weight of total charge (Ton) at the time of the further blowing operation; and

ΔT = temperature rise after measuring (° C) at the time of the further blowing operation;

determining the carbon content at the end-point of the process as a function of said oxygen quantity after the measuring and said decarburization parameters in accordance with the following:

$$C_{EC} = C_O + C_P \ln[1 + \left\{ \exp\left(\frac{C_B - C_O}{C_P}\right) - 1 \right\} \cdot \exp\left\{ -\frac{100V - \Delta Q}{W_{ST} - C_P} \right\}]$$

where

C_{EC} = calculated carbon content at the end-point (%);

C_O C_P V = decarburization parameters;

ΔQ = the quantity of oxygen blown in for raising the temperature up to an estimated level after the measuring (Nm^3); and

C_B = carbon content at the time of measuring (%); and

carrying out at least one of the following: (i) still further blowing in a given quantity of oxygen ΔQ_c at the end-point, (ii) supplying a requisite amount of coolant W_{Cb} and (iii) soft blowing in accordance with a given pattern of soft-blow, the given quantity of oxygen, the requisite amount of cooling and the soft-blow pattern being a function of the difference between said calculated carbon content at the end-point of the process and said target carbon content at the end-point, to simultaneously control the temperature and carbon content of said molten steel at the end-point of the process.

4,043,802

CONTINUOUS REFLUX REFINING OF METALS

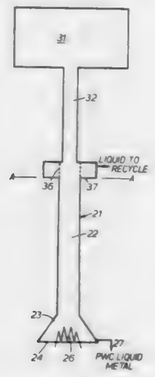
James Durie Esdaile, Glen Waverley, and Graeme William Walters, Mount Waverley, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Sept. 25, 1975, Ser. No. 616,816

Claims priority, application Australia, Sept. 30, 1974, 9067/74

Int. Cl.² C22B *7/00*

U.S. Cl. 75—63 **18 Claims**



1. A method for the continuous purification of an impure metal which is hypoeutectic with respect to the pure metal sought, said method comprising providing a column consisting of a slurry of metal crystals in liquid metal, said column having a relatively cool zone and a relatively hot zone at which almost all of the heat input into the column is supplied, and a continuous temperature gradient between said zones; the temperature of the cool zone being such as to permit coexistence of liquid and crystalline metal, and said hot zone being at a temperature sufficient to melt the crystals; chilling a portion of the column in the said cool zone to form a coherent mass of crystals of the metal then allowing incipient melting in the mass to occur to release crystals from the mass into the column of the crystals in the liquid metal in the cool zone of said column; transporting the crystals through the temperature gradient and into the hot zone, wherein melting of the crystals occurs and the hot zone thereby becomes enriched with the pure liquid metal; continuously supplying impure feed metal to the column and continuously withdrawing a portion of the pure liquid metal from the hot zone; the conditions being such that, over any given interval, the weight of crystals formed by chilling is greater than the weight of feed metal added.

4,043,803

PROCESS FOR THE MANUFACTURE OF A COMPACTED SYNTHETIC FLUX BASED ON CALCIUM FLUORIDE

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Filed Mar. 11, 1975, Ser. No. 557,370

Claims priority, application Switzerland, Mar. 15, 1974, 3612/74

Int. Cl.² C22B *9/10;* **C01D** *3/02*

U.S. Cl. 75—257 **18 Claims**

1. A process for producing a compacted, calcium fluoride based, synthetic flux from an aqueous effluent containing dissolved fluoride ions,

the steps comprising:

precipitating the dissolved fluorine ions essentially as calcium fluoride by the addition of calcium compounds;

separating the precipitate from the effluent and reducing the free water content of said precipitate to a content of from about 10 percent to about 30 per cent by weight;

mixing the separated precipitate with a binding agent and with at least one alkaline earth metal compound selected from the group consisting of oxides and hydroxides;

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4,043,804

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Kenneth O. Lindblad, Anaconda, Mont., assignor to The Anaconda Company, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,728

Int. Cl.² C22B *15/00*

U.S. Cl. 75—117 **9 Claims**

1. A process for the recovery of metals from copper reverberatory slag containing iron in the form of silicates comprising:

forming a substantially homogeneous mixture of iron sulfate and slag having from greater than about one to about five parts by weight slag per part iron sulfate,

roasting said mixture in an oxidizing atmosphere at a temperature of at least about 550° C. for a time sufficient to effect decomposition of substantially all of the iron sulfate to iron oxide and the copper values to water soluble copper salts, and

separating the water soluble copper salts from the iron oxide and silica.

4,043,805

ISOTROPIC AND HIGH-STRENGTH HIGH SILICON STEEL SHEET

Satohiro Hayami; Jun Imamura; Hiroshi Hayakawa, and Tadatzugu Yabuta, all of Yokohama, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Continuation of Ser. No. 477,098, June 6, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,692

Claims priority, application Japan, June 11, 1973, 48-65538

Int. Cl.² C22C *33/00;* **H01F** *1/04*

U.S. Cl. 75—123 L **7 Claims**

1. A high silicon steel composition consisting essentially of

0.03 to 0..15% carbon,

0.7 to 2.3% silicon,

0.7 to 2.0% manganese,

with the balance being iron and unavoidable impurities and wherein the ratio of Si/Mn is between 0.6 to 1.5 and the sulfur content is less than or equal to 0.02% as an unavoidable impurity, said composition being in the form of a rolled sheet having high ductility and thoughness in all directions independent of the rolling direction, said sheet having a total elongation measured in any direction of not less than 41%, a reduction of area measured in any direction of not less than 81%, and a tensile strength measured in any direction of not less than 50 kg/mm^2, and an n value of not less than 0.27, and wherein for a given sheet, each of said properties is substantially the same regardless of in which direction the property is measured.

4,043,806

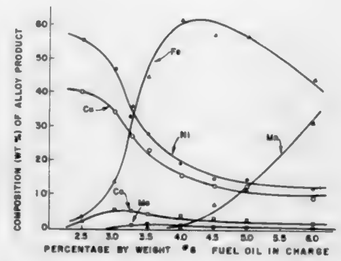
ALLOYS FROM MANGANESE NODULES

Thomas C. Wilder, Cambridge, Mass., and Walter E. Galin, Pawtucket, R.I., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 514,614, Oct. 15, 1974, Pat. No. 3,957,485. This application Nov. 17, 1975, Ser. No. 632,477

Int. Cl.² C22C *39/54*

U.S. Cl. 75—125 **8 Claims**



1. An alloy composed of several immiscible phases, a major phase being an iron-rich nickel phase, one minor phase containing 80–90% copper and another minor phase being a combination of manganese, molybdenum, nickel, cobalt and iron, the overall composition of the alloy having the following constituents in percent by weight:

Copper	22.9 %
Nickel	27.7 %
Cobalt	4.25 %
Molybdenum	1.23 %
Iron	44.3 %
Manganese	Balance

4,043,807

ALLOY STEELS

Ivor Kirman, Birmingham, England, assignor to The International Nickel Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 420,112, Jan. 2, 1974, abandoned. This application Feb. 10, 1976, Ser. No. 656,984

Int. Cl.² C22C *38/04, 38/12, 38/16*

U.S. Cl. 75—125 **7 Claims**

1. A low alloy, high strength steel characterized by good toughness, weldability and cold formability and consisting of from about 0.01 to 0.09% carbon, about 0.4% to about 0.8% nickel, about 0.7% to about 1.1% copper, about 0.2 to about 0.1% niobium, about 1.1% to about 1.65% manganese, aluminum present up to 0.08%, up to 0.5% each of chromium and molybdenum, up to about 0.6% silicon, up to about 0.01% boron, up to about 0.1% of at least one metal selected from the group consisting of zirconium, magnesium, calcium, and rare earths, the balance being essentially iron, said steel being further characterized in that the carbon equivalent expressed by the formula:

$$C + \frac{Mn}{6} + \frac{Cr + Mo}{5} + \frac{Ni + Cu}{15}$$

is not more than 0.41, said steel being further characterized in that the strength level is at least about 450 MN/m^2 and the 70J longitudinal impact transition temperature is below about −10° C. over section thickness of at least 15 to 35 mm notwithstanding that the steel was finished hot rolled at a temperature up to 1050° C.

4,043,808

STEEL ALLOY

Thomas Watmough, Dolton, and Robert P. O'Shea, Lombard, both of Ill., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1972, Ser. No. 282,082

Int. Cl.² C22C *38/02, 38/04, 38/24*

U.S. Cl. 75—126 E **3 Claims**

1. A fragmentation type steel alloy consisting essentially of by weight about 0.029 to 0.082 percent phosphorus; about 0.5 percent carbon; about 1.5 percent manganese; about 1.5 percent chromium; about 0.15 percent vanadium; about 0.4 percent silicon; and the balance substantially all iron.

4,043,809

HIGH TEMPERATURE SUPERCONDUCTORS AND METHOD

John J. Ruvalds, 245 Colonnade Drive, Apt. 11, Charlottesville, Va. 22901

Filed May 24, 1976, Ser. No. 689,252

Int. Cl.² C22C *19/03, 30/02*

U.S. Cl. 75—134 N **12 Claims**

1. A superconductive compound having the formula:

$$Ni_{1-x}M_xZ_y$$

wherein M is a metal which will destroy the magnetic character of nickel; Z is hydrogen or deuterium; x is 0.1 to 0.9; and y, correspondingly 0.9 to 0.1.

2. A superconductive compound having the formula:

$$Ni_{1-x}M_xZ_y$$

wherein M is a metal selected from copper, silver, gold or mixtures thereof; Z is hydrogen or deuterium; x is 0.1 to 0.9; and y, correspondingly, 0.9 to 0.1.

4,043,810

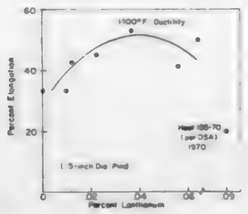
CAST THERMALLY STABLE HIGH TEMPERATURE NICKEL-BASE ALLOYS AND CASTING MADE THEREFROM

Dennis A. Acuncius; Robert B. Herchenroeder, both of Kokomo; Russell W. Kirchner, Greentown, and William L. Silence, Kokomo, all of Ind., assignors to Cabot Corporation, Kokomo, Ind.

Continuation-in-part of Ser. No. 179,922, Sept. 13, 1971. This application Dec. 29, 1975, Ser. No. 644,430

Int. Cl.[2] C22C *19/05*

U.S. Cl. 75—171 **6 Claims**



1. A cast thermally stable high temperature alloy characterized by superior oxidation resistance, sustainable high hot strength and retention of ductility on aging consisting essentially by weight of:

Mo: 13.7% to 15.5%
Cr: 14.7% to 16.5%
C: Up to 0.1%
La: An effective amount to produce oxidation resistance up to 0.08%
B: Up to 0.015%
Mn: 0.3% to 1.0%
Si: 0.2% to 0.75%
Co: Up to 2.0%
Fe: Up to 3.0%
W: Up to 1.0%
Cu: Up to 0.35%
P: Up to 0.02%
S: Up to 0.015%
Al: 0.1% to 0.5%
Ni: Balance

said alloy having an Nv number less than 2.31.

4,043,811

CONVERSION SOLUTIONS FOR PLANOGRAPHIC MASTERS

Richard John Pratt, Solon, Ohio, assignor to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed July 29, 1976, Ser. No. 709,667

Int. Cl.[2] G03G *13/28*

U.S. Cl. 96—1 R **12 Claims**

1. A conversion solution for treating an imaged electrostatic planographic master comprising a photoconductive material carried in a resinous binder to convert the non-image hydrophobic portions of said master to a condition of hydrophilicity comprising an aqueous solution of potassium ferrocyanide, a mineral acid, a buffering salt selected from the group consisting of monobasic ammonium phosphate and monobasic sodium phosphate to mantain the PH in the range from about 4.0 to about 5.0 and a solubilizing amine present in an amount from 1.0 – 6.0 weight percent having the formula:

$$R\,R'\,N - C_nH_{2n} - O - X$$

wherein R and R' are the same or different alkyl or hydroxy alkyl or amine alkyl substituents or hydrogen, X is hydrogen, lower alkyl or lower hydroxy alkyl and *n* is an integer from 2 to 4, inclusive.

4,043,812

ELECTROSTATOGRAPHIC IMAGING MEMBER AND PROCESS USING ANTHRACENE FUNCTIONAL POLYMERS

Milan Stolka, Fairport; James M. Pearson, Webster, and John F. Yanus, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

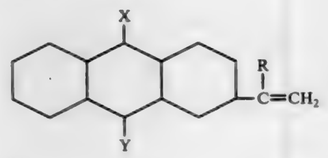
Division of Ser. No. 445,705, Feb. 25, 1974, Pat. No. 3,923,762, which is a continuation-in-part of Ser. No. 417,317, Nov. 19, 1973, abandoned. This application Mar. 7, 1975, Ser. No. 556,256

Int. Cl.[2] G03G *5/04*

U.S. Cl. 96—1.5 **6 Claims**

1. In an electrophotographic imaging member comprising a conductive substrate, a photoconductive layer covering at least one surface of said substrate and a charge carrier transport matrix layer overcoating the photoconductive layer, the improvement comprising

a charge carrier transport matrix layer comprising an anthracene functional polymer having polymer segments which consist essentially of the addition product of at least one monomer of the formula



wherein R is hydrogen or alkyl of 1 to about 3 carbon atoms; and X and Y are independently selected from chlorine, bromine, alkyl of 1 – 4 carbon atoms, or phenyl

said polymer segments having a degree of polymerization of about 40 or greater, aid transport layer having a thickness of from about 0.1 to about 300 microns.

4,043,813

PHOTOCONDUCTIVE PARTICLES OF ZINC OXIDE

Daniel R. Logue, Upland, and Terry G. Anderson, Pasadena, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Continuation of Ser. No. 367,668, June 6, 1973, abandoned. This application July 7, 1975, Ser. No. 594,150

Int. Cl.[2] G03G *5/08, 5/04*

U.S. Cl. 96—1.8 **2 Claims**

1. An improved photoconductive material having a surface coating comprising zinc oxide particles, sensitizer compound and an insulative binder, said sensitizer compound comprising a compound selected from the group consisting of cadmium selenide, cadmium telluride, zinc selenide, zinc telluride, mercuric selenide and mercuric telluride, said sensitizer compound being present in a concentration of at least about 0.5% and not in excess of about 10% by weight of the total concentration of zinc oxide plus sensitizer compound as a surface deposit on and strongly adhered to the surface of said zinc oxide particles in the form of substantially discontinuous islands on each said particle, said islands having an average thickness of between about 100 and 500 Angstroms, whereby said layer has increased light sensitivity, resists shifts in spectral response during reuse, and has a bi-chargeability.

4,043,814

IMAGE INTENSIFICATION

Isao Shimamura, and Koichi Nakamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 6, 1975, Ser. No. 629,444

Claims priority, application Japan, Nov. 6, 1974, 49-128327; Dec. 4, 1974, 49-139917

Int. Cl.[2] G03C *7/00, 5/24, 5/32*

U.S. Cl. 96—10 **24 Claims**

1. In an image-forming method which comprises contacting with an intensifying agent in the presence of a reducing agent, a photographic element comprising a support having thereon at least one layer containing image-wise distributed catalyst nuclei and thereby image-wise oxidizing the reducing agent and conducting image intensification, the improvement comprising using chlorite, chlorous acid, an aqueous solution of chlorine dioxide having a pH of 8 to 13, bromite or bromous acid as said intensifying agent.

4,043,815

METHOD OF MAKING PRINTING PLATES FOR OFFSET PRINTING

Stephane Klymus, 19 rue Gagner, Ivry-sur-Seine, val de Marne, France

Continuation of Ser. No. 592,521, July 2, 1975, abandoned, which is a continuation of Ser. No. 373,602, June 25, 1973, abandoned. This application Aug. 18, 1976, Ser. No. 715,384

Claims priority, application France, June 28, 1972, 72.23365

Int. Cl.[2] G03F *7/02*

U.S. Cl. 96—33 **3 Claims**

1. A method of making a printing plate for offset printing, comprising the steps of:

a. providing a positive transparency having a transparent non-sensitive base and a sensitive layer thereon;
b. printing a design on the sensitive layer of said positive transparency, the design when viewed by an observer from the sensitive layer side appearing right-reading;
c. mounting said positive transparency on a support provided with registration marks, said design carrying layer of the positive transparency being outward toward the observer on said mounting so that the design is rightreading for analysis;
d. contact printing a proof from said positive transparency for analysis of the mounted transparency and indicating connections on said proof;
e. using the indicated proof for correcting errors in the mounted transparency;
f. providing a negative transparency having a transparent non-sensitive base and a sensitive layer thereon;
g. contact-printing from said positive transparency a negative of the design on the sensitive layer of the negative transparency, said design appearing as a mirror image by an observer who looks at the sensitive layer said thereof;
h. providing a printing plate having a sensitive layer; and
i. reproducing the design of the negative transparency onto the printing plate by placing the design carrying layer of the negative transparency against the sensitive layer of said printing plate.

4,043,816

PHOTOGRAPHIC PROCESS FOR MAKING DIAZOTYPE COPIES UTILIZING SMALL QUANTITY OF LIQUID DEVELOPER

Johannes P. Bomers, Grubbenvorst, and Gerardus J. Vosbeek, Velden, both of Netherlands, assignors to Oce-van der Grinten N.V., Venlo, Netherlands

Continuation-in-part of Ser. No. 363,659, May 24, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,527

Claims priority, application Netherlands, May 26, 1972, 7207099

Int. Cl.[2] G03C *1/58, 5/34*

U.S. Cl. 96—49 **8 Claims**

1. Process for making diazotype copies which comprises imagewise exposing a diazotype material comprising a support and a light-sensitive surface layer, said surface layer having an average thickness of not more than 8 micrometers and comprising between 0.2 and 2 millimoles per square meter of one or more diazo compounds which, in vitro, couple more actively than 4-diazo-2-chloro-N.N.-diethylaniline, and thereafter applying to said light-sensitive surface layer a quantity of between 1.5 and 4.5 cm^3 per square meter of a buffered aqueous developing solution which is at a pH of between 5.5 and 7 and which contains, per liter, 0.1–0.6 g. mol of azo-coupling component consisting of at least 50% by weight of phloroglucinol and 1–3 g. equivalents of buffer salt, thereby obtaining a copy that immediately feels dry and exhibits an azo-dyestuff image in the unexposed areas of said diazotype material.

4,043,817

METHOD OF FORMING PHOTOGRAPHIC IMAGES FOR LITHOGRAPHIC USE

Eiichi Okutsu; Katsumi Hayashi; Shigenori Moriuchi, and Takeo Sakai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Nov. 7, 1975, Ser. No. 629,826

Claims priority, application Japan, Nov. 7, 1974, 49-128769

Int. Cl.[2] E03C *5/30, 1/76*

U.S. Cl. 96—66 R **6 Claims**

1. A continuous method for producing halftone images comprising:

1. image-wise exposing a lith-type silver halide photographic material comprising a silver halide emulsion with not less than about 85 mol% silver chloride and not more than about 8 mol% silver iodide and containing at least one organic silver complex compound which is substantially insoluble in water and has a maximum solubility of not more than 10^{-4} mol per liter in contiguous relationship with a photosensitive silver chlorobromide or chlorobromoiodide emulsion which contains not less than 60 mol% silver chloride and which is chemically and spectrally sensitized, a photographic speed of the silver halide emulsion containing the silver complex compound being about 1/5 to about 1/100 that of the silver chlorobromide or chlorobromoiodide emulsion, and
2. developing said photographic material in a continuous fashion with a developer containing hydroquinone and a carbonyl bisulfite adduct in the presence of a polyalkylene oxide of a molecular weight not less than 1000.

4,043,818

PROCESS FOR HARDENING PHOTOGRAPHIC LAYERS WITH CARBODIIMIDE COMPOUNDS CONTAINING SULPHOBETAINE GROUPS

Wolfgang Himmelmann, Opladen; Erwin Ranz, Leverkusen, and Edy Roche, Cologne, all of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany

Filed Aug. 12, 1975, Ser. No. 604,015

Claims priority, application Germany, Aug. 17, 1974, 2439553

Int. Cl.[2] G03C *1/40, 1/30*

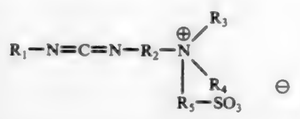
U.S. Cl. 96—77 **9 Claims**

1. The method of hardening a light sensitive photographic

material comprising a silver halide emulsion layer and containing at least one supported layer containing protein

by contacting the protein-containing layer with an effective amount of a hardener to harden the layer

wherein the improvement comprises the hardener is an asymmetric carbodiimide compound of the following formula:



in which

R_1 = alkyl with from 1 to 6 carbon atoms or cycloalkyl or alkoxy alkyl;

R_2 = alkylene with from 2 to 4 carbon atoms;

R_3 = alkyl with from 1 to 3 carbon atoms;

R_4 = alkyl with from 1 to 3 carbon atoms or phenyl, or R_3 and R_4 together represent the atoms required to complete a 6-membered heterocyclic ring which, in addition to the N-atom, may also contain nitrogen or oxygen; and

R_5 = alkylene with from 1 to 4 carbon atoms.

4,043,819

PHOTO-POLYMERIZABLE MATERIAL FOR THE PREPARATION OF STABLE POLYMERIC IMAGES AND PROCESS FOR MAKING THEM BY PHOTOPOLYMERIZATION IN A MATRIX

Niklaus Baumann, Marly, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

Continuation of Ser. No. 584,444, June 6, 1975, abandoned. This application Nov. 18, 1976, Ser. No. 743,011

Claims priority, application Switzerland, June 11, 1974, 7956/74; June 11, 1974, 7957/74; Apr. 16, 1975, 4843/75

Int. Cl.[2] **G03C** *1/68;* **C08F** *2/46*

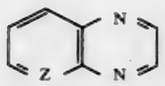
U.S. Cl. 96—115 P **69 Claims**

1. Photo-polymerisable material, suitable for the preparation of stable polymeric images, characterised in that it contains, on a carrier, at least one layer composed of

1. ethylenically unsaturated monomers which are soluble in water or water-alcohol mixtures and which contain one or more terminal double bonds and at least one polar atom grouping with a lone electron pair,

2. as the photo-initiator which, conjointly with the monomer (1) and/or the binder (3a), forms a photo-redox pair, a compound having a ring system of the formula

(1)



wherein Z is a nitrogen atom or the group C-R, R is hydrogen or a substituent and the compound is optionally quaternised, and

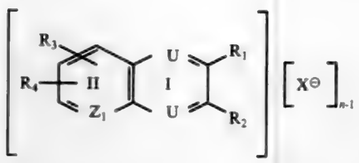
3. as a matrix for the monomer (1), a swellable reaction product of at least one

a. macromolecular binder which is soluble in water or water-alcohol mixtures and which has at least one polar atom grouping containing a lone electron pair, with

b. a hardener, the hardener being different from the monomers of the component (1), and optionally

4. a chemically inert macromolecular compound which does not react with the binder (a) or the hardener (b).

8. Photo-polymerisable material according to claim **1**, characterised in that the photo-initiator is a diazine compound of the formula



wherein n is 1 or 2, Z_1 denotes a nitrogen atom or a group



one U denotes a nitrogen atom and if n is 1, the other U also denotes a nitrogen atom, and if n is 2 denotes a group of the composition



X denotes an anion, Y denotes an alkyl radical which is optionally substituted further, R_1 and R_2 independently of one another denote a hydrogen atom or an alkyl, alkoxy, aroyl, aryloxy or aralkoxy radical which is optionally substituted further, or R_1 and R_2, conjointly with two carbon atoms of the ring I, denote a heterocyclic or isocyclic ring, and R_3, R_4 and R_5 independently of one another denote a hydrogen atom, an alkyl, alkoxy, aryloxy or aralkoxy radical which is optionally substituted further, a halogen atom, a nitro group, a cyano group, a hydroxyl group, an amino group which is optionally substituted further, an alkylammonium group, a carboxylic acid group, a carboxylic acid amide group, a carboxylic acid alkyl ester group or a sulphonic acid group or two of R_3, R_4 and R_5, conjointly with two adjacent carbon atoms of the ring II, denote an isocyclic or heterocyclic ring.

39. Process for recording information, in particular for preparing stable polymeric images, by photo-polymerisation in a matrix, characterised in that the photo-polymerisable material according to claim **1** is exposed image-wise and subsequently treated with a solvent, which dissolves the components (1) and optionally (2), but which does not dissolve the polymer formed from (1) by exposure and the hardened product from the components (3*a*) and (3*b*) which was formed in the manufacture of the photo-polymerisable material, and the solvent is then removed by drying.

41. Photopolymerisable material, suitable for the preparation of stable polymeric images, containing on a carrier at least one layer composed of at least one ethylenically unsaturated, photopolymerisable monomer and at least one photo-initiator, characterised in that the monomer is present in a matrix of a swellable reaction product from a chemically hardenable, non-light-sensitive, swellable macromolecular compound and a hardener, and optionally a macromolecular compound which is chemically inert towards the chemically hardenable compound and the hardener.

64. Photocurable material according to claim **41**, characterised in that ethylenically unsaturated photopolymerisable compounds are used which are soluble in lower alcohols with 1 to 4 carbon atoms and/or in water.

4,043,820

INK CONTAINING IRON CHELATE AND POLYHYDROXY COMPOUND

Raphael Landau, Woodford Green, England, assignor to Ozalid Group Holdings, Limited, England

Filed June 10, 1975, Ser. No. 585,754

Int. Cl.[2] **C09D** *11/00*

U.S. Cl. 106—21 **7 Claims**

1. An ink, capable of producing a visible trace having a high absorption for light, said ink being an aqueous solution containing a dissolved chelate of iron, said chelate being selected from the group consisting of the ferric sodium salt of ethylenediamine tetraacetic acid and ferric ammonium oxalate, and a dissolved water soluble polyhydroxy compound which is selected from the group consisting of tannic acid, pyrocatechol, pyrogallol and gallic acid, water soluble derivatives of said tannic acid, said pyrocatechol, said pyrogallol and said gallic acid, ascorbic acid and chromotropic acid sodium salt, the ink being sufficiently acid to prevent reaction between the chelate and the polyhydroxy compound until the ink is applied to an alkaline surface, and containing at least 5% by weight of said chelate and at least 5% by weight of said polyhydroxy compound.

4,043,821

VITROCERAMIC MATERIALS AND PROCESS OF MAKING THE SAME

Eugene Le Bras, Franconville-La Garenne, France, assignor to Compagnie Internationale de Minerallurgie - CIM, Neuilly-sur-Seine, France

Filed July 28, 1976, Ser. No. 709,430

Claims priority, application France, June 28, 1975, 75.23428

Int. Cl.[2] **C03C** *3/22*

U.S. Cl. 106—39.6 **7 Claims**

1. A vitroceramic product containing at least 90% by weight of the sum of the following ingredients expressed in percent by weight of the sum thereof:

$SiO_2 + Al_2O_3 + B_2O_3$	40–50%
Iron oxides (expressed in the form of ferric iron oxide - Fe_2O_3)	16–30%
CaO + MgO (wherein MgO may be 0%),	24–40%

the sum of $Al_2O_3 + B_2O_3$ being 2–15%; said product including at least 0.5% by weight of a nucleus forming agent.

4,043,822

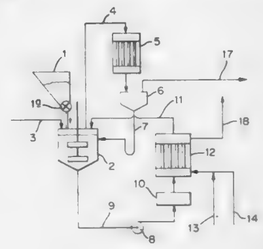
TREATMENT OF WATER-SOLUBLE METAL SULFATE RESIDUES

Bela I. Karsay, DeWitt, and Robert L. Sturtevant, Baldwinsville, both of N.Y., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Nov. 20, 1975, Ser. No. 633,775

Int. Cl.[2] **C04B** *33/04;* **C01B** *17/50, 17/72, 17/90*

U.S. Cl. 106—70 **9 Claims**



1. Process for transforming solid watersoluble metal sulfate residue obtained from spent sulfuric acid into a substantially water-insoluble agglomerated reduction product, which comprises introducing said metal sulfate residue into a pool of molten sulfur maintained at temperature of at least about 250° C, wherein said pool of molten sulfur furnishes both the reaction medium as well as the reductant for said metal sulfate residue, to thereby generate a gaseous stream comprising sulfur dioxide and to transform the metal sulfate residue into a corresponding reduction product, recovering sulfur dioxide and separating reduction product from the pool of molten sulfur to recover agglomerated reduction product containing sufficient elemental sulfur to bind together the reduction product.

4,043,823

LIGHTWEIGHT SILICON OXYNITRIDE

Malcolm E. Washburn, Princeton, and Stephen D. Hartline, Shrewsbury, both of Mass., assignors to Norton Company, Worcester, Mass.

Filed July 21, 1975, Ser. No. 597,821

Int. Cl.[2] **C04B** *35/48*

U.S. Cl. 106—40 R **7 Claims**

1. An insulating refractory body consisting essentially of Si_2ON_2, having less than 30% of SiO_2 and less than 15% Si_3N_4, said body having a density less than 50% of theoretical, at least 50% of the void volume of said body comprising spherical voids, said body being free of interparticular pores, as distinguished from matrix pores, and having a crush strength in excess of 500 p.s.i. and a thermal conductivity of less than 20 BTU inch/hr./ft.^{2}/°F. at 1170° F.

4,043,824

CERAMIC COLOR COMPOSITIONS AND A METHOD FOR DECORATING CERAMIC WARE THEREWITH

Nelson William Wagar, Pittsburgh, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 4, 1975, Ser. No. 601,738

Int. Cl.[2] **C03C** *5/02*

U.S. Cl. 106—48 **4 Claims**

1. A ceramic color composition comprising an intimate dispersion of from about 1 to about 6 parts of a ceramic pigment or a glass color in 1 part of a moisture or steam settable, liquid vehicle consisting essentially of a solution of at least one water-insoluble film-forming resin in a water-miscible solvent therefor, said vehicle being volatilizable without leaving objectionable residue thereof at a temperature below the decomposition temperature of the ceramic pigment and below the fusion temperature of the glass color, and the amount of resin in said vehicle ranging from about 15 to about 60% of the weight of said vehicle and being such that when the composition is applied to non-glazed ceramic ware and exposed to moisture or steam, a film of the resin is precipitated from the solvent onto the ware.

4,043,825

PRODUCTION OF FOAMED GYPSUM MOLDINGS

Martin Müller, Krefeld; Friedrich Hinsche, Leverkusen; Gerhard Winter, Krefeld, and Karl Brändle, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 14, 1975, Ser. No. 604,868

Claims priority, application Germany, Sept. 3, 1974, 2442098

Int. Cl.[2] **C04B** *11/00*

U.S. Cl. 106—87 **9 Claims**

1. In the production of a gypsum-based porous body of high strength by foaming a gypsum-water mixture containing alkali, hydrogen peroxide and a decomposition catalyst therefor, the improvement which comprises including in said mixture an acid reacting compound with active hydrogen atoms in a quantity sufficient to bring the final pH of the mixture to about 12 to 12.5, said acid reactimg compound being an acid, an ammonium salt or a salt of a metal of the first or second Main Group of the Periodic System.

4,043,826

PROCESS FOR MAKING ARTIFICIAL ROCKS

Bing W. Hum, 5227 Palco Place, College Park, Md. 20740

Filed Nov. 22, 1974, Ser. No. 526,404
Int. Cl.[2] C04B *7/35*
U.S. Cl. 106—90 **17 Claims**

1. A process for making light-weight simulated rock structures comprising molding an artificial rock molding composition comprising cement, a light-weight filler, water, a curing agent for the cement, and an acrylic resin latex paint in a mold having a nonuniform, grainy-textured molding surface to form a hardened rock body exhibiting a grainy surface resembling the surface of natural rock, said grainy surface defining cracks, indentations and concavities therein, removing the hardened rock body from the mold, applying to at least a portion of the grainy surface of the hardened rock body a coating of a cement colorant, and thereafter removing a portion of the coating of said cement colorant nonuniformly such that cement colorant preferentially resides in said cracks, identations and concavities, whereby a light-weight nonuniformly colored simulated rock structure is produced.

4,043,827

SAG-RESISTANT DRY-SET MORTAR COMPOSITION

Frank E. Bernett, Yardley, Pa., assignor to Tile Council of America, Inc., Princeton, N.J.

Continuation of Ser. No. 412,152, Nov. 2, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,749
Int. Cl.[2] C04B *7/352*
U.S. Cl. 106—92 **19 Claims**

1. In a dry-set Portland cement mortar composition consisting essentially of, in the dry state, Portland cement and sand present in amounts sufficient to form a conventional mortar composition, and a minor amount of a water-soluble cellulose ether, the improvement consisting of the inclusion in the composition of from 0.5 to 3.0 percent by weight of an additive selected from the group consisting of montmorillonite clays and attapulgite clays, and mixtures thereof.

4,043,828

SHRINKAGE INHIBITION OF CEMENTITIOUS SYSTEMS THROUGH THE ADDITION OF SPECIALLY PROCESSED CARBONACEOUS MATERIALS

Robert W. Gaines, Darien, Conn., assignor to Construction Products Research, Inc., Old Greenwich, Conn.

Continuation-in-part of Ser. No. 560,686, March 21, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,435
Int. Cl.[2] C04B *7/02*
U.S. Cl. 106—97 **15 Claims**

1. A method for inhibiting the shrinkage of an aqueous hydraulic cementitious system prior to hardening comprising selecting a particulate carbonaceous material from the group consisting of delayed coke and naturally occurring coal, treating the material by heating it to a temperature substantially in excess of that temperature at which moisture is driven out of the material, incorporating the treated particulate carbonaceous material in the cementitious system, in an amount effective to counteract the shrinkage tendency of the cementitious system, the carbonaceous material being one which when so treated is effective to inhibit shrinkage by causing expansion of the system compared to no incorporation of carbonaceous material.

4,043,829

STABILIZED WAX EMULSIONS

Edward L. Ratledge, Claymont Heights, Del., and Richard E. Ware, Aston, Pa., assignors to Sun Oil Company of Pennsylvania, Philadelphia, Pa.

Continuation-in-part of Ser. No. 175,380, Aug. 26, 1971, abandoned, which is a division of Ser. No. 744,705, July 15, 1968, Pat. No. 3,819,530. This application Oct. 31, 1975, Ser. No. 627,731
Int. Cl.[2] C08L *91/06*
U.S. Cl. 106—271 **17 Claims**

1. A wax-in-water emulsion composition consisting of a wax, an emulsifier, and 2.0 to 5.0 weight percent based on the weight of the whole composition of a stabilizing additive of the structural formula:



wherein Q is a substitutent selected from the group consisting of $-NH_2$, $-NHCH_3$ and $-NHC_2H_5$ and Q' is a substitutent selected from the group consisting of $-NHCH_3$ and $-NHC_2H_5$.

4,043,830

METHOD OF CONSOLIDATING POOR QUALITY SOILS

Manao Suzuki, Tokyo, Japan, assignor to Kyokado Engineering Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,773
Int. Cl.[2] C09K *3/00;* **E02D** *3/12*
U.S. Cl. 106—287 SS **6 Claims**

1. In a method of consolidating a poor quality soil by injecting hardeners thereinto, in which a mixture of water and a gelling agent and a water glass aqueous solution containing a gelling agent are employed as the hardeners, the improvement comprising the steps of

joining the hardeners together to form a resultant liquid,

injecting the resultant liquid obtained by joining the hardeners into the soil, and

during the injection, suspending the joining operation of the mixture of the water and gelling agent and only continuously injecting the water glass aqueous solution containing gelling agent into the soil.

4,043,831

DENSIFICATION OF COAL FLY ASH

Louis D. Friedman, New Brunswick, N.J., assignor to Cogas Development Co., Princeton, N.J.

Filed July 7, 1975, Ser. No. 593,921
Int. Cl.[2] C04B *31/00*
U.S. Cl. 106—288 B **6 Claims**

1. A method of producing densified fly ash pellets having a specific gravity of about 2.0 to 2.3 consisting essentially of the steps

a. sizing the fly ash to produce a fraction substantially finer than −200 mesh (U.S. Standard);

b. moistening the sized fraction with sufficient water to form green pellets;

c. sizing the green pellets;

d. tumbling the sized green pellets to effect particle packing until excess water has been squeezed out, said pellets being kept dusted during tumbling with sized fly ash from step (a) to absorb the squeezed out water and thereby prevent agglomeration;

e. drying the packed green pellets below about 300° F to remove the free water therefrom;

f. heating the dried pellets from about 1000° F to about 70–90% of the absolute softening temperature of the ash until the iron oxides are converted substantially to the $\alpha-Fe_2O_3$ form of hematite and carbon is burned off to a residual value of no more than about 3 to 5% and;

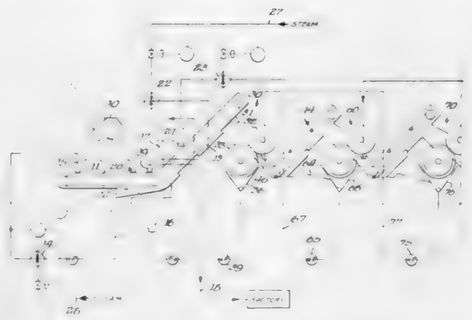
g. sintering the treated, dried pellets of step (f) at a temperature of 70 to 90% of the absolute softening temperature of the ash.

4,043,832

APPARATUS FOR EXTRACTING SUBSTANCES FROM FIBROUS MATERIALS

Wilhelm J. Leibig, Aurora; Clarence R. Steele, and Frank B. Price, both of Denver, all of Colo., assignors to CF&I Engineers, Inc., Denver, Colo.

Continuation of Ser. No. 232,690, March 8, 1972, abandoned, which is a continuation of Ser. No. 54,370, July 30, 1970, abandoned. This application Apr. 5, 1976, Ser. No. 673,676
Int. Cl.[2] C13D *1/04;* **B30B** *3/04, 9/20*
U.S. Cl. 127—6 **20 Claims**



1. In an apparatus for extracting soluble substances from sugar cane, the combination comprising:

means for fiberizing the sugar cane so as to substantially expose the cane juice,

means for collecting the fiberized mass of cane,

a first compressing means for expressing liquid contained in said fiberized mass,

said compressing means having opposed upper and lower compression surfaces,

said lower compression surface provided with openings therein for conducting a substantial portion of the expressed liquid therethrough during the compressing operation,

means for macerating the fiberized mass prior to said first compressing means,

means for supplying said maceration means with liquid expressed from said first compressing means, and

means for removing liquid from said maceration means for supply to the final product.

4,043,833

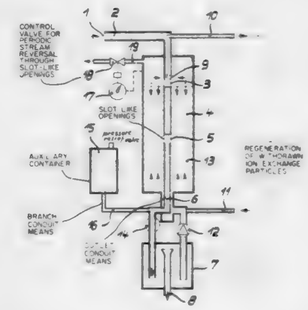
METHOD OF AND DEVICE FOR CLEANING THE SLOT-LIKE OPENINGS OF DISTRIBUTION AND COLLECTION PIPES IN AN ION EXCHANGER COLUMN

Georg Plura, Bergnestadt, Germany, assignor to L. & C. Steinmuller GmbH, Gummersbach, Germany

Filed Jan. 21, 1976, Ser. No. 650,898
Claims priority, application Germany, Jan. 23, 1975, 2502607
Int. Cl.[2] B08B *3/00*
U.S. Cl. 134—34 **4 Claims**

1. A method of cleaning the periodically blocked slot-like openings of distribution and collection pipes of a continuously operating ion exchange column in which the ion exchange particles during the treatment phase of a medium stream conveyed to an ion exchange bed in said column do not change places, and in which said bed during said treatment phase carries out an axial movement without temporal interruption, which includes the steps of continuing to convey said medium stream into said column, and through said bed and through slot-like openings to an outlet conduit, and when the throughflow per time unit decreases, applying fluid under pressure from an external source to said outlet conduit and openings to create flow under pressure opposed to said medium stream and subjecting said medium stream to periodic short time flow reversals to shock clean said slot-like openings while releasing the pressure of said medium stream on said bed in said column, during said subjecting said medium stream to periodic short time flow reversals the ion exchange particles being not subject to any space change during the flow reversal within the ion exchanger bed.

2. In combination: a housing adapted to receive an ion exchange bed, inlet conduit means leading into the upper portion of said housing and provided with first opening means for conveying an untreated medium stream into a section of an ion exchange bed inserted in said housing, outlet conduit means provided with slot-like opening means for receiving from said bed treated medium stream, a storage container, first conduit means including a shut-off valve interposed therein and leading



from said outlet conduit means to said storage container, second conduit means leading from said storage container into said housing and including a pump interposed in said second conduit means, said storage container also having an outlet adapted selectively to be opened and closed, a closed auxiliary container having a gaseous atmosphere therein, branch conduit means branching off from said outlet conduit means upstream of said shut-off valve and also leading into said auxiliary container for conveying medium from said outlet conduit means into said auxiliary container and compressing said gaseous atmosphere therein, and control means including a control valve communicating with the interior of the upper portion of said housing above a bed in said housing and adapted when open to vent said medium from said housing, said control means also including gauge means operatively connected with said control valve to cause said control valve to open in response to pressure in said upper portion of said housing above a set pressure, thereby controlling brief reversal of medium stream flowing through said slot-like openings to shock clean said slot-like openings.

4,043,834

FLEXIBLE SOLAR GENERATOR PANEL

Dieter Rusch, Wedel, Holstein, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Germany

Filed Sept. 7, 1976, Ser. No. 720,653
Claims priority, application Germany, Sept. 18, 1975, 2541536
Int. Cl.[2] H01L *31/04*
U.S. Cl. 136—89 SA **6 Claims**

1. A solar generator for satellite and terrestrial energy supply systems, comprising a flexible support, a plurality of solar cells mounted on said support and being rollable and foldable therewith, connector means electrically interconnecting said

cells, and at least one conducting layer adapted to be grounded to the associated satellite or to the earth and applied to said



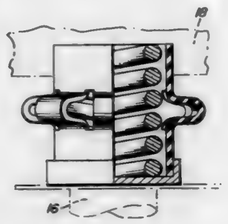
support on the side opposite said cells for elimination of charge carriers.

4,043,835

FLEXIBLE SLEEVE THERMAL PATH DEVICE FOR THERMOELECTRIC CONVERTER ELEMENT PRESSURE LOADING FORCE APPLICATION SPRING

Samuel D. Hall, Jr., Catonsville, Md., assignor to Teledyne Isotopes, Timonium, Md.

Filed July 9, 1975, Ser. No. 594,449
Int. Cl.[2] H01L *35/02*
U.S. Cl. 136—221 **4 Claims**



1. A device for augmenting transfer of heat between a thermoelectric element cold end and a heat rejection system around a thermoelectric force application spring comprising:

a thermally conductive flexible sleeve for surrounding the force application spring with a highly conductive heat transfer path between the thermoelectric element and the heat rejection system, said sleeve comprising a cylindrical slotted tube comprising a plurality of layers of foil bonded together at the ends thereof and having a plurality of collapsible flat strips defined between longitudinal slits in the side walls of said cylindrical tube, which collapsing strips bow outwardly of the tube when an axial compressive force is applied to the ends of said tube to allow the sleeve to be longitudinally collapsible and to decrease the axial length thereof without interfering with the application of force by the force application spring; and

an end cap on said sleeve assembly located adjacent to and electrically insulated from said thermoelectric cold end.

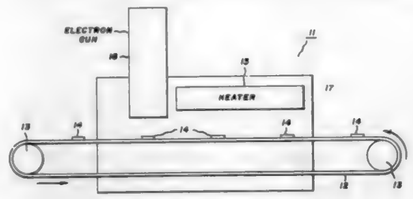
4,043,836

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES

Yen Sheng Edmund Sun, Liverpool, N.Y., assignor to General Electric Company, Auburn, N.Y.

Filed May 3, 1976, Ser. No. 682,581
Int. Cl.[2] H01L *21/263*
U.S. Cl. 148—1.5 **5 Claims**

1. A method of adjusting the electrical characteristics of a semiconductor device comprising forming deep level recombination centers by subjecting the monocrystalline semiconductor material of said device at a temperature in the range of about 150° to 375° C to impact by crystal lattice-damaging



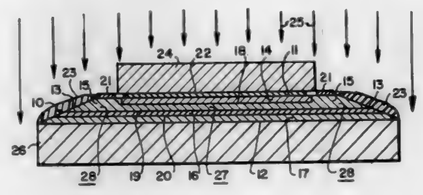
electrons (with irradiation) of an energy level in excess of about 250 Kev.

4,043,837

LOW FORWARD VOLTAGE DROP THYRISTOR

Michael W. Cresswell, Pittsburgh, and John S. Roberts, Export, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 540,208, Jan. 10, 1975, Pat. No. 3,990,091, which is a continuation of Ser. No. 354,620, April 25, 1973, abandoned. This application Aug. 11, 1976, Ser. No. 713,568
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **4 Claims**



1. A method of making a thyristor comprising the steps of:

a. diffusing impurities into a semiconductor body to form a cathode-base region therein having an impurity concentration at the working point of less than 5×10^{15} per cm^3;

b. masking against radiation from a radiation source conducting portions of the thyristor; and

c. thereafter irradiating unmasked portions of the semiconductor device with the radiation source to increase gate current to fire the thyristor.

4,043,838

METHOD OF PRODUCING PITTING RESISTANT, HOT-WORKABLE AUSTENITIC STAINLESS STEEL

Harry E. Deverell, Natrona Heights, Pa., assignor to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 571,460, April 25, 1975, Pat. No. 4,007,038. This application Oct. 7, 1976, Ser. No. 730,400
Int. Cl.[2] C21D *7/13*
U.S. Cl. 148—2 **4 Claims**

1. A method for producing an austenitic stainless steel alloy consisting essentially of about 20% to 40% nickel, 14% to 21% chromium, about 6% to 12% molybdenum, 0.010% to 0.20% cerium, 0.005% to 0.050% calcium and the remainder substantially all iron, which comprises melting said alloy and casting it into a shape which can be rolled, and thereafter hot rolling said shape with a finishing temperature after rolling about or greater than 1800° F.

4,043,839

INTERNAL NITRIDATION OF COBALT-BASE SUPERALLOYS

Albert G. Hartline, III, and Lynn E. Kindlimann, both of Woodland Hills, Calif., assignors to Allegheny Ludlum Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 565,189, April 3, 1975, abandoned. This application May 24, 1976, Ser. No. 689,402
Int. Cl.[2] C21D *1/56*
U.S. Cl. 148—20.3 **13 Claims**

1. A method of strengthening cobalt-base superalloys by internal nitridation of substantially the entire volume of said alloys, which comprises the steps of: heating a cobalt-base alloy containing at least 33% cobalt as the major constituent, chromium, up to 25% nickel, up to 0.15% carbon, from 1 to 3% of nitride forming elements from the group consisting of titanium, vanadium, niobium, and tantalum, balance residuals and those elements which enhance the properties of cobalt-base alloys, at a temperature of from 1600° to 2500° F in a nitrogen-bearing atmosphere substantially free of moisture and oxygen, and diffusing nitrogen from said atmosphere into and throughout said alloy for a period of time sufficient to form nitrides having an interparticle spacing of less than 10 microns, said nitrides being from the group consisting of titanium nitride, vanadium nitride, niobium nitride and tantalum nitride, said nitrides being distributed substantially throughout said nitrided alloy; said cobalt base alloy being less than 25 mils thick.

4,043,840

ALUMINUM ALLOYS POSSESSING IMPROVED RESISTANCE WELDABILITY

Philip R. Sperry, North Haven, Conn.; William C. Setzer, Creve Coeur, Mo., and Lloyd E. Damon, Wallingford, Conn., assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed July 9, 1976, Ser. No. 703,781
Int. Cl.[2] C22C *21/06*
U.S. Cl. 148—32 **18 Claims**

1. A wrought article exhibiting reduced electrical conductivity, increased electrical resistivity, improved resistance weldability plus good tensile properties prepared from an aluminum base alloy consisting essentially of from 2.0 to 6.0% magnesium, up to 0.40% iron, up to 0.40% silicon, and from 0.03 to 0.20% vanadium, balance aluminum, wherein vanadium is retained in solid solution.

4,043,841

METAL-REFRACTORY COMPOSITE MATERIAL

Hervé Bibring, Meudon; Jean-Pierre Trottier, Bagneux; Tasadduq Khan, Plessis-Robinson; Maurice Rabinovitch, Chatillon, and Jean-François Stohr, Bourg-la-Reine, all of France, assignors to O.N.E.R.A. - Office National d'Etudes et de Recherches Aerospatiales, Chatillon, France

Filed Aug. 27, 1975, Ser. No. 608,346
Claims priority, application France, Sept. 13, 1974, 74.31140
Int. Cl.[2] C22C *19/05*
U.S. Cl. 148—32.5 **8 Claims**

1. A refractory composite material adapted to be used particularly in the manufacture of aviation turbine blades, comprising a nickel-based superalloy matrix consisting essentially of nickel, cobalt, aluminum, in the form of Ni_3Al precipitate, and 7 to 10% by weight tungsten; and a reinforcing phase of oriented monocrystalline niobium carbide fibers formed in situ during production of the material by unidirectional solidification, said composite material having a density of less than 9 and a composition by weight of:

Co — 20 to 30%
Cr — 6 to 15%
W — 7 to 10%
Al — 3 to 6%
Nb — 4 to 6%
C — 0.4 to 0.65%
Ni — balance to 100.

4,043,842

GRINDING MEMBERS

Victor L. J. Joiret, 115, rue de la Beole, Chaudfontaine, Belgium

Continuation of Ser. No. 271,027, July 12, 1972, abandoned, which is a continuation-in-part of Ser. No. 32,802, April 29, 1970, abandoned, which is a continuation-in-part of Ser. No. 696,325, Jan. 8, 1968, abandoned, said Ser. No. 271,027, is a continuation-in-part of Ser. No. 178,822, Sept. 8, 1971, abandoned, which is a continuation of Ser. No. 696,325, , abandoned. This application Mar. 9, 1976, Ser. No. 665,292
Int. Cl.[2] C22C *37/06;* C21D *5/00*
U.S. Cl. 148—35 **4 Claims**

1. Heat-treated cast grinding members for use in a grinding mill, wherein said members are subjected to abrasion and repeated impacts, which members are made of a casting consisting essentially in weight percentage of chromium and carbon limited to a range defined by a closed area of a chromium-carbon coordinate diagram having the following coordinates:

Cr = 22%; C = 2%
Cr = 27%; C = 3%
Cr = 14%; C = 2%
Cr = 19%; C = 3%

the balance being essentially iron with the usual impurities; said casting having been subjected to a hardening heat-treatment from a temperature between 950° C to 1100° C, the temperature for hardening increasing within the range in accordance with the following relationship: $\%Cr - 5 \times \%C$, and subsequently to a tempering heat-treatment at a temperature between 440° C and 530° C, the temperature for tempering increasing within the range in accordance with the following relationship: $\%Cr - 5 \times \%C$, in such a manner as to evidence a metallographic structure constituted by eutectic carbides and a matrix, which matrix is free of pearlite and includes a martensitic solid solution containing less than 3% of residual austenite, and pro-eutectoidic carbides, said heat-treated casting having a Rockwell C hardness of at least 59.

4,043,843

ABRASION RESISTANT, HEAT HARDENABLE, STAINLESS STEEL

Harry Tanczyn, Baltimore, Md., assignor to Armco Steel Corporation, Middletown, Ohio

Continuation-in-part of Ser. No. 555,708, March 5, 1975, abandoned, which is a division of Ser. No. 354,243, April 25, 1973, abandoned. This application Aug. 4, 1976, Ser. No. 711,636
Int. Cl.[2] C22C *38/28, 38/34*
U.S. Cl. 148—37 **5 Claims**

1. Heat hardened stainless steel fabricated product having good corrosion resistance, and an abrasion resistance of less than 4,500 milligrams per 1,000 cycles by the test herein described, consisting essentially of, in weight percent, from about 1.8% to about 5% carbon, up to about 1.0% manganese, greater than 1.5% to about 4.5% silicon, about 11.5% to about 18% chromium, up to about 1% nickel, greater than about 4% to about 10% titanium, up to about 1.5% molybdenum, and balance essentially iron exept for incidental impurities.

4,043,844

HEAT-TREATED CAST GRINDING MEMBERS

Michel J. Feltz, rue Hotteux, 14e, Ayeneux, Belgium

Continuation of Ser. No. 406,102, Oct. 12, 1973, abandoned, which is a continuation of Ser. No. 175,200, Aug. 26, 1971, abandoned. This application May 19, 1976, Ser. No. 688,004
Claims priority, application Luxembourg, Sept. 1, 1970, 61624; Sept. 1, 1970, 61625
Int. Cl.[2] C22C *38/22*
U.S. Cl. 148—37 **20 Claims**

1. Heat-treated cast grinding members for use in a grinding mill wherein said members are subjected to abrasion and re-

peated impacts in the presence of a wet corrosive medium, said members essentially of

0.5% to 2.8% carbon,

15.0% to 35.0% chromium

the balance being essentially iron except for manganese and silicon, the optional addition of which is known in the production of wear-resistant castings and normal impurities; wherein the total percentage by weight of carbon and chromium must satisfy the relationship

$$\%Cr - 8 \times \%C = 11 \text{ to } 16\%;$$

said heat-treated members having been subjected to processing including hardening without subsequent tempering from a temperature range of from 1075° to 1175° C in such a manner as to evidence a metallographic structure of primary chromium carbides in a ferrite-free matrix which is a predominantly martensitic solid solution consisting essentially of from 0.30% to 0.45% of carbon and from 14% to 18% of chromium, and said members having a Rockwell "C" hardness of at least 60.

4,043,845

CARBON STABILIZED COBALT-RARE EARTH MAGNETIC MATERIALS

Norman J. Dionne, Arlington Heights, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 28, 1975, Ser. No. 636,177

Int. Cl.² H01F *1/02*; C22C *23/00*; B22F *3/00*

U.S. Cl. 148—105 **6 Claims**

1. A magnetic composite material comprised of powder particles, each particle comprising a bulk mixture of rare earth, cobalt, and elemental carbon constituents, and a protective overlayer of elemental carbon.

4,043,846

METHOD OF PRODUCING FERROMAGNETIC METAL POWDER BY GASEOUS REDUCTION OF SILICON COMPOUND-COATED RAW MATERIAL

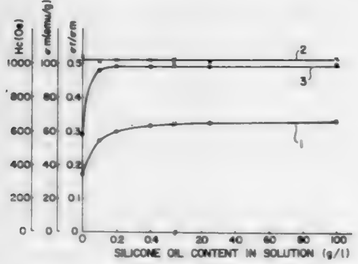
Masahiro Amemiya, Hino, and Seiichi Asada, Hachioji, both of Japan, assignors to Hitachi, Ltd. and Hitachi Maxell, Ltd., both of Japan

Filed Mar. 17, 1976, Ser. No. 667,549

Claims priority, application Japan, Mar. 17, 1975, 50-31178; Mar. 17, 1975, 50-31177

Int. Cl.² H01F *1/02*; C22C *1/04*; B22F *3/00*

U.S. Cl. 148—105 **24 Claims**



2. A method of producing ferromagnetic metal powder comprising the steps of:

i. coating a starting raw material powder with a solution containing more than 0.05 g/l of one silicon compound selected from the group consisting of sodium silicate, potassium silicate, silicic acid, potassium metasilicate, magnesium silicate, cobalt silicate, calcium metasilicate, metasilicic acid, sodium metasilicate and silicone oil and a solution containing ions of a silver compound in which the content of silver compound is more than 0.02 g/l, said raw material being at least one selected from the group consisting of oxalate, formate, oxide and oxyhydroxide of iron,

ii. drying said powder coated at step (i),

iii. heating said powder at temperature ranging from 200° to 700° C. in a reducing atmosphere, and

iv. cooling said powder reduced in the preceding step (iii).

4,043,847

HARDENING PROCESS FOR CRANKSHAFTS

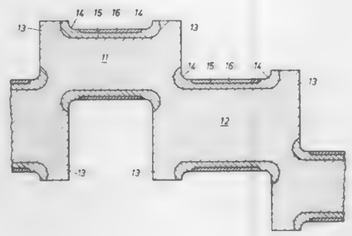
Karl Just, Immenstaad, Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Germany

Filed Nov. 24, 1975, Ser. No. 634,775

Claims priority, application Germany, Nov. 22, 1974, 2455285

Int. Cl.² C21D *9/30*

U.S. Cl. 148—146 **10 Claims**



1. A process for hardening a crankshaft which includes bearing locations defined by crank pins, journal pins and crank webs with the respective transitional areas between the crank pins, journal pins and crank webs being rounded areas, the process comprising:

hardening all bearing locations and rounded areas of the crankshaft to provide a hardening layer of a predetermined depth at the bearing locations and rounded areas;

tempering the hardening layer at the bearing locations and rounded zones to a predetermined hardness value which permits subsequent alignment of the crankshaft at the rounded areas;

hardening only the bearing locations without affecting the rounded areas so as to provide a further hardening layer having a predetermined depth on the first mentioned hardening layer; and

tempering the entire crankshaft to eliminate internal stresses therein.

4,043,848

METHOD OF FABRICATION OF INSULATED GATE FIELD EFFECT SEMICONDUCTOR DEVICES

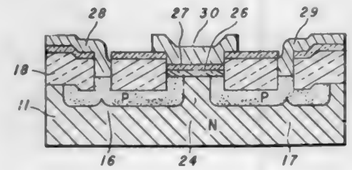
Bernard Bazin, Paris, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 23, 1972, Ser. No. 265,854

Claims priority, application France, Apr. 30, 1971, 71.15577

Int. Cl.² H01L *21/316*

U.S. Cl. 148—187 **8 Claims**



1. A process for the fabrication of an insulated gate field effect transistor comprising the steps of:

forming an adherent, apertured mask of silicon oxide on a monocrystalline silicon body of one conductivity type, said mask having an oxygen-impermeable film on selected areas thereof including a gate area and areas where ohmic contacts are to be formed;

exposing the masked body to a suitable dopant for inducing the opposite conductivity type in the apertured surface regions of said body;

exposing the masked body to an oxidizing atmosphere, whereby the silicon surface is selectively oxidized at locations not protected by said oxygen-impermeable film;

selectively removing the oxide and oxygen-impermeable films fromthe ohmic contact areas; and

depositing and patterning a conductor film on the structure to form a gate electrode on said remaining oxygen-impermeable film, in combination with source and drain electrodes extending through the oxide in contact with said regions of opposite conductivity type.

4,043,849

PLANAR DIFFUSION METHOD FOR AN I²L CIRCUIT INCLUDING A BIPOLAR ANALOG CIRCUIT PART

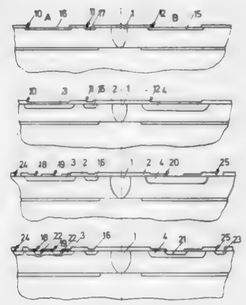
Wolfgang Kraft, and Lothar Blossfeld, both of Freiburg, Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,339

Claims priority, application Germany, Nov. 8, 1974, 2453134

Int. Cl.² H01L *21/22, 21/265, 29/72*

U.S. Cl. 148—187 **8 Claims**



1. A planar diffusion method for the monolithic integration of an I²L circuit of the type including a bipolar analog circuit part including the steps of diffusing highly doped intermediate layers into a substrate, depositing an epitaxial layer on the surface of said substrate and said intermediate layers, producing an isolation region for insulating an I²L circuit part from a bipolar analog circuit part and depositing a diffusion masking layer on the surface of said epitaxial layer and said insulating region, comprising:

opening windows in said masking layer over the base and injector regions of said I²L part and the base region of said bipolar analog circuit part;

depositing a second masking layer in the windows over the base and injector regions of said I²L circuit part of such a thickness that during following treatment with an etching agent, the semiconductor material below said base and injector window is again exposed;

prediffusing a first doping material of a first concentration into the remaining opening in said bipolar analog circuit part for forming a prediffused base region;

removing excessive doping material from the diffusion masking layer and simultaneously exposing said substrate in the I²L circuit part base and injector regions;

depositing a second doping material having a concentration of smaller than said first concentration on the exposed regions of said epitaxial layer; and

simultaneously diffusing the base and injector regions of said I²L circuit part and the base region of said bipolar analog circuit part prior to emitter diffusion.

4,043,850

POLYMERIC-COATED HMX CRYSTALS FOR USE WITH PROPELLANT MATERIALS

Richard E. Hoffman, Sandy, Utah, and Edward K. Lindsay, Cumberland, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 6, 1976, Ser. No. 712,417

Int. Cl.² C06B *45/10*

U.S. Cl. 149—19.4 **4 Claims**

1. A propellant composition comprising:

a binder material,

a propellant material, and

a crystalline oxidizer fuel,

said binder and material and said fuel being incorporated in said propellant material and said oxidizer fuel consisting of:

cyclotetramethylenetetranitramine (HMX) crystals having a dry film polyurethane primary coating formed on the crystals by catalytically reacting a solution of a poly-aryl isocyanate with water to an isocyanate-to-hydroxyl ratio of about 3:1.

4,043,851

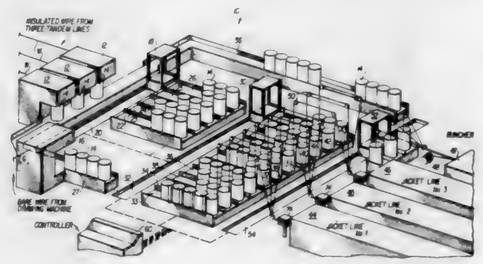
METHOD AND APPARATUS FOR CONTINUOUS PRODUCTION OF NM CABLE

James F. Holladay; R. Emory Starnes; Bobby C. Gentry; W. Carl Jones, all of Carrollton, Ga., and James O. Lowery, Ranburne, Ala., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 23, 1975, Ser. No. 643,689

Int. Cl.² G05G *15/00*

U.S. Cl. 156—47 **21 Claims**



1. System for continuous production of insulated multi-strand electrical cable comprising;

a. a first station having means for coiling insulated single strand conductor wires in a plurality of wire pack containers;

b. a second station having means for coiling bare ground wire in a plurality of wire pack containers;

c. means for transporting said containers to selected ones of a plurality of conveyor paths adapted to convey said containers to a plurality of third stations, the wire in each of said containers having a leading end and a trailing end, said conveyor paths including accumulation conveyors adapted to accumulate a plurality of said containers in tandem array so as to facilitate connecting the trailing ends of wires in each of said containers with the leading ends of wires in the following containers;

d. programmable controller means for operating said system in accordance with a predetermined program;

e. means for monitoring the supply of containers on each of said conveyor paths;

f. means responsive to said monitoring means and operatively connected to said programmable controller means for transmitting information to said programmable controller means;

g. said programmable controller means including means for

processing the information transmitted from said monitoring means and for generating signals to said transporting means to deliver selected ones of said types of electrical conductor wires to selected ones of said third stations in accordance with said predetermined program;

h. means for paying-out wire from said containers located at said third stations, including means for bringing together two insulated wires and one bare wire from their respective containers;

i. means for automatically removing depleted ones of said containers from said conveyor paths and for advancing the next container to said respective third station for continuous paying of wire therefrom;

j. means for continuously jacketing wire payed-out of said containers; and

k. a return conveyor line for conveying depleted ones of said containers from said third stations back to the first and second stations.

10. Method of handling electrical conductor wires in a continuous system for the production of multi-strand electrical cable comprising:

a. coiling a plurality of types of electrical conductor wires in respective wire pack containers;

b. transporting said containers to a plurality of processing stations along a plurality of conveyor paths;

c. monitoring the supply of containers on each of said conveyor paths;

d. transmitting information to a programmable controller as a function of the supply of containers monitored on said conveyor paths; and

e. processing the information transmitted to the programmable controller and generating signals to deliver selected ones of said types of electrical conductor wires to selected ones of said processing stations in accordance with a predetermined program.

4,043,852

ANOMALOUS DISPERSION GLASS EXHIBITING THE ANOMALOUS PARTIALLY DISPERSING PROPERTY IN THE LONG WAVE LENGTH REGION

Tetsuro Izumitani, Hino; Yasuo Fukuoka, Akishima, and Toshiharu Yamashita, Hachioji, all of Japan, assignors to Hoya Glass Works, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 526,996, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 316,607, Dec. 19, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 712,617

Claims priority, application Japan, Dec. 20, 1971, 46-103521

Int. Cl.[2] C03C *3/08, 3/10, 3/30*

U.S. Cl. 106—53 **7 Claims**

1. An anomalous dispersion glass exhibiting an ηd value of 1.54–1.71 νd value of 55–30 and the remarkable anomaly of the partial dispersing property in the long wave length region, which contains B_2O_3 45–70 mol%, PbO 5–30 mol%, Na_2O 1–15 mol%, SiO_2 0–10 mol%, Al_2O_3 5–25 mol%, one or more components selected from the group consisting of CaO, BaO, MgO and CdO 0–16 mol%, and any one component selected from the group consisting of TiO_2, ZrO_2, $Sb_2O_3WO_3$ and Tl_2O 0–3 mol%, wherein F ion may be added to said oxide mixture in such amount that the F/O ion ratio in the resulting glass lies in a range of 0–0.35.

4,043,853

METHOD OF RENOVATING A SERIES OF IDENTICAL BATHTUBS

Matthew L. Saladino, 31 Pine Hill Road, Old Tappan, N.J. 07675

Filed Mar. 5, 1976, Ser. No. 664,228

Int. Cl.[2] B32B *35/00*

U.S. Cl. 156—94 **5 Claims**

1. A method of renovation of at least one existing bathtub for multi-unit dwellings or the like, said method comprising in sequence the steps of:

lining the exposed exterior surface of the existing bathtub including that portion defining the bathtub cavity with a pliable molding material of a thickness generally equal to that of the liner to be applied to the existing bathtub plus that of the working mold;

applying a mass of curable, pliable, initial mold material to the molding material lined existing bathtub to form an initial mold;

curing said initial mold,

removing said initial mold from said molding material lined bathtub,

inverting said initial mold,

applying a mold release agent to the outer surface of the initial mold,

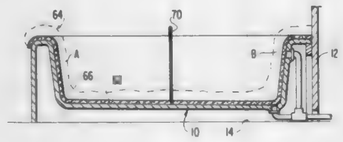
applying at least one fiberglass and resin layer to said initial mold and curing said resin to form the base material of a working mold,

applying a gel coat to the outer surface of the fiberglass and resin working mold and curing said gel coat to complete said working mold,

removing the working mold from the initial mold,

applying a mold release agent to the gel coat surface of the working mold to a form a portion of a liner and curing said gel coat,

applying at least one fiberglass and resin layer to the gel coat on said working mold and curing said resin to complete said liner,



removing the finished liner from the working mold,

applying adhesive to at least the exposed outer surface of the existing bathtub corresponding to that of the liner,

nesting the liner within the existing bathtub,

pressing the liner into contact over the full adhesive coated bathtub and curing said adhesive to complete renovation of the bathtub by applying a liner of slightly larger size and of equal configuration to the existing bathtub,

removing protruding drain fittings from the exposed surface of said existing bathtub prior to lining of the exposed surface of the bathtub with pliable molding material and forming holes within the fiberglass and resin liner conforming to the drain openings prior to nesting and adhesively fixing the liner to the existing bathtub and completing the renovation of the bathtub by sealably replacing the drain fittings onto the openings within the liner at respective drain locations, and

wherein prior to nesting of the liner within the existing bathtub, said method further comprises roughening, cleaning and degreasing the exterior exposed surface of the existing bathtub which receives said liner, and said step of adhesively fixing the liner to the exposed exterior surface of said existing bathtub comprises applying an impervious structural adhesive to the cleaned, roughened surface of the bathtub and an accelerator to the surface of the fiberglass liner which contacts the existing bathtub surface upon nesting of the liner within the bathtub.

4,043,854

METHOD AND APPARATUS FOR SPLICING OPTICAL FIBER CABLES

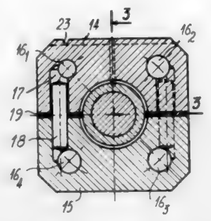
Georges E. Le Noane, Batiment C, 43 Ar Sante; André M. Mathern, route du Busquet, Brelevenez, and Gabrielle Morizur, Les Fontaines, batiment L, n°' 141, all of Lannion, France (22300)

Filed Nov. 24, 1976, Ser. No. 744,595

Claims priority, application France, Nov. 26, 1975, 75.36176

Int. Cl.[2] B65H *69/02;* **G02B** *5/16*

U.S. Cl. 156—158 **8 Claims**



1. The method of splicing the optical fibers of an optical fiber cable including an axial core, fibers and a jacket where said fibers are mounted around the cable core and substantially parallel thereto, including the steps of:

unsheathing the cable at spaced out places corresponding to the ends of the cable sections to be spliced;

rigidly securing the optical fibers to the cable core at the unsheathed places;

covering the fibers at the unsheathed places with shell means and rigidly securing said shell means to the fibers, said shell means being provided with longitudinal bores;

sawing said cable core, fibers and shell means along a plane perpendicular to the cable whereby said shell means is divided into two shell means segments registering with each other; and

connecting said registering shell means segments by aligning the bores thereof and inserting columns therein.

4,043,855

MULTI-LAYER ARTICLE AND A PROCESS AND AN APPARATUS FOR ITS MANUFACTURE

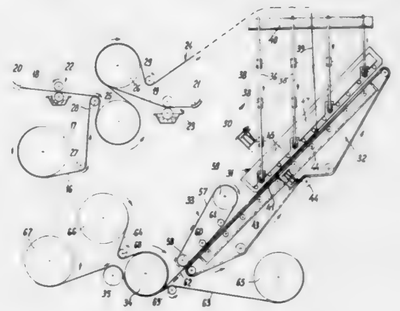
Claude Guy Patin, Pont-Audemer, France, assignor to Compagnie des Etablissements Dela Risle, Paris, France

Filed Mar. 3, 1975, Ser. No. 554,707

Claims priority, application France, Mar. 1, 1974, 74.06985; Feb. 12, 1975, 75.04295

Int. Cl.[2] B31F *1/00*

U.S. Cl. 156—178 **8 Claims**



1. A process for continuously manufacturing an article which comprises at least two thicknesses of pliable and thin material, effected by folding a single continuous strip or web of the said material, wherein the said strip or web is folded on itself regularly, concertina-fashion, thereby forming alternate loops in zig-zag formation, each second portion of one of the said loops partially covering the first associated portion of the same loop and being partially covered in the same proportion by the first portion of the following contiguous loop, the said loops being flattened, and the said portions being fixed one upon the other while overlapping so as to form a multi-layer strip or web, each face of the said strip having applied thereto before the loops are formed a series of heat-bonding filaments, parallel to the edges of the said strip, and with a regular spacing from one another, the filaments on one face being able to be offset relatively to the filaments of the other face.

4,043,856

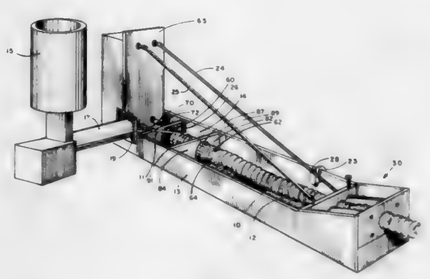
APPARATUS AND METHOD FOR PRODUCING FLEXIBLE PLASTIC TUBING

William L. Steward, Costa Mesa, Calif., assignor to Hudson Oxygen Therapy Sales Company, Temecula, Calif.

Filed July 11, 1975, Ser. No. 595,119

Int. Cl.[2] B31C *1/00*

U.S. Cl. 156—195 **12 Claims**



1. In an apparatus for producing a flexible plastic corrugated tubing having rotating mandrel means on which a continuous ribbon of molten plastic is spirally wrapped with successive adjacent convolutions being partially overlapped and having a spiral rib extending convolutely along the exterior surface, the improvement comprising:

a plurality of elongated rollers being axially spaced apart to form a passageway therebetween through which said tubing is directed from said mandrel means said plurality of said rollers engaging said rib of said tubing and wherein at least one of said rollers is rotatably driven along its elongated axis, and means for increasing and decreasing the angle between the roller axes and the rib for decreasing and increasing, respectively, the distance between adjacent rib convolutions.

11. In a method for producing flexible plastic corrugated tubing by extruding a continuous molten thermoplastic ribbon and wrapping said ribbon around a mandrel in successive and partially overlapping adjacent convolutions to form said tubing having an inclined spiral rib extending along the exterior surface thereof the improvement comprising:

directing said tubing into a passageway extending between a plurality of elongated rotatable rollers each of which overlie a plurality of adjacent rib convolutions, maintaining contact of said rollers only on said rib portion of said tubing surface while simultaneously rotating at least one of said rollers and wherein said rollers each extend along and rotate about an axis having an angle of less than 90° from the inclination of said spiral rib and whereby the distance between adjacent rib convolutions on said tubing is decreased by increasing said angle and increased by decreasing said angle.

4,043,857

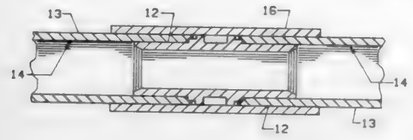
METHOD OF JOINING PLASTIC PIPE

Michael F. Byrne, Long Island City, N.Y., and Douglas V. N. Powelson, Audubon, Pa., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 372,119, June 21, 1973, Pat. No. 3,961,814, which is a division of Ser. No. 77,489, Oct. 2, 1970, Pat. No. 3,768,841, which is a continuation-in-part of Ser. No. 868,139, Oct. 21, 1969, abandoned. This application Nov. 12, 1975, Ser. No. 631,331

Int. Cl.[2] F16L *21/00*

U.S. Cl. 156—198 **2 Claims**



1. A method of joining polyethylene pipe sections which comprises:

1. heating the internal wall of the end of a high molecular weight polyethylene pipe section at about 470°–530° F. for a period sufficient to soften the wall,
2. heating the external wall of the insert portion of a polyethylene polymer fitting having an annular insert portion with an outer diameter substantially the same as the inner diameter of the pipe section to be joined thereto and a shoulder portion with a larger diameter than the insert portion, at about 470°–530° F. for a period sufficient to soften the external wall surface of the insert, said fitting being formed of a reaction product of a polymer or copolymer of ethylene having a density of 0.940–0.950, with from about 5.0 to about 15.0 percent by weight of the polymer or copolymer of ethylene of a butyl rubber and from about 0.30 to about 2.5 percent by weight of the ethylene polymer or copolymer of a bifunctional phenolic composition having ortho functionality and the para position of the phenol ring substituted with an inert hydrocarbon radical selected from the group consisting of alkyl, aryl, alkyl-aryl and arylalkyl radicals of up to 16 carbon atoms,
3. removing the pipe end and the fitting from the heat source,
4. fitting the insert portion of the coupling into the pipe section so that the edge of the pipe substantially abuts the shoulder portion of the fitting, and
5. crimping the pipe to the insert to cause fusion therebetween.

2. A method according to claim **1** wherein an externally positioned sleeve is fitted over the crimped pipe joint assembly and affixed thereto.

4,043,858

PLASTIC NAME TAG HOLDER

Edward Dantowitz, Chestnut Hill, Mass., assignor to Albany Novelty Mfg. Co., Boston, Mass.

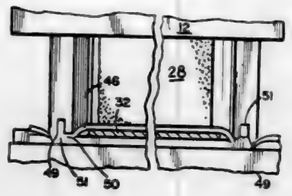
Division of Ser. No. 586,508, June 12, 1975, Pat. No. 3,969,063. This application Feb. 11, 1976, Ser. No. 657,072

Int. Cl.[2] B29C *17/00*; B29D *23/00*

U.S. Cl. 156—251 **12 Claims**

1. A method for manufacturing plastic name tag holders on a dielectric sealing machine comprising the following steps:

a. placing a bottom plastic sheet on the lower platen of the sealing machine;
b. overlying the bottom plastic sheet with at least one horizontal insert finger having a substantially U-shaped horizontal perimeter;
c. placing a top plastic sheet over the insert finger;
d. contacting the upper surface of the top sheet with a compression block to press said top sheet horizontally against the insert finger;
e. maintaining the compression block in engagement with the upper surface of the top sheet while contacting said top sheet with a horizontal substantially U-shaped electrode die, the substantially U-shaped inner periphery of said die being slightly wider than the substantially U-shaped perimeter of the insert finger, said die and said insert finger being in vertical telescopic registration, said



die drawing said top sheet downwardly around the perimeter of said insert fingers and out wardly against the horizontal upper surface of the bottom sheet, said electrode die electronically sealing the top and bottom sheets together around the periphery of said insert finger; and
f. raising the electrode die from the top sheet and removing the completely sealed name tag holder from the insert finger, said name tag holder having a cavity formed by said insert finger between the top and bottom sheets in which the top sheet is parallel to the bottom sheet.

4,043,859

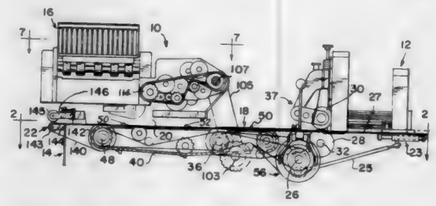
LABEL APPLYING MACHINE

John F. Van Dam, Westmont, and Jaroslaw Pacholok, Downers Grove, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Mar. 31, 1975, Ser. No. 563,750

Int. Cl.[2] B65C *9/06*

U.S. Cl. 156—566 **9 Claims**



1. A machine for applying labels to mailing pieces or similar work pieces which machine comprises a supply hopper for receiving an upstanding stack of the work pieces and having a reciprocating feeding mechanism for delivering the work pieces one-by-one from the stack, a transport system including an endless transport conveyor having a horizontally disposed run extending from adjacent said hopper to a label applying area which is spaced from said hopper, said conveyor having lugs spaced thereon for advancing work pieces of a predetermined normal length, alternate lugs on said conveyor being readily removable so as to enable the space between successive lugs to be varied to accommodate work pieces of twice the normal length, and a label applying head unit mounted at said label applying area which includes driven mechanism for feeding successive labels and applying the same in predetermined position on each successive work piece as it is advanced to said label applying area by said lugs, power drive means for operating said transport conveyor at a predetermined speed, a drive connection between said conveyor drive means and said hopper feeding mechanism which includes a clutch having first and second operating positions for selectively changing the

speed of operation of said work piece feeding mechanism between first and second speeds according to the speed of advance of the lugs on said transport conveyor whereby to feed the work pieces from the hopper in properly timed relation for delivery to said transport conveyor and a drive connection between said transport conveyor drive means and said label applying head unit which includes means for selectively varying the speed of the label applying mechanism according to the speed of said transport conveyor and the spacing of the lugs on said transport conveyor thereby to time the application of the labels for properly positioning them on the work pieces.

4,043,860

METHOD OF GROWING SINGLE CRYSTALS OF NEODYMIUM PENTAPHOSPHATE

Thomas R. Au Coin, Ocean; Abraham Schwartz, Oakhurst; John G. Gualtieri, Oceanport, and Melvin J. Wade, Howell, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 24, 1977, Ser. No. 761,913

Int. Cl.[2] B01J *17/04, 17/20*; C01B *25/38*; C01F *17/00*

U.S. Cl. 156—624 **12 Claims**

1. Method of growing single crystals of neodymium pentaphosphate greater than 1 centimeter in size and of high purity and quality from polyphosphoric acid solutions, said method including the steps of

A. heating orthophosphoric acid contained in a first crucible made of a material that is leakproof and highly resistant to acid attack to about 200° C,
B. adding neodymium oxide to the acid in the ratio of 0.5 to 3.0 grams of oxide per 50 milliliters of orthophosphoric acid,
C. increasing the temperature to a temperature of about 350° C,
D. placing the first crucible in a second crucible, larger than the first crucible, said second crucible containing phosphoric acid and being made of a material that is leakproof and highly resistant to acid attack,
E. placing lids over said first and second crucibles, and heating the double crucible configuration in a furnace at a temperature of about 500° C to 650° C for about 24 to 48 hours,
F. removing the lids from said crucibles and adding several seed crystals to said first crucible, and
G. replacing the lids on the crucibles and maintaining the furnace at about 500° C to 650° C until maximum growth of the single crystals are obtained.

4,043,861

PROCESS FOR POLISHING SEMICONDUCTOR SURFACES AND POLISHING AGENT USED IN SAID PROCESS

Herbert Jacob, and Ingolf Lampert, both of Burghausen, Germany, assignors to Wacker-Chemitronic Gesellshaft fur Elektronik Grundstoffe mbh, Burghausen, Germany

Filed Dec. 9, 1976, Ser. No. 749,194

Claims priority, application Germany, Jan. 13, 1976, 2600990

Int. Cl.[2] C09K *13/00*

U.S. Cl. 156—636 **8 Claims**

1. A process for polishing semiconductor surfaces which comprises preparing an aqueous suspension of a hydroxide of a member of the group consisting of aluminum, gallium, and a mixture of the two, by precipitating the hydroxide from an aqueous solution containing a salt of said elements with an alkaline compound at a pH value between 7.5 and 8, thus forming the suspension, adding to said suspension an alkali hypochlorite in such an amount that in addition to 0.05 –0.6 mol hydroxide per liter the molar content of the hypochlorite per liter will be three to ten times that of the hydroxide, and subjecting the surfaces to a buffing action with said suspension.

4,043,862

FIRE RESISTANT VERMICULITE COMPOSITION BOARD AND METHOD OF MANUFACTURE

James R. Roberts, Sao Paulo, Brazil, assignor to Eucatex S. A. Industria E Gomercio, Sao Paulo, Brazil

Filed July 21, 1975, Ser. No. 597,451

Int. Cl.[2] D21H *3/22, 3/28, 3/66*; D21J *1/08*

U.S. Cl. 162—135 **19 Claims**

1. Fire resistant vermiculite composition board comprising a felted, dried sheet comprising in dispersed admixture:

	% by weight
Heat-expanded vermiculite particles	40 to 90
Ceramic clay particles	5 to 20
Hydrated cellulosic gel having a TAPPI drainage time of at least 900 seconds	10 to 30.

14. The process for the manufacture of fire resistant vermiculite composition board which comprises:

a. heating vermiculite to a temperature for a duration predetermined to partially expand the vermiculite to a degree of from 40 to 98% of its capacity for heat expansion,
b. forming an aqueous slurry of board-forming consistency comprising:

	% by weight
The partially expanded vermiculite of step "a"	40 to 90
Ceramic clay particles	5 to 20
Hydrated cellulosic gel having a TAPPI drainage time of at least 900 seconds	10 to 30

c. vacuum forming the slurry into a wet sheet on a board-forming screen, and
d. drying the sheet.

4,043,863

PROCESS FOR SIZING CELLULOSE FIBERS WITH SULFAMOYLCHLORIDES

James Axel Christer Bjorklund, Saltsjo-Boo, and Turid Ekengren, Sollentuna, both of Sweden, assignors to Kemanord Aktiebolag, Stockholm, Sweden

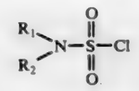
Filed Mar. 1, 1976, Ser. No. 663,000

Claims priority, application Sweden, Mar. 20, 1975, 7503209

Int. Cl.[2] D21D *3/00*

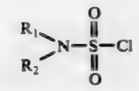
U.S. Cl. 162—158 **6 Claims**

1. A process for sizing cellulose fibers or cellulose fiber-containing materials wherein cellulose fibers in aqueous suspension or in paper products are reacted with at least 0.001% by weight based on the weight of the dry cellulose fibers of a sizing agent, said sizing agent being a compound having the general formula



wherein R_1 is an organic, hydrophobic group having 8 to 40 carbon atoms and R_2 is an alkyl group having 1 to 7 carbon atoms or has the same meaning as R_1.

5. A sizing composition for cellulose fibers in aqueous suspension or in paper products comprising an aqueous in dispersion of at least one emulsifier and a sizing agent having the general formula



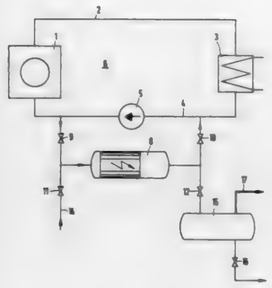
wherein R_1 is an organic, hydrophobic group having from 8 to 40 carbon atoms and R_2 is an alkyl group having 1 to 7 carbon atoms or has the same meaning as R_1.

4,043,864

NUCLEAR POWER PLANT HAVING A PRESSURIZED-WATER REACTOR

Hans-Günther Heitmann, Buckenhof, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Dec. 22, 1972, Ser. No. 317,604
Claims priority, application Germany, Dec. 22, 1971, 2163695
Int. Cl.² G21C *19/30*
U.S. Cl. 176—37 **1 Claim**



1. The nuclear power plant having a pressurized water reactor connected in a primary circulatory loop wherein a pump is also connected for circulating a coolant therein, an electromagnetic filter device having an inlet and an outlet and connected by said inlet and said outlet in direct shunt with a portion of the primary circulatory loop so that a portion of the coolant is passed therethrough and nuclear waste contained in the coolant is filtered-out therein, an inlet valve and an outlet valve respectively connected to said inlet and said outlet of said filter device and, in turn, connecting said filter device in parallel with the primary circulatory loop, a rinsing line and a waste line for said filter device, a rinsing line valve connecting said inlet of said filter device to said rinsing line, and a waste line valve connecting said outlet of said filter device to said waste line, said inlet and said outlet valves being closable so as to discontinue the flow of coolant through said electromagnetic filter device from said primary circulatory loop, and said rinsing line valve and said waste line valve being openable so as to flush accumulated waste out of said filter device independently of the continued circulation of coolant in the primary circulatory loop.

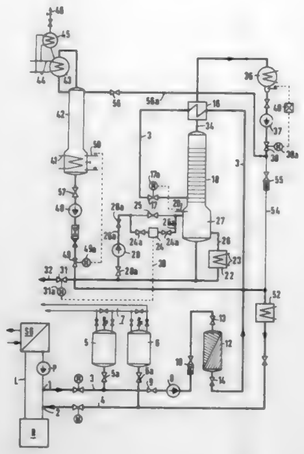
4,043,865

PRESSURIZED-WATER REACTOR COOLANT TREATMENT SYSTEM

Ivan Kausz, Weiher; Helmut Stiinkel, and Harald Wille, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 12, 1974, Ser. No. 450,546
Claims priority, application Germany, Mar. 12, 1973, 2312228
Int. Cl.² G21C *9/00*
U.S. Cl. 176—37 **5 Claims**

1. A pressurized-water reactor having a main coolant loop containing circulating pressurized-water coolant containing boron, and a coolant treating system comprising a gas stripper and a rectification column and means for removing a flow of said coolant from said loop and passing said flow through said stripper and column and back to said loop; wherein the improvement comprises said means being for passing said flow first through said column and thereafter through said stripper said system includer means for controllably shutting off said



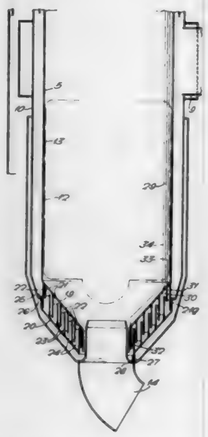
stripper and bypassing said flow around said stripper for passage of said flow from said column back to said loop.

4,043,866

LIQUID METAL COOLED FAST BREEDER NUCLEAR REACTORS

John Graham Durston, Northwich, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 25, 1974, Ser. No. 526,822
Claims priority, application United Kingdom, Dec. 6, 1973, 56704/73
Int. Cl.² G21C *1/02*
U.S. Cl. 176—40 **3 Claims**



1. A liquid metal cooled fast breeder nuclear reactor comprising:

a pool of liquid coolant within a closed container having a roof,

a housing extending from the roof of the container into the coolant and having a lower end wall,

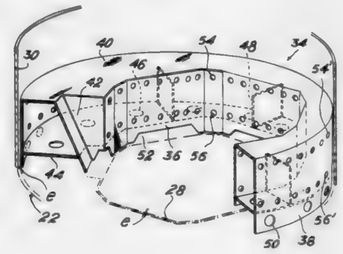
a heat exchanger having a tube bundle and depending from the roof of the container within but spaced from the housing and immersed in the pool of coolant, the heat exchanger having a shell with side walls surrounding said tube bundle, said shell having a lower end wall carrying a multiplicity of downwardly extending generally co-axial skirts defining a series of gas retaining jackets at the lower end of the shell, and the lower end wall of the heat exchanger housing having a multiplicity of generally coaxial inverted skirts defining a series of liquid containing jackets, one inverted skirt extending into each gas retaining jacket, the gas retaining jackets each containing a pocket of gas bounded by the upper regions of the gas containing jackets and the surfaces of the coolant in each side of the associated inverted skirts, said downwardly extending skirts and the gas retaining jackets thereby defined being within the lateral extent of the side walls of the shell so as to minimize the lateral extent of the heat exchanger.

4,043,867

STRUCTURE FOR REDUCING CONVECTION CURRENTS WITHIN THE PRESSURE VESSEL OF A FAST REACTOR

Jean-Pierre Benqué, Paris; Jean Lallement, Verrieres-le-Buisson, and Paul Lambert, Echirolles, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 28, 1975, Ser. No. 608,611
Claims priority, application France, Sept. 3, 1974, 74.29932
Int. Cl.² G21C *15/20*
U.S. Cl. 176—40 **5 Claims**



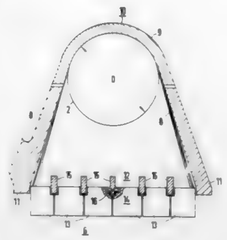
1. In a fast nuclear reactor of the type having a pressure vessel, a reactor core, support means for supporting the reactor core within the vessel, a liquid metal coolant and means for circulating the liquid metal coolant through the core, the improvement comprising an inner tank spaced from and surrounding said reactor core to define an annular space between said reactor core and said inner tank, heat exchanger means within said pressure vessel for receiving liquid metal coolant from said reactor core and discharging said liquid metal coolant into said inner tank, pump means within said pressure vessel for pumping said liquid metal coolant from said inner tank to said reactor core for circulation therethrough and a structure for reducing convection currents of said coolant within said pressure vessel comprising a hollow metallic ring supported by said support means and located within said annular space, said ring having walls provided with a plurality of holes with the width of said ring being smaller than the width of said annular space and the height of said ring being equal at a maximum to the height of said reactor core.

4,043,868

WATER-COOLED NUCLEAR REACTOR WITH LOSS-OF-COOLANT PROTECTION

Leonhard Irion, Ruckersdorf; Jürgen Tautz, Erlangen, and Gerhard Ulrych, Erlangen-Tennenlohe, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Oct. 30, 1975, Ser. No. 627,206
Claims priority, application Germany, Nov. 20, 1974, 2455060
Int. Cl.² G21C *9/00*
U.S. Cl. 176—50 **6 Claims**



1. A water-cooled reactor comprising a pressure vessel having a vertical, substantially cylindrical side wall having an inside; a vertical, substantially cylindrical core barrel having an outside and upper and lower ends; said inside and outside being radially interspaced and forming therebetween an annular, coolant descent space; said side wall having a plurality of coolant inlet openings adjacent to said upper end of said core barrel and interspaced circumferentially with respect to the side wall and through which openings coolant normally flows into said descent space; and for each one of said openings, a check-valve assembly comprising a row of individually-swinging flap valves and means for positioning said row so that coolant flow through the opening must pass through the flap valves; said flap valves being normally held open by inward coolant flow through the opening into said descent space and closing in the event coolant starts to flow outwardly through the opening from the descent space: wherein the improvement comprises said means being in each instance a chamber open to and extending downwardly from the coolant inlet opening and having an open lower end positioned above the core barrel's said lower end and substantially conforming in contour to a segment of said descent space, said chamber having means for mounting said row of flap valves in its said open lower end so that coolant flow through the chamber's said open lower end must pass through the flap valves, said chamber having side walls confining coolant flow through the chamber to a downward direction.

4,043,869

WATER INSOLUBLE BIOLOGICALLY ACTIVE MATERIAL

Sidney Alan Barker, and Charles John Gray, both of Birmingham, England, assignors to Koch-Light Laboratories, Ltd., England

Continuation of Ser. No. 379,403, July 13, 1973, abandoned.
This application Oct. 1, 1975, Ser. No. 618,590
Claims priority, application United Kingdom, July 13, 1972, 32911/72
Int. Cl.² C07G *7/02*
U.S. Cl. 195—63 **36 Claims**

1. Biologically active material which comprises a water-insoluble solid with a surface to which molecules of diazotized m-diamino-benzene are linked by adsorption, and biologically active protein molecules chemically bonded to said molecules of diazotized m-diamino-benzene.

4,043,870

PROCESS OF PURIFYING CHOLESTEROL OXIDASE

Timothy W. Evans, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 11, 1976, Ser. No. 685,489
Int. Cl.[2] C07G 7/028
U.S. Cl. 195—66 R 38 Claims

1. In a process of isolating cholesterol oxidase from an aqueous processing solution containing a nonionic surfactant, the improvement comprising removal of nonionic surfactant from said aqueous processing solution by contacting said aqueous processing solution with a water-immiscible solvent and precipitation of the cholesterol oxidase with an effective amount of a salt.

4,043,871

ENZYMATIC SUBSTRATE COMPOSITION ADSORBED ON A CARRIER

Kjell Gunnar Blixt; Sven Ivan Arvid Tornmarck, both of Malmo; Rolf Juhlin, Akers Styckebruk; Karl Rune Salenstedt, Upplands Vasby, and Mandayam Tiru, Jarfalla, all of Sweden, assignors to Kommanditbolaget Kockums Chemical AB & Co., Malmo, Sweden

Continuation-in-part of Ser. No. 354,412, April 25, 1973, abandoned. This application July 18, 1974, Ser. No. 489,667
Claims priority, application Sweden, Apr. 18, 1974, 7405199
Int. Cl.[2] G01N 33/00; C07G 7/02
U.S. Cl. 195—99 18 Claims

1. A carrier-substrate combination, comprising
1. a solid granular carrier with a specific surface area of at least 50 m^2/g; and
2. a substrate-containing layer in which said substrate is an enzymatic substrate capable of undergoing an enzymatic reaction, said layer derived by impregnation of the carrier with a substrate-containing non-aqueous liquid and fixedly bound to said carrier by adsorption;

said substrate being present in the carrier-substrate combination in an amount of at least 25% by weight of the carrier-substrate combination; said substrate having a solubility of less than 0.1% by weight in water at 20° C and being stable and free from hydrolysis and dissolution in the absence of its specific enzyme; and said carrier being inert to said substrate.

4,043,872

POLYIODOTHYRONINE IMMUNOASSAY

Judith I. Blakemore, Mill Valley; Richard K. Leute, Sunnyvale, and Roberta D. Ernst, Mountain View, all of Calif., assignors to Syva Company, Palo Alto, Calif.

Continuation-in-part of Ser. No. 551,566, Feb. 20, 1975, abandoned. This application Dec. 29, 1975, Ser. No. 644,408
Int. Cl.[2] G01N 31/14
U.S. Cl. 195—103.5 A 12 Claims

1. A method for determining the presence of thyroxine in a medium suspected of containing said thyroxine, which comprises:

bringing together in an aqueous liquid zone: (1) said medium; (2) soluble ENZ-bound-thyroxine; and (3) antithyroxine, said antithyroxine having sites common to and capable of binding to said thyroxine and said ENZ-bound-thyroxine, wherein ENZ is an enzyme selected from malate dehydrogenase or tricore phosphate isomerase and both of which are reversibly inhibited by said thyroxine and said antithyroxine is present at a concentration resulting in substantial enhancement of said enzyme activity in the absence of thyroxine; and

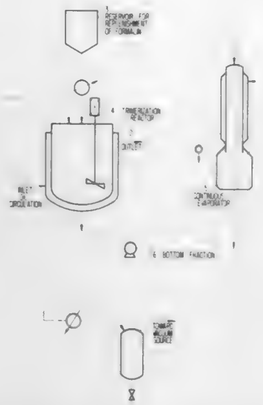
analyzing in said zone for the effect of said medium on the enzymatic activity of said ENZ-bound-thyroxine.

4,043,873

PLURAL STAGE RECOVERY OF TRIOXANE IN A PROCESS HAVING A MOLECULAR DISTILLATION STEP

Jacob Ackermann, Wigoltingen, Switzerland; Pierino Radici, Turate (Como); Umberto Santini, Legnano (Milan), and Paolo Colombo, Saronno (Varese), all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Continuation of Ser. No. 480,449, June 17, 1974, abandoned.
This application Apr. 19, 1976, Ser. No. 677,952
Claims priority, application Italy, June 15, 1973, 25410/73
Int. Cl.[2] B01D 3/12
U.S. Cl. 203—46 15 Claims



1. A process for the separation of trioxane from a solution comprising trioxane, formaldehyde and water, which consists of subjecting the said solution to evaporation in equipment suitable for instantaneous distillation at temperatures, pressures and residence times which substantially eliminate deposition of polymers of formaldehyde on the cooler parts of the apparatus used in said evaporation and minimize the formation of by-products by secondary reactions including the Cannizzaro reaction under the evaporation conditions, with a vaporization and condensing of a quality of from about 5 to about 15% by weight of the solution introduced, and subsequently recovering the trioxane from the trioxane enriched overhead product.

4,043,874

PROCESS FOR SEPARATING AND RECOVERING THE CONSTITUENTS OF AN EXHAUSTED SOLVENT MIXTURE USED FOR CLEANSING REACTORS FOR THE POLYMERIZATION OF VINYL CHLORIDE

Francesco Testa, Bresso (Milan), and Antonio Bigliani, Saronno (Varese), both of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed Dec. 16, 1976, Ser. No. 751,250
Claims priority, application Italy, Dec. 23, 1975, 30688/75
Int. Cl.[2] B01D 3/36; B08B 3/08
U.S. Cl. 203—47 7 Claims

1. A process for separating and recovering the constituents of an exhausted toluene-dimethylformamide solvent mixture used for cleansing surfaces of equipment used for the polymerization of vinyl chloride by removing the deposits of polymer therefrom, which comprises:

a. adding water to said exhausted solvent mixture and then distilling off toluene in the form of an azeotropic mixture with water, the amount of added water and the amount of toluene distilled off being so adjusted as to ensure in the distillation residue a water content of at least 2.5% by weight and a toluene content not exceeding 10% by weight;

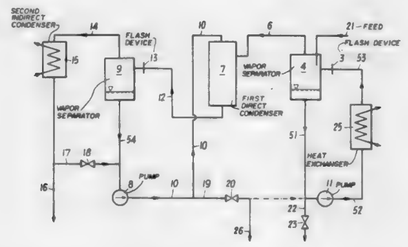
b. cooling said distillation residue, thereby to precipitate the polymer present therein;
c. adding to the resulting suspension water in an amount of at least 20% of the weight of the dimethylformamide present therein;
d. distilling off any toluene still present in the suspension;
e. recovering the precipitated polymer from the residual suspension obtained in (d) and recovering by distillation the dimethylformamide from the resulting aqueous solution.

4,043,875

TWO-STEP FLASH TECHNIQUE FOR VAPORIZING RADIOACTIVE LIQUIDS

Gundolf E. Rajakovics, Vienna; Heinz Gabernig, Graz, and Guenter Peter Klein, Vienna, all of Austria, assignors to Vereinigte Delstahlwerke AG. (VEW), Vienna, Austria

Continuation-in-part of Ser. No. 328,065, Jan. 30, 1973. This application Dec. 17, 1975, Ser. No. 641,770
Claims priority, application Austria, Feb. 2, 1972, 842/72
Int. Cl.[2] B01D 3/00
U.S. Cl. 203—82 19 Claims



1. In a process for vaporizing a radioactive liquid by a two-step vaporization technique employing at least one unit having first and second flash-vaporization stages, wherein in each unit liquid is introduced to the first vaporization stage to be circulated, heated and flash-evaporated and wherein vapor resulting from the flash-evaporation of the liquid in the first vaporization stage is condensed in a first direct condenser, the improvement wherein the condensing step is accomplished by means of enriched liquid obtained from the second vaporization stage and applied via a circulating pump to the first condenser to form therein a mixture of the liquid obtained from the second vaporization stage and the condensate of the vapor from the first vaporization stage, and wherein the process further comprises the steps of flash-evaporating said mixture in the second vaporization stage and of withdrawing a portion of enriched liquid from the loop formed by said second vaporization stage, said circulating pump, said first direct condenser, and the connecting conduits therebetween.

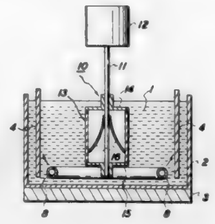
4,043,876

METHOD FOR ELECTROFORMING

Peter G. Hambling, Reading, England; Leslie W. Owen, deceased, late of Kingsclere, England; by Elizabeth Bertram Owen, executrix, Kingsclere, and by George Mould, executor, Orpington, both of England, assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 307,699, Nov. 17, 1972, abandoned.
This application Mar. 29, 1976, Ser. No. 671,240
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.
Int. Cl.[2] C25D 1/02, 1/20
U.S. Cl. 204—9 3 Claims

1. A method of electroforming which consists essentially of:
a. providing an apparatus for electroforming which consists essentially of:
1. a tank suitable for containing an electroplating bath;
2. an anode and a cathode located in said tank in a position to allow a plating current to pass between said anode and cathode, said cathode being a former onto which a metal coating is electroformed, said cathode being centralized in said tank and located further from said tank walls than said anode, said anode located adjacent said tank walls;
3. means for filtering and circulating said electroplating bath connected to said tank;
4. a closed loop feeding pipe located in said tank between said anode and said cathode for feeding an electrolyte



into said tank, said closed loop feeding pipe having a plurality of apertures which are located such that the flow of said electrolyte is directed toward an inward facing surface of said anode surface;
5. means for passing a plating current between said anode and cathode; and
6. means to rotate said cathode such that its surface has a linear viscosity through said electroplating bath at least about 30 cm. per second;

b. providing said electroplating bath containing a source of copper and zinc having the following composition:

Cu metal	40 – 25 gm/liter
Zn metal	2.4 – 3.4 gm/liter
Sodium Carbonate	40 – 4.4 gm/liter
Free OH	10 – 1.5 gm/liter
pH	about 12

c. said former cathode having a current density in the range of about 10–13 amps/dm^2; and
d. rotating the former during the electroplating such that its surface has a linear velocity through the bath of about 323–395 cm. per second.

4,043,877

METHOD FOR THE MANUFACTURE OF MICROSCOPICALLY SMALL METAL OR METAL-ALLOY STRUCTURES

Burkhard Littwin, Hohenschaeftlarn, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 15, 1976, Ser. No. 667,074
Claims priority, application Germany, Mar. 19, 1975, 2512115
Int. Cl.[2] C25D 5/02; C25F 3/14
U.S. Cl. 204—15 24 Claims

1. A method for manufacture of microscopically small metal or metal alloy structures particularly a method for manufacture of a memory with cylindrical magnetic domains on one storage layer which memory has manipulative patterns, domain extenders, detector strips, guide loop generators, domain annihilators, control lines, and read lines formed on the storage layer comprising the steps of providing a storage layer; vapor depositing an Ni-Fe layer on a surface of the storage layer; providing a first photo-resist layer on the Ni-Fe layer, exposing the photo-resist layer with at least one pattern corresponding to a pattern selected from a group including patterns for guide loop generators, domain annihilators, control lines and read lines; developing the first photo-resist layer to form a channel exposing a portion of the Ni-Fe layer corresponding to each of

the selected patterns; electroplating a first gold layer on the exposed portions of the Ni-Fe layer; electroplating a nonmagnetic Ni-P layer on the first gold layer; electroplating a second gold layer on the nonmagnetic layer; electroplating a third gold layer on the second gold layer; subsequently removing the remaining portions of the first photo-resist layer; applying a second photo-resist layer; exposing the second photo-resist layer with at least one pattern corresponding to the desired manipulation patterns and domain extenders; developing the photo-resist layer to expose the Ni-Fe layer with a pattern corresponding with each of said patterns; electroplating a fourth gold layer on the exposed Ni-Fe layer; electroplating a thick Ni-Fe layer on the fourth gold layer; removing the remaining portions of the second photo-resist layer; applying a third photo-resist layer; exposing the third photo-resist layer for the desired pattern for the detector strips, with said pattern overlapping portions of the read line; developing the third photo-resist layer to remove all portions except that for the desired detector strips; ething away the exposed Ni-Fe layer which was vapor deposited on the storage layer; and removing the remaining portions of the third photo-resist layer.

4,043,878

ELECTROPLATING METHOD

Robert F. Ehrsam, Monroe, Conn., assignor to John L. Raymond, Fairfield and Robert Z. Reath, Easton, both of Conn.

Filed June 14, 1976, Ser. No. 696,073
Int. Cl.[2] C25D *15/00, 3/02*
U.S. Cl. 204—16 **11 Claims**

1. In the method of electrolytically depositing on the surface of a substrate metal a layer of a metal having a plurality of discrete particles of a finely divided solid non-metallic material uniformly dispersed throughout said layer, said metal layer and said particles being co-deposited from an aqueous electrolyte solution containing said metal in solution and said particles in suspension therein, said electrolyte solution containing a surface active agent deposition promoter for the non-metallic material and being agitated to maintain the particles uniformly in suspension therein, the improvement which comprises employing as said deposition promoter a surface active agent selected from the group having the chemical structure:



Where

R_1 is an alkyl, alkene or alkyne radical having from 6 to 22 carbon atoms,

R_2 is an alkyl or hydroxyalkyl radical having from 1 to 4 carbon atoms, and

R_3 is an alkyl or hydroxyalkyl radical having from 1 to 4 carbon atoms.

4,043,879

ELECTROLYTICALLY INDUCED POLYMERIZATION UTILIZING BISULFITE ADDUCT FREE RADICAL PRECURSOR

Steven Levinos, Chatham, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Division of Ser. No. 273,903, July 21, 1972, Pat. No. 4,012,295. This application Sept. 1, 1976, Ser. No. 719,539
Int. Cl.[2] B44C *1/04;* **C25B** *3/00*
U.S. Cl. 204—18 PC **3 Claims**

1. A method of forming an image which comprises:

a. providing imaging material comprising an electrically-conductive support having a surface comprising a substantial proportion of metallic copper, said surface bearing a layer of a composition comprising:

1. a polymerizable ethylenically unsaturated compound, and

2. an aldehyde/bisulfite adduct;

b. contacting the exposed surface of said layer with a cathode exhibiting a pattern of electrical conductivity corresponding to said image;

c. arranging a source of electrical potential in circuit with said cathode and said electrically-conductive support, said support constituting the anode of the arrangement;

d. causing electrical current to flow through said layer in accordance with said image pattern of said cathode, thereby effecting image-wise migration of cupric ions into and generation of polymerization-inducing species in said composition layer with concurrent polymerization of said polymerizable compound;

e. separating said cathode from said composition layer; and

f. removing unpolymerized composition from said layer.

4,043,880

METHOD FOR PRODUCING GREEN-COLORED ANODIC OXIDE FILM ON ALUMINUM OR ALUMINUM BASE ALLOY ARTICLES

Kiyomi Yanagida; Tadashi Hirokane; Tadashi Tsukiyasu, and Tomoari Sato, all of Nagoya, Japan, assignors to Sumitomo Aluminum Smelting Co., Ltd., Osaka, Japan

Filed July 26, 1976, Ser. No. 708,978
Claims priority, application Japan, July 24, 1975, 50-90848; Feb. 25, 1976, 51-20514
Int. Cl.[2] C25D *11/24*
U.S. Cl. 204—35 N **22 Claims**

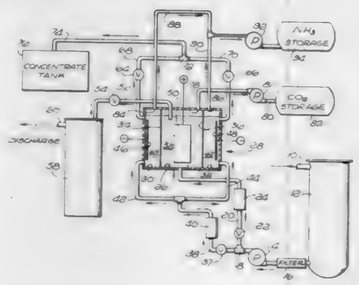
1. In a method for producing a green colored anodic oxide film on an aluminum or aluminum alloy article which comprises subjecting said article to alternating current anodization in an anodic oxidation bath containing sulfuric acid, then subjecting said anodized article to an immersion treatment into an aqueous immersion bath containing copper ions, and thereafter subjecting said immersed article to an aftertreatment, the improvement wherein said immersion bath further contains an acid.

4,043,881

ELECTROLYTIC RECOVERY OF ECONOMIC VALUES FROM SHALE OIL RETORT WATER

Teh Fu Yen, Altadena, and Chaur-Shyong Wen, Los Angeles, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,857
Int. Cl.[2] C25B *1/00, 3/00*
U.S. Cl. 204—102 **9 Claims**



1. A process for the recovery of economic values from shale oil retort water, said retort water including soluble material comprising substantial portions of inorganic, acidic organic and basic organic components, said process comprising:

defining an electrolytic cell having a cathode chamber electrolytically operative with an anode chamber, an anode in said anode chamber and a cathode in said cathode chamber, each disposed for contacting aqueous solution therein;

delivering said shale oil retort water to said cell as said aqueous solution;

applying a direct current potential across said anode and cathode chambers at a current density above about 50 A/m^2 for a time sufficient to effect a substantial decrease of organic compounds in the retort water in said anode chamber and to evolve a substantial amount of ammonia from the retort water in said cathode chamber; and

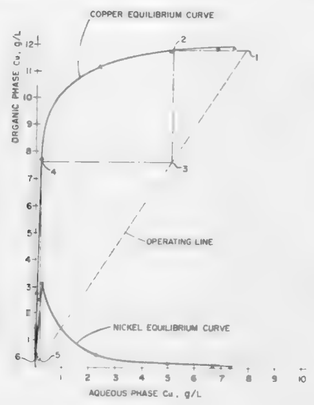
recovering said evolved ammonia.

4,043,882

SELECTIVE SOLVENT EXTRACTION PROCESS FOR COPPER FROM NICKEL

Roald R. Skarbo, Lexington, Mass.; Hal D. Peterson, Boulder, and Edmond A. Morin, Aurora, both of Colo., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed June 28, 1972, Ser. No. 266,986
Int. Cl.[2] C72B *15/10, 23/04*
U.S. Cl. 204—106 **7 Claims**



1. A process for selectively extracting copper from an aqueous ammoniacal solution containing copper and nickel and having a pH above about 9 which comprises contacting said aqueous solution with a water-immiscible organic oxime extractant in a plurality of extraction stages to effect copper ion transfer from the aqueous solution to the oxime extractant and hydrogen ion transfer from the oxime extractant to the aqueous solution in accordance with the equation:

$$(2R^oH)_{organic} + (Cu^{++})_{aqueous} \rightarrow (R^o{}_2Cu)_{organic} + (2H^+)_{aqueous.}$$

where R^o is the organic moiety fo the oxime, said solution and extractant being flowed countercurrently between stages, the mole ratio of exchangeable hydrogen ion in the oxime extractant, prior to contact with the aqueous solution, to copper ion in the aqueous solution, prior to contact with the oxime extractant, being maintained between about 1.8 and 2.4.

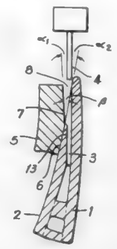
4,043,883

ELECTROLYTIC PRECISION DRILLING PROCESS

Jorg Puhr-Westerheide, Birkenau, Germany, assignor to MTU-Motoren-und Turbinen-Union, Munich, Germany

Filed Aug. 18, 1976, Ser. No. 715,571
Claims priority, application Germany, Aug. 30, 1975, 2538652
Int. Cl.[2] B23D *1/00;* **C25F** *3/00*
U.S. Cl. 204—129.65 **4 Claims**

1. An electrolytic precision drilling process for making at least one hole in a workpiece, the axis of which hold has an inclination of between 2° and 20° relative to the surface of the workpiece, by means of least one tubular electrode through which a stream of an electrolyte is directed onto the workpiece, comprising the step of positioning a guide member during the drilling for sealing the gap between the guide member and the surface of the workpiece adjacent to the at least one hole, such that a surface of the guide member forms an angular space with the surface of the workpiece, the aperture



angle of the angular space being twice the angle of inclination of the electrode relative to the surface of the workpiece, and the apex of which is in the area of a sharp upper edge of each hole.

4,043,884

ELECTROLYTIC HYDROGENATION OF LEACHED OIL SHALE COMPONENTS

Teh Fu Yen, Altadena, and Chaur-Shyong Wen, Los Angeles, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,858
Int. Cl.[2] C25B *3/00*
U.S. Cl. 204—131 **5 Claims**

1. A process for upgrading the kerogen components of oil shale, comprising:

leaching carbonate minerals from said oil shale to form a porous residue;

forming a slurry of said residue with a reductive electrolytically active solution;

subjecting said slurry to reductive electrolysis; and

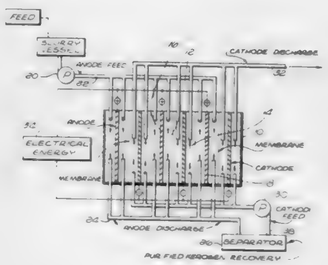
separating the reduced residue from the electrolyzed slurry.

4,043,885

ELECTROLYTIC PYRITE REMOVAL FROM KEROGEN MATERIALS

Teh Fu Yen, Altadena; Chaur-Shyong Wen, Los Angeles, and Jonathan Kwan, Monterey Park, all of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,860
Int. Cl.[2] C25B *3/00*
U.S. Cl. 204—131 **10 Claims**



1. A process for treating bituminous material for removal of pyrite therefrom, comprising:

forming an aqueous, substantially non-oxidative electrolytically active slurry of said material;

defining an electrolytic cell having a cathode chamber electrolytically operative with an anode chamber, an anode in

said anode chamber in contact with said slurry and a cathode in said cathode chamber; and

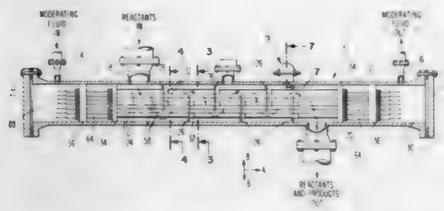
applying a direct current potential across said anode and cathode chambers at a current density of above about 50 A/m² to effect an electrolytic reaction of the pyrite in said material for a time sufficient for substantial removal of pyrite from said material.

4,043,886

PHOTOCHEMICAL REACTOR AND IRRADIATION PROCESS

George John Bierker, Devon, and Arnold Kivnick, Erdenheim, both of Pa., assignors to Pennwalt Corporation, Philadelphia, Pa.

Filed Mar. 15, 1976, Ser. No. 666,816
Int. Cl.² B01J *1/00, 1/10*
U.S. Cl. 204—157.1 R **36 Claims**



1. A process for the radiation catalyzed reaction of reactants, performed in a photochemical reactor containing a plurality of longitudinally oriented parallel spaced funicular radiation sources, comprising the steps of:

a. passing said reactants generally longitudinally through said reactor;

b. moving, in directions, to said skew longitudinal direction, at longitudinally spaced positions within said reactor, at least a portion of said reactants thereby producing oscillating flow at least of said portion of reactants with respect to said longitudinal direction thereby promoting mixing of said reactants as said reactants pass through said reactor; and

c. irradiating the reactants;

whereby a reaction product is produced.

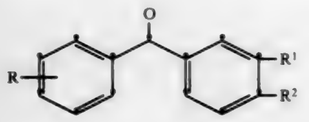
4,043,887

BENZOPHENONE INITIATORS FOR THE PHOTOPOLYMERIZATION OF UNSATURATED COMPOUNDS

James G. Pacifici; Richard H. S. Wang, and Gordon C. Newland, all of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1977, Ser. No. 759,688
Int. Cl.² C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **3 Claims**

1. A composition comprising a photopolymerizable ethylenically unsaturated compound having admixed therewith, as a photo-polymerization initiator, about 0.1 to about 10% by weight, based on the weight of the unsaturated compound, of at least one benzophenone derivative of the formula



wherein

R is hydrogen, chloro, methoxycarbonyl, methyl, t-butyl, and R^1 and R^2 are the same or different and each is $—CH_2X$, CHX_2, or CX_3 wherein X is chloro or bromo.

4,043,888

SUPERCONDUCTIVE THIN FILMS HAVING TRANSITION TEMPERATURE SUBSTANTIALLY ABOVE THE BULK MATERIALS

John R. Gavaler, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 383,625, July 30, 1973, abandoned. This application Aug. 29, 1975, Ser. No. 609,137
Int. Cl.² C23C *15/00;* C22C *27/02;* H01F *7/22*
U.S. Cl. 204—192 S **14 Claims**

1. In a method of producing thin films of superconductor materials of the beta-wolfram type having high transition temperatures, the steps comprising (a) assembling within a closed reactor a substrate and a composite containing at least two target materials which when reacted are capable of forming the beta-wolfram crystallographic structure, (b) evacuating the reactor to a pressure not in excess of 5×10^{-10} Torr while heating the components contained within the reactor to remove all volatile impurities therefrom under said conditions, (c) admitting an inert gas which will support sputtering to the reactor and adjusting the pressure within the reactor with said inert gas to the range between about 2 and 6×10^{-1} Torr, (d) heating the substrate to a temperature not in excess of about 1000° C, (e) connecting the components within the reactor to a source of DC power while controlling the voltage within the range between about 600 and about 1000 volts and the cathode current density within the range between about 10 and about 50 milliamps per square inch, (f) continuing said sputtering until the desired film thickness is obtained on the substrate, said film having the beta-wolfram structure, and (g) thereafter quenching the deposited film to room temperature.

9. An elongated superconducting body having a transition temperature of about 22° K formed of a plurality of turns containing the composition Nb_3Ge, said Nb_3Ge having been deposited by the method of claim **1**.

12. A thin film Type II superconductor of niobium-germanium said film having a beta-wolfram crystallographic structure of the required stoichiometry and a transition temperature at least 4 Kelvin degrees higher than the bulk material of the same gross stoichiometry.

14. In a method of producing thin films of materials requiring predetermined stoichiometry, the steps comprising, in sequence, (a) assembling within a closed reactor a substrate and a composite containing at least two materials for forming a predetermined composition which materials, when reacted, form the predetermined stoichiometrical composition (b) evacuating the reactor to a vacuum of at least 5×10^{-10} Torr while heating the components contained within the reactor to remove all volatile impurities therefrom, (c) admitting an inert gas to the reactor and adjusting the pressure within the reactor with said inert gas to a range between 2 and 6×10^{-1} Torr (d) heating the substrate to a temperature not in excess of about 1000° C (e) connecting the components within the reactor to a source of DC power while controlling the voltage within the range between about 600 to about 1000 volts and the cathode current density within the range between about 10 and about 50 milliamps per square inch to effect sputter deposition of a thin film of the predetermined stoichiometry on the substrate (f) continuing said sputter deposition until the desired film thickness on the substrate, is obtained, and (g) thereafter quenching the deposited film to room temperature.

4,043,889

METHOD OF AND APPARATUS FOR THE RADIO FREQUENCY SPUTTERING OF A THIN FILM

Leroy Joseph Kochel, Fridley, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,202
Int. Cl.² C23C *15/00*
U.S. Cl. 204—192 R **8 Claims**

1. In an RF sputtering apparatus in which a thin film is to be deposited upon a substrate that is supported by a substrate holder in a spaced relationship with a cathodic target, a

method of maintaining the DC bias voltage of said substrate holder at a constant predetermined level comprising:

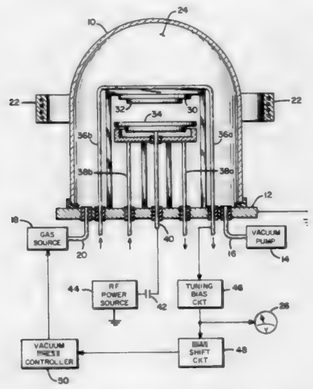
coupling an RF signal to the target of said RF sputtering apparatus;

generating an effective DC bias voltage at the substrate holder of said RF sputtering apparatus;

generating a predetermined DC shift of said DC bias voltage;

coupling a vacuum pressure modifying means to said shifted DC bias voltage for modifying the vacuum pressure within said RF sputtering apparatus in response to said shifted DC bias voltage whereby said DC bias voltage is maintained constant in accordance with a predetermined bias voltage vs. vacuum pressure characteristic of said RF sputtering apparatus.

4. In an RF sputtering apparatus in which a thin film is to be deposited upon a substrate that is supported by a substrate holder in a spaced relationship with a cathodic target, an appa-



ratus for maintaining the DC bias voltage of said substrate holder at a constant predetermined level comprising:

RF signal source means for coupling an RF signal to the target of said RF sputtering apparatus;

a substrate holder; means coupled to said substrate holder of said RF sputtering apparatus for generating a DC bias voltage that has a predetermined bias voltage vs. vacuum pressure characteristic for said RF sputtering apparatus;

means coupled to said DC bias voltage generating means for generating a predetermined DC shift of said DC bias voltage;

vacuum pressure modifying means coupled to said RF sputtering apparatus and to said DC bias voltage shift generating means for modifying the vacuum pressure within said RF sputtering apparatus in response to said shifted DC bias voltage and controlling said DC bias voltage to remain constant in accordance with said predetermined bias voltage vs. vacuum pressure characteristic.

4,043,890

DEVICE FOR MEASURING THE TOTAL CONCENTRATION OF OXYGEN IN GASES

Hugh S. Isaacs, Shoreham, and Anthony J. Romano, Kings Park, both of N.Y., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed June 14, 1976, Ser. No. 695,899
Int. Cl.² G01N *27/46*
U.S. Cl. 204—195 S **3 Claims**

1. An electrode assembly for use in a cell for the detection of the total oxygen in a gas stream whose oxygen content is to be measured comprising:

a. a thin disc-shaped solid-electrolyte element having oppositely facing first and second surfaces;

b. a porous coating layer of metal in which oxygen will dissolve but not react covering at least a portion of the first surface of the disc-shaped element;

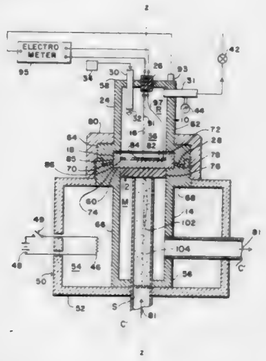
c. carbon means adjacent the second surface for producing CO by a reaction between the carbon means and oxygen;

d. housing means for supporting the disc-shaped element for partial exposure to the gas stream whose oxygen content is to be measured, such that the latter would be in contact with the second surface of said disc-shaped element;

e. annular spring sealing means surrounding and sealing the disc-shaped element to limit leakage of the measurement gas stream from the second side of the disc-shaped element into the interior of said housing means for preventing the measurement gas and a reference gas from mixing on the first side of the disc-shaped element;

f. contact means of electrically conducting material in contact with said porous coating layer of metal and extending through and out of the interior of said housing means;

g. means supplying an oxygen containing reference gas into said housing means and in contact with said porous coating layer of metal;



h. means having a heater for supplying said gas stream whose oxygen content is to be measured to said second surface and circulating it slowly through the carbon means adjacent thereto for converting all the oxygen contained in the measurement gas stream to CO at an elevated temperature for producing said CO in an equilibrium with the total amount of oxygen in the gas stream; and

i. means connected to the contact means and the second surface of the solid electrolyte element for measuring the electrical potential difference across the electrolyte as a measure of the oxygen in the gas stream to be measured;

j. the CO equilibrium directly corresponding substantially with the concentration of the total oxygen in the gas stream on the other side of the electrolyte for reducing the electronic conduction of the electrolyte at low oxygen concentrations, thus to increase the sensitivity of the electrical potential difference across the electrolyte as a measure of the total oxygen in the gas stream whose oxygen content is to be measured.

4,043,891

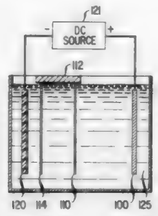
ELECTROLYTIC CELL WITH BIPOLAR ELECTRODES

Richard Collin Alkire, Champaign, Ill.; Werner Engelmaier, Mendham, N.J., and Thomas Jacob Kessler, East Rochester, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 14, 1976, Ser. No. 649,041
Int. Cl.² C25D *3/38, 17/10, 17/12*
U.S. Cl. 204—231 **7 Claims**

1. Apparatus for electrodepositing a selected metal onto a surface comprising an electrolytic solution, means for contain-

ing said electrolytic solution, an anode of the depositing metal in said electrolytic solution, a cathode in spaced relation to said anode in said electrolytic solution, one side of said cathode being the surface on which said selected metal is deposited, a pair of metal screen electrodes intermediaate said anode and said cathode in said electrolytic solution, means for electrically interconnecting said pair of electrodes, means for positioning



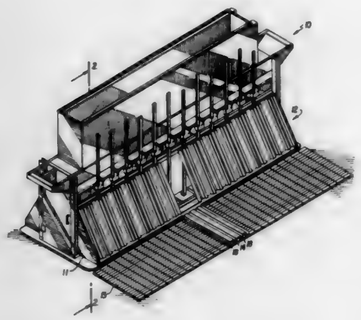
one of said electrodes in close proximity to said cathode, means for positoning the other of said electrodes between said node and said one of said electrodes, and means for periodically reversing the positions of said pair of electrodes whereby said metal is uniformly deposited on said cathode side from the electrode in close proximity thereto substantially independent of the position, size, and shape of said anode.

4,043,892

ALUMINUM REDUCTION CELL HAVING A LATERAL ENCLOSURE SYSTEM

Juan M. Gonzalez, and William V. Nichols, Jr., both of Portland, Oreg., assignors to Reynolds Metals Company, Richmond, Va.

Filed Dec. 15, 1975, Ser. No. 640,811
Int. Cl.² C25C *3/06*
U.S. Cl. 204—247 **17 Claims**



1. In an aluminum reduction cell having a row of individually adjustable prebaked carbon anodes, the improvement comprising:

a plurality of successively overlapping, alternating male and female access panels arranged to form a lateral enclosure along the cell,

said panels being pivoted on a common axis at the lower ends thereof and adapted for being opened selectively at each anode position of the cell in sets of three adjacent panels,

each such set including a male panel and a female panel on each side thereof,

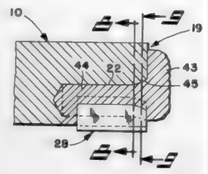
said male panel having laterally spaced outwardly directed flanges and the adjacent female panels having corresponding inwardly open flange receptacles.

4,043,893

ELECTRICAL CONTACT

Leonard Gelfand, Orange Village, Ohio, assignor to Erico Products, Inc., Cleveland, Ohio

Filed Mar. 31, 1976, Ser. No. 672,054
Int. Cl.² C25B *9/04*
U.S. Cl. 204—281 **23 Claims**



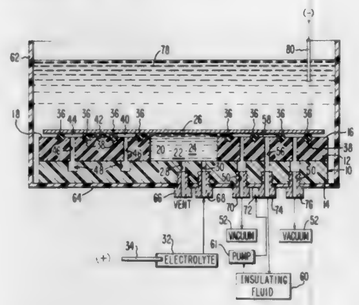
1. An electrode which includes an aluminum bar, said bar including a hole in the end of the bar, a passage means extending between the hole and the exterior of the bar, a copper insert projecting beneath the bar and extending through the passage means and into the hole, and cast metal filling such hole securing the insert to the bar.

4,043,894

ELECTROCHEMICAL ANODIZATION FIXTURE FOR SEMICONDUCTOR WAFERS

Stephen R. Gibbs, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 20, 1976, Ser. No. 688,415
Int. Cl.² C25D *17/06, 11/02*
U.S. Cl. 204—297 W **7 Claims**



1. An anodization fixture for a semiconductor wafer comprising:

a body member having a major surface;

a plurality of closed looped ridges on said surface for supporting a semiconductor wafer, said ridges having a progressively larger perimeter with adjacent ridges defining channels therebetween;

electrical contact means in said body member for contacting one surface of the wafer, with at least one channel surrounding said contact;

means for maintaining a vacuum in at least one channel for securing the wafer against the ridges; and

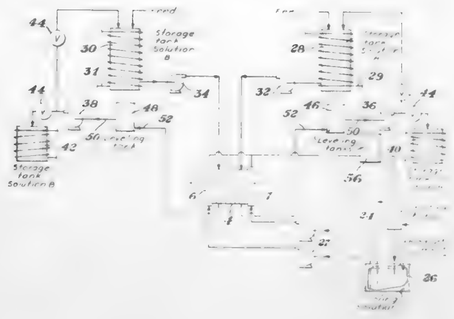
means for supplying an insulating fluid to another channel surrounding said electrical contact means to prevent electrical shorting between the contact and an anodizing solution for anodizing the wafer.

4,043,895

ELECTROPHORESIS APPARATUS

Gerhard Gritzner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 360,990, May 16, 1973, Pat. No. 3,989,613. This application Mar. 1, 1976, Ser. No. 662,499
Int. Cl.² B01D *13/02*
U.S. Cl. 204—301 **5 Claims**



1. An apparatus for continuous electrophoresis comprising an electrophoresis cell defined by a pair of membranes;

a permeable boundary membane in the cell generally parallel to the membranes and dividing the cell into the first and second separate compartments on opposite sides thereof;

separate inlet means on the cell for continuously feeding a separate solution into each compartment;

separate outlet means at a location spaced from the inlet means on the cell for separately withdrawing each solution from its compartment continuously;

means for passing a direct current through the cell and across the boundary membrane and compartments; and

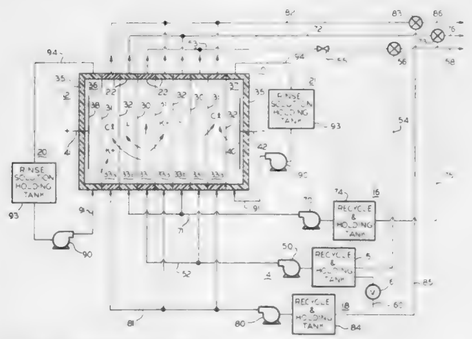
balancing means associated with the inlets and outlets for continuously maintaining the fluid pressure in the first compartment substantially equal to the fluid pressure in the second compartment.

4,043,896

ULTRAFILTRATION AND ELECTRODIALYSIS APPARATUS

Richard M. Ahlgren, Waukesha, Wis., assignor to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Mar. 25, 1976, Ser. No. 670,159
Int. Cl.² B01D *13/02*
U.S. Cl. 204—301 **20 Claims**



1. The combination of:

an enclosure,

membrane support means disposed within said enclosure, a plurality of membranes supported in spaced relation by said membrane support means to form a plurality of permeation cells within said enclosure,

electrode means disposed in spaced relation relative to the sides of said membranes, for supplying an electric field thereacross,

a first one of said membranes being selective to ions having one charge and a second one of said membranes being ion-nonselective for passing ions of either charge, and

a filtration membrane disposed between said first and second ones of said membranes to define at least one filtration cell therebetween with one side of said first one of said membranes and a permeate collecting cell with one side of the second one of said membranes,

means for delivering fluid under pressure to at least said filtration cell.

4,043,897

OIL SHALE RETORTING

Roland F. Deering, Brea, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation-in-part of Ser. No. 465,265, April 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 412,494, Nov. 2, 1973, abandoned. This application June 10, 1976, Ser. No. 694,528
Int. Cl.² C10G *1/02*
U.S. Cl. 208—11 R **14 Claims**

1. In a process for producing a low-arsenic shale oil and a hydrogen-containing product gas wherein a stream of raw crushed, arsenic-containing oil shale is first countercurrently contacted in an eduction zone with a stream of essentially oxygen-free, hot eduction gas contaning carbon dioxide to thereby produce shale oil, an eduction off-gas and hot, essentially oil-free, coke-containing spent shale, and wherein said hot spent shale is thereafter countercurrently contacted in a gasification zone with a conversion gas mixture comprising steam and oxygen to partially combust the coke on said spent shale and thereby heat said spent shale to sufficiently high temperatures to react said steam with remaining coke, thereby producing an essentially oxygen-free, hydrogen-containing water gas, and decarbonized shale which is passed through a cooling zone communicating with said gasification zone, and wherein said eduction gas comprises a mixture of said water gas and a recycle portion of said eduction off-gas, the improvements which comprise:

1. passing said raw shale upwardly through said eduction zone;
2. maintaining an essentially oxygen-free transition zone between said eduction zone and said gasification zone;
3. passing said spent shale serially and downwardly through said transition zone, said gasification zone and said cooling zone;
4. passing serially through said cooling zone and said gasification zone sufficient of said conversion gas mixture to provide at least about 25 pounds of oxygen and at least about 100 pounds of steam per ton of raw shale, sufficient oxygen being supplied to maintain a peak temperature above about 1,000° F in said gasification zone;
5. passing said water gas through said transition zone into said eduction zone;
6. injecting all of said recycle portion of eduction off-gas into said transition zone to mingle therein with said water gas and form said eduction gas; and
7. withdrawing the non-recycled portion of said eduction off-gas as said hydrogen-containing product gas.

4,043,898

CONTROL OF FEEDSTOCK FOR DELAYED COKING

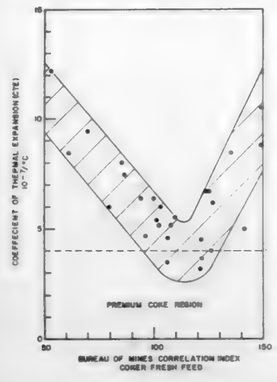
William H. Kegler, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Aug. 25, 1975, Ser. No. 607,728
Int. Cl.² C10G *9/14*
U.S. Cl. 208—50 **6 Claims**

1. In a delayed coking process for producing premium coke

wherein a petroleum derived feedstock is charged to a coker furnace, heated to coking temperature, charged to a coking drum and maintained therein at coking conditions until premium coke is formed, the improvement wherein:

a. said feedstock has a BMCI value outside the range of 95 to 130;



b. a desired BMCI value for the feedstock within the range of 95 to 130 is preselected;

c. the BMCI of the feedstock is determined prior to charging same to the coker furnace; and

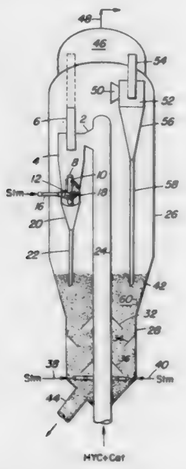
d. the BMCI of the feedstock, prior to charging same to the coker furnace, is adjusted to said preselected desired value.

4,043,899

METHOD AND MEANS FOR SEPARATING GASIFORM MATERIALS FROM FINELY DIVIDED CATALYST PARTICLES

Conroy D. Anderson, Wenonah, N.J.; Klaus W. Schatz, Philadelphia, Pa., and Paul W. Snyder, Jr., Pitman, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,187
Int. Cl.² C10G *11/04*; B01J *8/26*
U.S. Cl. 208—161 **4 Claims**



1. In the catalytic conversion of hydrocarbons with fluid catalyst particles in a riser conversion zone the method for improving the separation of fluid catalyst particles from hydrocarbon conversion products which comprises passing a suspension of hydrocarbons and catalysts upwardly through a riser conversion zone under elevated temperature conversion conditions, passing the suspension from the riser conversion zone directly into a cyclonic separation zone wherein a first cyclonic separation is made in an upper portion thereof between fluid catalyst particles and vaporous hydrocarbon products comprising said suspension, passing the catalyst thus separated substantially immediately into a lower separate portion of said cyclonic separation zone through a restricted opening into an annular zone in the lower portion of said cyclonic separation zone and into contact with tangentially introduced stripping gas, passing stripping gas and stripped products separated from said catalyst in said annular zone upwardly through an open end restricted passageway concentric with said annular zone and in open communication with an upper withdrawal passageway for removing first separated hydrocarbon vapors from the upper portion of said cyclonic separation zone and recovering stripped catalyst from said cyclonic separation zone beneath said annular zone.

4,043,900

HYDRODESULFURIZATION WITH A METAL HALIDE-HYDROGEN HALIDE CATALYST

Michael Siskin, Maplewood, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 4, 1975, Ser. No. 628,588
Int. Cl.² C10G *23/02*
U.S. Cl. 208—216 **20 Claims**

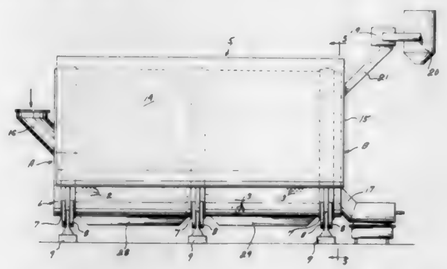
1. A hydrodesulfurization process for the removal of organic sulfur compounds from a hydrocarbon feed stock which comprises contacting said feed stock in the reaction zone with hydrogen and with an acid catalyst comprising (1) a difficultly reducible metal halide selected from the group consisting of the chlorides and bromides of gallium, and the fluorides, chlorides and bromides of tantalum, niobium, tungsten, and molybdenum, and (2) a hydrogen halide selected from the group consisting of hydrogen fluoride, hydrogen chloride, or hydrogen bromide, the ratio of hydrogen halide to metal halide being at least equal molar, wherein the temperature of said reaction zone is maintained between the melting point and the critical temperature of the catalyst components for a period of time sufficient to effect hydrodesulfurization of a portion of said organic sulfur compounds.

4,043,901

WOOD CHIP SCREENS

Warren Thomas Gauld, Mobile, Ala., assignor to Gauld Equipment Sales Company, Mobile, Ala.

Filed Dec. 3, 1975, Ser. No. 637,303
Int. Cl.² B07B *1/24*
U.S. Cl. 209—10 **10 Claims**



1. A wood chip screen of the rotary type comprising a screen having perforations in a first inlet portion thereof to permit passage therethrough of fines material and having perforations in a second discharge portion thereof to permit passage therethrough of acceptable chips, a hollow spiral baffle secured to the inner surface of the screen, means to separate unwanted material from the wood chips and to float said unwanted material into the interior of the screen, air suction means creating an air stream to withdraw from the interior of the screen the said unwanted material, said air suction means including a conduit communicating with the interior of the screen at an end thereof such that the unwanted material can pass with said air stream directly from the interior of the screen into said conduit without passing through the screen perforations, and including a fan means for drawing air from the interior of the screen into said conduit, a cyclone separator in communication with the fan, first conveyor means below the said screen to receive the fines and acceptable chips, and second conveyor means adjacent the discharge end of the screen to receive oversize wood chips, and a casing enclosing the upper half and a portion only of the lower half of the screen in spaced relation thereto, the said casing including an end closure plate adjacent to the discharge end of the screen, said conduit connecting the said fan with the interior of the screen through the said casing and closure plate.

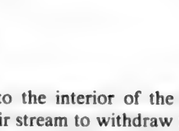
4,043,902

TRI-CARBOXYLATED AND TETRA-CARBOXYLATED FATTY ACID ASPARTATES AS FLOTATION COLLECTORS

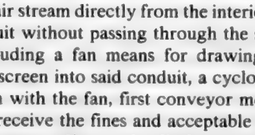
Hermen Hartjens, Sun City, Ariz., and Arnold Day, Wilton, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed June 6, 1975, Ser. No. 584,545
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **17 Claims**

1. A method of beneficiating an ore selected from the group consisting of non-sulfide minerals such as sulfates, carbonates, fluorides, tungstates, phosphates and oxides, which comprises grinding said ore to flotation size, pulping the ground ore in water, and subjecting the pulp to froth flotation with a compound of the group, trivalent salts of the formula:



and tetravalent salts of the formula



where R is a long chain alkyl group containing 12 to 22 carbon atoms and X is sodium, potassium or ammonium, and the mono or di alkyl esters thereof, where the alkyl group contains from 1 to 13 carbon atoms, preferably from 1 to 8 carbon atoms.

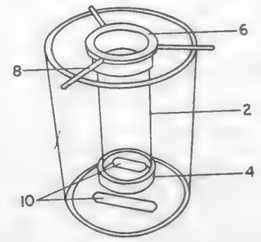
4,043,903

PROCESS FOR PROMOTION OF ALGAE GROWTH IN A SEWAGE MEDIUM

Inka Dor, 119 Ein Kerem D, Jerusalem, Israel

Filed Oct. 28, 1975, Ser. No. 626,292
Claims priority, application Israel, Nov. 8, 1974, 46022
Int. Cl.² B01D *13/00*; C02C *1/04*
U.S. Cl. 210—22 C **2 Claims**

1. An improved method for promoting algae growth in sewage medium comprising placing algae in pure water separated by a dialysis membrane from sewage water in the presence of light of an intensity of at least about 15,000 lux and allowing osmotic interaction to occur across said membrane as a result of the difference in concentration gradient, wherein



said dialysis membrane has a porosity in the range of about 250A to 24A.

4,043,904

WASTE WATER TREATMENT METHOD

Tsuneshi Takeda; Yasuyuki Atarashi, and Akira Mori, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 17, 1976, Ser. No. 715,009
Claims priority, application Japan, Sept. 1, 1975, 50-105012
Int. Cl.² C02C *5/02*
U.S. Cl. 210—28 **3 Claims**

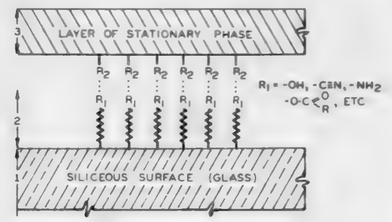
1. A process for treating waste water containing from 1 to 1000 ppm of water-soluble salts of condensates obtained by condensing, with formaldehyde, sulfonates of mono or fused polycyclic benzenoid aromatic hydrocarbons having from 1 to 12 benzene rings, which comprises the sequence of steps of: (1) adding to said waste water from 50 to 1000 ppm of at least one inorganic flocculating agent while maintaining the pH of the waste water at from about 6.5 to about 8.5 to form flocs containing a portion of said condensates and removing the resulting flocs from the waste water, and then (2) adding to the treated waste water product from step (1) from 50 to 400 ppm of activated carbon and agitating same therein for a period of time effective to absorb the condensate into the activated carbon and then filtering the activated carbon from the waste water.

4,043,905

CHROMATOGRAPHIC SEPARATION COLUMNS WITH SELECTIVELY MODIFIED ACTIVE SURFACES AND METHODS FOR THEIR PREPARATIONS

Milos V Novotny, Bloomington, Ind., and Karel Grohmann, Pasadena, Calif., assignors to Indiana University Foundation, Bloomington, Ind.

Filed Aug. 26, 1974, Ser. No. 500,226
Int. Cl.² B01D *15/08*
U.S. Cl. 210—31 C **4 Claims**

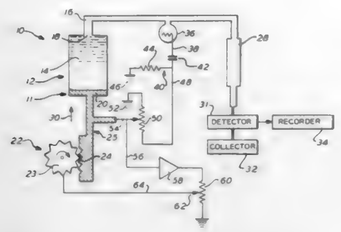


1. A method of preparing chromotographic columns comprising active surfaces fabricated of a siliceous material which method includes the step of modifying said surfaces by reaction with chlorodimethyl (4-(4-chloromethylphenyl)butyl) silane.

4,043,906
METHOD AND APPARATUS FOR REDUCING THE TRANSIENT EFFECTS OF LIQUID COMPRESSIBILITY IN A LIQUID CHROMATOGRAPHY SYSTEM

John Colville Helmer, Menlo Park, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Mar. 18, 1976, Ser. No. 668,340
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—31 C 24 Claims



1. In a liquid chromatography system of the type including a chromatographic column, a reservoir defining a variable volume for containing a slightly compressible mobile liquid phase, piston means cooperating with said reservoir for enabling pumping of said liquid phase through said chromatographic column, and means for normally driving said piston means at a pre-selected velocity; a method for reducing the effective systemtime constant incident to reattainment of equilibrium pressure and flow, to thereby damp the oscillatory behavior following a change in fluid pressure in said system; said method comprising:

superimposing upon said piston motion an additional velocity component proportional to the time derivative of pressure at said reservoir, and to the volume of said reservoir; to thereby damp the transient oscillations generated by compression of said liquid phase in response to said fluid pressure change.

4,043,907
PROCESS FOR TREATING WASTE PHOTOGRAPHIC PROCESSING SOLUTIONS

Isao Shimamura, and Haruhiko Iwano, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 307,265, Nov. 16, 1972, Pat. No. 3,869,383. This application Sept. 13, 1974, Ser. No. 505,877
Claims priority, application Japan, Nov. 17, 1971, 46-92115; Dec. 30, 1971, 47-634; Mar. 6, 1972, 47-22907
The portion of the term of this patent subsequent to Mar. 4, 1992, has been disclaimed.
Int. Cl.[2] B01D *15/06*
U.S. Cl. 210—32 20 Claims

1. A process for treating a waste solution from a photographic treatment which solution contains at least one of ferricyanide and ferrocyanide ions comprising contacting the waste solution with a weakly basic anion exchange resin in the salt form thereby adsorbing said ions on said weakly basic anion exchange resin.

4,043,908
PROCESS FOR CLEANING OF A DISPERSION OF DISPERSED PARTICLES

Kelvin Roberts, Osterskar, and Barbro Margareta Stenqvist, Vasterhaninge, both of Sweden, assignors to Kemanord Aktiebolag, Stockholm and Sala International AB, Sala, both of Sweden

Filed Mar. 11, 1976, Ser. No. 666,104
Claims priority, application Sweden, Mar. 11, 1975, 7502720
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—43 8 Claims

1. A process for purifying waste water containing organic and/or colloidal impurities obtained from de-inking of paper, which process comprises:

a. adjusting the pH to a value of about 8 or higher,

b. adding a surface active amine or amino acid to the aqueous dispersion or pulp slurry in an amount sufficient to form a micellar solution containg the organic and/or colloidal impurities, said amount exceeding the critical micelle concentration of said surfactant, said amine or amino acid being cationic at a pH of 7 or lower,

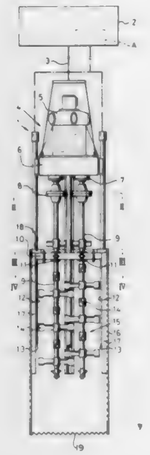
c. precipitating micelles of the micellar solution formed in step (b) by reducing the pH of the dispersion or slurry to a range of about 7 or lower, and

d. removing the precipitate of micelles formed in step (c).

4,043,909
APPARATUS AND METHOD FOR SOLIDIFICATION OF SLUDGES

Masaaki Endo, Saitama; Mitsuo Miura; Yoshinori Kukino, both of Tokyo; Kimio Kikuchi, Saitama, and Hayao Aoyagi, Chiba, all of Japan, assignors to Takenaka Komuten Co., Ltd., Osaka, Japan

Filed Dec. 22, 1976, Ser. No. 753,199
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—49 4 Claims



4. A method for the solidification of sludge layers using a solidification apparatus comprising a solidification apparatus proper, a lifting means for moving said apparatus proper in the vertical direction, and a cylindrical casing, said solidification apparatus proper including driving means, agitating shafts driven by said driving means, agitating blades attached to the lower portions of the agitating shafts to form a kneading zone, and means for feeding a hardener into the kneading zone, said casing surrounding said kneading zone of the solidification apparatus proper, said casing being disposed so that it can shift in the vertical direction with respect to the solidification apparatus proper, said solidification method comprising:

the first step of setting the casing at the lowermost position thereof and lowering the apparatus proper with the lifting means until the lower ends of the agitating shafts arrive at the top face of the sludge layer;

the second step of piercing the sludge layer with the apparatus proper while rotating the agitating shafts and supplying the hardener into the kneading zone until the bottom of the casing arrives at the bottom of the sludge layer and the lower ends of the agitating shafts arrive at the bottom of the sludge layer; and

the third step of lifting the solidification apparatus proper alone to the position uppermost with respect to the casing while stopping supply of the hardener but continuing rotation of the agitating shafts and then lifting the casing integrally with the solidification apparatus proper to thereby agitate the sludge entirely from the bottom to the top sufficiently to effect the solidification treatment.

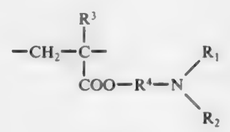
4,043,910
REMOVAL OF PHOSPHOROUS FROM WASTE WATER

John Rodney Field, Hipperholme, near Halifax, England, and Kenneth Guthrie Andrew, Dundee, Scotland, assignors to Allied Colloids Limited, Bradford, England

Continuation-in-part of Ser. No. 504,791, Sept. 10, 1974, abandoned. This application June 3, 1976, Ser. No. 692,607
Int. Cl.[2] C02B *1/20*
U.S. Cl. 210—53 10 Claims

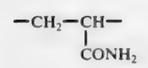
1. A process for removing phosphate from aqueous waste selected from the group consisting of raw sewage, an effluent from a primary or secondary sewage sedimentation process, and a food processing factory effluent containing phosphate comprising the steps of, in order, (1) precipitating soluble and colloidal phosphate in the waste by adding a sufficient amount of an inorganic coagulant containing a multivalent metal cation selected from the group consisting of aluminum, ferrous, ferric and calcium to the waste to precipitate soluble and colloidal phosphate therefrom, (2) adding to the waste after an interval of about 15 seconds to 4 minutes a sufficient amount of a cationic polyelectrolyte which is quaternary ammonium salt of a copolymer, having a molecular weight such that at 25° C the viscosity in centipose of an aqueous solution have a pH of 6.0, containing 1% by weight of the polymer and in the absence of added salts using a Brookfield Model RVT viscometer with spindle No. 3 at 20 rpm is greater than 2000, and consisting essentially of units of

(a)



and

(b)



in which R_1 and R_2 may be the same or different and are selected from the group consisting of hydrogen and alkyl, R^4 is alkylene containing 1 to 8 carbon atoms and R^3 is hydrogen and in which (b) is present in an amount of 80 to 97 mole % based on (a) plus (b) to flocculate the precipitated phosphate, and (3) subjecting the waste to a liquid-solids separation process.

4,043,911
STERILIZATION OF HOLDING TANKS AND TOILET BOWLS BY QUATERNARY COMPOUNDS

Joseph L. Melnick, and Craig Wallis, both of Houston, Tex., assignors to Baylor College of Medicine, Houston, Tex.

Division of Ser. No. 561,447, March 24, 1975, Pat. No. 3,941,696, which is a continuation of Ser. No. 426,793, Dec. 20, 1973, abandoned. This application Feb. 27, 1976, Ser. No. 662,072
The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.
Int. Cl.[2] C02B *3/06*
U.S. Cl. 210—62 20 Claims

1. A method of sterilizing wastewater in tanks and the like, the wastewater having an organic load containing bacteria not inactivated by basicity alone and viruses comprising,

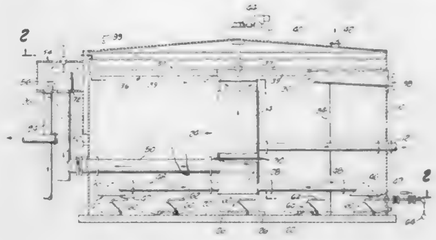
adding 10 to 400 ppm liquid quaternary compound containing a pyridinium moiety to the wastewater for 1000 ppm suspended solids in the wastewater, and

adding a liquid base to the wastewater to interact with said quaternary compound to cause said quaternary compound to inactivate said bacteria and viruses and in an amount sufficient to bring the wastewater to a pH of about 9.5 to about 10.5.

4,043,912
CLARIFICATION TANK

Alberto H. Bascope, and Eugene H. Grizzard, both of Huntington Beach, Calif., assignors to Burmah Oil and Gas Company, Houston, Tex.

Continuation-in-part of Ser. No. 157,343, June 28, 1971, Pat. No. 3,951,816. This application Aug. 14, 1975, Ser. No. 604,718
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.[2] B01D *17/02, 21/10*
U.S. Cl. 210—83 10 Claims



1. An apparatus for clarifying a liquid mixture of two liquid components, comprising:

a. a tank;

b. means for feeding said liquid mixture into said tank below the liquid surface level, for gravity separation of said mixture in said tank whereby said lighter component separates from said mixture and rises toward the liquid surface level in said tank leaving said heavier component relatively pure in the lower portion of said tank;

c. means in said tank for removing said lighter component at the liquid surface level in said tank;

d. a central collection plenum for removing said clarified heavier component from below the level of said tank where said heavier component is substantially free of said lighter component;

e. a plurality of pick-up conduits in said tank in fluid communication with said central collection plenum and extending radially therefrom in said tank; said pick-up conduits each being of equal length and equal internal diameter;

f. means exterior of said tank and in fluid communication with said central collection plenum for controlling the rate of discharge of said heavier component from said tank.

9. In a method for clarifying a liquid mixture of two liquid components in a tank having means for feeding said liquid mixture into said tank below the liquid surface level for gravity separation of said mixture in said tank, whereby said lighter component separates from said mixture and rises toward the liquid surface level in said tank leaving said heavier component relatively pure in the lower portion of said tank, comprising the steps:

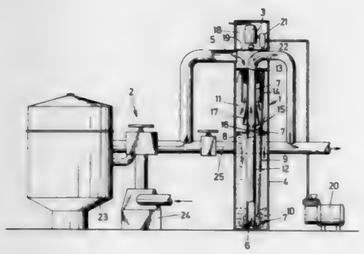
a. skimming the lighter component from the liquid surface of said mixture;
b. removing said clarified heavier component from said tank through a plurality of conduits extending radially into a central collection plenum, at substantially equal flow rates through each of said conduits;
c. removing said heavier component from said tank through said collection plenum; and
d. controlling the rate of said removal from said tank.

4,043,913

DEVICE FOR STERILIZING SWIMMING-POOL WATER

Edouard Hintermeister, 15 Notelaarweg, Keerbergen, Belgium

Filed Mar. 18, 1976, Ser. No. 667,997
Claims priority, application Belgium, Mar. 18, 1975, 826801
Int. Cl.[2] E04H *3/16*
U.S. Cl. 210—169 **5 Claims**



1. Device for sterilizing swimming-pool water, particularly of small-volume pools, said device being provided in the water regenerating flow circuit and comprising an ozonizer, in which the ozonizer is so arranged as to supply the ozone directly into the water inside a water-ozone contacting chamber without venting the ozone to the atmosphere,

the ozonizer being mounted inside the water-ozone contacting chamber, which is sealed-off and comprises an inlet and an outlet for the water to be sterilized, means being provided in said chamber for insuring the water-ozone contacting,

the water-ozone contacting chamber being of the constant level type, the ozonizer being located above the water level and so arranged as to supply the ozone through a pipe and through a diffuser dipping in the water, at the bottom of the contacting chamber, the water inlet to said chamber being located above the water level in such a way that the water to be sterilized runs into that tank portion located above the water level and containing gas escaping from the water, the water outlet being located below the water level adjacent the contacting chamber bottom, and the chamber having a water-outlet pipe, the outlet of which lies at the contacting chamber bottom, which is so arranged in said contacting chamber as to extend above the chamber water level to the inlet level of the water to be sterilized, said pipe being surrounded over a portion of the length thereof lying above said water level, by two co-axial pipe sections staggered relative to one another, a first pipe section being connected to the chamber walls below the inlet for the water to be sterilized, in such a way that said water to be sterilized flows between said outlet pipe and said first pipe section, a second pipe section surrounding the first section and being staggered relative thereto in such a way that the water flow between the outlet pipe and the first pipe section causes an underpressure between both pipe sections so that the gas present inside the contacting chamber above the water level be forced between the pipe sections and contacted with the water to be sterilized as soon as it enters the contacting chamber, said water-outlet pipe comprising at the water level inside the contacting chamber, at least one opening,

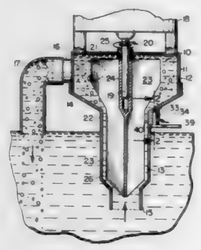
the said means for insuring the water ozone contacting including means provided in said pipe to cause a turbulence in the water flow at the level of said opening so as to feed therethrough in the pipe gas present above the water level inside the contacting chamber, said last-named means comprising, a baffle on said water-outlet pipe above said opening, said baffle being so arranged as to cause turbulences in the water flowing between said pipe and said first pipe section to insure a water-gas mixing and avoid water entering the water-outlet pipe through said opening.

4,043,914

AQUARIUM PUMP WITH AERATION

Tibor Horvath, Brooklyn, N.Y., assignor to Aquology Corporation, Newark, N.J.

Filed Aug. 19, 1976, Ser. No. 715,701
The portion of the term of this patent subsequent to July 10, 1990, has been disclaimed.
Int. Cl.[2] E04H *3/16*
U.S. Cl. 210—169 **6 Claims**



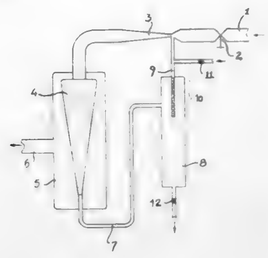
1. A pump with aeration for an aquarium filter tank, said filter tank having filter material, means supporting said filter material, and a suction outlet drawing from below said filter material, said pump comprising, in combination, a housing containing a large cylindrical upper chamber disposed at least partly above the top of said filter tank and having a tangential outlet extending out over the top of said filter tank, a smaller lower chamber extending downward to connect with said suction outlet, and a flared transition portion between said chambers, a motor fixed on top of said casing and having a vertical shaft entering said casing, a vertical impeller mounted on said shaft having a large upper portion extending above said transition portion into said upper chamber and having a smaller lower portion extending in said lower chamber below the level of water in said filter tank, said smaller lower portion primimg said upper chamber by raising water into said upper chamber where efficient pumping takes place, a projection within said transition portion having an edge in the direction said impeller moves adjacent to said projection, and air valve means controlling the flow of air through said channel into pumped fluid in said housing.

4,043,915

FILTER FOR USE WITH IRRIGATION SYSTEMS

Nahum Man, Kibbutz Merhavia, Merhavia, Israel

Filed Jan. 17, 1977, Ser. No. 759,622
Claims priority, application Israel, Jan. 30, 1976, 48942
Int. Cl.[2] B01D *21/24*
U.S. Cl. 210—195 R **2 Claims**



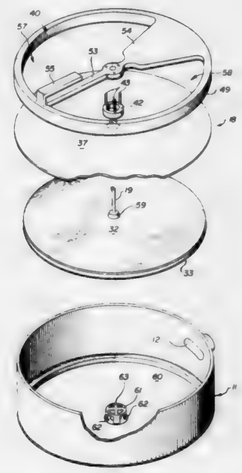
1. A filtering system comprising a hollow screening and filtering body having an inlet and an outlet, a Venturi pipe being provided in communication with the said hollow screening and filtering body, the said screening and filtering body being accommodated in a casing having an outlet, a first conduit leading from the interior of the said hollow screening and filtering body into a container from the interior of which a second conduit leads to a point co-incident with the throat of the Venturi pipe, the said second conduit being closed at its end which is within the said container, the end portion of said second conduit — so far as it extends within the container — being permeable to liquid, the said container being provided with flushing inlets and outlets.

4,043,916

ON-LINE CLOSED-VESSEL CIRCULATING FILTER FOR EDIBLE COOKING OILS

Walter A. Wecker, Sr., Delray Dunes, Boynton Beach, Fla. 33436, assignor to Wacker-Dearborn Corporation, Chicago, Ill.

Filed June 16, 1976, Ser. No. 696,650
Int. Cl.[2] B01D *35/28*
U.S. Cl. 210—238 **5 Claims**



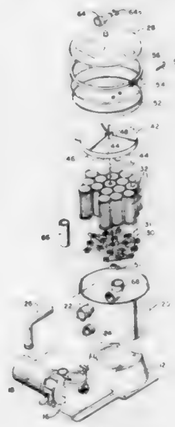
1. Vacuum filtering apparatus for use in reconditioning cooking oils comprising a vertically walled filtering vessel an inlet having an oblong cross-section formed in the vessel wall and a throat of circular cross-section smaller than the oblong throat cross-section and formed upstream of the throat, a conical vessel bottom, a centrally located suction outlet disposed at a lower gravitational level than said inlet at the apex of the conical bottom, and horizontally disposed shoulder means for supporting a filter bed assembly between said inlet and said outlet; removable cover means for said vessel; and a filter bed assembly manipulatable as a unit, including a relatively rigid foraminous member supportable at said shoulder means, lift rod means connectable to said foraminous member and having a lift rod upstanding therrefrom, and gravity clamping means for positioning a porous filter element on top of said foraminous member and having a first weight element mountable adjacent said lift rod, a second weight element radially spaced from said first weight element to define open regions therebetween exposing said foraminous member for filtering action, spanner means joining said first and second weight elements, and a one-piece radially apertured stem surrounding the suction outlet and extending upwardly from the suction outlet and vessel bottom sufficiently to support the foraminous member, together with the horizontal shoulder means, in a planar condition in the vessel and to provide, between the shoulder means and the stem, an open annular space encouraging free filtering action.

4,043,917

LIQUID FILTER APPARATUS

William N. Rowley, Palos Verdes Estates; Gordon F. Ehret, Alhambra, and Robert R. Williams, San Dimas, all of Calif., assignors to Weil-McLain Company, Inc., Dallas, Tex.

Filed Apr. 1, 1976, Ser. No. 672,732
Int. Cl.[2] B01D *27/04*
U.S. Cl. 210—323 T **5 Claims**



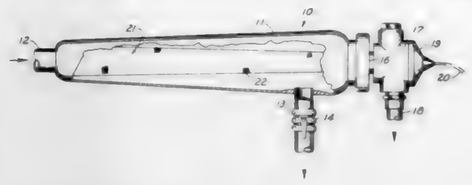
1. A liquid filter apparatus comprising:

a vessel having an open upper end, an inlet for receiving liquid to be filtered, and an outlet for discharging filtered liquid;

a unitary assembly removably positioned in said vessel and comprising a plurality of filter units disposed in said vessel in the path of said liquid for filtering said liquid, each of said filter units comprising a perforated tube and filter means extending around said tube, said filter units being formed in at least two groups extending in a vertically stacked relationship, a plate-like member having a plurality of nipples extending from its upper surface and its lower surface and registering with the respective tubes of adjacent groups of filter units for supporting the groups of filter units relative to each other so that the respective tubes of the filter units of each group register with the tubes of the filter of an adjacent group, a collection manifold having an outlet and communicating with a plurality of said filter units for receiving the filtered liquid, and

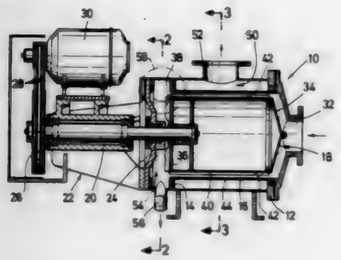
means cooperating with said collection manifold and said support means for releasably securing said groups of filter units in said vertically stacked relationship;
means communicating said vessel outlet with said manifold outlet; and
means formed separate from said unitary assembly for providing a seal-tight cover for the upper end of said vessel.

4,043,918
SELF CLEANING FILTER ASSEMBLY WITH FLUTTERING INNER FILTER MEMBER
Fidel Orona, El Cajon, Calif., assignor to Reed Irrigation Systems, El Cajon, Calif.
Filed May 24, 1976, Ser. No. 688,948
Int. Cl.[2] F01D *33/00, 35/20*
U.S. Cl. 210—356 **8 Claims**



1. A self cleaning filter comprising:
an elongated tubular housing having an inlet and a first outlet at its opposite ends;
a central generally tubular filtering element extending between said inlet and said first outlet within said housing, said element including a flexible inner filtering member having a multiplicity of openings and surrounded by a relatively rigid apertured sleeve member;
said filtering element having a diameter less than said housing and retained therein to form an annular space around said element;
a second outlet for filtered liquid located in the sidewall of said housing;
said flexible inner filtering member being of a generally frustoconical shape functioning to flutter in response to liquid flowing through said first outlet;
whereby said filter may be cleaned when liquid is allowed to flow through said first outlet, and said filter normally operates to provide filtered liquid through said second outlet.

4,043,919
PRESSURE SCREEN WITH TURBULENCE CHAMBER MEANS
Hagen Hutzler, Reutlingen, Germany, assignor to Hermann Finckh Maschinenfabrik, Pfullingen, Germany
Filed June 8, 1976, Ser. No. 693,916
Claims priority, application Germany, June 14, 1975, 2526657
Int. Cl.[2] B01D *21/02, 21/18, 25/32, 33/36*
U.S. Cl. 210—407 **11 Claims**



1. Apparatus for treating a fibrous suspension of raw fibre stock to separate acceptable stock from waste matter including in combination, a casing, a generally cylindrical screen having a longitudinal axis, means mounting said screen in a fixed position within said housing with the longitudinal axis thereof generally horizontally disposed, said screen and said casing forming an outer chamber therebetween, a generally cylindrical rotor having an imperforate peripheral wall and a first closed end, means mounting said rotor within said screen for rotary movement around a generally horizontal axis, the peripheral wall of said rotor and said screen forming therebetween an inner elongated generally annular chamber, a turbulance chamber means defined by said casing and the second end of said rotor, a first inlet on said casing adjacent to said first rotor end for introducing raw fiber stock into said inner chamber, a first outlet on said casing for removing acceptable stock from said outer chamber means, a second outlet on said casing leading into the upper region of said turbulence chamber means for removing relatively light waste material, a third outlet on said casing communicating with the lower region of said turbulence chamber means, said third outlet functioning to remove relatively heavy waste matter, from said turbulence chamber means, a projection on said rotor at the second end thereof functioning to create turbulence within said turbulence chamber means and a second inlet in said casing for feeding diluting water into said turbulence chamber means to dilute material being introduced into the turbulence chamber means.

4,043,920
SKIMMER FOR SQUARE SETTLING TANKS
Thomas Wooh, Wilton, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.
Filed Aug. 25, 1976, Ser. No. 717,637
Int. Cl.[2] B01D *21/18*
U.S. Cl. 210—525 **13 Claims**



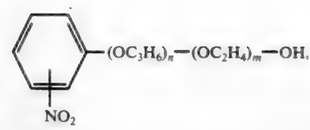
1. In a square type continuously operating settling tank having a central feed supply, a four-sided overflow launder extending along the periphery of the tank, defining the overflow level for supernatant liquid separated from sludge settled on the tank bottom, sludge outlet means in the tank bottom, and a rotary rake structure having rake arms effective to move sludge over the tank bottom to said outlet means,
the combination which comprises a four-sided scum baffle having rounded corners, cooperating with the overflow launder in arresting floating scum,
a post rising vertically from a rake arm of said raking structure,
an horizontal skimmer arm structure turnably supported by said post for swinging movement in an horizontal plane,
a scum engaging skimmer member carried by said arm structure unitary therewith and shaped to form with the scum baffle a scum collecting pocket, said skimmer member having a resiliently deflectable bottom edge portion,
pressure means for urging said skimmer member into cooperative contact with said scum baffle, so as to form therewith said scum collecting pocket,
a scum receiving box located at one side of said scum baffle,
and a ramp connected to the inlet side of the box, said ramp and said skimmer member being constructed and arranged for cooperation with one another so that the scum collected in said pocket is trapped between said skimmer member and said ramp while being moved up the ramp and into said receiving box by said deflectable bottom edge portion of the skimmer member.

4,043,921
CELLULOSE ETHER-POLYACRYLAMIDE AQUEOUS GELS
James E. Hessert, and Richard L. Clampitt, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Division of Ser. No. 611,751, Sept. 10, 1975, Pat. No. 3,971,440. This application Feb. 9, 1976, Ser. No. 656,772
Int. Cl.[2] C09K *7/02;* **E21B** *43/22, 43/26*
U.S. Cl. 252—8.5 C **6 Claims**

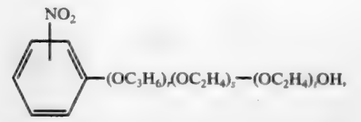
1. A fluid-gelable composition consisting essentially of
1. water;
2. a water-thickening amount of a water-soluble polymeric mixture of (a) at least one carboxymethylcellulose ether and (b) at least one acrylamide homopolymer having a molecular weight of about 200,000 to about 16,000,000 with from 2 percent to about 75 percent of the amide groups being hydrolyzed to carboxyl groups wherein the amount of (a) present in the mixture ranges from about 25 to about 95 weight percent of the total amount of (a) plus (b);
3. from 0.05 to about 60 weight percent of a water-soluble compound of a polyvalent metal wherein the metal present is capable of being reduced to a lower valence state and which is sufficient to gel said water when the valence of at least a portion of said metal is reduced to said lower valence state, said metal compound being selected from the group consisting of ammonium chromate, ammonium dichromate, the alkali metal chromates and dichromates, chromium trioxide, and mixtures thereof; and
4. from 0.1 to at least about 200 percent of the stoichiometric amount of a water-soluble reducing agent which is effective to reduce at least a portion of said metal to said lower valence state, said reducing agent being selected from the group consisting of hydroquinone, sodium sulfide, sodium hydrosulfite, sodium metabisulfite, potassium sulfite, sodium bisulfite, potassium metabisulfite, sodium sulfite, sodium thiosulfate, ferrous sulfate, ferrous chloride, p-hydrazinobenzoic acid, hydrazine phosphite, hydrazine dihydrochloride, and mixtures thereof with the further proviso that the proportions of (a) and (b) in the water are such that the resulting gel strength of the composition is greater than that obtained with the same total polymer concentration of either (a) or (b) alone.

4,043,922
SECONDARY OIL RECOVERY PROCESS USING OXYALKYLATED ADDITIVES
Harold A. Palmer, and Thomas E. Sample, Jr., both of Houston, Tex., assignors to Texaco Inc., New York, N.Y.
Continuation-in-part of Ser. No. 451,712, March 15, 1977, abandoned. This application June 26, 1975, Ser. No. 590,650
The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.
Int. Cl.[2] E21B *43/22, 43/24*
U.S. Cl. 252—8.55 D **9 Claims**

1. A method of recovering hydrocarbons from a subterranean hydrocarbon-bearing formation having in communication therewith at least one injection well and at least one production well comprising:
a. injecting into the said formation through said injection well an aqueous alkaline flooding medium containing a solubilizing agent comprising a water-soluble, oxyalkylated, nitrogen-containing aromatic compound,
b. forcing said alkaline flooding medium through the formation and,
c. recovering hydrocarbons through said production well, wherein the said water-soluble oxyalkylated, nitrogen-containing aromatic compound is selected from the group consisting of:
A. a block-type, water-soluble, oxyalkylated compound of the formula:



wherein *n* is an integer of from 1 to about 10 and *m* is an integer of from 5 to about 40, and
B. a random-type, water-soluble oxyalkylated compound which has been further reacted with ethylene oxide having the formula:



wherein the sum of *r* plus *s* is an integer of from 2 to about 12 and with the proviso that *r* and *s* are each not less than 1 and *t* is an integer of from 5 to about 32 and wherein the said aqueous alkaline flooding medium contains an alkaline agent selected from the group consisting of alkali metal hydroxides, alkali metal hypochlorites, alkaline earth metal hydroxides, and mixtures thereof.

4,043,923
TEXTILE TREATMENT COMPOSITION
Basil L. Loudas, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 26, 1974, Ser. No. 446,003
Int. Cl.[2] C08K *5/02, 5/05;* **D06M** *13/00*
U.S. Cl. 252—8.75 **14 Claims**

1. A composition comprising a liquid vehicle containing from about 1% to about 25% by weight of a detergent-compatible organic fluorochemical compound containing about 10 to 60 weight percent carbon-bonded fluorine and having the formula $(R_fQ)_e(XCO)_mA(COOM)_p$ where R_f is fluorinated aliphatic radical of at least three carbon atoms, "Q" is a divalent linking group, "M" is a cation selected from NH_4^+, Na^+, K^+, Li^+, H^+ or is a protonated alkyl amine having from 1-6 carbon atoms in the alkyl group, "A" is a polyvalent organic radical having a valency of $m + p$ and is the residue of a polybasic organic acid or an organic anhydride, "X" is NR (wherein R is hydrogen or an alkyl group of from 1 to 14 carbon atoms), N or O and *e, p* and *m* are integers of 1 or 2.

7. A composition comprised of a liquid vehicle containing (1) from about 1% to about 25% of a detergent-compatible fluorochemical compound containing from about 10 to about 60 weight percent carbon-bonded fluorine and having the formula $(R_fQ)_e(XCO)_mA(COOM)_p$ where R_f is fluorinated aliphatic radical of at least three carbon atoms, "Q" is a divalent linking group, "M" is a cation selected from NH_4^+, Na^+, K^+, Li^+, H^+ or is a protonated alkyl amine having from 1-6 carbon atoms in the alkyl group, "A" is a polyvalent organic radical having a valency of $m + p$ and is the residue of a polybasic organic acid or an organic anhydride, "X" is NR (wherein R is hydrogen or an alkyl group of from 1 to 14 carbon atoms), N or O and *e, p* and *m* are integers of 1 or 2, and (2) compatible non-ionic or anionic detergent, said detergent being water dispersible at concentrations of at least 1% by weight and being capable of drying to a non-oily, non-tacky residue, the weight ratio of said detergent to said fluorochemical compound being on the order of 1:1 to 2:1.

4,043,924

WATER BASED GREEN TIRE LUBRICANT

Frank J. Traver, Troy, N.Y., assignor to General Electric Company, Waterford, N.Y.

Continuation-in-part of Ser. No. 367,961, June 7, 1973, abandoned. This application Dec. 19, 1974, Ser. No. 534,101

Int. Cl.[2] C10M *3/18, 5/14, 7/20, 7/24*

U.S. Cl. 252—21 **1 Claim**

1. A composition for reducing the friction between an expanding fluid pressure core and the internal surface of a green tire during vulcanization, said composition comprising:

a. from 2 to 20% by weight of a high molecular weight poly(diorganosiloxane) fluid;

b. from2 to 20% by weight of a glycerol adduct of propylene oxide;

c. from 20 to 55% by weight of mica;

d. from 0.05 to 5% by weight of a magnesium silicate;

e. from 0.05 to 5% by weight of an amine salt of an alkylaryl sulfonic acid; and

f. the substantial balance being water.

4,043,925

LOW SMOKING COMPOSITION AND METHOD FOR COLD HEADING OPERATIONS

George F. Felton, Jr., Chadds Ford, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 532,562, Dec. 13, 1974, abandoned. This application Mar. 26, 1976, Ser. No. 670,607

Int. Cl.[2] C10M *1/06*

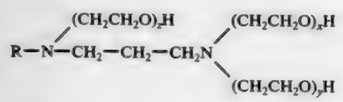
U.S. Cl. 252—49.3 **12 Claims**

1. A liquid composition useful as a low smoking metalworking liquid comprising:

a. about 20–40 parts by weight of a block copolymer having a central portion of polypropylene oxide with polyethylene oxide on each end and the copolymer having a molecular weight of from about 1800 to 2900;

b. about 10–30 parts by volume of a sulfo-chlorinated fatty acid containing about 0.5 to 1.5 parts by weight of sulfur and about 4 to 7 parts by weight of chlorine;

c. about 1–10 parts by volume of a compound having the following structure:



wherein R is a C_{10}–C_{20} aliphatic group derived from tallow and the total value of z, x and y is such that the compound is water soluble;

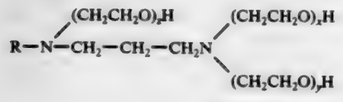
d. amounts of potassium hydroxide, water and defoaming agent sufficient to make the liquid useful as a metal-working liquid.

7. In a method of cold working a metal piece the improvement of applying to the metal being cold worked a liquid comprising:

a. about 20–40 parts by weight of a block copolymer having a central portion of polypropylene oxide with polyethylene oxide on each end and having a molecular weight of from about 1800 to 2900;

b. about 10–30 parts by volume of a sulfo-chlorinated fatty acid containing about 0.5 to 1.5 parts by weight of sulfur, about 4 to 7 parts by weight of chlorine;

c. about 1–10 parts by volume of a compound having the following structure:



wherein R is a C_{10}–C_{20} aliphatic group and the total value of z, x and y is such that the compound is water soluble;

d. amounts of potassium hydroxide, water and defoaming agent sufficient to make the liquid useful as a metal-working liquid.

4,043,926

LUBRICANT COMPOSITION

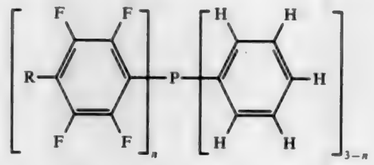
Carl E. Snyder, Jr., Trotwood, and Christ Tamborski, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 629,469, Nov. 6, 1975. This application Apr. 30, 1976, Ser. No. 681,871

Int. Cl.[2] C10M *3/24*

U.S. Cl. 252—49.9 **11 Claims**

1. A lubricant composition comprising (1) a perfluorinated polyalkylether base fluid and (2) a corrosion inhibiting amount of a phosphine compound having the following formula:



where one of the R's is a perfluoroalkylether group, two of the R's are fluorine, and n is 1, 2 or 3.

4,043,927

FRICTION OR TRACTIVE DRIVE CONTAINING ETHERS OF ADAMANTANES

Irl N. Duling, West Chester; David S. Gates, Swarthmore; Frederick P. Glazier, Thornton, all of Pa., and Robert E. Moore, Wilmington, Del., assignors to Sun Ventures, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 232,510, March 7, 1972, abandoned. This application Dec. 15, 1975, Ser. No. 641,110

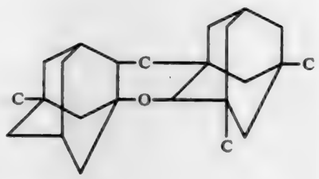
The portion of the term of this patent subsequent to Mar. 14, 1989, has been disclaimed.

Int. Cl.[2] C10M *1/20*

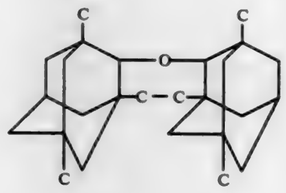
U.S. Cl. 252—52 R **6 Claims**

1. A method of improving the coefficient of traction between relatively rotatable members of torque transmitting relationship which comprises introducing to the surfaces of said members at least one adamantane compound having a structure corresponding to one of the following formulae: II, VI, VII and VIII.

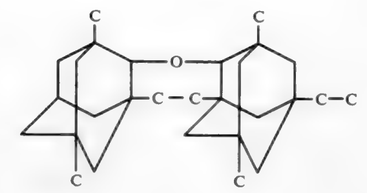
II



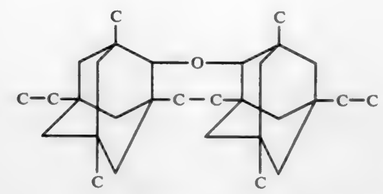
VI



-continued



VII



VIII

4. A method according to claim **1** wherein said tractant comprises from 5–95 parts by volume of one or more of said ethers and from 95–5% of an acyclic branched chain fluid polymer or hydrogenated polymer of a C_3–C_8 mono-olefin, said fluid polymer having an SUS viscosity at 100° F. in the range of 20–2,000 SUS, and an ASTM viscosity index in the range of 30–160.

4,043,928

SERUM SEPARATING COMPOSITION OF MATTER

Michel J. Lukacs, Goshen, N.Y., and Ian H. Jacoby, Franklin Lakes, N.J., assignors to Lukacs and Jacoby Associates, Middletown, N.Y.

Filed Oct. 31, 1973, Ser. No. 411,239

Int. Cl.[2] B29F *3/00;* **C09K** *3/00*

U.S. Cl. 252—60 **4 Claims**

1. A sealant adapted to be used in a method of separating a sample of whole blood into serum and clot portions by centrifuging wherein said sealant forms a separator between said portions, whereby the serum may be removed without disturbing the clot, said sealant consisting essentially of:

a. a major amount of a silicone liquid; and

b. a minor amount of an inert filler dispersed within said silicone liquid, said inert filler being used in an amount sufficient to set the specific gravity of said sealant in the range of 1.026 to 1.092, said sealant being thixotropic, water insoluble, substantially non-toxic and substantially chemically inert with respect to the constituents of the blood sample.

4,043,929

ELECTROSTATOGRAPHIC CARRIER COMPOSITION

Harry W. Gibson, Penfield, and Franklin D. Saeva, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 26, 1974, Ser. No. 500,775

Int. Cl.[2] G03G *9/00*

U.S. Cl. 252—62.1 R **9 Claims**

1. An electrostatographic carrier composition for use in developing electrostatic latent images on a recording surface, said carrier composition comprising carrier particles having an average particle diameter of between about 50 microns and about 1,000 microns, each of said carrier particles comprising a core surrounded by an outer coating of a polymer containing hydroxyl moieties, said polymer having been selected from the group consisting of styrene-alkylmethacrylates and styrene-alkylacrylates wherein said polymer has been exposed to systematic chemical alteration of said hydroxyl moieties by silylation to provide carrier particles characterized as having controlled triboelectric charging properties.

4,043,930

1,4-BIS-FORMYL CYCLOHEXANE POLYCARBOXYLIC ACIDS, PROCESS OF MAKING SAME, AND COMPOSITIONS AND METHODS OF USING SAME

Friedrich Krueger, Edingen, and Dieter Palleduhn, Mannheim, both of Germany, assignors to Joh. A. Benckiser GmbH, Ludwigshafen (Rhine), Germany

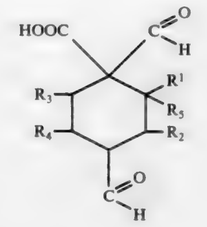
Filed July 9, 1975, Ser. No. 594,259

Claims priority, application Germany, July 9, 1974, 2432832

Int. Cl.[2] C11D *1/00;* **C02B** *1/18, 5/06;* **C07C** *53/00*

U.S. Cl. 252—89 R **11 Claims**

1. A 1,4-bis-formyl cyclohexane polycarboxylic acid of the Formula

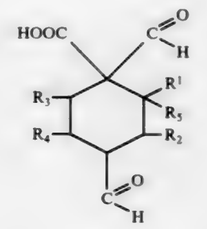


in which

R_1, R_2, R_3, and R_4 are hydrogen or the carboxyl group, at least one of the substituents R_1, R_2, R_3, and R_4 being a carboxyl group, and

R_5 is hydrogen or the methylene carboxyl group (—CH_2—COOH).

11. In a process of producing a 1,4-bis-formyl cyclohexane polycarboxylic acid of the Formula

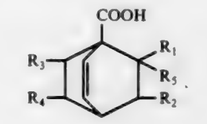


in which

R_1, R_2, R_3, and R_4 are hydrogen or the carboxyl group, at least one of the substituents R_1, R_2, R_3, and R_4 being a carboxyl group, and

R_5 is hydrogen or the methylene carboxyl group (—CH_2—COOH),

said process comprising the steps of oxidizing a compound of the Formula



in which

R_1, R_2, R_3, and R_4 are hydrogen or the carboxyl group and at least one of the substituents R_1, R_2, R_3, and R_4 being a carboxyl group, and

R_5 is hydrogen or the methylene carboxyl group (—CH_2—COOH),

or the anhydride of said compound with two neighboring

carboxyl groups being present in the form of their anhydride, said oxidation being effected by heating said compound with 40% to 68% nitric acid at a temperature between 60° and 100° C. in the absence of a catalyst so as to yield said 1,4-bis-formyl cyclohexane polycarboxylic acid.

4,043,931

LAVATORY CLEANSING BLOCK

Daniel John Jeffrey, East Harling, and Keith Charles Gingell, Roydon, near Diss, both of England, assignors to Jeyes Group Limited, Thetford, England

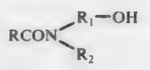
Filed Feb. 19, 1974, Ser. No. 443,529

Claims priority, application United Kingdom, Feb. 26, 1973, 9329/73

Int. Cl.[2] C11D *1/10, 1/48*

U.S. Cl. 252—93 **7 Claims**

1. A lavatory cleansing block comprising at least 35% of a solid carrier base which consists essentially of a mixture of at least two non-ionic surface active agents, one of which has a water solubility of 0.01 to 0.5% at 20° C. and is a mono- or dialkanolamide of a long chain fatty acid of the formula:



in which R is a long chain aliphatic group of from 8–24 C atoms, R_1 is a lower alkylene group and R_2 is a hydrogen atom or R'OH and the other of which has a water solubility of 1–100 at 20° C., the degree of release of components from the block being to a large extent controlled by the relative properties of relatively soluble and relatively insoluble non-ionic surface active components.

4,043,932

WATER STERILIZING AGENT

Wilhelm Fresenius, Wiesbaden; Remigius Fresenius, Heidenrod-Zorn; Ludwig Fresenius, Wiesbaden, and Wilhelm Schneider, Heidenrod, all of Germany, assignors to Erfindergesellschaft Fresenius, Taunusstein, Germany

Filed Nov. 21, 1975, Ser. No. 633,963

Claims priority, application Germany, July 9, 1975, 2530487

Int. Cl.[2] E11D *3/395*

U.S. Cl. 252—95 **5 Claims**

1. a dry, light-resistant, silver-based composition for sterilizing water, consisting essentially of (1) a sodium-silver-chloride complex, (2) an excess of sodium chloride, the mol ratio of the complex bound silver to the total amount of complex bound and free sodium chloride being 1:10 to 1:10,000, (3) 30 to 95% by weight of the composition of an alkali hydrogen carbonate as a buffer and (4) 0.1–5% by weight of the composition of calcium hypochlorite capable of splitting off chlorine.

4,043,933

METHOD OF FABRICATING A FUEL CELL ELECTRODE

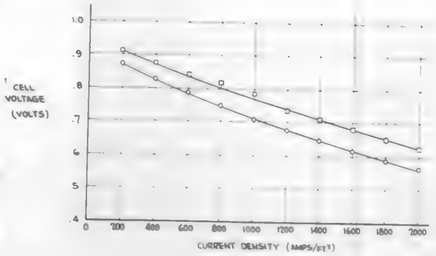
Richard D. Breault, Coventry; Richard P. Harding, South Windsor, and Fred S. Kemp, Ellington, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 15, 1976, Ser. No. 696,335

Int. Cl.[2] H01M *4/04*

U.S. Cl. 252—182 **11 Claims**

1. The method of constructing a stabilized fuel cell electrode comprising the steps of forming a uniform aqueous suspension of electrocatalyst particles and hydrophobic polymer particles; adjusting the pH of said suspension to a range of from pH 1.5 to pH 6, or from a range of pH 10 to pH 12 to form an electrocatalyst/polymer flocculate; and fabricating said flocculate into a fuel cell electrode.



4,043,934

CATALYST AND METHOD FOR OXIDIZING REDUCING GASES

Kurt E. Shuler, Rancho Santa Fe, and Gerhard N. Schrauzer, La Jolla, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 491,338, July 24, 1974, abandoned, and Ser. No. 491,464, July 24, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,841

Int. Cl.[2] B01D *53/34;* **C10K** *1/26*

U.S. Cl. 252—186 **11 Claims**

1. A reagent which is self-regenerating in air, and which, on contact with a reducing gas, oxidizes the gas and is reduced from an oxidized state to a reduced state, the reagent comprising a mixture of a palladium salt, a compound which includes a complex ion of a metal selected from the group consisting of molybdenum, tungsten and vanadium, and a salt of a metal selected from the group consisting of copper, nickel and iron, said salt being present in an amount sufficient to cause the reagent to oxidize from the reduced state caused by contact with the reducing gas to the oxidized state in the presence of air and absence of the reducing gas, and a hydrophilic carrier for the mixture.

4,043,935

LIQUID CRYSTAL COMPOSITION HAVING HIGH DIELECTRIC ANISOTROPY AND DISPLAY DEVICE INCORPORATING SAME

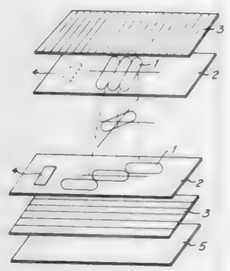
Sadao Kanbe, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed July 3, 1974, Ser. No. 485,673

Claims priority, application Japan, July 6, 1973, 48-75765

Int. Cl.[2] C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **8 Claims**



1. A liquid crystal display device including a liquid crystal cell, a nematic liquid crystal composition of positive dielectric anisotropy therein, said cell being constructed for operation in the Field-Effect Mode, said liquid crystal composition consisting of at least one biphenyl compound selected from the group consisting of 4-pentyl-4'-cyanobiphenyl, 4-hexyl-4'-cyanobiphenyl, 4-heptyl-4'-cyanobiphenyl and at least one ester compound selected from the group consisting of 4-cyanophenyl-4'-butylbenzoate, 4-cyanophenyl-4'-hexylbenzoate and 4-butyl-phenyl-4'-pentylbenzoate.

4,043,936

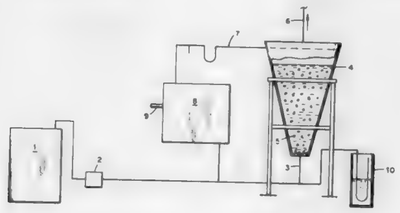
BIOLOGICAL DENITRIFICATION OF HIGH CONCENTRATION NITRATE WASTE

Chester W. Francis, Oak Ridge, and Frank S. Brinkley, Knoxville, both of Tenn., assignors to The United States of America as represented by United States Energy Research and Development Administration, Washington, D.C.

Filed Feb. 24, 1976, Ser. No. 660,903

Int. Cl.[2] G21F *9/18*

U.S. Cl. 252—301.1 W **10 Claims**



1. A process for removing nitrate ions from an aqueous waste stream having a nitrate concentration in excess of one kilogram nitrate per cubic meter, comprising the steps of:

incubating under anaerobic conditions a culture of mixed denitrifying bacteria in the presence of a solution comprising at least 750 grams of nitrate per cubic meter and a biologically effective amount of a first carbon source to produce a culture of incubated mixed denitrifying bacteria;

mixing said waste stream with a second source of carbon to form an influent solution;

passing said influent solution vertically upward through a packed concially shaped column having as a packing material a support for denitrifying bacteria and having said incubated mixed denitrifying bacteria attached thereto; said conically shaped column having an upper diameter larger than its lower diameter;

allowing said influent solution to contact said packing whereby said nitrate ions and said carbon source are converted to carbon dioxide and elemental nitrogen by the incubated denitrifying bacteria; and

separating said elemental nitrogen from the influent solution.

4,043,937

HALOGEN DERIVATIVES OF ASCORBIC ACID AND D-ARABOASCORBIC ACID ANTIOXIDANTS

Joseph Kiss, Arlesheim, Switzerland, and Klaus Peter Berg, Grenzach-Wylen, Germany, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

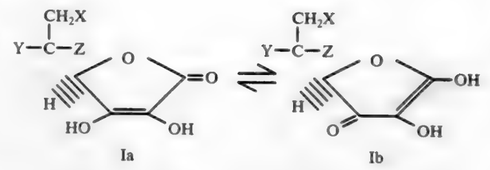
Filed Apr. 28, 1976, Ser. No. 681,083

Claims priority, application Switzerland, May 3, 1975, 5741/75

Int. Cl.[2] C07D *307/32*

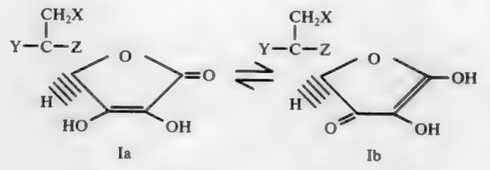
U.S. Cl. 252—407 **9 Claims**

1. A compound of the tautomeric formulae



wherein X is halogen; and one of Y and Z is hydrogen, and the other is hydroxy; with the proviso that when Y is hydroxy and Z is hydrogen, X is chlorine or bromine;
a salt of these compounds.

6. Process for stabilizing oxidation-sensitive organic materials comprising incorporating in said material a stabilizing amount of a compound of the tautomeric formula:



wherein X is halogen; and one of Y and Z is hydrogen and the other is hydroxy; with the proviso that when Y is hydroxy and Z is hydrogen, X is chlorine or bromine;
or with a salt thereof.

4,043,938

METHODS FOR REACTIVATING ZEOLITES

Hans-Heinrich Reif; Klaus Wehner, both of Leuna; Jürgen Welker, Halle-Neustadt; Karl-Heinz Schmidt, Leuna; Waltraud Schnick; Lutz Widmann, both of Halle-Neustadt; Otto Schicker, Merseburg-Sud; Gunter Seidel, Leuna; Karsten Kalb, Weissenfels; Wolfhard Dollase, Bad Durrenberg; Helmut Fürtig, Jessnitz; Werner Höse, Dresden; Wolfgang Roscher, Halle; Udo Hädicke; Herbert Knoll, both of Dessau; Rüdiger Seidel, Sandersdorf; Gunter Nemitz, Wolfen; Edith Stürmer, Bad Durrenberg, and Manfred Kaiser, Berlin-Karlshorst, all of Germany, assignors to VEB Leuna-Werke "Walter Ulbricht", Leuna, Germany

Filed Feb. 3, 1975, Ser. No. 546,244

Claims priority, application Germany, June 24, 1974, 179392; June 24, 1974, 179393

Int. Cl.[2] B01J *29/38;* **C10G** *25/12;* **C07C** *7/12*

U.S. Cl. 252—412 **16 Claims**

1. A method for reactivating a zeolite whose absorptive capacity has been deactivated in a process of separating normal paraffins from a hydrocarbon mixture containing said paraffins by means of alternating adsorption onto said zeolite and desorption therefrom with water-containing ammonia vapor; which method comprises a first step of contacting said zeolite directly after said desorption step with water, or water-containing gases at a temperature of about 20°–250° C, the proportion by weight of water to zeolite being at least 1:10, and then contacting said zeolite in a second step with a stream of gas selected from the group consisting of air, hydrogen, oxygen, nitrogen and ammonia, at a temperature of about 400°–550° C, said gas having a water content of less than 5% by volume, until said zeolite is restored to substantially its original adsorption capacity.

7. A method for reactivating a zeolite whose absorptive capacity has been deactivated in a process of separating normal paraffins from a hydrocarbon mixture containing said paraffins by means of alternating adsorption onto said zeolite and desorption therefrom with water-containing ammonia vapor; which method comprises a first step of contacting said zeolite directly after said desorption step with an aqueous solution of a salt of the bivalent metal of group IIA of the periodic system

at a temperature below about 100° C, for a period of 1 to 72 hours, the amount of salt used being 0.1 to 1.0 mole per mole of zeolite; and then contacting said zeolite in a second step with a stream of gas selected from the group consisting of air, hydrogen, oxygen, nitrogen and ammonia, at a temperature of about 400°–550° C, said gas having a water content of less than 5% by volume, until said zeolite is restored to substantially its original adsorption capacity.

10. A method for reactivating a zeolite whose absorptive capacity has been deactivated in a process of separating normal paraffins from a hydrocarbon mixture containing said paraffins by means of alternating adsorption onto said zeolite and desorption therefrom with water-containing ammonia vapor; which method comprises a first step of contacting said zeolite directly after said desorption step with an aqueous solution of a substance selected from the class consisting of urea and a nitrogen compound having the formula $NR_1R_2R_3$, wherein R_1 and R_2 are independently H, CH_3 or C_2H_5 and R_3 is CH_3 or C_2H_5, at a temperature below about 150° C, for a period of 1 to 72 hours, and then contacting said zeolite in a second step with a stream of gas selected from the group consisting of air, hydrogen, oxygen, nitrogen and ammonia, at a temperature of about 400°–550° C, said gas having a water content of less than 5% by volume, until said zeolite is restored to substantially its original adsorption capacity.

4,043,939

REACTIVATION OF CATALYSTS USEFUL FOR NITROGEN OXIDE REMOVAL

Shigeaki Kasaoka, Okayama, Japan, assignor to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Filed Oct. 10, 1975, Ser. No. 621,434
Int. Cl.² B01J *23/94, 23/96, 23/92, 21/20*
U.S. Cl. 252—416 **4 Claims**

1. A method of regenerating a catalyst which removes nitrogen oxides from exhaust gas in the presence of ammonia, which catalyst comprises copper, iron, cobalt, chromium, nickel, manganese, titanium, vanadium, molybedenum, silver, platinum, rhodium or palladium supported on an alumina, silica-alumina, magnesia-alumina, titania-alumina, calcium oxide alumina, chromium oxide-alumina, or chromium oxide alumina carrier, which catalyst has been employed to remove nitrogen oxides from exhaust gas in the presence of ammonia, and which is inactivated by the presence of sulfur oxides in the exhaust gas which method comprises calcining said catalyst in substantially the atmosphere at a temperature in the range of from about 700° to 1200° C thereby restoring the initial nitrogen oxide removing activity of said catalyst.

3. A method, as in claim **1**, of regenerating a catalyst comprising copper.

4,043,940

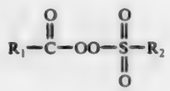
LIQUID ACYL SULFONYL PEROXIDE FORMULATIONS DERIVED FROM SOLID ACYL ALKYLSULFONYL PEROXIDES

Jose Sanchez, Grand Island, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed July 15, 1975, Ser. No. 596,115
Int. Cl.² C08F *4/34;* **C07C** *179/06*
U.S. Cl. 252—426 **18 Claims**

1. A liquid solution composition which is a storable stable liquid at 0° to −40° C consisting essentially of

a. 10 to 70% by weight of a solid acyl alkylsulfonyl peroxide with a melting point between −10° and 70° C having the formula



where

1. R_1 is an alkyl of 1 to 4 carbons and
2. R_2 is selected from the group consisting of an alkyl or monochloroalkyl radical of 3 to 18 carbons and a cycloalkyl or cyclomonochloroalkyl radical of 4 to 12 carbons, and

b. 90 to 30% by weight of a solvent or solvent system having a complete solidification temperature below about −10° C and a miscibility number of greater than 8 and less than 21, which solvent or solvent system possesses at least about 20% by weight based on the solid acyl sulfonyl peroxide of a solvent which has a boiling point of at least 165° C at 760 torr.

4,043,941

SUPPORTED TRANSITION METAL CATALYSTS AND PROCESS FOR THEIR PREPARATION

John F. White, and Jerome C. Bertrand, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Filed Nov. 26, 1975, Ser. No. 635,467
Int. Cl.² B01J *31/02*
U.S. Cl. 252—430 **28 Claims**

1. In a process for preparing a supported transition metal catalyst by the reaction of a hydroxylic support with a transition metal alkoxide of the formula

$$M(OR)_nQ_m$$

where M is a transition metal selected from Groups IVb, Vb and VIB, OR is an alkoxy radical containing 1 to 18 carbon atoms, *n* is an integer from 2 up to the valence of the metal M, Q is an inert group which will not react with the hydroxyl groups of the support, the alkoxide radical OR or alcohol ROH formed therefrom and *m* is an integer so that n + m statisfies the valence of the metal M, to obtain a free-flowing, hydrolytically stable catalyst having superior activity and having the transition metal bound to the surface thereof, the improvement consisting essentially of: heating the support and an excess of transition metal alkoxide, based on the available surface hydroxyl groups, in an inert hydrocarbon in the presence of water at a temperature in the range 100°–300° C to effect condensation of the transition metal alkoxide and reaction of the transition metal alkoxide or oligomer thereof with the surface hydroxyl groups.

4,043,942

MODIFIED NICKEL CATALYST SYSTEMS AND THEIR USE IN REDUCTIVE ALKYLATION REACTIONS

Farris H. Wilson, Jr., Cuyahoga Falls, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 876,174, Dec. 3, 1969, Pat. No. 3,739,026, which is a continuation of Ser. No. 606,010, Dec. 30, 1966, abandoned. This application Mar. 15, 1973, Ser. No. 341,411
Int. Cl.² B01J *31/02*
U.S. Cl. 252—430 **6 Claims**

1. A catalytic system comprising (a) a nickel catalyst, (b) at least one acid selected from the group consisting of sulfur-free acids and sulfur-containing acids in which the sulfur is in the form of a



radical and (c) at least one sulfur-containing material selected from the group consisting of sulfur and a sulfur-containing compound at least a portion of said sulfur being in the form of at least one radical selected from the group consisting of — S — and

3. A catalytic system according to claim **1** wherein the acid is selected from the group consisting of acidic acid, oxalic acid, toluene sulfonic acid, sulfuric acid, hydrochloric acid and oleic acid wherein the sulfur-containing material is selected from the group consisting of thiodipropionic acid, xylene monosulfide, thioanisole, thiodipropionitrile, benzothiazole, mercaptobenzothiazole, di-tert.butylsulfide, benzothiazole monosulfide, S-alkyl (C-6) mercapto propionic acid, dimethyl sulfoxide, tetramethyl thiuram monosulfide, sulfur, di-iso-octyl thio dipropionic acid, beta-mercapto propionic acid, dithiodibenzoic acid, tetramethyl thiuram disulfide, n-butyl sulfoxide, thiobenzoic acid, thiourea, dithiobenzoic acid, thiomalic acid, benzothiazole disulfide, 4-methyl-thiophenol, benzyl disulfide, morpholine disulfide and sodium sulfide.

4,043,943

PROCESS FOR PRODUCING A MIXED OXIDE OF VANADIUM AND PHOSPHORUS HAVING AN IMPROVED INTRINSIC SURFACE AREA

Ronald A. Schneider, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 521,428, Nov. 6, 1974, which is a continuation of Ser. No. 274,685, July 24, 1972, abandoned, which is a continuation-in-part of Ser. No. 263,883, June 19, 1972, abandoned. This application Sept. 12, 1975, Ser. No. 612,823
Int. Cl.² B01J *27/14*
U.S. Cl. 252—437 **2 Claims**

1. A process for preparing a catalyst for catalayzing maleic anhydride production by oxidation of a hydrocarbon and which has an intrinsic surface area in excess of 5 m^2/g, which preparation process comprises:

a. forming a solution containing a vanadium compound and a phosphorus compound in an organic liquid medium, the medium containing less than 20 volume percent water and at least 15 volume percent oxygen-containing organic compounds selected from the group consisting of alcohols, carboxylic acids, ethers, esters, amides, and ketones, said medium and said vanadium and phosphorus compounds being effective so as to form a vanadium phosphate compound wherein the average valence of vanadium is between +3.8 and +4.6;
b. precipitating said vanadium phosphate compound in said solution;
c. removing liquid medium from the solution to obtain said vanadium phosphate compound; and
d. calcining the vanadium phosphate compound to obtain said catalyst having an intrinsic surface area in excess of 5 m^2/g.

4,043,944

CATALYSTS FOR HYDROCARBON CONVERSION

Bernard Juguin, Rueil-Malmaison; Jean Cosyns, Nanterre; Jean-Francois Le Page, Rueil-Malmaison, and Jean Miquel, Paris, all of France, assignors to Societe Francaise des Produits pour Catalyse, Rueil-Malmaison, France

Filed Oct. 7, 1975, Ser. No. 620,410
Claims priority, application France, Oct. 11, 1974, 74.34392
Int. Cl.² B01J *23/38, 21/00, 23/62;* **C10G** *35/06*
U.S. Cl. 252—441 **12 Claims**

1. A catalyst consisting essentially of (a) a carrier and, expressed in proportion by weight with respect to the carrier, (b) 0.005 to 2% of platinum, (c) 0.005 to 1% of a metal selected from the group consisting of iridium, rhodium and ruthenium, (d) 0.05 to 0.8% of cobalt, 0.005 to 1% of at least one metal selected from the group consisting of copper, manganese, silver and gold, and (f) 0.1 to 10% of at least one halogen.

4,043,945

METHOD OF PRODUCING THIN LAYER METHANATION REACTION CATALYST

Yutaka Fukui; Fumio Hataya; Ryoichi Sasaki; Fumito Nakajima; Shimpei Matsuda; Munehiko Tonami, and Ryo Hiraga, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 11, 1975, Ser. No. 630,881
Claims priority, application Japan, Nov. 11, 1974, 49-128993
Int. Cl.² B01J *21/04, 23/74*
U.S. Cl. 252—466 J **12 Claims**

1. A method of producing a methanation reaction catalyst comprising forming an aluminum diffusion layer on the inner surface of a tube of an alloy containing at least 45% by weight nickel and having a tensile strength of at least 35 kg/mm^2 and an elongation of at least 20% at 500° C. by heating said tube together with a powdery pack comprising an aluminum powder in an amount of 1 to 50 percent by weight, ammonium chloride as an active agent and a heat-resistant inactive carrier for preventing agglomeration of said aluminum powder, said pack being charged into the interior of said tube, and developing said aluminum diffusion layer with an alkaline solution.

4,043,946

PRODUCTION OF SUPPORTED RANEY NICKEL CATALYSTS BY REACTIVE DIFFUSION

Philip E. Sanker; Laurance L. Oden, both of Albany, and James H. Russell, Corvallis, all of Oreg., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 30, 1976, Ser. No. 709,990
Int. Cl.² B01J *21/04, 23/74*
U.S. Cl. 252—466 J **7 Claims**

1. A method for producing a Raney nickel catalyst which comprises:

placing a nickel substrate within a mold cavity in a casting mold, the edge of the cavity being spaced about 0.5 to about 1.3 mm from the nickel substrate surface;
heating the mold to a temperature of from about 950° C to about 1,050° C in a heating zone;
pouring into said mold cavity molten aluminum heated to a temperature of about 700° to about 900° C to fill said cavity whereby the molten aluminum contacts the nickel substrate;
continuing heating said mold in the heating zone for about 30 seconds after the pouring of the aluminum is completed;
removing the mold from the heating zone;
allowing the mold to cool to ambient temperature;
removing from the mold a structure comprising a nickel substrate, a Ni_2Al_3 intermediate layer and a $NiAl_3$ face; and leaching said structure with alkali metal caustic solution to form a Raney nickel catalyst.

4,043,947

IMPACT IMPROVEMENT OF RUBBER-MODIFIED NITRILE RESINS

Herbert Talsma, East Cleveland, and William M. Giffen, Jr., Aurora, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Jan. 15, 1976, Ser. No. 649,223
Int. Cl.² C08K *5/04, 5/09, 5/13, 5/53*
U.S. Cl. 260—23.7 M **12 Claims**

1. An impact-resistant resin composition comprising an intimate mixture of from 1 to 30 parts by weight of an impact improver selected from the group consisting of triethyl phosphate, 2-ethyl hexanoic acid, 2,4-di-t-butyl phenol, trimethyl phosphate, tributyl phosphate, 4-hexyl resorcinol, epoxidized soybean oil, 2,6-di-t-butyl-4-methyl phenol, and p-nonyl phenol and 100 parts by weight of a resin resulting from the polymerization of a major proportion of an unsaturated nitrile in the presence of a preformed rubber component and optionally

a minor proportion of at least one other polymerizable component.

4,043,948

INSOLUBLE POLYALKYL PHOSPHONIUM SALT RESINS HAVING CARBON-CARBON CROSSLINKED BACKBONE

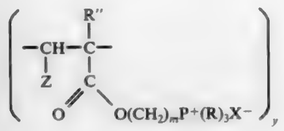
Joseph W. Rakshys, Jr., Midland, Mich., and Suzanne V. McKinley, Wellesley, Mass., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 390,830, Aug. 23, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,337

Int. Cl.[2] **C08F** *230/00, 210/00;* **C08L** *23/32;* **C08F** *230/02*

U.S. Cl. 260—2.1 E **13 Claims**

1. An insoluble polymer having a carbon to carbon crosslinked backbone, said polymer having a plurality



groups where R″ is H or a methyl group, R is a saturated unsubstituted aliphatic hydrocarbon group having from 1 to 10 C atoms, X is an OH^- or an OR‴ group where R‴ is a hydrocarbyl group of 1 to 10 C atoms free of aliphatic unsaturation, a CN^-, NO_3^-, $SO_4^=$, or a ClO_4^- group, *m* is an integer from 1 to 6 and Z is H or a CO_2R''' group, having R″ as defined, or a $(CH_2)_mP^+(R)_3X^-$ group, as defined, and constitutes from 20 to 99 mole percent of the polymer, from about 0.1 to about 30 mole percent being derived from a polyolefinic monomer and the remainder being derived from a mono-olefinic monomer.

4,043,949

OXIDATIVE STABILITY OF FLEXIBLE POLYURETHANE FOAMS

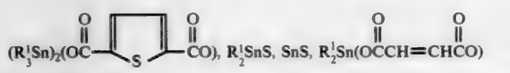
Kenneth Treadwell, Rahway; Bernard G. Kushlefsky, Edison, both of N.J., and Robert V. Russo, Brooklyn, N.Y., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Mar. 6, 1975, Ser. No. 556,011

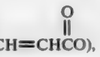
Int. Cl.[2] **C08G** *18/18, 18/14, 18/24*

U.S. Cl. 260—2.5 AC **5 Claims**

1. In a method for improving the oxidative stability of flexible cellular polyurethanes prepared by reacting a polyol containing at least two active hydrogen atoms per molecule, as determined by the Zerewitinoff method, with a stoichiometric excess of a polyfunctional isocyanate, the reaction being conducted in the presence of water as a blowing agent, at least one tertiary amine blowing catalyst, and effective amount of a gel catalyst of the formula $R_a{}^1SnX_{4-a}$, $(R_3{}^1Sn)_2S$,



or



wherein X is a monovalent radical selected from the group consisting of



chlorine and bromine, R^2 and R^3 each represents an alkyl radical containing between 1 and 20 carbon atoms, a cycloalkyl, phenylalkyl, alkylphenyl or a phenyl radical, R^4 represents an alkyl radical containing between 1 and 20 carbon atoms, a cycloalkyl, phenyl or a substituted phenyl radical, a represents the integer 1, 2 or 3 and *n* represents an integer between 1 and 12, inclusive, the improvement consisting essentially of employing a gel catalyst wherein R^1 is selected from the group consisting of methyl, allyl, phenyl, and substituted phenyl.

4,043,950

PROCESS FOR THE MANUFACTURE OF PLASTIC FOAMS AND FLAME-PROOFING FOAMS CHARACTERIZED BY THE USE OF A CARRIER FOAM

Hans Wilmsen, deceased, late of Essen, Germany, by Joerg Michael Wilmsen, sole heir, 243 Alfredstrasse, 4300 Essen, Germany

Continuation of Ser. No. 500,722, Aug. 26, 1974, abandoned. This application May 3, 1976, Ser. No. 682,254

Claims priority, application Switzerland, Aug. 27, 1973, 12235/73

Int. Cl.[2] **C08J** *9/16;* **C08L** *5/02, 61/24*

U.S. Cl. 260—2.5 F **16 Claims**

1. Process for the manufacture of plastic foams and flame-proofing foams based on aqueous and/or aqueous alcoholic synthetic resins, in which the synthetic resin is foamed up by means of foaming agents and compressed gas and is subsequently cured, if appropriate using catalysts and/or reducing agents and/or oxidizing agents, and the chemical and/or the mechanical and/or the physical properties of the known foams and/or new foams are improved by new reaction systems and/or additives, characterised in that a carrier foam of urea-formaldehyde resin or a carrier foam containing urea-formaldehyde resin and at least one member from the group consisting of:

a. furan resin,

b. furan resin co-condensate,

c. polyester resin, epoxy resin polyurethane, acrylic resin, alkyd, phenoplast resin or aminoplast resin,

is formed, the carrier foam being rapid curing, and (2) further solid and/or liquid additives are mixed into the finished but not yet cured carrier foam in one or more subsequent mixing chambers.

4,043,951

ACRYLONITRILE-CAPPED POLYETHER-SILOXANE

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,251

Int. Cl.[2] **C08J** *9/00*

U.S. Cl. 260—2.5 AH **37 Claims**

1. An acrylonitrile-capped polyoxyalkylene-polysiloxane polymer containing at least one silicon-bonded acrylonitrile-capped polyoxyalkylene radical having the average formula $—R''(X)_q(OC_3H_6)_n(OC_2H_4)_mOCH_2CH_2CN$ wherein R″ is an alkylene radical, free from unsaturation, and containing from 2 to 6 carbon atoms, wherein X is a bridging group selected from the class consisting of —CO— and —NHCO—, wherein *q* has a value of 0 or 1, wherein *m* has a value of from 4 to 30 and wherein *n* has a value of from 0 to 10.

4,043,952

SURFACE TREATMENT PROCESS FOR IMPROVING DISPERSIBILITY OF AN ABSORBENT COMPOSITION, AND PRODUCT THEREOF

Stuart H. Ganslaw, Piscataway, and Howard G. Katz, East Windsor, both of N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed May 9, 1975, Ser. No. 576,132

Int. Cl.[2] **C08L** *3/04*

U.S. Cl. 260—17.4 ST **19 Claims**

1. A process for surface treating a water-absorbent composition of matter to improve its aqueous dispersibility comprising the steps of

A. forming a dispersion comprising (i) a water-absorbent composition of matter based on an anionic poly-electrolyte, (ii) polyvalent, cations of at least one metal, and (iii) a dispersing medium in which said composition of matter is substantially insoluble;

B. maintaining said dispersion at a temperature of about −40° to about +150° C for a period of time sufficient for said cations to ionically complex the outer surface of said composition of matter exposed to said dispersing medium; and

C. removing said dispersing medium.

4,043,953

AMBIENT TEMPERATURE, MOISTURE-CURABLE ACRYLIC-SILANE COATING COMPOSITIONS HAVING IMPROVED POTLIFE

Wen-Hsuan Chang, Gibsonia; Marvis E. Hartman, Pittsburgh, and Roger L. Scriven, Gibsonia, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed May 2, 1975, Ser. No. 574,194

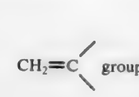
Int. Cl.[2] **C08L** *91/00*

U.S. Cl. 260—18 S **24 Claims**

1. In an ambient temperature, moisture-curable coating composition which includes:

A. an acrylic-silane interpolymer of:

1. at least one ethylenically unsaturated monomer which contains



group and is devoid of active hydrogen atoms; and

2. a copolymerizable organoalkoxysilane selected from the group consistng of acrylatoalkoxysilanes, methacrylatoalkoxysilanes and vinylalkoxysilanes; and

B. a cure accelerating catalyst; the improvement which comprises the addition of:

C. from about 0.5 percent to about 15 percent by weight of interpolymer solids of a monomeric hydrolytically reactive organosilicon stabilizer represented by the formula:

$X_nSi(OR)_{4-n}$

wherein X is an organic radical having from 1 to 12 carbon atoms, R may be methyl, ethyl, 2-methoxymethyl, 2-ethoxyethyl or an acyl group containing 5 or less carbon atoms and *n* is 0, 1 or 2.

4,043,954

COMPOSITIONS AND LAMINATES MADE THEREFROM

LeRoy A. Claybaker, Coshocton, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 27, 1975, Ser. No. 562,526

Int. Cl.[2] **C08L** *91/00*

U.S. Cl. 260—19 A **8 Claims**

1. In the process of preparing an oil-modified resole by (a) reacting a phenol moiety with tung oil in the presence of strong acid and (b) reacting the product of (a) in an alcohol solvent with an aldehyde moiety in the presence of an amine catalyst, the improvement which consists of using as the alcohol solvent a mixture consisting of, by weight, from 15 to 50 percent methyl alcohol and 85 to 50 percent isopropyl alcohol.

4,043,955

CONTINUOUS METHOD OF AGGLOMERATING AQUEOUS LATICES

Mark D. Paster, Worthington, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Feb. 20, 1975, Ser. No. 551,791

Int. Cl.[2] **C08L** *91/00*

U.S. Cl. 260—23.7 A **31 Claims**

1. An improved process for agglomerating polymer particles in an aqueous latex, with a water soluble organic acid anhydride, the improvement comprising:

A. feeding continuously into a mixing zone an aqueous solution of a water soluble organic acid anhydride, while simultaneously feeding continuously into said mixing zone an aqueous latex of a low heat distortion polymer, said polymer being a diene rubber polymer, the particles of said polymer being small and adherent upon collision and said latex containing an emulsifying agent, which is a salt of an organic acid with an ionization constant lower than that of the acid of the anhydride;

B. mixing continuously said solution of said water soluble organic acid anhydride with said latex in said mixing zone forming an admixture;

C. passing continuously said admixture from said mixing zone through a perforated member forming a wall section of said mixing zone into an interconnected conduit;

D. flowing continuously, said admixture under laminar flow, induced by said perforated member, through said conduit wherein said admixture has a passage-time through said conduit sufficient to hydrolyze the acid anhydride, agglomerating the particles of the polymer to a predetermined size, forming an agglomerated admixture;

E. moving continuously said agglomerated admixture from said conduit through a low-shear zone being interconnected at one end portion to said conduit and having a withdrawal port at an opposite end portion;

F. stabilizing continuously said agglomerated admixture moving through said low-shear zone by adding an emulsifying material selected from the group consisting of an acid-stable emulsifiying compound or a basic compound and combinations thereof, said stabilizing being prior to subjecting said agglomerated admixture to substantial shear which would cause coagulation of said agglomerated admixture; and

G. withdrawing continuously said stabilizing agglomerated admixture from said low-shear zone at said opposite end by a withdrawal means providing flow-mixing in said stabilized agglomerated admixture.

4,043,956

HYDROCURABLE OXAZOLIDINE POLYANHYDRIDE COMPOSITIONS

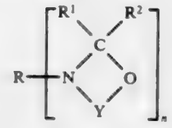
Thomas W. Hutton, Doylestown; John J. Miller, Warminster; Lawrence K. Wempe, Lansdale, all of Pa., and Sheldon N. Lewis, Zurich, Switzerland, assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Mar. 14, 1975, Ser. No. 558,523

Int. Cl.[2] **C07D** *261/00;* **C09D** *3/74*

U.S. Cl. 260—23 R **18 Claims**

1. A hydrocurable composition comprising a polyanhydride having two or more pendant anhydride groups and an oxazolidine of the formula:



wherein R is an organic radical; R^1 is hydrogen, phenyl, benzyl or C_1–C_{12} alkyl; R^2 is hydrogen or C_1–C_4 alkyl or R^1 and R^2 are

joined together with the carbon atom to which they are attached to form a five- or six-membered saturated carbon ring; Y is a radical of the formula



wherein n' is an integer of 2 or 3 and R^3 and R^4 are the same or different radicals selected from hydrogen, C_1–C_{12} alkyl, C_6–C_{10} aryl or C_7–C_{12} aralkyl or alkaryl and n is an integer equal to the valence of R.

12. A polymeric material formed from the composition of claim **1** and water.

4,043,957

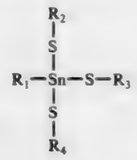
STABILIZED VINYL HALIDE RESIN COMPOSITIONS

Emery Szabo, Freehold, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Apr. 27, 1976, Ser. No. 680,565
Int. Cl.² C08K *5/58*
U.S. Cl. 260—23 XA **10 Claims**

1. A heat and light stable resinous composition comprising a vinyl halide resin and 0.2 to 5 percent by weight, based on the weight of the vinyl halide resin, of a stabilizer system that consists essentially of

a. 15 percent to 75 percent by weight of an organotin mercaptide having the structural formula



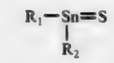
wherein R_1, R_2, R_3, and R_4 each represents an alkyl group having 1 to 18 carbon atoms or an alkenyl group having 2 to 18 carbon atoms;

b. 1 to 25 percent by weight of a mercapto alcohol having from 2 to 20 carbon atoms and having the structural formula



wherein R_5, R_6, R_7, and R_8 each represents hydrogen or an aryl, alkyl, alkenyl, or cycloalkyl group and n is 0 or 1;

3 to 15 percent by weight of an organotin sulfide having the structural formula



wherein R_1 and R_2 each represents an alkyl group having 1 to 18 carbon atoms or an alkenyl group having 2 to 18 carbon atoms; and

d. 10 to 80 percent by weight of an inert organic diluent selected from the group consisting of hydrocarbons and alkyl esters of aliphatic monocarboxylic acids.

4,043,958

FLAME RETARDED NBR/PVC COMPOSITIONS

William Paul Whelan, Woodbury, Conn., assignor to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 515,799, Oct. 17, 1974, abandoned. This application Sept. 10, 1975, Ser. No. 612,146
Int. Cl.² C08K *3/22*
U.S. Cl. 260—2.5 FP **7 Claims**

7. A sponged composition comprising an acrylonitrile-butadiene rubber and: (a) from 1 to 200 parts by weight per 100 parts by weight of said rubber of polyvinyl chloride; and (b) from 0.1 to 50 parts by weight per 100 parts by weight of said rubber of an iron oxide selected from the group consisting of the anhydrous and hydrated forms of ferric oxide and ferroso-ferric oxide and mixtures thereof.

4,043,959

POLYOLEFIN CONTAINING EMULSION ADHESIVES

David R. Frye, Pittsburg, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 22, 1975, Ser. No. 580,081
Int. Cl.² C08L *23/30*
U.S. Cl. 260—27 R **6 Claims**

1. An adhesive composition comprising an emulsion of (1) 5 to 35 weight percent oxidized polyethylene having a melt viscosity in the range of about 200 cp. to about 1500 cp., an inherent viscosity of about 0.05 to 0.5 and an acid number of about 4 to 30, (2) 10 to 50 weight percent of at least one tackifying resin selected from the group consisting of hydrocarbon resins and polyterpene resins (3) 5 to 25 weight percent emulsifiers and (4) 5 to 80 weight percent water.

4,043,960

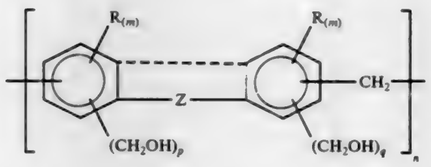
AQUEOUS DISPERSIONS OF THERMOSETTING HYDROXY-FUNCTIONAL FORMALDEHYDE COPOLYMER RESINS DERIVED FROM DIARYL OXIDES, SULFIDES, DIBENZOFURAN OR DIBENZOTHIOPHENE

Paul Joseph Kress, Muncie, Ind., and Raymond A. Plepys, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 19, 1976, Ser. No. 650,086
Int. Cl.² C08L *61/28, 29/04;* **C10M** *3/04*
U.S. Cl. 260—29.4 R **12 Claims**

1. An aqueous dispersion comprising:

a. a thermosetting hydroxy-functional condensation copolymer having the repeating unit



wherein R is independently an alkyl group of from 1 to about 10 carbon atoms or a halogen, Z is oxygen or sulfur, the dashed line is an optional chemical bond, the group represented by Z taken with the dashed line represents dibenzofuran and dibenzothiophene moieties, or mixtures thereof, n is 3–10, m is 0–2 and p and q are 0 or 1 with the proviso that the sum of p and q has an average value of 0.1–1 and there is an average of at least 1 hydroxymethyl group per polymer;

b. a curing amount of curing agent selected from the group consisting of strong acids with a pKa of about 2.1 or less and acid-catalyzed hexamethoxymethylmelamine; and

c. at least about a 1 weight percent aqueous polyvinyl alcohol.

4,043,961

VINYL ACETATE-ETHYLENE COPOLYMER EMULSIONS HAVING IMPROVED WATER RESISTANCE

Aleksander Beresniewicz, Wilmington, and Harold Kirkwood Inskip, Newark, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 29, 1976, Ser. No. 653,518
Int. Cl.² C08L *31/04*
U.S. Cl. 260—29.6 WA **7 Claims**

1. An aqueous emulsion consisting essentially of (a) from about 40 to about 60 percent by weight of vinyl acetate-ethylene copolymer having from about 70 to about 90 percent by weight of vinyl acetate and from about 10 to about 30 percent by weight of ethylene, (b) from about 2.5 to about 6.0 percent, based on the weight of the vinyl acetate-ethylene copolymer, of polvinyl alcohol, at least about 20 percent by weight of said polyvinyl alcohol being an at least about 98.0 mole percent hydrolyzed vinyl alcohol copolymer having a methyl methacrylate content of from about 1 to 10 percent by weight, said vinyl alcohol copolymer having a 4% aqueous solution viscosity at 20° C. of from about 5 to about 50 cps.

4,043,962

PARTICULATED RUBBER AND PLASTICS COVERINGS AND BINDERS THEREFOR

Klaus Adler; Engelbert Pichler; Christoph Kemenater; Wilfried Dressler, and Johann Bauer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Oct. 1, 1975, Ser. No. 618,447
Claims priority, application Germany, Oct. 14, 1974, 2448852
Int. Cl.² C08L *61/10, 61/24;* **C10M** *3/04*
U.S. Cl. 260—29.3 **16 Claims**

8. A composition forming a resilient coating on drying consisting essentially of from 40% to 75% by weight of a particulated resilient material selected from the group consisting of rubber, plastics and mixtures thereof and from 25% to 60% by weight of a binder consisting essentially of an aqueous mixture of from 1% to 10% by weight of a still water-soluble formaldehyde polycondensate resin selected from the group consisting of a urea-formaldehyde resin, a phenol-formaldehyde resin and a melamine-formaldehyde resin, from 0.5% to 5% by weight of formaldehyde as obtained from a compound selected from the group consisting of formaldehyde and formaldehyde condensates releasing formaldehyde on hydrolysis, and from 85% to 98.5% by weight of a film-forming plastics dispersion.

4,043,963

HEAT-HARDENABLE AQUEOUS EPOXY EMULSIONS CONTAINING AMINOPLAST RESIN

Ronald W. Anderson, Pittsburgh, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 9, 1976, Ser. No. 656,504
Int. Cl.² C08L *63/02*
U.S. Cl. 260—29.4 R **11 Claims**

1. A thermally curable aqueous emulsion coating composition comprising, as the discontinuous phase of the emulsion, liquid particles of a mixture of resinous polyepoxide and an aminoplast resin having N-methylol groups etherified with 2-hexoxy ethanol to an extent of at least 5%, said resins being dissolved in an essentially water immiscible organic solvent and a surfactant stably suspending said liquid particles in the aqueous continuum of the emulsion, said polyepoxide having a plurality of 1,2-epoxy groups and said aminoplast resin constituting from 5% to 50% by weight of the resin mixture.

4,043,964

CARPET TREATING AND TREATED CARPET

Patsy O. Sherman, Bloomington, and Samuel Smith, Village of Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 415,506, Nov. 14, 1973, Pat. No. 3,916,053, which is a continuation of Ser. No. 180,216, Sept. 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 76,982, Sept. 30, 1970, abandoned. This application July 30, 1975, Ser. No. 600,401
Int. Cl.² C08L *27/12*
U.S. Cl. 260—29.6 F **2 Claims**

1. A composition suitable for the treatment of carpets to impart durable soil-resistant and stain repelling properties thereto, said composition comprising at least 0.1% solids in a liquid medium said solids comprising:

a. a water-insoluble addition polymer derived from polymerizable ethylenically unsaturated monomer free of nonvinylic fluorine, said polymer having at least one major transition temperature higher than about 45° C. and a solubility parameter of at least about 8.5, and

b. a water-insoluble fluorinated component containing fluoroaliphatic radical of at least 3 carbon atoms, said fluorinated component containing at least 25 percent by weight of fluorine in the form of fluoroaliphatic radicals and having at last one major transition temperature higher then about 45° C.;

said composition being substantially free of polymers not having a major transition temperature higher than about 45° C.

4,043,965

COPOLYMER OF ACRYLIC ACID AND 1,1-DIHYDROPERFLUOROOCTYL METHACRYLATE USEFUL FOR APPLYING NON-PERMANENT SOIL RELEASE FINISH

Robert E. Dickson, Belle Mead, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 414,880, Nov. 12, 1973, Pat. No. 3,912,681, which is a continuation-in-part of Ser. No. 249,089, May 1, 1972, Pat. No. 3,836,496. This application July 25, 1975, Ser. No. 599,195
The portion of the term of this patent subsequent to Sept. 17, 1991, has been disclaimed.
Int. Cl.² C08F *218/10;* **C08L** *31/02*
U.S. Cl. 260—29.6 F **3 Claims**

1. A stable aqueous emulsion containing a copolymer consisting essentially of acrylic acid and 1,1-dihydroperfluorooctyl methacrylate in a weight ratio of about 21:1 to 5:4.

4,043,966

FLUOROCARBON POLYMER COMPOSITIONS WITH ALUMINUM PHOSPHATE-INORGANIC ACID MIXTURE BINDER

John Wilmar Edwards, Welwyn Garden City, and Barry William Farrant, St. Neots, both of England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 594,000, July 8, 1975, abandoned, which is a continuation of Ser. No. 368,049, June 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 207,650, Dec. 13, 1971, abandoned. This application Aug. 11, 1976, Ser. No. 713,508
Claims priority, application United Kingdom, July 27, 1971, 35203/71; Nov. 15, 1971, 52940/71; June 8, 1972, 26801/72
Int. Cl.² C08L *27/18*
U.S. Cl. 260—29.6 F **13 Claims**

1. A coating composition which consists essentially of an aqueous dispersion containing 1% to 60% by weight of fluorocarbon polymer resin and as binder a solution of an aluminium phosphate-acid mixture, identifiable as equivalent to a mixture of aluminium phosphate in an acid selected from the group consisting of hydrochloric, sulphuric, nitric and hydrobromic acids, the amount of binder in the composition being that the

weight of aluminum divided by the weight of fluorocarbon polymer resin is from 0.02 to 0.25, and in the binder, the ratio of the number of aluminum atoms to the number of molecules of the said acid is from 1:0.1 to 1:5 and the ratio of the number of aluminum atoms to the number of atoms of phosphorus is from 1:0.1 to 1:1.8.

4,043,967

LATENTIZING SOLVENTS FOR EPOXY SYSTEMS

Eric P. Berg, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 20, 1976, Ser. No. 659,792
Int. Cl.² C08K *5/01, 5/06, 5/11, 5/15*
U.S. Cl. 260—30.4 EP **15 Claims**

1. A latent polymerizable epoxy material comprising a polymerizable epoxy monomer or precondensate, a catalytically active amount of a bis(highly fluorinated aliphatic sulfonyl)methane, and a volatile, liquid solvent selected from ethers, esters, and aromatic compounds which are not reactive with said epoxy material, said solvents comprised of only C, H and O atoms and having a vapor pressure at 25° C between 0.10 and 650 torr, said solvent being present in an amount at least equal to 10% of the weight of said polymerizable epoxy material.

4,043,968

PROCESS FOR PRODUCING METHYLOLATED AMIDE COPOLYMERS IN CONCENTRATED ORGANIC SOLVENT SOLUTION

Arthur T. Spencer, New Providence, and Stanley F. Siranovich, Highland Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 30, 1976, Ser. No. 653,687
Int. Cl.² C08F *8/00, 22/38;* **C08K** *5/05*
U.S. Cl. 260—33.4 R **10 Claims**

1. A process for the production of methylolated amide copolymers in concentrated alcoholic organic solvent solution comprising, copolymerizing polymerizable monomers consisting essentially of monoethylenically unsaturated monomers, at least 50% of which are monoethylenically unsaturated monomers selected from vinyl aromatic hydrocarbons, acrylic-type esters, vinyl esters and monoethylenic nitriles, and including from 4–25% of an amide monomer selected from acrylamide or methacrylamide, in alcoholic organic solvent solution to provide an amide copolymer solution, removing volatile nitrogen-containing decomposition products of the amide monomer in an amount corresponding to at least 0.5% by weight of the amide monomer used without removing more than 15% of solvent, based on the weight of the solution, and then reacting the amide copolymer in said solution with formaldehyde in the presence of an acid catalyst.

4,043,969

CASTING COMPOUND FOR SEMICONDUCTOR DEVICES

Christian R. Sporck, Saratoga, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Continuation-in-part of Ser. No. 353,458, April 23, 1973, Pat. No. 3,838,094, and Ser. No. 475,441, May 31, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 567,724
Int. Cl.² C08L *63/00*
U.S. Cl. 260—37 EP **7 Claims**

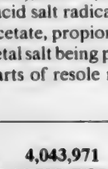
1. A curable composition which is liquid at room temperature or at a slightly elevated temperature and which comprises

a. a major proportion of a polyepoxide

$$A-(X)_e-B$$

wherein A and B are selected from the class of (1) cycloaliphatic groups, (2) open chain aliphatic groups and (3) segments of a cycloaliphatic single ring or fused ring systems, A and B each containing an epoxide group, X is a linking entity selected from the class of a valence bond and an atom or group of atoms and a is unity except where A and B belong to group (3) in which case a is zero;

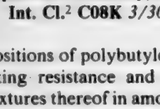
b. a cross-linking agent in the form of an anhydride of a polycarboxylic acid



wherein R is a cycloaliphatic group, an open chain aliphatic group or an aromatic group

c. a catalyst capable of promoting polymerizing and cross-linking of (a) and (b); and

d. a filler in the form of a finely divided fused silica the surface of which has been treated with a substance to convert silanol groups to groups



wherein the R_3's are the same or different hydrocarbon groups

said components (a) and (b) being present in amounts and proportions to enable the composition to cure at temperatures not greater than about 175° C, to a hard product;

said components (a), (b) and (d) being selected and their proportions being such that the composition is a pourable liquid at temperatures not greater than about 40° C and is free of significant quantities of chloride and sodium ions.

4,043,970

RESOLE RESIN BINDER COMPOSITION

Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,395
Int. Cl.² C08L *61/10;* **C08G** *8/10*
U.S. Cl. 260—29.3 **12 Claims**

1. A binder composition comprising a low viscosity resole resin and a metal salt curing accelerator, said salt being soluble in said resole resin, having a metal ion selected from the group consisting of barium (Ba^{++}), magnesium (Mg^{++}), manganese (Mn^{++}), chromium (Cr^{+++}), zinc (Zn^{++}), aluminum (Al^{+++}), dibasic aluminum $Al(OH_2^{+})$, cobalt (Co^{++}) and mixtures thereof and having an organic acid salt radical selected from the group consisting of formate, acetate, propionate, benzoate, lactate and mixtures thereof said metal salt being present in from about 0.5 to 5 parts based on 100 parts of resole resin solids.

4,043,971

THERMOPLASTIC POLYBUTYLENE TEREPHTHALATE MOLDING COMPOSITIONS OF IMPROVED TRACKING RESISTANCE

Rolf Wurmb, Heidelberg; Joachim Kunde, Frankenthal; Johannes Schlag, Ludwigshafen, and Hans Georg Dorst, Deidesheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 21, 1976, Ser. No. 678,946
Claims priority, application Germany, May 30, 1975, 2524121
Int. Cl.² C08K *3/30*
U.S. Cl. 260—40 R **4 Claims**

1. Molding compositions of polybutylene terephthalate having improved tracking resistance and containing as fillers, $CaSO_4$, $BaSO_4$ or mixtures thereof in amounts of from 5 to 60% by weight of the total weight of the composition.

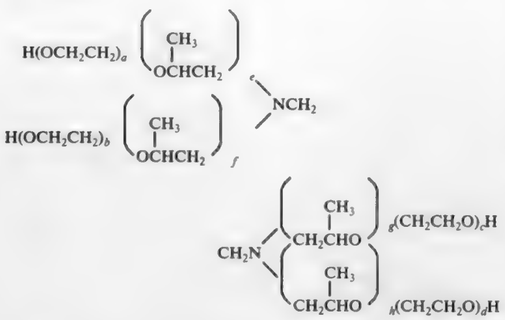
4,043,972

STABILIZING POLYAMIDE ANTISTATIC COMPOSITIONS

Ronald D. Mathis, Taylors, S.C., assignor to Phillips Fibers Corporation, Greenville, S.C.

Filed Oct. 6, 1975, Ser. No. 620,085
Int. Cl.² C08J *3/20;* **C08L** *3/00;* **C08K** *5/50*
U.S. Cl. 260—45.9 NC **12 Claims**

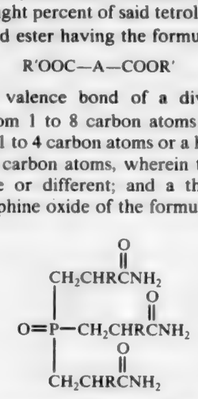
1. A composition of matter comprising a polyamide; an antistatic property imparting amount of an antistatic agent comprising the reaction product of (1) a tetrol compound of the formula



where *a, b, c, d, e, f, g,* and *h* are each a whole number and the total of *a, b, c,* and *d* is between 8 and 1,000 and the total of *e, f, g,* and *h* is between 8 and 850, wherein the molecular weight of said tetrol compound is between about 1,650 to about 135,000 and said ethylene oxide moieties make up from about 10 to about 90 weight percent of said tetrol compound, and (2) a dicarboxylic acid ester having the formula

$$R'OOC-A-COOR'$$

wherein A is a valence bond of a divalent hydrocarbyl radical having from 1 to 8 carbon atoms and R′ is an alkyl group containing 1 to 4 carbon atoms or a hydroxyalkyl group containing 2 to 4 carbon atoms, wherein the two R′ radicals may be the same or different; and a thermally stabilizing amount of a phosphine oxide of the formula



wherein each R is individually selected from the group consisting of hydrogen or an alkyl group containing 1 to 4 carbon atoms.

4,043,973

MULTICHROMOPHORIC ULTRAVIOLET STABILIZERS FOR ORGANIC COMPOSITIONS

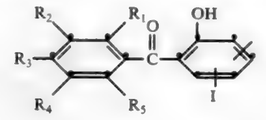
Richard H. S. Wang, and Gether Irick, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 511,570, Oct. 2, 1974, Pat. No. 3,936,419. This application Oct. 28, 1975, Ser. No. 626,521
Int. Cl.² C08K *5/47, 5/35, 5/34*
U.S. Cl. 260—45.8 NT **10 Claims**

1. An organic composition susceptible to ultraviolet degradation stabilized against such degradation with a stabilizing amounts of a composition of matter comprising compounds having the formula:

$$(A-B)_2-C$$

wherein A is a group having the structure:



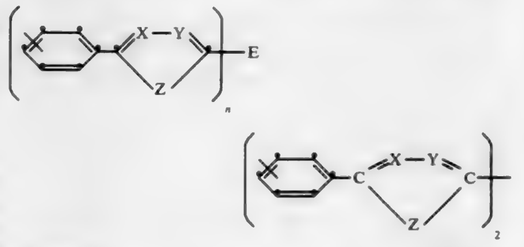
wherein

R_1, R_2, R_3, R_4, R_5 and I are hydrogen, fluoro, chloro, bromo, lower alkyl, substituted lower alkyl, cycloalkyl, substituted cycloalkyl, aryl, substituted aryl, lower alkylaryl, alkoxy, aryloxy, substituted amino, cyano, carboalkoxy, and the substituents R_1 and R_2, R_2 and R_3,R_3 and R_4, and R_4 and R_5, combined with the carbon atoms to which they are attached, are joined alkylene groups completing a carbocyclic ring, which ring can also be substituted with one or more of the substituents listed above for R_1, R_2, R_3, R_4, R_5 and I;

B is a linking group connecting A and C and can have the structure



where E is lower alkylene or substituted lower alkylene; the C group is a heterocyclic group having the structures



wherein

X and Y are a carbon atom, a carbon atom containing an alkyl group containing 1 to 12 carbon atoms, a carbon atom containing an aryl group containing 6 to 18 carbon atoms or a nitrogen atom; Z is an oxygen atom, a sulfur atom, or a nitrogen atom containing a hydrogen atom or a substituted or unsubstituted lower alkyl group having 1 to 12 carbon atoms; E is a substituted or unsubstituted, branched, or unbranched alkylene containing 1 to 12 carbon atoms or arylene containing 6 to 18 carbon atoms; n is an integer from 1 to 6.

4,043,974

PROCESS FOR STABILIZING POLYAMIDES

John Maxwell Davis, Signal Mountain, Tenn., and Sigred Boyd Lanoux, Lafayette, La., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 546,593, May 2, 1966, abandoned. This application Nov. 10, 1975, Ser. No. 630,425
Int. Cl.² C08K *5/53*
U.S. Cl. 260—45.75 C **8 Claims**

1. In a process for the preparation of a heat-stabilized polycarbonamide filament having enhanced acid-dyeability including preparing the polymer by melt polymerization in the presence of a soluble copper compound, a metal halide and a phosphorus compound and melt-spinning a filament from the polymer, the improvement for reducing the loss of soluble copper from the molten polymer comprising adding as the phosphorus compound at least 0.01% based on the weight of the polymer of hexamethylene diammonium phenyl-phosphonate to the polymer precursors before or during polymerization.

4,043,975

FLAME-RESISTANT POLYOLEFIN COMPOSITIONS

Howard W. Bost, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 12, 1976, Ser. No. 741,584
Int. Cl.[2] C08K *5/52, 3/22*
U.S. Cl. 260—45.75 W **22 Claims**

1. A flame-resistant polyolefin composition comprising (1) normally solid polyolefin; (2) a phosphorus-containing flame retardant comprising the reaction product of (a) at least one phosphorus oxide compound of the formula $(P_2O_5)_{0.5-1.0}(H_2O)_{0.0-1.5}$, (b) melamine, and (c) at least one saturated open-chain polyol containing from 5 to 15 carbon atoms and from 4 to 8 hydroxyl groups per molecule, which reaction product has been heated prior to incorporation into said polyolefin composition under such conditions that said reaction product will not cause the significant foaming of the polyolefin composition when said polyolefin composition is subjected to molding conditions; and (3) at least one zinc compound selected from the group consisting of zinc oxide and zinc bromide; wherein said phosphorus-containing flame retardant is present in an amount that alone would be insufficient to impart to said polyolefin a flame resistance rating of V-O according to the Modified UL-94 test and wherein said at least one zinc compound is present in an amount which enhances the flame resistance provided by the phosphorus-containing flame retardant.

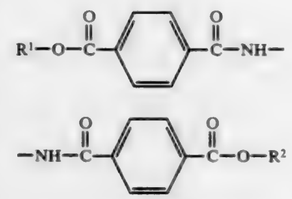
4,043,976

STABILIZED OLEFIN POLYMER COMPOSITION

Toshio Yoshikawa; Nagayoshi Sakamoto; Masayuki Kurita; Shunji Oh-e, and Lomitado Nagamori, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Sept. 14, 1976, Ser. No. 723,141
Claims priority, application Japan, Mar. 30, 1976, 51-34208
Int. Cl.[2] C08K *5/25*
U.S. Cl. 260—45.8 N **9 Claims**

1. An olefin polymer composition which comprises 100 parts by weight of an olefin polymer and from 0.001 to 5 parts by weight of a compound having the formula



in which R^1 and R^2 are the same or different, and each represents an alkyl group having 1 – 4 carbon atoms.

4,043,977

NON-STICK POLYORGANOSILOXANE COATING COMPOSITIONS

Armand deMontigny; Kurt-Wilhelm Eichenhofer; Hans Toepsch, all of Leverkusen, and Reinhard Schliebs, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 25, 1976, Ser. No. 670,583
Claims priority, application Germany, Apr. 9, 1975, 2515484
Int. Cl.[2] C08G *77/04*
U.S. Cl. 260—46.5 UA **7 Claims**

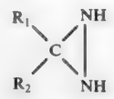
1. A composition for coating paper, films and fiber materials, comprising

a. 4 parts by weight of a linear polyorgano siloxane with ends stopped by vinyl groups and having a viscosity of up to about 500 cP (20° C) and

b. about 0.5 to 1.5 parts by weight of a crosslinking agent containing Si-vinyl units and SiH units and comprising molecules with a miximum of about 10 Si atoms bonded to one another via oxygen, and wherein the two reactive groups are present in adjacent positions in one and the same molecule and the remaining valencies of the Si atom are saturated by methyl groups and the SiH groups are present in a ratio of about 1:1 to 2.5:1 to the total amount of all Si-vinyl units present in the composition,

c. a platinum metal complex, the amount of metal being up to about 0.01 part by weight - based on 100 parts by weight of total composition, and

d. a diaziridine of the formula



wherein R_1 and R_2 each individually is an alkyl radical containing up to 6 carbon atoms or $R_1 + R_2$ are pentamethylene or hexamethylene, the amount of diaziridine being about 75 to 250 times the weight of said metal.

4,043,978

POLYIMIDES

Gerhard Martin Julius Schmidt, deceased, late of Rehovot, Israel, by Ester Schmidt, administratrix and sole heir; Michael Dror; Gad Friedman, both of Rehovot, Israel, and Harold H. Levine, La Jolla, Calif., assignors to Yeda Research & Development Co., Ltd., Rehovot, Israel

Filed Mar. 20, 1974, Ser. No. 453,049
Claims priority, application Israel, Mar. 25, 1973, 41869
Int. Cl.[2] C08G *73/10, 73/12*
U.S. Cl. 260—47 CP **10 Claims**

1. A process for the production of polyimide polymers, which comprises reacting cyclooctadiene-1,2,5,6-tetracarboxylic acid bisanhydride with 4,4'-diamino-diphenyl-methane, 4,4'-diamino-diphenyl ether, a mixture of 4,4'-diamino-diphenyl-methane and 4,4'-diaminodiphenyl ether or hexamethylene diamine in the presence of m-cresol as a solvent.

4,043,979

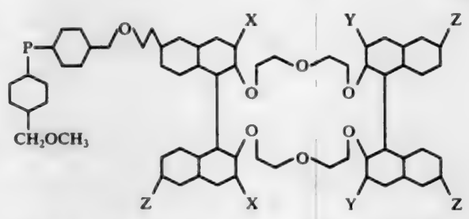
POLYMER-MULTIHETEROMACROCYCLES

Donald J. Cram, Los Angeles, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Division of Ser. No. 448,333, March 5, 1974, Pat. No. 4,001,279, which is a continuation-in-part of Ser. No. 346,089, March 29, 1973, abandoned. This application Mar. 31, 1976, Ser. No. 672,211
Int. Cl.[2] C08F *12/08*
U.S. Cl. 260—47 UP **6 Claims**

1. A compound of the formula

(III)



wherein P is the backbone of a solid styrene-divinylbenzene copolymer, each Z is H or CH_2CH_2OH, each X is either H or CH_3, each Y is either H or CH_3, and the binaphthyl groups of the macrocycle are in the (RR)- or (SS)- configurations.

4,043,980

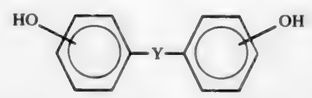
FLAME RETARDANT POLYCARBONATE HAVING IMPROVED CRITICAL THICKNESS

Arthur L. Baron, and Parameswar Sivaramakrishnan, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 18, 1976, Ser. No. 687,491
Int. Cl.[2] C08G *63/62*
U.S. Cl. 260—47 XA **14 Claims**

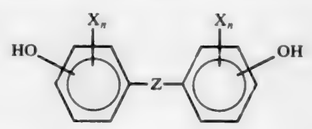
1. In a flame retardant polycarbonate having a weight average molecular weight of 10,000 to 200,000 based on the reaction product of:

a. an aromatic diol of the structural formula



wherein Y is a single bond, an alkylene or alkylidene radical with 1 to 7 carbon atoms, a cycloalkylene or cycloalkylidene radical with 5 to 12 carbon atoms, —O—, —CO—, —SO—, or $—SO_2—$;

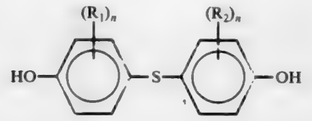
b. a halogenated dihydric phenol of the structural formula



wherein Z is a single bond, an alkylene or alkylidene radical with 1 to 7 carbon atoms, —O—, —CO—, —SO— or $—SO^2—$ and X is chlorine or bromine and n is 1 to 4; and,

c. a carbonic acid derivative, the improvement comprising co-reacting with components (a), (b) and (c);

d. an effective amount of a thiodiphenol of the structural formula



wherein R_1 and R_2 are hydrogen or lower alkyl groups having 1 to 4 carbon atoms and n equals 0 to 2 to improve the critical thickness of said polycarbonate.

4,043,981

COPOLYESTERS DERIVED FROM ETHOXYLATED 3,5-DIBROMO-4-HYDROXYBENZOIC ACID

William L. O'Brien, Cincinnati, Ohio, assignor to Emery Industries, Inc., Cincinnati, Ohio

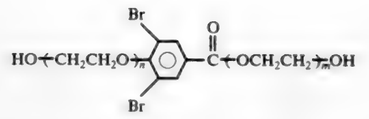
Filed Feb. 6, 1976, Ser. No. 655,780
Int. Cl.[2] C08G *63/68*
U.S. Cl. 260—47 C **7 Claims**

1. A flame retardant copolyester having improved thermal and ultraviolet stability comprising the condensation product of

a. an aliphatic or alicyclic diol having from 2 to 10 carbon atoms,

b. an aliphatic, alicyclic or aromatic dicarboxylic acid having from 4 to 12 carbon atoms or lower allkyl esters thereof, and

c. ethoxylated brominated hydroxybenzoic acid of the formula



where n amd m are integers from 1 to 3,

said ethoxylated brominated hydroxybenzoic acid comprising about 1 to 30% by weight of the copolyester composition.

4,043,982

PEROXIDE INITIATED POLYMERIZABLE ACRYLATE-ISOCYANATE MONOMER COMPOSITIONS

Denis J. O'Sullivan; Bernard J. Bolger, and T. Eisert Casey, all of Dublin, Ireland, assignors to Loctite (Ireland) Limited, Dublin, Ireland

Continuation of Ser. No. 362,970, May 23, 1973, abandoned. This application July 30, 1975, Ser. No. 600,384
Claims priority, application Ireland, May 29, 1972, 717/72
Int. Cl.[2] C08F *120/36*
U.S. Cl. 260—47 UA **9 Claims**

1. A polymerizable composition which comprises a first part consisting essentially of a diacyl peroxide of the formula Ar.-$CO.O_2CO$.Ar wherein each Ar is an aryl or substituted aryl radical containing up to about 10 carbon atoms, or a silyl peroxide of the formula $CH_2{=}CHSi(OOR^1)_3$ wherein each R^1 is a C_1 to C_6 alkyl radical; and a second part consisting essentially of a free radical polymerizable monomer which is made by reacting at a temperature of 0°–200° C an organic polyisocyanate with a polymerizable acrylate ester having a reactive hydrogen atom in a hydroxy or a primary or secondary amino group in the alcoholic moiety of said ester, each such hydrogen atom having reacted with an isocyanate group, said polyisocyanate having the formula

$$(O{=}C{=}N)_nR^4$$

wherein n is 2 and R^4 is a C_{2-20} alkylene, alkenylene or cycloalkylene radical or a C_{6-40} arylene, alkarylene, aralkylene, alkyloxyalkylene or aryloxyarylene radical which may be substituted by 1-4 chlorine atoms or by 1-3 amino or mono- or di-C_{1-3}-alkylamino or C_{1-3} alkoxy groups, and about 0.1 to about 10 percent by weight of the second part of an aryl amine polymerization accelerator of the formula $ArNR^8R^9$ wherein Ar is as defined above and each R^8 and R^9 is a hydrogen or a C_1 to C_4 alkyl group.

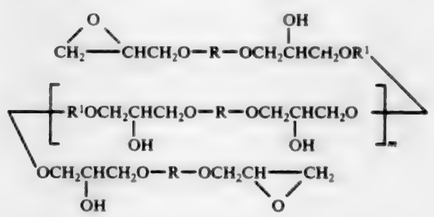
4,043,983

ELECTRICALLY-CONDUCTIVE RESINS, AND INTERMEDIATES FOR THEIR PREPARATION

Bernard Peter Stark, Stapleford, and Michael Robert Thoseby, Cambridge, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 12, 1976, Ser. No. 715,571
Claims priority, application United Kingdom, Jan. 22, 1975, 2699/75
Int. Cl.[2] C08G *59/24;* **C07D** *407/00*
U.S. Cl. 260—65 **8 Claims**

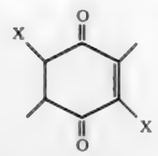
1. Epoxide resins of the general formula



where

each R represents an alkylene hydrocarbon group of from 2 to 30 carbon atoms, an alkylene hydrocarbon group of from 2 to 30 carbon atoms interrupted in the chain by at least one ether oxygen atom, an alkylene hydrocarbon group of from 2 to 30 carbon atoms interrupted in the chain by at least one sulfide group, or an alkylene hydrocarbon group of from 2 to 30 carbon atoms interrupted in the chain by at least one carbonyloxy group,

each R^1 represents a group of formula



X being a halogen atom, and

m is zero or a positive integer of at most 50.

4,043,984

AMINOPLASTS ELASTICIZED WITH BENZOIC ACID ESTERS

Karl-Heinz Keil, Offenbach (Main); Karlfried Keller, Bergen-Enkheim; Joachim Ribka, Offenbach (Main)-Buergel, and Dieter Tichy, Frankfurt (Main) all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed Sept. 4, 1975, Ser. No. 610,317

Claims priority, application Germany, Sept. 12, 1974, 2443645

Int. Cl.² C08G *12/26, 2/28, 2/30, 14/02*

U.S. Cl. 260—67.6 R **7 Claims**

1. In the combination of an aminoplast resin with an elasticizing agent to improve the elasticity of the cured resin, the improvement according to which the elasticizing agent has the formula

$$R—C_6H_4—COO—X—OH$$

wherein C_6H_4 denotes a phenylene group, R denotes a hydrogen atom or a methyl or ethyl group, and X denotes an unbranched or branched alkylene group with 2 to 6 carbon atoms whose carbon chain is either uninterrupted or interrupted by one oxygen atom.

4,043,985

TIRE MONOFILAMENTS

Günther Vock, Strassberg, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 484,162, June 28, 1974, Pat. No. 3,998,920, which is a continuation of Ser. No. 313,533, Dec. 8, 1972, abandoned. This application Sept. 17, 1976, Ser. No. 725,133

Claims priority, application Germany, Dec. 14, 1971, 2161967

Int. Cl.² C08G *63/12*

U.S. Cl. 260—75 T **1 Claim**

1. A monofilament of high molecular weight polyethylene terephthalate having an intrinsic viscosity of more than 0.67, a content of terminal carboxy groups of less than 25 milliequivalents/kg, a diameter of from 0.20 to 0.55 mm, a specific strength of more than 60 g/tex, an elongation at break of from 6 to 15%, an elongation at the specific load of 27 g/tex of less than 6%, and a thermoshrinkage measured at 160° C of less than 8%.

4,043,986

POLYMERS POSSESSING IMIDE GROUPS

Max Gruffaz, La Mulatiere, and Gerard Lefebvre, Lyon, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Apr. 16, 1975, Ser. No. 568,447

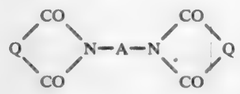
Claims priority, application France, Apr. 18, 1974, 74.13529

Int. Cl.² C08G *69/26*

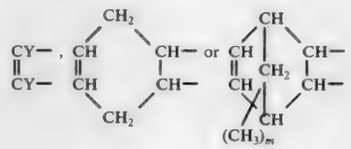
U.S. Cl. 260—78 UA **10 Claims**

1. A process for preparing a polymer possessing imide groups, which consists essentially of reacting, at 50° to 300° C., cyanamide and a product possessing imide groups selected from the group consisting of:

a. a bis-imide of the general formula:

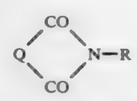


in which Q represents a divalent radical of the formula:



wherein Y represents H, CH_3 or Cl and *m* is 0 or 1, and A represents a divalent organic radical containing 2 to 30 carbons atoms; and

b. a mixture of said bis-imide and a mono-imide of the general formula:



in which Q is as defined above and R represents a hydrogen, atom or a monovalent organic radical containing 1 to 20 carbon atoms, in amounts such that the ratio

$$\frac{\text{number of imide groups}}{\text{number of mols of cyanamide}} \quad (r)$$

is from 1 to 20.

4,043,987

SUBSTITUTED AMMONIUM POLYPHOSPHATE COMPOSITION

Carmel Réjean Jolicoeur, Sherbrooke, and Richard Riverin, Chomedey, both of Canada, assignors to Encoat Chemicals Limited, Montreal, Canada

Filed Apr. 11, 1975, Ser. No. 567,260

Claims priority, application Canada, Dec. 10, 1974, 215811

Int. Cl.² C07D *251/66;* **C07F** *9/02*

U.S. Cl. 260—78.41 **21 Claims**

1. A substantially water-insoluble substituted ammonium polyphosphate composition having the general formula (I)

$$Z_1—O[—(PO_3NH_4)_j—(PO_3R'N)_k—]_yZ_2 \quad (I)$$

wherein Z_1 and Z_2 are each selected from $—NH_4$ and —NR', N is a reactive nitrogen, R' is the residue R, of an organic nitrogenous spumific agent of general formula (II)

$$R(NH_2)_p(NH)_q(N)_r \quad (II)$$

wherein *p*, *q* and *r* are integers from 0 to 6 and $(p + q + r)$ is 1 or more; said spumific agent hving a nitrogen to carbon ratio of 5 : 1 to 0.1 : 1, and a thermal decomposition temperature above 150° C, and wherein *j* is from 1 to 20, *k* is 1 to 10 and *y* is 1 or more.

4,043,988

LOW PROFILE POLYESTER MOLDING COMPOSITION

Victor F. G. Cooke, Youngstown, and Donald H. Thorpe, Williamsville, both of N.Y., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,112

Int. Cl.² C08L *67/06*

U.S. Cl. 260—862 **15 Claims**

1. A molding composition comprising

A. a polymerizable unsaturated polyester component; and

B. an additive component comprising discrete particles of less than about 50 microns diameter of a cross-linked vinyl chloride polymer having a glass transition temperature of below about 100° C and which is chemically inert with respect to the polyester component and is swellable but insoluble therein, said additive component comprising the polymeric reaction product of vinyl chloride and at least one polyfunctional monomer.

4,043,989

OXAZEPAM DERIVATIVES FOR IMMUNOASSAY REAGENTS

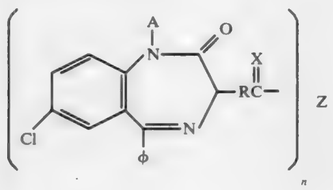
Richard S. Schneider, Saratoga, Calif., and Steven J. Gould, South Windham, Conn., assignors to Syva Company, Palo Alto, Calif.

Filed Sept. 11, 1975, Ser. No. 612,425

Int. Cl.² C07G *7/00*

U.S. Cl. 260—112 R **6 Claims**

1. A compound of the formula:



wherein:

A is hydrogen or lower alkyl of from 1 to 3 carbon atoms;

R is a linking group of from 0 to 8 carbon atoms and 0 to 4 heteroatoms which are chalcogen and nitrogen;

Z is Y, wherein Y is an antigenic poly(amino acid);

n is at least 1 and not greater than the molecular weight of Y divided by 500; and

X is chalcogen or nitrogen.

4,043,990

PROCESS FOR THE RECOVERY OF WHEY PROTEIN HAVING IMPROVED SOLUTION CLARITY USING POLYPHOSPHATES

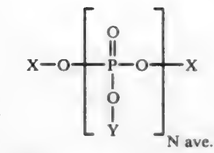
Nicholas Melachouris, Hartsdale, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 452,894, March 20, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,203

Int. Cl.² A23C *21/00;* **A23J** *1/20*

U.S. Cl. 260—112 R **26 Claims**

1. In a process for the recovery of protein having improved solution clarity at acid pH from a proteinaceous aqueous solution containing whey protein in which a medium chain length polyphosphate of the formula:



wherein X is selected from the group consisting of proteinaceous and alkali metal; and Y is alkali metal; and N ave. represents an average chain length from about 3 to about 20,000, is admixed with a proteinaceous aqueous solution containing whey protein to form a protein-phosphate complexed solution; and the pH of said protein-phosphate complexed solution is adjusted to a range of from about 4.5 to about 2.0 to form a protein-phosphate precipitate, the protein-phosphate precipitate is separated from said mineral solution and dispersed in an aqueous solution having a final pH from about 5.0 to about 12.0 and the protein-phosphate dispersion is contacted with an anionic ion exchange resin to remove phosphate from said dispersion and provide a protein-aqueous effluent; the improvement which consists essentially of pretreating said proteinaceous aqueous solution containing whey protein prior to subjecting said proteinaceous aqueous solution containing whey protein to the process outlined in the preamble which pretreatment consists essentially of the steps of:

a. admixing with said proteinaceous aqueous solution containing whey protein a phosphate selected from the group consisting of tetrasodium pyrophosphate, tetrapotassium pyrophosphate, sodium acid pyrophosphate, potassium acid pyrophosphate, potassium tripolyphosphate, sodium tripolyphosphate, calcium pyrophosphate, magnesium pyrophosphate, ammonium pyrophosphate, or mixtures thereof at a concentration greater than 1.0 gram per liter to thereby form a phosphate complexed solution;

b. adjusting the pH of said phosphate complexed solution to a neutral range of from about 6.0 to about 8.0 by the addition of a base to a level of base sufficient to form a precipitate and a pretreated proteinaceous aqueous solution containing whey protein;

c. separating said precipitate from said pretreated proteinaceous aqueous solution containing whey protein to give a separated precipitate and a separated pretreated proteinaceous aqueous solution containing whey protein; and

d. recovering the protein from said pretreated proteinaceous aqueous solution containing whey protein using said process, said protein having improved solution clarity at acid pH.

4,043,991

PREPARATION OF PEPTIDES AND CEPHALOSPORINS

Noritaka Hamma, Sakai; Masataka Fukumura, Kobe; Kaoru Maeshima, Takarazuka, and Takenari Nakagome, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

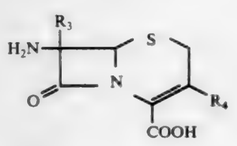
Filed Sept. 22, 1975, Ser. No. 615,751

Claims priority, application Japan, Sept. 20, 1974, 49-108985; May 21, 1975, 50-61233

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 R **18 Claims**

1. A process for preparing a cephalosporin of the formula:



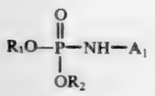
(I-a)

wherein R_4 is formyl, hydroxyl, C_1–C_4 alkyl, C_1–C_4 alkoxy or a

methyl group substituted with hydroxy, C_1–C_4 alkoxy, C_2–C_5 alkanoyloxy, phenoxy, carbamyloxy, C_1–C_4 alkylamino, C_2–C_5 alkanoylamino, azido, halogen, or a group of the formula:

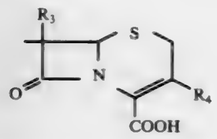
$$-S-R_5$$

wherein R_5 is hydrogen, C_1–C_4 alkyl, phenyl, C_2–C_5 alkanoyl, pyridyl, 1,3,4-thiadiazol-2-yl, or tetrazol-5-yl; and R_3 is hydrogen, C_1–C_4 alkyl, C_1–C_4 haloalkyl, C_1–C_4 alkoxy, phenyl(C_1–C_4)alkyl, hydroxy, phenoxy, C_2–C_5 alkanoyloxy, C_1–C_4 alkylsulfonyloxy, mercapto, C_1–C_4 alkylthio, phenylthio, amino, C_1–C_4 alkylamino, C_2–C_5 alkoxycarbonyl, phenyl(C_2–C_5)alkanoyl, carboxyl, formyl, azido, or halogen, or the salt or the ester thereof, which comprises reacting a phosphoramide derivative of the formula:



(II-a)

wherein R_1 and R_2 are each C_1–C_6 alkyl, C_3–C_7 cycloalkyl, phenyl, p-tolyl, p-chlorophenyl, benzyl, p-nitrobenzyl, or p-chlorobenzyl; and A_1 is a cephalosporin residue of the formula:



(I-a')

wherein R_3 and R_4 are as defined above, with a phosphorus acid, or the ester or the anhydride thereof.

4,043,992

METHOD FOR PREPARING ACYLATED PRODUCTS

Yasuo Fujimoto, and Nobuhiro Nakamizo, both of Machida, Japan, assignors to Kyowa Hakko Kogyo Co., Ltd., Tokyo, Japan

Division of Ser. No. 498,125, Aug. 16, 1974, Pat. No. 3,963,728, which is a division of Ser. No. 49,918, June 25, 1970, Pat. No. 3,867,424. This application Apr. 2, 1976, Ser. No. 673,149

Claims priority, application Japan, June 30, 1969, 44-51061

The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.² C07C *102/06*

U.S. Cl. 260—112.5 R **12 Claims**

1. In a process for preparing a carboxylic acid amide which comprises acylating an amino acid or ester thereof with an ester derived from an aliphatic or aromatic carboxylic acid, the improvement which comprises carrying out said acylation in the presence of an alkali-metal salt, an alkaline earth metal salt or a quaternary ammonium salt of a pyridine compound whose pyridine nucleus is directly substituted by a hydroxy group or a mercapto group, and optionally by at least one member selected from the group consisting of an alkyl group having from 1 to 6 carbon atoms, an aryl group, an aralkyl group, an alkoxy group having from 1 to 6 carbon atoms, a nitro group, a cyano group and an unsubstituted benzene ring which is fused to the pyridine nucleus.

4,043,993

PENTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Francis John Tinney; Ernest D. Nicolaides, and Alfred Campbell, all of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed June 23, 1976, Ser. No. 699,124

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 LH **8 Claims**

1. A pentapeptide of the formula

X—R—Tyr(benzyl)—Ser(benzyl)—R^1—Y

wherein X is t-butoxycarbonyl or benzyloxycarbonyl, R is a single amino acid fragment, a dipeptide fragment or tripeptide fragment utilizing amino acids selected from the group consisting of Pro. Aze, His(benzyl) and Trp; R^1 is a single bond or a single amino acid fragment or a dipeptide fragment utilizing amino acids selected from the group consisting of Ala, Trp and His and Y is lower alkoxy, hydrazino, amino, lower alkylamino or di(lower alkyl)amino with the proviso that the total number of amino acid units when R and R^1 are combined is three.

4,043,994

PENTAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Eugene Leroy Wittle; Ernest D. Nicolaides, both of Ann Arbor, and Marland Paul Hutt, Saline, all of Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed June 23, 1976, Ser. No. 699,125

Int. Cl.² C07C *103/52*

U.S. Cl. 260—112.5 LH **7 Claims**

1. A pentapeptide of the formula

X—R—Ser(benzyl)—Tyr(benzyl)—R^1Y

wherein X is t-butoxycarbonyl or benzyloxycarbonyl, R is a single amino acid fragment or a dipeptide fragment utilizing amino acids selected from the group consisting of Aze, His(benzyl) and Trp; R^1 is a single amino acid fragment or a dipeptide fragment utilizing amino acids selected from the group consisting of Ala, Leu and Pro and Y is lower alkoxy, hydrazino, amino, lower alkylamino and di(lower alkyl)amino with the proviso that the total number of amino acid units when R and R^1 are combined is three.

4,043,995

PROCESS FOR CROSSLINKING HYDROPHILIC COLLOIDS

Rainer Kitzing, and Norman Alfred Smith, both of Ilford, England, assignors to Ciba-Geigy AG, Basel, Switzerland

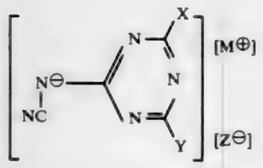
Filed May 19, 1975, Ser. No. 578,585

Claims priority, application United Kingdom, June 5, 1974, 24888/74; Oct. 25, 1974, 46165/74

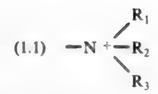
Int. Cl.² C09H *7/00*

U.S. Cl. 260—117 **12 Claims**

1. A process for crosslinking hydrophilic colloids which contain amino, imino and/or hydroxyl groups, which comprises incorporating into the hydrophilic colloid as a crosslinking agent a compound of the formula



wherein each of X and Y are a fluorine, chlorine or bromine atom or a hydroxy group, a lower alkoxy group or a radical of the formula



(I.1)

wherein R_1, R_2 and R_3 are each optionally substituted alkyl, alkenyl, alkinyl, cycloalkyl, aryl, aralkyl or together with the nitrogen atom to which they are bonded form a saturated or unsaturated ring which optionally contains yet other heteroatoms, and M is a cation and Z is an anion, one of which or neither may be required to balance the charge in the triazine ring system.

4,043,996

GELATIN MANUFACTURE-PEROXIDE LIQUEFACTION PROCESS

Thomas H. Donnelly, Western Springs, Ill., and Robert S. McGinnis, Florissant, Mo., assignors to Swift & Company, Chicago, Ill.

Filed Jan. 27, 1975, Ser. No. 544,415

Int. Cl.² C09H *3/00*

U.S. Cl. 260—118 **7 Claims**

1. A gelatin extraction process comprising the steps of: placing an uncured normally water-insoluble collagen-containing tissue in an aqueous hydrogen peroxide solution, said hydrogen peroxide being a sole lyotropic agent to effect liquefaction of said tissue; said liquefaction step being accomplished at a temperature within the approximate range of 45° to about 60° C. for about 7 to about 24 hours, the weight ratio of hydrogen peroxide to collagen within said uncured tissue being from about 1:3 to about 3:1; immobilizing said hydrogen peroxide; and drying the tissue liquefaction to recover gelatin.

4,043,997

METHOD FOR ISOLATING ALBUMIN USING INSOLUBLE SUPPORTS COUPLED TO A DYE

Duane D. Schroeder, Orinda, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

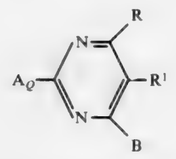
Filed May 28, 1976, Ser. No. 691,172

Int. Cl.² C07G *7/00*

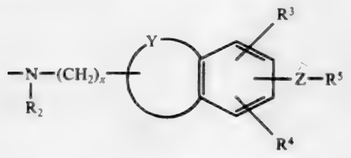
U.S. Cl. 260—122 **16 Claims**

1. A process for selectively removing albumin from aqueous fluids containing the same comprising the step of:

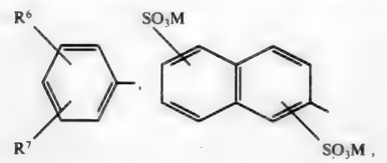
a. Contacting the albumin-containing fluid with a composition of the general formula

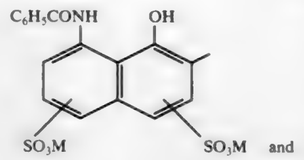


wherein A and B are different; wherein A is a support consisting of an insoluble polymer having hydroxyl groups and B is a dye having the formula

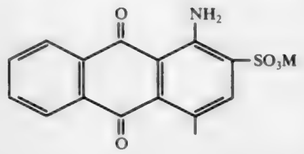


wherein R is halogen or lower alkyl; R^1 is hydrogen, SCH_3, halogen, or lower alkyl; R^2 is hydrogen or lower alkyl; R^3 and R^4 each are members of the group consisting of hydrogen, lower alkyl, lower alkoxy, hydroxy and $-SO_3M$; X is an integer from 0-1; Y is $-[H]_2$ or $-CH=CH-CH=CH-$; Z is $-NH-$ or $-N=M-$; R^5 is a substituted aryl selected from the group consisting of





and



wherein R^6 and R^7 each are members of the group consisting of hydrogen, lower alkyl, lower alkoxy, and $-SO_3M$; wherein M is hydrogen or alkali metal; and wherein Q is a weight ratio of the insoluble polymer to the remainder of the compound of between 1:1 and 50:1;

b. adsorbing the albumin on the composition, and

c. separating the composition on which the albumin is adsorbed from the aqueous phase.

4,043,998

1-(p-BENZENEDIAZONIUM)-ETHYLENEDIAMINE TETRAACETIC ACID

Claude F. Meares, Davis, Calif., and Michael W. Sundberg, Penfield, N.Y., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 513,420, Oct. 9, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 712,534

Int. Cl.² C07C *113/04;* **C07G** *7/00*

U.S. Cl. 260—141 **1 Claim**

1. Salts of 1-(p-Benzenediazonium)-ethylenediaminetetraacetic acid in which the anion is the anion of a strong acid.

4,043,999

METHYL OR METHOXY SUBSTITUTED IMINOISOINDOLINONE PIGMENTS

Ernst Model, Basel, and Andre Pugin, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

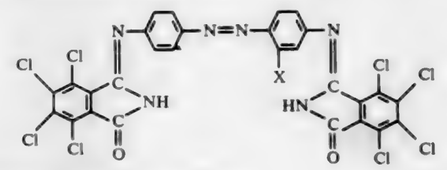
Continuation-in-part of Ser. No. 287,314, Sept. 8, 1972, abandoned. This application Mar. 3, 1976, Ser. No. 663,329

Claims priority, application Switzerland, Sept. 27, 1971, 14052/71

Int. Cl.² C09B *43/00*

U.S. Cl. 260—152 **3 Claims**

1. A compound of the formula



wherein X is methyl or methoxy.

4,044,000

SUBSTITUTED β-LACTAM ANTIBIOTICS

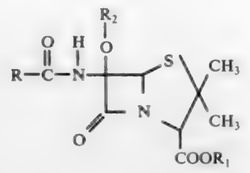
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 545,451, Jan. 30, 1975, Pat. No. 3,994,885, which is a division of Ser. No. 301,694, Oct. 27, 1972, abandoned, Continuation-in-part of Ser. No. 222,293, Jan. 31, 1972, abandoned. This application Aug. 23, 1976, Ser. No. 716,606

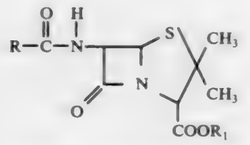
Int. Cl.[2] C07D *499/44, 499/46, 499/50, 499/58*

U.S. Cl. 260—239.1 **3 Claims**

1. The process for preparing a substituted β-lactam compound of the formula



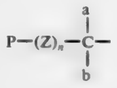
which comprises a) reacting in an inert, anhydrous solvent at a temperature between −90° and −15° C. a β-lactam ester of the formula



with between 2 and 6 equivalents per 1 equivalent of β-lactam ester of an alkali metal salt of the formula

$M^{+-}O-R_2$.

in the presence of an excess of the corresponding alcohol of the formula HOR_2; b) adding between 1 and 5 equivalents of a halogenating agent; c) acidifying said mixture; and d) recovering the substituted β-lactam ester from the reaction mixture; where in the preceding formulae R is hydrogen, C_1–C_6 alkyl, 4-amino-4-carboxybutyl, phenyl, substituted phenyl, or a group of the formula



wherein

P is phenyl, C_1–C_4 lower alkylphenyl, halophenyl, hydroxyphenyl, C_1–C_4 lower alkoxyphenyl, 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, or 1-tetrazyl;

Z is an oxygen atom, or a sulfur atom;

n is 0 or 1;

a is hydrogen or C_1–C_3 lower alkyl,

b is hydrogen, C_1–C_3 lower alkyl, protected hydroxy, amino, or protected amino;

and when n is 1, P is phenyl, C_1–C_4 lower alkylphenyl, halophenyl, hydroxyphenyl, C_1–C_4 lower alkoxyphenyl and

b is hydrogen or C_1–C_3 lower alkyl;

R_1 is hydrogen, an alkali metal cation or a readily removable ester forming moiety; and

R_2 is C_1–C_4 lower alkyl, allyl, propargyl, C_3–C_6 cycloalkyl, or benzyl.

4,044,001

PROCESS FOR PREPARING α-CHLORO-ε-CAPROLACTAM

Theodore Largman, Morris Township, and Stylianos Sifniades, Madison, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Sept. 2, 1976, Ser. No. 720,013

Int. Cl.[2] C07D *223/10*

U.S. Cl. 260—239.3 R **23 Claims**

1. A process for preparing α-chloro-ε-caprolactam which comprises reacting N-substituted-α-chloro-ε-caprolactam, wherein the N-substituent is an organic radical selected from the group consisting of aroyl, alkanoyl and arylsulfonyl radicals with ε-caprolactam at a temperature of about 50° to 250° C., thereby forming a reaction mixture containing α-chloro-ε-caprolactam and N-substituted-ε-caprolactam, and recovering the α-chloro-ε-caprolactam from the reaction mixture.

4,044,002

REDUCTION PROCESS FOR CEPHALOSPORIN SULFOXIDES

Lowell D. Hatfield, Bargersville, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed June 9, 1976, Ser. No. 694,516

Int. Cl.[2] C07D *501/04*

U.S. Cl. 544—16 **23 Claims**

1. The process for reducing a cephalosporin sulfoxide to the corresponding cephalosporin which comprises reacting said sulfoxide in an inert solvent at a temperature between −25° C. and about 50° C. with at least 2 molar equivalents per mole of sulfoxide of an acyl bromide of the formula



wherein R_3 is C_1–C_{10}alkyl; C_1–C_{10}alkyl substituted by halogen, cyano, phenyl, C_1–C_4 alkoxy, or C_1–C_4 alkoxycarbonyl; phenyl, or phenyl substituted by halogen, cyano, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy, or C_1–C_4 alkoxycarbonyl; or R_3 is a cycloalkyl group having from 3 to 8 ring carbon atoms; in the presence of a bromine scavenger wherein said sulfoxide is a 3-cephem sulfoxide or a 3-exomethylenecepham sulfoxide.

4,044,003

PROCESS FOR PREPARING 1,4-BENZODIAZEPINES

Kikuo Ishizumi, Ikeda; Kazuo Mori, Kobe; Tadashi Okamoto, Ashiya; Takeshi Akase, Nishinomiya; Takahiro Izumi, Takarazuka; Mitsuhiro Akatsu, Toyonaka; Yoshiharu Kume; Shigeho Inaba, both of Takarazuka, and Hisao Yamamoto, Nishinomiya, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 223,303, Feb. 3, 1972, abandoned. This application July 24, 1975, Ser. No. 598,621

Claims priority, application Japan, Feb. 9, 1971, 46-5511; Apr. 6, 1971, 46-21523; May 28, 1971, 46-37196

Int. Cl.[2] C07D *243/16*

U.S. Cl. 260—239 BD **8 Claims**

1. A process for producing 1-methyl-5-phenyl-7-chloro-2,3-dihydro-1H-1,4-benzodiazepine which comprises reducing 1-methyl-5-phenyl-7-chloro-1,3-dihydro-2H-1,4-benzodiazepin-2-one with diborane.

4. A process for producing 1-methyl-5-phenyl-7-chloro-2,3,4,5-tetrahydro-1H-1,4-benzodiazepine which comprises reducing 1-methyl-5-phenyl-7-chloro-1,3-dihydro-2H-1,4-benzodiazepin-2-one with diborane with application of heat.

4,044,004

TOTAL STEROID SYNTHESIS EMPLOYING SUBSTITUTED ISOXAZOLE DERIVATIVES

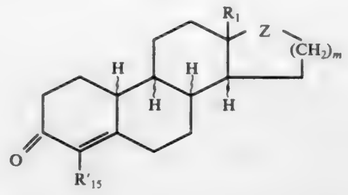
Gabriel Saucy, Essex Fells, and John William Scott, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 472,033, May 21, 1974, Pat. No. 3,984,428, which is a division of Ser. No. 278,889, Aug. 9, 1972, abandoned, which is a division of Ser. No. 39,560, May 21, 1970, Pat. No. 3,691,190, which is a continuation-in-part of Ser. No. 778,314, Nov. 22, 1968, Pat. No. 3,700,661. This application June 14, 1976, Ser. No. 695,610

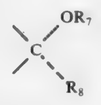
Int. Cl.[2] C07J *43/00*

U.S. Cl. 260—239.55 C **3 Claims**

1. A process for the preparation of a steroidal compound of the formula

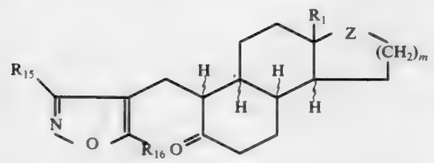


wherein R'_{15} is hydrogen or lower alkyl; Z is selected from the group consisting of carbonyl, lower alkylenedioxymethylene, di-lower alkoxymethylene, phendioxymethylene and a group of the formula

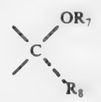


wherein R_7 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl, tetrahydropyranyl and lower acyl; R_8 is selected from the group consisting of hydrogen and lower alkyl; the configuration is trans-anti-trans-anti; R_1 is a primary alkyl group of from 1 to 5 carbons and *m* is 1 or 2

which comprises treating a starting reactant of the formula



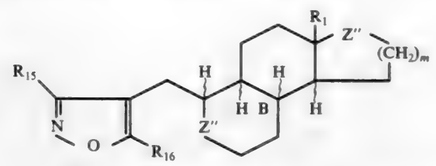
wherein R_{15} and R_{16} are hydrogen or lower alkyl, with the proviso that when R_{15} is lower alkyl, R_{16} equals R_{15}, when R_{16} is hydrogen, R_{15} is lower alkyl and when R_{15} is hydrogen, R_{16} is lower alkyl; Z is selected from the group consisting of carbonyl, lower alkylenedioxymethylene, di-lower alkoxymethylene, phendioxymethylene and a group of the formula



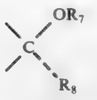
wherein R_7 is as above; R_8 is selected from the group consisting of hydrogen and lower aliphatic hydrocarbyl; the configuration is trans-anti-trans; and R_1 and *m* are as above

in the following manner;

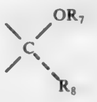
a. converting the free carbonyl group or groups of the starting reactant to a derivative of the formula



wherein R_{15}, R_{16}, R_1 and *m* are as above, the D-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

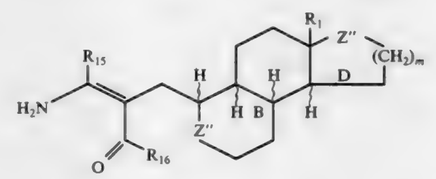


wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen and lower aliphatic hydrocarbyl; and the B-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

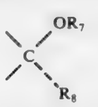


wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen;

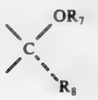
b. contacting the protected carbonyl compound of step (a) with hydrogen to yield a vinylogous amide of the formula



wherein R_{15}, R_{16}, R_1 and *m* are as above, the D-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

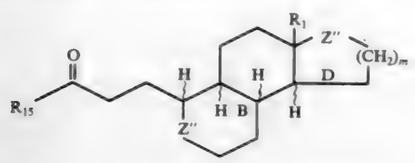


wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen and lower alkyl; and the B-ring Z″ is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

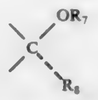


wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen;

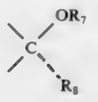
c. contacting the vinylogous amide of step (b) with aqueous base to yield a compound of the formula



wherein R_{15}, R_1 and m are as above, the D-ring Z'' is selected from the group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula

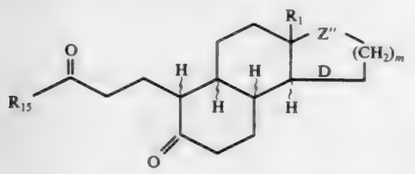


wherein R_7 is selected from the group consisting of hydrogen, lower alkyl, lower alkoxy-lower alkyl, phenyl-lower alkyl and tetrahydropyranyl and R_8 is selected from the group consisting of hydrogen and lower alkyl; and the B-ring Z'' is selected from a group consisting of lower alkylenedioxymethylene, phendioxymethylene, di-lower alkoxymethylene and a group of the formula



wherein R_7 is as above and R_8 is selected from the group consisting of hydrogen; and

d. removing the carbonyl protecting group or groups formed in step (a), regenerating the free carbonyl group or groups to yield a B-ring ketone of the formula



wherein R_{15}, R_1, m and the D-ring Z'' are as above, cyclizing the B-ring ketone and recovering the steroid.

4,044,005

PEROXIDES OF 2-OXO-CYCLOPENTA[b]FURANS

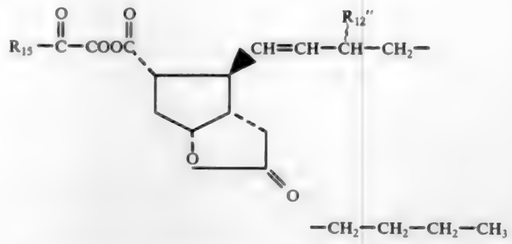
Frank Kienzle, Therwil, Switzerland, and Perry Rosen, North Caldwell, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 613,137, Sept. 15, 1975, Pat. No. 4,005,110, which is a division of Ser. No. 381,322, July 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,633, Nov. 25, 1972, abandoned. This application Oct. 6, 1976, Ser. No. 730,036

Int. Cl.[2] C07C *177/00;* **C07D** *307/77, 309/04*

U.S. Cl. 542—426 **3 Claims**

1. A compound for the formula:



wherein R_{15} is the source of variation which distinguishes one peracid from another; and R_{12}'' is hydroxy protected with a hydrolyzable ester of ether;
or enantiomer and racemate thereof.

4,044,006

OXAZINE CONTAINING UREIDOALKYLPHOSPHONATES

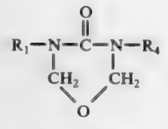
Edward D. Weil, Hastings-on-Hudson, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 50,304, June 26, 1970, Pat. No. 3,763,281. This application May 2, 1973, Ser. No. 356,526

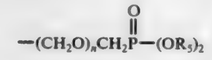
Int. Cl.[2] C07D *273/04*

U.S. Cl. 544—67 **2 Claims**

1. Ureidoalkylphosphonates corresponding to the formula:



wherein R_1 and R_4 are selected from the group consisting of hydrogen, hydroxymethyl, C_1-C_{12} alkoxymethyl, and a phosphonate group Z where Z corresponds to the formula:



in which n is an integer having a value of from 0 to 1 and R_5 is selected from the group consisting of C_1-C_{12} alkyl, allyl, C_2-C_{12} 2-chloroalkyl, and C_2–C_{12} 2-hydoxyalkyl groups, with the proviso that either of said R_1 and R_4 groups are Z groups and that at least one of said R_1 and R_4 groups is selected from the group consisting of hydrogen, hydroxymethyl, and C_1–C_{12} alkoxymethyl.

4,044,007

STABILIZATION OF BIOCIDAL COMPOSITION

William L. Howard, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 591,201, June 27, 1975, abandoned, which is a continuation of Ser. No. 869,902, Oct. 27, 1969, abandoned. This application Nov. 18, 1976, Ser. No. 742,825

Int. Cl.[2] C07D *295/02*

U.S. Cl. 544—185 **7 Claims**

1. A substantially water-free composition consisting essentially of

a. from about 10 to about 95 weight percent of an adduct of hexamethylenetetramine and an olefinic halide or acetylenic halide having two to eight carbon atoms, selected from the group consisting of a dihaloalkene and a haloalkyne, the halogen of which has an atomic number from 17 to 53 inclusive, and

b. from about 90 to about 5 weight percent of a suppressor additive, said additive being a compound which undergoes an endothermic change at a temperature below that at which spontaneous exothermic decomposition of said adduct is initiated, wherein the suppressor additive is

a. a polymeric form of formaldehyde or acetaldehyde,

b. an alkali metal- or ammonium hydrogen carbonate,

c. an alkali metal- or ammonium salt of a polycarboxylic lower alkylene acid having a total of 2 to 8 carbon atoms,

d. urea,

e. biuret or

f. triuret.

4,044,008

1-[2-HYDROXY-3-(2-NAPHTHOXY)PROPYL]-2(1H)PYRIMIDONE HYDROCHLORIDE

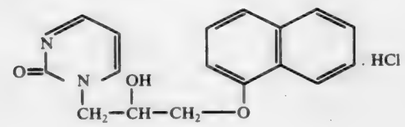
Thomas J. Schwan, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Oct. 6, 1976, Ser. No. 730,195

Int. Cl.[2] C07D *239/10*

U.S. Cl. 260—251 R **2 Claims**

1. A compound of the formula:



4,044,009

PYRIMIDINE ALCOHOLS AND DERIVATIVES THEREOF

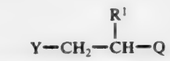
Hans Peter Panzer, Stamford; Michael Niall Desmond O'Connor, Norwalk, and Louis J. Baccei, Hartford, all of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 467,332, May 6, 1974, Pat. No. 4,007,200. This application July 16, 1976, Ser. No. 706,086

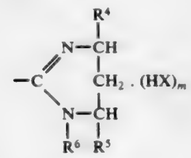
Int. Cl.[2] C07D *239/06*

U.S. Cl. 260—251 R **17 Claims**

1. A compound having the formula



wherein Y is hydroxyl or R^2O, R^2 being alkyl (C_1-C_{10}), aryl (C_6-C_{10}) or aralkyl (C_7-C_{11}), R^1 is hydrogen, methyl or phenyl and Q is



wherein m is 0 or 1, X is a halogen, and R^4, R^5 and R^6 are, individually, hydrogen, alkyl (C_1-C_4), aryl (C_6-C_{10}), aralkyl (C_7-C_{11}) or alkaryl (C_7-C_{11}).

4,044,010

DIBENZO[b,f] THIEPINS BEARING PIPERAZINYL SUBSTITUTION

Max Gerecke, Reinach, Switzerland; Jean-Pierre Kaplan, Le Plessis Robinson, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

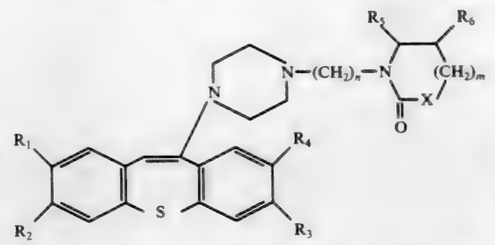
Division of Ser. No. 471,094, May 17, 1974, Pat. No. 3,954,764, which is a continuation-in-part of Ser. No. 378,732, July 12, 1973, abandoned. This application Feb. 4, 1976, Ser. No. 655,183

Claims priority, application Switzerland, Mar. 30, 1973, 4605/73; Jan. 14, 1974, 74448

Int. Cl.[2] C07D *413/14*

U.S. Cl. 260—268 TR **6 Claims**

1. A compound of the formula



wherein one of R_1 and R_2 is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, chloro, fluoro or trifluoromethyl; one of R_3 and R_4 is hydrogen and the other is methyl, methoxy, methylthio, dimethylsulfamoyl, chloro, fluoro or trifluoromethyl; n is 2; m is 0; X is oxygen, and R_5 and R_6 are hydrogen or taken together are the group



or a salt thereof with a pharmaceutically acceptable acid.

4,044,011

PROCESS FOR THE PREPARATION OF 8-HYDROXYQUINOLINE

Jean-Marie Cognion, Saint Genis Laval, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Oct. 9, 1975, Ser. No. 621,024

Claims priority, application France, Oct. 14, 1974, 74.34398

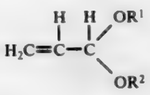
Int. Cl.[2] C07D *215/24*

U.S. Cl. 260—289 XA **14 Claims**

1. In a process for the preparation of 8-hydroxyquinoline by reacting o-aminophenol, o-nitrophenol, and acrolein or an allylidene diacetal or diester, the improvement which comprises the steps of:

a. forming a first solution of o-nitrophenol in acrolein or an acrolein derivative having the formula

(I)



wherein R^1 and R^2 are the same or different lower alkyl or lower alkanoyl group of 1–3 carbon atoms;

b. forming a second solution of o-aminophenol in an aqueous solution of a mineral acid selected from the group of hydrochloric acid, phosphoric acid and sulfuric acid or a mixture of said mineral acid and a lower mono-alkanoic acid;

c. gradually adding the solution from step (a) to the solution

from (b), at a temperature of from about 90°to 120° C thereby causing the mixture to react to form 8-hydroxyquinoline; and

d. separating the 8-hydroxyquinoline from the reaction mixture.

4,044,012

INDOLO-QUINOLIZIDINE DERIVATIVES

Csaba Szantay; Lajos Szabo; Gyorgy Kalaus; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

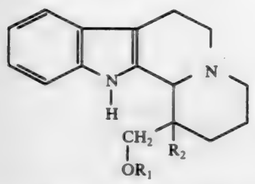
Division of Ser. No. 575,038, May 6, 1975. This application Mar. 25, 1976, Ser. No. 670,243

Claims priority, application Hungary, May 7, 1974, RI 536

Int. Cl.[2] C07D *459/00*

U.S. Cl. 260—293.53 **2 Claims**

1. A compound of the formula (I),



(I)

wherein R_1 stands for hydrogen, and R_2 stands for an alkyl group having 1 to 4 carbon atoms, the optically active enanthiomers and the pharmaceutically acceptable salts thereof.

4,044,013

1,2-DIALKYLPYRAZOLIUM COMPOUNDS HAVING 3-(OR 3,5-) NITROGEN-CONTAINING HETEROCYCLIC GROUP

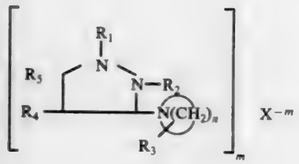
Barrington Cross, Rocky Hill, and Bryant Leonidas Walworth, Pennington, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 574,795, May 5, 1975, abandoned. This application May 5, 1976, Ser. No. 683,562

Int. Cl.[2] C07D *401/04, 403/04*

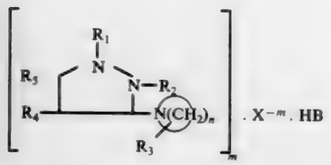
U.S. Cl. 260—293.63 **8 Claims**

1. A compound having a formula selected from the group consisting of:



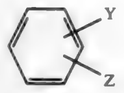
and

(I)

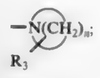


(II)

wherein R_1 and R_2 each represents alkyl (C_1–C_4); R_3 represents a member selected from the group consisting of hydrogen alkyl (C_1–C_3), alkoxy (C_1–C_3), phenyl, benzyl, cyano, carboxamido and carboxy; R_4 represents a member selected from the group consisting of hydrogen, alkoxy (C_1–C_4) and halogen; R_5 represents a member selected from the group consisting of



cyclohexyl and



Y and Z each independently represents a member selected from the group consisting of hydrogen, halogen, methyl and -alkoxy (C_1–C_4); X represents a non-phytotoxic anion with a charge of 1 to 3; *n* represents an integer from 4 to 6; *m* represents an integer from 1 to 2; and HB is an inorganic acid.

8. The compound according to claim **1** wherein the compound is: 4-bromo-1,2-dimethyl-3,5-dipiperidinopyrazolium bromide, hydrobromide.

4,044,014

SULFIDE COMPOUNDS

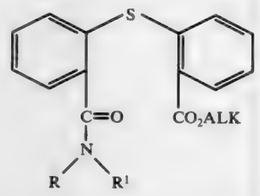
Nariman Romanshaw Mehta, and Lawrence Edward Brieaddy, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 597,697, July 21, 1975, Pat. No. 3,997,540. This application Sept. 23, 1976, Ser. No. 726,049

Int. Cl.[2] C07D *295/16*

U.S. Cl. 260—293.73 **6 Claims**

1. The compound of the formula



where R and R^1 taken together are $(CH_2)_x$ where *x* is 4 or 5 and ALK is alkyl of 1 to 4 carbon atoms.

4,044,015

IMIDAZOPYRIDINIUM COMPOUNDS AS HYPOGLYCEMIC AGENTS

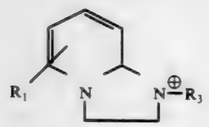
Donald E. Kuhla, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 609,914, Sept. 3, 1975, abandoned. This application Aug. 6, 1976, Ser. No. 712,204

Int. Cl.[2] C07D *487/00*

U.S. Cl. 260—294.8 C **20 Claims**

1. A compound selected from the group consisting of:



wherein R_1 is hydrogen, chlorine, methoxy or benzyloxy; R_3 is benzyl, α-naphthylmethyl, β-naphthylmethyl, β-phenethyl, or substituted benzyl wherein the substituent is chloro, fluoro, bromo, dichloro, trifluoromethyl, cyano, methylsulfonyl, sulfamoyl, dimethylsulfamoyl, carbethoxy, phenyl or methoxy; and X is a pharmaceutically acceptable anion.

4,044,016

PREPARATION OF TRIAZOLO BENZODIAZEPINES AND NOVEL COMPOUNDS

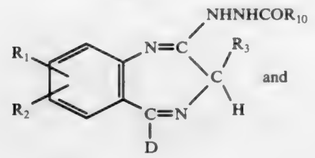
Leo Henryk Sternbach, Upper Montclair, and Armin Walser, West Caldwell, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 540,626, Jan. 13, 1975, Pat. No. 3,970,664. This application May 7, 1976, Ser. No. 684,435

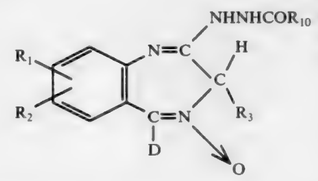
Int. Cl.[2] C07D *213/24;* A61K *31/44*

U.S. Cl. 260—295 F **1 Claim**

1. A compound selected from the group consisting of



and



wherein D is a 2-pyridyl group; R_2 and R_3 are hydrogen; R_1 is hydrogen or halogen and R_{10} is methyl.

4,044,017

SUBSTITUTED PHENYL KETONES

Cedric Herbert Hassall, Welwyn; William Henry Johnson, Hitchin; Antonin Krohn, London; Carey Ernest Smithen, Welwyn, and William Anthony Thomas, Huntingdon, all of England, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

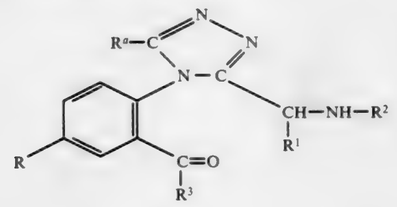
Division of Ser. No. 605,580, Aug. 18, 1975, Pat. No. 4,007,219. This application Nov. 11, 1976, Ser. No. 740,894

Claims priority, application United Kingdom, Aug. 20, 1974, 36567/74; May 21, 1975, 21321/75; Aug. 11, 1975, 36567/75

Int. Cl.[2] C07D *249/06;* A61L *31/44*

U.S. Cl. 260—295 AM **1 Claim**

1. A compound of the general formula



wherein R is selected from the group consisting of a halogen atom, nitro and a trifluoromethyl group; R^1 is a hydrogen atom or a lower alkyl group; R^2 is an acyl group derived from a naturally occurring amino acid; R^3 is a 2-pyridyl group; and R^a is selected from the group consisting of a hydrogen atom, lower alkyl or a hydroxymethyl group and the acid addition salts thereof.

4,044,018

ISOXAZOLONE DERIVATIVES, THEIR PREPARATION AND THEIR USE AS PLANT GROWTH REGULATORS

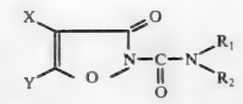
Kazuo Tomita, Yokosuka; Tadashi Murakami, Tokyo; Yoshio Yamazaki, and Toyokuni Honma, both of Nozu, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 498,617, Aug. 19, 1974, abandoned, which is a continuation of Ser. No. 308,942, Nov. 24, 1972, abandoned. This application Oct. 23, 1974, Ser. No. 517,298

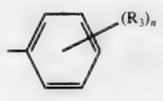
Int. Cl.[2] C07D *261/12*

U.S. Cl. 260—307 A **14 Claims**

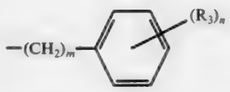
1. A compound having the formula



wherein X is hydrogen atom, lower alkyl or halogen atom; Y is hydrogen atom, lower alkyl or phenyl; and R_1 and R_2 may be the same or different and each represents lower alkyl, dialkoxyalkyl having from 1 to 3 carbon atoms in each of the alkyl and alkoxy portions, alkoxycarbonylalkyl having 1 to 4 carbon atoms in the alkoxy portion and 1 to 2 carbons in the alkyl portion, cycloalkyl having from 5 to 7 carbon atoms, alkenyl having from 3 to 5 carbon atoms, alkynyl having from 3 to 4 carbon atoms, lower alkoxy, substituted phenyl having the formula



wherein R_3 is lower alkyl, halogen, lower alkoxy, alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy portion, nitro or trifluoromethyl, and n is an integer from 0 to 3 and R_3 may be the same or different, or substituted aralkyl having the formula



wherein *m* is 1 or 2 and R_3 and n are as defined above.

4,044,019

HYDROXYPHENYLATED HYDANTOINS

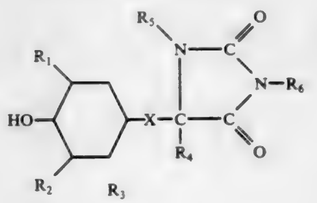
Andreas Schmidt, Reinach, Switzerland; Janet B. Peterson, Yonkers, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 469,717, May 14, 1974, Pat. No. 3,939,175, which is a continuation-in-part of Ser. No. 357,744, May 7, 1953, abandoned. This application Sept. 17, 1975, Ser. No. 614,039

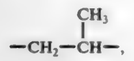
Int. Cl.[2] C07D *233/78*

U.S. Cl. 548—313 **9 Claims**

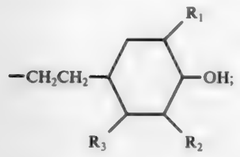
1. A compound of the formula



wherein R_1 and R_2 independently of one another denote alkyl with 1 to 4 carbon atoms, R_3 denotes hydrogen, X denotes a direct bond,



R_4 denotes alkyl with 1 to 17 carbon atoms or a group



R_5 denotes hydrogen as alkyl with 1 to 18 carbon atoms, and R_6 denotes alkyl with 1 to 18 carbon atoms.

4,044,020

PROCESS FOR PREPARING BIOTIN

Michael Marx, Sunnyvale, Calif., and Josef H. Reisdorff, Wuppertal, Germany, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed June 30, 1975, Ser. No. 591,597
Int. Cl.² C07D *495/04*
U.S. Cl. 548—303 **3 Claims**

1. The process of preparing biotin which comprises

a. ozonizing a lower alkoxycyclohexene to form the lower alkyl ester of 6-oxohexanoic acid;

b. reacting nitromethane with the lower alkyl ester of 6-oxohexanoic acid from step (a) under basic conditions in the presence of a solvent suitable for nitromethylation to form the lower alkyl ester of 7-nitro-6-hydroxy-heptanoic acid;

c. reacting the product of step (b) with a lower alkanoic acid or its halide or anhydride derivative to form the lower alkyl ester of 7-nitro-6-lower alkanoyl -heptanoic acid;

d. placing the reaction product of step (c) in a suitable solvent under basic conditions at slightly raised temperatures to form the lower alkyl ester of 7-nitrohept-6-enoic acid;

e. reacting nitroethanethiol with the reaction product from step (d) in an inert atmosphere, in a solvent and under conditions suitable for nucleophilic addition to form the lower alkyl ester of dl-7-thio-6-nitromethyl-9-nitrononanoic acid;

f. reactively contacting the reaction product of step (e) with a catalytic amount of a tertiary alkyl amine and phosphorus oxychloride under substantial anhydrous conditions in a substantially inert atmosphere in a suitable solvent to form dl-6-(4-carbo lower alkoxy-butyl)-4H-6H-thieno [3,4-d]-furoxan;

g. reducing the product from step (f) by catalytic hydrogenation or by using a suitable reducing agent and acylating with a suitable carboxylic acid of one to four carbon atoms or its acid chloride or anhydride derivative, said acid or its derivative being substituted with from 0 to 3 halogens, to form dl-2(4-carbo lower alkoxy-butyl)-3,4-bis(alkamido)-2,5-dihydro-thiophene;

h. selectively hydrogenating the product from step (g) to form dl-cis-2(4-carbo lower alkoxy-butyl)-3,4-cis-bis(alkamido)-tertrahydro-thiophene;

i. hydrolyzing and cyclizing the product from step (h) to form dl-biotin.

4,044,021

TETRASUBSTITUTED IMIDAZOLIDINE DIURETICS USEFUL IN THE TREATMENT OF HYPERALDOSTERONISM

John William Hanifin, Jr.; Robert Zalmon Gussin, both of Suffern, and Elliott Cohen, Pearl River, all of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 191,470, Oct. 21, 1971, abandoned. This application Oct. 2, 1972, Ser. No. 293,874
Int. Cl.² C07D *233/88*
U.S. Cl. 548—312 **6 Claims**

1. 1-(p-chlorophenyl)-2-imino-3-methyl-4-oxoimidazolidine.

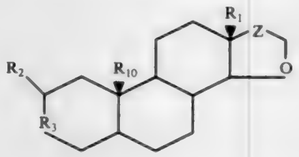
4,044,022

15-OXASTEROIDS

Perry Rosen, North Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 528,115, Nov. 29, 1974, Pat. No. 3,987,066, which is a division of Ser. No. 217,956, Jan. 14, 1972, Pat. No. 3,872,076. This application July 2, 1976, Ser. No. 702,265
Int. Cl.² C07D *231/54*
U.S. Cl. 548—369 **3 Claims**

1. A compound of the formula

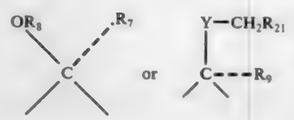


wherein

R_1 is lower alkyl of from 1 to 5 carbon atoms;

where

R_2 and R_3 taken together with carbon atoms 2 and 3 of the steroid nucleus represent a 5-membered pyrazole ring wherein one heteroatom is attached to carbon atom 3; R_{10} is hydrogen or methyl; and Z is one of the groups carbonyl, ketal protected carbonyl,



where

Y is carbonyl or



R_7 is hydrogen, lower alkyl, lower alkenyl or lower alkynyl; R_8 is hydrogen, lower alkyl, cycloalkyl, lower alkanoyl or aroyl; R_9 is hydrogen, hydroxy, or lower alkanoyloxy; R_{20} is hydroxy or lower alkanoyloxy; and R_{21} is hydrogen, hydroxy, lower alkanoyloxy or halogen.

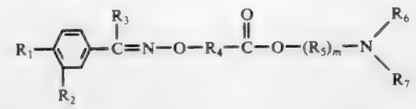
4,044,023

NOVEL BASIC SUBSTITUTED-ALKYLIDENAMINO-OXYLALKYLCARBOXYLIC-ACID ESTERS

Jan Van Dijk, and Johannes Maria Antonius Zwagemakers, both of van Houtenlaan, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 151,793, June 10, 1971, Pat. No. 3,853,955. This application Sept. 27, 1974, Ser. No. 509,807
Claims priority, application Netherlands, Mar. 2, 1971, 7008493
Int. Cl.² C07D *207/12*
U.S. Cl. 260—326.47 **4 Claims**

1. A compound selected from the group consisting of the amines of the formula:



wherein R_1 is a moiety selected from the group consisting of hydrogen, halogen, CF_3 and CH_3, R_2 is a moiety selected from the group consisting of chlorine and hydrogen, R_3 is a moiety selected from the group consisting of hydrogen and CH_3, R_4 is alkylene of up to 5 carbon atoms, m is 0 or 1, R_5 is alkylene of up to 6 carbon atoms which may be substituted by phenyl, R_6 together with R_7 and N to which they are both attached forming a cyclic moiety selected from the group consisting of pyridyl and alkyl derivatives of said pyridyl and the acid addition salts thereof with pharmaceutically acceptable acids.

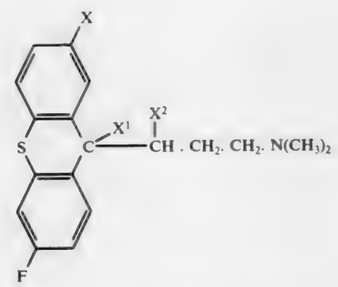
4,044,024

THIAXANTHENE DERIVATIVES

Jorn Lasse Martin Buus, Bjaeverskov; Niels Lassen, Gentofte, and Allan Johan Bigler, Copenhagen, all of Denmark, assignors to Kefalas A/S, Denmark

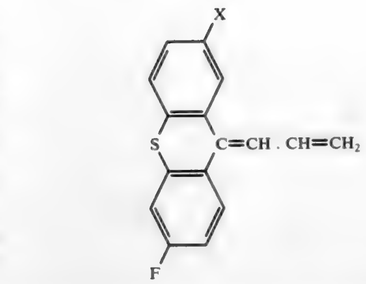
Continuation-in-part of Ser. No. 421,279, Dec. 3, 1973, abandoned. This application July 7, 1975, Ser. No. 593,559
Claims priority, application United Kingdom, Dec. 8, 1972, 56910/72
Int. Cl.² C07D *335/20*
U.S. Cl. 260—328 **4 Claims**

1. A compound of formula



wherein X is selected from the group consisting of $—CF_3$ and $—SO_2.N(CH_3)_2$, and X^1 and X^2 form together a single bond.

2. A compound of the formula



wherein X is selected from the group consisting of $—CF_3$ and $—SO_2.N(CH_3)_2$.

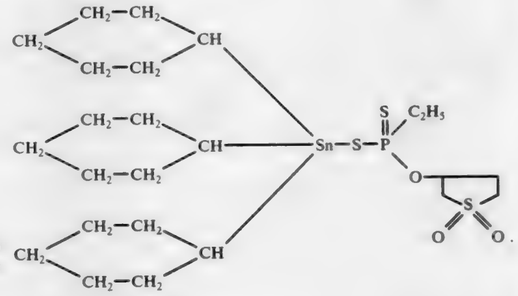
4,044,025

ORGANOTIN MITICIDAL AND INSECTICIDAL COMPOUNDS

Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 644,703, Dec. 29, 1975, Pat. No. 4,012,421, which is a division of Ser. No. 482,033, June 24, 1974, which is a division of Ser. No. 293,974, Oct. 2, 1972, abandoned, which is a continuation-in-part of Ser. No. 208,046, Dec. 10, 1971, abandoned. This application Sept. 27, 1976, Ser. No. 726,890
Int. Cl.² C07D *333/48*
U.S. Cl. 260—332.1 **1 Claim**

1. A compound of the formula



4,044,026

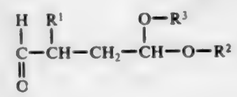
SUBSTITUTED SUCCINALDEHYDE MONOACETALS

Joachim Paust, Neuhofen, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Rhine, Germany

Filed Nov. 13, 1974, Ser. No. 523,442
Claims priority, application Germany, Nov. 24, 1973, 2358690
Int. Cl.² C07C *45/00, 47/02*
U.S. Cl. 260—340.9 R **2 Claims**

1. 2-Methyl-4-methoxy-4-phenoxybutanal.

2. A process for the production of a succinaldehyde monoacetal of the formula (I):



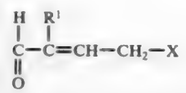
(I)

in which

R^1 is hydrogen, alkyl of one to 10 carbon atoms, cycloalkyl of five to seven carbon atoms, phenyl, or phenyl bearing alkyl as a substituent;

R^2 is alkyl of one to four carbon atoms or phenyl;

R^3 is alkyl of one to four carbon atoms; and
R^2 and R^3 may together by an ethylene group which may bear alkyl as a substituent;
wherein an α,β-unsaturated aldehyde of the formula (II):



(II)

in which R^1 has the above meanings and X is chlorine, bromine or methylsulfonyloxy is introduced into a solution of an alkali metal alcoholate, an alkali metal glycolate or an alkali metal phenolate in an alcohol of one to four carbon atoms so that the temperature of the reaction mixture does not rise substantially above 50° C and the reaction mixture is allowed to complete the reaction.

4,044,027

MALEIC ANHYDRIDE PROCESS

Robert G. Anderson, San Rafael; Alan E. Straus, El Cerrito, and John B. Wilkes, Richmond, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Aug. 27, 1976, Ser. No. 718,235
Int. Cl.² C07D *307/60*
U.S. Cl. 260—346.75 **11 Claims**

1. In a process for the conversion of normal butane to maleic anhydride at a pressure between about 15 and 100 psig and a temperature above 675° F, by contacting the normal butane with oxygen-containing gas an an oxidation catalyst disposed in a fixed catalyst bed or set of tubes in a reactor vessel, and withdrawing an effluent comprising unreacted normal butane, oxygen and maleic anhydride from the catalyst bed or tubes, the improvement which comprises cooling the effluent below 675° F before the effluent is withdrawn from the reactor vessel.

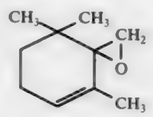
4,044,028

PREPARATION OF α,β-UNSATURATED ALDEHYDES OR KETONES

Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 468,836, May 10, 1974, Pat. No. 4,000,131. This application Sept. 15, 1976, Ser. No. 723,375
Int. Cl.² C07D *303/06*
U.S. Cl. 260—348 R **1 Claim**

1. A compound of the formula:



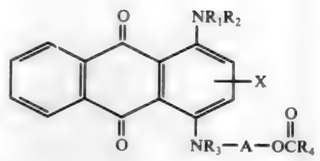
4,044,029

AMINO-ANTHRAQUINONE REACTIVE DISPERSE DYES

Stefan Koller, Ramlinsburg; Urs Karlen, Magden; Werner Kneubühler, Bockten, and Raymond Defago, Riehen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed May 26, 1976, Ser. No. 689,985
Int. Cl.² C09B *1/16, 1/40*
U.S. Cl. 260—376 **5 Claims**

1. Reactive disperse dyes of the formula (1)



(I)

wherein
R_1 represents hydrogen or alkyl,
R_2 represents hydrogen, alkyl, cycloalkyl, aralkyl or substituted or unsubstituted phenyl,
R_3 represents hydrogen or alkyl,
R_4 represents an alkyl radical of 1 to 6 carbon atoms which is substituted in α-position, or in α- and β-position, by halogen, or represents an α,β-unsaturated alkene radical which can be substituted in α- or β-position by halogen;
A represents an alkylene or cycloalkylene radical which optionally contains oxygen or sulphur,
X represents hydrogen, chlorine, bromine, cyano or $COOR_5$, and
R_5 represents alkyl.

4,044,030

PROCESS FOR THE MANUFACTURE OF N-ALKYLAMINO- AND N,N-DIALKYLAMINOANTHRAQUINONES

Zdenek Seha, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed May 20, 1976, Ser. No. 688,517
Claims priority, application Switzerland, May 23, 1975, 6665/75
Int. Cl.² C09B *1/16, 1/20*
U.S. Cl. 260—378 **6 Claims**

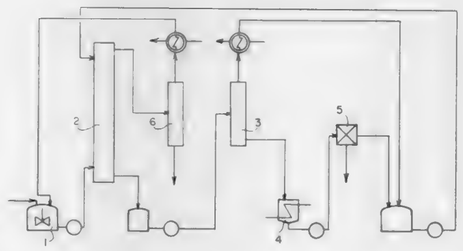
1. A process for the manufacture of N-alkylamino- and N,N-dialkylaminoanthraquinone from the corresponding nitroanthraquinones, which comprises reacting substituted or unsubstituted nitroanthraquinones or dinitroanthraquinones with at least twice the molar amount, referred to the nitro groups to be reacted, of an alkyl acid amide, at temperatures between 100° C and the boiling point of the alkyl acid amide.

4,044,031

PROCESS FOR THE SEPARATION OF STEROLS

Åke Allan Johansson, Laivastokatu 4 B 23, 00160 Helsinki 16; Riitta Helena Kristiina Kivikari, Puistokaari 15 A 11, 00200 Helsinki 20, and Elias Uolevi Suokas, Kimmeltie 26 D 29, 02100 Espoo 10, all of Finland

Filed July 2, 1976, Ser. No. 702,118
Int. Cl.² C07J *9/00*
U.S. Cl. 260—397.25 **7 Claims**



1. A process for the separation of sterols or mixtures of sterols from mixtures of unsaponifiables obtained from crude soap skimmings, soap of vegetable oil, tall oil, animal fat or the like, comprising the steps of:

1. dissolving the mixture of unsaponifiables in a water immiscible mixture of solvents containing
   30 – 100% by weight of hexane
   0 – 50% by weight of acetone
   0 – 50% by weight of methanol,
2. extracting from the solution obtained the polar components including the sterols into a mixture of
   0 – 99.9% by weight of methanol
   0 – 50% by weight of hexane
   0 – 50% by weight of acetone
   0.1 – 10% by weight of water
   0 – 10% by weight of unsaponifiables other than sterols,
3. separating the hydrophilic methanol phase,
4. concentrating the separated hydrophilic phase by evaporation, and
5. crystallizing the sterols by cooling the solution.

4,044,032

METAL DIALKYL DITHIOPHOSPHATES

Morris A. Wiley; Raymond C. Schlicht, both of Fishkill, and James O. Waldbillig, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 443,567, Feb. 19, 1974, Pat. No. 3,944,495. This application Aug. 27, 1975, Ser. No. 608,114
Int. Cl.² C08H *3/00;* **C07F** *3/06*
U.S. Cl. 260—399 **4 Claims**

1. An alkyl dithiophosphate represented by the formula:



wherein
R is a straight-chain aliphatic group containing from about 4 to 30 carbon atoms;
R' is selected from a hydrogen, alkyl and aryl group;
M is zinc;
a is an integer of from about 2 to about 12;
b is an integer of from about 1 to about 10;
n is an integer corresponding to the valence of M.

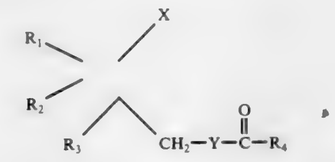
4,044,033

HIGH TEMPERATURE LUBRICANT

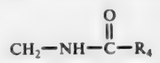
Anthony M. Fusco, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed Apr. 14, 1975, Ser. No. 568,047
Int. Cl.² C07C *103/127, 103/133*
U.S. Cl. 260—404 **7 Claims**

1. A high temperature lubricant comprising a gem disubstituted alicyclic compound in which the ring portion of said compound is cycloaliphatic hydrocarbyl and contains from about 5 and 7 carbon atoms and said compound is represented by the formula



wherein R_1 and R_2 are H or a lower alkyl group, X is a polyalkyleneoxy chain, and the gem radicals are R_3 and



wherein R_3 is an alkyl group containing 1 to about 6 carbon atoms and R_4 is an alkyl or alkylene group containing about 3 to about 20 carbon atoms.

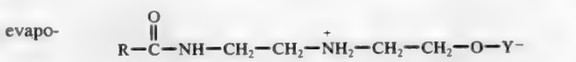
4,044,034

NITROGENOUS CONDENSATION PRODUCTS

Arvid Christiansen, North Arlington, N.J., assignor to The Miranol Chemical Company, Inc., Irvington, N.J.

Filed July 22, 1975, Ser. No. 598,092
Int. Cl.² C07C *101/26*
U.S. Cl. 260—404.5 **5 Claims**

1. A nitrogenous compound of formula:



wherein Y is a saturated residue of an α, β-unsaturated dicarboxylic acid of 4 or 5 carbon atoms wherein the carboxylic acid groups are an adjacent carbon atoms and the double bond is between the two carbon atoms or immediately adjacent to one of them and wherein one of the carboxylic acid groups may be neutralized with a base or esterified with an alcohol of 1–6 carbon atoms and R is an alkyl or alkenyl group of 5–25 carbon atoms.

4,044,035

METHOD FOR THE PREPARATION OF ALKYL TIN HALIDES

Eric J. Bulten, Bilthoven, and Francois Verbeek, Harmelen, both of Netherlands, assignors to Commer S.r.l., Lodi (Mi), Italy

Filed Mar. 26, 1976, Ser. No. 670,823
Claims priority, application Netherlands, Apr. 4, 1975, 7504073
Int. Cl.² C07F *7/22*
U.S. Cl. 260—429.7 **5 Claims**

1. A method for preparing an alkyltin halide by direct conversion of a stannous halide with an alkyl halide at raised temperatures in the presence of iodine and/or iodide as a catalyst, to obtain a dialkyl tin dihalide, comprising:
forming a mixture of said stannous halide, said catalyst, and an acid amide solvent, said acid amide solvent being present in an amount of about 1 to 4 mols per mol of said stannous halide; and
introducing, at substantially atmospheric pressure, a gaseous, lower alkyl halide into the mixture to bring about reaction of said stannous halide with said lower alkyl halide.

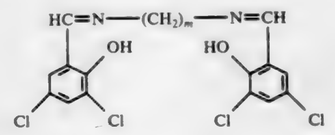
4,044,036

METAL COMPLEXES OF BIS-AZOMETHINES FROM HYDROXY-ALDEHYDES AND ALKYLENE DIAMINES

Stefan Hari, Allschwil, Switzerland; Alexander McHugh Irvine, Paisley, England; James McGeachie McCrae, Stewarton, Scotland; Laurent Vuitel, and Francois L'Eplattenier, both of Therwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

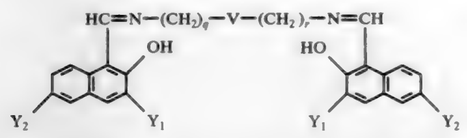
Filed Sept. 9, 1974, Ser. No. 504,597
Claims priority, application United Kingdom, Sept. 11, 1973, 42659/73
Int. Cl.² C07F *1/08*
U.S. Cl. 260—438.1 **10 Claims**

1. A 1:1 nickel complex of a bis-azomethine of the formula



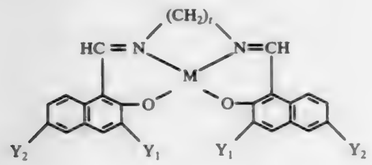
wherein *m* denotes a number from 5–7.

2. A 1:1 copper, nickel or zinc complex of a bis-azomethine of the formula



wherein V denotes an O or S atom or an imino group, Y_1 denotes a H atom, a carboxyl group, an alkoxycarbonyl group containing 2–6 C atoms, a carbamoyl group, an alkylcarbamoyl group containing 2–6 C atoms or a phenylcarbamoyl group, Y_2 denotes a H or halogen atom, an alkoxy group containing 1–4 C atoms or a nitro or cyano group and q and r denote a number from 2–4.

4. A metallized bis-azomethine of the formula



wherein M denotes a copper, nickel or zinc atom, *t* denotes a number from 3–6 and Y_1 denotes a H atom, a carboxyl group, an alkoxycarbonyl group containing 2–6 C atoms or a phenylcarbamoyl group and Y_2 denotes a H or halogen atom, an alkoxy group containing 1–4 C atoms or a nitro or cyano group.

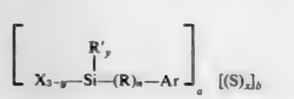
4,044,037

SULFUR CONTAINING SILANE COUPLING AGENTS

Jeffrey Y. P. Mui, Marietta, Ohio, and Arthur N. Pines, Katonah, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 24, 1974, Ser. No. 536,207
Int. Cl.[2] C07F *7/08, 7/18*
U.S. Cl. 260—448.2 N **17 Claims**

1. A polysulfide aryl silane compound having the average formula



wherein X is a hydrolyzable group selected from the class consisting of halogen, alkoxy and acyloxy radicals; R′ is an alkyl radical containing from 1 to 4 carbon atoms; *y* has a value of 0 to 2 inclusive; R is a divalent bridging group selected from the class consisting of alkylene and alkyleneoxy, radicals containing from 1 to 7 carbon atoms; *n* has a value of 0 or 1; Ar is an aryl radical containing from 6 to 12 carbon atoms; $(S)_x$ is a divalent polysulfide radical each free valence thereof being directly bonded to an aromatic carbon atom of an Ar radical whereby each Ar radical is bonded to another Ar radical through a $(S)_x$ radical, *x* has a value of from 2 to 6; *a* has a value of at least 2; *b* has a value of at least 1; and wherein the ratio of *a* to *b* is a value ranging from 0.4 to 2; and hydrolyzates and condensates thereof.

4,044,038

PROCESS FOR THE MANUFACTURE OF AT LEAST SUBSTANTIALLY BALANCED ORGANOPOLYSILOXANE MIXTURES WITH SILYL HALIDE GROUPINGS

Gerd Rossmy, Essen-Werden, Germany, assignor to Th. Goldschmidt AG, Essen, Germany

Continuation of Ser. No. 517,319, Oct. 23, 1974, abandoned. This application May 4, 1976, Ser. No. 683,085
Claims priority, application Germany, Oct. 24, 1973, 2353166
Int. Cl.[2] C07F *7/08*
U.S. Cl. 260—448.2 P **13 Claims**

1. In a process of preparing at least approximately equilibrated organopolysiloxane mixtures having silylhalide groups, by redistribution of siloxane and silylhalide groups, wherein mixtures of organohalogensilanes and organopolysiloxanes or mixtures of organopolysiloxanes with terminal silylhalide groups are equilibrated in the presence of an equilibration catalyst, the molecular weight distribution or the distribution of the individual siloxane structures of the mixtures to be treated deviating from the statistical equilibrium, the improvement which comprises that the equilibration treatment is performed in the presence of an equilibration catalyst which is a mixed catalyst comprising

a. hydrogen halide acid and

b. peralkylated acid amide,

the amount of said mixed catalyst being in the range of 0.002 to 0.2 mole per siloxane bond, said mixed catalyst being removed from the system after the equilibration treatment by phase separation.

4,044,039

HCN-OLEFIN ADDUCT USING HF

Louis DeVries, Green Brae, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 884,752, Dec. 12, 1969, abandoned. This application Nov. 13, 1972, Ser. No. 306,118
Int. Cl.[2] C07C *119/18*
U.S. Cl. 260—453 RW **8 Claims**

1. A method for preparing a primary amine in the form of a formimidate ester or thioformimidate ester, wherein the amine nitrogen is bonded to a saturated aliphatic carbon atom which comprises reacting a nonconjugated hydrocarbon olefin having a molecular weight of 28–500,000 and containing 1–50 sites of olefinic unsaturation with hydrogen fluoride and hydrocyanic acid in the presence of an alcohol mercaptan of the formula R—XH wherein X represents oxygen or sulfur and R represents a hydrocarbyl of 1–300 carbon atoms at a temperature of from about −10° to about 100° C wherein the mol ratio of hydrocyanic acid to said olefin is in the range of about 0.5–20:1, the mol ratio of said alcohol or said mercaptan to said olefin is in the range of about 0.9–10:1, and the mol ratio of hydrogen fluoride to hydrocyanic acid is in the range of about 1–10:1.

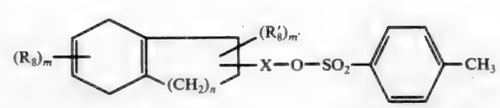
4,044,040

4,7-DIHYDROINDANYL ALKANOLS, ANALOGUES THEREOF AND THEIR CORRESPONDING TOSYLATES

Frederic Peter Hauck, Somerville; Joyce Reid, Highland Park; Venkatachala L. Narayanan, Hightstown; Christopher M. Cimarusti, Hamilton; Rudiger D. Haugwitz, Titusville, all of N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

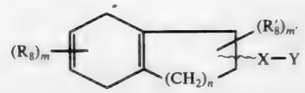
Division of Ser. No. 570,121, April 21, 1975, Pat. No. 3,984,407, which is a division of Ser. No. 372,448, June 21, 1973, Pat. No. 3,894,031, which is a continuation of Ser. No. 71,229, Sept. 10, 1970, abandoned. This application Mar. 15, 1976, Ser. No. 667,003
Int. Cl.[2] C07C *143/68, 33/02, 35/32, 35/36*
U.S. Cl. 260—456 P **4 Claims**

1. A compound of the structure



wherein X is a single bond or a straight or branched chain alkylene radical having from one to ten carbons, R_8 and R'_8 are lower alkyl or cycloalkyl having 3 to 6 ring members; and *n* is 1 to b **3;** and *m* and *m′* are 0, 1 or 2.

3. A compound of the structure



wherein X is a single bond or a straight or branched chain alkylene radical having from one to 10 carbon atoms, Y is hydroxyl, R_8 and R'_8 are lower alkyl or cycloalkyl having 3 to 6 ring members; and *n* is 1 to 3; *m* and *m′* are 0, 1 or 2; and stereoisomers thereof.

4,044,041

PREPARATION OF ESTERS OF UNSATURATED ALCOHOLS

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

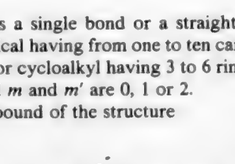
Filed Oct. 22, 1975, Ser. No. 624,694
Int. Cl.[2] C07C *67/04, 121/52, 121/54*
U.S. Cl. 260—465 D **23 Claims**

1. A process for the production of esters of monoolefinically unsaturated alcohols which comprises reacting a conjugated diolefin with an organic acid reactant under reaction conditions in the substantial absence of oxygen and employing catalytic amounts of a catalyst system consisting essentially of a copper ion, an alkali metal ion, and a halide,

wherein said conjugated diolefin is an acyclic conjugated diolefin represented by the formula

(I)

or a cyclic conjugated diolefin represented by the formula



(II)

wherein each R is individually selected from hydrogen, halogen, cyano, —COOR′, and the monovalent hydrocarbyl radicals, wherein R′ is hydrogen, or alkyl or aryl hydrocarbon radical, and n has the value of 1 to 12, and

wherein said organic acid reactant is a monocarboxylic acid R″COOH, a dicarboxylic acid R‴$(COOH)_2$, a corresponding anhydride, or both; wherein R″ is an alkyl, cycloalkyl, aryl, or combination radical, or the halogen, cyano, or −COOR′ derivative thereof, wherein the R″ radical can contain up to 4 such substituents; wherein said R‴ is a valence bond, or an alkylene, cycloalkylene, arylene, or combination radical, wherein R‴ further can contain up to 4 substituents selected from the group consisting of halogen, cyano, and —COOR′, and

employing a catalyst concentration expressed in terms of the amount of copper ion:conjugated diolefin charged in the range of about 0.01 mol percent up to an equimolar amount.

4,044,042

AMMOXIDATION PROCESS

Howard P. Angstadt, Media, Pa., assignor to Suntech, Inc., Wayne, Pa.

Filed Dec. 13, 1976, Ser. No. 750,092
Int. Cl.[2] C07C *120/14*
U.S. Cl. 260—465 C **16 Claims**

1. In the ammoxidation process of a lower alkyl substituted aromatic hydrocarbon to the corresponding nitriles, which process is carried out by reacting said hydrocarbon with ammonia and oxygen at about 375° to about 500° C., the improvement of using as catalyst an alkali metal vanadium bronze supported on α-alumina and promoted with about 2 to about 3% of tellurium, about 2 to about 3% of titanium and about 0.15% to about 0.3% of boron, said percentages being by weight of the total catalyst and its support.

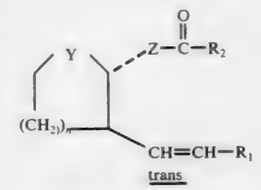
4,044,043

DERIVATIVES OF 9-OXO-13-TRANS-PROSTENOIC ACID ESTERS

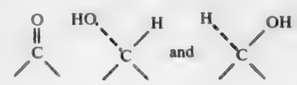
Karel Francis Bernady; Middleton Brawner Floyd, Jr., both of Suffern; John Frank Poletto, Nanuet, all of N.Y.; Robert Eugene Schaub, Upper Saddle River, and Martin Joseph Weiss, Oradell, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 427,894, Dec. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 162,711, July 14, 1971, abandoned. This application May 5, 1975, Ser. No. 574,794
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—468 D **34 Claims**

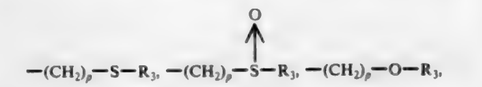
1. An optically active compound of the formula:



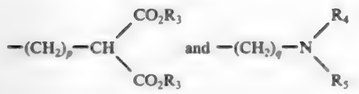
wherein *n* is the integer 1 or 2; Y is a divalent radical selected from the group consisting of those of the formulae:



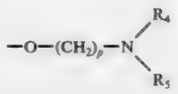
R_1 is selected from the group consisting of a straight chain alkyl group having from 3 to 10 carbon atoms, a straight chain alkyl group having from 2 to 6 carbon atoms and having one branched methyl group, a straight chain alkenyl group having from 3 to 6 carbon atoms, a straight chain ω-haloalkyl group having from 3 to 6 carbon atoms, a straight chain ω-mercaptoalkyl group having from 3 to 6 carbon atoms, a straight chain ω-carboxyalkyl group having from 3 to 6 carbon atoms, and moieties of the formulae:



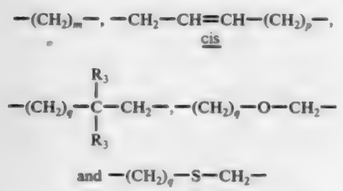
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wherein p is an integer from 2 to 4, inclusive, q is an integer from 3 to 6, inclusive, R_3 is an alkyl group having from 1 to 3 carbon atoms, R_4 is selected from the group consisting of hydrogen and lower alkyl, R_5 is selected from the group consisting of hydrogen and lower alkyl, and R_4 and R_5 taken together with the N(itrogen) is selected from the group consisting of pyrrolidino, piperidino and morpholino; R_2 is selected from the group consisting of hydroxy, alkoxy having from 1 to 4 carbon atoms, pyridoxy, 2,2,2-trichloroethoxy, and a moiety of the formula:



wherein P, R_4 and R_5 are as hereinabove defined; and Z is a divalent radical selected from the group consisting of those of the formulae:



wherein m is an integer from 1 to 8, inclusive, and p, q and R_3 are as hereinabove defined; and the pharmaceutically acceptable cationic salts thereof when R_1 is an ω-carboxyalkyl group or when R_2 is hydroxy.

4,044,044

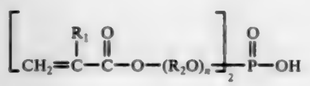
ANAEROBIC ADHESIVE COMPOSITION CONTAINING 0.05 TO 20 PARTS PER WEIGHT OF PHOSPHATE ESTERS OF HYDROXYACRYLATES PER 100 PARTS PER WEIGHT OF POLYMERIZABLE ACRYLIC ESTER MONOMER

Tsutomu Saito, 1459, Hazama-cho, Hachioji, Tokyo, Japan

Filed Apr. 21, 1976, Ser. No. 679,011
Claims priority, application Japan, Apr. 21, 1975, 50-48488
Int. Cl.² C08F *4/34, 30/02, 130/02, 230/02*
U.S. Cl. 260—47 UA **13 Claims**

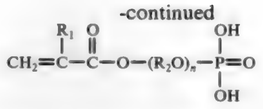
1. In an anaerobic adhesive composition comprising an anaerobically polymerizable acrylic ester monomer or mixtures thereof and an organic peroxide characterized wherein said composition contains therein phosphorus compounds having the following general formulas (A) and (B) singly or in combination, in an amount of at least 0.05 and not more than 20 parts per weight per 100 parts per weight of said monomer, thereby to enhance an adhesive force of the composition;

(A)

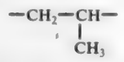


(B)

-continued



in the formulas (A) and (B), R_1 indicates H, CH_3, or C_2H_2, R_2 $-CH_2-$, $-C_2H_4-$, $-C_3H_6-$ or



and n indicates an integer from 1 to 10.

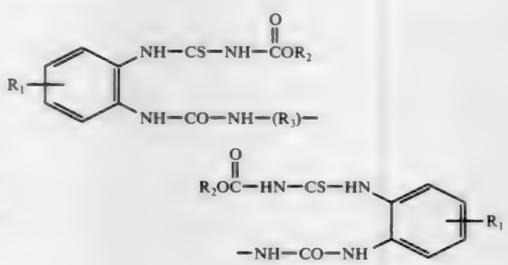
4,044,045

COMBATING PESTS WITH DI-[2-THIOUREIDO-(N-ALKOXYCARBONYL)-N-PHENYLUREIDO]-COMPOUNDS

Werner Perkow, Ahrensburg; Hans Hopp, Itzehoe, and Walter Ingwersen, Nindorf, all of Germany, assignors to Norddeutsche Affinerie, Hamburg and C. F. Spiess & Sohn, Kleinkarlbach, both of Germany

Filed May 19, 1976, Ser. No. 687,846
Claims priority, application Germany, May 24, 1975, 2523072
Int. Cl.² C07C *149/40*
U.S. Cl. 260—470 **3 Claims**

1. Di-[2-thioureido-(N-alkoxycarbonyl)-N-phenylureides] of the formula



wherein

R_1 is hydrogen, halogen, or an alkoxy or alkyl radical having 1 to 4 C atoms,

R_2 is an alkyl radical having 1 to 4 C atoms, and

R_3 is an alkylene radical having 3 to 10 C atoms, or a cycloalkylene or phenylene radical, or a combination of an alkylene radical with cycloalkylene or phenylene radicals, the radicals having a total of 6 to 20 carbon atoms.

4,044,046

METHOD FOR RECOVERING POLYOL FROM A POLYURETHANE

Osamu Kondo; Torao Hashimoto, and Hajime Hasegawa, all of Yokohama, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed July 31, 1975, Ser. No. 600,681
Claims priority, application Japan, Aug. 2, 1974, 49-87968
Int. Cl.² C07C *125/06*
U.S. Cl. 260—471 C **6 Claims**

1. A method for recovering a polyol from a polyurethane which comprises dissolving a polyurethane in an aliphatic diol having a molecular weight of about 400 to 3000 and a boiling point of higher than 180° C and decomposing the polyurethane into the polyisocyanate employed in the production of the polyurethane, the polyol employed in the production of the polyurethane and a polyamine resulting from the dissociation of the urea bond in the polyurethane by heating the dissolved polyurethane at a temperature of about 170° to 250° C in the presence of a halogenated ester of phosphoric acid, with the weight ratio of the aliphatic diol to the halogenated ester of phosphoric acid being 1:1 to 20:1, wherein said halogenated ester of phosphoric acid is tris(chloroethyl) phosphate, tris(dichloropropyl) phosphate, tris(chloropropyl) phosphate, bis(2,3-dibromopropyl) phosphate or bis(chloropropyl) monophenyl phosphate, whereby the polyamine resulting from the dissociation of the urea bond in the polyurethane employed in the production of the polyurethane is precipitated as a solid amine derivative of phosphoric acid, and the polyol employed in the production of the polyurethane is recovered together with a polyol having a urethane bond formed by reaction of said polyisocyanate employed in the production of the polyurethane with said aliphatic diol as a liquid.

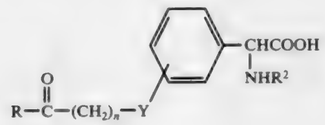
4,044,047

INTERMEDIATES FOR PREPARING SUBSTITUTED PHENYLGLYCYLCEPHALOSPORINS

John Gerald Gleason, Cornwells Heights, Pa., assignor to Smith-Kline Corporation, Philadelphia, Pa.

Division of Ser. No. 384,771, Aug. 1, 1973, Pat. No. 3,953,439.
This application Dec. 15, 1975, Ser. No. 641,064
Int. Cl.² C07C *125/06*
U.S. Cl. 260—471 C **9 Claims**

1. A compound of the formula:



in which:

Y is O, or NH;

n is one to five;

R is NH_2 or OR′, where R′ is hydrogen or lower alkyl of from one to four carbon atoms; and

R^2 is t-butoxycarbonyl.

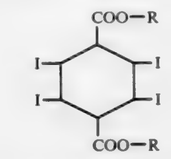
4,044,048

RADIOPAQUE ESTERS OF TETRA-IODOTEREPHTHALIC ACID

Ernst Felder, Riva S. Vitale, Switzerland, and Davide Pitre, Milan, Italy, assignors to Bracco Industria Chimica Societa per Azioni, Milan, Italy

Filed May 10, 1976, Ser. No. 684,724
Claims priority, application Switzerland, June 16, 1975, 7799/75
Int. Cl.² C07C *69/82*
U.S. Cl. 260—475 P **11 Claims**

1. A compound of the formula



wherein R is 2-hydroxyethyl, 2,3-dihydroxypropyl, 1-hydroxy-2-propyl, 3-hydroxypropyl, 1,3-dihydroxy-2-propyl, 2-hydroxypropyl, 4-hydroxybutyl, or 2-(2′-hydroxyethoxy)-ethyl.

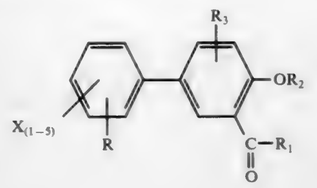
4,044,049

PHENYL BENZOIC ACID COMPOUNDS

William V. Ruyle, Scotch Plains; Lewis H. Sarett, Princeton, and Alexander R. Matzuk, Colonia, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 699,017, Jan. 19, 1968, Pat. No. 3,681,445, which is a continuation-in-part of Ser. No. 577,819, Sept. 8, 1966, abandoned, which is a continuation-in-part of Ser. No. 420,823, Dec. 23, 1964, abandoned. This application Oct. 8, 1971, Ser. No. 187,833
Int. Cl.² C07D *69/14*
U.S. Cl. 260—479 R **5 Claims**

1. A compound of the formula:



wherein

X is halogen;

R is
- halogen,
- lower alkyl, or
- lower alkoxy;

R_1 is
- amino,
- loweralkylamino,
- diloweralkylamino,
- diloweralkylaminoloweralkylamino,
- hydrazino,
- hydroxylamino,
- N-morpholino,
- N-(4-loweralkylpiperidino),
- N-[4-hydroxyloweralkyl)-piperidino], or
- hydroxyloweralkylamino;

R_2 is
- hydrogen, or
- loweralkanoyl; and

R_3 is
- hydrogen,
- lower alkyl,
- lower alkoxy,
- benzyl,
- lower alkenyl or
- halo.

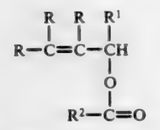
4,044,050

ISOMERIZATION OF PROPENYL ESTERS

Victor P. Kurkov, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

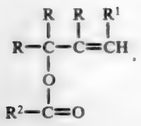
Filed Sept. 9, 1975, Ser. No. 611,763
Int. Cl.² C07C *67/28*
U.S. Cl. 260—491 **5 Claims**

1. A process for preparing propenyl ester isomers which comprises heating a diacyloxy propene selected from the group consisting of compounds of the formulas



and

-continued



wherein each R is independently selected from the group consisting of hydrogen and lower alkyl; R^1 is selected from the group consisting of, —O—C(O)R^2, and —CH_2—O—C(O)R^2; and R^2 is lower alkyl at a temperature of from about 25° to about 150° C in the presence of a catalytic amount of a nitrile/-palladium complex of the formula

$$(L)_mPd(X)_n$$

wherein L is a nitrile ligand; X is halogen complexed to palladium; n is 2; m is 1 to 2; and $m + n$ is 3 to 4.

4,044,051

9-[2-(1-ALKOXY-ETHYL)-5,5-DIMETHYL-CYCLOPENT-1-EN-1-YL]-3,7-DIMETHYL-NONA-2,4,6,8-TETRAEN ACID COMPOUNDS

Werner Bollag, Basel; Norbert Rigassi, Arlesheim, and Ulrich Schwieter, Reinach, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

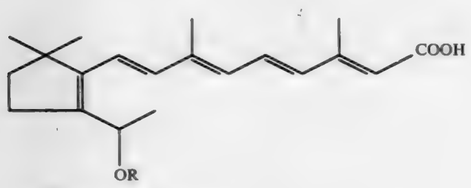
Continuation of Ser. No. 314,998, Dec. 14, 1972, abandoned. This application July 16, 1975, Ser. No. 596,499

Claims priority, application Switzerland, Dec. 22, 1971, 18721/71

Int. Cl.² A61K *31/19;* **C07C** *53/00, 61/38, 63/04*

U.S. Cl. 260—514 R **3 Claims**

1. A polyene compound of the formula:



wherein R is lower alkyl.

4,044,052

PROCESS FOR RECOVERY OF UREA FROM ITS PHENOLIC SOLUTION

Hideaki Suda, Takaishi; Iwao Dohgane, Nishinomiya, and Hirokazu Hosaka, Minoo, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Continuation of Ser. No. 303,614, Nov. 3, 1972, abandoned. This application May 19, 1975, Ser. No. 578,661

Int. Cl.² C07C *102/00;* **C07B** *21/00*

U.S. Cl. 260—96.5 C **7 Claims**

1. A process for the recovery of urea from a phenolic solution thereof which comprises adding an organic solvent selected from the group consisting of N,N-dimethylformamide, N,N-dimethylacetamide, hexamethylphosphoric triamide, pyrrolidone, dimethyl ether, diethyl ether, dipropyl ether, diisopropyl ether, dioxane, tetrahydrofuran, carbon disulfide and dimethyl sulfoxide to the said phenolic solution at a temperature wherein crystals of urea are formed, and separating and collecting the resulting crystals of urea from the obtained mixture.

4,044,053

PREPARATION OF POLYALKYLENE POLYAMINES

Michael E. Brennan; Philip H. Moss, and Ernest L. Yeakey, all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

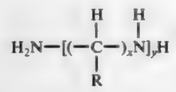
Continuation-in-part of Ser. No. 583,018, June 2, 1975, abandoned. This application May 3, 1976, Ser. No. 682,823

Int. Cl.² C07C *87/20, 85/06*

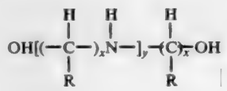
U.S. Cl. 260—583 P **8 Claims**

1. A process for preparing noncyclic polyalkylene polyamines comprising the steps of:

contacting an alkyleneamine compound having two primary amino groups of the formula:



wherein R is a hydrogen or a lower alkyl, x is a number from 2 to about 6 and y is a number from 1 to about 4 with a diol having primary or secondary hydroxy groups of the general formula:



where R is a hydrogen or a lower alkyl; x is a number from 2 to about 6; and y is a number from 0 to about 3 in the presence of a catalytically effective amount of the phosphoruscontaining substance selected from the group consisting of acidic metal phosphates, phosphoric acid compounds and their anhydrides, phosphorous acid compounds and their anhydrides, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorous acids and phosphoric acids wherein said alkyl groups have from 1 to about 8 carbon atoms and said aryl groups have from 6 to about 20 carbon atoms, alkali metal monosalts of phosphoric acid and mixtures of the above at temperatures of from about 250° to about 350° C under a pressure sufficient to maintain the mixture essentially in liquid phase wherein said alkyleneamine compound is present in molar excess; and,

recovering said polyalkylene polyamine compound from the resultant reaction mixture.

4,044,054

2-OXO-3-ALKENYL DIMETHYLAMINE

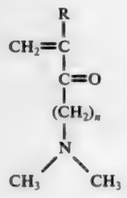
Gerry Karl Noren, Hoffman Estates, Ill., assignor to Calgon Corporation, Pittsburgh, Pa.

Filed Apr. 9, 1976, Ser. No. 675,379

Int. Cl.² C07C *97/03*

U.S. Cl. 260—584 A **2 Claims**

1. A compound of the formula



wherein:

R may be hydrogen or methyl; and

n may be 1 to 3.

4,044,055

PROCESS FOR MANUFACTURE OF TETRAKIS-(HYDROXYMETHYL)-PHOSPHONIUM SALTS

Daniel Stanley Katz, Norwalk, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 26, 1975, Ser. No. 635,521

Int. Cl.² C07F *9/54*

U.S. Cl. 260—606.5 F **6 Claims**

1. A process for synthesis of tetrakis-(hydroxymethyl)-phosphonium salt by reaction of phosphine reactant in a continuously flowing gas stream with a mixture of formaldehyde reactant and acid reactant in a continuously flowing liquid stream by continuously contacting said gas and liquid streams countercurrently in a multiple-stage series of at least three separate gas-liquid contacting reactor stages, each of said separate reactor stages comprising a pressure kettle having sparging means by which the part of the gas stream in said kettle is sparged through the part of the agitated liquid stream in said kettle as said respective streams are fed continuously through said series of separate stages.

4,044,056

SYMMETRICAL AROMATIC SULFIDE PRODUCTION

Richard T. Hawkins, Orem, Utah, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 20, 1976, Ser. No. 688,492

Int. Cl.² C07C *148/00*

U.S. Cl. 260—609 E **10 Claims**

1. A process for converting unsymmetrical aromatic sulfides to symmetrical aromatic sulfides which comprises subjecting an unsymmetrical aromatic sulfide of the formula RSR′ wherein R and R′ are different and are each selected from aryl and alkaryl radicals having from 6 to about 18, inclusive, carbon atoms per molecule to heating at an elevated temperature and for a period of time sufficient to disproportionate said unsymmetrical aromatic sulfide and form symmetrical aromatic sulfides of the formulas RSR and R′SR′ wherein each R and each R′ are as defined above with both R radicals being the same and both R′ radicals being the same, with the proviso that when said heating is carried out at temperatures below about 300° C there are present (1) a free radical source capable of generating a substantial concentration of free radicals at the reaction temperature employed or (2) an atmosphere of a free oxygen-containing gas.

4,044,057

AROMA CHEMICALS

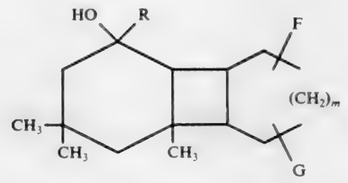
Jordan J. Bloomfield, and Dennis C. Owsley, both of St. Louis, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 645,182

Int. Cl.² C07C *35/22*

U.S. Cl. 260—617 F **4 Claims**

1. A compound represented by the structural formula



wherein m is an integer from 1 through 8; F and G represent hydrogen or alkyl having from 1 to 3 carbon atoms; and R represents hydrogen or an alkyl having from 1 to 6 carbon atoms.

4,044,058

PROCESS FOR THE PREPARATION OF α,α,α′,α′-TETRAMETHYLPHENYLENE BISCARBINOLS

Hans-Josef Buysch, Krefeld-Bockum, and Jurgen Heuser, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Sept. 29, 1975, Ser. No. 617,381

Claims priority, application Germany, Oct. 4, 1974, 2447346

Int. Cl.² C07C *29/00, 27/10*

U.S. Cl. 260—618 C **6 Claims**

1. In the process for the preparation of an α,α,α′,α′-tetramethyl-phenylene-biscarbinol by the oxidation of at least one diisopropyl benzene with air or oxygen at elevated temperatures in the presence of an aqueous solution of a strong alkali, the improvement comprising carrying out the oxidation with a monocarbinol and/or biscarbinol content of at least 52% by weight in the organic phase and an alkali concentration of 9 to 30% by weight based on the aqueous phase and 1 to 10% by weight based on the organic phase.

4,044,059

ONE-STEP METHOD FOR HYDROLYZING AND HYDROGENATING ACETAL-ALDEHYDES

Harry Bugbird Copelin, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

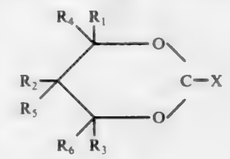
Continuation-in-part of Ser. No. 494,292, Aug. 2, 1974, abandoned. This application May 4, 1976, Ser. No. 682,979

Claims priority, application Germany, May 30, 1975, 2523840

Int. Cl.² C07C *27/14, 31/18*

U.S. Cl. 260—635 A **8 Claims**

1. A one-step process for the hydrolysis and hydrogenation of a cyclic acetal-aldehyde of the general formula



wherein

X is



which M is alkyl of 1 to 20 carbon atoms and R_1, R_2, R_3, R_4, $R_5$and R_6 are the same or different hydrogen or alkyl of 1 to 20 carbon atoms which comprises contacting the cyclic acetal-aldehyde with the combination of hydrogen, water at a molar ratio of water to acetal-aldehyde of 1:1 to 100:1, separate solid particles of a strongly acid water insoluble ion-exchange resin and a catalytic amount of a nickel hydrogenation catalyst, said ion-exchange resin to nickel catalyst weight ratio being 0.1:1 to 100:1 at a temperature of from 65° to 150° C and a hydrogen pressure of from 500 to 10,000 psig to form the corresponding polyol.

4,044,060

PROCESS FOR PREPARING GEMINAL DIHALIDES

Hans-Josef Buysch, and Karl-Heinz Scholz, both of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 12, 1976, Ser. No. 685,558

Claims priority, application Germany, June 7, 1975, 2525442

Int. Cl.² C07C *25/00, 23/00*

U.S. Cl. 260—651 R **8 Claims**

1. Process for preparing geminal dichloride from a non-enolisable compound selected from the group consisting of aldehydes and ketones which comprises reacting said compound

selected from the group consisting of aldehydes and ketones with phosgene or thionyl chloride in the presence of an organyl-phosphorus compound selected from the group consisting of di-organyl-halogenophosphine, tri-organyl-phosphine, tri-organyl-phosphonium salt, tri-organyl-phosphorus betaine, tri-organyl-phosphine alkylene, 1,1-dihalogeno-tri-organyl-phosphine, 1-halogeno-1-acyl-tri-organyl-phosphine, 1-halogeno-1-hydroxy-tri-organyl-phosphine, tri-organyl-phosphine oxide and tri-organyl-phosphine sulfide.

4,044,061

PREHEATING METHANOL EFFECTS STEADY STATE OPERATION OF CONVERSION TO GASOLINE

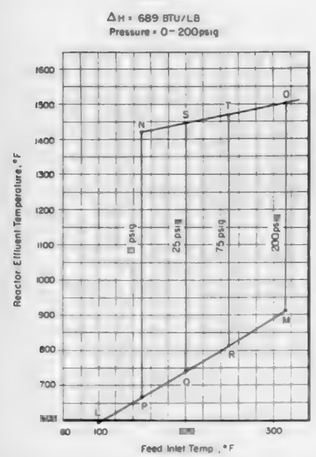
Clarence D. Chang, Princeton, N.J.; Anthony J. Silvestri, Morrisville, Pa., and John C. Zahner, Princeton, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 508,390, Sept. 23, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,633

Int. Cl.[2] C07C *1/22*

U.S. Cl. 260—668 R **10 Claims**

FIGURE II



1. In a process for the catalytic conversion of methanol to form a gaoline boiling range hydrocarbons under exothermic reaction conditions within the range of 689 to 747 BTU/LB in the presence of a crystalline zeolite conversion catalyst, the improvement which comprises,

limiting the adiabatic reactor effluent temperature of the exothermic conversion of methanol to gasoline below about 900° F by preheating the methanol feed only sufficient to take advantage of the exothermic reaction heat for providing latent heat of vaporization of the preheated feed plus the sensible heat required to take the preheated feed up to reaction temperature.

4,044,062

HYDROCARBON SEPARATION

Donald J. Korous, Maywood, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed Apr. 21, 1971, Ser. No. 136,199

Int. Cl.[2] C07C *7/13*

U.S. Cl. 260—674 SA **5 Claims**

1. A process for separating bi-alkyl substituted monocyclic aromatic isomers having more than eight and less than about eighteen carbon atoms per molecule from a feed mixture containing at least two of said isomers including the para-isomer which comprises contacting said feed with a crystalline aluminosilicate selected from the group consisting of type X structured and type Y structured zeolites containing at cationic exchangeable sites both barium and potassium cations, or potassium and beryllium cations, or potassium and magnesium cations, or rubidium and barium cations, or cesium and barium cations, or potassium and rubidium cations or potassium and cesium cations, said contacting being at adsorption conditions to selectively adsorb said para-isomer from said feed.

5. A process for separating cymene isomers from a feed mixture consisting essentially of p-cymene and m-cymene, which comprises contacting said mixture with a type X structured zeolite containing at cationic exchangeable sites both barium and potassium cations, said contacting being at adsorption conditions to selectively adsorb said p-cymene from said mixture.

4,044,063

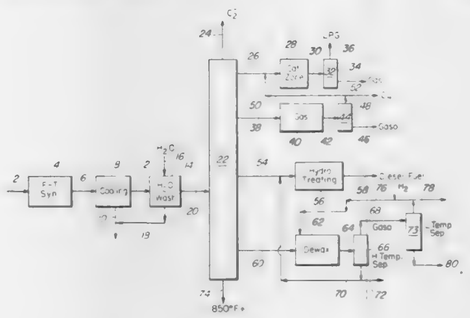
METHOD FOR ALTERING THE PRODUCT DISTRIBUTION OF WATER WASHED, FISCHER-TROPSCH SYNTHESIS HYDROCARBON PRODUCT TO IMPROVE GASOLINE OCTANE AND DIESEL FUEL YIELD

Henry R. Ireland, Woodbury, and Thomas R. Stein, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Sept. 18, 1975, Ser. No. 614,589

Int. Cl.[2] C07C *1/04*

U.S. Cl. 260—676 R **7 Claims**



1. A method for upgrading products of Fischer-Tropsch Synthesis comprising hydrocarbon and oxygenates which comprises,

cooling the product of Fischer-Tropsch Synthesis sufficient to recover a water phase separately from a liquid hydrocarbon phase and a gaseous phase comprising hydrocarbons,

water washing said liquid hydrocarbon and said gaseous phase to recover oxygenates therefrom,

separating the liquid hydrocarbon phase and said gaseous phase under conditions to recover C_2 and lower boiling gaseous material, a C_3—C_4 rich hydrocarbon fraction, a gasoline boiling fraction comprising C_5 and higher boiling material, a light oil fraction extending in boiling range from the separated gasoline fraction up to about 600° F, and a high boiling waxy hydrocarbon fraction boiling above about 600° F,

hydrodewaxing said high boiling waxy fraction in the presence of a crystalline zeolite conversion catalyst having a pore diameter greater than about 5 Angstroms; a silica-to-alumina ratio of at least 12; and a constraint index within the range of 1 to 12 which is suitable for the purpose of producing a low boiling fuel oil product fraction and a lower boiling fraction comprising gasoline boiling range material,

combining the low boiling fuel oil product with said light oil fraction and subjecting the combined materials to hydrogenating conditions sufficiently severe to produce a stabilized fuel oil product,

passing the separated C_5 plus gasoline fraction in contact with a crystalline zeolite having a pore diameter greater than about 5 Angstroms; a silica to alumina ratio of at least 12; and a constraint index within the range of 1 to 12 under conditions selected to produce a gasoline product of considerably improved octane rating and lower boiling gaseous materials which are thereafter separated from one another;

combining gaseous materials above separated from the octane improved gasoline product with the C_3—C_4 rich hydrocarbon fraction and thereafter contacting the gaseous materials thus combined with a catalyst promoting the formation of additional gasoline boiling component and liquified petroleum gas.

4,044,064

CONVERSION OF FISCHER-TROPSCH HEAVY PRODUCT TO HIGH QUALITY JET FUEL

Donald Milstein, and Thomas R. Stein, both of Cherry Hill, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,511

Int. Cl.[2] C07C *1/04*

U.S. Cl. 260—676 R **9 Claims**

1. A process of producing high quality gasoline and higher boiling products which comprises hydrotreating a wide boiling range aliphatic hydrocarbon fraction comprising oxygenates boiling in the range of about 350° to 850° F;

separating the hydrotreated product to produce a 650° F plus fraction and a 650° F minus fraction,

separating said 650° F minus fraction to produce a gasoline boiling fraction and higher boiling light oil fraction,

separating said high boiling light oil fraction to produce a kerosine boiling fraction and a higher boiling distillate fraction having a low pour point;

separately converting said kerosine boiling fraction and said 650° F plus fraction with a catalyst comprising a special zeolite component having a silica to alumina ratio of at least 12 and a constraint index of 1 to 12, at a temperature in the range of about 500° to 800° F, and at a space velocity of about 0.5 to 5 WHSV, to produce a conversion product of said zeolite catalyst,

separating product obtained by converting said 650° F plus distillate fraction with said special zeolite catalyst to produce a C_4 minus gaseous product, a naphtha boiling range product, and a higher boiling distillate product suitable for producing jet fuel boiling range material and diesel fuel; and

separating product obtained by converting said kerosine boiling fraction with said special zeolite catalyst to produce a C_4 minus gaseous product, a naphtha boiling range product and a kerosine boiling range product suitable for use as jet fuel.

4,044,065

CONVERSION UTILIZING A PHOSPHORUS-CONTAINING ZEOLITE CATALYST

Stephen A. Butter, East Windsor, and Warren W. Kaeding, Westfield, both of N.J., assignors to Mobile Oil Corporation, New York, N.Y.

Division of Ser. No. 508,308, Sept. 23, 1974, Pat. No. 3,972,832. This application Dec. 8, 1975, Ser. No. 638,862

Int. Cl.[2] C07C *3/62*

U.S. Cl. 260—677 R **19 Claims**

1. A process for the conversion of an aliphatic hydrocarbon comprising contacting the same with a catalyst comprising a crystalline aluminosilicate zeolite containing hydrogen ions, having a silica to alumina ratio of at least about 12 and a constraint index of about 1 to 12, said zeolite having been contacted with a phosphorus compound to combine therewith at least about 0.78 percent by weight of phosphorus.

4,044,066

NICKEL-PHOSPHORUS OXIDATIVE DEHYDROGENATION CATALYST

Dennis L. Ripley, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 140,963, May 6, 1971, Pat. No. 3,943,068. This application Oct. 8, 1975, Ser. No. 620,729

Int. Cl.[2] C07C *11/12*

U.S. Cl. 260—680 E **8 Claims**

1. A process for the dehydrogenation of a hydrocarbon feedstock having 2 to 12 carbon atoms and at least one



grouping which comprises contacting said feedstock in the vapor phase under dehydrogenation conditions in the presence of molecular oxygen with a catalyst consisting essentially of nickel, phosphorus, an alkali metal and oxygen, wherein the amount of nickel is in the range of 48 to 75 weight percent, the amount of phosphorus is in the range of 0.1 to 16.8 weight percent, the amount of alkali metal is in the range of about 0.1 to 10 weight percent and the amount of oxygen is sufficient to satisfy the valence requirements of all elements therein present; and wherein the amount of phosphorus is less than that required for stoichiometric nickel phosphate.

4,044,067

PURIFICATION OF UNSATURATED COMPOUNDS

Alfio J. Besozzi, and Alan W. Foster, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 420,046, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,363, Feb. 3, 1972, abandoned. This application Oct. 30, 1975, Ser. No. 627,117

Int. Cl.[2] C07C *11/12, 15/00, 11/00, 7/00*

U.S. Cl. 260—680 E **1 Claim**

1. In a vapor phase process for the preparation of unsaturated hydrocarbons comprising

catalytic oxidative dehydrogenation of a feed stream of hydrocarbon compounds having 4 to 8 carbon atoms to produce an unsaturated hydrocarbon product stream having a greater degree of ethylenic unsaturation than said feed stream and containing organic carbonyl compounds as an impurity

wherein the improvement comprises contacting said product stream in vapor phase at a temperature in the range of 250° to 800° C and containing less than 5 mol percent free oxygen with a solid catalyst for destroying said carbonyl compounds consisting of mixtures of oxides of Mn, Zn and Cr, and removing organic carbonyl compounds.

4,044,068

PROCESS FOR AUTOTHERMIC CRACKING OF ETHANE TO ETHYLENE

Bruce E. Kurtz, Marcellus, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.

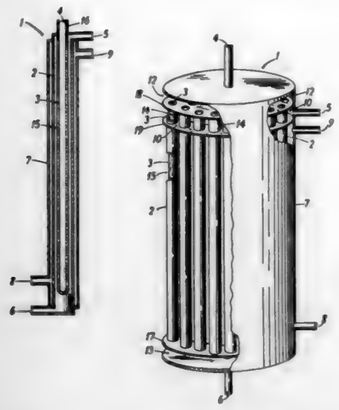
Filed Oct. 14, 1975, Ser. No. 622,347

Int. Cl.[2] C07C *5/42, 5/44, 5/48*

U.S. Cl. 260—683.3 **11 Claims**

1. A process for producing ethylene by the oxidative dehydrogenation of ethane which comprises (a) passing a gas containing ethane under pressure into a first elongated gas passage, (b) passing a gas mixture containing chlorine and oxygen under pressure into a second elongated gas passage positioned along said first gas passage, said first and second elongated gas passages being separated by a porous member, (c) maintaining the pressure of the gases in said second gas passage in excess of the pressure in said first gas passage for diffusion of oxygen and chlorine into said first gas passage, (d) maintaining said first gas passage under conditions sufficient to effect the reaction

therein of at least a portion of said diffused oxygen and chlorine with ethane for production of ethylene, and (e) withdraw-



ing the gas product containing ethylene from said first gas passage.

4,044,069

CATALYTIC COMPOSITION FOR THE ISOMERIZATION AND ALKYLATION OF HYDROCARBONS

Jean René Bernard, St-Symphorien d' Ozon; Daniel Elie Brunel, Montpellier; Auguste André Coimmeyras, Clapiers; Camille Michel Coste, Amelie-Les-Bains; Jean Joseph Itier, Montpellier, and Hubert Wilhelm Knoche, Meyzieu, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Division of Ser. No. 509,608, Sept. 26, 1974, Pat. No. 3,960,764. This application Feb. 10, 1976, Ser. No. 656,902
Claims priority, application France, Sept. 26, 1973, 73.34561
Int. Cl.[2] C07C *3/54, 5/24*
U.S. Cl. 260—683.47 **15 Claims**

1. A method for the isomerization of paraffins in which the paraffins are brought into contact under conditions suited to the isomerization with a catalytic composition which comprises a mixture of (1) a Lewis acid corresponding to the formula MX*m* in which:

M is an atom of a metal belonging to Groups IV, V and VI of the Periodic Table of Elements,

X is a halogen,

m is within the range of 3 to 6,

and (2) an acid corresponding to the formula $C_NF_{(2n+1)}SO_3H$ in which *n* is within the range of 2 to 8, and

recovering isomerized paraffins from said contact.

14. A method for the alkylation of isoparaffins with olefins in which the isoparaffins and olefins are brought into contact under conditions suited to the alkylation with a catalytic composition which comprises a mixture of (1) a Lewis acid corresponding to the formula MX*m* in which:

M is an atom of a metal belonging to Groups IV, V and VI of the Periodic Table of Elements,

X ix a halogen,

m is within the range of 3 to 6,

and (2) an acid corresponding to the formula $C_NF_{(2n+1)}SO_3H$ in which *n* is within the range of 2 to 8, and

recovering alkylate product from said contact.

4,044,070

POWDER PAINT BLENDS OF AN EPOXY AND HYDROXY-FUNCTIONAL COPOLYMER AND A CARBOXY-TERMINATED COPOLYMER

Santokh S. Labana, Dearborn Heights, and Ares N. Theodore, Farmington, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 426,164, Dec. 19, 1973, Pat. No. 3,959,405. This application Feb. 18, 1976, Ser. No. 659,178
Int. Cl.[2] C08L *63/10*
U.S. Cl. 260—836 **2 Claims**

1. In a thermosettable powder paint which exclusive of pigments, catalysts, antistatic agents, and plasticizers, the same being conventional non-reactive additives to a thermosettable powder paint, consists essentially of a coreactable particulate mixture of

A. an epoxy-functional copolymer of monoethylenically unsaturated monomers consisting essentially of about 5 to about 20 weight percent of a glycidyl ester of a monoethylenically unsaturated carboxylic acid and about 80 to about 95 weight percent of other monoethylenically unsaturated monomers, and having a glass transition temperature in the range of about 40° to about 90° C. and a molecular weight in the range of about 1500 to about 15,000,

B. as crosslinking agent, a carboxy-functional polymer,

C. 0.05 to about 4 weight percent of a non-reactive polymeric flow control agent based on the weight of said coreactable particulate mixture,

the improvement wherein:

1. said epoxy-functional copolymer is qualitatively difunctional and said other monoethylenically unsaturated monomers consist essentially of difunctional monomers selected from the group consisting of hydroxyethyl acrylates and methacrylates, hydroxypropyl acrylates and methyacrylates, and hydroxybutyl acrylates and methacrylates in an amount comprising about 2 to about 10 weight percent of said copolymer and monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1—C_8 monohydric alcohol and acrylic acid, esters of C_1—C_8 monohydric alcohol and methacrylic acid and C_8—C_{12} monovinyl hydrocarbons, and
2. said carboxy-functional polymer has molecular weight in the range of about 1500 to about 15,000 and is a copolymer of about 5 to about 20, weight percent of an alpha-beta olefinically unsaturated monocarboxylic acid selected from acrylic and methacrylic acid and about 80 to about 95 weight percent of alpha-beta, monoethylenically unsaturated monomers consisting essentially of monofunctional monomers selected from the group consisting of esters of a C_1 - C_8 monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid, and C_8 - C_{12} monovinyl hydrocarbons, said esters of a C_1 - C_8 monohydric alcohol and a monocarboxylic acid selected from acrylic acid and methacrylic acid comprising in excess of 50 weight percent of said carboxy-functional polymer, and is present in said coreactive particulate mixture in an amount that provides about 0.4 to about 1.4 carboxyl groups per functional group on said epoxy-functional copolymer.

4,044,071

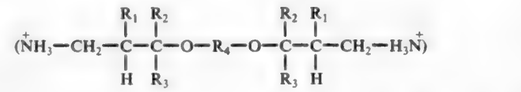
SINGLE STEP PREPARATION OF BLOCK COPOLYMER OF POLYAMIDES

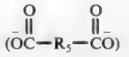
Stephen L. Nickol, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Nov. 8, 1976, Ser. No. 740,160
Int. Cl.[2] C08L *77/00*
U.S. Cl. 260—857 TW **6 Claims**

1. A process for forming a block polyamide copolymer comprising:

a. mixing in an inert atmosphere a molten melt spinnable polyamide and a dry salt selected from the group consisting of prepolyamides represented by the formula:





wherein

R_1, R_2 and R_3 are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls; and

R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes; and

R_5 is selected from the group consisting of C_6–C_{14} arylenes, C_0–C_{10} alkylenes and C_3–C_{10} isoalkylenes; and the salt content amounts to between from about 10 weight % to about 75 weight % of the total weight;

b. heating and mixing in the inert atmospheres resulting mixture of the salt and the polyamide to a temperature in the range of between from the melting point of higher melting component to below about amide-interchange temperature to a blend of the melt-spinnable polyamide and polyamide which would result from the polymerization of the salt; and

c. continuing mixing at the aforementioned temperature and in the inert atmosphere until substantially all of the salt and the polyamide are converted to the block polyamide copolymer.

4,044,072

FLAME RETARDANT COMPOSITIONS AND METHODS FOR THEIR PREPARATION

Irving Touval, Edison, N.J., assignor to M&T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 325,036, Jan. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 179,167, Sept. 9, 1971, abandoned, which is a continuation-in-part of Ser. No. 68,538, Aug. 31, 1970, abandoned. This application Mar. 5, 1976, Ser. No. 664,193
Int. Cl.[2] C08K *5/03, 3/38, 3/22*
U.S. Cl. 260—859 PV **6 Claims**

3. A polymer composition possessing enchanced flame retardng characteristics comprising a normally flammable non-halogen-containing polymer selected from the group consisting of polyolefins, polyesters, vinyl polymers, polyurethanes and acrylic polymers in combination with a) between 10 and 50%, based on the weight of said polymer composition, of a halogen source selected from the group consisting of chlorine-containing hydrocarbons, bromine-containing hydrocarbons, poly(vinyl chloride), poly(vinylidene chloride) and copolymers wherein at least 50% of the repeating units are derived from one or both of vinyl chloride and vinylidene chloride, and b) from 0.5 to 25 parts by weight per 100 parts of said polymer, of a mixture of hydrated stannic oxide and hydrated zinc borate wherein the zinc borate constitutes from 50 to 65%, based on the total weight of said mixture.

4,044,073

HIGH IMPACT STRENGTH BLENDS OF POLYBUTYLENE TEREPHTHALATE

Arthur L. Baron, and Herbert L. Rawlings, both of New Martinsville, W. Va., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed May 23, 1975, Ser. No. 580,400
Int. Cl.[2] C08L *67/02*
U.S. Cl. 260—860 **19 Claims**

1. A thermoplastic resin having a drop dart impact resistance of at least about 60 foot-pounds and comprising an intimate mechanical blend of:

a. 60 to 90 wt.% of polybutylene terephthalate with an intrinsic viscosity of at least about 0.95,

b. 10 to 20 wt.% of an aromatic polycarbonate having a melt index of 0.1 to 25 gm/10 min. at 572° F (ASTM - D-1238); and

c. 0 to 20 wt.% of a flame retardant package comprising

i. an aromatic bromine compound present in sufficient amount to provide about 3.5 to 10 wt.% bromine based on the total weight of the resin, and

ii. an antimony containing compound present in sufficient amounts to provide about 3 to 8 wt.% of antimony based on the total weight of resin,

at least one of said polybutylene terephthalate and said polycarbonate being in the form of a powder at the time the blend is produced.

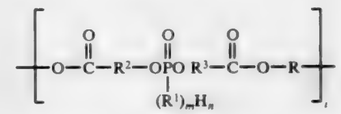
4,044,074

FLAME RETARDANT POLYCARBOXY ALKYL AND ARYL PHOSPHONATES

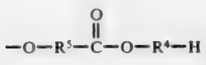
Edward N. Walsh, New City, and Milton L. Honig, Bronx, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Mar. 22, 1976, Ser. No. 669,004
Int. Cl.[2] C07F *9/40*
U.S. Cl. 260—928 **4 Claims**

1. A compound having the formula:



wherein R is selected from the group consisting of C_2–C_{10} alkylene, arylene, C_7–C_{20} alkylene substituted arylene, C_3–C_{20} cycloalkylene, C_4–C_{20} vinylene and derivatives of the foregoing containing non-labile pendant halogens, C_1–C_6 alkyl groups, C_1–C_6 haloalkyl groups, vinyl groups, ether groups and C_1–C_6 alkyl alcohol groups; R^1 is selected from the group consisting of C_1–C_{10} alkyl, aryl, C_7–C_{20} alkyl substituted aryl, C_2–C_{10} alkenyl, phenoxy, C_1–C_{10} alkoxy, aryloxy, and C_3–C_{20} cycloalkyl, and derivatives thereof containing non-labile pendant halogens, C_1–C_6 alkyl groups, C_1–C_6 haloalkyl groups, vinyl groups, ether groups, and C_1–C_6 alkyl alcohol groups and



and OR^4H wherein R^4 has the same definitions as R, and R^4 and R can be the same or different; R^2, R^3 and R^5 are straight or branched C_1–C_{10} alkylene and can be the same or different; i is an integer from about 2 to about 20; the integers represented by m and n are different and are 0 to 1.

4,044,075

DIALKYLPHOSPHONOPROPIONIC ACID AMIDES AND PROCESS FOR THEIR MANUFACTURE

Horst Jäger, Bettingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 10, 1975, Ser. No. 639,320
Claims priority, application Switzerland, Dec. 20, 1974, 17036/74
Int. Cl.[2] C07F *9/40*
U.S. Cl. 260—943 **9 Claims**

1. Dialkylphosphonopropionic acid amides of formula



wherein R is straight-chain or branched alkyl of 1 to 8 carbon atoms, R_1 is hydrogen or methyl, R_2 is hydrogen or C_nH_{2n+1} and *n* is an integer from 1 to 24.

4,044,076

METHOD FOR PRODUCING PHOSPHORUS-CONTAINING POLYMERS

Yoshiya Kametani; Tetsuro Nakahama, both of Yokohama; Atsushi Kawai, Hiroshima, and Koji Mimura, Otake, all of Japan, assignors to Nitto Chemical Industry Co., Ltd. and Mitsubishi Rayon Co., Ltd., both of Tokyo, Japan

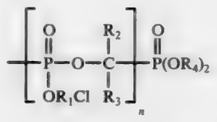
Filed Feb. 27, 1976, Ser. No. 661,861

Claims priority, application Japan, Apr. 18, 1975, 50-46549; Apr. 18, 1975, 50-47925

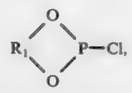
Int. Cl.[2] C07F *9/40*

U.S. Cl. 260—969 **8 Claims**

1. In a method for producing a phosphorus-containing polymer having the formula:



by reacting a cyclic chlorophosphite compound having the formula



a ketone compound having the formula



and a triorganophosphite compound having the formula

$P(OR_4)_3$

wherein R_1 is ethylene or propylene, R_2 and R_3 are methyl or ethyl and may be the same or different, R_4 is an alkyl group having 1 to 4 carbon atoms or an aralkyl group in which the alkyl substituent has 1 to 4 carbon atoms and the hydrogen atoms in these groups may be substituted with chlorine or bromine, and *n* is an integer of from 1 to 1000, the improvement which comprises:

reacting said compounds in the presence of an active halide represented by the formula

$R_5—X$

wherein R_5 is an unsaturated or saturated aliphatic, alicyclic or aromatic group having 1 to 10 carbon atoms or a combination thereof, and R_5 may contain a carbonyl group or a sulfonyl group and X is halogen at a temperature of from −50° C to 200° C.

4,044,077

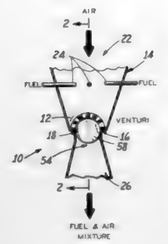
VARIABLE VENTURI NOZZLE-MATRIX CARBURETOR ADD METHODS FOR INTERMIXING FUEL AND AIR

Viney Kumar Gupta, Newport Beach, Calif., assignor to Matrix, Inc., Santa Ana, Calif.

Filed Feb. 25, 1976, Ser. No. 661,318

Int. Cl.[2] F02M *29/04*

U.S. Cl. 261—23 A **25 Claims**



1. Apparatus for substantially homogeneously intermixing flows of fuel and air to be supplied to an engine or the like, which comprises:

a. a chamber adapted for receiving mainstream flows of fuel and air and for discharging a substantially homogeneous mixture of said flows,

b. a matrix including a number of nozzle cells arranged in generally parallel flow, as opposed to series flow, relationship,

said nozzle-matrix being disposed within the chamber in a position adapted for receiving at least a portion of the mainstream flows of fuel and air and for causing said received flow portion to be divided into separate subflows through said nozzle cells,

said nozzle cells being arranged, oriented, and structured to focus said subflows therefrom towards a common downstream cross flow mixing zone defined by the nozzle-matrix center of curvature and adapted for substantially homogeneously intermixing fuel and air from said mainstream flows, at least most of said nozzle cells having cross sections which converge towards said common mixing zone and having nozzle cell lengths at least comparable to cross sectional dimensions thereof.

4,044,078

AIR HANDLER

Richard E. Curtis, Pleasanton; Robert H. Dench, Monte Sereno, and Victor J. Dervin, Cupertino, all of Calif., assignors to N.P.I. Corporation, Burlingame, Calif.

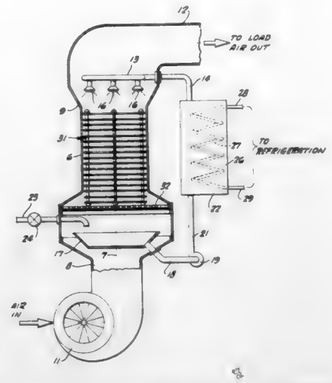
Filed Feb. 9, 1976, Ser. No. 656,121

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—30 **1 Claim**

1. An air handler especially for use with a produce storage room comprising a housing having an upright tubular portion, a transversely enlarged lower portion immediately below said tubular portion, a reduced vertical inlet portion opening into the bottom of said enlarged lower portion, an enlarged vertical outlet portion opening from the top of said tubular portion, means for supplying air above atmospheric pressure to said inlet portion, means for conducting air from said outlet portion to said storage room, a water cooler, a water collector positioned substantially centrally in said enlarged lower portion spaced above and extending entirely across said inlet portion and spaced below and extending entirely across said tubular portion, said collector being of less transverse dimension than said enlarged portion to provide an air flow path therearound from said inlet portion to said tubular portion, a water distributor in said outlet portion, means for withdrawing water from said collector and propelling said water through said water cooler to said distributor to fall from said distributor through said tubular portion back to said collector, a transverse grid

base extending across said enlarged lower portion above said collector, and a water and air baffle unit in said tubular portion in the path of water falling from said distributor to said collector, said unit including a plurality of superposed expanded metal flat plates having diamond-shaped openings between connecting bars therein and each extending horizontally substantially across said housing, said unit also including vertical rods at their lower ends resting loosely on said transverse grid base for transverse movement and supporting individual ones of said plates at vertical intervals from adjacent ones of said plates to provide intervening spaces between said plates for air and water flow.



4,044,079

DROP LINE DEVICES

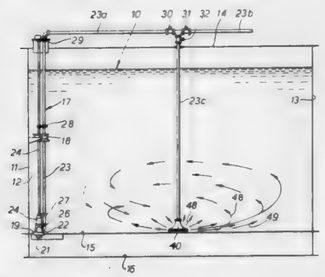
Oyvind Tveit, Skjoldtun, Norway, assignor to Patents and Developments A/S, Helldal, Norway

Filed Nov. 20, 1975, Ser. No. 633,782

Claims priority, application Norway, Nov. 20, 1974, 744164

Int. Cl.[2] B01F *3/04*

U.S. Cl. 261—36 R **6 Claims**



1. In combination with a storage tank for fluid cargo, a drop line device for circulating the fluid cargo within said tank, said drop line device comprising

a pump having an inlet opening into said tank to receive a flow of fluid cargo;

a conduit connected to said pump and disposed within said tank to receive a pressurized flow of the fluid cargo from said pump; and

a discharge head connected to said conduit and disposed above a bottom of said tank to discharge the pressurized flow of fluid cargo in a plurality of currents into said tank outwardly of said discharge head to produce strong and concentrated currents of the fluid cargo along the bottom of said tank, said discharge head including a skirt portion having a convexly curved inner surface, an inset member having a concavely curved inner surface opposite said surface of said skirt portion, and a plurality of separating walls extending between said surfaces to define branch passages between each first pair of walls communicating with said conduit and a hollow space between each second pair of walls, wherein the sum of the cross-section of said branch passages is less than the internal flow cross-section of said conduit to provide an increase in flow velocity of the flow at the outlets of said passages.

4,044,080

CARBURETOR

Hiromitsu Matsumoto, and Kazuo Uchiyama, both of Hamamatsu, Japan, assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

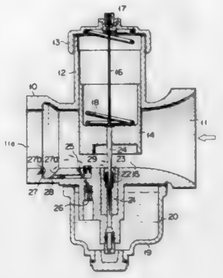
Continuation of Ser. No. 536,407, Dec. 26, 1974, abandoned.

This application June 17, 1976, Ser. No. 696,931

Claims priority, application Japan, Dec. 28, 1973, 49-120

Int. Cl.[2] F02M *29/00*

U.S. Cl. 261—44 R **11 Claims**



1. In combination: a carburetor having a piston type throttle valve defining a carburetor throat of variable cross-section, said cross-section being reduced so that flow of fluid therethrough generates a reduced pressure therein; an upstream air passage for exposure to atmospheric pressure; a downstream mixture supply passage for connection with an intake port of an internal combustion engine, said carburetor throat interconnecting and being placed immediately between said passages; supply means for delivering fuel to said carburetor throat, catching means downstream from said throat for catching liquefied fuel which has deposited on the inner wall of the mixture supply passage and then flowed downstream; and return passage means for conducting the recovered liquefied fuel from the catching means to the carburetor throat by virtue of a difference in pressure between the pressure in the mixture supply passage at the catching means and the pressure in the carburetor throat, said return passage means having a first opening opening directly into the carburetor throat to return said liquefied fuel thereto, the rate of flow of said liquefied fuel being determined by its availability and by the difference between said pressures.

4,044,081

DEVICE IN CARBURETTORS, PARTICULARLY FOR INTERNAL COMBUSTION ENGINES

Franz Weidlich, Snapphanevagen 150, 175 34 Jarfalla, Sweden

Filed Feb. 3, 1976, Ser. No. 654,883

Claims priority, application Sweden, Feb. 6, 1975, 7501340

Int. Cl.[2] F02M *17/16*

U.S. Cl. 261—51 **8 Claims**

1. A carburetor device for an internal combustion engine having a combustion air inlet duct, which comprises

a. a rotatable member mounted for rotation in the inlet duct about the axis thereof, the rotatable member defining

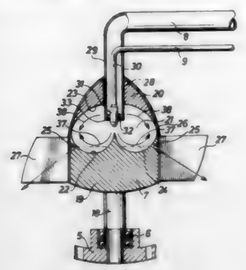
1. a substantially heart-shaped interior chamber,

b. means for supplying fuel under pressure to the interior chamber, the fuel supplying means including

1. an axially extending jet portion mounted centrally in the interior chamber for ejecting the fuel thereinto,

c. means for supplying a gaseous medium under pressure to the interior chamber whereby the gaseous medium is mixed with the fuel therein,

1. curved surfaces in the interior of the rotatable member defining the heart-shaped interior chamber and merging in axial alignment with the jet portion into a fuel flow



dividing portion for deflecting the fuel flow from the axis of rotation towards the periphery of the chamber, and

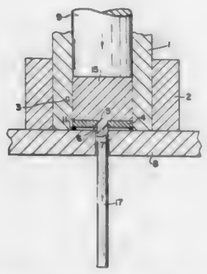
d. outlet channels in the rotatable member in communication with the periphery of the interior chamber for exhausting the fuel-gaseous-medium mixture therefrom, the outlet channels being arranged to impart a rotational force to the rotatable member.

4,044,082

MULTIPLE EXTRUSION OF POLYCRYSTALLINE EXTRUDATES

King Harry Rosette, Chagrin Falls, Ohio, assignor to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 179,787, Sept. 13, 1971, abandoned. This application Dec. 17, 1973, Ser. No. 425,090
Int. Cl.[2] B29D *11/00*
U.S. Cl. 264—1 **2 Claims**



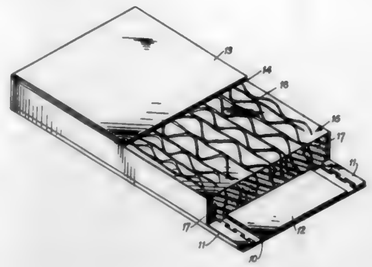
1. A process of making a fully dense, optically integral, polycrystalline body comprising extruding an optically single crystal ingot at a temperature below its melting point but above about one-half its melting point measured in degrees Centigrade, and under sufficient pressure to produce a first extrudate, and re-extruding said first extrudate at a temperature below its melting point but above about one-half its melting point measured in degrees Centigrade, and under sufficient pressure to produce a re-extrudate, said re-extrudate having a structure different from said first extrudate in that said re-extrudate exhibits a characteristic first scatter pattern of a visible laser beam which first pattern is distinguishable from a second scatter pattern of said beam through said first extrudate.

4,044,083

METHOD OF MAKING PLASTIC SKI

John G. Howe, and William L. Schmidt, both of Boulder, Colo., assignors to AMF Incorporated, White Plains, N.Y.

Division of Ser. No. 410,825, Oct. 29, 1973, Pat. No. 3,930,658. This application July 23, 1975, Ser. No. 598,196
Int. Cl.[2] B29D *27/04*
U.S. Cl. 264—45.3 **3 Claims**



1. A method of making aluminum and plastic foamed sandwich ski structure comprising the steps of preforming top and bottom ski subassemblies, laying said top subassembly in the bottom of a mold, spreading depositing and a foamable thermosetting resin material in liquid form over said top subassembly, inserting a slightly oversized corrugated paper laminate member having strips of compressible highly porous foam material on opposite sides thereof into said foamable thermosetting resin over said laminated member and strip members closing said mold to partially crush said laminate member and compress said strip members whereby the same bears against said top and bottom subassemblies to retain them seated in said mold to the desired thickness of a core between said top and bottom subassemblies, and retaining said mold closed until said liquid foamable thermosetting resin material foams, cures and unites to the preform to form a rigid foamed plastic sandwich ski structure.

2. In a method as in claim **1**, wherein said top subassembly comprises a top plastic running surface and a first strip of aluminum adhered to the underside of said top plastic running surface, said top subassembly being inverted in said mold, said bottom subassembly comprising a plastic bottom running surface having a pair of steel edges adhered to opposite side edges thereof and a second strip of aluminum adhered to the top surface of said bottom running surface, said bottom subassembly being inverted in said mold, and said corrugated laminate is constructed from narrow strips of paper oriented perpendiculr to said top and bottom subassemblies, said corrugated member having a thickness in excess of said desired core thickness whereby the same is partially crushed when said mold is closed while still bearing against said top and bottom subassemblies to space them from each other to said desired core thickness and said foamable thermosetting resin material has glass micro-balloons added thereto.

4,044,084

METHOD OF REMOVING AN ARTICLE FROM A CHAMBER HAVING A REDUCED PRESSURE THEREIN

Arthur L. Phipps, 6204 Raymond Court, Erie, Pa. 16505

Filed Aug. 11, 1975, Ser. No. 603,715
Int. Cl.[2] B29D *27/00*
U.S. Cl. 264—51 **2 Claims**

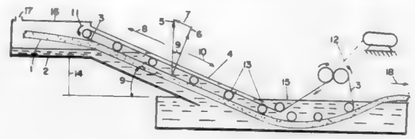
1. In a method of producing a low density foamed thermoplastic resin article by extruding a foamable thermoplastic resin into a chamber at subatmospheric pressure and withdrawing the foamed thermoplastic resin extrudate from said chamber into the atmosphere, the improvement comprising,

providing a vacuum chamber with means to evacuate it,

a barometric leg connected to said vacuum chamber and terminating in a pool of liquid open to the atmosphere,

the density of the liquid being greater than the density of said foamed thermoplastic resin extrudate and the barometric leg having a conveyor therein extending from the vacuum chamber into said pool of liquid,

conveying said extrudate from said chamber without substantial tension sufficient to deform said extrudate into said pool of liquid whereby said workpiece floats up into



engagement with said conveyor and moving said extrudate with said conveyor into said pool of liquid and through said liquid out into said atmosphere,

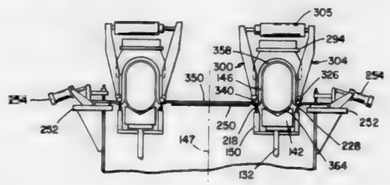
said conveyor having a relatively flat underside inclined at an acute angle to the horizontal such that friction between the workpiece and the conveyor is sufficient to cause said extrudate to move along with the conveyor through said pool of liquid.

4,044,085

METHOD FOR FORMING A TUBE ARTICLE ON A CORE

Charles E. Grawey, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 385,956, Aug. 6, 1973, abandoned. This application June 20, 1975, Ser. No. 588,732
Int. Cl.[2] B29C *17/04;* B29H *15/00*
U.S. Cl. 264—90 **9 Claims**



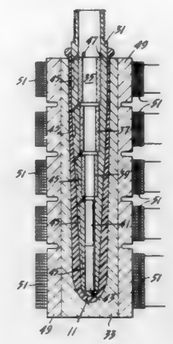
1. A method of forming a portion of a tube on a toroidal core comprising the steps of: positioning a sheet of elastomeric material adjacent the toroidal core along one side thereof; depositing elastomeric material of said sheet thereof onto said toroidal core along a continuous path thereof; and applying force to an annular portion of elastomeric material associated with said core to urge said annular portion of elastomeric material against the core, independent of any force used to initially deposit said elastomeric material of said sheet onto said core along said continuous path thereof, wherein the step of applying force to the annular portion of the elastomeric material comprises the step of applying said force adjacent a continuous edge of the so-deposited elastomeric material, and further comprising the step of cutting away elastomeric material not deposited on the core adjacent and about said continuous edge of the so-deposited elastomeric material, and further comprising the step of applying force to an extended portion of elastomeric material extending from the so-deposited elastomeric material subsequent to said cutting to force said extended portion thereof against the core, wherein the step of applying force to the annular portion of elastomeric material comprises the step of selectively moving a movable member into contact with the annular portion of the elastomeric material, and wherein the step of applying force to the extended portion of elastomeric material comprises the step of moving said movable member into continuous annular contact with said extended portion.

4,044,086

METHOD FOR MAKING A BLOW MOLDED ORIENTED PLASTIC BOTTLE

Charles Edmund McChesney, Monmouth Junction; Robert J. McHenry, Belle Mead, and James Alan Wachtel, Princeton, all of N.J., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 319,380, Dec. 29, 1972, Pat. No. 3,934,743. This application July 21, 1975, Ser. No. 597,678
Int. Cl.[2] B29C *17/07*
U.S. Cl. 264—97 **11 Claims**



1. A method for making a self-supporting biaxially oriented container having a substantially uniform high degree of orientation radially of the sidewall of the container comprising the steps of forming a parison having a tubular sidewall with inner and outer surfaces from a glassy, essentially non-crystalline thermoplastic polymeric material which is capable of being biaxially oriented during blow molding, temperature conditioning the parison to establish between the inner and outer surfaces of the sidewall of the parison outwardly radially decreasing temperatures within the orientation temperature range of the polymeric material, the decreasing temperatures being related to the radially outwardly decreasing degree of blow molding induced stretch so as to achieve substantial radial uniformity of orientation and blow molding the temperature conditioned parison to stretch the polymeric material of the parison to the container shape and to biaxially orient the material.

4,044,087

METHOD OF MAKING FAST CURED LIGNOCELLULOSIC PARTICLE BOARD

Paul Robitschek, and Ross L. Christensen, both of Eugene, Oreg., assignors to Chembond Corporation, Springfield, Oreg.

Division of Ser. No. 457,438, April 3, 1974, Pat. No. 3,968,294. This application Jan. 2, 1976, Ser. No. 646,410
Int. Cl.[2] B29J *5/00*
U.S. Cl. 264—113 **5 Claims**

1. The method of making lignocellulosic particle board, comprising:

a. mixing a first portion of lignocellulose particles with from 3 to 15% by weight, dry solids basis, of an acid catalyzed, phenol aldehyde thermosetting resin having a pH of less than 2,

b. mixing a second portion of lignocellulose particles with from 3 to 15% by weight, dry solids basis, of an alkali catalyzed, phenol aldehyde thermo-setting resin having an alkaline pH of not more than about 13

c. forming a laminar mat having a middle lamina of the mixture of said first portion of particles and acid catalyzed resin and opposed outer surface laminae of the mixture of said second portion of particles and alkali catalyzed resin, each other surface lamina being at least 0.025 inch in thickness, and

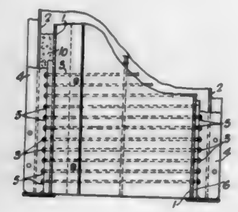
d. subjecting the laminar mat to heat and pressure sufficient to consolidate it to predetermined density and thickness and cause the resins to cure and bond the particles into a unitary structural board.

4,044,088

STRESSED HOLLOW CONCRETE CYLINDERS

Graeme Reginald Hume, 5 Ian's Grove, Lower Templestowe, 3107 Victoria, Australia

Continuation-in-part of Ser. No. 386,619, Aug. 9, 1973, abandoned. This application Nov. 25, 1975, Ser. No. 635,224
Claims priority, application Australia, Aug. 10, 1972, 36/72; July 30, 1975, 2565/75
Int. Cl.² B28B *23/12*
U.S. Cl. 264—130 **9 Claims**



1. A method of producing a concrete pipe comprising the steps of:

substantially continuously coating a stressable tendon with an anti-bonding material, the inner radius of the anti-bonding material being substantially equal to the outer radius of the tendon, such that the outer surface of said tendon closely contacts the inner surface of said anti-bonding material with no gaps present therebetween, said anti-bonding material being of sufficient strength to withstand without failure the compressive load applied thereupon by said tendon to preclude relative radial movement of said tendon with respect to said coating material to the point where said tendon contacts said concrete while assuring low friction relative circumferential movement of said tendon with respect to the cured concrete,

installing at least one coated unstressed tendon in a concrete pipe mould prior to pouring of concrete, the tendon extending substantially concentrically relative to the walls of the mould and being secured to tendon anchorages positiond within the mould, said mould having at least one longitudinal divider so that the pipe to be cast therein has at least one longitudinal split, portions of said tendon lying on both sides of said split and being connected together across said split,

pouring concrete into said mould to substantially completely immerse said tendon and said anchorages in said concrete except for those points wherein said tendon passes through said longitudinal split, so that concrete surrounds and intimately contacts said coating material with no gaps therebetween to preclude relative radial movement of said coating material with respect to said concrete after curing the concrete in the mould,

expanding said pipe radially outwardly to cause circumferential movement of said tendon with respect to the cured concrete to thereby stress the tendon, and

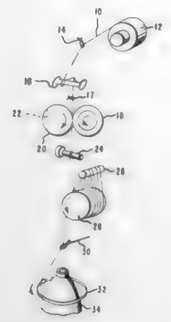
filling the split in said pipe with a filler to form a substantially continuous stressed cylinder.

4,044,089

PROCESS AND APPARATUS FOR PRODUCING THICK AND THIN FILAMENTS

Stanley Robert Cochran, Harrisonburg, and Oren Hardin Davis, Axton, both of Va., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 13, 1976, Ser. No. 686,644
Int. Cl.² D02J *1/22;* B29C *17/02*
U.S. Cl. 264—167 **2 Claims**



2. A process for continuously drawing an undrawn filament to produce thick and thin sections along its length comprising: passing the filament while under a tension of from about 0.005 to about 0.015 grams per denier into the nip of a feed roll assembly comprising rotating driven presser and feed rolls; removing said filament from said nip under tension, the filament being in a single plane as it enters, passes through and exits the nip; drawing the filament and collecting the filament, the said presser roll having a depression extending over from about 10 to about 40% of its circumference, whereby the presser and driven rolls intermittently engage the filament between them and forward it and then release the filament when the depression of the presser roll is over the filament.

4,044,090

PROCESS FOR PRODUCING REGENERATED CELLULOSIC PRODUCT

Norman A. Portnoy, Hopatcong, N.J., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 9, 1975, Ser. No. 594,325
Int. Cl.² C08B *5/00, 16/00;* D01F *2/28*
U.S. Cl. 264—187 **9 Claims**

1. A process for producing a regenerated cellulosic product comprising

nitrosating and dissolving a cellulosic material in a solution comprising a dialkylacylamide solvent and adding from 2–25% by weight of the solution of a tertiary amine to form a soluble cellulose nitrite ester, forming the cellulose ester into a filament or other shape,

contacting the cellulose ester with a coagulant therefore,

stretching the coagulated cellulose ester prior to complete regeneration thereof, and

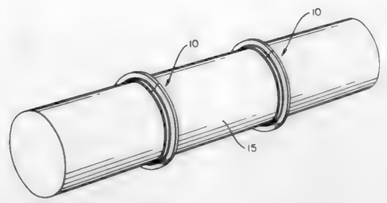
completing the regeneration of the cellulose,

4,044,091

SEPARATOR FOR CONCRETE WRAPPING TO SUBMARINE PIPELINES

John Hurst, London, England, assignor to W. R. Grace Limited, London, England

Division of Ser. No. 674,693, April 7, 1976. This application Nov. 4, 1976, Ser. No. 738,804
Claims priority, application United Kingdom, May 20, 1975, 21596/75
Int. Cl.² B28B *23/08*
U.S. Cl. 264—251 **13 Claims**



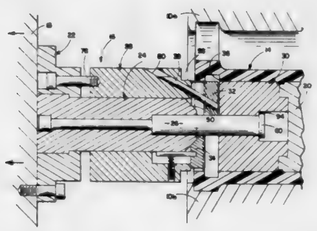
1. A method of applying concrete cladding to pipes wherein spaces each comprising in combination a base flange having opposed sides, a web extending generally perpendicularly from the base flange from one said side, the cross-section of the spacer being generally T-shaped, the spacer being flexible, the web being compressible and the web being at least as resistant to bending adjacent the base flange as at positions remote from the base flange, are positioned at intervals along the pipe such that the side of the flanges of said spacers opposite the sides from which said webs extend are adjacent the pipe, and concrete is sprayed onto the pipe to form discrete sections separated by the spacers.

4,044,092

GROOVE MOLDING METHOD

Wayne Spears, 12884 Bradley Ave., Sylmar, Calif. 91342

Division of Ser. No. 528,259, Nov. 29, 1974, Pat. No. 3,966,385, which is a continuation-in-part of Ser. No. 422,776, Dec. 7, 1973, abandoned. This application Apr. 29, 1976, Ser. No. 681,705
Int. Cl.² B29C *1/14, 1/14*
U.S. Cl. 264—318 **18 Claims**



1. A method for molding an annular groove internally in a tubular molded part, said method comprising:

a. providing a mold core assembly having an outer mold surface and a plurality of first mold segments forming a first group and a plurality of second mold segments forming a second group thereof circumferentially around and intermediate the ends of the mold core,

b. introducing said mold core assembly into a mold cavity,

c. molding a part in said cavity and radially expanding said first and second groups of segments to form a recess in the molded part,

d. moving the first group of segments radially inwardly until they are fully withdrawn from the recess,

e. initiating axial movement of the first group of segments relative to the second group of segments after being withdrawn from said recess,

f. moving the second group of segments radially inwardly until they are fully withdrawn from the recess, and which radial movement of the second group of segments starts approximately when or without substantial delay after said first group of segments starts said axial movement,

g. initiating axial movement of the second group of segments, and

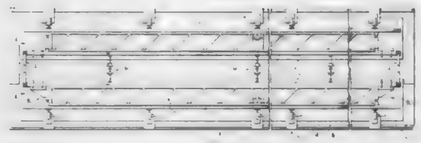
h. removing the molded part from the cavity.

4,044,093

FLAT CHORD TRUSS JIG ASSEMBLY

John Calvin Jureit, Coral Gables, and Adolfo Castillo, Miami, both of Fla., assignors to Automated Building Components, Inc., Miami, Fla.

Filed Sept. 26, 1974, Ser. No. 509,568
Int. Cl.² B23Q *3/00*
U.S. Cl. 269—321 F **7 Claims**



1. A jig assembly for holding wooden members in predetermined positions for forming a truss comprising:

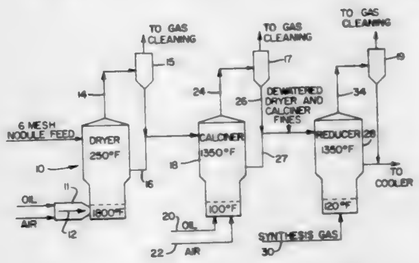
an elongated jig pad, a pair of generally parallel guide bars carried by said pad at spaced locations one from the other and defining abutments substantially coextensive in length with the length of respective upper and lower chords of a truss disposed between said bars, and means carried by said pad at least at one end of the jig assembly and located between said bars forming a stop for the ends of the chords disposed between said bars, said jig assembly being constructed such that the first and second pairs of bars define inner and outer pairs thereof, the first mentioned camber forms means including an element engaging between the inner pair of bars, and means cooperable between said element and said inner pair of bars for displacing said inner pair of bars toward one another and to substantially simultaneously form a camber in said inner pair of guide bars.

4,044,094

TWO-STAGE FLUID BED REDUCTION OF MANGANESE NODULES

Herbert E. Barner, Westford; David S. Davies, Andover, both of Mass., and Lester J. Szabo, Prince Edward Island, Canada, assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Aug. 26, 1974, Ser. No. 500,493
Int. Cl.² C01G *3/14, 53/12;* C22B *5/18*
U.S. Cl. 423—32 **48 Claims**



31. A process for recovering metal values selected from the

group consisting of copper and nickel from a manganese ore containing copper and nickel base metal values comprising the steps of:

a. drying the ore in a fluid bed dryer to remove free moisture from the ore producing an off gas from which scrubber fines can be recovered in a scrubber;

b. calcining the dried ore in a fluid bed calciner under a neutral or oxidizing atmosphere to remove remaining free moisture and combined moisture and to convert MnO_2 in the ore to intermediate oxides of manganese producing an off gas from which scrubber fines can be recovered in a scrubber;

c. delivering the calcined ore to a fluid bed reducer and reducing the calcined ore in the fluid bed at a temperature between the range of 1200°–1500° F to convert the oxides of the manganese in the ore to MnO;

d. forwarding scrubber fines recovered from the off gases from the fluid bed dryer and fluid bed calciner directly to the fluid bed reducer to enable the temperature in which the ore is reduced in step (c) to be maintained between the range of 1200°–1500° F;

e. introducing the ore reduced in steps (c) and (d) into an ammonium carbonate leach solution and oxidizing the copper and nickel values prior to dissolution in the leach solution to produce a pregnant leach liquor containing copper and nickel values; and,

f. recovering metal values from pregnant leach liquor.

4,044,095

PROCESS FOR RECOVERY OF ALUMINA FROM HIGH-SILICA ORE

Lawrence Keith Hudson, Oakmont, Pa.; Kenneth I. Savage, Downers Grove, and John M. Stinson, Jr., Belleville, both of Ill., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 20, 1975, Ser. No. 623,931
Int. Cl.² C01F 7/06, 7/04
U.S. Cl. 423—127 **8 Claims**

1. In a process for extraction of alumina from particulate aluminous material of high silica content by a digest with highly concentrated NaOH and lime to form a sodium-aluminate solution and an insoluble sodium-calcium-silicate residue, the improvement which comprises:

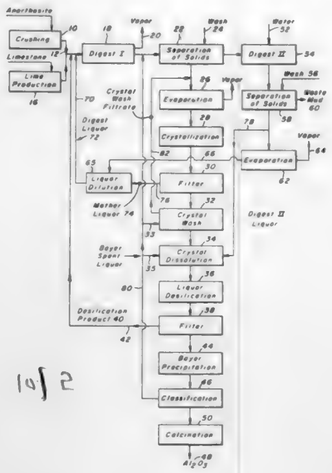
a. digesting said material having a particle size distribution range of at least 80% by weight −35 to +325 mesh and at a temperature of at least 200° C; and

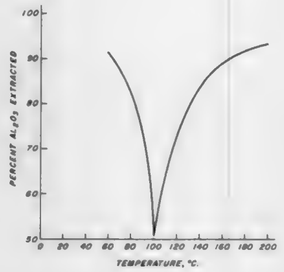
b. separating said insoluble sodium-calcium-silicate residue at a temperature in the range of 120° to 200° C in a time period not exceeding 60 minutes.

8. In a process for extraction of alumina from particulate aluminous material of high silica content by digest with highly concentrated NaOH and lime to form a sodium-aluminate solution and an insoluble sodium-calcium-silicate residue, the improvement which comprises:

a. digesting material having a particle size distribution range of at least 80% by weight −35 to +325 mesh and at a temperature of at least 200° C; and

b. separating said insoluble sodium-calcium-silicate residue





at a temperature below about 80° C in a time period not exceeding 60 minutes.

4,044,096

SULFURIC ACID LEACHING OF NICKELIFEROUS LATERITE

Paul B. Queneau, Golden, and Eddie C. Chou, Arvada, both of Colo., assignors to AMAX Inc., New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,712
Int. Cl.² C01G 53/10
U.S. Cl. 423—150 **11 Claims**

1. A process for improving the leaching efficiency of nickeliferous lateritic ore of minus 100 mesh size and containing at least about 1% by weight of nickel which comprises,

providing in an autoclave an aqueous slurry of said ore at a pulp density of not exceeding about 33% solids,

subjecting said slurry to high pressure leaching in a sulfuric acid solution in said autoclave at a temperature of over 260° C and ranging up to about 290° C at a pressure of about 700 psig to 1000 psig at an agitation rate sufficient to suspend solids in said slurry,

the amount of sulfuric acid being injected in said autoclave in a single addition and corresponding to an acid-to-ore ratio ranging from about 0.2 to 0.35, the leaching time being sufficient to leach at least about 95% of said nickel,

and then discharging the leached slurry into a flash tank such that the slurry is subjected to turbulence due to the release of autoclave pressure during flashdown, the slurry being then neutralized during said turbulence to a pH of at least about 1.8 but not exceeding about 4.5 to precipitate iron and aluminum and thereby inhibit dissolution of precipitated iron and aluminum downstream of said process and provide a pregnant solution having a nickel to Fe+Al+Cr ratio exceeding 2.

4,044,097

RECOVERY OF SODA VALUES FROM SODIUM CARBONATE CRYSTALLIZER PURGE LIQUORS

Alan B. Gancy, and Rustom P. Poncha, both of Syracuse, N.Y., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 587,581, June 17, 1976, Pat. No. 3,991,160. This application Sept. 16, 1976, Ser. No. 723,681
Int. Cl.² C01D 7/24
U.S. Cl. 423—186 **6 Claims**

1. The method of recovering soda values from aqueous carbonate process crystallizer mother liquor purge containing soluble silicates and carbonaceous impurities from the process for making sodium carbonate precursor crystals, which comprises:

a. mixing the mother liquor purge with from about 1 to 10 parts by weight, per part of mother liquor purge, as treating agent of insoluble impurities obtained by crushing crude trona, calcining the crushed trona, dissolving the calcined trona comprising sodium carbonate and insoluble impurities in an aqueous medium followed by separation of insoluble impurities;

b. evaporating the mixture to dryness and calcining at temperature of 300° to 600° C. for time sufficient to insolubilize soluble silicates and to reduce contamination with carbonaceous impurities; and

c. leaching the calcined mixture with water or aqueous sodium carbonate solution to recover sodium carbonate values therefrom.

4,044,098

REMOVAL OF MERCURY FROM GAS STREAMS USING HYDROGEN SULFIDE AND AMINES

Alvin J. Miller, and William F. Tuckett, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 18, 1976, Ser. No. 687,476
Int. Cl.² B01D 47/00; B01J 8/00; C01B 17/20
U.S. Cl. 423—210 **9 Claims**

6. A process for treating a gas stream that contains mercury thereby producing a gas stream with reduced mercury content and minimal sulfur content, said process comprising contacting said mercury-containing gas stream with an amine capable of absorbing hydrogen sulfide with the amine containing an amount of hydrogen sulfide sufficient to precipitate the mercury contained in the gas stream, said amine in an amount sufficient to retain hydrogen sulfide in excess of the amount required to precipitate said mercury.

4,044,099

POLLUTED AIR EFFLUENT INCINERATING METHOD

Lawrence C. Griffin, Seattle, Wash., assignor to Griffin Research & Development, Inc., Miami, Fla.

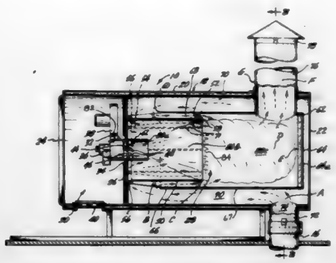
Division of Ser. No. 397,947, Sept. 17, 1973, Pat. No. 3,960,504. This application May 20, 1976, Ser. No. 688,355
Int. Cl.² A61L 9/00; F23G 7/06
U.S. Cl. 423—210 **6 Claims**

1. A process for incinerating a polluted air effluent, said process comprising:

a. directing fuel and unpolluted primary air as a reacting fuel-air mixture in a downstream direction axially through a confined generally cylindrical combustion area comprising a first combustion zone, a second intermediate combustion zone coaxially downstream of said first combustion zone and a third final combustion zone coaxially downstream of said second combustion zone,

b. directing a portion of the polluted air effluent into said intermediate combustion zone in a flow pattern annularly surrounding and flowing generally coaxially with the combustion products emerging from said first combustion zone,

c. directing additional polluted air effluent into said final combustion zone in a flow pattern annularly surrounding



and flowing generally coaxially with the combustion products emerging from said intermediate combustion zone, and

d. discharging the combustion products exhausting from said third combustion zone to the atmosphere.

4,044,100

SEPARATION OF ACIDIC GAS CONSTITUENTS FROM GASEOUS MIXTURES CONTAINING THE SAME

Paul L. McElroy, Jr., Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 883,338, Dec. 8, 1969, abandoned, which is a continuation-in-part of Ser. No. 445,774, April 5, 1965, abandoned. This application Mar. 29, 1972, Ser. No. 239,366
Int. Cl.² B01D 53/34
U.S. Cl. 423—226 **12 Claims**

1. A method of separating carbon dioxide from a gaseous mixture containing same which comprises contacting the gaseous mixture in an absorption zone with a liquid solvent comprising a solution of from 10 to 65% by weight of di-isopropanolamine and of from 35 to 90% by weight of a normally liquid dialkalyl ether of a polyalkalylene glycol under conditions which effect absorption of the carbon dioxide in the solvent while controlling temperature at above about 15° to 90° C. and total pressure between about 50 and 1500 pounds per square inch gauge such as to maintain said solvent as a single phase.

4,044,101

METHOD OF TREATING EXHAUST GASES CONTAINING NITROGEN OXIDES AND SULFUROUS ACID GAS

Tokuichi Hisamatsu; Taketsugu Kitamura; Takeshiro Saito; Hitoshi Takagi, and Takuzo Sekiya, all of Kurashiki, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 17, 1975, Ser. No. 641,870
Claims priority, application Japan, Dec. 21, 1974, 49-147172; Feb. 17, 1975, 50-19617
Int. Cl.² C01B 21/00
U.S. Cl. 423—235 **17 Claims**

1. A method of treating exhaust gases containing nitrogen oxides and sulfurous acid gas which comprises contacting an exhaust gas containing nitrogen oxides and sulfurous acid gas with an aqueous solution containing a sulfite in a concentration of 0.05 to 1.0 mole/liter, an iron ion in a concentration of 0.01 to 0.7 g-ion/liter and an aminopolycarboxylic acid in a concentration of 0.005 to 2.0 moles/liter at 40° to 100° C. and a pH of 4 to 9 in an absorbing zone, so as to remove nitrogen oxides and sulfurous acid gas from said exhaust gas and form a dithionate in the absorbing solution and treating the absorbing solution from the absorbing zone at 40° to 100° C. for 1 to 30 minutes in

a reducing zone while insulating the absorbing solution from contact with the exhaust gas, so as to reduce at least a portion of the absorbed nitrogen oxides to N_2, iron ion to ferrous ion and form further dithionate.

4,044,102

METHOD FOR TREATING EXHAUST GASES

Ryoji Muraki; Masao Endo, both of Nishinomiya; Nobuaki Aoki, Hirakata, and Masahiro Takeshita, Nishinomiya, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Dec. 19, 1975, Ser. No. 642,625
Claims priority, application Japan, Dec. 28, 1974, 50-3228
Int. Cl.[2] B01D *53/34*
U.S. Cl. 423—239 6 Claims

1. In a continuous method of removing nitrogen oxides and dust from flue gases formed by the combustion of fuel which comprises passing the flue gas, in admixture with ammonia, through a fixed particulate catalyst bed capable of reducing nitrogen oxides in the presence of ammonia, wherein said nitrogen oxides are reduced and said dust is retained by the catalyst bed thereby increasing the gas passage pressure, the improvement which comprises:

a. continuously or intermittently discharging a portion of the particulate catalyst and accumulated dust from said bed at a rate between about 10 to 100 mm per hour per 500 to 10,000 mm of catalyst bed height, which rate is sufficient to prevent plugging of the catalyst bed, while feeding catalyst into the catalyst bed in an amount that compensates for the amount of catalyst removed,

b. heating of the catalyst discharged from said bed to reactivate said catalyst and remove a gas therefrom,

c. separating the reactivated catalyst from the dust, and

d. returning the regenerated catalyst to the catalyst bed.

4,044,103

STORAGE-STABLE SODIUM CHLORITE

Paul Mollard, Sainte Foy les Lyon, and Louis Mesaros, Ouillins, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Jan. 16, 1974, Ser. No. 433,659
Claims priority, application France, Feb. 5, 1973, 73.03917
Int. Cl.[2] C01B *11/10*
U.S. Cl. 423—267 13 Claims

1. A method for stabilizing sodium chlorite which comprises the steps of

1. admixing with sodium chlorite slurry an amount of stabilizing inorganic alkali metal or alkaline earth metal salt chemically inert to sodium chlorite and having at least one hydrate whose melting point is higher than about 50° C., the amount being sufficient to capture in the hydrate form a quantity of water equal to at least 5% of the weight of the sodium chlorite and insufficient to inordinately diminish the effective chlorite level, and the weight of water in the total mixture being at least 5% of the weight of said sodium chlorite; and

2. drying the mixture sufficiently at a temperature within the thermal stability temperatures of the hydrated stabilizing salt and the sodium chlorite, to reudce the water not captured to an amount not greater than about 2% of the weight of said sodium chlorite with, when noncaptured water is present, the mixture being comprised of granules having a diameter of at least about 2mm and the amount of uncaptured water being insufficient to form the trihydrate of the sodium chlorite salt.

4,044,104

PRODUCTION OF PHOSPHORUS NITRIDES

Joseph Cremer, Hurth-Hermulheim; Egon Joerchel, Hochheim am Main, and Heinz Harnisch, Cologne-Lovenich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Apr. 13, 1976, Ser. No. 676,467
Claims priority, application Germany, Apr. 17, 1975, 2516915; Feb. 27, 1976, 2608018
Int. Cl.[2] C01B *21/06, 25/00*
U.S. Cl. 423—302 5 Claims

1. In the process for making phosphorus nitrides of the general formula PN_x, in which x stands for a number of 0.9 to 1.7 by reacting phosphorus halides with ammonia and heating the resulting reaction product, the improvement which comprises reacting the phosphorus halides with the ammonia in the gas phase at temperatures between the boiling or sublimation point of the phosphorus halides and 250° C, the ammonia being used in excess, based on the phosphorus halides, and after-heating the resulting reaction product to temperatures of 500° to 950° C until ammonia substantially ceases to be evolved from the reaction product whereby PH_x is obtained in yields of about 97 percent based on phosphorus.

4,044,105

PROCESS FOR PREPARATION OF CALCIUM HYDROGEN PHOSPHATE ANHYDRIDE

Takamitsu Enomoto; Motoshige Ogura, and Tetsuhiro Ono, all of Ube, Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Jan. 28, 1976, Ser. No. 653,036
Claims priority, application Japan, Jan. 29, 1975, 50-11424
Int. Cl.[2] C01B *15/16, 25/26*
U.S. Cl. 423—308 10 Claims

1. A process of preparing highly pure calcium hydrogenphosphate anhydride in the form of platy crystals of uniform particle size, the process comprising the steps of:

preparing calcium hydrogenphosphate dihydrate by preparing a first aqueous solution of sodium ammonium hydrogenphosphate of commercial grade in a concentration of about 5% by weight on the basis of P_2O_5;

preparing a second aqueous solution of calcium chloride in a concentration of 20% by weight at the highest on the basis of $CaCl_2$;

mixing said first aqueous solution with said second aqueous solution by showering said first and second aqueous solutions into a vessel; the quantities of said first and second aqueous solutions being determined such that the molar ratio expressed by Ca/P is in the range of from 1.05 to 1.20, the pH of the mixture being adjusted such that the pH of the mixture at the end of the mixing step is in the range from 5.0 to 5.8;

preparing an aqueous slurry of said calcium hydrogen-phosphate dihydrate in a concentration ranging from 5 to 20% by weight;

adjusting the pH of said slurry to a value in the range from 4.5 to 5.5; and

flowing said slurry on a sloping and convex surface as a thin layer stream and blowing steam against the flowing slurry to rapidly heat said slurry to a temperature in the range of 85° to 97° C.

4,044,106

RECLAMATION OF PHOSPHATE FROM BRIGHT DIP DRAG-OUT

Albert Yi-Hung Fang, 8542 Wildwood Ave., Westland, Mich. 48185

Filed Oct. 15, 1975, Ser. No. 622,472
Int. Cl.[2] C01B *15/16;* B08B *7/04*
U.S. Cl. 423—312 12 Claims

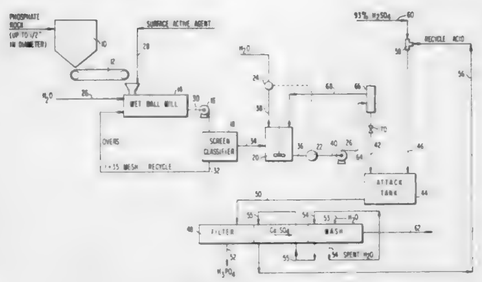
1. The method of recovering phosphate values from waste aqueous acid solutions generated in aluminum bright dip operations of the type containing phosphoric acid in combination with appreciable amounts of dissolved aluminum phosphate and nitric acid which comprises the steps of reacting said waste aqueous acid solution with an alkali material selected from the group consisting of sodium hydroxide and a combination of sodium hydroxide and sodium carbonate in a manner to convert substantially all of the aluminum phosphate to sodium aluminate and trisodium phosphate, said nitric acid to sodium nitrate, and substantially all of said phosphoric acid to trisodium phosphate; said sodium aluminate, sodium nitrate and trisodium phosphate present in the form of dissolved salts in the liquid aqueous reaction solution, removing a portion of said trisodium phosphate from said aqueous reaction solution by crystallization while retaining said sodium aluminate and said sodium nitrate in the form of solubilized salts in the remaining mother liquor, and thereafter separating the crystallized trisodium phosphate from said mother liquor.

4,044,107

PROCESS FOR THE MANUFACTURE OF WET PROCESS PHOSPHORIC ACID USING WET-GRINDING OF THE PHOSPHATE ROCK FEED

Samuel V. Houghtaling, Lakeland, Fla., assignor to Davy Powergas, Inc., Lakeland, Fla.

Continuation of Ser. No. 416,647, Nov. 16, 1973, abandoned.
This application July 21, 1975, Ser. No. 597,337
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—320 6 Claims



1. A method of manufacturing wet process phosphoric acid from phosphate rock, comprising the steps of

i. grinding the phosphate rock in a water slurry sufficiently that the phosphate rock will pass a 30 mesh (Tyler) screen, said slurry containing at least about 20 weight percent water, and said slurry being formed with water containing no more than 2 percent P_2O_5;

ii. passing the slurry of ground rock to an attack tank and therein contacting and reacting the slurry with diluted sulfuric acid obtained from step (vi) herein to yield a product slurry of crystalline hydrated calcium sulfate in phosphoric acid having a P_2O_5 value of at least about 25 weight percent, said slurry providing about 15 to 35 weight percent of the water present in said attack tank;

iii. removing said product slurry from the attack tank;

iv. subjecting said product slurry to a separation step whereby the crystalline hydrated calcium sulfate is separated from the phosphoric acid;

v. washing the separated calcium sulfate with water and obtaining spent wash water having a P_2O_5 value of about 15 to 25 weight percent;

vi. mixing the spent calcium sulfate wash water with concentrated sulfuric acid having a concentration of at least about 90 percent to obtain diluted sulfuric acid; and

vii. passing the diluted sulfuric acid to step (ii) above to supply about 60 to 85% of the total amount of water in the attack tank, said concentrated sulfuric acid supplying up to about 5 percent of the water present in said attack tank.

4,044,108

PROCESS FOR REMOVING ORGANIC MATERIAL FROM WET PROCESS PHOSPHORIC ACID

Mitsuo Kikuchi, and Yoichi Hiraga, both of Shin-nanyo, Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed June 11, 1976, Ser. No. 695,310
Claims priority, application Japan, Feb. 13, 1976, 51-13948
Int. Cl.[2] C01B *25/16*
U.S. Cl. 423—321 R 10 Claims

1. A process for removing organic material from extracted phosphoric acid, which comprises: contacting extracted phosphoric acid containing metallic impurities in trace amounts with a chlorate and hydrochloric acid at a temperature greater than 100° C while maintaining the concentration of the extracted phosphoric acid at a value greater than 90 wt.% as H_3PO_4.

4,044,109

PROCESS FOR THE HYDROCHLORINATION OF ELEMENTAL SILICON

Han-Joachim Kötzsch, Rheinfelden; Hans-Jöachim Vahlensieck, Wehr, Baden, and Walter Josten, Rheinfelden, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Dec. 17, 1974, Ser. No. 533,740
Claims priority, application Germany, Dec. 31, 1973, 2365273
Int. Cl.[2] C01B *33/08*
U.S. Cl. 423—342 9 Claims

1. In a process for preparing a mixture of $SiCl_4$ and $SiHCl_3$ wherein elemental silicon is contacted with HCl in a fluidized bed, the improvement which comprises carrying out the process in the presence of an iron compound, which iron compound is present in an amount such that when calculated as iron the iron content is 10 to 43 weight percent based on the weight of the total solids in the fluidized bed, at a temperature in the range of 260° to 600° C.

4,044,110

METHOD OF FORMING A SILICON CARBIDE ARTICLE - III

Jack E. Noakes, Plymouth Township, Wayne County, Mich.; Hiroshi Sato, West Lafayette, Ind., and Leslie L. Terner, West Bloomfield Township, Oakland County, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 3, 1975, Ser. No. 619,427
Int. Cl.[2] C01B *31/36*
U.S. Cl. 423—346 2 Claims

1. In a method of forming a silicon carbide article: (a) wherein 60–80% by weight of silicon carbide particles having an average particle size in the range from about 40 microns to less than 1 micron are mixed together with 40–20% by weight of a thermosetting binder which produces a flowable liquid phase when melted and which produces carbon upon nonoxidative pyrolysis; (b) wherein the mixture is heated to a temperature whereat the thermosetting binder is in a liquid phase; (c) wherein the mixture is injected molded by an injection molding technique to form an article, the injection molding technique operating on the basis that the flowable thermosetting binder forms a continuous phase about the silicon carbide particles supported therein; (d) wherein the thermosetting binder is stiffened to lend sufficient strength to the molded article so that it may be removed from its mold; (e) wherein the molded article is pyrolized in the absence of oxygen so that the thermosetting binder undergoes a volumetric reduction in breaking down to form a vitreous carbon phase which serves to bond silicon carbon particles together, this action also developing a pore structure throughout the article and producing excess carbon at the surface; and (f) wherein the article is silicided at an elevated temperature by permitting the penetration of the article through its pore structure with silicon whereby the silicon reacts with the available carbon to form silicon carbide; the improvement which comprises:

treating the surface of the article after it has been pyrolized and prior to the siliciding thereof to remove said excess carbon on the surface thereof by heating the article to a treatment temperature in the range from 700° F to 850° F and thereafter exposing the article to an oxygen containing atmosphere for a period of time up to 5 minutes.

4,044,111

METHOD OF TREATING CALCIUM NITRATE CONTAINED IN DENITRATION WASTE LIQUID

Isao Furuta, Mitaka; Hiroshi Tamura, Akashi, and Masami Takao, Kobe, all of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed May 12, 1976, Ser. No. 685,625
Claims priority, application Japan, May 12, 1975, 50-56253
Int. Cl.² C01B *21/00*
U.S. Cl. 423—351 **8 Claims**

1. A method of treating a denitration waste liquid comprising calcium chloride and calcium nitrate which comprises the steps of:

A. adding concentrated sulfuric acid to said denitration waste liquid to obtain a mixed solution including nitric acid, hydrochloric acid, sulfuric acid and calcium sulfate and adjusting the ratio of chloride ions to nitrate ions in said mixed solution within the range of $Cl^-/NO_3^- = 2 - 3$;

B. Adjusting the sulfuric acid concentration in said solution to from 10 to 70 wt.%.

C. heating said mixed solution to 110° to 150° C to generate a mixed gas comprising NOCl, Cl_2 nitrogen oxides, HCl, Cl_2 and HNO_3;

D. passing said mixed gas through a concentrated sulfuric acid which has a concentration of higher than 80% and is maintained at a temperature of 80° to 150° C. to obtain a mixed gas containing chlorine and hydrogen chloride and a nitrosylsulfuric acid solution;

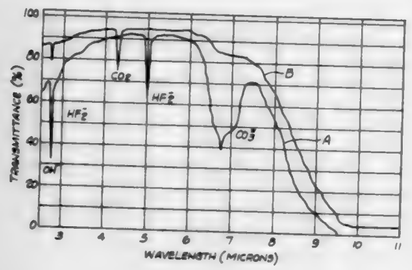
E. introducing a mixed gas of $(SO_2 + H_2O)$ into said nitrosylsulfuric acid to form sulfuric acid and a mixed gas of $(NO + NO_2 + SO_2)$ and thereafter introducing the latter mentioned mixed gas into a reducing solution to convert nitrogen oxides to N_2 gas.

4,044,112

HOT-PRESSABLE MAGNESIUM FLUORIDE POWDER

Robert H. Moss, Cleveland Heights; Carl F. Swinehart, University Heights, and William F. Spicuzza, Eastlake, all of Ohio, assignors to The Harshaw Chemical Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 447,948, March 4, 1974, Pat. No. 3,920,802. This application Nov. 14, 1975, Ser. No. 632,059
Int. Cl.² C01F *5/28*
U.S. Cl. 423—490 **1 Claim**



1. A pressable magnesium fluoride powder consisting essentially of unground calcined individual particles deformable under sufficient heat and pressure to form an optical body, said powder having a uniform particle size distribution wherein more than 50 percent by weight of said particles is in the size range from about 5 μ to about 62 μ average particle diameter, and more than 33 percent by weight of said particles are greater than 14 μ average particle diameter, said powder having a uniform refractive index of $n_D = 1.3850$ at 20° C, and exhibiting a Debye-Scheurer X-ray pattern indicating the magnesium fluoride powder to be of an amorphous structure.

4,044,113

PREPARATION OF BROMINE

Joseph P. Kleiman, Birmingham, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Feb. 17, 1976, Ser. No. 658,839
Int. Cl.² C01B *7/10*; C07C *17/20*
U.S. Cl. 423—500 **9 Claims**

1. Process for preparing bromine comprising reacting chlorine with ethylene dibromide in the presence of a catalytic quantity of iron halide selected from ferric chloride, ferric bromide and ferric chlorobromides.

4,044,114

PROCESS FOR PURIFYING A GAS CONTAINING SULFUR COMPOUNDS

Claude Dezael, Maisons Laffitte; Sigismond Franckowiak, Rueil Malmaison; Philippe Courty, Colombes, and Henri Gruhier, Chatillon, Bagneux, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 16, 1975, Ser. No. 641,223
Claims priority, application France, Dec. 27, 1974, 74.43201
Int. Cl.² C01B *17/04*
U.S. Cl. 423—574 R **7 Claims**

1. A process for purifying a gas containing hydrogen sulfide and sulfur dioxide in a molar ratio of H_2S to SO_2 of more than 2 : 1, said gas being discharged from a sulfur production unit in which hydrogen sulfide is oxidized by means of molecular oxygen or sulfur dioxide in gas phase, comprising the steps of (a) contacting the hydrogen sulfide and sulfur dioxide containing gas with molten sulfur or with an organic solvent, thereby producing sulfur by reaction between said hydrogen sulfide and said sulfur dioxide, and recovering separately said produced sulfur and a gas of relatively higher H_2S to SO_2 molar ratio, (b) passing the gas recovered from step (a) over a solid zinc oxide containing mass at 300°–800° C. for absorbing hydrogen sulfide and discharging the resultant H_2S depleted gas, (c) periodically interrupting the contact of the gas with said mass and passing over the same at 400°–1200° C. a gas containing molecular oxygen produced by burning hydrogen sulfide with an excess oxygen containing gas, thereby regenerating the mass, and recovering an SO_2 containing effluent gas, and (d) reacting said effluent gas with hydrogen sulfide in said sulfur production unit thereby producing additional sulfur.

4,044,115

PRODUCTION OF ALUMINA MONOHYDRATE FROM ALUMINUM NITRATE SOLUTIONS

Judith A. Eisele, Verdi; Barlane R. Eichbaum, and Donald J. Bauer, both of Reno, all of Nev., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed July 2, 1976, Ser. No. 702,262
Int. Cl.² C01F *7/30, 7/34*
U.S. Cl. 423—631 **3 Claims**

1. A method for production of alumina monohydrate consisting of treating an aqueous solution of aluminum nitrate containing about 0.5 to 7.2 weight percent aluminum at a temperature of about 250° to 350° C and a pressure of about 500 to 2500 psig for a time sufficient to convert a major proportion of the nitrate to monohydrate, cooling the reaction mixture to room temperature and separating the precipitated alumina monohydrate.

4,044,116

METHOD FOR THE COMPLETE DISSOLUTION OF MINERAL SAMPLES

Kent J. Eisentraut, Xenia, and Shib C. Chattoraj, Fairborn, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1976, Ser. No. 692,720
Int. Cl.² B01F *1/00*
U.S. Cl. 423—658.5 **3 Claims**

1. A method of the complete dissolution of milligram amounts of a sample of minerals which comprises the steps of:

1. adding dropwise about 0.15 to 0.30 ml of hydrofluoric acid to a flat-bottomed beaker containing about 50 to 80 milligrams of the sample in finely divided form spread out over the bottom of the beaker;
2. tilting the beaker so that a major portion of the sample is contacted with the hydrofluoric acid;
3. adding dropwise to the beaker an additional amount of hydrofluoric acid ranging from about 1.5 to 4.0 ml;
4. swirling the beaker so as to ensure contact between the acid and the entire sample;
5. heating the contents of the beaker to a temperature ranging from about 95° to 100° C;
6. swirling the beaker for a period of about 2 to 5 minutes;
7. heating the contents of the beaker to a temperature ranging from about 210° to 215° C;
8. adding dropwise to the beaker about 1.5 to 4.0 ml of a mixture of equal volumes of sulfuric acid and distilled, demineralized water;
9. continuing to heat the contents of the beaker at a temperature ranging from about 210° to 215° C until the volume of the contents is reduced to about 2 ml;
10. rapidly cooling the contents of the beaker to about room temperature;
11. adding about 6 to 10 ml of distilled, demineralized water to the beaker;
12. heating the contents of the beaker to a temperature ranging from about 95° to 215° C; and
13. swirling the beaker until its contents are in the form of a crystal clear solution.

4,044,117

HIGH TEMPERATURE CHEMICAL REACTION PROCESSES UTILIZING FLUID-WALL REACTORS

Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.

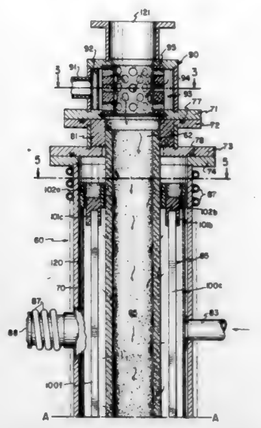
Division of Ser. No. 271,560, July 13, 1972, Pat. No. 3,933,434. This application June 30, 1975, Ser. No. 591,949
Int. Cl.² C01B *1/13*; C10C *9/42*
U.S. Cl. 423—659 **17 Claims**

1. A high temperature chemical reaction process which comprises:

i. generating an annular envelope of an inert fluid which is substantially transparent to radiation within a shell of a refractory material which reflects radiation; the volume enclosed by the shell constituting a black body cavity, the envelope having substantial axial length and the interior of the envelope defining a reaction chamber;

ii. passing at least one reactant into the black body cavity and through the reaction chamber along a predetermined path substantially coincident with the longitudinal axis of the envelope, the reactants being confined within the reaction chamber; and

iii. directing high intensity radiant energy into the reaction chamber to coincide with at least a portion of the predetermined path of the reactants, sufficient radiant energy being absorbed within the reaction chamber to raise the



temperature of the reactants to a level required to initiate and sustain the desired chemical reaction.

4,044,118

SOLUBILIZING PROCESS FOR OIL INSOLUBLE PESTICIDES

Frederick C. McCoy, Beacon, N.Y., and Carl Loyal W. Swanson, deceased, late of Hopewell Junction, N.Y., by Viola C. Swanson, executrix, assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 470,686, May 16, 1974, Pat. No. 3,939,272, which is a continuation-in-part of Ser. No. 275,680, July 27, 1972, Pat. No. 3,914,808. This application Sept. 24, 1975, Ser. No. 616,228
Int. Cl.² A01N *9/36*
U.S. Cl. 424—200 **6 Claims**

1. A process for converting a normally oil-insoluble N-[1-halomethyl-1-(S-dialkylphosphorodithioate)]methinyl phythalimide pesticide wherein said alkyl group of said dialkylphosphorothioate contains 1 to 2 carbon atoms, to their oil-soluble form by:

a. admixing each mole of said pesticide to be converted to oil-soluble form with:

b. a molar excess of at least one alkylate phenol wherein the alkyl substituent contains from 3 to 30 carbon atoms, at temperatures ranging from about 20° C to 100° C, until said normally oil-insoluble compounds are converted to their oil-soluble form.

4,044,119

METHOD OF CONTROLLING RELEASE OF MEDICAMENT AND BOLUS THEREFOR

Arthur Carlson, Jr., Overland Park, and Billy D. Rupe, Leawood, both of Kans., assignors to Cutter Laboratories, Inc., Berkeley, Calif.

Continuation-in-part of Ser. No. 356,717, May 3, 1973, abandoned. This application Nov. 14, 1975, Ser. No. 631,885
Int. Cl.² A61K *9/26, 31/18, 9/64*
U.S. Cl. 424—22 **37 Claims**

1. A prolonged release oral dosage drug composition for administration to ruminant animals comprising:

a solid, compressed dosage form of a size and shape to be orally administered to said ruminant animals and containing a medically effective amount of a drug distributed throughout an essentially water-insoluble disintegration resistant, slowly digestible matrix,

said dosage form comprising originally undenatured native milk solids which have been (1) insolubilized in the pres-

ence of the drug added thereto by chemical reaction with an effective quantity of an aqueous solution of a substantially water soluble, volatile, aliphatic aldehyde insolubilizing agent having from 1 to 5 carbon atoms, (2) treated to entrap the drug in an essentially dry cross-linked lattice-like matrix of the aldehyde reacted milk protein solids and containing no more than a residual, non-toxic amount of said agent and an insignificant quantity of moisture, and (3) compressed into a self-sustaining body having a density at least greater than 1 to cause the dosage form to sink in the rumino-reticular fluids and become entrapped in the rumino-reticular sacs for slow digestion thereof by proteolytic enzymes upon administration of said dosage form to a ruminant animal,

said drug being of a type which does not significantly react in a deleterious manner with said aldehydic agent during use thereof to insolubilize the native milk solids and making up about 0.5% to 80% by weight of the compressed dosage form,

there being about 20% to 99.5% of dried reacted milk solids in said compressed dosage form,

the ratio of aldehydic insolubilizing agent to milk protein solids and the degree of compression of said reacted milk solids and drug into said dosage form being correlated to provide a densified body which resists total disintegration when tumbled in water at a temperature of about 37° C. for a time period exceeding about 24 hours.

4,044,120

COMPOUNDS HAVING A PHYSIOLOGICAL COOLING EFFECT, AND COMPOSITIONS CONTAINING THEM

David G. Rowsell, Staines, and Roger Hems, Maidenhead, both of United Kingdom, assignors to Wilkinson Sword Limited, London, England

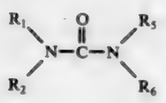
Filed Apr. 16, 1975, Ser. No. 568,663

Claims priority, application United Kingdom, Apr. 17, 1974, 16803/74

Int. Cl.² A61K *9/68*

U.S. Cl. 424—48 **8 Claims**

1. In a manufactured consumer product for application to or consumption by the human body, said product comprising (a) a topically administrable or orally ingestible vehicle and one or more of the following: a flavorant, colorant, odorant, surfactant or antiseptic, and (b) a compound capable of stimulating the cold receptors of the nervous system in the surface tissues of the body when brought into contact therewith, the improvement which comprises using as the cold receptor stimulating compound an effective amount of a cold receptor stimulating urea of the formula:



wherein R_1 is H, C_1–C_7 alkyl or C_3–C_6 cycloalkyl;

R_2 is C_3–C_8 alkyl or C_3–C_8 cycloalkyl, alkylcycloalkyl, cycloalkylalkyl or alkylcycloalkylalkyl, with the proviso that when R_1 is H then R_2 is branched at an alpha carbon atom relative to the N atom, or at an alpha or beta carbon atom when R_1 is alkyl or cycloalkyl; and

R_5 and R_6 are each H, C_1–C_6 alkyl, C_3–C_8 alkylcycloalkyl, cycloalkyl or cycloalkylalkyl, C_2–C_8hydroxyalkyl, C_2–C_8 carboxyalkyl or C_3–C_8 alkylcarboxyalkyl;

R_1, R_2, R_5 and R_6 together providing a total of from 7–16 carbon atoms.

4,044,121

HAIR SPRAY CONTAINING FLUOROCARBON COMPOUNDS AS ADDITIVES

Su Sen Ko, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Mar. 11, 1976, Ser. No. 665,922

Int. Cl.² A61K *7/11*

U.S. Cl. 424—71 **14 Claims**

1. In a hair spray composition comprising a non-fluorinated film-forming resin in a solvent vehicle, the improvement comprising the addition to said composition of 0.005 to 5.0 percent by weight of said composition of a vehicle-soluble, dermally non-irritating compound of the formula:

$$R_fQ(XCO)A(COOZ)$$

wherein R_f is a monovalent, fluorinated, saturated, aliphatic radical having 3 to 20 carbon atoms and at least one terminal perfluorinated carbon atoms;

Q is a divalent linking group free of reactive groups which would chemically interfere with the formation of ester or amide linkages and free of heteroatoms other than sulfur, oxygen or nitrogen;

X is —O— or —NR— where R is hydrogen or alkyl having 1 to 14 carbon atoms;

A is phenylene containing only hydrogen substituents on the aromatic carbon atoms, or phenylene where one or more of said hydrogen substituents have been replaced by bromine, chlorine, alkyl having 1 to 4 carbon atoms, nitro, alkoxy having 1 to 4 carbon atoms, or combinations thereof;

Z is hydrogen or a cation selected from the group consisting of NH_4^+, Na^+, K^+, Li^+, a protonated alkyl amine, a protonated alkanol amine having 1 to 6 carbon atoms and quaternized forms of said amines

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4,044,122

METHOD OF TREATING HERPES VIRUS HOMINIS INFECTIONS

S. Harvey Sklar, 647 Anderson Ave., Cliffside Park, N.J. 07010

Filed Jan. 27, 1976, Ser. No. 652,656

Int. Cl.² A61K *31/70*

U.S. Cl. 424—180 **17 Claims**

1. A method of treating herpes virus hominis infection in a mammal afflicted with said infection which comprises administering to said mammal an effective amount for treating herpes virus hominis of the sodium salt of adenylic acid.

4,044,123

6′-N-ALKYL-4,6-DI-O-(AMINOGLYCOSYL)-1,3-DIAMINOCYCLITOLS, METHODS FOR THEIR USE AS ANTIBACTERIAL AGENTS AND COMPOSITIONS USEFUL THEREFOR

Peter J. L. Daniels, Cedar Grove, and William N. Turner, Bloomfield, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 574,070, May 2, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,715

Int. Cl.² A61K *31/71*; C07H *15/22*

U.S. Cl. 424—180 **15 Claims**

14. The method of eliciting an antibacterial response in a warm-blooded animal having a susceptible bacterial infection, which comprises administering to said animal a non-toxic, antibacterially effective amount of a member selected from the group consisting of a 6′-N-alkylaminoglycoside derivative selected from the group consisting of

6′-N-X-sisomicin,
6′-N-X-Antibiotic 66-40B,
6′-N-X-Antibiotic 66-40D,
6′-N-X-Antibiotic Mu-1,
6′-N-X-Antibiotic Mu-2,
6′-N-X-Antibiotic Mu-4,
6′-N-X-Antibiotic Mu-5, and

the 5-epi-, 5-epi-amino-5-deoxy-, and the 5-epi-azido-5-deoxy- analogs of the following:

6′-N-X-gentamicin C_{1a}
6′-N-X-gentamicin B,
6′-N-X-Antibiotic JI-20A,
6′-N-X-Antibiotic 66-40B,
6′-N-X-Antibiotic 66-40D, and
6′-N-X-sisomicin,

wherein X is a substituent selected from the group consisting of alkyl, cycloalkylalkyl, alkenyl, hydroxyalkyl, aminoalkyl, alkylaminoalkyl, aminohydroxyalkyl and alkylaminohydroxyalkyl, said substituent having two to eight carbon atoms, the carbon in said substituent adjacent to the aminoglycoside nitrogen being primary or secondary and unsubstituted by hydroxyl or amino functions, and when said substituent is substituted by both hydroxyl and amino functions only one of said functions can be attached at any one carbon atom;

and the pharmaceutically acceptable acid addition salts thereof.

4,044,124

TRIAZOLYLPHOSPHORUS COMPOUNDS

Beat Boehner, Binningen; Dag Dawes, Prattein, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 572,785, April 29, 1975, abandoned, which is a continuation of Ser. No. 310,726, Nov. 30, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,733

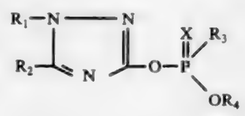
Claims priority, application Switzerland, Dec. 10, 1971, 18064/71; Sept. 29, 1972, 14252/72

The portion of the term of this patent subsequent to Feb. 18, 1992, has been disclaimed.

Int. Cl.² C07D *249/12*; A01N *9/36*

U.S. Cl. 424—200 **6 Claims**

1. A compound of the formula



wherein

R_1 represents C_1–C_5-alkyl, cyclopentyl, cyclohexyl or unsubstituted phenyl,

R_2 represents C_1–C_5-alkoxy or phenoxy,

R_3 represents C_1–C_5-alkyl, C_1–C_5-alkoxy or C_1–C_5-alkylthio,

R_4 represents C_1–C_5-alkyl and

X represents oxygen or sulfur.

5. An insecticidal and acraicidal composition which contains as active component an insecticidally and acaricidally effective amount of a compound according to claim **1**, together with a suitable inert carrier therefor.

4,044,125

METHOD OF STABILIZING ACETYLSALICYLIC ACID IN THE PRESENCE OF d-PROPOXYPHENE HYDROCHLORIDE AND COMPOSITIONS THEREOF

Walter D. Walkling, Huntingdon Valley, Pa., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 597,130, July 18, 1975, abandoned, which is a division of Ser. No. 177,870, Sept. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 72,504, Sept. 15, 1970, abandoned. This application Mar. 22, 1976, Ser. No. 669,059

Int. Cl.² A61K *31/61, 31/615, 31/625*

U.S. Cl. 424—232 **5 Claims**

1. The method of inhibiting the hydrolysis of acetylsalicylic acid in a pharmaceutical composition comprising actylsalicylic acid and d-propoxyphene hydrochloride which comprises incorporating glutamic acid hydrochloride into such pharmaceutical composition in an amount of from about 5 to about 130 percent by weight of d-propoxyphene hydrochloride in such pharmaceutical composition.

4,044,126

STEROIDAL AEROSOL COMPOSITIONS AND PROCESS FOR THE PREPARATION THEREOF

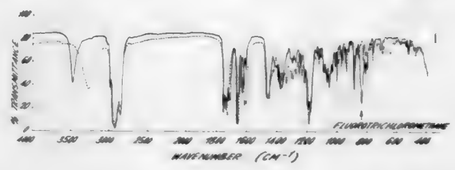
Peter Barry Cook, Standon, and John Harold Hunt, Theydon Bois, both of England, assignors to Allen & Hanburys Limited, London, England

Continuation of Ser. No. 352,187, April 18, 1973, abandoned. This application July 9, 1976, Ser. No. 703,821

Claims priority, application United Kingdom, Apr. 20, 1972, 18421/72

Int. Cl.² A61K *31/56*

U.S. Cl. 424—243 **16 Claims**



1. A method of converting an anti-inflammatory steroid selected from the group consisting of pregn-4-en-3,20-diones having at the 17α-position a hydroxy or acyloxy group, provided that when the 17α-position is substituted by a hydroxy group, the 21-position is substituted by an acyloxy group, or having a 16,17-ketonide group; having an axo group or a β-chlorine or β -hydroxy group at the 11-position; and having a single or double bond in the 1,2-position, the 21-position being unsubstituted or substituted by a hydroxy or acyloxy group or a halogen atom, said steroid having a hydrogen, fluorine or chlorine atom or a methyl group in the 6α-position; a hydrogen or chlorine atom in the 9α-position when there is a β-chlorine atom in the 11-position; a fluorine, chlorine or hydrogen atom in the 9α-position when there is an oxygen function at the 11-position; and a hydrogen atom or a methyl or methylene group at the 16-position; said steroid exhibiting crystal growth in aerosol propellants into a form which does not exhibit such growth whereby the said steroid is contacted with a halogenated hydrocarbon to form a crystalline solvate therewith, the crystalline material so formed being, if desired after removal of some or all of the halogenated hydrocarbon therefrom, reduced to a particle size permitting inhalation into the human bronchial system when dispersed as an aerosol.

4,044,127

PROCESS FOR UTILIZING TETRAHYDRO-3-(4-PYRIDYLMETHYL)-2H-1,3,5-THIADIAZINE-2-THIONES AS FUNGICIDAL AGENTS

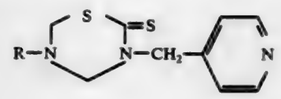
Thomas Andrew Lies, Montgomery Township, Somerset County, and Herman Berenson, Trenton, both of N.J., assignors to American Cyanamide Company, Stamford, Conn.

Division of Ser. No. 665,656, March 10, 1976. This application Sept. 23, 1976, Ser. No. 725,754

Int. Cl.² A01N *9/12*

U.S. Cl. 424—246 **10 Claims**

1. A method for the protection of plants from fungi comprising applying to said plants a fungicidally effective amount of the compound of the formula:



wherein R is selected from the group consisting of methyl, ethyl, isopropyl, n-butyl, tert-butyl, n-dodecyl, β-hydroxyethyl, carboxymethyl, carboxamidomethyl, o-tolyl and 4-chloro-o-tolyl.

4,044,128

INSECTICIDAL SULFONIUM SALTS

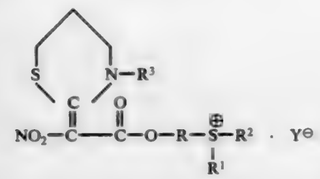
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 582,578, June 2, 1975, abandoned, which is a continuation-in-part of Ser. No. 468,125, May 8, 1974, abandoned. This application June 10, 1976, Ser. No. 694,748

Int. Cl.[2] C07D *279/04;* A01N *9/12*

U.S. Cl. 424—246 **5 Claims**

1. A sulfonium salt of the formula:



wherein Y is an anion selected from chloride, bromide, iodide, methyl sulfate, fluorosulfonyl and fluoborate, R is —CH$_2$—CH$_2$—or such in which one of the hydrogen atoms has been replaced by methyl, R^1 is alkyl of 1 to 3 carbon atoms, R^2 contains up to twenty carbon atoms and is alkyl or alkenyl or is phenyl, benzyl or phenethyl, and R^3 is hydrogen or



wherein Z is —R^4, —OR^4 or —SR^4, R^4 being one of the moieties represented by R^2.

4. A method for controlling insects which comprises contacting them with an insecticidally effective amount of a salt of claim **1**.

4,044,129

4-PYRIDINE CARBONYL PHENYL 1,2,4 TRIAZOLES

Yutaka Kuwada, Ashiya; Kanji Meguro, Takarazuka; Hideaki Natsugari, Nishinomiya; Yoshiaki Sato, Kobe, and Hiroyuki Tawada, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

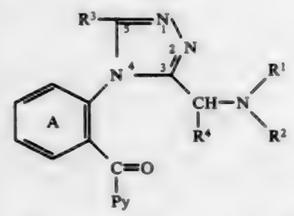
Filed July 3, 1975, Ser. No. 592,889

Claims priority, application Japan, July 25, 1974, 49-85787

Int. Cl.[2] C07D *413/14;* A61K *31/535*

U.S. Cl. 424—248.56 **25 Claims**

1. A compound of the formula



wherein R^1 and R^2, which may be the same or different, represent a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group or a benzyl or phenethyl group, and one of R^1 and R^2 may be hydrogen atoms or R^1 and R^2 form a heterocyclic ring together with the nitrogen atom adjacent thereto selected from the group consisting of pyrrolidine, piperidine, piperazine, morpholine and N-substituted piperazines selected from the group consisting of N—C_1—C_2 alkyl piperazines, N-(2-hydroxy ethyl)piperazine and homopiperidine; R^3 represents hydrogen, a C_1–C_6 alkyl group, a C_3–C_6 cycloalkyl group, a benzyl or phenthyl group or an aryl group selected from the group consisting of phenyl, tolyl and naphthyl; R^4 represents hydrogen or a C_1–C_4 alkyl group; Py represents a pyridyl group and the ring A is either unsubstituted or substituted by a halogen, nitro, a C_1–C_4 alkyl group, a C_1–C_4 alkoxy group or a trilfluoromethyl group or a pharmaceutically acceptable acid addition salt thereof.

25. A pharmaceutical compound having central nervous system activity comprising a therapeutically effective amount of a compound selected from the group consisting of a compound as claimed in claim **1** or a pharmaceuticaly acceptable acid addition salt thereof together with a pharmaceutically acceptable carrier or diluent therefor.

4,044,130

COMPOSITIONS FOR THE CONTROL OF MICROORGANISMS

Graham Arton Howarth, Knutsford, and James Gainer, Tyldesley, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

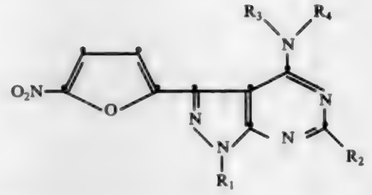
Division of Ser. No. 485,472, July 3, 1974, Pat. No. 3,948,913, which is a continuation-in-part of Ser. No. 247,284, April 25, 1972, abandoned. This application Dec. 17, 1975, Ser. No. 641,479

Int. Cl.[2] A61K *31/04, 31/415*

U.S. Cl. 424—248.56 **3 Claims**

1. A composition for the control of microorganisms harmful to domestric mammals or organic materials comprising an effective amount of a compound of formula I

(I)



wherein

R_1 represents alkyl of 1 to 3 carbon atoms,

R_2 represents a hydrogen atom or alkyl of 1 to 3 carbon atoms, and

R_3 represents a hydrogen atom, alkyl or hydroxy-alkyl of 1 to 3 carbon atoms, alkoxyalkyl wherein the alkoxy and alkyl moieties may each have from 1 to 3 carbon atoms or a hydroxy group, while

R_4 has the meaning given above for R_3 except that it may not represent a hydroxy group, or R_3 and R_4 together represent pyrrolidine, morpholine, piperidine or azepine,

as well as the 5-n-oxides of said compounds and/or pharmaceutically acceptable acid addition salts thereof and an inert carrier material.

4,044,131

2-MORPHOLINOL DERIVATIVES

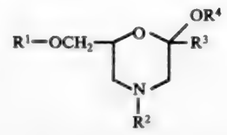
Andre A. Asselin, Ville le Moyne, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,685

Int. Cl.[2] C07D *265/32;* A61K *31/535*

U.S. Cl. 424—248.58 **8 Claims**

1. A compound of formula I



(1)

in which R^1 is 1-naphthalenyl; R^2 is selected from the group consisting of lower alkyl and lower alkynyl; R^3 is selected from the group consisting of hydrogen, lower alkyl, phenyl and phenyl substituted with a halo; and R^4 is selected from the group consisting of hydrogen and lower alkyl; or therapeutically acceptable salt thereof.

6. A β-adrenergic or anti-fungal composition comprising an effective amount of a compound of formula I, or a therapeutically acceptable salt thereof as defined in claim **1**, and a pharmaceutically acceptable carrier.

4,044,132

SUBSTITUTED PIPERAZINE DERIVATIVE, ITS PREPARATION AND ANOREXIA COMPOSITIONS CONTAINING IT

Henry Najer; Regis Dupont, both of Paris, and Don Pierre René Lucien Giudicelli, Fontenay sous Bois, all of France, assignors to Synthelabo, Paris, France

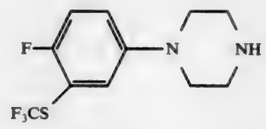
Filed Mar. 11, 1976, Ser. No. 665,884

Claims priority, application France, Mar. 12, 1975, 75.07650

Int. Cl.[2] A61K *31/495;* C07D *295/06*

U.S. Cl. 424—250 **4 Claims**

1. 1-(4-Fluoro-3-trifluoromethylthio-phenyl)piperazine of the formula



or a pharmaceutically acceptable acid addition salt thereof.

3. An anorexigenic composition comprising a dosage unit form containing 1 to 50 mg of the compound of claim **1** in association with a pharmaceutically compatible carrier or excipient.

4. A method of inducing anorexia in a patient which comprises administering to said patient 1-(4-fluoro-3-trifluoromethylthio-phenyl)piperazine or a pharmaceutically acceptable salt thereof in an amount sufficient to induce anorexia.

4,044,133

ANTICOCCIDIAL COMPOSITIONS

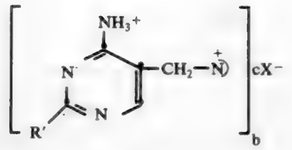
Edward F. Rogers, Middletown; John Hannah, Matawan, both of N.J., and Richard A. Dybas, Center Square, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 462,063, April 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 224,620, Feb. 8, 1972, abandoned. This application Oct. 16, 1975, Ser. No. 623,183

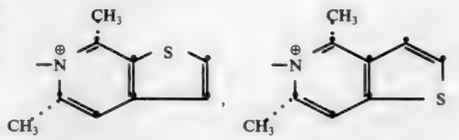
Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **9 Claims**

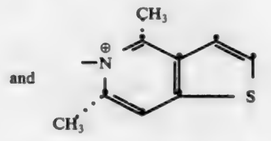
1. A feed supplement composition useful as a coccidiostat comprising a solid, orally ingestible carrier and a compound of the formula:



wherein R′ is alkyl having 1 to 3 carbon atoms; X^- is a non-toxic anion; b and c are integers such that the positive charge of *b* moles of cation are neutralized by c moles of anion X^-; and —N⊕ is a member of the group consisting of:



and



wherein the dotted line indicates that the alpha methyl group can be present or a hydrogen group can be present, with the proviso that one and only one methyl group is present and wherein said compound is from 2 to 25% by weight of said feed supplement composition.

4,044,134

FUSED PYRIMIDIN-4(3H)-ONES AS ANTIALLERGY AGENTS

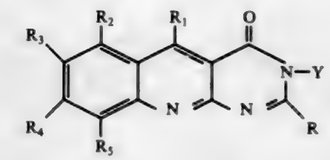
Thomas H. Althuis, Groton; Leonard J. Czuba, New London; Hans-Jurgen E. Hess, Old Lyme, and Saul B. Kadin, New London, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 485,945, July 5, 1974, Pat. No. 3,974,161, which is a continuation-in-part of Ser. No. 444,138, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 351,025, April 13, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,515

Int. Cl.[2] A61K *31/505*

U.S. Cl. 424—251 **17 Claims**

1. The method of controlling allergic symptoms in a mammalian subject which comprises administering to the subject an allergy symptom-controlling amount of a compound selected from the group consisting of those having the formula



and the pharmaceutically acceptable cation salts thereof wherein R is selected from the group consisting of methyl, ethyl, acetyl and COR* wherein

R* is selected from the group consisting of hydroxy, alkoxy having 1 to 4 carbon atoms, hydroxyalkoxy having 2 to 4 carbon atoms, amino and hydroxyamino;

Y is selected from the group consisting of (a) hydrogen and (b) alkyl having 1 to 4 carbon atoms, carbalkoxyalkyl having 2 to 5 carbon atoms in the carbalkoxy moiety and 1 to 4 carbon atoms in the alkyl moiety, carboxyalkyl

having 1 to 4 carbon atoms in the alkyl moiety, $-(CH_2)_m-O-CO-C_6H_5$ and $-(CH_2)_m-O-CO-$alkyl having 1 to 4 carbon atoms in the alkyl moiety; with the proviso that when R is COR° wherein R° is amino or hydroxyamino, Y is hydrogen; m is an integer from 2 up to and including 4;

R_1 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms and phenyl;

each of R_2, R_3, R_4 and R_5 is selected from the group consisting of hydrogen, alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, halo, benzyloxy, hydroxy, thiol, alkanoyloxy having 1 to 4 carbon atoms, benzylthio, benzoyloxy, benzylsulfinyl, methylthio and methylsulfinyl and

R_2 and R_3 and R_3 and R_4 when taken together are selected from the group consisting of methylenedioxy and ethylenedioxy.

4,044,135

ANTIHYPERTENSIVE AGENTS

Martin Winn, Deerfield; Jaroslav Kyncl, Lake Bluff; Daniel Ambrose Dunnigan, Winthrop Harbor, and Peter Handley Jones, Lake Forest, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 14, 1975, Ser. No. 621,979
Int. Cl.² C07D *239/84;* A61K *31/505*
U.S. Cl. 424—251 **6 Claims**

1. The compound comprising 2[4-(tetrahydro-2-furoyl)-hexahydro-1,4-diazepinyl-1]-4-amino-6,7-dimethoxy quinazoline and pharmaceutically acceptable salts thereof.

5. The method of treating hypertension in mammals comprising administering to said mammals a therapeutically effective amount of a compound of claim **1.**

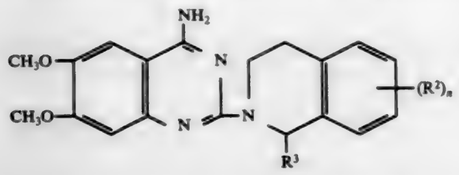
4,044,136

AMINOQUINAZOLINE THERAPEUTIC AGENTS

John Christopher Danilewicz, Ash; John Edward Glyn Kemp, Canterbury, and James Robert Wright, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 394,491, Sept. 5, 1973, Pat. No. 3,960,861.
This application Mar. 3, 1976, Ser. No. 663,627
Claims priority, application United Kingdom, Sept. 9, 1972, 41992/72
Int. Cl.² A61K *31/505*
U.S. Cl. 424—251 **9 Claims**

1. A method for lowering blood pressure in the treatment of a hypertensive subject, which comprises administering to said subject an effective amount of a compound selected from the group consisting of a 4-aminoquinazoline base of the formula



and a pharmaceutically-acceptable acid addition salt thereof, wherein $(R^2)_n$ represents 6,7-di-lower alkoxy, 7,8-di-lower alkoxy or 6-methoxy-7-allyloxy and R_3 is hydrogen or methyl.

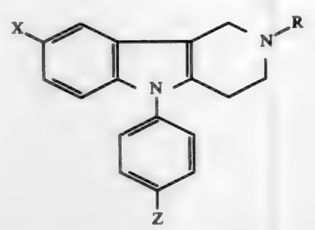
4,044,137

2-(PHENYLTHIOPROPYL)-5-ARYL-1,2,3,4-TETRAHYDRO-γ-CARBOLINES

Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed July 7, 1976, Ser. No. 703,175
Int. Cl.² A61K *31/44;* C07D *471/04*
U.S. Cl. 424—256 **11 Claims**

1. A compound selected from those of the formula:

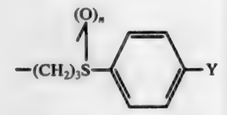


and the pharmaceutically acceptable acid addition salts thereof, wherein

X is selected from the group consisting of fluoro, chloro, bromo and hydrogen;

Z is selected from the group consisting of hydrogen, fluoro, chloro and methoxy; and

R is



wherein *n* is an integer of 0 or 1 and Y is selected from the group consisting of fluoro, chloro, methyl and hydrogen.

10. A method for tranquilizing a mammal displaying schizophrenic manifestations which comprises administering to said mammal in need of such treatment, a tranquilizing effective amount of a compound of claim **1.**

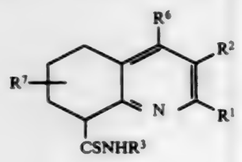
4,044,138

PHARMACEUTICAL COMPOSITIONS CONTAINING 5,6,7,8-TETRAHYDROQUINOLINE DERIVATIVES AND RELATED COMPOUNDS

Adrian Charles Ward Curran, South Cave; Roger Crossley, Reading, and David George Hill, Cookham, all of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 600,257, July 30, 1975, which is a continuation-in-part of Ser. No. 460,265, April 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 403,289, Oct. 3, 1973, abandoned. This application Oct. 24, 1975, Ser. No. 625,431
Claims priority, application United Kingdom, Oct. 21, 1972, 48595/72; Oct. 15, 1973, 7424/73; July 21, 1973, 34866/73; Aug. 16, 1973, 38701/73; Oct. 17, 1973, 48595/72
Int. Cl.² A61K *31/47*
U.S. Cl. 424—258 **14 Claims**

1. An anti-ulcer pharmaceutical composition comprising an effective amount of a compound of formula I



or an acid addition salt thereof with a pharmaceutically acceptable acid, wherein R^1, R^2 and R^6 are the same or different and are selected from hydrogen, trifluoromethyl, alkyl containing from 1 to 6 carbon atoms, phenylalkyl wherein the alkyl group has 1 – 6 carbon atoms, or phenyl groups or R^1 and R^2 taken together represent a polymethylene chain of 3 to 5 carbon atoms, R^7 represents hydrogen or from 1 to 3 groups selected from alkyl of 1 to 6 carbon atoms which may be substituted by alkoxy of 1 to 6 carbon atoms or trifluoromethyl, phenylalkyl wherein the alkyl group has 1 to 6 carbon atoms and phenyl groups, R^3 is hydrogen or alkyl of 1 to 6 carbon atoms, and any of the phenyl or the phenyl portion of any phenylalkyl groups R^1, R^2, R^6 and R^7 may be substituted by alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halogen, nitro or trifluoromethyl with the provisos that (1) when R^1 and R^2 or R^2 and R^6 are both alkyl they are selected from normal and secondary alkyl groups and (2) when two alkyl R^7 groups are present on the same carbon atom then they are both n-alkyl groups and when two R^7 alkyl groups are present on adjacent carbon atoms they are selected from normal and secondary alkyl groups and a pharmaceutically acceptable carrier.

4,044,139

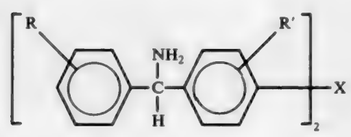
BIS(DIPHENYLAMINOMETHANE) ANTIMICROBIAL AGENTS

Bogislav von Schmeling, Hamden, Conn., and Walter R. Boos, Guelph, Canada, assignors to Uniroyal, Inc., New York, N.Y. and Uniroyal Ltd., Canada

Division of Ser. No. 440,941, Feb. 8, 1974, Pat. No. 3,954,868, which is a division of Ser. No. 231,385, March 2, 1972, Pat. No. 3,808,316. This application Feb. 13, 1976, Ser. No. 658,004
Int. Cl.² A61K *31/44;* C07D *213/36*
U.S. Cl. 424—263 **10 Claims**

6. A composition for the control of bacteria or fungi comprising a chemical containing two dephenylaminomethane groups, linked together by a moiety other than oxygen, having the following formula I, in bactericidally or fungicidally effective amount, and a carrier therefor, said formula being as follows:

I



wherein X is furyl fused to one phenyl group of each diphenylaminomethane moiety, and R and R′ are the same or different and are selected from the group consisting of hydrogen, methyl, methoxy, and phenoxy.

7. A composition for the control of bacteria or fungi, comprising 1,4-bis(4-phenoxy-alpha-aminobenzyl)benzene, in bactericidally or fungicidally effective amount, and a carrier therefor.

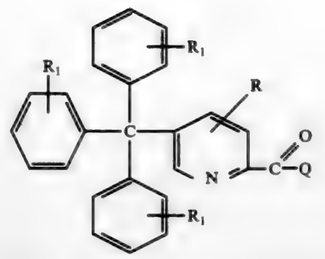
4,044,140

TRITYL PICOLINIC ACID DERIVATIVES AND THEIR USE AS ANTI-ACNE AGENTS

Margaret H. Sherlock, Bloomfield, N.J., assignor to Schering Corporation, Kenilworth, N.J.

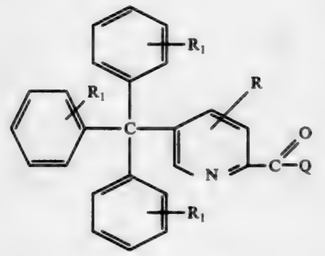
Filed Nov. 28, 1975, Ser. No. 636,010
Int. Cl.² A61K *31/455;* C07D *213/44*
U.S. Cl. 424—266 **16 Claims**

1. A compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein R is hydrogen or alkyl; each R_1 is a member selected from the group consisting of hydrogen, halogen, hydroxy, alkyl, alkoxy, trifluoromethyl and phenyl; and Q is a member selected from the group consisting of hydroxy, and alkoxy, wherein said alkyl or alkoxy contains up to 12 carbon atoms.

12. A method of eliciting an anti-acne effect which comprises topically administering a therapeutically effective quantity of a compound of the formula:



and the pharmaceutically acceptable salts thereof, wherein R is hydrogen or alkyl; each R_1 is a member selected from the group consisting of hydrogen, halogen, hydroxy, alkyl, alkoxy, trifluoromethyl and phenyl; and Q is a member selected from the group consisting of hydroxy, and alkoxy, wherein said alkyl or alkoxy contains up to 12 carbon atoms.

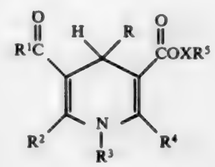
4,044,141

1,4-DIHYDROPYRIDINES

Friedrich Bossert, Wuppertal; Egbert Wehinger, Neviges; Kurt Stoepel, Wuppertal; Wulf Vater, Leverkusen, and Stanislav Kazda, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Feb. 2, 1976, Ser. No. 654,278
Claims priority, application Germany, Feb. 26, 1975, 2508181
Int. Cl.² A61K *31/455;* C07D *213/55*
U.S. Cl. 424—266 **22 Claims**

1. A compound of the formula:



wherein

is a phenyl group, unsubstituted or substituted with from one to three sterically permissible substituents selected from the group consisting of lower alkyl of 1 to 6 carbon atoms,

alkoxy of 1 to 6 carbon atoms, halo, trifluoromethyl, nitro, azido, cyano, hydroxy, amino, carbo(lower alkoxy) wherein lower alkoxy contains from 1 to 6 carbon atoms. carbamido, sulfonamido, (lower alkyl)thio of 1 to 6 carbon atoms, (lower alkyl)sulfinyl of 1 to 6 carbon atoms o. (lower alkyl)sulfonyl of 1 to 6 carbon atoms, or naphthyl,

R^1 is lower alkoxy of 1 to 6 carbon atoms, cycloalkoxy of 3 to 7 carbon atoms or (lower alkoxy)lower alkoxy wherein each lower alkoxy contains 1 to 6 carbon atoms;

each of R^2 and R^4, independently of the other is hydrogen or lower alkyl of 1 to 6 carbon atoms;

R^3 is hydrogen, lower alkyl of 1 to 6 carbon atoms or (lower alkoxy)lower alkyl wherein each of lower alkoxy and lower alkyl contain 1 to 6 carbon atoms;

R^5 is a phenyl, phenoxy or phenylthio group unsubstituted or substituted with from one to three sterically permissible substituents selected from the group consisting of lower alkyl of 1 to 6 carbon atoms, lower alkoxy of 1 to 6 carbon atoms, halo, trifluoromethyl, hydroxy, amino, di(lower alkyl)amino wherein each lower alkyl contains 1 to 6 carbon atoms, nitro, cyano, carbamido, sulfonamido, (lower alkyl)thio of 1 to 6 carbon atoms, (lower alkyl)sulfinyl of 1 to 6 carbon atoms, a (lower alkyl) sulfonyl of 1 to 6 carbon atoms; and

X is lower alkylene of 1 to 6 carbon atoms.

21. The method of producing coronary dilating, spasmolytic and hypotensive effects in humans and other animals which comprises orally, parenterally or perlingually administering thereto an effective amount of a compound according to claim **1**.

4,044,142

1,2-DIHYDRO-6-PHENYL-1H,4H-IMIDAZOBENZODIAZEPIN-1-ONES

John Bodenham Taylor, Down Ampney, near Cirencester, and Derek Ralph Harrison, Swindon, both of England, assignors to Roussel Uclaf, Paris, France

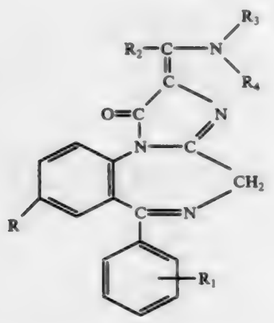
Filed Feb. 17, 1976, Ser. No. 658,301

Claims priority, application United Kingdom, Feb. 15, 1975, 6509/75; Nov. 4, 1975, 4580/75

Int. Cl.[2] **C07D** *403/14*

U.S. Cl. 424—250 **21 Claims**

1. A compound selected from the group consisting of 1,2-dihydro-6-phenyl-1H,4H-imidazo-benzodiazepin-1-ones of the formula



wherein R is selected from the group consisting of hydrogen, halogen, nitro and trifluoromethyl, R_1 is selected from the group consisting of hydrogen and halogen, R_2 is selected from the group consisting of hydrogen and methyl and R_3 and R_4 taken together with the nitrogen atom to which they are attached from a piperazinyl optionally substituted with at least one member of the group consisting of alkyl of 1 to 5 carbon atoms, hydroxyalkyl of 1 to 5 carbon atoms, hydroxyalkyl of 1 to 5 carbon atoms, dialkylphosphinylalkyl with 1 to 5 carbon atoms in the alkyl groups, cycloalkylalkyl with 3 to 6 carbon atoms in the ring and 1 to 5 alkyl carbon atoms, alkenyl of 2 to 5 carbon atoms and phenyl and their non-toxic, pharmaceutically acceptable acid addition salts.

4,044,143

10,11-BIS-(HYDROXYALKYL) DERIVATIVES OF CYPROHEPTADINE

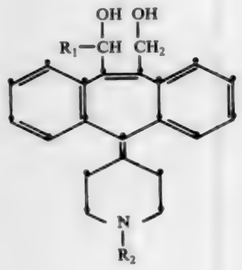
David C. Remy, North Wales, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 545,646, Jan. 30, 1975, Pat. No. 3,974,285. This application Mar. 3, 1976, Ser. No. 663,187

Int. Cl.[2] **C07D** *211/70*

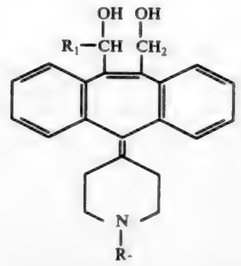
U.S. Cl. 424—267 **12 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen or lower alkyl having from one to five carbon atoms and R_2 is lower alkyl having from one to five carbon atoms, and the nontoxic pharmaceutically acceptable salts thereof.

9. A method of producing an anticholinergic effect comprising administering a therapeutically effective amount in unitary dosage form of a compound having the structure:



or a nontoxic pharmaceutically acceptable acid addition salt thereof.

4,044,144

1H-TETRAZOLE-5-CARBOXAMIDES

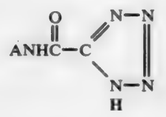
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, both of Pa., and Albert J. Begany, Tucson, Ariz., assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,562

Int. Cl.[2] **A61K** *31/41;* **C07D** *257/04*

U.S. Cl. 424—269 **9 Claims**

1. A process for preventing the release of pharmocological mediators from an immediate hypersensitivity reaction between reaginic type antibodies and an antigen, thereby preventing the symptoms manifest in bronchial asthma, seasonal pollinosis, allergic rhinitis, urticaria, allergic conjunctivitis, food allergy and anaphylactoid reactions of a sensitized animal, which comprises prophylactically administering to said animal an effective amount of a compound of the formula:

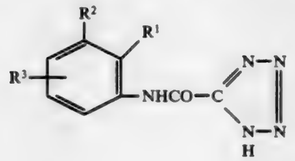


in which

A is a member selected from the group consisting of α-naphthyl, β-naphthyl, phenyl, 2,6-dichlorophenyl, and substituted phenyl moieties containing from one to three substituents in any of the 2,3,4 and 5 positions of the phenyl ring, independently selected from the group consisting of lower alkyl, lower alkylsulfinyl, lower alkoxy, hydroxy(lower) alkoxy, 2-(lower alkoxy oxalyloxy)ethoxy, N-mono- and di-lower alkylamino(lower)alkoxy, halo, sulfamyl, polyhalo(lower)alkyl, carbamoyl, N-lower alkylcarbamoyl, mono- and di-lower alkylamino, carboxy, lower alkylcarbonyl, cyano, carb(lower)alkoxy, phenoxy(lower)alkoxy, lower alkoxy-oxalamido and lower alkoxyoxalamidophenoxy radicals;

of a pharmaceutically acceptable salt thereof.

2. The process of claim **1** which comprises administering to said sensitive animal a compound of the formula



in which

R^1 is —CN or $CONH_2$;

R^2 is lower alkoxy, hydroxy(lower)alkoxy, lower alkylamino or di(lower)alkyl amino;

R^3 is hydrogen, lower alkyl, lower alkoxy, halo, poly-halo(lower)alkyl, lower alkyl carbonyl or carb(lower) alkoxy;

or pharmaceutically acceptable salt thereof.

4,044,145

FUNGICIDAL COMPOSITIONS

Laurent Lacroix, Villers St-Fargeau, France, assignor to Rhone-Poulenc Industries, Paris, France

Filed July 14, 1975, Ser. No. 595,605

Claims priority, application France, July 15, 1974, 74.24511; June 4, 1975, 75.17425

Int. Cl.[2] **A01N** *9/02, 9/12, 9/22*

U.S. Cl. 424—273 R **7 Claims**

1. A fungicidal composition which comprises a combination of 1-isopropylcarbamoyl-3-(3,5-dichlorophenyl)hydantoin and another fungicide selected from the class consisting of 2-methoxycarbonylamino-benzimidazole, 1-butyl-carbamoyl-2-methoxycarbonylamino-benzimidazole, and 1,2-bis-(3-methoxycarbonylthioureido)benzene, in association with one or more diluents or adjuvants compatible with the fungicides and suitable for use in agricultural fungicidal compositions, the amount of fungicide in the composition being between 0.005% and 80% by weight of the composition, and the percentage of 1-isopropylcarbamoyl-3-(3,5-dichlorophenyl)hydantoin in the said combination of fungicides present in the composition being between 10% and 90% by weight.

4,044,146

XANTHENE-9-CARBOXYLATES

Egon Kárpáti; László Szporny, both of Budapest; Mihály Bartók, Szeged; József Czombos, Szeged; Károly Felföldi, Szeged; Márta Laszlavik, Szeged, and Ferenc Notheisz, Szeged, all of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar R.T., Budapest, Hungary

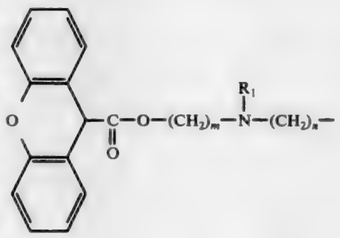
Continuation-in-part of Ser. No. 673,135, April 2, 1976. This application Jan. 21, 1977, Ser. No. 761,402

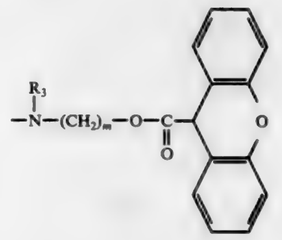
Claims priority, application Hungary, June 27, 1975, RI 569

Int. Cl.[2] **C07D** *311/84*

U.S. Cl. 424—283 **7 Claims**

1. A xanthene-9-carboxylate of the formula





wherein

R_1 and R_3 may be the same or different and each is lower alkyl,

n and *m* each represent integers of 2 to 5, or a pharmaceutically effective salt thereof.

4,044,147

N-(ACYL)-p-AMINO-N'-(MONOSUBSTITUTED)-BENZAMIDE ANTI-ULCER AGENTS

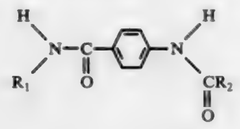
Albin J. Nelson, Ledyard, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed May 26, 1976, Ser. No. 690,300

Int. Cl.[2] A61K *31/24, 31/19;* **C07C** *101/44*

U.S. Cl. 424—309 **10 Claims**

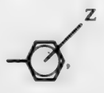
1. A compound of the formula



wherein:

R_1 is selected from the group consisting of n-alkyl having from seven to eighteen carbon atoms, phenyl, benzyl and phenylethyl,

R_2 is selected from the group consisting of $-(CH_2)_nCO_2R_3$, $-(CHOR_4)_nCO_2R_3$ and



said Z substituent being $-(CH_2)_uCO_2R_3$,

R_3 is hydrogen or alkyl having from one to five carbon atoms,

R_4 is hydrogen or acetyl;

n is an integer from one to four;

u is 0 or an integer from one to two; and the alkali, alkaline earth and ammonium salts of those compounds having at least one carboxylate group.

4,044,148

COMPOUNDS, COMPOSITIONS AND METHODS OF USE

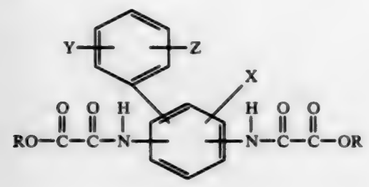
John B. Wright, and Charles M. Hall, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 477,818, June 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 382,762, July 26, 1973, Pat. No. 3,993,679, which is a continuation-in-part of Ser. No. 317,005, Dec. 20, 1972, abandoned. This application Jan. 22, 1976, Ser. No. 651,480

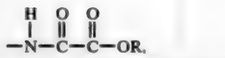
Int. Cl.[2] A01N *9/24;* **C07C** *101/447*

U.S. Cl. 424—317 **23 Claims**

1. A pharmaceutical composition which comprises an antireagin or non-reagin mediated allergy effective amount of a compound



wherein the

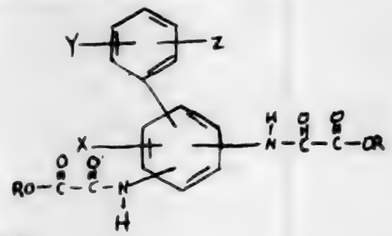


groups or meta or para to each other; R is hydrogen or a physiologically acceptable metal or amine cation; and X, Y, and Z are the same or different and are selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, hydroxy, fluoro, chloro, bromo and

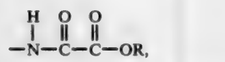


wherein D is selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, and a physiologically acceptable metal or amine cation, with the proviso that when D is hydrogen or a physiologically acceptable metal or amine cation, D is the same as R; in association with a pharmaceutical carrier.

9. Compounds of the structure



wherein the



groups are meta or para to each other; R is hydrogen or a physiologically acceptable metal or amine cation; and X, Y and Z are the same or different and are selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, alkoxy of one to four carbon atoms, inclusive, hydroxy, fluoro, chloro, bromo and



wherein D is selected from the group consisting of hydrogen, alkyl of one to six carbon atoms, inclusive, and a physiologically acceptable metal or amine cation, with the proviso that when D is hydrogen or a physiologically acceptable metal or amine cation, D is the same as R.

4,044,149

ALUMINUM SALTS OF SUBSTITUTED PHENYLALKANOIC ACIDS AND PHARMACEUTICAL SUSPENSIONS PREPARED THEREFROM

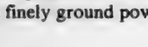
Calvin H. Fields, and Clarence A. Hirsch, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Division of Ser. No. 469,257, May 13, 1974, Pat. No. 3,976,674, which is a continuation-in-part of Ser. No. 302,709, Nov. 1, 1972, abandoned. This application July 14, 1976, Ser. No. 705,225

Int. Cl.[2] A61K *31/19*

U.S. Cl. 424—317 **6 Claims**

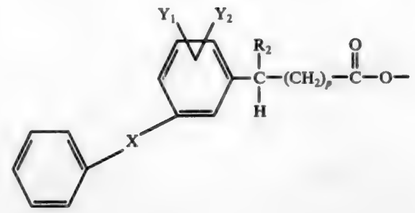
1. A chemically and physically stable pharmaceutical suspension comprising a finely ground powder of a compound of the formula:



wherein

n is 1 or 2; and

R_1 is the moiety:



wherein:

p is 0, 1, 2 or 3;

X is oxygen or sulfur

R_2 is hydrogen, C_1–C_5 alkyl, C_2–C_5 alkenyl, C_2–C_5 alkynyl, or C_3–C_6 cycloalkyl; and

Y_1 and Y_2 are, independently, hydrogen, hydroxy, halo, C_1–C_3 alkyl, or C_1–C_3 alkoxy, but Y_2 is hydrogen when Y_1 is hydroxy or C_1–C_3 alkoxy

suspended in a vehicle comprising water, one of the parabens as a preservative, a specific gravity adjusting agent selected from the class consisting of fructose, dextrose, mannose, lactose, sucrose, glycerin, propylene glycol and mannitol, and a viscosity adjusting substance selected from the class consisting of methylcellulose, polyvinylpyrrolidone hydroxypropylcellulose, sodium carboxymethylcellulose, microcrystalline cellulose, finely ground bentonite, gelatin, guar gum, or a combination of two or more of such substances.

4,044,150

ANTIHYPERTENSIVE 4'-[1-HYDROXY-2-[(1-PHENOXY ETHYL)-AMINO]ETHYL]METHANESULFONANILIDE AND SALTS THEREOF AND THERAPEUTIC USE

William E. Kreighbaum, and Herbert R. Roth, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed June 18, 1976, Ser. No. 697,508

Int. Cl.[2] A61K *31/18;* **C07C** *143/72, 143/84*

U.S. Cl. 424—321 **11 Claims**

1. A compound selected from the group consisting of 4'-[1-hydroxy-2-[(2-phenoxyethyl)amino]ethyl]methanesulfonanilide and the pharmaceutically acceptable acid addition and metal salts thereof.

5. An antihypertensive process which comprises systemically administering to a hypertensive mammal an effective antihypertensive amount of a compound selected from the group consisting of 4'-[1-hydroxy-2-[(2-phenoxyethyl)amino]ethyl]methanesulfonanilide and pharmaceutically acceptable acid addition and metal salts thereof.

9. A pharmaceutical dosage unit adapted for systemic administration to a hypertensive mammal comprising a pharmaceutical carrier and an effective antihypertensive amount of a compound selected from the group consisting of 4'-[1-hydroxy-2-[(2-phenoxyethyl)amino]ethyl]methanesulfonanilide and pharmaceutically acceptable acid addition and metal salts thereof.

4,044,151

SULFAMIDOPHENETHANOLAMINE THERAPEUTIC PROCESS

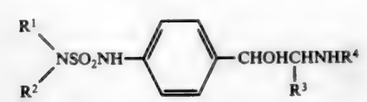
William T. Comer, and John D. Catt, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 399,024, Sept. 20, 1973, Pat. No. 3,923,886. This application Nov. 19, 1975, Ser. No. 633,537

Int. Cl.[2] A61K *31/18, 31/44, 31/445*

U.S. Cl. 424—321 **7 Claims**

1. The method for inhibiting beta-adrenergic activity in a mammalian host having a disease state resulting from excessive activation of the beta-adrenergic receptors which comprises administering to said host a non-toxic effective adrenergic beta-receptor inhibiting dose of a compound selected from a group consisting of



wherein:

R^1 is hydrogen, lower alkyl having from 1 to 4 carbon atoms cyclopropyl, phenyl, or tolyl;

R^2 is hydrogen, lower alkyl having from 1 to 4 carbon atoms, cyclopropyl or benzyl; or

R^1 and R^2 are joined to form with the nitrogen atoms to which they are attached the 1-piperidyl group;

R^3 is hydrogen, methyl, or ethyl; and

R^4 is hydrogen, cyclopropyl, or lower alkyl having from 1 to 4 carbon atoms,

and the pharmaceutically acceptable acid addition and metal salts thereof.

4,044,152

METHODS OF PREPARING METHYLROSANILINE CHLORIDE ANTI-MICROBIAL COMPOSITIONS

Dennis E. Jackson, Springfield, Mo., assignor to Naremco, Inc., Springfield, Mo.

Division of Ser. No. 538,905, Jan. 6, 1975, Pat. No. 3,965,266, which is a continuation of Ser. No. 307,372, Nov. 17, 1972, abandoned. This application Dec. 2, 1975, Ser. No. 637,042

Int. Cl.[2] A01N *9/20;* **A61K** *31/14*

U.S. Cl. 424—329 **7 Claims**

3. A method of preparing a methylrosaniline chloride-containing, anti-microbial composition from which methylrosaniline chloride is readily released in the presence of moisture, comprising dissolving methylrosaniline chloride in a vaporizable solvent, adding the resulting solution and a solution of a non-toxic acid to a finely-divided mineral carrier, the acid being one which does not form water insoluble reaction products with said mineral carrier, the proportions of methylrosaniline chloride being in the range of from about 0.1% to 5% by weight and the proportions of acid being in the range of from about 0.1 to 10% by weight based on the weight of said mineral carrier, and mixing the resulting mass to thoroughly disperse the methylrosaniline chloride and acid throughout the carrier to provide a product in which the acid or its reaction product is in intimate contact with said methylrosaniline chloride on the mineral carrier to thereby facilitate said release of the methylrosaniline chloride from the carrier.

4,044,153

ANTIINFLAMMATORY 2-AMINOMETHYL-6-TRIHALOMETHYLPHENOLS

Everett M. Schultz, Ambler, and Edward J. Cragoe, Jr., Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

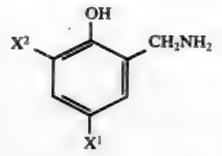
Continuation of Ser. No. 600,990, Aug. 1, 1975, Pat. No. 3,979,361, which is a continuation-in-part of Ser. No. 444,200, Feb. 20, 1974, abandoned, which is a continuation-in-part of Ser. No. 120,730, March 3, 1971, Pat. No. 3,794,734. This application May 7, 1976, Ser. No. 684,138

The portion of the term of this patent subsequent to Feb. 26, 1991, has been disclaimed.

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 **2 Claims**

1. A pharamaceutical composition comprising an antiinflammatory effective amount of a compound of the formula:



wherein X^1 is C_{1-7} lower alkyl, or cycloalkyl containing 5 to 6 carbon atoms; and X^2 is trifluoromethyl; or the non-toxic pharamaceutically acceptable salts thereof in a pharamceutically acceptable carrier.

4,044,154

SALTS OF 6-O-ACYL ASCORBIC ACID FOR YEAST-RAISED BAKED PRODUCTS

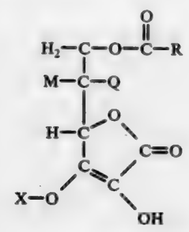
Russell C. Hoseney; Paul A. Seib, and Charles W. Deyoe, all of Manhattan, Kans., assignors to The Kansas State University Research Foundation, Manhattan, Kans.

Filed Nov. 17, 1975, Ser. No. 632,353
Int. Cl.² A21D *2/14*
U.S. Cl. 426—21 **12 Claims**

1. A method of preparing an improved yeast-leavened dough or batter comprising the steps of:

admixing the ingredients making up the yeast-leavened dough or batter; and

adding to said dough or batter prior to the baking or frying thereof from about 0.25 to 1.5% (baker's weight) of a compound of the formula



wherein M and Q are different and respectively taken from the group consisting of —H and —OH, R represents an aliphatic group having from 12 to 18 carbon atoms, inclusive, and X is a salt-forming member selected from the group consisting of sodium, potassium, calcium and magnesium.

4,044,155

NONFAT DRY MILK SUBSTITUTE FOR YEAST-LEAVENED BAKED PRODUCTS

Russell C. Hoseney, and Rujira Srisuthep Ling, both of Manhattan, Kans., assignors to The Kansas State University Research Foundation, Manhattan, Kans.

Filed Dec. 16, 1975, Ser. No. 641,293
Int. Cl.² A21D *2/02, 2/36*
U.S. Cl. 426—62 **15 Claims**

1. A yeast-leavened dough comprising respective quantities of flour, water, yeast, and a nonfat dry milk substitute, said substitute consisting essentially of:

deproteinized whey;

a quantity of a substance providing from about 1 to 10% by weight of ammonium ion in the substitute; and from about 20 to 60% by weight of a protein supplement;

said dough containing the substitute in an amount to provide about 0.02 to 0.2% (baker's weight) of ammonium ion in the dough.

4,044,156

RUMINANT FEED SUPPLEMENT AND PROCESS FOR PRODUCING SAME

Uriel Diner, and Richard MacLeod Elofson, both of Edmonton, Canada, assignors to The Research Council of Alberta, Edmonton, Canada

Filed Dec. 24, 1974, Ser. No. 536,118
Int. Cl.² A23K *1/14*
U.S. Cl. 426—69 **3 Claims**

1. A process for producing a non-protein nitrogen feed supplement for ruminants which comprises:

mixing glucose, produced by the hydrolysis of starch in grain selected from the group consisting of barley, wheat and corn, said glucose still being associated with the other normal constituents of the grain, with water, urea and sufficient mineral acid to provide a mixture having a starting pH of about 2 – 4, said glucose being the major dry matter constituent of said mixture; and

drying the mixture at an elevated temperature for sufficient time to cause urea and the major portion of the glucose to react and form urease - resistant glucosyl ureides in solid form.

4,044,157

PROCESS FOR PREPARING EXPANDED SOYBEAN GRANULES

Morris D. Wilding, Downers Grove, Ill., assignor to Swift & Company, Chicago, Ill.

Continuation-in-part of Ser. No. 436,358, March 1, 1965, abandoned. This application May 29, 1967, Ser. No. 642,208
Int. Cl.² A23J *3/00*
U.S. Cl. 426—250 **16 Claims**

1. A method for preparing an improved protein food product comprising: forming a dough containing from about 15% to about 45% by weight, of water and defatted, undenatured, solvent-extracted oil seed protein material; heating said dough for a period of time less than about five minutes under pressure to a temperature of about 260° F. to about 380° F., sufficient to rapidly denature the protein of said dough, said dough having sufficient plasticity to be extruded in a self-binding form; and extruding said heated dough into an area of reduced pressure under conditions causing the dough to expand by the flashing of moisture therefrom, and causing sufficient denaturation to occur prior to said heated dough reaching said area so as to cause the product to retain an elongated cellular structure created by said flashing of moisture upon reaching said area.

4,044,158

CASEINATE REPLACEMENT FOR PET FOOD USING A NEUTRAL CHELATING AGENT

Morris P. Burkwall, Jr., Marengo, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 598,415, July 23, 1975, abandoned. This application July 19, 1976, Ser. No. 706,536
Int. Cl.² A23K *1/18, 1/10, 1/14*
U.S. Cl. 426—271 **11 Claims**

1. In a marbled, semi-moist pet food comprising:

about 5 percent to about 50 percent by weight meat or meat by-products;

about 15 to about 50 percent by weight moisture content;

about 5 percent to about 35 percent by weight sugar;

up to about 1 percent by weight of an antimycotic;

about 1 to bout 20 percent by weight polyhydric component; and casein salt, the improvement comprising

replacing at least part of the casein salt with about 1 to about 26 percent by weight vegetable protein; about 4 to about 25 percent by weight starch; and at least 0.01 percent by weight of at least one edible substantially neutral chelating agent — wherein the pH of the pet food is 6.3 to 7.2

4,044,159

EXTRUDED CEREAL PRODUCT AND ITS PREPARATION

Roger J. Lutz, Fremont, Mich., assignor to Gerber Products Company, Fremont, Mich.

Continuation of Ser. No. 185,871, Oct. 1, 1971, abandoned. This application Sept. 17, 1973, Ser. No. 398,032
Int. Cl.² A23L *1/164*
U.S. Cl. 426—302 **4 Claims**

1. A process for preparing a nutritional, ready-to-eat expanded cereal product in the form of thin flakes, especially suitable for the feeding of junior-age infants, from a moist, free flowing blend formed of dry ingredients including cereal grain, consisting essentially of the steps of: blending the dry ingredients with from 12 to 30% by total weight of water; providing an extruder having a diehead opening in the range of 1/16 to ¼ inch; cooking said blended ingredients at a temperature of about 300° F while simultaneously extruding the same from said diehead opening under sufficient pressure to provide a product form expanded by a factor of about 3; slicing said expanded form into flakes of a thickness of about 0.005 to 0.2 inches; and drying said flakes at a temperature of about 300° F to a moisture content of less than about 5% by total weight.

4,044,160

ANTIMICROBIAL AND ANTIRANCIDITY AGENT

David R. Erickson, Downers Grove, and Robert B. Tompkin, LaGrange, both of Ill., assignors to Swift & Company, Chicago, Ill.

Continuation of Ser. No. 587,085, June 16, 1975, abandoned. This application June 15, 1976, Ser. No. 696,390
Int. Cl.² A23C *9/08;* A23D *5/04;* A23L *3/34*
U.S. Cl. 426—330 **11 Claims**

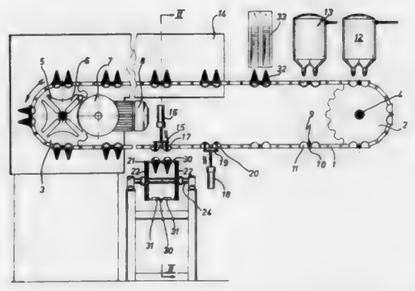
7. A method for inhibiting the development of microorganisms in an aqueous material, said method comprising adding a microorganism growth inhibitor to an aqueous material, said aqueous material containing water and being a biodegradable material in which microbial growth normally occurs, said microorganism growth inhibitor consisting essentially of tertiary butyl hydroquinone at a bacteriostatic concentration that inhibits microbial growth in said aqueous material, said bacteriostatic concentration in the aqueous material being greater than the concentration known to inhibit oxidative rancidity and being based on the total weight of the aqueous material.

4,044,161

AUTOMATIC ICE CREAM MANUFACTURING MACHINE

Giovanni Tanara, Parma, Italy, assignor to Ice Cream Engineering di G. Tanara & C. S.a.s., Parma, Italy

Filed Feb. 2, 1976, Ser. No. 654,414
Claims priority, application Italy, Feb. 10, 1975, 42505/75
Int. Cl.² A23G *9/26*
U.S. Cl. 426—421 **4 Claims**



1. Process for manufacturing ice cream of the type consisting of a hardened creamy mass and in which a support stick is embedded, comprising the following operations in succession:

feeding one or more different types of creamy material by known proportioning devices into suitable deformable elastomer recesses,

inserting a stick into said recesses in succession,

introducing said recesses into a chamber at very low temperature of the order of 40°– 45° C below zero, for a time of approximately 40 – 46 minutes;

withdrawing said recesses from said chamber and feeding them inverted to a suitable discharge station;

deforming said recesses by acting on them externally from above with a suitable pressure to make them assume an inverted symmetrical configuration, with the consequent expulsion of the hardened creamy mass;

subsequently deforming said recess in the opposite direction to make them assume their initial configuration.

3. Automatic machine for manufacturing blocks of ice cream and the like comprising a refrigerated chamber, a conveyor which travels along part of its path of travel in the open air and part of said path within said chamber, transverse members on said conveyor, each consisting of a plate of elastomeric material defining recesses having walls thinner than said plate, feed means for a creamy material, spray means for material in aqueous suspension and feeder means for a wooden stick or cone of edible material upstream of said refrigerated chamber, and means located on opposite sides of said conveyor downstream of the refrigerated chamber for causing said recesses to assume an inverted configuration symmetrical with respect to their initial configuratiion and then returning them to their initial configuration.

4,044,162

DECAFFEINATED COFFEE OF IMPROVED FLAVOR

Frank Lando, Wayne, N.J., and Charles Leonard Teitelbaum, New York, NY, assignors to General Foods Corporation, White Plains, N.Y.

Filed Nov. 14, 1973, Ser. No. 415,924
Int. Cl.² A23F *1/10*
U.S. Cl. 426—427 **6 Claims**

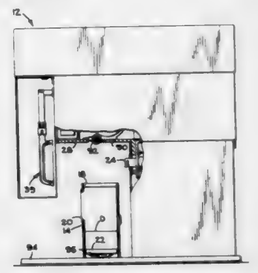
1. In a method of decaffeinating coffee wherein caffeine-containing green coffee is contacted with an extraction medium comprised of a water extract of green coffee solubles to effect caffeine removal from said coffee, the improvement comprising adding sucrose to said extraction medium in an amount sufficient to result in a decaffeinated green coffee having at least about 6% sucrose by dry weight.

4,044,163

METHOD FOR FORMING DOUGH BARRIER

Mounir A. Shatila; William H. Von Der Lieth, both of Blackfoot; John L. Veeneman, and Marion E. Thomas, both of Idaho Falls, all of Idaho, assignors to Ampco Foods Inc., San Francisco, Calif.

Continuation of Ser. No. 507,602, Sept. 19, 1974, abandoned. This application Nov. 24, 1976, Ser. No. 744,461
Int. Cl.² A23L *1/216;* A21C *3/04*
U.S. Cl. 426—502 **2 Claims**



1. An improved method for forming an impervious dough barrier upon start up of a potato dough forming and shaping

machine comprising the steps of providing a machine having an elongate chamber of uniform cross section which defines a discharge opening and a rear opening axially spaced from the discharge opening, the chamber having a side inlet opening adjacent the rear opening, mounting means for mounting the chamber in a substantially horizontal position with the side inlet opening in an upward position, devices in vertical alignment above the side inlet opening which form means for introducing preselected amounts of dry potato agglomerates and water along a vertical path into the chamber through the side inlet opening, a piston sized for a fluid-tight sliding fit within the chamber, a piston rod extending into the chamber through the rear opening and mounted to the piston to axially move the piston toward and away from the discharge opening to extrude dough through the discharge opening, the piston rod operating to terminate piston movement short of the discharge opening so as to retain in the chamber a dough mass constituting an impervious barrier for effecting formation of subsequent batches of dough from dry potato and agglomerates introduced through the side inlet opening, and dough shaping mechanism supported at the discharge opening for shaping the dough into shaped pieces as the dough is extruded through the discharge opening by the piston,

disengaging the piston from the rod,

supporting the piston in substantially horizontal orientation in alignment below the introducing devices,

placing the chamber in an empty condition with the discharge opening downward over the piston and in a substantially vertical orientation so that the piston seals the lowermost opening of the chamber,

activating the introducing devices to deposit into the chamber through the rear opening preselected quantities of dry potato agglomerates and water,

maintaining the piston and chamber in position until the water has thoroughly wetted the potato agglomerates so as to form a set dough sufficiently stiff to retain a charge of potato agglomerates and water in said chamber and

installing the chamber in horizontal relationship beneath the introducing devices after completion of said maintaining step, and extruding the stiff dough through the discharge opening, such that at least part of the stiff dough remains in the chamber after extruding the dough through the discharge opening so as to afford formation of a subsequent dough charge while the chamber is in the horizontal position.

4,044,164

USES OF α-OXY(OXO) SULFIDES AND ETHERS IN FOODSTUFFS AND FLAVORS FOR FOODSTUFFS

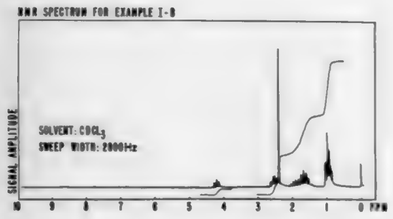
William J. Evers, Red Bank; Howard H. Heinsohn, Jr., Hazlet, and Manfred Hugo Vock, Locust, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,537

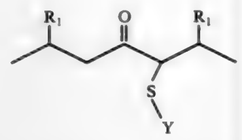
The portion of the term of this patent subsequent to May 17, 1994, has been disclaimed.

Int. Cl.² A23L *1/226, 1/235*

U.S. Cl. 426—535 **14 Claims**



1. A process for augmenting or enhancing the taste or aroma of a foodstuff comprising the step of adding to said foodstuff from about 0.1 ppm up to about 50 ppm by weight of said foodstuff of an alpha oxosulfide compound having the structure:



wherein R_1 is hydrogen or methyl and Y is one of C_1–C_4 alkyl or C_3 or C_4 alkenyl.

4,044,165

PROCESS FOR PREPARING PRECOOKED PASTA PRODUCTS

Gérard Baumann, 60 Avenue Henri Martin, 75016 Paris, France

Filed Aug. 29, 1975, Ser. No. 609,075

Claims priority, application France, Aug. 29, 1974, 74.29492

Int. Cl.² A23L *1/16*

U.S. Cl. 426—557 **7 Claims**

1. A process of producing precooked pasta products with a good shelf-life and having, after preparation at the time of consumption, the usual looks, taste and flavor of ordinary pasta products, consisting essentially of, mixing without heating, wheat semolina with 15 to 20% by weight of cold water on the basis of the weight of the semolina to form a dough and thereafter cooking and simultaneously extruding the thus obtained dough under high pressure at temperatures ranging between 90° C and 110° C to gelatinize the starch in the wheat semolina, and drying the extrusion-cooked product to a final moisture content of about 12.5% by weight.

4,044,166

EXPANDED BOARD OR SHEET-LIKE FOOD PRODUCT AND METHOD OF MANUFACTURING THE SAME

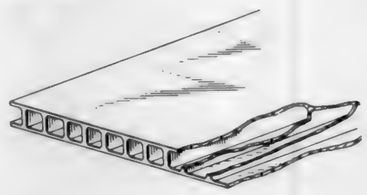
Eiji Koizumi, Niigata, Japan, assignor to Kameda Seika Co., Ltd., Niigata, Japan

Filed June 2, 1976, Ser. No. 692,037

Claims priority, application Japan, June 6, 1975, 50-68375; June 24, 1975, 50-78453

Int. Cl.² A21D *13/08;* A23L *1/16*

U.S. Cl. 426—560 **8 Claims**



1. A sheet-like food product having solely a surface sheet, a backing sheet spaced from said surface sheet, and a plurality of laterally spaced generally parallel bulkheads extending between said surface sheet and said backing sheet and defining a plurality of elongated laterally spaced rectangular chambers between said sheets and said bulkheads formed by passing a viscoelastic dough cake comprised of edible vegetable material through a gap between a pair of oppositely rotating rollers and subsequently through a gap between a pair of scrapers where the scrapers scrape the dough cake from the rollers and form the sheet-like food product.

4,044,167

METHOD FOR AROMATIZING SOLUBLE COFFEE

Michael D. Jolly, Highland Mills, N.Y.; Anthony T. Nacci, Bergenfield; Gaetano J. DeCeglie, Palisades Park, both of N.J., and Rudolf A. Vitti, Dumont, N.J., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 12, 1972, Ser. No. 252,757

Int. Cl.² A23F *1/04*

U.S. Cl. 426—594 **4 Claims**

1. A method for producing an aromatized soluble coffee product comprising the steps of:

a. combining coffee grinder gas aroma and water-soluble or water dispersible carbohydrate solids with a liquid glyceride, the carbohydrate solids being present at from 10 to about 40% by weight of the glyceride,

b. cooling the aromatized glyceride-carbohydrate material to a solid state,

c. comminuting the solidified aromatized glyceride-carbohydrate material,

d. blending the comminuted particles with a soluble coffee powder,

e. permitting the blend to warm to at least room temperature whereby liquefaction of the solidified aromatized glyceride-carbohydrate material occurs and the aromatized liquid spreads over the surface of the soluble coffee powder.

4,044,168

FLAVORED FAT COMPOSITION

Arie Steenhoek, Barendrecht, and Herman Olsman, Terborg, both of Netherlands, assignors to Lever Brothers Company, New York, N.Y.

Filed Sept. 17, 1975, Ser. No. 614,295

Claims priority, application Netherlands, Sept. 18, 1974, 7412329

Int. Cl.² A23D *5/00*

U.S. Cl. 426—613 **15 Claims**

14. An improved frying fat composition, suitable for the preparation of a gravy, comprising

a. fat, wherein said fat is present in said composition at a level of at least about 80 percent by weight,

b. at least one proteinaceous material selected from the group consisting of whey powder and milk powder, wherein said whey powder is present in said composition at a level up to about 8 percent by weight, and said milk powder is present in said composition at a level up to about 2 percent by weight,

c. about 0.1 to about 1.5 percent of phosphatide, and

d. about 0.2 to about 5 mg equivalents per 100 grams of said composition of monoammonium adipate.

4,044,169

FEED ADDITIVE FOR RUMINANTS

Heidrun Bertram, Grossauheim; Rudolf Fahnenstich, Mombris, and Herbert Tanner, Grossauheim, all of Germany, assignors to Duetsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Division of Ser. No. 441,983, Feb. 13, 1976, Pat. No. 3,968,253.

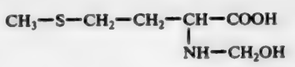
This application Mar. 10, 1976, Ser. No. 665,575

Claims priority, application Germany, Feb. 16, 1973, 2307836

Int. Cl.² A23K *1/22*

U.S. Cl. 426—656 **5 Claims**

1. A ruminant feed containing an additive consisting essentially of N-hydroxymethyl methionine of the formula



or a non-toxic salt thereof.

4,044,170

SURGICAL IMPLANT AND METHOD FOR ITS PRODUCTION

Heinz Scharbach, Plankstadt; Achim Engelhardt, and Peter Bunz, both of Frankfurt, all of Germany, assignors to Pfaudler-Werke A.G., Schwetzingen, Germany

Division of Ser. No. 496,268, Aug. 9, 1974, Pat. No. 3,987,499.

This application Apr. 8, 1976, Ser. No. 675,129

Claims priority, application Germany, Aug. 10, 1973, 2340546

Int. Cl.² B05D *1/38, 7/14, 3/02*

U.S. Cl. 427—2 **1 Claim**

1. A method for the manufacture of a surgical implant comprising a metallic substrate wholly coated with porcelain enamel, comprising:

applying crystallizable porcelain enamel frit to part of said substrate;

firing said frit to form an enamel coating on part of said substrate;

subjecting said enamel coating to controlled heat treatment to partially crystallize said coating, whereby the viscosity of said coating is increased;

applying porcelain enamel frit to the remaining non-enamelled surface of said metallic substrate;

positioning said implant upon a firing support with said partially crystallized enamel in contact with said support; and

first the frit applied to the previously non-enamelled surface to form an enamelled coating over said surface.

4,044,171

PROCESS FOR POLYADDITION PRODUCTS WHICH CONTAIN URETDIONE GROUPS AND USE IN COATINGS

Hanns Peter Muller, Leverkusen; Kuno Wagner, Leverkusen-Steinbuechel, and Richard Muller, Bergisch-Neukirchen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 17, 1975, Ser. No. 569,112

Claims priority, application Germany, Apr. 27, 1974, 2420475

Int. Cl.² B05D *7/26;* C08G *18/79*

U.S. Cl. 427—27 **18 Claims**

8. A process for the coating of substrates which comprises:

a. mixing the cross-linking agent of claim **1** with from 5 to 85% by weight based on the total quantity of binder, of polyhydroxyl compounds free from uretdione groups having molecular weights of from 400 to 10,000 and conventional lacquer pigments and fillers,

b. coating the mixture on a substrate, and

c. heating the coating at temperatures in excess of 110° C until it hardens.

12. A process for the preparation of pulverizable latent cross-linking agents which comprises

1. dimerizing diisocyanates in the presence of a dimerization catalyst,
2. then inactivating the dimerization catalyst, and
3. reacting said dimerized reaction mixture containing said inactivated catalyst with
4. compounds containing hydrogen atoms reactive with isocyanate groups selected from the groups consisting of water and aliphatic, cycloaliphatic or araliphatic compounds with molecular weights of 62 to 300 which contain one or two hydroxyl groups wherein said compounds are comprised of no more than 60 wt.% of monohydroxy compounds,
5. wherein the reactants are used in such proportions that the NCO/OH ratio is between 1:1 and 1:1.6 and the products of the process contain from 5 to 20 wt.% of latent NCO groups and from 0 to 2 hydroxyl end groups.

4,044,172

WOOD TREATING PROCESS

Kenly C. Bugg, 1202 Sunset Drive, Fort Wayne, Ind. 46807

Filed June 2, 1975, Ser. No. 582,703
Int. Cl.[2] B05D *3/06, 3/02, 1/18*
U.S. Cl. 427—55 **14 Claims**

1. A process for coloring wood comprising:

applying to substantially all surfaces of the wood a continuous coating of a silicone treating liquid, and heating the coated wood to a temperature above about 170° C. and for a time sufficient to effect a predetermined color change in the wood; said treating liquid having a minimum viscosity of at least 75 centistokes at said temperature and also being substantially inert to the color-bearing constituents of the wood at said temperature.

4,044,173

ELECTRICAL RESISTANCE COMPOSITIONS

Alexander S. Laurie, Horsham, England, assignor to E. R. A. Patents Limited, Leatherhead, England

Continuation-in-part of Ser. No. 249,804, May 3, 1972, abandoned. This application Oct. 31, 1974, Ser. No. 519,717
Int. Cl.[2] H01B *1/06;* **B05D** *5/12*
U.S. Cl. 427—101 **8 Claims**

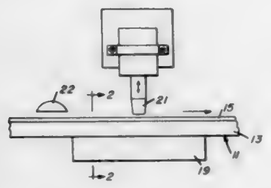
1. A process for forming a vitreous enamel electrical resistor coating on a substrate, said vitreous enamel containing an electrically conductive species as a crystalline phase and having a temperature coefficient of resistance, as measured in the temperature range of 20° to 120° C., of from −500 to +500 ppm/° C., comprising applying to a substrate a composition which comprises (1) a liquid organic medium, (2) a powdered aluminoborate glass, containing as a dissolved component, a metal oxide selected from the group consisting of molybdenum trioxide, tungsten troixide, cerium dioxide, manganese dioxide and ferric oxide in an amount of 2 to 30 mol percent based on the total amount of glass expressed as its component oxides and (3) a powdered reducing agent capable of withstanding glass firing temperature selected from the group consisting of boron, and silicon, in an amount of 0.25 to 30 percent by weight based on the total weight of glass and reducing agent, the relative proportions of (1), (2) and (3) being such that said compositions is a paste, and firing said paste on said substrate at a temperature of about 600° to 900° C. to form a vitreous enamel.

4,044,174

ULTRASONICALLY SMOOTHING A MAGNETIC LAYER ON A WEB

David L. Carr, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 69,203, Sept. 3, 1970. This application Aug. 14, 1972, Ser. No. 280,306
Int. Cl.[2] H01F *10/02*
U.S. Cl. 427—130 **9 Claims**



1. A method for smoothing a layer comprising magnetic particles in a binder on a carrier wherein said carrier is positioned in contact with a stationary anvil, said method comprising

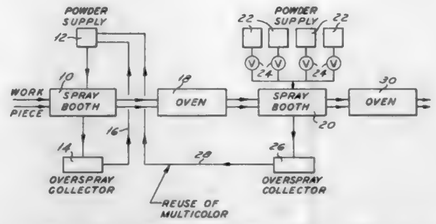
effecting relative movement between said carrier and a vibrating ultrasonic horn having a vibrating surface in physical contact with said layer, causing said surface to pressure said layer to uniform smoothness.

4,044,175

METHOD OF RECYCLING POWDER COATINGS IN A PLURAL COATING OPERATION

J. Barton Coxon, Novi, and Kenneth R. Ling, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 29, 1975, Ser. No. 626,691
Int. Cl.[2] B05D *1/40, 3/12*
U.S. Cl. 427—195 **1 Claim**



1. A method of painting successive articles with powder paint which comprises the steps of:

a. establishing a first spray zone of powder paint for applying powder paint on each of the successive articles;

b. moving articles successively through the first spray zone so as to have a first coat of powder paint placed on each article;

c. fusing the first coat of powder paint on each of the articles after the articles have been moved through the first spray zone thereby to form an undercoat on each of the articles;

d. establishing a second spray zone of powder paint for applying a second coat of powder paint on each of the successive articles;

e. spraying a powder paint having a desired color on each of the successive articles passing through the second spray zone;

f. from time to time or from article to article changing the desired color sprayed in the second spray zone so that the successive articles are generally not of the same color;

g. moving successive articles through the second spray zone to receive a coating of a second powder paint having a color selected for that article;

h. fusing the second coating of powder paint on each of the successive articles after the articles have been moved through the second spray zone thereby to form a top coat on each of the successive articles;

i. collecting any over sprayed powder paint from the second spray zone, the second over sprayed paint being nonhomogeneous in color because it contains a mixture of the top coat color powders used in the second spray zone;

j. using the collected second over sprayed powder paint in the first spray zone as an undercoat powder paint;

k. collecting the overspray of the first spray zone and respraying in the first spray zone.

4,044,176

GRAPHIC ARTS AND GRAPHIC MEDIA

Leon E. Wolinski, Cheektowaga, and Arthur R. Endress, Hamburg, both of N.Y., assignors to Pratt & Lambert, Inc., Buffalo, N.Y.

Continuation-in-part of Ser. No. 378,704, July 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 342,744, March 19, 1973, Pat. No. 3,864,181, which is a division of Ser. No. 259,656, June 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 122,086, March 8, 1971, abandoned. This application June 12, 1975, Ser. No. 586,249
Int. Cl.[2] B05D *5/00*
U.S. Cl. 427—256 **12 Claims**

1. In a graphic arts medium for selective application to a substrate comprising a polymeric film-forming binder and a volatile solvent vehicle therefor, the improvement comprising dispersing in said medium about 1 to 45 weight percent, based on the non-volatile content of said medium, of thermally expandable thermoplastic poly(vinylidene chloride) microspheres having a particle size of about 0.5 to 300 microns in diameter and containing about 5 to 50 weight percent of a volatile neopentane blowing agent, said microspheres being insolubilized in said volatile solvent vehicle by a coating of a compound which preferentially wets the surface of said microspheres, said compound being a member selected from the group consisting of alkyl alcohols having about 3 to about 5 carbon atoms in the alkyl chain.

7. The method of forming a raised graphic pattern upon a substrate which comprises selectively applying in a pattern to said substrate a graphic arts medium comprising a polymeric film-forming binder and a volatile solvent vehicle therefor, said medium having dispersed therein about 1 to 45 weight percent, based on the non-volatile content of said medium, of thermally expandable thermoplastic poly(vinylidene chloride) microspheres having a particle size of about 0.5 to 300 microns in diameter and containing about 5 to 50 weight percent of a volatile neopentane blowing agent, said microspheres being insolubilized in said volatile solvent vehicle by a coating of a compound which preferentially wets the surface of said microspheres, said compound being a member selected from the group consisting of alkyl alcohols having about 3 to about 5 carbon atoms in the alkyl chain, drying said medium and heating to expand said microspheres, whereby said medium forms a raised graphic pattern.

4,044,177

METHOD OF DECORATING AN EMBOSSED PLASTIC STRIP

Peter V. Paulus, Ypsilanti, Mich., and Theodore Loew, Schenectady, N.Y., assignors to The Standard Products Company, Cleveland, Ohio

Filed Mar. 25, 1976, Ser. No. 670,182
Int. Cl.[2] B05D *3/00, 5/00, 3/12*
U.S. Cl. 427—264 **3 Claims**



1. The method of forming a decorative trim strip comprising the steps of: extruding a plastic strip with a decorative surface having raised portions therein, applying a release agent to the entire decorative surface of the strip, abrading the raised surfaces of said strip to remove the release agent thereon so as to expose said raised surfaces, applying a coloring material to the entire decorative surface of said strip, and removing said release agent whereby said raised portions are highlighted by said coloring material.

4,044,178

PROCESS FOR REINFORCING NONWOVENS

Heinz Abel, Reinach; Rosemarie Toepfl, Basel, and Luzius Schibler, Rhine, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 275,117, July 26, 1972, abandoned. This application Jan. 12, 1976, Ser. No. 648,430
Claims priority, application Switzerland, Aug. 4, 1971, 11473/71
Int. Cl.[2] B05D *3/02, 1/18*
U.S. Cl. 427—373 **19 Claims**

1. A process for reinforcing nonwoven fiber material by a foaming process, comprising the steps of

A. impregnating the nonwoven fiber material with an aqueous preparation containing a water-soluble or water-dispersible binding agent and a foaming assistant, wherein the binding agent is a reaction product obtained by reacting, in the presence of an organic solvent,

a. an epoxide which contains at least 2 epoxide groups per molecule,

b. a fatty amine having 12 to 22 carbon atoms, and

c_1. an aliphatic, saturated dicarboxylic acid containing 7 to 14 carbon atoms, and wherein the foaming assistant is a reactive surfactant which is convertable into the irreversibly insoluble state at elevated temperature and thereby loses its surface activity, the foaming assistant being a surface active methylolmelamine or methylolurea having methylol groups etherified with a monoalcohol of 4 to 22 carbon atoms and at least one member of the group consisting of an alkanolamine of 2 to 6 carbon atoms, a polyethyleneglycol having an average molecular weight of 1000 to 5000, an alkanol of the formula $H—(OCH_2CH_2)_m—OH$ where m is 1 to 25 and which contains an alkali metal sulfonate group bonded to carbon and an aliphatic-hydroxy-carboxylic acid containing 2 to 4 carbon atoms, and

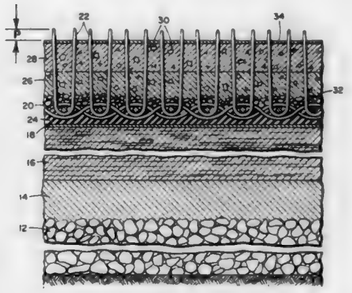
B. subsequently heating the impregnated non-woven fiber material at 60° to 190° C to convert the foaming assistant to an irreversibly insoluble state and to destroy the surface activity of the foaming assistant.

4,044,179

PLAYING SURFACE FOR ATHLETIC GAMES

Frederick T. Haas, Jr., Metairie, La., assignor to MOD-SOD Sport Surfaces, Metairie, La.

Filed Nov. 18, 1975, Ser. No. 632,970
Int. Cl.[2] D03D *27/00;* **D04H** *11/00*
U.S. Cl. 428—17 **10 Claims**



1. A playing surface for athletic games comprising:

a. a substantially flat, firm subsurface;

b. a pile fabric disposed on said subsurface comprising a relatively flexible, substantially moisture-impermeable backing and normally generally upstanding pile elements resembling grass; the length of said pile elements lying in the range from about ½ to about 1½ inches;

c. A compacted layer of weather-resistant, mineral, granular material disposed among said pile elements on said backing; the depth of said granular material layer lying in the range from about 75% to substantially equal to the length of said pile elements and being substantially uniform over the entire area of said playing surface;

d. said mineral material comprising less than 10% clay and further comprising a quantity of moisture retaining material sufficient to maintain the moisture content of said mineral material above about 3% by weight under normal climatic conditions.

4,044,180

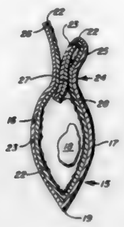
SHEET STRUCTURE

Robert C. Baker, 1395 Northwestern Natl. Bank Bldg., St. Paul, Minn. 55101

Continuation-in-part of Ser. No. 338,963, March 7, 1973, abandoned, which is a continuation-in-part of Ser. No. 192,241, Oct. 26, 1971, abandoned, and Ser. No. 300,788, Oct. 25, 1972, Pat. No. 3,776,644. This application May 2, 1975, Ser. No. 573,834

Int. Cl.[2] B65D *29/02;* **B32B** *27/36*

U.S. Cl. 428—35 **8 Claims**



1. A composite flexible sheet material especially useful in the packaging art, comprising

i. a base sheet structure of permanently united layers including a thermoplastic polymeric resin layer which is non-sticky at room temperature but is flowable and fusible at predetermined sealing conditions of elevated temperature above 50° C and the application of pressure, and a polyester resin backing film which is substantially non-flowable and non-fusible at said sealing conditions, the rear surface of said backing film away from said thermoplastic layer being non-fibrous, said thermoplastic layer being of greater thickness than said backing film and being normally non-sticky to said rear surface of said backing film but being capable of forming a temporary peelable mechanical seal theragainst when subjected to said sealing conditions, any such temporary mechanical seal being free of intermingled fused constituents between said thermoplastic layer and said backing film, and

ii. a recess-containing layer adhered to and exposed on said thermoplastic layer side of said base sheet structure, said recess-containing layer being non-compressed and consisting essentially of non-woven polyester resin fibers which are non-flowable and non-fusible at said sealing conditions and have open spaces therebetween, said open spaces being sufficiently extensive to be capable of mechanically holding and carrying an organic-diluent-containing messy composition within the same, said polyester resin fibers of said recess-containing layer being characterized by the fact that they are resistant to irretrievable adsorption of any said organic-diluent-containing messy composition, the quantity relationship between said fibers of said recess-containing layer and the material of said thermoplastic layer of said composite sheet material being such that said recess-containing layer is capable of being substantially submerged into said thermoplastic layer of said base sheet structure upon the application of said sealing conditions, and

iii. a temporary peelable mechanical seal extending as a narrow band of no more than about one centimeter in width with material of said thermoplastic layer against the rear surface of said backing film and containing within said band of seal said recess-containing layer submerged into said thermoplastic layer, said temporary seal being spaced from edges of said base sheet structure and being rupturable at the interface between material of said thermoplastic layer and the rear surface of said backing film

4,044,181

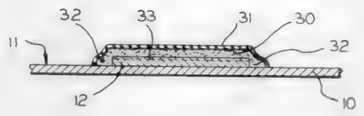
DECALCOMANIA IMAGE TRANSFER SYSTEM

Ronald D. Edhlund, 418 N. Fairview, Mount Prospect, Ill. 60056

Filed May 21, 1975, Ser. No. 579,371

Int. Cl.[2] B32B *3/10, 7/06, 27/24, 27/38*

U.S. Cl. 428—40 **9 Claims**



1. A system for transferring decalcomania images to a receiving surface, which system comprises: a non-stretching styrene base sheet having a smooth surface free of irregularities; at least one image formed of ink or lacquer deposited on and in intimate contact with surface of said base sheet and composed of a flexible decal ink or lacquer which does not chemically react with said base sheet, said smooth base sheet surface precluding leakage of air into the interface area between said image and said base sheet surface owing to intimate contact, whereby said image clings to said base sheet primarily because there is no air at the surface between the image and base sheet when said ink or lacquer is dry, and a pressure sensitive adhesive, said adhesive having a readily oxidizable outer surface film, said adhesive further extending over and bonding to a thin outer layer of the exposed surface of said image without penetrating through the image while said oxide protects the adhesive underlying said surface film from drying so that the bond between said adhesive and said image is stronger than the bond primarily caused by an absence of air space at the interface between said image and said base sheet.

4,044,182

VENEER CORE BLOCK FOR PLYWOOD AND METHOD FOR FORMING SAME

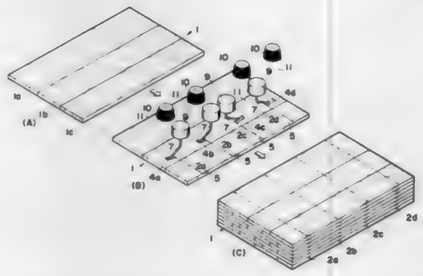
Noboru Aizawa, Anjo, Japan, assignor to Hashimoto Denki Co., Ltd., Takahama, Japan

Filed June 8, 1976, Ser. No. 694,038

Claims priority, application Japan, June 14, 1975, 50-71447

Int. Cl.[2] B32B *3/10, 29/02;* **B27F** *7/00*

U.S. Cl. 428—44 **8 Claims**



6. A veneer core block for a plywood, comprising a plurality of green veneer strips contacted closely side by side, said green veneer strips having a plurality of inclined slits and strings with an adhesive within said slits, thereby connecting said green veneer strips to form a veneer core block.

4,044,183

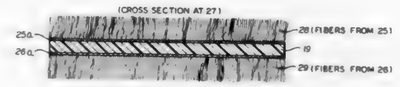
SYNTHETIC SUEDE AND PROCESS THEREFOR

Norman Forrest, 216 Byram Road, Byram, Conn. 10573

Filed Nov. 4, 1976, Ser. No. 738,918

Int. Cl.[2] D06C *11/00;* **B32B** *33/00*

U.S. Cl. 428—91 **13 Claims**



1. A method of continously producing a synthetic suede product which comprises the following sequential steps:

a. continuously feeding an assembly of at least three feed materials into a nip formed by two rotating cylinders, each of said rotating cylinders carrying a preheated, endless silicone rubber molding band the outer surfaces of which are provided with a multiplicity of cavities, the separate feed materials comprising two outer polyurethane film layers, and at least one inner layer comprising a polyurethane consisting of film sheet, web or foam;

b. continuously compressing said assembly in said nip at a temperature of from about 385° to 410° F and at a pressure of from about 65 to 100 psi whereby the outer polyurethane film are are in a molten state, a major proportion of said molten polyurethane being forced into said cavities, and wherein the remaining portion of the outer polyurethane films and the inner layers are welded together;

c. continuously passing the resulting composite assembly compressed between molding bands into a cold water bath maintained at a temperature sufficiently cold to solidify any molten feed material;

d. continuously stripping the composite assembly from the molding bands by passing the molding bands over a pair of rotating cylinders provided with an internal vacuum and gripping the composite assembly with a pair of rotating cylinders covered with card clothing which perforates the composite assembly; and

e. continuously winding up the stripped, perforated composite assembly comprising the layered feed material having outwardly extending fibers on both surfaces thereof and constituting said synethetic suede product.

10. A perforated synthetic suede product having the appearance and feel of natural suede leather which is characterized by polyurethane fibers extending outwardly from two outer polyurethane surface layers welded to at least one inner layer comprising a polyurethane film, sheet, web or foam.

4,044,184

CRYOGENIC INSULATING STRUCTURE

Kaneyoshi Ashida, Chofu; Masaaki Ohtani, Kawasaki; Makoto Ichii, Yokohama, and Tatsuhiko Kobayashi, Kawasaki, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

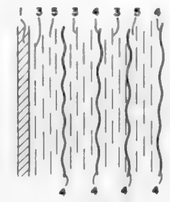
Continuation of Ser. No. 483,715, June 27, 1974, abandoned. This application Sept. 12, 1975, Ser. No. 612,853

Claims priority, application Japan, June 27, 1973, 48-72633; Sept. 17, 1973, 48-104763

Int. Cl.[2] B32B *3/26*

U.S. Cl. 428—113 **7 Claims**

1. A cryogenic heat insulating structure, which comprises: a wall on whose surfce is coated a plurality of superposed rigid resin foam layers each of which has a surface skin layer of a thickness of from 0.2 to 0.6 mm having a surface membrane free of rigid foam which skin layers possess a density gradient between the maximum density of the resin and the density of the foam layer, wherein each foam layer is formed by simultaneously spraying a fiber and a foamable resin, and contains fibers oriented parallel to said wall.



2. The insulating structure of claim **1**, wherein said fibers are glass fibers having a length of 10–100 mm.

4,044,185

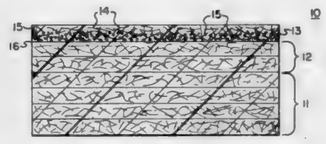
DECORATIVE SHEET FOR SOLID COLOR LAMINATES

Harold O. McCaskey, Jr., Allendale, S.C., and Salvatore E. Palazzolo, Elizabeth City, N.C., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 20, 1975, Ser. No. 542,311

Int. Cl.[2] B32B *3/00, 29/00*

U.S. Cl. 428—153 **10 Claims**



1. A machinable, colored, postformable decorative plastic laminate comprising a core layer of a plurality of resin impregnated fibrous sheets, and superimposed thereon a resin impregnated, colored decorative layer consisting of fibrous material selected from the group consisting of rayon, cellulose wood pulp and mixtures thereof, coloring particles having a Moh's hardness of up to about 6 and an average particle size range between about 53 to 210 microns and resin; wherein the weight ratio of fibrous material:coloring particles is from about 1:0.04 to 1:0.4; the colored decorative layer characterized in that the coloring particles are dispersed only through the bottom two-thirds of the colored layer and concentrated in the colored layer near the core-decorative layer interface, the top one-third of the colored layer containing substantially no coloring particles, the colored laminate characterized by having no separate clear protecting overlaying layer.

4,044,186

SHEAR FLEXIBILITY FOR STRUCTURES

Maynard L. Stangeland, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 504,927, Sept. 11, 1974, Pat. No. 3,956,543, which is a continuation-in-part of Ser. No. 294,403, Oct. 2, 1972, abandoned. This application Jan. 26, 1976, Ser. No. 652,594

Int. Cl.[2] B32B *3/30, 15/00*

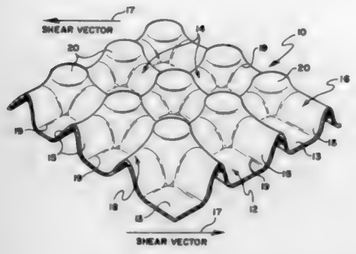
U.S. Cl. 428—167 **4 Claims**

1. In a combination including a flexible member connected between components that will withstand shear translation up to 0.5 percent across said member, said components being capable of independent movement therebetween comprising:

a first component, and

a second component spaced from said first component and adapted to move laterally with respect to said first component, said flexible member being attached to adjacent edges of said first and second components bridging the space between said components, the improvement wherein said flexible member comprises a flat sheet of metal formed with a plurality of linearly extending inter-

secting convolutions at right angles to one another having a constant cross-section, the radius of said intersecting convolutions is 6 to 12 times the thickness of said sheet of metal, each of said plurality of intersecting convolutions being substantially at a 45 ° angle to a shear vector and shear translation imparted to said flat sheet of metal, the height of said intersecting convolutions is 9 to 17 times the thickness of said sheet of metal, said intersecting convolution having a spherical domed region extending beyond the apex of each of said intersecting convolutions approxi-



mately equal to the height of said convolution of the area of intersection, said spherical domed region serves to interrupt the principal stress lines that act along said apex of each of said convolutions when said flexible member is subjected to said shear vector translations, a wall portion of said constant cross-section intersecting convolutions is formed with a radius 3 to 5 times the thickness of the metal between said wall of said convolutions and a flat portion of said sheet of metal and a radius 3 to 5 times the thickness of the metal between said spherical domed region and said intersecting convolutions.

4,044,187

FILM LAMINATES HAVING A REIRRADIATED LAYER

William P. Kremkau, Watkinsville, Ga., assignor to W. R. Grace & Co., Duncan, S.C.

Filed May 22, 1975, Ser. No. 580,103
Int. Cl.[2] B05D *3/06*; B32B *7/02, 27/08*
U.S. Cl. 428—212 **20 Claims**

1. A method of improving the properties of polymeric film laminates comprising the steps of:

a. forming a laminate by preparing a layer that is cross-linked and applying at least one additional polymeric layer thereto, at least one of said additional layers being uncross-linked but being cross-linkable by irradiation; and,

b. irradiating said laminate.

4,044,188

STAMPABLE THERMOPLASTIC SHEET REINFORCED WITH MULTILENGTH FIBER

Leon Segal, Randolph, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 293,975, Oct. 2, 1972, abandoned. This application Apr. 1, 1975, Ser. No. 564,019
Int. Cl.[2] B32B *5/16*
U.S. Cl. 428—283 **10 Claims**

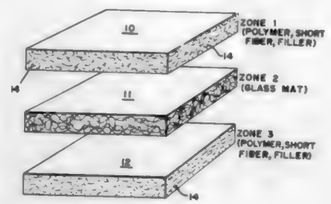
1. A smooth surfaced thermoplastic composite sheet having an average surface roughness height under 500 microinches comprising, in percent by weight of the total composite,

a. from about 25 to 65% of a synthetic thermoplastic resin,

b. from about 25 to 40% of a particulate filler,

c. from about 15 to 45% of short glass reinforcing fibers having a length of not greater than about 0.85 inch, at least 50% of said fibers being aligned substantially parallel to the plane of the sheet, and

d. from about 2% to 10% of long glass fibers having a length



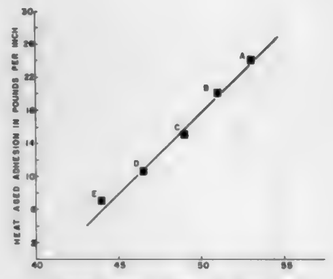
of about 1½ inches to continuous and being substantially below the exterior surface of the composite sheet.

4,044,189

SURFACE TREATED POLYESTER SUBSTRATES

Robert J. Arrowsmith, Charlotte, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Continuation of Ser. No. 14,479, Feb. 26, 1970, abandoned. This application Sept. 7, 1972, Ser. No. 287,123
Int. Cl.[2] C08G *63/12*; B31B *27/38*
U.S. Cl. 428—295 **9 Claims**



1. A filament reinforced rubber article, the reinforcing filament being a polyester filament having a surface energy greater than 45 dynes per centimeter and having a surface which is substantially chemically unmodified.

4,044,190

COATED METAL ARTICLE

John J. Miller; Richard E. Baus, both of Warminster, and Sheldon N. Lewis, Willow Grove, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Continuation of Ser. No. 360,856, May 16, 1973, abandoned. This application June 12, 1975, Ser. No. 586,327
Int. Cl.[2] B05D *3/02*; B32B *15/08*; B22B *27/30*
U.S. Cl. 428—463 **8 Claims**

1. As an artilce of manufacture, a coated metallic substrate having a fused thermoset coating thereon derived from powdered polymeric material consisting essentially of a polymeric material having units derived from:

1. about 1 to about 30% by weight of a (C_2–C_4)-hydroxyalkyl ester of acrylic acid or methacrylic acid or a mixture of said hydroxyalkyl esters;

2. about 1 to about 30% by weight of a monoethylenically α,β-unsaturated carboxylic acid or a mixture of said acids; and

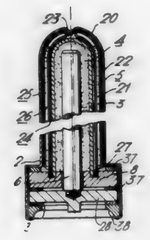
3. about 55 to about 98% by weight of a (C_1–C_{18}) alkyl ester of acrylic acid or methacrylic acid, or a mixture of said alkyl esters, or an admixture containing said mixtures and up to about 60% by weight of the admixture of an additional copolymerizable α,β-ethylenically unsaturated monomer or monomers, wherein about 7 to about 95% of the carboxylic acid groups of the polymeric material have been neutralized to sodium, potassium, or barium carboxylate groups, the carboxylate groups thus being partially neutralized, the polymeric material having been derived from a liquid composition having an alkaline pH.

4,044,191

ELECTRIC CELLS

Leslie Samuel Evans, Reading; Roger John Bones, Abingdon, and John Richard Harbar, Wantage, all of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England

Filed Nov. 17, 1975, Ser. No. 632,784
Claims priority, application United Kingdom, Dec. 24, 1974, 55767/74
Int. Cl.[2] H01M *4/36*
U.S. Cl. 429—104 **8 Claims**



1. An electric cell having a liquid alkali metal anode and a liquid cathode which reacts with said liquid alkali metal anode and comprising,

a solid electrolyte;

a liquid anode compartment having a side which is partially bounded by one side of the solid electrolyte, said liquid anode compartment being of very limited capacity so as to contain only a very limited proportion of the liquid anode required by the cell but being incapable of capillary action and being shaped so that the compartment generally follows the contour of the solid electrolyte so as to present a shallow spaced for the liquid anode normal to the surface of the solid electrolyte;

a liquid cathode compartment which is partially bounded by the other side of the solid electrolyte;

a reservoir for storing the bulk of the liquid anode;

barrier means lying between the liquid anode compartment and the reservoir and shaped so as to separate the liquid anode compartment from said reservoir, said barrier means preventing liquid cathode, which might leak into the liquid anode compartment in the event of damage to the solid electrolyte, from reaching the reservoir; and

a capillary duct, removed from the solid electrolyte and connected between the liquid anode compartment and the reservoir, for providing a restricted feed of liquid anode therethrough, said duct providing feeding of that amount of liquid anode required during normal discharge of the cell but limiting higher rates of feed of liquid anode.

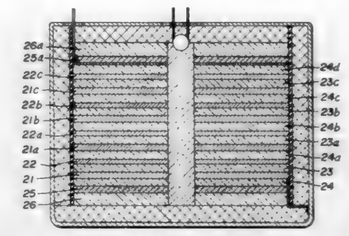
4,044,192

THERMAL BATTERIES

George C. Bowser, Jr., Towson, and Richard L. Blucher, Baltimore, both of Md., assignors to Catalyst Research Corporation, Baltimore, Md.

Filed July 10, 1970, Ser. No. 56,023
Int. Cl.[2] H01M *6/00*
U.S. Cl. 429—112 **9 Claims**

1. A thermal battery comprising an aligned stack of annular elements forming a toroidal cell stack having a central hole therethrough and an outer peripheral surface, said elements comprising an anode, a pellet element consisting essentially of an intimate finely divided mixture of a depolarizer, a fusible electrolyte and an inert absorbent, a cathode and a combustible composition that forms an electrically conductive ash on burning, a layer of rigid, nonporous electrical insulating material



tightly engaging and covering said peripheral surface and a solid electrical insulating fuze material filling said central hole.

4,044,193

FINELY PARTICULATED COLLOIDAL PLATINUM COMPOUND AND SOL FOR PRODUCING THE SAME, AND METHOD OF PREPARATION OF FUEL CELL ELECTRODES AND THE LIKE EMPLOYING THE SAME

Henry G. Petrow, Watertown, and Robert J. Allen, Saugus, both of Mass., assignors to Prototech Company, Newton, Mass.

Continuation-in-part of Ser. No. 153,824, June 16, 1971, abandoned, which is a continuation of Ser. No. 430,190, Dec. 28, 1973, abandoned. This application Dec. 20, 1974, Ser. No. 534,731
Int. Cl.[2] H01M *8/00, 4/86, 4/88*
U.S. Cl. 429—40 **34 Claims**

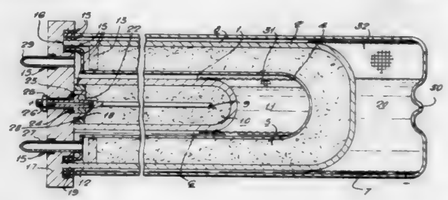
1. In a fuel cell and the like, a catalytic electrode comprising an electrically conductive high surface area substrate on which has been deposited platinum particles of the order of substantially 15 to 25 Angstroms in particle size and in which said particles are formed from one of an oxidative decomposition of a platinum complex comprising an oxidizable ligand, and hydrolysis of a non-complex platinum salt solution.

4,044,194

ELECTRIC BATTERIES

Leslie Samuel Evans, Upper Basildon, and John Richard Harbar, Grove, near Wantage, both of England, assignors to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdon of Great Britain and Northern Ireland, United Kingdom

Filed June 30, 1975, Ser. No. 591,322
The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.
Int. Cl.[2] H01M *4/36*
U.S. Cl. 429—104 **9 Claims**



1. An electric battery having at least two electric cells, each said cell having a solid electrolyte with liquid sodium on one side and liquid sulphur on the other side, as the cell reactants, the improvement wherein the solid electrolytes are of tubular form enclosed at one end and disposed substantially concentrically one within the other and said battery further comprises common electrode means of tubular form closed at one end and disposed substantially concentrically between adjacent

solid electrolytes so as to electrically connect the adjacent cells and at least in part separate the cell reactants in said adjacent cells.

4,044,195

ORGANOLITHIUM/ALKADIENOL ADDUCTS AS POLYMERIZATION INITIATORS

Carl A. Uraneck, and Richard L. Smith, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

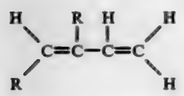
Division of Ser. No. 625,745, Oct. 24, 1975, Pat. No. 3,993,854. This application June 8, 1976, Ser. No. 694,122

Int. Cl.² C08F *4/48*

U.S. Cl. 526—29 **59 Claims**

1. A polymerization process which comprises polymerizing at least one vinylidene group-containing polar monomer under anionic solution polymerization conditions in a hydrocarbon diluent employing a lithium-based adduct as polymerization initiator, effective polymerization conditions of temperature, pressure, and time, and effective ratios of said lithium-based adduct, and

wherein said polymerization initiator is the adduct reaction product of a hydrocarbon lithium compound with a monohydroxyalkyl-substituted conjugated alkadiene is represented by the formula:



(I)

wherein R is hydrogen or a monohydroxyalkyl group such that (I) contains a single monohydroxyalkyl group, and wherein said (I) contains 5 to 10 carbon atoms per molecule.

4,044,196

CROSSLINKED COPOLYMERS OF α,β-OLEFINICALLY UNSATURATED DICARBOXYLIC ANHYDRIDES

Fritz Hüper; Erich Rauenbusch; Günter Schmidt-Kastner, all of Wuppertal; Bruno Bömer, Leverkusen, and Herbert Bartl, Odenthal-Hahnenberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 487,437, July 11, 1974, abandoned, which is a division of Ser. No. 345,792, March 28, 1973, Pat. No. 3,910,825. This application Dec. 1, 1975, Ser. No. 636,569

Int. Cl.² C08F *222/04, 222/06*

U.S. Cl. 526—271 **3 Claims**

1. A crosslinked copolymer comprising the following copolymerized units:

A. 2.0 to 20 weight percent of at least one α,β-olefinically unsaturated dicarboxylic acid anhydride having 4 to 9 carbon atoms; and

B. 80 to 98 weight percent of at least one di- and/or poly(-meth)acrylate of a diol and/or polyol.

4,044,197

THERMALLY SELF-CROSS-LINKABLE ETHYLENE/VINYL ACETATE COPOLYMERS

Hubert Wiest; Erwin Lieb, and Heinz Schafer, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Jan. 22, 1976, Ser. No. 651,610

Claims priority, application Germany, Mar. 21, 1975, 2512589; Nov. 17, 1975, 2551556

Int. Cl.² C08F *210/02*

U.S. Cl. 526—304 **10 Claims**

1. A thermally self-cross-linkable ethylene/vinyl acetate copolymer consisting essentially of the following monomer units:

a. from 5 to 50% by weight of ethylene,

b. from 30 to 87% by weight of vinyl acetate,

c. from 2 to 10% by weight of mono-olefinically unsaturated compound capable of copolymerizing and containing an N-methylol group selected from the group consisting of N-methylol acrylamide, N-methylol methacrylamide, lower alkanol ethers thereof, and mixtures thereof,

d. from 5 to 20% by weight of an acryl compound selected from the group consisting of alkyl acrylate and alkyl methacrylate where alkyl has from 1 to 10 carbon atoms,

e. from 0.5 to 3% by weight of an unsaturated acid selected from the group consisting of alkenoic acids having from 3 to 6 carbon atoms and alkenedioic acids having from 4 to 6 carbon atoms, and

f. from 0 to 1% by weight of a poly-olefinically-unsaturated monomer copolymerizable with vinyl acetate and ethylene, said copolymer having a glass transition temperature of between −40° and +10° C.

4,044,198

METHOD FOR COLD-MILLING CELLULOSE DERIVATIVES

Michael Kostrzewa, Wiesbaden; Arno Holst, Wiesbaden-Biebrich, and Gerhard Buchberger, Auringen, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed Mar. 6, 1975, Ser. No. 556,053

Claims priority, application Germany, Mar. 7, 1974, 2410789

Int. Cl.² C08B *11/00*

U.S. Cl. 536—86 **3 Claims**

1. In the method for the cold-milling of a cellulose derivative, in which the cellulose derivative is cooled by means of liquid nitrogen until it becomes brittle and the thus cooled cellulose derivative is milled in a mill,

the improvement comprising cold-milling to a milled product having a high proportion of fine grain, a cellulose derivative which is soluble or swellable in water and has a water content of between 40 and 150 per cent by weight, based on its dry weight, and which is, at 20° C, able to absorb, during swelling, more than 150 per cent by weight of water, based on its dry weight.

4,044,199

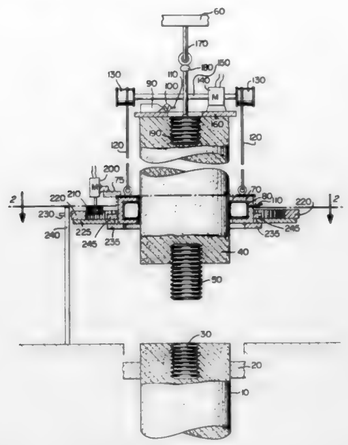
APPARATUS FOR APPLYING TORQUE TO ELECTRODES

Irvin C. Simon, Kenmore, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed June 10, 1975, Ser. No. 585,685

Int. Cl.² F16H *21/12, 1/06;* H05B *7/18, 7/14*

U.S. Cl. 13—18 **2 Claims**



1. Apparatus for applying torque to a vertically suspended electrode section comprising a ring member surrounding the electrode section and fixedly engaged thereto; a ring gear member rotatably supported by said ring member and surrounding said electrode section; drive means fixedly supported on said ring member; a drive gear coupled to said drive means and engaging said ring gear; arresting means fixedly positioned with respect to the vertical axis of said electrode section and arranged to engage said ring gear and prevent rotation thereof upon engagement therewith whereby upon actuation of said drive means torque is applied to cause rotation of said electrode section.

4,044,200

INSULATED WIRE OR CABLE

Robert J. Turbett, Millington, N.J., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 312,134, Dec. 4, 1972, abandoned. This application Mar. 14, 1974, Ser. No. 451,113

Int. Cl.² H01B *7/28*

U.S. Cl. 174—23 R **4 Claims**

1. Insulated wire or cable having primary insulation between copper conductor and moisture barrier filler and wherein said primary insulation comprises, based on the total weight of said insulation.

a. solid ethylene polymer having a density of about 0.928 to 0.955,

b. about 0.05 to 0.2% by weight of 3-salicyloyl-amido-1,2,4-triazole, and

c. about 0.01 to 0.2% by weight of at least one organic compound having a molecular weight of at ≧550, and which is selected from the group consisting of compounds containing at least four hindered phenolic hydroxyl groups.

4,044,201

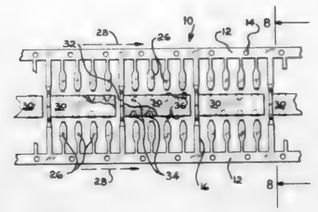
LEAD FRAME ASSEMBLY

Charles W. Wallick, York, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 506,760, Sept. 17, 1974. This application Oct. 6, 1975, Ser. No. 619,971

Int. Cl.² H05K *1/04*

U.S. Cl. 174—52 FP **8 Claims**



1. A lead frame assembly comprising a pair of spaced parallel carrier strips, a plurality of spaced leads extending from each carrier strip toward the other strip and arranged in opposed groups along the length of said strip, and collapsible rungs joining said strips between groups of leads, each rung including a pair of collapsible links bent up at a shallow angle from the assembly and joining each other at a shallow apex.

4,044,202

PLURAL FREQUENCY SIGNALLING SYSTEMS

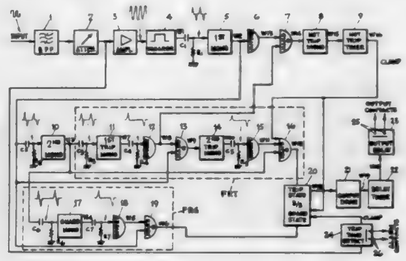
Eugeniusz Antoszewski, Stafford, England, assignor to The General Electric Company Limited, London, England

Filed Dec. 29, 1975, Ser. No. 644,570

Claims priority, application United Kingdom, Jan. 21, 1975, 2571/75

Int. Cl.² H04L *27/14*

U.S. Cl. 178—88 **11 Claims**



1. A receiver for use in a signalling system of the kind wherein data is conveyed by transmitting a signal having alternately first and second frequencies comprising: shaping and squaring circuitry which provides in response to the received signal first and second trains of pulses, the two trains having frequencies correspondingly dependent on the frequency of the received signal and the durations of the pulses in each being independent of the durations of the pulses in the other train and small compared with the period of the received signal; a first delay circuit fed with one of said trains of pulses; a second delay circuit fed with one of said trains of pulses; a first coincidence gate circuit having as inputs the output of the first delay circuit and said first train of pulses; and a second coincidence gate circuit having as inputs the output of said second delay circuit and said second train of pulses; the delays of the delay circuits being such that the first coincidence gate circuit produces an output substantially only when the received signal has its first frequency; and the second coincidence gate circuit produces an output substantially only when the received signal has its second frequency.

4,044,203

ACTIVE CONTROL OF SOUND WAVES

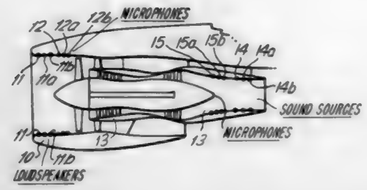
Malcolm Alexander Swinbanks, Glasgow, Scotland, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 417,636, Nov. 28, 1973, abandoned. This application Aug. 25, 1975, Ser. No. 607,462

Claims priority, application United Kingdom, Nov. 24, 1972, 54370/72

Int. Cl.² E04B *1/99*; G10K *11/04*

U.S. Cl. 179—1 P **10 Claims**



1. A method of attenuating a sound wave propagating in a given direction along a duct through a fluid contained in the duct, the method comprising:

generating sound waves from an array of similar sound sources located adjacent the wall of said duct respectively at different positions along said duct, each source generating a pair of sound waves which travel through said fluid in opposite directions along said duct from the position of that source; and

controlling the operation of said array of sources to cause destructive interference to occur between the wave to be attenuated and the resultant of the waves generated by said sources and travelling in said given direction and simultaneously to cause the resultant of the waves generated by said sources and travelling in the direction opposite to said given direction to be negligible.

4,044,204

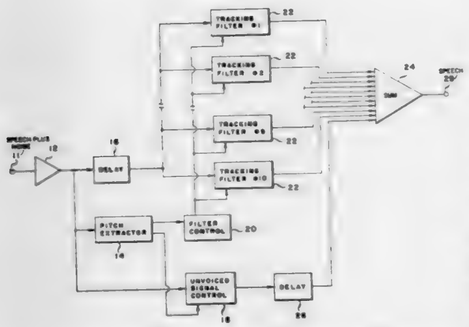
DEVICE FOR SEPARATING THE VOICED AND UNVOICED PORTIONS OF SPEECH

Howard E. Wolnowsky, Mountain View, and Erling N. Belland, San Mateo, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Feb. 2, 1976, Ser. No. 654,089

Int. Cl.² G10L *1/00*

U.S. Cl. 179—1 SA **3 Claims**



1. A device for separating the voiced portion of speech from voice communications comprising:

input amplifier means for amplifying the input electrical signal representative of sound,

a plurality of tracking filters operably connected to the output of said input amplifier means,

means for extracting the fundamental pitch frequency of the voiced portion of the input signal, said extraction means connected to the output of said amplifier means,

said pitch extracting means further defined as providing an output proportional to the fundamental pitch frequency, said output being operably connected to said plurality of tracking filters for controlling the tuning of said filters,

a summing amplifier,

the outputs of said plurality of tracking filters connected to the input of said summing amplifier.

4,044,205

RECEPTION TECHNIQUES FOR IMPROVING INTELLIGIBILITY OF AN AUDIO FREQUENCY SIGNAL

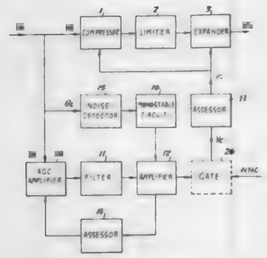
William Joseph Mullarkey, Whitefield, England, assignor to The Cunard Steam-Ship Company Limited, London, England

Continuation-in-part of Ser. No. 510,704, Sept. 30, 1974, abandoned, which is a continuation of Ser. No. 319,685, Dec. 29, 1972, abandoned. This application Mar. 11, 1975, Ser. No. 557,240

Claims priority, application United Kingdom, Jan. 3, 1972, 49/72

Int. Cl.² H03G *1/00*

U.S. Cl. 179—1 P **25 Claims**



1. A method of improving intelligibility of an audio frequency signal containing interference and wanted speech signals, including the steps of filtering the frequency band of the audio frequency signal so as to derive a narrow band section in which the interference is the least, filtering said narrow section from the remainer of the band, and generating a control signal from the derived section by using the changing value of the mean amplitude of the derived narrow section, and amplitude modulating the audio frequency signal on the basis of the control signal.

4,044,206

DIGITAL DECODER FOR MULTIPLE FREQUENCY TELEPHONE SIGNALLING

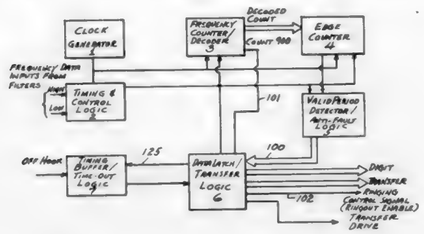
Louis W. Champan, Kent, and Arthur T. Perkins, Bellevue, both of Wash., assignors to Melco, Bellevue, Wash.

Continuation-in-part of Ser. No. 635,214, Nov. 25, 1975, abandoned. This application June 2, 1976, Ser. No. 692,122

Int. Cl.² H04M *1/50*

U.S. Cl. 179—84 VF **16 Claims**

1. A Touch Tone number decoder comprising means to generate clock pulses at a relatively high frequency as compared with the Touch Tone frequencies, means to derive a binary code word as a timed output for a number dialed, said binary word representing the number of said clock pulses over the intervals of time represented by the periods of the Touch Tone frequencies corresponding to the dialed number, means to store the binary word, means to compare a received binary word with a stored binary word for a plurality of consecutive times and derive a true input signal each time equality exists, shift register means arranged to fill up only in response to the reception of successive true input signals for said plurality of successive times, means to deliver the true input signals to said shift register means, means to derive a data valid signal responsive to the filling up of said shift register means by such consecutive true input signals, and means to transmit the stored binary word responsive to a data valid signal.



4,044,207

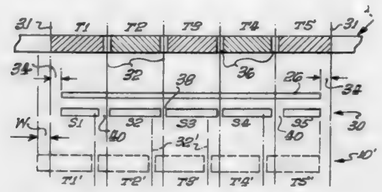
APPARATUS FOR REPRODUCING A MULTIPLE TRACK PHOTOGRAPHIC SOUND RECORD

Petro Vlahos, Tarzana, Calif., assignor to The Association of Motion Picture and Television Producers, Inc., Hollywood, Calif.

Filed Nov. 12, 1975, Ser. No. 630,966

Int. Cl.² G11B *7/20*

U.S. Cl. 179—100.3 B **5 Claims**



1. Apparatus for reproducing sound recorded on a film subject to film weave having a normal maximum value, said sound comprising a channel of primary sound and a channel of auxiliary sound recorded in respective adjacent variable density optical sound tracks which are laterally spaced by less than said normal maximum film weave; said apparatus comprising

means for optically scanning the sound tracks with respective sensors responsive to film areas which correspond generally to the respective sound tracks and which are laterally separated from each other by an interval larger than said track spacing and of the order of the normal maximum film weave,

said interval between areas being offset in the direction toward the track representing the auxiliary sound,

whereby in the reproduced sound any cross-talk between channels due to film weave of said normal maximum value is substantially free of sound leakage from the primary sound channel to the auxiliary sound channel.

4,044,208

TWO-PART ELECTRICAL CONNECTORS AND ELECTRICAL INTERLOCKS INCLUDING THEM

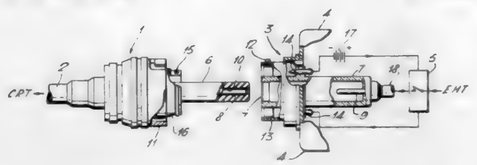
Thomas V. McDonald, Cheltenham, and Stephen D. Witts, Prestbury, both of England, assignors to Smiths Industries Limited, London, England

Filed June 9, 1975, Ser. No. 585,424

Claims priority, application United Kingdom, June 12, 1974, 26177/74

Int. Cl.² H01R *33/30*

U.S. Cl. 200—51.09 **11 Claims**



1. In a two-part electrical connector that comprises two parts each of which has an electrical contact, the two parts being engageable with one another in a mating relationship to establish electrical interconnection of the two contacts through the connector, the improvement wherein the connector further includes an elongate electrical conductor-element carried by a first of said two parts, said elongate conductor-element being in the form of a resilient-wire loop, two electrical contact-elements, and means mounting the said two contact-elements with said second part to abut the said conductor-element at spaced positions along its length, so that the two contact-elements are thereby bridged electrically by said conductor element, when the said first and second parts are engaged with one another in said mating relationship.

4,044,209

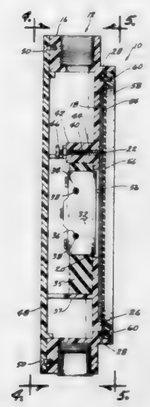
MATERIAL SENSING SWITCH

Reuben E. Peterson, Fergus Falls, Minn., assignor to Jenoff, Incorporated, Fergus Falls, Minn.

Filed Feb. 9, 1976, Ser. No. 656,352

Int. Cl.² H01H *35/00*

U.S. Cl. 200—61.21 **2 Claims**



1. A material sensing switch assembly comprising,

a cylindrical body means having first and second ends,

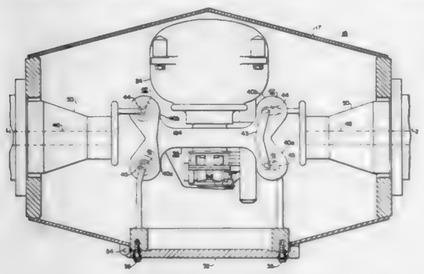
a backing plate means removably closing said first end to define an interior compartment between said backing plate means and said wall means,

connection means for securing said body means to a support means,

said second end of said body means being closed by a wall

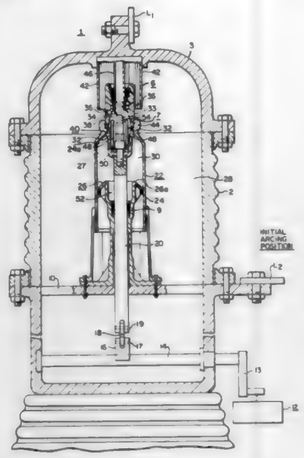
means having inner and outer surfaces, said wall means having a first opening formed therein,
a switch means secured to said body means within said interior compartment adjacent the inner surface of said wall means,
said switch means having a switch actuator extending outwardly through said first opening in said wall means,
a movable pressure plate means positioned at said second end of said body means at the outer surface of said wall means for engagement with said switch actuator to activate said switch means when said pressure plate means is moved towards said wall means by pressure exerted thereon,
a flexible member operatively removably secured to said second end of said body means and covering said pressure plate means,
means securing said flexible member to said body means,
said wall means having a second opening formed therein;
said wall means having a post means on its inner surface which has a longitudinal base formed therein communicating with said second opening,
an elongated spring means positioned in said base and said second opening and having one end in engagement with said pressure plate means to normally urge said pressure plate means outwardly from said wall means and said switch actuator,
and an adjustment screw means threadably mounted in said bore having one end in engagement with the other end of said spring means whereby the pressure exerted by said spring means on said pressure plate means may be selectively varied by threadable rotation of said screw means relative to said post means,
said adjustment screw means being accessible for adjustment upon removal of said backing plate means.

4,044,210
FLUID-BLAST CIRCUIT INTERRUPTER
Roswell C. Van Sickle, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed July 17, 1975, Ser. No. 596,792
Int. Cl.[2] H01H *33/82*
U.S. Cl. 200—148 H **9 Claims**



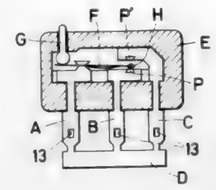
1. A multiple break circuit interrupter having open and closed positions, comprising:
an upstanding insulating column;
a housing supported upon said column;
a pair of terminal bushings extending into said housing;
a hollow insulating arm rotatively mounted within said housing and having two ends;
a plurality of stationary contact pairs supported within said housing;
a plurality of movable contacts mounted upon each of said arm ends, each of said movable contacts being cooperable with one of said stationary contacts to establish an arc when said circuit interrupter is operated from the closed position to the open position.

4,044,211
PUFFER-TYPE COMPRESSED-GAS CIRCUIT-INTERRUPTER
Charles F. Cromer, Trafford, and Willie B. Freeman, Monroeville, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 7, 1975, Ser. No. 602,705
Int. Cl.[2] H01H *33/88*
U.S. Cl. 200—148 A **8 Claims**



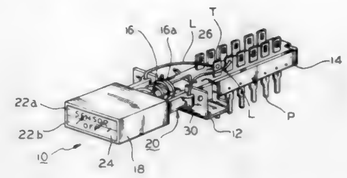
1. A puffer-type compressed-gas circuit-interrupter adaptable for high-current ratings including means defining a relatively-stationary contact structure, said relatively-stationary contact structure including a cluster of stationary main contact fingers **(42)** disposed in a generally cylindrical arrangement and a centrally-disposed stationary tubular arcing contact **(46)**, means defining a cooperable movable contact structure **(7)**, a movable operating-cylinder assembly **(22)** carrying said movable contact structure **(7)** and also an insulating nozzle, said movable operating-cylinder assembly **(22)** having disposed thereon adjacent its forward end an annular relatively-heavy movable main contact **(44)** making cooperable engagement with said cluster of stationary main contact fingers **(42)** in the closed-circuit position of the circuit-interrupter, means defining a relatively-fixed piston member **(26)**, a movable operating rod **(20)** for actuating the movable contact structure **(7)** and extending centrally through said relatively-fixed piston member **(26)** and guided thereby, said movable operating-cylinder assembly **(22)** having an elongated skirt portion **(24)** slidable over said relatively-fixed piston member **(26)** during the opening operation for gas compression, said movable contact structure **(7)** additionally carrying a centrally-disposed movable arc horn **(54)** at its forward end which enters the stationary tubular arcing contact **(46)** in the closed-circuit position of the device, a cluster of relatively-movable arcing contact fingers **(48)** surrounding said centrally-disposed movable arc-horn **(54)** and making separable cotacting engagement with the external side of said centrally-disposed stationary tubular arcing contact **(46)**, and arrangement functioning to first separate the main stationary and movable contacts **(42, 44)** followed by a subsequent separation of the cluster of relatively-movable arcing contact fingers **(48)** from the stationary tubular arcing contact **(46)** and finally a subsequent withdrawal of the arc-horn **(54)** from the interior of the stationary tubular arcing contact **(46)**, gas being compressed between the movable operating cylinder and the relatively fixed piston being forced out of the movable cylinder assembly through said hollow movable insulating nozzle **(33)** into engagement with the established arc **(34)** drawn within the hollow movable nozzle **(33)** and between the stationary tubular arcing contact **(46)** and the movable contact probe **(54)** during the opening operation of the device.

4,044,212
ELECTRIC SWITCHES AND PROCESS AND APPARATUS FOR MANUFACTURE THEREOF
Tetsuo Takano, Tachihongo 446, Yatsuomachi, Nei, Toyama, Japan
Continuation of Ser. No. 399,681, Sept. 24, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 615,600
Claims priority, application Japan, Sept. 26, 1972, 47-96402; Apr. 26, 1973, 48-51324; July 24, 1973, 48-82680
Int. Cl.[2] H01H *3/00*
U.S. Cl. 200—283 **1 Claim**



1. An electrical switch comprising:
a first terminal of conductive material having an elongated portion and an end portion, the end portion having first and second indentations therein on opposite sides thereof to serve as a spring support,
a second terminal of conductive material disposed adjacent to the first terminal and having an elongated portion and an end portion, the end portion having a groove therein,
an electrical contact disposed within the groove of the second terminal to be flush with the second terminal and not to project therefrom,
a third terminal of conductive material disposed adjacent to the second terminal and having an elongated portion and an end portion, the end portion having a groove therein,
an electrical contact disposed within the groove of the third terminal to be flush with the third terminal and not to project therefrom,
the end portion of the third terminal being disposed opposite to the end portion of the second terminal so that the electrical contact of the second terminal is disposed opposite to the electrical contact of the third terminal,
an elongated leaf spring having outer and inner integrally formed portions with an opening therebetween having the first terminal passing therethrough,
one end of the inner spring portion being disposed within the first indentation of the first terminal and an internal end of the outer spring portion being disposed within the second indentation of the first terminal,
an electrical contact disposed at an end of the leaf spring so as to lie between the contact of the second terminal and the contact of the third terminal,
a push rod disposed to abut the end of the leaf spring opposite to the end having the electrical contact to move the electrical contact between the contacts of the first and second terminals,
a switch case for receiving the push rod, the first, second and third terminals and the leaf spring comprising first, second and third grooves for receiving the elongated portions of the first, second and third terminals, a stepped portion for immobilizing the first, second and third terminals, a groove for receiving the push rod and permitting movement thereof in only two opposite directions and a cavity to permit movement of the leaf spring.

4,044,213
PUSH-BUTTON SENSOR SWITCH
Dwayne R. Kinney, Minnetonka, Minn., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed July 28, 1976, Ser. No. 709,328
Int. Cl.[2] H01H *9/16*
U.S. Cl. 200—308 **12 Claims**

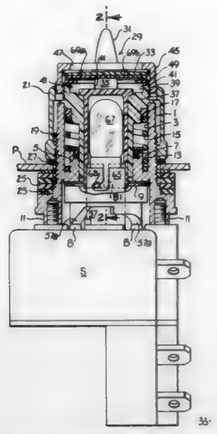


1. A push-button sensor switch comprising, in combination:
a switch body having a frame in which a switch plunger is slidably mounted for reciprocal movement to operate at least one set of contacts mounted to said frame;
a housing attached to the outer end of said plunger for reciprocal movement therewith and said housing having a viewing portion at its outer end;
a fixed member attached to said frame and extending into said housing, said member having a forward portion including a surface area visible through said viewing portion of said housing wherein said forward portion is alternately positioned adjacent to and spaced apart from said viewing portion in response to the reciprocal movement of said housing;
a sensor having a pair of electrodes, said sensor being mounted on said forward portion of said fixed member whereby the distance between said electrodes and said one set of contacts is fixed;
at least one shutter member rotatably mounted within said housing adjacent said viewing portion, and said shutter engaging said fixed member for rotation between first and second positions in response to relative movement between said fixed member and said housing wherein said shutter exposes said sensor when said fixed member is adjacent said viewing portion and wherein said shutter conceals said sensor when said fixed member is spaced apart from said viewing portion; and
means electrically coupling said electrodes with said one set of contacts to control the output of said sensor in response to movement of said housing.

4,044,214
ILLUMINATED TWO-COLOR SELECTOR SWITCH
Donald Lee Rayburn, Asheville, N.C.; Larry Ray Sunday, Brown Deer, and Edgar Robert Larsen, Milwaukee, both of Wis., assignors to Square D Company, Park Ridge, Ill.
Filed Mar. 23, 1976, Ser. No. 669,548
Int. Cl.[2] H01H *9/00*
U.S. Cl. 200—316 **9 Claims**

1. In an illuminated selector switch operator comprising a base member having an axial passage, a rotor rotatably received in the axial passage and drivingly connected to a switch operating means for operating a switch in relation to at least two rotated positions of the rotor, the rotor having an axial passage coaxial with the axial passage of the base, the passages being open at their common ends, a light source removably mounted in the passage of the rotor, and an operating knob removably connected to one of the open ends of the rotor for effecting rotation of the rotor and the knob to the two rotated positions, the improvement comprising a lamp shield removably mounted and fixedly received in the passage of the rotor around the light source and having an aperture in an otherwise closed end for directing light from the light source toward the knob, and the knob having at least two translucent portions

one of which is positioned to be in alignment with the aperture in a first rotated position of the knob and the other of which is positioned to be in alignment with the aperture in a second rotated position of the knob.

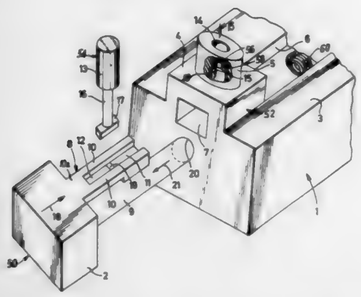


4,044,215

ELECTRIC SWITCH CONSTRUCTION HAVING AN EXTERNAL LOCKING MECHANISM

Paul Leibinger, Rietheim; Reinhold Mesle, Aldingen; Arnold Methner, Rietheim, and Alfons Steidle, Spaichingen, all of Germany, assignors to J. and J. Marquardt, Rietheim, Germany

Filed Mar. 6, 1975, Ser. No. 555,825
Claims priority, application Germany, Mar. 7, 1974, 2410871
Int. Cl.² H01H *13/02*
U.S. Cl. 200—318 **8 Claims**



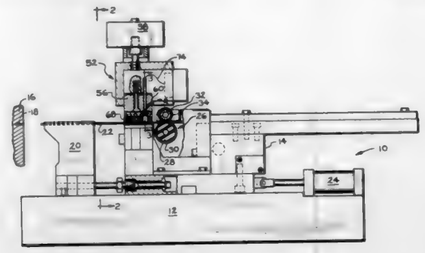
1. A switch, comprising a closed switch housing adapted to contain the switch contacts and having a guide bore extending into said housing, a switch operating member having a shaft portion movable in the guide bore between at least two operating first and second positions one of which being an operative position of the switch contacts, an operating member lock including a lock housing associated with said switch housing having a lock guide channel and a lock member bore intercepting said guide channel, a lock member movable in the bore, and a lock actuator connected to said switch operating member and displaceable in the lock guide channel, said lock member being engageable with said lock actuator when said switch operating member is in a predetermined one of said first and second positions to lock said lock member and said switch operating member against movement, said switch actuating member including a push button portion connected to said shaft portion, said lock actuator including a portion extending from said push button substantially parallel to said shaft portion and engageable in said guide channel.

4,044,216

MULTIPLE ELECTRODE ELECTRICAL DISCHARGE MACHINING

John M. Check, Chelsea, and Gary F. Rupert, Ann Arbor, both of Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Filed Feb. 27, 1976, Ser. No. 662,025
Int. Cl.² B23P *1/08*
U.S. Cl. 219—69 E **11 Claims**



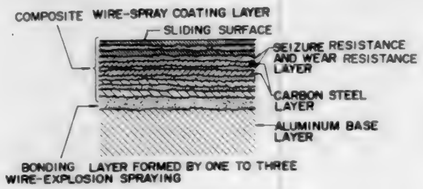
1. In electrical discharge machining apparatus for machining a workpiece wherein a plurality of generally parallel electrodes are moved during machining and during refeed in generally parallel paths, means for refeeding said electrodes to compensate for erosion thereof during maching comprising a drive roller assembly, said assembly consisting of a plurality of rollers arranged on opposite sides of said electrodes and having said electrodes drivingly engaged therebetween, means for rotating the rollers in said roller assembly so as to refeed said electrodes toward engagement with said workpiece, said rollers being operable to slip on any of said electrodes that are engaged with said workpiece during refeeding of other of said electrodes toward engagement with said workpiece, and means providing for termination of said roller rotation only in response to engagement of all of said electrodes with said workpiece.

4,044,217

SLIDING SURFACE WORKING METHOD USING WIRE-EXPLOSION COATING

Yukio Otsuki; Hiroyuki Matsumoto, both of Akashi; Hiroshi Ito, Dazaifu, and Shusuke Takezaki, Fukuoka, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Kobe and Nippon Tungsten Co., Ltd., Fukuoka, both of Japan

Filed May 7, 1975, Ser. No. 575,169
Int. Cl.² B23K *9/04*
U.S. Cl. 219—76 **10 Claims**



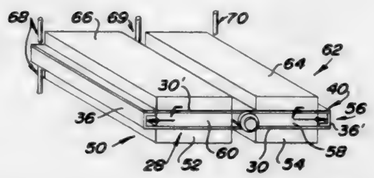
1. A method of forming an improved surface in the cylinder of an internal combustion engine comprising the steps of wire-explosion spray coating the inner surface of an aluminium alloy cylinder by using wire material selected from the group consisting of molybdenum wire, molybdenum-tungsten alloy wire and tungsten wire to form a bonding layer; alternately forming on said coating surface a layer which is formed by wire-explosion spraying a carbon steel wire to reinforce the sliding surface and a layer which is formed by wire-explosion spraying a wire of a material having good seizure resistance and wear resistance characteristics; and grinding and finishing the miltilayer-coated inner surface formed by the foregoing steps.

4,044,218

DIMENSIONALLY STABLE ANODE AND METHOD AND APPARATUS FOR FORMING THE SAME

Richard O. Olson, Parma, and Gerald R. Pohto, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 514,143, Oct. 11, 1974, Pat. No. 3,981,790, which is a division of Ser. No. 368,843, June 11, 1973, Pat. No. 3,895,210. This application Sept. 2, 1976, Ser. No. 719,820
Int. Cl.² B23K *11/10*
U.S. Cl. 219—91 **6 Claims**



1. A method of forming a dimensionally stable anode for use in an electrolytic cell comprising the steps of:

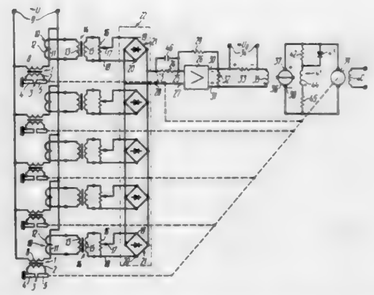
a. providing first and second sheets, each sheet having a major, generally planar, extent terminating in first and second edge portions, the second edge portion of each sheet comprising an integral leg portion bent to extend laterally from said planar extent and terminating in a tab portion extending generally parallel to said planar extent;
b. providing a generally cylindrical anode riser member;
c. positioning said pair of sheets in generally parallel relationship with the tab portion of the second edge portion of each sheet being parallel to, and in engagement with, the first edge portion of the other sheet and positioning said riser member to extend generally parallel to said first and second edge portions and between the major planar extent of said sheets to form an anode assembly;
d. placing rigid platen members within the assembly to extend between the planar extents of the two sheets and between the leg portions and the riser member;
e. clamping the assembly between rigid, planar, external platens positioned to leave exposed the first and second edge portions of each sheet and the external portions of the major planar extent of each sheet adjacent the riser; and, thereafter,
f. joining the sheets to the riser and the second edge portion of each sheet to the first edge portion of the other sheet by welding.

4,044,219

METHOD AND APPARATUS FOR CONTROLLING FLASHING SPEED DURING RESISTANCE BUTT WELDING

Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Ivan Alexeevich Chernenko, ulitsa Vladimirskaya, 98/3, kv. 45, both of Kiev; Nikolai Ivanovich Postolaty, ulitsa K. Marxa, 68, kv. 45, Kakhovka Khersonskoi oblasti; Sergei Ivanovich Kuchuk-Yatsenko, ulitsa Filatova, 1/22, kv. 47; Vladimir Ivanovich Tishura, ulitsa Chigorina, 55, kv. 27, both of Kiev; Yakov Borisovich Entin, ulitsa Chernyakhovskogo, 3, kv. 5, Kolomna Moskovskoi oblasti; Alexandr Nikolaevich Filippov, ulitsa Lenina, 42, kv. 52, Kolomna Moskovskoi oblasti, and Evgeny Petrovich Martynov, ulitsa Kalinina, 24, kv. 47, Kolomna Moskovskoi oblasti, all of U.S.S.R.

Filed Oct. 14, 1975, Ser. No. 622,394
Int. Cl.² B23K *11/04*
U.S. Cl. 219—100 **3 Claims**



1. A method for controlling flashing speed during resistance butt welding comprising measuring values of flashing current density for at least two joints of parts being welded; converting said values of current density into at least two d-c voltages and detecting the maximum value of said at least two d-c voltages; comparing said maximum d-c voltage to a preset d-c voltage, said preset voltage being proportional to a current within an admissible range of variation of the flashing current; determining a time derivative of said maximum value of said d-c voltage and using the resultant difference value between said maximum and preset voltage concurrently with said time derivative of said maximum value as parameter for controlling the flashing speed of said two joints.

4,044,220

RESISTANCE WELDING ELECTRODE AND METHOD OF MAKING

Michael A. Giagola, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 15, 1975, Ser. No. 613,611
Int. Cl.² B23K *11/30*
U.S. Cl. 219—119 **33 Claims**

1. A method for forming work-contacting layer on a surface portion of a copper or copper-base alloy body member of a resistance welding electrode, which comprises the steps of:

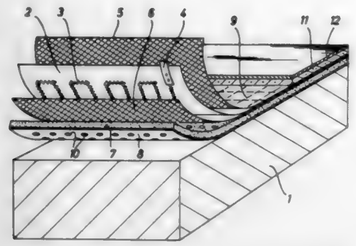
a. shot-peening said surface portion of said body member and
b. coating said surface portion of said body member with a material selected from the group consisting of nickel, berylium, cobalt, iron and high melting point alloys of the foregoing.

4,044,221

FLEXIBLE HEATING ELEMENT FOR HEATING SEATS, IN PARTICULAR MOTOR VEHICLE SEATS, COUCHES, BERTHS OR THE LIKE

Gerald Kuhn, Evenhausen, Germany, assignor to Kommanditgesellschaft Warmetechnik B. Ruthenberg GmbH, Germany

Filed May 15, 1975, Ser. No. 577,635
Claims priority, application Germany, July 19, 1974, 7424704
Int. Cl.² H05B *1/00*
U.S. Cl. 219—217 **10 Claims**



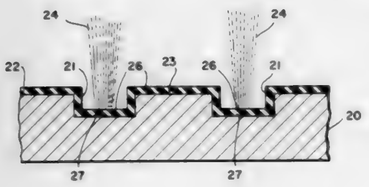
1. A flexible electrical heating element comprising:
a planar carrier sheet, said carrier sheet being formed of an air permeable material;
an electrical heater, said heater being in the form of a conductive wire which defines a seam on said carrier sheet;
a perforated foam member, said foam member having a first side facing a first side of said carrier sheet; and
means mechanically interconnecting said carrier sheet and foam member, said interconnecting means including closing seams.

4,044,222

METHOD OF FORMING TAPERED APERTURES IN THIN FILMS WITH AN ENERGY BEAM

Ami Kestenbaum, East Windsor Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,766
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 LM **9 Claims**



1. A method of forming a tapered aperture in an outer surface of a thin film machinable by an energy beam, the thin film having a thickness X and thermal and optical characteristics such that a temperature gradient is establishable between the outer surface of the thin film and an inner surface thereof upon impingement of the beam on the outer surface, which method comprises:
impinging the beam on a selected site on the outer surface in a series of pulses, each having a duration less than τ, where

$$\tau = X^2/4K_{td} = (X^2C_p\rho)/(4k_{tc}),$$

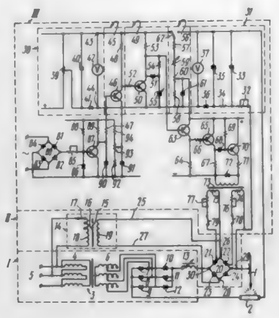
and where K_{td} is the coefficient of thermal diffusivity of the film material, C_p is the specific heat of the film material, τ is the density of the film material, and k_{tc} is the coefficient of thermal conductivity of the film material, whereby each pulse terminates before said temperature gradient is zero, so as to form a tapered aperture of a desired depth.

4,044,223

APPARATUS FOR PULSED ARC WELDING AND BUILDING-UP OF ARTICLES

Boris Evgenievich Paton, ulitsa Kotsjubinskogo, 9, kv. 21; Vladimir Konstantinovich Lebedev, ulitsa Engelsa, 25, kv. 12; Pavel Petrovich Sheiko, prospekt Nauki, 86/90, korpus 3, kv. 16; Mikhail Petrovich Pashulya, ulitsa Konstantinovskaya, 61, kv. 11, and Boris Antonovich Steblovsky, ulitsa Anri Barbjusa, 22/26, kv. 122, all of Kiev, U.S.S.R.

Filed Apr. 8, 1975, Ser. No. 566,048
Int. Cl.² B23K *9/10*
U.S. Cl. 219—135 **6 Claims**



1. An apparatus for pulsed arc welding and building-up of articles, comprising: a rectifier (I) having a three-phase input and a choke (13) at its output; a current pulse generator (II) having a transformer (14) with a primary (18) and a secondary (19), a rectifier (20) at its output, and a control circuit (III) also having an output and an input; said rectifier (20) of said generator having a number of cells and being connected to an electrode (1) and an article (2) with an arc gap therebetween, in a series connection with said choke, said rectifier (20) of said generator being constructed and including means for producing a welding current which flows continuously, having a preset threshold value, from said choke through said arc gap, irrespective of the state of said cells of the rectifier; said electrode and article being connected to said input of the control cirucit, whose output is connected to control electrodes (at 21, 22) in the rectifier (20) of said current pulse generator.

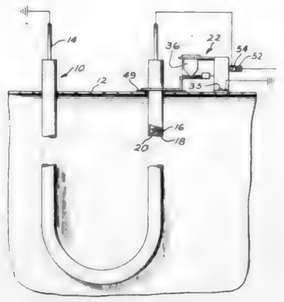
4,044,224

PROTECTIVE CIRCUIT FOR DISHWASHER HEATING ELEMENT

Thomas E. Jenkins, and LeRoy J. Herbst, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Mar. 1, 1976, Ser. No. 662,550
Int. Cl.² H05B *1/02*; F24H *1/22*
U.S. Cl. 219—322 **4 Claims**

1. A protective circuit for a heating element in an automatic dishwasher which includes:
an electrical resistance-type heating element connected in an electric power circuit and encased in a ceramic-filled metallic sheath;
conductive first and second supports confining a switch means and electrically connected by a fusible link, said first support being electrically attached to said sheath and said fusible link being a current-carrying link in a grounding circuit from said sheath to ground; further, said switch means being a normally-open switch in the electric power circuit of the resistance-type heating element, the protective circuit being further defined in that said fusible link maintains said normally-open switch in the closed position until current caused by an electric arc passing from said heating element to said sheath through said link to ground, melts said link and allows said switch to move to its normally-open position, thereby simultaneously opening the ground circuit to terminate the passage of said electric arc and cutting off the power to said heating element.

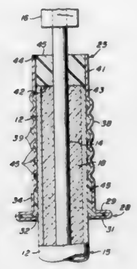


4,044,225

ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

James F. Pease, 5805 Folkestone Drive, Dayton, Ohio 45459

Division of Ser. No. 640,737, Dec. 15, 1975, which is a division of Ser. No. 454,291, March 25, 1974, Pat. No. 3,930,140, which is a continuation-in-part of Ser. No. 334,002, Feb. 20, 1973, Pat. No. 3,800,415, which is a division of Ser. No. 244,516, April 17, 1972, Pat. No. 3,732,398, which is a continuation-in-part of Ser. No. 194,742, Nov. 1, 1971, abandoned. This application Jan. 3, 1977, Ser. No. 756,321
The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.
Int. Cl.² F24H *1/00*; H05B *1/00*
U.S. Cl. 219—336 **8 Claims**



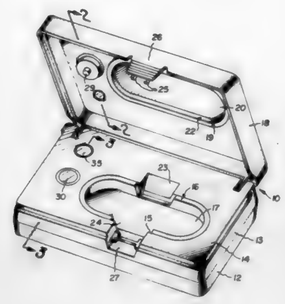
1. In an electrical heating element assembly for mounting within spaced openings of a liquid heating vessel, and including an elongated tubular sheath having opposite end portions, and elongated electrical resistance element positioned within the sheath with a thermally conductive insulation material, and terminal members extending from end portions of the resistance element through the corresponding end portions of the sheath, the improvement comprising a pair of tubular sheet metal fittings each having a flange portion projecting outwardly from a tubular wall portion, said tubular wall portion of each said fitting having a helical convoluted thread portion with a corrugated wall configuration in axial cross-section, each said fitting having axially spaced first and second annular wall portions engaging said sheath at axially spaced locations, and a bonding and sealant material confined within the space defined between said tubular wall portion of each said fitting and said sheath and between said axially spaced first and second corresponding annular wall portions.

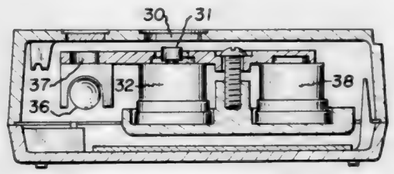
4,044,226

APPARATUS FOR DISINFECTION OF HYDROPHILIC CONTACT LENSES

John Kadlecik, Macedon, and Wayne R. Manning, Victor, both of N.Y., assignors to Bausch & Lomb Incorporated, Rochester, N.Y.

Continuation-in-part of Ser. No. 597,125, July 18, 1975, abandoned. This application Aug. 30, 1976, Ser. No. 718,729
Int. Cl.² A61L *3/00*; F24C *1/16*
U.S. Cl. 219—521 **14 Claims**





1. A hydrophilic contact lens disinfecting device for disinfecting contact lenses carried within a contact lens carrying case comprising in combination, means defining a housing having a base and a cover, said cover and said base being movable relative to each other, a well member received within said housing, said member adapted to receive a lens carrying case, said well member and said cover cooperating to define a compartment, means for heating said well member to a predetermined temperature, manual reset thermostat means for actuating said heating means and subsequently thermostatically deactivating said heating means upon said well member obtaining the predetermined temperature and substantially prior to the completion of a disinfecting cycle, said well member having a specific heat of from 0.09 to about 0.11 BTU/lb_mF° and a density of from about 445 to about 560 $lb_m/ft.^3$ whereby the heat transferred from the well to the contact lens carrying case received therein is sufficient to destroy pathogenic microorganisms contaminating a contact lens contained in the case.

4,044,227

BAR CODE READER

James P. Holm, Kalamazoo, and Ronald J. Dudley, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 7, 1975, Ser. No. 602,777
Int. Cl.² G06K *7/12*; H04N *7/00*; G06K *19/06*; B07C *5/34*
U.S. Cl. 235—61.7 R **24 Claims**

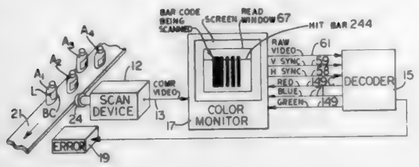
3. A bar code reading system including a bar code emplaceable on an article, the bar code having an acquisition bar followed by a succession of uniform data spaces occupiable by a pattern of data bars to encode information characters, the system comprising:
scanning means for line canning said bar code and producing

a video signal having transitions corresponding to transitions between bars and spaces of the scanned bar code;

decoder means responsive to said video signal and synchronized with said scanning means for identifying the bar code on the article being scanned, said decoder means including

a source of clock pulses of fixed frequency independent of transitions in said video signal,

strobe pulse means including means for counting clock pulses produced as said scanning means scans across said acquisition bar to establish a clock pulse count proportional to the width of said acquisition bar, and means responsive to said count and subsequent clock pulses produced after said scanning means leaves said



acquisition bar for in turn producing a sequence of strobe pulses (1) spaced by identical clock pulse quantities proportioned to said count to define uniform time intervals related to the width of said acquisition bar and (2) occurring substantially as the line of scan crosses the centers of successive data spaces of the bar code,

comparison means responsive to said strobe pulses and video signal for comparing a pattern of video signal values coincident with said pulses to a stored reference pattern of values corresponding to a correct bar code and for producing a "compare" output when the two patterns correspond,

output means responsive to signals from said comparison means meeting a preselected criterion for indicating whether the scanned bar code is a correct one.

4,044,228

ELECTRONIC CALCULATOR WITH PRINTER

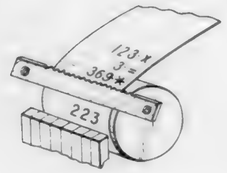
Jyuji Kishimoto, Tokyo, and Shigeru Toyomura, Kawasaka, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 608,019

Claims priority, application Japan, Aug. 30, 1974, 49-99685; Aug. 30, 1974, 49-99686

Int. Cl.² B41J *15/00*; G06F *7/38*; G01D *15/10*; B41J *27/00*

U.S. Cl. 235—61.9 A **10 Claims**



4. Electronic apparatus of the type including a printer for recording information on a recording medium, comprising:

key input means including numerical keys and an operation command key for depression to produce corresponding key signals;

control means coupled to said key input means for controlling operations and printing by said apparatus in response to the key signals from said key input means; and

feed drive means coupled to said operation command key and said control means, said feed drive means including a memory arranged to assume a first state during depression of said operation command key and a second state at a predetermined time after said depression is discontinued, wherein said feed drive means is operative to continuously advance said recording medium past said printer when said memory is in said first state, and to feed a predetermined length of said recording medium past said printer after said depression is discontinued until said memory is in said second state.

4,044,229

DEVICE FOR ELECTROCONDUCTIVE CONNECTION AND READING

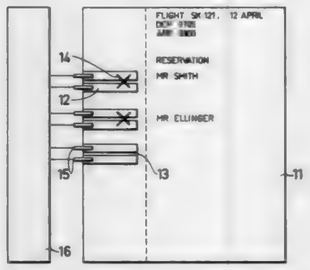
Nikolay Samreus, 15, Kyrkogatan, Sundbyberg, Sweden (S-172 32)

Division of Ser. No. 380,468, July 18, 1973, Pat. No. 3,934,120. This application Jan. 14, 1976, Ser. No. 649,076

Claims priority, application Sweden, July 21, 1972, 9601/72

Int. Cl.² G06K *7/06, 19/06*; G09B *7/06*; H01H *43/08*

U.S. Cl. 235—61.11 A **9 Claims**



1. A data storage retrieval memory device comprising:

a. at least one exchangeable sheet of material which is electrical substantially non-conductive and provides a plurality of data storage positions on at least one side which can individually be coded by the presence and absence of marking material which is electrically substantially conductive at said data storage positions;

b. a stationary pad on which said sheet is removably supported in overlying relationship providing a surface for carrying out said coding having first means with a plurality of electrical contacts for releaseably engaging said side of said sheet, said contacts including at least an individual one of said plurality of contacts directly contacting each of said storage positions to thereby contact any marking which may be placed thereon;

c. contact means contacting all of said positions in common; and

d. second means coupled to said plurality of contacts and said contact means providing an electrical readout device for sensing the presence and absence of said marking material at each of said data storage positions while said sheet, contacts, and contact means remain stationary with respect to each other, and said sheet is stationary on said stationary pad, said stationary relationship between said sheet, contacts, contact means and stationary pad being maintained during processing of data at all of said data storage positions on said sheet of material.

4,044,230

PERFORATED TAPE READER

Armando Costa, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Apr. 9, 1976, Ser. No. 675,382

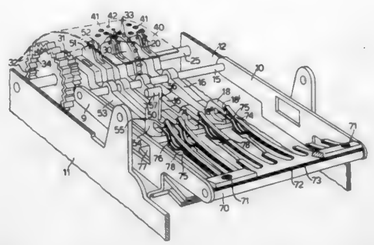
Claims priority, application Italy, May 12, 1975, 68193/75

Int. Cl.² G06K *7/04*; H01H *43/08*

U.S. Cl. 235—61.11 C **2 Claims**

1. A perforated tape reader comprising a plurality of detecting means associated with said perforated tape, driving means for moving said tape with respect to said detecting means, a

plurality of movable rocker arms said detecting means having means rotatably mounting at one end thereof and wherein the other end has a fork having an upper and a lower arm, a plurality of conductive elements selectively movable from a first to a second of two positions by said rocker arms for closing electric circuits, a plurality of fixed contacts located in alignment with said plurality of conductive elements, means asso-



ciated with said rocker arms to normally keep said detecting means in contact with said perforated tape, whereby said conductive elements associated with said lower arms of said fork are moved away from said fixed contacts when they are in said first position and are arrested against said fixed contacts in an intermediate position between said arms of said fork when said conductive elements are in said second position in order to close said electric circuits

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4,044,231

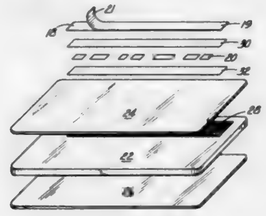
SECURE PROPERTY DOCUMENT AND METHOD OF MANUFACTURE

Charles K. Beck, Mentor, and Francis C. Foote, Rocky River, both of Ohio, assignors to Addressograph Multigraph Corporation, Cleveland, Ohio

Filed May 27, 1975, Ser. No. 581,428

Int. Cl.² G06K *19/08, 7/10*; B42D *15/00*; G11B *7/00*

U.S. Cl. 235—61.12 N **15 Claims**



1. A fraud resistant document comprising:

a main body,

a plurality of radiant energy reflectors overlying said main body in a data area for reflecting incident radiant energy of predetermined characterisitcs.

a magnetic recording member overlying said radiant energy reflectors, said member being substantially transparent to said radiant energy and generally opaque to normal visible light whereby said reflectors are at least partially concealed against detection by the naked eye, and

a layer of material on the bottom of said magnetic recording member having a lower reflector-receiving surface interfacing with said reflectors, said layer of material being substantially transparent to said radiant energy and said surface having known general microtopographical characteristics,

said reflectors comprising thin elements particle deposited onto said reflector-receiving surface, each element having a reflective surface interfacing with said reflector-receiving surface and having substantially the same microtopographical characteristics as said reflector-receiving surface.

4,044,232

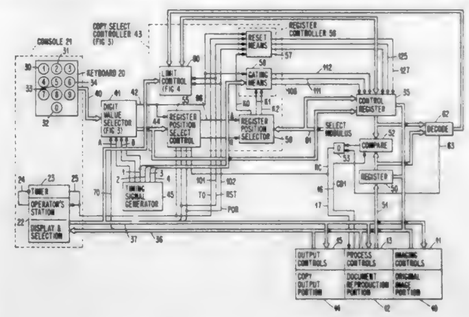
ELECTRONIC COPY SELECTION CONTROLS FOR A DOCUMENT REPRODUCTION MACHINE

James Henry Hubbard, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 23, 1976, Ser. No. 651,987

Int. Cl.² G06B *27/06*

U.S. Cl. 235—92 SB **33 Claims**



1. A document reproduction machine having controllable sequencing means, said sequencing means supplying signals indicating machine signal states, a keyboard for serially entering control value digit signals, each said control digit signal capable of having a value of a nonsignificant zero or one of a plurality of significant values, a control register for receiving said control digit signals, said register having a given number of signal receiving digit positions, having a given modulus and capable of assuming any one of a plurality of signal control states including a reference signal state, said machine capable of producing a number of copies of one image in one copy run in accordance with the signal contents of said control register, the improvement including in combination electrical means electrically interposed between said keyboard and said control register, and including:

digit value selector means limiting each keyboard actuation to selecting one and only one value and for supplying value signals indicative of said selected one value;

gating means for enabling gating and shifting said value signals to predetermined digit positions of said control register;

register position indicating means indicating the number of digits in a set of significant value signals in said control register and controlling said gating means in accordance therewith;

reset means responsive to first predetermined one of said signal states to reset said control register to said reference signal state for actuating said machine to produce copy per copy run; and

position select control means responsive to a second predetermined one of said signal states to reset said register position indicating means to a reference state for enabling said keyboard to enter significant digit value signals into said control register without first separately clearing said control register.

4,044,233

END PREDICTOR FOR CASSETTE TAPE

Masaaki Sato, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 27, 1976, Ser. No. 690,539

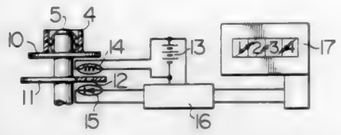
Claims priority, application Japan, June 5, 1975, 50-68024; June 10, 1975, 50-69968; June 10, 1975, 50-69969; Sept. 10, 1975, 50-109732

Int. Cl.² G06M *3/02*

U.S. Cl. 235—92 PE **4 Claims**

1. A tape end predictor for a tape cassette of a tape recorder, the cassette being of a type which contains a measured length of tape corresponding to a given number of turns thereof on

one of the tape hubs which are mounted in a cassette when the tape is entirely received on said one tape hub, the tape cassette of the type being provided with an indication aperture indicative of the type of cassette, the predictor comprising a counter for counting the number of revolutions of a shaft on which said one tape hub is mounted to thereby indicate the length of tape reeled off the one tape hub, alarm means responsive to a given count in the counter to close an electrical circuit, thereby providing an alarm, a detection lever disposed for detecting the presence of the indication aperture in the cassette mounted



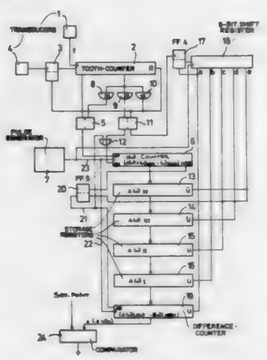
on the tape recorder, and a reset lever operatively associated with an operating lever which is carried by the detection lever and adapted to reset the counter, a movement of a record/-playback actuating member of the tape recorder to its operative position being effective, when a tape cassette having the indication aperture is mounted on the tape recorder, to reset the counter through the operating lever and the reset lever, said alarm means providing an alarm when a given count is reached in the counter, thereby predicting the tape end at a given time interval before the tape end is actually reached.

4,044,234

PROCESS AND APPARATUS FOR CONTROLLING ENGINE OPERATION NEAR THE LEAN-RUNNING LIMIT

Wolf-Dietrich Frobenius, Asperg, and Hartmut Schweizer, Korntal, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1976, Ser. No. 659,493
Claims priority, application Germany, Feb. 19, 1975, 2507138
Int. Cl.² G06F *15/20*; F02D *5/00*
U.S. Cl. 235—150.21 **10 Claims**



1. A process for obtaining a signal for controlling an internal combustion engine, said engine including a rotating crankshaft, and cyclically moving piston means, comprising the steps of:

obtaining a first datum related to the speed of rotation of said crankshaft at a first angular position and obtaining a second datum related to the speed of rotation of said crankshaft at a second angular position;

forming and storing a first arithmetic difference between said first and second datum;

repeating the step of obtaining a first and a second datum related to the speed of rotation of said crankshaft, during a subsequent revolution thereof, and at the same position of said piston means;

forming a second arithmetic difference between the first and second datum obtained during said subsequent revolution of the crankshaft;

comparing said first difference with said second difference and obtaining a result;

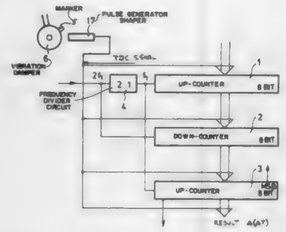
comparing said result with a predetermined set-point value and obtaining a second result from which said signal for controlling the engine may be derived.

4,044,235

METHOD AND APPARATUS FOR DETERMINING SMOOTH RUNNING OPERATION IN AN INTERNAL COMBUSTION ENGINE

Wolf-Dietrich Frobenius, Asperg, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1976, Ser. No. 659,494
Claims priority, application Germany, Feb. 19, 1975, 2507057
Int. Cl.² G06F *15/20*; F02D *5/00*
U.S. Cl. 235—150.21 **12 Claims**



1. A process for obtaining a signal for controlling the operation of an internal combustion engine, said engine including a crankshaft, and a fuel supply system, comprising the steps of:

measuring the period of successive crankshaft revolutions;

during each crankshaft revolution, counting a first frequency in a first counter in increasing numerical sense, counting a second frequency in a second counter in decreasing numerical sense, said second frequency being equal to twice said first frequency, and counting said first frequency in a third counter in increasing numerical sense; and

at the termination of each revolution, transferring the contents of said first counter to said second counter and resetting said first counter to zero; and transferring the contents of said second counter to said third counter before the contents of the first counter are transferred to the second counter.

4,044,236

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF AN INTERNAL COMBUSTION ENGINE

Valerio Bianchi, Hochdorf; Peter Schmidt, Schwieberdingen, and Reinhard Latsch, Vaihingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 19, 1976, Ser. No. 659,538
Claims priority, application Germany, Feb. 19, 1975, 2507137
Int. Cl.² G06F *15/20*; F02D *5/00*
U.S. Cl. 235—150.21 **12 Claims**

1. A method for obtaining a signal for controlling the operation of an internal combustion engine, said engine including a rotating crankshaft, comprising the steps of:

sensing the rotation of the crankshaft and generating a first signal representative of the irregularities of crankshaft motion;

deriving a pulse signal from said first signal;

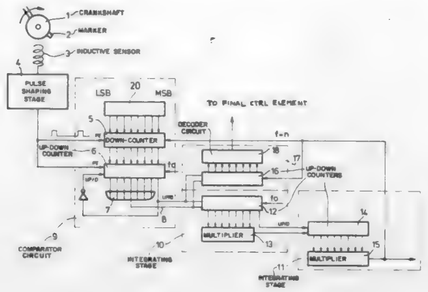
generating a second signal representative of a regularly rotating crankshaft;

performing a phase comparison between said first signal and said second signal;

generating a second pulse train of variable frequency from the twice-integrated results of said phase comparison;

applying said second pulse train to the counting input of a down counter circuit;

gating said down counter circuit by the first pulse train of a frequency substantially less than that of said second pulse train;



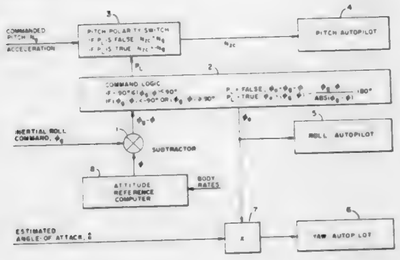
supplying the contents of said down counter circuit to the jam of an up-down counter and gating said up-down counter by said first pulse train for counting at a constant system clock frequency; thereby performing said phase comparison and generating a datum whose duration is proportional to changes in the period of rotation of the crankshaft.

4,044,237

MISSILE MANEUVER CONCEPT

Paul N. Cowgill, Bellevue, Wash., and John L. Pearson, Fountain Valley, Calif., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 16, 1976, Ser. No. 667,819
Int. Cl.² G06F *15/50*; F42B *15/02*
U.S. Cl. 235—150.27 **2 Claims**



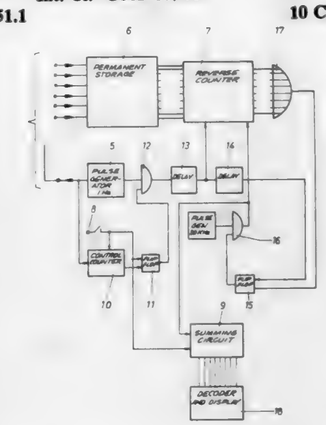
1. A system for controlling a missile having a lifting body configuration comprising a pitch autopilot having an input; a roll autopilot having an input; a yaw autopilot having an input; a pitch polarity switch having an output connected to the pitch autopilot input; logic device having first and second input and an output; an attitude reference device having output which is indicative of the attitude of said missile; pitch control signal connected to an input of said pitch polarity switch; subtractor having two inputs and an output; roll command signal connected to one input of said subtractor; the output of said attitude device being connected to the other input of said subtractor; the output of subtractor being connected to said logic device whereby said logic device will set the polarity of said pitch polarity switch; said logic device further having said second output connected to said roll autopilot; said logic determining the polarity of the signal applied to said roll autopilot; a multiplier having first and second inputs and an output; and estimated angle of attack of said missile vehicle signal being fed into one input of said multiplier; said second output of said logic device being fed to the other input of said multiplier; and said output of said multiplier being connected to said yaw autopilot.

4,044,238

METHOD AND ARRANGEMENT FOR MEASURING AND EVALUATING TEMPERATURES IN TEMPERATURE PROCESSED GOODS

Hans Heinrich Emschermann; Bruno Fuhrmann, and Dieter Huhnke, all of Braunschweig, Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Germany

Filed Dec. 1, 1975, Ser. No. 636,710
Claims priority, application Germany, Nov. 30, 1974, 2456663
Int. Cl.² G06F *15/46*
U.S. Cl. 235—151.1 **10 Claims**



1. An arrangement for determining the effect of a heating and/or cooling process upon the goods being processed, the arrangement comprising, in combination, means for measuring the temperature of the goods at regular time intervals; means for storing the successively measured temperature values during the course of the measurements; means operative after completion of the process for deriving from each stored temperature value a process effectiveness value indicative of the effect of the process upon the processed goods during the respective corresponding time interval; and means for summing the process effectiveness values and generating a sum signal indicative of the effectiveness of the entire process, wherein the means for summing the process effectiveness values comprises a backward counter, means for applying successive ones of the process effectiveness values to the backward counter, and means for causing the backward counter after receipt of each successive effectiveness value to count backward to zero.

4,044,239

METHOD AND APPARATUS FOR ADJUSTING VIBRATION FREQUENCY OF VIBRATING OBJECT

Minoru Shimauchi, Hamamatsu, and Takashi Onoda, Hamakita, both of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Feb. 24, 1976, Ser. No. 661,020
Claims priority, application Japan, Feb. 28, 1975, 50-25330; Mar. 4, 1975, 50-25587
Int. Cl.² G10G *7/02*; G05B *15/00*
U.S. Cl. 235—151.3 **8 Claims**

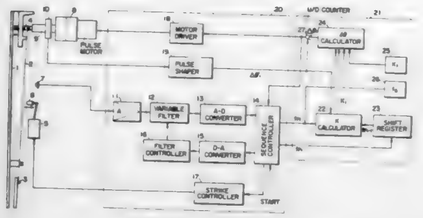
1. A method for conducting stepwise adjustment of the vibration frequency of a vibrating object by operating a vibration frequency varying means connected to said vibrating object to make said vibration frequency of said vibrating object

substantially equal to a reference frequency, comprising the steps of:

a. measuring the vibration frequency of said vibrating object;

b. operating said vibrating frequency varying means by an increment to cause the vibrating frequency to change and measuring the resulting vibration frequency of the vibrating object;

c. stopping the operating step whenever the difference between said resulting vibration frequency measured in a preceding step of operating and the reference frequency is smaller than a certain predetermined permissible frequency error;



d. continuing to operate, whenever said difference is not smaller than said certain permissible frequency error, said vibration frequency varying means to cause the vibrating frequency to successively change by a present increment determined by: the past increment in the immediately prior step of operating, the frequency representing the difference between the vibration frequencies of the vibrating object before and after said immediately prior step of operating said vibration frequency varying means, and the frequency deviation representing that frequency difference relative to the reference frequency still remaining after the immediately prior step of operating; and

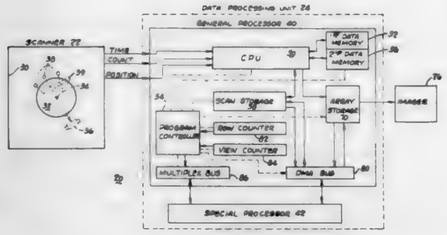
e. repeating steps (c) through (d) until the vibration frequency of the vibrating object becomes substantially equal to the frequency.

4,044,240

TOMOGRAPHY SYSTEM HAVING AN ULTRA HIGH SPEED PROCESSING UNIT

Jerome P. Cox, Jr., St. Louis, and Vernon W. Gerth, Jr., Kirkwood, both of Mo., assignors to Picker Corporation, Cleveland, Ohio

Filed Nov. 28, 1975, Ser. No. 635,953
Int. Cl.² G01T *1/16*; G06F *15/52*
U.S. Cl. 235—151.3 **27 Claims**



1. A transverse section tomography system for providing a reconstructed image of a planar section of a subject, comprising:

a. a movably supported radiation detector for detecting radiation which has passed through the planar section of the subject and for generating a sequence of scan data signals indicative of the intensity of the radiation after it has passed through the subject, said scan data signals being generated at predetermined orientations and positions whereby detection of the radiation at a given orientation and position defines a scan element and detection of the radiation at all predetermined orientations and positions defines a scan cycle; and,

b. data processing means responsive to the sequence of scan data signals for generating a set of repeatedly updated, elemental image signals characterizing structure of the planar section of the subject, said data processing means including:

i. input storage means for storing the respective scan data signals in particular input storage locations;

ii. filter processing means coupled to the input storage for successively retrieving the scan data signals from the input storage locations of the filter processing means and for producing filtered scan signals from the retrieved scan data signals which are representative of the reconstructed image contribution of each of the scan data signals;

iii. scan storage means for retrievably storing the filtered scan signals in scan storage locations corresponding to scan elements occurring at predetermined orientations during the scan cycle;

iv. array storage means for storing as they are generated, elemental image signals which are to be repeatedly updated; the elemental image signals being stored in array storage locations coordinated with a preselected array of points of said planar section;

v. an array storage address calculator for addressing a selected array storage location containing the elemental image signal corresponding to a selected one of said preselected points of the planar section;

vi. a scan storage address calculator for addressing the scan storage location containing the filtered scan signal corresponding to a given scan element which resulted in the detection of radiation sufficiently near said selected point to contribute to the reconstruction of the image at said selected point;

vii. updating means for combining the addressed filtered scan signal with the addressed elemental image signal to provide one of the updated, elemental image signals; and,

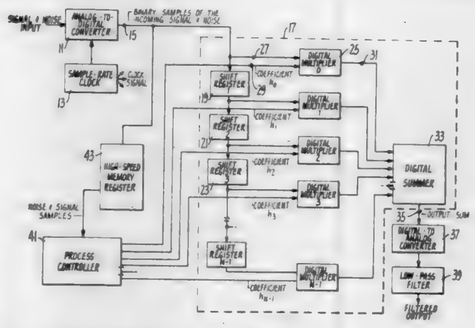
viii. a controller coupled to the storage address calculators for operating them concurrently.

4,044,241

ADAPTIVE MATCHED DIGITAL FILTER

William T. Hatley, Jr., Sunnyvale, Calif., assignor to ESL Incorporated, Sunnyvale, Calif.

Filed Jan. 12, 1972, Ser. No. 217,171
Int. Cl.² G06F *15/34*
U.S. Cl. 235—152 **14 Claims**



1. An electronic filter, comprising,

means receiving an electronic noise plus signal waveform for sampling said waveform at periodic intervals with the amplitude of each waveform sample expressed in a binary code,

a digital filter receiving the binary waveform samples at an input and forming a filtered binary signal at an output, said filter having a transfer function that is controllable by application of a plurality of binary constants thereto, and

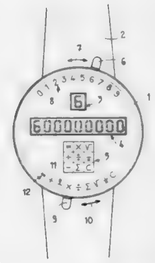
means receiving said input binary samples for automatically generating said transfer function controlling filter binary constants and continuously conforming said constants to changes in said noise plus signal waveform.

4,044,242

DATA SELECTION AND DISPLAY ARRANGEMENT FOR A SMALL DEVICE

Claude Laesser, La Chaux-de-Fonds, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

Filed Apr. 30, 1975, Ser. No. 573,264
Claims priority, application Switzerland, May 3, 1974, 6031/74
Int. Cl.² G04B *47/00*
U.S. Cl. 235—152 **3 Claims**



1. For use with an electronic calculator through which operations on selected numeric data are performed in accordance with selected functions after entry of the data and functions to produce operational outputs, a selector and display arrangment comprising a casing having a dial face enclosed by a peripheralportion, scale means mounted on the dial face adjacent said peripheral portion bearing indicia corresponding to the numeric data and the functions, at least two display devices for respectively displaying said indicia and the operational outputs, means mounting the display devices in the casing for display of the indicia and the operational outputs on separate displaying areas of the dial face, pressure responsive key means for initial selection of the indicia and subsequent entry of the corresponding numeric data and functions into the calculator, means movably mounting the key means for displacement to different operative positions along the scale means to effect said initial selection and display of the selected indicia on at least one of the said displaying areas prior to entry of the corresponding data and functions into the calculator, and means responsive to pressure exerted on the key means in each of said different positions thereof for said subsequent entry of the selected data and functions to effect display of the operational outputs in another of the displaying areas.

4,044,243

INFORMATION PROCESSING SYSTEM

Leon N. Cooper, and Charles Elbaum, both of Providence, R.I., assignors to Nestor Associates, Stonington, Conn.

Filed July 23, 1976, Ser. No. 707,995
Int. Cl.² G05B *13/02*; G06F *7/38*
U.S. Cl. 235—152 **18 Claims**

1. A digital, adaptive information processing system comprising, in combination:

a. digital input register means for storing a plurality (N) of digital numbers $s_1, s_2 \ldots s_j \ldots s_N$, representing an input signal;

b. digital output register means for storing a plurality (n) of digital numbers $r_1, r_2 \ldots r_i \ldots r_n$, representing an output response; and

c. digital information processing apparatus connecting said input register means with said output register means, said apparatus comprising:

1. digital memory means for storing a plurality ($n \times N$) of digital weighting numbers $A_{11}, A_{12} \ldots A_{ij} \ldots A_{nN}$;

2. digital multiplier means, coupled to said input register means and to said memory means, for multiplying selected ones s_j of said numbers located in said input register means with selected ones A_{ij} of said weighting numbers to produce digital product numbers s'_j in accordance with the formula:

$$s'_j = A_{ij}s_j$$

3. digital adder means, coupled to said multiplier means and to said output register means, for adding together selected ones of said product numbers s'_j produced by said multiplier means to produce digital sum numbers r_i in accordance with the formula:

$$r_i = \sum_{j=1}^{N} s'_j$$

said sum numbers r_i being stored in said output register means; and

4. digital modifier means, coupled to said input register means, said output register means and to said memory means, for changing at least one of said weighting numbers A_{ij} in accordance with the formula:

$$A_{ij}(t) = \gamma A_{ij}(t-1) + \eta s_j r_i$$

where $A_{ij}(t)$ is the new number stored in said memory means,

$A_{ij}(t-1)$ is the number previously stored in said memory means,

γ is a decay constant in the range $o \leqq \gamma \leqq 1$,

η is a learning constant for which $o \leqq \eta$,

s_j is the number stored in said input register means,

r_i is the member stored in said output register means, and

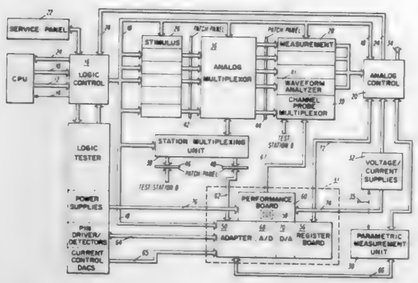
i and j are integers from 1 to n and N, respectively.

4,044,244

AUTOMATIC TESTER FOR COMPLEX SEMICONDUCTOR COMPONENTS INCLUDING COMBINATIONS OF LOGIC, MEMORY AND ANALOG DEVICES AND PROCESSES OF TESTING THEREOF

Steven H. Foreman, Manassas; Ernest H. Millham; James E. Ortloff, both of Warrenton, and Ronald Jay Prilik, Annandale, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,303
Int. Cl.[2] G06F *11/00*; G01R *15/12*
U.S. Cl. 235—153 AC **16 Claims**



1. A testing apparatus for stimulating and measuring analog properties of a circuit under test while enabling the simultaneous stimulation and measurement by a logic testing apparatus on a plurality of terminals of the circuit under test, connected to the I/O bus of a central processing unit for receiving an instruction having an address and a data component, the address component including an analog/logic selection field, an instrument selection field, and a circuit under test pin selection field and the data portion including an instrument data field and a buffer circuit data field, comprising:

an instrument decoder having an input connected to said central processing unit I/O bus;

a first testing instrument having a control input connected to an output of said instrument decoder and a second testing instrument having a control input connected to an output of said instrument decoder, said first and second testing instruments having data lines connected to said central processing unit I/O bus;

said instrument decoder generating an enabling signal to said first testing instrument in response to the receipt of a first instrument select field in a first instruction output from said central processing unit, causing said first testing instrument to generate a signal waveform on an output line, characterized by a first instrument data field in said first instruction;

said instrument decoder enabling said second testing instrument in response to the receipt of a second instrument select field in a second instruction output from said central proceasing unit, causing said second testing instrument to measure a second signal waveform on an input line, based upon measurement criteria specified by a second instrument data field in said second instruction;

a multiplexor having a first signal input connected to the output of said first testing instrument and a control input for receiving a component under test pin select field from said first instruction;

a first buffer circuit having an input connected to a first output from said multiplexor, which first output is connected through said multiplexor to said signal output of said first test instrument in response to a component under test pin select field in said first instruction;

a buffer circuit decoder having an input connected to said I/O bus from said central processing unit and a control input connected to said first buffer circuit, for connecting said first output from said multiplexor, through said first buffer circuit to a first terminal on said component under test in response to a buffer circuit data field in said first instruction, enabling the input of said first signal waveform to said first terminal on said component under test;

a second buffer circuit having an input connected to a second terminal of said component under test, which second terminal generates said second signal waveform which is the component under test's response to said first signal waveform;

a second buffer circuit decoder having an input connected to said I/O bus of said central processing unit and a control output connected to said second buffer circuit for connecting said second terminal of said component under test through said second buffer circuit to a second input line to said multiplexor in response to a second buffer circuit data field in said second instruction;

said multiplexor having a second output line connected to said signal input line for said second testing instrument, connected through said multiplexor to said second buffer circuit in response to a second circuit under test pin select field in said second instruction;

said second testing instrument measuring said second signal waveform generated from said second terminal of said component under test and generating a digital representation of said measurement which is output over said output line of said second testing instrument to the I/O bus of said central processing unit;

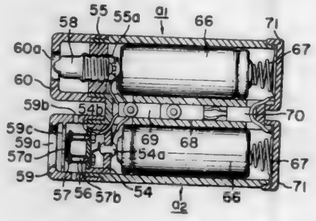
whereby a plurality of test may be performed on the component under test.

4,044,245

PORTABLE, MULTI-PURPOSE, RECHARGEABLE CIGARETTE LIGHTER

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

Division of Ser. No. 413,764, Nov. 8, 1973, Pat. No. 3,934,302. This application July 17, 1975, Ser. No. 596,808
Claims priority, application Japan, Nov. 14, 1972, 47-114183; Dec. 12, 1972, 47-124497
Int. Cl.[2] F21V *33/00*
U.S. Cl. 240—6.4 CL **1 Claim**



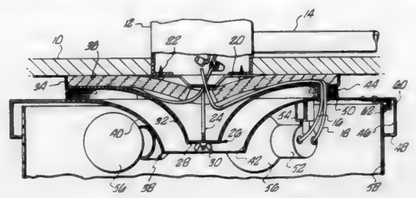
1. A portable cigarette lighter comprising laterally spaced apart first and second, side-by-side housing means defining a volume, each of said housing means being adapted to contain a rechargable battery cell, spacer means interconnecting said first and second housing means, a heating element in one of said housing means, an illuminating lamp in the other of said housing means, separate switch means for said heating element and said illuminating lamp, said switch means being located in said spacer means, and socket means in said spacer means, said socket means being electrically coupled to terminal means in said spacer means and adapted to be connected to a source of current for recharging the battery cells.

4,044,246

CEILING MOUNTED LIGHT FIXTURE

Peter J. Docimo, Northridge, and Paul L. Richey, Long Beach, both of Calif., assignors to Marvin Electric Manufacturing Company, Los Angeles, Calif.

Filed Aug. 12, 1976, Ser. No. 713,665
Int. Cl.[2] F21S *1/06, 3/06, 13/06*
U.S. Cl. 240—78 CF **9 Claims**



1. A light fixture to be mounted to a ceiling, comprising

a ceiling cover plate having an underside extending upwardly and outwardly from a central position to meet the ceiling when positioned thereon;

a second plate extending outwardly from a central position beneath said ceiling cover plate, said second plate having an opening therethrough;

fastening means extending between said ceiling cover plate and said second plate to hold said second plate spaced from said ceiling cover plate to define and upwardly and radially outwardly extending passageway;

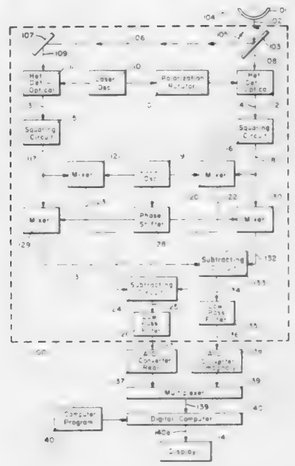
light socket means positoned below said second plate outwardly of said opening.

4,044,247

POLARIZATION REFERENCE IMAGING TECHNIQUE

Wilbur P. Brown, Jr., Woodland Hills, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 16, 1975, Ser. No. 641,329
Int. Cl.[2] H04B *9/00*
U.S. Cl. 250—199 **26 Claims**



1. A polarization reference imaging system having a transmitter and receiver, said receiver having a pair of channels, comprising the combination:

a pair of squaring circuits, one of said squaring circuits as in integral part of each said channel;

a pair of mixing circuits electrically connected to each of the squaring circuits; and

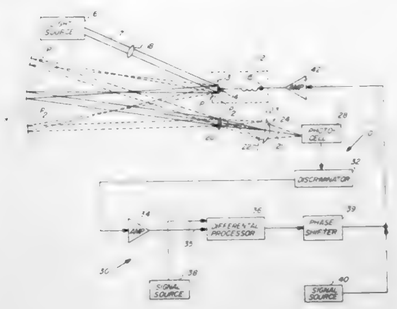
a pair of subtracting circuits electrically connected to the mixing circuits.

4,044,248

METHOD AND APPARATUS FOR LINEARIZING A MIRROR GALVANOMETER

David M. Glassman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 249,922, May 3, 1972, abandoned. This application Nov. 7, 1973, Ser. No. 413,465
Int. Cl.[2] G01J *1/20*; G01R *13/38, 13/40*
U.S. Cl. 250—201 **3 Claims**



1. In combination with scanning apparatus of the type having a radiation deflecting member mounted for movement to scan a beam of radiation along a path, means for providing an electrical primary drive signal, and means associated with said deflecting member and responsive to said primary drive signal for moving said deflecting member in a manner effecting scan of such radiation along said path at a generally-predetermined, actual rate, a device for effecting a more precise rate of radiation scan comprising:

means, positioned along said path, for modulating such radiation to provide a radiation signal of frequency proportional to the actual rate of radiation scan along said path;

means for converting said radiation signal to a first electrical signal having a parameter that is proportional to the frequency of said radiation signal;

means for providing an electrical reference signal having a parameter which is comparable with said parameter of said first signal and which is representative of the precise rate of scan desired;

means for comparing said reference signal and said first signal and providing a correction signal proportional to the deviation of the actual scanning movement of said deflecting member from the desired scanning movement of said deflecting member; and

means for combining said correction signal with said main primary drive signal to adjust the actual scanning movement of said deflecting member.

4,044,249

VOLTAGE SUPPLY INCLUDING BILATERAL ATTENUATOR

Charles E. Moore, Jr.; Sammy L. Crane, and Donald L. Lipke, all of Garland, Tex., assignors to A Division of Varo, Inc. Biometrics Instrument Corporation, Garland, Tex.

Filed Dec. 15, 1975, Ser. No. 640,687
Int. Cl.[2] H01J *39/12*
U.S. Cl. 250—213 VT **13 Claims**

6. An automatic brightness control system for an image intensifier tube having a screen and a microchannel plate comprising:

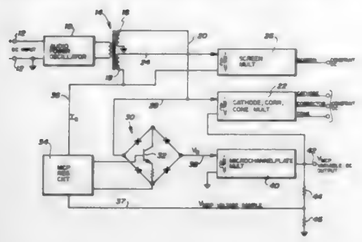
a power oscillator for generating an A.C. voltage,

a first multiplier responsive to said A.C. voltage for generating at least one constant D.C. voltage for application to the screen of the image intensifier tube,

a regulator circuit including a low power oscillator for

generating a control A.C. signal and further including circuitry responsive to the screen current of the image intensifier tube for varying the amplitude of said control A.C. signal,

a bilateral attenuator for receiving said A.C. voltage and operable in response to said control A.C. signal for generating an amplitude varied A.C. voltage, and



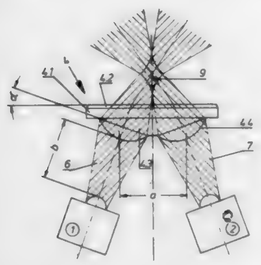
a second multiplier connected to the output of said bilateral attenuator for receiving said amplitude varied A.C. voltage and in response thereto for generating a variable D.C. voltage for application to the microchannel plate of the image intensifier tube.

4,044,250

DEVICES FOR DETECTING THE PRESENCE OF AN OBJECT IN A MONITORED REGION

Gunter Fetzer, Gundelfingen, Germany

Filed Oct. 20, 1975, Ser. No. 624,181
Claims priority, application Germany, Nov. 28, 1974, 2456248
Int. Cl.[2] H01J *3/14, 5/16, 39/12*
U.S. Cl. 250—216 **17 Claims**



1. A device for detecting the presence of an object in a region to be monitored, comprising:

light emitting means,

electronic light receiving means, and

an optical system comprising means for focussing the light emitted by the light emitting means into a bundle of light rays and means for focussing any bundle of light rays reflected by an object in the monitored region and passing same to the light receiving means,

said respective focussing means being so arranged relative to one another that the bundle of the light rays from the light emitting means and the bundle of any light rays passed to the light receiving means meet at an angle to one another to define said object region exclusively at the intersection of the most constricted cross-section areas of both said light ray bundles,

said respective focussing means being fixedly incorporated in a common block which is a nonreadily disassemble and disadjustable unitary structure consisting essentially of transparent optically refractive material which is permmeable to light,

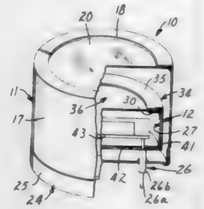
wherein said block has a plane surface as one side thereof and its opposite side includes as at least part of said focussing means two respective lens portions whose optical axes are both at an oblique angle relative to said plane surface and convergingly extend through said block for intersection at a predetermined distance outward from said plane surface at least near the center of said object region.

4,044,251

ELECTROMAGNETIC RADIATION DETECTOR WITH LARGE AREA SENSING MEDIUM

Allen L. Taylor, Woodbury, Minn., and Thomas C. Ensign, Hudson Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 18, 1976, Ser. No. 687,543
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—342 **7 Claims**



1. A phroelectric infra-red radiation sensing device exhibiting an improved signal to noise ratio comprising:

outer housing means sealed to preclude entry of noise creating currents,

infra-red radiation transmissive window means in said outer housing means,

a pyroelectric sensing medium disposed within said outer housing means in facing relationship to said window means to directly receive infra-red radiation transmitted through said window means, said pyroelectric sensing medium having a surface area exposed to said window means of at least one square centimeter and comprising a pyroelectric film and conductive electrode means on opposing surfaces of said pyroelectric film,

said window means being sufficiently rigidly constructed to inhibit airborne acoustic oscillations from acting on said sensing medium,

inner housing means for holding said sensing medium in a stretched configuration within said outer housing means,

support means for supporting said inner housing means in a relationship to said outer housing means to inhibit transmission of mechanical vibration from said outer housing means to said sensing medium, and backing means of a low thermally conductive member in contact with the conductive electrode of said sensing medium on the side away from said window.

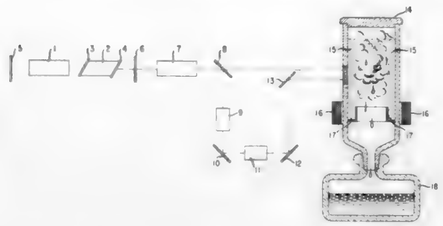
4,044,252

SEPARATION OF CHEMICAL SPECIES

Peter Michael Rentzepis, Millington, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 2, 1975, Ser. No. 538,081
Int. Cl.[2] H01J *39/34*
U.S. Cl. 250—282 **10 Claims**

1. Process for species separation in accordance with which a vapor containing at least two different species is irradiated so as to electronically excite but one selected species and is separated by use of an agent which has a preferential coulombic attraction for the excited species, characterized in that the said vapor is irradiated by radiation which includes a sharply defined spectral portion for exciting the selected species to an elevated vibrational state and a portion for electronically raising the energy level of the selected species in the elevated vibrational state to an electronically elevated level in which electronic charges are separated, and in that the ambient atmosphere is substantially saturated with respect to said agent, which is a condensable vapor which is substantially a non-solvent for any included isotopic species which is not in an electrically elevated level in which electronic charges are separated, whereby the selected species serves as nucleation sites for the said condensable vapor so that the selected species selectively precipitates at such sites.



4,044,253

NON-DESTRUCTIVE INSPECTION OF COMPOSITE AND ADHESIVELY BONDED STRUCTURES

Robert L. Crane, Kettering, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed June 4, 1976, Ser. No. 692,840
Int. Cl.[2] G01N *21/16*
U.S. Cl. 250—302 **7 Claims**

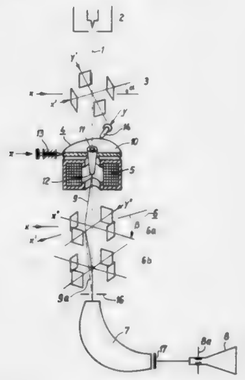
1. A method for detecting through-the-thickness flaws in composites comprising a plastic sheet or coating bonded to a metal substrate which comprises the steps of applying to the sheet or coating a solution of 8-hydroxyquinoline in a solvent therefor; and exposing the sheet or coating to ultraviolet radiation.

4,044,254

SCANNING CORPUSCULAR-BEAM TRANSMISSION TYPE MICROSCOPE INCLUDING A BEAM ENERGY ANALYZER

Burkhard Krisch, and Moriz V. Rauch, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,847
Claims priority, application Germany, Aug. 28, 1975, 2538523
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 **2 Claims**



1. In a scanning corpuscular-beam transmission-type microscope including a magnetic objective lens for focusing the beam on a specimen, the total field of the objective lens helically deflecting parts of the beam not disposed in the microscope axis through an image rotation angle and rotating the image of the specimen in the microscope; first beam deflection means disposed between the source of the beam and the specimen for guiding the focused beam over the specimen in a first pair of orthogonal directions in raster-fashion; and energy analyzing means disposed behind the specimen along the beam path for analyzing the energy of the beam including an entrance aperture with a fixed input area disposed about the microscope axis; the improvement comprising:

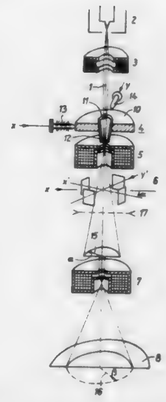
second beam deflection means disposed between said specimen and said energy analyzing means, for guiding said beam in a second pair of orthogonal directions disposed in a plane parallel to said first pair of orthogonal directions and rotated with respect to said first pair of orthogonal directions through an angle which coincides with said image rotation angle, said second beam deflection means redirecting said beam, synchronously with said first beam deflection means, toward said fixed input area of said entrance aperture of said energy analyzing means near the microscope axis.

4,044,255

CORPUSCULAR-BEAM TRANSMISSION-TYPE MICROSCOPE INCLUDING AN IMPROVED BEAM DEFLECTION SYSTEM

Burkhard Krisch, and Moriz V. Rauch, both of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,848
Claims priority, application Germany, Aug. 28, 1975, 2538521
Int. Cl.[2] G01M *23/00*
U.S. Cl. 250—311 **1 Claim**



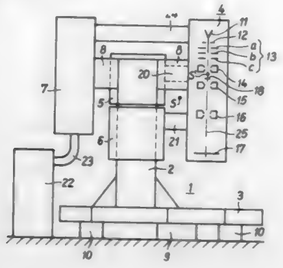
1. In a corpuscular-beam transmission-type microscope in which image elements are generated simultaneously including means for holding a specimen movable perpendicular to the microscope axis in a pair of transverse adjustment directions, beam deflection means disposed behind the specimen along the beam path for deflecting an image of the specimen in the microscope in at least one deflection direction, and magnetic lens imaging means disposed between the specimen and the beam deflection means which helically deflects, between the specimen and the beam deflection means, parts of the beam not disposed in the microscope axis and rotates the image of the specimen through an image rotation angle in the microscope, the improvement comprising said beam deflection means deflecting said beam in a pair of transverse deflection directions disposed in a plane parallel to said pair of transverse adjustment directions and rotated with respect to said pair of transverse adjustment directions through an angle coinciding with said image rotation angle.

4,044,256

SUPPORT STAND FOR A CORPUSCULAR-BEAM MICROSCOPE

Burkhard Krisch; Karl-Heinz Muller; Moriz von Rauch, all of Berlin, Germany, and Lee H. Veneklasen, San Leandro, Calif., assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 31, 1976, Ser. No. 719,140
Claims priority, application Germany, Sept. 9, 1975, 2540595
Int. Cl.² G01M *23/00*
U.S. Cl. 250—311 **3 Claims**



1. In a corpuscular-beam microscope including a support stand, a columnar housing containing optical elements of the microscope, an electronic control and regulating means for generating and transmitting voltage signals to parts of a beam generator of the microscope which are at high-voltage potential, and at least one high-vacuum pump for evacuating the microscope housing, the improvement comprising said support stand comprising a horizontal base member and a flexure-resistant vertical support member disposed on said base member, said microscope housing, said control and regulating means. and said pump being mounted on different sides of said support member and beng arranged so that the center of gravity of said support stand is disposed between said support member and the optical axis of the microscope near said axis.

4,044,257

RETENTION TIME CHROMATOGRAPH EMPLOYING AN IR ABSORPTION SPECTROGRAPHIC DETECTOR

Lloyd B. Kreuzer, San Francisco, Calif., assignor to Diax Corporation, Palo Alto, Calif.

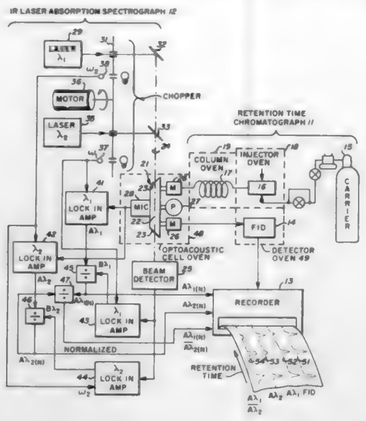
Filed Feb. 20, 1975, Ser. No. 551,379
Int. Cl.² G01J *1/00*
U.S. Cl. 250—344 **14 Claims**

4. The method for resolving constituents of a fluid sample including the steps of:

deriving a pair of sample absorption signals which are a function of the absorption of infrared energy by constituents of the sample material from a laser beam of infrared radiation at first and second wavelengths λ_1 and λ_2, respectively;

controlling the pressure of the fluid sample to a predetermined value in the region where the absorption signals are derived; and

deriving an output proportional to the ratio of the two sample absorption signals at λ_1 and λ_2 said output being characteristic of the constituents in the fluid sample under analysis.

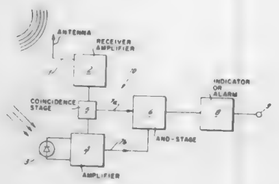


4,044,258

NUCLEAR EXPLOSION DETECTOR WITH FALSE ALARM PREVENTION

Frank Frungel, Herwigredder 105a, 2 Hamburg 56, Germany

Continuation-in-part of Ser. No. 212,429, Dec. 27, 1971, abandoned. This application Nov. 14, 1973, Ser. No. 415,617
Claims priority, application Germany, Dec. 30, 1970, 2064406
Int. Cl.² G01J *1/00*; G01T *1/00*
U.S. Cl. 250—336 **9 Claims**



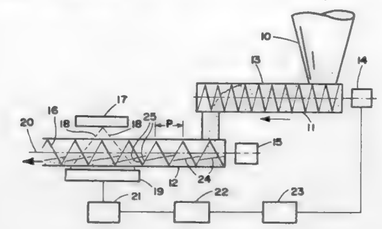
2. An apparatus for detecting nuclear explosions with a false alarm prevention feature, the apparatus, comprising, in combination, first receiving means for detecting electromagnetic radiation having frequencies outside the visible range and of the type generated from a nuclear explosion; second receiving means for detecting visible light of the type generated from a nuclear explosion; control circuit means connected to said first and second receiving means for generating a control signal if the visible light detected by said second receiving means follows the electromagnetic radiation detected by said first receiving means by a time interval less than a predetermined time interval having a predetermined duration; inhibit means connected to said control circuit means and to said first and second receiving means and operative for inhibiting the generation of said control signal if the visible light detected by said second receiving means follows the electromagnetic radiation detected by said first receiving means by a time interval less than approximately 3 microseconds, 3 microseconds constituting a predetermined minimum time delay; and output means operative for generating an alarm signal in response to generation of said control signal.

4,044,259

METHOD AND APPARATUS FOR MONITORING THE FLOW OF SOLIDS

Wayne W. Wyton, Trail, and Gerard Doeksen, Montrose, both of Canada, assignors to Cominco Ltd., Trail, Canada

Filed Feb. 2, 1976, Ser. No. 654,126
Int. Cl.² G01N *23/00*
U.S. Cl. 250—360 **5 Claims**



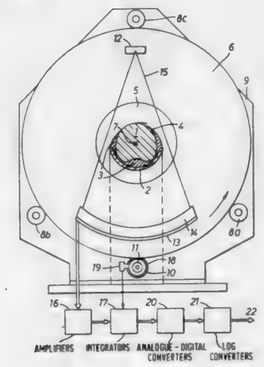
1. Apparatus for monitoring the flow of particulate solids through a screw conveyor comprising a radiation source and a radiation detector disposed about said conveyor, an amplifier and a recorder, said source and detector being placed in fixed relationship one above and one below the screw conveyor so that radiation from the source passes in a path into a bed of particulate solids moving through the conveyor and a substantial portion of said radiation, that is not absorbed or scattered by the solids or the screw conveyor, is received by the detector, said path being on the lift side of the conveyor screw, said path not being intercepted by the shaft of said screw, said detector extending parallel to the shaft of the screw for a distance at least about equal to the pitch of the screw, and said recorder receiving amplified electrical signals from said detector.

4,044,260

RADIOGRAPHY

Godfrey Newbold Hounsfield, Winthorpe, England, assignor to EMI Limited, Hayes, England

Filed Mar. 18, 1976, Ser. No. 668,045
Claims priority, application United Kingdom, Mar. 18, 1975, 11131/75
Int. Cl.² A61B *6/02*
U.S. Cl. 250—360 **5 Claims**



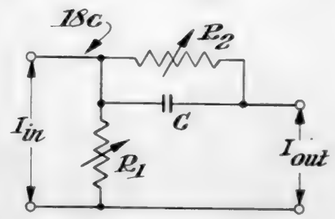
1. Radiographic apparatus including a source of a substantially planar fan shaped spread of radiation adapted to irradiate a planar section of the body of a patient, detectors sensitive to the radiation and disposed to receive radiation emergent from the body to provide output signals indicative of the intensity of the radiation received along respective paths within said spread, means for moving said source and detectors relative to said body to provide further output signals for paths at different dispositions in said section and processing circuit means for modifying said output signals to compensate, at least in part, for variations in the amplitude thereof resulting from variations in the energy spectrum of said radiation with angular position in the fan-shaped spread.

4,044,261

METHOD AND SYSTEM FOR IMPROVING THE DEFINITION OF A SCINTILLATION DETECTOR

James B. Wilson, Arlington, Va., assignor to Georgetown University, Washington, D.C.

Filed Mar. 17, 1976, Ser. No. 667,631
Int. Cl.² G01T *1/20*
U.S. Cl. 250—369 **8 Claims**



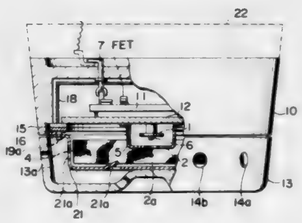
1. A system for improving the definition of a scintillation detector comprising a network connected to the detector, the network being constructed and arranged to minimize the effect of a phosphorescent afterglow in the detector, the network has an input and comprises a pair of variable resistors and a capacitor, one of the variable resistors being connected directly across and in parallel with the input, the other variable resistor being connected in parallel with the capacitor, the parallel-connected variable resistor and capacitor being connected in series with the input, and the capacitor having a relatively large capacitance and a low dissipation factor.

4,044,262

IONIZATION SMOKE SENSOR

Osami Minowa, Tokyo, Japan, assignor to Hochiki Corporation, Tokyo, Japan

Filed Feb. 5, 1976, Ser. No. 655,615
Claims priority, application Japan, Feb. 10, 1975, 50-17773
Int. Cl.² G01N *23/12*
U.S. Cl. 250—381 **3 Claims**



1. An ionization smoke sensor comprising an insulating plate, an electric sensor circuit including a field effect transistor disposed on one side of said insulating plate, a first metallic case surrounding said electric circuit and spaced therefrom, an inner electrode disposed on the opposite side of said insulating plate from said electric sensor circuit, a radiation source connected to said inner electrode, the intermediate electrode surrounding said inner electrode, a second metallic case surrounding said intermediate electrode and defining an ionization chamber therewith, said second metallic case serving as the outer electrode, means electrically connecting said first metal-

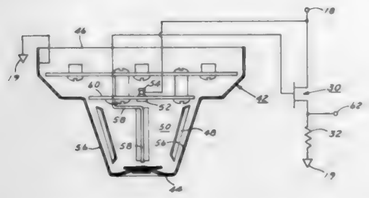
lic case and said second metallic case, and said electrodes being coupled to said sensor circuit for supplying to the field effect transistor a voltage generated across the intermediate electrode and the outer electrode when smoke enters the ionization chamber and causing the field effect transistor to produce an output signal in response to the voltage.

4,044,263

IONIZATION DUAL-ZONE STATIC DETECTOR HAVING SINGLE RADIOACTIVE SOURCE

Louis Ried, Jr., Boulder, and Arthur L. Wade, Brighton, both of Colo., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed Jan. 28, 1975, Ser. No. 544,818
Int. Cl.[2] G01T *1/18*
U.S. Cl. 250—381 **40 Claims**



1. A combustion product detector of the ionization chamber type comprising:

an ionization chamber having therein a relatively small reference zone and a relatively large signal zone, and further including means for allowing introduction of ambient air and products of combustion;

a source of radiation located within said ionization chamber for generating ion pairs of low density in the reference zone and of high density in the signal zone;

means comprising pairs of electrodes spaced apart across the reference and signal zones for applying voltage across and conducting current through the reference and signal zones in series, said voltage applying means being associated with the signal zone and arranged for sensing predetermined changes in voltage across the signal zone produced by products of combustion in the ionization chamber; and,

means for monitoring the voltage across the signal zone.

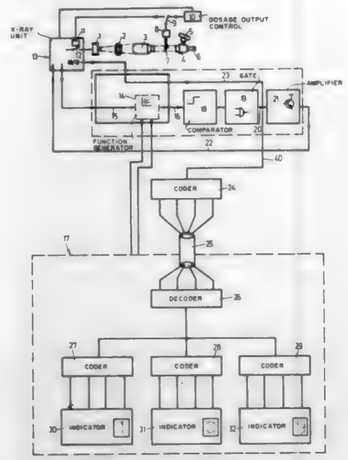
4,044,264

X-RAY DIAGNOSTIC INSTALLATION FOR RADIOSCOPY AND EXPOSURES

Herbert Lutz, Seukendorf; Rolf Pfeifer, Erlangen, and Hans Sausen, Bad Neuenahr-Ahrweiler, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 22, 1975, Ser. No. 543,054
Claims priority, application Germany, Jan. 22, 1974, 2404937
Int. Cl.[2] H05G *1/30*
U.S. Cl. 250—409 **2 Claims**

1. In an X-ray diagnostic installation for fluoroscopy and exposures including an X-ray tube and an X-ray image amplifier; an arrangement for regulating the dosage output of said tube during fluoroscopy; means for determining the tube's exposure voltage from the tube's fluoroscopic voltage; an automatic exposure timer; and a function generator receiving an input signal corresponding to the prevailing fluoroscopic voltage, said function generator generating an analog output signal from said input signal for controlling determining means for the exposure voltage, said function generator having a plurality of the exposure voltages programmed therein dependent upon the fluoroscopic voltage, the improvement comprising: means for digitizing said analog output signal and an arrangement including a digital indicator for remotely indicating the prevailing exposure voltage as a numerical value, said arrangement being controlled by the analog output of said function generator, said digitizing means including a plurality of output connectors corresponding to a predetermined number of exposure voltage increments, a binary signal being applied to respectively one said output connector characterizing



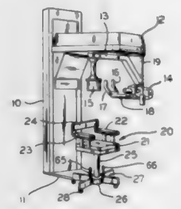
a prevailing exposure voltage increment; a coding arrangement being connected to each said indicating arrangement for each digit, said coding arrangement being controlled by the signals in said output connectors.

4,044,265

MOBILE CHAIR FOR PANORAMIC DENTAL X-RAY MACHINE

Walter A. Schmidt, Milwaukee, Wis., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,162
Int. Cl.[2] G01N *21/00*; H01J *37/20*
U.S. Cl. 250—439 P **2 Claims**



1. For use with a panoramic oral radiography apparatus including arm means rotatable about a vertical axis and film holder means supported on said arm means on one side of said axis and an X-ray source supported on said arm means on the other side of said axis for said film holder means and said source to orbit about a space for accommodating the head of a radiographic examination subject in a radiographic active position;

a chair that is adapted for being locked normally in a first position such that an examination subject seated on said chair will be located substantially in said radiographic active position and which chair is removable so that a wheel chair may be situated in its place, said chair comprising:

seat means and support means including leg means supporting said seat means and roller means supporting said leg means for enabling said chair to be moved on the floor adjacent said apparatus,

one of said chair and said apparatus having first means for being engaged and disengaged, and

one of said chair and said apparatus having second means for alternately engaging and disengaging said first means, such that when said means are engaged said chair will be located in correspondence with said radiographic active position and when said means are disengaged said chair may be moved as a unit on said roller means to and from other positions,

said means for supporting said seat means comprising vertically disposed post means having an upper end on which said seat is supported and having a lower end,

means for clamping said lower end of said post means to said support means such that a portion of said post means is exposed,

means that are fixed proximate to the floor beneath said arm means, said means having a recess that is substantially complementary in shape to said exposed portion of said post means for receiving said post means,

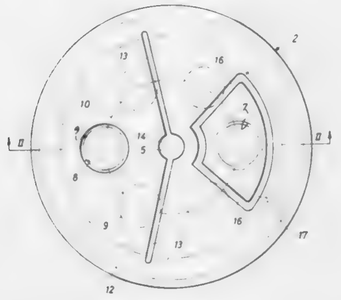
selectively operable means for locking said means for clamping and said fixed means together when said exposed portion of said post means is in said recess of said fixed means.

4,044,266

APPARATUS FOR ION-IMPLANTATION IN ELEMENTS, ESPECIALLY DISCS OF SEMI-CONDUCTING MATERIAL

Einar Jespersen, Roskilde, and Ottar Asbjørn Skilbreid, Lyngby, both of Denmark, assignors to Danfysik A/S, Denmark

Filed July 1, 1976, Ser. No. 701,498
Claims priority, application Denmark, July 9, 1975, 3103/75
Int. Cl.[2] G01N *21/00, 23/00*; G21G *5/00*
U.S. Cl. 250—441 **5 Claims**



1. Apparatus for ion-implantation in elements such as discs of semi-conducting material, comprising:

a. a high vacuum container;

b. an ion source and ion acceleration means disposed in said container;

c. a first disc forming a wall of said container and a second disc secured in spaced relation thereto, said discs having stationary plane parallel walls facing each other, said first disc having a first aperture leading to the interior of said container and said second disc having a second aperture leading to the atmosphere;

d. a slide valve having parallel surfaces slidably abutting said parallel walls, said slide valve having at least one through-going aperture for receiving an element through said second aperture, and for moving it into registration with said first aperture and back; and

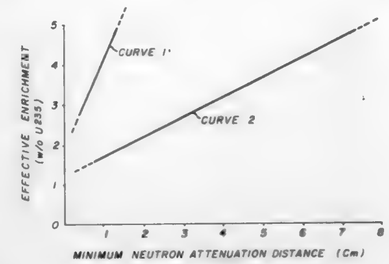
e. evacuated cavities in said discs and disposed to intercept the air introduced through said second aperture and leaking along said parallel valve surfaces, whereby air is prevented from reaching said first aperture.

4,044,267

FISSIONABLE MASS STORAGE DEVICE

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation-in-part of Ser. No. 558,767, March 17, 1975. This application Mar. 26, 1976, Ser. No. 671,182
Int. Cl.[2] G21F *5/00*; G21C *11/00*
U.S. Cl. 250—518 **7 Claims**



1. An apparatus for the safe yet compact storage of a plurality of fissionable masses having a predetermined effective fissile enrichment and having cross-sections of a given size and shape, comprising:

a. a plurality of adjacent discrete neutron absorbing open ended shields disposed in side-by-side relationship, one of each of which is adapted to parametrically encircle one of each of said plurality of fissionable masses, said neutron absorbing shields having neutron absorbing characteristics similar to the neutron absorbing characteristics of a 0.635 centimeter thick stainless steel plate containing one weight percent of natural boron and having cross-sections closely matching in size and shape the cross-sections of the fissionable masses to be stored;

b. spacing means in each of two directions for spacing each of said side-by-side neutron absorbing shields from the next adjacent neutron absorbing shield by a predetermined minimum neutron attenuation distance no less than the minimum neutron attenuation distance determined from curve 1 of FIG. 4 for said predetermined effective fissile enrichment; and

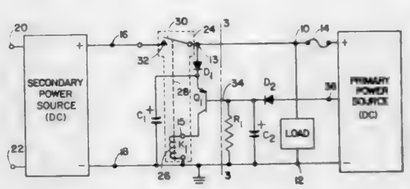
c. hydrogenous moderating means between said adjacent discrete neutron absorbing shields for moderating neutrons which are emitted from said fissionable masses whereby a neutron flux trap is created.

4,044,268

MULTIPLE POWER SOURCE AUTOMATIC SWITCHING CIRCUITRY

Ronald O. Hammel, Englewood, and Charles E. Coleman, Lakewood, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Filed Jan. 5, 1976, Ser. No. 646,731
Int. Cl.[2] H02J *9/06*
U.S. Cl. 307—66 **10 Claims**



1. Automatic switching and disconnect circuitry for connecting a load normally across a primary power source, for connecting the load across a secondary power source when the primary power has failed, for disconnecting the secondary

power source when its voltage has been reduced below a predetermined cut-off point corresponding to no greater than about its 90 percent discharge level, and to reenable the primary power source when it has regained power comprising:

voltage responsive electromechanical switch means interposed between the primary and secondary power sources and operable between open and closed positions;

first circuit means connected between the switch means and a tapping point at the primary power source for controlling the opening and closing of the switch means responsive to the voltage level of the primary power source;

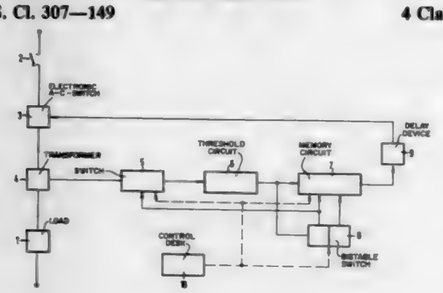
second circuit means connected between the secondary power source and the switch means for controlling the opening of the switch means, when the primary power source has failed, responsive to the voltage level of the secondary power source so that the secondary power source is automatically disconnected from the laod and any other discharge path in the circuitry with total latch out upon reduction of the voltage exhibited by the secondary power source to the cut-off point.

4,044,269

CIRCUIT ARRANGEMENT FOR A REPETITION-BLOCKING DEVICE

Eduard Hermann, Weilimdorfer Strasse 7, Korntal-Munchingen, Germany

Filed Feb. 17, 1976, Ser. No. 658,453
Claims priority, application Germany, Feb. 24, 1975, 2507807
Int. Cl.² H02J *4/00*
U.S. Cl. 307—149 **4 Claims**



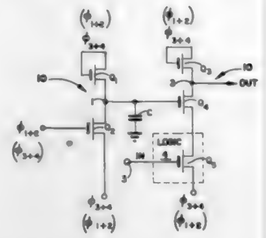
1. In a repetition-blocking device for preventing prohibited or undesired operations involving a load supplied with polyphase power, particularly for preventing the prohibited repetition of the taking of fuel from self-service fuel pumps, an improved circuit arrangement comprising, circuit means including a transformer having a primary side included in at least one phase conductor of the polyphase supply, and having a secondary side providing a control signal; a control circuit connected to said secondary side and including a threshold circuit receiving the control signal, a memory circuit connected to said threshold circuit to receive a threshold signal therefrom, a bistable switch connected to said threshold circuit and said memory circuit and switched by the threshold signal to a position preventing the stored signal from being passed on from said memory circuit, and a controlled electronic switch inserted in said at least one phase conductor and controlled and opened by the stored signal responsive to interruption of the control signal supplied from said transformer secondary side; and a resetting switch connected to said control circuit and selectively operable to reset said control circuit to the initial state.

4,044,270

DYNAMIC LOGIC GATE

Mark B. Lesser, Laguna Niguel, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 21, 1976, Ser. No. 698,237
Int. Cl.² H03K *19/08, 19/20, 19/40*
U.S. Cl. 307—205 **12 Claims**



1. A logic gate driven by a clock signal source means, said source means providing first and second recurring clock signals having opposite reference levels relative to one another during first and second time intervals and the same reference level during an in-between time interval occurring between said first and second time intervals, said logic gate including:

an input terminal;

an output terminal;

a plurality of mulit-terminal semiconductor devices;

a first of said plurality of semiconductor devices connected between said signal source means to receive said first clock signal and said output terminal to charge said output terminal during the first of said time intervals;

a second of said semiconductor devices selectively connected between said output terminal and said signal source means to receive said first clock signal and responsive to an information signal applied to said input terminal to conditionally discharge said output terminal during the in-between time interval;

a third of said semiconductor devices selectively connected between said output terminal and said second semiconductor device and responsive to said second clock signal so as to electrically isolate said output terminal from said input terminal during the second of said time intervals and

a fourth of said plurality of multi-terminal semiconductor devices connected between said signal source means to receive said first clock signal and a control electrode of said third semiconductor device so as to enable said third semiconductor device during the first of said time intervals.

4,044,271

MONOLITHIC NTDS DRIVER AND RECEIVER

Jerome J. Symanski, San Diego, and Russell L. Keefer, Spring Valley, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

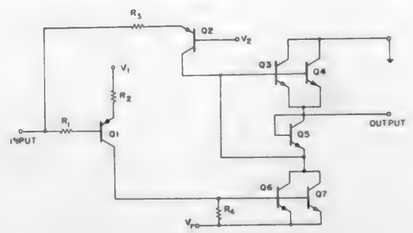
Filed Sept. 9, 1974, Ser. No. 504,393
Int. Cl.² H03K *1/14, 5/00*
U.S. Cl. 307—262 **15 Claims**

1. A level shifting network comprising:

a negative voltage logic level system having an input and an output;

a driver network including an input and an output for converting positive voltage logic levels to the negative voltage logic levels of said negative voltage logic level system comprising first and second transistor means connected to said driver input, third and fourth transistor means connected to said first and second transistor means respectively for outputting at said driver output negative voltage logic levels to said negative voltage logic level system, whereby in response to a low positive voltage logic level signal at said driver input, said driver output is at a low negative voltage logic level and in response to a high positive voltage logic level signal at said driver input, said driver output is at a high negative voltage logic level;

a receiver network including an output for converting the negative voltage logic levels of said negative voltage logic level system to positive voltage logic levels comprising a differential amplifier having a first input connected to the output of said negative voltage logic level system, a second input, and an output, said receiver network further including a fifth transistor means connected to the output of said differential amplifier, sixth and seventh transistor means connected to said fifth transistor means for outputting positive voltage logic levels at said receiver output, whereby in response to a low negative voltage logic level and in response to a high negative voltage logic level signal at said first input, said receiver output is at a high positive voltage logic level.

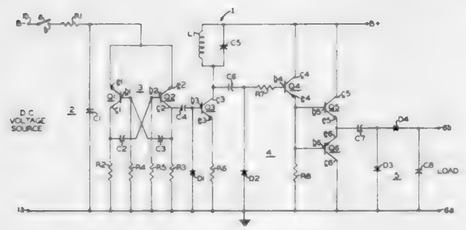


4,044,272

FAIL-SAFE ELECTRONIC TIME DELAY CIRCUIT

John O. G. Darrow, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Aug. 12, 1976, Ser. No. 713,995
Int. Cl.² H03K *5/13;* H01H *47/18*
U.S. Cl. 307—293 **10 Claims**



1. A fail-safe time delay circuit comprising,

a. a source of d.c. voltage,

b. a resistance-capacitance network coupled to said d.c. voltage cource for charging said capacitance to said d.c. voltage,

c. an inverter coupled to said resistance-capacitance network for converting said d.c. voltage charge to a.c. signals,

d. a tuned amplifier coupled to said inverter for amplifying said a.c. signals,

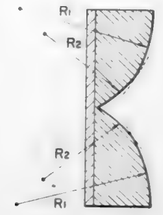
e. a rectifier coupled to said tuned amplifier, and f. a load coupled to said rectifier for normally being energized and for being deenergized a definite time interval after the source of d.c. voltage is disconnected from the circuit.

4,044,273

ULTRASONIC TRANSDUCER

Hiroshi Kanda, Tokorozawa; Kageyoshi Katakura, Naka, and Takaji Suzuki, Kashiwa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Medical Corporation, both of Japan

Filed Nov. 25, 1975, Ser. No. 635,086
Claims priority, application Japan, Nov. 25, 1974, 49-134311
Int. Cl.² H01L *41/04*
U.S. Cl. 310—313 **16 Claims**



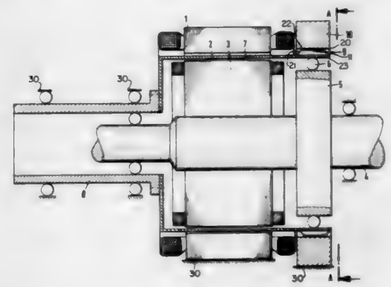
1. An ultrasonic transducer device comprising ultrasonic transducer means for generating ultrasonic waves and providing a locus of points of convergence of the generated ultrasonic waves in the form of a ring, said ultrasonic transducer means including an ulrasonic transducer formed of a piezoelectric material, said ultrasonic transducer being a surface type transducer and being provided with a shape such that a locus of points of convergence of said generated ultrasonic waves forms a ring.

4,044,274

TRANSMISSION SYSTEM

Werner Ohm, Hamburg, Germany, assignor to Stephan-Werke GmbH & Co., Hameln, Weser, Germany

Filed July 14, 1975, Ser. No. 595,978
Claims priority, application Germany, July 19, 1974, 2434834
Int. Cl.² F16H *33/00, 37/02;* H02K *3/42, 7/10*
U.S. Cl. 310—83 **6 Claims**



1. In a transmission system, a combination comprising an input shaft mounted for rotation about an axis; drive means for rotating said input shaft at a predetermined speed, including an electrical machine having opposite axial ends, a rotor mounted on said shaft for rotation therewith, and a stator surrounding said rotor and defining a cylindrical air gap therewith; a hollow output member mounted for rotation about said axis and means journalling a portion of said input shaft coaxially within said output member for rotation relative thereto; and step-down gearing means for rotating said output member at a speed less than said predetermined speed, including a rotary flexible non-magnetic cylindrical sleeve radially spaced from said stator and having an end region connected with said output member axially adjacent one of said axial ends of said electrical machine, another end region at the other of said axial ends of said electrical machine and having a first annular set of

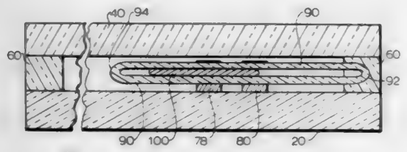
teeth on an outer circumferential region of said sleeve, and an intermediate region surrounding said rotor and extending through said gap, means for flexing said sleeve, including an eccentric element mounted on said shaft axially adjacent said other axial end of said electrical machine in juxtaposed relationship with said first set of teeth for rotation within said sleeve and for imparting the eccentricity of said eccentric element to said first set of teeth on said sleeve as said shaft rotates, anti-friction bearing means interposed between said sleeve and said eccentric element, and an annular reaction member axially aligned with and connected to said stator at said other axial end of said electrical machine, said reaction member having a second annular set of teeth on an inner circumferential region of said annular reaction member and being in meshing engagement with said first set, said second set having a greater number of teeth than said first set for permitting rotation of said output member at a speed lower than said predetermined speed of said input shaft.

4,044,275

DISPLAY PANEL HAVING IMPROVED MERCURY ASSEMBLY

George John Przybylek, Warren, and Joseph Lesky, Cranford, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 8, 1976, Ser. No. 739,986
Int. Cl.² H01J *61/12, 61/36*
U.S. Cl. 313—177 **3 Claims**



1. A display panel comprising

a gas-filled envelope made up of a base plate and a face plate hermetically sealed together, said face plate having a viewing window,

at least one glow cathode and an anode in said envelope disposed in a display area in said envelope,

a generally C-shaped body of insulating material disposed within said envelope between said base plate and face plate, said C-shaped body including a base and a pair of closely-spaced legs, there being a relatively narrow gas flow path between said legs, and

a glass capillary tube containing a vaporizable substance to be admitted to said panel, said capillary tube extending across said C-shaped body, disposed within the area defined by said C-shaped body, and having one end embedded in said C-shaped body and the other end unsupported and shatterable by means external to said panel, the vapor of said substance, but not glass particles or globules of said substance, being able to diffuse into said display area through said space between said legs of said C-shaped member.

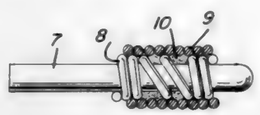
4,044,276

HIGH PRESSURE MERCURY VAPOR DISCHARGE LAMP HAVING IMPROVED ELECTRODES

William M. Keeffe, Rockport, Mass., and Frederic Koury, Alexandria, N.H., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Apr. 9, 1976, Ser. No. 675,433
Int. Cl.² H01J *17/04, 61/06*
U.S. Cl. 313—218 **3 Claims**

1. In a high pressure mercury vapor arc discharge tube having a main electrode at each end thereof and containing a fill including mercury and a starting gas, the improvement which comprises an electron-emitting material on the electrodes comprising barium oxide, calcium oxide and hafnium oxide, the hafnium oxide constituting about 1/6 to ⅔ by weight



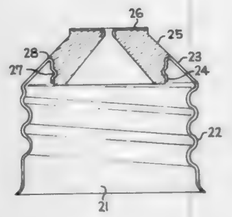
of said material, the electrode temperature during normal lamp operation being between about 1200° and 1700° C.

4,044,277

MECHANICALLY ASSEMBLED BASE FOR ELECTRIC LAMPS

William J. Komyati, Mentor, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 24, 1976, Ser. No. 689,635
Int. Cl.² H01J *5/48, 5/50*
U.S. Cl. 313—318 **10 Claims**



1. A mechanically assembled base for an electric lamp comprising:

a base shell having an inwardly tapered end portion;

a hollow insulator having a cylindrical portion having an annular groove and a conical portion having the base thereof merging with said cylindrical portion, the taper of said conical portion being approximately the same as the taper of the end portion of said shell, said conical portion terminating in a plateau;

conductive contact means positioned on said plateau and attached to said insulator; and

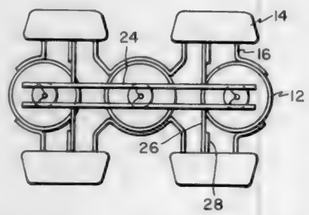
means for engaging said groove for attaching said insulator to said shell.

4,044,278

ELECTRON GUN CATHODE HEATER FILAMENT ELECTRICAL CONNECTION AND SUPPORT SYSTEM

Praveen K. Jariwala, Hammondsport, N.Y., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 7, 1976, Ser. No. 647,026
Int. Cl.² H01J *29/50, 29/04*
U.S. Cl. 313—417 **3 Claims**



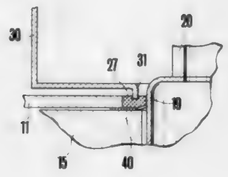
1. An improved cathode heater filament electrical connection and support system for a three in-line electron gun color television picture tube in which the cathode heaters of each of the electron guns have filament leads extending from the rear end of the electron gun assemblies and the cathode heaters are electrically connected in parallel and are supported from a plurality of insulative support rods which are disposed about and supporting the electron gun assembly parts, the improvement wherein a pair of identical, thin, electrically conductive support rails supported from the plurality of insulative support rods, which support rails are spaced apart and disposed parallel to each other and aligned with the in-line direction and respectively offset on opposite sides from an in-line plane passing through the three cathode centers, with a pair of integral tabs extending from each of the support rails, which integral tabs extend from the support rails at an angle normal to the support rail and away from the parallel other support rail, which integral tabs are connected to support tabs which are embedded in and extend from the insulative support rods, with one cathode heater filament from each cathode heater electrically connected to one of the support rails, and the other filament from each cathode heater connected to the other support rail.

4,044,279

MAGNETRONS

Mamoru Tsuzurahara, and Ichiro Ohara, both of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed July 1, 1976, Ser. No. 701,661
Claims priority, application Japan, July 23, 1975, 50-101337
Int. Cl.² H01J *25/50*
U.S. Cl. 315—39.51 **5 Claims**



1. In a magnetron of the class comprising an electric discharging tube comprising a cylindrical anode electrode provided with a plurality of vanes, a cathode electrode and an output portion, said output portion comprising a cup shaped metal cylinder having an opening at a bottom portion thereof, a cylindrical insulator disposed on said bottom portion of said metal cylinder and an antenna terminal disposed on said insulator; a permanent magnet; a yoke having an opening for passing and extending through said metal cylinder; and a gasket disposed between said yoke and said metal cylinder, the improvement which comprises an annular metallic cushion having an internal diameter slightly smaller than the outer diameter of said metal cylinder, and a plurality of radial slits or notches on the inner periphery, said annular metallic cushion being fitted over said metal cylinder.

4,044,280

MULTIPLEXED SEGMENTED CHARACTER DISPLAY

Anton P. Shulski, St. Charles, Ill., assignor to NCR Corporation, Dayton, Ohio

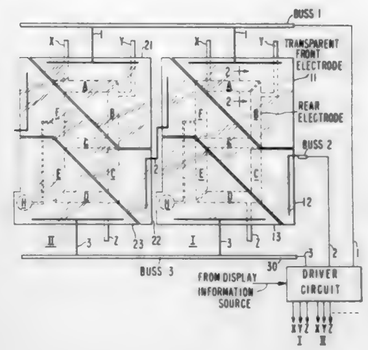
Filed Oct. 30, 1975, Ser. No. 627,170
Int. Cl.² H05B *37/00, 39/00, 41/00*
U.S. Cl. 315—169 TV **18 Claims**

1. In a segmented-matrix character display of the type comprising an enclosure containing a display medium and a plurality of opposing electrodes actively coupled electrically across at least a quantity of said display medium, the improvement wherein:

a first set of at least three electrically separated electrodes is positioned on one side of said quantity of said display medium,

a second set of at least three electrically separate electrodes is positioned on an opposite side of said quantity of said display medium,

said second set of electrodes being positioned and shaped to form a multiple-character matrix of the type in which selected combination of elements forming said matrix can be actuated to display respective differently-shaped characters, at least one of said electrodes of said second set forming a plurality of elements of said matrix, which plurality of elements are commonly connected electrically,



said first set of electrodes being positioned and shaped such that a projection thereof across said display medium on said second set of electrodes will cover said second set of electrodes,

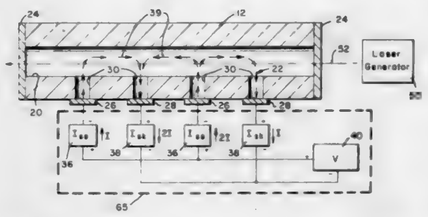
at least two adjacent electrodes of said first set being positioned so that a projection of the separation therebetween across said display medium will lie on said one electrode of said second set at a locus which divides said first electrode into a pair of adjacent elements of said matrix.

4,044,281

HIGH VOLTAGE GLOW DISCHARGE POWER SOURCE

Robert D. Washburn, Malibu, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Apr. 20, 1976, Ser. No. 678,522
Int. Cl.² H01S *3/02*
U.S. Cl. 315—171 **10 Claims**



1. In a glow discharge power source, the combination comprising:

at least one elongated electronically insulating member having a bore therethrough, said bore retaining a gaseous mixture therein;

electrodes positioned at predetermined locations of and attached to the outer surface of the member; and

active electronic current sources and sinks connected in alternation to said electrodes.

4,044,282

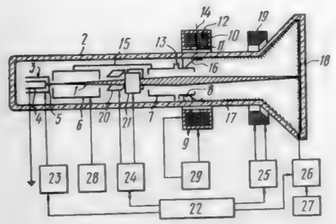
CATHODE-RAY TUBE WITH VARIABLE ENERGY OF BEAM ELECTRONS

Genrikh Dmitrievich Balandin, ulitsa Tsentralnaya, 4a, kv. 23, Fryazino Moskovskoi oblasti, and Nikolai Grigorievich Rumyantsev, ulitsa Komsomolskaya, 7/1, kv. 106, Schelkovo Moskovskoi oblasti, both of U.S.S.R.

Continuation of Ser. No. 515,633, Oct. 17, 1974, abandoned. This application Oct. 20, 1976, Ser. No. 734,272

Int. Cl.[2] H01J *29/58, 29/64*

U.S. Cl. 315—382 **1 Claim**



1. A cathode-ray tube with variable electron energy, comprising: a glass bulb having an axis and front and rear portions; a screen located in said front portion and being coated with a luminophore whose luminescence color varies with the change of the electron-beam energy impinging upon said screen; an electron source arranged in said rear portion and emitting a diverging electron beam; electron accelerating means arranged in said bulb behind said source, downstream of the diverging beam; first deviation means for the diverging beam, arranged behind said accelerating means, downstream of the diverging beam, to form symbols on said screen; means for focusing the diverging beam with the variable electron energy, located downstream of the beam, behind said first deviation means; two axisymmetrical electrodes serving as an electrostatic lens for said focusing means, mounted with a gap therebetween along the bulb axis; the first one of said electrodes being downstream of the focused beam and electrically connected with said accelerating means; the second of said electrodes being electrically connected with said screen; an axisymmetrical magnetic lens for said focusing means, located behind said electrostatic lens, downstream of the focused beam, and having a magnetic field intensity that is constant in time, and being arranged beyond said bulb; second deviation means for the focused beam, arranged downstream of that beam, behind said focusing means, to move the symbols formed by said first deviation means along said screen; a D.C. voltage source connected with said accelerating means for creating a potential on said first electrode; an A.C. voltage source connected with said screen for creating a potential on said second electrode, which latter potential is different from the potential of said first electrode, so that while altering the potential of said screen, and of said second electrode, the change of optical force formed by said electrodes is automatically made up for a reverse conjugated alteration of the optical force of said magnetic lens, so that under two values of the potential of said screen, consecutively changed in time, automatically ensures simultaneously both the invariable focusing of lines forming the symbols on said screen, and the invariable size of the symbols formed by said first deviation means; and other power sources electrically connected with said electron source, said deviation means and said magnetic lens, respectively; said electron source, said accelerating means, said focusing means and said deviation means being arranged along the bulb axis.

4,044,283

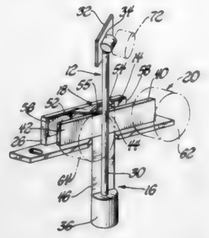
ELECTROMECHANICAL RESONATOR

William Allison, Huntington Station, N.Y. 11743, assignor to Schiller Industries, Inc., Troy, Mich.

Filed Oct. 22, 1975, Ser. No. 624,791

Int. Cl.[2] H02K *33/00*

U.S. Cl. 318—128 **22 Claims**



1. A resonator comprising a frame member, a nodal zone member, a first resonant system including a torsion element having one end fixed to the nodal zone member and an oscillating mass fixed to the other end, a second resonant system fixed to the nodal zone member and disposed on the same side of the nodal zone member as the first resonant system and in side-by-side relation with the first resonant system, a coupling spring suspending said nodal zone member from said frame member and means coupled with one of said resonant systems for driving it into oscillation whereby the other resonant system is driven in counterphase oscillation.

4,044,284

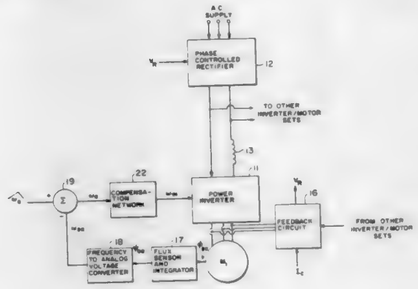
ALTERNATING CURRENT MOTOR CONTROL METHOD AND SYSTEM

Allan Barr Plunkett, and John Douglas D'Atre, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Aug. 19, 1975, Ser. No. 605,847

Int. Cl.[2] H02P *5/40*

U.S. Cl. 318—227 **30 Claims**



1. In a feedback loop stabilization control system for controlling the operation of power conversion circuit means supplying alternating current electric power to alternating current electric machines of the synchronous or asynchronous type; the improvement comprising machine frequency responsive sensing means for developing an alternating signal having a frequency indicative of the frequency of the rotating electromagnetic flux produced in such a machine, feedback signal deriving means for deriving from said alternating signal a feedback signal having a value that is a measure of the frequency of said alternating signal, and compensating circuit means responsive to the value of said feedback signal for influencing the operation of said power conversion circuit means so as to control the frequency of the alternating current supplied to the machine.

4,044,285

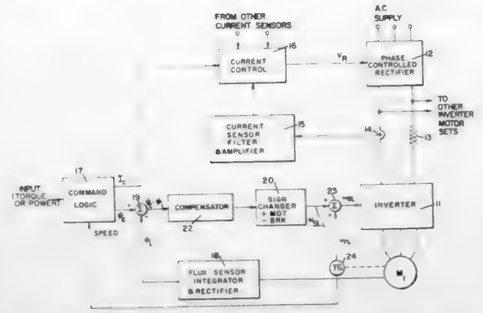
METHOD AND APPARATUS FOR CONTROLLING VARIABLE SPEED, CONTROLLED CURRENT INDUCTION MOTOR DRIVE SYSTEMS

Allan Barr Plunkett, and John Douglas D'Atre, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Aug. 19, 1975, Ser. No. 605,848

Int. Cl.[2] H02P *5/40*

U.S. Cl. 318—227 **47 Claims**



1. A new and improved induction motor control system including in combination electric power conversion apparatus having input terminals adapted to be coupled to a source of electric energy and output terminals adapted to supply alternating current excitation to an induction motor at a desired stator excitation frequency, motor flux sensing means for deriving a first feedback signal representative of the magnitude of electromagnetic flux being developed across the stator-rotor gap of the induction motor, means for providing a first control signal representative of a desired value of flux, and flux regulating means coupled to said conversion apparatus and responsive to said feedback signal and said first control signal for controlling the frequency of the stator excitation alternating current supplied to the induction motor by said apparatus as necessary to minimize the difference between the value of said feedback signal and the value of said first control signal.

4,044,286

CONTROL CIRCUIT FOR HOSPITAL BED

James S. Adams, Batesville, and Charles W. Cutler, Indianapilis, both of Ind., assignors to Hill-Rom Company, Inc., Batesville, Ind.

Filed June 23, 1976, Ser. No. 699,069

Int. Cl.[2] H02P *1/00*

U.S. Cl. 318—297 **15 Claims**

1. A control circuit for a bed with a movable portion actuated by an electric motor, the control circuit having a selecting portion and a power portion and comprising:

a source of AC power;

a first field winding for the electric motor, energization of said first field winding causing the motor to raise the movable portion of the bed;

a second field winding for the electric motor, energization of said second field winding causing the motor to lower the movable portion of the bed;

a first bidirectional power switch to cause said first field winding to be selectively energized by said source of AC power;

a second bidirectional power switch to cause said second field winding to be selectively energized by said source of AC power;

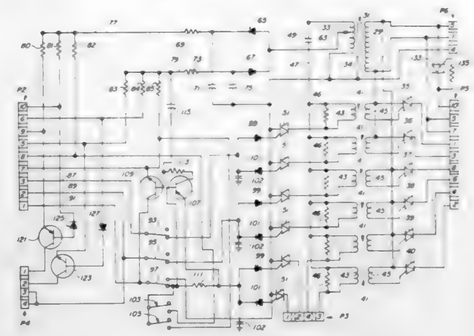
a first gating transformer to provide an actuating signal for said first bidirectional switch while isolating the selecting portion from the power portion of the control circuit;

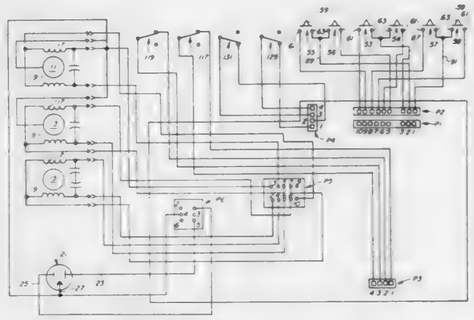
a second gating transformer to provide an actuating signal for said second bidirectional switch while isolating the selecting portion from the power portion of the control circuit;

a power transformer having primary and secondary windings, the secondary winding of said power transformer being grounded;

a first bidirectional gating switch to cause selective energization of said first gating transformer from the secondary winding of said power transformer;

a second bidirectional gating switch to cause selective energization of said second gating transformer from the secondary winding of said power transformer;





phase shifting means between the secondary winding of said power transformer and said gating transformers to produce actuating signals for said bidirectional power switches that properly commutate said bidirectional power switches; and

switch means to selectively actuate said bidirectional gating switches from the secondary of said power transformer.

4,044,287

CIRCUIT FOR ENERGIZING THE ELECTROMOTOR DRIVING A BLOWER

Rüdiger Ratzel, Buhl, and Helmut Steinmann, Baden-Baden, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed July 23, 1974, Ser. No. 491,146

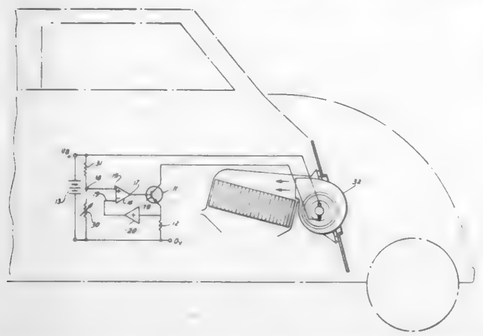
Claims priority, application Germany, July 27, 1973, 2338215

Int. Cl.[2] H02P *7/00*

U.S. Cl. 318—432 **9 Claims**

1. In a motor vehicle provided with a blower for blowing air into the interior of the motor vehicle, the blower being a radial-flow blower provided with a drum rotor the vanes of which are curved in the forward direction, and the blower being subjected to a load which varies as a function of the vehicle speed, in combination, an electromotor for driving said blower, whereby said electromotor is likewise subjected to load varia-

tions dependent upon vehicle speed, and a constant current source connected to said electromotor for furnishing to the



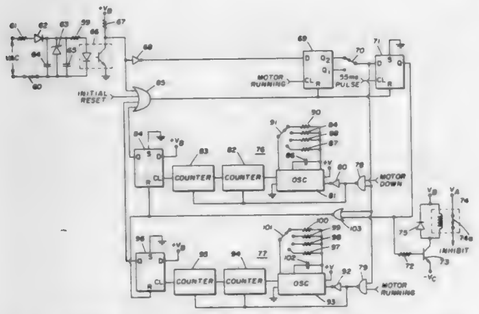
electromotor an energizing current substantially independent of the load applied to said electromotor.

4,044,288

TEMPERATURE-RESPONSIVE MOTOR RESTART LIMITER

William L. Godfrey, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,666
Int. Cl.[2] H02H *7/08*
U.S. Cl. 318—485 **9 Claims**



1. A system for controlling the operation of a motor to prevent damaging heat build-up within the motor, comprising:

a. means responsive to the condition of said motor for producing a start signal each time the motor is started and a stop signal each time the motor fails,

b. means responsive to a select temperature condition of said motor for indicating whenever such temperature condition exceeds a predetermined level,

c. a counter that is set to count start signals whenever the temperature condition exceeds said predetermined level,

d. means for resetting said counter whenever the motor runs continuously during a first time period following a predetermined number of motor starts,

e. means for inhibiting the restarting of the motor during a second time period whenever the motor fails to run continuously for said first time period following said predetermined count of motor start signals, and

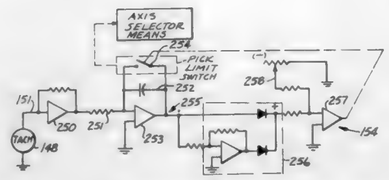
f. means for allowing the restarting of said motor following said second time period.

4,044,289

CYCLING SYSTEM FOR TRACER-CONTROLLED MACHINE TOOLS

Robert H. Wenzel, Orange, and Franklin O. Stavros, Pomona, both of Calif., assignors to Textron Inc., Providence, R.I.

Continuation of Ser. No. 455,019, March 26, 1974, abandoned. This application Aug. 27, 1975, Ser. No. 608,217
Int. Cl.[2] G05B *19/36*
U.S. Cl. 318—571 **8 Claims**



1. In combination: a machine tool including a frame and a movable machine element for supporting a pattern for movement along first, second and third mutually perpendicular axes; a first, second and third axis bi-directional motor adapted to drive the machine element along said first, second and third axes, respectively; a tracer mechanism mounted to the frame and including a body and a stylus having a tip adapted to trace over the surface of a pattern; mounting means mounting said stylus to the body, the stylus having a longitudinal axis which is generally aligned with the first axis, and is mounted for axial shifting movement along the first axis, and for lateral movement of its tip in all lateral directions from the first axis; first axis power control means, second axis power control means, and third axis power control means mounted to the body and responsive to components of stylus tip deflection along the respective first, second and third axes to control the application of power to the respective first, second and third axis motor in response to said stylus deflection; axis selector means for selecting two of the power control means and respective motors to establish a tracing plane in which the stylus traces the surface of the pattern in response to the two selected power control means; limit means defining the limit of travel of the stylus along the second and third axes and adapted to cause the axis selector means to select the previously-unselected one of the power control means and its respective motor and one of the previously selected power control means and its respective motor, thereby selecting a new cutting plane for pick movement over the surface of the pattern in response to the two power control means which are respective to the newly-selected axes; distance measuring means for terminating said pick movement at the conclusion of a predetermined distance of movement along one of the newly-selected axes, and adapted to cause the axis selector means again to select the first-named pair of power control means and their respective motors, whereby a pair of parallel paths for trace cuts are established which are laterally spaced apart by a pick distance, all movements in trace cut and in pick movement being under control of at least two power control means which tend to maintain substantially constant the surface rate of travel of the stylus over a pattern.

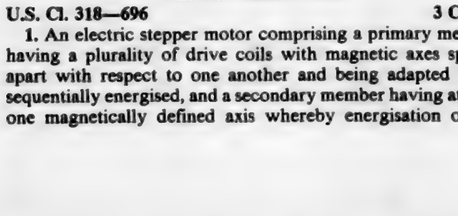
4,044,290

DRUM CONTROL SYSTEM

Robert Gullo, Staten Island, N.Y., assignor to Typographic Innovations Inc., New York, N.Y.

Filed June 21, 1974, Ser. No. 482,025
Int. Cl.[2] G05B *5/00*; H02H *7/08*; B41B *13/00*
U.S. Cl. 318—640 **54 Claims**

1. A drum control system for providing a predetermined incremental lateral spacing on a drum surface to be accessed in response to a request signal therefor, said system comprising means for rotatably driving said drum about the longitudinal axis thereof; means operatively connected to said drum rotatable driving means for controlling the degree of rotation of said drum in response to said request signal to provide said predetermined incremental lateral spacing, said rotation control means comprising a plurality of optically readable encoded discs, each of said discs having at least a first circumferentially extending band comprising a plurality of optically readable sense marks, said plurality of discs being coaxially rotatably mounted for simultaneous incremental rotation with said drum in response to said request signal, each of said sense marks is a given band corresponding to a predetermined uniform proportionate degree of incremental rotation of said drum, each of said disc circumferential bands being encoded to correspond to a different uniform proportionate degree of incremental rotation of said drum, said plurality of discs comprising at least a pair of said coaxially mounted discs spaced apart from each other with said first bands optically aligned with each other; said rotation control means further comprising a first light source means mounted so as to be optically common to both discs of said pair and optically alignable for illumination of said first bands when energized, a pair of optical reader means optically aligned with said first common light source and associated therewith, each one of said optical reader means



being associated with a different one of said discs of said pair and being optically alignable with said first band associated with said associated disc, each of said optical reader means being selectively energizable and being responsive to said sense marks on said associated first band when said optical reader is selectively energized and said first light source illuminates said first band for providing an output signal indicative of the proportionate degree of incremental rotation of said disc, and means for substantially simultaneously selectively energizing said optical reader associated with the disc band corresponding to the requested incremental lateral spacing and said first common light souce in response to said request signal; said system further comprising braking means operatively connected to said drum rotatable drive means for halting the rotatable drive of said drum in response to a braking signal, and comparator means operatively connected to said braking means and to receive said request signal and said selectively energized optical reader output signal for providing said braking signal to said braking means when said selectively energized optical reader output signal corresponds to said requested incremental lateral spacing, whereby the proportionate degree of rotation of said drum corresponds to said requested incremental lateral spacing.

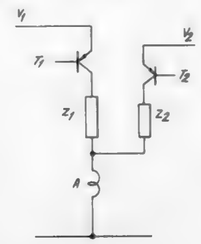
4,044,291

ELECTRIC STEPPER MOTORS

Austin Hughes, and Peter John Lawrenson, both of Leeds, England, assignors to National Research Development Corporation, London, England

Filed Sept. 23, 1975, Ser. No. 616,013
Claims priority, application United Kingdom, Sept. 25, 1974, 41713/74
Int. Cl.[2] H02K *37/00*
U.S. Cl. 318—696 **3 Claims**

1. An electric stepper motor comprising a primary member having a plurality of drive coils with magnetic axes spaced apart with respect to one another and being adapted to be sequentially energised, and a secondary member having at least one magnetically defined axis whereby energisation of the drive coils during a drive pulse period causes relative movement between the primary and secondary members, first and second impedances of different values joined to each of said drive coils, voltage supply means, and switching means for selectively connecting each of said impedances to the voltage supply means during said pulse drive period, said switching



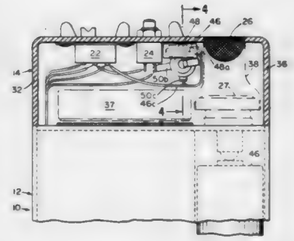
means connecting the first impedance to the voltage supply means during a first portion of the pulse drive period to permit rapid build-up of current in said coil and connecting the second impedance to the voltage supply means during a second portion of the pulse drive period to produce damping of said relative movement.

4,044,292

PAGER POWER CONVERSION APPARATUS FOR BATTERY CHARGING

James J. Tomlin, Sudbury, Mass., assignor to Commterm Inc., Maynard, Mass.

Filed Apr. 1, 1976, Ser. No. 672,671
Int. Cl.[2] H02J *7/00*; H04B *1/08*
U.S. Cl. 320—2 **9 Claims**



1. In a battery-powered pager originally constructed without arrangement for charging the battery while installed therein, said pager having a case with a removable top cover having an end wall and sidewalls and having mounted therein along one sidewall the pager on-off switch and the pager reset switch, each such switch having one contact connected to a different terminal of a battery installed therein, the improvement of

conversion apparatus for charging the pager battery while operatively installed therein, said conversion apparatus comprising in combination

A. a component assembly disposed within the top cover and including a fixed resistor and a semiconductor rectifying diode,

B. a power-receiving jack mounted to one cover wall through a hole therethrough adjacent the location of said component assembly, said jack having first and second contacts and being removably and replaceably connectable with a mating electrical plug for applying an alternating-voltage current from the plug to said jack contacts, and

C. means connecting said first and second jack contacts in series with said resistor and said diode between said one

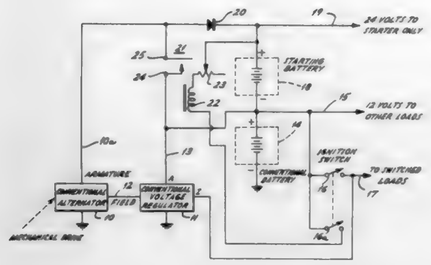
contact of said on-off switch and said one contact of said reset switch.

4,044,293

DUAL BATTERY CHARGING SYSTEM

William C. Follmer, Norristown, Pa., assignor to Ford Aerospace & Communications Corporation, Dearborn, Mich.

Continuation of Ser. No. 552,435, Feb. 24, 1975, abandoned.
This application June 7, 1976, Ser. No. 693,664
Int. Cl.[2] H02J 7/14
U.S. Cl. 320—15 **4 Claims**



1. In an engine electrical system including first and second series connected batteries, said first battery being connected between a first end terminal and an intermediate terminal of said series combination and said second battery being connected between said intermediate terminal and a second end terminal of said series combination, an alternator-rectifier combination providing between first and second alternator output terminals associated with a single charging path a direct current output at a voltage dependent upon a voltage control signal supplied to said alternator-rectifier combination and means for selectively charging only said first battery or both of said batteries in series with energy supplied between said first and second output terminals, said charging means comprising means connecting said first end terminal of said series connected batteries to said first alternator output terminal, voltage regulator means connected to said intermediate terminal of said series connected batteries and to said alternator-rectifier combination for suplying said voltage control signal to said alternator-rectifier combination, voltage controlled switch means connected between said second alternator output terminal and said intermediate terminal of said series connected batteries and responsive to the voltage appearing across said battery for alternatively connecting said second alternator output terminal to said intermediate terminal through said switch means thereby to permit current flow from said second terminal through said first battery and disconnecting said second alternator output terminal from said intermediate terminal, and current control means connecting said second alternator output terminal and said second end terminal of said series connected battery combination, said last mentioned means permitting current to flow in a selected direction to said series connected batteries when said switch means is operative to disconnect said second alternator output terminal from said intermediate terminal and to prevent flow of current in the reverse direction when said switch means is operative to connect said second alternator output terminal to said intermediate terminal.

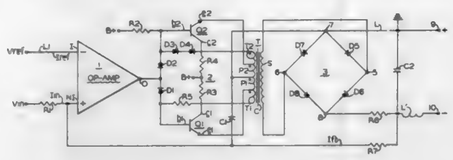
4,044,294

CONVERTER-REGULATOR CIRCUIT ARRANGEMENT

Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed Nov. 25, 1974, Ser. No. 526,514
Int. Cl.[2] H02M 3/335
U.S. Cl. 363—25 **9 Claims**

1. A converter-regulator circuit arrangement which has high immunity to voltage transients appearing on its output comprising, an amplifier having a first and a second input and an output, as reference voltage coupled to said first input, an input voltage coupled to said second input, an inverter electrically coupled to the output of said amplifier, a rectifier having its a.c. input terminals electrically coupled to said inverter and having a pair of d.c. output terminals, a feedback circuit coupled between one of said pair of d.c. output terminals of said rectifier by a feedback resistor and providing a feedback voltage to said second input of said amplifier for controlling the conductive condition of said amplifier and in turn for causing said amplifier to clamp said inverter to ground by rendering a pair of diodes conductive and for causing said amplifier to unclamp



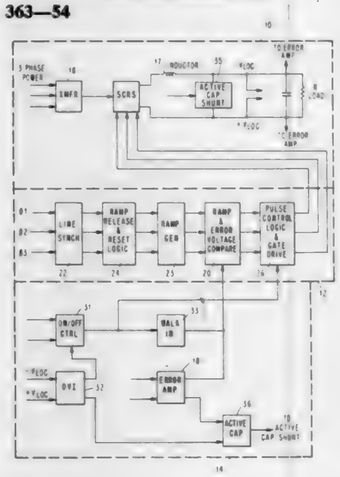
said inverter from ground by rendering said pair of diodes nonconductive for regulating the d.c. voltage developed across said pair of d.c. output terminals, and a transient protection circuit including a bypass capacitor coupled across said pair of d.c. output terminals and an inductive choke connected by a series resistor to said one of said pair of d.c. output terminals for preventing voltage transients from damaging said amplifier and said inverter by providing that said rectifier short circuits the voltage transients to ground, and by providing that said bypass capacitor and said inductive choke isolates said inverter from the voltage transients and by providing that said feedback resistor decreases the magnitude of the voltage transients appearing on said second input of said amplifier.

4,044,295

OVER-VOLTAGE INTERRUPT FOR A PHASE CONTROLLED REGULATOR

Frank A. Ferraiolo, Newburgh, and Roy K. Griess, Wappingers Falls, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1976, Ser. No. 755,285
Int. Cl.[2] H02M 1/18
U.S. Cl. 363—54 **9 Claims**



1. In a phase controlled regulator an over-voltage interrupt circuit comprising in combination:

a sensing means for sensing the outputs of the phase controlled regulator and for generating a voltage proportional to the voltage difference between the outputs;

a reference generator for generating a reference;

a comparator means having the reference connected thereto as one input for establishing an upper threshold and having positive feedback establishing a resetting threshold lower than said setting threshold;

an on/off controller means for controlling the on and off switching of said regulator;

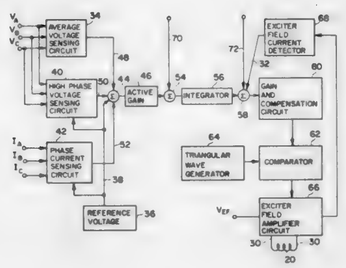
a first switching means for providing an override signal to said on/off controller which turns said regulator off in response to a sensed output above said setting threshold and turns said regulator on in response to a sensed output below said resetting threshold, thereby providing output voltage off/on sequencing between said setting and resetting threshold values in response to an over-voltage.

4,044,296

ELECTRONIC VOLTAGE REGULATOR FOR THREE-PHASE GENERATORS

P. John J. Dhyanchand; Timothy F. Glennon, and Roland W. Christen, all of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 14, 1976, Ser. No. 649,006
Int. Cl.[2] H02P 9/30
U.S. Cl. 322—25 **25 Claims**



1. An electronic voltage regulator for generators having exiter field circuits, comprising:

means for sensing the voltage output of the generator;

means, responsive to said voltage sensing means, for comparing the voltage output to a reference value;

means for sensing the current output of the generator;

means, responsive to said current sensing means, for comparing the current output to a reference value;

means, responsive to said voltage and said current comparing means, for generating an error signal;

means, responsive to said error signal, for integrating said error signal over time; and

means, responsive to said integrated error signal, for controlling the exciter field circuit, thereby regulating the voltage and current output of the generator.

4,044,297

ULTRASONIC GENERATOR WITH COMBINED OSCILLATOR AND CURRENT REGULATOR

Takaaki Nobue, Yamatokoriyama; Masao Itou, Nara; Katsuhiko Yamamoto, Nabari, and Makoto Hori, Ikoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

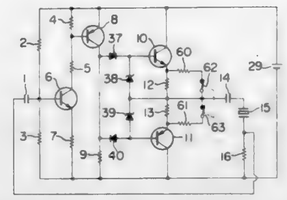
Filed Dec. 5, 1975, Ser. No. 637,875
Claims priority, application Japan, May 20, 1975, 50-60822; June 19, 1975, 50-75133
Int. Cl.[2] G05F 1/44; H03F 3/18
U.S. Cl. 323—4 **8 Claims**

1. An ultrasonic generator comprising:

a constant current circuit including a first bipolar transistor whose emitter is connected to one end of a resistor and base is connected to one end of a constant-voltage regulating element, the other ends of said resistor and said constant-voltage regulating element being connected together;

a first switching circuit including a second bipolar transistor whose base is connected to the base of said first transistor to form a complementary symmetry circuit with said first transistor;

an ultrasonic transducer having a natural frequency at which the dynamic admittance thereof becomes maximum, said transducer being connected between one terminal of an electric power source and the junction of an output terminal of said switching circuit and an output terminal of said



constant-current circuit; said output terminal being coupled to the emitters of said transistors;

a second switching circuit whose output terminal is connected to the bases of said first and second transistors and adapted to drive the others of said circuits with a square wave having a frequency substantially equal to the natural frequency of said ultrasonic transducer; and

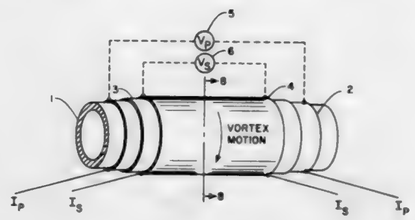
a feedback circuit coupled between said transducer and said second switching circuit and adapted to provide an AC feedback voltage in proportion to the current flowing through said ultrasonic transducer to cause said generator to oscillate at said natural frequency.

4,044,298

SUPER CONDUCTING DEVICE WITH MINIMAL PINNING

John Walter Ekin, 1345 Drexel St., Boulder, Colo. 80303

Filed Mar. 26, 1975, Ser. No. 562,295
Int. Cl.[2] G05F 7/00; H01F 10/00
U.S. Cl. 323—44 F **6 Claims**



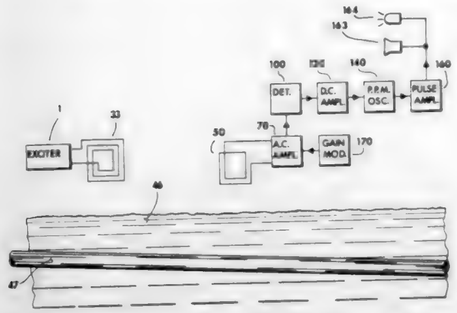
1. A device comprising a Type II superconductive material and means for inducing movement of vortices in the superconductive material positioned adjacent the superconductive material, the superconductive material having a ratio at constant reduced temperature of $\langle D \rangle$, the average scale of structural disorder in such material, to ξ, the vortex core size, less than 120% of the minimum obtainable such ratio, but less than unity.

4,044,299

CONCEALED STRUCTURE LOCATING AND SURVEYING TRANSLATOR APPARATUS

Harold James Weber, 20 Whitney Drive, Sherborn, Mass. 01770

Filed Dec. 22, 1975, Ser. No. 643,606
Int. Cl.[2] G01V *3/08, 3/10*
U.S. Cl. 324—3 **23 Claims**



1. A translator means for locating a concealed structure which intercepts alternating current electromagnetic field lines reradiating from the concealed structure, where-in the electromagnetic field lines have been introduced into the structure directly or inductively by a separate exciter means and furthermore where-in the structure is a buried or otherwise concealed pipe, cable, or like conductive object, and thereby produces in the said translator a sensory indication of the relative proximity of the said translator to the said concealed structure, including in combination:

a. a directional inducer which produces a minute alternating current voltage from the said electromagnetic field lines re-radiated from the concealed structure;

b. an A.C. amplifier means coupled to said directional inducer which increases the magnitude of the said minute signal voltage;

c. a rectifier means coupled to said A.C. amplifier means, said rectifier means operative to establish the threshold of rectification of the amplified A.C. voltage signal;

d. a modulator means coupled to said A.C. amplifier operative to cause the gain amplification of said A.C. amplifier to be cyclically varied from a point of maximum gain to a point of decreased gain wherein said point of maximum gain is sufficient to produce a significant electronic-noise output from the A.C. amplifier, said variation is gain being at a slow periodic rate independent of the signal being amplified, and furthermore that in the absence of an incoming signal the magnitude of the said cyclical variation causes the output of the A.C. amplifier to vary between a level of high-noise content and lesser noise;

e. a direct current amplifier means coupled to said rectifier which includes means for purifying the D.C. output signal voltage to be free from noise fluctuations arriving from said A.C. amplifier and rectified by said rectifier means;

f. a pulse oscillator means coupled to said D.C. amplifier purified output and being operative to produce pulses essentially constant in duration but with various pulse-to-pulse periods generally proportional to the magnitude of the output voltage from the said D.C. amplifier;

g. a current switch amplifier means coupled to said pulse oscillator means which follows the said pulse oscillator and causes higher magnitude current pulses to be outputed;

h. a sensory indicating means coupled to said current switch amplifier;

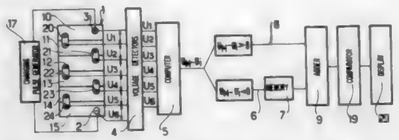
i. a source of direct current power including a disconnect means so arranged as to provide operating voltage and current to each of the functional circuit groups comprising the translator.

4,044,300

METHOD FOR CHECKING A STORAGE BATTERY

Jean-Michel Dupuis, Gennevilliers, and Pierre Lasserre, Nanterre, both of France, assignors to Compagnie Europeenne d'Accumulateurs, Paris, France

Filed June 24, 1976, Ser. No. 699,401
Claims priority, application France, June 24, 1975, 75.19747
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—29.5 **8 Claims**



1. A method of checking a storage battery with series-connected cells comprising the following steps:

passing a charging current pulse through the battery;

measuring elementary transient voltages at the terminals of each storage cell; and measuring a total transient voltage and dividing the total voltage by the number of storage cells to obtain an average transient voltage,

comparing the elementary transient voltages with the average transient voltage of said storage cells; and

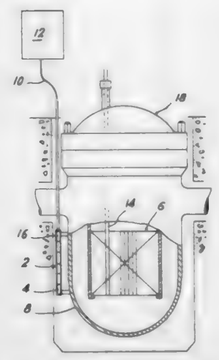
providing a battery reject signal as a result of said comparing if the absolute value of the difference between said transient voltage and one of the elementary transient voltages, becomes higher than a predetermined threshold.

4,044,301

MODULAR IONIZATION CHAMBER OF THE BORON-COATING TYPE

Jacques Allain, Palaiseau; Jean Duchene, Fontenay-aux-Roses, and Marc Merelli, Plaisir, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 21, 1975, Ser. No. 570,131
Claims priority, application France, Apr. 19, 1974, 74.13768
Int. Cl.[2] G01N *27/00;* **H01J** *39/22*
U.S. Cl. 324—33 **4 Claims**



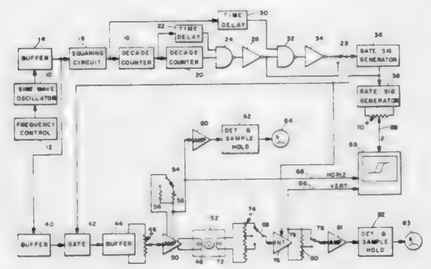
1. A boron-coating ionization chamber comprising a leak-tight cylindrical casing containing N modules each operating as an independent ionization chamber, each module being constituted by a central cylindrical core serving as a support by means of cylindrical insulating rings in concentric relation to said central core for two concentric cylindrical electrodes Ea and Eb whose opposite faces are provided with a coating of boron, electrically insulated resilient means for maintaining each module radially with respect to said casing including three transverse springs working in compression and disposed at angular intervals of 120°, said springs attached to the central core of said module and applied by means of an insulating ball against the internal surface of the casing, and electrically insulated resilient means for maintaining the modules longitudinally with respect to each other including six longitudinal springs disposed at angular intervals of 60°, said springs be placed between the core of the adjacent module and the insulating rings.

4,044,302

TEST SET FOR MEASURING MAGNETIC PROPERTIES OF MAGNETIC AMPLIFIER CORES BY SINUSOIDAL CURRENT EXCITATION

Leonard Adolphus Mayberry, 710 Paul St., Escondido, Calif. 92027

Filed June 9, 1976, Ser. No. 694,308
Int. Cl.[2] G01R *33/12*
U.S. Cl. 324—34 MC **13 Claims**



1. A test set for measuring magnetic properties of magnetic amplifier cores, comprising,

means for receiving a magnetic amplifier core for test, including a primary winding for applying a sinusoidal drive signal to produce a magnetic field in said core, and a secondary winding for sensing an output signal indicative of the magnetic flux produced in said core in response to said drive signal, and

means for producing a repetitive constant current sinusoidal drive signal coupled to said primary winding for providing said applied sinusoidal drive signal,

wherein the improvement comprises,

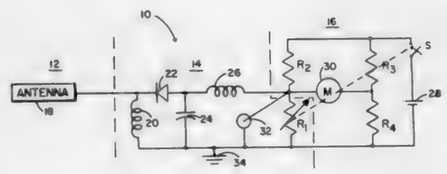
means for causing said sinusoidal drive signal to be repeated at a low duty cycle rate of not more than one full sine wave in one hundred sine waves.

4,044,303

MICROWAVE RADIATION DETECTOR

John Reindel, 5352 Via Carancho, San Diego, Calif. 92111

Filed Nov. 10, 1975, Ser. No. 630,229
Int. Cl.[2] G01R *21/04, 31/02*
U.S. Cl. 324—95 **9 Claims**



1. A microwave radiation detector comprising:

first means for receiving r.f. signals;

a negative resistance device connected to said first means and having an I-V characteristic including a positive resistance operating region and a negative resistance operating region and a point of peak current therebetween;

an oscillation network connected to said negative resistance device;

bias supply means connected to said oscillation network and to ground for biasing said negative resistance device in said positive resistance operating region when no r.f. signal has been received by said first means, the output of said first means biasing said negative resistance device at least temporarily into said negative resistance operating region; and

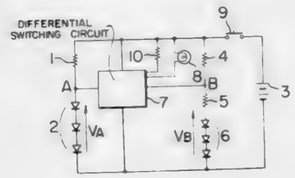
sensing means connected to said oscillation network for indicating the amplitude of said r.f. signals.

4,044,304

DEVICE FOR CHECKING A D C SOURCE VOLTAGE RELATIVE TO A PREDETERMINED VALUE

Ichiro Hamaguchi, Yokohama, and Kenji Toyoda, Kawasaki, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Division of Ser. No. 542,542, Jan. 20, 1975, Pat. No. 3,970,933. This application Feb. 11, 1976, Ser. No. 657,277
Claims priority, application Japan, Jan. 28, 1974, 49-10890
Int. Cl.[2] G01R *19/16;* **G01N** *27/46*
U.S. Cl. 324—133 **1 Claim**



1. In a device for checking and indicating the voltage of a D.C. source relative to a predetermined value and including a detecting circuit connected across said D.C. source and having a detecting terminal, the detecting circuit detecting whether the voltage of a D.C. source is higher than a predetermined value and generating a detecting signal at the said detecting terminal; and an indicating element connected at its one end to the said detecting terminal and at its other end to one terminal of said D.C. source to be turned on upon receiving the said detecting signal and to be turned off when said detecting signal is not received; an oscillation preventing device comprising an output terminal provided in the said detecting circuit to generate a signal when the voltage across said D.C. source is less than said predetermined value; and resistor means connected at its one end to the said output terminal and at its other end to said one terminal of said D.C. source and having a resistance value substantially equal to that of said indicating element so that said resistor means receives the output signal from said output terminal and permits the flow therethrough of current substantially equal to the current flowing through said indicating element upon said indicating element being turned on.

4,044,305

APPARATUS FOR PROVIDING A DISPLACEMENT REPRESENTATIVE OF THE MAGNITUDE OF A SIGNAL

George A. Oberbeck, Belmont, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Mar. 17, 1975, Ser. No. 558,960
Int. Cl.[2] G01R *5/14, 1/00*
U.S. Cl. 324—154 R **12 Claims**

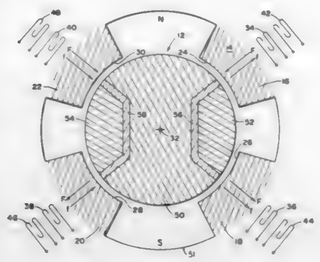
1. Apparatus for providing a displacement proportional to a signal magnitude comprising:

an element having first and second sections of high magnetic permeability separated by a spacer of low magnetic permeability;

means for motionally suspending the element;

means for applying a first magnetic flux to said element and to the first and second sections thereof;

said first and second sections being configured to provide a variation in the reluctance for said first magnetic flux through the first section with motion of said element and a generally lesser variation in reluctance to the first flux through the second section with motion of the element thereby producing a force on said element dependent upon position thereof; and



means for applying a second flux representative of said signal through said element;

said first and second sections being further configured to provide a variation in the reluctance of said second section to said second flux with motion of said element without substantially changing said force resulting from said first flux;

said element moving in response to the second flux applied in response to said signal to a point representative of said signal.

4,044,306

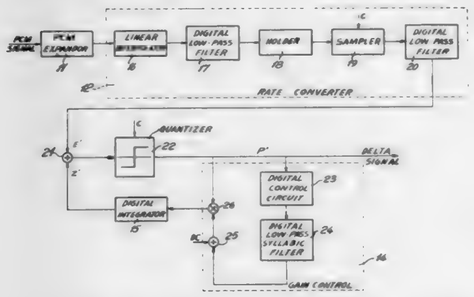
DIGITAL CONVERTER FROM PULSE CODE MODULATION TO CONTINUOUS VARIABLE SLOPE DELTA MODULATION

Michel Villeret, Sherbrooke; Hubert Stephenne, Rock Forest, and Pierre A. Deschenes, Sillery, all of Canada, assignors to Universite de Snerbrooke, Sherbrooke, Canada

Filed July 26, 1974, Ser. No. 492,022

Int. Cl.[2] H03K *13/24*

U.S. Cl. 325—38 B **10 Claims**



1. A digital converter for converting a compressed pulse code modulation (PCM) signal provided from a pulse code modulation system and being at a predetermined rate into a delta signal flowing at a delta rate, said delta signal being supplied to a delta modulation telecommunication system, comprising:

a. a first conversion means receiving said compressed PCM signal for converting the code thereof into a intermediate code, said intermediate code being at a rate corresponding to said PCM rate;

b. a second conversion means connected to said first conversion means for converting the rate of said intermediate signal into the delta rate; and

c. a third conversion means fed with said intermediate signal at said delta rate for converting the code thereof into the code of the delta signal, said third conversion means comprising:

a comparator for comparing the intermedite signal at the delta rate with a feedback signal and for providing an output signal,

a quantizer connected to receive the output signal of said comparator, said quantizer having an output for providing said delta signal at the delta rate, and

means connected between the output of said quantizer and the comparator for providing said feedback signal to said comparator.

4,044,307

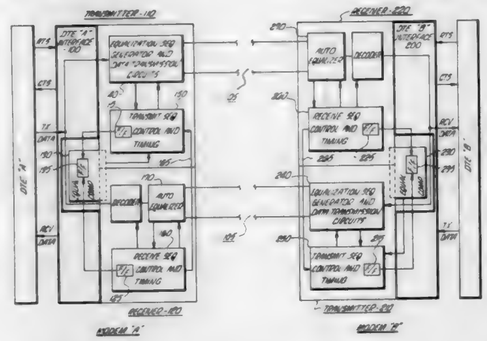
DATA MODEMS WITH AUTOMATIC EQUALIZATION, DROP-OUT DETECTION AND DATA ECHO PROTECTION

Richard Borysiewicz, Miami, and Charles W. Roedel, Miami Shores, both of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Continuation of Ser. No. 600,895, Aug. 1, 1975, abandoned, which is a continuation of Ser. No. 438,387, Jan. 31, 1974, abandoned. This application June 29, 1976, Ser. No. 700,903

Int. Cl.[2] H04M *11/00*

U.S. Cl. 325—42 **19 Claims**



18. In a modem system, a method of equalizing for line distortion prior to successive data transmissions comprising the steps of:

sending a long equalization sequence;

initially equalizing in accordance with said long equalization sequence prior to a first data transmission; and

re-equalizing in accordance with a short equalization sequence prior to a second data transmission.

4,044,308

COMMUNICATION TRANSMITTING APPARATUS WITH CARRIER LEVEL CONTROL

Francis H. Stites, Wayland, and Colin B. Weir, Franklin, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Sept. 20, 1976, Ser. No. 725,001

Int. Cl.[2] H04B *1/04*

U.S. Cl. 325—144 **6 Claims**

1. Communication transmitting apparatus including in combination

a source of an RF carrier signal;

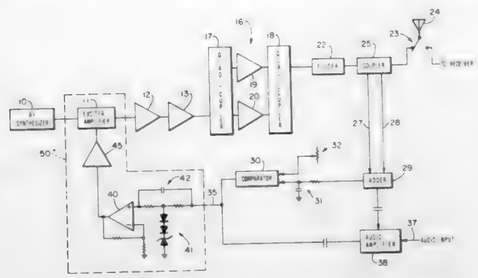
audio signal input means for conducting an audio signal;

first amplifier means having an input connected to said source of an RF carrier signal;

second amplifier means having an input coupled to the output of the first amplifier means;

control signal means coupled to the output of the second amplifier means and operable to produce a DC control signal related to the carrier signal voltage at the output of the second amplifier means; and

modulating and control means connected to the audio signal input means, the control signal means, and the first amplifier means for amplitude modulating the RF carrier signal produced at the output of the first amplifier means with the audio signal and for adjusting the carrier signal voltage produced at the output of the first amplifier means in response to the DC control signal and in a manner tending



to maintain the carrier signal voltage at the output of the second amplifier means constant;

said modulating and control means including

DC limiting means for preventing the control signal from causing the modulating and control means to increase the carrier signal voltage at the output of the first amplifier means above a predetermined voltage, and

audio by-pass means for causing the audio signal to by-pass said DC limiting means whereby said DC limiting means has no effect on the audio signal.

4,044,309

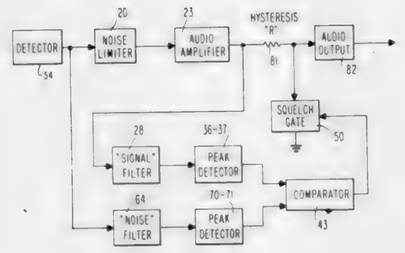
AUTOMATIC SQUELCH CIRCUIT WITH HYSTERESIS

John F. Smith, Warminster, Pa., assignor to Narco Scientific Industries, Inc., Fort Washington, Pa.

Continuation of Ser. No. 489,597, July 18, 1974, abandoned. This application Feb. 9, 1976, Ser. No. 656,259

Int. Cl.[2] H04B *1/10*

U.S. Cl. 325—478 **2 Claims**



1. In a squelch circuit for a radio receiver having an audio detector and an audio output amplifier,

a. means, including a noise limiter and an audio amplifier in series, for applying the output of said audio detector to the input of said audio output amplifier;

b. said audio amplifier having an output circuit which includes a voltage divider comprising a series resistor and a shunt resistor, the resistance of said series being low relative to the resistance of the shunt resistor;

c. an electronic squelch gate having conductive and nonconductive states, said squelch gate having an output circuit connected in parallel with said shunt resistor of said audio amplifier;

d. a comparator having first and second input circuits for receiving audio and noise signals, respectively;

e. means coupling the noise-limited audio output of said audio amplifier to said first input circuit of said comparator;

f. means, including a noise filter for passing noise signals above the audio range, coupling said audio detector to said second input circuit of said comparator;

g. means coupling the output of said comparator across the input of said squelch gate;

h. said comparator, in response to predominantly noise signals, developing and applying to said squelch gate a signal of a polarity to cause said squelch gate to be conductive, whereby the impedance of its output circuit becomes low and effectively shorts out said shunt resistor in the output circuit of said audio amplifier;

i. said comparator, in response to predominately noiselimited audio signals, applying to said squelch gate a signal of a polarity to cause said gate to be nonconductive, whereby the impedance of its output circuit becomes high and maintains the effectiveness of said shunt resistor in the output circuit of said audio amplifier; non-conductive,

j. whereby once the squelch gate becomes non-conductive the amplitude required of a decreasing audio input signal to maintain said squelch gate non-conductive is substantially less than the amplitude required of an increasing audio input signal to turn off a conducting squelch gate, whereby said squelch circuit exhibits a hysteresis character.

4,044,310

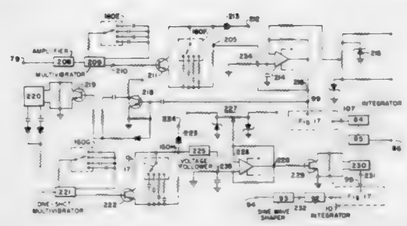
CIRCUITRY FOR GENERATING A SINE WAVE AND/OR COSINE WAVE FROM A PULSE SIGNAL

Robert S. Morrow, Columbus, and Lloyd D. Penn, Johnstown, both of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio

Division of Ser. No. 420,594, Nov. 30, 1973, Pat. No. 3,938,394. This application Dec. 4, 1975, Ser. No. 637,751

Int. Cl.[2] H03K *5/08*

U.S. Cl. 328—27 **1 Claim**



1. In an electronic circuit for generating a sine wave and a corresponding cosine wave each having a fundamental frequency corresponding to the frequency of repetitive voltage input pulses, including:

A. means for generating the said sine wave including:

means responsive to each pulse for generating a uniformly changing electrical sawtooth signal;

a square wave generator which generates a first square wave signal having a positive excursion corresponding to one-half of the said sawtooth signal and having a negative excursion corresponding to the other half of the said sawtooth signal;

means for integrating the said first square wave signal to produce a first triangular wave having a fundamental frequency identical to the frequency of the said input pulses; and

sine wave shaping means to convert the said first triangular wave to the desired sine wave;

B. means for generating the said cosine wave including means for generating from the first said square wave

signal a second sawtooth signal having exactly twice the frequency of the said first sawtooth signal;

a second square wave generator which generates a second square wave signal having a positive excursion corresponding to one-half of the said second sawtooth signal and having a negative excursion corresponding to the other half of the said second sawtooth signal;

a third square wave generator which generates a third square wave signal at twice the frequency of the said second square wave signal and 90° out of phase from the said first square wave signal;

means for integrating the said third square wave signal to produce a second triangular wave having a fundamental frequency identical to the frequency of the said input pulses and being 90° out of phase from the first triangular wave;

sine wave shaping means to convert the said triangular wave to the desired cosine wave; and

comparison means for comparing the said first square wave signal with the said second square wave signal to maintain the desired phase relationship between the third square wave signal and the first square wave signal.

4,044,311

FEATURE EXTRACTION SYSTEM FOR EXTRACTING A PREDETERMINED FEATURE FROM A SIGNAL

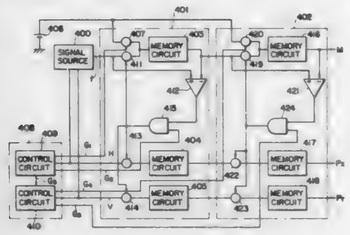
Seiji Kashioka, Kokubunji; Masayoshi Kameyama, Sagamihara; Masakazu Ejiri, Tokorozawa, and Takafumi Miyatake, Hachioji, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 13, 1976, Ser. No. 648,711

Claims priority, application Japan, Jan. 16, 1975, 50-6276

Int. Cl.² H03B *1/00*

U.S. Cl. 328—139 **15 Claims**



1. A feature extraction system for extracting a predetermined feature from a signal comprising:

first means, to which said signal is applied for extracting sequentially said predetermined feature from said signal during a predetermined time period and for storing the extracted predetermined feature in said time period, said first means extracting said predetermined feature during every predetermined time period;

second means coupled with said first means, for extracting an optimum predetermined feature from the predetermined features extracted by said second means and for storing said optimum predetermined feature, said second means being so designed that the contents stored therein are held for a long period of time in comparison with that stored in said first means; and

third means coupled with said second and first means for controlling said second and first means to extract said predetermined feature from said signal and then to transfer the contents of said first means to said second means at the end portion of the predetermined time period.

4,044,312

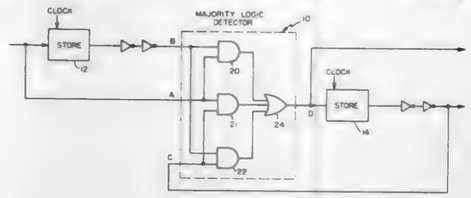
COMPARISON CIRCUIT FOR REMOVING POSSIBLY FALSE SIGNALS FROM A DIGITAL BIT STREAM

Remo J. D'Ortenzio, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,442

Int. Cl.² H03K *1/10*

U.S. Cl. 328—165 **3 Claims**



1. A comparison circuit for removing possibly false signals from a digital bit stream comprising first and second stores each capable of storing one frame of a selected bit stream, comparison means for producing an instantaneous output signal corresponding to the states of a majority of three input signals, means for applying the selected bit stream to said comparison means and simultaneously to said first store, means for applying the output of said comparison means to said second store, and means for applying the outputs of both said first and second stores to said comparison means.

4,044,313

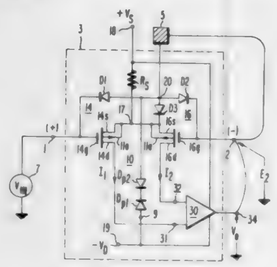
PROTECTIVE NETWORK FOR AN INSULATED-GATE FIELD-EFFECT (IGFET) DIFFERENTIAL AMPLIFIER

Harold Allen Wittlinger, Pennington, N.J., and Michael Scott Fisher, Farmers Branch, Tex., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 1, 1976, Ser. No. 746,214

Int. Cl.² H03F *3/45*; H02H *3/20*

U.S. Cl. 330—207 P **8 Claims**



4. In combination with an amplifier having first aand second input terminals to which are connected the gates of first and second insulated gate field effect transistors (IGFETs) respectively, and wherein first and second rectifying junctions are connected back to back between said gates, the improvement comprising:

means for applying an input signal to one of said first and second input terminals; and

means for short circuiting the rectifying junction connected to the other one of said first and second terminals.

4,044,314

FREQUENCY SYNTHESIZERS

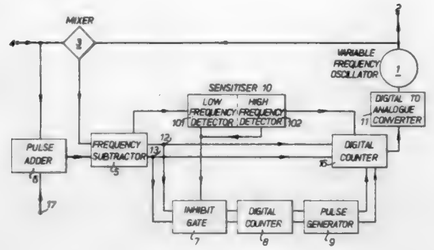
Boleslaw Marian Sosin, Chelmsford, England, assignor to The Marconi Company Limited, England

Filed July 28, 1972, Ser. No. 276,094

Claims priority, application United Kingdom, Sept. 28, 1971, 45024/71

Int. Cl.² H03B *3/04*

U.S. Cl. 331—1 A **18 Claims**



1. A frequency synthesizer including a variable frequency oscillator; comparison means for deriving a first control signal representative of a departure of the output frequency of the frequency synthesizer from a desired output frequency; control means dependent on said first control signal for controlling said variable frequency oscillator to reduce said departure; means for determining whether the first control signal results from a drift in the frequency of the variable frequency oscillator; means for generating a second control signal representative of the rate of said drift to compensate for such drift and for maintaining said second control signal until a change in the rate of said drift occurs.

4,044,315

MEANS FOR PRODUCING AND AMPLIFYING OPTICAL ENERGY

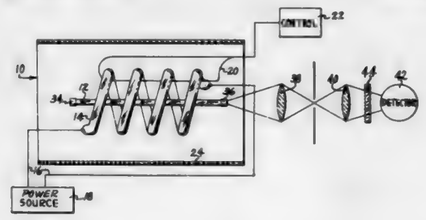
Elias Snitzer, Brookfield, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Jan. 16, 1962, Ser. No. 168,012

The portion of the term of this patent subsequent to Apr. 24, 1990, has been disclaimed.

Int. Cl.² H01S *3/16*

U.S. Cl. 331—94.5 F **42 Claims**



1. In a laser, a solid luminescent sensitive element of Fabrey-Perot optical regenerative configuration and consisting essentially of a clear glass activated with trivalent ytterbium ions.

4,044,316

STABILIZED CAVITY-DUMPED ND:YAG LASER

Chandler J. Kennedy, Huntington Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

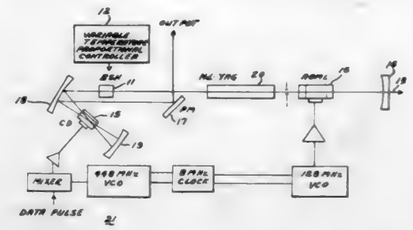
Filed Apr. 19, 1976, Ser. No. 678,506

Int. Cl.² H01S *3/13*

U.S. Cl. 331—94.5 S **3 Claims**

1. In a cavity dumped, solid state laser having an optical cavity with circulating power of a fundamental frequency and wherein the laser output frequency is only at said fundamental frequency, said laser having a solid state laser element in said optical cavity, an improvement for decreasing relaxation oscillations associated with dumping, wherein said improvement comprises:

a. a second harmonic generation crystal for generating second harmonic power from said fundamental frequency



circulating power positioned in said optical cavity in intercepting relationship with said fundamental circulating power; and

b. means for controlling the temperature of said second harmonic generation crystal to provide a second harmonic power of approximately 0.05% to 0.1% of said fundamental frequency circulating power, whereby relaxation oscillations associated with dumping are decreased.

4,044,317

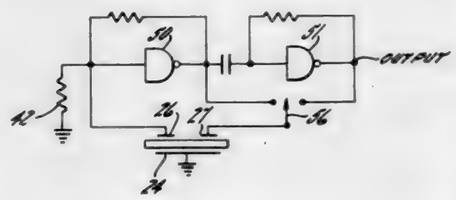
CRYSTAL CONTROLLED SQUARE WAVE OSCILLATOR

Darrell E. Newell, Yorkville; John F. Jennings, Chicago; Steven Lyle Fritsch, Earlville, and Howard D. Hinnah, Sandwich, all of Ill., assignors to CTS Corporation, Elkhart, Ind.

Filed Oct. 18, 1976, Ser. No. 733,210

Int. Cl.² H03B *5/36*

U.S. Cl. 331—116 R **14 Claims**



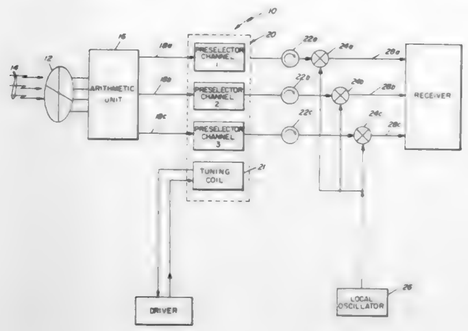
1. A square wave crystal controlled oscillator comprising a quartz crystal monolithic dual resonator having a pair of signal electrodes and a reference electrode cooperating therewith, integrated circuit logic gate means having an input coupled to one of said signal electrodes and an output coupled to the other of said signal electrodes, said resonator operating as an acoustic transformer wherein said electrodes form high Q series resonant input and output circuits acoustically coupled to resonate in symmetric and anti-symmetric modes at related frequencies, said logic gate means introducing a phase shift between said signal electrodes to cause said resonator to oscillate in a predetermined one of said modes and being of the type having a transistor input structure and a transistor output structure wherein conductive transistors in the output structure produce both high and low output states, thereby to provide low impedance drive to the resonator so as to avoid any substantial degradation of the Q of said resonator.

4,044,318

GANGED RADIO FREQUENCY FILTER

Edward J. Daly, Sudbury; Richard Sparks, Bedford, and George R. Spencer, Needham, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 20, 1975, Ser. No. 579,165
Int. Cl.[2] G01S 9/02; H01P 1/20
U.S. Cl. 333—1 **6 Claims**



1. In a monopulse receiver wherein radio frequency energy received by an antenna is passed through an arithmetic unit to form, in a different one of three separate channels, a sum and two difference radio frequency signals, the improvement comprising:

a. an electrically tunable filter arrangement having a separate filter in each different one of the three separate channels, each one of said separate filters having substantially the same insertion loss and frequency response characteristics;

b. means for tuning, over a preselected band of radio frequencies, each separate filter to correspond with the frequency of a desired portion of the radio frequency energy received by the antenna; and

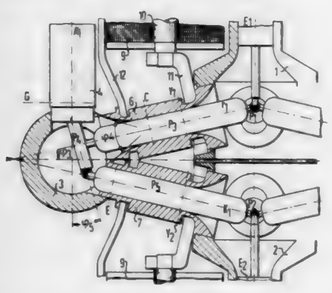
c. means for adjusting the bandpass response of each separate filter so that each of the separate filters phase and amplitude track each other.

4,044,319

COAXIAL 2-OF-n RELAY TRANSFER SWITCH HAVING REED CONTACTS

Siegfried Seinecke, Soecking, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,889
Claims priority, application Germany, Sept. 30, 1975, 2543675
Int. Cl.[2] H01P 1/10
U.S. Cl. 333—7 R **8 Claims**



1. A coaxial 2-of-*n* relay transfer switch arrangement, where *n* is an integer comprising

first and second coaxial input lines and *n* coaxial output lines each including an inner conductor and an outer conductor,

first and second groups of reed switches, each group including *n* reed switches arranged generally in the shape of a star with said reed switches forming the edges of a pyramid,

each of said reed switches including reed contacts, a first reed terminal connected in common with the like terminals in the same group to form two first branching points, one for each of said groups, each first branching point connected to an inner conductor of a respective input line, and a second reed terminal which is connected to a like terminal from the other group to form *n* second branching points, each of said second branching points connected to said inner conductor of a respective output line,

a plurality of non-magnetic metallic tubes, each of said tubes housing a respective reed switch,

a pair of metallic heads, each of said heads enclosing a respective first branching point and connected to an outer conductor of a respective input line and serving with that branching point as a respective coaxial input,

the ends of said metallic tubes adjacent a second branching point electrically connected to said outer conductor of a respective output line and serving with the respective branching point as a coaxial output,

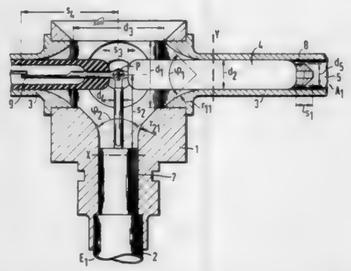
said metallic tube and metallic heads electrically connected and including interior constructions which electrically add inductance between said input line inner conductors and said first branching points and between said first branching points and the respective reed contacts in each group.

4,044,320

COAXIAL 1-OF-n RELAY TRANSFER SWITCH HAVING REED CONTACTS

Siegfried Seinecke, Soecking, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 21, 1976, Ser. No. 688,888
Claims priority, application Germany, Sept. 30, 1975, 2543669
Int. Cl.[2] H01P 1/10
U.S. Cl. 333—7 R **6 Claims**



1. A coaxial 1-of-*n* relay transfer switch, where *n* is an integer, comprising

an input coaxial line and *n* output coaxial lines, each coaxial line including an inner conductor and an outer conductor,

n reed switches arranged in a star configuration and each including reed contacts and first and second reed terminals, said first reed terminals connected together to form a branching point, said branching point connected to said inner conductor of said input line and having a capacitive loading which is dependent on the number of open reed switches connected to said branching point,

n metallic, non-magnetic tubes each enclosing a respective reed switch and connected to an outer conductor of a respective output line, and

a metallic head electrically connected to said tubes and to said outer conductor of said input line, said head enclosing said branching point,

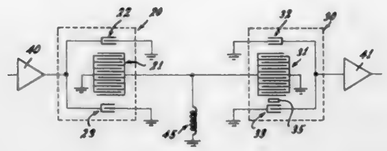
the interior walls of said head and tubes constructed to add inductance between said inner conductor of said coaxial input line and said branching point and between said branching point and said reed contacts to reduce the capacitive loading effect and form a low pass T filter section.

4,044,321

SURFACE ACOUSTIC WAVE BAND PASS FILTERING

Carmine F. Vasile, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 1, 1976, Ser. No. 662,761
Int. Cl.[2] H03H 9/04, 9/26, 9/32, 9/30
U.S. Cl. 333—72 **37 Claims**



1. A band pass filter for h.f. electrical signals, comprising:

a first acoustic surface wave device, having at least two transducers coupled to each other by a piezoelectric body, a first one of the two transducers receiving an electrical signal, the other of the two transducers generating an electrical signal in response to surface waves generated by the first transducer and transmitted by the piezoelectric body, the device having a particular frequency response which includes a particular pass band on account of the signal transmission through surface waves, the device having an additional frequency band outside of the said pass band on account of bulk waves;

a second acoustic surface wave device having at least two transducers coupled to each other by a piezoelectric body, a first one of the two transducers of the second device receiving an electrical signal, the other one of the two transducers of the second device generating an electrical signal in response to surface waves generated by the first transducer of the second device and transmitted by the piezoelectric body thereof, said second device having a substantially similar frequency response and a substantially similar pass band as said first device with regard to surface waves but differing frequency responses with regard to bulk waves; and

circuit means for connecting the second transducer of the first device to the first transducer of the second device to obtain a filter cascade in which said particular pass band of said first device and said substantially similar pass band of said second device coincide and are being cascaded and the bulk wave response of one of the devices is outside of the band pass and off the bulk wave response of the respective other one of the devices and vice versa.

4,044,322

ELECTROMAGNETIC SOLENOID RELAY ASSEMBLY AND ELECTRICAL CONNECTION MEANS THEREFOR

Samuel J. Brown, South Lyon; Gideon A. DuRocher, Mount Clemens, and Gerald L. McClure, Warren, all of Mich., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed July 9, 1976, Ser. No. 703,888
Int. Cl.[2] H01H 67/02
U.S. Cl. 335—131 **4 Claims**

1. An electromagnetic solenoid relay assembly comprising:

an electromagnetic coil assembly including a spool-like bobbin having a bore extending axially therethrough, first and second end flanges on said bobbin, and an electromagnetic coil wound upon said bobbin;

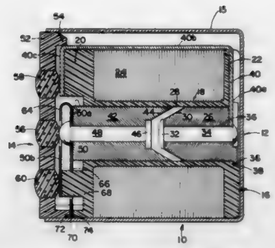
a stationary core member occupying a first end of said bore and secured to said bobbin;

a movable core member slidably located in said bore for movement toward and away from said stationary core member;

electrical contacts on the opposing faces of said stationary and movable cores;

an insulative pressure plate attached to said second end flange, said pressure plate having a plurality of spaced apart electrical contacts located thereon;

spring means for biasing said movable core away from said stationary core;



electrically conductive means for electrically connecting the contact on said stationary core member with one of the electrical contacts on said insulative pressure plate;

said spring means being electrically connected to another one of the electrical contacts on said insulative pressure plate;

electrically conductive means connecting said spring means with the electrical contact on said movable core member; and

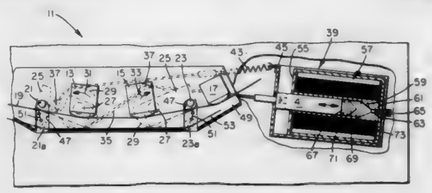
the leads of said electromagnetic coil being connected to electrical contacts on said insulative pressure plate.

4,044,323

DAMPED SOLENOID

Roger R. Sieger, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed May 3, 1976, Ser. No. 682,455
Int. Cl.[2] H01H 51/08
U.S. Cl. 335—240 **5 Claims**



1. A damped solenoid, comprising:

a first magnetizable member having an opening formed therein and a second magnetic movable member fitting within said opening, together with means for magnetizing said first member to move said second member between first and second positions with respect to said first member;

said first member and said second member having confronting portions defining a chamber vented by a restricted orifice; and

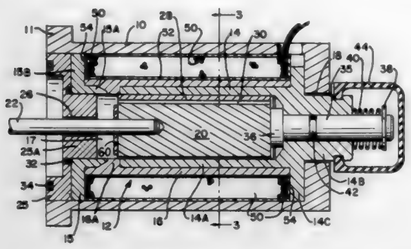
pressure sealing means disposed between said first member and said second member to ensure control of the operating speed of said solenoid by said restricted orifice.

4,044,324

COIL COMPRESSED PLUNGER CAVITY COMPONENTS FOR A WET TYPE SOLENOID

George Thom. Coors, Tipp City, Ohio, assignor to Ledex, Inc., Dayton, Ohio

Filed Apr. 30, 1976, Ser. No. 682,125
Int. Cl.[2] H01F 7/08
U.S. Cl. 335—260 6 Claims



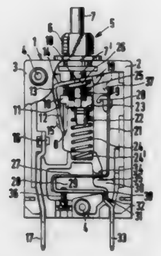
1. In a wet plunger solenoid in which an armature moves within a spool assembly defining an armature cavity subject to extreme hydraulic pressure from within, the improvement for reinforcing said assembly comprising a magnetic base having an inside surface forming at least an axial portion of the wall of said cavity, a sleeve of non-magnetic material fitted in telescopic relation to at least an axial portion of said base and having an outside coil receiving surface, a pole having a portion thereof telescopically received within said sleeve, and an electric coil wound in tension directly on said sleeve outside surface to cause said sleeve to be compressed about said base and pole for increasing the resistance of said assembly against deformation due to hydraulic pressure within.

4,044,325

PUSHBUTTON ACTUATED EXCESS CURRENT SWITCH

Fritz Krasser; Konrad Heydner, and Horst Ellenberger, all of Altdorf, Germany, assignors to Ellenberger & Poensgen GmbH, Altdorf, Germany

Filed Jan. 16, 1976, Ser. No. 649,804
Claims priority, application Germany, Jan. 23, 1975, 2502579; Mar. 14, 1975, 2511223
Int. Cl.[2] H01H 71/58
U.S. Cl. 337—66 14 Claims



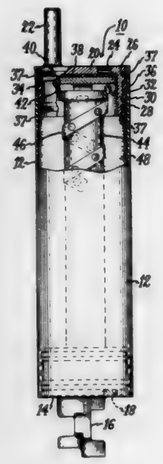
1. A pushbutton actuated excess current switch comprising:
a housing,
a pushbutton slidably mounted in said housing, an actuating rod rigidly connected to the pushbutton,
a connecting bridge rigidly connected to said actuating rod,
a driver member on said connecting bridge, two lugs on said connecting bridge,
a stud rigidly connected to the connecting bridge and pointing in a direction away from the actuating rod, said stud having a spring retaining groove,
a disconnection spring disposed between said stud and an abutment in said housing,
a contact bridge in the form of angled lever freely pivotably carried by said lugs of the connecting bridge and being displaceable in the axial direction of said actuating rod counter to the force of a second spring supported by the connecting bridge,
a dog on said angled lever being arranged to be engaged and entrained by said driver member of the connecting bridge upon switching-on,
an oblique stop in said housing against which the contact bridge is urged by the lugs upon switching-off,
a bimetal strip being directly or indirectly heated and having first and second portions extending substantially at right angles to each other, the first portion which is substantially co-extensive with the actuating rod, having a retaining protuberance which is engageable behind the contact bridge to maintain the contact bridge in the switched-on position, the end of the second portion being connected to a bimetal strip carrier which is co-extensive with the second portion, the carrier having an end portion which is directed away from the bimetal strip and is retained in a groove formed in the housing, the first and second portions of the bimetal strip are of substantially equal length, two substantially semi-circular projections disposed in the housing to retain, with free play, the second portion of the bimetal strip, the two projections being situated on an imaginary line which extends substantially parallel to the first portion and passes through the protuberance of the bimetal strip, a setscrew engageable with the bimetallic strip carrier at a position adjacent the connection to the bimetal strip, the setscrew being rotatable only relative to the housing.

4,044,326

HERMETIC SEAL BETWEEN TELESCOPING CYLINDERS OF A FUSE HOUSING

David A. Rodrigues, Pittsfield, Mass., assignor to General Electric Company

Filed Oct. 9, 1975, Ser. No. 621,017
Int. Cl.[2] H01H 85/14
U.S. Cl. 337—248 6 Claims



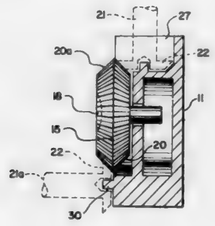
1. An electrical device comprising
a cylindrical housing first member
a cylindrical second member telescopingly fitted inside said housing member,
at least one resilient gasket member between the inner surface of said first member and the outer surface of said second member, said gasket defining one end of an annular space between said first and second members, and
a settable adhesive filling said granular space and rigidly bonding together said first and second members to form an annular hermetic seal.

4,044,327

TRIMMING POTENTIOMETERS WITH COARSE AND FINE ADJUSTMENT MEANS

Derek Taylor, Whitstable, England, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 489,526, July 18, 1974, abandoned.
This application Sept. 7, 1976, Ser. No. 721,024
Claims priority, application United Kingdom, Aug. 1, 1973, 36624/73
Int. Cl.[2] H01C 10/32
U.S. Cl. 338—166 12 Claims



1. A potentiometer drive having a body housing a resistive member and a rotatable member attached to a wiper in contact with said resistive member for varying the position of said wiper thereon, wherein said rotatable member has a peripherally toothed portion and said body is formed with a plurality of pivot points for a rotatable adjusting tool, each of said pivot points being spaced from said periphery toothed portion of said rotatable member by less than the radius of said rotatable member, whereby a toothed adjusting tool can be engaged with any one of said pivot points and with the toothed portion of said rotatable member for adjustment of said rotatable member by rotation of the tool, said pivot points being pegs formed on said body for rotatably fitting within a bore in the nose of an adjusting tool, and being positioned to define different adjustment directions for the tool.

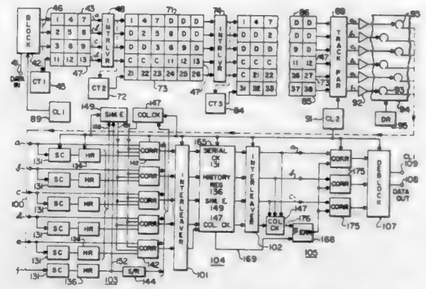
4,044,328

DATA CODING AND ERROR CORRECTING METHODS AND APPARATUS

Anthony P. Herff, Los Angeles, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed June 22, 1976, Ser. No. 698,570
Int. Cl.[2] G06F 11/10
U.S. Cl. 340—146.1 AG 72 Claims

1. In a method of encoding data, the improvement comprising in combination the steps of:
arranging said data in data rows;
providing a first error checking signal for said arranged data;
arranging said first error checking signal in a first correction row accompanying said data rows;
modifying said data in said data rows and said first error checking signal by at least one data characteristic;
providing a second error checking signal for said modified data and first error checking signal;
arranging said second error checking signal in a second correction row accompanying said data rows and first correction row; and
processing said modified data and first error checking signal



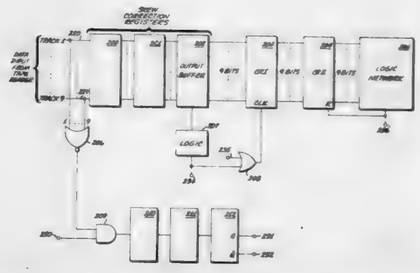
and said second error checking signal in said data rows and said first and second correction rows.

4,044,329

VARIABLE CYCLIC REDUNDANCY CHARACTER DETECTOR

Edward R. Besenfelder, and Jack L. Gooding, both of Phoenix, Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed July 2, 1976, Ser. No. 702,158
Int. Cl.[2] G06K 5/04
U.S. Cl. 340—146.1 F 6 Claims



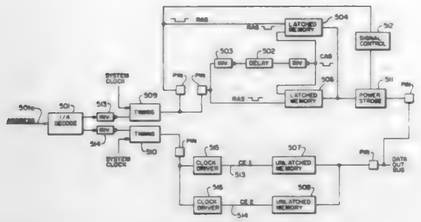
1. A variable cyclic redundancy character detector for use in a magnetic tape unit used in a data processing system comprising:
a. discrimination means for determining whether data or a blank was read from the magnetic tape and what type coding was used in writing the data on the magnetic tape;
b. data shifting means connected to the discrimination means for aligning and shifting the data read from the magnetic tape, the data shifting means further comprising a plurality of data registers;
c. logic means connected to the data shifting means for determining if the cyclic redundancy character has been read, where it is in the data shifting means, and whether or not the cyclic redundancy character was a blank;
d. control signal means connected to the logic means for providing the necessary signals to the logic means to interpret the data being read from the magnetic tape;
e. counting means connected to the logic means for varying the time frame for looking for the cyclic redundancy character from the magnetic tape;
f. parity checking means connected to the data shifting means for determining the validity of the data read from the magnetic tape and for generating a signal each time a byte of data is read from the data shifting means.

4,044,330

POWER STROBING TO ACHIEVE A TRI STATE

Robert B. Johnson, Billerica, and Chester M. Nibby, Jr., Peabody, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed Mar. 30, 1976, Ser. No. 671,802
Int. Cl.² G11C *13/00, 11/40*
U.S. Cl. 340—166 R **9 Claims**



1. In combination with a random access memory array (RAM) having data in and data out lines and enabling means for reading/writing data in or data out of said RAM during one memory cycle of said RAM, said random access memory array (RAM) being comprised of first type memory elements whereby information is retained on said data-out lines for the duration of the memory cycle when an enabling signal on the enabling means is removed, and apparatus for uncoupling said data out lines of said RAM from a data bus comprising:

a. first means, coupled to said data out lines and said data bus for disconnecting said data out lines from said data bus during the memory cycle of said RAM;

b. second means, coupled to said first means, for providing power to said first means, said first means disconnecting said data out lines from said data bus only when power is provided by said second means to said first means;

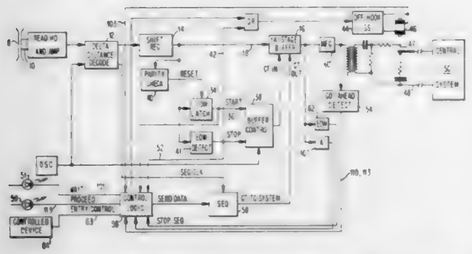
c. third means in said second means for controlling the power to said second means, said third means being comprised of at least two NPN transistors wherein the collector of one of said transistors is coupled to the base of the other of said transistors.

4,044,331

DATA INPUT APPARATUS HAVING BIDIRECTIONAL READER FOR INPUTTING ALTERNATIVE MESSAGES

Frank John Garofalo, Jr., Woodstock, and George Nathan Pardonner, Jr., Saugerties, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 16, 1973, Ser. No. 379,691
Int. Cl.² G06F *11/00;* **G06K** *9/18, 19/06;* **H04Q** *9/00*
U.S. Cl. 340—172.5 **8 Claims**



1. In a data entry system, a bi-directional machine code reader and a document cooperative therewith, said document including a data stripe having code manifesting means readable by said reader in opposite directions, said stripe including start of message and data message codes in a first portion thereof followed by the mirror image of said data message codes and said start of message code in a second portion thereof,

said second portion also including a control code unique to said second portion to distinguish said second portion from said first portion,

said stripe including an end of message code between said data codes and the mirror image thereof to define the boundary between said portions of said stripe,

said reader including start of message and end of message code detector means and storage means controlled thereby to store codes from whichever of said portions is encountered first by the reading of said stripe,

decoder means responsive to said storage means to detect said control code if present in the codes stored therein, and

means responsive to the detection of said control code by said decoder means to generate an output signal to an external device,

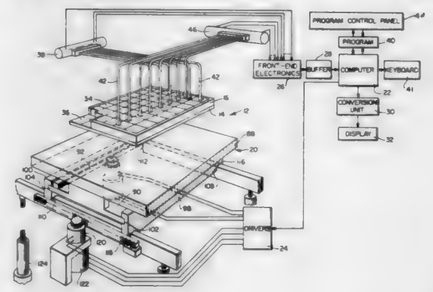
said output signal being indicative that said stripe has been read from the end thereof bearing said second portion.

4,044,332

HALFTONE DISPLAY, PARTICULARLY FOR A HIGH RESOLUTION RADIOACTIVITY DISTRIBUTION DETECTION SYSTEM

Raymond P. Grenier, Wilmington, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Continuation of Ser. No. 348,993, April 9, 1973. This application June 9, 1975, Ser. No. 585,329
Int. Cl.² G01T *1/20;* **G06G** *3/14;* **178** *6.7 R;6.6 R;6.6 B;6.8*
U.S. Cl. 364—900 **9 Claims**



1. A device for presenting a halftone pictorial representation of radioactivity distribution within a specimen, said device comprising:

a. means for detecting a number of radioactive events at X, Y locations within the specimen;

b. computer means operatively connected to said detecting means for generating coded signals proportional to the number of radioactive events detected at each X, Y location;

c. display means for presenting a pictorial representation comprised of a plurality of like profile picture elements, each said picture element defining a matrix having a plurality of like profile sections; and

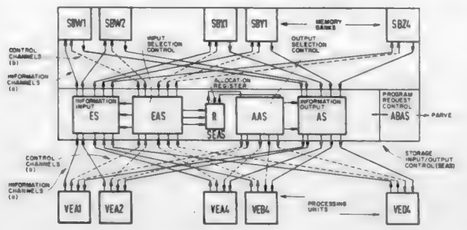
d. conversion means operatively connected to said computer means and display means, said coded signal selectively applied to said display means via said conversion means, said conversion means generating character code signals in response to said coded signals, said character code signals representing a specified number of dot elements per unit area for each said picture element, the number of dot elements per unit area in each said picture element defining a shade in the Gray scale, said dot elements and said sections having like profiles, said pictorial representation presented by said display means being a halftone presentation of radioactivity distribution within the specimen.

4,044,333

DATA PROCESSING SWITCHING SYSTEM

Heinz Auspurg, Gauting, and Josef Huber, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 377,129, July 6, 1973. This application Feb. 18, 1975, Ser. No. 550,610
Claims priority, application Germany, July 26, 1972, 2236718
Int. Cl.² G06F *13/00*
U.S. Cl. 364—200 **13 Claims**



1. A data processing switching system comprising a plurality of processing units, a plurality of memory banks, and a storage input/output control system governing the information traffic between said processing units and said memory banks, said storage input/output control system comprising an input circuit and an output circuit as well as an input control unit and an output control unit cooperating with said input and output circuits for establishing and controlling said information traffic over parallel information channels connecting said processing units and said memory banks via said input and output circuits, said input control unit being associated with said processing units said output control unit being associated with said memory banks,

wherein each of said plurality of processing units (VE) is selectively assigned to one group of a plurality of processing groups and each of said plurality of memory banks (SB) is selectively assigned to one group of a plurality of memory groups, the number of groups in both said plurality of processing groups and said plurality of memory groups being equal to the number of parallel information channels simultaneously available to said input and output control units for establishing and controlling traffic between the processing units and the memory banks, each of said processing units within each of said plurality of processing groups having an assigned priority of the first order relative to the other processing units in the same group in said plurality of processing groups and each of said memory banks within each of said plurality of memory groups having an assigned priority of the first order relative to the other memory banks in the same group in said plurality of memory groups, and each group in said plurality of processing groups and each group in said plurality of memory groups having an assigned priority of the second order relative to the other groups in said plurality of processing groups and said plurality of memory groups, respectively,

said plurality of processing units each including means for sending input requests to said input/output control system and said plurality of memory banks each including means for sending output requests to said input/output control system,

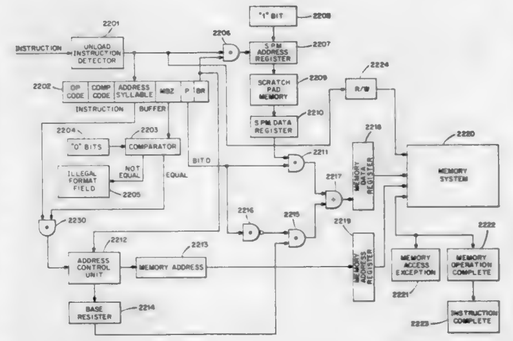
said input control unit and said output control unit including means for evaluating said input and output requests, respectively, during each operating interval of the input-/output control system according to the assigned priority of the plurality of processing units and plurality of memory banks, said input control unit and said output control unit each further including means for comparing said input and output requests on the basis of their respective memory bank and processing unit destinations, whereby said evaluating and comparing means enable said input-/output control system during each operating interval to simultaneously connect information channels between one or more of said plurality of processing units requesting an input and one or more of said plurality of memory banks requesting an output and their respective destinations according to the assigned priority of said plurality of processing units and said plurality of memory banks, the number of possible simultaneous connections being equal to said number of parallel information channels simultaneously available to said input and output control units.

4,044,334

DATABASE INSTRUCTION UNLOAD

Charles W. Bachman, Lexington, and Benjamin S. Franklin, Cambridge, both of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 19, 1975, Ser. No. 588,522
Int. Cl.² G06F *9/10, 9/16, 9/20, 13/00*
U.S. Cl. 364—200 **10 Claims**



1. In an internally programmed data processing apparatus having a memory comprised of a plurality of segments of addressable space, each segment having a segment number, each of said segments delineated by upper and lower variable bounds, each of said segments being further subdivided into at least one page located at a predetermined displacement address within said segment and having an identifying page number, each of said pages for storing a plurality of files of database records grouped in sets of database records, each set having at least one owner record, each of said pages also including offset address information for locating any one of said database records of a selected one of said sets from a predetermined location in a selected one of said pages; said data processing apparatus also having a system base for locating relative to said system base the absolute address of predetermined ones of said segments, pages and database records; said data processing apparatus further having an index register for storing a selected database-index address comprised of a database pointer address for forming a next address of a predetermined one of said database records, each of said database records having at least one of said database pointers comprised of an area, page and line address, said area address for locating a predetermined file of said database records, said page address for locating a predetermined group of said database records within said file, and said line address for locating a predetermined one of said database records; instruction hardware, responsive to an unload instruction having an address syllable, for unloading said database pointer from said index register and placing it in said database record, comprising:

a. first means coupled to be responsive to said database pointer address stored in said index register for converting said database pointer address to an equivalent segmented number of a segment storing a selected one of said database records in a selected one of said sets;

b. second means coupled to be responsive to said first means and said address syllable register in said unload instruction register for storing a displacement address of said selected one of said database records from a predetermined address in said segment;

c. third means coupled to be responsive to said first and second means for generating an absolute address of said selected one of said database records in said memory; and,

d. fourth means coupled to be responsive to said first, second and third means for transferring said database pointer address stored in said index register into said selected one of said database records.

4,044,335

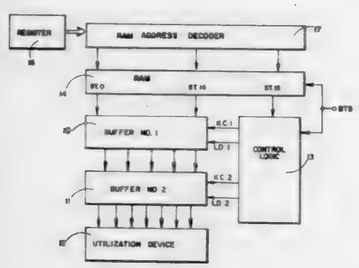
MEMORY CELL OUTPUT DRIVER

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 508,297, Sept. 23, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 713,029

Int. Cl.² G06F *3/00, 5/04*

U.S. Cl. 364—900 **7 Claims**



1. In combination,

first memory means for receiving and storing information therein,

said first memory means comprising a plurality of memory cells, each of said memory cells having respective input and output means,

second memory means for receiving and storing the information from said first memory means,

said second memory means comprising a plurality of memory cells, each of said memory cells having respective input and output means, the respective output means of said memory cells comprising said first memory means connected to the respective input means of the memory cells comprising said second memory means,

first control means connected to said first memory means to selectively address the plurality of memory cells comprising said first memory means to selectively enable each of said memory cells to receive information one at a time, said first control means generating a load-complete signal indicating that information entry into the memory cells comprising said first memory means is complete, and

second control means connected to each of said first and second memory means and responsive to said load-complete signal of said first control means to control transferring the information that is stored in said first memory means to said second memory means and to control clearing said second memory means prior to permitting said information to be received by and stored in said second memory means.

4,044,336

FILE SEARCHING SYSTEM WITH VARIABLE RECORD BOUNDARIES

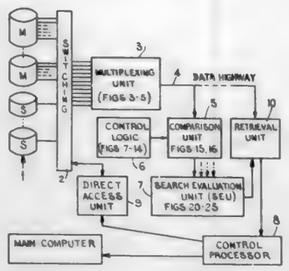
Edward Babb, Stevenage, England, assignor to International Computers Limited, Stevenage, England

Filed Aug. 6, 1975, Ser. No. 602,274

Claims priority, application United Kingdom, Feb. 21, 1975, 7291/75

Int. Cl.² G06F *15/40, 13/00*

U.S. Cl. 364—900 **3 Claims**



1. A data processing system comprising:

a. a data store holding a plurality of groups of data, each group being terminated by a data item having one of a plurality of different values;

b. a plurality of key stores holding a plurality of search keys;

c. a plurality of comparison means connected in parallel to receive data from the data store, for comparing the data with respective ones of the search keys to produce a plurality of comparison result signals;

d. a writable store containing a threshold value;

e. end-of-record detection means connected to receive data from the store concurrently with the reception of that data by the comparison means, for comparing each said data item which terminates a group of data with said threshold value to produce an end-of-record signal when this comparison produces a predetermined result; and

f. processing means connected to receive said comparison result signals from the comparison means and responsive to said end-of-record signal to form a predetermined logical combination of said comparison result signals, thereby indicating whether the data satisfies a predetermined search criterion.

4,044,337

INSTRUCTION RETRY MECHANISM FOR A DATA PROCESSING SYSTEM

Glen LeRoy Hicks, Endwell; Leland Delmar Howe, Jr., Owego, and Frank Anthony Zurla, Jr., Binghamton, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,998

Int. Cl.² G06F *11/00*

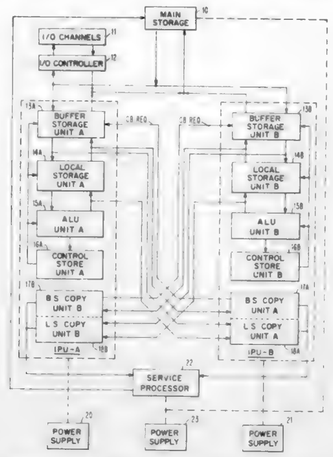
U.S. Cl. 364—200 **10 Claims**

1. In a data processing system having a data store and address circuitry for accessing such data store, the combination comprising:

a copy store system having a set of at least two separately addressable copy storage locations for each of a plurality of data store addresses;

circuitry for supplying to the copy store system the same data as is supplied to the data store for storage therein;

and copy store address circuitry responsive to the address supplied to the data store address circuitry for controlling the address at which the data is copied in the copy store system, such copy store address circuitry including circuitry for causing data stored at the same data store address during different data processing instruction cycles to



be alternately copied into different ones of the copy storage locations in the same copy store set.

4,044,338

ASSOCIATIVE MEMORY HAVING SEPARATELY ASSOCIABLE ZONES

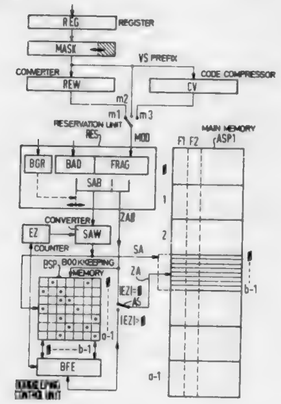
Gerhard Wolf, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,615

Claims priority, application Germany, Feb. 10, 1975, 2505477

Int. Cl.² G06F *13/00;* **G11C** *15/00*

U.S. Cl. 340—172.5 **4 Claims**



1. In an associative memory of the type wherein there are separately associable zones, a linearly addressable main memory for input and read out of data consisting of an associative component and a non-associative component, a comparator for comparing the read-out association words with the search word, a device including address converters for deriving addresses from at least the higher-value bits of association and search words, and an extension counter connected to the address converters whose count influences the derivation of the addresses and whose count is increased by one in response to an initially addressed storage position being occupied, the improvement therein comprising:

a reservation unit connected in front of said device which includes said address converters, said reservation unit including a shift network for receiving zone delimiting control information and a selected part of the lower-value bits of a zone address and a fragment which is a selected part of the higher-value bits of a primary bit group having a width 1 and derived from the association and search words, and responsive thereto to derive and provide said device including address converters with a secondary bit group having a width 1 of a complete address in order for the address converters to provide, in conjunction with said extension counter, a memory address.

4,044,339

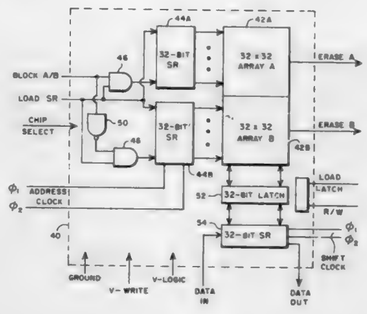
BLOCK ORIENTED RANDOM ACCESS MEMORY

Robert O. Berg, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Dec. 15, 1975, Ser. No. 641,044

Int. Cl.² G11C *8/00*

U.S. Cl. 340—173 R **3 Claims**



1. An integrated circuit for use in a block oriented random access memory, the integrated circuit comprising:

a memory block for storing a plurality of words, the memory block comprising an N × M memory array having N words of M bits each;

terminal means for receiving block select signals;

sequential addressing means associated with the memory block for sequentially addressing each word of the memory block in a predetermined order when the memory block is selected, the sequential addressing means comprising an N bit shift register wherein each bit of the N bit shift register is connected to one of the N words of the N × M memory array and wherein each word of the N × M memory array is addressed when the bit of the N bit shift register to which it is connected attains a first level;

loading means for loading a signal of the first level in one end of the N bit shift register when the memory block is selected, and wherein the shift register is adapted to receive clock signals and to shift sequentially the signal of the first level from the one end of the N bit shift register to an opposite end, and then off the end, in response to the clock signals, whereby each word of the memory block is sequentially addressed in a predetermined order;

data input means for entering data into each addressed word in response to an input signal; and

data output means for reading out data from each addressed word in response to an output signal.

4,044,340

SEMICONDUCTOR MEMORY

Kiyoo Itoh, Higashi-kurume, Japan, assignor to Hitachi, Ltd., Japan

Filed Dec. 29, 1975, Ser. No. 645,306

Claims priority, application Japan, Dec. 25, 1974, 49-148056

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **17 Claims**

14. A random access semiconductor memory comprising:

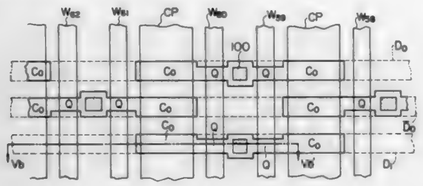
first and second data line portions disposed parallel and adjacent to each other

a plurality of first word lines orthogonally crossing over each of said data line portions;

a plurality of memory cells, disposed at the cross points of said first word lines and one of said data line portions, each of which memory cells is capable of storing selected information to be written therein and is capable of reading out information stored therein, each memory cell having an address terminal connected to a respective word line so that each word line is connected to the address terminal of only one memory cell, and having a data terminal connected to one of said data line portions;

a differential amplifier connected to each of said data line portions for differentially amplifying signals supplied thereby;

means, connected to said differential amplifier and said data line portions, for deriving output signals representative of signals on said pair of data line portions;



a pair of second word lines orthogonally crossing over each of said data line portions;

a first dummy memory cell, disposed at the crosspoint of one of said second word lines and said first data line, and being capable of storing selected information to be written therein, and being capable of reading out information stored therein, and having an address terminal connected to said one of said second word lines, and having a data terminal connected to said first data line portion; and

a second dummy memory cell, disposed at the crosspoint of the other of said second word lines and said second data line, and being capable of storing selected information to be written therein, and being capable of reading out information stored therein, and having an address terminal connected to said other of said second word lines, and having a data terminal connected to said second data line portion.

4,044,341

MEMORY ARRAY

Roger Green Stewart, Neshanic Station, and Joel Roy Oberman, Somerville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 22, 1976, Ser. No. 668,909
Int. Cl.² G11C *11/00*
U.S. Cl. 340—173 R **9 Claims**

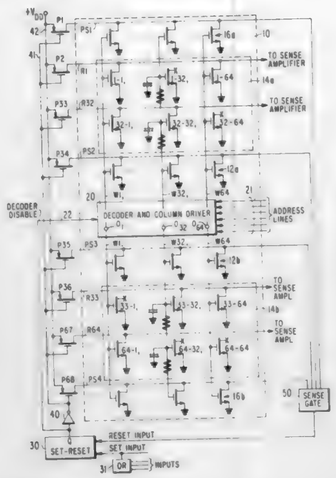
1. The combination comprising:

a matrix array of row and column conductors, the intersection of each row and column conductor defining a bit location and each bit location storing binary data; said array being characterized in that corresponding to the enabling of a column conductor, the row conductors remain charged at a first level or are placed at a second level depending on the value of the binary data at the intersection of a row and the enabled column;

an additional row conductor storing the same binary data at every one of its bit locations of a value for placing said row conductor at said second level each time a column conductor is enabled;

a set-reset circuit having input means; and an output; said circuit being responsive to a set signal at its input means for setting and maintaining its output at a first binary condition, and responsive to a reset signal at its input means for setting and maintaining its output at the other binary condition;

charging means responsive to the output of said set-reset circuit, connected to each row conductor including said additional row conductor for charging all of said row conductors to said first level in response to the presence of said first binary condition; and



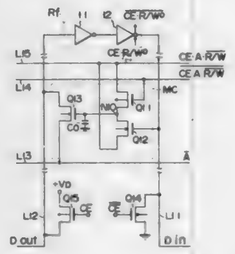
sensing means having an input connected to said additional row conductor and having an output connected to said input means of said set-reset circuit, said sensing means being responsive to the level to which said additional row conductor is charged and producing a reset signal to said set-reset circuit for terminating the charging of said row conductors when the level on said additional row conductor reaches a predetermined value.

4,044,342

DYNAMIC TYPE SEMICONDUCTOR MEMORY DEVICE

Yasoji Suzuki, Ayase, and Kiyofumi Ochii, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1976, Ser. No. 679,177
Claims priority, application Japan, Apr. 22, 1975, 50-48953
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 DR **13 Claims**



1. A dynamic type semiconductor memory device comprising a refresh circuit, a plurality of semiconductor memory cells which are connected across a data input line and a data output line, a plurality of read/write command signal line and a plurality of word selection lines which are provided for each of said semiconductor memory cells, each of said semiconductor memory cells comprises serially connected first and second transistors of the opposite polarity, the gate electrodes of said

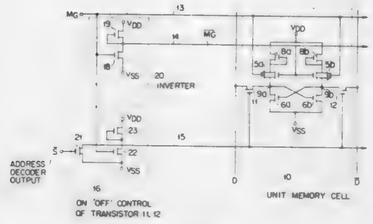
first and second transistors being connected to said read/write command signal line and said data input line, respectively, a third transistor connected across said data output line and said word selection line, the gate electrode of said third transistor being connected to the node between said first and second transistors, and a parasitic capacitance formed at the common node between said first, second and third transistors for storing data.

4,044,343

NON-VOLATILE RANDOM ACCESS MEMORY SYSTEM

Yukimasa Uchida, Yokohama, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Apr. 29, 1976, Ser. No. 681,557
Claims priority, application Japan, May 2, 1975, 50-52494
Int. Cl.² G11C *11/40*
U.S. Cl. 340—173 R **4 Claims**



1. A random access non-volatile memory system comprising:

a memory array circuit having a plurality of unit non-volatile memory cells arranged in a matrix array, each unit non-volatile memory cell including a volatile binary logic circuit and a non-volatile semiconductor memory element into which a data in the volatile binary logic circuit is written and from which the data written is transferred to the binary logic circuit;

cell selecting means including a decoder for decoding a plurality of address signals, and supplying the output of the decoder to the memory array circuit to select one of the unit memory cells;

a data input and output circuit supplying an input data to the selected unit memory cell and delivering a data read out of the unit memory cell;

a voltage variation detector circuit adapted to detect the variation of a source voltage supplied to the memory array circuit and generate a control signal for controlling, according to a detected output, a data transfer between the binary logic circuit and the non-volatile memory element; and

means for interrupting in synchronism with the control signal a data transfer path between the selected unit memory cell and the input-output circuit.

4,044,344

METHOD OF AND APPARATUS FOR MEASURING INFORMATION HOLD TIME OF MEMORY CELL IN DYNAMIC MIS MEMORY

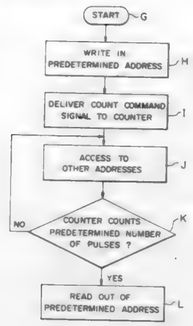
Hidetsugu Wada, Kokubunji; Yoichi Asano, Tokyo, and Yoshikazu Suzumura, Fuchu, all of Japan, assignors to Hitachi, Ltd., Japan

Filed May 12, 1976, Ser. No. 685,808
Claims priority, application Japan, May 28, 1975, 50-62901
Int. Cl.² G11C *11/40, 7/06*
U.S. Cl. 340—173 DR **2 Claims**

1. A method of measuring the information hold time of memory cell in a MIS dynamic memory having a plurality of memory cells, comprising the steps of:

writing and storing information in a memory cell at a predetermined address of said memory;

carrying out the access to other plural addresses for a fixed time period without refreshing said memory cell of said predetermined address; and



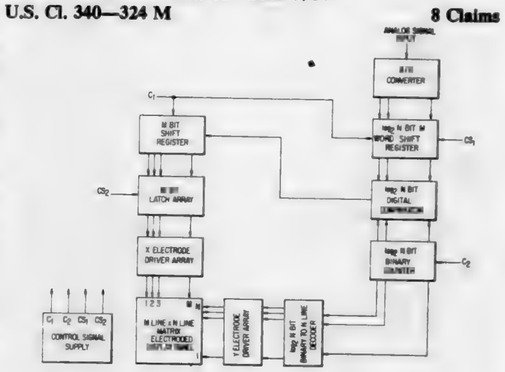
thereafter reading the stored information out of said memory cell of said predetermined address and comparing the level of the read information with a predetermined threshold value.

4,044,345

METHOD FOR ADDRESSING X-Y MATRIX DISPLAY CELLS

Fumio Ueda, and Hirotsugu Arai, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 453,065, March 20, 1974. This application Oct. 21, 1975, Ser. No. 624,427
The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.
Int. Cl.² G06F *3/14*
U.S. Cl. 340—324 M **8 Claims**



1. A matrix addressing method for a group of X-Y matrix display cells having an X_i-Y_j two-dimensional matrix electrode structure (where i equals 1,2,3, . . . , M, and j equals 1,2,3, . . . , N) during an N time frame period comprising the steps of:

applying an X_i-electrode voltage e_{Xi} having a binary value of one or zero to the 1,2,3, . . . , M electrodes in such a manner that predetermined number of binary is applied during each time frame;

applying a Y_j-electrode voltage e_{Yj} having a binary value of one or zero sequentially to the 1,2,3, . . . , N Y_j electrodes in such a manner that a binary one is only applied to the first electrode during the first time frame, a binary one is only applied to the second electrode during the second time frame, a binary one is only applied to the third electrode during the third time frame, . . . , and a binary one is

only applied to the Nth electrode during the Nth time frame; and

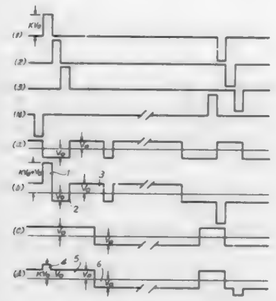
addressing matrix display cells P_{ij} in response to the timing at which the electrode voltages e_{Xi} and e_{Yj} assume individual binary states.

4,044,346

DRIVING METHOD FOR LIQUID CRYSTAL DISPLAY

Masao Akahane; Minoru Hosokawa, both of Suwa, and Kanemitsu Kubota, Shiojiri, all of Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 6, 1975, Ser. No. 584,310
Claims priority, application Japan, June 6, 1974, 49-64205
Int. Cl.² G02F 1/13
U.S. Cl. 340—336 **11 Claims**



1. A liquid crystal display having first and second sets of electrodes; liquid crystal material; means supporting said first and second sets of electrodes on opposed sides of said liquid crystal material to define, by overlapping regions of said first and second sets of electrodes, a plurality of regions of said liquid crystal material; and means for applying driving signals to said first and second electrodes for selectively rendering selected of said regions visually identifiable and not visually identifiable, said driving means being adapted to sequentially and repetitively apply driving timing signals to selected of said electrodes associated with said regions of said liquid crystal material to be rendered visually identifiable, said driving circuit means being adapted so that the ratio of the effective value of the voltage applied between the overlapping electrodes of said first and second sets of electrodes associated with a region of said liquid crystal material to be rendered visually identifiable, to the effective value of the voltage applied across the overlapping electrodes defining a region of the liquid crystal material not rendered visually identifiable, is maximum, said driving timing signal being applied sequentially and periodically to N electrodes, each of said N electrodes being one of the electrodes defining each region of the liquid crystal material to be rendered visually identifiable, said driving means being adapted so that the voltage applied across the electrodes defining each region of the liquid crystal material to be rendered visually identifiable is $(\sqrt{N} + 1)$ times as high as the voltage applied across a region of liquid crystal material not rendered visually identifiable.

4,044,347

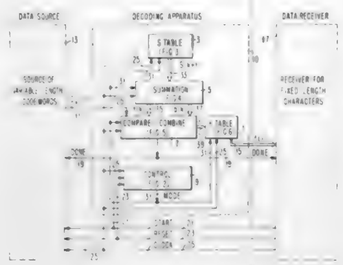
VARIABLE-LENGTH TO FIXED-LENGTH CONVERSION OF MINIMUM-REDUNDANCY CODES

David Curtis Van Voorhis, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 19, 1975, Ser. No. 578,959
Int. Cl.² H03K 13/24
U.S. Cl. 340—347 DD **13 Claims**

1. Apparatus for converting the code words of variable length codes into corresponding fixed-length characters, comprising:

a table storage for storing two tables, a first table containing the fixed-length characters, and a second table whose values $s(1)$, $s(2)$, . . . uniquely identify the variable length code;



summation circuitry including means operative as the successive code word bits are received to calculate from elements of the second table successive values of a weighted sum $t(1)$, $t(2)$, . . . and an unweighted sum $b(1)$, $b(2)$, . . . according to the relation:

$$t(k) = \sum_{j=1}^{k} 2^{k-j} s(j),$$

$$b(k) = \sum_{j=1}^{k} s(j);$$

compare/combine circuitry adapted to accept as input the successive bits of a code word to be converted into its corresponding fixed character, connected to said summation circuitry, responsive to the successive values of said weighted sum to isolate the bits comprising the code word;

said compare/combine circuitry further including means for adding said code word to the unweighted sum and subtracting the weighted sum to provide a fixed-length integer; and

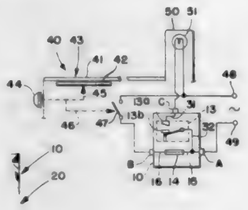
means responsive to said integer to index said table of fixed-length characters.

4,044,348

CIRCUIT ENERGIZATION INDICATOR WITH THERMAL TIMING MEANS TO MAINTAIN THE INDICATION FOR A PREDETERMINED TIME AFTER DE-ENERGIZATION

Richard G. Huebscher, Cleveland, Ohio, assignor to Gould Inc., Chicago, Ill.

Filed Sept. 22, 1975, Ser. No. 615,566
Int. Cl.² H01H 37/08, 61/02
U.S. Cl. 340—227.1 **23 Claims**



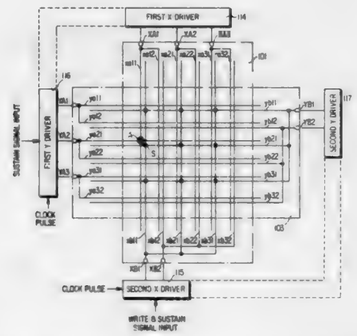
1. A thermal timer, comprising storage means for storing thermal energy in a thermally insulative environment having a predetermined thermal energy leakage rate, supply means for supplying thermal energy to said storage means to change the temperature of the latter from one to another temperature, and thermally responsive output means for producing a distinguishable output in response to the temperature thereof, said output means being positioned relative to said supply means to produce such distinguishable output promptly upon the initiation of the latter to supply such thermal energy, and said output means also being positioned relative to said storage means to produce such distinguishable output in response to and generally indicative of the temperature of said storage means after said supply means ceases to supply such thermal energy, the duration of continued production of such distinguishable output after termination of a supply of thermal energy by said supply means to said storage means being proportional to such thermal leakage rate.

4,044,349

GAS DISCHARGE PANEL AND METHOD FOR DRIVING THE SAME

Shizuo Andoh, and Norihiko Nakayama, both of Kobe, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Sept. 20, 1974, Ser. No. 507,797
Claims priority, application Japan, Sept. 21, 1973, 48-106730
Int. Cl.² G06F 3/14
U.S. Cl. 340—324 M **6 Claims**



1. A method of driving a gas discharge panel having first and second substrates disposed in spaced, parallel relationship and sealed to confine an ionizable gas therebetween, first and second sets of plural electrode pairs supported on said first and second substrates, respectively, and disposed in orthogonal relationship to establish four points of intersection between each electrode pair of said first set and each electrode pair of said second set defining respectively corresponding discharge points with addresses determined by the electrodes associated with the said points of intersection, a discharge at a given first one of said four intersection points defined by a first electrode in a given pair in each of said sets as a write-in point requiring that a voltage of a predetermined first level in excess of a firing voltage be applied to the first electrodes of said first and second sets intersecting at that point, the discharge at a given second one of said four intersection points defined by a second electrode in said given pair in each of said sets as a display point requiring that a voltage of a level less than said firing voltage be applied to the second electrodes of said first and second sets intersecting at that given display point when a discharge is produced at its corresponding given write-in point, said method comprising the steps of:

identifying a pair of electrodes of each of said first and second sets corresponding to the address of points of intersection at which a discharge is to be established;

applying a write voltage having a value greater than said firing voltage to a first electrode of the identified pair of each of said first and second sets corresponding to the addressed write-in point to establish a discharge at the write-in point of the said first electrodes of said identified pairs of said first and second sets, and

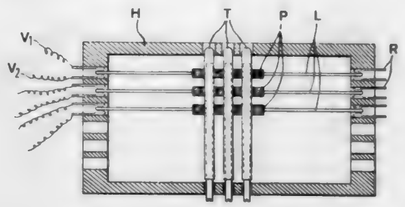
selectively applying an energizing voltage having a value less than said firing voltage to second electrodes of said identified pairs of said first and second sets thereby to establish a discharge at the display point of said second electrodes of said identified pairs of said first and second sets in accordance with the discharge established at the write-in point of said first electrodes of the respectively corresponding, identified pairs of said first and second sets.

4,044,350

ELECTROMECHANICAL TRANSDUCER FOR RELIEF DISPLAY PANEL

Oleg Tretiakoff, and Andrée Tretiakoff, both of 43 avenue Lulli, Sceaux, France (92330)

Filed Aug. 19, 1975, Ser. No. 605,853
Claims priority, application France, Aug. 22, 1974, 74.28793
Int. Cl.² G09F 9/32
U.S. Cl. 340—407 **20 Claims**



1. An electromechanical transducer device comprising:

a bimorphous piezoelectric reed bendable around an axis perpendicular to the longitudinal axis of the reed on the application of a DC voltage;

support means for each end of said reed;

coupling means supported on said reed;

a rod arranged transversely to said piezoelectric reed and coupled to said coupling means;

and means for applying a DC voltage to said reed;

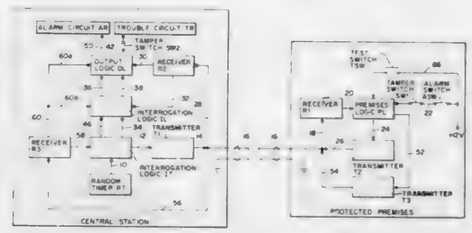
whereby on the application of said voltage the bending of the reed causes static displacement of said rod in the direction of its own longitudinal axis.

4,044,351

SYSTEM MONITOR WITH INNATE LINE SECURITY ABILITY

Evan Philip Everson, Cedar Rapids, Iowa, assignor to Walter Kidde & Company, Inc., Clifton, N.J.

Continuation of Ser. No. 482,231, June 24, 1974. This application May 3, 1976, Ser. No. 682,382
Int. Cl.² G08B 23/00; H04Q 9/00
U.S. Cl. 340—408 **12 Claims**



1. A system for monitoring a protected premises from a central station including apparatus for location at the protected premises and apparatus for location at the central station and for interconnection by electrical lines, the central apparatus comprising generating means for generating first pulses at random time intervals, first transmitter means responsive to said first pulses for generating first tones having a first fre-

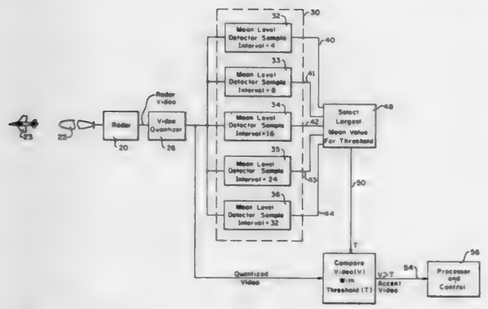
quency at sequential intervals substantially contemporaneous with those of said first pulses and of substantially like durations and for transmitting said first tones over the lines to the premises apparatus; the premises apparatus comprising premises logic means, first receiver means for receiving said first tones and providing second pulses to said premises logic means at sequential intervals substantially contemporaneous with those of said first pulses and of substantially like durations, second transmitter means operatively connected to said first receiver means through said premises logic means and responsive to said second pulses for generating second tones having a second frequency different from that of said first tones but at sequential intervals substantially contemporaneous with those of said first pulses and of like durations and for transmitting said second tones over the lines to the central apparatus substantially simultaneously with the transmission thereover of said first tones; the central apparatus further comprising second receiver means for receiving said second tones and providing third pulses at sequential intervals substantially contemporaenous with those of said first pulses and of substantially like durations, central logic means operatively connected to said generating means and said second receiver means for ascertaining the presence or not of both said first and said third pulses at the central apparatus at substantially contemporaneous times; the premises apparatus still further comprising a first alarm circuit responsive to an alarm condition at the protected premises, the first alarm circuit including said premises logic means and third transmitter means for generating a third tone having a third frequency different from those of said first and second tones, said premises logic means operatively disconnecting said first receiving means from said second transmitting means and activating said third transmitter in the event of said condition, said third transmitter means transmitting said third tone over the lines to the central apparatus substantially simultaneously with the transmission thereover of said first tones to the premises apparatus; the central apparatus still further comprising a second alarm circuit including third receiver means for receiving said third tone.

4,044,352

SIGNAL PROCESSOR

Richard D. Wilmot, Buena Park, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 23, 1974, Ser. No. 535,869
Int. Cl.² G01S 9/02
U.S. Cl. 343—5 VQ **8 Claims**



1. A clutter processor for providing a signal threshold and responding to a source of video signals, the source receiving the video signals over a range distance comprising:

an early and late plurality of detecting means coupled to said source of video signals, each early and late detecting means sampling over a range interval of a different time interval from the other range intervals of the corresponding early and late detecting means to form a plurality of sample intervals, each plurality being respectively before and after the time of occurrence of a video signal, each detecting means determining a signal related to the clutter amplitude, and

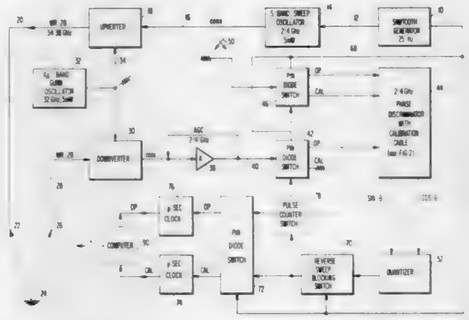
signal selection means coupled to said early and late plurality of detecting means for selecting as a function of amplitude one of the signals from said early or late detecting means related to the clutter amplitude as a threshold so as to substantially match the corresponding sample interval to the range interval of clutter.

4,044,353

MICROWAVE LEVEL GAGING SYSTEM

Ralph Levy, Newton, Mass., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,168
Int. Cl.² G01S 9/38
U.S. Cl. 343—12 R **21 Claims**



11. A liquid level measuring method, which comprises the steps of:

generating a broad-band, swept-frequency, continuous wave, microwave signal;

transmitting said microwave signal in a narrow beam onto a liquid surface being measured;

receiving a portion of said microwave signal reflected from said liquid surface;

comparing said reflected signal with a portion of said generated signal during a first predetermined interval while said generated signal is being swept across the frequency band in a measuring direction, and generating a first phase angle signal proportional to the phase angle between said generated and said reflected signal;

quantizing said first phase angle signal to produce a standard pulse output at each of a plurality of equally spaced predetermined phase angles, said pulses comprising a first pulse train proportional to the change in said phase angle during said first predetermined interval;

transmitting at least a portion of said generated microwave signal through a calibration conductor having a length equivalent to a known free-space path length L_c;

comparing said signal passed through said calibration conductor with a portion of said generated microwave signal during a second predetermined interval that is equal and adjacent to said first predetermined interval while said generated microwave signal is being swept across the frequency band in said measuring direction, and generating a second phase angle signal proportional to the phase angle between said generated microwave signal and said signal from said calibration conductor;

quantizing said second phase angle signal to produce said standard pulse outputs at each of said plurality of equally spaced phase angles, said pulses comprising a second pulse train proportional to the change in phase angle during said second predetermined interval;

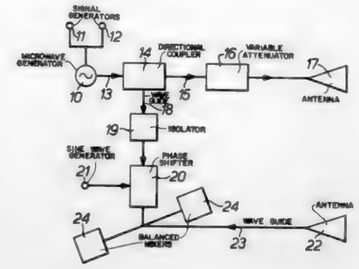
comparing said first and second pulse trains; and calculating the path length L of the reflected signal, corresponding to a particular level of the liquid, from said comparison of the first and second pulse trains, and the known freespace path length L_c of said calibration conductor.

4,044,354

DISTANCE MEASUREMENT USING MICROWAVES

David Robert Bosher, Hayes, and John Folkard, Waltham Cross, both of England, assignors to British Steel Corporation, London, England

Filed Mar. 6, 1973, Ser. No. 338,619
Claims priority, application United Kingdom, Mar. 15, 1972, 12115/72
Int. Cl.² G01S 9/28
U.S. Cl. 343—14 **10 Claims**



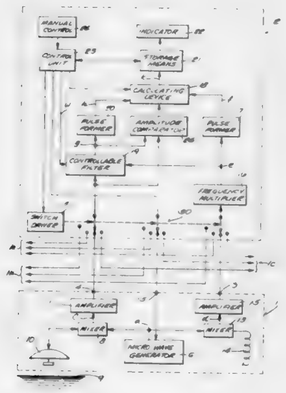
1. A method for determining the distance from an object including, generating a micro-wave frequency carrier wave, simultaneously modulating the carrier wave at two different frequencies to provide a modulated signal, directing a first portion of the modulated signal towards the object and receiving a reflected signal from the object directing a second portion of the modulated signal to form a reference signal non-linearly, cyclically varying the phase of one portion of the modulated signal, mixing the reflected signal with the reference signal, and detecting the difference frequency between the reflected signal and the reference signal, said difference frequency being proportional to the distance to be determined.

4,044,355

MEASUREMENT OF CONTENTS OF TANKS ETC. WITH MICROWAVE RADIATIONS

Kurt Olov Edvardsson, Linkoping, Sweden, assignor to Saab-Scania Aktiebolag, Linkoping, Sweden

Continuation-in-part of Ser. No. 524,143, Nov. 15, 1974, abandoned. This application Feb. 13, 1976, Ser. No. 658,075
Claims priority, application Sweden, Nov. 20, 1973, 7315649
Int. Cl.² G01S 9/24
U.S. Cl. 343—14 **8 Claims**



8. A method of measuring distance to a target surface by generating a microwave signal that varies in frequency substantially regularly through a predetermined time period, radiating a first part of said generated signal towards the target surface to produce a return signal reflected from the target surface, and mixing said return signal with a second part of the generated signal to obtain an oscillatory output having a difference frequency which is a function of the distance to be measured, said method being characterized by steps which enable a final output to be obtaned that accurately denotes the distance travelled by the return signal notwithstanding any irregularities in said oscillatory output that are due to disturbances in the return signal and lack of perfect regularity in the frequency variation of the generated microwave signal, said steps comprising:

A. producing a second oscillatory output having a reference frequency which is substantially higher than that of the first oscillatory output by

1. mixing a third part of said generated signal with a fourth part thereof that has been subjected to a predetermined delay and
2. multiplying by a fixed constant value the difference frequency signal obtained as a result of the last mentioned mixing;

B. producing

1. a first pulsing output that provides a pulse for every half-cycle of said first oscillatory output, and
2. a second pulsing output that provides a pulse for every half cycle of said second oscillatory output;

C. assigning a numerical weighting factor to each of the successive short time intervals that begins with the issuance of each pulse of said first pulsing output during a major portion of said time period, which weighting factor is equal to $n(N-n)$, where

N denotes the number of said time intervals in said portion of said time period, and

n denotes the ordinal number of the particular time interval in said time period;

D. multiplying each pulse of the first pulsing output issued during said portion of said time period by the value of $n(N-n)$ for the time interval in which such pulse is issued;

E. storing the products of all such multiplications during the time period to obtain a first weighted pulse count;

F. multiplying each pulse of said second pulsing output by the value of $n(N-n)$ for the time interval in which that pulse is issued;

G. storing the products of all of the last mentioned multiplications during said time period to obtain a second weighted pulse count; and

H. at the conclusion of said time period producing an output which corresponds to a quotient relationship between said first and second weighted pulse counts and which consitutees said final output.

4,044,356

PROCESS AND DEVICE FOR CORRELATION FOR USE IN A DOPPLER RADAR INSTALLATION

Jacques Fournier, Chatillon sur Bagneux, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Sept. 22, 1975, Ser. No. 615,686
Claims priority, application France, Sept. 27, 1974, 74.33248
Int. Cl.² G01S 9/02, 7/28
U.S. Cl. 343—17.2 R **3 Claims**

1. A doppler radar device for target measurements comprising the combination of:

a pseudo-random digital pulse generator delivering a series of pulses alternatively representative of 1 and 0 binary states;

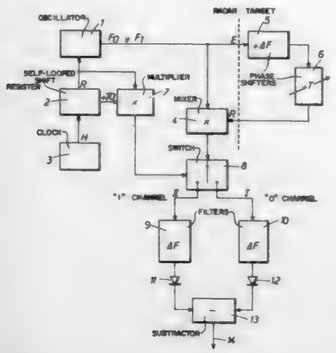
an oscillator under the control of said pulse generator to alternatively deliver signals at two different frequencies for radar transmission purposes;

a first multiplier having two inputs to which are applied respectively said series of pulses and a delayed version

thereof imparted with a predetermined delay corresponding to the distance zone to be surveyed by radar, and an output;

a second multiplier having two inputs to which are applied respectively said radar transmission signals and radar receiver echo signals, and an output;

a switch connected to said second multiplier output and monitored by said first multiplier output;



a 1 channel and a 0 channel each comprising a filter, under the control of said switch to be alternatively connected therethrough to said second multiplier output, depending on the monitoring of said switch by said first multiplier output; and

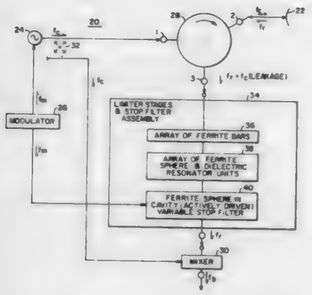
means for extracting from said channels an operational radar signal.

4,044,357

FM/CW RADAR INCLUDING A NOVEL RECEIVER PROTECTOR OF GENERAL UTILITY

Harry Goldie, Randallstown, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 4, 1975, Ser. No. 637,493
Int. Cl.² G01S *9/24*
U.S. Cl. 343—17.5 **16 Claims**



1. A radar system utilizing a single duplexing antenna arrangement, said system comprising:

means for continously generating a transmission signal;

an antenna that is operative to radiate the output of the generating means and to receive a target echo signal;

means for coupling the output of said generating means to said antenna, said coupling means further having a target echo signal output port and being operative to couple said target echo signal from the antenna to said target echo signal output port, said coupling means having leakage of a component of the output of said generating means to said target echo signal output port;

means for modulating the generating means to produce at the output of the generating means a transmission signal having a frequency which varies in a predetermined manner relative to time to cause a first predetermined difference between the instantaneous frequencies of the transmission signal and target echo signals appearing at said target echo signal output of said coupling means;

means for attenuating signals at the target echo signal output port of the coupling means, said attenuating means being operable to attenuate a signal having a frequency within a known range of frequencies and having a power level which exceeds a predetermined threshold in excess of the expected power level of the target echo signal, said attenuating means also being operable to propagate with acceptable attenuation signals having a power level which is below said predetermined threshold and to propagate with acceptable attenuation signals which are of a frequency displaced from that of the signal above the threshold by a second predetermined frequency difference at least as great as said first predetermined difference, said attenuating means also being operable to attenuate a signal over a narrow frequency band at an instantaneous stop band center frequency coincident with the instantaneous frequency of the leakage of the radar transmission signal; and

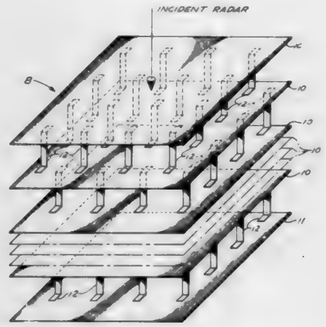
means for heterodyning a portion of the transmission signal and the signal at the output port of said attenuating means to produce a beat frequency signal.

4,044,358

SELF ERECTABLE STRUCTURE

William P. Manning, and Louis Maus, both of Tulsa, Okla., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Sept. 25, 1967, Ser. No. 670,828
Int. Cl.² H01Q *15/00, 17/00*
U.S. Cl. 343—18 A **14 Claims**



2. A self-erectable structure comprising:

a plurality of sheets of thin flexible material, at least a portion of said sheets having a resistivity in the range of from about 40 to 2,000 ohms per square; and

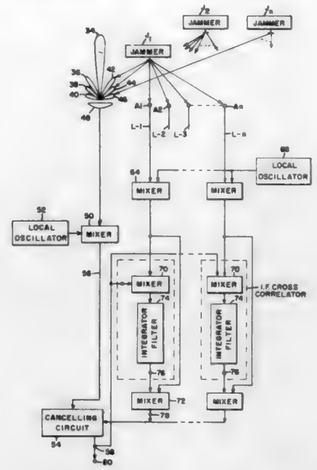
a plurality of thin flexible non-conductive connecting members attached between each of said sheets for spacing each of said sheets apart a selected distance, said connecting members comprising a material having shape memory so that said members deform when the structure is compressed and spontaneously return to their original shape when released.

4,044,359

MULTIPLE INTERMEDIATE FREQUENCY SIDE-LOBE CANCELLER

Sidney P. Applebaum, Liverpool; Paul W. Howells, Morrisville, and James C. Kovarik, North Syracuse, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Jan. 9, 1962, Ser. No. 165,259
Int. Cl.² H04B *1/10*; G01S *3/06*
U.S. Cl. 343—100 LE **8 Claims**



1. In an undesired canceller, a main signal transmission channel having an output terminal, a plurality of auxiliary signal transmission channels having output terminals, means for cross coupling each of said auxiliary channels separately to said main signal transmission channel, means for generating error signals representing the relative amplitude and phase of each undersired signal in the auxiliary channels cross-coupled with undesired signals in the main channel, compensating cross feed networks capable of adjustment for minimizing cross coupling at said main channel output terminal, and means responsive to said error signals for adjusting said cross feed networks in order to minimize cross coupling.

4,044,360

TWO-MODE RF PHASE SHIFTER PARTICULARLY FOR PHASE SCANNER ARRAY

Ronald I. Wolfson, Northridge, and Bobby J. Sanders, Pacoima, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

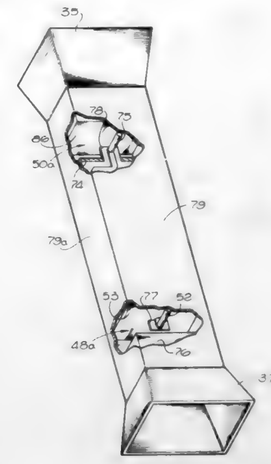
Filed Dec. 19, 1975, Ser. No. 642,297
Int. Cl.² H01Q *19/00*
U.S. Cl. 343—754 **12 Claims**

1. In a scanning antenna system including a plurality of antenna elements arranged in a two-dimensional array having first and second back-to-back apertures surfaces and having space feed means arranged for illuminating said first aperture surface, the combination comprising:

means within each element of a predetermined fraction of said elements comprising a first RF window within said first aperture of said array and a second RF window within said second aperture of said array;

phase shift means within each of said elements of said predetermined fraction of elements coupled betwen said windows of each corresponding element, for controlling the RF phase through each element in response to a corresponding condition of a discrete externally supplied phase control signal for each of said elements so controlled;

and switching means within at least a second fraction of said predetermined fraction of said elements for selectively permitting passage of RF energy from said space feed through said first window, said phase shift means and said second RF window in a first switching condition, and bidirectionally through said first window and said phase



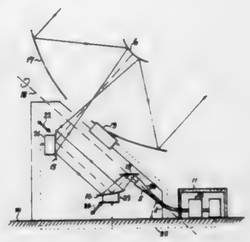
shift means in a second switching condition, said switching means providing a reflection point within said antenna element in said second switching condition.

4,044,361

SATELLITE TRACKING CASSEGRAINIAN ANTENNA

Hiroshi Yokoi, Machida, and Masataka Akagawa, Yokohama, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Apr. 29, 1976, Ser. No. 681,450
Claims priority, application Japan, May 8, 1975, 50-54240
Int. Cl.² H01Q *19/18, 3/12*
U.S. Cl. 343—754 **9 Claims**



1. An antenna apparatus comprising:

a primary radiator having an auxiliary symmetric field pattern;

a subreflector coupled to said primary radiator through a beam wave-guide path;

a main reflector coupled to said subreflector through a beam wave-guide path;

movable wave-guide means provided in said beam wave-guide path between said primary radiator and said subreflector;

rotation means coupled to said primary radiator, said subreflector, said main reflector and said movable beam wave-guide means for rotating, within a small angular range, said primary radiator, said subreflector, said main reflector and said movable beam wave-guide means as one body about an antenna rotating axis aligned with the axis of the primary radiator but a little deviated from the polar axis of the earth; and

drive means coupled to said movable beam wave-guide

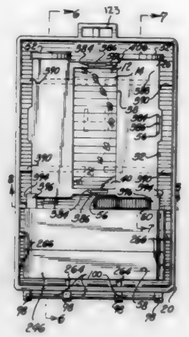
means for controlling said movable beam wave-guide means to deflect an antenna beam radiated from said main reflector.

4,044,362

DATA RECORDING INSTRUMENT

Bart E. Greenhut, c/o Impact-O-Graph Corporation, 4943 McConnell Ave., Suite K, Los Angeles, Calif. 90066

Filed Mar. 4, 1976, Ser. No. 663,701
Int. Cl.[2] G01D *15/24, 9/00*
U.S. Cl. 346—136 **2 Claims**



1. A recording instrument for accompanying a cargo, to record an environmental variable that can affect the cargo, comprising:

a housing;

a chart pack in said housing, said chart pack including a chart case containing a supply reel, a takeup reel, and a strip chart extending between the reels, and including a driven gear (**286**) connected to the takeup reel;

means lying in said housing responsive to a predetermined environmental variable for marking said chart; and

a drive motor having a motor case (**246**) located in said housing and a drive gear (**284**), said motor case including a pair of lug-like top portions (**396**) on either side of the drive gear;

said chart pack positioned with an upper part (**34**) of the chart case immediately under the lug-like top portions (**396**) of the motor case and the driven gear (**286**) engaged with the drive gear (**284**), the housing having pack retainer portions (**398**) which old down the side of the chart pack adjacent the driven gear thereof, whereby the gears are accurately meshed and yet when the housing is opened the chart pack can be easily removed.

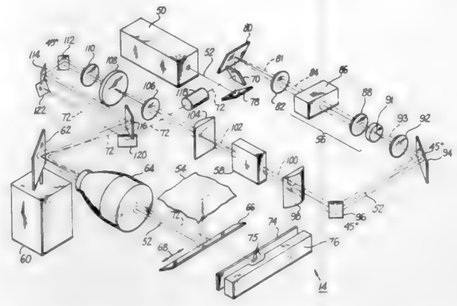
4,044,363

LASER PHOTOCOMPOSITION SYSTEM AND METHOD

Grant T. Morgan, Delray Beach, Fla., assignor to Dymo Industries, Inc., San Francisco, Calif.

Continuation of Ser. No. 535,842, Dec. 23, 1974, abandoned.
This application Feb. 13, 1975, Ser. No. 549,844
Int. Cl.[2] G06K *15/12;* **B41B** *0/00*
U.S. Cl. 354—5 **30 Claims**

1. A photocomposing device comprising, in combination, a laser source for producing a laser beam, first deflection means for moving said beam in a first direction lengthwise of a line of characters to be composed, second deflection means for moving said beam rapidly back and forth in a second direction which is transverse to said first direction, projection means for projecting said beam onto a photo-sensitive surface, and blanking means for substantially completely blocking the transmission of said beam at selected times to form images of characters and space them proportionally on said photo-sensitive surface.

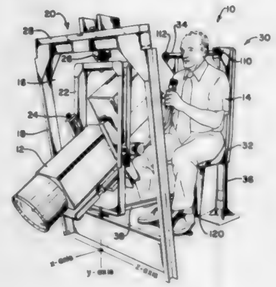


4,044,364

GRAVITY STABILIZED CAMERA AND OPERATOR MOUNT

Joseph Prinzo, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed July 2, 1976, Ser. No. 702,245
Int. Cl.[2] G03B *39/00*
U.S. Cl. 354—74 **14 Claims**



1. An assembly for installation in a window opening of an airborne vehicle providing gravity stabilization of a camera and its operator against changes in vehicle attitude comprising a combination:

A. a tilt frame mounting a camera thereon;

B. a main frame;

C. pin means pivotably mounting the tilt frame in the swing frame;

D. a universal assembly hang-mounting the main swing frame in the vehicle window opening to provide rotational motion and front-to-back and side-to-side rocking motion to the swing frame;

E. an operator mounting assembly exhibiting front-to-back and side-to-side rocking motion when occupied;

F. means mounting the operator assembly in the vehicle; and

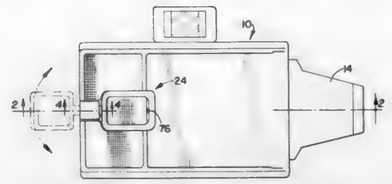
G. means interconnecting the main swing frame and the operator assembly such that both move as an intergral unit irrespective of the motions of the vehicle.

4,044,365

HANDLE CONSTRUCTION FOR SELF-DEVELOPING CAMERAS

Donato F. Pizzuti, Saugus, and James K. Skurski, Beverly, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Sept. 2, 1976, Ser. No. 719,841
Int. Cl.[2] G03B *17/50*
U.S. Cl. 354—85 **26 Claims**



1. In a self-developing camera having a housing to receive photographic sheet material and a means for spreading a processing fluid over such sheet material as same is withdrawn from an opening at one end of the housing, a handle located at the other end of the housing and connected thereto at a point spaced from the opening and positioned close to a longitudinal axis of the housing passing through the opening, such handle permitting rotational freedom of said housing relative to the handle on axis perpendicular to such longitudinal axis the improvement comprising:

means defining a handle recess in the housing; and

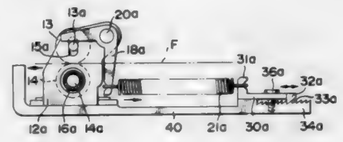
means mounting the handle for movement to a recessed position within said handle recess.

4,044,366

DEVICE FOR APPLYING PRESSURE TO DEVELOPER DISTRIBUTING MEANS IN SELF-DEVELOPMENT TYPE CAMERAS

Toshio Goto, Omiya, Japan, assignor to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Oct. 29, 1974, Ser. No. 519,029
Claims priority, application Japan, Nov. 6, 1973, 48-124812
Int. Cl.[2] G03B *17/50;* **G03D** *9/02*
U.S. Cl. 354—86 **7 Claims**



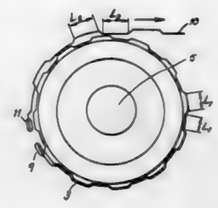
1. In a photographic camera including a pair of pressure-applying members having opposite ends and forming a nip between which a film unit including a photosensitive sheet is fed to spread a developer thereon, a pressure-applying device for urging one of said pressure-applying members towards the other comprising, in combination a pair of bell crank levers pivotally mounted in said camera respectively adjacent said opposite ends of said pressure-applying members for swinging movement about an axis extending parallel to said nip, one arm of each of said bell crank levers being engaged respectively with said opposite ends of one of said pressure-applying members, a pair of tension springs each of which is engaged in tension with the other arm of a respective one of said bell crank levers for urging the bell crank levers in the direction to press said one of said pressure-applying members toward the other pressure-applying member, spring-force control means for controlling the force of the springs exerted on the bell crank levers by controlling the tension of said tension springs, said spring-force control means comprising a pair of tension control members mounted in said camera and respectively engaged with one end of said pair of tension springs each of said tension control members including a fixed toothed member having a row of teeth arranged in a lengthwise direction and a movable member having a projection which is engaged with said one end of the respective one of said tension springs and a hook selectively engaged with a tooth of its associated toothed member.

4,044,367

ROLLER BLIND SHUTTER FOR CAMERAS

Lennart Dahlgren, Vastra Frolunda, Sweden, assignor to Fritz Victor Hasselblad, Goteburg, Sweden

Filed Oct. 14, 1975, Ser. No. 621,847
Claims priority, application Sweden, Nov. 15, 1974, 7414378
Int. Cl.[2] G03B *9/32*
U.S. Cl. 354—242 **5 Claims**



1. A shutter for cameras including,

a. an opening curtain and

b. a closing curtain,

c. a transverse slit formed between said curtains,

d. drive means for traversing said curtains and said transverse slit formed therebetween longitudinally of said curtains from a first position to a second position, said drive means including,

e. axle means for receiving said closing curtain wound thereon and for receiving a portion of said opening curtain wound at least partially thereon in overlapped relationship with a portion of said closing curtain in said first position,

f. said opening curtain and said closing curtain having transverse depressions therein,

g. said transverse depressions forming

h. planar plateaus and intermediate,

i. planar valleys separated by

j. transition areas,

k. the longitudinal length of the plateaus of one of said curtains being substantially greater than the longitudinal length of the planar valleys of the other of said curtains in the region of overlap of the curtains in said first position.

4,044,368

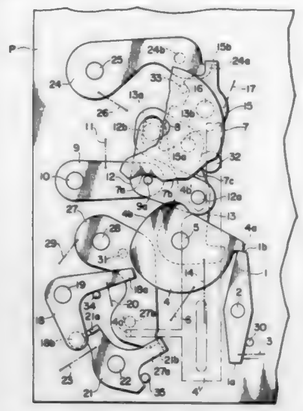
HIGH SPEED EXPOSURE TIME CONTROL MEANS FOR FOCAL PLANE SHUTTERS

Nobuyoshi Inoue, Kawagoe, Japan, assignor to Copal Company Limited, Japan

Filed Apr. 19, 1976, Ser. No. 678,437
Claims priority, application Japan, Apr. 21, 1975, 50-47489
Int. Cl.[2] G03B *17/38*
U.S. Cl. 354—267 **3 Claims**

1. A high speed exposure time control means for focal plane shutters comprising a base plate, a high speed exposure time controlling member mounted on said base plate so as to be able to move between its cocked position and uncocked position, a high speed switching lever supported rotatably on said base plate and supporting rotatably thereon a high speed operating lever engageable with said high speed exposure time controlling member, a front blade operating lever supported rotatably on said base plate and pin-slot connected with said high speed operating lever, a speed changing cam engageable with said

high speed operating lever to change relative positions of said high speed exposure time controlling member and high speed operating lever, and a rear blade operating lever supported rotatably on said base plate and engageable with said high speed exposure time controlling member, said high speed operating lever being so arranged with respect to said high speed exposure time controlling member that engaging time of said high speed operating lever and high speed exposure time controlling member may vary in response to set position of said speed changing cam, and said rear blade operating lever being so arranged with respect to said high speed exposure time controlling member that engagement of said rear blade operating lever and high speed exposure time controlling member with each other may take place when a fixed time has elapsed after starting of said high speed exposure time controlling member.

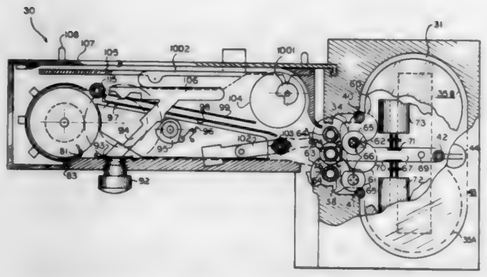


4,044,369

PHOTOGRAPHIC FILM ASSEMBLY AND MAGAZINE THEREFOR

Ashok B. Nayak, Tustin, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 14, 1975, Ser. No. 540,765
Int. Cl.[2] G03B *17/26*
U.S. Cl. 354—275 **14 Claims**



1. A cartridge-type photographic medium comprising in combination:

a cartridge housing having first and second openings for discharging photographic media;

a first photographic medium assemblage located in said cartridge housing and comprising:

a plurality of separate first elongate backing strips for photographic film;

a plurality of separate strips of said photographic film located on said first backing strips; and

means for interconnecting said first backing strips and covering said photographic film strips, comprising a first single continuous strip extending over at least the entire length of each photographic film strip and being attached to each of said first backing strips at least at two spaced portions of each first backing strip located, respectively, adjacent opposite ends of said length; and

means for successively separating said first single continuous strip from said first backing strips and photographic film strips and for propelling said separated first back strips and photographic film strips through said first cartridge housing opening, said separating and propelling means including first means in said cartridge housing for successively pull and first continuous strip away from each of said first backing strips and for storing said pulled-away first continuous strip inside said cartridge housing; and

a second photographic medium assemblage located in said cartridge housing and comprising:

a plurality of separate second backing strips for a photographic developer medium;

a plurality of separate strips containing said photographic developer medium; and

means for interconnecting said second backing strips and covering said developer medium strips, comprising a second continuous strip extending over at least one entire dimension of each developer medium strip and being attached to each of said second backing strips at least at portions of each second backing strip located adjacent opposite ends of said dimension; and

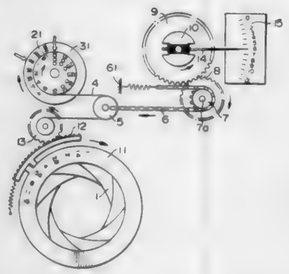
means for successively separating said second continuous strip from said second backing strips and photographic developer medium strips and for propelling said separated second backing strips and said photographic developer medium strips through said second cartridge housing opening, said separating and propelling means including second means in said cartridge housing for successively pulling said second continuous strip away from each of said second backing strips and for storing said pulled-away second continuous strip inside said cartridge housing.

4,044,370

PHOTOGRAPHIC CAMERA WITH DENSITY-VARIABLE FILTER

Toshihiro Kondo, Chofu, Tokyo, Japan, assignor to Toshihiro Kondo, Chofu and Fuji Photo Film Co., Ltd., both of Japan

Filed July 28, 1975, Ser. No. 599,342
Claims priority, application Japan, July 29, 1974, 49-86714
Int. Cl.[2] G03B *17/00*
U.S. Cl. 354—289 **7 Claims**



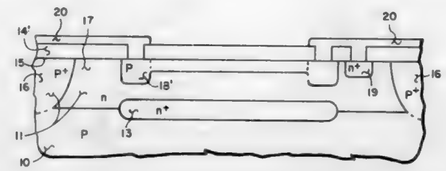
1. A photographic camera comprising a diaphragm the aperture size of which is freely selectable by manual operation, a shutter means the shutter speed of which is freely selectable by manual operation, and a density-variable optical filter means the density of which is freely selectable by manual operation independently of said diaphragm and shutter means, said filter means comprising a manual control member which is manually operated to vary the density of the filter, and an optical filter the density of which is varied by operation of said manual control member, said manual control member being graduated with a scale which indicates the density of the filter and an exposure meter which indicates the scene brightness in the same unit system as that of said scale graduated on the manual control member.

4,044,371

PLURALITY OF PRECISE TEMPERATURE RESISTORS FORMED IN MONOLITHIC INTEGRATED CIRCUITS

Mona M. Abdelrahman, Minnetonka, and James M. Daughton, Edina, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 29, 1976, Ser. No. 727,736
Int. Cl.[2] H01L *23/56, 29/66, 27/02, 27/04*
U.S. Cl. 357—28 **6 Claims**



1. A monolithic integrated circuit sensistor provided in a semiconductor material of a selected total resistance having a selected temperature coefficient of resistance and having a voltage coefficient of resistance which is less than a selected value, said sensistor comprising:

a set of n isolated regions in said semiconductor material, each of a first conductivity type;

a set of n resistor regions, each of a second conductivity type which is determined by ions implanted therein in a selected dose to provide said temperature coefficient of resistance, each of said resistor regions being located in a corresponding one of said isolated regions with a semiconductor junction occurring between each said resistor region and its corresponding isolated region and each of said resistor regions having a first end and a second end; and

an interconnection network means electrically connecting each of said resistor regions in series with one another at said first and second ends in a resistor string and further adapted to electrically connect said resistor string into a circuit, said interconnection network means directly electrically connecting said first end of each said resistor region to its corresponding isolated region, a value for n being selected of two or more to be sufficiently large to reduce said voltage coefficient of resistance to being less than said selected value.

4,044,372

PHOTOVOLTAIC CELL HAVING CONTROLLABLE SPECTRAL RESPONSE

Harold Weinstein, Sherman Oaks, Calif., assignor to Sensor Technology, Inc., Chatsworth, Calif.

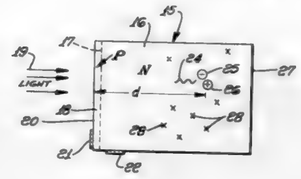
Filed Aug. 5, 1974, Ser. No. 494,764
Int. Cl.[2] H01L *27/14*
U.S. Cl. 357—30 **6 Claims**

1. A photovoltaic cell having preselected spectral response, comprising;

a semiconductor body,

a shallow junction in said body adjacent the front face thereof, and

means modifying the minority carrier transport properties of said body to decrease the percentage of minority carriers, produced by absorption of photons of relatively long wavelength within said body, that reach said junction, so that the peak spectral response of said cell is shifted toward shorter wavelengths, said modifying means comprising recombination centers for said minority carriers in said body.

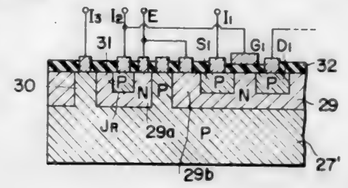


4,044,373

IGFET WITH GATE PROTECTION DIODE AND ANTIPARASITIC ISOLATION MEANS

Kosei Nomiya, Tokyo; Toshihiko Kohisa, Sayama, and Isao Matsumura, Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Division of Ser. No. 768,794, Oct. 18, 1968, Pat. No. 3,934,159.
This application June 12, 1973, Ser. No. 369,131
Claims priority, application Japan, Nov. 13, 1967, 42-72628; Nov. 13, 1967, 42-72629; Nov. 13, 1967, 42-72630; Nov. 15, 1967, 42-73055; Nov. 15, 1967, 42-73056
Int. Cl.[2] H01L *29/78, 27/04, 27/12, 29/90*
U.S. Cl. 357—41 **7 Claims**



1. In a semiconductor device comprising:

an insulated gate type field effect element including a semiconductor substrate of first conductivity type, a pair of source and drain regions of second conductivity type opposite to said first conductivity type formed in a surface of said semiconductor substrate, an insulated gate electrode disposed on said surface between said source and drain regions, and an insulating film interposed between said insulated gate electrode and said semiconductor substrate;

a protecting diode means formed unitarily with said field effect element and connected in parallel between said insulated gate electrode and said semiconductor substrate for preventing the insulating film below said gate electrode from breakdown, said protecting diode means including a semiconductor region and an electrode means with a rectifying barrier disposed therebetween, said rectifying barrier having a backward breakdown voltage lower than the breakdown voltage of the insulating film below said gate electrode; the improvement comprising

isolation means for electrically isolating said semiconductor region of said protecting diode means from said semiconductor substrate in which said field effect element is formed; and wherein

the conductivity type of said semiconductor region of said protecting diode means is said first conductivity type, and said isolation means includes a semiconductor layer of said second conductivity type interposed between said semiconductor region of said protecting diode means and said semiconductor substrate; and wherein

said semiconductor layer is biased in the backward polarity

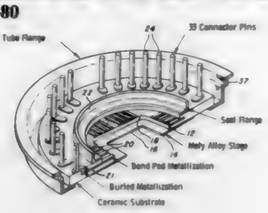
to said semiconductor region of said protecting diode means and said semiconductor substrate; and wherein the semiconductor region of said protecting diode means is connected together with said semiconductor substrate.

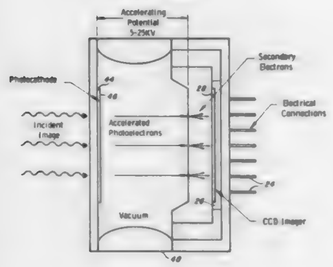
4,044,374

SEMICONDUCTOR DEVICE HEADER SUITABLE FOR VACUUM TUBE APPLICATIONS

Charles Grady Roberts; Wayne W. Chan, both of Plano, and Dean R. Collins, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 19, 1976, Ser. No. 650,396
Int. Cl.² H01L *39/02, 29/78;* G01T *1/24;* H01L *23/02*
U.S. Cl. 357—80 **22 Claims**





1. A header assembly including a charge transfer device chip having a plurality of spaced apart terminal pads on one surface thereof, an insulating support; a mounting surface unitary with said support; a plurality of conductive leads affixed to said support member and extending generally outwardly from said mounting surface; means fixedly mounting said charge transfer device chip on said mounting surface; respective electrical interconnections between said terminal pads and said conductor leads; and cover means surrounding said chip in vacuum-tight sealed relation with said insulating support to enclose said electrical interconnection; said conductive leads extending beyond said cover means; means hermetically sealing said conductive leads along the lengths thereof between the interior and exterior of said cover means; and terminal leads electrically connected with said conductive leads externally of said cover means.

4,044,375

BRIGHTNESS CONTROL APPARATUS

Marvin Neil Norman, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 19, 1976, Ser. No. 715,851
Int. Cl.² H04N *9/535, 5/58, 5/18*
U.S. Cl. 358—40 **13 Claims**

1. In a color television system including means for amplifying color representative signals, means for amplifying luminance signals having periodic blanking intervals and image intervals containing image brightness information disposed between adjacent ones of said blanking intervals, and a color image reproducing device, apparatus comprising:
means fo providing periodic keying signals during said banking intervals;
first means for coupling said color representative signals to said color signal amplifying means;
first clamping means coupled to said keying means and to said first coupling means and responsive to said keying signals for clamping said color representative signals to a first reference voltage level;
second means for coupling said luminance signals to said luminance signal amplifying means;
second clamping means coupled to said keying means and to said second coupling means for clamping said blanking interval portions of said luminance signals to a second reference voltage level representative of a black tone of an

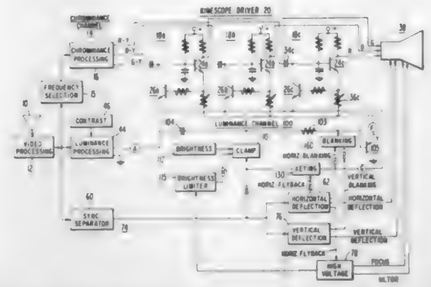


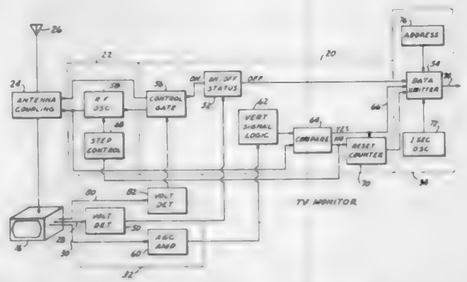
image reproduced by said image reproducing device, said first and second reference voltage levels being in predetermined relation and dependent upon said keying signals; and
image brightness controlling means coupled to said second clamping means for varying said second reference voltage level and therefore said black tone reference level and brightness of a reproduced image.

4,044,376

TV MONITOR

James L. Porter, San Diego, Calif., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Aug. 13, 1976, Ser. No. 714,431
Int. Cl.² H04N *7/02*
U.S. Cl. 358—84 **15 Claims**



14. In a television monitor for monitoring the reception status of a television receiver, said receiver being capable of detecting selected ones of a plurality of wave signals, each representing a separate video channel, said receiver including an antenna for receiving said wave signals, a horizontal retrace circuit, a vertical retrace circuit and a kinescope circuit, and said monitor including a first probe connected to said horizontal retrace circuit for detecting a voltage in said horizontal retrace circuit, a second probe connected to said kinescope circuit for detecting a signal frequency in said kinescope circuit, first logic means connected to said first probe for determining whether said receiver is in an "on" or "off" condition, a signal oscillator for generating a radio frequency signal within the bandwidth of a channel which said receiver is capable of receiving, an antenna coupler for selectively coupling said receiver to said antenna or to said oscillator so that the antenna input of said receiver selectively receives wave signals from said antenna or a radio frequency signal from said oscilla-

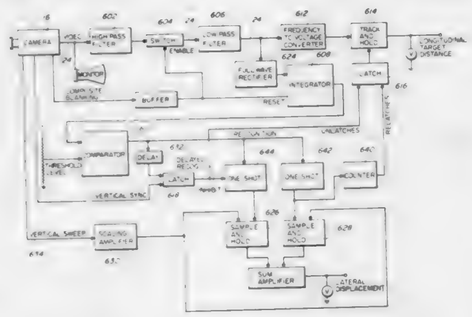
tor, and a comparator connected to said oscillator and to said second probe for comparing the frequency of signals in said kinescope circuit with the radio frequency signal generated by said oscillator and for providing an indication of the correspondance or non-correspondance of such signals, said oscillator being responcive to an indication of non-coincidence of such signals from said comparator to generate another radio frequency signal within the bandwidth of a channel which said receiver is capable of receiving different from said first-named channel, the inprovement comprising: third probe means connected to said vertical retrace circuit for detecting a predetermined voltage level in said vertical retrace circuit; second logic means coupled to said third probe means and responcive to the voltage level detected thereby for providing a gate signal when the voltage level detected by said third probe means is representative of the beginning of a vertical sweep in said receiver, said antenna coupler being connected to said second logic means and responcive to said gate signal for coupling said oscillator to said antenna input of said receiver.

4,044,377

VIDEO TARGET LOCATOR

Edwin R. Bowerman, Topsfield, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 28, 1976, Ser. No. 680,832
Int. Cl.² H04N *7/18;* G01C *3/08, 3/32*
U.S. Cl. 358—107 **14 Claims**



11. A method for locating a targeted object with respect to a station point comprising the steps of:
mounting a video camera at the station point;
placing a target pattern of successive spaced-apart markings in a fixed spactial relationship with the targeted object;
bringing the target pattern within the viewing field of the camera to cause the camera to generate a series of pulses during its scan of the pattern, and
generating a first distance signal related to the pulse frequency.

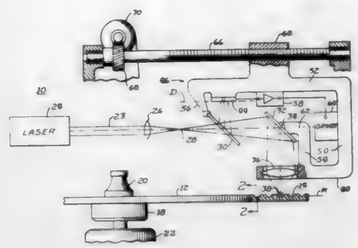
4,044,378

OPTICAL SYSTEM FOR REFLECTIVE MODE VIDEO PLAYBACK APPARATUS

Leonard J. Laub, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Nov. 4, 1975, Ser. No. 628,717
Int. Cl.² H04N *5/76*
U.S. Cl. 358—128 **1 Claim**

1. In an optical video playback device for scanning the storage track of a video record ot the type that is reflective to a reading beam derived from a source of light energy, an improved optical system for deriving an output signal which comprises:
a light detector;
means for directing a reading beam along a predetermined optical path extending from said energy source to a reading plane and thence to said light detector; its back focal plane located inside said objective, positioned in said path for focusing said beam on the storage track of a record located in said reading plane and for returning energy reflected from said record track along said path to said light detector;
a mirror, displaceable about a reference axis, disposed across said path with said reference axis effectively positioned in said back focal plane of said reading lens;
an optical relay interposed between said mirror and said achromat objective for effectively positioning said mirror axis in said back focal plane of ssid achromat objective,
said optical relay comprising an intermediate lens for forming a light spot to be projected by said achromat objective onto said record track and for imaging said mirror axis into said back focal plane of said achromat objective,



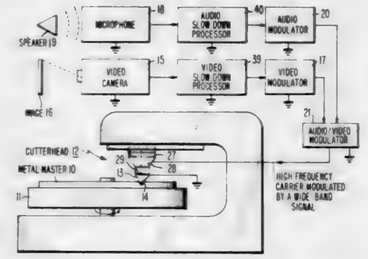
said intermediate lens being spaced from said mirror axis by a distance equal to $f_1[(1 + f_1x)]$, where f_1 is the focal length of said intermediate lens and x is the Newtonian back conjugate distance specified for said achromat objective,
and spaced from said achromat objective a distance equal to $f_1 + x + f'$, where f' is the focal length of said achromat objective;
and a beam-splitter also disposed across said path and spaced from said mirror in the direction of said source for deflecting reflected energy out of said path toward said light detector.

4,044,379

METHOD AND APPARATUS FOR ELECTROMECHANICAL RECORDING OF SHORT WAVELENGTH MODULATION IN A METAL MASTER

Jerome Barth Halter, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed June 30, 1975, Ser. No. 591,968
Int. Cl.² H04R *17/02;* G11B *3/00*
U.S. Cl. 358—128 **13 Claims**



1. A method for recording short wavelength modulation in a master by mechanical cutting comprising:
1. placing a metal master on a support in operating relationship with an unheated cutting stylus in order to effect a relative motion between the metal master and the cutting stylus;
2. positioning the cutting stylus with respect to the metal master in order to cut a groove having a quiescent groove

depth less than one micrometer while the relative motion is established; and

3. vibrating the cutting stylus about the quiescent position thereof in response to a relatively high frequency signal while cutting the groove in order to effect short wavelength modulation of groove depth having a peak-to-peak dimension less than one micrometer;

wherein the wavelength of the groove modulation is such that a satisfactory recording is obtained when the peak-to-peak dimension of the groove modulation is less than one micrometer.

4,044,380

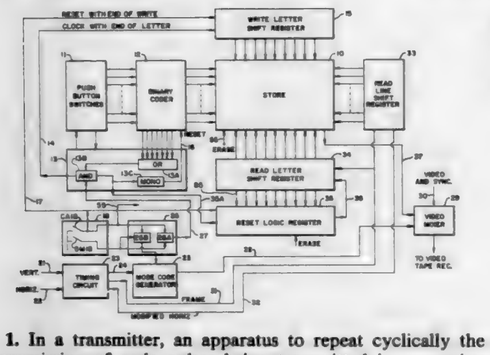
ENCODER AND CONSTRUCTED ANSWER SYSTEM FOR TELEVISION

James W. H. Justice, Murrysville, and Marcus H. Uhler, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 425,667, Dec. 17, 1973, abandoned. This application June 27, 1975, Ser. No. 591,212

Int. Cl.[2] H04N *7/08*

U.S. Cl. 358—142 **16 Claims**



1. In a transmitter, an apparatus to repeat cyclically the transmission of code pulses being transmitted in succession within the waveform for video signals in a television system, said apparatus comprising:

means for storing code pulses corresponding to encoded indicia;

means for loading said means for storing with preselected encoded indicia;

shift register means for indexing said means for storing to receive successive encoded indicia;

read shift register means for reading from said means for storing code pulses in succession corresponding to said preselected encoded indicia;

means for controlling said means for reading to repeat cyclically the reading of code pulses by comparing the number of preselected encoded indicia loaded into said means for storing with the number of encoded indicia read from said means for storing; and

control means coupled to said read shift register means for clocking at a selected video transmission rate the readings of each successive code pulse from said means for storing.

10. A receiver apparatus in a constructed answer system employing code pulses corresponding to encoded indicia which are repeated cyclically in a serial manner during transmission within a waveform of a television video signal, said apparatus comprising:

means for deriving a television video signal including said code pulses transmitted therewith in a cyclically repeating manner;

means for separating said code pulses transmitted in said serial manner from said video signal;

converter means receiving said code pulses in their occurring serial manner for conversion into time-collected groups of cyclically repeating code pulses corresponding to said encoded indicia;

decoder means receiving each of said groups of cyclically repeating code pulses for producing cyclically repeating decoded signals representing recovered indicia;

means for producing a plurality of signals corresponding to selected indicia to form a response answer input;

a plurality of AND gates separately receiving a cyclically repeating signal representing said recovered indicia, said gates further separately receiving a signal corresponding to said selected indicia such that the signals to each AND gate represent corresponding ones of said selected and recovered indicia;

means for delivering clocking pulses to said AND gates collectively; and

a correct pulse shift register means responsive to a pulse from said AND gates for indexing the delivery of successive clocking pulses by said means for delivering.

4,044,381

AUTOMATIC WAVEFORM EQUALIZING SYSTEM FOR TELEVISION RECEIVER

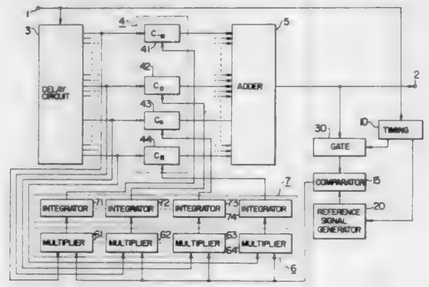
Masaru Shimano, and Iwao Aizawa, both of Yokohama, Japan, assignors to Hitachi, Ltd., Japan

Filed May 30, 1975, Ser. No. 582,076

Claims priority, application Japan, June 3, 1974, 49-62680; June 3, 1974, 49-62681; June 3, 1974, 49-62682; June 3, 1974, 49-62684

Int. Cl.[2] H04N *5/14, 5/44*

U.S. Cl. 358—160 **4 Claims**



1. An automatic waveform equalizing system for use in a television receiver for automatically compensating for linear waveform distortion occurring in a standard television signal received by the television receiver comprising a transversal filter including delay means having a plurality of taps for delivering output signals with successively increased delay times having a predetermined time interval therebetween, a plurality of control means for controlling the polarity and amplitude of the individual output signals delivered from said taps of said delay means, and adding means for adding the individual output signals controlled by said control means; means for applying the standard television signal to said transversal filter; means for extracting solely a predetermined signal portion from the television signal output of said transversal filter; reference signal generating means for generating a reference signal having the same waveform as the original transmitted waveform of said predetermined signal portion; comparing means for comparing said signal extracted by said extracting means with said reference signal generated by said reference signal generating means with the same timing thereby obtaining an error signal representing the difference therebetween; a plurality of control signal generating means including means for multiplying the individual output signals delivered from said taps of said delay means by said error signal obtained by said comparing means, and integrating means for integrating the resultant individual signals respectively; and means for controlling said control means by applying the individual control signals generated by said control signal generating means on the basis of the individual output signals of said taps of said delay means to said control means controlling the output signals of the respective taps of said delay means; wherein said extracting means comprises means for extracting at least one serrated portion of the vertical synchronizing pulses in said television signal, and said reference signal generating means comprises means for generating a pulse signal having the same waveform as that of the original transmitted waveform corresponding to said serrated portion extracted by said extracting means.

4,044,382

TRANSMITTING SYSTEM FOR FACSIMILE AND THE LIKE

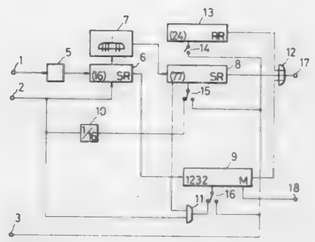
Tohmi Yagishita, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Aug. 13, 1975, Ser. No. 604,100

Claims priority, application Japan, Aug. 20, 1974, 49-95158

Int. Cl.[2] H04N *7/12*

U.S. Cl. 358—260 **3 Claims**



1. A transmitting system for facsimile comprising:

a. a first shift register **(6)** the input of which is connected to an image signal terminal through a binary converter **(5)**,

b. a ring-register **(13)** for storing a predetermined pattern of synchronizing signals,

c. a second shift register **(8)** whose input is connected to said first shift register **(6)** through an OR circuit **(7)** so that each place of the second shift register **(8)** is written one whenever at least one place of the first shift register **(6)** is one, thus enabling the second shift register **(8)** to store a pattern of a group weight indicator signal,

d. a third shift register **(9)** whose input is connected to said first shift register **(6)**, for receiving the content of said first shift register **(6)** only when the first place of said second shift register **(8)** is one,

e. an OR circuit **(12)** whose output is connected to the output of the transmitting system and whose inputs are connected to the outputs of said ring register **(13)**, said second shift register **(8)** and said third shift register **(9)**, respectively, and

f. switching means **(14, 15, 16)** for controlling the operation of said ring register **13**, said second shift register **(8)** and said third shift register **(9)**.

4,044,383

METHOD AND APPARATUS FOR SYNCHRONIZING FACSIMILE TRANSCEIVERS

John M. Vandling, Pleasantville, N.Y., assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation of Ser. No. 493,119, July 30, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,369

Int. Cl.[2] H04N *1/36;* G01D *15/34*

U.S. Cl. 358—264 **42 Claims**

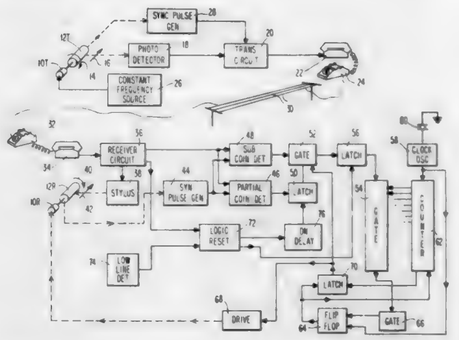
1. A method of achieving synchronization in a facsimile system comprising a receiver having a rotatably driven drum for receiving a copy medium and information writing means juxtaposed to various angular positions of the receiver drum as the drum is rotated, a transmitter having a rotatably driven drum for receiving a document and information sensing means juxtaposed to various angular positions on the transmitter drum as the transmitter drum is rotated, and a communications link carrying signals between the transmitter and the receiver, the method comprising the following steps:

rotatably driving one drum at a first angular frequency and another drum at a second angular frequency, the first angular frequency and the second angular frequency having a first frequency differential;

generating first synchronizing pulses corresponding to a predetermined angular position of one transmitter drum;

generating second synchronizing pulses corresponding to a predetermined angular position of the other drum;

first detecting a degree of coincidence in time between said first synchronizing pulses and at least a portion of said second synchronizing pulses;



rotatably driving said other drum at a third angular frequency in response to the first coincidence detection, the differential between said third angular frequency and said first angular frequency being substantially less than the differential between said second angular frequency and said first angular frequency;

subsequently detecting a more substantial degree of coincidence in time than first detected between said first synchronizing pulses and said second synchronizing pulses; and

rotatably driving said other drum at said first angular frequency in response to the subsequent detection.

4,044,384

OPTICAL SCANNING APPARATUS

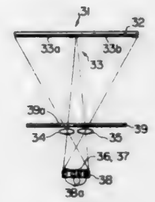
Toshiyuki Inokuchi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed July 23, 1976, Ser. No. 707,962

Claims priority, application Japan, July 24, 1975, 50-90542; July 31, 1975, 50-93728; July 31, 1975, 50-93730

Int. Cl.[2] H04N *1/10, 3/14*

U.S. Cl. 358—293 **10 Claims**



1. An optical scanning apparatus for producing a plurality of electrical signals representing a scan line of an original document, comprising:

a photosensitive array including a plurality of photosensitive elements for producing said electrical signals respectively;

first optical means for focussing a first image of a first half of

the scan line onto the photosensitive array coextensively therewith;

second optical means for focussing a second image of a second half of the scan line onto the photosensitive array coextensively therewith; and

optical switching means for alternatingly blocking the first and second images.

4,044,385

PRINTING PLATE PRODUCTION APPARATUS

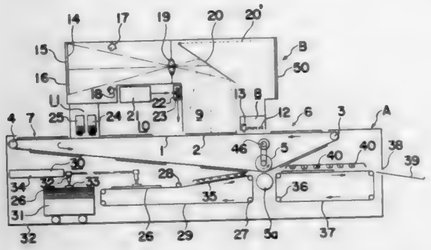
Masakatsu Nishimura, Settsu; Shin Saito; Kunsei Tanabe, both of Hirakata; Yasusi Umeda, Osaka; Seiji Arimatsu, Kyoto, and Yasuyuki Takimoto, Takatsuki, all of Japan, assignors to Nippon Paint, Osaka, Japan

Filed Mar. 15, 1976, Ser. No. 667,144

Claims priority, application Japan, Dec. 22, 1975, 50-153772

Int. Cl.[2] H04N *1/30*

U.S. Cl. 358—300 **10 Claims**



1. Printing plate production apparatus with employment of a photoconductive insulating sheet including a conductive base having a coating of a photoconductive insulating material thereon, said photoconductive insulating material being capable of varying its resistance from high to low by light, comprising:

a photoconductive insulating sheet transport means for conveying the photoconductive insulating sheet through the apparatus, said transport means being provided with both a loading station and an unloading station for said sheets, said stations being spaced apart along the path formed by said transport means;

a corona discharge means disposed adjacent and subsequent said loading station by which a charge is trapped on said coating where said photoconductive material is in said high condition;

image information-carrying light emission and scanning means disposed subsequent to said corona discharge means, said light emission and scanning means having modulating means for varying the amount of light in response to a transmitted original document signal and writing means for forming a latent image by applying light to selected regions of said coating, in an amount sufficient to vary the resistance of said photoconductive insulating material from said high to low;

developing means disposed subsequent to said light emission and scanning means and adjacent to said unloading station for applying toner particles to said photoconductive sheet which cling to said coating at said selected regions, whereat a latent image is formed;

optical exposing means disposed between said corona discharge means and said light emission and scanning means for forming latent image to the previously prepared charged photoconductive insulating sheet by using said developed image as master copy;

transferring means disposed subsequent to said developing means through said unloading station for conveying the said developed powder images from the surface of the said photoconductive material sheet directly to the surface of the printing plates, passing through between two rolls, and applying uniform pressure along their moving line of contact;

printing plate transport means disposed adjacent said transferring means for transport of said printing plates through said transfer station; and

control means connected to the said each means, corona discharge means, writing means, modulating means, exposing means, developing means, transferring means, and transport means of photoconductive sheet and printing plate.

4,044,386

TAPE CASSETTE WITH ERASE INHIBIT PLUG

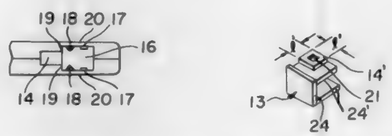
Takateru Satou, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Apr. 22, 1976, Ser. No. 679,369

Claims priority, application Japan, Apr. 22, 1975, 50-54881[U]

Int. Cl.[2] G11B *15/04, 23/06*

U.S. Cl. 360—60 **4 Claims**



1. A tape cassette comprising:

means defining an accidental erasure preventive slot having at least one ridge member and at least one projecting member on an internal wall thereof;

means defining a bias changeover slot adjacent to said accidental erasure prventive slot; and

a U-shaped snap for selectively closing and opening said accidental erasure preventive slot while not disturbing said bias changeover slot and having a base and two arms upstanding therefrom;

means for retaining said U-shaped snap within the accidental erasure preventive slot in either of two positions whereby said base of U-shaped snap is disposed at the opening of the accidental erasure preventive slot when the said accidental erasure preventive slot is to be kept in an inoperative state, and said base of the U-shaped snap is set against the wall of the accidental erasure preventive slot being disposed opposite the bias changeover slot when said accidental erasure preventive slot is to be kept in an operative state.

4,044,387

MAGNETIC HEAD SWITCHING SYSTEM

Lee A. Watkins, San Jose, and Larry M. Jacob, Los Altos, both of Calif., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,701

Int. Cl.[2] G11B *15/12*

U.S. Cl. 360—61 **2 Claims**

1. A combined magnetic recording and reading system for recording data on and reading data from a magnetic recording medium, said system comprising:

a read/write head capable of recording data on the magnetic recording medium responsive to electrical signals and for generating electrical signals responsive to reading data from the recording medium;

a write driver circuit for generating electrical signals for causing the read/write head to record data on the medium;

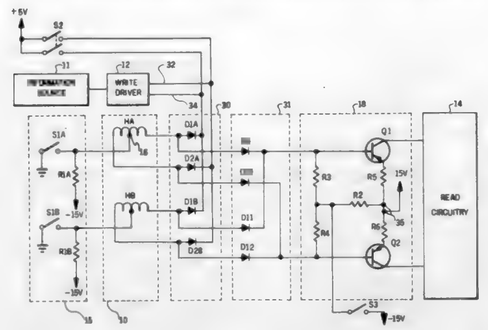
a read circuit for processing electric signals generated by the read/write head reading recorded data from the medium;

a first switching circuit connecting the write driver circuit to the read/write head;

a second switching circuit connecting the read circuit to the read/write head;

switching means in the first and second switching circuits; and

means for energizing said switching means operable to open the switching means in the first switching circuit while the read/write head is reading data and for opening the switching means in the second switching circuit when the read/write head is recording data thereby to prevent the electrical signals of the read circuit and write driver circuit from being transmitted through the other switching circuit.



4,044,388

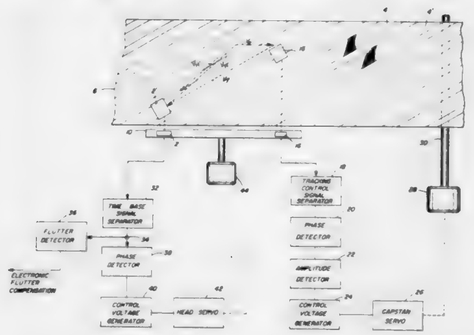
INTERACTIVE SERVO CONTROL SYSTEM FOR USE WITH A ROTATING-HEAD MAGNETIC TAPE PLAYER

Lenard M. Metzger, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 5, 1976, Ser. No. 729,621

Int. Cl.[2] H04N *5/795;* G11B *21/04*

U.S. Cl. 360—70 **6 Claims**



1. In a servo control system for use with a rotary head magnetic tape player having a rotary playback head that reproduces an information signal from slant tracks on a magnetic tape, the information signal having a signal component thereof with a parameter dependent upon variations in the speed of head rotation, the tape player also having a rotary tracking control head that overlaps adjacent slant tracks for providing a tracking control signal to a capstan servo apparatus whereby the tape speed is so maintained that the playback head overlies a recorded slant track when the tracking control head is in a predetermined overlapping position, the improvement comprising:

means responsive to the signal component in the information signal for generating a time base control signal for regulating the speed of the rotary playback head;

means responsive to said time base control signal for so adjusting the rotation of the playback head that the signal component parameter substantially assumes a predetermined value; and

interactive means associating the rotary playback head with the rotary tracking head for changing the overlapping position of the tracking head from its predetermined position relative to said adjacent tracks in response to a change in the rotational speed of the playback head, and for thereby causing a modification of the tracking control signal, whereby the capstan servo so adjusts the tape speed that the playback head regains its predetermined position overlying a recorded slant track.

4,044,389

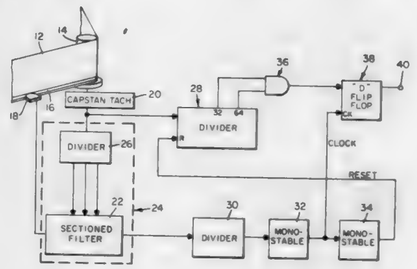
METHOD AND APPARATUS FOR MEASURING THE SPEED AT WHICH A TAPE WAS RECORDED

Reginald W. Oldershaw, Los Altos, and Edwin S. Busby, Jr., Menlo Park, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,677

Int. Cl.[2] G11B *15/52, 15/46, 15/54*

U.S. Cl. 360—73 **13 Claims**



1. A method for measuring the standard recording speeds of a tape in a tape recorder/reproducer upon motion of the tape, wherein the recorder/reproducer includes a capstan tach for providing tach pulses and a multiple frequency control track recorded on the tape, comprising the steps of;

extracting a selected control track frequency from the control track;

generating a selected control track averaging period in response to the capstan tach which period is a function of the control track frequency;

generating a predetermined count of the tach pulses commensurate with the control track averaging period, which count is a function of a capstan tach frequency;

measuring the ratio of the capstan tach frequency relative to the control track frequency; and

generating logic levels indicative of the ratio measured and thus of the recording tape speed.

4,044,390

CARTRIDGE LOADING AND UNLOADING DEVICE USE IN CARTRIDGE TYPE TAPE RECORDERS

Masakazu Yamashita, Iwaki, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 15, 1975, Ser. No. 613,713

Claims priority, application Japan, Sept. 26, 1974, 49-116024

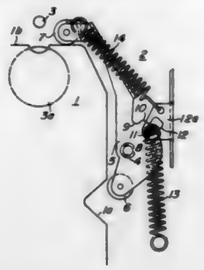
Int. Cl.[2] G11B *25/06, 23/04*

U.S. Cl. 360—93 **9 Claims**

1. In a cartridge type tape recorder in which a cartridge is located in an operational position by having a holder engage a V-shaped notch in the cartridge, and improved cartridge loading and unloading device comprising:

a rotary member rotatably attached to a chassis and provided with a holder means and a responder means, said holder means and said responder means integrally rotatable with said rotary member and said holder means positioned for selectively engaging and disengaging a V-

shaped notch in a cartridge in association with the rotational motion of said rotary member, said responder means positioned for engaging a portion of the cartridge upon the insertion thereof and rotating said rotary member;
a floating pin disposed movable relative to the chassis; and spring means for urging said pin against said rotary member;



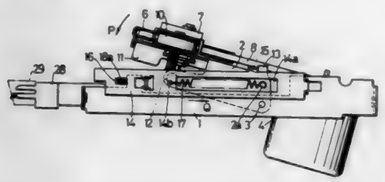
said rotary member having at least one recess formed therein for selectively engaging said pin in response to the operation of loading and unloading the cartridge, wherein said pin and said recess restrain the rotational motion of said rotary body and provide a predetermined rotary position for said rotary body, said responder means and said holder means.

4,044,391

CASSETTE TAPE RECORDERS

Akira Takahashi, Seki, Japan, assignor to Fulton Electronic Industry, Ltd., Aichi, Japan

Filed Mar. 3, 1975, Ser. No. 554,864
Claims priority, application Japan, July 30, 1974, 49-87841; July 30, 1974, 49-87842
Int. Cl.² G11B *15/00, 15/18*
U.S. Cl. 360—96 **7 Claims**



1. In combination with a cassette tape recorder of the type in which a first stationary chassis and a second stationary chassis spaced above said first stationary chassis defined therebetween a space adapted to receive a tape cassette therein, and in which a tape driving mechanism is mounted on a movable chassis rotatably supported on said first stationary chassis, the improvement which comprises:
an elongate slide member slidably attached to one side wall of said first stationary chassis;
a first tension spring fastened to said movable chassis at its one end and to said slide member at its other end;
means rotatably supported on said second stationary chassis and operatively connected with said slide member for rotation in one direction to move said slide member in one direction for urging said movable chassis into one position under the action of said first tension spring during insertion of said tape cassette into said space;
means engaged with said slide member moving means for latching it to maintain said movable chassis in said one position;
means for acting on said latching means for unlatching said slide member moving means to permit movement of said slide member in the other direction under the action of said first tension spring; and
means engaged by said slide member for rotating said movable chassis into another position under the action of said first tension spring during removal of said tape cassette from said space; and wherein
said slide member moving means comprises an L-shaped lever rotatably supported at its corner by a pin on said second stationary chassis, and a starting member slidably supported by said second stationary chassis and engageable by said tape cassette during said insertion and removal thereof, said L-shaped lever operatively connected to said slide member by a first arm engaged with said slide member at its free end, and a second arm extending generally at right angles to said first arm and engaged with said latching means at its free end, said starting member comprising means for rotating said L-shaped lever in said one direction of said slide member moving means upon sliding in one direction when pushed by said tape cassette during said insertion thereof.

4,044,392

PROCESS FOR MAKING A READ-WHILE-WRITE TAPE HEAD AND THE PRODUCT MADE THEREBY

George W. Brock; Frank B. Shelledy, and Arthur B. Wills, all of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 14, 1975, Ser. No. 604,689
Int. Cl.² G11B *5/221*
U.S. Cl. 360—113 **7 Claims**



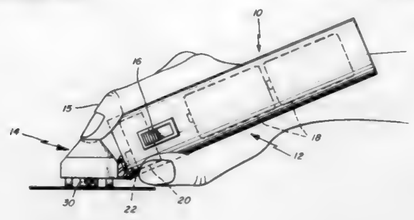
1. A method for manufacturing a multitrack read-while magnetic head comprising the steps of:
bonding substrates of ferrite on two titanium bodies;
depositing on one ferrite substrate a single copper write winding for each track;
depositing on the other ferrite substrate a single magnetoresistive read element for each track;
connecting each of the write windings and read elements to a separate write connector block and a read connector block via a pair of wires;
brazing a silver-copper sheet between a pair of ferrite layers, one of which contains glass-filled slots, thereby forming a center section which resists feedthrough, and forming a yoke which provides a magnetic closure;
assembling the sheet between the two substrates such that the ferrite layers of the center suction cooperate with respective ones of the ferrite substrates to form a magnetic head.
applying low viscosity epoxy from the outside of the bodies;
squeezing the bodies together between two titanium end pieces fastened by titanium bolts; and
forming a surface contour on the head by grinding and lapping the ferrite substrates and center section while simultaneously monitoring the resistance of the read elements.

4,044,393

HAND GUIDED TAPE PLAYER

Charles R. Budrose, Melrose, Mass., assignor to Upaya, Inc., Saugus, Mass.

Filed July 14, 1975, Ser. No. 595,521
Int. Cl.² G11B *21/02, 5/10*
U.S. Cl. 360—117 **13 Claims**



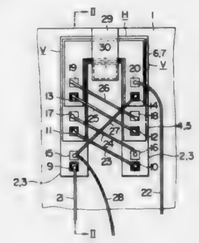
1. A hand held and guided player for use with a card or the like having a recording medium thereon and comprising:
a chassis,
a transducer means,
means for mounting the transducer means on said chassis in a position so that said transducer means can contact said medium and including biasing means for urging the transducer means downwardly,
wheel means extending at least in part below the chassis for supporting the chassis for movement over the recording medium surface,
means for coupling driving power to the wheel means for propelling the chassis at a predetermined fixed rate,
means coupled from said transducer means for providing an audio sound corresponding to a message recorded on the recording medium,
and a first housing covering said chassis and a second housing containing at least part of said means for propelling,
said means for supporting including at least two wheels and an interconnecting shaft, said means for propelling including a motor having a flexible output shaft coupled to said interconnecting shaft.

4,044,394

THIN FILM MAGNETIC HEAD WITH A CENTER TAP

Masanobu Hanazono; Osamu Asai, both of Hitachi, and Kunio Ono, Katsuta, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Apr. 5, 1976, Ser. No. 673,523
Claims priority, application Japan, Apr. 7, 1975, 50-41304
Int. Cl.² G11B *5/20, 5/28*
U.S. Cl. 360—123 **5 Claims**



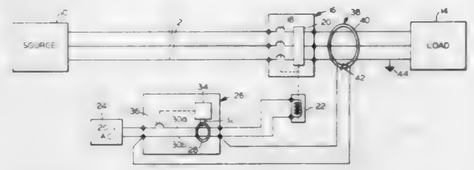
1. A magnetic head comprising:
a substrate;
magnetic core means superimposed on said substrate such that it elongates from a margin portion of said substrate perpendicularly to a direction of movement of a recording medium and is arranged so as to define a magnetic gap at one end of said magnetic core means on the margin portion of said substrate and come into magnetic connection with said substrate on the other end of said magnetic core means;
an even number of laminated conductive films each having a first portion extending to cross said magnetic core means and a second and a third portion respectively extending from the opposite ends of said first portion perpendicularly to the margin portion of said substrate;
insulating films provided among said conductive films so as to insulate said conductive films from one another;
connecting conductors for successively connecting said conductive films in such a manner that, assuming said conductive films are numbered in order from the top to the bottom, the free end of the second portion of the first one of said conductive films is connected with the free end of the third portion of the third one of said conductive films, the free end of the second portion of the second one of said conductive films is connected with the free end of the third portion of the fourth one of said conductive films, the free end of the second portion of the third one of said conductive films is connected with the free end of the third portion of the fifth one of said conductive films and the same manner is repeated till the free end of the third portion of the bottom one of the said conductive films is connected with the free end of the second portion of the conductive film having a number smaller by two than the number of said bottom one so as to form two sections of a coil;
a connecting conductive having a center tap, one end of which is connected with the free end of the second portion of the conductive film having a number smaller by one than the number of said bottom one and the other end of which is connected with the free end of the third portion of the second one of said conductive films so as to connect the two sections of the coil;
a first head-out conductor connected at its one end to the free end of the third portion of said first one of said conductive films, and
a second lead-out conductor connected at its one end to the free end of the second portion of said bottom one of said conductive films.

4,044,395

GROUND FAULT PROTECTION SYSTEM

Gregory C. Eckart, Southington, Conn., assignor to General Electric Company, New York, N.Y.

Filed Aug. 2, 1976, Ser. No. 710,391
Int. Cl.² H02H *3/28*
U.S. Cl. 361—44 **8 Claims**



1. A protection system for an electrical power distribution circuit, said system comprising, in combination:
A. a circuit breaker having contacts connected in the distribution circuit;
B. an actuator operable to open said breaker contacts and interrupt current flow in the distribution circuit;
C. a control circuit for said actuator;
D. a GFCI device including
1. contacts connected in said control circuit,
2. a differential current transformer having a primary winding connected in series with each of the two sides of said control circuit and a secondary winding in which is developed an output signal indicative of an

imbalance in the currents flowing in said primary windings,

3. means responsive to said output signal for opening said device contacts to interrupt said control circuit; and

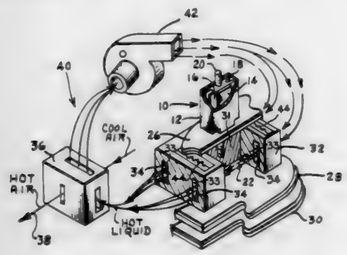
E. a ground fault sensor coupled with the distribution circuit and having an output connected across one of said primary windings, said sensor developing in response to a ground fault on the distrubution circuit a current signal in said one primary winding effective to create a current imbalance in said differential current transformer, whereby said device contacts open to interrupt said control circuit and said actuator operates to effect opening of said breaker contacts.

4,044,396

HEAT PIPE COOLING OF AIRBORNE PHASED ARRAY RADAR

James L. Haws; Douglas W. Quinney, both of Plano, and Frank A. Richards, Dallas, all of Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 14, 1975, Ser. No. 604,530
Int. Cl.[2] H05K *7/20*
U.S. Cl. 361—385 **3 Claims**



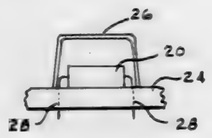
1. A system for controlling temperature in individual miniature modules comprising: a module having a case forming an enclosure, a pair of parallel panels positioned in the case, electronic circuitry mounted on said panels between each panel and the case, and means mounted in juxtaposition and between said panels for heat transfer, said means extending beyond the limits of said case in at least one direction, forming an extension; a fluid heat transfer medium; means supporting said module and having said fluid medium pass therethrough and operatively associating with the heat transfer means extension, thereby removing heat from said module.

4,044,397

INTEGRATED CIRCUIT WIRING BRIDGE APPARATUS

John H. Moore, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 12, 1976, Ser. No. 713,750
Int. Cl.[2] H05K *1/04*
U.S. Cl. 361—398 **5 Claims**



1. A wiring bridge apparatus comprising in combination:

a bridge forming means mounted over an integrated circuit device, said bridge forming means only contacting the leads of said integrated circuit device, said bridge forming means being formed from a base material, said base material being non-conductive, and,

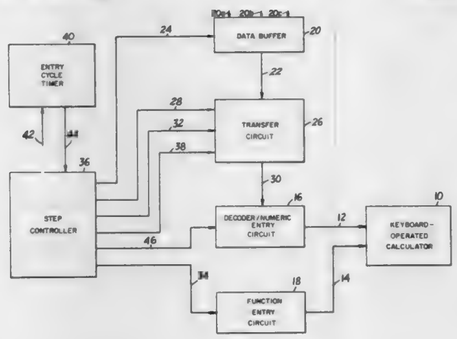
a plurality of conductive leads bonded to said bridge forming means, said plurality of conductive leads extending around the edge of said bridge forming means and being disposed on both sides thereof, said plurality of conductive leads being in alignment with said integrated circuit device leads, said plurality of conductive leads being bonded to said integrated circuit device leads, said plurality of conductive leads extending toward the center of said bridge forming means, each of said plurality of conductive leads being terminated in a conductive pad, said conductive pad having a hole disposed in the center thereof, said hole extending through said bridge forming means.

4,044,398

SYSTEM FOR INTERFACING KEYBOARD-OPERATED APPARATUS WITH ELECTRICAL DATA SIGNALS

Szee Ming Yao, Norwalk, Conn., assignor to Abbott Coin Counter Co., Inc., Greenwich, Conn.

Filed Jan. 9, 1976, Ser. No. 647,860
Int. Cl.[2] G06F *1/00*
U.S. Cl. 364—900 **8 Claims**



1. In combination, for processing information contained in manipulative input signals or electrical data signals:

a. a calculator having a keyboard and switches manually operable by depression of keys of said keyboard for entry of said manipulative input signals in said calculator; and

b. a system for entry of said electrical data signals in said calculator, comprising

1. transfer circuit means for receiving said data signals and responsive to a first control signal to provide first output signals indicative of first preselected content of said data signals and responsive to a second control signal to provide second output signals indicative of second preselected content of said data signals,

2. a plurality of switching means, each connected in parallel with a distinct one of said calculator key-operable switches,

3. decoder means receiving said first and second output signals from said transfer circuit means for operating said switching means in accordance with such preselected information contents of said data signals for entry of said contents in said calculator; and

4. step controller means for generating said first and second second control signals successively in predetermined time-spaced relation, and for maintaining said switching means unoperated for a preselected time period following each such operation thereof.

DESIGN PATENTS

GRANTED AUGUST 23, 1977

ERRATA

For CLASS	See PATENT NO.
014–059	245,520
024–064	245,537
024–034	245,538
024–062	245,539
024–062	245,540
024–038	245,541
024–038	245,542
024–054	245,543
028–025	245,544
029–008	245,545

DESIGNS

AUGUST 23, 1977

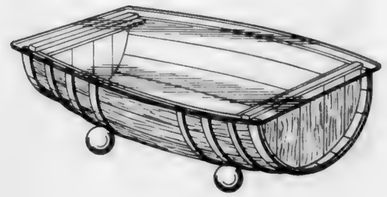
245,461
SHOULDER WALLET
Jack Jones, Jr., Decatur, Ga., assignor to Jones, Sr., Jack, Decator, Ga.
Filed Feb. 11, 1976, Ser. No. 657,029
Term of patent 14 years
Int. Cl. D2—*07*
U.S. Cl. D2—383



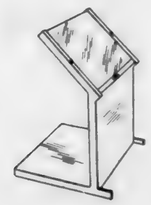
245,462
CLEANING BRUSH FOR A DRY SHAVER
Karl Peter Günter Hauf, Klagenfurt, Viktring, and Werner Karl Hofmeister, Klein St. Paul, both of Austria, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Feb. 24, 1976, Ser. No. 660,837
Claims priority, application Netherlands, Aug. 29, 1975, 7550516
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D4—10



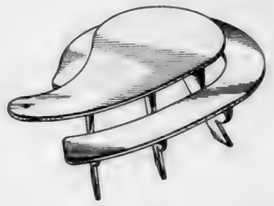
245,463
COMBINED COFFEE TABLE AND PLANTER
Stephen L. Smedley, 1030 5th Ave., Chula Vista, Calif. 92011
Filed Nov. 3, 1975, Ser. No. 627,932
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—4



245,464
PROTECTIVE SHIELD FOR USE WITH RADIOACTIVE MATERIALS
Meyer M. Reiss, 29 Lake Ave., Center Moriches, N.Y. 11931
Filed Feb. 17, 1976, Ser. No. 658,511
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—27



245,465
COMBINED TABLE AND SEATING UNIT
Wayne E. Hindle, Rte. 1, Box 141J, New Windsor, Md. 21776
Filed Mar. 31, 1976, Ser. No. 672,396
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—45



245,466
LOVE SEAT
Salvatore M. Asaro, 2334 Caminito Eximio, San Diego, Calif. 92107
Filed Feb. 2, 1976, Ser. No. 654,073
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—74



245,467
LIQUID DISPENSER
John R. Frassanito, 9400 Fredericksburg, San Antonio, Tex. 78240
Filed June 18, 1976, Ser. No. 697,523
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95



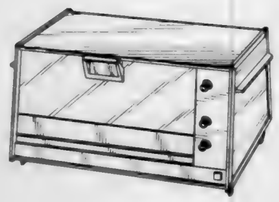
245,468
TABLE
Norton Jay Horwitz, Knoxville, Tenn., assignor to Silver Manufacturing, Inc.
Filed June 23, 1976, Ser. No. 699,061
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—175



245,469
PLANTER
Paul Smilko, 133-68 Hook Creek Blvd., Rosedale, N.Y. 11422
Filed Nov. 3, 1975, Ser. No. 627,840
Term of patent 14 years
Int. Cl. D6—*06, 01;* D11—*02*
U.S. Cl. D6—182



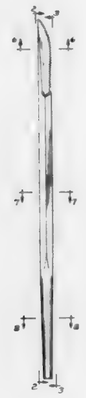
245,470
TOASTER OVEN
Robert O. Ernest, Oak Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 31, 1975, Ser. No. 645,686
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—91



245,471
SCOOP
John W. MacInnis, 711 30th Ave., and J. Thomas MacInnis, 702 17th St., both of Monroe, Wis. 53566
Filed Mar. 15, 1976, Ser. No. 666,937
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D7—104



245,472
COMBINED KNIFE AND CHOPSTICK
Wayne E. Jensen, Homewood, Ill., assignor to B & J Rocket (Hong Kong) Limited, Hong Kong
Division of Ser. No. 521,976, Nov. 8, 1974, Pat. No. Des. 242,760.
This application July 16, 1976, Ser. No. 705,753
Claims priority, application United Kingdom, May 17, 1974, 966677/74
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—149



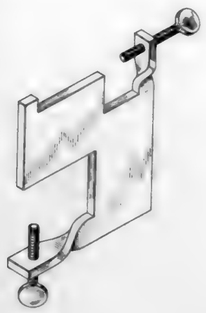
245,473
MOP HEAD
Francine F. Heninger, 968 Terrace Hills Drive, Salt Lake City, Utah 84103
Filed Apr. 9, 1976, Ser. No. 675,373
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—178



245,474
ADHESIVE DISPENSER
Charles H. Scholl, Vermilion, Ohio, assignor to Nordson Corporation, Amherst, Ohio
Filed Apr. 7, 1975, Ser. No. 565,933
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—30

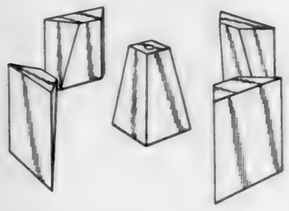


245,475
SKI VISE
Ronald D. Bourgeois, 38 Ellison Park, Waltham, Mass. 02154
Filed Feb. 19, 1976, Ser. No. 659,420
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—72

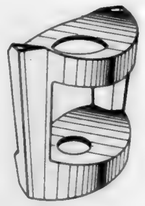


245,476
GOLF TEE SHARPENER
David Francis Cammarota, 2233 Broad Hollow Road, Farmingdale, N.Y. 11735
Filed Feb. 6, 1976, Ser. No. 655,686
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—91

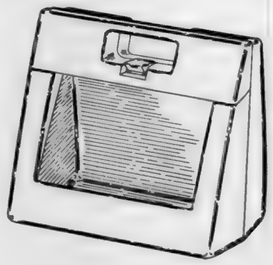
245,477
GROUND ANCHOR TIE-DOWN FOR MOBILE HOMES AND THE LIKE
Earnest R. Mullenax, P.O. Box 32349, Warr Acres Branch, Oklahoma City, Okla. 73132
Filed Jan. 14, 1974, Ser. No. 433,001
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382



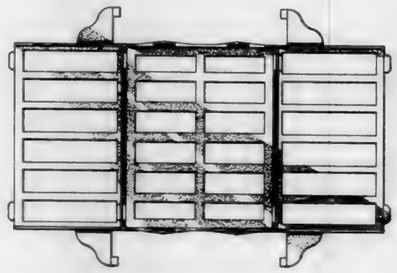
245,478
COLLAPSIBLE DISPLAY CARTON
Christopher John Clough, 113 Welbeck Drive, Great Horton, Bradford 7, Yorkshire, England, and Eric Jackson, 10 Rockville Drive, Embsay, Skipton, Yorkshire, England
Filed July 29, 1975, Ser. No. 600,040
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



245,479
DISPLAY CASE
Donald A. Malcolm, Roanoke Rapids, N.C., assignor to W. R. Grace & Co., Duncan, S.C.
Filed Sept. 12, 1975, Ser. No. 612,829
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—224



245,480
FOLDING DISPLAY BASKET FOR CARTONED PRODUCTS
John B. Brush, North College Hill, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 4, 1975, Ser. No. 583,846
Term of patent 14 years
Int. Cl. D9—*04*
U.S. Cl. D9—248



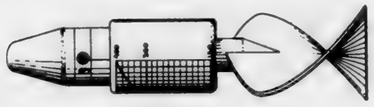
245,481
QUAHOG SIZING RING
Anthony Ronci, 38 Elmdale Ave., Johnston, R.I. 02919, and Robert A. Petrucci, 95 Orlando Drive, North Providence, R.I. 02904
Filed Oct. 20, 1975, Ser. No. 624,172
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



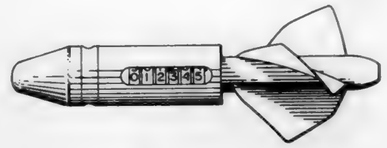
245,482
PITOT TUBE FITTING
Jan Flinta, Nykoping, and Gunnar Hernborg, Trosa, both of Sweden, assignors to Aktiebolaget Atomenergi, Nykoping, Sweden
Filed Sept. 25, 1975, Ser. No. 616,743
Claims priority, application Sweden, Mar. 26, 1975, 75648
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



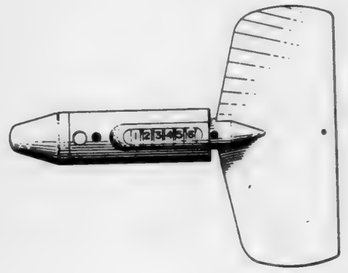
245,483
SHIELDED FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,662
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



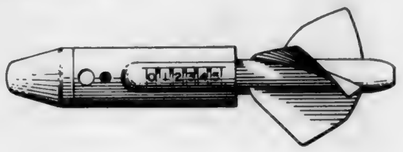
245,484
THREE BLADED CYLINDRICAL FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,663
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



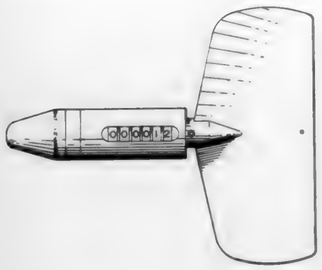
245,485
BAYED FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,664
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



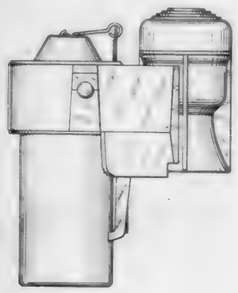
245,486
THREE BLADED BAYED FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,665
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



245,487
CYLINDRICAL FLOW METER
Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed Mar. 29, 1976, Ser. No. 671,666
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—96



245,488
FIRE ALARM
Michael Pappas, Irvington; Paul A. Witte, and Thomas Johnson, both of Hopewell, all of N.J., assignors to Falcon Safety Products, Inc., Mountainside, N.J.
Filed Nov. 24, 1976, Ser. No. 744,801
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—106



245,489
STAR RING OR SIMILAR ARTICLE
Harry Rimberg, 175 Willoughby St., Brooklyn, N.Y. 11201
Filed May 6, 1976, Ser. No. 683,885
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—26



245,490
ZODIAC CHARM
William S. Klitzner, 400 Narragansett Parkway, Warwick, R.I. 02888
Filed Jan. 19, 1976, Ser. No. 650,931
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—81



245,491
PLAQUE OR THE LIKE
Owen Siegel, 1517 Basswood Court, Glenview, Ill. 60025
Filed Mar. 16, 1976, Ser. No. 667,462
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—139

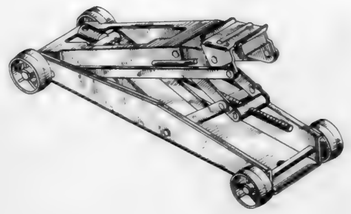


245,492
AIR CUSHIONED VEHICLE
Michael A. Clare, Toledo, Ohio, assignor to Windcraft Corporation, Maumee, Ohio
Filed Jan. 26, 1976, Ser. No. 652,065
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—5

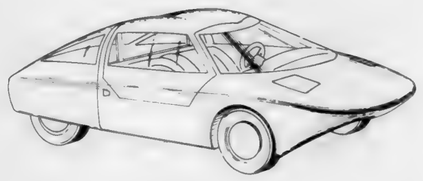




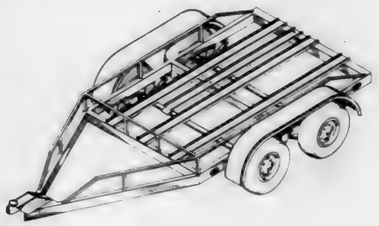
245,493
FLOOR JACK
Howard Kenig, Bristol, Pa., assignor to Gulf & Western Manufacturing Company (Systems)
Filed Nov. 19, 1975, Ser. No. 633,347
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—55



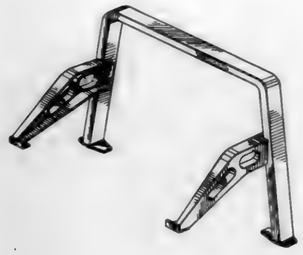
245,494
AUTOMOTIVE VEHICLE
Craig A. Selvidge, Edmonds, and Michael R. Seal, Bellingham, both of Wash., assignors to Western Washington State College, Bellingham, Wash.
Filed Feb. 6, 1976, Ser. No. 655,859
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—90



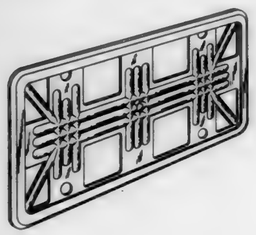
245,495
TRAILER
Thomas J. Henderson, P.O. Box 941, Pollock Pines, Calif. 95726
Filed Aug. 5, 1976, Ser. No. 711,846
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—101



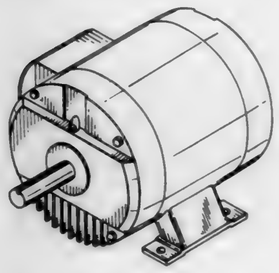
245,496
VEHICLE ROLL BAR UNIT
John Francis Wheeler, 9364 Jamacha Road, Spring Valley, Calif. 92077
Filed Apr. 5, 1976, Ser. No. 673,623
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—156



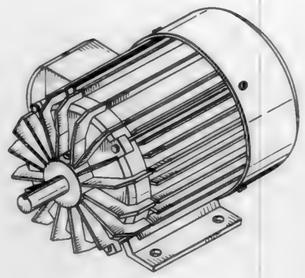
245,497
LICENSE PLATE HOLDER
Donald W. Ritch, 1531 Burgandy, Streamwood, Ill. 60103
Filed Jan. 19, 1976, Ser. No. 645,091
Term of patent 7 years
Int. Cl. D12—*16*
U.S. Cl. D12—193



245,498
HOUSING FOR ELECTRIC MOTOR
John C. Andreas, Des Peres, Mo., assignor to Gould Inc.
Filed Mar. 1, 1976, Ser. No. 662,531
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—1



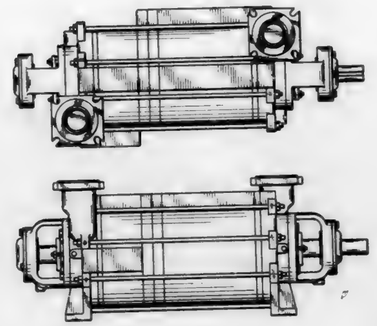
245,499
HOUSING FOR ELECTRIC MOTOR
John C. Andreas, Des Peres, Mo., assignor to Gould Inc.
Filed Mar. 1, 1976, Ser. No. 662,532
Term of patent 14 years
Int. Cl. D13—*01*
U.S. Cl. D13—01



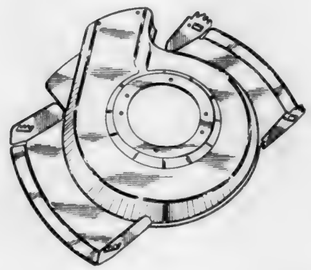
245,500
TELEPHONE SET
Hisao Fukushima; Katsuhito Watanabe; Yoshinori Kanda, and Tsutomu Watanabe, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan
Filed Dec. 15, 1976, Ser. No. 750,641
Claims priority, application Japan, June 22, 1976, 51-23588
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—57



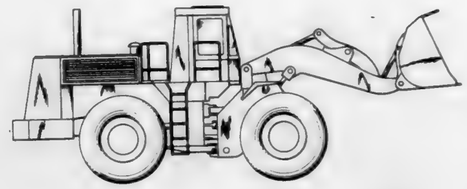
245,501
LIQUID RING PUMP
James B. Fitch, Marshfield, Mass., assignor to General Signal Corporation, Rochester, N.Y.
Filed Apr. 7, 1976, Ser. No. 674,532
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—7



245,502
LAWN MOWER HOUSING
Jerker E. Oscarsson; Hans T. A. Ehrlin, and Christian G. Haggstam, all of Tranas, Sweden, assignors to Stiga AB, Tranas, Sweden
Filed Dec. 16, 1975, Ser. No. 641,200
Claims priority, application Sweden, June 18, 1975, 1254/75
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—17



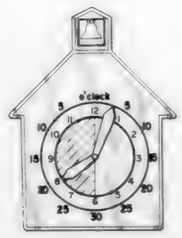
245,503
TRACTOR LOADER VEHICLE
Stanley B. Adams, Yorkville; John M. Parks, Peoria, and James M. Reisel, Naperville, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 12, 1976, Ser. No. 675,657
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—25



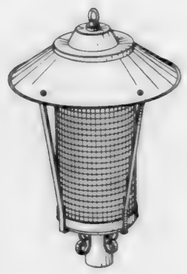
245,504
PEN
Eugene Defores, Nantes, France, assignor to Waterman, Paris, France
Filed Nov. 24, 1975, Ser. No. 634,464
Claims priority, application France, May 26, 1975, 75.73900
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—50



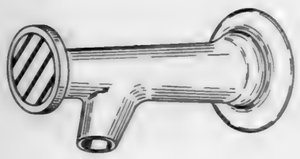
245,505
EDUCATIONAL TOY CLOCK
Maynard J. Bullock, 3106 Barth, Flint, Mich. 48504
Filed Sept. 2, 1975, Ser. No. 609,810
Term of patent 14 years
Int. Cl. D19—*07*
U.S. Cl. D19—64



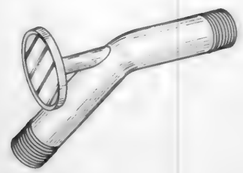
245,506
ELECTRONIC INSECT LAMP
Ted G. Kikoler, 47 Manchester Road, Kitchener, Ontario, Canada
Filed Apr. 7, 1976, Ser. No. 674,678
Term of patent 14 years
Int. Cl. D22—*06;* D26—*03*
U.S. Cl. D22—19



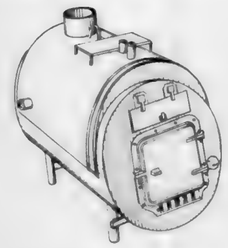
245,507
BATHTUB SPOUT
Lawrence E. Crow, 388 12th St., Oakland, Calif.
Filed Dec. 1, 1976, Ser. No. 746,382
Term of patent 14 years
Int. Cl. D23—*1*
U.S. Cl. D23—32



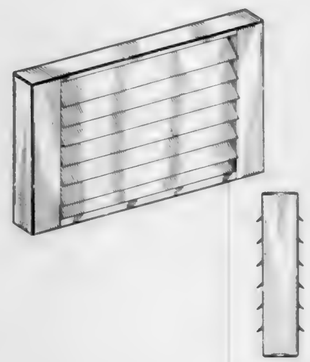
245,508
SHOWER SPOUT
Lawrence E. Crow, 388 12th St., Oakland, Calif.
Filed Dec. 1, 1976, Ser. No. 746,383
Term of patent 14 years
Int. Cl. D23—*1*
U.S. Cl. D23—32



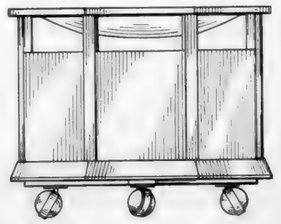
245,509
WOOD BURNING FURNACE
Robert G. Ulmer, 182 Kready Ave., Millersville, Pa. 17551, and David K. Stoltzfus, Ronks, Pa., assignors to said Robert G. Ulmer by said David K. Stoltzfus
Filed Mar. 23, 1976, Ser. No. 669,681
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—92



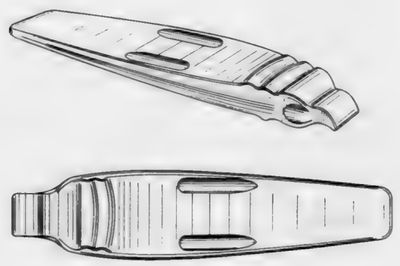
245,510
ELECTRIC RADIANT SPACE HEATER
Albert W. Herman, North Olmsted, and Joseph W. Adams, Westlake, both of Ohio, assignors to Bettcher Manufacturing Corporation
Filed Oct. 17, 1975, Ser. No. 623,376
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—113



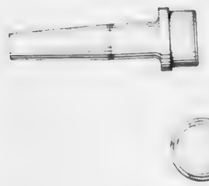
245,511
COMBINED FURNITURE COMMODE AND ROOM FAN
Nolan Lewis, W. 2136 Riverside, Apt. 63, Spokane, Wash. 99201
Filed Dec. 22, 1975, Ser. No. 642,711
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155



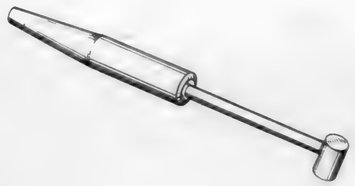
245,512
VENTILATED BITE STICK
William A. Kohl, Anza, Calif., assignor to Dyna Med, Inc., Carlsbad, Calif.
Filed Aug. 16, 1976, Ser. No. 714,633
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—10



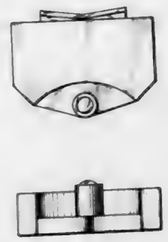
245,513
ULTRASONIC TRANSDUCER PROBE
Leroy A. Kopel, McVeytown, Pa., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.
Filed Nov. 10, 1975, Ser. No. 630,634
Term of patent 14 years
Int. Cl. D24—*02;* D10—*04*
U.S. Cl. D24—17



245,514
ULTRASONIC TRANSDUCER PROBE
Bradley Pennebaker, McClure, Pa., assignor to Krautkramer-Branson, Incorporated, Stratford, Conn.
Filed Jan. 29, 1976, Ser. No. 653,439
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



245,515
LIGHT FOR VAGINAL SPECULUM
Vernon H. Troutner, St. Petersburg, and Raymond W. Simmons, North Pinellas Park, both of Fla., assignors to Concept, Inc.
Filed Nov. 21, 1975, Ser. No. 634,257
Term of patent 14 years
Int. Cl. D24—*02;* D26—*99*
U.S. Cl. D24—29



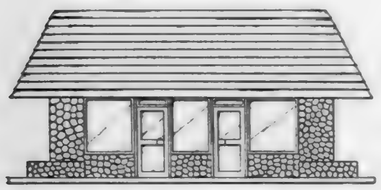
245,516
ARTIFICIAL CRUCIATE LIGAMENT
James T. Treace, Malibu, Calif., assignor to Richards Manufacturing Company, Inc., Memphis, Tenn.
Filed Jan. 21, 1976, Ser. No. 651,215
Term of patent 14 years
Int. Cl. D24—*03*
U.S. Cl. D24—33



245,517
MEXICAN FOOD RESTAURANT STRUCTURE
Jerome A. Gary, Irvine, Calif., assignor to Taco Charley, Inc., San Mateo, Calif.
Filed Oct. 29, 1976, Ser. No. 736,847
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—22



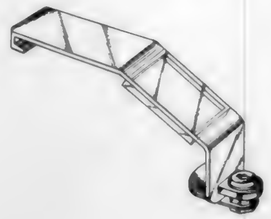
245,518
RESTAURANT BUILDING
Alvin C. Copeland, 5001 Folse Drive, Metairie, La. 70002
Division of Ser. No. 568,380, April 15, 1975. This application Dec. 6, 1976, Ser. No. 748,129
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25



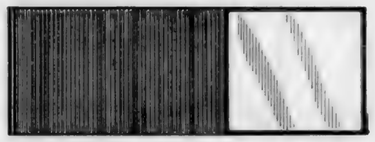
245,519
BURIAL FACILITY
Clyde C. Booth, 6001 NW. Highway, Oklahoma City, Okla. 73132
Filed Apr. 21, 1975, Ser. No. 569,862
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—33



245,520
TELEPHONE LOCKING DEVICE
Albert H. Smith, and Randall S. Smith, both of 17736 Hatteras St., Encino, Calif. 91316
Filed July 23, 1976, Ser. No. 708,094
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—59

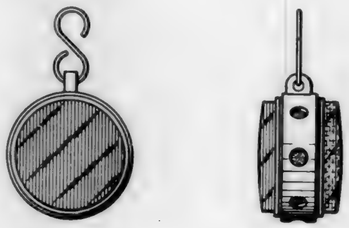


245,521
PORTABLE ANIMAL ENCLOSURE
Neil A. Koster, Rte. 1, Sylvia, Kans. 67581
Filed July 12, 1976, Ser. No. 704,462
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1





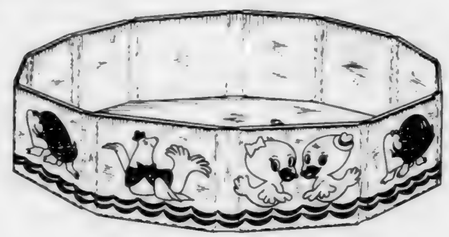
245,522
INSECT REPELLANT AND DISINFECTANT PENDANT FOR DOMESTIC ANIMALS
Dennis A. Mulkey, 2 Wharfside Road, Richmond, Va. 23228, and Robert E. Hatcher, 7300 Townes Road, Richmond, Va. 23229
Filed July 29, 2976, Ser. No. 709,885
Term of patent 3½ years
Int. Cl. D30—*08*
U.S. Cl. D30—43



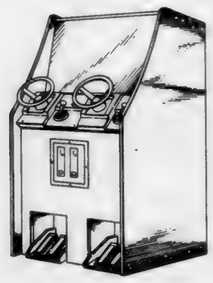
245,523
TOY FIGURE
Fredric C. Behling, 41 Washington St., West Barrington, R.I. 02890, and Paul J. Sullivan, 300 Metacom Ave., Bristol, R.I. 02809
Filed May 17, 1976, Ser. No. 687,244
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—4 R



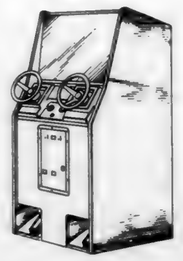
245,524
FOLDING SWIMMING POOL
Alan P. Friedlander, Searington, N.Y., assignor to Alvimar Manufacturing Co., Inc., Long Island City, N.Y.
Filed Sept. 30, 1975, Ser. No. 617,994
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 F



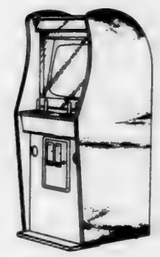
245,525
GAME CABINET
Ronald G. Wayne, 1900 California St., No. 4, Mountain View, Calif. 94040
Filed Jan. 26, 1976, Ser. No. 652,127
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



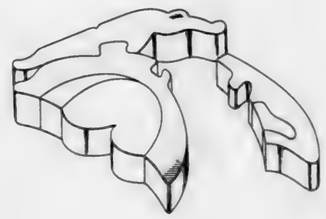
245,526
GAME CABINET
Kenneth W. Sauter, 17665A Del Monte Ave., Morgan Hill, Calif. 95037
Filed Jan. 26, 1976, Ser. No. 652,165
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



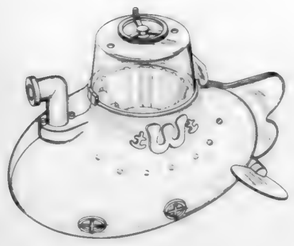
245,527
GAME CABINET
Kenneth W. Sauter, 17665A Del Monte Ave., Morgan Hill, Calif. 95037
Filed Feb. 6, 1976, Ser. No. 655,861
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 L



245,528
BUTTERFLY PUZZLE
Carol D. Milner, 7519 Beck Ave., North Hollywood, Calif. 91360
Filed Sept. 17, 1975, Ser. No. 614,259
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 M



245,529
TOY SUBMARINE
Robert H. Hudson, Seekonk, Mass., and George W. Ptaszek, Pascoag, R.I., assignors to Hasbro Development Corporation
Filed Jan. 12, 1976, Ser. No. 648,952
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



245,530
COMBINED TOY VEHICLE AND FIGURE THEREFOR
Edward M. Ferguson, Nashville, Tenn., assignor to Kusan, Inc., Nashville, Tenn.
Filed Apr. 23, 1976, Ser. No. 677,881
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AN



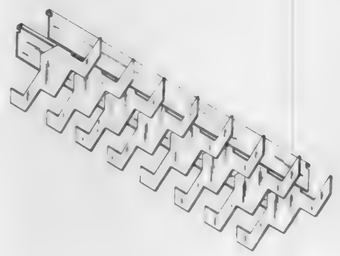
245,531
TOY BIRD
Masami Shiraishi, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed May 13, 1976, Ser. No. 686,632
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 C



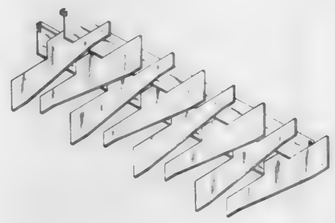
245,532
SWIM VEST WITH DORSAL FIN
Donald Taylor, 413 Auburn Ave., Altamonte Springs, Fla. 32701
Filed Nov. 21, 1975, Ser. No. 634,141
Term of patent 14 years
Int. Cl. D2—*02;* D21—*02*
U.S. Cl. D34—43



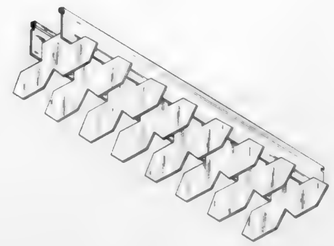
245,533
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,262
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



245,534
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,263
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



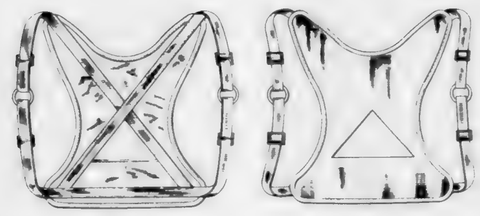
245,535
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,264
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



245,536
LIGHTING BAFFLE
Arthur W. Segil, 910 Skokie Blvd., Northbrook, Ill. 60062
Filed Apr. 2, 1976, Ser. No. 673,265
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D48—16 A



245,537
HUMAN BACK SUPPORT HARNESS
Donald Joseph Gurgiolo, P.O. Box 432, Islamorado, Fla. 33036
Filed Sept. 8, 1975, Ser. No. 611,000
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—64



245,538
STAND FOR A DRAINAGE DEVICE
Leonard David Kurtz, Woodmere, and Robert Bidwell, Melville, both of N.Y., assignors to Deknatel, Inc., New York, N.Y.
Filed Sept. 8, 1975, Ser. No. 611,422
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—34



245,539
NEBULIZER-HUMIDIFIER BAG ASSEMBLY
Joseph W. Lindsey, Salt Lake City, Utah, assignor to Arbrook, Inc., Arlington, Tex.
Filed Nov. 26, 1975, Ser. No. 635,511
Term of patent 14 years
Int. Cl. D28—*01;* D24—*02*
U.S. Cl. D24—62



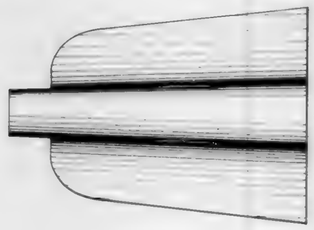
245,540
NEBULIZER BAG
Joseph W. Lindsey, Salt Lake City, Utah, assignor to Arbrook, Inc., Arlington, Tex.
Filed Nov. 26, 1975, Ser. No. 635,512
Term of patent 14 years
Int. Cl. D28—*01*; D24—*02*
U.S. Cl. D24—62



245,542
BATHING POOL
Merle C. Melcior, Los Angeles, Calif., assignor to Hydro-Spa, Inc., Encino, Calif.
Division of Ser. No. 434,433, Jan. 18, 1974, Pat. No. Des. 240,084.
This application Feb. 23, 1976, Ser. No. 660,769
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D24—38



245,543
PORTABLE URINAL
Raymond J. DeBurgh, P.O. Box 521-A, Rte. 2, Weslaco, Tex. 78596
Filed Apr. 23, 1976, Ser. No. 679,649
Term of patent 14 years
Int. Cl. D24—*05*
U.S. Cl. D24—54



245,541
BATHING POOL
Merle C. Melchior, Los Angeles, Calif., assignor to Hydro-Spa, Inc., Encino, Calif.
Division of Ser. No. 434,433, Jan. 18, 1974, Pat. No. Des. 240,084.
This application Feb. 23, 1976, Ser. No. 660,768
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D24—38





245,544
COMBINED COMB AND BRUSH
Cleother Pittman, 11946 E. 164th St., Norwalk, Calif. 90650
Filed Feb. 27, 1976, Ser. No. 661,852
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—25



245,545
PROTECTIVE FACE MASK
Chen Ching Chou, 444 Lombard St., San Francisco, Calif. 94133
Filed Oct. 28, 1975, Ser. No. 625,956
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D29—8



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF AUGUST, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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A/S Kongshavn Industri: *See*—
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Aaberg, Carl Peter Noe. Method and apparatus for exhausting air from a limited zone. 4,043,257, Cl. 98-43.00R.

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Abbott Laboratories: *See*—
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Abbott, William G. Carburetor spacer plate with vapor fuel inlet. 4,043,306, Cl. 123-121.000.

Abdelrahman, Mona M.; and Daughton, James M., to Honeywell Inc. Plurality of precise temperature resistors formed in monolithic integrated circuits. 4,044,371, Cl. 357-28.000.

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Abel, Heinz; Toepfl, Rosemarie; and Schibler, Luzius, to Ciba-Geigy Corporation. Process for reinforcing nonwovens. 4,044,178, Cl. 427-373.000.

Abernethy, Robert R. Edge deformable lock nut. 4,043,369, Cl. 151-21.00C.

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Adler, Franklin P., to Pullman Transport Leasing Company. Alternatively usable sling and key roller bearing retainers. 4,043,273, Cl. 105-221.00R.

Adler, Klaus; Pichler, Engelbert; Kemenater, Christoph; Dressler, Wilfried; and Bauer, Johann, to Wacker-Chemie GmbH. Particulated rubber and plastics coverings and binders therefor. 4,043,962, Cl. 260-29.300.

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Allain, Jacques; Duchene, Jean; and Merelli, Marc, to Commissariat a l'Energie Atomique. Modular ionization chamber of the boron-coating type. 4,044,301, Cl. 324-33.000.

Allanic, Jacques; and Fuchs, Guerchon Georges, to Societe Anonyme de Telecommunications; and Etat Francais represente par le Secretaire des Postes et Telecommunications (Centre National D'Etudes des Telecommunications). Waveguide and process for making the same. 4,043,029, Cl. 29-600.000.

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Ballew, Audrey H., to Dallas County Association for the Blind. Method and apparatus for constructing a mop. 4,043,602, Cl. 300-16.000.

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Bansal, Surinder K. Arm board for intravenous infusions. 4,043,330, Cl. 128-133.000.

Barbee, Robert B., to Eastman Kodak Company. Grafting process for preparing a polyester fabric having desirable stain-release, antisoil-redeposition, antistatic and hydrophilic properties. 4,043,753, Cl. 8-115.500.

Barclay, Andrew Conway: *See—*
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Barker, Sidney Alan; and Gray, Charles John, to Koch-Light Laboratories, Ltd. Water insoluble biologically active material. 4,043,869, Cl. 195-63.000.

Barner, Herbert E.; Davies, David S.; and Szabo, Lester J., to Kennecott Copper Corporation. Two-stage fluid bed reduction of manganese nodules. 4,044,094, Cl. 423-32.000.

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Bartko, John; and Wonn, James W., to Westinghouse Electric Corporation. Method and apparatus for determining uranium concentration in a moving stream. 4,043,755, Cl. 23-230.00R.

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Baumstimler, August B. Safety sleeve. 4,043,150, Cl. 64-32.00R.
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Bearup, Charles D.; and Few, Marvin F., to Few, Marvin F. Rowing and steering device for boats. 4,043,291, Cl. 115-29.000.
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Berkowitz, Murray, to Curtiss-Wright Corporation. Seal grid assembly for rotary piston mechanism. 4,043,714, Cl. 418-123.000.
Bernady, Karel Francis; Floyd, Middleton Brawner, Jr.; Poletto, John Frank; Schaub, Robert Eugene; and Weiss, Martin Joseph, to American Cyanamid Company. Derivatives of 9-oxo-13-trans-prostenoic acid esters. 4,044,043, Cl. 260-468.00D.
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, to Societe Nationale Elf Aquitaine. Catalytic composition for the isomerization and alkylation of hydrocarbons. 4,044,069, Cl. 260-683.470.
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Bianchi, Valerio; Schmidt, Peter; and Latsch, Reinhard, to Robert Bosch GmbH. Method and apparatus for controlling the operation of an internal combustion engine. 4,044,236, Cl. 235-150.210.
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Rabinovitch, Maurice; and Stohr, Jean-Francois, to O.N.E.R.A. - Office National d'Etudes et de Recherches Aerospatiales. Metal-refractory composite material. 4,043,841, Cl. 148-32.500.
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Birchler, Robert O.; and Williams, E. R., Jr., to Texas Instruments Incorporated. Process for encapsulating electronic components in plastic. 4,043,027, Cl. 29-588.000.
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Bost, Howard W., to Phillips Petroleum Company. Flame-resistant polyolefin compositions. 4,043,975, Cl. 260-45.75W.
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BRS, Inc.: *See*—
Hollister, Geoffrey L.; and Vixie, Dennis E., 4,043,058, Cl. 36-102.000.
Bruck, Howard P.: *See*—
Godin, Victor B.; and Bruck, Howard P., 4,043,234, Cl. 83-40.000.
Brundler, Hans Josef. Machine for comminuting and mixing materials. 4,043,515, Cl. 241-97.000.
Brunel, Daniel Elie: *See*—
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.
Bryars, David J. J., to Austen Bryars of London, Inc. Inlay wheel and method. 4,043,152, Cl. 66-9.00R.
Bryceland, Maurice Cyril, to Waldman Corporation. Push button assembly and electronic watch including the same. 4,043,115, Cl. 58-50.00R.
Buchberger, Gerhard: *See*—
Kostrzewa, Michael; Holst, Arno; and Buchberger, Gerhard, 4,044,198, Cl. 536-86.000.
Bucher, David Hoffer: *See*—
Sorlie, Donald Thomas; and Bucher, David Hoffer, 4,043,281, Cl. 111-85.000.
Sorlie, Donald Thomas; Bucher, David Hoffer; and Sutherland, Gail Russell, 4,043,404, Cl. 172-555.000.
Buckman, Thomas P. Combination vent and shut off valve. 4,043,489, Cl. 222-397.000.
Budrose, Charles R., to Upaya, Inc. Hand guided tape player. 4,044,393, Cl. 360-117.000.
Bugg, Kenly C. Wood treating process. 4,044,172, Cl. 427-55.000.

Buhrke Industries, Inc.: *See—*
Gorgius, Otto; and Quaas, Dietmar G., 4,043,169, Cl. 72-349.000.

Bulman, Melvin John; and Graham, Alfred Rapp, to General Electric Company. Liquid propellant gun (recoilless regenerative piston). 4,043,248, Cl. 89-1.703.

Bulten, Eric J.; and Verbeek, Francois, to Commer S.r.l. Method for the preparation of alkyl tin halides. 4,044,035, Cl. 260-429.700.

Bunker, James W., to Hi-Shear Corporation. Knee joint coupling. 4,043,000, Cl. 16-128.00R.

Bunker Ramo Corporation: *See—*
Ayer, George Edward, 4,043,627, Cl. 339-75.00R.
Taylor, Derek, 4,044,327, Cl. 338-166.000.

Bunn, Stuart E.; and Owsley, Herbert B. Compressor unloader assembly. 4,043,710, Cl. 417-440.000.

Bunz, Peter: *See—*
Scharbach, Heinz; Engelhardt, Achim; and Bunz, Peter, 4,044,170, Cl. 427-2.000.

Burkwall, Morris P., Jr., to Quaker Oats Company, The. Caseinate replacement for pet food using a neutral chelating agent. 4,044,158, Cl. 426-271.000.

Burlington AG: *See—*
Schmidt, Walter Richard, 4,043,151, Cl. 66-9.00R.

Burmah Oil and Gas Company: *See—*
Bascope, Alberto H.; and Grizzard, Eugene H., 4,043,912, Cl. 210-83.000.

Burroughs Corporation: *See—*
Gibbs, Stephen R., 4,043,894, Cl. 204-297.00W.
Przybylek, George John; and Lesky, Joseph, 4,044,275, Cl. 313-177.000.

Burroughs Wellcome Co.: *See—*
Mehta, Nariman Bomanshaw; and Brieaddy, Lawrence Edward, 4,044,014, Cl. 260-293.730.

Burton, Gardner T.: *See—*
Croce, Richard F.; and Burton, Gardner T., 4,043,653, Cl. 355-2.000.

Busby, Edwin S., Jr.: *See—*
Oldershaw, Reginald W.; and Busby, Edwin S., Jr., 4,044,389, Cl. 360-73.000.

Busch, Richard E., to Addmaster Corporation. Paper feed and web rewind mechanism. 4,043,440, Cl. 197-114.00R.

Bush, Bill R.; and Hornstein, Jack, to Preload Company, Inc. Overlap closure system for precast prestressed water tanks. 4,043,089, Cl. 52-516.000.

Butler, James L., to American Bath and Shower Corporation. Automatic bathtub water level control system. 4,042,984, Cl. 4-200.000.

Butter, Stephen A.; and Kaeding, Warren W., to Mobile Oil Corporation. Conversion utilizing a phosphorus-containing zeolite catalyst. 4,044,065, Cl. 260-677.00R.

Buuck, Dennis L., to Fairfield Manufacturing Company, Inc. Disengage mechanism for gear drive. 4,043,226, Cl. 74-801.000.

Buus, Jorn Lasse Martin; Lassen, Niels; and Bigler, Allan Johan, to Kefalas A/S. Thiaxanthene derivatives. 4,044,024, Cl. 260-328.000.

Buysch, Hans-Josef; and Heuser, Jurgen, to Bayer Aktiengesellschaft. Process for the preparation of α,α,α',α'-tetramethylphenylene biscarbinols. 4,044,058, Cl. 260-618.00C.

Buysch, Hans-Josef; and Scholz, Karl-Heinz, to Bayer Aktiengesellschaft. Process for preparing geminal dihalides. 4,044,060, Cl. 260-651.00R.

BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H.: *See—*
Noe, Oskar; and Skrober, Wolfgang, 4,043,162, Cl. 72-163.000.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*
Kramann, Bernhard; and Tammen, Heinrich, 4,043,345, Cl. 128-349.00R.

Byrne, Michael F.; and Powelson, Douglas V. N., to Allied Chemical Corporation. Method of joining plastic pipe. 4,043,857, Cl. 156-198.000.

C. F. Spiess & Sohn: *See—*
Perkow, Werner; Hopp, Hans; and Ingwersen, Walter, 4,044,045, Cl. 260-470.000.

C. van der Lely N. V.: *See—*
van der Lely, Cornelis; and van der Lely, Ary, 4,043,400, Cl. 172-43.000.

Cabell, Douglas N., to GF Business Equipment, Inc. Adjustable chair rest member. 4,043,594, Cl. 297-353.000.

Cabot Corporation: *See—*
Acuncius, Dennis A.; Herchenroeder, Robert B.; Kirchner, Russell W.; and Silence, William L., 4,043,810, Cl. 75-171.000.

Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., to Tribotech. Self-aligning bearing and rod end assembly including formed ball mount. 4,043,617, Cl. 308-72.000.

Caldwell, John R., to Xerox Corporation. Copier document handler. 4,043,665, Cl. 355-76.000.

Calgon Corporation: *See—*
Noren, Gerry Karl, 4,044,054, Cl. 260-584.00A.

California Institute of Technology: *See—*
Goetz, Alexander F. H.; Graham, Richard A.; and Ozawa, Tetsuo, 4,043,668, Cl. 356-73.000.

Cambridge Thermionic Corporation: *See—*
Lyman, Frank, 4,043,614, Cl. 308-10.000.

Camelio, Joseph Robert. Ski carrying device and method. 4,043,493, Cl. 224-45.00S.

Cameron Iron Works, Inc.: *See—*
Weldon, James M., 4,043,391, Cl. 166-217.000.

Campbell, Alfred: *See—*
Tinney, Francis John; Nicolaides, Ernest D.; and Campbell, Alfred, 4,043,993, Cl. 260-112.5LH.

Campbell, Douglas C. Plugging of abandoned dry wells. 4,043,394, Cl. 166-253.000.

Campbell, Norman: *See—*
Dix, Joseph; Campbell, Norman; and Tonseth, Ivar S., Jr., 4,043,499, Cl. 228-173.000.

Canon Kabushiki Kaisha: *See—*
Hirose, Ryusho; and Tsuji, Takao, 4,043,642, Cl. 350-184.000.
Inoue, Shozo; and Sato, Tadashi, 4,043,658, Cl. 355-10.000.
Kishimoto, Jyuji; and Toyomura, Shigeru, 4,044,228, Cl. 235-61.90A.

Carl Zeiss Stiftung: *See—*
Holzinger, Otto; and Pross, Wilhelm, 4,043,676, Cl. 356-226.000.

Carlomagno, Giovanni Maria; and Costa, Bruno, to Italsider S.p.A. Method and device for blowing oxygen in metal refining converters in unstationary manner. 4,043,799, Cl. 75-60.000.

Carlson, Arthur, Jr.; and Rupe, Billy D., to Cutter Laboratories, Inc. Method of controlling release of medicament and bolus therefor. 4,044,119, Cl. 424-22.000.

Carlson, Jerome A.: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,043,617, Cl. 308-72.000.

Carlson, Robert G., to General Electric Company. Impact resistant composite article comprising laminated layers of collimated filaments in a matrix wherein layer-layer bond strength is greater than collimated filament-matrix bond strength. 4,043,703, Cl. 416-230.000.

Carpentier, John H., to Beatrice Foods Co. Drain assembly for sinks and the like. 4,042,983, Cl. 4-291.000.

Carr, David L., to Eastman Kodak Company. Ultrasonically smoothing a magnetic layer on a web. 4,044,174, Cl. 427-130.000.

Casey, Robert, to Caterpillar Tractor Co. Rim construction and tool apparatus for safe tire inflation. 4,043,375, Cl. 157-1.000.

Casey, T. Eisert: *See—*
O'Sullivan, Denis J.; Bolger, Bernard J.; and Casey, T. Eisert, 4,043,982, Cl. 260-47.0UA.

Caspel Industries: *See—*
DiMatteo, Frank J., 4,043,329, Cl. 128-132.00R.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*
Keil, Karl-Heinz; Keller, Karlfried; Ribka, Joachim; and Tichy, Dieter, 4,043,984, Cl. 260-67.60R.

Castillo, Adolfo: *See—*
Jureit, John Calvin; and Castillo, Adolfo, 4,044,093, Cl. 269-321.00F.

Castro, Manuel A. Stack loader for bales. 4,043,461, Cl. 214-6.00B.

Catalyst Research Corporation: *See—*
Bowser, George C., Jr.; and Blucher, Richard L., 4,044,192, Cl. 429-112.000.

Caterpillar Tractor Co.: *See—*
Beals, Charles E.; Chambers, Robert O.; Hanson, Edwin E.; and Satzler, Ronald L., 4,043,227, Cl. 74-868.000.
Casey, Robert, 4,043,375, Cl. 157-1.000.
Grawey, Charles E., 4,044,085, Cl. 264-90.000.
Kolb, David L., 4,043,220, Cl. 74-543.000.
Smith, Duane R., 4,043,374, Cl. 152-405.000.
Stepe, Visvaldis A., 4,043,060, Cl. 37-141.00R.
Unwin, William B.; Groezinger, John J.; and Grawey, Charles E., 4,043,370, Cl. 152-354.000.

Cathles, Lawrence MacLagan, III: *See—*
Lingane, Peter James; Cathles, Lawrence MacLagan, III; and Hsueh, Limin, 4,043,599, Cl. 299-4.000.

Catt, John D.: *See—*
Comer, William T.; and Catt, John D., 4,044,151, Cl. 424-321.000.

Cavicchio, Raymond A. Circuit for musical instrument. 4,043,242, Cl. 84-1.170.

Cawood, Charles D., Jr.; and Ziegler, John S., to American Hospital Supply Corporation. Urological drape. 4,043,328, Cl. 128-132.00D.

Celotex Corporation, The: *See—*
Jones, William R., 4,043,719, Cl. 425-115.000.

Center for Design Research and Development N.V.: *See—*
Ambasz, Emilio, 4,043,063, Cl. 40-119.000.

Central Glass Company, Limited: *See—*
Enomoto, Takamitsu; Ogura, Motoshige; and Ono, Tetsuhiro, 4,044,105, Cl. 423-308.000.

Cepuritis, Talivaldis, to Johnson & Johnson. Diaper with repositionable tab fastener. 4,043,340, Cl. 128-287.000.

Cerkanowicz, Anthony E., to Photochem Industries, Inc. Control of the initiation of combustion and control of combustion. 4,043,308, Cl. 123-143.00R.

Cerruti, Roger Anthony; McWhorter, Thomas Ellsworth; and Ruprecht, David Russell, to Air Products and Chemicals, Inc. Combined flow measuring and valve leakage indicator. 4,043,355, Cl. 137-312.000.

Cervin, Curtis M. Poultry shackle scrubber. 4,042,993, Cl. 15-21.00D.

CF&I Engineers, Inc.: *See—*
Leibig, Wilhelm J.; Steele, Clarence R.; and Price, Frank B., 4,043,832, Cl. 127-6.000.

Chambers, Robert O.: *See—*
Beals, Charles E.; Chambers, Robert O.; Hanson, Edwin E.; and Satzler, Ronald L., 4,043,227, Cl. 74-868.000.

Champan, Louis W.; and Perkins, Arthur T., to Melco. Digital decoder for multiple frequency telephone signalling. 4,044,206, Cl. 179-84.0VF.

Chan, Wayne W.: *See—*
Roberts, Charles Grady; Chan, Wayne W.; and Collins, Dean R., 4,044,374, Cl. 357-80.000.

Chang, Clarence D.; Silvestri, Anthony J.; and Zahner, John C., to Mobil Oil Corporation. Preheating methanol effects steady state operation of conversion to gasoline. 4,044,061, Cl. 260-668.00R.

Chang, Wen-Hsuan; Hartman, Marvis E.; and Scriven, Roger L., to PPG Industries, Inc. Ambient temperature, moisture-curable acrylic-silane coating compositions having improved potlife. 4,043,953, Cl. 260-18.00S.

Charles Stark Draper Laboratory, Inc., The: *See—*
Oberbeck, George A., 4,044,305, Cl. 324-154.00R.

Charm, Stanley E.; and Blair, Henry E. Method of determining methotrexate. 4,043,759, Cl. 23-230.600.

Chattoraj, Shib C.: *See—*
Eisentraut, Kent J.; and Chattoraj, Shib C., 4,044,116, Cl. 423-658.500.

Cheatum, Leo George, to Deere & Company. Agricultural implement hydraulic system. 4,043,099, Cl. 56-10.900.

Check, John M.; and Rupert, Gary F., to Raycon Corporation. Multiple electrode electrical discharge machining. 4,044,216, Cl. 219-69.00E.

Chelberg, Rodney. Drill attachment. 4,043,698, Cl. 408-201.000.

Chembond Corporation: *See—*
Robitschek, Paul; and Christensen, Ross L., 4,044,087, Cl. 264-113.000.

Cherian, Abraham, to Xerox Corporation. Transparency copying machine. 4,043,656, Cl. 355-3.00R.

Chernenko, Ivan Alexeevich: *See—*
Lebedev, Vladimir Konstantinovich; Chernenko, Ivan Alexeevich; Postolaty, Nikolai Ivanovich; Kuchuk-Yatsenko, Sergei Ivanovich; Tishura, Vladimir Ivanovich; Entin, Yakov Borisovich; Filippov, Alexandr Nikolaevich; and Martynov, Evgeny Petrovich, 4,044,219, Cl. 219-100.000.

Cherrington, Martin D., to Tidril Corporation. System and method for installing production casings. 4,043,136, Cl. 61-72.700.

Chervin, Andre. Finger ring with means for locking behind the knuckle. 4,043,145, Cl. 63-15.000.

Chevron Research Company: *See—*
Anderson, Robert G.; Straus, Alan E.; and Wilkes, John B., 4,044,027, Cl. 260-346.750.
DeVries, Louis, 4,044,039, Cl. 260-453.0RW.
Fredriksson, Oke A.; and Thomas, Elmer L., 4,043,175, Cl. 73-1.0DV.
Kurkov, Victor P., 4,044,050, Cl. 260-491.000.
Schneider, Ronald A., 4,043,943, Cl. 252-437.000.

Chicago Tool and Engineering Company: *See—*
Glomb, Frank A.; and Griffith, William S., 4,043,547, Cl. 269-136.000.

Chichin, Alexandr Vasilievich: *See—*
Romanenko, Nikolai Trofimovich; Chichin, Alexandr Vasilievich; Lyaskovsky, Ivan Frantsevich; Melnik, Vladimir Jurievich; Medinsky, Nikolai Ivanovich; and Yakunin, Valentin Matveevich, 4,043,211, Cl. 74-110.000.

Chihara, Hiroyuki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece battery-potential detecting circuit. 4,043,110, Cl. 58-23.0BA.

Chodnikiewicz, Krzysztof: *See—*
Marciniak, Zdzislaw; Sklad, Mateusz; and Chodnikiewicz, Krzysztof, 4,043,173, Cl. 72-403.000.

Chou, Eddie C.: *See—*
Queneau, Paul B.; and Chou, Eddie C., 4,044,096, Cl. 423-150.000.

Christ, Hubertus: *See—*
Bourg, Guillaume; Christ, Hubertus; Hausmann, Taddaus; and Sales, Louis, 4,043,608, Cl. 303-104.000.

Christen, Roland W.: *See—*
Dhyanchand, P. John J.; Glennon, Timothy F.; and Christen, Roland W., 4,044,296, Cl. 322-25.000.

Christensen, Ross L.: *See—*
Robitschek, Paul; and Christensen, Ross L., 4,044,087, Cl. 264-113.000.

Christiansen, Arvid, to Miranol Chemical Company, Inc., The. Nitrogenous condensation products. 4,044,034, Cl. 260-404.500.

Christo, Christ, to Masco Corporation of Indiana. Water faucet. 4,043,359, Cl. 137-625.410.

Chromalloy American Corporation: *See—*
Anderson, Carl M.; and Anderson, Charles W., 4,043,403, Cl. 172-413.000.

Chu, Simon Long; Shu, Peter; and Sharowsky, Robert, to Polychrome Corporation. Roll construction for coating apparatus. 4,043,296, Cl. 118-419.000.

Churchward, Roy Alexander. Golf club. 4,043,563, Cl. 273-171.000.

Ciba-Geigy AG: *See—*
Baumann, Niklaus, 4,043,819, Cl. 96-115.00P.
Kitzing, Rainer; and Smith, Norman Alfred, 4,043,995, Cl. 260-117.000.
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,044,029, Cl. 260-376.000.

Ciba-Geigy Corporation: *See—*
Abel, Heinz; Toepfl, Rosemarie; and Schibler, Luzius, 4,044,178, Cl. 427-373.000.
Boehner, Beat; Dawes, Dag; and Meyer, Willy, 4,044,124, Cl. 424-200.000.
Hari, Stefan; Irvine, Alexander McHugh; McCrae, James McGeachie; Vuitel, Laurent; and L'Eplattenier, Francois, 4,044,036, Cl. 260-438.100.
Howarth, Graham Arton; and Gainer, James, 4,044,130, Cl. 424-248.560.
Jager, Horst, 4,044,075, Cl. 260-943.000.
Model, Ernst; and Pugin, Andre, 4,043,999, Cl. 260-152.000.
Schmidt, Andreas; Peterson, Janet B.; and Dexter, Martin, 4,044,019, Cl. 548-313.000.
Seha, Zdenek, 4,044,030, Cl. 260-378.000.
Stark, Bernard Peter; and Thoseby, Michael Robert, 4,043,983, Cl. 260-65.000.

Cimarusti, Christopher M.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

Cincinnati Milacron Inc.: *See—*
Wisbey, Jerry Dale, 4,043,486, Cl. 222-134.000.

Clampitt, Richard L.: *See—*
Hessert, James E.; and Clampitt, Richard L., 4,043,921, Cl. 252-8.50C.

Clarisse, Eddy Johan, to U.S. Philips Corporation. Frequency selector comprising a freewheel coupling. 4,043,207, Cl. 74-10.150.

Clark Equipment Company: *See—*
Albright, Larry E.; and Frederick, Dan A., 4,043,253, Cl. 92-25.000.
Albright, Larry E.; Bauer, James J.; and Cramton, Earl W., 4,043,416, Cl. 180-6.480.
Hansen, Howard C., 4,043,463, Cl. 214-16.40A.
Hoyt, Deryl R., 4,043,472, Cl. 214-750.000.

Clarke Chapman Limited: *See—*
Jones, Emyr, 4,043,496, Cl. 228-2.000.
Jones, Emyr, 4,043,497, Cl. 228-2.000.

Claybaker, LeRoy A., to General Electric Company. Compositions and laminates made therefrom. 4,043,954, Cl. 260-19.00A.

Cline, Clinton: *See—*
Miller, Joseph; and Cline, Clinton, 4,043,457, Cl. 213-75.00B.

Cloud, James Zeno, Jr.: *See—*
Little, John D.; and Cloud, James Zeno, Jr., 4,043,326, Cl. 128-82.000.

Coats & Clark, Inc.: *See—*
Jovin, Eudor Louis, 4,043,232, Cl. 83-13.000.

Cobb, A. Tom, to Continental Oil Company. Ram-shear and slip device for well pipe. 4,043,389, Cl. 166-55.000.

Cochran, Robert W. Electro-pneumatic fruit picker. 4,043,105, Cl. 56-328.00R.

Cochran, Stanley Robert; and Davis, Oren Hardin, to Du Pont de Nemours, E. I., and Company. Process and apparatus for producing thick and thin filaments. 4,044,089, Cl. 264-167.000.

Cockshott, Ian Derek: *See—*
Martin, Graham Ernest; and Cockshott, Ian Derek, 4,043,331, Cl. 128-156.000.

Cogas Development Co.: *See—*
Friedman, Louis D., 4,043,831, Cl. 106-288.00B.

Cognion, Jean-Marie, to Produits Chimiques Ugine Kuhlmann. Process for the preparation of 8-hydroxyquinoline. 4,044,011, Cl. 260-289.0XA.

Cohen, Elliott: *See—*
Hanifin, John William, Jr.; Gussin, Robert Zalmon; and Cohen, Elliott, 4,044,021, Cl. 548-312.000.

Coleman, Charles E.: *See—*
Hammel, Ronald O.; and Coleman, Charles E., 4,044,268, Cl. 307-66.000.

Colgate-Palmolive Company: *See—*
Dickson, Robert E., 4,043,965, Cl. 260-29.60F.

Collins, Dean R.: *See—*
Roberts, Charles Grady; Chan, Wayne W.; and Collins, Dean R., 4,044,374, Cl. 357-80.000.

Collins Machinery Corporation: *See—*
Elkin, Robert D., 4,043,016, Cl. 29-240.000.

Colombo, Paolo: *See—*
Ackermann, Jacob; Radici, Pierino; Santini, Umberto; and Colombo, Paolo, 4,043,873, Cl. 203-46.000.

Columbus McKinnon Corporation: *See—*
Schreyer, Kenneth D., 4,043,538, Cl. 254-168.000.

Combustion Engineering, Inc.: *See—*
Bevilacqua, Frank, 4,044,267, Cl. 250-518.000.

Comer, William T.; and Catt, John D., to Mead Johnson & Company. Sulfamidophenethanolamine therapeutic process. 4,044,151, Cl. 424-321.000.

Cominco Ltd.: *See—*
Wyton, Wayne W.; and Doeksen, Gerard, 4,044,259, Cl. 250-360.000.

Commer S.r.l.: *See—*
Bulten, Eric J.; and Verbeek, Francois, 4,044,035, Cl. 260-429.700.

Commeyras, Auguste Andre: *See—*
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.

Commissariat a l'Energie Atomique: *See—*
Allain, Jacques; Duchene, Jean; and Merelli, Marc, 4,044,301, Cl. 324-33.000.
Benque, Jean-Pierre; Lallement, Jean; and Lambert, Paul, 4,043,867, Cl. 176-40.000.

Commonwealth Scientific and Industrial Research Organization: *See—*
Esdaile, James Durie; and Walters, Graeme William, 4,043,802, Cl. 75-63.000.

Commterm Inc.: *See—*
Tomlin, James J., 4,044,292, Cl. 320-2.000.

Compagnie des Etablissements Dela Risle: *See—*
Patin, Claude Guy, 4,043,855, Cl. 156-178.000.

Compagnie Europeenne d'Accumulateurs: *See—*
Dupuis, Jean-Michel; and Lasserre, Pierre, 4,044,300, Cl. 324-29.500.
Compagnie Internationale de Minerallurgie - CIM. *See—*
Le Bras, Eugene, 4,043,821, Cl. 106-39.600.
Conair, Inc.: *See—*
Peterson, Russell I., Jr., 4,043,514, Cl. 241-36.000.
Condurso, Letterio Dominic. Fish and lure retriever. 4,043,072, Cl. 43-17.200.
Conn, Bartley Russell, to Irradiated Strings, Inc. Racquet string and method. 4,043,555, Cl. 273-73.00D.
Conn, Charles E., Jr., to TRE Corporation. Method of plastic flow diffusion bonding. 4,043,498, Cl. 228-265.000.
Connors, Frank T., to Symons Corporation. Method and means for supporting an elevated concrete wall panel form. 4,043,087, Cl. 52-127.000.
Consiglio Nazionale Delle Ricerche: *See—*
Migliaccio, Mariano; and Pisani, Emilio, 4,043,303, Cl. 123-119.00R.
Construction Products Research, Inc.: *See—*
Gaines, Robert W., 4,043,828, Cl. 106-97.000.
Consumer Publishing Company, Inc.: *See—*
Suarez, Richard A., 4,043,553, Cl. 272-128.000.
Container Corporation of America: *See—*
Kaulfuss, William P.; and Kaulfuss, Robert H., 4,043,086, Cl. 52-71.000.
Continental Can Company, Inc.: *See—*
Herbst, Edward J., 4,043,481, Cl. 220-266.000.
Mazurek, Stanley L., 4,043,168, Cl. 72-345.000.
Continental Group, Inc., The: *See—*
Khoury, Nick S., 4,043,479, Cl. 220-271.000.
Continental Gummi-Werke Aktiengesellschaft: *See—*
Pakur, Henryk; and Tiemann, Reinhard, 4,043,371, Cl. 152-362.00R.
Schiron, Dieter, 4,043,462, Cl. 214-10.50R.
Continental Oil Company: *See—*
Cobb, A. Tom, 4,043,389, Cl. 166-55.000.
Every, Richard L.; and Dell'Osso, Luino, Jr., 4,043,395, Cl. 166-263.000.
Kegler, William H., 4,043,898, Cl. 208-50.000.
Contractor, Rashmikant Maganlal; and Hwang, Sang-Hak, to Du Pont de Nemours, E. I., and Company. Process for forming a staple fiber batt. 4,043,005, Cl. 19-155.000.
Contreras, Albert. Flush toilet water conservation valve assembly. 4,042,982, Cl. 4-67.00A.
Control Data Corporation: *See—*
Porter, James L., 4,044,376, Cl. 358-84.000.
Cook, Donald F.: *See—*
McHugh, Donald P.; and Cook, Donald F., 4,043,509, Cl. 239-265.410.
Cook, John Walter, to North American Philips Corporation. Toilet waste holding apparatus. 4,042,981, Cl. 4-10.000.
Cook, Peter Barry; and Hunt, John Harold, to Allen & Hanburys Limited. Steroidal aerosol compositions and process for the preparation thereof. 4,044,126, Cl. 424-243.000.
Cook, Virgil W.: *See—*
Blough, Ronald S.; Cook, Virgil W.; and Spates, Charles D., 4,042,998, Cl. 15-312.00A.
Cooke, Victor F. G.; and Thorpe, Donald H., to Hooker Chemicals & Plastics Corporation. Low profile polyester molding composition. 4,043,988, Cl. 260-862.000.
Cooksey, James Judson: *See—*
Weiss, William Robert; Cooksey, James Judson; and Mullins, Phillip Leroy, 4,043,008, Cl. 28-271.000.
Cooper, Leon N.; and Elbaum, Charles, to Nestor Associates. Information processing system. 4,044,243, Cl. 235-152.000.
Cooper, Nathan E. Solar heat collector. 4,043,315, Cl. 126-270.000.
Coors, George Thom., to Ledex, Inc. Coil compressed plunger cavity components for a wet type solenoid. 4,044,324, Cl. 335-260.000.
Copal Company Limited: *See—*
Inoue, Nobuyoshi, 4,044,368, Cl. 354-267.000.
Copelin, Harry Bugbird, to Du Pont de Nemours, E. I., and Company. One-step method for hydrolyzing and hydrogenating acetal-aldehydes. 4,044,059, Cl. 260-635.00A.
Corco, Inc.: *See—*
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Corning Glass Works: *See—*
DeMunn, Clark V.; Kerko, David J.; Westwig, Ralph A.; and Wrisley, David B., Jr., 4,043,781, Cl. 65-30.00R.
Rogers, Charles H.; and Sullivan, Kevin J., 4,043,292, Cl. 118-5.000.
Costa, Armando, to Ing. C. Olivetti & C., S.p.A. Perforated tape reader. 4,044,230, Cl. 235-61.11C.
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Carlomagno, Giovanni Maria; and Costa, Bruno, 4,043,799, Cl. 75-60.000.
Costa, Charles R.; and Smigel, Robert L., to Loctite Corporation. Dispensing and wiping device. 4,043,683, Cl. 401-264.000.
Coste, Camille Michel: *See—*
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.
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Courtenay, John Henry; and Wardell, Martin Bernard Peter, to Foseco Trading A.G. Tundish with weirs. 4,043,543, Cl. 266-275.000.
Courty, Philippe: *See—*
Dezael, Claude; Franckowiak, Sigismond; Courty, Philippe; and Gruhier, Henri, 4,044,114, Cl. 423-574.00R.
Cowgill, Paul N.; and Pearson, John L., to United States of America, Army. Missile maneuver concept. 4,044,237, Cl. 235-150.270.
Cowley, John M., to Atwood & Morrill Co. Auxiliary closing force for valves. 4,043,533, Cl. 251-57.000.
Cox, Jerome P., Jr.; and Gerth, Vernon W., Jr., to Picker Corporation. Tomography system having an ultra high speed processing unit. 4,044,240, Cl. 235-151.300.
Coxon, J. Barton; and Ling, Kenneth R., to Ford Motor Company. Method of recycling powder coatings in a plural coating operation. 4,044,175, Cl. 427-195.000.
Cragoe, Edward J., Jr.: *See—*
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Craig, John William Thomas: *See—*
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Crain, Auther Lee. Kneeling apparatus for cement masons. 4,043,424, Cl. 182-230.000.
Cram, Donald J., to University of California, The Regents of the. Polymer-multiheteromacrocycles. 4,043,979, Cl. 260-47.0UP.
Cramton, Earl W.: *See—*
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Crane Packing Company: *See—*
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Crane, Robert L., to United States of America, Air Force. Non-destructive inspection of composite and adhesively bonded structures. 4,044,253, Cl. 250-302.000.
Crane, Sammy L.: *See—*
Moore, Charles E., Jr.; Crane, Sammy L.; and Lipke, Donald L., 4,044,249, Cl. 250-213.0VT.
Cremer, Joseph; Joerchel, Egon; and Harnisch, Heinz, to Hoechst Aktiengesellschaft. Production of phosphorus nitrides. 4,044,104, Cl. 423-302.000.
Cresswell, Michael W.; and Roberts, John S., to Westinghouse Electric Corporation. Low forward voltage drop thyristor. 4,043,837, Cl. 148-1.500.
Crisler, John E.: *See—*
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Croce, Richard F.; and Burton, Gardner T., to United States of America, Air Force. Holographic high resolution contact printer. 4,043,653, Cl. 355-2.000.
Croley, Thomas E., to Corco, Inc. Packing, shipping, and side-dispensing container for dense material. 4,043,502, Cl. 229-17.00B.
Cromer, Charles F.; and Freeman, Willie B., to Westinghouse Electric Corporation. Puffer-type compressed-gas circuit-interrupter. 4,044,211, Cl. 200-148.00A.
Cross, Barrington; and Walworth, Bryant Leonidas, to American Cyanamid Company. 1,2-Dialkylpyrazolium compounds having 3-(or 3,5-) nitrogen-containing heterocyclic group. 4,044,013, Cl. 260-293.630.
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CTS Corporation: *See—*
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Cunard Steam-Ship Company Limited, The: *See—*
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Cunnell, Michael Derek, to Lucas Electrical Limited. Fluid pressure transducer. 4,043,201, Cl. 73-398.0AR.
Cunningham, Sinclair Upton, to National Research Development Corporation. Cam follower piston. 4,043,255, Cl. 92-158.000.
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, to John Wyeth & Brother Limited. Pharmaceutical compositions containing 5,6,7,8-tetrahydroquinoline derivatives and related compounds. 4,044,138, Cl. 424-258.000.
Curry, Paul F. Shuttle car with operator protection. 4,043,588, Cl. 296-102.000.
Curtis, Richard E.; Dench, Robert H.; and Dervin, Victor J., to N.P.I. Corporation. Air handler. 4,044,078, Cl. 261-30.000.
Curtiss-Wright Corporation: *See—*
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D. S. Brown Company, The: *See—*
Brown, Delmont D., 4,043,693, Cl. 404-64.000.
Dahl, Robert M. Sorting table arrangement. 4,043,276, Cl. 108-28.000.
Dahlgren, Lennart, to Hasselblad, Fritz Victor. Roller blind shutter for cameras. 4,044,367, Cl. 354-242.000.
Dahms, Ronald H., to Monsanto Company. Resole resin binder composition. 4,043,970, Cl. 260-29.300.
Dai Nippon Toryo Co., Ltd.: *See—*
Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, 4,043,634, Cl. 350-160.0LC.
Daimler-Benz Aktiengesellschaft: *See—*
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Dallas County Association for the Blind: *See—*
Ballew, Audrey H., 4,043,602, Cl. 300-16.000.
Daly, Dante, to Ing. C. Olivetti & C., S.p.A. Serial printing device for typewriters, accounting machines, teleprinters and similar office machines. 4,043,439, Cl. 197-18.000.
Daly, Edward J.; Sparks, Richard; and Spencer, George R., to Raytheon Company. Ganged radio frequency filter. 4,044,318, Cl. 333-1.000.
Damon, Lloyd E.: *See—*
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,043,840, Cl. 148-32.000.
Danfysik A/S: *See—*
Jespersen, Einar; and Skilbreid, Ottar Asbjorn, 4,044,266, Cl. 250-441.000.
Danguillier, Wilhelm: *See—*
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, 4,043,766, Cl. 48-73.000.
Daniels, Peter J. L.; and Turner, William N., to Schering Corporation. 6'-N-alkyl-4,6-di-O-(aminoglycosyl)-1,3-diaminocyclitols, methods for their use as antibacterial agents and compositions useful therefor. 4,044,123, Cl. 424-180.000.
Danilewicz, John Christopher; Kemp, John Edward Glyn; and Wright, James Robert, to Pfizer Inc. Aminoquinazoline therapeutic agents. 4,044,136, Cl. 424-251.000.
Dantowitz, Edward, to Albany Novelty Mfg. Co. Plastic name tag holder. 4,043,858, Cl. 156-251.000.
Darrow, John O. G., to Westinghouse Air Brake Company. Fail-safe electronic time delay circuit. 4,044,272, Cl. 307-293.000.
Dart Industries Inc.: *See—*
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Data General Corporation: *See—*
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Plunkett, Allan Barr; and D'Atre, John Douglas, 4,044,285, Cl. 318-227.000.
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Davis, John Maxwell; and Lanoux, Sigred Boyd, to Du Pont de Nemours, E. I., and Company. Process for stabilizing polyamides. 4,043,974, Cl. 260-45.75C.
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Sorlie, Donald Thomas; and Bucher, David Hoffer, 4,043,281, Cl. 111-85.000.
Sorlie, Donald Thomas; Bucher, David Hoffer; and Sutherland, Gail Russell, 4,043,404, Cl. 172-555.000.
Deering, Roland F., to Union Oil Company of California. Oil shale retorting. 4,043,897, Cl. 208-11.00R.
Deese, Raymond E. Coin display. 4,043,477, Cl. 220-23.400.
Defago, Raymond: *See—*
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DeFusco, Ernest L., to General Motors Corporation. Shim nut and screw bolt assembly. 4,043,239, Cl. 85-1.00R.
de Jong, Arie, to Perswerk de Jong B.V. Device for transforming a single pressure force into separate pressure forces. 4,043,236, Cl. 83-137.000.
DeKock, Cornelis; and Breure, Floris Hendrik, to ITT Industries, Inc. Arrangement for adjusting the damping force of a shock absorber. 4,043,435, Cl. 188-319.000.
Dell'Osso, Luino, Jr.: *See—*
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deMontigny, Armand; Eichenhofer, Kurt-Wilhelm; Toepsch, Hans; and Schliebs, Reinhard, to Bayer Aktiengesellschaft. Non-stick polyorganosiloxane coating compositions. 4,043,977, Cl. 260-46.5UA.
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DeMunn, Clark V.; Kerko, David J.; Westwig, Ralph A.; and Wrisley, David B., Jr., to Corning Glass Works. Method for making a brown photochromic glass. 4,043,781, Cl. 65-30.00R.
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Dervin, Victor J.: *See—*
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Farrand, John M., 4,043,699, Cl. 408-201.000.
DeTray, Donald E. Dry lap polisher. 4,043,081, Cl. 51-129.000.
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Dezael, Claude; Franckowiak, Sigismond; Courty, Philippe; and Gruhier, Henri, to Institut Francais du Petrole. Process for purifying a gas containing sulfur compounds. 4,044,114, Cl. 423-574.00R.
Dhyanchand, P. John J.; Glennon, Timothy F.; and Christen, Roland W., to Sundstrand Corporation. Electronic voltage regulator for three-phase generators. 4,044,296, Cl. 322-25.000.
Dial, Darrell D.; and von Bose, Robert J., to Halliburton Company. Sealed cushioning unit. 4,043,545, Cl. 267-116.000.
Diamond Shamrock Corporation: *See—*
Olson, Richard O.; and Pohto, Gerald R., 4,044,218, Cl. 219-91.000.
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Diax Corporation: *See—*
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di Carlo, Joseph Scotto: *See—*
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Dickson, Robert E., to Colgate-Palmolive Company. Copolymer of acrylic acid and 1,1-dihydroperfluorooctyl methacrylate useful for applying non-permanent soil release finish. 4,043,965, Cl. 260-29.60F.
Die-Quip Corporation: *See—*
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DIEHL: *See—*
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Diez de Aux, Alfonzo. Dental dowel pin setting apparatus. 4,043,040, Cl. 32-11.000.
DiMatteo, Frank J., to Caspel Industries, a part interest. Protective device. 4,043,329, Cl. 128-132.00R.
Diner, Uriel; and Elofson, Richard MacLeod, to Research Council of Alberta, The. Ruminant feed supplement and process for producing same. 4,044,156, Cl. 426-69.000.
Dionne, Norman J., to Raytheon Company. Carbon stabilized cobalt-rare earth magnetic materials. 4,043,845, Cl. 148-105.000.
Dix, Joseph; Campbell, Norman; and Tonseth, Ivar S., Jr., to General Electric Company. Method of making helical assembly. 4,043,499, Cl. 228-173.000.
Docimo, Peter J.; and Richey, Paul L., to Marvin Electric Manufacturing Company. Ceiling mounted light fixture. 4,044,246, Cl. 240-78.0CF.
Dr. C. Otto & Comp. G.m.b.H.: *See—*
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Domain Industries, Inc.: *See—*
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Donley, Shawn T.; and Freitag, Valentine A., to United States of America, Navy. Autopilot hardover failure protection system. 4,043,526, Cl. 244-194.000.

Donnelly, Charles E.; and Sauve, Richard G., to FMC Corporation. Quick release troughing roll mounting. 4,043,447, Cl. 198-827.000.

Donnelly, Thomas H.; and McGinnis, Robert S., to Swift & Company. Gelatin manufacture-peroxide liquefaction process. 4,043,996, Cl. 260-118.000.

Dor, Inka. Process for promotion of algae growth in a sewage medium. 4,043,903, Cl. 210-22.00C.

Dorius, John O.: *See—*
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Dorr-Oliver Incorporated: *See—*
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D'Ortenzio, Remo J., to Stromberg-Carlson Corporation. Comparison circuit for removing possibly false signals from a digital bit stream. 4,044,312, Cl. 328-165.000.

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Dow Chemical Company, The: *See—*
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Rakshys, Joseph W., Jr.; and McKinley, Suzanne V., 4,043,948, Cl. 260-2.10E.

Downs, Edgar S. Portable door lock. 4,043,578, Cl. 292-290.000.

Drago, Leo; and Ries, Edmond, to Robreli Holding S.A. Method for packaging and dyeing yarns and yarn packaging obtained thereby. 4,042,989, Cl. 8-149.000.

Draxler, Helmut J., to New England Union Co. Valve with electrically operated actuator. 4,043,532, Cl. 251-11.000.

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Dressler, Wilfried: *See—*
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Dreyer, Wesley M.; and Huntington, Richard G., to General Dynamics Corporation. Support and load alleviation system for space vehicles. 4,043,524, Cl. 244-118.00R.

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Duling, Irl N.; Gates, David S.; Glazier, Frederick P.; and Moore, Robert E., to Sun Ventures, Inc. Friction or tractive drive containing ethers of adamantanes. 4,043,927, Cl. 252-52.00R.

Duncan, Richard D. Beverage container with integral straw. 4,043,478, Cl. 220-90.200.

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Dunning, Reginald: *See—*
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Du Pont de Nemours, E. I., and Company: *See—*
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Cochran, Stanley Robert; and Davis, Oren Hardin, 4,044,089, Cl. 264-167.000.
Contractor, Rashmikant Maganlal; and Hwang, Sang-Hak, 4,043,005, Cl. 19-155.000.
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Davis, John Maxwell; and Lanoux, Sigred Boyd, 4,043,974, Cl. 260-45.75C.
Gorrafa, Adly Abdel-Moniem, 4,043,010, Cl. 28-220.000.
Kilmurry, Lindsay; and Urion, Howard Kirby, 4,043,752, Cl. 8-41.00B.
Reese, Cecil Everett, 4,043,108, Cl. 57-157.00R.
Sauers, Richard Frank, 4,043,793, Cl. 71-86.000.
Sauers, Richard Frank, 4,043,794, Cl. 71-86.000.
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Dupuis, Jean-Michel; and Lasserre, Pierre, to Compagnie Europeenne d'Accumulateurs. Method for checking a storage battery. 4,044,300, Cl. 324-29.500.

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Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

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Solomon, Richard L., 4,043,775, Cl. 55-302.000.

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Koppel, Gary A., 4,044,000, Cl. 260-239.100.
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Rielly, Owen G., 4,043,450, Cl. 206-45.140.
Frungel, Frank. Nuclear explosion detector with false alarm prevention. 4,044,258, Cl. 250-336.000.
Frye, David R., to Eastman Kodak Company. Polyolefin containing emulsion adhesives. 4,043,959, Cl. 260-27.00R.
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Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, 4,043,307, Cl. 123-139.0AW.
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Fukino, Kunihiro, to Nippon Kogaku K.K. Device for locking a body to be mounted. 4,043,691, Cl. 403-322.000.
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Yamada, Hiroshi; Shirai, Yukio; and Fukuda, Minolu, 4,043,661, Cl. 355-50.000.
Fukui, Yutaka; Hataya, Fumio; Sasaki, Ryoichi; Nakajima, Fumito; Matsuda, Shimpei; Tonami, Munehiko; and Hiraga, Ryo, to Hitachi, Ltd. Method of producing thin layer methanation reaction catalyst. 4,043,945, Cl. 252-466.00J.
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Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, 4,043,634, Cl. 350-160.0LC.
Fusco, Anthony M., to Milliken Research Corporation. High temperature lubricant. 4,044,033, Cl. 260-404.000.
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Galliker, Joseph, to Patelhold Patentverwertungs- & Elektro-Holding AG. Process and apparatus for the treatment of water-containing substances and application of this method for the preparation of pasteurized dried sludge. 4,043,047, Cl. 34-1.000.
Gallo, Mario, to Wirth, Gallo & Co. Mass and force meter. 4,043,190, Cl. 73-141.00R.
Gancy, Alan B.; and Poncha, Rustom P., to Allied Chemical Corporation. Recovery of soda values from sodium carbonate crystallizer purge liquors. 4,044,097, Cl. 423-186.000.
Ganslaw, Stuart H.; and Katz, Howard G., to National Starch and Chemical Corporation. Surface treatment process for improving dispersibility of an absorbent composition, and product thereof. 4,043,952, Cl. 260-17.4ST.
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Senior, Robert B.; and Karasinski, Frederick, 4,043,362, Cl. 140-1.000.
Gardner, Henry C., to Dow Badische Company. Positive yarn feeding device. 4,043,518, Cl. 242-45.000.
Garfall, Peter J. Photographic light source. 4,043,662, Cl. 355-71.000.
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White, David G., 4,043,564, Cl. 277-212.0FB.
Garofalo, Frank John, Jr.; and Pardonner, George Nathan, Jr., to International Business Machines Corporation. Data input apparatus having bidirectional reader for inputting alternative messages. 4,044,331, Cl. 364-900.000.
Garrett, Donald E.: *See—*
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Gates Rubber Company, The: *See—*
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Gauld Equipment Sales Company: *See—*
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Gavaler, John R., to Westinghouse Electric Corporation. Superconductive thin films having transition temperature substantially above the bulk materials. 4,043,888, Cl. 204-192.00S.
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Gays, Susan; and Romano, Anthony. Removable crib canopy. 4,043,349, Cl. 135-5.300.
Gaysert, Gerhard; and Ottle, Walter, to J. Eberspacher. Catalytic

converter having resilient monolith-mounting means. 4,043,761, Cl. 23-288.0FC.
Gazda, Imre I., to Otis Engineering Corporation. Well system. 4,043,392, Cl. 166-217.000.
Gehatia, Matatiahu; and Wiff, Donald R., to United States of America, Air Force. Light scattering test apparatus. 4,043,669, Cl. 356-104.000.
Gelder, Kenneth M.: *See—*
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Gelfand, Leonard, to Erico Products, Inc. Electrical contact. 4,043,893, Cl. 204-281.000.
Gellert, Jobst Ulrich. Injection molding nozzle seal. 4,043,740, Cl. 425-567.000.
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Dreyer, Wesley M.; and Huntington, Richard G., 4,043,524, Cl. 244-118.00R.
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Bochan, John, 4,043,158, Cl. 68-17.00R.
Bulman, Melvin John; and Graham, Alfred Rapp, 4,043,248, Cl. 89-1.703.
Carlson, Robert G., 4,043,703, Cl. 416-230.000.
Claybaker, LeRoy A., 4,043,954, Cl. 260-19.00A.
Dix, Joseph; Campbell, Norman; and Tonseth, Ivar S., Jr., 4,043,499, Cl. 228-173.000.
Eckart, Gregory C., 4,044,395, Cl. 361-44.000.
Jenkins, Thomas E.; and Herbst, LeRoy J., 4,044,224, Cl. 219-322.000.
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McHugh, Donald P.; and Cook, Donald F., 4,043,509, Cl. 239-265.410.
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Scheldorf, Owen H., 4,043,432, Cl. 188-1.00B.
Schmidt, Walter A., 4,044,265, Cl. 250-439.00P.
Speir, Donald W.; and McHugh, Donald P., 4,043,508, Cl. 239-265.190.
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Thomas, William W.; and Sprunger, Elmore V., 4,043,121, Cl. 60-204.000.
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General Electric Company Limited, The: *See—*
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General Foods Corporation: *See—*
Jolly, Michael D.; Nacci, Anthony T.; DeCeglie, Gaetano J.; and Vitti, Rudolf A., 4,044,167, Cl. 426-594.000.
Lando, Frank; and Teitelbaum, Charles Leonard, 4,044,162, Cl. 426-427.000.
General Motors Corporation: *See—*
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Halmosi, Rudolph; Schneider, Karl W.; and Weidman, John F., 4,043,610, Cl. 305-19.000.
Suverison, Lyle B.; and Beck, William R., 4,043,630, Cl. 339-218.00M.
Weisgerber, Thomas W., 4,043,124, Cl. 60-404.000.
General Steel Industries, Inc.: *See—*
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Gentry, Bobby C.: *See—*
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Georg Fischer Aktiengesellschaft: *See—*
Reich, Fritz; and Lehmann, Ernesto, 4,043,576, Cl. 285-322.000.
Speck, Reinhold; and Forberger, Stefan, 4,043,295, Cl. 118-317.000.
George, Lyndell J. C.; and Shelly, Robert S., to AGL Corporation. Self-leveling construction alignment laser. 4,043,679, Cl. 356-249.000.
Georgetown Texas Steel Corporation: *See—*
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Gerber Products Company: *See—*
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Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Dibenzo[b,f] thiepins bearing piperazinyl substitution. 4,044,010, Cl. 260-268.0TR.
Gernhardt, Paul; Grams, Wolfgang; Danguillier, Wilhelm; and Pohl, Siegfried, to Dr. C. Otto & Comp. G.m.b.H. Slag bath generator. 4,043,766, Cl. 48-73.000.
Gerth, Vernon W., Jr.: *See—*
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Jutte, Hans; Babendererde, Siegmund H.F.L.M.; Foik, Adolf; and Bokemeyer, Reinhard E. J., 4,043,137, Cl. 61-85.000.
GF Business Equipment, Inc.: *See—*
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Gfroerer, Gerald T.: *See—*
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Giallourakis, Michael A.; and Mlecka, Louis F. Bug deflecting devices. 4,043,587, Cl. 296-91.000.
Gibbs, Stephen R., to Burroughs Corporation. Electrochemical anodization fixture for semiconductor wafers. 4,043,894, Cl. 204-297.00W.
Gibson, Harry W.; and Saeva, Franklin D., to Xerox Corporation. Electrostatographic carrier composition. 4,043,929, Cl. 252-62.10R.
Gibson, John, to Gewerkschaft Eisenhutte Westfalia. Drive assemblies for mining apparatus. 4,043,213, Cl. 74-242.800.
Giffen, William M., Jr.: *See—*
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Gilbert, Lyman F.: *See—*
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Gillett, William G.: *See—*
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Gilmer, William N.; and Barnes, Vernon M., Jr., to Texaco Inc. Method and apparatus for static type fluid mixing. 4,043,539, Cl. 259-4.0AB.
Gingell, Keith Charles: *See—*
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Giraudi, Giorgio Aldo Maria; and Imperiale, Nino, to W. R. Grace & Co. Packaging machines. 4,043,011, Cl. 29-33.500.
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Glagola, Michael A., to Reynolds Metals Company. Resistance welding electrode and method of making. 4,044,220, Cl. 219-119.000.
Glasrock Products, Inc.: *See—*
McDaniel, John E.; and Morris, Harold B., 4,043,682, Cl. 401-199.000.
Glassman, David M., to Eastman Kodak Company. Method and apparatus for linearizing a mirror galvanometer. 4,044,248, Cl. 250-201.000.
Glazier, Frederick P.: *See—*
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Gleason, John Gerald, to SmithKline Corporation. Intermediates for preparing substituted phenylglycylcephalosporins. 4,044,047, Cl. 260-471.00C.
Glennon, Timothy F.: *See—*
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Glomb, Frank A.; and Griffith, William S., to Chicago Tool and Engineering Company. Precision machine vise. 4,043,547, Cl. 269-136.000.
Glotin, Bernard Jean-Pierre, to Schlumberger Technology Corporation. Anchoring device and running tool for downhole apparatus. 4,043,390, Cl. 166-215.000.
Gloucester Engineering Co., Inc.: *See—*
Schott, Charles M., Jr., 4,043,458, Cl. 214-6.00D.
Glowienke, Richard A. Fire fighting equipment. 4,043,397, Cl. 169-45.000.
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Wheeler, Eric Charles, 4,043,475, Cl. 215-223.000.
Gocke, Eberhard Wilhelm, to Braukmann Armaturen AG. Filter fitting for heating installations. 4,043,357, Cl. 137-495.000.
Godfrey, William L., to Mobil Oil Corporation. Temperature-responsive motor restart limiter. 4,044,288, Cl. 318-485.000.
Godin, Victor B.; and Bruck, Howard P., to Victor B. Godin, Trustee. Apparatus and method for cutting circles from sheet material. 4,043,234, Cl. 83-40.000.
Goetz, Alexander F. H.; Graham, Richard A.; and Ozawa, Tetsuo, to California Institute of Technology. Portable reflectance spectrometer. 4,043,668, Cl. 356-73.000.
Goetze, Britton A., Jr. Stirring device with dual head. 4,043,039, Cl. 30-325.000.
Goldie, Harry, to Westinghouse Electric Corporation. FM/CW radar including a novel receiver protector of general utility. 4,044,357, Cl. 343-17.500.
Gonzalez, Juan M.; and Nichols, William V., Jr., to Reynolds Metals Company. Aluminum reduction cell having a lateral enclosure system. 4,043,892, Cl. 204-247.000.
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Goodman, Steven J.; and Echevarria, Angel M., to Echevarria, Angel M. Body supporting and cushioning surface for bedding. 4,042,986, Cl. 5-335.000.
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Gore, LeRoy D.; Gillett, William G.; and Roberts, George F., to Vendo Company, The. Drawer apparatus for article dispensing machine. 4,043,483, Cl. 221-155.000.
Gorgius, Otto; and Quaas, Dietmar G., to Buhrke Industries, Inc. Triple action cupping tool. 4,043,169, Cl. 72-349.000.
Gorondi, Istvan: *See—*
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Goto, Toshio, to Fuji Photo Optical Co., Ltd. Device for applying pressure to developer distributing means in self-development type cameras. 4,044,366, Cl. 354-86.000.
Gottelt, Herbert R., to Alco Standard Corporation. Method of bottle boring. 4,043,695, Cl. 408-1.00R.
Gotti, Lui. Water wheel assembly. 4,043,702, Cl. 415-202.000.
Gottlieb, Nathan, to American Optical Corporation. Three-lens system providing a variable focal power along one principal meridian. 4,043,641, Cl. 350-181.000.
Gottshall, Edward R., to Mosser Industries, Inc. Sealing means for sliding gate valve. 4,043,534, Cl. 251-174.000.
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Gould, Steven J.: *See—*
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Graham, Alfred Rapp: *See—*
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Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., to Uniroyal, Inc.; and Uniroyal Ltd. Plant growth regulation using certain substituted 2,3-dihydro-1,4-oxathiins. 4,043,792, Cl. 71-78.000.
Graham, James T., to Android International, Inc. Fluid cam assembly. 4,043,122, Cl. 60-375.000.
Graham, Lloyd J., to Rockwell International Corporation. Acoustic white noise generator. 4,043,176, Cl. 73-1.0DV.
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Graser, Earl J., to Olinkraft, Inc. Method of packaging in carrier with drop down partition. 4,043,095, Cl. 53-26.000.
Grawey, Charles E., to Caterpillar Tractor Co. Method for forming a tube article on a core. 4,044,085, Cl. 264-90.000.
Grawey, Charles E.: *See—*
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Green, Harvey L., to Raymond Lee Organization, Inc., The, a part interest. Fishing pole holder. 4,043,531, Cl. 248-537.000.
Greenberg, Jerome S., to Regal China Corporation. Apparatus for casting in molds for the production of ceramic hollowware. 4,043,737, Cl. 425-434.000.
Greenfield, John B., to Rheem Manufacturing Company. Resilient mounting for fan motor. 4,043,708, Cl. 417-363.000.
Greenhut, Bart E. Data recording instrument. 4,044,362, Cl. 346-136.000.
Greenlee, Hugh T., to Wright Tool & Forge Company, The. Holder and display device for wrench sockets. 4,043,453, Cl. 206-349.000.
Greenwell, Joseph Daniel; and Scarpa, Eric W., to R. A. Jones & Co. Inc. Transfer mechanism. 4,043,442, Cl. 198-420.000.
Greer, James H. Level indicator for granulate storage tanks. 4,043,199, Cl. 73-290.00R.
Grenier, Raymond P., to Baird-Atomic, Inc. Halftone display, particularly for a high resolution radioactivity distribution detection system. 4,044,332, Cl. 364-900.000.
Grevich, John J., to Domain Industries, Inc. Adjustable stop assembly. 4,043,709, Cl. 417-404.000.
Griess, Roy K.: *See—*
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Griffin, Arthur F. Note pad construction. 4,043,573, Cl. 283-2.000.
Griffin, Lawrence C., to Griffin Research & Development, Inc. Polluted air effluent incinerating method. 4,044,099, Cl. 423-210.000.
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Griffin, William Dale. Apparatus for removing concrete around exposed reinforcing rod. 4,043,408, Cl. 175-416.
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Grizzard, Eugene H.: *See—*
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Grobman, William, to Molins Macine Company, Inc. Ink level warning system. 4,043,265, Cl. 101-350.000.
Groeper, Lawrence H. Portable wheel-balancer. 4,043,218, Cl. 73-486.000.
Groezinger, John J.: *See—*
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Grohmann, Karel: *See—*
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Ground, Ernest R., to International Minerals & Chemical Corporation. Beneficiation of fluorspar ore. 4,043,455, Cl. 209-167.000.
Gruffaz, Max; and Lefebvre, Gerard, to Rhone-Poulenc Industries. Polymers possessing imide groups. 4,043,986, Cl. 260-78.0UA.
Gruhier, Henri: *See—*
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Grundy, Reed H., to Westinghouse Air Brake Company. Converter-regulator circuit arrangement. 4,044,294, Cl. 363-25.000.
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GTE Sylvania Incorporated: *See—*
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Lafferty, William Daniel; Smith, James Thomas; and Rench, Nicholas Wayne, 4,043,716, Cl. 425-6.000.
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Guerbet, Francois. Suspension system. 4,043,571, Cl. 280-716.000.
Guido, Jurgen; and Stock, Robert. Injection line system. 4,043,506, Cl. 239-76.000.
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Gulton Industries, Inc.: *See—*
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Gunther, Gerhard; and Stillig, Josef, to Leuze-Electronic KG. Arrangement for automatically controlling the travel speed of yarns, filaments, and the like in machines processing the same. 4,043,107, Cl. 57-34.00R.
Gupta, Viney Kumar, to Matrix, Inc. Variable venturi nozzle-matrix carburetor add methods for intermixing fuel and air. 4,044,077, Cl. 261-23.00A.
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Haag, Albrecht; and Siefert, Roland, to Kienzle Uhrenfabriken GmbH. Pendulum device for battery-powered clockwork mechanism. 4,043,118, Cl. 58-152.00R.
Haas, Frederick T., Jr., to MOD-SOD Sport Surfaces. Playing surface for athletic games. 4,044,179, Cl. 428-17.000.
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Hafer, Paul R., to Boyertown Auto Body Works. Floating window assembly for vehicles. 4,043,586, Cl. 296-84.00C.
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Hall, Samuel D., Jr., to Teledyne Isotopes. Flexible sleeve thermal path device for thermoelectric converter element pressure loading force application spring. 4,043,835, Cl. 136-221.000.
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Halmosi, Rudolph; Schneider, Karl W.; and Weidman, John F., to General Motors Corporation. Track shoe. 4,043,610, Cl. 305-19.000.
Halter, Jerome Barth, to RCA Corporation. Method and apparatus for electromechanical recording of short wavelength modulation in a metal master. 4,044,379, Cl. 358-128.000.
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Hamaguchi, Ichiro; and Toyoda, Kenji, to Nippon Kogaku K.K. Device for checking a d c source voltage relative to a predetermined value. 4,044,304, Cl. 324-133.000.

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Hamma, Noritaka; Fukumura, Masataka; Maeshima, Kaoru; and Nakagome, Takenari, to Sumitomo Chemical Company, Limited. Preparation of peptides and cephalosporins. 4,043,991, Cl. 260-112.50R.

Hammel, Ronald O.; and Coleman, Charles E., to Gates Rubber Company, The. Multiple power source automatic switching circuitry. 4,044,268, Cl. 307-66.000.

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Hamworthy Engineering Limited: *See—*
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Hanazono, Masanobu; Asai, Osamu; and Ono, Kunio, to Hitachi, Ltd. Thin film magnetic head with a center tap. 4,044,394, Cl. 360-123.000.

Hancock, Frank John Thompson, to Imperial Chemical Industries Limited. Drying plastics. 4,043,050, Cl. 34-48.000.

Hand, Arthur S., Jr., to FMC Corporation. Rotary car dumper with shiftable frame. 4,043,467, Cl. 214-52.00C.

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Hansen, Howard C., to Clark Equipment Company. Material storage frame support and vehicle guide structure. 4,043,463, Cl. 214-16.40A.

Hansen, Rolf Steen; Lie, Ole Hannibal; Nilsen, Henning Reier; and Sandal, Thor, to Norsk Hydro a.s. Process for manufacturing of phosphoric acid. 4,043,789, Cl. 71-34.000.

Hanson, Edwin E.: *See—*
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Hari, Stefan; Irvine, Alexander McHugh; McCrae, James McGeachie; Vuitel, Laurent; and L'Eplattenier, Francois, to Ciba-Geigy Corporation. Metal complexes of bis-azomethines from hydroxy-aldehydes and alkylene diamines. 4,044,036, Cl. 260-438.100.

Harnisch, Heinz: *See—*
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Harris, David E.; Watson, Robert M.; and Redmyer, John D., to Autech Corporation. Reticle calibrated diameter gauge. 4,043,673, Cl. 356-160.000.

Harris, Walter William, to Johns-Manville Corporation. Electric resistance bushing for melting inorganic materials. 4,043,778, Cl. 65-1.000.

Harrison, Derek Ralph: *See—*
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Harshaw Chemical Company, The: *See—*
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Hart, James E., to Westinghouse Air Brake Company. Emergency portion for a brake control valve. 4,043,604, Cl. 303-33.000.

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Hartjens, Hermen; and Day, Arnold, to American Cyanamid Company. Tri-carboxylated and tetra-carboxylated fatty acid aspartates as flotation collectors. 4,043,902, Cl. 209-166.000.

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Hartline, Stephen D.: *See—*
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Hasegawa, Hajime: *See—*
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Hashimoto Denki Co., Ltd.: *See—*
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Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, to Hoffmann-La Roche Inc. Substituted phenyl ketones. 4,044,017, Cl. 260-295.0AM.

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Hastings, William G.: *See—*
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Hataya, Fumio: *See—*
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Hatfield, Lowell D., to Eli Lilly and Company. Reduction process for cephalosporin sulfoxides. 4,044,002, Cl. 544-16.000.

Hatley, William T., Jr., to ESL Incorporated. Adaptive matched digital filter. 4,044,241, Cl. 235-152.000.

Hattori, Yoshiyuki; Suzuki, Mikio; and Taguchi, Masahiro, to Nippon Soken, Inc. Air bag device for vehicles. 4,043,572, Cl. 280-738.000.

Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. 4,7-Dihydroindanyl alkanols, analogues thereof and their corresponding tosylates. 4,044,040, Cl. 260-456.00P.

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Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

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Hausmann, Taddaus: *See—*
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Hawkins, Richard T., to Phillips Petroleum Company. Symmetrical aromatic sulfide production. 4,044,056, Cl. 260-609.00E.

Haws, James L.; Quinney, Douglas W.; and Richards, Frank A., to United States of America, Air Force. Heat pipe cooling of airborne phased array radar. 4,044,396, Cl. 361-385.000.

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Hayami, Satohiro; Imamura, Jun; Hayakawa, Hiroshi; and Yabuta, Tadatzugu, 4,043,805, Cl. 75-123.00L.

Hayami, Satohiro; Imamura, Jun; Hayakawa, Hiroshi; and Yabuta, Tadatzugu, to Nippon Steel Corporation. Isotropic and high-strength high silicon steel sheet. 4,043,805, Cl. 75-123.00L.

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Hayashi, Katsumi: *See—*
Okutsu, Eiichi; Hayashi, Katsumi; Moriuchi, Shigenori; and Sakai, Takeo, 4,043,817, Cl. 96-66.00R.

Hedstrom, Bengt Olof-Arvid. Process and apparatus for flash drying fluffed cellulose pulp. 4,043,049, Cl. 34-10.000.

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Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
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Heimberger, Helmut, to OPTI Patent-, Forschungs- und Fabrikations-AG. Warp-knit slide-fastener support tape and stringer, 4,043,007, Cl. 24-205.10C.

Heine, Helmut A.; Schmidt, Otto H.; and Spitschan, Hans J., to Propper Manufacturing Co., Inc. Filter mechanism with interconnected heat and color filters for optical examination devices. 4,043,646, Cl. 350-315.000.

Heinik, Josef: *See—*
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Heinsohn, Howard H., Jr.: *See—*
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Heinz, Richard A. Replaceable slip ring rotor. 4,043,621, Cl. 308-189.00R.

Heitman, LeRoy Marvin. Ground-shaping systems for a backhoe bucket. 4,043,061, Cl. 37-141.00R.

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Held, Manfred, to Messerschmitt-Bolkow-Blohm GmbH. Hollow charge construction and method of forming a hollow charge lining. 4,043,266, Cl. 102-24.0HC.

Helmer, John Colville, to Varian Associates, Inc. Method and apparatus for reducing the transient effects of liquid compressibility in a liquid chromatography system. 4,043,906, Cl. 210-31.00C.

Hems, Roger: *See—*
Rowsell, David G.; and Hems, Roger, 4,044,120, Cl. 424-48.000.

Henault, Claude, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Control device for regulating the compositions of the inlet and exhaust gases of an internal combustion engine. 4,043,305, Cl. 123-119.00A.

Hendry, James W., to Ex-Cell-O Corporation. Pumped injection of gas for making foamed plastic. 4,043,715, Cl. 425-4.00R.

Henkel & Cie GmbH: *See—*
Kubersky, Hans Peter; and Weinrich, Erwin, 4,043,750, Cl. 8-10.200.

Henzl, Jerry, to Crane Packing Company. O-ring mold. 4,043,727, Cl. 425-578.000.

Herbert Management Co., Inc.: *See—*
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Herbst, Edward J., to Continental Can Company, Inc. Scored metal flap areas. 4,043,481, Cl. 220-266.000.

Herbst, LeRoy J.: *See—*
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Hercules Incorporated: *See—*
Wagar, Nelson William, 4,043,824, Cl. 106-48.000.

Herff, Anthony P., to Bell & Howell Company. Data coding and error correcting methods and apparatus. 4,044,328, Cl. 340-146.1AG.

Herman Miller, Inc.: *See—*
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Hermann, Eduard. Circuit arrangement for a repetition-blocking device. 4,044,269, Cl. 307-149.000.

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Herrington, Richard A.: *See—*
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Hessert, James E.; and Clampitt, Richard L., to Phillips Petroleum Company. Cellulose ether-polyacrylamide aqueous gels. 4,043,921, Cl. 252-8.50C.

Heumann, Anton; and Weibart, Heinz, to Klein, Schanzlin & Becker Aktiengesellschaft. Submersible motor-driven pump. 4,043,707, Cl. 417-360.000.

Heuser, Jurgen: *See—*
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Heydner, Konrad: *See—*
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Hi-Shear Corporation: *See—*
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Hiatt, Martin H. Counter current decantation apparatus. 4,043,760, Cl. 23-270.00R.

Hickman, Charles E.; and Hastings, William G., to Brazeway, Inc. Method of forming a header assembly. 4,043,015, Cl. 29-157.400.

Hicks, Glen LeRoy; Howe, Leland Delmar, Jr.; and Zurla, Frank Anthony, Jr., to International Business Machines Corporation. Instruction retry mechanism for a data processing system. 4,044,337, Cl. 364-200.000.

Higgs, Kenneth O.; and Marsch, Lawrence F., to Texaco Inc. Consistometer with sensors failure and sensors misalignment indicating means. 4,043,183, Cl. 73-59.000.

Hill, David George: *See—*
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Adams, James S.; and Cutler, Charles W., 4,044,286, Cl. 318-297.000.

Himmelmann, Wolfgang; Ranz, Erwin; and Roche, Edy, to AGFA-Gevaert, A.G. Process for hardening photographic layers with carbodiimide compounds containing sulphobetaine groups. 4,043,818, Cl. 96-77.000.

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Hintermeister, Edouard. Device for sterilizing swimming-pool water. 4,043,913, Cl. 210-169.000.

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Hirayama, Eiichi: *See—*
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Hirose, Ryusho; and Tsuji, Takao, to Canon Kabushiki Kaisha. Zoom lens system having electrical control of moving elements. 4,043,642, Cl. 350-184.000.

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Hirsh, Ivan Y., to Molins Limited. Testing of cigarettes. 4,043,182, Cl. 73-41.000.

Hisamatsu, Tokuichi; Kitamura, Taketsugu; Saito, Takeshiro; Takagi, Hitoshi; and Sekiya, Takuzo, to Asahi Kasei Kogyo Kabushiki Kaisha. Method of treating exhaust gases containing nitrogen oxides and sulfurous acid gas. 4,044,101, Cl. 423-235.000.

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Itoh, Kiyoo, 4,044,340, Cl. 340-173.00R.
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Matsuyama, Sigeru; Tanaka, Hironari; Koyama, Masaharu; and Ishibashi, Tadashi, 4,043,639, Cl. 350-160.0LC.
Nomiya, Kosei; Kohisa, Toshihiko; and Matsumura, Isao, 4,044,373, Cl. 357-41.000.
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Hoberg, Heinz; and Schulz, Erwin. Process and apparatus for sorting refuse. 4,043,513, Cl. 241-24.000.

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Hoes, Klaus Gerd; and Wobken, Gerold, to Klaus-Gerd Hoes, Firma. Trench cutter for excavating trenches and for laying water pipes and drainage pipes. 4,043,135, Cl. 61-72.500.

Hoffeins, Hans, to Brown Boveri-Sulzer Turbomaschinen AG. Starting arrangement for combined air and gas turbine power plant. 4,043,120, Cl. 60-39.140.

Hoffman, Richard E.; and Lindsay, Edward K., to United States of America, Navy. Polymeric-coated HMX crystals for use with propellant materials. 4,043,850, Cl. 149-19.400.

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Holladay, James F.; Starnes, R. Emory; Gentry, Bobby C.; Jones, W. Carl; and Lowery, James O., to Southwire Company. Method and apparatus for continuous production of NM cable. 4,043,851, Cl. 156-47.000.
Holland, Dennis P. Water ski tow handle. 4,043,290, Cl. 115-6.100.
Holliday, Odell. Air mattress. 4,042,988, Cl. 5-349.000.
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Hollister, Geoffrey L.; and Vixie, Dennis E., to BRS, Inc. Athletic training shoe having foam core and apertured sole layers. 4,043,058, Cl. 36-102.000.
Hollon, James F. Mud flap assembly. 4,043,568, Cl. 280-154.50R.
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Holstrom, Geoffrey B.: *See—*
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Holzinger, Otto; and Pross, Wilhelm, to Carl Zeiss Stiftung. Photometer. 4,043,676, Cl. 356-226.000.
Homm, Roger; and Katz, Gilbert, to Ortho Pharmaceutical Corporation. Pharmaceutical formulation applicator device. 4,043,338, Cl. 128-260.000.
Honeywell Inc.: *See—*
Abdelrahman, Mona M.; and Daughton, James M., 4,044,371, Cl. 357-28.000.
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Hoseney, Russell C.; Seib, Paul A.; and Deyoe, Charles W., to Kansas State University Research Foundation, The. Salts of 6-O-acyl ascorbic acid for yeast-raised baked products. 4,044,154, Cl. 426-21.000.
Hoseney, Russell C.; and Ling, Rujira Srisuthep, to Kansas State University Research Foundation, The. Nonfat dry milk substitute for yeast-leavened baked products. 4,044,155, Cl. 426-62.000.
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Hovey, Richard J., to American Optical Corporation. Photochromic light valve. 4,043,637, Cl. 350-160.00P.
Howard, William L., to Dow Chemical Company, The. Stabilization of biocidal composition. 4,044,007, Cl. 544-185.000.
Howarth, Graham Arton; and Gainer, James, to Ciba-Geigy Corporation. Compositions for the control of microorganisms. 4,044,130, Cl. 424-248.560.
Howe, John G.; and Schmidt, William L., to AMF Incorporated. Method of making plastic ski. 4,044,083, Cl. 264-45.300.
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Hudson, Lawrence Keith; Savage, Kenneth I.; and Stinson, John M., Jr., to Aluminum Company of America. Process for recovery of alumina from high-silica ore. 4,044,095, Cl. 423-127.000.
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Huffman, Allan M., to American Color & Chemical Corporation. Process for dyeing blended nylon carpet material. 4,043,749, Cl. 8-1.0XB.
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Humphrey, William E., to Humphrey Instruments, Inc. Elastically compensated off-axis mirror. 4,043,644, Cl. 350-295.000.
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ITT Industries, Inc.: *See—*
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Sassaman, David S.; and McDonald, Raymond F., 4,042,994, Cl. 15-83.000.

J. and J. Marquardt: *See—*
Leibinger, Paul; Mesle, Reinhold; Methner, Arnold; and Steidle, Alfons, 4,044,215, Cl. 200-318.000.

J. Sklar Mfg. Co., Inc.: *See—*
Sklar, Alan L., 4,043,754, Cl. 21-82.00R.

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Rau, Winfried; and Sommerschuh, Lothar, 4,043,284, Cl. 112-178.000.

Jackson, Dennis E., to Naremco, Inc. Methods of preparing methylrosaniline chloride anti-microbial compositions. 4,044,152, Cl. 424-329.000.

Jackson, Leigh F.: *See—*
Kraft, Joseph K.; Sette, Robert A.; and Jackson, Leigh F., 4,043,430, Cl. 187-52.00R.

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Jacob, Larry M.: *See—*
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Jacoby, Ian H.: *See—*
Lukacs, Michel J.; and Jacoby, Ian H., 4,043,928, Cl. 252-60.000.

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Jager, Horst, to Ciba-Geigy Corporation. Dialkylphosphonopropionic acid amides and process for their manufacture. 4,044,075, Cl. 260-943.000.

Jahrig, Gunter, to Industrie-Werke Karlsruhe Augsburg Aktiengesellschaft. Device for controlling thread spooling drives. 4,043,517, Cl. 242-18.0DD.

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Nakada, Tetsuo, 4,043,263, Cl. 101-45.000.

Jariwala, Praveen K., to Westinghouse Electric Corporation. Electron gun cathode heater filament electrical connection and support system. 4,044,278, Cl. 313-417.000.

Jaworzyn, Joseph Franciszek: *See—*
Jones, Michael Edward Benet; Jones, Eileen; and Jaworzyn, Joseph Franciszek, 4,042,978, Cl. 3-1.000.

Jeffery, Edwin A.; and Hinlein, Sigmund, to Data General Corporation. Scanning polygon with adjustable mirrors. 4,043,632, Cl. 350-7.000.

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Peterson, Reuben E., 4,044,209, Cl. 200-61.210.

Jensen, Donald D. Exhaust hood. 4,043,319, Cl. 126-299.00D.

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Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, 4,043,634, Cl. 350-160.0LC.

Joerchel, Egon: *See—*
Cremer, Joseph; Joerchel, Egon; and Harnisch, Heinz, 4,044,104, Cl. 423-302.000.

Joh. A. Benckiser GmbH: *See—*
Krueger, Friedrich; and Palleduhn, Dieter, 4,043,930, Cl. 252-89.00R.

Johansson, Ake Allan; Kivikari, Riitta Helena Kristiina; and Suokas, Elias Uolevi. Process for the separation of sterols. 4,044,031, Cl. 260-397.250.

John D. Hotchkiss Limited: *See—*
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John Wyeth & Brother Limited: *See—*
Curran, Adrian Charles Ward; Crossley, Roger; and Hill, David George, 4,044,138, Cl. 424-258.000.

Johnes, Graham Lloyd: *See—*
Moss, Gerald; Johnes, Graham Lloyd; and Craig, John William Thomas, 4,043,741, Cl. 431-3.000.

Johns-Manville Corporation: *See—*
Harris, Walter William, 4,043,778, Cl. 65-1.000.

Johnson, Douglas M., to Fluoroware, Inc. Shipping container for silicone semiconductor wafers. 4,043,451, Cl. 206-334.000.

Johnson, John R., to Royal Industries, Inc. Mobile pump. 4,043,441, Cl. 198-317.000.

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Cepuritis, Talivaldis, 4,043,340, Cl. 128-287.000.
Perfect, Alan J., 4,043,042, Cl. 32-40.00R.

Johnson, Noel K. Skateboard. 4,043,566, Cl. 280-87.04A.

Johnson, Oliver C.: *See—*
Toma, Joseph R.; and Johnson, Oliver C., 4,043,161, Cl. 72-78.000.

Johnson, Oliver Wendell: *See—*
Larson, Bernard J.; Johnson, Oliver Wendell; and Yip, James Kwok-fun, 4,043,419, Cl. 180-132.000.

Johnson, Raymond A.; Lum, John M.; and Kazakoff, Mike, to Interior Mill Equipment Ltd. Hopper bin. 4,043,491, Cl. 222-503.000.

Johnson, Robert B.; and Nibby, Chester M., Jr., to Honeywell Information Systems, Inc. Power strobing to achieve a tri state. 4,044,330, Cl. 340-166.00R.

Johnson, William Henry: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.

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Joiret, Victor L. J. Grinding members. 4,043,842, Cl. 148-35.000.

Jolicoeur, Carmel Rejean; and Riverin, Richard, to Encoat Chemicals Limited. Substituted ammonium polyphosphate composition. 4,043,987, Cl. 260-78.410.

Jolly, Michael D.; Nacci, Anthony T.; DeCeglie, Gaetano J.; and Vitti, Rudolf A., to General Foods Corporation. Method for aromatizing soluble coffee. 4,044,167, Cl. 426-594.000.

Jones, Eileen: *See—*
Jones, Michael Edward Benet; Jones, Eileen; and Jaworzyn, Joseph Franciszek, 4,042,978, Cl. 3-1.000.

Jones, Emyr, to Clarke Chapman Limited. Friction welding machine. 4,043,496, Cl. 228-2.000.

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Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Handley, 4,044,135, Cl. 424-251.000.

Jones, Thomas M.: *See—*
Freeman, John W.; Jones, Thomas M.; and Reagan, Harold D., 4,043,535, Cl. 251-329.000.

Jones, W. Carl: *See—*
Holladay, James F.; Starnes, R. Emory; Gentry, Bobby C.; Jones, W. Carl; and Lowery, James O., 4,043,851, Cl. 156-47.000.

Jones, William Clifford, Jr.; and Long, Robert E., to General Steel Industries, Inc. Railway locomotive trucks. 4,043,272, Cl. 105-136.000.

Jones, William R., to Celotex Corporation, The. Apparatus for producing rigid foam plastic laminated board. 4,043,719, Cl. 425-115.000.

Joseph, Raymond, to Ateliers Reunis Societe Anonyme. Locking device for goods transporting carts and like receptacles. 4,043,476, Cl. 220-19.000.

Josten, Walter: *See—*
Kotzsch, Han-Joachim; Vahlensieck, Hans-Joachim; and Josten, Walter, 4,044,109, Cl. 423-342.000.

Jovin, Eudor Louis, to Coats & Clark, Inc. Automatic cutting machine for continuous tapes. 4,043,232, Cl. 83-13.000.

Juguin, Bernard; Cosyns, Jean; Le Page, Jean-Francois; and Miquel, Jean, to Societe Francaise des Produits pour Catalyse. Catalysts for hydrocarbon conversion. 4,043,944, Cl. 252-441.000.

Juhlin, Rolf: *See—*
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Jung, Wilhelm H., to AMF Incorporated. Sewing apparatus employing twin needles. 4,043,283, Cl. 112-163.000.

Jureit, John Calvin; and Castillo, Adolfo, to Automated Building Components, Inc. Flat chord truss jig assembly. 4,044,093, Cl. 269-321.00F.

Just, Karl, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Hardening process for crankshafts. 4,043,847, Cl. 148-146.000.

Justice, James W. H.; and Uhler, Marcus H., to Westinghouse Electric Corporation. Encoder and constructed answer system for television. 4,044,380, Cl. 358-142.000.

Jutte, Hans; Babendererde, Siegmund H.F.L.M.; Foik, Adolf; and Bokemeyer, Reinhard E. J., to Gewerkschaft Eisenhutte Westfalia; and Hochtief AG. Apparatus for and a method of constructing a tunnel. 4,043,137, Cl. 61-85.000.

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Kabushiki Kaisha Kawaguchiya Hayashi Juho Kayaku-Ten: *See—*
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Kabushiki-Kaisha KIP: *See—*
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Kabushiki Kaisha Suwa Seikosha: *See—*
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Kadlecik, John; and Manning, Wayne R., to Bausch & Lomb Incorporated. Apparatus for disinfection of hydrophilic contact lenses. 4,044,226, Cl. 219-521.000.

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Kaiser, Manfred: *See—*
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Kaiser, Virgil W., deceased (by Kaiser, William J., administrator), to V. W. Kaiser Engineering, Inc. Steering axle assembly. 4,043,567, Cl. 280-96.100.

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Kajimoto, Isamu; and Morii, Hideaki, to Morii Chokoku Co., Ltd.; and Sumikin-Kiko Co., Ltd. Apparatus for imprinting markings on cylindrical vessels for compressed gases or the like. 4,043,262, Cl. 101-7.000.

Kalaus, Gyorgy: *See—*
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Kalb, Karsten: *See—*
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Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, to Nitto Chemical Industry Co., Ltd.; and Mitsubishi Rayon Co., Ltd. Method for producing phosphorus-containing polymers. 4,044,076, Cl. 260-969.000.

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Kanady, Garland Harold. Smoking pipe tamper means. 4,043,348, Cl. 131-243.000.

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Kanda, Hiroshi; Katakura, Kageyoshi; and Suzuki, Takaji, to Hitachi, Ltd.; and Hitachi Medical Corporation. Ultrasonic transducer. 4,044,273, Cl. 310-313.000.

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Kaplan, Jean-Pierre: *See—*
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Kaplan, Stanley. Anchoring device. 4,043,245, Cl. 85-3.00R.

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Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, to Richter Gedeon Vegyeszeti Gyar R.T. Xanthene-9-carboxylates. 4,044,146, Cl. 424-283.000.

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Karsay, Bela I.; and Sturtevant, Robert L., to Allied Chemical Corporation. Treatment of water-soluble metal sulfate residues. 4,043,822, Cl. 106-70.000.

Kasai, Yuuji; Ogura, Hironuri; and Toyoda, Atsushi, to Nippon Gakki Seizo Kabushiki Kaisha. Casting process by vacuum molding. 4,043,376, Cl. 164-7.000.

Kasaoka, Shigeaki, to Kurashiki Boseki Kabushiki Kaisha. Reactivation of catalysts useful for nitrogen oxide removal. 4,043,939, Cl. 252-416.000.

Kashioka, Seiji; Kameyama, Masayoshi; Ejiri, Masakazu; and Miyatake, Takahumi, to Hitachi, Ltd. Feature extraction system for extracting a predetermined feature from a signal. 4,044,311, Cl. 328-139.000.

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Kato, Takashi; Hoshi, Koichi; and Nakamura, Norihiko, to Toyota Jidosha Kogyo Kabushiki Kaisha. Internal combustion engine having auxiliary combustion chamber. 4,043,309, Cl. 123-191.0SP.

Katona, Joseph W., to Mills Products, Inc. Flange mount oven door window. 4,043,091, Cl. 52-616.000.

Katz, Daniel Stanley, to American Cyanamid Company. Process for manufacture of tetrakis-(hydroxymethyl)-phosphonium salts. 4,044,055, Cl. 260-606.50F.

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Katz, Howard G.: *See—*
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Kaufmann, Meinolph, to BBC Brown Boveri & Company Limited. Liquid crystal display mounted behind a front glass. 4,043,638, Cl. 350-160.0LC.

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Kaulfuss, William P.; and Kaulfuss, Robert H., to Container Corporation of America. Structure for exhibition purposes. 4,043,086, Cl. 52-71.000.

Kausz, Ivan; Stunkel, Helmut; and Wille, Harald, to Siemens Aktiengesellschaft. Pressurized-water reactor coolant treatment system. 4,043,865, Cl. 176-37.000.

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Kaye, Steven. Educational game. 4,043,053, Cl. 35-8.00R.

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to Cassella Farbwerke Mainkur Aktiengesellschaft. Aminoplasts elasticized with benzoic acid esters. 4,043,984, Cl. 260-67.60R.
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Kerkonian, Siragan K. Exerciser seat. 4,043,552, Cl. 272-120.000.
Kern, Eugene F. Barbecue grill. 4,043,312, Cl. 126-41.00R.
Kessler, Milton; and Ullman, Myron E., Jr., to Kessler Products, Inc. Knock-down light weight table kit. 4,043,278, Cl. 108-150.000.
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Kikuchi, Kimio: *See—*
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Kikuchi, Mitsuo; and Hiraga, Yoichi, to Toyo Soda Manufacturing Co., Ltd. Process for removing organic material from wet process phosphoric acid. 4,044,108, Cl. 423-321.00R.
Kilmurry, Lindsay; and Urion, Howard Kirby, to Du Pont de Nemours, E. I., and Company. Phenylazoaminophenylpyrazole acid dye solutions containing two nonionic surfactants. 4,043,752, Cl. 8-41.00B.
Kimberly-Clark Corporation: *See—*
Appel, David W., 4,043,739, Cl. 425-461.000.
Kimura, Hiroshi: *See—*
Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, 4,043,022, Cl. 29-460.000.
Kindlimann, Lynn E.: *See—*
Hartline, Albert G., III; and Kindlimann, Lynn E., 4,043,839, Cl. 148-20.300.
Kinney, Dwayne R., to International Telephone and Telegraph Corporation. Push-button sensor switch. 4,044,213, Cl. 200-308.000.
Kioritz Corporation: *See—*
Okamoto, Tatsuo; Nogawa, Masat; and Okabe, Nobuyoshi, 4,043,037, Cl. 30-276.000.
Kirchner, Russell W.: *See—*
Acuncius, Dennis A.; Herchenroeder, Robert B.; Kirchner, Russell W.; and Silence, William L., 4,043,810, Cl. 75-171.000.
Kirman, Ivor, to International Nickel Company, Inc., The. Alloy steels. 4,043,807, Cl. 75-125.000.
Kishimoto, Jyuji; and Toyomura, Shigeru, to Canon Kabushiki Kaisha. Electronic calculator with printer. 4,044,228, Cl. 235-61.90A.
Kiss, Joseph; and Berg, Klaus Peter, to Hoffmann-La Roche Inc. Halogen derivatives of ascorbic acid and D-araboascorbic acid antioxidants. 4,043,937, Cl. 252-407.000.
Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Method of manufacturing double-structure sound absorbing wall for motor vehicle. 4,043,022, Cl. 29-460.000.
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Hisamatsu, Tokuichi; Kitamura, Taketsugu; Saito, Takeshiro; Takagi, Hitoshi; and Sekiya, Takuzo, 4,044,101, Cl. 423-235.000.
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Seki, Masao; Kito, Hidetoshi; and Yoshino, Masaki, 4,043,233, Cl. 83-23.000.
Kitzing, Rainer; and Smith, Norman Alfred, to Ciba-Geigy AG. Process for crosslinking hydrophilic colloids. 4,043,995, Cl. 260-117.000.
Kivikari, Riitta Helena Kristiina: *See—*
Johansson, Ake Allan; Kivikari, Riitta Helena Kristiina; and Suokas, Elias Uolevi, 4,044,031, Cl. 260-397.250.
Kivnick, Arnold: *See—*
Bierker, George John; and Kivnick, Arnold, 4,043,886, Cl. 204-157.10R.
Klarman, Casimir M.: *See—*
Miller, Lewis J.; and Klarman, Casimir M., 4,043,615, Cl. 308-32.000.
Klaus-Gerd Hoes, Firma: *See—*
Hoes, Klaus Gerd; and Wobken, Gerold, 4,043,135, Cl. 61-72.500.
Kleiman, Joseph P., to Ethyl Corporation. Preparation of bromine. 4,044,113, Cl. 423-500.000.
Klein, Guenter Peter: *See—*
Rajakovics, Gundolf E.; Gabernig, Heinz; and Klein, Guenter Peter, 4,043,875, Cl. 203-82.000.
Klein, Schanzlin & Becker Aktiengesellschaft: *See—*
Heumann, Anton; and Weibart, Heinz, 4,043,707, Cl. 417-360.000.
Kleinewefers Industrie-Companie GmbH: *See—*
Schiffer, Gunter, 4,043,157, Cl. 68-5.00E.
Kleist, Earl F., to Allis-Chalmers Corporation. Brake pedal. 4,043,217, Cl. 74-470.000.
Klotz, Michael C.; and Mei, Viung C., to Dole Refrigerating Company. Hot gas defrost system. 4,043,144, Cl. 62-277.000.
Klymus, Stephane. Method of making printing plates for offset printing. 4,043,815, Cl. 96-33.000.
KMS Fusion, Inc.: *See—*
Siebert, Larry D., 4,043,635, Cl. 350-160.00R.
Sigler, Robert D., 4,043,643, Cl. 350-200.000.
Knapp, Philip B. Universal drive joint. 4,043,148, Cl. 64-17.00R.
Kneubuhler, Werner: *See—*
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, 4,044,029, Cl. 260-376.000.
Knight, Clifford: *See—*
Phillips, Kenneth G.; Walford, Richard P.; and Knight, Clifford, 4,043,550, Cl. 271-233.000.
Knoche, Hubert Wilhelm: *See—*
Bernard, Jean Rene; Brunel, Daniel Elie; Commeyras, Auguste Andre; Coste, Camille Michel; Itier, Jean Joseph; and Knoche, Hubert Wilhelm, 4,044,069, Cl. 260-683.470.
Knoll, Herbert: *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.
Knox, J. Paul: *See—*
Dyche, Kenneth I.; Knox, J. Paul; and Swearengin, Ronald I., 4,043,078, Cl. 49-220.000.
Knuth, Eugene W. Removable cutting elements. 4,043,367, Cl. 145-31.00R.
Ko, Su Sen, to Minnesota Mining and Manufacturing Company. Hair spray containing fluorocarbon compounds as additives. 4,044,121, Cl. 424-71.000.
Kobatake, Tatsuo: *See—*
Saito, Katashi; Matsumoto, Toshio; Hasebe, Nobuhisa; and Kobatake, Tatsuo, 4,043,382, Cl. 164-76.000.
Kobayashi, Tatsuhiko: *See—*
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Kobe Steel, Limited: *See—*
Furuta, Isao; Tamura, Hiroshi; and Takao, Masami, 4,044,111, Cl. 423-351.000.
Koch-Light Laboratories, Ltd.: *See—*
Barker, Sidney Alan; and Gray, Charles John, 4,043,869, Cl. 195-63.000.
Kochel, Leroy Joseph, to Sperry Rand Corporation. Method of and apparatus for the radio frequency sputtering of a thin film. 4,043,889, Cl. 204-192.00R.
Koehring Company: *See—*
Nelson, Albert W., 4,043,402, Cl. 172-112.000.
Koehring GmbH: *See—*
Kuhn, Hans, 4,043,405, Cl. 173-127.000.
Kohisa, Toshihiko: *See—*
Nomiya, Kosei; Kohisa, Toshihiko; and Matsumura, Isao, 4,044,373, Cl. 357-41.000.
Koike, Yoshiyasu; Shiraki, Hachio; Suzuki, Eigen; and Yoshida,

Makoto, to Showa Electric Wire and Cable Company. Method of fabricating composite superconductors. 4,043,028, Cl. 29-599.000.
Koizumi, Eiji, to Kameda Seika Co., Ltd. Expanded board or sheet-like food product and method of manufacturing the same. 4,044,166, Cl. 426-560.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See—*
Yokoi, Hiroshi; and Akagawa, Masataka, 4,044,361, Cl. 343-754.000.
Kolb, David L., to Caterpillar Tractor Co. Adjustable controls of a work vehicle. 4,043,220, Cl. 74-543.000.
Koller, Stefan; Karlen, Urs; Kneubuhler, Werner; and Defago, Raymond, to Ciba-Geigy AG. Amino-anthraquinone reactive disperse dyes. 4,044,029, Cl. 260-376.000.
Komet Stahlhalter- und Werkzeugfabrik, Robert Breuning GmbH: *See—*
Eckle, Otto, 4,043,697, Cl. 408-182.000.
Komiya, Osamu, to Olympus Optical Co., Ltd. Medical instrument attached to an endoscope. 4,043,323, Cl. 128-4.000.
Kommanditbolaget Kockums Chemical AB & Co.: *See—*
Blixt, Kjell Gunnar; Tornmarck, Sven Ivan Arvid; Juhlin, Rolf; Salenstedt, Karl Rune; and Tiru, Mandayam, 4,043,871, Cl. 195-99.000.
Kommanditgesellschaft Warmetechnik B. Ruthenberg GmbH: *See—*
Kuhn, Gerald, 4,044,221, Cl. 219-217.000.
Komyati, William J., to General Electric Company. Mechanically assembled base for electric lamps. 4,044,277, Cl. 313-318.000.
Kondo, Osamu; Hashimoto, Torao; and Hasegawa, Hajime, to Bridgestone Tire Company Limited. Method for recovering polyol from a polyurethane. 4,044,046, Cl. 260-471.00C.
Kondo, Toshihiro, to Toshihiro Kondo; and Fuji Photo Film Co., Ltd. Photographic camera with density-variable filter. 4,044,370, Cl. 354-289.000.
Konishi, Hiromu; Horie, Mitsuyuki; and Toda, Tadahide, to Toyota Jidosha Kogyo Kabushiki Kaisha. Negative pressure generating system for internal combustion engine powered vehicles. 4,043,123, Cl. 60-397.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Machida, Masaaki, 4,043,667, Cl. 355-97.000.
Konucik, George J.; Robertson, Thomas B.; and Davis, Robert. Super frog gig. 4,043,067, Cl. 43-6.000.
Koppel, Gary A., to Eli Lilly and Company. Substituted β-lactam antibiotics. 4,044,000, Cl. 260-239.100.
Koppers Company, Inc.: *See—*
Isenberg, Don Eugene; Parker, Irvin Lee, Jr.; and Zelenski, Paul Allen, 4,043,383, Cl. 164-274.000.
Korous, Donald J.; and Neuzil, Richard W., to Universal Oil Products Company. Hydrocarbon separation. 4,044,062, Cl. 260-674.0SA.
Koser, Rolf, to Sidro KG Ludwig Moller Fabrik fur Rohrbogen. Process and machine for finishing a 15° to 180° pipe bend which has been preformed on a pipe bending press. 4,043,167, Cl. 72-340.000.
Kostrzewa, Michael; Holst, Arno; and Buchberger, Gerhard, to Hoechst Aktiengesellschaft. Method for cold-milling cellulose derivatives. 4,044,198, Cl. 536-86.000.
Kotzsch, Han-Joachim; Vahlensieck, Hans-Joachim; and Josten, Walter, to Dynamit Nobel Aktiengesellschaft. Process for the hydrochlorination of elemental silicon. 4,044,109, Cl. 423-342.000.
Koury, Frederic: *See—*
Keeffe, William M.; and Koury, Frederic, 4,044,276, Cl. 313-218.000.
Kovacs, Laszlo: *See—*
Erodi, Gyorgy; Gorondi, Istvan; Kovacs, Laszlo; and Takacs, Gyorgy, 4,043,170, Cl. 72-364.000.
Kovarik, James C.: *See—*
Applebaum, Sidney P.; Howells, Paul W.; and Kovarik, James C., 4,044,359, Cl. 343-100.0LE.
Koyama, Masaharu: *See—*
Matsuyama, Sigeru; Tanaka, Hironari; Koyama, Masaharu; and Ishibashi, Tadashi, 4,043,639, Cl. 350-160.0LC.
Kozlov, Jury Georgievich; and Lopatin, Alexandr Iosifovich. Spectrometer and method of examining spectral composition of light. 4,043,670, Cl. 356-106.00S.
Kraft, Joseph K.; Sette, Robert A.; and Jackson, Leigh F., to Westinghouse Electric Corporation. Elevator system having common enclosure for open wiring between door controls, car top inspection station controls and traveling cable. 4,043,430, Cl. 187-52.00R.
Kraft, Wolfgang; and Blossfeld, Lothar, to ITT Industries, Inc. Planar diffusion method for an I^2L circuit including a bipolar analog circuit part. 4,043,849, Cl. 148-187.000.
Kraftwerk Union Aktiengesellschaft: *See—*
Heitmann, Hans-Gunther, 4,043,864, Cl. 176-37.000.
Irion, Leonhard; Tautz, Jurgen; and Ulrych, Gerhard, 4,043,868, Cl. 176-50.000.
Krall, Thomas J.: *See—*
Dybala, Ambrose B.; Krall, Thomas J.; and Uhlig, Albert R., 4,043,734, Cl. 425-532.000.
Kramann, Bernhard; and Tammen, Heinrich, to Byk Gulden Lomberg Chemische Fabrik GmbH. Catheter. 4,043,345, Cl. 128-349.00R.
Krasser, Fritz; Heydner, Konrad; and Ellenberger, Horst, to Ellenberger & Poensgen GmbH. Pushbutton actuated excess current switch. 4,044,325, Cl. 337-66.000.
Kratzmann, Helmut; Heinik, Josef; Obermaier, Robert; Zentner, Erich; and Redinger, Robert, to Hoechst Aktiengesellschaft. Calender with nip boundary plates. 4,043,731, Cl. 425-366.000.
Kreb, Robert J., III. Sterile syringe device. 4,043,336, Cl. 128-218.00R.
Kreighbaum, William E.; and Roth, Herbert R., to Mead Johnson & Company. Antihypertensive 4'-[1-hydroxy-2-[(1-phenoxy ethyl)-amino]ethyl]methanesulfonanilide and salts thereof and therapeutic use. 4,044,150, Cl. 424-321.000.
Kremkau, William P., to W. R. Grace & Co. Film laminates having a reirradiated layer. 4,044,187, Cl. 428-212.000.
Krenzer, John, to Velsicol Chemical Corporation. Thiadiazolyl and cycloimino imidazolidinones. 4,043,795, Cl. 71-90.000.
Kress, Paul Joseph; and Plepys, Raymond A., to Dow Chemical Company, The. Aqueous dispersions of thermosetting hydroxy-functional formaldehyde copolymer resins derived from diaryl oxides, sulfides, dibenzofuran or dibenzothiophene. 4,043,960, Cl. 260-29.40R.
Kreuzer, Lloyd B., to Diax Corporation. Retention time chromatograph employing an IR absorption spectrographic detector. 4,044,257, Cl. 250-344.000.
Krisch, Burkhard; and Rauch, Moriz V., to Siemens Aktiengesellschaft. Scanning corpuscular-beam transmission type microscope including a beam energy analyzer. 4,044,254, Cl. 250-311.000.
Krisch, Burkhard; and Rauch, Moriz V., to Siemens Aktiengesellschaft. Corpuscular-beam transmission-type microscope including an improved beam deflection system. 4,044,255, Cl. 250-311.000.
Krisch, Burkhard; Muller, Karl-Heinz; Rauch, Moriz von; and Veneklasen, Lee H., to Siemens Aktiengesellschaft. Support stand for a corpuscular-beam microscope. 4,044,256, Cl. 250-311.000.
Krohn, Antonin: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.
Krueger, Friedrich; and Palleduhn, Dieter, to Joh. A. Benckiser GmbH. 1,4-Bis-formyl cyclohexane polycarboxylic acids, process of making same, and compositions and methods of using same. 4,043,930, Cl. 252-89.00R.
Krug, Aribert: *See—*
Hartmann, Job-Werner; Falk, Roland; Krug, Aribert; Huber, Georg; Balz, Werner; and Mahler, Karl, 4,043,297, Cl. 118-640.000.
Krumkalns, Eriks V., to Eli Lilly and Company. Method of regulating the growth of aquatic weeds with pyridine derivatives. 4,043,790, Cl. 71-66.000.
Krumkalns, Eriks V., to Eli Lilly and Company. Method of regulating the growth of aquatic weeds with pyridine derivatives. 4,043,791, Cl. 71-66.000.
Kubersky, Hans Peter; and Weinrich, Erwin, to Henkel & Cie GmbH. Developer-coupler hair dyes based on triamino-pyrimidinones. 4,043,750, Cl. 8-10.200.
Kubik, Philip A. Fluid system. 4,043,125, Cl. 60-406.000.
Kubik, Philip A. Reservoir housing. 4,043,127, Cl. 60-453.000.
Kubo, Masanobu: *See—*
Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.
Kubota, Kanemitsu: *See—*
Akahane, Masao; Hosokawa, Minoru; and Kubota, Kanemitsu, 4,044,346, Cl. 340-336.000.
Kuchuk-Yatsenko, Sergei Ivanovich: *See—*
Lebedev, Vladimir Konstantinovich; Chernenko, Ivan Alexeevich; Postolaty, Nikolai Ivanovich; Kuchuk-Yatsenko, Sergei Ivanovich; Tishura, Vladimir Ivanovich; Entin, Yakov Borisovich; Filippov, Alexandr Nikolaevich; and Martynov, Evgeny Petrovich, 4,044,219, Cl. 219-100.000.
Kudchadker, Mohan Vaikunth; and Walker, Thad Oscar, to Texaco Inc. Alkoxylated asphalt as sacrificial agents in oil recovery processes. 4,043,396, Cl. 166-274.000.
Kugler, Jorg: *See—*
Mahn, Gustav; Schoop, Josef; and Kugler, Jorg, 4,043,800, Cl. 75-60.000.
Kuhl, Thomas J.: *See—*
Rowlson, Peter C.; and Kuhl, Thomas J., 4,043,012, Cl. 29-105.00R.
Kuhla, Donald E., to Pfizer Inc. Imidazopyridinium compounds as hypoglycemic agents. 4,044,015, Cl. 260-294.80C.
Kuhn, Gerald, to Kommanditgesellschaft Warmetechnik B. Ruthenberg GmbH. Flexible heating element for heating seats, in particular motor vehicle seats, couches, berths or the like. 4,044,221, Cl. 219-217.000.
Kuhn, Hans, to Koehring GmbH. Pile-driving arrangement. 4,043,405, Cl. 173-127.000.
Kukino, Yoshinori: *See—*
Endo, Masaaki; Miura, Mitsuo; Kukino, Yoshinori; Kikuchi, Kimio; and Aoyagi, Hayao, 4,043,909, Cl. 210-49.000.
Kume, Yoshiharu: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 4,044,003, Cl. 260-239.0BD.
Kunde, Joachim: *See—*
Wurmb, Rolf; Kunde, Joachim; Schlag, Johannes; and Dorst, Hans Georg, 4,043,971, Cl. 260-40.00R.
Kurashiki Boseki Kabushiki Kaisha: *See—*
Kasaoka, Shigeaki, 4,043,939, Cl. 252-416.000.
Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; and Takeshita, Masahiro, 4,044,102, Cl. 423-239.000.
Kuris, Arthur. Ultrasonic perspective carving. 4,043,084, Cl. 51-318.000.
Kurita, Masayuki: *See—*
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, 4,043,976, Cl. 260-45.80N.
Kurkov, Victor P., to Chevron Research Company. Isomerization of propenyl esters. 4,044,050, Cl. 260-491.000.
Kurtz, Bruce E., to Allied Chemical Corporation. Process and appara-

tus for autothermic cracking of ethane to ethylene. 4,044,068, Cl. 260-683.300.
Kushlefsky, Bernard G.: *See—*
Treadwell, Kenneth; Kushlefsky, Bernard G.; and Russo, Robert V., 4,043,949, Cl. 260-2.5AC.
Kusters, Eduard: *See—*
Ahrweiler, Karl-Heinz, 4,043,732, Cl. 425-371.000.
Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, to Takeda Chemical Industries, Ltd. 4-Pyridine carbonyl phenyl 1,2,4 triazoles. 4,044,129, Cl. 424-248.560.
Kuwana, Toshitsugu, to Rank Xerox Ltd. Interlinear feeder for copying machine. 4,043,664, Cl. 355-75.000.
Kuzunuki, Soshiro: *See—*
Hirasawa, Kotaro; Kuzunuki, Soshiro; Iwasaka, Tatsuo; and Kaneko, Takashi, 4,043,429, Cl. 187-29.00R.
Kwan, Jonathan: *See—*
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Kyburz, Emilio: *See—*
Gerecke, Max; Kaplan, Jean-Pierre; and Kyburz, Emilio, 4,044,010, Cl. 260-268.0TR.
Kyncl, Jaroslav: *See—*
Winn, Martin; Kyncl, Jaroslav; Dunnigan, Daniel Ambrose; and Jones, Peter Handley, 4,044,135, Cl. 424-251.000.
Kyokado Engineering Co., Ltd.: *See—*
Suzuki, Manao, 4,043,830, Cl. 106-287.0SS.
Kyowa Hakko Kogyo Co., Ltd.: *See—*
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, 4,043,992, Cl. 260-112.50R.
L.C.P. Group Services Limited: *See—*
Turner, Harold Roy, 4,043,593, Cl. 297-341.000.
L. & C. Steinmuller GmbH: *See—*
Plura, Georg, 4,043,833, Cl. 134-34.000.
Labana, Santokh S.; and Theodore, Ares N., to Ford Motor Company. Powder paint blends of an epoxy and hydroxy-functional copolymer and a carboxy-terminated copolymer. 4,044,070, Cl. 260-836.000.
Lacroix, Bernard, to Cycles Peugeot. Handle-bar stem. 4,043,684, Cl. 403-8.000.
Lacroix, Laurent, to Rhone-Poulenc Industries. Fungicidal compositions. 4,044,145, Cl. 424-273.00R.
Laesser, Claude, to Ebauches S.A. Data selection and display arrangement for a small device. 4,044,242, Cl. 235-152.000.
Lafferty, William Daniel; Smith, James Thomas; and Rench, Nicholas Wayne, to GTE Sylvania Incorporated. Apparatus for providing a stream of molten metal from a metallic ingot. 4,043,716, Cl. 425-6.000.
Lahr, Fred H.; and Murley, Roger W., to Rockwell International Corporation. Edger-trimmer head indexing mechanism. 4,043,101, Cl. 56-17.100.
Lakin, George W.; and Lakin, Robert L. Lawn edger accessory. 4,043,103, Cl. 56-295.000.
Lakin, Robert L.: *See—*
Lakin, George W.; and Lakin, Robert L., 4,043,103, Cl. 56-295.000.
Lallement, Jean: *See—*
Benque, Jean-Pierre; Lallement, Jean; and Lambert, Paul, 4,043,867, Cl. 176-40.000.
Lambert, Paul: *See—*
Benque, Jean-Pierre; Lallement, Jean; and Lambert, Paul, 4,043,867, Cl. 176-40.000.
Lamothe, Aime, to Raymond Lee Organization, Inc., The. Ice fishing rod. 4,043,070, Cl. 43-21.200.
Lamp, Thomas R., to Hughes Aircraft Company. Water heat pipe with improved compatability. 4,043,387, Cl. 165-105.000.
Lampert, Ingolf: *See—*
Jacob, Herbert; and Lampert, Ingolf, 4,043,861, Cl. 156-636.000.
Land-O-Tackle: *See—*
Lando, Joseph A., 4,043,071, Cl. 43-23.000.
Landau, Raphael, to Ozalid Group Holdings, Limited. Ink containing iron chelate and polyhydroxy compound. 4,043,820, Cl. 106-21.000.
Landi, Henry Patrick; and Perciaccante, Vincent Anthony, to American Cyanamid Company. Non-absorbable surgical sutures coated with polyoxyethylene-polyoxypropylene copolymer lubricant. 4,043,344, Cl. 128-335.500.
Lando, Frank; and Teitelbaum, Charles Leonard, to General Foods Corporation. Decaffeinated coffee of improved flavor. 4,044,162, Cl. 426-427.000.
Lando, Joseph A., to Land-O-Tackle. Fishing rod assembly. 4,043,071, Cl. 43-23.000.
Langley, Thomas W.: *See—*
Morris, David A.; Flournoy, Norman E.; and Langley, Thomas W., 4,043,180, Cl. 73-40.50A.
Lanoux, Sigred Boyd: *See—*
Davis, John Maxwell; and Lanoux, Sigred Boyd, 4,043,974, Cl. 260-45.75C.
Lapes, Rubin, to Hollingsead-Pryor Enterprises. Electrical terminal structure for connector. 4,043,631, Cl. 339-252.00R.
LaPour, Robert H.; and Liefbroer, Harold G. Open-fire rotisserie stand. 4,043,260, Cl. 99-421.0HH.
Lappa, Cleto L. Wheel rolling game. 4,043,556, Cl. 273-86.00R.
Larco Societe Miniere et Metallurgique de Larymna S.A.: *See—*
Tsirigotis, Constantin, 4,043,758, Cl. 23-262.000.
Largman, Theodore; and Sifniades, Stylianos, to Allied Chemical Corporation. Process for preparing α-chloro-ε-caprolactam. 4,044,001, Cl. 260-239.30R.
Larrabee, Edward Whittum; Rawson, Paul Olney; and Yagami, Richard Hajime, to Union Carbide Corporation. Portable liquid package container for use with blood washing device. 4,043,501, Cl. 229-14.0BE.
Larsen, Edgar Robert. *See—*
Rayburn, Donald Lee; Sunday, Larry Ray; and Larsen, Edgar Robert, 4,044,214, Cl. 200-316.000.
Larson, Bernard J.; Johnson, Oliver Wendell; and Yip, James Kwok-fun, to Eaton Corporation. Load sensing power steering system. 4,043,419, Cl. 180-132.000.
Larson, Robert A.: *See—*
Segar, William R.; and Larson, Robert A., 4,043,436, Cl. 191-32.000.
Lassen, Niels: *See—*
Buus, Jorn Lasse Martin; Lassen, Niels; and Bigler, Allan Johan, 4,044,024, Cl. 260-328.000.
Lasserre, Pierre: *See—*
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Laszlavik, Marta: *See—*
Karpati, Egon; Szporny, Laszlo; Bartok, Mihaly; Czombos, Jozsef; Felfoldi, Karoly; Laszlavik, Marta; and Notheisz, Ferenc, 4,044,146, Cl. 424-283.000.
Latsch, Reinhard: *See—*
Bianchi, Valerio; Schmidt, Peter; and Latsch, Reinhard, 4,044,236, Cl. 235-150.210.
Laub, Leonard J., to Zenith Radio Corporation. Optical system for reflective mode video playback apparatus. 4,044,378, Cl. 358-128.000.
Laubham, Rockne L.: *See—*
Padden, Thomas R.; Miller, William J., Jr.; and Laubham, Rockne L., 4,043,500, Cl. 228-175.000.
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Lussenden, Delbert. Method and apparatus for drying grain. 4,043,051, Cl. 34-77.000.
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Machida, Masaaki, to Konishiroku Photo Industry Co., Ltd. Method and system for printing photographs. 4,043,667, Cl. 355-97.000.
Macy, Robert L.; and Zupanick, Joseph E., to Suntech, Inc. Parallelogram structure. 4,042,991, Cl. 14-1.000.
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Mahn, Gustav; Schoop, Josef; and Kugler, Jorg, to Stahlwerke Peine-Salzgitter AG. Method for monitoring and controlling the refining of crude iron. 4,043,800, Cl. 75-60.000.

Malacheski, Joseph J.; and Zenda, Richard J. Padlock construction. 4,043,159, Cl. 70-38.00R.

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Marconi Company Limited, The: *See*—
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Mathis, Ronald D., to Phillips Fibers Corporation. Stabilizing polyamide antistatic compositions. 4,043,972, Cl. 260-45.9NC.

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Mayberry, Leonard Adolphus. Test set for measuring magnetic properties of magnetic amplifier cores by sinusoidal current excitation. 4,044,302, Cl. 324-34.0MC.

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Mazurek, Stanley L., to Continental Can Company, Inc. Shell control manifold. 4,043,168, Cl. 72-345.000.

McCabe, Barkman C.; and Zajac, Edward, to Magma Energy, Inc. High temperature geothermal energy system. 4,043,129, Cl. 60-641.000.

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McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, to American Can Company. Method for making a blow molded oriented plastic bottle. 4,044,086, Cl. 264-97.000.

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McHugh, Donald P.; and Cook, Donald F., to General Electric Company. Actuation system for a gas turbine engine exhaust device. 4,043,509, Cl. 239-265.410.

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McKinley, Suzanne V.: *See*—
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Burroughs Wellcome Co. Sulfide compounds. 4,044,014, Cl. 260-293.730.

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Melachouris, Nicholas, to Stauffer Chemical Company. Process for the recovery of whey protein having improved solution clarity using polyphosphates. 4,043,990, Cl. 260-112.00R.

Melco: *See*—
Champan, Louis W.; and Perkins, Arthur T., 4,044,206, Cl. 179-84.0VF.

Melnick, Joseph L.; and Wallis, Craig, to Baylor College of Medicine. Sterilization of holding tanks and toilet bowls by quaternary compounds. 4,043,911, Cl. 210-62.000.

Melnik, Vladimir Jurievich: *See*—
Romanenko, Nikolai Trofimovich; Chichin, Alexandr Vasilievich; Lyaskovsky, Ivan Frantsevich; Melnik, Vladimir Jurievich; Medinsky, Nikolai Ivanovich; and Yakunin, Valentin Matveevich, 4,043,211, Cl. 74-110.000.

Mercer, Howard Alexander, to Akzona Incorporated. Device for adjusting strand carrier tube in composite yarn producing apparatus. 4,043,720, Cl. 425-113.000.

Merck & Co., Inc.: *See*—
Remy, David C., 4,044,143, Cl. 424-267.000.
Rogers, Edward F.; Hannah, John; and Dybas, Richard A., 4,044,133, Cl. 424-251.000.
Ruyle, William V.; Sarett, Lewis H.; and Matzuk, Alexander R., 4,044,049, Cl. 260-479.00R.
Schultz, Everett M.; and Cragoe, Edward J., Jr., 4,044,153, Cl. 424-330.000.

Mercury Machine Co.: *See*—
Petrenchik, John R., 4,043,385, Cl. 164-342.000.

Merelli, Marc: *See*—
Allain, Jacques; Duchene, Jean; and Merelli, Marc, 4,044,301, Cl. 324-33.000.

Merkle, Eberhard, to Wilh. Bleyle KG. Spool rack. 4,043,154, Cl. 66-125.00R.

Merlo, Michele. Miniaturized precision speed gyroscope. 4,043,205, Cl. 74-5.500.

Mesaros, Louis: *See*—
Mollard, Paul; and Mesaros, Louis, 4,044,103, Cl. 423-267.000.

Mesle, Reinhold: *See*—
Leibinger, Paul; Mesle, Reinhold; Methner, Arnold; and Steidle, Alfons, 4,044,215, Cl. 200-318.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Held, Manfred, 4,043,266, Cl. 102-24.0HC.

Metallgesellschaft Aktiengesellschaft: *See*—
Peschel, Dieter; and Funke, Dieter, 4,043,221, Cl. 74-573.00R.

Metallprodukte A.G. Grenchen: *See*—
Schlappi, Hans, 4,043,116, Cl. 58-88.00R.

Metallurgie Hoboken-Overpelt: *See*—
Leroy, Jean, 4,043,166, Cl. 72-39.000.

Metcalf, Harold J., to Blumberg, Nathan; Public Systems Research, Inc.; and Metcalf, Harold J., part interest to each. Constant flow rate liquid medicament administering device. 4,043,332, Cl. 128-214.00E.

Methner, Arnold: *See*—
Leibinger, Paul; Mesle, Reinhold; Methner, Arnold; and Steidle, Alfons, 4,044,215, Cl. 200-318.000.

Mettler Instrumente AG: *See*—
Luchinger, Paul, 4,043,415, Cl. 177-255.000.
Stutz, Andreas, 4,043,414, Cl. 177-248.000.

Metzger, Lenard M., to Eastman Kodak Company. Interactive servo control system for use with a rotating-head magnetic tape player. 4,044,388, Cl. 360-70.000.

Meyer, Engelbert A., to USM Corporation. Elastomeric bumper securing press fit clip. 4,043,579, Cl. 293-71.00R.

Meyer, Willy: *See*—
Boehner, Beat; Dawes, Dag; and Meyer, Willy, 4,044,124, Cl. 424-200.000.

Meyers, George Leroy; and Mueller, David Charles, to American Can Company. Reclosable carton. 4,043,503, Cl. 206-613.000.

Mickelson, Micheal J., to Minnesota Mining and Manufacturing Company. Automatic microfilm handling apparatus. 4,043,652, Cl. 353-26.00A.

Mida Mfg. Inc.: *See*—
Love, Michael, 4,043,449, Cl. 206-45.140.

Midland-Ross Corporation: *See*—
Durling, Harold, 4,043,351, Cl. 137-554.000.

Migliaccio, Mariano; and Pisani, Emilio, to Consiglio Nazionale Delle Ricerche. Air-fuel ratio control system for internal-combustion engines with controlled ignition. 4,043,303, Cl. 123-119.00R.

Mikuni Kogyo Kabushiki Kaisha: *See*—
Seino, Tadashi, 4,043,711, Cl. 417-469.000.

Milano, Lawrence V., to Raymond Lee Organization, Inc., The. Artist's brush with disposable cartridge. 4,043,680, Cl. 401-40.000.

Milgo Electronic Corporation: *See*—
Borysiewicz, Richard; and Roedel, Charles W., 4,044,307, Cl. 325-42.000.

Miller, Alvin J.; and Tuckett, William F., to Phillips Petroleum Company. Removal of mercury from gas streams using hydrogen sulfide and amines. 4,044,098, Cl. 423-210.000.

Miller, George H.: *See*—
Williams, Ben; and Miller, George H., 4,043,006, Cl. 24-90.00R.

Miller, John J.; Baus, Richard E.; and Lewis, Sheldon N., to Rohm and Haas Company. Coated metal article. 4,044,190, Cl. 428-463.000.

Miller, John J.: *See*—
Hutton, Thomas W.; Miller, John J.; Wempe, Lawrence K.; and Lewis, Sheldon N., 4,043,956, Cl. 260-23.00R.

Miller, Joseph; and Cline, Clinton. Safety mine car coupling and uncoupling apparatus. 4,043,457, Cl. 213-75.00B.

Miller, Lewis J.; and Klarman, Casimir M., to Westinghouse Electric Corporation. Thrust bearing locating device and a method for locating a thrust bearing within a turbine casing. 4,043,615, Cl. 308-32.000.

Miller, William J., Jr.: *See*—
Padden, Thomas R.; Miller, William J., Jr.; and Laubham, Rockne L., 4,043,500, Cl. 228-175.000.

Millham, Ernest H.: *See*—
Foreman, Steven H.; Millham, Ernest H.; Ortloff, James E.; and Prilik, Ronald Jay, 4,044,244, Cl. 235-153.0AC.

Milliken Research Corporation: *See*—
Fusco, Anthony M., 4,044,033, Cl. 260-404.000.

Mills, Manuel Dee. Dynanometer for a pump-off control. 4,043,191, Cl. 73-151.000.

Mills Products, Inc.: *See*—
Katona, Joseph W., 4,043,091, Cl. 52-616.000.

Milstein, Donald; and Stein, Thomas R., to Mobil Oil Corporation. Conversion of Fischer-Tropsch heavy product to high quality jet fuel. 4,044,064, Cl. 260-676.00R.

Mimura, Koji: *See*—
Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, 4,044,076, Cl. 260-969.000.

Miner, Antonia V.; and Nichols, Joseph, to Toni Totes of Vermont, Inc. Needlework frame. 4,043,270, Cl. 38-102.910.

Minnesota Mining and Manufacturing Company: *See*—
Berg, Eric P., 4,043,967, Cl. 260-30.4EP.
Ko, Su Sen, 4,044,121, Cl. 424-71.000.
Loudas, Basil L., 4,043,923, Cl. 252-8.750.
Mickelson, Micheal J., 4,043,652, Cl. 353-26.00A.
Sherman, Patsy O.; and Smith, Samuel, 4,043,964, Cl. 260-29.60F.
Taylor, Allen L.; and Ensign, Thomas C., 4,044,251, Cl. 250-342.000.

Minowa, Osami, to Hochiki Corporation. Ionization smoke sensor. 4,044,262, Cl. 250-381.000.

Miquel, Jean: *See*—
Juguin, Bernard; Cosyns, Jean; Le Page, Jean-Francois; and Miquel, Jean, 4,043,944, Cl. 252-441.000.

Miranol Chemical Company, Inc., The: *See*—
Christiansen, Arvid, 4,044,034, Cl. 260-404.500.

Mitchell, Terry L.: *See*—
Propst, Robert L.; Kelley, James O.; and Mitchell, Terry L., 4,043,626, Cl. 339-23.000.

Mitsubishi Chemical Industries Ltd.: *See*—
Ashida, Kaneyoshi; Ohtani, Masaaki; Ichii, Makoto; and Kobayashi, Tatsuhiko, 4,044,184, Cl. 428-113.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Onishi, Masayoshi; and Aiyama, Yoshinobu, 4,043,030, Cl. 29-622.000.
Ueda, Fumio; and Arai, Hirotsugu, 4,044,345, Cl. 340-324.00M.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, 4,043,022, Cl. 29-460.000.
Yamanaka, Akira, 4,043,585, Cl. 296-35.00R.

Mitsubishi Jukogyo Kabuskiki Kaisha: *See*—
Nishino, Mutsumi; Sasaki, Hideo; Uda, Kazumi; Tamura, Motohiko; Hiyama, Kunihiko; and Fujiike, Hiroshi, 4,043,769, Cl. 55-25.000.

Mitsubishi Rayon Co., Ltd.: *See*—
Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, 4,044,076, Cl. 260-969.000.

Miura, Mitsuo: *See*—
Endo, Masaaki; Miura, Mitsuo; Kukino, Yoshinori; Kikuchi, Kimio; and Aoyagi, Hayao, 4,043,909, Cl. 210-49.000.

Miyamoto, Toshio, to Marumiya Shoko Co., Ltd. Back-splitting apparatus in the production of brochures. 4,043,235, Cl. 83-207.000.

Miyatake, Takahumi: *See*—
Kashioka, Seiji; Kameyama, Masayoshi; Ejiri, Masakazu; and Miyatake, Takahumi, 4,044,311, Cl. 328-139.000.

Miyoshi, Isao; Abe, Masaru; Tezuka, Toshiro; and Yoshimoto, Toshio, to Bridgestone Tire Company Limited. Pneumatic tire for off-road vehicles. 4,043,372, Cl. 152-354.000.

Mizuguchi, Teruki: *See*—
Tsunemoto, Shiro; Mizuguchi, Teruki; and Hirayama, Eiichi, 4,043,726, Cl. 425-563.000.

Mizuno, Zenichiro: *See*—
Suzuki, Teiji; and Mizuno, Zenichiro, 4,043,519, Cl. 242-55.530.

Mlecka, Louis F.: *See*—
Giallourakis, Michael A.; and Mlecka, Louis F., 4,043,587, Cl. 296-91.000.

Mobay Chemical Corporation: *See*—
Baron, Arthur L.; and Sivaramakrishnan, Parameswar, 4,043,980, Cl. 260-47.0XA.
Baron, Arthur L.; and Rawlings, Herbert L., 4,044,073, Cl. 260-860.000.

Mobil Oil Corporation: *See*—
Anderson, Conroy D.; Schatz, Klaus W.; and Snyder, Paul W., Jr., 4,043,899, Cl. 208-161.000.
Anderson, Ronald W., 4,043,963, Cl. 260-29.40R.
Chang, Clarence D.; Silvestri, Anthony J.; and Zahner, John C., 4,044,061, Cl. 260-668.00R.
Godfrey, William L., 4,044,288, Cl. 318-485.000.

Ireland, Henry R.; and Stein, Thomas R., 4,044,063, Cl. 260-676.00R.
Milstein, Donald; and Stein, Thomas R., 4,044,064, Cl. 260-676.00R.
Spencer, Arthur T.; and Siranovich, Stanley F., 4,043,968, Cl. 260-33.40R.

Mobile Oil Corporation: *See—*
Butter, Stephen A.; and Kaeding, Warren W., 4,044,065, Cl. 260-677.00R.

Mobley, David F.; and Baum, Neil H., to Baylor College of Medicine. Catheter. 4,043,346, Cl. 128-349.00R.

MOD-SOD Sport Surfaces: *See—*
Haas, Frederick T., Jr., 4,044,179, Cl. 428-17.000.

Model, Ernst; and Pugin, Andre, to Ciba-Geigy Corporation. Methyl or methoxy substituted iminoisoindolinone pigments. 4,043,999, Cl. 260-152.000.

Modesto, Narciso G.; and Brejcha, Robert J. Vibratory compacting machine. 4,043,738, Cl. 425-456.000.

Mogannam, Paul. Recreational device. 4,043,565, Cl. 280-11.120.

Molins Limited: *See—*
Hirsh, Ivan Y., 4,043,182, Cl. 73-41.000.

Molins Macine Company, Inc.: *See—*
Grobman, William, 4,043,265, Cl. 101-350.000.

Mollard, Paul; and Mesaros, Louis, to Produits Chimiques Ugine Kuhlmann. Storage-stable sodium chlorite. 4,044,103, Cl. 423-267.000.

Momose, Yutaka, to Aisin Seiki Kabushiki Kaisha. Power shift transmission for motor vehicles. 4,043,225, Cl. 74-761.000.

Monsanto Company: *See—*
Bloomfield, Jordan J.; and Owsley, Dennis C., 4,044,057, Cl. 260-617.00F.
Dahms, Ronald H., 4,043,970, Cl. 260-29.300.
Paster, Mark D., 4,043,955, Cl. 260-23.70A.

Montesi, Edward N., to Dart Industries Inc. Spoon holder and measuring spoon set. 4,043,203, Cl. 73-427.000.

Moore, Charles E., Jr.; Crane, Sammy L.; and Lipke, Donald L., to Biometrics Instrument Corporation, A Division of Varo, Inc. Voltage supply including bilateral attenuator. 4,044,249, Cl. 250-213.0VT.

Moore, John H., to United States of America, Air Force. Integrated circuit wiring bridge apparatus. 4,044,397, Cl. 361-398.000.

Moore, Robert E.: *See—*
Duling, Irl N.; Gates, David S.; Glazier, Frederick P.; and Moore, Robert E., 4,043,927, Cl. 252-52.00R.

Moreau, Alain, to Alcan Research and Development Limited. Apparatus for loading stillages. 4,043,459, Cl. 214-6.0DK.

Morgan, Clyde R.; and Blocksom, David C., to Wheelsport Distributing Co. Helmet face guard accessory for motorcycle riders. 4,042,974, Cl. 2-9.000.

Morgan, Grant T., to Dymo Industries, Inc. Laser photocomposition system and method. 4,044,363, Cl. 354-5.000.

Mori, Akira: *See—*
Takeda, Tsuneshi; Atarashi, Yasuyuki; and Mori, Akira, 4,043,904, Cl. 210-28.000.

Mori, Akiyoshi: *See—*
Nashiwa, Hajime; Mori, Akiyoshi; and Tokuda, Makoto, 4,043,798, Cl. 75-53.000.

Mori, Kazuo: *See—*
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 4,044,003, Cl. 260-239.0BD.

Morii Chokoku Co., Ltd.: *See—*
Kajimoto, Isamu; and Morii, Hideaki, 4,043,262, Cl. 101-7.000.

Morii, Hideaki: *See—*
Kajimoto, Isamu; and Morii, Hideaki, 4,043,262, Cl. 101-7.000.

Morin, Edmond A.: *See—*
Skarbo, Roald R.; Peterson, Hal D.; and Morin, Edmond A., 4,043,882, Cl. 204-106.000.

Morinaga & Co., Ltd.: *See—*
Sato, Fumio, 4,043,259, Cl. 99-353.000.

Morine, Richard L.; and Hokes, James J., to Fedco Inc. Cake icing apparatus. 4,043,294, Cl. 118-9.000.

Morishita Chemical Industry Co. Ltd.: *See—*
Ochiai, Fukuzo, 4,043,085, Cl. 52-3.000.

Moriuchi, Shigenori: *See—*
Okutsu, Eiichi; Hayashi, Katsumi; Moriuchi, Shigenori; and Sakai, Takeo, 4,043,817, Cl. 96-66.00R.

Moriwaki, Yoshinaga: *See—*
Tsukada, Tameyasu; Sumi, Yoshio; Moriwaki, Yoshinaga; Oshio, Hirosuke; Ueda, Katsunobu; and Umino, Yoiti, 4,043,618, Cl. 308-174.000.

Morizur, Gabrielle: *See—*
Le Noane, Georges E.; Mathern, Andre M.; and Morizur, Gabrielle, 4,043,854, Cl. 156-158.000.

Morris, David A.; Flournoy, Norman E.; and Langley, Thomas W., to Texaco Inc. Gathering line leak detection system tester. 4,043,180, Cl. 73-40.50A.

Morris, Harold B.: *See—*
McDaniel, John E.; and Morris, Harold B., 4,043,682, Cl. 401-199.000.

Morris, Ralph; and Turner, William Gordon, to Morris Turner Pty. Limited. Inflating probe. 4,043,356, Cl. 137-320.000.

Morris Turner Pty. Limited: *See—*
Morris, Ralph; and Turner, William Gordon, 4,043,356, Cl. 137-320.000.

Morris, William E. Non-aerosol type dispenser. 4,043,510, Cl. 239-323.000.

Morrison, Burk Guy. Tooth for a roto tiller. 4,043,399, Cl. 172-42.000.

Morrison, Charles F., Jr., to Valleylab, Inc. Electrosurgical devices having sesquipolar electrode structures incorporated therein. 4,043,342, Cl. 128-303.140.

Morrison, Wilbur J.; and Tress, Norwood E., to Bell & Howell Company. In-line inserter. 4,043,551, Cl. 271-243.000.

Morrow, Robert S.; and Penn, Lloyd D., to IRD Mechanalysis, Inc. Circuitry for generating a sine wave and/or cosine wave from a pulse signal. 4,044,310, Cl. 328-27.000.

Mortimer, James R.: *See—*
Reese, Thomas J.; Tobin, Melvin W.; and Mortimer, James R., 4,043,784, Cl. 65-107.000.

Morton-Norwich Products, Inc.: *See—*
Schwan, Thomas J., 4,044,008, Cl. 260-251.00R.

Mosbacher, Rudolf; and Ruppik, Hans, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Process for making sheet-metal planet carrier. 4,043,021, Cl. 29-437.000.

Moss, Gerald; Johnes, Graham Lloyd; and Craig, John William Thomas, to United States of America, Administrator, Environmental Protection Agency. Burner equipment and operation thereof. 4,043,741, Cl. 431-3.000.

Moss, Philip H.: *See—*
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,044,053, Cl. 260-583.00P.

Moss, Robert H.; Swinehart, Carl F.; and Spicuzza, William F., to Harshaw Chemical Company, The. Hot-pressable magnesium fluoride powder. 4,044,112, Cl. 423-490.000.

Mosser Industries, Inc.: *See—*
Gottshall, Edward R., 4,043,534, Cl. 251-174.000.

Mosteller, James K.: *See—*
Keller, Alex J.; Williams, Joseph R.; and Mosteller, James K., 4,043,464, Cl. 214-17.0CA.

Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
Just, Karl, 4,043,847, Cl. 148-146.000.

Motoren- und Turbinen-Union Munchen GmbH M.A.N. Maybach Mercedes-Benz: *See—*
Stegherr, Rudolf; and Ruecker, Gerhard, 4,043,146, Cl. 64-1.00V.

Motorola, Inc.: *See—*
Sessions, Douglas Charles, 4,043,302, Cl. 123-117.00R.
Yamashita, Masakazu, 4,044,390, Cl. 360-93.000.

Motosuke Umezu: *See—*
Mae, Shinroku, 4,043,261, Cl. 100-26.000.

Mould, George, executor: *See—*
Hambling, Peter G.; Owen, Leslie W., deceased; Owen, Elizabeth Bertram, executrix; and Mould, George, executor, 4,043,876, Cl. 204-9.000.

Mounteer, Carl A.; and Sizgorich, Anthony T., to Gulton Industries, Inc. Flow rate transducer. 4,043,197, Cl. 73-205.00R.

MTU-Motoren-und Turbinen-Union: *See—*
Puhr-Westerheide, Jorg, 4,043,883, Cl. 204-129.650.

Mueller, David Charles: *See—*
Meyers, George Leroy; and Mueller, David Charles, 4,043,503, Cl. 206-613.000.

Mui, Jeffrey Y. P.; and Pines, Arthur N., to Union Carbide Corporation. Sulfur containing silane coupling agents. 4,044,037, Cl. 260-448.20N.

Mullarkey, William Joseph, to Cunard Steam-Ship Company Limited, The. Reception techniques for improving intelligibility of an audio frequency signal. 4,044,205, Cl. 179-1.00P.

Mullen, Larry P., to Scientific Engineering, Inc. Vibratory compactor. 4,043,694, Cl. 404-133.000.

Muller, Hanns Peter; Wagner, Kuno; and Muller, Richard, to Bayer Aktiengesellschaft. Process for polyaddition products which contain uretdione groups and use in coatings. 4,044,171, Cl. 427-27.000.

Muller, Karl-Heinz: *See—*
Krisch, Burkhard; Muller, Karl-Heinz; Rauch, Moriz von; and Veneklasen, Lee H., 4,044,256, Cl. 250-311.000.

Muller, Martin; Hinsche, Friedrich; Winter, Gerhard; and Brandle, Karl, to Bayer Aktiengesellschaft. Production of foamed gypsum moldings. 4,043,825, Cl. 106-87.000.

Muller, Richard: *See—*
Muller, Hanns Peter; Wagner, Kuno; and Muller, Richard, 4,044,171, Cl. 427-27.000.

Mullins, Phillip Leroy: *See—*
Weiss, William Robert; Cooksey, James Judson; and Mullins, Phillip Leroy, 4,043,008, Cl. 28-271.000.

Munsch, John Michael, to Baxter Laboratories, Inc. Clamp-on injection site. 4,043,333, Cl. 128-214.00R.

Murakami, Tadashi: *See—*
Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, 4,044,018, Cl. 260-307.00A.

Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; and Takeshita, Masahiro, to Kurashiki Boseki Kabushiki Kaisha. Method for treating exhaust gases. 4,044,102, Cl. 423-239.000.

Murley, Roger W.: *See—*
Lahr, Fred H.; and Murley, Roger W., 4,043,101, Cl. 56-17.100.

Musgrave, Daniel Dennis. Pistol charging socket. 4,043,065, Cl. 42-1.00R.

Myers, Dick T., to PPG Industries, Inc. Glass sheet conveyor rolls and process for conveying thereon. 4,043,786, Cl. 65-114.000.

N.P.I. Corporation: *See—*
Curtis, Richard E.; Dench, Robert H.; and Dervin, Victor J., 4,044,078, Cl. 261-30.000.

Nacci, Anthony T.: *See—*
Jolly, Michael D.; Nacci, Anthony T.; DeCeglie, Gaetano J.; and Vitti, Rudolf A., 4,044,167, Cl. 426-594.000.

Nagamori, Lomitado: *See—*
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, 4,043,976, Cl. 260-45.80N.

Nagano, Syuzi: *See—*
Ohnuma, Kiyoshi; and Nagano, Syuzi, 4,043,223, Cl. 74-688.000.

Najer, Henry; Dupont, Regis; and Giudicelli, Don Pierre Rene Lucien, to Synthelabo. Substituted piperazine derivative, its preparation and anorexia compositions containing it. 4,044,132, Cl. 424-250.000.

Nakada, Tetsuo, to Janome Sewing Machine Co. Printing machine with vertically shiftable credit card supporting plate. 4,043,263, Cl. 101-45.000.

Nakagome, Takenari: *See—*
Hamma, Noritaka; Fukumura, Masataka; Maeshima, Kaoru; and Nakagome, Takenari, 4,043,991, Cl. 260-112.50R.

Nakahama, Tetsuro: *See—*
Kametani, Yoshiya; Nakahama, Tetsuro; Kawai, Atsushi; and Mimura, Koji, 4,044,076, Cl. 260-969.000.

Nakajima, Fumito: *See—*
Fukui, Yutaka; Hataya, Fumio; Sasaki, Ryoichi; Nakajima, Fumito; Matsuda, Shimpei; Tonami, Munehiko; and Hiraga, Ryo, 4,043,945, Cl. 252-466.00J.

Nakamizo, Nobuhiro: *See—*
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, 4,043,992, Cl. 260-112.50R.

Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, to Dai Nippon Toryo Co., Ltd. Liquid crystal electro optical element. 4,043,634, Cl. 350-160.0LC.

Nakamura, Koichi: *See—*
Shimamura, Isao; and Nakamura, Koichi, 4,043,814, Cl. 96-10.000.

Nakamura, Norihiko: *See—*
Kato, Takashi; Hoshi, Koichi; and Nakamura, Norihiko, 4,043,309, Cl. 123-191.0SP.

Nakamura, Toshio, to Sanyei Corporation. Shower head. 4,043,511, Cl. 239-394.000.

Nakayama, Norihiko: *See—*
Andoh, Shizuo; and Nakayama, Norihiko, 4,044,349, Cl. 340-324.00M.

Narayanan, Venkatachala L.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

Narco Scientific Industries, Inc.: *See—*
Smith, John F., 4,044,309, Cl. 325-478.000.

Naremco, Inc.: *See—*
Jackson, Dennis E., 4,044,152, Cl. 424-329.000.

Narihiro, Michiaki; and Nishimura, Akira, to New Nippon Electric Company, Ltd. Channel selecting shaft mounting arrangement for UHF tuners. 4,043,206, Cl. 74-10.540.

Narozny, Ronald S., to Thomas & Betts Corporation. Electrical contact. 4,043,628, Cl. 339-99.00R.

Nashiwa, Hajime; Mori, Akiyoshi; and Tokuda, Makoto, to Sumitomo Metal Industries Limited. Process for producing steel having improved low temperature impact characteristics. 4,043,798, Cl. 75-53.000.

National Controls, Inc.: *See—*
Rock, Frank C., 4,043,412, Cl. 177-25.000.

National Research Development Corporation: *See—*
Cunningham, Sinclair Upton, 4,043,255, Cl. 92-158.000.
Hughes, Austin; and Lawrenson, Peter John, 4,044,291, Cl. 318-696.000.
Swanson, Sydney Alan Vasey; and Roper, Brian Arnold, 4,042,980, Cl. 3-1.910.
Swinbanks, Malcolm Alexander, 4,044,203, Cl. 179-1.00P.

National Semiconductor Corporation: *See—*
Spadea, Gregorio, 4,043,025, Cl. 29-571.000.
Sporck, Christian R., 4,043,969, Cl. 260-37.0EP.

National Starch and Chemical Corporation: *See—*
Ganslaw, Stuart H.; and Katz, Howard G., 4,043,952, Cl. 260-17.4ST.

Natsugari, Hideaki: *See—*
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Neff, Edward C., to Westinghouse Electric Corporation. Method and tool for removing tubes from multi-tube finned heat exchange coil. 4,043,018, Cl. 29-427.000.

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Nelson, Albert W., to Koehring Company. Soil stabilizer machine with detachable hydraulic motor structure driving rotatably mounted cutting elements. 4,043,402, Cl. 172-112.000.

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New England Union Co.: *See—*
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New Products Development, Inc.: *See—*
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Newell, Darrell E.; Jennings, John F.; Fritsch, Steven Lyle; and Hinnah, Howard D., to CTS Corporation. Crystal controlled square wave oscillator. 4,044,317, Cl. 331-116.00R.

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Nickol, Stephen L., to Suntech, Inc. Single step preparation of block copolymer of polyamides. 4,044,071, Cl. 260-857.0TW.

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Nippon Electric Company, Ltd.: *See—*
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Nippon Kokan Kabushiki Kaisha: *See—*
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Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.

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Hayami, Satohiro; Imamura, Jun; Hayakawa, Hiroshi; and Yabuta, Tadatzugu, 4,043,805, Cl. 75-123.00L.

Nippon Tungsten Co., Ltd.: *See—*
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Nippondenso Co., Ltd.: *See—*
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Nishimura, Akira: *See—*
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Noakes, Jack E.; Sato, Hiroshi; and Terner, Leslie L., to Ford Motor Company. Method of forming a silicon carbide article - III. 4,044,110, Cl. 423-346.000.

Nobue, Takaaki; Itou, Masao; Yamamoto, Katsuhiko; and Hori,

Makoto, to Matsushita Electric Industrial Co., Ltd. Ultrasonic generator with combined oscillator and current regulator. 4,044,297, Cl. 323-4.000.
Noe, Oskar; and Skrober, Wolfgang, to BWG Bergwerk- und Walzwerk-Maschinenbau G.m.b.H. Roller assembly for sheet-bending head and method of making roller bearings therefor. 4,043,162, Cl. 72-163.000.
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Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injection system for an internal combustion engine. 4,043,307, Cl. 123-139.0AW.
Nomiya, Kosei; Kohisa, Toshihiko; and Matsumura, Isao, to Hitachi, Ltd. IGFET with gate protection diode and antiparasitic isolation means. 4,044,373, Cl. 357-41.000.
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Norman, Marvin Neil, to RCA Corporation. Brightness control apparatus. 4,044,375, Cl. 358-40.000.
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North American Philips Corporation: *See—*
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Novotny, Milos V; and Grohmann, Karel, to Indiana University Foundation. Chromatographic separation columns with selectively modified active surfaces and methods for their preparations. 4,043,905, Cl. 210-31.00C.
Numabe, Hitomi, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece. 4,043,109, Cl. 58-23.00R.
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O'Brien, William L., to Emery Industries, Inc. Copolyesters derived from ethoxylated 3,5-dibromo-4-hydroxybenzoic acid. 4,043,981, Cl. 260-47.00C.
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Okutsu, Eiichi; Hayashi, Katsumi; Moriuchi, Shigenori; and Sakai, Takeo, to Fuji Photo Film Co., Ltd. Method of forming photographic images for lithographic use. 4,043,817, Cl. 96-66.00R.
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Orel, Jeannette V. Smoke sorbing device. 4,043,776, Cl. 55-385.00G.
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Pace, Aylmer Raymond. Device for measuring the amount of product in bottles, jars and containers. 4,043,043, Cl. 33-137.00L.
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Padden, Thomas R.; Miller, William J., Jr.; and Laubham, Rockne L., to Westinghouse Electric Corporation. Tube to tube brazing. 4,043,500, Cl. 228-175.000.
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Patin, Claude Guy, to Compagnie des Etablissements Dela Risle. Multilayer article and a process and an apparatus for its manufacture. 4,043,855, Cl. 156-178.000.
Paton, Boris Evgenievich; Lebedev, Vladimir Konstantinovich; Sheiko, Pavel Petrovich; Pashulya, Mikhail Petrovich; and Steblovsky, Boris Antonovich. Apparatus for pulsed arc welding and building-up of articles. 4,044,223, Cl. 219-135.000.
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Paust, Joachim, to BASF Aktiengesellschaft. Substituted succinaldehyde monoacetals. 4,044,026, Cl. 260-340.90R.
Payton, Edward L., to Mastic Corporation. Trailer skirting. 4,043,088, Cl. 52-169.900.
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Pease, James F. Electrical heating element and fitting assembly. 4,044,225, Cl. 219-336.000.
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Pei, Yu K., to Owens-Illinois, Inc. Solar energy collector. 4,043,318, Cl. 126-271.000.
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Perkow, Werner; Hopp, Hans; and Ingwersen, Walter, to Norddeutsche Affinerie; and C. F. Spiess & Sohn. Combating pests with di-(2-thioureido-(N-alkoxycarbonyl)-N-phenylureido)-compounds. 4,044,045, Cl. 260-470.000.
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Peschel, Dieter; and Funke, Dieter, to Metallgesellschaft Aktiengesellschaft. Mass-imbalance oscillation generator. 4,043,221, Cl. 74-573.00R.

Peterson, Hal D.: *See—*
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Peterson, Reuben E., to Jenoff, Incorporated. Material sensing switch. 4,044,209, Cl. 200-61.210.
Peterson, Richard H. Electronic chorus and tremulant system. 4,043,243, Cl. 84-1.250.
Peterson, Russell I., Jr., to Conair, Inc. Comminution device. 4,043,514, Cl. 241-36.000.
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Petrow, Henry G.; and Allen, Robert J., to Prototech Company. Finely particulated colloidal platinum compound and sol for producing the same, and method of preparation of fuel cell electrodes and the like employing the same. 4,044,193, Cl. 429-40.000.
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Phillips, Kenneth G.; Walford, Richard P.; and Knight, Clifford, to Xerox Corporation. Improved registration means for automatic document handling apparatus. 4,043,550, Cl. 271-233.000.
Phillips Petroleum Company: *See—*
Bost, Howard W., 4,043,975, Cl. 260-45.75W.
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Stapp, Paul R., 4,044,041, Cl. 260-465.00D.
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Phipps, Arthur L. Method of removing an article from a chamber having a reduced pressure therein. 4,044,084, Cl. 264-51.000.
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Pickles, Joseph, to Ferro Manufacturing Corporation. Seat adjusting mechanism. 4,043,529, Cl. 248-419.000.
Piepenhagen, John H.K.; and Vanecek, Michael J., to Georgetown Texas Steel Corporation. Spray apparatus for continuous casting machine. 4,043,384, Cl. 164-282.000.
Pilch, John S., to Ware Machine Service, Inc. Hitch for coupling alignment of tractor and backhoe. 4,043,470, Cl. 214-145.00A.
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Pisani, Emilio: *See—*
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Pizzuti, Donato F.; and Skurski, James K., to Polaroid Corporation. Handle construction for self-developing cameras. 4,044,365, Cl. 354-85.000.
Pizzuti, William J., to Skytrends, Inc. Sliding roof assembly. 4,043,590, Cl. 296-137.00H.
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Plunkett, Allan Barr; and D'Atre, John Douglas, to General Electric Company. Alternating current motor control method and system. 4,044,284, Cl. 318-227.000.
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Plura, Georg, to L. & C. Steinmuller GmbH. Method of and device for cleaning the slot-like openings of distribution and collection pipes in an ion exchanger column. 4,043,833, Cl. 134-34.000.
Pohl, Siegfried: *See—*
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Polanski, John: *See—*
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Pozzato, Tarcisio; Pozzato, Mariano; and Pozzato, Alberto. Disk mill for milling crushing or grinding pebbles, gravel, small rocks and the like. 4,043,516, Cl. 241-252.000.
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Chang, Wen-Hsuan; Hartman, Marvis E.; and Scriven, Roger L., 4,043,953, Cl. 260-18.00S.
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Myers, Dick T., 4,043,786, Cl. 65-114.000.
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Reese, Thomas J., 4,043,785, Cl. 65-107.000.
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Price, Norris F. Mortar applying machine. 4,043,487, Cl. 222-166.000.
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Propper Manufacturing Co., Inc.: *See—*
Heine, Helmut A.; Schmidt, Otto H.; and Spitschan, Hans J., 4,043,646, Cl. 350-315.000.
Propst, Robert L.; Kelley, James O.; and Mitchell, Terry L., to Herman Miller, Inc. Power supply for movable office unit. 4,043,626, Cl. 339-23.000.
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Snyder, Richard C., 4,043,274, Cl. 105-409.000.
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Putnam, Roger L., Jr.; and O'Brien, Edward F., to Package Machinery Company. Vertical form, fill and seal packaging machine with improved back-up bar for longitudinal sealing. 4,043,098, Cl. 53-180.00M.
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Raczkowski, Mark B. Automatic bed making device. 4,042,985, Cl. 5-317.00R.
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Rajakovics, Gundolf E.; Gabernig, Heinz; and Klein, Guenter Peter, to Vereinigte Delstahlwerke AG. (VEW). Two-step flash technique for vaporizing radioactive liquids. 4,043,875, Cl. 203-82.000.
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Brookman, Anthony Haldane Ray, 4,043,171, Cl. 72-393.000.
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Ratledge, Edward L.; and Ware, Richard E., to Sun Oil Company of Pennsylvania. Stabilized wax emulsions. 4,043,829, Cl. 106-271.000.
Ratliff, Roger D., to PepsiCo Inc. Transport vehicle. 4,043,569, Cl. 280-423.00R.
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Stangeland, Maynard L., 4,044,186, Cl. 428-167.000.
Vasile, Carmine F., 4,044,321, Cl. 333-72.000.
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Scheffel, Walter. Apparatus to deliver weft to fluid weft inserting means. 4,043,361, Cl. 139-452.000.
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Daniels, Peter J. L.; and Turner, William N., 4,044,123, Cl. 424-180.000.
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Schliebs, Reinhard: *See*—
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Schmidt, Oskar. Apparatus for molding pneumatic vehicular tires. 4,043,725, Cl. 425-542.000.
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Schmidt, Walter Richard, to Burlington AG. Method of producing pile or plush goods on double-bed circular knitting machines by means of plush hooks. 4,043,151, Cl. 66-9.00R.
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Sherlock, Margaret H., to Schering Corporation. Trityl picolinic acid derivatives and their use as anti-acne agents. 4,044,140, Cl. 424-266.000.
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Sliski, Chester, to Victaulic Company of America. Flapper check valve. 4,043,358, Cl. 137-512.100.
Smigel, Robert L.: *See—*
Costa, Charles R.; and Smigel, Robert L., 4,043,683, Cl. 401-264.000.
Smith, Duane R., to Caterpillar Tractor Co. Wheel rim assembly and method for demounting a tire therefrom. 4,043,374, Cl. 152-405.000.
Smith, James Thomas: *See—*
Lafferty, William Daniel; Smith, James Thomas; and Rench, Nicholas Wayne, 4,043,716, Cl. 425-6.000.
Smith, John F., to Narco Scientific Industries, Inc. Automatic squelch circuit with hysteresis. 4,044,309, Cl. 325-478.000.
Smith, Lonnell E. Air car. 4,043,421, Cl. 180-117.000.
Smith & Nephew Research Limited: *See—*
Potter, William Duncan; Barclay, Andrew Conway; Dunning, Reginald; and Parry, Richard John, 4,043,327, Cl. 128-89.00R.
Smith, Norman Alfred: *See—*
Kitzing, Rainer; and Smith, Norman Alfred, 4,043,995, Cl. 260-117.000.
Smith, Richard L.: *See—*
Uraneck, Carl A.; and Smith, Richard L., 4,044,195, Cl. 526-29.000.
Smith, Samuel: *See—*
Sherman, Patsy O.; and Smith, Samuel, 4,043,964, Cl. 260-29.60F.
Smith, Walter E. Automatic latch door apparatus. 4,043,079, Cl. 49-394.000.
Smithen, Carey Ernest: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.
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Smiths Industries Limited: *See—*
McDonald, Thomas V.; and Witts, Stephen D., 4,044,208, Cl. 200-51.090.
Snitzer, Elias, to American Optical Corporation. Means for producing and amplifying optical energy. 4,044,315, Cl. 331-94.50F.
Snotrix Division of Pittway Corporation: *See—*
Hackett, Kenneth R., 4,043,686, Cl. 403-90.000.
Snyder, Carl E., Jr.; and Tamborski, Christ, to United States of America, Air Force. Lubricant composition. 4,043,926, Cl. 252-49.900.
Snyder, Paul W., Jr.: *See—*
Anderson, Conroy D.; Schatz, Klaus W.; and Snyder, Paul W., Jr., 4,043,899, Cl. 208-161.000.
Snyder, Richard C., to Pullman Incorporated. Railway car nailable door post. 4,043,274, Cl. 105-409.000.
Societa' Italiana Resine S.I.R. S.p.A.: *See—*
Ackermann, Jacob; Radici, Pierino; Santini, Umberto; and Colombo, Paolo, 4,043,873, Cl. 203-46.000.
Testa, Francesco; and Bigliani, Antonio, 4,043,874, Cl. 203-47.000.
Societe Anonyme de Telecommunications: *See—*
Allanic, Jacques; and Fuchs, Guerchon Georges, 4,043,029, Cl. 29-600.000.
Societe Francaise des Produits pour Catalyse: *See—*
Juguin, Bernard; Cosyns, Jean; Le Page, Jean-Francois; and Miquel, Jean, 4,043,944, Cl. 252-441.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
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Societe Nationale Elf Aquitaine: *See—*
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Societe Nationale Industrielle Aerospatiale: *See—*
Signorelli, Louis; and Geoffroy, Alain Yves Louis Marcel, 4,043,607, Cl. 303-100.000.
Soldner, Richard; and Walz, Alfred, to Siemens Aktiengesellschaft. Arrangement for ultrasonic-echo encephalography. 4,043,321, Cl. 128-2.00V.

Solomon, Richard L., to Ecolaire Inc. Air lock filter system. 4,043,775, Cl. 55-302.000.
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Rau, Winfried; and Sommerschuh, Lothar, 4,043,284, Cl. 112-178.000.
Sommervold, David E., to Hycel, Inc. Calibration in an automatic chemical testing apparatus. 4,043,756, Cl. 23-230.00R.
Sorlie, Donald Thomas; and Bucher, David Hoffer, to Deere & Company. Dual packer wheel unit for tillage apparatus. 4,043,281, Cl. 111-85.000.
Sorlie, Donald Thomas; Bucher, David Hoffer; and Sutherland, Gail Russell, to Deere & Company. Tillage apparatus having improved cutting and drive structure. 4,043,404, Cl. 172-555.000.
Sosin, Boleslaw Marian, to Marconi Company Limited, The. Frequency synthesizers. 4,044,314, Cl. 331-1.00A.
Southard, Robert Keith: *See—*
Bickford, David Edward; Southard, Robert Keith; Sucheski, Mathew Michael; and Wagner, Earl William, 4,043,494, Cl. 226-109.000.
Southwire Company: *See—*
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Spadea, Gregorio, to National Semiconductor Corporation. Self-aligned CMOS process for bulk silicon and insulating substrate device. 4,043,025, Cl. 29-571.000.
Spangler, Paul Joseph, to International Telephone and Telegraph Corporation. Terminal applicator apparatus for terminals in strip form. 4,043,032, Cl. 29-628.000.
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Spates, Charles D.: *See—*
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Spears, Wayne. Groove molding method. 4,044,092, Cl. 264-318.000.
Speck, Reinhold; and Forberger, Stefan, to Georg Fischer Aktiengesellschaft. Apparatus for spray-coating internal surfaces of tubular articles. 4,043,295, Cl. 118-317.000.
Speir, Donald W.; and McHugh, Donald P., to General Electric Company. Articulated plug nozzle. 4,043,508, Cl. 239-265.190.
SPEM: Societa Prodotti Elettronici Meccanici: *See—*
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Spence, John R., to Rockwell International Corporation. Memory cell output driver. 4,044,335, Cl. 364-900.000.
Spencer, Arthur T.; and Siranovich, Stanley F., to Mobil Oil Corporation. Process for producing methylolated amide copolymers in concentrated organic solvent solution. 4,043,968, Cl. 260-33.40R.
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Spencer, William H.; Dorius, John O.; and Brown, James D., to Trend Ceilings Systems Co. Modular ceiling system. 4,043,689, Cl. 403-252.000.
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., to Swiss Aluminium Ltd. Aluminum alloys possessing improved resistance weldability. 4,043,840, Cl. 148-32.000.
Sperry Rand Corporation: *See—*
Kochel, Leroy Joseph, 4,043,889, Cl. 204-192.00R.
Watkins, Lee A.; and Jacob, Larry M., 4,044,387, Cl. 360-61.000.
Spicuzza, William F.: *See—*
Moss, Robert H.; Swinehart, Carl F.; and Spicuzza, William F., 4,044,112, Cl. 423-490.000.
Spieth-Maschinenelemente GmbH & Co. Kg: *See—*
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Spitschan, Hans J.: *See—*
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Splittstoesser, Clair D.: *See—*
Uhlinger, Charles E.; and Splittstoesser, Clair D., 4,043,102, Cl. 56-17.400.
Sporck, Christian R., to National Semiconductor Corporation. Casting compound for semiconductor devices. 4,043,969, Cl. 260-37.0EP.
Sprunck, Emile. Blast furnace tuyere. 4,043,541, Cl. 266-268.000.
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Square D Company: *See—*
Rayburn, Donald Lee; Sunday, Larry Ray; and Larsen, Edgar Robert, 4,044,214, Cl. 200-316.000.
Stageboe, Jan; and Einstabland, Tomas Berge, to Ingenior F. Selmer A/S. Offshore foundation structure. 4,043,138, Cl. 61-88.000.
Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans. Open-end spinning machine with a travelling maintenance unit. 4,043,106, Cl. 57-34.00R.
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Stahlwerke Peine-Salzgitter AG: *See—*
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Standard Oil Company: *See—*
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Standard Products Company, The: *See—*
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Stangeland, Maynard L., to Rockwell International Corporation. Shear flexibility for structures. 4,044,186, Cl. 428-167.000.
Stanley, Robert K.; and Schwartz, Ira, to Textured Yarn Co., Inc. Strand treatment. 4,043,009, Cl. 28-221.000.
Stanley Works, The: *See—*
Parsons, John S., 4,043,001, Cl. 16-189.000.
Stapp, Paul R., to Phillips Petroleum Company. Preparation of esters of unsaturated alcohols. 4,044,041, Cl. 260-465.00D.
Star, Scott Clifford. Magnetic maze game. 4,043,558, Cl. 273-110.000.
Stark, Bernard Peter; and Thoseby, Michael Robert, to Ciba-Geigy Corporation. Electrically-conductive resins, and intermediates for their preparation. 4,043,983, Cl. 260-65.000.
Stark, Reiner: *See—*
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Starnes, R. Emory: *See—*
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Baker, Don R., 4,044,025, Cl. 260-332.100.
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Stavros, Franklin O.: *See—*
Wenzel, Robert H.; and Stavros, Franklin O., 4,044,289, Cl. 318-571.000.
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Steelcase Inc.: *See—*
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Steele, Bruce B., to Eastman Kodak Company. Tray stacking and unstacking apparatus. 4,043,460, Cl. 214-6.0BA.
Steele, Clarence R.: *See—*
Leibig, Wilhelm J.; Steele, Clarence R.; and Price, Frank B., 4,043,832, Cl. 127-6.000.
Steenhoek, Arie; and Olsman, Herman, to Lever Brothers Company. Flavored fat composition. 4,044,168, Cl. 426-613.000.
Steer, Ronald John, to Lucas Industries Limited. Compound pinions for use in epicyclic gear boxes. 4,043,216, Cl. 74-410.000.
Stegherr, Rudolf; and Ruecker, Gerhard, to Motoren- und Turbinen-Union Munchen GmbH M.A.N. Maybach Mercedes-Benz. Shaft coupling. 4,043,146, Cl. 64-1.00V.
Steidle, Alfons: *See—*
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Stein, Volkhard; and Wessel, Wolf, to Robert Bosch GmbH. Air flow meter for internal combustion engine. 4,043,188, Cl. 73-116.000.
Steinberg, Robert; and di Carlo, Joseph Scotto, to Scorpio Industries, Inc. Positive feed device for knitting machine. 4,043,155, Cl. 66-132.00T.
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Stenqvist, Barbro Margareta: *See—*
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Stepansky, Daniel Marion. Puzzle and method of playing same. 4,043,561, Cl. 273-153.00P.
Stepe, Visvaldis A., to Caterpillar Tractor Co. Combination strengthened loader bucket and replaceable cutting edge. 4,043,060, Cl. 37-141.00R.
Stephan-Werke GmbH & Co.: *See—*
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Villeret, Michel; Stephenne, Hubert; and Deschenes, Pierre A., 4,044,306, Cl. 325-38.00B.
Sternbach, Leo Henryk; and Walser, Armin, to Hoffmann-La Roche Inc. Preparation of triazolo benzodiazepines and novel compounds. 4,044,016, Cl. 260-295.00F.
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Ochs, David J.; Behrens, James D.; and Stevens, John H., 4,043,325, Cl. 128-75.000.
Stevens, Richard N., Sr.; Possell, Clarence R.; and Winkler, Robert J., to Alpha Nova Development Corporation. Power driven shaver. 4,043,036, Cl. 30-43.600.
Steward, William L., to Hudson Oxygen Therapy Sales Company. Apparatus and method for producing flexible plastic tubing. 4,043,856, Cl. 156-195.000.
Stewart, Roger Green; and Oberman, Joel Roy, to RCA Corporation. Memory array. 4,044,341, Cl. 340-173.00R.
Stillig, Josef: *See—*
Gunther, Gerhard; and Stillig, Josef, 4,043,107, Cl. 57-34.00R.
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Stites, Francis H.; and Weir, Colin B., to GTE Sylvania Incorporated. Communication transmitting apparatus with carrier level control. 4,044,308, Cl. 325-144.000.

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Stoepel, Kurt: *See—*
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Stohr, Jean-Francois: *See—*
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Stolka, Milan; Pearson, James M.; and Yanus, John F., to Xerox Corporation. Electrostatographic imaging member and process using anthracene functional polymers. 4,043,812, Cl. 96-1.500.

Stone, Alan J., administrator: *See—*
Stone, Guthrie B., deceased, 4,043,540, Cl. 259-171.000.

Stone Construction Equipment, Inc.: *See—*
Stone, Guthrie B., deceased, 4,043,540, Cl. 259-171.000.

Stone, Guthrie B., deceased (by Stone, Alan J., administrator), to Stone Construction Equipment, Inc. Mixer paddle assembly and drive system. 4,043,540, Cl. 259-171.000.

Stonehocker, Clara Francis. Expandable pot for containing plants and method therefor. 4,043,077, Cl. 47-66.000.

Straus, Alan E.: *See—*
Anderson, Robert G.; Straus, Alan E.; and Wilkes, John B., 4,044,027, Cl. 260-346.750.

Strew, Mitchell, to Illinois Range Company. Hood assembly for cooking ranges. 4,043,320, Cl. 126-299.00E.

Strobel, Karl-Heinz Harry: *See—*
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Stromberg-Carlson Corporation: *See—*
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Stumpp, Gerhard; Eckert, Konrad; Runge, Detlev; and Wessel, Wolf, to Robert Bosch GmbH. Fuel injection system for self-igniting internal combustion engines. 4,043,304, Cl. 123-119.00A.

Stunkel, Helmut: *See—*
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Sturmer, Edith: *See—*
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Sturtevant, Robert L.: *See—*
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Stutz, Andreas, to Mettler Instrumente AG. Weighing scale with compensating weights. 4,043,414, Cl. 177-248.000.

Suarez, Richard A., to Consumer Publishing Company, Inc. Eccentric rotatable weight exercising device. 4,043,553, Cl. 272-128.000.

Sucheski, Matthew Michael; and Wagner, Earl William, to AMP Incorporated. Method and apparatus for connecting conductors to terminals in connectors. 4,043,034, Cl. 29-749.000.

Sucheski, Matthew Michael: *See—*
Bickford, David Edward; Southard, Robert Keith; Sucheski, Matthew Michael; and Wagner, Earl William, 4,043,494, Cl. 226-109.000.

Suda, Hideaki; Dohgane, Iwao; and Hosaka, Hirokazu, to Sumitomo Chemical Company, Limited. Process for recovery of urea from its phenolic solution. 4,044,052, Cl. 260-96.50C.

Suda, Minoru. Centerless grinding machine using tangential-feed method. 4,043,767, Cl. 51-103.0WH.

Sullivan, Kevin J.: *See—*
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Sumi, Yoshio: *See—*
Tsukada, Tameyasu; Sumi, Yoshio; Moriwaki, Yoshinaga; Oshio, Hirosuke; Ueda, Katsunobu; and Umino, Yoiti, 4,043,618, Cl. 308-174.000.

Sumikin-Kiko Co., Ltd.: *See—*
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Sumitomo Aluminum Smelting Co., Ltd.: *See—*
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Sumitomo Chemical Company, Limited: *See—*
Hamma, Noritaka; Fukumura, Masataka; Maeshima, Kaoru; and Nakagome, Takenari, 4,043,991, Cl. 260-112.50R.
Ishizumi, Kikuo; Mori, Kazuo; Okamoto, Tadashi; Akase, Takeshi; Izumi, Takahiro; Akatsu, Mitsuhiro; Kume, Yoshiharu; Inaba, Shigeho; and Yamamoto, Hisao, 4,044,003, Cl. 260-239.0BD.
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Sumitomo Metal Industries Limited: *See—*
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Sun Oil Company Limited: *See—*
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Sun Oil Company of Pennsylvania: *See—*
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Sun Shipbuilding and Dry Dock Co.: *See—*
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Sun Ventures, Inc.: *See—*
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Sun, Yen Sheng Edmund, to General Electric Company. Method of manufacturing semiconductor devices. 4,043,836, Cl. 148-1.500.

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Watanabe, Kiyoshi; Sunahara, Kazuo; Terao, Motoyasu; and Fujita, Tsutomu, 4,043,748, Cl. 432-253.000.

Sunday, Larry Ray: *See—*
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Sundberg, Michael W.: *See—*
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Sundeen, Joseph E.: *See—*
Hauck, Frederic Peter; Reid, Joyce; Narayanan, Venkatachala L.; Cimarusti, Christopher M.; Haugwitz, Rudiger D.; and Sundeen, Joseph E., 4,044,040, Cl. 260-456.00P.

Sundstrand Corporation: *See—*
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Suntech, Inc.: *See—*
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Felton, George F., Jr., 4,043,925, Cl. 252-49.300.
Macy, Robert L.; and Zupanick, Joseph E., 4,042,991, Cl. 14-1.000.
Nickol, Stephen L., 4,044,071, Cl. 260-857.0TW.
Norman, Oscar L.; and Seitzer, Walter H., 4,043,763, Cl. 44-1.00R.

Suokas, Elias Uolevi: *See—*
Johansson, Ake Allan; Kivikari, Riitta Helena Kristiina; and Suokas, Elias Uolevi, 4,044,031, Cl. 260-397.250.

Sureau, Robert Frederic Michel: *See—*
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Surface Technology Corporation: *See—*
Rausch, John J.; and Van Thyne, Ray J., 4,043,623, Cl. 308-238.000.

Sutherland, Gail Russell: *See—*
Sorlie, Donald Thomas; Bucher, David Hoffer; and Sutherland, Gail Russell, 4,043,404, Cl. 172-555.000.

Suverison, Lyle B.; and Beck, William R., to General Motors Corporation. Molded electrical connector. 4,043,630, Cl. 339-218.00M.

Suzuki, Eigen: *See—*
Koike, Yoshiyasu; Shiraki, Hachio; Suzuki, Eigen; and Yoshida, Makoto, 4,043,028, Cl. 29-599.000.

Suzuki, Katsuya: *See—*
Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.

Suzuki, Manao, to Kyokado Engineering Co., Ltd. Method of consolidating poor quality soils. 4,043,830, Cl. 106-287.0SS.

Suzuki, Mikio: *See—*
Hattori, Yoshiyuki; Suzuki, Mikio; and Taguchi, Masahiro, 4,043,572, Cl. 280-738.000.

Suzuki, Takaji: *See—*
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Suzuki, Teiji; and Mizuno, Zenichiro. Holder for roll of stripped material. 4,043,519, Cl. 242-55.530.

Suzuki, Yasoji; and Ochii, Kiyofumi, to Tokyo Shibaura Electric Co., Ltd. Dynamic type semiconductor memory device. 4,044,342, Cl. 340-173.0DR.

Suzumura, Yoshikazu: *See—*
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Svensson, Karl Ernst, to Aktiebolaget Optimus. Base or stand for a camping stove. 4,043,744, Cl. 431-142.000.

Swackhamer, Stanley B., to Xerox Corporation. Magnetic toner scavenging system. 4,043,298, Cl. 118-652.000.

Swanson, Carl Loyal W., deceased: *See—*
McCoy, Frederick C.; and Swanson, Carl Loyal W., deceased, 4,044,118, Cl. 424-200.000.

Swanson, Sydney Alan Vasey; and Roper, Brian Arnold, to National Research Development Corporation. Endoprosthetic shoulder joint device. 4,042,980, Cl. 3-1.910.

Swanson, Viola C., executrix: *See—*
McCoy, Frederick C.; and Swanson, Carl Loyal W., deceased, 4,044,118, Cl. 424-200.000.

Swearengin, Ronald I.: *See—*
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Swede, Harald Georg: *See—*
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Erickson, David R.; and Tompkin, Robert B., 4,044,160, Cl. 426-330.000.
Wilding, Morris D., 4,044,157, Cl. 426-250.000.

Swift, Roderick D., to United States of America, Army. Method to observe damage induced in optical elements by intense thermal radiation. 4,043,177, Cl. 73-15.00R.

Swinbanks, Malcolm Alexander, to National Research Development Corporation. Active control of sound waves. 4,044,203, Cl. 179-1.00P.

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Moss, Robert H.; Swinehart, Carl F.; and Spicuzza, William F., 4,044,112, Cl. 423-490.000.

Swiss Aluminium Ltd.: *See—*
Skaria, Arankathu; and Stark, Reiner, 4,043,803, Cl. 75-257.000.
Sperry, Philip R.; Setzer, William C.; and Damon, Lloyd E., 4,043,840, Cl. 148-32.000.

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Connors, Frank T., 4,043,087, Cl. 52-127.000.

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Marx, Michael; and Reisdorff, Josef H., 4,044,020, Cl. 548-303.000.

Synthelabo: *See—*
Najer, Henry; Dupont, Regis; and Giudicelli, Don Pierre Rene Lucien, 4,044,132, Cl. 424-250.000.

Syva Company: *See—*
Blakemore, Judith I.; Leute, Richard K.; and Ernst, Roberta D., 4,043,872, Cl. 195-103.50A.
Schneider, Richard S.; and Gould, Steven J., 4,043,989, Cl. 260-112.00R.

Szabo, Emery, to Tenneco Chemicals, Inc. Stabilized vinyl halide resin compositions. 4,043,957, Cl. 260-23.0XA.

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Szabo, Lester J.: *See—*
Barner, Herbert E.; Davies, David S.; and Szabo, Lester J., 4,044,094, Cl. 423-32.000.

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Trumble, John H.; Ehlert, Thomas C.; and Szekely, Akos, 4,043,314, Cl. 126-263.000.

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Tachibana, Katsuhiko: *See—*
Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.

Taguchi, Masahiro: *See—*
Hattori, Yoshiyuki; Suzuki, Mikio; and Taguchi, Masahiro, 4,043,572, Cl. 280-738.000.

Takacs, Gyorgy: *See—*
Erodi, Gyorgy; Gorondi, Istvan; Kovacs, Laszlo; and Takacs, Gyorgy, 4,043,170, Cl. 72-364.000.

Takagi, Hitoshi: *See—*
Hisamatsu, Tokuichi; Kitamura, Taketsugu; Saito, Takeshiro; Takagi, Hitoshi; and Sekiya, Takuzo, 4,044,101, Cl. 423-235.000.

Takagi, Katsuhide, to Sankyo Kogaku Kogyo Kabushiki Kaisha. Film counter for use with a portable cine-camera. 4,043,648, Cl. 352-72.000.

Takahashi, Akira, to Fulton Electronic Industry, Ltd. Cassette tape recorders. 4,044,391, Cl. 360-96.000.

Takano, Tetsuo. Electric switches and process and apparatus for manufacture thereof. 4,044,212, Cl. 200-283.000.

Takao, Masami: *See—*
Furuta, Isao; Tamura, Hiroshi; and Takao, Masami, 4,044,111, Cl. 423-351.000.

Takase, Tsuneo; and Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd. Circuits for setting the display mode and the correction mode of electronic timepieces. 4,043,114, Cl. 58-23.00R.

Takeda Chemical Industries, Ltd.: *See—*
Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, 4,044,129, Cl. 424-248.560.

Takeda, Tsuneshi; Atarashi, Yasuyuki; and Mori, Akira, to Kao Soap Co., Ltd. Waste water treatment method. 4,043,904, Cl. 210-28.000.

Takenaka Komuten Co., Ltd.: *See—*
Endo, Masaaki; Miura, Mitsuo; Kukino, Yoshinori; Kikuchi, Kimio; and Aoyagi, Hayao, 4,043,909, Cl. 210-49.000.

Takenaka, Yoshisuke; and Hori, Kikuo, to Teijin Limited. Spinning apparatus with retractable suction gun. 4,043,718, Cl. 425-72.00S.

Takeshita, Masahiro: *See—*
Muraki, Ryoji; Endo, Masao; Aoki, Nobuaki; and Takeshita, Masahiro, 4,044,102, Cl. 423-239.000.

Takezaki, Shusuke: *See—*
Otsuki, Yukio; Matsumoto, Hiroyuki; Ito, Hiroshi; and Takezaki, Shusuke, 4,044,217, Cl. 219-76.000.

Takimoto, Yasuyuki: *See—*
Nishimura, Masakatsu; Saito, Shin; Tanabe, Kunsei; Umeda, Yasusi; Arimatsu, Seiji; and Takimoto, Yasuyuki, 4,044,385, Cl. 358-300.000.

Talsma, Herbert; and Giffen, William M., Jr., to Standard Oil Company. Impact improvement of rubber-modified nitrile resins. 4,043,947, Cl. 260-23.70M.

Tamborski, Christ: *See—*
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,043,926, Cl. 252-49.900.

Tammen, Heinrich: *See—*
Kramann, Bernhard; and Tammen, Heinrich, 4,043,345, Cl. 128-349.00R.

Tamura, Hiroshi: *See—*
Furuta, Isao; Tamura, Hiroshi; and Takao, Masami, 4,044,111, Cl. 423-351.000.

Tamura, Motohiko: *See—*
Nishino, Mutsumi; Sasaki, Hideo; Uda, Kazumi; Tamura, Motohiko; Hiyama, Kunihiko; and Fujiike, Hiroshi, 4,043,769, Cl. 55-25.000.

Tanabe, Kunsei: *See—*
Nishimura, Masakatsu; Saito, Shin; Tanabe, Kunsei; Umeda, Yasusi; Arimatsu, Seiji; and Takimoto, Yasuyuki, 4,044,385, Cl. 358-300.000.

Tanaka, Hironari: *See—*
Matsuyama, Sigeru; Tanaka, Hironari; Koyama, Masaharu; and Ishibashi, Tadashi, 4,043,639, Cl. 350-160.0LC.

Tanaka, Kojiro, to Kabushiki Kaisha Daini Seikosha. An electronic timepiece having a battery voltage monitor. 4,043,112, Cl. 58-23.0BA.

Tanaka, Taro: *See—*
Noguchi, Masaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, 4,043,307, Cl. 123-139.0AW.

Tanaka, Yoshinobu, to Alpha Techno Company. Child-proof container. 4,043,448, Cl. 206-1.500.

Tanara, Giovanni, to Ice Cream Engineering di G. Tanara & C. S.a.s. Automatic ice cream manufacturing machine. 4,044,161, Cl. 426-421.000.

Tanczyn, Harry, to Armco Steel Corporation. Abrasion resistant, heat hardenable, stainless steel. 4,043,843, Cl. 148-37.000.

Tange, Fumiko. Binding device for bundling openings of bags or the like. 4,043,363, Cl. 140-93.00A.

Tanner, David John, to Linwo Industries Ltd. Artificial fireplace logs with ignition strips. 4,043,765, Cl. 44-14.000.

Tanner, Herbert: *See—*
Bertram, Heidrun; Fahnenstich, Rudolf; and Tanner, Herbert, 4,044,169, Cl. 426-656.000.

Tanner, Jesse H. Wind shear warning system. 4,043,194, Cl. 73-178.00T.

Tarrant Manufacturing Company: *See—*
Tarrant, William P., 4,043,446, Cl. 198-728.000.

Tarrant, William P., to Tarrant Manufacturing Company. Conveyor. 4,043,446, Cl. 198-728.000.

Tautz, Jurgen: *See—*
Irion, Leonhard; Tautz, Jurgen; and Ulrych, Gerhard, 4,043,868, Cl. 176-50.000.

Tawada, Hiroyuki: *See—*
Kuwada, Yutaka; Meguro, Kanji; Natsugari, Hideaki; Sato, Yoshiaki; and Tawada, Hiroyuki, 4,044,129, Cl. 424-248.560.

Taylor, Allen L.; and Ensign, Thomas C., to Minnesota Mining and Manufacturing Company. Electromagnetic radiation detector with large area sensing medium. 4,044,251, Cl. 250-342.000.

Taylor, Derek, to Bunker Ramo Corporation. Trimming potentiometers with coarse and fine adjustment means. 4,044,327, Cl. 338-166.000.

Taylor, Frederick P., to Lipe-Rollway Corporation. Torque limiting clutch brake. 4,043,437, Cl. 192-13.00R.

Taylor, John Bodenham; and Harrison, Derek Ralph, to Roussel Uclaf. 1,2-Dihydro-6-phenyl-1H,4H-imidazobenzodiazepin-1-ones. 4,044,142, Cl. 424-250.000.

Taywood Seltrust Offshore: *See—*
Wilkins, John William, 4,043,407, Cl. 175-50.000.

TDK Electronics Co., Ltd.: *See—*
Satou, Takateru; and Shiba, Haruo, 4,044,386, Cl. 360-60.000.

Teche, Andre: *See—*
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,043,796, Cl. 71-98.000.

Technicon Instruments Corporation: *See—*
Farrell, Gregory A.; and Gordon, Abraham, 4,043,678, Cl. 356-246.000.

Technology Incorporated: *See—*
Trageser, James H., 4,043,196, Cl. 73-204.000.

Tedeschi, Rinaldo Robert, to United Technologies Corporation. Engine, cylinder identification (CID) transducer. 4,043,189, Cl. 73-117.300.

Teijin Limited: *See—*
Ishida, Kinyu; Gose, Kenji; Matsunami, Shigeo; Sigeoka, Miyoyuki; and Matsumura, Teruichi, 4,043,097, Cl. 53-52.000.
Takenaka, Yoshisuke; and Hori, Kikuo, 4,043,718, Cl. 425-72.00S.

Teijin Seiki Co., Ltd.: *See—*
Ishida, Kinyu; Gose, Kenji; Matsunami, Shigeo; Sigeoka, Miyoyuki; and Matsumura, Teruichi, 4,043,097, Cl. 53-52.000.

Teitelbaum, Charles Leonard: *See—*
Lando, Frank; and Teitelbaum, Charles Leonard, 4,044,162, Cl. 426-427.000.

Teledyne Isotopes: *See—*
Hall, Samuel D., Jr., 4,043,835, Cl. 136-221.000.

Templet Industries Incorporated: *See—*
Rheingold, Lawrence M., 4,043,301, Cl. 123-52.00B.

Tenneco Chemicals, Inc.: *See—*
Szabo, Emery, 4,043,957, Cl. 260-23.0XA.

Terao, Motoyasu: *See—*
Watanabe, Kiyoshi; Sunahara, Kazuo; Terao, Motoyasu; and Fujita, Tsutomu, 4,043,748, Cl. 432-253.000.

Terner, Leslie L.: *See—*
Noakes, Jack E.; Sato, Hiroshi; and Terner, Leslie L., 4,044,110, Cl. 423-346.000.

Teske, Fritz; and Teske, Lothar. Sliding ring seal. 4,043,619, Cl. 308-187.100.

Teske, Lothar: *See—*
Teske, Fritz; and Teske, Lothar, 4,043,619, Cl. 308-187.100.

Testa, Francesco; and Bigliani, Antonio, to Societa' Italiana Resine S.I.R. S.p.A. Process for separating and recovering the constituents of an exhausted solvent mixture used for cleansing reactors for the polymerization of vinyl chloride. 4,043,874, Cl. 203-47.000.

Texaco Development Corporation: *See—*
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,044,053, Cl. 260-583.00P.

Texaco Inc.: *See—*
Franz, William F.; and Hess, Howard V., 4,043,386, Cl. 165-45.000.
Gilmer, William N.; and Barnes, Vernon M., Jr., 4,043,539, Cl. 259-4.0AB.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,043,183, Cl. 73-59.000.
Kudchadker, Mohan Vaikunth; and Walker, Thad Oscar, 4,043,396, Cl. 166-274.000.
McCoy, Frederick C.; and Swanson, Carl Loyal W., deceased, 4,044,118, Cl. 424-200.000.
Morris, David A.; Flournoy, Norman E.; and Langley, Thomas W., 4,043,180, Cl. 73-40.50A.
Palmer, Harold A.; and Sample, Thomas E., Jr., 4,043,922, Cl. 252-8.55D.
Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., 4,044,032, Cl. 260-399.000.

Texas Instruments Incorporated: *See—*
Bazin, Bernard, 4,043,848, Cl. 148-187.000.
Birchler, Robert O.; and Williams, E. R., Jr., 4,043,027, Cl. 29-588.000.
Roberts, Charles Grady; Chan, Wayne W.; and Collins, Dean R., 4,044,374, Cl. 357-80.000.

Textilform S.A.: *See—*
Paracchi, Antonio, 4,043,729, Cl. 425-348.00R.

Textron Inc.: *See—*
Wenzel, Robert H.; and Stavros, Franklin O., 4,044,289, Cl. 318-571.000.

Textured Yarn Co., Inc.: *See—*
Stanley, Robert K.; and Schwartz, Ira, 4,043,009, Cl. 28-221.000.

Tezuka, Toshiro: *See—*
Miyoshi, Isao; Abe, Masaru; Tezuka, Toshiro; and Yoshimoto, Toshio, 4,043,372, Cl. 152-354.000.

Th. Goldschmidt AG: *See—*
Rossmy, Gerd, 4,044,038, Cl. 260-448.20P.

Thagard Technology Company: *See—*
Matovich, Edwin, 4,044,117, Cl. 423-659.000.

Thaule, Birger Hellmann, to A/S Kongshavn Industri. Cable-controlled grab device. 4,043,580, Cl. 294-70.000.

Theodore, Ares N.: *See—*
Labana, Santokh S.; and Theodore, Ares N., 4,044,070, Cl. 260-836.000.

Thermo-Couple Products Company, Inc.: *See—*
Finney, Philip F., 4,043,200, Cl. 73-359.00R.

Thermology, Inc.: *See—*
Trumble, John H.; Ehlert, Thomas C.; and Szekely, Akos, 4,043,314, Cl. 126-263.000.

Therrien, Gordon G.: *See—*
Rutten, James B.; Rutten, Peter T.; Therrien, Gordon G.; and Gaylord, Richard S., 4,043,465, Cl. 214-17.0DB.

Theurer, Josef, to Franz Plasser Bahnbaumaschinen-Industrie-Gesellschaft m.b.H. Mobile track tamping machine. 4,043,271, Cl. 104-12.000.

Theurer, Josef: *See—*
Folser, Karl; and Theurer, Josef, 4,043,398, Cl. 171-16.000.

Thomas & Betts Corporation: *See—*
Narozny, Ronald S., 4,043,628, Cl. 339-99.00R.

Thomas, Charles F. Edge finder probe. 4,043,046, Cl. 33-185.00R.

Thomas, Elmer L.: *See—*
Fredriksson, Oke A.; and Thomas, Elmer L., 4,043,175, Cl. 73-1.0DV.

Thomas, Marion E.: *See—*
Shatila, Mounir A.; Von Der Lieth, William H.; Veeneman, John L.; and Thomas, Marion E., 4,044,163, Cl. 426-502.000.

Thomas, William Anthony: *See—*
Hassall, Cedric Herbert; Johnson, William Henry; Krohn, Antonin; Smithen, Carey Ernest; and Thomas, William Anthony, 4,044,017, Cl. 260-295.0AM.

Thomas, William W.; and Sprunger, Elmore V., to General Electric Company. Two-spool variable cycle engine. 4,043,121, Cl. 60-204.000.

Thor Power Tool Company: *See—*
Dudek, Edmund C., 4,043,222, Cl. 74-606.00R.

Thorpe, Donald H.: *See—*
Cooke, Victor F. G.; and Thorpe, Donald H., 4,043,988, Cl. 260-862.000.

Thoseby, Michael Robert: *See—*
Stark, Bernard Peter; and Thoseby, Michael Robert, 4,043,983, Cl. 260-65.000.

Tichy, Dieter: *See—*
Keil, Karl-Heinz; Keller, Karlfried; Ribka, Joachim; and Tichy, Dieter, 4,043,984, Cl. 260-67.60R.

Tidril Corporation: *See—*
Cherrington, Martin D., 4,043,136, Cl. 61-72.700.

Tidwell, Carl E., Jr. Lightweight trailer construction. 4,043,583, Cl. 296-28.00M.

Tiemann, Reinhard: *See—*
Pakur, Henryk; and Tiemann, Reinhard, 4,043,371, Cl. 152-362.00R.

Tile Council of America, Inc.: *See—*
Bernett, Frank E., 4,043,827, Cl. 106-92.000.

Timken Company, The: *See—*
Otto, Dennis L., 4,043,620, Cl. 308-187.200.

Tinney, Francis John; Nicolaides, Ernest D.; and Campbell, Alfred, to Parke, Davis & Company. New pentapeptides and methods for their production. 4,043,993, Cl. 260-112.5LH.

Tippetts, Kenneth Boyd, to Honeywell Information Systems, Inc. Magazine for a plurality of fixtures holding integrated circuit chips. 4,043,485, Cl. 221-312.00R.

Tiru, Mandayam: *See—*
Blixt, Kjell Gunnar; Tornmarck, Sven Ivan Arvid; Juhlin, Rolf; Salenstedt, Karl Rune; and Tiru, Mandayam, 4,043,871, Cl. 195-99.000.

Tishura, Vladimir Ivanovich: *See—*
Lebedev, Vladimir Konstantinovich; Chernenko, Ivan Alexeevich; Postolaty, Nikolai Ivanovich; Kuchuk-Yatsenko, Sergei Ivanovich; Tishura, Vladimir Ivanovich; Entin, Yakov Borisovich; Filippov, Alexandr Nikolaevich; and Martynov, Evgeny Petrovich, 4,044,219, Cl. 219-100.000.

Tobin, Melvin W.: *See—*
Reese, Thomas J.; Tobin, Melvin W.; and Mortimer, James R., 4,043,784, Cl. 65-107.000.

Toda, Tadahide: *See—*
Konishi, Hiromu; Horie, Mitsuyuki; and Toda, Tadahide, 4,043,123, Cl. 60-397.000.

Toepfl, Rosemarie: *See—*
Abel, Heinz; Toepfl, Rosemarie; and Schibler, Luzius, 4,044,178, Cl. 427-373.000.

Toepsch, Hans: *See—*
deMontigny, Armand; Eichenhofer, Kurt-Wilhelm; Toepsch, Hans; and Schliebs, Reinhard, 4,043,977, Cl. 260-46.5UA.

Tokuda, Makoto: *See—*
Nashiwa, Hajime; Mori, Akiyoshi; and Tokuda, Makoto, 4,043,798, Cl. 75-53.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Suzuki, Yasoji; and Ochii, Kiyofumi, 4,044,342, Cl. 340-173.0DR.
Takase, Tsuneo; and Yamaguchi, Tetsuo, 4,043,114, Cl. 58-23.00R.
Tsukada, Tameyasu; Sumi, Yoshio; Moriwaki, Yoshinaga; Oshio, Hirosuke; Ueda, Katsunobu; and Umino, Yoiti, 4,043,618, Cl. 308-174.000.
Uchida, Yukimasa, 4,044,343, Cl. 340-173.00R.

Toma, Joseph R.; and Johnson, Oliver C., to Astrolab, Inc. Apparatus for forming corrugations of "zero" pitch in coaxial cable. 4,043,161, Cl. 72-78.000.

Tomar Corporation: *See—*
Hoggard, Anthony J., 4,043,020, Cl. 29-427.000.

Tomita, Kazuo; Murakami, Tadashi; Yamazaki, Yoshio; and Honma, Toyokuni, to Sankyo Company Limited. Isoxazolone derivatives, their preparation and their use as plant growth regulators. 4,044,018, Cl. 260-307.00A.

Tomlin, James J., to Commterm Inc. Page power conversion apparatus for battery charging. 4,044,292, Cl. 320-2.000.

Tomomatsu, Kenichi, to Doryokuro Kakunenryo Kaihatsu Jigyodan. Method of measuring surface roughness. 4,043,187, Cl. 73-105.000.

Tompkin, Robert B.: *See—*
Erickson, David R.; and Tompkin, Robert B., 4,044,160, Cl. 426-330.000.

Tonami, Munehiko: *See—*
Fukui, Yutaka; Hataya, Fumio; Sasaki, Ryoichi; Nakajima, Fumito; Matsuda, Shimpei; Tonami, Munehiko; and Hiraga, Ryo, 4,043,945, Cl. 252-466.00J.

Toni Totes of Vermont, Inc.: *See—*
Miner, Antonia V.; and Nichols, Joseph, 4,043,270, Cl. 38-102.910.

Tonseth, Ivar S., Jr.: *See—*
Dix, Joseph; Campbell, Norman; and Tonseth, Ivar S., Jr., 4,043,499, Cl. 228-173.000.

Toolmatic Corporation: *See—*
Singer, Arrigo, 4,043,700, Cl. 408-237.000.

Tornmarck, Sven Ivan Arvid: *See—*
Blixt, Kjell Gunnar; Tornmarck, Sven Ivan Arvid; Juhlin, Rolf; Salenstedt, Karl Rune; and Tiru, Mandayam, 4,043,871, Cl. 195-99.000.

Toshihiro Kondo: *See—*
Kondo, Toshihiro, 4,044,370, Cl. 354-289.000.

Totani, Kazuo: *See—*
Nakamura, Kenji; Jinnai, Toshio; Totani, Kazuo; and Furuta, Shigetaro, 4,043,634, Cl. 350-160.0LC.

Touval, Irving, to M&T Chemicals Inc. Flame retardant compositions and methods for their preparation. 4,044,072, Cl. 260-859.0PV.

Toyama, Satoru: *See—*
Kisuna, Keiichi; Toyama, Satoru; and Kimura, Hiroshi, 4,043,022, Cl. 29-460.000.

Toyo Soda Manufacturing Co., Ltd.: *See—*
Kikuchi, Mitsuo; and Hiraga, Yoichi, 4,044,108, Cl. 423-321.00R.

Toyoda, Atsushi: *See—*
Kasai, Yuuji; Ogura, Hironuri; and Toyoda, Atsushi, 4,043,376, Cl. 164-7.000.

Toyoda, Kenji, to Nippon Kogaku K.K. Exposure meter. 4,043,677, Cl. 356-227.000.

Toyoda, Kenji: *See—*
Hamaguchi, Ichiro; and Toyoda, Kenji, 4,044,304, Cl. 324-133.000.

Toyomura, Shigeru: *See—*
Kishimoto, Jyuji; and Toyomura, Shigeru, 4,044,228, Cl. 235-61.90A.

Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Ichimiya, Touru; and Oosawa, Koichi, 4,043,310, Cl. 123-179.00G.
Kato, Takashi; Hoshi, Koichi; and Nakamura, Norihiko, 4,043,309, Cl. 123-191.0SP.
Konishi, Hiromu; Horie, Mitsuyuki; and Toda, Tadahide, 4,043,123, Cl. 60-397.000.
Noguchi, Masaaki; Sumiyoshi, Masaharu; Tanaka, Taro; and Fujisawa, Hideya, 4,043,307, Cl. 123-139.0AW.
Ohnuma, Kiyoshi; and Nagano, Syuzi, 4,043,223, Cl. 74-688.000.

Trageser, James H., to Technology Incorporated. Method and apparatus for effecting fluid flow measurement in a single sensor. 4,043,196, Cl. 73-204.000.

Trappenberg, Hans-Joachim: *See—*
Weidhaas, Wolfgang; and Trappenberg, Hans-Joachim, 4,043,026, Cl. 29-592.000.

Traver, Frank J., to General Electric Company. Water based green tire lubricant. 4,043,924, Cl. 252-21.000.

TRE Corporation: *See—*
Conn, Charles E., Jr., 4,043,498, Cl. 228-265.000.

Treadwell, Kenneth; Kushlefsky, Bernard G.; and Russo, Robert V., to M&T Chemicals Inc. Improving the oxidative stability of flexible polyurethane foams. 4,043,949, Cl. 260-2.5AC.

Trend Ceilings Systems Co.: *See—*
Spencer, William H.; Dorius, John O.; and Brown, James D., 4,043,689, Cl. 403-252.000.

Tress, Norwood E.: *See—*
Morrison, Wilbur J.; and Tress, Norwood E., 4,043,551, Cl. 271-243.000.

Tretiakoff, Andree: *See—*
Tretiakoff, Oleg; and Tretiakoff, Andree, 4,044,350, Cl. 340-407.000.

Tretiakoff, Oleg; and Tretiakoff, Andree. Electromechanical transducer for relief display panel. 4,044,350, Cl. 340-407.000.

Triantafyllou, Demetrios. Miniaturized vacuum cleaner device. 4,042,999, Cl. 15-422.000.

Tribotech: *See—*
Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,043,617, Cl. 308-72.000.

Tromovitch, Theodore A. Portable cryosurgical instrument. 4,043,341, Cl. 128-303.100.

Trottier, Jean-Pierre: *See—*
Bibring, Herve; Trottier, Jean-Pierre; Khan, Tasadduq; Rabinovitch, Maurice; and Stohr, Jean-Francois, 4,043,841, Cl. 148-32.500.

Trozzi, Norman K., to Foster Wheeler Energy Corporation. Coal burner. 4,043,512, Cl. 239-402.500.

Trumble, John H.; Ehlert, Thomas C.; and Szekely, Akos, to Thermology, Inc. Food heaters. 4,043,314, Cl. 126-263.000.

Trumbull, Harold E.; and Hartung, Ronald F., to Battelle Memorial Institute. Method of particle feeding. 4,043,471, Cl. 214-152.000.

Trusell, Fred Charles: *See—*
Guennel, Gottfried Kurt; and Trusell, Fred Charles, 4,043,675, Cl. 356-191.000.

TRW Inc.: *See—*
Blazek, William S., 4,043,379, Cl. 164-23.000.

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Morris, Ralph; and Turner, William Gordon, 4,043,356, Cl. 137-320.000.

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Tveit, Oyvind, to Patents and Developments A/S. Drop line devices. 4,044,079, Cl. 261-36.00R.

Typographic Innovations Inc.: *See—*
Gullo, Robert, 4,044,290, Cl. 318-640.000.

UBE Industries, Ltd.: *See—*
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, 4,043,976, Cl. 260-45.80N.

Uchida, Yukimasa, to Tokyo Shibaura Electric Co., Ltd. Non-volatile random access memory system. 4,044,343, Cl. 340-173.00R.

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Justice, James W. H.; and Uhler, Marcus H., 4,044,380, Cl. 358-142.000.

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Kessler, Milton; and Ullman, Myron E., Jr., 4,043,278, Cl. 108-150.000.

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Irion, Leonhard; Tautz, Jurgen; and Ulrych, Gerhard, 4,043,868, Cl. 176-50.000.

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Nishimura, Masakatsu; Saito, Shin; Tanabe, Kunsei; Umeda, Yasusi; Arimatsu, Seiji; and Takimoto, Yasuyuki, 4,044,385, Cl. 358-300.000.

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Larrabee, Edward Whittum; Rawson, Paul Olney; and Yagami, Richard Hajime, 4,043,501, Cl. 229-14.0BE.
Mui, Jeffrey Y. P.; and Pines, Arthur N., 4,044,037, Cl. 260-448.20N.
Prokai, Bela; and Kanner, Bernard, 4,043,951, Cl. 260-2.5AH.
Simon, Irvin C., 4,044,199, Cl. 13-18.000.
Turbett, Robert J., 4,044,200, Cl. 174-23.00R.

Union Oil Company of California: *See—*
Deering, Roland F., 4,043,897, Cl. 208-11.00R.

Uniroyal, Inc.: *See—*
Graham, Bruce A.; Puttock, Michael A.; Felauer, Ethel E.; and Neidermyer, Robert W., 4,043,792, Cl. 71-78.000.
von Schmeling, Bogislav; and Boos, Walter R., 4,044,139, Cl. 424-263.000.
Whelan, William Paul, 4,043,958, Cl. 260-2.5FP.

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Uniscrew Limited: *See—*
Zimmern, Bernard, 4,043,704, Cl. 417-62.000.

United Kingdom Atomic Energy Authority: *See—*
Durston, John Graham, 4,043,866, Cl. 176-40.000.
Wace, Peter Frederick, 4,043,507, Cl. 239-102.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the: *See—*
Evans, Leslie Samuel; Bones, Roger John; and Harbar, John Richard, 4,044,191, Cl. 429-104.000.

U.S. Engineering Company, Inc.: *See—*
Rowinski, Anthony S., 4,043,247, Cl. 85-31.000.

United States Gypsum Company: *See—*
Paul, George W.; Balinski, Henry A.; Quigg, Paul S.; and Crumbaugh, John H., 4,043,092, Cl. 52-712.000.

U.S. Industries, Inc.: *See—*
Van Huis, Robert L., 4,043,256, Cl. 98-1.500.

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Administrator, Environmental Protection Agency: *See—*
Moss, Gerald; Johnes, Graham Lloyd; and Craig, John William Thomas, 4,043,741, Cl. 431-3.000.
Agriculture: *See—*
Folk, Craig L., 4,043,004, Cl. 19-200.000.
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Crane, Robert L., 4,044,253, Cl. 250-302.000.
Croce, Richard F.; and Burton, Gardner T., 4,043,653, Cl. 355-2.000.
Eisentraut, Kent J.; and Chattoraj, Shib C., 4,044,116, Cl. 423-658.500.

Gehatia, Matatiahu; and Wiff, Donald R., 4,043,669, Cl. 356-104.000.
Haws, James L.; Quinney, Douglas W.; and Richards, Frank A., 4,044,396, Cl. 361-385.000.
Kennedy, Chandler J., 4,044,316, Cl. 331-94.50S.
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Moore, John H., 4,044,397, Cl. 361-398.000.
Snyder, Carl E., Jr.; and Tamborski, Christ, 4,043,926, Cl. 252-49.900.
Watmough, Thomas; and O'Shea, Robert P., 4,043,808, Cl. 75-126.00E.
Wiebe, David J., 4,043,147, Cl. 64-1.00V.

Army: *See—*
Ambrosini, Leonard R., 4,043,269, Cl. 102-87.000.
Au Coin, Thomas R.; Schwartz, Abraham; Gualtieri, John G.; and Wade, Melvin J., 4,043,860, Cl. 156-624.000.
Cowgill, Paul N.; and Pearson, John L., 4,044,237, Cl. 235-150.270.
Hunter, Joe S.; and Little, Little J., 4,043,204, Cl. 73-516.00R.
Rocha, John G., 4,043,249, Cl. 89-33.0CA.
Swift, Roderick D., 4,043,177, Cl. 73-15.00R.
Van Dyke, William A., Jr.; Baker, Frank S.; and McClintock, Robert, 4,043,687, Cl. 403-109.000.
Wiese, Harold Herman, 4,043,250, Cl. 89-170.000.

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Francis, Chester W.; and Brinkley, Frank S., 4,043,936, Cl. 252-301.10W.
Goodwin, William L., 4,043,671, Cl. 356-106.00R.
Isaacs, Hugh S.; and Romano, Anthony J., 4,043,890, Cl. 204-195.00S.
Shuck, Lowell Z., 4,043,192, Cl. 73-155.000.

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Eisele, Judith A.; Eichbaum, Barlane R.; and Bauer, Donald J., 4,044,115, Cl. 423-631.000.
Sanker, Philip E.; Oden, Laurance L.; and Russell, James H., 4,043,946, Cl. 252-466.00J.

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Wuerker, Ralph F.; and Heflinger, Lee O. Spatial filter for Q-switched lasers. 4,043,674, Cl. 350-162.0SF.

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Donley, Shawn T.; and Freitag, Valentine A., 4,043,526, Cl. 244-194.000.
Hoffman, Richard E.; and Lindsay, Edward K., 4,043,850, Cl. 149-19.400.
Symanski, Jerome J.; and Keefer, Russell L., 4,044,271, Cl. 307-262.000.
Whitehead, Jan Valgene; Reininger, Frederick J.; and Lawrence, Arthur, 4,043,044, Cl. 33-172.00E.

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Clarisse, Eddy Johan, 4,043,207, Cl. 74-10.150.
Van Dijk, Jan; and Zwagemakers, Johannes Maria Antonius, 4,044,023, Cl. 260-326.470.

United Technologies Corporation: *See—*
Breault, Richard D.; Harding, Richard P.; and Kemp, Fred S., 4,043,933, Cl. 252-182.000.
Tedeschi, Rinaldo Robert, 4,043,189, Cl. 73-117.300.

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Korous, Donald J.; and Neuzil, Richard W., 4,044,062, Cl. 260-674.0SA.

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Villeret, Michel; Stephenne, Hubert; and Deschenes, Pierre A., 4,044,306, Cl. 325-38.00B.

University of California, The Regents of the: *See—*
Cram, Donald J., 4,043,979, Cl. 260-47.0UP.
O'Brien, Michael, 4,043,443, Cl. 198-525.000.
Shuler, Kurt E.; and Schrauzer, Gerhard N., 4,043,934, Cl. 252-186.000.

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Yen, Teh Fu; and Wen, Chaur-Shyong, 4,043,881, Cl. 204-102.000.
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Unwin, William B.; Groezinger, John J.; and Grawey, Charles E., to Caterpillar Tractor Co. Seal arrangement for an oval tire and rim. 4,043,370, Cl. 152-354.000.

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Budrose, Charles R., 4,044,393, Cl. 360-117.000.

Updegrave, Walter C., to Reading Techmatic Corporation. Rotator drive system. 4,043,210, Cl. 74-750.00R.

Upjohn Company, The: *See—*
Evans, Timothy W., 4,043,870, Cl. 195-66.00R.
Holm, James P.; and Dudley, Ronald J., 4,044,227, Cl. 235-61.70R.
Roseman, Theodore J., 4,043,339, Cl. 128-260.000.
Wright, John B.; and Hall, Charles M., 4,044,148, Cl. 424-317.000.

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Kilmurry, Lindsay; and Urion, Howard Kirby, 4,043,752, Cl. 8-41.00B.

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Meyer, Engelbert A., 4,043,579, Cl. 293-71.00R.

V. W. Kaiser Engineering, Inc.: *See—*
Kaiser, Virgil W., deceased, 4,043,567, Cl. 280-96.100.

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Valentine, James M., 4,043,380, Cl. 164-41.000.

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Riano, Marcos D., 4,043,717, Cl. 425-7.000.

Valleylab, Inc.: *See—*
Morrison, Charles F., Jr., 4,043,342, Cl. 128-303.140.

Van Dam, John F.; and Pacholok, Jaroslaw, to Bell & Howell Company. Label applying machine. 4,043,859, Cl. 156-566.000.

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van der Lely, Cornelis; and van der Lely, Ary, 4,043,400, Cl. 172-43.000.

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Piepenhagen, John H.K.; and Vanecek, Michael J., 4,043,384, Cl. 164-282.000.

van Ham, Ernest E., to Sanders Associates, Inc. Cable cutter. 4,043,238, Cl. 83-595.000.

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Vanjo, Benno. Newspaper vending machine. 4,043,484, Cl. 221-213.000.

Van Sickle, Roswell C., to Westinghouse Electric Corporation. Fluid-blast circuit interrupter. 4,044,210, Cl. 200-148.00H.

Van Thyne, Ray J.: *See—*
Rausch, John J.; and Van Thyne, Ray J., 4,043,623, Cl. 308-238.000.

Van Voorhis, David Curtis, to International Business Machines Corporation. Variable-length to fixed-length conversion of minimum-redundancy codes. 4,044,347, Cl. 340-347.0DD.

Vapor Corporation: *See—*
Fluder, Chester Henry; and Yohanna, Nick J., 4,043,143, Cl. 62-243.000.

Varian Associates, Inc.: *See—*
Helmer, John Colville, 4,043,906, Cl. 210-31.00C.

Varon, Hyman. Tool for removing animal hair from carpeting. 4,042,995, Cl. 15-142.000.

Vasile, Carmine F., to Rockwell International Corporation. Surface acoustic wave band pass filtering. 4,044,321, Cl. 333-72.000.

Vater, Wulf: *See—*
Bossert, Friedrich; Wehinger, Egbert; Stoepel, Kurt; Vater, Wulf; and Kazda, Stanislav, 4,044,141, Cl. 424-266.000.

Veater, Vallon C. Laboratory drying oven and method. 4,043,048, Cl. 34-4.000.

VEB Leuna-Werke "Walter Ulbricht": *See—*
Reif, Hans-Heinrich; Wehner, Klaus; Welker, Jurgen; Schmidt, Karl-Heinz; Schnick, Waltraud; Widmann, Lutz; Schicker, Otto; Seidel, Gunter; Kalb, Karsten; Dollase, Wolfhard; Furtig, Helmut; Hose, Werner; Roscher, Wolfgang; Hadicke, Udo; Knoll, Herbert; Seidel, Rudiger; Nemitz, Gunter; Sturmer, Edith; and Kaiser, Manfred, 4,043,938, Cl. 252-412.000.

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Veeneman, John L.: *See—*
Shatila, Mounir A.; Von Der Lieth, William H.; Veeneman, John L.; and Thomas, Marion E., 4,044,163, Cl. 426-502.000.

Velsicol Chemical Corporation: *See—*
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Vendo Company, The: *See—*
Gore, LeRoy D.; Gillett, William G.; and Roberts, George F., 4,043,483, Cl. 221-155.000.

Veneklasen, Lee H.: *See—*
Krisch, Burkhard; Muller, Karl-Heinz; Rauch, Moriz von; and Veneklasen, Lee H., 4,044,256, Cl. 250-311.000.

Venezio, William R. Socket wrench. 4,043,228, Cl. 81-57.300.

Verbeek, Francois: *See—*
Bulten, Eric J.; and Verbeek, Francois, 4,044,035, Cl. 260-429.700.

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Vereinigte Delstahlwerke AG. (VEW): *See—*
Rajakovics, Gundolf E.; Gabernig, Heinz; and Klein, Guenter Peter, 4,043,875, Cl. 203-82.000.

Verkler, David C. Combination cart-checkstand. 4,043,426, Cl. 186-1.0AC.

Vetter, Earl E., to Boeing Company, The; and Aeritalia S.p.A. Common pod for housing a plurality of different turbofan jet propulsion engines. 4,043,522, Cl. 244-54.000.

Viapiano, Ugo; and Andreoni, Odoardo. Assembly of prefabricated

elements for forming walls of planar and/or non-planar configuration. 4,043,090, Cl. 52-583.000.

Vic-Tree (Mouldings) Limited: *See—*
Hyams, Joseph Edward, 4,043,685, Cl. 403-19.000.

Vice, Earl C., to Armco Steel Corporation. Dual track transfer system and a transfer car for use therewith. 4,043,466, Cl. 214-18.0SC.

Victaulic Company of America: *See—*
Sliski, Chester, 4,043,358, Cl. 137-512.100.

Victor B. Godin, Trustee: *See—*
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Vidakovic, Aleksandar; and Salna, Karl, to International Harvester Company. Armored tire having a flexible tapered belt arrangement. 4,043,609, Cl. 305-19.000.

Villeret, Michel; Stephenne, Hubert; and Deschenes, Pierre A., to Universite de Snerbrooke. Digital converter from pulse code modulation to continuous variable slope delta modulation. 4,044,306, Cl. 325-38.00B.

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Vixie, Dennis E.: *See—*
Hollister, Geoffrey L.; and Vixie, Dennis E., 4,043,058, Cl. 36-102.000.

Vlahos, Petro, to Association of Motion Picture and Television Producers, Inc., The. Apparatus for reproducing a multiple track photographic sound record. 4,044,207, Cl. 179-100.30B.

Vock, Gunther, to Hoechst Aktiengesellschaft. Tire monofilaments. 4,043,985, Cl. 260-75.00T.

Vock, Manfred Hugo: *See—*
Evers, William J.; Heinsohn, Howard H., Jr.; and Vock, Manfred Hugo, 4,044,164, Cl. 426-535.000.

von Bose, Robert J.: *See—*
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von Schmeling, Bogislav; and Boos, Walter R., to Uniroyal, Inc.; and Uniroyal Ltd. Bis(diphenylaminomethane) antimicrobial agents. 4,044,139, Cl. 424-263.000.

Vosbeek, Gerardus J.: *See—*
Bomers, Johannes P.; and Vosbeek, Gerardus J., 4,043,816, Cl. 96-49.000.

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Hari, Stefan; Irvine, Alexander McHugh; McCrae, James McGeachie; Vuitel, Laurent; and L'Eplattenier, Francois, 4,044,036, Cl. 260-438.100.

Vulovic, Radoje, to Sun Shipbuilding and Dry Dock Co. Ship loading ramp. 4,043,288, Cl. 114-270.000.

W. R. Grace & Co.: *See—*
Giraudi, Giorgio Aldo Maria; and Imperiale, Nino, 4,043,011, Cl. 29-33.500.
Kremkau, William P., 4,044,187, Cl. 428-212.000.
Wessells, Forrest A.; and Pickard, John E., 4,042,996, Cl. 15-306.00R.
Wright, John L., 4,043,246, Cl. 85-11.000.

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Wace, Peter Frederick, to United Kingdom Atomic Energy Authority. Apparatus for the formation of liquid droplets. 4,043,507, Cl. 239-102.000.

Wachtel, James Alan: *See—*
McChesney, Charles Edmund; McHenry, Robert J.; and Wachtel, James Alan, 4,044,086, Cl. 264-97.000.

Wacker-Chemie GmbH: *See—*
Adler, Klaus; Pichler, Engelbert; Kemenater, Christoph; Dressler, Wilfried; and Bauer, Johann, 4,043,962, Cl. 260-29.300.
Wiest, Hubert; Lieb, Erwin; and Schafer, Heinz, 4,044,197, Cl. 526-304.000.

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Wacker-Dearborn Corporation: *See—*
Wecker, Walter A., Sr., 4,043,916, Cl. 210-238.000.

Wada, Hidetsugu; Asano, Yoichi; and Suzumura, Yoshikazu, to Hitachi, Ltd. Method of and apparatus for measuring information hold time of memory cell in dynamic MIS memory. 4,044,344, Cl. 340-173.0DR.

Wade, Arthur L.: *See—*
Ried, Louis, Jr.; and Wade, Arthur L., 4,044,263, Cl. 250-381.000.

Wade, Melvin J.: *See—*
Au Coin, Thomas R.; Schwartz, Abraham; Gualtieri, John G.; and Wade, Melvin J., 4,043,860, Cl. 156-624.000.

Wagar, Nelson William, to Hercules Incorporated. Ceramic color compositions and a method for decorating ceramic ware therewith. 4,043,824, Cl. 106-48.000.

Wagner, Earl William: *See—*
Bickford, David Edward; Southard, Robert Keith; Sucheski, Matthew Michael; and Wagner, Earl William, 4,043,494, Cl. 226-109.000.
Sucheski, Matthew Michael; and Wagner, Earl William, 4,043,034, Cl. 29-749.000.

Wagner, Kuno: *See—*
Muller, Hanns Peter; Wagner, Kuno; and Muller, Richard, 4,044,171, Cl. 427-27.000.

Wagner, Robert J.; and Atherton, Ralph R., to Allis-Chalmers Corporation. Vehicle suspension and stabilizer system. 4,043,584, Cl. 296-35.00R.

Wagstaff, Paul Arlen, to Ortho Pharmaceutical Corporation. Method for detection of human mammary carcinoma. 4,043,757, Cl. 23-230.00B.

Wald Manufacturing Company, Inc.: *See—*
Humlong, Robert F., 4,043,688, Cl. 403-209.000.

Waldbillig, James O.: *See—*
Wiley, Morris A.; Schlicht, Raymond C.; and Waldbillig, James O., 4,044,032, Cl. 260-399.000.

Walden, Craig C.: *See—*
Birkbeck, Alexander E.; and Walden, Craig C., 4,043,299, Cl. 119-3.000.

Waldman Corporation: *See—*
Bryceland, Maurice Cyril, 4,043,115, Cl. 58-50.00R.

Walford, Richard P.: *See—*
Phillips, Kenneth G.; Walford, Richard P.; and Knight, Clifford, 4,043,550, Cl. 271-233.000.

Walker, Alan John. Bearing support structure for electro-magnet driven pump. 4,043,706, Cl. 417-353.000.

Walker, Thad Oscar: *See—*
Kudchadker, Mohan Vaikunth; and Walker, Thad Oscar, 4,043,396, Cl. 166-274.000.

Walkling, Walter D., to Eli Lilly and Company. Method of stabilizing acetylsalicylic acid in the presence of d-propoxyphene hydrochloride and compositions thereof. 4,044,125, Cl. 424-232.000.

Wallace, Doralee A., to Raymond Lee Organization, Inc., The, a part interest. Foldable stool. 4,043,277, Cl. 108-35.000.

Wallace, Duane W., to Reed Tool Company. Hard surfaced well tool and method of making same. 4,043,611, Cl. 308-4.00A.

Wallick, Charles W., to Du Pont de Nemours, E. I., and Company. Lead frame assembly. 4,044,201, Cl. 174-52.0FP.

Wallis, Craig: *See—*
Melnick, Joseph L.; and Wallis, Craig, 4,043,911, Cl. 210-62.000.

Wallis, Marvin E. Automatic packaging method and apparatus. 4,043,096, Cl. 53-41.000.

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Ware, Richard E.: *See—*
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Wecker, Walter A., Sr., to Wacker-Dearborn Corporation. On-line closed-vessel circulating filter for edible cooking oils. 4,043,916, Cl. 210-238.000.
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Wickham, David John, to Westinghouse Brake & Signal Co. Ltd. Rail vehicle brake pipe valve arrangement having a fluid pressure drop detector and a vent valve controlled thereby for brake pipe pressure gradient reduction. 4,043,606, Cl. 303-82.000.
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Wilson, James B., to Georgetown University. Method and system for improving the definition of a scintillation detector. 4,044,261, Cl. 250-369.000.
Wilson, John C. Method of making a waste flue heat recovery device. 4,043,014, Cl. 29-157.400.
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Wolf, Tobin. Chance device for board racing game. 4,043,406, Cl. 273-138.00R.
Wolf, Tobin. Weight game. 4,043,554, Cl. 273-1.00M.
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Sakamoto, Eiichi; Kubo, Masanobu; Yasui, Takashi; Suzuki, Katsuya; and Tachibana, Katsuhiko, 4,043,801, Cl. 75-60.000.
Yeakey, Ernest L.: *See—*
Brennan, Michael E.; Moss, Philip H.; and Yeakey, Ernest L., 4,044,053, Cl. 260-583.00P.

Yeda Research & Development Co., Ltd.: *See*—
Schmidt, Gerhard Martin Julius, deceased; Dror, Michael; Friedman, Gad; and Levine, Harold H., 4,043,978, Cl. 260-47.0CP.
Yegge, Lawrence R. Structure and method of constructing and test-loading pile anchored foundations. 4,043,133, Cl. 61-50.000.
Yen, Teh Fu; and Wen, Chaur-Shyong, to University of Southern California. Electrolytic recovery of economic values from shale oil retort water. 4,043,881, Cl. 204-102.000.
Yen, Teh Fu; and Wen, Chaur-Shyong, to University of Southern California. Electrolytic hydrogenation of leached oil shale components. 4,043,884, Cl. 204-131.000.
Yen, Teh Fu; Wen, Chaur-Shyong; and Kwan, Jonathan, to University of Southern California. Electrolytic pyrite removal from kerogen materials. 4,043,885, Cl. 204-131.000.
Yeo, Herbert G., to Augat Inc. Machine for inserting electrical contacts into electrical interconnection boards. 4,043,033, Cl. 29-739.000.
Yip, James Kwok-fun: *See*—
Larson, Bernard J.; Johnson, Oliver Wendell; and Yip, James Kwok-fun, 4,043,419, Cl. 180-132.000.
Yohanna, Nick J.: *See*—
Fluder, Chester Henry; and Yohanna, Nick J., 4,043,143, Cl. 62-243.000.
Yokoi, Hiroshi; and Akagawa, Masataka, to Kokusai Denshin Denwa Kabushiki Kaisha. Satellite tracking cassegrainian antenna. 4,044,361, Cl. 343-754.000.
Yonkers, Robert A.: *See*—
McDowell, David E.; and Yonkers, Robert A., 4,042,997, Cl. 15-366.000.
York Engineering, Inc.: *See*—
Browne, William R. K., 4,043,690, Cl. 403-268.000.
York, George. Automatic screw driver having brake responsive ball clutch means. 4,043,365, Cl. 144-32.00R.
Yoshida, Makoto: *See*—
Koike, Yoshiyasu; Shiraki, Hachio; Suzuki, Eigen; and Yoshida, Makoto, 4,043,028, Cl. 29-599.000.
Yoshikawa, Toshio; Sakamoto, Nagayoshi; Kurita, Masayuki; Oh-e, Shunji; and Nagamori, Lomitado, to UBE Industries, Ltd. Stabilized olefin polymer composition. 4,043,976, Cl. 260-45.80N.
Yoshimoto, Toshio: *See*—
Miyoshi, Isao; Abe, Masaru; Tezuka, Toshiro; and Yoshimoto, Toshio, 4,043,372, Cl. 152-354.000.
Yoshino, Masaki: *See*—
Seki, Masao; Kito, Hidetoshi; and Yoshino, Masaki, 4,043,233, Cl. 83-23.000.
Zahner, John C.: *See*—
Chang, Clarence D.; Silvestri, Anthony J.; and Zahner, John C., 4,044,061, Cl. 260-668.00R.
Zahner, Marvin L. Fish hook setting device. 4,043,069, Cl. 43-15.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Mosbacher, Rudolf; and Ruppik, Hans, 4,043,021, Cl. 29-437.000.
Zajac, Edward: *See*—
McCabe, Barkman C.; and Zajac, Edward, 4,043,129, Cl. 60-641.000.
Zebuhr, William Henry, to Deschamps Laboratories, Inc. Thermal transfer care. 4,043,388, Cl. 165-166.000.
Zegel, Snyder M. Teaching aid for accounting. 4,043,055, Cl. 35-24.00R.
Zelenski, Paul Allen: *See*—
Isenberg, Don Eugene; Parker, Irvin Lee, Jr.; and Zelenski, Paul Allen, 4,043,383, Cl. 164-274.000.
Zenda, Richard J.: *See*—
Malacheski, Joseph J.; and Zenda, Richard J., 4,043,159, Cl. 70-38.00R.
Zenith Radio Corporation: *See*—
Laub, Leonard J., 4,044,378, Cl. 358-128.000.
Zens, Rene Joseph Louis; and Horsman, William W., to Horsman, William W. High frequency gas detonator. 4,043,420, Cl. 181-117.000.
Zentner, Erich: *See*—
Kratzmann, Helmut; Heinik, Josef; Obermaier, Robert; Zentner, Erich; and Redinger, Robert, 4,043,731, Cl. 425-366.000.
Zeppernick, Friedrich; and Dotzel, Klaus-Peter, to Felix Bottcher, Firma. Transfer roller. 4,043,013, Cl. 29-132.000.
Ziegler, John S.: *See*—
Cawood, Charles D., Jr.; and Ziegler, John S., 4,043,328, Cl. 128-132.00D.
Zimmer, Aaron. Bearing cartridge assembly. 4,043,616, Cl. 308-36.300.
Zimmern, Bernard, to Uniscrew Limited. Double-acting rotary expansible chamber pump adaptable to series or parallel operation. 4,043,704, Cl. 417-62.000.
Zitko, Ronald F.; and Adams, James R., to International Harvester Company. Louver linkage seal. 4,043,258, Cl. 98-121.00A.
Zupanick, Joseph E., to Sun Oil Company Limited. Method and apparatus for preventing fluid solidification in an aperture. 4,043,132, Cl. 61-1.00R.
Zupanick, Joseph E.: *See*—
Macy, Robert L.; and Zupanick, Joseph E., 4,042,991, Cl. 14-1.000.
Zurla, Frank Anthony, Jr.: *See*—
Hicks, Glen LeRoy; Howe, Leland Delmar, Jr.; and Zurla, Frank Anthony, Jr., 4,044,337, Cl. 364-200.000.
Zwagemakers, Johannes Maria Antonius: *See*—
Van Dijk, Jan; and Zwagemakers, Johannes Maria Antonius, 4,044,023, Cl. 260-326.470.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF AUGUST, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Allied Chemical Corporation: *See*—
Pez, Guido P., Re. 29,368, Cl. 260-429.300.
Anderson Bros. Mfg. Co.: *See*—
Reid, Laurie M., Re. 29,362, Cl. 53-198.00R.
Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, to Eli Lilly and Company. Fluoroalkoxyphenyl-substituted nitrogen heterocycles as plant stunting agents. Re. 29,367, Cl. 71-76.000.
Butler Automatic, Inc.: *See*—
Butler Jr., Richard A., Re. 29,365, Cl. 242-58.300.
Butler Jr., Richard A., to Butler Automatic, Inc. Web supply apparatus. Re. 29,365, Cl. 242-58.300.
DeBortoli, George; and Lukas, Helmut Hans, to Northern Electric Company Limited. Connecting block. Re. 29,371, Cl. 174-60.000.
Du Pont de Nemours, E. I., and Company: *See*—
McKay, Jerry Bruce, Re. 29,363, Cl. 57-140.00J.
Eli Lilly and Company: *See*—
Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, Re. 29,367, Cl. 71-76.000.
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, to Kyowa Hakko Kogyo Co., Ltd. Method for preparing acylated products. Re. 29,369, Cl. 260-471.00C.
Giannotti, Hugo V., to Ski Dynamics, Inc. Ski anti-crossing device. Re. 29,366, Cl. 280-11.37E.
Imperial Chemical Industries Limited: *See*—
Sandiford, Denis James Henry; and Kail, John Alan Elliott, Re. 29,370, Cl. 264-22.000.
Kail, John Alan Elliott: *See*—
Sandiford, Denis James Henry; and Kail, John Alan Elliott, Re. 29,370, Cl. 264-22.000.
Krumkalns, Eriks Viktors: *See*—
Benefiel, Robert Lee; and Krumkalns, Eriks Viktors, Re. 29,367, Cl. 71-76.000.
Kyowa Hakko Kogyo Co., Ltd.: *See*—
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, Re. 29,369, Cl. 260-471.00C.
Lukas, Helmut Hans: *See*—
DeBortoli, George; and Lukas, Helmut Hans, Re. 29,371, Cl. 174-60.000.
McKay, Jerry Bruce, to Du Pont de Nemours, E. I., and Company. False-twist texturing yarn of polyester filaments having multilobal cross sections. Re. 29,363, Cl. 57-140.00J.
Nakamizo, Nobuhiro: *See*—
Fujimoto, Yasuo; and Nakamizo, Nobuhiro, Re. 29,369, Cl. 260-471.00C.
Northern Electric Company Limited: *See*—
DeBortoli, George; and Lukas, Helmut Hans, Re. 29,371, Cl. 174-60.000.
Pez, Guido P., to Allied Chemical Corporation. Metal-organo compounds with sterically exposed metal-metal bonds, and a method for their production. Re. 29,368, Cl. 260-429.300.
Reid, Laurie M., to Anderson Bros. Mfg. Co. Packaging apparatus. Re. 29,362, Cl. 53-198.00R.
Robley, Spencer H., deceased, to Underwater Devices, Inc. Method of submarine pipe laying. Re. 29,364, Cl. 61-111.000.
Sandiford, Denis James Henry; and Kail, John Alan Elliott, to Imperial Chemical Industries Limited. Thermoplastic film production. Re. 29,370, Cl. 264-22.000.
Ski Dynamics, Inc.: *See*—
Giannotti, Hugo V., Re. 29,366, Cl. 280-11.37E.
Underwater Devices, Inc.: *See*—
Robley, Spencer H., deceased, Re. 29,364, Cl. 61-111.000.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Burchell Nursery, Inc., The. Nectarine tree. 4,093, 8-23-77, Cl. 41.000.
Burchell Nursery, Inc., The: *See*—
Anderson, Frederic W., 4,093, Cl. 41.000.
Doyle, Thomas E. Doyle's Blackberry. 4,094, 8-23-77, Cl. 46.000.

LIST OF DESIGN PATENTEES

Adams, Joseph W.: *See*—
Herman, Albert W.; and Adams, Joseph W., 245,510, Cl. D23-113.000.
Adams, Stanley B.; Parks, John M.; and Reisel, James M., to Caterpillar Tractor Co. Tractor loader vehicle. 245,503, 8-23-77, Cl. D15-25.000.
Aktiebolaget Atomenergi: *See*—
Flinta, Jan; and Hernborg, Gunnar, 245,482, Cl. D10-96.000.
Alvimar Manufacturing Co., Inc.: *See*—
Friedlander, Alan P., 245,524, Cl. D34-5.00F.
Andreas, John C., to Gould Inc. Housing for electric motor. 245,498, 8-23-77, Cl. D13-1.000.
Andreas, John C., to Gould Inc. Housing for electric motor. 245,499, 8-23-77, Cl. D13-01.000.
Arbrook, Inc.: *See*—
Lindsey, Joseph W., 245,539, Cl. D24-62.000.
Lindsey, Joseph W., 245,540, Cl. D24-62.000.
Asaro, Salvatore M. Love seat. 245,466, 8-23-77, Cl. D6-74.000.
B & J Rocket (Hong Kong) Limited: *See*—
Jensen, Wayne E., 245,472, Cl. D7-149.000.
Behling, Fredric C.; and Sullivan, Paul J. Toy figure. 245,523, 8-23-77, Cl. D34-4.00R.
Bettcher Manufacturing Corporation: *See*—
Herman, Albert W.; and Adams, Joseph W., 245,510, Cl. D23-113.000.
Bidwell, Robert: *See*—
Kurtz, Leonard David; and Bidwell, Robert, 245,538, Cl. D24-34.000.
Booth, Clyde C. Burial facility. 245,519, 8-23-77, Cl. D25-33.000.
Bourgeois, Ronald D. Ski vise. 245,475, 8-23-77, Cl. D8-72.000.
Brush, John B., to Procter & Gamble Company, The. Folding display basket for cartoned products. 245,480, 8-23-77, Cl. D9-248.000.
Bullock, Maynard J. Educational toy clock. 245,505, 8-23-77, Cl. D19-64.000.
Cammarota, David Francis. Golf tee sharpener. 245,476, 8-23-77, Cl. D8-91.000.
Caterpillar Tractor Co.: *See*—
Adams, Stanley B.; Parks, John M.; and Reisel, James M., 245,503, Cl. D15-25.000.
Chou, Chen Ching. Protective face mask. 245,545, 8-23-77, Cl. D29-8.000.
Clare, Michael A., to Windcraft Corporation. Air cushioned vehicle. 245,492, 8-23-77, Cl. D12-5.000.
Clough, Christopher John; and Jackson, Eric. Collapsible display carton. 245,478, 8-23-77, Cl. D9-224.000.
Concept, Inc.: *See*—
Troutner, Vernon H.; and Simmons, Raymond W., 245,515, Cl. D24-29.000.
Copeland, Alvin C. Restaurant building. 245,518, 8-23-77, Cl. D25-25.000.
Crow, Lawrence E. Bathtub spout. 245,507, 8-23-77, Cl. D23-32.000.
Crow, Lawrence E. Shower spout. 245,508, 8-23-77, Cl. D23-32.000.
DeBurgh, Raymond J. Portable urinal. 245,543, 8-23-77, Cl. D24-54.000.
Defores, Eugene, to Waterman. Pen. 245,504, 8-23-77, Cl. D19-50.000.

Deknatel, Inc.: *See—*
Kurtz, Leonard David; and Bidwell, Robert, 245,538, Cl. D24-34.000.
Dyna Med, Inc.: *See—*
Kohl, William A., 245,512, Cl. D24-10.000.
Ehrlin, Hans T. A.: *See—*
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., 245,502, Cl. D15-17.000.
Ernest, Robert O., to Sunbeam Corporation. Toaster oven. 245,470, 8-23-77, Cl. D7-91.000.
Falcon Safety Products, Inc.: *See—*
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, 245,488, Cl. D10-106.000.
Ferguson, Edward M., to Kusan, Inc. Combined toy vehicle and figure therefor. 245,530, 8-23-77, Cl. D34-15.0AN.
Fitch, James B., to General Signal Corporation. Liquid ring pump. 245,501, 8-23-77, Cl. D15-7.000.
Flinta, Jan; and Hernborg, Gunnar, to Aktiebolaget Atomenergi. Pitot tube fitting. 245,482, 8-23-77, Cl. D10-96.000.
Frassanito, John R. Liquid dispenser. 245,467, 8-23-77, Cl. D6-95.000.
Friedlander, Alan P., to Alvimar Manufacturing Co., Inc. Folding swimming pool. 245,524, 8-23-77, Cl. D34-5.00F.
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, to Oki Electric Industry Co., Ltd. Telephone set. 245,500, 8-23-77, Cl. D14-57.000.
Gary, Jerome A., to Taco Charley, Inc. Mexican food restaurant structure. 245,517, 8-23-77, Cl. D25-22.000.
General Signal Corporation: *See—*
Fitch, James B., 245,501, Cl. D15-7.000.
Gould Inc.: *See—*
Andreas, John C., 245,498, Cl. D13-1.000.
Andreas, John C., 245,499, Cl. D13-01.000.
Gulf & Western Manufacturing Company (Systems): *See—*
Kenig, Howard, 245,493, Cl. D12-55.000.
Gurgiolo, Donald Joseph. Human back support harness. 245,537, 8-23-77, Cl. D24-64.000.
Haggstam, Christian G.: *See—*
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., 245,502, Cl. D15-17.000.
Hasbro Development Corporation: *See—*
Hudson, Robert H.; and Ptaszek, George W., 245,529, Cl. D34-15.0JJ.
Hatcher, Robert E.: *See—*
Mulkey, Dennis A.; and Hatcher, Robert E., 245,522, Cl. D30-43.000.
Hauf, Karl Peter Gunter; and Hofmeister, Werner Karl, to U.S. Philips Corporation. Cleaning brush for dry shaver. 245,462, 8-23-77, Cl. D4-10.000.
Henderson, Thomas J. Trailer. 245,495, 8-23-77, Cl. D12-101.000.
Heninger, Francine F. Mop head. 245,473, 8-23-77, Cl. D7-178.000.
Herman, Albert W.; and Adams, Joseph W., to Bettcher Manufacturing Corporation. Electric radiant space heater. 245,510, 8-23-77, Cl. D23-113.000.
Hernborg, Gunnar: *See—*
Flinta, Jan; and Hernborg, Gunnar, 245,482, Cl. D10-96.000.
Hindle, Wayne E. Combined table and seating unit. 245,465, 8-23-77, Cl. D6-45.000.
Hofmeister, Werner Karl: *See—*
Hauf, Karl Peter Gunter; and Hofmeister, Werner Karl, 245,462, Cl. D4-10.000.
Horwitz, Norton Jay, to Silver Manufacturing, Inc. Table. 245,468, 8-23-77, Cl. D6-175.000.
Hudson, Robert H.; and Ptaszek, George W., to Hasbro Development Corporation. Toy submarine. 245,529, 8-23-77, Cl. D34-15.0JJ.
Hydro-Spa, Inc.: *See—*
Melchior, Merle C., 245,541, Cl. D24-38.000.
Melcior, Merle C., 245,542, Cl. D24-38.000.
Jackson, Eric: *See—*
Clough, Christopher John; and Jackson, Eric, 245,478, Cl. D9-224.000.
Jensen, Wayne E., to B & J Rocket (Hong Kong) Limited. Combined knife and chopstick. 245,472, 8-23-77, Cl. D7-149.000.
Johnson, Thomas: *See—*
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, 245,488, Cl. D10-106.000.
Jones, Jack, Jr., to Jones, Sr., Jack. Shoulder wallet. 245,461, 8-23-77, Cl. D2-383.000.
Jones, Sr., Jack: *See—*
Jones, Jack, Jr., 245,461, Cl. D2-383.000.
Kanda, Yoshinori: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Kenig, Howard, to Gulf & Western Manufacturing Company (Systems). Floor jack. 245,493, 8-23-77, Cl. D12-55.000.
Kikoler, Ted G. Electronic insect lamp. 245,506, 8-23-77, Cl. D22-19.000.
Klitzner, William S. Zodiac charm. 245,490, 8-23-77, Cl. D11-81.000.
Kohl, William A., to Dyna Med, Inc. Ventilated bite stick. 245,512, 8-23-77, Cl. D24-10.000.
Kopel, Leroy A., to Krautkramer-Branson, Incorporated. Ultrasonic transducer probe. 245,513, 8-23-77, Cl. D24-17.000.
Koster, Neil A. Portable animal enclosure. 245,521, 8-23-77, Cl. D30-1.000.
Krautkramer-Branson, Incorporated: *See—*
Kopel, Leroy A., 245,513, Cl. D24-17.000.
Pennebaker, Bradley, 245,514, Cl. D24-17.000.
Kurtz, Leonard David; and Bidwell, Robert, to Deknatel, Inc. Stand for a drainage device. 245,538, 8-23-77, Cl. D24-34.000.
Kusan, Inc.: *See—*
Ferguson, Edward M., 245,530, Cl. D34-15.0AN.
Lewis, Nolan. Combined furniture commode and room fan. 245,511, 8-23-77, Cl. D23-155.000.
Lindsey, Joseph W., to Arbrook, Inc. Nebulizer-humidifier bag assembly. 245,539, 8-23-77, Cl. D24-62.000.
Lindsey, Joseph W., to Arbrook, Inc. Nebulizer bag. 245,540, 8-23-77, Cl. D24-62.000.
MacInnis, J. Thomas: *See—*
MacInnis, John W.; and MacInnis, J. Thomas, 245,471, Cl. D7-104.000.
MacInnis, John W.; and MacInnis, J. Thomas. Scoop. 245,471, 8-23-77, Cl. D7-104.000.
Malcolm, Donald A., to W. R. Grace & Co. Display case. 245,479, 8-23-77, Cl. D9-224.000.
Melchior, Merle C., to Hydro-Spa, Inc. Bathing pool. 245,541, 8-23-77, Cl. D24-38.000.
Melcior, Merle C., to Hydro-Spa, Inc. Bathing pool. 245,542, 8-23-77, Cl. D24-38.000.
Milner, Carol D. Butterfly puzzle. 245,528, 8-23-77, Cl. D34-15.00M.
Mulkey, Dennis A.; and Hatcher, Robert E. Insect repellant and disinfectant pendant for domestic animals. 245,522, 8-23-77, Cl. D30-43.000.
Mullenax, Earnest R. Ground anchor tie-down for securing objects such as mobile homes and the like. 245,477, 8-23-77, Cl. D8-382.000.
Niskin, Shale J. Shielded flow meter. 245,483, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Three bladed cylindrical flow meter. 245,484, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Bayed flow meter. 245,485, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Three bladed bayed flow meter. 245,486, 8-23-77, Cl. D10-96.000.
Niskin, Shale J. Cylindrical flow meter. 245,487, 8-23-77, Cl. D10-96.000.
Nordson Corporation: *See—*
Scholl, Charles H., 245,474, Cl. D8-30.000.
Oki Electric Industry Co., Ltd.: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., to Stiga AB. Lawn mower body. 245,502, 8-23-77, Cl. D15-17.000.
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, to Falcon Safety Products, Inc. Fire alarm. 245,488, 8-23-77, Cl. D10-106.000.
Parks, John M.: *See—*
Adams, Stanley B.; Parks, John M.; and Reisel, James M., 245,503, Cl. D15-25.000.
Pennebaker, Bradley, to Krautkramer-Branson, Incorporated. Ultrasonic transducer probe. 245,514, 8-23-77, Cl. D24-17.000.
Petrucci, Robert A.: *See—*
Ronci, Anthony; and Petrucci, Robert A., 245,481, Cl. D10-64.000.
Pittman, Cleother. Combined comb and brush. 245,544, 8-23-77, Cl. D28-25.000.
Procter & Gamble Company, The: *See—*
Brush, John B., 245,480, Cl. D9-248.000.
Ptaszek, George W.: *See—*
Hudson, Robert H.; and Ptaszek, George W., 245,529, Cl. D34-15.0JJ.
Reisel, James M.: *See—*
Adams, Stanley B.; Parks, John M.; and Reisel, James M., 245,503, Cl. D15-25.000.
Reiss, Meyer M. Protective shield for use with radioactive materials. 245,464, 8-23-77, Cl. D6-27.000.
Richards Manufacturing Company, Inc.: *See—*
Treace, James T., 245,516, Cl. D24-33.000.
Rimberg, Harry. Star ring or similar article. 245,489, 8-23-77, Cl. D11-26.000.
Ritch, Donald W. License plate holder. 245,497, 8-23-77, Cl. D12-193.000.
Ronci, Anthony; and Petrucci, Robert A. Quahog sizing ring. 245,481, 8-23-77, Cl. D10-64.000.
Sauter, Kenneth W. Game cabinet. 245,526, 8-23-77, Cl. D34-5.00L.
Sauter, Kenneth W. Game cabinet. 245,527, 8-23-77, Cl. D34-5.00L.
Scholl, Charles H., to Nordson Corporation. Adhesive dispenser. 245,474, 8-23-77, Cl. D8-30.000.
Seal, Michael R.: *See—*
Selvidge, Craig A.; and Seal, Michael R., 245,494, Cl. D12-90.000.
Segil, Arthur W. Lighting baffle. 245,533, 8-23-77, Cl. D48-16.00A.
Segil, Arthur W. Lighting baffle. 245,534, 8-23-77, Cl. D48-16.00A.
Segil, Arthur W. Lighting baffle. 245,535, 8-23-77, Cl. D48-16.00A.
Segil, Arthur W. Lighting baffle. 245,536, 8-23-77, Cl. D48-16.00A.
Selvidge, Craig A.; and Seal, Michael R., to Western Washington State College. Automotive vehicle. 245,494, 8-23-77, Cl. D12-90.000.
Shiraishi, Masami, to Tomy Kogyo Co., Inc. Toy bird. 245,531, 8-23-77, Cl. D34-15.00C.
Siegel, Owen. Plaque or the like. 245,491, 8-23-77, Cl. D11-139.000.
Silver Manufacturing, Inc.: *See—*
Horwitz, Norton Jay, 245,468, Cl. D6-175.000.
Simmons, Raymond W.: *See—*
Troutner, Vernon H.; and Simmons, Raymond W., 245,515, Cl. D24-29.000.
Smedley, Stephen L. Combined coffee table and planter. 245,463, 8-23-77, Cl. D6-4.000.
Smilko, Paul. Planter. 245,469, 8-23-77, Cl. D6-182.000.
Smith, Albert H.; and Smith, Randall S. Telephone locking device. 245,520, 8-23-77, Cl. D14-59.000.

Smith, Randall S.: *See—*
Smith, Albert H.; and Smith, Randall S., 245,520, Cl. D14-59.000.
Stiga AB: *See—*
Oscarsson, Jerker E.; Ehrlin, Hans T. A.; and Haggstam, Christian G., 245,502, Cl. D15-17.000.
Stoltzfus, David K.: *See—*
Ulmer, Robert G.; and Stoltzfus, David K., 245,509, Cl. D23-92.000.
Sullivan, Paul J.: *See—*
Behling, Fredric C.; and Sullivan, Paul J., 245,523, Cl. D34-4.00R.
Sunbeam Corporation: *See—*
Ernest, Robert O., 245,470, Cl. D7-91.000.
Taco Charley, Inc.: *See—*
Gary, Jerome A., 245,517, Cl. D25-22.000.
Taylor, Donald. Swim vest with dorsal fin. 245,532, 8-23-77, Cl. D34-43.000.
Tomy Kogyo Co., Inc.: *See—*
Shiraishi, Masami, 245,531, Cl. D34-15.00C.
Treace, James T., to Richards Manufacturing Company, Inc. Artificial cruciate ligament. 245,516, 8-23-77, Cl. D24-33.000.
Troutner, Vernon H.; and Simmons, Raymond W., to Concept, Inc. Light for vaginal speculum. 245,515, 8-23-77, Cl. D24-29.000.
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Hauf, Karl Peter Gunter; and Hofmeister, Werner Karl, 245,462, Cl. D4-10.000.
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Malcolm, Donald A., 245,479, Cl. D9-224.000.
Watanabe, Katsuhito: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Watanabe, Tsutomu: *See—*
Fukushima, Hisao; Watanabe, Katsuhito; Kanda, Yoshinori; and Watanabe, Tsutomu, 245,500, Cl. D14-57.000.
Waterman: *See—*
Defores, Eugene, 245,504, Cl. D19-50.000.
Wayne, Ronald G. Game cabinet. 245,525, 8-23-77, Cl. D34-5.00L.
Western Washington State College: *See—*
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Windcraft Corporation: *See—*
Clare, Michael A., 245,492, Cl. D12-5.000.
Witte, Paul A.: *See—*
Pappas, Michael; Witte, Paul A.; and Johnson, Thomas, 245,488, Cl. D10-106.000.

CLASSIFICATION OF PATENTS

ISSUED AUGUST 23, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

9	4,042,974
19	4,042,975
135	4,042,976
161 A	4,042,977

CLASS 3

1	4,042,978
1.5	4,042,979
1.91	4,042,980

CLASS 4

10	4,042,981
67 A	4,042,982
200	4,042,984
291	4,042,983

CLASS 5

317 R	4,042,985
335	4,042,986
345 R	4,042,987
349	4,042,988

CLASS 8

1 XB	4,043,749
10.2	4,043,750
41 B	4,043,752
41 C	4,043,751
115.5	4,043,753
149	4,042,989

CLASS 9

8 P	4,042,990

CLASS 13

18	4,044,199

CLASS 14

1	4,042,991
69.5	4,042,992

CLASS 15

21 D	4,042,993
83	4,042,994
142	4,042,995
306 R	4,042,996
312 A	4,042,998
366	4,042,997
422	4,042,999

CLASS 16

128 R	4,043,000
189	4,043,001

CLASS 17

32	4,043,002
67	4,043,003

CLASS 19

155	4,043,005
200	4,043,004

CLASS 21

82 R	4,043,754

CLASS 23

230 B	4,043,757
230 R	4,043,755
	4,043,756
230.6	4,043,759
262	4,043,758
270 R	4,043,760
288 FC	4,043,761
292	4,043,762

CLASS 24

90 R	4,043,006
205.1 C	4,043,007

CLASS 28

220	4,043,010
221	4,043,009
271	4,043,008

CLASS 29

33.5	4,043,011
105 R	4,043,012
132	4,043,013
157.4	4,043,014
	4,043,015
240	4,043,016
427	4,043,018
	4,043,019
	4,043,020
437	4,043,021
460	4,043,022
527.6	4,043,023
571	4,043,024
	4,043,025
588	4,043,027
592	4,043,026
599	4,043,028
600	4,043,029
622	4,043,030
628	4,043,031
	4,043,032
739	4,043,033
749	4,043,017
	4,043,034

CLASS 30

40.2	4,043,035
43.6	4,043,036
276	4,043,037
293	4,043,038
325	4,043,039

CLASS 32

11	4,043,040
22	4,043,041
40 R	4,043,042

CLASS 33

137 L	4,043,043
172 E	4,043,044
174 S	4,043,045
185 R	4,043,046

CLASS 34

1	4,043,047
4	4,043,048
10	4,043,049
48	4,043,050
77	4,043,051
122	4,043,052

CLASS 35

8 R	4,043,053
9 A	4,043,054
24 R	4,043,055
28	4,043,056
74	4,043,057

CLASS 36

102	4,043,058
121	4,043,059

CLASS 37

141 R	4,043,060
	4,043,061

CLASS 38

102.91	4,043,270
140	4,043,062

CLASS 40

119	4,043,063
343	4,043,064

CLASS 42

1 R	4,043,065
71 P	4,043,066

CLASS 43

6	4,043,067
9	4,043,068
15	4,043,069
17.2	4,043,072
18 GF	4,043,074
21.2	4,043,070
23	4,043,071
124	4,043,073

CLASS 44

1 R	4,043,763
10 A	4,043,764
14	4,043,765

CLASS 46

202	4,043,075
228	4,043,076

CLASS 47

66	4,043,077

CLASS 48

73	4,043,766

CLASS 49

220	4,043,078
394	4,043,079

CLASS 51

33 W	4,043,080
103 WH	4,043,767
129	4,043,081
135 R	4,043,082
170 EB	4,043,083
318	4,043,084

CLASS 52

3	4,043,085
71	4,043,086
127	4,043,087
169.9	4,043,088
516	4,043,089
583	4,043,090
616	4,043,091
712	4,043,092
749	4,043,093

CLASS 53

3	4,043,094
26	4,043,095
41	4,043,096
52	4,043,097
180 M	4,043,098
198 R	Re.29,362

CLASS 55

5	4,043,768
25	4,043,769
62	4,043,770
93 BN	4,043,771
220	4,043,772
228	4,043,773
269	4,043,774
302	4,043,775
385 G	4,043,776

CLASS 56

10.9	4,043,099
16.5	4,043,100
17.1	4,043,101
17.4	4,043,102
295	4,043,103
	4,043,104
328 R	4,043,105

CLASS 57

34 R	4,043,106
	4,043,107
140 J	Re.29,363
157 R	4,043,108

CLASS 58

23 BA	4,043,110
	4,043,112
	4,043,113
23 R	4,043,109
	4,043,111
	4,043,114
50 R	4,043,115
88 R	4,043,116
142	4,043,117
152 R	4,043,118

CLASS 60

39.14	4,043,119
	4,043,120
204	4,043,121
375	4,043,122
397	4,043,123
404	4,043,124
406	4,043,125
407	4,043,126
453	4,043,127
636	4,043,128
641	4,043,129
655	4,043,130

CLASS 61

1 F	4,043,131
1 R	4,043,132
50	4,043,133
69 R	4,043,134
72.5	4,043,135
72.7	4,043,136
85	4,043,137
88	4,043,138
105	4,043,139
111	Re.29,364

CLASS 62

66	4,043,140
91	4,043,141
243	4,043,143
259	4,043,777
277	4,043,144

CLASS 63

15	4,043,145

CLASS 64

1 V	4,043,146
	4,043,147
17 R	4,043,148
30 C	4,043,149
32 R	4,043,150

CLASS 65

1	4,043,778
2	4,043,779
29	4,043,780
30 R	4,043,781
104	4,043,782
106	4,043,783
107	4,043,784
	4,043,785
114	4,043,786
227	4,043,787

CLASS 66

9 R	4,043,151
	4,043,152
120	4,043,153
125 R	4,043,154
132 T	4,043,155
170	4,043,142
177	4,043,156

CLASS 68

5 E	4,043,157
17 R	4,043,158

CLASS 70

38 R	4,043,159

CLASS 71

29	4,043,788
34	4,043,789
66	4,043,790
	4,043,791
76	Re.29,367
78	4,043,792
86	4,043,793
	4,043,794
90	4,043,795
98	4,043,796
	4,043,797

CLASS 72

39	4,043,166
61	4,043,160
78	4,043,161
163	4,043,162
255	4,043,163
307	4,043,165
332	4,043,164
340	4,043,167
345	4,043,168
349	4,043,169
364	4,043,170
393	4,043,171
402	4,043,172
403	4,043,173
412	4,043,174

CLASS 73

1 DV	4,043,175
	4,043,176
15 R	4,043,177
23	4,043,178
37	4,043,179
40.5 A	4,043,180
41	4,043,182
59	4,043,183
65	4,043,184
67.7	4,043,185
67.8 R	4,043,181
84	4,043,186
105	4,043,187
116	4,043,188
117.3	4,043,189
141 R	4,043,190
151	4,043,191
155	4,043,192
	4,043,193
178 T	4,043,194
204	4,043,195
	4,043,196
205 R	4,043,197
242	4,043,198
290 R	4,043,199
359 R	4,043,200
398 AR	4,043,201
422 GC	4,043,202
427	4,043,203
486	4,043,218
516 R	4,043,204

CLASS 74

5.5	4,043,205
10.15	4,043,207
10.54	4,043,206
16	4,043,208
60	4,043,209
110	4,043,211
230.17 A	4,043,212
242.8	4,043,213
243 DR	4,043,214
258	4,043,215
410	4,043,216
470	4,043,217
536	4,043,219
543	4,043,220
573 R	4,043,221
606 R	4,043,222
688	4,043,223
710.5	4,043,224
750 R	4,043,210
761	4,043,225
801	4,043,226
868	4,043,227

CLASS 75

53	4,043,798
60	4,043,799
	4,043,800
	4,043,801
63	4,043,802
117	4,043,804
123 L	4,043,805
125	4,043,806
	4,043,807
126 E	4,043,808
134 N	4,043,809
171	4,043,810
257	4,043,803

CLASS 81

57.3	4,043,228
177 A	4,043,230

CLASS 82

24 A	4,043,229

CLASS 83

9	4,043,231
13	4,043,232
23	4,043,233
40	4,043,234
137	4,043,236
207	4,043,235
478	4,043,237
595	4,043,238

CLASS 84

1.01	4,043,240
	4,043,241
1.17	4,043,242
1.25	4,043,243
423	4,043,244

CLASS 85

1 R	4,043,239
3 R	4,043,245
11	4,043,246
31	4,043,247

CLASS 89

1.703	4,043,248
33 CA	4,043,249
170	4,043,250

CLASS 91

376 R	4,043,251

CLASS 92

24	4,043,252
25	4,043,253
85 B	4,043,254
158	4,043,255

CLASS 96

1 R	4,043,811
1.5	4,043,812
1.8	4,043,813
10	4,043,814
33	4,043,815
49	4,043,816
66 R	4,043,817
77	4,043,818
115 P	4,043,819

CLASS 98

1.5	4,043,256
43 R	4,043,257
121 A	4,043,258

CLASS 99

353	4,043,259
421 HH	4,043,260

CLASS 100

26	4,043,261

CLASS 101

7	4,043,262
45	4,043,263
269	4,043,264
350	4,043,265

CLASS 102

24 HC	4,043,266
38	4,043,267
66	4,043,268
87	4,043,269

CLASS 104

12	4,043,271

CLASS 105

136	4,043,272
221 R	4,043,273
409	4,043,274
477	4,043,275

CLASS 106

21	4,043,820
39.6	4,043,821
40 R	4,043,823
48	4,043,824
53	4,043,852
70	4,043,822
87	4,043,825
90	4,043,826
92	4,043,827
97	4,043,828
271	4,043,829
287 SS	4,043,830
288 B	4,043,831

CLASS 108

28	4,043,276
35	4,043,277
150	4,043,278

CLASS 109

50	4,043,279

CLASS 110

7 R	4,043,280

CLASS 111

85	4,043,281

CLASS 112

3 R	4,043,282
163	4,043,283
178	4,043,284

CLASS 114

72	4,043,285
222	4,043,286
266	4,043,287
270	4,043,288

CLASS 115

6.1	4,043,290
29	4,043,291
75	4,043,289

CLASS 118

5	4,043,292
7	4,043,293
9	4,043,294

317 4,043,295
419 4,043,296
640 4,043,297
652 4,043,298

CLASS 119

3 4,043,299

CLASS 123

32 EA 4,043,300
52 B 4,043,301
117 R 4,043,302
119 A 4,043,304
4,043,305
119 R 4,043,303
121 4,043,306
139 AW 4,043,307
143 R 4,043,308
179 G 4,043,310
191 SP 4,043,309

CLASS 125

18 4,043,311

CLASS 126

41 R 4,043,312
121 4,043,313
263 4,043,314
270 4,043,315
4,043,316
4,043,317
271 4,043,318
299 D 4,043,319
299 E 4,043,320

CLASS 127

6 4,043,832

CLASS 128

2 B 4,043,322
2 H 4,043,324
2 V 4,043,321
4 4,043,323
75 4,043,325
82 4,043,326
89 R 4,043,327
132 D 4,043,328
132 R 4,043,329
133 4,043,330
156 4,043,331
214 E 4,043,332
214 R 4,043,333
215 4,043,334
218 N 4,043,335
218 R 4,043,336
229 4,043,337
260 4,043,338
4,043,339
287 4,043,340
303.1 4,043,341
303.14 4,043,342
321 4,043,343
335.5 4,043,344
349 R 4,043,345
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419 PG 4,043,347

CLASS 131

243 4,043,348

CLASS 134

34 4,043,833

CLASS 135

5.3 4,043,349

CLASS 136

89 SA 4,043,834
221 4,043,835

CLASS 137

39 4,043,350
204 4,043,353
247.33 4,043,354
312 4,043,355
320 4,043,356
495 4,043,357
512.1 4,043,358
554 4,043,351
625.41 4,043,359

CLASS 138

31 4,043,352
42 4,043,360

CLASS 139

452 4,043,361

CLASS 140

1 4,043,362
93 A 4,043,363
106 4,043,364

CLASS 144

32 R 4,043,365
34 E 4,043,366

CLASS 145

31 R 4,043,367

CLASS 148

1.5 4,043,836
4,043,837
2 4,043,838
20.3 4,043,839
32 4,043,840
32.5 4,043,841
35 4,043,842
37 4,043,843
4,043,844
105 4,043,845
4,043,846
146 4,043,847
187 4,043,848
4,043,849

CLASS 149

19.4 4,043,850

CLASS 150

52 R 4,043,368

CLASS 151

21 C 4,043,369

CLASS 152

354 4,043,370
4,043,372
362 R 4,043,371
365 4,043,373
405 4,043,374

CLASS 156

47 4,043,851
94 4,043,853
158 4,043,854
178 4,043,855
195 4,043,856
198 4,043,857
251 4,043,858
566 4,043,859
624 4,043,860
636 4,043,861

CLASS 157

1 4,043,375

CLASS 162

135 4,043,862
158 4,043,863

CLASS 164

7 4,043,376
4,043,377
17 4,043,378
23 4,043,379
41 4,043,380
65 4,043,381
76 4,043,382
274 4,043,383
282 4,043,384
342 4,043,385

CLASS 165

45 4,043,386
105 4,043,387
166 4,043,388

CLASS 166

55 4,043,389
215 4,043,390
217 4,043,391
4,043,392
248 4,043,393
253 4,043,394
263 4,043,395
274 4,043,396

CLASS 169

45 4,043,397

CLASS 171

16 4,043,398

CLASS 172

42 4,043,399
43 4,043,400
59 4,043,401
112 4,043,402
413 4,043,403
555 4,043,404

CLASS 173

127 4,043,405

CLASS 174

23 R 4,044,200
52 FP 4,044,201
60 Re.29,371

CLASS 175

50 4,043,407
321 4,043,409
323 4,043,410
369 4,043,411

CLASS 176

37 4,043,864
4,043,865
40 4,043,866
4,043,867
50 4,043,868

CLASS 177

25 4,043,412
126 4,043,413
248 4,043,414
255 4,043,415

CLASS 178

88 4,044,202

CLASS 179

1.P 4,044,203
4,044,205
1 SA 4,044,204
84 VF 4,044,206
100.3 B 4,044,207

CLASS 180

6.48 4,043,416
9.54 4,043,417
98 4,043,418
117 4,043,421
132 4,043,419
140 4,043,422

CLASS 181

117 4,043,420

CLASS 182

22 4,043,423
230 4,043,424

CLASS 184

55 A 4,043,425

CLASS 186

1 AC 4,043,426

CLASS 187

12 4,043,427
17 4,043,428
29 R 4,043,429
52 R 4,043,430

CLASS 188

1 B 4,043,431
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73.4 4,043,433
296 4,043,434
319 4,043,435

CLASS 191

32 4,043,436

CLASS 192

13 R 4,043,437

CLASS 195

63 4,043,869
66 R 4,043,870
99 4,043,871
103.5 A 4,043,872

CLASS 197

1 R 4,043,438
18 4,043,439
114 R 4,043,440

CLASS 198

317 4,043,441
420 4,043,442
525 4,043,443
557 4,043,444
611 4,043,445
728 4,043,446
827 4,043,447

CLASS 200

51.09 4,044,208
61.21 4,044,209
148 A 4,044,211
148 H 4,044,210
283 4,044,212
308 4,044,213
316 4,044,214
318 4,044,215

CLASS 203

46 4,043,873
47 4,043,874
82 4,043,875

CLASS 204

9 4,043,876
15 4,043,877
16 4,043,878
18 PC 4,043,879
35 N 4,043,880
102 4,043,881
106 4,043,882
129.65 4,043,883
131 4,043,884
4,043,885
157.1 R 4,043,886
159.23 4,043,887
192 R 4,043,889
192 S 4,043,888
195 S 4,043 890
231 4,043,891
247 4,043,892
281 4,043,893
297 W 4,043,894
301 4,043,895
4,043,896

CLASS 206

1.5 4,043,448
45.14 4,043,449
4,043,450
334 4,043,451
343 4,043,452
349 4,043,453
613 4,043,503

CLASS 208

11 R 4,043,897
50 4,043,898
161 4,043,899
216 4,043,900

CLASS 209

10 4,043,901
81 R 4,043,454
166 4,043,902
167 4,043,455

CLASS 210

22 C 4,043,903
28 4,043,904
31 C 4,043,905
4,043,906
32 4,043,907
43 4,043,908
49 4,043,909
53 4,043,910
62 4,043,911
83 4,043,912
169 4,043,913
4,043,914
195 R 4,043,915
238 4,043,916
323 T 4,043,917
356 4,043,918
407 4,043,919
525 4,043,920

CLASS 211

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CLASS 213

75 B 4,043,457

CLASS 214

6 B 4,043,461
6 BA 4,043,460
6 D 4,043,458
6 DK 4,043,459
10.5 R 4,043,462
16.4 A 4,043,463
17 CA 4,043,464
17 DB 4,043,465
18 SC 4,043,466
52 C 4,043,467
85 4,043,468
138 R 4,043,469
145 A 4,043,470
152 4,043,471
750 4,043,472

CLASS 215

21 4,043,473
211 4,043,474
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CLASS 219

69 E 4,044,216
76 4,044,217
91 4,044,218
100 4,044,219
119 4,044,220
121 LM 4,044,222
135 4,044,223
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322 4,044,224
336 4,044,225
521 4,044,226

CLASS 220

19 4,043,476
23.4 4,043,477
90.2 4,043,478
266 4,043,481
271 4,043,479
307 4,043,482
334 4,043,480

CLASS 221

155 4,043,483
213 4,043,484
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CLASS 222

134 4,043,486
4,043,487
233 4,043,488
4,043,489
442 4,043,490
503 4,043,491

CLASS 223

30 4,043,492

CLASS 224

45 S 4,043,493

CLASS 226

4,043,494
109 4,043,495
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CLASS 227

116 4,043,504

CLASS 228

2 4,043,496
4,043,497
4,043,499
173 4,043,500
175 4,043,498
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CLASS 229

14 BE 4,043,501
17 B 4,043,502

CLASS 235

61.11 A 4,044,229
61.11 C 4,044,230
61.12 N 4,044,231
61.7 R 4,044,227
61.9 A 4,044,228
92 PE 4,044,233
92 SB 4,044,232
150.21 4,044,234
4,044,235
4,044,236
150.27 4,044,237
151.1 4,044,238
151.3 4,044,239
4,044,240
152 4,044,241
4,044,242
4,044,243
153 AC 4,044,244

CLASS 239

11 4,043,505
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102 4,043,507
265.19 4,043,508
265.41 4,043,509
323 4,043,510
394 4,043,511
402.5 4,043,512

CLASS 240

6.4 CL 4,044,245
78 CF 4,044,246

CLASS 241

24 4,043,513
36 4,043,514
97 4,043,515
252 4,043,516

CLASS 242

18 DD 4,043,517
45 4,043,518
55.53 4,043,519
58.1 4,043,520
58.3 Re.29,365
84.41 4,043,521

CLASS 244

54 4,043,522
87 4,043,523
118 R 4,043,524
137 R 4,043,525
194 4,043,526

CLASS 248

65 4,043,527
251 4,043,528
419 4,043,529
453 4,043,530
537 4,043,531

CLASS 250

199 4,044,247
201 4,044,248
213 VT 4,044,249
216 4,044,250
282 4,044,252
302 4,044,253
311 4,044,254
4,044,255
4,044,256
336 4,044,258
342 4,044,251
344 4,044,257
360 4,044,259
4,044,260
369 4,044,261
381 4,044,262
4,044,263
409 4,044,264
439 P 4,044,265
441 4,044,266
518 4,044,267

CLASS 251

11 4,043,532
57 4,043,533
174 4,043,534
329 4,043,535

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8.5 C 4,043,921
8.55 D 4,043,922
8.75 4,043,923
21 4,043,924
49.3 4,043,925
49.9 4,043,926
52 R 4,043,927
60 4,043,928
62.1 R 4,043,929
89 R 4,043,930
93 4,043,931
95 4,043,932
182 4,043,933
186 4,043,934
299 4,043,935
301.1 W 4,043,936
407 4,043,937
412 4,043,938
416 4,043,939
426 4,043,940
430 4,043,941
4,043,942
437 4,043,943
441 4,043,944
466 J 4,043,945
4,043,946

CLASS 254

2 R 4,043,536
134.4 4,043,537
168 4,043,538

CLASS 259

4 AB 4,043,539
171 4,043,540

CLASS 260

2.1 E 4,043,948
2.5 AC 4,043,949
2.5 AH 4,043,951
2.5 F 4,043,950
2.5 FP 4,043,958
17.4 ST 4,043,952
18 S 4,043,953
19 A 4,043,954
23 R 4,043,956
23 XA 4,043,957
23.7 A 4,043,955
23.7 M 4,043,947
27 R 4,043,959
29.3 4,043,962
4,043,970
29.4 R 4,043,960
4,043,963
29.6 F 4,043,964
4,043,965
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29.6 WA 4,043,961
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45.75 C 4,043,974
45.75 W 4,043,975
45.8 N 4,043,976
45.8 NT 4,043,973
45.9 NC 4,043,972
46.5 UA 4,043,977
47 C 4,043,981
47 CP 4,043,978
47 UA 4,043,982
4,044,044
47 UP 4,043,979
47 XA 4,043,980
65 4,043,983
67.6 R 4,043,984
75 T 4,043,985
78 UA 4,043,986
78.41 4,043,987
96.5 C 4,044,052
112 R 4,043,989
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112.5 LH 4,043,993
4,043,994
112.5 R 4,043,991
4,043,992
117 4,043,995
118 4,043,996
122 4,043,997
141 4,043,998

152 4,043,999
239 BD 4,044,003
239.1 4,044,000
239.3 R 4,044,001
239.55 C 4,044,004
251 R 4,044,008
4,044,009
268 TR 4,044,010
289 XA 4,044,011
293.53 4,044,012
293.63 4,044,013
293.73 4,044,014
294.8 C 4,044,015
295 AM 4,044,017
295 F 4,044,016
307 A 4,044,018
326.47 4,044,023
328 4,044,024
332.1 4,044,025
340.9 R 4,044,026
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348.11 4,044,028
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448.2 P 4,044,038
453 RW 4,044,039
456 P 4,044,040
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583 P 4,044,053
584 A 4,044,054
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609 E 4,044,056
617 F 4,044,057
618 C 4,044,058
635 A 4,044,059
651 R 4,044,060
668 R 4,044,061
674 SA 4,044,062
676 R 4,044,063
4,044,064
677 R 4,044,065
680 E 4,044,066
4,044,067
683.3 4,044,068
683.47 4,044,069
836 4,044,070
857 TW 4,044,071
859 PV 4,044,072
860 4,044,073
862 4,043,988
928 4,044,074
943 4,044,075
969 4,044,076

CLASS 261

23 A 4,044,077
30 4,044,078
36 R 4,044,079
44 R 4,044,080
51 4,044,081

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1 4,044,082
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45.3 4,044,083
51 4,044,084
90 4,044,085
97 4,044,086
113 4,044,087
130 4,044,088
167 4,044,089
187 4,044,090
251 4,044,091
318 4,044,092

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268 4,043,541
270 4,043,542
275 4,043,543

CLASS 267

83 4,043,544
116 4,043,545
162 4,043,546

CLASS 269

136 4,043,547
321 F 4,044,093

CLASS 271

80 4,043,548
118 4,043,549
233 4,043,550
243 4,043,551

CLASS 272

120 4,043,552
128 4,043,553

CLASS 273

1 M 4,043,554
73 D 4,043,555
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4,043,557
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130 R 4,043,559
135 AC 4,043,560
138 R 4,043,406
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164 4,043,562
171 4,043,563

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212 FB 4,043,564

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11.12 4,043,565
11.37 E Re.29,366
87.04 A 4,043,566
96.1 4,043,567
154.5 R 4,043,568
423 R 4,043,569
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716 4,043,571
738 4,043,572

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CLASS 285

21 4,043,574
90 4,043,575
322 4,043,576

CLASS 291

25 4,043,577

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24 R 4,043,582
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35 R 4,043,584
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353 4,043,594

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4 4,043,599
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16 4,043,602

CLASS 301

63 PW 4,043,603

CLASS 303

33 4,043,604
37 4,043,605
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100 4,043,607
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9 4,043,612
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10 4,043,614
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36.3 4,043,616
72 4,043,617
174 4,043,618
187.1 4,043,619
187.2 4,043,620
189 R 4,043,621
208 4,043,622
238 4,043,623

CLASS 310

83 4,044,274
313 4,044,273

CLASS 312

214 4,043,624
351 4,043,625

CLASS 313

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218 4,044,276
318 4,044,277
417 4,044,278

CLASS 315

39.51 4,044,279
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171 4,044,281
382 4,044,282

CLASS 318

128 4,044,283
227 4,044,284
4,044,285
297 4,044,286
432 4,044,287
485 4,044,288
571 4,044,289
640 4,044,290
696 4,044,291

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2 4,044,292
15 4,044,293

CLASS 322

25 4,044,296

CLASS 323

4 4,044,297
44 F 4,044,298

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29.5 4,044,300
33 4,044,301
34 MC 4,044,302
95 4,044,303
133 4,044,304
154 R 4,044,305

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38 B 4,044,306
42 4,044,307
144 4,044,308
478 4,044,309

CLASS 328

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139 4,044,311
165 4,044,312

CLASS 330

207 P 4,044,313

CLASS 331

1 A 4,044,314
94.5 F 4,044,315
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116 R 4,044,317

CLASS 333

1 4,044,318
7 R 4,044,319
4,044,320
72 4,044,321

CLASS 335

131 4,044,322
240 4,044,323
260 4,044,324

CLASS 337

66 4,044,325
248 4,044,326

CLASS 338

166 4,044,327

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75 R 4,043,627
99 R 4,043,628
126 J 4,043,629
218 M 4,043,630
252 R 4,043,631

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173 DR 4,044,342
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4,044,341
4,044,343
227.1 4,044,348
324 M 4,044,345
4,044,349
336 4,044,346
347 DD 4,044,347
407 4,044,350
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4,044,355
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18 A 4,044,358
100 LE 4,044,359
754 4,044,360
4,044,361

CLASS 346

136 4,044,362

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54 4,043,633
160 LC 4,043,634
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4,043,639
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160 P 4,043,637
160 R 4,043,635
162 SF 4,043,674
181 4,043,641
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200 4,043,643
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4,043,646
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3 P 4,043,654
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4,043,658
15 4,043,659
43 4,043,660
50 4,043,661
71 4,043,662
73 4,043,663
75 4,043,664
76 4,043,665
4,043,666
97 4,043,667

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73 4,043,668
104 4,043,669
106 R 4,043,671
106 S 4,043,670
152 4,043,672
160 4,043,673
191 4,043,675
226 4,043,676
227 4,043,677
246 4,043,678
249 4,043,679

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30 4,044,372
41 4,044,373
80 4,044,374

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40 4,044,375
84 4,044,376
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128 4,044,378
4,044,379
142 4,044,380
160 4,044,381
260 4,044,382
264 4,044,383
293 4,044,384
300 4,044,385

CLASS 360

60 4,044,386
61 4,044,387
70 4,044,388
73 4,044,389
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96 4,044,391
113 4,044,392
117 4,044,393
123 4,044,394

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44 4,044,395
385 4,044,396
398 4,044,397

CLASS 363

25 4,044,294
54 4,044,295

CLASS 364

200 4,044,333
4,044,334
4,044,337
900 4,044,331
4,044,332
4,044,335
4,044,336
4,044,338
4,044,398

CLASS 401

40 4,043,680
151 4,043,681
199 4,043,682
264 4,043,683

CLASS 403

8 4,043,684
19 4,043,685
90 4,043,686
109 4,043,687
209 4,043,688
252 4,043,689
268 4,043,690
322 4,043,691
373 4,043,692

CLASS 404

64 4,043,693
133 4,043,694

CLASS 408

1 R 4,043,695
179 4,043,696
182 4,043,697
201 4,043,698
4,043,699
237 4,043,700
241 G 4,043,701

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CLASS 416

230 4,043,703

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151 4,043,705
353 4,043,706
360 4,043,707
363 4,043,708
404 4,043,709
440 4,043,710
469 4,043,711
477 4,043,712
499 4,043,713

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123 4,043,714

CLASS 423

32 4,044,094
127 4,044,095
150 4,044,096
186 4,044,097
210 4,044,098
4,044,099
226 4,044,100
235 4,044,101
239 4,044,102
267 4,044,103
302 4,044,104
308 4,044,105
312 4,044,106
320 4,044,107
321 R 4,044,108
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346 4,044,110
351 4,044,111
490 4,044,112
500 4,044,113
574 R 4,044,114
631 4,044,115
658.5 4,044,116
659 4,044,117

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22 4,044,119
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71 4,044,121
180 4,044,122
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232 4,044,125
243 4,044,126
246 4,044,127
4,044,128
248.56 4,044,129
4,044,130
248.58 4,044,131
250 4,044,132
4,044,142
251 4,044,133
4,044,134
4,044,135
256 4,044,136
258 4,044,137
263 4,044,138
266 4,044,139
4,044,140
4,044,141
267 4,044,143
269 4,044,144
273 R 4,044,145
283 4,044,146
309 4,044,147
317 4,044,148
4,044,149
321 4,044,150
4,044,151
329 4,044,152
330 4,044,153

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6 4,043,716
7 4,043,717
72 S 4,043,718
113 4,043,720
115 4,043,719
116 4,043,721
174.8 R 4,043,722
186 4,043,723
218 4,043,724
256 4,043,728
348 R 4,043,729
352 4,043,730
366 4,043,731
371 4,043,732
4,043,733
389 4,043,735
397 4,043,736
434 4,043,737
456 4,043,738
461 4,043,739
532 4,043,734
542 4,043,725
563 4,043,726
567 4,043,740
578 4,043,727

CLASS 426

21 4,044,154
62 4,044,155
69 4,044,156
250 4,044,157
271 4,044,158
302 4,044,159
330 4,044,160
421 4,044,161
427 4,044,162
502 4,044,163
535 4,044,164
557 4,044,165
560 4,044,166
594 4,044,167
613 4,044,168
656 4,044,169

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55 4,044,172
101 4,044,173
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17	4,044,179	283	4,044,188	**CLASS 431**		60	4,043,747			185	4,044,007
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										313	4,044,019
										369	4,044,022

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D6—	4	245,463	D9—	224	245,478	D12—	5	245,492		64	245,505			245,542		5 L	245,525
	27	245,464			245,479		55	245,493	D22—	19	245,506		54	245,543			245,526
	45	245,465		248	245,480		90	245,494	D23—	32	245,507		62	245,539			245,527
	74	245,466	D10—	64	245,481		101	245,495			245,508			245,540		15 AN	245,530
	95	245,467		96	245,482		156	245,496		92	245,509		64	245,537		15 C	245,531
	175	245,468			245,483		193	245,497		113	245,510	D25—	22	245,517		15 JJ	245,529
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	178	245,473		106	245,488	D15—	7	245,501		29	245,515	D30—	1	245,521			245,535
D8—	30	245,474	D11—	26	245,489		17	245,502		33	245,516		43	245,522			245,536
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PATENTS

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	4,043,204		4,043,326		4,043,918		4,043,686		4,043,349		4,043,561
	4,043,901		4,043,334		4,043,934		4,043,832		4,043,587		4,043,568
3 :	4,043,690		4,043,341		4,043,943		4,044,083		4,043,687		4,043,601
4 :	4,043,198		4,043,373		4,043,969		4,044,096		4,043,719		4,043,609
	4,043,291		4,043,387		4,043,979		4,044,232		4,043,723		4,043,623
	4,043,302		4,043,412		4,043,989		4,044,263		4,043,728		4,043,650
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5 :	4,043,064		4,043,461		4,044,039		4,043,181	13 :	4,043,179		4,043,738
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	4,043,490		4,043,489		4,044,077		4,043,315		4,043,682		4,043,808
	4,043,679		4,043,498		4,044,078		4,043,528		4,043,851		4,043,859
	4,043,708		4,043,505		4,044,092		4,043,621		4,044,187		4,043,891
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	4,042,975		4,043,525		4,044,128		4,043,828		4,044,163		4,044,062
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	4,042,984		4,043,565		4,044,207		4,043,920		4,043,071		4,044,157
	4,042,986		4,043,566		4,044,241		4,043,933		4,043,086		4,044,158
	4,042,987		4,043,573		4,044,246		4,043,958		4,043,087		4,044,160
	4,042,990		4,043,575		4,044,247		4,044,009		4,043,092		4,044,181
	4,043,000		4,043,597		4,044,257		4,044,015		4,043,119		4,044,280
	4,043,008		4,043,598		4,044,270		4,044,055		4,043,143		4,044,296
	4,043,016		4,043,612		4,044,271		4,044,134		4,043,144		4,044,317
	4,043,025		4,043,617		4,044,281		4,044,137		4,043,168		4,044,378
	4,043,036		4,043,628		4,044,289		4,044,139		4,043,169	18 :	Re.29,367
	4,043,038		4,043,631		4,044,302		4,044,147		4,043,200		4,043,088
	4,043,041		4,043,636		4,044,303		4,044,183		4,043,222		4,043,226
	4,043,043		4,043,644		4,044,316		4,044,267		4,043,227		4,043,273
	4,043,044		4,043,651		4,044,321		4,044,395		4,043,244		4,043,274
	4,043,045		4,043,668		4,044,323		4,044,398		4,043,258		4,043,478
	4,043,061		4,043,674		4,044,328	10 :	4,043,005		4,043,272		4,043,624
	4,043,066		4,043,689		4,044,335		4,043,010		4,043,276		4,043,790
	4,043,096		4,043,702		4,044,347		4,043,722		4,043,286		4,043,791
	4,043,103		4,043,717		4,044,352		4,043,752		4,043,320		4,043,810
	4,043,113		4,043,742		4,044,360		4,043,763		4,043,333		4,043,905
	4,043,117		4,043,760		4,044,362		4,043,793		4,043,340		4,043,960
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	4,043,215		4,043,885		4,043,342		4,043,083		4,043,479		4,044,375
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U. S. GOVERNMENT PRINTING OFFICE : O - 1977

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PATENT AND TRADEMARK OFFICE NOTICES

United States Patent and Trademark Office Before the Commissioner of Patents and Trademarks

IN RE LEWIS A. PALEY, RESPONDENT. PROCEEDING FOR SUSPENSION OR DISBARMENT

Final Order

Lewis A. Paley of Aurora, Illinois, whose registration number is 11,294, is hereby suspended for a two-year period, beginning with the date of this order from practice as a Patent Agent in applications before the United States Patent and Trademark Office, without prejudice to his re-registration thereafter upon a sufficient showing.

This action is taken under the provisions of Section 32 to Title 35, U.S. Code, and Section 1.348, Title 37, of the Code of Federal Regulations.

Dated: Feb. 16. 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Board of Appeals Decisions Rendered in the Month of July 1977

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Patent Suits

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3,032,345, J. H. Lemelson, TARGET GAME; **3,917,271,** Lemelson and Elfman, BALL FOR TARGET GAMES, **filed** Mar. 30, 1977, D.C., S.D.N.Y., Doc. 77–C–1515, *Synergistics Research Corporation and Jerome H. Lemelson* v. *Frankl Toy Company et al.*

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3,374,844, E. L. Rogers, APPARATUS AND METHOD FOR WEIGHING RAILROAD CARS IN MOTION, **filed** Apr. 21, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1379, *Railweight, Inc.* v. *Mangood Corporation.*

3,482,372, W. J. Hottendorf, METHOD AND APPARATUS FOR PACKAGING CONTAINERS, **filed** Mar. 27, 1973, D.C. Del. (Wilmington) Doc. 4617, *International Paper Company* v. *Fibreboard Corporation.* This action is dismissed with prejudice, Mar. 29, 1977.

3,546,478, J. M. Lindsey, BOREHOLE TOOL, **filed** Apr. 11, 1977, D.C., S.D. Tex. (Houston) Doc. CA H–77–568, *Sperry-Sun Well Surveying Co.* v. *Eastman Whipstock, Inc.*

3,619,381, G. R. Fitterer, DETERMINING OXYGEN CONTENT OF MATERIALS; **3,752,753,** same, METHOD OF FABRICATING A SENSOR FOR THE DETERMINATION OF THE OXYGEN CONTENT OF LIQUID METALS; **3,733,641,** same, MEANS FOR DETERMINING OXYGEN CONTENT OF LIQUID METALS, **filed** Dec. 6, 1976, D.C., W.D. Pa. (Pittsburgh) Doc. 76–1250, *Fitterer Engineering Assoc., etc.* v. *Electro-Nite Co.* Defendant is not to infringe on plaintiff's patents, Apr. 21, 1977.

3,647,990, Eul, Jr. and Richter, DEMAGNETIZER/CLEANER, **filed** Apr. 13, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77–C–707, *Ampex Corporation* v. *Robins Industries Corporation.*

3,736,584, Hackett and Goble, MOTION DETECTOR AND INTRUDER ALARM SYSTEM, **filed** Apr. 13, 1977, D.C., W.D.N.Y. (Buffalo) Doc. C–77–169, *Detection Systems, Inc.* v. *Pittway Corporation.*

3,746,518, F. C. Holtz, Jr., ALLOY COMPOSITION AND PROCESS, **filed** Apr. 8, 1977, D.C., S.D.N.Y., Doc. 77–C–1706, *Stora Kopparberg Corporation* v. *C. Marshall Dann, Commissioner of Patents and Trademarks.*

3,752,753. (See 3,619,381.)

3,773,641. (See 3,619,381.)

3,792,133, R. R. Goughnour, METHOD FOR SLIP-FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION; **3,957,405,** same, SLIP FORM HAVING HINGED GATE MEANS; **4,014,633,** same, ADJUSTABLE SLIP FORM, **filed** Apr. 18, 1977, D.C., N.D. Ga. (Atlanta) Doc. C77–604, *A. C. Aukerman Co.* v. *Pittman Highway Contracting Co., Inc.*

3,811,780, M. D. Liston, CHEMICAL ANALYSIS CUVETTE, **filed** Aug. 29, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c2911, *Abbott Laboratories* v. *Robert A. Stough & Company, Inc.* Defendant is hereby permanently restrained and enjoined from directly or indirectly infringing said patent, Mar. 4, 1977. **Same, filed** Mar. 11, 1977, D.C. Conn. (Bridgeport) Doc. B–77–76, *Centaur Chemical Co.* v. *Abbott Laboratories.*

3,815,285, H. S. Kuyper, COVERED WINDOW SASH AND METHOD FOR MAKING THE SAME, **filed** Oct. 15, 1975, D.C., W.D.N.Y. (Buffalo) Doc. 75–436, *Rolscreen Company* v. *King Bros. Wholesale Co., Inc. et al.* Consent decree and permanent injunction and order of dismissal as to certain defendants, Oct. 27, 1976.

3,818,196, Walker and Maloy, AUTOMATIC DIRECT-READING PHOTOMETER APPARATUS AND METHOD, **filed** Apr. 12, 1977, D.C., S.D. Calif. (San Diego) Doc. 77–0234–T, *Gamma Scientific, Inc.* v. *Kollmorgen Technologies Corporation.*

3,820,642. (See 3,307,671.)

3,828,903. (See 3,307,671.)

3,829,634. (See 3,307,671.)

3,913,744, Turner and Thomas, LUMBER SORTER APPARATUS, **filed** Apr. 15, 1977, D.C. Oreg. (Portland) Doc. C–77–324, *Donald B. Turner et al.* v. *U.S. Natural Resources, Inc.*

3,917,271. (See 3,032,345.)

3,957,405. (See 3,792,133.)

3,963,035. (See 3,307,671.)

3,999,552, W. H. Huggins, EPILATOR, **filed** Feb. 10, 1977, D.C., S.D.N.Y., Doc. 77–C–0685, *Depilatron, Inc.* v. *Individually Yours, Inc. and Individually Yours, International, Ltd.* **Same, filed** Mar. 29, 1977, D.C. Conn. (Bridgeport) Doc. B–77–112, *Epilator Corporation* v. *Universal Technology, Inc. and Depilatron, Inc.*

4,014,633. (See 3,792,133.)

D. 215,979, H. P. Post, DISPLAY CABINET FOR MERCHANDISE, **filed** Mar. 7, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c763, *M.G. Design Associates, Inc.* v. *Display Workshop, Inc.*

D. 231,758, A. Rosselli, COUCH; **D. 231,759,** same, ARMCHAIR, **filed** Apr. 6, 1977, D.C., S.D.N.Y., Doc. 77–C–1633 CBM, *Industria Arredamenti Fratelli Saporiti* v. *Eros Leather Furniture Corp.*

D. 231,759. (See D. 231,758.)

D. 234,727, R. Mark, COSMETIC VANITY CONTAINER, **filed** Apr. 20, 1977, D.C., E.D.N.Y. (Brooklyn) Doc. 77–C–834, *Harbor Trading Company* v. *Cosmepak, Inc.*

D. 243,032, D. R. Hodges, PLANTER, **filed** Apr. 29, 1977, D.C. N.D. Tex. (Dallas) Doc. CA3–77–0595–D, *Fitz and Floyd, Inc.* v. *The Whittier Potteries, Inc. and Jack Manes Associates.*

D. 243,217, E. E. Warsaw, SOFA, **filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–998–DWW, *Sheffield Furniture Corp.* v. *Bailey Schmitz.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV–77–999–WPG, *Sheffield Furniture Corp.* v. *Brand Furniture Manufacturing Co.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1000–LTL, *Sheffield Furniture Corp.* v. *Cal Custom Furniture Mfg.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1001–HP, *Sheffield Furniture Corp.* v. *Cal-Pacific Furniture.* **Same, filed** Mar. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1003–R, *Sheffield Furniture Corp.* v. *Charm Furniture Mfg. Corp.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1006–LEW, *Sheffield Furniture Corp.* v. *Cims Furniture & Cabinet Mfg.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV–77–1007–HP, *Sheffield Furniture Corp.* v. *Claridge Furniture Mfg. Co., Inc.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1008–RF, *Sheffield Furniture Corp.* v. *Coleman of California.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1009–R, *Sheffield Furniture Corp.* v. *De Ville Furniture Mfg. Co., Inc.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1010–MML, *Sheffield Furniture Corp.* v. *Fedco, Inc.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc.CV77–1011–AAH, *Sheffield Furniture Corp.* v. *Furniture Guild.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1012–RJK, *Sheffield Furniture Corp.* v. *R.B. Furniture.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1013–FW, *Sheffield Furniture Corp.* v. *Riviera Convertibles.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1014–WPG, *Sheffield Furniture Corp.* v. *Royal Pacific Furniture Mfg. Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1015–AAH, *Sheffield Furniture Corp.* v. *Shelly & Anderson Furniture Mfg. Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1016–RF, *Sheffield Furniture Corp.* v. *Sofa Line.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1017–RMT, *Sheffield Furniture Corp.* v. *Sofas Unlimited.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1020–WPG, *Sheffield Furniture Corp.* v. *Town House Mfg. Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1021–HP, *Sheffield Furniture Corp.* v. *William Volker & Co.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1022–LTL, *Sheffield Furniture Corp.* v. *B. P. John Furniture.* **Same, filed** Mar. 18, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1023–WMB, *Sheffield Furniture Corp.* v. *Style Crest of California.* **Same, filed** Mar. 22, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–1059–IH, *Sheffield Furniture Corp.* v. *Capitol Furniture.* **Same, filed** Mar. 31, 1977, D.C. Ariz. (Phoenix) Doc. C–77–258 Phx, *Sheffield Furniture Corp.* v. *Lunn Furniture Mfg. Co.* **Same, filed** Mar. 31, 1977, D.C. Ariz. (Phoenix) Doc. C–77–259 Phx, *Sheffield Furniture Corp.* v. *Richardson Furniture Mfg. Co.* **Same, filed** Mar. 31, 1977, D.C. Ariz. (Phoenix) Doc. C–77–260 Phx, *Sheffield Furniture Corp.* v. *Continental Mfg. Co.* **Same, filed** Apr. 6, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1157, *Sheffield Furniture Corp.* v. *Covington Furniture.* **Same, filed** Apr. 6, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c1158, *Sheffield Furniture Corp.* v. *Kingsley Manufacturing Co.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,526,001, Re. S.N. 810,007, Filed June 24, 1977, Cl. 210/23, PERMEATION SEPARATION DEVICE FOR SEPARATING FLUIDS AND PROCESS RELATING THERETO, William G. Smith, Owner of Record: *E. I. Du Pont De Nemours and Company, Wilmington, Del.,* Attorney or Agent: Gary A. Samuels, Ex. Gp.: 176

3,660,344, Re. S.N. 813,415, Filed July 6, 1977, Cl. 260/37 N, SELF-EXTINGUISHING POLYAMIDE MOULDING COMPOSITIONS, Dietrich Michael, et al., Owner of Record: *Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany,* Attorney or Agent: Allan R. Plumley, et al., Ex. Gp.: 141

3,820,083, Re. S.N. 813,402, Filed July 5, 1977, Cl. 340/172.5, CODED DATA ENHANCER, SYNCHRONIZER, AND PARITY REMOVER SYSTEMS, John L. Way, Owner of Record: *Bell & Howell Company, Chicago, Ill.,* Attorney or Agent: Luc P. Benoit, Ex. Gp.: 237

3,892,062, Re. S.N. 812,411, Filed July 1, 1977, Cl. 57/34 R, APPARATUS AND METHOD FOR START-SPINNING ON AN OPEN-END SPINNING MACHINE, Fritz Stahlecker, et al., Owner of Record: *Inventors,* Attorney or Agent: Paul M. Craig, Jr., et al., Ex. Gp.: 244

3,926,411, Re. S.N. 812,468, Filed July 1, 1977, Cl. 254/89 R, LIFTING JACK, Sheldon D. Tegtmeier, Owner of Record: *Tegtmeier & Sons, Inc., West Fargo, N. Dak.,* Attorney or Agent: John W. Adams, Ex. Gp.: 323

PATENT NOTICES

Certificates of Correction for the Week of Aug. 30, 1977

D. 243,899	4,000,541	4,019,692	4,024,515
D. 244,519	4,001,263	4,019,861	4,024,689
3,681,299	4,002,304	4,019,962	4,025,303
3,728,382	4,002,305	4,019,995	4,025,311
3,734,919	4,003,518	4,020,150	4,025,315
3,764,869	4,003,557	4,020,227	4,025,393
3,786,195	4,003,866	4,020,233	4,025,413
3,796,743	4,004,233	4,020,919	4,025,628
3,798,116	4,004,526	4,020,929	4,025,706
3,815,698	4,004,799	4,021,069	4,025,716
3,852,642	4,006,149	4,021,240	4,025,738
3,875,004	4,006,231	4,021,275	4,025,756
3,876,544	4,006,292	4,021,310	4,025,773
3,909,209	4,006,672	4,021,376	4,025,789
3,923,740	4,007,045	4,021,591	4,026,100
3,928,911	4,007,524	4,021,592	4,026,141
3,939,189	4,009,866	4,021,625	4,026,351
3,940,541	4,011,249	4,021,642	4,026,659
3,947,714	4,013,120	4,022,411	4,026,685
3,954,161	4,013,813	4,022,448	4,026,812
3,955,659	4,013,840	4,022,716	4,026,860
3,957,992	4,014,242	4,022,778	4,026,934
3,966,880	4,014,915	4,022,851	4,026,973
3,976,158	4,015,218	4,022,912	4,027,008
3,976,198	4,016,263	4,022,996	4,027,037
3,977,310	4,016,846	4,023,009	4,027,038
3,978,529	4,017,024	4,023,027	4,027,219
3,979,481	4,017,388	4,023,046	4,027,226
3,982,622	4,017,453	4,023,083	4,027,278
3,983,385	4,017,716	4,023,139	4,027,850
3,987,117	4,017,784	4,023,228	4,027,952
3,990,776	4,018,048	4,023,308	4,028,128
3,991,187	4,018,158	4,023,315	4,028,179
3,992,527	4,018,613	4,023,463	4,028,204
3,992,552	4,018,716	4,023,586	4,028,226
3,995,033	4,018,774	4,023,877	4,028,418
3,995,256	4,018,865	4,023,898	4,028,440
3,995,668	4,018,946	4,024,032	4,028,537
3,995,981	4,018,965	4,024,082	4,028,629
3,996,285	4,019,069	4,024,093	4,029,214
3,996,410	4,019,206	4,024,135	4,030,023
3,996,515	4,019,325	4,024,186	4,030,069
3,996,847	4,019,423	4,024,260	4,030,071
3,999,004	4,019,662	4,024,385	4,035,568

Disclaimer

3,885,630.—*Edwin A. Richardson,* Houston, Tex. BUFFER-REGULATER CARBONATE ACIDIZATION. Patent dated May 27, 1975. Disclaimer filed July 5, 1977, by the assignee, *Shell Oil Company.*

Hereby enters this disclaimer to all claims of said patent.

Disclaimers and Dedications

3,754,737.—*John A. O'Dea,* Columbus, Ohio. DIRECT GEAR DRIVE FOR TRUCK MIXER DRUM. Patent dated Aug. 28, 1973. Disclaimer and dedication filed May 15, 1977, by the assignee, *Fairfield Manufacturing Company, Inc.*

Hereby disclaims and dedicates to the Public claims 1–16 of said patent.

3,912,238.—*Merrill D. Martin,* Oakland, Calif. CONVEYOR SYSTEM FOR CONVEYING SHEETS. Patent dated Oct. 14, 1975. Disclaimer and dedication filed May 6, 1977, by the inventor.

Hereby disclaims and dedicates all claims of said patent.

Dedication

4,027,616.—*Robert O. Guenther,* Irving, *Donald F. Huffhines,* Richardson, *James W. Krall,* Irving, and *Charles D. Ray,* Dallas, Tex. PROTECTION MEANS FOR DEPTH CONTROL DEVICE. Patent dated June 7, 1977. Dedication filed July 14, 1977, by the assignee, *Mobil Oil Corporation.*

Hereby dedicates to the Public the entire term of said patent.

Patents Available for Licensing or Sale

3,028,828. FLOTATION DEVICE FOR SHIPS. Joseph Girolame, 10 Helen St., Johnson City, N.Y. 13790.

3,482,418. FOOD STORAGE APPARATUS. Georgia Lee Moore, P.O. Box 21425, Houston, Tex. 77026.

3,511,338. LADDER STAND WITH AUXILIARY PLATFORM. Edwin H. Chapman, West Union, W. Va., % C & S Sales Co., 101 Neely Ave., West Union, W. Va. 26456.

3,589,717. BICYCLE-SUPPORTING STAND FOR EXERCISING. Charles M. Alexander, 937 B. Joyce St., SW., Atlanta, Ga. 30314.

3,605,386. FURNACE EXHAUST POLLUTION ELIMINATOR. Paul H. Brown, % J. Gibson Semmes, Esq., 3524 K St. NW., P.O. Box 3559, Washington, D.C. 20007.

3,618,059. ELECTRONIC DETECTION AND TRACING MEANS. Milton F. Allen, 2989 McCully Drive NE., Atlanta, Ga. 30345.

3,744,453. DOGGONIT. Gershon Deitch, 553 Chelsea Road, Oceanside, N.Y. 11572.

3,781,920. WATER DISCHARGE VALVE FOR TOILET BOWL. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,790,043. METHOD AND APPARATUS FOR REMOVING WRINKLES FROM SLACKS OR THE LIKE. Elmer R. Hagen, Royal Arms, Apt. #6, 230 W. Genesee St., Auburn, N.Y. 13021.

3,796,209. SPACE HEATER. Alfred Luft, 3031 Regatta Drive, Sarasota, Fla. 33581.

3,812,086. SANDWICH TOAST PRESS. Evelyn Trovinger, 1425 Lake St., Lodi, Calif. 95240.

3,820,001. TRANSISTOR POWER CONVERTER. Jan Van Valkenburg Schaefer, 2345 Sea Breeze Drive, San Diego, Calif. 92139.

3,862,719. BALL MILL FOR TREATING USED CASTING SAND. W. G. Fasse, P.O. Box K, St. Albans, Maine. 04971.

3,881,637. ONE SHOT METERING VALVE. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,883,275. MODULAR PUMP ASSEMBLY. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,893,706. CHILDREN'S RIDING TOY. Elmer R. Hagen, Royal Arms, Apt. #6, 230 W. Genesee St., Auburn, N.Y. 13021.

3,885,708. FLEXIBLE TUBE WINDING AND EMPTYING DEVICE. David W. Parry, 2390 N. Forest Road, Getzville, N.Y. 14068.

3,899,157. TACK FASTENER AND STRIPPER. Robert Thomas, 30 W. Chicago Ave., Chicago, Ill. 60610.

3,910,432. APPARATUS FOR LIFTING AND LOADING A LOAD INTO AND OUT OF A VEHICLE OR THE LIKE. Browne Engineering Corp., John G. Leake, Trustee, Box 526, Harrisonburg, Va. 22801.

3,918,071. AUTOMATIC LENS FOCUSING METHOD AND APPARATUS. Fritz Albrecht, % J. Gibson Semmes, Esq., 3524 K St. NW., Washington, D.C. 20007.

3,951,446. CAR TRUNK LITTER RECEPTACLE. Fred W. Zehnder, 590 Frederick St., Frankenmuth, Mich. 48734.

3,953,011. VEHICLE SHOCK ABSORBER. Paul M. Staehlin, 9307 McVickers A, Oak Lawn, Ill. 60453.

3,953,983. REFRIGERATION METHOD AND REFRIGERATION APPARATUS FOR CARRYING OUT THE METHOD. Ernst Sander, Correspondence to Craig Antonelli, 909 Watergate Office Bldg., 2600 Virginia Ave. NW., Washington, D.C. 20037.

3,961,386. TOILET SEAT COVER APPARATUS. Ferdinand Beno, 3548 W. 25th St., Chicago, Ill. 60623.

3,970,313. ANCESTRY (PARLOR GAME). E. A. Montemayor, 4600 45th St. NW., Washington, D.C. 20016.

3,986,934. APPARATUS FOR AEROBIC CULTIVATION OF MICROORGANISMS. Hans Muller, Zurich, Switzerland. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

3,987,824. WATER GLASS FILLER. Fred W. Zehnder, 590 Frederick St., Frankenmuth, Mich. 48734.

3,991,922. ABRASIVE SHEET MEASURING AND CUTTING BOARD. Mervin B. Martin, Box 408, R.D. #4, Coatsville, Pa. 19320.

3,997,966. COMBINATION NAIL CLIPPER, CLIPPING RECEPTACLE AND REMOVABLE FRONT LID. James J. A. Sartore, 128 Morris St., Albany, N.Y. 12208.

3,998,148. PRESS FOR SUGAR BEET AND SIMILAR CHIPS. Salzgitter Maschinen A.G. Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,000,594. BUILDING CONSTRUCTION MEMBER. James D. Kirk, Jr., Kirkwall Corporation, 2021 Spring Road, Oak Brook, Ill. 60521.

4,001,679. WEDGE ACTION ELECTRICAL TEST PROBE. William P. Cargile, 835 Page Mill Road, Ste. 11, Palo Alto, Calif. 94301.

4,003,160. PROCESS FOR GROWING CHLORPHYLLOSE PLANTS USING CARBON DIOXIDE AND HEAT GENERATED IN EXOTHERMIC AEROBIC FERMENTATION PROCESSES. Hans Muller, Zurich, Switzerland. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,003,722. PROCESS AND ARRANGEMENT OF THE REMOVAL OF IMPURITIES FROM GASES. Heinz Holter, Beisenstrasse 39, 439 Gladbeck, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,003,795. PROCESS FOR THE DETERMINATION OF AT LEAST ONE OF THE ISOENZYMES OF LACTATEND-DEHYDROGENASE. Kommanditgesellschaft Schwarzhaupt, Cologne, Germany. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,005,443. SCANNING DEVICE AND METHOD FOR AUTOMATIC FOCUSING. Fritz Albrecht, % J. Gibson Semmes, Esq., 3524 K St. NW., Washington, D.C. 20007.

4,010,510. PAINT BRUSH AND THE LIKE. George S. Belza, 22 Carney Road, Willowdale, Ontario M2M 1Tx, Canada.

4,011,851. DISTRIBUTOR ASSEMBLY FOR A VEHICLE. Eden Beutler, 4830 Zube Court, Carmichael, Calif. 95608.

4,014,194. MECHANICAL PUSH BUTTON LOCK. Susan Nilson Hartman, 20 Binnacle Hill, Oakland, Calif. 94618.

4,017,229. APPARATUS FOR UNITING CONCENTRICALLY EXTRUDED TUBULAR FILMS OF THERMOPLASTIC SYNTHETIC RESIN. Michio Dudo, Tokyo, Japan. Correspondence to: Michael J. Striker, 360 Lexington Ave., New York, N.Y. 10017.

4,017,933. TYPEBALL CLEANING APPARATUS. Raymond A. Aja and Alphonse C. Dufault, 2 Murray Road, Essex Junction, Vt. 05452.

4,018,124. AUTOMATIC GUITAR TUNER FOR ELECTRIC GUITARS. Ruperto L. Rosado, 3525 Whitney Ave., Sacramento, Calif. 95821.

4,020,530. SECURABLE MULTI-PURPOSE CLAMP AND INSERTS. James J. A. Sartore, 128 Morris St., Albany, N.Y. 12208.

4,020,854. DEVICE AND METHOD FOR PROGRAMMED HAIR COLORING. L. Caruso, 2187 Union St., San Francisco, Calif. 94123.

4,024,829. LEAKAGE WARNING DEVICE FOR PNEUMATIC TIRE. Robert Osann, Balough, Osann, Kramer, Dvorak, Genova & Traub, 55 Broad St., New York, N.Y. 10004.

4,032,099. RECLINER PLATFORM. James W. Maude, 52 Village St., Marblehead, Mass. 01945.

4,033,538. ADJUSTABLE DRIP DRY SUPPORT APPARATUS. Harold Levy, P.O. Box 600015, North Miami Beach, Fla. 33160.

The following two patents are offered by How Wachspress, Technical Director Auditac, Ltd., 1940 Washington St., San Francisco, Calif. 94109.

3,875,932. AUDIOTACTILE STIMULATION AND COMMUNICATIONS SYSTEM.

3,954,101. AUDIOTACTILE COMMUNICATION SYSTEM.

The Nedlog Company is prepared to grant non-exclusive licenses under U.S. Patent 3,528,587 for Automatic Liquid Feed Device and U.S. Patent 3,643,835 for Automatic Liquid Proportioner on reasonable terms to domestic manufacturers. The application for licenses under the aforementioned patents may be addressed to The Nedlog Company, 3224 N. Elston Ave., Chicago, Ill. 60618.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following patents..

Inquiries respecting licenses under these patents should be addressed to: RCA Corporation, Staff Vice President, Domestic Licensing, 30 Rockefeller Plaza, New York, N.Y. 10036.

D244,866. INSULATOR FOR AN ANTENNA.

4,028,499. UNIVERSAL ASSIGNED NIGHT ANSWERING SYSTEM FOR EPABX.

4,028,575. ELECTRON MULTIPLIER IMAGE DISPLAY DEVICE.

4,028,582. GUIDED BEAM FLAT DISPLAY DEVICE.

4,028,586. PARABOLIC CURRENT GENERATOR.

4,028,625. SIDEBAND ANALYZER FOR AM TRANSMITTERS.

4,028,631. CURRENT AMPLIFIERS.

4,028,720. PHOTOVOLTAIC DEVICE.

4,028,724. READ/WRITE CHARACTER GENERATOR MEMORY LOADING METHOD.

4,029,501. METHOD OF PREPARING IMPROVED MAGNETIC HEAD MATERIAL.

4,029,528. METHOD OF SELECTIVELY DOPING A SEMICONDUCTOR BODY.

4,029,531. METHOD OF FORMING GROOVES IN THE (011) CRYSTALLINE DIRECTION.

4,029,542. METHOD FOR SLOPING THE SIDEWALLS OF MULTILAYER P+PN+JUNCTION MESA STRUCTURES.

4,029,594. NOVEL LIQUID CRYSTAL COMPOUNDS AND ELECTRO-OPTIC DEVICES INCORPORATING THEM.

4,029,595. NOVEL LIQUID CRYSTAL COMPOUNDS AND ELECTRO-OPTIC DEVICES INCORPORATING THEM.

4,029,971. TRI-STATE LOGIC CIRCUIT.

4,029,984. FLUORESCENT DISCHARGE COLD CATHODE FOR AN IMAGE DISPLAY DEVICE.

4,030,040. RECEIVED SIGNAL SELECTING SYSTEM.

4,030,042. FEEDBACK AMPLIFIERS.

4,030,046. PREALIGNED LASER MOUNT AND METHOD OF MAKING SAME.

4,030,048. MULTIMODE COUPLING SYSTEM INCLUDING A FUNNEL-SHAPED MULTIMODE COUPLER.

4,030,090. FLAT IMAGE DISPLAY DEVICE UTILIZING DIGITAL MODULATION.

4,030,118. COLOR ENCODING CAMERA UTILIZING COMB FILTERING FOR COLOR SIGNAL SEPARATION.

4,030,123. STYLUS ADJUSTMENT APPARATUS FOR A VIDEO DISC PLAYER.

4,030,124. VIDEO DISC PLAYBACK SYSTEM AND PICK-UP CARTRIDGE THEREFOR.

Re. 29,203. METHOD OF MAKING PHOSPHOR SCREENS.

4,021,219. METHOD OF MAKING A COMPOSITE GLASS STRUCTURE.

4,021,375. METHOD OF FABRICATING POLYCRYSTALLINE SELENIUM IMAGING DEVICES.

4,021,588. METHOD FOR PREPARING FILTER-COATED PHOSPHOR PARTICLES.

4,021,615. APPARATUS FOR CONSERVING ENERGY IN A BUILDING.

4,021,620. MULTIFREQUENCY SIGNAL RECEIVER WITH DIGITAL TONE RECEIVER.

4,021,686. FLIP-FLOP WITH SETTING AND SENSING CIRCUITRY.

4,021,722. TEMPERATURE - SENSITIVE CURRENT DIVIDER.

4,021,750. BROAD-BAND TRAPATT AMPLIFIER HAVING A TAPERED IDLER CIRCUIT.

4,021,757. PHASE LOCK-LOOP MODULATOR USING AN ARITHMETIC SYNTHESIZER.

4,021,820. LIGHTHOUSE HAVING A MAIN FILTER AND A SUPPLEMENTAL FILTER.

4,021,839. DIODE PACKAGE.

4,021,852. SIGNAL DEFECT COMPENSATION.

4,021,945. LIQUID CRYSTAL DEVICE WITH LOUVER MEANS LOCATED BEHIND THE LIQUID CRYSTAL DEVICE.

4,022,533. LASER ALIGNMENT APPARATUS AND METHOD WITH AN ALIGNMENT MIRROR.

4,022,618. METHOD FOR DESENSITIZING RECORDED ORGANIC VOLUME PHASE HOLOGRAPHIC RECORDING MEDIA.

4,022,968. RECORDING APPARATUS AND METHODS FOR USE IN FORMING A VIDEO DISC RECORD HAVING SPIRALLY ALIGNED SYNC STORAGE LOCATIONS.

4,023,049. GTO SWITCHING CIRCUITS.

4,023,062. LOW BEAM DIVERGENCE LIGHT EMITTING DIODE.

4,023,069. VERTICAL DEFLECTION CIRCUIT.

4,023,105. COUNTER TYPE REMOTE CONTROL RECEIVER PRODUCING BINARY OUTPUTS CORRELATED WITH NUMERICAL COMMANDS OF A COMPANION REMOTE CONTROL TRANSMITTER.

4,023,114. STAPLE WIDE DEVIATION LINEAR VOLTAGE CONTROLLED FREQUENCY GENERATOR.

4,023,129. DEFLECTING YOKE WITH NON-RADIAL CONDUCTORS.

4,023,160. ANALOG TO DIGITAL CONVERTER.

4,023,165. SIGNAL MODIFICATION TECHNIQUES.

4,030,138. RECORD PROTECTION SYSTEM.

4,030,316. PASSIVE COOLER.

4,030,657. WIRE LEAD BONDING TOOL.

4,030,815. HYDROSTATIC BEARING APPARATUS.

4,030,835. DEFECT DETECTION SYSTEM.

4,031,427. FLAT CATHODE RAY TUBE.

4,031,465. SCR, DIODE, DIAC, AND TRIAC TESTER.

4,031,476. NON-INTEGER FREQUENCY DIVIDER HAVING CONTROLLABLE ERROR.

4,031,485. METHOD FOR ACHIEVING GAS DYNAMIC LASING.

4,031,539. BROADBAND TURNSTILE ANTENNA.

4,031,546. DISC PLAYER AND STYLUS THEREFOR.

4,031,549. TELEVISION TUNING SYSTEM WITH PROVISIONS FOR RECEIVING RF CARRIER AT NONSTANDARD FREQUENCY.

4,031,597. METHOD OF ASSEMBLING A MOUNT ASSEMBLY IN THE NECK OF A CATHODE-RAY TUBE.

4,032,338. HALOGRAPHIC RECORDING MEDIUM EMPLOYING A PHOTOCONDUCTIVE LAYER AND A LOW MOLECULAR WEIGHT MICROCRYSTALLINE POLYMERIC LAYER.

4,032,340. METHOD OF IMPROVING THE SENSITIVITY OF ORGANIC VOLUME PHASE HALOGRAPHIC RECORDING MEDIA.

4,032,470. ELECTRO-OPTIC DEVICE.

4,032,819. RASTER CENTERING CIRCUIT.

4,032,839. CURRENT SCALING CIRCUITS.

4,032,851. COMPLEMENTARY SYMMETRY FET MIXER CIRCUITS.

4,032,852. FILTER WHICH TRACKS CHANGING FREQUENCY OF INPUT SIGNAL.

4,032,872. BEAM ADJUSTMENT ASSEMBLY FOR A CATHODE RAY TUBE.

4,032,903. CHARGE INJECTION DEVICE ARRAYS.

4,032,967. COMPLEMENTARY FIELD EFFECT TRANSISTOR SIGNAL MULTIPLIER.

4,032,976. SMEAR REDUCTION IN CCD IMAGERS.

Re. 29,177. SOLAR TORQUE COMPENSATION FOR A SATELLITE.

4,015,315. METHOD OF SETTING CATHODE-G1 SPACING.

4,015,707. CARRIER FOR SEMICONDUCTOR COMPONENTS.

4,016,016. METHOD OF SIMULTANEOUSLY FORMING A POLYCRYSTALLINE SILICON GATE AND A SINGLE CRYSTAL EXTENSION OF SAID GATE IN SILICON ON SAPPHIRE MOS DEVICES.

4,016,363. METHOD FOR ADHERING COMPONENTS PLATFORM TO CATHODE-RAY TUBE AND PRODUCT THEREOF.

4,016,433. GTO CIRCUITS.

4,016,550. CHARGE TRANSFER READOUT OF CHARGE INJECTION DEVICE ARRAYS.

4,016,564. MULTIPLE TARGET DATA RECEIVER FOR A COLLISION AVOIDANCE SYSTEM.

4,017,144. RECORDING ASSEMBLY FOR VOLUME HOLOGRAPHY.

4,017,677. SQUELCH CIRCUIT FOR A VIDEO RECORD PLAYER.

4,017,678. END-OF-PLAY CONTROL SYSTEM.

4,017,719. BINARY RATE MULTIPLIER WITH MEANS FOR SPACING OUTPUT SIGNALS.

4,017,741. DYNAMIC SHIFT REGISTER CELL.

4,017,747. FIRST TIMING CIRCUIT CONTROLLED BY A SECOND TIMING CIRCUIT FOR GENERATING LONG TIMING INTERVALS.

4,017,865. FREQUENCY SELECTIVE REFLECTOR SYSTEM.

4,017,882. TRANSISTOR HAVING INTEGRATED PROTECTION.

4,018,489. METHOD FOR EXTENDING CATHODE LIFE IN VIDICON TUBES.

4,018,506. FIBER-OPTIC TO PLANAR-WAVEGUIDE OPTICAL COUPLER.

4,018,692. COMPOSITION FOR MAKING GARNET FILMS FOR IMPROVED MAGNETIC BUBBLE DEVICES.

4,018,937. ELECTRON BEAM RECORDING COMPRISING POLYMER OF 1-METHYLVINYL METHYL KETONE.

4,018,945. METHOD OF MAKING A METALLIZED VIDEO DISC HAVING AN INSULATING LAYER THEREON.

4,018,984. VIDEO DISC RECORD HAVING SPIRALLY ALIGNED SYNC STORAGE LOCATIONS.

4,018,987. VIDEO DISC PLAYBACK APPARATUS.

4,018,988. NEGATIVE GAMMA CIRCUIT.

4,019,071. BIASING CURRENT ATTENUATOR.

4,019,082. ELECTRON EMITTING DEVICE AND METHOD OF MAKING THE SAME.

4,019,118. THIRD HARMONIC SIGNAL GENERATOR.

4,019,152. BIAS CIRCUIT FOR JUNCTION DIODES.

4,019,155. ACOUSTO-OPTIC MODULATED LASER.

4,019,818. INTERFEROMETRIC TECHNIQUE FOR DETERMINING ULTRASONIC WAVE INTENSITY.

4,020,147. METHOD FOR PREPARING CATHODOCHROMIC SODALITE.

4,020,416. METHOD OF DETECTING HEATER RESISTANCE INDEPENDENT OF CONTACT RESISTANCE.

4,020,500. CONTROLLED OSCILLATOR.

4,023,185. ABLATIVE OPTICAL RECORDING MEDIUM.

4,023,752. ELIMINATION OF RESIDUAL SPACECRAFT NUTATION DUE TO PROPULSIVE TORQUES.

4,024,069. YTTRIUM TANTALATE PHOSPHORS.

4,024,122. METHOD OF PURIFYING 2,4-BIS(6-DIAZO-5,6-DIHYDRO - 5 - OXO-1-NAPHTHALENESULFONYLOXY BENZOPHENONEL.

4,024,476. PROGRAMMABLE FREQUENCY DIVIDER FOR A TELEVISION RECEIVER FREQUENCY SYNTHESIZER.

4,024,569. SEMICONDUCTOR OHMIC CONTACT.

4,024,571. SYNCHRONIZING SYSTEM EMPLOYING BURST-CROSSOVER DETECTION.

4,024,572. PAL ALTERNATE LINE COLOR PHASE DETECTOR.

4,025,661. METHOD OF MAKING VIEWING-SCREEN STRUCTURE FOR A CATHODE-RAY TUBE.

4,025,842. CURRENT DIVIDER PROVIDED TEMPERATURE-DEPENDENT BIAS POTENTIAL FROM CURRENT REGULATOR.

4,025,945. COLOR FUNCTION DISPLAY SYSTEM.

4,025,959. RECORDER-REPRODUCER SYSTEM.

4,026,780. METHOD AND APPARATUS FOR CATAPHORETIC DEPOSITION.

4,027,179. HIGH REPETITION RATE INJECTION LASER MODULATOR.

4,027,192. ELECTROLUMINESCENT DEVICE COMPRISING ELECTROLUMINESCENT LAYER CONTAINING INDIUM OXIDE AND/OR TIN OXIDE.

4,027,260. CHARGE TRANSFER CIRCUITS EXHIBITING LOW PASS FILTER CHARACTERISTICS.

4,027,280. TRANSDUCER DRIVE CIRCUIT FOR REMOTE CONTROL TRANSMITTER.

General Electric Company is prepared to grant non-exclusive licenses under the following patents on reasonable terms to domestic manufacturers.

Applications for license may be addressed to the General Electric Company, Aircraft Engine Group, 1000 Western Ave., Lynn, Mass. 01910, Attention: Patent Counsel.

3,112,915. ROTOR ASSEMBLY AIR BAFFLE.

2,123,283. ANTI-ICING VALVE MEANS.

3,138,930. COMBUSTION CHAMBER LINER CONSTRUCTION.

3,151,294. FREQUENCY SENSING CIRCUIT INCLUDING DIRECT CURRENT SOURCE AND REACTANCE MEANS.

3,237,864. LOW DRAG VARIABLE PLUG JET EXHAUST NOZZLE.

3,241,842. SEALING MEANS WITH COOLING FLUID MEANS.

3,249,906. THERMOCOUPLE CONNECTOR.

3,292,050. MOUNTING OF SOLID STATE ELECTRONIC COMPONENTS.

3,313,475. MOUNTING OF HARDWARE ON AXIAL FLOW COMPRESSOR CASINGS.

3,329,596. METHOD OF ELECTROLYTICALLY MACHINING BRANCH PASSAGES PROVIDING COMMUNICATION BETWEEN MAIN PASSAGES IN A METAL ARTICLE.

3,336,213. CATHODE FOR ELECTROLYTIC MACHINING.

3,339,574. PRESSURIZING AND DRAIN VALVE.

3,364,678. MEANS FOR STABILIZING FLUID FLOW IN DIFFUSER-COMBUSTOR SYSTEMS IN AXIAL FLOW GAS TURBINE ENGINES.

3,369,942. BEARING AND METHOD OF MAKING.

3,377,779. AIR SEPARATION DEVICE AND LIQUID DELIVERY SYSTEM INCORPORATING SAME.

3,383,093. HOLLOW TURBOMACHINERY BLADES.

3,395,534. SPEED RESPONSIVE AND CONTROL SYSTEMS FOR ROTORS.

3,398,535. ENGINE SUPPORTING STRUCTURE.

3,403,084. ELECTROLYTIC MATERIAL REMOVAL WHEREIN THE CURRENT-VOLTAGE RELATIONSHIP IS IN THE "KELLOGG REGION."

3,403,085. ELECTROLYTIC MATERIAL REMOVAL WHEREIN THE CHARGE IN THE ELECTROLYTE IS PARTIALLY DISSIPATE.

3,415,383. CENTRIFUGAL SEPARATOR.

3,415,672. METHOD OF CO-DEPOSITING TITANIUM AND ALUMINUM ON SURFACES OF NICKEL, IRON AND COBALT.

3,433,021. CONTROL SYSTEM HAVING OUTPUT VARIABLY RESPONSIVE TO TWO SIGNAL INPUTS.

3,442,176. ACTUATOR LOCKING MECHANISM.

3,442,442. MOUNTING OF BLADES IN AN AXIAL FLOW COMPRESSOR.

3,456,881. FLUID PRESSURE CONTROL SYSTEM.

3,472,480. FLOW CONTROL VALVE.

3,477,231. NOISE REDUCTION.

3,479,009. BLADE RETAINER.

3,489,534. LIGHTWEIGHT METALLIC STRUCTURE.

3,500,639. COMBUSTION CHAMBER MOUNTING MEANS.

3,501,089. JET PUMP EJECTOR.

3,519,282. ABRADABLE MATERIAL SEAL.

3,519,368. COMPOSITE TURBOMACHINERY ROTORS.

3,527,624. CONTROLLING CARBIDE SURFACES.

3,528,246. FAN ARRANGEMENT FOR HIGH BYPASS RATIO TURBOFAN ENGINE.

3,533,238. INLET CONTROL SYSTEM.

3,533,486. JET ENGINE SILENCER WITH RETRACTABLE SOUND ABSORBING BODY.

3,540,682. TURBOFAN TYPE ENGINE FRAME AND SUPPORT SYSTEM.

3,556,675. TURBOMACHINERY ROTOR WITH INTEGRAL SHROUD.

3,572,733. SHAFT SEAL USED IN GAS TURBINE ENGINES.

3,572,960. REDUCTION OF SOUND IN GAS TURBINE ENGINES.

3,572,971. LIGHTWEIGHT TURBO-MACHINERY BLADING.

3,574,082. CURRENT LEAK PROTECTIVE CIRCUIT.

3,579,805. METHOD OF FORMING INTERFERENCE FITS BY HEAT TREATMENT.

3,587,973. PROPULSION NOZZLES WITH IMPROVED SOUND SUPPRESSION.

3,588,037. EROSION SHIELD FOR A THROTTLING VALVE.

3,598,638. DIFFUSION METALLIC COATING METHOD.

3,611,724. CHOKED INLET NOISE SUPPRESSION DEVICE FOR A TURBOFAN ENGINE.

3,617,360. HIGH TEMPERATURE METALLIC DIFFUSION COATING AND METHOD.

3,618,699. MULTIPLE PURE TONE NOISE SUPPRESSION DEVICE FOR AN AIRCRAFT GAS TURBINE ENGINE.

3,619,640. STEM OVERCURRENT PROTECTION.

3,631,674. FOLDED FLOW COMBUSTION CHAMBER FOR A GAS TURBINE ENGINE.

3,632,223. TURBINE ENGINE HAVING MULTISTAGE COMPRESSOR WITH INTERSTAGE BLEED AIR SYSTEM.

3,638,865. FUEL SPRAY NOZZLE.

3,653,207. HIGH FUEL INJECTION DENSITY COMBUSTION CHAMBER FOR A GAS TURBINE ENGINE.

3,658,682. ELECTROLYTE SUPPLY SYSTEM.

3,667,221. FUEL DELIVERY APPARATUS.

3,667,985. METALLIC SURFACE TREATMENT METHOD.

3,668,052. CORRUGATED ARCUATE MEMBER.

3,679,566. APPARATUS WITH STEM OVERCURRENT PROTECTION.

3,685,931. APPARATUS FOR PRODUCING A CORRUGATED MEMBER.

3,686,041. METHOD OF PRODUCING TITANIUM ALLOYS HAVING AN ULTRAFINE GRAIN SIZE AND PRODUCT PRODUCED THEREBY.

3,693,749. REDUCTION OF GAS TURBINE ENGINE NOISE ANNOYANCE BY MODULATION.

3,696,500. SUPERALLOY SEGREGATE BRAZE.

3,696,678. WEIGHTED OPTICAL TEMPERATURE MEASUREMENT OF ROTATING TURBOMACHINERY.

3,700,348. TURBOMACHINERY BLADE STRUCTURE.

3,704,194. PERFORATED REINFORCED PLASTIC MEMBER AND METHOD FOR MAKING.

3,710,568. INTEGRAL TUBING AND/OR ELECTRICAL LEAD SUPPORT AND MOUNTING PAD FOR GAS TURBINE ENGINE CONTROLS AND ACCESSORIES.

3,714,778. ANNULAR COMBUSTOR SYSTEMS.

3,720,058. COMBUSTOR AND FUEL INJECTOR.

3,736,746. RECIRCULATING ANNULAR SLOT FUEL/AIR CARBURETING SYSTEM FOR GAS TURBINE COMBUSTORS.

3,748,107. SUPERALLOY EUTECTIC BRAZE.

3,757,827. LIGHTWEIGHT DUCT AND METHOD OF MAKING SAME.

3,759,091. ENGINE INLET DISTORTION TESTING APPARATUS.

3,764,307. NI-AU BASE BRAZING ALLOY.

3,764,510. METHOD AND APPARATUS FOR ELECTROLYTIC MATERIAL REMOVAL.

3,775,975. FUEL DISTRIBUTION SYSTEM.

3,777,489. COMBUSTOR CASING AND CONCENTRIC AIR BLEED STRUCTURE.

3,787,546. METHOD FOR MAKING A PERFORATED PLASTIC ARTICLE.

3,793,865. MIXER FABRICATION.

3,794,444. ANTI-ICING SPINNER CONSTRUCTION.

3,794,915. CIRCUITRY FOR DETECTING LOW AMPLITUDE RAPID VIBRATIONS IN A HIGH AMPLITUDE OUTPUT SIGNAL.

3,795,604. ELECTROLYTIC MACHINING ELECTRODE.

3,798,626. FOREIGN OBJECT IMPACT DETECTION IN MULTI-BLADED FLUID ENGINES.

3,819,008. BROAD BAND ACOUSTIC BARRIER.

3,830,056. CONVERSION MEANS FOR A GAS TURBINE ENGINE.

3,832,092. DEVICE FOR LOCKING TURBOMACHINERY BLADES.

3,833,414. ALUMINIDE COATING REMOVAL METHOD.

3,834,965. METHOD OF MAKING A LIGHTWEIGHT DUCT.

3,837,411. DIVERTER VALVE FOR A GAS TURBINE WITH AN AUGMENTER.

3,841,091. MULTI-MISSION TANDEM PROPULSION SYSTEM.

3,844,677. BLUNTED LEADING EDGE FAN BLADE FOR NOISE REDUCTION.

3,846,899. METHOD OF CONSTRUCTING A LABYRINTH SEAL.

3,847,781. APPARATUS FOR ELECTROLYTIC MATERIAL REMOVAL.

3,850,544. MOUNTING ARRANGEMENT FOR A BEARING OF AXIAL FLOW TURBOMACHINERY HAVING VARIABLE PITCH STATIONARY BLADES.

3,853,548. NI-AU BRAZING ALLOY.

3,854,285. COMBUSTOR DOME ASSEMBLY.

3,856,201. TEMPERATURE REGULATING CONTROL VALVE.

3,861,139. TURBOFAN ENGINE HAVING COUNTER-ROTATING COMPRESSOR AND TURBINE ELEMENTS AND UNIQUE FAN DISPOSITION.

3,861,140. TURBOFAN ENGINE MIXER.

3,861,822. DUCT WITH VANES HAVING SELECTIVELY VARIABLE PITCH.

3,866,415. FAN BLADE ACTUATOR USING PRESSURIZED AIR

3,866,417. GAS TURBINE ENGINE AUGMENTER LINER COOLANT FLOW CONTROL SYSTEM.

3,866,448. APPARATUS FOR CONSTRUCTING AIR COOLED TURBOMACHINERY BLADING.

3,867,068. TURBOMACHINERY BLADE COOLING INSERT RETAINERS.

3,868,196. CENTRIFUGAL COMPRESSOR WITH ROTATING VANELESS DIFFUSER POWERED BY LEAKAGE FLOW.

3,870,434. GEAR ARRANGEMENT FOR VARIABLE PITCH FAN.

3,873,236. FAN WITH VARIABLE PITCH BLADES AND TRANSLATING BEARING ACTUATION SYSTEM.

3,875,038. ELECTROLYTIC MACHINING APPARATUS.

3,879,940. GAS TURBINE ENGINE FUEL DELIVERY TUBE ASSEMBLY.

3,879,941. VARIABLE CYCLE GAS TURBINE ENGINE.

3,883,268. BLUNTED LEADING EDGE FAN BLADE FOR NOISE REDUCTION.

3,887,987. METHOD OF MAKING AND OF MEASURING ARTICLE FATIGUE LIFE.

3,888,601. TURBOMACHINE WITH BALANCING MEANS.

3,892,358. NOZZLE SEAL.

3,893,297. BYPASS AUGMENTATION BURNER ARRANGEMENT FOR A GAS TURBINE ENGINE.

3,893,640. SOUND SUPPRESSING NACELLE ARRANGEMENT.

3,897,001. NOZZLE AND AUXILIARY INLET ARRANGEMENT FOR GAS TURBINE ENGINE.

3,899,267. TURBOMACHINERY BLADE TIP CAP CONFIGURATION.

3,900,274. REMOTE CONTROLLED ACTUATION SYSTEM FOR THE ROTOR OF A GAS TURBINE ENGINE.

3,903,690. TURBOFAN ENGINE LUBRICATION MEANS.

3,908,447. METHOD OF MEASURING ARTICLE FATIGUE LIFE.

3,915,413. VARIABLE AIR INLET SYSTEM FOR A GAS TURBINE ENGINE.

3,921,271. AIR-COOLED TURBINE BLADE AND METHOD OF MAKING SAME.

3,922,628. STRAIN GAGE.

3,922,852. VARIABLE PITCH FAN FOR GAS TURBINE ENGINE.

3,923,420. BLADE PLATFORM WITH FRICTION DAMPING INTERLOCK.

3,925,979. ANTI-ICING SYSTEM FOR A GAS TURBINE ENGINE.

3,943,707. GAS TURBINE ENGINE EXHAUST NOZZLE DIVERTER VALVE.

3,949,775. FUEL SUPPLY AND DISTRIBUTION SYSTEM.

3,957,450. ARTICLE OF MANUFACTURE WITH PREDETERMINED FATIGUE LIFE.

3,965,066. COMBUSTOR-TURBINE NOZZLE INTERCONNECTION.

3,973,874. IMPINGEMENT BAFFLE COLLARS.

3,999,378. BYPASS AUGMENTATION BURNER ARRANGEMENT FOR A GAS TURBINE ENGINE.

Applications for license may be addressed to: Division Patent Counsel, Switchgear & Distribution Transformer Division, General Electric Company, 6901 Elmwood Ave., Philadelphia, Pa. 19142.

3,816,798. TRIGGERABLE VACUUM ARC DEVICE SUITABLE FOR ALTERNATING CURRENT OPERATIONS.

3,823,343. COMMUTATION DIRECTING CIRCUIT FOR FAULT CURRENT LIMITING STATIC SWITCH.

3,883,792. OPTIMUM CONTROL SYSTEM FOR MINIMIZING HARMONIC EFFECTS IN HVDC POWER CONVERTERS.

3,654,528. COOLING SCHEME FOR A HIGH CURRENT SEMICONDUCTOR DEVICE EMPLOYING ELECTROMAGNETICALLY-PUMPED LIQUID METAL FOR HEAT AND CURRENT TRANSFER.

3,911,239. VACUUM ARC DEVICES WITH NON-WELDING CONTACTS.

Application for license may be addressed to the General Electric Company, Division Patent Counsel Housewares and Audio Business Division, 1285 Boston Ave., Bridgeport, Conn. 06602.

D. 241,779. DESIGN FOR HAIR DRYER POWER UNIT OR SIMILAR ARTICLE.

D. 242,494. DESIGN FOR HAIR DRYER OR SIMILAR ARTICLE.

Applications for Licenses may be addressed to the Patent Counsel, Mobile Radio Products Dept., General Electric Company, Lynchburg, Va. 24502.

4,001,693. APPARATUS FOR ESTABLISHING COMMUNICATION BETWEEN A FIRST RADIO TRANSMITTER AND RECEIVER AND A SECOND RADIO TRANSMITTER AND RECEIVER.

4,014,715. SOLDER CLEANING AND COATING COMPOSITION.

4,022,973. APPARATUS FOR INDICATING SYNCHRONIZATION AND OUT-OF-SYNCHRONIZATION CONDITIONS.

4,027,243. MESSAGE GENERATOR FOR A CONTROLLED RADIO TRANSMITTER AND RECEIVER.

Application for license may be addressed to the Group Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky. 40225.

3,570,266. REFRIGERATOR INCLUDING ICE MAKER WATER RESERVOIR.

3,726,578. CONVERTIBLE SIDE-BY-SIDE REFRIGERATOR.

3,868,152. REFRIGERATOR CABINET CONSTRUCTION.

3,874,552. REFRIGERATOR APPARATUS.

3,876,148. DISHWASHER HAVING EPICYCLIC SPRAY SYSTEM.

4,007,318. PHOSPHORYLATED POLYSTYRENE AND METHOD FOR FORMING SAME.

4,016,641. METHOD OF ADAPTING A MOBILE HOME FOR AN AIR CONDITIONER.

4,019,794. ROLLER FOR DISHWASHER RACK.

Applications for license may be addressed to Patent Counsel, Gas Turbine Division, General Electric Company, 1 River Road, Building #500, Room 218, Schenectady, N.Y. 12345.

4,011,017. BORESCOPE SUPPORT APPARATUS.

Applications for licenses should be addressed to: Division Patent Counsel, Space Division, General Electric Company, P.O. Box 8555, Philadelphia, Pa. 19101.

4,008,573. MOTIVE FLUIDS FOR EXTERNAL COMBUSTION ENGINES.

4,016,493. SIMPLIFIED LAND LINE AND SATELLITE COMMUNICATION SWITCHING SYSTEM.

4,016,494. SATELLITE COMMUNICATION SYSTEM WITH IMPROVED CONFERENCE FACILITY.

4,017,985. MULTISENSOR DIGITAL IMAGE GENERATOR.

4,025,248. RADIALLY EXTENDED VAPOR INLET FOR A ROTARY MULTIVANED EXPANDER.

Application for license may be addressed to the General Electric Company, 100 Woodlawn Ave., Pittsfield, Mass. 01201.

3,612,750. CABLE-CONNECTED ADAPTOR FOR HIGH VOLTAGE BUSHING OF A PAD-MOUNTED TRANSFORMER.

3,782,324. METER DIAL WITH MIRROR IMAGE PORTION.

3,792,404. CIRCUIT BREAKER HAVING MECHANICAL LOCK TO PREVENT AUTOMATIC OPERATION.

3,829,810. BUSHING, FUSE AND FUSEHOLDER.

4,009,417. ELECTRICAL APPARATUS WITH HEAT PIPE COOLING.

4,009,418. ATTACHMENT OF HEAT PIPES TO ELECTRICAL APPARATUS.

Application for license may be adressed to the General Electric Company, 2001 Jefferson Davis Highway, Arlington, Va. 22202.

3,996,081. METHOD FOR MAKING A HIGH VOLTAGE CABLE SPLICE.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JULY 2, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-23-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director. Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	9-3-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-19-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	4-8-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy; Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director. Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	1-12-77
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	6-2-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-14-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-29-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	12-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	4-14-70
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during July 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents..... Numbers 2,943,327 to 2,947,000, inclusive
Plant Patents..... Numbers 1,957 to 1,962, inclusive

REISSUES

AUGUST 30, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,372

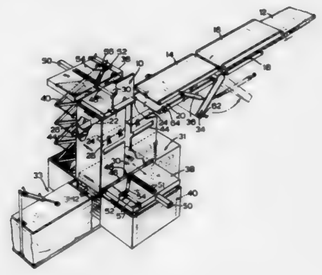
APPARATUS FOR AUTOMATICALLY STACKING AND COMPRESSING BATTS OF COMPRESSIBLE MATERIAL

Theodore Earl O'Brien, Watford, Canada, assignor to Patco Packing Limited, Sarnia, Canada

Original No. 3,908,539, dated Sept. 30, 1975, Ser. No. 505,805, Sept. 13, 1974. Application for reissue Aug. 9, 1976, Ser. No. 712,820

Int. Cl.[2] B30B *15/30*

U.S. Cl. 100—49 2 Claims



1. Apparatus for stacking and compressing batts of compressible material comprising:

i. a vertical stacking chamber,

ii. indexing gates in the upper portion of said stacking chamber normally disposed to receive batts,

iii. an indexing and compression plate,

iv. means for repeatedly cycling said indexing and compression plate around a first path [a predetermined number of times and then] *and* around a second path [once],

v. said first path extending upwardly of the outside *of* said stacking chamber laterally into said stacking chamber at a level above said indexing gates, downwardly in said stacking chamber, through said indexing gates, and laterally out of said stacking chamber, said second path extending upwardly of the outside of said stacking chamber, laterally into said stacking chamber, downwardly in said stacking chamber to a compression level in the lower portion thereof that is below the extent of downward travel of said first path and laterally out of said stacking chamber,

vi. said indexing gates being operable in response to the passage therethrough of said indexing and compression plate to permit said indexing and compression plate to carry batts thereon to the portion of said stacking chamber therebelow,

vii. an ejection passage extending across said stacking chamber at the lower end thereof and below said compression level through which batts underlying said index and compression plate at the compression level can be laterally removed from said stacking chamber,

viii. means for ejecting batts underlying said indexing and compression plate when said indexing and compression plate is at said compression level,

ix. said means for repeatedly cycling said indexing and compression plate being adapted to remove said compression plate out of said stacking chamber on said second path after operation of said means for ejecting batts.

Re. 29,373

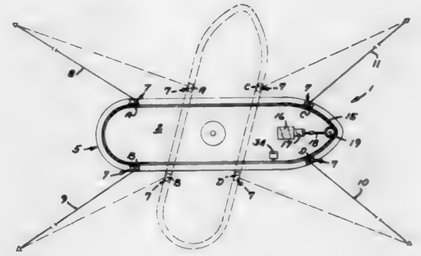
METHOD AND APPARATUS FOR MOORING FLOATING VESSELS

Henry C. Boschen, Jr., Chippewa Falls, Wis., assignor to Global Marine, Inc., Los Angeles, Calif.

Original No. 3,822,663, dated July 9, 1974, Ser. No. 296,079, Oct. 10, 1972. Application for reissue June 14, 1976, Ser. No. 695,842

Int. Cl.[2] B63B *21/50*

U.S. Cl. 114—293 8 Claims



1. A vessel intended to be floated in a body of water, said vessel comprising:

a. a hull;

b. guide means carried by said hull and substantially completely encircling said hull along a line [between the top of said hull and] *above* the Plimsoll line;

c. a plurality of attaching means moveably carried by said guide means for separately attaching a plurality of anchor lines to said hull and for controlling the length thereof; and

d. control means operably connectable to said attaching means for selectively moving said attaching means to selected points along said guide means to vary the position of the vessel, for holding said attaching means at said selected points and for operating said attaching means to control the length of said anchor lines.

Re. 29,374

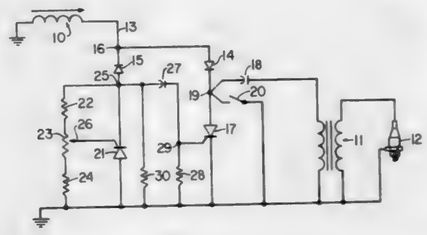
SOLID STATE IGNITION CIRCUITRY

Franklin H. Just; Brent L. Powell, and John A. Waters, all of Idaho Falls, Idaho, assignors to Franklin H. Just and John A. Waters, both of Idaho Falls, Idaho

Original No. 3,851,636, dated Dec. 3, 1974, Ser. No. 402,010, Oct. 1, 1973. Application for reissue Oct. 6, 1975, Ser. No. 620,147

Int. Cl.[2] F02P *3/06*

U.S. Cl. 123—148 CC 10 Claims



1. Circuitry for controlling the transmission of impulse volt-

ages produced by a magneto on an internal combustion engine to a transformer which, in turn, generates a high voltage impulse to produce sparks in the spark plugs of the engine, said circuitry comprising,

an input conductor *means* adapted to receive impulse voltages from a magneto;

a first circuit connected to said input conductor [compris] *means comprising* in series a first diode rectifier, a first capacitor and an output conductor, the latter being adapted to be connected to the transformer;

a second circuit connected between said first circuit and ground comprising, a first silicon controlled rectifier having an anode, cathode and a control electrode, with the cathode thereof connected to ground and the anode thereof connected to said first circuit between said first rectifier diode and said first capacitor;

a third circuit comprising, a second diode rectifier and a second silicon controlled rectifier connected in series between said input conductor and ground with the cathode and anode of said second diode rectifier being connected to the input conductor and the cathode of the second silicon controlled rectifier respectively, and the anode of said second silicon controlled rectifier being connected to ground, said second silicon controlled rectifier having a potentiometer shunting the anode and cathode thereof with the variable contact arm of said potentiometer being connected to the control electrode of said second silicon controlled rectifier, said third circuit also including a second capacitor and a resistor connected in series between the cathode of said second silicon controlled rectifier and ground, with the control electrode of said first silicon controlled rectifier being connected to said third circuit at a point therein intermediate between said second capacitor and said resistor.

Re. 29,375

LAMINATED POLYMERIC ARTICLES AND PROCESS FOR THE PRODUCTION THEREOF

William Charles Thiele, Somerville, N.J., assignor to Johns-Manville Corporation, Denver, Colo.

Original No. 3,931,836, dated Jan. 13, 1976, Ser. No. 406,750, Oct. 15, 1973. Continuation-in-part of Ser. No. 225,662, Feb. 11, 1972, abandoned. Application for reissue July 28, 1976, Ser. No. 687,974

Int. Cl.² F16L *9/16, 9/12;* **B32B** *31/06, 27/12*

U.S. Cl. 138—141 **42 Claims**

22. In a process for bonding together a plastic layer comprising a thermoplastic poly(vinyl acetate), poly(methyl methacrylate), polystyrene, polybutene, poly(vinyl butyral) or polymeric olefinic chloride resin and a thermosetting layer comprising a liquid thermosetting epoxy, phenolic, or polyester resin, which layers are substantially chemically unbondable to each other;

which process comprises forming a surface solution, on the surface of said thermoplastic layer, of said thermoplastic resin and a coating comprising a butadiene resin and a mutual solvent for said butadiene resin and said thermoplastic resin; at least partially fusing said surface solution; applying to said coating said thermosetting layer in a substantially uncured state; and curing said thermosetting layer and simultaneously bonding said thermosetting layer to said coating;

the improvement which comprises increasing the strength of the bond formed in said curing step between said coating and said thermosetting layer by incorporating into said coating a solid thermosetting epoxy, phenolic or polyester resin and a curing agent therefor.

34. A laminated article having improved bonding between the laminae comprising a thermoplastic layer containing as the principal component a polymeric olefinic chloride resin selected from the group consisting of polyvinyl chloride and copolymers of vinyl chloride and vinylidene chloride, and a thermosetting layer containing as the principal component an epoxy resin, said layers being bonded into a laminate by a coating therebetween and an intimate contact therewith, said coating initially comprising:

a. a butadiene resin, which is thermoplastic, substantially curable to said epoxy resin and substantially chemically unbondable directly to and substantially incompatible with said polymeric olefinic chloride resin other than in a solvated state;

b. a solid epoxy resin;

c. a mutual solvent for at least said polymeric olefinic chloride resin and said butadiene resin; and

d. a curing agent for said solid epoxy resin;

said coating and said polymeric olefinic chloride resin forming a fused surface solution on the surface of said thermoplastic layer and said coating and said thermosetting layer being chemically bonded; and

said solid epoxy resin and said butadiene resin being present in said coating in a weight ratio of epoxy resin to butadiene resin in the range of 0.175:1 to 0.70:1.

Re. 29,376

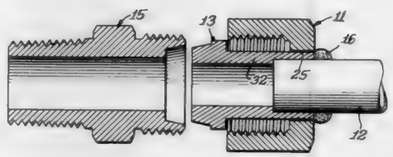
WELDED SLEEVE FITTING

Jan A. Hiszpanski, Chicago, Ill., assignor to Imperial-Eastman Corporation, Chicago, Ill.

Original No. 3,751,077, dated Aug. 7, 1973, Ser. No. 229,707, Feb. 28, 1972. Application for reissue Dec. 2, 1975, Ser. No. 637,079

Int. Cl.² F16L *55/00*

U.S. Cl. 285—169 **12 Claims**



1. A tube coupling structure comprising: a body having a port and a threaded portion coaxially of said port; a tubular sleeve having an inner end adapted to sealingly engage the body, an annular radially outer, axially outwardly facing shoulder, and a tubular outer end extending axially outwardly of said shoulder and terminating in a distal end; an annular nut having a threaded portion threadedly connected to the body threaded portion, said nut coaxially encircling said sleeve and having an inturned flange disposed axially outwardly of said sleeve shoulder for engaging said shoulder to urge said sleeve into sealing engagement with said body as an incident of threaded advance of said nut toward said body; a tube end extending coaxially inwardly into said sleeve; and an annular weld between said sleeve distal end and said tube sealingly connecting the sleeve to the tube end, said weld and said shoulder having a radial outer dimension greater than the corresponding radial inner dimension of said nut flange whereby said nut flange is captured axially movably between said sleeve shoulder and said weld in the made-up arrangement of the tube coupling, the length of said sleeve outer end outwardly of said shoulder being preselected to permit withdrawal of the nut axially outwardly of the axially inner end of the sleeve thereby to permit separation of said sleeve and nut from said body with said nut flange maintained radially outwardly of said sleeve outer end.

Re. 29,377

FRANGIBLE CONCRETE-JOINT SEALANT PACKAGE

Robert O'Brill, 8116 Lorel, Skokie, Ill. 60076

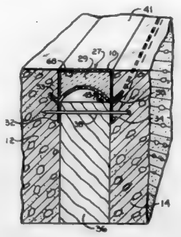
Original No. 3,813,180, dated May 28, 1974, Ser. No. 307,037, Nov. 16, 1972. Application for reissue Jan. 27, 1975, Ser. No. 544,260

Int. Cl.² B65D *83/00*

U.S. Cl. 404—48 **11 Claims**

1. A frangible sealant [package] *device* for joints between adjacent panels, comprises:

[an] *a one piece* elongated tube-like bar having a hollow interior extending throughout its length, *said bar having a top wall and a pair of parallel spaced-apart depending external flanges extending longitudinally throughout the length of said bar on opposite sides of the top wall to form an upper U-shaped portion and having a bottom wall and a second pair of parallel spaced-apart downwardly depending external flanges extending longitudinally throughout the length of said bar on opposite sides of the bottom wall to form a lower U-shaped portion below said upper portion, said bar* [and] having a pair of continuous lines of weakened areas extending longitudinally along its entire length on opposite



sides thereof to enable said bar to be broken apart longitudinally along said lines [;] *to separate said upper and lower portions; said bar being adapted to receive* a concrete-joint sealant [disposed] within said hollow interior of said bar;

[a pair of end walls sealing said sealant within said bar,] and said [bar further including a] *second* pair of parallel spaced-apart downwardly depending external flanges extending longitudinally throughout the length of said bar to *receive* an expansion joint strip therebetween.

Re. 29,378

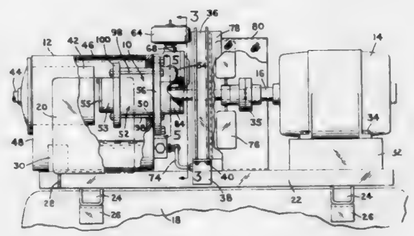
COMPACT HOUSING FOR ROTARY COMPRESSOR SYSTEM

Carl Bloom, Springfield, Mass., assignor to Worthington Compressors, Inc., Holyoke, Mass.

Original No. 3,547,164, dated Dec. 15, 1970, Ser. No. 785,304, Dec. 9, 1968. Application for reissue July 16, 1975, Ser. No. 596,364

Int. Cl.² B01D *46/00*

U.S. Cl. 55—473 **5 Claims**



1. A rotary compressor assembly comprising:

tank means for receiving compressed fluid, said tank means having one wall defining an opening and inner and outer wall surfaces, said tank means also having a discharge outlet for compressed fluid;

fluid compressing means including a housing disposed to extend into said opening in said tank means and a rotor mounted within said housing;

a drive means for said compressing means, said drive means including a drive shaft connected to said rotor;

said compressing means having an inlet disposed at a point external to said tank means and an outlet within said tank means to permit compressed fluid to be discharged therein;

demister means mounted in said tank means for separating out oil mixed in the discharge from said fluid compressing means;

said compressing means housing having cover means at the opposite ends thereof, one cover means being connected to the inwardly disposed end of the housing and the other cover means being connected to the opposite end of the housing and the one wall of the tank at the periphery of the opening, said other cover means coacting with said housing and said rotor to provide an operative seal between the outward end of said rotor and said other cover means;

sealing means located between one of said wall surfaces and the confronting surfaces of said other cover means adjacent the opening in the one wall of said tank means;

means providing a mechanical seal for said drive shaft at a point outboard of said other cover means; and

means to connect said other cover means at one end of said housing to said tank means about said opening for mounting said compressing means in operative relation to said tank and to permit said cover means and said sealing means to form a fluid tight cover for said opening in said tank means, and thereby prevent leakage from said compressing means housing to atmosphere.

Re. 29,379

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

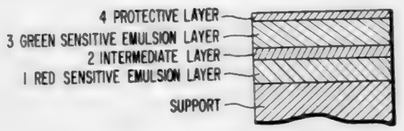
Keisuke Shiba; Nobuo Furutachi; Harumi Katsuyama; Takeshi Hirose; Toshiaki Aono, and Shoji Ishiguro, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Original No. 3,933,500, dated Jan. 20, 1976, Ser. No. 454,525, Mar. 25, 1974. Application for reissue Apr. 21, 1976, Ser. No. 678,815

Claims priority, application Japan, Mar. 23, 1973, 48-33238

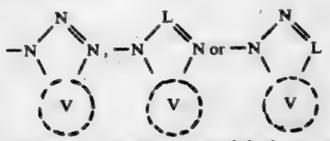
Int. Cl.² G03C *1/76, 7/00, 1/40*

U.S. Cl. 96—74 **13 Claims**



1. A color photographic silver halide light-sensitive material which comprises a support having thereon at least two light-sensitive layers, at least one of said layers containing a compound capable of coupling with an oxidation product of a color developing agent and in which a splitable hetero aromatic ring containing a triazole or diazole ring is connected to the carbon atom in the coupling position, through the nitrogen atom in the 1-position of said triazole or diazole ring, *said triazole or diazole ring having an aromatic ring fused thereto.*

13. The color photographic light-sensitive material of claim 1, wherein said splitable heteroaromatic ring is represented by the following general formulae



wherein V represents an aromatic ring of the benzene series or a heteroaromatic ring containing at least one nitrogen atom; L represents a methine group; and wherein V can contain substituents selected from the group consisting of an amino group, an acylamino group, a halogen atom, an alkyl group, a nitro group, an alkoxy group, an alkylthio group, an arylthio group, or an aryl group.

Re. 29,380

RECORDING APPARATUS FOR MAGNETIC DISKS USING BOTH SIDES OF THE DISK

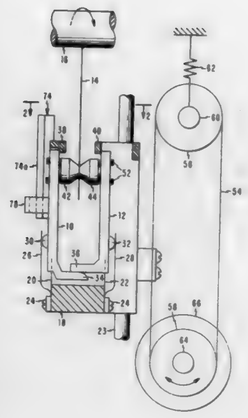
Daniel O. Castrodale; Steven G. Steele; William S. Wentink, and Stephen E. Wheeler, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,946,439, dated Mar. 23, 1976, Ser. No. 545,841, Jan. 31, 1975. Application for reissue Sept. 20, 1976, Ser. No. 724,663

Int. Cl.[2] G11B *5/54, 5/48, 5/60*

U.S. Cl. 360—105

22 Claims



1. Magnetic recording apparatus comprising a magnetic medium having opposite sides both of which have a magnetic surface, a pair of transducers for magnetic action on the opposite sides of said medium, means for moving said magnetic medium so that a track or path is described by each of said tranaducers on a side of said medium, first and second swing arms each carrying one of said transducers, a carriage, a swing mounting for said first arm with respect to said carriage, a swing mounting for said second arm with respect to said carriage, means for moving said carriage and thereby said arms and said transducers in a direction at angles to said track so that the transducers traverse the magnetic medium on other tracks of the magnetic medium, an arm portion fixed with respect to said second swing arm adjacent to its swing mounting with said carriage and extending toward said first swing arm, and an arm portion fixed with respect to said first swing arm adjacent to its swing mounting with said carriage and extending toward said second swing arm to form a power transmitting connection with said arm portion of said second swing arm so as to swing said second swing arm and said transducer carried thereby away from said medium when said first swing arm is swung about its swing mounting with said carriage to move said first swing arm and said transducer carried thereby away from said medium.

Re. 29,381

ELECTRICAL SWITCHGEAR WITH PRIMARY AND SECONDARY SWITCH MEANS ASSOCIATED WITH CURRENT TRANSFORMER

George Caton, Ilkley, England, assignor to Yorkshire Switchgear and Engineering Co., Limited, England

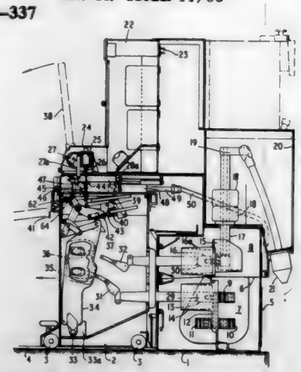
Original No. 3,842,321, dated Oct. 15, 1974, Ser. No. 340,263, Mar. 12, 1973. Application for reissue Apr. 12, 1976, Ser. No. 675,796

Claims priority, application United Kingdom, Mar. 16, 1962, 12482/72

Int. Cl.[2] H02B *11/06*

U.S. Cl. 361—337

13 Claims



1. Electrical switchgear, comprising:

a. a stationary housing containing current inlet and outlet conductors forming elements of a primary high voltage circuit, transformer means, at least one secondary circuit fed by the transformer means and secondary switch means for controlling said secondary circuit, *and trip control means;*

b. a movable housing containing primary switching means for said primary circuit, said primary switching means including contacts movable between open and closed positions, *and a spring-operated circuit breaker for moving said contacts to the open position to break said primary circuit;*

c. mating primary supply contacts on said stationary housing and said movable housing, said primary supply contacts mating with each other when said movable housing is in an operative position relative to said stationary housing to connect said inlet and outlet conductors to said primary switching means;

d. *a* movable mechanical transmission [elements] *element* projecting from said movable housing;

e. means [coupling said transmission elements to said movable contacts] for controlling the position of said *mechanical* transmission [elements] *element* in accordance with the open and closed positions of said movable contacts of said primary switching means;

f. *a* movable mechanical sensing [elements] *element* projecting from said stationary housing and linked to operate said secondary switch means;

g. said sensing [elements] *element* being juxtaposed with and engageable by said transmission [elements] *element* when said movable housing is in said operative position whereby said secondary switch means is controlled in accordance with the open and closed positions of said movable contacts of said primary switching means through said *mechanical* transmission [elements] *element* and sensing [elements] *element;*

h. a mechanical operating member projecting from said stationary housing and controlled to move between different positions by said trip control means;

i. a mechanical trip member projecting from said movable housing and movable for controlling operation of said circuit breaker;

j. said mechanical trip member being juxtaposed with and engageable by said mechanical operating member when said movable housing is in said operative position whereby in response to a signal from said trip control means said mechanical operating member moves said mechanical trip member causing operation of said circuit breaker.

PLANT PATENTS

GRANTED AUGUST 30, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,095

NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.

Filed Aug. 30, 1976, Ser. No. 719,051

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—41

1 Claim

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is large, vigorous, upright to spreading, foliated with large to medium size, lanceolate, acutely pointed leaves having a glandular, crenate margin, and a regular and very productive bearer of large, uniform, symmetrical, globose to oblong, freestone fruit having yellow skin substantially overspread with red, yellow flesh, and a stone with a sweet kernel; the fruit being quite similar to that of the Red Diamond nectarine, but ripens about two weeks later.

4,096

APPLE TREE

Dan E. Simmons, Rogers, Ohio, assignor to Hilltop Orchards & Nurseries, Inc., Hartford, Mich.

Filed Oct. 6, 1976, Ser. No. 730,234

Int. Cl.[2] A01H *5/03*

U.S. Cl. Plt.—34

1 Claim

1. A new and distinct variety of apple trees substantially as described and illustrated in this application.

PATENTS

GRANTED AUGUST 30, 1976

ERRATA

For CLASS	See PATENT NO.
273–136 F	4,045,013
351–132	4,045,137
351–178	4,045,138
195–103.5 R	4,045,296
195–103.5 R	4,045,297
195–080 R	4,045,298
202–093	4,045,299
225–002	4,045,356
250–527	4,045,359
542–413	4,045,434
544–028	4,045,435
544–023	4,045,436
544–017	4,045,437
544–029	4,045,438
424–330	4,045,580
200–153 K	4,045,650
363–089	4,045,719
363–126	4,045,722
346–075	4,045,770
364–900	4,045,779
364–900	4,045,780
364–200	4,045,781
364–200	4,045,782

PATENTS

GRANTED AUGUST 30, 1977

GENERAL AND MECHANICAL

4,044,399

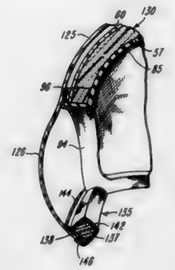
SAFETY HELMET WITH INDIVIDUALIZED HEAD-CONTOURED INTER-LINER

William G. Morton, Box 841, Hopewell, Va. 23860

Continuation-in-part of Ser. No. 570,712, April 23, 1975, Pat. No. 3,992,721, which is a continuation-in-part of Ser. No. 360,950, May 16, 1973, Pat. No. 3,882,546, which is a continuation-in-part of Ser. No. 323,195, Jan. 12, 1973, abandoned. This application Sept. 9, 1976, Ser. No. 721,871

Int. Cl.² A42B *3/00*

U.S. Cl. 2—414 **8 Claims**



1. An improved safety helmet assembly comprising a substantially rigid dome-shaped outer shell including a pair of depending ear portions, a dome-shaped inner shell disposed within said outer shell, a deformable dome-shaped headpiece of substantially uniform thickness and spaced within said inner shell to define a dome-shaped cavity therebetween, said headpiece being effective to receive and cover the wearer's head and to conform to the contour of the head over the area covered by said headpiece, said headpiece having an outwardly projecting and peripherally extending integral flange portion forming the lower edge portion of said headpiece, means for connecting said flange portion of said headpiece to the corresponding lower edge portion of said inner shell adjacent the bottom of said cavity and cooperating with said inner shell and said headpiece to form a removable inter-liner, an edge roll assembly mounted on the lower surface of each said ear portion of said outer helmet shell and having opposite ends terminating generally adjacent said flange portion of said headpiece, and said edge roll assemblies include resilient foam material adapted to be deformed to provide for conveniently removing and replacing said inter-liner.

4,044,400

HELMET RETENTION SYSTEM

Lester R. Lewicki, Woodland Hills, and James D. Santacroce, Beverly Hills, both of Calif., assignors to Bell Helmets Inc., Norwalk, Calif.

Filed Oct. 18, 1976, Ser. No. 733,139

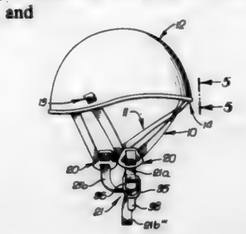
Int. Cl.² A42B *7/00*

U.S. Cl. 2—421 **12 Claims**

1. In a helmet retention system including a forwardly facing helmet,

a. left and right side retention strap sections, the left section having attachments to the helmet at forward and rearward locations, and the right section having attachments to the helmet at forward and rearward locations, the sections hanging from the helmet,

b. left and right sliders respectively slidably attached to the left and right retention straps to be adjustably slidable therealong, and



c. chin strap means having attachment to and hanging from the sliders to extend therebetween.

4,044,401

ARTIFICIAL BLADDER

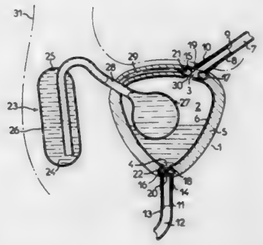
Jacques Guiset, 62, rue E., Delesalle Lille (Nord), France

Filed Aug. 3, 1976, Ser. No. 711,209

Claims priority, application France, Aug. 4, 1975, 75.25283

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1 **20 Claims**



1. An artificial bladder characterized in that it comprises: a leak-proof enclosure wall internally forming a closed cavity which is accessible through two upper apertures and through one lower aperture, means for connecting each of the upper apertures to a ureter, means for connecting the lower aperture to the urethra, a balloon made of leak-proof, flexible material which is positioned inside the said cavity and internally forms a closed space, means for selectively introducing a fluid into the said balloon or for extracting it therefrom so as to inflate and deflate it respectively, means for sealing the two upper apertures, which are normally open and means for opening the lower aperture, which is normally closed when the said balloon is inflated so as to induce urination.

4,044,402

LARYNGEAL PROSTHESIS

Nigel Edwards, Bristol, England, assignor to National Research Development Corporation, London, England

Filed Feb. 28, 1975, Ser. No. 554,125

Claims priority, application United Kingdom, Mar. 1, 1974, 9345/74

Int. Cl.² A61F *1/20*

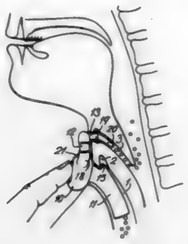
U.S. Cl. 3—1.3 **9 Claims**

1. For a laryngectomee with a fistula and a tracheostome, a aryngeal prosthesis comprising:

a hollowed body having a fistular tube and a tracheal tube connected thereto to respectively communicate the hollow of said body with said fistula and tracheostome, and

a valve mechanism mounted in said body to open and close said hollow body relative to the exterior of said body, said valve mechanism including first valve member operable to move from one position for opening said hollow body to

another position for closing said hollow body in response to a substantially predetermined first value of air pressure in said hollow, said mechanism including a second valve member operable to move from one position for closing



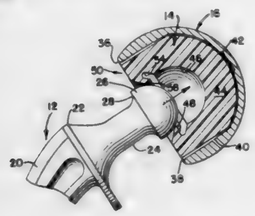
said hollow body to another position for opening said hollow body in response to a substantially predetermined second value of air pressure in said hollow body and said second value of air pressure being higher than said first value.

4,044,403

IMPLANTABLE JOINT PROSTHESIS

Joseph D'Errico, Clifton, N.J., assignor to Howmedica, Inc., New York, N.Y.

Filed Nov. 1, 1976, Ser. No. 737,586
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.913 **9 Claims**



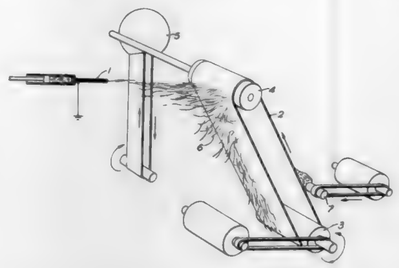
5. An implantable component for cooperatively engaging an implantable prosthetic member having a substantially spherical head to form an articulating joint prosthesis, said component having a substantially congruent cavity formed therein for cooperatively engaging said spherical head, said cavity having hemispherical portion terminating in a diametral plane and an entrance portion extending beyond said plane and terminating in a circular entrance to said cavity, an outwardly tapering guideway surrounding said entrance, said component further having a continuous annular groove formed substantially at said diametral plane and adjacent said guideway, said guideway and said groove defining between them a resilient annular lip surrounding said entrance, said lip being inwardly deformable during insertion of said spherical head through said entrance to admit and entrap said head in said cavity, and said lip being outwardly deformable to resist escape of said head from said cavity.

4,044,404

FIBRILLAR LINING FOR PROSTHETIC DEVICE

Graham Ernest Martin; Ian Derek Cockshott, both of Runcorn, and Francis James Thomas Fildes, Macclesfield, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Aug. 1, 1975, Ser. No. 600,942
Claims priority, application United Kingdom, Aug. 5, 1974, 34338/74
Int. Cl.² A61F *1/02*
U.S. Cl. 3—19 **17 Claims**



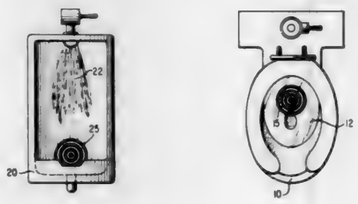
1. A lining for a prosthetic device comprising a mat of organic fibers prepared by electrostatically spinning an organic material and collecting the spun fibers on a suitable receiver.

4,044,405

TARGET IN A BOWL OR URINAL TO ATTRACT THE ATTENTION OF URINATING HUMAN MALES

Joel S. Kreiss, Washington Valley Road, Martinsville, N.J. 08836

Filed Jan. 27, 1976, Ser. No. 652,816
Int. Cl.² A47K *17/00*
U.S. Cl. 4—1 **8 Claims**



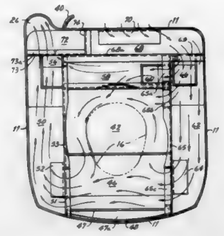
1. In a toilet bowl or urinal the combination comprising:
A target means to attract the attention of urinating human males to be wholly disposed within the bowl or urinal and to be permanently connected to the bowl or urinal; said target means being flexible prior to being non-removedly connected; said target being disposed in said bowl or urinal such that no part of said target extends outside of the volume partially enclosed by said bowl or urinal; and said target being void of moving parts.

4,044,406

COMPACT PORTABLE SELF-CONTAINED AEROBIC DIGESTION TOILET

William J. Hargraves, 121 Lake Highlander Mobile Home Park, County Road No. 1, Dunedin, Fla. 33528

Filed July 1, 1975, Ser. No. 591,069
Int. Cl.² E03D *5/016*
U.S. Cl. 4—10 **3 Claims**



1. An aerobic digestion toilet structure for purifying organic waste material dissolved or dispersed in water comprising: a toilet bowl; a main liquid-filled digestion chamber having vertical side walls said main digestion chamber being divided into first and second side-by-side portions by a vertical weir having an upper edge slightly below the liquid level in said chamber portions inlet means communicating with said first chamber portion for receiving organic waste from the bowl; a plurality of secondary liquid-filled digestion chambers surrounding the vertical side walls of said main chamber and forming therewith a unitary portable structure; means connecting said chambers in series such that a volume of waste added to said main chamber displaces liquid sequentially into the last downstream secondary chamber, said connecting means including between each two serially-connected chambers a quiescent chamber in which solids settle by gravity and means forming an overflow outlet from the respective quiescent chamber to the next downstream digestion chamber, the quiescent chamber associated with said main digestion chamber being in communication with said second chamber portion at a location remote from said weir; means for continuously mixing the contents of each digestion chamber to maintain any solids therein in suspension and for continuously aerating the contents of each chamber, said mixing and aerating means including air inlet means located adjacent the lower end of said weir and wherein said first and second chamber portions have bottom walls inclined downwardly toward the lower end of said weir to cause circulation of the liquid in each of said chamber portions in a direction upward along said weir, then away from said weir, then downwardly along respective chamber side walls and then toward said weir; and a pump carried by said unitary structure for pumping rinse liquid from one of the secondary chambers to said bowl.

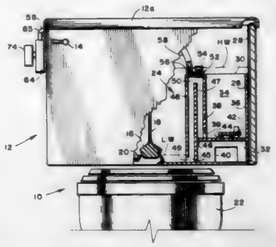
4,044,407

TOILET WATER SAVER DEVICE

George E. Silcox, 1532 Sierra Drive, Petaluma, Calif. 94952

Filed May 4, 1976, Ser. No. 683,179
Int. Cl.² E03D *1/22, 1/34, 5/02*
U.S. Cl. 4—40 **4 Claims**

1. A toilet tank water saving device comprising:
an open top container with generally vertical side and end walls, and a bottom wall adapted to be positioned in a toilet tank above the bottom thereof:
an aperture in one end wall adjacent said bottom wall;
spaced upright side wall members extending outward from said one end wall, said side wall members extending vertically from the tops of said container to below said bottom wall;
an outer partition spanning the ends of said side wall members from the top therof to below said bottom wall and being spaced from the bottom of said tank;
a cover spanning the tops of said sidewall members, said one end wall and said outer partition;
an intermediate partition spanning said side panels from below said cover to below said bottom wall and spaced between said one end wall and said outer partition to form an inverted U-tube has been inserted after "wall".



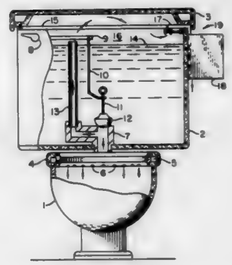
means sealing between said intermediate partition and said bottom wall;
a check valve in the lower portion of said container to enable one-way flow therein; and
means selectively operable to vent the inverted U-tube to the atmosphere.

4,044,408

DEODORIZING ACCESSARY FOR WATER CLOSETS

Raymond H. Pearson, 627 Sherwood Drive, Richardson, Tex. 75080

Filed Sept. 27, 1976, Ser. No. 727,174
Int. Cl.² E03D *9/05, 9/04;* A47K *3/22*
U.S. Cl. 4—213 **5 Claims**



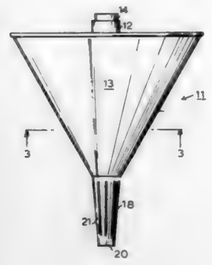
1. A deodorizing accessary for water closet including a toilet bowl, water tank and water tank cover, said water tank including an overflow conduit, whereby water in excess of the desired water level may be dispensed into said toilet bowl, and through which odorous air may be induced from said toilet bowl, said water tank also including a flushing mechanism whereby water may be discharged into said toilet bowl so as to flush said toilet bowl, and an air space above the water level, said accessary comprising air blower means having an inlet communication with said overflow conduit whereby odorous air may be induced from said toilet bowl, control means operable to initiate and terminate the odorous air flow, the air valve means in said inlet communication said air valve means operable to close when said accessary is not in use, retarding the intrusion of water vapor from said water tank into said accessary, said air valve means operable to open so as to pass said odorous air flow when said accessary is in use, said air valve means also operable to open so as to pass air into said water tank air space when said toilet bowl is flushed.

4,044,409

VERTICALLY SLOTTED STRAINER

Harry N. Hood, 302 Thorn St., San Diego, Calif. 92103

Filed Mar. 8, 1976, Ser. No. 664,888
Int. Cl.[2] E03C *1/26*
U.S. Cl. 4—292 2 Claims



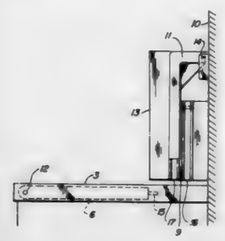
1. A sink strainer comprising:
a hollow vertical cylindrical member open on each end thereof, said vertical cylindrical member having a lower end portion dimensioned for being snugly received by a sink drain opening;
a plurality of vertical slots disposed in said vertical cylindrical members; and
a funnel member coupled to a lower portion of said vertical cylindrical member above said lower end portion, said funnel member diverging toward the plane of the top portion of said vertical cylindrical member.

4,044,410

COMBINATION BUNK BED AND SEAT

Richard Klingler, Elkhart, Ind., assignor to Holiday Rambler Corporation, Wakarusa, Ind.

Filed Aug. 23, 1976, Ser. No. 716,527
Int. Cl.[2] A47C *13/00, 17/04*
U.S. Cl. 5—9 R 2 Claims



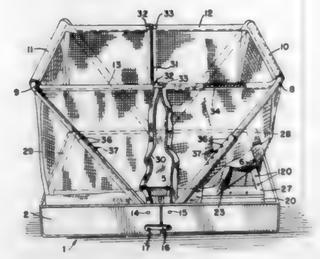
1. A foldable bunk bed and seating arrangement comprising a first horizontally disposed bed surface located adjacent a wall, a second bed surface vertically spaced from said first surface, said second surface having a first generally rigid segment, and a second lip segment hingedly connected to said first segment so as to permit approximately 180° rotational movement of said second segment from a rigid position coplanar with said first segment to a position approximately parallel to and contiguous with said first segment, said first segment eccentrically mounted to the wall a distance so as to accommodate the thickness of said second segment when the second bed surface is in the seating mode, support means engageable with said second segment to support said segment in its coplanar position.

4,044,411

TRANSPORTABLE FOLDING CRIB

Jerald G. Peterson, Apt. 11C Northgate Square, Reston, Va. 22090

Filed Aug. 29, 1975, Ser. No. 609,006
Int. Cl.[2] A47C *29/00*
U.S. Cl. 5—99 A 17 Claims



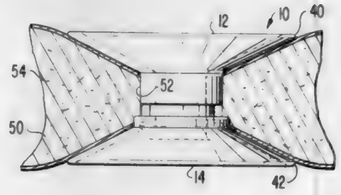
1. A suitcase-crib combination comprising:
a suitcase structure having an outer wall formed in two halves and an inner wall structure formed in two halves, said inner wall structure being spaced apart from said outer wall structure;
hinge means coupling said two halves of said inner wall structure and said two halves of said outer wall structure together to form said suitcase structure; and
a folding crib structure having a pair of telescoping rods and a mesh wall structure secured to said telescoping rods, said telescoping rods being pivotally secured in the space between said inner wall structure and said outer wall structure, one of said pair of rods being pivotally secured to one of said halves of inner and or outer wall and the other of said rods being pivotally secured to the other of said halves, said telescoping rods and said mesh wall structure of said folding crib being folded into spaces formed between said inner wall structure and said outer wall structure and said suitcase being closed when said suitcase-crib combination is not in use.

4,044,412

TUFTING BUTTON

James Elliott Barron, Midland, Tex., assignor to Magnatex Corporation, Midland, Tex.

Filed July 2, 1976, Ser. No. 702,370
Int. Cl.[2] A47C *27/00*; A44B *1/18, 17/00*
U.S. Cl. 5—356 3 Claims



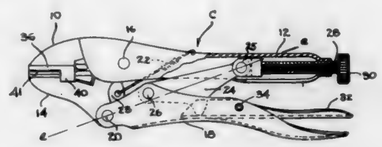
1. A tufting button for a cushion having an upper substantially planar surface, a lower substantially planar surface and a tufting material disposed therebetween, the tufting button comprising:
a first enlarged flanged portion having a central aperture therein and conically configured sides sloping toward the central aperture;
a first cylindrical portion connected to said enlarged flange portion and havig a central longitudinal axis in alignment with the center of the aperture in said first enlarged flange portion;
a second enlarged flange potion having a central aperture therein and conically configured sides sloping toward the central aperture;
a second cylindrical portion connected to said second enlarged flange portion and having a central longitudinal axis in alignment with the center of the aperture in said second enlarged flange portion;
first means connected to said first cylinder portion for engaging and interconnecting said first cylinder portion with said second cylinder portion; and
second means connected to said second cylinder portion for cooperatively engaging and interconnecting with said first means for connecting said second cylinder portion with said first cylinder portion, wherein
fluid contacting either of said first or second enlarged flange portions will be funneled into and axially through said first and second cylindrical portions of the tufting button without contaminating the tufting material of a cushion tufted with the tufting button.

4,044,413

CLAMP ASSEMBLY WITH GUIDE MEANS FOR REMOVING SELECTED ARC LENGTH OF CLAMPED RING FOR SIZE REDUCTION

Dalton R. Tucker, 1803 Rockefeller Lane, Redondo Beach, Calif. 90277

Filed Sept. 28, 1976, Ser. No. 727,697
Int. Cl.[2] B25B *7/22*
U.S. Cl. 7—3 R 5 Claims



1. A composite clamp assembly comprising a clamp having a pair of adjustable clamp jaws and means for functionally opening and closing same, each clamp jaw carrying an extension jaw having clamp faces of corresponding transverse arcuate curvature and disposed in position to clamp an arcuate segment of a workpiece such as a ring therebetween, one extension jaw consisting of an arcuate surfaced plate laterally projecting beyond one of said clamp jaws, such projecting portion being characterized by at least one longitudinal tongue forming an open-ended guide slot having mutually parallel side walls extending adjacent a side of the clamp jaw, each side of said slot and of said tongue thus forming guide walls jointly defining different arc lengths of a clamped workpiece, the width of said slot and of said tongue corresponding to aliquot parts of an arcuate unit distance, whereby a desired arc length of a clamped workpiece may be severed by making cuts along a selected pair of said guide walls as by moving a juxtaposed sawblade therealong, said clamp assembly including interlocking means for preventing lateral displacement of one extension jaw relative to the other when in functional engagement.

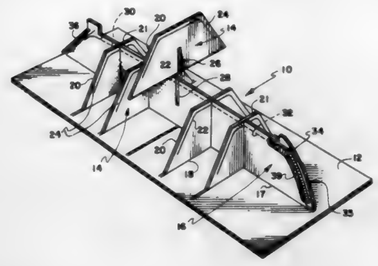
4,044,414

BOAT CONSTRUCTION AND MOLD

Felix John Grycel, III, 14322 Emelita, Van Nuys, Calif. 91401

Filed June 23, 1976, Ser. No. 698,953
Int. Cl.[2] B63B *3/00*
U.S. Cl. 9—6 R 11 Claims

1. A method of constructing a framed structure comprising the steps of:
forming a mold base surface to support a mold assembly,
forming a first peripheral edge of each of at least a pair of frame members from construction material, said material serves as a frame support member for said at least a pair of frame members of said structure,
forming a second side substantially opposite each frame first peripheral edge a predetermined distance from said first peripheral edge, said second side forming a base for said at least a pair of frame support members,
cutting partially through the frame support member forming each of said frame members to form a third inwardly facing edge of said frame member without removing said frame member from said frame support member, each partially cut frame member remaining an integral part of said support member,



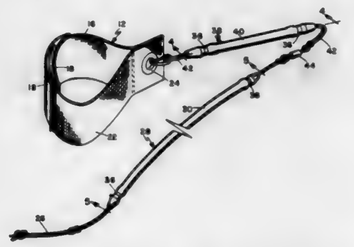
attaching said second side forming said base of said at least a pair of frame support members to said mold base surface, said frame support members being affixed substantially perpendicular to said mold base surface and in substantially spaced parallel relationship with each of the other of said at least a pair of frame support members,
attaching at least one sheet member formed from said construction materials to the first peripheral edge of each of said at least a pair of partially cut frame members affixed to said mold base surface,
severing each frame member from its frame support member affixed to said mold base surface, and
removing said framed structure from said severed frame support members affixed to said mold base surface.

4,044,415

SURFBOARD LEASH

Bruce G. Wood, 4943½ Cape May Ave., San Diego, Calif. 92107

Filed Apr. 12, 1976, Ser. No. 675,732
Int. Cl.[2] A63C *15/06*
U.S. Cl. 9—310 E 3 Claims



2. An ankle leash for securing a surfboard to a surfer comprising:
a. an elongated line having means at each end to engage a surfer's ankle and a surfboard, respectively;
b. a first portion of said line being elastic and capable of stretching from a first length to a second length and being substantially inextensible beyond said second length;
c. a second portion of said line being elastic and of elastic strength greater than that of said first portion; and
d. said first and second line portions each comprise an elastic

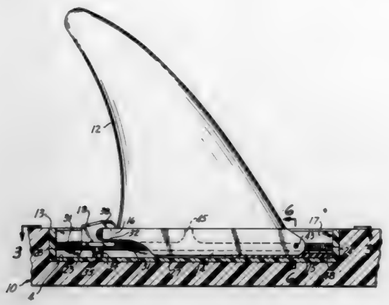
tube having cord loops securely connected within and extending from each of the ends thereof, said loops releasably connecting said portions to each other and to said means to engage the surfer's ankle and the surfboard.

4,044,416

SURFBOARD WITH ADJUSTABLE FIN

Charles A. Brewer, 72957 Joshua Tree St., Palm Desert, Calif. 92660, and Richard A. Brewer, 61479 Kamehameha Highway, Honolulu, Hawaii 96712

Filed June 14, 1976, Ser. No. 696,088
Int. Cl.² A63C *15/00*
U.S. Cl. 9—310 E **62 Claims**



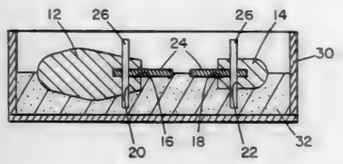
10. A surfboard structure comprising in combination:
a surfboard;
a fin for said surfboard having a longitudinal fin base having first and second end portions;
a fin holder in the underside of said surfboard defining an elongate channel extending lengthwise of said surfboard for receiving said fin base for lengthwise adjustment of said fin relative to said surfboard; and
means engageable with said fin holder and fin base for releasably retaining said fin relatively to said surfboard at variable locations, said retaining means including a clamp having a mouth portion for receiving one of said first and second end portions of said fin base and having a manually engageable top portion projecting out of said fin holder and reaching over said one end portion of said fin base into engagement with said one end portion, means for mounting said clamp for lengthwise sliding movement in said fin holder, and means for selectively arresting movement of said clamp in said fin holder.

4,044,417

MOLDING FOOTWEAR LASTS

Arnold Cohen, Marblehead, Mass., assignor to Jones & Vining, Incorporated, Braintree, Mass.

Filed Dec. 31, 1975, Ser. No. 645,547
Int. Cl.² A43D *00/00*
U.S. Cl. 12—146 L **10 Claims**



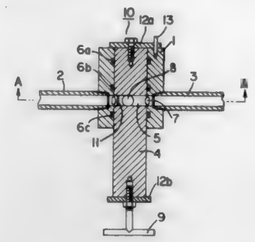
1. A method of making molded footwear lasts, comprising the steps of
preparing an oversized model of the last to be molded,
isolating, applying mold release to, and covering with liquid instant set polymer (ISP) at least first and second surface portions of said model,
allowing said ISP to cure to form at least first and second mold portions, and
using said mold portions to mold plastic lasts.

4,044,418

TUBE SCRUBBING APPARATUS

Masaichi Ishii, Sakai, and Kazuo Mihara, Hyogo, both of Japan, assignors to Daicel Ltd., Sakai, Japan

Filed May 21, 1976, Ser. No. 688,607
Claims priority, application Japan, June 6, 1975, 50-68329
Int. Cl.² B08B *9/04*
U.S. Cl. 15—104.06 A **7 Claims**



1. An apparatus for inserting cleaning elements into pipes, comprising:
an elongated cylinder defining an internal elongated chamber, said cylinder being open at its opposite longitudinal ends and having aligned inlet and outlet flow passages intersecting said chamber between the longitudinal ends thereof;
an elongated rod disposed within said chamber for longitudinal sliding movement therein, said rod having a single transverse through opening adapted to be aligned with said inlet and outlet flow passages in a first position of said rod in said chamber, said rod being longer than said cylinder and having a first imperforate end portion which extends from said through opening through and beyond one longitudinal end of said chamber, said rod having a second imperforate end portion which extends from the opposite side of said through opening to the other longitudinal end of said chamber, said rod being movable between said first position and a second position in which said through opening is positioned outside of said chamber and said first end portion is aligned with said inlet and outlet passages so that cleaning element means can be inserted into said through opening while said first end portion prevents flow of fluid from said inlet and outlet flow passages into said chamber, said cylinder having at least two annular sealing means mounted therein and sealingly contacting the periphery of said rod, one of said sealing means being located on one longitudinal side of said cylinder from said flow passages for continuous sealing engagement with said first end portion and the other of said sealing means being located on the opposite longitudinal side of said cylinder from said flow passages for continuous sealing engagement with said rod.

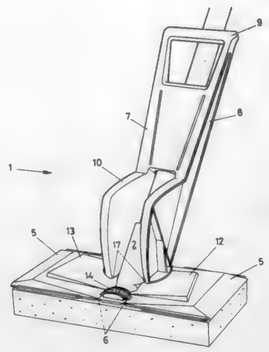
4,044,419

MOP WRINGER

Paul E. Robinson, Adelaide, Australia, assignor to Sabco Limited, Albert Park, Australia

Filed Feb. 25, 1976, Ser. No. 661,130
Claims priority, application Australia, Mar. 6, 1975, 0814/75
Int. Cl.² A47L *13/146*
U.S. Cl. 15—119 A **6 Claims**

1. A squeeze mop comprising a mop body, and a pair of wings hinged to the mop body at opposite sides thereof with a mopping element affixed to the undersurface of the wings, the mop body having a socket for the reception of a handle of the mop, characterized by a one piece actuator pivoted to the mop body, the actuator comprising a lever including a handle and a pair of members to engage the wings, the actuator being pivoted about an axis transverse to the hinging of the wings to the body and the pivotal axis being adjacent the rear of the wings, the pair of members straddling the handle socket and having



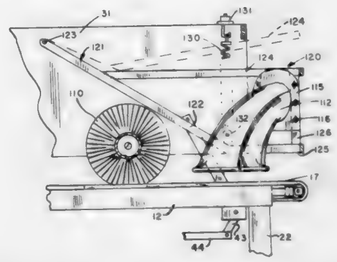
portions extending forwardly as radius arms from the pivotal axis of the actuator, flat bottom surfaces of the radius arms being in engagement with the wings to form stops to limit upward movement of the wings, actuation of the lever forwardly forcing the wings downwardly, and the final squeezing is caused by the inside surfaces of the members engaging the upper surfaces of the wings with a wedging or camming action.

4,044,420

PAN CLEANING APPARATUS

Douglas R. Hanson, 1720 - 9th Ave. South, Minneapolis, Minn. 55404

Continuation-in-part of Ser. No. 496,105, Aug. 9, 1974, Pat. No. 3,999,238. This application June 26, 1975, Ser. No. 590,404
Int. Cl.² B08B *9/08*
U.S. Cl. 15—304 **4 Claims**



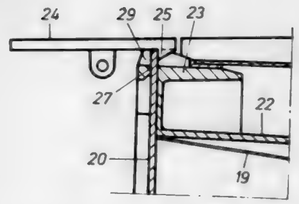
1. A cleaning apparatus for flat pans having means forming a plurality of receptacles therein comprising a frame, conveyor means on said frame to support and move a pan to be cleaned generally in a plane along said frame from a first end of said frame to a second end of said frame, a vacuum hood mounted on said frame and positioned to overlie a pan moving along said first plane, said vacuum hood having peripheral edges defining a downwardly facing opening, said opening overlying an area of said conveyor means, means to support said vacuum hood relative to said frame comprising a pivoting subframe pivotally mounted with respect to said frame to permit said vacuum hood to more upwardly relative to said conveyor means as said subframe pivots without substantially changing the orientation of said opening relative to the conveyor means during normal operation, a source of vacuum connected to said vacuum hood to subject a pan to a vacuum induced airflow across the entire opening of said hood as a pan is moved below said opening, air tube means to carry air under pressure from a source, means to mount said air tube means adjacent a leading edge of said opening first overlying a pan being moved by said conveyor means, an air source connected to said air tube means, said air tube means including passageways defined therethrough having axes positioned at an angle with respect to said plane to direct streams of air under pressure in a direction downwardly toward a pan supported on said conveyor means and below said opening whereby material agitated by said stream of air will be subjected to said vacuum induced airflow from said vacuum hood, and stop means to stop downward movement of said subframe when the vacuum hood is in a desired stopped position relative to said plane.

4,044,421

COMBINATION DUST CONTAINER AND LATCHING MEANS FOR A VACUUM CLEANER

Kerstin Elisabeth Kristenson, Ronninge, and Sven Bertil Simonsson, Tyresco, both of Sweden, assignors to Aktiebolaget Electrolux, Sweden

Filed Jan. 16, 1976, Ser. No. 649,691
Claims priority, application Sweden, Jan. 20, 1975, 7500558
Int. Cl.² A47L *9/14*
U.S. Cl. 15—339 **7 Claims**



1. A combination dust container and a latching means for a vacuum cleaner comprising said dust container having an air pervious portion provided with an inlet opening for the reception of dust laden air and an attachment plate, said plate being of a relatively rigid material, a two-part vacuum cleaner housing, a latching hook and keeper member on said two-part housing whereby when said dust container is inserted in one part of said two-part housing with its attachment plate located between said two parts, a lug projecting from a peripheral surface of said attachment plate is provided with a portion that acts as an intermediate filler panel when said latching hook on one part of said two-part housing engages one side of said lug while the keeper member engages the opposite side thereof to retain said two-part housing in a closed position, said closed position indicating that the dust container is in place in said one part of said vacuum cleaner housing.

4,044,422

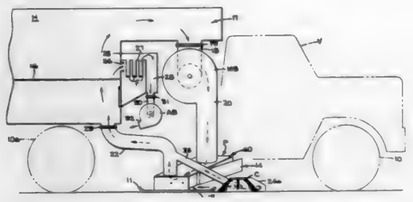
SWEEPER PICKUP HOOD WITH AIR LOCK

Gregory J. Larsen, Claremont, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 8, 1976, Ser. No. 647,521
Int. Cl.² A47L *5/14*
U.S. Cl. 15—340 **13 Claims**

1. In a street sweeper of the type comprising a vehicle mounted hopper, a blower and debris pickup means comprising a hood extending transversely across the swept surface; said hood having an air line for delivering air-entrained debris to the hopper, and flexible, surface engaging sealing flaps; the improvement comprising a tunnel connecting the interior of the hood with ambience having a forwardly opening entrance for admitting large articles of debris, air lock means in said

tunnel for accommodating the passage of large articles of debris through said tunnel while maintaining an air seal between the ambience and the interior of said hood, air lock operator means for cyclically operating said air lock means to



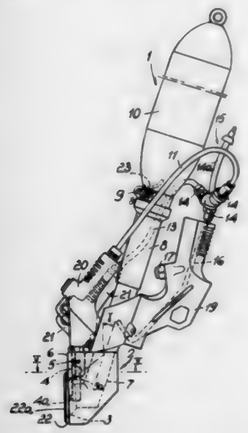
pass said debris from the ambience to the interior of the hood, said debris pickup means including deflector means engaging the swept surface for windrowing large articles of debris into the entrance of said tunnel.

4,044,423

PNEUMATIC CLEANER PARTICULARLY FOR CLEANING ELEMENTS OF TEXTILE MACHINERY

Giuseppe Gaiardelli, via Bertacchi, 15, Parabiago (Prov. of Milan), Italy

Filed Dec. 16, 1974, Ser. No. 533,384
Claims priority, application Italy, Dec. 27, 1973, 32319/73
Int. Cl.² A47L *5/18*
U.S. Cl. 15—345 **1 Claim**



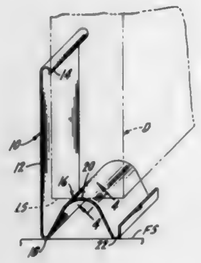
1. A pneumatic cleaner, particularly for cleaning turbines of twisting machines, comprising a suction head having a suction duct and a front surface defining a conical suction mouth communicating with said suction duct, said conical suction mouth sloping from said front surface toward said suction duct, a nozzle inside said suction duct and means for connecting said nozzle to a source of compressed air, said nozzle being oriented to generate an air jet inside said suction duct directed opposite to said suction mouth for generating suction at said suction mouth and inside said suction duct, a first passage within said suction head separate from said suction duct and having an air blast nozzle opening substantially at the peripheral portion of said conical suction mouth and directed with an axis crossing the axis of said conical suction mouth at a point outside of said suction head for creating an air jet centrally oriented into the object to be cleaned, a second passage within said suction head separate from said first passage and from said suction duct and having an air blast nozzle opening into said conical suction mouth in a direction inclined with respect to said front surface and having an axis skew with respect to the axis of said conical suction mouth for creating a vortical air movement inside the object to be cleaned, means for connecting said first and second passage to a source of compressed air, means on said front surface for geometrical connection of said head with the object to be cleaned, and a collecting container at the outlet of said suction duct, whereby simultaneous air ejection from said air blast nozzles causes vortical dislodgement of foreign material from the object to be cleaned to the center thereof while air ejection from said nozzle inside said suction duct causes suction of the dislodged material through said suction duct to said collecting container.

4,044,424

DOOR STOP

Anthony M. Sasgen, 1S 174 Ingersoll Lane, Villa Park, Ill. 60181

Filed Apr. 21, 1976, Ser. No. 678,914
Int. Cl.² E05C *17/54*
U.S. Cl. 16—85 **3 Claims**



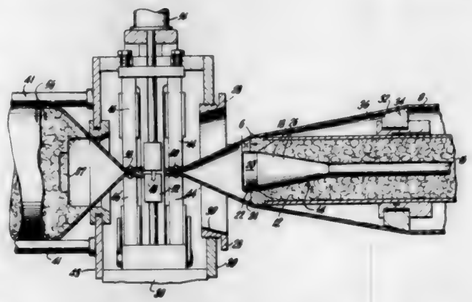
1. A one-piece door stop of metal comprising a flat vertical flange adapted to bear against one side of the door and an upwardly convex leg integral with the lower end of said flange and joined thereto by a bend and, in which the free end of the flange and leg are each defined by a bent-over head extending the width thereof.

4,044,425

PRODUCT STUFFING APPARATUS AND METHOD

Joseph Anthony Nausedas, Chicago, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 17, 1976, Ser. No. 724,255
Int. Cl.² A22C *11/02*; B65B *1/24*
U.S. Cl. 17—35 **14 Claims**



13. A method for stuffing a casing with product to produce stuffed casings with product-free closure zones which comprises:

a. sheathing a casing onto a stuffing horn, said horn having an inlet end and a discharge end, and the fore end of the casing proximal the discharge end of the horn being closed;

b. supplying a pressurized flowable viscous product at the inlet end of the stuffing horn and releasing said product from the discharge end of said stuffing horn to progressively stuff the casing;

c. stopping the flow of pressurized product after a predetermined length of casing has been stuffed;

d. compacting the product at the trailing end of the casing to produce a recess therein and severing the product at the discharge end of the stuffing horn;

e. advancing the casing over the discharge end of said stuffing horn so as to provide a product-free closure zone in the casing trailing the end of the stuffed product; and

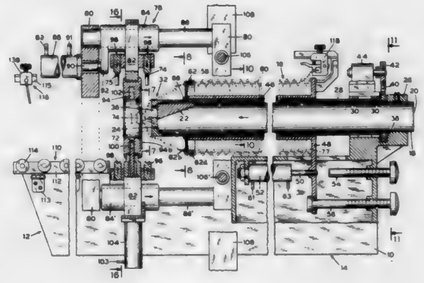
f. applying a closure at the product-free closure zone of said casing at the aft end of the stuffed product.

4,044,426

STUFFING APPARATUS

Vytautas Kupcikevicius, Chicago, and Anton LeRoy Mika, Downers Grove, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,252
Int. Cl.² A22C *11/02*
U.S. Cl. 17—49 **31 Claims**



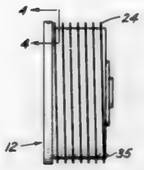
1. An apparatus for controlling the uniformity of stuffed diameter and conformation of the terminal ends of an encased product comprising in combination, a frame; a stuffing horn assembly including a central support tube having an inlet end and a discharge end for conveying emulsion from a supply source, an emulsion cut-off tube rotatably mounted with respect to said support tube and a sleeve means axially movably mounted with respect to said support tube and adapted to mount and secure a shirred tubular casing on said sleeve means, and emulsion cut-off means disposed at the discharge end of said support tube to control the flow of emulsion into a mounted casing; snubbing means associated with said stuffing horn assembly and adapted to be partially advanced over and retracted from said emulsion cut-off tube and further adapted to provide a closure means adapted for enclosing an encased product after a predetermined stuffing length; motive means to operate said sleeve means and snubbing means to regulate the position of said snubbing means over said emulsion cut-off tube and the position of said sleeve means relative to said snubbing means; and control means operatively associated with said stuffing horn assembly and said snubbing means to selectively control a cycle of successive stuffing and closing operations, thereby producing a stuffed closed encased product of predetermined length and diameter with controlled shape of the leading and trailing ends of said product.

4,044,427

COMBER ROLL

Albert M. Ankrom, and John T. Vernon, both of Sanford, N.C., assignors to Rogers Corporation, Rogers, Conn.

Filed May 21, 1976, Ser. No. 688,640
Int. Cl.² D01G *15/84*
U.S. Cl. 19—97 **2 Claims**



1. A comber roll comprising:

a molded plastic core, said core having a spirally grooved cylindrical portion of constant diameter, said core further having an axial passage for receiving a rotary drive shaft and a pair of parallel end faces, said end faces being oriented transversely to the axis of said core cylindrical portion;

a plurality of equally spaced notches in at least a first of said core end faces, said notches and the core segments therebetween defining vanes to establish air currents for directing debris away from said roll;

a flat card clothing wire positioned on edge in said groove in said core cylindrical portion, said wire having regularly spaced teeth in its outwardly disposed edge; and

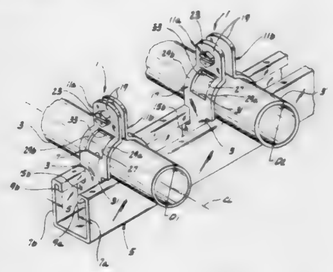
a wear-resistant coating on at least the toothed portion of said wire, said coating including diamond particles.

4,044,428

CONDUIT CLAMP

Joseph W. Kowalski, Florissant, Mo., assignor to B-Line Systems, Inc., Highland, Ill.

Filed Sept. 8, 1975, Ser. No. 611,529
Int. Cl.² F16L *3/08*; B65D *67/02*
U.S. Cl. 24—16 R **2 Claims**



1. A clamp for clamping a member of generally circular cross-section, such as a conduit or the like, to a channel having side flanges each having an inwardly directed, hook-shaped lip defining a slot therebetween with said member extending generally perpendicularly to said channel and engaging the outer edges of said lips, said clamp being adapted to clamp any of a plurality of said members having outer diameters ranging from a specified minimum diameter to a specified maximum diameter, said clamp comprising a pair of clamp straps, one for each side of the member, each of which comprises a generally flat stem portion of a width less than the width of said slot, and an ear at each lateral side of said stem extending out beyond a respective side of the stem for engagement with one of said lips, an intermediate portion bent out of the plane of said stem

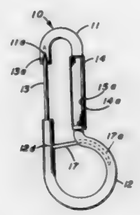
to extend around and grip a portion of the surface of said member to be clamped, an outer end portion, a transition between said intermediate and outer end portions, and means engageable with said outer end portions for drawing together said straps on opposite sides of said member, said intermediate portion of each strap being formed to be selectively weakened along a part thereof so as to enable said part of said intermediate portion to conform to the curvature of the outer surface of the conduit member being clamped, said intermediate portion including a pair of spaced bridge portions defining a cutout therebetween, said cutout having a first or lower edge and a second or upper edge extending between said bridge portions, said lower edge being positioned at substantially the same level as the longitudinal centerline of the conduit member being clamped when the latter has said specified minimum diameter and said upper edge being positioned adjacent said transition so that said bridge portions extend along said weakened part of said intermediate portion and so that said bridge portions are bendable so as to conform to the curvature of the outer surface of said conduit member upon said straps being drawn together, and said bridge portions having a width such that they have a tensile strength which only slightly exceeds the tensile strength of said ears so that upon application of a force to pull said conduit member away from said channel said ears will fail prior to failure of said bridge portions.

4,044,429

LOCKING SAFETY PIN AND KEY CARRIER

Robert W. Wagner, 1102 Lowenhill St., Pittsburgh, Pa. 15216

Filed Sept. 7, 1976, Ser. No. 720,753
Int. Cl.² A44B *9/10*
U.S. Cl. 24—156 **15 Claims**



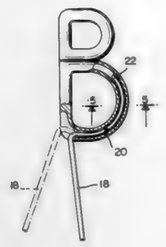
1. In a self-locking safety pin device, having a pair of cooperating upper and lower hollow loop parts, having a pointed pin part secured at its back end to project from a front end of the lower loop part and with its pointed end positioned in a cooperative relation with a front end of said upper loop part, and having a sleeve part rotatably positioned in an operating relation over back end portions of said pair of loop parts, the improvement which comprises, a back end portion of said upper loop part having a hole extending tranversely therethrough, a camming element operatively positioned within the back end portion of said upper loop part and having a cam end portion adapted to project outwardly through said hole, said sleeve part having a closed-end spiral-shaped guide slot portion in its wall into which said cam end portion of said element is adapted to extend for guided movement therealong to raise said upper loop part with respect to said lower loop part to a clearing position with respect to the pointed end of said pin part when said sleeve part is manually forwardly rotated with respect to said upper loop part to advance said cam end portion from a lower position to an upper position along said slot portion and to then swing said upper loop part to a sidewise-open position with respect to the pointed end of said pin part when the manual forward rotation of said sleeve part is continued, and a spring operatively positioned within the back end portion of said lower loop part and connected to said sleeve part to flexibly resist manual forward rotation of said sleeve part.

4,044,430

CLASP FOR JEWELRY CHAIN

Bari Bing, 128 W. Caranetta Terrace, and Barbara S. Sloan, 1425 Cedarview Ave., both of Lakewood, N.J. 08701

Filed Oct. 6, 1975, Ser. No. 619,836
Int. Cl.² A44B *19/00*
U.S. Cl. 24—201 R **2 Claims**



1. A clasp for jewelry chains comprising a hook member and a keeper member, said hook member having a shank segment and a hook segment, said hook segment being arcuate in shape and having a distal end, said keeper member comprising an arcuately shaped enclosed channel section, the arcuate shape of said channel section conforming to the arcuate shape of said hook segment, one end of said arcuately shaped channel section being closed and the other end terminating in an open mouth portion, said mouth portion being adapted to receive the distal end of said hook segment, said channel section and said hook segment cooperating to permit said hook member to pivot about the center of the arcuate shape of said channel section and fully slide within said channel section with only the shank segment remaining outside said channel section, said mouth portion comprising spaced apart shoulder members, the shoulder members being spaced apart a distance slightly less than the thickness of said shank segment, said shank segment being received past said shoulder members with a snap fit when said hook segment is fully inserted in said channel section, wherein said hook member is of a length such that its distal end terminates short of said closed end of said channel section in a direction substantially perpendicular to the direction of the jewelry chain connected at said hook and keeper members, whereby the hook member and the keeper member are held together in an arcuate configuration of substantially less circumference than a circle by complete mating of said hook segment with said channel section for dynamic tension at the distal end of the hook member, and by said snap fit.

4,044,431

SLIDE FASTENER AND METHOD AND APPARATUS OF MANUFACTURE

George B. Moertel, Conneautville, Pa., assignor to Textron Inc., Providence, R.I.

Filed Jan. 9, 1975, Ser. No. 539,802
Int. Cl.² B29D *5/00*
U.S. Cl. 24—205.13 C **20 Claims**

9. A method of manufacturing an improved chain for a slide fastener comprising the steps of

forming a slide fastener chain having a pair of planarly disposed tapes of a heat shrinkable thermoplastic material and a pair of rows of interlocking spaced engaging elements secured to respective adjacent edges of the pair of tapes,

advancing the slide fastener chain continuously though a sensing station,

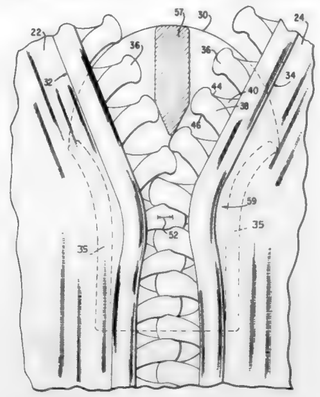
sensing the number of interlocking spaced engaging elements per unit length of the chain as the slide fastener chain passes through the sensing station,

heating the chain to the glass transistion temperature of the thermoplastic material,

passing the slide fastener chain between first and second pairs of rollers which grip the chain at spaced points,

driving the first pair of rollers at a constant speed,

driving the second pair of rollers at a variable speed changed in accordance with a deviation of the number of interlocking spaced engaging elements per unit length sensed at the



sensing station from a selected number of interlocking elements per unit length to produce a desired uniform spacing of interlocking engaging elements throughout the length of the slide fastener chain, and

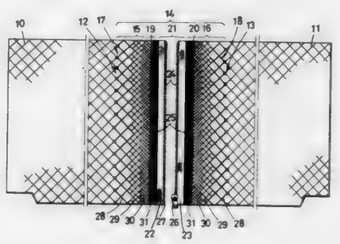
cooling the slide fastener chain having uniform spacing of interlocking engaging elements.

4,044,432

NET JOINTING STRUCTURE

Hiroyuki Ebata, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Mar. 11, 1976, Ser. No. 665,707
Claims priority, application Japan, Mar. 13, 1975, 50-34201
Int. Cl.² A44B *19/40, 19/00*
U.S. Cl. 24—205.16 R **8 Claims**



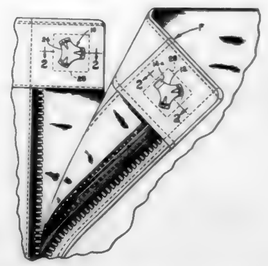
1. A net jointing structure for releaseably joining a pair of nets together, comprising; a pair of elongate net strips each having first and second longitudinal opposite edges and having a mesh size progressively decreasing toward said second edge, the first edge of each net strip being connected to a corresponding end of each of said nets; and a sliding claps fastener including a pair of stringers each having on and along one longitudinal edge a row of interlocking elements and secured at the opposite longitudinal edge to the second edge of a corresponding net strip, and a slider slidably mounted on said rows of interlocking elements for coupling and uncoupling same to correspondingly connect and disconnect said pair of stringers.

4,044,433

WAISTBAND FASTENER HAVING SUBSTANTIALLY IDENTICAL PARTS

William D. Aureli, Watertown, Conn., assignor to Scovill Manufacturing Company, Waterbury, Conn.

Filed Dec. 22, 1976, Ser. No. 753,467
Int. Cl.² A44G *13/00*
U.S. Cl. 24—227 **7 Claims**



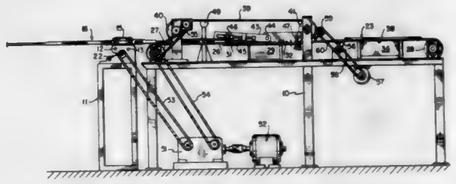
1. A waistband assembly comprising a waistband outer flap and an inner flap, the outer surface of the inner flap and the inner surface of the outer flap having affixed thereto respectively a pair of fastener halves, the halves being substantially identical, each half comprising a Y-shaped body having three legs distributed uniformly about the center of the body, the bodies of the two halves being in identical rotary orientation when the units are aligned with one of the legs of each being pointed in the direction of the outer flap and the other legs directed substantially up and down so that one of the legs on the outer flap half may be hooked between the said other legs of the inner flap half, all of the legs except said one leg of the unit on the outer flap being secured to the respective flaps.

4,044,434

APPARATUS FOR PROCESSING SWEATER SECTIONS AND THE LIKE

Clifford Chandler Bryan, Statesville, N.C., assignor to Samcoe Holding Corporation, Woodside, N.Y.

Continuation-in-part of Ser. No. 488,672, July 15, 1974, abandoned. This application July 10, 1975, Ser. No. 594,718
Int. Cl.² D06C *5/00*
U.S. Cl. 26—18.5 **13 Claims**



1. Apparatus for processing tubular knitted fabrics in continuous or piece form, which comprises

a. belt spreader means for engaging the fabric internally and distending it to flat form and to predetermined, uniform width,

b. lower endless conveyor blanket means having a first portion disposed adjacent and below the discharge end of the spreader means and having a second portion extending

downstream from the discharge end of the spreader means,

c. an upper endless conveyor blanket means having a first portion disposed adjacent and above the discharge end of the spreader means and extending above the lower conveyor blanket,

d. said conveyor blanket means including flexible conveyor blankets formed of a porous, non-metallic, hydrophobic material,

e. guide means for said conveyor blankets for guiding said blankets into fabric engaging and gripping relation a predetermined distance downstream of the discharge end of the spreader means and for maintaining said blankets in such engaging and gripping relation in the absence of substantial concentrated, localized pressure throughout a predetermined zone,

f. said guide means including means for guiding the conveyor blankets adjacent the discharge end of the spreader means while maintaining the blankets free of concentrated pressure contact with fabric on said spreader means,

g. means for controllably adjusting the position of said guide means for adjusting said predetermined distance,

h. means for steaming the fabric while it is being conveyed through said zone and is engaged and gripped by said conveyor blankets, and

i. means for removing moisture from said conveyor blankets subsequent to the steaming of the fabric and in advance of the re-engagement of the conveyor blankets with the fabric.

7. Apparatus for processing tubular knitted sweater sections in separated form, which comprises

a. means for supplying an individual sweater section in substantially dry form,

b. generally flat belt spreader means for engaging the section internally, distending it to predetermined uniform width, and advancing the section,

c. upper and lower flat endless conveyor blankets straddling the discharge end portion of said spreader means for receiving fabric discharged therefrom,

d. first guide means adjacent but spaced from the discharge end of said spreader means for guiding said conveyor blankets into light, uniform, across the width gripping engagement with sweater sections discharged from said spreading means,

e. said guide means including means for guiding the conveyor blankets adjacent the discharge end of the spreader means while maintaining the blankets free of concentrated pressure contact with fabric on said spreader means,

f. means for controllably adjusting the relationship of said first guide means to the discharge end of the spreader,

g. further guide means for maintaining said conveyor blankets in said light gripping engagement with said sweater section from the commencement thereof throughout a predetermined steaming zone,

h. means in said steaming zone for causing the flow of steam through at least one of said conveyor blankets and into said sweater section,

i. means for effecting disengagement of said upper conveyor blanket from said sweater section adjacent the downstream end of said steaming zone,

j. means for directing a flow of air through said sweater section and through said lower conveyor blanket in a predetermined cooling and moisture removal zone,

k. means for mounting and guiding said spreader means and said conveyor blankets to maintain said sweater section free of any substantial, concentrated, localized pressures from at least immediately upstream of said steaming zone to at least immediately downstream of said cooling zone, and

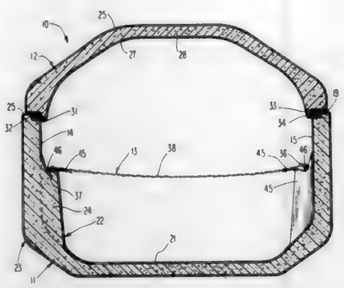
l. means for removing moisture from said upper conveyor blanket downstream of said steaming zone and in advance of said spreader means.

4,044,435

CASKET WITH SUPPORTED PALLET

Hugh Acton, Augusta, Mich., assignor to Boyertown Burial Casket Company, Boyertown, Pa.

Filed Sept. 30, 1975, Ser. No. 618,147
Int. Cl.² A61G *17/00*
U.S. Cl. 27—2 **4 Claims**



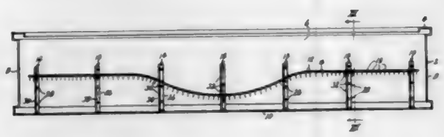
1. A casket assembly comprising a tub portion and a lid portion closable therewith; the tub portion comprising a peripheral upstanding wall portion defining sidewalls and end walls, the wall portion extending upwardly of and about a bottom wall portion, pallet support means disposed inwardly of and about the interior of said upstanding wall portion, and including a pallet for disposition in said tub, said pallet having engagement portions at its periphery for engagement with and support by said pallet support means, said pallet also including supporting surface means extending between said engagement portions and in generally horizontal planar disposition upon engagement of said engagement portions with associated said pallet support means about said wall portion wherein said supporting surface means comprises a flexible sheet-like member and wherein said engagement means comprise rod means extending about the periphery of said supporting surface means and wherein said sheet-like member includes tunnel portions at its periphery in which said rod means are disposed.

4,044,436

CASKET SUSPENSION

John H. Patrick, Carthage, Mo., assignor to Flex-O-Lators, Inc., Carthage, Mo.

Filed Apr. 28, 1976, Ser. No. 681,169
Int. Cl.² A61G *17/00*
U.S. Cl. 27—12 **4 Claims**



1. A device for suspending a body in a casket, said device comprising:

a. a series of brackets fixed to the interior surface of said casket in spaced relation along substantially the entire length of said casket along each side of said casket, each of said brackets comprising a vertically disposed member projecting inwardly from the casket side to which it is affixed, and having a series of vertically spaced apart notches formed therein, each of said notches opening through the inner edge of said vertical bracket member, and extending outwardly and then downwardly from said opening, the downwardly extending portion of each of said bracket notches being inclined downwardly and inwardly relative to said casket, and

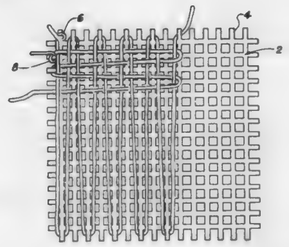
b. a deck sheet flexible transversely of its plane and of sufficient area to cover substantially the entire interior horizontal area of said casket, said deck sheet including a pair of flexible side strands disposed respectively along the opposite sides thereof and each engageable in any selected notch of each bracket at the corresponding side of the casket, whereby said deck sheet is supported, said side strand being insertable, transversely of itself, outwardly and downwardly into said notch, the width of said deck sheet being such that its side strands are normally spaced apart less than the distance between the lower ends of the downwardly extending notch portions of brackets at opposite sides of the casket, said deck sheet being laterally resiliently strechable, whereby said side strands may be engaged in said notches, whereupon the lateral resilience of said deck sheet urges the side strands thereof to the lower ends of said downwardly extending notch portions.

4,044,437

RESILIENT HAND LOOM GRID

Ruth B. Ebenstein, 2685 Glendessary Lane, Santa Barbara, Calif. 93105

Filed Mar. 19, 1976, Ser. No. 668,431
Int. Cl.² D03D *29/00*
U.S. Cl. 28—151 **7 Claims**



1. A loom adapted to hold threads interwoven to form a fabric, the loom including a resilient sheet incorporating a series of regularly spaced openings to define a grid, the sheet being sufficiently flexible to accommodate a reduction in the fabric's span as the threads are interwoven, and peripheral bars attached to, co-planar with and projecting from the resilient sheet, the bars being the size and location to permit threads to be wrapped about them, the peripheral bars being formed of a resilient material.

4,044,438

APPARATUS AND METHOD FOR FORMING YARN BALLS

John R. Everhart, Mount Airy, N.C., assignor to Renfro Corporation, Mount Airy, N.C.

Filed July 19, 1976, Ser. No. 706,904
Int. Cl.² D04D *7/06*
U.S. Cl. 28—147 **14 Claims**

1. Apparatus for forming relatively short yarn bundles for use in making yarn balls characterized by a series of successive work stations at which the various procedures incident to formation of the yarn bundles are performed, said apparatus comprising

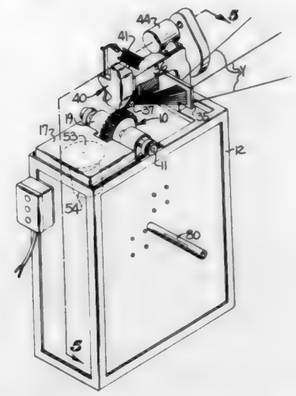
a. means for receiving a multiplicity of yarn and arranging those yarns into a generally parallel, composite arrangement,

b. means operatively associated with and in spaced relation to said yarn arranging means for sequentially applying a binder element around the composite yarn arrangement at predetermined points spaced apart along the length of the yarns a distance equal to the desired length of the yarn bundles being formed;

c. cutting means disposed in spaced relation to said binder applying means for sequentially severing the composite yarn arrangement between adjacent binder elements to form the composite yarn arrangement into relatively short yarn bundles; and

d. feeding means for feeding the composite yarn arrangement from said yarn arranging means to said binder applying means and then to said cutting means, said feeding means including

1. spaced apart gripper means for receiving and grippingly



engaging successive incremental lengths of the composite yarn arrangement to maintain the yarns in the composite arrangement until the binder elements are applied and to hold the bound lengths in position for severing to form the yarn bundles, and

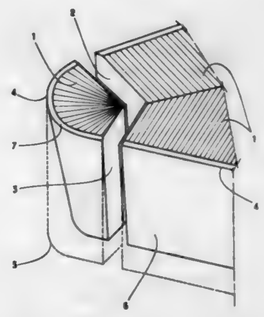
2. drive means for successively indexing said spaced apart gripper means into successive operative association with said yarn arranging means, binder applying means and cutting means.

4,044,439

CUTTING PLATE WITH CHIP BREAKERS

Gerard Romagnolo, Eybens, France, assignor to Ugine Carbone, Grenoble, France

Continuation-in-part of Ser. No. 578,821, May 19, 1975, abandoned. This application July 22, 1976, Ser. No. 707,857
Claims priority, application France, June 14, 1974, 74.20644
Int. Cl.² B26D *1/00*
U.S. Cl. 29—95 R **5 Claims**



1. A cutting plate adapted to be connected to the body of a tool for machining metal pieces, said plate having an upper surface having a generally planar face portion, a plurality of planar sides generally normal to said upper generally planar face portion, said sides joining each other in at least a rounded cutting point having a cutting edge at a cutting edge plane which is generally parallel to, and below, the upper generally

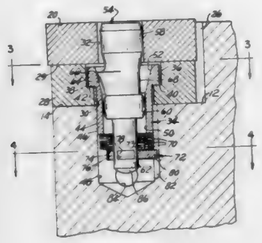
planar face portion, a chip breaker groove in the upper surface defined by a downwardly inwardly declining first planar surface extending from adjacent the cutting edge to a rounded fillet and then extending upwardly as a chip breaker surface that terminates at a level above said cutting edge plane as a central planar chip breaker island portion of said upper generally planar face portion, said downwardly declining surface being planar all along the cutting edge of the planar sides and conical adjacent the rounded cutting point planes at a first angle constant to said cutting edge plane, said upwardly extending chip breaker surface defining a second angle with said cutting edge plane, which second angle is constant, a lowest point in the rounded fillet being located in a plane normal to the cutting edge plane of the cutting point and bisecting the cutting point and the depth of the fillet at the bisecting plane being greater than the depth of the fillet at a point other than at said bisecting plane.

4,044,440

CUTTING TOOL

Henry W. Stier, 8134 Lochdale, Dearborn Heights, Mich. 48127

Filed Feb. 25, 1976, Ser. No. 661,125
Int. Cl.² B26D *1/00*
U.S. Cl. 29—96 **22 Claims**



1. In a cutting tool comprising in combination a support member, a pocket on one end of the support member, a removable cutting bit disposed in the pocket with a portion thereof exposed for cutting engagement with a workpiece, and means for holding the cutting bit in the pocket, the improvement of said holding means comprising a cylindrical recess in said support member, a pin disposed in said cylindrical recess and having an end portion in engagement with a surface of said cutting bit, a laterally projecting portion on said pin having an end in engagement with an inner surface of said cylindrical recess, means for applying a force on the other end of said pin in a general direction holding said cutting bit in said pocket comprising spring means disposed about said pin proximate said other end thereof and spring retainer means maintaining said spring means in a compressed state between said spring retainer means and a shoulder abutment formed in said cylindrical recess, and means preventing rotation of said pin relative to said cylindrical recess.

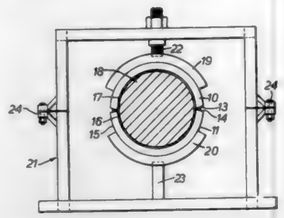
4,044,441

BEARINGS

William Craig Morrison, Doonfoot, Scotland, assignor to The Glacier Metal Company Limited, Wembly, England

Filed Aug. 12, 1974, Ser. No. 496,827
Claims priority, application United Kingdom, Aug. 15, 1973, 39538/73
Int. Cl.² B21D *53/10*
U.S. Cl. 29—149.5 R **4 Claims**

1. A method of producing a bearing in which a bush for insertion in a bearing housing is produced by the steps of
pressing from flat sheet material comprising a strong backing and a layer of bearing lining, two semi-cylindrical bearing bush segments each segment having a convex surface, a concave inner surface, a pair of part annular end faces, and a pair of side faces;
assemblying said bearing bush segments to form a complete annular bush pre-assembly in which side faces of adjacent segments are close to one another but separated by a V-groove;
welding together adjacent segments of said pre-assembly by deposition of metal in the V-grooves in contact with the



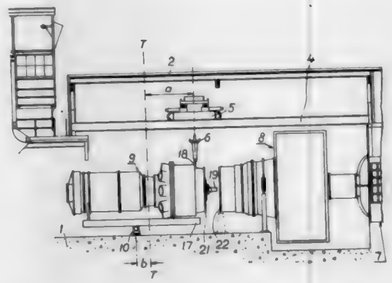
side faces of the backings but not in contact with the linings to provide a complete self-supporting bush having an essentially continuous internal cylindrical bearing surface; and
then inserting the bush in the bearing housing in which method a plurality of segments are supported to form a plurality of bushes arranged end to end, and are joined, except along the end faces of said bushes, in a single operation.

4,044,442

METHOD OF INSTALLATION OF LARGE CAPACITY GAS-TURBINE POWERED ELECTRICAL GENERATING MACHINERY

Arne Carlson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Filed Dec. 18, 1975, Ser. No. 642,021
Claims priority, application Sweden, Dec. 23, 1974, 7416223
Int. Cl.² B23P *15/04*
U.S. Cl. 29—156.4 R **4 Claims**



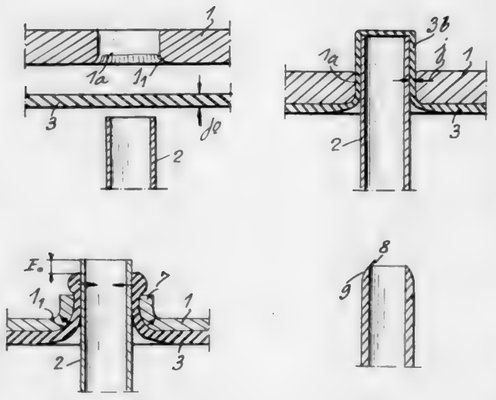
1. A method of installing in a machinery hall a gas turbine apparatus for coupling mechanically to an electric power generator, the gas turbine comprising a power turbine unit whose output shaft is coupled to the input shaft of the generator and also comprising as a separate unit a gas generator unit which is to be connected to the power turbine with a gas-tight fitting by means of respective cooperating flanges and also with a protruding axial shaft on the gas generator which mates with a bearing in the power turbine unit, said method comprising the steps of:
fixedly installing on supporting means in the machinery hall the power turbine unit and coupling said power turbine unit to the generator with the said bearing of said power turbine unit being oriented horizontally for coaxial alignment with said shaft of said gas generator,
transporting the gas generator into the machinery hall and to the site of its assembly with the power turbine unit by rolling the gas generator horizontally on a plurality of roller means and with its entire weight supported in static equilibrium on the roller means,
lifting one end of the gas generator slightly so as to permit the removal from thereunder of sufficient of the roller means to ensure that the roller means remaining do not provide static equilibrium of the gas generator,
concurrently with the lifting step, supporting a portion of the weight of the gas generator from an overhead travelling crane which is attached to the gas generator at a point to provide, in cooperation with said remaining roller means, static equilibrium support of the gas generator,
and repeatedly adjusting the height of said roller means and also the extent of lift provided by the travelling crane while concurrently moving said gas generator horizontally to bring the cooperating flanges on the gas generator and power turbine unit into abutting relationship with each other while said shaft concurrently is coaxially aligned with said bearing.

4,044,443

METHOD FOR ASSEMBLING TUBES AND TUBE PLATES AND PRODUCT RESULTING THEREFROM

André Chartet, Meudon, France, assignor to Societe Anonyme des Usines Chausson

Filed Apr. 28, 1975, Ser. No. 572,450
Claims priority, application France, May 30, 1974, 74.18840
Int. Cl.² B23P *15/26*
U.S. Cl. 29—157.4 **7 Claims**



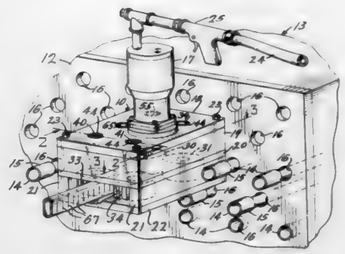
1. A method of assembling at least one tube having an outer wall in a tube plate comprising the steps of:
forming at least one tube passage in said plate, said tube passage having a shape corresponding to that of said tube and a cross-section slightly greater than that of said tube;
placing a flexible, resilient sheet of substantially uniform thickness on one side of and in a planar coextensive relationship with said tube plate;
bringing an end of said tube into contact with said flexible, resilient sheet;
forcibly inserting said tube while in contact with said flexible, resilient sheet into said tube passage of said tube plate and beyond, a portion of said flexible, resilient sheet thus covering an end portion of said tube which extends beyond said plate; and
cutting said portion of said sheet, whereby the inner stress of the material constituting said sheet restricts said portion of said sheet extending beyond said tube plate while forming a stressed flange pressing said outer wall of said tube and bearing on said tube plate.

4,044,444

TUBE TRAVELER

Richard T. Harris, Newport, Mich., assignor to William W. Sismore, Newport, Mich., a part interest

Filed Feb. 12, 1976, Ser. No. 657,357
Int. Cl.² B23P *15/26*
U.S. Cl. 29—727 **5 Claims**



1. A tube extractor comprising, in combination, a housing having a passageway extending therethrough along which a tube is advanced, first and second pairs of drivers, four shafts, means attaching each of said drivers to a different one of said shafts, means mounting said shafts in said housing for rotation about parallel axes which extend perpendicular to said passageway with a first driver in each pair positioned on one side of said passageway and a second driver in each pair positioned on an opposite side of said passageway, means on said drivers extending into said passageway for deformably engaging sides of a tube in said passageway, and motor means for simultaneously rotating all of said drivers at the same speed for advancing a tube along said passageway, said rotating means including means for rotating said first drivers in each pair in a predetermined direction and means for rotating said second drivers in each pair in the opposite direction.

4,044,445

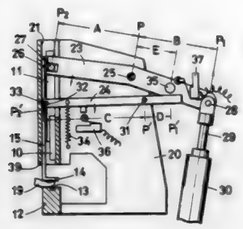
APPARATUS FOR ATTACHING END STOPS TO FASTENER STRINGERS WITH A SAFETY STOP FUNCTION

Hisashi Douri, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

Filed Nov. 6, 1975, Ser. No. 629,527
Claims priority, application Japan, Nov. 15, 1974, 49-132356
Int. Cl.² H01H *3/16*
U.S. Cl. 29—706 **4 Claims**

1. In combination apparatus for attaching end stops to fastener stringers by means of a punch carried by a punch holder and arranged over a stationary die for up-and-down motion relative to same, and the combination of a sensor arranged over said die for up-and-down motion relative to same, a first lever pivotally supported intermediate both ends and coupled at one end to said punch holder, actuator means coupled to the other end of said first lever to impart up-and-down motion to said punch via said punch holder, a second lever pivotally supported intermediate both ends and coupled at one end to said sensor, spring means urging the other end of said second lever into engagement with said first lever whereby said second lever follows the motion of said first lever to impart up-and-down motion to said sensor, said first and second levers being so constructed and arranged in relation to each other that said

sensor completes its downward stroke earlier than said punch, and detector means effective to cause said actuator means to prevent the full descent of said punch in event said sensor fails



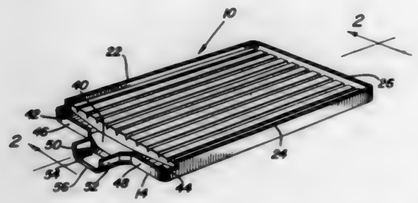
to complete the downward stroke because of the presence of some foreign matter other than the fastener stringers between itself and said die.

4,044,446

TRAY FOR STRING JEWELRY ITEMS

Morton Segerman, 8950 Chickamagua, Tucson, Ariz. 85710

Filed Feb. 2, 1976, Ser. No. 654,342
Int. Cl.² B23P *19/04*
U.S. Cl. 29—241 **11 Claims**



1. A tray for stringing jewelry items, said tray comprising a horizontal panel member including an upper surface having a plurality of generally parallel elongated upwardly opening grooves formed therein and opening outwardly of one end of said surface, and means defining an upwardly facing guide surface extending transversely of said grooves, spaced endwise outwardly of said one end of said upper surface and generally horizontally aligned with said grooves, said guide surface including portions thereof spaced endwise outwardly of and generally horizontally aligned with at least two of said grooves, said panel member including an upstanding curb projecting above said surface at the ends of said grooves remote from said guide surface closing said remote ends of said grooves.

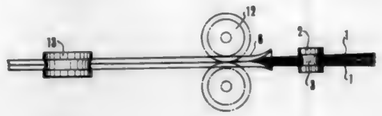
4,044,447

METHOD OF SIMULTANEOUSLY DRAWING A NUMBER OF WIRE MEMBERS

Koichi Hamada, Tokyo; Kaoru Kikubu, Sakai, and Tsunehiro Itoh, Hirakata, all of Japan, assignors to Nippon Seisen, Co., Ltd., Osaka, Japan

Filed Mar. 7, 1972, Ser. No. 231,152
Claims priority, application Japan, Mar. 2, 1971, 46-10864
Int. Cl.² B23P *17/00*; B21C *1/00*
U.S. Cl. 29—419 R **7 Claims**

1. In a method for manufacturing filament of the type comprising gathering and bundling a plurality of wire members in parallel relationship to one another while feeding said wire members in a predetermined direction, feeding a band-shaped armoring of medium carbon steel out of a reel in parallel with said bundled wire members, said band-shaped armoring being formed into the shape of an upwardly directed conduit, storing the gathered plurality of wire members within said armoring formed into the shape of a conduit such that each wire member is parallel to the longitudinal axis of said conduit, enveloping said wire members in said conduit by closing said armoring such that said wire members are compressed by forces exerted by said armoring, thus tightly binding said wire members



together forming an enveloped bundle of said wire members, drawing said enveloped bundle by means of dies, and removing said armoring from said wire members, the improvement which comprises:

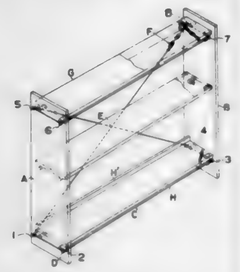
plating in advance the wire members with a plating material.

4,044,448

METHOD OF ASSEMBLING ARTICLES OF FURNITURE

Kazuko Watanabe, 6 of 4 Nishikamata 6, Ohta, Tokyo, and Mitsuko Arai, 12 of 9, Asagaya-minami 3, Suginami, Tokyo, both of Japan

Filed Aug. 17, 1976, Ser. No. 715,178
Claims priority, application Japan, Aug. 25, 1975, 50-102690
Int. Cl.² B23P *19/04*
U.S. Cl. 29—433 **5 Claims**



1. A method of assembling articles of furniture from a single rope member made of a soft material, combined with assembling members made of a rigid material, comprising the steps of:

passing one end of said single rope member successively through said assembling members, said assembling members arranged in predetermined positional relationships with each other;

forming at least one diagonal intersection of said rope member;

connecting said one end of said rope member to the other end of said rope member through an adjustable stretching means;

applying tension to said rope member by adjusting said adjustable stretching means causing said assembling members to cooperate with each other under pressure; and

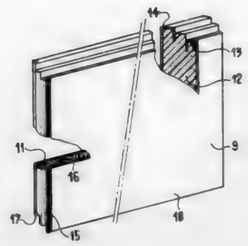
maintaining said rope member at a predetermined tension whereby the rigidity of the structure is retained.

4,044,449

METHOD OF MAKING REFRIGERATING UNITS AND THE LIKE AND PRODUCT THEREOF

Chi Quy Phan, Paris, France, assignor to Thomson-Brandt, Paris, France

Filed Feb. 7, 1975, Ser. No. 547,953
Int. Cl.² B23P *3/00, 19/04*; B29D *27/04*
U.S. Cl. 29—460 **6 Claims**



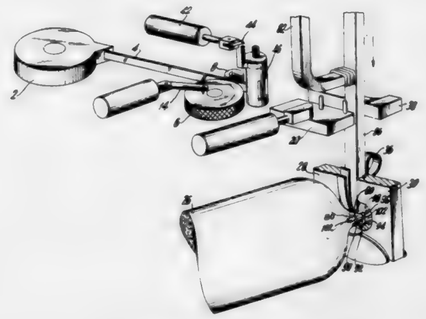
1. In a method of manufacturing refrigerating or refrigerated units which are fabricated from lapped standard modular elements, including a layer of thermally insulating plastic foam formed in situ and having multiple step tiers on two opposite edges of each element, each of said elements constituting a fraction of a wall, bottom or upper portion of a unit, the improvement comprising in the production of said standard modular elements, the step of forming along two other opposite edges of each element respective outwardly extending foam plastic protuberances; and a step of assembling a plurality of thus constructed standard modular elements side by side along their edges so as to realize a tight sealing by effecting an intimate contact between said plastic foam stepwise tiers and by compressing said outwardly extending plastic foam protuberances against one another.

4,044,450

APPARATUS AND METHOD FOR PROVIDING HANGER-CLIP CLOSURES FOR CASINGS

Vytas Andrew Raudys, and Ronald Robert DeVitto, both of Chicago, Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 12, 1976, Ser. No. 731,372
Int. Cl.² B21D *39/00*; B23P *11/00*; B23Q *7/10*
U.S. Cl. 29—509 **12 Claims**



1. An apparatus for securing a tape loop hanger at the gathered end portion of a casing using a substantially U-shaped clip member comprising:

a. means for continuously and successively supplying a predetermined length of tape from a supply source;

b. means for forming a loop hanger in each of said predetermined lengths of tape and supporting each of said tape loop hangers so formed in relative alignment with a gathered end portion of a casing;

c. means for continuously and successively supplying a substantially U-shaped clip in relative alignment with the tape loop hanger and the gathered end portion of the casing, said clip comprising a pair of opposed legs and a crown connecting the corresponding end of said legs; and

d. means for first advancing and projecting said clip onto and about said tape loop hanger, and then advancing said clip and said tape loop hanger into contact with said gathered end portion of the casing and thereafter deforming the legs of said clip to encircle said tape loop hanger and said gathered end portion of the casing so that said tape looper hanger is secured to the gathered end of said casing.

9. A method for securing a tape loop hanger at the gathered end of a casing using a substantially U-shaped clip comprising the steps of:

a. gathering an end portion of a casing;

b. forming a loop hanger having two extended free ends from a predetermined length of tape and positioning said tape loop hanger in substantial alignment with said gathered end portion of said casing;

c. advancing a substantially U-shaped clip having a crown member connecting corresponding ends of two opposed legs into contact with said tape loop hanger so as to initially position said tape loop hanger adjacent the crown member between the legs of said clip;

d. advancing the clip and tape loop hanger into contact with the gathered end portion of said casing; and

e. deforming the legs of said clip to encircle the tape loop hanger and the gathered end portion of the casing so as to secure said tape loop hanger to the gathered end portion of the casing via said clip.

4,044,451

APPARATUS FOR INSERTING WIRES INTO TERMINALS IN MODULAR TYPE CONNECTOR

Edward Denman Bunnell, Palm Harbor, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 707,981, July 23, 1976. This application Nov. 11, 1976, Ser. No. 740,996
Int. Cl.² H01R *43/04*
U.S. Cl. 29—566.4 **13 Claims**

1. An assembling apparatus for modular electrical connectors comprising:

a frame structure comprising a base section and a head section which is spaced from, and extends parallel to, said base section, connector supporting means on said base section for supporting an elongated electrical connector thereon,

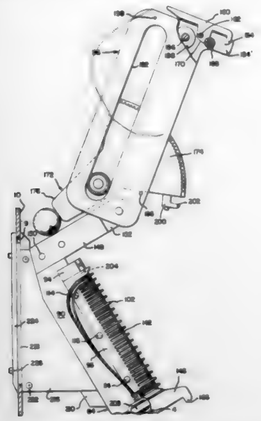
force applying means for applying a force to a connector supported on said supporting means, said force applying means comprising a sector-shaped member having an arcuate surface, said sector shaped member being pivotally mounted in said head section by pivotal mounting means, said pivotal mounting means having an axis which extends normally of said sector shaped member, said arcuate surface having an arc-and-tangent-line relationship to a connector on said supporting surface,

an elongated guide slot means in said head section extending parallel to a connector supported on said supporting means, said pivotal mounting means being movably mounted in said guide slot means, and

actuating means for moving said pivotal mounting means along a rectilinear path defined by said slot means and

simultaneously rotating said sector shaped member with respect to said pivotal axis whereby,

upon placing a connector on said supporting means, moving



said pivotal mounting means along a path defined by said slot means and simultaneously rotating said sector shaped member, said arcuate surface moves progressively over said connector and imposes a force against said connector.

4,044,452

PROCESS FOR MAKING FIELD EFFECT AND BIPOLAR TRANSISTORS ON THE SAME SEMICONDUCTOR CHIP

Shakir Ahmed Abbas, Wappingers Falls, and Robert Charles Dockerty, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1976, Ser. No. 729,937

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—571 **7 Claims**

1. Method for manufacturing an integrated circuit structure having dielectrically isolated regions containing bipolar and field effect transistor devices comprising:

providing a silicon monocrystalline substrate;

etching said silicon in the areas to be the dielectric regions isolating the said field effect transistor devices;

oxidizing the exposed silicon in said regions to form first oxidized areas;

etching said silicon in the areas to be the dielectric regions isolating the said bipolar devices to form a mesa in the center of the etched area;

oxidizing the exposed silicon areas to form a screen oxide area;

ion implanting impurities through said screen oxide areas to form the subcollector for a bipolar device;

growing thick silicon dioxide in said screen oxide areas to completely fill the areas with silicon dioxide and complete said dielectrically isolated regions;

simultaneously forming the source, drain and emitter regions of said devices;

forming gate insulator and gate electrodes for said field effect transistor devices;

forming electrical contacts to said source, drain, gate, emitter, base and, collector of said devices.

4,044,453

METHOD FOR THE PRODUCTION OF A DIODE MATRIX FOR CHARACTER GENERATORS

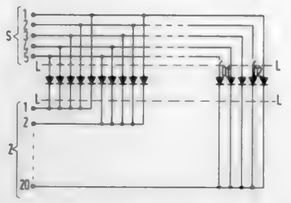
Guenther Vorbach, Schwindegg, and Siegfried Kuballa, Puchheim, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 8, 1975, Ser. No. 610,926

Claims priority, application Germany, Sept. 11, 1974, 2443491

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—574 **4 Claims**



1. A method of producing a diode matrix composed of a plurality of diode components, carried by a plug-in circuit board, and adapted in use to be operatively disposed at selected matrix points forming a predetermined pattern in accordance with the desired matrix programming thereof, for character generators, in particular for the code generator of electronic teleprinters or for a circuit board with optionally differing line configurations, comprising the steps of disposing an individually formed diode, having respective individual lead elements, at each matrix point and connecting the individual diode lead elements to the circuit board to provide an operable diode for each possible operative matrix point of the total design number thereof, with such lead elements providing both the operative electrical and supporting connections between the associated diodes and the circuit board, thereby forming a complete electrically operative diode matrix having a total number of operative diodes in excess to the number of diodes to be operative, in use, in accordance with the desired program, with each diode being so disposed with respect to such board that a portion of at least one of the electrical lead elements connected thereto extending between such diode and the board is sufficiently exposed for possible severance thereat, and programming said matrix in accordance with the desired programming by determining each matrix point, of the total number thereof, at which the diode thereat is to be operative, and rendering all of said excess diodes inoperative by cutting the exposed portion of at least said one exposed lead element of each of said unrequired diodes.

4,044,454

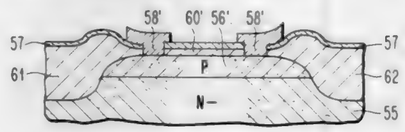
METHOD FOR FORMING INTEGRATED CIRCUIT REGIONS DEFINED BY RECESSED DIELECTRIC ISOLATION

Ingrid E. Magdo, Hopewell Junction, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Apr. 16, 1975, Ser. No. 568,636

Int. Cl.[2] B01J *17/00*

U.S. Cl. 29—578 **6 Claims**



1. In the fabrication of integrated circuits, a method for forming dielectrically isolated regions in a silicon substrate comprising

introducing conductivity-determining impurities into the substrate to form at least one region of one-type conductivity at the surface of said substrate

forming over at least a part of said surface of said region, a composite mask comprising

a lower layer of silicon dioxide in contact with said surface, and

an upper layer of silicon nitride on said lower layer,

said mask having a plurality of apertures extending therethrough,

etching recesses in the portions of said substrate exposed in said apertures,

thermally oxidizing the recessed portions of said substrate to an extent sufficient to form regions of recessed silicon dioxide abutting and laterally defining said at least one region of one-type conductivity, said mask acting as a barrier to prevent oxidation of the unrecessed surface of said substrate,

providing a layer of electrically insulative material over at least a portion of the surface of said substrate by a processing step comprising at least the removal of said silicon nitride layer,

forming at least one contact opening through said electrically insulative layer to expose at least a portion of said at least one region of one-type conductivity, said contact opening exposing a portion of a region of recessed silicon dioxide abutting said one-type conductivity region and

depositing metal in said contact opening to form a contact to said region of one-type conductivity, said contact overlapping said recessed silicon dioxide.

4,044,455

METHOD OF MAKING A PRINTING HAMMER UNIT

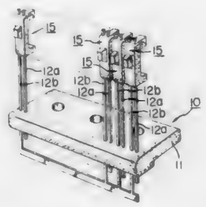
Satoshi Watanabe, Inagi; Atsuo Tsunoda, Fuchu; Takeshi Kimura, and Hitoshi Narita, both of Chichibu, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo and Canon Denshi Kabushiki Kaisha, both of, Japan

Filed May 28, 1976, Ser. No. 690,925

Claims priority, application Japan, June 5, 1975, 50-68028; June 5, 1975, 50-68029; June 5, 1975, 50-68030; June 5, 1975, 50-68031

Int. Cl.[2] B23P *17/00*

U.S. Cl. 29—592 **17 Claims**



1. A method of making a printing hammer unit comprising the steps of:

a. forming a group of printing hammers by fixedly securing a respective hammer portion to each of a plurality of pairs of resilient members made of electrically conductive material and connected together at connecting portions, and also forming a base by fixedly securing the same onto a portion of said resilient members spaced apart from said hammer portions;

b. removing at least a part of said connecting portions to each pair of break the electrical connection between one of said resilient members and the other resilient member of each pair on which a respective portion is fixedly secured; and

c. fixing a magnet member to said hammer portion formed in said printing hammer forming step, said magnet member fixing step being carried out subsequent to said printing hammers forming step or to said connecting portions removing step.

4,044,456

METHOD FOR THE MANUFACTURE OF A SUPERCONDUCTOR WITH A SUPERCONDUCTIVE INTERMETALLIC COMPOUND OF AT LEAST TWO ELEMENTS

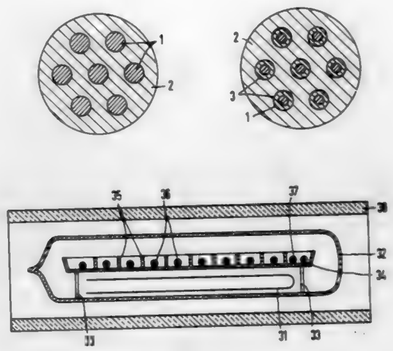
Günther Ziegler; Sigrun Frohmader, both of Erlangen, and Manfred Wilhelm, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 30, 1975, Ser. No. 573,073

Claims priority, application Germany, May 16, 1974, 2423882

Int. Cl.[2] H01V *11/00*

U.S. Cl. 29—599 **28 Claims**



1. A method for the manufacture of a superconductor with a superconductive intermetallic compound consisting of at least two chemical elements by steps comprising bringing a ductile structural part made of at least one element of the compound into contact with a second structural part which contains a ductile carrier metal for the remaining elements of the compound; subsequently supplying the remaining elements of the compound to the second structural part at elevated temperature; and diffusing the remaining elements through the second structural part and reacting said remaining elements with said first structural part to form the compound, wherein the improvement comprises performing said step of supplying so as to supply the remaining elements to the second structural part solely by a chemical transport reaction of the type in which said remaining elements are initially converted by a gaseous transport agent in a reversible reaction to form gaseous reaction products and the gaseous reaction products subsequently decomposed in a reversal of the reaction to thereby supply the remaining elements to the second structural part.

4,044,457

METHOD OF FABRICATING COMPOSITE SUPERCONDUCTING WIRE

Bruce P. Strauss, Downers Grove, Ill.; Paul J. Reardon, Princeton, N.J., and Robert H. Remsbottom, Middleton, Wis., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

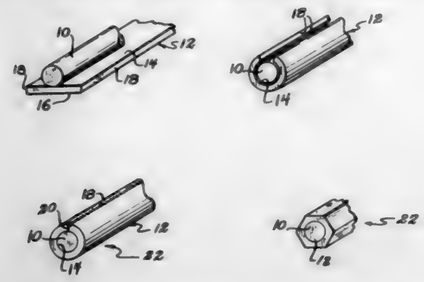
Filed Apr. 1, 1976, Ser. No. 672,575

Int. Cl.[2] H01V *11/00*

U.S. Cl. 29—599 **8 Claims**

1. In the method for preparing multifilament composite electrical conductors in which a rod of ductile superconducting alloy is provided with an annular sheath of ductile normal metal to form a composite rod, a plurality of composite rods having a hexagonal cross-sectional shape are stacked in parallel into an extrusion can of ductile normal metal to form an assembly, and the assembly is worked to elongate and reduce the cross section of the assembly to a predetermined cross-sec-

tional size, thereby forming a multifilament composite electrical wire, the improvement in the method for preparing the composite rod comprising: bending longitudinally a strip of ductile normal metal around a rod of ductile superconductor alloy so that the longitudinal edges meet, the strip having an inner face which will contact the rod and an outer face, the



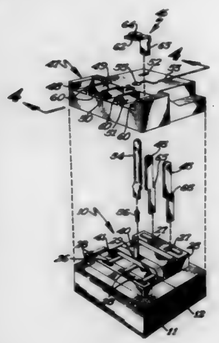
inner face containing a diffusion barrier, the width of the strip being about equal to the circumference of the rod, joining the longitudinal edges together, thereby forming an annular sheath around the rod, and providing the rod with a hexagonal cross-sectional shape, thereby forming a composite rod of a superconducting alloy material in a normal metal sheath having a hexagonal cross-sectional shape.

4,044,458

METHOD OF MAKING A POWER-PACK ASSEMBLY

Luther T. Prince, Jr., Minneapolis, Minn., assignor to Ault Incorporated, Minneapolis, Minn.

Division of Ser. No. 547,781, Feb. 7, 1975, Pat. No. 3,979,707.
This application Apr. 19, 1976, Ser. No. 678,078
Int. Cl.[2] H01F *41/10*
U.S. Cl. 29—605 **3 Claims**



1. The method of simultaneously establishing a mechanical and electrical connection between the windings and multiple terminals of a power-pack assembly which comprises the steps of:

forming a bobbin having a spool portion and a plurality of recesses in its surface;

winding at least primary and secondary windings on said spool portion;

forming solderless terminal engagement means of a conductive material, each having a female clip portion and a tang portion extending from said clip portion;

securing the clip portion of different terminal engagement means within at least some of said recesses, said tang portions extending, in the same direction, away from said recesses and said bobbin surface;

establishing an electrical contact between said tang portions and said windings;

forming a terminal block;

mounting a plurality of terminals on said terminal block in a configuration which may be aligned with the clip portions secured within said recesses;

aligning said terminals and clip portions;

forcing said terminals into said clip portions from the direction of extension of said tang portions by a force imparted to at least one of said bobbin and terminal block, said clip portions frictionally engaging said terminal means and said terminal means extending from said clip portions in the direction of extension of said tang portions.

4,044,459

HIGH-GRADE METALLIC PRODUCTS

Richard D. Burlingame, Cleveland Heights, Ohio, assignor to Luria Brothers & Co., Inc., Cleveland, Ohio

Division of Ser. No. 412,119, Nov. 2, 1973, Pat. No. 3,883,997.
This application Jan. 29, 1975, Ser. No. 544,882
The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.
Int. Cl.[2] B08B *3/10*
U.S. Cl. 29—614 **3 Claims**



1. A product of manufacture comprising: a multiplicity of irregularly shaped masses of blast-furnace slag-iron having a random size distribution throughout the range of up to a thickness of about 6 inches and a lateral dimension of about three feet and each article having a relatively low amount of slag substantially uniformly distributed therethrough and having at or in contact with its surface a large number of irregularities, crevices and fissures, a quantity of a contaminating slag rigidly adhered to the iron, at least part of said slag being located within said crevices and fissures, said slag comprising less than about ten percent by weight of the total weight of the product, said product having been produced by

breaking blast furnace iron-slag into pieces having a substantial amount of such slag exposed at or to the surface of each piece;

continuously tumbling a mass of such pieces against each other in order to achieve a relatively uniform redistribution of such pieces within such mass; and while effecting such redistribution substantially continuously imparting such pieces with a shower of a substantial quantity of small particles having a hardness greater than the hardness of the slag impurities and at a high velocity and for a period of time sufficient to abrade such impurities from the iron.

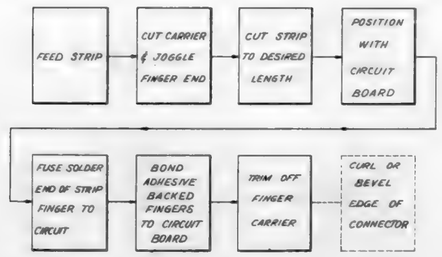
4,044,460

METHOD OF MOUNTING PREFABRICATED CONTACTS FOR PRINTED CIRCUIT CARD CONNECTORS

Herbert I. Schechter, 86 Campbell St., New Hyde Park, N.Y. 11040

Division of Ser. No. 625,090, Oct. 23, 1975. This application Sept. 20, 1976, Ser. No. 724,611
Int. Cl.[2] H01R *43/02*
U.S. Cl. 29—628 **15 Claims**

1. Method of mounting a prefabricated strip of conductive elements in the form of contacts on a printed circuit board to form an array of serially spaced contacts or terminals at the free ends of a plurality of circuit leads or conductors on the circuit board, the method comprising the steps of feeding a prefabricated strip comprising at least one elongate carrier and a plurality of spaced contacts made out of electrically conductive material, each of said contacts being connected at one end to said carrier and having a free end at the other end thereof; aligning the free ends of said contacts with the free ends of the plurality of circuit leads or conductors and positioning said contacts proximate to the circuit board portions on which said



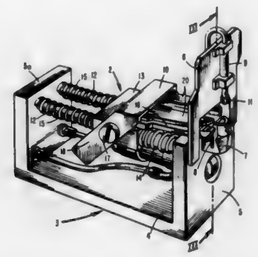
contacts are to be mounted; first electrically joining said contact free ends to said free ends of said plurality of associated circuit leads or conductors; secondly mechanically joining said contacts to the circuit board; and removing said carrier from said contacts to permit the resulting free ends of said contacs to mate with cooperating connector elements on a connector to be electrically connected to the printed circuit on said board.

4,044,461

DEVICE FOR THE MECHANICAL INSERTION OF CURSORS ONTO OPEN SLIDE FASTENERS, ALREADY APPLIED ON GARMENTS

Angelo Lova, Vigevano (Pavia), Italy, assignor to Manifattura Magni Dante & C., S.p.A., Pavia, Italy

Filed Nov. 11, 1975, Ser. No. 631,169
Int. Cl.[2] A41H *37/06*; B21D *53/50*; B29D *5/00*
U.S. Cl. 29—768 **4 Claims**



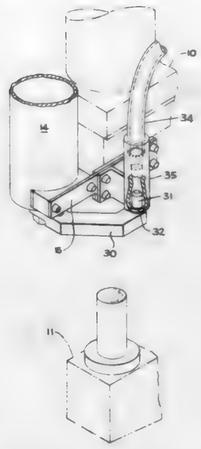
1. Device for mechanical insertion of a cursor onto a slide fastener composed of two belts carrying teeth already applied to garments, comprising a carrying structure to be applied on a table consisting of front and rear parallel vertical plates, said front plate having an extension which carries an opening therein, a block cursor support applied on said front plate of said structure in correspondence with the opening of the extension to receive and support the cursor to be inserted, a first fluid pressure cylinder positioned on said extension, a pressing element controlled by said fluid pressure cylinder so that the driving of the cylinder determines the locking of the cursor in its support, a pair of parallel grippers having upper and lower jaws placed on both sides of the cursor support to grasp the ends of the two belts of the fastener to draw them backwards and to engage the two series of teeth in the cursor, longitudinal guides extending between said two vertical plates of the structure, a slide plate carried by said guides, the lower jaws of said grippers being carried by said slide plate and a second fluid pressure cylinder having a shaft positioned on said front plate to operate said grippers.

4,044,462

RIVET BLANK FEEDER FOR RIVETING APPARATUS

Dario Anselmo, Williamsville, N.Y., assignor to General-Electro Mechanical Corporation, Buffalo, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,389
Int. Cl.[2] B23Q *7/10*
U.S. Cl. 29—809 **7 Claims**



1. Apparatus for inserting rivet slugs in an annular holder associated with rivet head forming means, said apparatus comprising a fluid pressure power cylinder, a piston in said cylinder and a piston rod projecting therefrom, a rivet slug transfer arm fixed to said piston rod, said power cylinder being operable to raise and lower said transfer arm by axial movements of said piston rod, and means for swinging said transfer arm about the axis of said cylinder between positions in axial alignment with a rivet slug supply means and said rivet head forming means with said transfer arm in a lowered position, whereby said transfer arm receives a rivet slug at said supply means, is lowered by operation of said power cylinder, swings to alignment with said rivet head forming means and is raised by operation of said power cylinder to insert said slug in said holder.

4,044,463

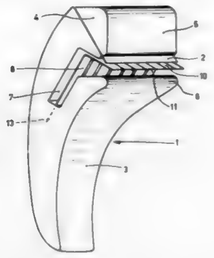
SHAVING APPARATUS WITH A HOLDER FOR A CUTTING ELEMENT

Eduard Willem Tietjens, Drachten, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,799
Claims priority, application Netherlands, June 12, 1975, 7506985
Int. Cl.[2] B26B *21/22*
U.S. Cl. 30—34.2 **3 Claims**

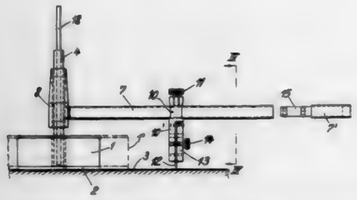
1. A shaving apparatus comprising a holder, a cutting element fixedly positioned in said holder, and a hair-pulling member mounted at one end in said holder in proximity to said cutting element, said hair-pulling member being resilient and having at its other end a blade shaped portion normally projecting further from the holder than the cutting member, said blade shaped portion being composed of a plurality of individ-

ual lamellar segments disposed in side-by-side relationship and independently movable relative to each other, and said blade



shaped portion being adapted in use to move into and out of said holder.

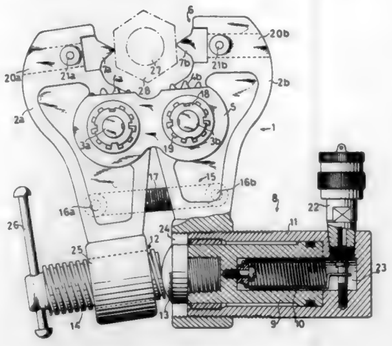
4,044,464
CIRCULAR CUTTING DEVICE
Georg Schiess, Predigergasse 7, Zurich, Switzerland (8001), and Jorg Heinzer, Vrenelisgartli 6, Einsiedeln (Kt.Schwyz), Switzerland (8840)
Filed July 27, 1976, Ser. No. 708,947
Int. Cl.[2] B26B *5/00*
U.S. Cl. 30—164.9 **6 Claims**



1. A circular cutting device with an arm rotatable about a central axis carrying the cutting tool, wherein the axis is defined by a hollow shaft held in a stand plate which provides the necessary stability for working by means of its own weight and an adhesive coating on its underside resting on the workpiece, the hollow shaft guiding a centering pin displaceably in the axial direction, with a spring tending to hold the centering pin in a position protruding from the stand plate at the bottom.

4,044,465
CUTTING APPARATUS FOR A RUSTY NUT
Hashimoto Shuji, No. 224-1 Notame-Oaza,, Minami, Fukuoka, Japan
Filed July 9, 1976, Ser. No. 704,053
Claims priority, application Japan, Feb. 17, 1976, 51-16712[U]
Int. Cl.[2] B26B *17/00*
U.S. Cl. 30—180 **2 Claims**

1. Apparatus for cutting a rusty nut comprising two arms, two blades, a respective one of the blades being mounted near one end of each of the arms in opposition to the other blade on the other arm, a hydraulic cylinder and piston assembly mounted at the other end of one of the arms, the cylinder being connected to said other end of said one arm, adjustable means connected to the other end of the other arm and providing a surface for being contacted by the free end of the piston, the hydraulic assembly being so oriented that actuation of the piston extends the piston toward the other arm and into contact with the adjustable means, the adjustable means including means for adjusting said surface toward or away from the free end of the piston, a respective axis connected to each of the arms at a point between the ends thereof, each of the arms being pivotable about its respective axis, a plate connected to both axes and thereby linking the arms together, a respective gear rotatably mounted on each of the axes, the gears being in mutual engagement so that the arms move simultaneously inwardly or outwardly and spring means for urging the arms away from each other.

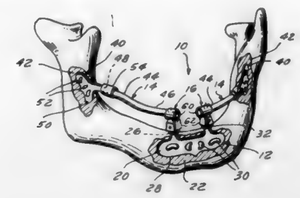


4,044,466
DEVICE ESPECIALLY FOR ENDOOSSEOUS IMPLANTATION
Ugo Pasqualini, Via Borgonuovo, 26, Milan, and Giovanni Russo, Via del Minatore, Verona, both of Italy
Filed May 19, 1975, Ser. No. 578,566
Claims priority, application Italy, May 30, 1974, 23360/74
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—10 A **1 Claim**



1. A device for endoosseous implantation, comprising a plate member insertable into a surgical fissure provided into the cancellous tissue of the jaw bone, below the cortical tissue of the jaw bone, said plate member having on its oral cavity facing edge an appendix with, at its free end, a threaded portion emerging into the oral cavity, at least one through hole provided in said plate member and at least one stabilising bar engaging within said at least one hole and extending transverse to said plate member, said stabilizing bar being insertable into a respective surgical transcortical channel and having its ends supported by the vestibular cortical tissue and the lingual cortical tissue of the jaw bone respectively and positioning means removably connectable to said plate member for the preparation of said trascortical channel in alignment with said hole and for inserting said stabilising bar therein and in said hole, wherein said positioning means comprise a bridge element having an arm including connecting means for removable rigid connection with said plate member, said bridge element further comprising, on the side opposite said arm, at least one guide cylinder comprising an inner through cavity the axis of which is in alignment with the axis of said at least one hole when said positioning means is fixed on said plate member, said removable connecting means comprising a bush in said arm and engaging with said appendix and a threaded plug for removable engagement with the threaded portion of said appendix and wherein said removable connection means further comprise a pair of wedge projections on that edge of said plate element from which said appendix extends, and a pair of conjugate cavities provided in said arm.

4,044,467
SYMPHYSEAL-RAMI EDOSTEAL IMPLANT
Leonard I. Linkow, 30 Central Park South, and Joni Chambliss, 58 W. 58 St., both of New York, N.Y. 10019
Filed June 28, 1976, Ser. No. 688,012
Int. Cl.[2] A61C *13/00*
U.S. Cl. 32—10 A **30 Claims**



17. A symphyseal-rami endosteal implant adapted for use with at least one anterior abutment comprising

A. at least one ramus blade having a first portion adapted to be received in a ramus bone and a second portion defining a rod adapted to extend generally parallel to the occlusal plane when said ramus blade first portion is received in the ramus bone; and

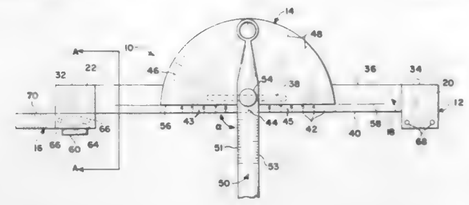
B. at least one means for connecting said ramus blade to an associated anterior abutment, said connecting means having generally vertically aligned first and second portions, said first portion being adapted to engage, slide longitudinally with respect to, and be secured to a length of said rod and said second portion being adapted to engage and be secured to, the associated anterior abutment.

4,044,468
HANDLE FOR CUTTING AND ABRADING INSTRUMENTS USEFUL IN THE PRACTICE OF ENDODONTIA
Henry Kahn, 366 Dell, Highland Park, Ill. 60035
Filed May 3, 1976, Ser. No. 682,361
Int. Cl.[2] A61C *5/02*
U.S. Cl. 32—57 **2 Claims**



1. A file useful in root canal therapy comprising a toothed working end and a shank end, said shank end having a hangle attached thereto to be held between the thumb and index finger, said handle having two pairs of opposite faces, each of said faces being doubly concave inwardly and said faces being further characterized by different surface discontinuities for tactile differentiation therebetween.

4,044,469
MULTI-FUNCTION MEASURING INSTRUMENT
Donald L. Posey, 1418 N. King St., Hampton, Va. 23669
Continuation of Ser. No. 606,892, Aug. 22, 1975, abandoned, which is a continuation-in-part of Ser. No. 475,339, May 31, 1974, abandoned. This application Sept. 24, 1976, Ser. No. 726,715
Int. Cl.[2] B43L *7/06*
U.S. Cl. 33—102 **6 Claims**



1. A geometrical instrument for simultaneously measuring linear distance and angles comprising:

an elongated bar having two ends and an indicia means for making linear measurements;

a first mounting plate fastened to one of said ends and a second mounting plate fastened to said other end;

an adjustable tape measure having means for detachment and reattachment of said same tape measure to said instrument; said tape measure being selectively detachable from one of said first or second mounting plates and reattachable to the other of said first or second plates, said first and second mounting plates positioning said tape measure thereon; said tape measure cooperating with said indicia means to indicate the distance from a distant point from either end of said bar to any indicia point along said elongated bar;

an adjustable angle measuring device slidably mounted on said elongated bar for enabling measurements to be made of an angle and of the distance from the vertex of that angle to a distant point, concurrently and in combination; wherein said elongated bar has a slot therein in which said angle measuring device is slidably mounted and a measurement edge means on said elongated bar said measurement edge means for alining said instrument with a workpiece and being positionable on a first surface of the workpiece and said first and second mounting plates being oriented with respect to said elongated bar such as to extend below said measurement edge means to provide an angled recess for engagement of an angled corner of a workpiece.

4,044,470
COLLAR LOCATING APPARATUS
Alex Dufrene, P.O. Box 194, Des Allemands, La. 70030
Filed Jan. 15, 1976, Ser. No. 649,440
Int. Cl.[2] E21B *47/04;* **G01B** *5/18*
U.S. Cl. 33—125 R **7 Claims**

1. Collar locating apparatus adapted to be run in a tubing string to locate collars therein which apparatus comprises:

a. and elongate body;

b. a pair of opposing, resiliently urged arms;

c. spaced first and second shoulders facing one another on said body and defining a portion therebetween of reduced relative diameter;

d. a ring segment appended to each arm and positioned between said first and second shoulders, said ring segments mounting said arms for pivotal movement from a first to a second position where the first position is closer to said elongate body and the other position is outwardly deflected from the first position;

e. resilient means bearing against said arms to urge said arms to said deflected position;

f. clamp means carried on said elongate body and slidably movable axially of said body to clamp said arms, said clamp means further being constructed and arranged to adjustably vary the clamping achieved on said arms wherein said arms deflect by differing amounts on moving to the deflected position dependent on the position of said



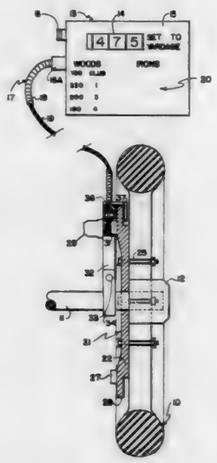
clamping means and lock means for locking said arms in the retracted position during downward movement of the tool in the tubing string by holding said clamp means in its upward most position so that said arms are in said first position and wherein said lock means is releasable to enable said arms to deflect outwardly from said body.

4,044,471

YARDAGE COUNTER ATTACHMENT FOR GOLF CARTS AND THE LIKE

Oscar Fredrick Allan Peterson, 3125 Portage Ave., Winnipeg, Manitoba, Canada

Filed Apr. 16, 1976, Ser. No. 677,698
Int. Cl.[2] G01C *22/00*
U.S. Cl. 33—141 R **5 Claims**



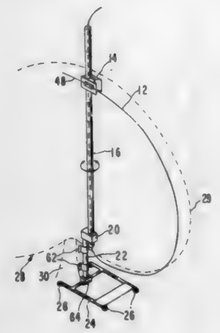
1. In a yardage measurement device for use on golf carts and the like which include a pair of ground engaging wheels, and axles bearingly mounting said wheels for rotation, said device including a settable distance counter mounted on the golf cart; the improvement which comprises in combination a drive component securable to one of said ground engaging wheels, a rim on said component, gear tooth means on said component adjacent said rim, a converter assembly, means to support said assembly adjacent said component whereby said gear tooth means operatively engages said converter assembly, and flexible cable drive means operatively extending from said converter assembly to said distance counter, said means to support said assembly adjacent said component including a bracket detachably clampable to one of said axles, said converter assembly being secured to the distal end of said bracket, and a retainer clip secured to said converter assembly and freely engaging over and around the rim of said component.

4,044,472

SHRUB TRIMMING GUIDE

John Jue, 141 Connemara Way, Sunnyvale, Calif. 94087

Continuation of Ser. No. 510,104, Sept. 27, 1974, abandoned.
This application Jan. 12, 1976, Ser. No. 648,222
Int. Cl.[2] G01B *3/14*
U.S. Cl. 33—174 G **13 Claims**



1. Apparatus for use in trimming a plant having growth defining an outer peripheral margin therefor comprising: a rod having means adjacent to one end thereof for positioning the same adjacent to the central part of a plant to be trimmed with the rod extending from a first location near the lower part of the growth to a second location near the upper part of the growth; an elongated, resilient member of one-piece construction adapted to extend along and adjacent to the outer peripheral margin of the plant to provide a guide for a cutter to shorten the growth at said outer peripheral margin, said rod including means for housing at least a part of said member and for allowing the member to pay out from a first end of the rod, to return to said housing means, and to extend along and adjacent to said outer peripheral margin from a position near the first end of the rod to a position near the second end of the rod; and second means adjacent to the second end of said rod for adjustably securing the member thereto.

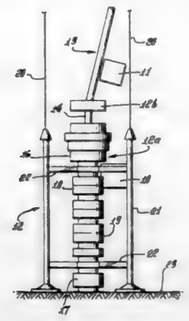
4,044,473

TILT DETECTOR AND SYSTEM

Geoffrey J. Crask, Santa Ana, Calif., assignor to Hydril Company, Los Angeles, Calif.

Division of Ser. No. 445,639, Feb. 25, 1974, Pat. No. 3,911,592.
This application May 2, 1975, Ser. No. 574,033
Int. Cl.[2] G01C *9/06, 9/22*
U.S. Cl. 33—333 **16 Claims**

1. A system including the combination comprising a sub-surface stack of wellhead equipment on the ocean-floor and a riser pipe projecting upwardly from said stack, the riser pipe proximate the stack tilted from vertical, and relative to the stack, and a tilt accommodating universal joint connecting the riser pipe and stack including means maintaining the stack and riser in aligned azimuthal relation, a pair of tilt detectors, one carried by said sub-surface stack of equipment on the ocean floor and the other carried by said riser pipe projecting upwardly from said stack, said other detector spaced above said stack, each detector defining a plane and including a level sensor, the



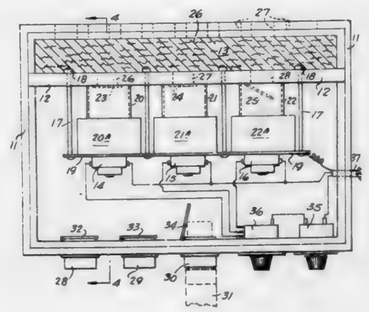
output of each level sensor corresponding to the magnitude of tilt of said plane with respect to vertical, and control means on a vessel at the ocean surface operatively connected with each detector for providing a visual display corresponding to the magnitude of tilt and said riser with respect to said stack.

4,044,474

ANIMAL DRYER

Edwin R. Greene, and Rodney F. Greene, both of 1634 Michael Drive, Pinole, Calif., 94564

Filed Aug. 6, 1976, Ser. No. 712,057
Int. Cl.[2] F26B *19/00*
U.S. Cl. 34—86 **7 Claims**



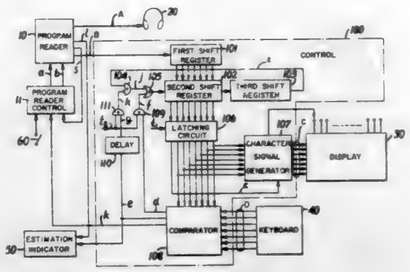
1. A hair dryer comprising a filter system, means for admitting surrounding air to the filter system, a partition having a plurality of openings for directing the air to leave the filter system, a plurality of valves in said openings for selectively permitting the air to leave said openings, a plurality of motors each having an air inlet connected to one of said openings, fans driven by the motors to blow the air past the motors and to thereby warm the air from the heat of the motors, means for collecting the warm air from the motors, and means for attachment to the collecting means for conducting warm air to a user.

4,044,475

TRAINING MACHINE FOR KEYBOARDS

Kenzo Fujisawa; Yoshiyasu Sakaedani, and Akio Tsuji, all of Kamakura, Japan, assignors to Mitsubishi Precision Company, Ltd., Japan

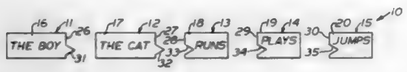
Filed June 25, 1975, Ser. No. 590,115
Claims priority, application Japan, July 2, 1974, 49-74976
Int. Cl.[2] G09B *13/00*
U.S. Cl. 35—6 **4 Claims**



1. A portable training machine for training keyboard operation comprising, in combination, program reader means for reading out a character coded signal including a plurality of binary coded signal blocks which form a word, display means for displaying characters represented by said plurality of binary coded signal blocks which form said word, keyboard means including a plurality of keys bearing different characters thereon, said keyboard means delivering binary coded signal blocks representing those characters borne on said keys when a student strikes the keys in accordance with said word displayed on said display means, said binary coded signal block from said keyboard means being identical to that from said program reader means for the same character, and control means connected to both said program reader means and said keyboard means to successively compare said binary coded signal blocks from said keyboard means with corresponding binary coded signal blocks from said program reader means to thereby successively erase said characters of said word displayed on said display means when the keys are correctly struck and cause said word to be again displayed on said display means when a key is erroneously struck during the striking of the keys corresponding to the words, said control means further including means for adding to each of said binary coded signal blocks of said character coded signal an additional bit for determining whether a character represented by the binary coded signal block with said additional bit is display on said display means, wherein said control means includes a closed loop memory including a pair of shift registers serially connected, said binary coded signals blocks of said character coded signal being stored in said closed loop memory while recirculating at a high speed therethrough, means for adding an additional bit to each of said binary coded signal blocks entered into one of said shift registers, said display means being responsive to said additional bit for permitting an associated signal block to be displayed as a character on said display means, a latching circuit connected to the one shift register to latch each of said binary coded signal blocks each time it is transferred thereto, a comparison circuit connected to both said keyboard means and said latching circuit to successively compare said binary coded signal blocks from said keyboard means with corresponding binary coded signal blocks from said latching circuit to produce a coincidence signal when each pair of said compared signal blocks are identical to each other and to produce a non-coincidence signal when said pair of compared signal blocks are different from each other, circuit means responsive to said coincidence signal to change said additional bit coupled to that signal block compared with the correct signal block from said keyboard means to erase that character represented by the signal block coupled thereto, and

display on said display means, and another circuit means responsive to said non-coincidence signal to return the changed additional bit back to its original bit thereby to again display all the original characters on said display means.

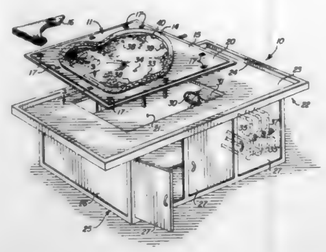
4,044,476
EDUCATIONAL METHODS AND DEVICES
Jeanette B. Marsh, 1400 N. Lake Shore Drive, Chicago, Ill. 60610
Filed Sept. 5, 1973, Ser. No. 394,509
Int. Cl.[2] G09B *17/00*; A63F *9/10*
U.S. Cl. 35—35 J **10 Claims**



1. In an educational system for facilitating the learning through discovery and inductive reasoning provess a plurality of sets of expression means for enabling a student to learn a plurality of applications of the discovery and inductive reasoning process as applied to the learning of a plurality of sets of interrelated concepts, the respective subject matters of said plurality of sets of interrelated concepts being substantially different and being such that a student learns that the discovery and inductive reasoning process is applicable to a variety of fields of interest from learning of its application to said plurality of subject matters, said expression means of each of said sets having a multiplicity of expressions thereof divided into first and second groups and being physically manipulatable to dispose any expression of said first group into adjacent relation to any expression of said second group, each expression of said first group being combinable with a plurality of expressions of said second group to form a plurality of different correct examples of similar expressions and to establish for the corresponding set of interrelated concepts a plurality of different correct examples of combinations of expressions and a plurality of incorrect examples of combinations of expressions,, interengagement means on said expression means of each of said sets having physical configurations and interchangability such that a physically non-mating relationship exists when each incorrect example is established and such that a physically mating relationship exists when each correct example is established so as to reward the student and so as to increase his confidence as each new correct example is established, said multiplicity of expressions on said expression means of each of said sets and the numbers of said correct and incorrect examples being sufficient to enable the student to learn said interrelated concepts solely from the discovery and inductive reasoning process during trial and error manipulation of said expression means and to facilitate learning through the discovery and inductive reasoning process itself irrespective of the subject matter of said one set of interrelated concepts, each of said sets of expression means being such as to provide at least on the order of 100 different possible complete and correct examples and being such that at least eight simultaneously visible different correct examples can be formed, said expression means including mating projection and recess means so constructed and arranged that both the existence and non-existence of said physical mating relation is readily determined tactilely without visual observation.

4,044,477
POOL MODELS
Robert J. Kane, 5035 N. 12th St., Phoenix, Ariz. 85011
Filed Oct. 26, 1976, Ser. No. 735,375
Int. Cl.[2] G09B *25/00*
U.S. Cl. 35—49 **8 Claims**

1. A model of a swimming pool installation comprising:
a swimming pool defining a cavity having bottom and side walls and a first flange having a first part extending around the edge of said cavity and substantially perpendicular thereto simulating a pool decking and a second part extending laterally from said first part around its free edge but coplanar therewith at a different level,
the said free edge of said second part defining a given configuration,
a cabinet for supporting said swimming pool having an apertured top,
the aperture of said top being slightly larger than and of substantially the same geometrical configuration as the peripheral edge of said cavity,
said first flange lying over the surface of said top of said



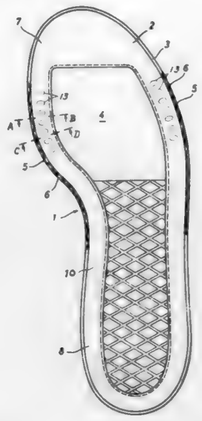
cabinet for supporting the swimming pool positioned to extend into the aperture,
said top having a second flange around its edge for receiving within its periphery the outer edge of said given configuration of said second part of said first flange, and
a plurality of indentations formed in and around the periphery of said given configuration for receiving fastening means for securing said swimming pool to the top of said cabinet,
whereby the fastening means when inserted in indentations lie below the top surface of said second part of said first flange.

4,044,478
QUICK RELEASE FOR WADERS
Gerald H. Girard, Springside-Morrison Ave., Troy, N.Y. 12180
Filed Mar. 9, 1976, Ser. No. 665,221
Int. Cl.[2] A43B *3/00*; A44B *9/00*
U.S. Cl. 36—1.5 **3 Claims**



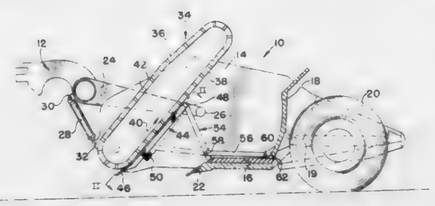
1. A quick release for waders, comprising:
a pair of waders,
a strap attached to the waders,
means of movably attaching a pin to the strap,
a male ferrule forming a shaftway through the ferrule and attached to an end of the strap, and
a female ferrule forming a pair of shaftways through the female ferrule and attached to an upper edge of the waders, whereby the male ferrule may be received in the female ferrule and the pin may be passed through the shaftways of the female and the male ferrules thereby releaseably connecting the waders strap to the waders and thereby securing the waders to a fisherman.

4,044,479
SHELL SOLE
Eugen Brutting, Nurnberg, Germany, assignor to EB Sport International GmbH vormals and Heiner Stuhfauth GmbH, Germany
Filed Feb. 13, 1976, Ser. No. 658,130
Claims priority, application Germany, Feb. 15, 1975, 2506530
Int. Cl.[2] A43B *13/04*
U.S. Cl. 36—32 R **27 Claims**



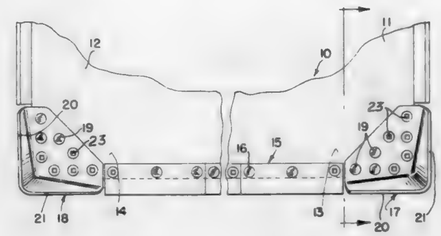
1. A unitary shell sole for footwear comprising a sole bottom portion providing a base for a tread sole portion, an upwardly rising edge portion extending around the periphery of the sole bottom at the outer edge thereof, and a plurality of longitudinally distributed predetermined bending points along said edge portion, said plurality of bending points being constituted by a plurality of spaced relatively thin-walled portions in said edge portion.

4,044,480
ELEVATING SCRAPER WITH PERFORATE SEPARATOR
Robert Norris Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed May 27, 1976, Ser. No. 690,347
Int. Cl.[2] E02F *1/00*; B07B *1/00*
U.S. Cl. 37—8 **5 Claims**



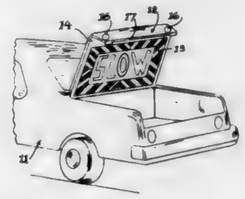
1. In an elevating scraper adapted to be towed by a tractor to perform earth-grading operations and the like including a vehicle frame, means on the frame whereby the frame may be towed over the underlying terrain, a forwardly open scraper bowl on said frame and terminating in a lower, forwardly extending scraper edge, an upwardly and rearwarding extending elevating conveyor assembly mounted on said frame forwardly of said scraper bowl and spaced from said scraper edge, and a support surface closely adjacent to and extending upwardly from the lower end of said conveyor assembly and cooperating therewith whereby material may be elevated by said conveyor assembly and supported during such elevation by said support surface to be moved into said scraper bowl, the improvement wherein said support surface comprises a first grid assembly; means securing said first grid assembly to said frame; a second grid assembly extending downwardly and rearwardly from said first grid assembly toward said scraper edge and means mounting said second grid assembly on said frame for movement between positions opening and closing said scraper bowl.

4,044,481
REVERSIBLE BLADE BIT
Larry G. Eftefield, and Paul J. Lukavich, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 11, 1976, Ser. No. 665,731
Int. Cl.[2] E02F *9/28*
U.S. Cl. 37—141 T **6 Claims**



1. a reversible end bit for selective mounting to an earth-working blade having opposite corner portions, said bit comprising a one-piece rigid member having a first cutting edge portion, a second cutting edge portion extending transversely to said first cutting edge portion, and a mounting portion included between said cutting edge portions and adapted to be mounted to one corner portion of a blade with said mounting portion facially abutting the blade and said first cutting edge portion in forwardly projecting cutting position, and to the opposite corner portion of the blade with said mounting portion turned approximately 90° and facially abutting the blade and the second cutting edge portion in forwardly projecting cutting position, said member being substantially symmetrical about a centerline bisecting the angle defined by said cutting edge portions and said mounting portion.

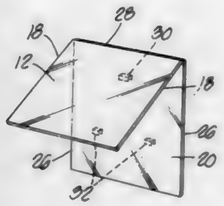
4,044,482
WARNING DEVICE
Alfred Mosch, 9705 NW. 70 St., Tamarac, Fla. 33321
Filed Mar. 25, 1976, Ser. No. 670,351
Int. Cl.[2] B60Q *7/02*
U.S. Cl. 40—129 C **8 Claims**



1. An optical warning device, for use in connection with the lid of a compartment of a vehicle, said lid having an inner surface disposed in the compartment when the lid is closed and, respectively, being visible from outside said vehicle when said lid is open;

comprising, in combination:
an optical warning sign mounted on said inner surface of said lid; and
illuminating means spaced apart from said sign and being mounted on and through said lid and operable to illuminate said sign when the lid is open and including a light source spaced apart from said sign and being operable to direct light towards said sign to be reflected by said sign; said illuminating means additionally comprising both means for directing light in an upward direction away from said lid, and means for directing light in an outward direction away from said lid in a substantially horizontal direction.

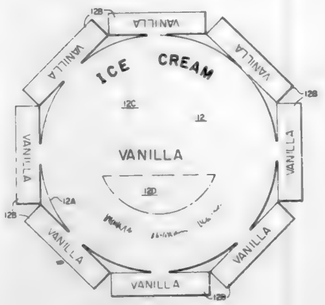
4,044,483
DISPLAY DEVICE AND METHOD OF MAKING SAME
Cole C. Williams, 2408 Ailanjay Place, Glendale, Calif. 91208
Filed Dec. 3, 1975, Ser. No. 637,297
Int. Cl.² G09F *1/12*
U.S. Cl. 40—152 **4 Claims**



1. A frame for displaying photographs and the like comprising:
a. a first sheet of glass having opposing front and back parallel faces and at least one substantially straight side disposed within a plane generally perpendicular to the plane of said faces;
b. a second sheet of glass having opposing front and back parallel faces and at least one substantially straight side disposed within a plane generally perpendicular to the plane of said faces; and
c. hinge means for hingeably interconnecting said first and second sheets of glass along said straight sides thereof so that said first and second sheets are movable from a closed position wherein said back face of said first sheet of glass is in engagement with said front face of said second sheet of glass into an open position wherein said first and second sheets of glass are in a subtantially coplanar relationship, said hinge means comprising a room temperature vulcanizing silicone rubber bonding material bonded to said straight sides of said first and second sheets of glass to hingeably interconnect said sheets of glass, said bonding material being in the form of a yieldably deformable bead which is generally semicircular in cross-section when said sheets are in a closed position and is resiliently deformable into a configuration wherein said bead is disposed intermediate said straight sides of said sheets of glass when said sheets of glass are in an open coplanar position.

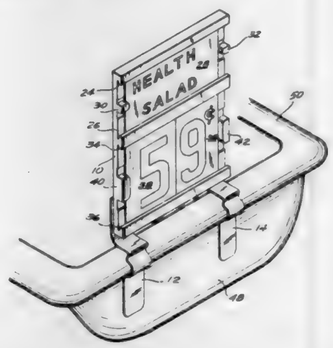
4,044,484
LONG-SKIRTED PAPER AND PLASTIC LID FOR FOOD CONTAINERS AND THE LIKE
Rodney E. Ludder, Severna Park, Md., assignor to Maryland Cup Corporation, Owings Mills, Md.
Filed Aug. 6, 1976, Ser. No. 712,355
Int. Cl.² G09F *3/00*
U.S. Cl. 40—306 **10 Claims**

1. A two-piece lid for containers comprising:
a plastic shell having a first central web portion and an annular skirt dependent from the periphery of said web portion, said annular skirt having inner and outer wall portions defining an annular trough therebetween and said outer wall having an upper portion extending above said web portion; and
an indicia bearing disc member having a second central web portion in substantially coextensive juxtaposition with said first central web portion and peripheral tab means thereon extending downwardly into said annular trough;



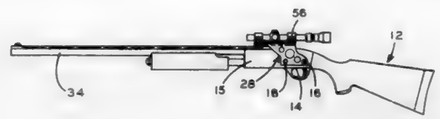
said upper portion of said outer wall of said skirt comprising an inwardly facing annular top curl juxtaposed with said second web portion of said disc member about the periphery of said first central web portion.

4,044,485
DISPLAY SIGN WITH EDGE ATTACHING FLANGE MEMBERS
Philip Hopp, New York, N.Y., assignor to The Hopp Press, Inc., New York, N.Y.
Filed Mar. 1, 1976, Ser. No. 662,460
Int. Cl.² G09F *3/00*
U.S. Cl. 40—324 **1 Claim**



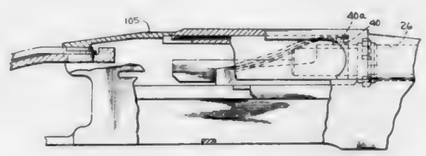
1. A display sign for attachment to the edge of a tray including in combination a sign body, first and second spaced flanges connected to and depending downwardly from said body, each of said flanges being formed of a resilient material and having shoulder, edge engaging and leg portions, said shoulder portion projecting forwardly below said body, said edge engaging portion projecting downwardly from said shoulder portion, said leg portion projecting downwardly from said edge engaging portion and rearwardly thereof, said edge engaging portion being arcuately formed to engage a rolled edge of said tray and resiliently urge said leg portion against the side thereof, a knuckle formed in said edge engaging portion projecting rearwardly to abut against the edge of said tray to distort said respective flange which due to its resiliency seeks to return to its original configuration, and a further flange depending from said sign body rearwardly of said first and second flanges whereby said tray edge can be sandwiched between said further flange and said first and second flanges.

4,044,486
GUN SIGHT MOUNTING
James Wilbur Van Holten, Rte. 5, Columbia City, Ind. 46725
Filed Feb. 23, 1976, Ser. No. 659,992
Int. Cl.² F41G *1/38*
U.S. Cl. 42—1 ST **5 Claims**



1. A shoulder gun having a receiver, two spaced mounting bolts, a trigger housing retained by said mounting bolts, a mounting bracket including two openings, one for each of said mounting bolts and adapted to be clamped to the gun by said bolts, said bracket having an upright flange portion extending alongside of the receiver, a transverse flange disposed slightly above the receiver and in parallel relationship with the receiver of said gun, means forming a track on said transverse flange and extending for virtually the entire length of said transverse flange to provide a continuously extending mounting means of variably useable length and including parallel longitudinally extending continuous wedge sections, screw means for fastening said track on to said transverse flange, and replaceable sight means including mounting means mounted on said track and movable to a preferred position along the length of said track over the length of said transverse flange covered by said track, said mounting means including a screw-clamping means for effecting a rigid mounting connection between said track and said sight means.

4,044,487
ROTARY PORT COVER
James C. Hutton, Mohawk; Thomas G. Bauman, Ilion, and Kenneth C. Rowlands, Utica, all of N.Y., assignors to Remington Arms Company, Inc., Bridgeport, Conn.
Filed May 27, 1976, Ser. No. 690,518
Int. Cl.² F41C *27/08*
U.S. Cl. 42—16 **31 Claims**



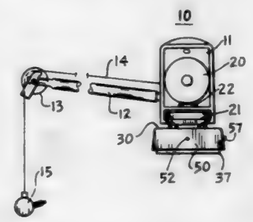
9. A firearm having a hollow receiver in which a bolt assembly reciprocates from a rear, breech open position to a forward, breech closed position, an ejection port in said receiver, a port cover mounted in said receiver, means restraining longitudinal movement of said port cover relative to said receiver while permitting rotational movement into and out of ejection port covering position, cam pin means on said bolt assembly, corresponding cam track means on said port cover, said pin means and said cam track means cooperating to cause rotational movement of said port cover during a portion of the total reciprocating stroke of said bolt assembly, said port cover being shorter in length than the length of stroke of said cam pin means so as to permit a compact port cover which is slightly longer than said ejection port.

4,044,488
ROD CHUCKING HANDLE FOR A FISHING ROD
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Japan
Filed June 24, 1974, Ser. No. 482,413
Claims priority, application Japan, June 27, 1973, 48-76976; Mar. 13, 1974, 49-28940
Int. Cl.² A01K *87/02*
U.S. Cl. 43—23 **1 Claim**



1. A rod chucking handle for a fishing rod which comprises in combination, a handle portion having a cylindrical front extension, said extension having an axial hole disposed for receiving a butt end of a fishing pole, said cylindrical front extension having outer threads formed on the front end portion, a fixing sleeve having inner surface threads and matingly disposed over said threads of the cylindrical front extension, said fixing sleeve having an inner flange formed near its front end adjacent a non-threaded surface thereof, an elastic clamping ring having a cylindrical configuration and disposed in a nonthreaded annular recess gap defined by the rear end surface of said inner flange, the adjacent non-threaded surface of the fixing sleeve and a front end surface of said front extension, an anti-friction annular spacer, said spacer having an L-shaped transverse cross-sectional profile taken in half-section from an axial line and having one leg member thereof disposed between the inner flange of the fixing sleeve and the elastic clamping ring, and the other leg member thereof being disposed between the non-threaded surface of the fixing sleeve and the elastic clamping ring, said anti-friction annular spacer being supported in the recess gap by the elastic clamping ring, said axial hole having a terminal rear inner wall converging and disposed to receive the butt end of a fishing pole along the converging inner wall, said threads on the cylindrical front extension and the fixing sleeve being mated such that fastening of the fixing sleeve onto the cylindrical front extension causes narrowing of the annular recess gap and thereby said clamping ring is forced to deform inwardly to provide a reduced inner diameter snugly engaging said butt end and transmitting an axial force thereto, and whereby the butt end of a fishing pole may be secured to the chucking handle by forceful engagement with the converging wall at one end and by the elastic clamping ring along a body portion of the butt end thereof.

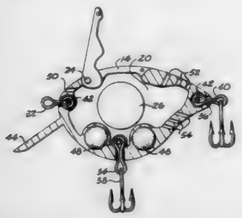
4,044,489
TROLLING APPARATUS
Walter J. Henze, and San Thein, both of Philadelphia, Pa., assignors to Penn Fishing Tackle Mfg. Co., Philadelphia, Pa.
Filed Apr. 26, 1976, Ser. No. 680,118
Int. Cl.² A01K *97/10*
U.S. Cl. 43—27.4 **8 Claims**



1. Trolling apparatus for fishing which comprises

a frame,
a reel mounted on said frame,
a boom secured to said frame with a pulley attached thereto for carrying line from said reel,
a swivel base,
means for detachably connecting said frame to said swivel base,
said swivel base including a fixed bottom plate, and
a rotatable top swivel plate detachably secured together and to which said frame is detachably connected, and
said swivel plate and said bottom plate having interengaging portions limiting free horizontal pivotal movement of said frame through a predetermined arc relative to the bottom plate.

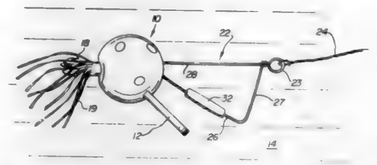
4,044,490
FISHING LURE
Walter M. Young, 27 Anderson St., Piedmont, S.C. 29673, and Robert S. Young, Rte. 1, Pelzer, S.C. 29669
Filed Mar. 25, 1976, Ser. No. 670,105
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.06 **1 Claim**



1. An artificial fishing lure provided for receiving a tablet which generates a gas when contacted by water so that as the lure is pulled through the water bubbles are generated for attracting the attention of fish, said lure comprising:
a rigid unitary body construction, said rigid body having a rounded front portion and a rearwardly and inwardly tapered rear portion, said body being formed by a pair of molded shells secured together by adhesive, said shells being substantially concave so as to define a cavity therebetween when secured together,
a pivotal door carried in a top portion of said body for providing access to said cavity so that said tablet can be deposited therein,
cooperating latch means carried by said pivotal door and said body holding said door closed,
weights carried in said cavity for causing said lure to sink in water,
a hole provided in a front portion of said rigid body through which water flows to said cavity for contacting said table when said plug is being fished, (and) a treble hook attached to the extreme rear portion of said body,
a row of holes provided in said housing above said treble hook, and a row of holes provided in said housing below said treble hook so that gas bubbles generated by said tablet encompass said treble hook as they are discharged through said rows of holes.

4,044,491
FISH LURE
John Thomas Potter, 152 Fernbank Road, Box 565, Stittsville, Ontario, Canada (K0A 3G0)
Filed June 29, 1976, Ser. No. 700,858
Claims priority, application Canada, June 18, 1976, 255280
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.22 **11 Claims**

1. A fish lure, comprising:
a buoyant body;
means for connecting said fish lure to a fishing line;
a hook suspended from said body;
a lip projecting from said body;
a projection extending from said body;
said projection comprising a first portion extending out-



wardly from said body past said lip and a second portion extending laterally from said first portion opposite from said lip; and
a weight selectively attachable to and releasable from either of said first and second portions of said projection.

4,044,492
FISHING LURE
Alexander John Ingram, 40 Kiln Close, Mevagissey, Cornwall, England
Filed Feb. 20, 1976, Ser. No. 659,884
Claims priority, application United Kingdom, Feb. 28, 1975, 8516/75
Int. Cl.[2] A01K *85/00*
U.S. Cl. 43—42.28 **10 Claims**

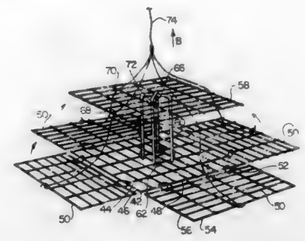


1. A fishing lure comprising:
i. a simulated fish body having therein a generally horizontal slot extending longitudinally through the body towards the head of the fish and dividing the body into upper and lower body portions to allow the upper portion to flex horizontally relative to the lower portion, said lower body portion including a fishing hook receiving aperture
ii. a flexible tail portion moulded integrally with the upper body portion,
iii. a baffle plate positioned at the end of the tail and extending transversely of the body so that water action flexes the tail horizontally, and
iv. means disposed close to the rear end of the longitudinal slot to keep the two body portions together.

4,044,493
CRAB TRAP
Sam Fox, 630 N. Pulaski St., Baltimore, Md. 21217
Filed Apr. 22, 1976, Ser. No. 679,466
Int. Cl.[2] A01K *69/10*
U.S. Cl. 43—105 **8 Claims**

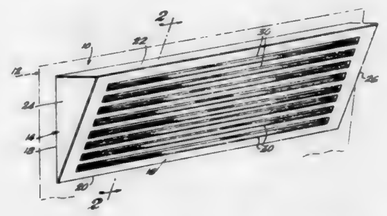
1. A meshed crab trap device having an open state when a crab can enter the device and a closed state for entrapping a crab in the device, said device comprising:
a. a meshed base member comprising a first plurality of wires positioned parallel to each other and a second plurality of wires positioned at an angle with respect to said first plurality of wires and affixed thereto;
b. a plurality of rectangular meshed side members having a width equal to approximately three-fifth of the length, each side member being pivotally coupled to one side of said base member wherein each side member comprises a first plurality of wires positioned parallel to each other and a second plurality of wires positioned at an angle with respect to said first plurality of wires and affixed thereto;

c. a meshed top member having a size and shape substantially identical to said bottom member, said top member comprising a first plurality of wires positioned parallel to each other and a second plurality of wires positioned at an angle with respect to said first plurality of wires and affixed thereto;



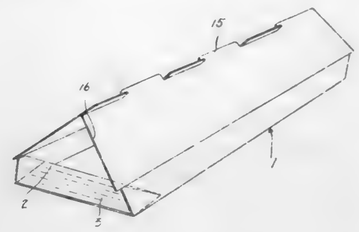
d. a plurality of U-shaped support means coupling said top member to said base member such that said top member is parallel to said base member, the distance between said top and bottom members being equal to the width of said side members, wherein when said crab trap is in its closed state said side members are perpendicular to said top and bottom members.

4,044,494
TRAP FOR FLYING INSECTS AND BUGS
Zbigniew Grajnert, P.O. Box BM, Marco Island, Fla. 33937
Filed Mar. 19, 1976, Ser. No. 668,692
Int. Cl.[2] A01M *1/24*
U.S. Cl. 43—119 **15 Claims**



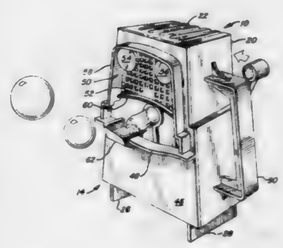
1. A trap for flying insects and bugs comprising:
a housing formed of a clear, transparent material, defining an interior chamber,
a slot means in said housing, opening into said interior chamber and defining confronting edges,
inwardly converging flange means along said confronting edges,
tape means fixed along said converging flange means, providing inwardly converging frayed warp strands along their lengths;
said trap including a highly reflective tape as of aluminum foil fixed along at least one surface of said flange means.

4,044,495
DEVICE FOR CAPTURING COCKROACHES
Akira Nishimura; Hiroshi Akamatsu; Sentaro Negoro, all of Ako, and Yasutoshi Yoshida, Kakogawa, all of Japan, assignors to Earth Chemical Company, Limited, Japan
Continuation-in-part of Ser. No. 566,798, April 10, 1975, abandoned, which is a division of Ser. No. 360,021, May 14, 1973, Pat. No. 3,913,259. This application Oct. 20, 1975, Ser. No. 624,190
Claims priority, application Japan, May 26, 1972, 47-62290; June 5, 1972, 47-66606; June 6, 1972, 47-67058; Nov. 21, 1972, 47-134736; Nov. 21, 1972, 47-117407
Int. Cl.[2] A01M *1/10, 1/14*
U.S. Cl. 43—121 **11 Claims**



1. A device for capturing cockroaches comprising:
a rectangular base member,
two side means, extending from opposite side edges of said base member, said side means meeting along a line parallel to said opposite side edges of said base member to form a housing;
at least one stepping plate extending from said base along an end edge thereof, said stepping plate being inclined inwardly into said housing;
wherein an opening directly into said housing is formed at at least one end of said housing, said opening being defined by said stepping plate and said side means; and
wherein said stepping plate serves to prevent cockroaches from escaping from the interior of the housing after they have been captured.

4,044,496
BUBBLE BLOWER
Hans Jernstrom, 1 Villa Verdi, Apt. 111, Buffalo Grove, Ill. 60090
Filed Dec. 15, 1975, Ser. No. 640,826
Int. Cl.[2] A63H *33/28*
U.S. Cl. 46—7 **11 Claims**



1. A hand-operated bubble-blowing machine which includes:
a. a housing having:
i. a rear wall, a larger front wall spaced therefrom, outwardly flaring side, top and bottom walls which interconnect the rear and front walls and form a forwardly

tapering nozzle-like structure which enhances air flow through said housing;

ii. air inlet means in said rear wall;

iii. air inlet means in each of said top and bottom walls;

iv. bubble outlet means generally centrally positioned in said front wall;

v. means defining a reservoir for bubble-forming liquid positioned within said housing below said bubble outlet means and cooperatively associated with said front wall;

b. a bubble-forming mechanism cooperatively associated with said housing which includes:

i. main shaft means rotatably mounted within said housing and journalled to said front wall and said rear wall at positions below the bubble outlet means;

ii. externally positioned hand crank means associated with said rear wall and secured to one end of said shaft means for rotating said shaft means;

iii. propeller means positioned within said housing and rotatably mounted to said front and rear walls above said bubble outlet means and main shaft means, for drawing air through said inlet means and creating a bubble-forming air stream directed toward said bubble outlet means, with the axis of rotation of said propeller means substantially parallel to and vertically offset from said main shaft means;

iv. gear means for drivingly interconnecting said main shaft means and said propeller means and for rotating said propeller means at a rate substantially greater than the rotation of said main shaft; and

v. dipper means, mounted on said shaft means for rotation therewith, which includes a hub, a plurality of arms extending radially from said hub and a plurality of bubble-forming rings, one mounted to the distal end of each of said arms, said diper means being positioned within said housing and for rotation through said reservoir means for forming a film of bubble-forming liquid in said rings, and for positioning said film in said air stream and in alignment with said bubble outlet means.

4,044,497

KIT WITH MALE AND FEMALE ELEMENTS HAVING DEFORMABLE GRIPPING MEANS

Jean-Paul Bettens, Morges, Switzerland, assignor to Modulo S.A., Le Sentier, Switzerland

Filed Nov. 24, 1975, Ser. No. 634,863

Claims priority, application Switzerland, Dec. 4, 1974, 16073/70

Int. Cl.² A63H *33/10*

U.S. Cl. 46—17 **8 Claims**

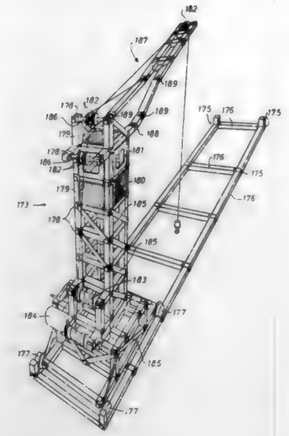
1. A construction kit comprising a plurality of male and female assembly elements,

said male elements being in the form of cubic bodies having square faces of predetermined dimensions, each said body having at least two securing members protruding from respective said faces, said securing members being in the form of tenons, each said tenon having a cylindrical shank, each said tenon having a guiding and positioning part in the form of a polygonal head on said shank, said polygonal head having side faces,

said female elements being in the form of elongate pieces of square section of said predetermined dimensions, each said female element having an end wall, said end wall having an opening therein with a major circular arcuate part which is bounded by and entered into through a narrow passageway defined and formed by gripping means comprising two elastically deformable facing projections defined in said end wall,

each said tenon shank being shaped and dimensioned such that said tenon shank can be forced through said narrow passageway and past said projections and said tenon shank deforms said projections as its passes and such that said tenon shank can be introduced into and retained in said major circular arcuate part of said opening in said end wall of said female element,

each said female element having inner walls defining a hol-



low space for receiving a said tenon polygonal head, said polygonal head being shaped and sized such that said faces of said polygonal head engage and are guided and positioned by said inner walls of a said female element.

4,044,498

TOY ANIMAL FIGURES WITH INTERCHANGEABLE SADDLE AND CENTER BODY PART

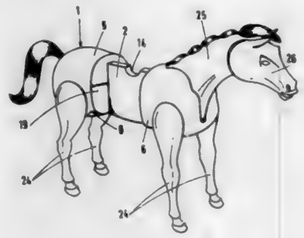
Dietmar Rahmstorf, Nurnberg, Germany, assignor to Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag, Furth, Bayern, Germany

Filed July 28, 1976, Ser. No. 709,287

Claims priority, application Germany, Aug. 2, 1975, 7524554[U]

Int. Cl.² A63H *3/16*

U.S. Cl. 46—116 **6 Claims**



1. a quadruped toy animal figure of the type used to mount a rider comprising a rigid body capable of carrying a saddle, wherein the improvement consists in that the middle of the body is constructed from a narrow web extending in the longitudinal direction of the body between front and rear parts of generally naturally appearing proportion; a body centerpiece and a saddle each formed with respective means enabling either one of them to be selectably securely mounted on said web; said centerpiece being shaped at its outer surface to blend with the contour of the parts of the said body adjacent to the said web.

4,044,499

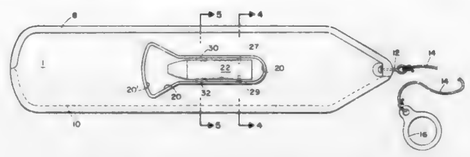
WHIRL TOY

Jacob A. Toler, 4900 Pembridge Ave., Baltimore, Md. 21215

Filed Mar. 31, 1976, Ser. No. 672,418

Int. Cl.² A63H *1/32, 33/26*

U.S. Cl. 46—228 **4 Claims**



1. An improved whirl toy including an elongated, thin, substantially flat body member having circular side surfaces and parallel edges and means at one end thereof for attaching a thong thereto for whirling the body member in a circular path, the improvement comprising:

a. said body member having an opening extending therethrough adjacent the center;

b. a light assembly fitted centrally of said opening including a casing of such dimensions as to house a battery and a light element;

c. said casing being hingedly supported within the opening at a point adjacent the rear end of the casing, the center of the casing being in a plane with the elongated axis of the body;

d. means at the opposite ends of the casing for releasably securing the casing to the opposite end of said opening;

e. a battery having means for electrically connecting the light element with the battery when the toy is put in a whirling circular path.

4,044,500

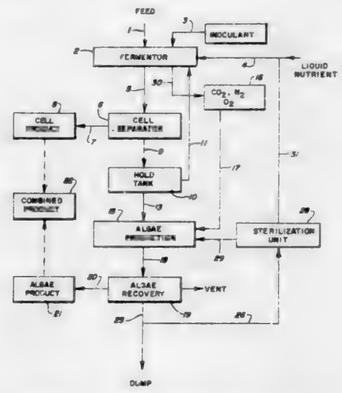
INTEGRATED FERMENTATION-PHOTOSYNTHESIS BIOMASS PROCESS

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 9, 1974, Ser. No. 432,069

Int. Cl.² A01G *7/00*

U.S. Cl. 47—1.4 **4 Claims**



1. A process which comprises fermenting under aerobic conditions a fermentable feed selected from the group consisting of hydrocarbons, carbohydrates, alcohols, acids, aldehydes and industrial waste streams to produce a protein cellular product, separating the protein cellular product from the spent liquid fermentation effluent, recycling a portion of the spent liquid fermentation effluent to the fermentation and passing the remainder of the spent liquid fermentation effluent to a cultivation tank, inoculating, cultivating and propagating algal microorganisms therein while irradiating same with light, separating the algae from the waste liquid, sterilizing said last-mentioned waste liquid and then recycling the last-mentioned waste liquid to the fermentation.

4,044,501

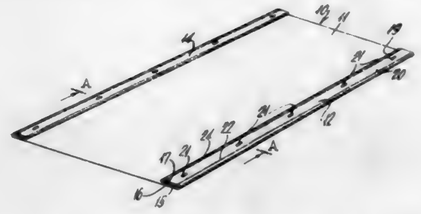
SEED BED COVER WITH IMPROVED, REINFORCED EDGE SECTIONS

John Frydryk, Springfield, Mass., assignor to Johnson & Johnson, New Brunswick, N.J.

Continuation of Ser. No. 637,904, Dec. 5, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 734,917

Int. Cl.² B32B *3/04, 7/14*

U.S. Cl. 47—26 **10 Claims**



1. A flat, lightweight, porous, nonwoven fabric for use as a seed bed cover having improved, reinforced edge sections, each of said edge sections consisting of: multiple layers of said fabric in superimposed relationship on a side of said fabric, the layers of the edge section having an inside border facing the fabric and an outside border facing away from the fabric; a plurality of openings at spaced intervals through said multiple layers; and two flexible reinforcing bands on said edge section securing said layers together, each band extending in a continuous path along the length of the edge section, one band positioned between the openings and the inside border of the layers, the other band positioned between the openings and the outside border of the layers.

4,044,502

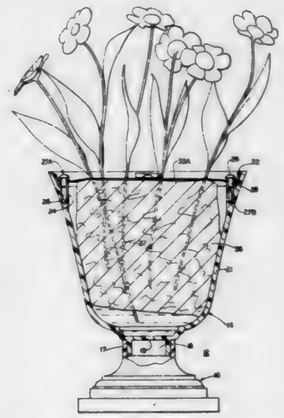
CONTAINER FOR FLOWERS

George C. Hillenbrand, Sabal Ridge Apts., Apt. 9N, 750 S. Ocean Blvd., Boca Raton, Fla. 33432

Filed Mar. 10, 1976, Ser. No. 665,629

Int. Cl.² A47G *7/07*

U.S. Cl. 47—41.12 **4 Claims**



1. A container for flowers which comprises a hollow body having a bottom and an annular wall terminating in an upwardly opening mouth, a plurality of lugs mounted on the

interior of the wall adjacent the mouth, there being upright sockets in the lugs, plugs mounted in the sockets, each of the plugs having a shank received in one of the sockets and a head overlying the lug associated therewith and flexible straps spanning opposed plugs, openings in the straps adjacent ends thereof receiving the plugs, the straps being adapted to hold a block of flower holding material in the container.

4,044,503

FRAME CONCEALED EXTERIORLY OPENING OPERATING SASH

Neil F. Maune, Ladue, Mo., assignor to Profile Systems, Inc., St. Louis, Mo.

Filed Sept. 29, 1975, Ser. No. 617,637
Int. Cl.² E05D *7/06*
U.S. Cl. 49—400 **14 Claims**



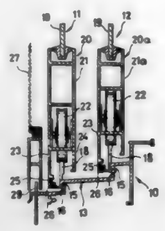
1. In a window structure for a building and of the type wherein its window frame presents a narrow profile, and its operating and fixed sashes present a zero line of sight through concealment behind their facades of the uniformly narrow fixed frame and operating sash structure, as when the operating sash is maintained in a closed position, said operating sash being an exteriorly opening sash, said window structure incorporating a glazed fixed sash and a glazed operating sash, a perimeter frame peripherally surrounding said sashes and capable of being permanently mounted to the building structure, an intermediate frame member of reinforced structure provided between said sashes and being fixed to said perimeter frame thereby forming the operating and fixed sash openings, said perimeter frame having jamb, sill, and head portions, said portions being of uniform semi-tubular structure, and when viewed exteriorly along with the intermediate frame member being of uniform dimensions, the glazed operating sash being hingedly mounted to the perimeter frame within said operating sash opening and capable of being opened outwardly with respect thereto, said operating sash being formed as a tubular like frame around its perimeter and having a reglet provided forwardly thereof for securing the glaze firmly in place and to allow its replacement from interiorly of the building, said glazed fixed sash including a retainer being formed of channel like structure around its perimeter, said retainer being removable to allow glaze replacement from interiorly of a building, those portions and the intermediate frame forming the fixed sash opening and the reglet of the operating sash having integral face flanges extending inwardly and outwardly respectively thereof, said face flanges having a width substantially less than the width of said portions and the intermediate frame member, said face flanges on said portions and the intermediate frame forming the fixed sash opening cooperating to form a continuous seat for the fixed sash glaze thereagainst their interior for holding said glaze firmly in place, said operating sash when maintained in closed position having its face flanges substantially concealing its tubular like frame and the perimeter frame therebehind, in addition to said fixed sash being substantially concealed behind its proximate face flanges as the window structure is viewed exteriorly.

4,044,504

SASH WINDOW WITH WEATHERTIGHT SEALING MEANS

Katsuo Nakada, Kurobe, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 28, 1976, Ser. No. 709,337
Claims priority, application Japan, Aug. 8, 1975, 50-110307[U]
Int. Cl.² E05D *13/02*
U.S. Cl. 49—425 **3 Claims**



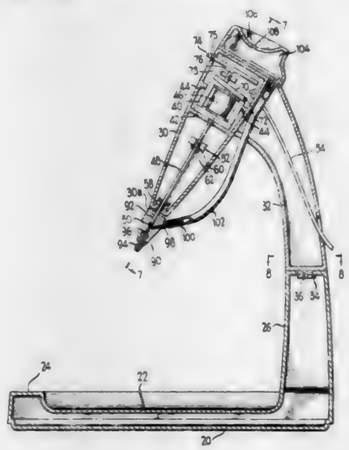
1. In a sash window of the type having at least two overlapping sashes independently movable horizontally within an outer frame, wherein each of the sashes includes an inner frame extending along and embracing the periphery of a panel, the improvement comprising a sill included in said outer frame, said sill being formed into a series of longitudinally extending steps decreasing in height toward the exterior of the window, said steps including risers, and at least a pair of upstanding rails formed by upward extensions of said risers respectively, said sashes being supported respectively on said rails for horizontal movement therealong, and a weathertight sealing strip carried by said inner frame of each of said sashes respectively in sliding engagement with the exterior surface of said risers.

4,044,505

ETCHING DEVICE FOR GLASS OR OTHER ETCHABLE SURFACES

Burton C. Meyer, Downers Grove, and Ralph J. Kulesza, Chicago, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Dec. 18, 1975, Ser. No. 642,153
Int. Cl.² B28D *1/22*
U.S. Cl. 51—5 R **9 Claims**



1. An arts and crafts apparatus for etching designs on glass, plastic, or like etchable surfaces comprising:

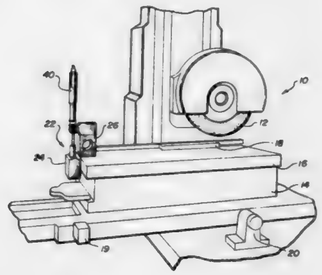
a housing;
an operative vibratory motor means mounted on said housing;
an engraving blade driven by said motor means,
a working head, including surface means engageable with an etchable surface, driven by said motor means through reciprocating vibratory strokes, said working head being removably mounted on said engraving blade so that with the head removed, the blade can be used for engraving outlines on the glass;
a supply of particulate abrasive material such as sand or the like; and
means for slowing and delivering said sand from said supply to said head during vibration thereof to trap the sand between said surface means and the glass piece to etch the glass piece by abrasive action of the sand.

4,044,506

METHOD AND APPARATUS FOR REFACING AN ABRASIVE WHEEL

Jun A. Taketa, 2343 Fir St., Glenview, Ill. 60025

Filed Apr. 29, 1976, Ser. No. 681,449
Int. Cl.² B24B *53/04*
U.S. Cl. 51—5 D **3 Claims**



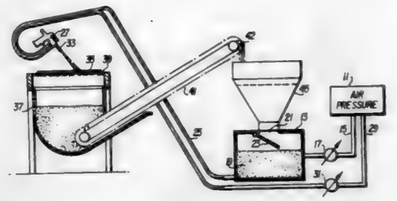
1. A grinding wheel refacer for use in combination with grinding apparatus having an abrasive wheel and a work bed supporting a magnetic chuck; a diamond bit; mounting means fixedly secured to said work bed and adjustably supporting said diamond bit in refacing relationship with said abrasive wheel, said mounting means comprising a mounting head having a bore extending through it, said diamond bit being slidably adjustably disposed within said bore, a finger cavity in communication with said bore, whereby said diamond bit can be adjustably positioned within said bore by extending a finger through said finger cavity to engage said diamond bit, and means for positionally locking said diamond bit at an established position within said bore; a gauge assembly comprising a generally rectangular-shaped member having an offset portion for supporting therein a micrometer means, said gauge assembly being removably secured to said magnetic chuck by the operation of the latter and supporting said micrometer means in operative relationship with said diamond bit such that said diamond bit can be adjustably positioned to engage said micrometer means, said micrometer means being adjustable to establish a fixed determinable dimensional relationship with respect to a work piece to be ground; whereby said diamond bit can be adjustably positioned to reface an abrasive wheel such that the radius of the peripheral face of said abrasive wheel corresponds to the finished dimension of the work piece.

4,044,507

METHOD AND APPARATUS FOR STRIPPING, CLEANING AND TREATING SURFACES

Fred L. Cox, Alexandria, Va.; Steve Crump, and Phate Hice, both of Morganton, N.C., assignors to Silver Creek Minerals Corporation, Morganton, N.C.

Filed May 12, 1976, Ser. No. 685,679
Int. Cl.² B24C *1/00, 9/00*
U.S. Cl. 51—424 **11 Claims**



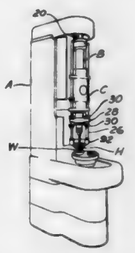
1. A method for treating a surface of a material which comprises
directing a stream of olivine grit material against said surface under a predetermined pressure.

4,044,508

ADJUSTABLE HONING TEMPLATE

Richard Frederick, 1560 Dennison, Dundee, Mich. 48131

Filed Mar. 26, 1976, Ser. No. 671,007
Int. Cl.² B24B *5/00*
U.S. Cl. 51—165.93 **16 Claims**



1. In a machine for increasing the diameter of holes in metals, and the like, having a spindle with a longitudinally extending axis of rotation and material removing elements which expand radially outwardly to increase the diameter of the hole, an improved diameter limiting device, comprising:
a plurality of template segments for engagement by said material removing elements, an annular holder having an axially extending opening therethrough for receiving the spindle of the machine, said annular holder having generally exially extending fingers respective ones of which support respective ones of said template segments, a camming ring concentric with said fingers, said fingers having abutment surfaces thereon which are moved radially upon rotation of said camming ring, and torque sensing means for sensing the torque exerted on said template segments by said material removing elements, and whereby the torque sensing means can be utilized to indicate that the hole in the work has been enlarged to a predetermined diameter.

15. An adjustable honing template comprising: an annular body member having a longitudinally extending opening therethrough for receiving a hone, a plurality of generaly parallel fingers extending longitudinally of said annular body member, a template segment on each finger with said template segments defining a circle, a rigid adjustment ring positioned opposite said fingers, and a camming surface advanced over said fingers by rotation of said adjustment ring for wedging said fingers

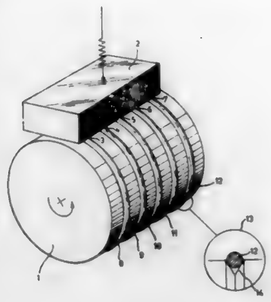
radially, and whereby the diameter of the circle defined by said template segments is changed by rotation of said adjustment ring.

4,044,509

METHOD OF AND DEVICE FOR GRINDING GROOVES

Jules Bos, and Gunter von der Kall, both of Rijswijk, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 590,437, June 26, 1975, Pat. No. 4,011,692.
This application Oct. 26, 1976, Ser. No. 735,615
Claims priority, application Netherlands, July 5, 1974, 7409107
Int. Cl.² B24D 5/00; B24B 1/00
U.S. Cl. 51—206 P **4 Claims**



1. A method of forming a number of shallow mutually parallel grooves in a workpiece which comprises: providing a drum having a plurality of axially spaced circumferential grooves, each groove carrying at least one metal wire, each wire extending above the circumferential surface of said drum; providing means for rotating said drum about the axis thereof; and pressing the workpiece against the circumferential surface of said drum to form grooves with said wires.

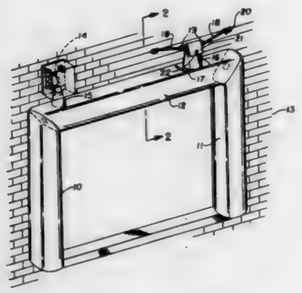
3. A device for grinding shallow mutually parallel grooves in workpieces which comprises a drum having a set of axially spaced circumferential grooves; at least one stretched metal wire carried in each groove, the dimensional relationship between each wire and each groove carrying said wire being such that said wire protrudes above the surface of said drum, said device further including means for rotating said drum.

4,044,510

VENTING VALVE FOR INFLATABLE DOCK SEALS

Larry O'Neal, 4953 Timbercrest Drive, Canfield, Ohio 44406

Filed Apr. 30, 1976, Ser. No. 681,797
Int. Cl.² E06B 7/22
U.S. Cl. 52—2 **6 Claims**



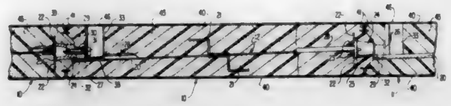
1. In an inflatable dock seal for positioning on a wall around an opening therein and having means for inflating the same, a quick venting valve in communication with said inflatable dock seal and comprising a flexible tubular member extending outwardly therefrom, means normally supporting said flexible tubular member inwardly of the ends thereof so that a portion of the flexible tubular member is held in position outwardly of the inflatable dock seal and another portion of the flexible tubular member is unsupported and normally folded inwardly against the supported portion so as to form a closure in said flexible tubular member, said flexible tubular member arranged to temporarily unfold and open responsive to increased air pressure in said inflatable dock seal as occasioned by a truck or a trailer striking the inflated dock seal.

4,044,511

FASTENING MEANS FOR FRAMELESS INSULATING PANELS

Cleo M. Lingle, 1201 Montclair, Longview, Tex. 75601

Filed Oct. 8, 1976, Ser. No. 730,849
Int. Cl.² E04B 2/82, 1/90
U.S. Cl. 52—127 **5 Claims**



1. A locking bar assembly adapted for embedment bodily in the foam insulation core of a frameless metal faced structural panel adapted to be joined in edge-to-edge assembled relationship with other panels, said assembly comprising a bar body portion, mounting bracket means secured to one end of the bar body portion, a female threaded coupling element secured to the mounting bracket means, a male screw shielding and retaining means secured to the other end of the bar body portion and defining an access passage, and a male screw coupling element held loosely within said shielding and retaining means and adapted to be manipulated from within the access passage to project the male screw coupling element beyond the adjacent end of the bar body portion for rotational engagement with a female threaded coupling element of a like locking bar assembly of another panel, said shielding and retaining means comprising a box formation on the bar body portion projecting away from one side thereof and having an open end defining an entrance to said access passage, one side wall of the box formation having a clearance opening for the shank of said male screw coupling element, said shielding and retaining means additionally comprising an arched shield for the shank of the male screw coupling element at one side of the box formation and being secured to said bar body portion, a transverse channel bracket secured to the bar body portion and containing said arched shield and having side wall openings receiving said shank which are coaxial with said clearance opening of said box formation, and a puncturable sheet material element on the outer side wall of said channel bracket covering the adjacent side wall opening and blocking premature extension of said male screw coupling element beyond the adjacent end of the locking bar assembly.

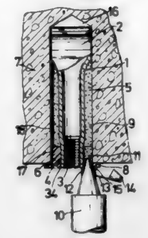
4,044,512

METHOD AND ARRANGEMENT FOR ANCHORING AN OBJECT TO A SUPPORT STRUCTURE

Artur Fischer, and Klaus Fischer, both of Tumlingen, Germany, assignors to Artur Fischer, Tumlingen, Germany

Filed Nov. 11, 1975, Ser. No. 631,153
Claims priority, application Germany, Nov. 14, 1974, 2453957; June 6, 1975, 2523198; June 6, 1975, 2525220; June 7, 1975, 2525452; June 14, 1975, 2526744; June 21, 1975, 2527773
Int. Cl.² E04B 1/41
U.S. Cl. 52—127 **34 Claims**

1. An arrangement for anchoring an object to a support structure having an anchoring hole, comprising an anchoring element including an anchoring member of transverse dimensions smaller than, and a cap member of transverse dimensions substantially corresponding to those of the anchoring hole, said anchoring member having a leading and a trailing end portion, an interior extending between said end portions, and an internal thread in said interior at said trailing end portion, said cap member externally embracing said trailing end portion of said anchoring member upon insertion of said anchoring element into the anchoring hole through an open end thereof so that said cap member supports said anchoring element at the open end of the anchoring hole with clearance between the latter and said anchoring member and closes the open end of the clearance; and means for filling the clearance with a body of



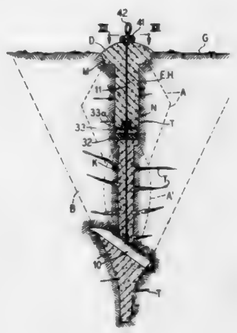
hardenable material for the latter to harden in the clearance about said anchoring member to thereby anchor said anchoring element in the anchoring hole, including at least one flow-through passage passing through said leading end portion of said anchoring member between said interior of the latter and the clearance, shielding means adapted to communicate with said passage for introducing the hardenable material thereinto and through the same into the clearance and to shield said internal thread of said anchoring member from contact with the hardenable material, and venting means at said cap member communicating the clearance with the exterior of the support structure and operative for venting air which is present in the anchoring hole and displaced by the hardenable material as the clearance is filled with said body.

4,044,513

EARTH ANCHOR

Robert F. Deike, Cheyenne, Wyo., assignor to Foresight Industries, Cheyenne, Wyo.

Continuation-in-part of Ser. No. 535,428, Dec. 23, 1974, Pat. No. 3,969,854. This application Mar. 19, 1976, Ser. No. 668,695
Int. Cl.² E02D 5/80, 5/58
U.S. Cl. 52—163 **10 Claims**



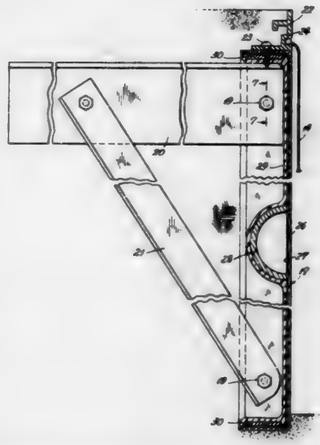
1. A ground anchor which comprises an elongated rigid hollow tubular member having a leading driving end with an internal abutment adapted to be impacted by a driving tool and an open trailing end with an out-turned lip on one side thereof, an external cable anchor intermediate said ends on the side of the member opposite said lip side, said cable anchor being positioned rearwardly of the center of mass of the member so that when the member is suspended from a cable attached to the anchor, the leading end of the member will be at a lower level than the trailing end, said member adapted to slidably receive a driving and guiding tool for impacting against said abutment to drive the member and guide it upright into the ground, and said member when driven into the ground to a desired depth adapted to be rotated about said lip and plow laterally into the ground when a cable attached to the cable anchor is tensioned.

4,044,514

IN GROUND SWIMMING POOL FRAMEWORK

Philip N. Rubin, Trumbull, and Michael Fleming, Easton, both of Conn., assignors to Fairfield Fiberglass Inc., Fairfield, Conn.

Filed Dec. 19, 1975, Ser. No. 642,556
Int. Cl.² E04H 3/18
U.S. Cl. 52—169.7 **10 Claims**



1. An in ground swimming pool framework that rests on an earth foundation for supporting a water containing flexible liner comprising a plurality of horizontally aligned elongate panels, each of said panels having a pair of horizontal and vertical edges and a smooth inner surface adapted to be engaged by the liner, peripheral flanges formed to extend from each edge rearwardly with respect to the inner surface at least along the vertical and bottom edges with the flanges having essentially flat exterior surfaces, means joining the vertical flanges of adjacent panels together to define a vertical upper wall of an in ground depression with the flat horizontal bottom surfaces of the flanges resting on the earth surface of the depression and liner support means securable to the top horizontal edge of the panels for retaining the peripheral edge of the liner and in which each of the panels is formed in situ as a one-piece unit of material consisting essentially of hardened plastic material having glass fiber strands embedded therein, said plastic material and glass fiber strands being shaped and of sufficient thickness to cause the panels to be horizontally and vertically rigid and self-supporting with said plastic material and glass fiber strands supplying essentially all of the rigidity of the panel.

4,044,515

GASKET FOR AN AVIONIC TRAY

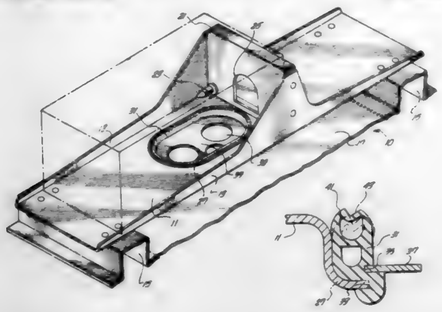
Robert A. Hollingsead, Yorba Linda, and Clyde Robert Pryor, Anaheim, both of Calif., assignors to Hollingsead-Pryor Enterprises, Inc., Santa Fe Springs, Calif.

Division of Ser. No. 399,961, Sept. 24, 1973, Pat. No. 3,871,937, which is a division of Ser. No. 125,561, March 18, 1971, Pat. No. 3,771,023. This application Nov. 29, 1974, Ser. No. 528,027

The portion of the term of this patent subsequent to Nov. 6, 1990, has been disclaimed.

Int. Cl.[2] H05K *7/20*; E04B *1/62*

U.S. Cl. 52—173 R **13 Claims**



1. A gasket for use in an avionic tray having an apertured rim and a removable metering plate comprising:

an annular flexible gasket body member having an inner and outer side and a first hollow annular passageway;

means defining a first groove on the outer side of the gasket body member for receiving the apertured rim;

means defining a second groove above the first groove on the inner side of the gasket body member for detachably receiving the metering plate, the first and second grooves being generally parallel and, the depth of the first groove into the gasket body member overlaps the depth of the second groove into the gasket body member; and

means defining a concave annular sealing surface extending above the second groove, immediately above the first annular passageway and generally parallel therewith for wedging the metering plate in the second groove towards the apertured rim in the first groove when a force is exerted on the same side of the sealing surface means as the first groove whereby the gasket body member is progressively locked tighter between the rim and the metering plate as the force increases, the first annular passageway surface configuration permits a deformational movement of the gasket body member by any force applied against the sealing surface area of the gasket body member while maintaining a continual planar sealing surface throughout the length of the gasket body member.

4,044,516

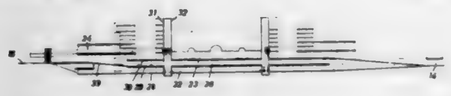
AIR TERMINAL BUILDING

Karl Lennart Billgren, Grev Magnigatan 4, 114 55 Stockholm, Sweden

Filed Sept. 8, 1975, Ser. No. 610,959

Int. Cl.[2] E04H *6/00*

U.S. Cl. 52—174 **9 Claims**



1. An air terminal building having a central portion and an outer peripheral portion, an arrival hall for passengers arriving at the building by airplane, a departure hall for passengers departing the building by airplane, a baggage hall commonly used for baggage of both arriving and departing passengers, said arrival, departure and baggage halls being located on different levels in said central portion of said building with said baggage hall being located on a level between the levels of said arrival and departure halls, and a waiting hall commonly used for both arriving and departing passengers, said waiting hall being located in said outer peripheral portion of said building, said outer peripheral portion being located at a level above the levels of said arrival, departure and baggage halls.

4,044,517

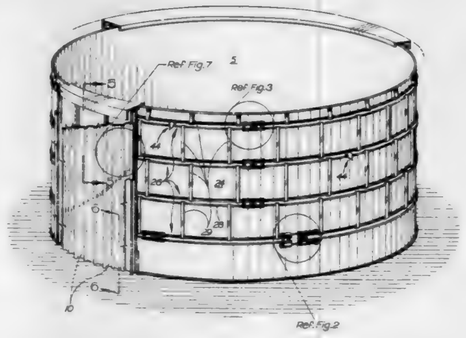
INSULATED TANK JACKETING SYSTEM

Richard C. Schroter, Orinda, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed July 12, 1976, Ser. No. 704,725

Int. Cl.[2] B65D *25/16*

U.S. Cl. 52—248 **8 Claims**



1. An insulated jacketing system for an upstanding cylindrical tank wall and the like comprising at least one pretensioned circular track means made up of a plurality of individual track segments each having multi-perforated ends disposed immediately adjacent the tank wall and each of which is provided with an outwardly facing recess, means for splicing certain opposing and adjacent multi-perforated ends of selected track segments together, said means comprising a splice plate provided at each of its ends with a plurality of struck out lug portions engageable with a corresponding plurality of similarly shaped and matching perforations on the said ends of the selected track segments, track take-up means including rod elements and plates having multi-struck out lug elements engaging and holding other opposing and adjacent multi-perforated ends of selected track segments together, the splice plate and the take-up plate each are channel shaped in cross section, insulated panels secured crosswise to said track segments, said panels comprising channel-shaped sections having opposing upstanding flanges one of which comprises a terminal bead and the other of which comprises a deformable sleeve that can be folded tightly about the bead on a similarly configured channel-shaped section disposed adjacent thereto, insulating material affixed to the underside of each panel and clip means provided with a head portion insertable within and engageable with the bead of one panel and a foot element insertable within the outwardly facing recess of a track segment.

4,044,518

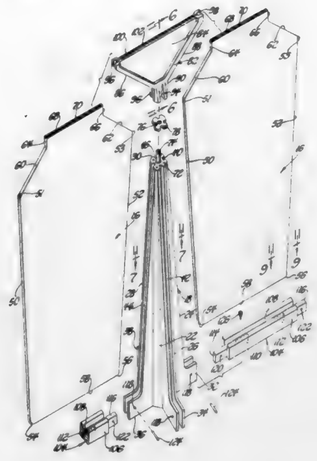
BUILDING STRUCTURE

John S. Hodge, 2350 Westridge Court, Ferndale, Mich. 48220

Continuation of Ser. No. 635,048, Nov. 25, 1975, abandoned, which is a continuation of Ser. No. 520,374, Nov. 4, 1974, abandoned, which is a division of Ser. No. 340,595, March 12, 1973, Pat. No. 3,861,102. This application June 7, 1976, Ser. No. 693,334

Int. Cl.[2] F04H *12/00*

U.S. Cl. 52—301 **12 Claims**



1. A structural column assembly, comprising vertically extending elongated column main body means, said main body means comprising an upper first top end and a lower first base end, a plurality of first groove-like recess means formed in said main body means and extending generally longitudinally thereof, said first groove-like recess means being of generally unifor, width along the entire length of said first groove-like recess means, and said first groove-like recess means being inclined with respect to the vertical as to have said first groove-like recess means more nearly approach each other as the elevation of such first groove-like recess means increases from said lower base end, and secondary body mens situated atop said main body means, said secondary body means comprising a second upper top end and a second lower base end, said lower base end being adapted as to be vertically operatively supported by said first top end, said secondary body means further comprising a plurality of second groove-like recess means formed in said secondary body means and extending generally vertically, at least certain of said second groove-like recess means being aligned with at least certain of said first groove-like reces means, said second groove-like recess means having at least portions thereof inclined with respect to the vertical as to have upper portions thereof further spaced from each other generally as the elevation thereof increases from said second lower base end.

4,044,519

INSULATED DOUBLE GLASS WINDOW ASSEMBLY

Wilfred F. Morin, 326 E. Taylor St., Suite B, Reno, Nev. 89502, and Joseph A. Martini, 6555 Plumas St., Reno, Nev. 89501

Filed May 7, 1976, Ser. No. 684,226

Int. Cl.[2] G02B *5/24*; E06B *7/00, 3/24*

U.S. Cl. 52—304 **5 Claims**

1. An apparatus for selectively varying the color of a window, said apparatus comprising:

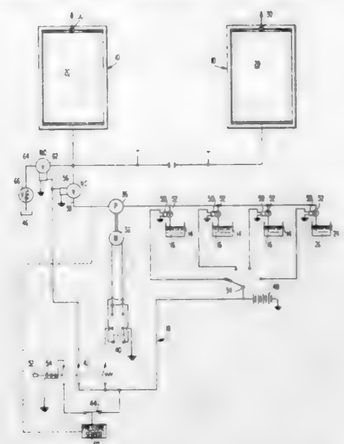
a double pane window assembly comprising two at least generally parallel, spaced transparent or translucent panes defining a volume therebetween,

at least three liquid reservoirs containing respectively two different colored antifreeze liquids and a cleaning liquid capable of removing residue antifreeze liquid from said window volume,

conduit means for connecting said liquid reservoirs to said double pane window assembly and opening to said volume,

a pump operatively positioned within said conduit means intermediate of said liquid reservoirs and said double pane window assembly,

solenoid valve means within said conduit means between each liquid reservoir and said pump for selectively connecting said pump to a given liquid reservoir,



a reversible electric motor for driving said pump,

switch means for controlling reversible energization of said pump motor, and

selector means for preventing energization of more than one of said solenoid means such that between pumping of different colored antifreeze liquids to and from said window volume assembly, said cleaning liquid may be pumped from its liquid reservoir to said window assembly to flush residue antifreeze liquid from said volume.

4,044,520

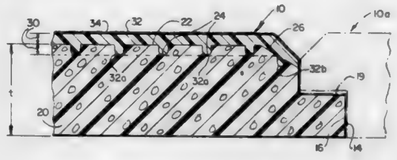
BUILDING PANEL

Albert G. Barrows, West Haven, Conn., assignor to John P. Bogiovanni, Chester, Conn.

Filed July 21, 1975, Ser. No. 597,659

Int. Cl.[2] E04C *2/10*

U.S. Cl. 52—309.12 **13 Claims**



1. An exterior wall panel adapted for assembly with other similar panels, and comprising a base of heat insulating material, said base having a generally regular polygonal configuration and having at least one side defining a projecting edge adapted to mate with a cavity defined in the adjacent side of an identical adjacent panel, said base having a rear face adapted for attachment to a structure or the like, and having a front face defining grooves oriented generally perpendicularly with respect to said projecting edge, and a polymer fortified cementitious facing on said front face of said base, said facing having a thickness in the range of $\frac{1}{8}$ to $\frac{1}{4}$ inch, said facing including

rearwardly projecting ribs integrally formed in the facing which ribs fill said grooves in the base to a depth at least as great as that of said facing thickness, and a layer of polymer material adhered to the facing, said front face of said base has a bevelled edge, and wherein said facing also includes a bevelled edge such that an overhanging portion of the facing projects inwardly thereof to further reinforce the base.

4,044,521

ROOF INSULATION SUPPORT SYSTEM

Larry J. Fischer, 809 108th Lane, NW., Coon Rapids, Minn. 55433, and Terrence J. McNellis, 608 82nd Ave., North, Brooklyn Park, Minn. 55444

Filed June 3, 1976, Ser. No. 692,488
Int. Cl.[2] E04B *1/74*; E04F *15/18*
U.S. Cl. 52—404 **11 Claims**



1. A roof structure comprising:
a. a plurality of longitudinally extending beams;
b. a plurality of laterally extending purlins supported by said beams, said purlins each having a vertically oriented webb having a bottom edge, a bottom flange perpendicular to said webb and extending horizontally from said bottom edge of said webb, said bottom flange having an outer edge and a bottom surface, and a lip portion extending upwardly from said outer edge of said bottom flange so that said lip portion is parallel to said webb portion;
c. an elongated liner support member depending from each of said purlins, each said liner support member having a generally inverted T-shaped cross section comprising a lower horizontal portion, an upstanding portion perpendicular to said horizontal portion, and clip means to engage said lip portion of said purlin to support said liner support member; and
d. a plurality of roof liner panels each having opposite side edges, said panels being laid horizontally between adjacent pairs of said purlins, supported by said side edges overlying said lower horizontal portions of adjacent pairs of said liner support members depending from said adjacent pairs of purlins.

4,044,522

STEEL-CONCRETE COMBINATION ELEMENT FOR LINING VESSELS SUCH AS STORAGE TANKS, PRESTRESSED CONCRETE REACTOR PRESSURE VESSELS, AND THE LIKE

Horst Sturmer, Bergneustadt, and Klaus Schweim, Gummersbach, both of Germany, assignors to L. & C. Steinmuller G.m.b.H, Gummersbach, Germany

Filed July 23, 1975, Ser. No. 598,548
Claims priority, application Germany, July 24, 1974, 2435521
Int. Cl.[2] E04C *2/04*; E04B *1/54*
U.S. Cl. 52—599 **1 Claim**



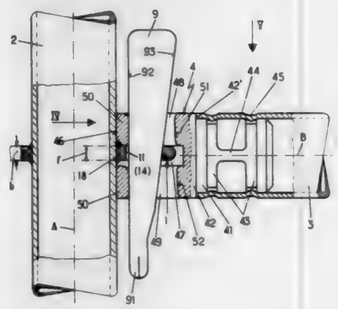
1. A self-supported compound element of steel and concrete for joining to similar elements for lining containers, including a steel plate base member, a plurality of individual anchoring means fixed on one surface of said plate, a rim along at least one edge of said plate and fixed on the same surface as said anchoring means, concrete cast on said surface of said plate and having a surface substantially parallel with the plate surface with said anchoring means extending into said concrete and said rim confining said concrete along said edge, certain of said anchoring means extending above said concrete surface and said rim, said rim having flanges projecting laterally outwardly on the side opposite said concrete to form one-half of a hollow formation, the rim formed with flanges for engaging flanges of an adjoining element to form a closed hollow space between the elements when welded together along said flanges, so the welding seams may be inspected when said elements are assembled to form a lining.

4,044,523

FRAME STRUCTURE, PARTICULARLY SCAFFOLDING

Eberhard Layher, D7129 Eibensbach, Kreis Heilbronn, Germany

Filed Oct. 14, 1975, Ser. No. 621,660
Claims priority, application Germany, Oct. 16, 1974, 2449124
Int. Cl.[2] E04G *7/00*; F16B *7/00*
U.S. Cl. 52—638 **11 Claims**



1. A frame structure, particularly a scaffolding, comprising a plurality of tubular upright elements each having an upright axis and an outer surface; a plurality of bracing elements each having two elongated end portions each of which has a longitudinal slot of a predetermined width and subdividing the respective end portion into two sections which have registering openings extending substantially normal to the elongation of the respective end portion; means for connecting at least some of said bracing elements to said upright elements to obtain a basic rectangular grid of said bracing elements, including a number of circumferentially complete ring flanges so supported on each of said upright elements as to circumferentially embrace the same with axial spacing from one another and each having a thickness at most equal to said width of said slot so as to be receivable therein so that said sections of the respective end portion straddle said flange, a plurality of first cut-outs extending through the respective flange and having respective radial axes located in a common plane normal to said upright axis and which intersect at the latter and are normal to each other in said plane, and a plurality of wedge members each receivable in said registering openings of the respective end portion to extend across said slot thereof and through one of said first cut-outs, the latter being of substantially barrel-shaped configurations so that a partly advanced wedge member is receivable therein even when the elongation of said respective end portion deviates from the respective radial axis, while further advancement of said wedge member results in alignment of said elongation with said respective radial axis; means for connecting other bracing elements to said flanges for each of said other bracing elements to extend from

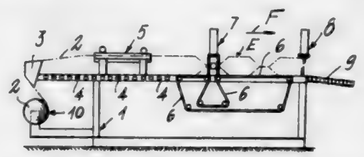
the respective flange in a direction different from those of said radial axes, including a plurality of second cut-outs extending through the respective flange intermediate said first cut-outs and being of such shapes that a respective one of said wedges can be received therein in the fully advanced position thereof even when the elongation of said end portion of the respective other bracing element is located in a plane deviating from the radial direction of said flange; and means for at least suppressing shearing stresses in the zone of juxtaposition of said flange with said upright element by transmitting loading forces acting on the respective bracing element parallel to said upright axis of the respective upright element from the respective end portion of the respective bracing element directly to the respective upright element, including respective endfaces on said sections of said end portions of at least said some bracing elements, said endfaces being of mating configurations to said outer surface of the respective upright element so that the respective wedge member in the advanced position thereof presses said endfaces into frictional contact with said outer surface with a force resulting in a frictional force between said endfaces and said outer surface which opposes and compensates for said loading forces, whereas said wedge member simultaneously subjects said flange to a counterforce opposite to said force and transmitted through said circumferentially complete flange to act on a region of said outer surface which is diametrally opposite to the region of application of said force.

4,044,524

METHOD OF PACKAGING PRODUCTS TO BE PRESERVED UNDER VACUUM OR ATMOSPHERE OF SUITABLE GASES

Luigi Segale, Via Nullo 5, Caravaggio (Bergamo), and Pier Enrico Passerini, Via Arco 13, Rho (Milan), both of Italy

Division of Ser. No. 628,380, Nov. 3, 1975, Pat. No. 3,995,407.
This application Sept. 13, 1976, Ser. No. 722,738
Claims priority, application Italy, Nov. 12, 1974, 29328/74
Int. Cl.[2] B65B *31/08*
U.S. Cl. 53—22 A **8 Claims**



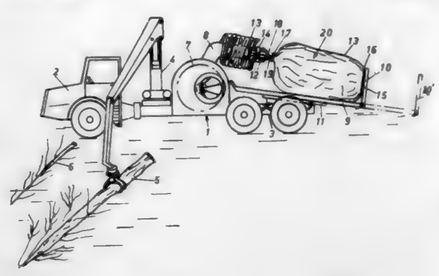
1. A method for packaging a product in a controlled atmosphere comprising the steps of:
wrapping the product with a length of flexible sheet material;
sealing the longitudinal edges of said material to form a package for the product;
carrying out a first transverse seal to close the package with a pair of opposed sealing electrodes;
communicating with the interior of the package with a hollow needle by piercing the sheet material to produce a hole therein and effect said controlled atmosphere;
carrying out a further transverse seal at such a position that the needle-produced hole is isolated between the two seals and not in communication with the package interior containing the product with a second pair of opposed sealing electrodes; and
supporting said first and second transverse sealing means and said communicating means for longitudinal rectilinear movement thereof;
said first transverse sealing step, said communicating step, and said second transverse sealing step being sequentially carried out while said wrapped product is moved in a feed direction of said sheet material.

4,044,525

METHOD AND MACHINE FOR PACKING WOOD CHIPS

Ernst Erik Forsgren, Hudiksvall, Sweden, assignor to Anders Eric Sundin, Sweden, a part interest

Continuation of Ser. No. 568,815, April 17, 1975, abandoned.
This application June 8, 1976, Ser. No. 694,191
Int. Cl.[2] B65B *1/20*
U.S. Cl. 53—24 **6 Claims**



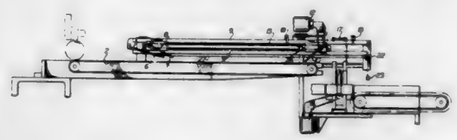
1. An improved method for packaging wood chips comprising, making wood chips in a mechanical wood chipper by feeding waste wood including large branches of trees and tree tops to the mechanical wood chipper and simultaneously mechanically developing an air stream for immediately discharging the wood chips in a stream of air and principally as a stream of wood chips along a discharge path of flow, before discharging the wood chips along said dishcarge flow path defining a terminal length of said discharge flow path and the volume of chips that can flow along said discharge path of flow with an air-permeable, packaging tube of variable length disposed in an axially folded condition to receive the discharge stream of air and wood chips for storing thereof as a package, said tube having a closed end terminating flow of said wood chips internally of the tube, automatically filling the tube defining the terminal length of the discharge flow path with said stream of air and wood chips while progressively feeding said air-permeable tube along said flow path under control of wood chips impelled along said flow path by air thereby varying the length of the terminal length of the flow path in dependence upon the length of the package intended and while filling the tube simultaneously venting the air in said stream through said air-permeable tube at a rate to pack the wood chips as said tube fills with wood chips, before filling said tube positioning a stop for determining the terminal length of the tube by determining the position at which said closed end thereof will engage said stop, and removing the filled tube as a storable package.

4,044,526

METHOD AND APPARATUS FOR PACKAGING TUBULAR ARTICLES

Roger Lafleur, Greenfield Park, Canada, assignor to Imasco Limited, Montreal, Canada

Filed Oct. 26, 1976, Ser. No. 735,275
Int. Cl.[2] B65B *35/40, 19/34*
U.S. Cl. 53—26 **9 Claims**



1. A method of packing a predetermined number of articles which comprises,
ascertaining the number of said articles which pass a counting means;

arranging said articles in a row on conveyor means; said counting means being capable of actuating separator means to locate and cease downstream movement of a said article and thereby create a space between a predetermined number of said articles which have passed said separator means and following articles on said conveyor means;

actuating a first picking plate into a dropped position onto or adjacent said conveyor means and into said space on said conveyor means;

moving said first picking plate in a downstream direction to scoop said predetermined number of articles, and simultaneously moving said separator means out of location with said article;

stopping said first picking plate at a position adjacent a second picking plate, the first and second picking plates cooperating to retain said predetermined number of articles therebetween;

removing said predetermined number of articles from the picking plates and into a box; and

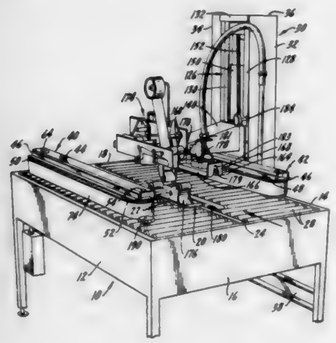
returning said picking plates to initial positions from repeating the packaging operation.

4,044,527

APPARATUS FOR SEALING CONTAINERS

Lawrence Walter Ulrich, and Connie Wayne Walker, both of Bolingbrook, Ill., assignors to Durable Packaging Corporation, Chicago, Ill.

Filed June 28, 1976, Ser. No. 700,170
Int. Cl.² B65B *7/16*
U.S. Cl. 53—137 **7 Claims**



1. Apparatus of the type used for sealing the foldable flaps of cartons of random sizes, said apparatus including a frame structure, a vertically movable sealing head means mounted to said frame structure, and carton conveying means having a pair of facing longitudinally extending side arm means mounted to said frame structure so as to permit transverse movement of said side arm means towards and away from each other, said side arm means having endless conveyor belts engageable with opposite sides of said carton to move same through said sealing head means; an improved mechanism for transversely moving said side arm means towards and away from each other comprising:

a. a pair of longitudinally spaced sprocket wheels supported for simultaneous rotation about a substantially vertical axis;

b. a pair of substantially horizontal connecting rods associated with each of said sprocket wheels, each of said connecting rods having first ends pivotally secured to said sprocket wheels and second ends pivotally secured to corresponding ends of said side arm means; and

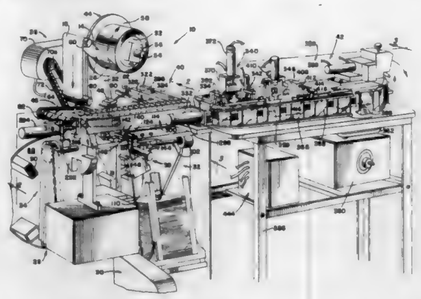
c. means for rotating said sprocket wheels in a clockwise and counter-clockwise direction, such rotary motion of said sprocket means being translated to linear motion at said side arm means through said connecting rods.

4,044,528

METHOD AND APPARATUS FOR FORMING SEALED PACKAGES

James Harold Black, Quinton, and Vernon C. Stant, Richmond, both of Va., assignors to American Brands, Inc., New York, N.Y.

Filed Sept. 3, 1974, Ser. No. 502,791
Int. Cl.² B65B *5/02*
U.S. Cl. 53—192 **27 Claims**



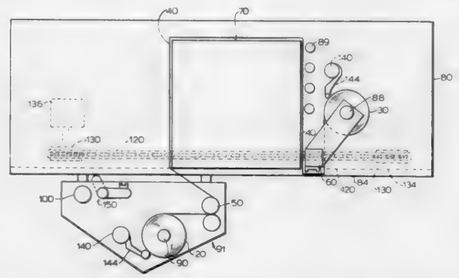
1. In an automatic wrapping machine adapted for wrapping and sealing a package made from a foil of thin, flexible, and heat-sealable wrapping material in which said machine includes a support means, a rotatable indexing turret means carrying a plurality of discrete forming mandrels which are circumferentially spaced with respect to each other and are successively rotated in an intermittent step-by-step fashion from a first operating position to at least second, third and fourth operating positions, and a clamping means being effective to clamp a portion of the wrapping material to respective ones of the mandrels at said first operating position, the improvement comprising, foil supply and cutting assembly means operatively connected to said support means for advancing a predetermined length of severed wrapping material to said first operating position, foil folding and sealing assembly means operatively connected to the machine and including foil folding means for folding a side edge of the unclamped portion of the wrapping material about said mandrel and toward the opposite side edge of the clamped portion of the wrapping material as said mandrel is advanced from said first operating position to said second operating position, side sealing means for heat sealing the opposed side edges together at said second operating position to thereby form a side fin seal, fin folding means for folding the formed side fin seal at said third operating position, bottom fin forming and sealing means for forming and heat sealing a bottom fin seal at said third operating position, top fin forming and sealing assembly means operatively connected to said machine for forming and sealing a top fin seal on respective ones of the packages, transfer assembly means operatively mechanically connected to said support means and said machine for selectively transferring a partially formed package filled with the article to be packaged from respective ones of said mandrels to said top fin forming and sealing assembly means, said transfer assembly means including an indexing transfer wheel having a plurality of discrete circumferentially spaced radially extending pockets, each of which is adapted to receive respective ones of the partially formed packages whenever ejection means of said indexing turret means is operated and for selectively transferring the ejected partially formed package circumferentially to a deposit position, first and second and third pusher means mechanically operatively connected to said support means, said first pusher means located adjacent said deposit position and being operable for pushing the package from the indexing transfer wheel, conveying means connected adjacent said first pusher means for enabling conveyance of a plurality of the packages which are pushed by said first pusher means along a path, said second pusher means operatively connected to said support means adjacent an end of the path defined by said conveying means and being actuatable for pushing respective ones of the packages from said conveying means, said second pusher means including mechanical switch means operatively connected to said second pusher means and being operable to actuate said second pusher means upon operative contact therewith by respective ones of the packages, said third pusher means connected to said support means and being actuatable for delivering ones of the packages to said top fin forming and sealing assembly.

4,044,529

PALLET STRETCH-WRAP APPARATUS

Seymour Zelnick, Somerville, N.J., assignor to Weldotron Corporation, Piscataway, N.J.

Filed Apr. 27, 1976, Ser. No. 680,849
Int. Cl.² B65B *13/08*
U.S. Cl. 53—198 R **33 Claims**



1. Apparatus for stretch-wrapping a load with stretchable film comprising

a fixed first roll,

a second roll including first means for moving said second roll toward and away from said first roll,

wrapping film wound on said rolls and forming a continuous curtain between said first and second rolls, said second roll being movable along a first path from a first position remote from said first roll to a second position adjacent to said first roll,

second means defining a load path extending across said first path and moving a load along said load path into and beyond said film curtain whereby said film partially envelops said load, operation of said first means to move said second roll toward said first roll causing said film to completely envelop said load, and

sealing means for sealing said film about said load.

4,044,530

APPARATUS FOR GUIDING AND CUSHIONING A PLURALITY OF ARTICLES AS THEY MOVE INTO A CONTAINER

David E. Phillips, Forest, Va., assignor to Simplimatic Engineering Co., Lynchburg, Va.

Filed Jan. 22, 1975, Ser. No. 543,069
Int. Cl.² B65B *5/08*
U.S. Cl. 53—248 **45 Claims**

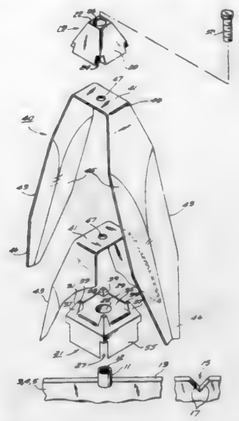
1. In an apparatus for guiding and cushioning a plurality of articles adapted to be deposited into a container positioned below said apparatus, the combination comprising:

a. a support;

b. a plurality of elongated members mounted on said support spaced from one another to define therebetween a plurality of unobstructed elongated spaces open at top and bottom with each space bounded on its sides by adjacent ones of said members;

c. guides mounted on and exposed at the upper portions of said members at intervals spaced along said members and having portions overhanging said members and extending over said spaces to define a row of vertical passages subdividing said elongated spaces with each of said passages being bounded in part by two of said members and in part by said guides, each of said articles being adapted to be deposited into a container through one of said passages;

d. flexible fingers secured to said members and extending inwardly of said passages, adjacent fingers of adjacent passages being connected to one another to define a unit



having a mounting section adapted to be secured to an associated member, from which mounting section said fingers extend inwardly of said adjacent passages; and

e. means for fastening said finger mounting section between a guide and said associated member;

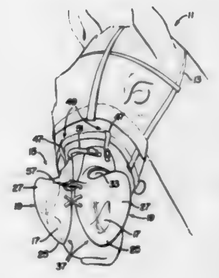
whereby as the article approaches the apparatus it is initially moved into proper position in said passage by said guide and then further guided by said flexible fingers so that it is deposited into the container.

4,044,531

PROTECTIVE NOSE SHIELD FOR RACE HORSES AND THE LIKE

John L. Marchello, 9934 Daleview, South Lyon, Mich. 48178, and Gerald F. Trotter, 43263 Eleven Mile Road, Novi, Mich. 48050

Filed Apr. 26, 1976, Ser. No. 680,066
Int. Cl.² B68C *5/00*
U.S. Cl. 54—80 **9 Claims**



1. A protective nose shield for race horses and the like whose head and face portions normally carry bridle means, said protective nose shield comprising a pair of reverse air scoop members and fastening means operably coupling said air scoop members to said bridle means and about portions of said horses face for adjustably positioning each of said air scoop members over one of the horse's nostrils, each of said air scoop members including a domed portion forming an air space about

the nostril, a rearwardly flared deflection surface integral with the front of said domed portion for diverting foreign debris and cold air away from the nostril area, said domed portion including an inwardly facing rim portion adapted to rest comfortably against the horse's face and to fit relatively closely thereto to prevent the passage of cold air or foreign debris into said air space from the front or side of said domed portion, and a rearwardly facing breathing port in the rear of said domed portion at the opposite end of said domed portion from said deflection surface for channeling the inhaled and exhaled air into and out of said air space such that the cold incoming air is at least slightly warmed by contact with the warmer exhaled air and by the body heat generated by the portion of the horse's face over which the incoming air is drawn.

4,044,532

TWO-MOTION SWITCH FOR CORDLESS LAWNMOWER

William Ralph Lessig, III, Towson, Md., assignor to The Black and Decker Manufacturing Company, Towson, Md.

Filed Aug. 25, 1975, Ser. No. 607,635
Int. Cl.² A01D *75/20*
U.S. Cl. 56—10.5 **12 Claims**



1. A switch-operating mechanism for an electric tool including a working output member, an electric motor for driving said output member, wire means for connecting said motor to a source of electric power for energization thereof, a switch for controlling the connection of said motor to said source, and a switch operating mechanism, said mechanism comprising a switch-operating lever movable between a first position wherein said switch is off and said motor is disconnected from said source, a second position wherein said switch is on and said motor is connected to said source, and a third position intermediate said first position and said second position wherein said switch is off; a housing having an aperture therein for receiving said lever in said first position, said aperture being shaped to substantially completely enclose said lever in a close fitting manner to prevent operator access thereto when said lever is in said first position; and means associated with said housing while being independent of said aperture and of said lever enabling an operator to move said lever from said first position into said third position.

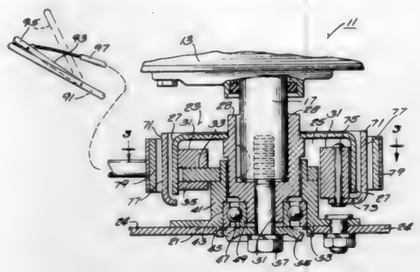
4,044,533

LAWN MOWER BLADE CLUTCH AND BRAKE

Gerald H. Wick, Galesburg, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed May 27, 1976, Ser. No. 690,632
Int. Cl.² A01D *69/10*
U.S. Cl. 56—11.3 **20 Claims**

1. A lawn mower comprising a blade housing supported for travel over the ground, a drive shaft mounted for rotation by said blade housing and including thereon a clutch drum, an engine drivingly connected to said drive shaft for rotation thereof, a cutter blade located in said blade housing and mounted for rotation coaxially with and relative to said drive shaft, a clutch shoe connected to said cutter blade for common rotation therewith and for movement relative to a position of engagement with said clutch drum, biasing means urging said clutch shoe into said position of engagement, a brake surface fixed to said clutch shoe, and a brake member movable between a first position wherein said brake member is spaced from said brake surface, and a second position wherein said brake member engages said brake surface to brake rotation of



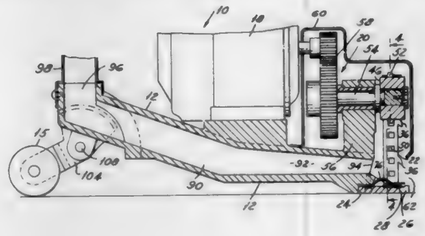
said cutter blade and to displace said clutch shoe from said position of engagement against the action of said biasing means.

4,044,534

LAWN MOWER

Stanley R. Day, and Ray E. Day, both of 340 Lakeland, Grosse Pointe, Mich. 48230

Filed Mar. 18, 1976, Ser. No. 668,315
Int. Cl.² A01D *87/10, 55/24*
U.S. Cl. 56—13.3 **4 Claims**



1. A lawn mower comprising a frame supported on wheels for movement over the ground, an elongated slotted cutter bar mounted on said frame extending horizontally in a position close to the ground when said frame is supported on said ground by said wheels as aforesaid, an endless cutting band, means on said frame for guiding said cutting band for movement across the slots of said cutter bar to cut grass projecting through said slots, drive means for moving said band continuously in one direction, said guide means including a hold-down member for holding said cutting band down against the top surface of said cutter bar, spring means for pressing down resiliently on said hold-down member, said slots in said cutter bar being formed between forwardly projecting teeth along the front edge of said cutter bar, said band having forwardly projecting cutting elements which pass over said slots, and said hold-down member having forwardly projecting fingers above said cutting elements and in register with said cutter bar teeth.

4,044,535

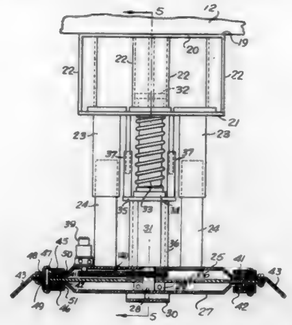
NON-SOIL PENETRATING HARVESTING BLADE FOR SUGAR CANE

Victor M. Alexandrino, Box 882, Fajardo, P.R. 00648

Filed Dec. 19, 1975, Ser. No. 642,548
Int. Cl.² A01D *35/12*
U.S. Cl. 56—15.8 **15 Claims**

1. A harvesting cutter assembly comprising a tractor tool bar, generally horizontally extending housing means below the tool bar, a rotary cutter blade supporting disc journalled in said

housing means with its peripheral portion extending outwardly from said housing means, cutting blade means on said peripheral portion, means to yieldably connect said housing means to the tractor tool bar and including means biasing said housing means downwardly, and ground-engaging skid means positioned underneath said supporting disc and on the bottom of said housing means and acting to limit the position of said cutting blade means to a substantially constant height above ground level while preventing said cutting blade means from penetrating the soil.

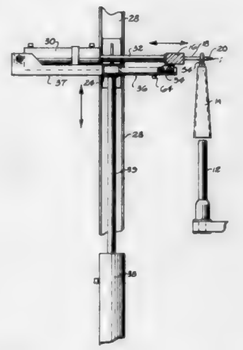


4,044,536

APPARATUS AND METHOD FOR REMOVING BOBBINS ON SPINNING MACHINES

James D. Stone, 412 Rockmont Road, Greenville, S.C. 29607

Filed Jan. 21, 1976, Ser. No. 651,130
Int. Cl.² D01H *9/04*
U.S. Cl. 57—52 **10 Claims**



1. A bobbin removal apparatus wherein bobbin members arranged over spindle members on a spinning frame are to be engaged and moved from one location to another comprising:

a movable bobbin engagement means for engaging and removing said bobbins from said spindles;

a support assembly carrying said bobbin engagement means for movement in a vertical and a horizontal direction;

a bobbin adapter member carried on an upper end of each bobbin having a loop projection swivelably carried by said adapter member;

said loop projection having a central eye portion defined by an interior surface thereof for receiving said engagement means therethrough;

power means for moving said bobbin engagment means in said vertical and horizontal directions along with said support assembly into linear alignment with said eye portion of said loop projection and for engagement therewith;

said engagement means including a complimentary means for turning said loop projection to automatically align said eye portion with said engagement means for connection with said engagement means; and

said bobbin engagement means being further movable by said power means to lift and remove said bobbin from said spindle and spinning frame.

8. The method of removing a plurality of bobbins arranged over spindles on a spinning frame by automatically engaging said bobbins for removal therefrom comprising:

a. providing a movable bobbin engagement means having a plurality of engaging elements for engaging said bobbins;

b. providing an automatically aligning adapter member carried adjacent the top of each said bobbin having a projection means with an engagement portion for receiving said bobbin engagement means;

c. moving said engagement means into linear alignment with said adapter members;

d. providing complimentary end portions on said engaging elements to initially engage said projection means of said adapter member;

e. automatically turning an aligning said engagement portion with said engagement elements for providing a connecting relationship therebetween regardless of the orientation of said bobbin on said spindle; and

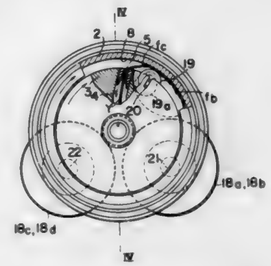
f. moving said engagement means to remove said bobbins from said spindles.

4,044,537

SPINNING METHOD AND APPARATUS THEREFOR

Eizaburo Negishi, Yono, and Masanori Negishi, Tokyo, both of Japan, assignors to Kabushiki Kaisha Negishi Kobyo Kenkyusho, Japan

Filed Nov. 18, 1975, Ser. No. 633,004
Claims priority, application Japan, Nov. 29, 1974, 49-138194
Int. Cl.² D01H *1/12*
U.S. Cl. 57—58.89 **4 Claims**



1. An open-end spinning method for forming a yarn comprising the steps of:

projecting sliver fibers radially outwardly onto the inner surface of an outer rotor so as to form a sliver;

disposing an inner rotor concentrically within said outer rotor;

providing said inner rotor with a spinning passage, disposed along a radial line and within a radial plane, which is provided with an inlet disposed toward said inner surface of said outer rotor and an outlet disposed along the axis of said inner rotor;

conducting said sliver radially inwardly into said spinning passage of said inner rotor and discharging said sliver through said outlet;

rotating said inner and outer rotors at revolution rates having a predetermined revolution differential defined therebetween,

whereby said sliver is twisted and subjected to a predetermined amount of tension; and

during the spinning operation, pressing the sliver formed along the inner surface of the outer rotor onto said inner surface by means of at least one centrifugal disk means provided between the inner and outer rotors at a position

adjacent the inlet end of the spinning passage of the inner rotor,

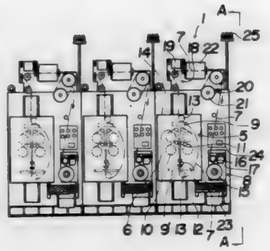
said centrifugal disk being made to revolve concentrically together with the inner rotor and within the outer rotor and to carry-out self-rotation by press-friction with the sliver which results from said disk being moved centrifugally outward toward said sliver and said outer rotor.

4,044,538

ARRANGEMENT OF STRAND TWISTING APPARATUSES

Itsuo Hoshide, Iwakuni, Japan, assignor to Teijin Seiki Company Limited, Osaka, Japan

Filed Jan. 24, 1977, Ser. No. 762,123
Int. Cl.² D07B *3/00*
U.S. Cl. 57—62 **3 Claims**



1. Arrangement of strand twisting apparatuses, comprising a plurality of strand twisting apparatuses which are side-by-side and vertically installed in a row on floor, and each of which comprises a fore portion of a frame including a flyer unit vertically disposed for supplying and twisting strands into a cable, a take-up unit disposed in side-by-side relation with said flyer unit to wind said cable, a direction change roll unit disposed immediately above said flyer unit for changing said cable vertically fed from said flyer unit to a horizontal direction, a capstan roll unit disposed immediately above said take-up unit for smooth feed of said cable fed from the direction change roll unit to said take-up unit, and an over-twister unit disposed between said direction change roll unit and said capstan roll unit to stabilize twisting of said cable during travelling between said direction change roll unit and said capstan roll unit; and a rear portion of said frame including a driving unit for driving said flyer unit, said take-up unit, said direction change roll unit, said capstan roll unit and said over-twister unit.

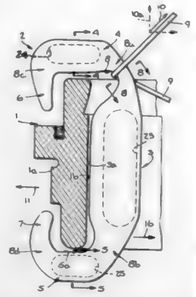
4,044,539

AERODYNAMIC RING TRAVELERS FOR YARN TWISTERS

Robert L. Goerens, Esch sur Alzette, Luxembourg, assignor to Uniroyal Luxembourg S.A., Steinfort, Luxembourg

Filed Dec. 15, 1976, Ser. No. 750,795
Claims priority, application Germany, Dec. 23, 1975, 2558428
Int. Cl.² D01H *7/60*
U.S. Cl. 57—125 **33 Claims**

1. In a ring traveler designed for movement in only one given direction along a ring of a yarn twister or like machine, which traveler (a) has streamlined cross-sectional contours as well as respective guide surfaces for sliding contact with the ring and for guiding the yarn to the spindle and (b) is provided, in a section thereof which lies at the inside face of the ring when the traveler is mounted thereon, with a generally airfoil-like cross-sectional configuration such that when the traveler is in motion aerodynamic lift forces are generated at said section which are directed toward the middle of the ring; the improvement which comprises a construction of said section of the traveler to define in said section and within the confines of said airfoil-like cross-sectional configuration thereof at least one hollow space, thereby to provide the traveler at said section



with a maximized ratio of the magnitude of its outer surface to its weight.

4,044,540

ELASTOMER COATED CARBON FILAMENT REINFORCING YARN OR CORD, METHOD AND ARTICLE

Masamichi Toki; Noriaki Kusatsu; Yoshio Kohno, all of Okazaki, and Kenji Matsugasako, Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,859
Int. Cl.² D02G *3/36, 3/40, 3/48*
U.S. Cl. 57—153 **13 Claims**

1. A multi-filament reinforcing carbon yarn having tenacity of at least about 7 grams per denier, said reinforcing yarn being encapsulated by a resorcinol-formaldehyde-latex composition, in which the amount by weight of the resorcinol-formaldehyde-latex composition encapsulating said multi-filament yarn is equivalent at least to about 10% by weight of the multi-filament yarn, said multi-filament yarn having a denier in the range of from about 500 to 4,000 and a twist factor in the range of from 0 to about 250, wherein the twist factor is the twist in turns per 10 cm in the multi-filament yarn multiplied by the square root of the denier of the multi-filament yarn, said multi-filament yarn further comprising individual filaments having a denier in the range of from about 0.4 to 2.0 and a tenacity of at least about 10 grams per denier.

2. A yarn according to claim **1**, in which the multi-filament yarn is encapsulated by an epoxy resin, and in which the equivalent amount of the epoxy resin encapsulating the multi-filament yarn is in the range of from about 0.5% to 10% by weight of the multi-filament yarn.

4,044,541

PROCESS FOR PRODUCING TEXTURED POLYESTER MULTIFILAMENT YARN

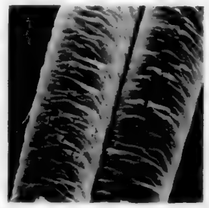
Morio Ikeda, Matsuyama, Japan, assignor to Teijin Limited, Osaka, Japan

Filed Apr. 10, 1975, Ser. No. 566,758
Claims priority, application Japan, Apr. 15, 1974, 49-40897
Int. Cl.² D02G *1/02*
U.S. Cl. 57—157 TS **8 Claims**

1. A process for producing textured polyester multifilament yarn comprising the steps of:

providing a feed yarn consisting of a plurality of synthetic linear ethylene terephthalate polymer filaments having a birefringence value of at most 0.04, by melt-spinning said linear polyester to form an undrawn multifilament yarn, winding up said undrawn multifilament yarn at a speed of 2750 m/min or lower and, applying to said undrawn multifilament yarn, a finishing agent not capable of diffusing into the inside of said filaments but capable of preventing formation of protuberances at a surface protuberance

number larger than 5, on the surface of said filaments when the resultant feed yarn is twisted at a twist number of 32500/D turns/m, wherein D represents a denier of said feed yarn, without drawing the yarn after aging the



feed yarn at a temperature of 40° C at a relative humidity of 70% for 21 days, and;

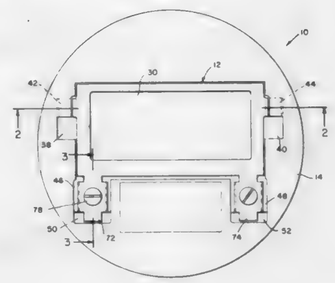
subjecting said feed yarn to a simultaneous or sequential draw-twisting operation.

4,044,542

WATCH MODULE CONSTRUCTION

Roger A. Burke, Laguna Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed June 1, 1976, Ser. No. 691,815
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R **4 Claims**



1. A digital watch module comprising:

a top spacer having a pocket therein for receipt of a digital display device and electrical contacts in said pocket for making contact with a display device in said pocket, said pocket having a bottom to serve as a limiting position of a display device in said pocket;

a digital display device sized to fit within said pocket and being positioned within said pocket and resting on said bottom;

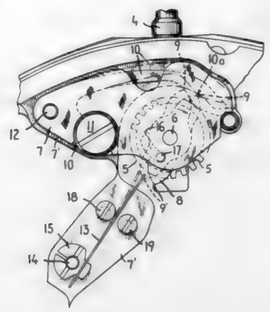
a spring frame engaging over said display device and engaging in said top spacer for resiliently restraining said display device and retaining it in said pocket, said spring frame having first and second spring fingers thereon respectively engaging in first and second spring-finger recesses in said top spacer, said spring fingers being resiliently deflected to urge said spring frame downwardly on the said display device, said spring frame further having first and second tangs thereon and a screw through each of said tangs and into said top spacer for retaining said spring frame with a respect to said top spacer.

4,044,543

SWITCHING MECHANISM OF AN ELECTRONIC WRIST WATCH

Yukio Ikehata; Nobuo Ohara; Yasuhiro Kawanishi; Shigeyuki Masuda; Isamu Nishida, and Hideyuki Nakao, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 28, 1976, Ser. No. 755,071
Int. Cl.² G04C *3/00*
U.S. Cl. 58—23 R **3 Claims**



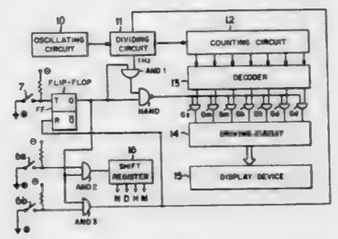
1. A switching mechanism of an electronic wristwatch comprising a rotatable winding stem, a clutch wheel rotatable with but axially movable on said stem, a winding pinion rotatable on said stem adjacent said clutch wheel, said winding pinion and clutch wheel having on adjacent ends rectangular teeth engageable with one another to couple said winding pinion to said winding stem, a transmission gear wheel rotatable about an axis perpendicular to the axis of said winding stem and meshing with said winding pinion, a rotatable cam coaxial with and adjacent to said transmission gear wheel, lost-motion connecting means coupling said cam with said transmission gear wheel, spring means cooperating with said cam means to restrain rotation of said cam by rotation of said transmission gear wheel until one end of travel of said lost-motion connecting means is reached and then advancing said cam until the other end of said lost-motion connection is reached, and a switching spring engageable by said cam for flexing said switching spring into engagement with a contact connected with watch circuitry to perform a switching function.

4,044,544

ELECTRONIC TIMEPIECE

Kenjiro Yagi, Tokyo, and Kazuhiro Asano, Chiba, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Jan. 29, 1976, Ser. No. 653,621
Claims priority, application Japan, Feb. 5, 1975, 50-15134
Int. Cl.² G04B *27/08*; G04C *3/00*
U.S. Cl. 58—23 R **6 Claims**



1. In an electronic timepiece of the type having an oscillator for generating a high frequency signal suitable as a time standard; circuit means including a multi-stage dividing circuit connected to receive signal for dividing it to a lower frequency

time signal representative of a predetermined time function; display means responsive to the time signal for displaying in a normal display mode the time function represented thereby; and time-correcting means including a manually operable switch coacting with said circuit means for effecting correction of the displayed time function in response to operation of said switch, the improvement comprising: means including a manually operable safety switch for enabling said time-correcting means to effect a correction of the displayed time function when said safety switch is in one switching state and for disenabling said time-correcting means to render it ineffective to make a correction of the displayed time function when said safety switch is in another switching state; and means coacting with said circuit means whenever said safety switch is in said one switching state for changing the display mode of said display means to one other than said normal display mode thereby providing by the changing in display mode an indication that said time-correcting means is enabled to effect a correction of the displayed time function.

4,044,545

WORLD CLOCK

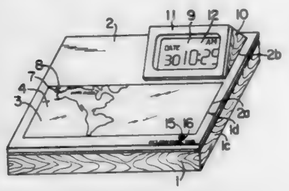
Teruo Shimizu, Katano, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 1, 1975, Ser. No. 636,641

Claims priority, application Japan, Dec. 11, 1974, 49-150513[U]; Dec. 11, 1974, 49-150514[U]; Dec. 11, 1974, 49-150515[U]; Dec. 13, 1974, 49-151901[U]; Dec. 13, 1974, 49-151902[U]; Dec. 13, 1974, 49-151903[U]; Dec. 13, 1974, 49-151904[U]

Int. Cl.² G04B *19/22, 19/24, 19/02*

U.S. Cl. 58—42.5 **5 Claims**



1. A world clock comprising:

a cabinet including an open box and a front plaque having a central opening for exposing a world map;

a time display means including a time display board mounted above the upper surface of said front plaque;

a world map board attached to said front plaque and exposed through said opening;

a plurality of touch indicator means, each including a touch pin and marking light source disposed in the neighborhood of each other and in correspondence to respective districts in said world map board; and

display circuit means for turning on a marking light corresponding to a touch pin touched with a finger and displaying the time at the district designated by said touched pin in said time display board, wherein said open box is formed of wood and said front plaque is formed of a metal plate disposed to cover the open end of said open box, and further comprising a metal bottom plate disposed on the outer surface of the bottom plate of said box and fastening means penetrating through said metal bottom plate and the bottom plate of said box for attaching electric parts contained in said box.

4,044,546

DIGITAL LIQUID CRYSTAL ELECTRONIC TIMEPIECE WITH COLOR CODED DISPLAY

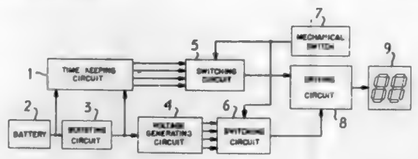
Mitsuo Koike, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Aug. 10, 1976, Ser. No. 713,227

Claims priority, application Japan, Aug. 11, 1975, 50-97387

Int. Cl.² G04B *19/34*

U.S. Cl. 58—50 R **6 Claims**



1. An electronic timepiece with a digital liquid crystal display, comprising a time signal pulse generating circuit, a time counting circuit for generating time signals corresponding to seconds, minutes, hours and dates, liquid crystal display means having retardation effect for displaying a digital time signal in different colors according to the drive voltage applied, a first switching circuit means for selectively supplying different time signals from said time counting circuit to said display means for visual display thereby, a voltage generating circuit for generating a plurality of different drive voltages for driving said liquid cyrstal display means, and a second switching circuit means coordinated with said first switching circuit means to supply from said voltage generating circuit to said liquid crystal display means a selected drive voltage corresponding to the selected time signal to be displayed, whereby different time signals are distinguished from one another by being displayed in different colors.

4,044,547

TIME ADJUSTING SYSTEM FOR AN ELECTRONIC TIMEPIECE

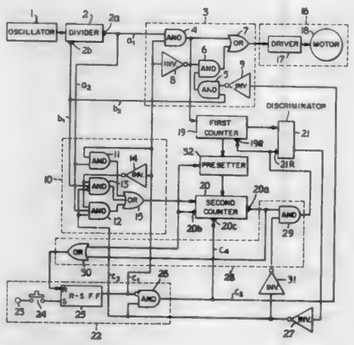
Yasuo Kusumoto, Matsudo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 11, 1975, Ser. No. 639,767

Claims priority, application Japan, Dec. 11, 1974, 49-142098

Int. Cl.² G04B *27/00*

U.S. Cl. 58—85.5 **1 Claim**



1. A time adjusting system for an electronic timepiece comprising: an oscillator circuit for generating high frequency pulses; a dividing circuit connected to said oscillator circuit for dividing the high frequency pulses therefrom into 1 HZ pulses for use as time standard pulses and higher frequency pulses higher in frequency than 1 HZ for use as time adjusting pulses; a time-measuring device for measuring time in response to the 1 HZ pulses; a first counter for selectively counting 30 1 HZ pulses from said dividing circuit and providing a corresponding count signal; a discriminating circuit for discriminating between an advanced signal appearing during the first 30 seconds of 1 minute and a delayed signal appearing during the latter 30 seconds of the 1 minute in response to the count signal provided by said first counter; a second counter comprising an up-down 30-counter for counting 1 HZ pulses when counting in an up-counting mode; a first gate circuit connected to said dividing circuit to receive therefrom the 1 HZ pulses and the higher frequency pulses operative to selectively apply them to said time-measuring device and operative to selectively apply the 1 HZ pulses to said first counter; a second gate circuit connected to said dividing circuit to receive therefrom the 1 HZ pulses and the higher frequency pulse and operative to selectively apply them to said second counter; a manually operable switch operable to initiate the time adjustment; control circuit means responsive to operation of said switch for generating a control signal and applying it to said first gate circuit which responds thereto to stop the supply of 1 HZ pulses and higher frequency pulses to said time-measuring device and to stop the supply of the 1 HZ pulses to said first counter, and applying the control signal to said second gate circuit which responds thereto to supply 1 HZ pulses to said second counter and for changing the operation of said second counter to the down-counting mode when said advanced signal is generated from said discriminating circuit, and applying the control signal to said first gate circuit and second gate circuit which respond thereto to supply the higher frequency pulses to said time-measuring device and second counter when said delayed signal is generated from said discriminating circuit; a pre-setting circuit for presetting the counting content of said first counter in said second counter when operating in the down-counting mode when the counting content reaches 0-second in response to the control signal; and a resetting circuit for resetting said control circuit when the counting content of said second counter reaches 0-second when operating in the down-counting mode in response to the control signal, and for resetting said control circuit, first counter and discriminating circuit when the counting content of said second counter reaches 30-seconds when operating in the up-counting mode.

4,044,548

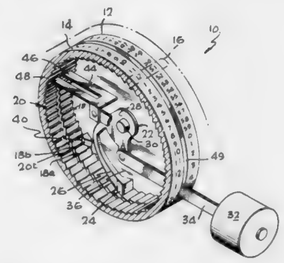
TIME INDICATING APPARATUS AND TRANSMISSION MECHANISM THEREFOR

Francis W. Rowbottam, Santa Barbara, Calif., assignor to New England Business Service, Inc., Townsend, Mass.

Filed Mar. 26, 1976, Ser. No. 670,619

Int. Cl.² G04B *19/02*; G06C *15/26*

U.S. Cl. 58—125 C **11 Claims**



1. A timing device comprising:

a minute wheel having 60 numbers 0 through 59 formed thereon;

an hour wheel having a portion forming the numbers 1 through 12 repeated five times so that there are 60 numbers thereon; and

means for rotating said wheels about a predetermined axis, said means rotating said minute wheel by one-sixtieth turn every minute, and rotating said hour wheel by one-sixtieth turn after each complete rotation of said minute wheel.

4,044,549

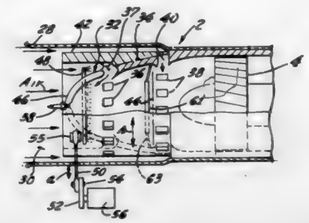
LOW EMISSION COMBUSTION PROCESS AND APPARATUS

Eugene B. Zwick, 16841 Edgewater Lane, Huntington Beach, Calif. 92647

Continuation of Ser. No. 313,681, Dec. 11, 1972, abandoned. This application Nov. 5, 1975, Ser. No. 629,071

Int. Cl.² F02C *9/14*

U.S. Cl. 60—39.02 **27 Claims**



1. A combustion process for producing exhaust gases having a low content of carbon monoxide and nitrogen oxides, said process comprising:

introducing a mixture of hydrocarbon fuel and air into a combustion zone having a volume which is sufficient to support stable combustion under the desired combustion conditions, with the mixture being premixed to a sufficient extent to provide a substantially uniform and homogeneous mixture within the combustion zone;

igniting and burning the mixture within the combustion zone;

maintaining the combustion temperature at about 3000° F. or less to reduce the content of nitrogen oxides in the exhaust gases to a level of about 1.5 grams or less for each kilogram of consumed fuel;

controlling the fuel-to-air ratio in the combustion zone at lean fuel-to-air ratios of about 0.0035 to about 0.035 under stable combustion conditions which exceed lean blowout to a sufficient extent to reduce the carbon monoxide levels in the exhaust gases to about 12.0 grams or less per kilogram of consumed fuel, and

maintaining the flow rate of the fuel-air mixture into the combustion zone at a level which exceeds the turbulent flame velocity within the combustion zone to prevent flashback to the point of introduction of the combustible mixture.

4,044,550

TURBINE WHEEL CONTAINMENT SHROUD FOR A PNEUMATICALLY POWERED TURBINE ENGINE STARTER MOTOR

Michael Lee Vermilye, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sept. 10, 1975, Ser. No. 612,205

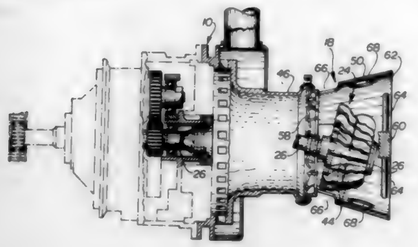
Int. Cl.² F02C *7/26, 7/32*

U.S. Cl. 60—39.09 R **8 Claims**

1. A containment shroud for affixation to the exhaust duct of a fluid powered starter motor for a turbine engine, said exhaust duct including an exhaust outlet having an axis and a generally circular opening oriented transversely to said axis, said motor having a turbine wheel mounted within said motor for rotation about an axis substantially coaxial with the axis of said exhaust outlet, said shroud comprising:

an annularly shaped member, said member being adapted to be positioned adjacent to and to extend outwardly from the opening of said exhaust outlet, said member having an axis adapted to be oriented substantially coaxially with the

axis of said exhaust outlet, said member having at least one aperture opening radially outwardly adjacent the opening of said exhaust outlet for relieveing fluid pressure from within said member and said exhaust outlet, the outer end of said member terminating in and defining an outer opening spaced outwardly from the opening of said exhaust outlet when said member is positioned adjacent said exhaust outlet, and



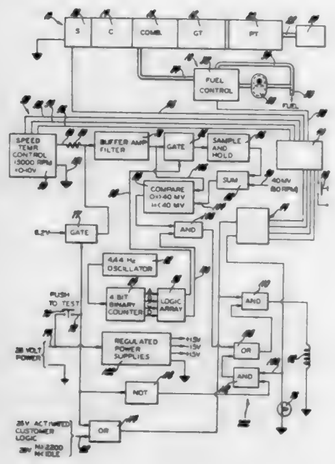
blocking means positioned within and fixed to said annularly shaped member adjacent said outer opening, said blocking means being so oriented and constructed as to permit substantial fluid flow through said outer opening and to prevent egress of said turbine wheel from said outer opening.

4,044,551

STAGNATION SENSING CONTROL

Robert E. Nelson, Indianapolis, and Keith A. Pieper, Brownsburg, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 30, 1976, Ser. No. 681,782
Int. Cl.[2] F02C 7/26
U.S. Cl. 60—39.14 **5 Claims**



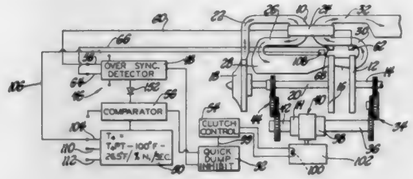
1. An engine speed stagnation control system for a gas turbine engine having a starter motor and fuel supply means under the control of rely switch means and wherein the gas turbine engine includes a combustor, compressor and power turbine; the control system comprising: means for sensing engine speed and producing an output signal directly in response thereto, means including signal responsive gate means to sample said output signal and to maintain a first control speed signal, means for adding a fixed increment control signal to said first control speed signal to produce a reference signal of desired speed increase, time delay means for controlling said gate means to maintain said reference signal for a perdetermined time delay period, signal generating means including comparator means for comparing said reference signal and said engine speed signal and operative following the predetermined time period to produce a relay control signal, and logic means responsive to said relay control signal for controlling starter energization and fuel supply to the combustor to maintain engine start when the engine speed has increased an amount equal to the desired speed increase during the elapsed time period established by said time delay means and to terminate engine start when the engine speed increase is below the desired speed increase.

4,044,552

GAS TURBINE ENGINE SYNCHRONOUS SPEED DETECTOR

Gene A. West, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed July 19, 1976, Ser. No. 706,495
Int. Cl.[2] F02C 3/10
U.S. Cl. 60—39.16 S **3 Claims**



1. In a gas turbine power plant having a gas generator including a compressor, combustion apparatus, a compressor drive turbine and a power turbine coupled to the gas generator and torque transmitting means including a selectively energized clutch for coupling the compressor drive turbine and power turbine to regulate the amount of power transfer therebetween and wherein the combustion apparatus temperature is characterized by falling abruptly when the power turbine and compressor drive turbine are operated at synchronous speed the improvement comprising: means for unloading said clutch to prevent power transfer from the power turbine to the compressor drive turbine capable of producing compressor surge, means for generating first and second signals corresponding to power turbine speed and compressor drive turbine speed, respectively, oversynchronous speed detector means for comparing said first and second signals including means to produce a first predetermined output signal, quick dump inhibit means having an input responsive to said first predetermined output signal and an output signal for controlling said selectively energized clutch, said quick dump inhibit means being responsive to said first predetermined output signal to prevent quick unloading of said clutch, said oversynchronous speed detector means including means conditionable to produce an oversynchronous speed trip signal when the power turbine speed exceeds that of said compressor turbine speed, means for sensing and producing an engine temperature signal, means for producing a temperature schedule signal and a signal in response to the derivative of compressor drive turbine speed, signal generating means operative in response to said temperature signals and the signal of the derivative of the speed of said compressor drive turbine at the abrupt change in engine temperature produced upon the power turbine speed becoming synchronous with the compressor turbine speed to produce a temperature drop output signal in response to synchronous speed operation of the compressor turbine and the power turbine, comparator means responsive to the temperature drop output signal to condition said oversynchronous speed detector means to maintain said first predetermined output signal as the speed of said compressor drive turbine approaches and becomes synchronous with the speed of said power turbine, said signal generator means and comparator means being responsive to an increase in engine temperature subsequent to the abrupt temperature fall at synchronous speed operation of the

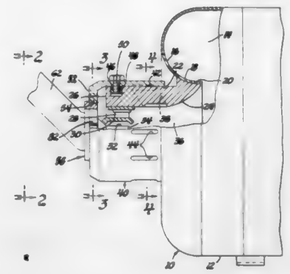
power turbine and compressor drive turbine to condition said oversynchronous speed detector means to produce an oversynchronous speed trip signal for conditioning said quick dump inhibit means to produce a quick dump of said clutch thereby to prevent load transfer from said power turbine to the compressor drive turbine.

4,044,553

VARIABLE GEOMETRY SWIRLER

John M. Vaught, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 16, 1976, Ser. No. 714,310
Int. Cl.[2] F02C 9/14
U.S. Cl. 60—39.23 **2 Claims**



1. A variable swirler assembly for controlling air swirl into the inlet of a combustor having fuel supplied thereto by a pump operative in accordance with turbine engine operation comprising an open ended tubular member having one end thereof for connection to the inlet of a combustor, said tubular member having a wall with a plurality of inflow passages therethrough to direct an air swirl into the combustor inlet, a variable geometry element supported on the outer periphery of said tubular member in overlying relationship with said inflow passages to control air flow therethrough, a nozzle directed through the opposite end of said tubular member including an inboard peripheral surface and an outboard stem portion, an actuator supported on said nozzle between said inboard peripheral surface and said outboard stem portion, said actuator including a first wall portion fixedly secured to said stem, a second movable portion on said actuator, means for connecting said movable wall portion to said sleeve for rotating it with respect to said inflow passages, said nozzle having a fuel passage therein, said pump increasing fuel flow through said passage in accordance with engine operation, means forming a variable volume chamber in said actuator including a port for receiving fuel from said fuel passage to produce relative movement between said first portion and said movable portion to shift said variable geometry element with respect to said inflow passages to produce an incresed amount of air swirl into said inlet in accordance with increases in fuel flow through said nozzle thereby to improve mixture of air and increasing quantities of fuel flow to the combustor during engine operation.

4,044,554

GAS TURBINE ENGINE FUEL CONTROL

Gene A. West, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

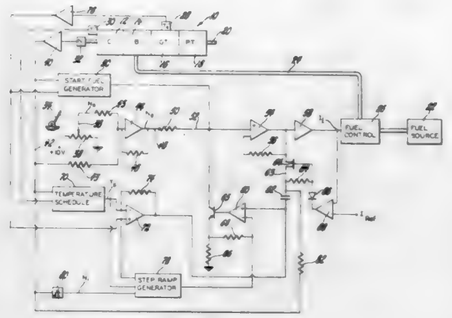
Filed July 19, 1976, Ser. No. 706,512
Int. Cl.[2] F02C 9/08
U.S. Cl. 60—39.28 T **4 Claims**

1. In a fuel control system for a gas turbine engine having means for generating a turbine inlet temperature signal, means for generating a turbine speed signal, and means for controlling fuel flow to the engine in response to a fuel control signal; means for producing said fuel control signal comprising

a speed governing circuit having a throttle signal input requesting a certain turbine speed,

means comparing the throttle signal with the turbine speed signal to produce a speed error signal,

a compensation loop having a differentiating circuit responsive to a rapid increase in the speed error signal for subtracting a variable compensation signal from the speed error signal to produce the fuel control signal which therefore is constrained in its rate of increase, the compensation loop including a step ramp generator programmed according to the temperature signal for offsetting at least a portion of the compensation signal to limit the response of the compensation signal to high change rates of the speed error signal, thereby allowing moderate increases in the speed error signal to be immediately reflected in the



fuel control signal, the step ramp generator further gradually decreasing the compensation signal to allow an increasing fuel control signal following the rapid increase in the speed error signal,

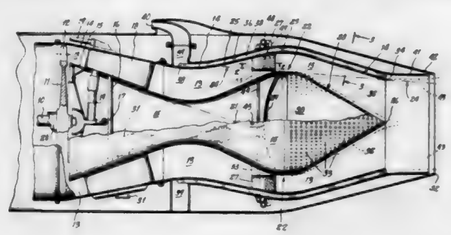
and engine temperature limiting means including means for establishing an engine temperature limit schedule to provide a schedule signal, comparator means for comparing the turbine temperature signal and the schedule signal to produce a temperature error signal, the compensation loop including integrator means responsive to the temperature error signal to vary the compensation signal to reduce the fuel control signal when turbine temperature exceeds the temperature schedule.

4,044,555

REAR SECTION OF JET POWER PLANT INSTALLATIONS

William G. McLoughlin; Arnold V. Pilling; John Reardon, and William E. Addison, all of Birmingham, Ala., assignors to Hayes International Corporation, Birmingham, Ala.

Filed Sept. 30, 1958, Ser. No. 765,700
Int. Cl.[2] F02K 3/04
U.S. Cl. 60—264 **7 Claims**



1. In a gas turbine engine having blades and an exhaust tailpipe, the combination of an exhaust cone axially mounted within the tailpipe and having its rearward end adjacent to discharge opening of the exhaust pipe with substantially all of the externally viewable surfaces of said exhaust cone formed or porous stainless steel material, means to supply cooling air to

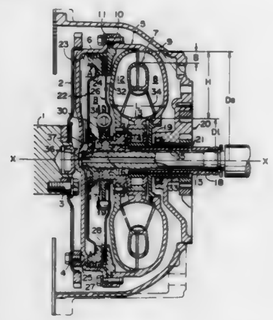
the interior of the cone for venting thereof through said porous material, a hollow strut member of airfoil configuration spanning the annular gas passageway between the exhaust tailpipe and the said cone with substantially all of the externally viewable surfaces of said strut member formed of stainless steel material, means to supply cooling air to the interior of said hollow strut member, means to pass cooling air in heat interchange relation with the outer surface of substantially all parts of the exhaust tailpipe whose related inner surface is externally viewable, and a constriction in the exhaust tailpipe located downstream of the hot parts of the engine and serving with the exhaust cone to conceal the hot parts of the engine from external view, whereby the detectible infrared emission of the engine is substantially reduced.

4,044,556

HYDRAULIC TORQUE CONVERTER WITH A LOCK-UP CLUTCH

Koujirou Kuramochi, and Kiyoshi Ohnuma, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 5, 1976, Ser. No. 683,284
Claims priority, application Japan, Dec. 26, 1975, 50-157478
Int. Cl.² F16D *33/00, 33/20*
U.S. Cl. 60—361 **1 Claim**



1. A hydraulic torque converter comprising an input member including an impeller, an output member including a turbine, a reaction member including a stator, and a lock-up clutch adapted to mechanically connect said input member with said output member, wherein the improvement comprises that a torus formed by said impeller, said turbine and said stator is so dimensioned that a ratio of its axial length L to its radial height H (L/H) is substantially from 0.64 to 0.80, the ratio of its inner diameter D_i to its diameter D_o (D_i/D_o) is substantially from 0.40 to 0.33, and the ratio of an annular flow passage area *a* at the exit of the impeller to a circular area A defined by the torus outer diameter is substantially from 0.18 to 0.23.

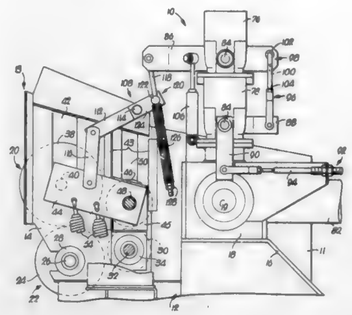
4,044,557

FEED ROLLS HAVING AUTOMATIC SPEED CONTROL

Herman V. Stoessel, and Daniel R. Prichard, both of Wichita, Kans., assignors to Hesston Corporation, Hesston, Kans.

Division of Ser. No. 678,499, April 20, 1976. This application Dec. 9, 1976, Ser. No. 749,175
Int. Cl.² F15B *18/00;* F16H *39/46;* G01M *1/168*
U.S. Cl. 60—420 **11 Claims**

1. A control mechanism for two independent power trains, said mechanism including:
- a first speed regulator associated with one of said power trains and having a first control lever;
- a second speed regulator associated with the other of said power trains and having a second control lever;
- a connector operably coupling said levers for in unison movement thereof to control said power trains simultaneously; and
- a linkage associated with said first lever for independent control of said one power train,



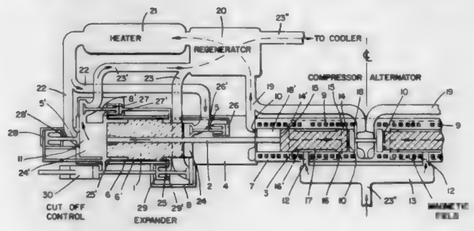
said connector having shiftable means permitting relative movement between said levers in response to operation of said linkage.

4,044,558

THERMAL OSCILLATOR

Glendon M. Benson, Danville, Calif., assignor to New Process Industries, Inc., Minneapolis, Minn.

Division of Ser. No. 496,229, Aug. 9, 1974, Pat. No. 3,928,974. This application Sept. 10, 1975, Ser. No. 611,933
Int. Cl.² F02G *1/04*
U.S. Cl. 60—520 **92 Claims**



1. A thermal machine which functions as a damped resonant positive displacement mechanical oscillator comprising:
- heat exchange means including at least one thermal source and at least one thermal sink;
- a working fluid adapted to flow through the heat exchange means including the thermal source and the thermal sink; and
- at least two positive displacement elements that oscillate out of phase with one another and in resonance in combination with one another interposed in the working fluid and adapted to subject the working fluid to a thermodynamic cycle.

4,044,559

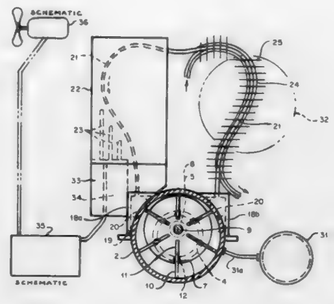
ROTARY CLOSED SERIES CYCLE ENGINE SYSTEM

Donald A. Kelly, 58-06 69th Place, Maspeth, N.Y. 11378

Filed Dec. 11, 1973, Ser. No. 423,777
Int. Cl.² F02G *1/04*
U.S. Cl. 60—525 **1 Claim**

1. A rotary closed series cycle engine comprising multiple indentical rotary units consisting of rotors and vanes revolving within cylindrical housings,
- two identical end plates secured to the ends of said cylindrical housings including concentric circular grooves uniformly disposed on the inside faces of said end plates,
- a uniformly slotted rotor eccentrically and tangentially disposed within said cylindrical housing,

- multiple flat and hollow rectangular vanes in sliding communication with the slots of said uniformly slotted rotor,
- multiple ball bearings secured to each side of said multiple flat and hollow rectangular vanes by means of multiple cylindrical pins, said multiple ball bearings are in rolling contact with said concentric circular grooves uniformly disposed on the inside faces of said end plates,
- two low-friction discs disposed on either side of said uniformly slotted rotor between said two identical end plates,
- a drive shaft concentrically disposed through said uniformly slotted rotor supported by two needle bearings eccentrically disposed within each of said two identical end plates,
- multiple gas pressure seals disposed on the outer faces of each of said two identical end plates over said drive shaft,
- four outer mounting brackets secured to the outer surface and ends of said cylindrical housing,
- four spacers disposed adjacent to said four outer mounting brackets fastened by four mounting screws and nuts,



standard fastening and sealing means utilized for joining and securing components of said rotary closed series cycle engine,
- identical gas flow manifolds secured at the sides of said cylindrical housings,
- two rectangular ports disposed at the upper sides of said cylindrical housings in direct communication with said gas flow manifolds,
- multiple small diameter transfer tubing connected from one lateral group of said gas flow manifolds to the opposite lateral group of gas flow manifolds on adjacent rotary units of said rotary closed series cycle engine,
- joining and sealing means for said gas flow manifolds to said cylindrical housings,
- joining and sealing means for said multiple small diameter transfer tubing to said gas flow manifolds.

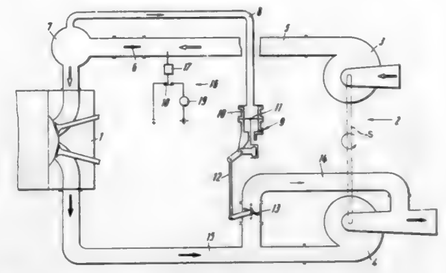
4,044,560

AIR PRESSURE REGULATOR ARRANGEMENT FOR AN INTERNAL COMBUSTION

Heinz Dorsch, Leonberg, and Julius Weber, Grossingersheim, both of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Germany

Filed June 29, 1976, Ser. No. 700,747
Claims priority, application Germany, July 1, 1975, 2529186
Int. Cl.² F02B *23/00, 33/34*
U.S. Cl. 60—601 **12 Claims**

1. An air pressure regulating arrangement for an internal combustion engine which includes a supercharging means for supplying a quantity of charging air to the internal combustion engine, the arrangement comprising:
- means operatively associated with the supercharging means for interrupting a supply of fuel to the internal combustion engine upon a pressure of the charging air supplied to the internal combustion engine by the supercharging means reaching a predetermined charging pressure and for restoring a supply of fuel to the internal combustion engine



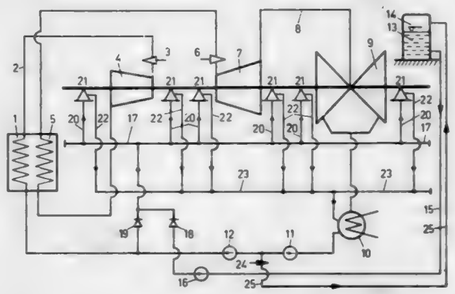
upon the pressure of charging air dropping below the predetermined charging pressure.

4,044,561

STEAM TURBINE HAVING BEARING STRUCTURES LUBRICATED WITH STEAM CONDENSATE IN RECIRCULATING SYSTEM

Alfred Hohn, Kirchdorf, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Aug. 11, 1975, Ser. No. 604,061
Claims priority, application Switzerland, Aug. 6, 1974, 11238/74
Int. Cl.² F01B *31/00;* F01K *21/00*
U.S. Cl. 60—657 **2 Claims**



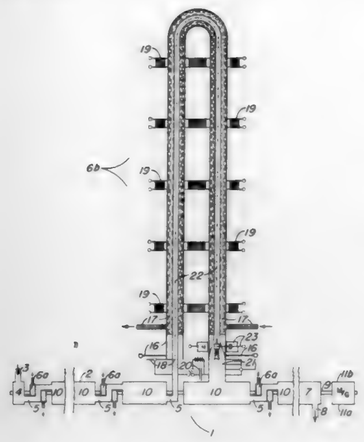
1. A steam turbine comprising a housing within which the turbine rotor is mounted and includes shafting extending through an end wall structure of the housing, bearing means mounted within said end wall structure and which support the shafting, said bearing means having a spheric dome-shaped outer surface adjoining a complementary configured surface provided in said end wall and including pressure pockets facing said shafting, feed-in channels to said adjoining spheric surfaces and to said pressure pockets from a lubrication line, and a lubrication system for supplying said lubricating line with water condensed from the working steam supplied to the turbine, said adjoining surfaces of said bearing means and end wall providing adjustment of said bearing means, and the flow of water between said adjoining surfaces of said bearing means and end wall serving as a seal to prevent loss of steam from said housing.

4,044,562

MULTIROTARY ENERGY CONVERSION VALVE

Will Clarke England, 7310 Eastcrest Drive, Austin, Tex. 78752

Filed May 2, 1974, Ser. No. 466,874
Int. Cl.[2] F01K *27/00*
U.S. Cl. 60—721 8 Claims



1. A multirotary energy conversion valve for fluids comprising:

a. a valve casing;

b. a pair of continuously meshing inlet rotors of constant volume displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing;

c. a pair of continuously meshing outlet rotors of constant volume displacements in the meshing irregular peripheries of said rotors rotatably mounted in said valve casing; said outlet rotors having torque characteristics and volumetric displacement rates quantitively unequal to the torque characteristics and volumetric displacement rates of said inlet rotors;

d. an inlet passage in said valve casing leading to the reappearing volumetric displacement side of said meshing inlet rotors;

e. an outlet passage in said valve casing leading from the vanishing volumetric displacement side of said meshing outlet rotors;

f. an enclosed channel in said valve casing leading from the vanishing volumetric displacement side of said meshing inlet rotors to the reappearing volumetric displacement side of said meshing outlet rotors;

g. at least one rotary linkage connecting one inlet rotor and one outlet rotor for synchronous rotation about one axis with said rotary linkage having access external to said valve casing for rotary drive purposes;

h. at least one pair of meshing intermediate rotors of constant volumetric displacements interposed in said enclosed channel with at least one intermediate rotor connected by said rotary linkage to one inlet rotor and one outlet rotor for synchronous rotation about one axis;

i. a multiplicity of meshing intermediate rotors of constant volume displacements of sequentially larger volumetric displacement rates with heat exchange means in each divided segment of said enclosed channel whereby a fusionable thermodynamic fluid is diminished in density and increased in temperature under flowing conditions;

j. at the end of said multiplicity of meshing intermediate rotors with heat exchange means, a fusion means for said enclosed channel comprising:

1. an enclosed channel with cooled current carrying conductors about the enclosed channel, said current carrying conductors producing a magnetic field in said enclosed channel with the magnetic lines of force being parallel to the centerline of said enclosed channel whereby the ions flowing through said channel and crossing said magnetic lines would be accelerated back toward said centerline of said enclosed channel for "magnetic bottling" means, said enclosed channel being encased in a kinetic and heat energy absorbing means for energy conversion of the fusion products;

2. an ionization and ion neutralizing means at the ends of said "magnetically bottled" enclosed channel whereby the flowing thermodynamic fusionable fluid is converted to a plasma at the entrance and neutralized at the exit of said enclosed channel;

3. a multiplicity of magnetic core transformers surrounding said enclosed channel and being electrically synchronized in such a manner as to produce secondary alternating current about the path of flow for resistive heating of said plasma; and

4. capacitive discharge means connected to the ionization means and ion neutralizing means and the primary of the magnetic core transformers for intermittent discharge of a substantial current along and about the path of plasma flow whereby the unidirectional self contracting plasma flow will be magnetically "pinched" for further contraction;

k. another multiplicity of meshing intermediate rotors of constant volume displacements of sequentially larger volumetric displacement rates whereby the partially fusioned thermodynamic fluid is volumetrically expanded; and

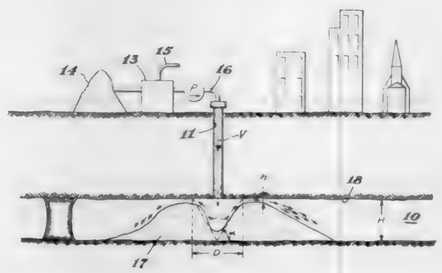
l. a power driving means for said multirotary valve whereby said power driving means is utilized to the limit of self sustaining operation of said multirotary valve by the expansion of the partially fusioned thermodynamic fluid.

4,044,563

SUBSIDENCE CONTROL

Robert E. Hurst, and Charles L. Lunsford, both of Tulsa, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 26, 1973, Ser. No. 326,611
Int. Cl.[2] E21F *15/08*
U.S. Cl. 61—35 4 Claims



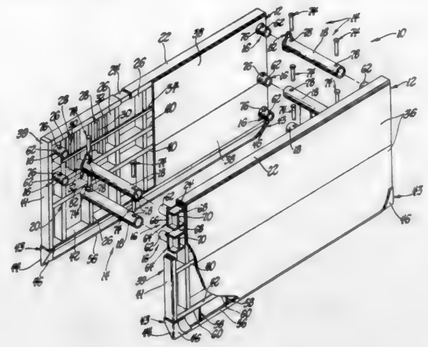
1. In a method of filling a subterranean void by injecting under pressure a carrier liquid, in which solid particles are suspended said particles consisting of a material which in a deposited form is permeable to the flow of said carrier liquid, into said void to form a deposit of solid particles within said void, the improvement which comprises: emplacing a filtercake consisting of a second layer of solids which is substantially impermeable to said carrier liquid on the exposed surface of the deposit then present to render said surface less permeable to said carrier liquid and then continuing said injection of said suspension of solid particles thereby to extend the deposit of said particles through said void.

4,044,564

TRENCH SHORING ASSEMBLY WITH CORNER GUARD ACCESSORY

James L. Griswold, 513 Morningside Drive, Battle Creek, Mich. 49015

Filed Feb. 9, 1976, Ser. No. 656,147
Int. Cl.[2] E21D *5/00;* E02F *9/28*
U.S. Cl. 61—41 A 8 Claims



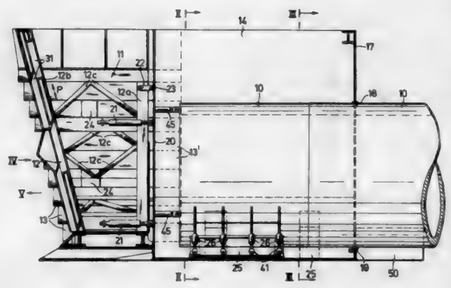
1. A trench shoring assembly of the type including a pair of interconnected spaced wall means, said assembly comprising: wall means having a predetermined thickness and a tapered bottom portion defining a triangularly shaped pointed lower extremity extending between the ends thereof, and guard means disposed at least at one of said ends of said lower extremity for providing protection against abrasion, said tapered bottom portion of said wall means including metal plate means diverging upwardly from said pointed lower extremity, said guard means comprising a triangular member having a triangular front face extending transversely to and between said metal plate means and flanges extending rearwardly from said front face and disposed in lapping relationship with said metal plate means, said guard means being of a higher abrasion resistance than said metal plate means.

4,044,565

APPARATUS FOR AND A METHOD OF LAYING A PIPE LINE

Dieter Stuckmann, Selm, Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed May 17, 1976, Ser. No. 687,076
Claims priority, application Germany, May 27, 1975, 2523340
Int. Cl.[2] E21D *5/12;* F16L *1/00*
U.S. Cl. 61—41 A 19 Claims



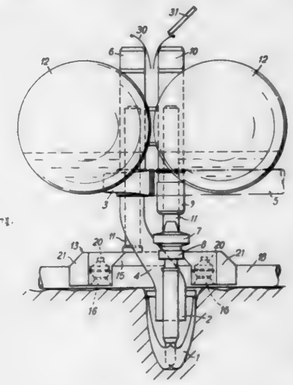
1. An apparatus for use in laying a pipe line composed of pipe sections arranged end-to-end; said apparatus comprising an advanceable shield usable to excavate a trench and to support the walls thereof, the shield having a plurality of elongate members and a frame supporting the members for lonitudinal displacement, an adjustable bulkhead at the front end of the frame which can be adjusted to open a selected portion of the working face to the interior of the shield, and a receptacle for receiving individual pipe sections, the receptacle being disposed behind the shield and having an opening permitting communication between the interior and exterior thereof whereby the pipe sections can be arranged end-to-end and the receptacle can be moved up in the direction of advancement as the pipe line is extended.

4,044,566

MACHINE FOR FORMING TRENCHES FOR PIPELINES OR THE LIKE IN THE SEA BED

Odd Bjørn Biberg, Bronnveien 7, Oslo 2, Norway

Filed Aug. 20, 1975, Ser. No. 606,227
Claims priority, application Norway, Aug. 28, 1974, 743088
Int. Cl.[2] E02F *5/02;* F16L *1/00*
U.S. Cl. 61—72.4 5 Claims



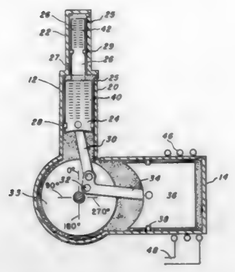
1. In underseas trenching apparatus for forming trenches for pipelines and the like in the sea bed, comprising a releasably-engaging carriage having motive means for releasable engagement on the pipeline and movement along and in an arc around the longitudinal axis of the pipeline, means for driving said motive means along the pipeline by engagement of the motive means with the pipeline, a trenching unit on said apparatus, and projecting beyond the carriage, power means on said apparatus for operating said trenching unit and said means for driving said motive means, said trenching unit and power means comprising a major part of the weight of the apparatus, buoyancy tanks on the apparatus for supporting a major part of the weight of the apparatus, the improvement in which said trenching unit and said power means are integrally-connected to said buoyancy tanks for simultaneous movement therewith, means connecting said carriage to said trenching unit and said power means for causing the same to move along with the carriage on the pipeline and around said pipeline, said means connecting comprising means permitting relative vertical movement between said carriage and said major part of the weight of said apparatus so that a major part of the weight is not imposed on said pipeline, means connecting said bouyancy tanks to each other for altering their bouyancy in relation to the longitudinal axis of the pipeline and said carriage for causing the trenching unit to be adjusted in an arc about the pipeline upon which the carriage is supported and relieving the major part of the weight from off the pipeline.

4,044,567

MODULAR, MAGNETICALLY-COUPLED DRIVE FOR A CRYOGENIC REFRIGERATOR

Robert M. Dix; Samuel F. Tobias, and Stephen L. Whicker, all of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 2, 1975, Ser. No. 609,850
Int. Cl.² F25B 9/00
U.S. Cl. 62—6 **8 Claims**



1. A Vuilleumier refrigerator comprising
a. a housing having a cold cylinder portion, a hot cylinder portion and a crankcase portion including a cylindrical portion, said hot and cold cylinder portions in open communication with said crankcase portion;
b. a working fluid within said housing;
c. a cold volume fluid displacer slidably positioned within said cold cylinder portion for forming a working volume within the cold cylinder portion;
d. a regenerator mounted within said cold volume fluid displacer;
e. a hot volume fluid displacer slidably positioned within said hot cylinder portion for forming a working volume within the hot cylinder portion;
f. a heating means for heating the working fluid in the hot cylinder portion;
g. a crankshaft means mounted within the crankshaft portion, said crankshaft means including a crankshaft, means connecting the hot and cold volume fluid displacers to the crankshaft for selective movement as to each other, and a cylindrically shaped magnet coupled to rotate the crankshaft, said magnet supported by the crankshaft in the cylindrical portion of the crankcase housing portion; and
h. a modular prime mover means including a housing detachably mounted on the crankcase housing portion, a cylindrically shaped stator, a corresponding cylindrically shaped rotor rotatably mounted in the housing for rotation within the cylindrical motor stator, a cylindrically shaped magnet attached interiorally of the motor rotor for rotation therewith, said cylindrical magnet of the rotor corresponding to the cylindrical portion of the crankcase housing portion housing the cylindrically shaped crankshaft magnet whereby said magnets are locked for rotation.

4,044,568

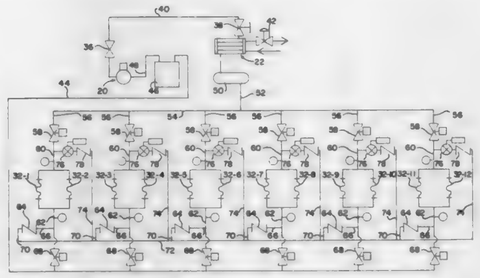
SPACE HEATING AND COOLING SYSTEM

William F. Hagen, Argyle, Tex., assignor to Turbo Refrigerating Company, Denton, Tex.

Filed Dec. 22, 1975, Ser. No. 642,906
Int. Cl.² F25C 5/10
U.S. Cl. 62—73 **19 Claims**

1. In an ice making and harvesting system comprising a refrigerant compressor and condenser, a plurality of ice making plates defining passages for the movement of refrigerant therethrough, means for applying water to said plates for the formation of ice thereon, and a plurality of refrigerant expansion valves communicating with said plates, the improvement comprising additional valves for directing condensed refrigerant from the condenser to the plates without passing through the expansion valves, means for setting the expansion valves for selected ones of said plates for the passage of gaseous refrigerant through said selected plates, at least one of said additional valves being at the same time set for the passage of unexpanded refrigerant through plates other than said selected plates, said means for applying water applying the water only to said selected plates for the formation of ice thereon, the higher temperature of the condensed refrigerant simultaneously passing through said other plates operating to heat said other plates and to release ice formed thereon for harvesting of the ice, means for periodically operating all of said valves whereby said selected plates are successively changed whereby ice is successively formed on the plates, said other plates thereby also being successively changed whereby ice is successively harvested after formation thereof, and including means for directing the condensed refrigerant passing through said other plates to the expansion valves for said selected plates for passage of gaseous refrigerant to said selected plates.

14. A method for making and harvesting ice comprising the steps of providing an ice making apparatus having a refrigerant compressor and condenser and a plurality of ice making plates defining passages for the movement of refrigerant there-



through, providing expansion valves adjacent each of said plates and directing refrigerant through selected ones of said expansion valves, introducing water into contact with those plates having the passages thereof connected to said selected expansion valves for the formation of ice on those plates, providing additional valves between said condenser and said plates, connecting the passage of at least one additional valve to the plates other than those plates connected to said selected expansion valves whereby the higher temperature of the unexpanded refrigerant from the condenser will provide for the release of ice from said other plates, collecting the ice released from said other plates, successively operating said expansion and additional valves for changing their connections with said plates and for thereby forming ice on said other plates after release of ice therefrom and for releasing ice from said selected plates after formation of ice thereon, and wherein the refrigerant directed through the selected ones of said expansion valves is provided by directing the condensing refrigerant passing through said other plates to the selected ones of said expansion valves for said selected plates for passage of gaseous refrigerant to said selected plates.

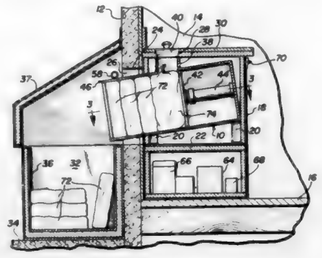
4,044,569

REFUSE DISPOSAL APPARATUS

Richard D. Harza, 150 S. Wacker, Chicago, Ill. 60606

Filed Apr. 15, 1976, Ser. No. 677,221
Int. Cl.² F25C 5/14; B02C 11/08; B30B 1/00, 15/06
U.S. Cl. 62—341 **10 Claims**

1. Refuse disposal apparatus comprising a receptacle for refuse, compressing means, means for operating said compressing means to compact said refuse in said receptacle and to force previously compacted refuse from said receptacle along a predetermined path, means adjacent said receptacle for freezing said refuse as compacted, restraint means adjacent said receptacle for restraining a previously compacted and frozen mass of refuse, said mass serving as a backup means against which said compressing means compacts refuse, said restraint means comprising a pair of backup members at least partially across said predetermined path and engaged by said mass of



refuse along opposite edges thereof opposite to said compressing means, and means for retracting said backup members transversely of said path to permit release of previously compacted and frozen refuse.

4,044,570

REFRIGERATOR

Minoru Ono, Izumi; Sakae Fukuchi, Sano; Syouzou Ogawa, Ohira; Fumio Ishikawa, Utsunomiya, and Shigeo Nagakita, Tochigi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 27, 1976, Ser. No. 652,664
Claims priority, application Japan, Feb. 28, 1975, 50-26655
Int. Cl.² F25D 17/06; F01D 5/08, 5/18, 25/08
U.S. Cl. 62—419 **26 Claims**

1. A refrigerator comprising at least one refrigerating chamber means defined by an outer box and an inner box spaced therefrom, foam insulating material filling the space between said outer and inner box, and an air blower including a fan and a driving motor for circlation of cooled air in the at least one refrigerating chamber means, characterized in that:
a recess means is provided in a rear portion of said outer box for accommodating the driving motor;
a pipe means is provided for communicating said recess means with the at least one refrigerating chamber means;
a drive shaft means is provided on the driving motor and extends through said pipe means, the fan is mounted at a forward end of said drive shaft means on a side thereof facing the at least one refrigerating chamber means;
means are provided in said pipe means for guiding the drive shaft means therein to ensure a steady, non-wobbling positioning thereof,
the driving motor includes a main body portion and bracket portions provided at opposite longitudinal sides of said main body portion,

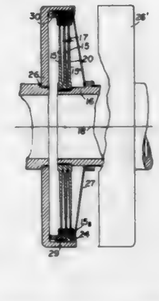
means are provided for mounting said bracket portions at said recess means including:
an adapter plate means mounted at said outer box,
a first rubber seat means mounted at said adapter plate means for accommodating one of said bracket portions,
a second rubber seat means arranged in said pipe means for accommodating the other of the bracket portions of the driving motor and for preventing leakage of cooled air through said pipe means,
a third rubber seat is interposed between opposite ends of said adapter plate means and the outer box means,
and in that means are provided at the outer box for covering the driving motor and the adapter plate means.

4,044,571

FLEXING-DISK COUPLING

Ernest Wildhaber, 124 Summit Drive, Rochester, N.Y. 14620

Filed June 11, 1976, Ser. No. 695,205
Int. Cl.² F16D 3/78
U.S. Cl. 64—13 **5 Claims**



1. A flexing-disk coupling for connecting two rotating parts, comprising a plurality of generally circular disks secured to one of said parts at their inner portion,
said disks extending along parallel planes in proximity of each other when the axes of said parts coincide,
the outer ends of said disks being connected to the other of said parts through radially yielding rubber-like layers, to permit said outer ends to relatively expand and contract radially in tilting, whereby each disk transmits only a nearly equal fraction of the total torque transmitted by the coupling,
said disks being of metal to keep them torsionally stiff, whereby to minimize relative angular deflection about the coupling axis,
said layers being confined to the outer end portions of said disks and having a thickness smaller than the average thickness of the working portion of said disks.

4,044,572

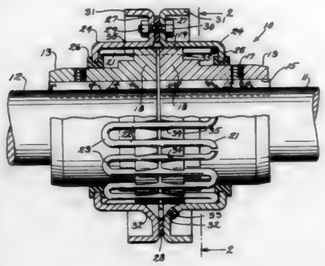
SERPENTINE GRID FLEXIBLE COUPLING

Edward J. Wellauer, Wauwatosa, and John A. Strommen, West Allis, both of Wis., assignors to The Falk Corporation, Milwaukee, Wis.

Filed Apr. 9, 1976, Ser. No. 675,324
Int. Cl.² F16D 3/52
U.S. Cl. 64—15 B **2 Claims**

1. In a coupling for connecting driving and driven shafts, which coupling includes a pair of hubs connectable to said shafts for rotation therewith with each hub having a plurality of axially extending teeth which define between them a series of axially directed grooves, the teeth of each hub being so shaped that each groove flares at the face of said teeth which opposes the teeth of the other hub, and a grid interlacing the teeth of both hubs, and including a series of rungs each lying in a groove of each hub, wherein the improvement comprises:
each of said rungs having a circular cross section, and

the bottom of each groove being rounded and being formed



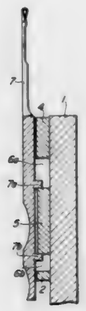
at the narrowest width of the groove as an arc of a circle which mates with said rungs.

4,044,573

CAM MECHANISM FOR CIRCULAR KNITTING MACHINE

Yosiharu Nakajima, Itami, Japan, assignor to Okuma Machinery Works Ltd., Nagoya, Japan

Filed July 6, 1976, Ser. No. 702,949
Claims priority, application Japan, July 25, 1975, 50-103743[U]
Int. Cl.² D04B *15/32*
U.S. Cl. 66—57 **4 Claims**



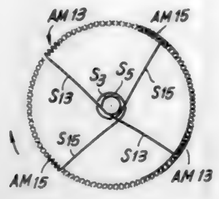
1. A cam mechanism for a circular knitting machine including stitch cams and double butt needles wherein each of said stitch cams is disposed inside or between a pair of fixed operating butts of each double-butt needle and is provided with main cam wall sections on its under side adapted to control the position of each double-butt needle while causing descending motion thereof after one of its operating butts has come into contact on its upper side with one of said main cam wall sections so that knitting operation is effected thereby, and each of said stitch cams is also provided with auxiliary cam wall sections on its upper side of substantially the same contours as said main cam wall sections for guiding the needle on the under side of the other operating butt to permit smooth movement of said each needle while said one operating butt is being controlled by said main cam wall sections, whereby said main cam wall sections and said auxiliary cam wall sections are brought into contact with the inner sides of the respective operating butts to minimize irregular motion of said each needle during knitting operation.

4,044,574

METHOD OF CLOSING THE TOE OPENING OF A KNIT STOCKING OR THE LIKE

Arrigo Micheletti, Florence, Italy, assignor to Billi, S.p.A., Italy

Filed Oct. 3, 1968, Ser. No. 764,835
Claims priority, application Italy, Oct. 9, 1967, 4763/67
Int. Cl.² A41B *11/02*; D04B *9/42*
U.S. Cl. 66—187 **2 Claims**



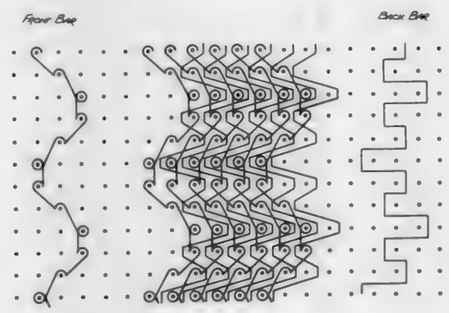
1. The method of operating a circular knitting machine of the type having a circle of needles and having a circle of welt hooks associated with said circle of needles, which comprises knitting a first section of tubular fabric on said needles, positioning spaced needles at welt level with their last formed stitches of said first fabric section thereon, knitting a second section of tubular fabric of predetermined length on the intervening needles in continuation of the corresponding intervening wales of said first fabric section, holding the terminal course of said second fabric section on said circle of welt hooks, knitting a third section of tubular fabric of said predetermined length in continuation of said terminal course, said terminal course being a course common to said second and to said third fabric sections, said second and third fabric sections being nested and commonly extending between said circle of welt hooks and said intervening needles, winding yarn under tension peripherally around said nested tubular fabric sections midway of their length to constrict the same to effectively close the opening therein, whereby said pair of nested two-ply welts is closed at the fold line thereof to produce a closed toe for a stocking, activating said spaced needles, transferring said terminal course from said welt hooks to said spaced needles, knitting upon said circle of needles to join the terminal courses of said tubular sections to form a pair of nested, two-ply tubular welts, and knitting a further portion of tubular fabric on said needles.

4,044,575

BALANCED BI-DIRECTIONAL STRETCH KNIT FABRIC

Herbert A. Krug, 402 Semino Road, Northvale, N.J. 00647

Filed Aug. 24, 1976, Ser. No. 717,134
Int. Cl.² D04B *23/08*
U.S. Cl. 66—192 **3 Claims**



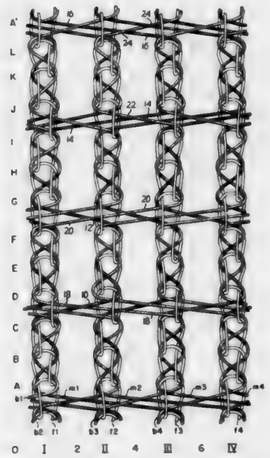
1. A warp knitted stretch fabric capable of balanced bi-directional stretch having in combination an inelastic knitted ground structure and elastic lay in, said ground structure comprising a plurality of courses and wales formed from single stitches, said single stitches being deposed in a six stitch repeating pattern, the first three stitches of said six stitch repeating pattern traversing diagonally to adjacent wales and courses, the fourth stitch of said six stitch repeating pattern being knitted in the same wale and adjacent course as the third stitch of said six stitch repeating pattern, the fifth and sixth stitches of said six stitch repeating pattern traversing diagonally from said fourth stitch to adjacent wales and courses said diagonally traversing being in a direction opposite that of the traversing of said first, second and third stitches, and an elastic thread extending through said ground structure and being held into said ground structure by the unknitted portions of said inelastic ground structure.

4,044,576

WARP-KNITTED FABRICS

Milton Kurz, Pond Crossing, Lawrence, N.Y. 11559

Filed Nov. 7, 1975, Ser. No. 629,851
Int. Cl.² D04B *23/08, 23/10*
U.S. Cl. 66—193 **4 Claims**



1. A warp-knitted fabric having a multiplicity of threads forming a multiplicity of wales and courses comprising a set of threads forming a multiplicity of interconnected contracted loops and two sets of laid-in threads arranged in pairs, each of the threads of said pairs including in each repeat of a knitting pattern at least two short lay-ins between wales and at least two long lay-ins between wales, there being for each long lay-in between wales of each thread of each pair a corresponding short lay-in between wales of the other thread of the pair which is located in the same course as and extends in the opposite direction from the said long lay-ins between wales, and the threads of each pair being mirror images of each other offset from each other by at least two courses and thus being of substantially equal total length in each repeat.

4,044,577

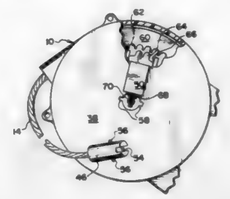
ANTI-THEFT DEVICE FOR PORTABLE APPARATUS

Albert F. Horlacher, Palatine, Ill., assignor to Lock-A-Bike, Inc., Winnetka, Ill.

Filed Sept. 9, 1976, Ser. No. 721,688
Int. Cl.² B62H *5/00*
U.S. Cl. 70—234 **17 Claims**

1. An automatic locking device adapted to be operably mounted on a support wwhich is rigidly formed with a bicycle or like portable instrument for releasably securing said instrument against theft, said locking device comprising:

i. a substantially enclosed casing;
ii. a spindle secured within said casing and having retractile reel means mounted thereon;
iii. said reel means including a flexible cable having one end secured thereto and a protruding second free end extending through said casing, and means for automatically retracting said cable when it is extended from said casing;
iv. latch means supported on said casing for latching said



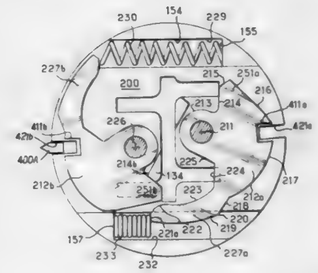
reel means against movement in a first position, and for releasing said reel means for movement in a second position;
v. said free end of the cable arranged to be engaged through said casing with said latch means in said first position; and
vi. lock means supported on said casing for releasably locking said free end of the cable in said casing and concurrently preventing movement of the reel means and latch means.

4,044,578

SAFETY LOCK

Francois Guiraud, Chambourcy, France, assignor to Fichet-Bauche, Velizy, France

Filed Jan. 9, 1976, Ser. No. 647,975
Claims priority, application France, Jan. 17, 1975, 75.01552
Int. Cl.² E05B *19/06, 29/06*
U.S. Cl. 70—366 **6 Claims**



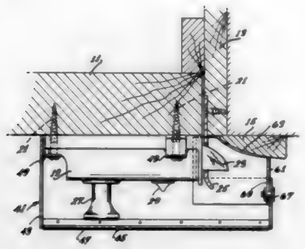
1. A safety lock comprising; a cylinder having a transverse end wall provided with an opening for the entrance of a key, a barrel within said cylinder, a number of notched cams located in transverse planes of the barrel and pivotally mounted around at least one axis extending parallely to the longitudinal axis of the lock, at least one longitudinal catch mounted between said barrel and said cylinder, and adapted to be received into said notches when they are aligned, thereby rotatively freeing the barrel with respect to the cylinder, and an aperture extending longitudinally into said barrel for said key the introduction of which within said barrel displaces said cams by acting on the portions thereof projecting into said axially directed aperture the latter having a central channel and two couples of shanks extending substantially perpendicularly to said channel, the shanks of each couple being offset with respect to one another.

4,044,579

PROTECTION MEANS FOR MANUALLY OPERATED DEAD BOLT LOCK

John Paul Le Bel, 238 1/2 S. Vendome St., Los Angeles, Calif. 90057

Filed Nov. 21, 1975, Ser. No. 630,072
Int. Cl.[2] E05B *13/00*
U.S. Cl. 70—416 2 Claims



1. Apparatus for limiting access to a manually operable lock mountable on a door having a jamb upon which a striker element is mounted comprising

a housing adapted to surround such a lock and its striker on all sides thereof except on the side thereof against a door comprising

wall means arranged to extend substantially perpendicularly from a door and its adjacent jamb to an outer edge further from the door than the furthermost extremity of a lock and striker therefrom,

cover means moveably mounted on at least one portion of said outer edge and so formed as to substantially fill the area within the boundaries formed by said outer edge when moved into position thereagainst,

means for prohibiting unauthorized movement of said cover means, and

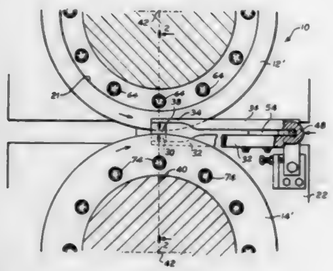
means within housing for receiving the means which fasten a manufally operable lock to a door so that the lock fastening means also fix said housing to the door.

4,044,580

ROLLING MILL GAP SENSOR

Donald A. Worden, Pompton Plains; William I. de Versterre, Warren, and Henry Alfred Petry, Sparta, all of N.J., assignors to Marotta Scientific Controls, Inc., Boonton, N.J.

Continuation of Ser. No. 592,540, July 2, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,696
Int. Cl.[2] B21B *37/08*
U.S. Cl. 72—21 14 Claims



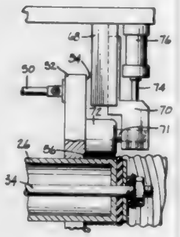
1. A rolling mill comprising a first and a second roll that rotate on parallel axes and that have cylindrical working faces which form a roll pass through which material travels to determine the gauge of said material, sensors for determining movement on the rolls toward and from one another including a first sensor that is adjacent to a circumferential area of said first roll at a location immediately adjacent to a center line extending through the axes of said rolls but axially spaced from the surfaces of the rolls that contact with the material that travels through the roll pass, a second sensor that is adjacent to a circumferential area of the second roll at a location immediately adjacent to a center line extending through the axes of said rolls and axially spaced from the first sensor and from the surfaces of the rolls that contact with the material that travels through the roll pass, said circumferential area of each of said first and second rolls being axially spaced from the corresponding circumferential area of the other roll and being substantially coaxial with its roll and of the same circumference as the cylindrical working face of its roll and located in position to be ground whenever the working face of its roll is ground and as part of the grinding operation whereby any eccentricity ground into the working face is duplicated in said circumferential area of the roll, one of the rolls having a circumferential recess between its working face and its circumferential area that is adjacent to one of the sensors for providing clearance for the sensor that is adjacent to the circumferential area of the other roll, a frame connected with the respective sensors, a transducer operated by relative movement in said frame, and apparatus responsive to signals from the transducer.

4,044,581

THIN-WALLED METAL DUCT HAVING INTEGRAL REINFORCED ENDS FOR JOINING AND METHOD AND APPARATUS FOR ITS MANUFACTURE

Robert Henry Meserole, Maumee, Ohio, assignor to Johns-Manville Corporation, Denver, Colo.

Filed Nov. 10, 1975, Ser. No. 630,123
Int. Cl.[2] B21D *51/12*
U.S. Cl. 72—68 11 Claims



1. In a method of reforming at least one end portion on a tubular metal duct section having a wall with ribs therearound comprising at least partially removing the ribs from the least one end portion of the duct by working the wall of the at least one end portion to partially collapse the ribs and form generally cylindrical end portion, the improvement comprising;

compressing the duct lengthwise from the end containing the at least one end portion prior to working the wall of that one end portion such that the lengthwise distance between the ribs and the end portion is significantly less than the lengthwise distance between the ribs in an intermediate portion of the duct adjacent to said end portion.

4,044,582

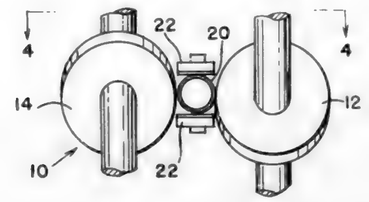
WORK GUIDE FOR PIPE REELING MACHINES AND THE LIKE AND PROCESS FOR TREATING THE SAME

Robert G. Griffith, Poland Township, Mahoning County, Ohio, assignor to Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed June 14, 1976, Ser. No. 695,903
Int. Cl.[2] B21B *39/14*
U.S. Cl. 72—97 5 Claims

1. A pipe reeling machine external guide for guiding and burnishing an external surface of a pipe, said guide having a work contact surface of a composition consisting essentially, in

percent by weight, of: 0.70–0.90 carbon; up to 1.75 manganese, 0.08 max. phosphorus, 0.08 max. sulfur, 0.5–1.75 silicon, 8–12.0



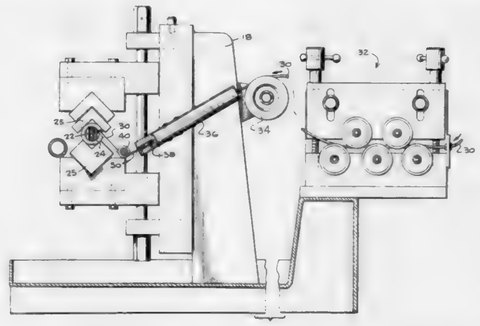
nickel, 23–27 chromium, and the balance being essentially iron with residual impurities.

4,044,583

METHOD AND APPARATUS FOR MAKING ELONGATED FLAT WIRE COILS

C. Mills Kinney, Jr., Washington, D.C., assignor to Wire Conveyor Belts, Inc., Easton, Md.

Filed May 27, 1976, Ser. No. 690,793
Int. Cl.[2] B21F *3/04*
U.S. Cl. 72—137 18 Claims



1. A method of forming an elongated flattened wire spiral of spring-like wire in a forming station having a continuously rotating elongated winding blade extending axially through a rigid flat spiral outfeed guide, said method comprising the steps of continuously feeding spring-like wire toward said forming station, bending said spring-like wire beyond its elastic limit in a first direction to impart a set bend in said wire at a location immediately upstream of said forming station, feeding said wire having said set bend into wrapped engagement with said winding blade between adjacent spirals of said flat spiral outfeed guide in a direction so that said wire is bent on said winding blade beyond its elastic limit in an opposite direction to said set bend as it is wrapped around said winding blade.

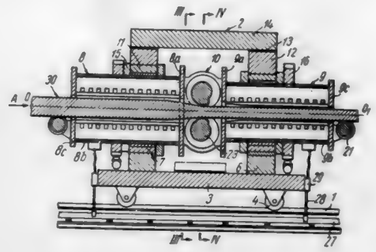
4,044,584

MILL FOR ROLLING CONTINUOUSLY CAST INGOT

Evgeny Alexeevich Korshunov, pereulok Otdelny, 5a, kv. 29, Sverdlovsk, U.S.S.R.

Filed Oct. 7, 1976, Ser. No. 730,649
Claims priority, application U.S.S.R., Oct. 15, 1976, 2177703
Int. Cl.[2] B21B *13/22*
U.S. Cl. 72—214 1 Claim

1. A mill for rolling a round continuously cast ingot, said mill rolling the ingot intermittently, and comprising: slideways running coincident with the axis of rolling and mounted on a foundation and a movable mill stand mounted in said slideways, said mill stand comprising: a stage-separator fitted with runners and travelling along said slideways; two pairs of braces fixed on said stage-separator; a top-mill separator interconnecting said braces; two supports with insertion pieces, said supports being installed along the axis of rolling on said stage-separator and being intermediate of said braces; two cylindrical inductors set up on said supports and having bodies with cylindrical shapes and end face parts, said inductors being adapted for establishing a travelling magnetic field therein; two pairs of flanges fixed on the cylindrical portions of the bodies of said inductors, the flanges, comprised in each flange pair mounted on each of said inductors, being spaced at a distance corresponding to a lengthwise size of the appropriate supports with the insertion piece, and the spacing between the pairs of said flanges set up on said inductors corresponding to that between the inductor supports; said inductors with the flanges are rotatably mounted on the insertion pieces of said



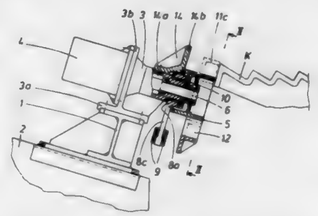
supports through an angle of at least 90° about the axis of rolling and are pressed to said insertion pieces by said top-mill separator, which precludes the displacement of said inductors relative to said supports towards the axis of rolling; and a mill roll unit disposed intermediate of the end faces of said inductor bodies and fixed rigidly to said end faces, said mill roll unit having two housings with openings, said housings being rigidly fixed on the end faces of said inductor bodies, two grooved rolls with lengthened necks introduced into the openings in said housings, two hydraulic drives mounted on one of said housings and coupled with the necks of said grooved mill rolls, and two gear wheels in mesh with each other fitted on the necks of said mill rolls from the side of the other of said housings.

4,044,585

ENTRY ROLLERWAY FOR A COOLING BED FOR ELONGATE ROLLED STOCK

Otto K. Buchheit, St. Ingbert, Germany, assignor to Moeller & Neumann GmbH, St. Ingbert, Saar, Germany

Filed June 3, 1976, Ser. No. 692,569
Claims priority, application Germany, June 5, 1975, 2525014
Int. Cl.[2] B21B *43/00*
U.S. Cl. 72—201 5 Claims



1. An entry rollerway for a cooling bed for elongate rolled stock, for example, rods or bars, comprising:

an elongated carrier means;

a plurality of lantern-shaped cast members mounted on said elongated carrier means at spaced locations therealong;

elongated cast members supported only on adjacent ones of said lantern-shaped cast members, and including bottom

and side wall portions defining an entry groove for said rolled stock;

a driven roller means carried by each of said lantern-shaped cast members, and arranged to extend into said entry groove generally transversely thereof;

pivot axis means also carried by each of said lantern-shaped cast members, each pivot axis means having a bell crank means rotatably mounted thereon;

a lifter element disposed to extend between each pair of said bell crank means, and pivotally connected thereto; and

an actuator rod means connecting all of said bell crank means, and operable to rotate said bell crank means from a position in which said lifter element(s) are flush with said bottom wall portions of said entry groove to a raised position in which said lifter element(s) eject rolled stock from said entry groove to said cooling bed.

4,044,586

CONTINUOUS ROLLING MILL

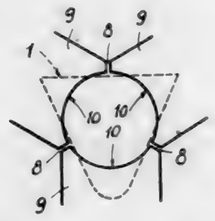
Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy

Filed Sept. 5, 1975, Ser. No. 610,817

Claims priority, application Italy, Sept. 20, 1974, 27526/74

Int. Cl.[2] B21B *1/04, 27/02*

U.S. Cl. 72—224 **5 Claims**



1. A continuous rolling mill having rolling units with three rolls for rolling an ingot originating from a continuous casting machine of the wheel and band type, said ingot having a substantially triangular or trapezial cross-section of mutually proportional sides, the rolling mill comprising at least a first rolling unit with three rolls each having rolling grooves of equal geometry configured as an arc of a circle, to define a substantially circular passage dimensioned so that a surface portion of the ingot is untouched by the rolls during rolling, this surface portion being not greater than approximately 15% of the surface touched by the rolls.

4,044,587

FORMING OF MATERIALS BY EXTRUSION

Derek Green, Cumbria; John Alan Pardoe, Lytham St. Annes, and Clifford Etherington, Blackpool, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

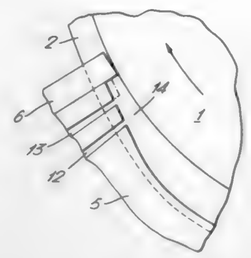
Filed Apr. 23, 1975, Ser. No. 570,753

Claims priority, application United Kingdom, May 7, 1974, 20120/74; Oct. 24, 1974, 46035/74

Int. Cl.[2] B21C *23/01, 33/00*

U.S. Cl. 72—261 **6 Claims**

1. In an extrusion process in which a feed of metallic material to be extruded is engaged frictionally by a driving surface which in conjunction with a non-driving surface also engaged with the feed defines a passageway having an inlet end and an extrusion die end, the driving surface having a feed-engaging area which is greater than that of the non-driving surface over at least a sufficient length of the passageway for the requisite extrusion pressure to be developed in the feed by a frictional drag effect, the improvement for extruding to a product having a cross-sectional dimension larger than any cross-sectional dimension of the feed, characterized in that the cross-sectional area of the passageway is changed along its length in the direction from the inlet end of the passageway to the extrusion die end of the passageway in a manner such that at least one cross-sectional dimension of the passageway at the die end thereof is



greater than the corresponding dimension at the inlet end thereof, and such that shape deformation of the feed occurs during the passage of the feed along the passageway.

4,044,588

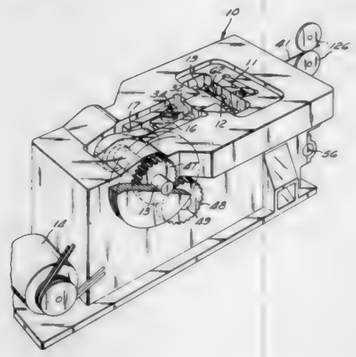
HIGH SPEED BALL HEADER

Allan D. Haines, Tiffin, Ohio, assignor to The National Machinery Co., Tiffin, Ohio

Filed June 25, 1976, Ser. No. 699,892

Int. Cl.[2] B21D *28/00*

U.S. Cl. 72—337 **22 Claims**



1. A header comprising a frame, a stationary die mounted on said frame, a movable die mounted on said frame for movement relative to said stationary die between an extended position adjacent to such stationary die and a retracted position spaced from stationary die, a powered slide operable to a forward position to move said movable die to said extended position causing a blank to be formed by said dies, a transfer operable to position a blank for gripping by said dies, and control means operable independent of slide movement to cause movement of said movable die to a position in which said dies grip a blank held by said transfer.

4,044,589

ROTARY PISTON MACHINES

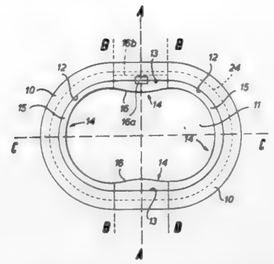
Robert Edwin Waimsley, Buckinghamshire; Robert Oliver, Berkshire, and Norman Ernest Fisher, St. Albans, all of England, assignors to Vandervell Products Limited, London, England

Continuation-in-part of Ser. No. 381,353, July 20, 1973, Pat. No. 3,973,883. This application Apr. 21, 1976, Ser. No. 679,092

Int. Cl.[2] B21D *28/00*

U.S. Cl. 72—341 **7 Claims**

1. A method of manufacturing a liner element having a trochoidal shaped inner surface for a housing of a rotary piston machine comprising the steps of extruding a flat strip, machining or rolling the flat strip to provide a variation in the thickness of the strip along the length thereof and then bending the strip into semi-circular form to fit in the housing, said variation



in thickness of the bent strip being such that the inner surface of the strip is trochoidal shaped when the outer surface of the strip is semi-circular.

4,044,590

DENTED ARTICLE SMOOTHING AND SHRINKING ARRANGEMENT

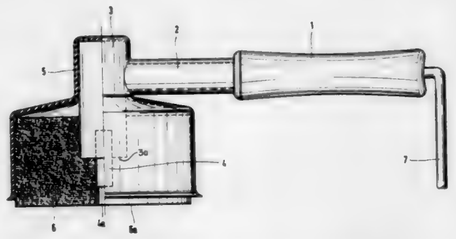
Anton Strahm, Oberweier, Germany, assignor to Robert Brendle & Cie., France

Filed Apr. 8, 1976, Ser. No. 675,241

Claims priority, application Germany, Apr. 8, 1975, 2515296

Int. Cl.[2] B21D *1/06*

U.S. Cl. 72—342 **29 Claims**



1. An arrangement for smoothing and shrinking a dented article, the arrangement comprising:

an electrode means for effecting a heating of at least a portion of the article, said electrode means including an end face for contacting the article, said electrode means and the dented article being connectable with a voltage source means;

a cooling means provided at said electrode means for cooling at least a portion of the article affected by said electrode means, said cooling means consisting of a means for selectively impermanently taking up a cooling fluid having an outer end surface which is aligned with said end face of said electrode means; and

a shield means mounted at said electrode means so as to be coaxial therewith for shielding the electrode means, said shield means including a cylindrical casing means for accommodating said cooling means, said cylindrical casing means defining an annular space between said electrode means and said casing means with said cooling means being accommodated in said annular space.

4,044,591

BLIND RIVET AND IMPROVED METHOD OF BLIND RIVETING

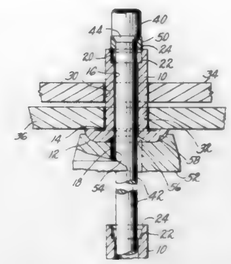
John Powderley, Birmingham, England, assignor to USM Corporation, Boston, Mass.

Filed June 29, 1976, Ser. No. 700,909

Claims priority, application United Kingdom, July 23, 1975, 30725/75

Int. Cl.[2] B21J *15/34;* **F16B** *21/00*

U.S. Cl. 72—391 **6 Claims**



1. A method of blind riveting wherein a headed mandrel is pulled by its stem through a succession of axially tubular rivets, a ring of material being separated from the interior of each rivet by the mandrel head and being retained on the mandrel stem until the mandrel head is pulled through the ring in the setting of the next rivet in the succession.

4,044,592

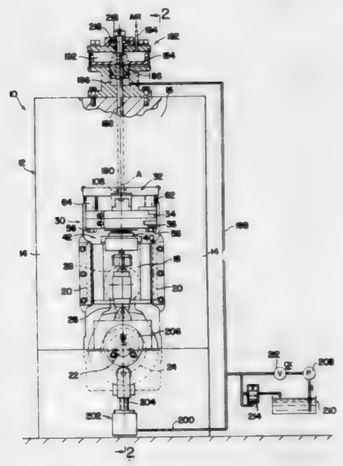
COINING DIE ASSEMBLY

Louis F. Carrieri, La Grange Park, Ill.; James R. Brownell, Delton, Mich.; Robert A. Helrigel; Roderick K. Ward, both of Hastings, Mich., and Jerome J. Wroblewski, Clarendon Hills, Ill., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed May 19, 1976, Ser. No. 688,019

Int. Cl.[2] B21J *13/02*

U.S. Cl. 72—462 **28 Claims**



1. A unitary coining die assembly for mounting on a press having a frame and slide means reciprocable in opposite directions relative to said frame, said die assembly including first coining die means, second coining die means, support means for said first and second coining die means and supporting said second coining die means for reciprocation between first and

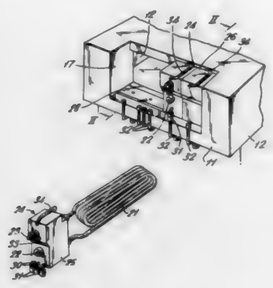
second position relative to said first coining die means, said second coining die means in said first position being spaced from said first coining die means for a coin blank to be received therebetween, said second coining die means in said second position being cooperable with said first coining die means to shape said blank, means biasing said second coining die means toward said first position, and said support means including means to mount said die assembly on said frame for reciprocation of said slide means in one of said opposite directions to engage and displace said second die means from said first position toward said second position.

4,044,593

CHROMATOGRAPH

Tatsuro Haruki, and Yoshiro Hayashi, both of Kyoto, Japan, assignors to Shimadzu Seisakusho Ltd., Kyoto, Japan

Continuation of Ser. No. 201,646, Nov. 24, 1971, abandoned.
This application Feb. 13, 1974, Ser. No. 442,055
Claims priority, application Japan, Mar. 31, 1971, 46-23282[U]; Mar. 31, 1971, 46-23283[U]
Int. Cl.² G01N *31/08*
U.S. Cl. 73—23.1 **9 Claims**



1. A chromatograph comprising a housing having walls defining a column chamber; a plurality of blocks constituting at least a portion of said housing walls so that said blocks are selectively detachable from said housing wall portion, at least one of said blocks carrying thereon a sample introducing portion, a column and a detector so as to form an analysis unit and including an inner block of thermally conductive material enclosing substantial portions of said sample introducing portion and said detector means; means for supplying a carrier fluid to said sample introducing portion; and means for heating said inner block, said heating means contained in said housing and having an exposed surface, said exposed surface adapted to contact a corresponding exposed surface of said inner block of thermally conductive material whereby heat is transferred from said heating means to said inner block when said blocks are attached to said housing.

4,044,594

ULTRASONIC TRACK TESTING CARRIAGE

William T. Owens, Elmhurst, N.Y.; Albin A. Davidson, St. Louis Park, and Eldrid W. Nelson, Minneapolis, both of Minn., assignors to Krautkramer-Branson, Incorporated, Stratford, Conn.

Filed July 22, 1976, Ser. No. 707,899
Int. Cl.² G01N *29/04*
U.S. Cl. 73—67.8 S **50 Claims**

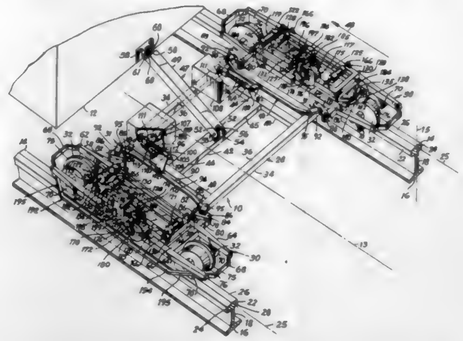
1. An ultrasonic track testing carriage for movement along rails in operative relationship with a test vehicle, comprising:

A. a pair of wheel frames each having guide means for following the gauge side of the rail and ultrasonic sensing means mounted in working relationship with a portion of the rail for detecting changes in the rail and the position of said sensing means relative to the rail,

B. a main frame disposed between said wheel frames and adapted to be coupled to the test vehicle for movement therewith, and

C. interconnecting means between said main frame and each of said wheel frames, said interconnecting means including:

1. a pair of link members associated with each said wheel frame and said main frame,
2. means for pivotally mounting each pair of said link members in spaced apart relationship to each other between said wheel frames and said main frame, and
3. coupling means for pivotally joining each pair of said link members together to provide a connection therebetween so as to permit each said wheel frame independent freedom of motion relative to said main frame in a plane substantially perpendicular to the gauge side of the rail while simultaneously maintaining parallelism between said wheel frames.

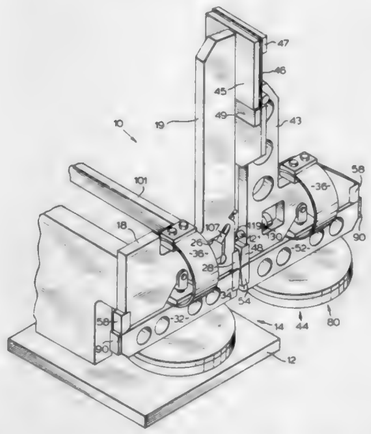


4,044,595

SHORT SPAN TENSILE TESTER SYSTEM

Bote G. Bruinsma, 2795 Bates Road, Montreal, Quebec, Canada

Filed July 19, 1976, Ser. No. 706,923
Int. Cl.² G01N *3/08*
U.S. Cl. 73—95 **6 Claims**



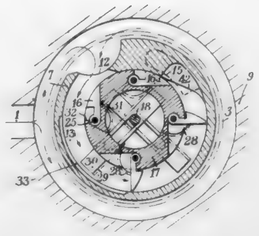
1. Testing apparatus for testing the tensile strength of a web of sheet material, having two pairs of clamping jaws in adjacent clamping relation for clamping adjoining portions of sheet material over a minimal zero gauge length, force applying wedge means to force one pair of jaws away from the other pair of jaws to cause rupture of the web, and force measuring means to measure the force required to rupture the web, one said pair of jaws comprising opposed first and second jaw portions, spring means extending between said first and second jaw portions to position them in mutual resiliently spaced relation, said spring means having substantially a single degree of freedom, to retain said jaws in predetermined self indexing relation.

4,044,596

VOLUMETRIC METER

Yves Luce, 1 bis rue Rabelais, 93100 Montreuil, France

Filed July 22, 1976, Ser. No. 707,685
Claims priority, application France, Aug. 11, 1975, 75.24928
Int. Cl.² G01F *1/07*
U.S. Cl. 73—260 **1 Claim**



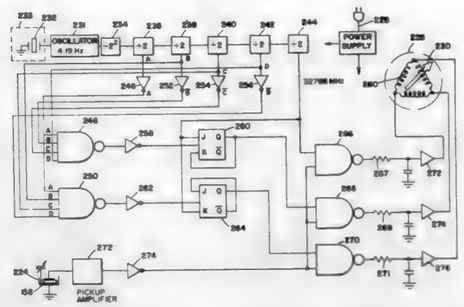
1. Volumetric meter for measuring the output of a liquid flowing therethrough, which comprises a case having at least one aperture formed therein for introducing the liquid of which the output is to be measured, at least one liquid outlet aperture, and an inner circular channel connecting one inlet aperture to one outlet aperture, said liquid being led to flow through said channel for circulating from said at least one inlet aperture to said at least one liquid outlet aperture, a central member concentric to said circular channel which bounds internally said channel and is mounted for free rotation in said case, at least two pairs of diametrally opposite vanes pivotally mounted on, and rotatably rigid with, said central member, said vanes being distributed at spaced intervals on, and mounted at the outer periphery of, said central member between a first end position in which said vanes are retracted towards the center and another end position in which said vanes are spread radially outwards so as to close said channel in this other end position, said vanes being normally urged to said other end position by the pressure of the liquid stream flowing through said channel, and wherein each pair of successive vanes form therebetween in said channel, between one inlet aperture and one outlet aperture of said channel, a predetermined volume of liquid of which the output is to be measured, means for positively controlling the return of each previously spread vane to its retracted position after the vane concerned, during its pivotal movement in said channel, has bounded with the next following vane said predetermined volume of liquid, a diametral slide, rigid with said central member, operatively associated with each pair of diametrally opposite vanes, a toothed circular segment rotatably rigid with, and coaxial to, each vane, and a rack at either end of each diametral slide, each rack being in constant meshing engagement with the circular toothed segment of the associated vane, whereby the retraction of one towards the center of the meter will control the radial spreading of the diametrically opposite vane, said vice versa, and a shaft coaxial to and rotatably rigid with said central member, each revolution of said shaft corresponding to a predetermined output of the liquid flowing through said meter.

4,044,597

FREQUENCY TUNING SYSTEM WITH VISUAL DISPLAY

Bruce G. Erickson, Santa Clara, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Division of Ser. No. 578,606, May 19, 1975, Pat. No. 4,024,750.
This application Sept. 13, 1976, Ser. No. 723,035
Int. Cl.² G04D *7/12*
U.S. Cl. 73—6 **3 Claims**



1. A visual timing aid system for aligning a time base signal generator in an electronic timepiece to a correct frequency including:

reference signal generator means for generating a reference signal at a frequency integrally related to said correct frequency;

sensor means for sensing and selectively amplifying a time base signal generated by the time base signal generator in a said electronic timepiece to be aligned;

phase change indicator means connected to said reference signal generator and to said sensor means for indicating by a relative movement the rate of phase change between said reference signal and said time base signal, said phase change indicator means including a multiphase motor having an armature element attached to a display indicator and a multiphase shifting network of the same number of phases as said motor and connected thereto and to said reference signal generator means and to said sensor means, for driving said motor with a drive signal proportional to the rate of change between said reference signal and said sensed time base signal;

whereby alignment of said time base signal generator to said correct frequency eliminates said phase change, and thereupon said display indicator ceases said relative movement indicating alignment of said time base signal generator to said correct frequency.

4,044,598

PERFORMANCE EVALUATION FACILITY FOR SEAL SKIRT-FINGERS OF SURFACE EFFECT SHIPS

Alexander B. Stavovy, Springfield, and Richard H. Chiu, Falls Church, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,946
Int. Cl.² G01N *3/56;* G01M *10/00;* B63B *9/00*
U.S. Cl. 73—7 **10 Claims**

1. A system for testing seal skirt fingers of surface effect ships comprising:

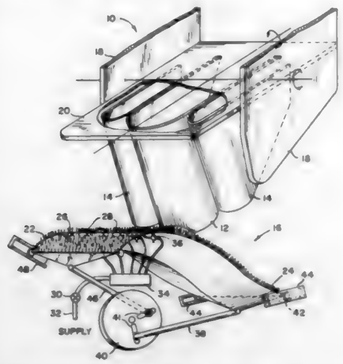
a sample skirt finger;

a first means for moving sample skirt finger to simulate both pitch and roll motion of an actual skirt finger on a surface effect ship underway;

an adjustable second means producing a flow of water over said finger's surface to simulate the effect of waterflow on said finger when said finger is mounted on a surface effect ship underway;

a third means for simulating an ocean wave profile and

operatively connected to said second means for contacting and flexing said finger to simulate movement of said



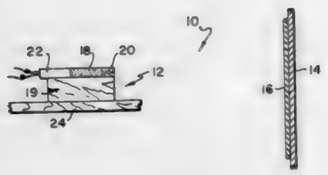
finger when underway, whereby the wear of said finger under service conditions may be determined.

4,044,599

TEST SYSTEM FOR EVALUATION OF ARMORS USING DUPLICATE FRAGMENTS

David Goldstein, Adelphi; William C. Pless, Havre de Grace; Michael Shapiro, Oxon Hill, all of Md.; Dana Spencer, Woodbridge, Va., and Leland E. Starr, Jr., Silver Spring, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 1, 1976, Ser. No. 663,003
Int. Cl.² G01N *3/08*
U.S. Cl. 73—12 **9 Claims**



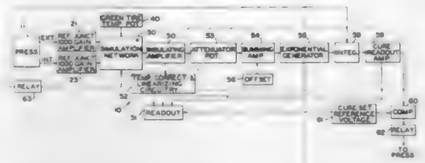
1. A test system for evaluating material comprising:
a projectile propulsion unit;
a plurality of fragments propelled by said propulsion unit as a layer;
a target for receiving the fragments;
a stroboscopic light source means for periodic illumination of the test system and the fragments in flight;
a photographic means responsive to said light source to record the test results;
said projectile propulsion unit comprising a propelling charge producing a plane shock wave without the use of a launch barrel for the propulsion of said fragments in a layer; and
ignition means to initiate detonation of said propelling charge.

4,044,600

TIRE CURE AND HEAT TRANSFER SIMULATOR

William E. Claxton, Mogadore, and Harold C. Holden, Clinton, both of Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 222,345, Jan. 31, 1972, abandoned, which is a continuation of Ser. No. 1,799, Jan. 9, 1970, abandoned. This application Aug. 19, 1974, Ser. No. 498,395
Int. Cl.² B29H *5/02*; G01N *25/00*
U.S. Cl. 73—15 R **17 Claims**



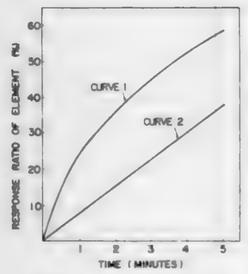
1. Apparatus for simulating the heat transfer in a tire to determine the state of cure of the tire comprising means for generating a first input voltage signal in accordance with the temperature proximate the external surface of the tire, means for generating a second voltage input signal in accordance with the temperature proximate the internal surface of the tire, simulation network means having at least one resistor representative of the heat conductivity parameter of the tire and at least one capacitor representative of the specific heat parameter of the tire, the length of said network means being representative of the physical dimension of the tire, said network means receiving said first and second voltage signals and providing a selective output signal in accordance with the temperature of a selective point internally of the tire, means establishing said selective output signal as an exponential representation of the temperature of said selective point internally of the tire relative to a reference temperature, and integrator means for integrating said exponential output signal to provide a signal proportional to an equivalent cure factor.

4,044,601

SMOKE AND GAS SENSOR ELEMENT

Yo Sakursi, Kunitachi; Hidehito Obayashi, and Tetsuo Gejyo, both of Tokyo, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 29, 1975, Ser. No. 600,052
Claims priority, application Japan, July 29, 1974, 49-86095
Int. Cl.² G01N *27/12*
U.S. Cl. 73—23 **22 Claims**



1. In a sensor device for detecting the presence of smoke and/or a gaseous substance in an atmosphere, said sensor device including a sensor element whose resistance changes with the presence of said smoke or gaseous substance, said sensor element having a surface capable of coming into contact with said atmosphere and a means for indicating the presence of said smoke or gaseous substance in said atmosphere in response to a change in the resistance of said sensor element, the improvement wherein said sensor element is formed from a material comprising:

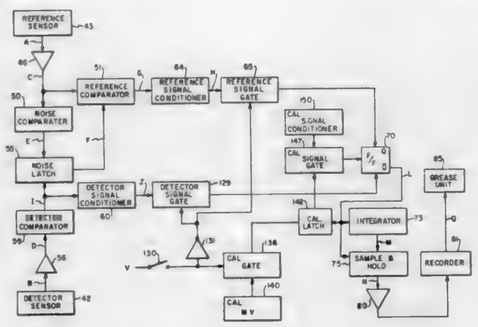
1. a complex metal oxide having a perovskite type crystal structure and represented by the general formula $ABO_{3-\delta}$, wherein A is at least one element selected from the group consisting of yttrium, a rare earth element of an atomic number from 57 to 71, and an alkaline earth metal, B is at least one element selected from the group consisting of transition metals of the atomic numbers from 21 to 30, O is oxygen and δ is a nonstoichiometric parameter, and
2. at least one metal oxide selected from the group consisting of CdO, In_2O_3, SnO, Tl_2O_3 and PbO.

4,044,602

CONSISTOMETER WITH INTERNAL CALIBRATION MEANS

Kenneth O. Higgs, Port Neches, and Lawrence F. Marsch, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,626
Int. Cl.² G01N *11/14*
U.S. Cl. 73—59 **4 Claims**



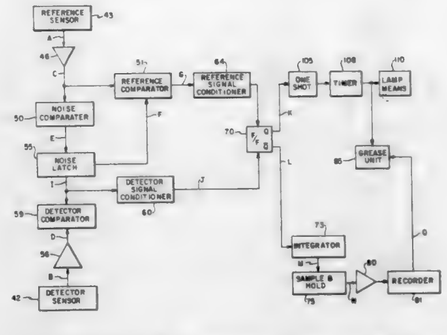
1. A consistometer for continuous measuring the consistency of a stream of material from apparatus manufacturing the material comprising a rotatable resilient member located in said stream so that the opposite surface about which said member is flexible is substantially parallel to the direction of flow in said stream, means for rotating said member at a constant rotate about an axis which is parallel to the direction of flow in said stream, a reference member, means for rotating the reference member in synchronism with the resilient member, resilient member sensing means spatially related to the resilient member for providing a resilient member signal in accordance with the movement of the resilient member, reference member sensing means spatially related to the reference member for providing a reference member signal in accordance with the movement of the reference member, noise means connected to both sensing means for providing an enabling pulse in accordance with the reference member signal and the resilient member signal, first comparison means connected to the reference member sensing means and to the noise means for comparing the reference member signal with a predetermined voltage, corresponding to an acceptable reference member signal level, when enabled by an enabling pulse, and providing a first comparison signal at one level when the reference member signal is an acceptable signal and at another level when it is not acceptable and for not making the comparison when the noise means does not provide an enabling pulse when not making the comprison; reference member pulse means connected to the first comparison means for providing a reference member pulse in response to the first comparison signal going from the other level to the one level; resilient member pulse means connected to the resilient member sensing means for providing a resilient member pulse in accordance with the resilient member signal; a flip-flop connected to both pulse means provides a signal corresponding to the consistency of the material, in accordance with the resilient member, member pulses and the reference member pulses; output means connected to the flip-flop for providing an output corresponding to the consistency of the material in accordance with the signal from the flip-flop; and calibration means connected to the flip-flop, the resilient member pulse means and to the resilient member pulse means for providing calibration pulses of a predetermined repetition rate to the flip-flop while blocking the resilient member pulses and the reference member pulses so that output means may be calibrated.

4,044,603

CONSISTOMETER WITH AUTOMATIC SHUT-DOWN

Kenneth O. Higgs, Port Neches, and Lawrence F. Marsch, Port Arthur, both of Tex., assignors to Texaco Inc., New York, N.Y.

Filed Sept. 1, 1976, Ser. No. 719,628
Int. Cl.² G01N *11/14*
U.S. Cl. 73—59 **4 Claims**



1. A consistometer for continuously measuring the consistency of a stream of material from apparatus manufacturing the material comprising a rotable resilient member located in said stream so that the opposite surfaces about which said member is flexible are substantially parallel to the direction of flow in said stream, means for rotating said member at a constant rate about an axis which is parallel to the direction of flow in said stream, a reference member, means for rotating the reference member in synchronism with the resilient member, resilient member sensing means spatially related to the resilient member for providing a resilient member signal in accordance with the movement of the resilient member, reference member sensing means spatially related to the reference member for providing a reference member signal in accordance with the movement of the reference member, noise means connected to both sensing means for providing an enabling pulse in accordance with the reference member signal and the resilient member signal, first comparison means connected to the reference member sensing means and to the noise means for comparing the reference member signal with a predetermined voltage, corresponding to an acceptable reference member signal level, when enabled by an enabling pulse, and providing a first comparison signal at one level when the reference member signal is an acceptable signal and at another level when it is not acceptable and for not making the comparison when the noise means does not provide an enabling pulse when not making the comparison; reference member pulse means connected to the first comparison means for providing a reference member pulse in response to the first comparison signal going from the other level to the one level; resilient member pulse means connected to the resilient member sensing means for providing a resilient member pulse in accordance with the resilient member signal; a flip-flop connected to both pulse means provides a signal corresponding to the consistency of the material, in accordance with the resilient member pulses and the reference member pulses; output means connected to the flip-flop for providing an output corresponding to the consistency of the material in accordance with the signal from the flip-flop; and control

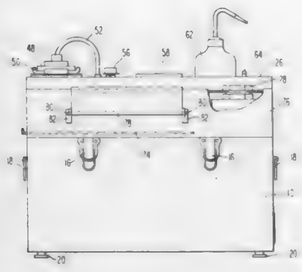
means connected to the flip-flop and to the apparatus for controlling the apparatus in accordance with the signal from the flip-flop so that the apparatus continues to manufacture the material when the flip-flop provides a signal which alternately changes level and to prevent the apparatus from manufacturing the material when the signal from the flip-flop does not change levels.

4,044,604

PORTABLE CONTAMINATED FUEL DETECTOR WITH TIERED DECK

Daniel G. Russ, Fort Wayne, Ind., assignor to Telectro-Mek, Inc., Fort Wayne, Ind.

Filed June 15, 1976, Ser. No. 696,273
Int. Cl.² G01N *21/34, 33/22*
U.S. Cl. 73—61 R **7 Claims**



1. A combination contaminated fuel detector, comprising at least sample holder means, fuel filter means in a filter retainer, a vacuum receptacle arranged in series with means causing said parts to seal together upon drawing a vacuum to accelerate flow of fuel through the filter means into the vacuum receptacle and vacuum pump means for said purpose connected by a vacuum line to said vacuum receptacle, and a free water detector, comprising a sample holder for a filter sample in close proximity to a plurality of comparison standards representative of different water content levels against which the sample may be compared and a light source positioned to illuminate the sample holder and comparison standards and providing an ultraviolet light to cause chemicals in a treated filter pad subject to free water from a fuel sample passed therethrough and the comparison standards to fluoresce, the intensity of sample fluorescence being a function of the amount of free water, the improvement comprising combining the two detectors in a single unit and providing

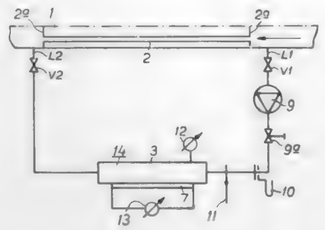
a box enclosure including a top and bottom, a tiered deck supported on said bottom for supporting, in turn, a photosensor filter examination system, including at least a light source, a filter holder and a photosensor and a meter means coupled to said photosensor, an entrance to the vacuum receptacle including a removable filter retainer, the top cover enclosing parts projecting above the deck tiers and the tiers serving to provide a better view of all parts on display, a slide element being insertable into the enclosure beneath, spaced from, and generally parallel to one of the tiered decks supported on a slide support to be positionable in sequence beside standards located proximate to the slide between the slide and the deck, a source of ultraviolet light being positioned beneath the deck and spaced above the sample holder and standards and a viewing opening being provided in a vertical connecting wall between the tiered deck region beneath which the slide is located and the lower deck element so as to be enclosed within the top cover.

4,044,605

APPARATUS FOR MEASURING FOULING ON THE INSIDE OF A HEAT-EXCHANGER TUBE

Lars Bratthäll, Linköping, Sweden, assignor to Stal-Laval Apparat AB, Linköping, Sweden

Filed Nov. 12, 1975, Ser. No. 630,946
Claims priority, application Sweden, Nov. 15, 1974, 7414392
Int. Cl.² G01N *25/18*
U.S. Cl. 73—61.2 **4 Claims**



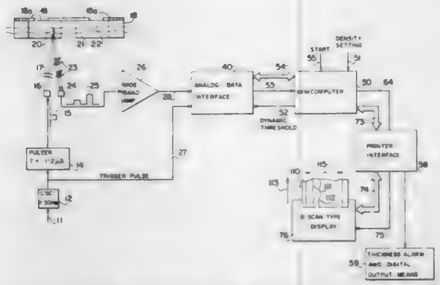
1. An apparatus for measuring fouling on the insides of the tubes of a working heat exchanger comprising a casing surrounding the tubes with the tubes internally carrying a flow of medium capable of fouling the tubes' insides; said apparatus being separate from said heat exchanger and operative without putting the heat exchanger out of operation and comprising a test tube having substantially the same composition as said heat exchanger tubes, conduit means for conducting a portion of said flow through said test tube, a pressure chamber surrounding and enclosing at least a portion of the outside of said test tube and forming a space therearound isolated from external uncontrollable influences, a condensible vapor contained by said chamber in said space, the total quantity of condensed and uncondensed vapor being constant and means for measuring the fluid pressure in said space as determined by the condensation of said vapor in the space.

4,044,606

SENSING THICKNESS OF A THIN BODY DISPOSED BETWEEN TWO DIVERSE SURFACES

Lester Robert Le Blanc, 80 Highland Ave., Narragansett, R.I. 02882, and Foster Hugh Middleton, Curtis Corner Road, Peace Dale, R.I. 02879

Filed June 11, 1976, Ser. No. 695,144
Int. Cl.² G01N *29/00*
U.S. Cl. 73—67.7 **7 Claims**



1. Apparatus for indicating the thickness of a layer of oil floating on a moving body of water comprising in combination,

acoustic pulser apparatus comprising an ultrasonic transducer adapted to be positioned beneath the surface of said body of water and adapted to repetitively transmit discrete pulses of wave energy in a narrow beam at a predetermined repetition frequency from said body of water along a path through said layer of oil and into the atmosphere thereabove,

a float for supporting said transducer in said body of water, said float being of a size to encompass a large enough surface area to track with waves on the oil-water surface to average out the effect of wave motion,

acoustic receiver apparatus adapted to detect noise and reflected pulses from said beam including some discrete signals reflected from the oil-water interface and some discrete signals reflected from the oil-atmosphere interface,

dynamic threshold apparatus for rejecting reflected energy and noise having a predetermined amplitude below the amplitude of discrete signals reflected from the oil-water interface,

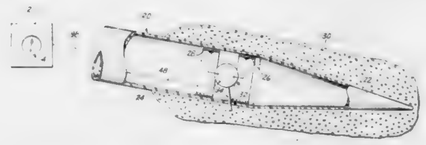
and means for translating the time span between the pulses reflected from the two said interfaces into an indication of the thickness of said layer of oil.

4,044,607

GRAIN MOISTURE MEASUREMENT PROBE

Clarence D. Deal, Oklahoma City, Okla., assignor to Electromeasures, Inc., Ennis, Tex.

Filed Apr. 30, 1976, Ser. No. 682,013
Int. Cl.² G01R *27/26*
U.S. Cl. 73—73 **11 Claims**



1. A moisture measuring apparatus comprising:

a. a probe for insertion into material to be measured, having a housing of dielectric material;

b. means for generating a divergent electrostatic field substantially symmetrical about the probe housing and having a major portion thereof extending externally of the housing, said means including a pair of capacitance electrodes disposed within said probe physically isolated by said housing from the material to be measured,

c. a frequency generating circuit including said electrodes, said frequency generating circuit providing an output signal having a frequency dependent upon the capacitance between said electrodes, and

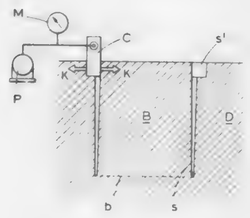
d. readout means connected to receive said output signal.

4,044,608

METHOD FOR IN SITU DETERMINATION OF CONCRETE STRENGTH

Randulf Inge Johansen, Trondheim, Norway, assignor to A/S Trondhjems Nagle & Spigerfabrik, Trondheim, Norway

Filed May 26, 1976, Ser. No. 689,984
Claims priority, application Norway, June 5, 1975, 751978
Int. Cl.² G01N *3/20*
U.S. Cl. 73—88 C **3 Claims**



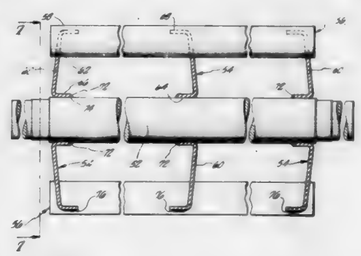
1. A method for in situ determination of concrete strength in a concrete structure or parts thereof, wherein the flexural strength of the concrete is determined at a test section located a certain distance from the surface of the concrete structure and preferably parallel thereto, said method comprising establishing the test section by arranging a tubular form element of a certain length in freshly poured and levelled concrete and extending down from the surface thereof, allowing the concrete to harden at least partly, removing the form element from the hardened or partly hardened concrete to leave in the concrete a slit surrounding a concrete core projection having a shape corresponding to the dimensions of the form element, and then subjecting the concrete core to a bending test by applying a recordable force at a place in the slit opening between the concrete core and the surrounding concrete until rupture occurs at the test section where the core is connected to the remainind concrete.

4,044,609

WHEEL-ENGAGING ROLLER STRUCTURE FOR VEHICLE TESTING APPARATUS

Carl J. Asmus, Temple City, Calif., assignor to Clayton Manufacturing Company, El Monte, Calif.

Filed July 18, 1975, Ser. No. 597,170
Int. Cl.² G01M *15/00*; G01L *5/28*
U.S. Cl. 73—117 **10 Claims**



1. A roller adapted to engage and drive a wheel for testing purposes, comprising:

a shaft extending along the axis of rotation of the roller at least part of the roller's axial length,

a plurality of generally disc-shaped supporting members secured to the shaft at axially spaced points and extending generally radially outward from the shaft,

said disc-shaped supporting members each having a plurality of circumferentially-spaced slots formed in its periphery and axially aligned with corresponding slots in the other supporting member or members, and

a plurality of axially extending wheel-engageable members secured to the disc-shaped members and supported in the slots formed therein, each said wheel engageable member having a substantially V-shaped cross-section, each side of which provides a wheel-engageable rib.

4,044,610

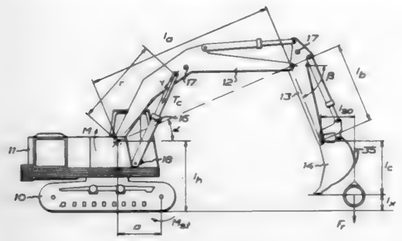
EXCAVATORS

Karl Olof Oldaeus, Landskrona; Osten Lars Tordenmalm, Sodra Sandby, and Nils Bo Nilsson, Eslov, all of Sweden, assignors to Akermans Verkstad AB, Eslov, Sweden

Filed Mar. 10, 1976, Ser. No. 665,699
Claims priority, application Sweden, Mar. 12, 1975, 75027599
Int. Cl.² E02F *9/26*
U.S. Cl. 73—133 R **4 Claims**

1. In an excavator, including a chassis, a turret rotatable relative thereto, and an excavation assembly mounted on said turret and including a boom, a stick and a shovel, the improvement comprising angular measurement devices placed on at least the boom and the stick and arranged to measure, by means of the gravitational force, the angle of the boom and the stick, respectively, relative to the horizontal plane, and an evaluation instrument to which all of the angular measurement devices

are connected and which is arranged to indicate the excavation depth on the basis of the length of the boom and the stick and



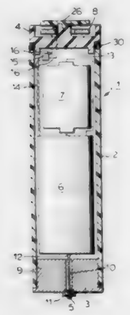
by means of the values received from the measurement devices.

4,044,611

EXPENDABLE OCEANOGRAPHY PROBE

Yuichi Kaname, Kaizuka; Masaya Nakajima, Neyagawa, and Katumi Tabuchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed July 15, 1975, Ser. No. 596,564
Int. Cl.² G01W *1/00*
U.S. Cl. 73—170 A **13 Claims**



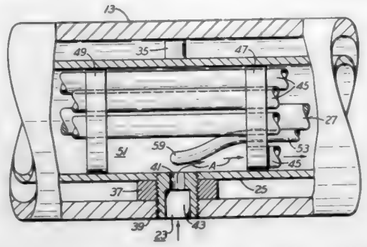
1. An expendable oceanography probe of the free-falling type comprising: a hollow cylindrical housing; a front end weight element hermetically fitted into the lower end of said cylindrical housing; a sensor mounted on the external surface of said front end element for detecting information relating to water to be tested, said external surface of said front end element being a flat surface: an oscillating circuit electrically coupled to said sensor and the oscillating frequency of which is changed according to the signal from said sensor; an electro-acoustical disk transducer to operate in radial vibration mode and electrically coupled with said oscillating circuit for radiating a sound signal corresponding to the detected information into water around the probe; a transducer holder hermetically mounted on the upper end of said cylindrical housing and having an end surface facing outwardly of the probe, a center axle on the end surface and a cylindrical wall around said end surface; and a rear end disk plate, said transducer having a center hole and being mounted within said cylindrical wall and over said center axle with said center axle extending through said hole and said rear end disk plate attached to said axle for holding said transducer on said transducer holder, said probe having an apparent density in the range of about 1.9 grams/cm³ to 2.8 grams/cm³, the center of gravity of said probe being positioned at a point between the lower end and one third the length of the probe from the lower end and along the central longitudinal axis of said probe.

4,044,612

PROBE FOR OBTAINING GAS SAMPLES FROM A SHAFT FURNACE

Russell A. Powell, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Jan. 14, 1977, Ser. No. 759,430
Int. Cl.² G01N *1/26*
U.S. Cl. 73—341 **10 Claims**



1. Apparatus adapted to take samples of gas from a plurality of locations within the burden in a shaft furnace and to measure the ambient temperature in said furnace at said locations, comprising:

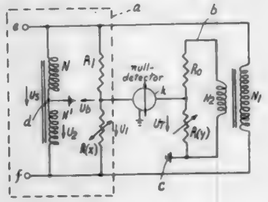
a. a hollow tubular outer shell having one shaped closed end adapted for penetrating said burden;
b. a hollow tubular inner shell having one closed end adjacent said closed end of said outer shell;
c. means for maintaining said inner shell axially aligned within said outer shell and spaced apart therefrom;
d. means within said inner tubular shell subdividing the interior thereof into a plurality of chambers;
e. a plurality of gas entry ports in said outer and inner shells, each said port communicating with a respective chamber in said inner shell;
f. an axial supporting member extending lengthwise within said tubular inner shell;
g. a plurality of gas sampling conduits arranged around said axial supporting member in spaced relation thereto, each said gas sampling conduit communicating with a respective chamber in said inner shell;
h. a plurality of sheathed thermocouples arranged around said axial supporting member and disposed between said gas sampling conduits and said axial supporting member, each sheathed thermocouple terminating in a sensing end disposed in a respective chamber in said inner shell; and
i. means for flowing a cooling fluid in the annulus between said inner and outer shells.

4,044,613

DIRECT READING TEMPERATURE MEASURING BRIDGE CIRCUIT

Arnfried Preuss, Bordesholm, Germany, assignor to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel, Kiel, Germany

Filed Feb. 21, 1975, Ser. No. 551,943
Claims priority, application Germany, Mar. 1, 1974, 2409841
Int. Cl.² G01K *7/20*; G05F *3/00*
U.S. Cl. 73—362 AR **1 Claim**



1. A temperature measuring circuit comprising in combination:

a. an electrical bridge comprising;
1. a temperature responsive resistor and a reference resistor in two of its branches respectively;

2. first and second windings of a transformer in the other two of its branches respectively;
b. means for supplying a voltage input across the junction points between said resistors and said transfer windings;
c. a null detector;
d. means for connecting said null detector to the output of said bridge taken between the junction of said transformer windings and a common connecting point between said temperature responsive and reference resistors;
e. a voltage divider comprising a fixed resistor and a variable resistor;
f. means for supplying a portion of said voltage input across said fixed and said variable resistors;
g. means for connecting said null detector to a junction between said fixed and variable resistors whereby said variable resistor may be adjusted so as to supply voltage to said null detector until the voltage from said bridge has been nullified; and
h. a linear graduation scale associated with said variable resistor having a predetermined temperature indicating scale;
i. the ratio of the supply voltage for said potential divider to the supply voltage of said bridge being such that when balanced there is a linear relationship between the actual temperature change sensed by said temperature responsive resistor and the incremental change of the value of said variable resistor necessary to nullify the voltage from said bridge as determined by said null detector.

4,044,614

THERMOMETER

Paul Beckman, Tarrytown, N.Y., assignor to IPCO Hospital Supply Corporation, White Plains, N.Y.

Filed Oct. 8, 1975, Ser. No. 620,586
Int. Cl.² G01K *1/08, 5/08*
U.S. Cl. 73—371 **12 Claims**



1. A thermometer having a bulb portion and a stem portion comprising:

a. a first layer member enclosing said stem portion of said thermometer, said first layer having an index of refraction sufficiently high to provide visual interpretation of the positional location of an internally contained heat expandable substance in relation to indicia formed on said stem portion, and,
b. a second thermally conductive silicone rubber layer member enclosing said bulb portion of said thermometer, said second layer member being separate and distinct from said first layer member, said first and second layers being joined to form closed contour enclosure for said thermometer throughout an extended length of said thermometer, said first and second layer members being secured to said stem and bulb portion and each of the other for providing contiguous contact of said layers with an outer surface of said thermometer throughout said extended length of said thermometer, said first and second layer member being non-removably secured to said outer surface of said thermometer.

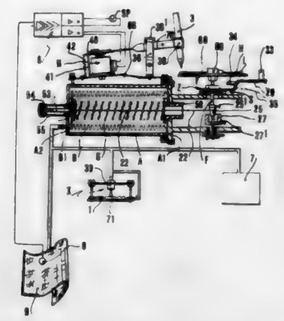
4,044,615

ELECTRIC SPHYGMOMANOMETER

Rino Ghigini, c/o Dr. Ing. Misitano A.G., Via Padova, 217, 20127 Milan, Italy

Filed Dec. 1, 1975, Ser. No. 636,672
Int. Cl.² G01L *19/08, 7/06*
U.S. Cl. 73—391 **1 Claim**

1. In a blood pressure recording device including a manometric bracelet or cuff adapted to encircle a limb of a person: pressure means for applying a pressure to said limb; a rotatable platform for removably supporting a blood pressure recording disc and rotating the disc in response to the value of pressure applied by said pressure means; a writing instrument for writing on said record disc and actuating means for operating said writing means to write on said record disc in response to pulse beats of blood pressure; and means for locating the said record disc with respect to the said rotatable platform, the improvement comprising the provision of a mechanism for rotating the said platform including: a cylindrical bellows having a bottom and a flanged opening; a rigid cup shaped body surrounding the said bellows; a flanged frame rigidly connected with the said cup shaped body and sealing the said flanged opening of the bellows so as to define a sealed chamber in communication with the said cuff; a first screw setting means screwed to said flanged frame; a strong cylindrical spring arranged in the said bellows and compressed between the said bottom of the said



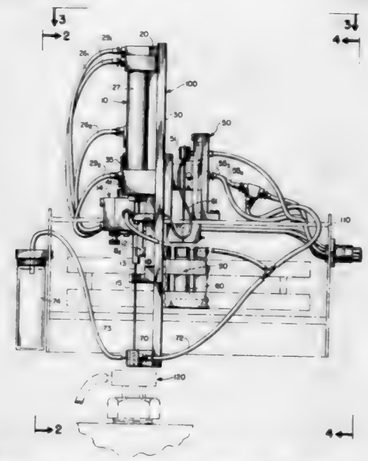
bellows and the said first screw setting means; a rotatable spindle connected to said platform, a conical pulley adjustably connected to the said spindle so as to provide a second setting means; a bush adjustably connected to the said spindle; a wire connected at one end to said bottom of the bellows and at the other end to the said bush whereby the axial deformations of the said bellows body in response to decreasing pressure in the said cuff may be adjustably converted into rotation of the said conical pulley and of the said platform; adjustable elastic means for biasing the said platform in a direction opposite to that caused by the strong cylindrical spring and constituting a third setting means.

4,044,616

AUTOMATIC FLUID INJECTOR

Rano J. Harris, Sr., 1945 Carolyn Sue Drive; Rano J. Harris, Jr., 5443 Stonewall Drive, both of Baton Rouge, La. 70815, and Julius P. Averette, Jr., 4332 Delaware St., Baton Rouge, La. 70805

Continuation-in-part of Ser. No. 618,374, Oct. 1, 1975, Pat. No. 4,000,654. This application Dec. 13, 1976, Ser. No. 749,804
Int. Cl.² G01N *1/12*
U.S. Cl. 73—422 GC **10 Claims**



1. A fluid injector for the measurement and injection of

preselected quantities of a fluid specimen into a media such as an inlet to an analytical instrument which comprises

a barrel,

a hollow needle sealed and slidably mounted within the forward end of said barrel,

a valve located at the rearward end of said barrel for opening and closing said barrel to the flow of the fluid specimen through the barrel and hollow needle,

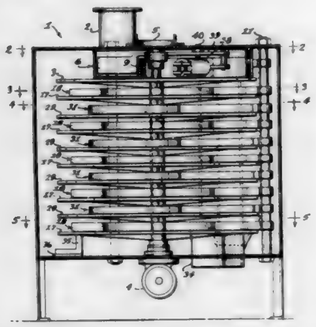
whereby, on opening the valve, the fluid specimen can be flowed through the barrel and needle to purge and clean same and, on closing the valve, a measured amount of the fluid specimen can be trapped inside the barrel and needle, and then injected by relative forward movement of the barrel such that the needle moves rearwardly into the barrel to displace and cause ejection of the fluid specimen through the forward end of the hollow needle.

4,044,617

MULTI-STAGE SAMPLER FOR FLOWING MATERIAL

Flavio J. Mazzetti, 6580 Arequa Ridge Lane, Colorado Springs, Colo. 80919

Filed Sept. 27, 1976, Ser. No. 726,808
Int. Cl.[2] G01N *1/14*
U.S. Cl. 73—424 **9 Claims**



1. A multi-stage sampler for providing a representative sample of a flowing stream of material, the multi-stage sampler comprising:

a first conveying means including a movable member with a conveying surface and a drive means for moving said member,

a first delivery means for delivering material onto said conveying surface,

a first guide means positioned above the conveying surface in close proximity thereto for guiding the material being conveyed by said first conveying means along a predetermined path across said conveying surface,

a portion of said conveying surface has at least one hole through it, said driving means moving said portion under said predetermined path so that an initial sample of the material being conveyed by said first conveying means will fall through said hole,

a second conveying means including a movable member with a conveying surface and a drive means for moving said member,

a second guide means positioned above the conveying surface of said second conveying means for guiding material being conveyed by said second conveying means along a predetermined path across the conveying surface thereof,

a portion of said conveying surface of said second conveying means has at least one hole through it, said driving means of said second conveying means moving said portion thereof under the predetermined path defined by said second guide means,

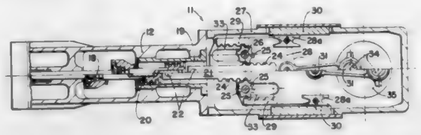
a second delivery means for delivering material onto the conveying surface of said second conveying means, said second delivery means includes a receiving means positioned below said predetermined path defined by said first guide means to receive said falling initial sample whereby an initial sample of the material delivered onto the conveying surface of the first conveying means passes through the hole therein into the receiving means of the second delivery means which delivers the initial sample onto the conveying surface of the second conveying means which passes a sample of the initial sample through the hole therein.

4,044,618

MACHINE DRIVE MECHANISM

Anton Braun, 6421 Warren Ave., Minneapolis, Minn. 55435

Filed Mar. 15, 1976, Ser. No. 666,697
Int. Cl.[2] F16H *19/04*
U.S. Cl. 74—29 **15 Claims**



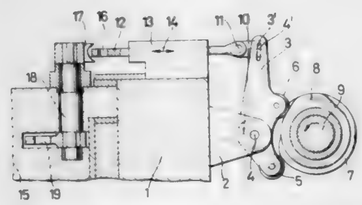
1. A machine drive mechanism for use between a power unit and an energy absorbing unit comprising a counterbalancing and floating rack and pinion mechanism between the units including an axially reciprocable guide means, a pair of spaced and rigidly connected gear racks symmetrically spaced with respect to the axis of said guide means and reciprocable thereon, a double rack member extending between and spaced from said gear racks and reciprocable on said axis, one of said pair of spaced gear racks and double rack member being connected to said guide means so as to permit some lateral movement of the double rack member and spaced gear racks with respect to the axis of said guide means, a pair of gears pivoted on fixed pivots with one each of said gears operably engaging one each of the gear racks on said double rack member and said pair of spaced gear racks for causing said pair of spaced racks and double rack to move in opposite directions and means for connecting one of said pair of spaced gear racks and double rack member to a power source, the masses of the oppositely moving elements of the drive mechanism and the reciprocable elements of the power unit and the energy absorbing unit to be connected thereto being substantially equal.

4,044,619

DEVICE FOR CONTROLLING AUXILIARY MEANS ARRANGED IN THE RECIPROCATING CARRIAGE OF SINGLE OR MULTISTAGE PRESSES

Friedrich-Karl Koch, and Hugo Schneiders, both of Krefeld, Germany, assignors to Peltzer & Ehlers, Krefeld, Germany

Filed June 23, 1975, Ser. No. 589,793
Int. Cl.[2] F16H *25/08*
U.S. Cl. 74—53 **7 Claims**



1. Apparatus comprising a reciprocating carriage (15) having an ejector plunger (20) that travels therewith;

a two-arm lever (18) pivotally mounted on said carriage and movable therewith, one arm of said lever being operably connected to said ejector plunger;

operating means (12) having a flat bearing surface (16, 33) slidably engaging the outer end of the other arm of said lever, said flat bearing surface extending parallel to the line of travel of said carriage, whereby reciprocating movement of said carriage merely causes said other arm of said lever to slide along said flat bearing surface without rocking said lever on its pivot;

said operating means being movable in the direction perpendicular to said flat surface so as to rock said other arm of said lever about its pivot axis and thereby actuate said ejector plunger and

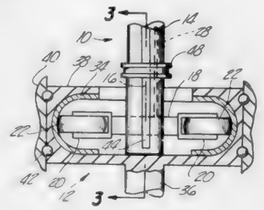
means for periodically moving said operating means.

4,044,620

TRANSMISSION

Erwin F'Geppert, Novi, Mich., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 10, 1975, Ser. No. 639,529
Int. Cl.[2] F16H *15/00, 55/34;* F16D *13/22*
U.S. Cl. 74—190 **5 Claims**



1. A variable speed ratio transmission comprising a rotary input mechanism and a rotary output mechanism coaxially aligned for rotation on a single transmission axis;

said output mechanism including an endless annular track centered on the transmission axis; said input mechanism including a rotary shaft on the transmission axis, a cross head extending transverse to the shaft, and a pneumatic tire rotatably mounted at each end of the cross head for planetary orbiting movement around the track surface; the tires and track constituting the drive connected between the input and output mechanisms; said input mechanism futher comprising means carried by the input shaft for rotatably adjusting the cross head around its axis, whereby the tire rotational planes are enabled to take varying angles relative to the track plane.

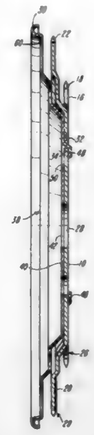
4,044,621

SPROCKET STRUCTURE AND CHAIN GUARD

John C. McGregor, Sr., 252 N. Broadmoor Blvd., Springfield, Ohio 45504; Daniel P. McGregor, 1505 N. Lowry Ave., Springfield, Ohio 45506, and James B. McGregor, 622 Snowhill Blvd., Springfield, Ohio 45504

Filed June 9, 1975, Ser. No. 585,380
Int. Cl.[2] F16H *55/30*
U.S. Cl. 74—243 R **17 Claims**

1. A compound sprocket structure particularly advantageous for use in a bicycle or other vehicle comprising a single plate structure including at least two plate segments each of which has a peripheral edge formed to include a set of teeth, one of said plate segments being offset from the other to provide that said plate segments are arranged thereby to lie in adjacent substantially parallel planes, one of said plate segments being rimmed by and lying within the boundary of the other and the outer of said plate segments having an annular shape, and strip-like plate portions providing connector means joining the respective plate segments, as a continuing part thereof, to rigidly maintain said plate segments in their respective offset substantially parallel planes.

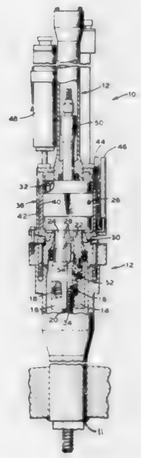


4,044,622

ANTI-EJECTION SYSTEM FOR CONTROL ROD DRIVES

John C. Matthews, 516 E. Allen St., Lancaster, Ohio 43130

Filed Feb. 18, 1975, Ser. No. 550,250
Int. Cl.[2] F16H *1/18*
U.S. Cl. 74—424.8 R **13 Claims**



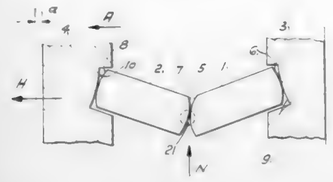
1. An anti-ejection system for a control rod drive assembly of a nuclear reactor comprising:

a linearly movable control member driven by the control rod drive assembly for positioning a control rod in the nuclear reactor;

latch means engageable with said control member to move with said control member whenever said control member moves in a first direction, said latch means remaining stationary when said control member moves in a second direction opposite said first direction; and

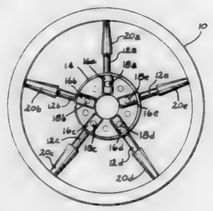
deforming means for binding said control member to prevent further movement thereof in response to said latch means moving a predetermined distance in said first direction.

4,044,623
TOGGLE-LEVER POWER AMPLIFIER
Peter Preisenhammer, Kempten, Germany, assignor to Saurer-Allma GmbH Allgauer Maschinenbau, Kempten, Germany
Continuation of Ser. No. 441,579, Feb. 11, 1974, abandoned.
This application July 16, 1975, Ser. No. 596,574
Claims priority, application Germany, Feb. 19, 1973, 2308175
Int. Cl.² G05G *1/04*
U.S. Cl. 74—520 **15 Claims**



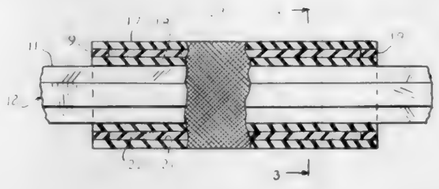
1. A toggle-lever power amplifier comprising a central axis and a plurality of toggle-lever pairs symmetrically and concentrically arranged around said axis, one of whose levers is supported on a stationary abutment means and whose other lever is supported on a movable pressure block means forming the high-pressure part, a low-pressure part having inclined pressure surfaces engaging in each case a counter-pressure surface on one toggle-lever of each of said toggle-lever pairs, said low-pressure part being positioned between these toggle-lever pairs and slidable in the direction of movement of said pressure block means and acting on said counter-pressure surface on said one toggle with a force directed approximately perpendicular to said one toggle, said two toggle-levers of each pair being supported directly on one another and on said stationary abutment means and said pressure block means and all supporting surfaces roll on one another with line contact during the movement of said toggle-lever pairs, each of said supporting surfaces on said toggle-lever pairs which roll on one another having means defining a recess therein and a roller element is loosely received in said recess while maintaining the support between said supporting surfaces which roll on one another.

4,044,624
BOAT STEERING WHEEL
Donald Allen Dekker, Grand Rapids, Mich., assignor to Attwood Corporation, Lowell, Mich.
Filed Oct. 28, 1975, Ser. No. 625,895
Int. Cl.² B62D *1/04*
U.S. Cl. 74—552 **15 Claims**



1. A steering wheel comprising:
an annular steering rim;
a central hub having a spoke receiving means and a central axial opening;
a plurality of elongated radial spokes having a first end with rim coupling means and a second end with hub coupling means, each spoke coupled at the first end to the steering rim and at the second end to the spoke receiving means; and
spoke securing means in the central hub, the spoke securing means being a relatively more easily deformed portion of the central hub for engaging the spoke within the spoke receiving means and including a staked projection from the central hub projecting into said spoke receiving means and engaging said hub coupling means of a radial spoke passing through said spoke receiving means thereby securing the radial position of the spoke.

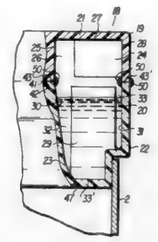
4,044,625
VIBRATION ISOLATING HAND GRIP FOR SHANK OF A PERCUSSIVE CHISEL
Marcel P. D'Haem, New Hartford, and Wallis C. Axt, Holland Patent, both of N.Y., assignors to Chicago Pneumatic Tool Company, New York, N.Y.
Filed July 1, 1976, Ser. No. 701,536
Int. Cl.² G05G *1/04*
U.S. Cl. 74—558.5 **7 Claims**



1. A sleeve unit adapted to be applied to the shank of a work element of a perspective tool and adapted to be grasped in the palm of a worker's hand during operation of the tool, the sleeve unit comprising an enlongated cylindrical body formed of manually squeezable resilient material, the body having an axially extending through hole adapted to receive slidably the shank of a percussive work element, the body having an elongated annular or closed cavity therein, and fluent material filling the cavity, said body comprising a cylindrical outer sleeve of elastomeric material, a cylindrical inner sleeve of elastomeric material disposed in coaxial relation to the outer sleeve, an annular elastomeric spaced disposed between the sleeves at one end of the unit, a second annular spacer disposed between the sleeves at the opposite end of the unit, the spacers serving the space the outer sleeve radially from the inner sleeve, the spacers defining a closed annular cavity between the sleeves containing the fluent material, the spacers being bonded to the inner and outer sleeves, and the inner sleeves defining the axial through hole.

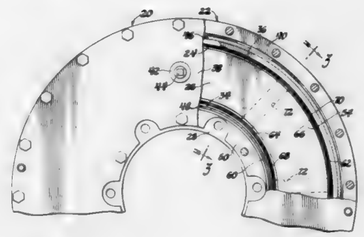
4,044,626
BALANCING RING OF CENTRIFUGAL EXTRACTOR
Gentaro Hayashi, Kanzaki; Kenji Yamamoto, Kusatsu, and Yasakao Yamamoto, Yasu, all of Japan, assignors to Sanyo Electric Co., Ltd., Moriguchi, Japan
Filed Apr. 14, 1976, Ser. No. 676,820
Claims priority, application Japan, Apr. 18, 1975, 50-48851; May 7, 1975, 50-61404[U]
Int. Cl.² F16F *15/22*; D06F *37/24*
U.S. Cl. 74—573 F **7 Claims**

1. The combination comprising a spin basket for a cetrifugal type washing machine, said basket having a bottom and a side wall, a hollow balancing ring adapted for containing a liquid attached to said basket side wall, said balancing ring having top bottom and side walls, and a plurality of partition members projecting from said ring top and bottom walls extending only



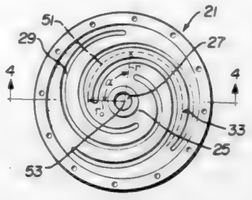
partially into the interior of the ring adapted to modify the flow of liquid in the ring.

4,044,627
VISCOUS DAMPER FOR SMOOTHING TORSIONAL AND BENDING VIBRATIONS IN ROTATING SHAFTS
Robert W. Zander, Detroit, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Mar. 1, 1976, Ser. No. 662,325
Int. Cl.² F16F *15/10*
U.S. Cl. 74—574 **1 Claim**



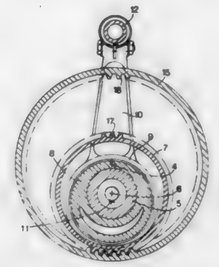
1. A rotary shaft damper for damping torsional and bending vibrations, said damper comprising
a housing having mounting means and defining an internal annular chamber,
a flywheel ring floating freely in said chamber and having oppositely axially facing working surfaces in shear film spaced relation to confronting internal working surfaces of the housing, said ring also having a radially facing surface spaced farther than shear film spacing and sufficiently far from a confronting radially facing surface of the housing to permit substantial lateral movement of said ring within said chamber,
radially yieldable spring means disposed between said radially confronting surfaces and biasing said radially facing ring surface toward a position concentric with said radially facing housing surface and
viscous damping fluid in said chamber in the spaces between the confronting surfaces of the flywheel and housing,
said flywheel ring being movable in said chamber a sufficient amount both angularly and laterally relative to said housing to transmit damping forces to said housing through said viscous fluid and said spring means to oppose both torsional and lateral vibrations of said housing, wherein said radially yieldable spring means comprises a metal spring element annularly disposed between said radially confronting surfaces and having alternately oppositely directed humps resiliently deformed by and engaging said confronting surfaces whereby said surfaces are urged apart.

4,044,628
TORSIONAL DAMPER
Roy T. Jacks, Sterling Heights, Mich., assignor to U.S. Manufacturing Corporation, Fraser, Mich.
Filed Mar. 24, 1976, Ser. No. 670,052
Int. Cl.² F16F *15/10*
U.S. Cl. 74—574 **9 Claims**



1. A torsional damper for damping out vibrations produced when a shaft is driven by the intermittent application of a discontinuous torque-like force comprising a unitary, integrally cast, disk-like mass having three concentric portions, namely, a first central portion adapted for engaging said driven shaft, a second outer annular ring portion, and an intermediate spring-like portion coupling said inner and outer portions, said spring-like portion including elongated, spirally-arranged, overlapping slots of uniform radial thickness extending axially through said disk and radially between said inner and outer portions to provide spirally-arranged integral web portions adapted to act as torsional shock-absorbing spring means for damping out said vibrations, and wherein for each spiral slot, its radial distances from the spiral center to any point along the web portion centerline is given by the equation $r=r_o+\alpha C$.

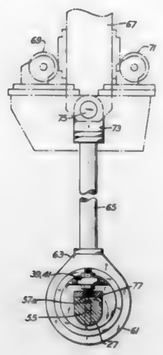
4,044,629
RECIPROCATING PISTON MACHINE
John Michael Clarke, Poplars Farm House, Mollington, Banbury, Oxfordshire, England
Filed Dec. 29, 1975, Ser. No. 645,011
Int. Cl.² G05G *1/00*; F02B *75/04*
U.S. Cl. 74—579 E **9 Claims**



1. A reciprocating piston machine including a cylinder, a piston reciprocatable therein, a crank-shaft, a crank-pin offset laterally from the axis of rotation of said crank-shaft, a connecting-rod pivotally-mounted on said crank-pin and pivotally-connected at the end thereof remote from said crank-pin to said piston, the axis of pivoting of said connecting-rod on said crank-pin offset laterally from the longitudinal axis of said crank-pin, and means constraining the axis of pivoting of said connecting-rod on said crank-pin to follow a predetermined locus as said crank-shaft is rotated, said constraining means comprising a non-rotatable gear mounted co-axially of the crank-shaft axis of rotation and a rotatable gear wheel mounted co-axially on said crank-pin for rotation thereon and in mesh with said non-rotatable gear, said connecting-rod mounted on

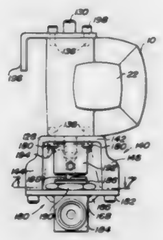
said rotatable gear to pivot about an axis offset laterally from the longitudinal axis of said crank-pin.

4,044,630
ADJUSTABLE ECCENTRIC
Donald N. Adams, Pittsburgh, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Continuation of Ser. No. 535,835, Dec. 23, 1974, abandoned.
This application Mar. 18, 1976, Ser. No. 668,214
Int. Cl.² G05G *1/00*
U.S. Cl. 74—600 **3 Claims**



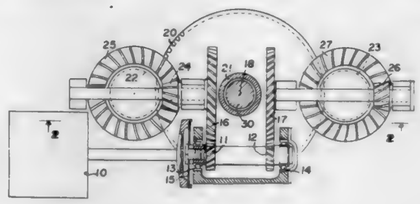
1. Apparatus that oscillates the casting mold of a continuous casting machine, wherein the improvement comprises:
a. a shaft journaled for rotation about a horizontal axis;
b. means for rotating said shaft;
c. a D-shaped protrusion on said shaft;
d. a hub having an aperture within which said D-shaped protrusion is disposed in slidable contact therewith;
e. a housing intimately surrounding said hub and secured to means connected to said mold for actuating said mold;
f. means disposed in said aperture and coacting with said hub and said protrusion for maintaining said hub and said protrusion in intimate contact and in preselected relative positions; and
g. means including a shim for variably positioning said hub relative to said protrusion.

4,044,631
ROTARY ACTUATOR
Stephen Matousek, and Ulrich H. Koch, both of Chagrin Falls, Ohio, assignors to Whitney Research Tool Company, Emeryville, Calif.
Filed May 21, 1975, Ser. No. 579,467
Int. Cl.² F16H *57/02*
U.S. Cl. 74—606 R **21 Claims**



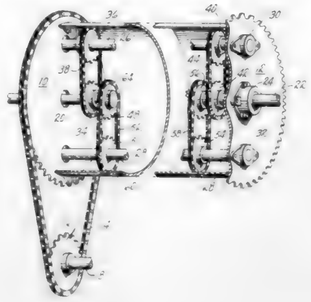
1. A rotary actuator comprising in combination:
a unitary housing having first and second cylindrical bores communicating with each other in an end to end relationship with at least the end of said first bore spaced from said second bore being open, said housing further including an open ended third bore communicating with and extending generally normal to said second bore;
a piston closely received in said first bore and selectively movable between first and second positions therein;
an elongated rack extending outwardly of one face of said piston into said second bore, said rack having a generally rectangular cross sectional configuration with the teeth of said rack being disposed longitudinally along the upper surface thereof;
a pinion disposed in said third bore in operative association with said rack, said pinion including an elongated operating member extending outwardly of said third bore;
a separate bushing member disposed in said second bore at least on the other side thereof from the operative interconnection between said rack and pinion for guiding and supporting said rack, said bushing member extending along at least a longitudinal portion of said second bore and including an outer wall configuration closely received in said second bore, said bushing member further including a longitudinally extending groove having the same cross sectional configuration as said rack and dimensioned to receive the bottom wall surface and a portion of the side wall surface of at least a portion of said rack in a sliding relationship therein;
means for closing the open end of said first bore;
means for selectively forcing said piston between said first and second positions to effect rotary movement of said pinion and operating member through linear movement of said rack in operative engagement with said pinion; and,
means for establishing a precise desired distance between said first and second positions in said first bore for controlling the amount of rotation of said pinion.

4,044,632
TWIN CHANNEL REDUCTION DRIVE WITH ELECTRIC MOTOR
Ernest Wildhaber, 124 Summit Drive, Rochester, N.Y. 14620
Filed May 9, 1975, Ser. No. 576,103
Int. Cl.² F16H *37/06, 57/00*
U.S. Cl. 74—665 G **4 Claims**



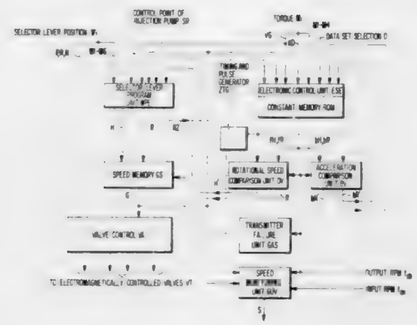
1. A reduction drive comprising
an electric motor,
two axially spaced cylindrical pinions coaxial with the motor and rigid with each other,
said pinions contain helical teeth of equal lead and opposite hand and are rotatably mounted for axial self-adjustment to equalize their loads,
said pinions mesh with two coaxial cylindrical gears respectively whose axis is parallel to the pinion axis,
a rotating power consumer having a plurality of working parts spaced about its axis of rotation,
a finai drive gear forming part of said power consumer,
two pinions meshing with said final drive gear and being spaced about the axis of the drive gear,
each of the last-named pinions being operatively connected with one of said cylindrical gears.

4,044,633
DIFFERENTIAL DRIVES INCLUDING FLEXIBLE INTERCONNECTING DRIVE ELEMENTS
Robert W. Lee, 5 Rockwood St., Walpole, Mass. 02081
Filed Feb. 25, 1976, Ser. No. 661,393
Int. Cl.² F16H *3/44, 1/28, 9/00*
U.S. Cl. 74—750 R **10 Claims**



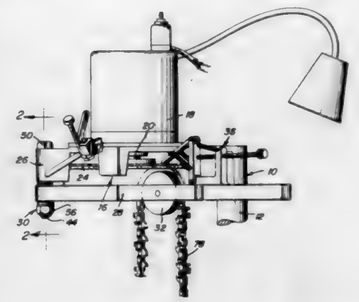
1. A differential planetary drive assembly comprising means defining a primary axis, means defining a secondary axis, a rotatable external planetary carrier journalled about the primary axis for supporting the secondary axis for movement about the primary axis, a power path comprising a first couple including a driving toothed wheel on the primary axis, a driven toothed wheel on the secondary axis and a complementary flexible connector linking the driving and driven wheels and a second couple including a second driving toothed wheel on the secondary axis, a second driven toothed wheel on the primary axis and a complementary flexible connector linking the second driving and driven wheels.

4,044,634
INSTALLATION FOR AUTOMATIC SHIFTING OF CHANGE-SPEED GEARS
Hans-Jörg Florus, Goppingen; Horst Grossner, Geradstetten, and Günter Weiger, Zell, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany
Filed July 26, 1974, Ser. No. 492,145
Claims priority, application Germany, July 27, 1973, 2338122
Int. Cl.² B60K *21/00*
U.S. Cl. 74—866 **64 Claims**



1. An installation for the automatic shifting of change-speed transmissions which includes actuating means for the engagement and disengagement of the speeds, the actuating means being controllable by way of control means by at least two influencing magnitudes, characterized in that an electronic control unit having a programmable constant memory means is provided, in which is stored at least one set of output rotational speed limit values coordinated to the individual speeds and torque steps, means for applying to the electronic control unit by way of corresponding inputs at least the influencing magnitudes of torque and engaged speed, said constant memory means including an output operatively connected with a rotational speed comparison means in which the driven rotational speed limit values produced by the constant memory means are compared with the respective output rotational speed of the transmission, said rotational speed comparison means being operable to trigger shifting-up or shifting-down signals, when exceeding or falling below the limit values, and means for applying the shifting-up and shifting-down signals to the actuating means, and further characterized in that the transmission has a transmission output shaft, in that acceleration limit values are additionally storable in the constant memory means for each speed, the output of the constant memory means being operatively connected with an acceleration comparison means, in which the acceleration limit values produced by the constant memory means are compared with the prevailing acceleration of the output shaft of the transmission, said acceleration comparison means being operable to produce signals when exceeding and falling below the limit values which are fed as a further influencing magnitude to the electronic control unit, and in that output rotational speed limit values are additionally storable in the constant memory means which, in addition to torque and engaged speed, are coordinated to the acceleration signals.

4,044,635
SAW CHAIN SHARPENER
Jack F. Simington, Box 141, Star Rte., Chiloquin, Oreg. 97624
Continuation-in-part of Ser. No. 516,129, Oct. 18, 1974. This application June 18, 1976, Ser. No. 697,745
Int. Cl.² B23B *63/16*
U.S. Cl. 76—42 **7 Claims**



7. In combination, a mount, a drivable rotary grinding wheel journaled from said mount, a support, a disc, mounting means mounting said disc on said support for angular adjustment relative to said support about a first axis passing centrally through said disc, support means mounting said support from said mount for swinging about an axis generally normal to said first axis and generally paralleling the axis of rotation of the rotary grinding wheel, the outer periphery of said disc including peripherally continuously extending groove sections formed therein of slightly different predetermined width for snugly slidably receiving chain tooth guide lugs of different thicknesses, said groove sections each extending generally 180° about said disc and being of constant width.

4,044,636

METHOD AND APPARATUS FOR FORMING A HELICAL CUTTER STRIP FOR A DRY SHAVER ASSEMBLY

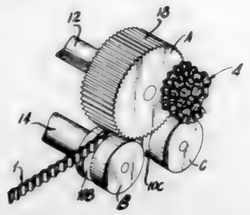
Alojzy Antoni Kolodziej, Stobhill, Northcumberland, England, assignor to Ronson Corporation, Woodbridge, N.J.

Continuation-in-part of Ser. No. 455,535, March 28, 1974, Pat. No. 3,927,581. This application Nov. 25, 1975, Ser. No. 635,093

Claims priority, application United Kingdom, Apr. 2, 1973, 15759/73

Int. Cl.[2] B21K *11/00*; B21D *11/08*

U.S. Cl. 76—104 R **5 Claims**



5. A method for winding into a helical configuration an elongated cutter strip for the cutter unit of a dry shaver assembly having undulations extending along the length thereof comprising the steps of passing said elongated cutter strip in an edgewise position through a roller triad including a main roller and a pair of auxiliary rollers mounted for rotation about parallel axes, said auxiliary rollers each having a diameter smaller than the diameter of the main roller and arranged relative to said main roller to circumferentially receive said strip between said main roller and each of said auxiliary rollers, with passage of said undulated strip in said edgewise position circumferentially about said main roller between said main roller and each of said auxiliary rollers operating to form said strip in said helical configuration, said elongated cutter strip being first passed between said main roller and one of said auxiliary rollers and being subsequently passed between said main roller and the other of said auxiliary rollers with said main roller and said auxiliary rollers being configured such that they impart to said strip as it is passed therebetween a directional component of travel extending obliquely to said parallel axes.

4,044,637

TOOL FOR CLOSING BOTTLES BY A CROWN CAP

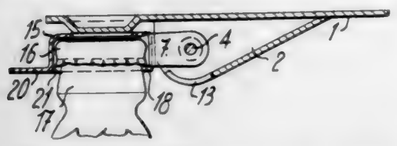
Georges Solica, 6, chemin de Renens, Lausanne, Switzerland (CH-1000)

Filed Sept. 10, 1975, Ser. No. 612,032

Claims priority, application Switzerland, Sept. 26, 1974, 13012/74

Int. Cl.[2] B67B *5/00, 7/16*

U.S. Cl. 81—3.43 **16 Claims**



1. A tool for closing bottles with a crown cap, said tool including a handle, tightening means carried by said handle for tightening the crown cap on the neck of the bottle to close the latter, said tightening means comprising an expansible split ring for surrounding said cap, means associated with said handle and with said split ring for causing the latter to contract in response to a certain force applied to said handle so as to tighten the cap about the bottle neck, said split ring defining a plane and said handle defining a lengthwise direction, said means for causing said split ring to contract including pivot means for said handle to permit the latter to pivot about an axis substantially parallel to said plane of said split ring and perpendicular to said lengthwise direction of said handle, cam means associated with said handle for contracting said split ring when said certain force is applied to said handle to cause the latter to turn on said axis, said split ring including an upper lip, as seen in the normal working position of the tool, for supporting the tool on the upper face of the cap of the capped bottle , said split ring having an upper central opening, as seen in the normal working position of the tool, said handle including a nose for entering said central opening when said handle and said tightening means are in said nontightening position and for causing a tell-tale depression in the upper face of the cap to show that the bottle was already opened.

4,044,638

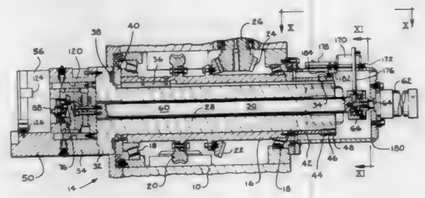
CRANKSHAFT MACHINE STOCK AND CHUCK APPARATUS

Allan J. Heffron, Freeland, and Leverne H. Kennedy, Saginaw, both of Mich., assignors to Crankshaft Machine Company, Jackson and C. M. Systems, Incorporated, Bay City, both of Mich.

Continuation of Ser. No. 519,501, Oct. 31, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,317

Int. Cl.[2] B23B *5/18*

U.S. Cl. 82—9 **8 Claims**



1. Crankshaft positioning and chucking apparatus for crankshaft machines having a headstock and a tailstock for use with crankshafts having a centering hole defined in an end thereof axially related in a predetermined manner to crankshaft bearing surfaces to be machined comprising, in combination, a frame, a headstock spindle and a tailstock spindle rotatably mounted upon said frame in spaced opposed, coaxial relationship, a first chuck mounted upon said headstock spindle, a second chuck mounted upon said tailstock spindle a center located in one of said chucks for receiving a crankshaft centering hole for axially positioning a crankshaft received within said one chuck, center support means movably mounted within said one chuck for axial adjustment toward and away from the other chuck between a loading and unloading position and a machining position fixedly supporting said center, positioning means axially fixedly positioning said center support means at said machining position, crankshaft biasing means located in said other chuck biasing a crankshaft received therein toward said center, crankshaft holding means defined on each of said chucks, and actuating means associated with each spindle operatively connected to the associated holding means for selective actuation thereof.

4,044,639

SYSTEM FOR CUTTING PIECES FROM A TRAVELING STRIP OF SHEET MATERIAL

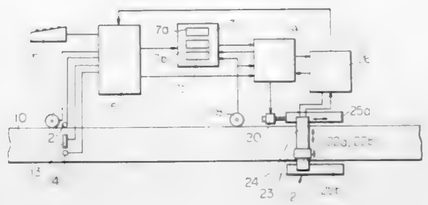
Tetsuji Kato, Otake, Japan, assignor to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Division of Ser. No. 533,182, Dec. 16, 1974, which is a division of Ser. No. 434,065, Jan. 17, 1974, Pat. No. 3,892,153. This application June 12, 1975, Ser. No. 586,367

Claims priority, application Japan, Jan. 18, 1973, 48-8169; Jan. 18, 1973, 48-8170

Int. Cl. B26D *3/08, 5/00*

U.S. Cl. 83—7 **1 Claim**



1. A method for obtaining at least two collections of sheets respectively of relatively longer and shorter lengths, by transversely severing a polymerized and continuously traveling plastic strip which leaves one end of a polymerizing interspace defined by confronting belt working lengths of a pair of upper and lower endless belts having specified weld lines and known defects formed on the surface of said upper and lower belts, said belts being disposed to run continuously at the same speed in the same direction, the other end of the polymerizing interspace being continuously fed with an unhardened plastic raw material to be polymerized at an appropriate temperature condition, said plastic strip having usable longitudinally extending portions from which a plurality of sheets of either of said longer and shorter lengths may be severed, said portions being such terminated at least at one end by one of a plurality of defects including a first group of defects which occur, according to expectation, in the polymerized plastic sheet due to the cause of said weld lines and known defects of said endless belts, and a second group of defects which occur, contrary to expectation, in the polymerized plastic sheet during polymerizing said plastic sheet due to diverse known causes, wherein the improvement comprises:

passing said traveling plastic strip through a first pickup means for successively detecting occurrence of said first group of defects, and through a second pickup means for successively detecting occurrence of said second group of defects of said polymerized plastic strip;

obtaining position information on each of said second group of defects in the traveling direction of said plastic strip, relative to position information of an adjacent one of said first group of defects having occurred due to said weld lines and known defects of said upper and lower endless belts;

determining successively the lengths of successive portions of said usable portions on the basis of the obtained position information of said first and second groups of said defects in said polymerized plastic strip;

calculating a ratio of number of sheet pieces of said longer and shorter lengths for obtaining an entire combined length which is closest to but shorter than the length of each said usable portion, and;

severing each of said usable portions into the longer and shorter lengths in accordance with the calculated numbers ratio.

4,044,640

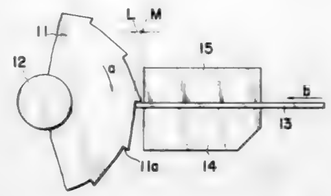
METHOD OF MAKING REINFORCEMENTS FOR CONCRETE

Isao Gokyu, Musashino, Japan, assignor to Nippon Concrete Industries Co., Ltd., Tokyo, Japan

Filed Nov. 10, 1975, Ser. No. 630,629

Int. Cl.[2] B26D *3/00, 5/20*

U.S. Cl. 83—42 **4 Claims**



1. Method of making reinforcements for concrete from a band material of a steel plate, said reinforcements having preferred dimensions, comprising the steps of:

rotating a cutter wheel about is rotational axis, said cutter wheel width being in excess of the width of said band material, said cutter wheel including a number of cutting edges extending inwardly from its outer periphery, the height of said edges being in the range of 0.2 to 0.5 mm. from a root to said outer periphery, said edges being aligned parallel to said rotational axis of said cutter wheel;

supporting said band of material on a planar surface adjacent said rotating cutter wheel, the spacing between said surface and said cutting edge being about 0.05 mm., said planar surface being parallel to said rotational axis;

feeding said band of material to said rotating cutter wheel until the forward end of said material contacts said cutter wheel at said root of said cutting edge, the thickness of said band being approximately equal to the height of said cutting edge, the width of said band being 10 to 50 mm.;

shearing said band of material by contact of one of said cutting edges, whereby a superior reinforcement for concrete is formed.

4,044,641

MACHINE FOR HANDLING SHEET MATERIAL

George A. Burt, Jr., and William M. Neill, both of Santa Clara, Calif., assignors to International Paper Company, New York, N.Y.

Continuation of Ser. No. 546,602, Feb. 3, 1975, abandoned, which is a division of Ser. No. 388,813, Aug. 16, 1973, Pat. No. 3,888,395. This application Sept. 21, 1976, Ser. No. 725,328

Int. Cl.[2] B26D *1/56*

U.S. Cl. 83—341 **7 Claims**



1. In a machine for handling sheet material in combination:

a source of flexible sheet material;

means for receiving a web of material from said source and directing the same along a feed path;

a cutting mechanism positioned along the feed path for dividing the web into successive sheets, the cutting mechanism having a pair of rollers and cutting means carried by only one of the rollers, the rollers being skewed relative to each other and being angularly disposed with respect to a direction transverse to the direction of movement of the web along said feed path to provide point contact between

the cutting means and the other roller, the cutting means being angularly disposed with respect to said transverse direction, being parallel to the axis of rotation of said other roller and severing the web along a straight line which extends in a direction transverse to said direction of movement; and

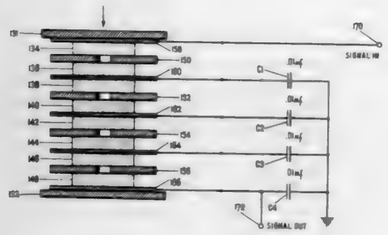
drive means for advancing the web between said rollers.

4,044,642

TOUCH SENSITIVE POLYPHONIC MUSICAL INSTRUMENT

Alan R. Pearlman, Newton Highlands, and Dennis P. Colin, Beverly, both of Mass., assignors to ARP Instruments, Inc., Lexington, Mass.

Division of Ser. No. 381,783, July 23, 1973, abandoned, which is a division of Ser. No. 263,178, June 15, 1972, Pat. No. 3,784,935.
This application Oct. 29, 1974, Ser. No. 518,347
Int. Cl.[2] G10H *1/02, 5/02*
U.S. Cl. 84—1.1 **19 Claims**



1. In an electronic music system having at least one waveform oscillator, and a control voltage source, a touch responsive assembly composed of a plurality of stacked touch responsive devices comprising;

a touch responsive filter network, coupled from the waveform oscillator and having conductance means variable continuously over at least a portion of a selected conductance range in accordance with pressure applied to said stack over a range including a range corresponding to said selected conductance range,

and a touch responsive control network coupled from the voltage source and having conductance means variable continuously over at least a portion of a selected conductance range in accordance with pressure applied to said stack over a range including a range corresponding to said selected conductance range.

4,044,643

MUSICAL INSTRUMENT CIRCUIT PROVIDING CELESTE AND VIBRATO EFFECTS

Willis E. Chase, P.O. Box 4042, Lancaster, Pa. 93534

Continuation-in-part of Ser. No. 431,937, Jan. 9, 1974, abandoned. This application Apr. 23, 1975, Ser. No. 570,650
Int. Cl.[2] G10H *1/02, 5/02*
U.S. Cl. 84—1.24 **9 Claims**

1. An electronic circuit for a musical instrument comprising:

a keying circuit for generating a keying voltage;

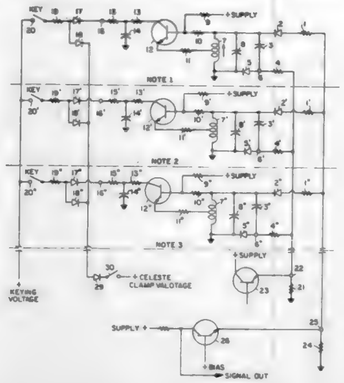
an oscillator made operative by application of said keying voltage thereto;

control means coupling said keying circuit to said oscillator whereby said keying voltage applied to said oscillator is controlled;

frequency modulation means coupled to said oscillator whereby the frequency of oscillation is modified in response to the magnitude of said keying voltage;

said keying circuit consists of a first keying means for generating a keying voltage of high magnitude for normal effects, and coupled directly to said oscillator; and

a second keying means for generating a keying voltage of lower magnitude than said high magnitude for celeste



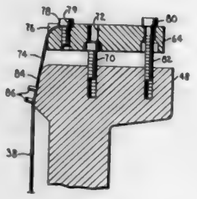
effects, and coupled to said oscillator through an isolation diode to the exclusion of any other controlling means.

4,044,644

PIANO

Charles E. Mussulman, 2 E. Main, Chanute, Kans. 66720

Division of Ser. No. 477,295, June 7, 1974, Pat. No. 3,923,939.
This application Oct. 28, 1975, Ser. No. 626,217
Int. Cl.[2] G10C *3/10*
U.S. Cl. 84—207 **3 Claims**



1. In a stringed instrument where a plurality of strings under tension are employed having predetermined frequencies of vibration, and where frame means supports one end of each string and is provided with apparatus for adjusting the tension, the improvment in said apparatus comprising:

a plurality of tuning bars each having a pair of opposed ends;

means attaching said end of each string to one end of a corresponding bar;

a base provided with means supporting said bars intermediate their ends for rocking movement of each bar in directions to respectively decrease and increase the tension on the corresponding string; and

selectively adjustable elements engaging the opposite ends of respective bars and secured to said base for independently holding each bar against movement under the force of the attached string and permitting adjustment of the bar to a position that will set the string at the predetermined frequency,

each element and said base having mating thread means providing a fine adjustment of the tension of each string upon rotation of the corresponding element,

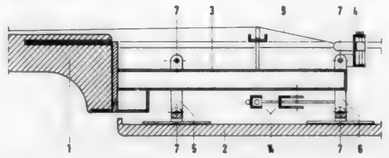
said supporting means comprising selectively adjustable components engaging respective bars and providing a fulcrum for each bar, each of said components and said base having mating thread means providing a relatively coarse adjustment of the tension of each string upon rotation of the corresponding component.

4,044,645

DEVICE FOR CONTINOUS PITCH VARIATION OF STRINGED INSTRUMENTS

Rainer Franzmann, Mittelstrasse 24, 2000 Norderstedt 2, Germany

Filed Sept. 16, 1975, Ser. No. 613,803
Claims priority, application Germany, Nov. 21, 1974, 2445181; Feb. 20, 1975, 2507285
Int. Cl.[2] G10D *3/00*
U.S. Cl. 84—313 **6 Claims**



1. A stringed musical instrument comprising:

a neck, a body, and a plurality of tuned strings extending over said neck and body, said neck having an extension extending into said body;

rotary support including at least one support lever pivotally connected both to said body and said neck extension to rotate about a body rotation axis and a neck extension rotation axis, respectively, said rotary support means being so arranged that said neck extension may move longitudinally relative to said body to rotate said support lever;

string holder means firmly mounted on said support lever for holding one end of said strings, said string holder means rotating with said support lever about said neck extension rotation axis to vary the tension of said strings; and

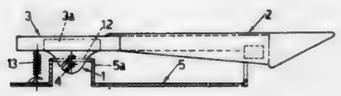
compensating means connected to said neck extension and said support lever for zeroing the torque on said support lever created by the tension of said tuned strings.

4,044,646

SUPPORTING AND PIVOT DEVICE MADE OF PLASTIC FOR KEYS OF PIANOS, ELECTRONIC ORGANS AND THE LIKE

Carlo Invernati, Sirolo, Italy, assignor to Danyel S.A.S., Sirola (Ancona), Italy

Filed Mar. 26, 1976, Ser. No. 670,982
Claims priority, application Italy, Apr. 1, 1975, 609/75
Int. Cl.[2] G10C *3/12*
U.S. Cl. 84—435 **5 Claims**



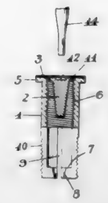
1. A supporting and pivot device to be connected to the lever carrying a key of keyboard of a piano, electronic organ or the like, to be pivotally connected with a transverse pivot pin or rod supported by the stationary frame of said keyboard and where the key is associated with a return spring, characterized by the fact that the device comprises a body made of plastic having a sufficient strength and capable of a slight elastic deformation, said body being shaped substantially as a wedge having an upper flat surface designed to be connected with said lever, and curved front and rear surface portions which merge at their respective lower portion, one of the curved rear surface portions of said body includes a first transverse slot extending upwardly and inwardly where it terminates at a central cylindrical hole, the axis of said hole being parallel to the axis of the pivot pin and having substantially the same diameter as that of said pin, said slot having a width slightly smaller than the diameter of said pin, a second slot which is adjacent to and parallel with said first named slot which cooperates with said first slot to increase the elastic deformability of one of the side walls of said first slot when said pivot pin is received into said first slot where it is secured within said hole associated with said first slot.

4,044,647

SPREADABLE ANCHOR ASSEMBLY

Kenryu Takahashi, 3-go, 22-ban, 1-chome, Tokyo, Japan

Filed Jan. 15, 1975, Ser. No. 541,212
Claims priority, application Japan, Aug. 28, 1974, 49-102236[U]
Int. Cl.[2] F16B *13/10*
U.S. Cl. 85—72 **8 Claims**



1. A spreadable anchor assembly, adapted to be fixed to an opening of a wall or the like, comprising an elongated tubular sleeve having opposed open ends and being formed with inner threads at the region of one of said open ends while being formed with longitudinally extending slits extending along said sleeve from the other of the open ends thereof to define spreadable legs between said slits, said sleeve being formed with an inner tapered opening at the region of said spreadable legs thereof and having adhered to said one open end in a position extending across and closing said one open end of said sleeve a cap of easily ruptured sheet material which has an inner surface directed toward the other open end of said sleeve, and an elongated tapered spreader element adhered to said cap at said inner surface thereof and situated in the interior of said sleeve, so that a punch may be applied to said cap to rupture the latter while driving said spreader element into the inner tapered opening of said sleeve to spread said legs thereof outwardly into engagement with the surface of an opening which is formed in a wall or the like for anchoring said sleeve thereto, the rupturing of said cap and the driving of said spreader element into the tapered opening to spread said legs uncovering the inner threads so that a screw may be received therein.

4,044,648

ROCKET EXHAUST PLENUM FLOW CONTROL APPARATUS

Edward T. Piesik, Pomona, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Sept. 29, 1975, Ser. No. 617,337
Int. Cl.[2] F41F *3/04*
U.S. Cl. 89—1.8 **30 Claims**

1. Controlled fluid flow apparatus comprising:

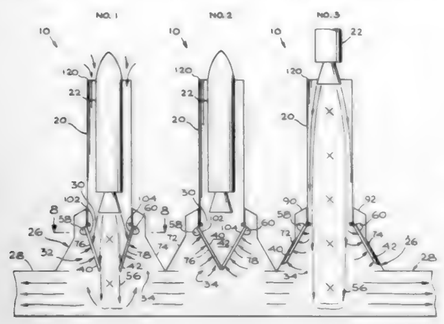
a. a plurality of fluid flow elements;

b. a common manifold;

c. means for connecting said elements to said manifold in fluid exchange relationship, said connecting means including a plurality of transition sections adapted for separately directing pressurized fluid from said elements into said manifold; and

d. means for controlling the flow of pressurized fluid through said transition sections, said controlling means including a plurality of pairs of flow control doors and means for pivotably hanging the doors in opposing relationship by pairs in corresponding portions of the transition sections, said doors of each of said pairs being configured to hang, under the action of gravity alone, at least

slightly inclined toward one another and being operative to pivot to a fully closed position in response to back pressure in the associated transition section when pressurized fluid is flowing through any non-associated transition



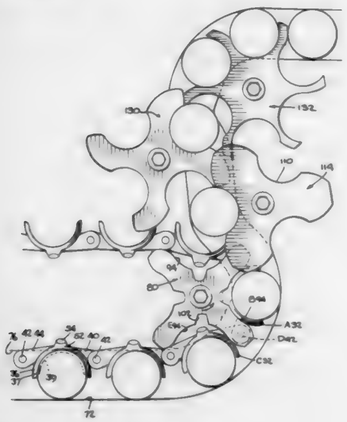
section into the manifold, and being operative to pivot to just that degree of openness required to prevent fluid backflow when pressurized fluid is flowing through the associated transition section into the manifold.

4,044,649

CONVEYOR MECHANISM

Frank A. Wilder, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed Sept. 17, 1973, Ser. No. 397,846
Int. Cl.[2] F41D *9/02*
U.S. Cl. 89—33 BB **6 Claims**



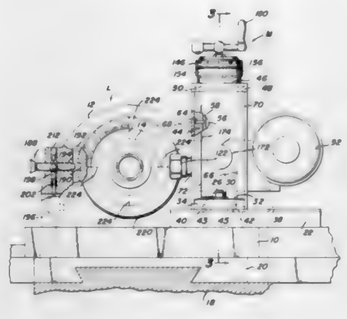
1. A conveyor system comprising:
a sprocket; and
a chain of conveyor elements;
each of said conveyor elements having a body portion including:
a convex cylindrical surface having a first radius defining a longitudinal axis,
a projecting leading rigid arm having a distal first portion of a pivot means,
a projecting trailing rigid arm having a distal second portion of a pivot means for coupling with the first portion of a pivot means of the leading arm of the next succeeding element said arms having a mode of operation such that immediately adjacent arms mutually pivot about a common axis;
said sprocket including:
a hub having a longitudinal axis,
a pair of spaced apart plates fixed on said hub and having a plurality of pairs of longitudinally aligned concave recesses therein congruent with and for seating the convex surface of a respective element body portion,
said hub having a like plurality of surfaces, one adjacent each of said pairs of sprocket concave recesses, for underlying and abuting the leading and trailing arms of a respective element when its body portion is seated in a respective pair of sprocket concave recesses.

4,044,650

MILLING ATTACHMENT FOR A LATHE

Garnet Rexford Lyon, Elmira, and Ivan Richard Brown, Horseheads, both of N.Y., assignors to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Jan. 16, 1976, Ser. No. 649,800
Int. Cl.[2] B23C *7/02*; B23B *3/36*
U.S. Cl. 90—14 **15 Claims**



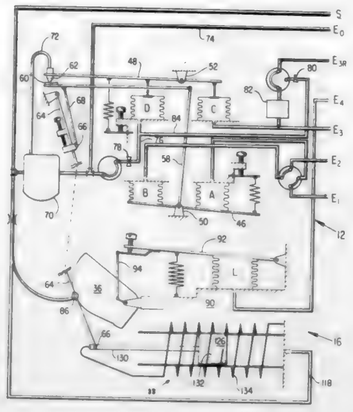
1. In combination with a lathe including a headstock, a lathe spindle assembly received within said stock, a carriage and a cross-slide; a milling attachment comprising:
a base secured to said cross-slide,
a vertical support column attached to said base and including a first interlocking element,
a block having a second interlocking element in interfitting engagement with said first element and movable relative thereto in the vertical direction,
a tool carrying spindle rotatably received in said block and extending horizontally along one side of said supporting column in a first direction,
a motor mounted to said block and positioned adjacent said supporting column,
said motor having an axis of rotation and an output shaft collinear therewith which are horizontal and extend perpendicularly to said first direction,
gear means operatively connected between said motor output shaft and said spindle for rotating said spindle,
vertical adjusting means associated with said supporting column means raising and lowering said block,
locking means passing through said first and second interlocking elements clamping said second element to said first element to lock said block at a selected vertical position,
an electric drive motor driving said lathe spindle assembly, and
three position lock switch means associated with said headstock mechanically locking said lathe spindle assembly against rotation and electrically disabling said drive motor when in its first position, mechanically releasing said spindle assembly and electrically enabling said drive motor when in its second position, and mechanically releasing said spindle assembly and disabling said drive motor when in its third position.

4,044,651

PNEUMATIC FUNCTION GENERATOR ASSEMBLY

James C. Warrick, Euclid, Ohio, assignor to Bailey Meter Company, Wickliffe, Ohio

Continuation of Ser. No. 576,904, May 12, 1975, abandoned. This application Sept. 7, 1976, Ser. No. 720,911
Int. Cl.[2] F15B *13/16*; F01B *31/00*
U.S. Cl. 91—47 **5 Claims**



1. A motion balance servomechanism for a function generator comprising:
nozzle means for providing different backpressure signals in relation to restrictions of fluid therethrough;
flexible restriction means having a plane surface mounted proximate to said nozzle means to restrict fluid flow through said nozzle means; and
a guide member connected to said nozzle to be located directly opposite said nozzle but spaced therefrom to allow the plane surface of said flexible restriction means to move between said nozzle and said guide member, said guide member having an opening extending therethrough which is always aligned with said nozzle,
motion means for moving said nozzle means with respect to said restriction means from a position along the plane surface to a position along an edge of the plane surface of said flexible restriction means allowing substantially unrestricted fluid flow through said nozzle means, said motion means including a piston assembly having a movable piston and being connected to said nozzle means to provide different piston positions in response to different backpressure signals from said nozzle means, said piston assembly including a cylinder having one end sealably connected to said nozzle means to sense the backpressure signal therefrom and the opposite end open to ambient, a piston sealably movable within said cylinder in response to the backpressure signal from said nozzle means and flexible tubing extending partially over the open end of said cylinder to prevent said piston from moving out of said cylinder.

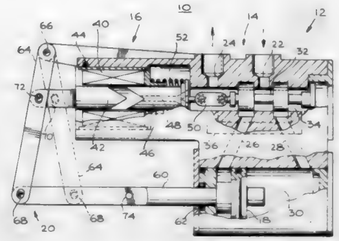
4,044,652

ELECTROHYDRAULIC PROPORTIONAL ACTUATOR APPARATUS

Leon David Lewis, Palos Verdes; Wilfried Wiher, Redondo Beach, and Warde L. Parker, Rancho Palos Verdes, all of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed May 12, 1975, Ser. No. 576,611
Int. Cl.[2] F15B *9/10, 13/044*
U.S. Cl. 91—368 **10 Claims**

1. Electrohydraulic proportional actuator apparatus comprising:
a housing;
a double-acting fluid-responsive motive member having an output shaft coupled for movement therewith;
means for admitting pressurized fluid to develop a differential pressure across said motive member, said means including a valve movable between a null position and respective flow positions for applying pressure to one side or the other of said motive member;
a solenoid coupled to drive said valve to a selected flow position corresponding to an incremental change of current level in the solenoid; and
means responsive to the movement of the motive member for restoring the valve to its null position upon the motive



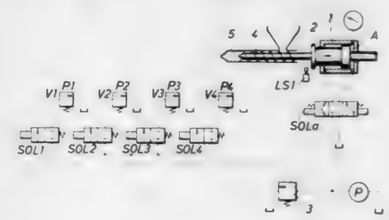
member reaching a position corresponding to the level of current in the solenoid;
wherein said valve comprises a spool valve having a spool member translatable along an axis within a valve chamber; wherein the solenoid comprises a support frame mounting an integral coil and core adapted for translatable movement along the translation axis of said spool member, and a plunger connected to the spool member; and wherein the movement-responsive means comprises a link pivotably anchored to the housing and pivotably connected respectively to said motive member and to said solenoid frame to cause translation of the coil and core in proportion to the movement of the motive member.

4,044,653

HYDRAULIC CONTROL APPARATUS FOR INJECTION MOLDING FLUENT PLASTIC MATERIAL

Katashi Aoki, Sakaki, Japan, assignor to Nissei Plastics Industrial Co., Ltd., Japan

Division of Ser. No. 414,655, Nov. 12, 1972, abandoned. This application Sept. 9, 1975, Ser. No. 611,802
Claims priority, application Japan, Nov. 17, 1972, 47-114830
Int. Cl.[2] F15B *15/20*
U.S. Cl. 91—392 **6 Claims**



1. Hydraulic control apparatus for controlling the injection speed and pressure of an injection molding machine having a hydraulic cylinder with a piston therein coupled to an injection molding nozzle, said apparatus comprising:
a source of hydraulic fluid;
a hydraulic fluid pump;
a main hydraulic circuit comprising:
a main line connected to said hydraulic cylinder, said

pump being arranged to provide hydraulic fluid under pressure from said fluid source to said main line; and

valve means in said main line between said pump and said hydraulic cylinder for controlling the application of hydraulic fluid to said cylinder for selective actuation of said piston in either direction;

a pilot hydraulic circuit for controlling the pressure in said main line, said pilot circuit comprising:

a plurality of pilot pressure control valves each having a pressure set point;

a like plurality of pilot pressure control lines respectively connecting said pilot pressure control valves in parallel;

a main pressure control valve, said parallel pilot pressure control lines being connected to said main line between said pump and said valve means through said main pressure control valve, said main pressure control valve being arranged to selectively provide hydraulic fluid under pressure to said pilot pressure control lines; and

means in each pilot pressure control line for selectively and individually isolating and connecting the respective one of said pilot pressure control valves to said main pressure control valve; and

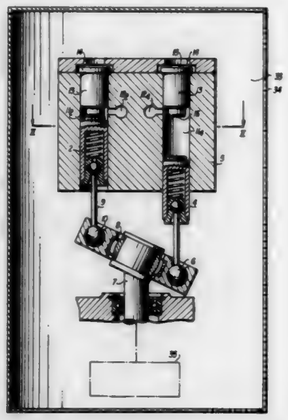
means for sequentially and individually actuating said selective isolating and connecting means in said pilot pressure control lines for respective predetermined periods of time to sequentially adjust the main line pressure to the respective pressure set points by coupling said main line individually to said pilot pressure control valves through said main pressure control valve and through a respective isolating and connecting means, only one of each of said pilot pressure control valves and its respective pilot pressure control line and isolating and connecting means being coupled through said main pressure control valve to said main line at any one time, whereby the pressure within said hydraulic cylinder and the speed of movement of said piston therein is controlled.

4,044,654

HYDRAULIC ENGINE

Marcel F. Guillon, Issy-les-Moulineaux, France, assignor to D. B. A., Clichy, France

Continuation-in-part of Ser. No. 558,559, March 14, 1975, abandoned. This application July 1, 1976, Ser. No. 701,579
Claims priority, application France, Mar. 27, 1974, 74.10489
Int. Cl.² F01B *13/04*
U.S. Cl. 91—499 **3 Claims**



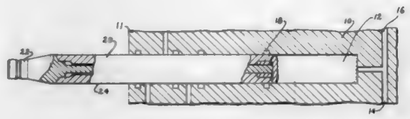
1. A hydraulic engine of the type comprising working chambers and working members having two working faces and movable in said chambers under the action of a working fluid for actuating the engine, said engine lying in a fluid under ambient high pressure, whereby each of said working members is submitted on one working face to said ambient high pressure and on the other working face to the pressure of the fluid in said working chamber, means being provided for connecting each of said working chambers in turn with an external low pressure source for moving the corresponding working members (working stroke) and with said ambient high pressure (return stroke).

4,044,655

HIGH PRESSURE PLUNGER AND METHOD OF MANUFACTURE

Wilbur L. Kennicott, Ligonier, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed Oct. 1, 1975, Ser. No. 618,412
Int. Cl.² F16J *1/02*
U.S. Cl. 92—258 **3 Claims**



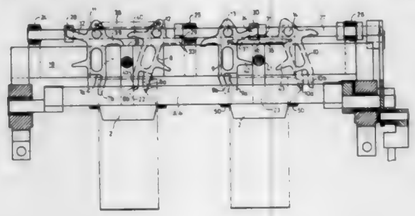
1. A high pressure plunger comprising a tubular member of cemented hard metal carbide, said tubular member having a length over diameter ratio of at least six to one, and having opposite ends, steel end caps abutting the opposite ends of said tubular member and each end cap having an axial portion engaging the inside of said tubular member adjacent the respective end cap, a rod-like portion on one of said end caps extending axially through said member with radial clearance and threadedly connected to the other end cap for interconnecting said end caps internally of said tubular member and holding said tubular member in a predetermined, compressively stressed condition, one of said end caps forming the rearward end of said plunger and the other end cap forming the forward end of said plunger, said rearward cap adapted for engagement to be driven linearly, a deformable metallic seal interposed between said forward end cap and said tubular member sealing the internal region of said tubular member from the atmosphere surrounding the forward end of the plunger, and orifice means formed between the rear end cap and the tubular member connecting the internal region of the tubular member with the atmosphere surrounding the rear cap of the plunger.

4,044,656

DEVICE FOR THE PRE-FOLDING OF THE CLOSURE OF A FOLDING BOX

Wilhelm Vetten, Dusseldorf, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany

Filed Apr. 9, 1976, Ser. No. 675,362
Claims priority, application Germany, May 7, 1975, 2520404
Int. Cl.² B31B *1/52*
U.S. Cl. 93—44.1 GT **7 Claims**



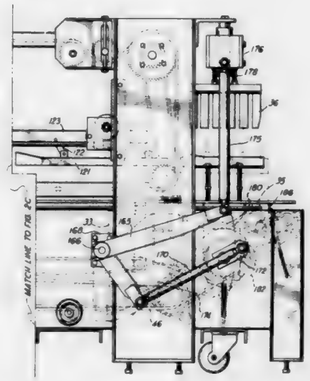
1. In a device for the pre-folding of a closure on a folding box of rectangular cross-section, which closure is formed of the creased unslotted end portion of the walls of the box of which two opposite closure panels are each provided with a pair of creases running from the corners and converging away therefrom so as to form triangular pockets upon folding, the device comprising two pairs of folding tools which pairs are at 90° to one another, means for displacing said folding tools so as to effect a pre-fold, a plunger corresponding in shape to the cross-section of the box, and means for reciprocating said plunger into and out of said box, said plunger when in said box serving as a backing means during a pre-folding tool of that pair which is associated with the creased opposite closure panel is bifurcated so as to have a folding tine and an unfolding tine, each of said bifuracted tools being positioned so that during pre-folding one tine is within said box and the other outside said box.

4,044,657

CASE ERECTOR

Donald G. Reichert, Tarpon Springs, Fla., assignor to ABC Packaging Machine Corporation, Tarpon Springs, Fla.

Division of Ser. No. 496,028, Aug. 9, 1974, Pat. No. 3,952,636.
This application Jan. 21, 1976, Ser. No. 651,078
Int. Cl.² B31B *1/64*
U.S. Cl. 93—49 M **5 Claims**



1. A method of erecting a case having opposed front and rear panels and opposed side panels, comprising the steps of:

a. folding said front and rear panels inwardly to a generally horizontal position;

b. bending a selected one of said side panels inwardly to a position beneath and in underlying relationship to said folded front and rear panels;

c. applying an adhesive to the bottoms of said bent side panel;

d. folding the other side panel to a generally horizontal position underlying the bottom side of said bent side panel; and

e. upwardly urging the bottommost side panel while simultaneously applying a downward force directed upon the upper surfaces of said front and rear panels and said bent panel.

4,044,658

APPARATUS FOR FOLDING PANELS OF CARTON BLANK

John M. Mitchard, Cherry Hill, N.J., assignor to Union Camp Corporation, Wayne, N.J.

Filed Apr. 1, 1976, Ser. No. 672,729
Int. Cl.² B31B *3/26*
U.S. Cl. 93—49 R **9 Claims**

1. Apparatus for folding a bulk box blank scored to define side panels in which the opposite ends of the blank will be brought together to form a flat tube comprising:

a folding table;

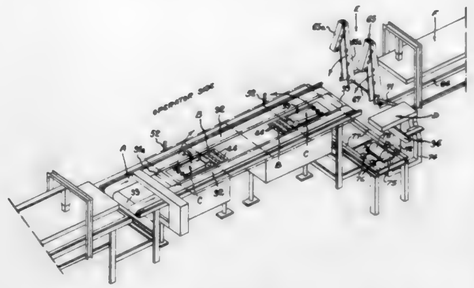
means to feed the box blank onto the said table into a predetermined position;

means to retain the said blank in such predetermined position;

means to successively fold the panels at each end of the blank toward each other to bring the outer ends of such panels together for joining to form a tube comprising an upstream arm rotatable approximately 180° to fold the one said panel at one end and a downstream arm rotatable more than 90° to fold the other said panel at the opposite end;

a hold-down device adapted to apply pressure to the top of the folded blank and restrain the folded blank in flat condition; and

means to feed the folded blank from beneath the hold-down device.

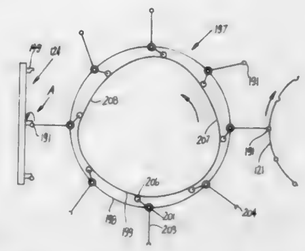


4,044,659

APPARATUS FOR MAKING COMPOSITE FILTER PLUGS

Dietrich Bardenhagen; Helmut Niemann, both of Hamburg; Wolfgang Steiniger, Bornsen; Gerhard Tolasch, and Wolfgang Wiese, both of Hamburg, all of Germany, assignors to Hauni-Werke Korber & Co. KG, Hamburg, Germany

Filed Oct. 14, 1975, Ser. No. 622,333
Claims priority, application United Kingdom, Oct. 15, 1974, 44544/74
Int. Cl.² B65G *47/32*
U.S. Cl. 93—77 FT **2 Claims**



1. Apparatus for the production of composite filter plugs for cigarettes or the like, comprising means for assembling rod-like filter sections of several types into groups of assorted coaxial filter sections which move sideways toward a first station, including a discrete set of conveyors for the sections of each of said types; an auxiliary conveyor having a plurality of holder means for transferring groups directly to said first station and means for changing the distance between said holder means; means for transferring successive groups from said first station to a second station where said groups move axially, including a rotary carrier having at least one eccentric holder arranged to accept groups at said first station and to transport the thus accepted groups to said second station and means including a

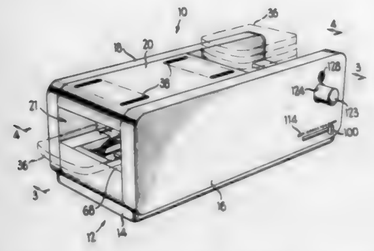
linkage for turning said holder with respect to said carrier during rotation of the carrier so as to maintain said holder in parallelism with groups arriving at said first station and to thereupon maintain the orientation of said holder substantially unchanged during travel from said first to said second station; means for converting the groups arriving at said second station into a continuous rod-like filler, for moving the filler axially and for draping the filler into a web to form a continuous filter rod; and means for subdividing the filler rod into discrete rod-like plugs each of which contains a section of each of said types.

4,044,660

AUTOMATIC TOASTER

Douglas P. Montagne, Chicago; Derek A. Brand, Naperville, and Howard J. Morrison, Deerfield, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed Mar. 8, 1976, Ser. No. 664,918
Int. Cl.² A47J *37/08*
U.S. Cl. 99—326 **8 Claims**



1. A toaster for automatically toasting a predetermined number of bread slices or the like comprising:
   a housing including a discharge station at one end;
   a loading station on the housing generally at an end opposite from the discharge station for supporting a generally vertical stack of bread slices;
   conveyor means mounted on the housing for continuously feeding the bread slices one at a time from the bottom of the stack through the housing to the discharge station;
   a pair of heating elements mounted on the housing between the loading station and the discharge station, on either side of the conveyor means; and
   lifting means mounted on the housing adjacent the loading station on the side thereof in the direction of travel of the conveyor means for engaging and elevating the slices of bread above the lowermost slice, said lifting means including cam means actuated by the movement of said slices of bread on said conveyor means into engagement therewith for raising all but said lowermost slice relative to the conveyor to facilitate feeding of only the lowemost slice between the heating elements and to the discharge station.

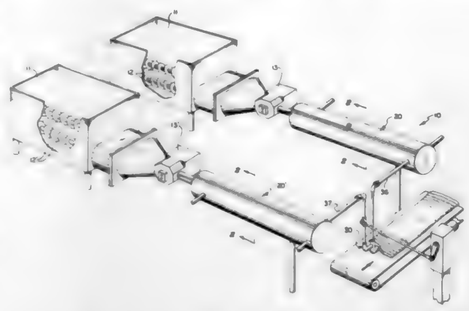
4,044,661

APPARATUS FOR MAKING A MARBLED MEAT FOOD PRODUCT

Alexander Balaz, Elkhart, Ind., assignor to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 521,241, Nov. 6, 1974, abandoned. This application July 24, 1975, Ser. No. 598,583
Int. Cl.² A47J *43/00*
U.S. Cl. 99—355 **5 Claims**

1. A food processing system comprising: first pumping means for pumping a first dough containing a first coloring agent through a first swept surface heat exchanger into the entrance of a first conduit, said first conduit having an entrance and an outlet end, said first conduit being substantially closed at its outlet end and having a plurality of openings adjacent to the substantially closed outlet end; second pumping means for pumping a second dough containing a second coloring agent through a swept surface heat exchanger into the entrance of a second conduit, said second conduit having a discharge port and an inner cavity, said inner cavity of said second conduit



completely enclosing said outlet end of said first conduit whereby said second dough containing a second coloring agent may be admixed with said first dough.

4,044,662

APPARATUS FOR CONTINUOUS CHEESE MAKING

Joseph Savarese, 386 Commercial St., Boston, Mass. 02109

Continuation-in-part of Ser. No. 528,207, Nov. 29, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,510
Int. Cl.² A01J *25/06, 25/00;* A23C *19/02*
U.S. Cl. 99—460 **2 Claims**

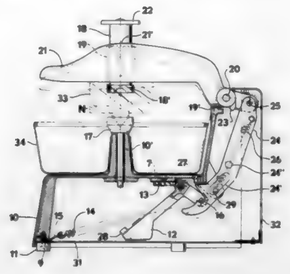
1. A machine for producing a cheese from a milk containing liquid that coagulates to form curd and whey, said machine comprising:
   a. a cylindrical upright tank defining a chamber for receiving the milk containing liquid;
   b. inlet means near the central portion of said tank for introducing and radially dispersing the milk containing liquid into said tank;
   c. first cutting means horizontally disposed in said tank at an upper portion thereof, said first cutting means operative to cut rising curd into elongated vertical bars;
   d. rotatable blade means horizontally disposed within said tank at an upper region thereof above said first cutting means, said blade means including a pair of outwardly extending blades, each said blade having a substantially C-shaped profile in right cross section, said blades extending outwardly in a curved path from diametrically opposite locations, said blades defining an abbreviated spiral configuration;
   e. drive means connected to said blade means for rotating said blade means;
   f. second cutting means vertically disposed in said tank at the upper region thereof above said first cutting means and substantially coplanar with said blade means, said blade means operative to push said elongated bars inwardly through said second cutting means to form diced pieces;
   g. discharge means disposed near the central upper portion of said tank about an axis of rotation of said blade means and slightly below said second cutting means for receiving said diced pieces, said diced pieces transmitted exterior to said tank through said discharge means; and
   h. outlet means disposed at a bottom region of said tank, said outlet means including means for closing and opening said outlet means.

4,044,663

NUT SHELLER

Jesse Harold Straw, R.R. No. 3, Box 193A, Tyrone, Pa. 16686

Filed Mar. 10, 1976, Ser. No. 665,560
Int. Cl.² A23N *5/00;* A47J *43/00*
U.S. Cl. 99—577 **7 Claims**



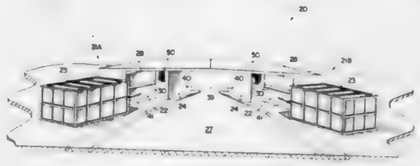
1. A nut sheller comprising a base, a nut supporting anvil mounted on said base for limited movement, an opposing inertial anvil operably mounted on said base for movement into engagement with a nut to be shelled and for movement to a remote position for loading a nut into shelling position, a hammer for operating against the nut supporting anvil, spring means for operating said hammer and an operataing lever for moving the inertial anvil and also controlling the hammer, a link having an operable connection to said operating lever and an operable connection to said hammer for energizing the spring as the operating lever moves the opposing anvil from its position remote from the nut to be shelled, and upon being operated provides a shelling of said nut with an opposing spring activating a hammer blow.

4,044,664

SYSTEM FOR THE HANDLING OF SOLID WASTE

Hyman Budoff, Akron, Ohio, assignor to Hybud Equipment Corporation, Akron, Ohio

Filed Sept. 18, 1975, Ser. No. 614,357
Int. Cl.² B30B *15/18*
U.S. Cl. 100—48 **4 Claims**



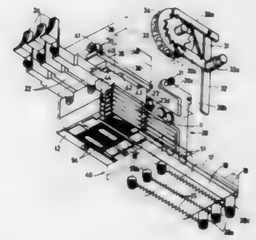
1. A solid waste handling system having multiple and operatively interconnected stations, each said station having a hopper unit with an opening in a side thereof for receiving such waste, a removable storage unit for such waste, and a compactor unit having a reciprocally driven compactor means, for transferring such waste from said hopper unit and compacting such waste in said storage unit, and an associated control means for actuating said compactor means,
   each said hopper unit having a door pivotally mounted for opening and closing movement relative to said side opening therein and an associated hopper unit control means for actuating said movement of said door, the mounting of said door including a projection oscillating between an upper position when said door is open and a down position when said door is closed,
   each said hopper unit further having (1) an upper limit switch operatively connected with said hopper unit control means and positioned for engagement with said mounting projection when in said upper position whereby opening movement of said door is stopped, and (2) a lower limit switch operatively connected with said hopper unit control means and said compactor unit control means and positioned for engagement with said mounting projection when in said lower position whereby closing movement of said door is stopped and said compactor means is reciprocated through said hopper unit,
   each said compactor unit having associated therewith a detector means responsive to the density of such accumulated waste in each said storage unit for detecting when said storage unit is packed with such waste having reached a predetermined density,
   there being a station selector means in said operative interconnection between said stations, said selector means being responsive to a signal generated by one of said compactor unit detector means when a storage unit associated therewith has been packed with such waste having a predetermined density.

4,044,665

PRINTING MACHINES

Kurt Anton Kuhne, Manawatu, and Alexander Wassilieff, Palmerston North, both of New Zealand, assignors to Delta Plastics Limited, Palmerston North, New Zealand

Filed Mar. 11, 1976, Ser. No. 666,058
Claims priority, application New Zealand, Mar. 12, 1975, 176915
Int. Cl.² B41J *1/60*
U.S. Cl. 101—21 **15 Claims**



1. A magazine type printing head for a printing machine comprising:
   at least one two part chamber;
   a first stack of typeface carrying slugs in a first of said parts, one end of said first stack defining a printing position;
   a second stack of typeface carrying slugs in the second of said parts, one end of said second stack defining a removal position, the other end of said second stack defining a depositing position;
   operating means movable between a rest position and a second position, said operating means including a first means to move a first slug from the end of said stack remote from said printing position to the depositing position of said second stack as said operating means is moved from said rest position to said second position; and
   cooperating means on said slugs for moving each slug in said first stack away from said printing position, said operating means further including a second means to move a second slug from the removal position of said second stack to the printing position of said first stack when said operating means is moved from said second position to said rest position.

4,044,666

ATTACHMENT FOR OFFSET DUPLICATING MACHINE

Laurent Doucet, 13, l'Assomption, Repentigny, Quebec, Canada

Filed Mar. 24, 1976, Ser. No. 670,050
Int. Cl.² B41L *45/00*
U.S. Cl. 101—76 **12 Claims**

1. An attachment device for use with an offset duplicating

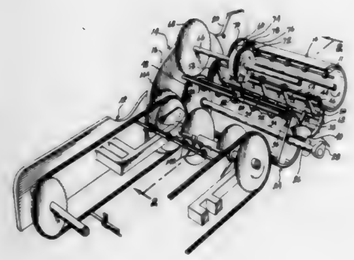
machine having, at the delivery end thereof, rotary cylinder means including circular gear means and sheet gripping means for conveying a sheet to said delivery end, said device being provided for imprinting consecutive code characters on successive sheets being delivered from said duplicating machine, comprising, in combination:

a frame consisting of laterally spaced sidewalls fixedly attached to said delivery end of said machine;

an impression cylinder rotatably mounted, at opposite ends thereof, to said sidewalls, said impression cylinder including circular gear means and sheet gripping means;

a gripper bar device rotatably mounted to said sidewalls and being disposed between said rotary cylinder means of said duplicating machine and said impression cylinder; said gripper bar device including circular gear means in meshing engagement with said circular gear means of said rotary cylinder means and with said circular gear means of said impression cylinder, said gripper bar device further including a series of sheet gripping elements for gripping a sheet received from said rotary cylinder means and for conveying said sheet to said sheet gripping means of said impression cylinder;

character printing means mounted to said sidewalls, including: a rotatable shaft, circular gear means on said shaft in



meshing engagement with said circular gear means of said impression cylinder, and an actuable character containing device mounted on said shaft for rotation therewith and adapted to successively contact said sheets, when conveyed on said impression cylinder, for printing consecutive characters thereon;

character changing means, mounted to said sidewalls, including actuator means contacting said character containing device for consecutively changing characters for each successive sheet printing operation;

means associated with said impression cylinder for raising said impression cylinder to said character containing device for each successive sheet printing operation;

said impression cylinder including a shaft supported on said sidewalls and having an eccentric portion; and wherein said means associated with said impression cylinder includes lever means pivotally mounted to one of said sidewalls for actuating said eccentric portion and raising said impression cylinder for contacting engagement between said sheet thereon and said character containing device; and

a cam mounted to one end of said rotatable shaft of said character printing means outside said one sidewall for contacting and actuating said lever means.

4,044,667

MANDRELS FOR SUPPORTING CONTAINERS WITH NEGATIVE AND POSITIVE AIR PRESSURE

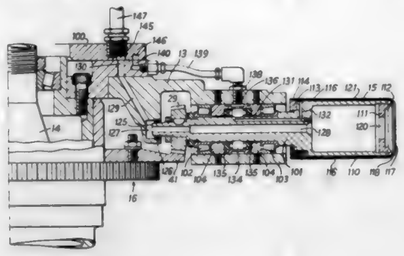
John Maxwell Jackson, Potters Bar, England, assignor to Chromax Limited, Perrywood Worcester, England

Filed Feb. 13, 1975, Ser. No. 549,819

Claims priority, application United Kingdom, Feb. 13, 1974, 6620/74

Int. Cl.[2] B41F *17/28*

U.S. Cl. 101—38 R **9 Claims**



1. A rotary mandrel for holding and centering a container having a base, a side wall which is circular in cross-section and an open top at the end of the side wall remote from the base, said mandrel comprising a body having an inner end thereof mounted on a support and an outer end insertable into the interior of the container through the open top thereof, the mandrel body being rotatable about the longitudinal axis of the mandrel body and having two axially spaced centering rings on the periphery thereof co-axial with said rotational axis, said centering rings being engageable with the side wall of the container to centralize the container with respect to said rotational axis upon axial movement of the container on the mandrel body towards the inner end thereof, and said rings subdividing the space enclosed between the container and the mandrel body therein into an end chamber between the mandrel body and the base of the container and an annular chamber between the mandrel body and the side wall of the container, said end chamber being pneumatically sealed from said annular chamber when said centering rings engage a side wall of a container fitted on the mandrel, first conduit means in the mandrel body for extracting air from said end chamber, and second conduit means in the mandrel body for supplying fluid under pressure to said annular chamber whereby, in operation, the difference between the pressure in the end chamber and atmospheric pressure exerts a force on the base of the container holding the container on the mandrel, and the pressure of the fluid in the annular chamber supports the part of the container side wall between the centering rings.

7. A multi-cylinder printing machine for printing on containers of a standard size each having a base, a side wall which is circular in cross-section and an open top at the end of the side wall remote from the base, said printing machine comprising a frame, a turret rotatably mounted on the frame, and a plurality of rotary mandrels mounted on the turret and adapted to hold said containers, said frame having a plurality of stations disposed around the turret, said stations including a container loading station, a container unloading station, and printing stations between the container loading and unloading stations in the circumferential direction of the turret, and said turret being angularly movable to index each mandrel in succession to each of said stations, wherein each of said mandrels comprises a support member on said turret, a mandrel body mounted on said support member for rotation about the longitudinal axis of the mandrel body, said mandrel body having an outer end insertable into the interior of one of said containers through the open top thereof and having two axially spaced centering rings on the periphery of the mandrel body co-axial with said longitudinal axis, said centering rings being engageable with the side wall of the container to centralize the container with respect to said longitudinal axis upon axial movement of the container on the mandrel body towards its support member, and said rings sub-dividing the space enclosed between the container and the mandrel body therein into an end chamber between the mandrel body and the base of the container and an annular chamber between the mandrel body and the side wall of the container, said end chamber being pneumatically sealed from said annular chamber when said centering rings engage a side wall of a container fitted on the mandrel, first conduit means in the mandrel body for extracting air from said end chamber, and second conduit means in the mandrel body for supplying fluid under pressure to said annular chamber, and wherein said frame includes a vacuum conduit connectable to a source of vacuum, a pressure conduit connectable to a source of fluid under pressure, and distribution means operable upon rotation of the turret to connect said first conduit means of each mandrel to said vacuum conduit during passage of said each mandrel through the loading station and printing stations and to connect said second conduit means of each mandrel to said pressure conduit during passage of said each mandrel through the printing stations, whereby, during passage of said each mandrel through the printing stations, the difference between the pressure in the end chamber and atmospheric pressure exerts a force on the base of the container holding the container on the mandrel, and the pressure of fluid in the annular chamber supports the part of the container side wall between the centering rings.

4,044,668

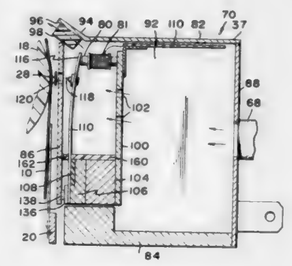
PRINT HAMMER MECHANISM

Gordon Brent Barrus, and Leo Joseph Emenaker, both of El Segundo, Calif., assignors to Printronix, Inc., Irvine, Calif.

Continuation of Ser. No. 578,180, May 16, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,746

Int. Cl.[2] B41J *7/70*

U.S. Cl. 101—93.04 **18 Claims**



1. A hammer mechanism for a printer comprising:

a housing having a hollow interior and a magnetic portion thereof;

means for introducing air under pressure into the interior of the housing;

an elongated magnetic circuit structure including permanent magnet means extending along the length of the magnetic circuit structure, the length of the magnetic circuit structure being divided into a succession of like hammer element positions, there being a dummy hammer element position adjacent each end of the magnetic circuit structure and a plurality of intermediate hammer element positions therebetween;

a different resilient magnetic hammer element coupled to the magnetic circuit structure in each of the intermediate hammer element positions and only in the intermediate hammer element positions, each hammer element being disposed adjacent the magnetic portion of the housing and separated from the other hammer elements;

a plurality of electrical coils, each being mounted on the magnetic circuit structure in a different one of the hammer element positions and extending into the region of a different one of the hammer elements; and

means for selectively energizing the electrical coils to momentarily release the associated hammer elements from the electrical coils.

4,044,669

ROTARY SCREEN MOUNTING DEVICE

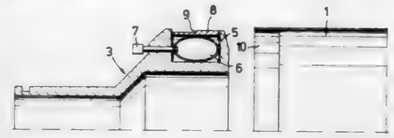
Harald Johan Luther, Alingsas, Sweden, assignor to Almedahls Aktiebolag, Alingsas, Sweden

Filed May 30, 1975, Ser. No. 582,434

Claims priority, application Sweden, May 30, 1974, 7407201

Int. Cl.[2] B41F *15/38*

U.S. Cl. 101—127.1 **6 Claims**



1. A device for releasably mounting a thin walled cylindrical member in a rotary machine, whereby said cylindrical member can be installed and maintained in an axially stretched condition and used in rotary working operations, comprising a pair of cylindrical mounting members disposed in spaced axial alignment in said rotary machine, each of said mounting members comprising an annular outer peripheral slot, a radially outwardly expansible ring member containing an annular outer peripheral groove disposed in said slot within the outer periphery of each said mounting member, annular expansion means disposed in said slot for outwardly expanding said ring member, said thin walled member comprising a peripheral flange disposed on the inner annular surface of each end thereof, said peripheral flange of said thin walled member engaging said groove of said ring member and being retained therein upon expansion of said ring member, whereby when both of said flanges are engaged and retained in said respective groove members, said thin walled member can be axially stretched and maintained in an axially stretched condition for use in rotary working operations.

4,044,670

STENCIL DUPLICATOR

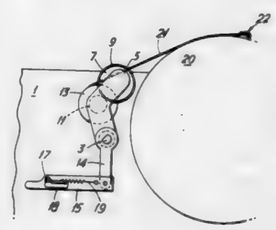
Michael Maynard, London, England, assignor to Gestetner Limited, London, England

Continuation-in-part of Ser. No. 397,305, Sept. 14, 1973, Pat. No. 3,943,850. This application Dec. 2, 1975, Ser. No. 636,821

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.[2] B41F *15/12*

U.S. Cl. 101—128.1 **6 Claims**



1. A stencil duplicator including at least one duplicator cylinder; means carried by said at least one duplicator cylinder for holding a stencil for rotation with said cylinder; a core for receiving one end of said stencil during removal of the stencil from said duplicator; means operatively connected to said at least one duplicator cylinder for driving said cylinder for

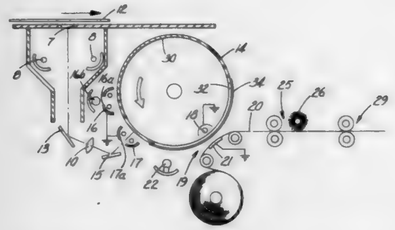
rotation in use of the duplicator; torque limiting core holding means constructed to removably support said core for rotation adjacent and parallel to said at least one cylinder; core driving means optionally engageable with said duplicator for transmitting limited torque drive from said cylinder drive means to said core holding means, said core driving means being effective to rotate said core with a surface speed higher than that of said at least one duplicator cylinder but with a limiting maximum torque transmitted to said core; and means for optionally engaging drive from said duplicator cylinder to said core driving means.

4,044,671

DUPLICATING APPARATUS EMPLOYING MODULATOR SCREEN CYLINDER

Shou L. Hou, and John D. Blades, both of Chagrin Falls, Ohio, assignors to Addressograph-Multigraph Corporation, Cleveland, Ohio

Continuation of Ser. No. 493,216, July 31, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,786
Int. Cl.² B41F *15/08*
U.S. Cl. 101—129 **6 Claims**



1. A duplicating machine for making reproductions of a graphic original on a dielectric material utilizing aperture controlled electrostatic printing techniques, comprising:
   - photoconductive modulator means formed in the shape of a cylinder comprising a photoconductive layer sandwiched between a metal screen and a transparent insulating layer forming at least a segment of said cylinder;
   - support means for rotatably supporting said modulator cylinder including means for driving the cylinder;
   - exposure means for the slit-scan exposure of a stationary graphic original to produce and project a pattern of light and shadow;
   - means for creating a charge distribution system on the outside surface of said photoconductive modulator cylinder while rotating said cylinder at a first imaging speed, said image corresponding to the pattern of light and shadow projected from said graphic original;
   - a charge particle imaging station positioned in the path of movement of said cylinder comprising a charge particle generating source within the cylinder and a curved collecting electrode disposed opposite said charge particle generating source and in convex relationship with the outside surface of said cylinder, said collecting electrode having a degree of curvature to produce an electric field between the modulator and the collecting electrode which compensates for curvature of the modulator, said drum rotating at a second speed faster than said first speed during the operation of said charge particle generating source;
   - a supply of dielectric material;
   - means for feeding said dielectric material in contact with said collecting electrode for collecting thereon gas ions transmitted by the modulator cylinder; and
   - means for developing the dielectric material to create a visible image thereon.

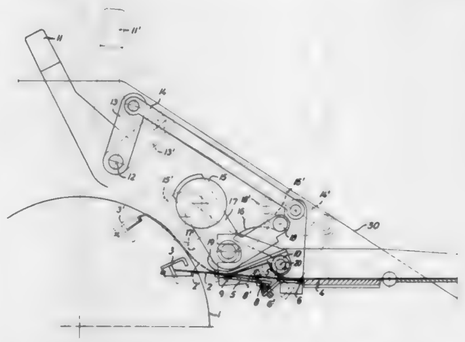
4. A method of making reproductions of a graphic original on a dielectric material utilizing a rotatable photoconductive modulator means formed in the shape of a cylinder comprising a photoconductive layer sandwiched between a metal screen and a transparent insulating layer forming at least a segment of said cylinder comprising the steps of
   - mounting said modulator cylinder for rotation and rotating said cylinder at at least two different speeds;
   - scanning incremental portions of said graphic original and slit exposing said photoconductive modulator to generate a pattern of light and shadow of said graphic original;
   - projecting said pattern of light and shadow through an optical system onto said modulator cylinder;
   - generating a charge distribution system on the surface of said modulator cylinder while rotating at a first imaging speed corresponding to the pattern of light and shadow representing the light and dark portions of said graphic original;
   - projecting charged particles from a particle generating source at a charge particle imaging station onto the surface of said modulator cylinder while it is rotating at a second speed, said station disposed at a fixed position relative to the path of movement of said cylinder with said charge particle generating source positioned inside and adjacent the surface of said cylinder;
   - collecting said charge particles transmitted by the modulator cylinder on said dielectric material;
   - controlling the movement of said projected particles emanating from the charge particle generating means within said modulator cylinder to provide a charge pattern that corresponds precisely to said graphic original by providing a curved collecting electrode in convex relation to the modulator cylinder for supporting the dielectric material;
   - developing the dielectric material to create a visible image thereon.

4,044,672

PRINTING MACHINE, IN PARTICULAR AN OFFICE OFFSET MACHINE WITH MEANS FOR PRE-CURVING THE MASTER

Theodor Wilhelm Gorr, Birkerod, Denmark, assignor to Zeuthen & Aagaard A/S, Glostrup, Denmark

Filed July 30, 1975, Ser. No. 600,448
Claims priority, application Denmark, Aug. 5, 1974, 4169/74
Int. Cl.² B41F *1/28*
U.S. Cl. 101—132.5 **11 Claims**



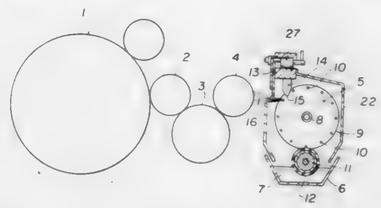
1. A printing machine comprising a frame, a cylinder mounted on said frame with gripping members for a master to be wrapped around said cylinder, a table mounted on said frame along which the master is advanced to said cylinder during the mounting operation, said table comprising two parts, a stationary table part and a movable table part having front and rear edges, said front edge of said movable table part being positioned closer to said cylinder than said rear edge, said movable table part being located closer to the master cylinder than said stationary table part and pivotable around an axis positioned intermediate its front and rear edges which is parallel to the plane of said table and at right angles to the direction of advance of the master, a pivotable operating member positionable in contact with said movable table part for pivoting said movable table part about said axis, a stationary shaft mounted on said frame, and a guiding roller mounted rotatably around said stationary shaft and contactable by said master when being mounted, said movable table part being pivotable into a position in which its rear edge is located at a short distance from said guiding roller to enable the master to pass therebetween and alter the direction of travel of the master and to provide a means for giving pre-curvature to the master as it is advanced along the movable table part.

4,044,673

DAMPENING UNIT FOR OFFSET PRINTING MACHINES

Rudi Junghans, Wilhelmsfeld, Germany, assignor to Heidelberger Druckmaschinen Aktiengesellschaft, Heidelberg, Germany

Filed July 23, 1976, Ser. No. 708,215
Claims priority, application Germany, July 25, 1975, 2533267
Int. Cl.² B41F *7/30*
U.S. Cl. 101—148 **15 Claims**



1. Dampening unit for an offset printing machine comprising at least one dampening unit roller, a container for dampening medium and a rotatable sprinkler roller disposed mutually adjacent one another, said sprinkler roller comprising a shaft, a pair of discs disposed at opposite ends of said shaft and an envelope wettable by dampening medium from said container and formed of a plurality of means displaceable in a rotary path for throwing onto said dampening-unit roller from a region of an edge of said envelope extending along the length of said sprinkler roller droplets of dampening medium withdrawn from said container, said plurality of throwing means being stressed in tension between said discs and extending parallel to said shaft, and traverse means carrying a plurality of fingers disposed adjacent to and spaced from said discs and having respective edges projecting into said rotary path of said plurality of throwing means.

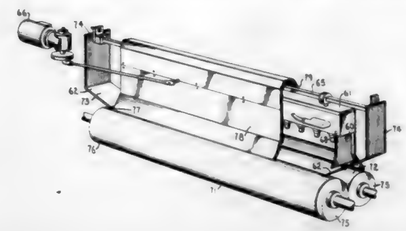
4,044,674

SPRAY DAMPENING SYSTEM FOR HIGH QUALITY OFFSET PRINTING

Roy R. Smith, Jr., Leawood, Kans., assignor to Smith R.P.M. Corporation, Lenexa, Kans.

Continuation-in-part of Ser. No. 491,290, July 24, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 637,879
Int. Cl.² B41F *7/30*
U.S. Cl. 101—148 **5 Claims**

1. In combination with a printing press having a frame, an inking train and an offset plate cylinder which engages a blanket cylinder for transferring an ink image thereto, dampening apparatus comprising:
   - a. an elongated spray member having a line of several dampening liquid atomizing spray nozzles positioned on said press in laterally spaced relation; means reciprocating said spray member laterally of said press;
   - b. dampening roller means having opposite ends, said dampening roller means being positioned to receive spray from said nozzles and having a length between said roller means ends less than the spray path width emitted from said nozzles, including said reciprocation, whereby said spray path extends beyond said roller means ends;
   - c. a pair of spray shield means associated with said spray member and respectively positioned to intersect and prevent overspray beyond said roller means ends;
   - d. said spray shield means respectively having a first shield



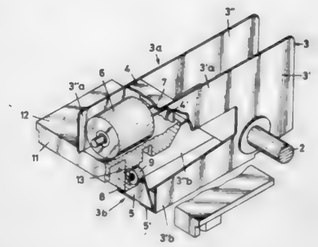
and a second shield each with free dripping lower portions positioned over said roller means, said first shield being mounted on said spray member and said second shield being fixed with respect to said frame, whereby intersected spray is dripped onto said roller means; and
   - e. transfer means contacting said dampening roller means and transferring moisture to said plate cylinder.

4,044,675

PRINTING DEVICE HAVING A SLIDING CARRIAGE

Horst Jürgen Deisting, Berlin, Germany, assignor to Adrema Pitney Bowes GmbH, Heppenheim, Bergstrasse, Germany

Filed Sept. 29, 1975, Ser. No. 617,660
Claims priority, application Germany, Oct. 7, 1974, 2447714
Int. Cl.² B41F *3/20*
U.S. Cl. 101—269 **2 Claims**



1. A printing device of the type to be operated in conjunction with a printing plate such as a credit card, the combination comprising:
   - a housing having at the upper portion thereof a pair of parallel, longitudinally extending openings,
   - a longitudinally extending rod disposed within said housing below the first of said openings,
   - a longitudinally extending anvil member, operative to receive and hold a printing plate, fixedly received within the second of said openings, said anvil having at its lower portion thereof a longitudinally extending aperture with upturned ends,
   - a U-shaped carriage having a base and a pair of arms extending laterally from said base, said base being received within said first opening and slidably and pivotably supported upon said rod, the first of said arms extending outside said housing and over said anvil, the second of said arms extending within said housing, said first arm at its end distal from said base rotatably supporting a printing roll over said anvil, said second arm at its end distal from said base rotatably supporting a guide roll which is received within said aperture, the axis of said printing roll and said guide roller being parallel to one another, said

printing roll and said guide roller being vertically aligned relative to one another and perpendicular to said anvil,

whereby said carriage is operative to be slid along said rod and to be pivoted upwardly when said guide roller is received within said upturned ends of said aperture thereby maintaining said printing roll is printing engagement with said anvil when located intermediate said aperture ends and disengaging said printing roll from said anvil when said guide roll is received by one of the said aperture ends.

4,044,676

PRINTING MECHANISM

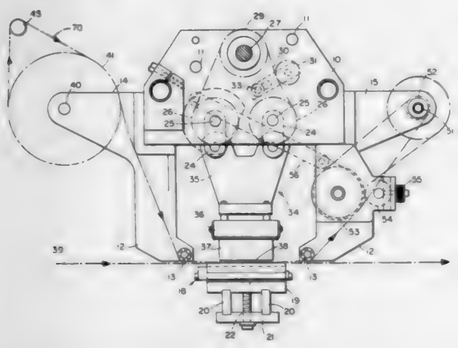
William Ronald Hudson, Leigh, England, assignor to Milford-Astor Limited, England

Filed Feb. 12, 1975, Ser. No. 549,444

Claims priority, application United Kingdom, May 6, 1974, 5830/74

Int. Cl.² B41F *1/04*

U.S. Cl. 101—297 **1 Claim**



1. Printing mechanism comprising

a housing

print head support means including a print head carrying a flat type of face movably mounted on said housing

a platen comprising a freely movable endless conveyor for supporting a sheet to be printed, said sheet moving forwardly with respect to said printing mechanism and being interposed between said platen and said type face

said platen being mounted on said housing and including a base fixed with respect to said housing and an extended planar portion adjacent said sheet and movable with respect to said housing, by pressure contact of said type face against said sheet, in a plane parallel with said sheet and in the direction of movement of said sheet, through a limited distance between a type face initial contact position and a type face release position,

said print head support means bodily moving said printing head relative to said housing along a path defining a closed curve around an axis that is substantially parallel to the plane of the sheet and platen, said path lying in a plane that is substantially perpendiuclar to the plane of the sheet and platen so as to bring said type face into printing contact with said sheet against said platen movable planar portion, said type face pinching said sheet against said planar portion, said type face and said sheet moving parallel during said printing contact and providing the sole driving force to move said platen therewith,

said platen planar portion being thereby moved parallel with said sheet and at the same linear speed and in the same direction as said sheet from said type face initial contact position to said type face release position during said printing contact.

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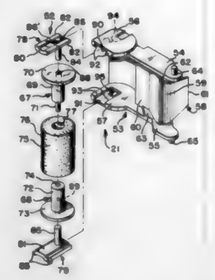
INKING MECHANISM

Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio

Filed Aug. 13, 1975, Ser. No. 604,389

Int. Cl.² B41K *3/60*; B41F *1/46, 31/33*

U.S. Cl. 101—348 **19 Claims**



1. An inking mechanism, comprising: an ink roller, an inker body having a pair of undercut slots and a pair of shoulders, and a pair of separate mounting members, each mounting member having a mounting member body, a pair of flanges joined to the mounting member body, a shaft joined at one end to the mounting member body, and a resilient finger joined to the mounting member body, the flanges of each mounting member being received in the respective slot in the inker body, and the resilient finger of each mounting member being cooperable with the respective shoulder of the inker body, each mounting member being of one-piece molded plastics construction.

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PRINTING CYLINDER FOR PRINTING MACHINES

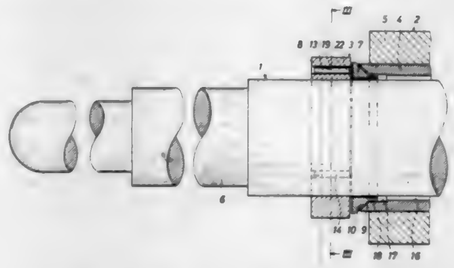
Claus Løwe Rasmussen, Horsens, Denmark, assignor to Schublich A/S, Denmark

Filed July 7, 1976, Ser. No. 703,209

Claims priority, application Denmark, July 14, 1975, 3199/75

Int. Cl.² B41F *27/10*

U.S. Cl. 101—378 **10 Claims**



1. A printing cylinder for printing machines, particularly flexoprinting machines and indirect photogravure printing machines, comprising a shaft (1), a sleeve (2) adapted to support a printing block and mounted on the shaft (1) with radial clearance, and two adjusting mechanisms (3), said adjusting mechanisms including a respective adjusting mechanism (3) provided at each end of said sleeve (2), each adjusting mechanism (3) being adapted to centre and secure the sleeve (2) on the shaft (1) and each comprising a guide ring (7) and a clamping ring (8), said guide ring (7) being provided with a circumferential conical guide surface (9) engageable with a corresponding circumferential conical guide surface (10) at each end of the sleeve (2), characterized in that a fit between the shaft (1) and the guide ring (7) is so easy that the guide ring (7) may be somewhat tilted relative to a plane at right angles to the longitudinal axis of the shaft (1), and that the clamping ring (8) comprises radial, adjustable securing means (11, 12) for securing said clamping ring to said shaft and axial adjusting means (13, 14, 15) for adjusting said guide ring.

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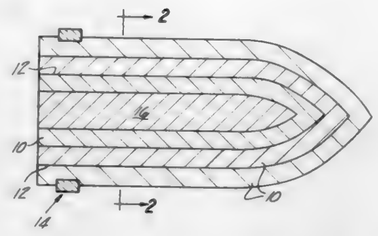
LAMINATED ARMOR-PIERCING PROJECTILE

Victor H. Pagano, Rochester, and Server Tasdemiroglu, Sterling Heights, both of Mich., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 6, 1975, Ser. No. 619,874

Int. Cl.² F42B *13/06*

U.S. Cl. 102—52 **2 Claims**



1. An armor-piercing military projectile of the solid type, comprising a central core (16) nested within a plurality of concentric metallic lamellae (10); each of said core and lamellae having an outer circular cylindrical side surface merging into an axial ogive termination at the projectile front end; each lamellae being a hollow annular shell structure having a substantially uniform wall thickness therealong; said lamellae and core terminating at a common transverse plane at the rear end of the projectile; copper bonding material fused to the core and lamellae surfaces along each entire interface; the lamellae being of decreasing hardness and increasing toughness measured from the outermost lamellae to the innermost lamellae; the outermost lamellae being a quenchhardened steel providing a relatively hard outer surface along the entire length of the projectile.

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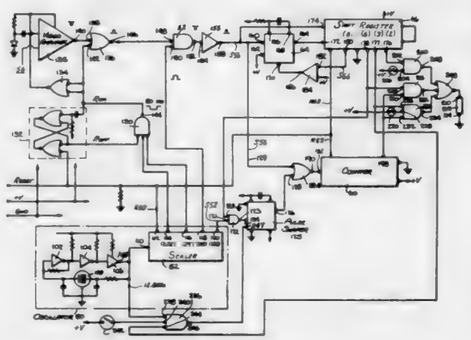
REMOTELY CONTROLLED ELECTRONIC FUZE

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Filed May 14, 1975, Ser. No. 577,510

Int. Cl.² F42C *11/00*

U.S. Cl. 102—70.2 R **5 Claims**



1. A weapon system comprising:

a projectile having a fuze,

said fuze including

detonator means,

timing means having output means for providing an output timing signal after a predetermined period of time,

detonator function means having output means coupled to said detonator means for providing a signal to actuate said detonator means,

impact responsive means coupled to said timing means for providing an output signal in response to an impact after a period of flight,

said impact responsive means upon impact causing said timing means to commence timing said predetermined period of time to provide said output timing signal to cause said detonator function means to actuate said detonator means at the end of said period of time,

said timing means including

a local oscillator,

a counter coupled to said oscillator for receiving and accumulating pulses therefrom,

said impact responsive means normally disabling said coupling between said oscillator between said oscillator and said counter and upon impact enabling said counter to thereafter receive pulses from said oscillator and upon accumulating a predetermined count to provide said output timing signal.

4,044,681

CONTROL CIRCUIT FOR THE CONDUCTION OF AN ELECTRONIC SWITCH

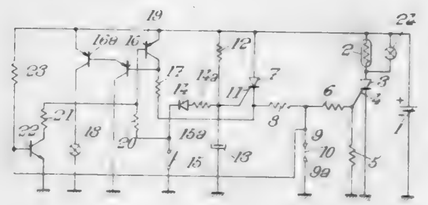
Henri Edouard Courier de Méré, Paris, France, assignor to Bicosa Societe de Recherches, Clichy, France

Filed Nov. 12, 1975, Ser. No. 631,110

Claims priority, application France, Nov. 14, 1974, 37623/74

Int. Cl.² F42C *11/00*

U.S. Cl. 102—70.2 R **11 Claims**



1. Detonation circuit for firing a detonator, comprising a detonator to be fired, a D.C. source, a first electronic switch which includes a control electrode and is connected in series with the detonator and the D.C. source, a feed circuit for the control electrode of the first electronic switch, a second electronic switch, which includes a control electrode, triggering means arranged to offer, in response to detection of an event, an increase in value of resistance from below a first, lower limit to above a second, upper limit, and means for putting the detonation circuit into a state of readiness by giving a conduction signal to the control electrode of the second electronic switch in order to make it conducting wherein the second electronic switch is situated in the feed circuit of the control electrode of the first electronic switch, and the triggering means is situated in series with said second electronic switch, and is adapted to prevent the supply of current from said second electronic switch to the control electrode of said first electronic switch when said second electronic switch is conducting and said triggering means has a value of resistance less than that of said lower limit, said second electronic switch being adapted to provide a control signal to the control electrode of the first electronic switch, when the second electronic switch is conducting and the triggering means has a resistance

above the second limit, to render said control electrode of the first electronic switch conductive.

4,044,682

IGNITION CURRENT GENERATOR FOR AN ELECTRICAL PROJECTILE FUZE

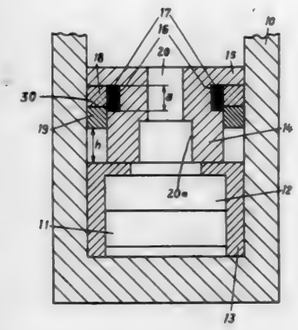
Panayotis Karayannis, Zurich, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland

Filed Dec. 4, 1975, Ser. No. 637,639

Claims priority, application Switzerland, Dec. 6, 1974, 16212/74

Int. Cl.² F42C *11/04*; F42B *9/00*; F42C *9/00, 19/12*

U.S. Cl. 102—70.2 GA **2 Claims**



1. An ignition current generator for an electrical projectile fuze of a projectile having a lengthwise extending axis comprising in combination:

a. a soft iron core arranged substantially coaxially with respect to the projectile axis;

b. an induction coil surrounding the soft iron core;

c. a substantially ring-shaped permanent magnet having front and rear end faces and arranged to be axially displaceable between a first position and a second position, said ring-shaped permanent magnet surrounding the induction coil when in its first position to close a first magnetic circuit;

d. a soft iron ring which, viewed in the direction of the projectile, is secured at said rear end face of said ring-shaped permanent magnet;

e. said soft iron ring being secured at said rear end face of said ring-shaped permanent magnet in that said ring-shaped permanent magnet and said soft iron core are mutually bonded to one another;

f. said soft iron core possessing a flange at which bears said substantially ring-shaped permanent magnet with said front end face thereof when in its first position for closing said first magnetic circuit;

g. said soft iron core being provided at its periphery with a groove, said induction coil being located in said groove;

h. said soft iron core possessing an outer substantially cylindrical surface;

i. said substantially ring-shaped permanent magnet having a substantially inner cylindrical surface; and

j. said substantially ring-shaped permanent magnet, when in said second position, bearing by means of said inner cylindrical surface at said outer cylindrical surface at a location spaced from said induction coil in order to close a second magnetic circuit spaced from said first magnetic circuit.

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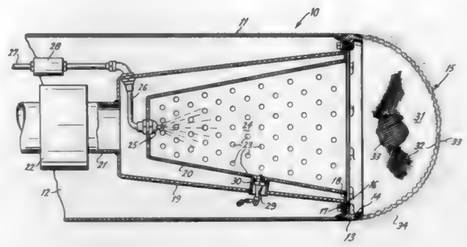
HEAT GENERATOR

Harold H. Ostroff, Normandy, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Aug. 20, 1959, Ser. No. 835,815

Int. Cl.² F42B *4/26*

U.S. Cl. 102—90 **2 Claims**



1. A decoy missile for high speed air travel comprising the improvement of a casing open at one end, a substantially closed air receiving chamber in said casing, conduit means supplying combustion air under pressure from a remote source connected to said closed chamber, hollow flameholder means mounted in said closed chamber to admit air under pressure to the hollow interior, said flameholder means having an open end adjacent said one end of the casing, fuel supply spray means connected to said flameholder means to supply fuel thereto under pressure, igniter means to initiate combustion of the fuel sprayed into the air within the hollow interior of said flameholer means, and a heat radiating foraminous member carried by said casing over the open ends of said casing and flameholder means and exposed for viewing in the high speed air stream, said foraminous member forming with the hollow interior of said flameholder means an enclosed combustion space and being composed of a finely perforated sintered porous material through which the hot combustion gases pass and which imposes a substantial pressure drop between the combustion space and the exterior surface of said member to create a layer of hot gases on the exterior surfaces which is relatively stable in the high velocity air flow about said casing and over the exterior of said member, the products of combustion passing through said foraminous member acting to soak said member and raise the temperature thereof to infrared to emission temperature.

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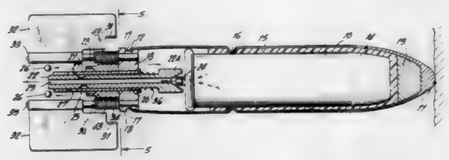
AEROSOL PROJECTILE FOR LACHRYMATING MATERIAL

Guido John Gaggini, Cowansville, and Eugene Lawrence Gould, Kittanning, both of Pa., assignors to Federal Laboratories, Inc., Saltsburg, Pa.

Filed July 13, 1976, Ser. No. 704,788

Int. Cl.² F42B *13/46*

U.S. Cl. 102—90 **6 Claims**



1. A projectile for conveying and dispersing lachrymating material in an aerosol form comprising:

a. a hollow enclosing shell having an impacting portion at one end and a base at the other end thereof.

b. a container having a quantity of lachrymating material under pressure within the shell;

c. valve means for the container disposed adjacent the base of the shell for dispensing the said lachrymating material;

d. a plurality of stabilizing fins swingably carried by and extending outwardly of the base.

e. a washer shaped member carried in the base of the shell said washer shaped member having a central opening therein;

f. an actuating plunger slidably carried within the washer opening in alignment with the valve means;

g. locking means engagable with the actuating plunger until shell impacting;

h. an inertial member, slidably disposed about the plunger and overlying the locking means and;

i. tabs carried by the fins to hold the locking means in engagement with the plunger and inertia member until launching of the shell.

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JACKETLESS HUNTING BULLET WITH ROLL-BACK CUTTING FLAGS

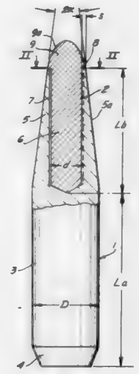
France Avcin, Ljubljana, Yugoslavia, assignor to Hirtenberger Patronen-, Zundhutchen- und Metallwarenfabrik Aktiengesellschaft, Hirtenberg, Austria

Continuation-in-part of Ser. No. 442,432, Feb. 14, 1974, abandoned, which is a continuation of Ser. No. 264,278, June 19, 1972, abandoned. This application Feb. 27, 1976, Ser. No. 662,166

Claims priority, application Austria, June 18, 1971, 5291/71

Int. Cl.² F42B *11/10*

U.S. Cl. 102—91 **2 Claims**



1. A jacketless hunting bullet comprising:

a one-piece projectile body having a solid cylindrical portion extending over at least half the length of the bullet and a frustoconical head converging away from said solid cylindrical portion, said head being formed with a generally cylindrical chamber extending over the entire length of only said frustoconical head, terminating at said cylindrical portion and defined by an internal wall, said chamber opening at the small-diameter end of the frustoconical head and being surrounded at the latter end by a thin wall portion of said head, said wall being formed with a plurality of angularly equispaced axially extending grooves of constant V cross section with the wide part of the V being open toward the axis of said body, said grooves extending the full length of said generally cylindrical chamber, said grooves having depths of substantially half the wall thickness of said wall portion; and

a mass of plastically deformable material filling said chamber and projecting therefrom at said end of said head to form a tip for the bullet, said tip having an outer surface flush with the external surface of said head at said portion, said mass reaching substantially to the solid cylindrical portion, said head having a length L_b, said body having a total length (L_a+L_b), said solid cylindrical portion having a diameter D, said chamber having a diameter d and the parameters L_a, L_b, D and d being related so that the ratio $d:D$ is about 0.50 ± 0.15; the ratio $d:L_b=1:3$ to $1:4$; and the ratio $(L_a+L_b)/D=4.0\pm1.0$.

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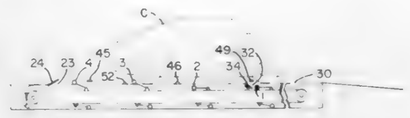
REDUCED LENGTH VEHICLE CONVEYOR

Russel A. Van Brakel, Harshaw, Wis., assignor to Haverberg Auto Laundry Equipment Co. Inc., Chicago, Ill.L

Filed Oct. 30, 1975, Ser. No. 627,222

Int. Cl.² B61B *13/12*

U.S. Cl. 104—172 B **2 Claims**



1. A compact conveyor for moving a vehicle by sequentially engaging one each of the front and rear wheels of the vehicle and moving them along a path, comprising:

an active track for supporting the wheels of the vehicle and having a roller drop slot intermediate its ends,

an inactive track paralleling said active track and lying therebelow,

a plurality of spaced rollers positionable along said inactive track and also along said active track for engaging the wheels of the vehicle on said active track, said rollers being spaced apart less then the length of said active track,

drive means having a roller driving run for moving the rollers along said inactive track or active track,

means for selectively moving the rollers into said active track for propelling a wheel or for moving the rollers along said inactive track for by-passing the wheels,

roller removing means for selectively removing a roller in engagement with a front wheel of the vehicle from the active track to the inactive track through said roller drop slot to disengage the roller prior to the termination of said roller driving run so that the roller no longer propels the front wheel still resting on the active track, said roller removing means including a roller drop guide, an over-center linkage for holding the roller drop guide in a raised wheel-passing position covering said roller drop slot for supporting the weight of a vehicle wheel, and power means operatively connected to said linkage for selectively positioning the roller drop guide between said raised wheel-passing position and a lowered roller-dropping position exposing the roller drop slot, and

control means for actuating said power means to remove a roller and actuating said means for moving a roller into the active track for bringing a subsequent roller into engagement with a rear wheel of the vehicle in a sequence to first move the vehicle by pushing against the front wheel and then moving the vehicle through the remainder of said driving run by pushing against the rear wheel.

4,044,687

TRUCK FOR THE COMMON PIVOTAL SUPPORT OF TWO CAR BODIES

Helmut Bugarcic, Berlin, Germany, assignor to Linke-Hofmann-Busch GmbH, Germany

Filed Aug. 21, 1975, Ser. No. 606,549

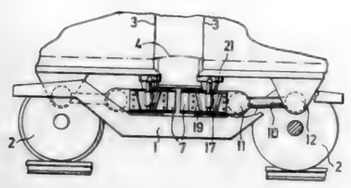
Claims priority, application Germany, Aug. 21, 1974, 2440069

Int. Cl.² B61F *5/08*

U.S. Cl. 105—4 R **8 Claims**

1. A truck for the pivotal support of two car bodies, particularly of articulated rail motor cars, comprising a truck frame, a vertical pivot for each car body mounted in closely spaced longitudinal locations on said truck frame, a transversely ex-

tending swiveling bolster mounted intermediate its length for pivoting movement about each of said vertical pivots, spring support means adjacent each end of each of said bolsters for



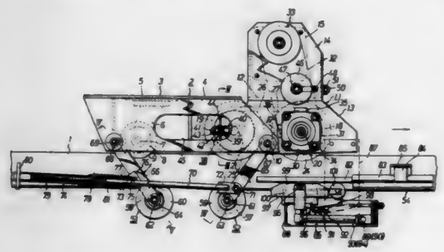
resiliently supporting a car body on the respective ends of respective bolsters, and slide means on said truck underlying said spring support means and slidably supporting the respective ends of said bolsters on said truck.

4,044,688

MONORAIL TRANSPORT APPARATUS

Kazuharu Kita, Kobe, Japan, assignor to Senyo Kiko Kabushiki Kaisha, Osaka, Japan

Filed Dec. 19, 1975, Ser. No. 642,404
Claims priority, application Japan, June 24, 1975, 50-78733
Int. Cl.[2] B61C *11/00*
U.S. Cl. 105—30 **5 Claims**



1. A monorail transport apparatus comprising a transport vehicle body provided with a caster wheel rollable on a monorail having upper and lower surfaces, a driving vehicle body partly received in and pivotally connected to the front portion of said transport vehicle body so as to be swingable around the axis of a transverse shaft, a driving wheel and a driven wheel disposed on opposite sides of said transverse shaft, an endless driving belt entrained around said driving and driven wheels and pressed against the upper surface of said monorail, and an auxiliary wheel pivotally connected to said driving vehicle body so as to be swingable around the axis of said transverse shaft and pressed against the lower surface of the monorail, the arrangement being such that the monorail transport apparatus is propelled along the monorail by means of the driving vehicle body which engages the monorail from above and below between said endless driving belt and said auxiliary wheel.

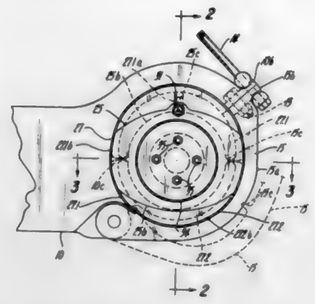
4,044,689

RESILIENTLY RAILWAY TRUCK SUSPENSION

Walter S. Eggert, Jr., Huntingdon Valley, Pa., assignor to The Budd Company, Troy, Mich.

Filed Oct. 21, 1975, Ser. No. 624,368
Int. Cl.[2] B61F *5/30, 5/38, 5/52, 15/12*
U.S. Cl. 105—221 R **2 Claims**

1. A railway truck journal bearing mount comprising, in combination, a bearing assembly on an axle journal, elastomeric bushing means surrounding said bearing assembly, an inner retaining ring having elliptical end flanges with the major axis horizontal and dimensioned to embrace the ends of said bushing means, an outer retaining ring means for clamping said bushing means on said inner retaining ring, said bushing means having radial circumferential end flanges embraced within the flanges of the inner retaining ring, the elastomeric bushing means at the ends being more completely embraced at the sides than at the top and bottom, the flanges of the bushing means embracing the sides of the clamping ring means, the bushing means being thicker at the top than elsewhere, tapering toward the sides, the bushing means being thinner at the middle circumferentially than at the sides, the bushing means being divided into upper and lower segments meeting on a horizontal axial plane, said clamping ring means being divided into upper



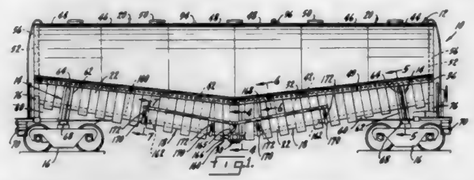
and lower parts along an inclined axial plane, the lower clamping ring part being hinged to the upper clamping ring part and being connected at the outer end to the upper clamping ring part at an elevation above the horizontal axial plane, said inner retaining ring having radial pins at the top projecting into holes in the upper bushing segment, said upper clamping ring part having an interior lug embraced on the sides and ends by concavities in the adjacent ends of the bushing segments, and said lower clamping ring part having an interior lug embraced on the sides and ends by concavities in adjacent ends of the bushing segments.

4,044,690

RAILWAY TANK HOPPER CAR

Ronald George Deeks, 1521 Warland Road, Oakville, Ontario, Canada

Filed Mar. 24, 1975, Ser. No. 561,143
Int. Cl.[2] B61D *5/00, 5/06, 5/08, 7/00*
U.S. Cl. 105—247 **8 Claims**



1. In a railroad tank car for use in handling dry bulk commodities including a pair of bolster assemblies secured to longitudinally spaced wheel truck assemblies for supporting the car, an improved car body structure mounted on and secured to said bolster assemblies, comprising:

a. a pair of V-shaped hopper sections sloping downwardly from each end of the car to meet at the center of the car, said hopper sections having side walls which increase in length as they extend towards the center of the car;

b. a pair of asymmetric truncated cone sections secured adjacent to the corresponding upper edges of each of said hopper sections and to each other at the center of the car, said cone sections having an increasing diameter as they extend toward the center of the car;

c. a pair of end sections secured adjacent the outer edges of said hopper section and said cone section;

d. a plurality of substantially vertical longitudinally spaced apart first stiffener members secured to the outer surfaces of said hopper section side walls;

e. longitudinally extending second stiffener members secured to said first stiffener members adjacent the intersection between said hopper sections and said cone sections; and

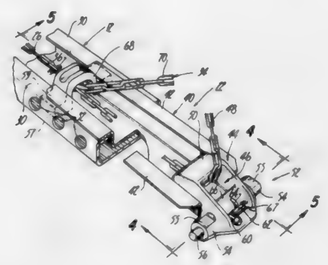
f. a plurality of substantially horizontal longitudinally spaced tie members which extend transversely across said hopper section and pass through said side walls for attachment at their respective ends to said second stiffener members.

4,044,691

VEHICLE TIE-DOWN SYSTEM FOR RAIL CARS

Donald C. Kilgus, deceased, late of Grosse Point Woods, Mich., by Marjorie M. Kilgus, executrix, 1288 Fairholme Road, Grosse Point Woods, Mich. 48236

Filed July 8, 1976, Ser. No. 703,594
Int. Cl.[2] B60P *7/08*
U.S. Cl. 105—368 T **8 Claims**



1. A vehicle tie-down system comprising in combination, a transport, a vehicle supported on said transport and having front and rear ends, an idler body mounted on said transport at a position extending fore and aft of the vehicle, said idler body having a pair of ends, a tie-down member having ends and connected to said vehicle and operatively associated with said idler body so as to hold said vehicle on said transport, said idler body including at least two support portions located fixed distances apart, said tie-down member being connected intermediate the ends thereof to said vehicle and having a pair of diverging sections inclined downwardly therefrom in a direction fore and aft of said vehicle into sliding engagement with said support portions, and tensioning means connected directly to at least one end of said tie-down member operable to draw said sections cross said support portions so as to place tension forces in said tie-down member sections operable to pull said vehicle downwardly on said transport and to restrain forward and rearward movement of said vehicle on said transport while maintaining substantially the same inclination of said tie-down member sections.

4,044,692

RAILROAD CAR VEHICLE STOWING DEVICE

Robert Duane Cruthis, and Robert Samuel Mills, both of Decatur, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 28, 1975, Ser. No. 626,381
Int. Cl.[2] B60P *3/06, 7/08*; B61D *3/02, 45/00*
U.S. Cl. 105—368 R **12 Claims**

1. A railroad flatcar securement apparatus for a wheeled vehicle comprising:

a plurality of wheel chocks;

means for securing said wheel chocks to said flatcar at positions fore and aft of the wheels of the vehicle and in contact therewith;

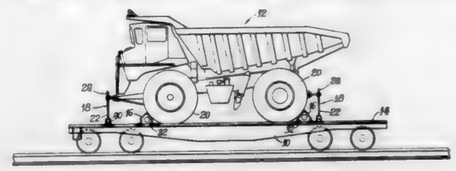
a plurality of tie rod members;

means for securing said tie rod members to the flatcar at positions respectively forwardly and rearwardly of the vehicle including at each position

an inverted channel-shaped bracket fixed laterally across the flatcar,

an elongate tapping rod inserted within said bracket, said tapping rod being rotatable on a lateral axis and being laterally movable within said bracket, said bracket having a portion cut away to expose a portion of said tapping rod, and

means for securing the lower end of at least one of said tie rod members to the exposed portion of said tapping rod so that said one tapping rod rotates within said bracket as said one tie rod member is pivoted relative to the



flatcar, said one tie rod member extending outwardly from said tapping rod with its upper end adjacent the vehicle when pivoted to an upright position, said one tie rod member thereby being laterally movable relative to the flatcar and pivotally movable toward a prone position on the bed of the flatcar; and

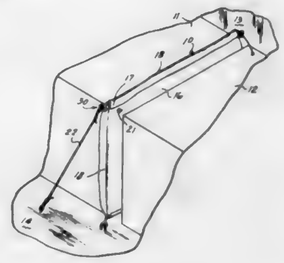
means for securing the upper ends of said tie rod members to the vehicle forwardly and rearwardly whereby said tie rod members are tensioned with the vehicle in position for transport to prevent movement of the vehicle in a direction away from the flatcar in excess of the tensioned position and whereby the wheels of the vehicle are retained against said wheel chocks at all times and under all railroad transport conditions.

4,044,693

INFLATABLE DUNNAGE WITH TIE-DOWNS

John W. Ramsey, Jr., Benton, Ark., assignor to Guardpack, Incorporated, Sheridan, Ark.

Filed Mar. 12, 1976, Ser. No. 666,259
Int. Cl.[2] B61D *45/00*; B65D *57/00, 81/10*; B65G *1/14*
U.S. Cl. 105—468 **17 Claims**



1. An inflatable dunnage bag comprising:

multiple plies of puncture-resistant sheet material folded into a rectangular form with four corners and four edges, and inner and outer surfaces;

a pneumatically inflatable bladder contained within said bag adjoining said inner surface thereof; and

a tie-down device made of flexible plastic affixed to said plies of said bag and provided as an integral part of the bag, said tie down device comprising,

a first, enlarged anchor portion received within said bag, and

a second, enlarged loop portion attached to said anchor portion within said bag, bearing a loop at a distal end

thereof outside said bag, and having a reduced portion extending through the plies of the bag,

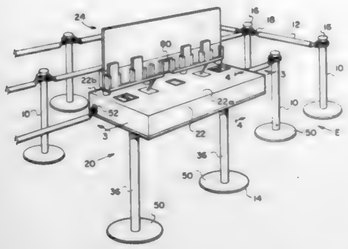
whereby said dunnage bag may be tied down in place by a rope through said loop to prevent shifting of the bag with respect to freight and a vehicle in which the bag is employed.

4,044,694

CHEQUE WRITING DESK AND CONTROL SYSTEM

Glenn John Wylie, 114 W. Deanepark Drive, Islington, Ontario, Canada

Filed Sept. 24, 1975, Ser. No. 616,252
Int. Cl.² A47B *41/04*
U.S. Cl. 108—28 **7 Claims**



1. A cheque writing desk unit for use in a customer control line rail system as a portion of such system, said system having a series of posts of predetermined height, and rail means interconnected therewith, the rail means having connection means thereon, said desk unit comprising;

a platform of predetermined length and width defining a working surface suitable for use by persons standing;

leg means supporting said platform at a suitable elevation and leaving a vacant space therebeneath between the platform and the floor whereby a person may stand close to the platform;

partition means extending upwardly from said platform, along the length thereof, and offset to one side to define a wider and a narrower portion of said platform on opposite sides of said partition means;

proper holder means on both sides of said partition means, and,

line rail interconnection means on at least one end of said platform, below the top surface of said platform, for interconnection with said rail means, whereby said rail means may be interconnected between a said post and said interconnection means in an essentially horizontal manner and freely supported therebetween, without applying tension to said platform.

4,044,695

MULTI-STAGE PNEUMATIC MUNICIPAL SOLID WASTE SEPARATION AND RECOVERY OF A PLURALITY OF CLASSIFICATIONS

Harold B. Mackenzie, Wheaton, Ill., and Ingvar G. Anderson, Dunedin, Fla., assignors to New Life Foundation, Wheaton, Ill.

Filed Feb. 27, 1976, Ser. No. 662,240
Int. Cl.² F23G *5/00*; F23K *1/00*
U.S. Cl. 110—8 P **21 Claims**

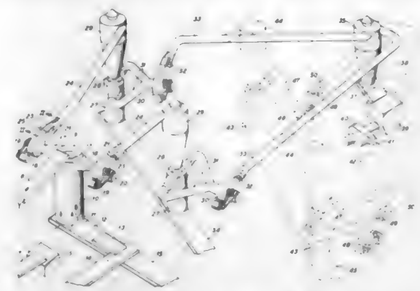
1. A system of municipal solid waste separation and fuel recovery, comprising:

effecting primary shredding of heterogeneous municipal solid waste;

pneumatically separating said primary shredded solid waste in a first-stage pneumatic separator into relatively light, low density combustible waste materials and relatively incombustible and high density waste materials;

pneumatically separating said first-stage combustible waste materials in at least one second-stage pneumatic separator into a relatively heavy density classification fuel fraction and a light density classification fuel fraction in a continuous processing operation;

transporting the relatively heavy density classification fuel fraction from said second-stage pneumatic separator; and



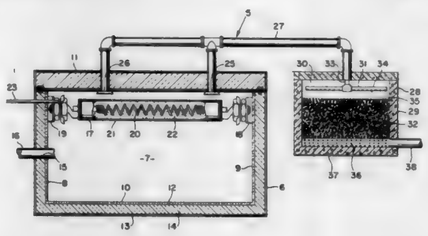
separately transporting the light density classification fuel fraction from the second-stage pneumatic separator.

4,044,696

SEWAGE DISPOSAL PLANT WITH EVAPORATION/INCINERATION MEANS

Frank M. Marincek, 2019 Campus Road South Euclid, Cleveland, Ohio 44121

Continuation of Ser. No. 273,401, July 20, 1972, abandoned, which is a continuation of Ser. No. 23,601, March 20, 1970, abandoned. This application June 7, 1976, Ser. No. 693,485
Int. Cl.² A47K *11/02*
U.S. Cl. 110—9 E **12 Claims**



3. A batch method of sewage disposal in a building such as a home or apartment, comprising:

a. feeding a batch of raw human sewage, including feces and urine, deposited in a plumbing fixture in the building, into the confined chamber of a tank located remote from the plumbing fixture, the tank having a removable top for sealing the chamber and a heater means disposed in the upper portion of the chamber free of the removable top;

b. heating the batch of sewage with the heater means to evaporate water of said batch and further to incinerate solid material of said batch remaining after evaporation of the water, so as to produce a powdery residue therefrom;

c. removing the water vapor from the chamber and feeding it to a condenser means comprising (I) an inlet through which water vapor enters the condenser means, (II) an outlet through which condensed water vapor exits from the condenser means, and (III) a quantity of particulate material sufficient to condense water vapor from said batch by absorbing heat thereform;

d. withdrawing and disposing of water exiting from the outlet of the condenser means; and

e. withdrawing and disposing of powdery residue in the tank.

9. A batch system of sewage disposal in a building such as a home or apartment, comprising:

a. a closed tank coupled by piping to at least one plumbing fixture in which a batch of raw human sewage, including feces and urine, is deposited, the tank located remote from the plumbing fixture and including a confined chamber for containing said batch of sewage and a removable top for sealing the chamber from the ambient atmosphere;

b. heater means mounted in the chamber in an upper portion thereof free of the removable top, the heater means functioning to evaporate water of the sewage and further to incinerate solid material of the sewage remaining after evaporation of the water, so as to produce a powdery residue therefrom;

c. inlet means cooperating with the tank and functioning to feed said batch of sewage from said piping into the chamber;

d. vapor outlet means cooperating with the tank and functioning to remove water vapor from the chamber;

e. means for condensing the water vapor, including (I) an inlet through which water vapor enters the condenser means, (II) an outlet through which condensed water vapor exits from the condenser means, and (III) a quantity of particulate material sufficient to condense water vapor from said batch by absorbing heat therefrom; and

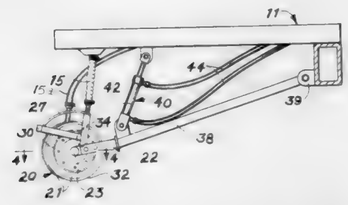
f. conduit means cooperating with the vapor outlet means and functioning to feed water vapor to the inlet of the condenser means.

4,044,697

NO TILL SEED DRILL

Morton C. Swanson, P.O. Box 214, Palouse, Wash. 99161

Filed Apr. 28, 1975, Ser. No. 571,947
Int. Cl.² A01C *5/08*; A01B *63/00*
U.S. Cl. 111—66 **10 Claims**



1. A tractor drawn no till seed drill for planting seeds in previously harvested plots that have not since been tilled with the seeds being evenly spaced along a furrow formed in the stubble ground, while moving in a forward direction, comprising:

a wheel supported framework;

a hopper on said framework for receiving seeds in bulk;

a seed delivery tube extending downwardly from said hopper to an open end;

a coulter disc operatively connected to said framework for rotation about a first axis;

a furrow opening disc operatively connected to said framework for rotation about a second axis inclined to and rearward of said first axis with said furrow opening disc tangentially engaging said coulter disc at a point of convergence elevationally below said first and second axes; and

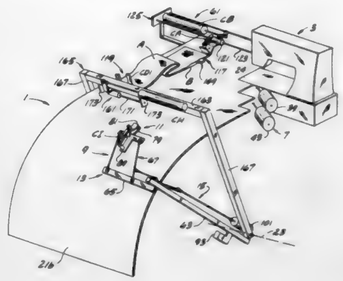
wherein said seed delivery tube open end is located directly above said point of convergence.

4,044,698

APPARATUS FOR JOINING PLIES OF MATERIAL SUCH AS TEXTILE FABRIC

William R. Conner, Jr., Shelbyville, Tenn., assignor to Stahl-Urban Company, Brookhaven, Miss.

Filed July 16, 1976, Ser. No. 705,897
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.12 **29 Claims**



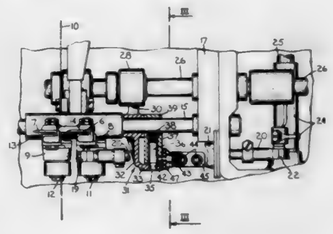
1. Apparatus for joining plies of material such as textile fabric comprising means for seaming the plies together along an edge thereof, means for feeding the plies through the seaming means, and contour guide means for shifting the plies as they are fed forward by the feeding means to effect contour seaming of the plies, wherein the improvement comprises the provision of means for controlling the feed of the plies, said control means comprising a control clamp for clamping the plies as they are fed forward and means mounting said control clamp for movement with the plies as they are fed forward, and loading means adapted, while one assembly of plies is being fed through the seaming means, to receive the next assembly of plies to be seamed and operable upon completion of seaming of the said one assembly to enter the next assembly in the seaming means and in said control clamp.

4,044,699

DEVICE FOR TILTING SEWING MACHINE HOOKS TO FACILITATE THREADING

Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy

Filed Sept. 8, 1976, Ser. No. 721,621
Claims priority, application Italy, Sept. 23, 1975, 27523/75
Int. Cl.² D05B *57/02*
U.S. Cl. 112—200 **5 Claims**



1. A device for tilting the hooks within the base of a sewing machine of the type having needles operatively associated with the hooks for forming chain stitches, said device comprising:

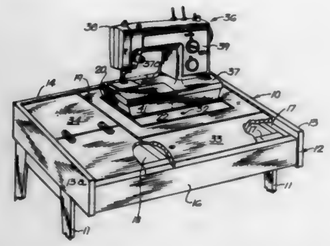
a. a hook supporting shaft (15) oscillatably supported within the base of the sewing machine;

b. a lever member (31) pivotally mounted on said hook supporting shaft which includes:

i. an arm (32) having a segment (33) formed on the free end thereof, said segment being concentric to said hook

supporting shaft (15) and including means on the inner surface thereof defining a radial bore (34);
c. actuating means (37) fixed on said hook supporting shaft in operative association with said lever member;
d. a pin (36) slidably carried by said actuating means for connecting said lever member (31) with said actuating means (37) to effect oscillating movement of said hook supporting shaft (15); and
e. means for selectively disconnecting said lever member (31) from said actuating means (37) to permit tilting of the hooks to a position to facilitate the threading thereof.

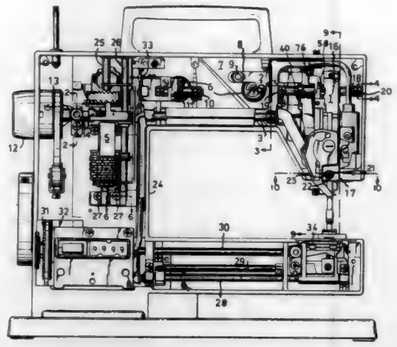
4,044,700
SEWING MACHINE SUPPORT STRUCTURE AND WORK SURFACE
Eugene Aeschliman, Jackson, Miss., assignor to DeSoto, Inc., Des Plaines, Ill.
Filed Sept. 10, 1976, Ser. No. 722,016
Int. Cl.² D05B *75/02*
U.S. Cl. 112—217.1 **7 Claims**



1. A support structure for a sewing machine comprising a frame supported on a plurality of legs, said frame including a pair of horizontal support members, a first horizontal panel member slidably supported on said support members, a sewing machine supported on said first horizontal panel member, a second horizontal panel member removably supported on said support members contiguous to said first panel member and coplanar therewith, said first and second panel members constituting the work surface of said support structure, said first panel member and said member being selectively slidable on said support members to position said machine in in-use or out-of-use positions with said second panel member being disposed either rearwardly or forwardly in relation to said first panel member.

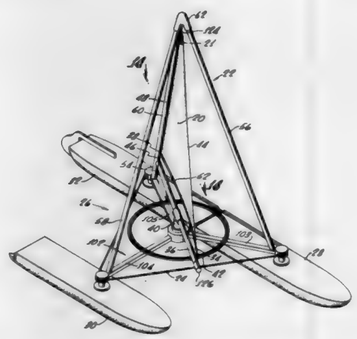
4,044,701
SEWING MACHINE FRAME WITH PRESSER FOOT AND NEEDLE BAR UNIT
Hannes Giesselmann, and Karl Ingvar Fredrik Rendahl, both of Huskvarna, Sweden, assignors to Husqvarna Aktiebolag, Huskvarna, Sweden
Filed Mar. 15, 1974, Ser. No. 451,706
Claims priority, application Sweden, Mar. 16, 1973, 7303690; Mar. 16, 1973, 7303691; Mar. 16, 1973, 7303692
Int. Cl.² D05B *73/02*
U.S. Cl. 112—259 **5 Claims**

1. A sewing machine including a body having an open rear portion, an arm, precast seats in the body, a presser foot and needle bar unit, a thread tension device and a top shaft unit, means fastening said unit and device in said seats in the body, the presser foot and needle bar unit being provided with a presser foot mechanism and a needle bar holder, and being defined by an elongated frame having ends, points of attachment at both ends, said points of attachment comprising means providing a range of adjustment for setting of the position of the presser foot and needle bar unit in the arm in at least one



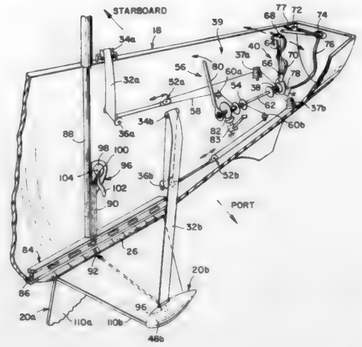
direction at a right angle to the longitudinal direction of the elongated frame.

4,044,702
HIGH EFFICIENCY AERODYNAMIC SAIL SYSTEM FOR BOATS, AND METHOD FOR SAILING
Robert S. Jamieson, 411 N. Bush, Anaheim, Calif. 92805
Filed Oct. 21, 1974, Ser. No. 516,166
Int. Cl.² B63H *9/04*
U.S. Cl. 114—102 **39 Claims**



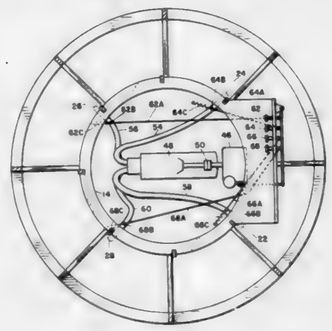
1. A high efficiency aerodynamic sail system, comprising:
a. a sail having a luff, a leech, a head and a foot,
said sail having a center of area at, or below, mid-height,
b. means for supporting said sail,
said supporting means being adapted to suspend said sail from every corner,
said supporting means being adapted for mounting on a sailing craft,
said supporting means including means to adjust the angle between said sail and said sailing craft while sailing, and to maintain said angle independently of the strength of the incident wind,
c. means for causing the luff-to-leech airfoil chords of said sail to be virtually parallel each with the others when said sail is generating an aerodynamic lift force,
said means for causing the luff-to-leech airfoil chords of said sail to be virtually parallel with each other when said sail is generating an aerodynamic lift force being capable of adjustment while said sail is in use, and,
d. means for connecting said sail to said means for matching the leeward deflections of said luff and leech.

4,044,703
SAILBOAT CONTROL APPARATUS
Joel Kurtz, Box 26, Damascus, Pa. 18415
Filed Aug. 25, 1976, Ser. No. 717,638
Int. Cl.² B63B *41/00*
U.S. Cl. 114—143 **8 Claims**



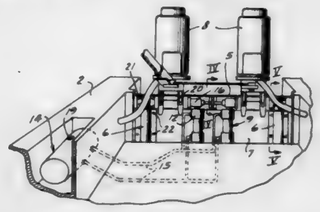
1. In a boat, attitude control apparatus comprising: first and second weighted keels pivotally mounted to a medial point on the underside of said boat for independent rotation about a common longitudinally directed axis; first and second flexible line means upwardly directed along opposite external sides of said boat; the lower ends of said first and second line means being connected respectively to said pair of keels for supporting said keels at variable angles with respect to the vertical; first and second independently moveable controls within said boat; and means within said boat coupling each of said first and second controls to the upper ends of each of said first and second line means for selectively taking up or letting out said first and second line means in response to movement of said first and second control means in a manner that movement of only said second control varies the angle between said keels but maintains the orientation of the bisector of said angle substantially constant and that movement of only said first control varies the angular orientation of said bisector while maintaining the angle between said keels substantially constant.

4,044,704
SAUCER BOAT
Gerald R. Miller, R.R. No. 4 Box 64A, Arkansas City, Kans. 67005
Filed June 28, 1976, Ser. No. 700,316
Int. Cl.² B63H *11/04*
U.S. Cl. 115—12 R **6 Claims**



1. In a circular boat, apparatus for controlling the direction comprising;
a. a power source and liquid pump;
b. a plurality of pipes supplied with high pressure, high velocity liquid from said pump through valve means;
c. said pipes directed through the wall of said boat below the water line in selected directions;
whereby by controlling the flow of said high velocity liquid through one or more of said pipes, said boat can be controlled to move in a selected one of a plurality of predetermined directions and wherein
d. each of said pipes has a valve near its discharge end;
e. each valve controlled by a separate control element;
f. each control element being a lever operating a valve by means of a tension means restrained by a spring means; and in which
g. the engine throttle is responsive to the operation of at least one control element.

4,044,705
OUTBOARD MOTOR MOUNTING ASSEMBLY AND SERVO MECHANISM THEREFOR
William Roberts, Tavernier, Fla., assignor to Ross D. Siragusa, Barrington, Ill.
Filed Mar. 25, 1976, Ser. No. 670,431
Int. Cl.² B63H *5/12*
U.S. Cl. 115—41 HT **1 Claim**



1. An outboard motor mounting assembly for use on a boat to be powered by outboard-type motors and/or engines, comprising
an assembly body,
an auxiliary transom carried by said body and having a selected width to conform with a width dimension of a transom of said boat, said auxiliary transom positioned on an outside of said boat transom and having an inner vertical face aligned with an outer vertical face of said boat transom,
interlocking guide rail means including a pair of support members having a top horizontal portion with an outer end thereof secured to a top inner side of said auxiliary transom and a vertical slide portion having a top end carried by an inner end of said horizontal portion, one each of said members positioned along each outer vertical edge of said auxiliary transom, and a pair of elongated C-shaped channels secured to an inner face of said boat transom and positioned to receive, in a telescoping relationship, one each of said vertical slide portions of said support member respectively,
raising and lowering means including,
two spaced hydraulic lifting cylinders secured to said inner face of said boat transom and vertically positioned to provide a mounting space for said outboard motor between said cylinders and said interlocking guide rail means,
piston means carried by each cylinder and limited to a 3½ inch stroke, said pistons having top ends joined to a horizontal collar, and
an elongated horizontal lifting bar disposed in said collars and supported by brackets attached along said top edge of said inner face of said auxiliary transom between said collars and at ends of said bar, respectively,
a fluid pumping means operatively connected to said lifting cylinders to allow a user, from a remote location,

to selectively move said top edge of said transom from a deep water position wherein said top edge proximately aligns with a top edge of a boat transom to a shallow water position proximately 3¾ inches thereabove,

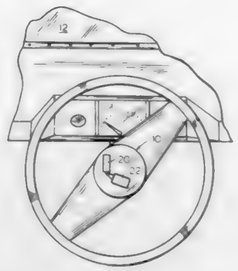
wherein motors carried by said auxiliary transom can be selectively moved from a deep water, high speed configuration to a shallow water, slow speed configuration without affecting cavitation during operation.

4,044,706

TRAILER DIRECTION INDICATOR

Chester C. Gill, 950 Colorado Ave., A-27, Stuart, Fla. 33494

Filed Oct. 22, 1976, Ser. No. 734,722
Int. Cl.² B60Q *1/42*
U.S. Cl. 116—31 **7 Claims**



1. A trailer guide for visually assisting the driver in manually operating the steering mechanism of a vehicle-trailer combination during travel in the reverse direction, said guide comprising in combination:

frame means for being coupled to the steering mechanism of the vehicle, said frame means having a first pivot thereon for being laterally displaced responsive to the movement of the steering mechanism, with said frame means having further a second pivot thereon spaced from and relatively below said first pivot;

a first elongated indicator rotatably coupled adjacent a first end thereof about said first pivot; and

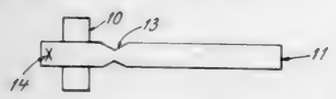
a second elongated indicator movably coupled along the longitudinal axis thereof to said second pivot for rotating therearound, with a first end of said second elongated indicator being movably coupled to a second end of said first elongated indicator, whereby a movement of the steering mechanism causes a gravitationally induced rotational displacement of said first and second longitudinal indicators about said first and second pivots for indicating to the vehicle operator the expected direction of travel of the trailer to the steering commands.

4,044,707

INTERRUPTIBLE TIME-TEMPERATURE INDICATOR

Charles H. Byrne, Pearl River, N.Y., assignor to General Foods Corporation, White Plains, N.Y.

Filed June 5, 1975, Ser. No. 583,942
Int. Cl.² G01K *11/06*; G01D *1/00*
U.S. Cl. 116—114.5 **8 Claims**



1. A time-temperature indicator comprising: a fluid source and an interruptible wick in contact with said fluid source upon activation of said time-temperature indicator, said wick being interruptible through severance at a weakened area after activation of said indicator, and said fluid source containing an indicating substance which has a defined melting range and a set rate of migration along said wick when melted and after activation of said indicator.

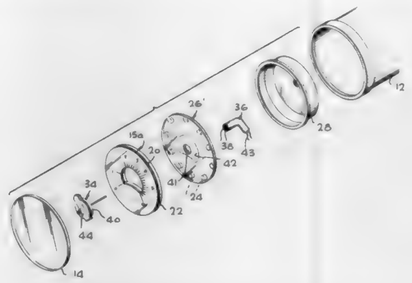
6. A time-temperature indicator comprising: a fluid source and an interruptible wick in contact with said fluid source upon activation of said time-temperature indicator, said wick being interruptible through severance by a cutting device incorporated on it after activation of said indicator, and said fluid source containing an indicating substance which has a defined melting range and a set rate of migration along said wick when melted and after activation of said indicator.

4,044,708

TRANSILLUMINATED DIAL PRESENTATION

Herman C. Klein, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed July 23, 1975, Ser. No. 598,183
Int. Cl.² G01D *11/28*
U.S. Cl. 116—129 P **25 Claims**



1. An indicator dial system for instruments, which comprises a display of an instrument dial face in the form of a developed photographic film or a reverse silk screened presentation of said instrument dial face, a light diffuser element, said display of an instrument dial face being mounted on one side of said diffuser element, a high light transmission element mounted on the other side of said diffuser element and supporting same, a light source spaced from and positioned on the opposite side of said high light transmission element from said diffuser element, said light source comprising light emitting diode means, means supporting said light emitting diode means in spaced relation to said light transmission element, and reflector means at the rear of said light transmission element for backlighting said instrument dial face display, said reflector means being positioned to reflect light from said light emitting diode means through said light transmission element to said diffuser element, said diffuser element diffusing the light received from said high light transmission element for uniformly illuminating said instrument dial face display.

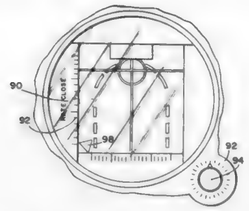
4,044,709

OMNIDIRECTIONAL SPEED COCKPIT DISPLAY

David L. Green, Potomac, Md., assignor to Pacer Systems, Inc., Burlington, Mass.

Filed Sept. 29, 1975, Ser. No. 617,590
Int. Cl.² G01D *7/04*
U.S. Cl. 116—129 F **21 Claims**

1. Helicopter cockpit omnidirectional display comprising an indicator having a frame for mounting on an instrument panel, a window connected to the frame for viewing indicator movements, a plate mounted on the frame behind the window, a first horizontal crossbar and a second vertical crossbar positioned between the plate and the window for movement across the plate in orthogonal directions, means connected to the crossbars for independently moving the crossbars to indicate speeds in lateral directions with the vertical crossbar and in forward and rearward directions with the horizontal crossbar, and a zero center indicator on the plate, the improvements comprising a zero indication being centered horizontally on the plate



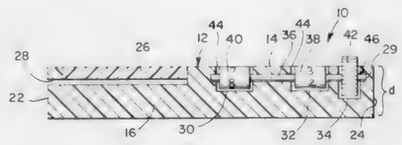
and being offset vertically on the plate to provide a greater range of speed indications in a forward direction than in a backward direction.

4,044,710

INVENTORY CONTROL BOARD

Richard Hansen, Rte. No. 1 - 9826 Sherman Road, Cedarburg, Wis. 53012

Filed Apr. 9, 1976, Ser. No. 675,314
Int. Cl.² G09F *11/24*
U.S. Cl. 116—133 **2 Claims**



1. An inventory control board comprising:

a housing having top, bottom, front, rear and side walls, a portion of said top wall adjacent one of said side walls being provided with a series of transparent sections which are in spaced relation between said front and rear walls;

a plurality of slots formed in one of the side walls of said housing beneath each one of said transparent sections, each of said slots being open at said one side wall and extending inwardly of the housing therefrom to respectively receive indicia-bearing cards visually inspectable through said transparent sections;

a plurality of shafts rotatably mounted in said housing, each of said shafts being spaced laterally from and in longitudinally aligned relation with a different one of said slots;

a plurality of indicia-bearing drums carried by each of said shafts;

a series of windows formed in the top wall of said housing located respectively above said drums so as to provide visual access to the indicia carried thereon;

a thumbwheel carried by each of said shafts for selectively rotating same;

and a spring detent carried by each said shaft adapted to prevent inadvertant rotation thereof.

4,044,711

AERIAL DISTRESS MARKER

Leon L. Jamison, late of Wilmington, Del., by Barbara A. Jamison administratrix, Wilmington, Del., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Feb. 9, 1976, Ser. No. 656,620
Int. Cl.² G09F *21/06*
U.S. Cl. 116—124 B **2 Claims**

1. A distress kit for location of a person in distress by means of an inflatable balloon attached to the kit, comprising

an inflatable balloon joined to a cylinder of pressurized gas of a density less than air,

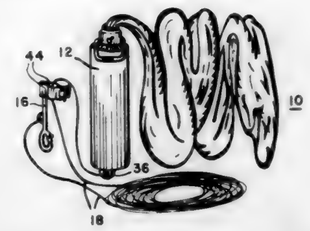
an anchor unit, and

a flexible line joining the cylinder to the anchor unit, in which

a quantity of fine metallic powder is located in the interior of the balloon, to serve as a radar marker when the balloon is inflated with the pressurized gas and the powder is dispersed throughout the balloon, and in which

the anchor unit is formed of a member fitted with

a first fastening means adaptable for fastening to an end of the flexible line,



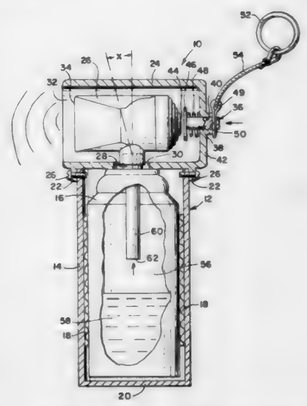
a second fastening means adaptable for clasping to an object apart from the assembly, and a third fastening means comprising means for clamping, under spring bias, a section of the line passing through the third fastening means, and third fastening means fitted with gripping means to permit manual adjustment of he clamping force of the said means about said section of the line.

4,044,712

PRESSURIZED FLUID POWERED HORN

Manuel Goodman, and Boubene M. Jaremus, both of 3410 N. Lake Shore Drive, Chicago, Ill. 60657

Filed May 7, 1976, Ser. No. 684,287
Int. Cl.² G08B *3/00*; G10K *9/00*
U.S. Cl. 116—142 FP **1 Claim**



1. A pressurized fluid powered audible alarm device comprising: a housing; a container of pressurized fluid mounted in said housing, said container having a deflection responsive valve and outlet member projecting therefrom for selectively dispensing said pressurized fluid from said container through said valve and outlet member in response to displacement of said valve and outlet member in a predetermined direction; a horn mounted on said outlet member for receiving said pressurized fluid; said horn being excited to sound in response to pressurized fluid passing through said horn; said horn receiving pressurized fluid in response to displacement of said horn relative to said housing in said predetermined direction and consequent deflection of said valve and outlet member; a plunger carried slideably by said housing proximate said horn and being positioned for selectively approaching said horn

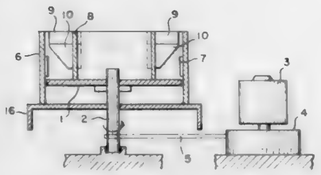
from a direction opposite said predetermined direction; spring means acting between said plunger and said horn for urging said plunger to contact and displace said horn in said predetermined direction; removeable means for retaining said plunger spaced from said horn against the urging of said spring means; said removeable means including a pull ring to facilitate rapid removal of said removeable means; said pressurized fluid in said container having a liquid phase and a gaseous phase; a tubular intake duct within said container; one end of said duct being connected to said valve and outlet member, the other end of said duct being open and being positioned in said container; the volume of said liquid phase and the length of said duct being selected to be of a preselected volume and length, respectively, for preventing said liquid phase from contacting the open end of said duct in any orientation of said device.

4,044,713

TUMBING APPARATUS

Muneaki Takase, Kita-Ootzumi, Japan, assignor to Zenyaku Kogyo Kabushiki Kaisha, Japan

Division of Ser. No. 444,056, Feb. 20, 1974, Pat. No. 3,968,277.
This application Aug. 29, 1975, Ser. No. 608,988
Int. Cl.² B05C *3/08*; A61D *3/06*
U.S. Cl. 118—19 **3 Claims**



1. Apparatus for coating solid particles with a digestive tracts-soluble film comprising a horizontally disposed rotary disk, an outer cylinder clearly surrounding said disk and supported upon a fixed support below said disk, a stationary inner cylinder concentrically arranged with respect to said outer cylinder and having a smaller diameter than the outer cylinder to form an annular space between the cylinders, the lower end of the inner cylinder being spaced a slight distance from the upper surface of the disk, a cover mounted on the upper cylinder and supporting a coating liquid pipe, a water feeding pipe, a ventilating pipe and an exhaust pipe, said pipes being spaced from each other and the outlets of all of said pipes opening into said annular space so that particles supported on said rotary disk are sequentially moved past the outlets of said pipes, a plurality of spaced-apart partitions are positioned in the annular space between the cylinders dividing said space into a coating section, a water feeding section and a drying section, said partitions being spaced from said rotary disk and in sealing relationship with said particles, the outlet of the coating liquid pipe being positioned in the coating section, the outlet of the water feeding pipe being positioned in the water feeding section and the outlets of the ventilating and exhaust pipes being positioned in the drying section, and means for rotating said disk.

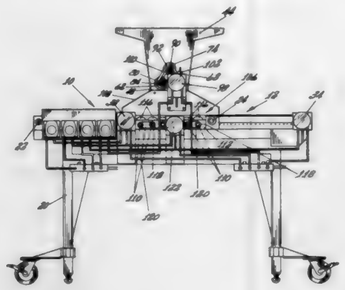
4,044,714

FOOD PRODUCT COATING APPARATUS

Richard E. Jones, and Donald F. Jago, both of Duluth, Minn., assignors to Jeno's, Inc., Duluth, Minn.

Filed Oct. 2, 1975, Ser. No. 618,905
Int. Cl.² B05B *3/02*
U.S. Cl. 118—24 **16 Claims**

1. Apparatus for coating an article of food with a granular food product at a selected density, said apparatus comprising
means for transporting an article of food to be coated along a preselected path at a predetermined speed;
a granular food product distributor comprising
a housing positioned above said transporting means for storing granular food product to be coated on an article of food, said housing including means defining a pair of parallel elongated apertures, each having a variable cross-sectional area and capable of being set at a predetermined cross-sectional area, said housing being located in a spaced position above said transporting means with said pair of apertures positioned substantially perpendicular to the preselected path to permit the transporting means to pass a said article of food thereunder;
a pair of axially aligned, contiguous contrarotatable food product distributing augers rotatably mounted in said housing one above each of said apertures;



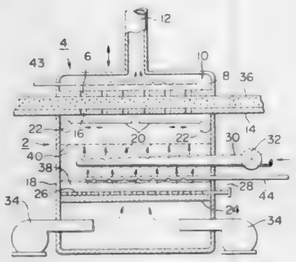
means operatively coupled to said distributing augers and mounted on said housing for selectively adjusting the height of each of said distributing augers at a selected distance above its respective aperture; and
rotating means operatively coupled to each of said distributing augers for rotation thereof at a variable selected speed, said distributing augers during rotation thereof being capable of delivering a metered quantity of granular food product through each of said apertures at a predetermined rate to coat the surface of an article of food with a metered density of granular food product as said transporting means transport said article of food along said preselected path and under said pair of parallel elongated apertures.

4,044,715

APPARATUS FOR MANUFACTURING CUSHION MATERIALS

Muneharu Urai; Koji Kogure, and Youichiro Haraguchi, all of Tokyo, Japan, assignors to Takeji Saitoi, Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,175
Claims priority, application Japan, Sept. 17, 1974, 49-105981
Int. Cl.² B05C *19/02*
U.S. Cl. 118—50 **8 Claims**



1. An apparatus for manufacturing a cushion material including a hollow body, a table disposed on said body and formed with apertures of predetermined shape, a hollow upper cover member movable toward and away from said table, and a plate

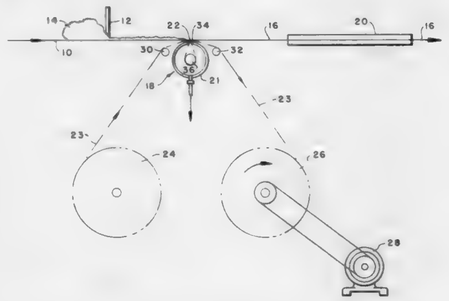
closing the lower end opening of said upper cover member and formed with apertures of the same shape as that of said apertures of said table and aligning with the latter, said table and said plate being adapted to hold a sheet of foamed material of continuous cell structure therebetween during impregnation of a fine powdery welding material into said foamed material through said aligned apertures, said apparatus comprising a porous member disposed within said body, means for supplying air under relatively low pressure from beneath said porous member thereby providing a cloud-like floating layer of said fine powdery welding material above said porous member, and conduit means extending into the zone of said cloud-like floating layer for jetting a gas under high pressure into said cloud-like floating layer for jetting a gas under high pressure into said cloud-like floating layer thereby forceably carrying said fine powdery welding material in said cloud-like floating layer toward said apertures of said table by the gas under high pressure.

4,044,716

VACUUM SLOT COATING APPARATUS

Dennis L. Riddle, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 6, 1976, Ser. No. 683,728
Int. Cl.² B05C *11/08*; A47L *5/38*
U.S. Cl. 118—50 **3 Claims**



1. In a apparatus to provide a coated fabric having means to coat a fabric, suction conduit means having an elongated opening thereon to apply suction pressure to the fabric to impregnate the coating into the fabric and means to cure the coated fabric the movement comprising: guide means mounted inside said conduit means to guide a web material across one side of said elongated opening into said suction conduit means and out across the other side of said elongated opening to clean the surface of said opening, said opening being lined with a friction resistant material.

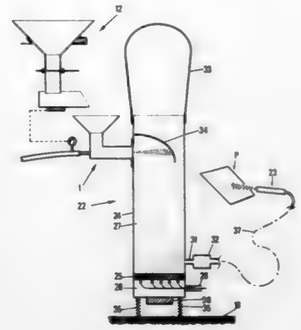
4,044,717

APPARATUS FOR COATING A SURFACE WITH A PULVERULENT PRODUCT

Roger Provost, Louveciennes, France, assignor to Institut Francais du Petrole, France

Filed June 9, 1976, Ser. No. 694,337
Claims priority, application France, June 18, 1975, 75.19299
Int. Cl.² B05B *5/02*
U.S. Cl. 118—629 **27 Claims**

1. An apparatus for depositing a homogeneous layer of a pulverulent product onto the surface of an object, comprising in combination:
treating means for subjecting the pulverulent product to a sudden pressure drop to produce a pulverulent fluid containing solid particles of the pulverulent product suspended in a carrier gas,
a storage chamber for receiving the pulverulent fluid, said chamber communicating with said treating means,
means for spraying said particles of the pulverulent fluid, said spraying means being connected to said chamber through a conduit, and



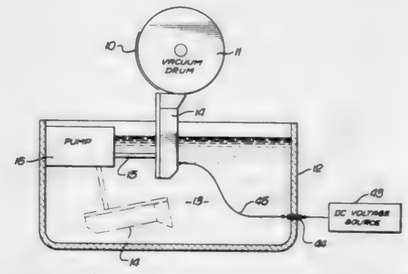
means controlling the flow of pulverulent fluid in said conduit.

4,044,718

ELECTROSTATIC FOUNTAIN DEVELOPER

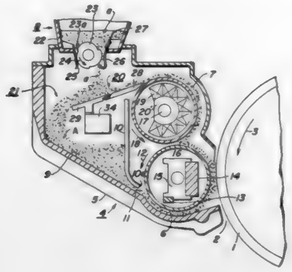
Stephen D. Blake, North Hollywood; Emil M. Kaegi, La Canada; Eric P. Muntz, Pasadena, and Murray S. Welkowsky, Chatsworth, all of Calif., assignors to Xonics, Inc., Van Nuys, Calif.

Filed Sept. 10, 1976, Ser. No. 722,090
Int. Cl.² G03G *15/10*
U.S. Cl. 118—647 **11 Claims**



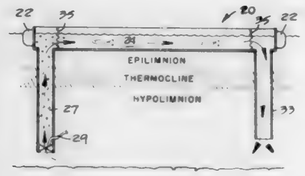
1. A toner fountain for an electrostatic image developer having means for moving a receptor past the fountain and a pump for delivering liquid toner to the fountain, the improvement comprising in combination:
a base having a receptacle for liquid toner;
pool means carried at the upper end of said base defining a pool of liquid toner for wetting the receptor, with a flow passage from said receptacle to said pool,
said pool means including spaced end members and spaced side members of electrical insulating material, with liquid entering said pool through an entrance slot at the bottom thereof; and
an electrode positioned in said pool bottom between said end members, with an electrical insulating bottom member positioned between said entrance slot and said electrode for horizontal fluid flow from said slot across said bottom member so that the liquid toner moving upward from said receptacle through said slot to said pool changes flow direction over said bottom member.

4,044,719
DEVELOPING APPARATUS IN ELECTRO-COPYING MACHINES
Hitoshi Ohmori, Mino, Japan, assignor to Rank Xerox Ltd., London, England
Filed July 27, 1976, Ser. No. 709,034
Claims priority, application Japan, Nov. 6, 1975, 50-132429
Int. Cl.² G03G *15/08*
U.S. Cl. 118—652 **2 Claims**



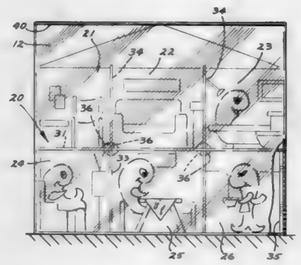
1. An improved developing apparatus for transporting developer from a reservoir past a photoreceptor to develop electrostatic latent image on the latter, the apparatus including:
a magnetic roller mounted adjacent the photoreceptor,
a stripping member extending away from the magnetic roller and downwardly toward the reservoir for stripping excess developer from the magnetic roller and returning it to the reservoir, the stripping member including a first flat plate having one edge located immediately adjacent the magnetic roller, a second flat plate, and means biasing the plates into contact with each other to form a continuous surface inclined downwardly from the magnetic roller toward the reservoir whereby excess developer is returned to the reservoir,
means located above the stripping member for dispensing toner onto the stripping member, and
means connected to the second flat plate for vibrating the latter to stir and mix stripped developer and newly supplied toner together.

4,044,720
FLOATING FISH REARING SYSTEM
Arlo W. Fast, 1024 Moreno Drive, Ojai, Calif. 93023
Filed Mar. 29, 1976, Ser. No. 671,052
Int. Cl.² A01K *63/00*
U.S. Cl. 119—3 **15 Claims**



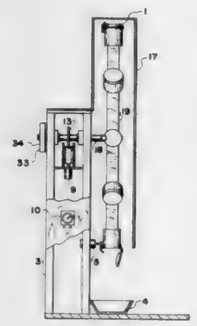
1. A floating fish rearing system comprising:
a. a floating frame structure having float means for maintaining said frame structure in a stable position on the surface of a water body;
b. fish confining raceway means within said floating frame for defining at least one area of shallow depth near the water surface;
c. upwelling means associated with said floating frame for supplying water from a deeper cold water zone within the water body up to the area defined by the fish confining means;
d. means associated with the upwelling means for pumping water upwardly through the upwelling means; and
e. discharge means associated with said floating frame and operatively connected to said fish confining means at a position which is downstream of said upwelling means whereby water flows from the upwelling means through the fish confining means and out the discharge means.

4,044,721
FISH TANK CONSTRUCTION
Charles F. Foley, 3908 Merriam Road, Minnetonka, Minn. 55343, and Lewis J. Halberstadt, Conway Road, Williamsburg, Mass. 01060
Filed Apr. 5, 1976, Ser. No. 673,376
Int. Cl.² A01K *64/00*
U.S. Cl. 119—5 **15 Claims**



1. In aquarium construction comprising a tank defining an interior compartment having a generally transparent front wall and a rear wall spaced from the front wall, means on the rear wall forming a visable backdrop simulating a cross section of an interior of a building including rooms normally inhabited by humans and including representations of wall dividers between the rooms, and a plurality of removable wall dividers extending between the front and rear walls of said aquarium and having edges generally aligning with the representations of wall dividers of the backdrop, said removable wall dividers having substantial unobstructed openings therethrough to permit fish passage through all of the removable wall dividers.

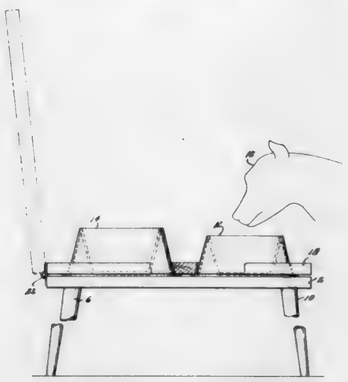
4,044,722
TIMED PET FOOD DISPENSER
John O. Bradshaw, Rte. 1, Box 117-F, New Canton, Va. 23123
Filed Aug. 13, 1976, Ser. No. 714,087
Int. Cl.² A01K *5/02*
U.S. Cl. 119—51.13 **2 Claims**



1. A timed pet food dispenser comprising:

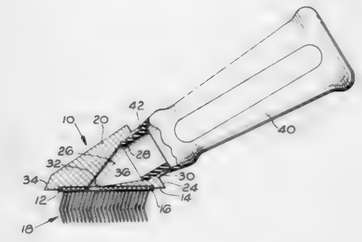
a dispenser stand,
a dispensing wheel rotatably mounted for rotation in a vertical plane about a horizontal shaft mounted on said stand,
a dispenser cover enclosing said dispensing wheel having a food drop opening at the bottom portion thereof and a top access opening therein for removing, cleaning, filling and replacing said food containers,
a plurality of insulated food containers rigidly mounted on said dispensing wheel in the vicinity of the periphery thereof and adapted to be removed therefrom by a twisting motion,
an indexing means for indexing said dispensing wheel to a plurality of positions corresponding to the location of said food containers mounted thereon and to advance said food containers to a dispensing position,
a container cover hingedly attached to each of said food containers,
a trip lever for holding each of said container covers in a closed position and adapted, when tripped in said dispensing position, to permit said associated container covers to open and permit the contents of said associated food container to fall by gravity into a pet eating area,
a 24-hour time clock settable to a predetermined time for feeding,
an actuating means for tripping the trip lever of said food container located in said dispensing position whereby the container cover of said food container is permitted to open and any food contained therein permitted to be dispensed therefrom by gravity, and
solenoid means associated with said indexing means and adapted to be actuated by said time clock to advance sequentially said food containers one at a time to said dispensing position, said solenoid's movement being delayed until after said actuating means trips said trip lever dispensing the contents of the food container before being permitted to index said dispensing wheel to the next position where it is maintained until the next feeding time.

4,044,723
ANIMAL FEEDING APPARATUS
Robert E. Fitzpatrick, 27 Lyle Terrace, Malden, Mass. 02148
Filed Sept. 1, 1976, Ser. No. 719,612
Int. Cl.² A01K *5/00*
U.S. Cl. 119—61 **2 Claims**



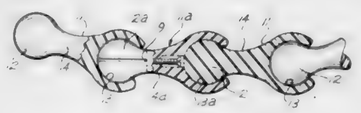
1. A dog feeding apparatus comprising a table member having a top section of rectilinear shape and a plurality of legs attached to the underside of the top section for supporting said top section in a horizontally disposed position and at a raised feeding level recommended by veterinarians for feeding large dogs of the mastiff breed, said legs being arranged in angularly opposed relationship at two opposite ends of the top section and projecting outwardly to encompass a floor area greater than the area of the top section and to resist overturning during a feeding by a large dog of the mastiff breed, container means slideably disposed at the upper section of the top section, said container means including inner generally circular food receptacle means and outwardly tapering side portions terminating in bottom flange portions, a cover member, hinge means for attaching the cover at one of said ends of the top section, said cover having a rectilinear shape which is the same as the shape of the top section and being recessed to form circular aperture means through which the container means may be received when the cover is closed, the axes of turning of the hinge means lying in a plane above the upper surface of the top section to position the cover when closed firmly against the container flange means.

4,044,724
GROOMING AND DISPENSING BRUSH HEAD
Geoffrey Leonard Merchill, Solihull, England, assignor to Hindes Limited, Shirley, England
Filed May 13, 1976, Ser. No. 686,059
Int. Cl.² A01K *13/00*
U.S. Cl. 119—83 **7 Claims**



1. A powder-dispensing brush head comprising a body having first and second angularly related faces, a plurality of relatively stiff bristles distributed over a sheet connected with said first face, a single powder outlet in said first face and said sheet, a powder inlet in said second face, and at least one coupling formation connecting the brush head to a flexible-walled powder container with the mouth of the latter in registry with said inlet, wherein the improvement comprises a passageway leading from said inlet and having only one outlet orifice coinciding with the outlet in said first face, said passageway:
a. being unidirectional and extending in a straight line from said inlet to said outlet orifice,
b. extending at an acute angle to said first face, and
c. being smoothly tapered over a major part of its length from a larger diameter adjacent said inlet to a smaller diameter adjacent said outlet orifice, whereby powder flows smoothly from said inlet to said outlet orifice without clogging.

4,044,725
PET COLLAR
Howard I. Miller, Unit 35, Sixty-01 Apt.'s, Redmond, Wash. 98052
Filed Jan. 24, 1975, Ser. No. 543,804
Int. Cl.² A01K *27/00*
U.S. Cl. 119—106 **15 Claims**



1. A releasable pet collar including a plurality of interconnected, elongate, snap-locking links, each having longitudi-

nally aligned, complementary resiliently yieldable, head and socket portions, comprising:

at least one of said links being an adjustable releasing link wherein its head portion has slot means affording relative compressibility of the outer circumference of said head portion; and

adjustable screw means carried by such link and being engagable with said slot means for adjustably varying said compressibility of said outer circumference of said head portion, whereby said head portion of said link is held within a cooperating socket portion of an adjoining link by a threshold release force that may be adjusted by said screw means for each individual pet.

4,044,726

CIRCULATING WATER HEATER

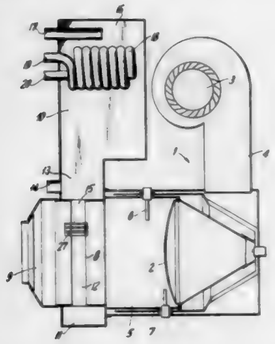
Horst Reichmann, Wuppertal, Germany, assignor to Joh. Vaillant K.G., Remscheid, Germany

Filed Dec. 23, 1975, Ser. No. 643,869

Claims priority, application Germany, Dec. 13, 1975, 7540065[U]

Int. Cl.² F22B *1/02, 7/06, 37/10*

U.S. Cl. 122—33 **5 Claims**



1. A forced circulation water heater comprising a blower burner, a horizontally extending exhaust gas duct, a heat exchanger constructed as a plate block and including upright water tubes disposed in said gas duct, a water circuit connected to said heat exchanger tubes, a storage vessel disposed above said heat exchanger and mounted directly thereon, a common support structurally connecting said storage vessel with said heat exchanger, heating system header connections and return connections extending directly into said storage vessel, said heat exchanger together with its upright water tubes being incorporated into said horizontally extending exhaust gas duct to extend over the entire cross section thereof with said tubes of said heat exchanger being connected to said storage vessel, and including plates in said heat exchanger, said plates being longer in the flow direction of said exhaust gas duct than the effective length of said heat exchanger in the same direction but smaller than the width of said support frame.

4,044,727

APPARATUS FOR HEATING A HEAT TRANSFER FLUID PROTECTED AGAINST OVERHEATING

Niklaus Rychen, Bensheim, Auerbach, and Peter Werner Fuchshuber, Dudenhofen, Sp., both of Germany, assignors to Konus-Kessel Gesellschaft fur Warmetechnik mbH & Co. KG, Hockenheim, Germany

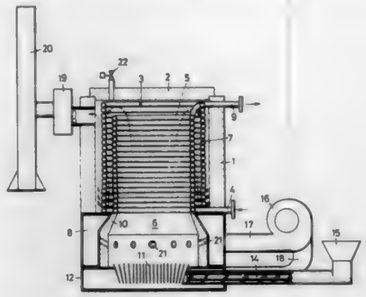
Filed July 27, 1976, Ser. No. 709,098

Claims priority, application Germany, July 30, 1975, 2534093

Int. Cl.² F22B *37/42, 27/08*

U.S. Cl. 122—449 **21 Claims**

1. Apparatus for using a solid fuel in heating a heat transfer fluid, such as a thermal oil, which is to be protected against overheating, comprising a boiler, means for effecting forced circulation of the heat transfer fluid through said boiler, said means for effecting forced circulation comprising an electrically operated pump, said boiler comprising a vertically arranged boiler casing forming a vertically extending passage, a pipe coil system located in said passage for flowing the heat transfer fluid therethrough, a furnace connected to said boiler for flowing heating gases into said passage for flow in indirect heat transfer relation with the heat transfer fluid within said pipe coil system, means for supplying solid fuel into said furnace, means for supplying combustion air into said furnace, an outlet connected to said casing for discharging heating gases after they flow over said pipe coil, and means for stopping the



heating of said pipe coil system when the forced circulation of the heat transfer fluid stops, wherein the improvement comprises that said boiler casing is open at the bottom forming an opening into the lower end of said passage, said furnace comprises a vertically extending combustion chamber having an upper end and a lower end with said upper end thereof opening into the lower end of said passage for flowing heating gases from said combustion chamber into said passage, said furnace supporting the lower end of said boiler casing, and said means for stopping the heating of said pipe coil system being connected to said means for supplying solid fuel and to said means for supplying combustion air for rendering both of said means inoperative when the forced circulation of said heat transfer fluid is stopped.

4,044,728

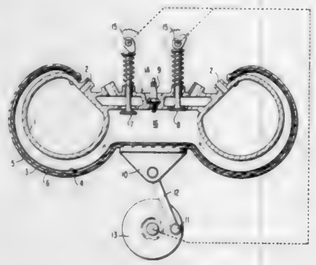
INTERNAL COMBUSTION ENGINE

Guido Moeller, Box 3647, Washington, D.C. 20007

Filed Oct. 22, 1975, Ser. No. 624,835

Int. Cl.² F02F *1/10*; F01B *19/00*

U.S. Cl. 123—18 A **16 Claims**



1. An internal combustion engine, comprising:

A. a rigid, curved wall;

B. a flexible curtain including a central base portion, sealingly attached along an edge region to said rigid wall and capable of substantially conforming to the surface contours of said rigid wall, thereby defining a combustion chamber of variable geometrical form and volume;

C. valve means, located in said rigid wall, for selective passage of gases to and from said combustion chamber; and

D. heat transfer means for cooling said rigid wall and said flexible curtain.

4,044,729

AUTOMOTIVE COOLING FAN DRIVE INCLUDING FRICTION CLUTCH

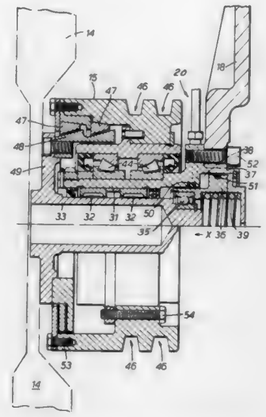
Arthur Ernest Henry Elmer, Merry Lodge, Court Orchard, Painswick, Gloucestershire, England

Filed Nov. 21, 1975, Ser. No. 634,152

Claims priority, application United Kingdom, Oct. 10, 1975, 41562/75

Int. Cl.² F01P *7/02*

U.S. Cl. 123—41.12 **9 Claims**



1. A cooling fan drive assembly comprising a static support member formed with means for attachment to a stationary mounting, an axially movable fan blade carrying element supported for rotation and axial movement relative to said support member, a rotary drive member located axially by a first thrust bearing relative to said support member, a friction clutch comprising an input clutch element connected to said drive member and an output clutch element connected to said blade carrying element, a spring acting on said blade carrying element in a direction to engage said clutch, a nonrotating fluid operated ram, a second thrust bearing interposed between said ram and said blade carrying element, and a fluid input connection to said ram, located on said static support member, said ram being arranged to oppose said spring to disengage said clutch.

4,044,730

AUXILIARY COMBUSTION CHAMBER FOR AN INTERNAL COMBUSTION ENGINE

Noguchi Masaaki, Nagoya; Tanaka Yukiyasu, Okazaki; Sekiya Setsuro, and Motosugi Katsuhiko, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Nov. 6, 1975, Ser. No. 629,234

Claims priority, application Japan, Nov. 13, 1974, 49-130011

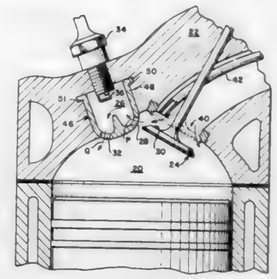
Int. Cl.² F02B *75/02*

U.S. Cl. 123—75 B **5 Claims**

1. In an internal combustion engine including a main combustion chamber, an air/fuel mixture intake to the main combustion chamber through the cylinder head, an intake valve for controlling the flow of the air/fuel mixture into the main combustion chamber, and a spark plug for igniting the air/fuel mixture, the improvement comprising:

an auxiliary combustion chamber including a cavity in the wall of the cylinder head adjacent said air/fuel mixture intake and a shell at least partially lining said cavity and forming a portion of the wall of the said main combustion chamber said shell being integrally cast within the cylinder head for enhancing heat transfer therebetween and said spark plug having its spark gap in the auxiliary combustion chamber;

at least one unvalved inlet port in said shell interconnecting the auxiliary combustion chamber and the main chamber



for conducting air/fuel mixture into the auxiliary chamber and at least one unvalved outlet port in said shell for conducting residual combustion gas from the auxiliary chamber into the main chamber;

means for retaining said shell in said cavity and means for positioning said shell in said cavity; said means for retaining said shell in said cavity including an annular channel formed in the wall of said cavity and a flange formed on the surface of said shell.

4,044,731

COMPOSITE PISTON WITH PROTECTION OF THE FASTENING SCREWS AGAINST CORROSION BY A COOLANT

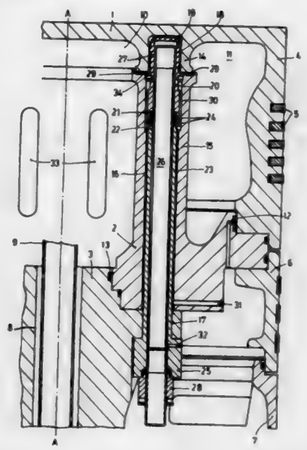
Horst Lindner, Konigsbrunn, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.), Augsburg, Germany

Filed Feb. 23, 1976, Ser. No. 660,052

Claims priority, application Germany, Mar. 8, 1975, 2510192

Int. Cl.² F01M *1/06*; F01B *31/08*

U.S. Cl. 123—90.35 **16 Claims**



1. In a piston for an internal combustion engine composed of a piston head and a piston body fastened together by clamping screws located within the piston and providing space between

the piston head and piston body that are filled with a cooling liquid, the improvement wherein:

each clamping screw is surrounded by a sleeve-shaped liquid-tight casing affixed in the piston head (1) and open only to the underside of the piston body said casing being a member separate from the piston head or body, extending all the way to the vicinity of the the bearing collar serving as screw head at the lower end of the clamping screw and provided at its piston head end with internal threading (27) for screwing in the upper end of the clamping screw,

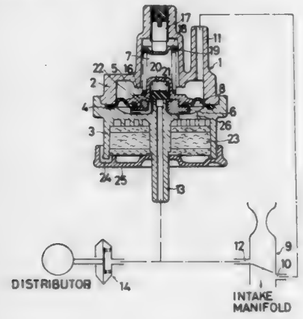
whereby the screws are protected against corrosion in the event of use of an aqueous cooling liquid.

4,044,732

PNEUMATIC CONTROL SYSTEM AND PRESSURE RESPONSIVE VALVE ASSEMBLY THEREFOR

Masami Inada, Toyoake, and Kazuhiko Kitamura, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sept. 10, 1975, Ser. No. 611,960
Claims priority, application Japan, Sept. 20, 1974, 49-108971; Nov. 7, 1974, 49-128403
Int. Cl.² F02P 5/10
U.S. Cl. 123—117 A **1 Claim**



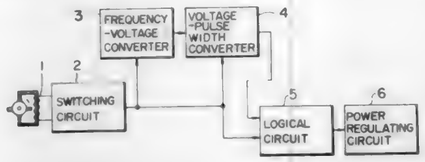
1. A pneumatic control system comprising a carburetor having a vacuum inlet; a device for advancing the spark timing of an engine; and a pressure responsive valve assembly comprising a housing which includes an inlet port communicated with said vacuum inlet and an outlet port communicated with said advancing device, a diaphragm dividing the interior of said housing into a first chamber communicated with said vacuum inlet through said inlet port and a second chamber communicated with atmospheric air, a power piston secured to said diaphragm for unitary movement therewith, a first spring disposed within said first chamber for urging said power piston to move in one direction, said power piston being moved in the other direction against an exerting force of said first spring when a vacuum is applied to said first chamber, a valve member operatively associated with said power piston and cooperative with a valve seat to control the admission of atmospheric air to said advancing device from said second chamber via said outlet port, and a second spring disposed between said power piston and said valve member and having a smaller exerting force than said first spring, thereby urging said valve member to rest on said valve seat when said power piston is being moved in said one direction.

4,044,733

IGNITION APPARATUS FOR INTERNAL COMBUSTION ENGINE

Seiji Suda, Mito, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 29, 1975, Ser. No. 572,859
Claims priority, application Japan, Apr. 30, 1974, 49-47669
Int. Cl.² F02P 5/04
U.S. Cl. 123—117 R **6 Claims**



1. In an ignition apparatus for an internal combustion engine comprising:

means for generating an AC signal with a waveform having zero-level crossing points corresponding to an ignition timing and changing in predetermined time relationship with engine revolutions;

a DC power supply; an ignition coil having at least a primary winding;

an ignition coil having at least a primary winding;

a first switching transistor for producing a primary current flowing from said DC power supply into said primary winding of the ignition coil;

a second switching transistor being rendered respectively conductive and nonconductive in accordance with the waveform of the AC signal from said AC signal generating means; and

a switching circuit for rendering said first transistor respectively conductive and nonconductive in response to the output of said second switching transistor during low engine speed operation, to thereby cause primary current to flow through the primary winding of said ignition coil in accordance with a prescribed relationship between the threshold level of said second switching transistor and the waveform of said AC signal and then to interrupt the primary current for producing a high voltage at the output terminal of said ignition coil in response to said zero-level crossing points of the wave-form of said AC signal;

the improvement further comprising:

means for generating a voltage in accordance with the revolutions of said engine;

means for generating pulses the widths of which vary in accordance with the output of said voltage generating means; and

OR gate means for rendering said first transistor respectively conductive and nonconductive in response to the outputs from said second switching transistor during low engine speed operation and in response to the outputs from said pulse generating means during high engine speed operation, to thereby produce said high voltage at the output terminal of said ignition coil.

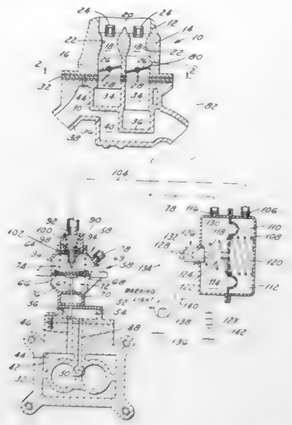
4,044,734

EXHAUST GAS RECIRCULATION VALVE MALFUNCTION INDICATOR APPARATUS

John A. Lewis, Detroit, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 28, 1976, Ser. No. 691,263
Int. Cl.² F02M 25/06
U.S. Cl. 123—119 A **5 Claims**

1. A malfunction indicating apparatus for an engine exhaust gas recirculating (EGR) system that includes a vacuum controlled first servo connected to an (EGR) valve that is spring biased to a position blocking the flow of engine exhaust gases to the engine intake manifold and moved by vacuum above a predetermined level applied to the servo to a position permitting the flow, the apparatus including a pressure balanced second servo means operably connected to the first servo and attaining a pressure unbalance condition to actuate a malfunction indicator in response to non-movement of the (EGR) valve upon application of vacuum above the predetermined level to the first servo, a source of carburetor induction passage throttle valve controlled vacuum, the pressure balancing servo means including a hollow housing divided into first and second chambers by a piston, means connecting the source of vacuum to the first servo and to the first chamber, second



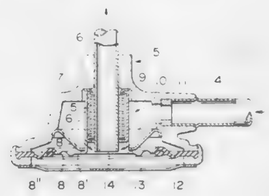
means connecting the first servo to the second chamber whereby flow of vacuum to the first servo flows vacuum to both first and second chambers to provide a pressure balanced neutral position of the piston, spring means acting on opposite sides of the piston to urge the piston to the balanced neutral position, malfunction indicator means engaged by and rendered operative in response to movement of the piston in one direction to a predetermined position, and control means in the second means normally blocking vacuum to the second chamber to thereby effect movement of the piston by the vacuum in the first chamber to engage the malfunction indicator means.

4,044,735

EXHAUST GAS RECIRCULATION VALVE

Masaharu Sumiyoshi, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 20, 1976, Ser. No. 659,954
Claims priority, application Japan, Oct. 22, 1975, 50-127106
Int. Cl.² F02M 25/06
U.S. Cl. 123—119 A **4 Claims**



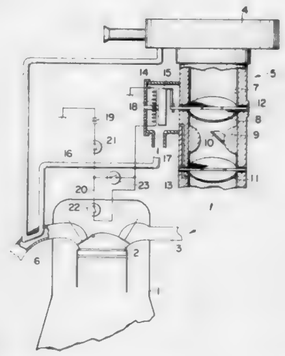
1. An exhaust gas recirculation valve comprising a housing which contains a back pressure control chamber provided with a gas inlet port connected with an exhaust pipe of an internal combustion engine via a throttling means, a membrane means including a central metal sheet member and an annular peripheral rubber sheet member, said membrane means forming a part of the wall defining said back pressure control chamber, the outer surface of said membrane which faces opposite to the inside of said chamber being exposed to atmospheric pressure, a gas outlet tube supported by said housing and having an open end positioned to closely oppose a central portion of the inside surface of said membrane means which faces the inside of said chamber, the opening of said open end of said gas outlet tube being controlled by said membrane means, a funnel means adapted to guide gases from said gas inlet port towards said central portion of said membrane means, an annular spring retainer supported on said central portion of said membrane means, and a coil spring located around said gas outlet tube and supported between said spring retainer and said housing, wherein the ratio of the opening area of said open end of said gas outlet tube to an effective pressure responsive area of said membrane means is substantially smaller than 1.

4,044,736

DEVICE FOR CONTROLLING A CHOKE VALVE IN A CARBURETOR

Hidenori Tateno, Nagoya; Toshiro Yoshida, and Koichi Hirasawa, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

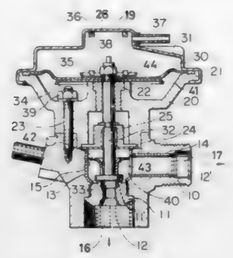
Filed July 18, 1974, Ser. No. 489,492
Claims priority, application Japan, July 18, 1973, 48-80248
Int. Cl.² F02D 11/08
U.S. Cl. 123—119 F **4 Claims**



1. In an internal combustion engine, an automatic choke unit including an air cleaner, a carburetor arranged to be connected to said air cleaner, a venturi located in said carburetor, a choke valve positioned within said carburetor between said venturi and the connection of said carburetor to said air cleaner for controlling the flow of air to said venturi, a casing located exteriorly of and mounted on said carburetor, a bimetal member positioned within said casing and connected to said choke valve so that said bimetal member controls the opening and closing of said choke valve as the temperature level within the casing rises and falls, a flow passageway for introducing a flow of air into said casing, said flow passageway arranged to be heated by the internal combustion engine so that as the engine warms-up said flow passageway delivers heated air into said casing, means connected to the interior of said casing for drawing air through said flow passageway into said casing, a heater unit positioned within said casing and arranged to supply heat to said bimetal member, means for generating heat within said heater unit including a first actuating means for commencing the operation of said heater unit only after the internal combustion engine has reached a predetermined warm-up level, wherein the improvement comprises that said means for generating heat includes second actuating means for commencing the operation of said heater unit when the ambient atmospheric pressure surrounding the exterior of the internal combustion engine drops below a predetermined level, said second actuating means located adjacent to and exteriorly of said engine and being separate from and spaced from both said carburetor and said casing containing said bimetal member for directly sensing the ambient atmospheric pressure outside the engine so that the ambient atmospheric pressure is the sole control of said second

actuating means which controls the operation of said heater unit, and said flow passageway having an inlet end connected to said air cleaner for flowing a part of the intake air from said air cleaner through said flow passageway for introduction into said casing.

4,044,737
EXHAUST GAS CONTROL VALVE
Satomu Nishimura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed May 17, 1976, Ser. No. 687,088
Claims priority, application Japan, Nov. 10, 1975, 50-151727[U]
Int. Cl.² F02M *25/06*; F16K *51/00*
U.S. Cl. 123—119 A **5 Claims**

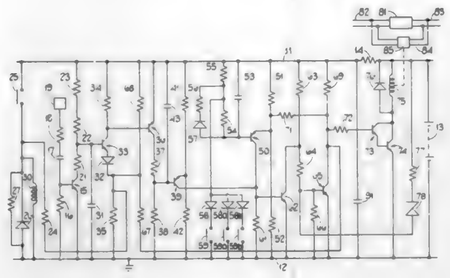


1. An improved internal combustion engine exhaust gas control valve of the type in which a valve-closure member for controlling the flow of exhaust gas into the gas chamber located between an inlet port and outlet port is mechanically connected to a diaphragm by a valve stem, said diaphragm forming one wall of a vacuum chamber in fluid flow communication with an engine vacuum source and being biased to a position where said valve closure member closes said inlet port and in which an increase in engine vacuum causes said diaphragm to move against said bias for opening said inlet port, the improvement comprising a corrosion-resistant metal liner covering the inside walls of said exhaust gas chamber, inlet port, and outlet port that are exposed to said exhaust gas and also including a fluted flange mounted on and around said valve stem proximate said valve-closure member, the periphery of said flange flaring out from said valve stem and towards the walls of said gas chamber for protecting said stem from exposure to said gas and for forming a curved wall of said gas chamber when said valve-closure member is moved to open said inlet port, the exposed surfaces of said flange also being covered with a corrosion-resistant metal liner, said fluted flange providing rounded corners in said gas chamber for reducing locations at which condensate in said exhaust gas may accumulate.

4,044,738
POLLUTION CONTROL ARRANGEMENTS FOR ENGINES
Malcolm Williams, Solihull, and Christopher Robin Jones, Alcester, both of England, assignors to Lucas Electrical Company Limited, Birmingham, England
Filed June 5, 1975, Ser. No. 584,167
Claims priority, application United Kingdom, June 7, 1974, 25304/74
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **6 Claims**

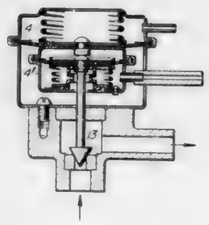
1. A pollution control arrangement for an engine including a valve by way of which exhaust gases can be recirculated, a solenoid which when energized closes said valve, and electronic control means energizing said solenoid when the engine speed is above a predetermined level, said control means comprising:

an engine speed transducer for producing an a.c. signal of frequency proportional to the engine speed; and



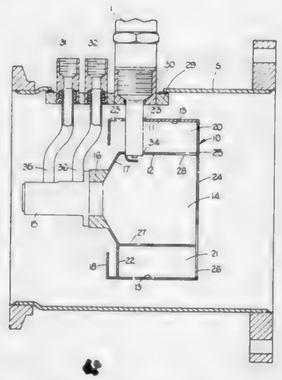
means sensitive to said frequency of said a.c. signal for continuously energizing said solenoid when the frequency of said signal is above a predetermined level.

4,044,739
EXHAUST GAS CONTROL VALVE
Motohisa Miura, Kariya; Yukihiko Muramatsu, Hekinan, and Noboru Matsumoto, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Tokyta, both of, Japan
Filed Aug. 6, 1975, Ser. No. 602,313
Claims priority, application Japan, Aug. 8, 1974, 49-95351[U]
Int. Cl.² F02M *25/00*
U.S. Cl. 123—119 A **8 Claims**



1. An exhaust gas control valve for an internal combustion engine comprising;
an upper and a lower outer casings;
a diaphragm interposed between said upper and lower outer casings for forming respectively upper and a lower compartments, said lower compartment being communicated wth the atmosphere;
an upper inner casing disposed in said upper compartment and fixed to said diaphragm;
a first spring disposed in said upper compartment for biasing said diaphragm toward said lower compartment;
said upper outer casing, said upper inner casing and said diaphragm forming a first sealed negative pressure chamber to be interconnected with a carbureter for being applied with the negative pressure in said carbureter;
a lower inner casing disposed in said lower compartment and fixed to said diaphragm;
a bellows fixed to said diaphragm and said lower inner casing;
said bellows, said diaphragm and said lower inner casing forming a second sealed negative pressure chamber to be interconnected with an intake manifold of an engine for being applied with the negative pressure in said intake manifold;
a second spring disposed in said second sealed negative pressure chamber for biasing said diaphragm toward said upper compartment;
a valve seat disposed in a conduit communicating an exhaust pipe of said engine with an intake pipe of said engine;
a rod fixed at one end thereof to the inner portion of said diaphragm surrounded by said lower inner casing, said rod being provided at the other end thereof with a valve head for abutting on said valve seat, whereby the amount of the exhaust gases flowing through said conduit is controlled by the displacement of said rod driven by said diaphragm.

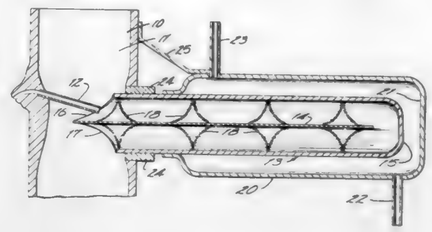
4,044,740
BURNER ASSEMBLY FOR AN INLET MANIFOLD OF AN INTERNAL COMBUSTION ENGINE
Alan Joseph Gerrard, Blackburn, England, assignor to Lucas Industries Limited, Birmingham, England
Filed Nov. 4, 1975, Ser. No. 628,554
Claims priority, application United Kingdom, Nov. 6, 1974, 47951/74
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 G **4 Claims**



1. An internal combustion engine having an air inlet manifold in combination with a burner assembly for heating air in said air inlet manifold, said burner assembly comprising (i) a hollow body mounted in said inlet manifold, said hollow body including a first annular casing and a second annular casing spaced inwardly of said first annular casing so as to define an air passage between said casings, (ii) a plurality of inlets at one end of said body, (iii) a plurality of outlets at an opposite end of said body, (iv) baffle means dividing said air passage into a first series of compartments alternating with a second series of compartments, each compartment of said first series being connected with one of said inlets, and each compartment of said second series being connected with one of said outlets, (v) an aperture through said annular casing serving to connect each said compartment with an interior of said second annular casing, which interior defines a combustion zone of said burner assembly, and (vi) a fuel sprayer arranged to discharge fuel into said combustion zone, the arrangement being such that air passing through said inlets is constrained to flow into said combustion zone before reaching said outlets, said outlets being arranged to communicate directly with said combustion zone.

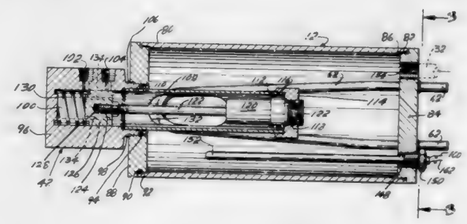
4,044,741
FUEL VAPOR GENERATOR
Wayne Swingley, Rte. 6, Box 138, Spokane, Wash. 99207
Filed Aug. 27, 1975, Ser. No. 608,040
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 AB **11 Claims**

1. A fuel vapor generator for an internal combustion engine including a carburetor that has a main nozzle with an outlet through which fuel is normally discharged into a venturi through which the fuel-air mixture is drawn into an intake manifold, the fuel vapor generator comprising:
a hollow tubular member having interior walls which form a continuous passageway double back upon itself in an elongated configuration, the passageway terminating at open inlet and outlet ends located adjacent to one another;
thermal insulating means surrounding the member at locations adjacent the inlet and outlet ends of the passageway



adapted to fix the member to the exterior of a carburetor with the inlet end projecting into a portion of the venturi in receptive communication with the outlet of the main nozzle and with the outlet end projecting into the venturi downstream from the location of the inlet end to thereby direct the fuel and a portion of the air entering the carburetor through the passageway;
means for heating the hollow tubular member to a temperature above the boiling point of the fuel.

4,044,742
METHOD AND APPARATUS FOR PROCESSING FUEL INTO AN INTERNAL COMBUSTION ENGINE
Henry C. Linder, 131 Biz Point Road, Anacortes, Wash. 98221
Filed Aug. 18, 1975, Ser. No. 605,665
Int. Cl.² F02M *31/00*
U.S. Cl. 123—122 E. **15 Claims**



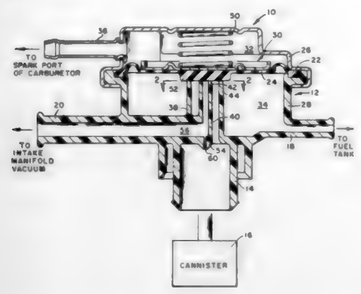
1. A fuel expander comprising:
a. a housing for housing a liquid;
b. a cold water inlet connecting with said housing:
c. a hot water inlet connecting with said housing;
d. a heat sensitive means inside said housing;
e. a valve means functioning with said cold water inlet, and with said hot water inlet for controlling the flow of cold water and for controlling the flow of hot water into said housing to achieve a heating water of a desired temperature and also connecting with said heat sensitive means;
f. A fuel line positioned in said housing for flowing fuel through said housing and to heat said fuel to a temperature approximately that of said heating water of a desired temperature; and,
g. said heat sensitive means in reacting to the temperature in the housing moving said valve means to regulate the flow of hot water through said hot water inlet and to regulate the flow of cold water through said cold water inlet.

4,044,743

CANNISTER PURGE VALVE ASSEMBLY

Bryan Eaton, Chatham, Canada, assignor to Fram Corporation, Providence, R.I.

Filed Mar. 19, 1976, Ser. No. 668,368
Int. Cl.[2] F02M *37/00*
U.S. Cl. 123—136 **9 Claims**



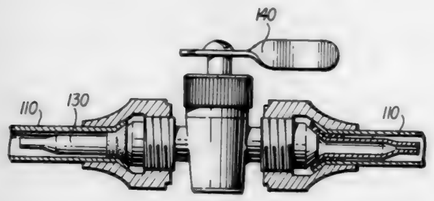
1. In a vehicle emissions control system including a cannister containing material for absorbing vapors from the vehicle fuel tank, a purge valve for purging said cannister during normal operation of the vehicle, said purge valve including a housing defining a chamber therewithin, first inlet means communicating said chamber with the cannister, second inlet means communicating said chamber with said fuel tank, outlet means through which the cannister is purged, said first inlet means and said outlet means terminating in inner and outer rings defining valve seating areas on each of said rings, valve means adapted to engage said valve seating areas, and yieldable means urging said valve means into sealing engagement with said valve seating areas to thereby prevent communication between said first and second inlet means to said outlet means until the valve means move away from the seating areas.

4,044,744

INTERNAL COMBUSTION ENGINE FUEL ECONOMIZER SYSTEM

James J. Keefer, 5205 Hillburn Ave., Baltimore, Md. 21206

Filed July 9, 1976, Ser. No. 703,772
Int. Cl.[2] F02M *17/14*
U.S. Cl. 123—136 **2 Claims**



1. In combination with an internal combustion engine, fuel feed economizer apparatus, adapted to a gas line leading from a fuel tank to the carburetor comprising:

A. a fuel line joining tank to carburetor;

B. plural injectors sealed within the fuel line, between the tank and the carburetor, each said injector having a fluted orifice end of expanded circular cross-section and a restricted orifice end of substantially elongate cross-section;

C. plural control valves interposed between the said tank and carburetor, there being one each injector disposed with the fluted end of each said injector adjacent the respective input and output ends of the valves; and

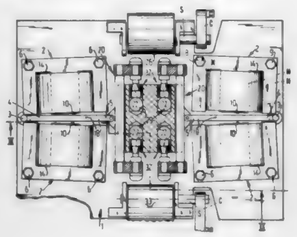
D. at least one union disposed between the valves, said union having injectors with the fluted end of each said injector adjacent input and output ends of the union.

4,044,745

INJECTOR PUMP

Willem Brinkman, Velp, and Bernard Breunkink, Enschede, both of Netherlands, assignors to Holec, N.V., Hengelo, Netherlands

Continuation of Ser. No. 416,852, Nov. 19, 1973, abandoned. This application Mar. 8, 1976, Ser. No. 665,113
Claims priority, application Netherlands, Mar. 14, 1973, 7303579
Int. Cl.[2] F02M *32/00*
U.S. Cl. 123—139 E **39 Claims**



1. The method of forming a combustible fuel/air mixture for an internal combustion engine, which comprises the steps of:

a. providing an armature which is pivoted at one end so as to present a free end which may swing freely back and forth and which free end has at least one fuel displacing member connected thereto;

b. intermittently pumping fuel into admixture with air to form fuel/air mixture by swinging said free end of the armature back and forth in response only to electro-magnet motivating forces;

c. effecting said motivating forces for intermittent time durations to act alternately in opposite directions by subjecting a region of said armature lying between its ends to electro-magnetic attraction first on one side of the armature and then on the other side of the armature and so on so that fuel is discharged at a rate which increases strongly during each discharge period;

d. intercepting the motion of said armature and the fuel-displacing member connected to it during each of said time durations positively to terminate motion of said member substantially at the instant of each interception whereby to control the volume of fuel pumped during each intermittent fuel discharge period;

e. controlling the frequency of occurrence of said motivating forces according to engine speed; and

f. controlling the volume of fuel pumped per intermittent discharge period by changing the timing of motion termination whereby to alter the extent of movement of said displacing member in a direction of movement of said displacing member.

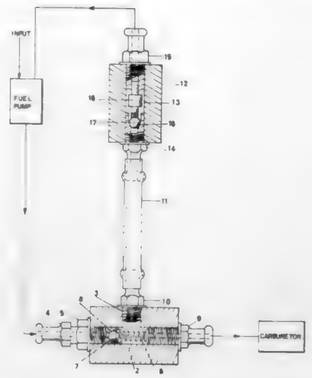
4,044,746

FUEL CONTROL DEVICE

Ronald Swynerton Kaye, Mt. Eliza, Australia, assignor to Marie Kaye, Mt. Eliza, Australia, a part interest

Filed Feb. 27, 1975, Ser. No. 553,827
Claims priority, application Australia, Dec. 24, 1974, 0135/74
Int. Cl.[2] F02M *5/10*; G05D *9/00*
U.S. Cl. 123—139 AV **6 Claims**

1. A fuel regulating device for motor vehicles having a fuel pump, a carburetor and a connecting fuel line, comprising a block having a bore formed therein to provide a first unitary housing, one end of said bore being adapted to be connected to the fuel pump outlet line, the opposite end of said bore being adapted to be connected to the fuel inlet line to the carburetor, pressure responsive means mounted in said bore to prevent fuel flow to the carburetor below a minimum pressure, a second bore formed in said block extending transversely to said first bore and communicating therewith; a second block of the same configuration as said first block and having a bore formed therein providing a second unitary housing, conduit means connecting said second bore to one end of the bore in said second block, the opposite end of the bore in said second block



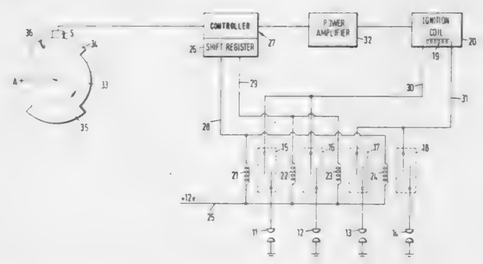
being adapted to be connected to the inlet of said fuel pump, and pressure responsive means in the bore of said second block adapted to allow the flow of fuel to the inlet of the fuel pump at a pressure greater than said minimum fuel pressure of said pressure responsive means in said first housing; the second bore in the first housing communicating with and being connected to one end of said conduit means in an orientation of the first housing at a lower level than said opposite end of the bore in the first housing, to thereby prevent any air entrained in the fuel from passing to the fuel pump.

4,044,747

SPARK IGNITION ENGINE

Kenneth Longstaff, Alcester, England, assignor to British Leyland UK Limited, London, England

Filed Jan. 26, 1976, Ser. No. 652,043
Claims priority, application United Kingdom, Feb. 4, 1975, 4641/75
Int. Cl.[2] F02P *3/02*
U.S. Cl. 123—148 E **4 Claims**



1. A spark ignition engine, having a crankshaft to which is coupled a plurality of reciprocatable pistons, incorporating an ignition system comprising:

a. a crankshaft pulse generator adapted to generate output pulses in dependence on crankshaft speed;

b. an ignition coil having a high voltage secondary winding;

c. a first group of at least two reed relays and a second group of at least two reed relays; each relay of the first group connecting one end of the secondary winding to a different spark plug, each relay of the second group connecting the other end of the secondary winding to a different spark plug; and

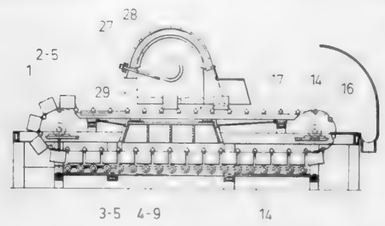
d. a shift register adapted, in response to a pulse from the crankshaft pulse generator to close one reed relay in each group prior to generation of a voltage in the winding so that at least two spark plugs fire upon generation of a voltage in the winding; the register also being adapted to cause the opening of the reed relay in each group when the voltage has been dissipated.

4,044,748

CONTINUOUS CUTTING MACHINE FOR STONE AND BUILDING MATERIALS

Eliseo Herrando Villanueva, Ctra. de Barcelona Km. 9, Museros Valencia, Spain

Filed Dec. 8, 1975, Ser. No. 638,787
Claims priority, application Spain, Feb. 5, 1975, 209676
Int. Cl.[2] B28D *1/04*
U.S. Cl. 125—13 R **1 Claim**



1. A cutting machine for petrous and building materials, comprising:

first endless conveyor belt means made up of a plurality of plates which extend transversely of the direction of travel of the conveyor belt means and are journalled together, each plate having a central projection extending in the direction of travel, said central projections together forming a longitudinal partition which acts to divide the upper strand of the conveyor belt means into two zones;

a cutting member positioned above the upper strand of the first endless conveyor belt means for cutting petrous or building material being transported on said upper strand;

second endless conveyor belt means aligned with the first endless conveyor belt means at the discharge end thereof, to receive and convey cut petrous or building material that has been conveyed by the first endless conveyor belt means to the discharge end thereof; and third endless conveyor belt means aligned with the second endless conveyor belt means at the discharge end thereof, to receive and convey cut petrous or building material that has been conveyed by the second endless conveyor belt means to the discharge end thereof, said third endless conveyor belt means comprising at least two parallel endless belts having a space therebetween for permitting waste material to fall from the third endless conveyor belt means.

4,044,749

CONCRETE REMOVAL TOOL

Burlie R. Bowen; Claud C. Barrington; Thomas J. Ames, and Glen E. Lochte, all of Houston, Tex., assignors to HydroTech International, Inc., Houston, Tex.

Filed Apr. 30, 1976, Ser. No. 682,039
Int. Cl.[2] B28D *1/32*
U.S. Cl. 125—23 R **19 Claims**

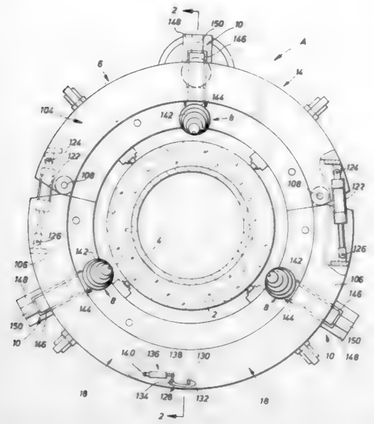
1. Apparatus for breaking concrete from a concrete coated pipe comprising:

a frame mountable on said pipe;

bit means rotatably supported by said frame for disengageably engaging said concrete to break said concrete from said pipe,

means for moving said bit means relative to said pipe;

and means for simultaneously driving said bit means against said concrete to impart massive force thereto exceeding



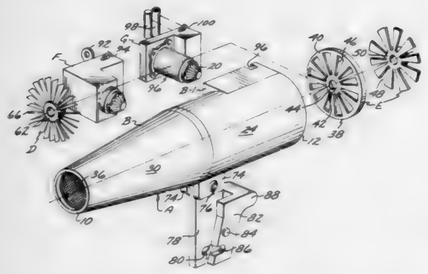
the strength of said concrete to thereby break said concrete from said pipe as aforesaid.

4,044,750

BARBEQUE BLOWER

Kenneth H. Zeigler, 23851 Larkwood St., El Toro, Calif. 92630

Filed Mar. 26, 1976, Ser. No. 670,984
Int. Cl.[2] F01D *17/00;* **F04D** *29/56*
U.S. Cl. 126—25 B **3 Claims**



1. In combination with a barbeque fire box having a rolled upper edge, which fire box holds a plurality of charcoal briquettes in side-by-side relationship, a power-driven blower unit that may be oriented in a desired direction relative to said fire box to generate a stream of air that sweeps across said briquettes to serve as a draft to assist in the initial ignition of said briquettes and to maintain said briquettes in a glowing heat emitting condition after said ignition, said power-driven blower unit including:

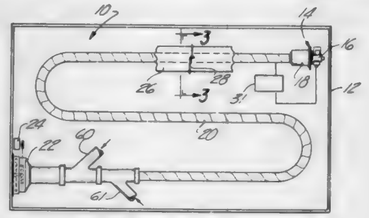
a. an elongate housing that has first and second open ends;
b. a transverse spider in said housing intermediate said first and second ends;
c. an air intake member transversely disposed in said second end, said intake member having a number of circumferentially spaced air openings therein;
d. a transverse bladed fan disposed in said housing intermediate said spider and said second end;
e. a plate that defines a number of circumferentially spaced, radially extending spokes, said plate adjacently disposed to said air intake member, and said plate when rotated controlling the effective area of said openings in said air intake member;
f. a prime mover mounted on said housing adjacent said second end, said prime mover including a drive shaft that extends into said housing;
g. first and second meshing bevel gears, said first gear secured to said drive shaft and said second gear secured to said bladed fan;
h. a longitudinal shaft rotatably supported by said spider and said air intake member and rigidly secured to said plate, said shaft rotatably supporting said bladed fan;
i. a handle secured to said shaft adjacent said plate and outwardly disposed therefrom, said shaft serving the dual function of rotatably supporting said bladed fan, said rotatably adjusting said plate relative to said air intake member when said handle is manually rotated; and
j. spring loaded clamp means secured to said housing that may removably engage said fire box to support said housing at a desired position on the latter, and the rate at which air is discharged from said first end of said housing being controlled by rotating said handle to vary the effective area of said air openings.

4,044,751

RADIANT ENERGY HEATING SYSTEM WITH POWER EXHAUST AND EXCESS AIR INLET

Arthur C. W. Johnson, Troy, Mich., assignor to Combustion Research Corporation, Pontiac, Mich.

Filed May 19, 1975, Ser. No. 578,764
Int. Cl.[2] F24C *3/06*
U.S. Cl. 126—91 A **13 Claims**



1. A radiant energy heating system comprising: a burner for producing heat through the combustion of a fuel/air mixture, said burner comprising a housing defining a large combustion chamber and a fuel nozzle adjacent one end thereof; an elongated radiant energy heater tube of a diameter substantially smaller than the diameter of the combustion chamber having an input end and an exhaust end and extruding through the area to be heated; the input end being connected to the other end of the combustion chamber housing for receiving the products of combustion; power exhaust means at said exhaust end for continuously drawing air through the tube from the burner during operation of the burner and discharging said products and air beyond the area to be heated thereby to produce a negative pressure within the heater tube; and excess air inlet means for admitting excess ambient air to said input end at a point downstream of the fuel/air combustion area under the forced draft of said power exhaust means to cool the heated primary air at said inlet end below the rated capability of said burner to limit tube temperatures so as to maintain strength of materials of construction and minimize oxidation.

4,044,752

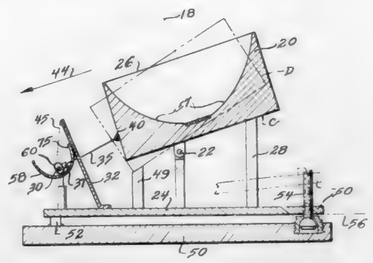
SOLAR COLLECTOR WITH ALTITUDE TRACKING

Amitzur Z. Barak, Chicago, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Aug. 1, 1975, Ser. No. 601,112
The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—270 **10 Claims**

1. A device for turning a solar energy collector about an east-west axis between at least two positions so that the frontal face of the collector is directed approximately towards the sun as the altitude of the sun varies, comprising,

axle means upon which the collector is mounted free to rotate thereabout with the frontal face directed skyward, said axle means being aligned so that rotation of the collector thereabout is in a north-south direction, a frame, a first heat responsive element which with solar radiation incident thereupon assumes a first stable state, and fixed shadow means for shading said first element from the sun's radiant energy with the sun within a first range of altitudes of the sun and for allowing the sun's radiant energy to be incident upon said first element within a second range of altitudes of the sun, said first element being responsive to



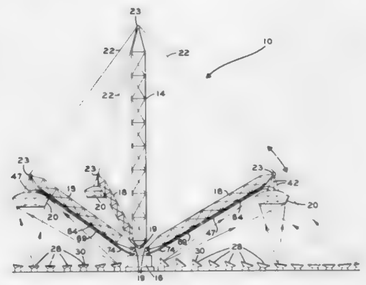
being shaded by said shadow means to assume a second stable state, said first element being so coupled to the collector and said frame that in response to said first element being in said first state due to being radiated by said sun within said second range, the collector is rotated about said axle means to assume a first position whereby the collector's frontal face is approximately directed towards said second range of altitudes of the sun, and that in response to said first element being in said second state due to being shaded by said shadow means with the sun within said first range the collector is rotated about said axle means to assume a second position whereby the collector's frontal face is approximately directed towards said first range of altitudes of the sun.

4,044,753

SOLAR ENERGY COLLECTION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of M. Kudret Selcuk, La Canada, Calif.

Filed Apr. 28, 1976, Ser. No. 681,096
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **8 Claims**



1. An energy collection system particularly suited for use in collecting energy from a solar source including:

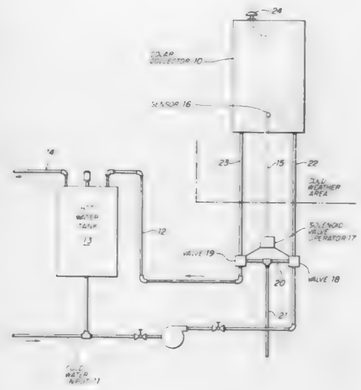
A. at least one heliostat having a reflecting surface for reflecting an incident beam of radiant solar energy; and
B. an energy receiver for absorbing heat from an incident beam of radiant solar energy reflected by said surface including means for converting solar energy to heat, comprising a plurality of concentrically related annular conduits and a plurality of substantially linear conduits interconnecting said annular conduits forming a network of a substantially aspherical configuration for conducting a working fluid in its liquid phase along a tortuous path.

4,044,754

SOLAR COLLECTOR AUTOMATIC FREEZE PROTECTION SYSTEM

Paul W. Cronin, Andover; Peter H. Ottmar, Attleboro, both of Mass.; Ernest F. Root, Nashua, N.H., and Harry M. Simmons, Reading, Mass., assignors to Itek Corporation, Lexington, Mass.

Filed May 10, 1976, Ser. No. 684,519
Int. Cl.[2] F24J *3/02*
U.S. Cl. 126—271 **6 Claims**



1. A freeze protection system for solar collectors comprising:

a. solar collector means for holding a fluid to be heated;
b. input means for supplying fluid to said collector means;
c. output means for removing fluid from said collector means;
d. sensor means for automatically monitoring the temperature of said collector means;
e. valve means coupled to said output means for automatically removing fluid from said collector means when the temperature of said collector means drops to a first predetermined level to prevent fluid from freezing up within said collector means; and
f. switch means coupling said sensor means to said valve means and actuated by said sensor means, said switch means being normally closed when said collector means is filled with fluid and which automatically opens when the temperature in said collector means drops to said first predetermined level for actuating said valve means for automatically removing fluid from said collector means.

4,044,755

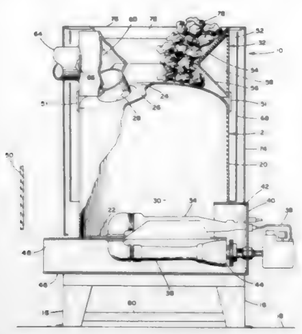
ROCK HEATER FOR SAUNA

Toivo I. Kolkka, 1175 Shasta, Redwood City, Calif. 94063

Filed June 10, 1975, Ser. No. 585,613
Int. Cl.[2] F24H *1/34*
U.S. Cl. 126—344 **12 Claims**

1. In a rock heater: a housing of heat-conductive material, said housing being provided with a top and having a chamber below the top in which combustion gases can be generated, said top having an upper extremity and sloping downwardly and outwardly from said upper extremity in substantially all directions; means having a fluid passage therethrough and

disposed adjacent to the top for retaining a pile of rocks thereon; and a pipe placing said fluid passage in fluid communi-



cation with said housing for permitting combustion gases to flow out of the housing and into the fluid passage, the latter having a fluid outlet for the exhausting of gases therefrom.

4,044,756

PHOSPHENE GENERATOR DEVICE

Robert W. Hamilton, 5109 Williams Fork Trail; No. 207, Boulder, Colo. 80301, and Robert E. Gillis, P.O. Box 67, Aptos, Calif. 95003

Filed Apr. 2, 1976, Ser. No. 673,145
Int. Cl.[2] A61B *5/00*; G02B *11/04*; G03B *35/02*
U.S. Cl. 128—2 N **11 Claims**



1. In a phosphene generator device adapted to be worn on the head of a person wherein openings are provided therein in spaced relation to one another so as to be aligned with the eyes whereby to pass light from an external light source to the eyes, the improvement comprising:

a movable element mounted on said device so as to traverse the eye openings, said movable element having blade members passing over the eye openings of a size so as not to completely block the passage of light through the eye openings, and

variable speed drive means to impart movement to said movable element at a predetermined but variable rate of speed in order to produce light pulses in the range of 1 to 25 cycles per second.

4,044,757

CHOLANGIOGRAPHY DEVICE AND METHOD

Daniel M. McWhorter, Arlington Heights, and Bhupendra C. Patel, Elgin, both of Ill., assignors to The Kendall Company, Boston, Mass.

Filed Jan. 14, 1976, Ser. No. 648,990
Int. Cl.[2] A61B *6/00*; A61M *1/00*
U.S. Cl. 128—2 A **3 Claims**

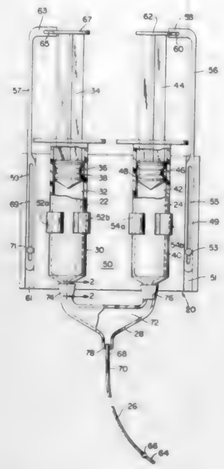
1. A device for use in cholangiography and similar procedures, comprising:

a first syringe having a barrel defining a chamber for retaining an irrigation liquid, and a plunger having one end received in said chamber for pumping the liquid from said chamber;

a second syringe having a barrel defining a chamber for retaining a liquid contrast medium, and a plunger having one end received in the chamber of the second syringe for pumping the contrast medium from said chamber;

a catheter having a distal end, a proximal end, and a lumen extending through the catheter;

means for connecting the proximal end of said catheter to the chambers of the first and second syringes without



exposing the liquids to the atmosphere intermediate the lumen and chambers, whereby the irrigation liquid and contrast medium may be ejected through the catheter without introduction of air into the device; and

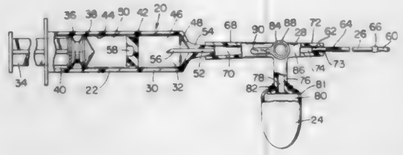
a plate, said syringes being secured to said plate, a pair of elongated arms each having one end secured to said plungers and the other ends being slotted and slidably secured to said plate, screws secured to said plate and positioned in said slots to releasably lock said arms to in turn lock said plungers at any inner or outer selected position.

4,044,758

CHOLANGIOGRAPHY DEVICE AND METHOD

Bhupendra C. Patel, Elgin, Ill., assignor to The Kendall Company, Boston, Mass.

Filed Jan. 14, 1976, Ser. No. 649,112
Int. Cl.[2] A61B *6/00*
U.S. Cl. 128—2 A **22 Claims**



1. A device for use in cholangiography and similar procedures, comprising:

a syringe having a barrel defining a chamber, a plunger having one end received in a proximal end of the syringe chamber for pumping liquid from the chamber, a floating barrier received in the chamber and defining a first compartment intermediate the barrier and a distal end of the chamber for retaining an irrigation liquid and a second compartment intermediate the barrier and said one end of the plunger for retaining a liquid contrast medium;

a catheter having a distal end, a proximal end, and a lumen extending through the catheter;

a liquid receiving receptacle having a chamber;

means for selectively connecting the syringe to the catheter lumen and the receptacle chamber; and

means for establishing communication between the connecting means and said second compartment when said barrier is located adjacent the distal end of the chamber, whereby an initial portion of the irrigation liquid may be pumped through the catheter, a remaining portion of the irrigation liquid may be pumped into the receptacle chamber until the barrier is located adjacent the distal end of the syringe chamber to establish communication with the second compartment, and the liquid contrast medium may be pumped through the catheter lumen without introducing air into the device.

4,044,759

AUTO-TRANSFUSION TORNIQUET APPLIANCE AND METHOD OF UTILIZING THE SAME TO CONTROL FLOW OF BLOOD THROUGH A BLOOD VESSEL

Bahman Ghayouran, 860 Harrison Ave., Boston, Mass. 02111

Filed Feb. 11, 1976, Ser. No. 657,212
Int. Cl.[2] A61H *1/00*
U.S. Cl. 128—24 R **4 Claims**



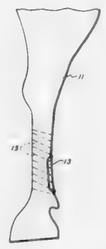
1. An improved tourniquet apparatus for controlling flow of blood in a patient's body, said apparatus including a flexible, substantially non-stretchable wrapper member engageable around a limb of the patient's body and inflatable means for selectively exerting pressure along the limb to displace blood therefrom, said inflatable means consisting in a bladder supported inside the wrapper member and having intermediate portions yieldably secured together by Velcro surfaces.

4,044,760

TENDON SHIELD AND METHOD OF MAKING THE SAME

Armand Pontarella, 36 Lansing Circle North, Rochester, N.Y. 14624

Filed Mar. 15, 1976, Ser. No. 666,631
Int. Cl.[2] A61F *13/00*
U.S. Cl. 128—82 **3 Claims**



1. A bowed tendon shield assembly for protecting an affected part of a horse's leg having a bowed tendon, said assembly comprising a shield member constituting a single integral light-weight piece of moldable rigid material and of curved cross-section having a concave surface shaped to engage exactly and precisely against the area of the bowed tendon and a substantial marginal area immediately around the bowed tendon of a particular individual horse, and means for securing said shield member to the leg of the horse, said securing means comprising a bandage-like wrapping adapted to extend a multiplicity of turns around said leg outside said shield member for holding said shield member tightly engaged throughout substantially its entire concave surface with said affected part of said leg and for exerting pressure against said tendon through said shield member, the entire assembly being of sufficiently light weight so that it may be worn on the horse during a race without interfering appreciably with the speed of running.

4,044,761

ORTHOPEDIC BANDAGE

John Ives Hall, Welwyn Garden City, England, assignor to Smith & Nephew Research Limited, England

Filed Feb. 19, 1976, Ser. No. 659,261
Int. Cl.[2] A61F *5/04*
U.S. Cl. 128—90 **12 Claims**

1. An orthopedic bandage which comprises:

a carrier, and

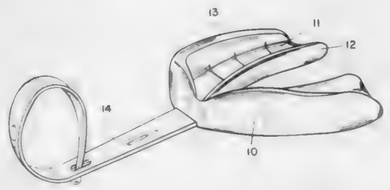
a water-hardenable powder material loaded on said carrier, said water-hardenable powder material comprised of a mixture of particles of (a) a water-soluble cross-linkable polymeric material containing carboxylic acid groups, and (b) at least one material selected from the group consisting of zinc oxide and zinc salts with at least one weak acid, said at least one material having been at least partially coated with an organic acid to reduce its surface reactivity.

4,044,762

ATHLETIC MOUTHGUARD

Alfred G. Jacobs, c/o Safe-T-Gard, Inc., P.O. Box 934, Madison, Wis. 53701

Continuation of Ser. No. 331,794, Feb. 12, 1973, abandoned. This application Aug. 23, 1976, Ser. No. 716,375
Int. Cl.[2] A61M *7/00*
U.S. Cl. 128—136 **1 Claim**



1. A generally U-shaped athletic mouthguard molded from a composition of liquid impermeable ethylene vinyl acetate copolymer and not more than 5% by weight fluoride compound selected from the group consisting essentially of sodium fluoride, stannous fluoride, and sodium fluorosilicate; said liquid impermeable ethylene vinyl acetate copolymer having a melting point below the fluoride compound whereby when heated to a temperature in excess of normal human body temperature can be molded to receive an impression of the wearer's teeth and when cooled to the normal human body temperature is resilient and shape retaining.

4,044,763

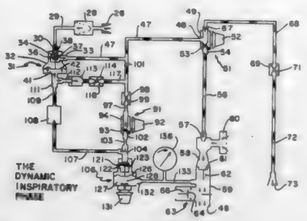
VENTILATOR AND METHOD

Forrest M. Bird, 212 NW. Cerritos, Palm Springs, Calif. 92262

Filed July 7, 1975, Ser. No. 593,667
Int. Cl.[2] A61M *16/00*
U.S. Cl. 128—145.8 **8 Claims**

1. In a ventilator having an inhalation phase and an exhalation phase in its operative cycle for use with a source of gas under pressure, a master sequencing cartridge having an inlet

adapted to be connected to the source of gas under pressure and an outlet, a valve member movable between open and closed positions for controlling the flow of gas from the inlet to the outlet, diaphragm means for moving said valve member from an open position to a closed position and forming first and second chambers in the cartridge on opposite sides of the diaphragm means, a breathing circuit outlet, breathing circuit means coupling the breathing circuit outlet to the outlet of the master sequencing cartridge, a single volume/rate control valve assembly having an inlet and an outlet with an orifice interconnecting the same and an adjustable needle valve disposed in the orifice, means coupling the inlet of the control valve assembly to the outlet of the master sequencing cartridge, means connecting the outlet of the control valve assembly to the first chamber on one side of the diaphragm means to bleed gas through the control valve assembly in one direction into said first chamber to move said valve member to terminate



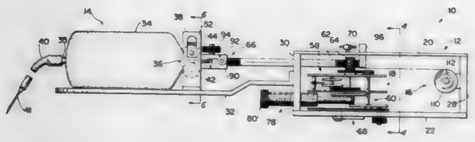
the inspiratory phase and initiate the expiratory phase and thereafter to bleed off gas from the first chamber through the control valve assembly in an opposite direction into the breathing circuit means whereby after sufficient bleed-off of gas from the first chamber the valve member moves to the open position to terminate the expiratory phase and initiate the inspiratory phase, and volume/rate control valve assembly including a single adjustable control means for the ventilator to control both the length of the inspiratory phase and the length of the expiratory phase such that an almost constant inspriatory expiratory time ratio from operative cyclic frequencies from over approximately 30 per minute down to approximately 5 per minute is maintained and a volume of gas to the patient which is substantially inverse to the rate is provided whereby, at high frequencies, there is a small tidal volume and at low frequencies there is a large tidal volume which meet the requirements for an infant and an adult, respectively.

4,044,764

FLUID INFUSION APPARATUS

Anthony W. Szabo, 37 Cobblewood Road, Livingston, N.J. 07039, and Louis R. M. Del Guercio, 14 Pryer Lane, Larchmont, N.Y. 10538

Filed Oct. 30, 1975, Ser. No. 627,341
Int. Cl.² A61M *5/20*
U.S. Cl. 128—214 F **5 Claims**



1. Portable, automatic fluid infusion apparatus for administering a predetermined amount of fluid at an adjustable, predetermined rate over an extended time period, the device comprising:

an elongated housing attachable to a patient;

a mechanical power means including a main spring enclosed by said elongated housing, said infusion apparatus including an elongated member extendable from a first end of said housing and in axial alignment with said elongated housing, said power means further including a timing mechanism, said timing mechanism including an escapement mechanism and a control mechanism to adjust the rate at which the fluid is administered, wherein said control mechanism includes a main driving disc operably engaged by said main spring, a driven disc operably engageable with said elongated member, a wheel for placing said driving disc in mechanical communication with said driven disc, and a shaft onto which said wheel is rotatably mounted for positioning said wheel along the radii of both said driving and said driven discs, for varying the speed at which the driving disc turns the driven disc; and

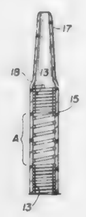
a receptacle means for storing the fluid, said receptacle means mounted at said first end of said housing in axial alignment therewith, said receptacle means including a soft plastic bag for holding the fluid, and a support platform for said soft plastic bag, said support platform fixedly attached to said first end of said elongated housing and in axial alignment therewith, said soft plastic bag positioned on said support platform in axial alignment with said elongated housing, said receptacle means further including a set of rollers fixedly attached to said support platform at a position adjacent said first end of said elongated housing, said soft plastic bag positioned between said set of rollers, said elongated member having a connecting means secured thereto for connecting said plastic bag to said elongated member, said elongated member for pulling said soft plastic bag through said rollers.

4,044,765

FLEXIBLE TUBE FOR INTRA-VENOUS FEEDING

William Mathes Kline, Gloversville, N.Y., assignor to Medical Evaluation Devices and Instruments Corporation, Gloversville, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,690
Int. Cl.² A61M *5/00, 25/00*
U.S. Cl. 128—214.4 **5 Claims**



1. A flexible intra-venous feeding tube including an inner body having proximal and distal ends and formed from stainless wire as a continuously wound lumen-defining helical spring with a majority of the helices thereof in contact with each other; an uninterrupted externally smooth transparent outer sheath having proximal and distal ends and formed from an inert plastic material so applied around said spring that its inner surface is firmly bonded thereto except at the proximal end portion thereof, the proximal end portion of said outer sheath being radially spaced from the adjacent of said spring whereby to define an annular void therebetween, the distal end of said outer sheath extending beyond the distal end of said spring and shaped to define a distally tapered hollow tip having an open distal end, a plurality of the helices of said spring being separated intermediate the proximal and distal ends thereof to provide a sight zone for visual observation of liquid flow; and a connected hub sealingly secured to the proximal ends of said spring and its said outer sheath, said hub having a proximal end portion provided with an axial socket for the initial retention of the handle of a puncture needle and for subsequent connection to a source of feeding liquid and terminating inwardly in a transverse web provided with a central aperture, said hub having a distal end bell housing provided

with two serially arranged cylindrical cavities coaxial with said central aperture, the distal one of said cavities having a diameter greater than that of the other thereof, a rigid sleeve affixed within the smaller diameter of said cavities and having a length to extend distally beyond the distal end of said bell housing, said sleeve having an inside diameter to receive and retain the unsheathed proximal end portion of said spring, means for securing the said proximal end portion of said spring within said sleeve, the proximal end of said outer sheath being fitted over the distal end portion of said sleeve and extending proximally into the annular void defined by the outer surface of said sleeve and the inner surface of said larger diameter cylindrical cavity, at least a portion of the wall of said larger diameter cavity being radially displaced inwardly whereby to secure the said proximal end portion of said outer sheath against the adjacent portion of said sleeve within said larger diameter cavity.

4,044,766

COMPRESSED CATAMENIAL TAMPONS WITH IMPROVED CAPABILITIES FOR ABSORBING MENSTRUAL FLUIDS

Leonard M. Kaczmarzyk; James J. Hlaban, both of Neenah, and Leo J. Bernardin, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Feb. 27, 1976, Ser. No. 661,971
Int. Cl.² A61F *13/00, 13/20*
U.S. Cl. 128—285 **9 Claims**

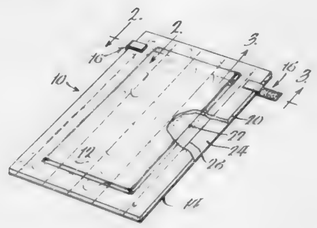
1. A compressed catamenial tampon comprised of a mixture of absorbent fibers in which a selected amount of said absorbent fibers are carboxymethylcellulose fibers having a degree of substitution in the range of 0.4 to 2.0 with at least a portion of the carboxyl radicals present being in free-acid form and the remainder of the carboxyl radicals present being in the alkali-metal salt form and in which said carboxymethylcellulose fibers are characterized by an absorbency time of less than about 41 minutes, said absorbency time being the number of minutes it takes for one gram of said carboxymethylcellulose fibers compressed to the 5cc mark in a 10cc BD multifit glass syringe to absorb a 0.9% NaCl solution up to the 5cc mark.

4,044,767

TAB FASTENER HAVING TWO TAPE SEGMENTS ATTACHED TO EACH OTHER AND TO DIAPER

Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 27, 1976, Ser. No. 661,919
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **17 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means which comprises:

a backing web folded over to form first and second anchoring legs each having an inner face and an outer face and receiving a marginal portion of the diaper therebetween, said inner face of said anchoring legs being provided with an adhesive coating by means of which said first anchoring leg is permanently attached to a marginal portion of said backing sheet and said second anchoring leg is permanently attached to a marginal portion of said facing sheet;

a securing tape segment having an inner face and an outer face and including a fixed end permanently attached to said backing sheet inwardly of said first anchoring leg, a free working end provided with a pressure-sensitive adhesive coating on said inner face thereof, and an intermediate portion of said tape segment between said fixed end and said free working end permanently attached to the outer face of said first anchoring leg;

release means associated with said tab fastener means and releasably attached to said adhesive coating on said free working end;

said free working end being separable from said release means to make said free working end available for securing said diaper about an infant.

4,044,768

DIAPER WITH SPLIT PUFF BONDED FACING

Frederick K. Mesek, Tinley Park, and Virginia L. Repke, Oak Forest, both of Ill., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Feb. 23, 1976, Ser. No. 660,607
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **13 Claims**



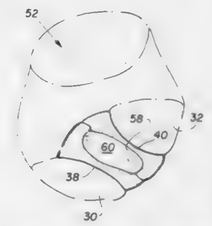
1. A multi-layer diaper comprising: a water-repellent backing member; an absorbent batt positioned on one face of said backing member; and a facing layer in juxtaposed relationship with respect to said batt and said backing member, said facing layer comprising a non-woven fibrous web including a randomly arranged, binder-stabilized, cellular, fibrous structure, said structure including chambers within the interior portion of the web surrounded by fiber strata more dense than the density within said chambers, and a binder interconnecting the fibers of said web, said binder being provided in sufficient quantity to prevent said fiber strata from collapsing, there being a density gradient between the opposite faces of said fibrous structure, the structure being more dense at one face than at the opposite face and having smaller chambers at one face than at the opposite face.

4,044,769

PANTY WITH SANITARY NAPKIN HOLDER

Elissa D. Papajohn, 65 Montague St., Brooklyn, N.Y. 11201

Filed Sept. 16, 1974, Ser. No. 506,229
Int. Cl.² A61F *13/16*
U.S. Cl. 128—288 **1 Claim**



1. In combination, a panty and the like having a front, rear

and opposite sides cooperating to define at least a lower torso garment having a waist opening and edges bounding right and left leg openings, elastic secured along said waist and leg openings to urge said edges of the latter into gripping contact with the user's legs to contribute to an optimum sealed confinement for a sanitary napkin during wearing service of said panty, and a sanitary napkin compartment formed of plies of fluid-tight material disposed in facing, superposed relation to each other in the crotch area of said panty, said compartment being oriented to extend between the front and rear of said panty and in substantial spanning relation between said elasticized leg openings, said compartment being further adapted to receive as a sanitary napkin a fluid absorbent material that is exposed to the interior of said panty through an opening defined in one of said plies in the interior of said panty, said opening extending for a substantial portion of the length of said compartment and for a width of said compartment sufficient to receive fluids discharged from the body of the user without side leakage from said compartment, and elastic secured along said compartment opening oriented substantially parallel to the elastic of said leg openings to retain the sides of said compartment opening about the absorbent material in said compartment without adverse effect on said seal of said elasticized leg openings, said panty supporting said compartment in position on the user such that the opening is restrained from movement relative to the body so that the compartment opening will remain in position to enable the absorbent material to receive the discharged body fluids.

4,044,770

EAR CURETTE

John J. Ocel; Donald J. Ocel, and Jon A. Mathisrud, all of Minneapolis, Minn., assignors to Ocelco, Inc., Minneapolis, Minn.

Filed Apr. 4, 1975, Ser. No. 565,003.
Int. Cl.² A61B 17/22
U.S. Cl. 128—304 **4 Claims**



1. An ear curette means comprising, in combination, a generally resilient self-supporting flexible gripping shaft with distal and proximal ends and having a wire loop means secured to the distal end thereof, and wherein:

a. said gripping shaft having a generally rigid proximal end segment and a generally flexible distal end segment and being a generally solid shaft with a certain first diameter at the proximal end segment and a certain reduced diameter at the distal end segment and with a tapered step separating said distal end from said proximal end to provide a generally rigid proximal end segment and a generally flexible distal end segment, and wherein a shaft deflection of 35° is achieved with a load of from between 75 and 125 grams secured to the tip end thereof.

4,044,771

FORCEPS MADE IN ONE PIECE

Arne T. Wannag, 11 A Palnasvagen, 133 00 Saltsjobaden, Sweden

Filed Dec. 31, 1975, Ser. No. 645,602
Int. Cl.² A61B 17/30
U.S. Cl. 128—354 **3 Claims**



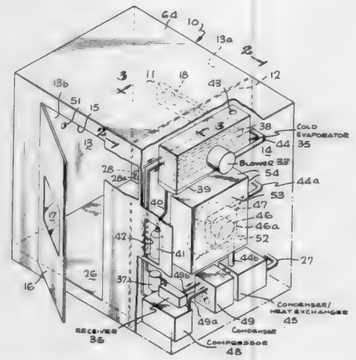
1. Forceps of one piece of material preferably a plastic material, comprising a pair of arms being joined together at one end thereof and having tips at their other free ends, said arms having a relatively short distance from their joining point two projections which face each other and are dimensioned to engage each other by abutment substantially when the tips of said arms contact each other, the portion of each of said arms which is located between said projection and said joining point being flexible, the portion of each of said arms between said tip being relatively rigid and for such purpose are dimensioned for a minimum deflection when said second portions are supported by the two spaced apart supports, that is said tips and said projections, and in use are to be manually pressed towards each other, said manual pressure acting intermediate said supports, said tips forming planar gripping surfaces facing each other and having a relatively large extension in the length direction as well as in the transverse direcion of said arms, said gripping surfaces forming such an angle with the rest of said arms that said gripping surfaces just when said projections engage each other by abutment will be in contact with each other along their entire surface.

4,044,772

APPARATUS FOR CARDIOVASCULAR CONDITIONING AND OTHER PHYSIOLOGICAL PURPOSES

Benjamin Schloss, 6961 Valjean Ave., Van Nuys, Calif. 91406

Filed Mar. 29, 1976, Ser. No. 671,592
Int. Cl.² A61H 33/06
U.S. Cl. 128—371 **28 Claims**



1. A physiological apparatus useful for cardiovascular conditioning and other physiological purposes, comprising:

a chamber,

heater means for introducing heated air into said chamber at a controlled, elevated temperature to promote profuse perspiration of a nude person in said chamber, and

evaporation means for circulating said introduced heated air over said person in said chamber at a flow rate sufficient to achieve continued rapid evaporation of said perspiration and of moisture expired by said person, and for continuously, rapidly removing from said chamber air containing evaporated perspiration and expired moisture.

4,044,773

COLD THERAPEUTIC PACKAGE

Henry Clay Baldwin, III, 429 S. Bolmar St., West Chester, Pa. 19380

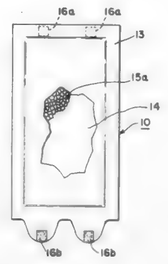
Filed Aug. 27, 1975, Ser. No. 608,270
Int. Cl.² A61F 7/04
U.S. Cl. 128—402 **5 Claims**

1. The method of using a cold therapeutic package for local treatment, said package having a longitudinal axis, comprising the steps of

forming a generally flat layer of ice between sheets of polyurethane film materials;

fragmenting the layer of ice into a plurality of small, finely subdivided, randomly shaped and sized particles;

applying the package about an area to be treated; and



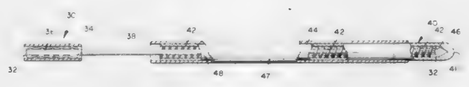
conforming the film materials and the fragmented particles to the contours of the area to be treated.

4,044,774

PERCUTANEOUSLY INSERTED SPINAL CORD STIMULATION LEAD

Terry Corbin, Crystal, and Duane J. Zytkovicz, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 23, 1976, Ser. No. 660,353
Int. Cl.² A61N 1/04
U.S. Cl. 128—404 **21 Claims**



1. A lead adapted to be attached to and extended between first and second sources of electrical stimulation and animal tissue to conduct and apply such stimulation to the tissue, comprising:

a. a stimulation electrode of an electrically conductive material substantially inert to body fluids and tissues;

b. a first conductor having a distal end electrically connected to said stimulation electrode and extending therefrom a first distance along said lead to a proximal end thereof;

c. a first electrical contact electrically connected to said proximal end of said first conductor, and adapted to be connected to the first source of stimulation to be applied along said first conductor to said stimulation electrode for stimulating the animal tissue;

d. a second conductor having a distal end electrically connected to said stimulation electrode and extending a second distance along said lead to a proximal end of said second conductor, said second distance being greater than said first distance;

e. a second electrical contact electrically connected to said proximal end of said second conductor and adapted to be connected to the second source of stimulation whereby electrical stimulation may be applied through said second conductor to said stimulation electrode; and

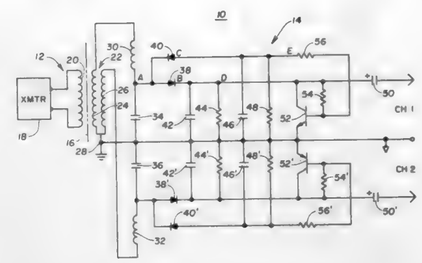
f. a sheath of an electrically insulating material substantially inert to body fluids and tissues and covering said first and second conductors between said stimulation electrode and said first and second contacts, said second conductor and said sheath covering said second conductor between said first and second contacts being of a reduced dimension, whereby said second conductor may be readily severed and removed from said lead.

4,044,775

IMPLANTABLE RECEIVER CIRCUIT

Larry A. McNichols, Coon Rapids, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 29, 1976, Ser. No. 681,766
Int. Cl.² A61N 1/36
U.S. Cl. 128—421 **10 Claims**



1. A circuit included in a device implantable within a body for providing at a given rate pulses of a pulse signal to a lead connecting said device to bodily tissue, said device including means responsive to a signal applied external to said body and radiated to said device for providing an internal signal manifesting said externally applied signal to said circuit, said external signal being a series of alternating current pulse bursts which occur at given rate, said circuit comprising:

first means responsive to said internal signal for providing a pulse during the occurrence of each pulse burst;

output energy storage means coupling said pulse signal to said lead; and

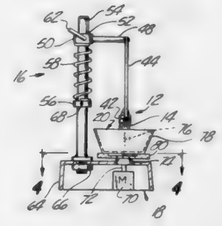
second means switchably engaged for providing a low resistance discharge path for said storage means during the time pulses of said pulse signal are not applied to said storage means.

4,044,776

CORN KERNEL CUTTER

Kenneth C. Moore, 5024 N. Lake Road, Columbiaville, Mich. 48421

Filed July 14, 1975, Ser. No. 595,765
Int. Cl.² A01F 11/06
U.S. Cl. 130—9 D **7 Claims**



1. A device for severing kernels of corn from a cob, comprising:

a. means for rotating an ear of corn,

b. means for cutting the kernels from the ear, the means for cutting engaging the ear of corn as it rotates, the means for cutting comprising:

1. a pair of semi-circular cutting members, the members each having a portion thereof overlapping the other member, the members cooperating to define a circular cutting blade, and

2. means biassing the cutting members toward each other and enveloping the cutting members,

c. means for vertically moving the means for cutting, the means for moving comprising:
   1. a pair of downwardly depending arms, each arm being connected to the cutting means,
   2. a first movable member connected to the depending arms,
   3. a second movable member spaced apart from the first movable member,
   4. biassing means disposed between the movable members and secured thereto, and
   5. a vertically extending shaft, the movable members being axially slidably mounted onto the shaft, such that vertical movement of the movable members along the shaft causes contemporaneous movement of the cutting means,
d. means for mounting the cutting means to the moving means, the mounting means comprising:
   1. a pair of threaded arms, one end of each arm being removably attached to one of the cutting members, the other end being connected to an associated one of the depending arms,
   2. biassing means mounted on each threaded arm, and
   3. means for threadably securing each of the threaded arms to the associated depending arm, and

wherein the ear of corn is vertically aligned, the cutting means moving along the vertical extent thereof as the ear rotates.

4,044,777

SYNTHETIC SMOKING PRODUCT

Dennis Boyd, Belfast, Northern Ireland, and George Porter, London, England, assignors to Gallaher Limited, Belfast, Northern Ireland

Division of Ser. No. 352,238, April 18, 1973, Pat. No. 3,943,941. This application Dec. 1, 1975, Ser. No. 636,705
Claims priority, application United Kingdom, Apr. 20, 1972, 18315/72
The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.
Int. Cl.[2] A24B *15/00*; A24D *1/18*
U.S. Cl. 131—2 **6 Claims**



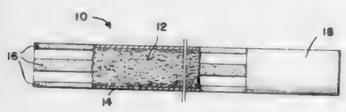
1. The method of preparing a fuel for smoking by human beings which comprises the steps of agglomerating a plurality of flexible cellulose-base fibres containing only carbon, hydrogen and oxygen, into a coherent mass, and subjecting said mass to a controlled pyrolysis until said fibres have suffered a weight loss of at least 60% during the pyrolysis, having a cross-sectional dimension between 5 and 10 microns and an organic content which is at least 90% carbon by weight.

4,044,778

CIGARETTES

Charles C. Cohn, c/o Colonial Alloys Company, 4041 Ridge Ave., Bldg. No. 11, Philadelphia, Pa. 19129

Filed Sept. 10, 1973, Ser. No. 395,650
Int. Cl.[2] A24D *1/02*
U.S. Cl. 131—4 A **18 Claims**



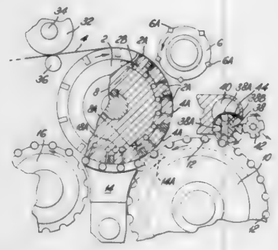
1. In a cigarette having a body of tobacco enclosed by a combustible wrapper, a heat insulating coating on said wrapper making the cigarette self-extinguishing when in contact with a surface, said coating being deposited from an aqueous solution of a soluble alkali silicate containing from about 17 to 27 percent by weight of SiO_2, the coating area of the silicate solution on the wrapper being from about 40 to 84 percent of the entire wrapper area to produce a cigarette which is self-extinguishing when in contact with a flammable or other surface, said coating area being generally evenly distributed along the length of the wrapper to reduce the burning rate of the wrapper throughout its length and to limit the air access to the burning tobacco throughout the length of the wrapper.

4,044,779

MANUFACTURE OF FILTER-TIPPED CIGARETTES

Edward George Preston, and Jan Antoni Rakowicz, both of London, England, assignors to Molins Limited, England

Filed Nov. 10, 1975, Ser. No. 630,517
Claims priority, application United Kingdom, Nov. 15, 1974, 49420/74
Int. Cl.[2] A24C *5/343, 5/52*
U.S. Cl. 131—21 R **7 Claims**



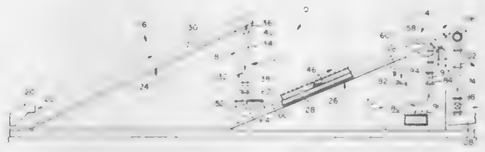
1. A filter-attachment machine comprising a drum and a cooperating rolling plate between which assemblies of cigarette and filter portions are rolled in order to wrap connecting sheets around them to join the cigarette portions to the associated filter portions, including means for monitoring the regular passage of assemblies through the rolling area between the drum and the plate and for producing a fault signal when assemblies stop passing a given point in the rolling area at regular predetermined intervals.

4,044,780

APPARATUS FOR TOTAL BLEND EXPANSION

James G. Kelly, Richmond, Va., assignor to American Brands, Inc., New York, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,740
Int. Cl.[2] A24B *3/18*
U.S. Cl. 131—135 **20 Claims**



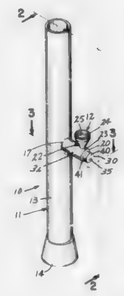
20. Apparatus for increasing the filling capacity of cut tobacco material comprising first means for elevating the temperature of the tobacco to about above 130° F. and about below the temperature at which the tobacco becomes charred or discolored and moisture content of the tobacco such that the heating and moisturizing are performed for a time sufficient to permit cut tobacco to open from its compressed condition, means for forming a relatively thin dispersion of the opened tobacco in a gas, and means operatively connected to said first means for rapidly lowering the moisture content of the thin dispersion of tobacco as the tobacco is maintained in the thin dispersion in a generally laminar gas flow to about its making moisture within about five seconds such that the tobacco has achieved an expanded and opened condition which resists the closing back thereof, said lowering means conveying a hot, relatively dry gas to reduce the moisture content of the tobacco and an expanding means for increasing the relative velocity of the air to the tobacco to wipe moisture from the tobacco surface.

4,044,781

SMOKING DEVICE

James E. Heggestuen, 1017 N. 14th St., Fargo, N. Dak. 58102

Filed Apr. 7, 1976, Ser. No. 674,327
Int. Cl.[2] A24F *1/14, 1/26*
U.S. Cl. 131—173 **5 Claims**



1. A smoker's pipe comprising, in combination:
a bowl assembly including
   a hollow cylinder having an inwardly shouldered end, a medical radial lighting opening, and a distal radial filler opening;
   a hopper mounted at said distal opening for supplying smoking material;
   a plunger movable axially in said cylinder and having a generally axial bore, a radial bowl cavity of generally the same cross-sectional outline and size as said filler opening, and perforations connecting said bore with the bottom of said bowl cavity;
   and spring and guide means acting between said shoulder and said plunger to urge the latter out of a first position, in which said bowl cavity is aligned with said medical opening, and a second position, in which said bowl cavity is aligned with said distal opening, said medial cavity is closed, and a first end of said plunger projects beyond the unshouldered end of said cylinder;
flexible conduit means secured to the inner end of said plunger, in communication with said generally axial bore, for moving said plunger within said cylinder;
an inhalation and liquid chamber comprising a vertical tube, means capping the lower end of said tube so that the latter may be filled with liquid to a desired level, and a lateral aperture located above said desired level;
and means securing said shouldered end of said cylinder in said lateral aperture with said flexible conduit extending toward the bottom of said chamber to terminate below said desired level.

4,044,782

ACID TREATED POLYESTER POLYURETHANE FOAM END WRAP

David Martin Adrion, Phoenix, Ariz., and Lloyd Bruce Hartsough, Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 26, 1976, Ser. No. 670,594
Int. Cl.[2] A45D *7/00*
U.S. Cl. 132—7 **9 Claims**

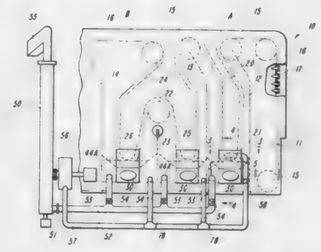
1. An end wrap for use in the permanent waving process which comprises a permeable flexible wafer of open-celled polyester polyurethane foam having a thickness of from about one-sixteenth inch to about one sixty-fourth inch, an average pore incidence within the range of from about 30 to 120 pores per linear inch and, contained in said end wrap, a solid, carboxylic acid having a pK_1 of from about 2.5 to about 6.0 and a water-solubility of from about 0.1 to 10.0 parts acid per 100 parts water at 15°–20° C., said acid being present at a level of at least 5 milligrams of acid per cubic inch of foam.

4,044,783

LABEL REMOVAL APPARATUS FOR CONTAINER WASHING MACHINES

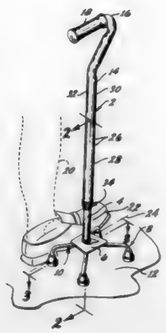
Momir Babunovic, Des Peres, and Donald E. Whitlock, Creve Coeur, both of Mo., assignors to Barry-Wehmiller Company, St. Louis, Mo.

Filed Mar. 22, 1976, Ser. No. 669,043
Int. Cl.[2] B08B *3/04, 9/08*
U.S. Cl. 134—73 **11 Claims**



1. Label removal apparatus for washing machines for containers bearing removable labels and for removing the detached labels from the machine, comprising: a washing solution containing compartment formed by and between side walls and walls transverse to said side walls; guide means extending downwardly in said compartment; label collecting trough means connected to said guide means and spaced above the bottom of said compartment, said guide means directing labels into said trough means, container conveying means movable through said compartment in descending and ascending paths outside of said guide means so as to have a path of travel beneath said trough means from the descending path to the descending path; an assembly of baffle means spaced below the path of travel of said conveyor means and above the compartment bottom to define a bottom space below said trough means; washing solution and label transfer passage means forming a communication between said trough means and said bottom space; fluid directing nozzle means in said trough means adjacent said transfer passage means to create a flow current for moving washing solution burdened with labels from said trough through said transfer passage means into said bottom space, and outlet means for washing solution burdened with labels connected into said bottom space.

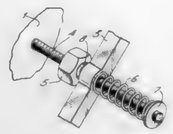
4,044,734
WALKING AID CANE
Alfred A. Smith, 13114 Margate St., Van Nuys, Calif. 91401
Filed Mar. 1, 1976, Ser. No. 662,525
Int. Cl.[2] A45B *1/00*; F16M *13/08*
U.S. Cl. 135—67 **16 Claims**



1. A walking aid cane construction comprising:
a central support member having an upper end, a lower end and a longitudinal axis;
four legs rigidly connected to said lower end for contact with a supporting surface;
each of said legs having a body portion and a foot portion;
the body portions of said legs being generally transversely connected to said member with the foot portions depending downwardly from the outer ends of the body portions for contact with a supporting surface;
said support member having an inner region that faces the user's leg and an outer region that faces away from the user's leg;
said foot portions having lower ends which are positioned in a plane that is generally transverse to said support member with said lower ends positioned generally at the corners of a rectangle within said plane;
said support member having a front region which faces generally in the direction of movement of the user and a rear region which faces generally in a reverse direction to said direction of movement;
said rectangle having a front side and a rear side which are generally parallel and are positioned generally transverse to the direction of movement of the user;
said rectangle having an inner side and an outer side which are generally parallel and are positioned generally in alignment with the direction of movement of the user;
said inner side being positioned closer to the axis of said support member than said outer side and said front side and said rear side being positioned at about the same distance from the axis of said member;
said rectangle having inner corners formed by intersection of said inner side with said front and rear sides and outer corners formed by the intersection of said outer side with said front and rear sides;
the body portions of the legs which terminate at said inner corners being shorter than the body portions of the legs which terminate at said outer corners;
handle means adjustably connected to said support member for vertical positioning with respect thereto and being aligned with the direction of travel, and
support means to provide support for supported lengths of said body portions with the support means being shaped and positioned to provide unsupported lengths of the body portions which have a substantially equal resistance to bending forces.

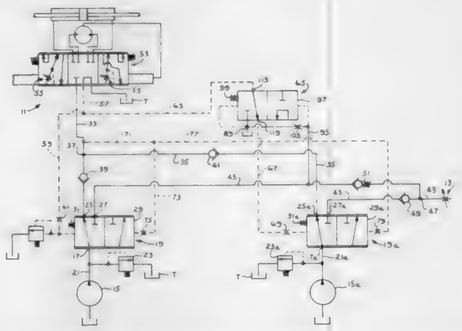
4,044,785
COMBINED, ADJUSTABLE AIRING VALVE AND FIRE PROTECTION VALVE
Ole Arvid Larsen, Michelets vei 38C, Oslo 10, Norway
Filed Jan. 22, 1976, Ser. No. 651,348
Claims priority, application Norway, Jan. 31, 1975, 750302
Int. Cl.[2] F16K *17/38*
U.S. Cl. 137—75 **3 Claims**





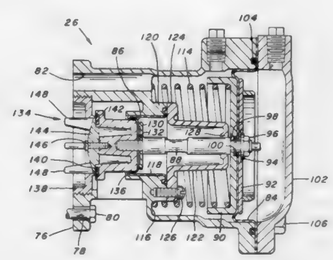
1. In a combined adjustable airing valve and fire protection valve comprising a valve head shaped commensurate with a valve seat, a valve stem fixed to said valve head and in the form of an adjusting screw, a fusible structure responsive to temperature taking the form of a threaded portion of an adjustable nut threadably engaged with the valve stem, a support bracket supporting and guiding the valve stem, and a biasing means arranged between the support bracket and a stop plate on the valve stem to bias the valve head towards the valve seat thereby abutting the adjustable nut against the support bracket, the improvement being that the adjustable nut is disposed on the valve stem with sufficient friction such that the adjustable nut rotates with the valve stem if the valve head is rotated, so that the valve head cannot be undesirably displaced, and the adjustable nut is disposed on the valve stem between the supporting bracket and the valve head.

4,044,786
LOAD SENSING STEERING SYSTEM WITH DUAL POWER SOURCE
James K. Yip, Richfield, Minn., assignor to Eaton Corporation, Cleveland, Ohio
Filed July 26, 1976, Ser. No. 708,657
Int. Cl.[2] F15B *11/16, 18/00*
U.S. Cl. 137—101 **7 Claims**



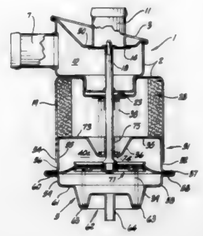
1. A system for providing pressurized fluid to a primary load circuit end to an auxiliary load circuit means, the primary load circuit including means providing at least one load pressure signal representative of the demand for fluid pressure and flow by the primary load circuit, said system comprising:
a. a first sub-system including a first source of pressurized fluid and a first valve means operable in response to variations in the load pressure signal to control the flow of fluid from said first fluid source to the primary load circuit to satisfy the demand for fluid thereby, and to port excess fluid to the auxiliary load circuit means when the fluid demand by the primary load circuit is less than the output capacity of said first fluid source;
b. a second sub-system including a second source of pressurized fluid and a second valve means operable in response to variations in the load pressure signal to control the flow of fluid from said second fluid source to the primary load circuit to satisfy any demand for fluid thereby in excess of the output capacity of said first fluid source and to port any excess fluid from said second fluid source to the auxiliary load circuit means; and
c. third valve means operable to communicate the load pressure signal to said second valve means to cause said second valve means to be responsive thereto, when said first valve means is porting all of the fluid from said first fluid source to the primary load circuit, and to block the communication of the load pressure signal to said second valve means when said first valve means is porting excess fluid from said first fluid source to the auxiliary load circuit means, the load pressure signal acting on said second valve means being relieved to tank by said third valve means.

4,044,787
BACKFLOW PREVENTER AND RELIEF VALVE ASSEMBLY
Ray Sutherland, Hopwood, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Division of Ser. No. 668,627, March 19, 1976, Pat. No. 3,996,962. This application July 19, 1976, Ser. No. 706,349
Int. Cl.[2] E03B *7/07*
U.S. Cl. 137—107 **5 Claims**



1. A pressure differential operable valve comprising: a body having an inlet and an outlet and a seat between said inlet and outlet; said inlet being connected to a fluid flow line; a valve member engageable with said seat for controlling flow therethrough; a valve stem connected with said valve member; means including a pair of diaphragms providing a first pressure chamber therebetween; means connecting said diaphragm with said valve stem, said valve body including an opening communicating with said first pressure chamber for admitting operating fluid into said first pressure chamber; a second pressure chamber defined by one of said diaphragms and the cover of said body, and being connected to a source of line pressure upstream of said opening communicating with said first pressure chamber; a spring operatively connected to said valve stem and biasing said valve member toward the valve opening position; said operating fluid normally effective in said second pressure chamber to oppose said spring bias and move said valve stem and valve member toward valve closed position; the other of said diaphragms adding force of pressure in said first pressure chamber to move said stem and said member toward valve closed position.

4,044,788
DIAPHRAGM ACTUATED VALVES
Edward N. Crawford, Florissant, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Dec. 23, 1974, Ser. No. 535,957
Int. Cl.[2] G05D *11/00*
U.S. Cl. 137—117 **3 Claims**



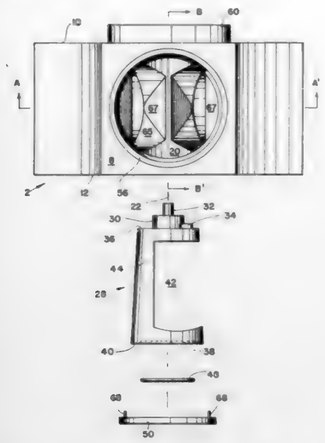
1. In a valve structure including an air connection part having inlet, outlet and bypass openings in it, said air connection part including a valve seat operatively associated with said outlet opening, a diaphragm chamber part having a diaphragm assembly including a flexible diaphragm dividing said chamber into a first section and a second section, a valve stem having first and second ends, said first valve stem end being attached to said diaphragm, and a valve member mounted to said second valve stem end, the improvement which comprises means for providing fail safe operation of said valve, said means including a first spring mounted in said first section of said diaphragm chamber part adapted to bias the diaphragm so as to seat said valve member, means for supplying a source of negative pressure to said chamber coupled to said chamber on the same side as said diaphragm as said first spring, said first section of the diaphragm chamber part including stop means for limiting the movement of said diaphragm integrally formed in it, a muffler portion between said air connection part and said diaphragm chamber portion, said muffler portion including a valve seat about said bypass opening, a second valve member mounted to said valve stem, said second valve member being movable independently of said valve stem, and means for biasing said second valve member towards said seat about said bypass opening.

4,044,789
SANITARY DIVERSION VALVE
John E. Elmore, P.O. Box 474, Oak Hill, W. Va. 25901
Filed Jan. 12, 1977, Ser. No. 758,640
Int. Cl.[2] F16K *11/07*
U.S. Cl. 137—367 **15 Claims**

1. An improved sanitary diversion valve, for connection to plastic sanitary pipe, comprising:
a molded housing having three side surfaces, a top and a bottom surface, with an inlet port in a first one of said side surfaces and first and second outlet ports in second and third ones of said side surfaces, with a frusto-conical core receiving cavity having an axis substantially perpendicular to said top surface and opening onto said top surface through a core shaft port and opening onto said bottom surface through a core insertion port, said cavity communicating with said inlet and said first and second outlet ports;
a frusto-conical valve core having a shaft extending from its narrower top end, a circular depression engraved in its larger bottom and coaxial with the conical axis, and a trough in the conical side thereof, transverse to said conical axis, said valve core inserted through said core insertion port of said housing with said shaft extending through said shaft port of said housing and said conical side of said valve core mating with the inner conical surface of said housing cavity, for selectively connecting said inlet port

with either said first or said second outlet port by axially rotating said core within said cavity, to align said trough with said first or second outlet port;

a resilient O-ring positioned in said circular depression of said bottom end of said core;



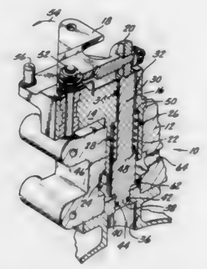
a bottom plate mounted to said bottom surface of said housing over said core insertion pipe, for pressing upwardly against said O-ring, to resiliently seat said conical surface of said core with the mating inner conical surface of said cavity in said housing.

4,044,790

SELF RE-ARMING VALVE

Normand N. Rodrigue, Long Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 27, 1976, Ser. No. 690,543
Int. Cl.² F16K *17/04*
U.S. Cl. 137—465 **2 Claims**



1. A self re-arming dump valve for use in controlling a pressurized fluid comprising:

a valve port,

a valve piston,

means for guiding said piston into said port,

a spring for biasing said piston into said port,

means for holding said piston from being forced out of said port by the pressurized fluid and for releasing said piston to permit opening of said valve by said fluid comprising a valve stem attached to said piston on the side opposite of the pressurized fluid, a roller follower to engage said valve stem and a spring to position said follower into engagement with said valve stem, and

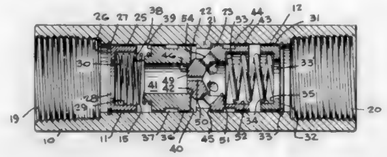
means for stabilizing said valve with said piston in said port comprising a detent in the end of the valve stem that is not attached to said piston, to co-act with said roller follower.

4,044,791

VALVE ASSEMBLY

Roland W. McKenzie, Culpeper, Va., assignor to City Tank Corporation, Culpeper, Va.

Filed Dec. 10, 1975, Ser. No. 639,600
Int. Cl.² F16K *17/18*
U.S. Cl. 137—493.9 **16 Claims**



1. A flow control valve assembly for providing fluid flow at varying rates in accordance with the input pressure of fluid to the valve assembly comprising a body having a fluid passageway therethrough including first and second ports, engageable first and second valve elements movably disposed in said fluid passageway between said ports, means disposed on said body for yieldably biasing said first valve element into engagement with said second valve element, means disposed on said body for yieldably biasing said second valve element into engagement with said first valve element, abutment means disposed on said body engageabie by said first and second valve elements for restricting the movement of each of said valve elements toward the other thereof under the influence of said biasing means, said first valve element having a main fluid passageway therethrough intercommunicating said first port and said second valve element when said valve elements are disposed in engagement, said second valve element having a primary fluid passageway therethrough intercommunicating said main fluid passageway of said first valve element and said second port when said valve elements are disposed in engagement, and said second valve element having at least one secondary fluid passageway intercommunicating said first valve element and said second port whereby liquid flow at a relatively high rate of flow occurs through said primary fluid passageway and said secondary fluid passageway and said main fluid passageway when the input pressure is above a predetermined value with flow being restricted at a lower rate to the primary fluid passageway and the main fluid passageway when the input pressure is below a predetermined value.

4,044,792

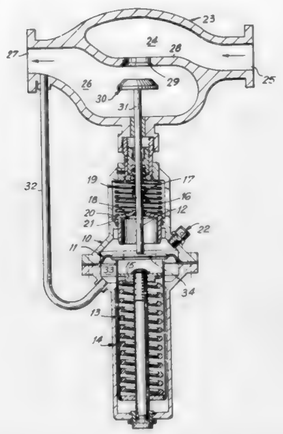
DIAPHRAGM OPERATED PRESSURE REGULATOR

Knud Kjaergaard, Ballerup, Denmark, assignor to Odin Clorius A/S, Kovlunde, Denmark

Continuation-in-part of Ser. No. 588,338, June 19, 1975, abandoned. This application May 28, 1976, Ser. No. 691,081
Int. Cl.² F16K *31/12*
U.S. Cl. 137—505.22 **3 Claims**

1. In a throttle valve comprising a valve housing having a high pressure chamber with a high pressure inlet port and a low pressure chamber with a low pressure outlet port, a wall having a valve seat therein separating said high and low pressure chambers, a valve element comprising a valve spindle positioned in said valve housing, said valve spindle extending movably through the outer wall thereof for movement of said valve element in a direction towards and away from abutment against said valve seat by means of a pressure regulator acting against the outer end of said spindle, said pressure regulator comprising first and second housing parts sealingly separated from each other by a diaphragm, the second housing part and said diaphragm defining a regulator pressure chamber being connected through adequate tubing to the low pressure chamber of said throttle valve, said diaphragm having secured thereto and placed centrally thereof a rigid member being biased by a preselected spring force acting against the force exerted upon said diaphragm by the pressure in said regulator

pressure chamber so as to define a balanced axial position of said rigid member within said regulator housing in response to the actual pressure within said regulator pressure chamber, a stem mounted to slide axially in said first housing part for abutment with its outer end against the outer end of said valve spindle and with its inner end against said rigid member and being relatively slightly biased by a spring force thereagainst, the improvement comprising a slide member mounted in said first housing part for sliding movement in a generally axial direction thereof in sealing contact around said stem and against the surrounding portions of said first housing part so as to define a generally closed chamber together with said diaphragm and situated on the side thereof opposite said regulator pressure chamber, first abutment means provided on said first housing part, said slide member being in its normal position under normal operational conditions of said pressure regulator relatively slightly biased against said first abutment means, said stem extending slidably through a central bore in said slide member and having in the normal position of said slide member spaced outside thereof second abutment means adapted to engage against sad slide member when the latter during failure of said diaphragm is moved away from its normal position by fluid pressure acting thereon, so as to move said stem and thereby said valve element against its closed position.

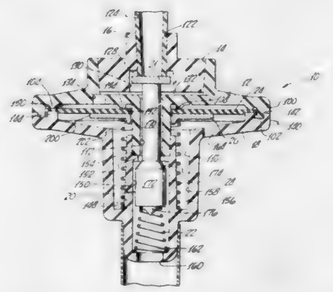


4,044,793

RELIEF VALVE

Kenneth Keith Krueger, Tustin, and Todor Pavlov, Laguna Niguel, both of Calif., assignors to Shiley Laboratories, Inc., Irvine, Calif.

Filed Aug. 25, 1975, Ser. No. 607,265
Int. Cl.² F16K *11/20*
U.S. Cl. 137—612.1 **24 Claims**



1. A relief valve for preventing greater than a predetermined fluid pressure from being applied through a main passage to the outlet of the valve, comprising, in combination:

a generally circular inlet member having on one side, peripheral diaphragm sealing ridge, an annular valve seat ridge interior to and concentric with the diaphragm sealing ridge, and a tubular main fluid conductor extension having a main fluid passage therein, said conductor being interior to and concentric with the valve seat ridge, said inlet member also forming, on the other side, an opening for receiving a luer tip adapter and a passage through the inlet member in communication with the luer tip receiving opening and the annular space between the diaphragm sealing ridge and the valve seat;

a luer tip adapter received in the opening therefore in the inlet member, said luer tip adapter having a luer inlet therethrough in fluid communication with the main fluid passage and with the passage to the space between the diaphragm and the valve seat;

a generally circular outlet member having a diaphragm sealing ridge constructed and adapted to cooperate with the diaphragm sealing ridge on the inlet member to secure and seal between said ridges the edge of a diaphragm, an annular tubular portion defining a main passage generally coaxial with the main passage in the inlet member, said main passage being in communication with an outlet on the opposite side of an in generally coaxially with the luer tip inlet, a valve seat formed in the main passage, the annular tubular portion being constructed and adapted to mate with the conductor extension of the inlet member for thereby forming the main fluid passage through the valve from the luer tip inlet through the main fluid passage to the outlet, the outlet member including at least one vent opening spaced laterally from the tubular portion;

a movable generally cylindrical main valve member disposed for axial movement in the main fluid passage, the main valve member having thereon a shoulder valving portion which seats, in the closed position, against the seat and having one end which extends through the main passage in the inlet member in spaced relation to the walls of the main passage to a point proximate the inside of the luer inlet for being moved axially upon insertion of a luer tip into the luer inlet to thereby move the shoulder away from the seat to open the main valve;

a coil compression spring bearing resiliently against the main valve member for resiliently biasing the main valve to the normally closed position;

an annular diaphragm sealed at its edges between the diaphragm sealing ridges of the inlet and the outlet members having an opening in the center thereof through which the conductor extension of the inlet member extends in spaced relation to the inside edge of the annular diaphragm, the portion adjacent the central opening forming a valving member for contacting the seat ridges on the inlet member;

an annular washer surrounding the conductor disposed on the opposite side of the diaphragm from the portion which contacts the seat ridges;

a compression spring bearing against the washer and received around the tubular portion of the outlet member for resiliently biasing the washer and the valving portion of the diaphragm toward the valve seat ridges; and

the passage through the luer inlet, through the inlet member, between the inside edge of the diaphragm and the conductor extension, and through the vent opening, forming a vent passage which is normally closed by the vent valve comprising the diaphragm valving portion and the seat ridge on the inlet member, the resiliency of the spring and of the diaphragm requiring a predetermined pressure to open the vent valve, the main passage being defined by the luer inlet, the luer tip receiving opening, the passage through the conductor extension of the inlet member and the tubular portion and outlet of the outlet member, whereby upon insertion of a luer into the luer inlet the main valve is opened and upon application of fluid pres-

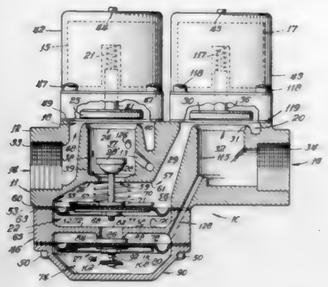
sure into the luer inlet above predetermined pressure value the vent opens the vent passage to thereby prevent application of pressure above said predetermined pressure valve from being applied through the main passage to the outlet.

4,044,794

SLOW-OPENING GAS VALVE

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Nov. 10, 1975, Ser. No. 630,166
Int. Cl.² F23N *5/24*
U.S. Cl. 137—613 **8 Claims**



1. A fluid flow control valve comprising a housing, including a main body portion having a central passageway interconnecting an inlet and an outlet of said valve, said main body portion having first and second ports formed therein between said inlet and said outlet of said valve, a first valve member disposed in open and close said first port, a second valve member disposed to open and close said second port, and regulator means interposed between said first port and said second port for regulating the flow rate from said first port to an inlet of said second port, said regulator means including regulator valve means having a regulating valve member disposed to normally close a regulator port disposed within said central passageway between said first and second ports, and first actuator means responsive to fluid flow through said first port following operation of said first valve member to open said first port to control said regulating valve member to open said regulator port to permit fluid flow at a first rate from said first port to said inlet of said second port, said second valve member being operable to open said second port to enable fluid supplied to said inlet of said second port to flow to said outlet, and control valve means responsive to fluid flow through said second port to control said first actuator means to increase the fluid flow rate through said regulator port to thereby increase the pressure of fluid supplied to said outlet to a predetermined value.

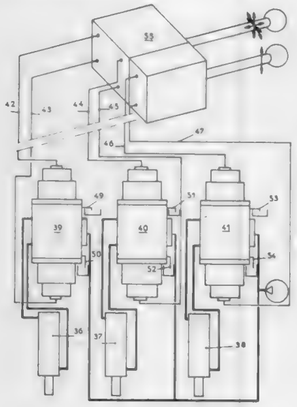
4,044,795

SELECTIVE AND PROPORTIONAL HYDRAULIC REMOTE CONTROL DEVICE, IN PARTICULAR FOR HANDLING AND PUBLIC WORK GEARS

Maurice Tardy, and Jean Paulet, both of Saint-Etienne, France, assignors to Bennes Marrel, France

Filed Jan. 20, 1975, Ser. No. 542,173
Claims priority, application France, May 31, 1974, 74.19652
Int. Cl.² F15B *13/042*
U.S. Cl. 137—625.6 **1 Claim**

1. A fluid control device comprising, in combination:
a fluid emitter including body means and piston means;
a source of fluid operably connected to said fluid emitter;
said body means including a first port, a second port and a third port;
said piston means being mounted in said body means for displacement therein;
said piston means being normally biased to a first position so that the first port, through which fluid from said source of fluid may be introduced into said fluid emitter, is closed, while the fluid which may flow from the third port is permitted to leave said fluid emitter through said second port;
said piston means being movable by an external force to a second position so that fluid from said source of fluid which is introduced into said fluid emitter through said first port is permitted to leave said fluid emitter through said third port, while the second port is closed;
said piston means being provided with control means for varying the effective fluid communication passageway between said first port and said third port;
said fluid emitter allows in particular the admission of the fluid sent under low pressure toward a distributor connected to said fluid emitter through an inlet port of said distributor, wherein said distributor is adapted to control operation of power members, such as jacks or the like;
said control means adjusts the pressure to the inlet port of said distributor, while the pressure of an outlet port of said distributor is constant;



said control means which adjusts the pressure of the inlet port of said distributor are grouped inside said fluid emitter;
said fluid emitter includes a body provided with at least one hollow piston which slides inside an axial bore in said body;
said control means includes calibrated holes drilled in a radial direction in said piston;
a control lever is provided attached to said hollow piston; and
the position of said control lever defines the number of said calibrated holes being obturated, the unobturated holes defining a section of said inlet port by opening in a chamber of pressure;
the fluid sent by said fluid emitter under low pressure acts on at least one piston connected to a slide valve of said distributor to control said slide valve;
said piston being provided with a hole parallel to its longitudinal axis; and
said hole being provided with a jet through which a controlled flowing out of the low pressure fluid takes place.

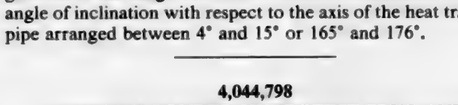
4,044,796

TURBULATOR

Ronald H. Smick, 745 Chapel St., Ottawa, Ill. 61350

Filed Feb. 9, 1976, Ser. No. 656,329
Int. Cl.² B01F *15/06*; F15D *1/02*
U.S. Cl. 138—38 **9 Claims**

1. An improved turbulator for insertion in a heat exchanger conduit having substantially straight longitudinal internal walls, comprising, an elongated strip of metal formed into a series of alternating deflection panels successively joined together by substantially triangular bridging portions each having a pair legs forming an apex disposed laterally of the axis of said turbulator and joined to a base substantially parallel to said axis with said deflection panels along the length of said strip



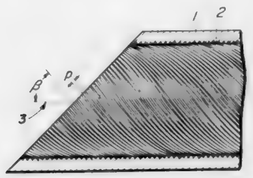
merging into the legs of said triangular portions while alternately angling back and forth and simultaneously tilting up and down relative to said axis for mixing and directing heat exchanger fluid flowing within said conduit substantially completely circumferentially and uniformly against the internal walls of said conduit.

4,044,797

HEAT TRANSFER PIPE

Kunio Fujie, Tokyo; Masaaki Itoh; Tamio Innami, both of Tsuchiura; Hideyuki Kimura, Chiyodamura; Wataru Nakayama, Kashiwa, and Takehiko Yanagida, Chiyodamura, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 14, 1975, Ser. No. 632,155
Claims priority, application Japan, Nov. 25, 1974, 49-134295; June 4, 1975, 50-66559; Sept. 22, 1975, 50-113692
Int. Cl.² F28F *1/40, 13/02, 13/12*
U.S. Cl. 138—38 **11 Claims**



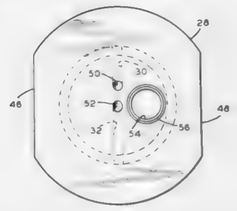
1. In a heat transfer pipe for forced convection boiling or condensing the improvement comprising said heat transfer pipe being formed on its inner wall surface with grooves having a depth from the wall surface to their bottoms in the range between 0.02 and 0.2 millimeters, a pitch between the adjacent grooves in the range between 0.1 and 0.5 millimeters, and an angle of inclination with respect to the axis of the heat transfer pipe arranged between 4° and 15° or 165° and 176°.

4,044,798

ADHESIVE BONDED HYDROTEST PLUG AND METHOD FOR USING THE SAME

Joel Gary Feldstein, and Jeffrey Forsha Martin, both of Alliance, Ohio, assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Dec. 15, 1975, Ser. No. 641,102
Int. Cl.² F16L *55/10*
U.S. Cl. 138—90 **2 Claims**



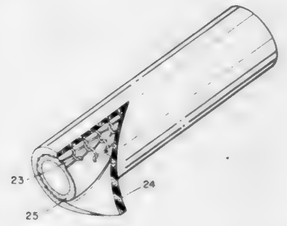
1. In a system using a test plug for testing the pressure integrity of that portion of a conduit member extending beyond the test plug, the conduit member being subjected to a fluid environment, the pressure characteristics of which vary from that of the environment surrounding the conduit member, the method of securing the test plug to the wall of the conduit member, the test plug having at least two internal passageways leading to the periphery of the test plug body, comprising:
placing and centering the test plug in the conduit member,
injecting a fluid adhesive through one of the passageways into an annular chamber between the periphery of the test plug and a wall of the conduit member while allowing gas to escape the annular chamber through another of the passageways, allowing the fluid adhesive to harden to form a fluid pressure tight bond between the test plug and the wall of the conduit member, and subjecting the conduit member to the fluid pressure environment.

4,044,799

CELLULAR WALL HOSE AND METHOD FOR MAKING SAME

Charles D. Higbee, Arvada, and Bennie A. Stevens, Denver, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 724,928, April 29, 1968. This application Feb. 16, 1972, Ser. No. 226,675
Int. Cl.² F16L *11/00*
U.S. Cl. 138—125 **2 Claims**



1. An extruded, foamed, tubular product comprising:
an inner seamless tube having a multitude of closed gas-filled cells interspersed throughout the walls of said tube;
an outer cover comprising a wall structure having a multitude of gas-filled cells interspersed throughout said walls of the outer cover; and
at least one intermediate seamless, closed cell, cellular layer contiguous to the next adjacent inner layer and the next concentric outer layer.

4,044,800

LOOM WITH SHUTTLES

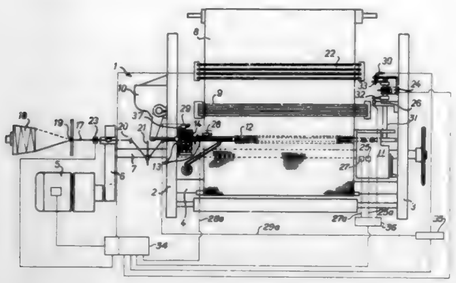
Cesare Germani, Como, Italy, assignor to Omita S.p.A., Italy

Filed Feb. 20, 1976, Ser. No. 659,950
Claims priority, application Switzerland, Feb. 27, 1975, 2483/75
Int. Cl.² D03d *51/40*
U.S. Cl. 139—341 **4 Claims**

1. A loom having a monitoring system, said loom being of the type having a weft bobbin located outside the shed, the weft is fed into the shed by means of shuttles which are brought into a shooting position by a rotary transporting drum, said shuttles being braked after passing through the shed carrying the weft, said shuttles pass through a chute from the braking means to a conveyor belt and are then returned to the transporting drum by the conveyor belt, the operation of said shuttles and the position in the cylical path of each shuttle being monitored by said monitoring system which comprises:
first sensing means in said braking means for determining the position of said shuttle after passing through said shed;
second sensing means in said chute for determining the

position of said shuttle at the beginning of its return movement;

third sensing means adjacent said transporting drum for determining the presence of said shuttle at the end of its return movement; and



fourth sensing means for detecting the rotational phase of said transporting drum with respect to the loom movement.

4,044,801

WEFT THREAD BEAT-UP MECHANISM FOR TRAVELLING WAVE SHEDDING LOOMS

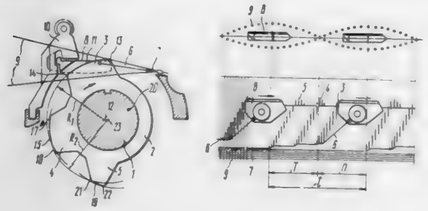
Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49, Moscow; Jury Ivanovich Komzrov, ulitsa Miklukho-Maklaya, 29, korpus 1, kv. 215, Moscow; Alexei Vasilievich Butuzov, Balaklavsky prospekt, 38, kv. 61, Moscow, and Mazakhir Gamza Ogly Farzaliev, pereulok Mirza Fatalei, 13, Baku, all of U.S.S.R.

Filed May 12, 1976, Ser. No. 685,634

Claims priority, application U.S.S.R., May 15, 1975, 2134357

Int. Cl.[2] D03D *47/26*

U.S. Cl. 139—436 **5 Claims**



1. In a mechanism for beating up a weft thread in a travelling wave loom, a rotary shaft and a plurality of discs distributed along and carried by said shaft for rotation therewith, each disc having, for beating up a weft thread, at least a pair of teeth one of which is a leading tooth and the other of which is a trailing tooth in the direction of rotation of each disc, each of said teeth having leading and trailing edges projecting outwardly from the center of each disc and respectively terminating in outer ends, and each tooth having an outer convex edge extending between said ends of said leading and trailing edges of each tooth and having opposed ends joining said ends of said leading and trailing edges of each tooth respectively at leading and trailing merging points of each tooth, the trailing merging point of said trailing tooth being situated at a greater radial distance from the center of each disc than the trailing merging point of said leading tooth while the latter trailing merging point of said leading tooth is situated at a greater radial distance from the center of each disc than the leading merging point of the trailing tooth, said trailing tooth having a central portion of its outer convex edge situated at the same radial distance from the center of each disc as the trailing merging point of said leading tooth, so that during beating up of a weft thread at least said trailing tooth does not engage the weft thread with its leading merging point and instead provides for beating up of the weft thread primarily by engaging the latter thread at the central portion of said outer edge of said trailing tooth with the beating up action by said trailing tooth continuing up to the trailing merging point thereof.

4,044,802

MECHANICAL MULTIPLIER FOR WEAVING LOOMS

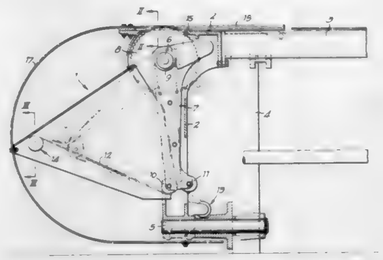
Patrick A. Steverlynck, Vichte, Belgium, assignor to N. V. Weefautomaten Picanol, Ieper, Belgium

Filed Sept. 7, 1976, Ser. No. 720,593

Claims priority, application Netherlands, Sept. 19, 1975, 7511118

Int. Cl.[2] D03D *47/00*

U.S. Cl. 139—449 **4 Claims**



1. Mechanical multiplier for weaving looms, characterized by the combination of: a pivotally mounted driven rocker lever; a gear which meshes with the part to be driven; a pinion fixedly attached to said gear; and a flexible elongated element trained over said pinion and, guided over two rollers .ournalled on one end of said rocker lever remote from its pivot mounting and both ends of which are attached to fixed points of the device.

4,044,803

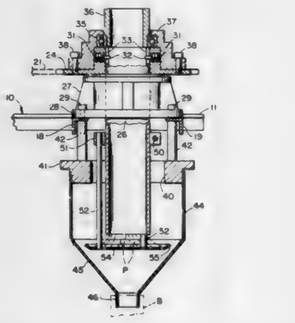
APPARATUS FOR FILLING CONTAINERS WITH DEHYDRATED AGGLOMERATES

Woodrow A. Baker, 13979 Allen Road, Albion, N.Y. 14411

Filed Oct. 14, 1975, Ser. No. 621,875

Int. Cl.[2] B65B *1/14*

U.S. Cl. 141—34 **5 Claims**



1. A machine for filling containers with predetermined quantities of dry particles, comprising

a frame,

indexing means including a drive shaft mounted on said frame to be intermittently rotated in one direction about its axis,

a sleeve mounted on said frame for intermittent rotation by said drive shaft and coaxially about a vertical axis, said sleeve having an unobstructed axial bore disposed to be filled with said dry particles,

means for connecting said bore of said sleeve adjacent its upper end to a supply of said dry particles to be filled thereby,

a plate mounted on said sleeve for intermittent rotation therewith, and extending transversely across said lower end of said sleeve in axially spaced relation thereto partially to obstruct the opening in said lower end of said sleeve thereby normally to cause the particles filling said bore in the sleeve to pile up on the upper surface of said plate and to accumulate in said sleeve above said plate and the pile of particles thereon,

said indexing means further including means connecting said sleeve to said shaft and operative to transmit the intermittent rotation of said shaft simultaneously to said sleeve and to said plate, and whereby each time said shaft is rotated said sleeve and said plate are rotated a fraction of a revolution about the axis of said sleeve so that a predetermined quantity of said particles is discharged by centrifugal force radially off the edge of said plate from said pile, and said pile is replenished by gravity from the particles accumulated in the unobstructed bore of said sleeve, and

means for guiding into one of said containers said quantity of particles discharged from said plate.

4,044,804

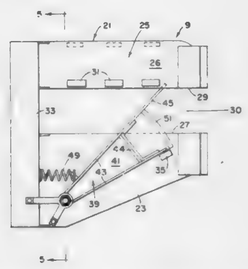
TREE SHEARER

Wesley Lamar Dodd, Hamilton, Ga., assignor to Deere & Company, Moline, Ill.

Filed June 20, 1975, Ser. No. 588,770

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—34 E **15 Claims**



15. A tree shearing device, comprising: a frame member having edges defining a recess therein at a shearing area; a pivot member mounted on said frame member so that a portion of said pivot member is adjacent to said recess and within said shearing area; severing means mounted on said portion of said pivot member, whereby movement of said frame member in a predetermined direction causes said severing means to be moved toward one of said edges defining said recess so that a tree between said severing means and said one edge is sheared by continued movement of said frame member in said predetermined direction; and a guide member rigid with the pivot member and protruding outwardly from one edge of said severing means to assure pivoting of said pivot member when in contact with a tree.

4,044,805

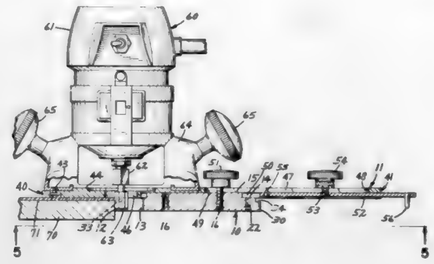
ROUTER GUIDE UNIT

Donald D. Gronholz, 10941 Morris Ave. South, Bloomington, Minn. 55437

Filed Feb. 4, 1976, Ser. No. 655,278

Int. Cl.[2] B27C *5/10*

U.S. Cl. 144—134 D **5 Claims**



1. In combination:

a router having a flat base with a central aperture through which a selected router bit may project axially for peripheral engagement with the edge of a work piece;

a guide fence, having first and second flat faces, to be secured with respect to the router base with the first face of the fence turned toward the router, said fence including a straight edge having a length of the base, said edge being centrally interrupted by a recess of a width substantially the same as the diameter of the largest bit to be used;

adjustable means for securing said fence flat against said router base, with said straight edge parallel to a line passing perpendicularly through the axis of the bit, said adjustable means enabling adjustment of said fence in a direction perpendicular to said straight edge, said adjustable means comprising a sub-base having a first face secured against said router base and having a second base remote from said router base including a groove extending radially with respect to the axis of said center aperture, and said fence including a tongue projecting from said first surface thereof and aligned with said direction of adjustment, and means adjustable along said groove independently of said fence and including at least one trammel point.

4,044,806

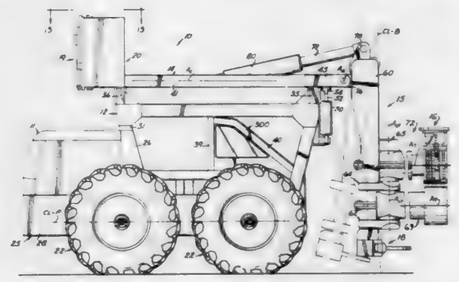
TREE PROCESSING MACHINE

Donald D. Savage; Robert V. Chambers, and Maurice T. Mills, all of Marietta, Ga., assignors to B. J. Powell, Atlanta, Ga., a part interest

Continuation-in-part of Ser. No. 293,482, Sept. 29, 1972, Pat. No. 3,881,533. This application Feb. 24, 1975, Ser. No. 552,318

Int. Cl.[2] A01G *23/08*

U.S. Cl. 144—309 AC **23 Claims**



1. A compact tree processing machine for cutting trees substantially longer than said machine including:

a prime mover movable along its longitudinal axis, and having a forward end and length substantially shorter than said tree to be harvested;

a support frame mounted on said prime mover and fixed relative to said prime mover;

a carriage frame pivotally mounted on said support frame for rotation about a roll axis spaced above, generally parallel to, and generally vertically aligned with the longitudinal axis of said prime mover, said carriage frame also longitudinally fixed with respect to said prime mover;

a support bed pivotally mounted on the forward end of said carriage frame about a single generally horizontal bed pivot axis generally perpendicular to said roll axis; said bed pivot axis spaced above said prime mover at the foward end thereof, longitudinally fixed with respect to said prime mover and generally vertically aligned with a point immediately forward of the support area of said prime mover for movement of said support bed from a generally vertical plane immediately forward of said prime mover to a generally horizontal plane above said prime mover; the remote end of said bed opposite said pivot axis being adjacent the ground when said bed is in the substantially vertical plane;

pivot means for selectively pivoting said bed about said pivot axis; and,

roll alignment means for selectively pivoting said carriage frame and said bed about said roll axis.

4,044,807

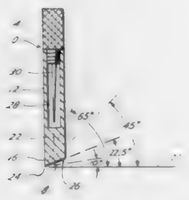
PIPE TOBACCO TAMPER AND METHOD

Ralph V. Swainson, 238 16th St., NE., Winter Haven, Fla. 33880

Continuation-in-part of Ser. No. 544,877, Jan. 29, 1975, abandoned. This application July 18, 1975, Ser. No. 596,978

Int. Cl.[2] A24F *3/02, 9/02*

U.S. Cl. 131—243 **10 Claims**



1. A pipe tamper for tamping tobacco in a pipe bowl having a draw opening in its bottom portion comprising,

a handle, and

a tamping head at one end of the handle having a face at an angle of from about 10° to about 65° to a plane extending at a right angle to a longitudinal line extending through the head, thereby providing the face with a leading edge and a trailing edge,

the head portion being of a size to fit within the pipe bowl and to cover up to about one-half of the tobacco's upper surface,

whereby tamping of the tobacco's upper surface with the leading edge adjacent the pipe bowl's inner surface while moving the pipe tamper around the inner surface compresses the tobacco at its outer edges substantially devoid of air pockets and leaves air pockets in its central portion.

4,044,808

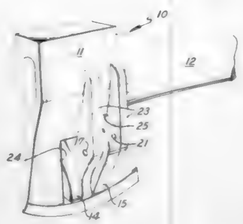
SPLITTING ASSEMBLY

Robert A. Kolonia, RD No. 3, Box 318, Agnes Lane, Milford, N.J. 08848

Filed May 20, 1976, Ser. No. 688,287

Int. Cl.[2] A47J *4/02;* **B26B** *23/00;* **B27L** *7/00*

U.S. Cl. 145—2 R **14 Claims**



1. A device useful for splitting objects comprising:

a. a head portion having a cutting edge located substantially on the centerline thereof,

b. means movably mounted directly on said head portion, and

c. said movable means being effective to move away from the head portion when the cutting edge is thrust against an object,

d. said movable means including lever means mounted to pivot about a point at one end thereof and swing the outer end thereof from a resting position outwardly with respect to a first side of the head portion,

e. said pivot point being laterally displaced with respect to said centerline and on a side of the head portion opposite said first side,

f. said head portion including an opening for receiving the outer end portion of the lever means,

g. said outer end portion being disposed at a location with respect to the cutting edge to be effective to enter into a cut made by the cutting edge when thrust against the object and having a structural configuration effective to cause the lever means to pivot about said pivot point.

4,044,809

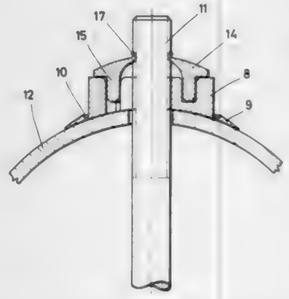
TIGHTENING AND SEALING DEVICE

Nicolás Guerrico Echevarría, Legazpia (Guipuzcoa), Spain, assignor to Plasticos Mel S.A., Legazpia (Guipuzcoa), Spain

Filed Feb. 13, 1976, Ser. No. 658,012

Int. Cl.[2] F16B *39/284, 39/36*

U.S. Cl. 151—19 R **3 Claims**



1. A tightening and sealing device, particularly for sealingly attaching a corrugated roofing element to a threaded stem extending through an orifice in the roofing element, said device comprising:

a tightening member including a central, cylindrical internally threaded body divided into a plurality of separate cylindrical segments by a plurality of radial and longitudinal slots, each of said cylindrical segments having extending outwardly from a first axial end thereof a leg, the legs of said segments being circumferentially spaced from each other, an outer body coaxially surrounding said central body, said outer body being joined at a first axial end thereof to said legs, said outer body having a cylindrical inner surface and a polygonal outer surface, said central and outer bodies defining therebetween an annular cylindrical channel open at second ends of said cylindrical segments and said outer body, said outer body having extending outwardly from said first end thereof a flexible annular skirt, said cylindrical segments, said legs, said outer body and said skirt being formed as an integral single member of a rigid plastic material;

said tightening member being axially slidable without rotation over a threaded stem until said skirt contacts a roofing element supported by the stem, said cylindrical segments being outwardly bendable at said legs during such sliding; and

a sealing member including a cap-shaped element having extending therethrough an orifice to receive the threaded stem and having extending therefrom a cylindrical flange dimensioned to fit within and fill said annular channel, said flange when fitting within said channel forcing said cylindrical segments inwardly such that the internal threads thereof mesh with the threads of the stem, such that a wrench engaging said outer surface of said outer body can rotate said tightening member about the stem and into tight and sealing contact with the roofing element.

4,044,810

PNEUMATIC TIRE FOR AIRPLANES

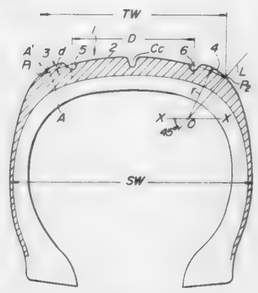
Motoaki Taniguchi, Higashi-Yamato, and Toyomi Iwata, Sayama, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,860

Claims priority, application Japan, Oct. 23, 1974, 49-122137

Int. Cl.[2] B60C *11/06*

U.S. Cl. 152—209 R **8 Claims**



1. In pneumatic tire for airplanes comprising a plurality of circumferentially extending grooves and a plurality of circumferentially extending ribs separated from each other by means of said grooves, the improvement comprising, a pair of circumferentially extending grooves each arranged at a shoulder portion of the tire and substantially symmetrically and equally spaced apart from a crown center of the tire, the distance between said circumferentially extending grooves arranged at the shoulder portions being, when the tire is inflated, from 50% to 95% of a tread width and dividing a tread portion of the tire into a center zone and two shoulder zones, a sectional contour defining an outer surface of said tread portion being a continuous curve in both the center zone and the two shoulder zones, and the outer surface of the tire being protruded at both said shoulder zones from said circumferentially extending grooves arranged at the shoulder portions of the tire toward the outside thereof by a step projected from said tread portion even after said tire is inflated and having a level difference when the tire is uninflated from 0.5 mm to 6 mm, whereby a ratio of the load subjected to said center zone to the load subjected to said two shoulder zones is reduced, thereby improving the high speed durability of the tire without sacrificing the wear resistance thereof.

4,044,811

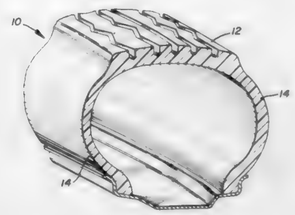
LAMINATED PNEUMATIC TIRE

Thomas J. Dudek, Tallmadge; Leon F. Marker, Cuyahoga Falls, both of Ohio, and Hendrik Jan Jacob Janssen, Den Haag, Netherlands, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed July 16, 1975, Ser. No. 596,494

Int. Cl.[2] B60C *5/12*

U.S. Cl. 152—354 **16 Claims**



1. In a pneumatic tire casing having a tread portion and flexible sidewall portions which are free of fabric reinforcement, the improvement wherein each of said sidewall portions comprises:

a series of layers of flexible polymeric material with a calculated molecular weight of at least 10,000 and a Shore A durometer hardness of at least 20,

a series of said layers comprising low-modulus polymeric material with a Young's modulus which is from about 100 to about 5,000 pounds per square inch,

a plurality of said layers being interspersed with the low-modulus layers and comprising a higher-modulus polymeric material with a Young's modulus which is from about 3000 to 100,000 pounds per square inch, each of which layers has a Young's modulus at least twice that of the next adjacent low-modulus layer.

4,044,812

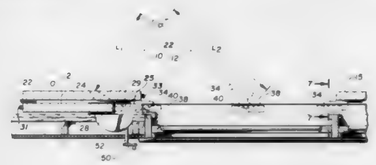
REMOTELY OPERATED WINDOW SHUTTERS

Paul W. Swanstrom, 505 McNamara Ave., Hastings, Minn. 55033

Filed Mar. 5, 1976, Ser. No. 664,161

Int. Cl.[2] E05D *15/26*

U.S. Cl. 160—206 **1 Claim**



1. A remotely operated folding shutter system for covering or uncovering an aperture in a building wall, comprising, in combination:

a first rectangular shutter panel pivotally mounted about a vertical axis with a first vertical edge adjacent to an edge of the aperture to be covered;

a second rectangular shutter panel having a width slightly greater than the width of said first shutter panel pivotally connected along one vertical edge to said first panel with

one vertical edge of said second shutter panel aligned adjacent to the second vertical edge of said first shutter panel;

track means mounted above and below said aperture in said building wall;

slide means mounted for slidable movement along said track along a straight path substantially parallel to said building wall;

guide means connected at one end to the other vertical edge of said second rectangular shutter panel and pivotally connected at the other end to said slide means;

a worm mounted on a rotatable shaft which projects through said wall;

a worm gear mounted on a frame for rotation about a substantially vertical axis, said worm gear being engaged with said worm to rotate about said vertical axis when said worm is rotated about its shaft axis;

a drive arm having one end fixed to said worm gear for rotation of said drive arm when said worm gear is rotated about said vertical axis;

a connecting link pivotally connected at one end to the free end of said drive arm and pivotally connected at its other end to an extension of said shutter;

a first cam block attached to said link, said cam block having a cam surface;

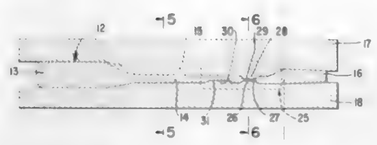
a mating cam block attached to said frame with cam surface cooperative with the cam surface of said first cam block, said cam surface operative when said shutter is perpendicular to said wall to limit the angular rotation of said link to within approximately 20 degrees of perpendicular, thereby to prevent a relative reversal of the direction of rotation of said shutter relative to rotation of said rotatable shaft.

4,044,814

METHOD OF FINLESS COLD FORMING OF SEWING MACHINE NEEDLE

Josef Zocher, AAchen, Haaren, Germany, assignor to The Singer Company, New York, N.Y.

Filed July 16, 1976, Ser. No. 705,859
Int. Cl.² B21G *1/04*
U.S. Cl. 163—5 **7 Claims**



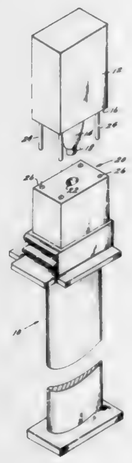
1. The method of cold forming a finless sewing machine needle comprising a butt portion and a blade portion of reduced cross-sectional area extending from said butt portion to a free extremity, comprising subjecting said entire blade portion to one finless flow pressing operation to form a continuous groove in said blade portion from the butt portion to closely adjacent said free extremity, and simultaneously, to form an eye portion along said continuous groove having a thin eye-accommodating web, punching an eye hole through said eye-accommendating web, and forming a point at the free extremity of said blade portion.

4,044,815

PRECISION INVESTMENT CASTING MOLD, PATTERN ASSEMBLY AND METHOD

Russell W. Smashey, and Dwight O. Bartell, both of Albuquerque, N. Mex., assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 1, 1976, Ser. No. 737,620
Int. Cl.² B22C *7/02*
U.S. Cl. 164—35 **9 Claims**



1. In a method for making a precision investment casting ceramic mold of the self-casting type, in which method a ceramic slurry is deposited on a wax pattern, the slurry is dried to provide a ceramic coating, the wax pattern is removed and then the ceramic is fired to create the mold, the improvement for making a unitary mold comprising the steps of:

providing separately a wax charge-holding assembly pattern and a wax article casting assembly pattern,

the wax charge-holding assembly pattern including:

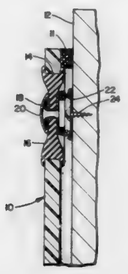
i. a wax charge cup pattern having a bottom portion; and

4,044,813

ATTACHMENT MEANS FOR SCREEN OR STORM WINDOW

Oren L. Emmons, Rte. 4, 44th St., Allegan, Mich. 49010

Filed June 10, 1976, Ser. No. 694,697
Int. Cl.² A47H *3/00*
U.S. Cl. 160—369 **9 Claims**



1. In a screen or storm window device that is removably mountable on first attachment means on a window casing or the like, the improvement wherein the periphery of the device is provided with a plurality of apertures therethrough disposed in spaced relation, a flexible and resilient grommet is mounted within each of said apertures, and second attachment means is secured to each grommet and is releasably engageable with said first attachment means, said grommets serving to enable movement of said second attachment means to insure proper mating of said first and second attachment means.

ii. a wax plug cup pattern projecting from the bottom portion, and including a first alignment portion;

the wax article casting assembly pattern including:

i. an article pattern including a top portion; and

ii. a second alignment portion in the top portion shaped to cooperate with the first alignment portion of the plug cup pattern to align and maintain in spaced apart relationship the article casting assembly pattern and the charge-holding assembly pattern;

providing a plurality of refractory support and locating members;

securing together the charge-holding assembly pattern and the article casting assembly pattern to provide a composite wax pattern:

i. at the first and second alignment portions; and

ii. through the support and locating members by connecting the members between the charge-holding assembly pattern and the article casting assembly pattern, the members being disposed generally about the plug cup pattern; and then

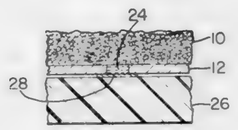
making a reinforced unitary ceramic precision investment casting mold from the composite wax pattern.

4,044,816

FORMATION OF METAL PARTS

Theodore H. Krueger, Lincoln; Robert Eller, Boston; John O'Brien, Winchester, and William L. Robbins, Newton, all of Mass., assignors to Theodore H. Krueger, Lincoln, Mass.

Division of Ser. No. 588,283, June 19, 1975. This application Jan. 12, 1976, Ser. No. 648,315
Int. Cl.² B22D *25/00, 27/16*
U.S. Cl. 164—63 **17 Claims**



1. Method of forming a material from the class consisting of metals and alloys as a solid part having a predetermined geometry, said method comprising the steps of:

a. providing a hollow body having at one end a porous surface and a non-porous surface that are made of substances which are not wettable by said material and are disposed so that a selected area of said porous surface is exposed through an opening in said non-porous surface;

b. immersing said one end of said hollow body in a melt of said material far enough so that said selected area of said porous surface contacts said melt;

c. withdrawing said one end of said hollow body from said melt with at least a portion of said selected area of said porous surface and at least a portion of said non-porous surface at a temperature at least as high as the melting point of said material,

d. providing a suction force on said porous surfaces as said body is withdrawn from the melt so as to cause a portion of said melt to adhere in liquid form to said selected area of said porous surface by suction; and

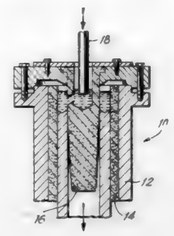
e. thereafter cooling the adhering portion of said melt by removing heat from said one end of said hollow body and removing said suction force so that said adhering portion is released from said porous surface and forms a solid part having substantially the same geometry as the exposed area of said porous surface.

4,044,817

CONTINUOUS CASTING METHOD USING GRAPHITE MOLD IMPREGNATED WITH UNSATURATED DRYING OIL

William J. Varga, Woodbury, Conn., assignor to Chase Brass & Copper Co., Incorporated, Waterbury, Conn.

Filed Mar. 25, 1975, Ser. No. 561,701
Int. Cl.² B22D *11/00*
U.S. Cl. 164—138 **10 Claims**



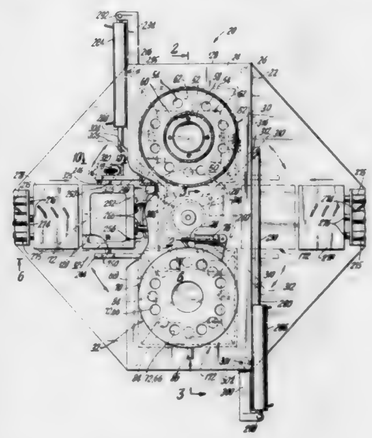
1. In a method of continuously casting of a metal using a graphite mold or die having interstitial space, the improvement comprising, impregnating the interstitial space in said graphite mold or die with an unsaturated oil or a mixture of unsaturated oils, wherein the unsaturated oil or mixtures thereof have a drying capability equivalent to at least soybean oil, applying heat to dry the same, and casting said metal thereby carbonizing said oil or mixtures thereof in said interstitial space.

4,044,818

APPARATUS FOR FORMING SAND MOLDS

Sam Larkin, 254 Beach 140th St., Belle Harbor, N.Y. 11694

Filed Apr. 6, 1976, Ser. No. 674,131
Int. Cl.² B22C *15/08, 15/24, 11/04*
U.S. Cl. 164—172 **31 Claims**



1. Automatic sand mold fabricating apparatus comprising:

a. a first drag and a first cope;

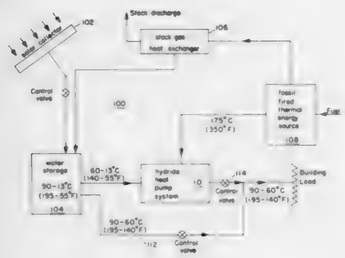
b. first and second filling means defining first and second stations, respectively, for depositing a quantity of sand in said first drag and in said first cope;

c. first and second support means for positioning said first drag and said first cope in opposition to said first and said second filling means, respectively;

d. first and second impression forming means coopertively associated with said first drag and with said first cope at said first and said second stations, respectively;

e. first and second actuating means for reciprocatingly moving said first and second impression forming means, respectively, wherein complimentary recesses are formed in the sand in said first drag and in said first cope with said recesses facing in the same direction;
f. displacing means for reciprocatingly moving said first drag and said first cope to and from a common, third station whereby said first cope is superimposed over said first drag;
g. first rotating means for reciprocatingly inverting said first drag before said first drag reaches said third station and before said first drag returns to said first station whereby said recesses in said first cope and said first drag are in opposition to each other; and
h. first ejection means for discharging the sand from said first cope and said first drag in the form of a mold at said third station.

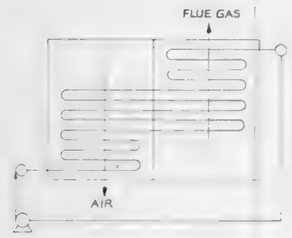
4,044,819
HYDRIDE HEAT PUMP
James G. Cottingham, Center Moriches, N.Y., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Feb. 12, 1976, Ser. No. 657,519
Int. Cl.[2] F28D *15/00*
U.S. Cl. 165—1 **7 Claims**



1. A system for the transfer of thermal energy from a first temperature to and for use at an elevated, second temperature comprising:
a. first container means having within a hydrided first compound at a temperature below its decomposition temperature;
b. second container means having within a dehydrided second hydridable compound whose decomposition temperature is lower than the decomposition temperature of the first hydrided compound, the second compound being at a temperature below its decomposition temperature;
c. means communicating the interior of said first container means with said second container means forming a pressure sealed system;
d. means for heating the hydrided first compound above both of said second temperature and its decomposition temperature for a sufficient period to release its hydrogen and causing the pressure within both said container means to rise, said second compound being hydrided thereby, thermal energy being released by said second compound during hydriding at said second temperature until dehydriding is terminated in said first container means causing a decrease in pressure in said system;
e. means for thereafter cooling said first container means at said second temperature and exposing said second container means to a heat soruce at said first temperature reducing the pressure within said system sufficiently whereby said second temperature is above the decomposition temperature of said second hydride and said first compound is below its decomposition temperature at the reduced pressure, whereby said second hydride decomposes causing release of hydrogen which is absorbed by said first compound, said first compound releasing thermal energy at about said second temperature, said system effectively transferring thermal energy from said heat source at said first temperature for use at said second temperature.

4. The method of pumping heat from a first temperature for use at an elevated, second temperature comprising the steps of:
a. heating a hydride of a first hydridable intermetallic compound to a temperature above its decomposition temperature causing its decomposition and relese of hydrogen;
b. exposing to said hydrogen in a pressure sealed system a second hydridable intermetallic compound having a decomposition temperature lower than that of the first compound at said secondtemperature which is below its decomposition temperature, thermal energy being released from said second compound at said second temperature, the pressure within said system rising during the aforesaid release of hydrogen; and
c. thereafter removing the source of heat from said first compound and exposing the hydride of said second compound to a source of heat at said first temperature, thereby reducing the pressure within said system to where the temperature of the hydride of said second compound is above its decomposition temperature and the temperature of said first compound is below its decomposition temperature, thereby causing the release of hydrogen from said second compound and the hydriding of said first compound, and effectively pumping heat from the source of heat at the first temperature for use at the elevated, second temperature.

4,044,820
METHOD AND APPARATUS FOR PREHEATING COMBUSTION AIR WHILE COOLING A HOT PROCESS GAS
Elon J. Nobles, Minnetonka, Minn., assignor to Econo-Therm Energy Systems Corporation, Minneapolis, Minn.
Filed May 24, 1976, Ser. No. 689,126
Int. Cl.[2] F28D *7/08, 15/00*
U.S. Cl. 165—2 **39 Claims**

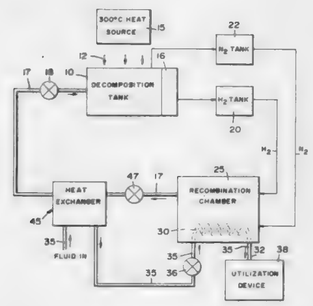


1. A method for cooling a hot gas close to its dew point without causing condensation comprising
flowing air through a first chamber while flowing the hot gas to be cooled through a second chamber which is separated from the first chamber by a common wall, and
continuously flowing a heat transfer fluid having a high heat capacity as compared to said hot gas through the inlet end of heat transfer tubes which extend back and forth between the two chambers through said common wall in a serpentine path between the two chambers which extends in one direction and out the inlet end of the tubes at the opposite end of said serpentine path, whereby the heat which is adsorbed by the heat transfer fluid in each section of the tubes in the hot gas chamber is directly transferred to the air as the heat transfer fluid advances through the tubes in the first air chamber.

5. A heat transfer apparatus for heating combustion air while cooling a hot process gas close to its dew point comprising

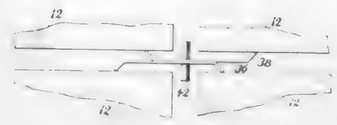
a first chamber defining a combustion air zone through which air to be heated flows in a first direction along the longitudinal axis of the apparatus;
a second chamber adjacent said first chamber defining a process gas zone through which heated process gas flows in a second direction parallel to the longitudinal axis and opposite to said first direction;
a common wall between said two chambers thermally separating said combustion air zone and said process gas zone;
hollow conduit heat transfer means extending through said common wall and bending back and forth between said two zones to form at least one serpentine coil extending in one direction;
an inlet header at one end of said serpentine coil;
an outlet header at the opposite end of said serpentine coil; and
means to continuously circulate a heat transfer fluid through said inlet header, said heat transfer means between said two zones, and said outlet header, whereby the heat adsorbed by said fluid in the hot process gas zone is transferred to said combustion air.

4,044,821
LOW TO HIGH TEMPERATURE ENERGY CONVERSION SYSTEM
James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Charles G. Miller, Pasadena, Calif.
Filed Dec. 27, 1974, Ser. No. 536,786
Int. Cl.[2] F25B *13/00*
U.S. Cl. 165—2 **6 Claims**



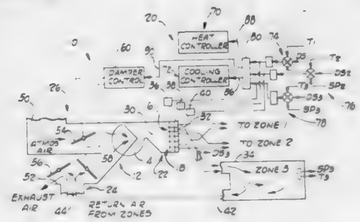
1. A method for utilizing solar energy to produce superheated steam, the steps comprising:
concentrating solar energy to heat a first chamber to a temperature on the order of 300° C;
introducing into said first chamber a working substance which is gaseous and decomposes into first and second gaseous constituents at a temperature on the order of 300° C, whereby as said substance is heated to a temperature on the order of 300° C it decomposes into said two gaseous constituents;
continuously separating and removing said first constituent from the other constituent and the undecomposed working substance in said first chamber to produce an imbalance in the equilibrium gaseous content in said chamber to thereby promote the continued decomposition of said substance in said first chamber;
removing at least part of the second constituent from said first chamber;
recombining the separated first and second constiuents which were removed from said first chamber in a second chamber to reform the working substance, the recombination being accomplished by the release of heat which raises the temperature in said second chamber to a temperature on the order of not less than 500° C; and
passing through said second chamber steam which absorbs heat present in said second chamber and is heated thereby to a temperature on the order of not less than 500° C to form superheated steam, for use in turbine electrical energy generation.

4,044,822
HORIZONTAL MODULAR INTER-GASKET SEAL
Richard Franklin Stockman, Friendship, N.Y., assignor to The Air Preheater Company, Inc., Wellsville, N.Y.
Filed Jan. 8, 1976, Ser. No. 647,533
Int. Cl.[2] F28D *19/00*
U.S. Cl. 165—9 **6 Claims**



1. Rotary regenerative heat exchange apparatus having a horizontal rotor post, a plurality of circumferentially spaced open ended compartments carried by the rotor post to comprise a first annular element layer that extends around the rotor post, a second annular layer of element similar to said first layer and supported by the rotor post in axially spaced relation to provide an annular space therebetween, a mass of permeable heat absorbent material carried in the compartments of the rotor, housing means surrounding the rotor and including connecting plates at opposite ends thereof with openings for a heating fluid and a fluid to be heated, means for rotating the rotor about its axis to alternately align the heating element with the heating fluid and the fluid to be heated, and elongate sealing means extending radially through the space between annular compartment layers and having guide pins normal thereto that ride on the sides of laterally adjacent compartments.

4,044,823
METHOD AND APPARATUS FOR CONTROLLING AIR-CONDITIONING SYSTEMS
Frederick S. Biesecker, Columbus, Ohio, assignor to Ranco Incorporated, Columbus, Ohio
Filed Feb. 26, 1976, Ser. No. 661,620
Int. Cl.[2] F25B *29/00*
U.S. Cl. 165—16 **3 Claims**



1. In an air conditioning system having zone heating equipment, zone cooling equipment and a control system for governing operation of the heating and cooling equipment in response to electric analog zone temperature condition responsive signals from a zone sensor, the improvement comprising:
a signal amplifier having one input connected to the zone sensor and its output connected for controlling the heating and cooling equipment, said signal amplifier producing a command signal whose values vary in accordance with changes in sensed zone temperature conditions above and below a no load band of zone temperatures;
a command signal modifier means comprising a suppressor amplifier having one input connected to the signal ampli-

fier output and its output connected to said one signal amplifier input; and

a reference voltage source connected to the other inputs of said signal amplifier and said suppressor amplifier;

said suppressor amplifier rendered effective by a predetermined command signal value indicative of a sensed zone temperature in said no load band, said suppressor amplifier output, when effective, substantially preventing the signal amplifier output from varying from said predetermined command signal value in response to variations in sensed zone temperature within said no load band;

said suppressor amplifier output ineffective to prevent command signal variations in response to variations in sensed zone temperatures outside of said no load band.

4,044,824

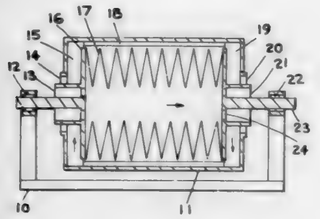
HEAT EXCHANGER

Michael Eskeli, 7994-41 Locke Lee, Houston, Tex. 77042

Continuation-in-part of Ser. No. 537,067, Dec. 30, 1974, Pat. No. 3,931,713, and Ser. No. 591,881, June 30, 1975, abandoned. This application July 14, 1975, Ser. No. 595,389

Int. Cl.[2] F25B *3/00*

U.S. Cl. 165—88 **5 Claims**



1. A heat exchanger comprising:

a. a support for shaft;

b. a shaft rotatably mounted on said support;

c. a heat exchanger housing mounted on said shaft to rotate therewith, said housing having an entry and an exit for a first fluid and an entry and an exit for a second fluid, a first fluid and a second fluid within said housing, a heat exchanger element within said housing to exchange heat between said first fluid and said second fluid, with said heat exchanger element separating said first fluid and said second fluid, said heat exchanger element being a convoluted bellows type member with the folds of the bellows being transverse to the housing shaft said bellows type member having radially outwardly extending heat conductive members alternately connected at their outward ends to form a first set of folds and connected at their inward ends to form a second set of folds, said first and second set of folds forming a continuous fluid tight heat exchanger element separating the two fluids, said first set of folds being open inwardly toward the heat exchanger center and filled by one of said fluids, said second set of folds being open outwardly toward the housing and filled by one of said fluids, with the first and second fluids being on opposite sides of said heat exchanger element and within the folds of the convoluted bellows, with centrifugal force assisting in the circulation of the fluids within the folds due to density differentials provided by heat transfer through the heat conductive heat exchanger members.

4,044,825

HEAT EXCHANGER FOR HIGH TEMPERATURE

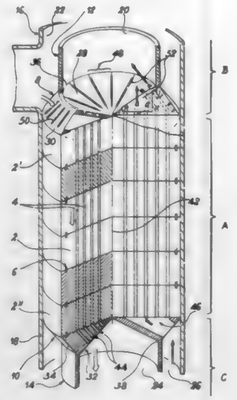
René Gugenberger, Gif-sur-Yvette, and Roger Martin, Paris, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 5, 1976, Ser. No. 646,548

Claims priority, application France, Jan. 6, 1975, 75.00264

Int. Cl.[2] F28F *9/00*

U.S. Cl. 165—165 **9 Claims**



1. A heat exchanger for the convection of heat between primary and secondary fluids circulating through the exchanger, comprising:

at least one heat exchange block having first and second parallel planar surfaces;

a first end member having a planar surface in sealing contact with said first parallel planar surface of said heat exchange block, and first and second inclined transverse surfaces opposite said planar surface;

a second end member having a planar surface in sealing contact with said second parallel planar surface of said heat exchanging block, and first and second inclined transverse surfaces opposite said planar surface;

means on said first end member separating said first inclined surface from said second inclined surface for forming a primary collecting duct associated with said first inclined surface and for forming a secondary collecting duct associated with said second inclined surface;

means on said second end member separating said first inclined surface from said second inclined surface for forming a primary collecting duct associated with said second inclined surface and for forming a secondary collecting duct associated with said first inclined surface;

first channel means for conducting primary fluid from said primary collecting duct of said first end member through said heat exchange block to said primary collecting duct of said second end member; and

second channel means disposed in a heat convecting relationship with said first channel means and for conducting secondary fluid from said secondary collecting duct of said first end member through said heat exchange block to said secondary collecting duct of said second end member.

4,044,826

RETRIEVABLE WELL PACKERS

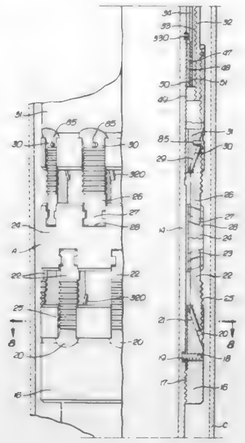
Talmadge L. Crowe, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed May 17, 1976, Ser. No. 686,886

Int. Cl.[2] E21B *23/00*

U.S. Cl. 166—120 **43 Claims**

1. A well tool adapted to be lowered in a well conduit disposed in a well bore, comprising body means, expander means on said body means, normally retracted slip means coacting with said expander means, normally retracted packing means on said body means, actuating means on said body means for effecting relative longitudinal movement between said expander means and slip means to expand said slip means into anchoring engagement with the well conduit, said actuating



means including means movable downwardly of said body means for expanding said packing means against the well conduit, and releasable means for preventing said actuating means from expanding said packing means against the well conduit until said slip means have first been expanded against the well conduit.

4,044,827

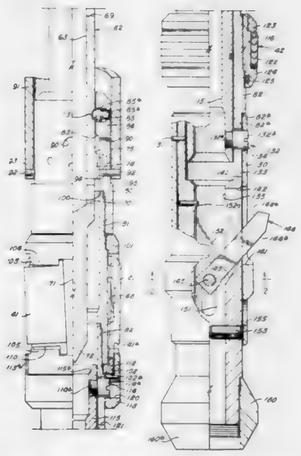
APPARATUS FOR TREATING WELLS

Richard Kerzee, Longview; Robert W. McCollum, Allen, and Carter R. Young, Lewisville, all of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Division of Ser. No. 460,773, April 15, 1974, Pat. No. 3,957,115. This application Mar. 18, 1976, Ser. No. 668,202

Int. Cl.[2] E21B *33/12*

U.S. Cl. 166—133 **5 Claims**



1. A retrievable well plug for use in temporarily plugging a well bore comprising: a body mandrel having a longitudinal bore therethrough; an annular seal assembly on said body mandrel for sealing around said mandrel with a wall surface along a well bore; radially movable locating and locking keys on said body mandrel for releasably locking said plug at a locking recess along a well bore; retainer means on said body mandrel for restraining said keys inwardly at non-locking positions on said body mandrel; operator finger means on said body mandrel for engaging a coupling recess to activate said key locking means to release said keys for expansion to locking positions on said body mandrel; means for actuating said retainer means to release said keys and for retracting and latching said operator finger means inwardly at an inoperative position responsive to an upward force on said body mandrel; a handling head coupled with said body mandrel for engaging and supporting said plug in a well bore; and valve means connected with said handling head and operable in said bore of said body mandrel to permit fluid bypass through said body mandrel when said plug is lifted in said well bore and to close said bore through said body mandrel when said plug is landed and locked in said well bore.

4,044,328

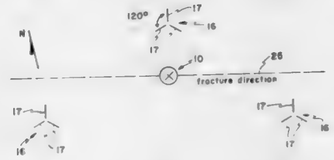
PROCESS FOR DIRECT MEASUREMENT OF THE ORIENTATION OF HYDRAULIC FRACTURES

Arfon Harry Jones; Henri Samuel Swolfs, and Sidney Joseph Green, all of Salt Lake City, Utah, assignors to Terra Tek, Inc., Salt Lake City, Utah

Filed July 6, 1976, Ser. No. 703,091

Int. Cl.[2] E21B *47/00, 43/26*

U.S. Cl. 166—250 **4 Claims**



1. A method for directly measuring, from ground stress changes, the orientation of fractures induced into a formation surrounding a well bore comprising the steps of:

packing off, at a desired depth, a portion of a well bore wherein fracturing of the formation surrounding said well bore will be undertaken,

positioning a plurality of stress meters around said well bore, each such stress meter being capable of and arranged to sense ground surface stress changes resultant from fracturing occurring within said well bore said ground surface stress changes being resolvable, as to magnitude and direction, into principal horizontal components of stress change at each stress meter location,

fracturing said material around said well bore by introducing a pressure medium within the packed off area of said well bore, recording, with said stress meters, surface stress changes resultant from fracturing the material around said well bore,

resolving said ground stress changes, as to magnitude and direction, into principal horizontal components of stress change at each stress meter location, and;

determining from said resolved principal horizontal components of stress change the direction of the fracture.

4,044,829

METHOD AND APPARATUS FOR ANNULUS PRESSURE RESPONSIVE CIRCULATION AND TESTER VALVE MANIPULATION

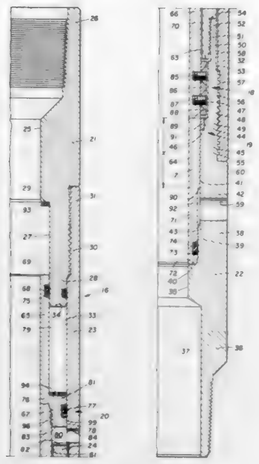
Robert L. Jessup, Duncan, Okla., and Joe E. Coleman, New Orleans, La., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 540,361, Jan. 13, 1975, Pat. No. 3,970,147. This application July 19, 1976, Ser. No. 706,429

The portion of the term of this patent subsequent to July 20, 1993, has been disclaimed.

Int. Cl.[2] E21B *21/00, 23/04, 47/06*

U.S. Cl. 166—264 **7 Claims**



1. In a pipe string located in a fluid filled well bore so as to vertically separate said well bore into an annulus region and an axial bore region, said pipe string including a circulation valve, the method of movement of said circulating valve from a first position preventing to a second position allowing fluid communication between said regions, comprising the steps of:

isolating a negligible pressure gas chamber within said pipe string from said axial bore and said annulus region;

pressurizing one of said regions to a pressure of at least a predetermined magnitude above the pressure in said isolated chamber;

unlocking said circulating valve when the pressure in said pressurized region reaches said predetermined magnitude;

moving said unlocked circulating valve from said first position to said second position in response to the pressure in said pressurized region; and

maintaining said moved valve in said second position.

4. Apparatus for circulation of well fluids in response to pressure in an isolated portion of an annulus between a pipe string and a surrounding well bore, comprising:

a. a hollow cylindrical housing having a recess communicating with the isolated portion of the annulus, an axial interior bore, a passageway communicating the axial interior bore with the annulus, and means for connecting the housing in said pipe string;

b. a valve body carried by said housing and at least partially overlying the recess and movable between a first position closing said passageway and a second position opening said passageway;

c. a first locking means for locking said valve body in said first position to said housing and for releasing said valve body from said housing upon a predetermined force applied to said valve body; and

d. piston means, attached to said valve body, including: seal means for sealingly contacting said recess so as to divide said recess into a negligible pressure compressible chamber isolated from both said axial bore and said annulus, and an annulus pressure chamber isolated from said axial bore but communicating with said isolated portion of said annulus and differential means for applying said predetermined force upon said valve body urging said valve body toward said second position in response to a predetermined higher pressure in said annulus pressure chamber than in said isolated negligible pressure chamber.

4,044,830

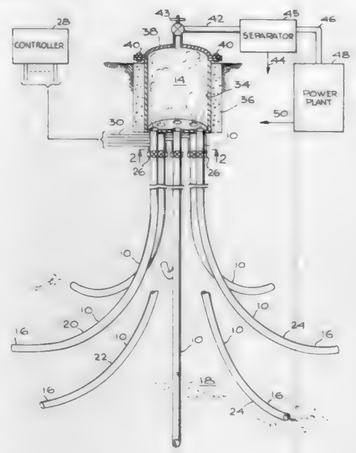
MULTIPLE-COMPLETION GEOTHERMAL ENERGY PRODUCTION SYSTEMS

Allen T. Van Huisen, 29456 Indian Valley Road, Rolling Hills Estates, Calif. 90274

Filed July 2, 1973, Ser. No. 375,751

Int. Cl.[2] E21B *43/14*

U.S. Cl. 166—267 **19 Claims**



1. A system for the recovery of geothermal energy comprising:

a closed, steam vapor collection reservoir vessel for collection of high pressure steam vapor having side walls, a top wall and a bottom wall, said side walls and bottom wall being recessed below the surface of the earth and said bottom wall containing a plurality of apertures;

a plurality of cased geothermal wells, the casings of each having a first end converging toward and sealingly connected to one of the apertures in the bottom wall of said reservoir and each well casing diverging from said reservoir and having a second end disposed within a common, wet geothermal zone having a temperature of at least 300° F; and

vapor fluid delivery means within each of said wells to conduct heated steam vapor fluid from each second end to said reservoir vessel for collecting high pressure steam vapor fluid therein.

4,044,831

SECONDARY RECOVERY PROCESS UTILIZING WATER SATURATED WITH GAS

Joseph C. Allen, Bellaire, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Apr. 2, 1975, Ser. No. 564,390

Int. Cl.[2] E21B *43/20*

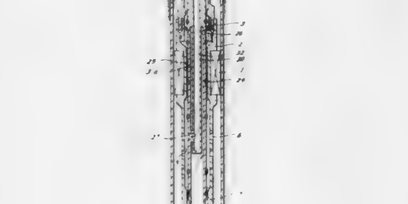
U.S. Cl. 166—275 **14 Claims**

1. A process for recovering hydrocarbons from a subterranean hydrocarbon-bearing formation penetrated by an injecting well and a production well which comprises:

a. injecting into the formation via an injection well a fluid comprising water saturated at the injection pressure with a gas selected from the groups consisting of natural gas, carbon dioxide, ammonia, flue gas, and mixtures thereof, and containing a minor amount of a solubilizing agent selected from the group consisting of compounds of the formula:

$$R(OR')_aOH \qquad (A)$$

wherein R is selected from the group consisting of:

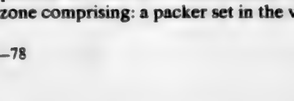


and

R' is alkylene of from 2 to 5 carbon atoms and *a* is an integer of from about 5 to about 50,

$$R(OC_3H_6)_b—(OC_2H_4)_c \qquad (B)$$

wherein R has the same meaning as previously described, *b* is an integer of from about 3 to about 20, *c* is an integer of from about 10 to about 50 an wherein the sum of *b* plus *c* is not more than about 60, and



(C)

wherein R' has the same meaning as previously described and *d* is an integer of from about 5 to about 50,

b. forcing the said fluid through the formation, and

c. recovering hydrocarbons through the production well.

4,044,832

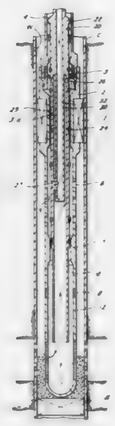
CONCENTRIC GRAVEL PACK WITH CROSSOVER TOOL AND METHOD OF GRAVEL PACKING

Charles A. Richard, Gretna, and John Philip Barbee, Luling, both of La., assignors to Baker International Corporation, Orange, Calif.

Filed Aug. 27, 1976, Ser. No. 718,151

Int. Cl.[2] E21B *33/12, 43/04*

U.S. Cl. 166—278 **15 Claims**



1. An apparatus for use in a subterranean well having a production zone comprising: a packer set in the well above the zone, a tubular liner assembly adapted to depend from the packer within the production zone and to communicate with an outer tubular string sealingly engaged with the packer and extending to the top of the well, said liner assembly including a lower perforated portion through which fluid can flow between the well bore and the interior of the liner assembly and an upper ported portion through which fluid can flow between the well bore and the interior of the upper part of the liner assembly, crossover means positionable within said packer and liner assembly, and adapted for connection to an inner tubular member extending through the outer tubular string to the top of the well, said crossover means having spaced sealing means selectively co-engageable with sealing surfaces within the packer and liner assembly upon movement of said crossover means longitudinally within said packer and liner assembly to prevent flow of fluid between said lower perforated portion and the annular area between said inner tubular member and said outer tubular string, and to selectively form separate fluid passages between said inner tubular member and said upper ported portion, said inner tubular member and said lower perforated portion and between said inner tubular member and said annular area.

8. A method of gravel packing a production zone in a subterranean well comprising the steps of lowering a liner assembly provided with a perforated portion on a packer in the well to locate the perforated portion of said liner assembly within the production zone, setting the packer in the well above the production zone, lowering an outer tubular string into the well and operatively connecting it to the packer, lowering a crossover assembly within the outer string on an inner tubular string to position the crossover assembly within the packer and liner assembly and to provide an annular space between said strings communicable with said perforated portion, said liner assembly having an upper passage above said perforated portion establishing communication between said inner tubular string and the exterior of said liner assembly below said packer, circulating fluid downwardly through said inner string into the region of the well below said packer and surrounding the liner assembly for upward flow through said annular space to the two of the well, and pumping gravel down said inner tubular string into the well surrounding the liner assembly to fill the annular space around the perforated portion of the liner assembly.

4,044,833

ACID FOAM FRACTURING

Herbert A. Volz, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 8, 1976, Ser. No. 694,114

Int. Cl.[2] E21B *43/26, 43/27*

U.S. Cl. 166—307 **8 Claims**

1. A method for fracturing subterranean formations comprising the steps of:

a. forming a gelled acid-liquid solution by combining an acid chemically reactive with a subterranean formation with about 250 to about 15,000 ppm of a gelling agent selected from carboxymethylcellulose polymers, polyacrylamides, and polysaccharides,

b. adding a sufficient amount of a surfactant to said gelled acid-liquid solution obtained in (a) to form a stable foam at formation injection conditions, said surfactant being compatible with the other ingredients of the gelled acid-liquid solution and capable of producing foam in an acidic environment,

c. introducing said gelled acid-liquid solution containing surfactant and an inert gas into a subterranean formation under sufficient pressure to form a foam and cause fracturing of said subterranean formation, and

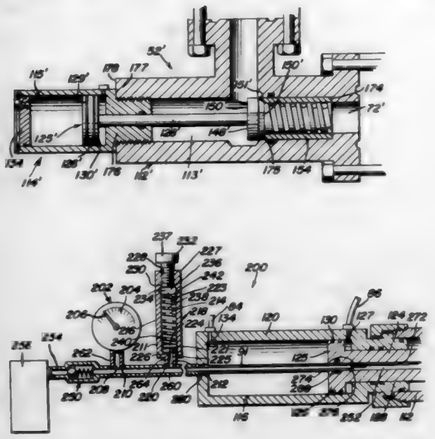
d. allowing the acid contained in said foam to react with the subterranean formation and cause etching thereof.

4,044,834

APPARATUS AND METHOD FOR CONTROLLING THE FLOW OF FLUIDS FROM A WELL BORE

Lee E. Perkins, 127 Malibu Blvd., Houma, La. 70360

Filed Apr. 9, 1975, Ser. No. 566,399
Int. Cl.[2] E21B *43/12*; F16K *31/122*
U.S. Cl. 166—314 **27 Claims**



1. A choke valve for controlling the flow of fluid which comprises means defining a valve chamber having an inlet and an outlet, said outlet defined by an axial bore, a movable bolt-like plug means axially aligned and received within said axial outlet bore to establish at least one helical flow path through said outlet, the relative position of said plug means within said outlet bore controlling the flow of said fluid through said outlet and movement of said plug means within said outlet bore controlled by a hydraulically operated piston means, and surface means associated with said plug means and said piston means which is instantaneously responsive to a change in pressure in said valve chamber to move said plug means within said outlet bore in a direction to dissipate said pressure change.

23. A method of controlling well bore pressure comprising the steps of:

providing a chamber having an inlet and an outlet in the flow path of fluid exiting a well bore;

causing said fluid to flow through an elongated duct in said outlet to control the flow conditions therethrough and the fluid pressure in the chamber and

instantaneously changing the length of said elongated duct in response to changes in the pressure in said chamber in a manner to dissipate said pressure changes and thereby control the pressure in said well bore.

4,044,835

SUBSURFACE WELL APPARATUS HAVING IMPROVED OPERATOR MEANS AND METHOD FOR USING SAME

James D. Mott, Houston, Tex., assignor to Hydril Company

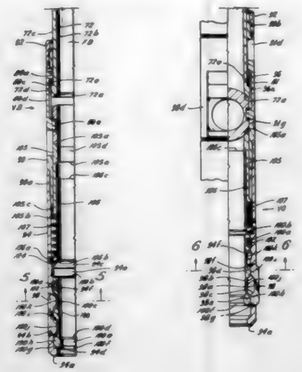
Division of Ser. No. 580,241, May 23, 1975, Pat. No. 4,026,362. This application June 23, 1976, Ser. No. 698,884
Int. Cl.[2] E21B *43/12*
U.S. Cl. 166—322 **34 Claims**

1. A subsurface safety valve apparatus adapted for movement through a bore of a well tubing to a desired subsurface location in the well for operably securing in the bore of the well tubing for controlling the flow of fluid in the bore of the well tubing at the subsurface location, including:

frame means movable through the bore of the well tubing to the desired subsurface location for securing and having means for releasably securing with the well tubing at said desired subsurface location;

bore closure means mounted with the frame means for movement to and from open and closed positions for controlling flow of fluid through the bore of the well tubing; and

operator means carried with said frame means for moving said bore closure means to and from the open and closed positions, said operator means having tubular operator assembly movable longitudinally of said frame means for effecting desired operating movement of said bore closure means to and from the open and closed positions, said



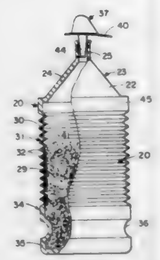
operator assembly having means actuated by initial operation of said bore closure means for eliminating lost motion operating slack in said operator assembly by changing the length of longitudinal travel of said operator assembly to achieve positive operation of said bore closure means by said operator means in response to longitudinal movement of said tubular operator assembly wherein positive operation of said bore closure means is assured.

4,044,836

AXIAL COMPRESSION POWDER DISPENSER

Edward J. Martin, 17 Deerfield Road, and Joseph M. Minkevitch, 26 Folan Ave., both of Norwood, Mass. 02062

Continuation-in-part of Ser. No. 525,226, Nov. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 419,790, Nov. 28, 1973, abandoned. This application Feb. 2, 1976, Ser. No. 654,718
Int. Cl.[2] A62C *21/00*
U.S. Cl. 169—30 **27 Claims**



1. A hand-held and hand-operable powder dispenser, comprising in combination

a. a container having a noncollapsible handle/nozzle section termination at its discharge end in an unobstructed powder dispensing opening of relatively large diameter sized to pass a cloud of dry powder therethrough and at its other end in a cylindrical band member, said handle/section having an internal configuration which permits the free flow of a powder therethrough;

b. a hand gripping section;

c. a central, thin-walled, flexible bellows section joining, through said cylindrical band member, said handle/nozzle section and said hand gripping section, said bellows section having a diameter essentially equal to said band member and being adapted to be collapsed and expanded axially to serve as a pump, the pleats forming said bellows section being joined to form relatively sharp edges; and

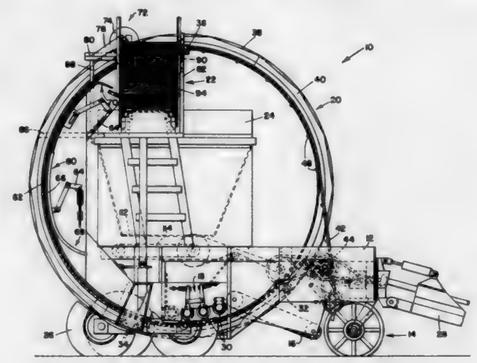
d. readily removable closure/sealing means engageable with said powder dispensing opening; said handle/nozzle section fitting one hand of an operator while said operator graps said hand gripping section with the other hand to axially pump said central bellows section for dispensing dry powder contained therein in repeated cloud-like bursts.

4,044,837

CLEANER FOR ROOT CROP HARVESTER CONVEYOR

Virgil Dean Haverdink, Ankeny, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Mar. 1, 1976, Ser. No. 662,581
Int. Cl.[2] A01D *19/00, 25/00*
U.S. Cl. 171—58 **8 Claims**



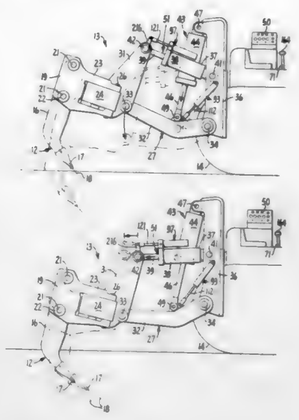
1. A root crop harvester comprising: a mobile frame; root digging means secured across the forward end of the frame; first conveyor means carried by the frame rearwardly of the digging means for receiving roots from the digging means and conveying the same upwardly and rearwardly; second conveyor means carried by the frame for receiving roots from the first conveyor means and moving the same transversely; annular elevator means supported on the frame and disposed for rotation about a horizontal axis, the interior lowermost portion thereof passing in root-receiving relationship to the second conveyor means, said elevator means including a root elevating wheel having a plurality of endless ribs, each rib forming a ring with said rings coaxially disposed in horizontally spaced apart parallel vertical planes, and a plurality of root conveying basket means peripherally spaced and interiorally affixed to said ribs; stripping means for ejecting roots and foreign material from between the rib rings of the annular elevator means including a stripping means support structure carried by the frame and disposed adjacent the upper portion of the root elevating wheel, a shaft carried by the support structure axially parallel with the elevator means axis of rotation, and spaced radially outwardly therefrom, a plurality of stripper wheels rotatably carried by the shaft and disposed to project between the rib rings of the root elevating wheel; and a conveyor means supported on the frame and disposed in underlying and root-receiving relationship to the upper portion of the annular elevator means for receiving elevated roots therefrom and for moving the same transversely to a deposit area.

4,044,838

AUTOMATIC CONTROL FOR RIPPER TOOL

Darrel M. Wooldridge, Oakland, Calif., assignor to American Tractor Equipment Corporation, Oakland, Calif.

Filed Apr. 21, 1975, Ser. No. 570,034
Int. Cl.[2] A01B *63/111*
U.S. Cl. 172—2 **17 Claims**



16. A tractor mounted ripper tool having,

a. an articulated tool mount for supporting and positioning the ripper tool relative to the tractor,

b. a depth positioning fluid operated cylinder operatively connected to said tool mount and formed for changing the vertical displacement of the ripper tool,

c. a pitch positioning fluid operated cylinder operatively connected to said tool mount and formed for changing the angular displacement of the ripper tool,

d. a fluid power circuit for selectively applying fluid power to the said fluid positioning cylinders and having,

i. a source of fluid power,

ii. first and second fluid conduits and a fluid control valve formed for selectively directing fluid power to either said first fluid conduit or said second fluid conduit,

iii. a diverter valve formed for selectively communicating the first and second conduits to the operative ports of either the depth positioning cylinder or the ports of the pitch positioning cylinder, and

e. control means connected with said diverter valve for positioning said diverter valve and including depth sensor means responsive to the vertical displacement of the ripper tool, said control means operative in response to said depth sensor means to position the diverter valve to direct fluid to the pitch positioning cylinder at a specified vertical displacement.

4,044,839

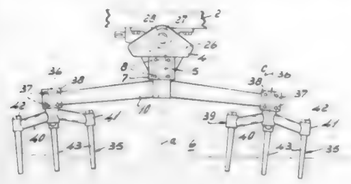
SOIL CULTIVATING MACHINES

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Sept. 16, 1975, Ser. No. 613,903
Claims priority, application Netherlands, Sept. 18, 1974, 7412331
Int. Cl.[2] A01B *33/06*
U.S. Cl. 172—49 **14 Claims**

14. A soil cultivating machine comprising a frame and two soil working members rotatably mounted side-by-side on corresponding upwardly extending axes defined by respective shafts on said frame, driving means connected to rotate said shafts in relative opposite directions and said soil working members being positioned to work overlapping strips of soil, each soil working member comprising support means that extends outwardly from its respective shaft, and at least one tool that is freely rotatable about a further upwardly extending

axis defined by a second shaft, said second shaft being journalled on said support means and spaced from said respective shaft, said second shaft extending at an angle to the first mentioned shaft and the upper end of the second shaft being located further from its corresponding axis than the lower end thereof, said tool being moved across the ground in a circular path inclined to the horizontal during the operative rotation of the soil working member.



4,044,840

SOIL CULTIVATING MACHINES

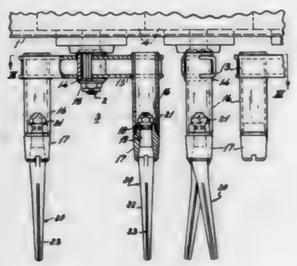
Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands

Filed Nov. 17, 1975, Ser. No. 632,688

Claims priority, application Netherlands, Nov. 21, 1974, 7415161

Int. Cl.² A01B *33/00, 23/00*

U.S. Cl. 172—59 **13 Claims**



1. A soil cultivating machine comprising a frame and a plurality of soil working members rotatably mounted on upwardly extending shafts that are positioned in a row extending transverse to the direction of travel of said machine, and driving means connected to rotate said shafts, each soil working member comprising a substantially horizontal support at the lower end of a corresponding upwardly extending shaft and at least one elongated, downwardly extending arm depending from said support, said arm being spaced from said shaft and extending downwardly in a direction substantially parallel to that of said shaft, the lower end of said arm comprising a sleeve-like holder and a tine secured in said holder, said tine having a lower active portion and an upper fastening portion, said fastening portion being secured in said holder by fastening means and said active portion extending downwardly below the holder, said fastening means being located within said arm, and the upper end of said fastening portion terminating adjacent the lower end of said arm, said support being normally positioned substantially above the soil being worked by the active tine portion to avoid impact damage from debris in and on the ground.

4,044,841

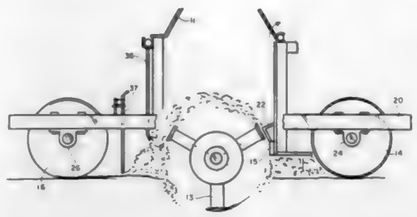
ROTARY TILLER DEVICE ADAPTED FOR CHOPPING

Alexander Smith, and Burton D. Baggs, Jr., both of Sanford, Fla., assignors to Smitty's Incorporated, Sanford, Fla.

Continuation-in-part of Ser. No. 319,039, Dec. 27, 1972, Pat. No. 3,892,278. This application June 27, 1975, Ser. No. 591,098

Int. Cl.² A01B *33/02, 33/12*

U.S. Cl. 172—72 **32 Claims**



11. A tiller for cutting and mulching vegetation, comprising a framework, an elongate, ground-engaging rotor mounted for rotation with respect to said framework, and a cooperative cover essentially surrounding the upper portion of said rotor but spaced above said rotor for a substantial distance to define the upper boundaries of a large mixing chamber, said mixing chamber also having forward and rear walls, said framework having rolling support means, means for driving said rotor in a rotative direction opposite to that of said rolling support means, said rotor having a plurality of blade means that serve to forcefully engage the ground and bring about a cross-mix of earth and vegetation into a fluidized conglomerate in said mixing chamber, said blade means involving a multiplicity of cutting blades, said framework having a fixed shear bar arranged to interact with peripheral portions of said cutting blades, thus to enable a cutting of heavy vegetation, deflector means disposed closely adjacent the path of travel of said blade means, and disposed above the lower edge of the forward wall of said mixing chamber, said deflector means serving to intercept earth thrown off from said rotor blades and directed toward or parallel to said forward wall, and functioning to redirect such earth rearwardly over said rotor, and spring bias means for biasing said rotor in such a way that its blades normally operate in close proximity to said shear bar, though not in metallic contact therewith, such bias means being at least partially overcome in the event a hard obstruction wedges between said shear bar and said blades, thus allowing an increase in the shear bar-blade spacing, such that the obstruction may pass through.

12. A tiller for cutting and mulching vegetation comprising a framework, an elongate, ground-engaging rotor mounted for rotation with respect to said framework, and a cooperative cover essentially surrounding the upper portion of said rotor but spaced above the rotor for a substantial distance to define a large mixing chamber, said tiller having rolling support means, means for driving said rotor in a rotative direction opposite to that of said rolling support means, said rotor having a plurality of blade means that serve to forcefully engage the ground and bring about a cross-mix of earth and vegetation into a fluidized conglomerate in said mixing chamber, with the action of said rotor causing the fluidized mixture of earth and vegetation to flow over said rotor and thence downwardly behind said rotor, upper and lower hinged skirts, said upper skirt forming at least a portion of the rear wall of said mixing chamber, with the position of said upper skirt being responsive to at least some degree to the rate of flow of the fluidized conglomerate flowing through said mixing chamber, said lower skirt having a lower edge generally in contact with the tilled earth, and arranged to level the fluidized mixture after it has been deposited on the ground, and means for accomplishing a ready adjustment of the position of said rotor with respect to said framework.

4,044,842

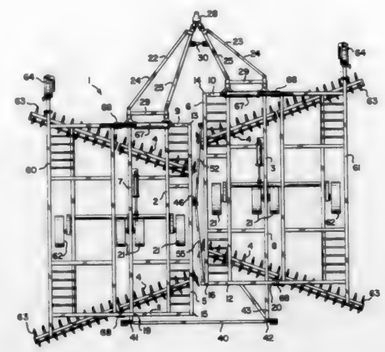
FLEXIBLE MULTI-SECTION IMPLEMENT

Richard A. Worick, Beloit, Kans., assignor to Charles W. Fleming; Gerald H. Meier; Milton Rasdall, all of Beloit and William Laas, Salina, all of Kans.

Filed July 11, 1975, Ser. No. 594,968

Int. Cl.² A01B *5/04*

U.S. Cl. 172—314 **9 Claims**



1. An implement frame construction comprising:

a. left rigid horizontal frame section and a right rigid horizontal frame section positioned in generally side-by-side relation, tillage tools depending from said frame sections, said frame sections respectively including inner and outer elongated longitudinal structural beams and front and rear elongated transverse beams welded together and forming front and rear inner and outer frame section corners;

b. vertically adjustable wheels mounted on said respective frame sections and supporting same for forward horizontal movement along the ground;

c. an elongated forwardly and inwardly angled draw tongue for each of said frame sections, pivotal joint members connecting the rear ends of said draw tongues to said respective front transverse beams and permitting said draw tongues to pivot vertically, a tractor hitch clevis flexibly connected to the front ends of said draw tongues and forming a common generally central draw point for said frame sections;

d. a front transverse spacer link having ball joints at opposite ends, said last named ball joints being connected respectively to said draw tongues intermediate said tongue ends, an elongated rear transverse stabilizing bar having opposite ends and extending generally parallel to said rear transverse beams, said rear bar ends being vertically pivotally connected to said frame sections near said respective rear outer corners;

e. a gag link having an upper end and a lower end and a central mount therebetween, said gag link being positioned generally between said frame sections and pivotally engaged at said central mount with one of said inner beams intermediate said front and rear inner corners, a first gag having a forward end pivotally connected to the other of said inner beams near said front inner corner, said first gag bar having a rear end pivotally connected to one of said gag link ends, a second gag bar having a rear end pivotally connected to said other inner beam near said rear inner corner, said second gag bar having a front end pivotally connected to the other of said gag link ends;

f. whereby said frame sections are permitted to universally flex with respect to each other without substantial variation in lateral spacing therebetween.

4,044,843

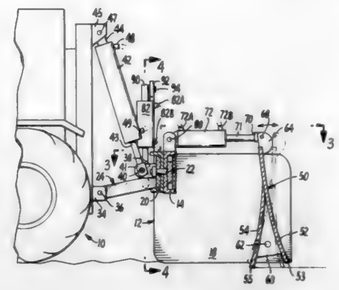
TRACTOR-MOUNTED SCRAPER

Arnold Emeral Holub, 1611 Ayers Road, Concord, Calif. 94521

Filed Apr. 22, 1976, Ser. No. 679,217

Int. Cl.² E02F *3/76*

U.S. Cl. 172—802 **3 Claims**



1. A scraper attachment for a tractor, comprising:

a scraper blade having a first scraping edge and a second scraping edge;

blade carrier means pivotably mounted on carrier pivot means affixed to one end of said tractor;

blade pivot means for pivotably mounting said blade in said blade carrier means, the location of said blade pivot means in said blade carrier means and the range of pivotal positions of said blade being such that either one of said scraping edges can be selectively positioned below the other and below the lower edge of said blade carrier means; and

power-operated blade carrier positioning means for

a. raising said blade carrier means and thus raising said blade out of contact with the ground when in a first, powered mode of operation,

b. pivoting said blade carrier means downwardly about said carrier pivot means so that one end of said tractor is supported solely by said blade when in a second, powered mode of operation, and,

c. permitting said blade to rest upon the ground, bearing the weight of said blade carrier means but not bearing the weight of said tractor, when in a third, unpowered mode of operation;

said blade carrier means comprising a pair of planar side members the lower edges of which constitute said lower edges of said blade carrier means, said blade being located between said planar side members, and said blade pivot means being located near the lower edges of said side members and near the edges of said side members remote from said tractor.

4,044,844

IMPACT DRILLING TOOL

Jesse W. Harris; Ross Bassinger, and Grey Bassinger, all of San Antonio, Tex., assignors to Bassinger Tool Enterprises, Ltd., San Antonio, Tex.

Continuation-in-part of Ser. No. 479,369, June 14, 1974, Pat. No. 3,970,152. This application July 19, 1976, Ser. No. 706,678

Int. Cl.² E21B *1/06*

U.S. Cl. 173—73 **10 Claims**

1. A fluid actuated impact drilling tool for use in rotary drilling in a string of drilling pipe comprising:

housing means;

means for connecting said housing means to said string of drilling pipe;

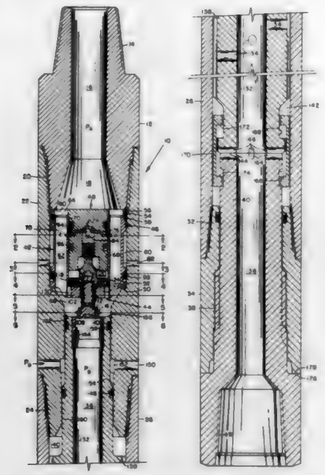
flow means through said housing means for allowing a fluid to flow therethrough;

valve means slidably mounted in said flow means of said housing means;

hammer means slidably mounted in said flow means of said housing means, said valve means and said hammer means

moving independently of and relative to each other for periodically interrupting substantial flow of said fluid in said flow means by a first movement along an axis of said drilling tool when said valve means and said hammer means reach a predetermined plane perpendicular to said axis, said interruption of flow of said fluid causing an increase in pressure of said fluid above said plane and a decrease in pressure of said fluid below said plane, said respective increase and decrease in pressures of said fluid driving said valve means and hammer means in a direction opposite the first direction of movement along said axis;

means for communicating pressure outside said housing



means to said valve means and said hammer means, said outside pressure being less than pressure of said fluid received by said flow means thereby giving a pressure differential, said first movement of said valve means and said hammer means being caused by said pressure differential acting on given surfaces of said valve means and hammer means as defined by seal means, movement in said opposite direction being caused by said increase and decrease in pressures above and below said plane, respectively, acting on said surfaces;

said movement of said valve means between predetermined stops, said valve means having dampening means for preventing impact damage to said valving means.

4,044,845

DRILLING TOOL WITH A TWO PART INPUT UNIT

Gerhard Rampp, Issing; Wilm Krüger, Puchheim, and Dieter Scholz, Unterpfaffenhofen, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 27, 1976, Ser. No. 662,234

Claims priority, application Germany, Mar. 3, 1975, 2509141

Int. Cl.² E21C *13/00*

U.S. Cl. 175—409 **20 Claims**

1. A drilling tool arranged to be inserted into a drilling machine for use in boring holes and the like where rotational movement developed in the drilling machine is transferred to the drilling tool, said drilling tool comprising a drilling member and an input unit, said drilling member comprises an axially elongated shank having a forward end shaped to effect boring action and a rearward end, said input unit being formed at least in part of material having a different and lower thermal conductivity than the material forming said drilling member and laterally enclosing at least an axially extending portion of said rearward end, said input unit having an outer surface spaced radially outwardly from and extending circumferentially about the rearward end of said shank and arranged to fit into and to transmit the rotational movement of the drilling machine to said drilling member, said input unit being formed of at least a first material and a second material with said first material having a higher thermal conductivity than said second material and forming at least part of the outer surface of said input unit, said second material having the different and lower thermal conductivity than the material forming said drilling member, wherein the improvement comprises a heat conducting bridge extending between the outer surface of said input unit and said shank, said heat conducting bridge being formed of said first



material, said heat conducting bridge being capable of transmitting heat radially outwardly from said shank of said drilling member and said second material being of a softer material than the material of said drilling member and being in contact with said heat conducting bridge and filling said input unit between the outer surface thereof and said shank so that the combination of said first and second materials affords sufficient strength to said input part to transmit the rotational movement of the drilling machine to said shank.

4,044,846

AUTOMATIC ZEROING OF SCALES WITH DIGITAL DISPLAY

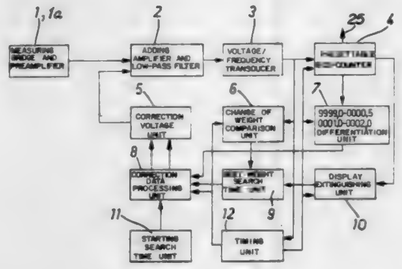
Waltteri Matilainen, Hiirakkotie 3 E 86, 01200 Hakunila, Finland

Filed Mar. 2, 1976, Ser. No. 663,125

Claims priority, application Finland, Mar. 7, 1975, 664/75

Int. Cl.² G01G *13/14, 3/14, 19/40*

U.S. Cl. 177—165 **8 Claims**



1. A system for the automatic zero setting of scales with digital display after a normal weighing process comprising: a goods pan having measuring voltage means connected through a preamplifier to an adding amplifier unit having a low-pass filter; said amplifier unit with the low-pass filter being connected to a frequency and voltage transducer unit which is connected to a presettable BCD-counter and to a change of weight comparison means; said presettable BCD-counter being connected to a memory store which is connected to a calculator; the calculator being connected through a display drive to a display; a timer unit being connected to said BCD-counter, to said change of weight comparison means, to said memory store, to said calculator, and to said display drive; said BCD-counter being connected to a differentiating means for detecting deviations of a count value of the BCD-counter within given limits in one direction or the other from a count value producing zero indication, the differentiating means supplying a correction order and direction of correction to a correction data processing unit which is connected to a correction voltage means; said correction voltage means being connected between the BCD-counter and said measuring voltage means for causing a correction of the count value until it produces the count value corresponding to zero indication of weight; said change of weight comparison means being connected to said correction data processing unit for preventing correction during the normal weighing process when rate of weight change exceeds a given magnitude; said differentiating means and correction data processing unit also being connected to said timer unit.

4,044,847

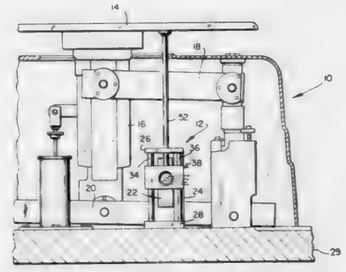
WEIGHING SYSTEM WITH A MOIRE OPTOELECTRONIC TRANSDUCER

Bosco Wu, Trumbull, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Filed Jan. 30, 1976, Ser. No. 653,850

Int. Cl.² G01G *3/00, 23/36*

U.S. Cl. 177—210 R **9 Claims**



1. A weighing scale having a frame, a displaceable tare structure carried by said frame, said tare structure being yieldably displaceable in accordance with the mass of a load being weighed, and an optical detector system for determining the extent of tare structure displacement: said optical detector system comprising

means for providing a light beam;

a pair of grating sets, each of said grating sets having an optical grating, one of said grating sets being mounted on said frame, and the other of said grating sets being mounted so as to move with said tare structure and relative to said one of said grating sets;

said pair of optical grating sets being mutually angularly oriented so that said two optical gratings are positioned at an angle with respect to one another and modulate said light beam so as to generate a pattern of moire optical interference fringe lines, movement of the grating set that moves with said tare structure causing transverse movement of said fringe lines; and

photodetector means adapted to be aligned with said transverse fringe movement for detecting movement of said fringe lines produced by the displacement of said tare structure.

4,044,848

FLOOR TREATING MACHINES

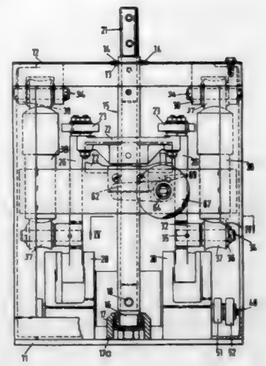
John Thomas Wilkins, Bushey Heath, England, assignor to R. G. Dixon & Company Limited, Wembley, England

Filed Jan. 28, 1976, Ser. No. 652,988

Claims priority, application United Kingdom, Jan. 30, 1975, 4158/75

Int. Cl.² B62D *11/02*

U.S. Cl. 180—6.5 **7 Claims**



1. In a floor treating machine comprising a pair of driving wheels with independent speed control, a control tube mounted in a swivel joint to move differentially, a pair of independently movable manually operable control members mounted to move on parallel axes side by side on the machine, a cross member on the control tube and links connecting the said cross member to the control members with each of such control members being operably connected to an individual electrical component forming part of the speed control for one of the driving wheels, guide means to restrict the said control elements to fore and aft movement in relation to the machine, whereby synchronized movement of the control members provides equal adjustment of the wheel speeds, whereas differential movement of the control members provides a steering effect: the improvement of at least one damping device associated with each of the electrical control components to reduce the sensitivity thereof to fluctuating forces applied by an operator and a switch operating means mounted on at least one control member.

4,044,849

STEERING CONTROL APPARATUS FOR USE IN ENDLESS TRACK TYPE TRACTORS AND CONTROL VALVE FOR USE THEREWITH

Kazutoshi Imon, Komatsu, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jan. 28, 1976, Ser. No. 652,994

Claims priority, application Japan, Aug. 20, 1975, 50-100089

Int. Cl.² B62D *11/00*

U.S. Cl. 180—6.7 **11 Claims**

1. A steering control apparatus for an endless track type tractor comprising a pair of control members,

a barrel rotatably mounted on a stationary shaft, said control members being fixedly secured to said barrel,

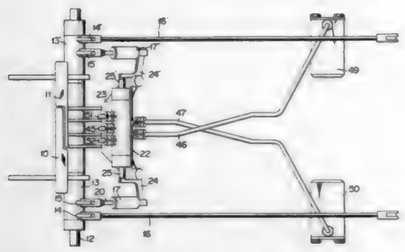
a pair of valve connecting levers fixedly secured to said barrel on a first side thereof,

a driving rod connected to a second side of each said valve connecting levers,

a spring means connecting each said driving rod to a crank means,

valve means for steering control clutch for releasing said clutch when actuated, said valve means having stem members mounted at both ends thereof, said stem members being connected to each of said crank means,

a pair of clutch yokes for releasing clutches when actuated, said clutch yokes being connected to said valve means, wherein said valve means is of a mono-spool type,



a pair of brakes, with a pair of brake connecting levers fixedly secured to said barrel, and

means for biasing said control members in a clockwise direction.

4,044,850

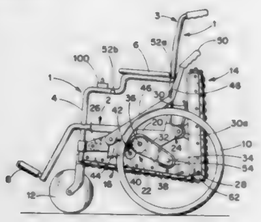
WHEELCHAIR

Malcolm C. Winsor, Pond Road, Mont Vernon, N.H. 03057

Filed Apr. 14, 1975, Ser. No. 567,547

Int. Cl.² B62D *55/04*

U.S. Cl. 180—9.2 C **23 Claims**



1. A wheelchair comprising,

a. a seat frame for carrying an operator or a load,

b. large diameter ground contacting wheels on each side of the frame,

c. a hub for each of said wheels, said hubs defining wheel axle which are parallel,

d. for each wheel, a wheel arm carrying at one end thereof the wheel hub and pivotally connected at the other end to the frame,

e. whereby rotation of the wheel arm in one direction raises the wheel and rotation in the opposite direction lowers the wheel to contact the ground and support the wheelchair,

f. means for rotating the wheel arm including a manually operated lever pivotally attached to the frame and

g. a drive connection between the lever and the wheel arm,

h. whereby rotation of the lever rotates the wheel arm raising the wheel,

i. a traction device carried by the frame and oriented to propel the wheelchair in the same direction as the wheels,

j. traction device positioning means for positioning the traction device in a retracted position and in at least one position for propelling the wheelchair when the large diameter wheels are raised and

k. means for driving the tractor device to propel the wheelchair.

4,044,851

CYCLE PROPELLED BY MOTOR AND PEDALS

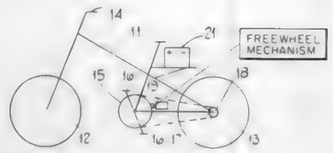
Leslie Thomas Shaw, Birmingham, and Charles Patrick Duncan Davidson, Droitwich, both of England, assignors to Lucus Industries Limited, England

Filed Jan. 21, 1976, Ser. No. 650,871

Claims priority, application United Kingdom, Jan. 21, 1975, 2629/75

Int. Cl.² B62D *3/00*

U.S. Cl. 180—33 C **2 Claims**



1. An electrically assisted cycle including a frame, a ground engaging wheel rotatably mounted on the frame, a rotatable drive member rotatably mounted on the frame, rider operable pedals coupled to the drive member whereby the rider can apply driving force, an endless, non-extensible flexible member coupling said drive member and said wheel whereby rotation of said drive member propels said cycle, an electric motor and an associated power source carried by said frame, the output of said motor being coupled to said wheel whereby said motor can apply driving force to said wheel, and an electrical switch means operable by the application to said pedals by the rider of driving force to propel the cycle, said switch being so associated with said motor that the motor cannot be energized unless said switch means is operated, wherein there is a degree of lost motion between the pedals and the drive member which must be taken up before the pedals drive the drive member, said switch means being operated by th take-up of said degree of lost motion and there being resilient means urging the pedals in a direction relative to the drive member to restore said lost motion.

4,044,852

ELECTRICALLY ASSISTED CYCLE

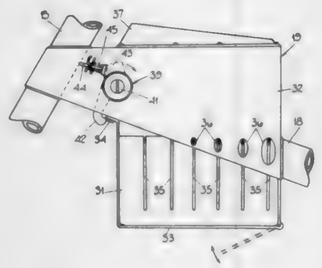
Frank Lewis, Birmingham, and Charles Patrick Duncan Davidson, Droitwich, both of England, assignors to Lucas Industries Limited, England

Filed Jan. 21, 1976, Ser. No. 650,876

Claims priority, application United Kingdom, Jan. 21, 1975, 2634/75; Feb. 7, 1975, 5262/75

Int. Cl.² B62D *25/00*

U.S. Cl. 180—68.5 **18 Claims**



1. An electrically assisted cycle including a frame, a ground engaging wheel, means rotatably mounting the ground engaging wheel on the frame, a rotatable drive member, means rotatably mounting the drive member on the frame, means whereby a rider of the cycle can rotate said rotatable drive member relative to the frame, an endless non-extensible flexible member coupling the drive member and the wheel whereby

rotation of the drive member propels the cycle, an electric motor, means mounting the electric motor on the frame, a battery support including a box-like member secured to or incorporated in the frame, the box-like member being open at one face and receiving therein an electric storage battery, the battery support further including a releasable retaining member carried by the box-like member to retain the battery therein in use, said electric motor having an output member coupled to said ground engaging wheel whereby the motor can propel the cycle, means electrically connected said electric storage battery to said electric motor said means incorporating a first electrical switch whereby the electrical circuit between the motor and the battery can be made and broken, and, a key operated mechanism incorporating first locking means associated with said battery retaining member whereby said retaining member can be locked in said operative position so that the appropriate key is required to release the retaining member to remove the battery, and said key operated mechanism further including a latch bolt arranged to lock a movable part of the cycle against movement so as to inhibit unauthorised use of the cycle, said latch bolt being movable by operation of the appropriate key in said key operated mechanism.

4,044,853

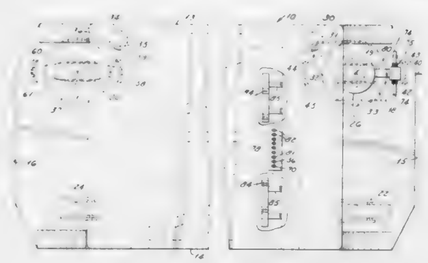
DRIVERLESS VEHICLE AND GUIDANCE SYSTEM

George A. Melke, Charlevoix, Mich., assignor to Jervis B. Webb Company, Farmington Hills, Mich.

Filed Apr. 5, 1976, Ser. No. 674,052

Int. Cl.² B60K *26/00*

U.S. Cl. 180—98 **11 Claims**



1. A driverless vehicle movable along a guide path provided on a surface over which the vehicle travels;

said vehicle including a frame having a front end and a rear end;

wheel means for supporting the frame including a front steerable wheel mounted for steering movement about a steering axis located adjacent to the front end of the frame, a rear steerable wheel mounted for steering movement about a steering axis located adjacent to the rear end of the frame, each of said steerable wheels having a steering motor arranged to move such steerable wheel about the steering axis thereof;

a guidance system for independently regulating the operation of the steering motor for each of the steerable wheels, said guidance system including for each steerable wheel a direction sensing unit adapted to produce steering signal from the guide path, and separate circuit means for regulating the operation of each steering motor in response to said steering signals whereby each of the steerable wheels is independently controlled to follow the guide path; and,

drive means operably connected to one or more of said steerable wheels for propelling the vehicle.

4,044,854

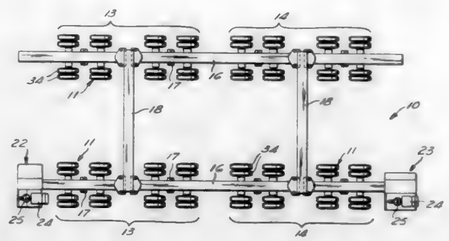
POWER STEERING SYSTEM FOR HEAVY LOAD DOLLIES

Marvin G. Schmitt, Fountain Valley, Calif., assignor to AMI Industries, Inc., Downey, Calif.

Filed May 14, 1976, Ser. No. 686,492

Int. Cl.² B62D *5/06*

U.S. Cl. 180—140 **10 Claims**



1. A system for transporting a load of high mass and/or bulk comprising a plurality of steerable wheeled dollies, means for locating each of the dollies relative to one another and to the load, each steerable dolly having at least one castered wheel, a source of pressurized fluid, a fluid power actuator associated with each steerable dolly, the power actuator of each steerable dolly being operably connected to its associated castered wheel to forcibly steer the wheel angularly to the left or right in response to changes in fluid volume in the actuator, control means for directing fluid from the source to the actuators and for exhausting fluid pressure from the actuators to thereby operate the actuators and determine the steering position of the castered wheels, at least two of said actuators being coupled by a common fluid pressure in a parallel branch circuit fluid connection to said control means whereby steering reaction forces on the associated wheels are employed to synchronize the angular steering displacement of the associated wheels by balancing of the common fluid pressure in the coupled actuators.

4,044,855

LOUDSPEAKER DEVICE

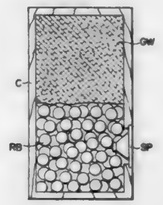
Fumio Kobayashi, Hino, Japan, assignor to Sansui Electric Co., Inc., Tokyo, Japan

Filed Oct. 30, 1975, Ser. No. 627,335

Claims priority, application Japan, Nov. 1, 1974, 49-126290

Int. Cl.² H05K *5/00*

U.S. Cl. 181—151 **11 Claims**



8. A loudspeaker device having a speaker cabinet with spaced front and rear faces defining a depth, each face having a length and a width, and a speaker unit mounted in said front face,

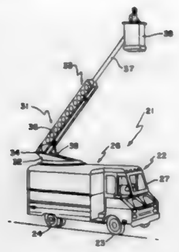
said speaker cabinet having at least one first inner region filled with a first filler material formed of a flexible, gas-bearing material and at least one second inner region adjacent to said first inner region and filled with a second filler material made of a fibrous cotton-like material.

4,044,856

LIFTING EQUIPMENT HAVING A BOOM STRUCTURE AND A CONTROL MECHANISM FOR USE THEREWITH USING A FLEXIBLE LIGHT GUIDE

Robert E. Stevenson, Redwood City, Calif., assignor to General Cable Corporation, San Carlos, Calif.

Filed July 25, 1975, Ser. No. 598,743
Int. Cl.[2] B66F *11/04*
U.S. Cl. 182—2 **12 Claims**



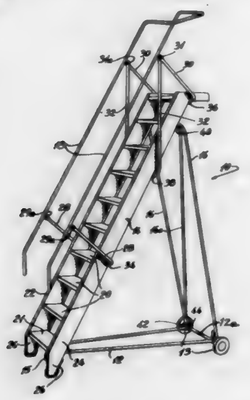
1. In a lifting equipment, a support structure, a boom structure movably mounted on said support structure, a workman's platform carried by the boom structure, the boom structure including means for electrically insulating the workman's platform from the support structure, a source of light electrically insulated from said workman's platform, a control mechanism accessible from the workman's platform, means for supplying light from said source to said control mechanism, at least one flexible light guide means carried by the boom structure and coupled to the control mechanism, said control mechanism having control means whereby upon operation of said control means light from the source can be selectively introduced into said flexible light guide means, photosensitive means for sensing when light is introduced into said light guide means and motive means connected to said photosensitive means for operating the lifting equipment whereby the outer end of the boom structure and the workman's platform can be moved relative to the support structure.

4,044,857

MOBILE LADDER

Marcel Guerette, Lachenaie, Canada, assignor to Moody Si Ltd., Terrebonne, Canada

Filed May 17, 1976, Ser. No. 686,736
Int. Cl.[2] E06C *5/04*
U.S. Cl. 182—17 **7 Claims**



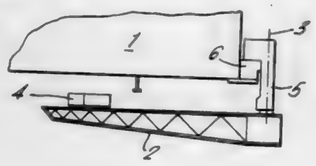
1. A mobile ladder comprising a base, castors mounted to the base adapted to provide mobility thereto, a ladder connected to the base, a support member connected at one end to the base at a point spaced from the ladder connection with the base, and the other end of the support member being hingedly connected to the ladder at a point spaced from the ladder and base connection, forming a structural triangle therewith; the ladder including a floor engaging member fixed thereto and adapted to engage the floor, the connection of said ladder to said base including a link member pivotally mounted to the base about a first axis normal to the plane through the structural triangle, said link being pivotally connected to the ladder about a pivot having an axis parrallel to the first axis and spaced therefrom, the link being adapted to pivot about the first axis such that said ladder pivot follows an arc between a first position whereby the floor engagement member of the ladder is in frictional contact with the floor surface and a second position whereby the ladder pivot with the link is passed over the gravitational dead center position above the first axis, and whereby said floor engaging member of said ladder is spaced from the floor surface.

4,044,858

MAINTENANCE DEVICE FOR USE UNDERNEATH DECK STRUCTURES

Lauritz Vikre, Bergen, Norway, assignor to Sverre Munck A/S, Bergen, Norway

Filed Nov. 21, 1975, Ser. No. 634,117
Claims priority, application Norway, Nov. 22, 1974, 744217; Nov. 17, 1975, 753855
Int. Cl.[2] E04G *3/10, 3/14*
U.S. Cl. 182—82 **15 Claims**



1. A maintenance device for use underneath a deck comprising:

an elongated arm which includes connecting means for connecting the arm to a deck with the arm extending beneath the deck and pivotable about a first vertical axis to swing around underneath the deck,

and a platform mounted on the arm and movable longitudinally therealong beneath the deck, said platform further being rotatable about a second vertical axis, spaced from the first vertical axis, relative to said arm.

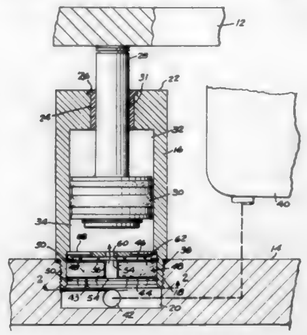
4,044,859

LUBRICATING MEANS FOR GAS-OPERATED CYLINDERS

Bernard J. Wallis, 25200 Trowbridge Ave., Dearborn, Mich. 48124

Filed Sept. 13, 1976, Ser. No. 722,862
Int. Cl.[2] F16N *1/00, 23/00*
U.S. Cl. 184—18 **15 Claims**

1. In combination, a cylinder, a piston in said cylinder dividing it into a working chamber adjacent the head end of the cylinder and an idle chamber adjacent the rod end of the cylinder which vary inversely in size in response to reciprocation of the piston in the cylinder, said piston having a rod extending axially through said idler chamber and outwardly beyond the rod end of the cylinder for connection with a force-applying means for displacing the piston in a direction toward the head end of the cylinder, port means adjacent the head end of the cylinder for introducing gas under pressure to said working chamber for displacing the piston in a direction toward the rod end of the cylinder, means defining a lubricant chamber interposed between said port means and said working chamber and through which the gas from said port means is directed to said working chamber, an air-permeable, lubricant-impregnated material in said lubricant chamber, said lubricant chamber having a wall provided with a plurality of apertures through which said gas is adapted to flow from said lubricant



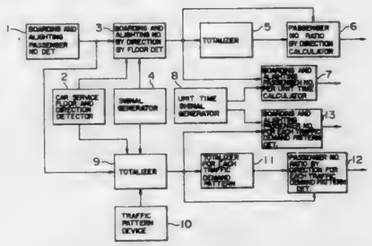
chamber to the working chamber, a valve plate cooperating with said apertured wall for blocking said apertures when the gas pressure in the working chamber is equal to or exceeds the pressure at said port means and means for causing the gas to bypass said lubricant chamber when the gas flow is from the working chamber toward said port means.

4,044,860

ELEVATOR TRAFFIC DEMAND DETECTOR

Takashi Kaneko, and Tatsuo Iwasaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 18, 1976, Ser. No. 658,894
Claims priority, application Japan, Feb. 21, 1975, 50-20948
Int. Cl.[2] B66B *1/18*
U.S. Cl. 187—29 R **12 Claims**



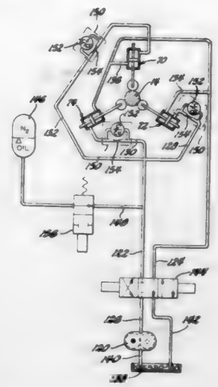
1. An elevator car traffic demand detecting apparatus for a plurality of elevator cars serving a plurality of floors, comprising a first device for detecting the number of passengers boarding and alighting from each car each time the car serves each floor, a second device for detecting the floors served by the car, a third device for detecting the direction of travel of the car service, a fourth device supplied with at least the three outputs respectively from said first, second and third devices for detecting the number of boarding and alighting passengers by direction for each floor each time the car serves each floor, and a fifth device for accumulating, by floor and by direction, the numbers of boarding and alighting passengers by direction for each floor which are detected by said fourth device each time the car served each floor.

4,044,861

SUPPORT DEVICE FOR ROTATING BAR INCLUDING AN ASSEMBLY FOR CUSHIONING AND DAMPENING VIBRATORY MOVEMENT OF THE BAR

Abdulhadi K. Abu-Akeel, and Gerald C. Rieck, both of Sterling Heights, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1976, Ser. No. 734,366
Int. Cl.[2] F16D *63/00*
U.S. Cl. 188—1 B **2 Claims**



1. A support device for dampening the vibrational movement of an elongated rotating cylindrical bar, said support device comprising a base member supporting at least three hydraulic cylinders with the longitudinal center axis of each hydraulic cylinder being angularly spaced from the longitudinal center axis of the adjacent hydraulic cylinder by equal amounts and adapted to pass through the center of the bar, each of said hydraulic cylinders having an inner end located adjacent said center of the bar and an outer end, a piston member reciprocably mounted in each hydraulic cylinder having connecting rods extending from the inner and outer ends thereof and being sized so that the corresponding pressure responsive areas of said piston member on which fluid pressure acts to move said piston member in corresponding directions is equal for all hydraulic cylinders, a roller connected to the connecting rod of the piston members in each of said hydraulic cylinders adjacent the inner end thereof, spring means connected to the connecting rod of the piston member of each of said hydraulic cylinders adjacent the outer end thereof for counterbalancing the inertia of the roller and the piston member, a hydraulic circuit having a pump for selectively directing pressurized hydraulic fluid to the chambers at the outer and inner ends of each of said hydraulic cylinders for adjusting the position of the roller relative to the outer periphery of said bar, said hydraulic circuit including an accumulator, conduit means for fluidly connecting the outer ends of the three hydraulic cylinders to said accumulator, and a flow control valve located in said conduit means between each hydraulic cylinder and the accumulator for dampening vibratory movement of the bar during high speed rotation thereof.

4,044,862

VEHICLE SUCTION BRAKE

Sundar Savarimuthu, 17 Gleneagle Crescent, Willowdale, Ontario, Canada

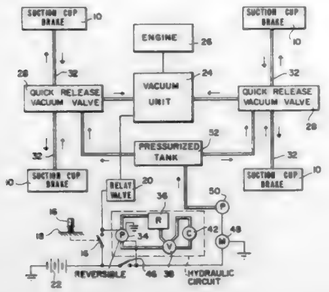
Filed Aug. 24, 1976, Ser. No. 716,998
Int. Cl.[2] B60T *1/14*
U.S. Cl. 188—5 **5 Claims**

1. An auxiliary brake for a motor vehicle driven upon a roadway comprising:

at least one suction cup normally stored on said vehicle;

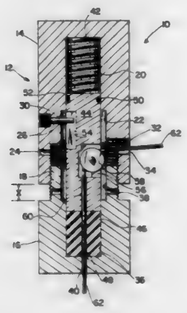
means on said vehicle for lowering and raising said suction cup, said raising and lowering means including a fluid

cylinder having a piston connected to said suction cup and a fluid circuit for driving said piston in said cylinder, said fluid circuit being selectively actuable;
means on said vehicle for evacuating air from the interior of said suction cup thereby creating a vacuum between said suction cup and said roadway;
means on said vehicle for supplying air to said interior of said suction cup to break the vacuum between said suction cup and said roadway;



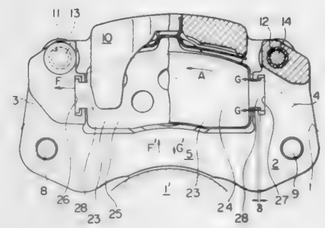
first switch means mounted on the floor of said vehicle for activating said evacuation means, said first switch means simultaneously activating said lowering and raising means to lower said piston; and
second switch mounted on the dash of said vehicle for simultaneously actuating said supply means and for deactivating said raising and lowering means to raise said piston.

4,044,863
CABLE BRAKE AND LOCK
Harold P. Feldman, Frederick, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed May 25, 1976, Ser. No. 689,894
Int. Cl.[2] B65H *59/10*
U.S. Cl. 188—65.1 **14 Claims**



1. A control device to automatically regulate the deployment of a flexible connecting element passing through the device in response to ambient pressure which comprises:
a housing having a central, longitudinal bore in a fluid communication with the ambient environment;
a resilient element positioned within said bore and having a passage for the flexible connecting element;
a biasing means for applying a selectable, predetermined force to said resilient element and responsive to pressure increase in said bore to reduce the force on said resilient element;
means to vary the force of said biasing means;
said biasing means comprising a force transmitting member reciprocally positioned within said bore having one end in abutting contact with said resilient element;
a spring in said central bore and in biasing contact with the remaining end of said force transmitting member; and
wherein
two interconnected tubular elements comprise said housing and said means to vary the force of said biasing means includes roatable connecting means joining said tubular elements,
whereby said biasing means responds to increases in the ambient pressure force within said bore to permit the flexible connecting element to pass through said resilient element when the ambient pressure force equals to exceeds the predetermined force of the biasing means and rotation of the tubular elements varies the compression of said spring.

4,044,864
DISC BRAKE
Yasuo Karasudani, Yokohama, Japan, assignor to Tokico Ltd., Japan
Filed July 1, 1976, Ser. No. 701,606
Claims priority, application Japan, July 17, 1975, 50-87598
Int. Cl.[2] F16D *65/02*
U.S. Cl. 188—73.3 **2 Claims**

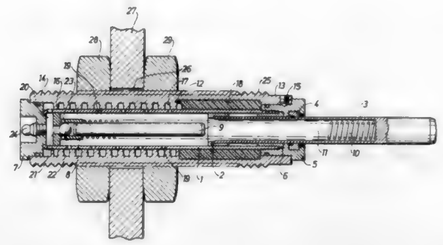


1. A disc brake comprising a stationary supporting member for mounting on a non-rotatable part of a vehicle on one side of a rotatable brake disc, a pair of arms on said supporting member spaced in the direction of the circumference of the disc and extending axially from the supporting member and straddling a portion of the circumference of the disc, a pair of friction pad assemblies slidably engaged with said arms for sliding movement in the direction of the axis of the disc, and clamping means for urging the friction pad assemblies against the opposite surfaces of the disc, each of the friction pad assemblies having T-shaped projection means on each of the circumferential ends thereof, and said arms each having complementarily shaped grooves therein in which said projection means are slidable, whereby braking drag is received by both of said arms when the disc is rotating in either direction.

4,044,865
HYDRAULIC SHOCK ABSORBER
Pekka Tapio Tourunen, Sodertalje, Sweden, assignor to AB Mecman, Alvsjo, Sweden
Filed May 25, 1976, Ser. No. 690,044
Int. Cl.[2] F16F *9/44*
U.S. Cl. 188—287 **3 Claims**

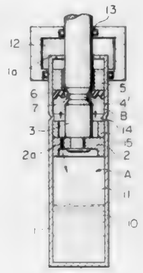
1. A hydraulic shock absorber comprising a cylinder, a movable piston within said cylinder, a liquid receptacle outside the cylinder, at least one cylinder chamber within said cylinder and in communication with said receptacle through at least one narrow opening in the wall of said cylinder, said opening serving to damp the movement of the piston due to its resistance against the outflow of the liquid from the cylinder chamber, a sleeve enclosing said cylinder and having an internal thread having a slot which constitutes at least a part of said liquid receptacle, said thread having a crest which engages the

cylinder wall, whereby a change of the damping power is obtained by rotating the sleeve and the cylinder in relation to



each other, so that the crest of the thread will more or less cover the cross-section area of the opening for the flow of liquid.

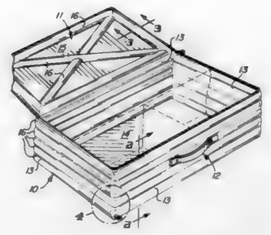
4,044,866
METHOD FOR FILLING GAS INTO GAS SPRING
Kunio Ishida, Yokohama, Japan, assignor to Tokico Ltd., Japan
Filed Dec. 15, 1976, Ser. No. 750,719
Claims priority, application Japan, Mar. 19, 1976, 51-30448
Int. Cl.[2] F16F *9/43*
U.S. Cl. 188—322 **6 Claims**



1. A method for filling gas into a cylindrical container having a rod slidably extending from one end thereof comprising the steps of forming passage means in the rod at a position adjacent to the inner end thereof, projecting the rod outwardly from the cylinder to its maximum extending position thereby forming a gas filling passage, by said passage means, communicating the inner end and the outer sides of an annular seal member which normally engages the rod sealingly and slidably, filling high pressure gas through the gas filling passage into the container, and moving the rod inwardly relative to the seal member to close the gas filling passage.

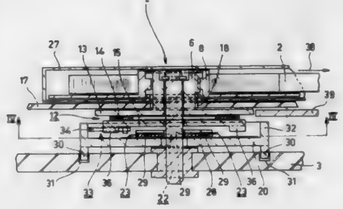
4,044,867
INFLATABLE LUGGAGE
Robert J. Fisher, 170 City Blvd. West, Apt. 201, Orange, Calif. 92668
Filed June 3, 1976, Ser. No. 692,444
Int. Cl.[2] A45C *7/00*
U.S. Cl. 190—43 **6 Claims**

1. Inflatable and collapsible luggage comprising:
a case having walls which define a storage compartment having a closeable opening,
the walls of said case being formed at least in part from a fluid impervious material and define a plurality of tubular interconnected passages,
handle means secured to said case,
a conduit connected to one of said passages for receiving air to inflate said passages and render said case rigid and self supporting,
said passages when inflated extending outwardly of said case to form a plurality of spaced ribs arranged in a ribbed configuration for protecting the case and its contents,
said case when deflated collapsing so that it can be folded or coiled for storage purposes,



said handle means comprising means connected to said conduit for inflation and deflation of said passages.

4,044,868
SLIPPING COUPLING FOR A RECORDING AND/OR PLAYBACK APPARATUS
Erich Berger, Vienna, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 10, 1975, Ser. No. 639,358
Claims priority, application Austria, Dec. 16, 1974, 10034/74
Int. Cl.[2] F16D *67/02*
U.S. Cl. 192—12 B **5 Claims**



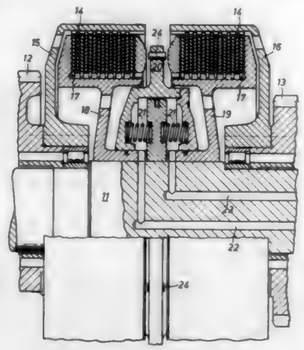
1. A slipping clutch comprising a spindle, a first slipping clutch section rotatable about the spindle, a second slipping clutch section coaxial with the first section and rotatable about the spindle, a counter-bearing, means for controlling rotation of the counter-bearing, and an annular bearing part mounted coaxially with said slipping clutch sections, having a pair of first diametrically opposed bearing points which project in one direction of the spindle and engage the second section and having a pair of second bearing points which project in a direction opposite said first points, 90° offset with respect to said first point, and engage the counter-bearing, at least one of said pairs being formed as plain bearings for withstanding continuous rotation between said part and the surface engaged by said at least one pair.

4,044,869
RELEASE STOP FOR DISC CLUTCH
Hermann Gros, Friedrichshafen, Germany, assignor to Motoren- und Turbinen-Union Friedrichshafen GmbH, Germany
Filed June 2, 1975, Ser. No. 582,687
Claims priority, application Germany, June 28, 1974, 2431104
Int. Cl.[2] F16D *25/10*
U.S. Cl. 192—48.91 **5 Claims**

1. In a friction clutch comprising a plurality of interspersed friction disks disposed along an axis and first means including a pressure plate for compressing said plurality of friction disks along said axis, thereby engaging the clutch, the improvement comprising second means disposed at said pressure plate for determining an axial distance of said plurality of friction disks

in the noncompressed state dependent on a predetermned axial thickness of said plurality of friction disks,

wherein said second means includes a plurality of pins fitted into a plurality of corresponding axial bores through said pressure plate, said pins having a length exceeding the



axial thickness of said pressure plate, and said pins being slidable in said bores, and

wherein said plurality of interspersed friction disks include two sets of said interspersed friction disks, each of said two sets disposed at opposing sides of said pressure plate.

4,044,870

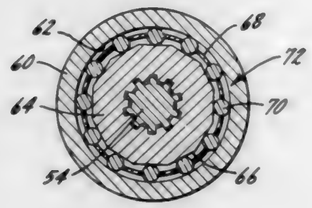
AUTOMATIC FOUR-WHEEL DRIVE TRANSFER CASE

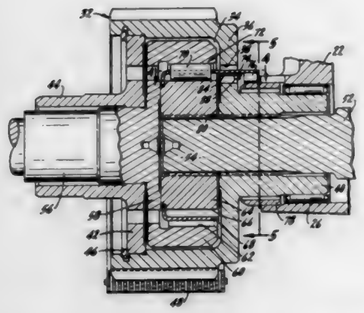
Mark John Fogelberg, Muncie, Ind., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Sept. 19, 1975, Ser. No. 615,001

Int. Cl.[2] F16D *13/44*

U.S. Cl. 192—89 W **9 Claims**





1. A torque transfer assembly comprising a housing, an input shaft supported for rotation in said housing, first and second output shafts supported for rotation in said housing, and means coupling said input shaft with said output shafts for transfer of torque thereto, said coupling means including an overrunning clutch having wedging means movable between two clutch engaging positions wherein torque is transferred to said second output shaft and a clutch disengaging position wherein torque is not transferred to said second output shaft, means biasing said wedging means toward one of said clutch engaging position in response to rotation of one of said shafts, and means responsive to centrifugal force developed upon rotation of one of said shafts for blocking movement of said wedging means to the other of said clutch engaging positions, said blocking means being movable into the path of said wedging means upon initial movement of said wedging means toward said one clutch engaging position.

4,044,871

HYDRAULICALLY OPERATED CLUTCH RELEASE BEARING

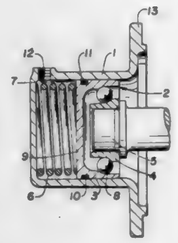
Heinz Kiener, Waigolshausen, Germany, assignor to SKF Industrial Trading and Development Company, B. V., Amsterdam, Holland

Continuation-in-part of Ser. No. 349,456, April 9, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,363

Claims priority, application Germany, Apr. 13, 1972, 2217942

Int. Cl.[2] F16D *25/08*

U.S. Cl. 192—91 A **3 Claims**



1. A hydraulic release mechanism for automobile clutches and the like comprising:

a cylindrical housing open at one end thereof to receive the operating member of a clutch and having inlet means therein adjacent an end thereof for the introduction of pressurized fluid thereinto;

a bearing located entirely and concentrically within said housing including a rotatable inner race ring adapted to be connected to the operating member of the clutch and a separable non-rotatable outer race ring one axial end of which defines with inner surfaces of said housing a pressure chamber for the pressurized fluid;

a plurality of roller elements located between said inner and outer race rings;

said non-rotatable outer race ring having the radially outer wall surface thereof in direct axially slidable engagement with the inner surface of said housing;

spring means located within said pressure chamber in engagement with said one axial end of said outer race ring and biasing same towards the other end of said housing so as to maintain said roller elements in operative engagement with the cooperable surfaces of said inner and outer race rings;

and seal means interposed between the said inner surfaces of the housing and said radially outer wall surface of the non-rotatable race ring to circumferentially enclose the same and to permit said outer race ring and said bearing to move axially within said housing on introduction of pressurized fluid into said housing.

4,044,872

COUPLING THE SWITCHING OF WHICH IS DEPENDENT ON THE ROTATIONAL SPEED

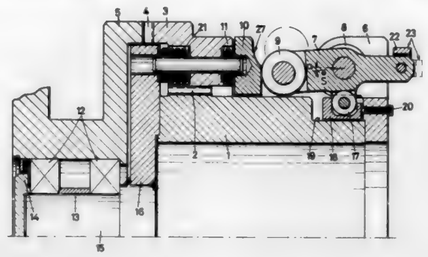
Josef Punsmann, Bocholt, and Ludger Hecking, Holtwick, both of Germany, assignors to A. Friedr. Flender & Co., Bocholt, Germany

Filed Apr. 5, 1976, Ser. No. 673,894

Claims priority, application Germany, Apr. 9, 1975, 2515351

Int. Cl.[2] F16D *23/10*

U.S. Cl. 192—103 A **11 Claims**



1. A coupling with switching dependent on rotational speed, comprising: switching elements, one coupling half held in fixed connection with another coupling half up to a switching speed by being supported on said switching elements, said switching elements being centrigually controlled and spring loaded, a switching ring, said switching elements being pivoted and coupled with one another by said switching ring for joint tilting.

4,044,873

DRIVEN PLATES FOR FRICTION CLUTCHES

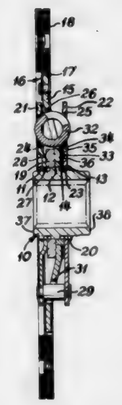
David Parsons, and Keith Vernon Leigh-Monstevens, both of Leamington Spa, England, assignors to Automotive Products Company Ltd., England

Filed Dec. 22, 1975, Ser. No. 642,786

Claims priority, application United Kingdom, Dec. 31, 1974, 56233/74

Int. Cl.[2] F16D *3/66*

U.S. Cl. 192—106.2 **14 Claims**



1. An annular hub component for assembly with an annular friction facing carrier and two annular disc-like members forming a clutch driven plate with said annular friction facing carrier being mounted for limited rotational movement on said hub component and said two annular disc-like members fixed directly and non-rotatably to said hub component to extend radially from said hub component, at least one of said annular disc-like members being fixed to said hub component by a fixing arrangement which comprises serrations formed on the inner peripheral edge of at least one annular disc-like member and engaged in corresponding grooves formed in said hub component, wherein said annular hub component has at least one radially outwardly projecting annular rim with a frusto-conical outer peripheral surface extending over the total axial length of the radially-outer surface of the respective annular rim, the smaller diameter end of said frusto-conical outer peripheral surface portion being nearer to the adjacent end of said hub component toward which said frusto-conical outer peripheral surface portiofi tapers.

4,044,874

CLUTCH DISC WITH PLURAL FRICTION DAMPERS

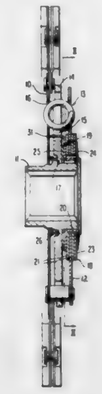
Günter Wörner, Rommelshausen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 15, 1974, Ser. No. 461,115

Claims priority, application Germany, Apr. 14, 1973, 2318908

Int. Cl.[2] F16D *3/66*

U.S. Cl. 192—106.2 **12 Claims**



1. In a clutch disc arrangement for main clutches which includes a disc means carrying friction linings, a hub means having a hub flange, said disc means being operatively connected with the flange of said hub means, side plate means, means for rigidly connecting said side plate means to said disc means, a first set of window means provided in said hub flange, a second set of window means provided in said disc means in alignment with said first set of window means, a third set of window means provided in said side plate means in alignment with said first and second set of window means, several spring means having respectively harder characteristics for producing a multi-stage operation of the clutch disc arrangement, said spring means being arranged in the window means of said hub flange, said disc means, and said side plate means, said spring means includes individual springs defining four stages, each spring being arranged in a respective set of aligned window means, and at least two friction means for damping vibrations of the clutch disc arrangement, a first of said friction means being operatively connected with the softest of the springs, a second of said friction means being operatively connected with at least one of the harder springs, the improvement comprising: control plate means mounted on said hub means for determining the starting point of operation of at least one of the friction means, the control plate means including means for engaging at least one of the two parts consisting of spring means and window means to render effective the friction means operatively connected with a relatively harder spring stage during the operating range of a preceding softer spring stage, the operation of the first friction means begins with the operation of the first spring stage and the operation of the second friction means begins with the operation of the third spring stage, and wherein said control plate means is mounted on said hub means

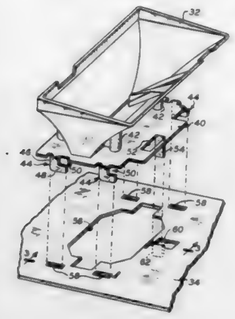
so that a spacing is provided between said engaging means and the part consisting of at least one of the window means and spring ends of the third spring stage, said friction means being operatively effective in only one direction of rotation of the clutch disc arrangement.

4,044,875

REMOVABLE FUNNEL FOR A COIN OPERATED APPARATUS

Harry Greenwald, Whitestone, and Salvatore Iglio, Valley Stream, both of N.Y., assignors to Walter Kidde & Company, Inc., Clifton, N.J.

Filed June 14, 1976, Ser. No. 695,763
Int. Cl.[2] G07F *1/04*
U.S. Cl. 194—1 K **6 Claims**



1. A removable coin funnel for catching coins deposited in a housing of a coin operated apparatus and directing said coins to a coin receiving location within said housing, and in which the housing has a support plate formed having a plurality of slotted openings and a blocking tab, said funnel comprising:

a. mounting means for mounting said funnel in said housing and permitting movement of said mounted funnel between a first position wherein said funnel is removable from said housing and a second position wherein said funnel is prevented from being removed therefrom;

b. said mounting means comprising a plurality of hook members each projecting outwardly from said funnel and adapted to be received in a separate one of said support plate openings to permit said funnel to be removably mounted in its first position, each of said hook members having a portion spaced from said funnel to define a passage adapted to receive therein an edge portion of said support member defining the associated opening when said mounted funnel is moved to its second position in engagement with said support member; and,

c. locking means disposed for bending movement from an unlocked position to a locked position when said funnel is in its second position

d. said locking means comprising a tab member projecting outwardly from said funnel and adapted to be received in another one of said support plate openings when said funnel is mounted in its first position, said locking tab being adapted to engage with the blocking tab of said support plate when said funnel is in its second position and said locking tab is bent to its locked position to prevent movement of said funnel from its second position to its removable first position;

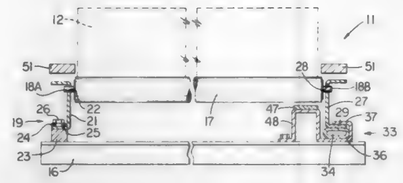
whereby said funnel is removable from said housing by moving said locking means to its unlocked position and then moving said funnel from its second position to its removable first position.

4,044,876

FAIL-SAFE GRAVITY CONVEYOR

Theodore A. Hammond, 3575 52nd St., S.E., Kentwood, Mich. 49508

Filed Apr. 30, 1976, Ser. No. 682,051
Int. Cl.[2] B65G *13/00*
U.S. Cl. 193—35 SS **12 Claims**



10. In a fail-safe, gravity-type roller conveyor for permitting intermittent controlled movement of articles therealong, comprising:

elongated frame means;

a plurality of elongated cylindrical roller means rotatably supported on said frame means, said roller means being disposed with their axes extending substantially horizontally and in spaced parallel relationship, said roller means having their upper surfaces disposed on a declining plane which extends at a small acute angle relative to the horizontal so as to permit said articles to move by gravity along said plurality of roller means;

braking means for controlling the gravity-induced movement speed of said articles along said plurality of roller means, said braking means being fixed relative to and extending longitudinally along said frame means;

support means for supporting said plurality of roller means at one axial end thereof for permitting angular displacement of said plurality of roller means in a vertical direction substantially about said one axial end;

lifting means coacting between said frame means and said plurality of roller means for causing intermittent and periodic vertical reciprocating movement of said other axial end of said plurality of roller means in a cyclic manner between a raised position permitting gravity-urged movement of the articles along said roller means and a lowered position wherein said articles are stopped by said braking means, said lifting means causing said roller means to effectively vertically pivot about said one axial end thereof as defined by said support means, said lifting means also causing said roller means to automatically move into said lowered position upon failure of said lifting means so that said braking means stop said articles; and

control means operatively interconnected to said lifting means for causing cyclic actuation thereof to cause said roller means to vertically pivot back-and-forth between said raised and lowered positions in a periodic and repetitive manner.

4,044,877

MULTIPLE COLUMN VENDING MACHINE MALFUNCTION LOCKOUT CIRCUIT

Paul F. Burton, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ransom, W. Va.

Filed Feb. 6, 1976, Ser. No. 655,846
Int. Cl.[2] G07F *5/22*
U.S. Cl. 194—10 **10 Claims**

1. A control circuit for a multiple-selection, independent column vending machine, said control circuit comprising:

a. coin operable credit establishing means having a first condition corresponding to the establishment of credit upon deposit of proper coinage, and a second condition corresponding to the cancellation of credit;

b. a plurality of customer operable product selection means, one selection means corresponding to each column, and each of said selection means having a momentary operable state;

c. a plurality of individual product dispensing means, each of said dispensing means operatively connected to one of said independent columns for dispensing a product;

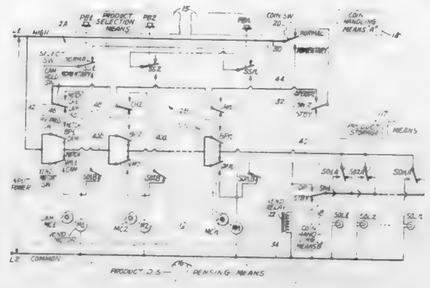
d. a plurality of individual actuating circuits corresponding to each column, each of said actuating circuits operatively connected for actuating a corresponding product means;

e. each of said actuating circuits comprising:

i. drive motor means operable, in response to the momentary operable state of a corresponding product selection means for momentary energizing said drive motor means, by a first energizing path;

ii. cam means driven by said drive motor means;

iii. first cam actuated means having a first condition for maintaining said credit establishing means in said first condition for a first portion of a complete product dispensing cycle, and having a second condition for



maintaining said credit establishing means in said second condition for a second portion of said dispensing cycle;

iv. second cam actuated means, having an initial condition and actuatable to a second condition by said momentary motor energization, for establishing a second motor energizing path to maintain energization of said motor means during said first portion of said dispensing cycle;

v. said first cam actuated means further providing a third motor energizing path for energizing said motor means during said second portion of said dispensing cycle; and

vi. lockout switching means, operable directly by said cam means such that during a malfunction condition of said product dispensing means during said second portion of said dispensing cycle, said lockout switching means provides an alternate circuit path comprising a portion of said third motor energizing path for maintaining said credit establishing means in said first condition during a first portion of a subsequently ordered dispensing cycle.

4,044,878

MATRIX PRINTER HEAD HAVING A REMOVABLE ASSEMBLY

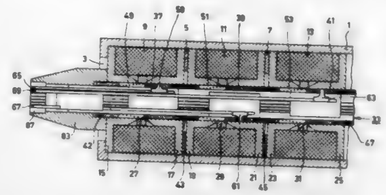
Helfrid Kunath, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 696,031
Claims priority, application Germany, June 18, 1975, 2527186
Int. Cl.[2] B41J *3/50*
U.S. Cl. 197—1 R **7 Claims**

1. A matrix printer head comprising a housing, a plurality of substantially straight printing pins having free ends for printing, means for mounting and guiding said pins in said housing so that said pins are mutually parallel and displaceable in their longitudinal direction, said free ends being arranged in a line, and magnetic means for displacing respective pins,

wherein said head has a cylindrical bore extending in said longitudinal direction through said housing, and an axially removable assembly arranged in said bore, said pins and said mounting and guiding means forming part of said assembly; and

said assembly comprises a cylindrical guide formed by at least two mating semi-cylindrical rods, said guide having a corresponding plurality of longitudinally extending adjacent guide means for said printing pins; means for retaining the assembly in the bore; a corresponding plurality of armatures forming part of said means for displacing,



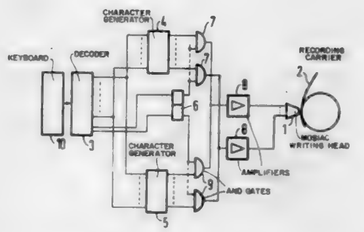
respectively slidably mounted at longitudinally separated locations on an outer surface of said cylindrical guide for displacement in said longitudinal direction, concentric with said bore; and means connecting individual printing pins to respective armatures for longitudinal displacement therewith.

4,044,879

ARRANGEMENT FOR RECORDING CHARACTERS USING MOSAIC RECORDING MECHANISMS

Horst Stahl, Weidach, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,642
Claims priority, application Germany, Mar. 7, 1975, 2510044
Int. Cl.[2] B41J *3/04*
U.S. Cl. 197—1 R **6 Claims**



1. A device for recording characters on a recording carrier, comprising:

recording means comprising a mosaic recording head including a plurality of first recording members which may be activated to record characters of a first height and a plurality of second recording members which may be activated to extend the recording height to a second height; and

recording height control means connected to said recording head and including a signal input, said recording height control means responsive to first input signals to selectively activate said first recording members to record characters of the first height and responsive to alternately received second input signals to selectively activate said first and second recording members to record characters of the second height.

4,044,880

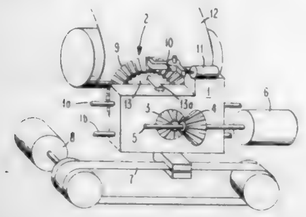
HIGH SPEED WHEEI PRINTER AND METHOD OF OPERATION

Blair Robertson Martin, Owego, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 427,962, Dec. 26, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,913

Int. Cl.[2] B41J *1/26, 19/30*

U.S. Cl. 197—18 **18 Claims**



8. A serial printer apparatus comprising in combination

a print mechanism operable for printing a line of characters or the like at plural uniformly-spaced print positions along a print line on a record medium,

said print mechanism including a movable print element carrying a plurality of type characters in a predetermined fixed arrangement,

said print mechanism having variable set-up times for presenting individual type characters on said print element depending on the relative location of said type characters on said print element during printing,

means for effecting a relative motion of said print mechanism and said record medium whereby said print mechanism is positioned successively at each of said plural print positions along said print line,

means for operating said print mechanism to effect recording of a succession of characters at said plural print positions during said relative motion,

means operable for maintaining said relative motion at a constant first velocity when said set-up times for successive type characters to be printed at successive adjacent print positions occur within the traverse time of said print mechanism while moving at said first velocity across the space between adjacent print positions,

traverse time determining means for determining when said set-up time for printing a character will exceed the traverse time between adjacent print positions at said first velocity, and

velocity altering means responsive to said traverse time determining means for altering said relative motion between adjacent print positions to a second velocity including restoring said relative motion to said first velocity for printing at said adjacent print position.

4,044,881

SERIAL PRINTER WITH LINEAR MOTOR DRIVE

Hi Dong Chai, Binghamton, and Joseph Paul Pawletko, Endwell, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 13, 1976, Ser. No. 676,584

Int. Cl.[2] B41J *19/30*

U.S. Cl. 197—82 **10 Claims**

1. A serial printer apparatus comprising in combination:

a print mechanism operable for recording data marks or the like on a print medium, and

drive means for causing said print mechanism to traverse said print medium in a fixed path corresponding with a print line on said print medium,

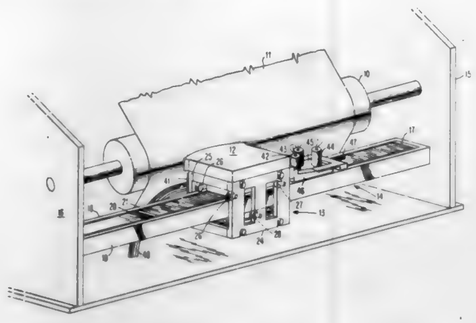
said drive means comprising a linear stepper motor having a magnetic stator bar fixed in a position substantially parallel with said fixed path,

said stator bar having at least one surface with teeth extending along the direction of said fixed path,

said teeth having a pitch proportional to the spacing of print positions on said print line,

a carrier for said print mechanism movably mounted on said stator bar,

said carrier including an armature formed with poles having surfaces cooperative with said surface of said stator bar and windings on said poles,



said pole surfaces having teeth with a pitch correlated to the pitch of said stator bar teeth,

and control means connected to energize said windings for controlling the motion of said carrier and print mechanism along said stator bar

said control means including sense means movable with said carrier and coating with the teeth of said stator bar for generating control signals useful in the operation of said printer apparatus.

4,044,882

APPARATUS FOR MOVING A PRINTER CARRIAGE

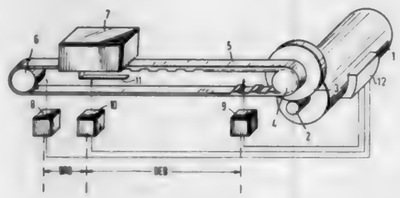
Robert Weinke, Munich, and Georg Wiesmeier, Weidach, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 15, 1975, Ser. No. 613,475

Claims priority, application Germany, Sept. 20, 1974, 2445081

Int. Cl.[2] B41J *19/30*

U.S. Cl. 197—82 **1 Claim**



1. A method for controlling the positioning of a printer carriage wherein a reversible stepping motor drives said carriage in forward and reverse directions along a row and a plurality of signal generators are spaced along said row for selective actuation by said carriage, a first one of said generators being fixed at a selected line-commence location, a second at a line-end location, and a third signal generator at an intermediate location spaced adjacent said line-commence location, said carriage carrying a control strip means for actuating said third generator while said carriage is between said line-commence and intermediate locations, and said motor having a control unit comprising a timing pulse generator, a coincidence signal generator, and an AND- logic circuit, said method comprising the steps:

moving said carriage stepwise in a forward direction, a plurality of steps constituting one type-character space or column;

operating said stepping motor for carriage return in a reverse direction of rotation in its maximum torque range;

generating at intervals a coincidence signal from said coincidence signal generator as a function of timing pulses which govern rotation of the stepping motor;

triggering an output signal from said logic circuit upon carriage return by a coincidence of a signal from said coincidence signal generator and a signal from said first signal generator; and

employing said output signal in said control means to terminate said timing pulses from said timing pulse generator to stop the return movement of said carriage selectively adjacent said line-commence location.

4,044,884

APPARATUS FOR ORIENTING A FLAT WORKPIECE

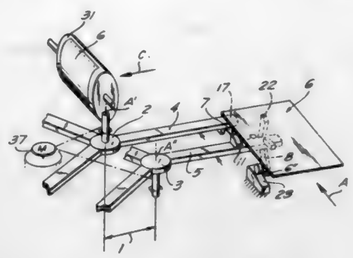
Josef Opletal, Karl-Marx Stadt, Germany, assignor to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed June 16, 1976, Ser. No. 696,498

Claims priority, application Germany, June 16, 1975, 186650

Int. Cl.[2] B65G *47/24*

U.S. Cl. 198—415 **10 Claims**



1. An apparatus for orienting a flat workpiece, said apparatus comprising: a support; first and second hubs rotatable on said support about respective spacedapart first and second rotation axes; respective radially extending elongated first and second arms mounted on said first and second hubs; respective first and second levers pivotal on said first and second arms about respective first and second pivot axes parallel to said first and second arms at locations thereon spaced from said first and second rotation axes; respective first and second workpiece-engaging elements mounted on said first and second levers at substantially like spacings from said first and second rotation axes, each lever being pivotal between an operative position with the respective element engageable with a workpiece and an inoperative position unengageable with a workpiece; respective first and second cam followers on said first and second levers; a first cam on said second arm engageable in a predetermined angular position of said first and second arms with said first cam follower to pivot said first lever from its inoperative into its operative position; a second cam on said support engageable in said predetermined angular position of said arms with said second cam follower to pivot said second lever from its inoperative into its operative position; respective first and second locking means on said arms each operable for maintaining the respective levers in their operative positions for a predetermined angular travel of the respective lever from said predetermined position; and means for rotating said hubs about their rotation axes in the same direction.

4,044,883

APPARATUS FOR ADVANCING A RIBBON IN OFFICE TYPEWRITERS, TELEPRINTERS, DATA PRINTERS AND THE LIKE

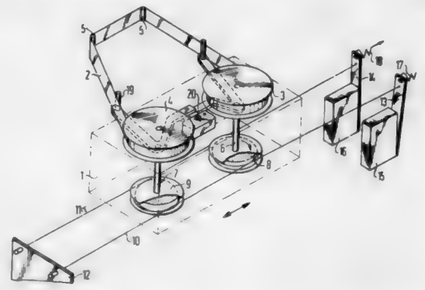
Georg Boehmer, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 25, 1975, Ser. No. 607,192

Claims priority, application Germany, Aug. 30, 1974, 2441694

Int. Cl.[2] B41J *33/32*

U.S. Cl. 197—151 **9 Claims**



1. A ribbon-type printing machine comprising a stationary member, a type carrier carriage mechanism, means for moving said type carrier carriage mechanism relative to said stationary member in a line-typing direction, and a ribbon advancing, mechanism comprising ribbon reel means including a ribbon reel for receiving ribbon windable thereabout upon rotation thereof, drive roller means including a drive roller for rotating said ribbon reel, means rotatably mounting said ribbon reel and said drive roller on said type carrier carriage mechanism for movement therewith in the line-typing direction, means interconnecting said drive roller and said ribbon reel for corotation, a cable fixed at one end to said stationary member extending substantially in parallel relation to said line-typing direction and in tangential relation to said drive roller except for a portion thereof looped around said drive roller for rotating same upon tensioning of said cable relative to said stationary member, and cable tensioning means attached to the other end of said cable for selectively tensioning said cable to rotate said drive roller and said ribbon reel whereby upon tensioning of said cable, the movement of said carriage mechanism relative to said stationary member serves to cause a rotation of said drive roller and a corresponding ribbon advancing movement.

4,044,885

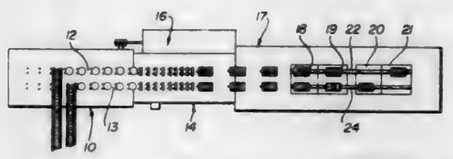
METHOD AND APPARATUS FOR COUNTING AND LOADING ITEMS, PARTICULARLY COOKIES, INTO PACKAGES AND THE LIKE

Edward Rose, Skokie, and Robert A. Roth, Chicago, both of Ill., assignors to Peters Machinery Company, Chicago, Ill.

Filed July 2, 1976, Ser. No. 702,012

Int. Cl.[2] B65G *47/26*

U.S. Cl. 198—419 **12 Claims**



1. Apparatus for conveying items such as cookies and the like, said items being conveyed in two rows in parallel spaced-

apart relation and being of one kind in one of said rows and of another kind in the other one of said rows, said apparatus comprising a counting conveyor means for conveying, counting and separating the items in each of the two rows into spaced aligned groups, a transfer conveyor means forming a continuation of said counter conveyor means, at least a first pair of drop chutes mounted in item receiving relation with respect to said transfer conveyor means, each of said first pair of drop chutes receiving in consecutive fashion one group of items from one of the two rows and one group of items from the other one of the two rows, the outlet of said first pair of drop chutes being in alignment, drop gates forming an item carrying surface of said transfer conveyor means and extending over said first pair of drop chutes and movable laterally to accommodate predetermined ones of said groups of the items in the respective ones of the two rows to drop through said first pair of drop chutes, discharge means for discharging stacked groups of the items to a wrapping machine, and an accumulator means for receiving from the respective ones of the two rows one group of the items dropped through said first pair of drop chutes, for combining said groups of items to form a stacked group of items consisting of half items from one of said rows and half from the other one of said rows, and for delivering said stacked group of items to said discharge means.

4,044,886

SYSTEM FOR HANDLING STRUCTURAL MEMBERS

Wilfred E. Sender, 742 Cooper Ave., Johnstown, Pa. 15906

Filed Dec. 29, 1975, Ser. No. 644,564
Int. Cl.² B65G *47/54*
U.S. Cl. 198—488 **4 Claims**



1. A conveyor system for moving elongated structural members to a saw adjacent a roller conveyor comprising,

a roller conveyor having spaced rollers with an axis of rotation disposed perpendicular to the direction of travel of said roller conveyor,

spaced conveyor members disposed transversely of the direction of travel of said roller conveyor and supported adjacent said roller conveyor,

each said conveyor member comprising,

two large spaced channel members having their webs adjacent to each other and disposed in parallel planes with the flanges of said large channels extending away from each other,

the top surface of each said large channel member being disposed below a plane passing through the top of the rollers of said roller conveyor,

spaced angle members fixed to the lower flanges of said large channel members and extending therebetween,

each said angle member having a top surface inclined upwardly and in a direction toward said roller conveyor,

two spaced small channel members disposed between said large channel members and having their flanges extending toward each other and defining a space therebetween,

a car having a load supporting member disposed in said space between said small channel members,

at least one car wheel on each said of said car,

each said car wheel being disposed in the space between the flanges of a said small channel member,

and making rolling engagement with the upper side of the lower flange of each said small channel member,

spaced cams fixed to the lower sides of said small channel members and resting on said top surface of said angle members,

a hydraulic cylinder having a piston rod,

said hydraulic cylinder and piston rod being connected between said large channel members and said small channel members for moving said small channel members axially between said large channel members whereby said cam surfaces move up and down along said inclined surfaces and said small channel members are moved upwardly in translation relative to said large channel members whereby the top of said car is moved above the level of said rollers and may be moved down,

two spaced sprocket members,

each said sprocket member being supported on an axle extending between said small channel members and supported on said small channel members,

a chain supported on said sprocket members,

said chain being connected to said car between the adjacent ends of the flanges of said small channel members and motor means driving said chain for moving said car along said small channel members,

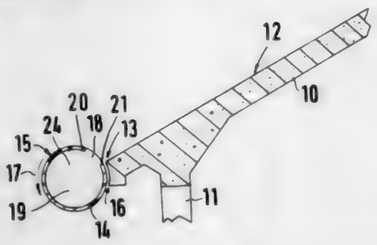
said hydraulic cylinder being adapted to move said small channel members axially relative to said large channel members whereby said car is lifted by said cam to bring the top surface thereof above said large channel members whereby an article supported on said large channel members will be lifted by said car from said large channel members and may be moved toward said roller conveyor by said motor means through said chain.

4,044,887

APPARATUS FOR REMOVING COKE FROM AN INCLINED WHARF

Wilhelm Stog, Waltrop, Germany, assignor to WSW Stahl- und Wasserbau GmbH Selm, Waltrop, Germany

Filed July 26, 1976, Ser. No. 708,874
Claims priority, application Germany, July 25, 1975, 2533394
Int. Cl.² B65G *37/00*; G01F *11/10*
U.S. Cl. 198—526 **7 Claims**



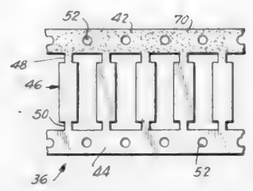
1. In an apparatus for uniformly and controllably removing coke delivered continuously from an inclined wharf without any retaining grate and in combination with a horizontal endless conveyor belt arranged below and extending longitudinally of the lower discharge end of said wharf which has a concave-shaped end surface, a rotatably mounted and continuously driven roll openly disposed at said discharge end of said wharf for uniformly transferring the coke in measured quantities on to said horizontal conveyor, said roll being provided with a circumferential shell enclosing a chamber within the cavity of said hollow roll, said concave-shaped end surface forming a gap with the respective opposite-adjacent surface portion of said circumferential shell, said chamber having a peripheral aperture provided in said circumferential shell, said peripheral aperture extending helically over the periphery and extending longitudinally over the entire length of said roll but only a small portion of the periphery of said chamber.

4,044,888

PREFABRICATED CONTACTS FOR PRINTED CIRCUIT CARD CONNECTORS

Herbert I. Schachter, 86 Campbell St., New Hyde Park, N.Y. 11040

Filed Oct. 23, 1975, Ser. No. 625,090
Int. Cl.² B65P *73/02*; B23P *15/16*
U.S. Cl. 206—330 **23 Claims**



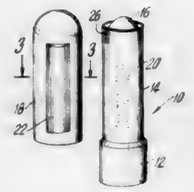
1. An arrangement of conductive contact elements for mounting on a printed circuit board to form an array of serially spaced contacts or terminals at the free ends of a plurality of circuit leads or conductors on the circuit board, the arrangement comprising a pair of elongate spaced carriers which are parallel to each other; a plurality of contacts made from an electrically conductive material and being generally co-planar with said carriers, said contacts being serially spaced along the length direction of said carriers and extending between and being connected at opposing ends to the same to maintain the spacing between said contacts, at least one portion of each of said plurality of contacts being substantially planar and coplanar with at least one of said carriers and configurated to mate with the surface of the printed circuit board to which it is adapted to be abutted, at least one of said pair of elongate spaced carriers positioning said contacts during attachment of the same to the circuit board and said circuit leads or conductors; whereby selective removal of portions of one of said pair of carriers exposes one set of free ends of said contacts for attaching the same to similarly spaced associated free ends of circuit leads or conductors on the circuit board and subsequent severance of the other of said pair of carriers to electrically isolate selected ones of said plurality of contacts.

4,044,889

COSMETIC CONTAINER INCLUDING INTEGRATED LENS STRUCTURE

Seymour Orentreich, 99 Greenway Terrace, Forest Hills, N.Y. 11375, and Joseph Vogelman, 48 Green Drive, Roslyn, N.Y. 11576

Filed Sept. 13, 1976, Ser. No. 722,527
Int. Cl.² B65D *25/54*; G02C *11/02*
U.S. Cl. 206—459 **2 Claims**



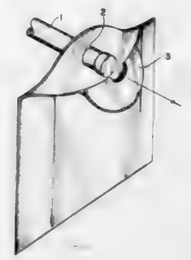
1. A cosmetic container comprising a first member adapted to contain a cosmetic material therein and carrying on an external surface thereof indicia descriptive of said cosmetic material, said indicia being of a relatively small size that is difficult to read with the naked eye, a second cover member placed in overlying relationship with said first member when said container is in a closed condition, said second member including a thin Fresnel lens magnifying element integrally formed as part thereof and conforming in shape to at least a portion of said cover member and thereby constituting a part of the overall aesthetic appearance of said cover member, said Fresnel lens overlying and being in registration with said indicia, such that said Fresnel lens is effective to magnify said small-size indicia on said first member to an apparent size that can be read when the container is in its said closed condition.

4,044,890

METHOD OF STORING HANDLE BAGS

Erik Kramming, Saltsjobaden, Sweden, assignor to Bengt Lundin AB, Arvika, Sweden

Continuation of Ser. No. 415,854, Nov. 14, 1973, abandoned.
This application Nov. 20, 1975, Ser. No. 633,880
Claims priority, application Sweden, Nov. 24, 1972, 7215339
Int. Cl.² B65D *73/00*
U.S. Cl. 206—493 **5 Claims**



1. A bag supporting and dispensing arrangement comprising in combination:

a. a bundle of bags, each bag having only two handle openings consisting of a first handle opening located on one side of the bag and a second handle opening located on the opposite side of the bag, the first handle opening of each bag being aligned with the first handle opening of every other bag in the bundle, the second handle opening of each bag being disposed so that it is out of circumferential alignment with said aligned first handle openings, and

b. an elongated supporting member for slideably supporting said bundle of bags, said elongated supporting member passing through all of the said aligned first handle openings of each bag in the bundle, the discharge end of said supporting member being shaped to inhibit but not prohibit the removal of each first handle opening therefrom, the second handle opening of each bag being closer to the discharge end of the supporting member than the first handle opening of said same bag.

4,044,891

CAN TESTING CONVEYOR

Raymond F. Pynsky, Barrington, Ill., assignor to dun-Rite Erectors, Inc., Elk Grove Village, Ill.

Filed Jan. 12, 1976, Ser. No. 648,270
Int. Cl.² B07C *5/02*
U.S. Cl. 209—73 **9 Claims**

1. A transporter for controlling the movement of articles through a monitoring station whereat a parameter of each article is tested and those articles determined to vary from predetermined limits are removed from the transporter, comprising

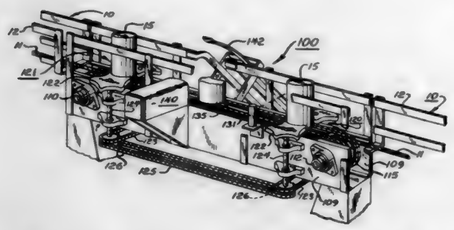
transport means including a pair of spaced transport chains movable in parallel endless paths of movement,

support means positioned in contact with said transport chains forming a fixed support base therefore during a portion of movement in said endless path, guide means carried by said support means and positioned adjacent the path of movement of said transport chains to control lateral movement thereof,

said transport means positionable on-line in a conveying system for transporting articles from an entrance position whereat the articles are conveyed from the conveying system to the transport means through an exit position whereat the articles are passed from the transport means to the conveying system,

index means positioned adjacent said entrance position for controlling the spacing between articles being transported by said transport means,

detecting means positioned adjacent said index means for detecting the presence of an article being transported by



said transport means and producing a control signal in response to the presence of the article,

monitoring means operatively connected to said detecting means and actuable in response to said control signal for testing a parameter of the articles and producing a command signal when the tested parameter varies from a predetermined limit, and

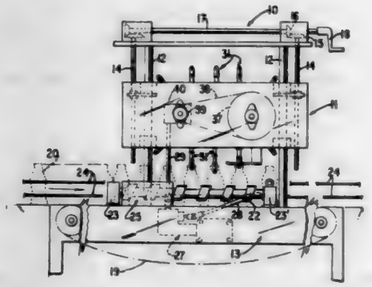
reject means positioned adjacent said transport means and operatively connected to said monitoring means for actuation in response to said command signal to remove articles from said transport means when the tested parameter varies from the predetermined limits.

4,044,892

CONTINUOUS PLUG GAUGER FOR CONTAINER OPENINGS

Theodore G. Loos, Oscawana Heights Road, Putnam Valley, N.Y. 10579

Filed Apr. 26, 1976, Ser. No. 680,196
Int. Cl.[2] B07B *13/04*
U.S. Cl. 209—73 **4 Claims**



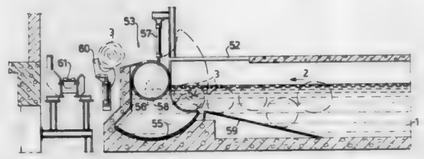
1. In an apparatus for gauging containers, the combination of means for conveying a plurality of containers to be gauged along a straight line, endless chain means disposed above said container conveying means straight line and having a first run spaced above said conveying means straight line and a second run spaced vertically above said first run, a guide frame for said chain means, a plurality of gauging devices mounted upon said chain means and spaced thereon corresponding to the spacing between said containers in said conveying means, each gauging device having a go-no go gauge reciprocally mounted thereon and freely movable axially of said device between an extended gauging position and a retracted position, a horizontally movable pin on said gauge, means for moving said pin horizontally to a reject position when said gauge indicates no go and for returning said pin to its normal non-reject position, means for retracting each of said gauges at the end of said first run, said gauges each remaining in their retracted positions through said second run and moving into their extended positions as each gauge is moved to the beginning of said first run, and said pin moving and returning means comprising first and second cams mounted on said guide frame.

4,044,893

DEVICE FOR LIFTING PIECES OF LUMBER

Rolf Ekholm, Nyland, and Hans Danielsson, Ljusne, both of Sweden, assignors to AB Hammars Mekaniska Verkstad, Nyland, Sweden

Filed Mar. 29, 1976, Ser. No. 671,376
Claims priority, application Sweden, June 27, 1975, 7507383
Int. Cl.[2] B66F *9/04*
U.S. Cl. 214—1 PB **1 Claim**



1. A lumber lifting device for removing pieces of lumber which are free floating in a liquid such as water in an elongate soaking basin, which pieces are fed to the lifting device in their transverse direction, said device comprising:

hoisting means including a concave hoisting surface and a stopping surface connected to said hoisting surface on the bottom of a front outter edge of said hoisting surface;

said basin including an upwardly inclined surface extending from the bottom of said basin toward said hoisting means with an upper edge below the water level of said basin adjacent the surfaces of said hoisting means; and

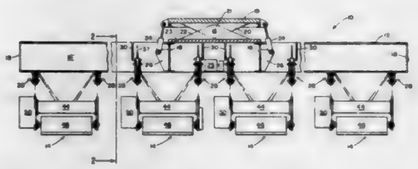
means for rotating said hoisting means less than one-half revolution from a first reception position with said hoisting surface outter edge substantially aligned with said upper edge of said inclined surface below the water level of said basin to receive one or more pieces of lumber and a second dumping position with said hoisting surface above the water level to discharge said pieces of lumber and said stopping surface extending below the water level adjacent said upper edge of said inclined surface to prevent pieces of lumber from interfering with the rotation of said hoisting means.

4,044,894

LOAD TILTING MAGNETIC LIFT

Donald C. McDonald, Sherborn; Roger B. Ela, Spencer, and Francis E. Whittaker, Holliston, all of Mass., assignors to Walker Magnetics Group, Inc., Worcester, Mass.

Filed May 25, 1976, Ser. No. 689,729
Int. Cl.[2] B66C *1/04*
U.S. Cl. 214—1 QD **15 Claims**



1. Apparatus for lifting and rotating an elongate load comprising:

a plurality of electromagnets;

a corresponding plurality of yokes arranged in linear array and pivotally supporting respective ones of said electromagnets for rotation about essentially aligned axes;

a corresponding plurality of stepping motors, each of said motors being resiliently coupled to a respective electromagnet to effect torque sharing between the motors and to allow each motor to gradually engage the load during start-up to minimize stalling, each of said motors being operative to produce precise, incremental rotation of the respective electromagnet about the said aligned axes; and

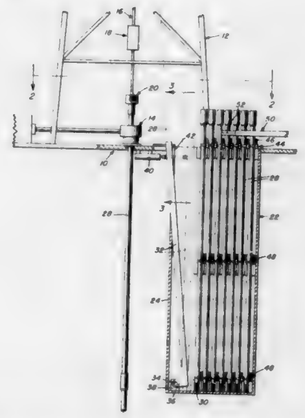
means for energizing said motors for synchronous operation, whereby said elongate load may be lifted by said electromagnets acting together and may be rotated essentially about its longitudinal axis.

4,044,895

PIPE RACKING SYSTEM

Lewell Seidell Adair, Fort Smith, Ark., assignor to Barney Silis Adams, Jr., Fort Smith, Ark.

Filed June 4, 1976, Ser. No. 692,785
Int. Cl.[2] E21B *19/00*
U.S. Cl. 214—2.5 **5 Claims**



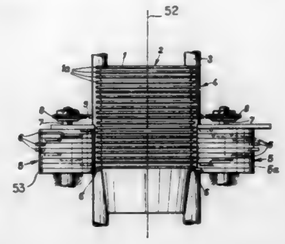
1. A pipe rack system for well drilling apparatus including a platform with a rotary table in operative position thereon and a drilling derrick rising thereover, said pipe rack system comprising a vertically elongated pipe container rigid with and depending from said platform in closely spaced relation to the rotary table, said container opening upwardly through said platform, said container having a base and peripheral walls including a near wall between the container and the rotary table, a pipe rack within said container, pipe handling means operative for a manipulation of pipe within said container, a pipe chute positioned within said container adjacent said near wall for receiving and supporting pipe along the length thereof, said pipe chute being movable between a first substantially vertical position orientating chute-received pipe substantially vertically and in cooperative relationship with the pipe handling means, and a second position inclined toward the rotary table for selective reception of pipe into or discharge of pipe from the container, said chute having a lower end and an upper end, means pivotally mounting the lower end of the chute inward of said near wall, and power means engaged with the chute adjacent the upper end thereof for a pivotal movement of the chute about the lower end between said first substantially vertical position for orientation of pipe in cooperative relationship with the pipe handling means and said second position inclined toward the rotary table for selective reception or discharge of pipe.

4,044,896

APPARATUS FOR DISCHARGING STACKED ARTICLES IN DISCRETE GROUPS

Guenter Reinecke, Solingen-Graefrath, Germany, assignor to Benz & Hilgers GmbH., Dusseldorf, Germany

Filed Sept. 17, 1976, Ser. No. 724,077
Claims priority, application Germany, Oct. 7, 1975, 2544754
Int. Cl.[2] B65G *59/10*
U.S. Cl. 214—8.5 H **4 Claims**



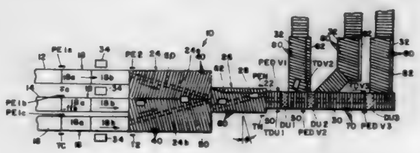
1. In an apparatus for discharging a plurality of stacked articles each having a peripheral rim, means for supporting the plurality of articles in vertically stacked relation, at least a pair of rotatably ganged cylindrical blocking members having vertical axes and disposed in circumferentially spaced relation around the periphery of the rims of the article stack, the blocking members respectively having corresponding axially spaced projections extending horizontally from the periphery thereof and engageable with the lower surfaces of the peripheral rims of the N lowermost successive ones of the stacked articles, and cyclically operable means for progressively moving the successive projections on the blocking members into engagement with the lower ends of the peripheral rims of the N lowermost articles in the stack and for thereafter discharging the N engaged lowermost articles from the bottom of the supporting means, the projection on at least one of the blocking members being adapted to inhibit a downward movement of the stacked articles overlying the lowermost N articles during the engagement and discharge of said N lowermost articles, whereby the articles are discharged from the apparatus in discrete groups of N articles each.

4,044,897

CONVEYOR SORTING AND ORIENTING SYSTEM

Wesley R. Maxted, Grand Rapids, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Jan. 2, 1976, Ser. No. 646,237
Int. Cl.[2] B65G *47/00*
U.S. Cl. 214—11 R **8 Claims**



1. A high speed sorter for sorting packages comprising:

a plurality of infeed conveyors;

a plurality of induction conveyor means coupled with said infeed conveyors for receiving packages from said infeed conveyors;

a merge conveyor means coupled with said induction conveyor means for receiving packages from said induction conveyor means and biasing said packages deposited thereon toward a generally centrally located discharge point, said induction conveyor means discharging pack-

ages on said merge conveyor means in a spaced relationship said merge conveyor means comprising:

a support frame including a longitudinally extending central rail and longitudinally extending spaced side rails;

a first set of power driven rollers rotatably mounted between one of said side rails and said central rail, said rollers being generally parallel to one another and skewed at an angle relative to a line extending perpendicular to said central rail so that said rollers bias articles to converge toward said central rail in the direction of package movement; and

a second set of power driven rollers rotatably mounted between the other of said side rails and said central rail, said rollers being generally parallel to one another and positioned at an angle relative to a line extending perpendicular to said central rail so that said rollers converge toward said central rail in the direction of package movement, whereby packages inducted onto said merge conveyor at transversely spaced points are biased toward the center of said merge conveyor;

alignment conveyor means coupled with said merge conveyor means for receiving packages from said merge conveyor means and biasing each package toward one edge thereof, said alignment conveyor means including longitudinally extending, spaced, parallel, lateral sides and further comprising:

a plurality of longitudinally spaced, coplanar, parallel rollers, said rollers being skewed at an angle relative to a line extending perpendicular to the sides of said alignment conveyor means; and

a longitudinally extending guard rail extending along one lateral side of said alignment conveyor, said rollers converging toward said guard rail in the direction of conveyor movement;

a plurality of destination conveyors; and

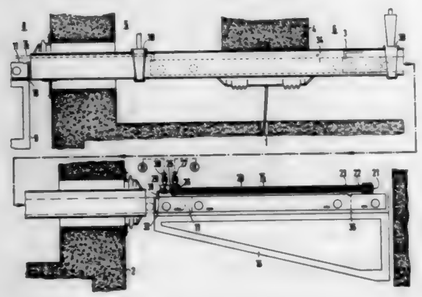
a main discharge conveyor means coupled with said alignment conveyor means, said discharge conveyor means including at longitudinally spaced points adjacent the destination conveyors, a plurality of diverter means for selectively diverting preselected packages to a predetermined one of said destination conveyor.

4,044,898

REACTOR FUEL ASSEMBLY LOCK TRANSPORT

Hans-Peter Schabert; Horst Porner, and Artur Bauer, all of Erlangen, Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed July 7, 1975, Ser. No. 593,382
Claims priority, application Germany, July 16, 1974, 2434180
Int. Cl.[2] F23K *3/00*
U.S. Cl. 214—18 N **6 Claims**



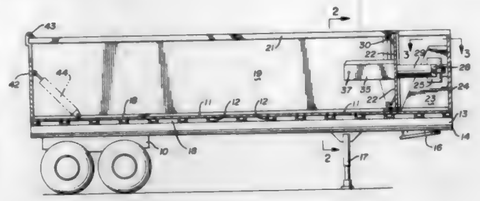
1. A nuclear reactor installation having a containment, a fuel assembly lock extending through the containment, an elongated fuel assembly carriage which is movable lengthwise through the lock, and at least one stationary motor having a drive for moving the carriage; wherein the improvement comprises said drive being formed by a rod that is movable in the lengthwise direction of the carriage, and means for releasably connecting the rod with the carriage, the rod being driven lengthwise by the motor, said means being for connecting the rod with the carriage at two positions spaced apart lengthwise with respect to the carriage.

4,044,899

HORIZONTALLY DISCHARGING SEMI-TRAILER

Howard Booher, Randolph, Ohio, assignor to Robert J. Bruce, New Castle, Pa. and Mark T. Tate, Atwater, Ohio, part interest to each

Filed June 7, 1976, Ser. No. 693,639
Int. Cl.[2] B60D *1/00*
U.S. Cl. 214—82 **7 Claims**



1. In a horizontally discharging semi-trailer having an elongated body with a discharge opening in one end and a movable pusher plate and means for moving the same normally positioned in the opposite end, said elongated body having a smooth floor and smooth inner side walls; said floor comprising a floor plate, a plurality of longitudinally spaced transversely positioned reinforcing members secured to the underside thereof, longitudinally extending frame members secured to the longitudinal sides of said floor plate and reinforcing members, a pair of transversely spaced longitudinally extending beams having notches therein registering with said reinforcing members and secured thereto and to said floor plate and a secondary plate positioned between said beams and secured to the bottoms thereof, the side walls of said elongated body comprising substantially vertically standing wall plates attached to and extending upwardly from said longitudinally extending frame members, rails positioned on the upper longitudinal edges of said wall plates and a plurality of longitudinally spaced vertically standing tapered secondary reinforcing members secured to the outer surfaces of said wall plates and attached at their upper and lower ends to said rails and frame members respectively so that said side walls form rigid truss-like members continuously engaged on and supporting said floor therebetween.

4,044,900

AUTOMOBILE TOWING DEVICE

Richard J. Gaumont; Maurice Leonard Wolfe, both of Los Angeles, and Robert Lee Collins, Culver City, all of Calif., assignors to West Manufacturing & Towing Equipment Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 631,669, Nov. 13, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 745,610
Int. Cl.[2] B60P *3/12*
U.S. Cl. 214—86 A **5 Claims**

1. In an automobile towing device for towing a vehicle with a tow truck having a boom for lifting and supporting the vehicle and a hydraulic cylinder for driving the boom pivotally upwardly and downwardly wherein the improvement comprises:

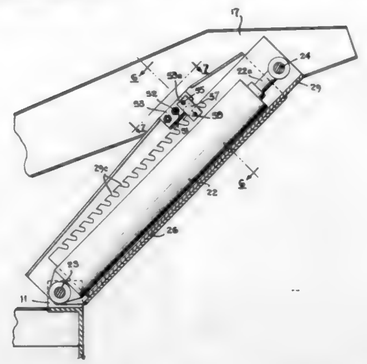
a hollow support member,

a hollow bracing post slidably mounted within said support member, said cylinder being mounted within said bracing post,

means for pivotally supporting said cylinder and said support member on said tow truck,

means for pivotally attaching the ram of said cylinder and said bracing post to said boom for pivotal motion about a common pivot axis,

said bracing post being U-shaped and having a plurality of paired canted slots formed along the edges of the opposing walls thereof, and



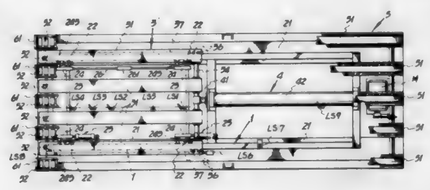
pawl mechanism means pivotally mounted on said support member for successively engaging the bracing post in pairs of said slots as said bracing post is driven upwardly along the support member, thereby to prevent downward motion of said bracing post when the bracing post is stopped with the pawl mechanism means engaged in a pair of said slots.

4,044,901

GOODS DISCHARGING APPARATUS

Masateru Tokuno, Nishinomiya, Japan, assignor to Rengo Co., Ltd., Osaka, Japan

Filed Apr. 30, 1975, Ser. No. 573,253
Claims priority, application Japan, Dec. 18, 1974, 49-145915
Int. Cl.[2] B65G *65/02*
U.S. Cl. 214—89 **8 Claims**



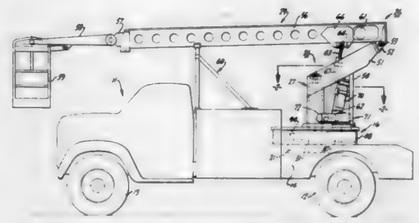
1. A goods discharging apparatus comprising a vertically movable platform, means for lifting said movable platform up and down, including a pair of shafts arranged substantially parallel to each other and rotatably supported by bearings disposed in a base frame, two pairs of arms each of which is secured at its middle portion to each end of each of said shafts, with the upper ends of said respective arms being pivotally secured to said movable platform, two piston-cylinder means, each having its cylinder tube pivotally secured to said base frame, with the piston rod of each of said piston-cylinder means being pivotally secured to the lower end of the corresponding one of said arms which are in turn secured to the corresponding ends of said shafts, and a connecting rod pivotally secured at both of its ends to the lower ends of said respective arms which are secured to the other ends of said shafts, a goods support means mounted on said movable platform, said goods support means extending from the movable platform, means mounted on said movable platform for moving said goods support means in the forward and backward directions, conveyor means having a goods conveying surface, said conveyor means being arranged such that said goods support means can be raised up from the goods carrying surface of said conveyor means with the vertical movement of said movable platform, said goods support means also projecting out from the conveyor means at the same time as it projects out from said movable platform, a checking means disposed at the discharge end of said conveyor means so as not to impede the forward or backward movement of said goods support means, said checking means being provided with a pawl portion which is positioned lower than the upper surface of the goods support means when the goods support means is disposed in its raised position and higher than the upper surface of said goods support means when said goods support means is disposed in its lowered position.

4,044,902

AERIAL LIFTING EQUIPMENT

Jay M. Eitel, Atherton, Calif., assignor to General Cable Corporation, San Carlos, Calif.

Continuation of Ser. No. 615,238, Sept. 22, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,553
Int. Cl.[2] E02F *3/70*
U.S. Cl. 214—132 **8 Claims**



1. In a lifting equipment, a platform, a support structure, means rotatably mounting the support structure upon the platform for rotation about a substantially vertical axis, a boom structure mounted on the support structure for movement about a substantially horizontal axis and drive means mounted upon said platform and said support structure for causing rotation of said support structure about said substantially vertical axis, said drive means including a track structure mounted in a fixed position on the platform, said drive structure having a circular track surface, at least three spaced friction members offset from the vertical axis and adapted to engage the circular track surface, motive means for driving only one of said three friction members, said motive means including a motor having an output shaft and speed reducing gearing connecting the output shaft of the motor to said one friction member, said one friction member being in the form of a wheel assembly having an outer tire, said speed reducing gearing including a gear assembly mounted within the confines of the wheel assembly and means for applying a preload force to said one friction member to yieldably urge said outer tire into engagement with said circular track surface, said means for applying a preload force including means for applying a yieldable force to at least one of said three friction members other than said one friction member to yieldably urge said at least one friction member into engagement with said circular track surface whereby a preload force is applied to said one friction member which is sufficient to permit said boom structure to sustain heavy side loading.

4,044,903

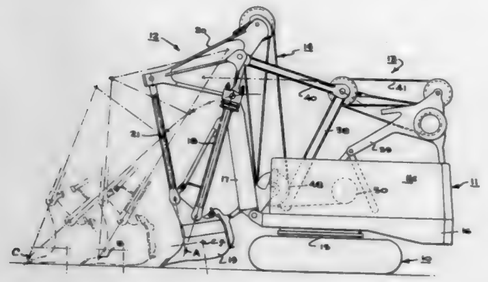
SPECIFIC LINKAGE ARRANGEMENT FOR BUCKET CONTROL

George B. Baron, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio

Filed Mar. 19, 1975, Ser. No. 559,963
Int. Cl.[2] E02F *3/62*
U.S. Cl. 214—138 R **14 Claims**

1. A power shovel comprising a base unit; a support unit rotatably mounted on said base unit; a front end assembly including a stiffleg pivotally connected at a lower end thereof

to said support unit, a dipper handle operatively connected to said stiffleg, a dipper having a forwardly disposed digging end pivotally connected to said dipper handle, said dipper being biased to pitch the forwardly disposed digging end thereof upwardly, means for limiting the upward pitch of the digging end of said dipper relative to said dipper handle, a hoist frame pivotally connected to said stiffleg, and a hoist link pivotally connected at the ends thereof to said hoist frame and said dipper, said dipper handle, hoist link and hoist frame defining a four bar linkage; a crowd system operatively interconnecting said support unit and said front end assembly; a hoist system operatively interconnecting said support unit and said front end assembly; and control means mounted on said support



means for operating said crowd and hoist systems to crowd, hoist, lower and retract said dipper, said four bar linkage having a geometry wherein the point of intersection of the longitudinal centerlines of said hoist link and said dipper handle is confined to the lower and forwardly disposed quadrant of a set of coordinates having the center of gravity of the dipper defining the origin of the set of coordinates, said coordinates being parallel and perpendicular to a longitudinal centerline of said dipper and said quadrant thereof including said forwardly disposed digging end of said dipper, and said point of intersection is positioned inwardly of the bottom surface of said dipper when said dipper is in a retracted position, pitched upwardly and restrained by said pitch limiting means.

4,044,904

METHOD OF FEEDING PARTICLES FROM A FIRST REGION TO A SECOND REGION

Harold E. Trumbull, and Dean F. Poeth, both of Columbus, Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Aug. 25, 1975, Ser. No. 607,203
Int. Cl.[2] B65G *65/30*
U.S. Cl. 214—152 **3 Claims**

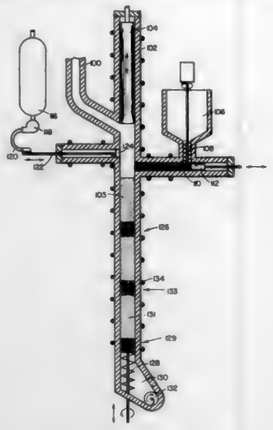
1. A method of feeding a material comprising solid particles from a first region at a first pressure to a second region at a substantially different second pressure, comprising

conveying the material from the first region into an elongate tube connected to communicate between the first region and the second region,

providing a plurality of movable sealing zones in the tube, each sealing zone comprising a mixture of solid particles and an added liquid contacting the inner wall of the tube, to provide a substantially fluid-tight seal between the second region and at least a substantial portion of the tube communicating with the first region while the material is being conveyed from the first region into the tube,

forcing the material and sealing zones through the tube toward the second region, and

conveying the material, and at least one of the sealing zones, from the tube into the second region by boring into the at



least one sealing zone and the material with an auger and then retracting the auger into the second region.

4,044,905

METHODS AND APPARATUS FOR TRANSFERRING REFUSE

Harvey W. Liberman, Knoxville, and John C. Salyers, Oak Ridge, both of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,757
Int. Cl.[2] B65G *67/20*
U.S. Cl. 214—152 **5 Claims**

1. Refuse handling process comprising:

depositing a container on a carriage;

aligning the forward end of the container with the discharge opening of a packer assembly;

displacing said carriage toward said packer assembly, said container having a movable wall situated near a forward end thereof, said wall being movable away from said forward end;

packing refuse from said packer assembly through said forward end into said container while progressively displacing said movable wall rearwardly under the urgings of oncoming refuse;

subsequently displacing said container from said packer assembly, placing said container on a support at an unloading site, and aligning said movable wall with an extendable-retractable power ejector means mounted on said support;

extending said ejector means toward said container wall so that said ejector contacts and pushes said movable wall forwarding toward said end, thereby discharging refuse from the container through said forward end;

retracting said ejector, leaving said movable wall in a forward position; and

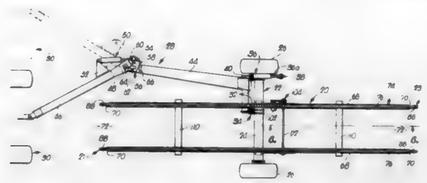
transporting said container to a loading site.

4,044,906

MULTIPLE ROUND BALE MOVER

Thomas Gene Schrag; Merle Keith Burkhart, and Harold Keith Garrison, all of Newton, Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 11, 1975, Ser. No. 603,359
Int. Cl.[2] B60P *1/16*
U.S. Cl. 214—506 **18 Claims**



1. In a transporting implement for cylindrical crop bales:

an elongated, normally horizontal support bed including a pair of laterally spaced beams extending longitudinally between opposite ends of the bed and terminating in outermost tips;

a continuous, flexible conveying element having an uppermost stretch extending along the top surface of each of said beams respectively;

means for selectively tilting the bed in either of two opposite directions about a transverse, horizontal axis to place a selected end of the bed close to the ground for loading;

a transverse stub shaft at each of the four tips of the beams, respectively,

the two stub shafts at each end of the bed being axially aligned but physically spaced apart in accordance with the distance between the two beams;

a guide associated with each stub shaft, respectively, and supported for rotation about the axis of the stub shaft to entrain the corresponding element; and

reversible means for driving said elements in unison along the bed in either of two opposite directions,

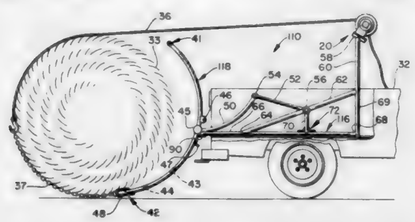
said bed at both of its opposite ends being devoid of structure spanning the beams whereby to define unobstructed areas from the tips inwardly that permit the beams to straddle a bale during endwise loading of the same from either end of the bed.

4,044,907

HAY HANDLER

Carl R. Craft, Rte. 1, Box 15, Kempner, Tex. 76539

Filed Apr. 26, 1976, Ser. No. 680,158
Int. Cl.[2] B60P *1/04*
U.S. Cl. 214—506 **14 Claims**



1. Hay loading and transporting apparatus comprising a main frame having opposed sides, a forward end, and a trailing end;

a cradle in the form of an upwardly opening, elongated, segment of a cylinder having an open framework and providing a leading edge spaced from a rear edge and opposed end members;

a winch, a cable means, means by which one end of said cable is attachable to said rear edge, with the remaining marginal cable end being rove about said winch such that the cable is extensible from and movable towards said winch, means mounting said winch in proximity of said forward end of said main frame;

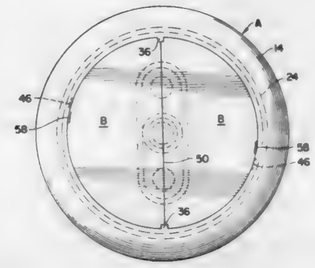
mount means affixed to said main frame for pivotally supporting said cradle at an off-center location underlying said cradle, said mount means moves said cradle from a retracted position closely adjacent said main frame into an extended position spaced from said main frame with an over-the-center movement to thereby enable said cradle to be extended away from said main frame and pivoted into a position to place a marginal rear edge portion of the cradle at ground level, and the main frame thereafter moved in a direction towards said rear edge in order to engage a bale of hay with said rear edge, a marginal length of said cable can then be forced under the bale, whereupon the cable is then tightened to move the bale of hay into the cradle and thereafter pivotally move the cradle into the retracted position, thereby loading the bale and enabling the bale to be transported to another geographical location.

4,044,908

COVER FOR ELECTRICAL FLOOR BOXES

George R. Dauberger, Pittsburgh, Pa., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Dec. 31, 1975, Ser. No. 645,683
Int. Cl.[2] H02G *3/08*
U.S. Cl. 220—3.8 **7 Claims**



1. A support member having an opening therein, said opening having an outer peripheral edge, a shoulder spaced inwardly from said opening peripheral edge, and an opening peripheral wall extending between said shoulder and said opening peripheral edge, a two-piece cover received in said opening and having outer and under surfaces, the outer peripheral portion of said undersurface being supported on said shoulder, said cover having a cover peripheral wall facing said opening peripheral wall, said cover being formed of two generally flat members having mating walls extending across said opening to define a joining line, said cover peripheral wall having detents extending outwardly therefrom on opposite sides of said joining line, said opening peripheral wall having recesses releasably receiving said detents, said flat members having rabbets in said outer surface at the opposite ends of said joining line, and inwardly extending abutments on said opening peripheral wall received in said rabbets.

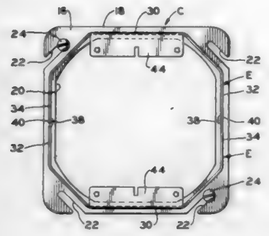
6. A half part cooperable with a like half part to form a cover for an opening in a support member or the like comprising; a generally flat member having outer and under surfaces and generally opposite corners, a mating wall extending generally across said corners for mating with a like mating wall on a like flat member, a peripheral wall extending around said flat member generally between said corners, tab means extending outwardly from said peripheral wall intermediate said corners for reception in a recess to releasably lock said flat member in an opening, and a rabbet in said outer surface adjacent at least one of said corners for receiving a projection to aid in releasably locking said flat member in an opening.

4,044,909

TILE WALL COVER

David C. Amsler, Pittsburgh, and William E. Wagner, Elizabeth, both of Pa., assignors to Midland-Ross Corporation, Cleveland, Ohio

Filed Nov. 15, 1976, Ser. No. 741,728
Int. Cl.² H02G 3/12
U.S. Cl. 220—3.8 **6 Claims**



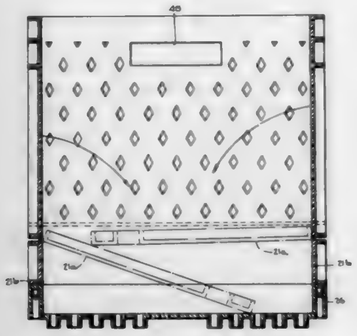
1. In a tile wall cover for electrical outlet boxes including a substantially flat plate having mounting means adjacent the outer periphery thereof for mounting same to an electrical outlet box and having a large opening therethrough inwardly of said mounting means, and a ringlike extension welded to said plate in surrounding relationship to said opening, the improvement comprising; said extension being formed from a pair of substantially identical generally U-shaped members each having a base and opposite first and second legs, said first leg on each said member having an offset terminal end portion offset toward said second leg a distance generally equal to the thickness of the material from which said member is made to form a rabbet on the outer surface of said first leg, said pair of members being reversely positioned with the rabbet on the first leg of each member receiving the terminal end portion of the second leg on the other member.

4,044,910

COLLAPSIBLE CRATE

Theodor M. Box, 1108 Aileen Road, Brielle, N.J. 08730

Filed May 5, 1976, Ser. No. 683,390
Int. Cl.² B65D 7/24, 9/14
U.S. Cl. 220—7 **7 Claims**



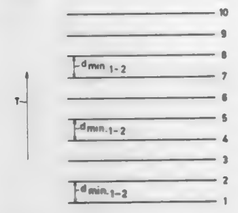
1. A collapsible shipping crate comprising a base portion having vertical flanges extending from its outer edges, two inwardly folding side wall members and two inwardly folding end wall members, said wall members being attached to the respective upper edge portions of said vertical flanges, said wall members each having a hinge dividing the wall members into an upper and lower portion, the lower portions of said end wall members extending to a greater height than the lower portion of said wall members such that the upper end wall members fold and overlie the upper side wall members when the crate is in its collapsed position and a plurality of stops and latches located on the vertical edges of the upper wall portions for locking the wall members in an upright position when assembled, said wall members each having a plurality of plug means depending from the lower edges thereof, and respective complementary socket members in the upper edge portion of said vertical flanges receiving said plug means to affix said walls to said flanges.

4,044,911

HEAT INSULATION SYSTEM

Clifford McDonald Hargreaves, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 483,612, June 27, 1974, abandoned.
This application Jan. 19, 1976, Ser. No. 650,368
Claims priority, application Netherlands, July 13, 1973, 7309766
Int. Cl.² F16L 59/08; F17C 3/08
U.S. Cl. 220—9 LG **3 Claims**



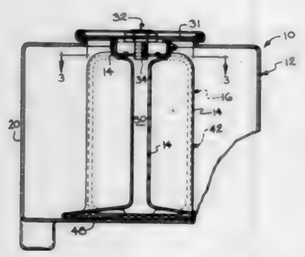
1. In a heat insulation system suitable for cryogenic apparatus and including a plurality of spaced layers of a radiation-reflecting material, the improvement comprising the spacing apart of each two adjacent layers having facing surfaces by a distance d_{min} which satisfies the relationship: $d_{min} = (0.1/T)$, where d_{min} is expressed in cm. and T = the mean operational temperature of the two layers expressed in ° K.

4,044,912

LINED CONTAINER FOR STORING AND TRANSPORTING THICK VISCOUS SUBSTANCES SUCH AS GREASE HAVING ANTI-CLOGGING LINER SUPPORT

Dwight E. Nichols, Beatrice, Nebr., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed June 4, 1976, Ser. No. 693,101
Int. Cl.² B65D 25/16
U.S. Cl. 220—63 R **5 Claims**



1. In a container for storing and transporting material, an upright collapsible bag having a single opening at the upper end thereof, and a spacer assembly disposed inside said bag and aligned with said opening, said spacer assembly comprising a central hub member and a plurality of spaced apart frame members radiating outwardly from said hub member, said hub member being annular in shape and being secured to said frame members at the upper ends thereof, said hub member being

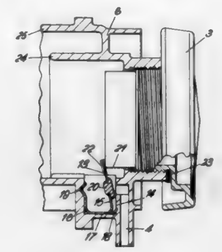
disposed within the open upper end of said bag member, means securing said hub member in fluid tight relation to said upper end of said bag member, each of said frame members being of generally C-shape so that each has a main upright portion and laterally extending end portions, the end portions at the upper ends of said frame members being secured to said hub members, and a base member secured to the end portions at the lower ends of said frame members.

4,044,913

VALVE MECHANISMS

Stig Erik Brunnert, Vanersborg, Sweden, assignor to Saab-Scania AB, Sodertalje, Sweden

Filed Feb. 19, 1976, Ser. No. 659,341
Claims priority, application Sweden, Feb. 21, 1975, 7501957
Int. Cl.² B65D 25/00
U.S. Cl. 220—86 R **8 Claims**



1. In a container for holding a liquid, a filling pipe having an inlet which is closable by a removable cap and an outlet disposed in said container, at least one air-ventilating line which opens into an internal recess defined in the inner surface of the filling pipe adjacent the filling pipe inlet end, and a valve mechanism for said air-ventilating line, the improvement which comprises, said recess being of parallelepipedic configuration and extending transversely of said filling pipe with said air-ventilating line opening in an axial wall of said recess, a spring comprising a double-bent U-shaped plate spring having two legs and a web portion connecting said legs mounted in said filling pipe and tensioned against the walls of said recess so that its legs are spaced apart in the longitudinal direction of said filling pipe, said plate spring having a part thereof extending into the through-passage of said filling pipe, a seal carried by said plate spring and arranged to close the connection to the air-ventilating line, and an axial sleeve extension provided on said cap arranged, when said cap is mounted on said filling pipe, to engage and urge said plate spring, via its extension, in a manner to cause the connection to the airventilating line to be opened.

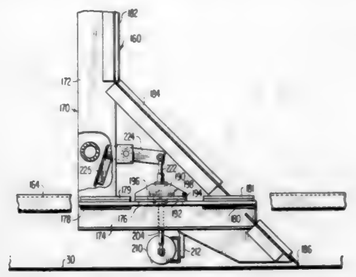
4,044,914

REFUSE CONTAINER

Donald J. Hopkins, Knoxville; John C. Salyers, Oak Ridge, and Paul L. Goranson, Knoxville, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1975, Ser. No. 641,371
Int. Cl.² B65D 25/10
U.S. Cl. 220—93 **7 Claims**

1. A transportable refuse container comprising:
walls defining a tubular body having a pair of ends;
slideable bulkhead means within the body and displaceable between the pair of ends;
end closure means hingedly connected to one end of the body, openable for container unloading, and having an opening for filling the container;
the other end of the body having an opening operable to receive means for advancing the bulkhead means; and
frictional resistance means carried by the bulkhead means, operable to frictionally resist movement of the bulkhead means relative to the container, and releasable during movement of the bulkhead means toward the end closure



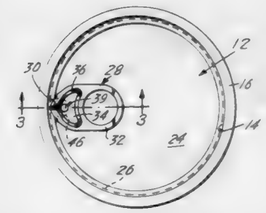
means so that the force necessary to advance the bulkhead means is minimized.

4,044,915

CONTAINER END CLOSURE

Leonard Thomas LaCroce, Paramus, and Charles Stephan Radtke, Little Ferry, both of N.J., assignors to American Can Company, Greenwich, Conn.

Filed July 22, 1976, Ser. No. 707,533
Int. Cl.² B65D 41/32
U.S. Cl. 220—270 **10 Claims**



1. A container end closure comprising: a wall having an at least partially removable panel defined therein by a rupturable primary score, said panel having formed therein at least a portion of a double-folded band adjacent said primary score; an opening tab having a nose portion at one end and a handle portion at its other end; means for securing said tab, intermediate said end portions thereof, to the outer surface of said panel, so that said nose portion is disposed adjacent said primary score and said band portion; and a hinge section defined in said panel by a rupturable, generally U-shaped ancillary score, the loop portion of said ancillary score being disposed about said securing means with its two leg portions having end regions presented toward and terminating adjacent said band portion and said nose portion of said tab, so that lifting of said handle portion of said tab is operative to rupture said ancillary score through a region terminated by said band and elevate said hinge section while forcing said nose portion thereof downwardly to initiate rupture of said primary score, subsequent rearward force on said tab causing further rupture of said primary score to effect at least partial removal of said panel.

4,044,916

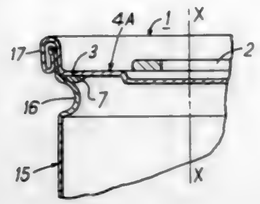
CONTAINERS HAVING PROTECTIVE OPENING EDGES

John Beveridge, Uxbridge, England, assignor to Metal Box Limited, England

Filed Dec. 23, 1975, Ser. No. 643,649
Int. Cl.² B65D 41/32
U.S. Cl. 220—270 **5 Claims**

2. An easy opening container comprising a tubular body and a closure secured to one end of said body by a seam, said

closure including an end panel, said body having a circumferentially disposed continuous bead inwardly directed and underlying said end panel in closely spaced relation thereto, said closure being of the easy opening type and including a circumferential score formed in said end panel in overlying relation to said bead, said score dividing said end panel into a removable panel portion and a non-removable panel portion, said non-removable panel portion having an inner periphery overlying



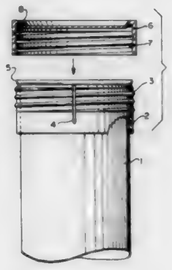
said bead, and a band bonded to said removable panel portion and extending across said score and overlapping said non-removable panel portion, at least a portion of said band being disposed between said bead and said non-removable panel portion, said band being arranged to mask the edge of said removable panel portion and said bead being arranged to mask the edge of the non-removable panel portion when said removable panel portion is removed.

4,044,917

CLOSURE ELEMENT FOR A CONTAINER

James Vella, 504 Walker St., SW., Vienna, Va. 22180

Filed June 30, 1976, Ser. No. 701,205
Int. Cl.² B65D *45/32*
U.S. Cl. 220—288 **9 Claims**



1. A stretchable, externally-threaded collar member which is adapted to cooperate with an internally-threaded cap member to form a closure for a container, said threaded collar member containing at least one slot which extends for a distance from one open end thereof, the stretchable nature of said threaded collar and the presence of said slot enabling said threaded collar to be mounted over a top lip of the container and positioned around the neck of said container beneath said lip.

4,044,918

HIGH TEMPERATURE, QUICK ACCESS DOOR FOR HIGH VACUUM CHAMBERS

Lyna J. Altes, Boulder Creek, Calif., assignor to Huntington Mechanical Laborstories, Inc., Mountain View, Calif.

Filed June 16, 1975, Ser. No. 586,961
Int. Cl.² B65D *45/28*
U.S. Cl. 220—314 **9 Claims**

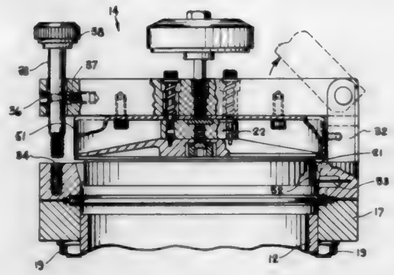
3. A high temperature, quick access door for a high vacuum chamber and the like comprising:

a rim circumscribing with a bakeable metal sealing surface an opening into a high vacuum chamber to be closed;

a sealing disc for closing said opening having a bakeable metal peripheral sealing edge shaped to hermetically mate conformably with said bakeable sealing surface of said rim with a hermetic fit sufficient to separate a vacuum of 10^{-6} torr within said chamber from atmospheric pressure;

a support arm for said disc selectively securable across said opening to support said disc in front of said opening in position for registry therewith;

means mounting said sealing disc on said support arm for selective movement between a registering position in which said sealing disc closes said opening with its sealing edge hermetically engaging said sealing surface and a retracted position in which said disc is spaced from said opening and its sealing edge is hermetically disengaged from said sealing surface, said mounting means including drive means for applying force centrally to said disc when it is in said registering position to hermetically engage said



sealing edge of said disc with said sealing surface of said rim, the skirt of said disc providing said sealing edge being generally a right circular section of a cone tapering inwardly away from said opening when it is supported by said support arm in front of said opening, whereby upon said drive means applying said force to said disc it applies axial compression of said disc into said opening to generate peripheral expansion of said disc in the plane of said opening and hermetically engage said sealing edge and said sealing surface with high vacuum sealing pressure, and wherein the thickness of a circumferential skirt portion of said sealing disc decreases radially outward of said disc toward said sealing edge to provide said skirt portion with increasing flexibility toward said sealing edge for accommodating hermetic sealing engagement of said edge with said conical sealing surface under the action of said drive means.

4,044,919

THERMOPLASTIC BAG DISPENSING ASSEMBLY

Robert H. Olson, Pittsford, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 552,076, Feb. 24, 1975, abandoned. This application Sept. 2, 1975, Ser. No. 609,269
Int. Cl.² B65D *85/67*
U.S. Cl. 221—63 **4 Claims**

1. A thermoplastic bag dispenser assembly comprising a dispenser carton containing a plurality of thermoplastic bags mounted on and folded about a resilient insert member, said bags having an open mouth and a closed bottom said closed bottom portions being folded underneath said insert member and said open mouth portions resting on the upper surface of said insert member, said carton comprising coextensive bottom, top, front and rear walls and an end wall at each opposed end of the carton, said top and front walls having a longitudinally extending tear strip defined by a pattern of perforations which extend in an oval-like configuration around a common longitudinal edge of the carton top and front wall, said thermoplastic bags being characterized by having transversely extending, spaced-apart and substantially parallel ribs, said ribs being solid, continuous and formed as an integral part of said thermo-

plastic bag, and said bags being positioned on said resilient insert member so that, upon removal of said tear strip from said



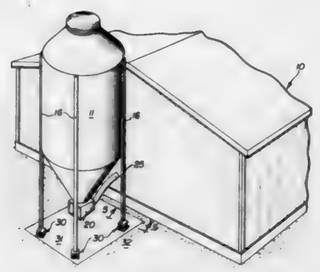
carton thereby forming a bag dispensing orifice, individual bags are dispensed from said carton with the open mouth of said bag in an upright position and ready for loading.

4,044,920

LOAD CELL AND CONTROL FOR BULK BIN

Ray E. Swartzendruber, Syracuse, Ind., assignor to Chore-Time Equipment, Inc., Milford, Ind.

Filed Feb. 2, 1976, Ser. No. 654,165
Int. Cl.² B67D *5/08*; G01G *3/14*; G01L *5/12*
U.S. Cl. 222—58 **28 Claims**



1. A load cell for measuring the weight of a feed container bin and any feed contained therein, the combined weights acting in a given direction, comprising slug means aligned in a predetermined direction and capable of being deformably strained in response to the weight of the bin and any feed applied to the load cell, transducer means connected to the slug means and having an electrical characteristic corresponding to the strain caused to the slug means, and support means for maintaining the slug means in a predetermined orientation relative to the direction in which the weight forces of the container bin and any feed contained therein are applied to the load cell, said support means including a foot adapted to support said slug means at one slug means end, a first cylinder extending upwardly from the foot, first and second annular disks affixed to the first cylinder, a second cylinder affixed to the first and second disks but spaced apart from the slug, foot and first cylinder so as to be cantilevered from the first cylinder, and a cap affixed to the second cylinder and adapted to engage the slug means at an opposite end to maintain the slug means in a desired orientation, and including a cap disk affixed to the second cylinder, and a cap plug carried by the cap disk for engaging the slug means and adjustable through a range of positions relative to the cap disk.

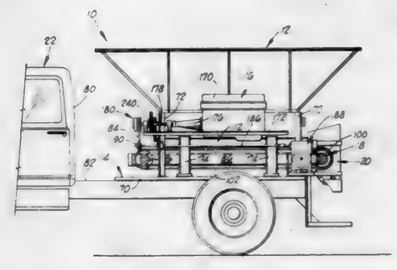
3. A load cell for measuring the weight of a feed container bin and any feed contained therein, the combined weights acting in a given direction, comprising slug means aligned in a predetermined direction and capable of being deformably strained in response to the weight of the bin and any feed applied to the load cell, transducer means connected to the slug means and having an electrical characteristic corresponding to the strain caused to the slug means, and support means for maintaining the slug means in a predetermined orientation relative to the direction in which the weight forces of the contained bin and any feed contained therein are applied to the load cell, said support means including a foot adapted to support said slug means at one slug means end, a first cylinder extending upwardly from the foot, first and second annular disks affixed to the first cylinder, a second cylinder affixed to the first and second disks but spaced apart from the slug, foot and first cylinder so as to be cantilevered from the first cylinder, and a cap affixed to the second cylinder and adapted to engage this slug means at an opposite end to maintain the slug means in a desired orientation, and jack support means for selectively and directly supporting said cap upon said first cylinder to release strain upon said slug means for load cell servicing.

4,044,921

SAND BAG FILLING APPARATUS

Warren R. Caverly, 900 S. Beard, Shawnee, Okla. 74801

Filed Apr. 12, 1976, Ser. No. 675,800
Int. Cl.² B67D *5/12*
U.S. Cl. 222—74 **10 Claims**



1. An apparatus for receiving bulk sand and for bagging the sand, comprising:

a frame assembly;

a hopper assembly supported by the frame assembly and comprising a hopper having a discharge opening, the hopper assembly being further characterized as comprising agitating means for imparting lifting energy to the sand contained in the hopper, the agitating means being characterized as comprising:

a first longitudinal member journally supported in the hopper;

a plurality of radially extending arm members connected to the first longitudinal member in a spatial pattern wherein the sand is caused to be fluffed by the arm member as the longitudinal member is rotated;

a second longitudinal member journally supported in the hopper in generally parallel relationship to the first longitudinal member;

a plurality of radially extending arm members connected to the second longitudinal member in a spatial pattern wherein the sand is caused to be fluffed by the arm members as the second longitudinal member is rotated, the arm members of the second longitudinal member meshingly cooperating with the arm members of the first longitudinal member;

a third longitudinal member journally supported in the hopper in generally parallel relationship to the first longitudinal member and the second longitudinal member;

a plurality of radially extending arm members connected to the third longitudinal member in a spatial pattern wherein the sand is caused to be fluffed by the arm members as the third longitudinal member is rotated, the arm members of the third longitudinal member meshingly cooperating with the arm members of the

first longitudinal member and the second longitudinal member; and

rotating means for rotating the first longitudinal member, the second longitudinal member, and the third longitudinal member;

a conveyor assembly supported by the frame assembly comprising a conveyor belt disposed spatially in sand receiving relationship to the discharge opening;

power means connected to the conveyor assembly for selectively powering the conveyor belt in an actuated mode;

a bag chute supported by the frame assembly and disposed spatially in sand receiving relationship to the conveyor belt; and

actuating means for selectively actuating the power means to transmit driving power to the conveyor belt.

4,044,922

PROTECTIVE DEVICE

Lewis O. Bordelon, 300 Dulles St., Lafayette, La. 70501

Filed May 25, 1976, Ser. No. 689,866

Int. Cl.[2] B65D *83/14*; B05B *15/06*

U.S. Cl. 222—183 **10 Claims**



1. An anti-personnel spray container having article retaining means, said container comprising a case having a cap removably fastened to the body of the case, a replaceable aerosol cartridge containing a fluid immobilizing agent under pressure enclosed in the main body of the case, said cartridge having a nozzle with a central opening therein, said nozzle extending into the cap, the cap having a central opening on the end thereof in alignment with the opening of the nozzle, mechanism within the container to effectuate release of the fluid under pressure, and pivotally mounted hook means associated with said mechanism and extending to the outside of the cap which acts both as a safety latch to prevent release of fluid under pressure and alternately as a push button to trigger the mechanism to release the fluid under pressure.

4,044,923

FOAM GENERATING DISPENSER HAVING A MOVABLE AND STATIONARY POROUS ELEMENT

Jack C. Gardner, College Park, Ga., assignor to Glasrock Products, Inc., Fairburn, Ga.

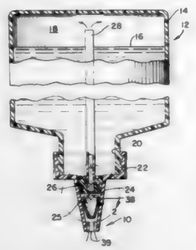
Filed May 19, 1976, Ser. No. 687,762

Int. Cl.[2] B65D *37/00*; B67D *5/58*

U.S. Cl. 222—190 **11 Claims**

1. In a low pressure foam generating and dispensing device having a receptacle for containing foamable liquid and air, a nozzle near one vertical extremity of the receptacle and having internal surfaces to define a discharge passageway open at one end to the receptacle interior and to a foam discharging opening at its other end, at least a portion of the discharge passageway being defined by an outwardly converging frusto-conical interior surface, a mixing subassembly connected to the one end of the discharge passageway and having an imperforate tube extending to and opening near the other vertical extremity of the receptacle, and a one-way air return passage operative to pass air into the receptacle upon a reduction of pressure within the receptacle to below atmospheric pressure, the improvement comprising:

a movable form sustaining porous element positioned in the discharge passageway between the mixing subassembly a frusto-conical portion of the discharge passageway, said movable porous element being larger than the small end of the frusto-conical portion and smaller than the transverse area of the discharge passageway at the mixing subassembly, whereby said movable porous element moves against the internal frusto-conical surfaces of the nozzle upon discharge of a foamable liquid and air mixture from the receptacle to cause passage of the discharged mixture through the movable porous element and whereby the movable porous element moves toward the mixing subassembly to allow air to return to the interior of the receptacle around said movable porous element and through the air return passage.



4,044,924

ADJUSTABLE PROGRESSIVE DISTRIBUTOR VALVE

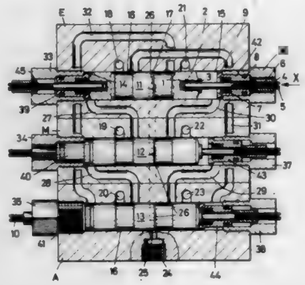
Horst Saretzky, Ennepetal, Germany, assignor to De Limon Fluhme & Co., Dusseldorf, Germany

Filed July 28, 1975, Ser. No. 599,587

Claims priority, application Germany, Aug. 3, 1974, 2437473

Int. Cl.[2] F01M *1/02*

U.S. Cl. 222—250 **10 Claims**



1. An adjustable progressive distributor valve for the intermittent metered distribution of a flowable medium, for example a lubricant, to a plurality of separate destination points, in accordance with an automatic cycling operation of the valve which is generated by said medium as it enters the valve under pressure, the distributor valve comprising in combination:

a valve block having arranged therein a plurality of main bores;

a corresponding number of free valve plungers received in the main bores of the valve block for reciprocating movement therein;

an intake channel in the valve block with an intake branch line opening into each main bore for the supply of pressurized medium to each valve plunger;

a pair of metering chambers defined in part by each main bore and in part by the two extremities of the associated valve plunger, whereby an axial movement of said plunger simultaneously diminishes the volume of one chamber and increases that of the other chamber;

means for abutting each valve plunger axially in both directions, so as to determine two fixed end positions of the stroke over which each valve plunger reciprocates;

a pair of pressure lines leading from axially spaced openings in the main bore of one valve plunger to the two metering chambers of another valve plunger;

a pair of discharge branch lines leading from axially space openings in the main bore of each valve plunger to the outside of the valve block; and

means for individually adjusting the displacement volume of each valve plunger extremity with respect to the associated metering chamber independently of said fixed plunger stroke; and wherein

each valve plunger has at least two flow grooves in its midportion, and the axial locations of the intake branch line, pressure lines, and discharge branch lines opening into the associated main bore are so coordinated with the flanks of said flow grooves that said valve plunger, arriving in a stroke end position, connects one of the two associated pressure lines with the intake branch line and the other pressure line with a discharge branch line, reversing said connections when arriving in the opposite stroke end position, thereby controlling the admission of the pressurized medium into one of the metering chambers of said other valve plunger via one pressure line, and the discharge of the medium from the opposite metering chamber via the other pressure line, as the entering pressurized medium moves that other valve plunger to its opposite end position, in which that other valve plunger, in turn, establishes the pressure line connections for the movement of the next-following valve plunger, as part of a continuing automatic cycling operation; and

the displacement volume adjusting means includes, for each metering chamber:

a metering plunger of smaller diameter than the valve plunger;

a matching guide bore located axially outside and adjoining the metering chamber, so that the metering plunger, when received therein, defines with its axially inwardly oriented extremity a portion of the metering chamber; and

an adjustable drag connection between the valve plunger and the metering plunger, including means for adjusting the length of the drag stroke of the metering plunger over which the latter moves in unison with the valve plunger, thereby acting as a differential piston in cooperation with the latter; an increase in the length of said drag stroke thus resulting in a decrease in the effective volume of the metering chamber.

4,044,925

SCREW FEEDER FOR INJECTION MOLDING MACHINE

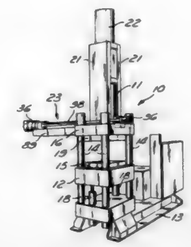
James R. Mercer, Akron, Ohio, assignor to McDowell-Wellman Engineering Co., Cleveland, Ohio

Filed Apr. 16, 1976, Ser. No. 677,520

Int. Cl.[2] B29B *5/06*

U.S. Cl. 222—263 **10 Claims**

1. In an injection molding machine having a frame, a charging cylinder mounted on the frame including an internal charging chamber and an inlet port on the cylinder communicating with the charging chamber, the combination of a material stock feeder adapted to supply plasticized material to the charging chamber inlet, power actuator means for selectively moving an outlet of the material stock feeder into communication with the inlet of the charging chamber and alternately away from the inlet to automatically afford access to both the outlet and inlet, said power actuator means being constructed and arranged to develop fluidtight communication between said outlet and inlet while avoiding substantial unbalanced loading on the charging cylinder.



4,044,926

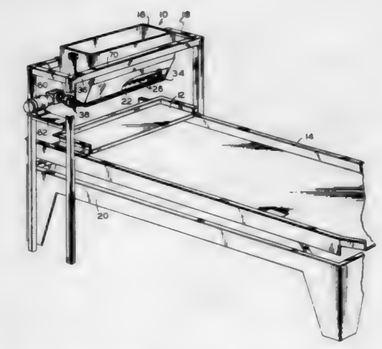
GRANULAR METERING

Kenneth M. Allen, P.O. Box 352, Newberg, Oreg. 97132

Continuation of Ser. No. 646,256, Jan. 2, 1976, abandoned, which is a continuation of Ser. No. 500,313, Aug. 26, 1974, abandoned, which is a continuation of Ser. No. 361,857, May 21, 1973, abandoned. This application Jan. 10, 1977, Ser. No. 757,897

Int. Cl.[2] G01F *11/00*

U.S. Cl. 222—409 **13 Claims**



1. In a metering device,

a hopper having a bottom having a tapped bore,

a vertical nipple screwed into the bore,

a locking nut on the nipple for holding the nipple in adjusted position relative to the hopper,

a receiving plate movable below the nipple and serving to support granular material dispersed through the nipple except when the plate is moved across the nipple,

and a movable abrading member above the nipple and extending across the upper end of the nipple in a position such as to block flow of lumps of the granular material through the nipple.

4,044,927

LADLE WITH AXIS OF ROTATION THROUGH DISCHARGE SPOUT

William Wayne Seaton, Dexter, Mich., assignor to Combustion Engineering, Inc., Windsor, Conn.

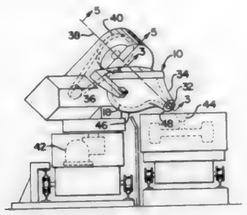
Filed Oct. 7, 1976, Ser. No. 730,405

Int. Cl.[2] B22D *37/00*

U.S. Cl. 222—604 **6 Claims**

1. A pouring ladle for pouring molten metal into molds or other containers, including wall means forming a chamber for holding the molten metal, a spout having wall means forming

longitudinal passage means therein, the passage means having an inlet end in fluid communication with the chamber, and an outlet end through which molten metal can be discharged, means for rotating the pouring ladle about an axis of rotation, positioned such that the axis of rotation passes through the



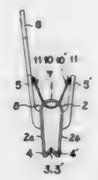
center of the discharge end of the passage means, and the pouring ladle and spout being constructed such that lower outer surface of the wall means forming the chamber and the lower outer surface of the wall means of the spout lie in the same horizontal plane when the ladle is in its full, non-pouring position.

4,044,928

CLOTHES HANGER PARTICULARLY FOR SKIRT, SLACKS AND THE LIKE

Kenji Watanabe, No. 3-6, 3-chome, Midorigaoka, Kokurakita, Kitakyushu, Japan

Filed Jan. 14, 1976, Ser. No. 648,896
Claims priority, application Japan, Apr. 26, 1975, 50-57294
Int. Cl.[2] A47J *51/142*
U.S. Cl. 223—96 **3 Claims**



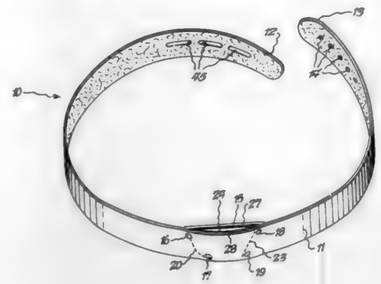
1. A clip type clothes hanger comprising a substantially U-shaped main body having a curved central web portion and a downwardly extending first and second leg portion on respective sides of said central web portion, each leg portion having a closed gripping claw formation adjacent the lower end thereof, a first and a second lug connected to respective sides of respective said first and second leg portions and extending beyond said curved web portion upwardly on each side thereof, a projection on each said first and second lugs extending toward the respective other one of said lugs, said curved portion of said main body having a slot therein, and a U-shaped spring having a central spring web portion disposed in the slot of said main body curved portion and a spring leg portion on each side extending away from said curved portion toward a respective first and second lug and engaged with the respective projection thereon, said lugs being movable together against the biasing force of said spring to open said first and second legs.

4,044,929

HOLSTER BELT

Albert P. Caruso, 147 Broadmoor Drive, Tonawanda, N.Y. 14150

Filed Oct. 30, 1973, Ser. No. 411,035
Int. Cl.[2] F41C *33/02*
U.S. Cl. 224—2 B **13 Claims**



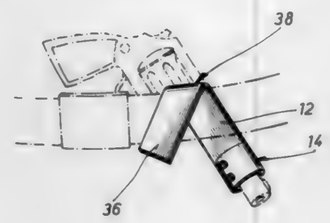
1. A combined holster belt construction for a side arm comprising an elongated belt member for encircling the waist of a wearer in a horizontal direction, band means, and spaced attaching means for securing laterally spaced portions of said band means to said belt member to define a loop therewith which is open at the top and bottom, said spaced attaching means effectively converging generally downwardly relative to each other to aid in retaining said side arm in position in said loop.

4,044,930

HAND GUN HOLSTER

Daniel J. Petroski, 2130 Campbell Road, Houston, Tex. 77055

Filed May 19, 1975, Ser. No. 578,521
Int. Cl.[2] F41C *33/00*
U.S. Cl. 224—2 C **6 Claims**



1. A variously adjustable holster for carrying a hand gun between a waistband of a pair of trousers and the wearer thereof, said holster comprising:

a hand gun barrel-receiving loop for supporting a handgun in a position beneath the waistband of a user at a selected distance from the waistband and and a selected angle in relation thereto;

adjustment means for providing distance and angular adjustment of said loop in relation to the waistband, said adjustment means comprising:

a substantially smooth strap for supporting said loop;

a metal plate internally disposed within said strap and cooperable therewith over substantially an entire length thereof;

said adjustment means being selectively manually bendable into a generally downwardly depending U-shaped hook operable to engage a belt or waistband, said hook comprising:

a first portion comprising a first length of said strap extending between said loop and a bend in said strap; and

a second portion comprising a second length of said strap extending from the bend in said strap to an end of said strap opposite said loop;

the length of said first and said second portions being variable to position said loop at a selected distance in relation to the waistband;

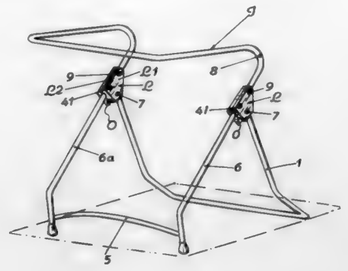
the alignment of said first and said second portions being variable to position said loop at a selected angle in relation to the waistband, the selected angle ranging from a forward slanting position to a rearward slanting position.

4,044,931

TUBULAR BACK SUPPORTED CHILD CARRIER

Pietro Catelli, Via Vittorio Emanuele, 112, Como, Italy (24100)

Filed Feb. 3, 1975, Ser. No. 546,668
Claims priority, application Italy, July 16, 1974, 25210/74
Int. Cl.[2] A45F *3/08;* **A47D** *1/02*
U.S. Cl. 224—6 **1 Claim**



1. A tubular back supported child carrier comprising in combination for each side of the carrier a resilient connection box made of plastics material and including two symmetric flanges, two tubular legs firmly fastened by and located between the said two symmetric flanges of the said box, an upper and a lower U-profiled tubular frame pivotally mounted between the said flanges of the said box so as to be manually displaced in a folded and in an unfolded position, a child supporting bag shaped means fastened between the said upper frame and the said legs, means for supporting the child carrier on a person's back, the said tubular legs being stiffened by a metallic stem operating as a strut, the said upper frame including two terminal portions, resilient detents cooperating with the said terminal portions of the said upper frame so as to removably fasten the upper frame in the unfolded position and when released to provide foldability of the upper frame against the said legs, each flange of the said box being formed with two intersecting grooves of profile complementary respectively to the section of the said upper and lower frame, the portion of the box comprised between the said intersecting grooves being profiled as profiled intersecting planes, whereby during the passage from the said folded to the said unfolded position and viceversa, the said flanges are elastically diverged from one another and thereafter cause a positive elastically contrained location of the said lower frame in said folded respectively unfolded position, the upper frame and the lower frame folding away from the said legs when the carrier is used as a baby chair the upper frame and the lower frame folding against the said legs when the carrier is stored the upper frame folding from the legs and the lower frame folding against the legs when the carrier is used as a baby pack.

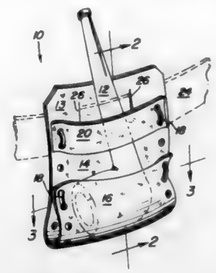
4,044,932

SMOKING PIPE SLING

Ellsworth L. Harris, Jr., 4624 G St., SE., Washington, D.C. 20019

Filed Oct. 16, 1975, Ser. No. 623,002
Int. Cl.[2] A45C *11/00*
U.S. Cl. 224—26 R **3 Claims**

1. A sling for holding a pipe readily accessible on the belt of a pipe smoker comprising: a main body member of a single piece of material having two ends, one end having means for attachment to a belt, a pipe stem holding member of rectangular shape and of substantially the same width as the main body member and closely associated with the one end thereof, means for attaching the stem holding member to the one end of the main body member at the edges thereof, the other end of the main body member being bent back upon itself to form a U-shaped pouch for holding the bowl of a pipe, means for holding the edges together of the portion of the member forming the



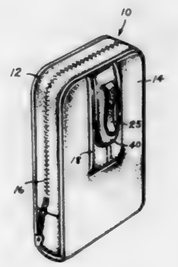
pouch to permit a readily adjustable change in size of the pouch, said means including evenly spaced holes through the edges of the member, a removable cord appropriately interwoven through selected ones of said holes to hold the side edges together before and after adjustment of the pouch, but easily loosened, removed, and rethreaded through other selected ones of said holes to permit said adjustment in the size of the pouch, and knots in the respective ends of the cord to hold the sling together as adjusted and assembled.

4,044,933

ARTICLE CARRIER WITH IMPROVED COMBINATION BELT LOOP AND CLIP

Kenneth W. Artz, Albuquerque, N. Mex., assignor to Kosgegi Leather & Vinyl Products, Inc., South Bend, Ind.

Continuation of Ser. No. 531,486, Dec. 11, 1974, Pat. No. 3,937,373. This application Jan. 9, 1976, Ser. No. 647,996
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.[2] A45C *11/00*
U.S. Cl. 224—26 R **1 Claim**



1. In an article carrier which includes a back having front and rear faces, the improvement comprising a loop member having upper and lower ends, said loop member having inner and outer sides, means attaching said upper and lower loop member ends to said carrier back with said loop member inner side spacedly confronting said back face to define a belt receiving passage between the back and loop member, clip means connected to said loop member at its outer side and including a downturned flexible part for engaging a belt, pocket or similar object to support said article carrier when no belt extends through said loop member defining passage, said clip means

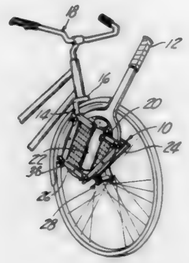
including an inverted U-shaped holder having a pair of depending leg parts connected by a web part, a cover having a horizontal slot therein, means connecting said cover at its margins to the outer side of said loop member, said cover and loop member forming an envelope, said cover slot communicating with the interior of said envelope, one of said clip means leg parts extending through said slot and into the interior of said envelope, theother clip means leg part extending downwardly over said cover for engaging said belt, pocket or similar object, means associated with said one leg part for securing said one leg part within said envelope interior.

4,044,934

TENNIS RACQUET AND BALL CARRIER FOR BICYCLES

Frederick E. Peters, 14720 Richmond, Southgate, Mich. 48195

Filed Apr. 25, 1975, Ser. No. 571,593
Int. Cl.² B62J *11/00*
U.S. Cl. 224—36 **1 Claim**



1. A tennis racquet press adapted to be mounted to the fork of the steering column of a conventional bicycle, said tennis racquet press comprising:

a pair of spaced press members and first connecting means for compressing said pres members toward one another to press against a tennis racquet disposed thereinbetween;

second connecting means carried on the outside surface of one of said press members for releasable attachment of said press to said cycle wheel frame, said second connecting means comprising first and second U-shaped clips each having a base and legs, each clip legs fabricated from a flexible material permitting the clip legs to receive a portion of said cycle wheel frame in a snap-locking relationship, one of said first U-shaped clip legs having a flexible post projecting outwardly therefrom, the outside surface of said one press member having a plurality of apertures, one of which selectively and releasably receives said flexible post for attaching said first clip to said one press member such that said first clip is pivotally mounted to said one press member;

one of said second U-shaped clip legs having an aperture through which said first connecting means extends for attaching said second clip to said one press member; and

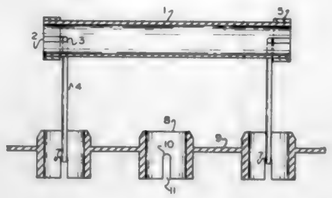
third connecting means carried on the outside surface of the other of said press members for releasably attaching a tennis ball container, said third connecting means comprising a horseshoe-shaped member, the extended ends thereof being adapted to receive and snap lockingly engage said tennis ball container, said horseshoe-shaped member having flexible post projecting outwardly therefrom the outside surface of, said other press member having a plurality of apertures, one of which selectively and releasably receives said flexible post for attaching said horseshoe-shape member to said other press member such that said horseshoe-shaped member is disposed in a plane which is perpendicular to said other press member and pivotal about an axis which is perpendicular to said other press member.

4,044,935

AUTOMOTIVE BATTERY CARRIERS

Hugh Stephens, 90 Leighton Ave., Winnipeg, Manitoba, Canada

Filed Apr. 14, 1976, Ser. No. 670,387
Int. Cl.² B65D *71/00*
U.S. Cl. 224—45 F **2 Claims**



1. In an automotive battery lifter of the type having a rigid handle of dielectric material having end slots disposed horizontally and which slidably receives two-point suspension means for linking said handle with said battery, the improvement consisting in said handle having telescopic end pieces to block the sliding movement at said points of suspension, and each said suspension means comprising a length of wire squarely bent and subsequently tempered to an inverted U configuration to form a pair of spring legs unitarily pivotal one at each of said points of suspension, the extremity of each said pair of legs having lower free ends enamelled to prevent acid corrosion, and said pair of spring legs each having a pair of lugs, each lug being bent at right angles from each leg, and each lug of said pair of lugs extending away from each other, said lugs to be less in length than the radius of a battery filling well, said spring legs being compressible to permit said lugs to be inserted into the filling well of said battery and when sprung engage the lower wall of the filling well and remain in locked position to facilitate the carrying of the automotive battery.

4,044,936

GLASS TUBE CUTTING

Derek Obersby, Great Hayward, near Stafford, and Thomas Kenneth Allen, Abingdon, both of England, assignors to James A. Jobling & Company Limited, Sunderland, England

Filed May 13, 1975, Ser. No. 577,083
Claims priority, application United Kingdom, May 21, 1974, 22588/74
Int. Cl.² B26F *3/14*; C03B *33/06*
U.S. Cl. 225—2 **18 Claims**



1. A method of cutting glass tubing transverse to its length, which method comprises:

forming a point of weakness on a surface of the tube at a required cutting position;

directing radiation at the tube so that sufficient stress is created in the glass to cause a fracture to run around a circumferential line passing through said point of weakness; and generating said radiation by

causing a laser beam of a wave length which is absorbed by the glass to converge from a position outside the tube whereby the beam is focused onto the glass,

directing the laser beam longitudinally along the tube, and

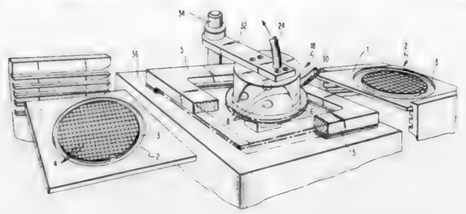
deflecting the direction of the beam so that the beam is focused fully incident on said circumferential line around the tube passing through the point of weakness without rotating the tube.

4,044,937

MULTIPLE BALL ELEMENT WAFER BREAKING APPARATUS

Thomas Hill, Gainesville; Ambrose Kennedy, Manassas, both of Va., and Walter Grey Thomson, Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,632
Int. Cl.² B26F *3/00*
U.S. Cl. 225—97 **5 Claims**



1. An apparatus for breaking a semiconductor wafer along pre-scribed lines, comprising;

a support means;

a plurality of ball elements mounted on said support means;

said ball elements having a diameter substantially smaller than the diameter of said wafer;

a sliding carriage means associated with said support means;

a flexible adhesive sheet attached to said carriage means defining a contact plane;

said wafer being mounted on said flexible sheet so as to be capable of motion in said contact plane over said support means;

said ball elements contacting said flexible sheet so as to deflect said flexible sheet out of said contact plane thereby inducing a bending moment about points in said wafer juxtaposed with said ball elements;

said carriage means displacing said flexible sheet in said contact plane so as to break said wafer along pre-scribed lines;

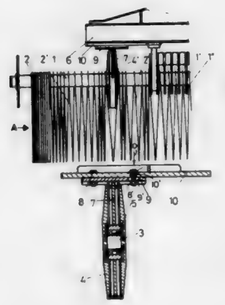
whereby the semiconductor wafer is broken along the pre-scribed lines in an improved manner.

4,044,938

WIRE COIL GUIDING DEVICE FOR WIRE TREATMENT APPARATUS

Wolfgang Heiss, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed May 5, 1976, Ser. No. 683,041
Claims priority, application Switzerland, May 20, 1975, 6455/75
Int. Cl.² B65H *51/02*; B61F *23/00*
U.S. Cl. 226—168 **8 Claims**



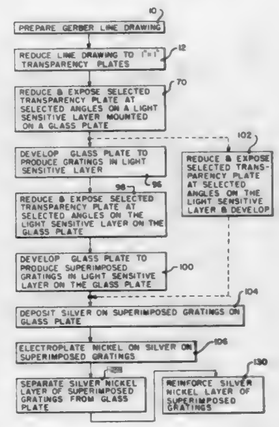
1. A device for guiding coils of wire through wire treatment apparatus, particularly jet descaling machines, comprising a rotating horizontal carrier shaft having said coils of wire suspended therefrom and imparting to said coils rotative movement about said shaft to transport said coils relative to said treatment apparatus in a direction generally parallel to the axis of said shaft, and guide disc means including at least one guide disc positioned on both sides of said carrier shaft, each of said guide discs being freely rotatable about a rotational axis of the disc arranged to extend generally parallel to the direction of transport of the wire coils.

4,044,939

METHOD OF FABRICATING DIFFRACTION GRATING MASTERS AND APPARATUS THEREFOR

William R. Horst, Dayton; James L. McNaughton, Kettering, and Charles F. Mort, Xenia, all of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Sept. 8, 1975, Ser. No. 611,377
Int. Cl.² G02B *27/38*; B23P *3/24*
U.S. Cl. 228—176 **11 Claims**



1. A method of producing a diffraction grating master capable of producing superimposed diffraction gratings, comprising the steps of:

a. exposing a first grating pattern means on a light sensitive layer;

b. processing said light sensitive layer from step (a) to physically form a first grating means in said light sensitive layer corresponding to said first grating pattern means;

c. exposing a second grating pattern means on said light sensitive layer from step (b);

d. processing said light sensitive layer from step (c) to physically form a second grating means in said light sensitive layer corresponding to said second grating pattern means;

e. depositing a thin layer of material on said layer from step (d) to physically conform to said first and second grating means on said light sensitive layer; and

f. reinforcing said thin layer of material from step (e).

4,044,940

WRAPPER BLANK

C. R. Helms, Collegeville, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Aug. 26, 1976, Ser. No. 718,053
Int. Cl.² B65D *5/02*
U.S. Cl. 229—40 **1 Claim**

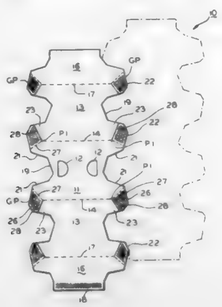
1. A wrapper blank for a group of containers, said blank comprising:

a. a main panel;

a pair of side panels foldably connected to side edges of said main panel;

c. a pair of closing panels foldably connected to said side

panels remote from said main panel and joined to define a tube;
d. the edges of all of said panels being pivoted with cutaway portions to form a scallop-like configuration along both edges of the blank;
e. each of said cutaway portions being generally U-shaped with divergent sides thereof extending toward the fold lines joining said panels and defining at such fold lines wrapper elements folded into position to restrain movement of the containers within said wrapper;
f. each of said wrapper elements comprising:



1. a first closure tab extending from said side panels adjacent the ends thereof;
2. a second closure tab folded with respect to said main and closing panels along fold lines extending at an angle to the fold lines of said panels;
3. said first and second closure tabs being separated by a cut line extending from the edges of the wrapper elements to the fold lines at said side panels;

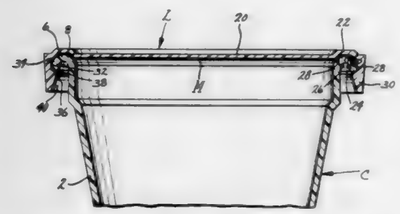
g. said second closure tab being folded into lapping engagement with said first closure tab and being secured together to bear against the endmost containers to restrain movement thereof.

4,044,941

CONTAINER CLOSED BY A MEMBRANE TYPE SEAL

David S. Knudsen, 3145 Hawthorne Blvd., St. Louis, Mo. 63104

Filed Apr. 12, 1976, Ser. No. 675,798
Int. Cl.[2] B65D *5/64, 53/00*
U.S. Cl. 229—43 **15 Claims**



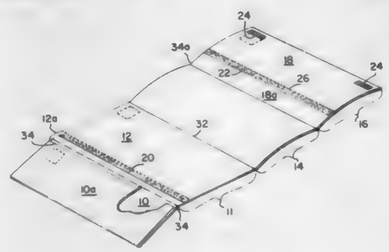
1. The combination comprising: a container having an upwardly presented opening and a rim surrounding the opening and being formed entirely from a nonmetallic material, the rim having a convex upwardly presented surface; a flexible seal membrane extended over the open top of container as well as over the convex upwardly presented surface of the rim, the membrane including a metal foil which is at least located in the area of the membrane overlying the rim of the container so that the membrane may be induction heated to a prescribed temperature by placing it in a magnetic field which undergoes rapid reversals in polarity; a nonmetallic sealing material interposed between the convex surface of the rim and the foil of the membrane, the sealing material being capable of becoming plastic when heated to the prescribed temperature, the sealing material being plastically deformed between and adhered to the foil and the rim at the convex surface as a result of the foil being induction heated to the prescribed temperature and forced toward the rim with plastic deformation being sufficient to effect a seal between the opposed surfaces of the membrane and rim; and a lid including a cross portion which overlies the membrane and the container rim and a downwardly projecting skirt at the periphery of the cross portion with the skirt fitting snugly around the rim, the cross portion having a preformed groove which aligns with and is directly above the rim with the groove being defined in part by continuous beveled side surfaces which downwardly diverge and are spaced sufficiently apart to enable the rim to be partially received in the groove when the skirt is around the rim, the side surfaces of the groove being arranged to confine the member such that it generally follows the contour of the convex upper surface of the rim for a substantial distance in the lateral direction.

4,044,942

MULTIPLE MAILING FOLDER

Jack Edward Sherwood, Roanoke, Va., assignor to Double Envelope Corporation, Roanoke, Va.

Filed Sept. 17, 1974, Ser. No. 506,709
Int. Cl.[2] B65D *27/06*
U.S. Cl. 229—73 **8 Claims**



1. A multiple use mailing folder, formed from a blank consisting of an elongated strip of sheet material having transverse fold lines dividing said strip into five panels, the first panel at one end of said strip having been folded forwardly against the adjacent second panel and adhesively secured thereto at its ends to form an envelope pocket, the said envelope pocket having been folded rearwardly on the fold line between the second and third panels, said third panel being of greater width than said first and second panels having a portion of said third panel exposed beyond the said envelope pocket, said fourth panel having been folded forwardly along the fold line between said third and fourth panels to overlie said third panel on its side remote from said envelope pocket. Said fifth panel having been folded forwardly along the fold line between said fourth and fifth panels to overlie the fold line between said envelope pocket and said third panel and to overlie said envelope pocket and being of a width to overlie at least part of said portion of said third panel exposed beyond said envelope pocket.

4,044,943

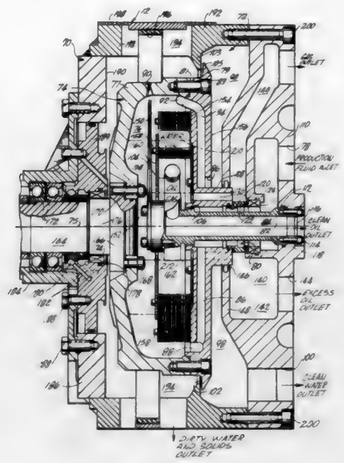
CENTRIFUGAL SEPARATOR AND SYSTEM

Francis Barton Brown, La Crescenta, and John W. Erickson, Huntington Beach, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.

Filed June 21, 1976, Ser. No. 697,987
Int. Cl.[2] B04B *1/12, 11/02*
U.S. Cl. 233—19 A **25 Claims**

1. In a centrifugal separator for separating the phase constituents of a multiconstituent feed of solid, liquid and gaseous phases, an improvement which comprises:
a. a housing;

b. a rotor rotatable in the housing and having a rotor chamber;
c. passage means for delivering the multiconstituent feed to the rotor chamber;
d. means to define radial zones of mixture phase constituents stratified in accordance with their density and in response to centrifugal force applied through the rotor, such means including exit passages from the rotor chamber for the individual phase constituents of the feed, the exit passages



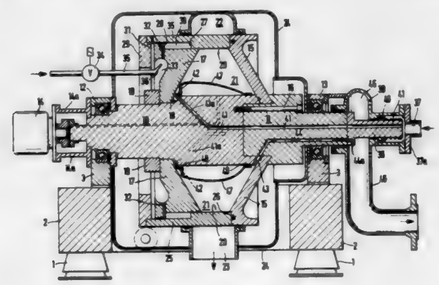
including a pitot tube having a mouth in the chamber at a selected radial zone therein for a select one of the phases, a plurality of constructed passages opening at the radial perimeter of the chamber for the solid phase, and a control fluid passage opening into the chamber between the constricted passages and the pitot tube for a control phase liquid of the phases, whereby the quantity of control phase liquid in the chamber determines the radial position of the other non-solid phases in the rotor chamber.

4,044,944

CENTRIFUGE

Bernhard Moebus, Waiblingen, Germany; Gerhard Larch, St. Marienkirchen, Austria, and Rudolf Friedrich, Pocking, Germany, assignors to Fa. Moebus KG., Stuttgart, Germany

Filed Mar. 17, 1976, Ser. No. 667,548
Claims priority, application Germany, Apr. 24, 1975, 2518206
Int. Cl.[2] B04B *1/14, 11/04*
U.S. Cl. 233—20 A **12 Claims**



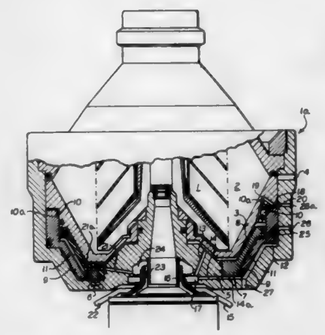
1. A centrifuge for separating and/or thickening liquid/solid mixtures, comprising in combination,
a support frame;
horizontal shaft means rotatably mounted in said support frame and having at least one first liquid/solid mixture supply conduit and at least one second clarified liquid outlet conduit disposed therein;
a drive motor operatively connected to said shaft means for rotating it;
two conical drum members axially rigidly mounted on said shaft means in spaced relationship to each other;
the respective outlet of said first conduit and the inlet of said second conduit being disposed on said shaft means between said two conical drum members;
a hollow cylindrical member axially slidably mounted on one of said two conical drum members and movable between a fully open and a closed position on one of said two conical drum members;
said shaft means and two conical drum members define a centrifuging chamber therebetween which can be opened or closed by the axial movement of said hollow cylindrical member;
said horizontal shaft means has a diameter which is at least a third of the maximum diameter of said centrifuging chamber.

4,044,945

SELF-CLEANING CENTRIFUGAL SEPARATOR HAVING A MAIN PISTON VALVE DEFINING ONE SIDE OF THE SEPARATING CHAMBER AND CONNECTED TO AT LEAST ONE AUXILIARY PISTON VALVE

Werner Kohlstette, and Gunthard Pautsch, both of Oelde, Germany, assignors to Westfalia Separator AG, Oelde, Germany

Filed May 14, 1976, Ser. No. 686,614
Claims priority, application Germany, May 16, 1975, 2521838
Int. Cl.[2] B04B *11/04*
U.S. Cl. 233—20 A **4 Claims**



1. In a certrifugal separator constructed for intermittent discharge of sludge, comprising:
a rotatably mounted separator drum having an upper end member and a lower end member, and at least one sludge discharge passageway disposed at the radially outward periphery of the drum, one of said end members comprising a main piston valve movable axially to open and close the sludge discharge passageway for desludging, a closing chamber disposed in the drum outwardly of the main piston valve for receiving and discharging control fluid for, respectively, forcing the main piston valve to the closed position and relieving force for initiating the moving of the main piston valve to its open position under the influence of material filling the drum, means for supplying fluid to the closing chamber and means for discharging fluid therefrom,
the improvement which comprises:
an auxiliary piston valve mounted in the drum and on the main piston valve and disposed axially outwardly of the main piston valve, a partition ring mounted in the drum and separating a portion of the auxiliary piston valve from the main piston valve, the auxiliary piston valve

being axially moveable in the drum so that an auxiliary piston valve closing chamber is provided on the axially outward side of the auxiliary piston valve and an auxiliary piston valve opening chamber is provided on the axially inward side of the auxiliary piston valve, and means for supplying control fluids to the auxiliary piston valve closing and opening chamber for, respectively, exerting a closing and opening force on the auxiliary piston valve, the mounting of the auxiliary piston valve on the main piston valve being such that said closing and opening forces on the auxiliary piston valve are transmitted to the main piston valve and add to the influence of the control fluid of the closing chamber of the main piston valve.

4,044,946

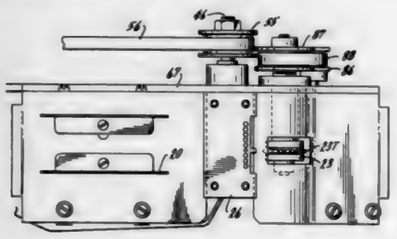
TAPE PUNCH MACHINE

Gerhard Cless, and Edward L. Kaplan, both of Northbrook, Ill., assignors to Extel Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 638,998, Dec. 8, 1975, abandoned, which is a division of Ser. No. 485,096, July 5, 1974, Pat. No. 3,964,673. This application Sept. 27, 1976, Ser. No. 726,768

Int. Cl.[2] G06K *1/02*

U.S. Cl. 234—39 **3 Claims**



1. A cyclically operable tape punch machine for punching a tape in accordance with command signals and comprising:

a plurality of punch elements arranged in openings formed in a die block for advancing and restoring movement, including a special punch element for punching the tape with a feed opening, the punch elements having shanks of substantially the same diameter;

interposers movable from a restored to an actuated position for selecting the punch elements to be operable in each cycle of the machine and having the selector ends thereof disposed adjacent the punch elements in their restored position;

and said special punch element having a punching stem of reduced diameter off-set to one side of its stem for punching a feed hole which is off-center compared to the openings punched by the other punch elements.

4,044,947

CONDITION AND VOLUME CONTROL FOR AIR CONDITIONING SYSTEM MIXING DAMPERS

Donald H. Spethmann, Arlington Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed June 1, 1976, Ser. No. 691,668

Int. Cl.[2] F24F *13/04*

U.S. Cl. 236—13 **20 Claims**

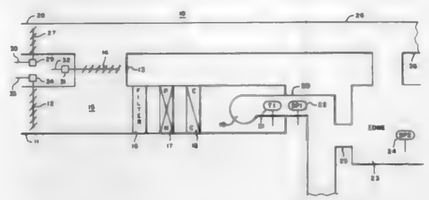
1. In an air conditioning system for supplying a volume of conditioned air to at least one zone, said system having a source of outdoor air and an outdoor air damper and a source of recirculated air and a recirculated air damper and discharge means for discharging a mixture of recirculated air and outdoor air to said at least one zone, a control apparatus adapted to control the condition and volume of air discharged by said discharge means comprising:

first actuating means adapted to operate said outdoor air damper;

second actuating means adapted to operate said recirculated air damper;

sensing means for sensing said condition and volume of said mixture of recirculated air and outdoor air; and,

control system means responsive to said sensing means and



connected to said first and second actuating means for controlling the operation of said outdoor air and recirculated air dampers in an opposite sense to maintain a predetermined condition of said mixture of outdoor air and recirculated air and in the same sense to maintain a predetermined volume of said mixture of said outdoor air and said recirculated air to be discharged by said discharge means.

4,044,948

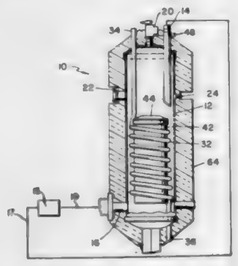
SOLAR HEATING SYSTEM COMPONENT

Edward W. Bottum, and Frank H. Rockwell, both of Brighton, Mich., assignors to Refrigeration Research, Inc., Brighton, Mass.

Filed Oct. 17, 1975, Ser. No. 623,251

Int. Cl.[2] F24J *3/02*

U.S. Cl. 237—1 A **5 Claims**



1. A solar heating system component comprising a closed vessel, a first fluid inlet and a first fluid outlet for said vessel, said first fluid inlet being adapted for connection to the fluid outlet of a solar energy collection system through which fluid flows in a closed system as a heat exchange medium, said first fluid outlet being adapted for connection to the fluid inlet of said solar energy collection system, said vessel defining an expansion tank for said solar energy collection system, a second fluid inlet and a second fluid outlet for said vessel, said second fluid inlet being adapted to receive a fluid to be heated, said second fluid outlet being adapted to forward such heated fluid to a point of use, and a heat exchange structure within the vessel positioned for heat exchange relationship to solar energy collector system fluid in the vessel, said heat exchange structure including means for fluid flow therethrough, said second fluid inlet and outlet being operably connected to said heat exchange structure, a first fluid pump connected to said first fluid outlet and a second fluid pump connected to said second fluid inlet for circulation of fluid through the respective systems, a first temperature sensor located to sense the temperature at the collector outlet, a second temperature sensor located to sense the temperature of fluid pumped by said second pump, a differential thermostat connected to said first and second sensors, means operably connecting said differential thermostat to said pumps to de-energize said pumps when the temperature of fluid being pumped by said second pump approaches the temperature of the fluid being pumped by said first pump, a pressure release valve for said vessel, and an air valve operable to close and open on said vessel located at a position above a selected level of solar energy collection system fluid to be present in said vessel to permit relief of air pressure in said vessel.

4,044,949

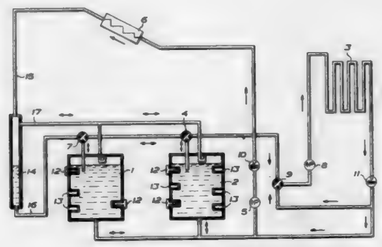
HEAT STORAGE SYSTEM

Ernst Morawetz, Repslagarevagen 10, Staffanstorp, Sweden (S-24500), and Lars-Olof Glas, Fabriksvagen 1, Vasterhaninge, Sweden (S-13700)

Filed Feb. 26, 1976, Ser. No. 658,557

Int. Cl.[2] F24J *3/02;* **F24D** *3/00*

U.S. Cl. 237—1 A **8 Claims**



1. An automatic heat storage system containing circulating fluid heating medium comprising:

a. means for collecting solar heat energy having a heating medium inlet and outlet,

b. a first heat storage vessel having openings for heating medium inlet or outlet at the top and bottom thereof, the top opening being connected to a first valve means,

c. a second heat storage vessel, operably associated with auxiliary heating means for heating medium therein, having openings for heating medium inlet or outlet at the top and bottom thereof, the top opening being connected to a second valve means,

d. a heat emitting system having a heating medium inlet and outlet,

e. a first pump for circulating heating medium through said solar heat energy collecting means,

f. a second pump for circulating heating medium through said heat emitting system,

g. a first pipe connecting the outlet of the solar heat energy collecting means with said first valve means,

h. a second pipe connecting said first valve means with said second valve means,

i. a third pipe connecting said second valve means with the inlet of said heat emitting system through said second pump,

j. a fourth pipe connecting at one end thereof to the outlet of said heat emitting system and at the other end thereof to said first pump,

k. a fifth pipe connecting said first pump with the inlet of said solar heat energy collecting means,

l. a sixth pipe connecting with said fourth pipe and the bottom openings of both said first heat storage vessel and said second heat storage vessel,

m. said pumps, said pipes and first and second valve means being the means adapted to control the flow of the heating medium in the following alternate paths:

i. passing the heating medium from said solar heat collecting means through the first pipe and partially through the first valve means, the second valve means, the third pipe and second pump, and the heat emitting system and returning heating medium through the fourth pipe, said first pump and the fifth pipe to said solar heat energy collecting means; and partially through the first and second valve means into the top of both said first and second heat storage vessels, while withdrawing heating medium from the bottom of said first and second heat storage vessels through the sixth and fourth pipes, said first pump and the fifth pipe to said solar heat energy collecting means,

ii. passing the heating medium from said solar heat energy collecting means through the first pipe, and partially through the first valve means, the second pipe, the second valve means, and the third pipe and second pump, through the heat emitting system and returning heating medium through the fourth pipe, said first pump and the fifth pipe to said solar heat energy collecting means; and partially into the top of said first heat storage vessel through said first valve means; while withdrawing heating medium from the bottom of said first heat storage vessel through the sixth pipe and passing it through the fourth pipe, said first pump and the sixth pipe to said solar heat energy collecting means,

iii. passing heating medium from the top of said first heat storage vessel through said first valve means, the second pipe, the second valve means, and the third pipe and second pump, through said heat emitting system and returning heating medium through the fourth pipe and sixth pipe to the bottom of said first heat storage vessel,

iv. passing heating medium from the top of said second heat storage vessel through said second valve means, and the third pipe and second pump, through said heat emitting system and returning heat medium through the fourth and sixth pipe to the bottom of said second heat storage vessel,

v. passing the heating medium from the top of said second heat storage vessel through said second valve means partially through the second pipe and said first valve means into the top of said first heat storage vessel, and partially through said third pipe and second pump, through said heat emitting system, and returning heating medium from the bottom of said first heat storage vessel into the bottom of said second heat storage vessel through the sixth pipe, and from said heating emitting system through the fourth and sixth pipes into the bottom of said second heat storage vessel,

vi. passing the heating medium from said solar heat energy collecting means through the first pipe, said first valve means, the second pipe, said second valve means, and the third pipe and second pump, through said heat emitting means and returning it to said solar heat energy collecting means through the fourth pipe, said first pump and said fifth pipe.

4,044,950

COMBINED HEAT-EXCHANGER AND SUPPLEMENTAL AIR CIRCULATOR FOR HOT-AIR FURNACES

Charles F. Engeling, R.R. No. 1, Morrisonville, Ill. 62546, and Ralph F. Staubly, 510 Myers Bldg., Springfield, Ill. 62701

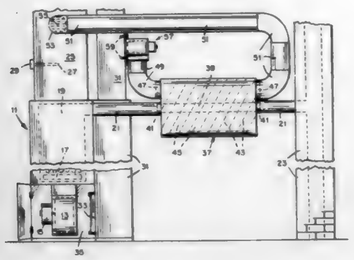
Filed Sept. 8, 1975, Ser. No. 611,357

Int. Cl.[2] F24B *7/02*

U.S. Cl. 237—55 **4 Claims**

1. In a forced-circulation air-heating system comprising a conventional fuel-burning hot-air furnace including a hot-air-feed duct system and a cold-air-return duct system, a pipe for conducting flue gases away from said furnace, a first thermostatic switch in and responsive to the temperature of the space to be heated, furnace-connected fuel-supply means controlled by said first thermostatic switch, a relatively high-power motorized blower for forcing air from said return system through said furnace and to said feed system, an air filter in the air-flow

path to and through and from said furnace, a second thermostatic switch located in the hot-air portion of said air-flow path for energizing said high-power motorized blower upon a selected rise in furnace air temperature, the improvement comprising: a normally constantly energized relatively low-power motorized blower, and duct means connecting said latter blower so as to force air from said return system into said feed system in bypassing relation to said furnace and its air filter,



said duct means including in series therewith a heat-exchanger adapted for good thermal association with said flue-gas pipe, and said heat-exchanger including means for performing an indirect heat exchange between the cold by-pass air and the hot flue gases or combustion products, whereby, the lower-power blower being normally constantly energized during heating periods, a gentle temperature-stratification-reducing air-flow is produced.

4,044,951

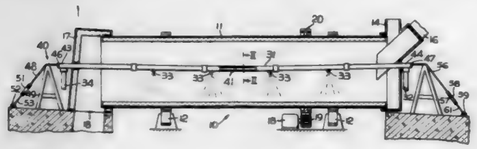
SPRAY TUBING WITHIN A ROTATING DRUM SUPPORTED INDEPENDENTLY OF THE DRUM

John J. Waite, Chateauguay, Canada, assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Division of Ser. No. 523,526, Nov. 13, 1974, Pat. No. 3,933,313. This application Sept. 18, 1975, Ser. No. 614,521

Int. Cl.² F16L *3/00*; F26B *11/04*

U.S. Cl. 239—1 **2 Claims**



1. In a method of supporting an elongated spray pipe within the cylindrical shell of a rotating cooling device comprising;

of providing the spray pipe with a support internally thereof and extending outwardly from each end of the spray pipe and the cylindrical shell;

of anchoring both external ends of the support externally of the cylindrical shell; and,

of applying a tensioning force to at least one external end of the support.

4,044,952

FOLDING BOOM

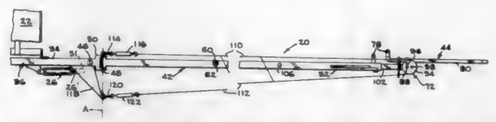
Michael R. Williams, and Dean T. McDonald, both of Jonesboro, Ark., assignors to FMC Corporation, San Jose, Calif.

Filed June 28, 1976, Ser. No. 700,664

Int. Cl.² B05B *1/20*

U.S. Cl. 239—165 **14 Claims**

1. A two-piece foldable boom comprising frame means, an inner boom arm supported by said frame means for pivotal movement about a generally vertical axis, an outer boom wing, mounting means connecting said wing to said inner boom arm for axial sliding movement and pivotal movement about a generally upright axis, resilient means urging said wing outwardly, first flexible torque applying and spring resisting means connected at one end thereof to said wing to urge said wing to pivot about said upright axis in one direction, second flexible torque applying and spring resisting means connected at one end thereof to said wing to urge said wing to pivot about said upright axis in the opposite direction whereby when said wing is caused to pivot about said upright axis one of said



flexible means resists the entire force of said resilient means causing inward sliding movement of said wing and slackening of said other flexible means, said resilient means exerting a rotative torque on said wing which tends to return said wing to a position wherein said resilient means is equally resisted by both of said flexible means and said wing is aligned in a generally parallel end-to-end relationship with said arm.

4,044,953

CAGE FOR FLAILING TUBE

John D. Vogel, Northfield, Ohio, assignor to McCord Corporation, Detroit, Mich.

Division of Ser. No. 550,542, Feb. 18, 1975, abandoned. This application July 27, 1976, Ser. No. 708,931

Int. Cl.² B05B *1/10, 3/14*; B08B *3/02*

U.S. Cl. 239—229 **3 Claims**



1. An assembly for directing fluid toward a surface comprising; cage means having an open entrance at one end thereof, a flexible tube having a first end anchored within said cage member at a point spaced from said entrance, said tube including a freely movable portion extending toward said entrance and terminating at a second end adjacent said open entrance, said cage means including a pair of oppositely disposed curved walls, said curved walls being curved away from one another upwardly and outwardly toward said open entrance and away from the longitudinal direction of the flexible tube for engaging said tube to curve said tube between the ends thereof.

4,044,954

NOZZLE

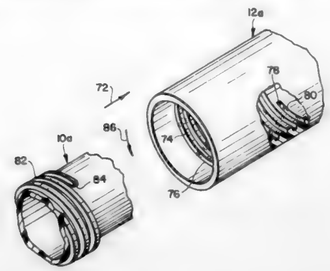
Duncan Paul Campbell, R.R. No. 1, Georgetown, Ontario, Canada

Filed Feb. 9, 1976, Ser. No. 656,403

Int. Cl.² B05B *1/32*

U.S. Cl. 239—458 **4 Claims**

1. A nozzle comprising a hollow body; a sleeve disposed about said body and having a baffle seat, one of said sleeve and said body having a female thread formed in its inner and outer wall respectively for mating with a male thread formed on the respective inner and outer wall of the other of said sleeve and body to permit rotation of said sleeve relative to said body between upstream and downstream stop positions, said female thread having spaced helically extending side walls which terminate at an end wall at the trailing edge of the thread, said end wall being disposed generally normal to said side walls adjacent thereto and abutting against the leading edge of said male thread when said sleeve is at the upstream stop position and preventing further upstream rotation of said sleeve, said



male and female threads throughout their extents between the upstream and downstream stop positions having uniform cross sections; and a baffle secured to said body and having a head which, as the sleeve is rotated toward the downstream stop position, approaches said baffle seat and thereby diminishes the quantity of liquid discharging from said nozzle.

4,044,955

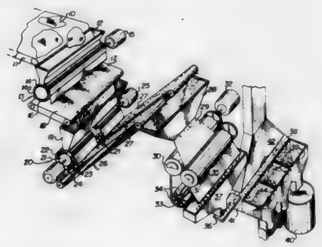
RECOVERY OF ALUMINUM FROM ALUMINUM-GLASS CLOTH RESIDUES

John P. Skelton, 101-515 Francois, Montreal, Quebec, Canada

Filed Oct. 12, 1976, Ser. No. 731,676

Int. Cl.² B02C *19/12*

U.S. Cl. 241—14 **6 Claims**



1. A method of reclaiming aluminum from aluminum-glass cloth residues in which the glass cloth is coated with aluminum comprising the steps of: breaking down said residue into small pieces, squeezing each piece of residue between hard surfaces on a pair of rotating cylindrical rolls with sufficient squeezing pressure to extrude the aluminum coating to destroy its integrity and expose the interior glass fibers along substantially the entire length of each piece and segregating the resulting glass fibers from the remaining aluminum pieces.

4,044,956

MECHANICAL METHOD FOR SEPARATING FRACTIONS OF INCINERATED URBAN REFUSE OR SIMILAR INDUSTRIAL REFUSE

Alexandre Benedetto, Marseille; Roger O. Cuvillier, Jargeau, Orleans, and Jean-Noël Gony, Orleans, all of France, assignors to Bureau de Recherches Geologiques et Minieres, Paris, France

Filed Mar. 12, 1976, Ser. No. 666,374

Claims priority, application France, Mar. 12, 1975, 75.07681

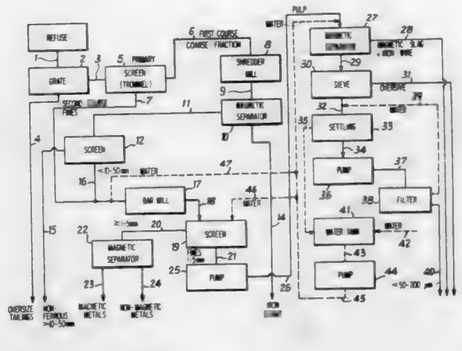
Int. Cl.² B02C *23/14*

U.S. Cl. 241—24 **10 Claims**

1. In a method for separating components of thermally degraded urban refuse and/or of industrial wastes of similar nature including the steps of primary screening of said refuse, and finally subjecting the primary screening fractions to a wet-process magnetic separation, the improvement comprising the steps of:

a. immediately and totally subjecting the coarse fraction of said primary screening along a first course to a percussion crushing and shredding operation followed by a magnetic separation operation and a secondary screening, and

b. directing the finer fraction of said primary screening along a second course and joining said first and second courses to form a combined course and subjecting said combined course to a crushing and flattening operation and further subjecting said common course to a third screening and subjecting the oversize fraction of the third screening to further magnetic separation, whereby there are separately extracted:



1. at the end of the first course, the major part of the magnetic metals cleared of all cinders and also non-magnetic metals with sizes exceeding the first course fines and rejected as oversize from the secondary screening of said first course, upstream of its junction with said finer fraction,

2. from the oversize fraction of the third screening made on the products obtained from said crushing and flattening operation in said combined course, and as the outcome of said further magnetic separation, both magnetic and non-magnetic metal fractions having a size comprised between the first course fines and the combined course fines, and from the third screening of said combined course, a combined course fines directed to a wet phase separation for the recovery of metals usable for the preparation of earthenware products.

4,044,957

APPARATUS FOR DISPERSING FINELY DIVIDED SOLID PARTICLES IN A LIQUID VEHICLE

George R. Schold, 7909 2nd St. North, St. Petersburg, Fla. 32507

Filed Feb. 13, 1976, Ser. No. 657,723

Int. Cl.² B02C *17/16*

U.S. Cl. 241—46.11 **8 Claims**

1. In apparatus for deagglomerating and dispersing solid particles held in agglomerated form and carried in a liquid vehicle while in a mixing vessel in which the particles are subjected to the action of a dispersing media while being forced to flow through the interior of the vessel and subjected to a contrifugal and agitating action therein which causes the dispersing media to be thrown outwardly and separated from the flow path of the product of liquid mixture being processed;

a rotatable shaft extending into said vessel and adapted to be driven from a power source;

a dispersing media separator located interiorly of the mixing vessel so as to be positioned in said flow path and having means for the admission of the processed product there-

into and therethrough so that the product is forced to travel through said dispersing media separator in a direction opposite to that generated by the normal centrifugal force;

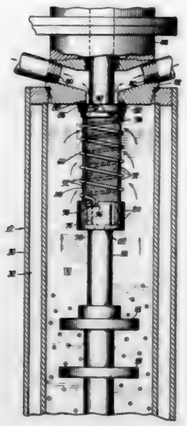
said separator comprising a body surrounding and attached to said shaft and rotatable therewith;

means defining inlet and outlet means to and from said separator, said separator outlet means being in fluid communication with said vessel outlet;

a flexible filter screen of sheet material surrounding and lying against the outer surface of said body;

coil spring means surrounding and lying against said filter screen to secure said filter screen to said body; and

means for detachably securing said coil spring means in place around said body.

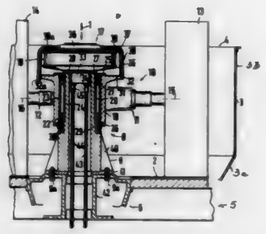


4,044,958

EDGE MILL

Erwin Gutjahr, Ersingen, Germany, assignor to Karl Handle & Sohne Maschinenfabrik und Eisengiesserei, Muhlacker, Germany

Filed Aug. 7, 1975, Ser. No. 602,654
Claims priority, application Germany, Aug. 9, 1974, 2438346
Int. Cl.[2] B02C *15/00*
U.S. Cl. 241—126 **21 Claims**



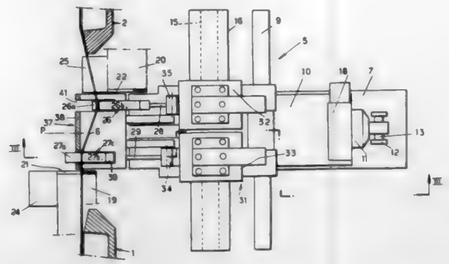
1. An edge mill for crushing materials for the manufacture of ceramic and similar articles, which includes: a substantially horizontally extending grinding track, a stationary track column extending at least approximately at a right angle and in upward direction through said grinding track, a cross head arranged above and in vertically spaced relationship to said track and being rotatably mounted on said track column, driver crank means mounted on said cross head, grinding roller means rotatably arranged on said crank means, and driving means comprising a driving motor mounted on said column and also comprising a driven member drivingly connected to said cross head.

4,044,959

PROCESS AND APPARATUS TO WIND CONTINUOUSLY THREAD ON A SUCCESSION OF REELS

Roland Lemaire, Fere-en-Tardenois, France, assignor to Etudes et Fabrications, France

Filed May 27, 1976, Ser. No. 690,394
Claims priority, application France, May 29, 1975, 75.16848
Int. Cl.[2] B65H *54/00*
U.S. Cl. 242—25 A **9 Claims**



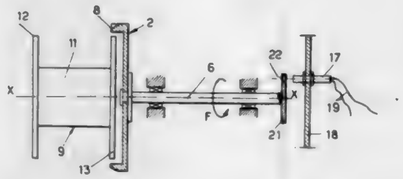
1. An apparatus to wind a thread on a succession of reels, comprising two annuli with parallel and practically horizontal axes, each carrying a coaxial reel, a reel traversing mechanism provided with a pulley movable over the reels for feeding of the thread around the reels in regular layers, means for cutting the thread when one reel has been filled up, means to then ensure without stopping the winding of the thread around a second empty reel, comprising a first movable catch pin being positioned near the empty reel to ensure the gripping of the thread, to allow the cutting of the thread and the coupling of this thread around said empty reel, a second movable catch pin placed near the full reel to grip and maintain the thread perpendicularly to the axis of said full reel after the cutting of thread, and means to control the position of said catch pins at the end of the filling of said first reel.

4,044,960

PROCESS AND APPARATUS TO WIND THREAD ON A SUCCESSION OF REELS

Roland Lemaire, Fere-en-Tardenois, France, assignor to Etudes et Fabrications, France

Filed May 27, 1976, Ser. No. 690,395
Claims priority, application France, May 29, 1975, 75.16849
Int. Cl.[2] B65H *54/00*
U.S. Cl. 242—25 A **9 Claims**



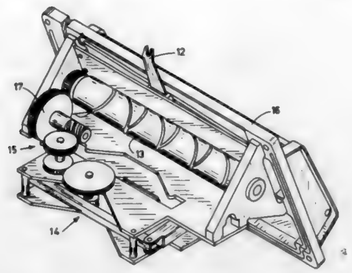
1. A method to wind a thread on a succession of reels supported by coaxial annuli rotatively driven and fitted with a peripheral clamp member to couple the thread on the associated reels fixed on annuli, fixed anvils being provided to cut the thread when a reel has been filled to capacity, the switching-over of the thread from a filled reel to an empty reel being initiated after the detection of a predetermined angular position of the clamp member fixed on the annulus associated with the empty reel, this angular position being measured with respect to the associated anvil.

4,044,961

MULTIPLE-UNIT SPOOLING MACHINE WITH YARN TRAVERSE MECHANISM

Rudolf Luz, Horgen, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed Mar. 4, 1976, Ser. No. 663,675
Claims priority, application Switzerland, Mar. 26, 1975, 3912/75
Int. Cl.[2] B65H *54/20, 54/28, 54/38*
U.S. Cl. 242—35.5 R **9 Claims**



1. Multiple-head spooling machine having a plurality of spooling units (**1***a*, **1***b*, **1***c* . . .) located adjacent each other comprising

a common drive shaft (**2**) for the spooling units of the spooling machine;

a plurality of main gears (**18**) on the common drive shaft (**2**), one each located to provide drive power for a respective spooling unit;

each spooling unit including

a wind-up spool carrier (**5**) for locating a wind-up spool (**6**) thereon,

means (**7**) to impart rotation to the wind-up spool (**6**),

and a yarn traverse mechanism including gearing means therefore located in position to guide yarn in axially traversing movement across the spool (**6**);

a main gear on each unit located in rotation power transmission postion with the main gear (**18**) of the respective spooling unit and in engagement with said traverse gearing means to transfer rotational power from the main drive shaft (**2**) through the respective main gear (**18**) of the respective spooling unit to the traverse mechanism thereof;

and a plurality of soft engagement clutches (**19**), one each associated with a respective spooling unit to selectively control rotational power transmission from the common drive shaft (**2**) to the main gear of each of the respective spooling units and hence to the respective yarn traverse mechanisms,

and wherein at least a portion of the traverse mechanism of each of the spooling units forms a single replaceable assembly.

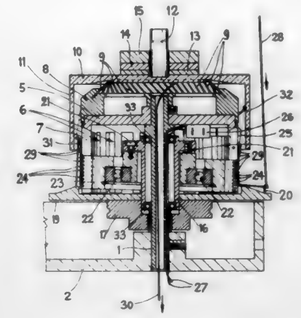
4,044,962

APPARATUS FOR YARN STORING AND FEEDING TO YARN USING MACHINES

Sergio Calamani, via Settima, 27-Segrate San Felice; Eugenio Turri, via Benedetto Marcello 1-, and Ermanno Savio, via Garofalo 22-, all of Milan, Italy

Filed Apr. 7, 1975, Ser. No. 565,607
Int. Cl.[2] B65H *51/24*
U.S. Cl. 242—47.05 **1 Claim**

1. An apparatus for storing and feeding yarn to a yarn utilization machine, comprising: a drum which, at least partly, is substantially cylindrical, said drum having a plurality of longitudinal slits distributed throughout its periphery; an arm fitted with members for hooking yarn from a spool and dispensing or distributing it as windings on said drum adjacent one end thereof; drive means for imparting relative rotational motion between said arm and said drum; and a swinging device for translating the windings from said one end of the drum where they are laid by said arm to the other end of said drum, where the yarn is drawn off and supplied to the yarn utilization machine; said swinging device including a shaft extending in said drum and secured therewith, a first bearing on said shaft, a bush mounted on said first bearing and coupled to said drive means for undergoing rotation relative to said shaft, said arm being fixed to said bush, a second roller bearing having an axis inclined to and eccentric with respect to the drum axis; an annular body mounted on said second bearing and including a plurality of superimposed and spaced blades projecting radially outwardly from its periphery, said blades being distributed in groups positioned and swingable in respective slits in the drum, and means tiltably carrying said second bearing from said bush and including leveling screws between said bush and said second bearing for adjusting the inclination of said second bearing, said annular body and said blades with respect to said drum.

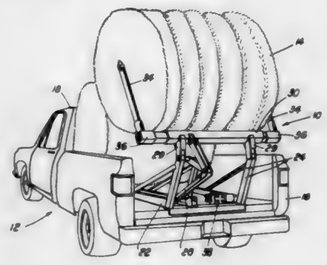


4,044,963

ROUND BALE LOADER, UNLOADER AND UNROLLER

Dewey L. Hostetler, Harper, Kans., assignor to DewEze Mfg., Inc., Harper, Kans.

Filed Sept. 22, 1976, Ser. No. 725,566
Int. Cl.[2] B65H *75/00, 75/40, 17/46*
U.S. Cl. 242—54 R **10 Claims**



1. A round bale loader, unloader and unroller for mounting on the rear of a flat bed vehicle, the loader comprising:

a frame attached to the flat bed of the vehicle;

a lateral cross bar pivotly attached to said frame, said cross bar parallel to the rear of the vehicle and adjacent thereto;

expansion means attached to said cross bar for expanding and contracting the length of said cross bar;

hugger arms attached to the ends of said cross bar and extending outwardly therefrom, said hugger arms disposed adjacent the sides of a round bale and gripping the sides thereof when said cross bar is contracted; and

pivot means attached to said cross bar and said frame for

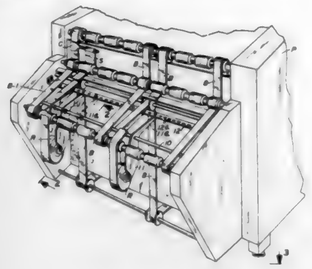
pivoting said cross bar on said frame for loading and unloading a round bale.

4,044,964

ROLL HOLDER FOR PHOTOGRAPHIC PROCESSORS

William B. Kellett, Minneapolis, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Sept. 7, 1976, Ser. No. 720,979
Int. Cl.[2] B65H *19/08*
U.S. Cl. 242—58 **8 Claims**



1. A roll holder for mounting supply rolls of photographic strip material to be processed, said holder comprising:
a transversely extending fixed mounting rod,
a fixed adjustment element spaced rearwardly from said mounting rod,
a pair of laterally extending roll mounting pin elements for journaling a supply roll of photographic strip material to be processed,
a pair of spaced apart roll holding brackets, each bracket including:
a hub element rotatably and slidably mounted on said transverse mounting rod,
a roll mounting arm fixed to said hub element and extending forwardly therefrom,
an anchoring arm fixed to said hub element and extending rearwardly therefrom and having an interlocking element adjustably connected to said adjustment element to anchor the bracket in the desired spaced apart from the other bracket of said pair,
said roll mounting arm including a pin receiving slot oriented to rotatably mount in captured relationship the mounting pins on which a roll of strip material to be processed is carried.

4,044,965

MAGNETIC TAPE REEL FOR COMPUTER

Patrick P. Posso, Lausanne, Switzerland, assignor to Societe Anonyme dite: GEFITEC S.A., Switzerland

Filed Sept. 3, 1976, Ser. No. 720,367
Claims priority, application Switzerland, Sept. 19, 1975, 12217/75
Int. Cl.[2] B65H *75/18*
U.S. Cl. 242—71.8 **3 Claims**

1. A magnetic tape reel for computers, said reel comprising:
a central part comprising:
a driving hub having an annular collar extending radially outwardly from the outer surface of said hub;
a driving ring concentric with said hub and having an annular collar extending radially inwardly from said inner surface of said ring; and
means for interconnecting said hub and said ring;
a first side flange formed with inner and outer substantially cylindrical welding surfaces projecting inwardly from the inner surface thereof and being connected to each said hub and said ring by means of respective first and second ultrasonic welds wherein said inner and outer cylindrical welding surfaces contact one side of said hub collar and said ring collar respectively; and
a second side flange formed with inner and outer substantially cylindrical welding surfaces projecting inwardly from the inner surface thereof and being connected to each said hub and said ring by means of respective third and fourth annular ultrasonic welds wherein said inner



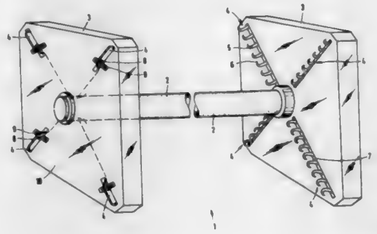
and outer surfaces contact the other side of said hub collar and said ring collar respectively;
said rigid joining of said first and second side flanges with said hub and said ring by means of said annular ultrasonic welds forming a box-like structure having a high resistance to compression produced by tape being wound thereon.

4,044,966

TAKE-UP FRAME FOR PILE FABRIC

Axel Schneider, Krefeld, Germany, assignor to Scheibler Peltzer & Co., Krefeld, Germany

Filed Jan. 31, 1975, Ser. No. 546,132
Claims priority, application Germany, Feb. 22, 1974, 2408590
Int. Cl.[2] B65D *85/671;* **B65H** *75/02*
U.S. Cl. 242—77.1 **2 Claims**



1. A take-up frame for pile fabric comprising in combination:
two one-piece suspension frames, each having a plurality of radially projecting, narrow, elongated slots formed therein, and each frame having a central hub with a cylindrical bore provided therein;
a cylindrical shaft extending between said frames and having its ends seated in said cylindrical bores, said cylindrical shaft being made of an easily penetrable material such as cardboard and the like;
said central hub having openings through its side in line with each of said slots;
a plurality of hook bands, each having a plurality of hooks projecting from one longitudinal edge thereof, each of said hook bands being slidably disposed within one of the slots in one of said suspension frames, with said hooks projecting from the side of the frame facing toward the other frame;

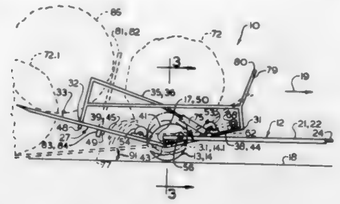
each of said hook bands having a pointed end that projects through the opening in line with its slot and is adapted to penetrate said cylindrical shaft; and
said hook bands being urged longitudinally within said slot in the direction toward the hub by tension of pile fabric attached to said hooks so as to cause said pointed ends to penetrate the cylindrical shaft and thereby lock said suspension frames to the shaft.

4,044,967

ROUND BALE FEEDER

Lawrence Joseph Charles Guichon, G. Guichon Ranch Ltd., Quilchena, British Columbia, Canada (V0E 2RO)

Filed Oct. 18, 1976, Ser. No. 733,111
Int. Cl.[2] B65H *17/46, 75/42*
U.S. Cl. 242—86.5 R **10 Claims**



1. A round bale feeder for transporting and unwinding round bales of hay or like material, the feeder including:
a. a wheeled frame carried on ground bearing wheels and adapted to be towed behind a vehicle,
b. a tilting frame hinged for rotation relative to the wheeled frame about a hinge axis disposed generally normally to direction of travel of the wheeled frame, the tilting frame having front and rear ends and a loading ramp at the rear end thereof,
c. front and rear rollers and a mid-roller positioned between the front and rear rollers, the rollers being journalled on the tilting frame for rotation about roller axes disposed parallel to the hinge axis so as to extend transversely across the tilting frame, at least one of the rollers being powered, the front and rear rollers being spaced apart longitudinally sufficiently to support a complete round bale thereon, the mid-roller being sufficiently close to one of the remaining rollers to support the bale when almost completely unwound,
d. tilting means cooperating with the tilting frame so that actuation of the tilting means rotates the tilting frame to lower the loading ramp towards the ground to permit the bale to be loaded onto the tilting frame and to position the rollers relative to each other to permit positioning of the bale on at least two rollers.

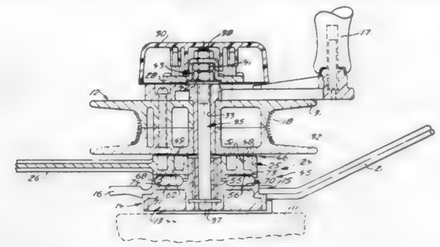
4,044,968

DOWNRIGGER FOR TROLLING

Blayney J. Scott, 306 Dallas Road, Victoria, British Columbia, Canada (V8V 1A7)

Filed Mar. 16, 1976, Ser. No. 667,257
Int. Cl.[2] A01K *89/02*
U.S. Cl. 242—106 **13 Claims**

1. A downrigger for trolling having: a reel adapted for winding a line thereonto and for unwinding a line therefrom; the reel being mounted for rotation about an axis and between a pair of spaced stop means; a brake means to brake the reel against rotation when engaged and to permit free wheeling of the reel when disengaged; and a cam means cooperating with the brake means and having a cam follower and a cam surface, the cam surface being characterized by:
a. a helical surface centered on the axis, the surface having location means thereon which holds the cam follower either in an off position in which the reel is free to rotate in either direction, or in cocked position in which rotation of the reel resulting from unwinding of the line actuates



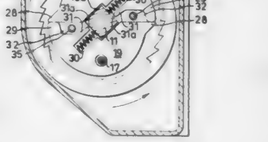
the cam means to engage the brake means to prevent further unwinding.

4,044,969

LOCKING MECHANISM FOR VEHICLE SAFETY BELTS

Jan-Olof Wallin, Mariefred, Sweden, assignor to Granges Essem Aktiebolag, Vasteras, Sweden

Filed Dec. 22, 1975, Ser. No. 643,117
Claims priority, application Sweden, Dec. 23, 1974, 7416264
Int. Cl.[2] A62B *35/02;* **B65H** *75/48*
U.S. Cl. 242—107.4 A **4 Claims**



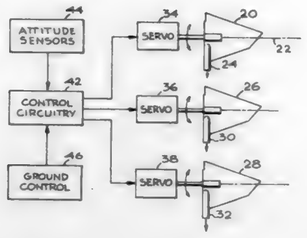
1. A locking mechanism for a retractable safety belt having a strap in a vehicle to lock the belt either at rapid retraction of the strap of the belt or at an alteration in travelling speed or direction of the vehicle, the mechanism comprising, in combination, a reel having an axis and on which the strap is coiled up when not in use; a supporting means attached to said reel for rotation with it; two pivot pins attached to said supporting means and positioned diametrically and at equal distances from and in parallel to said reel; at least two latching means pivotally mounted on said two respective pivot pins thereby to be turnable by centrifugal force from a retracted free position to an extended, latching position, said at least two latching means having substantially identical shapes, having respective notches and being positioned in a given plane perpendicular to said reel to abut one another in said plane whereby an angular turning of one of said at least two latching means causes a corresponding equal angular turning of the other of said at least two latching means; an actuating means rotatably mounted on said reel and provided with respective pins projecting into said respective notches in said at least two latching means so as to be driven by said at least two latching means upon rotation of said reel; and a movable inertia member for braking said actuating means in relation to said reel in response to an alteration of speed or direction of the vehicle, said actuating means when braked forcing said at least two latching means substantially simultaneously to the latching positions for locking said reel.

4,044,970

INTEGRATED THRUST VECTOR AERODYNAMIC CONTROL SURFACE

Inge Maudal, Claremont, Calif., assignor to General Dynamics Corporation, Pomona, Calif.

Filed Aug. 8, 1975, Ser. No. 603,218
Int. Cl.[2] F42B *15/18*
U.S. Cl. 244—3.22 **6 Claims**



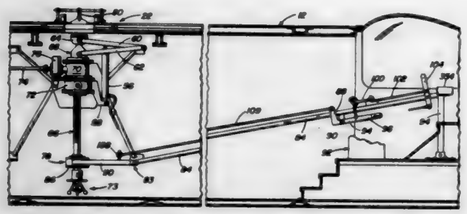
1. A missile comprising:
a cylindrical missile body;
main propulsion means acting along the axis of the body to propel the missile;
a plurality of tail panels pivotably mounted to and exteriorly of the body and pivotable about an axis normal to the cylindrical surface of the body, for aerodynamically controlling direction of the missile in flight;
a servo motor associated with each tail panel for controlling the angular position of the tail panel relative to the missile body;
control circuitry for activating the servo motors to control the flight of the missile; and
a continuously burning reaction thrust motor integral with and mounted in each tail panel and rotatable therewith for providing thrust along the chord thereof enhancing the aerodynamic control of the missile, and for developing rotational forces on the body in the absence of aerodynamic forces.

4,044,971

HIGH SPEED, LONG RANGE TURBO-JET AIRCRAFT

Jack W. Pharris, Alamogordo, N. Mex., assignor to Ruth Walcott, Albuquerque, N. Mex., a part interest

Continuation-in-part of Ser. No. 409,887, Oct. 26, 1973, Pat. No. 3,907,219. This application July 25, 1975, Ser. No. 599,106
Int. Cl.[2] B64C *27/22, 27/30*
U.S. Cl. 244—7 R **13 Claims**



1. A composite aircraft including a fuselage, a rotatable wing assembly, means mounting the rotatable wing assembly for rotation on the fuselage, thrust producing means mounted on the fuselage for propulsion thereof, disengageable drive means drivingly connecting said thrust producing means to the rotatable wing assembly for powered rotation thereof, means for retracting the rotatable wing assembly into the fuselage and means connected to the rotatable wing assembly for preventing retraction thereof in response to powered rotation.

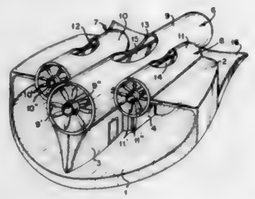
13. A convertible thrust and lift producing power plant for an aircraft comprising a combustion turbine having a combustion chamber and turbine blades, mechanical load means disengageably connected to the turbine blades, reaction nozzle means connected to the turbine for discharge of combustion products generated in the combustion chamber, compressor means driven by the turbine blades for inducing inflow of air to the turbine, after-burner means for conducting the combustion products from the turbine combustion chamber to the nozzle means, conduit means for conducting flow between the compressor means and the after-burner means in by-pass relation to the turbine, and means for supplying propellant fuel to the after-burner means while the turbine is unloaded from the load means, said propellant supplying means including means for selectively feeding rocket fuel and oxygen directly to the after-burner means during accelerating rocket operation and means for selectively feeding a refrigerant fluid to the conduit means during ram jet operation of the aircraft.

4,044,972

AIRCRAFT WITH CIRCULAR WINGS

Leif Anker-Holth, Munkedamsveien 55 b, Oslo 2, Norway

Filed Dec. 9, 1975, Ser. No. 639,103
Claims priority, application Norway, Mar. 24, 1975, 751010
Int. Cl.[2] B64C *15/14*
U.S. Cl. 244—12.2 **8 Claims**



1. In an aircraft an approximately circular lower aerofoil having a leading edge and a trailing edge, an upper at least partly circular aerofoil concentric with and of essentially the same diameter as said lower aerofoil and vertically spaced from said lower aerofoil; a central engine duct disposed generally in the plane of said upper aerofoil and having open forward and rear ends, said central duct extending along the longitudinal center line of the aircraft; means defining a central corridor extending along said lower aerofoil parallel to and directly under said central engine duct, said central corridor being continuous with and connected to both said aerofoils; at least two side engine ducts disposed parallel to and symmetrically on opposite sides of said central duct, said side ducts having open forward and rear ends; a vertical wall extending between each of said side ducts and said lower aerofoils; and propeller means mounted in each end of each duct for rotation about the axis of the respective duct.

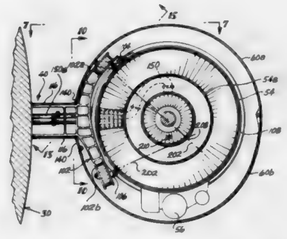
4,044,973

NACELLE ASSEMBLY AND MOUNTING STRUCTURES FOR A TURBOFAN JET PROPULSION ENGINE

James R. Moorehead, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 29, 1975, Ser. No. 644,915
Int. Cl.[2] B64D *29/06*
U.S. Cl. 244—54 **14 Claims**

1. In a structure for mounting a turbofan engine on a aircraft fuselage, said turbofan engine having a high bypass ratio and including a turbine casing housing a turbine engine, the rearward end of a turbine nozzle operably associated with said turbine casing for directing propulsion gases rearwardly from said engine, an annular fan casing surrounding and spaced outwardly from said turbine casing, a low pressure fan mounted within said fan casing and driven by said turbine engine, said fan casing being structurally coupled to said turbine casing, an improved structure for interchangeably mounting said turbofan engine to a plurality of locations on a fuselage comprising:
a structural yoke and means for affixing said yoke to the fuselage of an airplane, said yoke extending about a portion of the periphery of said fan casing and being spaced therefrom, said yoke having a central portion, a first end spaced in a first direction from said central portion and a second end spaced in the opposite direction from said central portion,
first shock absorbing mounting means associated with the first end of said yoke for releasably coupling the first end to a first location on the periphery of said fan casing,
second shock absorbing mounting means associated with the second end of said yoke for releasably coupling the second end of said yoke to a second location on the periphery of said fan casing, said second location being spaced from said first location,
a mounting arm and means for affixing said arm to the fuselage of an airplane, said arm having an outer end located adjacent said turbine casing and rearwardly from said yoke, said arm extending in a generally radial direction toward said turbofan engine,



third shock absorbing mounting means associated with the outer end of said arm for releasably coupling said outer end to said turbine casing,
nacelle means associated with said engine and including inner and outer fan duct walls defining an annular fan duct associated with and extending rearwardly from said fan casing for receiving fan air from said fan and directing said fan air rearwardly relative to said engine, and bifurcation means affixed to said engine and associated with said fan duct for splitting the flow of air therethrough, said bifurcation means extending longitudinally along said duct from a forward location adjacent said fan casing to a location rearwardly thereof, said bifurcation means being located in said fan channel adjacent the central portion of said yoke and having a central channel therethrough communicating between the region inside the inner fan duct wall and the region outside the outer fan duct wall, said mounting arm extending through said central channel, said nacelle means being coupled to said bifurcation means and said engine so as to be isolated from said mounting arm and said yoke when said engine is mounted thereon, and to remain coupled to said bifurcation means and said engine when said engine is released from said yoke and said mounting arm.

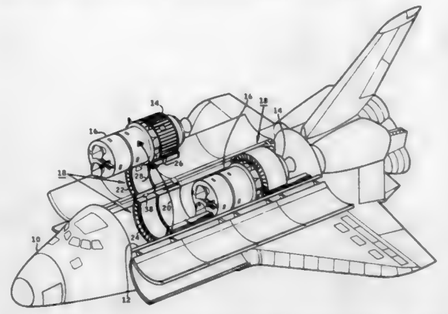
4,044,974

CLOSED CRADLE SPACE VEHICLE SUPPORT AND DEPLOYMENT SYSTEM

Richard C. Lingley, San Diego, and Milburn R. Smith, La Mesa, both of Calif., assignors to General Dynamics Corporation, San Diego, Calif.

Filed Aug. 23, 1976, Ser. No. 716,735
Int. Cl.[2] B64D *9/00*
U.S. Cl. 244—161 **6 Claims**

1. A support structure for carrying a spacecraft in a cargo bay of a reusable launch vehicle during launch and for deploying the space vehicle in outer space comprising:
a bi-sectional cradle having generally annular configuration, with an outer surface conforming generally to the inner surface of a reusable launch vehicle cargo bay and an inner surface generally conforming to the outer surface of a space vehicle to be released in space;
said cradle being longitudinally divided into a first fixed section secured to said launch vehicle and a second movable section adjacent to an openable side of said cargo bay;
one abutting edge of said first and second sections including a releasable latch means;
the second abutting edge of said first and second sections including a first hinge means having a hinged line lying substantially parallel to the cradle centerline;



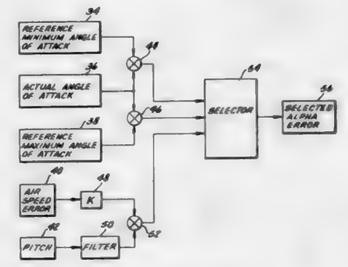
first actuator means for rotating said second section about said first hinge from a closed cradle position to an open deployed position upon release of said latch;
deployment probe means for securing a space vehicle to said second section for rotation with said second section;
said deployment probe means including second hinge means having a hinge line lying substantially parallel to said centerline; and
second actuation means for rotating said probe and any space vehicle secured thereto from a first position with said space vehicle in contact with the inner surface of said second section to an extended position extending away from said section.

4,044,975

AIRCRAFT SPEED COMMAND SYSTEM

Frederick C. Blechen, Long Beach, and Lloyd L. Roberts, Huntington Beach, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 17, 1976, Ser. No. 687,256
Int. Cl.[2] G05D *1/08*
U.S. Cl. 244—181 **8 Claims**

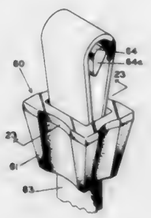


1. Apparatus for generating an angle of attack (alpha) error signal comprising:
means for generating a first signal proportional to a difference between a minimum angle of attack (alpha) and an actual alpha,

means for generating a second signal proportional to a difference between a maximum alpha and an actual alpha,
means for generating a third signal proportional to a difference between actual and reference aircraft speeds, and
selector means for transmitting as an output
a. the lower of said first and third signals when either represents an alpha less than minimum alpha,
b. the higher of said second and third signals when either represents an alpha greater than maximum alpha, or
said third means at all other times.

7. The method of generating an aircraft angle of attack (alpha) error signal, comprising:
generating a first signal proportional to the difference between actual and minimum alpha,
generating a second signal proportional to the difference between actual and maximum alpha,
generating a third signal proportional to the difference between actual and reference air speeds, and
selecting for output as an alpha error signal
a. the lower of said first and third signals when either represents an alpha smaller than minimum alpha,
b. the higher of said second and third signal when either represents an alpha greater than maximum alpha, or
c. said third signal at all other times.

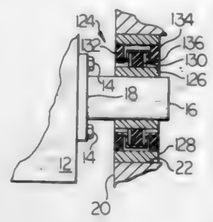
4,044,976
CHOCKS
Gaylord K. Campbell, 5113 St. Cyr, Middleton, Wis. 53562
Division of Ser. No. 470,948, May 17, 1974, Pat. No. 3,957,237.
This application May 10, 1976, Ser. No. 685,079
Int. Cl.[2] A47G *29/00*
U.S. Cl. 248—1 **4 Claims**



1. A mountaineering chock comprising: a rigid body having a bottom surface, a first pair of opposed external side rock engaging surfaces tapering toward said bottom surface for engagement in a rock constriction, a second pair of opposed external side rock engaging surfaces tapering toward said bottom surface for engagement in a rock constriction, a constricted aperture for accommodating a runner with a runner egress opening on said bottom surface, removable anchoring means around which the runner is to be looped in said aperture, said aperture having an opening on one of said second pair of opposed external side rock engaging surfaces through which said anchoring means can be inserted into said aperture, said anchoring means wedging the runner looped therearound in said constricted aperture to prevent said anchoring means and runner from being displaced through said runner egress at said bottom surface and for reinforcing said first pair of opposed external side rock engaging surfaces.

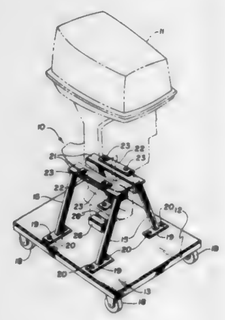
4,044,977
BUSHING TYPE MOUNT WITH TRIPLE SPRING RATE
Dennis D. Feucht, Morton, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 16, 1976, Ser. No. 677,576
Int. Cl.[2] F16C *35/12*
U.S. Cl. 248—7 **9 Claims**

1. In an isolation mount for absorbing shock loading including a stub shaft, mounting means providing at least a double spring rate including a first spring rate from substantially zero deflection to a first deflection limit and a second spring rate from said first deflection limit to a second deflection limit, said second spring rate being higher than said first spring rate, said second deflection limit being greater than said first deflection limit, wherein said mounting means comprises annular inner and outer bushings, said inner bushing having a diameter less than the diameter of said outer bushing and defining an annular space therebetween, said outer bushing having a radially inner face and said inner bushing having a radially outer face which define the radial limits of said space, an annular mounting ring intermediate said faces, said mounting ring defining a radially



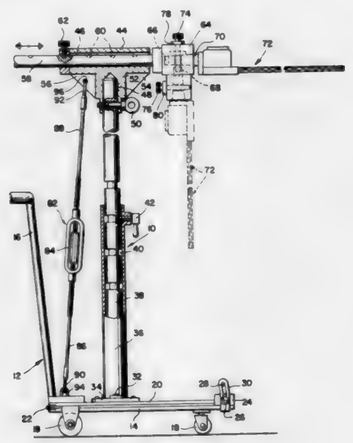
outer portion being generally axially directed, and a pair of generally axially directed radially inner portions on opposite sides of said radially outer portion, said outer and inner portions being connected by a pair of generally radially directed side walls, and further including a pair of annular, resilient outer bushing members intermediate said inner portions and said radially inner face, and an inner resilient bushing member intermediate said outer portion and said radially outer face, and wherein said outer portion is spaced from said inner face by an outer gap.

4,044,978
BOAT MOTOR DISPLAY AND WORK STAND
James F. Williams, 2004 Knollwood Drive, Grand Rapids, Minn. 55744
Filed May 10, 1976, Ser. No. 684,748
Int. Cl.[2] F16F *15/00*
U.S. Cl. 248—13 **6 Claims**



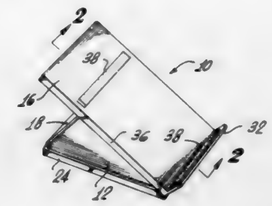
1. A stand for supporting boat motors comprising:
a base lying in a generally horizontal plane and having wheel means connected thereto;
means for supporting said boat motor on said base comprising connection means for connecting the stand to the cavitation plate of said boat motor on said each side of said motor and a support means extending between said base and said connection means for supporting said connection means in spaced relationship above said base;
said connection means including a pair of corresponding clamps spaced and adapted for straddling said boat motor, said clamps each including first and second clamp members being disposed one above the other and adapted for clamping a portion of said cavitation plate therebetween, each of said first clamp members comprising a first elongated member positioned below its corresponding second clamp member and having a longitudinal axis extending generally in the direction of its elongated dimension and orientated such that its longitudinal axis is generally parallel to the longitudinal axis of the other first elongated member and generally equally spaced therefrom, each of said first elongated members further having an inner, top surface for engaging and supporting a portion of said cavitation plate along a substantial portion of the length thereof, each of said second clamp members being positioned in spaced relationship above said inner, top surface of its corresponding first elongated member, said connection means further including means connected with said first and second clamp members for providing a clamping action between said clamp members;
said support means including a support member connected with each of said first clamp members and extending outwardly and downwardly therefrom to said base to form an included angle with said generally horizontal plane of less than 90°.

4,044,979
HEDGE TRIMMER
Patrick V. Lemmo, 119 Scooter Lane, Hicksville, N.Y. 11801
Filed June 11, 1976, Ser. No. 695,150
Int. Cl.[2] F16F *15/00*; F16M *1/00*
U.S. Cl. 248—13 **6 Claims**



1. Hedge trimming apparatus comprising:
a base;
a substantially horizontal platform pivotally connected to said base so as to be adjustably positioned relative to said base;
means for retaining said platform in an adjusted position relative to said base, said retaining means comprising a block fixedly secured to an edge of said platform, a screw threadably received within an aperture disposed in said block, an arcuate arm fixedly secured to a lateral edge of said base adjacent to said edge of said platform, said arcuate arm having an arcuate slot disposed therein, said screw disposed through said arcuate slot and selectively engaging said arcuate arm upon the tightening of said screw;
wheel and handle means connected to said base;
a substantially vertical tubular pedestal on said base;
a column telescopically received and adjustably mounted in said pedestal;
a substantially horizontal tubular sleeve mounted on one end of said column;
a shaft slidably adjustable within said tubular sleeve; and
a bracket for mounting an electric hedge trimmer in either a vertical or horizontal position on the end of said shaft, said bracket having a first open-ended bore with a substantially horizontal longitudinal axis relative to said platform and a second open-ended bore with a substantially vertical longitudinal axis relative to said platform, said first and second bores for receiving a portion of said hedge trimmer therein.

4,044,980
COLLAPSIBLE DESKTOP STAND FOR PORTABLE ELECTRONIC CALCULATOR
Victor Cummins, Burbank, Calif., assignor to Cummins Enterprises, Burbank, Calif.
Filed Apr. 26, 1976, Ser. No. 679,980
Int. Cl.[2] F16F *15/00*; A47B *97/04*
U.S. Cl. 248—13 **4 Claims**



1. A collapsible one-piece stand for supporting a portable electronic calculator or the like on a work surface in inclined relation thereto, comprising:
a base portion formed by a thin rectangular plate having an upper and a lower surface extending in longitudinal and transverse directions, said upper surface having relatively short upstanding walls integrally formed along opposite end and side edges thereof for structural rigidity, said lower surface adapted to rest on said work surface and having means for resisting sliding movement therebetween;
a backrest portion comprising a thin rectangular plate adapted to hold said calculator thereon, said plate having a face surface and a rear surface extending in longitudinal and transverse directions, said face surface having a forwardly projecting, integrally formed flange extending transversely along a first end thereof to provide support underneath said calculator, and said rear surface having short rearwardly projecting, integrally formed side walls extending longitudinally along opposite side edges thereof, said side walls having at least one pair of rearwardly extending slots in register with each other near the end opposite said first end;
a brace portion comprising a thin rectangular plate extending in longitudinal and transverse directions having a first end and a second end, said second end of said brace portion having transversely projecting tabs extending beyond the side edges thereof;
said base portion, said backrest portion and said brace portion integrally formed as a single unit of a flexible plastic material, said first end of said backrest portion hingedly connected to one end of said base portion by a transversely extending thin integral web, and said first end of said brace portion hingedly connected to the opposite end of said base portion by a like integral web, said backrest portion and said brace portion swingable about the opposite ends of said base portion between at least one assembled state in which said brace portion engages said backrest portion for support thereof in an inclined position with said face surface facing outwardly and at least one collapsed state in which said backrest portion and said brace portion lie substantially flat with said base portion; and

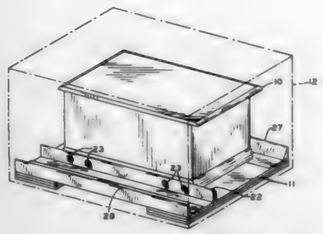
said tabs receivable within said slots with a snug fit for releasably fixing said brace portion to said backrest portion in an assembled state.

4,044,981

PAPERBOARD PALLET

Robert Horace Richter, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed June 14, 1976, Ser. No. 695,697
Int. Cl.[2] B60P *7/00*
U.S. Cl. 248—119 R **8 Claims**



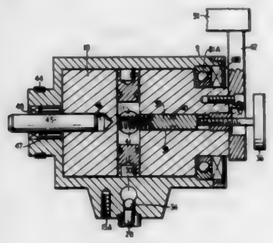
1. A pallet for supporting cargo comprising:
a. a paperboard sheet having an upper surface and a lower surface;
b. an upstanding rib formed by folding said sheet so that adjacent strip portions of said lower surface are in facing relationship;
c. a base member beneath said sheet, the upper surface of said base member bonded to at least a portion of the lower surface of said sheet; and
d. means for securing a cargo residing on said paperboard sheet to said upstanding rib.

4,044,982

SUPPORTS FOR CAMERAS

Jeanette Mary Miller, and Robert Eric Miller, both of Rose Bay, Australia, assignors to Victoria Alice Miller and Timothy Robert Miller, both of Rose Bay, Australia, part interest to each

Filed Oct. 18, 1973, Ser. No. 407,687
Claims priority, application Australia, Oct. 25, 1972, 967/72
Int. Cl.[2] F16M *11/12*
U.S. Cl. 248—183 **13 Claims**



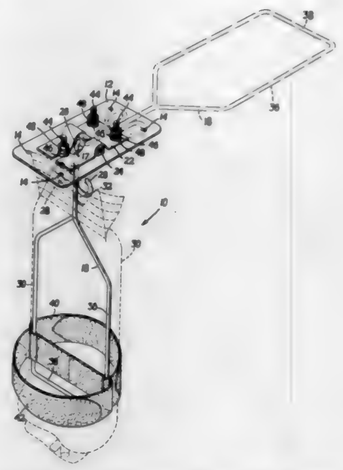
1. A fluid head support for rotating an apparatus supported thereon, said support comprising a casing having a substantially cylindrical bore therein, a cylindrical block, which is rotatable within said cylindrical bore, means permitting attachment of said apparatus to said fluid head support, sealing means to maintain a hydraulic fluid between the cylindrical surfaces of the casing bore and the block, said block being provided with a plurality of radial passages, an open end of each of said passages being located adjacent the cylindrical surface of the casing bore, each passage having a brake piston in sliding engagement therein, each said piston being located adjacent said open end of its respective passage, a control piston cylinder combination, means permitting fluid communication between the control piston-cylinder combination and the radial passages, means permitting displacemebt of the control piston and thereby causing radial displacement of the brake pistons relative to the cylindrical surface of the casing bore.

4,044,983

RETRACTABLE PLASMA CONTAINER HOLDER

Orville Francis, Piqua, Ohio, assignor to Indian Head, Inc., New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,419
Int. Cl.[2] A47F *5/00*
U.S. Cl. 248—293 **14 Claims**



1. A retractable holder suitable for plasma containers comprising:
a. a ceiling plate having an elongated slot;
b. a support prism positioned on one side of the ceiling plate with its major axis substantially perpendicular to the length of the slot;
c. spring clip means attached to the one side of the ceiling plate and resiliently urging the support prism against the ceiling plate while allowing the prism to be rotated around its major axis upon imposition of a substantial force for holding the prism in positions corresponding to the flat surfaces along the major axis of the prism; and
d. a hanger connected to the prism and including a portion extending through the slot to the other side of the ceiling plate, this portion of the hanger swinging back and forth along the length of the slot upon rotation of the prism and including means for supporting and restraining at least one container.

4,044,984

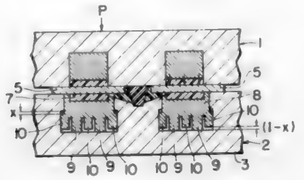
MOLD ASSEMBLY FOR RESIN-SEALING

Tsuyoshi Shimizu, Hinode, and Katsuhiro Tabata, Kodaira, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Oct. 29, 1976, Ser. No. 737,038
Claims priority, application Japan, Oct. 29, 1975, 50-129206
Int. Cl.[2] B29C *6/00*
U.S. Cl. 249—95 **10 Claims**

1. In a mold assembly including a pair of upper and lower molds, said upper and lower molds having parting surfaces and clamping an object to-be-sealed between said parting surfaces so as to effect resin sealing of said object,
the improvement wherein each of said upper and lower molds comprises a cavity block and a holder formed with a concave portion for receiving said cavity block therein,

said cavity block of at least one of said upper and lower molds being formed with
a concave portion so as to define a mold space on the side on which it comes into contact with said object to-be-sealed,



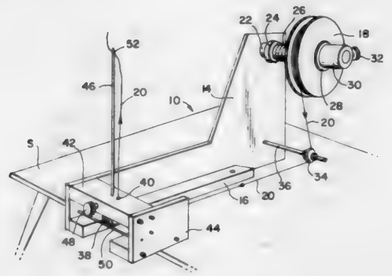
protrusions for deformation projecting beyond a surface of said cavity block on a side on which it comes into contact with a bottom surface of said concave portion of said holders, and
grooves of a desired depth in said surface of said cavity block among said protrusions for deformation.

4,044,985

CANDLE MAKING APPARATUS

Michael Ghany, 120 Harbord Street, Toronto, Ontario, Canada

Filed Nov. 2, 1976, Ser. No. 738,032
Int. Cl.[2] B29C *1/00*
U.S. Cl. 249—205 **10 Claims**



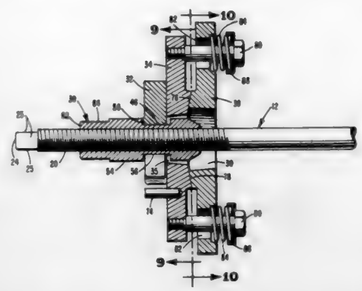
1. Candle making apparatus comprising:
a wick dispenser including
a support
means on said support for rotatably mounting a spool containing a continuous length of wick material,
means on said support spaced from said spool for mounting a substantially vertical needle having an eye,
means on said support between said spool and needle for guiding said wick material from said spool through the eye of said needle, and
a candle mold holder including
a bottom clamping bar having a hole therethrough receiving said needle and threaded wick material,
a pair of upright guide rods on said bottom clamping bar, and
a top clamping bar slidably adjustable along said rods for cooperation with said bottom clamping bar for clamping a candle mold therebetween about said needle and threaded with material.

4,044,986

CONCRETE FORM PANEL TYING APPARATUS

James K. Strickland; Frank R. Capps, both of Jacksonville; Todd B. Nekola, South Ponte Vedra Beach, and William A. Fremer, St. Petersburg, all of Fla., assignors to Strickland Systems Inc., Jacksonville, Fla.

Filed May 12, 1975, Ser. No. 576,862
Int. Cl.[2] E04G *17/08*
U.S. Cl. 249—216 **39 Claims**



1. Concrete form panel tying apparatus for restraining outward movement of a concrete form panel with respect to a tie passing outwardly through a form opening in said form panel, said apparatus comprising:
a bearing member attachable to said form panel, said bearing member having an opening alignable with said form opening, and an outwardly facing first bearing surface,
a tie extending through said bearing member opening,
an outer end portion on said tie having a first transverse dimension,
an inner end portion on said tie located inwardly of said outer end portion and having a second transverse dimension less than said first transverse dimension,
an outwardly sloped tie surface extending between said outer end portion and said inner end portion, said outwardly sloped tie surface being arcuate in cross-section,
anchoring means for engaging said tie, said anchoring means being adjustably positioned between said sloped tie surface and said first bearing surface to compensate for misalignment of the tie with respect to the bearing member and comprising a clamping member and a second bearing surface engageable with said first bearing surface, said clamping member having a clamping member recess of transverse dimension greater than said second transverse dimension and less than said first transverse dimension, said clamping member recess being defined by an outwardly sloped clamping surface of arcuate cross-section complementary to said tie surface and engageable therewith, said clamping member being movable radially with respect to said tie between a clamping position wherein said clamping surface is in engagement with said tie surface to restrain said concrete form panel against outward movement with respect to said tie and a nonclamping position wherein said clamping surface and said tie surface are not engaged with one another.

4,044,987

EXTERNALLY CONTROLLED SPREADER SYSTEM

Dusan Tausanovitch, 24 Crestwood Drive, Northport, N.Y. 11768; Peter R. Loviss, 1040 Pelhamdale Ave., Pelham, N.Y. 10803, and Tullio E. Loviss, 91 Whitson Road, Huntington, N.Y. 11743

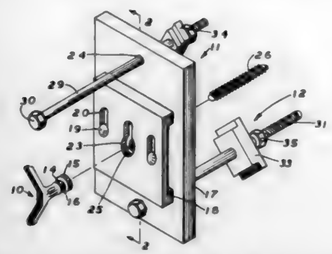
Continuation-in-part of Ser. No. 629,369, Nov. 6, 1975, which is a division of Ser. No. 525,887, Nov. 21, 1974, Pat. No. 3,920,214.
This application Nov. 3, 1976, Ser. No. 738,549
Int. Cl.[2] E04G *17/00, 11/06*
U.S. Cl. 249—219 W **15 Claims**

1. An exterior spreader system for a threaded end tie rod to

provide for controlled adjustment of concrete forms in both directions lengthwise of the tie rod, comprising:

a. nut means internally threaded for engagement with the adjacent end of the tie rod, said nut means having an inner end and other end and having a groove in the side thereof defined partly by a flange at the inner end;

b. a plate washer assembly incuding a washer adapted to be secured to a form and including a slidable plate slidably coupled to the exterior of the washer and defining therewith a recess, the plate having a through hole receiving the flange therethrough for disposition within the recess,



the plate being shiftable from a first disengaged position at which the flange is adapted to be inserted through the through hole into the recess and a second locked position at which the flange is locked within the recess and consequently the nut means is locked relative to the plate-washer assembly by the disposition of surfaces of the plate within said groove establishing a driving relation between said nut means and said plate-washer assembly; and

c. whereby threaded movement of said nut means on the tie rod will be transmitted through said flange and said plate-washer assembly to the form to which said washer is secured.

4,044,988

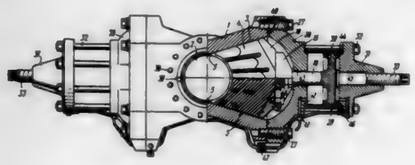
BLOWOUT RAM PREVENTER

Suren Akopovich Arzumanov, ulitsa Bogdana Khmelnitskogo, 2/15, kv.44, Moscow; Armais Avakovich Danieliants, ulitsa Nizami, 66, kv. 52, Baku; Kerim Salim ogly Aliverdizade, ulitsa Nizami, 66, kv. 19, Baku; Gasan Neimat ogly Seidov, ulitsa Chapaeva, 102, kv. 57, Baku; Artur Tair ogly Rasi-Zade, Tbilissky prospekt, 1 mikroraion, A-2, kv. 63, Baku; Boris Ovseevich Frenkel, ulitsa Chapaeva, 66, kv. 10, Baku, and Jury Alexandrovich Samoilov, ulitsa Nakhichevanskogo, 18, kv. 85, Baku, all of U.S.S.R.

Filed July 11, 1975, Ser. No. 595,218

Int. Cl.[2] E21B *33/06*

U.S. Cl. 251—1 A **4 Claims**



1. A blowout ram preventer, comprising: a housing having opposite ends, said housing being provided with a longitudinal cavity and a transverse central bore; guides in the cavity of said housing, the transverse spacing between said guides decreasing uniformly in a direction from the ends of said housing towards said bore, said guides adjacent said bore being spaced a distance at least equal to the diameter of said bore; a pair of opposed rams slidably mounted in said cavity for undergoing reciprocal movement relative to said bore, each said ram including a packer of resilient material having one end with reinforcing members therein facing said bore, and a ram body engaging said packer at the opposite end thereof, said ram body being slidably engaged with said guides, said guides and said ram body confining said packer so that the material of the packer will flow upon reciprocation of the ram, said ram body including a central drive member and two side members which are L-shaped in cross section and are movably coupled to each other and to said central member for undergoing relative movement upon reciprocation of said ram.

4,044,989

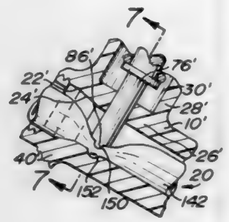
PINCH TUBE VALVE

Donald R. Basel, 9006 McCracken Blvd., Garfield Heights, Ohio 44125, and Raymond P. Kawolics, 6421 Woodbury Drive, Solon, Ohio 44139

Continuation of Ser. No. 508,208, Sept. 23, 1974, Pat. No. 3,976,277. This application Feb. 17, 1976, Ser. No. 658,195

Int. Cl.[2] F16K *7/06*

U.S. Cl. 251—7 **6 Claims**



1. A pinch tube type valve adapted to receive an elongated flexible tube for selective control of liquid through said tube, said valve comprising;

a valve body having upper and lower surfaces, an inlet end, and outlet end, a first enclosed passageway interconnecting said inlet and outlet ends and a second enclosed passageway disposed generally transversely to and communicating with said first passageway between said ends, said valve body further including mounting means for mounting said valve in a desired position to a mounting surface;

means for closing said valve disposed in said second passageway, said closing means comprising a stem member selectively reciprocal within said second passageway into said first passageway, said stem having a first position extending into said first passageway and adapted to act against said tube to force said tube into a closed condition to prevent liquid flow therethrough and a second position withdrawn from engagement with said tube toward said second passageway to allow liquid flow through said tube, said closing means further including spring biasing means disposed in said second passageway operating against said stem to continuously urge said stem toward said first position; and,

a distinct tube engaging protrusion extending outwardly from the outermost end of said stem wherein said protrusion has a width dimension as measured generally transverse of said first passageway and a thickness dimension as measured generally normal to said width dimension, said width being generally equal to the lateral dimension of said stem outermost end with said thickness being less than said width such that said protrusion comprises a generally rib-like area disposed transverse of said first passageway, said protrusion being cooperable with a distinct protrusion receiving area in the side wall of said first passageway opposite said second passageway with said receiving area having generally the same configuration as said protrusion and extending generally transversely across said first passageway whereby when said stem is in said first position, said distinct tube engaging protrusion engages said tube to force a portion thereof at least slightly into said distinct protrusion receiving area for more tightly closing said tube.

4,044,990

FLEXIBLE TUBULAR MEMBERS AND VALVES INCORPORATING SUCH MEMBERS

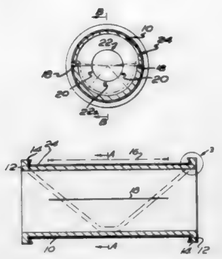
Francis Summerfield, Leeds, England, assignor to Alvasum (Aseptic) Limited, Pudsey, England

Continuation-in-part of Ser. No. 330,661, Feb. 8, 1973, abandoned. This application Jan. 30, 1975, Ser. No. 545,369

Claims priority, application United Kingdom, Feb. 18, 1972, 7560/72; Feb. 22, 1972, 8011/72

Int. Cl.[2] F16K *7/06*

U.S. Cl. 251—8 **5 Claims**



1. A flexible tubular member of circular cross section over an axial region between the ends thereof and having opposing shoulders at said region which divide the tube section at the shoulders into a first portion and a second portion which includes the shoulders, the circumferential internal length of the first portion being equal to the circumferential internal length of the second portion so that the tube can be pinched closed by a wrapping of the first portion into the second portion and over the shoulders, while the flexible tubular member is held in a rigid tube neatly matching the outside diameter of the flexible tubular member, said shoulders tapering away to nothing in the axial directions away from the center of the region, and wherein the tubular member in cross section is of constant thickness to one side of the shoulders defining a thick tube portion, and of constant thickness to the other side of the shoulders defining a thin tube portion and said thick and thin portions may each extend circumferentially over approximately half of the wall sectional length.

4,044,991

HIGH ENERGY LOSS FLUID FLOW CONTROL DEVICE

Henry A. Waller, Woodland Hills, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.

Filed Oct. 6, 1975, Ser. No. 619,709

Int. Cl.[2] F16K *47/06*

U.S. Cl. 251—122 **17 Claims**

1. A high energy loss fluid flow control device comprising:

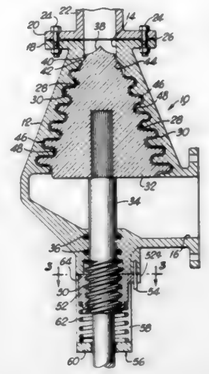
a housing member having an annular wall with an inlet adjacent one end and an outlet adjacent another end.

said housing wall having an inside surface formed with a continuous helical land and groove defining at least a part of a continuous helical flow passage between said inlet and outlet,

a valve member mounted in said housing for movement toward and away from said inlet and having an outer surface formed with a continuous helical land and groove defining at least a part of said helical flow passage extending between opposite ends of said member,

said land of said valve member projecting into said groove in said housing and said land of said housing wall projecting into said groove in said valve member forming said helical flow passage, and

means independent of said lands and grooves supporting said valve member in said housing for relative rotation and linear movement toward and away from said inlet to lengthen and shorten said continuous flow passage without contact between opposite facing surfaces of said lands projecting into said grooves,



said supporting means including a spindle secured to said valve member and having a threaded portion supported from said housing in threaded engagement with a support member movably mounted thereon.

4,044,992

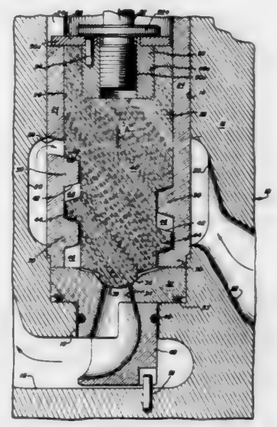
HIGH ENERGY LOSS FLUID FLOW CONTROL DEVICE

David Jukoff, Northridge, Calif., assignor to Consolidated Controls Corporation, Bethel, Conn.

Filed Jan. 9, 1976, Ser. No. 647,906

Int. Cl.[2] F16K *47/06*

U.S. Cl. 251—126 **6 Claims**



1. A high energy loss fluid flow control device comprising:

a body defining a generally cylindrical chamber in communication with an annular fluid inlet passage around said chamber spaced axially of a fluid outlet passage at one end of said chamber;

a hollow tubular generally cylindrical sleeve member coaxially mounted in said chamber open at one end adjacent said outlet passage and formed with a helical internally projecting thread extending between said one end and a radial inlet opening formed in the wall of said sleeve member in communication with said annular fluid inlet passage, and a helical groove formed between adjacent turns of said thread; and

a valve member coaxially mounted in said tubular sleeve

member for axial translation relative thereto and including an outwardly projecting helical thread extending between an end of said valve member and extending into said helical groove of said tubular sleeve member, and a helical groove defined on said valve member between adjacent turns of said thread thereon for receiving said thread of said sleeve member, said threads and said grooves defining a helical flow passage therebetween extending between said inlet opening and said one end of said tubular sleeve member, said threads of said members having a similar shape in transverse cross-section and each having a transverse cross-sectional width measured axially of said members substantially less than the width of said grooves receiving the same whereby said helical flow passage has a transverse cross-sectional flow area between said interfitting threads and grooves of said members of variable dimension and spaced to enlarge and contract said flow area upon relative axial translation of said valve member in said tubular sleeve member,

and means keying said members together permitting relative axial movement and preventing relative rotation therebetween.

4,044,993

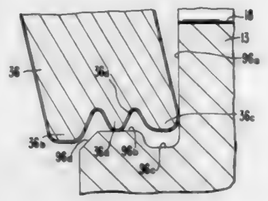
HIGH VACUUM GATE VALVE

William R. Wheeler, Saratoga, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Division of Ser. No. 452,110, March 18, 1974, Pat. No. 3,973,753. This application Jan. 26, 1976, Ser. No. 652,038

Int. Cl.[2] F16K *25/00, 51/02*

U.S. Cl. 251—158 **11 Claims**



1. Apparatus for valving comprising a valve member having a circular sealing surface, a sealing ridge extending outwardly from the said surface, a pair of protecting ridges extending outwardly from said surface, the sealing ridge being positioned between said protective ridges, and said sealing ridge being radially inward of a plane across said pair of protecting ridges.

4,044,994

PRESSURE LOADED SEALING ARRANGEMENT

Werner K. Priese, Barrington, Ill., assignor to Hills-McCanna Company, Carpentersville, Ill.

Continuation-in-part of Ser. No. 421,777, Dec. 5, 1973, abandoned. This application Oct. 14, 1976, Ser. No. 622,387

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—172 **8 Claims**



1. A valve comprising, in combination, a first element constituting a valve body defining a flow passage extending therethrough, a second element constituting a flow control member movably supported relative to said body for movement between an open position and a closed position for opening and closing said flow passage, one of said elements defining an annular sealing surface, the other of said elements defining an annular seal ring support groove oriented to confront said sealing surface in close proximity thereto; an annular seal ring member disposed in said support groove, said seal ring member, in section, including a first leg portion providing an annular anchoring flange, and a second leg portion including, an intermediate section extending in a direction toward said sealing surface as a continuation of said first leg portion, a reverse bent, bight segment of an arcuate shape joined to said intermediate section and extending radially outward of said support groove, said bight segment being joined with a free end segment which extends into said support groove oppositely of said intermediate section and spaced from said intermediate section, and lip means formed on said free end interiorly of said support groove and extending transversely thereof in a direction away from said intermediate section of said second leg portion, such that said bight segment and said free end segment serve to define with the remainder of said second leg portion and interior plenum chamber; said seal ring support groove including a first section for receiving said anchoring flange in fixed engagement therein, and a second section within which said second leg portion is disposed with said bight segment extending from said seal ring support groove for confronting sealing engagement with said annular sealing surface, said second section of the seal ring support groove being defined by spaced apart side surfaces, one of said surfaces defining shoulder means extending axially inward of said groove upon which said transversely extending lip means is engaged to maintain the free end of said second leg portion in said groove and to define the limit of the extension of said bight segment from said support groove, said bight segment extending from said groove a sufficient distance such that upon the engagement of said bight segment with said annular sealing surface upon movement of said flow control member to the valve closed condition, said second leg portion will be moved inwardly of said annular seal support groove to disengage said lip means from said shoulder means a sufficient amount to allow line fluid to enter said seal support groove and said plenum chamber, thereby to pressurize said seal, said sealing surface on said one element being disposed in close proximity to said confronting support groove in said valve closed condition, with the side surface of said support groove opposite said side surface having the shoulder means formed thereon, being disposed to form with said sealing surface an annular substantially right angle caulking corner, such that due to the close proximate of said sealing surface and said groove, and the provision of said caulking corner, upon said seal being pressurized, line pressure will force said bight segment into said caulking corner, with portions of said bight segment being forced into sealed engagement with said side surface and sealing surface defining said annular caulking corner, and means providing one or more passageways connecting the interior of said second section of said ring support groove with said flow passage such that fluid can escape from said plenum chamber even though said lip is engaged with said shoulder means.

4,044,995

VALVE

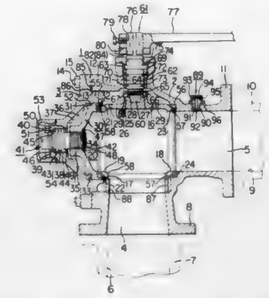
Yasuna Kubota, Kunitachi, Japan, assignor to Taimei Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed July 21, 1976, Ser. No. 707,403

Int. Cl.[2] F16K *25/00*

U.S. Cl. 251—188 **1 Claim**

1. An angle ball valve characterized by comprising a valve casing which consists of a main body and a cover member mounted detachably to said main body which has a first flow passage and a second flow passage, each passage being positioned in an angle state, said cover member having a seat holder fitted slidably in its seat holder fitting hole and an adjusting spindle fitting hole at its boss portion, said seat holder having a female screw hole at its boss portion, a valve member which is provided within the valve casing and which has an inlet port communicated always with the first flow passage, an outlet port capable of communicating with the second flow passage, a valve stem fitting hole, and a contacting surface provided around said valve fitting hole; seat rings fitted in the valve casing to support the valve member, one seat ring being fitted in the main body, and another seat ring being fitted in the seat holder; a valve stem arranged at the opposite side to the first flow passage and fitted in the valve stem fitting hole of the valve member at its lower portion, said valve stem being able



to rotate the valve member along the axis of the first flow passage; a receiving member mounted on the valve stem which is adjustably and movably engaged with the contacting surface of the valve member at its lower end surface so that the receiving member may receive a partial load to be applied on the valve member; and an adjusting spindle engaged in the female screw hole of the seat holder in its male screw portion and also fitted in the adjusting spindle fitting hole of the cover member so as to rotate merely without moving in the axial direction, whereby it is possible to compensate the contacting state between the seat rings and the valve member by the adjusting movement of the seat holder through the rotation of the adjusting spindle.

4,044,996

VALVE MEANS

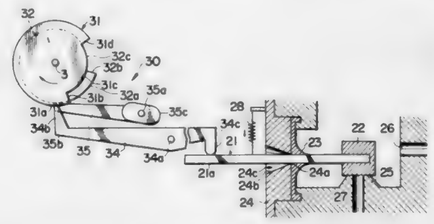
Heiichi Kodaira, Kitahara 3-2-18, Tanashi, Tokyo, Japan

Filed Oct. 14, 1975, Ser. No. 622,174

Claims priority, application Japan, Oct. 16, 1974, 49-123910[U]; Nov. 5, 1974, 49-132993[U]

Int. Cl.[2] F16K *31/524*

U.S. Cl. 251—229 **8 Claims**



1. A valve means comprising:

a valve lever pivotably supported by a valve guide and having a valve disk at one end thereof,

a seal of flexible material sealing the supporting portion of said valve guide and supporting said valve lever;

said seal being formed integral with said valve disk and covering a portion of said valve lever, and

a cam mechanism comprising:

a first cam having a cam surface of a high portion and low portion;

a second cam rotatable integrally with said first cam and having

a cam surface formed as a curved surface;

the distance of said curved surface from the center of rotation of said second cam being varied gradually from the highest portion toward the lowest portion of said cam surface;

a first lever pivotably supported by a shaft and biased so that one end thereof is pushed against said cam surface of said first cam, and

a second lever pivotably supported by another shaft and biased so that one end thereof is pushed against said cam surface of said second cam;

said valve means being arranged to integrally rotate both of said first and second cams so that said valve disk is opened when said one end of said first lever drops from said high portion to said low portion of said first cam as the other end of said first lever operates said valve lever and that said valve disk is closed when said one end of said second lever drops from said highest portion to said lowest portion of said second cam as said second lever pushes said first lever to return said first lever to the original position;

said seal being deformed when said valve lever is operated.

4,044,997

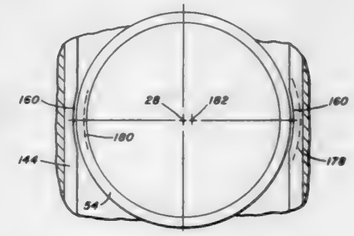
SEAT RING NOTCH FOR GATE VALVE GUIDE RAIL

Thomas A. Schelat, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 10, 1976, Ser. No. 721,947

Int. Cl.[2] F16K *3/12, 27/00*

U.S. Cl. 251—328 **6 Claims**



1. A gate valve comprising: a valve body having a flow passage intersected by a cavity; an annular valve seat member of predetermined diameter and height receivable within a bore formed in the passage adjacent the cavity; gate means having annular surfaces engageable with the valve seat member in a closed position and spaced therefrom in an open position; tongue means along the sides of the gate means; rail means formed on opposite sides of the body along the cavity and having spaced guide surfaces defining grooves for receiving the tongue means to guide the gate means in moving between said positions, said grooves having a width greater than the predetermined height of said valve seat member, the spacing between rail means on said opposite sides being less than said predetermined diameter; and notch means in the rail means in the rail means defining an opening toward the bores larger than said predetermined diameter whereby said valve seat member can be positioned into the bore by lowering the valve seat member into the cavity between said guide surface, aligning the valve seat member with the notch means, and shifting the valve seat member through said notch means into said bore.

4,044,998

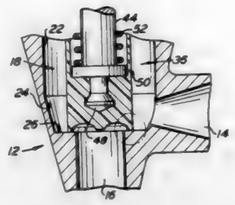
WEB TIP SEAT CUP

Elroy J. Giese, deceased, late of Cleveland, Ohio, by Alice F. Giese, executrix, assignor to Tomlinson Industries, Inc., Cleveland, Ohio

Continuation-in-part of Ser. No. 300,450, Oct. 25, 1972, Pat. No. 3,904,174. This application May 27, 1975, Ser. No. 580,630

Int. Cl.[2] F16K *7/12*

U.S. Cl. 251—331 **5 Claims**



1. A valve comprising:

a valve body having a cylindrical valve chamber connected with a lateral inlet passage and an axial outlet passage;

a valve seat formed in said chamber about said outlet passage, said valve seat being flat and lying in a plane generally perpendicular to the axis of said outlet passage;

a stem member extending generally axially into said valve chamber and selectively movable between valve opened and closed positions; and,

a resilient, cylindrical, generally cup-shaped valve member positioned in said valve chamber in operative communication with said stem member for movement between valve opened and closed positions and having an end face adapted to engage said seat and a peripheral side wall sealingly engaged with the inner wall of said chamber at a location axially spaced from said inlet, the end face of said valve member including a sealing portion in the form of a resilient peripheral downwardly extending flange having a length L and a tapered cross-section tapering toward and terminating in a flat, relatively narrow, circumferentially continuous band having a thickness D less than length L and lying in a plane generally perpendicular to the axis of said outlet passage with said band adapted to engage said seat about said outlet, said flange being defined by inner and outer walls with the outer wall being cylindrical and having its longitudinal axis substantially parallel to the axis of said valve chamber and said inner wall being inclined at an angle in the range of 20° to 40° relative to the axis of said chamber, the cooperative relationship between said stem and valve member being such that said continuous band of said flange positively engages said valve seat to form a sealing relationship therewith when said valve is in said closed position with said flange being axially compressed and at least slightly radially expanded, whereby fluid entering said chamber through said inlet passage will act against the at least slightly radially expanded area of said flange to further force said band into engagement with said valve seat and further enhance the effective sealing relationship therebetween.

4,044,999

CAMPER JACK

John N. Dodgen, Humboldt, Iowa, assignor to Dodgen Industries, Inc., Humboldt, Iowa

Filed Oct. 29, 1976, Ser. No. 736,695

Int. Cl.[2] B66F *7/26*

U.S. Cl. 254—45 **3 Claims**

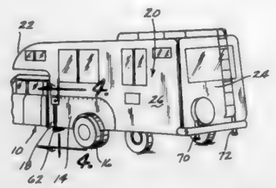
1. In combination,

a truck including a frame means having rearward and forward ends, a bed means operatively secured to said frame means and having opposite sides,

a camper means mounted on said bed means and including rearward and forward ends and opposite sides,

a first jack means having upper and lower ends and being length adjustable from first to second positions, the upper end of said first jack means being selectively movably secured to said camper means at one side thereof adjacent the forward end thereof, said first jack means being laterally adjustable from a travel position closely adjacent said one side to a support position outwardly therefrom,

a second jack means having upper and lower ends and being length adjustable from first to second positions, the upper end of said second jack means being selectively movably



secured to said camper means at the other side thereof adjacent the forward end thereof, said second jack means being laterally adjustable from a travel position closely adjacent said other side to a support position outwardly therefrom,

and means on said frame adapted for connection to the lower ends of first and second jack means to detachably hold said first and second jack means in said travel positions,

said first and second jack means normally having their upper ends positioned below the lower forward end of said camper means, when in said travel position, and normally dwelling in a vertical plane inwardly of the sides of said camper means when in said travel position.

4,045,000

RACK JACK

Erich Mai, Kirschfurt, Germany, assignor to Firma Josef Haamann, Hebe-und Transporttechnik, Freudenberg, M.-Kirschfurt, Germany

Filed Sept. 7, 1976, Ser. No. 720,807

Claims priority, application Germany, Sept. 11, 1975, 2540400

Int. Cl.[2] B66F *7/26*

U.S. Cl. 254—45 **8 Claims**



1. Rack jack for hoisting, lowering and/or supporting containers, cabins, shelters, exchangeable superstructures or the like, having upper and lower corner fittings, said rack jack comprising an upwardly extending jack shaft **(13)**, means for moving said jack shaft upwardly, an upper arm **(22)** mounted on the jack shaft and having an engaging part **(26)** at its outer end for engaging an adjacent upper corner fitting, a lower arm **(28)** mounted on the jack shaft and having an engaging part **(34)** at its outer end for engaging an adjacent lower corner fitting, each of said arms comprising a pair of supporting rods of different length connected at their inner ends to the jack shaft and at their outer ends to the engaging parts, the engaging part **(26)** for the upper corner fitting being adjustable substantially parallel to the axis of the jack shaft and substantially transversely to the jack shaft axis, and the engaging part **(34)** for the lower corner fitting being adjustable substantially perpendicularly with reference to the jack shaft axis, characterized in that the two rods **(29, 30)** of the lower arm **(28)** that is associated with a lower corner fitting **(11)** are articulatedly connected respectively with the jack shaft **(13)** and the engaging part **(34)**, and in that the longer rod **(29)** in the working position runs obliquely against the jack shaft **(13)**, the jack shaft is provided with a plurality of mutually spaced articulation points **(36)** in the upper half thereof to which the inner end of the longer rod **(29)** may be connected, and in that the total length of the two rods, **(29, 30)** of the lower arm **(28)** does not exceed, or does not substantially exceed, the height of the jack shaft **(13)**.

4,045,001

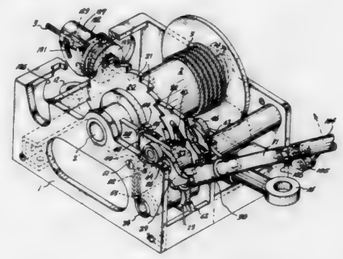
PUMPING RATCHET WINCH

Thomas G. Harvey, Jr., 2385 Bossert Ave., Kamloops, British Columbia, Canada V2B 4V6

Filed July 10, 1975, Ser. No. 594,585

Int. Cl.[2] B66D *1/00*

U.S. Cl. 254—164 **21 Claims**



1. In a ratchet winch including a drum for hauling a line, a frame mounting the drum for rotation, ratchet means for rotatively driving the drum relative to the frame and having a ratchet wheel, a drive pawl engageable with the ratchet wheel to drive it, a ratchet arm swingable to effect ratchet wheel rotating movement of the drive pawl, stop means engageable with the ratchet wheel to hold it against retrograde rotation and a handle arm for swinging the ratchet arm, the improvement comprising a hinge joint connecting the ratchet arm and the handle arm, and conversion means for selectively converting said hinge joint between a stiff arm condition in which the ratchet arm is swingable conjointly with the handle arm relative to the frame for effecting high-speed rotation of the drum and a pumping arm condition in which the handle arm is rockable relative to the ratchet arm about the hinge joint axis for swinging the ratchet arm incrementally relative to the frame through an angle much smaller than the angle of swing of the handle arm relative to the frame for effecting high-power rotation of the drum.

12. In a winch including a drum for hauling a line, a frame mounting the drum for rotation and means for rotatively driving the drum relative to the frame, the improvement comprising a tie slidably connected to the frame, bridging the frame and having one end connected to one end of the line, the other end of the line being connected to the drum and a portion of the line between its ends being connected to a load, anchor-connecting means connecting the other end of said tie to a fixed anchor remote from the frame, said tie thereby transmitting tension between such load and such anchor bypassing the frame, and frame-connecting means for connecting the frame and said tie for providing relative movement of said frame and said tie, said frame-connecting means including abutment means interengaged between the frame and said tie.

4,045,002

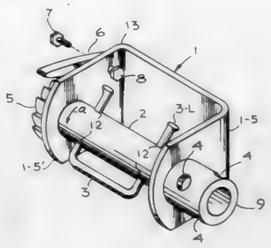
MULTI-PURPOSE LOAD WINCH

Errol S. Miller, 14500 S. McNab, No. 413, Bellflower, Calif. 90706

Filed Apr. 14, 1975, Ser. No. 568,137

Int. Cl.[2] A63B *61/04*

U.S. Cl. 254—164 **10 Claims**



1. An improved load tensioning winch apparatus adapted for tensioning engagement with a wide variety of load binders and comprising:

mandrel means comprising a cylindrical tube mounted rotatably on a relatively fixed frame means and including drive engagement means for accommodating selective rotation thereof together with rotation limit means for selectively limiting mandrel rotation to one direction; said cylindrical tube which is so perforated, being nonetheless otherwise substantially continuous and solid along its binder-engaging periphery; and

binder coupling means including minor perforate means through said mandrel means, this coupling means being adapted to be loosely engaged with the end of said binders, accommodating both straps and strand binders, and being translateable toward and away from said periphery, whereby, when said binder coupling means is translated toward said binder periphery, said strap is wound about said binder coupling means and said binder periphery, thereby coupling said strap to said binder.

4,045,003

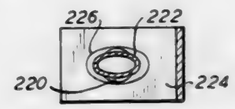
SUPPORT DEVICES FOR STANCHIONS

John R. McCluskey, and Ralph R. Edwards, both of P.O. Box 68, Hannacroix, N.Y. 12087

Continuation-in-part of Ser. No. 341,131, March 14, 1973, abandoned. This application Apr. 19, 1974, Ser. No. 462,314

Int. Cl.[2] E04H *17/14*

U.S. Cl. 256—59 **5 Claims**



1. Means for securing a stanchion, wherein the stanchion being of the type which may be secured or released by rotation with respect to a work surface, said securing means comprising:

a. stanchion means; and

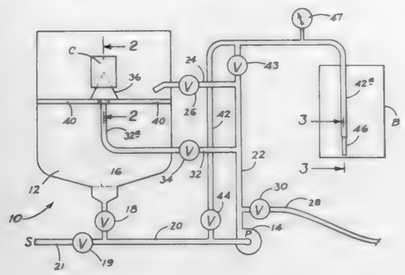
b. member means secured to said stanchion and movable with respect thereto such that with said member means being in a first position with respect to said stanchion, said member means being substantially rotable with respect to said stanchion means; with said member means being in a second position with respect to said stanchion, said member means upon rotation with respect to said stanchion engaging a predetermined part of said stanchion to thereby turn said stanchion.

4,045,004

CHEMICAL MIXING AND PUMPING APPARATUS

Henry F. Berger, 402 N17, Springfield, Oreg. 97477

Filed Oct. 1, 1976, Ser. No. 728,509
Int. Cl.[2] B01F *15/00*
U.S. Cl. 259—4 R **14 Claims**



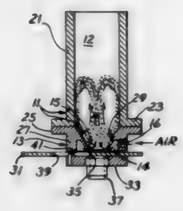
1. Apparatus for commingling liquids comprising
reservoir means for receiving and holding liquid;
drain valve means operable for selectively permitting liquid to be withdrawn from said reservoir means;
means disposed adjacent to said reservoir means for impaling a container to permit the container's liquid contents to flow into said reservoir means; and
pump means operable for transporting liquid from an external supply and a supply conduit into said reservoir means, said pump means also being operable for recirculating liquids from said reservoir means through said drain valve means and back into said reservoir means to thereby thoroughly mix the liquids, said pump means being further operable for discharging liquids so mixed away from said reservoir means.

4,045,005

BLENDING DEVICE

Dwight E. Davis, Escondido, and Stephen J. Foster, San Diego, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Dec. 13, 1974, Ser. No. 532,314
Int. Cl.[2] B01F *13/02*
U.S. Cl. 259—36 **9 Claims**



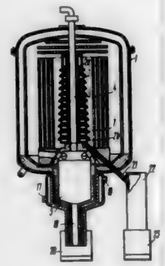
7. A blending device for providing a uniform mix of particulate material, comprising, wall means defining a mixing chamber and including a cylindrical upper section on a vertical axis and a frustoconical lower section terminating in a lower orifice, a slidable plate positioned perpendicular to the axis of said frustoconical lower section and spaced a distance therefrom to define a slit communicating with the interior of said mixing chamber at the bottom thereof, means defining with said slidable plate a plenum surrounding said frustoconical lower section, and means for conducting pressurized fluid to said plenum to discharge through said slit for agitating particulate material contained in said mixing chamber.

4,045,006

APPARATUS FOR CONTINUOUS VACUUM-REFINING OF METALS

Vladimir Semenovich Cherednichenko, ulitsa Zorge, 269, kv. 79, Novosibirsk; Valentin Innokentievich Belsky, ulitsa Zorge, 70, kv. 6, Novosibirsk; Gennady Ivanovich Orlov, ulitsa Vatutina, 27, kv. 20, Novosibirsk; Jury Anatolievich Naryshkin, ulitsa Bljukhera, 7, kv. 55, Novosibirsk, and Jury Petrovich Novikov, Leninsky prospekt, 30, kv. 19, Moscow, all of U.S.S.R.

Filed July 31, 1975, Ser. No. 600,864
Int. Cl.[2] F27B *17/00;* **F27D** *7/06*
U.S. Cl. 266—149 **7 Claims**



1. Apparatus for continuous vacuum refining of a metal comprising a cylindrical vacuum chamber, a stack of a plurality of vertically superposed trays disposed in said vacuum chamber for receiving impure molten metal and including interconnection means for flowing the metal downwardly from tray to tray while impurities are discharged therefrom, heater means in said vacuum chamber for heating of the metal in the trays and for evaporating the impurities therefrom, shield means in said chamber surrounding said trays for trapping volatilized impurities discharged from the trays and for condensing and discharging the impurities, and means for effecting irregular distribution of heat energy generated by the heater means along the height of the stack of trays such that the heat energy imparted to the trays diminishes in a vertically downwards direction.

4,045,007

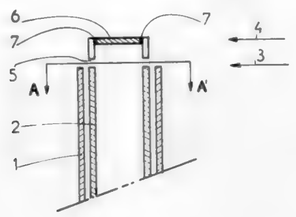
BLAST PIPE FOR METALLURGICAL CONVERTERS

Pierre Leroy, Saint-Germain-en-Laye, and Emile Sprunck, Moyeuvre-Grande, both of France, assignors to Emile Sprunck, Moyeuvre-Grande, France

Filed June 1, 1976, Ser. No. 691,435
Claims priority, application France, June 25, 1975, 75.19843
Int. Cl.[2] C21C *5/48*
U.S. Cl. 266—268 **4 Claims**

1. A blast pipe apparatus for a metallurgical converter comprising: a plurality of concentric tubes, including first and second tubes, the cross-sections of said tubes being adapted to fluid flows required for the refining of a metal bath, the first outermost tube of which is to be fed with a combustible fluid; the second tube, adjacent to said first tube, which defines on the inside, an annular combustible fluid passage and which is to be fed with gas to complete the combustion; said second tube extending beyond said first tube at the end of the blast pipe,

being provided with a row of orifices arranged in a crown solely in the projecting portion of the said second tube and



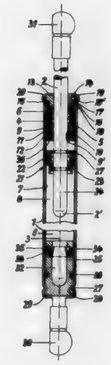
having its end closed by a metal cap soldered thereto by means of a hard solder which melts at a predetermined temperature.

4,045,008

GAS SPRING

Fritz Bauer, Altdorf, Germany, assignor to Suspa Federungstechnik Fritz Bauer & Sohne OHG, Nurnberg, Germany

Filed Apr. 13, 1976, Ser. No. 676,627
Claims priority, application Germany, Apr. 15, 1975, 2516478
Int. Cl.[2] F16F *9/02*
U.S. Cl. 267—120 **6 Claims**



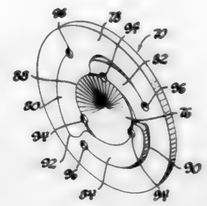
1. In a gas spring comprising a housing formed from a sealed cylindrical tube having an internal chamber filled with compressed gas, and a piston rod mounted coaxially displaceably in said chamber, said piston rod supporting a guide piston and emerging in a sealed manner from an end of the housing and acting as a compression piston, the improvement wherein
said piston rod is provided with an extension projecting beyond the guide piston, said housing having a space provided in the vicinity of the end of said housing opposite the end through which the piston rod emerges, into which space the extension enters in a sealing manner when the piston rod approaches its fully retracted end position, and
means to reduce the pressure of residual gas within said space to zero or close to zero when said piston rod is in its substantially fully retracted position, said means comprising valve means connecting said space with said chamber to open as said extension enters said space and to close when the extension begins to emerge from the space.

4,045,009

ENERGY ABSORBING UNIT WITH IMPROVED CONTROL VALVE

James M. Pees, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 17, 1975, Ser. No. 632,370
Int. Cl.[2] F16F *9/22, 9/34*
U.S. Cl. 267—139 **2 Claims**



1. An impact energy absorbing unit mounting a bumper assembly to a support on an automotive vehicle comprising: first and second cylinders, support means mounting said first cylinder for telescopic movement with respect to said second cylinder between an extended position and a retracted position, said first and second cylinders having cooperating stop means to establish the extended position of said cylinders, said first cylinder having cap means fixed at one end thereof and slidably disposed in said second cylinder to provide variable volume first and second fluid chambers in said unit, a hydraulic fluid in said first and second chambers, a centralized axial fluid passageway through said cap means hydraulically interconnecting said chambers, a one-piece valve element for controlling the flow of fluid in either direction through said passageway, said valve element comprising an outer annular part secured to said cap around said passageway, an inner disc part aligned with said passageway and a plurality of arcuate spring arms disposed in a circle around said inner disc part and attached at equally spaced peripheral point to said inner disc part for yieldably interconnecting said inner disc part to said outer annular part and for biasing said inner disc part into a blocking position relative to said passageway and further being yieldable in response to fluid pressure on said inner disc part to permit said inner disc part to move in a linear path away from said passageway to thereby control the flow of fluid between said chambers in one direction for absorption of energy from an impact load applied to said bumper assembly telescoping said cylinders, motor means to restore said cylinders to said extended position after removal of said impact load, and a plurality of fluid passage means extending through said valve element for metering fluid flow between said chambers in a direction opposite to said one direction as said motor means restores said cylinders to said extended position.

4,045,010

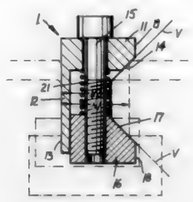
ABUTMENT PIECE ADAPTED TO BE INSERTED IN A T SLOT OF A MACHINE TOOL TABLE

Franz Arnold, Spatzenweg 20, 8960 Kempten, Germany

Filed Apr. 28, 1976, Ser. No. 681,122
Claims priority, application Germany, May 2, 1975, 7514168[U]
Int. Cl.[2] B23Q *3/00*
U.S. Cl. 269—315 **6 Claims**

1. In an abutment piece adapted to be inserted in a T slot of a machine tool table and which bears against a lateral surface of a leg section of the T slot by means of an abutment surface and projects beyond the clamping surface of the machine tool table, the improvement comprising wherein the abutment piece has a head portion projecting beyond the clamping surface and the width of which is greater than the slot width of the leg section, the abutment piece has a neck portion engaging in the T slot and the width of which is smaller than the slot

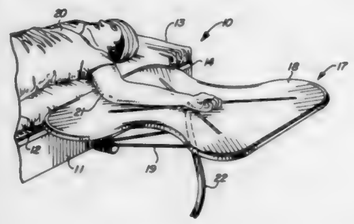
width, the head portion has on its side facing away from the abutment surface a bearing surface inclined at 45° with respect to the abutment surface and extending toward the neck portion and by means of which the head portion is supported on the chamfered outer edge of a lateral surface of the leg section, the said outer edge adjoining the clamping surface, and on the neck portion of the abutment piece there is provided a wedge



element movable parallel to the abutment surface and perpendicularly to the head portion by means of a clamping screw and engaging in the widened flange section of the T slot, the wedge surface of the said wedge element, which faces the bearing surface and is inclined at an opposite angle with respect to the abutment surface, being pressable against the inner edge of the corresponding lateral surface of the leg section.

4,045,011
ARMBOARD

John L. Ford, 4651 E. Palomino Road, Phoeniz, Ariz. 85018
Filed Oct. 27, 1976, Ser. No. 736,074
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—328 **4 Claims**



1. An armboard for detachable securement to a medical table and for supporting the arm of a patient during medical or surgical procedures, said armboard comprising:

a. a generally planar support member having an inboard edge and an outboard edge, and having an upper surface for receiving an arm thereon;

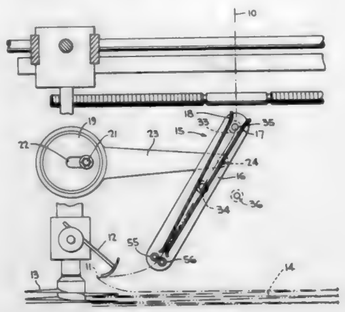
b. attachment means carried proximate the inboard edge of said support member for detachably affixing said armboard to said table; and

c. brace means carried by and depending from said support member and inclined toward said inboard edge and having a free end for abutting said table and for stabilizing said support member in a generally horizontal position.

4,045,012
ADJUSTABLE FOLDING APPARATUS FOR ZIGZAG FOLDING

Hans Jakob, Darmstadt-Eberstadt, Germany, assignor to Maschinenfabrik Goebel GmbH, Darmstadt, Germany
Filed May 27, 1976, Ser. No. 690,670
Claims priority, application Germany, May 27, 1975, 2523424
Int. Cl.[2] B65H *45/20*
U.S. Cl. 270—79 **7 Claims**

1. In a folding apparatus having a frame member and including at least one oscillating channel guide device for delivering a web of paper or other material downwardly from a web conveyor in zigzag folds, said device having opposite sides, means for effecting a synchronous movement of said channel guide device including at least one rotatable cam having elongated arms connected to said opposite sides of said channel guide device at first pivot points for reciprocating same upon rotation of said cam, said cam being mounted on a drive shaft by fastening means extending through an elongated opening extending substantially along the longitudinal axis of said arms, said device having at least a first and second pair of bearing openings therein which are respectively co-axial and which extend parallel to said drive shaft, said openings being spaced from said first pivot points, and a first pair of co-axial rod



members and a second pair of co-axial rod members, each pair respectively mounted on said frame member for axial shifting movement into and out of engagement with said first and second pair of co-axial openings for establishing second pivot points in said channel guide device, means for moving each respective pair of rod members into engagement with said first and second pair of co-axial openings thereby establishing alternate second pivot points in said device, whereby the amplitude of said channel guide device may be adjusted depending on the particular engagement between said co-axial rod members and one of said co-axial openings.

4,045,013
MARKER BOARD

Theo M. S. Coster, Beyt Horon Street 7, Tel Baruch, Israel
Filed Sept. 5, 1974, Ser. No. 503,307
Claims priority, application Israel, Jan. 22, 1974, 44054
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—136 F **2 Claims**



2. A marker board comprising:

a. a frame structure defining the spatial extent of the board;

b. an array of annular base rings forming at least part of said frame structure;

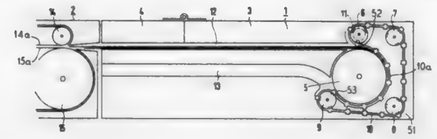
c. a plurality of flexible shells;

d. peripheral base portions of said shells formed respectively integrally with said rings, said shells being independently and reversibly invertible with respect to said frame structure; and

e. said frame structure further comprising at least one frame bar which is formed integrally with and between an adjacent pair of rows of said rings.

4,045,014
SHEET FILM MAGAZINE FOR AN X-RAY FILM EXCHANGER

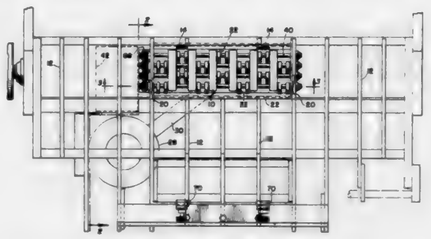
Ronny Karlsson, Mamsellstigen, Sweden, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Nov. 12, 1976, Ser. No. 741,387
Claims priority, application Germany, Nov. 13, 1975, 2551047
Int. Cl.[2] B65H *1/04, 5/02*
U.S. Cl. 271—8 R **10 Claims**



1. A sheet film magazine for an X-ray film exchanger which has means for transporting individual unexposed sheets of film received from the magazine to an exposure station, said magazine having a housing with a chamber, a drum mounted for rotation in the chamber and having a cylindrical surface, a belt having a set of teeth spaced along one surface thereof, means for mounting the belt for movement along a path in the chamber with a portion of the belt being biased toward a portion of the cylindrical surface and the spaced teeth being urged into engagement with said portion of the cylindrical surface, means disposed in said housing for guiding a leading edge of an inserted sheet of film between the belt and cylindrical surface, and drive means connected to one of said means for mounting and the drum for rotating the drum and moving the belt in said path with the surface of the drum and the belt moving together in an incremental step-like manner with each step having a distance equal to the distance between adjacent teeth on the belt, so that a portion of each sheet of film inserted into the magazine is engaged between the cylindrical surface and the belt and the leading edges of adjacent sheets are offset from each other a distance equal to the distance between adjacent teeth.

4,045,015
ROTARY FEEDER FOR PAPERBOARD BLANKS

Louis M. Sardella, Towson, Md., assignor to Wm. C. Staley Machinery Corporation, Hunt Valley, Md.
Filed Jan. 6, 1977, Ser. No. 757,158
Int. Cl.[2] B65H *3/64*
U.S. Cl. 271—112 **8 Claims**



1. Apparatus for feeding paperboard blanks one by one from a stack of blanks to nip rolls for feeding to printing, cutting, slotting, folding, gluing or the like machinery, said apparatus comprising

a. stack supporting structure;

b. feed means comprising wheels adapted to be rotated and each having

i. an active portion with an exterior convexly curved contour with a high coefficient of friction and

ii. a relieved portion;

c. transmission means comprising input shaft means which is adapted to be rotated and an output shaft means which is adapted to be rotated, said input and output shaft means being operatively connected so that the output shaft means undergoes a controlled acceleration during an initial portion of each revolution of said input shaft means and is stationary during a last portion of each revolution of said input shaft means;

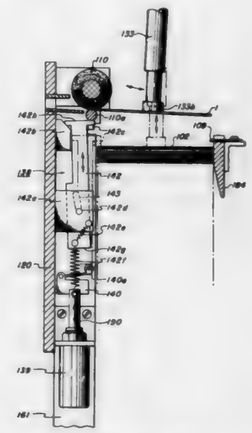
d. means operatively connecting said output shaft means with said wheels so that during operation of the apparatus the wheels are rotated and undergo controlled acceleration followed by a net deceleration followed by a dwell period during which the wheels are in a dwell position;

e. suction means for urging a blank into contact with the feed means;

whereby the wheels engage and grip a blank by means of static friction and move and accelerate that blank to the nip rolls without slippage occuring and so that each blank enters the nip rolls in register whereupon the blank is disengaged from the wheels.

4,045,016
APPARATUS FOR AUTOMATIC MICROPHOTOGRAPHY

Andrew L. Amort, Ann Arbor, Mich., assignor to Xerox Corporation, Stamford, Conn.
Division of Ser. No. 526,250, Nov. 22, 1974, Pat. No. 3,947,118.
This application Mar. 25, 1975, Ser. No. 561,759
Int. Cl.[2] B65H *7/04*
U.S. Cl. 271—155 **1 Claim**



1. An apparatus for sensing the height of a stack of cards comprising:

a bar having a projecting portion thereof adapted to engage the upper surface of the uppermost card in said stack;

a first spring biasing said bar in a position so that it does not engage said stack;

a solenoid to displace the bar downward in response to an actuating signal;

means for urging said projecting portion of said bar into contact with the upper surface of the uppermost card in said stack as said bar is urged downward by said solenoid;

means responsive to the position of said bar to provide a signal when the height of the stack is below a predetermined level, said means including a microswitch actuated by said bar;

a second spring connecting said bar to said solenoid, wherein upon energization of the solenoid the microswitch is actu-

ated when said height is below said predetermined level, and

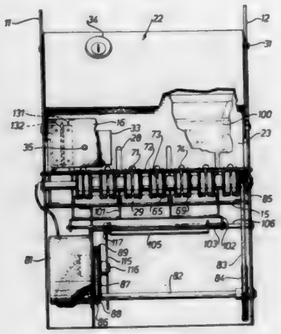
a motive source operative upon the energization of said microswitch upon the energization of said solenoid to raise the stack of cards to a position to displace the bar in an upward direction against the bias of said second spring an amount sufficient to deactuate the microswitch.

4,045,017

METHOD OF AND AN APPARATUS FOR COLLECTING VALUABLE SHEET-SHAPED OBJECTS

Leif Jörgen Ingemar Lundblad, Haradsvagen 102, Huddinge, Sweden

Filed May 1, 1975, Ser. No. 573,769
Claims priority, application Sweden, May 9, 1974, 7406187
Int. Cl.[2] B65H *29/46*
U.S. Cl. 271—181 **12 Claims**



1. Apparatus for receiving and collecting sheet-shaped objects representing a value in a vending machine, said apparatus comprising: a container for collecting said objects, said container comprising a removable and lockable cassette having an intake opening and resilient means for pushing existing objects in the container towards the intake opening, said cassette cooperating with the remainder of the apparatus such that the cassette is substantially closed when in the apparatus; means for locking said cassette before removal from the apparatus; feeding means for feeding successively received objects through said intake opening into the container; and actuating means including a number of finger-shaped means movably suspended outside the container and means for displacing said finger-shaped means through corresponding openings in at least one wall of the container into engagement with existing objects in the container for temporarily compressing and/or displacing said existing objects such that a free space is provided in the container adjacent said intake opening, said feeding means being arranged to feed at least one object into said free space, such that said object will be put together with said existing objects when the temporary compressing and/or displacing action of said actuating means stops.

4,045,018

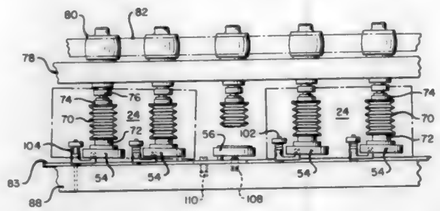
DOCUMENT DESKEWING APPARATUS

Gunnar P. Michelson, Van Nuys, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Sept. 16, 1976, Ser. No. 723,687
Int. Cl.[2] B65H *9/16*
U.S. Cl. 271—251 **14 Claims**

1. Apparatus for aligning documents comprising a passageway along which documents are transported in edgewise manner,

rotatable drive means normally assuming an inclined attitude and engageable with the documents for driving thereof in a downwardly inclined direction along said passageway, and rotatable idler means operably associated with the documents and including bearing means pivotally supported off center of rotation of said idler means to permit



said idler means to correspond with the attitude of said drive means in urging the documents into a longitudinally aligned position along said passageway.

4,045,019

COMBINATION ANIMAL TOY AND CONTAINER

Robert J. Wade, 104 Crestline Drive, Charleston Heights, S.C. 29405

Filed Dec. 31, 1975, Ser. No. 645,822
Int. Cl.[2] A63G *31/00*
U.S. Cl. 272—1 A **4 Claims**

1. A combination animal toy and container comprising:

a. a container means operative to hold materials and shaped whereby a child may enter said container means;

b. cover means operative to cover said container means and convexly contoured to simulate the outer portion of an animal;

c. appendage means extending from said combination animal toy and container, simulating a plurality of appendages of an animal wherein said appendage means comprises a plurality of feet-simulating, load-bearing bottom supports, which support said combination animal toy and container, and which simulate a plurality of feet of an animal;

d. elevating means, connecting to said container means and through said cover means, operative to raise or lower said cover means over said container means;

e. an oval-shaped rim surrounding said container means of sufficient width whereby a child may sit on said rim; and

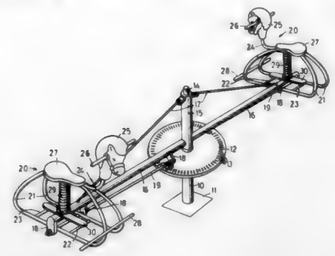
f. said elevating means comprising a plurality of rectangular, vertical supports connected to said container means and extending through said cover means; a crankbar extending through the upper portion of said plurality of rectangular, vertical supports containing a plurality of holes within said crankbar; a crank connected to said crankbar; a plurality of line secured to said cover means, each of said plurality of line extending through one of said plurality of holes within said crankbar whereby when said crank is turned, said crankbar revolves to wrap or unwrap said plurality of line around said crankbar and, therefore, raise or lower said cover means.

4,045,020

OCCUPANT-PROPELLED ROUND ABOUT

Raymond Townsend, 61 Dragon St., Warwick, Australia

Filed July 22, 1975, Ser. No. 598,154
Int. Cl.[2] A63G *1/20*
U.S. Cl. 272—33 R **2 Claims**



2. An amusement ride comprising:

a. a substantially vertical standard;

b. a hub rotatable on said standard;

c. a rotatable frame including a plurality of carrier arms fixed to and radiating from said hub;

d. a substantially horizontal actuating shaft mounted for oscillation on each arm;

e. a seating unit mounted on and fixed for oscillation with each shaft, each seating unit including a rocking horse secured above the respective actuating shaft, spring means between the rocking horse and the respective carrier arm to bias the rocking horse to an upright position, and stop means for limiting the oscillation of the rocking horse in both directions;

f. a ratchet wheel fixedly secured coaxially on said standard; and

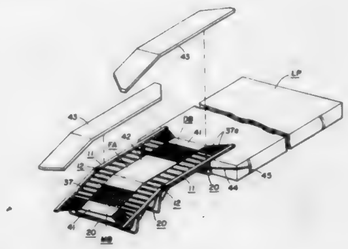
g. a detent on each shaft to coact with said wheel so that each oscillatory movement of said seating unit and of said shaft in one direction imparts rotary motion to said hub and to said arms.

4,045,021

TRAMPOLINE APPARATUS FOR USE IN CONNECTION WITH TUMBLING AND THE LIKE

George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa

Continuation of Ser. No. 449,243, March 8, 1974, abandoned.
This application July 16, 1975, Ser. No. 596,311
Int. Cl.[2] A63B *5/18*
U.S. Cl. 272—65 **9 Claims**



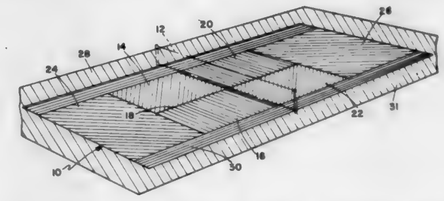
1. Trampoline apparatus for use in connection with tumbling and the like, the apparatus including elongated laterally spaced side members extending longitudinally of the apparatus and defining a trampoline-like bed frame but open at its opposite ends, a trampoline-like bed but narrower relative to its length of flexible material extending longitudinally of the apparatus disposed between the frame side members, the length of the bed being substantially 3 times or more its width to provide directional rebound characteristics, the bed having a pair of bed side edges along and spaced from the frame side members and first and second opposite bed ends unenclosed by the respective opposite ends of the frame, a plurality of elongated and resiliently extendable members interconnecting the bed side edges and the frame side members to effectively resiliently suspend the bed in tension therebetween, the resilient members most adjacent the open ends of the bed providing a greater tension on the side edges of the bed than is provided by the resilient members along the remainder of the bed side edges effective so that a performer running along a floor or the like and then jumping onto the first end of the bed is rebounded therefrom onto and then off the second end of the bed and onto the floor or the like, and means for supporting the frame and bed in overlying spaced relation above a floor or the like.

4,045,022

NO-LINE TENNIS COURT

Geoffrey F. Grant, La Jolla, and Robert W. Nicks, Del Mar, both of Calif.

Filed Apr. 23, 1975, Ser. No. 570,727
Int. Cl.[2] A63B *61/00*
U.S. Cl. 273—29 R **4 Claims**



1. A tennis court for playing singles or doubles tennis in which stripes between zones have been eliminated thereby eliminating two closely spaced lines on opposite edges of the stripes, said court comprising a playing surface;

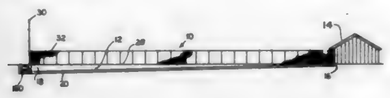
a net dividing said playing surface into a fore court and a far court; said fore court comprising a pair of quadrilaterally shaped near serving zones of different colors abutted to define a boundary line therebetween, said boundary line being defined only by the zone of one near receiving court being a first color and said other near serving zone being of a different color, an end play zone of a different color than said near serve-receiving zones and defining a laterally extending boundary line by the differences in colors between said end play zone and each of said near serving zones, and an end out of bounds zone of a different color than the color of said end play zone and said colors meeting and defining a laterally extending out of bounds boundary line for said near court; said far court comprising a pair of quadrilaterally shaped far serving zones each of different colors and abutted to define a boundary line therebetween only by the differences in colors therebetween, an end play zone of a different color than either of said far serve-receiving zones and defining a laterally extending boundary by the differences in colors between said end play zone and each of said far serving zones, and an end out of bound zone of a different color than the color of said end play zone and said colors meeting and defining therebetween a laterally extending out of bounds boundary line for said far court; a pair of double zones each having a color different than said near court end zone and said far court end zone and different than its abutted serve receiving zones, said colors of said doubles zones and said end zones and abutting serve-receiving zones defining the interior boundary lines for said doubles zones; and a pair of side out of bound zones extending fore and aft along said outer edges of said double zones and being of a different color than its adjacent doubles zones and meeting and defining by said differences in colors the outer side boundaries of said doubles zone.

4,045,023

GAME APPARATUS

Russell H. Heffley, Jr., 1533 Lochinvar Drive, Fort Wayne, Ind. 46825

Division of Ser. No. 405,575, Oct. 11, 1973, Pat. No. 3,897,947.
This application Dec. 9, 1974, Ser. No. 530,742
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—35 B 8 Claims



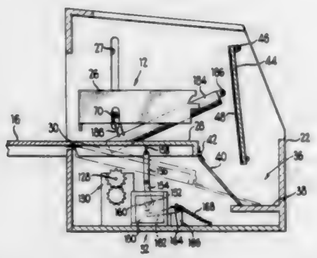
1. A game apparatus of the driving range type comprising an elongated fairway, one end of said fairway being narrower than the other of said ends, a tee adjacent said one end, said fairway having a longitudinal axis, said fairway having a continuous and generally planar surface extending between said ends on both sides of said axis, said fairway surfaces sloping downwardly from said one end to said other end, said fairway surfaces also being sloped downwardly from the lateral edges thereof toward said axis, whereby balls striking said fairway surface will be urged to roll toward said axis and said other end.

4,045,024

BOWLING ALLEY GAME

Jeffrey D. Breslow, Highland Park; Eugene Jaworski, Park Ridge, and Tom Kenzo Sakoda, Chicago, all of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.

Filed June 21, 1976, Ser. No. 698,177
Int. Cl.[2] A63D *5/08*
U.S. Cl. 273—43 A 17 Claims



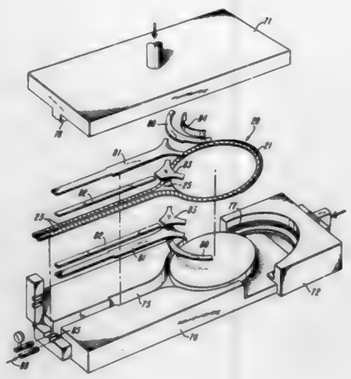
1. A bowling alley game including an automatic pin clearing apparatus, comprising:
   a bowling alley having a pit at one end thereof;
   a pin supporting, tiltable alley portion at the end of said alley adjacent said pit, said tiltable alley portion being pivotally connected to the end of said alley for movement between a generally horizontal position, coplanar with the alley, and a pin clearing position whereat the tiltable alley portion is pivoted downwardly with respect to said alley causing pins thereon to be transferred to the pit;
   drive means for moving the tiltable alley portion between its respective positions; and
   a manual actuator connected to said drive means for initiating operation thereof.

4,045,025

GLASS FIBER TENNIS RACKET FRAME

Anthony F. Staub; Norman T. Staub, both of Dayton, Ohio, and John R. Erwin, Paradise Valley, Ariz., assignors to Starwin Industries, Inc., Dayton, Ohio

Continuation-in-part of Ser. No. 332,130, Feb. 13, 1973, abandoned, which is a division of Ser. No. 107,304, Jan. 18, 1971, Pat. No. 3,755,037. This application June 18, 1974, Ser. No. 480,462
Int. Cl.[2] A63B *49/10*
U.S. Cl. 273—73 F 7 Claims



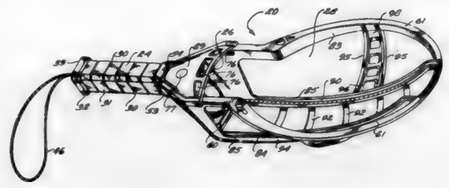
1. A racket frame of the character described comprising:
   a. an elongated hollow tubular member having the central portion thereof curved to define the generally oval head portion of said frame and having the end portions thereof extending in close parallel relation from said head portion to define the handle portion of said frame,
   b. the wall of said tubular member consisting essentially of a plurality of contiguous concentric annular layers of high tensile strength fibers impregnated and bonded together in tension by binder resin,
   c. each of said layers consisting of unidirectional essentially continuous fibers as distinguished from woven or braided fiber layers,
   d. the innermost and the outermost of said layers each being a helical winding of predetermined unidirectional hand with respect to the longitudinal axis of said tubular member and extending substantially the full length of said tubular member,
   e. at least one intermediate one of said layers also being a helical winding of unidirectional hand extending substantially the full length of said tubular member,
   f. another intermediate one of said layers extending lengthwise of said tubular member substantially the full length thereof,
   g. at least one additional intermediate one of said layers being a helical winding of unidirectional hand extending along only said head-defining portion of said tubular member,
   h. adjacent said helically wound layers being of opposite unidirectional hands, and
   i. means cooperating with said end portions of said tubular member to form the handle of said frame.

4,045,026

JAI ALAI APPARATUS

Richard Lee Gillespie, and Arthur Kelso Melin, both of San Gabriel, Calif., assignors to Wham-O Mfg. Co., San Gabriel, Calif.

Filed Oct. 14, 1975, Ser. No. 622,238
Int. Cl.[2] A63B *65/12*
U.S. Cl. 273—96 R 14 Claims



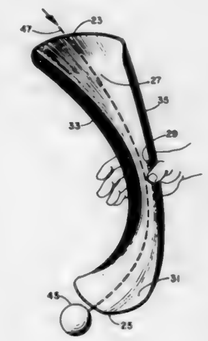
10. A projectile throwing, catching and cradling game apparatus comprising:
   a. a projectile having a texturized surface and
   b. a hand-held implement including:
      1. handle means;
      2. a cradling section for the projectile connected to the handle means; and
      3. a throwing and catching receptacle for the projectile connected to the cradling section, said receptacle comprising a closed loop elongated frame having a pair of tracks located interiorly of the receptacle, the surface of the tracks having a texture to cooperatively engage the surface texture of the projectile, said tracks extending longitudinally of the frame to guide the path and to maximize the spin of the projectile between the cradling section and the end of the frame opposite the cradling section thereby maximizing the curvature of the projectile's trajectory.

4,045,027

DEVICE FOR INTERCEPTING AND DEFLECTING A MOVING BODY

Wayne E. Manska, Santa Ana, Calif., assignor to Ronald R. Moody, Yorba Linda, Calif.

Filed Dec. 15, 1975, Ser. No. 640,644
Int. Cl.[2] A63B *65/12*
U.S. Cl. 273—96 R 12 Claims



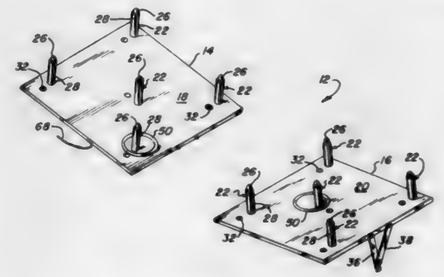
1. A device for intercepting and deflecting a body in motion, comprising:
   an elongated member having two ends and a surface therebetween over which a body may be directed, said surface containing a center line of symmetry along the length thereof and being progressively curved along said center line from a radius of curvature adjacent said one end to a larger radius of curvature adjacent said other end such that the curvature of said elongated member adjacent said other end substantially approximates the path of a body in motion which may be intercepted by said other end and progressively increases from said other end to said one end to smoothly deflect and change the direction of the intercepted body from the original path; and
   a pair of rail members attached to said surface of said elongated member, said pair of rail members being substantially parallel adjacent said one end and spaced apart by a distance greater than the diameter of the body which may traverse therebetween, said rail members progressively flaring outwardly from said one end to said other end to form therebetween a substantially wide flat area adjacent said other end such that a body which may be intercepted by said substantially wide flat area is deflected smoothly along said surface between said pair of rail members with a minimum number of contacts with said pair of rail members as the body traverses the length of said surface of said elongated member.

4,045,028

GAME TARGET WITH ADJUSTABLE PINS

Lonnie V. Dyess, 2644 Chestnut Drive, Grand Junction, Colo. 81501

Filed Aug. 23, 1976, Ser. No. 716,715
Int. Cl.[2] A63B *21/04*
U.S. Cl. 273—104 12 Claims



4. A game target comprising
   a. a pair of members each having a generally planar playing surface,
   b. a plurality of pin means associated with each playing surface,
      i. each pin means including a first member having a longitudinal axis disposed generally perpendicular to said playing surface, each first member of said pin means having a free end disposed outwardly from said playing surface, each pin means being spaced apart one from the other,
      ii. each of said pin means including a second member having a part thereof mounted for movement toward and away from the free end of the first member of said pin means, said second member having a longitudinal axis, said part of said second member being disposed, in one position of said second member, more distally from the playing surface than the free end of the first member of said pin means with a longitudinal axis of said second member being generally colinear with the longitudinal axis of said first member,
   c. means formed on each of said playing surfaces for cooperating with the free ends of the first member of the pin means of the other playing surface for positioning said playing surfaces relative to each other in a predetermined manner when said playing surfaces are disposed in opposed, generally parallel relationship one to the other, and
   d. means for securing together said members for compact storage and transportation of said game.

4,045,029

AERODYNAMIC ORIFICED DISC

Peter C. Katzmark, 3668 Tilden, Los Angeles, Calif. 90034

Filed Dec. 31, 1975, Ser. No. 645,713
Int. Cl.[2] A63H *27/00*
U.S. Cl. 273—106 B **1 Claim**



1. A toy centrally orificed circular disc having such aerodynamic capability as to enable said disc to sustain itself in stable flight when projected with a spin in a plane substantially parallel to the ground, said disc comprising:

A. a convexly raised outer annular portion, the periphery of said outer annular portion being at a lower level than the apex of the convex of said outer portion; and

B. an inner annular portion, said inner annular portion being

i. integral with said convexly raised outer annular portion;

ii. sloping inwardly toward the axis of the disc; and

iii. terminating in an annular edge defining a central orifice, the radius of said orifice being less than one-half of the radius of the entire disc, but said central orifice being of a sufficient diameter to permit an object to be supportively disposed in said orifice and spaced from said last-mentioned annular edge;

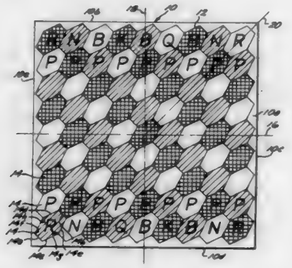
C. An object so disposed in said central orifice and supported in said disc position by a plurality of dihedral elements extending spirally inwardly from said annular edge defining the central orifice, the leading edges of said elements being on the same sides of the elements to present extended dihedral leading edges when the disc is spun in a predetermined direction, thereby to provide additional aerodynamic lift capability.

4,045,030

CHESS GAME APPARATUS

Casimir S. Strozewski, 2526 N. Santiago, Santa Ana, Calif. 92706

Filed Mar. 31, 1976, Ser. No. 672,161
Int. Cl.[2] A63F *3/02*
U.S. Cl. 273—131 AB **8 Claims**



1. A game comprising in combination,

a game board having a playing surface,

a playing configuration formed on said surface comprising contiguously arranged hexagonal spaces each side of which is aligned with the corresponding side of other spaces along axes at 90° or 45° to each other, and two sets of playing pieces, each set of which comprises a king, a queen, three bishops, two knights, two rooks, and nine pawns, all of the pieces in each set having indicia of only the respective set of pieces.

4,045,031

BOARD GAME APPARATUS

William Brenton Arnold, 21 W. Ivy Lane, Englewood, N.J. 07631

Filed Feb. 24, 1976, Ser. No. 660,817
Int. Cl.[2] A63F *3/00*
U.S. Cl. 273—134 AT **7 Claims**



1. Board game apparatus for playing a board game among a plurality of players, said board game apparatus comprising:

a playing board having a playing surface;

a central area on the playing surface, the central area displaying a representation of a court system including lower and higher courts arranged in a prescribed inner sequence of play proceeding from each lower court to a higher court in the court system;

movable playing pieces for representing the players on the playing surface;

a plurality of outer areas arranged sequentially on the playing surface around the central area and defining an outer path of travel of fixed increments for the playing pieces, some of the outer areas including representations of different fictional claims enforceable by a corresponding lawsuit and others of the outer areas including representations of imaginary people arbitrarily designated as experts in fields of endeavor related to the subject matter of the fictional lawsuit-enforceable claims, the representations being spaced along the outer path of travel;

first game elements each corresponding to a representation of a different fictional lawsuit-enforceable claim for denoting the possession by a particular player of a claim capable of enforcement by a corresponding lawsuit;

second game elements each corresponding to a representation of an expert for denoting the possession by a particular player of that expert for use as a witness in the related lawsuit;

chance means for operation by each player, in sequence, to determine the number of increments of movement of a corresponding playing piece along the outer path of travel, thereby determining possession among the players of the lawsuit-enforceable claims and the experts for use as witnesses, and establishing the parties to a lawsuit through chance location of a playing piece upon an outer area, and for operation by a party to a lawsuit to determine, by chance, the outcome of the lawsuit, once the lawsuit-enforceable claim is asserted in the court system, in accordance with the procedure prescribed by the inner sequence of play through the court system;

the central area including a specific location for the second game element corresponding to the expert in the field related to the subject matter of the lawsuit in the court system, whereby placement of the appropriate second game element by a party at the specific location engages the expert as a witness for that party to increase the chances of that party prevailing in the outcome of the lawsuit; and

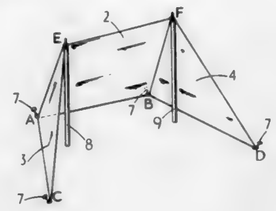
game pieces for representing assets of each player, the assets as represented by the game pieces to be transferred between players in accordance with the outcome of the lawsuits to which the players are parties.

4,045,032

GAMES PRACTICE NET AND PROTECTVE SCREEN

John William Andrew Cox, Arbroath, Scotland, assignor to Macleisure Limited, Scotland

Filed Apr. 29, 1975, Ser. No. 572,851
Claims priority, application United Kingdom, May 1, 1974, 19083/74
Int. Cl.[2] A63B *69/36;* **E04B** *1/347*
U.S. Cl. 273—181 F **4 Claims**



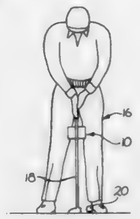
1. A games practice net and protective screen incorporating a sheet of flexible material capable of being laid flat, the shape of the sheet when laid flat being that of a hexagon comprising a quadrilateral center portion and two triangular wing portions, all of the angles of said triangular wing portions being acute angles and said triangular wing portions being so orientated that the bases of the triangular wing portions are common with respective opposite parallel sides of the quadrilateral center portion so that the sheet has six sides and six salient corners, a ring located at each of the six corners, and a pair of cords connected to and linking the rings which are located at the corners defined by the ends of the bases of the triangular wing portions.

4,045,033

GOLF PUTTING AID

Cary Schuman, 3276 Longridge Terrace, Sherman Oaks, Calif. 91423

Filed Mar. 22, 1976, Ser. No. 669,242
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—188 R **3 Claims**



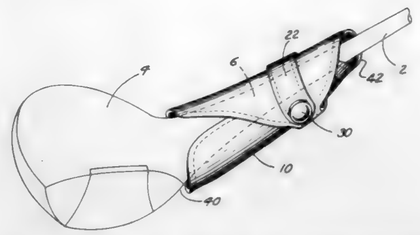
1. A golf putting aid configured to be placed between the golfer's legs comprising an elongated rigid member having a first pair of opposed concave indentations of equal curvature in the side surfaces of said member for receiving said legs to maintain said legs spaced apart in a substantially fixed putting position, and a second pair of opposed, concave leg receiving indentations of equal curvature positioned in the ends of said member and spaced a different distance apart than said first pair of concave indentations to provide the golfer a second leg spacing position upon the spatial rotation of said member.

4,045,034

GOLF CLUB WEIGHTED ATTACHMENT

Lewis P. Thomas, Box 4116 Long Beach Branch, Long Beach, Calif. 90804

Filed June 16, 1975, Ser. No. 587,338
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—194 B **10 Claims**



1. The combination of a golf club and a weighted attachment adapted to be detachably secured thereto, the golf club including a shaft and a club head secured on one end of the shaft, the club head having an upwardly projecting hosel for receiving the shaft, the attachment including:

a. a flexible sheet shaped to be wrapped about the golf club hosel, the lower edge of the sheet defining a relatively short foot section, the edge of the foot section being shaped to fit about the heel portion of the club head, the sheet also having,

b. a first longitudinal side edge shaped to fit along the shaft,

c. a top portion, the edge along this portion being of sufficient length to wrap about the shaft,

d. a weighted mass

e. means attaching the weighted mass to the flexible sheet,

f. a second longitudinal side edge of the sheet being configured to overlie the heel portion of the hosel, and

g. securing the weighted sheet about the golf club,

h. the foot section, longitudinal side edges and the top portion of the sheet defining the four sides of the sheet,

i. the portion of the flexible sheet overlying the heel portion of the club causing the foot section of the sheet to remain above the plane of the bottom of the club.

4,045,035

INFLATABLE LIP SEAL FOR PIPES

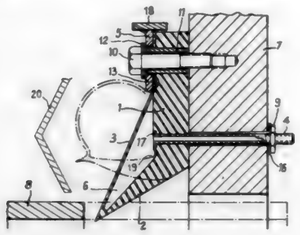
Michel G. Lecordier, Marseille, France, assignor to Compagnie Francaise des Petroles, Paris Cedex; Etudes Petrolieres Marines, Paris; Steliers et Chantiers de Bretagne, Nantes; Compagnie Maritime D'Expertises, Marseille; Compagnie Generale Pour Les Developpments Operationnels, Paris and Entreprise de Recherches et d'Activites Petrrolieres, Paris Cedex, all of France

Filed June 15, 1976, Ser. No. 696,442
Claims priority, application France, June 20, 1975, 75.19367
Int. Cl.[2] F16J *15/46*
U.S. Cl. 277—34.3 **13 Claims**

1. A lip-seal for sealing the junction between a pipe or the like projecting through an opening of larger diameter than the pipe within a flange or the like, said lip-seal comprising:

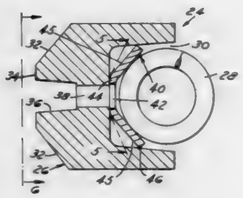
a flange with an opening; an annular body mounted to said flange and coaxial of said flange opening; a flexible sealing lip carried by said annular body and projecting radially inwardly of said annular body inner periphery at an angle to the plane normal to the seal axis; means interposed between said annular body and said lip, defining an inflatable chamber, said means for defining said inflatable chamber comprising a diaphragm more flexible than the sealing lip, fixed at one edge to the inner peripheral edge

of said lip and at an angle lesser than the lip angle, and at the other edge to said annular body, said inflatable chamber being defined between said diaphragm, said lip and



said body; passageway means for fluid communication with said chamber; and which said chamber when inflated modifies the profile of said sealing lip and moves the peripheral edge of said sealing lip radially outward.

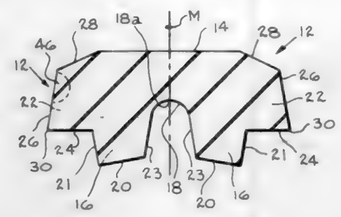
4,045,036
PISTON OIL CONTROL RING
Rudolph C. Shunta, Muskegon, Mich., assignor to Sealed Power Corporation, Muskegon, Mich.
Filed Oct. 18, 1976, Ser. No. 733,132
Int. Cl.[2] F16J *9/06*
U.S. Cl. 277—138 **9 Claims**



1. A composite oil control ring adapted for use as a seal between the piston and cylinder wall of a reciprocating piston internal combustion engine wherein the piston is provided with a ring groove, comprising a parted sealing ring adapted to be disposed in said piston ring groove for sealing engagement with said cylinder wall, an annular expander-spring disposed in a radially inwardly facing channel in said ring and adapted to circumferentially expand said ring into sealing engagement with said cylinder wall, and a parted annular insert disposed between said sealing ring and said expander-spring, said insert being generally V-shaped in radial cross section having inwardly diverging sides and a radially directed apex adjacent the root of said channel, said spring engaging each side of said V-shaped insert, the expanding force of said spring being transmitted through said insert to said ring.

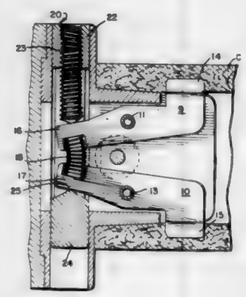
4,045,037
PACKING
Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.
Continuation-in-part of Ser. No. 444,331, Feb. 21, 1974, Pat. No. 3,915,463. This application Oct. 17, 1975, Ser. No. 623,353
The portion of the term of this patent subsequent to Oct. 29, 1992, has been disclaimed.
Int. Cl.[2] F16J *15/32*
U.S. Cl. 277—205 **17 Claims**

1. An elongate strip packing member comprising:
first and second lip sections adjoined to form a relatively broad planar head surface, each of said lip sections including a base having an outer lateral surface; said packing member having a groove between said bases extending the length of said packing member and opening downwardly away from said head surface; said first lip section further including a laterally outwardly depending sealing projection, said sealing projection having a generally laterally outwardly facing side surface and a lower surface, said lower surface being adjoined to the outer lateral surface of said base of said first lip section and, in a relaxed state, being generally inclined from its laterally inner to its laterally outer extremities at an angle so as to be non-



downwardly inclined from the outer lateral surface greater than or equal to 90° with respect to a line normal to said head surface, and said sealing projection being of such volume and transverse cross-section configuration that upon application of a generally laterally inward force to said side surface said sealing projection is deformed to form a cavity adjacent said lower surface, said cavity opening downwardly away from said head surface and forming a pressure trap.

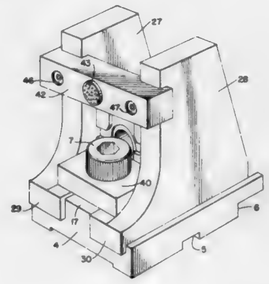
4,045,038
HOLLOW CORE CHUCKING DEVICE
David Noel Obenshain, Swanton, Md., assignor to Westvaco Corporation, New York, N.Y.
Filed Aug. 31, 1976, Ser. No. 719,158
Int. Cl.[2] B23B *31/40;* **B65H** *75/24*
U.S. Cl. 279—2 R **2 Claims**



1. A chucking device for engaging the hollow core of a web of material comprising:
a. a tapered chuck plug consisting of a generally cylindrical and tapered body portion and an enlarged base portion;
b. means for attaching the base portion of said tapered chuck plug to a rotatable spindle;
c. an opening formed in the tapered end of said chuck plug comprising an elongated slot that extends internally of the chuck plug from its back portion to the extreme tapered end thereof where the slot opens into the surface face of said chuck plug;
d. a pair of oppositely disposed core engaging elements pivotally mounted in said opening, said core engaging elements comprising a pair of chuck dogs which are pivotally mounted in said elongated slot at opposed sides of said chuck plug for movement from a normal retracted position within said chuck plug to a core engaging position

exteriorly of said chuck plug, said chuck dogs being generally aligned with one another and consisting of angular elements that are sharpened at their core engaging ends and which have means at their opposite ends for accepting and retaining a compression spring device that normally biases the chuck dogs into their retracted position within the chuck plug slot; and,
e. means located in said chuck plug for urging said chuck dogs into contact with the inside of a core placed on said chuck plug, said means comprising a slide element having an elongated cylindrical body with a slotted central portion for accomodating the opposite ends of said chuck dogs and said compression spring device located in said chuck plug base, said slide element further comprising a threaded upper portion which accomodates a set screw element and a solid lower portion having a raised base section wherein mechanical actuation of said set screw serves to overcome the compression spring bias to urge the sharpened ends of said chuck dogs into their core engaging position.

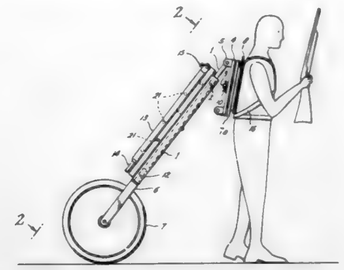
4,045,039
ADJUSTABLE CLAMPING JAW FOR CHUCKS
James W. Pope, Indianapolis, and Max E. Overpeck, Mooresville, both of Ind., assignors to Wallace Murray Corporation, New York, N.Y.
Filed Sept. 13, 1976, Ser. No. 715,964
Int. Cl.[2] B23B *31/12*
U.S. Cl. 279—123 **16 Claims**



1. An incrementally adjustable jaw assembly for machine tool chucks, comprising in combination;
a. a jaw base attached to a master jaw of a chuck and a top jaw mounted for incremental relative movement with respect to said jaw base,
b. tumble block and key means for providing an incrementally adjustable abutment between said top jaw and said jaw base which determines the relative position between said top jaw and said jaw base,
c. said tumble block including a multi-faceted block having differently positioned keyways in its faces, said key means being engageable with a selected of one said keyways for adjustably positioning said incremental adjustable abutment of said tumble block relative to said jaw base, and means for securing said top jaw to said tumble block and for clamping said top jaw and said jaw base together.

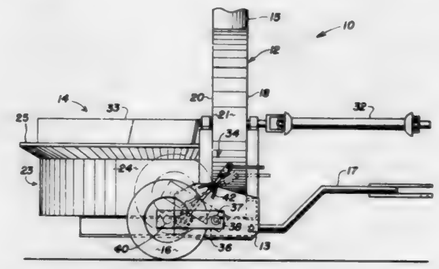
4,045,040
DEER STAND AND GAME CARRIER
Hershell W. Fails, 134 Scout Road, Freeport, Tex. 77541
Filed Jan. 13, 1976, Ser. No. 648,826
Int. Cl.[2] B62D *51/04*
U.S. Cl. 280—1.5 **3 Claims**

1. In a collapsible deer stand, a telescoping framework comprised of a first telescoping frame and a second telescoping frame, said second frame forming a ladder, means for selectively and detachably anchoring the second frame on said first frame in a collapsed position, wheels on one end of said first frame and a seat assembly pivotally mounted on the other end of said first frame, shoulder straps attached to said seat assembly, said straps and said seat assembly comprising a backpack



for towing said stand when collapsed, means on said seat for selectively receiving said second frame and pivotally suspending said second frame therefrom when said stand is in a noncollapsed position.

4,045,041
WHEEL ADJUSTMENT MECHANISM FOR A FORAGE BLOWER
Roger L. Risser, Leola, and Joe E. Shriver, East Earl, both of Pa., assignors to Sperry Rand Corporation, New Holland, Pa.
Filed May 14, 1976, Ser. No. 686,615
Int. Cl.[2] B62D *21/18*
U.S. Cl. 280—43.17 **13 Claims**



1. In an agricultural machine having a frame and at least one ground engaging element movably mounted on said frame to support said frame at a plurality of vertical positions relative to the ground, an improved mechanism for adjusting said frame to any of said vertical positions comprising:
a. an arcuate shaped first member mounted on said frame;
b. means interconnecting said first member to said ground engaging element and actuatable to cause relative movement between said ground engaging element and said frame;
c. said interconnecting means is pivotally mounted at one end to said ground engaging element and extends through an opening defined in said first member;
d. said interconnecting means including a second member shaped to be received by said first member in a mating relationship therewith such that the forces exerted on said interconnecting means by the weight of said agricultural machine is distributed over a large area.

4,045,042

TRAVELING UNDERCARRIAGE FOR A CONTAINER OR THE LIKE

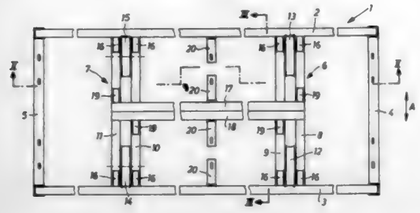
Josef Walter, Balterswil, Switzerland, assignor to J. Walter AG, Balterswil, Switzerland

Filed Mar. 30, 1976, Ser. No. 671,862

Claims priority, application Switzerland, Apr. 4, 1975, 4312/75

Int. Cl.[2] B62B *5/00*

U.S. Cl. 280—79.1 R **17 Claims**



1. A traveling undercarriage for a container, comprising a substantially rectangular frame, said frame including two main supports which extend substantially parallel to one another and transversely with respect to the direction of movement of the undercarriage, means for interconnecting the main supports with one another at their ends, transverse supports extending between said main supports, rollers carried by the transverse supports, connection elements for detachably connecting the transverse supports carrying the rollers with the main supports, and attachment elements which can be suspended at the main supports at which there are connectable transverse walls of the container, and wherein each main support comprises a hollow profile member which is open at a side confronting the other main support and each connection element comprises a first section engaging into the interior of one of the main supports and a second section threadably connected with one of said transverse supports.

4,045,043

TRANSPORT AND DISPLAY TROLLEYS

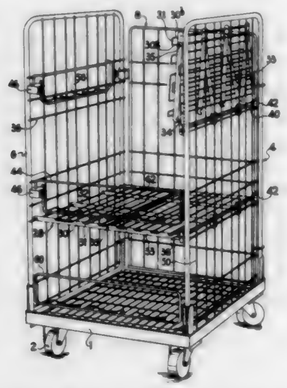
Francois Fourrey, Montbeliard, France, assignor to Cycles-Peugeot, Beaulieu-Valentigney, France

Filed July 23, 1976, Ser. No. 708,250

Claims priority, application France, July 24, 1975, 75.23136

Int. Cl.[2] B62B *3/00*

U.S. Cl. 280—79.3 **11 Claims**



1. A transport and display trolley comprising a lower platform, rollers mounted on the lower platform for shifting the trolley, two fixed grills and a movable grill, the three grills being vertically disposed and defining a space for receiving objects to be transported and being carried by the lower platform, at least one foldable shelf pivotably mounted on one of the fixed grills, the other fixed grill being opposed to said one fixed grill and having a transverse support means for said foldable shelf, said foldable shelf being pivotable between a folded back position in which it is folded against said one fixed grill and a horizontal position parallel to the platform, in which horizontal position said foldable shelf is supported on said support means; an openable gate movable from a closed position and an open position inwardly of said space defined by the grills and capable of interconnecting said two fixed grills in said closed position and disposed above said foldable shelf and slightly set back relative to an outer edge of said foldable shelf in said closed position whereby it precludes the pivoting of said foldable shelf to said folded back position and the unloading of said foldable shelf so long as the gate is in said closed position; and a fixed gate disposed above the lower platform connecting said two fixed grills together.

4,045,044

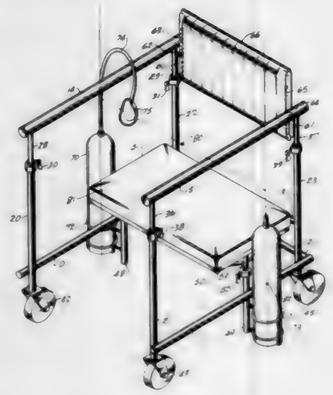
PATIENT TRANSPORT WITH OXYGEN SUPPLY

William F. Bierer, 769 Glenmont, Los Angeles, Calif. 90024

Filed Aug. 28, 1975, Ser. No. 608,525

Int. Cl.[2] B60D *7/08*

U.S. Cl. 280—87.02 R **11 Claims**



1. A patient transport comprising:

a tubular frame including two oppositely disposed sides;

a plurality of wheels attached to the frame to permit movement thereof;

first and second means for holding a pair of oxygen bottles on the respective two oppositely disposed sides of the frame outboard of the sides of the frame; and

horizontally extending patient support means attached to the frame between the first and second holding means, the first and second holding means lying below the horizontally extending patient support means.

4,045,045

FOLDABLE CHILD WALKER

Raymond W. Boucher, Dotham, Ala., and William H. Ziegler, Jr., Bedford, Pa., assignors to Hedstrom Co., Bedford, Pa.

Filed Apr. 1, 1976, Ser. No. 672,655

Int. Cl.[2] B62D *7/10*

U.S. Cl. 280—87.02 W **5 Claims**

1. A child walker comprising

A. an annular base,

B. a plurality of wheels mounted at space locations on said base,

C. a supporting frame including

1. first and second interfitting frame members, each said member including a pair of legs,

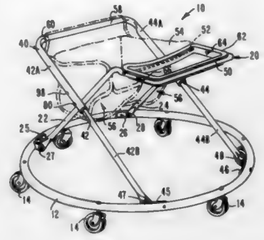
2. means for pivotally connecting each leg of said first member to an adjacent leg of said second member intermediate the ends of the legs,

3. means for pivotally mounting corresponding ends of said first and second frame members to spaced positions on said base, and

4. the legs of at least one of said frame members being composed of telescoping first and second sections,

D. a seat supported between the opposite ends of the legs of said first and second frame members,

E. means for maintaining said first and second frame members upright above said base, said maintaining means including



1. means for defining at least two spaced apertures extending through the wall of one of said upper and lower leg sections, and

2. a spring loaded release button mounted in the wall of the other of said upper and lower leg sections and positioned to selectively engage in one of said apertures so that the frame members are maintainable at at least two different levels above said base, said button being retractable from one aperture to release the maintaining means and fold the walker so that the frame members fold into a relatively flat position in more or less the same plane as said base.

4,045,046

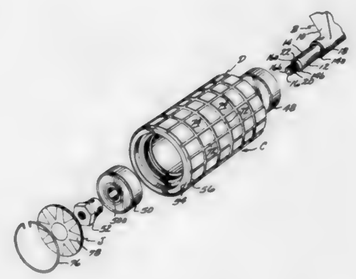
SKATEBOARD WHEEL ASSEMBLY

Gary Burton Taylor, 565 W. 39th St., and Roland C. Eberhardt, 564 W. 39th St., both of San Pedro, Calif. 90731

Filed Mar. 22, 1976, Ser. No. 668,717

Int. Cl.[2] B62B *7/00*

U.S. Cl. 280—87.04 A **5 Claims**



1. In combination with a skateboard having a pair of longitudinally spaced trucks, each of said trucks including a center body that has two transversely aligned stub axles projecting outwardly from opposite sides thereof, each of said stub axles including first and second axially aligned cylindrical portions, said second axle portion of smaller diameter than said first axle portion and having threads on the exterior surface thereof, said first portion forming a first body shoulder with said body and a second body shoulder at the junction with said second portion, wherein the improvement comprises four wheel assemblies rotatably supported on said stub axles, each of said wheel assemblies including:

a. a rigid cylindrical wheel member formed from a metallic material having a substantial heat conducting quality, said member having first and second oppositely disposed ends from which first and second circular cavities extend inwardly towards one another, a centrally disposed bore in said wheel member that extends between said first and second cavities, said bore of greater diameter than the diameter of said first axle portion, a circumferentially extending rib projects outwardly from said wheel member adjacent said first end thereof, said rib having a first inwardly disposed ring-shaped face that has an outer circumferential section and an inner circumferential section, said outer circumferential section substantially parallel to said first end of said member, and said inner circumferential section angularly disposed relative to said outer circumferential section, a cylindrical shell of substantially the same external diameter as said wheel member projects from said second end of the latter and is axially aligned with said wheel member and formed integral therewith, said shell having an interior cylindrical surface and exterior cylindrical surface said exterior cylindrical surface of said shell on an outwardly disposed end portion thereof having a circumferential groove formed therein;

b. first and second ball bearing assemblies disposed in said first and second cavities, each of said ball bearing assemblies including inner and outer races, said inner races having said first portion of said stub axle extending therethrough, said inner race of said first ball bearing assembly in abutting contact with said first shoulder of said body;

c. a nut in engagement with said threads on said second axle portion, said nut in abutting contact with said inner race of said second ball bearing assembly;

d. an elongate cylindrical tire formed from an elastomeric material, said tire having concentric inner and outer cylindrical surfaces and first and second end surfaces, first and second circular recesses that extend inwardly towards one another from inner portions of said first and second end surfaces, said first and second recesses each partially defined by inner walls parallel to said first and second end surfaces, said inner cylindrical surface of such diameter as to snugly and slidably engage said exterior surfaces of said wheel member and shell, said wall of said first recess in abutting contact with said outer circumferential section of said rib, and said wall of said first recess and said inner circumferential section of said rib cooperating to define a first circumferentially extending confined space therebetween;

e. a retaining ring removably mounted on said outwardly disposed end portion of said shell inwardly from said groove, said retaining ring having an inwardly disposed surface defined by a first outer ring-shaped section and a second inwardly disposed ring-shaped section that is angularly disposed relative to said first ring-shaped section of said retaining ring, said first ring-shaped section of said retaining ring in abutting contact with said wall of said second recess, and said second ring-shaped section of said retaining ring cooperating with said wall of said second recess to define a second circumferentially extending confined space; and

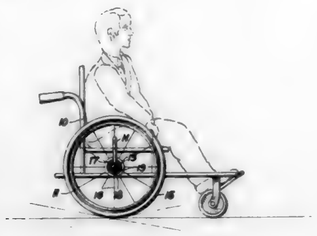
f. resilient means that engage said groove to hold said retaining ring in abutting contact with said wall of said second recess to maintain said tire in a fixed position on said wheel member and shell, and said tire when subjected to an axially directed force as said skateboard is directed through a curved path temporarily deforming into either said first or second confined spaces, rather than cold flowing outwardly over said rib or retaining ring.

4,045,047

ONE-WAY BRAKE FOR WHEEL CHAIRS

Clair S. Buckley, Main St., Emlenton, Pa. 16373

Filed Sept. 30, 1975, Ser. No. 618,036
Int. Cl.² B62M *1/14*
U.S. Cl. 280—242 WC **1 Claim**



1. In combination, a wheel chair having a frame, and two main wheels, each with a hub and a friction drive supported on axles and adapted to allow the chair to move forward but not backward,

said axles being fixed to said frame and,

said friction drive having an inner member and an outer member,

said inner member of said friction drive being fixed to said axle and,

the said outer member of said friction drive being fixed to said hub,

cam means on said inner member,

roller means between said outer member and said cam means,

said roller means being adapted to be moved into clamping contact between said cam means and said outer clutch member when the chair is moved in a rearward direction, but to allow the chair to move freely forward whereby said chair can be moved freely forward up an incline but will not run backwards,

stop members, handle means supported on said axle connected to said stop members for rotating said stop members whereby said roller means is held away from said cam means in unactuated position and said chair may be moved freely in both a forward and a rearward direction.

4,045,048

TRAILING ARM CAMBERING VEHICLE WITH STABILIZER LINKAGE HAVING LOCKING MEANS FOR PARKING AND STOWAGE

Clarence C. Irwin, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 28, 1976, Ser. No. 727,587
Int. Cl.² B62K *15/00*; B60G *19/10*
U.S. Cl. 280—278 **3 Claims**



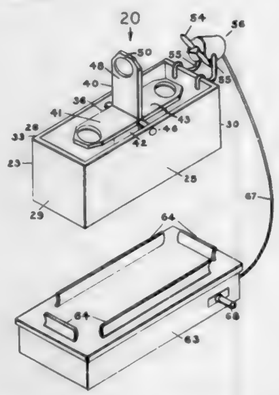
1. A cambering vehicle comprising a main frame, right and left trailing arms extending rearwardly from said main frame, forward pivot connection means pivotally connecting one end of each of said arms to said main frame so that said trailing arms may swing in an up and down movement with respect to said forward pivot connection means, a support and locking plate, pivot means pivotally mounting said support and locking plate to said forward portion of said frame in spaced relation to said forward pivot connection means for said trailing arms, left and right link means connected to said crank by laterally spaced pivot means, each of said link means extending from said plate to a pivot connection with the associated trailing arm rearward of said forward pivot connection means, front contact means steerably mounted to said main frame, manual steering means connected to said front contact means, and rear contact means for each of said trailing arms mounted at the rearward portions thereof foot rest means on each of said trailing arms rearward of said pivot connections with said link means to receive the feet of a vehicle operator so that an operator can stand on the vehicle and naturally camber the vehicle while the vehicle is moving, curved track means operatively connected to said plate and movable therewith, a follower for said track means operatively connected to said main frame and operative to secure said plate in a fixed position to stabilize said vehicle rigid in a three point stance for vehicle parking and means to foreshorten one of said links as said trailing arms are moved toward said main frame as said plate turns and said follower means moves relative to said track means to a position in which said vehicle is in a folded position, and means to rigidly secure said last mentioned link in said foreshortened position to maintain said vehicle in a collapsed position for stowage.

4,045,049

BUBBLE-MAKING APPARATUS AND MEANS FOR ATTACHMENT TO A BICYCLE

Arthur Harry Schultz, 6003 Louis Drive, North Olmsted, Ohio 44070

Filed May 9, 1975, Ser. No. 576,003
Int. Cl.² A63H *33/28*
U.S. Cl. 280—289 R **8 Claims**



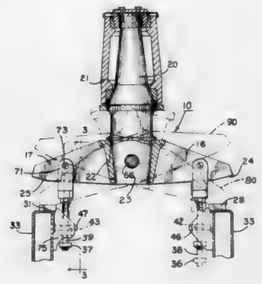
1. A bubble-making apparatus including in combination a generally rectangularly shaped container having first and second spaced and generally parallel sidewalls and first and second spaced and generally parallel endwalls, the upper perimeter of said four walls defining an opening to said container, said container adapted to contain a bubble-making solution, a paddle wheel having four blades connected together at a central location and with adjacent blades being spaced from each other about ninety degrees, pivot means connected to said paddle wheel at said central location and extending to said first and second sidewalls to rotatably mount said paddle wheel whereby said blades move in a circumferential path into and out of said container, said path being in a plane generally to said sidewalls, each of said blades having a flat surface arranged so as to have its width extend generally transverse to the plane of said path, wall means defining an opening in the outward end portions of said blades, each said flat surface having a width upwardly of said end portion on the order of the same magnitude as the diameter of the associated said opening, and relative air flow producing means for exerting an air force against said flat surfaces of said blades in a direction transverse to said flat surfaces and, also, transverse to said pivot means to cause rotation of said paddle wheel and cause formation of bubbles at said openings when bubble-making solution is appropriately present thereat, said relative air flow producing means being the only means for rotatably moving said paddle wheel.

4,045,050

ARTICULATED VEHICLE TILT LIMITING APPARATUS

Dale Wyatt Hawk, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Dec. 10, 1976, Ser. No. 749,318
Int. Cl.² B60D *7/02*
U.S. Cl. 280—492 **5 Claims**



1. Apparatus for use in limiting relative tilt between a tractor unit and a trailer unit of an articulated vehicle comprising

pivot means operatively connected to a tractor unit and a trailer unit of an articulated vehicle for enabling said units to tilt relative to each other about a horizontal axis,

a stop engaging member carried by said pivot means and extending transversely of said horizontal axis with the distal ends thereof positioned to engage first stop members carried on one of said units upon a predetermined amount of tilt between said units,

first stop members carried on one of said units in a position to be mutually exclusively engaged by one of the distal ends of said stop engaging member upon said predetermined amount of tilt between said units,

said stop engaging member having a pivotally connected stop engaging element depending from each end thereof in a position to engage a second stop member carried by one of said units upon said predetermined amount of tilt between said units, and

second stop members carried on one of said units in a position to simultaneously and mutually exclusively engage one of said pivotally connected stop engaging elements depending from an end of said stop engaging member when the other end engages one of said first stop members.

4. Apparatus for use in limiting relative tilt between a tractor unit and a trailer unit of an articulated vehicle comprising

pivot means operatively connected to a tractor unit and a trailer unit of an articulated vehicle for enabling said units to tilt relative to each other about a horizontal axis,

a stop engaging member carried by said pivot means and extending transversely of said horizontal axis with C-shaped distal ends positioned to engage a stop member carried on one of said units upon a predetermined amount of tilt between said units,

stop members having an upper and lower engaging surface carried on one of said units adjacent to the distal ends of said stop engaging member and in a position to engage said distal ends of said stop engaging member upon said predetermined amount of tilt between said units,

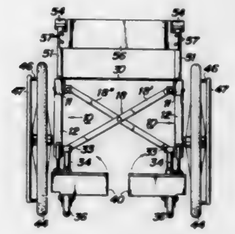
said stop members being positioned for simultaneous engagement of the upper portion of one of said C-shaped distal ends of said stop engaging member with the upper engaging surface of one of said stop members and the lower portion of the opposite C-shaped distal end with the lower engaging surface of the adjacent stop member to distribute stresses when limiting tilt between said units.

4,045,051

FOLDABLE WHEEL CHAIR

Jun Igarashi, Funabashi; Tadao Koga, Fukuoka, and Satoshi Ueda, Kiyose, all of Japan, assignors to Yaesu Rehabili Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1976, Ser. No. 671,487
Claims priority, application Japan, Apr. 2, 1975, 50-39941; Aug. 21, 1975, 50-101529
Int. Cl.² B62M *1/14*
U.S. Cl. 280—644 **4 Claims**



1. A foldable wheel chair comprising a three-dimensional link mechanism with two opposite side frames including horizontal upper frames with central portions base posts, said central portions being fixed to upper ends of said base posts, front and rear lower frames pivotally mounted on said base posts to swing from the vertical to the horizontal position universal joints, and a pair of diagonal braces pivotally mounted by said universal joints on said upper frames, the front lower frame at their forward ends, and on the upper and rear lower frames, said diagonal braces being folded simultaneously by folding the front and rear lower frames to reduce the distance between said two opposite side frames and simultaneously bring a caster wheel and a drive wheel mounted on the front and rear lower frames closer together.

4,045,052

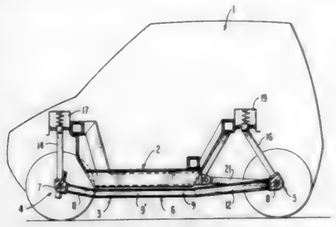
PASSENGER MOTOR VEHICLE

Karl Wilfert, Gerlingen-Waldstadt; Walter Schmid, Sindelfingen, and Arno Jambor, Vaihingen, Enz, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 30, 1975, Ser. No. 573,076
Claims priority, application Germany, May 2, 1974, 2421206
Int. Cl.² B60G *9/00*
U.S. Cl. 280—701 **58 Claims**

1. A passenger motor vehicle comprising a vehicle body, two axle means carrying the vehicle body, said vehicle body being supported with respect to at least one of the two axle means by way of elastic axle guide means, and said vehicle body being rotatable at least with respect to said one axle means about an axis of instantaneous rotation extending generally in the vehicle longitudinal direction and being disposed at least approximately at the height of its center of gravity, characterized in that the elastic axle guide means form simultaneously spring means for a vertical spring system of the one

axle means, and in that said elastic axle guide means are of such construction that the vehicle body is transversely displaceable



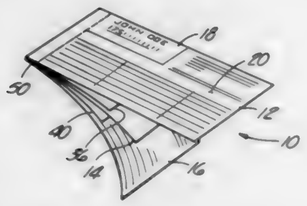
in a translatory manner with respect to at least the one axle means.

4,045,053

CREDIT CARD TRANSFER ASSEMBLY

James L. Carriere, 4678 Lu Ann Drive, Flushing, Mich. 48433

Filed Aug. 15, 1975, Ser. No. 605,214
Int. Cl.² B41L *1/24*
U.S. Cl. 282—22 R **6 Claims**



1. A credit card transfer assembly, comprising:

a. a first transfer medium receiving sheet having an upper surface and a lower surface, the upper surface having a predetermined area for receiving a credit card impression,

b. a second transfer medium receiving sheet having an upper surface and a lower surface, the upper surface having a predetermined area for receiving a credit impression, the predetermined area being coincident with the predetermined area of the first medium receiving sheet, the lower surface having a predetermined area for receiving a credit card impression which is spaced from the upper surface predetermined area to prevent coincidence therebetween,

c. a third transfer medium receiving sheet having an upper surface and a lower surface, the lower surface having a predetermined area for receiving a credit card impression, the predetermined area being coincident with the predetermined area of the lower surface of the second transfer medium receiving sheet,

d. a first transfer medium carrying sheet interposed between the first and second transfer medium receiving sheets,

e. a second transfer medium carrying sheet interposed between the second and third transfer medium sheets, and

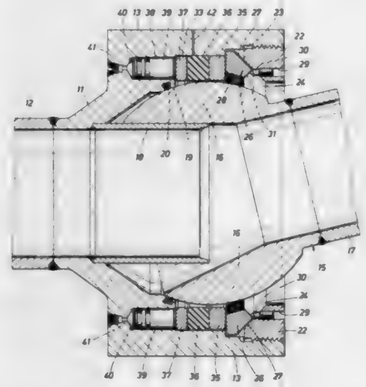
wherein the upper surface of the first transfer medium receiving sheet, carrying sheet and the upper surface of the third transfer medium receiving sheet cooperate to record a first transaction and the third transfer medium receiving sheet, the second transfer medium carrying sheet and the lower surface of the second transfer medium receiving sheet cooperate to record a second transaction upon a 180° rotation of the assembly about a horizontal axis, and further wherein the first transaction is recorded solely upon the upper surface of the first and second transfer medium receiving sheets and the second transaction is recorded solely upon the lower surfaces of the second and third transfer medium receiving sheets.

4,045,054

APPARATUS FOR RIGIDLY INTERCONNECTING MISALIGNED PIPE ENDS

James F. Arnold, Houston, Tex., assignor to HydroTech International, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 290,953, Sept. 28, 1972, Pat. No. 3,874,706, which is a continuation-in-part of Ser. No. 189,686, Oct. 15, 1971, abandoned. This application Mar. 14, 1975, Ser. No. 558,427
Int. Cl.² F16L *35/00*
U.S. Cl. 285—18 **19 Claims**



1. Apparatus for rigidly interconnecting the ends of two pipes comprising:

a pair of coupling members, each of which is adapted for connection at one end thereof to the end of one of said pipes;

one of said coupling members having attached thereto an annular radially outwardly enlarged portion having forward and rearward sides, with said forward side being generally spherical shaped;

the other coupling member having attached thereto a housing having a seat portion adapted for receiving the forward side of said enlarged portion in generally mating engagement therewith, to thereby accommodate axial misalignment between said coupling members;

gripping means supported generally between said housing and said enlarged portion, said gripping means being adapted for radial and axial movement relative to said housing seat portion between a retracted position in which said enlarged portion is freely mateable with said housing seat portion and an extended set position engaging the rearward side of said enlarged portion and urging said enlarged portion into positive contact with said housing seat portion and holding said enlarged portion and said housing rigidly interconnected;

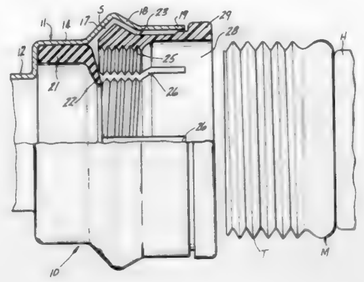
and setting means supported by said housing for urging said gripping means both radially and axially relative to said housing seat portion to said set position of engagement with said rearward side of said enlarged portion with sufficient force to hold said coupling members rigidly interconnected.

4,045,055

QUICK-CONNECT COUPLING

Stephen W. Blakely, Alton, Ill., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 442,220, Feb. 13, 1974, Pat. No. 3,901,538. This application July 18, 1975, Ser. No. 597,242
Int. Cl.² F16L *35/00*
U.S. Cl. 285—33 **4 Claims**



1. A quick-connect coupling device comprising a female coupling member adapted for use with a conventional threaded male coupling member, wherein said female member comprises:

A. a tubular shell member of monolithic construction for receiving said male member comprising a shank portion, a first enlarged portion, a larger main portion, and a mouth portion, said shell member possessing an outer contour identical to its inner contour as defined by said shank portion, said first enlarged portion, said main portion and said mouth portion;

B. a sealing means housed within said first enlarged portion, said sealing means comprising a formed hollow gasket portion and a formed frustoconical lip member extending therefrom, and situated within said first enlarged portion whereby said lip member extends within the inner surface of said male member and is attached to expand radially outward and against said inner surface in response to internal fluid pressure to provide a leak-proof seal;

C. a resilient snap ring possessing at one end thereof internal threads for engaging and holding said male member, and at the same end thereof an outer surface defining an outwardly extended peripheral bevel;

D. a locking means located in said main portion which contacts the peripheral bevel of said snap ring and thereby forces said snap ring radially inward into locking engagement with said male member when removal without release is attempted; and

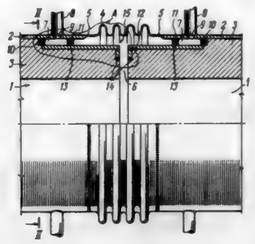
E. release means located on said snap ring for permitting the removal of said male member comprising a longitudinally extended sleeve-like projection which extends beyond said mouth portion, which, when pulled back toward said mouth, releases radially inwardly directed pressure maintained on said snap ring through said bevel, and a plurality of radially displaced, longitudinally extended slits extending through the threaded end of said snap ring defining distinct, finger-like segments at said threaded end, said segments thereby adapted for radially outward movement to facilitate the release of said male member.

4,045,056

EXPANSION COMPENSATOR FOR PIPELINES

Gennady Petrovich Kandakov, Sevastopolsky prospekt 51, kv. 163; Georgy Vasilievich Matveev, Novokhoroshovskoe shosse 25, kv. 58, and Viktor Yakovlevich Miller, Perekopskaya ulitsa 11, kor. 4, kv. 41, all of Moscow, U.S.S.R.

Filed Oct. 14, 1975, Ser. No. 622,393
Int. Cl.² F16L *51/02, 53/00*
U.S. Cl. 285—41 **7 Claims**



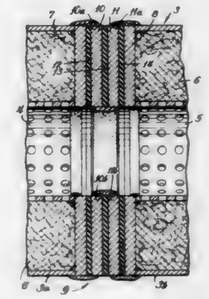
1. An expansion compensator for pipelines of the type including a metal casing lined with refractory materials, said compensator comprising: a corrugated sheath having its ends sealingly connected to said casing of adjacent portions of the pipeline mounted in a spaced relation to one another; shells having a diameter which is substantially smaller than the diameter of said casing, said shells being arranged within said casing; rings disposed between said casing and said shells and sealingly connected thereto; further rings, which are nearest to the space between the adjacent portions of the pipeline, said further rings being disposed between said casing and said shells and connected to one thereof and extending towards the other to define passages for a coolant supply beneath said corrugated sheath; annular distributing chambers for said coolant supply beneath said corrugated sheath arranged at either side of said space and at the inner side of said casing, each of the distributing chambers being formed by the inner surface of said casing, said shell, one of said first-mentioned rings sealingly connected to said casing and said shell and one of said further rings which is the nearest one to said space; and pipes for said coolant supply connected to said annular distributing chambers.

4,045,057

VIBRATION BARRIER/STRUCTURAL CONNECTOR FOR CONDUITS AND THE LIKE

Edmund John Halter, Irving, Tex., assignor to Burgess Industries Incorporated, Dallas, Tex.

Filed Feb. 2, 1976, Ser. No. 654,119
Int. Cl.² F16L *55/04*
U.S. Cl. 285—49 **5 Claims**



1. A vibration barrier/structural connector for conduits and the like comprising a plurality of spaced parallel substantially

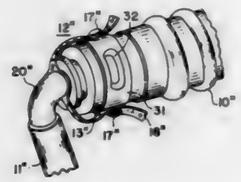
coextensive rigid structural plates, said plates being washer-shaped with outer and inner peripheries, the outermost plate at each end of the connector being adapted to be fastened at one of said peripheries to an end of the conduit in which said connector is to be interposed, said outermost plates being securely fastened to the respective adjoining plates at the other of said peripheries and any intermediate plates being alternately securely fastened together at one and then the other of said peripheries to form a cantilever labyrinth from one end to the other of said connector, and vibration damping bodies composed of material having the vibration damping characteristics of asbestos-filled rubber substantially coextensive with said plates sandwiched between adjoining plates in said labyrinth.

4,045,058

SLIP-PROOF COUPLING DEVICE

Bela Eross, Penn Hills Township, Allegheny County, Pa., assignor to Instrumentation Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 181,705, Sept. 20, 1971, Pat. No. 3,953,060.
This application Apr. 23, 1976, Ser. No. 679,679
Int. Cl.[2] F16L *27/08*; A61M *25/00*
U.S. Cl. 285—119 **1 Claim**



1. A coupling assembly for coupling sections of tubing, comprising a sleeve member to the opposite ends of which sections of tubing may be telescopically connected and an elongated strap the opposite ends of which are removably securable to said sleeve member and which removably cooperates intermediate said ends with at least one of said sections of tubing for elastically maintaining the connection between said section of tubing and said sleeve member, said sleeve member is substantially cylindrical in form and has intermediate the ends thereof a circumferential area of increased diameter, wherein a plurality of mushroom-like buttons are fixed in diametrical relation externally on said circumferential area, wherein said strap has a series of holes longitudinally spaced therein smaller in diameter than the said buttons but expandable thereover to secure said strap thereto, said one section of tubing has an annular flange spaced from one end thereof, said strap has an enlarged hole intermediate said ends, wherein the intermediate portion of the strap surrounds said one section of tubing and engages said flange to rotatably hold said one section of tubing to said sleeve member, and wherein an elongated circumferentially extending opening through said circumferential area is provided for unrestricted venting communication to atmosphere from within said sleeve.

4,045,059

MULTIPLE CONDUIT JOINT, CONSTANT INTERFACE AREA SWIVEL

Jack Edward Smith, Whittier, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Jan. 14, 1976, Ser. No. 649,031
Int. Cl.[2] F16L *27/08, 43/00*
U.S. Cl. 285—181 **5 Claims**

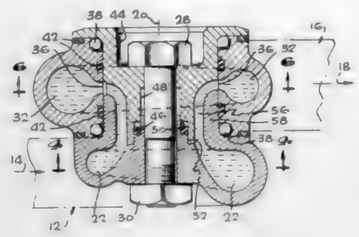
1. A multiple conduit joint, comprising in combination:

a. a first conduit having an ingress and a conducting port;

b. a second conduit articulate with said first conduit and having an egress and a conducting port opening to said first conduit conducting port in a substantially matching area of complemental joinder;

c. said first conduit being articulate about said second conduit thereby defining an axis of articulation;

d. each of said conduits being provided with a tapered chamber coupled in fluid communication to said ingress and said egress ports respectively, opening on said matching, complemental area of joinder defining a continuous, undivided channel forming a fluid path through said conduits, the orientation of any length of said path bypassing said axis, said path following a curve winding around said axis without intersecting said axis; and



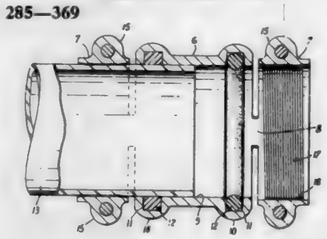
e. a cross-sectional area of said tapered chamber of said first conduit complements a cross-sectional area of said tapered chamber of said second conduit so that any plane intersecting the tapered chamber of said first conduit and the tapered chamber of said second conduit will have a cross-sectional total area of intersection approximately equal to a cross-sectional total area of intersection of any other plane intersecting said first conduit or said second conduit where said planes are coaxial with said axis of articulated movement.

4,045,060

PIPE RETAINER JOINTS

Rosaire Daigle, St. Lambert, Canada, assignor to Daigle Aqua Inc., Quebec, Canada

Filed Jan. 12, 1976, Ser. No. 648,046
Claims priority, application Canada, Dec. 4, 1975, 241069
Int. Cl.[2] F16L *17/00*
U.S. Cl. 285—369 **5 Claims**



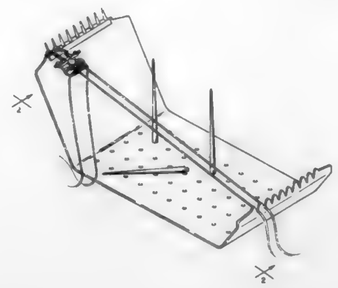
1. A pipe retaning joint for joining lengths of pipe, comprising a unitary coupling member having a central cylindrical member and a pair of split pipe retaining end members, each end member being split at diametrically opposite points, the said end members being joined to the said central member by integral narrow lugs located midway between th splits in the end members and retaining the said central and end members in axial alignment, the said central member having a pair of axially spaced apart annular grooves on its inner surface and an O-ring seated in each of said annular grooves, the said split end members each having their internal surface grooved to form pipe gripping surfaces, and bolt means for contracting the said split end members to bring them into gripping engagement with the pipes to be joined and to hold the pipes against axial withdrawal from the central member of the pipe retaining joint.

4,045,061

DECORATIVE ARTICLE FORMING SUPPORT

Mary M. Fierro, 11619 Downey Ave., Downey, Calif. 90241

Filed Apr. 14, 1976, Ser. No. 676,938
Int. Cl.[2] B65H *69/04*
U.S. Cl. 289—18 **2 Claims**



1. A decorative article forming support including:

a support portion having an upwardly extending first end and an upwardly extending second end, said first end being relatively longer in length than said second end so that said first end extends above said second end, wherein the area between the extended ends of said first end and said second end define a plane whereby said decorative article is adapted to be positioned, said first end and said second end being angled away from each other,

a plurality of V-shaped slots placed on said second ends and adapted to securely hold selected end of the decorative article being formed, and

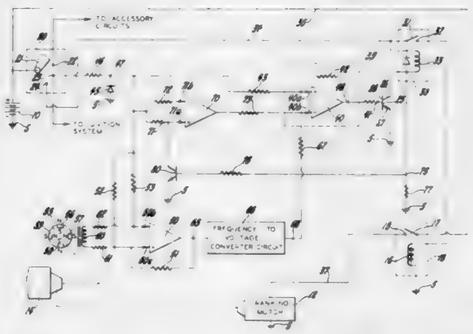
removably mounted means on said first end for holding the end opposite said selected end of the decorative article being formed, said means including an elongated bar having a slot disposed in an elongated plane thereof, said slot being adapted to be snugly placed over said first end thereof and secure said means to said end, and a plurality of spaced pins extending from said bar on a side opposite said slot, whereby said decorative article being formed is adapted to be positioned between said pins and said V-shaped slots.

4,045,062

ELECTRIC CRANKING MOTOR AUTOMATIC DISCONNECT AND LOCKOUT CIRCUIT

Mark D. Disosway, III, Anderson, and Leonard J. Sheldrake, Noblesville, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1975, Ser. No. 641,444
Int. Cl.[2] F02N *11/08*
U.S. Cl. 290—38 R **2 Claims**



2. An electric cranking motor automatic disconnect and lockout circuit of the type effective to automatically interrupt and lock out the electrically energizable energizing circuit for an internal combustion engine electric cranking motor when the speed of the cranked engine reaches and exceeds a predetermined value comprising in combination with an electric switch having "Off", "Run", and "Crank" positions:

an electrical switching device effective to establish and interrupt the internal combustion engine cranking motor electrically energizable energizing circuit and being of the type operable to an electrical circuit closed condition and to an electrical circuit open condition in response to respective applied electrical signals of a first polarity and of another polarity;

first circuit means having first and second input circuit means and being of the type which produces an output signal of a first polarity in response to a said first input circuit means input electrical signal level of a magnitude greater than the said second input circuit means input electrical signal level and which produces an output signal of a second polarity in response to a said second input circuit means input electrical signal level of a magnitude greater than the said first input circuit means input electrical signal level;

means for applying an electrical reference signal of a substantially constant magnitude and of a selected polarity to one of said first and second input circuit means of said first circuit means while said electric switch is in both the said "Run" and "Crank" positions;

means for producing an electrical engine speed signal of the same said selected polarity as said reference signal and of a magnitude directly proportional to the speed of an associated cranked internal combustion engine while said engine is in both the "Crank" and "Run" modes;

means for applying said engine speed signal to the other one of said first and second input circuit means of said first circuit means whereby said first circuit means produces a combination automatic disconnect and lockout electrical output signal of the polarity to which said electrical switching device is responsive for operation to the electrical circuit open condition when the level of said engine speed signal reaches and exceeds that of said reference signal;

means for applying said output signals of said first circuit means to said electrical switching device whereby said electrical switching device is operated to the electrical circuit open condition when the speed of said cranked engine reaches and exceeds said predetermined value; and

second circuit means for producing an electrical auxiliary lockout signal of the same polarity as said reference and engine speed signals in response to the operation of said second electrical switching device to the electrical circuit open condition and for applying said auxiliary lockout signal to the same one of said first and second input circuit means of said first circuit means as is said engine speed signal.

4,045,063

LOAD REGULATING LATCH

James C. Fletcher, Administrator of the National Aeronautics And Space Administration, with respect to an invention of, Walter Thomas Appleberry, Long Beach, Calif.

Filed Dec. 18, 1975, Ser. No. 641,784
Int. Cl.[2] E05C *5/04*
U.S. Cl. 292—110 **25 Claims**

1. A load-regulating mechanical latch, comprising:

a prepositioned strike roller;

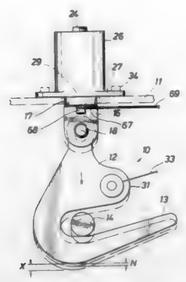
a latch element adapted for pivotal mounting comprising a laterally open hook having a surface for engagement with said strike roller;

means for pivotally moving said latch element;

a latch stem having pivotal mounting means at one end for pivotal mounting to said latch element;

a support bracket having an opening therein for receiving and supporting said latch stem;

adjustable loading means cooperating with said latch stem



and said support bracket for permitting selected axial movement of said latch stem whereby a predetermined load is exerted between said latch element strike roller-engaging surface and said strike roller.

4,045,064

LATCH MECHANISM

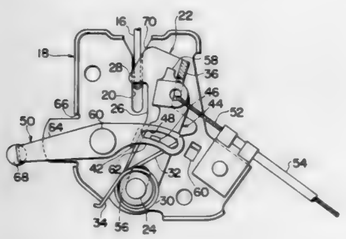
Yasumasa Okada, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 13, 1976, Ser. No. 648,690

Claims priority, application Japan, Jan. 17, 1975, 50-7511; Aug. 27, 1975, 50-118591[U]

Int. Cl.[2] E05C *3/30*

U.S. Cl. 292—125 **9 Claims**



1. In an automobile:

a luggage compartment to be closed by a lid;

a passenger compartment;

a latch mechanism having a latch member mounted within said luggage compartment, an open member mounted within said luggage compartment, said latch and open members being in conjoint action in a first condition and out of conjoint action in a second condition, whereby when in said first condition, said open member is operable to move said latch to its open position and when in said second condition said open member is inoperable to move said latch to its open position, and manually operable means for selectively rendering said latch and open members to the first and second conditions, said manually operable means being mounted within said luggage compartment so that when said lid is closed, said manually operable means is inaccessible for being manually operated; and

control means mounted within said passenger compartment for actuating said open member, said control means being operable from said passenger compartment only, whereby when said lid is closed with said manually operable means conditioned to render said latch and open members to the second condition, manual operation of said control means is inoperative to move said latch member to its open position.

4,045,065

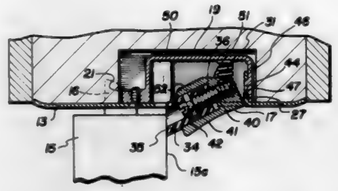
RELEASABLE DOOR STOP AND STRIKE PLATE ASSEMBLY FOR A BIDIRECTIONAL SWINGING DOOR

Larry K. Johnson, Morrison, Ill., assignor to Lawrence Brothers, Inc., Sterling, Ill.

Filed Nov. 6, 1975, Ser. No. 629,657

Int. Cl.[2] E05C *3/02*

U.S. Cl. 292—341.17 **8 Claims**



1. A door stop assembly for a bidirectional swinging door to permit opening of a door in a first direction during normal use and to permit selective opening of the door in a second direction during an emergency, comprising in combination: a face plate adapted to be fastened to a doorway frame and having a first aperture formed therein to receive the latch element of the door to provide a striker aperture therefore, a second aperture formed in said plate and offset laterally of said first latch receiving aperture, housing means secured to said face plate in registry with said second aperture for insertion into a mortise formed in the doorway frame receiving the same, a depressible stop member movably positioned within said housing means, said stop member including a main body element having a portion thereof projecting from said plate through said second aperture, and a bumper element carried by said portion of the main body element and having an abutment surface facing said first aperture for engagement by a door to provide the stop for said door, and means mounting said bumper element to said main body portion for movement toward or away from said first aperture, including means for maintaining a selective position, whereby the position of said stop relative to said strike may be adjusted and maintained to keep said door firmly engaged against said stop when in the closed condition with the door latch engaged in said first aperture.

4,045,066

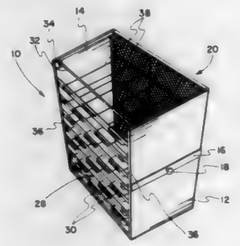
BULK TOBACCO CONTAINER

J. Curtis Griffin, and Clyde C. Griffin, both of Branford, Fla., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed June 25, 1976, Ser. No. 699,671

Int. Cl.[2] A24B *1/08*

U.S. Cl. 294—5.5 **10 Claims**



1. In a bulk tobacco container of the type which when oriented in an upright curing and drying position includes laterally spaced side retaining means; back retaining means extending across the back of said container and extending between said laterally spaced side retaining means; front tine frame support means extending across the front of said container and between said laterally spaced side retaining means so as to define an area within said container for containing a mass of tobacco leaf material; open areas about both the top and bottom of said container for allowing air to move vertically through said container during the curing and drying process; and tine means extending from said front tine frame support means through said mass of tobacco towards said back retaining means for supporting the mass of tobacco leaf material within said container; the improvement comprising an improved back retaining means for said container for receiving and supporting portions of said tine means about the back of said container, said improved back retaining means as oriented in said upright curing and drying position including a back frame having a plurality of vertically spaced and transversely extending support members extending between said laterally spaced retaining side means; and a perforated screen-like member disposed directly adjacent said back frame and the transverse members thereof and extending substantially over the entire area of said back retaining means for receiving and supporting portions of said tine means that extend through the mass of tobacco leaf material about the back of said container.

4,045,067

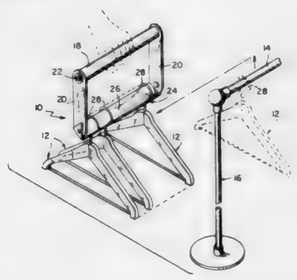
APPARATUS AND METHOD FOR HANDLING GARMENT HANGERS

Rodney L. Wieder, P.O. Box 86, R.D. No. 1, Coopersburg, Pa. 18036; Michael A. Neetz, 2433-Apt. 105, Prospect Ave., Allentown, Pa. 18103, and Earl O. Sell, 53 Buckeye Road, Emmaus, Pa. 18049

Filed Nov. 1, 1976, Ser. No. 737,474

Int. Cl.[2] A47G *25/06*

U.S. Cl. 294—15 **6 Claims**



1. A device for handling garment hangers of the type including a supporting hook adapted to be hung on a generally horizontal supporting bar in a garment rack, said device being useful for handling a plurality of hangers as a unit for mounting and dismounting on supporting bars and transportation therebetween, said device comprising:

a handle for holding said device;

a scooping member including a hanger hook-receiving surface generally parallel to said handle and spaced therefrom, said hook-receiving surface having surface normals inclined with respect to a plane parallel to said handle and intersecting both said handle and said hook-receiving surface; and

means for joining said handle and said scooping member in a spaced relationship;

said device being used to dismount a plurality of garment hangers from a supporting bar by holding said device with said hook-receiving surface below and inclined downward away from the open portion of said hanger hooks, and lifting said device so that said hanger hooks slide down said hook receiving surface and are simultaneously lifted from said bar, said hangers being placed on a bar by lowering said device towards and below said bar so that said hanger hooks engage said bar.

4,045,068

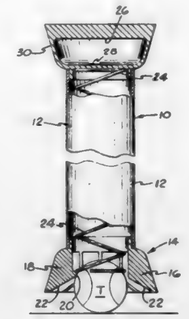
BALL PICK-UP, STORAGE, AND INDIVIDUAL DELIVERY DEVICE

James Irwin Nelson, R.D. 2, Ironia Road, Mendham, N.J. 07945

Filed May 19, 1976, Ser. No. 687,915

Int. Cl.[2] A63B *47/02*

U.S. Cl. 294—19 A **3 Claims**



1. A tennis ball pick-up, storage, and individual delivery device comprising: an elongated tubular canister for receiving and storing and individually delivering a plurality of tennis balls; tennis ball guiding and retaining means located at one end of said elongated tubular canister for guiding tennis balls individually into said elongated tubular canister and for retaining them therein, said tennis ball guiding and retaining means being located at the lower end of said elongated tubular canister when the tennis balls are to be guided into said elongated tubular canister and at the upper end of said elongated tubular canister when the tennis balls are to be delivered from said elongated tubular canister; spring means located within said elongated tubular canister for urging the tennis balls within said elongated tubular canister in the direction of said tennis ball guiding and retaining means, with the outermost tennis ball contacting said tennis ball guiding and retaining means; and a sufficiently enlarged base located at the other end of said elongated tubular canister opposite to the end where said tennis ball guiding and retaining means are located, providing a handle for the person picking up tennis balls with the tennis ball pick-up, storage, and individual delivery device and having a sufficiently large surface base area to enable said elongated tubular canister to be inverted and to stand substantially vertically upright thereon in inverted but stable fashion on the ground or on the playing surface of a tennis court, with said tennis ball guiding and retaining means being located at the upper end of said elongated tubular canister when the tennis balls are to be individually delivered from said elongated tubular canister and with the outermost tennis ball in position to be removed individually at a constant height at approximately waist-high level or above from said elongated tubular canister by a person using the tennis ball pick-up, storage, and individual delivery device without being required to bend over or stoop during either the picking-up or delivering of the tennis balls, said tennis balls being squeezable and compressible, and capable of being deformed and distorted by manual or digital pressure but being sufficiently resilient as to return substantially immediately to their original spherical shape when the manual or digital pressure is removed, said tennis ball guiding and retaining means comprising a plurality of relatively firm, rigid and unyielding fins which are sufficiently spaced from each other as to permit the fingers of a person using the device to enter therebetween to grasp and remove tennis balls individually, said relatively firm, rigid and unyielding fins extending radially outwardly from the center or axis of said elongated

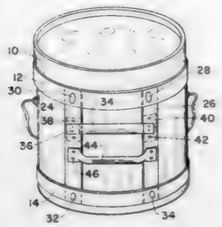
tubular canister, with their inner ends forming an opening slightly smaller than the cross-sectional area of a tennis ball, whereby pressure is required to squeeze and deform the tennis balls to enable them to be collected and guided into said elongated tubular canister or to permit them to be delivered individually from said elongated tubular canister.

4,045,069

PAINT BUCKET HOLDER

Clemens L. Fife, Baton Rouge, La., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed June 10, 1976, Ser. No. 694,677
Int. Cl.[2] B65D *25/28*
U.S. Cl. 294—31.2 **3 Claims**



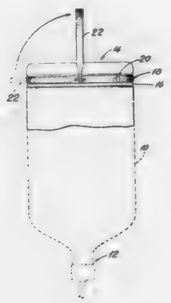
1. A paint bucket holder, comprising:
a strap releaseably secured around an upper portion of a paint bucket by means of a buckle,
a second strap releaseably secured around a lower portion of the paint bucket by second buckle,
a vertical strap connected between the strap and the second strap,
a second vertical strap connected between the strap and the second strap near the vertical strap,
a wooden handle attached at each end to a connected strap, each connecting strap secured to one of the vertical straps, and
a metal handle secured beneath the wooden handle to the vertical straps.

4,045,070

CONTAINER HANDLE

Wolfgang Geisinger, 180, rue Paradis, Rosemere, Quebec, Canada

Filed Nov. 20, 1975, Ser. No. 633,789
Claims priority, application Canada, Jan. 20, 1975, 218239/75
Int. Cl.[2] B65D *23/10*
U.S. Cl. 294—31.2 **5 Claims**



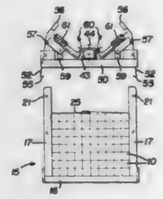
1. A handle for insuring the vertical positioning of an inverted suspended bottle having an external circumferential groove adjacent one end thereof, said bottle being used principally for administering intravenous solutions to patients, comprising: an endless band of thermoplastic material, said material being resiliently stretchable for passage over said one end of said bottle to be received in said groove firmly; a bail molded integrally with said band to form a unitary structure, said bail including a pair of arm portions and; flat connecting portions joined respectively at the end of each arm portion to generally diametrically opposed portions of said band; each said flat connecting portion extending outward from said band in a plane parallel to the plane of said band and having a reduced cross-section and resiliency compared to the cross-section and resiliency of the arm portion, said reduced cross-section providing a twistable hinge at the junction between said bail and said band allowing said bail to rotate 90° relative to said plane of said band to insure the vertical positioning of said bottle when suspended.

4,045,071

SYSTEM FOR TRANSPORTING AND STORING LONG EXTRUSIONS

James W. Dunstan, Kalamazoo, Mich., assignor to Acorn Building Components, Inc., Detroit, Mich.

Filed Jan. 5, 1976, Ser. No. 640,127
Int. Cl.[2] B66C *1/18*
U.S. Cl. 294—67 R **12 Claims**



12. A system for storing and transporting a bundle of elongated extrusion-like components comprising in combination:
a pair of racks for transporting and storing a bundle of elongated, extrusion-like components;
each rack having a U-shaped frame formed of a base and two upwardly extending spaced apart legs secured to the opposite ends of the base for receiving a bundle of stacked elongated components arranged transversely of the frame;
an elongated vertical slot formed in each leg near the upper end thereof; and
first anchor means formed on each leg whereby a flexible strapping band may be arranged over the top of the bundle and span the space between the legs and extend through the slots and engage with the anchor means for tightly securing the bundle within the frame provided that the height of the bundle above the frame base is greater than the height of the lower end of the slot above the base;
second anchor means formed on each leg near the upper end of its slot whereby the frame and its bundle may be lifted by engaging the first or second anchor means with a lifting hoist means;
an elongated beam of adjustable working length;
fastener means securing the working length of the beam at a length substantially equal to the distance between said racks;
a pair of rack-engaging units each secured to one end of the beam so that upon positioning the rack-engaging units over a racked bundle, each rack-engaging unit is aligned above a rack; and
locking means for engaging each rack-engaging unit with the anchor means of its associated rack,
each rack engaging unit including: an elongated yoke secured to one end of the beam and mounted transversely thereof;
a pair of arms each having upper and lower ends and pivotally mounted at one end of said yoke intermediate its upper and lower ends;

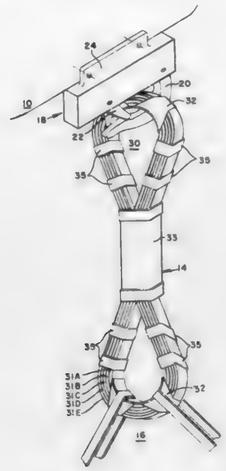
each arm counterbalanced so that the lower end of each arm is normaly in a non-rack engaging position solely by the influence of gravity; and
locking means cooperating with the upper end of each arm for pivoting each arm so that the lower end engages a rack and so that the upper end of each arm is positively locked against pivoting.

4,045,072

ABRASION RESISTANT BOOT

Frank J. Brown, Willow Grove, Pa., assignor to United Technology, Inc., Blue Bell, Pa.

Filed May 18, 1976, Ser. No. 687,627
Int. Cl.[2] B66C *1/12*
U.S. Cl. 294—74 **9 Claims**



1. A protective boot for use in conjunction with a support member, said boot comprising a first member of relatively flexible material, a second member of relatively inflexible material attached to said first member, said second member being somewhat smaller in width than said first member and being of such configuration so as to form a pocket, and an insert of a size to substantially fill said pocket, said insert comprising a woven member exhibiting preferred characteristics when subjected to large compressive stresses whereby longitudinally oriented fibers of said woven member exhibit a relatively high resistivity to compression while the transversely oriented fibers exhibit a relatively low resistivity to compression so that when said boot is subjected to impact forces of substantial magnitude a failure of the transversely oriented fibers occurs without a corresponding failure of the longitudinally oriented fibers thereby permitting the impact forces to be distributed over the length of said insert.

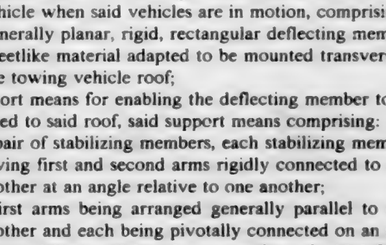
4,045,073

DEVICE FOR DISPLACING AN EGG-TRAY

Jacob Hendrik Mosterd, Barneveld, Netherlands, assignor to Moba Holding Barneveld B.V., Barneveld, Netherlands

Filed Apr. 2, 1976, Ser. No. 673,141
Claims priority, application Netherlands, Apr. 11, 1975, 7504326
Int. Cl.[2] B66C *1/02, 1/46*
U.S. Cl. 294—87 A **8 Claims**

1. A gripper device for displacing an egg-tray filled with eggs comprising:
supporting members movable in a generally horizontal direction into engagement with a rim of an egg-tray, said supporting members having an edge gripping portion of a height greater than the thickness of the rim of the tray, said thickness being taken in a vertical direction, such that the vertical position of the rim can be varied over a given range, relative to the said edge gripping portion, and still be positioned to be gripped by the edge gripping portion and hence carried by the supporting members,
a suction device comprising means for engaging the eggs in the tray by suction to support the weight of the eggs therein,



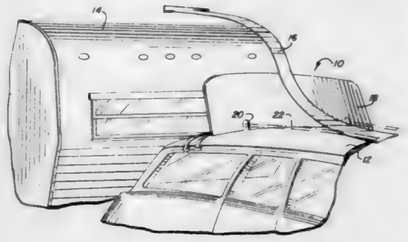
and means for fixing the height of the supporting members relative to the suction device and moving them together to thereby carry away the egg-tray filled with eggs with the suction device bearing the weight of the eggs and supporting members bearing the weight of the tray.

4,045,074

AIRSTREAM DEFLECTOR FOR TRAILER-TOW VEHICLE COMBINATIONS

George W. Howard, Northbrook, Ill., assignor to Leisure Manufacturing Co., Inc., Des Plaines, Ill.

Filed Apr. 15, 1976, Ser. No. 677,239
Int. Cl.[2] B60J *9/04;* **B62D** *35/00*
U.S. Cl. 296—1 S **15 Claims**



1. A collapsible airstream deflector device adapted to be mounted on the roof of a towing vehicle to deflect air over a towed vehicle when said vehicles are in motion, comprising:
A. a generally planar, rigid, rectangular deflecting member of sheetlike material adapted to be mounted transversely of the towing vehicle roof;
B. support means for enabling the deflecting member to be secured to said roof, said support means comprising:
1. a pair of stabilizing members, each stabilizing member having first and second arms rigidly connected to one another at an angle relative to one another;
the first arms being arranged generally parallel to one another and each being pivotally connected on an axis substantially parallel to the rear surface of said deflecting member at locations adjacent opposite ends of the member, and able to rotate on said axis parallel to the deflecting member when disassociated from the towing vehicle to enable each second arm to be swung between a first operative position where said first and second arms define a plane generally perpendicular to that of the deflecting member and a second position in which each second arm overlies the rear surface close thereto;
C. locking means for removably locking said deflecting

member and support means with the stabilizing members in said first operative position; and

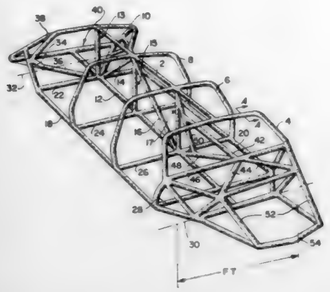
D. means for connecting the deflector device to the towing vehicle.

4,045,075

AUTOMOBILE BODY FRAME AND ENVELOPE CONSTRUCTION

Donald W. Pulver, 1616 Trolist Drive, Pittsburgh, Pa. 15241

Filed Dec. 18, 1975, Ser. No. 641,785
Int. Cl.[2] B62D *21/00*
U.S. Cl. 296—28 J **21 Claims**



1. A vehicle body frame and envelope construction for an elongated wheelbased vehicle of relatively narrow track having an aspect ratio for wheelbase to track of between approximately 2:1 and 3:1 comprising:

A. longitudinal frame means between points of attachment for a front wheel assembly and a rear wheel assembly, said points defining said vehicle wheelbase, and

B. transverse frame means between and encompassing wheel mounting positions on each of said front rear wheel assemblies, said positions defining said vehicle track,

C. wherein said longitudinal frame means further comprises a central truss member means extending longitudinally between said wheel assembly attachment points wherein said central truss member means is symmetrically between said wheel mounting positions and extends vertically through a passenger compartment to further define an upper roof support for said vehicle body, wherein said central truss member means further comprises an upper longitudinal strut defining said roof support and a bottom longitudinal strut defining the bottom of said vehicle frame, said struts being vertically interconnected by respective vertical struts at spaced longitudinal positions along said longitudinal struts.

4,045,076

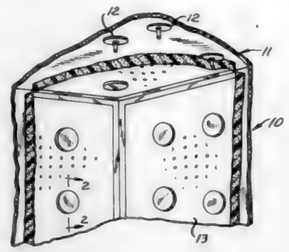
SYSTEM FOR REMOVABLY SECURING SOUND-PROOFING MATERIAL TO A CONSTRUCTION VEHICLE

Lloyd Franklin Day, Sr., West Linn; Jarvis Cathralle Buxton, Portland; Lary Hester Oliver, Portland, and Randall Jay Le Neve, Portland, all of Oreg., assignors to Portland Wire & Iron Works, Portland, Oreg.

Filed Mar. 29, 1976, Ser. No. 671,060
Int. Cl.[2] E04B *1/74*
U.S. Cl. 296—39 A **7 Claims**

1. In apparatus for applying sheet-like material to areas of a vehicle surrounded by walls including a plurality of externally grooved stud assemblies secured at spaced locations to said wall and projecting inwardly thereof to provide a non-pointed distal end; a layer of said material covering the interior of said walls, said assemblies projecting at least partially through said material; and a button for each assembly, including a head and sleeve for fitting over an associated stud assembly and being held by the grooves thereof,

the improvement wherein said stud assemblies comprise a flat, thin base, a grooved stud attached to said base and extending perpendicular to a front face of said base, a layer of flexible foam material on the back side of said



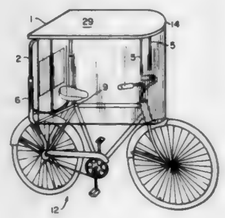
base; pressure-sensitive adhesive coating on the exterior side of said foam material; and a release film covering said adhesive.

4,045,077

CONVERTRA-BIKE TOP

James Milton DeVone, 3022 Chapel Hill Road, Apartment 70-C, Durham, N.C. 27703

Continuation-in-part of Ser. No. 598,666, Nov. 23, 1973, abandoned. This application Aug. 26, 1975, Ser. No. 607,916
Int. Cl.[2] B62J *17/00*
U.S. Cl. 296—78.1 **2 Claims**



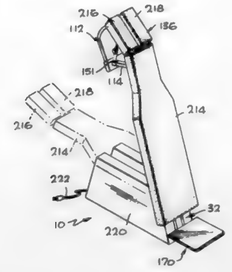
1. A multipurpose top for cycle type vehicles having a frame and a seat for a rider, comprising: a substantially rigid, elongated top frame, generally planar in construction and C-shaped at one extremity and straight at the other extremity; a pair of generally tubular, elongated, L-shaped combination shield guard and table leg members mounted generally parallel to the bottom surface of said top frame; clamp means securing said L-shaped guard members to said top frame; a plurality of detachable elongated generally divergent combination side supports and table legs vertically disposed between and attached to the vehicle frame on one end and said top frame on the other end; a plurality of detachable, elongated generally divergent tubular side arm members disposed generally horizontally and connected at one end to the vehicle seat mounting bracket and at the other end to, respectively, one of said side support members; and a combination top cover means and table top constructed of generally weatherproof material enveloping said top frame and comprising a plurality of sections including a combination weather shield and storage area at the rear of the seat of the vehicle, and a transparent weather shield extending about the sides and front of the vehicle whereby a multi-purpose top is provided which can be used as either a top or a removable table and, when in the cycle top configuration, provides a weather shield and storage area.

4,045,078

TILTING THERAPEUTIC TABLE

Alfred C. Shine, North Hollywood, Calif., assignor to Daniel J. Clinton, Hollywood, Calif.

Filed Oct. 20, 1976, Ser. No. 734,024
Int. Cl.[2] A61G *13/00*
U.S. Cl. 269—324 **6 Claims**



1. A tiltable table, comprising:

a base member having first and second ends and an intermediate portion;

a plate having an upper end and a lower end, said lower end of said plate being provided with a pair of wrist pins;

a bearing block swingably connecting each of said wrist pins to said intermediate portion of said base member;

an electric motor affixed to one side of said plate, said motor having an output shaft;

a screw-jack assembly including a vertically-movable cylinder having an upper end and a lower end, a drive nut affixed to said lower end of said cylinder, a drive screw having one end threadedly engaging said drive nut to reciprocate said cylinder and another end drivingly connected to said motor output shaft and a screw bearing block rotatably receiving said another end of said drive screw;

means affixing said screw bearing block to the other side of said plate;

a table support including a pair of channel members each having an upper end and a lower end;

means affixing the lower end of each channel member to said one end of said base member for maintaining said channel members in spaced-apart, near-vertical positions;

a one-piece, elongated tubular member having first and second ends and an intermediate portion;

a pivot pin swingably connecting the portion of said tubular member which lies between its first end and its intermediate portion to said table support between said upper ends of said channel members;

means pivotably connecting said upper end of said cylinder to said tubular member between said pivot pin and said intermediate portion for swinging said tubular member from a horizontal plane to a near-vertical plane;

a foot rest swingably connected to said first end of said tubular member; and

a head rest swingably connected to said second end of said tubular member.

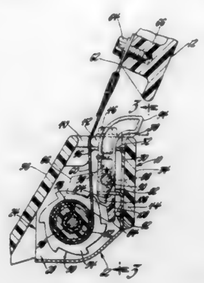
4,045,079

INERTIA SEAT BACK LOCK

Alfonsas Arlauskas, Troy, and Richard D. Loose, Birmingham, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 17, 1976, Ser. No. 686,693
Int. Cl.[2] B60R *21/10;* **A47C** *1/00*
U.S. Cl. 297—216 **5 Claims**

1. An inertia seat back lock for a seat back member pivotal relative to a seat cushion member comprising, in combination, a frame secured to one of the members and including spaced side walls, a reel including a shaft portion and a pair of toothed plates, each located adjacent a respective side wall and including a plurality of radially extending teeth, means rotatably mounting the shaft portion on the frame side walls, a strap secured at one end of the reel for winding and unwinding therefrom, means securing the other end of the strap to the other member, spring means located between a respective plate and side wall and interconnecting the reel and frame to normally bias the reel in a strap winding direction, and an inertia responsive member having a pawl portion traversing the reel plates and a pair of extensions located between a reel plate and respective frame side wall, means pivotally mounting the extensions on the frame side walls and positioning the pawl portion to one side of the pivotal mounting means and the



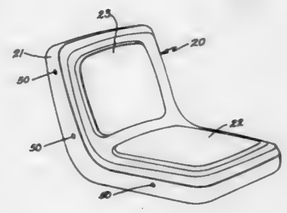
extensions to the other side thereof, the extensions being of predetermined weight and locating the center of gravity of the inertia member to the other side of the pivotal mounting means to normally bias the inertia member in one direction about the pivotal mounting means, and means limiting movement of the inertia member in the one direction to locate the pawl portion of the inertia member in a predetermined position out of the path of the teeth of the reel plates, a predetermined seat deceleration level pivoting the inertia member in the other direction relative to the pivotal mounting means and engaging the pawl portion with one tooth of each reel plate to block unwinding movement of the strap and pivotal movement of the seat back member relative to the seat cushion member.

4,045,080

FASTENING SYSTEM FOR REMOVABLE SEAT INSERT

Chester J. Barecki, Grand Rapids, and Larry A. Wilkerson, Wyoming, both of Mich., assignors to American Seating Company, Grand Rapids, Mich.

Filed Nov. 3, 1976, Ser. No. 738,566
Int. Cl.[2] A47C *27/00*
U.S. Cl. 297—283 **11 Claims**



1. In a seat having a rigid plastic shell and means for fastening said insert to the shell, the improvement comprising:

studs secured to and protruding from the back of said insert, said studs having a shank portion and an enlarged head;

said shell having openings for receiving said studs, said openings being sufficiently large to receive the heads of said studs;

an elongated retainer member mounted on said shell for movement in two sequential first and second directions

extending at angles from each other so said retainer member can be positioned in a retaining position and a non-retaining position;

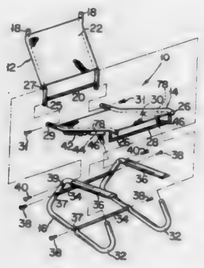
said retainer member having notched portions one for receiving each of said shanks of said studs, so that the retainer member is located between the heads of said studs and said shell, at least one of said notched portions in the retaining position of said retainer member having a first slot portion extending in one of said directions and a second connecting slot portion communicating with said first slot and extending in the other of said directions whereby when said retainer is moved from the non-retaining position to the retaining position one of said studs enters and passes through said first slot portion as said retainer is moved in said first direction and thereafter enters and passes into said second slot as said retainer member moves in said second direction.

4,045,081

RECLINING CHAIR

Kiyoshi Ueno, Kawasaki, Japan, assignor to NHK Spring Co., Ltd., Yokohama, Japan

Filed Feb. 13, 1976, Ser. No. 658,117
Claims priority, application Japan, June 24, 1975, 50-78409
Int. Cl.² A47C *1/02*
U.S. Cl. 297—317 **5 Claims**



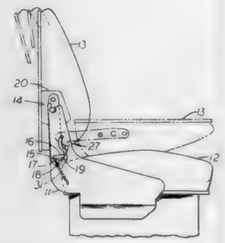
1. A reclining chair comprising: a seat section having a front end and a rear end, a back-rest section having a lower end rockably and separably connected to the rear end of said seat section; a frame section rockably and separably connected to said back-rest section and including a pair of mutually separably connected side frames and an upwardly extending portion; a friction brake apparatus tilted to one side of said seat section and including a housing, a slidable shaft having one end extended through said housing, a pair of coil springs differing in twisted direction from each other and fitted over said shaft so as to grip said shaft thereby to lock said shaft by frictional force between said coil springs and said shaft, release means rockably fitted over said shaft between said coil springs in a manner allowed to abut on the distal coil ends of mutually opposing end portions of said coil springs and so designed that when said release means has been rocked, said coil springs are twisted back to unlock said shaft, sleeve means received within said housing adjacent to said coil springs so as to cause respective coils of said coil springs to be twisted back uniformly, and bushing means fixed within said housing and having a pair of engaging means engaged with the distal bent coil ends of the other end portions of said coil springs, respectively, so as to prevent them from being rocked, and a pair of inclined shoulders each having a larger angle of inclination than the helical angle of said coil springs and abutting on the distal coil end of said other end portions of said coil springs, respectively; and coupling means for slidably coupling said seat section to said frame section through said brake apparatus, said coupling means including a fitting for fitting said housing of said brake apparatus to said seat section and a coupling mechanism for fixedly coupling an extended end portion of said shaft of said brake apparatus to said frame section, said coupling means including a connector separably fitted into said upwardly extending portion thereby slidably coupling said seat section to said frame section.

4,045,082

SEAT HAVING BACK REST WITH DIFFERENT PIVOTS FOR TILTING AND FOR FOLDING LEVEL

Allen C. Egert, Davenport, Iowa; L. John Koutsky, Milan, and Dale R. Ropp, Aledo, all of Ill., assignors to Sears Manufacturing Co., Davenport, Iowa

Filed Sept. 22, 1976, Ser. No. 725,398
Int. Cl.² A47C *1/025*
U.S. Cl. 297—357 **5 Claims**



1. In a seat assembly having a rigid seat frame, a seat cushion and a back rest supported by said frame,

a first separable pivot connecting said back rest to said seat frame, said first separable pivot being on that transverse axis of said back rest about which said back rest is to be rotated for adjustment of tilt,

locking means spaced from said first pivot and connecting said back rest and said seat frame in different selected degrees of tilt of said back rest,

a second separable pivot on a different transverse axis of said back rest, said second separable pivot connecting said back rest to said seat frame during rotation of said back rest to a folded position over said seat cushion,

said first separable pivot comprising a stud and a first arcuate bearing connected individually to said back rest and said seat frame, said first arcuate bearing being open in an upwardly direction, a guiding edge extending from an upper portion of said first arcuate bearing in a substantially horizontal direction such that said bolt is movable thereover for supporting said back rest until said bolt is free while said back rest is lifted slightly upwardly and then the upper portion of said back rest is tilted forwardly,

said second pivot comprising a pintle and a second arcuate bearing connected individually to said back rest and said seat frame, said second pivot being separated while said back rest is in position for use,

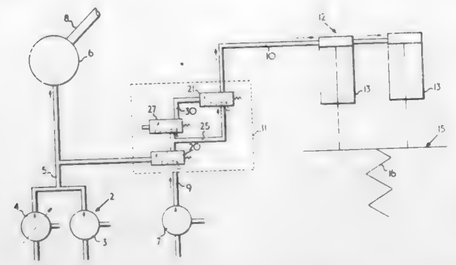
guiding means connecting said back rest to said seat frame, said guiding means cooperating with said guiding edge to position said pintle within said second arcuate bearing surface as said stud is removed from said first arcuate bearing and moved along said guiding edge, and said guiding means maintaining said pintle within said second arcuate bearing while said back rest is rotated to said folded position around said different transverse axis.

4,045,083

LONGWALL MINING MACHINE WITH HAULAGE MOTOR SENSED PRESSURE CONTROLLED RAIL BRAKE

Harry Monks, Burton-on-Trent, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Feb. 13, 1976, Ser. No. 657,876
Claims priority, application United Kingdom, Feb. 28, 1975, 08436/75
Int. Cl.² E21C *29/16*
U.S. Cl. 299—1 **11 Claims**



1. A mineral mining machine comprising haulage mechanism including a hydraulic motor for hauling the machine to and fro along a rail extending along a longwall face, first hydraulic pump means for feeding pressure fluid to drive the hydraulic motor, a first hydraulic control for controlling the feed of pressure fluid to said hydraulic motor, a resiliently biased rail-engaging brake operable under its resilient bias towards its applied position to prevent movement of the machine along said path, second hudraulic pump means separate from the said first hydraulic pump means for supplying pressure fluid tending to move the brake against its resilient bias towards its released position to allow movement of the machine along said path, a second hydraulic control for controlling the supply of pressure fluid from said second hydraulic pump means to said brake, and means responsive to the operational condition of the machine's haulage mechanism to thereby actuate said second hydraulic control to block off the pressure fluid supply to cause application of said brake against said rail to prevent uncontrolled movement of the machine along said path.

4,045,084

IN-SITU MINING OF COPPER AND NICKEL

Limin Hsueh, Bedford; Robert A. Hard, Still River; Donald H. Davidson, Bedford, and Ray V. Huff, Acton, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,547
Int. Cl.² E21B *43/28*
U.S. Cl. 299—4 **11 Claims**

1. A process for the in-situ mining of metal values selected from copper, nickel or mixtures thereof from a subterranean ore body characterized by natural microscopic fracture openings, a portion of said body being a sulfidic ore, said process being characterized by the steps of:

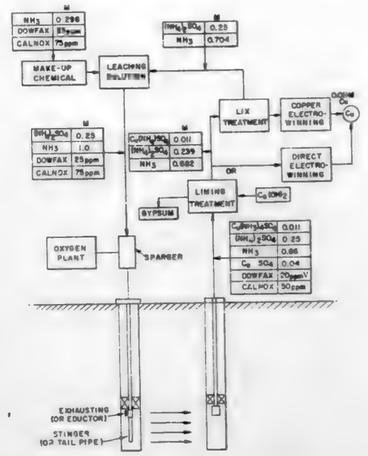
a. drilling at least one injection hole and at least one production hole communicating with said ore body;

b. forming a stable, two-phase lixiviant comprising an aqueous phase,

a multiplicity of gaseous, oxygen containing bubbles having a size, when subjected to the pressure employed during in-situ maining, sufficient to pass through the fracture openings in said ore body, and

a surfactant for maintaining the size and individuality of said bubbles;

c. forcing the lixiviant formed in step (b), under pressure, through said ore body to cause the lixiviant to penetrate the ore body through the natural microscopic fracture openings, the oxygen in said lixiviant reacting with the sulfide in the ore to enable metal ions to be solubilized by said aqueous phase;



d. withdrawing the resultant metal bearing aqueous phase to the surface through said production hole; and

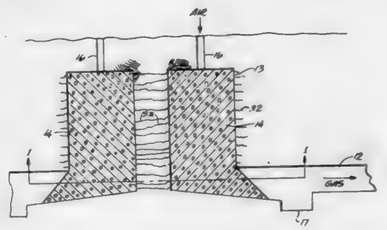
e. recovering metal values from said aqueous phase.

4,045,085

FRACTURING OF PILLARS FOR ENHANCING RECOVERY OF OIL FROM IN SITU OIL SHALE RETORT

Donald E. Garrett, Claremont, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Filed Apr. 14, 1975, Ser. No. 567,509
Int. Cl.² E21C *41/10, 43/00*
U.S. Cl. 299—2 **26 Claims**



1. A method for recovery of shale oil from a fragmented permeable mass of particles in an in situ oil shale retort in a subterranean formation containing oil shale and from fractured unfragmented formation containing oil shale adjacent the fragmented permeable mass, said retort having pillars of a first portion of unfragmented formation defining boundaries for the fragmented permeable mass of particles, said fragmented permeable mass being obtained by fragmenting part of a second portion of the formation within such boundaries, comprising the steps of:

fracturing unfragmented formation containing oil shale in the first portion and adjacent the second portion;

excavating a part of the second portion of the formation to form at least one void and leaving a remaining unfragmented part of said second portion extending away from such an excavated void, the excavated void volume being in the range of from about 10 to 25 percent of the volume of the fragmented permeable mass being formed;

explosively expanding said remaining part of said second portion toward such an excavated void for forming the fragmented permeable mass of particles; and

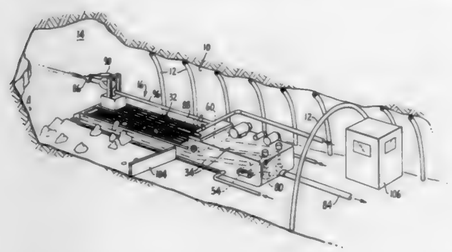
retorting the fragmented permeable mass of particles containing oil shale and fractured formation containing oil shale adjacent to the fragmented permeable mass for recovering carbonaceous products including shale oil therefrom.

4,045,086

PUMPABLE PRODUCT HYDRAULIC MINING APPARATUS AND METHOD

David M. Parkes, Calgary, and Thomas Brian Hart, Fernie, both of Canada, assignors to Kaiser Resources Ltd., Vancouver, Canada

Filed July 22, 1976, Ser. No. 707,701
Claims priority, application Canada, Apr. 6, 1976, 249699
Int. Cl.[2] E21C *25/60*
U.S. Cl. 299—17 **12 Claims**



9. An hydraulic mining apparatus comprising, in combination: a perforate continuous loop belt conveyor having upstream and downstream sections and a reach extending over the length of said sections, the belt of said conveyor being sufficiently open to permit the substantially unrestricted passage of mined aggregate therethrough and having an upstream support extending beneath said reach over the length of said upstream section and a downstream support extending beneath said reach over the length of said downstream section, at least said upstream support having openings therein sized to permit aggregate of a pumpable size to pass therethrough while preventing the passage therethrough of aggregate greater than pumpable size; primary breaker means disposed intermediate said sections to reduce the size of oversized aggregate passing from said upstream section to said downstream section; secondary breaker means disposed downstream from said primary breaker means to reduce oversized aggregate departing from the latter means to a pumpable size; collection means disposed to receive fluid and pumpable aggregate from said conveyor and secondary breaker means; and, pump means communicating with said collection means to withdraw and pump fluid and aggregate therefrom and convey the same under pressure.

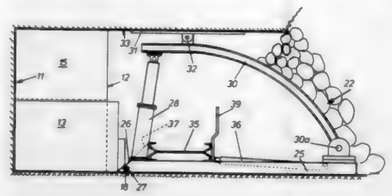
4,045,087

MINING APPARATUS

Cecil Vowe Peake, 2424 Blake Court, Bethlehem, Pa. 18017

Filed Sept. 8, 1975, Ser. No. 611,409
Claims priority, application United Kingdom, Sept. 7, 1974, 39148/74
Int. Cl.[2] E21D *15/502*
U.S. Cl. 299—31 **6 Claims**

1. Longwall mining apparatus comprising a mineral cutting machine arranged to traverse back and forth along a mineral face; and a plurality of self-advanceable roof supports arranged side by side along said mineral face, each of said supports comprising a base having a flat top portion adapted to support a face conveyor, said base having a front end and a rear end, an inclined plate-like shield having a lower end and an upper end, at least one substantially upright hydraulic prop adapted to be extended and retracted and mounted on the base adjacent said front end of the latter, first hinge means connecting said lower end of said shield to said base and second meas connecting said upper end of said shield to the upper end of said hydraulic prop, a roof support platen connected to said shield upwardly spaced therefrom, an extendable and retractable advance hydraulic cylinder mounted on said base and connected to said face conveyor, said face conveyor being located between said



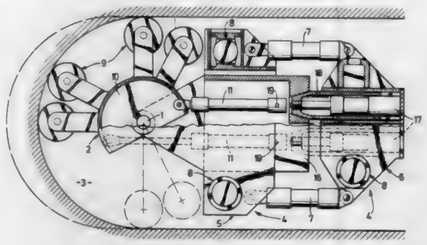
hydraulic prop and said hydraulic cylinder, guide means located on the face side of said hydraulic prop and adapted to guide a mineral cutting machine in its traverse along said mineral face, a ramp plate on said front end of said base adapted to scoop cut mineral onto said flat top portion of said base as said roof support is advanced towards said mineral face relative to said conveyor by operation of said hydraulic cylinder.

4,045,088

OSCILLATING DISK THIN SEAM MINING MACHINE WITH STEERING

Karl-Gunther Bechem, Hagen-Berchum, Germany, assignor to Hannelore Bechem and Ingrid Binnewies, both of Hagen, Germany

Filed Apr. 13, 1976, Ser. No. 676,420
Claims priority, application South Africa, Apr. 17, 1975, 75/2446; Sept. 29, 1975, 75/6187; Sept. 29, 1975, 75/6189
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—31 **14 Claims**



1. A mining machine having a drilling head and a carrier, means pivotally mounting said head to the forward end of said carrier; fluid operated means for arcuately reciprocating said drilling head about said pivot means; said carrier having a first portion and a second portion, said portions being laterally pivotable with respect to each other about a veratical axis which is capable of limited travel both lengthwise and laterally of said machine; a pair of laterally spaced hydraulic props mounted on one of said portions, one of said props being on each side of the longitudinal centerline of said machine, each of said props having extensible legs extending both above and below said carrier to provide floor and roof engagement; at least one hydraulic prop mounted on the second of said portions and having extensible legs extending both above and below said carrier to provide floor and roof engagement; a pair of extensible and retractable cylinders interconnecting said first and second portions, said cylinders being independently operable to pivot said portions with respect to each other and

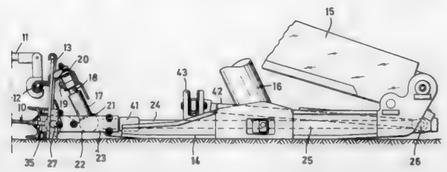
about one of said props by extension or retraction of said cylinders to enable said machine to execute a turn of 90° substantially about its midpoint.

4,045,089

APPARATUS FOR CONTROLLING THE POSITION OF A MINING MACHINE

Alois Hauschopp; Horst Schlusener, both of Werne, and Christoph Rassmann, Lunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed July 26, 1976, Ser. No. 708,368
Claims priority, application Germany, July 31, 1975, 2534325
Int. Cl.[2] E21C *27/32*
U.S. Cl. 299—43 **12 Claims**



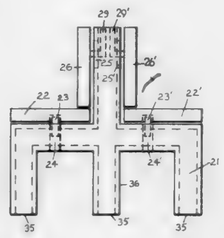
1. Apparatus for controlling the position of a mineral mining machine movable along guide means; said apparatus comprising beams pivotably connected to the guide means with connecting means and pivotably and displaceably connected with a support structure, at least one piston and cylinder unit operable to adjust the angle between the guide means and the beams, the unit being connected to the connecting means with a ball-and-socket type joint at a position disposed outwardly from the pivot axis between the guide means and the beams with the unit in an inclined disposition.

4,045,090

EASY-TO-ASSEMBLE STRUCTURE

William F. Fleisch, 126 Campbell Ave., Williston Park, N.Y. 11596, and Walter Pousche, 58-05 Metropolitan Ave., Brooklyn, N.Y. 11237

Continuation-in-part of Ser. No. 264,207, June 19, 1972, Pat. No. 3,845,988. This application Nov. 1, 1974, Ser. No. 520,441
Int. Cl.[2] A47C *7/00*
U.S. Cl. 297—440 **27 Claims**



1. An assembled structure comprising:

a supporting device containing therein wall means which defines and elongated slot system and having a first supporting surface and a second supporting surface in angular relation with the first supporting surface;

a first structural member having a first contact surface engageable with the first supporting surface;

a second structural member having a second contact surface engageable with the second supporting surface so as to be adjacent to, and disposed in angular relation with, the first member;

a connecting means for connecting a selected portion on the first member to an adjacent portion on the second member; and

locking means comprising a hook system securing the first member in gravity-controlled, locking engagement with the slot system on the supporting device;

the location of the second member in its intended position on the assembled structure preventing the disruption of the locking engagement of the first member with the slot system on the supporting device;

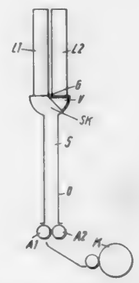
the first and second structural members, together with the supporting device and the connecting means being so relatively dimensioned as to have therebetween operating clearances so substantial that upon the selected portion on the first member being connected by the connecting means to the adjacent portion on the second member and simultaneously upon aligning the locking means with the slot system, the hook system is insertible into the slot system and subsequently slidable therealong whereby the second contact surface on the second member is made to engage with the second supporting surface at substantially the same time the first contact surface on the first member is made to engage with the first supporting surface so that the locking engagement is achieved and the assembly of the structure is substantially instantly completed.

4,045,091

DEVICE FOR THE PNEUMATIC FEEDING OF A QUANTITY OF CARDS

Wolfgang Beneke, 4072 Wickrathberg, Gudderather Weg 28, Germany

Continuation of Ser. No. 591,692, June 30, 1975, abandoned, which is a continuation of Ser. No. 391,766, Aug. 27, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,383
Claims priority, application Germany, Aug. 26, 1972, 2242038
Int. Cl.[2] B65G *53/60*
U.S. Cl. 302—28 **1 Claim**



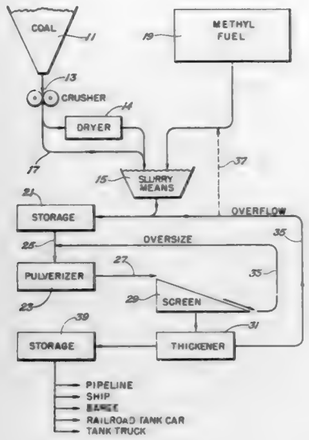
1. A device for pneumatic feeding of fiber flocks to a series of cards, each of said cards being fed by means of a deposit chute, at least two pneumatic lines having ends for feeding fiber flock selectively communicating with said deposit chutes, means disposed at the inlet of each of said deposit chutes to selectively connect or disconnect each said deposit chute to one of said pneumatic lines without interfering with flock flow through said lines to other deposit chutes whereby flock passing through any of said pneumatic lines may be simultaneously fed to one or more of said cards said means disposed at the inlet of each deposit chute consists of a flap pivotally movable to permit flock flow from one of said lines into said chute and to block flow from the other of said lines into said same chute.

4,045,092

FUEL COMPOSITION AND METHOD OF MANUFACTURE

Leonard J. Keller, Dallas, Tex., assignor to The Keller Corporation, Dallas, Tex.

Filed Sept. 22, 1975, Ser. No. 615,697
Int. Cl.[2] B65G *53/30*; C10L *1/32*
U.S. Cl. 302—66 **13 Claims**



1. A fuel composition comprising a combustible, pseudo-thixotropic liquid-solid suspensoid including a critical proportion of combustible carbonaceous particles having a critical settling velocity substantially uniformly dispersed in a solution of methyl fuel including methanol, water and other alcohol soluble constituents of said carbonaceous particles; said carbonaceous particles being present in a proportion of 50–80 percent by weight; said carbonaceous particles being sized and shaped to have a settling velocity in water of less than 2½ centimeters per second and worked in the presence of said methanol so as to be wet by said methanol along all surfaces; said carbonaceous particles being held in suspension in said liquid-solid suspensoid by even low intensity stirring in storage and not separating out when pumped through a pipe line; said suspensoid having shear thinning rheological properties so as to be pumpable with a lower apparent viscosity than its at-rest viscosity.

8. A method of preparing a fuel composition comprising the steps of:

a. preparing combustible carbonaceous particles of −8 mesh sizes with a majority of the carbonaceous particles being of −100 mesh size and having settling velocities of no more than 2½ centimeters per second in water;

b. working said combustible carbonaceous particles in the presence of methyl fuel including methanol so as to dissolve water and other alcohol-soluble impurities therefrom and activate and wet the surfaces of said combustible carbonaceous particles; and

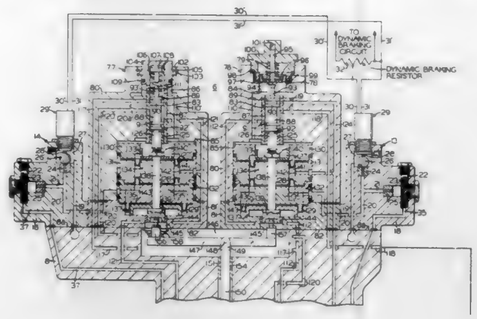
c. preparing a combustible, pseudo-thixotropic liquid-solid suspensoid having said worked combustible carbonaceous particles that have been worked to dissolve the alcohol-soluble impurities therefrom substantially uniformly distributed in the methyl fuel solution containing the alcohol soluble impurities dissolved from said combustible carbonaceous particles; said suspensoid including 50–80 percent by weight of said worked combustible carbonaceous particles and having shear thinning rheological properties so as to be pumpable with a lower apparent viscosity than its at-rest viscosity.

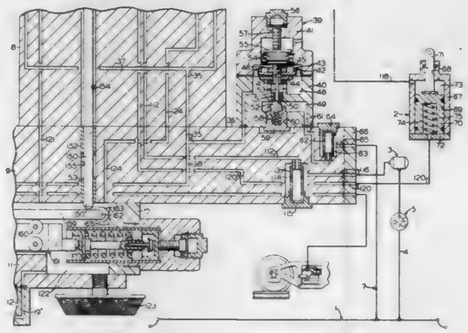
4,045,093

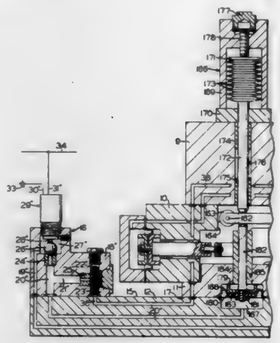
DYNAMIC BLENDING WITH A SPRING-APPLIED FLUID PRESSURE RELEASED SERVICE BRAKE INCLUDING COJOINT SPRING AND FLUID PRESSURE EMERGENCY FEATURE

Robert J. Bridigum, Plum Borough, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Nov. 11, 1976, Ser. No. 740,836
Int. Cl.[2] B60T *13/74*
U.S. Cl. 303—3 **26 Claims**







1. A combined fluid pressure and spring-applied brake apparatus for controlling braking of a vehicle, said brake apparatus comprising;

a. braking means including a brake cylinder having a piston and a spring for subjecting one side of said piston to the force of said spring to effect a service brake application in the absence of fluid under pressure on the other side,

b. a source of fluid under pressure,

c. a first valve means having one position in which fluid under pressure flows from said source of fluid under pressure to the other side of said piston to effect the compression of said spring and thereby a release of a service brake application, and a second position in which it prevents said flow and effects a release of fluid under pressure from said other side to atmosphere to enable said spring to effect a service brake application,

d. a second valve means having one position in which fluid under pressure is released from said one side of said piston, and a second position in which fluid under pressure flows from said source of fluid under pressure to said one side whereby the fluid pressure force established thereby on said one side acting cojointly with said spring effects an emergency brake application in the absence of fluid under pressure on the other side,

e. means so interlocking said first and second valve means as to prevent operation of said second valve means from its said one position to its said second position prior to operation of said first valve means from its said one position to its said second position,

f. a spring-biased mechanical linkage so cooperating with said interlocking means as to enable said linkage to transmit sufficient force to effect successive shifting of said first and second valve means from their said one to their said second positions, and

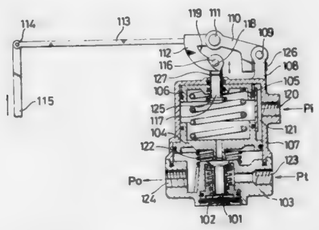
g. operator-controlled electro-pneumatic means for so controlling the force transmitted by said spring-biased mechanical linkage as to effect operation of only said first valve means or successively said first and said second valve means.

4,045,094

RELAY VALVE COMBINED WITH A LOAD-SENSING PROPORTION VALVE

Itiro Yanagawa, and Isao Suzuki, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Division of Ser. No. 469,008, May 10, 1974, Pat. No. 3,936,097.
This application Oct. 10, 1975, Ser. No. 621,594
Claims priority, application Japan, May 30, 1973, 48-60555; May 30, 1973, 48-60556
Int. Cl.[2] B60T *8/22*
U.S. Cl. 303—22 R **8 Claims**



1. A combined load-sensing proportion and relay valve for an air brake system in a vehicle comprising:

a valve body having an inlet port connected to an air source and an outlet port connected to a brake actuator and an internal chamber, said body including a passageway extending from said inlet port and through said chamber to said outlet port;

said valve body having an axial center hole as exhaust passage;

a valve disk mounted within part of said exhaust passage and being interposed in said passageway and cooperating with a valve seat formed on said body for opening said passageway to provide communication between said inlet and outlet port, and closing said passageway to provide communication between said outlet port and said exhaust passage;

a control inlet port for supplying a control pressure from a brake valve to said valve body;

a control piston unit mounted coaxially with said valve disk within said valve body, said unit being responsive to said control pressure applied through said control unit port, said control piston unit including a first pressure sensing piston for directly governing the opening and closing of said valve disk, a second pressure sensing piston coaxially connected and resiliently coupled by a spring with said first pressure sensing piston;

a rod mounted for axial movement disposed in an upper portion of said valve body, said rod having a stopper element at one end for limiting axial movement of the second control piston;

a bracket being disposed on said upper portion of said valve body;

a linkage mounted for movement with respect to said bracket, said linkage being movable responsive to a payload of the vehicle in an axial valve direction; and

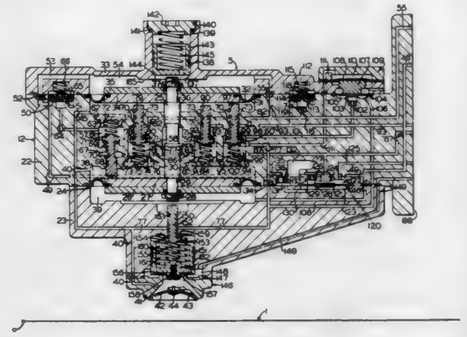
a control cam forming part of said linkage, said cam cooperating with said rod, said cam having an actuating cam face portion for moving the rod over a first vertical distance during normal load conditions and an idle cam face portion for moving the rod over a second vertical distance which is relatively smaller than said first distance corresponding to movement of a suspension spring of the vehicle outside of a normal spring deflection range whereby said valve will continue to operate regardless of any deflection of the vehicle spring outside said normal deflection range.

4,045,095

EMERGENCY PORTION FOR BRAKE CONTROL VALVE

Fred Temple, Swissvale, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 25, 1976, Ser. No. 699,624
Int. Cl.[2] B60T *15/44*
U.S. Cl. 303—37 **4 Claims**



1. For use in a brake apparatus including a brake pipe, an auxiliary reservoir and an emergency reservoir each normally charged to a certain chosen pressure, a brake cylinder and a fluid-pressure-operated service valve device, a fluid-pressure-operated emergency valve device operative in conjunction with said service valve device in response to a reduction of the pressure in the brake pipe at an emergency rate to effect the supply of fluid under pressure from said reservoirs to said brake cylinder to cause an emergency brake application and comprising:

a. a casing having therein a plurality of chambers, bores and passageways, one of said bores and one of said passageways cooperating to provide a communication through which fluid under pressure may be released from another chamber other than said plurality of chambers to atmosphere via one of said plurality of chambers, said one bore having at one end an annular valve seat, and one end of said passageways opening into said chambers and bores and the other end being connected respectively to the

brake pipe, the emergency reservoir and said another chamber,

b. a plurality of poppet-type valves for controlling flow between said chambers and passageways, a first one of said poppet-type valves cooperating with said annular valve seat to control flow between said another chamber and said one of said plurality of chambers,

c. movable abutment means subject respectively to pressure in the brake pipe and in said another chamber, the deflection of said abutment means in one direction responsive to a reduction of the pressure in the brake pipe being effective to cause said abutment means to operate said first one of said plurality of poppet-type valves to release fluid under pressure from said another chamber to atmosphere and a second one of said poppet-type valves to effect the supply of fluid under pressure from the emergency reservoir to the brake cylinder, and the deflection of said abutment means in an opposite direction responsive to a subsequent increase of the pressure in the brake pipe being effective to cause said abutment means to operate a third one of said poppet-type valves to effect the supply of fluid under pressure from the brake cylinder to the brake pipe,

d. resilient means effective to yieldingly resist deflection of said abutment means in said opposite direction, said resilient means being effective to subsequently deflect said abutment means in said one direction responsive to the pressure in said another chamber increasing to that in the brake pipe,

e. a first means enabling said first one of said plurality of poppet-type valves to release fluid under pressure from said another chamber to atmosphere at a chosen rate in response to the release of fluid under pressure from the brake pipe at said chosen rate,

f. a first fluid-pressure-operated means for rendering said first enabling means ineffective to release fluid under pressure from said another chamber at said chosen rate,

g. a second means enabling a fourth one of said plurality of poppet-type valves to effect the supply of fluid under pressure from said another chamber to said first fluid-pressure-operated means in response to the release of fluid under pressure from the brake pipe at a rate in excess of said chosen rate, and

h. a third means enabling the release of fluid under pressure from said first fluid-pressure-operated means to atmosphere at a rate different than said chosen rate.

4,045,096

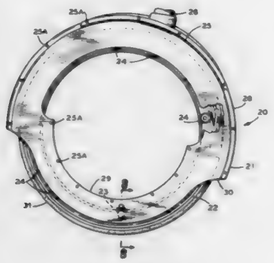
SPOKELESS WHEEL AND SHROUD THEREFOR

Arthur Lidov, Poughquag, N.Y., assignor to The Spokeless Wheel Patent Proceeds Partnership, Poughquag, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,620

Int. Cl.[2] B62D *55/00*

U.S. Cl. 305—7 **16 Claims**



15. A rotor and supporting shroud comprising means defining a rotor shroud,

an annular rotor disposed within said shroud for rotation relative to said shroud,

a plurality of centering bearings circumferentially spaced within said shroud,

said centering bearings acting on said rotor with a lateral bias to confine said rotor to a vertical plane of rotation within said shroud,

said centering bearings comprising rollers disposed on opposite sides of said rotor and disposed in rolling engagement with said rotor,

a plurality of circumferentially spaced load sustaining roller bearings for retaining said rotor within said shroud,

means for resiliently mounting each of said load sustaining roller bearings to said shroud whereby said resiliently mounted bearings absorb the impact forces imparted to said rotor as said rotor rolls over the ground,

said roller bearings being circumferentially spaced about said shroud and rotor disposed therein so as to be disposed on opposite sides of said rotor.

4,045,097

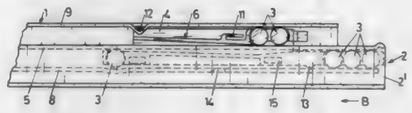
PULL-OUT GUIDE

Erich Röck, Kuferstrasse 1085, A-6973 Hochst, Germany, and Bernhard Mages, Hartle 10, A-6850 Dornburn, Austria

Filed June 8, 1976, Ser. No. 693,908

Int. Cl.[2] F16C *29/02*

U.S. Cl. 308—3.8 **6 Claims**



1. A pull-out for external sides, for use in a fixed structure having two internal sides comprising:

support rail means placeable on each of the fixed structure sides for supporting the drawer;

guide rail means disposed on the external sides of the drawer;

a plurality of rollers, each of said rollers being supported between a corresponding one of said guide and support rail means for taking up vertical forces, each of said support rail means having a track, said guide rail means having a front end, an adjustment element disposed at the front end of at least one of said guide rail means and resting on said track, said adjustment element being wedge-shaped and vertically positionable with respect to said at least one of said guide rail means.

4,045,098

FLUID BEARING

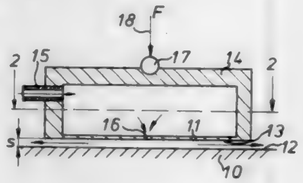
Eric Jozef Blondeel, Brugge, Belgium, assignor to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Oct. 6, 1975, Ser. No. 619,967

Claims priority, application United Kingdom, Aug. 10, 1974, 43554/74

Int. Cl.[2] F16C *17/16*

U.S. Cl. 308—9 **28 Claims**



1. A fluid-static bearing for supporting a load transmitting object wherein a surface of the bearing and a surface of a portion of said load transmitting object together define a bearing gap and wherein one of said surfaces is compliant and comprises a fluid inlet zone connected with an external supply of pressurized fluid at a substantially constant pressure for introduction of such fluid at a substantially constant pressure through said inlet opening into said bearing gap so that said fluid under pressure can flow along said gap from said inlet zone to one or more fluid outlet zones located at an outer extremity of said bearing gap, so that at any bearing load within a certain range the said gap will exhibit, where load supporting reaction forces occur, convergence in the direction of fluid flow, and any increase in such load within the said range will cause a relative displacement of said sufaces involving an increase in said convergence.

4,045,099

ROTOR FOR A TURBO-MACHINE

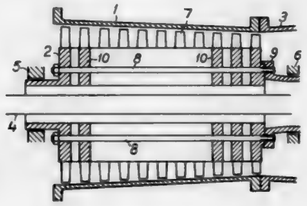
Lars Andersson, Hudiksvall; Johnny Rehn, Malmo, and Ragnar Torstenfelt, Finspong, all of Sweden, assignors to Stal-Laval Turbin AB, Finspong, Sweden

Filed Feb. 19, 1976, Ser. No. 659,293

Claims priority, application Sweden, Feb. 21, 1975, 7501949

Int. Cl.[2] F16C *32/00*

U.S. Cl. 308—36 **3 Claims**



1. In a rotor for a turbine machine of the axial flow type having a plurality of axially spaced discs for mounting turbine blades and interleaved spacing rings all held in abutting relationship for rotation as a unit by a plurality of circularly disposed through bolts and with each face of each of said spacing rings defining thereon an annular shoulder which mates with a cooperating annular shoulder on an opposing face of an adjacent disc to prevent relative radial movement among said assembled discs and spacing rings, the improvement comprising:

a portion of each said spacing ring extending radially inwardly of said annular shoulder and having a thickness in the axial direction less than the spacing between the opposing faces of the adjacent discs to thereby increase the strength of each said spacing ring but with a minimal increase on the stresses thereon resulting from high speed rotation.

4,045,100

CONCENTRIC ANTIFRICTION BEARING ASSEMBLY

Jean Beauchet, Annecy, France, assignor to Societe Nouvelle de Roulements, Annecy, France

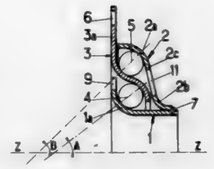
Continuation of Ser. No. 440,919, Feb. 8, 1974, abandoned. This application Dec. 1, 1975, Ser. No. 636,389

Claims priority, application France, Feb. 14, 1973, 73.05238; May 16, 1973, 73.17798

Int. Cl.[2] F16C *19/16, 19/38, 33/34, 33/48*

U.S. Cl. 308—183 **16 Claims**

1. An antifriction bearing adapted to be mounted between two relatively rotatable mechanical members, said bearing comprising two annular rows of bearing elements mounted approximately in the same radial plane, an intermediate flange formed from a sheet metal material adapted to be secured to one of said mechanical members and providing an inner race for one of said two rows of bearing elements and an outer race for the other of said two rows, an inner and an outer flange formed from a metal sheet material and being adapted to be secured to the other of said mechanical members, each of said inner and outer flange providing another race one for each of said two rows of bearing elements, said inner flange having a surface inclined with respect to the rotational axis of the antifriction bearing to contact the bearing elements in the other of said rows at points which are closer to the bearing axis than are the centers of the bearing elements in the other of said rows, each bearing element in both of said rows of bearing elements contacting said flanges at points on a line which forms an acute angle with respect to the rotational axis of the antifriction bearing, one of said inner and outer flanges having an integrally formed annular portion in the form of a tubular sleeve concentric with the axis of the bearing and adapted to be directly fitted on a corresponding cylindrical part of said other mechanical member.



12. An antifriction bearing adapted to be mounted between two relatively rotatable mechanical member, said bearing comprising two annular rows of bearing elements mounted approximately in the same radial plane, an intermediate flange formed from a metal sheet material adapted to be secured to one of said mechanical members and providing an inner race for each of said two rows of bearing elements, an inner and an outer flange formed from a metal sheet material and being adapted to be secured to the other of said mechanical members, each of said inner and outer flange providing another race one for each of said two rows of bearing elements, at least one of said inner, outer and intermediate flange having an integrally formed annular portion in the form of a tubular sleeve concentric with the axis of the bearing and adapted to be directly fitted on a corresponding cylindrical part of said other mechanical member.

4,045,101

MOUNTING FOR MULTI-WORMS IN TRANSMISSIONS FOR DRIVING MULTI-WORM PRESSES FOR PROCESSING SYNTHETIC MATERIAL

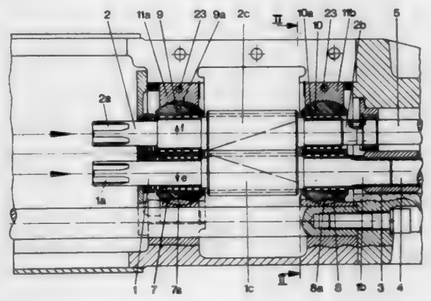
Heinrich Schafer, Vellmar, Germany, assignor to Rheinstahl Aktiengesellschaft, Essen, Germany

Filed Nov. 10, 1975, Ser. No. 630,133

Claims priority, application Germany, Nov. 13, 1974, 2453684

Int. Cl.[2] F16C *9/06*

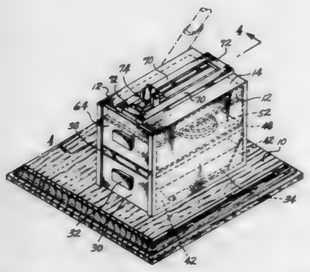
U.S. Cl. 308—194 **5 Claims**



1. In combination with a transmission, especially for transmitting high torques during driving of a worm press indepen-

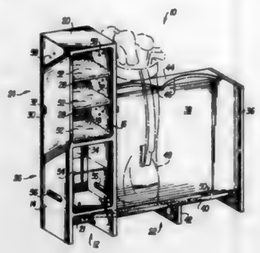
dently of forces exerted on shafts effective in radial direction being distributed uniformly upon adjoining rows of races of radial bearings used for processing synthetic material; a transmission housing, at least two shafts in said transmission housing in parallel spaced relation, a pair of axially spaced antifriction bearings for each shaft with the bearings for the respective shafts being coplanar, each bearing having an inner race on the respective shaft and an outer race over entire periphery thereof seated securely in said housing to assure necessary rigidity and rotary accuracy during high operational speeds and antifriction elements between and rollingly engaging the races, each outer race having the outer surface formed spherically, each adjacent pair of coplanar bearings having the adjacent sides of the outer races thereof formed with flat surfaces which are parallel to the axes of the shafts supported by the respective bearings, said flat surfaces on one side of the outer races of the pair of adjacent bearings being disposed in parallel spaced opposed relation and radially outwardly from the respective antifriction elements, and a supporting body in common and fixed in said transmission housing for each set of coplanar bearings and having spherical seating surfaces engaging the spherical outer surfaces of the outer races of the respective bearings.

4,045,102
CARD STORAGE AND DISPENSING DEVICE
Walter H. Austin, 2205 Harrison Ave., Everett, Wash. 98201
Filed Mar. 24, 1976, Ser. No. 669,830
Int. Cl.[2] A47F *01/12*; A45C *11/18*
U.S. Cl. 312—61 **8 Claims**



1. A card storage and dispensing device comprising a cabinet having vertically disposed side walls, a vertically disposed front wall, a vertically disposed rear wall, a horizontally disposed bottom wall means, and a horizontally disposed top wall, said walls forming a card enclosure for receiving a stack of cards to be dispensed, one at a time, the upper edge of said rear wall being spaced below and in close spaced relation to the bottom surfce of said top wall providing a discharge slot therebetween through which a single card may be dispensed, said top wall having a central, longitudinally disposed, dispenser guide slot therein; a slide guide means mounted on said guide slot; and a finger actuated, card-engaging member mounted for sliding traveling movement in said slide guide means to engage the surface of the top card of a stack of cards in one direction of its travel and to slide over said top card in its other direction of travel, said card-engaging member comprising a slide member mounted on said slide guide means, a tiltable finger-engaging piece having a lower end portion movable into and out of engagement with the upper surface of the topmost card of said stack of cards in said card enclosure, and pivot means carried by said slide member and positioned crosswise of the dispenser guide slot.

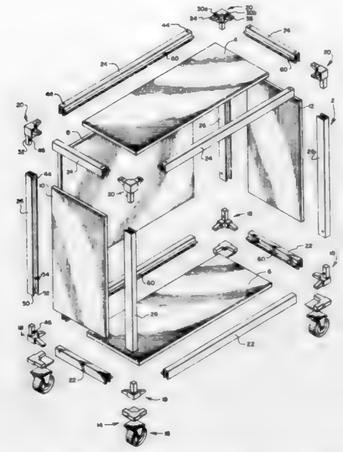
4,045,103
GOLF EQUIPMENT STORAGE DEVICE
Vincent J. Paolino, 2026 Sagamore Drive, Euclid, Ohio 44117
Filed June 30, 1976, Ser. No. 701,408
Int. Cl.[2] A47B *53/00, 81/00*
U.S. Cl. 312—198 **5 Claims**



1. A golf equipment storage device comprising, in combination, an upstanding cabinet having upper and lower shelved portions, a rack portion adjacent to said cabinet for receiving at least one golf bag therein in upright position, said rack portion including an upper retaining member and a lower shelf member upon which the golf bag can be securely position, said upstanding cabinet upper shelved portion includes a plurality of shelves for storing shoes or the like, said lower shelved portion having a spacing greater than the spacing between shelves in said upper portion for receiving a golf cart battery charger therein, means provided in said lower shelved portion for circulating air to dissipate heat generated by said battery charger during use, said rack portion being connected to one side of said upstanding cabinet, said upper retaining member including at least one arcuate-shaped portion for at least partly engaging the circumference of a golf bag situated in said rack portion, said lower shelf member being rearwardly inclined from a horizontal plane, said shelf member and the arcuate-shaped portions of said retaining member cooperating to prevent respective forward and sidewise toppling of a golf bag situated therein.

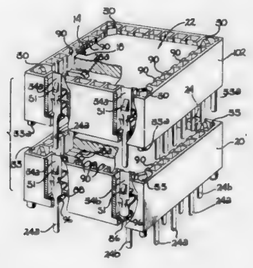
4,045,104
CABINET STRUCTURE AND METHOD OF CONSTRUCTION
Clinton B. Peterson, 3892 Jefferson Ave., Ogden, Utah 84403
Filed Aug. 20, 1975, Ser. No. 606,099
Int. Cl.[2] A47B *43/00*; A47F *5/14*
U.S. Cl. 312—257 R **6 Claims**

1. A cabinet structure comprising
a plurality of elongate frame members, the ends of which are hollowed out to define sockets, and at least certain ones of which include a hole in a side wall of each socket, and
a plurality of corner members for joining the ends of the frame members to form a cabinet structure, each of said corner members including
a central post adapted to slide longitudinally into the sockets of the frame members, and
a pair of legs extending substantially perpendicularly from one end of the central post at a predetermined angle with respect to each other, each leg having a rigid nipple protruding from one side of the leg opposite the side closest to the central post, with the other side of each leg being tapered such that the end of the leg is narrower than the base thereof to thereby enable slipping the leg into the sockets of the frame members so that the nipple of the leg is received into a hole of the sidewall of the sockets,
four of said frame members being arranged to form a lower rectangle,
four of said corner members being disposed at the corners of the rectangle, with the legs of each such corner members extending into corresponding contiguous sockets of the frame members and the central posts of such corner members extending upwardly,
four other of said frame members being arranged to form an upper rectangle,
four other of said corner members being disposed at the corners of the upper rectangle, with the legs of each such corner members extending into corresponding contiguous



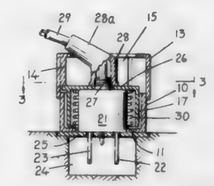
sockets of the upper frame members and the central posts of such corner members extending downwardly, and
four of said frame members being arranged to extend generally vertically between corresponding corners of the lower and upper rectangles. with the central posts of corresponding corner members extending into the sockets of the verticle frame members to thereby provide a unified cabinet frame.

4,045,105
INTERCONNECTED LEADLESS PACKAGE RECEPTACLE
James C. K. Lee, and Charles Joseph Donaher, both of Los Altos Hills, Calif., assignors to Advanced Memory Systems, Inc., Sunnyvale, Calif.
Continuation-in-part of Ser. No. 508,464, Sept. 23, 1974, Pat. No. 3,951,495. This application Mar. 17, 1975, Ser. No. 559,215
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.[2] H05K *1/12, 7/08*
U.S. Cl. 339—17 CF **18 Claims**



1. A chip carrier receptacle capable of being coupled to a second chip carrier receptacle, comprising:
a nonconductive receptacle body having a means for receiving a chip carrier assembly;
a plurality of spring contact members in said body, each of said contact members having a substantially straight portion thereof forming a terminal extending downward from said body, each of said contact members further having (i) a shaped cantilevered member extending toward the center of said body and disposed in said receptacle body so as to make a point contact with a conductive area on the bottom surface of said chip carrier assembly upon insertion thereof, each said cantilevered member having a projection with at least one component for engaging said conductive area on said chip carrier assembly, said cantilevered member making an acute angle with respect to said conductive area such that when said chip carrier assembly is disposed in said receptacle, the end of each said cantilevered member slides across said conductive area and makes a point contact therewith, and (ii) an upright, elongated arm member, said arm member being a substantially vertical member disposed on each said spring contact member such that each lead extending downward from said second receptacle engages an associated arm member;
means on said receptacle body for releasably retaining said chip carrier assembly in said receptacle therein; and
means on said receptacle body for coupling said receptacle to said second receptacle.

4,045,106
AUTOMATIC ELECTRICAL PLUG RELEASE
John P. Borg, 30 Fontenay Court No. 502, Islington, Ontario, Canada (M9A 4W5)
Filed Feb. 17, 1976, Ser. No. 658,510
Int. Cl.[2] H01R *13/62*
U.S. Cl. 339—45 R **4 Claims**



1. An automatic electric plug release comprising:
i. a hollow receptacle having a base portion with a substantially wide opening therethrough said base portion being seatable against the outer surface of an electrical wall socket and a top portion having at least two equally spaced lugs projecting inwardly from opposed portions on the inside wall thereof;
ii. a mounting member within the receptacle, said member having rotative, and up-and-down movement between a locked position and an unlocked position;
iii. an electrical plug mounted on the mounting member. and having its terminal prongs extendable through the opening in the base portion and an electrical cord connected of said prongs;
iv. a compression spring mounted in the receptacle between said mounting member and said base portion;
v. complemental ears on the mounting member engageable with said lugs when the mounting member is depressed and rotated in one direction whereby the mounting member and electrical plug are held in the locked position with the terminal prongs extending outwardly from the base; and
vi. an electrical cord sleeve mounted on the top of the electric plug and enclosing said cord, said electrical cord sleeve being inclined relative to the axis of rotation of the mounting member whereby on pulling on said cord the mounting member is rotated and released from the locked position and actuated to the unlocked position thereby withdrawing the prongs from the socket.

4,045,107

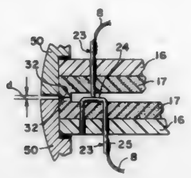
MULTI-CONTACT CONNECTORS WITH IDENTICAL CONTACTS

Byron Sutherland, Pearland, Tex., assignor to Walker-Hall-Sears, Inc., Houston, Tex.

Continuation of Ser. No. 606,902, Aug. 22, 1975, abandoned. This application Nov. 26, 1976, Ser. No. 759,686

Int. Cl.[2] H01R *25/00*

U.S. Cl. 339—48 **2 Claims**



1. A two-plug connector for detachably connecting together two lengths of a multiple conductor cable, each connector plug comprising:

an insulating base, a protective housing supporting said base;

a support covering said base, said support being made of a flexible, insulating material of sufficient resiliency to tend to reassume its original form after deformation;

a plurality of U-shaped contacts, each contact having an elongated prong-end and a pair of prongs forming integral part with and extending from each prong-end, one prong of each pair of prongs being adapted for connected to a cable conductor, each prong-end lying on and being resiliently supported by the upper surface of said support, and each prong-end being urged axially away from the upper surface of said support;

a plurality of pairs of aligned holes transversely extending through said support and said base, each pair of contact prongs being slidably received by a corresponding pair of said aligned holes, whereby said support makes a water tight joint with each prong, and each prong-end is removable by pulling axially thereon away from the upper surface of said support; and

the housing of one connector plug being adapted to form a mechanical attachment with the protective housing of the other connector plug to thereby mechanically and electrically engage the respective prong-ends of both connector plugs at an angle relative to each other.

4,045,108

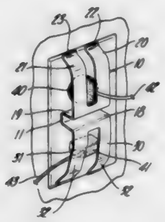
SPRING RETAINER FOR ELECTRIC PLUGS

Emil M. Olsen, 642 E. Webster Ave., Ferndale, Mich. 48220

Filed Jan. 31, 1977, Ser. No. 764,382

Int. Cl.[2] H01R *13/54*

U.S. Cl. 339—75 P **3 Claims**



1. A retainer to hold the plugs of electric cords in the dual sockets of electric power outlets with the outlets surrounded by a rectangular shield having opposite ends and sides and a centrally located attaching screw between the sockets, comprising,

a relatively narrow base plate for transversely overlying the shield between the sockets;

said base plate having a central aperture;

said base plate being attached to the outlet by removing the screw from the shield, inserting the screw in the aperture of said base plate, and returning the screw into attached position on the outlet to secure said base plate in a position overlying the shield on the outlet;

said base plate having opposite lateral sides at the dual outlets;

paired upstanding flanges leading from said sides on said base plate and terminating in outer ends;

paired, spaced-apart spring legs leading from the ends of said paired flanges; said paired legs on one said flange extending in the opposite direction from said paired legs on the other said flange;

said legs extending at an angle from said flanges so as to lie relatively parallel and spaced from the shield; and

depending spring feet on said legs normally lying in spring pressed relationship against the shield counterbalancing the force of one said pair of legs against the other to eliminate levering-twisting force on said base plate and the attaching screw;

a plug being insertable in a socket by leading the plug between one pair of spring legs and feet by manually flexing them outwardly of the shield;

upon insertion of the plug in the socket and the release of manual flexure on said legs and feet, said legs flexing back against the plug and exerting force on the plug to hold it in the socket;

the holding force of said legs against one inserted plug being counterbalanced by said other legs and feet bearing against the shield to eliminate levering-twisting force on said base plate and the attaching screw;

when two plugs are so inserted the spring force of each said pair of legs bearing against an inserted plug counterbalancing the other to eliminate levering-twisting force on said base plate and the attaching screw.

4,045,109

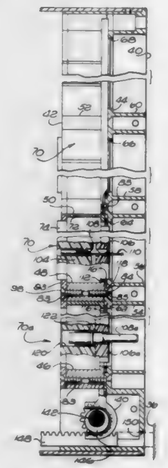
ELECTRONIC PACKAGING ASSEMBLY

Jack E. Langenbach, Newport Beach, and John L. Hawkins, Whittier, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,890

Int. Cl.[2] H01R *13/62*

U.S. Cl. 339—75 M **23 Claims**



1. An electronic packaging assembly comprising:

a generally flat stationary support having a front and a rear;

a box for containing electronic components slidable on the upper surface of said support from said front, said box having a front and a rear;

a first set of fixed contacts at said rear of said support;

a second set of movable contacts at said rear of said box, said first and second sets of contacts being positioned adjacent to but spaced from each other when said box is slid to said rear of said support;

means for moving said second set of movable contacts to engage said first set of contacts, said means including a movable actuating element on said front of said box, a contact actuating member at said rear of said box engaging said movable contacts and movable relative thereto, and motion transmitting means extending through said box from said front to said rear thereof for transmitting movement from said actuating element to said contact actuation member; and

said moving means also including a latching hook at said front of said box cooperating with said support to prevent lifting of said front of said box off of said support and prevent forward movement of said box on said support surface.

4,045,110

ELECTRICAL CONNECTOR HOUSINGS

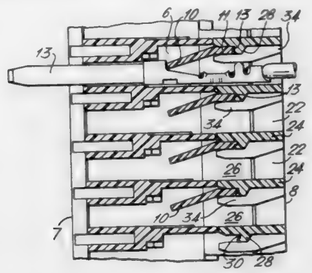
Cornelus Adrianus Henricus Maria Sterken, Eindhoven, Netherlands, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Sept. 28, 1976, Ser. No. 727,550

Claims priority, application United Kingdom, Oct. 4, 1975, 40727/75

Int. Cl.[2] H01R *9/16, 13/54*

U.S. Cl. 339—91 R **4 Claims**



1. An electrical connector housing for a plurality of electrical contacts comprising:

a. first and second housing parts of electrical insulating material and being adapted for mating one with the other, each housing part having at least one row of spaced parallel passageways, the passageways of the housing parts being aligned to define at least one row of cavities extending between opposed faces of the housings when mated for receiving electrical contacts;

b. a channel in the first housing part extending across the passageways;

c. an elongated strip of insulating material having a plurality of spaced apart lances projecting outward form one edge, said strip positioned in the channel with individual lances extending into the cavities in the row for resiliently engaging and retaining electrical contacts which may be inserted into the cavities.

4,045,111

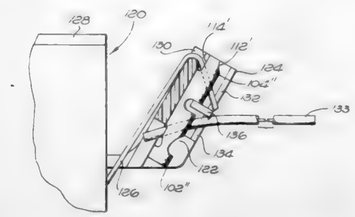
ELECTRICAL TERMINATION DEVICE AND METHOD

Carl W. Peterson, Westminster, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 4, 1976, Ser. No. 663,908

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—97 R **21 Claims**



16. A termination device for making electrical connection to an electrical conductor having a metallic core covered with insulation comprising:

an electrically conductive tubular member having longitudinally extending slots therein on generally opposite sides of said tubular member defining relatively closely spaced-apart core penetrating opposed edges and relatively further spaced-apart insulation penetrating edges, respectively;

said slots terminating in enlarged, generally aligned openings whereby the conductor may be inserted laterally into said tubular member through said enlarged openings and may be pulled at an angle into said slots to cause said insulation penetrating edges to penetrate the insulation of the conductor and said core penetrating edges to penetrate the core of the conductor; and

said tubular member having a longitudinal seam therein extending to the opposite ends thereof and passing through one of said slots.

4,045,112

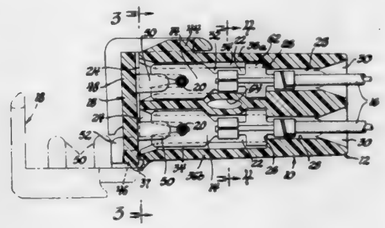
UNITARY INSULATOR HOUSING WITH SECONDARY LATCH MEANS AND ELECTRICAL CONNECTOR UTILIZING SAME

Andrew F. Rodondi, Sharpsville, Pa., and Martin H. Hommer, Cortland, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Apr. 5, 1976, Ser. No. 673,710

Int. Cl.[2] H01R *9/08*

U.S. Cl. 339—99 R **8 Claims**



1. A unitary molded housing of electrically insulative material comprising:

a body of generally rectangular cross section having a longitudinally extending open ended terminal receiving cavity,

said cavity having a rearward opening for a first lead wire to extend through,

and a forward opening for receiving a second lead wire to position the same in the cavity,

said body having a longitudinal slot through a forward

portion of a top wall which communicates with the forward opening and forward portions of the cavity,

a cover connected by an integral hinge to a forward end of said body and moveable upon bending of the integral hinge about a hinge axis transverse to the longitudinally extending open ended terminal receiving cavity from an open position whereat said forward opening is freely accessible to a closed position whereat portions of said cover block said forward opening,

said cover having a projection which projects rearwardly into said cavity via said forward opening when the cover is in the closed position, and

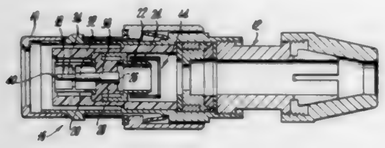
means for latching said cover in the closed position, said means comprising primary latch means including a latch arm associated with the free end of the cover and secondary latch means including lateral projections integral with the cover adjacent the integral hinge which project in a direction parallel to the hinge axis and hooks axis and hooks integral with the body, said secondary latch means in cooperation with said primary latch means retaining the cover in the closed position in the event the hinge fractures.

4,045,113

CONNECTOR SAFETY TIP

Frederick Della Iacono, Crestwood, N.Y., assignor to Kings Electronics Company, Inc., Tuckahoe, N.Y.

Filed June 28, 1976, Ser. No. 700,381
Int. Cl.² H01R *13/52*
U.S. Cl. 339—111 **6 Claims**



1. A connector having a male center conductor, a grounding contact surrounding said male center conductor and spaced therefrom and not contacting said male center conductor, an insulating tip on the end of said male center conductor for reducing the chance of finger contact between the male center conductor and the grounding contact.

4,045,114

METHOD OF MANUFACTURING AN ELECTRICAL CONNECTOR

Helen Dechelette, St. Cloud, France, assignor to AMP Incorporated, Harrisburg, Pa.

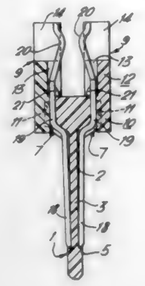
Filed Apr. 28, 1976, Ser. No. 681,294
Claims priority, application France, May 5, 1975, 75.13936
Int. Cl.² H01R *13/50*
U.S. Cl. 339—210 M **3 Claims**

1. An electrical connector comprising:

a. an elongated first housing part of insulating material having a thin portion depending from a cup shaped portion with a plurality of spaced vertical ribs extending along the two portions to provide a plurality of distinct coplanar surfaces;

b. a plurality of conductive contacts having a first elongated part and a second part with a transition part connecting the first and second parts, said first part positioned on a coplanar surface on the thin portion and the second part positioned over and extending above the cup shaped portion, and the transition part positioned over the junction of the thin portion and cup shaped portion; and

c. two second housing parts each having an elongated portion with a plurality of upstanding spaced walls across the upper section thereof, said second housing parts secured to either side of the cup shaped portion on the first housing part so that the upstanding walls are positioned on top of the cup shaped portion and the lower section presses in



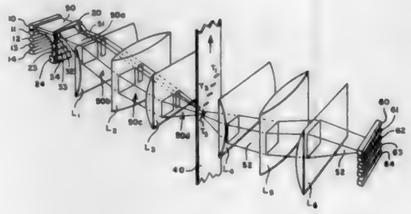
on the lower half of the second part of the contacts to thereby provide a bias against the contacts to hold the first parts thereof against the coplanar surfaces of the housing.

4,045,115

OPTICS FOR MULTI-TRACK HOLOGRAPHIC TAPE RECORDER

Tzuo-Chang Lee, Bloomington, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 17, 1975, Ser. No. 632,338
Int. Cl.² G03H *1/16*
U.S. Cl. 350—3.5 **11 Claims**



1. A multi-track holographic recorder comprising:

a plurality of one-dimensional page composers;

light beam means for supplying mutually coherent signal and reference beams, and signal beam simultaneously illuminating all of said page composers;

passive optical means for simultaneously directing a light beam from each page composer to a separate location at a memory medium, said passive optical means including optical Fourier Transform means, each light beam at the memory medium forming a one-dimensional Fourier Transform of the information in the page composer and each Fourier Transform interferring with the mutually coherent reference beam to form a one-dimensional hologram.

4,045,116

WIDE ANGLE OPTICAL IMAGING SYSTEM

Joseph A. La Russa, 451 Rutledge Drive, Yorktown Heights, N.Y. 10598

Filed Feb. 27, 1975, Ser. No. 553,870
Int. Cl.² G02B *13/06*
U.S. Cl. 350—21 **9 Claims**

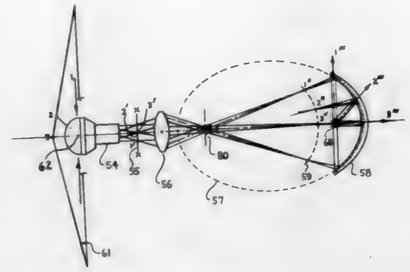
1. Optical imaging apparatus for viewing two- or three-dimensional models and remotely imaging the view comprising

i. image producing means;

ii. wide angle objective lens means for viewing the image producing means through approximately a field of view in the range of 90°–220°, 360° in azimuth about the optical axis of said objective lens means, said objective lens means producing a distorted aerial image, commonly referred to as fisheye distortion, at the focal plane thereof;

iii. relay lens means adapted to reproduce the distorted aerial image from the objective lens means focal plane in a second aerial focal plane;

iv. concave reflector means generally ellipsoidal and of an eccentricity such that the pupil of said relay lens means and the pupil of said reflector means are both at the foci of said reflector means which are positioned beyond said second aerial focal plane, said reflector being of such a size and shape that all of the principal rays from all image points in the distorted aerial image produced by the wide angle objective lens means and corresponding divergent rays from image points in the second aerial focal plane



which reproduces the distorted aerial image are redirected and the divergent rays are approximately collimated towards the pupil of said reflector means thereby forming an optically accessible pupil conjugate to the pupil of the objective lens means which produces an approximately collimated image which corresponds to the entire field of view of the objective lens means in true angles, free from distortion which permits, in effect, viewing the external world from the pupil of the objective lens means which is totally inaccessible and which is the only point through which the external world can be viewed without distortion and with true perspective; and

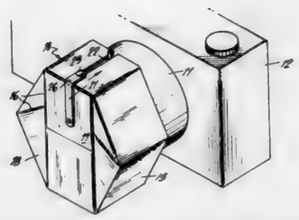
v. optical means to relay the collimated image produced at the pupil of said reflector means to an accessible viewing location.

4,045,117

COMBINED CAMERA LENS CAP AND LENS SHADE

Jack Lerner, 337 W. 71st St., New York, N.Y. 10023

Filed Apr. 23, 1976, Ser. No. 679,561
Int. Cl.² G03B *11/04*
U.S. Cl. 350—60 **4 Claims**



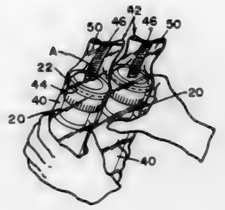
1. A combined camera lens cap and lens shade comprising a hollow housing open at each end for attachment to a camera lens, a plurality of flaps hingedly secured to the periphery of the housing opposite the camera lens receiving end thereof, said flaps being interconnected along their adjacent margins by fold lines and swingable from a closed position overlying the end of the housing to which they are secured to an open position substantially coaxial with the said housing end, said flaps being of a size which will cover the housing end to which they are attached when in the closed position and means operatively coupled to at least one of the flaps comprising an elongated groove in the housing, a strip of flexible material secured at one end to said flap and slidably received at its other end within the groove to actuate the said flaps.

4,045,118

DRAPE FOR OPERATING MICROSCOPE

James Leonard Geraci, Cincinnati, Ohio, assignor to Xomed, Inc., Cincinnati, Ohio

Filed Aug. 21, 1972, Ser. No. 282,409
Int. Cl.² G02B *23/16*
U.S. Cl. 350—61 **3 Claims**



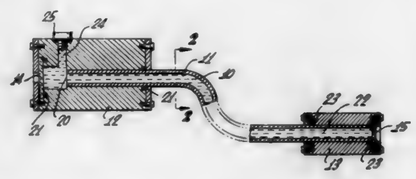
1. A drape for enclosing an operating microscope having an objective lens and an elongate ocular which terminates in a free outer end, said drape including an elongate, tubular portion dimensioned to loosely receive the ocular of the microscope, the free outer end of said tubular portion including a centrally disposed, elongate, partially closed, flattened area defining a pull tab portion, a circumferential tear line in said tubular portion spaced inwardly from the innermost end of said pull tab portion, wherein the relationship between the innermost end of the pull tab portion and said circumferential tear line are such that said tear line will be disposed closely adjacent the free outer end of the ocular when the ocular has been introduced into said tubular portion to the extent permitted by interference between the free outer end of the ocular with the constricted interior of the ocular housing adjacent the lower end of said pull tab.

4,045,119

FLEXIBLE LASER WAVEGUIDE

Harold F. Eastgate, Auckland, New Zealand, assignor to Laser Bioapplications, Los Angeles, Calif.

Continuation-in-part of Ser. No. 498,063, Aug. 14, 1974, abandoned. This application June 13, 1975, Ser. No. 586,713
Int. Cl.² G02B *5/14*
U.S. Cl. 350—96 LM **7 Claims**



1. A flexible waveguide for the transmission of a high-power laser beam, comprising:

a flexible tube of a material transparent to light of the same wavelength as that of the beam;

a substantially compressible liquid core filling said tube, said liquid being also transparent to light at the same wavelength, having a refractive index substantially greater than that of the material of said tube and being retained in said tube in a compressed condition, with a volume substan-

tially less than its volume when subjected to normal atmospheric pressure; and

sealing means at each end of said tube, including an input window at one end and an output window at the other end for the transmission of the beam into and from said tube, respectively, and wherein at least one of said sealing means includes means for compressing said liquid core on assembly of said flexible waveguide;

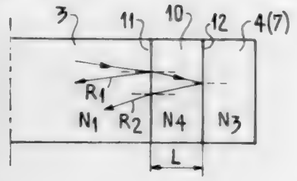
whereby the laser beam is transmissible around bends in said tube by multiple total internal reflections, to provide a portable source of laser energy at said output window, and said compressible liquid core is placed in said tube under pressure to prevent formation of cavities due to different rates of thermal expansion of said liquid and said tube.

4,045,120

COUPLER FOR OPTICAL COMMUNICATION SYSTEM

Guy de Corlieu, and Jean-Claude Reymond, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 19, 1975, Ser. No. 642,446
Claims priority, application France, Dec. 20, 1974, 74.42370
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 C **10 Claims**



1. In an optical communication system having at least one signal transmission line comprising at least one optical waveguide having a core of transparent material having a refractive index N1 surrounded by a layer of transparent cladding material having a refractive index N2 that is lower than N1 and associated by each end to a solid state converter device for light emission and light reception respectively, said converter devices having refractive indices higher than the said core index, optical coupling means for coupling at least one said waveguide end to a said associated device through an optical coupler comprising at least one transparent matching medium having a refractive index N4 intermediate between the said core index N1 and the refractive index N3 of the associated device and forming a thin plate whose maximum thickness along the optical axis direction is given by the relation

$$LM = [(D1 + D2)/2] \cdot [(\sqrt{N4^2 - A^2})/A]$$

where A is the numerical aperture of the waveguide, i.e. $\sqrt{N1^2 - N2^2}$ and D1, D2, the diameters of the plane interfaces perpendicular to said axis direction and provided by the core at said waveguide end and the associated device respectively.

4,045,121

OPTICAL FIBER CONNECTOR

Kenneth M. Clark, Beaumont, Calif., assignor to The Deutsch Company Electronic Components Division, Banning, Calif.

Filed Jan. 22, 1976, Ser. No. 651,285
Int. Cl.² G02B *5/16*
U.S. Cl. 350—96 C **33 Claims**

1. An optical waveguide connector comprising

a first element having an inclined surface means,

a second element,

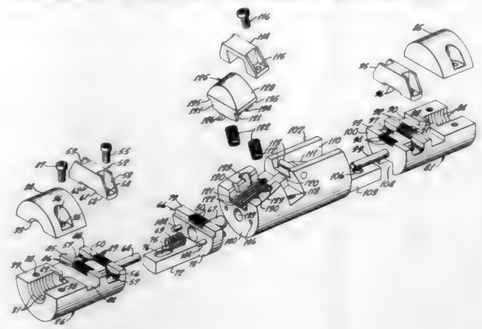
at least one first optical fiber having resilience,

means on said first element for holding said first optical fiber with an end portion thereof on said inclined surface means,

at least one second optical fiber having resilience,

means on said second element for holding said second optical fiber so as to have an outwardly facing end portion,

and means for aligning said first and second elements such that said end portion of said second optical fiber is at an angle to said inclined surface means and upon relative advancement of said first and second elements toward



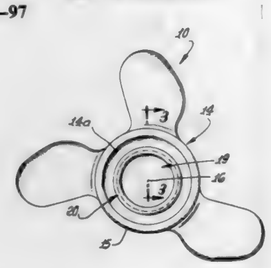
each other said end portion of said second optical fiber is caused to engage said inclined surface means and be bent thereby so as to slide therealong to a location where the end thereof engages the end of said first optical fiber.

4,045,122

PROPELLER HUB REFLECTOR HOLDER

Robert C. Burdick, 251 Avenida Santa Barbara, La Habra, Calif. 90631

Filed May 4, 1976, Ser. No. 683,100
Int. Cl.² G02B *5/12*
U.S. Cl. 350—97 **5 Claims**



1. In combination with a boat propeller hub having a frusto-conical flange the outer surface of which flares axially rearwardly toward the flange terminal, the combination comprising

a. an elastomer holder in the form of a disc having a main body and a peripheral frusto-conical lip at one side of the body, the lip defining an axis and the lip tapering axially away from said main body of the disc to removably receive the hub flange periphery between the disc main body and the lip, and

b. a light reflector carried by the main body of the holder and openly facing axially rearwardly away from the disc at the opposite side thereof, and to extend across the main extent of the area rearwardly subtended by the disc,

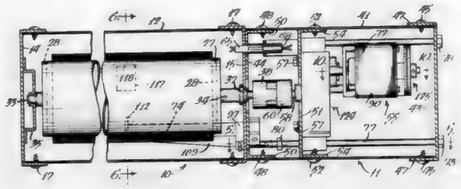
c. the hub and flange both being annular and the hub forming a central exhaust passage which is blocked by the holder and reflector.

4,045,123

CONTROL DEVICE TO POSITION PROJECTION SCREEN FOR VIEWING

Donald J. Brown, Naperville, Ill., assignor to Knox Manufacturing Co., Wood Dale, Ill.

Filed Jan. 9, 1976, Ser. No. 647,869
Int. Cl.² G03B *21/56*
U.S. Cl. 350—117 **10 Claims**



1. A control device for an electric motor unit of a projection screen apparatus adapted to position a predetermined length of flexible screen for viewing, comprising: an elongate roller provided with spaced bearings for rotatably supporting the opposite end portions of the roller, one end portion of the roller being operatively connected to the electric motor unit to rotate the roller when the motor unit is actuated; means defining a depression in the lateral surface of the roller; support means for securing the bearings to a supporting surface; a flexible screen having a transverse marginal edge portion secured to said rotatable roller, said screen being wound upon said roller when in closed position and being unwound from said roller when in exposed viewing position, the screen having a cut-out portion affording an opening which exposes the depression in the roller when the screen is in viewing position; switch means movable between a non-conductive open condition and a closed condition making an electrical connection with the motor unit to rotate the roller and unwind the screen toward viewing position, the switch means being mounted adjacent the roller; and a movable member mounted adjacent the switch means and positioned to cooperate therewith to said switch means to move from closed condition to open condition, the movable member being normally urged toward the roller and having an end portion normally bearing against screen wound about the roller, the end portion being positioned to move through the opening in the screen into the depression in the roller when the screen is in viewing position, the movement of said end portion causing the switch means to move from closed condition to open condition to electrically disconnect the motor unit and arrest rotation of the roller.

4,045,124

BISTABLE DEFLECTION SYSTEM

Joel M. Pollack, Rochester, and John B. Flannery, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

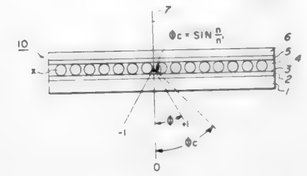
Filed Feb. 25, 1975, Ser. No. 552,898
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **8 Claims**

1. A method for selectively reflecting light of a given wavelength, λ, within a layer of nematic liquid crystalline material, comprising:

a. providing, between two transparent electrodes, an about 1 micron to about 6 micron thick layer of homogeneously aligned nematic liquid crystalline material having negative dielectric anisotropy;

b. transmitting through at least one of said two electrodes light comprising said light of wavelength, λ; and

c. applying a d.c. voltage, between said two electrodes, at least at the parallel variable diffraction mode voltage threshold for said nematic liquid crystalline material wherein vortical domains of said liquid crystalline material are formed in a direction parallel to the direction of initial homogeneous alignment, said domains being substantially parallel one to the other and having a spatial frequency dependent upon the magnitude of said d.c.



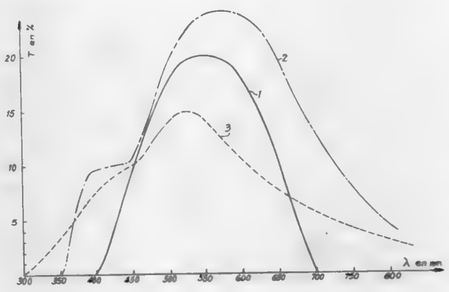
voltage, said d.c. voltage being above the critical angle voltage level for said light of wavelength, λ, wherein said spatial frequency is sufficient to totally internally reflect said light of wavelength, λ, within said layer of liquid crystalline material.

4,045,125

BAND FILTERS FOR USE IN PROTECTIVE GLASSES

Guy Farges, Paris, France, assignor to Etat Francias, Paris, France

Filed June 23, 1975, Ser. No. 589,511
Claims priority, application France, June 27, 1974, 74.22356
Int. Cl.² G02B *5/28*
U.S. Cl. 350—166 **12 Claims**



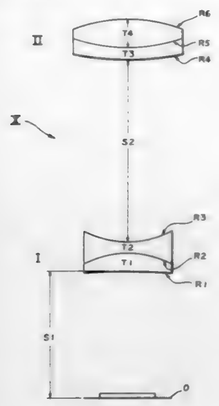
1. A band filter adapted to allow passage only of a band length between 350 and 750 nm, said filter consisting essentially of a support which is at least partially transparent in the considered band, a filter element coated on at least one of the two faces of said support, said filter element consisting of three metallic layers respectively separated by two layers of transparent material, said layers of transparent material having an index of refraction greater than 1.5, the optical thickness of the layers of transparent material each being equal to about ¼ of the mean wave length of the considered band, one of said metallic layers of said filter elements having a surface within about 15 nm of said support, and an anti-reflection coating on the outer surface of said filter element opposite said support, said anti-reflection coating consisting of a layer of a metallic or semi-metallic element on the other of said outer metal layers of said outer surface and a layer of transparent material disposed on said layer of metallic or semi-metallic element.

4,045,126

TWO-ELEMENT MICROSCOPE OBJECTIVE

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Filed June 24, 1976, Ser. No. 699,277
Int. Cl.[2] G02B *21/02*
U.S. Cl. 350—175 ML **2 Claims**



1. A microscope objective which has two elements aligned along an optical axis which comprises a biconcave negative doublet I and biconvex positive doublet II for the following optical parameters:

Lens	Radius(R) Thickness(T)	Spacing (S)	Index of Refraction(ND)	No.(γ)
		S_1= .24167B		
	R_1= −4.36334B			
	T_1=.04651B		1.77<ND_1 <1.79	γ_1≅25
I	R_2= − .25721B			
	T_2=.04070B		1.51<ND_2 <1.53	γ_2≅64
	R_3= .27059B			
		S_2= .48271B		
	R_4= .96467B			
	T_3=.04070B		1.77<ND_3 <1.79	γ_3≅25
II	R_5= .42024B			
	T_4=.07558B		1.48<ND_4 <1.50	γ_4≅70
	R_6= − .39640B			

wherein B is equal to 41 to 45mm.

4,045,127

ENLARGING LENS SYSTEM

Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 16, 1975, Ser. No. 641,171
Claims priority, application Japan, Dec. 17, 1974, 49-144171
Int. Cl.[2] G02B *9/60*
U.S. Cl. 350—210 **6 Claims**

1. An enlarging lens system comprising five components of seven lenses: a first positive meniscus lens component, a second positive meniscus lens component, a third lens component consisting of two lens elements, a fourth lens component consisting of two lens elements arranged after a stop and a fifth positive lens component, at least one of said third or fourth components including a positive lens, the concave face of which is adjacent and faced to said stop, and said enlarging lens system satisfying the following conditions:

$$n_b < n_a \quad (1)$$

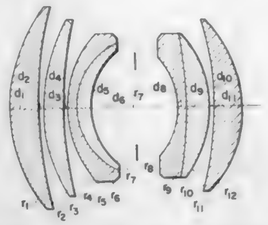
$$0.8f < f_a < 2.5f \quad (2)$$

$$0.04 < n_c - n_d < 0.12 \quad (3)$$

$$n_7 > 1.70, \nu_7 > 46 \quad (4)$$

$$0.6 < f_{II} / f_I < 1.6 \quad (5)$$

wherein the reference symbol n_a represents the refractive index of the positive lens which is comprised in the third or fourth component and is adjacent to said stop, the reference symbol n_b denotes the refractive index of a negative lens which is



cemented with said positive lens which is adjacent to said stop, reference symbol f_a designates the focal length of the cemented doublet which includes said positive lens which is adjacent to said stop, the reference symbols n_c and n_d represent refractive indices of the lens elements of the third or fourth components which includes a negative lens arranged on the side of said stop (n_c represents the refractive index of the lens element which is adjacent to said stop), the reference symbols n_7 and ν_7 denote the refractive index and Abbe's number of the fifth lens component, the reference symbols f_I and f_{II} denote the total focal lengths of the front and rear lens groups which are arranged before and after said stop respectively, and reference symbol f designates the focal length of the enlarging lens system as a whole.

4,045,128

TELEPHOTO OBJECTIVE

Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,958
Claims priority, application Japan, Apr. 25, 1974, 49-46920; June 28, 1974, 49-74168
Int. Cl.[2] G02B *9/60*
U.S. Cl. 350—216 **22 Claims**



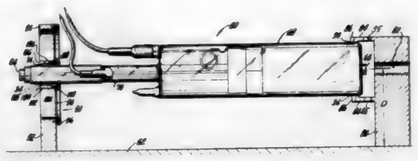
16. A telephoto objective of high speed adjustable focus comprising a front lens group which has a positive refracting power and remains stationary during focussing, and a rear lens group which is positioned on the image side axially apart from said front lens group and has a negative refracting power, said rear lens group being divided into two parts of which one part is axially movable to effect focussing to suit differing object distance, and the other part has a negative refracting power and stationary during focussing.

4,045,129

APPARATUS FOR HARD MOUNTING AN OPTICAL MEMBER TO A RIGID BASE

Martin R. Hamar, P.O. Box 31, Wilton, Conn. 06897

Filed Dec. 8, 1975, Ser. No. 638,506
Int. Cl.[2] G02B *7/00*
U.S. Cl. 350—321 **2 Claims**



1. Apparatus for hard mounting an elongated laser tube to a rigid base structure comprising:

an elongated hollow member having bilateral symmetry in a plane perpendicular to the longitudinal axis thereof, which member terminates at one end with a base that is flexibly connected to said rigid base by means of a diaphragm assembly, said base having an aperture therethrough which is of greater diameter then the diameter of said laser tube whereby said base is concentric with said laser tube, the opposite end of said member engaging the laser tube and rigidly bonded thereto, said hollow member including a longitudinally-extending flexible wall having longitudinally-extending slits extending from said opposite end to points intermediate the length of the hollow member so as to define flexible spring fingers whereby when the base of the hollow member is secured to the rigid base at one end, it is concentric with a laser tube, and bonded to the laser tube at the opposite ends of said flexible fingers thereby providing an assembly that allows for differential thermal expansion of the elements of the assembly with minimum stresses being introduced into the laser tube while maintaining relative spacial alignment of the assembly.

4,045,130

APPARATUS FOR THE PERIMETRIC TESTING OF THE VISUAL FIELD OF THE HUMAN EYE

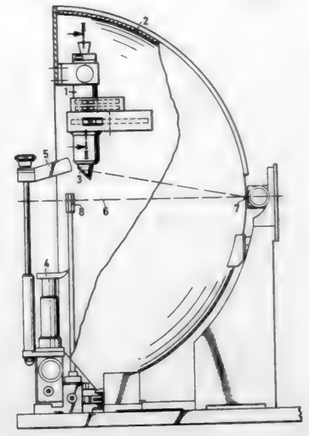
Wilhelm Krahn, Hamburg, Germany, assignor to Optische Werke G. Rodenstock, Germany

Filed June 9, 1975, Ser. No. 584,860
Claims priority, application Germany, June 12, 1974, 2428441
Int. Cl.[2] A61B *3/02*
U.S. Cl. 351—24 **20 Claims**

1. An apparatus for perimetric testing of the field of vision of eyes comprising:

an approximately hemipherical shell; and

means for successively projecting selected individual ones of a plurality of patterns of light spots wherein each of said patterns comprise a plurality of light spots on the inner surface of said hemispherical shell at an angle corresponding to the visual field of the eye to be tested, said projecting means including means for controlling the light spots of each pattern as to brightness of position, size, and contrast with respect to the brightness of the inner surface of said hemispherical shell.

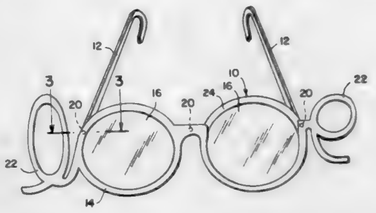


4,045,131

SPECTACLE FRAMES

Jack Sherman, 1 The Hollows, Syosset, N.Y. 11791

Filed Oct. 31, 1975, Ser. No. 627,540
Int. Cl.[2] G02C *11/02*
U.S. Cl. 351—52 **5 Claims**



1. An eyeglass frame comprising a frame portion including a pair of rim sections adapted to receive a lens therein; a pair of temples, one lateral side of each of said rim sections including first means for engaging a lettered ornament thereon, said lettered ornament including second means adapted to cooperate with said first means whereby said ornament is removably affixed to said rim, each of said rim sections being in the shape of at least one letter of the alphabet, said lettered ornament depending from said rim sections in planar alignment therewith and extending across the face thereof thereby increasing the longitudinal breadth of said frame beyond that defined between said rim sections and said temples whereby said combination of said pair of rims and said ornamental letters forming a word.

4,045,132

FILM REWINDING DEVICE FOR MOVIE CAMERA

Yozo Iida, Komae, Japan, assignor to Nippon Kogaku, K.K., Tokyo, Japan

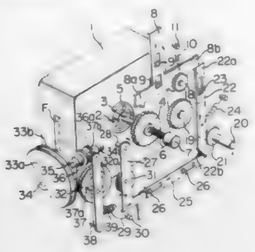
Filed Apr. 9, 1975, Ser. No. 566,305
Claims priority, application Japan, Apr. 15, 1974, 49-40918; May 2, 1974, 49-48748
Int. Cl.[2] G03B *21/36*
U.S. Cl. 352—91 C **12 Claims**

1. In a motor-driven motion-picture camera which is capable of selective use of both a type A magazine provided with a

non-releasable anti-backup device on an exposed film take-up shaft and a type B magazine provided with an externally releasable anti-backup device on said film take-up shaft, and which includes a winding gear rotatable in response to the motor operation and a member secured to said gear for rotating said take-up shaft with rotation of said gear, the improvements comprising:

a. detector means having a first position upon loading of a type A magazine and a second position upon loading of a type B magazine, so as to detect the type of magazine loaded;

b. means associated with said detector means for positioning said winding gear at a first position when a type A magazine is loaded and at a second position when a type B magazine is loaded;



c. means for disabling said anti-backup device for the type B magazine when this type of magazine is loaded;

d. means including a counting gear for counting the film footage of forward feed and reverse feed during overlap, double exposure and reverse photographing; and

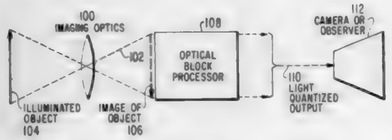
e. manually displaceable control means including a connecting gear driven by said motor and displaceable from a first position remote from said counting gear to a second position at which said counting and connecting gears mesh for coupling said counting means to said motor and including a winding gear control member displaceable from a first position to a second position for locking said winding gear against winding rotation when said winding gear is at its first position and for permitting winding rotation of said winding gear when said winding gear is at its second position.

4,045,133

ANALOG OPTICAL BLOCK PROCESSOR

Curtis Raymond Carlson, Rocky Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 13, 1975, Ser. No. 586,637
Int. Cl.² G03B *27/00*
U.S. Cl. 355—1 **3 Claims**



1. An analog optical processor for respectively quantizing the light of each elemental area of a light image manifesting pictorial information which is incident thereon, said analog optical processor comprising:

a. a plurality of contiguous light integrating tunnels, each of which has substantially the same cross sectional dimensions and a length which is long relative to the cross sectional dimensions thereof and wherein each respective tunnel has reflective sides,

b. a front diffuser covering the front surface of said plurality of contiguous light integrating tunnels through which said plurality of contiguous light integrating tunnels are illuminated by said incident light image,

c. a rear diffuser covering the back surface of said plurality of contiguous light integrating tunnels through which light emerging from each of said contiguous light integrating tunnels passes,

d. a printing-function array mask situated immediately behind said rear diffuser, said printing-function array mask including an individual element of said array corresponding to and in cooperative spaced relationship with each light integrating tunnel, all of said printing function array elements having a predetermined transmission characteristic, each said element comprising a point size hole, and

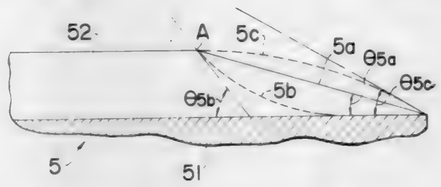
e. a camera situated behind said printing-function array mask at a distance therefrom to be illuminated by light passing through the respective elements of said printing-function array mask, and means including a single input aperture situated in front of said camera, said camera including a lens for imaging the light passing through said input aperture in an image plane, and said camera incorporating a recording medium situated in a given plane spaced from said image plane by a given distance to derive an individual blur image of said input aperture on said recording medium for the light from each respective element of said printing-function array mask.

4,045,134

PHOTOSENSITIVE MEMBER FOR USE IN ELECTROPHOTOGRAPHIC APPARATUS AND METHOD OF MANUFACTURING THE SAME

Shigeru Suzuki, Yokohama; Yasumori Nagabara, Yokosuka; Koji Sakamoto, Tokyo, and Katsuo Sakai, Machida, all of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Mar. 1, 1976, Ser. No. 662,723
Claims priority, application Japan, Mar. 5, 1975, 50-27530
Int. Cl.² G03G *15/00, 5/02*
U.S. Cl. 355—3 R **10 Claims**



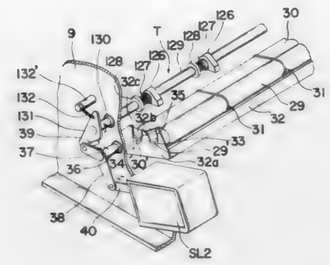
1. A photosensitive member for use in an electrophotographic apparatus which comprises means adjacent the surface of said member for appying a bias potential of the same polarity as an electrostatic latent image on said surface, toner being interposed between said means and said surface to develop said electrostatic image, said photosensitive member comprising a conductive support having a support surface with at least one support edge, and a photosensitive layer formed on said support surface and having an end extending up to a point substantially coincident with said support edge, the improvement comprising a tapered surface formed on said layer at said end extending from the top of said layer toward the support edge, the maximum angle between a tangent of said tapered surface and said support surface being less than 45°.

4,045,135

ELECTROPHOTOGRAPHIC COPYING APPARATUS WITH RETRACTABLE IMAGE TRANSFER ROLLER MEANS

Yasuhiko Doi, Toyokawa; Shunji Yamamoto, Shinshiro; Osamu Okada, Toyokawa; Takashi Hikosaka, Atsumi, and Masamichi Hayashi, Minami Shidara, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 500,171, Aug. 23, 1974, Pat. No. 3,997,262. This application Sept. 10, 1975, Ser. No. 611,874
Claims priority, application Japan, Sept. 7, 1973, 48-101372; Apr. 30, 1975, 50-52826
Int. Cl.² G03G *15/00*
U.S. Cl. 355—11 **3 Claims**



1. An electrophotographic copying apparatus of the electrostatic latent image transfer type, said apparatus comprising:

a reciprocatingly movable platform on which an original to be copied is placed;

a rotatable photoreceptor drum disposed below said platform and having a photosensitive surface onto which an image of the original is projected;

means disposed around said drum and including a corona charging means fopr applying charges uniformly onto said drum, an exposure slit means through which an image of the original is projected so as to form an electrostatic latent image on said photosensitive surface, an image transfer means for transferring the thus formed latent image onto a copying paper sheet, a separating means for separating said copying paper sheet from said drum, and an erasing means for erasing residual charges from said drum;

a paper feeding means for feeding a copying paper sheet along a path to said image transfer means;

a developing means for developing the copying paper sheet;

a fixing means for fixing the thus developed image;

means for detecting the arrival of a copying paper sheet at a predetermined location along said path;

shifting means for shifting said image transfer means between a first position in which said image transfer means is out of contact with said drum and a second position in which said image transfer means is in contact with said drum;

control means, actuatable by said detection means, for operating said shifting means for shifting said image transfer means from said first to second positions thereof; and

locking means normally preventing said platform from movement, and actuatable by said detecting means to release said platform and allow movement thereof.

4,045,136

CONTROL SYSTEM FOR PHOTOGRAPHIC FILM PRINTERS

Charles J. Watson, Elgin, and Larry L. Langrehr, Chicago, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

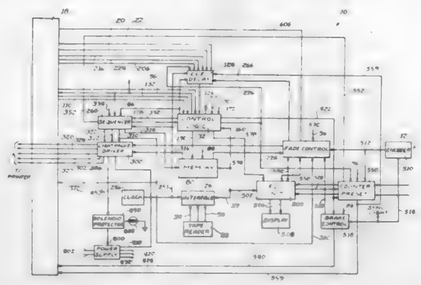
Filed Aug. 15, 1975, Ser. No. 605,008
Int. Cl.² G03B *27/78*
U.S. Cl. 355—83 **31 Claims**

1. A control system for controlling the operation of a photographic film printer which includes variable control means for printing a preprint film onto raw stock, comprising:

information input means for providing either first data comprising control information or second data comprising control information and cuing frame address information;

control data memory means for storing said control information from said information input means for conditioning variable control means of said film printer;

cue data memory means for storing cuing frame address information from said information input means;



discriminating means for determining whether said information input means has provided said first or second data and for conditioning said control system in accordance therewith; and

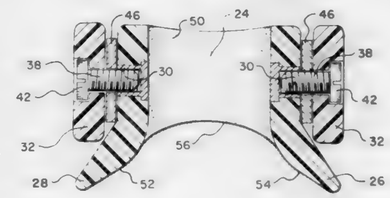
enabling means providing an output command signal at a predetermined position of said preprint film in the printer to selectively enable actuation of said variable control means in accordance with control information stored in said control data memory means.

4,045,137

OPHTHALMIC DEVICE AND METHOD

James B. Bradley, Jr., 110 Monteleon Drive, West Monroe, La. 71291

Filed Nov. 21, 1974, Ser. No. 525,842
Int. Cl.² G02C *5/04, 5/12*
U.S. Cl. 351—132 **6 Claims**



1. A removable nose piece attachment for an opthalmic eyeglass fitting frame comprising:

a. a generally inverted one piece rigid preformed U-shaped member formed with an upstanding portion thereon;

b. said U-shaped portion being sized in conform to a person's nose; and

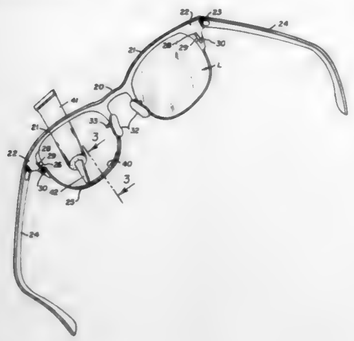
c. said upstanding portion having imbedded therein female receptacles for locking said nosepiece to said fitting frame to thereby prevent rotation of the nosepiece; said female receptacles having means formed thereon to prevent their rotation within the nosepiece and having formed therein an internal thread for receiving a mating male screw.

4,045,138

METHOD FOR APPLYING A LIQUID FILLER TO LENSES IN GLASSES FRAMES

Donald M. Kunde, and Frank M. Lagrimanta, both of Lakewood, Colo., assignors to Prado Verde, Inc., Santa Fe, N. Mex.

Filed June 4, 1975, Ser. No. 583,597
Int. Cl.² G02C *13/00*
U.S. Cl. 351—178 **4 Claims**



1. A method for installing a lens in a channel of an expansible eye wire rim of a glasses frame, said lens being ground to approximate the shape of said eye wire rim, comprising:

a. applying to said channel of said eye wire rim a bead of cellulose acetate butyrate cut to a viscous liquid by methylene chloride capable of changing to a resilient, solid state after the expiration of a short time period;

b. placing said lens in said eye wire rim while the rim is expanded to receive the same; and

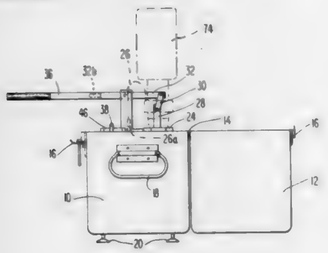
c. closing the eye wire rim upon the lens and resilient resin.

4,045,139

COMPACT PORTABLE CONTAMINATED FUEL DETECTOR WITH HAND-OPERATED PUMP

Daniel G. Russ, Fort Wayne, Ind., assignor to Telectro-Mek, Inc., Fort Wayne, Ind.

Filed Mar. 29, 1976, Ser. No. 671,309
Int. Cl.² G01N *1/00, 15/00*
U.S. Cl. 356—36 **4 Claims**



1. In a portable contaminated fuel detector comprising at least sample holder means, fuel filter means in a filter retainer, a vacuum receptacle arranged in series with means causing said parts to seal together upon drawing a vacuum to accelerate flow of fuel through the filter means into the vacuum receptacle and vacuum pump means for said purpose connected by a vacuum line to said vacuum receptacle, the improvement comprising

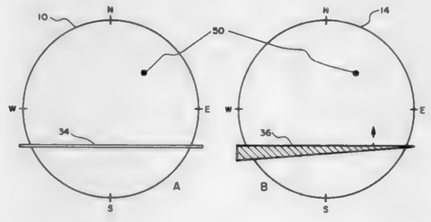
a box enclosure including a top and a bottom, a deck supported on said bottom for supporting, in turn, a photocell system, a meter coupled thereto, the vacuum chamber and vacuum pump, the vacuum pump being a hand-operated vacuum pump such that no electric power is needed to operate the vacuum pump including a vertically oriented cylinder parallel to and adjacent to the vacuum receptacle and containing a vertically-movable piston with sealing means between the cylinder and the edge of the piston and check valves between the vacuum chamber and pump preventing air return to the vacuum chamber and at the outlet preventing air return to the pump and an axially arranged piston rod, the deck supporting removable pieces such as the filter retainer and sample holder, the top cover enclosing parts projecting above the deck.

4,045,140

MEANS FOR NEAR REAL TIME C-W LASER SOURCE CHARACTERIZATION

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 15, 1975, Ser. No. 640,504
Int. Cl.² G01B *11/26*
U.S. Cl. 356—141 **6 Claims**



1. A system for locating the source of radiation incident on said system, comprising:

optical means for presenting two images of the field-of-view of said system:

detecting means optically cooperating with said optical means for providing an electrical output indicative of each image;

two optical modulation filters having finite lengths and attenuation factors, each filter movable across one of said images for occupying a portion of the optical path between the image and said detection means and wherein the attenuation factor of the filter moving across one of said images is invariant in a direction perpendicular to its movement, and the attenuation factor of the filter moving across the other image varies linearly in a direction perpendicular to its movement;

circuit means electrically connected to said detection means for comparing the amplitudes of the outputs said detecting means associated with each of said images with one another; and

means for sensing the position of at least one of said plurality of optical filters and providing an electrical analog of said position at the time of the comparison performed by said circuit means, whereby said position corresponds to the point of origin of said radiation within said field-of-view in at least one dimension.

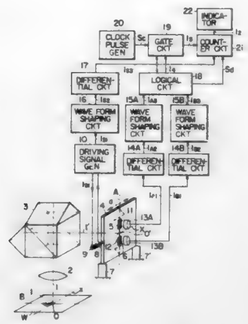
4,045,141

PHOTOELECTRIC MICROSCOPE

Shigeo Moriyama, and Yoshio Kawamura, both of Kokubunji, Japan, assignors to Hitachi, Ltd., Japan

Filed June 14, 1976, Ser. No. 695,556
Claims priority, application Japan, June 13, 1975, 50-71500; Apr. 2, 1976, 51-36003
Int. Cl.² G01B *9/04*
U.S. Cl. 356—156 **12 Claims**

11. A method of positioning a test piece having a reference line thereon, comprising the steps of forming a magnified real image of the reference line of said test piece and a point-symmetric image thereof on an identical focal plane by means of an objective and an optical system for making point-symmetric images as disposed in an optical path of said objective, passing the lights of the respective images through two openings provided in a slit plate for scanning said focal plane, introducing



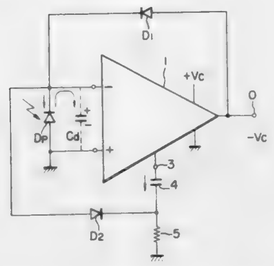
the lights passing through the slit plate into two photoelectric transducers disposed behind said respective openings, to convert them into electric signals, detecting the amount of deviation of said test piece from a central optic axis as determined by said objective and said optical system for making point-symmetric images from the relation of the time difference between the generation of said two electric signals.

4,045,142

METERING DEVICE FOR CAMERAS

Sakuji Watanabe, Yono, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 29, 1976, Ser. No. 681,506
Claims priority, application Japan, May 16, 1975, 50-57435
Int. Cl.² G01J *1/42*; G03B *7/08, 7/00*
U.S. Cl. 356—223 **2 Claims**



1. In a metering device comprising an operational amplifier, a photodiode connected between the positive and the negative input terminal of said operational amplifier, and a logarithmic conversion diode connected between the negative input terminal and the output terminal of said operational amplifier, the improvement comprising:

a terminal provided on said operational amplifier for producing an output synchronous with the output potential thereof;

means connected to said terminal and constituting a charging circuit when the output of said operational amplifier is within the range of metering potential and a short circuit when the output of said operational amplifier is below the range of metering potential; and

means connected between the junction between said charging circuit and said negative input terminal of said operational amplifier;

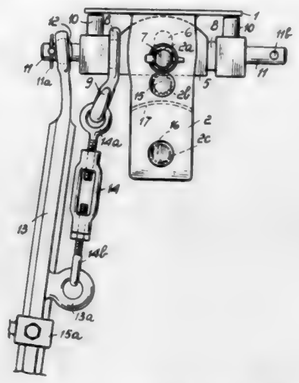
whereby the charge stored in the capacity present in said photodiode due to noise may be discharged through said second mentioned means to said charging circuit thereby to correct the photoresponsive characteristic of said metering device.

4,045,143

SWIVEL HITCH STRUCTURE

Valeriano Gomiero, Via Serravalle, 19, Fossona di Cervarese (Prov. Padova), Italy

Filed Aug. 29, 1975, Ser. No. 609,126
Claims priority, application Italy, Sept. 2, 1974, 41667/74
Int. Cl.² F16C *11/00*
U.S. Cl. 403—102 **4 Claims**



1. A hitch structure for connecting agricultural implements or the like to pulling machines, comprising, at least one draw bar member connected to a frame of a pulling machine, said draw bar member extending in a longitudinal direction of the pulling machine, a cross-bar member extending transverse to said draw bar member, a swivel connection means between said draw bar and cross-bar members allowing swivelling movement of said cross-bar member with respect to said draw bar member about an upright axis substantially perpendicular to said longitudinal direction, wherein according to the improvement said swivel connection means comprise a slotted hole in one of said draw bar and cross-bar member, said slotted hole having its longitudinal extension parallel to said longitudinal direction, a pin member inserted in said slotted hole and connected to that other one of said draw bar and cross-bar members without said slotted hole, said pin member defining said swivel axis and being shiftable within said slotted hole from a forward end position thereof to a rearward end position thereof together with said one of said draw bar and cross-bar members, abutment means cooperating with said frame of the pulling machine and facing opposite end portions of said cross-bar member, stop means on the opposite end portions of said cross-bar selectively cooperating with said abutment means in one position of said pin member with respect to said slotted hole, said stop and abutment means selectively allowing and preventing limited swivelling motion of said cross-bar about said pin member and lever and link members for connecting said cross-bar member with said agricultural implement.

4,045,144

WIND ENERGY CONCENTRATORS

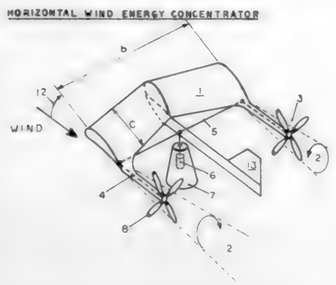
John Lodewyk Loth, P.O. Box 4094, Mogantown, W. Va. 26505

Filed Feb. 18, 1975, Ser. No. 550,841
Int. Cl.² F03D *1/04*
U.S. Cl. 415—1 **12 Claims**

1. A wind energy concentrator, comprising:

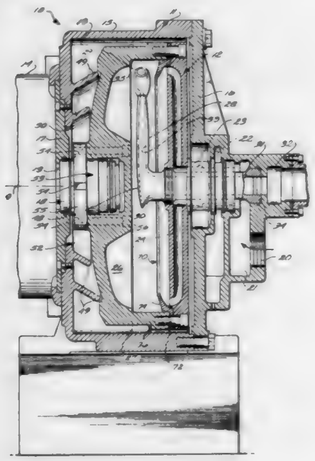
a. an airfoil for generating a trailing vortex system, said airfoil being constructed to concentrate a substantial portion of the rotational energy of said trailing vortex system

into a rolled-up vortex at a predetermined spanwise location along said airfoil;
b. a turbine disposed outside said rolled-up vortex;
c. a duct means for providing fluidic communication between said turbine and said rolled-up vortex to extract



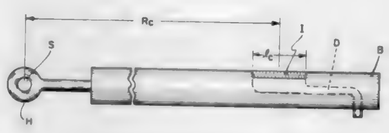
power therefrom, said fluidic communication being established within said rolled-up vortex; and
d. an air inlet provided for said turbine, whereby said rolled-up vortex creates a low pressure region within said duct means to cause air to be drawn through said air inlet and past said turbine thereby to drive said turbine.

4,045,145
PITOT PUMP WITH TURBULENCE ELIMINATION
John W. Erickson, Huntington Beach, and Vitolis Budrys, La Mirada, both of Calif., assignors to Kobe, Inc., Huntington Park, Calif.
Filed Dec. 19, 1975, Ser. No. 642,326
Int. Cl.² F04D *1/14*
U.S. Cl. 415—89 **3 Claims**



1. A pitot pump including:
a. a rotary casing mounted for rotation in a selected direction about an axis and having a pumping chamber therein;
b. a pumped fluid discharge duct coaxial with the casing;
c. a stationary element extending radially of said axis in the casing to an outer end thereof disposed toward the inner surface of the casing at the outer periphery of the pumping chamber, the element defining a pitot tube extending radially of the axis and having adjacent its outer end an inlet facing in a direction opposite to the direction of rotation of the casing for gathering from the chamber fluid to be pumped, the pitot tube having a passage connected to the inlet and extending generally in the direction of the casing rotation and toward the axis to an outlet connected to the discharge duct for discharging to the outlet duct fluid gathered from the chamber by the pitot tube inlet; and
d. delivery means for delivering fluid to be pumped to the pumping chamber proximately of the outer periphery thereof, the delivery means including:
1. a supply duct coaxially of the casing,
2. a plurality of supply passages in an end wall of the casing for delivering fluid from the supply duct to the periphery of the pumping chamber, the supply passages having discrete continuously open discharge openings spaced circumferentially around the one end wall of the pumping chamber near the periphery thereof, and
3. means carried by the one end wall adjacent the discharge end of each of the supply passages for diffusing flow of fluid from each discharge opening into the pumping chamber for reducing in the chamber in the vicinity of the stationary element the velocity, in a direction substantially parallel to the axis, of fluid delivered to the pumping chamber by the supply passages, wherein the diffusing means includes a shroud member extending radially inwardly into the chamber between the stationary element and the outlet ends of the supply passages for diverting the flow of fluid out of the passages into the chamber in a direction toward the axis of rotation of the casing.

4,045,146
HELICOPTER ROTOR BLADE
Peter Crimi, West Boxford, Mass., assignor to Avco Corporation, Wilmington, Mass.
Filed May 17, 1976, Ser. No. 687,359
Int. Cl.² B64C *27/46*
U.S. Cl. 416—1 **10 Claims**

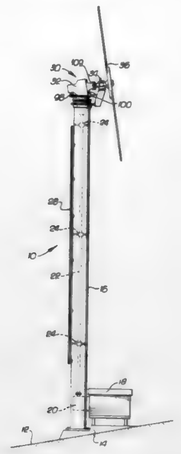


1. Means for reducing torsional oscillations of a blade of a rotary wing aircraft where the flow of air, due to the motion of the aircraft, is essentially in the plane of the rotary wing comprising intake means for sucking air from a boundary layer region located on the upper blade surface and essentially solely at the leading edge within the outer half of the span of the wing and exhaust means for exhausting the air into a region of lower static pressure than the suction region, the air being removed from suction region to exhaust solely by passing centrifugal pumping through wing rotation, said intake means being solely in the 80–90% of maximum wing radius region.

4,045,147
TILTABLE WIND MACHINE FOR USE ON VARIABLE TERRAIN
Russell W. Curp, Newhall, Calif., assignor to SSP Agricultural Equipment, Inc., Visalia, Calif.
Filed May 10, 1976, Ser. No. 684,550
Int. Cl.² F04D *29/32*
U.S. Cl. 416—100 **12 Claims**

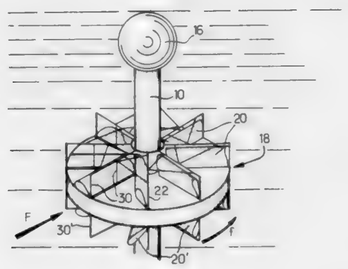
1. In a rotatable and variably tiltable wind machine for protection of agricultural growth, the wind machine being adapted for installation on a selected terrain having a varying surface contour 360° or less around the machine,
mounting means for securing the machine on the terrain,
a fan drive assembly mounted for rotation on and with respect to said mounting means, said rotation being about a generally vertical axis of the mounting means,

the fan drive assembly including a fan, a fan housing, and a fan shaft,
drive means associated with the mounting means to rotate the fan and the fan drive assembly, the rotation of the fan being on an axis generally transverse to said vertical axis,
the improvement comprising:



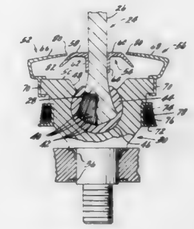
tilting means associated with the mounting means and the fan for variably tilting the fan with respect to said fan housing and the terrain while the fan drive assembly is being rotated, and
means forming a part of said fan shaft to permit the fan to be tilted with respect to the housing.

4,045,148
TURBINE
Bernard Morin, 1, rue Corneille, 78130 Les Mureaux, France
Filed Nov. 4, 1975, Ser. No. 628,650
Claims priority, application France, Nov. 4, 1974, 74.36632; Aug. 6, 1975, 75.24566; Sept. 1, 1975, 75.26787
Int. Cl.² F03B *7/00*
U.S. Cl. 416—84 **10 Claims**



1. A turbine with a current motor adapted to be immersed in water, said turbine comprising:
a disc having a density near that of the water in which it is immersed in horizontal attitude, said disc having cells containing a mixture of liquid and gas, said disc having upper and lower surfaces,
means resting on the bottom of the body of water and supporting said disc for rotation,
at least two blades respectively articulated to the upper and lower surfaces of the disc for pivotal movement about horizontal axes,
said blades having at least one pocket containing a mixture of gas and of a liquid such that the density of the blades articulated to the upper surface of the disc is less than that of water and the density of the blades articulated to the lower surface of the disc is greater than that of water,
means for locking the blades in one direction of pivotal movement when the blades reach a vertical position, and
at least one electrical generator means driven by rotation of said disc.

4,045,149
PLATFORM FOR A SWING ROOT TURBOMACHINERY BLADE
Richard Ravenhall, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Feb. 3, 1976, Ser. No. 654,787
Int. Cl.² F01D *5/30*
U.S. Cl. 416—135 **13 Claims**

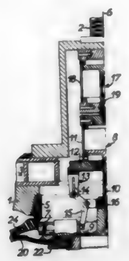


1. A rotor apparatus comprising:
a blade having a root portion and an airfoil portion;
means for supporting said blade including a groove curved in a generally circular concave profile to receive the blade root, the blade root conforming partially to the same profile, such that the blade is permitted to rotate laterally within the groove;
an inner flow path shroud extending generally laterally of the blade airfoil portion and laterally rotatable therewith; and
an outer flow path shroud nonrotatable with respect to said supporting means and in general alignment with the inner flow path shroud when the blade is in an unrotated position; wherein
said inner and outer shrouds are provided with a pair of complementary adjacent surfaces contoured to pass in relatively close-fitting relationship to each other when said blade is rotated laterally.

4,045,150
TIRE UPPER-BEAD POSITIONING DEVICE FOR USE IN A CURING PRESS
Georges Gazuit, Montlucon, France, assignor to Zelant, Gazuit, Montlucon, France
Filed Oct. 28, 1976, Ser. No. 736,311
Claims priority, application France, Oct. 29, 1975, 75.33047
Int. Cl.² B29H *5/02*
U.S. Cl. 425—58 **6 Claims**

1. Device for centering and positioning the upper bead of a horizontally disposed crude tire around a bead ring disposed centrally of a vertically movable upper portion of a mold in a vulcanizing press of the type comprising a set of segments regularly angularly disposed around a vertical axis of symmetry of the mold in a central cavity in the upper mold portion, each segment being movable both vertically and radially under control of an actuator common to all the segments of the set, and an inflatable vulcanizing bladder disposed centrally of a lower fixed portion of the mold wherein said segments have their outer ends shaped to form a tapered centering surface having a taper directed downwardly and radially inwardly

with its axis merging with the vertical axis of symmetry of the mold, said actuator having a place connected thereto to extend radially of the axis of symmetry with said segments mounted thereon and located in a first position to be remotely below



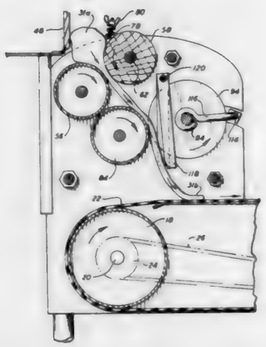
said bead ring and in abutment with an outer edge of the upper bead of the crude tire, said segments being movable to a second position by the vertical movement to be closely adjacent and below said bead ring to cooperate with said bladder for guiding the upper bead around said bead ring.

4,045,151

DOUGH FORMING AND CUTTING MACHINE

Joseph R. Zazzara, 302 Albert Road, Syracuse, N.Y. 13214

Filed Feb. 26, 1976, Ser. No. 661,724
Int. Cl.[2] A21C *11/12*
U.S. Cl. 425—297 **9 Claims**



1. Apparatus for shaping and severing dough, and the like, comprising:

a. frame means;

b. a pair of rollers mounted for rotation about parallel axes and having peripheral surfaces spaced by a predetermined distance;

c. a plurality of cutter disks of uniform diameter and mounted in spaced relation for rotation upon a common shaft;

d. guide means intermediate said pair of rollers and said cutter discs constructed and arranged to direct a sheet of dough emerging from between said rollers into engagement with said disks to be severed thereby into a plurality of side-by-side strips;

e. a pair of rigid arms mounted on opposite sides of said frame means and supporting said shaft therebetween;

f. a rigid bar supported at opposite ends upon portions of said arms parallel to and spaced from said shaft by a distance greater than the radius of said disks;

g. a rigid support member connected to said shaft and said bar to extend therebetween substantially perpendicular thereto, at a position intermediate of said arms;

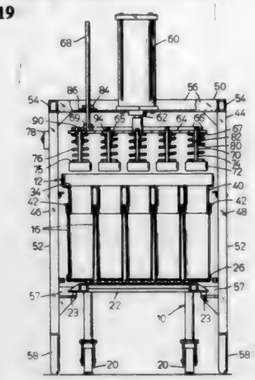
h. said arms being pivotally mounted upon pivot means provided on said frame means for rotation about a common axis parallel to and displaced from both said shaft and said bar.

4,045,152

APPARATUS FOR MAKING CHEESE

Harold J. Peterson, Dodgeville, and Wayne F. Kressin, Watertown, both of Wis., assignors to Kusel Equipment Company, Watertown, Wis.

Filed Sept. 2, 1975, Ser. No. 609,304
Int. Cl.[2] A01J *25/13, 25/15*
U.S. Cl. 425—419 **6 Claims**



1. A cheese processing apparatus comprising a cheese hoop supporting structure; a plurality of cheese hoops supported by said supporting structure in adjacent closely spaced relationship for receiving curds and whey to be poured therein; filler means removably connected to said cheese hoops to permit filling of said cheese hoops, said filler means including a tray having upwardly extending side walls, a bottom wall and a plurality of adjacent sleeves projecting downwardly from said bottom wall and receivable within said cheese hoops whereby curds and whey may be directed from said tray into each of said cheese hoops through said sleeves; and a vertical cheese press for compressing curds placed within said cheese hoops, said vertical press including a frame receiving said movable cheese hoop supporting structure and a force applying means supported by said frame; press head means suspended from said force applying means and operably connected to said force applying means for vertical movement; and a plurality of downwardly extending plunger means supported by said press head means for vertical movement therewith, each of said plunger means being receivable through a sleeve in one of said cheese hoops for compressing curds in said cheese hoop, means for independently shiftably supporting said plunger means on said press head means for vertical movement with respect to said press head and to other of said plunger means, and spring biasing means between each of said plunger means and said press head urging said plunger means downwardly with respect to said press head means, whereby the cheese within each of said hoops will be compressed uniformly.

4,045,153

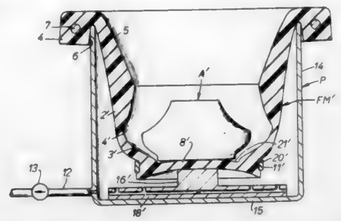
MOLDING APPARATUS INCLUDING ONE-PIECE FLEXIBLE MOLD AND MEANS TO RESTRICT THE DEFORMATION OF THE MOLD

William J. Maurino, and Raymond M. Putzer, both of Racine, Wis., assignors to Precision Flexmold, Inc., Racine, Wis.

Continuation of Ser. No. 542,214, Jan. 20, 1975, abandoned. This application Sept. 17, 1976, Ser. No. 724,356
Int. Cl.[2] B28B *7/06;* **B29C** *7/00*
U.S. Cl. 425—440 **8 Claims**

1. Apparatus for molding seamless articles comprising, a generally hollow one-piece distensible mold of elastomeric material having a vertically extending side wall and a bottom wall, a vacuum pot having a bottom wall and a side wall and

being of such size so as to receive said mold therein, said mold and pot forming an annular chamber therebetween, means connected to and for drawing a vacuum on said chamber whereby said mold distends downwardly and expands radially into said chamber to release the molded article from the mold, said vacuum pot having upwardly extending projection means from its said bottom wall, and said mold including means for supporting the mold side wall and the mold bottom wall, said



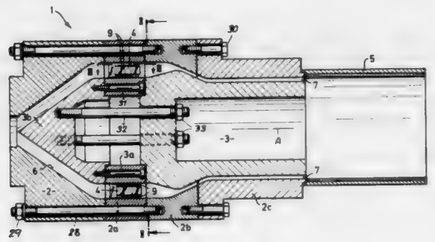
supporting means including a restraining ring member positioned around said mold side wall to restrict radial expansion of the bottom portion of said mold to prevent rupture thereof and for cooperation with said projection means to cause distortion of the bottom wall as the latter is distended downwardly to thereby free a molded article as said mold distends and expands into said pot so that the molded article may be easily removed from the mold.

4,045,154

DIE FOR EXTRUDING LARGE-DIAMETER TUBING

Heinz Ratheiser, Vienna, Austria, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Sept. 24, 1975, Ser. No. 616,306
Claims priority, application Germany, Sept. 28, 1974, 2446421
Int. Cl.[2] B29D *23/04*
U.S. Cl. 425—467 **9 Claims**



1. A tube-making die comprising:

a tube defining a flow axis and having an inner wall centered thereon;

a mandrel within said tube and having an outer wall centered on said axis and turned toward said inner wall, said walls defining an annular axially extending flow chamber; and

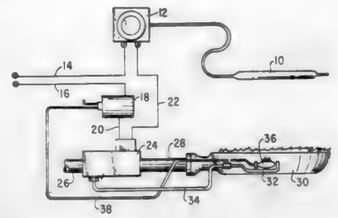
a plurality of webs extending radially between said tube and said mandrel for supporting said mandrel fixedly within said tube, each of said webs having axially extending side walls defining with said inner and outer walls a plurality of angularly spaced and axially extending passages being formed at the radial end of each of said webs with a groove extending axially of the respective passage, said grooves extending at least from the point of greatest transverse and tangential width of the respective web.

4,045,155

BURNER SYSTEM WITH ABSORBENT CARBON FLAME RESPONSIVE SWITCH

Denis G. Wolfe, Santa Ana, and Joseph S. Danon, El Toro, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 412,844, Nov. 5, 1973, Pat. No. 3,883,837. This application Apr. 29, 1975, Ser. No. 572,801
Int. Cl.[2] F23N *5/02*
U.S. Cl. 431—42 **4 Claims**



1. A burner system comprising

a main burner,

an electrically operated valve for controlling the supply of fuel to the main burner,

a pilot burner for igniting the main burner,

a flame sensing bulb positioned to be impinged upon by a flame from the pilot burner,

a flame switch having expandable and contractable means for opening and closing a pair of contacts in response to a gas pressure,

a tube connecting the flame sensing bulb to the expandable and contactable means of the flame switch,

a gas adsorbent material in the flame sensing bulb,

a charge of gas in the sensing bulb, the tube and the expandable and contractable means,

control means connected in series with the contacts of the switch means and the electrically operated valve for controlling the electrically operated valve, and

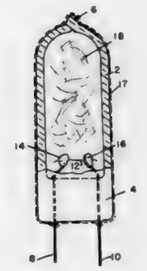
the gas adsorbent material including a material selected from carbonized polyvinylidene chloride and carbonized polyvinylidene fluoride.

4,045,156

PHOTOFLASH LAMP

Gordon P. K. Chu, Danvers; Dennis B. Shinn, Topsfield, and John F. Waymouth, Marblehead, all of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 23, 1974, Ser. No. 535,608
Int. Cl.[2] F21K *5/02*
U.S. Cl. 431—95 R **11 Claims**



1. A photoflash lamp comprising:

an hermetically sealed, light-transmitting envelope;

a quantity of combustible material located in said envelope;

a combustion-supporting gas in said envelope; and

ignition means attached to said envelope and disposed in operative relationship to said combustible material;

said envelope comprising a light-transmitting wall of uniformly crystallized glass having a mean coefficient of thermal expansion in the range of about 80 to 95 $\times$ 10^{-7} in./in./° C between 0° C and 300° C, whereby

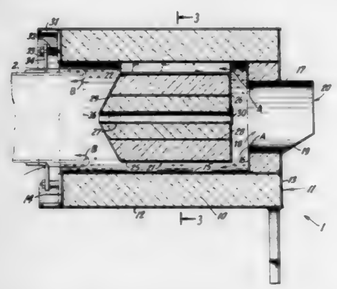
the relatively high refractoriness and strength of said crystallized glass wall render said envelope and the internal surface of said envelope particularly resistant to the thermal shock and mechanical stress resulting from the impingement of hot combustion residues upon flashing of said lamp, and the glass-crystal interfacial grain boundaries in said crystallized glass minimize the propagation of cracks through the thickness of said envelope.

4,045,157

SILENCER DEVICE FOR INDUSTRIAL BURNERS

Robert J. Peterson, Hillsdale, N.J., assignor to American Can Company, Greenwich, Conn.

Filed Apr. 30, 1976, Ser. No. 681,773
Int. Cl.[2] F23D *15/02*
U.S. Cl. 431—114 **8 Claims**



1. A silencer device adapted to be positioned near the combustion air intake orifice of the burner tube of an industrial burner; comprising

an outer toroid member having an outer wall and an inner wall separated therefrom, said inner wall being perforated, the space between said inner and outer toroid walls containing sound absorbed material therein, the front end of said toroid member forming a front air intake port;

a core member within said toroid member, said core member having a face of perforated heat-resistant material directed toward said burner tube air intake orifice, said core member containing sound absorbent material behind said face;

means to fasten said core member to the inner wall of said toroid member to thereby form a first air passage from the front air intake port of said toroid member, between said core member and said inner wall of said toroid member, to said intake orifice of the burner tube;

means to secure said silencer device to said burner tube and to thereby form a second air passage between said burner tube intake orifice and the rear end of said toroid member;

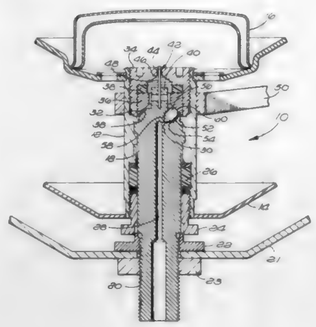
whereby the burner tube may be fastened to the silencer device with its intake orifice within said toroid member and said burner tube receives combustion air from both of said air passages and whereby noise from said burner tube is suppressed.

4,045,158

BURNER ASSEMBLY

Donald L. Coombs, and Richard E. Hollis, both of Springfield, Ohio, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,784
Int. Cl.[2] F24C *5/02*
U.S. Cl. 431—123 **5 Claims**



1. A burner assembly for liquid fuels comprising a stem member having a fuel passage therein, a body member engaging said stem member and axially movable thereon upon relative rotation therebetween, means providing a valve between said stem member and said body member, said body member including a nozzle having a nozzle opening therein, a needle carried by said stem member, said needle extending into said nozzle opening to close said opening when said valve means is in a closed position and being retractable to control said nozzle opening when said body member is moved relative to said stem member to open said valve means, said valve means comprising:

a generally transversely extending surface on said stem member, said fuel passage opening at said surface;

a valve seat in said fuel passage below said surface;

a poppet valve element loosely mounted in said fuel passage above said seat; and

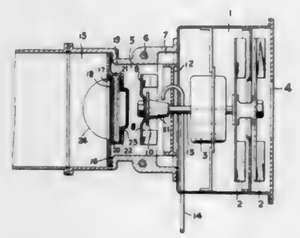
said body member engaging said poppet valve element pushing said element against said valve seat to close said fuel passage when said needle closes said nozzle opening.

4,045,159

COMBUSTION APPARATUS

Atsuyoshi Nishi, and Katuo Yashiro, both of Nakatsugawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed July 30, 1975, Ser. No. 600,378
Claims priority, application Japan, July 30, 1974, 49-90976[U]; July 30, 19874, 49-90980[U]
Int. Cl.[2] F23D *13/40*
U.S. Cl. 431—328 **5 Claims**



1. A combustion apparatus which comprises:

a mixing chamber for mixing a fuel and air for combustion separately introduced thereinto;

a combustion chamber for combustion of the mixed combustible gas being disposed adjacent to said mixing chamber;

a flame holes plate disposed between said mixing chamber and said combustion chamber for forming a combustion flame at a flame projecting aperture of said flame holes plate by injecting the mixed combustible gas from said mixing chamber therethrough to said combustion chamber; and

foraminous means disposed immediately adjacent said flame holes plate for uniformly maintaining the velocity of the mixed combustible gas injected from said mixing chamber through the flame projecting aperture of said flame holes plate to the combustion chamber over the entire peripheral part thereof lower than that at the central part thereof, wherein said velocity maintaining means comprises;

a porous plate between said flame holes plate and said mixing chamber; and

a choke plate having an opening which is smaller than said flame projecting aperture of said flame holes plate and being concentrically positioned on the mixing chamber side of said flame holes plate and said porous plate,

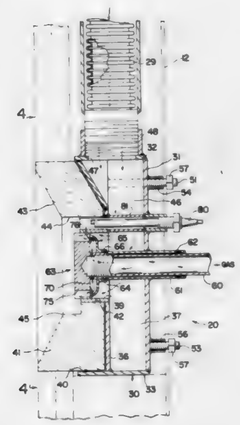
whereby the velocity of said mixed combustible gas injected from said mixing chamber through said opening of said choke plate, said porous plate and said flame projecting aperture of said flame holes plate to the combustion chamber is lower at the peripheral parts thereof than at the central parts thereof.

4,045,160

FLAT-FLAME GAS BURNER

Norman C. Michels, Bay Village, Ohio, assignor to Lee Wilson Engineering Company, Inc., Cleveland, Ohio

Filed Feb. 9, 1976, Ser. No. 656,519
Int. Cl.[2] F23D *13/12*
U.S. Cl. 431—348 **5 Claims**



1. A fuel gas burner adapted for mounting in a furnace wall facing the interior of the furnace and comprising:

an air inlet tube connected to said housing and having a section thereof extending through a portion of the wall of said furnace to heat air passing therethrough,

a housing defining an air plenum communicating with said air inlet, and also defining a forwardly facing plenum throat,

a combustion block formed of refractory material mounted in said housing surrounding said plenum throat and having a generally frusto-conical surface,

a fuel gas supply tube extending into said plenum throat,

distributor means mounted at the inner end of said supply tube and extending radially outward toward said plenum throat and defining therewith an annular air passage communicating with said plenum,

a nozzle element mounted at the inner end of said gas supply tube and defining with said distributor means a fuel gas chamber communicating with and located around said gas supply tube, said nozzle element having radially extending, pitched circumferential vanes that define swirl producing slots adapted to receive air from said plenum through said annular passage,

means for introducing fuel gas from said fuel gas chamber into said slots to be mixed with air, and

means for igniting the resulting fuel-air mixture to produce a generally flat-flame extending radially outwardly adjacent said frusto-conical surface.

4,045,161

ROTARY KILN HAVING A PLANETARY ROW OF COOLER TUBES

Hans Mollenkopf, Neubeckum; Jurgen Wurr, Ennigerloh; Antonius Vering, Ahlen; Bernhard Loffler, Warendorf, and Karl Eiring, Oelde, all of Germany, assignors to Polysius AG, Neubeckum, Germany

Filed Nov. 18, 1975, Ser. No. 632,997
Claims priority, application Germany, Dec. 13, 1974, 7441586[U]
Int. Cl.[2] F27B *7/38*
U.S. Cl. 432—80 **6 Claims**



1. A rotary kiln comprising a casing having an annular peripheral wall, a row of substantially parallel circumferentially spaced cooler tubes disposed around the periphery of said casing, and a plurality of individual heat conductive mounting plate means for said tubes, separately secured to said casing wall, the radially inner region of each individual mounting plate means near the casing being in side edge abutment with the corresponding inner region of each adjacent mounting plate means circumferentially of said casing and outer regions of adjacent mounting plate means located radially outward of said inner regions being spaced from one another in non-heat conducting relation circumferentially of said casing, the abutting radially inner regions of said plurality of said mounting plate means forming a substantially continuous annular link extending peripherally around said casing, and said tubes being disposed radially outwardly of said link.

4,045,162

METHOD OF BURNING GRANULAR OR PULVERULENT RAW MATERIAL AND KILN PLANT THEREFOR

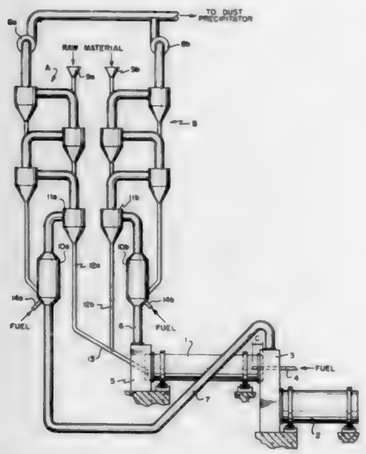
Søren Bent Christiansen, Copenhagen Valby, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Oct. 28, 1975, Ser. No. 626,478
Claims priority, application United Kingdom, Oct. 30, 1974, 47021/74
Int. Cl.[2] F27B *7/02*
U.S. Cl. 432—14 **33 Claims**

1. A method of heat treating granular or pulverulent raw

material by means of a suspension heat exchanger connected to the material inlet end portion of a rotary kiln having a burner pipe extending into the material outlet end portion, said heat exchanger including at least first and second multi-stage string preheating units operating in parallel, each of said units having at least one cyclone preheater stage defining a heat exchange zone in which the granular or pulverulent raw material is brought into heat exchange relationship with hot gases and a lowermost calcination stage for preheating and at least partially calcining the raw material, means to supply raw material to each of said multi-stage string preheater units, means for directing the preheated, at least partially calcined raw material to said material inlet end portion of said rotary kiln for sintering, and cooling means communicating with said rotary kiln defining a heat exchange zone in which the sintered material is brought into heat exchange relationship with cooling air comprising:

a. directing raw material to said multi-stage string preheating units for preheating and at least partially calcining the material;
b. feeding preheated, at least partially calcined material from said heat exchanger into said rotary kiln;
c. sintering the preheated, at least partially calcined material in said kiln;
d. directing the sintered material from said kiln into said communicating cooling means;



e. directing cooling air into said cooling means so as to contact said sintered material to effect a heat exchange between the sintered material and the cooling air thereby at least partially cooling the sintered material and at least partially heating the cooling air;
f. dividing the heated cooling air exiting the cooling means and directing a first portion of said heated cooling air to at least one of said calcination stages of at least a first of said multi-stage preheating units of said heat exchanger and directing a second portion thereof to said kiln in excess of that required to support combustion of fuel in the kiln for the sintering process thereby creating an intensified material cooling zone between the mouth of said burner pipe and the material exit end portion of said rotary kiln;
g. directing hot kiln exit gases to said calcination stage of at least a second of said multi-stage string preheating units; and
h. directing fuel to at least one of said calcination stages of said multi-stage string preheating units to support combustion with at least partially heated cooling air and thereby provide supplementary heating and at least partial calcining of said preheated material.

20. A plant for heat treating granular or pulverulent raw material which comprises:

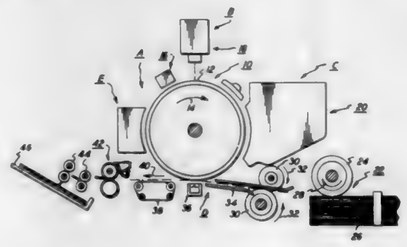
a. a heat exchanger having at least two preheating units operating in parallel relation, each preheating unit having at least a first preheater stage for preheating raw material, and at least a lowermost calcination stage to at least partially calcine the preheated raw material;
b. an inclined rotary kiln communicating with said exchanger and adapted and positioned to receive preheated, at least partially calcined material from said heat exchanger for sintering, said kiln having a material discharge end portion and a burner pipe extending into the material discharge end portion;
c. matterial cooling means communicating with the material discharge end portion of said rotary kiln and adapted to receive sintered material discharged from said material discharge end portion of said kiln;
d. means for dividing waste heated cooling air leaving the cooling means and for directing at least a portion of said cooling air to at least one of said calcination chambers of said heat exchanger and a portion to said kiln in excess of the air required to support combustion in the kiln for the sintering process, said excess cooling air thereby creating an intensive material cooling zone between the mouth of said burner pipe and the material outlet end portion of said rotary kiln;
e. means to direct hot kiln exit gases to at least one calcination stage of said heat exchanger; and
f. means to supply fuel to at least one of said calcination stages to support combustion therein with preheated cooling air to provide supplementary heat for said material and to at least partially calcine said preheated material.

4,045,163

HEATED FUSER RELEASE AGENT CONTAINER

Sukumaran K. Menon, Webster, and Louis R. Hattler, Marion, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 30, 1976, Ser. No. 719,043
Int. Cl.² F27B *9/28*
U.S. Cl. 432—59 **4 Claims**



1. An apparatus for metering a quantity of release material to a fuser member operatively associated with a back-up member to substantially fix particles to a sheet of support material passing therebetween, including:

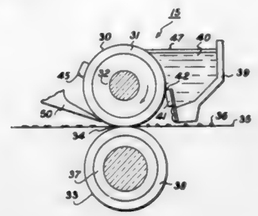
a housing defining a chamber for storing therein the release material, said housing comprising an inner shell defining the chamber for storing therein the release material, and an outer liner mounted contiguous with said inner shell and being made preferably from a thermally insulating material to substantially reduce loss of heat from the release material to the environment;
a substantially tubular heating member positioned in contact with a portion of said inner shell for heating said housing to maintain the release material in a substantially fluid state; and
means for applying release material from said housing to the surface of the fuser member.

4,045,164

USE OF SILICONE OIL AS A POLYETHYLENE OXIDATION RETARDANT IN A TONER IMAGE FUSING APPARATUS

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 22, 1974, Ser. No. 490,541
Int. Cl.² F27B *9/28*
U.S. Cl. 432—60 **5 Claims**



1. Contact fuser apparatus for fixing toner images to support sheets, said apparatus comprising:

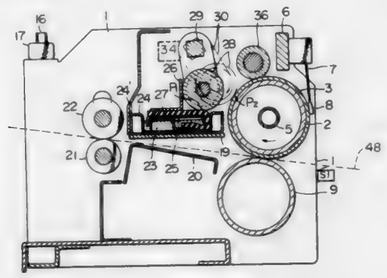
a heated fuser roll structure having a rigid, thermally conductive outer surface;
a backup roll forming a nip with said fuser roll structure through which said support sheets move with said toner images contacting said fuser roll structure;
thermally degradable means adapted to chemically react with said surface to form a thin toner impenetrable layer thereon;
a sump containing a quantity of said means adapted to chemically react with said surface;
means supporting said sump adjacent said fuser roll structure such that said surface directly contacts said chemically reacting material;
means for controlling the reactivity between said surface and the chemically reacting material contacted thereby whereby formation of a bead on said surface is retarded and wherein said thermally degradable material comprises polyethylene and said means for controlling reactivity comprises silicone oil.

4,045,165

CONTACT HEAT FIXING DEVICE

Takanobu Nakajima, Kashihara; Toshikazu Matsui, Kishiwada, and Tatsuo Aizawa, Osaka, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Oct. 17, 1975, Ser. No. 623,327
Claims priority, application Japan, Oct. 19, 1974, 49-120466
Int. Cl.² F27B *9/28*
U.S. Cl. 432—60 **4 Claims**



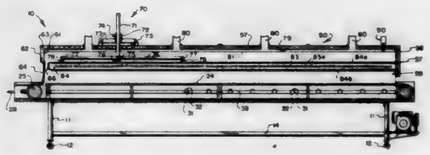
1. A contact heat fixing device which comprises a driving heated roller having a heating mechanism disposed in the interior thereof and a surface coated with an offset preventing material, a press roller which is rotatable in intimate contact under pressure with said heated roller, said press roller and heated roller being rotatably mounted on a frame plate, a vessel for containing therein an offset preventing liquid and a feed mechanism for supplying the offset preventing liquid to the heated roller from the vessel, fixation of a toner image being accomplished by the passage of a support having the toner image thereon through the nip position of the heated roller and the press roller, wherein said feed mechanism includes an applicator for applying the offset preventing liquid to the surface of the heated roller and supply means for supplying the offset preventing liquid from the vessel to the applicator, said applicator being a roller, at least the surface portion of which is composed of a porous, heat-resistant and abrasion resistant material having a liquid absorbing property, said applicator roller being supported by a swingable arm so that it can be rotated only in the same direction as that of rotation of the heated roller and it can shift between a position (**P1**) where it has a pressing contact with said supply means and a position (**P2**) where it has a pressing contact with said heated roller, said swingable arm being fixed to a shaft which is rotatably mounted on the frame plate and connected through a linkage to an electromagnetic solenoid mechanism said solenoid mechanism being energized in connection with a mechanism to be actuated at every copying operation synchronously with feeding of the support, so that when said solenoid mechanism is energized, the applicator roller is moved to said position **P2** to have a temporary contact with the surface of the heated roller and apply thereto the offset preventing liquid and when said solenoid mechanism is de-energized, said applicator roller being returned to the original position **P1** by its own weight, and said applicator roller and said supply means being arranged in such a positional relationship that while the applicator roller shifts from the position **P1** to the position **P2**, the applicator roller is rotated by frication with said supply means.

4,045,166

ARABIC BREAD OVEN

Jack T. Kaleel, 3801 Loretta Drive, Salt Lake City, Utah 84106

Filed Sept. 18, 1975, Ser. No. 614,508
Int. Cl.² F27B *9/00*
U.S. Cl. 432—146 **6 Claims**



1. An oven for baking Arabic-style bread and the like, comprising an endless mesh conveyor belt having an upper run and a lower run;

drive means for driving the conveyor belt;
support means for the conveyor belt and the drive means;
a housing having side walls extending upwardly from the edges of the upper run of the conveyor belt, a top wall interconnecting the side walls above the conveyor belt, an inlet end wall interconnecting the side and top walls and extending from the top wall towards the upper run of the conveyor belt to a location such that Arabic-style dough formed into a flat configuration and placed on the upper run of the belt can pass thereunder, a discharge end wall at the other end of the housing interconnecting the top and side walls and extending towards the belt to a distance such that a baked loaf of Arabic-style bread on the conveyor can pass thereunder, out of the housing, and a flexible flap fixed to and extending downwardly from the discharge end wall, between the side walls and terminating at about the upper surface of the upper run of the conveyor belt;
spaced lower burners extending transversely to the direction of travel of the conveyor belt between the upper run and the lower return run of the belt, said burners being ar-

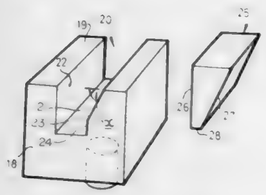
ranged from the inlet to the housing to a location beyond half the length of the housing;
means mounting said lower burners to be movable towards and away from said upper run;
upper burners in the housing above the upper run of the conveyor belt, said burners extending transversely to the upper run of the belt and being spaced in the housing from the discharge end of the housing less than one-half the length of the housing;
means mounting the upper burners to be adjustable towards and away from the upper run of the conveyor belt;
means for venting the interior of the housing, said means comprising
interconnected chambers formed in the side and top walls of the housing;
vent stacks connected into the chambers in the top wall;
openings in the side wall interconnecting the interior of the oven with the chambers in the walls; and
means for adjustably covering the said openings.

4,045,167

MUFFLED KILN CARS

John Elliott, Stoke-on-Trent, England, assignor to Acme Marls Limited, Stoke-on-Trent, England

Filed Nov. 6, 1975, Ser. No. 629,397
Int. Cl.[2] F27D *3/12*
U.S. Cl. 432—241 **2 Claims**



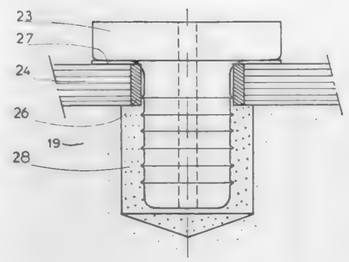
1. A clip assembly for a removable baffle plate of a muffled kiln car with a shelf, said assembly comprising a generally rectangular ceramic block having an upper and an under surface, the block having swivel mounting means provided on the under surface, adapted to swivelably mount the block upon the shelf of the kiln car, the block having a groove defined in its upper surface and adapted to receive the removable baffle plate, said groove being defined by a base and first and second walls, said first wall being upright and perpendicular to said upper surface, said second wall being inclined away from said first wall at least adjacent said upper surface of the block so as to intersect said upper surface at an angle in the range 60° to 70°, the assembly also comprising a truncated wedge of ceramic material having an apex angle in the range 20° to 30° and adapted to be inserted between the removable baffle plate and said second wall of the groove.

4,045,168

DEVICE FOR MOUNTING PANELS OF FIBROUS REFRACTORY MATERIAL

Lucien Abrial, Firminy, France, assignor to Creusot-Loire, Paris-Cedex, France

Filed Jan. 30, 1976, Ser. No. 654,006
Claims priority, application France, Feb. 26, 1975, 75.05923; Oct. 17, 1975, 75.31909
Int. Cl.[2] F27D *1/00*
U.S. Cl. 432—247 **5 Claims**



1. A device for mounting panels of fibrous refractory material of a predetermined thickness against a wall of an industrial furnace, the device comprising:
a plug of refractory material having the form of a bolt with a square head and a non-threaded cylindrical shank provided with a plurality of circular ribs, said plug having an axis arranged in planes perpendicular to the axis of said plug, the panels to be attached thereby having spaced-apart apertures of dimensions intermediate those of said head and of said ribs on the shank, and the wall of the furnace having corresponding cavities filled with a sealing material and for receiving said shank of the plug; and
two washers of combustible material, which are to be burned in the furnace and thereby eliminated at the first heating, one of said washers being adapted to be arranged between said head of the plug and the refractory panel to be mounted by said plug, the other of said washers having a height substantially equal to the thickness of the panel, and being adapted to line the apertures in the panel into which said plug is introduced and consequently surround a portion of said shank of the plug adjacent said head.

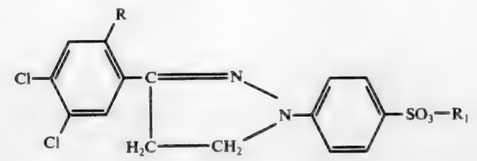
4,045,169

3-[3',4'-DICHLORO-6'-ALKYL-PHENYL]-Δ 2-PYRAZOLINE DERIVATIVES AND THEIR USE AS OPTICAL BRIGHTENERS

Helmut Mengler, Frankfurt am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Division of Ser. No. 483,355, June 26, 1974, Pat. No. 3,957,815, which is a division of Ser. No. 287,075, Sept. 7, 1972, Pat. No. 3,865,816. This application Feb. 18, 1976, Ser. No. 658,881
Claims priority, application Germany, Sept. 9, 1971, 2145019
Int. Cl.[2] D06P *1/38*; C07D *231/06*
U.S. Cl. 8—1 W **9 Claims**

1. A compound of the formula



in which R is alkyl of 1 to 4 carbon atoms and R_1 is alkyl of 1 to 20 carbon atoms.

5. A process for optically brightening synthetic fibers which comprises contacting the synthetic fiber with a compound as defined in claim **1**.

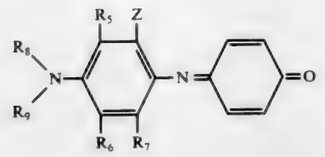
4,045,170

HAIR DYE COMPOSITION CONTAINING AN INDOANILINE

Gregoire Kalopissis, Paris; Andree Bugaut, Boulogne-sur-Seine, and Francoise Estradier, Paris, all of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 580,830, May 27, 1975, Pat. No. 3,963,764, which is a continuation-in-part of Ser. No. 249,227, May 1, 1972, abandoned, which is a continuation-in-part of Ser. No. 213,750, Dec. 29, 1971, Pat. No. 3,867,094. This application Mar. 1, 1976, Ser. No. 662,964
Claims priority, application Luxembourg, May 10, 1971, 63145; May 10, 1971, 63144; Dec. 30, 1970, 62348
Int. Cl.[2] D06P *3/08*
U.S. Cl. 8—11 **16 Claims**

1. A dye composition for keratinic fibers comprising an aqueous or aqueous alcoholic solution of an indoaniline selected from the group consisting of
a. an indoaniline having the formula



wherein Z is selected from the group consisting of amino, acetylamino and hydroxy; R_5, R_6 and R_7 each independently are selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and lower alkoxy having 1–6 carbon atoms; R_8 is selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and together with R_5 and the nitrogen atom to which R_8 is attached form dihydro-paroxazine; and R_9 is selected from the group consisting of hydrogen, lower alkyl having 1–6 carbon atoms and together with R_6 and the nitrogen atom to which R_9 is attached form dihydro-paroxazine, with the proviso that at least two of R_5, R_6, R_7, R_8 and R_9 are other than hydrogen when Z is NH_2 and that only one of R_8 and R_9 form dihydro-paroxazine;
b. an acid salt of said indoaniline in (a); and
c. a double chloride of zinc and said indoaniline in (a);
said indoaniline being present in an amount effective to color said fibers.

4,045,171

TREATMENT OF DYE WASTES

Leslie Emery Lancy, Ellwood City, Pa., assignor to Dart Industries Inc., Los Angeles, Calif.

Filed Mar. 28, 1975, Ser. No. 563,026
Int. Cl.[2] D06P *5/10*
U.S. Cl. 8—74 **10 Claims**

1. In a dyeing process for the production of color fast dyed textile articles wherein an undyed article is immersed in a dye bath for absorption of dye into its pores, and the dyed article having excess dye solution adhering to its surfaces is removed from said dye bath, the improvement which comprises:
contacting the removed article and the excess dye solution adhering thereto in a precipitation zone with an aqueous solution of a salt selected from halides or sulfates of metals of Group IA or Group IIA of the Periodic Chart in amounts such that the concentration of salt in the precipitation zone is at least 100 grams per liter of total liquid to precipitate the dye absorbed in the pores, to rinse the excess dye from the article and to precipitate said excess dye;
separating the precipitated dye from the aqueous salt solution substantially free of color,
recovering the aqueous salt solution for reuse in the precipitation zone, and
recovering a color fast dyed textile article.

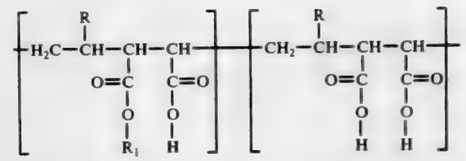
4,045,172

TEXTILE SOIL RELEASE COMPOSITION AND METHOD

John J. Duncan, Chattanooga, Tenn., and Alexander Kirjanov, S. Hamilton, Mass., assignors to GAF Corporation, New York, N.Y.

Continuation of Ser. No. 358,852, May 10, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,156
Int. Cl.[2] D06M *15/38*
U.S. Cl. 8—115.7 **2 Claims**

1. A polyester-containing cellulosic textile having thereon a cured soil-release composition which imparts soil-release properties thereto, comprising said soil-release composition having been applied to said textile and cured thereon, the latter composition comprising partial alkyl and oxyalkyl esters having the formula:



wherein R is an alkoxy group of 1 to about 7 carbon atoms, R_1 is selected from the group consisting of an alkyl chain having from 1 to 7 carbon atoms, an oxyalkylene chain having the formula:

$$R_2—(O—C_2H_4—)_m$$

in which R_2 is an alkyl chain having from 1 to about 30 carbon atoms and m is an integer of 1 to about 10, and mixtures thereof; x is between 40% and 50% by weight; y is between 50% and 60% by weight; and $x + y = 100\%$ by weight, said interpolymer being water-dispersible, having an acid number at least 5% higher than the theoretical acid number of the full half ester, and an nsp value of from about 0.2 to 3.5, based upon the specific viscosity of a one-gram concentration of said interpolymer in methyl ethyl ketone at 25° C., the pH of said inter-

polymer composition in water ranging from between 2.2 and about 4.0 and being controlled, as required, through the addition of a base.

4,045,173

TEXTILES FLAME RETARDED WITH HYDROXYMETHYLPHOSPHORUS COMPOUNDS IN COMBINATION WITH POLY(ETHYLENEUREAS) AND POLY(N-METHYLOLETHYLENEUREAS)

Stanley P. Rowland, New Orleans, La., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 18, 1975, Ser. No. 633,069
Int. Cl.² D06M *13/30*
U.S. Cl. 8—116 P **2 Claims**

1. A process for imparting durable flame retardancy to textiles comprising:

a. impregnating a textile fabric in an aqueous solution containing a nitrogeneous compound selected from the group consisting of a poly(ethyleneurea) made by reacting urea with a polyamine from the class of polyethylenamine or polyethyleneimine and a poly(N-methylolethyleneurea) made by the methylolation of the above-mentioned poly(ethyleneurea) and a phosphorus containing compound selected from the group consisting of tetrakis(hydroxymethyl)phosphonium chloride, tetrakis(hydroxymethyl)phosphonium hydroxide and tris(hydroxymethyl)-phosphine; and

b. drying and curing the impregnated fabric from (a).

4,045,174

METHOD OF CLEANING TEXTILES

Heinrich Fuhring, Augsburg, and Johannes Helmut Sieber, Aystetten, both of Germany, assignors to Bowe, Bohler & Weber KG Maschinenfabrik, Augsburg, Germany

Filed Jan. 10, 1975, Ser. No. 539,993
Claims priority, application Germany, Jan. 11, 1974, 2401296
Int. Cl.² D06L *1/00*
U.S. Cl. 8—142 **5 Claims**

1. A method of cleaning textiles, comprising the steps of:

presoaking a load of textiles to be cleaned within a vessel in an organic dry cleaning solvent vaporizable, at least when in an aqueous azeotropic mixture, at a boiling point lower than that of water;

removing excess solvent from the presoaked textiles while leaving some wetted with residual solvent;

immersing the solvent-wetted textiles within said vessel in a detergent-enriched water bath with resulting transfer of residual solvent from said textiles to the bath;

washing said textiles by agitation in said bath while increasing the bath temperature to a level below the boiling point of water but high enough to vaporize said solvent, thereby progressively depleting said bath of solvent;

measuring the rate of vaporization of said solvent; and

terminating the immersion upon a dropping of said rate to substantially zero.

4,045,175

MICRO-METHOD OF ERYTHROCYTE SEDIMENTATION

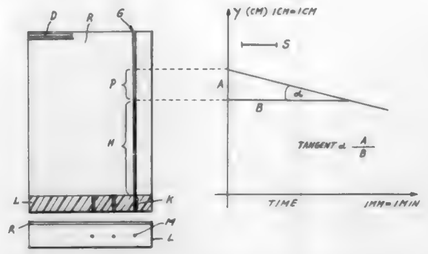
Ragnar Weber, No. 67, Rainweg, 6904 Ziegelhausen, Germany

Filed Dec. 10, 1975, Ser. No. 639,323
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **1 Claim**

1. A micro-method of determining erythrocyte sedimentation in the blood of a patient, said method comprising

a. introducing a blood sample into a vertical capillary tube having an anticoagulant heparin coating on the interior surface thereof,

b. measuring the distance from the original level of the blood in said tube to the erythrocyte level at a predetermined time interval after the blood sample is introduced into the tube, and



c. determining the angle of inclination of the straight sedimentation line in a plot of sedimentation distance against time as a measure of the pathological condition of said patient.

4,045,176

PREPARATION OF OPTICALLY CLEAR SERUM

Gary J. Proksch, 586 W. 77th North Drive, and Dean P. Bonderman, 1045 W. 77th South Drive, both of Indianapolis, Ind. 46260

Continuation-in-part of Ser. No. 586,569, June 13, 1975, Pat. No. 3,955,925, which is a continuation of Ser. No. 414,799, Nov. 12, 1973, abandoned. This application Mar. 29, 1976, Ser. No. 671,175
The portion of the term of this patent subsequent to May 11, 1993, has been disclaimed.
Int. Cl.² G01N *33/16*
U.S. Cl. 23—230 B **20 Claims**

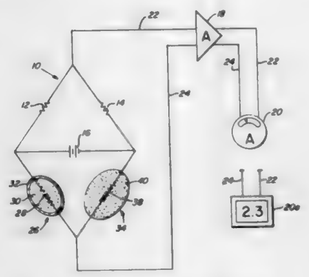
1. A substantially human serum for use as a standard or reference material is assaying human blood, said human serum being improved by containing in addition to essentially all normal human serum components, isolated non-primate, animal lipoproteins which contain cholesterol.

4,045,177

APPARATUS FOR DETECTING COMBUSTIBLE GASES

Frank X. McNally, Venetia, Pa., assignor to CSE Corporation, Monroeville, Pa.

Filed Aug. 16, 1976, Ser. No. 714,602
Int. Cl.² G01N *27/16*
U.S. Cl. 23—254 E **6 Claims**



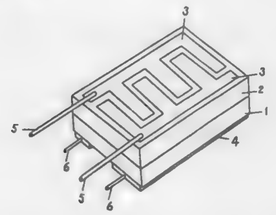
1. In an apparatus for detecting a combustible gas, such as methane, by a combination including a Wheatstone bridge circuit having a reference element comprising an electrically conducting member coated with a refractory, said reference element constituting one leg of said bridge, a detector element comprising an electrically conducting member coated with a refractory and having on the surface of said refractory a catalyst for the oxidation of said gas, said detector element constituting a second leg of said bridge, whereby upon catalytic oxidation of said gas an electrical signal approximately proportional to the amount of said gas present at the detector element is produced, the improvement comprising means at said reference element which increases its emissivity to the same emissivity as that of said detector element, whereby the energy radiation of the reference element is substantially linearly proportional to the energy radiation of the detector element during oxidation of said combustible gas at said detector element.

4,045,178

REDUCING GAS SENSOR

Hideyuki Okinaka, Setsu; Atsushi Iga, Tatatsuki; Masatake Ayusawa; Masatugu Yamaguchi, both of Hirakata; Seiichi Nakatani, Kadoma, and Toshiaki Yagami, Shijyonawate, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 3, 1976, Ser. No. 738,745
Claims priority, application Japan, Nov. 8, 1975, 50-134285; Nov. 8, 1975, 50-134286; Nov. 8, 1975, 50-134287; Nov. 11, 1975, 50-135772; Nov. 11, 1975, 50-135773; Nov. 13, 1975, 50-136941
Int. Cl.² G01N *27/12*
U.S. Cl. 23—254 E **11 Claims**



1. A reducing gas sensor comprising a gas sensitive element composed of, as a main constituent, γ-ferric oxide (γ-Fe_2O_3) and, as an additive, at least one member selected from the group consisting of WO_3, MoO_3, SiO_2, GeO_2, Li_2O, Na_2O, K_2O, CaO, SrO, BaO, Eu_2O_3, La_2O_3, CeO_2, Al_2O_3, Ga_2O_3, In_2O_3, SnO_2, TiO_2, MgO, NiO, ZnO, Mn_2O_3 and Cr_2O_3, a pair of electrodes on said sensitive element and a heater element adjacent said element, whereby when said gas sensitive element is heated to an elevated temperature it undergoes a rapid decrease in electrical resistance upon coming in contact with an atmosphere containing a reducing gas.

4,045,179

TEMPERATURE CONTROL APPARATUS FOR USE IN INVESTIGATING SPECIMENS

Roger Abraham Bunce, Birmingham, England, assignor to Secretary of State for Social Services, London, England

Filed June 11, 1976, Ser. No. 695,032
Claims priority, application United Kingdom, June 11, 1975, 35118/75
Int. Cl.² F27D *11/00*; B01L *7/02, 9/06*; G01N *1/10*
U.S. Cl. 23—259 **6 Claims**

1. Apparatus for use in investigating specimens, comprising:

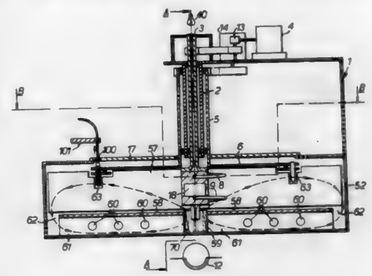
a. a substantially horizontal turntable having a central rotational axis and being adapted to support in a circular array centered on the said rotational axis a plurality of specimen vessels, each such vessel being positionable to extend down below the underside of the turntable;

b. means for stepwise advancing the turntable about the said rotational axis so that, during dwell periods of the turntable, specimens deposited during previous dwell periods in the vessels may be investigated;

c. an enclosure disposed beneath the turntable having an internal surface symetrically positioned about the said rotational axis so as to define a space bounded laterally and at the bottom by the said enclosure and upwardly by the turntable;

d. a baffle plate disposed within the enclosure so as to provide between this plate and the turntable a first space into which the vessels extend when supported by the turntable, and between said plate and the base of the said enclosure a second space, the outer edge of the baffle plate being separated by an air gap from the peripheral wall of said enclosure, said baffle plate being a central hole for air to circulate between said first and second spaces by way of the air gap and the said central hole;

e. a rotary vane disposed in the said first space and mounted



with its axis of rotation coincident with that of the turntable, the vane being formed with at least one cut-out portion as necessary to permit relative rotational movement between the turntable containing vessels and the vane, the shape of said vane conforming substantially the vertical cross-sectional shape of said first space so that upon rotation it sweeps out a volume substantially equal to that of the said first space:

f. air temperature changing means disposed in said second space; and

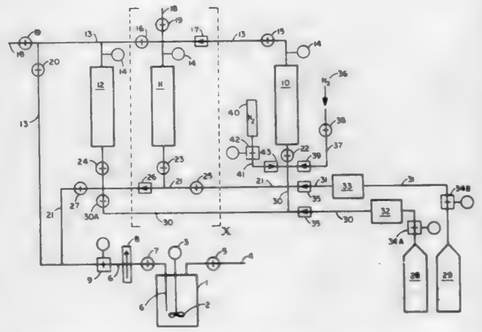
g. a control device for the air temperature changing means to maintain the temperature of the vessels substantially at a predetermined value.

4,045,180

APPARATUS FOR COPOLYMERIZING GASEOUS MONOMERS

Robert Hayward Young, Somerville, and Markus Matzner, Edison, both of N.J., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 4, 1976, Ser. No. 693,131
Int. Cl.² B01J *1/00*; C08F *2/00*
U.S. Cl. 23—260 **9 Claims**



1. Apparatus for copolymerizing at least two gaseous monomers comprising:

A. a closed reactor for receiving said monomers and subjecting them to copolymerizing conditions;

B. at least three feed tanks for containing said monomers

under pressure under conditions which preclude copolymerization;

C. a first feed manifold connected to one end of each said tank and to said reactor;

D. first valve means in said first feed manifold for controlling flow therein between the first and second of said feed tanks. for controlling flow therein between the second and third of said feed tanks and for controlling flow therein between said feed tanks and said reactor;

E. a second feed manifold connected to the other end of each of said feed tanks and to said reactor;

F. second valve means in said second feed manifold for controlling flow from each of said three feed tanks into said second feed manifold; and

G. third valve means in said second feed manifold for controlling flow therein between said first and second tanks and for controlling flow therein between all said feed tanks and said reactor.

4,045,181

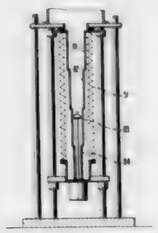
APPARATUS FOR ZONE REFINING

John W. Burd, Chesterfield; Bobbie D. Stone, Ballwin; William F. Tucker, Chesterfield, and Kedar P. Gupta, Creve Coeur, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 27, 1976, Ser. No. 754,155

Int. Cl.[2] B01J *17/10*

U.S. Cl. 23—273 R **7 Claims**



1. In an apparatus for zone refining polycrystalline semiconductor rods to produce monocrystalline semiconductor rods, said apparatus having an RF induction heating coil, a rod holder and a seed holder aligned vertically above and below said heating coil, said rod holder being adapted to hold one end of a polycrystalline semiconductor rod to be refined and said seed holder being adapted to hold a seed crystal of said semiconductor, means for moving said rod holder relative to said RF induction heating coil to bring the free end of the polycrystalline semiconductor rod into proximity with said RF induction heating coil to melt said free end, and means for moving said seed holder relative to said RF induction heating coil so that the seed crystal contacts and fuses with the molten free end of the polycrystalline rod, said rod holder and said seed holder thereafter being moved in the same direction relative to said RF induction heating coil so that the zone of the melt is moved along the length of the semiconductor rod, the improvement comprising:

an induction heating chamber having said RF inductive heating coil fixed therein, said induction heating chamber having a longitudinal dimension indendent of the length of the polycrystalline semiconductor rod to be processed,

a first gas tight bellows surrounding said rod holder, one end of said bellows being attached to said induction heating chamber and the other end of said bellows being attached to the base of said rod holder, said bellows expanding and collapsing with the relative movement of said rod holder and said RF induction heating coil,

a second gas tight bellows surrounding said seed holder, one end of said bellows being attached to said induction heating chamber and the other end of said bellows being attached to the base of said seed holder, said bellows expanding and collapsing with the relative movement of said seed holder said RF induction heating coil, and

a plurality of telescoping metallic cylinders surrounding said seed holder. within said corresponding second gas tight bellows, the largest of the telescoping metallic cylinders being attached in common with said second bellows to said induction heating chamber and the smallest of the telescoping steel cylinders being attached to the base of said seed holder, said plurality of telescoping metallic cylinders serving to protect said second bellows from molten semiconductor at all times when zone refining is taking place.

4,045,182

HYDRODESULFURIZATION APPARATUS WITH UPSTAGED REACTOR ZONES

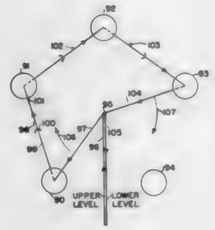
William S. Bonnell, Mount Lebanon; Robert D. Christman, Pittsburgh; Jordan S. Lasher, Pittsburgh; John A. Paraskos, Pittsburgh, and Stephen J. Yanik, Valencia, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 632,374, Nov. 17, 1975, Pat. No. 4,017,382.

This application Aug. 17, 1976, Ser. No. 715,035

Int. Cl.[2] B01J *8/04, 1/00*

U.S. Cl. 23—288 R **5 Claims**



1. A reactor apparatus comprising three or more reactor means disposed substantially equidistantly with respect to each adjacent other reactor with each centered on the locus of a circle, connecting conduit means, free of valves, between at least two adjacent reactor means including a lead reactor means and an end reactor means to provide series flow between said adjacent reactor means, at least one reactor means being disconnected from said series flow system, feed conduit means extending radially from substantially the center of said circle to the lead reactor means in said series, discharging conduit means also extending radially from substantially the center of said circle to the end reactor means of said series, first conduit disconnecting means disposed at the center of the circle permitting said feed conduit means to be rotated to or from any of the reactor means in the circle and second conduit disconnecting means disposed at the center of the circle permitting said discharge conduit means to be rotated to or from any of the reactor means in the circle.

4,045,183

SUPPORT DEVICE FOR USE IN A CRUCIBLE-FREE FLOATING ZONE MELTING APPARATUS

Gerhard Barowski; Wolfgang Keller, and Gerhard Schroetter, all of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 18, 1975, Ser. No. 632,957

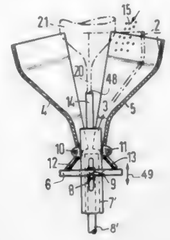
Claims priority, application Germany, Nov. 21, 1974, 2455173

Int. Cl.[2] B01J *17/10*

U.S. Cl. 23—273 SP **17 Claims**

1. In an apparatus for crucible-free zone melting of a crystalline rod of semiconductor material which rod is vertically mounted in the apparatus by mounting means engaging each end of the rod with the lower end of the rod having a junction

surface with a seed crystal, said apparatus having a container attached for rotation with the lower mounting means and surrounding said lower end for receiving a stabilization medium to support said lower end from vibration, the improvements comprising said container comprising a plurality of individual sections, said sections being moveable relative to each other from a first position spaced from the seed crystal



and said lower end of the rod to enable melting of the rod adjacent to the junction surface to a second position forming the container and surrounding both the seed crystal and said lower end of the rod, and means for holding the sections in said second position so that the container can receive the stabilization medium to support the seed crystal and the end of the rod to reduce vibrations applied to the junction surface and an adjacent conical portion of the lower end of the rod.

4,045,184

FLUIDIZED-BED REACTOR FOR CARRYING OUT CHEMICAL REACTIONS BETWEEN LIQUIDS AND SOLID GRANULATED SUBSTANCES

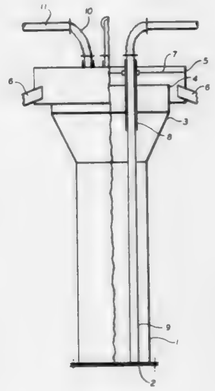
Georgi Alexandrov Haralampiev; Georgi Petrov Girdjev; Lyudmila Karlo Cheyka; Assen Parvanov Milenov, all of Sofia; Lyuben Rangelov Starev, Plovdiv; Georgi Ivanov Abrashev, Plovdiv, and Ivaylo Yanev Grigorov, Plovdiv, all of Bulgaria, assignors to Kzm "D. Blagoev", Plovdiv, Bulgaria

Filed Mar. 22, 1976, Ser. No. 669,069

Claims priority, application Bulgaria, Mar. 24, 1975, 29421

Int. Cl.[2] B01J *8/20;* **C22B** *3/02*

U.S. Cl. 23—283 **1 Claim**



1. A fluidized-bed reactor for carrying out chemical reactions between liquids and solid granulated substances, comprising a reaction cylinder having a flat bottom, and having a pressure pipe conduit for fluidizing liquid disposed therein, a transition zone, an upper cylinder and an overflow cylinder with overflow gutters positioned at the upper and outward position thereof, said reaction cylinder connected to said upper cylinder and said overflow cylinder by said transition zone a supporting frame positioned and fastened to the walls of said overflow cylinder guiding sleeves fastened to said supporting frame; vertically moveable pipes disposed inside said guiding sleeves and arranged to touch the bottom of said reaction cylinder at their outlet so as to form a seal against reverse flow, said vertically moveable pipes connected by means of flexible connectors to said pressure pipe conduit for the fluidizing liquid whereby upon introduction of said fluidizing liquid through said pressure pipe conduit, said flexible connectors, and said vertically moveable pipes, the pipes will lift to balance hydraulic forces allowing fluid to flow into said reaction cylinder, and whereby upon termination of liquid introduction said vertically moveable pipes will return to a sealing position against said bottom by force of gravity.

4,045,185

AUTOCLAVE

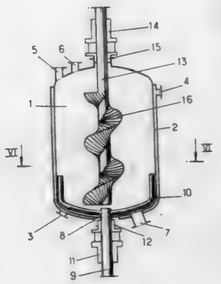
Michel Azemar, Soucieu-en-Jarrest, and Lucien Viglecca, Venissieux, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 20, 1976, Ser. No. 734,084

Claims priority, application France, Oct. 21, 1975, 75.32124

Int. Cl.[2] B01J *3/00;* **B01F** *7/16*

U.S. Cl. 23—290 **11 Claims**



1. An autoclave for preparation in bulk of polymers and copolymers based on vinyl chloride comprising a vessel, at least one agitator mounted for rotational movement within said vessel consisting essentially of a ribbon wound in helicoidal turns on a substantially vertical rotatable shaft, the upper surface and the lower surface of said ribbon being respectively surfaces S_1 and S_2 each generated by displacement of a straight segment of a line of substantially constant length, when one of the ends describes a helix on a cylinder which forms a surface of the rotatable shaft, said segments being situated during their displacement in planes tangential to said cylinder, upper surface S_1 extending from the shaft at a negative angle ϕ_1 with the plane perpendicular to the axis of the rotatable shaft and the lower surface S_2 extending at a positive angle ϕ_2 with the plane perpendicular to the axis of the rotatable shaft.

4,045,186

METHOD FOR PRODUCING LARGE SOFT HEXAGONAL BORON NITRIDE PARTICLES

Francis R. Corrigan, Westerville, Ohio, assignor to General Electric Company, Worthington, Ohio

Continuation-in-part of Ser. No. 622,822, Oct. 15, 1975, abandoned, which is a continuation of Ser. No. 394,635, Sept. 6, 1973, abandoned. This application Dec. 6, 1976, Ser. No. 747,845

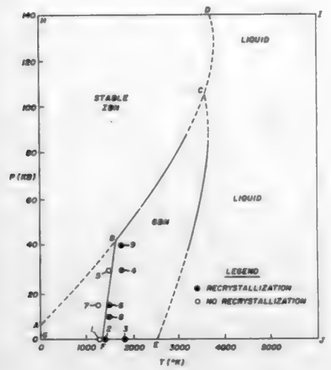
Int. Cl.[2] B01D *9/02;* **B01J** *17/04;* **C01B** *35/00, 21/06*

U.S. Cl. 23—295 R **7 Claims**

1. The method of producing soft hexagonal boron nitride crystals of larger than 50 microns average particle size which comprise the steps of:

a. mixing graphitic boron nitride particles (GBN) of less than 50 microns average particle size and lithium nitride, the boron nitride comprising 50 to 85 mole percent of the boron nitride-lithium nitride mixture,

b. simultaneously subjecting said mixture, and (d) separating the GBN crystals from the mixture to values of pressure



and temperature within Region FBCE of the Figure;
c. cooling and depressurizing said mixture.

4,045,187

CARBONACEOUS MATERIAL

Andries Brink; Adriaan Hendrikus Stander, and Leonard James Dry, all of Sasolburg, South Africa, assignors to South African Coal, Oil & Gas Corporation Limited, Sasolburg, South Africa

Filed May 20, 1975, Ser. No. 579,089
Claims priority, application South Africa, May 24, 1974, 74/3325
Int. Cl.² C10L *9/00;* C10G *1/00;* C10B *51/00*
U.S. Cl. 44—1 B **20 Claims**

1. A coking blend, which when subjected to conventional coking conditions is converted to a coke useful for metallurgical purposes, said blend consisting essentially of:

i. up to about 10% by weight of a carbonaceous material derived from solid carbonaceous fossil fuel, subjected to deoxygenation and dewatering in the presence of hydrogen and a solvent having hydrogen carrier properties which consists essentially of the combined, substantially non-volatile, substantially solid product and residues of said deoxygenation, including ash and carbonaceous insolubles, the material having a ring and ball softening point about 30° C, and

ii. the balance of said blend consisting of coal having coking properties inadequate for metallurgical purposes.

11. A process for the manufacture of coke useful for metallurgical purposes, which consists essentially of:

i. preparing a carbonaceous residue by subjecting a solid carbonaceous fossil fuel material of which the oxygen content is undersirably high for satisfactory coking properties to a step of deoxygenation and removal of such water as may be present, which step comprises heating the carbonaceous material in intimate contact with a liquid solvent and a hydrogen carrier and hydrogen under pressure to effect the deoxygenation, followed by distilling the solvent and such volatiles as are formed off the combined product of said heating, and recovering the combined residue,

ii. blending up to about 10% by weight of the carbonaceous material produced by step (i) with ordinary coal having coking properties unsatisfactory for metallurgical purposes, and

iii. subjecting the blend of step (ii) to conventional coking conditions and recovering the resulting coke as a product.

4,045,188

FUEL ADDITIVES FOR INTERNAL COMBUSTION ENGINES

Kenneth A. Hirschey, 6804 Southdale Road, Edina, Minn. 55435

Filed Dec. 29, 1975, Ser. No. 644,626
Int. Cl.² C10L *1/02*
U.S. Cl. 44—56 **3 Claims**

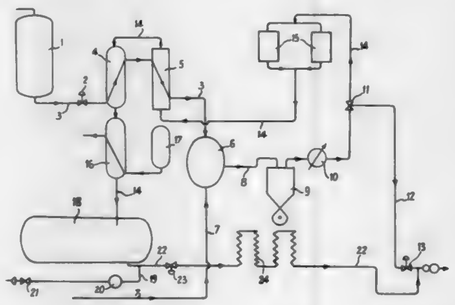
1. Hydrocarbon motor fuel for internal combustion engines and containing an additive therein consisting of an admixture of ditertiarybutyl peroxide and ditertiarybutyl alcohol on a basis of between about 1 part peroxide to about 20 parts ditertiarybutyl alcohol up to about 1 part ditertiarybutyl peroxide to about 1 part of ditertiarybutyl alcohol, with the ditertiarybutyl peroxide - ditertiarybutyl alcohol admixture being present in said fuel in an amount ranging from between about 0.1 ppm. to about 1 ppm. of the ditertiarybutyl peroxide component.

4,045,189

METHOD FOR PREPARING FUEL MIXTURES FOR TORCHES AND BURNERS

Maurice Bruni, Tremblay lesGonesses, and Georges Seris, Anthony, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude, Paris, France

Filed June 17, 1976, Ser. No. 697,259
Claims priority, application France, June 20, 1975, 75.19303
Int. Cl.² F17D *1/04;* C10L *3/02*
U.S. Cl. 48—190 **5 Claims**



1. A method of preparing a fuel mixture suitable for torches and burners to be used in welding and cutting operations and comprising from about 10 to about 60 mol % acetylene and from about 40 to about 90 mol % ethylene, comprising the steps of

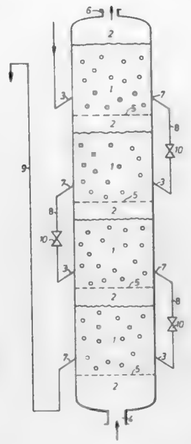
1. providing liquid ethylene at a temperature of −100° to −80° C and at a pressure on the order of about 1.4 to 3.4 bara;
2. providing acetylene at ambient temperature;
3. first vaporizing and then heating said ethylene to a temperature of − 30° to −25° C;
4. mixing said acetylene and said gaseous ethylene in desired proportions at a pressure very slightly above atmospheric and at a temperature in the range of −25° to +20° C;
5. compressing said mixture to a pressure of 2 to 5 bara;
6. distributing a first fraction of said compressed mixture at a pressure of 2 to 5 bara, and cooling and condensing said second fraction by passing the remaining second fraction in heat exchange relationship with said ethylene to effect said vaporizing and heating of said ethylene in step (3), and storing the resultant liquid mixture at 2 to 5 bara.

4,045,190

METHOD FOR REGULATING THE FLOW OF LIQUID THROUGH MASS TRANSFER COLUMNS

Artur Judat; Helmut Judat, both of Langenfeld, and Gerd Grah, Haan, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 6, 1974, Ser. No. 476,830
Claims priority, application Germany, June 19, 1973, 2331195
Int. Cl.² B01D *47/02*
U.S. Cl. 55—93 **7 Claims**



1. A method for regulating the heights of bubble layers in multistage mass-exchange columns with gas-distributor plates arranged at intervals above one another, in which the compartments each formed by two vertically adjacent gas-distributor plates communicate with one another through tubes which comprises throttling the flow of liquid through the tubes in response to the pressure difference between the gas cushions below the gas-distributor plates of two successive compartments.

5. An apparatus for bubbling a gas through a liquid comprising a vertically disposed housing enclosing a columnar space, means for introducing a gas into the bottom of the space, means for introducing liquid into the space above the gas introducing means, a plurality of vertically spaced plates which are pervious to gas and impervious to liquid separating the said columnar space into compartments, means for flowing liquid from one compartment to another comprising a throttle valve which is responsive to gas pressure, or to liquid height in a compartment into which liquid flows.

4,045,191

RADIOACTIVE KRYPTON GAS SEPARATION

Jay Robert Martin, Grand Island, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 252,219, May 11, 1972, Pat. No. 3,944,646.
This application June 23, 1975, Ser. No. 589,525
Int. Cl.² B01D *53/02*
U.S. Cl. 55—179 **6 Claims**

1. Apparatus for the separation of radioactive krypton from a feed gas mixture comprising nitrogen and trace amounts of carbon dioxide and said radioactive krypton comprising;

a. at least two crystalline zeolite molecular sieve adsorbent beds arranged in parallel flow relation;

b. means for providing said feed gas mixture at superatmospheric pressure and ambient temperature and sequentially introducing same to the inlet end of each of said adsorbent beds;

c. heat exchange means having first and second passageways and means for passing nonadsorbed prepurified gas from the discharge end of each of said adsorbent beds to said first passageway for cryogenic cooling therein;

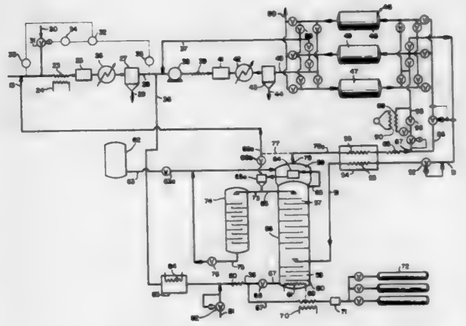
d. a distillation column comprising a top reflux condenser, a bottom kettle with heating means, and a multiplicity of spaced liquid-gas contact trays intermediate said top reflux condenser and said bottom kettle;

e. a liquid nitrogen supply and means for introducing same to the top reflux condenser;

f. conduit means for introducing the cryogenically cooled prepurified gas from said heat exchanger means to an intermediate tray section of said distillation column for mass and heat exchange with krypton-depleted condensate to form krypton-depleted vapor and krypton-enriched liquid;

g. a conduit means for passing said krypton-depleted vapor from the upper end of the distillation column intermediate tray section to said top reflux condenser for heat exchange with said liquid nitrogen supply to form nitrogen overhead gas and krypton-depleted condensate, and means for returning at least part of said krypton-depleted condensate to the upper end of said intermediate tray section;

h. conduit means for passing said nitrogen overhead gas to said second passageway of said heat exchanger means for partially rewarming same to about ambient temperature and for said cryogenic cooling of said prepurified gas;



i. other conduit and flow control means for sequentially passing a first part of the partially rewarmed nitrogen overhead gas at low pressure as cool purge gas to the feed discharge end of each of said adsorbent beds having previously been at least partially loaded with carbon dioxide and krypton from said feed gas mixture, for substantially complete desorption of only said krypton;

j. conduit means for returning the krypton-containing first part of cool purge gas from the adsorbent bed inlet end to the feed gas mixture providing means (b);

k. means for further warming a second part of said partially rewarmed nitrogen overhead gas as hot purge gas, and still other conduit and flow control means for sequentially passing same to the feed discharge end of each of said adsorbent beds having previously been at least partially loaded with carbon dioxide and krypton from said gas mixture and thereafter substantially completely desorbed of only said krypton, for desorption of the remaining carbon dioxide;

l. conduit means for discharging the carbon dioxide-containing hot purge gas from the adsorbent bed feed inlet end; and

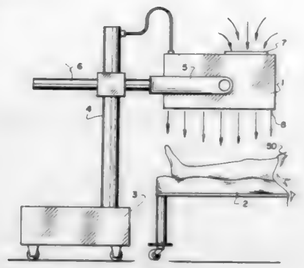
m. conduit and flow control means for sequentially introducing a third part of said partially rewarmed nitrogen overhead gas to the feed discharge end of each of said adsorbent beds after the hot purge gas flow for recooling thereof.

4,045,192

MOBILE FILTERING APPARATUS FOR KEEPING PATIENTS UNDER ASEPTIC CONDITIONS

Wolfgang Eckstein, Sereetz, and Frank Benthin, Lubeck-Israelsdorf, both of Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Filed Aug. 25, 1976, Ser. No. 717,694
Claims priority, application Germany, Sept. 6, 1975, 2539743
Int. Cl.² B01D *47/00*
U.S. Cl. 55—222 **9 Claims**



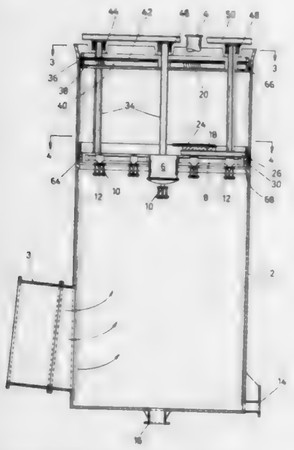
1. A mobile air filtering apparatus for keeping patients in hospital rooms under aseptic conditions, comprises a housing having an inlet for the inflow of air adjacent one end and an outlet for the discharge of filtered air to the patient adjacent the opposite end, a pre-filter located adjacent said inlet, air feeding means, a heater, and a mechanical filter arranged in succession between said inlet and said outlet, and a diffusion foil moistener located in the air stream between said heater and said mechanical filter and having a heat exchanger conduit for conducting water through the moistener which is coiled around said filter.

4,045,193

COOLING TOWER DESIGN

George Andrew Halliday, Etobicoke, Canada, assignor to Fabricated Plastics Limited, Rexdale, Canada

Filed Oct. 2, 1975, Ser. No. 618,965
Claims priority, application Canada, Sept. 15, 1975, 235467
Int. Cl.² B01D *47/06*
U.S. Cl. 55—257 PV **8 Claims**



5. A cooling tower for cooling liquid by counter-current flow through a rising flow of air comprising:

an upright surrounding wall having an upper end, and defining a flue adapted to contain said counter-current flow of liquid and air;

conduit means adapted to distribute said liquid to substantially the entire area of said flue and having outlet ports at spaced intervals adapted to disperse said liquid into said air flow;

demister means disposed across the flue in the path of said air flow and adapted to remove vapour therefrom;

support means adapted to support said liquid conduit means and said demister means in said tower and adapted to permit removal and replacement thereof as a unit; said support means including:

horizontal beams spanning across said flue to rest on the upper end of said wall;

a plurality of vertical members depending from said beams within said flue adjacent to said wall;

a first ring and a second ring respectively mounted on said vertical members and extending horizontally around said flue parallel to and in close proximity to said wall and having an inwardly projecting ledge;

a first platform and a second platform respectively formed of a lattice of intersecting beams resting at their outer ends on the ledge of said rings respectively;

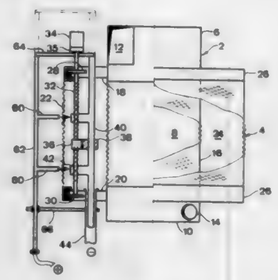
said first platform being spaced above said second platform and being thus adapted to support said demister means resting thereon and said liquid distribution means being suspended from said second lower platform.

4,045,194

APPARATUS FOR CLEANING AIR

Johann Walter Ferri, Uster, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Sept. 13, 1976, Ser. No. 722,889
Claims priority, application Switzerland, Sept. 23, 1976, 12331/76
Int. Cl.² B01D *46/38*
U.S. Cl. 55—290 **7 Claims**



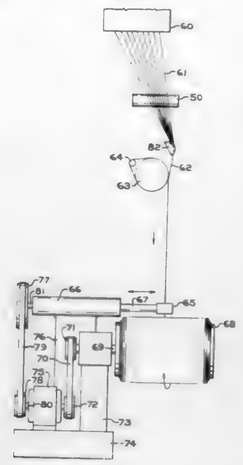
1. An apparatus for cleaning air charged with contaminants, especially fibers and dust, comprising a pre-separator, a dust filter cooperating with the pre-separator, said dust filter comprising a rotatable filter drum having a substantially cylindrical filter body possessing a filter, at least one movable suction nozzle effective at the filter of the dust filter, said pre-separator comprising a body of rotation having an inlet portion structured for generating a spin flow and a jacekt portion structured as a sieve surface, said filter drum surrounding the jacket portion of the pre-separator, said filter having an inner surface, the movable suction nozzle being operatively associated with the inner surface of the filter, and drive means operatively connected with the suction nozzle and the filter drum.

4,045,195

METHOD OF PREPARING GLASS STRAND AND NOVEL GLASS STRAND PACKAGES

Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Dec. 3, 1975, Ser. No. 637,344
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **12 Claims**



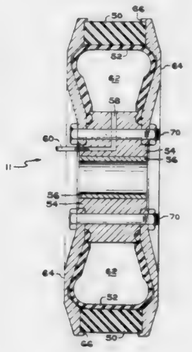
1. A method of winding glass strand comprising drawing a plurality of glass filaments from a molten glass feeding means, gathering said filaments into a strand, passing the strand so formed through a tension reducing zone to reduce tension thereon, passing the strand through a fluid turbulence means wherein a gaseous fluid is introduced perpendicular to the path of strand travel and tangential to the curved wall of the means to thereby microtraverse the strand and also produce a rounded strand and winding the strand on winding surface as it emerges from said fluid turbulence means at a high speed and in traversing relation to the winding surface.

4,045,196

METHOD AND APPARATUS FOR CHOPPING GLASS STRANDS

William L. Schaefer, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 6, 1976, Ser. No. 730,103
Int. Cl.² C03B *37/02*
U.S. Cl. 65—2 **14 Claims**



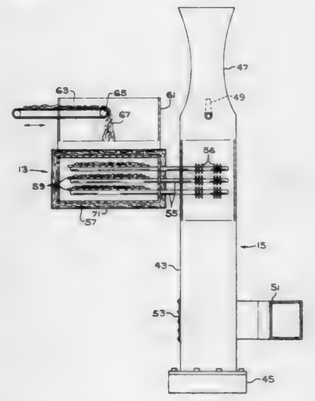
9. In a method of chopping glass fiber strands comprising passing the strands between a first wheel having an annular cutting surface and a second wheel having a plurality of cutting blades on the periphery thereof, whereby said strand is chopped between said cutting blades and said cutting surface, the improvement comprising providing a fluid expandable core member surrounded by said annular cutting surface and expanding a peripheral surface of said core member under fluid pressure to firmly conform to the inner diameter of said annular cutting surface and to provide a proper mesh between said cutting surface and said blades.

4,045,197

GLASSMAKING FURNACE EMPLOYING HEAT PIPES FOR PREHEATING GLASS BATCH

Yih-Wan Tsai, Pittsburgh; John E. Sensi, Arnold, and Vincent I. Henry, New Kensington, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 8, 1976, Ser. No. 721,244
Int. Cl.² C03B *1/00*
U.S. Cl. 65—27 **7 Claims**



1. In a method of melting glass batch materials in a combustion-heated, continuous, glass melting furnace to yield glass and combustion exhaust gases, wherein batch materials are continuously fed to the furnace and molten glass discharged therefrom and wherein the exhaust gases are employed to preheat batch materials prior to feeding them to the furnace, the improvement which comprises

isolating the batch materials during preheating from the exhaust gases

transferring heat from the exhaust gases to the batch materials through at least one heat pipe wherein a heat pipe working fluid is vaporized by heat of the exhaust gases and then condensed by giving up heat to the batch materials.

4. In a glassmaking apparatus comprising a combustion-heated, glass melting furnace, means for exhausting combustion gases, means for feeding glass batch materials to the furnace and means for discharging glass from the furnace, wherein means are provided for heating glass batch materials prior to feeding them to the furnace using heat from the combustion gases being exhausted from the furnace, the improvement which comprises

an enclosure surrounding said glass batch feeding means isolated from said combustion gas exhaust means, and

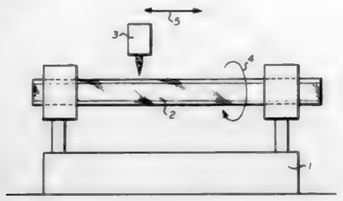
at least one heat pipe extending at one end into said combustion gas exhaust means and extending at its other end into said batch feeding means enclosure.

4,045,198

METHOD OF PREPARING A FOREPRODUCT FOR THE PRODUCTION OF AN OPTICAL LIGHTCONDUCTOR

Karlheinz Rau, Hanau; Albert Muhlich, Frankfurt; Fritz Simmat, Gelnhausen, and Norbert Treber, Kriftel, all of Germany, assignors to Heraeus Quarzschmelze GmbH, Hanau, Germany

Filed Aug. 24, 1976, Ser. No. 717,075
Claims priority, application Germany, Aug. 28, 1975, 2538313
Int. Cl.[2] C03C *17/00*; G02B *5/14*
U.S. Cl. 65—33 **15 Claims**



1. In a process for preparing a foreproduct useful in the production of an optical, self-focusing lightconductor in which the index of refraction of the lightconductor material diminishes with increasing distance from the conductor axis such that, when plotted against the conductor diameter, the refractive index curve is parabolic and the apex of the parabola lies over the center of the conductor diameter wherein a plurality of layers of doped silica are deposited on a cylindrical support, said layers being formed of a mixture of a vaporous silicon compound and a vaporous doping agent at elevated temperature, the improvement which comprises depositing at least one layer of undoped silica between layers of doped silica and following each deposition of each doped or undoped silica layer heating the deposited silica to a temperature of at least 900° C to vitrify the same, each layer being deposited in a thickness ranging from 0.1 to 20 μm, such that the number of layers of undoped silica which are to be deposited on a layer of doped silica before another layer of doped silica is deposited increases with increasing distance from the lightconductor axis if a doping agent is used which produces an increase in the refractive index of vitreous silica and decreases with increasing distance from the lightconductor axis if a doping agent is used which produces a decrease in the refractive index of vitreous silica.

4,045,199

METHOD OF MAKING A RECUPERATOR STRUCTURE BY CRYSTALLIZATION

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 554,791, March 3, 1975. This application May 12, 1976, Ser. No. 685,555
Int. Cl.[2] C03B *32/00*; B21D *50/00*; C03C *23/20*
U.S. Cl. 65—33 **15 Claims**

1. A method for making a recuperator heat exchange assembly having plural strata of parallel flow fluid passages therein, comprising

a. forming a multiplicity of elongated tubes of a glass that is thermally crystallizable to a low expansion glass ceramic having a coefficient of lineal thermal expansion of about -18 to $+50 \times 10^{-7}$/° C over the range of 0° - 300° C;

b. each of said tubes being sealed at each end and containing an expansible fluid medium, each of said tubes having a portion intermediate the ends thereof which is substantially straight;

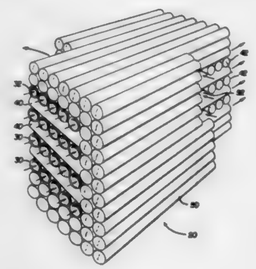
c. tightly packing pluralities of said tubes into a plurality of layers of tubes with the axes of the intermediate portion of the tubes in each layer essentially parallel to each other;

d. arranging said pluralities of layers with the intermediate tube portions thereof in a stacked array with respect to each other and with the axes of the intermediate portions of the tubes in each layer being essentially parallel to the axes of corresponding intermediate tube portions in the other layers;

e. spacing each layer of tubes from at least one of the adjacent layers in said array by interposing spacer means between each of the ends of the layers being spaced, each of said spacer means extending transversely across the tubes in the layers being spaced and adjacent the intermediate tube portions of the layers to define a passageway extending from a first spacer means at one end of the intermediate tube portions to a second spacer means at the other end of the intermediate tube portions of spaced tube layers, said spacer means being formed of a glass that is thermally crystallizable to a low expansion glass ceramic having a coefficient of lineal thermal expansion that is substantially the same as said elongated tubes;

g. constraining the outer surface of said assembly of elongated tubes, said spacer means, and said fluid flow directing means to restrict outward movement of those portions of the assembly;

h. subjecting said constrained assembly to an initial heat treatment which includes temperatures sufficient to soften said elongated tubes and thus to cause said fluid medium entrapped therein to expand and urge said tubes into contact with adjacent tubes and said spacer means and



said flow directing means to fuse said assembly portions into an integral mass;

i. opening the sealed ends of said elongated tubes to enable reception and discharge of a fluid to obtain a heat exchange between fluid flowing in said passageways, and

j. further heat treating said assembly to elevated temperatures sufficient to effect crystallization of said tubes, said spacer means and said flow directing means into a low expansion glass-ceramic.

12. A method as defined in claim **1** in which said layer spacing step includes

a. forming each spacing means from a plurality of tightly packed individually axially elongated elements arranged with their axes parallel to each other and disposing a group of such elements adjacent each end of the intermediate tube portions of the layers being spaced, and

b. interposing ceramic sealant material between adjacent elements and between each group of elements and adjacent layers of tubes to join said elements and said tube layers into an integral mass thereby preventing a fluid in a passageway from flowing out of said passageway through the interstices between said elements and between said tubes in said layers, said ceramic sealant material being selected from the group consisting of a ceramic cement, foamable ceramic cement and sinterable, thermally crystallizable glass frit.

4,045,200

METHOD OF FORMING GLASS SUBSTRATES WITH PRE-ATTACHED SEALING MEDIA

Charles W. Salisbury, Risingsun, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 2, 1975, Ser. No. 537,897
Int. Cl.[2] C03C *27/00*
U.S. Cl. 65—42 **3 Claims**

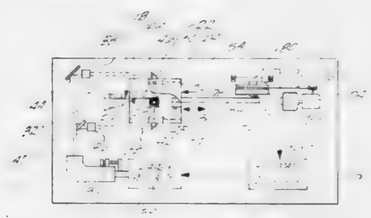
1. A method of producing a glass substrate with electrical conductors deposited thereon suitable for gas panel fabrication which comprises drawing a vitreous or crystallizing solder glass consisting essentially of, on a weight basis, 72% PbO, 15% B_2O_3, 4% SiO_2, 5% Al_2O_3 and 4% ZnO and having a softening point of 811° F into at least one rod 3 - 40 mils in diameter, applying said rod to one surface of said substrate adjacent the periphery thereof, and pre-firing said substrate for a period of time and at a temperature sufficient to permanently attach the solder glass thereto in a highly sintered or glassy state which will reflow and seal at a predetermined sealing temperature.

4,045,201

METHOD AND APPARATUS FOR SUBDIVIDING A GAS FILLED GLASS TUBE

Thomas E. Caffarella; George J. Radda, and David J. Watts, all of Tucson, Ariz., assignors to American Atomics Corporation, Tucson, Ariz.

Filed July 9, 1976, Ser. No. 703,809
Int. Cl.[2] C03B *33/08*
U.S. Cl. 65—105 **13 Claims**



1. Apparatus for subdividing a gas filled glass tube into individual sealed sections comprising means for supporting a tube in fixed position, means including a laser light beam source for directing a focused laser beam at the tube, means for repeatedly scanning the beam back and forth across the width of the tube along the same path in a direction perpendicular to the longitudinal axis of the tube to heat the wall of the tube to a temperature at which the glass softens, and means for maintaining the gas pressure higher on the outside of the tube than on the inside of the tube causing the softened portion of the tube to collapse.

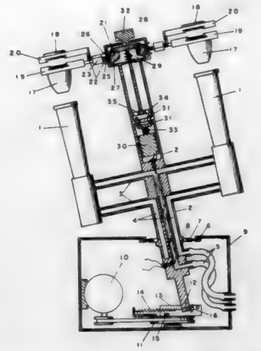
4. A method of dividing a sealed gas-filled glass tube into sealed segments comprising: directing laser beams simultaneously at the tube from at least two directions at a position along the length of the tube, and scanning the beam across the width of the tube while holding the tube stationary in an ambient atmosphere having a higher pressure than the gas in the tube to heat the entire perimeter of the tube until the tube softens and collapses to form sealed segments.

4,045,202

FUSION AND CASTING MACHINE

Fernand Claisse, 230 Boul. Monaco, Quebec, Quebec, Canada (GIP 3H2)

Filed May 7, 1975, Ser. No. 575,475
Claims priority, application Canada, Sept. 9, 1974, 208712
Int. Cl.[2] C03B *5/18, 9/00*; F27B *14/02*
U.S. Cl. 65—178 **6 Claims**



1. A machine for making glass buttons, comprising:

a base (**9**);

an upstanding column (**2**) pivoted at a pivot joint (**6, 7, 8**) adjacent its lower end to said base for universal lateral tilting movement;

drive means (**11**) below said pivot joint for swinging the lower end of said column in substantially circular motion;

a normally upright crucible (**17**) for a charge to be melted carried by the upper end of said column for tilting about a horizontal axis;

a mold (**18**) for receiving a molten charge and means (**20** and **22**) on said column holding said mold in inverted position over said crucible and mounting said mold for pivotal movement about said horizontal axis;

heater means (**1**) on said column arranged to heat said crucible and mold simultaneously;

means (**21, 28**) for rotating said mold about said horizontal axis and lost motion means (**43**) between said crucible and mold for tilting said crucible about said horizontal axis after a predetermined degree of tilt of said mold; and

means (**14**) for rendering said drive means inoperative when said mold and crucible are being rotated about their respective axes.

4,045,203

COMPOSITE SEAL FOR A GLASS FORMING CHAMBER

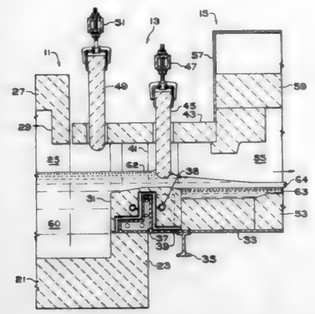
Mahesh C. Bhardwaj, Sarver, and William J. Englert, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 26, 1976, Ser. No. 670,598
Int. Cl.[2] C03B *18/02*
U.S. Cl. 65—182 R **10 Claims**

1. In an apparatus for making flat glass comprising a glass furnace connected to a forming chamber through a molten glass delivery facility wherein the forming chamber includes an impervious metal casing having an inner refractory liner containing a pool of molten metal for supporting glass during forming and the delivery facility includes a refractory support mounted at least partially inside the casing for supporting molten glass during its delivery to the forming chamber, the improvement which comprises:

a substantially impervious, flexible and compressible composite layered seal disposed between the refractory support and the casing, said composite layered seal comprising a pair of outer layers and an inner layer therebetween each of said layers having a surface in coextensive contact

with that of an adjacent layer, said outer layers being composed of a flexible and substantially impervious dense



refractory material and said inner layer being composed of a compressible less dense resilient refractory material.

4,045,204

FERTILIZER COMPOSITION

Hiroomi Matsunaga, Kobe; Sigel Fujimura, Nishinomiya; Hisao Namioka, Niihama; Kozo Tsuji, and Masashi Watanabe, both of Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., both of Japan

Filed Feb. 24, 1976, Ser. No. 660,871

Claims priority, application Japan, Feb. 24, 1975, 50-23310; Feb. 24, 1975, 50-23311

Int. Cl.² C05F *11/08*

U.S. Cl. 71—11 **34 Claims**

1. A fertilizer composition comprising a fertilizer or a fertilizing substance and pullulane or a derivative thereof.

4,045,205

METHOD FOR THE MANUFACTURE OF SOIL MODIFIERS FROM WASTE MATERIAL OF THE MANUFACTURE OF TITANIUM DIOXIDE

Luigi Piccolo, Milan; Gabriele Bottai, Venegono Inferiore (Varese); Antonio Paolinelli, Milan, and Angelo La Rovere, Rovereto (Trento), all of Italy, assignors to Societa Italiana Resine S.I.R. S.p.A., Milan, Italy

Filed July 7, 1976, Ser. No. 703,144

Claims priority, application Italy, July 8, 1975, 25180/75

Int. Cl.² C05D *9/00*

U.S. Cl. 71—31 **7 Claims**

1. A method for preparing a compact soil modifier comprising from 80 to 95% by weight of a mixture of ferric oxide and ferric sulphate in an oxide/sulphate weight ratio of from 0.2:1 to 2:1, which comprises calcining at a temperature of from 500° to 600° C, in the presence of an oxidizing gas, a material comprising as a main component hydrated ferrous sulphate with an average number of molecules of crystallization of from 1 to 5, for a period sufficient to convert from 80 to 95% by weight of said hydrated sulphate into ferric oxide and ferric sulphate, said material being obtained by the partial dehydration of a waste material consisting essentially of ferrous sulphate heptahydrate obtained in the manufacture of titanium dioxide from ilmenites or ilmenite slags by the sulphate process.

4,045,206

SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING N-(BUTOXYMETHYL)-6'-TERT-BUTYL-2-CHLORO-o-ACETOTOLUIDIDE AND METHABENZTHIAZURON

Bernard Convent, Leernes, Belgium, assignor to Monsanto Company, St. Souis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,569

Int. Cl.² A01N *9/12, 9/20, 9/02*

U.S. Cl. 71—90 **8 Claims**

1. A herbicidal composition consisting essentially of a a herbicidally effective amount of a mixture of (a) N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and (b) N-(2-benzthiazolyl-N,N'-dimethylurea wherein the ratio of (a) to (b) is within the range of from about 1:8 to 4:1 and an inert carrier therefor.

4,045,207

SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING N-(BUTOXYMETHYL)-6'-TERT-BUTYL-2-CHLORO-o-ACETOTOLUIDIDE AND PYRAZON

Bernard Convent, Leernes, Belgium, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,708

Int. Cl.² A01N *9/22, 9/20, 9/02*

U.S. Cl. 71—92 **7 Claims**

1. A herbicidal composition consisting essentially of a herbicidally effective amount of a mixture of (a) N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and (b) 5-amino-4-chloro-2-phenyl-3(2H)-pyridazinone wherein the ratio of (a) to (b) is within the range of from about 1:8 to 4:1 and an inert carrier therefore.

4,045,208

DIPHENYL ETHER AMIDES

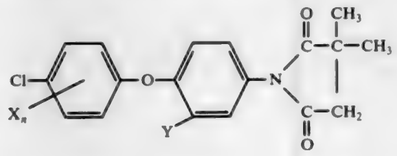
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 598,486, July 23, 1975, Pat. No. 3,976,470. This application June 14, 1976, Ser. No. 695,672

Int. Cl.² A01N *9/22;* **C07D** *207/04*

U.S. Cl. 71—95 **15 Claims**

1. A compound having the formula



in which X is chloro or methyl; *n* is 0, 1 or 2; and Y is chloro or trifluoromethyl.

4,045,209

SUBSTITUTED UREAS AS HERBICIDES

Daniel Hainaut, Villemomble; Jean-Pierre Demoute, Montreuil-Sous-Bois, and Andre Teche, Paris, all of France, assignors to Roussel Uclaf, Paris, France

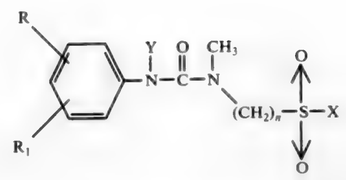
Continuation-in-part of Ser. No. 582,877, June 2, 1975, abandoned, which is a continuation of Ser. No. 305,336, Nov. 10, 1972, abandoned. This application Sept. 22, 1975, Ser. No. 615,401

Claims priority, application France, Nov. 17, 1971, 71.41102

Int. Cl.² A01N *9/12;* **C07C** *119/00*

U.S. Cl. 71—98 **12 Claims**

1. A urea of the formula



wherein R and R_1 are individually selected from the group consisting of hydrogen, chlorine, bromine, trifluoromethyl, lower alkyl of 1 to 6 carbon atoms and lower alkoxy of 1 to 6 carbon atoms, *n* is 0, X is lower alkyl of 1 to 6 carbon atoms optionally substituted with a halogen, Y is selected from the group consisting of hydrogen and alkyl of 1 to 4 carbon atoms and the dotted lines indicate that the compound may contain no oxygen bound to the sulfur atom or may be in sulfoxide or sulfonyl form.

10. A herbicidal composition comprising an effective amount of a compound of claim **1** and an inert carrier.

4,045,210

SYNERGISTIC HERBICIDAL COMPOSITION COMPRISING N-(BUTOXYMETHYL)-6'-TERT-BUTYL-2-CHLORO-o-ACETOTOLUIDIDE AND N-(3-CHLORO-4-METHYL PHENYL)-N',N'-DIMETHYLUREA

Bernard Convent, Leernes, Belgium, assignor to Monsanto Company, St. Louis, Mo.

Filed Aug. 18, 1975, Ser. No. 605,566

Int. Cl.² A01N *9/20, 9/02*

U.S. Cl. 71—120 **8 Claims**

1. A herbicidal composition consisting essentially of herbicidally effective amount of a mixture of (a) N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and (b) N-(3-chloro-4-methyl phenyl)-N',N'-dimethylurea in a weight ratio of (a) to (b) within the range of 1:8 to 8:1 and an inert carrier therefor.

4,045,211

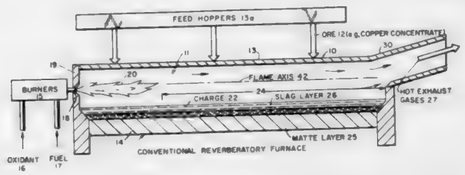
METHOD FOR INCREASING RADIANT HEAT TRANSFER FROM HOT GASES

Richard Mather Powers, Guthrie, Ariz., assignor to Phelps Dodge Corporation, New York, N.Y.

Filed Jan. 20, 1976, Ser. No. 650,809

Int. Cl.² C21B *5/02;* **C22B** *15/00*

U.S. Cl. 75—21 **4 Claims**



1. In a method for operating a reverberatory furnace wherein a gaseous fuel is combusted to produce a flame, and wherein a furnace charge of metallic ore is heated by radiation from the furnace hot gases, the improvement which comprises:

introducing to the furnace separate from said furnace fuel, at one or more locations downstream of said flame which are spaced from said charge but below the axis of the flame, and at an aggregate rate from all locations of about 1 to 10% the rate of gaseous fuel, an unsaturated gaseous hydrocarbon having a carbon to hydrogen weight ratio of at least about 6 which exothermically cracks inside said furnace to yield hydrogen and carbon particles in said hot gases, whereby radiant heat transfer from said gases to the charge is increased.

4,045,212

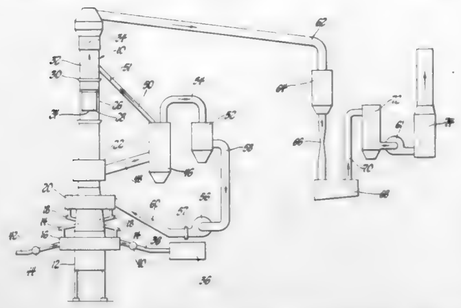
METHOD OF OPERATION OF A CUPOLA

Isidore Hodes, Farmington Hills, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 17, 1976, Ser. No. 658,477

Int. Cl.² C21B *11/00*

U.S. Cl. 75—40 **5 Claims**



1. A method of operating a cupola system having alternate layers of coke and metal to be melted arranged in a stack and having a combustion zone near the bottom of the stack and progressively upward along the stack a reducing zone, a melting zone and a preheat zone, comprising

continuously introducing substantially pure oxygen into said combustion zone and continuously recycling a fraction of the cupola gas from said preheat zone to said combustion zone and exhausting from said cupola system the remaining fraction of said cupola gas,

the rate of oxygen flow into said combustion zone and the fraction of cupola gas exhausted being balanced so that the amount of said pure oxygen introduced into said combustion zone is substantially equal to the amount of the oxygen in said remaining fraction, said pure oxygen being the only gas fed into said cupola system after the system is started in operation.

4,045,213

METHOD OF INJECTING A POWDER CONTAINING CARBON INTO A METAL BATH

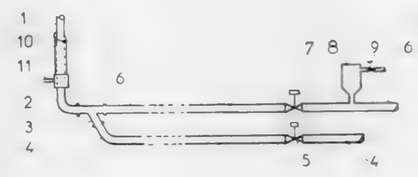
Pierre Leroy, Saint-Germain-En-Laye; Jean Bastien, L'Etrat; Jean-Claude Muller, and Roger Kieger, both of Guenange, all of France, assignors to Creusot-Loire and Societe Lorraine de Laminage Continu-Sollac, both of Paris, France

Continuation of Ser. No. 634,466, Nov. 24, 1975, abandoned. This application Jan. 27, 1977, Ser. No. 762,944

Claims priority, application France, Nov. 28, 1974, 74.38955

Int. Cl.² C21C *7/00*

U.S. Cl. 75—48 **7 Claims**



1. A method of deoxidizing or carburizing a ferrous metal bath by injecting into the bath a carbon powder by means of at least one immersed nozzle consisting of two concentric tubes, the method comprising feeding the central tube of said nozzle successively with pure oxygen during the oxidation phase or phases, then with a scavenging gas, selected from the group consisting of nitrogen, argon and carbon dioxide and then with

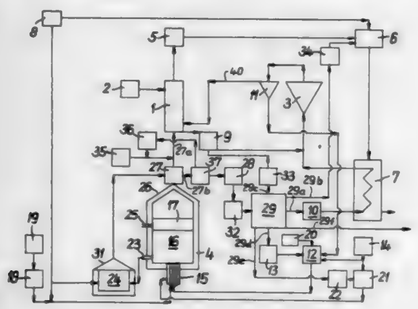
a neutral gas carrying said carbon powder during the deoxidation or carburization phase or phases, and finally with said scavenging gas before repeating the cycle, while feeding said peripheral tube successively with a fluid protecting said nozzle against wear during the oxidation phase or phases, and with this same fluid or another protective fluid during the deoxidation or carburization phase or phases and wherein the central tube of said nozzle is supplied by two distinct pipes, the first of the two pipes being fed selectively with pure oxygen or with said scavenging gas, the second of the two pipes being fed selectively with said neutral gas carrying the carbon powder or with said scavenging gas and wherein any contact between pure oxygen and carbon powder is avoided.

4,045,214

METHOD FOR PRODUCING STEEL

Rolf Wetzel, Heiligenhaus-Isenbugel, and Dietrich Radke, Essen-Margaretenhohe, both of Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Jan. 14, 1975, Ser. No. 540,957
Claims priority, application Germany, Jan. 16, 1974, 2401909
Int. Cl.[2] C21B *13/14*
U.S. Cl. 75—60 **16 Claims**



1. Method for producing steel from fine-grained iron ores, comprising the steps of:

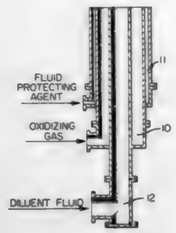
a. preheating and partially reducing the fine-grained iron ores in a countercurrent heat exchanger;
b. reducing the preheated and partially reduced fine-grained iron ores to fine-grained sponge iron in a fluidized bed reactor with exhaust gas which consists essentially of carbon monoxide and which emanates from a melting vessel in which sponge iron is melted;
c. separating the fine-grained sponge iron formed in the fluidized bed reactor from reduction gas which forms during the reduction in the fluidized bed reactor and pneumatically transporting the separated sponge iron into a carbon containing metal melt of iron in the melting vessel;
d. melting and finally reducing the sponge iron in the metal with the carbon in the metal melt and with further carbonaceous material which is pneumatically introduced into the metal melt;
e. refining the metal melt with pure oxygen; and
f. introducing the oxygen, the carbonaceous material, and the sponge iron into the metal melt through at least one nozzle which is disposed below the surface of the metal melt, said oxygen, fine-grained sponge iron and carbonaceous material being introduced into the metal in immediate proximity to one another.

4,045,215

METHOD OF REFINING MATTES CONTAINING NICKEL

Pierre Leroy, Saint-Germain-En-Laye; Jean Georges Morlet, Nevers, and Jean Saleil, Saint-Etienne, all of France, assignors to Creusot-Loire, Paris, France

Continuation of Ser. No. 487,165, July 10, 1974, abandoned.
This application May 3, 1976, Ser. No. 682,751
Claims priority, application France, July 16, 1973, 73.25954
Int. Cl.[2] C22B *23/00*
U.S. Cl. 75—82 **15 Claims**



1. A method of refining a molten nickel-containing matte containing in excess of 7% sulphur to remove sulphur therefrom without excessive oxidation of the nickel, comprising in a first oxidative refining stage the step of blowing an oxidizing gas from at least one tuyere into the molten matte below the surface thereof to lower the sulphur content thereof, and when the sulphur content of the matte is from 4 to 7% in at least one subsequent oxidative refining stage producing nickel with a low sulphur content including continuing the blowing of said oxidizing gas into the matte, below the surface thereof, together with an added diluent fluid for sulphur dioxide which dilutes the sulphur dioxide gas formed in the matte during refining, said oxygen and diluent fluid being blown into the matte as an inner flow from at least one tuyere, and passing a fluid tuyere protective agent separate from said diluent fluid into the matte from said tuyere peripherally around the inner oxidizing gas and diluent fluid flow, said protective agent protecting the tuyere against wear.

4,045,216

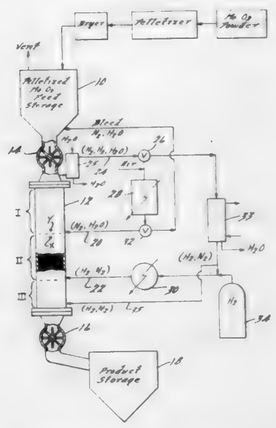
DIRECT REDUCTION OF MOLYBDENUM OXIDE TO SUBSTANTIALLY METALLIC MOLYBDENUM

Harry W. Meyer, deceased, late of Weston, Conn., by Elizabeth Jane Meyer, executrix; Jerry D. Baker, Ann Arbor, Mich., and William H. Ceckler, Orono, Maine, assignors to Amax Inc., Greenwich, Conn.

Filed Nov. 3, 1975, Ser. No. 627,972
Int. Cl.[2] C22B *34/34*
U.S. Cl. 75—84 **26 Claims**

1. A continuous process for producing a product in which molybdenum is present in metallic form comprising the steps of agglomerating a particulated feed material composed predominantly of molybdenum trioxide into pellets, continuously introducing said pellets at a controlled rate into a reaction chamber defining a first reaction zone, heating said pellets to a first reaction temperature range of from about 580° C up to about 650° C in the presence of a first reaction gas comprised of an inert carrier gas containing from about 3 mol percent up to about 10 mol percent hydrogen, controlling the flow rate of said first reaction gas and said pellets to provide a stoichiometric excess of hydrogen in an amount greater than 1:1 up to about 10:1 mols hydrogen per mol molybdenum trioxide to effect an exothermic reduction of substantially all of the molybdenum trioxide in said pellets to molybdenum dioxide and to maintain the temperature of said pellets by substantially adiabatic means within said first reaction temperature range, continuously transferring the partially reduced said pellets at a controlled rate from said first reaction zone into a second reaction zone, heating said pellets to a second reaction temperature above about 900° C in the presence of a second reaction gas comprised of an inert carrier gas containing from about 20 mol percent up to about 80 mol percent hydrogen, controlling the flow rate of said reaction gas and said pellets to provide a stoichiometric excess of hydrogen to effect an endothermic reduction of substantially all of the molybdenum dioxide in said pellets to metallic molybdenum and to maintain the temperature thereof above about 900° C, continuously transferring the reduced said pellets at a controlled rate to a third zone containing a protective nonoxidizing atmosphere to effect a stabilization and cooling of said pellets and thereafter recovering the pelletized metallic molybdenum product.

18. A continuous process for producing molybdenum dioxide comprising the steps of agglomerating a particulated feed material composed predominantly of molybdenum trioxide into pellets, continuously introducing said pellets at a controlled rate into a reaction chamber defining a reaction zone, heating said pellets to a reaction temperature range of from about 580° C up to about 650° C in the presence of a reaction gas comprised of an inert carrier gas containing from about 3 mol percent up to about 10 mol percent hydrogen, controlling the flow rate of said reaction gas and said pellets to provide a stoichiometric excess of hydrogen in an amount greater than 1:1 up to about 10:1 mols hydrogen per mol molybdenum trioxide to effect an exothermic reduction of substantially all of the molybdenum trioxide in said pellets to molybdenum dioxide and to maintain the temperature of said pellets by substantially adiabatic means within said reaction temperature range, continuously transferring the partially reduced said pellets at a controlled rate from said reaction zone to a cooling zone containing a protective nonoxidizing atmosphere to effect a stabilization and cooling of said pellets and thereafter recovering the pelletized molybdenum dioxide product.



4,045,217

DEVELOPING PROCESS FOR ELECTROPHOTOGRAPHY

Itaru Fujimura, Zushi, and Katutoshi Endo, Yokohama, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Dec. 23, 1975, Ser. No. 643,817
Claims priority, application Japan, Dec. 24, 1974, 50-3295
Int. Cl.[2] G03G *15/00*
U.S. Cl. 96—1 LY **8 Claims**

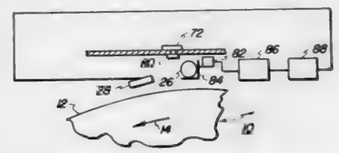
1. A developing process, for use in an electrophotographic copying machine of the wet developing type and which includes means providing an endless photosensitive surface cyclically movable along a predetermined endless path, and means disposed along the path for sequentially uniformly charging a portion of the photosensitive surface to a first potential, exposing the charged surface portion to an optical image to form an electrostatic latent image thereon, developing the latent image with a developing solution, having a toner dispersed therein of a charge opposite in polarity to the first potential, in a developing electrode arrangement maintained in opposing relation with the moving surface, removing any excessive solution from the moving surface, transferring the developed image onto copy sheets, cleaning the photosensitive surface, and eliminating any residual charge on the photosensitive surface, said process comprising the steps of charging at least the non-image portion of said moving surface to a second potential having a polarity opposite to that of the first potential at least prior to the time the non-image surface portion comes into opposing relationship with said electrode arrangement; maintaining, on said electrode arrangement, a third potential below a predetermined value which is lower than, and of the same polarity as, the first potential while said latent image carrying surface portion is passing by said electrode arrangement; and applying a fourth potential, lower than the second potential, to said electrode arrangement during the remaining time for one cycle that no image is present on said endless surface.

4,045,218

METHOD FOR ELECTRONSTATICALLY PRODUCING A COLOR ACCENTED PHOTOCOPY

James H. McVeigh, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 456,090, March 29, 1974, Pat. No. 3,914,043. This application June 30, 1975, Ser. No. 591,583
Int. Cl.[2] G03G *5/12*
U.S. Cl. 96—1.2 **4 Claims**



1. A method of forming a copy of an original document with portions of the copy being highlighted in at least one color other than the remainder thereof, including the steps of:

positioning the original document on a substantially transparent support member;
adjusting an indicator movably mounted on the support member to select the portions of the original document being reproduced in at least a first color with the remainder thereof to be reproduced in a second color; and
reproducing the original document so that the copy has the selected portions in at least the first color with the remainder thereof in the second color.

4,045,219

METHOD OF REPRODUCING COLOR HIGHLIGHTED DOCUMENTS

Lloyd F. Bean, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 7, 1976, Ser. No. 647,288
Int. Cl.[2] G03G *5/12, 13/01*
U.S. Cl. 96—1.2 **5 Claims**

1. A method of reproducing a color highlighted original document, including the steps of:

charging a photoconductive surface having an electrically insulating overcoating to a substantially uniform level;
projecting successive single color light images into the charged portion of the photoconductive surface, in superimposed registration with one another, to record a first electrostatic latent image on the overcoated photoconductive surface;
developing the first latent image recorded on the overcoated photoconductive surface with black particles;

transferring the black particles from the latent image to a sheet of support material;
charging the overcoated photoconductive surface to a substantially uniform level having a first polarity;
projecting a single color light image onto the charged portion of the overcoated photoconductive surface;
charging the portion of the overcoated photoconductive surface having the single color light image projected thereon to a substantially uniform level having a second polarity opposite to the charge of the first polarity;
projecting a light image of the original document onto the charged portion of the overcoated photoconductive surface;
applying an alternating charge to the portion of the overcoated photoconductive surface having the light image of the original document projected thereon;
illuminating uniformly the overcoated photoconductive surface to record a second electrostatic latent image corresponding to one of the colored regions of the original document;
developing the second latent image recorded on the overcoated photoconductive surface with particles corresponding in color to the color of the single color light image; and
transferring the colored particles to the sheet of support material having the black particles thereon.

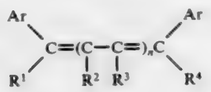
4,045,220

LOW COLOR PHOTOCONDUCTIVE INSULATING COMPOSITIONS COMPRISING NITROGEN-FREE PHOTOCONDUCTOR AND BENZOPYRILIUM SENSITIZER

Lawrence E. Contois, Webster; Charles J. Fox, and Richard W. Stahr, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed July 14, 1975, Ser. No. 595,990
Int. Cl.[2] G03G *5/09*
U.S. Cl. 96—1.6 **28 Claims**

1. A coloration resistant photoconductive insulating composition comprising (1) an organic polymeric binder, (2) a nitrogen-free photoconductor of the formula:



wherein
n represents an integer having a value of 0, 1 or
Ar represents an aryl group;
each of R^1, R^2, R^3 and R^4 represents a hydrogen atom, an aryl group, an alkyl group having 1 to about 10 carbon atoms in the alkyl moiety or an alkoxy group having 1 to about 10 carbon atoms in the alkoxy moiety and when *n* is 0, R^1 and R^4 are both aryl and when R^1 and R^4 are both hydrogen, R^2 and R^3 are aryl and (3) a substantially colorless benzopyrylium type sensitizer for the photoconductor.

4,045,221

PROCESS OF AMPLIFYING IMAGE IN IMAGE RECORDING LAYER BY RELEASING REACTANT FROM IMAGE FORMING LAYER CONTAINING COBALT(III) COMPLEX

Thap DoMinh, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 610,954, Sept. 8, 1975, abandoned, which is a division of Ser. No. 461,172, April 15, 1974, abandoned. This application Oct. 30, 1975, Ser. No. 627,393
Int. Cl.[2] G03C *5/00, 5/34, 7/00*
U.S. Cl. 96—29 R **3 Claims**

1. A process comprising
A. imagewise exposing to actinic radiation an image-forming layer sensitive to activating radiation and comprising, in intimate association, a chelating compound containing a conjugated π-bonding system capable of forming a tridentate chelate with cobalt(II), and selected from the group consisting of a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl) formazan dye; a 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-azo-2-(phenol or naphthol); 2-pyridinecarboxylaldehyde-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)hydrazone; or 1-(2-pyridyl, 2-quinolinyl, 2-thiazolyl, 2-benzothiazolyl, 2-oxazolyl or 2-benzoxazolyl)-dithiooxamide;
less than 50 mole percent of the anions of the layer being those which will form conjugate acids by deprotonation of a cobalt(III)-complex containing the chelating compound;
and an inert cobalt(III) complex different from said compound and capable of being reduced by a cobalt(III) complex containing said chelating compound to produce a basic ligard;
B. associating with the image-forming layer an image-recording layer which is visibly responsive to at least one basic ligand contained within the cobalt(III) complex upon release thereof; and
C. heating the image-forming layer above ambient temperature for a time sufficient to stimulate reduction of the cobalt(III)complex with
1. concomitant ligand release and transfer of the released ligand to the image-recording layer and
2. the formation of a tridentate chelate of cobalt(II) with said chelating compound, whereby additional cobalt-(III)-complex is reduced by said chelate to form additional cobalt(II) and to cause additional release and transfer of released basic ligand to the image recording layer, to give an amplified image.

4,045,222

ETCH BLEACHING PROCESS

Fumiaki Shinozaki; Tomoaki Ikeda, and Masayoshi Tsuboi, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Jan. 26, 1973, Ser. No. 326,658
Claims priority, application Japan, Jan. 28, 1972, 47-10670
Int. Cl.[2] G03F *7/02;* **G03C** *5/54*
U.S. Cl. 96—33 **9 Claims**

1. In an etch-bleaching process wherein a hydrophilic layer in/on which a silver image exists is first treated with an etch-bleaching solution, to remove those portions of the hydrophilic layer corresponding to the silver image the improvement wherein the hydrophilic layer is subsequently treated with an aqueous solution containing at least one of an oxyacid of chlorine and a salt thereof to remove etched residue of the hydrophilic layer in the area corresponding to the silver image.

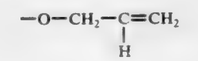
4,045,223

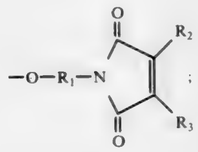
METHOD FOR THE PREPARATION OF LAYER STRUCTURES

Roland Rubner, Rottenbach near Forchheim; Wolfgang Kleeberg, and Eberhard Kühn, both of Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

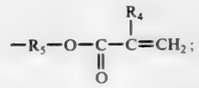
Filed July 24, 1975, Ser. No. 598,651
Claims priority, application Germany, Aug. 2, 1974, 2437368
Int. Cl.[2] G03C *5/00*
U.S. Cl. 96—35.1 **14 Claims**

1. In a method for the preparation of highly heat-resistant layered structures soluble in organic solvents comprising:
a. applying a coating of a radiation-sensitive, preliminary polymer to a substrate in the form of a layer or a foil;
b. irradiating the radiation sensitive layer or foil through negative patterns;
c. removing the non-irradiated layer or foil to form a relief structure; and
d. annealing said relief structure;
the improvement which comprises using as said radiation sensitive preliminary polymer a solvent soluble preliminary polymer comprising a polycondensation product of a primary diamine with bicyclo[2.2.2.]octene-7-tetracarboxylic acid-2,3,5,6-diester-bis-acid chloride or with a mixture of said bicyclo[2.2.2.]octene with a compound selected from the group consisting of an aromatic di-ortho-tetracarboxylic acid diester-bis-acid chloride, an aromatic di-ortho-tetracarboxylic acid-bis-anhydride and mixtures thereof; wherein the ester groups of said bicyclo[2.2.2.]octene-7-tetra-carboxylic acid-2,3,5,6-diester-bis-acid chloride and said di-ortho-tetracarboxylic acid diester-bis-acid chloride are in ortho position with respect to said acid chloride groups, said ester groups containing radiation reactive radicals selected from the group consisting of:

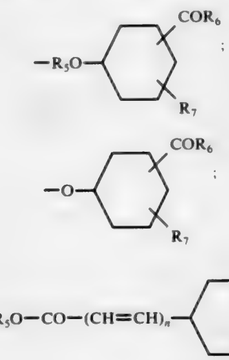




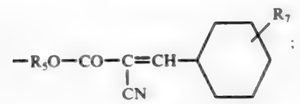
wherein R_1 is alkylene or aralkylene; R_2 is hydrogen, CH_3 or Cl and R_3 is hydrogen;



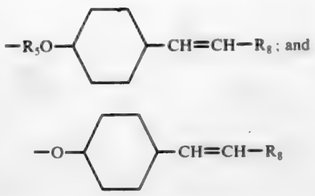
wherein R_4 is hydrogen or methyl; and R_5 is oxyalkylene;



-continued



wherein R_6 is alkyl, phenyl, alkoxy phenyl or halogenated phenyl; *n* is 1 or 2; and R_7 is H, Cl, alkyl or alkoxy;



wherein R_8 is a carbocyclic or heterocyclic aromatic radical bound via a ring carbon atom, and wherein said radiation-sensitive preliminary polymer is prepared in a hexamethyl phosphoric acid triamide solution.

4,045,224

METHOD FOR MAKING PHOSPHOR SCREEN FOR BLACK MATRIX TYPE COLOR PICTURE TUBE USING TWO LIGHT SOURCES

Eiichi Yamazaki, Ichihara, and Hiromi Kanai, Mobara, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Dec. 18, 1973, Ser. No. 425,710
Claims priority, application Japan, Dec. 25, 1972, 47-129266
Int. Cl.[2] G03C *5/00*
U.S. Cl. 96—36.1 **13 Claims**

1. A method for making a phosphor screen for a black matrix type color picture tube having a faceplate, comprising forming a first pattern of a black material on the inner surface of the faceplate, said first pattern defining areas in which black material does not cover the inner surface of said faceplate, pattern as well as on those areas of the inner surface of said faceplate not covered for black material, exposing said photosensitive phosphor material layer to light emitted from a first light source and passing through a color selective electrode positioned on the side of said faceplate defining the inner surface of said faceplate, the quantity of light from said first light source being larger at those portions of said photosensitive phosphor material layer corresponding to the areas of the inner surface of said faceplate not covered by said black material, exposing said photosensitive phosphor material layer to light from a second light source on the opposite side of said faceplate, said black material selectively controlling the light from said second light source whereby the quantity of light from said second light source is high only at the portions of the photosensitive phosphor material corresponding to the areas not covered by said black material, the quantity of light emitted either from said first light source or from said second light source being insufficient to activate said photosensitive material layer and the total quantities of light from said first and second light sources together being sufficient to activate said photosensitive material layer to thereby cooperatively limit the portions of the phosphor material layer remaining on said faceplate after subsequent development of said photosensitive phosphor material layer to the areas on the inner surface of said faceplate not covered by said black material, and developing said photosensitive phosphor material layer to remove those portions of said phosphor material layer covering said black material.

4,045,225

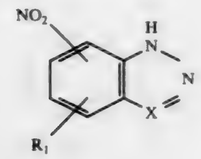
METHOD OF FORMING A PHOTOGRAPHIC IMAGE

Isao Shimamura, and Koichi Nakamura, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 23, 1976, Ser. No. 708,248
Claims priority, application Japan, July 23, 1975, 50-89899
Int. Cl.[2] G03C *5/32*
U.S. Cl. 96—60 R **7 Claims**

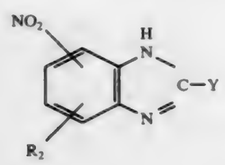
1. A method of forming an image which comprises subjecting an image-wise exposed and developed photographic element comprising a support and at least one photographic layer in which there is image-wise distributed a metallic silver having a catalytic effect to image-wise intensification in the presence of a reducing agent which diffuses into the layer of photographic element from the developer solution or the intensifier solution, or is previously incorporated into the layer, using a solution consisting essentially of at least one of a halogenite, hydrogen peroxide and one or more compounds capable of releasing hydrogen peroxide as an oxidation agent; and containing at least one nitro-substituted nitrogen-containing heterocyclic compound represented by the following General formulae (I) and (II);

(I)



in which R_1 represents a hydrogen atom, an alkyl group of 1 to 5 carbon atoms, SO_3M or COOM wherein M represents hydrogen atom, an alkali metal or an ammonium group, X represents nitrogen atom or CR′ wherein R′ represents a hydrogen atom or a lower alkyl group of 1 to 5 carbon atoms, and

(II)



in which R_2 represents hydrogen atom, an alkyl group of 1 to 5 carbon atoms, SO_3M or COOM wherein M represents hydrogen atom, an alkali metal or ammonium group and Y represents hydrogen atom, an alkyl group of 1 to 5 carbon atoms or $CH_2—S—(CH_2)_n—Y'$ wherein n represents 1 to 3 and Y′ represents a hydrogen atom or SO_3M.

4,045,226

IMAGE FORMING PROCESS BY COLOR INTENSIFICATION

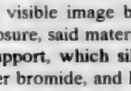
Hiroshi Hara, and Takushi Miyazako, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed July 16, 1976, Ser. No. 705,990
Claims priority, application Japan, July 17, 1975, 50-87484
Int. Cl.[3] G03C *5/32, 1/72*
U.S. Cl. 96—60 R **7 Claims**

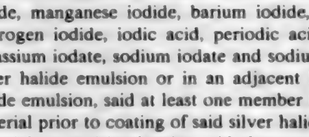
1. A color image forming process for an image-wise exposed color photographic element comprising a support having coated thereon at least one photosensitive silver halide emulsion layer, and optionally at least one auxilliary non-photosensitive layer, including at least a color development and simultaneously or subsequent thereto an intensification, in the presence of a color former and a reducing agent which is oxidized and oxidatively coupled with the color former which comprises carrying out the intensification step in the presence of a peroxide intensifying agent and a compound having a polymerization degree of 1 to 8,000 represented by the following general formula in at least one of said photosensitive silver halide emulsion layer and said auxiliary non-photosensitive layer, if the latter layer is present;

$$—(A)_x—(B)_y—$$

wherein A represents



wherein R represents



R_1 represents an alkyl group of 1 to 6 carbon atoms; R^2 represents a hydrogen atom or an alkyl group of 1 to 4 carbon atoms; and m represents an integer of 3 to 7; B represents a monomer unit induced from styrene, methacrylic acid ester, acrylic acid ester, vinyl acetate, acrylonitrile, vinyl alcohol, vinyl chloride, vinyl ether, acrylamide, N,N-dimethylacrylamide, acrylic acid, methacrylic acid, maleic acid, potassium styrene-sulfonate, N,N-dialkylaminoalkyl methacrylate, vinylimidazole or vinyl pyridine; and x and y represent mole percents; the sum of x and y being 100 mole percent and x being equal to or higher than 30 mole percent.

4,045,227

METHOD FOR STABILIZING SILVER HALIDE PHOTOGRAPHIC MATERIAL

Shinpei Ikenoue, and Eiichi Mizuki, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 3, 1973, Ser. No. 385,268
Claims priority, application Japan, Aug. 4, 1972, 47-7820872
Int. Cl.[2] G03C *5/38, 1/28*
U.S. Cl. 96—61 R **17 Claims**

1. A dry method of stabilizing a silver halide photographic print-out material containing a visible image formed therein against substantial changes in density in non-print-out areas, said visible image being printed-out through an image-wise exposure, said material comprising a silver halide emulsion on a support, which silver halide comprises at least 50 mol % silver bromide, and having at least one member selected from the group consisting of iodine, silver iodide, potassium iodide, sodium iodide, calcium iodide, magnesium iodide, ammonium iodide, nickel iodide, rubidium iodide, cesium iodide, lithium iodide, manganese iodide, barium iodide, chromium iodide, hydrogen iodide, iodic acid, periodic acid, iodine chloride, potassium iodate, sodium iodate and sodium periodate in said silver halide emulsion or in an adjacent layer to said silver halide emulsion, said at least one member being added to said material prior to coating of said silver halide emulsion on said material, comprising heating said photographic material while dry at a temperature above 80° C for more than 1 second after said visible image is printed-out.

4,045,228

DIRECT POSITIVE EMULSIONS CONTAINING FOGGED, MONODISPERSED SILVER HALIDE GRAINS HAVING MORE THAN 10 MILE % IODIDE

Willy Joseph Vanassche, Kontich; Herman Alberik Pattyn, Kapellen, both of Belgium; Otto Lapp, Leverkusen; Sieghart Klotzer, Cologne, and Erik Moisar, Cologne-Flittard, all of Germany, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Nov. 20, 1973, Ser. No. 417,500
Int. Cl.[2] G03C *5/24, 1/28*
U.S. Cl. 96—64 **13 Claims**

1. Photographic material comprising at least one layer of a direct-positive radiation-sensitive emulsion having high sensitivity and good maximum density containing fogged homodisperse silver halide grains wherein at least 95% by weight of the silver halide grains of the emulsion have a diameter which is within about 40% of the mean grain diameter and wherein the silver halide of the grains has a silver iodide content of more than 10 mole % and at most about 20 mole % relative to the total amount of silver halide.

4,045,229

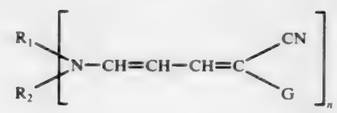
NOVEL UV ABSORBING COMPOUNDS AND PHOTOGRAPHIC ELEMENTS CONTAINING UV ABSORBING COMPOUNDS

Wayne Woodrow Weber, II, and Donald Warren Heseltine, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 506,913, Sept. 17, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 641,788
Int. Cl.[2] G03C *1/84*
U.S. Cl. 96—84 UV **19 Claims**

1. In a photographic element comprising a support, at least one radiation sensitive silver halide emulsion layer and an ultraviolet absorbing compound, the improvement comprising the use of a 1-amino-4-cyano-1,3-butadiene ultraviolet absorbing compound.

10. A photographic element comprising at least one silver halide emulsion layer coated on a film support, said film support being selected from a solvent cast or melt-formed film support and having incorporated therein at least one ultraviolet filter compound of the formula:



wherein n is 1 or 2, when n is 1, R_1 and R_2 are independently chosen to represent hydrogen, an alkyl group of 1 to 10 carbon atoms, an aryl group of 6 to 10 carbon atoms, or a cyclic alkyl group of 5 or 6 carbon atoms provided that R_1 and R_2 cannot both be hydrogen, or R_1 and R_2 taken together represent the atoms necessary to complete a cyclic amino group and when n is 2 at least one of R_1 and R_2 is alkylene or arylene, and G represents an electron withdrawing group.

4,045,230

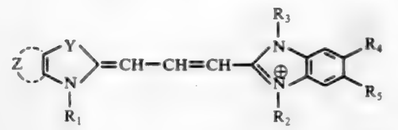
LIGHT-SENSITIVE SUPER-SENSITIZED SILVER HALIDE COLOR PHOTOGRAPHIC MATERIALS

Takeo Koitabashi; Hideo Akamatsu, and Noboru Fujimori, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 16, 1976, Ser. No. 667,361
Claims priority, application Japan, Mar. 19, 1975, 50-33159
Int. Cl.[2] G03C *1/40, 1/14*
U.S. Cl. 96—100 R **11 Claims**

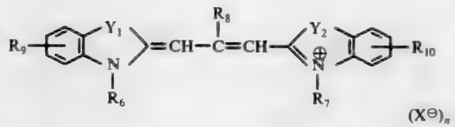
1. A light-sensitive silver halide color photographic material comprising at least a support and a red-sensitive, silver halide-containing layer which comprises at least one sensitizing dye of the following general formula (I)

(I)



wherein Z is a non-metallic atom group necessary to form a non-substituted naphthalene and a non-substituted or alkoxy-substituted benzene ring; Y is sulfur or selenium; R_1 and R_2 are individually alkyl, sulfoalkyl, carboxy alkyl, alkoxy alkyl, hydroxy alkyl or aralkyl; R_3 is alkyl, acyloxyalkyl, aryl or aralkyl and at least one of R_1 and R_2 is carboxyalkyl or sulfoalkyl; R_4 is hydrogen or halogen; R_5 is trifluoroalkyl or trifluoroalkylsulfonyl; X is an anion and n is zero or 1, and an inner salt is formed when n is zero; and at least one sensitizing dye of the following general formula (II)

(II)



wherein Y_1 and Y_2 are individually sulfur or selenium; R_6 and R_7 are individually a substituent selected from the same groups as defined as to R_1 and R_2; and at least one of R_6 and R_7 is carboxyalkyl or sulfoalkyl; R_8 is lower alkyl; R_9 and R_{10} are individually hydrogen, halogen, alkyl, alkoxy or aryl; X is an anion and n is zero or 1, provided that an inner salt is formed when n is zero.

11. A photographic material according to claim **1**, wherein the layer further comprises a cyan coupler.

4,045,231

PHOTOSENSITIVE RESIN COMPOSITION FOR FLEXOGRAPHIC PRINTING PLATES

Hiroyuki Toda, Samukawa; Eiichi Otomegawa, Kawasaki; Toshimi Aoyama, Yokohama, and Hisashi Nakane, Kawasaki, all of Japan, assignors to Tokyo Ohka Kogyo Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 18, 1976, Ser. No. 658,855
Claims priority, application Japan, Oct. 17, 1975, 50-125092; Mar. 15, 1975, 50-31414
Int. Cl.[2] G03C *1/68*
U.S. Cl. 96—115 P **10 Claims**

1. A photosensitive resin composition for flexographic printing plates comprising (a) styrene-butadiene block copolymer containing 35–50% by weight of styrene, (b) at least one liquid prepolymer having a molecular weight of 1,000–5,000 selected from the group consisting of polybutadiene and butadiene-styrene copolymer, and (c) at least one photopolymerizable monomer containing one or more vinyl groups.

4. The photosensitive resin composition of claim **1** wherein said photopolymerizable monomer as the component (c) is a polyvinyl ester obtained by reacting a diol or triol having 2–10 carbon atoms with a monoethylenically unsaturated monocarboxylic or polycarboxylic acid having 3–5 carbon atoms.

4,045,232

PRINTING INK COMPOSITION

Harold B. Parkinson, Gardner, Ill., assignor to Topar Products Corporation, Gardner, Ill.

Continuation-in-part of Ser. No. 414,872, Nov. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 201,242, Nov. 22, 1971, abandoned. This application Nov. 1, 1974, Ser. No. 520,164

Int. Cl.² C08D *11/06;* C08L *91/00*

U.S. Cl. 106—28 22 Claims

1. A modified ink vehicle for use in the preparation of printing ink compositions comprising a printing ink resin, a solvent and a strong mineral acid, said strong mineral acid being present at a level of from about 5 to about 20 cc per pound of resin, said printing ink resin being fluid and having a viscosity at room temperature in the range of from about Q to Z6 as determined by the Gardner-Holdt method, said strong mineral acid being selected from the group consisting of nitric acid and mixtures of nitric acid with sulphuric acid having at least about 50 percent by weight of nitric acid, said solvent being selected from the group consisting of turpentine, mineral spirits and short chain esters having a straight or branched chain aliphatic acid moiety of from 2 to 6 carbons and a straight or branched chain, aliphatic alcohol moiety of from 2 to 6 carbons.

4,045,233

REFRACTORY COMPOSITION AND METHOD FOR PREPARATION

Everett A. Thomas, and Ronald W. Knake, both of Cincinnati, Ohio, assignors to N L Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 639,582, Dec. 10, 1975. This application Sept. 27, 1976, Ser. No. 726,999

Int. Cl.² C04B *35/48*

U.S. Cl. 106—57 10 Claims

1. A refractory composition comprising from 45% to 70% alumino-silicate, from 5% to 15% calcined alumina, from 15% to 35% zircon, from 1% to 5% clay and from 1% to 5% pyrophyllite, said alumino-silicate containing from 45% to 75% alumina.

4,045,234

PROCESS FOR PRODUCING HIGH DENSITY SINTERED ALUMINA

Terry A. Ring, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 23, 1976, Ser. No. 716,723

Int. Cl.² C01F *7/06, 7/46*

U.S. Cl. 106—62 7 Claims

1. A process for producing sintered alumina shapes or grains of low porosity and reduced Na content which comprises treating a calcined alumina, resulting from the calcination of a Bayer process alumina hydrate precursor, possessing a 2–6 micron average particle size and having an Na_2O content in the range of about 0.2–1.0% by weight of Al_2O_3 with a synergistically acting combination of a boron-free magnesium salt and a boron compound, wherein the magnesium salt is selected from the group consisting essentially of water-soluble and essentially water-insoluble magnesium salts which during sintering of the alumina shapes decompose without leaving anionic impurities in the sintered alumina shape and wherein the boron compound is H_3BO_3 or B_2O_5, wherein in the combination, the quantity of magnesium salt, calculated as Mg, is kept in the range of about 0.01–0.3% by weight of Al_2O_3 and the amount of boron compound, calculated as B_2O_3, is maintained in the range of about 0.1–1.0% by weight of Al_2O_3, shaping and sintering the calcined alumina for a time period of 1 to 25 hours within the temperature range of about 1600° and 1900° C, and recovering a sintered alumina having a porosity of less than about 3% by volume and an Na content of less than about 0.03% by weight of Al_2O_3.

4,045,235

TREATMENT OF CLAY MINERALS

Jan Ivan Bidwell; Roger William Adams, and Walter Brian Jepson, all of St. Austell, England, assignors to English Clays Lovering Pochin & Company, Limited, St. Austell, England

Continuation-in-part of Ser. No. 350,395, April 12, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,526

Int. Cl.² C04B *33/13, 33/04*

U.S. Cl. 106—72 20 Claims

1. A method of treating a clay in order to improve the rheological properties of the clay which method comprises forming a mixture of (i) an aqueous suspension of the clay containing less than 450 parts per million of dissolved silicate, expressed as SiO_2, and at a pH in the range 5 to 9 and (ii) a weakly positively charged inorganic hydroxy polymer of aluminum in a quantity such that there is present in the mixture from 0.5 to 10.0 mg of aluminum per gram of clay, calculated on a dry weight basis; the inorganic hydroxy polymer of aluminum being represented by the formula:

$$Al(OH)_n . (3-n)X^-$$

where $0.5 \leqq n \leqq 2.8$ and X^- is Cl^-, NO_3^- or $\frac{1}{2} SO_4^{2-}$, and being formed by combining an inorganic aluminum salt and a base selected from the group consisting of the carbonates and hydroxides of lithium, sodium and potassium.

4,045,236

CELLULAR CEMENT COMPOSITION

Giuseppe Bianchi, Lerici (La Spezia), Italy, assignor to I.GE.Co. Z.r.l., Italy

Filed Apr. 8, 1975, Ser. No. 566,526

Int. Cl.² C04B *15/02*

U.S. Cl. 106—88 7 Claims

1. A light, high tensile strength cellular cement composition having a homogeneous distribution of microporosities of diameters of from 0.1 to 4 mm sufficient to produce a specific gravity of from about 800 k/m³ to about 1600 k/m³, said composition containing from about 300 to 800 k of cement per m³ of composition, up to 1000 k of inert fillers per m³ of composition and from 36 to 68% water by weight of composition, and further containing an alkali metal alkylbenzenesulfonate in an amount of from 1 to 45% by weight of water and a metal chloride in an amount of from 2 to 35% by weight of water.

4,045,237

CEMENTITIOUS COMPOSITIONS HAVING FAST-SETTING PROPERTIES AND INHIBITED SHRINKAGE

Robert W. Gaines, Darien; Dennison F. Fiala, Ridgefield, and Henry Nash Babcock, Old Greenwich, all of Conn., assignors to U.S. Grout Corporation, Old Greenwich, Conn.

Filed Dec. 6, 1974, Ser. No. 530,363

Int. Cl.² C04B *7/02*

U.S. Cl. 106—89 5 Claims

1. A cementitious composition which when mixed with water is capable of setting into a hard mass in a short period of time without substantial shrinkage during setting and early hardening, and possessing a high degree of impermeability to fluids, said composition comprising:

a. between 0.1 and 10 weight percent of portland cement;

b. between 0.1 and 40 weight percent of a calcined gypsum selected from the group consisting of normal calcined gypsum, anhydrite, and pressure calcined gypsum; and

c. between 50 and 90 percent of high alumina cement.

4,045,238

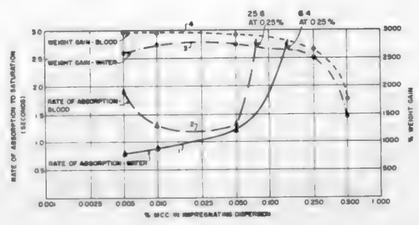
REGENERATED CELLULOSE SPONGE

Orlando A. Battista, and Richard L. Ward, both of Fort Worth, Tex., assignors to Avicon, Inc., Fort Worth, Tex.

Division of Ser. No. 471,546, May 20, 1974, Pat. No. 3,954,493, which is a continuation-in-part of Ser. No. 299,131, Oct. 19, 1972, abandoned. This application Dec. 4, 1975, Ser. No. 637,716

Int. Cl.² C08L *1/24*

U.S. Cl. 106—122 8 Claims



1. A method for increasing the liquid absorbency of regenerated cellulose sponge which comprises immersing the sponge, free of water-soluble materials, in a solution or dispersion consisting of water and a water-soluble or water-dispersible, high molecular weight, hydrophylic, film-forming polymer, the solution or dispersion containing from about 0.005 to about 0.250% by weight of the polymer, compressing and releasing the sponge while so immersed so as to impregnate the sponge with and distribute uniformly throughout the sponge the film-forming polymer, drying the impregnated sponge to a volatiles content including water of not more than about 0.5%, conditioning the dried sponge to a moisture content of at least about 6% and compressing the conditioned sponge.

4,045,239

PROCESS FOR THE PRODUCTION OF THERMOPLASTIC SYNTHETIC MATERIALS AND PLASTIC SHAPING MATERIALS OF CHEMICALLY MODIFIED PROTEIN AND A CHEMICAL PLASTICIZER AND INCLUDING A BISACRYLAMIDE OR BISMETHACRYLAMIDE

Klaus-Dieter Hammer, Mainz; Wolfgang Klendauer, Wiesbaden, and Max Bytzek, Naurod, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

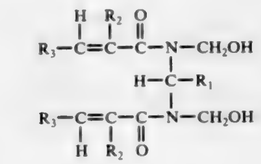
Filed Oct. 3, 1975, Ser. No. 619,224

Claims priority, application Germany, Oct. 7, 1974, 2447690

Int. Cl.² C08K *11/00;* C08L *89/00*

U.S. Cl. 106—147 19 Claims

1. A process for the production of a thermoplastic synthetic material of chemically modified casein, which comprises mixing an aqueous alkaline casein solution with an aqueous solution of a tetrafunctional, doubly unsaturated, organic compound of the general formula



in which

R_1 is hydrogen or an alkyl group with 1 to 18 carbon atoms,

R_2 is hydrogen or an alkyl group with 1 to 6 carbon atoms, and

R_3 is hydrogen or an alkyl group with 1 to 3 carbon atoms, subjecting the mixture to a dwell time, causing a precipitating liquid to act upon it, freeing the formed precipitate from excess liquid, and drying.

4,045,240

AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, and Peter van der Heem, Perryville, both of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Continuation of Ser. No. 286,656, Sept. 6, 1972, abandoned. This application Mar. 24, 1976, Ser. No. 670,018

Int. Cl.² C01B *33/18;* C09C *1/28*

U.S. Cl. 106—288 B 7 Claims

1. A method for producing amorphous, precipitated silica pigments having an improved combination of chemical and physical properties, said method comprising the steps of: acidulating an aqueous solution of an alkali metal silicate with an acid selected from the group consisting of sulfuric acid, nitric acid, and hydrochloric acid; said alkali metal silicate having a SiO_2/X_2O mol ratio in the range of from about 2.0 to 2.7 wherein X is selected from the group consisting of sodium, potassium, and lithium; said aqueous alkali metal silicate solution having a concentration on the order of about 1.0 to 2.5 pounds silicate per gallon, said acid being added as a dilute solution thereof and having a concentration of from about 10 to 25% by weight acid based on the weight of the solution thereof; continuing the addition of said acid until that point at which precipitation of said pigment just begins; interrupting and discontinuing the addition of said acid to said silicate at said point; aging the aqueous reaction mass for a period of time sufficient to obtain an equilibrium condition of the reactants comprising said reaction mass; continuing the addition of said acid to said aqueous silicate solution following said aging period until the precipitation of said pigment is complete; separating the precipitated pigment from the reaction mass and recovering the product.

4,045,241

SYNTHETIC TAENIOLITE AND PROCESS OF PRODUCING THE SAME

Nobutoshi Daimon, 195-112, Aza Kanda, Mikuriya, Kawanakajima-cho, Nagano, Nagano, and Toichiro Izawa, 25-26, Koganehara 7-chome, Matsudo, Chiba, both of Japan

Filed Mar. 3, 1976, Ser. No. 663,225

Int. Cl.² C09C *1/02*

U.S. Cl. 106—306 2 Claims

1. A process of producing taeniolite having the formula, $LiMg_2Li(X_4O_{10})F_2$ wherein X represents Si or Ge, which comprises mixing (a) a lithium compound selected from the group of lithium oxide and lithium fluoride, (b) a magnesium compound selected from the group of magnesium fluoride and magnesium oxide and (c) silicon oxide or germanium oxide in such a manner that the mixing ratio of Li : Mg : Si or Ge : F becomes 1 : 1 : 2 : 1, the fluoride being included in an excess amount of 10 – 30% to compensate for the loss of fluorine during the process; melting the mixture at 1,250° – 1,450° C; and slowly cooling until the melt crystallizes.

4,045,242

PROCESS FOR THE PURIFICATION OF SUGARBEET JUICE AND THE REDUCTION OF LIME SALTS THEREIN

Karlheinz W. R. Schoenrock, and Hugh G. Rounds, both of Ogden, Utah, assignors to The Amalgamated Sugar Company, Ogden, Utah

Continuation-in-part of Ser. No. 715,182, Aug. 17, 1976, abandoned. This application Dec. 3, 1976, Ser. No. 747,095

Int. Cl.² C13D *3/06*

U.S. Cl. 127—50 1 Claim

1. In the purification of raw sugarbeet juice having relatively low or even negative so-called effective alkalinity involving the treatment of the juice with an alkaline earth metal oxide and with carbon dioxide and separating precipitated solids from the liquid phase of the treated material, the improvement which comprises overcarbonating the juice to an alkalinity of

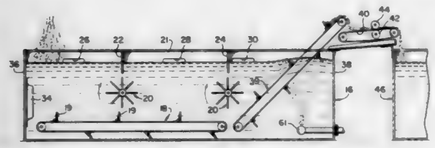
0.0 to 0.02% CaO equivalent during final carbonation in a gassing vessel; adding sufficient active MgO into the gassing vessel while carbonating to raise the effective alkalinities to around 0; and, subsequently, re-alkalizing the overcarbonated juice to an alkalinity of 0.01 to 0.03% CaO equivalent by the addition of active MgO, followed by a final separation of precipitated solids.

4,045,243

CARBON PAPER RECYCLING SYSTEM

Andrew M. Wohlert, St. Charles, Ill., assignor to Riverbank Laboratories, Inc., Geneva, Ill.

Filed May 19, 1975, Ser. No. 578,366
Int. Cl.² B08B *3/10, 3/12*
U.S. Cl. 134—1 **12 Claims**



1. A continuous process for removing the wax-carbon coating from carbon paper which coating comprises a wax which floats in water and pigment, comprising the steps of

passing said carbon paper through a first aqueous bath having a temperature of between about 170° F and 200° F to cause some of said wax and pigment to separate from said paper,

said bath comprising a solution of a wetting agent and water,

mechanically agitating said bath,

collecting and removing the wax which floats to the top of said bath,

then passing said carbon paper through a squeezer to remove the major portion of the water therefrom,

then passing the carbon paper through a second aqueous bath having a temperature in the range of about 200° F to less than the boiling point,

said second aqueous bath comprising a solution of a wetting agent and water,

collecting and removing the wax which floats to the top of said second bath,

then removing the paper from said second tank,

then squeezing the paper removed from said second tank to remove the major portion of the water therefrom,

then passing the paper through a water rinse bath, and

removing the paper from said rinse bath.

6. Apparatus for removing the wax-carbon coating from carbon paper, which coating contains wax and pigment which floats in water, comprising

an elongated tank for containing heated water,

a plurality of transverse baffles disposed in said tank near and above the surface of said water therein to separate said tank into a plurality of sections,

conveyor means in said tank for causing carbon paper inserted in the front of said tank to be carried beneath said baffles toward the rear of said tank,

means for removing said carbon paper through a surface area of said water near the rear end of said tank, and

means for causing the level of liquid at said area to be higher than the liquid level in the adjacent portions of said tank so that any wax and pigment contained therein floats away from the area through which said paper is removed from said tank.

4,045,244

REMOVAL OF MICROBIOLOGICAL DEPOSITS

K. Robert Lange, Huntingdon Valley, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Division of Ser. No. 400,461, Sept. 24, 1973, abandoned. This application May 5, 1976, Ser. No. 683,609
Int. Cl.² B08B *9/00*
U.S. Cl. 134—22 R **6 Claims**

1. A method of detaching hydrated slime adhered to a support in an aqueous medium which comprises contacting said aqueous slime with urea in an amount of from about 1 to about 100parts per million parts of aqueous medium and to penetrate the strongly hydrated slime structure and modify such to the extent that the slime is detached from the support.

5. A composition for detaching slime adhered to a support in an aqueous medium which consists essentially of:

i. urea; and

ii. at least one member of the group consisting of ethanolamine, amine-epoxy compound reaction products and derivatives of each so long as the derivatives have hydrogen-bonding characteristics,

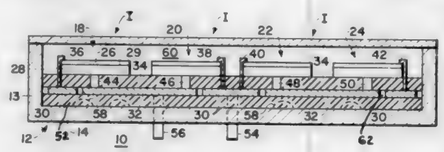
wherein the members of (i) and (ii) are present in the composition in a weight ratio of from about 5 to 95% and 95 to 5% respectively.

4,045,245

SOLAR CELL PACKAGE

Michael G. Coleman, Tempe, and Robert A. Pryor, Phoenix, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1976, Ser. No. 646,733
Int. Cl.² H01L *31/06*
U.S. Cl. 136—89 C **16 Claims**



1. A solar cell package comprising:

a back member;

transparent cover plate means said back member and said cover plate means being adapted for enclosing a space bounded by said back member and said cover plate means;

a plurality of solar cells, each having a first and a second surface thereof, located within said space;

first conductor means located between said solar cells and said back member and coupled to said first surface of each of said solar cells for electrically contacting said first surface of each of said solar cells;

second conductor means located between said solar cells and said back member coupled to said second surface of each of said solar cells for electrically contacting said second surface of each of said solar cells;

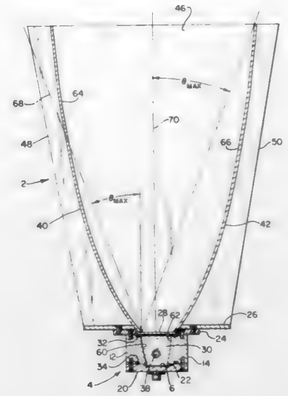
insulating means located between said back member and said first and second conductor means and also located between said first and second conductor means and said solar cells for preventing portions of said first and second conductor means from contacting or touching portions of said solar cells and for preventing portions of said first and second conductor means from contacting or touching portions of said back member.

4,045,246

SOLAR CELLS WITH CONCENTRATORS

Abraham I. Mlavsky, Lincoln, Mass., and Roland Winston, Chicago, Ill., assignors to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Aug. 11, 1975, Ser. No. 603,276
Int. Cl.² H01L *31/04*
U.S. Cl. 136—89 PC **12 Claims**



1. Apparatus for converting solar radiation to electrical energy comprising means defining a closed chamber with a wall capable of passing solar radiation, at least one solar cell disposed in said chamber, first solar radiation concentrator means for receiving solar radiation and directing it through said wall into said chamber, said chamber comprising second solar radiation concentrator means for directing said solar energy onto said at least one solar cell, and a cooling fluid in said chamber, said cooling fluid being (a) electrically non-conductive, (b) capable of passing said solar radiation to said at least one solar cell, and (c) having a higher-than-air index of refraction.

10. Apparatus for converting solar radiation to electrical energy comprising means defining a closed chamber with an entrance aperture capable of passing solar radiation, said chamber including walls adapted to reflect said solar radiation onto a predetermined position, at least one solar cell disposed in said chamber in said position to receive said radiation, and a cooling fluid in said chamber in contact with said at least one solar cell, said cooling fluid being (a) electrically non-conductive, (b) capable of transmitting solar radiation from said entrance aperture to said at least one solar cell, and (c) having a higher-than-air index of refraction.

4,045,247

THERMOCOUPLES OF TANTALUM AND RHENIUM ALLOYS FOR MORE STABLE VACUUM-HIGH TEMPERATURE PERFORMANCE

James F. Morris, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 6, 1975, Ser. No. 629,457
Int. Cl.² H01L *35/20;* **G21H** *1/10*
U.S. Cl. 136—240 **7 Claims**

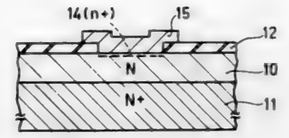
1. A thermocouple for measuring temperature in high temperature systems having a bimetallic thermocouple sensor wherein each metal of said bimetallic sensor is dissimilar and is selected from the group consisting of tantalum, rhenium and alloys thereof containing only rhenium and tantalum.

4,045,248

MAKING SCHOTTKY BARRIER DEVICES

John Martin Shannon, Whyteleafe, and Julian Robert Anthony Beale, Redhill, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 480,540, June 18, 1974, Pat. No. 3,943,552. This application July 25, 1975, Ser. No. 599,088
Claims priority, application United Kingdom, June 26, 1973, 30179/73
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **19 Claims**



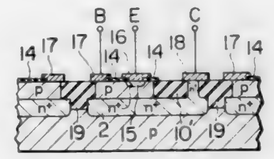
1. A method of manufacturing a semiconductor device having a Schottky barrier of desired barrier height between a metal and a semiconductor body portion but without significant degrading of its reverse characteristics, comprising providing a semiconductor body portion of given doping level which if directly contacted with a metal capable of forming therewith a Schottky barrier would result in a barrier of given height different from the desired barrier height, subjecting the said body portion to dopant ion bombardment to implant dopant therein to form a shallow surface layer having a higher doping level than said given doping level, the implanted ion dose being such as to change the given barrier height to that desired when contacted by said metal, the bombarding ion energy being such as to restrict the depth of the implanted layer from the surface to such a small value that it remains below the thickness of the depletion layer extending from the Schottky barrier in the zero bias condition of the barrier, whereby the implanted layer remains substantially depleted of charge carriers and the reverse characteristics of the barrier will not be significantly degraded, applying said metal as a contact to said body portion such that the barrier is formed between said metal and said shallow surface layer, and making an electrical connection to the body portion.

4,045,249

OXIDE FILM ISOLATION PROCESS

Atsuo Hotta, Higashiyamato, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 24, 1975, Ser. No. 634,783
Claims priority, application Japan, Nov. 22, 1974, 49-133658
Int. Cl.² H01L *21/26*
U.S. Cl. 148—1.5 **7 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of:

a. selectively forming a masking layer on one principal surface of a semiconductor substrate having the same crystalline structure throughout beneath said surface, said masking layer having a window which exposes a portion of said one principal surface of said substrate;

b. removing semiconductor material through said window from said substrate so as to form a groove in the exposed portion of the one principal surface of said substrate;

c. selectively implanting, through said window in said masking layer, ions of at least one element consistng of the group consisting of oxygen and nitrogen into said substrate, thereby forming a buried insulator layer spaced beneath the bottom of said groove by a prescribed distance; and

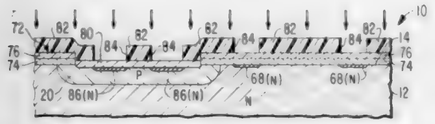
d. oxidizing that portion of said substrate exposed by said groove and not masked by said masking layer so as to form an insulator layer which fills said groove and extends therebeneath to be contiguous with said buried insulator layer.

4,045,250

METHOD OF MAKING A SEMICONDUCTOR DEVICE

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,832
Int. Cl.[2] H01L *7/54, 21/265*
U.S. Cl. 148—1.5 **6 Claims**



1. A method of making a semiconductor device comprising a body of semiconductor material having a surface and which has regions of relatively high and relatively low conductivity comprising:

forming on a surface of said body a masking coating having relatively thick portions and relatively thin portions,

depositing on said masking coating a layer of photoresist and forming openings therein at predetermined locations adjacent to both relatively thick portions and relatively thin portions on said masking coating at which regions of both relatively high and relatively low conductivity are to be introduced,

implanting conductivity modifiers into said body with sufficient energy to penetrate said masking coating but with insufficient energy to penetrate the combination of the masking coating and said photoresist,

without removing said photoresist, contacting the exposed areas of said masking coating with a solvent therefore for a time adequate to remove only the relatively thin portions thereof, and

diffusing conductivity modifiers into the semiconductor body through the areas so removed.

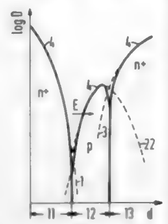
4,045,251

PROCESS FOR PRODUCING AN INVERSELY OPERATED TRANSISTOR

Jüergen Graul, Gruenwald, and Helmuth Murrmann, Ottobrunn, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Feb. 2, 1976, Ser. No. 654,616
Claims priority, application Germany, Feb. 21, 1975, 2507613
Int. Cl.[2] H01L *21/26*
U.S. Cl. 148—1.5 **2 Claims**

1. A process for the production of an inversely operated transistor in a semiconductor body on the surface of which are formed in spaced arrangement, collector region, then a base region and an emitter region wherein said base region is doped by ion implantation in such a manner that minority charge carriers injected from the emitter region into the base region are accelerated in the direction towards the collector region as a result of an inner drift field in the base region, wherein the ion implantation of the base region is accomplished in one step and wherein so as to dope the base region with a doping concentration of approximately $2 \cdot 10^{17}/cm^3$ in the vicinity of the emitter region, and wherein said base region has dimensions between



0.7 μm and 0.4 μm, an implantation energy level of approximately 300 keV is used.

4,045,252

METHOD OF MANUFACTURING A SEMICONDUCTOR STRUCTURE FOR MICROWAVE OPERATION, INCLUDING A VERY THIN INSULATING OR WEAKLY DOPED LAYER

Paul Cyril Moutou, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 15, 1975, Ser. No. 622,455
Claims priority, application France, Oct. 18, 1974, 74.35143
Int. Cl.[2] H01L *7/54*
U.S. Cl. 148—1.5 **3 Claims**

1. A method of manufacturing a semiconductor structure designed for microwave operation, comprising at least two following steps:

a. excessively doping by N type impurities to a concentration in excess of 10^{16} atom/cm ^{3} at least a layer of a gallium arsenide substrate having two parallel large faces;

b. bombarding said substrate with beryllium ions so as to implant an excessively P-doped layer to a concentration in excess of 10^{16} atom/cm ^{3} parallel to said large faces, thus promoting at the border separating the N and P layers the spontaneous formation of a thin layer much less doped than said N and P layers.

4,045,253

PASSIVATING METAL SURFACES

William P. Banks, and Larry D. Martin, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 15, 1976, Ser. No. 666,855
Int. Cl.[2] C23F *9/02*
U.S. Cl. 148—6.14 R **8 Claims**

1. A method for the simultaneous neutralization and passivation of an acid-treated ferrous metal surface comprising:

contacting an acid-treated ferrous metal surface with an aqueous solution consisting essentially of

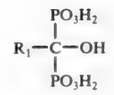
a. a base selected from alkali metal hydroxides, ethanolamines, alkali metal carbonates, alkali metal gluconates, alkali metal borates and mixtures thereof, said base being present in said aqueous solution in the range of from about 0.01 to about 3.0 percent base by weight of said solution;

b. an oxygen containing gas present in said solution in an amount sufficient to saturate said solution with oxygen at the temperature and pressure of said contacting;

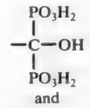
c. hydrazine present in said solution in the range of from about 0.001 to about 0.1 percent hydrazine by weight of said solution; and

d. an iron complexing agent selected from the group consisting of alkali metal gluconates; alkali metal salts of ethylenediaminetetraacetic acid; ethanolamines; polyphosphonic acids having the formula

(1)

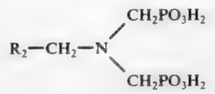


wherein R_1 is selected from the class consisting of C_1 to C_{12} alkyl groups and the group

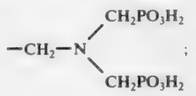


and

(2)



where R_2 is selected from the class consisting of —H, $—PO_3H_2$, C_1 to C_{12} alkyl groups, and the group



the alkali metal and amine salts of said polyphosphonic acids; and mixtures thereof; said complexing agent being present in said aqueous solution in the range of from about 0.01 to about 1.0 percent complexing agent by weight of said solution;

maintaining said contact for a time sufficient to neutralize and passivate said ferrous metal surface, wherein the pH of said solution is greater than about 8.0 and said contacting is conducted at a temperature greater than about 220° F and less than the degradation temperature of chemicals in said solution.

4,045,254

METHOD FOR TOUGHENING TREATMENT OF METALLIC MATERIAL

Akio Deguchi, Yokohama, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1974, Ser. No. 537,393
Int. Cl.[2] C21D *7/14*
U.S. Cl. 148—12 R **10 Claims**

1. A method for providing a toughening treatment for a piece of steel which has at least one transformation point, that is a limiting temperature at which a change in phase occurs, by making use of transformation super-plastic phenomena, comprising: simultaneously

a. applying a shearing stress to the piece of steel, and

b. cyclicly heating for a half cycle and cooling for a half cycle the piece of steel,

and in so doing, observing the following constraints:

1. the applied shearing stress has a value in the range of about 1/20th to about 1/10th of the yield point of said steel;

2. each half-cycle during which the steel is heated, it is raised to a temperature that is above said transformation point, and each half-cycle during which the steel is cooled, it is lowered to a temperature that is below said transformation point;

3. the steel is subjected to at least three of these heating and cooling cycles, and

4. each such cycle has a period of about 20 seconds.

4,045,255

DIRECTIONALLY SOLIDIFIED EUTECTIC $\gamma+\beta$ NICKEL-BASE SUPERALLOYS

Melvin R. Jackson, Schenectady, N.Y., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 1, 1976, Ser. No. 691,936
Int. Cl.[2] C22C *19/03*
U.S. Cl. 148—32 **12 Claims**



1. An article of manufacture having improved high temperature strength and oxidation resistance properties comprising a directionally solidified multivariant eutectic $\gamma+\beta$ nickel-base superalloy casting containing a two phase eutectic structure consisting of a γ phase matrix of a face-centered-cubic solid solution crystal structure based on nickel having embedded in the γ phase an aligned reinforcing lamellar β phase consisting primarily of a nickel-aluminum (NiAl) composition which is a body-centered-cubic (CsCl) ordered intermetallic based on NiAl.

4,045,256

CHROME STEEL CASTING ALLOY

Robert B. Fischer, Easton, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Continuation of Ser. No. 555,598, March 5, 1975, abandoned.
This application June 9, 1976, Ser. No. 694,348
Int. Cl.[2] C22C *38/44*
U.S. Cl. 148—36 **1 Claim**

1. A low chrome nickel martensitic casting manufactured to the standards of ASTM A 217 Gr C5 consisting essentially of

Ingredient	Wt. Percent
Carbon (C)	less than 0.06
Manganese (Mn)	less than 1.0
Phosphorus (P)	less than 0.04
Sulfur (S)	less than 0.04
Silicon (Si)	less than 1.0
Chromium (Cr)	4.75 to 5.75
Molybdenum (Mo)	0.45 to 0.65
Nickel (Ni)	2.75 to 3.50
Iron (Fe)	essentially balance

4,045,257

III(A)-V(B) TYPE LUMINESCENT DIODE

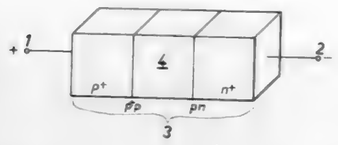
Ehrenfried Butter; Brigitte Jacobs; Klaus Jacobs; Konrad Unger; Alfred Zehe, all of Leipzig; Rainer Doss, and Florian Kugler, both of Teltow, all of Germany, assignors to Jenoptik Jena G.m.b.H., Jena, Germany

Division of Ser. No. 282,190, Aug. 9, 1972, Pat. No. 3,911,462.
This application July 10, 1975, Ser. No. 594,900
Int. Cl.[2] H01L *33/00, 33/19*
U.S. Cl. 148—171 **1 Claim**

1. A method for producing a luminescent diode comprising providing a monocrystalline G_aA_s wafer substrate doped with a material of the group consisting of Si, Sn and Te, at a concentration of $N_D = 10^{18}$ atoms/cc, to be $n+$ conductive, then

depositing a small $p+$ layer on said substrate, by a liquid epitaxy process from a non-stoichiometric melt composed of GaAs, Ga, Al and Zn with a weight ratio of 1:4.6 to 4.76:0.015 to 0.028:0.03, by cooling at a rate of 0.5° to 10° C per minute from an initial temperature of about 930° C to a final temperature of about 780° C, whereby Z_n diffuses a short distance into the substrate during growth, to produce a structure of the form:

n^+-GaAs/p -GaAs/p^+-$Ga_xAl_{1-x}As$,



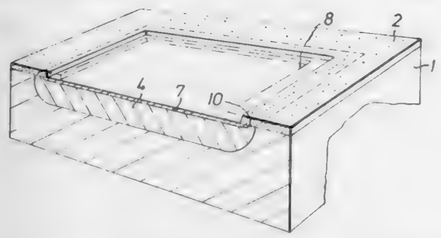
then subjecting the resultant structure, after separation from the melt solution, to a temperature process in a substantially hermetically closed system, at 900° C to 1000° C for 0.1 to 3 hours, in H_2 atmosphere, whereby the Z_n from the p+ region diffuses further into the substrate and results in an expanded light-emitting p-GaAs layer having an acceptor dopant profile with two dopant gradients, the greater of said gradients being toward said $p+$ region.

4,045,258

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Reinhold Kaiser, Heilbronn-Sontheim, Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Germany

Filed Jan. 31, 1975, Ser. No. 545,880
Claims priority, application Germany, Feb. 2, 1974, 2405067
Int. Cl.² H01L *21/22*
U.S. Cl. 148—187 **8 Claims**



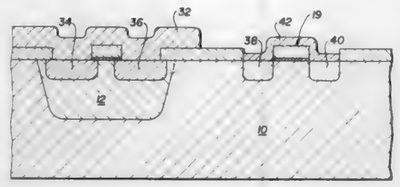
1. In a method of producing a semiconductor arrangement including applying a diffusion masking layer to one surface of a semiconductor body, forming a first semiconductor region of a first type of conductivity by opening a first diffusion window in said masking layer and diffusing said first semiconductor region into the semiconductor body via said window, forming a second semiconductor region of a second type of conductivity completely within said first semiconductor region so that the p-n junction between said first and second semiconductor regions extends to a portion of the semiconductor surface which is covered by said diffusion masking layer prior to and during said step of diffusing said first semiconductor region of the first type of conductivity, the improvement wherein said step of forming a second semiconductor region of the second type of conductivity comprises opening a second diffusion window in said masking layer which is greater than said first diffusion window for producing said semiconductor region of the first type of conductivity, and diffusing said second semiconductor region of the second type of conductivity into said first semiconductor region via said second diffusion window so that said second semiconductor region of the second type of conductivity is substantially thinner than said first semiconductor region of the first type of conductivity.

4,045,259

PROCESS FOR FABRICATING DIFFUSED COMPLEMENTARY FIELD EFFECT TRANSISTORS

Thomas J. Sanders, Indiatlantic, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Oct. 26, 1976, Ser. No. 735,285
Int. Cl.² H01L *21/225*
U.S. Cl. 148—188 **14 Claims**



1. In a process for fabricating complementary field effect transistors wherein source and drain apertures are provided through a first insulative layer superimposed on a substrate and each source and drain aperture are separated by a gate superimposed on said substrate, the improvement comprising:

forming unselectively a second insulative layer doped with N-type impurities;

selectively removing a portion of said second insulative layer to exposed apertures in which a P channel device is to be formed;

diffusing said N-type impurities from said second insulative layer into said substrate in a nonoxidizing atmosphere to form an N channel device; and

subsequently changing said nonoxidizing atmosphere to an atmosphere containing P-type impurities to diffuse P-type impurities through said exposed apertures to form said P channel device and further diffuse said N-type impurities.

4,045,260

EXPLOSIVE NITRAMINE SLURRY COMPOSITION

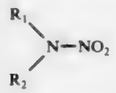
David Gordon Preston Start, Benoni, and John Thomas Francis Fenwick, Phalaborwa, both of South Africa, assignors to AE & CI Limited, Johannesburg, Transvaal, South Africa

Filed July 21, 1975, Ser. No. 597,838
Claims priority, application South Africa, July 19, 1974, 74/4617; July 19, 1974, 74/4618; July 19, 1974, 74/4619
Int. Cl.² C06B *45/00*
U.S. Cl. 149—2 **15 Claims**

1. An explosive slurry composition comprising a continuous phase and at least one nitramine sensitising component which is selected from the group consisting of

a. a primary nitramine of the formula R—NH—NO_2 wherein R represents a methyl, ethyl, propyl, isopropyl, butyl, isobutyl or tertbutyl group;

b. a secondary nitramine of the formula



wherein R_1 represents a methyl and R_2 represents methyl, ethyl, propyl or isopropyl group, or R_1 and R_2 are ethyl groups;

c. a primary dinitramine group of the formula



wherein n is 1, 2, 3 or 4; and

d. a salt of any of said nitramines or dinitramines wherein said composition contains 10–30% w/w of the nitramine sensitizing component.

4,045,261

MOLECULAR SIEVE CONTAINING STABILIZATION SYSTEM FOR URETHANE - CROSSLINKED DOUBLE BASE PROPELLANT

Robert J. Baczuk, Salt Lake City, Utah, assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 2, 1976, Ser. No. 710,955
Int. Cl.² C06B *45/10*
U.S. Cl. 149—19.8 **3 Claims**

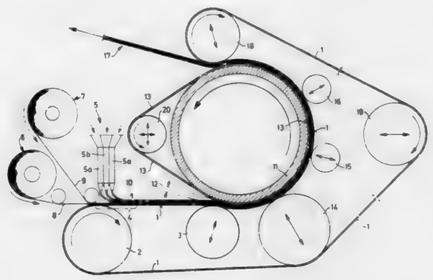
1. A solid urethane - crosslinked double base propellant comprising nitrocellulose, nitroglycerin, HMX, amonium perchlorate, aluminum, N-Methyl-p-Nitroaniline and aluminum silicate molecular sieve.

4,045,262

METHOD OF MAKING LAMINAR MATERIAL HAVING A BASE OF BONDED WOOD PARTICLES

Hans Joachim Enzinger, Oerlinghausen, Germany, and Hans Fechner, Kortrijk, Belgium, assignors to Feldmuhle Anlagen und Produktionsgesellschaft mit beschrankter Haftung, Dusseldorf-Oberkassel, Germany

Filed May 12, 1976, Ser. No. 685,909
Claims priority, application Germany, May 28, 1975, 2523670
Int. Cl.² B32B *31/00*; B05D *3/12*
U.S. Cl. 156—62.2 **10 Claims**



1. A process of producing a laminar material in continuous lengths which comprises:

a. sequentially and continuously moving a paper web through a loading zone and through a press zone,

1. said web consisting essentially of fibrous material impregnated with a synthetic resin composition, being free from sizing and filler, and having a permeability to water vapor of at least 1000 grams per square meter per day;

b. superimposing on said web in said loading zone loose wood particles intimately mixed with a bonding agent for said particles to form a layer on said web; and

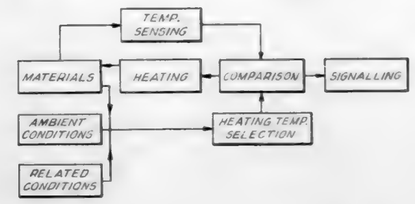
c. subjecting the web and the superimposed layer during said moving through said press zone to a temperature greater than 100° C and to a pressure sufficient to bond said loose particles to each other by said bonding agent in a dense structure and simultaneously to bond said particles to said web by at least one of said bonding agent and said synthetic resin composition.

4,045,263

CONTROL OF ROOFING PROCEDURE

Robert J. Moore, 614 Redman Ave., and Gerald B. Curtis, 50 Gill Road, both of Haddonfield, N.J. 08033

Division of Ser. No. 311,743, Dec. 4, 1972, Pat. No. 3,882,475.
This application Feb. 20, 1975, Ser. No. 551,094
Int. Cl.² E04D *7/00*
U.S. Cl. 156—64 **9 Claims**



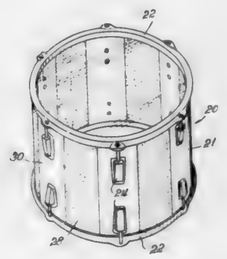
1. In formation of built-up roofs using molten bituminous material to adhere layers of roofing material, the improvement comprising heating bituminous material to melt it, sensing the temperature of the bituminous material being heated, sensing the temperature of molten bituminous material on the roof deck, and adjusting the heating temperature so that the temperature of the molten bituminous material applied to the deck will be within a predetermined satisfactory adhesion temperature range.

4,045,264

METHOD OF MANUFACTURING PLASTIC SHELLS FOR DRUMS

William F. Ludwig, Oak Brook, and Daniel S. Mikosz, Arlington Heights, both of Ill., assignors to Ludwig Industries, Chicago, Ill.

Filed Jan. 19, 1977, Ser. No. 760,564
Int. Cl.² B31C *5/00*
U.S. Cl. 156—63 **13 Claims**



1. A method of manufacturing plastic shells for drums from a plastic material which is relatively non-deformable at room temperature and is readily deformable when heated to a temperature substantially above room temperature, said method comprising steps of:

placing a large sheet of said plastic material on a substantially flat supporting surface when the material is at room temperature,

forming plastic panels from said plastic material by cutting it into individual panels,

forming a substantially V-shaped recess on one side of the sheet at said cut, which extends only partially through the panel,

forming a straight cut adjacent each V-shaped recess,

positioning the cut panels in abutting relation to each other

so that the V-shaped recesses face generally upwardly and the straight cuts of said adjacent panels abut with each other,

placing an adhesive having a higher deforming temperature than the temperature at which said plastic material becomes readily deformable to secure a desired plurality of said panels in an assembly,

removing excess adhesive from the assembly,

subjecting said assembly to a temperature at which said plastic material becomes readily deformable, but the adhesive material does not,

deforming the assembly into a generally cylindrical form while still heated,

thereafter placing the edges of the assembly in abutting relation with the straight cuts touching each other,

permitting the resultant assembly to return to room temperature by exposing it to room temperature for a sufficient period of time, and

placing adhesive in the V-shaped groove which has been formed by abutting the ends of the assembly together so that said shell is permanently retained in cylindrical form after hardening of the adhesive in the last mentioned V-shaped groove.

4,045,265

COMBINED APPLICATION PROCESS OF THERMAL INSULATION AND BUILT-UP ROOFING OR WATERPROOFING

Eiichi Tajima, and Kaname Yamamoto, both of Tokyo, Japan, assignors to Tajima Roofing Co., Ltd., Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,371
Claims priority, application Japan, Mar. 18, 1975, 50-31817
Int. Cl.² E04B *2/02*
U.S. Cl. 156—71 **11 Claims**

11. A process for manufacturing a combined, built-up, bituminous roofing or waterproofing and thermal insulation assembly, utilizing a base sheet having the entirety of one surface thereof covered with a compound coating layer consisting essentially of a pressure-sensitive self-adhesive composition that possesses high tackiness at ambient temperature, said compound layer being covered by a release paper having a release surface in releasably adhering contact with the outer surface of said compound layer and the other surface of said base sheet being free of said compound layer, comprising the steps of:

adhering, onto a wall of a building, foamed thermoplastic resin board means to form a thermal insulation layer on said wall, the outer surface of said board means being exposed;

removing the release sheet from said compound layer of said base sheet to expose said compound layer and then placing said base sheet onto the exposed outer surface of said foamed thermoplastic resin board means with said compound layer being in direct face-to-face adhering contact with said outer surface of said board means to form a substantially waterproof joint therebetween; and

then coating said outer surface of said base sheet with a layer of molten roofing bitumen.

4,045,266

PICTURE FRAMING METHOD AND KIT

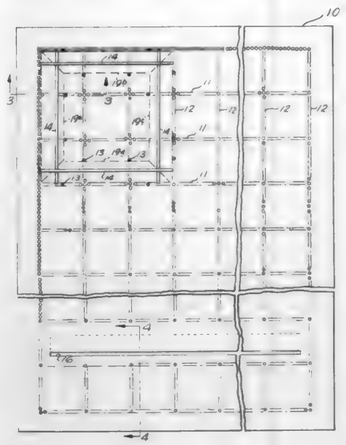
William T. Hewitt, Jr., 107-111 N. Main, Leland, Miss. 38756

Filed Sept. 12, 1975, Ser. No. 612,852
Int. Cl.² B32B *7/04*
U.S. Cl. 156—91 **8 Claims**

1. A method of assembling a picture frame from a plurality of picture frame segments having mitered corners, comprising:

a. providing a plurality of holes arranged in intersecting parallel rows and parallel columns in a flat board, and spacing said rows from each other and said columns from each other so that two frame segments may be placed between two sets of parallel rows of said holes and two other segments may be placed between two sets of parallel columns of said holes;

b. placing said two segments between said two sets of parallel rows and placing said other two segments between said two sets of parallel columns with the mitered corners of said segments abutting in the desired framing relationship;



c. inserting pegs in selected ones of said holes in said sets of parallel columns and said sets of parallel rows in abutting relationship to the edges of said frame segments and leaving the corners of said assembled frame segments free and unobstructed; and

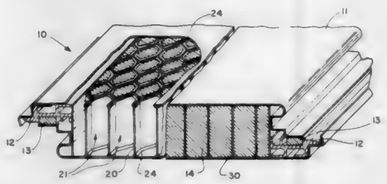
d. applying glue to said abutting corners of said frame segments.

4,045,267

METHOD AND APPARATUS FOR TACKING A HONEYCOMB CORE TO A BASE SHEET

Bernard H. Davis, Stoney Creek, Canada; Rollin T. Mack, and Kenneth Miyasaki, both of Stockton, Calif., assignors to H. H. Robertson Company, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 660,013
Int. Cl.² B31D *3/02*
U.S. Cl. 156—197 **17 Claims**



1. In the method of making an insulated panel comprising tacking a base sheet to one face of an expanded core member, said expanded core member having plural open-ended cells and having coatings of adhesive, one provided on the ends of the cells on each face of said core member; filling the cells of said core member with thermal insulation; depositing a facing sheet on the other face of said core member in confronting relation with the coating of adhesive thereon; and curing the coatings of adhesive under pressure and by heating the coatings to the curing temperature of the adhesive, thereby to reliably bond said facing sheet and said base sheet to said core member; the improvement in the step of tacking said base sheet to said core member comprising:

engaging said core member with said sheet so that one said coating of adhesive contacts said base sheet while moving said base sheet and said core member along a rectilinear path of travel; and

while engaging said base sheet with said core member,

a. heating said base sheet to temperatures within a wetting temperature range of the adhesive, said wetting temperature range being below the curing temperature of said adhesive,

b. maintaining said base sheet at temperatures within said wetting temperature range for a time interval sufficient to allow said one said coating of adhesive to be heated to flow, and to form a fillet between said core member and said base sheet, said time interval being insufficient to allow heating of the other said coating of adhesive to temperature within said wetting temperature range, and

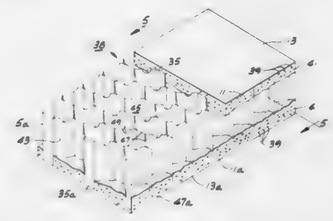
c. rapidly cooling said base sheet and said one said coating of adhesive and the other coating of adhesive to a discharge temperature below said wetting temperature range, whereby a reliable temporary adhesive bond is formed between the ends of all of the cells and caps the cells on one face of said core member by a reliable temporary adhesive bond.

4,045,268

MASTIC COMPOSITION AND COMPOSITE STRUCTURAL PANELS FORMED THEREFROM

Robert C. Geschwender, Lincoln, Nebr., assignor to Bell Fibre Products Corporation, Marion, Ind. and Robert C. Geschwender, Lincoln, Nebr., part interest to each

Division of Ser. No. 491,677, July 25, 1974, Pat. No. 3,990,936, which is a division of Ser. No. 381,073, July 20, 1973, abandoned. This application May 6, 1976, Ser. No. 683,708
Int. Cl.² B31D *3/02*
U.S. Cl. 156—197 **23 Claims**



1. A method of making composite structural panels comprising a core of expanded honeycomb material having cells extending from one face thereof to the other and layers of a mastic composition on opposite faces of the core keyed into the ends of the cells, said method comprising:

feeding honeycomb material of predetermined thickness in compacted condition from a supply and expanding it to form the cells;

feeding the expanded honeycomb material forward on a predetermined horizontal path with the cells vertical and with the upper face of the honeycomb material spaced below an upper guide and the lower face of the honeycomb material spaced above a lower guide and with these guides being spaced a distance greater than the thickness of the expanded honeycomb material for travel of the expanded honeycomb material therebetween;

supplying a first web of mastic-backing material to travel rearward in a horizontal path above the upper guide and then forward below the upper guide and above the honeycomb material;

applying hardenable mastic material in a layer substantially thicker than one-half the difference between the spacing of the upper and lower guides and the thickness of the honeycomb material to the upper face of the first web as it travels rearward over the upper guide;

supplying a second web of mastic-backing material to travel forward in a horizontal path over the lower guide means;

applying hardenable mastic material in a layer thicker than one-half the difference between the spacing of the upper and lower guides and the thickness of the honeycomb material to the face of the second web which faces upward as the second web travels forward over the lower guide;

said guides being operable to press the mastic layers into the upper and lower ends of the cells of the honeycomb material to a depth less than the thickness of the mastic layers.

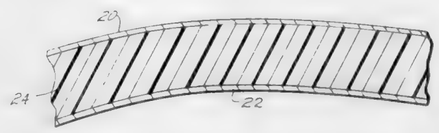
13. A method of making a composite structural panel comprising feeding an expanded honeycomb core having walls with openings therein between each cell and adjacent the opposite core faces, and concurrently pressing layers of hardenable mastic composition into the opposite core faces with the layers penetrating into each cell generally to the point of closing the openings and thereby trapping air in the cells to predetermine the depth of layer penetration.

4,045,269

TRANSPARENT FORMABLE POLYURETHANE POLYCARBONATE LAMINATION

David Lehmann Voss, Chatsworth; William Albert Miller, Thousand Oaks, and Ralph David Hermansen, Northridge, all of Calif., assignors to Sierracin Corporation, Sylmar, Calif.

Filed Dec. 22, 1975, Ser. No. 643,247
Int. Cl.² B29C *19/00*
U.S. Cl. 156—221 **26 Claims**



1. A method for producing a curved transparent polycarbonate laminate from a polycarbonate sheet comprising the steps of:

a. preparing a substantially completely cured, rigid, transparent thermoset polyurethane sheet having a Shore D hardness less than about 70 and a tear strength greater than about 50 pli at temperatures greater than the temperature T_1, the polycarbonate sheet heat deflection temperature, and less than the temperature T_2, the polycarbonate sheet chain scission temperature;

b. thereafter directly bonding the polyurethane sheet to the polycarbonate sheet to produce a laminate wherein the polyurethane sheet is an outer layer of the laminate;

c. heating the laminate to at least T_1 and less than T_2; and

d. forming the laminate to a desired curvature.

4,045,270

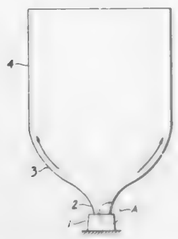
METHOD OF AND APPARATUS FOR MAKING A NON-SLIP PLASTICS FILM

Jar-Erik Jofs, Vasa, Finland, assignor to Oy Wiik & Hoglund Ab, Finland

Filed Apr. 20, 1976, Ser. No. 678,543
Claims priority, application Finland, Apr. 28, 1975, 751269
Int. Cl.² B32B *5/18*
U.S. Cl. 156—229 **8 Claims**

1. A method of making a plastic film having a rougher non-slip surface comprising the steps of simultaneously extruding at least two separate plasticized plastic materials so that two streams abut against one another and adhere to one another to

form a film having laminated layers defined by the material of said stream and stretching one of said layers relative to the



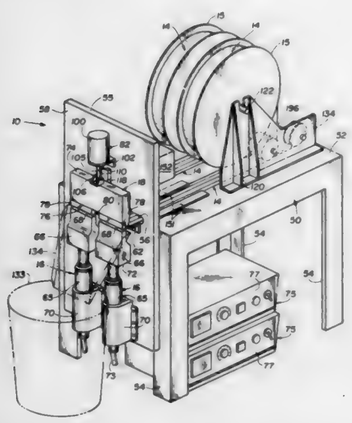
other layer whereby said other layer breaks to define a rougher surface on said stretched layer.

4,045,271

ULTRASONIC METHOD AND APPARATUS FOR MANUFACTURING BRASSIERE TAPES

Robert Alfred Clarke, White Plains; Peter J. Kuhl, Jackson Heights, and Richard H. Paschke, Medford, all of N.Y., assignors to Cavitron Corporation, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,786
Int. Cl.[2] B32B *31/10*
U.S. Cl. 156—366 **29 Claims**



1. Apparatus for forming tapes having a body portion and a pair of overlapping tabs extending outwardly therefrom, comprising

A. means for providing a continuous strip of said tape having elements thereon and layers of material in said body portion and in each of said tabs weldable with ultrasonic vibratory energy,

B. means for separating said tabs physically from each other and simultaneously maintaining said tabs in acoustical energy coupling relationship to each other, wherein said individual layers of material in said strip may be simultaneously severed and welded across said body portion and said tabs when interposed between an ultrasonically vibrating horn and an anvil, except for said layers of material in said tabs physically separated from each other, and

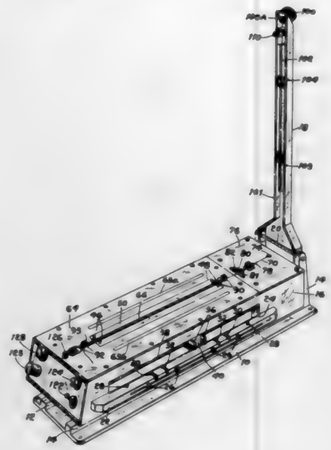
C. means for advancing said strip on an intermittent basis between said horn and said anvil for continuously producing said tapes of a desired number of elements.

4,045,272

APPARATUS FOR SEALING PLASTIC FILMS AND THE LIKE

Anthony Joseph Lombardi, Flanders, N.J., assignor to Barney Knitting Machinery Co., Inc., Brooklyn, N.Y.

Filed June 21, 1976, Ser. No. 698,189
Int. Cl.[2] B32B *19/02;* **B29C** *19/06*
U.S. Cl. 156—380 **14 Claims**



1. Sealing apparatus comprising in combination:

a housing supported on a base member;

a pressure arm member pivotally mounted to selectively exert pressure along one surface of said housing;

pin means mounted on said one surface to retain plastic pieces to be bonded together in an overlapping manner;

conducting means to retain and position a wire element between the overlapping pieces along said one surface of said housing;

wire cutting means mounted on said one surface and activated by said arm to cut said wire; and

control means coupled to said conducting means to apply a voltage to said wire for a predetermined time during exertion of pressure along said one surface to effect the bond between said pieces.

4,045,273

TAPE CUTTER PROTECTIVE GUARD MEANS FOR CARTON SEALING MACHINE TAPE APPLYING MECHANISM

Winton Loveland, 10 Timber Lane, Fort Salonga, N.Y. 11754, and Horst J. Hanemann, 175 Aldershot Lane, Manhasset, N.Y. 11030; Saul Warshaw, R.D. No. 1, Box 227, Hawley, Penn. 18428

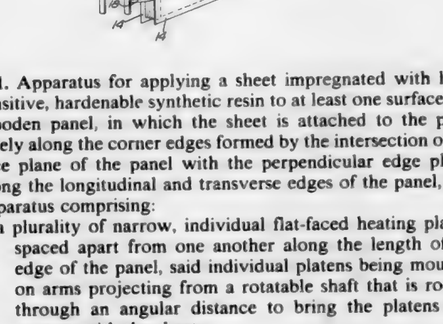
Filed July 7, 1976, Ser. No. 703,213
Int. Cl.[2] B32B *31/00;* **B26D** *5/00;* **B31B** *1/60*
U.S. Cl. 156—486 **6 Claims**

1. In a tape applying mechanism assembly of a carton sealing machine including movable tape cut-off means having a cutting edge, retractable guard means protectively covering the cutting edge when the cut-off means is in a projecting idle position, comprising,

1. a movable carrier that supports tape wipe-on means to be located in a path of advance of a carton through the machine and to be retractably moved by such advance;

2. manipulative tape cutter means having a cutting edge and additional movable carrier means supporting said cutter means for motion thereby of its cutting edge across a path of travel of the tape to the advancing carton for severance of the tape as the section of the latter of desired length is applied to the carton;

3. retractable guard means protectively covering the cutting edge when said cutter means is in a projecting idle position intervening successive tape applying actions with said guard means being carried by swinging arm means pivotally supported on frame structure of said tape applying mechanism assembly; and



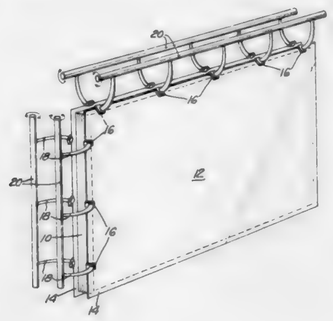
4. means linking said guard carrying swinging arm means to said movable carrier supporting the tape wipe-on means to retract said guard means for uncovering said cutting edge while the carton advances past the tape wipe-on means.

4,045,274

APPARATUS FOR SURFACE TREATMENT OF WOODEN PANELS

Wolfgang Lange, and Werner Schafer, both of Essen, Germany, assignors to Becker & Van Hullen, Niederrheinische Maschinen Fabrik, Krefeld, Germany

Division of Ser. No. 491,104, July 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 286,401, Sept. 5, 1972, abandoned. This application Mar. 1, 1976, Ser. No. 662,683
Claims priority, application Germany, Sept. 4, 1971, 2144347
Int. Cl.[2] B30B *7/00, 15/34*
U.S. Cl. 156—492 **2 Claims**



1. Apparatus for applying a sheet impregnated with heat-sensitive, hardenable synthetic resin to at least one surface of a wooden panel, in which the sheet is attached to the panel solely along the corner edges formed by the intersection of the face plane of the panel with the perpendicular edge planes along the longitudinal and transverse edges of the panel, said apparatus comprising:

a plurality of narrow, individual flat-faced heating platens spaced apart from one another along the length of the edge of the panel, said individual platens being mounted on arms projecting from a rotatable shaft that is rocked through an angular distance to bring the platens into contact with the sheet;

said individual platens being moved simultaneously into contact with the sharp corner edge of the panel so as to bend the edge of the sheet over the corner edge of the panel and apply pressure and heat to the sheet solely along a plurality of longitudinally spaced, linear contact areas substantially limited to the corner edge;

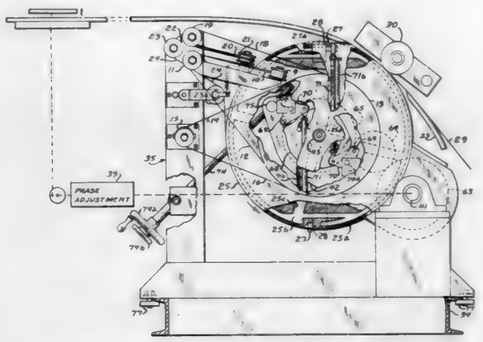
said flat faces of said heating platens forming substantially 45° angles with the face planes of the panel and with said edge planes.

4,045,275

MACHINE FOR APPLYING TAPES TO MOVING PRODUCT

Roger H. Stohlquist, 2002 Homewood Drive, Rockford, Ill. 61107, and John B. Bartell, 1227 N. Race Ave., Arlington Heights, Ill. 60004

Filed Sept. 4, 1975, Ser. No. 610,461
Int. Cl.[2] B32B *31/00*
U.S. Cl. 156—521 **7 Claims**



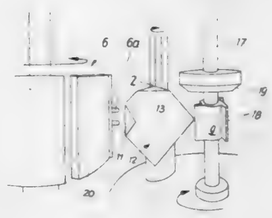
1. Apparatus for applying to a moving item a tape having an adhesive face and a back, including driven applicator wheel means for peripherally seizing the tape by its back and applying its adhesive face to the item at the speed of movement of the item, and feed means for pulling the tape from a roll of tape at a slower speed, and means for severing a length of tape from the following slower-fed tape and releasing said length to control of the applicator wheel means to accept the peripheral speed of the applicator wheel means for application to the item; said applicator wheel being carried in a subframe pivotable about a drive shaft and adjustable as to the angular position about the axis of said shaft for properly positioning varied sizes of applicator wheels to a given item path; said drive shaft driving said applicator wheel.

4,045,276

APPARATUS FOR APPLYING FOIL LABELS TO CONTAINERS

Rudolf Zodrow, Dusseldorf, Germany, assignor to Jagenberg Werke Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 16, 1976, Ser. No. 723,833
Claims priority, application Germany, Oct. 7, 1975, 2544785
Int. Cl.[2] B29C *17/00*
U.S. Cl. 156—571 **7 Claims**



1. In an apparatus for applying to a container labels having a plurality of points, comprising a rotating support, a rotating element on said support for picking up a foil label from a supply and for moving said label with a point thereof projecting horizontally and another point projecting vertically, first means for folding over said horizontally projecting point as

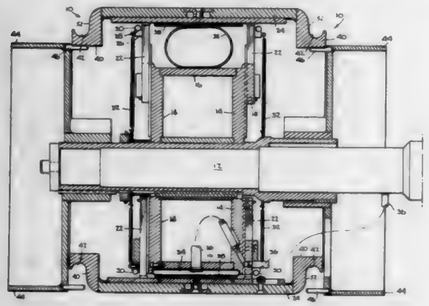
said rotating pickup element carries said label past a folding station, and a rotating gripper element receiving said label from said pickup element and gripping it where folded over, the improvement which comprises a second means for folding over said vertically projecting point after said pickup element picks up said label from said supply, whereby a more neat wrap will be produced when said label is applied to a container to be wrapped thereabout.

4,045,277

PNEUMATIC TIRE BUILDING DRUM

William C. Habert, Grosse Pointe Farms, and Jasjit S. Jawanda, Troy, both of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed May 11, 1976, Ser. No. 685,203
Int. Cl.² B29H *17/16, 17/22*
U.S. Cl. 156—417 **3 Claims**



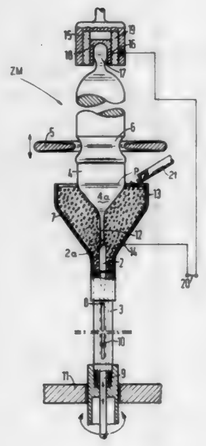
1. A building drum for building a first-stage, steel-reinforced, radial monoply, pneumatic tire carcass, whereby two specified carcass-bead-defining annular metallic cores are secured to the opposite end portions, respectively, of a cylindrically-oriented carcass-monoply, said drum comprising a circumferential array of drumforming segments, guide means supporting said segments for radial displacement to and from contracted and expanded dispositions, and shifting means for displacing said segments radially between said contracted and expanded dispositions, each of said segments having the same axial extent and terminating at each end in a respective flange projecting radially inwardly, each of said flanges having a respective recess exposed radially outwardly, corresponding ones of said recesses which are at the same segment end defining cooperatively with one another at each such segment end a radially outwardly exposed annular bead-seat, said segments when in a fully contracted disposition presenting a substantially cylindrical outer carcass-ply supporting surface having an outer diameter which is less than the inner diameter of any of said specified carcass-bead-defining annular metallic cores to be thereby operated upon, said bead-seats each having an inner diameter which is less than said outer diameter of said outer carcass-ply support-surface, said bead-seats each being entirely rigid and, thereby, having a depth-to-width ratio that does not vary with the expansion and contraction of said segments, the depth of each of said bead-seats measured radially from said outer carcass-ply support-surface to the radially innermost portion of said bead-seats being in excess of three times the radially directed thickness of any of said specified carcass-bead-defining annular metallic cores to be thereby operated upon.

4,045,278

METHOD AND APPARATUS FOR FLOATING MELT ZONE OF SEMICONDUCTOR CRYSTAL RODS

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 637,986, Dec. 5, 1975, Pat. No. 3,989,468, Ser. No. 638,261, Dec. 8, 1975, Pat. No. 3,996,096, and Ser. No. 638,302, Dec. 8, 1975, Pat. No. 3,996,011, each is a division of Ser. No. 580,548, May 27, 1975, Pat. No. 3,961,906, and Ser. No. 580,585, May 27, 1975, Pat. No. 3,988,197, each is a division of Ser. No. 525,641, Nov. 20, 1974, Pat. No. 3,923,468.
This application July 6, 1976, Ser. No. 702,575
Claims priority, application Germany, July 11, 1975, 2531099; Nov. 22, 1973, 2358300
Int. Cl.² B01J *17/10*
U.S. Cl. 156—602 **7 Claims**



1. A method of floating melt zone refining of a semiconductor crystal rod comprising:

arranging a semiconductor crystal rod within a floating zone melt environment with a seed crystal attached to a lower end thereof;

generating a melt zone at the juncture of said seed crystal and said rod and controllably moving said melt zone away from said juncture through said rod to a select point on such rod;

uniformly supporting said lower end of said rod so as to prevent oscillations at the juncture of said crystal and said rod by axially upwardly moving a conductive hollow funnel-shaped jacket from a position below said juncture to a position surrounding said lower end of the rod, said jacket including a conductive stabilizing means therein;

establishing operational contact between an electrical current source, said jacket and an upper end of said rod;

feeding an electrical current through said jacket and stabilizing means through the rod so that said electrical current passes from said jacket across said melt zone; and

controllably moving said melt zone from said select point on the rod through the remaining portions of said rod.

4,045,279

PROCESS FOR THE MANUFACTURE OF PULP USING SODIUM CARBONATE AND OXYGEN

Tadashi Nagano, Tokyo; Saisei Miyao, and Katsuhiko Takeda, both of Kure, all of Japan, assignors to Toyo Pulp Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 534,347, Dec. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,685, Dec. 22, 1972, abandoned. This application Sept. 9, 1976, Ser. No. 722,000
Claims priority, application Japan, Jan. 17, 1972, 47-6728
Int. Cl.² D21C *3/02*
U.S. Cl. 162—25 **5 Claims**

1. A process for the manufacture of pulp in a closed system, which comprises

1. mixing a fibrous raw material with an alkaline aqueous solution of sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients, which alkaline aqueous solution is completely free of sulfite and sulfide compounds and sulfur-containing ions resulting from dissolution of said compounds, the amount of sodium carbonate or mixture of sodium carbonate and sodium bicarbonate being 5 – 20% by weight, as sodium oxide, based on the weight of the raw material,
2. pre-cooking the fibrous raw material in the alkaline aqueous solution at a temperature of 90° to 190° C,
3. defibrating the pre-cooked material by mechanical means,
4. removing a major proportion of waste liquor, formed during the pre-cooking step, from the defibrated material,
5. pulping the defibrated material in an alkaline aqueous solution of sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients, which alkaline aqueous solution is completely free of sulfite and sulfide compounds and sulfur-containing ions resulting from dissolution of said compounds, the amount of sodium carbonate or mixture of sodium carbonate and sodium bicarbonate being 5 – 20% by weight, as sodium oxide, based on the weight of the raw material, in a pressurized pulping vessel at a temperature of 90° to 170° C in the presence of an oxygen-containing gas,
6. discharging waste liquor, formed during the pulping step, from the pulping vessel,
7. subjecting the waste liquor discharged from at least one of the pre-cooking and pulping steps to wet combustion, in which the waste liquor is treated at a temperature exceeding 230° C in the presence of an oxygen-containing gas, to recover an alkaline aqueous substance containing sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients and
8. recycling the recovered alkaline aqueous substance, without any chemical treatment thereof, to at least one of the pre-cooking and pulping steps.

4,045,280

ALKALINE PULPING OF LIGNOCELLULOSIC MATERIAL WITH AMINE AND NITRATE PRETREATMENT

David M. Mackie, Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Feb. 17, 1976, Ser. No. 658,868
Int. Cl.² D21C *3/02, 3/04, 3/20*
U.S. Cl. 162—65 **10 Claims**

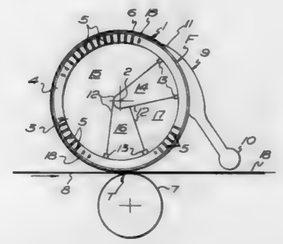
1. In a process for pulping raw lignocellulosic material, the steps which comprise first pretreating the lignocellulosic material with an aqueous solution containing from about 0.1 to 10% by weight of a water soluble, low molecular weight aliphatic amine selected from the group consisting of monoethanolamine and methylamine and from about 0.01 to 1% by weight of a water soluble transition metal salt selected from the group consisting of copper nitrate and nickel nitrate at elevated pressure in a closed vessel and thereafter subjecting the pretreated lignocellulosic material to an alkaline pulping process in the absence of oxygen.

4,045,281

METHOD FOR PREVENTING WEB REWETTING

Eberhard Wassermann, Sheffield, England, assignor to Sulzer Bros. (U.K.) Limited, Farnborough, England

Filed July 28, 1975, Ser. No. 599,394
Claims priority, application United Kingdom, Aug. 7, 1974, 34898/74
Int. Cl.² D21F *1/60*
U.S. Cl. 162—214 **3 Claims**



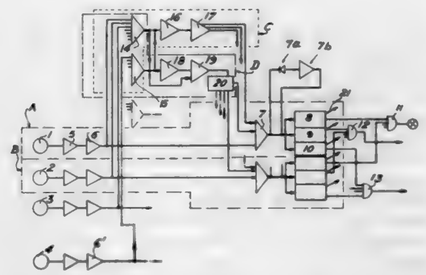
1. In a method of making paper using a paper making machine comprising a forming medium having a perforated surface, a pressure slice adjacent said surface, and a transfer zone from which a formed web is withdrawn, and wherein the withdrawn web is exposed to water thrown out from a length of said forming medium extending between said transfer zone and said pressure slice in a direction of movement of said medium, comprising the steps of moving said medium, supplying paper stock material from said pressure slice to said medium in a forming zone during movement of said medium, producing suction at said medium at the transfer zone thereof, withdrawing the formed web from said medium at the transfer zone, water from said moving medium tending to impinge on said withdrawn web, the additional step of producing suction at said medium along substantially the entire length of said medium extending between the transfer zone and the pressure slice in the direction of movement of said medium so as to prevent rewetting of said withdrawn web.

4,045,282

METHOD AND A DEVICE FOR THERMAL MONITORING OF A NUCLEAR REACTOR CORE

Georges Barbier, Aix-en-Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 26, 1976, Ser. No. 661,756
Claims priority, application France, Mar. 4, 1975, 75.06746
Int. Cl.² G21C *7/00*
U.S. Cl. 176—19 R **6 Claims**



1. A method of thermal monitoring of a nuclear reactor core having fuel assemblies at temperatures T_1 and T_2 utilizing

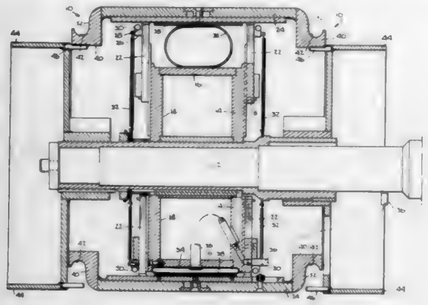
said rotating pickup element carries said label past a folding station, and a rotating gripper element receiving said label from said pickup element and gripping it where folded over, the improvement which comprises a second means for folding over said vertically projecting point after said pickup element picks up said label from said supply, whereby a more neat wrap will be produced when said label is applied to a container to be wrapped thereabout.

4,045,277

PNEUMATIC TIRE BUILDING DRUM

William C. Habert, Grosse Pointe Farms, and Jasjit S. Jawanda, Troy, both of Mich., assignors to Uniroyal, Inc., New York, N.Y.

Filed May 11, 1976, Ser. No. 685,203
Int. Cl.[2] B29H *17/16, 17/22*
U.S. Cl. 156—417 **3 Claims**



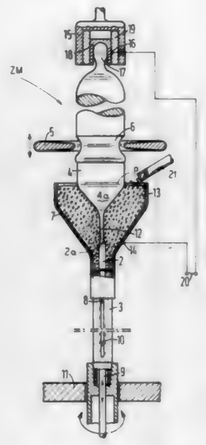
1. A building drum for building a first-stage, steel-reinforced, radial monoply, pneumatic tire carcass, whereby two specified carcass-bead-defining annular metallic cores are secured to the opposite end portions, respectively, of a cylindrically-oriented carcass-monoply, said drum comprising a circumferential array of drumforming segments, guide means supporting said segments for radial displacement to and from contracted and expanded dispositions, and shifting means for displacing said segments radially between said contracted and expanded dispositions, each of said segments having the same axial extent and terminating at each end in a respective flange projecting radially inwardly, each of said flanges having a respective recess exposed radially outwardly, corresponding ones of said recesses which are at the same segment end defining cooperatively with one another at each such segment end a radially outwardly exposed annular bead-seat, said segments when in a fully contracted disposition presenting a substantially cylindrical outer carcass-ply supporting surface having an outer diameter which is less than the inner diameter of any of said specified carcass-bead-defining annular metallic cores to be thereby operated upon, said bead-seats each having an inner diameter which is less than said outer diameter of said outer carcass-ply support-surface, said bead-seats each being entirely rigid and, thereby, having a depth-to-width ratio that does not vary with the expansion and contraction of said segments, the depth of each of said bead-seats measured radially from said outer carcass-ply support-surface to the radially innermost portion of said bead-seats being in excess of three times the radially directed thickness of any of said specified carcass-bead-defining annular metallic cores to be thereby operated upon.

4,045,278

METHOD AND APPARATUS FOR FLOATING MELT ZONE OF SEMICONDUCTOR CRYSTAL RODS

Wolfgang Keller, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 637,986, Dec. 5, 1975, Pat. No. 3,989,468, Ser. No. 638,261, Dec. 8, 1975, Pat. No. 3,996,096, and Ser. No. 638,302, Dec. 8, 1975, Pat. No. 3,996,011, each is a division of Ser. No. 580,548, May 27, 1975, Pat. No. 3,961,906, and Ser. No. 580,585, May 27, 1975, Pat. No. 3,988,197, each is a division of Ser. No. 525,641, Nov. 20, 1974, Pat. No. 3,923,468.
This application July 6, 1976, Ser. No. 702,575
Claims priority, application Germany, July 11, 1975, 2531099; Nov. 22, 1973, 2358300
Int. Cl.[2] B01J *17/10*
U.S. Cl. 156—602 **7 Claims**



1. A method of floating melt zone refining of a semiconductor crystal rod comprising:

arranging a semiconductor crystal rod within a floating zone melt environment with a seed crystal attached to a lower end thereof;

generating a melt zone at the juncture of said seed crystal and said rod and controllably moving said melt zone away from said juncture through said rod to a select point on such rod;

uniformly supporting said lower end of said rod so as to prevent oscillations at the juncture of said crystal and said rod by axially upwardly moving a conductive hollow funnel-shaped jacket from a position below said juncture to a position surrounding said lower end of the rod, said jacket including a conductive stabilizing means therein;

establishing operational contact between an electrical current source, said jacket and an upper end of said rod;

feeding an electrical current through said jacket and stabilizing means through the rod so that said electrical current passes from said jacket across said melt zone; and

controllably moving said melt zone from said select point on the rod through the remaining portions of said rod.

4,045,279

PROCESS FOR THE MANUFACTURE OF PULP USING SODIUM CARBONATE AND OXYGEN

Tadashi Nagano, Tokyo; Saisei Miyao, and Katsuhiko Takeda, both of Kure, all of Japan, assignors to Toyo Pulp Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 534,347, Dec. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 317,685, Dec. 22, 1972, abandoned. This application Sept. 9, 1976, Ser. No. 722,000
Claims priority, application Japan, Jan. 17, 1972, 47-6728
Int. Cl.[2] D21C *3/02*
U.S. Cl. 162—25 **5 Claims**

1. A process for the manufacture of pulp in a closed system, which comprises

1. mixing a fibrous raw material with an alkaline aqueous solution of sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients, which alkaline aqueous solution is completely free of sulfite and sulfide compounds and sulfur-containing ions resulting from dissolution of said compounds, the amount of sodium carbonate or mixture of sodium carbonate and sodium bicarbonate being 5 – 20% by weight, as sodium oxide, based on the weight of the raw material,
2. pre-cooking the fibrous raw material in the alkaline aqueous solution at a temperature of 90° to 190° C,
3. defibrating the pre-cooked material by mechanical means,
4. removing a major proportion of waste liquor, formed during the pre-cooking step, from the defibrated material,
5. pulping the defibrated material in an alkaline aqueous solution of sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients, which alkaline aqueous solution is completely free of sulfite and sulfide compounds and sulfur-containing ions resulting from dissolution of said compounds, the amount of sodium carbonate or mixture of sodium carbonate and sodium bicarbonate being 5 – 20% by weight, as sodium oxide, based on the weight of the raw material, in a pressurized pulping vessel at a temperature of 90° to 170° C in the presence of an oxygen-containing gas,
6. discharging waste liquor, formed during the pulping step, from the pulping vessel,
7. subjecting the waste liquor discharged from at least one of the pre-cooking and pulping steps to wet combustion, in which the waste liquor is treated at a temperature exceeding 230° C in the presence of an oxygen-containing gas, to recover an alkaline aqueous substance containing sodium carbonate or a mixture of a major proportion of sodium carbonate and a minor proportion of sodium bicarbonate as the only alkaline ingredients and
8. recycling the recovered alkaline aqueous substance, without any chemical treatment thereof, to at least one of the pre-cooking and pulping steps.

4,045,280

ALKALINE PULPING OF LIGNOCELLULOSIC MATERIAL WITH AMINE AND NITRATE PRETREATMENT

David M. Mackie, Vancouver, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Feb. 17, 1976, Ser. No. 658,868
Int. Cl.[2] D21C *3/02, 3/04, 3/20*
U.S. Cl. 162—65 **10 Claims**

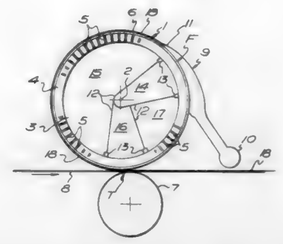
1. In a process for pulping raw lignocellulosic material, the steps which comprise first pretreating the lignocellulosic material with an aqueous solution containing from about 0.1 to 10% by weight of a water soluble, low molecular weight aliphatic amine selected from the group consisting of monoethanolamine and methylamine and from about 0.01 to 1% by weight of a water soluble transition metal salt selected from the group consisting of copper nitrate and nickel nitrate at elevated pressure in a closed vessel and thereafter subjecting the pretreated lignocellulosic material to an alkaline pulping process in the absence of oxygen.

4,045,281

METHOD FOR PREVENTING WEB REWETTING

Eberhard Wassermann, Sheffield, England, assignor to Sulzer Bros. (U.K.) Limited, Farnborough, England

Filed July 28, 1975, Ser. No. 599,394
Claims priority, application United Kingdom, Aug. 7, 1974, 34898/74
Int. Cl.[2] D21F *1/60*
U.S. Cl. 162—214 **3 Claims**



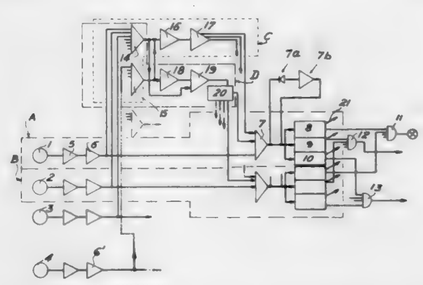
1. In a method of making paper using a paper making machine comprising a forming medium having a perforated surface, a pressure slice adjacent said surface, and a transfer zone from which a formed web is withdrawn, and wherein the withdrawn web is exposed to water thrown out from a length of said forming medium extending between said transfer zone and said pressure slice in a direction of movement of said medium, comprising the steps of moving said medium, supplying paper stock material from said pressure slice to said medium in a forming zone during movement of said medium, producing suction at said medium at the transfer zone thereof, withdrawing the formed web from said medium at the transfer zone, water from said moving medium tending to impinge on said withdrawn web, the additional step of producing suction at said medium along substantially the entire length of said medium extending between the transfer zone and the pressure slice in the direction of movement of said medium so as to prevent rewetting of said withdrawn web.

4,045,282

METHOD AND A DEVICE FOR THERMAL MONITORING OF A NUCLEAR REACTOR CORE

Georges Barbier, Aix-en-Provence, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 26, 1976, Ser. No. 661,756
Claims priority, application France, Mar. 4, 1975, 75.06746
Int. Cl.[2] G21C *7/00*
U.S. Cl. 176—19 R **6 Claims**



1. A method of thermal monitoring of a nuclear reactor core having fuel assemblies at temperatures T_1 and T_2 utilizing

coolant temperatures detected at the outlets of a plurality of said fuel assemblies comprising the steps of

establishing at each instant the mean core outlet temperature by forming the half-sum of the mean T_1 and T_2 core outlet temperatures corresponding respectively to the mean value of the coolant temperatures at the outlet of at least part of the fuel assemblies at temperatures T_1 and to the mean value of the coolant temperatures at the outlet of at least part of the fueld assemblies at temperatures T_2 and the difference between said core outlet temperatures T_1 and T_2,

producing for each fuel assembly an analog signal corresponding to the temperature difference between the coolant temperature at the outlet of said fuel assembly and the mean core outlet temperature as initially increased or decreased by a predetermined fraction of the difference between the mean core outlet temperatures T_1 and T_2 to define a state of equilibrium at which said temperature difference is equal to zero, and

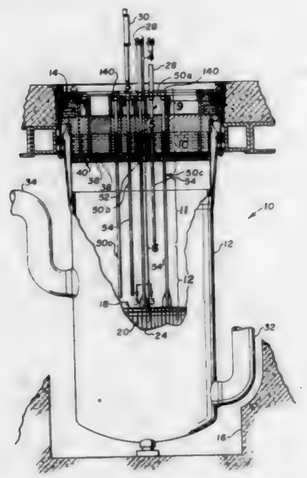
processing said signal to initiate appropriate safety actions by overstepping of threshold values corresponding to temperature variations permitted on each side of the equilibrium zero.

4,045,283

CONTROL ROD AND/OR INSTRUMENT TREE ASSEMBLY

Richard Croissant Noyes, Hartford, Conn.; Clive Frederick George Dupen, Encinitas; Donald Martin Barrus, Poway, both of Calif., and Edward Arnold Siegel, Bloomfield, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 30, 1974, Ser. No. 537,283
Int. Cl.[2] G21C *7/08*
U.S. Cl. 176—35 **9 Claims**



1. An improved core servicing apparatus for a nuclear reactor having a vessel, a head for said vessel, a penetration opening in said head and a core within said vessel of the type having an array of elongated assemblies the improvement comprising:

a. a support column adapted to be supported by and depend from said head in registry with said penetration;

b. a plurality of core servicing elements supported by said support column; and

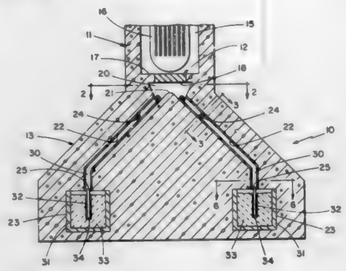
c. means for laterally displacing at least some of said elements between retracted and extended positions relative to said support column, whereby to vary said servicing apparatus between a laterally compact and a laterally expanded configuration, said laterally displaceable elements each including an elongated resilient drive cable extending upwardly therefrom and said lateral displacement means including a guide channel means for each of said elements and associated drive cables, said guide channel means being supported by said support column and extending generally vertically and being directed laterally outward at its lower end, said drive cables being longitudinally movable to move said elements between a position in said channel means and a position laterally outward thereof beyond said lower end.

4,045,284

NUCLEAR REACTOR FUEL CONTAINMENT SAFETY STRUCTURE

Michael P. Rosewell, 5155 S. Natchez Ave., Chicago, Ill. 60638

Filed Mar. 10, 1975, Ser. No. 556,692
Int. Cl.[2] G21C *9/00*
U.S. Cl. 176—38 **1 Claim**



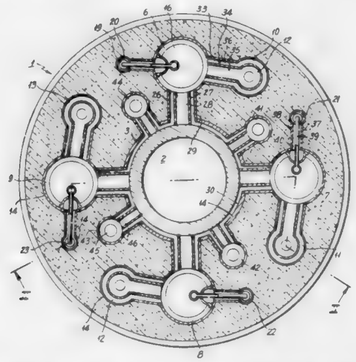
1. A nuclear reactor fuel containment safety structure for fuel of an atomic reactor in a primary containment and capable of heating to melt down temperatures if not properly cooled, and having means normally provided for cooling of the fuel comprising a fuel reactor shield having a fuel containment chamber adapted to contain the atomic reactor and reactor fuel therein, said fuel chamber having an exhaust passage means in the bottom thereof adapted to allow passage of a radioactive molten mass therethrough from said fuel chamber; a deactivating containment base attached to and extending generally downwardly from said fuel reactor shield at said exhaust passage means of said chamber for receiving any radioactive fuel flow from said chamber, whereby a molten radioactive mass formed by said reactor in said fuel reactor shield will pass into said deactivating containment base to be deactivated; said deactivating base has remotely located diffusing means for receiving a radioactive means flowing thereinto from said fuel chamber through said exhaust passage to diffusibly separate said fuel into remotely located parts to reduce the temperature of the mass, whereby a molten radioactive mass formed by said reactor in said fuel reactor shield will pass into said deactivating containment base to be dispersed to cool said mass; said deactivating base has flux material infusing means and poison control substance adapted to receive the dispersed flowing radioactive masses whereby said masses will be further cooled as a result of the fluxing action and the action of the poison control substance infused into the mass by the fluxing material; said flux material is positioned in said dispersing means for receiving the flowing radioactive mass to be infused therein for further cooling said mass, said diffusing means comprises a dispersion manifold chamber below said passage means for receiving fuel flow thereinto said chamber having a fuel receiving dome with the surface thereof centered below said passage means and being larger at its base than at the top thereof whereby fuel flowing thereonto, will flow downwardly thereover and therearound to diffuse said fuel around the base of said receiving dome; said diffusion means comprises multiple spaced apart passages extending radially outwardly and downwardly from said dispersion manifold chamber at the base of said dome for receiving fuel flow from said dome to further diffuse said fuel into said passages to further cool said fuel; wherein fluxing means is positioned in said dispersion passages for receiving said fuel and to infuse therewith to cool said fuel; and said fluxing means includes soluble melt plugs in said passages to temporarily stop flow of said fuel as said plugs are dissolved or melted causing a temporary backup of fuel to balance the fuel load in each diffusion passage.

4,045,285

PLANT FOR THE PRODUCTION OF HYDROGEN THROUGH UTILIZATION OF HEAT ENERGY OBTAINED FROM A GAS-COOLED NUCLEAR REACTOR

Heinrich Baumgaertner, Ketsch, and Ekkehard Barchewitz, Mannheim, both of Germany, assignors to Hochtemperatur-Reactorbau GmbH., Mannheim, Germany

Filed Nov. 21, 1975, Ser. No. 634,052
Claims priority, application Germany, Nov. 23, 1974, 2455508
Int. Cl.[2] G21D *9/00*
U.S. Cl. 176—39 **11 Claims**



1. A plant for the production of hydrogen through utilization of heat energy derived from a gas-cooled, high-temperature nuclear reactor, comprising:

a. a thick-walled vessel;

b. a high temperature reactor contained in a centrally oriented cavity with said vessel;

c. a plurality of process gas cracking reactors contained within the wall of said vessel;

d. a plurality of steam generators equal to the number of said gas cracking reactors, said generators being contained in the wall of said vessel;

e. a plurality of recuperative heat exchangers equal to the number of said gas cracking reactors each of said heat exchangers being contained within the wall of said vessel and being positioned closely adjacent one of said gas cracking reactors;

f. a coaxial conduit connecting said adjacent heat exchanger and gas cracking reactor pairs; and

g. a coaxial conduit connecting said gas cracking reactor and steam generator pairs; whereby said coaxial donduits transport cooling gas through the exterior space therein.

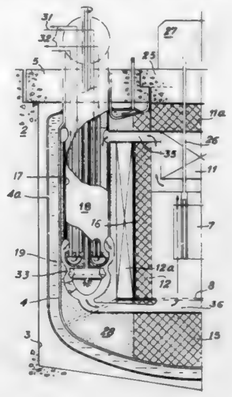
4,045,286

MOLTEN FUEL-SALT REACTOR

Jacques Marcel Blum, Levallois Perret; Michel Grenon, Neuilly-sur-Seine, and Edmond Ventre, Le Vesinet, all of France, assignors to Electricite de France (Service National) and Pechiney Ugine Kuhlmann, both of Paris, France

Filed Dec. 22, 1975, Ser. No. 642,996
Claims priority, application France, Dec. 24, 1974, 74.42767; Nov. 17, 1975, 75.35055
Int. Cl.[2] G21C *3/54*
U.S. Cl. 176—49 **4 Claims**

1. A molten-salt reactor provided within a common vessel containing the reactor core and a neutron-moderating mass pierced by passages for the circulation of the molten fuel salt with at least one primary heat exchanger which is located as close as possible to the reactor core and through which the hot fuel salt passes immediately after discharge from said core and with pumps for circulating the cold molten fuel salt which is discharged from the heat exchangers and returned into the reactor core, wherein the free spaces defined within the reactor vessel exterior of and between the core, the heat exchangers and the pumps are filled with expanded graphite which is



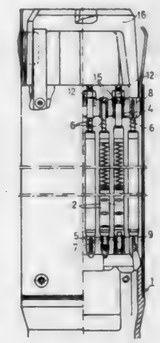
compatible with the molten fuel salt except for the connecting passages in which the fuel salt is circulated, wherein the reactor core is placed within the central portion of an open vessel having a vertical axis and is surrounded by a lateral reflector which defines an annular region with the internal vessel wall, the pumps for the circulation of molten fuel salt and the heat exchangers being placed within said annular region, said pumps and said heat exchangers being disposed at intervals around said reactor core.

4,045,287

FUEL ASSEMBLY WITH EASILY DETACHABLE COMPONENTS

Aart van Santen, Vasteras, Sweden, assignor to Aktiebolaget ASEA-ATOM, Vasteras, Sweden

Filed Dec. 22, 1975, Ser. No. 643,512
Claims priority, application Sweden, Dec. 30, 1974, 7416341
Int. Cl.[2] G21C *3/30, 3/10*
U.S. Cl. 176—78 **1 Claim**



1. Fuel assembly with easily detachable components, which fuel assembly comprises a bundle of substantially vertical fuel rods (2, 3) which are provided with upper (4,6) and lower (5,7) end plugs, a bottom plate (9) and a grid-formed top plate (8) provided with attachment holes for said upper end plugs, compressible individual springs (11) surrounding some of said

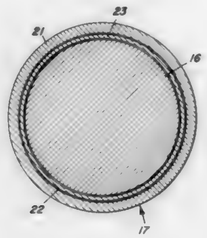
upper plugs, a plurality of fuel rods (3) having their lower end plugs (5) screwed in threaded holes (10) in said bottom plate, the upper end plugs (4) each having a portion located above said top plate and provided with a nut (12), means limiting the rotational movement of the nut (12) comprising at least one downwardly-directed nut projection (13), the end surface of which lies below the upper edge of a side (14) of the grid of the top plate (8), said grid side running between two attachment holes, and the length of said projection being, at the most, equal to the maximum elastic shortening of said compressible springs (11) obtainable by a reduction of the distance between the top and bottom plates by exerting a downwardly-directed force on the top plate.

4,045,288

NUCLEAR FUEL ELEMENT

Joseph Sam Armijo, Saratoga, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Nov. 11, 1974, Ser. No. 522,766
Int. Cl.² G21C *3/20*
U.S. Cl. 176—82 **19 Claims**



1. A nuclear fuel element comprising (a) a central core of a body of nuclear fuel material selected from the group consisting of compounds of uraniun, plutonium, thorium and mixtures thereof and (b) an elongated composite cladding container including an outer portion formed of a material selected from the group of zirconium and zirconium alloys and forming a substrate, an undeformed metal barrier of constant thickness formed of a material selected from the group of niobium, aluminum, copper, nickel, stainless steel and iron metallurgically bonded on the inside surface of the substrate, said metal barrier comprising from about 1 to about 4 percent of the thickness of the cladding container and an undeformed inner layer of constant thickness formed of zirconium metallurgically bonded on the inside surface of the metal barrier, said inner layer comprising from about 5 to about 15 percent of the thickness of the cladding container, said cladding container enclosing said core so as to leave a gap between said core and said cladding during use in a nuclear reactor.

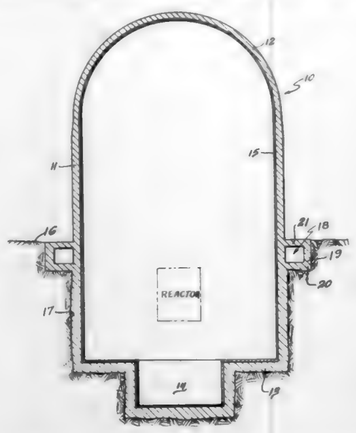
4,045,289

NUCLEAR REACTOR CONTAINMENT STRUCTURE WITH CONTINUOUS RING TUNNEL AT GRADE

Ralph W. Seidensticker, Wheaton, Ill.; Robert L. Knawa; Bernard C. Cerutti, both of Idaho Falls, Idaho; Charles R. Snyder, Naperville, Ill.; William C. Husen, Whittier, and Robert G. Coyer, Pasadena, both of Calif., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,837
Int. Cl.² G21C *13/02*
U.S. Cl. 176—87 **2 Claims**

1. A containment structure for a nuclear reactor comprising a vertically disposed, right circular cylindrical shell provided with a top dome and resting on a base mat, said shell, dome and base mat being constructed of steel-lined reinforced concrete, said structure being partially embedded in competent rock with the concrete thereof being in contact with the rock and including a hollow, reinforced-concrete ring tunnel continuously encircling said cylindrical shell and surrounding the shell with its top at grade, having one wall integral with the cylindrical shell, and with at least the base of the ring tunnel being poured in contact with the rock.



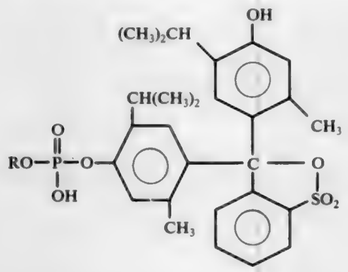
4,045,290

DIAGNOSTIC METHOD AND COMPOUNDS FOR USE THEREWITH

George F. Bulbenko, Langhorne, Pa., and Joseph Eliot Woodbridge, Princeton, N.J., assignors to Princeton Biomedix Incorporated, Princeton, N.J.

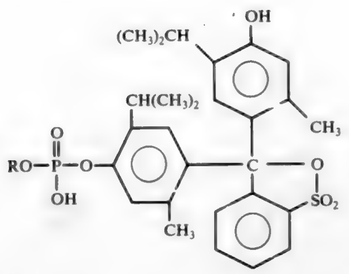
Continuation-in-part of Ser. No. 554,007, Feb. 28, 1975, abandoned. This application Feb. 18, 1976, Ser. No. 659,002
Int. Cl.² G07F *3/02;* **C09K** *15/26*
U.S. Cl. 195—99 **9 Claims**

1. Compounds useful in the assay of alkaline phosphatase enzymes comprising a compound having the structure



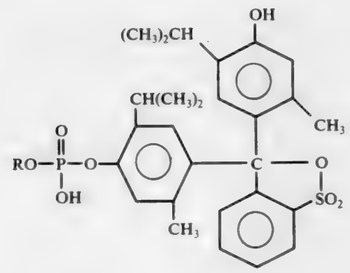
wherein R is selected from the group consisting of sodium, potassium, ammonium, 2 -amino-2-methyl 1,3-propanediol, dicyclohexylamine, cyclohexylamine and tris(hydroxymethyl) amminomethane.

3. A composition for the assay of alkaline phosphatase enzymes comprising a compound having the structure



wherein R is selected from the group consisting of sodium, potassium, ammonium, 2 -amino-2-methyl 1,3-propanediol, dicyclohexylamine, cyclohexylamine and tris(hydroxymethyl) aminomethane, a phosphorylatable buffer in an amount sufficient to produce a pH of about 10.2 and an activator for alkaline phosphatase in an amount sufficient to activate said alkaline phosphatase.

7. A method of assaying alkaline phosphatase enzymes present in a sample comprising contacting said sample with a composition which releases a dyestuff at a measurable rate, said composition comprising a compound having the structure



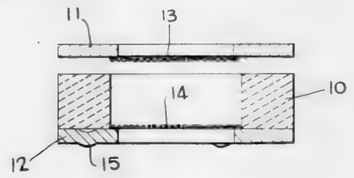
wherein R is selected from the group consisting of sodium, potassium, ammonium, 2-amino-2-methyl 1,3-propanediol, dicylohexylamine, cyclohexylamine and tris(hydroxymethyl) aminomethane, a phosphorylatable buffer in an amount sufficient to produce a pH of about 10.2 and an activator for alkaline phosphatase enzymes in an amount sufficient to activate said enzymes and spectrophotometrically measuring the rate of formation of dye.

4,045,291

TISSUE SPECIMEN CONTAINER

Jacob E. Berger, 4444 Main St., Snyder, N.Y. 14226

Filed July 15, 1976, Ser. No. 705,416
Int. Cl.² C12K *1/10*
U.S. Cl. 195—127 **7 Claims**



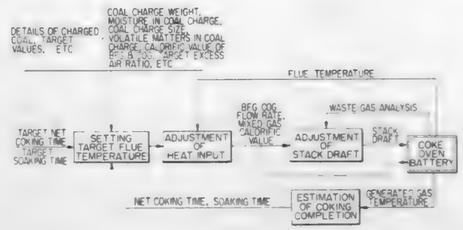
1. A tissue specimen container comprising a tubular body member means and closure means adapted to extend across the opposite ends of said body member means in axial abutment therewith to form a tissue specimen receiving chamber, at least one of said means comprising permanent magnet means and the other of said means being magnetically attractable thereto whereby the container is releasably held in closed assembly by axially directed magnetic force.

4,045,292

METHOD FOR CONTROLLING COMBUSTION IN COKE OVEN BATTERY

Taro Matsushita, Fukuyama; Masahiro Hiraki, Fukayasu; Takeo Fujimura, Yokohama, and Shinji Hasebe, Fukuyama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,150
Claims priority, application Japan, July 21, 1975, 50-88430
Int. Cl.² C10B *21/10*
U.S. Cl. 201—1 **4 Claims**



1. A method for controlling the combustion by oven group in the operation of a coke oven battery which comprises the steps of:

setting a target flue temperature for each oven group on the basis of the details of coal charge consisting of the weight, the particle size, the moisture content, the volatile matter content and the timing of charging of the coal charge, so as to achieve a target net coking time and a target soaking time given by a coke production schedule; measuring the temperature at the hairpin tops of individual flues at certain intervals of time; calculating deviations of thus measured flue temperatures from said target flue temperature by computer to set a flow rate and a calorific value of the fuel gas for each oven group with the use of said deviations; setting a stack draft for each oven group by computer so as to ensure optimum combustion in response to changes in the flow rate and the calorific value of the fuel gas, and simultaneously adjusting said stack draft by means of a measured excess air ratio obtained by analyzing the combustion waste gases from the flues and a target excess air ratio; and bias-correcting said target flue temperature with reference to the mean value of the measured flue temperatures, the measured net coking times, the measured soaking times and the details of coal charge corresponding thereto.

4,045,293

WATER PURIFICATION APPARATUS AND METHOD

Ralph D. Cooksley, Apt. 543, South Tower, 1800 Silas Deane Highway, Rocky Hill, Conn. 06067

Filed Nov. 6, 1975, Ser. No. 629,273
Int. Cl.² B01D *3/02*
U.S. Cl. 203—10 **21 Claims**

1. In a water purification apparatus, the combination comprising:

A. a boiler assembly having

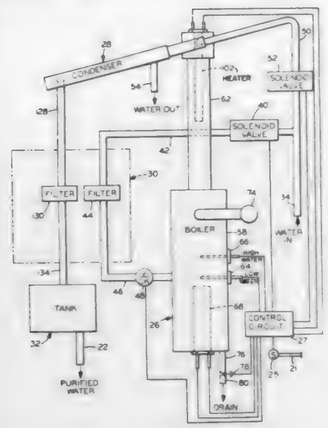
1. a water-boiling tank portion and
2. a vapor receiving and conducting portion thereabove, said tank portion including a first chamber, a water inlet into said chamber and heating means adapted to heat water in said chamber to the boiling point and produce vaporization thereof,

said vapor-receiving and conducting portion including a. a second chamber therewithin,

b. contact surface means occupying substantially the entire transverse dimension of at least a portion of the length of said second chamber and

c. heating means for heating said contact surface means to a temperature substantially above the vaporization temperature of water to effect vaporization of water particles which may come into contact therewith,

said boiler assembly including a passage between said first chamber and said second chamber for passage of vapors from said first chamber to said second chamber;



B. a condenser assembly connected to said vapor-receiving and conducting portion for receiving vapors passing therethrough and providing indirect heat exchange contact between the vapors and a cooling medium;

C. a filter assembly connected to said condenser assembly for receiving condensate therefrom and effecting filtration thereof; and

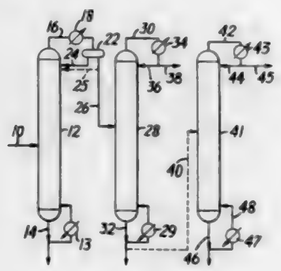
D. storage tank means for receiving filtrate from said filter assembly.

4,045,294

PROCESS FOR THE RECOVERY OF ALKYLENE GLYCOLS

Mitchell Becker, Teaneck, and Jon R. Valbert, Ridgewood, both of N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,824
Int. Cl.² B01D *3/36*; C07C *29/28*
U.S. Cl. 203—69 **4 Claims**



1. A process for recovering ethylene glycol or propylene glycol characterized by low ultraviolet absorbance from a complex mixture comprising propylene glycol or ethylene glycol in admixture with at least one mono-lower carboxylate ester and at least one di-lower carboxylate ester of said propylene glycol or ethylene glycol, said glycol and said esters tending to form azeotropic mixtures among themselves, which comprises the steps of:

a. subjecting said complex mixture to distillation in a distillation zone in the presence of an azeotroping agent effective to form a minimum-boiling azeotrope with said glycol, said azeotroping agent being a hydrocarbon which is essentially water-immiscible and has a boiling point at atmospheric pressure of above 190° to about 220° C and is characterized by being free from hydrogen atoms attached to secondary or tertiary carbon atoms contained in an open chain, whereby an overhead product and a bottoms product are produced, said overhead product comprising an azeotrope of said azeotroping agent and said glycol and said bottoms product comprising at least some of the esters in said mixture substantially reduced in glycol content;

b. separating said overhead product into a first phase comprising said azeotroping agent and a second phase comprising said glycol;

c. returning said first phase to said distillation zone as reflux; and

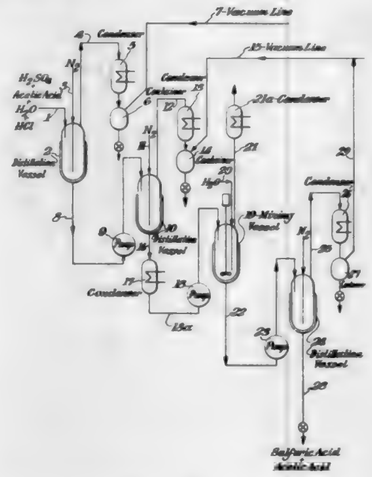
d. recovering purified glycol characterized by low ultraviolet absorbance from at least part of said second phase.

4,045,295

PURIFICATION OF SULFURIC ACID CONTAINING ACETIC ACID

Stefan Schäfer, Bruhl; Alexander Ohorodnik, Erftstadt-Liblar; Klaus Gehrmann, Erftstadt-Lechenich, and Albert Mainski, Rodenkirchen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 10, 1976, Ser. No. 694,664
Claims priority, application Germany, June 12, 1975, 2526241
Int. Cl.² B01D *3/10, 3/34*
U.S. Cl. 203—79 **6 Claims**



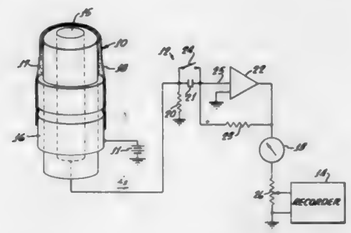
1. A process for purifying dilute sulfuric acid contaminated with acetic acid and hydrogen chloride with the resultant formation of concentrated sulfuric acid of about 94–96 % strength and acetic acid, the sulfuric acid to be purified forming part of a mixture consisting substantially of about 30–60 weight % of concentrated sulfuric acid, about 20–50 weight % of acetic acid, about 10–40 weight % of water, and about 2–10 weight % of hydrogen chloride, which process comprises: heating, in a first step, the contaminated sulfuric acid to a temperature of at most about 60° C under a pressure of about 25–30 mm Hg and thereby expelling all of the hydrogen chloride together with minor proportions of acetic acid and water; heating, in a second step, the sulfuric acid to a temperature of at most 165° C under a pressure of about 20–25 mm Hg and thereby distilling off the bulk of acetic acid together with water with the resultant formation of (a) sulfuric acid containing at most 1.3 up to 1.6 weight % of residual acetic acid and (b) of acetic acid of about 70–80 weight % strength; cooling, in a third step, the sulfuric acid down to a temperature of about 60°–90° C, diluting it with about 10–30 weight % of water with agitation and while cooling is continued, and then heating the sulfuric acid to a temperature of about 160°–165° C under a pressure of about 20–25 mm Hg and thereby freeing it from the water and residual acetic acid.

4,045,296

RATE SENSING BATCH ANALYSIS METHOD AND ENZYME USED THEREIN

James C. Sternberg, Fullerton, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation of Ser. No. 279,011, Aug. 9, 1972, Pat. No. 3,933,593, which is a division of Ser. No. 117,632, Feb. 22, 1971, abandoned, which is a division of Ser. No. 618,859, Feb. 27, 1967, Pat. No. 3,857,771. This application Dec. 29, 1975, Ser. No. 645,009
The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.
Int. Cl.² G01N *31/14*
U.S. Cl. 195—103.5 R **1 Claim**



1. A method of determining the cholesterol concentration in a cholesterol containing sample comprising the steps of:

oxidizing the cholesterol present in the sample in an oxygen saturated aqueous solution by means of cholesterol oxidase in the presence of a sensor which serves to monitor a property or characteristic of oxygen in said solution related to the oxygen concentration thereof;

generating a first electrical signal related to said oxygen concentration;

differentiating said first electrical signal to produce an output signal proportional to the instantaneous time rate of change of oxygen concentration; and

measuring said output signal to determine said cholesterol concentration.

4,045,297

TRIGLYCERIDES DETERMINATION METHOD

Lloyd E. Weeks, St. Louis; John H. Johnson, Kirkwood, and Margaret J. Reents, Manchester, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 15, 1975, Ser. No. 640,361
Int. Cl.² G01N *31/14*
U.S. Cl. 195—103.5 R **7 Claims**

1. The method of determining triglycerides in blood serum or plasma comprising reacting a sample of said blood serum or plasma with a lipolytic enzyme to liberate free glycerol, reacting said free glycerol with an oxygenated aqueous solution containing ATP, GK, α-GPDH, NAD and an electron acceptor and measuring the uptake of oxygen by the oxidation of the resulting NADH with an oxygen sensing electrode.

4,045,298

ANTIBIOTIC XK-62-2 AND PROCESS FOR PRODUCTION THEREOF

Takashi Nara, Tokyo; Seigo Takasawa, Kawasaki; Ryo Okachi, Machida; Isao Kawamoto, Machida; Mitsuyoshi Yamamoto, Machida; Seiji Sato, Machida; Tomoyasu Sato, Machida, and Atsuko Morikawa, Tama, all of Japan, assignors to Abbott Laboratories, North Chicago, Ill.

Division of Ser. No. 364,058, May 25, 1973. This application June 15, 1976, Ser. No. 696,306
Claims priority, application Japan, May 27, 1972, 47-52177; Sept. 11, 1972, 47-90477
Int. Cl.² C12D *9/14*
U.S. Cl. 195—80 R **12 Claims**

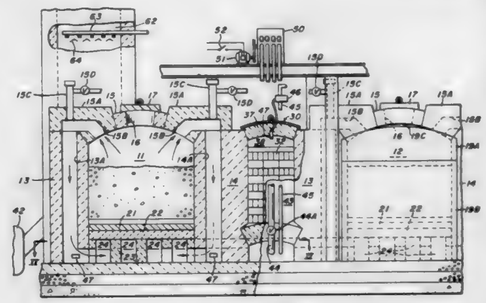
10. A process for the production of the antitiotics gentamicin C_1, gentamicin C_2 and gentamicin C_{1a} which comprises culturing a microorganism belonging to the species *Micromonospora sagamiensis* which is capable of producing said antibiotics in a nutrient medium until substantial antibacterial activity is detected in the culture liquor; and thereafter isolating at least one of said antibiotics therefrom.

4,045,299

SMOKELESS NON-RECOVERY TYPE COKE OVEN

James E. MacDonald, Latrobe, Pa., assignor to Pennsylvania Coke Technology, Inc., Greensburg, Pa.

Filed Nov. 24, 1975, Ser. No. 634,602
Int. Cl.² C10B *9/00*
U.S. Cl. 202—93 **9 Claims**



1. A smokeless and non-recovery type coke oven comprising:

means for forming an oven chamber including side walls, an oven roof carried by the side walls, removable door means for the discharge of coke from the oven chamber, and a floor to support a coal charge introduced into the oven chamber through a closable opening in said roof,

means defining a sole heating flue for conducting partially-burned distillation products beneath said floor in heat-conducting contact therewith,

means for conducting partially-burned distillation products from the space above a coal charge in said oven chamber into said sole heating flue,

means defining a discharge flue arranged to receive the partially-burned distillation products from said sole heating flue,

ignition chamber means including first and second ignition chambers each having checkerbricks therein to incinerate the partially-burned distillation products received from said discharge flue,

means coupled to at least said first ignition chamber to heat the ignition chamber means independently of the heat liberated by incinerating the partially-burned distillation products and only to maintain a predetermined elevated operating temperature within said first and second ignition chambers,

means responsive to the temperature within said ignition chamber means to activate said means to heat the ignition

chamber means only when the detected temperature therein falls below said predetermined elevated operating temperature,

secondary air supply means coupled to said ignition chamber means to insure and facilitate complete incineration of the partially-burned distillation products within the ignition chamber means independently of said means to heat the same,

conduit means extending horizontally to conduct combustion products from said second ignition chamber means, and

a stack to draw combustion products from said conduit means.

4,045,300

METHOD FOR REDUCING THE RESPONSE TIME IN OXYGEN MEASURING PROBES

Claude Renet, Pontchartrain, France, assignor to "Meci" Materiel Electrique de Controle et Industriel, Paris, France

Filed May 1, 1975, Ser. No. 573,720
Claims priority, application France, May 6, 1974, 74.15550
Int. Cl.² G01N *27/46*
U.S. Cl. 204—1 T **14 Claims**

1. A method for reducing the response time in the measurement of the oxygen content in molten metal by means of a probe of the type comprising a solid electrolyte which produces an electromotive force depending on the ratio of the partial pressure of oxygen in the molten metal to the partial pressure of oxygen in a powdered reference medium contained in the probe, said method comprising producing a temperature rise of the probe by an exothermic oxidation-reduction chemical reaction initiated in the powdered reference medium and by the bath itself and whereof the final products of said reaction do not substantially modify the partial pressure of oxygen produced by the reference medium to thereby accelerate the establishment of thermal equilibrium with the molten metal, wherein the reference medium is a powder which contains a metal and optionally its lowest oxide and wherein added to this powder is an oxide of a metal having a lower affinity for oxygen than the metal of the reference medium in an amount so that the final products do not substantially modify the partial pressure of oxygen produced by the reference medium, and wherein the metals used are chosen from the group constituted by: Fe, Cu, Ni, Co, Mo, Cr, these metals being arranged in increasing order of their affinity for oxygen, the metal of the reference medium being chosen from the last four and the oxide being an oxide of any one of the metals preceding the reference metal in the list.

4,045,301

ELECTROLYTIC DEPOSITION OF METALS

Karel Wens; Hubert Tobback, and Karel Hens, all of Olen, Belgium, assignors to Metallurgie Hoboken-Overpelt, Brussels, Belgium

Filed Sept. 24, 1975, Ser. No. 616,478
Claims priority, application Luxembourg, Oct. 8, 1974, 71072
Int. Cl.² C25D *1/20, 1/04*
U.S. Cl. 204—12 **11 Claims**

1. A process for separating an electrolytic deposit of metal from a cathode, in which the bath-level edge of the said electrolytic deposit is locally heated at a plurality of spots so as to form a plurality of spaced apart gaps between the said edge and the cathode, then the plurality of spaced apart gaps are enlarged by means of a plurality of spaced apart knives so as to unite the plurality of spaced apart gaps into a large gap along the said edge, and then a wedge is operated from the said large gap to separate the entire deposit from the cathode.

4,045,302

MULTILEVEL METALLIZATION PROCESS

Stephen R. Gibbs, Escondido, and Kuen Chow, Del Mar, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed July 8, 1976, Ser. No. 703,412
Int. Cl.² C25D *5/02;* H01L *23/48*
U.S. Cl. 204—15 **4 Claims**

1. A method of making a multilevel conductor pattern for a semiconductor device comprising:

depositing a first level aluminum layer on a semiconductor substrate;

anodizing said first level aluminum to form a porous alumina layer on the top surface thereof;

anodizing said first level aluminum layer to form a barrier alumina layer subjacent to the porous alumina layer;

masking desired first level conductor sites with a resist;

etching both of the alumina layers down to the first level aluminum layer except in the conductor site areas protected by the resist;

anodizing the first level aluminum layer to convert it to nonconductive alumina except in the conductor site areas protected by the resist and the remaining barrier alumina layer;

removing the resist;

forming an insulating layer over the first level aluminum layer;

etching an opening through the insulating area, porous alumina layer, and barrier alumina layer, respectively, to expose a portion of the first level aluminum which has not been anodized and is still conductive; and

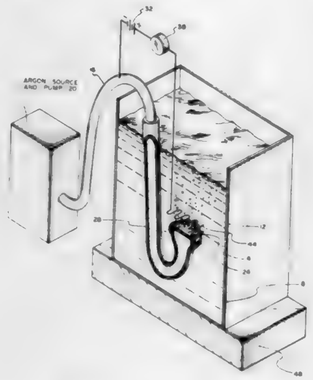
depositing a second level aluminum layer on the insulating layer, with the second level aluminum contacting the unanodized portion of the first level aluminum through the opening.

4,045,303

PROCESS OF ELECTROPLATING POROUS SUBSTRATES

Barrie C. Campbell, Orem, Utah, assignor to Billings Energy Corporation, Provo, Utah

Filed Aug. 5, 1976, Ser. No. 711,772
Int. Cl.² C25D *7/00, 7/04*
U.S. Cl. 204—24 **11 Claims**



1. A method of electroplating porous substrates comprising

placing a porous substrate in an electrolyte solution which includes ions of the material to be deposited on the substrate,

forcing a gas through the porous substrate from the bottom side upwardly, and

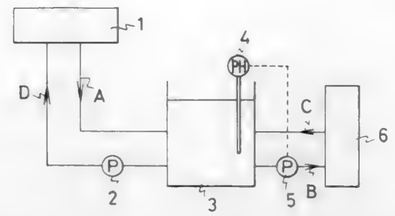
applying an electric current to the substrate and electrode while gas is being forced through the substrate.

4,045,304

HIGH SPEED NICKEL PLATING METHOD USING INSOLUBLE ANODE

Junichi Tezuka, Isehara, Japan, assignor to Electroplating Engineers of Japan, Ltd., Tokyo, Japan

Filed May 5, 1976, Ser. No. 683,250
Int. Cl.² C25D *3/12, 21/14, 21/18*
U.S. Cl. 204—49 **4 Claims**



1. A process for the high speed electroplating of nickel, utilizing an electroplating solution consisting essentially of from about 350 to about 400 grams per liter of nickel sulfate and from about 30 to about 50 grams per liter of boric acid, said solution having a pH in the range of from 2.5 to 3.5, which comprises the steps of: continuously pumping a first stream of said electroplating solution from a storage tank to jet nozzle means in a plating container, said nozzle means having insoluble anode means at the tip thereof, said anode means being opposed to and being located close to the workpiece to be plated which is connected as the cathode, and directing jet means of said electroplating solution from said nozzle means against the workpiece whereby to electroplate nickel on said workpiece at a current density of from about 10 to about 70 A/dm² and at a temperature of about 55° to about 65° C; continuously returning the electroplating solution from said plating container to said storage tank; continuously monitoring the pH of the electroplating solution in said storage tank and when the pH of said electroplating solution in said storage tank has decreased to a preselected low level, pumping a second stream of the electroplating solution, separate from said first stream, from said storage tank through a vessel containing pieces of nickel metal and thence back to said storage tank whereby to increase the nickel ion content of said electroplating solution present in said storage tank and to increase the pH thereof, and continuing to pump said second stream of electroplating solution from said storage tank through said vessel until the pH of the electroplating solution in said storage tank rises to a preselected high value and then discontinuing pump of said second stream through said vessel, the pH of the electroplating solution in said storage tank being continuously maintained in the range of from 2.5 to 3.5.

4,045,305

CADMIUM ELECTROPLATING BATH AND PROCESS

Jaan-Jiue Fong, Tolland, and Grace F. Hsu, Somers, both of Conn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 14, 1975, Ser. No. 595,276
Int. Cl.² C25D *3/26*
U.S. Cl. 204—50 R **11 Claims**

1. An aqueous electroplating bath for depositing cadmium consisting essentially of about 5 to about 75 grams per liter of cadmium ion, a free acid selected from the group consisting of sulfuric acid, fluoboric acid or mixtures thereof, the concentration of said free acid being from about 0.4N to about 4.0N, from about 0.05 to about 2.0 grams per liter of at least one non-sulfur containing organic brightener compound, and a surfactant combination comprising about 0.5 to about 10.0 grams per liter of a condensed naphthalene sulfonic acid or salt thereof and from about 1.0 to about 20.0 grams per liter of a non-ionic polyoxyalkylated compound.

4,045,306

ELECTROPLATING ZINC AND BATH THEREFOR

Gerd Senge, and Günter Voss, both of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin, Germany

Filed June 1, 1976, Ser. No. 691,625
Claims priority, application Germany, June 4, 1975, 2525264
Int. Cl.² C25D *3/22, 3/24*
U.S. Cl. 204—55 R **6 Claims**

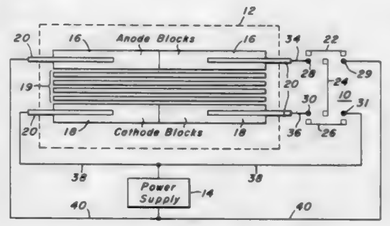
1. An aqueous alkaline substantially cyanide-free bath for the electrodeposition of zinc, comprising a zinc salt, an alkali hydroxide, and an effective amount of a brightener which is a reaction product of from 1 to 4 moles of a halohydrin selected from the group consisting of an epihalogen hydrin and a glycerol halogen hydrin with from 1 to 2 moles of a heterocyclic compound selected from the group consisting of pyrazol, 1,2,3-triazol, tetrazol, pyridazine, pyrimidine, pyrazine, 1,3,5-triazine, tetrazine, purine, quinoxaline, pteridine, 1,23-oxadiazol, 3-amino-1,2,4-triazol, 1,3,4-thiadazol, 1,2,4-thiadiazine, benzothiadiazine, and 1,2,4-triazol.

4,045,307

STRUCTURE FOR SWITCHING ELECTRICAL CURRENT AND CELL COMPRISING SAME

Bernard C. Turley, Pittsburgh, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 14, 1976, Ser. No. 648,903
Int. Cl.² C25C *3/00*
U.S. Cl. 204—64 **5 Claims**



1. Structure for changing the path of current flow through an electrical load connected to a source of electrical current by four fixed conductors physically disposed in close but spaced relationship to each other, two of the four conductors being hereinafter referred to as source conductors and two as load conductors, a movable, electrically conductive switch member located on one side of one source and one load conductor for electrically connecting the one load conductor and the one source conductor together, a second movable electrically conductive switch member located on one side of the other two load and source conductors for electrically connecting the same together, two electrically insulative members for physical disposal in location between the load conductors and, two electrically conductive members for physical disposal in respective locations between the switc members and their associated load conductors, the electrically conductive members being effective to respectively electrically connect together the switch members and their associated load conductors when the switch members are moved to engage the source conductors and the conductive members.

4,045,308

BATH LEVEL SET POINT CONTROL IN AN ELECTROLYTIC CELL AND METHOD OF OPERATING SAME

Russell L. White, Vienna, W. Va., and Kenneth L. Edwards, Louisville, Tenn., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 4, 1976, Ser. No. 738,657
Int. Cl.² C25C *3/06*
U.S. Cl. 204—67 **6 Claims**

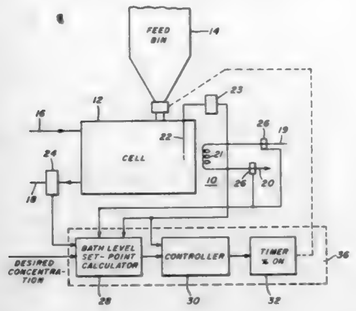
1. A method of operating an electrolytic cell for the produc-

tion of aluminum by reduction of an aluminum halide in a molten salt bath, the method comprising the steps of

measuring the height of the molten salt in the cell,

measuring the density of the molten salt,

measuring the volume of the molten metal in the cell, and



adding an amount of aluminum halide to the cell sufficient to prevent deleterious reduction of molten metal salts in the bath, said amount being determined by said measurements of salt level height, salt density and metal volume in the cell.

4,045,309

METHOD FOR MEASURING AND CONTROL OF THE ENERGY IN ALUMINUM REDUCTION CELLS

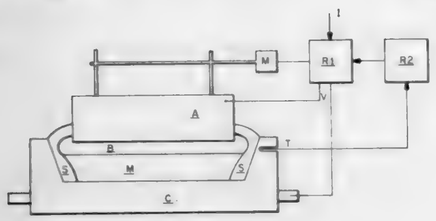
Jens Arvid Andersen, Kolbotn, Norway, assignor to Norsk Hydro a.s, Oslo, Norway

Filed Apr. 9, 1976, Ser. No. 675,568

Claims priority, application Norway, Apr. 10, 1975, 751256

Int. Cl.² C25C *3/06;* **C25D** *17/00*

U.S. Cl. 204—67 **4 Claims**



1. A method for measuring and controlling the energy balance in an aluminum reduction cell of the type wherein anodes are immersed in an electrolyte within a cathode lining, and wherein during operation of the cell, crust is formed on the inner surface of the lining, said method comprising:

measuring the temperature of a side of said lining by means of at least one thermoelement located in said lining;

comparing the thus measured temperature with a reference temperature; and

adjusting the immersion level of said anodes within said electrolyte when the difference between said measured temperature and said reference temperature exceeds a given value.

4,045,310

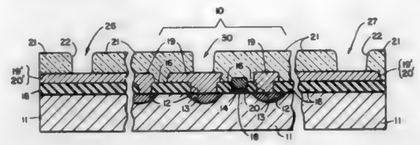
STARTING PRODUCT FOR THE PRODUCTION OF A READ-ONLY MEMORY AND A METHOD OF PRODUCING IT AND THE READ-ONLY MEMORY

Robert K. Jones, Centerville, Ohio, and Harry Sue, Chicago, Ill., assignors to Teletype Corporation, Skokie, Ill.

Filed May 3, 1976, Ser. No. 682,411

Int. Cl.² C25F *3/00, 3/14*

U.S. Cl. 204—129.4 **18 Claims**



1. A method of forming a ROM from a matrix of semiconductive devices which each include a plurality of electrodes, at least one of which electrodes in each device includes a metallic conductor in contact with a doped semiconductor region, wherein the method comprises:

rapidly decreasing the cross-sectional area of selected ones of the conductors in contact with doped regions with an etchant which forms, with the conductor and the doped region, an electrochemcial cell; conductors not in contact with the doped regions etching at a slower, chemical rate; and then

passing sufficient current through selected conductors to fuse the decreased cross-sectional area thereof.

4,045,311

PROCESS FOR MAKING A MINUTE HOLE

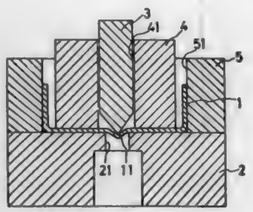
Masao Matsui, Nagoya; Atsunobu Murata, Aichi; Masami Isii, and Hiromu Komai, both of Toyota, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya and Aisin Seiki Kabushiki Kaisha, Kariya, both of, Japan

Filed Sept. 28, 1976, Ser. No. 727,695

Claims priority, application Japan, Sept. 30, 1975, 50-118675

Int. Cl.² C25F *3/02, 3/04, 3/06*

U.S. Cl. 204—129.55 **8 Claims**



1. A process for making a minute hole in the wall of a metal article, comprising the steps of:

forming a depression in the wall of a metal article at a localized spot on one of the surfaces of said wall, said depression having a depth exceeding the thickness of said wall and having a projection with an apex extending from the other surface of said wall;

positioning said apex of said projection formed on said other surface of said wall in an opposed spaced relationship to a cathode within an electrolyte; and

introducing an electric current between said projection, which serves as an anode, and said cathode until said apex of said projection is dissolved to form a minute hole in said wall.

4,045,312

METHOD FOR THE ELECTROLYTIC ETCHING OF METAL WORKPIECE

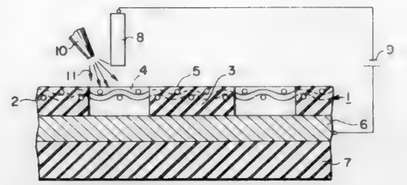
Takeuchi Satoshi, Kawasaki, Japan, assignor to Dai Nippon Printing Co., Ltd., Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,324

Claims priority, application Japan, Nov. 30, 1974, 49-138617

Int. Cl.² C25F *3/14, 3/00*

U.S. Cl. 204—129.65 **16 Claims**



1. A method for the electrolytic etching of a metal workpiece comprising placing a stencil made of an electric insulating material containing a pattern having open portions and closed portions into intimate contact with the metal workpiece, placing an electrode adjacent to said metal workpiece, maintaining a distance of from several 10 microns to several mm between said electrodes and said metal workpiece, and jetting an electrolyte between said electrode and said metal workpiece while passing an electric current through the jet of electrolyte in the direction from said metal workpiece to said electrode to electrolytically etch said metal workpiece, and then separating said stencil from the electrolytically etched metal workpiece.

4,045,313

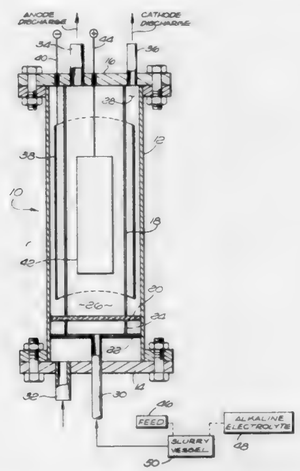
ELECTROLYTIC RECOVERY FROM BITUMINOUS MATERIALS

Teh Fu Yen, Altadena, and Chaur-Shyong Wen, Los Angeles, both of Calif., assignors to The University of Southern California, Los Angeles, Calif.

Filed Aug. 23, 1976, Ser. No. 716,859

Int. Cl.² C25B *3/02*

U.S. Cl. 204—131 **10 Claims**



1. A process for treating bituminous material for recovery of chemicals therefrom, comprising:

slurrying said material with an aqueous alkaline electrolytic solution;

defining an electrolytic cell having a cathode chamber electrolytically operative with an anode chamber, an anode in said anode chamber in contact with said slurry and a cathode in said cathode chamber; and

applying a direct current potential across said anode and cathode chambers at a current density of above about about 15 A/m² for a time sufficient to effect substantial oxidative electrolysis of said material whereby to obtain a water-soluble product, and a residue, therefrom; and

separating said water-soluble product from said residue.

4,045,314

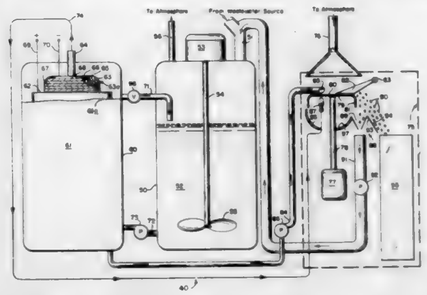
WASTE EVAPORATION DISPOSAL SYSTEM

Robert L. Rod, Marina Del Rey; Walter L. Penick, Jr., Culver City, and Henry B. Heller, Pasadena, all of Calif., assignors to Monogram Industries, Inc., Santa Monica, Calif.

Filed May 29, 1975, Ser. No. 581,851

Int. Cl.² C02C *5/12, 3/00*

U.S. Cl. 204—151 **12 Claims**



1. A non-polluting method for disposing of waste-water comprising:

bringing said wastewater into a liquid-retaining cell having an anode and cathode therein and into contact with an anode and cathode.

passing an electric current through said wastewater in said cell and between said anode and cathode thereby producing hydrogen gas at the cathode and a halogen at said anode;

keeping the hydrogen gas separate from the chlorine gas;

bringing said halogen into intimate contact with said wastewater in said cell to disinfect and said wastewater;

collecting said hydrogen gas;

removing said wastewater after contact with said halogen from said cell; and

evaporating said wastewater using said collected hydrogen gas as a source of fuel to convert the removed wastewater from said cell into disinfected non-polluting sterile solid residue and water vapor.

4,045,315

SOLAR PHOTOLYSIS OF WATER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Porter R. Ryason, La Canada, Calif.

Filed Feb. 13, 1976, Ser. No. 658,132

Int. Cl.² B01J *1/10;* **B01K** *1/00*

U.S. Cl. 204—157.1 R **26 Claims**

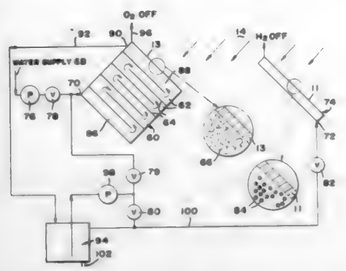
1. A method of photolyzing water comprising the steps of:

applying solar radiation to a first vessel containing an aqueous solution of a water soluble photo-oxidizable reagent and generating hydrogen gas therefrom while forming a spent solution containing oxidized, spent reagent;

applying solar radiation to a second vessel containing water and a water insoluble photoreducible reagent catalyst and generating oxygen gas therefrom while forming spent, reduced photoreducible reagent catalyst;

combining the spent solution containing oxidized photo-oxidizable reagent with the spent reduced photo-reducible

reagent catalyst and regenerating said reagents in the dark to form a solution of regenerated photo-oxidizable reagent



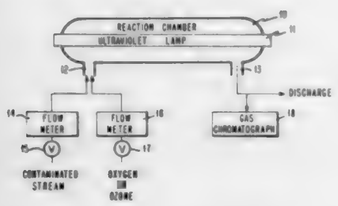
containing water-insoluble, regenerated photo-reducible reagent catalyst.

4,045,316

PHOTOCHEMICAL PROCESS FOR DECONTAMINATING GASEOUS OR VAPOROUS STREAMS

Robert W. Legan, Houston, Tex., assignor to Shintech Incorporated, Houston, Tex.

Filed May 27, 1975, Ser. No. 581,239
Int. Cl.[2] B01J *1/10*; B01K *1/00*
U.S. Cl. 204—158 R **13 Claims**



1. A process for photochemically treating a gaseous or vaporous stream containing an oxidizable contaminant, said process comprising exposing said contaminant to ultraviolet radiation from a source of radiation emitting ultraviolet wavelengths shorter than 2100 A in the presence of ozone thereby oxidizing said contaminant to form simple, gaseous products, said ozone being in addition to any ozone formed by said source of ultraviolet radiation.

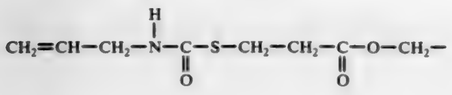
4,045,317

CURABLE POLYENE-POLYTHIOL COMPOUNDS AND METHODS FOR PREPARATION AND CURING

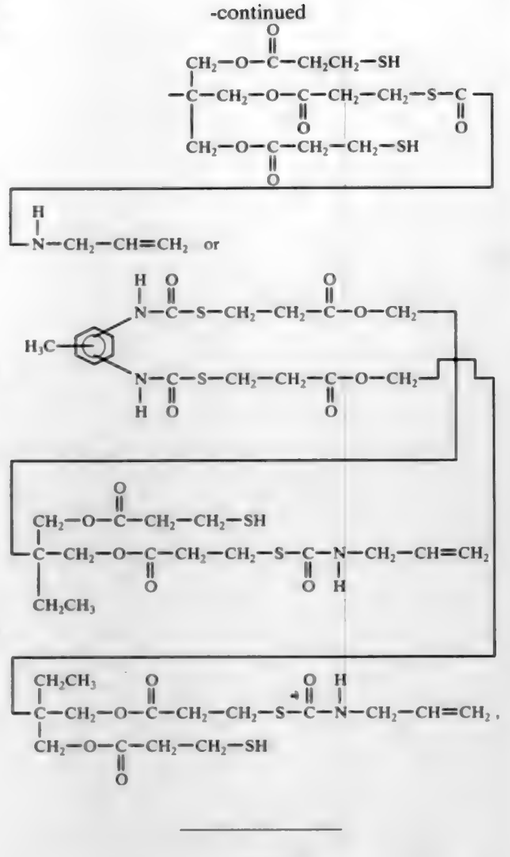
Donald W. Larsen, Marriottsville, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation of Ser. No. 558,041, March 13, 1975, Pat. No. 3,976,553, which is a division of Ser. No. 504,410, Sept. 9, 1974, Pat. No. 3,966,794, which is a continuation of Ser. No. 259,148, June 2, 1972, abandoned. This application June 11, 1976, Ser. No. 695,486
Int. Cl.[2] C08F *2/46, 4/00*
U.S. Cl. 204—159.23 **4 Claims**

1. A method for forming a solid article comprising exposing a compound having the formula



-continued

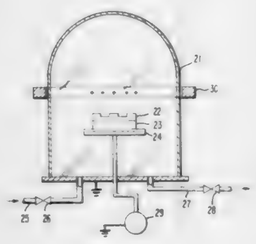


4,045,318

METHOD OF TRANSFERRING A SURFACE RELIEF PATTERN FROM A POLY(OLEFIN SULFONE) LAYER TO A METAL LAYER

Richard Joseph Himics, Skillman; Nitin Vithalbhai Desai, Edison, and Eugene Samuel Poliniak, Willingboro, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed July 30, 1976, Ser. No. 710,184
Int. Cl.[2] C23C *15/00*
U.S. Cl. 204—192 E **7 Claims**



7. A method for forming a surface relief pattern in a metal layer which comprises:

a. exposing a poly(olefin sulfone) layer in contact with the metal layer to a modulated beam of electrons;

b. developing the exposed poly(olefin sulfone) layer to form a surface relief pattern therein;

c. exposing the developed poly(olefin sulfone) layer to ultra violet radiation; and

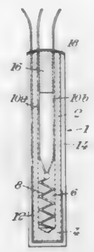
d. bombarding the irradiated surface with sufficient ions to substantially remove the poly(olefin sulfone) layer and etch the surface relief pattern into the metal layer.

4,045,319

ELECTROCHEMICAL GAGE FOR MEASURING PARTIAL PRESSURES OF OXYGEN

Charles Henri Deportes, Brignoud; Marc Patrice Sylvain Henault, Gieres; Francis Tasset, Fontaine, and Gerard Raymond Robert Vitter, Saint-Martin-D'Heres, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neilly-sur-Seine, France

Filed Sept. 9, 1974, Ser. No. 504,630
Claims priority, application France, Sept. 11, 1973, 73.32671
Int. Cl.[2] G01N *27/46*
U.S. Cl. 204—195 S **23 Claims**



1. In an electrochemical gage for measuring partial pressures of oxygen, said gage comprising a solid electrolyte and an internal reference, the improvement whereby the internal reference consists essentially of a palladium:palladium oxide redox couple.

4,045,320

GALVANIC ANODE

Øystein F. Klingenberg, Aby I Bamble, Norway, assignor to A. S. Skarpenord, Langesund, Norway

Filed May 28, 1976, Ser. No. 691,146
Int. Cl.[2] C23F *13/00*
U.S. Cl. 204—197 **8 Claims**



1. In an anode used for electrolytic protection of metal construction from corrosion, which anode includes an anode material cast onto a supporting metal structure for suspending or securing the anode to the construction to be protected, the improvement wherein:

said supporting metal structure comprises;

main support means extending along one side of and beyond said anode material, and

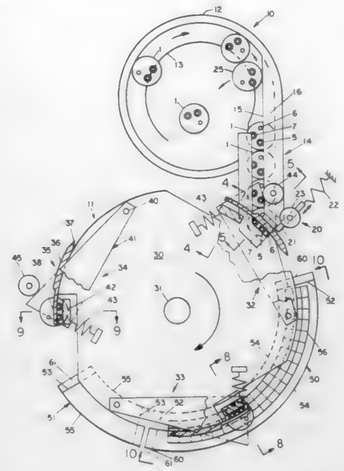
an expansible network of metal bonded to at least a portion of said one side of said anode material, and operable to hold said main support means in position while expanding and contracting with said anode material.

4,045,321

METHOD AND APPARATUS FOR PLATING THE POSTS OF A SEMICONDUCTOR CHIP HEADER

Carl E. Bernardi, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Oct. 17, 1975, Ser. No. 623,323
Int. Cl.[2] C25D *17/28, 17/22, 5/02*
U.S. Cl. 204—202 **8 Claims**



1. An apparatus for plating the posts of a semiconductor chip header having at least one envelope lead electrically connected to a metallic envelope enclosing said header and a predetermined number of thru-leads which are insulated from and pass through said envelope for forming posts on the top thereof comprising:

means for feeding a plurality of said headers in single file to a predetermined position in said apparatus, said means for feeding including means for providing a predetermined orientation of said thru-leads at said predetermined position;

means for transporting said headers from said predetermined position over the surface of a plating bath for immersing said posts in said bath;

means for separating and electrically insulating said thru-leads from said envelope lead including means associated with said transporting means for clamping and holding said header; and

means for coupling a source of potential between said thru-leads and said bath while said posts are immersed in said bath for selectively plating said posts.

4,045,322

CONNECTION MEANS FOR ANODE POSTS IN DIAPHRAGM CELLS

Philip R. Bridendall, Jr., Wilton, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Mar. 29, 1976, Ser. No. 671,303
Int. Cl.[2] C25B *1/26, 9/02*
U.S. Cl. 204—263 **8 Claims**

1. In an electrolytic cell comprised of a cell base having:

a. an interior layer which provides an interior surface,

b. a conducting layer which provides an exterior surface,

c. a cell body secured to said cell base,

1. a plurality of diaphragm-coated cathodes secured to said cell body,

d. a plurality of anodes, each anode comprising:

1. a metallic conductive surface secured to

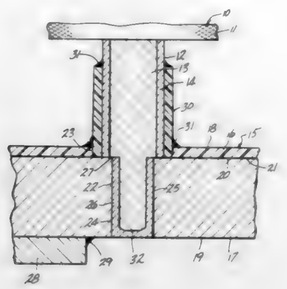
2. an anode post, said anode post being secured to said cell base,

3. each metallic conductive surface being positioned adjacent to and parallel to at least one of said cathodes,

e. and current conducting means secured to said exterior surface,

characterized by the improvement which comprises in combination,

f. soldered connections between each of said anode posts and said cell base in said separate opening for each anode post in said cell base, and



g. a plastic sleeve secured and sealed to the lower portion of each of said anode posts above said soldered connection, and

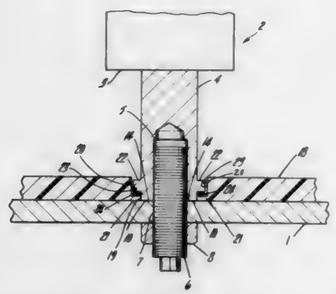
h. liquid-tight sealing means between said anode post, said plastic sleeve and said interior layer for each of said anode posts, whereby inhibition of crevice corrosion and electrolytic attack upon said anode post is obtained.

4,045,323

ANOLYTE SEALING, ELECTRICAL INSULATING FOR ELECTROLYTIC CELLS

Frank Boggs, Jr., Baton Rouge, La., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 5, 1976, Ser. No. 739,078
Int. Cl.² C25B *1/26, 9/00, 9/02*
U.S. Cl. 204—266 **10 Claims**



1. In a diaphragm-type electrolytic cell for the production of chlorine and caustic from alkali metal chloride solutions, the improvement comprising:

a. a cell base, having at least one opening defined therein,

b. a semi-rigid electrically non-conductive blanket covering said cell base having at least one opening defined therein corresponding to said opening in said cell base, said blanket having an integral lip disposed around said opening,

c. at least one metal anode having a collar near one end thereof corresponding to said lip, said end being affixed to said cell base passing through said blanket opening, and

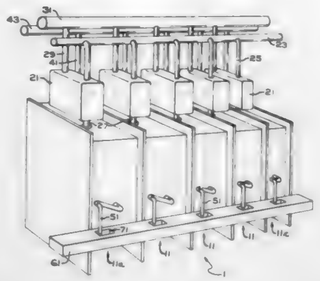
d. a resilient gasket disposed around said anode and interposed between the lip of said blanket and said collar.

4,045,324

CELL LIQUOR EMISSION CONTROL

Hugh Cunningham, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 11, 1976, Ser. No. 713,451
Int. Cl.² C25B *1/26, 9/00*
U.S. Cl. 204—268 **4 Claims**



1. In a bipolar electrolyzer having a plurality of individual electrolytic cells electrically and mechanically in series, each of said cells having an anolyte chamber and a catholyte chamber and catholyte liquor withdrawal means, said electrolyzer having a catholyte liquor trough disposed beneath said catholyte liquor withdrawal means, the improvement comprising means for limiting emission of catholyte liquor laden moisture from said cell liquor trough and for indicating low catholyte cell liquor level in an individual electrolytic cell of said electrolyzer, which emmision limiting and low liquor level indicating means comprises:

a top on said cell liquor trough, said top having recesses therein corresponding to said catholyte liquor withdrawal means;

said recesses having first apertures therein communicating with the cell liquor trough and at the intended level of cell liquor in the recess; and

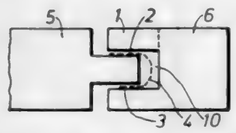
said recess having second apertures therein communicating with the cell liquor trough below the first apertures.

4,045,325

MEMBRANE SEAL FOR ELECTROLYSIS PLATE AND FRAME ASSEMBLIES

Karl-Josef Schwickart, Siershahn, Ww., and Lothar Sesterhenn, Dormagen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 21, 1976, Ser. No. 651,330
Claims priority, application Germany, Jan. 27, 1975, 2503215
Int. Cl.² C25B *1/24, 9/00*
U.S. Cl. 204—286 **6 Claims**



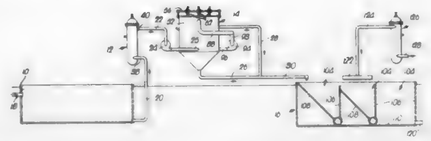
1. In a hydrochloric acid electrolysis plate and frame assembly comprising a graphite plate and a frame about said plate so as to provide a gas tight seal while maintaining a sliding fit, the improvement which comprises a tension-free membrane seal fastened to the frame and to the plate across the the space where sliding movement therebetween can occur.

4,045,326

SUSPENDED SOLIDS EXTRACTION SYSTEM AND METHOD

Arthur Shelley King, 8021 Cherokee Lane, Leawood, Kans. 66206

Filed Aug. 10, 1976, Ser. No. 713,251
Int. Cl.² B03C *5/00;* **C02C** *5/12*
U.S. Cl. 204—299 R **14 Claims**



1. In a device for treating fluids by exposing the same to an electric field:

an outer, hollow, cylindrical electrode defining an interior treating region for fluid flow therethrough;

an inner, cylindrical, coaxially disposed electrode within said region;

a plurality of intermediate, cylindrical, field concentrating electrodes within said region and arranged in a circular pattern about said inner electrode in concentric relationship therewith; and

means electrically connecting said electrodes across a source of electrical potential,

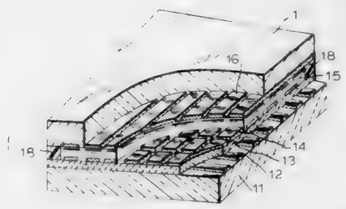
said inner and outer electrodes being connected to the same side of said source for similar charging thereof, and said intermediate electrodes all being connected to the opposite side of said source for charging thereof oppositely of said inner and outer electrodes.

4,045,327

ELECTROPHORETIC MATRIX PANEL

Shinichi Noma, Katano, and Nobumasa Ohshima, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Aug. 26, 1975, Ser. No. 607,902
Claims priority, application Japan, Aug. 28, 1974, 49-99344; Aug. 29, 1974, 49-99665
Int. Cl.² C25D *1/12;* **G03G** *13/00*
U.S. Cl. 204—299 R **4 Claims**



1. An electrophoretic matrix display panel comprising a first insulating substrate having a first set of strip-shaped parallel electrodes thereon, a voltage non-linear resistive layer on said first set of parallel electrodes, said non-linear resistive layer being SiC particles having an average grain size smaller than 5μ in urea resin, said SiC particles and urea resin being mixed in a weight ratio of from 2:3 to 2:10, dot-shaped intermediate electrodes isolated from each other and positioned on said voltage non-linear resistive layer, an electrophoretic suspension layer consisting of suspending medium and at least one electrophoretic material suspended in said suspending medium, a frame around the periphery of said panel, and a second insulating substrate having a second set of strip-shaped parallel electrodes thereon; at least said second insulating substrate and said second insulating substrate being attached to said first insulating substrate through said frame and said second set of parallel electrodes extending in a direction transverse to the direction of said first set of parallel electrodes and crossing said first set of parallel electrodes to define cross points between the respective elements of the sets of electrodes the cross points between said first and second sets of parallel electrodes constituting picture elements of said matrix display panel, said dot-shaped intermediate electrodes being positioned at the cross points between said first and second sets of parallel electrodes.

4,045,328

PRODUCTION OF HYDROGENATED COAL LIQUIDS

Robert C. Green, Berkeley Heights, and Robert L. Dubell, Florham Park, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed July 23, 1976, Ser. No. 707,963
Int. Cl.² C10G *1/06*
U.S. Cl. 208—8 **10 Claims**

1. A process for the production of liquid hydrocarbons from coal or similar liquefiable carbonaceous solids which comprises contacting said carbonaceous solids with a hydrogen-donor solvent and molecular hydrogen under liquefaction conditions in a liquefaction zone to produce a liquefaction effluent; separating said liquefaction effluent into a hot vapor stream and a liquid stream; recovering coal liquids in the hydrogen-donor solvent boiling range from said liquid stream; combining a portion of said hot vapor stream with makeup hydrogen and with said coal liquids to form a solvent hydrogenation feed stream; treating the remainder of said hot vapor stream for the removal of liquid hydrocarbons and contaminants and thereafter discharging the remaining gas as purge; passing said solvent hydrogenation feed stream to a catalytic solvent hydrogenation zone maintained under solvent hydrogenation conditions; recovering a hydrogenated effluent from said solvent hydrogenation zone; separating said hydrogenated effluent into a vaporous fraction containing molecular hydrogen and a liquids fraction; recycling at least a portion of said vaporous fraction including molecular hydrogen and at least a portion of said liquidsfraction to said liquefaction zone; and recycling fluid separated from said hydrogenated effluent to said solvent hydrogenation zone as a quench.

4,045,329

COAL HYDROGENATION WITH SELECTIVE RECYCLE OF LIQUID TO REACTOR

Edwin S. Johanson, Princeton, N.J., and Ronald H. Wolk, San Jose, Calif., assignors to Hydrocarbon Research, Inc., Trenton, N.J.

Continuation-in-part of Ser. No. 434,952, Jan. 21, 1974, abandoned, which is a continuation of Ser. No. 137,223, April 26, 1971, abandoned. This application Nov. 28, 1975, Ser. No. 635,796
Int. Cl.² C10G *1/08*
U.S. Cl. 208—10 **6 Claims**

1. A process for producing naphtha and light hydrocarbons distillate of a boiling range of about 400° to 800° F from solid carbonaceous substances selected from the class of coal, and lignite in a particulate form, which comprises:

a. slurrying the solid carbonaceous substances with at least a portion of a heavy hydrocarbon slurry-oil recycle liquid produced in the process:

b. feeding the slurry and a hydrogen-rich gas to a reaction zone containing particulate contact solids;

c. passing the slurry and gas upwardly through the reaction zone under liquid phase conditions in which the solids are placed in random motion in the liquid, with the velocity maintained below a rate which carries any substantial portion of the contact solids out of the reaction zone, and under hydrogenation reaction conditions of hydrogen partial pressure between 1500 and 3000 psig and temperature between about 750° and 900° F;

d. removing a gaseous effluent from the reaction zone;

e. removing a liquid effluent from the reaction zone;

f. fractionating out of said liquid effluent fractions comprising at least a light distillate liquid normally boiling between about 450° and 600° F, and a bottoms fraction normally boiling in the range of about 800° to 1000° F;
g. recycling to the reaction zone said bottoms fraction and at least a portion of the 450°–600° F liquid fraction, without recycling to the reaction zone any liquid fraction boiling between about 600° and 800° F; and
h. recovering from said fractionation step (f) a principal product fraction having a normal boiling range of about 400°–800° F.

4,045,330

PROCESS FOR REGENERATING LUBRICATING OILS

René Avrillon, Maisons Laffitte, and Daniel Defives, Paris, both of France, assignros to Institut Francais du Petrole, Rueil-Malmaison, France

Filed June 4, 1976, Ser. No. 692,861
Claims priority, application France, June 4, 1975, 75.17662
Int. Cl.² C10M *11/00*
U.S. Cl. 208—180 **16 Claims**

1. A process for regenerating a used lubricating oil, comprising contacting the oil with particles of a solid adsorption resin comprising at least 0.1 cc per gram of pores of a diameter in the range from 6 to 300 angstroms, said resin being a porous polycondensate or cross-linked copolymer comprising (a) hydroxy groups linked directly or through a $-CH_2-$ or

$$-\overset{|}{C}H-$$

group
to a benzene ring, or (b) pyridyl groups, said contacting being conducted at a temperature wherein the resin is stable.

4,045,331

DEMETALLIZATION AND DESULFURIZATION OF PETROLEUM FEED-STOCKS WITH MANGANESE ON ALUMINA CATALYSTS

John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Oct. 23, 1975, Ser. No. 624,788
Int. Cl.² C10G *23/02*; B01J *23/34*
U.S. Cl. 208—213 **16 Claims**

1. In a process for the demetallization and desulfurization of a liquid hydrocarbon feedstock wherein said feedstock is contacted with a demetallization and desulfurization catalyst at a hydrogen partial pressure between about 100 and 3000 psia and at a temperature between about 600° and 850° F and at a space velocity between about 0.1 and 10.0 L.H.S.V. to obtain therefrom a substantially demetallized product oil, the improvement which comprises utilizing as said demetallization catalyst a composition comprising one or more active manganese components composited with alumina, said catalyst composition having at least 60% of its total pore volume distributed in pores having diameters between about 50 and 200 A, having a surface area in excess of 250 m^2/gm, and containing between about 0.1 and 30 wt.% (calculated as manganese) of said one or more manganese components.

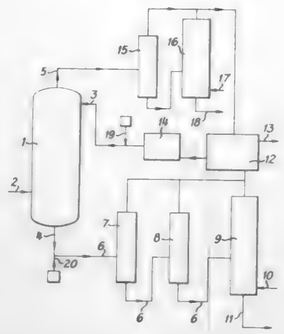
4,045,332

SOLVENT EXTRACTION

Eric Simon Forbes, Lightwater, and Angus Joseph Dickson Reid, Wokingham, both of England, assignors to The British Petroleum Company Limited, London, England

Filed Apr. 27, 1976, Ser. No. 680,695
Claims priority, application United Kingdom, May 14, 1975, 20319/75
Int. Cl.² C01G *21/16*
U.S. Cl. 208—323 **7 Claims**

1. A composition suitable for the solvent extraction of aromatic hydrocarbons from hydrocarbon mixtures containing them comprising furfural and from 0.001 to 5% wt. by weight of furfural, of a furfural soluble recoverable amine selected



from the group consisting of N,N-dialkyl anilines, in which the alkyl groups have from 1 to 5 carbon atoms.

4,045,333

AROMATIC PURIFICATION PROCESS

Allen E. Somers, Pittsburgh, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 29, 1976, Ser. No. 653,283
Int. Cl.² C10G *19/00, 21/16*
U.S. Cl. 208—327 **4 Claims**

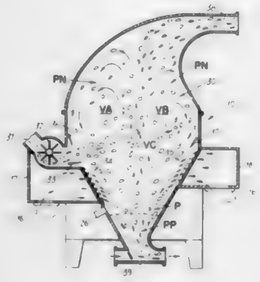
1. A process which comprises passing an aromatic feed containing greater than 50 ppm furfural through a solid bed of particles of a treating agent selected from the group consisting of sodium hydroxide and potassium hydroxide, and recovering therefrom an aromatic product containing less than 25 ppm furfural.

4,045,334

METHOD AND APPARATUS FOR SEPARATING LIGHTER AND HEAVIER PORTIONS OF THRESHED TOBACCO

Ferdinand F. Ferrary, Richmond, Va.; Herman T. Johnson, Pittsboro, N.C., and John H. Hudson, Richmond, Va., assignors to AMF Incorporated, White Plains, N.Y.

Filed May 28, 1976, Ser. No. 691,260
Int. Cl.² B07B *4/00*
U.S. Cl. 209—141 **20 Claims**



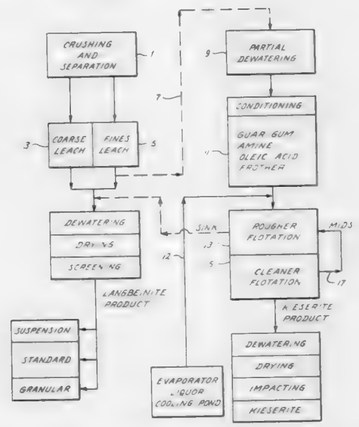
1. A method of separating lighter and heavier portions of threshed tobacco comprising the steps of:
providing a separator chamber having a discharge at its top for such lighter portions and a take-off at its bottom for such heavier portions;
providing air inlets in opposite sides of the separator chamber and providing flows of inlet air therethrough;
controlling the quantity and vertical deflection of each of the inlet air flows thereby creating two vortices adjacent to one another in the separator chamber each in a circulatory path in a direction opposite to the direction of the other of the vortices with the adjacent portions of said vortices coacting to provide a high velocity rising air column to the discharge of the separator chamber;
providing a flow of threshed tobacco into the lower portions of both vortices in the separator chamber;
separating the threshed tobacco by the turbulence of said vortices; and
carrying the lighter portions of threshed tobacco to the discharge of the separator chamber by said high velocity rising air column while permitting the heavier portions to drop to the take-off.

4,045,335

BENEFICIATION OF KIESERITE AND LANGBEINITE FROM A LANGBEINITE ORE

Ben E. Adams, Hanford, Calif., and Edward J. Gidak, Jr., Carlsbad, N. Mex., assignors to Duval Corporation, Houston, Tex.

Filed Mar. 10, 1976, Ser. No. 665,419
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **17 Claims**



1. A process for beneficiating langbeinite from an ore containing langbeinite and kieserite which comprises subjecting to froth flotation particles of said ore in an aqueous magnesium chloride brine containing above about 20 moles magnesium chloride per 1,000 moles of water, said brine containing a flotation reagent in a ratio of at least about 0.5 parts by weight flotation reagent to 2000 parts by weight of said ore particles, said flotation reagent comprising a fatty acid amine, and an organic acid selected from the group consisting of sebacic acid and oleic acid in a weight ratio of about 2 to about 4 parts amine to 1 part of said organic acid, said brine further having a pH below about 3.5, removing the froth from said flotation, and recovering concentrated langbeinite from the sink product of said flotation.

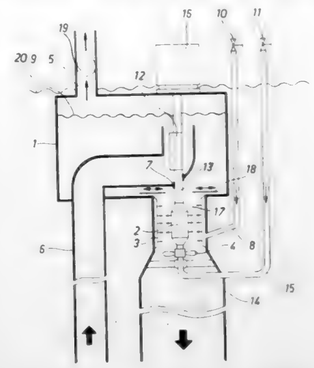
4,045,336

METHOD AND DEVICE FOR OXYGENATING WATER WITH VIBRATIONS AND UNDER PRESSURE STROKES

Pauli Henrik Isteri, Siilitie 9 S 223 00800, Helsinki 80, Finland

Filed Sept. 19, 1975, Ser. No. 614,876
Claims priority, application Finland, Sept. 27, 1974, 742479; Aug. 8, 1975, 752256
Int. Cl.² C02C *1/02, 5/02, 5/10*; C02B *1/78*
U.S. Cl. 210—15 **16 Claims**

1. A method for increasing the oxygen content of water for sanitizing natural waters and for purifying water, in which method oxygen or oxygen containing gas is fed into water liberated from gases dissolved therein, characterized in that gases are separated by pressure strokes on the liquid and vibration whereafter oxygen or oxygen containing gas, is fed into the liquid, and water flowing along the suction pipe is set to vibrate by means of a vibrator; said water being discharged and noxious gases escaping from the water; said water being forced by means of a propeller pump and the resultant pressure developed in said water into a gas feed zone provided by dispersion means, said zone being connected to a source of gas through pipes, gas bubbles formed on wet surfaces of the dispersion means for dispersing said bubbles said bubbles being mixed with flowing water, said propeller pump forcing said water with gas bubbles into a discharge pipe and therealong to the desired depth.



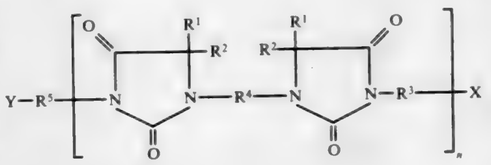
4,045,337

ASYMMETRIC, SEMIPERMEABLE MEMBRANES OF CYCLIC POLYUREAS

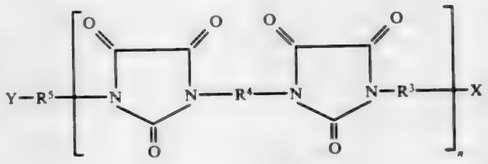
Birger Knickel, Meerbusch; Hans Rudolph, Krefeld; Jürgen Hocker, Schildgen; Jürgen Lewalter, Cologne, and Hans Jürgen Rosenkranz, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed June 24, 1975, Ser. No. 589,950
Claims priority, application Germany, June 28, 1974, 2431071
Int. Cl.² B01D *13/00*; C08G *22/02*
U.S. Cl. 210—23 H **9 Claims**

1. An asymmetric semipermeable membrane of a cyclic polyurea selected from the group consisting of a polyhydantoin of the formula



and a polyparabanate of the formula

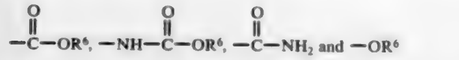


wherein R^1 and R^2, when taken separately, are each selected from the group consisting of hydrogen, C_1 to C_6 alkyl and C_3 to C_6 cycloalkyl; R^1 and R^2, when taken together with the carbon atom to which they are attached, are cycloalkyl having 5 to 10

carbon atoms; R^3 and R^4 are each selected from the group consisting of C_1 to C_{12} alkylene, C_3 to C_6 cycloalkylene, arylene and any two of the aforesaid members defining R^3 and R^4 connected together by a member selected from the group consisting of —O—, —CH_2,



—S—, —SO_2— and —CO—; R^5 is selected from the group consisting of a bond and the members of the group defining each of R^3 and R^4; X and Y are each selected from the group consisting of a bond,



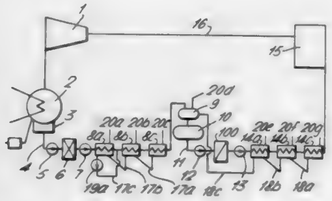
wherein R^6 is selected from the group consisting of aryl, C_1 to C_{12} hydroxyalkyl and C_1 to C_{12} alkoxyalkyl and *n* is an integer from 2 to 200.

4,045,338

METHOD OF REMOVING SCALE-FORMING SUBSTANCES FROM HOT WATER SYSTEM

Haruo Miyamoto; Tokuhisa Miyamatsu, both of Nagoya; Seiichi Shirakawa, and Hidetoshi Takamoku, both of Nagasaki, all of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Mitsubishi Heavy Industries, Ltd., both of Tokyo, Japan

Continuation-in-part of Ser. No. 474,148, May 28, 1974, abandoned. This application June 30, 1976, Ser. No. 701,732
Claims priority, application Japan, May 29, 1973, 48-59365
Int. Cl.² B01D *15/04*
U.S. Cl. 210—36 **9 Claims**



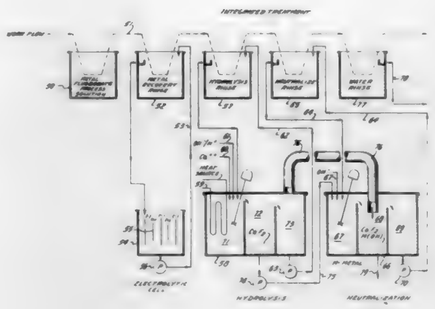
1. In a method of removing scale-forming substances from a water supply system for a steam generator which comprises passing hot water through a filter to remove the scale-forming substances, the improvement wherein the hot water is passed through a filter comprising a porous support having a pore diameter in the range of from 5 to 200 μ having laminated thereon carbonaceous fibers, said fibers (a) having a carbon content of at least 85% by weight (b) a length in the range of from 0.1 to 5 mm (c) a diameter in the range of from 1 to 50 μ (d) acidic groups in a concentration of at least 0.01 meq/g on their surface, and (e) being laminated on the said support in an amount from 100 to 5000 g/m^2.

4,045,339

WASTE TREATMENT OF FLUOROBORATE SOLUTIONS

Theodore Frank Korenowski; Jerry Lee Penland, both of Zelienople, and Chalmer John Ritzert, Butler, all of Pa., assignors to Dart Industries Inc., Los Angeles, Calif.

Division of Ser. No. 602,180, Aug. 5, 1975, Pat. No. 4,008,162. This application Oct. 18, 1976, Ser. No. 733,490
Int. Cl.² C02B *1/20*
U.S. Cl. 210—45 **5 Claims**



1. An integrated process for removing waste drag-out containing dissolved fluoroborates from work pieces that have been subjected to in line treatment in a fluoroborate bath and for pollution free disposal of process effluents which comprises

maintaining a first rinse zone containing an acidic solution, a second rinse zone containing a neutralizing solution, and a third rinse zone containing water; continuously moving the work pieces from the fluoroborate bath into and through each of the first, second and third rinse zones, whereby fluoroborate waste drag-out is substantially removed from surfaces of the work pieces into the acidic solution of the first rinse zone, and drag-out from the first rinse zone is substantially removed from said surfaces into the neutralizing solution of the second rinse zone, and drag-out from the second rinse zone is removed from the surfaces into the water of the third rinse zone; continuously passing the acidic solution containing the fluoroborate waste drag-out from the first rinse zone to a first treatment zone maintained at an elevated temperature of at least 130° F and at a pH of about 4 or less adding calcium ions to the first treatment zone to liberate fluoride values from the fluoroborate drag-out, wherein the total amount of calcium ions in the first treatment zone is sufficient to provide at least 0.25 times the potential molar fluoride value of the fluoroborate drag-out;

recirculating the acidic solution containing liberated fluoride values to the first rinse zone for further removal of fluoroborate waste drag-out;

continuously passing from the second rinse zone the neutralizing solution containing the drag-out from the first rinse zone including liberated fluoride values to a second treatment zone;

maintaining sufficient alkaline conditions in said second treatment zone to precipitate calcium fluoride; recirculating the neutralization solution depleted in fluoride values to the second rinse zone for further removal of drag-out from the first rinse zone; recovering precipitated calcium fluoride from the second treatment zone, and withdrawing spent rinse water from the third rinse zone.

4,045,340

METHOD FOR RECOVERING AND EXPLOITING WASTE OF THE CHROMIC ANHYDRIDE PRODUCTION

Diego Perrone, Cogoleto, Italy, assignor to Luigi Stoppani di P Stoppani & C., Milan, Italy

Filed July 13, 1976, Ser. No. 704,954
Claims priority, application Italy, Aug. 28, 1975, 26686/75
Int. Cl.² C02B *1/20*
U.S. Cl. 210—45 **9 Claims**

1. A process for treating the waste residue, resulting from the reaction of sodium bichromate and sulfuric acid in the production of chromic anhydride, to recover chromium values and other products therefrom, such waste residue consisting essentially of sodium bisulfate, sulfuric acid, and a hexavalent chromium compound consisting essentially of chromium trioxide, all of which are water-soluble, and a trivalent chromium compound consisting essentially of chromium bisulfate which is water-insoluble, said process comprising:

a. mixing said waste residue with water to form a first aqueous slurry comprising a solution containing sodium bisulfate, sulfuric acid, and chromic acid with the water-insoluble chromium bisulfate suspended therein;

b. forming a reaction mixture of the first aqueous slurry obtained in step (a) with an aqueous solution of sodium chromate, said reaction mixture having a specific gravity of about from 1.2 to 1.4 and a pH of about from 2 to 8, and heating said reaction mixture at a temperature of about from 70° to 250° C for about from 10 to 600 minutes, whereby part of the water-insoluble chromium bisulfate is converted into water-insoluble chromium chromate which precipitates out, thereby to obtain a second aqueous slurry comprising a solution containing sodium sulphate and sodium bichromate with the precipitated water-insoluble chromium chromate and the remainder of the unconverted, water-insoluble chromium bisulfate suspended therein;

c. curing the second aqueous slurry obtained from step (b), having a pH of about from 2 to 8, at a temperature of about from 70° to 250° C for about from 10 to 600 minutes to convert the remainder of the water-insoluble chromium bisulfate into water-insoluble chromium chromate thereby to obtain a third aqueous slurry comprising a solution containing sodium sulfate and sodium bichromate with the water-insoluble chromium chromate suspended therein; and

d. subjecting the third aqueous slurry obtained from step (c) to solid-liquid separation to recover a solid consisting essentially of chromium chromate and an aqueous solution containing sodium sulfate and sodium bichromate.

4,045,341

METHOD FOR THE DISPOSAL OF WASTE WATER CONTAINING AMMONIUM IONS, SULFATE IONS AND ORGANIC SUBSTANCES

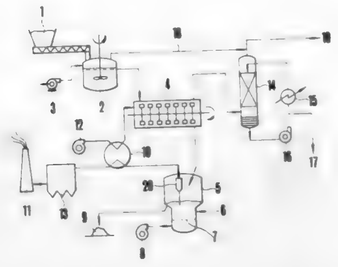
Hidemasa Tsuruta, Tokyo; Yoshiaki Kinoshita, Tachikawa, and Isao Tanaka, Tokyo, all of Japan, assignors to Nittetu Chemical Engineering Ltd., Tokyo, Japan

Filed Apr. 6, 1976, Ser. No. 674,161
Claims priority, application Japan, Jan. 22, 1976, 51-5485
Int. Cl.² C02B *1/20*
U.S. Cl. 210—45 **5 Claims**

1. A method for the disposal of a waste water containing ammonium ions, sulfate ions, and organic substances which comprises:

a. adding sufficient calcium hydroxide or calcium oxide to said waste water for reaction with the sulfate ions present in said waste water to form a precipitate of calcium sulfate and thereby liberating the ammonium ions in the form of ammonia in said waste water; then

b. contacting heated air with the waste water to distill off substantially all of said ammonia and a part of the water present in said waste water as a vapor and at the same time to produce an evaporation residue having a pH value of about 8.5 or more; and then



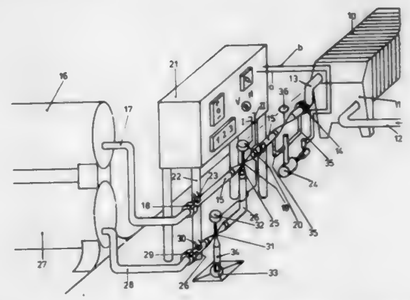
c. introducing said evaporation residue into a combustion furnace and burning said residue at a temperature in the range of from 700° C to 1000° C.

4,045,342

METHOD AND APPARATUS FOR FILTERING

Jürgen Küster, Bad Munster, and Hermann Schlosser, Guldental, both of Germany, assignors to Seitz-Werke GmbH, Bad Kreuznach, Germany

Filed Jan. 15, 1976, Ser. No. 649,408
Claims priority, application Germany, Jan. 17, 1975, 2501733
Int. Cl.² B01D *23/24*
U.S. Cl. 210—81 **14 Claims**



1. The method of operating a filtering system which includes a filter having a fluid inlet and a fluid outlet, a first receiving tank, a second receiving tank, a drain connection and valved conduits connecting the filter outlet with said tanks and said drain connection, said method comprising; continuously measuring the density of the fluid being discharged from the filter outlet, storing an initial measured value as a first reference value, adjusting the valves in said conduits to direct the flow from the filter when the measured value differs a predetermined amount from the stored value, thereafter storing successive measured values to form a changing second reference value and comparing the thus obtained second reference value with measured values in a time sequence, and again adjusting the valves to divert the flow from the filter when a condition of substantial equivalency exists between the stored value and the measured value.

9. A filter system which includes a filter having a fluid inlet and a fluid outlet, a first tank having an inlet, a second tank also having an inlet and a drain connection; a first conduit detachably connected to the filter outlet and also detachably connected to the inlet of the first tank, a first three way valve in said first conduit, a density measuring device on the upstream side of said first three way valve, a second conduit connected to said first three way valve and detachably connected to the inlet of said second tank, a second three way valve in said second conduit and a discharge conduit connected to said

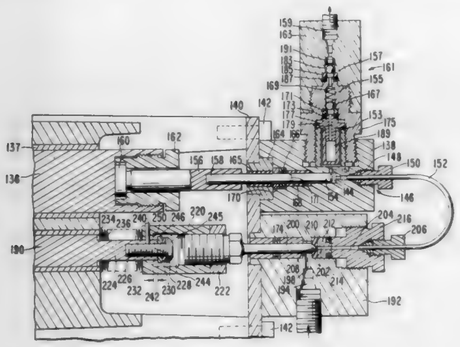
second three way valve and leading to said drain connection, said density measuring device being disposed directly adjacent said first three way valve on the upstream side thereof, said control means including a measured value emitter under the control of said measuring device and a selector connected to said emitter for adjustment thereof into selected operating modes.

4,045,343

HIGH PRESSURE LIQUID CHROMATOGRAPHY SYSTEM

Pierre Y. Achener; Detlef R. Boehme, both of Walnut Creek; Kenneth C. Judah, Napa, and Miner N. Munk, Walnut Creek, all of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Filed Nov. 10, 1975, Ser. No. 630,122
Int. Cl.[2] B01D *15/08*
U.S. Cl. 210—101 **21 Claims**



1. A high pressure liquid chromatography system comprising:

at least one reservoir for a liquid mobile phase;

a liquid chromatographic column;

conduit means connecting said column to a detector means for sensing the output flowing from said column;

a high-pressure reciprocating pump means including a pump chamber for enabling flow via connecting means from said pump chamber toward said column;

structure defining a flow path between said reservoir and said pump chamber;

inlet valve means in said flow path between said reservoir and said pump chamber; and

motor means coupled to said pump means for driving same;

said motor means being mechanically linked to said inlet valve means for actuating said inlet valve means to enable flow of said mobile phase to said pumping chamber.

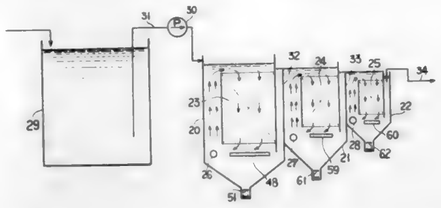
4,045,344

APPARATUS FOR TREATING WASTE WATER

Ittshu Yokota, Zentsuji, Japan, assignor to Ishigaki Kiko Co., Ltd., Tokyo, Japan, a part interest

Filed Apr. 29, 1974, Ser. No. 465,102
Int. Cl.[2] C02C *1/04*
U.S. Cl. 210—106 **14 Claims**

1. An apparatus for treating waste water comprising at least one treating tank having an inlet for waste water and an outlet for treated water, at least one bundle of a number of straight tubes arranged in said treating tank so that the bundle is submerged in waste water to be treated in the tank, said bundle being provided with a plurality of crossing passages extending across the bundle which passages are arranged intermittently along the bundle with certain intervals therebetween so that each of the tubes is divided into a plurality of tube sections each having a length such that the length is substantially covered with a flow-disturbed portion due to flowing-in of water and another flow-disturbed portion due to flow-out of water in



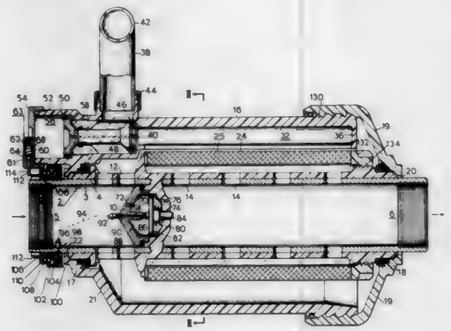
each tube section, and means for flowing waste water through said bundle in a direction along the bundle.

4,045,345

SELF-FLUSHING FILTER

Mordeki Drori, 89 Zahal Street, Kiron, Israel

Filed Sept. 29, 1976, Ser. No. 727,859
Claims priority, application Israel, July 30, 1976, 50171
Int. Cl.[2] B01C *29/38*
U.S. Cl. 210—107 **9 Claims**



1. A self-flushing filter, comprising: a housing including an inlet connectable to an upstream fluid pipe, and an outlet connectable to a downstream fluid pipe; a filter body disposed within the housing and having a cylindrical surface facing the inlet to intercept dirt particles in the fluid flowing in the forward direction through the filter body from the inlet to the outlet; a rotatable member defining a purging chamber having an inlet opening close to and facing said cylindrical surface of the filter body; a purging conduit fixed to the rotary member to rotate therewith; and valve means disposed between said purging chamber and purging conduit; said valve means being normally closed to block the flow of fluid from said purging chamber to the purging conduit but being openable to establish communication therebetween and thereby to cause the fluid to flow in the reverse direction through the filter body into the purging chamber and out through the purging conduit, whereby rotation of the rotatable member when the valve means are opened causes the purging chamber inlet opening to move along the cylindrical surface of the filter body as said reverse flow of fluid through the filter body flushes dirt particles from its cylindrical surface into said purging chamber and out through the purging conduit.

4,045,346

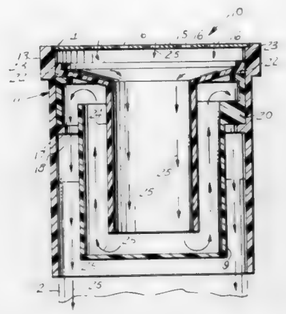
BASEMENT SEWER TRAP

Henry S. Swaskey, 2720 Hamilton Ave., Export, Pa. 15632

Filed Feb. 24, 1976, Ser. No. 660,874
Int. Cl.[2] E03F *5/06*
U.S. Cl. 210—164 **1 Claim**

1. A basement sewer trap, comprising in combination, a

cylindrical coupler sleeve, a radially inwardly flange on an inner face of said sleeve located along an intermediate portion of said inner face, a portion of said inner face below said flange fitting around an upper end of a sewer pipe, a portion of said inner face above said flange fitting an outer periphery of a cylindrical ring of a plastic cup which is supported on said coupler sleeve inward flange, said plastic cup including a cylindrical side wall, a circular bottom wall at a lower end of said cup side, and said ring being concentrically spaced around an upper edge of said cup, said plastic cup depending downwardly into a center of an upper end of said sewer pipe, said cup ring being joined with said cup side wall by a pair of diametrically spaced apart webs therebetween, a funnel tube of



cylindrical shape being concentrically within said cup, an upper edge of said funnel tube being integral with a radially outwardly conically-shaped flange which at its outer periphery fits said inner face of said coupler sleeve and rests upon an upper edge of said cup ring, and an upper end of said coupler sleeve having a circular recess in which is fitted a circular water strainer having a plurality of openings therethrough, for drain water to pass therethrough, then down through said funnel tube, then up in said cup around an outer side of said funnel tube, then over a top of said cup and down through spaces between said cup side wall and said cup ring so as to flow down around an outer side of said cup side wall and down into said sewer pipe.

4,045,347

SYSTEM FOR POLLUTION SUPPRESSION

Edward T. Armstrong, Butler, N.J., assignor to Tii Corporation, Lindenhurst, N.Y.

Division of Ser. No. 531,095, Dec. 9, 1974, Pat. No. 3,998,714, which is a continuation-in-part of Ser. No. 355,738, April 30, 1973, Pat. No. 3,853,764, which is a continuation-in-part of Ser. No. 100,333, Dec. 21, 1970, Pat. No. 3,730,881, which is a continuation-in-part of Ser. No. 813,382, Feb. 28, 1969, Pat. No. 3,549,528, which is a continuation-in-part of Ser. No. 362,118, April 23, 1964, abandoned. This application May 4, 1976, Ser. No. 682,962
Int. Cl.[2] C02B *3/06*
U.S. Cl. 210—199 **18 Claims**

1. A disinfectant mixing system for an influent treatment system utilizing a contact tank which comprises

an influent inlet port into the contact tank,

a manifold fed by the inlet port,

a pipe bundle fed by said manifold,

a flat plate orifice high momentum exchange mixing member in each pipe in said bundle,

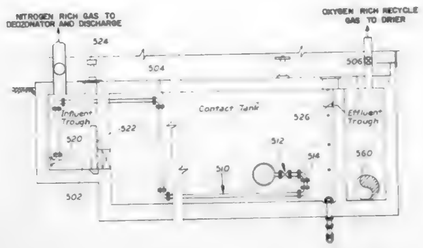
means for injecting a disinfecting fluid into each pipe at the point of highest momentum exchange,

an influent well,

means to effect influent flow from the influent well to the contact tank,

an effluent well,

means to effect flow from the contact tank to the effluent well, and



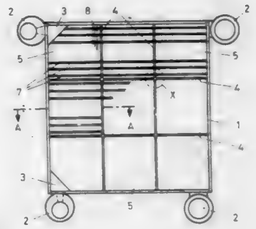
a hyperbolic transformed diffuser to deliver the influent from the pipe bundle to the influent well.

4,045,348

FILTER PRESS PLATE FOR LAYER AND SETTLING LAYER FILTERS

Fritz Strub, St. Gall, Switzerland, assignor to Filtrox Maschinebau Ag, St. Gall, Switzerland

Filed Nov. 11, 1975, Ser. No. 630,902
Claims priority, application Switzerland, Nov. 15, 1974, 15232/74
Int. Cl.[2] B01D *25/12*
U.S. Cl. 210—230 **9 Claims**



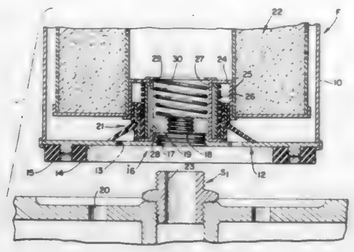
1. A filter press plate for layer and settling layer filters comprising a frame of stainless steel which defines at least one internal area, said frame having exteriorly projecting hollow eyes forming when a plurality of elements are stacked together in use manifolds for supplying and removing the liquid being filtered and passages connecting the interior of said eyes with the internal area of the frame, and within said internal area at least one separate partition plate of corrosion resistant material for supporting the filtering material, each said at least one partition plate extending over substantially the entirety of the corresponding internal area and being spaced along its exterior edges from the adjacent interior edges of said frame a distance sufficient to accommodate any difference in the heat expansions of said at least one plate and frame at the maximum temperature to which the filter press plate is to be exposed, each said at least one partition plate and frame having cooperating lugs and recesses on their adjacent exterior and interior edges for detachably securing the plate within the frame, each said at least one partition plate having its side faces profiled to form channels for supplying and removing the liquid being filtered.

4,045,349

FILTER WITH MULTIPLE ATTACHING MEANS

Kingsley E. Humbert, Jr., Gastonia, N.C., assignor to Wix Corporation, Gastonia, N.C.

Filed July 9, 1976, Ser. No. 703,913
Int. Cl.[2] B01D *27/08*
U.S. Cl. 210—232 **9 Claims**



1. A spin-on filter comprising: a housing having opposite ends, one of said ends having fluid inlet and outlet openings therein; cooperating male and female attaching means on said one end of the filter and on an apparatus with which the filter is to be used, for securing the filter to the apparatus to obtain fluid communication between the apparatus and the interior of the housing, said attaching means on the filter comprising multiple, axially arranged members of different diameters for cooperation with respective corresponding attaching means of different diameters on the apparatus, said members positioned axially adjacent one another and including an inner member and an outer member, the outer member having a larger diameter than the inner member; and means releasably holding one of said members adjacent the other of said members, whereby when the filter is positioned to be secured to an attaching means on the apparatus having a large diameter, the corresponding large diameter member on the filter is operatively engaged with and secured to the attaching means on the apparatus, and and other member is inoperative, and when the filter is positioned to be secured to an attaching means on the apparatus having a small diameter, the corresponding small diameter member on the filter is operatively engaged with and secured to the attaching means on the apparatus, and the other member is inoperative, said releasably held member being movable to a non-interfering position when the other of said members is operatively engaged with an attaching means on the apparatus, thus enabling the filter to be selectively used with attaching means of different diameter.

4,045,350

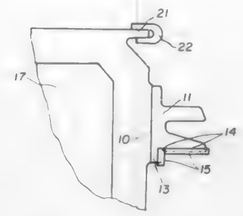
FILTER ASSEMBLY MADE OF THERMOPLASTIC MATERIALS

Lubomir Kupf, Prague, and Mirko Mursec, Pardubice, both of Czechoslovakia, assignors to Statni Vyzkumny Ustav Materialu, Prague, Czechoslovakia

Filed Mar. 19, 1975, Ser. No. 560,109
Int. Cl.[2] B01D *39/14;* **C02C** *1/22*
U.S. Cl. 210—232 **7 Claims**

1. In a filter assembly having filter support and filter frame elements, the improvement which comprises the elements of:

A monolithic filter support of expanded thermoplastic, the extended surfaces of said filter support being of greater density than the interior thereof to provide a structure of relative high strength and low weight; said filter support comprising as an integrated element of its monolithic structure, an upper edge which extends over two upper beveled corners of said filter support to form clamping projection means which function to hold a filter element means on said filter support in cooperation with independent clip means; said elements cooperatively functioning



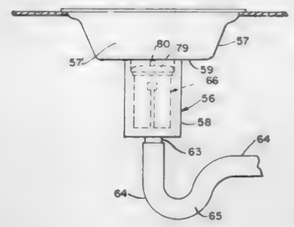
to facilitate adjustment of said filter element means during the operation of said assembly.

4,045,351

SINK STRAINER DEVICE

Carl M. Peterson, 2746 Taylor, Longview, Wash. 98632

Filed Dec. 31, 1975, Ser. No. 645,836
Int. Cl.[2] B01D *35/02;* **E03C** *1/26*
U.S. Cl. 210—238 **1 Claim**



1. A disposable strainer device for mounting in the bottom of a sink, said strainer device comprising a sink having an opening in the bottom thereof, a vertically elongated cylindrical sleeve mounted beneath the sink and having its upper edges fixed about the opening in the sink to provide fluid communication between the opening in the sink and the sleeve, said cylindrical sleeve having an opening in the bottom, an elongated outlet pipe having an elongated cylindrical upper portion of reduced diameter relative to the sleeve and fixed about the opening in the sleeve to provide fluid communication between the lower end of the sleeve and the drain outlet pipe, a vertically elongated perforated cylindrical receptacle holder detachably fitted onto said cylindrical sleeve downward through the opening in the sink, said receptacle holder being open at the top and having a diameter greater than the object pipe and only slightly smaller than the sleeve, a disposable perforated vertically elongated receptacle holder opening at the top and detachably fitted into said first mentioned cylindrical receptacle holder downward through the opening in the sink and through its opening at the top of the first receptacle holder, and having a diameter greater than the drain outlet and only slightly smaller than the first mentioned receptacle holder, said sink opening has a diameter greater than said first mentioned and said disposable receptacle holder whereby the holders may be inserted and fitted downward into the cylindrical sleeve and removed upward from the cylindrical sleeve through said sink opening, and whereby said disposable holder may receive and strain and retain therein refuse from fluid coming down the sink opening and may be removed upward through the sink opening with the first mentioned receptacle holder remaining in place in the cylindrical sleeve, said first cylindrical receptacle holder having a vertical length of at least equal to a majority of the vertical length of the sleeve, said cylindrical sleeve having an annular ledge fixed about its upper edge and said first mentioned receptacle holder has an outward projecting annular collar fixed about its upper edge whereby said collar of

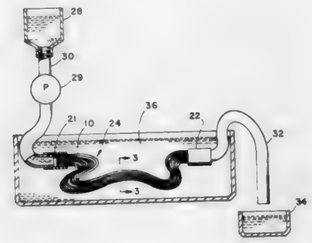
said receptacle can rest upon said ledge of the cylindrical sleeve, said second mentioned disposable receptacle holder has an annular collar fixed about its upper edge whereby said collar of said second receptacle holder may rest upon said collar of said first mentioned receptacle holder, said first mentioned receptacle holder having a stem fixed centrally to the bottom of the first receptacle and projecting upward therefrom, said second mentioned receptacle holder having a hollow column shaped portion fixed centrally to its bottom with an opening in the bottom into the column shaped portion whereby the stem may be received into the column portion to stack the first and second mentioned receptacle holders together, said device having a detachable cap, said ledge of said sleeve being spaced sufficiently beneath said opening in said sink, whereby said cap may be fitted into said sleeve in said space therebeneath and said cap being narrower in height than said space therebeneath said sink opening and said ledge whereby said cap when fitted into said space has its upper surfaces beneath the upper surfaces of sink immediately adjacent the sink opening and is adjacent the tops of the receptacle holders.

4,045,352

ION-EXCHANGE HOLLOW FIBERS

Alan Rembaum; Shiao-Ping S. Yen, both of Altadena, Calif., and Elias Klein, New Orleans, La., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 363,130, May 23, 1973. This application Feb. 24, 1975, Ser. No. 552,158
Int. Cl.[2] B01D *39/00*
U.S. Cl. 210—500 M **11 Claims**



1. An ion-exchange medium comprising a hollow, annular, thin-wall, microporous fiber of a synthetic, organic, thermoplastic resin having pores having an average diameter less than **1000** angstroms which join to form a path across the wall of the fiber and having solid particles of a cross-linked, insoluble ion-exchange resin formed in situ in said pores from ion-exchange reactants of a molecular weight capable of impregnating the pores having a diameter smaller than the pore diameter and having an even distribution of fixed charge embedded and constrained within said pores without blocking said pores of said path such that said medium has a hydraulic permeability of from 1 to 100 $\times$ 10^{-5} mil/cm^2 sec atm.

4,045,353

HIGH-ENERGY RADIATION INDUCED POLYMERIZATION ON A CHROMATOGRAPHIC SOLID SUPPORT

Yujiro Kosaka, Shin-nanyo; Masaru Uemura, Yokohama; Tsutomu Hashimoto, and Kazuyuki Fukano, both of Shin-nanyo, all of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Japan

Filed Jan. 24, 1975, Ser. No. 543,800
Claims priority, application Japan, Oct. 15, 1974, 49-118374
Int. Cl.[2] B01D *39/00, 39/14*
U.S. Cl. 210—502 **12 Claims**

8. A chromatography solid support which comprises a microporous solid inorganic substrate selected from the group consisting of silica, silica gel, alumina, diatomaceous earth, zeolite, porous glass, active carbon, carbon black and clay, having a polymer coating thereon, and having an average particle diameter of 1μm to 1 cm, an average specific surface area of 1 – 2000 m^2/g, an average pore diameter of 10 to 1900 A, and having said polymer coating formed by immersing said substrate into a radiation polymerizable monomer selected from the group consisting of ethylenically unsaturated monomers, aldehydes, ketones and cyclic ethers, and thereafter exposing said monomer coated substrate to the activity of high energy ionizing radiation to produce radiation-induced grafting of said polymerizable monomer onto said substrate to thereby bond said monomer onto said substrate, such as to produce polymer, a portion of which is grafted to said inorganic substrate, and a portion of which is not bonded to the inorganic substrate, the amount of grafter polymer per amount of inorganic substrate being defined by the equation;

$$A(\text{g/grams of inorganic substrate}) = (S \times m)/(a \times N)$$

wherein:

S=specific area of inorganic substrate (m^{2}g)
a=sectional area of one molecule of monomer (A^2)
m=molecular weight of the monomer
N-Avogadro's number

12. A method for forming a chromatography solid support which comprises immersing a microporous solid substrate selected from the group consisting of silica, silica gel, alumina, diatomaceous earth, zeolite, porous glass, carbon black, active carbon and clay, into a radiation polymerizable monomer selected from the group consisting of ethylenically unsaturated monomers, aldehydes, ketones and cyclic ethers, and thereafter exposing said monomer coated substrates to the activity of high energy ionizing radiation to produce radiation-induced grafting of said polymerizable monomer onto said substrate to thereby bond said monomer onto said substrate, wherein said support is characterized by an average particle diameter of 1μm to 1 cm, an average specific surface are of 1 – 2000 m^2/g and an average pore diameter of 10 to 1500 A, such as to produce polymer, a portion of which is grafted to said inorganic substrate, and a portion of which is not bonded to the inorganic substrate, the amount of grafter polymer per amount of inorganic substrate being defined by the equation;

$$A(\text{g/grams of inorganic substrate}) = (S \times m)/(a \times N)$$

wherein:

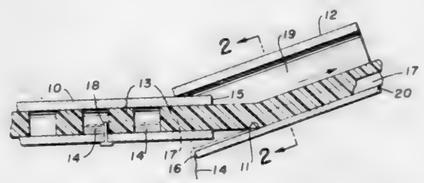
S=specific area of inorganic substrate (m^{2}g)
a=sectional are of one molecule of monomer (A^2)
m=molecular weight of the monomer
N-Avogadro's number

4,045,354

DEVICE FOR SEPARATION OF LIQUID FROM PASTE OR SEMI-SOLID

Charles E. Wyman, South Hadley, Mass., and Robert D. Holstead, Ruston, La., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 1, 1974, Ser. No. 456,495
Int. Cl.[2] B01D *17/00*
U.S. Cl. 210—523 **5 Claims**



1. Apparatus for separating a low viscosity liquid from an

immiscible high viscosity paste, and apparatus comprising in combination a compaction conduit for the liquid and paste in fixed relation and projecting proximate to an upwardly inclined surface for receiving a compacted liquid and paste, the surface provided with means for gravity drainage of the low viscosity liquid wherein said conduit has at least one means for forming a drain passage in said paste.

3. Apparatus for separating a low viscosity liquid from an immiscible high viscosity paste, said apparatus comprising in combination a compaction conduit for the liquid and paste in fixed relation and projecting proximate to an upwardly inclined surface for receiving a compacted liquid and paste, the surface provided with means for gravity drainage of the low viscosity liquid wherein said inclined surface is a screw pump rotor flight.

4,045,355

CLARIFICATION PLANT

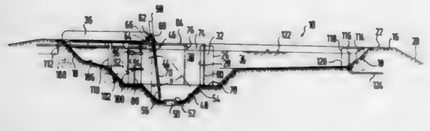
Josef Schleich, Pfarrkirchen, and Hans Zwisler, Unterpfaffenhofen, both of Germany, assignors to Heilmann & Littmann Bau-Aktiengesellschaft, Munich, Germany

Filed June 4, 1976, Ser. No. 693,109

Claims priority, application Germany, June 11, 1975, 2525909; Oct. 10, 1975, 2545406; Nov. 4, 1975, 2549270; Dec. 5, 1975, 2554768

Int. Cl.² B01D *21/02*

U.S. Cl. 210—532 R **15 Claims**



1. A clarification plant for aqueous waste comprising:
a. an embankment and a bottom wall upwardly flaring toward said embankment,
   1. said embankment being of oval contour in plan view;
   2. said bottom wall and said embankment bounding a basin open in an upward direction;
b. a plurality of upright partitions in said basin,
   1. said partitions being annular about an upright axis and spaced from each other radially relative to said axis to define in said basin an innermost settling area, an activating area surrounding said settling area, and a clarifying area surrounding said activating area,
   2. a portion of said embankment extending in an arc spacedly adjacent the radially outermost of said partitions,
   3. the remainder of said embankment extending away from said outermost partition farther than said portion thereof and bounding a radially elongated portion of said clarification area,
   4. a portion of said bottom wall downwardly bounding said clarifying area and sloping upwardly from said outermost partition toward said remainder of said embankment more gently than toward said portion of the embankment;
c. inlet means for admitting waste to said settling area;
d. outlet means for releasing clarified water from said portion of said clarifying area.

4,045,356

FRACTURING AGENT

Steve Eisner, and James LeRoy Powell, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed June 24, 1963, Ser. No. 290,237

Int. Cl.² B26F *3/00;* **C22C** *7/00*

U.S. Cl. 225—2 **17 Claims**

1. A fracturing solution for aluminum alloys, titanium alloys, copper-base alloys, iron alloys and steels comprising a first component of 98% to 99.8% mercury and 2% to 0.2% alkali metal selected from the group consisting of sodium, cesium potassium, and lithium and a second component of at least 1% of at least 0.0001N metallic sulfate solution selected from the group consisting of gold sulfate, copper sulfate and silver sulfate.

4,045,357

HYDROXY-ALUMINUM BASED DRILLING FLUID

Marion G. Reed, Hacienda Heights, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 574,810, May 5, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 725,807

Int. Cl.² C09K *7/02*

U.S. Cl. 252—8.5 A **3 Claims**

1. An aqueous drilling fluid comprising an aqueous hydroxy-aluminum solution having a ratio of the hydroxyl groups to aluminum atoms in the range of from 1.0 to 2.7 and a concentration of at least 0.5 molar, from 0.1 to 0.5% by weight of a polymer selected from the group consisting of polyvinylpyrrolidone and polyvinyl alcohol for viscosity control and an effective amount of a polyalkyl substituted nitrogen containing heterocyclic compound for corrosion control.

4,045,358

SOFTENER AND BLEACHING COMPOSITION

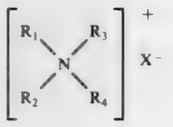
Pallassana Ramachandran, Robinsville, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

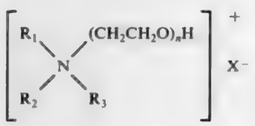
Continuation-in-part of Ser. No. 366,329, June 4, 1973, abandoned. This application Sept. 18, 1975, Ser. No. 614,815

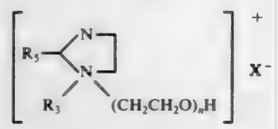
Int. Cl.² D06M *13/46;* **C11D** *3/60*

U.S. Cl. 252—8.6 **10 Claims**

1. A non-yellowing fabric softening composition comprising
a. a quaternary ammonium compound selected from the group consisting of those having the formulae:







wherein R_1 is a long chain aliphatic radical having from 18 to 22 carbon atoms, R_2 is a long chained aliphatic radical having from 18 to 22 carbon atoms, R_3 and R_4 are lower alkyl radicals, e.g. C_1 to C_4, R_5 is long chain aliphatic radical of from 12–22 carbon atoms, n is a number between 1 and 15 and X is a water soluble salt forming anion,
b. and a perphthalic acid bleach in a weight ratio of (a) to (b) of from 4:1 to 1:1.

4,045,359

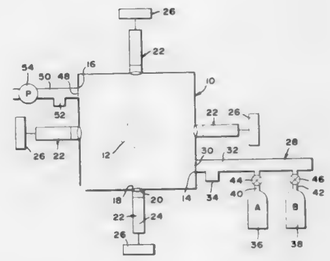
APPARATUS FOR PHOTON EXCITED CATALYSIS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Melvin M. Saffren, Altadena, Calif.

Filed Jan. 29, 1976, Ser. No. 653,316

Int. Cl.² B01J *1/00*

U.S. Cl. 250—527 **8 Claims**



1. An apparatus for increasing the yield of photonically excited gas phase reactions comprising in combination:
a closed gas phase reactor having a reaction chamber, an inlet for flowing a gas reactant to the reaction chamber, an outlet for removing a stable gaseous reaction product from the reactor and at least one aperture;
photon source means disposed outside said reactor including a laser having the output photon emitter end connected to said aperture in optical alignment with said chamber for directing excess light energy onto the inlet gas reactant for forming at least one highly excited unstable gas species containing excess energy; and
finely divided, solid, energy sink means disposed in said reactor between the inlet and outlet for stabilizing said unstable, excited species by contacting and absorbing excess energy therefrom to form said stable gaseous reaction product.

4,045,360

INHIBITING WAX DEPOSITION FROM A WAX-CONTAINING OIL

Paul W. Fischer, Whittier, and John W. Scheffel, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Sept. 22, 1975, Ser. No. 615,837

Int. Cl.² E21B *43/00;* **C09K** *3/00*

U.S. Cl. 252—8.3 **8 Claims**

1. A method for inhibiting the deposition of wax from wax-containing oil comprising incorporating into said oil a wax deposition inhibitor comprising an effective amount of a mixture of (A) one part by weight of a copolymer of ethylene and a monoethylenically unsaturated ester selected from the group consisting of (1) vinyl and allyl esters of saturated aliphatic carboxylic acids and (2) saturated aliphatic esters of unsaturated aliphatic carboxylic acids, and (B) about 2 to about 5 parts by weight of one or more oxygen-containing organic compounds selected from the group consisting of high molecular weight alcohols selected from the group consisting of unsubstituted saturated aliphatic, unsubstituted unsaturated aliphatic and unsubstituted alicyclic monohydroxy alcohols having about 10 to about 20 carbon atoms, natural waxes selected from the group consisting of insect and vegetable waxes, and fatty acids selected from the group consisting of palmitic, stearic, oleic and linoleic acids.

4,045,361

FABRIC CONDITIONING COMPOSITIONS

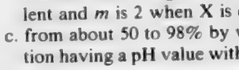
David M. Watt, Jr., Cincinnati, and Joseph P. Nirschl, Fairfield, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 21, 1975, Ser. No. 579,740

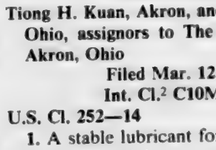
Int. Cl.² C09K *3/16;* **D06M** *13/36, 13/46*

U.S. Cl. 252—8.8 **11 Claims**

1. Liquid rinse-added fabric conditioning compositions comprising:
a. from about 0.5 to about 50% by weight of a static control agent selected from the group consisting of water-soluble acid salts of diamine compounds of the formula



wherein n ranges from 2 to 5; R_1 is an alkyl group containing from about 12 to 200 carbon atoms; and R_2, R_3 and R_4 are each hydrogen or alkyl groups containing 1 to 20 carbon atoms, provided that at least two of R_2, R_3 and R_4 are each hydrogen or alkyl containing from about 1 to about 3 carbon atoms, said salts having a solubility in water of at least 1 gram per liter at 25° C;
b. from about 0.5% to about 20.0% by weight of a quaternary ammonium fabric softener selected from the group consisting of compounds of the formula



wherein R^1 is an alkyl group containing from about 12 to 20 carbon atoms; R^2 is alkyl of about 1 to 20 carbon atoms, R^3 and R^4 are each alkyl of about 1 to 3 carbon atoms; X is a non-interfering anion; and m is 1 when X is monovalent and m is 2 when X is divalent; and
c. from about 50 to 98% by weight of water; said composition having a pH value within the range of from about 3 to 9.

4,045,362

DEFLATED TIRE LUBRICANT

Tiong H. Kuan, Akron, and John G. Sommer, Hudson, both of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Filed Mar. 12, 1976, Ser. No. 666,516

Int. Cl.² C10M *5/00, 7/00, 1/06, 3/04*

U.S. Cl. 252—14 **3 Claims**

1. A stable lubricant for a pneumatic tire for use when the tire is operated in an uninflated or deflated-condition, said lubricant comprising:
a. 100 parts of a water/ethylene-glycol mixture wherein there is at least one part of water for every 4 parts of ethylene glycol;

b. from about 0.05 to about 2 parts by weight of a polyethylene oxide of a molecular weight of about 500,000;
c. from about 0.15 to about 2 parts by weight of a polysaccharide having a molecular weight of at least about 10,000; and
d. up to 8 parts by weight of cellulose fibers, said fibers having a length not more than 400 microns;

a lubricant of a viscosity such that the fibers will remain dispersed when the tire is subjected to 200 g's at 70° C.

4,045,363

INVERT EMULSIONS OF IMPROVED EXTREME PRESSURE PROPERTIES

Donald A. Lee, Aurora, and Philip S. Korosec, Mentor, both of Ohio, assignors to The Elco Corporation

Filed Nov. 7, 1975, Ser. No. 629,763
Int. Cl.² C10M *1/06*
U.S. Cl. 252—49.5 **9 Claims**

1. A stable water-in-oil emulsion, suitable as a fire resistant fluid, comprising 50–80 parts mineral oil, 20–50 parts water and 2–10 parts of the reaction product of (1) the reaction product of sulfur with a mixture of polyisobutenyl succinic anhydride, at least one member selected from the group consisting of animal oil, mono esters of unsaturated fatty acids and vegetable oil, and a mono-alpha-unsaturated olefin and (2) a hydrophile selected from the group consisting of ammonia, alkyl amines, aryl amines, polyamines, alcohols and alcoholamines wherein the reaction product (1) is formed at a temperature within the range of from about 175° to 200° C, and, wherein the reaction product of (1) and (2) is formed at the reflux temperature of the mixture of components (1) and (2).

4,045,364

IODOPHOR SOAP TISSUES

Ferdinand Joseph Richter, Danbury, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 634,569, Nov. 24, 1975, abandoned. This application June 11, 1976, Ser. No. 695,226
Int. Cl.² A61K *33/18;* **C11D** *3/48*
U.S. Cl. 252—106 **4 Claims**

1. A single use wet strength paper useful in germicidal cleansing procedures impregnated with a mixture comprising:
a. a nonionic detergent consisting of condensates of propylene oxide, propylene glycol and ethylene oxide forming a compound having a molecular weight of about 5,000 to about 10,000, about 18 parts;
b. an anionic detergent consisting of sodium N-coconut-acid-N-methyl taurate, about 26 parts;
c. an anionic detergent consisting of a coconut-oil acid ester of sodium isethionate, about 1 part;
d. iodine, about 2.6 parts;
e. sodium iodide about 1.5 parts;
f. isopropanol about 5.0 parts;
g. a weak organic acid, about .2 parts; and
h. water, about 45.4 parts.

4,045,365

AZEOTROPE-LIKE COMPOSITIONS OF TRICHLORO-TRIFLUOROETHANE, ACETONITRILE AND ACETONE

Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 686,208, May 13, 1976, abandoned. This application Nov. 16, 1976, Ser. No. 741,633
Int. Cl.² C11D *7/50, 7/32, 7/30*
U.S. Cl. 252—141 **4 Claims**

1. Azeotrope-like compositions comprising about 90.62 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane, about 1.91 weight percent acetonitrile and about 7.47 weight percent acetone.

4,045,366

AZEOTROPE-LIKE COMPOSITIONS OF TRICHLOROTRIFLUOROETHANE, NITROMETHANE AND ACETONE

Francis J. Figiel, Boonton, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 686,209, May 13, 1976, abandoned. This application Nov. 16, 1976, Ser. No. 741,634
Int. Cl.² C11D *7/50, 7/32, 7/30*
U.S. Cl. 252—171 **4 Claims**

1. Azeotrope-like compositions comprising about 90.25 weight percent 1,1,2-trichloro-1,2,2-trifluoroethane, about 0.33 weight percent nitromethane and about 9.42 weight percent acetone.

4,045,367

GETTER FOR USE IN THE MANUFACTURE OF AN ELECTRIC DISCHARGE TUBE

Adrianus Maria Van Bakel, and Jan Josephus Bernardus Fransen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 9, 1973, Ser. No. 358,636
Claims priority, application Netherlands, May 11, 1972, 7206375
Int. Cl.² H01J *7/18*
U.S. Cl. 252—181.4 **1 Claim**

1. A getter comprising a mixture essentially of $BaAl_4$ and a titanium-containing material that is 10 to 50% by weight of Ni_3Ti and the balance $Ni\ Ti_2$, and wherein the weight ratio of the respective amounts of said titanium-containing material and said $BaAl_4$ is between 0.3 and 1.

4,045,368

PROCESS FOR PRODUCTION OF ACTIVATED CARBON SPHERES

Kunihiko Katori, Tokyo; Hiroshi Nagai, Chofu, and Zenya Shiiki, Tokyo, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo and Toyo Boseki Kabushiki Kaisha, Osaka, both of Japan

Filed Oct. 25, 1974, Ser. No. 518,084
Claims priority, application Japan, Oct. 29, 1973, 48-120653
The portion of the term of this patent subsequent to Sept. 30, 1992, has been disclaimed.
Int. Cl.² B01J *37/00*
U.S. Cl. 252—421 **6 Claims**

1. A process for the production of activated carbon spheres, comprising:
melting 100 parts by weight of a pitch in the presence of 10 to 50 parts by weight of naphthalene or tetralin to form a molten mixture;
shaping said molten mixture into the form of spheres;
contacting said spheres with a second solvent, said second solvent being compatible with the aromatic solvent, but lacking affinity for the pitch, to extract said aromatic solvent and to form microporous spheres;
oxidizing said microporous spheres by heating said spheres at a temperature of from 100° C to 400° C in the presence of a gas containing 5–30% by volume oxygen to produce pitch spheres containing at least 10% by weight of combined oxygen; then
heating said pitch spheres at a temperature in the range of from 150° C to 700° C in the presence of ammonia to produce pitch spheres having at least 1.5% by weight combined nitrogen; and
activating said pitch spheres.

4,045,369

SILVER-BASED CATALYTIC COMPOSITION FOR THE OXIDATION OF ETHYLENE TO ETHYLENE OXIDE AND METHANOL TO FORMALDEHYDE

Angelo Cantaluppi, Milan, Italy, assignor to S.A.E.S. Getters S.p.A., Milan, Italy

Filed Mar. 26, 1976, Ser. No. 670,954
Claims priority, application Italy, Apr. 2, 1975, 21923/75; Mar. 11, 1976, 21076/76
Int. Cl.² B01J *21/04, 21/08, 23/08, 23/50*
U.S. Cl. 252—432 **13 Claims**

1. Catalytic composition based on silver comprising:
A. from 0.001 to 10% based on the weight of silver of an oxide of a metal selected from the group consisting of barium, strontium and calcium,
B. from 0.001 to 8% based on the weight of silver of an oxide of indium,
C. the balance consisting essentially of silver.

4,045,370

CATALYST FOR THE DEPOLYMERIZATION OF LOWER POLYMERS OF ISOBUTENE

William Ronald Cares, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Mar. 8, 1976, Ser. No. 664,901
Int. Cl.² B01J *21/08, 23/30*
U.S. Cl. 252—458 **1 Claim**

1. A catalyst composition for the depolymerization of olefin polymers consisting essentially of an oxide of tungsten on a silica support having a surface area over 50 square meters per gram prepared by the process of mixing an aqueous solution of $H_4SiW_{12}O_{40}$ onto a silica gel and drying the mixture.

4,045,371

PROCESS FOR PREPARING A GAS DESULFURIZATION SORBENT

Kenneth S. Wheelock, and Geoffrey R. Say, both of Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 536,164, Dec. 24, 1974, Pat. No. 4,002,720. This application June 8, 1976, Ser. No. 693,875
Int. Cl.² B01J *21/04, 23/10*
U.S. Cl. 252—462 **7 Claims**

1. A process for preparing a supported sorbent for removing at least a portion of acidic gases from a gaseous mixture containing an acidic gas selected from the group consisting of hydrogen sulfide, carbonyl sulfide and mixtures thereof, which process comprises: first steam treating an inorganic oxide support for a period of time sufficient to decrease the surface area thereof, subsequently impregnating the steam-treated support with a solution of a rare earth metal compound thermally decomposable to the oxide, drying and calcining said impregnated support.

4,045,372

CONTROL OF PHYSICAL PROPERTIES OF ALUMINA EXTRUDATES

John Lawrence Warthen, Baltimore; Warren Stanley Briggs, Silver Spring, both of Md., and Marvin Vernon Paggen, Sulphur, La., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 606,275, Aug. 20, 1975, abandoned. This application July 1, 1976, Ser. No. 701,679
Int. Cl.² B01J *21/04*
U.S. Cl. 252—463 **5 Claims**

1. A process for preparing an auto exhaust conversion catalyst which consists essentially of the steps of:
a. preparing an alpha alumina monohydrate in the 10 to 150 micron size range,
b. adding a sufficient quantity of water to form an extrudable paste,
c. aging said paste at ambient temperatures for 0.5 to 6 hours,
d. extruding the alumina to form extrudates,
e. drying and calcining the extrudates,
f. contacting the extrudates with solutions of salts of metals having activity for conversion of the noxious components of exhaust gases to innocuous entities,
g. drying, calcining and recovering the product.

4,045,373

OXIDATION CATALYSTS AND PROCESS FOR PREPARING SAME

Robert A. Innes, Pittsburgh, and Anthony J. Perrotta, Monroeville, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Dec. 30, 1975, Ser. No. 645,418
Int. Cl.² B01J *23/14, 23/16*
U.S. Cl. 252—469 **5 Claims**

1. A novel catalyst defined by the following stoichiometry: $USb_aSn_bO_{8\text{-}12}$, wherein a is the number about 2.5 to about 1.5 and b is the number about 0.5 to about 1.5, with the atomic ratio of the sum of antimony and tin to uranium being about 2.5:1 to about 3.5:1.

4,045,374

ZINC OXIDE VOLTAGE-NONLINEAR RESISTOR

Masahiro Nagasawa, Hirakata; Yasuo Wakahata, Chitose; Kensuke Kuchiba, Hirakata; Kunio Nishi, Chitose, and Hiroshi Abe, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Oct. 10, 1975, Ser. No. 621,622
Int. Cl.² H01B *1/00*
U.S. Cl. 252—517 **5 Claims**

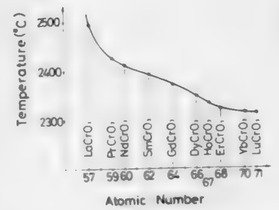
1. A voltage-dependent resistor of bulk type comprising a sintered body consisting essentially of a voltage-dependent composition which comprises, as a main constituent, zinc oxide (ZnO) and, as an additive, at least one member selected from the group consisting of bismuth oxide (Bi_2O_3), barium oxide (BaO), strontium oxide (SrO), lead oxide (PbO) and uranium oxide (UO_2), and, as a further additive, at least one member selected from the group consisting of aluminum oxide (Al_2O_3), indium oxide (In_2O_3) and gallium oxide (Ga_2O_3) in an amount of 1×10^{-4} to 5×10^{-3} mole per 100 moles of ZnO, and electrodes applied to opposite surfaces of said sintered body.

4,045,375

HIGHLY ELECTRON-CONDUCTIVE COMPOSITION

Masao Komatu, Tokyo, Japan, assignor to Koshi Arita, Tokyo, Japan

Filed Nov. 24, 1975, Ser. No. 634,632
Claims priority, application Japan, June 20, 1975, 50-75855
Int. Cl.² H01B *1/08*
U.S. Cl. 252—519 **6 Claims**



1. A highly electron-conductive composition comprising a multiple oxide having the general formula:

$$(L_{1-y}M_y)(Q_{1-y}R_y)O_3$$

in which L is an element selected from the group consisting of La, Pr, Nd, Yb, Gd and Lu; M is an element selected from the group consisting of Ca, Sr and Ba; QR is a pair of elements

selected from the group consisting of CrNi, ZrMn, FeTi, FeCo, and NiCu; and $0 \leqq x < 0.5$ and $0.2 < y < 0.8$.

4,045,376

SYNTHETIC TURBINE OILS

Isaac D. Rubin, Wappingers Falls, N.Y., and John W. Nebzydoski, Miami, Fla., assignors to Texaco Inc., New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,531
Int. Cl.² C10M *1/28*
U.S. Cl. 252—56 S **9 Claims**

1. A synthetic lubricating oil composition comprising a major amount of an aliphatic ester base oil having lubricating properties and formed by the reaction of a pentaerythritol or trimethylolpropane and an organic acid having from about 2 to about 12 carbon atoms per molecule together with a pour point depressant amount of a mixture of a mineral oil having lubricating properties and a pour point ranging from −40° F to +35° F with a copolymer of two or more esters of methacrylic acid characterized by the formula:



wherein R is a radical ranging from butyl to stearyl and n is an integer giving a molecular weight to said polymer ranging from 5000 to 500,000.

4,045,377

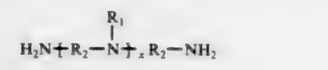
CATIONIC POLYMER PREPARED FROM DICYANDIAMIDE, A POLYAMIDE, A DIALKYLAMINE, AND AN EPOXIDE

Stephen C. Pearson, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 20, 1975, Ser. No. 624,212
Int. Cl.² B01D *21/01*; C02B *1/20*; C08G *73/02, 59/18*
U.S. Cl. 260—2 BP **12 Claims**

1. A process for the preparation of a water-soluble cationic polymer comprising:

a. reacting and polyalkylenepolyamine having the formula



wherein R_1 is hydrogen, C_1–C_4 alkyl, C_1–C_4 hydroxyalkyl; R_2 is independent of the other R_2 and is an alkylene radical having from 2 to 6 carbon atoms and x is an integer of 1 to 5 and dicyandiamide in a mole ratio of polyalkylenepolyamine to dicyandiamide of from about 1.2/1 to about 1/1.2 until reaction is substantially complete whereby a condensation polymer is produced,

b. forming an aqueous solution of the condensation polymer of step (a),

c. admixing dialkylamine having the formula



wherein R_3 is independent of the other R_3 and is a C_1–C_3 alkly, and the aqueous solution of condensate polymer of step (b) in a mole ratio of dialkylamine to the equivalent molecular weight of the repeating unit of the condensation polymer of from about 20/1 to about 2/1,

d. admixing the mixture of step (c) with difunctional epoxide, the mole ratio of difunctional epoxide to dialkylamine being from about 2/1 to about 1/1,

e. reacting the resulting admixture at a temperature of from about 50° C. to about 80° C., said reaction being continued until the viscosity of the resultant cationic polymer is in the range of from about 40 centipoises to about 250 centipoises, viscosity of the cationic polymer being measured in water as a 40% by weight solution at 25° C., and

f. terminating the reaction of step (e).

4,045,378

USE OF HYDROQUINONE IN POLYURETHANE FOAMS CONTAINING HALOGENATED PHOSPHATE POLYESTER ADDITIVES

Clifford J. Maxwell, Milford, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Sept. 29, 1976, Ser. No. 727,727
Int. Cl.² C08G *18/04*
U.S. Cl. 260—2.5 AJ **20 Claims**

1. In a method of making polyurethane foam which has reduced combustibility characteristics wherein the polyurethane foam formulation contains a halogenated phosphate polyester additive having the formula

wherein

R is an aliphatic hydrocarbon having 1–8 atoms or an aromatic hydrocarbon radical having 6–14 carbon atoms,

X is a halogen selected from chlorine, bromine and a mixture thereof,

a is an integer of 0–4,

n is an integer of 2–6, and

each

R′ is a haloalkyl radical having 1–8 carbon atoms, the halogen in this radical being chlorine, bromine or a mixture thereof,

wherein the improvement comprises:

adding an effective amount of hydroquinone to inhibit scorching in said foam formulation.

4,045,379

PROCESS FOR PREPARATION OF MODIFIED ION-EXCHANGE RESIN

Arien Kwantes; Pieter A. Gautier, and Anthony L. Farragher, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed July 26, 1976, Ser. No. 708,522
Claims priority, application United Kingdom, Aug. 1, 1975, 32251/75
Int. Cl.² C08F *8/34*; C07C *37/00*
U.S. Cl. 260—2.2 R **2 Claims**

1. A substantially water-insoluble cation exchange resin having an exchange capacity of from 2.6 to 5.2 meq/g dry weight comprising a plurality of mercaptoamine sulfonic acid salt groups, wherein said salt groups are cyclic aromatic mercaptoamine sulfonic acid salt groups wherein the mercapto and the amino groups are bound directly to the aromatic nucleus thereof.

4,045,380

CELLULAR MATERIAL

Geoffrey Vincent Dallow Blunt; Newton John Hodges, and Robert James Pragnell, all of Cheltenham, England, assignors to Coal Industry (Patents) Limited, London, England

Continuation of Ser. No. 345,574, March 28, 1973, abandoned. This application Feb. 13, 1975, Ser. No. 547,061
Claims priority, application United Kingdom, Apr. 6, 1972, 15940/72
Int. Cl.² C08J *9/06*; C08L *9/00*
U.S. Cl. 260—2.5 HA **10 Claims**

1. A process for the production of a cellular material by vulcanizing a mixture containing between 9 and 50% by weight of a mixture of a rubber together with vulcanizing agents to form an ebonite with the rubber, between 20% and 70 by weight of a coal digested in pitch, tar or tar oil, between 10% and 40% of a particular filler and a chemical blowing agent, whereby an ebonite structure is formed, so that, during the vulcanization, the chemical blowing agent decomposes or reacts to produce a gas, the viscosity of the composition during the production of the gas increasng whereby at least 25% by volume of closed cells are retained in the composition wherein the digested coal has a penetration converted to a Ring and Ball softening point of 85° C, of between 10 and about 45.

4,045,381

ORGANOSILICONE POLYMERS

Bela Prokai, Mahopac, and Bernard Kanner, West Nyack, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,838
Int. Cl.² C08J *9/00*
U.S. Cl. 260—2.5 AH **26 Claims**

1. A polysiloxane-polyoxyalkylene block copolymer having the average formula

$$[RSiO3/2]_t(R_2SiO)_w(R(R^1)SiO)_z[(C_nH_{2n}O)_pR^2],$$

wherein:

R represents a momovalent hydrocarbon radical having from 1 to 10 carbon atoms;

R^1 represents a cyano-substituted radical of the formula $-(O)_aR^3CN$ wherein R^3 is a bivalent alkylene radical having from 2 to 6 carbon atoms or a bivalent alkyleneoxyalkylene radical having from 4 to 12 carbon atoms, and *a* has a value of 0 or 1;

R^2 is a monovalent hydrocarbon radical having from 1 to 12 carbon atoms;

t has an average value of about 0.8 to about 4;

w has an average value of about 3 to about 100,

z has an average value of about 3 to about 20;

n has a value of from 2 to 4 provided that about 20 to about 65 weight percent of the oxyalkylene units of the polyoxyalkylene chain, $(C_nH_{2n}O)_p$, is constituted of oxyethylene units;

p has an average value such that the average molecular weight of the polyoxyalkylene chain is from about 800 to about 6000, and

v has an average value of about 2 to about 4.

12. A process for producing flexible polyurethane foam, which comprises reacting and foaming a reaction mixture comprising: (a) a polyether polyol reactant containing an average of at least two hydroxyl groups per molecule; (b) a polyisocyanate reactant containing at least two ixocyanato groups per molecule; (c) a blowing agent; (d) a catalyst comprising an amine; and (e) as the foam stabilizer, a polysiloxane-polyoxyalkylene block copolymer as defined in claim **1.**

4,045,382

MOLDING MATERIALS BASED ON POLYVINYL CHLORIDE AND POLYPHENYLENE OXIDE

Hans-Eberhard Braese, Cologne; Siegfried Adelmann, Krefeld; Dietrich Hardt, Cologne; Dieter Margotte, Krefeld, and Hugo Vernaleken, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 7, 1975, Ser. No. 602,950
Claims priority, application Germany, Aug. 28, 1974, 2441157
Int. Cl.² C08L *27/06, 7/00*
U.S. Cl. 260—4 R **16 Claims**

1. A thermoplastic molding composition consisting of a blend of

a. 30–90% by weight of polyvinyl chloride or of copolymers of vinyl chloride with up to 30% by weight based on the weight of the copolymer of one or more other copolymerizable vinyl compounds, and

b. about 10–70% by weight of a polyphenylene oxide based on 2,6-dimethylphenol having a molecular weight, $\bar{M}_w$, of between about 40,000 and 100,000.

4,045,383

STABLE EMULSIONS AND IMPROVED TEMPERATURE MONITORING FILMS PREPARED THEREFROM

Arnold Koff, West Orange, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 221,408, Jan. 27, 1972, abandoned, which is a continuation-in-part of Ser. No. 885,353, Dec. 15, 1969, abandoned. This application Jan. 21, 1976, Ser. No. 651,010
Int. Cl.² C09K *3/34*
U.S. Cl. 260—8 **3 Claims**

1. A device suitable for forming thermographic patterns consisting of a film having, as an integral part thereof, from about 25% to about 75% by weight on a dry weight basis of a cholesteric liquid crystal composition containing from about 0.2% to about 1.75% by weight based on the weight of the cholesteric liquid crystals of butylated hydroxytoluene and from about 75% to about 25% by weight on dry weight basis, of gelatin and wherein the cholesteric liquid crystals are homogeneously distributed throughout the film.

4,045,384

METHOD FOR FORMING AN AMIDE BOND BETWEEN A LATEX AND PROTEIN

Linneaus C. Dorman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 23, 1976, Ser. No. 708,232
Int. Cl.² C08L *89/00*
U.S. Cl. 260—8 **6 Claims**

1. A method for coupling a carboxylated latex to a protein with an amide bond which comprises reacting the latex with a water soluble carbodiimide and a water solubilized N-hydroxy compound to form an active ester latex, removing unchanged reactants from the active ester latex and coupling the cleaned active ester latex with a protein.

4,045,385

FREE-FLOWING UREA RESIN COMPOSITIONS WITH SILANE OR SILOXANE ADDITIVE ADDED BEFORE HARDENING

Gerd Klein, Troisdorf-Eschmar, and Kurt Schmoll, St. Augustin, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Nov. 13, 1975, Ser. No. 631,565
Claims priority, application Germany, Dec. 3, 1974, 2456979
Int. Cl.² C08J *3/00*; C08L *1/00*; C08G *12/12*
U.S. Cl. 260—15 **21 Claims**

1. In the manufacture of a urea-formaldehyde molding composition wherein:

A. a liquid urea-formaldehyde resin composition is formed by condensing a urea with a formaldehyde;
B. said resin is combined with a filler; and
C. to said filler containing urea-formaldehyde resin composition there is added a hardening accelerator to harden said composition to a solid urea-formaldehyde molding composition, the improvement for improving the free-flowing qualities of the resultant solid urea-formaldehyde molding composition when heated at elevated temperatures which comprises introducing into said liquid urea-formaldehyde resin prior to hardening:
A. a polyorganosiloxane having recurring units of the formula

$$X(R)_aSiO_{3-a/2}$$

wherein
X is alkyl, alkylene or a hydrocarbon radical having a functional group;
R is hydrogen, alkyl, alkoxy or aryl;
a is a value from 0 to 2; in an amount of 0.05 to 1.6 weight percent based on the weight of the urea in the resin
or
B. a silane of the formula

$$Y—A_n—Si(R'')_b(OR')_{3-b}$$

wherein
Y is a substituted or unsubstituted amino, carboxyl, glycidyl, mercapto or alkenyl group;
A is a bivalent straight or branched-chained alkylene radical which can contain oxygen in the chain;
R' is an alkyl or hydroxyl alkyl radical;
R'' is a C_{1-4} alkly radical;
n is 0 or 1, and
b is 0, 1 or 2; or a hydrolysis product thereof in an amount of 0.8 to 3.0 weight percent based on the weight of urea in said resin.

4,045,386
ALKALI-TREATED BARK EXTENDED TANNIN-ALDEHYDE RESINOUS ADHESIVES
Seymour Hartman, Mahopac, N.Y., assignor to Champion International Corporation, Stamford, Conn.
Continuation-in-part of Ser. No. 574,036, May 2, 1975, abandoned. This application Nov. 19, 1975, Ser. No. 633,235
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.2 **11 Claims**

1. A tree-derived adhesive composition, which comprises the reaction product of an admixture of an alkali-bark pre-mix, tannin and aldehyde, said alkali-bark pre-mix being a mixture of finely divided bark particles, alkali, and water, said pre-mix being neutralized with acid to a pH in the range of approximately 5.5 to 7 pH prior to the addition of the tannin and aldehyde, said admixture of said alkali-bark pre-mix, tannin, and aldehyde occurring without an application of external heat.

4,045,387
HIGHLY ABSORBENT POLYMERIC COMPOSITIONS DERIVED FROM FLOUR
George F. Fanta, Peoria, and William M. Doane, Morton, both of Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.
Filed July 26, 1976, Ser. No. 708,792
Int. Cl.[2] C08L *1/02*
U.S. Cl. 260—17.4 GC **10 Claims**

1. A method of preparing water-insoluble, aqueous fluid-absorbing compositions comprising the following steps:
a. graft polymerizing acrylontrile onto a starch-containing substrate to form a starch-containing substrate-polyacrylonitrile (SCS-PAN) graft copolymer, wherein said starch-containing substrate is selected from the group consisting of flours and meals, and wherein the weight ratio of said substrate to said acrylonitrile is in the range of 75:25 to 25:75;
b. saponifying the SCS-PAN graft copolymer from step (a) in an aqueous slurry with an alkali in amounts such that the molar ratio of alkali to the acrylonitrile repeating unit of said SCS-PAN graft copolymer is from about 0.1:1 to about 7:1 to form a water-soluble saponified graft copolymer (SCS-HPAN); and
c. drying said water-soluble SCS-HPAN from step (b) to a moisture level in the range of about 1 to 15% water by weight, whereby said SCS-HPAN is rendered water-insoluble.

4,045,388
RESIN COMPOSITION OF HYDROPHILIC PULLULAN, HYDROPHOBIC THERMOPLASTIC RESIN, AND PLASTICIZER
Hiroomi Matsunaga, Kobe; Kozo Tsuji, Ibaragi, and Teruo Saito, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka and Hayashibara Biochemical Laboratories, Inc., both of Okayama, Japan
Filed Feb. 25, 1975, Ser. No. 552,745
Claims priority, application Japan, Feb. 28, 1974, 49-24498; Feb. 28, 1974, 49-24499
The portion of the term of this patent subsequent to Aug. 24, 1993, has been disclaimed.
Int. Cl.[2] C08L *5/00*
U.S. Cl. 260—17.4 ST **4 Claims**

1. A resin composition prepared by blending
a hydrophilic pullulan resin having a molecular weight of 10,000 to 5,000,000 selected from the group consisting of pullulan and a pullulan resin which has been partly modified by etherification, esterification or graftcopolymerization with a vinyl compound,
a hydrophobic thermoplastic resin selected from the group consisting of polyethylene, polypropylene, polystyrene, acrylonitrile-butadiene-styrene copolymers, polymethylmethacrylate, polyvinyl acetate, polyvinyl chloride, polyvinylidene chloride, vinyl acetate-vinyl chloride copolymer, ethylene-vinyl acetate copolymer, propylene-vinyl acetate copolymer, polycarbonates, polyacetals, polysulfones, polyamides, and polyesters, present in an amount of 2 to 98 wt % based on the total resin and
a plasticizer selected from the group consisting of water, glycerin, ethylene glycol, propylene glycol, butylene glycol, dimethyl sulfoxide, and dimethyl formamide present in an amount of 1 to 50 wt % based on the total weight of pullulan and plasticizer.

4,045,389
METHOD OF ADHERING TEXTILES WITH A POLYAMIDE MELT ADHESIVE
Manfred Drawert, Froendenberg-Strickherdicke; Eugen Griebsch, Nordkirchen, and Wolfgang Imoehl, Unna, all of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Germany
Filed July 27, 1976, Ser. No. 709,116
Claims priority, application Germany, July 31, 1975, 2534121; Apr. 10, 1976, 2615765; Apr. 10, 1976, 2615766
Int. Cl.[2] C09J *3/16*
U.S. Cl. 260—18 N **6 Claims**

1. In the method of adhering textiles with a melt adhesive, the improvement wherein said melt adhesive is a polyamide melt adhesive having a melt viscosity, measured at 200° C, of 25–600 Pas and which is the reaction product of approximately equivalent amounts of an acid component and a basic component, said acid component comprising
a. 1. a dimerized fatty acid having a content of 70–100 percent by weight of dimeric fatty acid and, optionally,
2. a monocarboxylic acid, as a molecular weight regulator, whereby up to 50 equivalent percent of the total carboxy groups of the mixture (a) (1) and (2) can be derived from the monocarboxylic acid, and
b. one or more aliphatic straight chain co-dicarboxylic acids having 6–13 carbon atoms, wherein the ratio of carboxylic acids according to (a) (1) and (2) to carboxylic acid according to (b) is from 0.05:1 to 5:1, calculated on the carboxy groups, said basic component comprising
c an aliphatic straight chain diprimary diamine having 6–12 carbon atoms and
d. caprolactam, ϵ-aminocaproic acid, or mixtures thereof such that from 0.5 to 1.5 mols of caprolactam, ϵ-aminocaproic acid, or mixtures thereof are reacted per mol of carboxyl groups in said acid component.

4,045,390
SILICONE RUBBER COMPOSITIONS
Kunio Itoh, and Takeshi Fukuda, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co., Ltd., Japan
Filed Dec. 23, 1975, Ser. No. 643,795
Claims priority, application Japan, Dec. 28, 1974, 50-3994
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 S **8 Claims**

1. An organopolysiloxane composition comprising (a) 100 parts by weight of a linear diorganopolysiloxane with a polymerization degree higher than 3,000 terminated at both chain ends with hydroxy groups directly bonded to the silicon atoms and composed of alternately linked portions of two kinds of blocks, (i) one of which is a vinyl-containing diorganopolysiloxane block composed of randomly linked methylvinylsiloxane units $(CH_3)(CH_2=CH)SiO$ and diorganosiloxane units R_2SiO, where R is the same or different substituted or unsubstituted monovalent hydrocarbon group having no aliphatic unsaturation, the total number of said methylvinylsiloxane units and said diorganosiloxane units being from 10 to 400 and the number of said methylvinylsiloxane units in each of the vinyl-containing blocks being at least 3, and (ii) the other of which is a vinyl-free diorganopolysiloxane block composed of at least 400 of diorganosiloxane units $R_2'SiO$ where R' has the same meaning as R above, (b) from about 20 to about 200 parts by weight of a silica filler with a specific surface area at least 150 m^2/g, (c) an organohydrogenpolysiloxane having at least two hydrogen atoms directly bonded to the silicon atoms in a molecule in an amount such that the total number of the hydrogen atoms directly bonded to the silicon atoms is equal to from about 40% to about 400% of the total number of the vinyl groups in the said component (a) defined above, and (d) a catalytic amount of platinum or a platinum compound.

4,045,391
PROCESS FOR PREPARING LOW VISCOSITY FATTY ACID-MODIFIED POLYESTERS
Adolf Buschfeld, Alpen, Germany, assignor to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany
Filed Feb. 17, 1976, Ser. No. 658,545
Claims priority, application Germany, Feb. 25, 1975, 2507985
Int. Cl.[2] C09D *3/64*
U.S. Cl. 260—22 EP **20 Claims**

1. A multi-stage process for preparing low viscosity, fatty acid-modified polyesters for use in varnish systems of low solvent content which comprises the following stages conducted in sequential order at elevated temperatures:
a. reacting a monocarboxylic acid glycide ester with a compound selected from the group consisting of a polycarboxylic acid and an ester polycarboxylic acid to form a polyhydric ester alcohol,
b. reacting the said polyhydric ester alcohol with a polycarboxylic acid anhydride to form an ester polycarboxylic acid,
c. reacting the said ester polycarboxylic acid formed in (b) with a material selected from the group consisting of an alkylene oxide, an epoxyalkanol and a polyhydric alcohol to form the fatty-acid modified polyester product.

4,045,392
ALKYD RESIN MANUFACTURING PROCESS BY USING WATER OR STEAM TO REVERSE OR RETARD GELATION
William B. Callahan, Merion, Pa., and B. Frank Coe, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Mar. 11, 1975, Ser. No. 557,407
Int. Cl.[2] C08G *63/22;* **C09D** *3/64*
U.S. Cl. 260—22 R **8 Claims**

1. In a process for the manufacture of liquid alkyd resins which comprises esterifying a polybasic acid with a polyhydric alcohol under reaction temperature conditions and removing water as formed in the process; in the event gelation of the alkyd resin occurs in the process, the improvement in combination therewith which comprises the addition of sufficient steam at a rate of at least 0.02% by weight, based on the weight of the alkyd resin, per minute until a gel free composition is formed to reverse the gelation of the alkyd resin while maintaing the alkyd resin at reaction temperature conditions of about 200°–275° C.

4,045,393
RUST RESISTANT LATEX PAINT PRIMER FOR METAL SURFACES
Paul Krevenas, Philadelphia, Pa., and David Graeme Milne, Miami, Fla., assignors to N L Industries, Inc., New York, N.Y.
Continuation-in-part of Ser. No. 540,873, Jan. 14, 1975, abandoned. This application Dec. 24, 1975, Ser. No. 644,312
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—23 R **6 Claims**

1. In a latex paint primer containing a polyacrylic, polystyrene-acrylic or polyvinyl acetate latex emulsion, said polymeric latex emulsion containing from 45 to 60% solids, the amount of said latex emulsion employed in said latex paint being from 20 to 30%, the improvement comprising having present in said latex paint primer from 5 to 10% of a natural drying oil selected from the group consisting of tung, linseed, safflower, soya bean, peanut and tall oil and from 5 to 15% a basic zinc phosphite having the formula $xZnO.ZnHPO_3$ where *x* is a number from ½ to 10, thereby forming a paint primer which when used on a metal surface prevents flash rusting, all of the percentages expressed on a weight basis.

4,045,394
VISCOSITY STABILIZATION OF VICINAL ACRYLOXY HYDROXYL DERIVATIVES OF LINSEED OIL WITH N-ALKYLMORPHOLINES
Lawrence George Hess, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.
Filed June 9, 1976, Ser. No. 694,202
Int. Cl.[2] C08F *2/46*
U.S. Cl. 260—23 AR **4 Claims**

1. A composition comprising a vicinal acryloxy hydroxyl derivative of linseed oil and an amount sufficient to stabilize said composition against viscosity increases of an N-alkylmorpholine, wherein the alkyl unit contains from 1 to 4 carbon atoms.

4,045,395
ADHESIVE COMPOSITION
Ray I. Roby, Medford, Oreg., assignor to Roby's Enterprises, Inc., Medford, Oreg.
Filed Mar. 1, 1976, Ser. No. 662,736
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—28.5 AS **4 Claims**

1. A water-resistant adhesive composition which is essentially a mixture of an aqueous coal tar emulsion having a nonvolatile content by chemical analysis and an aqueous polyvinly acetate emulsion having a solids content by chemical analysis, the ratio of the coal tar nonvolatiles to polyvinyl acetate solids

in said mixture ranging from about 0.3 to 2.5:1, and sufficient water to produce a ratio of water to combined coal tar nonvolatiles and polyvinyl acetate solids in said composition within the range of about 2 to 4:1.

4,045,396

FLAME RETARDANT PERMANENT PRESS

Nelson Samuel Marans, and Alfred Gluecksmann, both of Silver Spring, Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 619,537, Oct. 3, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 733,983

Int. Cl.[2] C08K *3/00;* **C08G** *18/84;* **B32B** *27/40;* **D06M** *15/12*

U.S. Cl. 260—29.2 TN **3 Claims**

1. A composition designed to impart simultaneously wrinkle resistance and flame retardant properties to cellulosic textile materials which comprises the products obtained by reacting (A) a polyoxyalkylene polyol with (B) an aryl or alkyl diisocyanate to obtain a polyoxyalkylene capped diisocyanate which is then reacted with (C) a ketone solution of an alkyleneamine selected from diethylene triamine and triethylene tetramine to obtain a polyamine product, removing the ketone and further reacting the polyamine product with (D) a phosphorous compound selected from phosphorous acid and phosphorous trichloride, and (E) aqueous aldehyde containing 1 to 6 carbon atoms to obtain a phosphoalkylated amine-containing product, the mole ratio of components (A) to (B) to (C) being in the range of 1.0 of (A) to 1.5–2.5 of (B) to 1.5–4.0 of (C) and the mole ratio of (E) to (C) to (D) being in the range of 4.5–10.0 of (E) to 1.0 of (C) to 4.5–7.0 of (D) when (C) is diethylene triamine and 6.5–10.0 of (E) to 1.0 of (C) to 6.5–9.0 of (D) when (C) is triethylene tetramine.

4,045,397

PRINTING INK COMPOSITIONS FOR JET PRINTING ON GLAZED CERAMIC SURFACES

Dean Burton Parkinson, 450 W. Oakwood Blvd., Redwood City, Calif. 94061

Continuation-in-part of Ser. No. 571,215, April 24, 1975, abandoned. This application June 27, 1975, Ser. No. 590,802

Int. Cl.[2] C08L *61/10;* **C10M** *3/04*

U.S. Cl. 260—29.3 **14 Claims**

1. An ink composition in which the binder component consists essentially of a soluble, linear, low molecular weight novolac resin, and in which the diluent consists essentially of a low boiling alcohol or alcohol and water in which the amount of water does not exceed 50% and which includes a water and alcohol soluble dyestuff, an organo silicon compound in the form of a silane or its hydrolysis product in which the silane has the general formula R_nSiX_{4-n} in which X is a highly hydrolyzable group, n is a number of from 1 to 3, R is an organic group in which at least one of the groups is an organic group containing a highly functional group.

4,045,398

RESOLE RESIN BINDER COMPOSITION

Ronald H. Dahms, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 24, 1975, Ser. No. 634,572

Int. Cl.[2] C08L *61/10;* **C08G** *8/10*

U.S. Cl. 260—29.3 **10 Claims**

1. A non-corrosive binder composition comprising a low molecular weight resole resin and a boron compound curing accelerator, selected from the group consisting of boric acid, diammonium tetraborate, diammonium octaborate, diammonium pentaborate and mixtures thereof, said boron compound being present in from about 1 to 30 parts by weight per 100 parts of resole resin solids, said composition having a pH of about 7–10 by the addition of sufficient ammonium hydroxide to raise the pH to about 7–10 and said resole resin having a viscosity of 5 to 5000 cps.

4,045,399

CURABLE AQUEOUS COATING COMPOSITION

Hiroo Suzuki, and Isao Takada, both of Tokyo, Japan, assignors to Toyo Ink Mfg. Co., Ltd., Tokyo, Japan

Filed Jan. 30, 1976, Ser. No. 653,867

Int. Cl.[2] C08L *33/02*

U.S. Cl. 260—29.6 N **6 Claims**

1. A curable aqueous coating composition comprising dicyandiamide and/or a water soluble salt of guanidine dissolved in an aqueous solution of a water soluble salt of a copolymer comprising about 5 to about 30 wt% of one or more unsaturated carboxylic acid monomers, about 10 to about 50 wt% of one or more hydroxyalkyl (alkyl carbons: 2-8) acrylate or methacrylate monomers and about 20 to about 85 wt% of one or more (C_1-C_{18}) alkyl acrylate monomers, where the amount of the dicyandiamide and/or the water soluble salt of guanidine is about 0.1 to about 1.0 mol equivalent per 1 mol of hydroxyl group containing monomers in the copolymer.

4,045,400

ANTIFRICTION SELF-LUBRICATING MATERIAL

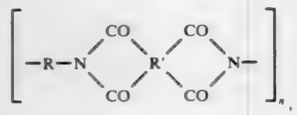
Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Irina Alexandrovna Gribova, ulitsa Vavilova, 12, kv. 31; Martin Izrailevich Kabachnik, ulitsa Gubkina, 4, kv. 11; Alexandr Petrovich Krasnov, prospekt Kalinina, 31, kv. 28; Alla Nikolaevna Chumaevskaya, ulitsa Novatorov, 40, kv. 24; Olga Vladimirovna Vinogradova, 5 Parkovaya ulitsa, 56, korpus 6, kv. 35; Svetlana Vasilievna Vinogradova, ulitsa Miklukho-Maklaya, 30, korpus 2, kv. 63; Evgenia Semenovna Krongauz, Leningradsky prospekt, 26, kv. 60; Alla Markovna Berlin, ulitsa Obrucheva, 3, korpus 4, kv. 67, all of Moscow; Alexandr Vasilievich Vinogradov, prospekt RKKA, 180, kv. 56, Zagorsk Moskovskoi oblasti; Galina Ilinichna Gureeva, ulitsa Molostovykh, 11, korpus 5, kv. 18, Moscow; Leonid Sergeevich Zakharov, B.Bronnaya ulitsa, 20, kv. 17, Moscow; Vladimir Dmitrievich Vorobiev, Novocheremushkinskaya ulitsa, 43/30, kv. 152, Moscow; Irina Sergeevna Mazaeva, Beskudnikovsky bulvar, 2, korpus 2, kv. 73, Moscow; Georgy Viktorovich Mamatsashvili, Ierusalimskaya ulitsa, 6, kv. 119, Moscow; Nikolai Sergeevich Zabelnikov, Zheleznodorozhnaya ulitsa, 26a, kv. 102, Krasnogorsk Moskovskoi oblasti, and Natalia Monovna Kofman, Sevastopolsky prospekt, 31, korpus 2, kv. 45, Moscow, all of U.S.S.R.

Filed May 14, 1975, Ser. No. 577,792

Int. Cl.[2] C08K *3/30, 9/02*

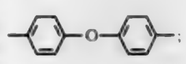
U.S. Cl. 260—37 N **8 Claims**

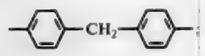
1. An antifriction self-lubricating material comprising a press-molded mixture of a nitrogen-containing polymer selected from the group consisting of fusible polyimides of the formula:



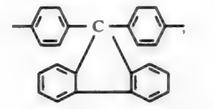
where

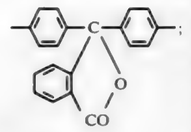
R is selected from the group consisting of





-continued



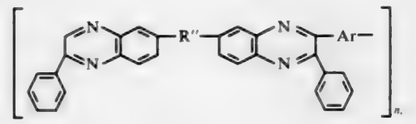


R′ is selected from the group consisting of



n = from 20 to 400,

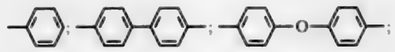
and polyphenylquinoxalines of the formula

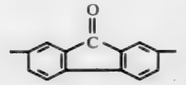


where

R″ is selected from the group consisting of —O—, —SO_2—, —CO— or is absent;

Ar is selected from the group consisting of





n = from 50 to 300, taken in a quantity of from 5 to 95 percent by weight of the antifriction material, and a filler comprising molybdenum disulphide modified with phosphorus-containing compounds selected from the group consisting of phosphorus-containing acids and phosphorus-containing esters, the phosphorus content in the modified molybdenum disulphide being from 0.01 to 2 percent by weight, and the content of the modified molybdenum disulphide in the antifriction material being within the range from 5 to 95 percent by weight.

4,045,401

MIXING APPARATUS AND METHOD

Donald G. Stenmark, Houston, and Raymond L. Heinrich, Baytown, both of Tex., assignors to Exxon Research & Engineering Co., Linden, N.J.

Division of Ser. No. 324,458, Jan. 17, 1973, Pat. No. 3,884,451. This application Nov. 11, 1974, Ser. No. 522,563

Int. Cl.[2] B29B *1/06;* **C08K** *7/14*

U.S. Cl. 260—42.18 **9 Claims**

1. A method of mixing a polyolefin and an additive which comprises introducing them into a single screw extruder having a rotatable core means comprising in combination:

a. an extruder screw means having a succession of individual spaced apart, offset, discontinuous, helical flights disposed on said screw means to form channels between said flights;

b. each successive flight being centered in a channel of preceding flights;

c. said flights having the narrowest-width-channel within the range from about —0.25 to about three diameters of said core means, the diameter of said core means including said flights;

whereby said polyolefin and said additive form a flowing first stream within said extruder, having a helical and longitudinal motion relative to the helical axis of the first stream, said first stream is subsequently split into at least second, third, fourth and fifth flowing streams, said second and third streams being subsequently combined with said fourth and fifth streams, successively repeating the said forming, splitting and combining steps to generate a number of mixed streams which increases exponentially with the length of said longitudinal motion, and recovering mixed polyolefin and additive from said extruder.

4,045,402

FLUOROELASTOMER-POLYACRYLATE BASED FRICTION MATERIAL

Roger O. Bjerk, Edelstein; William D. Brandon; Frederick S. Engelking, both of Peoria, and John P. Jero, Washington, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 366,967, June 4, 1973, Pat. No. 3,898,361. This application Aug. 1, 1975, Ser. No. 601,398

Int. Cl.[2] C08K *9/10, 9/12*

U.S. Cl. 260—42.18 **5 Claims**

1. As an article of manufacture a friction material formed of 20 to 60% by weight of a matrix comprising a fluoroelastomer intimately intermixed with a polyacrylate elastomer in a weight ratio of fluoroelastomer to polyacrylate which falls within the range from about 11:1 to about 1:11, at least 5% by weight of said 20 to 60% by weight total matrix being said fluoroelastomer, from about 12 to about 40% by weight of carbon black; and from about 20 to about 60% by weight of glassy or ceramic asperite particles of from about 0.0001 to about 0.005 inch in effective diameter intermixed with and dispersed throughout said friction material in mechanically held nonbonded relation to provide a friction surface of said article of manufacture including the said matrix and said ceramic particles.

4,045,403

METHOD OF COMPOUNDING THERMO-PLASTIC POLYMERIC MATERIALS AND FILLERS

Ray C. Lever, Fairfield, and Edward V. Wilkus, Trumbull, both of Conn., assignors to General Electric Company, New York, N.Y.

Division of Ser. No. 273,156, July 19, 1972, Pat. No. 3,997,494. This application July 29, 1974, Ser. No. 492,964

Int. Cl.[2] C08K *9/10, 9/12*

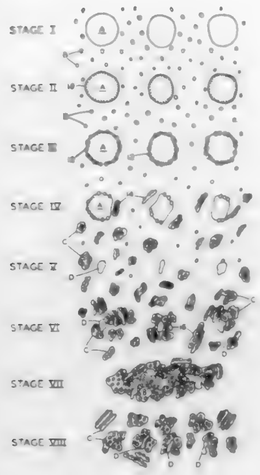
U.S. Cl. 260—42.42 **30 Claims**

1. The method of compounding thermoplastic polymeric material and filler, comprising the steps of:

a. mixing particles of thermoplastic polymeric material with particulate filler proportioned in amounts ranging from at least 5 to about 200 parts by weight of the filler per 100 parts by weight of the polymeric material while melting surface portions of the particles of polymeric material, whereby the filler is blended with the melting surface portions of said polymeric particles and the resultant blend of the melted polymeric material and filler is removed from the remaining portion of the polymeric particles by the mixing action; and,

b. continuing both the mixing of the particles of thermoplastic polymeric material with the filler and the melting of surface portions of said particles with the resulting blending of the melting surface portions and filler and the removal of the resultant blend of melted polymeric material and filler from said particles of polymeric material to effect a progressive melting and diminution of the said

particles of polymeric material until greater than 50% of the particulate polymeric material has become expended by melting and a majority of greater than 50% of the filler has become substantially assimilated into the polymeric material whereby said polymeric material and filler are



substantially compounded to a free flowing particulate form comprising discrete particles of the compounded blend of polyeric material and filler with said blend comprising fundamental units predominantly structured essentially of a stratified layer of filler adhesively embraced by a film-like mass of polymeric material.

4,045,404
HINDERED PHENOLIC NORBORNANE-2,3-DICARBOXIMIDES AND STABILIZED COMPOSITIONS

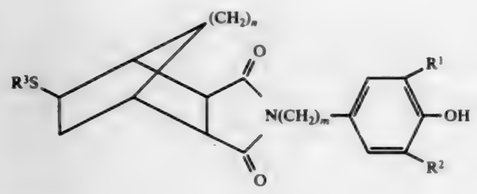
John F. Stephen, New City, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 429,234, Dec. 28, 1973, Pat. No. 3,896,147. This application May 8, 1975, Ser. No. 575,670
Int. Cl.[2] C08K 5/00; C08L 4/00
U.S. Cl. 260—45.8 N **6 Claims**

1. A composition of matter comprising an organic material normally subject to oxidative, thermal and/or ultraviolet light degredation and

a. from 0.01 to 5% of a stabilizer having the formula

I



wherein

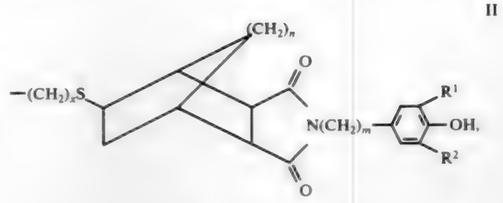
R^1 and R^2 are the same or different (lower) alkyl groups of 1 to 4 carbon atoms,

m has a value of 0 to 3,

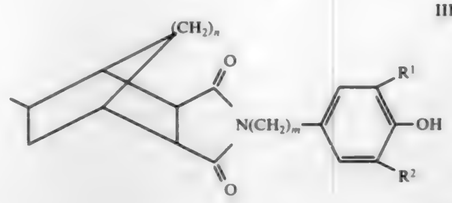
n has a value of 1 and 2, and

R^3 is alkyl group of 1 to 18 carbons, a group of the formulae

II



III or



IV

$-(CH_2)_p-CO_2R^4$

where

x has a value of 2 to 18,

R^4 is alkyl of 1 to 18 carbons, and p has a value of 1 or 2,

b. from 0 to 5% of a UV absorber, and

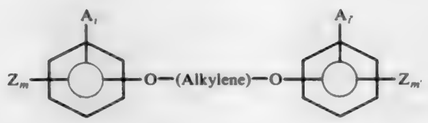
c. from 0 to 5% of a co-stabilizer.

4,045,405
PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,850
The portion of the term of this patent subsequent to Sept. 20, 1994, has been disclaimed.
Int. Cl.[2] C08L 9/00
U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising elastomers and a flame retardant, said flame retardant consisting of a compound having the formula



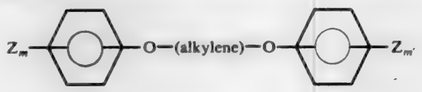
wherein Z is bromine; m is an integer having a value of 1–5 and m' is an integer having a value of 0–4; i is an integer having a value of 0–2 and i' is an integer having a value of 1–5; alkylene is a straight or branched chain alkylene group having from 1 to 6 carbon atoms; and A is chlorine.

4,045,406
PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Feb. 8, 1973, Ser. No. 330,840
The portion of the term of this patent subsequent to July 5, 1994, has been disclaimed.
Int. Cl.[2] C08L 77/06
U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising a nylon and a flame retardant said flame retardant consisting of a compound having the formula



wherein (a) Z is bromine; (b) m and m' are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,045,407
PROCESS FOR PREPARING AMIDEIMIDE POLYMERS IN THE PRESENCE OF ALCOHOLIC SOLVENT

Robert G. Keske, and James R. Stephens, both of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 23, 1976, Ser. No. 660,715
Int. Cl.[2] C08G 73/14
U.S. Cl. 260—47 CP **13 Claims**

1. The process of producing an amideimide polymer without using an acid having an acyl halide group, which comprises reacting a composition comprising an aromatic diprimary amine and a tricarboxylic acid compound selected from the group consisting of trimellitic acid and trimellitic anhydride in an alcoholic solvent containing a tertiary amine wherein said alcoholic solvent comprises an alkanol containing from 4 to 10 carbon atoms.

4,045,408
FLUORO-ANHYDRIDE CURING AGENTS AND PRECURSORS THEREOF FOR FLUORINATED EPOXY RESINS

James R. Griffith, Riverdale Heights, and Jacques G. O'Rear, Temple Hills, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 19, 1976, Ser. No. 668,555
Int. Cl.[2] C08G 59/42
U.S. Cl. 260—47 EA **10 Claims**

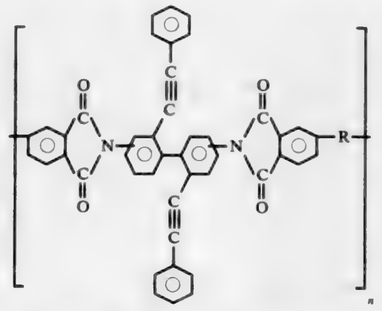
1. A precursor of a curing agent for fluorinated epoxy resins selected from the class consisting of hydroxyperfluoroalkyl phthalic acid, hydroxyperfluoroalkyl pyromellitic acid, hydroxyperfluoroalkyl benzenepentacarboxylic acid, and mixtures thereof.

4,045,409
THERMALLY STABLE, HIGHLY FUSED IMIDE COMPOSITIONS

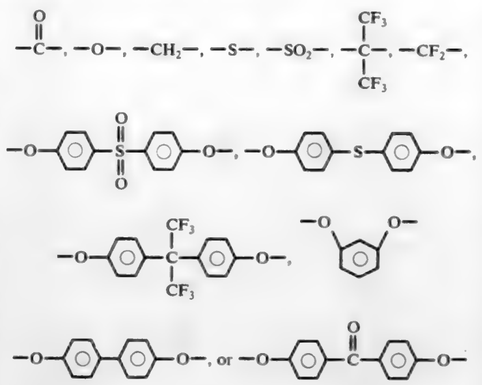
Fred E. Arnold, Centerville, and Frederick L. Hedberg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,324
Int. Cl.[2] C08G 73/10, 73/12
U.S. Cl. 260—49 **12 Claims**

1. A thermally stable imide polymer consisting essentially of repeating units having the following formula:



wherein the imido nitrogen atoms are connected to the 4,4' or the 5,5' positions of the biphenyl linkage containing the 2,2'-phenylethynyl groups, and wherein R is



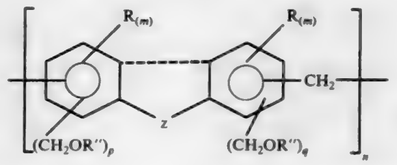
and n has a value such that the polymer has an inherent viscosity of about 0.1 to 2.0 as measured in N,N'-dimethylacetamide at 30° C.

4,045,410
CARBOXYLATED DIPHENYLETHER-FORMALDEHYDE COPOLYMER RESINS AND THEIR PREPARATION

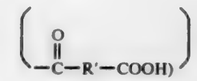
Raymond A. Plepys, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 17, 1975, Ser. No. 623,511
Int. Cl.[2] C08G 16/04
U.S. Cl. 260—52 **13 Claims**

1. A copolymer resin having the repeating unit



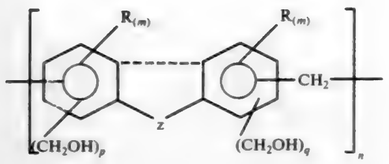
wherein each R is independently an alkyl group of 1 to about 10 carbon atoms or a halogen, z is oxygen or sulfur, the dashed line is an optional chemical bond, the group represented by z taken with the dashed line represents dibenzofuran and dibenzothiophene moieties, or mixtures thereof, each R'' is hydrogen or



wherein each R' is a substituted or unsubstituted alkylene or arylene radical of 2 to about 11 carbon atoms, n averages about 3–10, each m is 0–2, and p and q are each 0 or 1 with the proviso that the sum of p and q has an average value of 0.1–1 and there is an average of at least one carboxyl group per polymer molecule.

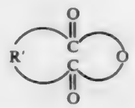
10. A process for preparing the copolymer resin having the repeating unit of claim **1** comprising heating with agitation a mixture comprising

a. a hydroxymethyl substituted diphenylether-formaldehyde copolymer resin having the repeating unit



wherein each R is independently alkyl of 1 to about 10 carbon atoms or halogen, *z* is oxygen or sulfur, the dashed line is an optional chemical bond, the group represented by *z* taken with the dashed line represents dibenzofuran and dibenzothiophene moieties, or mixtures thereof, *n* averages about 3–10, *m* is 0–2, and *p* and *q* are each 0 or 1 with the proviso that the sum of *p* and *q* has the average value of 0.1–1 and there is an average of at least one hydroxymethyl group per polymer molecule, and

b. an anhydride of the formula



wherein R' is a substituted or unsubstituted alkylene or arylene radical of from 2 to about 11 carbon atoms,

to a temperature between about 120° C and about 170° C for about 10 to about 50 minutes wherein the ratio of (*b*) to (*a*) is between about 0.1 to about 1.1 mole of (*b*) per equivalent hydroxyl group in (*a*).

4,045,411

MOBILE ROOM-TEMPERATURE STABLE ACID CATALYZED PHENOL FORMALDEHYDE RESIN COMPOSITIONS

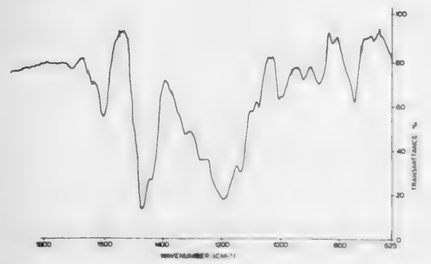
Ramesh C. Vasishth, Delta, and Pitchaiya Chandramouli, Richmond, both of Canada, assignors to Cor Tech Research Limited, Richmond, Canada

Continuation-in-part of Ser. No. 421,068, Dec. 9, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,864

Claims priority, application United Kingdom, Apr. 17, 1974, 16860/74

Int. Cl.[2] C08G *2/28, 2/30*

U.S. Cl. 260—59 R **5 Claims**



1. A room temperature-stable, acid-catalyzed and mobile thermosetting phenol-formaldehyde resin capable of rapid cure at elevated temperature, formed by reaction of formaldehyde and phenol in an aqueous reaction medium in the presence of a metal carboxylate catalyst therefor at a mole ratio of formaldehyde to phenol of greater than about 1.7:1 and acid catalysis of the resin so formed, and having a viscosity of about 1000 to 40,000 cps at 75° F.

4,045,412

ALUMINA SUBSTRATE AND METHOD OF MANUFACTURING SAME

Seiichi Yamada, Machida, and Kyohei Murakawa, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed July 14, 1975, Ser. No. 595,703

Claims priority, application Japan, July 16, 1974, 49-81296

Int. Cl.[2] C04B *35/64, 35/10*

U.S. Cl. 264—63 **13 Claims**

1. A method of manufacturing an alumina substrate having a surface finish of no more than 0.05 μm center line average on at least one major surface and a density of at least 3.90 g/cm^3 in an as-fired condition, comprising the steps of:

making an aggregated raw material powder by dry milling a mixture consisting of fine alumina particles, having high purity, and a grain growth inhibitor of 0.1 to 0.5 wt%;

producing a slip consisting of said aggregated raw material powder and an organic agent comprising a binder and a solvent; said solvent is provided to ensure that said raw material powder is uniformly dispersed in said slip;

forming a solvent-free green sheet from said slip, having a high content of said raw material powder and a density of more than 2.60g/cm^3, said step of forming including the step of subjecting said slip to a vacuum to eliminate bubbles and evaporate said solvent from said slip, followed by the step of shaping said solvent-free slip into a sheet and the further step of drying said sheet at room temperature; and firing said green sheet at a temperature in the range of 1525° C to 1650° C until said alumina particles in said fired sheet grow sufficiently to form straight boundaries and flat surfaces corresponding to said major surface of said alumina substrate.

4,045,413

POSSIBLE ACTIVE MATRIX POLYMERS

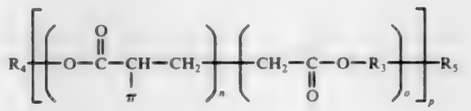
Richard W. Radler, Jr., Marion, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 401,468, Sept. 27, 1973, Pat. No. 3,884,690. This application Oct. 21, 1974, Ser. No. 516,066

Int. Cl.[2] C08G *63/18, 63/68*

U.S. Cl. 260—63 R **20 Claims**

1. A polyester material of the formula



wherein

π is defined as pyrene, tetraphenylpyrene, phenylpyrene, acetylpyrene, benzpyrene, alkylpyrene, chrysene, benzochrysene, benzathracene, dibenzathracene, perylene, picene, tetracene, fluorene, fluorenone, nitrofluoroenone, phenanthrene, anthraquinone, thiophene or dibenzothiophene radicals;

R_3 is defined as divalent aromatic hydrocarbon radical or as a straight or branched methylene chain of from 1–20 carbon atoms;

R_4 and R_5 are individually defined as low molecular weight aliphatic polymeric end groups;

n and *o* are integers in a ratio of about 1–3:1; and

p is an integer commensurate with a number average molecular weight of about 5,000 – 100,000.

4,045,414

DI-SUBSTITUTED META-TERPHENYL COMPOUNDS AND RESULTING POLYMERS

Guy Rabilloud, and Bernard Sillion, both of Grenoble, France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

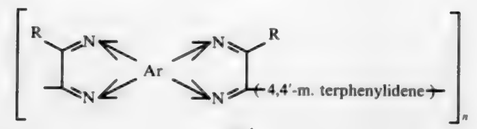
Division of Ser. No. 533,822, Dec. 18, 1974. This application Dec. 23, 1975, Ser. No. 643,837

Claims priority, application France, Dec. 19, 1973, 73.45637

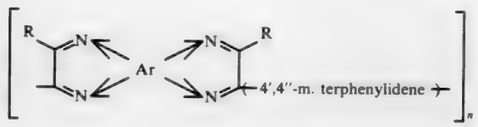
Int. Cl.[2] C08G *73/06*

U.S. Cl. 260—65 **7 Claims**

1. A heterocyclic thermostable polymer comprising recurring units of at least one of the types represented by the general formulae



and



wherein Ar is a tetravalent aromatic radical which comprises one or more aromatic rings, and the four valences of which are located, by pairs, on adjacent carbon atoms of the same ring, R is a hydrogen atom, an alkyl radical or an aryl radical, and the arrows indicate a possible isomerism.

4,045,415

PROCESS FOR PREPARING COPOLYMERS OF TRIOXANE

Günter Sextro, Naurod; Karlheinz Burg, Langenhain, Taunus; Klemens Gütweiler, Oberjosbach, and Klaus Dürichen, Munich, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt (Main), Germany

Continuation-in-part of Ser. No. 427,251, Dec. 21, 1973, abandoned, and a continuation-in-part of Ser. No. 427,254, Dec. 21, 1973, abandoned. This application June 18, 1975, Ser. No. 587,839

Claims priority, application Germany, Dec. 14, 1973, 2362172

Int. Cl.[2] C08G *2/10;* **C08F** *6/00, 3/00*

U.S. Cl. 260—67 FP **10 Claims**

1. In a process for producing copolymers of trioxane by copolymerization of 99.9 to 90 weight percent of trioxane and 0.1 to 10 weight percent of a cyclic acetal, which process includes the steps of mixing said trioxane and cyclic acetal with a cationically active catalyst at a temperature of 62° to 115° C., solidifying the resulting mixture by chilling it and thereafter heating the resulting mixture to about 62° to 130° C. while it is maintained in a solid state to substantially complete said polymerization, the improvement which consists in chilling the liquid mixture of trioxane and acetal immediately after it is mixed and prior to the development of turbidity therein.

4,045,416

AMINE ACRYLATE ADDITION REACTION PRODUCT COMPOSITIONS

John Howard Robson, and Erich Marcus, both of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

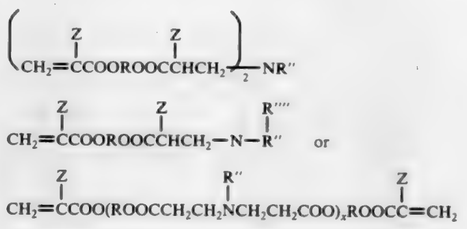
Division of Ser. No. 499,636, Aug. 22, 1974, Pat. No. 3,963,771, which is a division of Ser. No. 69,136, Sept. 2, 1970, Pat. No. 3,845,056, which is a continuation-in-part of Ser. No. 6,939, Jan. 29, 1970, abandoned. This application Oct. 17, 1975, Ser. No. 623,360

Claims priority, application Canada, Jan. 21, 1971, 103255

Int. Cl.[2] C08F *18/24;* **C07C** *101/20;* **C07D** *51/70*

U.S. Cl. 260—77.5 CR **7 Claims**

1. A pigmented or unpigmented composition comprising from 1 to 99.9 weight percent of at least one amine acrylate, said amine acrylate being the addition reaction product of a primary or secondary organic amine and a polyacrylate, said reaction product being selected from the group of:



wherein

Z is hydrogen or methyl

R'' is alkyl of from 1 to 5 carbon atoms, cycloalkyl of from 5 to 10 carbon atoms, or aryl or aralkyl or alkaryl of from 6 to 12 carbon atoms;

R'''' is hydrogen or alkyl of from 1 to 5 carbon atoms; and

R is the residue of a diol of the group of saturated aliphatic diols having from 2 to 20 carbon atoms, bicyclo[2.2.1]-hept-2-ene diols, cyclohexyl diols, phenyl and mono-and di- lower alkyl phenyl diols, polyalkylene ether diols having from 2 to 4 carbon atoms in the alkylene group and ester glycols having from 1 to an average of 17.5 ester groups; and

x has a value of from 1 to 4; in admixture with at least one other radiation curable composition.

4,045,417

PRODUCTION OF AROMATIC POLYAMIDES

Noboru Yamazaki, and Fukuji Higashi, both of Tokyo, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

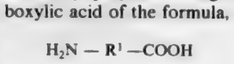
Filed Sept. 2, 1975, Ser. No. 609,740

Claims priority, application Japan, Sept. 9, 1974, 49-104247

Int. Cl.[2] C08G *69/12, 69/32*

U.S. Cl. 260—78 A **8 Claims**

1. In a process for producing a fiber forming aromatic polyamide by polycondensing an arylene containing aminocarboxylic acid of the formula,



wherein R^1 is an aromatic hydrocarbon radical or two or more aromatic hydrocarbon radicals bonded through an alkylene group having 1 to 4 carbon atoms, an alkylidene group having 2 to 4 carbon atoms, —O—, —S—, —SO_2—, —CO—, —NH—, —NR'— wherein R' is an alkyl group having 1 to 4 carbon atoms, —CONH—,

or said radical or radicals having one or more substituents on the aromatic nuclei, said substituent being an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a halogen atom, a nitro group or a cyano group,

in the presence of a phosphorus compound of the formula,

$$R^4 - P(OR^5)_2$$

wherein R^4 is OR^5, a hydroxyl group, an alkyl group having 1 to 6 carbon atoms or an aryl group with or without at least one substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a halogen atom, a nitro group and a cyano group; and R^5 is an aryl group with or without at least one substituent selected from the group consisting of an alkyl group having 1 to 6 carbon atoms, an alkoxy group having 1 to 6 carbon atoms, a phenyl group, a nitro group and a cyano group,

and a tertiary amine in the liquid phase, wherein the tertiary amine is used in an amount of 1 mole or more per mole of the phosphorus compound and the phosphorus compound is used in an amount of 1 mole or more per mole of the arylene containing aminocarboxylic acid,

the improvement which comprises carrying out the polycondensation using a solvent selected from the group consisting of N-methylpyrrolidone and dimethylacetamide as the reaction medium and a metal halide selected from the group consisting of a lithium halide and a calcium halide, wherein the metal halide is used in an amount of 1–15 percent by weight based on the weight of the mixture of the tertiary amine and the solvent.

4,045,418

COPOLYMERS OF D,L-LACTIDE AND EPSILON CAPROLACTONE

Richard G. Sinclair, Columbus, Ohio, assignor to Gulf Oil Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1975, Ser. No. 544,789

The portion of the term of this patent subsequent to Aug. 23, 1994, has been disclaimed.

Int. Cl.² C08G *63/08, 63/10*

U.S. Cl. 260—78.3 R **12 Claims**

1. A thermally stable copolymer of an optically inactive lactide and epsilon caprolactone, said copolymer being obtained by heating a mixture of L,L-lactide having a melting point above 100° C. and epsilon caprolactone at a temperature above the melting point of D,L-lactide and below 200° C. in the presence of a catalyst, said mixture comprising about 60 to about 95 per cent by weight of D,L-lactide.

4,045,419

CHEMICAL PROCESS FOR PRODUCING ISOPRENE BY PYROLYSIS OF ALLYLIC ESTERS

Charles N. Winnick, Teaneck, N.J., assignor to Halcon International, Inc., New York, N.Y.

Continuation of Ser. No. 318,942, Dec. 27, 1972, abandoned, which is a division of Ser. No. 638,659, May 15, 1967, abandoned, which is a continuation-in-part of Ser. No. 543,802, April 20, 1966, abandoned. This application Nov. 29, 1974, Ser. No. 528,103

Int. Cl.² C07C *1/00, 1/20, 5/42*

U.S. Cl. 260—681 **6 Claims**

1. A water tolerant process for the preparation of isoprene which comprises treating in the presence of a catalyst methylbutene with an aliphatic, mono-carboxylic acid having 2 to 8 carbon atoms and an oxidizing agent containing molecular oxygen at pressures of from about 0.5 atmosphere to about 70 atmospheres and at temperatures of from about 30° C. to about 200° C., the catalyst being mercury, selenium, or tellurium, an oxide, or an organic salt of said metals, or mixtures thereof, whereby to produce ester precursors which are allylic esters, and subjecting said allylic ester precursors thereby produced to pyrolysis conditions. thereby producing said isoprene.

4,045,420

NON-OXO-CARBONYL CONTAINING BENZOYL ECGONINE AND COCAINE COMPOUNDS POLYPEPTIDE AND DERIVATIVES THEREOF

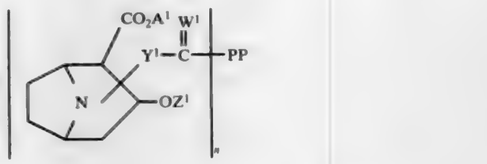
Michael J. Soffer, Redwood City, and Richard S. Schneider, Saratoga, both of Calif., assignors to Syva Company, Palo Alto, Calif.

Filed May 29, 1973, Ser. No. 364,842

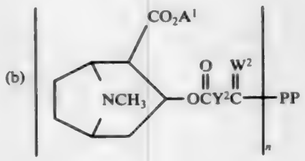
Int. Cl.² C07G *7/00*

U.S. Cl. 260—112 R **6 Claims**

1. A nor-tropane substituted polypeptide including proteins selected from the group consisting of compounds of the formula:



(a)



(b)

wherein

PP is an antigenic polypeptide, including proteins;

n is at least one;

A^1 is hydrogen or methyl;

Y^1 and Y^2 are hydrocarbylene of from 1 to 10 carbon atoms;

W^1 and W^2 are oxygen or imino; and

Z^1 is hydrogen or benzoyl, wherein the nor-tropane is bonded to the polypeptide through an amino group to form an amide or amidine.

4,045,421

LIGNIN DISPERSANT

Donald E. Wenzel, and Vincent F. Felicetta, both of Bellingham, Wash., assignors to Georgia-Pacific Corporation, Portland, Oreg.

Filed Aug. 10, 1976, Ser. No. 713,295

Int. Cl.² C07C *1/00*

U.S. Cl. 260—124 R **8 Claims**

1. A process for the preparation of a dispersant from an aqueous vanillin raffinate obtained upon partial oxidation of lignin, which comprises adding to the aqueous raffinate solution containing from 15 to 30 weight percent solids from 2 to 10 weight percent of formaldehyde, based upon raffinate solids, heating the mixture at a pH in the range of 8 to 11 at a temperature in the range of 60° to 120° C until a substantial portion of the formaldehyde has reacted with the lignin, subsequently acidifying the mixture at a temperature in the range of 70° to 95° C with an inorganic acid to a pH below 2.5 to precipitate and coagulate the lignin, cooling the acidified mixture after coagulation of the precipitate to a temperature below 50° C and separating the precipitated and coagulated lignin from the mixture.

4,045,422

SYNTHESIS OF α-NITROSOKETAL DIMERS

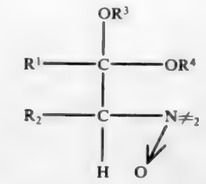
Milorad M. Rogic, Whippany; Michael D. Swerdloff, Parsippany, and Timothy R. Demmin, Morris Plains, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 460,836, April 15, 1974, abandoned. This application July 31, 1975, Ser. No. 600,666

Int. Cl.² C07C *105/00, 131/00*

U.S. Cl. 260—143 **5 Claims**

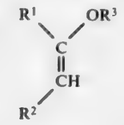
1. A process for the production of an α-nitrosoketal dimer of the formula



wherein R^1 and R^2 are selected from the group consisting of C_1–C_{10} alkyl or phenyl and/or combinations thereof, or in combination together R^1 and R^2 are a part of the C_5–C_{12} cyclic structures, and

R^3 and R^4 are independently selected from the group consisting of C_1–C_{10} alkyl, cyclohexyl and C_1–C_4 alkyl substituted cyclohexyl radicals, comprising the steps of:

a. nitrosating, in the presence of a catalytic amount of a suitable acid and at a temperature of between about −70° and 25° C and at a pressure of between about one atmosphere and 200 psi, an alkoxyalkene of the formula



wherein R^1 and R^2 are selected from the group consisting of C_1–C_{10} alkyl, phenyl and wherein both R^1 and R^2 are part of a C_5–C_{12} carbo-cyclic structure, and R^3 is selected from the group consisting of C_1–C_{10} alkyl, cyclohexyl and C_1–C_4 alkyl substituted cyclohexyl; with at least one molar equivalent of an alkyl nitrite of the formula

$$R^4ONO$$

wherein R^4 is selected from the group consisting of C_1–C_{10} alkyl, cyclohexyl and C_1–C_4 alkyl substituted cyclohexyl; and

b. isolating the dimer thus formed.

4,045,423

CHROMIUM COMPLEXES OF PHENYLAZOPYRAZOLYL OR PHENYLAZONAPHTHOL DYESTUFFS AND ACETYLACETONE

Claude Marie Henri Emile Brouard, Sotteville les Rouen, and Paulette Gisele Ficht, Mont Saint Aignan, both of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

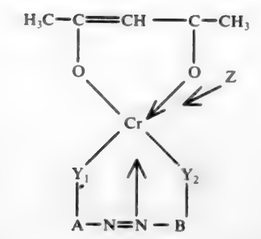
Filed Feb. 25, 1974, Ser. No. 445,183

Claims priority, application France, Mar. 2, 1973, 73.07457

Int. Cl.² C09B *45/16;* **D06P** *1/10, 3/24*

U.S. Cl. 260—147 **6 Claims**

1. A dyestuff represented by the following structure:



in which A represents phenylene which is unsubstituted or monosubstituted by nitro, chloro or sulpho, or disubstituted by nitro and sulpho or chloro and sulpho or methyl and nitro or chloro and chloro, B represents 1-phenyl-3-methyl-5-pyrazolyl which may be monosubstituted on the phenyl by sulpho, chloro or ethyl; or 1,2 naphthalene, one of A or B is substituted by sulpho, Y_1 represents —O— or



Y_2 represents —O— or



Y_1 and Y_2 are each in a vicinal position with respect to azo, and Z is water, ammonia or pyridine.

4,045,424

SALT OF A SULFONIC ACID SUBSTITUTED 1:2 METAL COMPLEX DYE WITH A BASIC DYE AND AN AMINE

Arnold Tartter, Lambsheim, Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

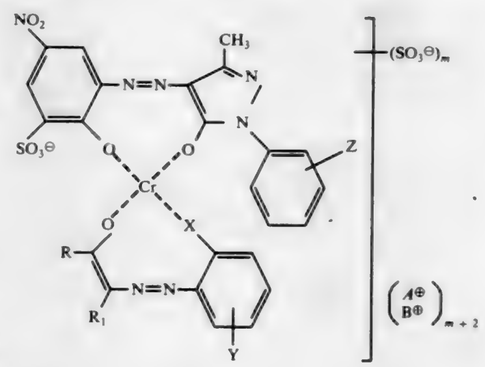
Continuation of Ser. No. 90,089, Nov. 16, 1970, abandoned. This application Jan. 6, 1976, Ser. No. 646,925

Claims priority, application Germany, Nov. 26, 1969, 1959306

Int. Cl.² C09B *45/06, 45/10, 45/16, 45/20*

U.S. Cl. 260—147 **4 Claims**

1. The salt of a 1:2 metal complex dye having the formula



in which:

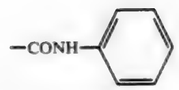
m is zero or 1;

X is —O— or —COO—;

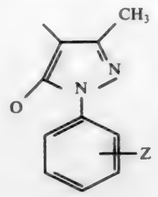
Y is hydrogen, chloro or nitro;

Z is hydrogen or chlorine;

R is



when R^1 is methyl, or R + R^1 together with the linking carbon atoms therebetween denote the radical



in which Z is hydrogen or chlorine;

$A^{\oplus}$ is a cation selected from the class consisting of Rhodamine G, Rhodamine 6G, Rhodamine B, Rhodamine F3B, Rhodamine 3GO, Rhodamine blue 6G, Brilliant green, Malachite green, Auramine, Methyl violet, Crystal violet, and Ethyl violet; and

$B^{\oplus}$ is a cation selected from the class consisting of n-hexylammonium, n-decylammonium, n-dodecylammonium, β-ethylhexylammonium, i-nonylammonium, i-tridecylammonium, γ-ethoxy-, γ-propoxy-, γ-butoxy- γ-isopentoxy- and γ-hexoxypropylammonium, γ- (β-ethylhexoxy)-propylammonium and γ-(i-nonyloxy)-propylammonium.

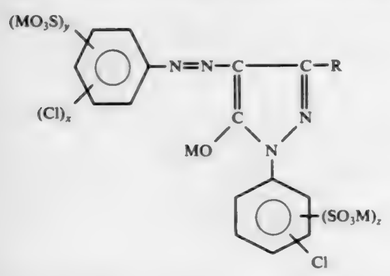
4,045,425

CRYSTALLINE AZOPYRAZOLONE ACID DYE

Frank Ray Hunter, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

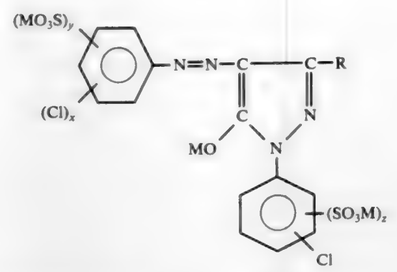
Filed Feb. 19, 1976, Ser. No. 659,512
Int. Cl.² C09B *43/00*
U.S. Cl. 260—163 **12 Claims**

1. Crystalline, azopyrazolone acid dye of the formula

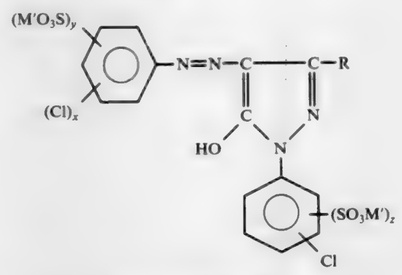


wherein R is H or CH_3, *x* is 1 or 2, *y* and *z* are each 0 or 1, the sum of *y* and *z* is 1 and M is ammonium, lithium, sodium or potassium cation, said crystalline dye being characterized by the absence of absorption in the 6.0 micron region of its infrared scan.

4. Process for preparing the crystalline, azopyrazolone acid dye of the formula



wherein R is H or CH_3, *x* is 1 or 2, *y* and *z* are each 0 or 1, the sum of y and z is 1 and M is ammonium, lithium, sodium or potassium cation, said crystalline dye being characterized by the absence of absorption in the 6.0 micron region of its infrared scan, which process consists of heating the dye which, in enol form, is of the formula



wherein R, *x*, *y* and *z* are as defined above and M′ is a cation, said dye being characterized by absorption in the 6.0 micron region of its infrared scan (using a mineral oil dispersant), in an aqueous liquid medium, at a pH above 10.0, at a temperature of 35° C to the boiling point of the aqueous liquid medium, in the presence of at least two equivalents of the cation M per equivalent of dye, with 0–1 equivalent of M being provided by M′.

4,045,426

BISAZO FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

Chester S. Sheppard, and Ronald E. MacLeay, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 435,623, Jan. 22, 1974, Pat. No. 3,956,269, which is a continuation of Ser. No. 98,893, Dec. 16, 1970, abandoned. This application Mar. 4, 1976, Ser. No. 663,655
Int. Cl.² C07C *107/02*
U.S. Cl. 260—174 **4 Claims**

1. A free radical initiator containing ultraviolet light stabilizing groups having the formula:

$$(R—N=N—)_2R'$$

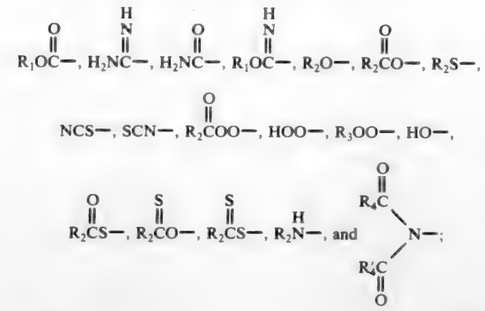
wherein

R is selected from the group consisting of alkyl of 1–20 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–20 carbons, aryl of 6–14 carbons, acyl of 2–20 carbons, aroyl of 7–20 carbons, carbamoyl, alkylcarbamoyl of 2–7 carbons, cycloalkylcarbamoyl of 4–11 carbons, $—CO_2Na$, $—CO_2K$, alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl, of 4–11 carbons, aryloxycarbonyl of 7–13 carbons, and



wherein

Y is selected from the group consisting of NC—, N_3—,



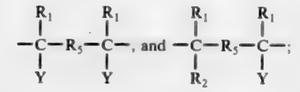
wherein

R_1 and R_2 are selected from the group consisting of alkyl of 1–20 carbons, cycloalkyl of 3–6 carbons, and alkylene of 2–30 carbons when R_1 and R_2 are joined together; and wherein one but not both of R_1 and R_2 can in addition be phenyl, tolyl, xylyl, benzyl, or phenethyl:

R_3 is t-alkyl of 4–8 carbons, t-cycloalkyl of 4–8 carbons or t-aralkyl of 9–15 carbons;

R_4 and R'_4 are alkyl of 1–6 carbons, cycloalkyl of 3–6 carbons, or aryl of 6–12 carbons:

R′ is selected from the groups consisting of di-t-alkylene of 6–20 carbons, di-t-cycloalkylene of 6–20 carbons, di-t-aralkylene of 12–20 carbons,



wherein

R_5 is alkylene of 1–10 carbons, cycloalkylene of 3–10 carbons, alkyleneoxyalkylene of 2–20 carbons, and



when R is alkyl, cycloalkyl, aralkyl or



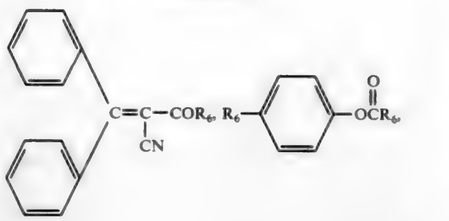
R′ can be, in addition, diacyl of 3–10 carbons, diaroyl of 8–14 carbons, arylene of 6–12 carbons, or



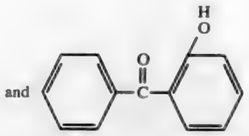
and at least one of R and R′ contains an ultraviolet light stabilizing radical or diradical of a compound selected from the group consisting of



-continued



and



where R_6 is alkyl of 1–6 carbons.

4,045,427

AZO-PEROXIDE FREE RADICAL INITIATORS CONTAINING ULTRAVIOLET LIGHT STABILIZING GROUPS

Chester S. Sheppard, and Ronald E. MacLeay, both of Buffalo, N.Y., assignors to Pennwalt Corporation, Philadelphia, Pa.

Division of Ser. No. 435,623, Jan. 22, 1974, Pat. No. 3,956,269, which is a continuation of Ser. No. 98,893, Dec. 6, 1970, abandoned. This application Mar. 4, 1976, Ser. No. 663,654
Int. Cl.² C07C *107/02*
U.S. Cl. 260—192 **4 Claims**

1. A free radical initiator containing ultraviolet light stabilizing groups having the formula:

$$(R—X—X)_n R'$$

wherein

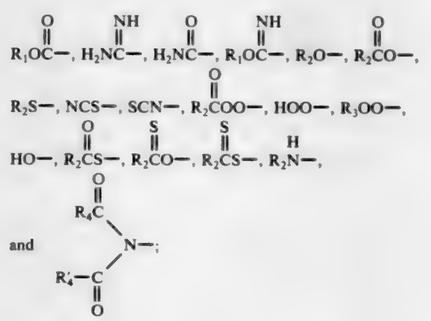
n is 2 to 4 with the provisos (a) through (e) recited below:

a. at least one —X—X— is —O—O— and at least one —X—X— is —N=N—;

b. where R—X—X— is R—N=N—, R is selected from the group consisting of alkyl 1–20 carbons, cycloalkyl of 3–10 carbons, aralkyl of 7–20 carbons, and



wherein Y is selected from the group consisting of NC—, N_3—,



wherein

R_1 and R_2 are selected from the group consisting of alkyl of

1–20 carbons, cycloalkyl of 3–6 carbons, and alkylene of 2–30 carbons when R_1 and R_2 are joined together; and wherein one but not both of R_1 and R_2 can in addition be phenyl, tolyl, xylyl, benzyl, or phenethyl;

R_3 is t-alkyl of 4–8 carbons, t-cycloalkyl of 4–8 carbons, or t-aralkyl of 9–15 carbons;

R_4 and R'_4 are alkyl of 1–6 carbons, cycloalkyl of 3–6 carbons, or aryl of 6–12 carbons;

c. where R—X—X is R—OO—, R is selected from the group consisting of hydrogen, acyl of 2–20 carbons, aroyl of 7–20 carbons, t-alkyl of 4–12 carbons t-cycloalkyl of 4 12 carbons, t-aralkyl of 9–15 carbons, alkoxycarbonyl of 2–20 carbons, cycloalkoxycarbonyl of 4–20 carbons, carbamoyl, phenylcarbamoyl, alkylcarbamoyl of 2–13 carbons, cycloalkylcarbamoyl of 4–13 carbons, α-hydroxyalkyl of 2–10 carbons, α-hydroxy-cycloalkyl of 3–10 carbons, α-hydroperoxyalkyl of 2–10 carbons, α-hydroperoxycycloalkyl of 3–10 carbons, alkylsulfonyl of 4–20 carbons, cycloalkylsulfonyl of 3–12 carbons, t-alkoxyalkyl of 4–20 carbons, t-alkoxycycloalkyl of 4–20 carbons, Q_3M—, Q_2M',

wherein

M is selected from silicon, germanium, or tin;

M′ is boron; and

Q is alkyl of 1–11 carbons, phenyl, benzyl or cyclohexyl;

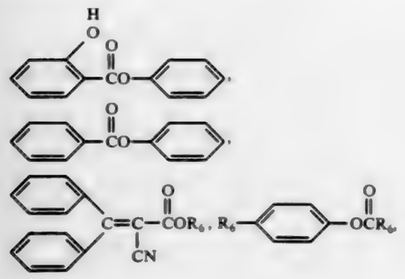
d. R′ ia a di, tri or tetravalent radical composed of a combination of two different components for linking the —OO— and —N=N— groups,

(i) when R′ is a divalent radical, R′ is a combination of a R'_a and a R'_b wherein the component of R'_b for connecting the —OO— linkage is selected from those radicals listed under step (c) except hydrogen, carbamoyl, diethylphosphate, dimethylphosphate, diphenylphosphinic, di-n-octylphosphate and dibutyl phosphinic and the component R'_a for connecting the —N=N— linkage is selected from those radicals listed under step (b); and in addition the component of R'_a for connecting the —N=N— linkage can be selected from aryl of 6–14 carbons, acyl of 2–20 carbons, aroyl of 7–20 carbons, alkylcarbamoyl of 2–7 carbons, cycloalkylcarbamoyl of 4–11 carbons, alkoxycarbonyl of 2–7 carbons, cycloalkoxycarbonyl of 4–11 carbons and aryloxy carbonyl of 7–13 carbons;

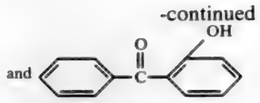
ii. when R′ is a trivalent radical R′ is defined as a combination of two R'_a and one R'_b or two R'_b and one R'_a wherein the subscripts a and b are in any order and the components of R′ can be selected from a combination of the moieties listed under (i) above,

iii. when R′ is tetravalent radical, R′ is defined as a combination of two R'_a and two R'_b or three R'_a and one R'_b or one R'_a and three R'_b wherein the subscripts a and b can be in any order and the components of R′ can be selected from a combination of the moities listed under (i) above;

e. and at least one of R and R′ contains an ultraviolet light stabilizing radical of a compound selected from the group consisting of:



-continued



where R_6 is alkyl of 1–6 carbons.

4,045,428

WATER-SOLUBLE REACTIVE NAPHTHYLAZONAPHTHYL DYESTUFFS

Fritz Meininger, Frankfurt am Main; Klaus Hunger, Kelkheim, Taunus, and Hartmut Springer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

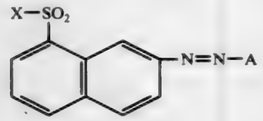
Continuation-in-part of Ser. No. 283,564, Aug. 24, 1972, abandoned. This application Aug. 12, 1975, Ser. No. 603,914

Claims priority, application Germany, Aug. 26, 1971, 2142728

Int. Cl.[2] C09B *62/50, 62/74;* **D06P** *1/06, 1/38*

U.S. Cl. 260—198 **4 Claims**

1. The watersoluble monoazodyestuff of the formula



in which X is $—CH=CH_2$ or $—CH_2—CH_2—Z$, Z is hydroxy, sulfato, chlorine, bromine, lower alkyl-sulfonyloxy, lower alkyl-sulfonylamino, phenyl-sulfonyloxy, lower alkyl-phenyl-sulfonyloxy, phenyl-sulfonylamino, lower alkyloyloxy, monosulfobenzoyloxy, phenoxy, di-(lower alkyl)-amino, tri-(lower alkyl)-ammonium, thiosulfato or phosphato, and A is monosulfo-hydroxynaphthylene, disulfo-hydroxy-naphthylene, trisulfo-hydroxynaphthylene, disulfo-dihydroxy-naphthylene, lower alkyloylamino-monosulfo-hydroxynaphthylene, lower alkenyloylamino-monosulfo-hydroxynaphthylene, benzoylamino-monosulfo-hydroxynaphthylene, N-lower alkyl-N-lower alkyloylamino-monosulfo-hydroxynaphthylene, N-lower alkyl-N-lower alkyloylamino-disulfo-hydroxynaphthylene, lower alkyloylamino-disulfo-hydroxynaphthylene, lower alkenyloylamino-disulfo-hydroxynaphthylene, benzoylamino-disulfo-hydroxynaphthylene, monosulfo-phenylamino-monosulfo-hydroxynaphthylene, monosulfo-aminonaphthylene, disulfo-aminonaphthylene, monosulfo-aminohydroxynaphthylene or disulfoamino-hydroxynaphthylene.

4,045,429

4-(4-HYDROXY- OR ACETOXY-3-CARBOMETHOXYPHENYLAZO)-BENZENESULPHONYL CHLORIDE

Karl Hubert Agback, Uppsala, Sweden, assignor to Pharmacia Aktiebolag, Rapsgatan, Sweden

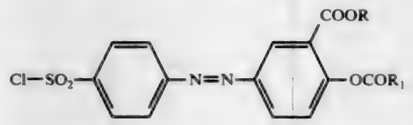
Continuation of Ser. No. 119,834, March 1, 1971, abandoned. This application Apr. 25, 1975, Ser. No. 571,653

Claims priority, application Sweden, Mar. 6, 1970, 2987/70

Int. Cl.[2] C07C *107/04, 107/06*

U.S. Cl. 260—207 **3 Claims**

1. The compound having the formula



wherein R and R_1 each represent a methyl group.

4,045,430

CONVERSION OF o-HALOGENOAZO COMPOUND TO o-CYANOAZO COMPOUND BY REACTION WITH A ZINC CYANIDE

Rainer Hamprecht, Loevenich, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 25, 1975, Ser. No. 635,051

Claims priority, application Germany, Nov. 29, 1974, 2456495

Int. Cl.[2] C09B *29/08, 29/36, 43/00*

U.S. Cl. 260—208 **9 Claims**

1. In a process for the preparation of a substantially metal-free o-cyanoazo dyestuff by reaction of the corresponding o-halogenoazo dyestuff with a metal cyanide, the improvement which comprises employing as the metal cyanide a zinc compound of the formula

$$Me_mZn(CN)_{2+m}$$

wherein

Me is an alkali metal and

m is the number 0, 1, or 2,

in the presence of 0.1–20 mol percent of a copper-I compound based on the exchangeable halogen in said o-halogenoazo dyestuff at a reaction temperature of 20°–150° C, and recovering the desired o-cyanoazo dyestuff containing less than 0.1% copper and zinc.

4,045,431

FLEXIBLE POLYESTER HAVING A MELTING POINT OF AT LEAST 140° C.

David R. Fagerburg, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,947

Int. Cl.[2] C08G *63/16*

U.S. Cl. 260—22 D **2 Claims**

1. A polyester having an inherent viscosity of at least 0.6, a flexural modulus of about 30,000 psi or less and a melting point of at least 140° C., the polyester being comprised of

A. a dicarboxylic acid component which is

1. from 90 to 70 mole percent 1,4-cyclohexanedicarboxylic acid having a trans isomer content of at least 80 percent, and

2. from 10 to 30 mole percent dimer acid, and

B. 1,4-cyclohexanedimethanol having a trans isomer content of at least 60 percent.

4,045,432

ANTIDEPRESSANT 1,1A,6,10b-TETRAHYDRODIBENZO[a,e]CYCLOPROPA[c]-CYCLOHEPTEN-6-SUBSTITUTED OXIMES

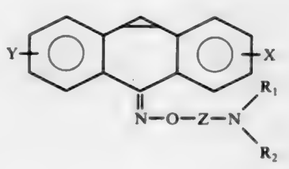
Roy Teruyuki Uyeda, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 616,483, Sept. 26, 1975, Pat. No. 3,960,956, which is a continuation-in-part of Ser. No. 525,877, Nov. 21, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,276

Int. Cl.[2] C07C *131/08*

U.S. Cl. 260—239 B **1 Claim**

1. A process for preparing a compound of the formula:



where

X or Y = H, F, Cl, Br, C_1–C_4 alkyl, C_1–C_4 alkoxy, CF_3, CH_3S, CH_3SO_2, $SO_2N(CH_3)_2$, provided that one is H;

Z = C_2–C_3 alkylene;

R_1 and R_2 independently = H, C_1–C_4 alkyl, or together can form a ring with N:

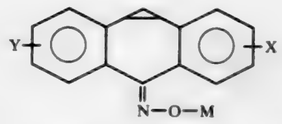


in which W can be

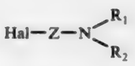
$—(CH_2)_4—$, $—(CH_2)_5—$, or

$—(CH_2)_2O(CH_2)_2—$;

which comprises contacting a compound of the formula:



where M is an alkali metal; with a compound of the formula:



where Hal is a halogen in an inert anhydrous solvent at a temperature of about 10°–50° C.

4,045,433

1,3,4,5-TETRAHYDRO-2H-1,4-BENZODIAZEPIN-2-ONES

Julia Rühricht; Lajos Kisfaludy; Laszlo Urogdi; Eva Palosi; Szabolcs Szeberenyi, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed May 23, 1975, Ser. No. 580,307

Claims priority, application Hungary, May 29, 1974, RI 538

Int. Cl.[2] C07D *243/24*

U.S. Cl. 260—239.3 D **2 Claims**

1. 4-Ethoxycarbonyl-5-phenyl-7-nitro-1,3,4,5-tetrahydro-2H-1,4-benzodiazepine-2-one.

4,045,434

ESTERS OF NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)ACETIC ACIDS

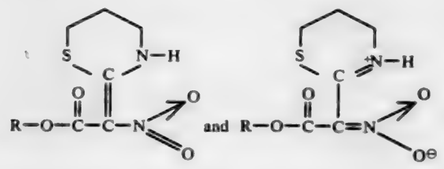
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed July 19, 1976, Ser. No. 706,326

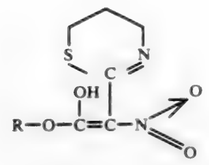
Int. Cl.[2] C07D *279/06*

U.S. Cl. 542—413 **3 Claims**

1. A resonance hybrid in which the significant forms are represented by the formulae



and the enol form represented by the formula



wherein R represents the moiety

$$-CH_2-CH=CH_n-\text{phenyl},$$

n being one or two, and "phenyl" being the unsubstituted phenyl moiety or such substituted by from one to three of alkyl of from one to three carbon atoms, middle halogen or nitro.

4,045,435

PREPARATION OF CEPHALOSPORIN ETHERS

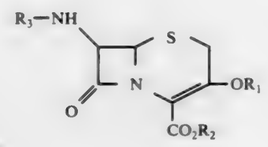
Gary A. Koppel, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Oct. 9, 1974, Ser. No. 513,669

Int. Cl.² C07D *501/02*

U.S. Cl. 544—28 **5 Claims**

1. A process for preparing a cephalosporin ether of the formula

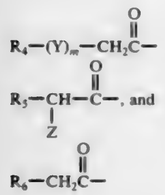


wherein:

R_1 is C_1-C_4 alkyl;

R_2 is a readily removable ester forming group; and

R_3 is a carboxylic acid acyl residue selected from the group consisting of



wherein:

R_4 is 1,4-cyclohexadienyl, phenyl, or phenyl substituted by chlorine, bromine, fluorine, iodine, hydroxy, nitro, amino, cyano, C_1–C_4 alkyl, C_1C_4 alkoxy, Y is O or S, and *m* is zero or one;

R_5 is R_4, 2-thienyl, or 3-thienyl;

Z is protected hydroxy or protected amino;

R_6 is 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 5-tetrazolyl, 2-thiazolyl, or 2-oxazolyl;

comprising treating a 7-acylamido-3-hydroxy-3-cephem-4-carboxylic acid ester with a non-hydroxylic base selected from the group consisting of alkali metal amides, alkali metal hydride, alkali metal alkoxides, alkali metal triphenylmethides, butyl lithium, phenyl lithium, and sodium dimsyl,

and a C_1–C_4 alkylfluorosulfonate in an unreactive organic solvent.

4,045,436

4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

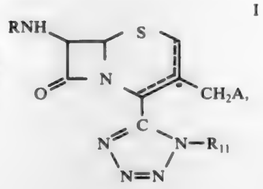
Division of Ser. No. 508,634, Sept. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Feb. 17, 1976, Ser. No. 658,303

Int. Cl.² C07D *501/18*

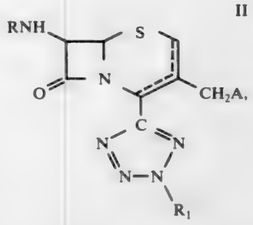
U.S. Cl. 544—23 **13 Claims**

1. A compound selected from the group consisting of

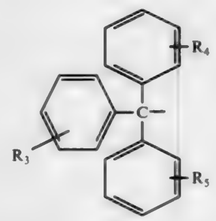
I



II



the acid addition salts thereof when R is hydrogen and the base addition salts thereof when R_1 and R_{11} are hydrogen; said R being selected from the group consisting of hydrogen and

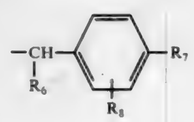


wherein R_3, R_4 and R_5 are each selected from the group consisting of hydrogen, chloro, bromo, fluoro, methyl, methoxy and phenyl;

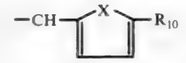
A being selected from the group consisting of hydrogen and acetoxy;

R_1 being selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl

and R_{11} being selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two or four carbon atoms, and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,045,437

4-(TETRAZOL-5-YL)-Δ^3-CEPHEM COMPOUNDS

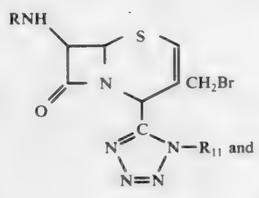
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer, Inc., New York, N.Y.

Division of Ser. No. 658,304, Feb. 17, 1976, which is a division of Ser. No. 508,634, Sept. 23, 1974, Pat. No. 3,966,719, which is a continuation-in-part of Ser. No. 407,097, Oct. 17, 1973, abandoned. This application Nov. 8, 1976, Ser. No. 739,985

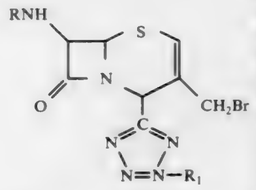
Int. Cl.² C07D *501/18*

U.S. Cl. 544—17 **1 Claim**

1. A compound selected from the group consisting of



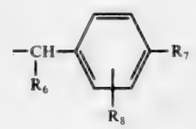
and



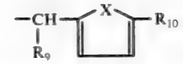
wherein R is hydrogen

R_1 is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, and phthalidyl;

and R_{11} is selected from the group consisting of hydrogen, alkanoyloxymethyl having from three to six carbon atoms, 1-(alkanoyloxy)ethyl having from four to seven carbon atoms, methoxymethyl, phthalidyl,



wherein R_6 is selected from the group consisting of alkyl having from one to three carbon atoms and phenyl and R_7 is selected from the group consisting of hydroxy, methoxy, alkanoyloxy having two to four carbon atoms, and benzyloxy and R_8 is selected from the group consisting of hydrogen, hydroxy, fluoro, chloro, bromo, iodo, methyl, methoxy, alkanoyloxy having from two to four carbon atoms, phenyl and benzyloxy and



wherein R_9 and R_{10} are each selected from the group consisting of hydrogen and methyl and X is selected from the group consisting of oxygen and sulfur.

4,045,438

CEPHALOSPORIN ANTIBIOTICS

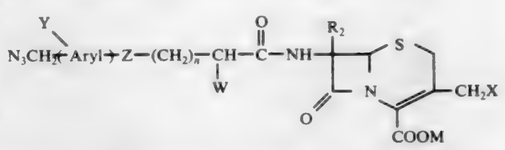
Fortuna Haviv, Montreal, Canada, and Abraham Patchornik, Ness-Ziona, Israel, assignors to Yeda Research and Development Co. Ltd., Rehovot, Israel

Filed Oct. 24, 1975, Ser. No. 625,558

Int. Cl.² C07D *501/22, 501/30, 501/32*

U.S. Cl. 544—29 **32 Claims**

1. A compound selected from a base of the formula



wherein Aryl is selected from phenyl and 2-thienyl; Y is selected from hydrogen, chlorine, bromine, a straight or branched lower alkyl group of from 1 to 4 carbon atoms and a lower alkoxy group of from 1 to 4 carbon atoms with the proviso that when Aryl is 2-thienyl, Y is hydrogen; Z is selected from a bond, oxygen, sulfur and imino with provisio that when Aryl is 2-thienyl, Z is a bond; W is selected from hydrogen, methyl, amino, hydroxy, SO_3H and $COOR_1$ wherein R_1 is selected from hydrogen and 5-indanyl; *n* is zero, 1 or 2 with the proviso that when W is other than hydrogen or methyl and Z is other than a bond, *n* is not zero; R_2 is selected from hydrogen, and methoxy; M is selected from hydrogen; a pharmaceutically acceptable non-toxic cation; alkanoyloxymethyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; alkanoylaminomethyl wherein the alkanoyl moitety contains from 1 to 5 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; alkoxycarbonylaminomethyl wherein the alkoxy moitey contains from 1 to 4 carbon atoms and may be straight or branched and wherein the amino nitrogen atom may be substituted with an alkyl group of from 1 to 4 carbon atoms; p-(alkanoyloxy)benzyl wherein the alkanoyl moiety contains from 1 to 5 carbon atoms and may be straight or branched; and aminoalkanoyloxymethyl wherein the alkanoyl moiety contains from 2 to 15 carbon atoms and the amino nitrogen may be mono- or di-substituted with a lower alkyl group of from 1 to 4 carbon atoms; X is hydrogen or acetoxy; and pharmaceutically acceptable salts thereof.

4,045,439

6-SUBSTITUTED-4-HYDROXYCINNOLIN-3-YL CARBOXYLIC ACIDS AND ESTERS THEREOF

John Preston, and Austin John Reeve, both of Macclesfield, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 28, 1975, Ser. No. 626,531

Claims priority, application United Kingdom, Nov. 7, 1974, 48205/74

Int. Cl.² C07D *237/28*

U.S. Cl. 260—250 C **5 Claims**

1. A cinnoline derivative selected from the group consisting of ethyl 6-cyclopentylamino-4-hydroxycinnolin-3-yl carboxylate, ethyl 4-hydroxy-6-isopropylaminocinnolin-3-yl carboxylate, ethyl 4-hydroxy-6-L-phenylalanylaminocinnolin-3-yl car-

boxylate and ethyl 4-hydroxy-6-thienylcinnolin-3-yl carboxylate, and pharmaceutically-acceptable acid-addition salts thereof.

4,045,440

METHOD OF PRODUCING THEBAINE FROM CODEINE AND ORIPAVINE FROM MORPHINE

Henry Rapoport, and Randy B. Barber, both of Berkeley, Calif., assignors to The United States of America as represented by the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 16, 1976, Ser. No. 724,018
Int. Cl.[2] C07D *489/02*
U.S. Cl. 260—285 **4 Claims**

1. A method of producing thebaine from codeine and oripavine from morphine which comprises (a) producing the 0-6 methyl ethers from codeine and morphine using potassium hydride and methyl iodide as the O-alkylation agents and (b) subsequently oxidizing the respective 0-6 methyl ethers of codeine and morphine to shift from an allylic structure to a dienol ether structure using an oxidizing amount of MnO_2 in tetrahydrofuran to produce thebaine from codeine and oripavine from morphine.

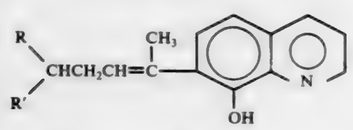
4,045,441

7-(ALPHA-METHYL-ALPHA-ALKENYL)SUBSTITUTED 8-HYDROXYQUINOLINES AND PROCESS FOR THE PREPARATION THEREOF

Harvey J. Richards, Columbus, and Bhupendra C. Trivedi, Worthington, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Mar. 10, 1976, Ser. No. 665,467
Int. Cl.[2] C07D *215/24*
U.S. Cl. 260—289 XA **10 Claims**

1. A compound of the formula



wherein R and R′ represent alkyl groups having a sum total of from 4–18 carbon atoms.

5. A process for preparing 7-(alpha-methyl-alpha-alkenylates) of 8-hydroxyquinoline which comprises reacting at a temperature of from about 200°–260° C. one mole of 8-hydroxyquinoline with from 1.1 to 2 moles of a ketone of the formula:



wherein R″ represents H or a C_1 – C_{21} hydrocarbyl group, to effect the condensation of said reactants and the concomitant removal of water of dehydration from the condensate and thereupon distilling the reaction product to recover the resultant alkenylate.

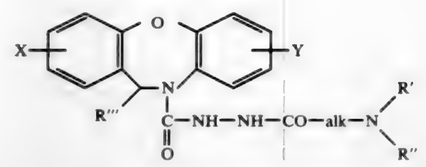
4,045,442

1-(SUBSTITUTED AMINO)ALKANOYL-2-(DIBENZOXAZEPINE-10-CARBONYL)HYDRAZINES AND DERIVATIVES THEREOF

Richard A. Mueller, Northbrook, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Filed Jan. 5, 1976, Ser. No. 646,686
Int. Cl.[2] C07D *413/12*
U.S. Cl. 260—293.58 **10 Claims**

1. A compound of the formula



wherein X and Y represent hydrogen, halogen, lower alkyl having 1–7 carbon atoms, trifluoromethyl; alk represents lower alkylene having 1–6 carbon atoms; R′ and R″ together with N represents an azamonocyclic ring wherein the azamonocyclic ring is pyrrolidino, 2,5-dimethylpyrrolidino, hexahydroazepine, piperidino, 4-ethoxycarbonyl-4-phenylpiperidino, 4-hydroxy-4-phenylpiperidino, 4-carboxy-4-phenylpiperidino, and R‴ represents hydrogen or lower alkyl having 1–4 carbon atoms.

4,045,443

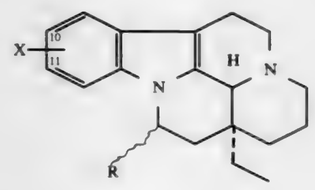
ORGANIC COMPOUNDS

Paul Pfäffli, Arlesheim, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Filed Sept. 2, 1975, Ser. No. 609,357
Claims priority, application Switzerland, Sept. 6, 1974, 12153/74; June 3, 1975, 7118/75
Int. Cl.[2] C07D *211/06;* A61K *31/475*
U.S. Cl. 260—293.53 **15 Claims**

1. A compound of formula I,

I



wherein

X is hydrogen or halogen having an atomic number from 9 to 35 in the 10- or 11-position, and or a pharmaceutically acceptable acid addition salt thereof.

4,045,444

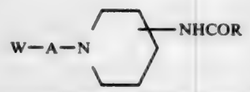
BENZAMIDO PIPERIDINES

John Frederick Cavalla, Isleworth, and John Leheup Archibald, Windsor, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 564,509, April 2, 1975, Pat. No. 3,992,389, which is a continuation-in-part of Ser. No. 323,684, Jan. 15, 1973, abandoned, which is a continuation of Ser. No. 175,345, Aug. 26, 1971, abandoned. This application Apr. 20, 1976, Ser. No. 678,772
Claims priority, application United Kingdom, Sept. 3, 1970, 42090/70; July 22, 1971, 34376/71
Int. Cl.[2] C07D *405/06, 405/12*
U.S. Cl. 260—293.58 **3 Claims**

1. A compound selected from the group consisting of

A. heterocyclic compounds of the formula



in which W represents a member of the group consisting of 3,4 methylene- or 3,4 ethylene-dioxyphenyl, A represents a bivalent radical selected from the group consisting of mono-keto

lower alkylene, hydroxy lower alkylene and radicals having the formula—$OCH_2CHOHCH_2$ or —O— loweralkylene, R represents phenyl and the term "lower" means that the radical contains from 1 to 6 carbon atoms and (B) the pharmaceutically acceptable acid addition and quaternary ammonium salts thereof.

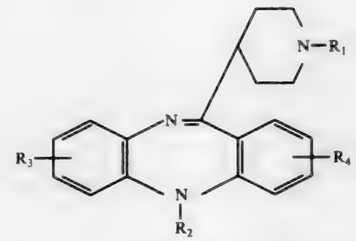
4,045,445

11-(4-PIPERIDYL)DIBENZO-DIAZEPINES

Robert Allis Hardy, Jr., Ridgewood, N.J., and Nicanor Quinones Quinones, New York, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Filed Dec. 14, 1975, Ser. No. 637,564
Int. Cl.[2] C07D *401/04*
U.S. Cl. 260—293.59 **20 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen, C_1–C_3 alkyl, and hydroxy C_1–C_3 alkyl; R_2 is selected from the group consisting of hydrogen and C_1–C_3 alkyl; R_3 and R_4 are selected from the group consisting of hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, halogen, hydroxy and trifluoromethyl; and nontoxic acid addition salts thereof.

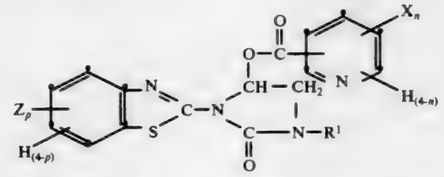
4,045,446

1-BENZOTHIAZOLYL-5-PYRIDYLCARBONYLOX-YIMIDAZOLIDINONES

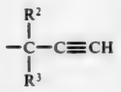
Chin Ching Wu, Libertyville, and John Krenzer, Oak Park, both of Ill., assignors to Velsicol Chemical Corporation, Chicago, Ill.

Filed June 17, 1976, Ser. No. 696,995
Int. Cl.[2] C07D *417/14*
U.S. Cl. 260—294.8 C **9 Claims**

1. A compound of the formula



wherein Z is selected from the group consisting of lower alkyl, halogen, lower haloalkyl and lower alkoxy; *p* is an integer from 0 to 2; R^1 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and



wherein R^2 and R^3 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms; X is selected from the group consisting of lower alkyl; and *n* is an integer from 0 to 4.

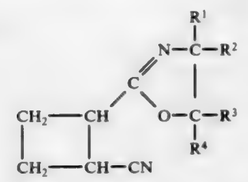
4,045,447

PROCESS FOR PREPARING 2-VINYL OXAZOLINES

Dieter Arlt, Cologne-Buchheim, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 472,016, May 21, 1974, Pat. No. 3,962,270. This application Aug. 26, 1975, Ser. No. 607,984
Claims priority, application Germany, June 9, 1973, 2329545
Int. Cl.[2] C07D *263/14, 263/12*
U.S. Cl. 260—307 F **4 Claims**

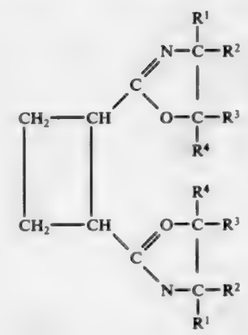
1. 2-oxazoline-2-yl cyclobutane nitriles having the formula



wherein

R^1, R^2, R^3 and R^4 are independently hydrogen, alkyl with up to 4 carbon atoms, hydroxy substituted alkyl with up to 4 carbon atoms, phenyl and substituted phenyl where the substituent is alkyl having 1 or 2 carbon atoms.

3. 1,2-bis-oxazolin-2-yl cyclobutanes having the formula



wherein

R^1, R^2, R^3 and R^4 are independently hydrogen, alkyl with up to 4 carbon atoms, hydroxy substituted alkyl with up to 4 carbon atoms, phenyl and substituted phenyl where the substituent is alkyl having 1 or 2 carbon atoms.

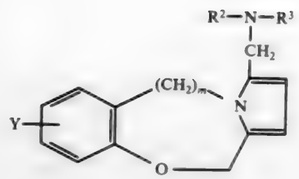
4,045,448

PYRROLO[2,1-c][1,4]BENZOXAZEPINE AND BENZOXAZOCINE DERIVATIVES

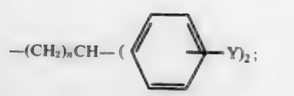
Richard C. Effland, Bridgewater; Larry Davis, Flemington, both of N.J., and Wolfgang Schaub, Kelkheim, Germany, assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Feb. 26, 1976, Ser. No. 661,533
Int. Cl.[2] C07D *498/04*
U.S. Cl. 260—326.5 B **9 Claims**

1. A compound of the formula



wherein Y is hydrogen, halogen, lower alkoxy, lower alkyl, trifluoromethyl, nitro or amino; R^2 is alkyl, phenylloweralkyl, alkylaminoalkyl, dialkylaminoalkyl or diphenylloweralkyl of the formula



and R^3 is hydrogen, alkyl, cycloalkylloweralkyl or phenylloweralkyl; *m* the integer 1 or 2; or a physiologically tolerable acid addition salt thereof.

4,045,449

PG-TYPE 1,15-LACTONES

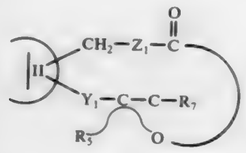
Gordon L. Bundy, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 589,724, June 23, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 670,524

Int. Cl.[2] **C07D** *313/00*

U.S. Cl. 260—340.2 **90 Claims**

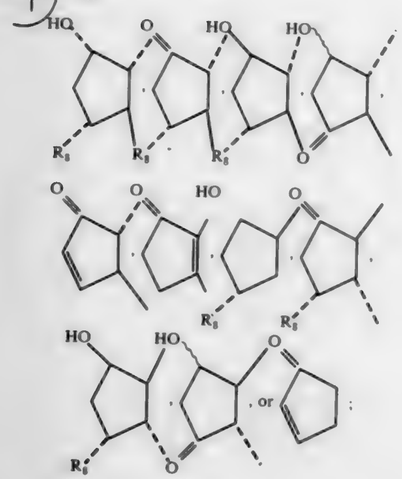
1. A prostaglandin-type, 1,15-lactone of the formula



wherein



is



wherein

R_8 is hydrogen or hydroxy;

wherein L_1 is



or a mixture of





and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro, only when the other is hydrogen or fluoro;

wherein M_1 is

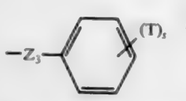


or



wherein R_5 is hydrogen or methyl;

wherein R_7 is $-(CH_2)_m-CH_3$, wherein *m* is one to 5, inclusive, cis—CH=CH-CH_2—CH_3, or



wherein T is chloro. fluoro, trifluoromethyl, alkyl of 1 to 3 carbon atoms, inclusive, or alkoxy of one to 3 carbon atoms, inclusive, the various T's being the same or different, *s* is 0, 1, 2, or 3, and Z_3 is oxa or methylene, with the proviso that not more than two T's are other than alkyl, and the further proviso that Z_3 is oxa only when R_3 and R_4 are hydrogen or methyl, being the same or different;

wherein Y_1 is trans—CH=CH—, $-CH_2CH_2-$, cis—CH=CH—, or $-C\equiv C-$; and

wherein Z_1 is

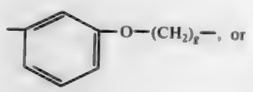
(1) cis—CH=CH—CH_2—$(CH_2)_g$—CH_2—,

(2) cis—CH=CH—CH_2—$(CH_2)_g$—CF_2—,

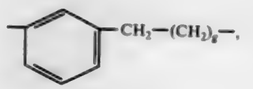
(3) cis—CH_2—CH=CH—$(CH_2)_g$—CH_2—,

(4) $-(CH_2)_3-(CH_2)_g-CH_2-$, (5) $-(CH_2)_3-(CH_2)_g-CF_2-$, (6) $-CH_2-O-CH_2-(CH_2)_g-CH_2-$,

(7)



(8)



wherein *g* is one to 3, inclusive.

4,045,450

OPTICAL RESOLUTION OF DL-PANTOLACTONE

Akikazu Kinugasa, Takayama; Toshio Okuda, Gifu; Makoto Goto, Takayama, and Mitsuo Saito, Tono, all of Japan, assignors to Alps Pharmaceutical Ind. Co., Ltd., Mukai, Japan

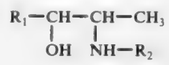
Filed Feb. 12, 1976, Ser. No. 657,660

Claims priority, application Japan, Feb. 19, 1975, 50-21330

Int. Cl.[2] **C07D** *307/83*

U.S. Cl. 260—343.6 **13 Claims**

1. A method of optically resolving DL-pantolactone which comprises reacting DL-pantolactone or its basic salt with an opticaly active N-substituted aminophenylpropanol of the general formula:



wherein R_1 is a phenyl group which may be substituted by a halogen atom, an aliphatic lower alkyl group having from 1 to 4 carbon atoms or an aliphatic lower alkoxy group having a 1 to 4 carbon atom alkyl and R_2 is an aralkyl group having from 7 to 10 carbon atoms which may be substituted on the benzene ring by a halogen atom, an aliphatic lower alkyl having from 1 to 4 carbon atoms or an aliphatic lower alkoxy whose alkyl has from 1 to 4 carbon atoms, or a mineral acid addition salt, respectively, separating the resulting diastereomer by the aid of difference in their dissolubility and decomposing the diastereomer into the corresponding antipode.

4,045,451

2-(METHYLTHIO)NAPHTHO[1,3-bc]PYRAN-3(2H)-ONE

David T. Connor, Parsippany, and Maximilian von Strandtmann, Rockaway, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 571,890, April 25, 1975, Pat. No. 4,012,422, which is a division of Ser. No. 464,706, April 26, 1974, Pat. No. 3,920,699. This application May 27, 1976, Ser. No. 690,751

Int. Cl.[2] **C07D** *311/02;* **A61K** *31/35*

U.S. Cl. 260—345.2 **1 Claim**

1. 2-(Methylthio)naphtho[1,8-bc]pyran-3(2H)-one.

4,045,452

STEROID TOTAL SYNTHESIS PROCESS UTILIZING A CYANOALKYL A-RING PRECURSOR

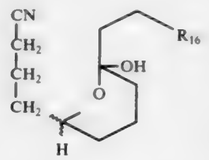
Noal Cohen, Montclair; Michael Rosenberger, Caldwell, and Gabriel Saucy, Essex Fells, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 450,701, March 13, 1974, Pat. No. 3,991,084, which is a division of Ser. No. 67,296, Aug. 26, 1970, Pat. No. 3,813,417. This application Dec. 22, 1975, Ser. No. 642,817

Int. Cl.[2] **C07D** *309/06*

U.S. Cl. 260—345.9 S **6 Claims**

1. A compound of the formula



wherein

R_{16} is lower alkylamino,α-phenethylamino or dehydroabietylamino

and mineral, non-optically active hydrocarbyl monocarboxylic or non-optically active hydrocarbyl dicarboxylic acid addition salts thereof.

4,045,453

METHOD FOR PRODUCING 5-NITRO-2-FURFURYL ACETATE

Ilkka Renvall, Suomenoja, and Tapio Mattila, Kivenlahti, both of Finland, assignors to Kemira Oy, Finland

Filed Aug. 18, 1975, Ser. No. 605,339

Claims priority, application Finland, Sept. 6, 1974, 2624/74

Int. Cl.[2] **C07D** *307/70*

U.S. Cl. 260—347.4 **5 Claims**

1. An improved method for the production of 5-nitro-2-furfuryl acetate, wherein furfuryl acetate is caused to react with a mixture containing concentrated nitric acid and less than 7 mole of acetic anhydride per 1 mole furfuryl acetate, in order to produce an intermediate of nitration, whereafter water is added and the aqueous solution is neutralized, then the mixture is heated to 40°–60° C in order to decompose the intermediate of nitration, the improvement comprising: reacting furfuryl acetate with the mixture consisting of nitric acid having a concentration of 60–70% in the proportion of 1-2 mole per mole of furfuryl acetate and acetic anhydride at 0°–20° C and neutralizing the aqueous solution to a pH of 4.7–6.5 .

4,045,454

PRODUCTION OF 1-NITROANTHRAQUINONE AND 1-AMINOANTHRAQUINONE

Eiji Yamada, Takatsuki; Akira Fukasawa, Toyonaka, and Shinzaburo Masaki, Takarazuka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 24, 1975, Ser. No. 625,475

Claims priority, application Japan, Oct. 25, 1974, 49-123714; Apr. 3, 1975, 50-41009

Int. Cl.[2] **C07C** *79/10;* **C09B** *1/00;* **C07C** *79/36*

U.S. Cl. 260—369 **21 Claims**

1. In a process for producing 1-nitroanthraquinone with high purity by treating crude 1-nitroanthraquinone containing as the main impurities dinitroanthraquinones and β-nitroanthraquinones with an aqueous alkali sulfite or bisulfite solution under heating, the improvement which comprises pulverizing the crude 1-nitroanthraquinone prior to and/or during the treatment with the aqueous alkali sulfite or bisulfite solution.

4,045,455

PROCESS FOR SEPARATING 1,5-DINITROANTHRAQUINONE AND 1,8-DINITROANTHRAQUINONE FROM DINITROANTHRAQUINONE MIXTURES

Axel Vogel, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 17, 1974, Ser. No. 533,595

Claims priority, application Germany, Jan. 3, 1974, 2400164

Int. Cl.[2] **C09B** *1/00*

U.S. Cl. 260—369 **14 Claims**

1. A process for separating substantially pure 1,5-dinitroanthraquinone and substantially pure 1,8-dinitroanthraquinone from an anthraquinone dinitration mixture containing 1,5- and 1,8-dinitroanthraquinone which comprises adding to the dinitration mixtures a mixture of concentrated nitric acid and an inert organic solvent, said inert organic solvent being an aliphatic or cycloaliphatic hydrocarbon having up to 12 carbon atoms which can be substituted once or several times by halogen or by a nitro group, separating off the insoluble 1,5-dinitroanthraquinone from the resulting mixture and isolating the 1,8-dinitroanthraquinone from the resulting mother liquor.

4,045,456

MANUFACTURE OF ANTHRAQUINONES

Franz Merger, Frankenthal; Theodor Jacobsen, Limburgerhof; Heinz Eilingsfeld, Frankenthal; Ernest Miesen, and Gerhard Nestler, both of Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed June 7, 1976, Ser. No. 693,515

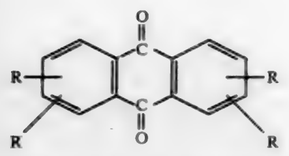
Claims priority, application Germany, June 20, 1975, 2527491

Int. Cl.[2] C09B *1/00*

U.S. Cl. 260—369 **13 Claims**

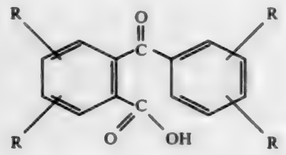
1. A process for the manufacture of anthraquinones of the formula

I



where the individual R's may be identical or different and each R is selected from the group consisting of hydrogen, halogen and alkyl, by cyclizing an o-benzoylbenzoic acid of the formula

II



where R has the above meanings, at elevated temperatures, in which the cyclization is carried out in the presence of a cyclizing agent of an oxygen-containing compound of aluminum and of silicon at a temperature of from 150° to 350° C.

4,045,457

ANTHRAQUINONE DYESTUFFS

Gunter Gehrke, Cologne; Reinold Schmitz, Blecher; Hans-Samuel Bien, Burscheid, and Helmut Herzog, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 20, 1975, Ser. No. 624,292

Claims priority, application Germany, Oct. 23, 1974, 2450287

Int. Cl.[2] C09B *1/10*

U.S. Cl. 260—381 **7 Claims**

1. Process for the preparation of "α, α'-diamino-α, α'-dihydroxy-β-chloroanthraquinones" comprising warming 2,8-dichloro-1,5-dinitro-anthraquinone, 2,5-dichloro-1,8-dinitro-anthraquinone or mixtures thereof with sulfur in concentrated sulfuric acid or oleum having a maximum SO_3 content of 20% in the presence of boric acid.

4,045,458

PROCESS FOR PREPARING TRIARYLMETHANE DERIVATIVES

Mitsura Kondo, Kawanishi; Kiyoshi Yasui, Amagasaki; Makoto Miyake, Nishionomiya; Hiroshi Iwasaki, Kawanishi, and Tetsuo Shiraishi, Nishinomiya, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

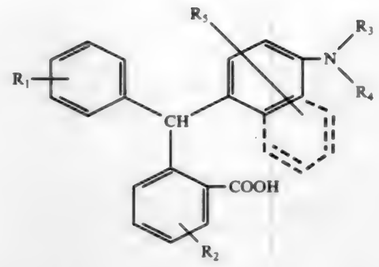
Filed June 24, 1976, Ser. No. 699,584

Claims priority, application Japan, July 3, 1975, 50-82898

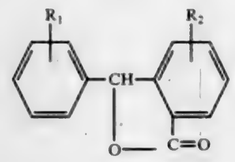
Int. Cl.[2] C09B *11/00, 11/26*

U.S. Cl. 260—393 **7 Claims**

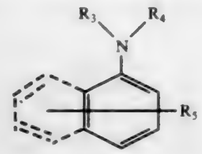
1. A process for preparing a triarylmethane derivative having the general formula:



wherein each R_1 and R_2 represents at least one of hydrogen, halogen, a nitro group, an alkyl group, a substituted alkyl group, an amino group, a substituted amino group, a hydroxyl group, a substituted hydroxyl group, a thiohydroxyl group or a substituted thiohydroxyl group, each R_3 and R_4 represents hydrogen, a substituted or unsubstituted alkyl group, a cycloalkyl group, a substituted or unsubstituted aralkyl group, substituted or unsubstituted aryl group, or a substituted unsaturated alkyl group, R_5 represents at least one of hydrogen, halogen, an alkyl group, a nitro group, a substituted or unsubstituted amino, group, substituted or unsubstituted hydroxyl group, or a substituted or unsubstituted thiohydroxyl group which comprises reacting a 3-phenylphthalide derivative having the general formula:



wherein R_1 and R_2 are the same as described hereinabove, with an aniline derivative having the general formula:



wherein R_3, R_4 and R_5 are the same as hereinabove defined, in the presence of a Friedel-Crafts type catalyst.

4,045,459

AGENT FOR THE REGULATION OF PLANT GROWTH

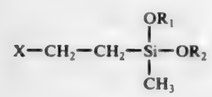
Werner Foery, Basel; Hanspeter Fischer, Bottmingen; Dieter Lohmann, Pratteln, and Gerd Greber, Binningen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 447,402, March 1, 1974, abandoned, which is a continuation-in-part of Ser. No. 278,890, Aug. 9, 1972, abandoned. This application July 29, 1976, Ser. No. 709,827

Int. Cl.[2] C07F *7/04, 7/18*

U.S. Cl. 260—448.8 R **7 Claims**

1. A silane according to the formula



wherein X represents chlorine or bromine and R_1 and R_2 are identical and represent benzyl radicals, unsubstituted or mono-

or polysubstituted in the phenyl ring by halogen, cyano, nitro, C_1–C_4 alkyl, C_1–C_4 alkoxy or C_1–C_4 alkylthio.

4,045,460

PREPARATION OF AMINOALKYLSILANES

Roland Kleinstuck, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 28, 1976, Ser. No. 681,020

Claims priority, application Germany, May 14, 1975, 2521399

Int. Cl.[2] C07F *7/10, 7/18*

U.S. Cl. 260—448.8 R **5 Claims**

1. In the preparation of an aminoalkylsilane of the formula

$$(RO)_{3-n}R_n^1SiR^2NH_2$$

wherein

n is an integer from 0 to 3,

R is an alkyl or alkoxyalkyl radical with 1 to 8 C atoms in each alkyl radical, or an aryl radical with up to 10 C atoms,

R^1 is an alkyl radical with up to 8 C atoms or an aryl radical with up to 10 C atoms, and

R^2 is a divalent hydrocarbon radical with 2 to 10 C atoms,

by reacting the corresponding halogenoalkylsilane with excess ammonia at a temperature above about 80° C, and working up the reaction mixture, the improvement which comprises adding a metal alcoholate to the reaction mixture obtained from the amination before the mixture is worked up.

4,045,461

HIGH TEMPERATURE METHANATION WITH MOLTEN SALT-BASED CATALYST SYSTEMS

Thomas E. Kiovsky, and Milton M. Wald, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 546,371, Feb. 3, 1975, Pat. No. 3,979,332. This application Mar. 15, 1976, Ser. No. 666,828

Int. Cl.[2] C07C *1/02, 1/04*

U.S. Cl. 260—449 M **11 Claims**

1. A process for the production of methane from a gaseous reactant mixture containing hydrogen and a compound selected from the group consisting of carbon monoxide, carbon dioxide, and mixtures thereof, which comprises contacting said gas mixture in a reaction zone maintained at temperatures above about 500° C with a molten metal salt-based catalyst system comprising a molten metal sald carrier melting below 1000° C; said molten salt having dispersed therein one or more catalytically active metals selected from the class consisting of iron, molybdenum, manganese, nickel, cobalt, zinc, titanium, silver, copper and thorium in the form of finely divided elemental metals, metal oxides, metal carbides and mixtures thereof, wherein said molten metal salt carrier is an iron halide.

4,045,462

BICYCLIC TRIISOCYANATES

Manfred Bock, Leverkusen; Walter Uerdingen, Schildgen, and Josef Pedain, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

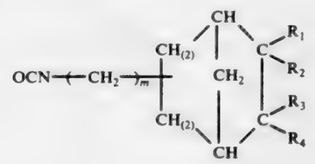
Filed Apr. 5, 1976, Ser. No. 674,014

Claims priority, application Germany, Apr. 9, 1975, 2515485

Int. Cl.[2] C07C *119/045*

U.S. Cl. 260—453 AP **5 Claims**

1. A composition of matter comprising a triisocyanate corresponding to the following general formula:



wherein

R_1, R_2, R_3 and R_4, which may be the same or different each represent a hydrogen atom, a methyl group or the radical $-(CH_2)_n-NCO$, wherein *n* is an integer of from 1 to 3, wherein two of the radicals R_1, R_2, R_3 and R_4 represent $-(CH_2)_n-NCO$, and wherein $m = 1$ to 2.

4,045,463

PEROXYESTERS OF SORBIC ACID

Kazuo Matsuyama, Gamagori, and Takeshi Komai, Aichi, both of Japan, assignors to Nippon Oil and Fats Co., Ltd., Tokyo, Japan

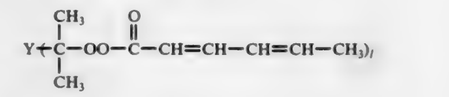
Filed Mar. 29, 1976, Ser. No. 671,553

Claims priority, application Japan, Apr. 4, 1975, 50-40372; June 7, 1975, 50-68971

Int. Cl.[2] C07C *179/18*

U.S. Cl. 260—453 RZ **7 Claims**

1. A compound having the formula



wherein *l* is one or two,

wherein when *l* is one, Y is alkyl having one to twelve carbon atoms or cycloalkyl having three to twelve carbon atoms, and

wherein when *l* is two, Y is —C≡C— or $-(CH_2)_m-$, wherein *m* is a number of from two to four.

4,045,464

PROCESS FOR THE PREPARATION OF AROMATIC CARBONATES

Ugo Romano, Milan, and Renato Tesei, San Donato Milanese, both of Italy, assignors to Anic, S.p.A., Palermo, Italy

Filed Dec. 1, 1975, Ser. No. 636,604

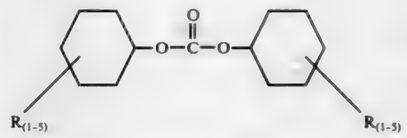
Claims priority, application Italy, Nov. 25, 1974, 29773/74

Int. Cl.[2] C07C *68/06*

U.S. Cl. 260—463 **4 Claims**

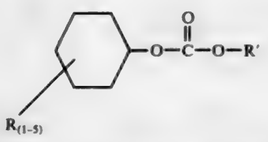
1. A process for the preparation of aromatic carbonates of the formula:

I



wherein R is selected from among the alkyl, alkoxy, aryl, aryloxy, NO_2 groups, and hydrogen, comprising contacting the compound of the formula:

II



wherein R has the same meaning as in Formula I and wherein R' is a non tertiary alkyl group, with a catalyst system comprised of titanium tetraphenate or titanium tetramethylate, at a temperature of 25° – 350° C and at a pressure of from 0.1 – 100 atmospheres absolute.

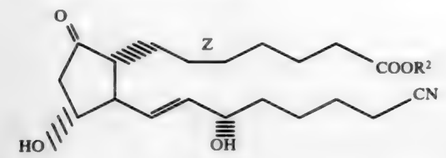
4,045,465

CYANOPROSTAGLANDINS

Hans-Jurgen E. Hess, and Thomas K. Schaaf, both of Old Lyme, Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,361
Int. Cl.[2] C07C *121/48*
U.S. Cl. 260—464 **3 Claims**

1. A compound of the formula



wherein R^2 is selected from the group consisting of hydrogen, alkyl having from one to four carbon atoms and 4-biphenylyl; and Z represents a single bond or a cis double bond.

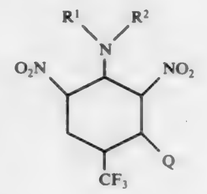
4,045,466

3-CYANOALKYLTHIO- OR 3-ALKOXYCARBONYLMETHYLTHIO-2,6-DI-NITROANILINES

James R. Beck, Indianapolis, and Joseph A. Yahner, New Palestine, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 668,360, March 19, 1976, abandoned, which is a continuation-in-part of Ser. No. 589,312, June 23, 1975, abandoned. This application Aug. 31, 1976, Ser. No. 719,309
Int. Cl.[2] C07C *101/44, 121/78*
U.S. Cl. 260—465 E **5 Claims**

1. A compound of the formula



wherein

Q is SCH_2CN, SCH_2CH_2CN, or $SCH_2CO_2CH_3$;

R^1 is hydrogen or C_1-C_3 alkyl; and when R^1 is hydrogen, R^2 is C_1-C_6 normal or branched alkyl containing no tertiary carbon atom; and

when R^1 is C_1-C_3 alkyl, R^2 is C_1-C_4 nontertiary alkyl.

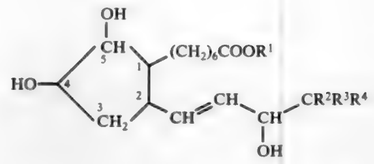
4,045,467

CYCLOPENTANE DERIVATIVES

Michael Peter Lear Caton, Upminster, and Trevor Parker, Romford, both of England, assignors to May & Baker Limited, England

Division of Ser. No. 423,376, Dec. 7, 1973, Pat. No. 3,933,890, which is a division of Ser. No. 332,660, Feb. 15, 1973, Pat. No. 3,923,872. This application Apr. 30, 1975, Ser. No. 573,107
Claims priority, application United Kingdom, Feb. 18, 1972, 7640/72
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—468 D **9 Claims**

1. A cyclopentane of the formula:



wherein R^1 is hydrogen or alkyl of 1 through 4 carbon atoms, R^2 and R^3 are hydrogen or alkyl of 1 through 4 carbon atoms, and R^4 is hydrogen or alkyl of 1 through 10 carbon atoms, and, when R^1 is hydrogen, non-toxic salts thereof.

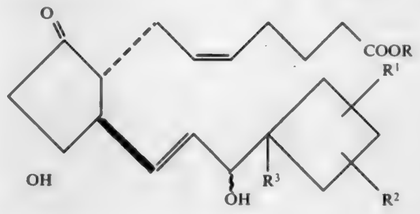
4,045,468

16-CYCLOBUTYL-PROSTAGLANDINS

Masayasu Kurono, Osaka; Hisao Nakai, and Takashi Muryobayashi, both of Ibaragi, all of Japan, assignors to Ono Pharmaceutical Company, Osaka, Japan

Filed Mar. 11, 1975, Ser. No. 557,437
Claims priority, application Japan, Mar. 14, 1974, 49-28544
Int. Cl.[2] C07C *177/00*
U.S. Cl. 260—468 D **9 Claims**

1. A compound of the formula:



wherein R represents a hydrogen atom or methyl group, R^1 and R^2 represent hydrogen atoms and R^3 represents an alkyl group containing from 1–6 carbon atoms, the non-toxic salts thereof when R is hydrogen, the C_1 to C_{12} alkyl esters thereof, and the cyclodextrin clathrates thereof.

4,045,469

INSECTICIDAL ESTERS OF SPIRO CARBOXYLIC ACIDS

Wayne I. Fanta, Colerain Township, Hamilton County, and Joel I. Shulman, Springfield Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 157,033, June 25, 1971, Pat. No. 3,823,177. This application May 16, 1973, Ser. No. 360,864
Int. Cl.[2] C07C *69/76, 63/337, 63/44*
U.S. Cl. 260—469 **5 Claims**

1. 2,2-dimethyl-4,5-benzospiro[2.4]hepta-4,6-diene-1-carboxylic acid.

2. 2,2-dimethyl-4,5-benzospiro[2.4]hepta-4-ene-1-carboxylic acid.

5. The allethrolone ester of 2,2-dimethyl-4,5,6,7-dibenzospiro[2,4]-hepta-4,6-diene-1-carboxylic acid.

4,045,470

ALKYL ALLOPHANATES, METHOD FOR PREPARATION AND FUNGICIDAL USE OF THE SAME

Paul William Knapp, Jr., Bordentown, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 24, 1976, Ser. No. 689,030
Int. Cl.[2] C07C *149/40*
U.S. Cl. 260—470 **1 Claim**

1. The compound: allophanic acid-, 3-thio-4-{o-[(2,2,2-trichloroethylidene)amino]phenyl}-, methyl ester.

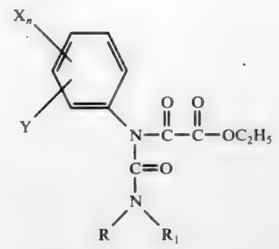
4,045,471

PROCESS FOR PREPARING N-CARBAMOYL ETHYL OXANILATES

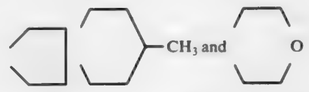
Alexander Mihailovski, Kensington, and Jimmy H. Chan, Martinez, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed May 29, 1975, Ser. No. 582,054
Int. Cl.[2] C07C *127/22, 131/11;* **C07D** *207/06, 295/20*
U.S. Cl. 260—471 A **8 Claims**

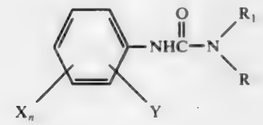
1. A process for the production of N-carbamoyl ethyl oxanilates having the formula



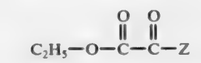
in which X and Y are independently selected from the group consisting of chloro, bromo and trifluoromethyl; *n* is either zero or one; and R and R_1 are independently selected from the group consisting of lower alkyl and lower alkoxy from C_1 to C_3 inclusive, or R and R_1 taken together is selected from the group consisting of



comprising reacting in an inert solvent a urea having the formula



with an ethyl oxalyl halide having the formula



wherein Z is selected from the group consisting of chloro and bromo.

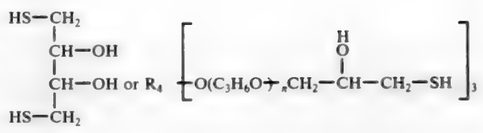
4,045,472

URETHANE POLYTHIOLS

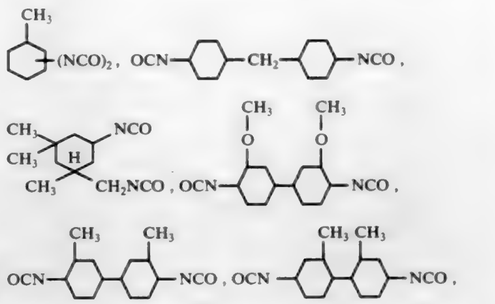
James Leverette Guthrie, Ashton, and Clifton Leroy Kehr, Silver Spring, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 546,707, Feb. 3, 1975, abandoned. This application Dec. 15, 1975, Ser. No. 640,499
Int. Cl.[2] C07C *149/437*
U.S. Cl. 260—471 C **6 Claims**

1. A urethane polythiol prepared by admixing and reacting at 0°–100° C: (a) a di- or trihydric polythiol having the formula



in which R_4 is a saturated trivalent hydrocarbon moiety having 12–24 carbon atoms and *n* is 1–2; and (b) a diisocyanate selected from the group consisting of



, and $OCN—CH_2(CH_2)_4CH_2—NCO$, the diisocyanate and the di- or trihydric polythiol being admixed in amounts to provide 1 equivalent of —NCO per 0.5–2 equivalent of —OH.

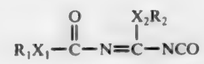
4,045,473

ALKOXYCARBONYLISOUREA ISOCYANATES

Julius Jakob Fuchs, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 11, 1975, Ser. No. 603,651
Int. Cl.[2] C07C *127/26, 155/02, 157/14*
U.S. Cl. 260—482 C **6 Claims**

1. A compound in solution in an inert organic solvent, which compound has the formula:



wherein

R_1 is alkyl of 1–3 carbon atoms;

R_2 is alkyl of 1–4 carbon atoms; and

X_1 and X_2 are independently selected from oxygen and sulfur.

4,045,474

LOW VISCOSITY POLY(EPOXIDE-CAPROLACTONE) POLYOLS

Robert Arthur Taller, Charleston, and Decker Kuykendall Elder, S. Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,399
Int. Cl.[2] C08G *63/06*
U.S. Cl. 260—484 A **6 Claims**

1. An adduct of a polycaprolactone polyol and a cycloaliphatic diepoxide comprising the reaction product of (a) at least two polycaprolactone polyols differing in average hydroxyl number by an amount from 250 to 400 and having average hydroxyl numbers from about 180 to about 600 and (b) a cycloaliphatic diepoxide, said adduct having a viscosity of less than 5,000 cks. at 130° F. and an equivalent weight of at least 150.

4,045,475

OPTICALLY ACTIVE ALCOHOLS AND LOWER ESTERS THEREOF

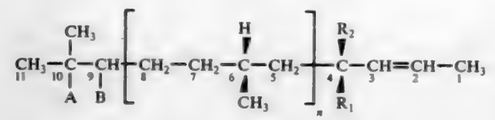
Ka-Kong Chan, Stanhope, and Gabriel Saucy, Essex Fells, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 544,153, Jan. 27, 1975, Pat. No. 4,000,169. This application Sept. 15, 1976, Ser. No. 723,401

Int. Cl.[2] C07C *69/145, 69/02, 33/02*

U.S. Cl. 260—488 H **6 Claims**

1. A compound of the formula:



wherein A and B are individually hydrogen or, taken together, form a carbon to carbon bond; one of R_1 and R_2 is hydrogen and the other is hydroxy or lower alkanoyloxy with the proviso that when R_1 is hydroxy or lower alkanoyloxy, the 2-3 double bond has a cis configuration and when R_1 is hydrogen, the 2-3 double bond has a trans configuration and n is an integer of from 0 to 1.

4,045,476

1-(2,6,6-TRIMETHYL-3-HYDROXY OR LOWER ALKANOYLOXYCYCLOHEXEN-1-YL)-3-METHYL-4-PENTEN-1-YN-3-OL COMPOUND

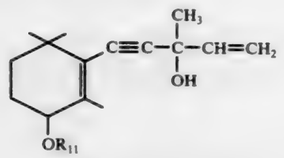
Michael Rosenberger, Caldwell, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 585,224, June 9, 1975, Pat. No. 4,000,198. This application Sept. 15, 1976, Ser. No. 723,411

Int. Cl.[2] C07C *175/00*

U.S. Cl. 260—488 R **2 Claims**

1. A compound of the formula:



wherein R_{11} is hydrogen or lower alkanoyl.

4,045,477

ACETOXYLATION PROCESS

Martin B. Sherwin, Wayne, and I-Der Huang, West Paterson, both of N.J., assignors to Chem Systems Inc., New York, N.Y.

Filed July 17, 1975, Ser. No. 596,903

Int. Cl.[2] C07C *67/05*

U.S. Cl. 260—497 R **10 Claims**

1. A process for preparing vicinal hydroxycarboxylates and vicinal dicarboxylates which comprises contacting an olefin with molecular oxygen in the liquid phase in the presence of a carboxylic acid at a temperature of at least 160° C. in a reaction zone in the presence of a catalyst of a tellurium metal ion and an iodide source, said carboxylates being the same as the carboxylate group in said carboxylic acid.

4,045,478

METHOD FOR THE PREPARATION OF METHACRYLIC ACID

Sumio Umemura; Kyoji Ohdan; Kenichi Suzuki, and Fumio Adachi, all of Ube, Japan, assignors to Ube Industries, Ltd., Ube, Japan

Filed Feb. 18, 1976, Ser. No. 658,909

Claims priority, application Japan, Feb. 28, 1975, 50-23904; Mar. 12, 1975, 50-29117

Int. Cl.[2] C07C *51/32*

U.S. Cl. 260—530 N **10 Claims**

1. A method for the preparation of methacrylic acid by oxidation of methacrolein, comprising bringing a reaction feed containing methacrolein in vapor phase and molecular oxygen into contact at a temperature of 200°–450° C with an oxidation catalyst consisting of an oxide composition of the formula (I):

$$Mo_aP_bC_cA_sO_e \quad (I)$$

wherein the subscripts a, b, c and d respectively denote the numbers of the respective element atoms, said numbers being within the ranges, a—5 to 15, $b = 1$ to 3, $c = 0.1$ to 3, $d = 0.1$ to 3, and the subscript e represents the number of oxygen atoms which corresponds to the oxides formed from the above mentioned elements and satisfies the average valency of the elements, said number e being within the range of 16 to 60.

4,045,479

PROCESS OF PREPARING PENICILLAMINE

Friedrich Asinger, Rott; Heribert Offermanns, Grossauheim, and Karl-Heinz Gulzek, Alpen, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Continuation of Ser. No. 306,370, Nov. 14, 1972, abandoned, which is a continuation-in-part of Ser. No. 158,512, June 30, 1971, abandoned. This application July 25, 1975, Ser. No. 598,995

Claims priority, application Germany, July 3, 1970, 2032952; May 11, 1971, 2123232; Nov. 15, 1971, 2156601

Int. Cl.[2] C07C *99/00*

U.S. Cl. 260—534 S **8 Claims**

1. In a process of preparing penicillamine or a homologue thereof by reacting together an aldehyde branched at the α-carbon atom, sulfur, and ammonia to form a thiazoline-Δ^3, converting the thiazoline-Δ^3 by reaction with anhydrous hydrogen cyanide to the corresponding thiazolidine-4-carbonitrile, hydrolyzing the carbonitrile with hydrochloric acid to form first the hydrochloride of the corresponding thiazolidine-4-carboxamide and then, at a higher temperature, to form the hydrochloride of the thiazolidine-4-carboxylic acid and an ammonium salt, separating the ammonium salt from the mixture and decomposing the thiazolidine-4-carboxylic acid hydrochloride by hydrolysis to form penicillamine or a homologue thereof, the improvement which consists essentially of the step of hydrolyzing the carbonitrile to the carboxamide by heating at a temperature between about 40° and 70° C a mixture of the carbonitrile and at least the amount of aqueous hydrochloric acid containing at least 30% by weight of hydrogen chloride that is required stoichiometrically to form the corresponding thiazolidine-4-carboxamide hydrochloride.

4,045,480

PROCESS FOR PREPARING 1,2-OXA-PHOSPHOLANES

Manfred Finke, Fischbach, Taunus; Hans-Jerg Kleiner, Kronberg, Taunus, and Elmar Lohmar, Rodenkirchen, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

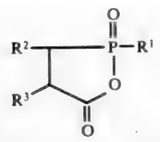
Filed June 11, 1976, Ser. No. 695,126

Claims priority, application Germany, June 14, 1975, 2526689

Int. Cl.[2] C07F *9/30*

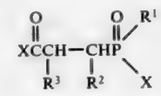
U.S. Cl. 260—545 P **11 Claims**

1. Process for preparing 2,5-dioxo-1,2-phospholanes of the formula (I)



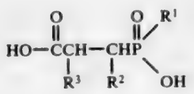
(I)

wherein R^1 represents an alkyl radical, optionally halogen substituted, having up to 18 carbon atoms, a cycloalkyl radical having up to 8 carbon atoms, an alkenyl radical having up to 8 carbon atoms, an aryl radical having up to 14 carbon atoms which may be substituted by lower alkyl groups having up to 4 carbon atoms, lower alkoxy groups having up to 4 carbon atoms, halogen or by amino groups alkylated or dialkylated by lower alkyl groups having up to 4 carbon atoms or an aralkyl radical having up to 15 carbon atoms which may be substituted in an analogous manner as the aryl radical, R^2 represents an alkyl radical having up to 4 carbon atoms or hydrogen and R^3 represents an alkyl radical having up to 6 carbon atoms, a phenyl radical or a phenyl radical substituted by halogen or lower alkyl groups having up to 4 carbon atoms, a benzyl radical or hydrogen, which comprises reacting 2-halogeno-formylethylphosphinic acid halides of the formula (II)



(II)

wherein R^1, R^2 and R^3 are defined as in formula (I) and X represents chlorine or bromine, with approximately an equimolar quantity of water or a phosphinic-carboxylic acid of the formula (III)



(III)

4,045,481

PROCESS FOR THE PREPARATION OF CHLORINATED ISOCYANIDE DICHLORIDE

Dieter Arlt, Cologne-Buchheim, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 793,926, Jan. 21, 1969, abandoned. This application July 17, 1975, Ser. No. 596,866

Claims priority, application Germany, Feb. 2, 1968, 1668089

Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—566 D **5 Claims**

1. Process for preparing chlorinated isocyanide dichloride which comprises reacting an olefine selected from the group consisting of vinyl chloride, vinyl fluoride and vinyl bromide, with at least equimolar quantities of chlorine and cyanogen chloride in the presence of a Friedel-Crafts catalyst at a temperature of from about −30° C to about 70° C.

4,045,482

4-(3-ISOPROPYLAMINO-2-HYDROXYPROPOXY INDENE

Masuo Murakami; Kiyoshi Murase; Kunihiro Niigata, all of Tokyo; Shiro Tachikawa, Omiya, and Toichi Takenaka, Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co. Ltd., Tokyo, Japan

Continuation of Ser. No. 141,936, May 10, 1971, abandoned, which is a continuation-in-part of Ser. No. 876,070, Nov. 12, 1969, abandoned. This application Apr. 14, 1975, Ser. No. 568,097

Claims priority, application Japan, Nov. 12, 1968, 43-82297; Sept. 11, 1969, 44-72582

Int. Cl.[2] C07C *93/06*

U.S. Cl. 260—570.7 **4 Claims**

1. A compound selected from the group consisting of 4-(3-isopropylamino-2-hydroxypropoxy)indene and a non-toxic acid addition salt thereof.

4,045,483

AMIDINOUREAS AND AMIDINOTHIOUREAS

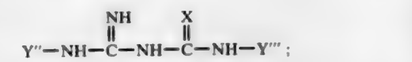
Royal A. Cutler, Sand Lake, and Samuel Schalit, Albany, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Division of Ser. No. 585,447, June 9, 1975, Pat. No. 4,009,163, which is a division of Ser. No. 391,473, Aug. 24, 1973, Pat. No. 3,988,370, which is a division of Ser. No. 79,266, Oct. 8, 1970, Pat. No. 3,798,269, which is a division of Ser. No. 749,986, Aug. 5, 1968, Pat. No. 3,652,766, which is a continuation-in-part of Ser. No. 556,897, June 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 462,077, June 7, 1965, abandoned. This application June 10, 1976, Ser. No. 694,768

Int. Cl.[2] C07C *127/15*; A61K *31/17*

U.S. Cl. 260—552 R **3 Claims**

1. A compound having the structural formula



wherein: X is oxygen or sulfur; Y″ and Y‴ may be the same or different and are members of the group consisting of alkenyl containing 3–18 carbon atoms, alkoxyalkyl containing 3–17 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, cycloalkyl containing 3–8 carbon atoms, di(lower alkyl-)aminoalkyl containing 4–10 carbon atoms; Y″ also is hydrogen when X is oxygen and Y‴ is alkenyl containing 3–18 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, di(lower alkyl)aminoalkyl containing 4–10 carbon atoms; and Y″ also is hydrogen when X is sulfur and Y‴ is alkyl containing 8–18 carbon atoms, alkoxyalkyl containing 3–17 carbon atoms, alkylthioalkyl containing 3–17 carbon atoms, cycloalkyl containing 3–8 carbon atoms, di(lower alkyl)aminoalkyl containing 4–10 carbon atoms.

4,045,484

PROCESS FOR PREPARING N′-METHYL ACETHYDRAZIDE

Russell E. Malz, Jr., Naugatuck; Roger W. Amidon, Oxford, and Harold Greenfield, Watertown, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 596,544, July 16, 1975, Pat. No. 3,965,174. This application June 21, 1976, Ser. No. 698,452

Int. Cl.[2] C07C *103/32*

U.S. Cl. 260—561 H **6 Claims**

1. A process for the production of N′-methylacethydrazide which comprises reacting acethydrazide, paraformaldehyde, and hydrogen, in a solvent and in the presence of a palladium catalyst, said solvent being selected from the group consisting of water, lower aliphatic alcohols, and mixtures thereof, at a temperature of from 20° to 150° C, a hydrogen partial pressure of from 1.0 to 10,000 psi, and an equivalent ratio of acethydrazide to paraformaldehyde of from 0.1/1 to 10/1.

4,045,485

NAPHTHYL ACETALDEHYDE DERIVATIVES; METHODS OF USE THEREOF; AND PROCESSES FOR THE PREPARATION THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Palo Alto, Calif.

Division of Ser. No. 566,554, April 9, 1975, abandoned, which is a division of Ser. No. 492,380, July 29, 1974, abandoned, which is a division of Ser. No. 250,733, May 5, 1972, Pat. No. 3,852,363, which is a division of Ser. No. 814,855, April 9, 1969, Pat. No. 3,663,713, which is a continuation-in-part of Ser. No. 741,900, July 2, 1968, Pat. No. 3,626,012. This application Nov. 5, 1976, Ser. No. 739,362

Int. Cl.[2] C07C *131/00, 47/56*

U.S. Cl. 260—566 A **3 Claims**

1. 2-(5'-fluoro- 6'-methoxy-2'-naphthyl) propionaldehyde and the oxime thereof.

4,045,486

PROCESS FOR PREPARING AZOMETHINES

Hermann-Dieter Krall, Meerbusch, and Hans-Helmut Schwarz, Krefeld, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

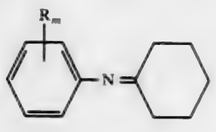
Filed May 12, 1976, Ser. No. 685,557

Claims priority, application Germany, June 6, 1975, 2525295

Int. Cl.[2] C07C *119/00*

U.S. Cl. 260—566 R **7 Claims**

1. Process for preparing an azomethine of the formula



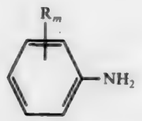
wherein

R is hydrogen, alkyl or alkoxy,

m denotes an integer of from 1 to 4, and

the *m* R radicals are the same or different,

which comprises condensing cyclohexanone and a primary aromatic amine of the formula



wherein

R and *m* are as defined above.

in the presence of an acid ion exchanger.

4,045,487

1-DIMETHYLAMINO-2,4-DIPHENYL-1-BUTENE-3,4-DIONE

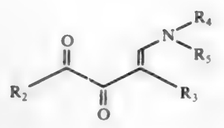
Roy Cleeland, Jr., Short Hills; Emanuel Grunberg, North Caldwell; Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 590,655, June 26, 1975, Pat. No. 3,969,373, which is a continuation-in-part of Ser. No. 338,019, March 5, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 668,179

Int. Cl.[2] C07C *97/03*

U.S. Cl. 260—570.5 C **2 Claims**

1. A compound of the formula



wherein R_2 is phenyl, lower-alkoxyphenyl, di-lower-alkoxyphenyl, R_3 is phenyl, naphthyl or nitrophenyl, and R_4 and R_5 taken independently are each lower alkyl.

4,045,488

AMINOPHENYLTETRALIN COMPOUNDS

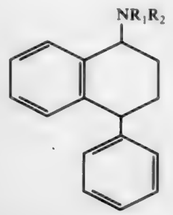
Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 521,451, Nov. 6, 1974, abandoned, which is a continuation of Ser. No. 292,526, Sept. 27, 1972, abandoned. This application May 27, 1976, Ser. No. 690,709

Int. Cl.[2] C07C *87/64*

U.S. Cl. 260—576 **13 Claims**

1. A compound selected from the group consisting of the trans-isomers of 1-amino-4-phenyltetralin bases of the formula:



and the pharmaceutically acceptable acid addition salts thereof, wherein R_1 is a member selected from the group consisting of hydrogen and alkyl having from one to three carbon atoms, and R_2 is a member selected from the group consisting of alkyl having from one to three carbon atoms and cycloalkyl having from three to six carbon atoms, said R_2 only being cycloalkyl when r_1 is hydrogen.

4,045,489

PROCESS FOR PRODUCING CIS-JASMONE

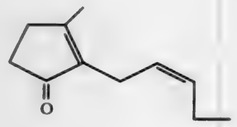
Wilhelmus Johannen Wiegers, Red Bank, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,544

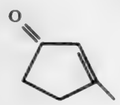
Int. Cl.[2] C07C *45/00*

U.S. Cl. 260—586 C **4 Claims**

1. A process for producing cis-jasmone having the structure:



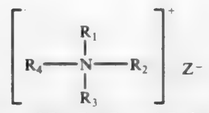
comprising the step of intimately admixing 3-methyl cyclopentenone-2 having the structure:



with a cis pentenyl halide having the structure:



in the presence of a base and a "phase transfer agent" having the generic formula:



wherein at least one of R_1, R_2, R_3 and R_4 is C_6-C_{14} aryl, C_6-C_{10} aralkyl, C_6-C_{20} alkyl, C_6-C_{14} aralkyl and C_6-C_{20} alkenyl and the other of R_2, R_3 and R_4 is C_1-C_8 alkyl, and Z^- is an anion selected from the group consisting of halogen anion and hydroxyl anion and wherein X is chloro or bromo, said reaction being carried out in a two liquid phase system; the reaction temperature being in the range of from 30° C up to 120° C; the mole ratio of 3-methyl cyclopentenone-2:cis-pent-2-enyl halide being in the range of from 0.5:1.5 up to about 1.5:0.5; the concentration of "phase transfer agent" in the reaction mass based on the amount of 3-methyl cyclopentenone-2 being in the range of from 0.5 grams of phase transfer agent per mole of 3-methyl cyclopentenone-2 up to 25 grams of phase transfer agent per mole of 3-methyl cyclopentenone-2; the reaction being carried out in a solvent inert to the reaction system, selected from the group consisting of toluene, benzene, o-xylene, m-xylene, p-xylene, ethyl benzene, n-hexane and cyclohexane; and then fractionally distilling the resulting product whereby a residue and a distillate are formed; and recovering said cis-jasmone from said distillate.

4,045,490

9,10-SECO-STEROID PREPARATION

Jean-Marie Cassal, St. Louis, France; Andor Furst, Basel, and Werner Meier, Bottmingen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

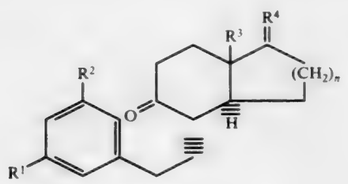
Division of Ser. No. 533,101, Dec. 16, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,764

Claims priority, application Switzerland, Dec. 21, 1973, 18029/73

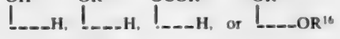
Int. Cl.[2] C07C *49/76, 49/82, 49/84*

U.S. Cl. 260—590 FA **8 Claims**

1. A process for the preparation of a compound of the formula

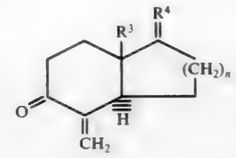


wherein R^1 and R^2 independently are hydrogen, amino, OR^5, $OCOR^6$ or $NHCOR^5$ wherein R^5 is hydrogen or lower alkyl and R^6 is lower alkyl or phenyl; R^3 is lower alkyl; R^4 is oxo,

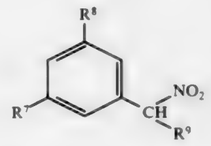


wherein R^{13} is lower alkyl, lower alkoxy-lower alkylene, tetrahydropyranyl or teytrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms, and *n* is 1 or 2, which comprises the steps of

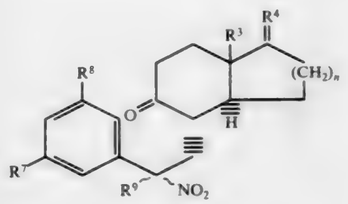
a. condensing a compound of the formula



wherein R^3, R^4 and *n* are as hereinbefore defined with a compound of the formula

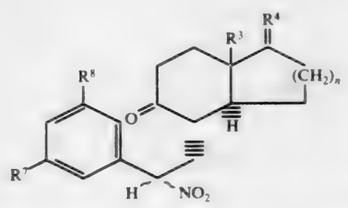


wherein R^7 and R^8 independently and respectively are R^1 and R^2, nitro, benzyloxy, dephenylmethoxy or triphenylmethoxy, and R^9 is hydrogen, cyano or $COOR^{10}$ wherein R^{10} is lower alkyl or benzyl, in the presence of a base to give a compound of the formula



wherein R^3, R^4, R^7, R^8 and *n* are as hereinbefore defined;

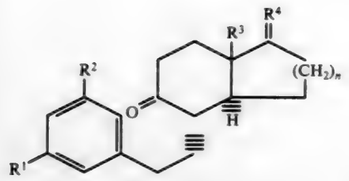
b. saponifying and then decarboxylating a compound obtained in step (a) when R^9 is cyano or $COOR^{10}$ wherein R^{10} is a hereinbefore defined in the presence of alkali and then in the presence of acid to give a compound of the formula



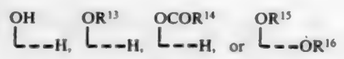
wherein R^3, R^4, R^7, R^8 and *n* are as hereinbefore defined, and

c. hydrogenating a compound obtained in step (b) in the presence of a noble metal or nickel catalyst.

6. A process for the preparation of a compound of the formula



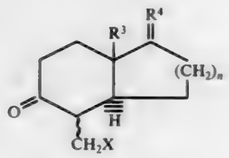
wherein R^1 and R^2 independently are hydrogen, amino, OR^5, $OCOR^6$ or $NHCOR^5$ wherein R^5 is hydrogen or lower alkyl and R^6 is lower alkyl or phenyl; R^3 is lower alkyl; R^4 is oxo,



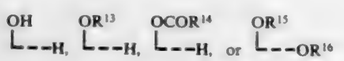
wherein R_{13} is lower alkyl, lower alkoxy-lower alkylene, tetrahydropyranyl or tetrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms, and n is 1 or 2,

which comprises the steps of

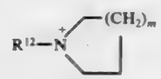
a. condensing a compound of the formula



wherein R^3 is lower alkyl; R^4 is oxo,

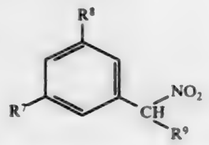


wherein R^{13} is lower alkyl, lower alkoxy-lower alkylne, tetrahydropyranyl or tetrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms; X is OR^{11}, $N(R^{12})_2$, SR^{11}, $N^+(R^{12})_3$,



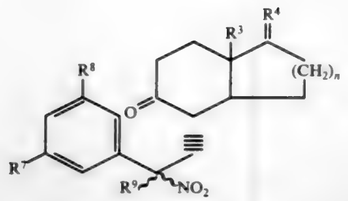
or $S^+(R^{12})_2$ wherein R^{11} is hydrogen, lower alkyl, acetyl or benzoyl, R^{12} is lower alkyl, and m is 1 or 2; and n is 1 or 2,

with a compound of the formula



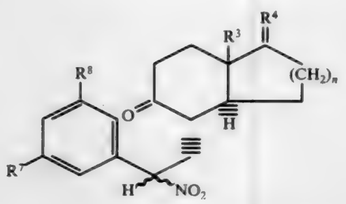
wherein R^7 and R^8 independently and respectively are R^1 and R^2, nitro, benzyloxy, diphenylmethoxy or triphenylmethoxy, and R^9 is hydrogen, cyano or $COOR^{10}$ wherein R^{10} is lower alkyl or benzyl,

in the presence of a base to give a compound of the formula



wherein R^3, R^4, R^7, R^8 and n are as hereinbefore defined;

b. saponifying and then decarboxylating a compound obtained in step (a) when R^9 is cyano or $COOR^{10}$ wherein R^{10} is as hereinbefore defined in the presence of alkali and then in the presence of acid to give a compound of the formula



wherein R^3, R^4, R^7, R^8, R^9 and n are as hereinbefore defined, and

c. hydrogenating a compound obtained in step (b) in the presence of a noble metal or nickel catalyst.

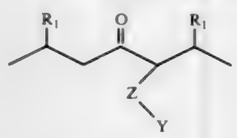
4,045,491

α-OXY(OXO) SULFIDES AND ETHERS

William J. Evers, Red Bank, and Howard H. Heinsohn, Jr., Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,538
Int. Cl.² C07C *49/175*
U.S. Cl. 260—594 **9 Claims**

1. An alpha oxo sulfide or oxo ether having the structure:



wherein Z is one of sulfur or oxygen; wherein R_1 is methyl or hydrogen; and Y is one of C_1–C_4 alkyl, C_3 or C_4 alkenyl, or 1,3-diethylacetonyl.

4,045,492

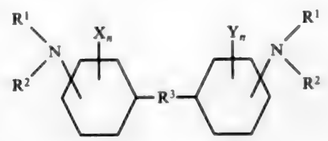
MANUFACTURE OF ALDEHYDES AND ALCOHOLS

Wilhelm Kniese, Limburgerhof, and Hans Juergen Nienburg, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 16, 1970, Ser. No. 3,522
Claims priority, application Germany, Jan. 18, 1969, 1902460
Int. Cl.² C07C *45/08, 29/16*
U.S. Cl. 260—604 HF **6 Claims**

1. In a process for the production of aldehydes and alcohols by oxo synthesis involving the reaction of an olefin having 2 to 20 carbon atoms with carbon monoxide and hydrogen at pressures ranging from 1 to 300 atmospheres in the presence of an amine and a carbonyl complex of cobalt, the improvement

comprising using as said amine a diamino diphenyl alkane having the formula



where R^1 and R^2 stand for alkyl radicals of 1 to 4 carbon atoms, R^3 stands for an alkylene or alkylidene radical of 1 to 3 carbon atoms, X and Y respectively stand for hydrogen or methyl, and n is 0,1 or 2 at temperatures in the range of 100°–140° C.

4,045,493

HYDROFORMYLATION OF OLEFINS

Alvin E. Trevillyan, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 546,323, Feb. 3, 1975, Pat. No. 3,998,864.
This application Apr. 19, 1976, Ser. No. 678,185
Int. Cl.² C07C *45/10, 29/16*
U.S. Cl. 260—604 HF **3 Claims**

1. A process for the production of aldehydes and alcohols which comprises contacting an olefinic hydrocarbon having about 4 to about 19 carbon atoms with carbon monoxide and hydrogen at the temperature of about 100°–300° C and a pressure of about 10–2,000 psig in the presence of a heterogeneous catalyst consisting of a polyphenylene comprising benzene ring structures bonded into a polymer chain wherein the amount of benzene ring structures bonded to three or more other benzene ring structures is from 15 to 25 percent by weight, the amount of benzene ring structures bonded to two other benzene ring structures is from 45 to 65 percent by weight, and the amount of benzene ring structures is bonded through the meta position to two other benzene ring structures is from 15 to 30 percent by weight, with the remaining benzene ring structures being bonded to only one other benzene ring structure, said polyphenylene having a number average molecular weight in the range of about 1,000 to about 10,000, said polyphenylene having $—PR_2$ substituents, where R is a phenyl or an alkyl group in amounts such that the ratio of aryl groups to phosphorus atoms is in the range of about 1.0 to about 20, said $—PR_2$ groups being complexed with a metal carbonyl compound selected from the group consisting of cobalt, rhodium, ruthenium, osmium, iridium, and iron carbonyls in amounts such that the ratio of phosphorus atoms to metal atoms is in the range of from about 1 to about 20.

4,045,494

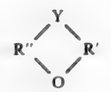
METHOD FOR PREPARING TRIOGRANOPHOSPHINES

Vilas M. Chopdekar, Parlin, and William R. Davis, South Plainfield, both of N.J., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Mar. 6, 1975, Ser. No. 556,010
Int. Cl.² C07F *9/50*
U.S. Cl. 260—606.5 P **4 Claims**

1. A method for preparing a triorganophosphine, said method comprising the steps of

1. adding to a reaction zone maintained under an inert atmosphere an organomagnesium halide of the formula RMgX and a phosphorus trihalide PX_3 such that three moles of the organomagnesium halide are added separately and concurrently with each mole of the phosphorus trihalide, wherein said reaction zone also contains either a linear ether of the formula R^1OR^2 or $R^3(OR^4)_nOR^3$ or a cyclic ether of the general formula



wherein R represents an alkyl group containing between 1 and 16 carbon atoms, a cycloalkyl, aryl, alkaryl or aralkyl group such that the alkyl portion of said alkaryl or aralkyl group contains between 1 and 16 carbon atoms, R^1 and R^2 each contain between 1 and 6 carbon atoms and are individually selected from the group consisting of alkyl, cycloalkyl and phenyl with the proviso that R^1 and R^2 cannot both be methyl, cycloalkyl or phenyl, R^3 is alkyl and contains 2, 3 or 4 carbon atoms, R^4 is alkylene and contains 2, 3 or 4 carbon atoms, R′ is methylene, ethylene or $=CHR'''$, wherein R‴ is alkyl and contains between 1 and 16 carbon atoms, R″ is unsubstituted alkylene such that R′ and R″ together contain 3 or 4 cyclic carbon atoms, and together with the oxygen atom and Y group form a ring containing 5 or 6 atoms, n is between 1 and 4, inclusive, X is chlorine, bromine or iodine and Y is a methylene or an N-alkyl group containing between 1 and 16 carbon atoms, with the proviso that when Y represents an N-alkyl group, the Y group and the oxygen atom are separated by 2 atoms and said ring contains 6 atoms,

2. maintaining said reaction zone at a temperature of between ambient and the boiling point of the reaction mixture throughout the addition of the organomagnesium halide and phosphorus trihalide,
3. adjusting the pH of the reaction mixture to less than 7 by the addition of an aqueous solution containing a non-oxidizing mineral or carboxylic acid,
4. removing the aqueous layer of the reaction mixture, and
5. removing at least a portion of the solvent from the organic layer of the reaction mixture to isolate the resultant triorganophosphine, R_3P.

4,045,495

PROCESS FOR THE PREPARATION OF TRIARYLBORANES

Nicholas Nazarenko, and William Carl Seidel, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1975, Ser. No. 630,995
Int. Cl.² C07F *5/04*
U.S. Cl. 260—606.5 B **7 Claims**

1. In a process for the preparation of triarylboranes by reacting an alkali metal, an aryl halide and a borate ester in an inert organic solvent at a ratio of halide to ester in the range of about 3.5:1 to 3:1 and thereafter contacting the reactants with water to obtain an aqueous solution of the alkali metal hydroxide salt of the triarylborane, the improvement which comprises recovering said triarylborane, the improvement which comprises recovering said triarylborane by acidifying said aqueous solution of a pH not less than about 6 to precipitate the borane and thereafter separating the triarylborane from the aqueous solution.

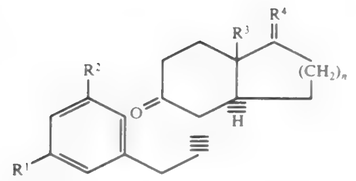
4,045,496

PROCESS FOR THE HYDROXYLATION OF PHENOLS AND PHENOL ETHERS IN THE NUCLEUS

Hermann Seifert, Cologne; Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1975, Ser. No. 553,939
Claims priority, application Germany, Mar. 6, 1974, 2410758
Int. Cl.² C07C *37/00*
U.S. Cl. 260—613 D **20 Claims**

1. In a catalytic process for the hydroxylation of the nucleus of a phenol or phenol ether wherein a phenol or phenol ether



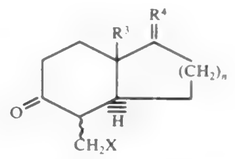
wherein R^1 and R^2 independently are hydrogen, amino, OR^5, $OCOR^6$ or $NHCOR^5$ wherein R^5 is hydrogen or lower alkyl and R^6 is lower alkyl or phenyl; R^3 is lower alkyl; R^4 is oxo,



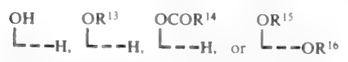
wherein R_{13} is lower alkyl, lower alkoxy-lower alkylene, tetrahydropyranyl or tetrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms, and n is 1 or 2,

which comprises the steps of

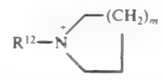
a. condensing a compound of the formula



wherein R^3 is lower alkyl; R^4 is oxo,

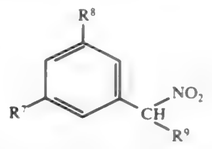


wherein R^{13} is lower alkyl, lower alkoxy-lower alkylne, tetrahydropyranyl or tetrahydrofuryl, R^{14} is lower alkyl or phenyl and R^{15} and R^{16} are lower alkyl or taken together form lower alkylene or arylene of 6 to 10 carbon atoms; X is OR^{11}, $N(R^{12})_2$, SR^{11}, $N^+(R^{12})_3$,



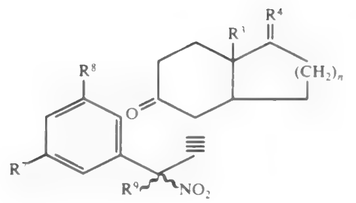
or $S^+(R^{12})_2$ wherein R^{11} is hydrogen, lower alkyl, acetyl or benzoyl, R^{12} is lower alkyl, and m is 1 or 2; and n is 1 or 2,

with a compound of the formula



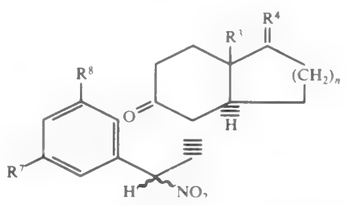
wherein R^7 and R^8 independently and respectively are R^1 and R^2, nitro, benzyloxy, diphenylmethoxy or triphenylmethoxy, and R^9 is hydrogen, cyano or $COOR^{10}$ wherein R^{10} is lower alkyl or benzyl,

in the presence of a base to give a compound of the formula



wherein R^3, R^4, R^7, R^8 and n are as hereinbefore defined;

b. saponifying and then decarboxylating a compound obtained in step (a) when R^9 is cyano or $COOR^{10}$ wherein R^{10} is as hereinbefore defined in the presence of alkali and then in the presence of acid to give a compound of the formula



wherein R^3, R^4, R^7, R^8, R^9 and n are as hereinbefore defined, and

c. hydrogenating a compound obtained in step (b) in the presence of a noble metal or nickel catalyst.

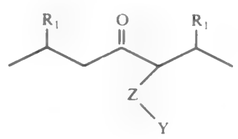
4,045,491

α-OXY(OXO) SULFIDES AND ETHERS

William J. Evers, Red Bank, and Howard H. Heinsohn, Jr., Hazlet, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Oct. 7, 1976, Ser. No. 730,538
Int. Cl.[2] C07C *49/175*
U.S. Cl. 260—594 **9 Claims**

1. An alpha oxo sulfide or oxo ether having the structure:



wherein Z is one of sulfur or oxygen; wherein R_1 is methyl or hydrogen; and Y is one of C_1–C_4 alkyl, C_3 or C_4 alkenyl, or 1,3-diethylacetonyl.

4,045,492

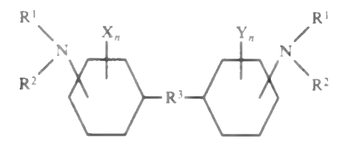
MANUFACTURE OF ALDEHYDES AND ALCOHOLS

Wilhelm Kniese, Limburgerhof, and Hans Juergen Nienburg, Ludwigshafen, both of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 16, 1970, Ser. No. 3,522
Claims priority, application Germany, Jan. 18, 1969, 1902460
Int. Cl.[2] C07C *45/08, 29/16*
U.S. Cl. 260—604 HF **6 Claims**

1. In a process for the production of aldehydes and alcohols by oxo synthesis involving the reaction of an olefin having 2 to 20 carbon atoms with carbon monoxide and hydrogen at pressures ranging from 1 to 300 atmospheres in the presence of an amine and a carbonyl complex of cobalt, the improvement

comprising using as said amine a diamino diphenyl alkane having the formula



where R^1 and R^2 stand for alkyl radicals of 1 to 4 carbon atoms, R^3 stands for an alkylene or alkylidene radical of 1 to 3 carbon atoms, X and Y respectively stand for hydrogen or methyl, and n is 0,1 or 2 at temperatures in the range of 100°–140° C.

4,045,493

HYDROFORMYLATION OF OLEFINS

Alvin E. Trevillyan, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 546,323, Feb. 3, 1975, Pat. No. 3,998,864.
This application Apr. 19, 1976, Ser. No. 678,185
Int. Cl.[2] C07C *45/10, 29/16*
U.S. Cl. 260—604 HF **3 Claims**

1. A process for the production of aldehydes and alcohols which comprises contacting an olefinic hydrocarbon having about 4 to about 19 carbon atoms with carbon monoxide and hydrogen at the temperature of about 100°–300° C and a pressure of about 10–2,000 psig in the presence of a heterogeneous catalyst consisting of a polyphenylene comprising benzene ring structures bonded into a polymer chain wherein the amount of benzene ring structures bonded to three or more other benzene ring structures is from 15 to 25 percent by weight, the amount of benzene ring structures bonded to two other benzene ring structures is from 45 to 65 percent by weight, and the amount of benzene ring structures is bonded through the meta position to two other benzene ring structures is from 15 to 30 percent by weight, with the remaining benzene ring structures being bonded to only one other benzene ring structure, said polyphenylene having a number average molecular weight in the range of about 1,000 to about 10,000, said polyphenylene having $—PR_2$ substituents, where R is a phenyl or an alkyl group in amounts such that the ratio of aryl groups to phosphorus atoms is in the range of about 1.0 to about 20, said $—PR_2$ groups being complexed with a metal carbonyl compound selected from the group consisting of cobalt, rhodium, ruthenium, osmium, iridium, and iron carbonyls in amounts such that the ratio of phosphorus atoms to metal atoms is in the range of from about 1 to about 20.

4,045,494

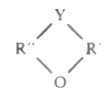
METHOD FOR PREPARING TRIOGRANOPHOSPHINES

Vilas M. Chopdekar, Parlin, and William R. Davis, South Plainfield, both of N.J., assignors to M&T Chemicals Inc., Greenwich, Conn.

Filed Mar. 6, 1975, Ser. No. 556,010
Int. Cl.[2] C07F *9/50*
U.S. Cl. 260—606.5 P **4 Claims**

1. A method for preparing a triorganophosphine, said method comprising the steps of

1. adding to a reaction zone maintained under an inert atmosphere an organomagnesium halide of the formula RMgX and a phosphorus trihalide PX_3 such that three moles of the organomagnesium halide are added separately and concurrently with each mole of the phosphorus trihalide, wherein said reaction zone also contains either a linear ether of the formula R^1OR^2 or $R^3(OR^4)_nOR^3$ or a cyclic ether of the general formula



wherein R represents an alkyl group containing between 1 and 16 carbon atoms, a cycloalkyl, aryl, alkaryl or aralkyl group such that the alkyl portion of said alkaryl or aralkyl group contains between 1 and 16 carbon atoms, R^1 and R^2 each contain between 1 and 6 carbon atoms and are individually selected from the group consisting of alkyl, cycloalkyl and phenyl with the proviso that R^1 and R^2 cannot both be methyl, cycloalkyl or phenyl, R^3 is alkyl and contains 2, 3 or 4 carbon atoms, R^4 is alkylene and contains 2, 3 or 4 carbon atoms, R′ is methylene, ethylene or $=CHR'''$, wherein R‴ is alkyl and contains between 1 and 16 carbon atoms, R″ is unsubstituted alkylene such that R′ and R″ together contain 3 or 4 cyclic carbon atoms, and together with the oxygen atom and Y group form a ring containing 5 or 6 atoms, n is between 1 and 4, inclusive, X is chlorine, bromine or iodine and Y is a methylene or an N-alkyl group containing between 1 and 16 carbon atoms, with the proviso that when Y represents an N-alkyl group, the Y group and the oxygen atom are separated by 2 atoms and said ring contains 6 atoms,

2. maintaining said reaction zone at a temperature of between ambient and the boiling point of the reaction mixture throughout the addition of the organomagnesium halide and phosphorus trihalide,
3. adjusting the pH of the reaction mixture to less than 7 by the addition of an aqueous solution containing a non-oxidizing mineral or carboxylic acid,
4. removing the aqueous layer of the reaction mixture, and
5. removing at least a portion of the solvent from the organic layer of the reaction mixture to isolate the resultant triorganophosphine, R_3P

4,045,495

PROCESS FOR THE PREPARATION OF TRIARYLBORANES

Nicholas Nazarenko, and William Carl Seidel, both of Orange, Tex., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Nov. 12, 1975, Ser. No. 630,995
Int. Cl.[2] C07F *5/04*
U.S. Cl. 260—606.5 B **7 Claims**

1. In a process for the preparation of triarylboranes by reacting an alkali metal, an aryl halide and a borate ester in an inert organic solvent at a ratio of halide to ester in the range of about 3.5:1 to 3:1 and thereafter contacting the reactants with water to obtain an aqueous solution of the alkali metal hydroxide salt of the triarylborane, the improvement which comprises recovering said triarylborane, the improvement which comprises recovering said triarylborane by acidifying said aqueous solution of a pH not less than about 6 to precipitate the borane and thereafter separating the triarylborane from the aqueous solution.

4,045,496

PROCESS FOR THE HYDROXYLATION OF PHENOLS AND PHENOL ETHERS IN THE NUCLEUS

Hermann Seifert, Cologne; Helmut Waldmann; Wulf Schwerdtel, both of Leverkusen, and Wolfgang Swodenk, Odenthal-Gloebusch, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 28, 1975, Ser. No. 553,939
Claims priority, application Germany, Mar. 6, 1974, 2410758
Int. Cl.[2] C07C *37/00*
U.S. Cl. 260—613 D **20 Claims**

1. In a catalytic process for the hydroxylation of the nucleus of a phenol or phenol ether wherein a phenol or phenol ether

is contacted with hydrogen peroxide at a temperature of 20°–150° C and at a pressure of 0.1 to 500 Torr employing 3 to 20 moles of said phenol or phenol ether per mole of hydrogen peroxide and the resulting hydroxylated phenol or phenol ether is recovered, the improvement which comprises employing a substantially anhydrous hydrogen peroxide obtained by distilling off said hydrogen peroxide together with the phenol or phenol ether to be hydroxylated from a nonaqueous solution whose solvent boils at a temperature higher than said phenol or phenol ether to be hydroxylated and affecting the hydroxylation in the presence of a strong acid either before or after condensing the vapor mixture which forms during the said distillation.

4,045,497

PROCESSES FOR PRODUCING ALKENALS AND INTERMEDIATES THEREFOR

William L. Schreiber, Ocean, and Alan O. Pittet, Atlantic Highlands, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 597,189, July 18, 1975, abandoned, which is a division of Ser. No. 383,579, July 30, 1973, Pat. No. 3,922,309. This application Mar. 8, 1976, Ser. No. 664,916

Int. Cl.[2] **C07C** *43/30;* **A61K** *7/46*

U.S. Cl. 260—615 A **2 Claims**

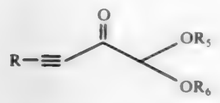
1. A process for the production of 2-alkylidene-3-alkynal dialkoxy acetals which comprises:

i. reacting a lower alkyl metallo acetylide having the formula:

R—C≡C—M

wherein R is lower alkyl and M is an alkali metal selected from the group consisting of lithium, sodium and potassium, with a dialkoxy acetonitrile wherein the alkoxy groups contain from 1 to 6 carbon atoms in the presence of a solvent selected from the group consisting of dialkyl ethers and aromatic hydrocarbons, thereby forming an imine salt;

ii. hydrolyzing the imine salt at a temperature in the range of from about 0° C up to approximately 30° C using an aqueous acid selected from the group consisting of lower carboxylic acids having a concentration of 3 molar or less and mineral acids having a concentration of 1 molar or less, thereby forming an acetylenic ketone having the structure:

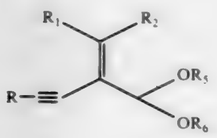


wherein R_2 is lower alkyl and R_5 and R_6 are C_{1-C6} alkyl; and

iii. reacting at from about 0° C to about 50° C said acetylenic ketone with a phosphorous compound having the structure:

$(R_7)_3P{=}C{-}R'$

to form a 1,1-dialkoxy-2-alkylidene-3-alkyne having the formula:



wherein R_5 and R_6 are C_1–C_6 alkyl groups; R_7 is phenyl; one of R_1 and R_2 is hydrogen and the other is methyl or ethyl; and R′ is the alkyl group represented by R_1 or R_2.

4,045,498

METHOD OF HYDROXYLATION

Norman C. Deno, State College, Pa., assignor to Fats and Proteins Research Foundation, Inc., Des Plaines, Ill.

Filed Oct. 15, 1975, Ser. No. 622,661

Int. Cl.[2] **C07C** *29/00, 31/18*

U.S. Cl. 260—617 R **27 Claims**

1. The process of preparing alcohols by single-carbon hydroxylation, which comprises the steps of: reacting a saturated hydrocarbon compound with an N-oxygenated amine in a medium including a Lewis acid and a ferrous salt; and separating the reaction product from said medium.

2. The process according to claim **1** in which the N-oxygenated amine is a di-alkylsubstituted hydroxylamine compound.

6. The process according to claim **1** in which the N-oxygenated amine is selected from the group consisting of N-oxygenated aliphatic, alicyclic and heterocyclic amines.

7. The process according to claim **6** in which the amine oxide is trimethylamine oxide.

8. The process according to claim **6** in which the amine oxide is a cyclic aza-alkane oxide.

4,045,499

PROCESS FOR THE PREPARATION OF 1,1,3,3-SUBSTITUTED HYDROXY INDANES

Alfons Klein, Duesseldorf, and Karlfried Wedemeyer, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

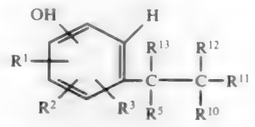
Filed Oct. 22, 1974, Ser. No. 516,945

Claims priority, application Germany, Nov. 14, 1973, 2356813

Int. Cl.[2] **C07C** *37/00*

U.S. Cl. 260—621 R **9 Claims**

1. Process for producing 1,1,3,3-substituted hydroxy indanes which comprises reacting an alkylphenol having the formula



wherein

R^1, R^2 and R^3, which may be the same or different, are selected from the group of hydrogen, halogen, alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms, in addition to which

R^2 and R^3, when they are in the ortho position relative to one another may be taken together with the carbon atoms of the benzene ring to which they are attached to form a 5-membered carbocylic ring,

R^5 is selected from the group of alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms,

R^{10} and R^{11} which may be the same or different, are selected from the group of hydrogen and alkyl with up to 12 carbon atoms, cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms, in addition to which

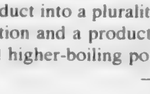
R^5 and R^{10} may form a cycloaliphatic ring with the carbon atoms to which they are attached,

R^{12} is hydrogen, and

R^{13} is halogen, hydroxyphenyl or —OR^{14} where R^{14} is selected from the group of hydrogen and alkyl with up to 12 carbon atoms; cycloalkyl with 3 to 8 carbon atoms, aralkyl with up to 6 carbon atoms in the alkyl portion and up to 14 carbon atoms in the aryl portion, phenyl, naphthyl, anthryl, and the foregoing substituted by alkyl with up to 12 carbon atoms, in addition to which

R^{12} and R^{13} together may also represent another bond between the carbon atoms to which they are attached,

with 2 moles, per mole of said alkylphenol, of an olefin containing the following group,



in which at least one double-bonded carbon atom contains only carbon-to-carbon bonds, or with a compound which yields the corresponding olefin in situ, in the presence of an acid catalyst at a temperature in the range from 70° to 360° C.

4,045,500

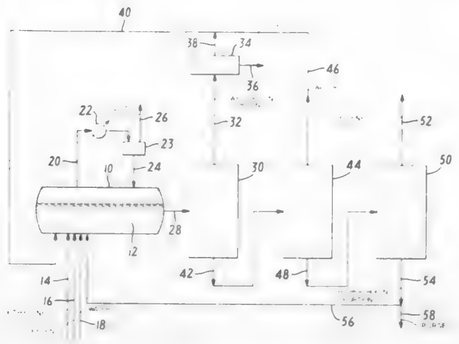
PREPARATION OF ETHYLENE GLYCOL

Olav T. Onsager, Suffern, N.Y., and Peter L. Szecsi, Montclair, N.J., assignors to Halcon International, Inc., New York, N.Y.

Filed May 28, 1976, Ser. No. 691,113

Int. Cl.[2] **C07C** *29/02, 47/06*

U.S. Cl. 260—635 H **4 Claims**



1. A process for preparing ethylene glycol, which comprises reacting ethylene, molecular oxygen and water in the presence of an iodine source in an oxidation zone at a temperature of 50° – 250° C. and under a pressure sufficient to maintain the liquid phase to produce a liquid reaction product, separating said product into a plurality of portions, including a higher-boiling portion and a product ethylene glycol portion, and recycling said higher-boiling portion to said oxidation zone.

4,045,501

METHOD FOR MAKING o- AND p-HALOALKYL STYRENES

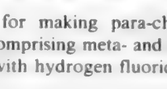
Thomas A. Bianchi, Irondequoit, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 391,180, Aug. 24, 1973, Pat. No. 3,927,117, which is a continuation-in-part of Ser. No. 237,902, March 27, 1972, abandoned. This application Aug. 4, 1975, Ser. No. 601,870

Int. Cl.[2] **C07C** *25/14*

U.S. Cl. 260—651 R **12 Claims**

1. In a method for making o- and p-chloromethylstyrenes comprising the steps of mixing ethyl benzene, paraformaldehyde and hydrogen chloride and reacting said mixture with bromine to form a mixture of o- and p-chloromethyl(1-bromoethyl)benzenes, the improvement which comprises: heating and dehydrobrominating said o- and p- chloromethyl(1-bromoethyl) benzenes with an equimolar amount of an amine acceptor of the formula



wherein R is alkyl of 1 to 6 carbon atoms, n is an integer of 1 to 5 and at least one alkyl is attached to a carbon atom adjacent the nitrogen atom in said formula, provided that the alkyls may be the same or different where, n is more than 1; whereby a mixture of said o- and p-chloromethyl styrenes is formed.

4,045,502

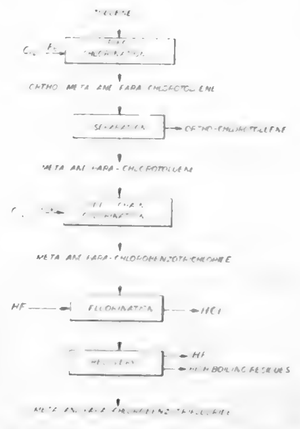
PROCESS FOR PRODUCING HIGH PURITY PARA-CHLOROBENZOTRIFLUORIDE

Sudhir K. Bhutani, Orange, and Willard A. Nichols, Madison, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Sept. 29, 1976, Ser. No. 727,813

Int. Cl.[2] **C07C** *25/14*

U.S. Cl. 260—651 F **3 Claims**



1. In a process for making para-chlorobenzotrifluoride wherein a mixture comprising meta- and para-chlorobenzotrichloride is reacted with hydrogen fluoride, the improvement which comprises

terminating the fluorination reaction when no more than 99% by weight of said para-chlorobenzotrichloride has been converted to para-chlorobenzotrifluoride and no more than 50% by weight of said meta-chlorobenzotrichloride has been converted into meta-chlorobenzotrifluoride.

4,045,503

ALKYL FLUORIDE STORAGE STABILIZATION AND ALKYLATION WITH STORED ALKYL FLUORIDE

Thomas Hutson, Jr., and Wayne P. Kraus, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 5, 1976, Ser. No. 673,324

Int. Cl.[2] **C07C** *17/42, 3/54*

U.S. Cl. 260—652.5 P **12 Claims**

1. A storage-stable composition comprising an alkyl fluoride diluted with a stabilizing amount of a paraffinic hydrocarbon having from 4 to 8 carbon atoms in an amount sufficient to prevent degradation of said fluoride to polymer formation during storage and handling.

4. A method for rendering alkyl fluoride storage-stable

under conditions conducive to polymer formation which comprises diluting said alkyl fluoride with a paraffinic hydrocarbon having from 4 to 8 carbon atoms in an amount effective to prevent any substantial degradation of alkyl fluoride during storage and handling under conditions conducive to polymer formation.

7. An improved process for the production of alkylate which comprises

a. hydrofluorinating an olefin-containing hydrocarbon stream with HF under hydrofluorination conditions which produce alkyl fluorides,

b. diluting the hydrofluorination effluent comprising alkyl fluorides with a paraffinic hydrocarbon having from 4 to 8 carbon atoms in an amount sufficient to prevent any substantial degradation of said fluoride to heavy polymer oil during storage and handling and transferring from storage to a place of utilization subsequent to hydrofluorination,

c. storing said paraffin-diluted alkyl fluoride, and

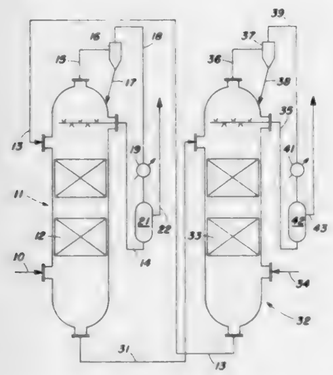
d. passing said paraffin-diluted alkyl fluoride obtained in step (b) after storage and handling in step (c) to alkylation and therein contacting same with an isoparaffin and HF under alkylation conditions to produce alkylate.

4,045,504

COUPLING PROCESS

Maurice E. Brooks, Great Neck, N.Y.; Herbert Riegel, Palisades, N.J.; Harvey D. Schindler, New York, N.Y., and Morgan C. Sze, Upper Montclair, N.J., assignors to The Lummus Company, Bloomfield, N.J.

Division of Ser. No. 769,791, Oct. 23, 1968, Pat. No. 3,947,489.
This application Mar. 29, 1976, Ser. No. 671,388
Int. Cl.² C07C *3/52, 15/10*
U.S. Cl. 260—669 R **19 Claims**



1. A process for coupling an alkane with at least one member selected from the group consisting of different alkanes, having a number of carbon atoms different than the number of carbon atoms of said alkane, alkenes, and aromatic hydrocarbons, comprising:

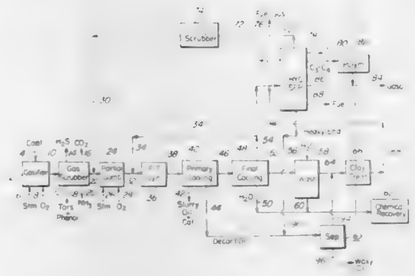
contacting the alkane and said member, both in the vapor phase, with a molten mixture comprising a multivalent metal halide in both its higher and lower valence state, said multivalent metal halide being selected from the group consisting of the chlorides, iodides and bromides of copper, manganese, iron, cobalt and chromium, said contacting being effected at a temperature from about 500° to about 1,200° F to produce a reaction effluent containing a coupled compound containing a number of carbon atoms corresponding to the total number of carbon atoms in said alkane and said member, said coupled compound when said member is said different alkane or said alkene being selected from the group consisting of alkanes, alkenes and mixtures thereof, and said coupled compound when said member is said aromatic hydrocarbon being selected from the group consisting of alkyl and alkenyl substituted derivatives of said aromatic hydrocarbon and mixtures thereof.

4,045,505

METHOD FOR UPGRADING A FISCHER-TROPSCH LIGHT OIL

Henry R. Ireland, Woodbury; Alan W. Peters, and Thomas R. Stein, both of Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 21, 1976, Ser. No. 650,994
Int. Cl.² C07C *5/22; C10G 35/06*
U.S. Cl. 260—673 **7 Claims**



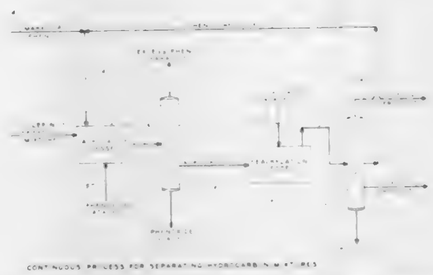
1. A method for increasing the on stream life of a catalyst during increasing the octane rating of an olefin rich C_5+ liquid product of Fischer-Tropsch synthesis having an end boiling point in the range of from about 340°–400° F which comprises contacting said olefinic feed in the presence of added hydrogen at a temperature within the range of about 500° to about 850° F and at a pressure within the range of from about 200–600 psig with a catalyst comprising a hydrogenating component and a crystalline aluminosilicate characterized by a pore dimension greater than about 5 Angstroms, a silica to alumina ratio of at least 12, and a constraint index within the range of 1:12 and recovering an olefinic gasoline boiling range product having an enhanced octane number.

4,045,506

SEPARATION OF HYDROCARBON MIXTURES BY CATALYTIC DEALKYLATION

Milutin Simic, Novato, and William A. Sweeney, Larkspur, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 1, 1976, Ser. No. 672,703
Int. Cl.² B01D *3/34; C07C 7/00*
U.S. Cl. 260—677 A **5 Claims**



1. A process for separating a close-boiling mixture comprising substantially linear olefins and paraffins which comprises the steps of:

1. contacting a paraffin-dilute substantially linear olefin mixture with a phenolic compound in the presence of an aluminum or magnesium phenoxide alkylation catalyst under conditions effective to cause olefin alkylation between the olefin and the phenol to prepare alkylphenols;

2. recovering the alkylphenols;

3. heating the alkylphenols in the presence of a silica-based dealkylation catalyst at a temperature below about 300° C under conditions effective to regenerate the olefin at conversions of from about 70–80% by weight; and

4. rapidly separating the parafffin-free olefin.

4,045,507

METHOD OF OLIGOMERIZING 1-OLEFINS

Barrett L. Cupples, Franklin Township, Allegheny County; William J. Heilman, Allison Park, and A. Norman Kresge, Penn Hills Township, Allegheny County, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 633,671
Int. Cl.² C07C *3/18*
U.S. Cl. 260—683.15 B **10 Claims**

1. The continuous process for polymerizing a l-olefin to an oligomer mixture including trimer and tetramer which comprises continuously introducing a l-olefin having from about five to about 14 carbon atoms or a mixture thereof into the first of a series of two or more tank reactors in the presence of a catalytic amount of boron trifluoride and a co-catalyst that complexes with boron trifluoride with mixing therein to provide a substantially homogeneous reaction mixture and continuously removing a partially oligomerized product stream from the first of said tank reactors and introducing said product stream into the second of said tank reactors for further conversion of said l-olefin to oligomer product, said series of tank reactors being maintained at a same or different temperature suitable for the oligomerization reaction.

4,045,508

METHOD OF MAKING ALPHA-OLEFIN OLIGOMERS

Barrett L. Cupples, Franklin Township, Allegheny County; William J. Heilman, Allison Park, and A. Norman Kresge, Penn Hills Township, Allegheny County, all of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 633,677
Int. Cl.² C07C *3/18*
U.S. Cl. 260—683.15 B **10 Claims**

1. The continuous process for polymerizing a l-olefin to an oligomer mixture including trimer and tetramer which comprises continuously introducing a l-olefin having from about five to about 14 carbon atoms or a mixture thereof into the first of a series of one or more tank reactors with mixing therein to provide a substantially homogeneous reaction mixture in the presence of a catalytic amount of boron trifluoride and a co-catalyst that complexes with boron trifluoride and continuously removing a partially oligomerized product stream from said series of one or more tank reactors and flowing said product stream through a tube reactor for further conversion of said l-olefin to oligomer product, the length to diameter ratio of said tube reactor being at least about 15 to one and said series of tank reactors and said tube reactor being maintained at a same or different temperature suitable for the oligomerization reaction.

4,045,509

ISOMERIZATION OF PARAFFINIC HYDROCARBONS WITH FUSED SALT COMPLEX OF ALUMINUM HALIDE AND MANGANOUS HALIDE DEPOSITED ON A CARRIER

Herbert L. Benson, Jr., Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 593,336, July 3, 1975, Pat. No. 3,992,326.
This application Aug. 20, 1976, Ser. No. 716,031
Int. Cl.² C07C *5/28*
U.S. Cl. 260—683.75 **25 Claims**

1. A process for the isomerization of less-branched paraffinic hydrocarbons to more-branched paraffinic hydrocarbons which comprises contacting said less-branched paraffinic hydrocarbons in the vapor phase at a reaction temperature of from about 180° to about 250° F in the presence of hydrogen and a hydrogen halide with a solid catalytic composition comprising a fused salt complex of an aluminum halide selected from the class consisting of aluminum chloride, aluminum bromide and mixtures thereof and a manganous halide selected from the class consisting of manganous chloride, manganous bromide and mixtures thereof; present on the surfaces of a porous, refractory inorganic oxide carrier; said solid catalytic composition being formed by heating a composite mixture of the halide salt components of the fused salt complex to a temperature above the melting point of the composite, depositing the melted composite on the carrier surfaces and cooling of the carrier containing the melted composite to a temperature below the melting point of the fused salt complex.

4,045,510

METHOD FOR PROVIDING POLYMERS WITH DURABLE IMPROVED PROPERTIES

Robert B. Login, Woodhaven, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Sept. 24, 1975, Ser. No. 616,183
Int. Cl.² C08L *63/00, 77/00*
U.S. Cl. 260—830 P **4 Claims**

1. A method of providing fibers selected from the group consisting of polyamides, polyesters, and polyurethanes with a durable anti-stat coating which comprises

preparing a first polymer having (a) an oxyalkylene content of 20 to 95 weight percent and sufficient to render it hydrophilic and (b) a blocked pendant amino group, said first polymer being difunctional, chain-extending said first polymer by reaction with a difunctional compound selected from the group consisting of diacids, diesters of diacids, diisocyanates and diepoxides to form a chain-extended polymer containing plural blocked-amine functional groups,

hydrolyzing said chain-extended polymer to obtain a polymer containing a plurality of reactive amino groups,

curing the polymer so obtained by reaction with a quantity of a diepoxide effective to produce an anit-stat agent in the form of a non-tacky, definitely cured film, and applying said anti-stat agent to said fibers.

4,045,511

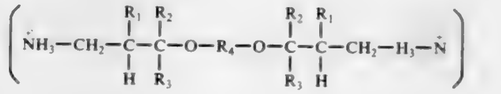
MINIMUM ENERGY PROCESS FOR PREPARING BLOCK COPOLYMERS OF POLYAMIDES

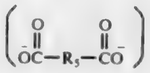
Stephen L. Nickol, Wilmington, Del., assignor to Suntech, Inc., Wayne, Pa.

Filed Nov. 8, 1976, Ser. No. 740,159
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 TW **6 Claims**

1. A process for forming a block polyamide copolymer comprising:

a. blending dry particles of a melt-spinnable polyamide and a dry salt selected from the group consisting of prepolyamides represented by the formula:





wherein

R_1, R_2 and R_3 are selected from the group consisting of H, C_1–C_{10} alkyls and C_3–C_{10} isoalkyls;

R_4 is selected from the group consisting of C_1–C_{10} alkylenes and C_3–C_{10} isoalkylenes; and

R_5 is selected from the group consisting of C_6–C_{14} arylenes, C_0–C_{10} alkylenes and C_3–C_{10} isoalkylenes;

wherein the salt content amounts to between from about 10 weight % to about 75 weight % of the total weight;

b. heating in an inert atmosphere resulting blend of the salt and the polyamide to a temperature in the range of between from the melting point of higher melting component to below about amide-interchange temperature of a mix of the melt spinnable polyamide and polyamide which would result from the polymerization of the salt; and

c. mixing the heated blend at the aforementioned temperature and in the inert atmosphere, until substantially all of the salt and the polyamide are converted to the block polyamide copolymer.

4,045,512

MELT BLENDING POLYAMIDE PROCESS

Robert M. Thompson, and Stephen L. Nickol, both of Wilmington, Del., assignors to Suntech, Inc., Wayne, Pa.

Filed Nov. 26, 1976, Ser. No. 745,320
Int. Cl.² C08L *77/00*
U.S. Cl. 260—857 TW **3 Claims**

1. In the process of melt-blending poly(4,7-dioxadecamethylene adipamide) and polycaprolactam wherein the improvement comprises continuing the melt blending until the clock copolymer is characterized in that the maximum amount of block copolymer recovered from an aqueous formic acid solution containing the dissolved block copolymer exceeds about 90.6 weight %.

4,045,513

ETHYLENE 2,6-NAPHTHALENE DICARBOXYLATED-ALKYLENE-2,5 DIBROMOTEREPHTHALATE FLAME-RETARDANT COPOLYESTERS

William N. Knopka, Wilmington, Del., assignor to Avtex Fibers Inc., Valley Forge, Pa.

Filed Jan. 30, 1973, Ser. No. 328,045
Int. Cl.² C08L *67/00*
U.S. Cl. 260—860 **5 Claims**

1. A filament-forming random copolyester resin of at least 75 mol % of ethylene-2,6-naphthalene dicarboxylate units and at least 5 mol % up to 25 mol % of alkylene-2,5-dibromoterephthalate units wherein the alkylene radical has from 2 to 10 carbon atoms.

4,045,514

THERMOPLASTIC RESIN COMPOSITION COMPRISING METHYL METHACRYLATE RESINS AND A POLYCARBONATE

Shunji Iwahashi; Fukuichi Morizane, both of Toyonaka, and Yasuyuki Kato, Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

Division of Ser. No. 416,875, Nov. 19, 1973, Pat. No. 3,957,921. This application Jan. 30, 1976, Ser. No. 653,762
Claims priority, application Japan, Nov. 18, 1972, 47-116024
Int. Cl.² C08L *69/00, 33/12*
U.S. Cl. 260—873 **8 Claims**

1. A thermoplastic resin composition which consists essentially of from 10 to 95 parts by weight of a methyl methacrylate resin containing at least 80% by weight of methyl methacrylate, from 90 to 5 parts by weight of a styrene-methyl methacrylate copolymer resin having a weight ratio of styrene/methyl methacrylate of from 80/20 to 70/30 and a reduced viscosity of from 0.5 to 3.5 dl/g in a 1% chloroform solution at 25° C. and a polycarbonate resin, the polycarbonate resin being present in an amount of from 5 to 150 parts by weight per 100 parts by weight of the methyl methacrylate resin and the styrene-methyl methacrylate copolymer resin.

4,045,515

FILM OF GOOD TEAR PROPERTY ON IMPACT

Tsutomu Isaka; Shuji Inoue, and Kunihiko Arakawa, all of Inuyama, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Division of Ser. No. 368,519, June 11, 1973, Pat. No. 3,952,073. This application Jan. 8, 1976, Ser. No. 647,630
Claims priority, application Japan, June 9, 1972, 47-57806
Int. Cl.² C08L *23/12, 23/08, 23/06;* **B29G** *27/00*
U.S. Cl. 260—897 A **13 Claims**

1. A biaxially stretched film having an excellent cutting property in the transverse direction, and sufficient break strength in the machine direction to resist breakage by impact in the machine direction, which comprises a mixture of polypropylene and at least one copolymer of ethylene with one or more other copolymerizable ethylenic monomers in a weight ratio of 40 : 60 to 95 : 5, the polypropylene having an isotactic index of not less than 85%, said film satisfying the following requirements:

1. $N_y - N_x = 6 \times 10^{-3}$ to 25×10^{-3} wherein N_x is the refractive index in the machine direction and N_y is the refractive index in the transverse direction;
2. $(N_x + N_y) \times 0.5 - N_z \leqq 0.012$ wherein N_z is the refractive index in the vertical direction and N_x and N_y are each as defined above;
3. the break elongation in the machine direction = 150 to 800%; and
4. no substantial necking is seen on the surface thereof, said film having been stretched at a draw ratio in the machine direction of from 1.05 to 2.0 and at a draw ratio in the transverse direction of not less than 4.

4,045,516

SOLID CURABLE POLYENE COMPOSITIONS CONTAINING A POLYTHIOL

Charles R. Morgan, Silver Spring, Md., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 330,818, Feb. 8, 1973, Pat. No. 3,925,320, which is a continuation-in-part of Ser. No. 250,554, May 5, 1972, abandoned. This application Nov. 24, 1975, Ser. No. 634,720
Int. Cl.² C08L *29/08*
U.S. Cl. 260—886 **9 Claims**

1. A solid curable composition useful for obtaining a solid cross-linked polythioether consisting essentially of:

1. a solid polyene which is the reaction product of a styrene-allyl alcohol copolymer and at least one reactive unsaturated monocarboxylic acid, said polyene containing at least 2 reactive carbon-to-carbon bonds per molecule; and
2. a liquid polythiol containing at least 2 thiol groups per molecule, the total combined functionality of (a) the reactive unsaturated carbon-to-carbon bonds per molecule in the polyene and (b) the thiol groups per molecule in the polythiol being greater than 4.

4,045,517

POLYACRYLIC HOT MELT ADHESIVES

John D. Guerin, Drexel Hill; Thomas W. Hutton, Doylestown; John J. Miller, Warminster, and Richard E. Zdanowski, Fort Washington, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 24, 1975, Ser. No. 634,815
Int. Cl.² C08L *33/14*
U.S. Cl. 260—901 **12 Claims**

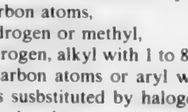
1. A hot-melt adhesive composition comprising a blend or sequential polymerizate of:

A. from about 5 to about 95 parts by weight of an addition copolymer having a Tg in the range of from 0° to −85° C. comprising:

1. from about 85 to about 99.5 parts by weight of a monomer or monomers selected from an alkyl ($C_{2\text{-}18}$) or alkoxyalkyl acrylate and
2. from about 0.5 to about 15 parts by weight of an ethylenically unsatuated amine, carboxylic acid or sulfonic acid or mixtures thereof with

B. from about 5 to about 95 parts by weight of an additiion copolymer having a Tg in the range of from about 20° to about 150° C. comprising:

1. from about 95 to about 99.5 parts by weight of a monomer or monomers of the formula:



wherein R is hydrogen or methyl and R^1 is lower alkyl, lower cycloalkyl or isobornyl and

2. from about 0.5 to about 15 parts by weight of an ethylenically unsaturated amine, carboxylic or sulfonic acid or mixtures thereof,

said components being compatible, one of the polymers A and B having acid groups and the other having amine groups.

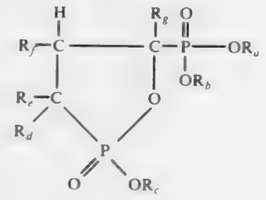
4,045,518

1,2-OXAPHOSPHOLANES

Helmut Zondler, Bottmingen; Emil Saladin, Augst, and Rudolf Kirchmayr, Munchenstein, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 499,888, Aug. 23, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,455
Claims priority, application Switzerland, Sept. 7, 1973, 12890/73; May 21, 1974, 6981/74; July 29, 1974, 10465/74
Int. Cl.² C07F *9/15;* **C08K** *5/53*
U.S. Cl. 260—927 R **10 Claims**

1. A compound of the formula Ia



(Ia)

wherein each of R_a, R_b and R_c independently represents alkyl of 1 to 18 carbon atoms, haloalkyl with 2 to 18 carbon atoms, alkoxyalkyl having not more than 18 carbon atoms, alkenyl with 3 to 18 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, aralkyl with 7 to 15 carbon atoms aralkyl with altogether 7 to 15 carbon atoms which is substituted by halogen or alkoxy groups of 1 to 4 carbon atoms,

R_d represents hydrogen or methyl,

R_e represents hydrogen, alkyl with 1 to 8 carbon atoms, aryl with 6 to 10 carbon atoms or aryl with 6 to 10 carbon atoms which is susbstituted by halogen, alkyl or alkoxy groups with 1 to 4 carbon atoms, and with the proviso that when R_e is hydrogen or alkyl, none of R_a, R_b or R_c can be alkyl,

R_f represents hydrogen, methyl or phenyl, and

R_g represents alkyl with 1 to 8 carbon atoms, aryl with 6 to 10 carbon atoms or aryl with 6 to 10 carbon atoms which is substituted by halogen, alkyl or alkoxy with 1 to 8 carbon atoms.

4,045,519

PROCESS FOR PREPARING DIALKYLPHOSPHITES

William E. Wright, Farmington, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Sept. 16, 1976, Ser. No. 723,761
Int. Cl.² C07F *9/141;* **C10M** *1/44*
U.S. Cl. 260—976 **5 Claims**

1. A process for making a di-$C_{1\text{-}4}$ alkylphosphite in high yield, said process comprising

a. forming a mixture of about 1.8–2.5 moles of a $C_{1\text{-}4}$ alkanol and about 0.5 to 1.2 moles of water,

b. adding about one mole PCl_3 to said mixture and reacting at about 0° to 70° C.,

c. distilling dialkylphosphite from the reaction product of (b), leaving a distillation residue,

d. adding about 0.5 to 5 parts by weight of said alkanol to each part by weight of said distillation residue and heating the resultant mixture at 65° to 140° C., and

e. distilling additional dialkylphosphite from the final reaction product.

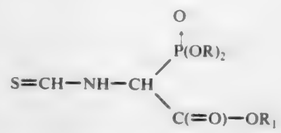
4,045,520

PROCESS FOR THE MANUFACTURE OF THIOFORMAMIDO-PHOSPHONO-ACETATES

Jacques Gosteli, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

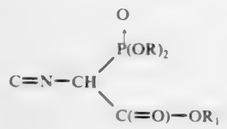
Filed Aug. 28, 1975, Ser. No. 608,798
Claims priority, application Switzerland, Sept. 11, 1974, 12353/74
Int. Cl.² C07F *9/40*
U.S. Cl. 260—985 **13 Claims**

1. A process for the manufacture of a thioformamidophosphono-acetate of the formula



(I)

wherein R represents lower alkyl, aryl or aryl-lower alkyl and R_1 represents a radical which protects the carboxyl group, characterized in that an isocyano compound of the formula $C{\equiv}N{-}CH_2{-}X_1$ (II) is reacted in the presence of a base with a compound of the formula $R_o{-}X_2$ (III), one of the radicals X_1 and X_2 representing a group of the formula $-C(=O)-OR_1$ (A) and the other representing a group of the formula $-P(\rightarrow O)(OR)_2$ (B) and R_o representing halogen or a reactive etherified or esterified hydroxyl group, and hydrogen sulphide is added on to the isocyano group of a resulting phosphono-isocyano-acetate of the formula



(IV)

4,045,521

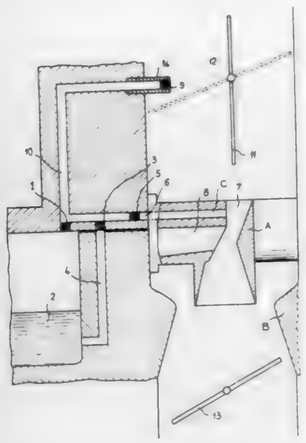
CARBURETTOR ENRICHING DEVICE

Jean-Yves Lemonnier, and Lucien Chatelain, both of Boulogne-Billancourt, France, assignors to Regie Nationale des Usines Renault and Automobiles Peugeot, both of Paris, France

Filed Sept. 13, 1976, Ser. No. 722,356
Claims priority, application France, Sept. 15, 1975, 75/28263
Int. Cl.² F02M *7/04*
U.S. Cl. 261—41 R **2 Claims**

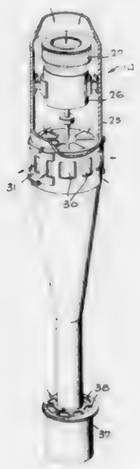
1. Enriching device for carburettors of internal combustion engines, comprising an aeration gaged orifice located at the upper portion of the float tank of the carburettor, a fuel gaged orifice communicating with the bottom of said fuel tank, and air/fuel mixture gaged orifice disposed in a passage interconnecting said aeration gaged orifice and said fuel gaged orifice and delivering said mixture at the level of the carburettor venturi, and an additional gaged orifice opening into the main passage of the carburettor, wherein said additional gaged ori-

fice is located at the end of a pipe section projecting to a predetermined extent into the main passage upstream of said venturi and slightly upstream of the closed position of the starter shutter, whereby said additional gaged orifice, according to the negative pressure discrepancy existing between its position and that of the mixture gaged orifice, will regulate the richness of the air/fuel mixture by performing successively as



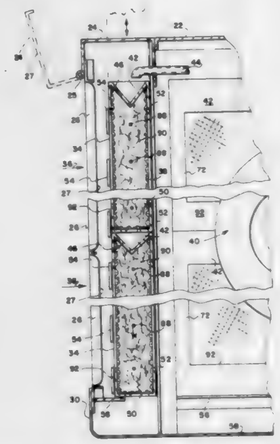
an additional air inlet orifice for producing a leaner mixture passing through the mixture gaged orifice under low or moderate engine load conditions, this function decreasing gradually to zero, during the range of part-load operating conditions, and then as a gaged orifice supplying an additional output of air/fuel mixture, therefore as an enriching device, under high/load engine conditions.

4,045,522
ANIMAL WASTE TREATMENT SYSTEM
Joel L. Nafziger, R.R. 1, Hopedale, Ill. 61747
Division of Ser. No. 430,475, Jan. 3, 1974, Pat. No. 3,927,644.
This application Oct. 10, 1975, Ser. No. 621,392
Int. Cl.[2] F04F *5/02*; F04B *23/02*
U.S. Cl. 261—93 **5 Claims**



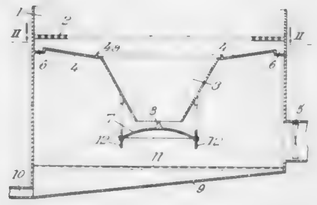
1. An aeration pump for use in a waste treatment system in which a slurry of animal waste and water is pumped and aerated, including the combination of a motor, a centrifugal fan driven by the motor, first and second pluralities of blades driven by the motor, a housing having a hollow interior in air receiving proximity to the centrifugal fan, a plurality of adjustable vents communicating with the hollow interior of the housing for venting a selected portion of air received by the hollow interior of the housing from the centrifugal fan to establish a desired level of aeration of the slurry, the bottom portion of the housing having a fluid inlet above the blades for directing the slurry into the first plurality of blades to pump the slurry, means for directing air from the hollow interior of the housing into the region of the second plurality of blades to aerate the slurry and a fluid outlet below the blades whereby the slurry is driven through the pump and aerated to a degree providing optimum bacterial action with a minimum foam production.

4,045,523
EVAPORATIVE COOLER WITH SUPERIMPOSED DISPOSABLE PAD ASSEMBLIES
Adam D. Goettl, P.O. Box 10036, Phoenix, Ariz. 85016
Filed June 9, 1975, Ser. No. 585,389
Int. Cl.[2] B01D *1/00*
U.S. Cl. 261—97 **2 Claims**



1. In an evaporative cooler the combination of: a frame; a sump pan secured to a lower portion of said frame; a plurality of superimposed foraminous evaporative cooler pad assemblies held by said frame above said sump pan; each pad assembly having an inlet side and an outlet side; means for forcing air through said pad assemblies in a direction from said inlet side toward said outlet side; each of said pad assemblies having an upper portion; a water trough in said upper portion; each water trough having a plurality of water distributor openings disposed and adapted to deliver water to an upper portion of a respective pad assembly therebelow; a foraminous water holding pad means below each trough; each of said pad assemblies having a lower portion provided with a water outlet opening; means disposed for delivering water into the trough of an uppermost pad assembly of said plurality; one of said pad assemblies being disposed such that said water outlet opening thereof is disposed above and adjacent to said trough one of said superimposed pad assemblies whereby water which tends to be forced by air towards said outlet side of each pad assembly drains from a respective water outlet opening into a respective water trough of a next lower one of said pad assemblies whereupon the respective water distributor openings thereof direct water into the upper portion of the respective water holding pad means therebelow; an inlet louver grill supported by said frame in spaced relation to said inlet sides of said pad; said louver grill having a lower channel portion; pan means having an upper edge portion supporting said lower edge portion of said louver grill; said louver grill having an upper edge portion provided with an upwardly directed open channel portion; a pivoted access door pivotally mounted on an axis in spaced relation to said louver grill; said access door having an edge portion engageable in said upwardly directed channel portion at the upper edge of said louver grill and means for holding said access door downwardly such that it is held in engaged relation with said upwardly directed channel portion of said louver grill for holding the same in closed position.

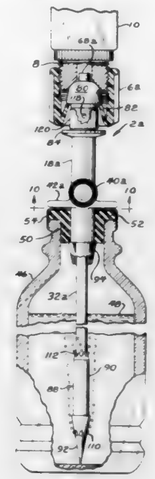
4,045,524
INSTALLATIONS FOR WASHING A POLLUTED GAS
Paul Bornert, La Celle Saint-Cloud, France, assignor to Air-Industrie, France
Continuation of Ser. No. 451,681, March 15, 1974, abandoned.
This application May 3, 1976, Ser. No. 682,595
Claims priority, application France, Mar. 20, 1973, 73.09949
Int. Cl.[2] B01D *47/00*
U.S. Cl. 261—112 **11 Claims**



1. Installation for washing a polluted gas comprising a vertically oriented trickling channel, the cross-section of which diminishes from above to below and which includes an opening at the lowermost end thereof, said opening being situated in a substantially horizontal plane, distributing means for causing washing liquid to trickle over the inner walls of said trickling channel in the form of a film so that the washing liquid detaches itself from the edge of the lower end of the trickling channel in the form of a sheet, at least one transverse wall situated in a substantially horizontal plane and extending across substantially the entire width of said opening, said transverse wall being arranged below the lower end of the trickling channel so that said sheet of liquid impinges directly thereon and having a continuous or discontinuous contour similar to the continuous or discontinuous contour of the lower end of said trickling channel, and means for circulating the polluted gas from above to below in said trickling channel such that said gas passes through said channel inwardly of said film of washing liquid and contacts and passes through said sheet of washing liquid, the distance between the uppermost major surface of said transverse wall and the lowermost end of the trickling channel being less than the width of the opening at the lowermost end of the trickling channel and said transverse wall cooperating with the lowermost end of the trickling channel to defined an area therebetween of such a shape and size that the sheet between the lower end of the trickling channel and said transverse wall is substantially free from tearing.

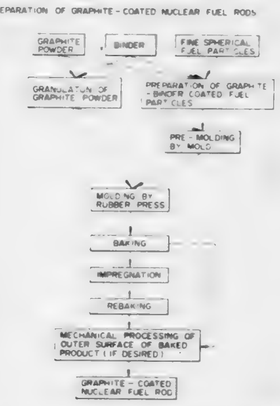
4,045,525
GAS HUMIDIFICATION APPARATUS
James A. Huggins, 551 W. Park Ave., Libertyville, Ill. 60048
Continuation of Ser. No. 480,843, June 19, 1974, abandoned.
This application July 23, 1976, Ser. No. 708,115
Int. Cl.[2] B01F *3/04*; A61M *15/00*
U.S. Cl. 261—124 **13 Claims**

1. In a connector for a gas humidification apparatus that includes a container of the type having a sealed but pierceable closure, a body having a tubular portion and a gas supply tube axially slidable therein, said gas supply tube being of substantially smaller diameter than that of said tubular portion to form a chamber by the part of the bore of said tubular portion that is unoccupied by said gas supply tube, said gas supply tube having an outlet end with a diffuser thereon, cooperating means comprised of an exterior wall portion of the tube disposed about and spaced from an interior wall portion on said diffuser and including divider elements forming a series of individual passageways communicating with said chamber and running longitudinally of said diffuser and exteriorly of said



tube, said passageways also communicating with said outlet end and terminating in groups of gas discharge openings spaced longitudinally along said diffuser, said individual passageways defining gas flow channels from the gas supply tube to the interior of said container, and means on said diffuser for piercing the pierceable closure.

4,045,526
PROCESS FOR THE PREPARATION OF GRAPHITE-CLAD NUCLEAR FUEL RODS
Kazumi Iwamoto, Naka; Tutomu Tobita, Katsuta; Toshio Masuyama, and Hiroshi Yamazoe, both of Yokohama, all of Japan, assignors to Nippon Carbon Co., Ltd. and Japan Atomic Energy Research Institute, both of Tokyo, Japan
Filed Mar. 17, 1975, Ser. No. 559,298
Claims priority, application Japan, Mar. 22, 1974, 49-31552
Int. Cl.[2] G21C *21/02, 21/16*
U.S. Cl. 264—.5 **10 Claims**



1. A process for the preparation of tubular crack-free graphite-coated nuclear fuel compacts which comprises the steps of: coating fine particles of a nuclear fuel with a matrix material formed by mixing 100 parts by weight of graphite powder

with 20 to 35 parts by weight of a binder, to form matrix material-coated globules,

pre-molding the thus coated globules in a tube forming pre-molding machine to obtain a tubular fuel compact,

charging the thus obtained tubular fuel compact into the rubber mold of a rubber press molding machine,

filling a matrix material formed by mixing 100 parts by weight of graphite powder with 15 – 20 parts by weight of a binder, around the tubular fuel compact in the rubber mold,

conducting compression molding by compressing the side face of the thus obtained whole mass towards the axis of the whole mass in the radial direction thereof by means of the rubber press, to form a green, matrix material-coated fuel compact,

baking the thus formed green matrix material-coated compact at a temperature of up to 1800° C to thereby prepare the tubular crack-free graphite-coated nuclear fuel compacts, and if desired,

impregnating the thus prepared product with a resin and subjecting the impregnated product to rebaking at a temperature of up to 1800° C for further densification thereof.

4,045,527

POLYURETHANE AND COMPOSITE THEREOF

Eduard P. Babayan, Huntington Beach, and Michael H. Rourke, Santa Ana, both of Calif., assignors to Hitco, Irvine, Calif.

Continuation-in-part of Ser. No. 508,507, Sept. 23, 1974, abandoned. This application Feb. 3, 1976, Ser. No. 654,956

Int. Cl.[2] B29D *3/02;* **C08G** *18/48, 18/26;* **B32B** *27/40*

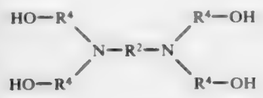
U.S. Cl. 264—46.7 **18 Claims**

1. A mobile, curable, reactive sealant, casting or potting composition consisting essentially of;

100 parts of a liquid prepolymeric polytetramethylene glycol polyol resin having a functionality from 1.7 to 3.5 and a molecular weight from 500 to 5,000;

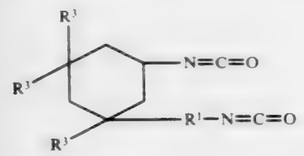
0.05 to 0.2 parts per 100 parts of glycol prepolymer resin (phr) of a metal salt curing catalyst selected from the group consisting of dibutyltindilaurate, zinc octoate, lead octoate and zirconium acetylacetonate; and

4–20 phr of a tetraalkanol amine curing agent of the formula:



where R^2 is alkylene of 2–6 carbon atoms and R^4 is selected from straight or branch chain alkylene or polyether containing 1–8 carbon atoms; and

50–70 parts by weight of a diisocyanate, at least 50% by weight of which is a cycloaliphatic isocyanate selected from compounds of the formula:



where R^1 is alkylene of 1–10 carbon atoms and R^3 is a lower alkyl of 1–8 carbon atoms.

4,045,528

METHOD FOR MAKING LAMINATED PARTICLEBOARD OF ORIENTED WOOD PARTICLES

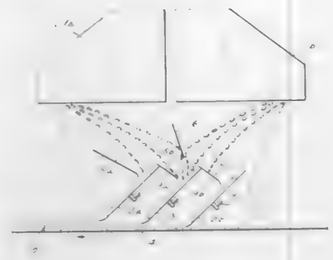
Urman Alexandrov Urmanov, Sofia, Bulgaria, assignor to DSO "Stara Planina", Sofia, Bulgaria

Division of Ser. No. 430,909, Jan. 4, 1974, Pat. No. 3,963,400. This application Jan. 10, 1975, Ser. No. 539,994

Claims priority, application Bulgaria, Apr. 25, 1973, 23438

Int. Cl.[2] B29J *5/00*

U.S. Cl. 264—69 **1 Claim**



1. A method of forming a multilayer blanket of wood particles adapted to be formed into particle board, said method comprising the steps of:

providing a conveyor belt support surface;

classifying by particle size a mass of wood particles and dispensing the classified particles above said surface in at least three streams, including a finest-particle stream, a fine particle stream and a coarse particle stream;

permitting said finest-particle stream to fall unintercepted on said surface;

intercepting each of the other particle streams upon a respective guide plate inclined downwardly and in the direction of displacement of said surface toward the latter for laying the particles of said other streams on said surface in respective layers, said plates being formed with mutually parallel downwardly extending channels adapted to receive the respective wood particles and orient them longitudinally as they meet said surface and the respective layers; and

vibrating said plates to align the successive particles in each of said channels.

4,045,529

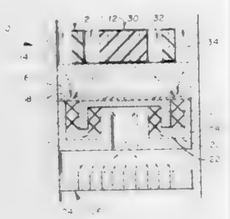
PROCESS FOR MAKING PRODUCER-COLORED FIBERS, YARNS, FILMS AND RELATED PRODUCTS

Bobby M. Phillips, and Dale R. Gregory, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,646

Int. Cl.[2] D01F *1/02;* **B01D** *47/00*

U.S. Cl. 264—75 **8 Claims**



1. Process for producing one or more colored filaments from a spinneret, the process comprising:

extruding from a source a flow of polymer to the spinneret, placing in the path of flow between the polymer flow and the spinneret a dye solid or pigment solid having a predetermined shaped surface area for continuous exposure to the polymer flow, and

flowing the polymer into contact against the exposed surface of the dye solid or pigment solid and by such contact dissolving at a predetermined rate a predetermined portion of the dye solid or pigment solid into the polymer flow and with such predetermined portion providing a desired concentration of dye or pigment in the polymer flow.

4,045,530

METHOD OF MANUFACTURING SHATTERPROOF COMBUSTION TYPE PHOTOFLASH LAMPS

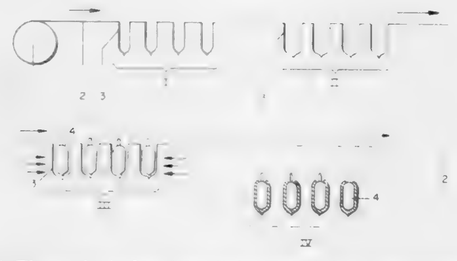
Hans Reiber, Augsburg, Germany, assignor to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H., Germany

Filed Oct. 5, 1976, Ser. No. 729,733

Claims priority, application Germany, Oct. 16, 1975, 2546403

Int. Cl.[2] B29C *17/04*

U.S. Cl. 264—92 **5 Claims**



1. The method of applying light-transmitting organic plastic shatterproof sleeves to the exterior of combustion-type photoflash lamps, which method comprises:

a. placing proximate mold means having a configuration corresponding to but slightly smaller than the dimensions of the lamps to be sleeved, a strip of light-transmitting organic plastic having a thickness of from about 0.3mm to about 0.8mm, a tough-plastic characteristic within the temperature range A of from about 160° C to about 200° C, a tough-elastic characteristic within the temperature range B of from about 90° C to about 125° C, and a freezing temperature T_E of from about 65° C to about 70° C; and heating said plastic strip to a temperature within said temperature range A and deep-drawing said heated organic plastic strip into said mold means to form organic plastic cups;

b. heating the formed organic plastic cups to a temperature within said temperature range B, and enlarging the heated organic plastic cups to a dimension slightly larger than the dimensions of the lamps to be sleeved, and freezing said enlarged organic plastic cups by reducing the temperature of said enlarged cups to less than said temperature T_E;

c. placing the lamps to be sleeved into said frozen cups;

d. heating said cups to cause same to shring-fit onto and sleeve said lamps; and

e. severing said sleeved lamps from residual organic plastic strip.

4,045,531

PROCESS FOR THE PRODUCTION OF CHIPBOARDS AND THE LIKE

Berndt Greten, Springe, Deister, Germany, assignor to bison-Werke Bahre & Greten GmbH & Co. KG, Germany

Filed June 24, 1975, Ser. No. 589,693

Claims priority, application Germany, June 28, 1974, 2431180

Int. Cl.[2] B29J *5/00*

U.S. Cl. 264—113 **10 Claims**

1. In the process for the production of particle boards which comprises:

a. intermixing particles with a heat-curable binder to cover the particles with said binder;

b. air screening the binder-covered particles to deposit a layer of the particles onto a support;

c. transporting the layer of particles into a first press;

d. prepressing the layer of particles within said first press to form a prepressed layer of particles;

e. transporting the prepressed layer of particles to a second press; and

f. pressing the prepressed layer of particles in said second press and heating the layer of particles within said second press to effect curing of said binder whereby the particles are bonded together to form a particle board;

the improvement which comprises

heating the air used in (b) for air-screening of the particles to provide more uniform temperature distribution through the thickness of the layer of particles transported to said first and second presses, the maximum temperature of the air being limited to avoid curing of the binder prior to compression of the particles in the first and second presses.

4,045,532

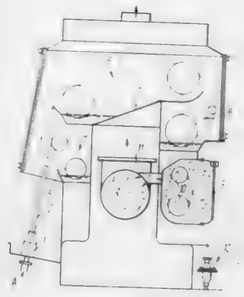
PROCESS OF PRODUCING VISCOSE YARN

Arkady Trofimovich Serkov, prospekt Mira, 13/19, kv. 20; Gennady Alfeevich Budnitsky, ulitsa Onezhskaya, 55, kv. 45, both of Moscow; Boris Matveevich Sokolovsky, ulitsa Pervomaiskaya, 27, kv. 71, Mytischi Moskovskoi oblasti, and Vyacheslav Kapitonovich Lezhnev, ulitsa Osipenko, 9, kv. 57, Moscow, all of U.S.S.R.

Filed Oct. 29, 1974, Ser. No. 518,793

Int. Cl.[2] D01F *2/06*

U.S. Cl. 264—196 **2 Claims**



1. A process of producing viscose yarn comprising providing a spinning bath, feeding a viscose solution through spinneret dies into said spinning bath to spin viscose yarn, finally regenerating and concurrently cooling the spun yarn, now carrying entrapped carbon bisulfide in the form of an emulsion, from said spinning bath at a temperature below the boiling point of the carbon bisulfide, then, while maintaining the finally regenerated yarn in the cooling condition, washing the yarn with water whereby some water, in addition to the carbon bisulfide, is also entrapped in the yarn and subjecting the thus-washed yarn to avivage treatment, drying the resulting yarn at an elevated temperature sufficient to concurrently remove both the entrapped water and carbon bisulfide from the yarn, and winding the resulting dried, carbon bisulfide-free yarn into a package.

4,045,533

METHOD OF MANUFACTURING PRESTRESSED REINFORCED CONCRETE ARTICLES

Viktor Vasilievich Mikhailov, ulitsa Chkalova, 25, kv. 14; Semen Lvovich Litver, Bolshaya Pirogovskaya, 37/43, Korpus A, kv. 32, and Alexandr Konstantinovich Karasev, ulitsa Georgiu Dezh, 2/I, kv. 192, all of Moscow, U.S.S.R.

Continuation of Ser. No. 56,948, July 21, 1970, abandoned. This application Jan. 15, 1973, Ser. No. 323,823

Int. Cl.[2] B28B *1/00, 11/00*

U.S. Cl. 264—228 **4 Claims**

1. A method of manufacturing prestressed reinforced concrete articles, consisting essentially of the following operations: moulding the articles from a concrete containing a stressing cement mixture of Portland cement with an added expanding component consisting essentially of a mixture of calcium sulphate, calcium aluminates and calcium oxide; curing the articles until they acquire a stripping strength; stripping said articles, subjecting said articles to hydrothermal treatment under water at a temperature which is not below 50° C for 1–4 hours, and subsequently keeping said articles in cold water for 3–4 days.

4,045,534

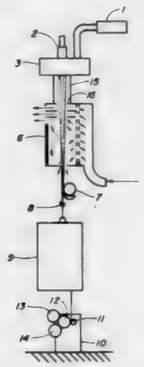
PROCESS FOR MELT-SPINNING SYNTHETIC FIBERS

William Bernard Fisher; Dong Wha Kim, both of Chester; Orin Wyatt Norwood, Richmond, all of Va.; John Walter Showers, Raleigh, N.C.; Eugene Addison Swanson, Disputanta, and Gene Clyde Weedon, Richmond, both of Va., assignors to Allied Chemical Corporation, Morris Township, N.J.

Continuation of Ser. No. 473,260, May 24, 1974, Pat. No. 3,936,253. This application Oct. 28, 1975, Ser. No. 626,156

Int. Cl.[2] B29C *25/00;* **D01D** *3/00*

U.S. Cl. 264—237 **5 Claims**



1. In a process for melt spinning synthetic fibers from a high-molecular weight thermoplastic polymer selected from the group consisting of linear polyester and polyamide polymers, comprising the steps of supplying a melt of said polymer at a temperature below the spinning temperature, heating the melt to spinning temperature immediately prior to filament formation, extruding the molten synthetic polymer downwardly through a spinneret having a plurality of extrusion orifices into a gaseous medium and cooling the polymer to form filaments and drawing the filaments at draw ratios of at least 4, the improvement comprising: extruding the molten synthetic polymer at a rate of at least 50 pounds per hour downwardly through a spinneret having a plurality of extrusion orifices; advancing the extruded filaments downwardly through a substantially stationary column of air having a height of 0.5 to 2 feet and a temperature of 100° to 330° C. immediately below the spinneret, the average distance between adjacent filaments immediately below the spinneret being at least 0.24 inch; continuously advancing the filaments downwardly through a top zone of a quenching chamber wherein the filaments are cooled with cooling air laterally introduced into the path of the filaments at a temperature not above 35° C., said top zone of said quenching chamber having 2 to 5 horizontal sections, intended to provide guided travel of the cooling air transverse to the downward movement of said filaments; then continuously advancing the filaments downwardly through a middle zone of said quenching chamber wherein the filaments are cooled with cooling air laterally introduced into the path of the filaments not above 35° C., said cooling air passing upwardly to a vent opening, thereby contacting said filaments countercurrent to the downward movement of said filaments; and then continuously advancing the filaments downwardly through a bottom zone of said quenching chamber wherein the filaments are cooled with cooling air laterally introduced into the path of the filaments at a temperature not above 35° C., said cooling air passing downwardly to a vent opening, thereby contacting said filaments cocurrent to the downward movement of said filaments; said quenching chamber having a height of at least 60 inches and said filaments being contacted with air at a volumetric rate of 200 to 700 cubic feet of air per pound of filaments entering the quenching chamber, the temperature of the filaments being reduced to not over 55° C., whereby a yarn having improved uniformity is produced at a production rate of at least 50 pounds per hour through the spinneret.

4,045,535

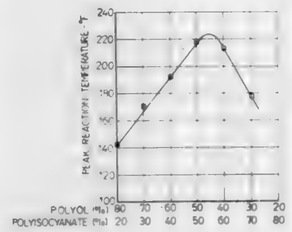
METHOD OF CASTING COMPOSITIONS IN ELASTOMERIC MOLDS

Raymond M. Putzer, Racine, Wis., assignor to Resment Inc., Racine, Wis.

Filed Oct. 28, 1975, Ser. No. 626,367

Int. Cl.[2] C08G *14/14, 18/08*

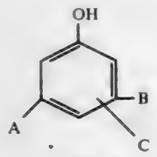
U.S. Cl. 264—313 **18 Claims**



1. A method of molding a substantially bubble free object with a mold release value of at least about 10 inches of mercury and with a critical surface tension for wetting of at least about 35 dynes/cm. that undergoes a change in volume of less than about 1%, comprising: introducing into an elastomeric mold an admixture substantially free from water and entrapped air, of a phenolic polyol, a polyisocyanate and a curing catalyst wherein:

I. said polyol is:

a. an organic solvent soluble benzylic ether polyol which contains benzylic ether group and which comprises a condensation polymer of a phenol having the general formula:



wherein A, B, and C are hydrogen, hydrocarbon radicals, oxyhydrocarbon radicals or halogen, condensed with an aldehyde having the general formula R'CHO wherein R' is hydrogen or a hydrocarbon radical of one to eight carbon atoms in the presence of catalytic concentrations of a metal ion, or

b. a methylol-terminated phenolic polyol which comprises a resole polyol which is organic solvent soluble;

II. said hardener component is a liquid polyisocyanate containing at least two isocyanate groups;

III. said curing agent is a base having a pK_b value in the range from between about 7 and about 11 and is present in an amount equal to 0.01 to 10.0 weight percent based on the weight of the polyol, and

IV. the components are mixed in the mold, the peak reaction temperature is maintained below about 235° F. the composition is maintained free from foaming and phase inversion is obtained by:

a. controlling the ratio of polyol to polyisocyanate from between about 1:2 and 2:1,

b. selecting solvents with flash points above the peak reaction temperature, and

c. maintaining a catalyst concentration sufficient to avoid adverse secondary reactions; the cured casting is removed from the mold by applying a vacuum from between about 10 and about 25 inches of Mercury to the mold cavity.

4,045,536

METHOD OF CASTING BISMUTH, SILICON AND SILICON ALLOYS

John F. Wallace, Shaker Heights, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed July 8, 1975, Ser. No. 594,184

Int. Cl.[2] B22D *21/00*

U.S. Cl. 264—327 **4 Claims**



1. In a method of preparing castings of materials having solidification expansion, which materials are chosen from the group consisting of bismuth, silicon and silicon alloys containing in excess of 92 atomic percent silicon, wherein the molten material is cooled to establish a casting thereof in a container, the improvement comprising cooling said material in a rigid, elongated, vertically disposed container having a higher rate of heat transfer our of said container in lower portions thereof then in higher portions thereof while applying heat to the top of said casting as said casting solidifies whereby to maintain a core and a portion of the top of the casting molten and in liquid communication with each other until the casting is substantially solidified.

4,045,537

PROCESS FOR RECOVERING SODA AND ALUMINA VALUES FROM RED MUD

Kizhakke G. Hrishikesan, Little Rock, Ark., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 593,109, July 3, 1975, abandoned. This application Oct. 8, 1976, Ser. No. 730,952

Int. Cl.[2] C01F *7/08*

U.S. Cl. 423—119 **6 Claims**

3. A recovery process for recovering available soda and alumina values from a high iron-Bayer red mud, comprising:

A. adding from 0.33 to about 3 moles of carbon in a carbon-containing material per mole of Fe_2O_3 to said high iron-Bayer red mud to form a mixture;

B. subjecting said mixture to a conventional lime-soda-sinter operation to form a sinter; and

C. without prior separation of iron from said sinter, extracting said sinter with an NaOH solution to recover said available soda and alumina values.

4,045,538

CATALYTIC OXIDATION OF VINYL CHLORIDE

Edward J. Sare, Clinton, and Jerome M. Lavanish, Akron, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 636,231, Nov. 28, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,535

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 **19 Claims**

1. A method for reducing the vinyl chloride content of a vinyl chloride-containing gas stream, which comprises contacting the vinyl chloride of said gas stream with an oxidizing amount of oxygen-containing gas at temperatures of from 20° to 300° C. in the presence of hydrated metal oxide catalyst selected from the group consisting of copper (II) oxide, manganese (IV) oxide, manganese (III) oxide, manganese (II, III) oxide, and mixtures of such manganese oxides with copper (II) oxide or copper (I) oxide for a time sufficient to reduce said vinyl chloride content of the gas stream, said temperature being such as to inhibit water induced loss of catalyst activity.

4,045,539

PROCESS FOR DECONTAMINATING GAS CONTAINING RADIOACTIVE IODINE

Mikio Hirano; Masaki Takeshima; Toru Saito, and Atou Shimozato, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 31, 1975, Ser. No. 546,192

Claims priority, application Japan, Feb. 1, 1974, 49-12778

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—240 **15 Claims**



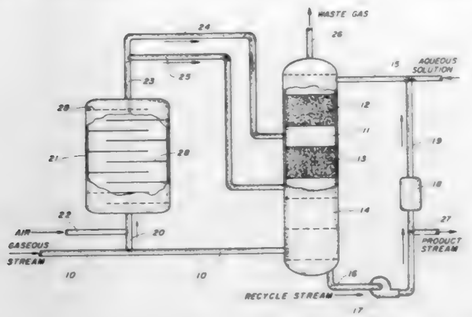
1. A process for decontaminating a vent gas containing radioactive iodine and radioactive methyl iodide, which comprises (1) chemically adsorbing iodine onto an activated carbon layer, (2) retaining the adsorbed iodine in a tightly sealed state for a predetermined period of time after the adsorption of iodine reaches a saturated state thereby decaying the radioactivity of the adsorbed iodine, (3) desorbing the adsorbed iodine by heating when decay of the radioactivity is completed thereby regenerating the activated carbon, (4) heating the vent gas passing out of said activated carbon layer during iodine adsorption, and (5) passing the heated vent gas through another activated carbon packed layer thereby decaying the radioactivity of the methyl iodide.

4,045,540

PROCESS FOR THE SYNTHESIS OF AMMONIUM NITRITE

Richard Ross Hertzog, Morristown, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 10, 1976, Ser. No. 665,584
Int. Cl.[2] C01B *21/50*
U.S. Cl. 423—385 **5 Claims**



1. In a process for producing ammonium nitrite by the absorption of a gas containing nitric oxide, nitrogen dioxide, oxygen and at least 65 percent by volume of inert gas in an absorption system with an aqueous absorbing solution containing a basically reacting ammonium compound selected from the group consisting of ammonium carbonate, ammonium bicarbonate, ammonium hydroxide and mixtures thereof, employing entering gas with at least 2.0 mol ratio of nitric oxide:-nitrogen dioxide and employing absorbing solution having normality of at least 0.01 with respect to the basically reacting ammonium compound, the improvement which comprises adding supplemental nitrogen dioxide to said gas being absorbed in the absorption system in amount sufficient to maintain a nitric oxide:nitrogen dioxide mol ratio between 0.8 and 1.0 in the exiting gas, said supplemental nitrogen dioxide being added to said gas when the absorption of nitrogen oxides is 50 to 95 percent complete based on the nitrogen oxides in the entering gas.

4,045,541

CARBONYLATION PROCESS

David L. Mercer, Wainfleet, Canada, assignor to The International Nickel Company, Inc., New York, N.Y.

Filed Oct. 6, 1975, Ser. No. 620,157
Claims priority, application Canada, June 25, 1975, 230113
Int. Cl.[2] C01G *1/04*
U.S. Cl. 423—417 **5 Claims**

1. A process for the production of nickel carbonyl wherein a mass comprising elemental nickel intimately mixed with at least one half mole per each 100 moles of nickel of at least one metal which forms sulfides more readily than nickel and is selected from the group of metallic iron, metallic copper and metallic cobalt in the temperature range of up to about 200° C is confined in a pressure retaining enclosure having walls chemically resistant to carbonylation and sulfidation and having a gas entry port and a gas exit port, mixing in said enclosure or in an extension thereof having walls chemically resistant to carbonylation and sulfidation a first gas stream containing carbon monoxide and devoid of hydrogen sulfide and a second gas stream containing hydrogen sulfide and devoid of carbon monoxide to provide a mixed gas stream containing about 0.01% to about 0.5% hydrogen sulfide based upon volume of carbon monoxide, reacting said mixed gas stream with said mass in said enclosure while maintaining the pressure in said enclosure at about 1 to 70 atmospheres absolute, while maintaining the temperatures in said enclosure at about 40° C to about 200° C and while maintaining an excess of metal which forms sulfides more readily than nickel to form nickel carbonyl and non-nickel sulfides and to remove hydrogen sulfide from said gas stream and withdrawing nickel carbonyl along with other volatile carbonyl from said enclosure through said gas exit port in a gas stream devoid of sulfur components.

4,045,542

PRODUCTION OF CHLORINE DIOXIDE

Willard A. Fuller, Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 532,666, Dec. 13, 1974, Pat. No. 3,975,505. This application Aug. 6, 1976, Ser. No. 712,283
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.[2] C01B *11/02, 7/04;* **C01D** *3/04*
U.S. Cl. 423—478 **14 Claims**



1. In a process for continuously generating a mixture containing chlorine dioxide, chlorine and an alkali metal salt wherein

a. an alkali metal chlorate and hydrochloric acid are continuously reacted in proportion to generate chlorine dioxide and chlorine;

b. the temperature is maintained from about 50 to about 100° C;

c. The acidity of the reaction solution is maintained within the range of about 0.05 to about 2.5 normal;

d. chlorine dioxide and chlorine produced by said reaction is withdrawn from the reactor;

e. water is removed and alkali metal salt of said hydrochloric acid is crystallized in the form of an aqueous slurry containing minor amounts of chlorate, and acid values;

The improvement which comprises:

continuously passing the slurry containing alkali metal salt crystals into the top of a separatory column, in a downward flow;

countercurrently passing a stream of water continuously upwardly through said column at a rate sufficient to effect washing of the downwardly flowing crystals whereby chlorate, chloride and acid values recovered therefrom are continuously and substantially completely returned to the reaction of (a) aforesaid; and continuously removing an aqueous slurry of substantially pure alkali metal chloride salt crystals from the bottom of said separatory column.

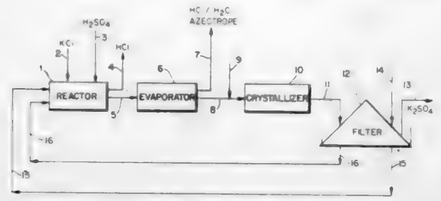
4,045,543

PRODUCTION OF POTASSIUM SULFATE AND HYDROGEN CHLORIDE

John B. Sardisco, Shreveport, La., assignor to Pennzoil Company, Shreveport, La.

Filed Nov. 12, 1975, Ser. No. 630,954
Int. Cl.[2] C01B *7/08;* **C01D** *5/02*
U.S. Cl. 423—482 **6 Claims**

1. A method for the production of potassium sulfate and potassium hydrogen sulfate which comprises initially reacting potassium chloride and sulfuric acid in an aqueous medium at a temperature of about 65° to 120° C. under conditions to form hydrogen chloride and removing a portion of the hydrogen chloride from the reaction zone by gaseous evolution, thereafter subjecting the resulting aqueous solution to azeotropic distillation at temperatures in the range of from 90° to 110° C., and removing an HCl/water azeotrope until the remainder of



the hydrogen chloride has been removed, and form a resulting aqueous slurry, thereafter adding to the resulting aqueous slurry an amount of water which is substantially equivalent to the amount of water removed with the azeotrope to again form an aqueous solution, cooling the aqueous solution to a temperature of about 30°–75° C., to allow a solid precipitate to crystallize from solution, and recovering the solid which comprises a mixture of potassium sulfate and potassium hydrogen sulfate.

4,045,544

PROCESS FOR THE PREPARATION OF FERROMAGNETIC CHROMIUM DIOXIDE

David Wyckoff Williston, Newark; Lewis Clinton Bancroft, and Dale Murray Hiller, both of Wilmington, all of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 31, 1976, Ser. No. 719,167
Int. Cl.[2] C01G *37/02*
U.S. Cl. 423—607 **8 Claims**

1. In a process for the preparation of ferromagnetic chromium dioxide which comprises heating a reaction mixture comprising one or more chromium oxides wherein the chromium has an average valence other than +4 in the presence of water to a temperature greater than 250° C. and under a pressure of at least 200 atmospheres, and cooling and drying the resulting ferromagnetic chromium dioxide, the improvement comprising:

heating said reaction mixture to form a rigid mass of chromium dioxide, in an annulus closed at one end and defined by inner and outer walls coaxially aligned each having a thermal coefficient of expansion different from that of said rigid mass of chromium dioxide, said inner wall defining a hollow column open at both ends, and

cooling both said chromium dioxide and said annulus to cause one of said walls to separate partially from contact with said rigid mass of chromium dioxide forming a ring-like escape path for water vapor.

4,045,545

MANUFACTURE OF COMPLEX HYDRIDES

Eugene C. Ashby, Atlanta, Ga., assignor to Ethyl Corporation, Richmond, Va.

Continuation of Ser. No. 221,075, Jan. 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 751,862, July 30, 1958, abandoned. This application Jan. 29, 1975, Ser. No. 545,114
Int. Cl.[2] C01B *6/24*
U.S. Cl. 423—644 **8 Claims**

1. The process for the manufacture of alkali metal aluminum tetrahydrides in solid, readily filterable form comprising pressure hydrogenating at a temperature of about 50° C to 250° C, a mixture consisting essentially of aluminum, the hydride of an alkali metal, and an organic liquid reaction medium stable at reaction conditions, said medium being selected from the class consisting of aliphatic hydrocarbons and aromatic hydrocarbons, said pressure hydrogenating being carried out in the presence of a catalyst selected from the group consisting of alkyl compounds of metals of Group I-A, II-A and III-A of the periodic table, said catalyst being in proportions of up to about 5 weight percent of the reaction medium thereby forming an alkali metal aluminum tetrahydride consisting of aluminum, the alkali metal and hydrogen in solid form and recovering said solid.

4,045,546

PROCESS FOR THE PREPARATION OF HYDROGEN

Anthony A. duPont, 8 Georgeff Road, Rolling Hills, Calif. 90274

Division of Ser. No. 613,236, Sept. 15, 1975, Pat. No. 4,010,249. This application Aug. 6, 1976, Ser. No. 712,272
Int. Cl.[2] C01B *1/08, 13/02*
U.S. Cl. 423—657 **2 Claims**

1. A process for generating hydrogen which comprises the following steps: (a) reacting cadmium metal with steam to form cadmium oxide (CdO) and hydrogen (H_2); (b) reacting iodine (I_2) with cadmium oxide (CdO) to form cadmium iodide ($0CdI_2$) and cadmium iodate ($Cd(IO_3)_2$); (c) decomposing the cadmium iodate by the introduction of heat to form the corresponding oxide (CdO), and iodine and oxygen gas; (d) replacing the cadmium in the cadmium iodide (CdI_2) with lead (Pb) by feeding gaseous cadmium iodide into the bottom of a column of liquid lead and taking gaseous cadmium (Cd) off the top of the column; (e) replacing the lead in the resulting lead iodide (PbI_2) with gallium (Ga) to form gallium iodide (GaI_3) and lead (Pb); (f) decomposing the gallium iodide by the introduction of heat to recover the original gallium; and (g) recycling the recovered gallium into step (e) of the process.

4,045,547

FABRICATION OF SOFT CONTACT LENS AND COMPOSITION THEREFOR

Albert R. Le Boeuf, Sturbridge, and William R. Grovesteen, West Dudley, both of Mass., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 526,022, Nov. 21, 1974, Pat. No. 3,978,164. This application Dec. 17, 1975, Ser. No. 641,466
Int. Cl.[2] A61K *9/70*
U.S. Cl. 424—28 **3 Claims**



1. A shaped eye bandage for medicament delivery which can be cut and shaped in the dry form and thereafter hydrated in a buffered saline solution to form a bandage having from about 45% to 65% water after hydration, said bandage in dry form consisting essentially of polymerized random graft copolymers containing from about 67.2% to about 79.3% HEMA; from about 14.25% to about 35% PVP; from about 0.1% to about 4.04% EDMA; from about 0.1% to about 2.5% MA; from about 0.1% to about 5.0% water; from about 0 to about 4 ppm, based on the weight of HEMA monomer, of HQ inhibitor; and from about 50 to 250 ppm, based on the weight of HEMA monomer, of MEHQ inhibitor; said composition having been polymerized in a three-stage polymerization process comprising:

A. A first stage, using only a low temperature polymerization initiator, with substantially all the oxygen having been removed from the polymerization mix prior to and during the polymerization reaction; the initial polymerization reaction being conducted at from 23° C. to about 30° C., for from about 16 to about 36 hours, with the heat of the reaction continuously absorbed to control the reaction exotherm; followed by

B. A second stage, wherein the product of (A) is heated to a temperature of from about 40° C. to about 80° C. in the absence of any additional polymerization initiator, without

control of the reaction exotherm, for from 2 to 6 hours; followed by

C. A third stage polymerization, wherein the product of (B) is heated to a temperature of from about 105° C. to about 125° C., in the absence of any additional polymerization initiator, for from 24 to 36 hours;

said bandage containing an opthalmologically acceptable medicament incorporated therein.

4,045,548

AEROSOL ANTIPERSPIRANT CONTAINING EMOLLIENTS

Wilmer Louis Luedders, Cincinnati, and Thomas Andrew Wetzel, Green Township, Hamilton County, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 442,299, Feb. 13, 1974, abandoned, which is a continuation of Ser. No. 190,303, Oct. 18, 1971, abandoned, which is a continuation-in-part of Ser. No. 59,694, July 30, 1970, abandoned. This application Apr. 25, 1975, Ser. No. 571,812

Int. Cl.[2] A61K *7/34, 7/36, 7/38*

U.S. Cl. 424—47 **8 Claims**

1. A powder aerosol antiperspirant composition consisting essentially of:

A. from about 1.0% to about 12% by weight of a finely divided powder antiperspirant compound that is insoluble in the composition, said compound being based on salts selected from the group consisting of aluminum chlorhydroxide, aluminum chloride, aluminum sulfate, aluminum oxychloride, aluminum oxysulfate, zirconyl hydroxychloride zirconium oxychloride, zinc sulfate and zinc sulfocarbolate;

B. from about 0.1% to about 1% by weight of a suspending agent for the antiperspirant compound, which suspending agent is a hydrophobic clay that swells in organic solvents;

C. from about 1.0% to about 15% by weight of a hydrophobic emollient-carrier liquid which is a multiple ester of an organic acid wherein said ester contains from about 12 to about 16 carbon atoms, and said ester has a ratio of ester groups to carbon atoms of from about 0.125 to about 0.214 and wherein said ester has a solubility in water of from about 0.0005% to about 0.1% at 30° C.; and

D. from about 70.7% to about 93.9% of anhydrous liquefiable propellant gas under pressure to produce an aerosol spray.

4,045,549

SULFONIUM SALT SUBSTANTIVE SUNSCREEN COMPOSITIONS

John Fred Gerecht, Somerville, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

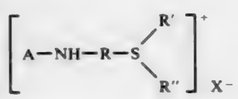
Division of Ser. No. 148,158, May 28, 1971, Pat. No. 3,864,474, which is a continuation-in-part of Ser. No. 820,280, April 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 492,316, Oct. 1, 1965, abandoned. This application Jan. 6, 1975, Ser. No. 538,688

The portion of the term of this patent subsequent to Feb. 4, 1992, has been disclaimed.

Int. Cl.[2] A61K *7/44*

U.S. Cl. 424—60 **19 Claims**

1. A sunscreening composition comprising from 0.1% to 25% by weight of a substantive sulfonium salt sunscreening agent represented by the formula



wherein A is a substituted benzene sunscreening moiety having a prominent spectral absorption peak within the range of 250–400 millimicrons and selected from the group consisting of 4-aminobenzoyl, 4-nitrobenzoyl, 2-hydroxybenzoyl, 4-(2′hydroxybenzoyl) benzoyl, 4-(2′-benzotriazoly)-2-hydroxybenzoyl, 4-aminobenzenesulfonyl, 4-nitrobenzene sulfonyl, 2-hydroxybenzenesulfonyl, 4-(2′-hydroxybenzoyl)benzenesulfonyl and 4-(2′benzotriazolyl)-2-hydroxybenzenesulfonyl; R represents an alkylene of from 2 to 18 carbon atoms; R′ represents an alkyl group containing from 7 to 26 carbon atoms; R″ represents an alkyl group containing 1 to 4 carbon atoms, the sum of R′ and R″ being not less than 9 carbon atoms and not greater than 27 carbon atoms; X is selected from the group consisting of Br, Cl, I, $CH_2H_5SO_4$, CH_3CO_2, and CH_3SO_4; and a skin compatible, non-toxic carrier which is compatible with said agent.

4,045,550

SKIN PROTECTIVE COMPOSITIONS

Ralph Kelly, Cincinnati, and Edmond Jean Ritter, Loveland, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Division of Ser. No. 46,561, June 15, 1970, which is a continuation-in-part of Ser. No. 696,509, Jan. 9, 1968, Pat. No. 3,630,934, which is a continuation-in-part of Ser. No. 613,095, Feb. 1, 1967, abandoned. This application Feb. 4, 1974, Ser. No. 439,119

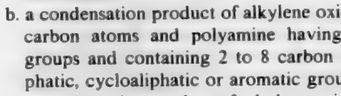
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.

Int. Cl.[2] A61K *7/02, 7/06*

U.S. Cl. 424—70 **17 Claims**

1. A skin protective lotion or creme consisting essentially of a skin irritation reducing effective amount of a protective agent and a non-aqueous emollient, humectant or surfactant; said lotion or creme capable of reducing skin irritation compared to said lotion or creme without protective agent when applied to the skin prior to contact with a skin irritant; said protective agent being dispersible in said lotion or creme; said protective agent containing two polar groups which are separated by a chain of at least 15 atoms a majority of which are carbon; said protective agent selected from the group consisting of:

1. esters and polyesters of the polymerized fatty acid product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid, said product containing 2 to 4 carboxyl groups; and an alcohol which is
   a. polyoxyalkylene ether containing 2 to 30 oxyalkylene units in which the alkylene radical contains 2 to 4 carbon atoms;
   b. a condensation product of alkylene oxide having 2 to 4 carbon atoms and polyamine having 2 to 4 amino groups and containing 2 to 8 carbon atoms in an aliphatic, cycloaliphatic or aromatic group; or
   c. a condensation product of ethylene oxide with a hydrophobic base formed by the condensation of propylene oxide with propylene glycol, having the general formula:



wherein *a* is 1 to 150
b is 15 to 70 and
c is 1 to 150; and

2. esters and polyesters of the hydrogenated polymerized product obtained from the polymerization of 2 to 4 molecules of a monomeric ethylenically unsaturated C_{12} to C_{26} fatty acid, said hydrogenated polymerized product containing 2 to 4 carboxyl groups; and an alcohol which is (a), (b) or (c) above.

4,045,551

SUBLIMABLE AROMATIC COMPOSITIONS

Yasuhiko Ueno, Kawanishi; Yoshito Saeki, Suita; Takuya Akiyama, Nagaokakyo, and Masao Fujita, Amagasaki, all of Japan, assignors to Ogawa & Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 424,313, Dec. 13, 1973, abandoned. This application July 2, 1975, Ser. No. 592,531

Claims priority, application Japan, Jan. 19, 1973, 48-9362; July 11, 1973, 48-66508

Int. Cl.[2] A61K *7/46;* **A61L** *13/00;* **A01N** *17/02*

U.S. Cl. 424—76 **8 Claims**

1. An aromatic, solid, sublimable composition consisting of 80–99% by weight of triisopropyl-s-trioxane and 1–20% by weight of an additive selected from the group consisting of a perfume which is liquid at room temperature, a perfume which is solid at room temperature, a deodorant which is liquid at room temperature, a deodorant which is solid at room temperature, an insecticide which is liquid at room temperature, an insecticide which is solid at room temperature and a mixture thereof.

4,045,552

PROTEASE-FREE PROTEINS, AND METHODS OF MANUFACTURING AND USING THE SAME

Carl Kutzbach; Alfred Arens, and Gunter Schmidt-Kastner, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Aug. 13, 1975, Ser. No. 604,086

Claims priority, application Germany, Sept. 7, 1974, 2442995

Int. Cl.[2] A61K *37/48*

U.S. Cl. 424—94 **10 Claims**

1. A method of removing protease from kallikrein, comprising contacting a solution of the kallikrein with a carrier-bound water-insoluble polypeptide protease inhibitor that does not bind to said kallikrein, and recovering a protease-free kallikrein.

8. Kallikrein having an activity of about 1000 to 1300 KU/mg and a protease content of about 0.004 to about 0.011 U/mg produced by the method of claim **1.**

4,045,553

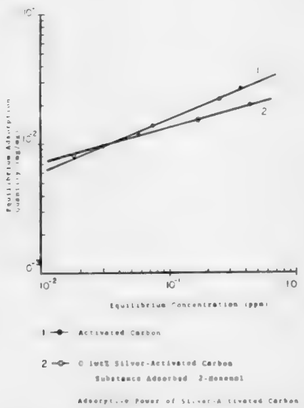
METHOD OF TREATING SILVER IMPREGNATED ACTIVATED CARBON

Nobuo Mitsumori; Chikahiro Takeda, and Hideichi Miyasako, all of Kyoto, Japan, assignors to Nippon Shinyaku Company, Limited, Kyoto, Japan

Filed Feb. 26, 1975, Ser. No. 553,244

Int. Cl.[2] B01D *15/06;* **A61L** *13/04*

U.S. Cl. 424—132 **1 Claim**



1. The method of restoring the sterilization and purification properties of silver impregnated activated carbon which comprises subjecting spent silver impregnated activated carbon to the action of steam until said properties are restored.

4,045,554

PROCESS FOR PRESERVING WOOD CHIPS DURING STORAGE

Edward L. Springer, Madison, Wis., assignor to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sept. 30, 1975, Ser. No. 618,187

Int. Cl.[2] A01N *13/00;* **A61L** *13/00*

U.S. Cl. 424—164 **2 Claims**

1. A method for preserving wood substance, brightness and tall oil in stored wood chips comprising treating said chips with a biocidally effective amount of an aqueous solution containing 2.0 percent sodium bisulfite and:

a. 0.35 percent resorcinol; or

b. 0.30 percent p-nitrophenol.

4,045,555

METHOD FOR THE PHOTOSTABILIZATION OF POLYHYDROXYLATED STEROLS AND STABILIZED BIOLOGICAL INSECTICIDAL PRODUCT OBTAINED THEREBY

Giorgio Ferrari; Luigi Canonica, both of Milan, and Bruno Danieli, Cesano Maderno (Milan), all of Italy, assignors to Dauten S.A., Switzerland

Filed Sept. 26, 1972, Ser. No. 292,295

Claims priority, application Italy, Sept. 29, 1971, 29276/71

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—174 **3 Claims**

1. A biological insecticide formulate comprising

an insect metamorphosis hormone which deteriorates in light, and

a stabilizing photoprotective compound mixed with said hormone in an amount ranging between a lower limit of 0.005 grams per 100 parts by weight of the final formulate, and an upper limit in which said compound equals the weight of said hormone, and selected from the group consisting of benzotriazoles, and substituted phenylglioxylic acids and their salts.

4,045,556

DIPEPTIDE DERIVATIVES, PROCESS FOR MANUFACTURE AND PHARMACEUTICAL PREPARATIONS

Eberhard Schwertner, Heinrichsallee 55, 51 Aachen, and Siegfried Herrling, Dohlenweg 33, 519 Stolberg, both of Germany

Filed Oct. 16, 1975, Ser. No. 622,804

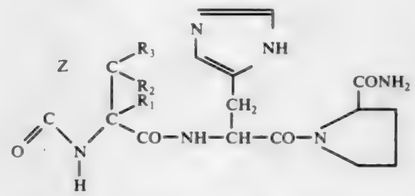
Claims priority, application Germany, Oct. 16, 1974, 2449167; June 21, 1975, 2527723

Int. Cl.[2] A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **31 Claims**

1. The dipeptide derivative of the formula

(I)



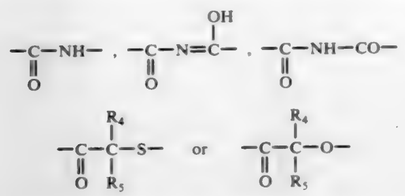
wherein R_1 and R_2 are the same or different, each one is hydrogen or alkyl having 1 to 3 carbon atoms or R_1 and R_2 considered together represent an additional bond between the carbon atoms to which R_1 and R_2 are linked;

R_3 is a hydrogen or alkyl of 1 to 3 carbon atoms and

Z is a divalent structure which completes the ring to a 5-or 6-membered ring, the divalent structure together with the



group to which it is attached being one of the following:



wherein R_4 and R_5 are the same or different, each one being a hydrogen or alkyl of 1 to 3 carbon atoms, hydrates thereof, and the pharmaceutically acceptable salts of these dipeptides with pharmaceutically acceptable acids.

21. The pharmaceutically acceptable composition which comprises a compound of claim **1** defined in formula I in a therapeutically effective amount, and a pharmaceutically acceptable carrier.

26. A method of causing a psychostimulating effect, with thyrotropin releasing hormone activity on the central nervous system which comprises administering to a warm-blooded patient subject to a depressive state, a therapeutically effective amount of a composition of claim **21.**

4,045,557

CERTAIN FORMAMIDINE DITHIOPHOSPHATES AND PHOSPHONATES AND THEIR USE AS INSECTICIDES

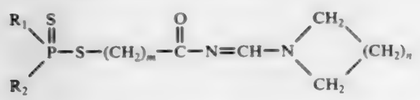
Hsiao-ling Lam, and Eugene G. Teach, both of El Cerrito, Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 12, 1976, Ser. No. 657,438

Int. Cl.[2] A01N *9/36;* **C07D** *211/06*

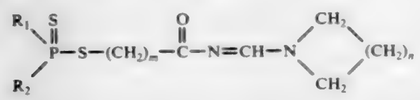
U.S. Cl. 424—200 **43 Claims**

1. A compound having the formula



in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy, or methylthio - substituted lower alkoxy, *m* is 1 or 2 and *n* is 0 or an integer from 1 to 4.

23. A method for controlling insects comprising applying to the nsect or the habitat thereof an insecticidally effective amount of a compound having the formula



in which R_1 is lower alkyl or lower alkoxy, R_2 is lower alkoxy or methylthio-substituted lower alkoxy, *m* is 1 or 2 and *n* is 0 or any integer from 1 to 4.

4,045,558

PILOCARPINE SALTS

Robert L. Smith, and Ta-Jyh Lee, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rayway, N.J.

Filed Oct. 8, 1975, Ser. No. 620,623

Int. Cl.[2] A61K *31/62, 31/672, 31/415;* **C07D** *405/06*

U.S. Cl. 424—232 **5 Claims**

1. Pilocarpinium 2,5-dihydroxybenzoate.

5. The method of reducing intraocular pressure in the eye which comprises topically administering to an eye of a host having raised intraocular pressure an effective amount of pilocarpinium 2,5-dihydroxybenzoate.

4,045,559

USE AS INSECTICIDES OF ESTERS OF NITRO(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)ACETIC ACIDS

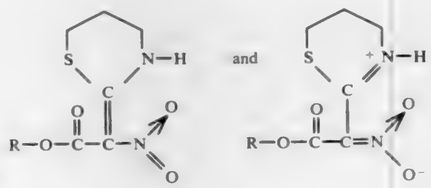
Steven A. Roman, Oakdale, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 554,371, March 3, 1975, Pat. No. 3,962,234, which is a continuation-in-part of Ser. No. 468,125, May 8, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,982

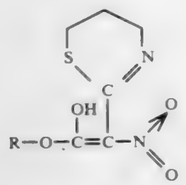
Int. Cl.[2] A01N *9/00, 9/12*

U.S. Cl. 424—246 **2 Claims**

1. A method of killing insects which comprises contacting them with an insecticidally effective amount of a resonance hybrid in which the significant forms are represented by the formulae



and the enol form represented by the formula



wherein R contains up to thirty carbon atoms and is alkyl, alkenyl, alkynyl, cycloalkyl, cycloalkylalkyl, alkadienyl, haloalkyl, haloalkenyl, mono- and poly-(alkoxy)alkyl, alkylthioalkyl, phenylthioalkyl, benzylthioalkyl, cyanoalkyl, hydroxyalkyl, alkylsulfinylalkyl, alkylsulfonylalkyl, phenyl or phenalkyl or either substituted on the ring by one to two of one or more of halogen, nitro, cyano, alkyl, phenyl, alkoxy or phenoxy; is aminoalkyl, $—CH_2—NR^3R^4$, wherein *m* is one or two, R^3 is alkyl, cycloalkyl, alkenyl, phenyl or phenalkyl, and R^4 is hydrogen or one of the moieties represented by R^3; or is $—CH_2—R^5$, wherein *n* is zero, one or two, and R^5 is a heteromonocyclic moiety with from five to six atoms in the ring, containing carbon atoms and one to two oxygen (—O—), sulfur (—S—) or nitrogen atoms (=N— or —NH—) bonded to carbon in the ring.

4,045,560

2-MORPHOLINE CONTAINING METHANO OR ETHANO ANTHRACENE COMPOUNDS

Makoto Sunagawa; Hiromi Sato; Junki Katsube, all of Osaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Japan

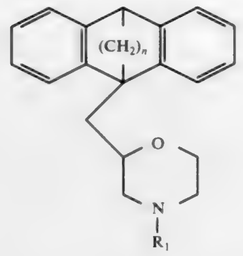
Filed July 7, 1976, Ser. No. 703,128

Claims priority, application Japan, July 7, 1975, 50-83870

Int. Cl.[2] C07D *265/30;* **A61K** *31/535*

U.S. Cl. 424—248.4 **7 Claims**

1. A compound of formula:



wherein R_1 is hydrogen, C_1–C_4 alkyl, C_3–C_5 alkenyl, phenyl(C_1–C_4)alkyl or (C_3–C_6)cycloalkyl(C_1–C_4)alkyl and *n* is 1 or 2, or a non-toxic salt thereof.

7. A method for treatment of mental depression which comprises administering to a human an effective amount of at least one compound according to claim **1.**

4,045,561

PESTICIDAL PYRIMIDINYL PHOSPHORUS ESTERS

Herbert Mühle; Karlheinz Milzner, both of Basel, and Fritz Reisser, Therwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

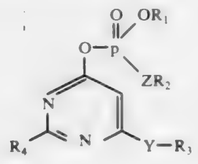
Continuation-in-part of Ser. No. 597,473, July 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 452,526, March 19, 1974, abandoned. This application Mar. 29, 1976, Ser. No. 671,446

Claims priority, application Switzerland, May 26, 1975, 6724/75; July 31, 1975, 10002/75; Jan. 6, 1976, 49/76; Mar. 23, 1973, 4253/73; Sept. 17, 1973, 13328/73

Int. Cl.[2] C07D *239/34, 239/38;* **A01N** *9/12, 9/22*

U.S. Cl. 424—251 **42 Claims**

1. A compound of the formula:



wherein

R_1 and R_2, are each, independently, alkyl-(C_1–C_6),

R_3 is alkyl (C_1–C_6), cycloalkyl (C_3–C_8), phenyl phenyl substituted by 1 to 3 members of the group chlorine, bromine and alkyl (C_1–C_3),

R_4 is a radical $-NR_5R_6$

wherein

R_5 and R_6 are each independently, hydrogen or alkyl (C_1–C_6),

or R_5 and R_6 together with the nitrogen atom to which they are bound form piperdino, morpholino or pyrrolidino,

or a radical $—WR_7$

wherein

W is oxygen or sulphur and

R_7 is alkyl (C_1–C_6)

Q and Y are each, independently, sulphur or oxygen and Z is oxygen, sulphur or a radical



wherein R_8 is hydrogen or alkyl (C_1–C_5).

30. An insecticidal composition comprising an insecticidally effective amount of a compound of claim **1,** in association with an insecticide carrier or diluent.

4,045,562

LISURIDE AND PHYSIOLOGICALLY ACCEPTABLE SALTS THEREOF TO ACHIEVE PSYCHIC ENERGIZER EFFECTS

Turan M. Itil, Nyack, N.Y., and Werner Martin Herrmann, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed May 21, 1976, Ser. No. 688,559

Claims priority, application Germany, May 22, 1975, 2523026

The portion of the term of this patent subsequent to May 4, 1993, has been disclaimed.

Int. Cl.[2] A61K *31/48, 31/475*

U.S. Cl. 424—261 **6 Claims**

1. A method for the treatment of psychic disturbances manifested by

a. behaviorally disturbed and/or hyperkinetic children suffering from loss of concentration and memory and learning difficulties,

b. adolescents and adults with so-called neurasthenic symptomatology with at least one of the following symptoms: loss of interest, loss of drive and activity, loss of energy and functional capacity, loss of concentration and learning ability, and

c. geriatric patients with loss of interest, loss of drive and activity, loss of energy and functional capacity, loss of concentration and learning ability combined with severe disturbances in mental function,

which comprises administering to the affected patient a daily dosage of from 300 μg. to 1,000 μg. of N-D-6-methyl-8-isoergolenyl-N′,N′-diethylurea or a physiologically acceptable acid addition salt thereof effective to ameliorate the psychic disturbance.

4,045,563

SUBSTITUTED 2-[PYRIDYLALKYLENESULFINYL]-BENZIMIDAZOLES WITH GASTRIC ACID SECRETION INHIBITING EFFECTS

Peder Bernhard Berntsson, Molndal; Stig Ake Ingemar Carlsson; Lars Erik Garberg, both of Molnlycke; Ulf Krister Junggren, Pixbo; Sven Erik Sjostrand, Kungsbacka, and Gunhild Wika von Wittken Sundell, Askim, all of Sweden, assignors to AB Hassle, Goteborg, Sweden

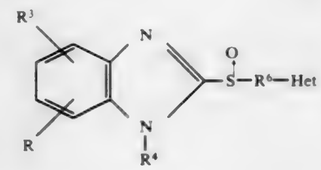
Filed Nov. 11, 1975, Ser. No. 630,916

Int. Cl.[2] A61K *31/44;* **C07D** *235/12*

U.S. Cl. 424—263 **65 Claims**

1. A compound of formula I

(I)

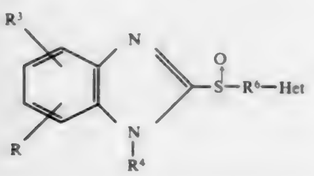


or a therapeutically acceptable salt thereof in which R is selected from the group consisting of hydrogen, alkyl having up

to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, cyano, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^3 is selected from the group consisting of hydrogen, alkyl having up to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^4 is selected from the group consisting of hydrogen, alkyl straight or branched chain having up to 5 carbon atoms, alkanoyl having up to 4 carbon atoms, carbamoyl, alkylcarbamoyl wherein the alkyl group may be straight or branched and has up to 4 carbon atoms, dialkylcarbamoyl wherein each alkyl group has up to 4 carbon atoms, alkylcarbonylmethyl wherein the alkyl group has up to 4 carbon atoms, alkoxycarbonylmethyl wherein the alkyl group has up to 4 carbon atoms, and alkylsulphonyl wherein the alkyl group has up to 4 carbon atoms; R^6 is a straight or branched alkyl group having 1 to 4 carbon atoms, wherein at most one methylene group is present between S and Het, and Het is pyridyl, which may be further substituted preferably in the 3 to 5 position with lower alkyl groups such as methyl, ethyl or propyl or with halogen substituents such as chloro and bromo.

7. A method of inhibiting gastric acid secretion by administering to mammals, including man, suffering from gastric acid secretion disturbances a compound of the formula I

(I)



or a therapeutically acceptable salt thereof in which R is selected from the group consisting of hydrogen, alkyl having up to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, cyano, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^3 is selected from the group consisting of hydrogen, alkyl having up to four carbon atoms, halogen of the group consisting of fluoro, iodo, bromo and chloro, carboxy, carboxyalkyl in which the alkyl group has up to 4 carbon atoms, carboalkoxy in which the alkyl group has up to 4 carbon atoms, carboalkoxyalkyl wherein each of the alkyl groups has up to 4 carbon atoms, carbamoyl, carbamoylalkyl in which the alkyl group has up to 4 carbon atoms, hydroxy, alkoxy having up to 5 carbon atoms, hydroxyalkyl having up to 7 carbon atoms, trifluoromethyl and alkanoyl having up to 4 carbon atoms in any position; R^4 is selected from the group consisting of hydrogen, alkyl straight or branched chain having up to 5 carbon atoms, alkanoyl having up to 4 carbon atoms, carboalkoxy wherein the alkyl group has up to 4 carbon atoms, carbamoyl, alkylcarbamoyl wherein the alkyl group may be straight or branched and has up to 4 carbon atoms, dialkylcarbamoyl wherein each alkyl group has up to 4 carbon atoms, alkyl carbonylmethyl wherein the alkyl group has up to 4 carbon atoms, alkoxycarbonylmethyl wherein the alkyl group has up to 4 carbon atoms, and alkylsulphonyl wherein the alkyl group has up to 4 carbon atoms; R^6 is a straight or branched alkyl group having 1 to 4 carbon atoms, wherein at most one methylene group is present between S and Het, and Het is pyridyl, which may be further substituted preferably in the 3 to 5 position which lower alkyl groups such as methyl, ethyl and propyl or with halo substituents such as chloro and bromo, in amount sufficient to inhibit such suffering.

4,045,564

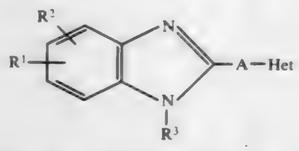
BENZIMIDAZOLE DERIVATIVES USEFUL AS GASTRIC ACID SECRETION INHIBITORS

Peder Bernhard Berntsson, Molndal; Stig åke Ingemar Carlsson; Lars Erik Garberg, both of Molnlycke; Ulf Krister Junggren, Pixbo; Sven Erik Sjöstrand, Kungsbacka, and Gunhild Wika von Wittken Sundell, Askim, all of Sweden, assignors to AB Hassle, Goteborg, Sweden

Continuation-in-part of Ser. No. 550,637, Feb. 18, 1975, abandoned. This application Feb. 4, 1976, Ser. No. 655,246
Claims priority, application Sweden, Feb. 18, 1974, 7402101
Int. Cl.[2] A61K *31/415*
U.S. Cl. 424—263 **12 Claims**

1. A method of inhibiting gastric acid secretion by administering to mammals, including man, suffering from gastric acid secretion disturbances, in an effective amount, a compound of the formula I

(I)



wherein R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, alkyl having up to seven carbon atoms, halogen, nitro, carboxy, carboalkoxy, wherein the alkyl group has up to four carbon atoms, carboalkoxyalkyl wherein each of the two alkyl groups has up to four carbon atoms, hydroxy, alkoxy having up to five carbon atoms, hydroxyalkyl having up to seven carbon atoms, and alkanoyl having up to four carbon atoms, in any position; R^3 is selected from the group consisting of hydrogen, alkanoyl having up to four carbon atoms, and carboalkoxy wherein the alkyl group has up to four carbon atoms; A is selected from the group consisting of $—SCH_2—$ and $—SCH(CH_3)—$, whereby the S atom is bound to the benzimidazolyl group; and Het is selected from the group consisting of 2-pyridyl and 2-pyridyl substituted with lower alkyl groups such as methyl, ethyl and propyl, and halogen substituents such as chloro and bromo, or its therapeutically acceptable salts.

4,045,565

9-HYDROXY ELLIPTICINE

Jean Bernard Le Pecq; Claude Paoletti, both of Paris, and Nguyen Dat-Xuong, Antony, all of France, assignors to Etablissement Public dit: Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly sur Seine, France

Filed Oct. 29, 1974, Ser. No. 518,875
Claims priority, application France, Oct. 29, 1973, 73.38416
Int. Cl.[2] C07D *471/04;* **A61K** *31/395*
U.S. Cl. 424—263 **8 Claims**

1. 9-hydroxy ellipticine or 9-hydroxy-5, 11-dimethyl-(6H)-pyrido [4,3-b] carbazole.

8. A method of cardiac treatment, which comprises using a therapeutically active amount of 9-hydroxy ellipticine.

4,045,566

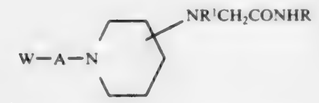
PIPERIDYL-GLYCYLAMIDE DERIVATIVES

John Leheup Archibald, Windsor, and John Lambert Jackson, Royston, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Apr. 14, 1976, Ser. No. 676,950
Claims priority, application United Kingdom, Apr. 15, 1975, 15394/75
Int. Cl.[2] C07D *401/06, 211/56*
U.S. Cl. 424—267 **10 Claims**

1. A compound having the general formula:

(Ia)



wherein W represents a phenyl or 3-indolyl radical, either of which radicals may be unsubstituted or substituted by halogen, lower alkyl, lower alkoxy or hydroxy; A represents a lower alkylene radical, an oxo lower alkylene radical or a hydroxy lower alkylene radical; R represents a phenyl radical optionally substituted by halogen, lower alkyl, lower alkoxy or hydroxy, or a cycloalkyl radical of 5 to 7 carbon atoms radical; R^1 represents hydrogen or a lower alkyl radical; or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

10. A hypotensive pharmaceutical composition comprising a therapeutically effective amount of a compound as claimed in claim **1** or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof together with a pharmaceutically acceptable carrier.

4,045,567

2-ALKYL-5-THIAZOLE-CARBOXYLIC ACID DERIVATIVES IN HYPOLIPEMIANT COMPOSITIONS

Francois Clemence, Rosny-sous-Bois, and Odile Le Martret, Paris, both of France, assignors to Roussel Uclaf, France

Continuation of Ser. No. 557,289, March 11, 1975, abandoned, which is a division of Ser. No. 431,881, Jan. 9, 1974, Pat. No. 3,882,110, which is a continuation of Ser. No. 244,909, April 17, 1972, abandoned, which is a continuation-in-part of Ser. No. 842,017, July 15, 1969, abandoned. This application Feb. 27, 1976, Ser. No. 662,122
Claims priority, application France, June 11, 1969, 69.19339
Int. Cl.[2] A61K *31/425*
U.S. Cl. 424—270 **12 Claims**

1. A hypolipemiant composition comprising an effective amount of at least one 2-alkyl-5-thiazolecarboxylic acid derivative of the formula



wherein R is a member selected from the group consisting of hydrogen, an alkali-metal, triethylammonium, diisopropylammonium, diethylammonium, ethanolammonium, collidinium, morpholinium, piperidinium, alkyl having 1 to 10 carbon atoms, benzyl, the alkyl residue of an alkylheterocyclic alcohol the alkyl residue of which contains 1 to 6 carbon atoms and of which the heterocyclic residue is selected from the group consisting of furyl, thienyl and pyridyl, α-glyceryl, diethylaminoethyl, diethylaminopropyl and dipropylaminoethyl, and R'_1 is a linear alkyl of 1 to 12 carbon atoms, and a major amount of a pharmaceutical carrier.

4,045,568

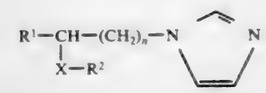
DERIVATIVES OF SUBSTITUTED N-ALKYL IMIDAZOLES

Keith A. M. Walker, Palo Alto, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 599,439, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 665,025
Int. Cl.[2] A61K *31/415;* **C07D** *233/60*
U.S. Cl. 424—273 **55 Claims**

1. A compound of the formula

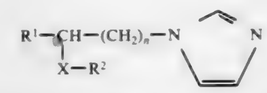
(I)



wherein R^1 is straight chain alkyl of from 1 to 12 carbon atoms, R^2 is halo-substituted phenyl or benzyl, X is oxygen or sulfur, n is an integer of from 1 to 8; and the antimicrobial acid addition salts thereof.

53. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing, or subject to attack by, fungi, bacteria or protozoa, an effective amount of a compound of the formula

(I)



wherein (a) R^1 is straight chain alkyl of from 1 to 12 carbon atoms, R^2 is halo-substituted phenyl or benzyl, X is oxygen or sulfur and n is an integer of from 1 to 8, or (b) R^1 is unsubstituted phenethyl or styryl, R^2 is straight chain alkyl of from 1 to 12 carbon atoms, X is oxygen or sulfur and n is 1, or an antimicrobial acid addition salt thereof, or a composition containing same as an active ingredient.

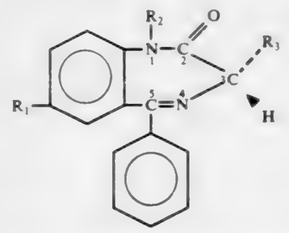
4,045,569

OPTICALLY ACTIVE 1,4-BENZODIAZEPINES AND PROCESS FOR USE AS A TRANQUILIZER

Franjo Kajfez; Nikola Blazevic, and Vitomir Sunjic, all of 18 via Motta, 6830 Chiasso, Switzerland

Division of Ser. No. 493,145, July 30, 1974, Pat. No. 3,998,811, which is a continuation-in-part of Ser. No. 234,645, March 14, 1972, abandoned. This application July 29, 1976, Ser. No. 709,858
Claims priority, application Switzerland, Mar. 17, 1971, 3868/71
Int. Cl.[2] A61K *31/33, 31/40*
U.S. Cl. 424—274 **1 Claim**

1. A method for tranquilizing a patient which comprises administering to the patient an effective amount of an optically active compound of the formula



having an asymmetric carbon atom in position 3, said asymmetric carbon atom having the S configuration wherein R_1 is

selected from the group consisting of hydrogen, halogen, nitro, and trifluoromethyl, R_2 is selected from the group consisting of hydrogen and C_{1-4} lower alkyl and R_3 is selected from the group consisting of C_{1-4} lower alkyl, hydroxy C_{1-4} lower alkyl, phenyl, hydroxyphenyl, benzyl, hydroxybenzyl, and 3'-methyleneindolyl.

4,045,570

HETEROCYCLIC S-IMINO-S-OXIDES

Gunther Dorhofer, Allschwil; Roland Heckendorn, Arlesheim; Erich Schmid, Basel; Angelo Storni, Rheinfelden, and Armin Zust, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

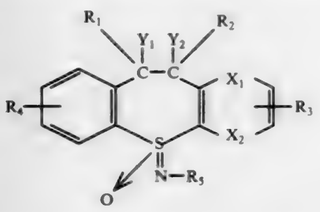
Filed May 7, 1975, Ser. No. 575,319

Claims priority, application Switzerland, May 10, 1974, 6423/74

Int. Cl.[2] C07D *337/14*

U.S. Cl. 424—275 **14 Claims**

1. A heterocyclic S-imino-S-oxide of the formula I



(I)

in which one of the symbols X_1 and X_2 denotes a direct bond and the other denotes the vinylene group —CH=CH— or the epithio radical —S—, Y_1 and Y_2 conjointly denote an additional bond or one of the symbols denotes hydrogen and the other denotes hydrogen or, conjointly with the symbol R_1 or R_2, which is present on the same carbon atom, denotes the oxo radical, one of the symbols R_1 and R_2 denotes hydrogen or lower alkyl and the other denotes hydrogen or lower alkyl or, conjointly with the symbol Y_1 or Y_2, which is present on the same carbon atom, denotes the oxo radical, or, if Y_1 and Y_2 conjointly denote an additional bond, also denotes lower alkoxy, and R_3 and R_4 independently of one another denote hydrogen, halogen up to atomic number 35, lower alkyl, lower alkoxy or trifluoromethyl and R_5 denotes hydrogen or lower alkyl, or a pharmaceutically acceptable acid addition salt thereof.

11. An oral anticonvulsive preparation comprizing an anticonvulsively effective amount of a compound according to claim **1**, wherein X_1, X_2, Y_1, Y_2, R_1, R_2, R_3, R_4 and R_5 have the meanings defined in claim **1**, or a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutical carrier.

13. A method for inducing an anticonvulsant action in a warm-blooded animal in need of treatment comprising peroral administration to said animal of an anticonvulsively effective amount of a compound according to claim **1**, wherein X_1, X_2, Y_1, Y_2, R_1, R_2, R_3, R_4 and R_5 have the meanings defined in claim **1**, or of a pharmaceutically acceptable acid addition salt thereof.

4,045,571

PYRAZOL-5-ONES

Eike Moller; Karl Meng, both of Wuppertal; Egbert Wehinger, Neviges, and Harald Horstmann, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

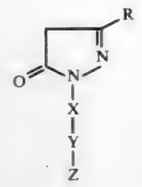
Division of Ser. No. 459,408, April 9, 1974. This application Nov. 20, 1975, Ser. No. 633,601

Claims priority, application Germany, Apr. 17, 1973, 2319278

Int. Cl.[2] A61K *31/415*

U.S. Cl. 424—273 P **42 Claims**

1. A pharmaceutical composition useful for effecting diuresis and saluresis in humans and animals and for treating hypertension in humans and animals which comprises a diuretic, saluretic or antihypertensive amount of a pyrazol-5-one of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen or lower alkyl;

X is methylene wherein 1 hydrogen atom is substituted by lower alkyl, ethylene, ethylene wherein 1 hydrogen atom on one of the carbon atoms is substituted by lower alkyl or ethylene wherein 1 hydrogen atom on each of the two carbon atoms is substituted by lower alkyl;

Y is a direct bond; and

Z is aryl of 6 to 10 carbon atoms unsubstituted or substituted by:

a. 1 or 2 of the same or different substituents selected from the group consisting of halogen. trifluoromethyl, alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, and alkenoxy of 2 to 4 carbon atoms;

b. cycloalkyl of 5, 6 and 7 carbon atoms, or cycloalkenyl of 5, 6 or 7 carbon atoms;

c. nitro;

d. nitro, and 1 or 2 substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkenyl of 2 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkenoxy of 2 to 4 carbon atoms, halogen and trifluoromethyl; or

e. a fused, saturated or unsaturated 5-, 6- or 7-membered ring; in combination with a pharmaceutically acceptable nontoxic inert diluent or carrier.

4,045,572

3-AMINO-1-PHENYL-1H,5H,-BENZO-2,4-THIAZEPINES

John Bernard Bream, Bern, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

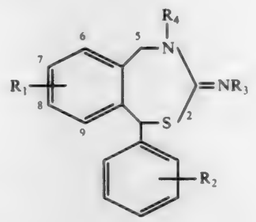
Filed May 26, 1976, Ser. No. 690,210

Claims priority, application United Kingdom, May 28, 1975, 23290/75; May 28, 1975, 23291/75; Jan. 14, 1976, 1909/76

Int. Cl.[2] C07D *281/02*

U.S. Cl. 424—275 **69 Claims**

1. A compound of formula I,



wherein

R_1 and R_2 are independently hydrogen, halogen, trifluoromethyl, lower alkoxy or lower alkyl,

R_3 is hydrogen, lower alkyl, lower hydroxyalkyl, or phenylalkyl of 7 to 10 carbon atoms, wherein the phenyl ring is unsubstituted or mono-substituted, or independently disubstituted, by halogen, lower alkyl, lower alkoxy, amino, lower alkylamino or di(lower alkyl)amino, and

R_4 is hydrogen,

in free base form or in pharmaceutically acceptable acid addition salt form thereof.

2. A pharmaceutical composition useful in treating depression or heart rhythm disorder comprising a therapeutically effective amount of a compound of claim **1** in association with a pharmaceutical carrier or diluent.

3. A method of treating depressions in animals which comprises administering a therapeutically effective amount of a compound of claim **1** to an animal in need of such treatment.

4,045,573

2,3-DIHYDROBENZOFURAN-2-ONE DERIVATIVES

Annemarie Closse, Binningen; Walter Haefliger, Basel, and Daniel Hauser, Binningen, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

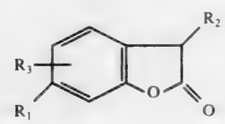
Filed Mar. 5, 1976, Ser. No. 664,235

Claims priority, application Switzerland, Mar. 12, 1975, 3129/75; July 24, 1975, 9678/75

Int. Cl.[2] A01N *9/28;* **C07D** *307/83*

U.S. Cl. 424—279 **25 Claims**

1. A compound of formula I,



I

wherein

R_1 is alkyl of 1 to 10 carbon atoms, cycloalkyl of 3 to 8 carbon atoms or phenyl,

R_2 is hydrogen or lower alkyl, and

R_3 is halogen, nitro, lower alkyl, methylthio, hydroxy, lower alkoxy, alkanoyloxy of 1 to 4 carbon atoms or alkanoylamino of 1 to 4 carbon atoms, with the proviso that when R_3 is in the 5 position, and R_1 and R_3 are identical and signify a straight alkyl chain of 1 to 5 carbon atoms, R_2 is lower alkyl.

25. A method of treating oedemas, inflammations and arthritis in animals which comprises administering a therapeutically effective amount of a compound of claim **1** to an animal in need of such treatment.

4,045,574

D-HOMO-20-KETOPREGNANES

Ulrich Kerb; Rudolf Wiechert; Klaus Kieslich; Karl Petzoldt; Helmut Wachtel; Dieter Palenschat; Reinhard Horowski; Gert Paschelke, and Wolfgang Kehr, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

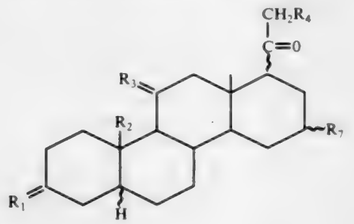
Filed Nov. 29, 1974, Ser. No. 528,328

Claims priority, application Germany, Nov. 30, 1973, 2360443; Sept. 19, 1974, 2445161

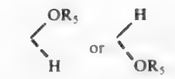
Int. Cl.[2] A01N *9/14;* **A61K** *31/255;* **C07C** *49/26*

U.S. Cl. 424—303 **23 Claims**

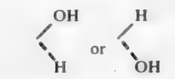
1. A D-homo-20-ketopregnane of the formula



wherein R_1 is an oxygen atom



in which R_5 is hydrogen or the acyl radical of a hydrocarbon carboxylic or sulfonic acid of up to 8 carbon atoms; R_2 is hydrogen or methyl; R_3 is an oxygen atom,



or two hydrogen atoms; R_4 is hydrogen, hydroxy, or hydrocarbon acyloxy of up to 15 carbon atoms; and R_7 is hydroxy or lower-alkanoyloxy.

4,045,575

THIOAMIDE PESTICIDES

Robert J. G. Searle, Sittingbourne, and Clive B. C. Boyce, Herne Bay, both of England, assignors to Shell Oil Company, Houston, Tex.

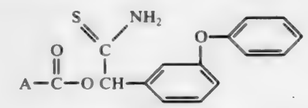
Filed Mar. 9, 1976, Ser. No. 665,220

Claims priority, application United Kingdom, Mar. 11, 1975, 10070/75

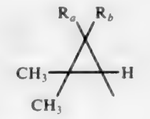
Int. Cl.[2] C07C *153/067;* **A01N** *9/12*

U.S. Cl. 424—305 **11 Claims**

1. A thioamide derivative of the formula



wherein A represents a cyclopropyl group of the formula



wherein R_a and R_b individually represents an alkyl group of 1 to 6 carbon atoms, a halogen atom of atomic number 9 to 35 or R_a and R_b together represent an alkylene group of up to 6 carbon atoms or R_a represents hydrogen and R_b represents an alkenyl or haloalkenyl group of up to 6 carbon atoms.

7. An insecticidal or acaricidal composition comprising an insecticidally or acaricidally effective amount of a thioamide as claimed in claim **1** and at least one carrier or surface-active agent.

4,045,576

ANTI-INFLAMMATORY METHODS USING 2-AMINO-3-(5- AND 6-)BENZOYLPHENYLACETIC ACIDS, ESTERS AND METAL SALTS THEREOF AND THE COMPOUNDS

William J. Welstead, Jr., and Henry W. Moran, both of Richmond, Va., assignors to A. H. Robins Company, Incorporated, Richmond, Va.

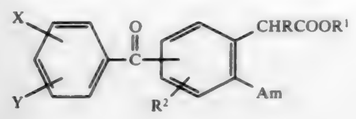
Continuation-in-part of Ser. No. 487,499, July 11, 1974, abandoned, which is a continuation-in-part of Ser. No. 354,625, April 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 254,285, May 17, 1972, abandoned. This application Aug. 13, 1975, Ser. No. 604,371

Int. Cl.[2] A01N *9/20;* **C07C** *101/447*

U.S. Cl. 424—309 **47 Claims**

1. The method for alleviating inflammation in a living animal

body with a minimum of undesirable side effects comprising internally administering to said living animal body an effective amount of a compound selected from the group having the formula:



wherein:

R is selected from the group consisting of hydrogen and lower alkyl,

R^1 is selected from the group consisting of hydrogen, lower alkyl, sodium and potassium

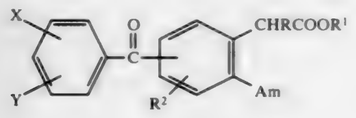
R^2 is selected from the group consisting of hydrogen, halogen having an atomic weight less than 80 and lower alkoxy,

X is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl,

Y is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl, and

Am is selected from the group consisting of primary amino and dimethylamino.

23. A compound selected from the group having the formula:



wherein;

R is selected from the group consisting of hydrogen and lower alkyl,

R^1 is selected from the group consisting of hydrogen, lower alkyl, sodium and potassium,

R^2 is selected from the group consisting of hydrogen, halogen having an atomic weight less than 80, and lower alkoxy,

X is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl,

Y is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl, and

Am is selected from the group consisting of primary amino ($-NH_2$) and dimethylamino.

4,045,577

VALUABLE MEDICINIAL PROSTAGLANDIN COMPOUNDS PREPARED FROM MATERIAL ISOLATED FROM THE SEA

Robert L. Spraggins, 1105 Mary Oaks, College Station, Tex. 77840, assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 154,193, June 17, 1971, abandoned. This application July 18, 1975, Ser. No. 597,212

Int. Cl.[2] A61K *31/215, 31/19;* **C07C** *177/00*

U.S. Cl. 424—311 **1 Claim**

1. A topical pharmaceutical preparation comprising 500 mg to 1500 mg of diasteroisomeric 15-propionyloxy-9-oxo-5-cis, 13-trans-prostadienoic acid mixed with 15 g of cetyl alcohol, 1 g of sodium lauryl sulfate, 40 g of liquid dimethylpolysiloxane, 43 g of sterile water, 0.25 g of methylparaben and 0.15 g of propylparaben.

4,045,578

N-CHLORO-AMINO ACID DERIVATIVES EXHIBITING ANTIBACTERIAL ACTIVITY

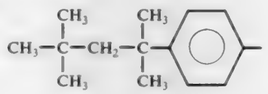
James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

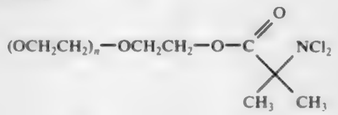
Division of Ser. No. 479,560, June 14, 1974, Pat. No. 3,966,796. This application Mar. 8, 1976, Ser. No. 664,697

Int. Cl.[2] A01N *9/24*

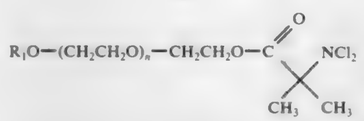
U.S. Cl. 424—311 **12 Claims**

1. A method for inhibiting bacterial growth which comprises applying thereto, an antibacterial effective amount of an ester of α-N,N-dichloroaminoisobutyric acid having the formula:





and



wherein R_1 represents a member selected from the group consisting of an *n*- or branched alkyl group of from 1 to 20 carbon atoms, a phenyl group and a naphthyl group; and wherein *n* represents an integer of from 1 to 11.

4,045,579

PROCESS FOR PASTEURIZING RAW POULTRY

Alan Barde Rogers, Palos Park, Ill., assignor to Armour and Company, Phoenix, Ariz.

Continuation of Ser. No. 477,058, June 6, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,629

Int. Cl.[2] A22C *21/04*

U.S. Cl. 426—327 **8 Claims**

1. A process for pasteurizing fresh or fresh frozen raw poultry comprising immersing said poultry having surface bacteria thereon in an edible oil, maintaining said oil at a temperature of from 180° F to 315° F and during the period after said poultry has been immersed in said oil at said temperature for ten seconds and before said poultry has been immersed in said oil at said temperature for sixty seconds, removing said poultry while still raw from said oil.

4,045,580

PHARMACEUTICAL PREPARATION USING 9-(2-HYDROXY-3-AMINO-PROPYL)-9,10-DIHYDRO-9,10-ETHANO-ANTHRACENES AS ANTIDEPRESSANTS

Max Wilhelm, Watchung, N.J.; Raymond Bernasconi, Oberwil, Switzerland; Angelo Storni, Rheinfelden, Switzerland; Dieter Beck, Basel, Switzerland, and Karl Schenker, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

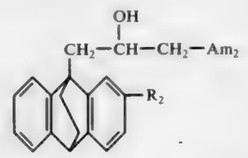
Division of Ser. No. 564,580, April 2, 1975, Pat. No. 4,017,542, which is a continuation-in-part of Ser. No. 226,329, Feb. 14, 1972, abandoned. This application Feb. 18, 1976, Ser. No. 659,069

Claims priority, application Switzerland, Feb. 23, 1971, 2578/71; Jan. 17, 1972, 669/72

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 **5 Claims**

1. An antidepressant pharmaceutical preparation comprising an antidepressively effective amount of a member selected from the group consisting of a compound of the formula



wherein R_2 represents a member selected from the group consisting of trifluoromethyl, chloro and hydrogen, and Am_2 denotes a member selected from the group consisting of diethylamino, monoethylamino, dimethylamino and monomethylamino, and a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutical carrier.

4,045,581

LONG-LASTING MINT-FLAVORED CHEWING GUM

Donald A. M. Mackay, Pleasantville; Frank Witzel, Spring Valley, both of N.Y.; Basant K. Dwivedi, Hopatcong, and Daniel Schoenholz, Basking Ridge, both of N.J., assignors to Life Savers, Inc., New York, N.Y.

Continuation of Ser. No. 577,589, May 15, 1975, abandoned. This application June 14, 1976, Ser. No. 695,487

Int. Cl.[2] A23G *3/30*

U.S. Cl. 426—3 **5 Claims**

1. A flavored chewing gum having a prolonged sweet taste comprising gum base, the free acid form of saccharin dispersed in said gum base, and flavoring, said free acid form of saccharin being present in an amount of from about 0.05 to about 0.5% by weight of the chewing gum and further including from about 0.05 to about 90% by weight of one or more water-soluble sweetening agents at least one of which is sucrose.

4,045,582

BENEFICIATION OF URIC ACID FROM NATURAL PRODUCTS

John D. Douros, Jr., Littleton, and Ira T. Warder, Jr., Lakewood, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 389,392, Aug. 15, 1973, which is a division of Ser. No. 80,517, Oct. 7, 1970, Pat. No. 3,850,930. This application May 26, 1976, Ser. No. 690,137

Int. Cl.[2] A23K *1/22*

U.S. Cl. 426—69 **2 Claims**

1. The process of producing a uric acid containing feed supplement for ruminant animals comprising the steps of:

collecting uric acid containing waste material within 120 hours of excrement;

promptly drying said collected material at a temperature of from 140° F. to 390° F. to remove a substantial portion of the water and to assure complete kill of microorganisms to prevent further decay and to render the material non-toxic; and

grinding the dried material and collecting that fraction of ground material of 80 mesh or smaller size.

4,045,583

METHOD OF MANUFACTURING A CHOCOLATE PRODUCT

Maurice Stanley Jeffery, Solihull; Paul Anthony Glynn, Birmingham, and Mohammed Moiz Uddin Khan, Solihull, all of England, assignors to Cadbury Limited, Birmingham, England

Filed July 14, 1976, Ser. No. 705,207

Claims priority, application United Kingdom, July 22, 1975, 30570/75

Int. Cl.[2] A23G *1/00*

U.S. Cl. 426—241 **11 Claims**

1. A method of manufacturing a shaped heat-resistant chocolate product comprising the steps of (i) thoroughly mixing at least the following ingredients: water, 15 to 35% by weight of at least one edible fat selected from (a) cocoa butter and (b) cocoa butter and at least one other fat, and not less than 40% by weight of sugar, said percentages being based on the total weight of the chocolate product, so as to produce an aqueous sugar solution in which said at least one edible fat is emulsified with the solution, (ii) maintaining said at least one edible fat emulsified with the aqueous sugar solution, evaporating sufficient water from the solution to prevent separation of said at least one edible fat from the said aqueous sugar solution, (iii) shaping the resultant evaporated mixture, and (iv) drying the shaped mixture so as to produce a shaped heat-resistant chocolate product having a moisture content of not more than 5% by weight and such that individual particles of said at least one edible fat are encapsulated in a sugar glass.

11. A method as claimed in claim **1,** wherein the drying step is effected by heating by micro-wave energy.

4,045,584

FOOD PRODUCT COATING APPARATUS AND METHOD

Richard E. Jones, and Donald F. Jago, both of Duluth, Minn., assignors to Jeno's, Inc., Duluth, Minn.

Division of Ser. No. 618,905, Oct. 2, 1975. This application Nov. 17, 1976, Ser. No. 742,624

Int. Cl.[2] B05B *3/02*

U.S. Cl. 426—289 **2 Claims**

1. A method of coating a surface of an article of food with granular food product at a selected density comprising the steps of

transporting an article of food to be coated along a preselected path at a predetermined speed;

enclosing a quantity of granular material to be coated on said article of food above said preselected path;

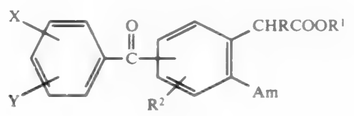
agitating said granular material with height adjustable rotatable agitating auger;

metering said agitated granular material with a pair of height adjustable rotatable distributing augers to a distributing surface forming a pair of elongated parallel slots positioned normal to the preselected path and having an adjustable orifice plate to define an opening between the elongated slot and orifice plate above said predetermined path and through which a metered quantity of granular food material enabling an article of food to be coated to pass thereunder;

adjusting the height of the agitating auger and distributing auger relative to the elongated slots at a selected height to enable a controlled weight of granular material to be metered from the agitating auger to the elongated slots in a circular pattern by said distributing auger;

adjusting the orifice plate to set the opening defined by the elongated slots and orifice plate at selected cross-sectional areas for passing the metered quantity of granular material

body with a minimum of undesirable side effects comprising internally administering to said living animal body an effective amount of a compound selected from the group having the formula:



wherein:

R is selected from the group consisting of hydrogen and lower alkyl,

R^1 is selected from the group consisting of hydrogen, lower alkyl, sodium and potassium

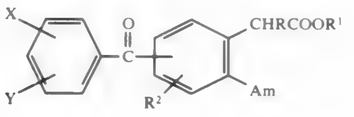
R^2 is selected from the group consisting of hydrogen, halogen having an atomic weight less than 80 and lower alkoxy,

X is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl,

Y is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl, and

Am is selected from the group consisting of primary amino and dimethylamino.

23. A compound selected from the group having the formula:



wherein;

R is selected from the group consisting of hydrogen and lower alkyl,

R^1 is selected from the group consisting of hydrogen, lower alkyl, sodium and potassium,

R^2 is selected from the group consisting of hydrogen, halogen having an atomic weight less than 80, and lower alkoxy,

X is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl,

Y is selected from the group consisting of hydrogen, lower alkyl, halogen having an atomic weight less than 80, nitro and trifluoromethyl, and

Am is selected from the group consisting of primary amino ($-NH_2$) and dimethylamino.

4,045,577

VALUABLE MEDICINIAL PROSTAGLANDIN COMPOUNDS PREPARED FROM MATERIAL ISOLATED FROM THE SEA

Robert L. Spraggins, 1105 Mary Oaks, College Station, Tex. 77840, assignor to Alza Corporation, Palo Alto, Calif.

Continuation of Ser. No. 154,193, June 17, 1971, abandoned. This application July 18, 1975, Ser. No. 597,212

Int. Cl.[2] A61K *31/215, 31/19;* **C07C** *177/00*

U.S. Cl. 424—311 **1 Claim**

1. A topical pharmaceutical preparation comprising 500 mg to 1500 mg of diasteroisomeric 15-propionyloxy-9-oxo-5-cis, 13-trans-prostadienoic acid mixed with 15 g of cetyl alcohol, 1 g of sodium lauryl sulfate, 40 g of liquid dimethylpolysiloxane, 43 g of sterile water, 0.25 g of methylparaben and 0.15 g of propylparaben.

4,045,578

N-CHLORO-AMINO ACID DERIVATIVES EXHIBITING ANTIBACTERIAL ACTIVITY

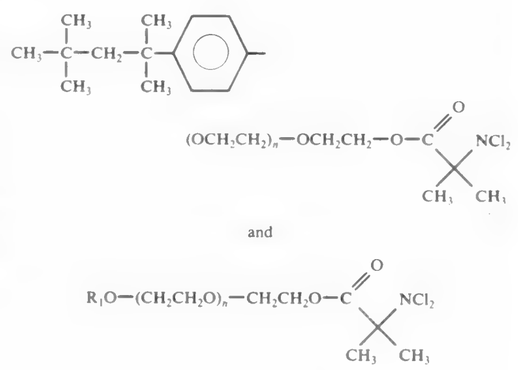
James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Division of Ser. No. 479,560, June 14, 1974, Pat. No. 3,966,796. This application Mar. 8, 1976, Ser. No. 664,697

Int. Cl.[2] A01N *9/24*

U.S. Cl. 424—311 **12 Claims**

1. A method for inhibiting bacterial growth which comprises applying thereto, an antibacterial effective amount of an ester of α-N,N-dichloroaminoisobutyric acid having the formula:



wherein R_1 represents a member selected from the group consisting of an *n*- or branched alkyl group of from 1 to 20 carbon atoms, a phenyl group and a naphthyl group; and wherein *n* represents an integer of from 1 to 11.

4,045,579

PROCESS FOR PASTEURIZING RAW POULTRY

Alan Barde Rogers, Palos Park, Ill., assignor to Armour and Company, Phoenix, Ariz.

Continuation of Ser. No. 477,058, June 6, 1974, abandoned. This application Aug. 14, 1975, Ser. No. 604,629

Int. Cl.[2] A22C *21/04*

U.S. Cl. 426—327 **8 Claims**

1. A process for pasteurizing fresh or fresh frozen raw poultry comprising immersing said poultry having surface bacteria thereon in an edible oil, maintaining said oil at a temperature of from 180° F to 315° F and during the period after said poultry has been immersed in said oil at said temperature for ten seconds and before said poultry has been immersed in said oil at said temperature for sixty seconds, removing said poultry while still raw from said oil.

4,045,580

PHARMACEUTICAL PREPARATION USING 9-(2-HYDROXY-3-AMINO-PROPYL)-9,10-DIHYDRO-9,10-ETHANO-ANTHRACENES AS ANTIDEPRESSANTS

Max Wilhelm, Watchung, N.J.; Raymond Bernasconi, Oberwil, Switzerland; Angelo Storni, Rheinfelden, Switzerland; Dieter Beck, Basel, Switzerland, and Karl Schenker, Binningen, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

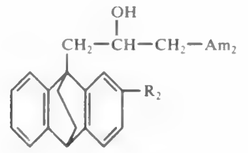
Division of Ser. No. 564,580, April 2, 1975, Pat. No. 4,017,542, which is a continuation-in-part of Ser. No. 226,329, Feb. 14, 1972, abandoned. This application Feb. 18, 1976, Ser. No. 659,069

Claims priority, application Switzerland, Feb. 23, 1971, 2578/71; Jan. 17, 1972, 669/72

Int. Cl.[2] A61K *31/135*

U.S. Cl. 424—330 **5 Claims**

1. An antidepressant pharmaceutical preparation comprising an antidepressively effective amount of a member selected from the group consisting of a compound of the formula



wherein R_2 represents a member selected from the group consisting of trifluoromethyl, chloro and hydrogen, and Am_2 denotes a member selected from the group consisting of diethylamino, monoethylamino, dimethylamino and monomethylamino, and a pharmaceutically acceptable acid addition salt thereof, together with a pharmaceutical carrier.

4,045,581

LONG-LASTING MINT-FLAVORED CHEWING GUM

Donald A. M. Mackay, Pleasantville; Frank Witzel, Spring Valley, both of N.Y.; Basant K. Dwivedi, Hopatcong, and Daniel Schoenholz, Basking Ridge, both of N.J., assignors to Life Savers, Inc., New York, N.Y.

Continuation of Ser. No. 577,589, May 15, 1975, abandoned. This application June 14, 1976, Ser. No. 695,487

Int. Cl.[2] A23G *3/30*

U.S. Cl. 426—3 **5 Claims**

1. A flavored chewing gum having a prolonged sweet taste comprising gum base, the free acid form of saccharin dispersed in said gum base, and flavoring, said free acid form of saccharin being present in an amount of from about 0.05 to about 0.5% by weight of the chewing gum and further including from about 0.05 to about 90% by weight of one or more water-soluble sweetening agents at least one of which is sucrose.

4,045,582

BENEFICIATION OF URIC ACID FROM NATURAL PRODUCTS

John D. Douros, Jr., Littleton, and Ira T. Warder, Jr., Lakewood, both of Colo., assignors to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 389,392, Aug. 15, 1973, which is a division of Ser. No. 80,517, Oct. 7, 1970, Pat. No. 3,850,930. This application May 26, 1976, Ser. No. 690,137

Int. Cl.[2] A23K *1/22*

U.S. Cl. 426—69 **2 Claims**

1. The process of producing a uric acid containing feed supplement for ruminant animals comprising the steps of:

collecting uric acid containing waste material within 120 hours of excrement;

promptly drying said collected material at a temperature of from 140° F. to 390° F. to remove a substantial portion of the water and to assure complete kill of microorganisms to prevent further decay and to render the material non-toxic; and

grinding the dried material and collecting that fraction of ground material of 80 mesh or smaller size.

4,045,583

METHOD OF MANUFACTURING A CHOCOLATE PRODUCT

Maurice Stanley Jeffery, Solihull; Paul Anthony Glynn, Birmingham, and Mohammed Moiz Uddin Khan, Solihull, all of England, assignors to Cadbury Limited, Birmingham, England

Filed July 14, 1976, Ser. No. 705,207

Claims priority, application United Kingdom, July 22, 1975, 30570/75

Int. Cl.[2] A23G *1/00*

U.S. Cl. 426—241 **11 Claims**

1. A method of manufacturing a shaped heat-resistant chocolate product comprising the steps of (i) thoroughly mixing at least the following ingredients: water, 15 to 35% by weight of at least one edible fat selected from (a) cocoa butter and (b) cocoa butter and at least one other fat, and not less than 40% by weight of sugar, said percentages being based on the total weight of the chocolate product, so as to produce an aqueous sugar solution in which said at least one edible fat is emulsified with the solution, (ii) maintaining said at least one edible fat emulsified with the aqueous sugar solution, evaporating sufficient water from the solution to prevent separation of said at least one edible fat from the said aqueous sugar solution, (iii) shaping the resultant evaporated mixture, and (iv) drying the shaped mixture so as to produce a shaped heat-resistant chocolate product having a moisture content of not more than 5% by weight and such that individual particles of said at least one edible fat are encapsulated in a sugar glass.

11. A method as claimed in claim **1**, wherein the drying step is effected by heating by micro-wave energy.

4,045,584

FOOD PRODUCT COATING APPARATUS AND METHOD

Richard E. Jones, and Donald F. Jago, both of Duluth, Minn., assignors to Jeno's, Inc., Duluth, Minn.

Division of Ser. No. 618,905, Oct. 2, 1975. This application Nov. 17, 1976, Ser. No. 742,624

Int. Cl.[2] B05B *3/02*

U.S. Cl. 426—289 **2 Claims**

1. A method of coating a surface of an article of food with granular food product at a selected density comprising the steps of

transporting an article of food to be coated along a preselected path at a predetermined speed;

enclosing a quantity of granular material to be coated on said article of food above said preselected path;

agitating said granular material with height adjustable rotatable agitating auger;

metering said agitated granular material with a pair of height adjustable rotatable distributing augers to a distributing surface forming a pair of elongated parallel slots positioned normal to the preselected path and having an adjustable orifice plate to define an opening between the elongated slot and orifice plate above said predetermined path and through which a metered quantity of granular food material enabling an article of food to be coated to pass thereunder;

adjusting the height of the agitating auger and distributing auger relative to the elongated slots at a selected height to enable a controlled weight of granular material to be metered from the agitating auger to the elongated slots in a circular pattern by said distributing auger;

adjusting the orifice plate to set the opening defined by the elongated slots and orifice plate at selected cross-sectional areas for passing the metered quantity of granular material

therethrough at a selected density and onto an article of food located thereunder; and

rotating said distributing augers and said agitating auger at a variable selected speed required to meter a selected quantity of granular material through said openings and onto said article of food being transported therepast at said predetermined speed.

4,045,585

FLAVORED ANIMAL FOOD COMPOSITIONS

Milo D. Appleman, Los Angeles, and Stanislao A. DeSantis, Rolling Hills, both of Calif., assignors to Decel Corporation, Los Angeles, Calif.

Filed May 19, 1976, Ser. No. 688,085
Int. Cl.[2] A23K *1/00*
U.S. Cl. 426—331 **19 Claims**

1. A coherent and physically stable, flavored animal food composition adapted to be used in the preparation of canned or expanded pet foods which consists essentially of:

flour from about 50 to about 75 wt. %, moisture from about 18 to about 30 wt. %, fat from about 2 to about 10 wt. %, and

comminuted natural flavor material selected from the group consisting of cheese, poultry, liver, kidney, fish and mixtures thereof, said natural flavor material being fresh, dried or mixtures thereof in an amount at least sufficient to impart flavor to the composition with the upper limit thereof being about 25 wt. % providing, however, that the upper limit for dried natural flavor material is about 12.5 wt. %.

4,045,586

SOLUBLE COFFEE OF IMPROVED STABILITY AND FLAVOR

Robert Franklin Howland, New City; Michael Herman Mansky, Tarrytown, and Willie James Richards, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed May 7, 1975, Ser. No. 575,551
The portion of the term of this patent subsequent to May 7, 1991, has been disclaimed.
Int. Cl.[2] A23F *1/04*
U.S. Cl. 426—387 **8 Claims**

1. A process for preparing soluble coffee powder of improved stability on storage comprising:

a. removing a portion of the aromatics from an aqueous coffee extract by subjecting said extract to evaporation for a time sufficient to remove from about 2 to about 20% by weight of said extract;

b. drying the remaining extract from (a);

c. condensing and collecting said removed aromatic portion;

d. mixing said collected aromatic portion in solution with a water-soluble carbohydrate fixative selected from the group consisting of dextrins, corn syrup solids, dextrose, lactose and gums and drying the resulting solution; and

e. mixing the dried product of (b) with at least a portion of the dried product of (d).

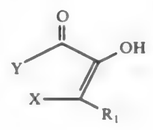
4,045,587

FOODSTUFF FLAVORING METHODS AND COMPOSITIONS

Ira Katz, Elberon; Alan O. Pittet, Atlantic Highlands; Richard Arnold Wilson, Monmouth Beach, and William John Evers, Long Branch, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jan. 13, 1970, Ser. No. 2,667
Int. Cl.[2] A23L *1/22*
U.S. Cl. 426—533 **24 Claims**

1. A process comprising heating in solution at least one cyclic carbonyl compound having the formula



wherein the dashed line is a single bond or a carbon-carbon double bond; Y is —O—, $—CR_3R_4—$ or $=CR_3—$; X is —O— or $—CR_2R_5—$ when the dashed line is a single bond and Y is $—CR_3R_4—$; X is $—CR_2R_5—$ when the dashed line is a single bond and Y is —O—; X is $=CR_2—O—$ when the dashed line is a double bond, and Y is $=CR_3—$ when the dashed line is a double bond; R_1, R_2, R_3, R_4, and R_5 are the same or different and are lower alkyl or hydrogen; with hydrogen sulfide in the molar ratio of sulfide to carbonyl compound of from about 0.05:1 to about 3:1 under a pressure of from about two to ten atmospheres to produce a hearty flavoring material, said solution being substantially free of esters of hydroxy polybasic acids.

4,045,588

MARGARINE FAT

Theophil Wieske, Hamburg, Germany, assignor to Lever Brothers Company, New York, N.Y.

Continuation of Ser. No. 501,946, Aug. 29, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 650,999
Int. Cl.[2] A23D *3/00*
U.S. Cl. 426—607 **5 Claims**

1. Margarine fat consisting essentially of (a) a liquid vegetable oil having a polyunsaturated fatty acid content of at least 40% and (b) 5–30% of a hard fat containing:

I. 25–60% of triglycerides containing three saturated fatty acids with 16–24 carbon atoms and triglycerides containing two saturated fatty acids with 16–24 carbon atoms and one mono-trans-unsaturated fatty acid with 16–24 carbon atoms,

II. 35–70% of saturated fatty acids with 16–24 carbon atoms,

III. 20–35% of mono-trans-unsaturated fatty acids with 16–24 carbon atoms,

IV. 0.25% of saturated fatty acids with 12–14 carbon atoms,

V. 15–45% of saturated fatty acids with 2–14 carbon atoms and mono-trans-unsaturated fatty acids with 16–24 carbon atoms,

VI. the balance being the remaining fatty acids, to provide from 0.2–5% triglycerides containing three saturated fatty acids with 16–20 carbon atoms in the margarine fat.

4,045,589

FAT EMULSION PRODUCT AND PROCESS FOR PRODUCING THE SAME

Gary E. Petrowski, Santa Monica; John M. Wolcott, Burbank, and Erlinda P. Ortiz, Ontario, all of Calif., assignors to Carnation Company, Los Angeles, Calif.

Filed June 21, 1976, Ser. No. 697,837
Int. Cl.[2] A23C *11/00*
U.S. Cl. 426—609 **18 Claims**

1. A dry, protein-free coffee whitener which comprises

a dried emulsion concentrate containing

from 0%-55% by weight of a water soluble carbohydrate,

from 0.2%–1.25% of an emulsifier, and

from 20%–50% by weight of an edible fat having an average particle size of about 1–3 microns in diameter, said fat being stabilized with a chemically modified dextrinized starch derivative having a lipophilic character in an amount sufficient to provide the product with a starch derivative to fat ratio of between about 0.4–1.25 to 1, and

a buffering salt in an amount sufficient to provide the product with a pH in the range of 6–7 when reconstituted.

4,045,590

MEAT ANALOG FROM AGGLOMERATED PROTEIN

Dwight Carl Weigle, Anderson Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Oct. 4, 1976, Ser. No. 729,522
Int. Cl.[2] A23J *3/00;* **A23L** *1/20*
U.S. Cl. 426—656 **4 Claims**

1. A process for making a simulated comminuted meat product comprising the steps of:

A. contacting, under conditions of mild agitation and in the presence of from about 5% to about 35% fat, a mixture of from about 5% to about 20% of a first heat-coagulable protein and from about 5% to about 20% of a second heat-coagulable protein with from about 25% to about70% water having a temperature at least equal to the temperature of coagulation of said first protein but less than the temperature of coagulation of said second protein, said agitation being sufficient to form agglomerates; and

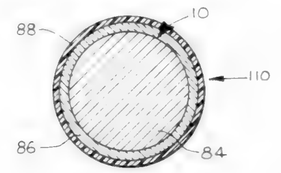
B. heating the agglomerates of step (A) to a temperature at least equal to the temperature of coagulation of said second protein thereby coagulating said second protein.

4,045,591

METHOD OF TREATING SUCKER ROD

Bobby L. Payne, Midland, Tex., assignor to Rodco, Inc., Odessa, Tex.

Continuation-in-part of Ser. No. 490,210, July 19, 1974, Pat. No. 3,958,049, which is a continuation-in-part of Ser. No. 195,658, Nov. 4, 1971, abandoned. This application May 3, 1976, Ser. No. 682,380
The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.
Int. Cl.[2] E21B *17/00;* **C23C** *7/00*
U.S. Cl. 427—37 **10 Claims**



1. A continuous process for improving ferrous metal sucker rods wherein the rods are protected against corrosion and hydrogen ion embrittlement comprising the steps of:

1. cleaning the surface of the rods to remove debris and scale therefrom;

2. mechanically cold working and further cleaning the exterior surface of the cleaned rods of step (1) by shot peening the surface thereof;

3. electronically inspecting the rods to determine the symmetry of composition;

4. electronically inspecting the rods to determine the presence of flaws therein;

5. discarding those rods of steps (3) and (4) whose structural integrity is deficient for carrying its designed load;

6. coating the exterior surface of the remaining rods of step (5) with a stainless steel metal alloy by using an electric arc metal spray apparatus;

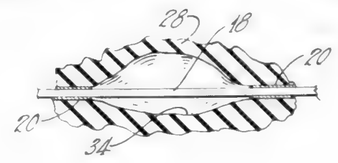
7. carrying out the coating step (6) immediately following the inspection steps (3) and (4); and, carrying out the inspection steps (3) and (4) immediately following the cleaning step (2) so that the coating is applied before appreciable oxidation can occur.

4,045,592

METHOD OF MAKING STRETCHABLE AND COMPRESSIBLE ELONGATE MEMBER

Alfred Marzocchi, Cumberland, R.I., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Division of Ser. No. 608,592, Aug. 28, 1972, which is a continuation of Ser. No. 483,860, June 27, 1974, abandoned. This application Dec. 5, 1975, Ser. No. 637,992
Int. Cl.[2] B05D *3/06*
U.S. Cl. 427—45 **10 Claims**



1. A method of making a stretchable cord comprising:

supplying a bundle of generally parallel continuous glass filaments;

applying a coating of vaporizable material to filaments;

subsequently applying a thermosetting elastomeric material to the bundle such that the material impregnates and surrounds the bundle and separates the filaments;

forming a vapor impervious skin on the outer surface thereof; and

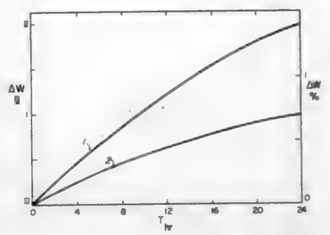
applying energy to heat such bundle sufficient to effect curing the elastomeric material and such that at least a portion of the vaporizable material will vaporize to form irregular voids randomly located in the elastomeric material whereby the filaments assume undulating paths in the vicinity of the voids and whereby bulbous enlargements are formed at the outer suface of the cord in the vicinity of the voids.

4,045,593

METHOD FOR PRODUCING MOISTURE RESISTANT ELECTRODES

David C. Hill, Somers, and Edith M. Flanigen, White Plains, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 379,917, July 17, 1973, abandoned. This application Sept. 22, 1975, Ser. No. 598,216
Int. Cl.[2] B05D *5/12, 3/04*
U.S. Cl. 427—59 **7 Claims**



1. A method for treating the outer surfaces of covered electrodes to make them moisture resistant, comprising; forming an aqueous dispersion consisting of water and a silicon containing material selected from the class consisting of soluble amorphous solid silicas and soluble silicates of lithium and potassium in a concentration of from about 1 to 20% by weight silica; applying said aqueous dispersion to each covered electrode outer surface for a period of from about 1 minute to about 5 hours at a temperature of from about 5° to 95° C, and drying each electrode outer surface until essentially all of the water is

driven off whereby a uniform and thin film deposit is formed upon each electrode outer surface having a composition containing substantially oxides of silicon, said film deposit being formed by mass transport of the silicon containing material through the aqueous dispersion.

4,045,594

PLANAR INSULATION OF CONDUCTIVE PATTERNS BY CHEMICAL VAPOR DEPOSITION AND SPUTTERING

Fred Sterns Maddocks, Poughkeepsie, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,772
Int. Cl.² B05D *5/12*
U.S. Cl. 427—89 **28 Claims**



1. A method for forming a conductive pattern atop a substrate comprising:

forming a first insulating film on said substrate;

forming a masking layer of photosensitive material on said first insulating film, said masking layer having at least one aperture;

forming apertures in said first insulating film corresponding to said masking-layer apertures;

depositing a conductive film atop said masking layer and into said apertures, the surface of said conductive film in said apertures being substantially flush with the surface of said first insulating film;

said deposition resulting in gaps between said conductive film in said apertures and insulating film;

removing said masking layer, thereby leaving a conductive pattern in said apertures;

forming on said first insulating film and said conductive pattern a second insulating film by a chemical vapor deposition reaction;

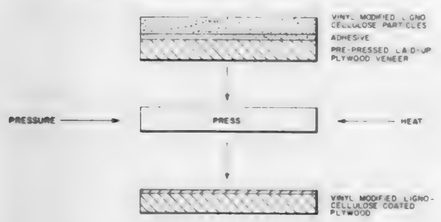
said second insulating film having a thickness which is at least one-half that of the width of the largest of said gaps, whereby a substantially planar second insulating film is formed.

4,045,595

COATING WOOD SURFACE BY VINYL-MODIFIED LIGNOCELLULOSIC PARTICLES

Shui-Tung Chiu, New Westminster, and William Melvin Turko, Burnaby, both of Canada, assignors to The Borden Chemical Company (Canada) Limited, West Hill, Canada

Division of Ser. No. 503,640, Sept. 6, 1974, abandoned. This application Jan. 20, 1976, Ser. No. 650,808
Claims priority, application Canada, June 13, 1974, 202417
Int. Cl.² B05D *1/36, 3/12, 3/02*
U.S. Cl. 427—202 **9 Claims**



1. A method for producing a coating on a lignocellulose based panel board, which comprises the steps of applying on the panel board surface a conventional resin adhesive; spreading thereon vinyl-modified lignocellulosic particles made by a free-radical donor initiated polymerization of ethylenically unsaturated monomers on substrate lignocellulosic particles to form a thermoplastic coating; and subjecting the coated panel board assembly to heat and pressure sufficient to soften and spread said thermoplastic coating and thereby form a thin, hard, integral surface coating in situ on said panel board.

4,045,596

SUPERFICIAL TREATMENT OF STEEL

Pierre Guiraldenq; Daniel Tréheux, and Daniel Marchive, all of Ecully, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed June 3, 1976, Ser. No. 692,415
Claims priority, application France, June 12, 1975, 75.19016
Int. Cl.² C23C *9/00*
U.S. Cl. 427—229 **5 Claims**

1. A method for the treatment of steel surfaces to form thereon an intermediate layer of ferrites and an outer layer on tin-iron compound of the type FeSn to improve their resistance to corrosion and their frictional properties which consists essentially:

in coating the parts with an organic varnish containing finely divided tin particles:

and in heating the coated parts to a temperature at least equal to 650° C but situated outside the range 700° C–970° C to eliminate the varnish, and maintaining said temperature for a time sufficient to cause the particles to react with the underlying steel and to form thereon said intermediate layer of ferrites and said outer layer of tin-iron compounds, the said outer layer being substantially continuous and firmly bound to the intermediate layer.

4,045,597

PROCESS FOR MODIFYING AMORPHOUS CARBON FILAMENTS

Harold E. Debolt, Andover, Mass., assignor to Avco Corporation, Wilmington, Mass.

Continuation-in-part of Ser. No. 230,867, March 1, 1972. This application Nov. 24, 1975, Ser. No. 634,478
Int. Cl.² C23C *11/08;* B05D *3/02*
U.S. Cl. 427—248 A **7 Claims**

1. A process for modifying amorphous carbon filament for use as a filamentary reinforcement for composites comprising:

depositing a flash coating or boron on said filament;

subsequently heat treating the flash coated filament at a temperature above 2,100° C in an inert atmosphere for catalytically transforming the amorphous carbon into a skin layer of highly oriented graphite such that the resistance of the filament with the skin layer aas a whole decreases by a factor of at least two times.

4,045,598

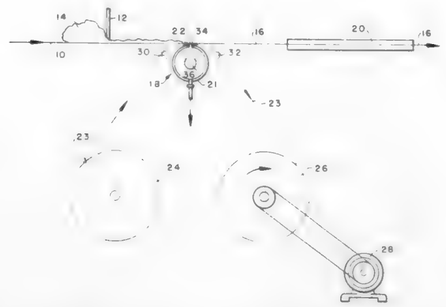
COATING METHOD AND APPARATUS

Jimmy B. Henson, Pacolet Mills, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.

Filed May 6, 1976, Ser. No. 683,721
Int. Cl.² B05D *3/00, 3/12*
U.S. Cl. 427—296 **1 Claim**

1. The method of providing a coated fabric on an apparatus having an elongated hollow manifold connected to a source of negative pressure and an elongated opening thereon comprising the steps of: providing a supply of fabric to be coated, applying a coating material to the fabric, passing the coated fabric over the elongated opening, passing a web material under the coated fabric into the hollow manifold over one side

of the elongated opening and out of the hollow manifold over the other side of the elongated opening to continuously clean



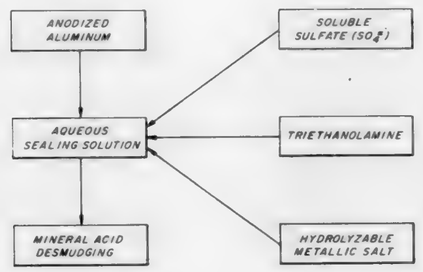
the elongated opening and curing the coated fabric after passage over said opening.

4,045,599

LOW TEMPERATURE SEALING OF ANODIZED ALUMINUM

Edward G. Remaley, New Kensington; Robert W. Baker, Natrona Heights, and Raymond J. Meyer, Apollo, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jan. 15, 1976, Ser. No. 649,403
Int. Cl.² C25D *11/24*
U.S. Cl. 427—333 **8 Claims**



1. A method for forming a low temperature seal on anodized aluminum and removing sealing smudge therefrom comprising:

a. contacting said anodized aluminum with an aqueous sealing solution containing 2 to 6 g/l of hydrolyzable metallic salt, 5 to 20 ml/l of an ethanolamine, and 50 to 2000 mg/l soluble sulfate ($SO_4^=$), for a period of time sufficient to provide said seal, said solution being capable of providing a seal at a temperature of at least 140° F; and

b. removing sealing smudge formed in said prior step with mineral acid.

4,045,600

METHOD OF INHIBITING PLASTICIZER MIGRATION FROM PLASTICIZED POLY(VINYL CHLORIDE) SUBSTRATES

Gary E. Williams, Lancaster, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed Nov. 18, 1976, Ser. No. 743,049
Int. Cl.² B32B *27/30;* D06N *3/04;* B44D *1/14*
U.S. Cl. 427—379 **5 Claims**

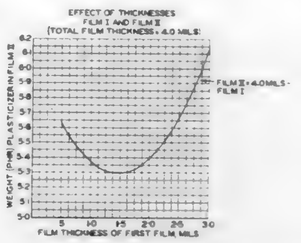
1. A method of inhibiting plasticizer migration from a plasticized polyvinyl chloride substrate comprising the steps of:

1. applying to the surface of said substrate a coating of a solution consisting essentially of an inert organic solvent and an isocyanate-terminated polyurethane, said coating having a viscosity of from 50 to 200 centipoise;

2. removing said inert organic solvent from the applied solution wherein a first substantially homogeneous film of thermosettable polyurethane is formed of from 1.0 to 2.0 mils in thickness;

3. applying to the substantially homogeneous film surface of Step 2 said coating solution of Step 1;

4. removing said inert organic solvent from the applied



solution of Step 3 wherein a second substantially homogeneous film of a thermosettable polyurethane is formed of from 2.0 to 3.0 mils in thickness; and

5. repeating Steps 1 and 2 wherein said coating solution is applied to the surface of the second substantially homogeneous film of Step 4; thereby forming a third substantially homogeneous film, of from about 1.5 to 3.0 mils in thickness, whereby plasticizer migration from the polyvinyl chloride substrate to the third substantially homogeneous film is inhibited.

4,045,601

SOLVENT FINISHING OF FIBER GLASS FABRICS

George L. Brodmann, and Carl Nelson Schlatter, both of Akron, Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 567,469, April 14, 1975, abandoned. This application Oct. 4, 1976, Ser. No. 729,223
Int. Cl.² B05D *1/38*
U.S. Cl. 427—381 **8 Claims**

1. A non-aqueous process for resin finishing and dyeing woven fiber glass fabric which comprises the steps of sequentially:

A. impregnating the fabric with a liquid pre-finishing composition having a surface tension of less than 30 dynes/cm. at 25° C.; which composition comprises (1) 0.1 to 5.0 weight percent of solvent soluble glass-reactive low molecular weight organosilicon compound and (2) organic solvent having a boiling point of 50° C. to 150° C. at 760 mm Hg pressure;

B. volatilizing a major portion of the organic solvent from the fabric;

C. impregnating the fabric with a liquid finishing composition having a surface tension of less than 30 dynes/cm. at 25° C.; and a viscosity of less than 1,000 centipoises at 25° C.; which composition comprises (1) 0.5 to 10.0 weight percent of solvent soluble synthetic resin selected from the group consisting of polyacrylics, polyurethanes, polyesters, and polysilicones; (2) pigment dye; and (3) single phase solvent comprising at least 90 percent by weight of aliphatic chlorinated hydrocarbon having 1 to 4 carbon atoms and no more than 5 chlorine atoms, said solvent having a boiling point between 50° C. to 150° C. at 760 mm Hg pressure; then

D. volatilizing a major portion of the aliphatic chlorinated solvent from the fabric thereby depositing resin and dye on the fabric.

4,045,602

ADHESION OF ORGANOPOLYSILOXANE ELASTOMERS TO SUBSTRATES

Oswin Sommer; Peter Huber, and Alois Strasser, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed May 17, 1976, Ser. No. 686,842
Claims priority, application Germany, May 26, 1975, 2523224
Int. Cl.[2] B05D *1/36, 7/06*
U.S. Cl. 427—386 **22 Claims**

1. A process for improving the adhesion of an organopolysiloxane elastomer to a substrate, which comprises (1) coating the substrate with a copolymer containing a compound selected from the class consisting of (a) 2-hydroxypropyl acrylate, 2-hydroxypropyl methacrylate and mixtures thereof, and (b) at least one other olefinically unsaturated monomer, (2) subsequently applying to the substrate a room temperature vulcanizable organopolysiloxane composition, and thereafter (3) curing the organopolysiloxane composition.

4,045,603

CONSTRUCTION MATERIAL OF RECYCLED WASTE THERMOPLASTIC SYNTHETIC RESIN AND CELLULOSE FIBERS

Teddy Van Smith, Dallas, Tex., assignor to Nora S. Smith, Dallas, Tex.

Filed Oct. 28, 1975, Ser. No. 625,896
Int. Cl.[2] B65D *71/00*
U.S. Cl. 428—2 **6 Claims**



1. A construction material comprising respective opposite face surfaces, said opposite face surfaces being contiguous with an intervening core material, said face surfaces consisting essentially of a re-hardened fused and rolled layer of thermoplastic synthetic resin material bits, said intervening core material consisting essentially of a compressed non-homogeneous mixture of cellulose aggregate material bits and re-hardened fused thermoplastic synthetic resin material bits, with said face surfaces being fused to respective opposite surfaces of said intervening core material.

4,045,604

RECOVERABLE ARTICLE WITH OUTWARDLY EXTENDING HOLLOW HEAT FLANGES; KIT INCLUDING SUCH ARTICLE AND A CYLINDRICAL SUBSTRATE; AND METHOD OF MAKING SUCH ARTICLE

Robin J. T. Clabburn, Highworth, England, assignor to Raychem Limited, London, England

Continuation-in-part of Ser. No. 513,111, Oct. 8, 1974, abandoned. This application Oct. 7, 1975, Ser. No. 620,405
Claims priority, application United Kingdom, Oct. 8, 1974, 43536/74
Int. Cl.[2] B32B *1/08;* **H01B** *17/56;* **B29C** *27/24;* **F16H** *55/48*
U.S. Cl. 428—36 **9 Claims**

1. A heat recoverable article for covering a substrate, comprising

a hollow member of heat recoverable material, said hollow member having an elongate cavity of uniform cross section; and

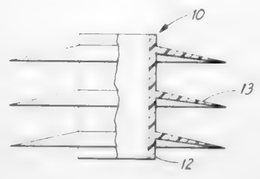
a plurality of outwardly extending flanges integrally molded with said hollow member and extending around at least a portion of said hollow member, said flanges being heat recoverable adjacent said hollow member, being in substantially identical orientation with one another and being capable of retaining substantially identical orientation with one another upon heat recovery of said hollow member and said flanges about a substrate.

7. A kit for a composite article, comprising

an elongate, substantially cylindrical substrate;

a hollow member of heat recoverable material, said hollow member having an elongate, substantially cylindrical cavity; and

a plurality of outwardly extending flanges integrally molded with said hollow member and extending around at least a portion of said hollow member, said flanges being heat recoverable adjacent said hollow member, being in substantially identical orientation with one another and being



capable of retaining substantially identical orientation with one another upon heat recovery of said hollow member and said flanges about said substrate.

9. A method for making a heat recoverable article having a hollow, substantially cylindrical member for covering a substrate and outwardly extending flanges symmetrical about the hollow, substantially cylindrical member including the steps of

molding said member with radially outwardly extending flanges;

expanding the member to a first heat recoverable state;

controlling the orientation of the flanges during expansion of the member; and cooling the member and flanges to a rigid state.

4,045,605

CARPETING HAVING STIFF FIBERS

Leon Frank Haddon Breens, London; Dennis Lockhart Armitage, Bolton, and Christopher Edward Summers, Swindon, all of England, assignors to Peter Smith Associates (Carpet Importers) Limited and Collie Carpets Limited, both of, England

Filed June 18, 1976, Ser. No. 697,526
Claims priority, application United Kingdom, June 24, 1975, 26701/75
Int. Cl.[2] B32B *33/00*
U.S. Cl. 428—88 **9 Claims**

1. A carpeting material comprising a backing fabric and fibres standing up from the backing fabric as pile or tufts, wherein the pile or tuft fibres comprise 75 to 98 percent by weight of conventional carpet yarns and 2 to 25 percent by weight of stiff fibres of filaments which are not plied with the conventional carpet fibre yarns and which are arranged to act as dirt scrapers, said carpet yarns being formed from fibres selected from the group consisting of nylon, acrylic, regenerated cellulose, wool, polyester, cotton and polypropylene fibres of less than 30 decitex per filament, and the stiff fibres or filaments being more resistant to being trodden down than the conventional carpet yarns.

4,045,606

PROTECTIVE COVER FOR AN ELECTRIC RANGE

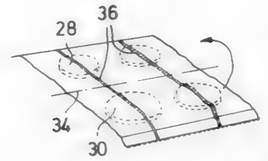
Kurt Ulrich Kalkowski, Am Bleiberg 3, Mechernich-Kommern, Germany

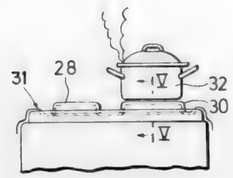
Filed Nov. 21, 1975, Ser. No. 634,280
Claims priority, application Germany, Nov. 25, 1974, 2455693
Int. Cl.[2] B32B *1/00, 3/00*
U.S. Cl. 428—174 **10 Claims**

1. A protective cover for an electric range having a stove plate and circular electric heating units comprising:

a piece of flexible heat resistant metal foil having good heat conductivity substantially covering said stove plate and said heating units;

bulges in said metal foil around said units and conforming to the shape thereof to prevent said protective cover from





slipping on said plate during use and to enclose said heating units to reduce heat losses therefrom; and,

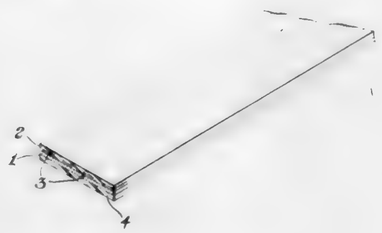
at least one strip of a temperature indicating salt of a kind which changes color at a temperature of approximately 400° C so that said strip of salt extends over said heating units.

4,045,607

CABLE SHIELDING TAPE

Charles C. Swearingen, Bay Village, and Nicholas Sheptak, Rocky River, both of Ohio, assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 31,386, April 23, 1970, Pat. No. 3,770,570, which is a continuation-in-part of Ser. No. 734,392, June 4, 1968, abandoned. This application Aug. 1, 1973, Ser. No. 384,662
Int. Cl.[2] B32B *3/00, 7/14*
U.S. Cl. 428—200 **7 Claims**



1. A cable shielding tape comprising a metallic strip, a layer of an adhesive copolymer of an α-olefin and and α,β-ethylenically unsaturated carboxylic acid in mating relationship with at least one surface of said strip, and a fugitive release agent disposed between said metallic strip and said layer of the adhesive copolymer which defines at least one zone of reduced adhesion between said layer of the adhesive copolymer and said metallic strip, the fugitive release agent being of a type which will become absorbed by the adhesive copolymer such that the adhesion of said layer of the adhesive copolymer to said metallic strip can be increased by the application of heat.

4,045,608

FRICTION FACING WITH POROUS SHEET BASE

Robert A. Todd, 187 Mountain Ave., North Caldwell, N.J. 07006

Continuation-in-part of Ser. No. 508,090, Sept. 23, 1974, abandoned. This application June 9, 1976, Ser. No. 694,349
Int. Cl.[2] B32B *15/06, 15/08, 15/12*
U.S. Cl. 428—251 **13 Claims**



1. A friction facing comprising a porous sheet base material including cellulose fibers, an inorganic absorbent filler, and a retention agent in a proportion throughout said base of up to 13% by weight of said base for holding said porous sheet base material together; a first coating of a resin binder impregnant on said porous sheet base, and a second outer coating of an ethyl silicate binder impregnant on said resin coating, said base with said coatings being porous and absorbent.

4,045,609

GAS RESISTANT FOAM MATERIALS

John A. H. Hart, South March, Canada, assignor to Her Majesty the Queen in right of Canada, Canada

Continuation of Ser. No. 438,621, Feb. 1, 1974, abandoned, which is a division of Ser. No. 132,611, April 8, 1971, abandoned. This application Apr. 7, 1976, Ser. No. 674,492
Claims priority, application Canada, May 4, 1970, 081768
Int. Cl.[2] B32B *7/00*
U.S. Cl. 428—253 **11 Claims**

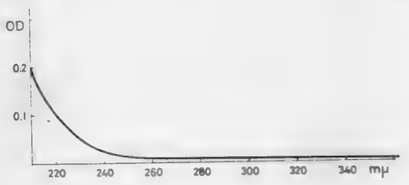
1. A laminated fabric material comprising an air and water permeable open cell solid flexible polyurethane foam resistant to passage therethrough of noxious chemicals in liquid or vapor form, said foam having dispersed therein particulate activated carbon of average particle size in the range of 7 to 10 microns and in an amount of at least 10% by weight of said foam but not in excess of 12 milligrams per sq. cm. of foam, said particulate activated carbon being bonded in said foam by an acrylic elastomeric binder which is substantially free from substances which substantially deactivate the carbon, said binder being present in an amount of from 15 to 100 parts by weight per 100 parts by weight of said activated carbon, and an air and water vapor permeable fabric backing to which said foam is bonded.

4,045,610

ANTIBIOTICS DESIGNATED XK-88 SERIES

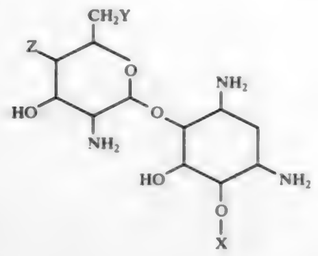
Takashi Nara, Tokyo; Seigo Takasawa, Hadano; Ryo Okachi, Machida; Isao Kawamoto, Machida; Mitsuyoshi Yamamoto, Machida; Seiji Sato, Machida; Tomoyasu Sato, Machida, and Atsuko Morikawa, Tama, all of Japan, assignors to Abbott Laboratories, N. Chicago, Ill.

Division of Ser. No. 516,816, Oct. 21, 1974, Pat. No. 3,939,043. This application Oct. 17, 1975, Ser. No. 623,308
Claims priority, application Japan, Oct. 24, 1973, 48-118932
Int. Cl.[2] C07H *15/22*
U.S. Cl. 536—17 **9 Claims**

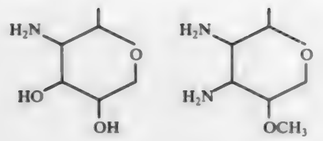


1. A composition of matter having antibacterial activity

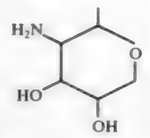
selected from the group consisting of XK-88-1, XK-88-2, XK-88-3 and XK-88-5 represented by the formula:



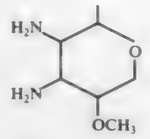
wherein X is



or —H; Y is $—NH_2$ or —OH; and Z is —H or —OH; and wherein when X is



Y and Z are —OH, said component being XK-88-1, or Y is NH_2 and Z is OH, said component being XK-88-3; and when X is



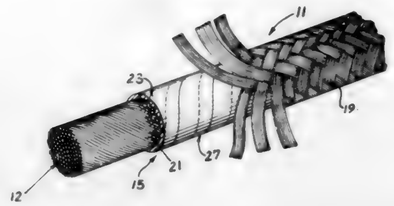
Y is NH_2 and Z is —H, said component being XK-88-5; and when X is —H, Y is NH_2 and Z is —H said component being XK-88-2; and the pharmaceutically acceptable acid addition salts thereof.

4,045,611

HERMETIC LEAD WIRE

Duane E. Torgerson, Oswego, Ill., assignor to Belden Corporation, Geneva, Ill.

Filed Sept. 30, 1975, Ser. No. 618,035
Int. Cl.² H01B *7/02*
U.S. Cl. 174—121 SR **6 Claims**



1. A hermetic lead wire for use in hermetically sealed electrical apparatus comprising an elongated central flexible conductor having a plurality of metallic strands extending longitudinally of the wire for carrying an electric current,

an inner flexible layer of meltable non-woven polyester fibers composed of fiber forming polymers of polyethylene terphthalate surrounding said central stranded conductor and disposed in direct engagement with said central stranded conductor for interlocking with the conductor when melted with a heated stripping tool during the manufacture of said apparatus,

an outer flexible layer of plastic film surrounding said inner layer of meltable non-woven polyester fibers and providing a dielectric shield for the wire, said non-woven polyester fibers being secured to and carried by said plastic film layer and being applied to said metallic strands by said plastic film layer, and

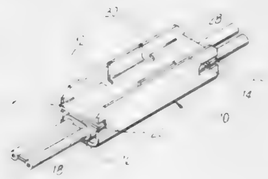
an outer braided flexible sheath of polyester surrounding said plastic film and providing a protective shield for said plastic film layer.

4,045,612

SPLICE CASE HOUSING

Michael Troy, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sept. 22, 1975, Ser. No. 615,818
Int. Cl.² H02G *15/10*
U.S. Cl. 174—136 **3 Claims**



1. A housing for a splice case comprising

a rigid channel member including parallel sidewalls, said sidewalls including notches therethrough at either end of each said sidewall;

a plate extending across said channel member between said parallel sidewalls and including tabs on either side thereof engaging said notches in said parallel sidewalls, said tabs and said notches allowing limited movement perpendicular to the plane of said plate; and

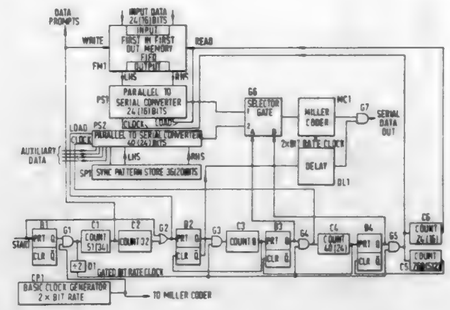
flanges extending from said plate parallel to said parallel sidewalls, said flanges extending outwardly from said channel beyond said parallel sidewalls.

4,045,613

DIGITAL STORAGE SYSTEMS

Ian Clive Walker, Newbury, England, assignor to Micro Consultants, Limited, England

Filed Mar. 26, 1976, Ser. No. 670,935
Claims priority, application United Kingdom, Mar. 26, 1975, 12607/75
Int. Cl.² H04L *7/00*
U.S. Cl. 178—69.1 **10 Claims**



8. A method of inserting synchronising data between blocks of serial data comprising:

a. producing a predetermined synchronising data sequence,

b. selecting either said serial data or said synchronising data, and

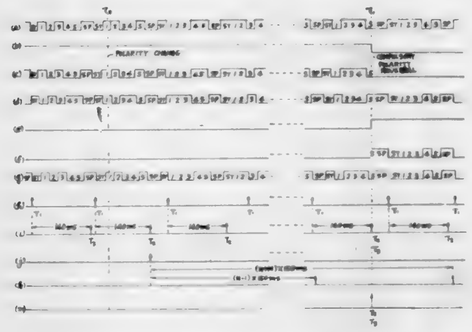
c. controlling said selected data to produce an identification gap in the data of a length equivalent to N bits of data before the start of the synchronising data which synchronising data is followed by said serial data.

4,045,614

SYSTEM FOR CONTROLLING POLARITY STATE OF START-STOP TELEGRAPH SIGNAL TRAIN

Fumio Takahata; Toshio Takahashi, and Yasuo Hirata, all of Tokyo, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Filed Mar. 2, 1976, Ser. No. 663,142
Claims priority, application Japan, July 18, 1975, 50-88005
Int. Cl.² H03K *1/17;* **H04B** *1/16*
U.S. Cl. 178—69.1 **8 Claims**



1. A system for controlling the polarity states of a start-stop telegraph signal train comprising:

input terminal means for receiving said start-stop telegraph signal train;

switch means connected to said input terminal means for reversing the polarity state of said start-stop telegraph signal train in response to a control input signal applied thereto;

output terminal means connected to receive the output of said switch means for sending out said controlled start-stop telegraph signal train having the correct polarity state;

timing means connected to receive the output of said switch means for generating first timing pulses and second timing pulses, each of said first timing pulses being included in a time slot at which the stop element of a character of said start-stop telegraph signal train is expected to arrive, at least one of said second timing pulses being included in a time slot at which a stop element after a predetermined number of characters from said first timing pulse is expected to arrive;

decision means connected to receive said output of said switch means and said timing means for deciding the polarities of signal elements of said start-stop telegraph signal train in synchronism with said first timing pulse and said second timing pulse respectively; and

control means connected to said decision means and said switch means for generating said control input signal and for applying it to said switch means only when the polarities of said signal elements of said start-stop telegraph signal train are decided as the A-polarity during both the decision operations by said decision means.

4,045,615

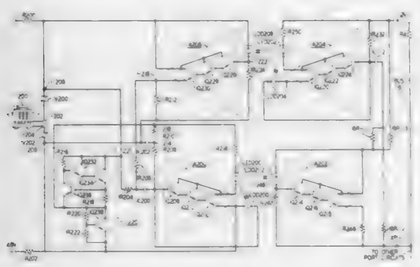
MONOBUS INTERFACE CIRCUIT USING OPTO-COUPLED HYBRIDS

Dennis Bryan James, Rumson; Chao Kai Liu, Matawan, and Douglas Charles Smith, Rumson, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 21, 1976, Ser. No. 688,787

Int. Cl.[2] H04M *3/56*

U.S. Cl. 179—1 CN **4 Claims**



1. An interface circuit for use in a switching system where any number of telephone communication lines can be connected together for transmission purposes, one said interface circuit being interposed between each telephone line and a common bus, said common bus including a summing means shared in common by any interface circuit connected to said common bus, each said interface circuit including,

first output current signal means for converting input voltage signals from said associated telephone line into output current signals and for communicating said converted output current signals to said common summing means, said communicated output current signals thereby being convertible into bus voltage signals by said common bus summing means,

means including said input voltage converting means for applying any converted bus voltage signals to said telephone line associated therewith,

means including said input voltage converting means for subtracting from said applied converted bus voltage signals any portion of said converted voltage signals which are representative of input voltage signals received over said associated telephone line,

said input voltage converting means including:

a first amplifier circuit means having an output and an input;

a first light-emitting means coupled to the output of the first amplifier circuit means;

first and second light detector means, the first and second light detector means being positioned so as to receive light from the first light-emitting means;

the first and second light detector means being characterized in that incident light thereon is proportional to the current induced therethrough; and the ratio of the induced currents is essentially constant,

the first light detector means being coupled to the input of the first amplifier;

second amplifier circuit means having an output and an input;

the second light detector means being coupled to the input of the second amplifier circuit means;

the output of said second amplifier connectable to said common bus and to said subtracting means;

said telephone line applying means including:

third amplifier circuit means having an input and an output;

a second light-emitting means coupled to the output of the third amplifier circuit means;

third and fourth light detector means, the third and fourth light detector means being positioned so as to receive light from the second light-emitting means;

the third and fourth light detector means being characterized in that incident light thereon is proportional to the current induced therethrough and the ratio of the induced currents is essentially constant;

the third light detector means being coupled to the input of the third amplifier circuit means,

fourth amplifier circuit means having an output and an input; and wherein

said fourth light detecting means is coupled to the input of said fourth amplifier circuit means, and the output of said fourth amplifier circuit means connectable to said telephone line.

4,045,616

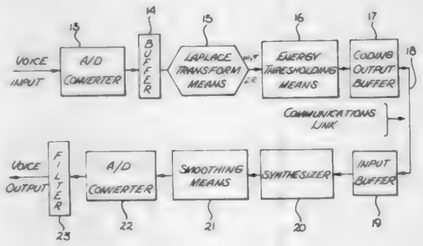
VOCODER SYSTEM

Edwin A. Sloane, Los Altos, Calif., assignor to Time Data Corporation, Santa Clara, Calif.

Filed May 23, 1975, Ser. No. 580,479

Int. Cl.[2] G10L *1/00*

U.S. Cl. 179—1 SA **32 Claims**



1. A vocoder system comprising:

input means for receiving an input signal;

time-domain to frequency-domain transformation means for determining s-plane pole locations and residues for said input signal coupled to said input means and for providing an output signal representative of such pole locations and residues; and

synthesizing means for synthesizing a signal from said output signal representative of such pole locations and residues, coupled to said transformation means;

whereby a signal representative of voice or the like may be stored or transmitted in the form of s-plane parameters.

4,045,617

TELECOMMUNICATION SWITCHING NETWORK HAVING A MULTISTAGE REVERSED TRUNKING ARRANGEMENT

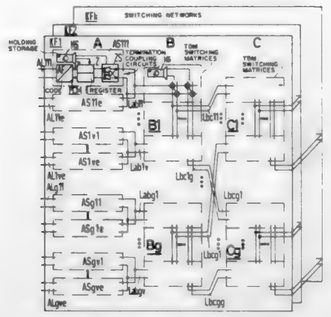
Max Schlichte, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 10, 1975, Ser. No. 630,639

Claims priority, application Germany, Nov. 14, 1974, 2454090

Int. Cl.[2] H04J *3/00*

U.S. Cl. 179—15 AT **3 Claims**



1. A telecommunication switching network having a multistage, reversed trunking arrangement and switching on a four wire basis, said switching network being constructed to operate as a pulse code modulation (PCM) time division multiplex (TDM) network, comprising:

a number *e . v . g .* of single channel subscriber lines connected to a first switching stage of said network wherein said subscriber lines are divided into a number *g* groups, each group containing a number *v* subgroups and each subgroup containing a number *e* terminals,

a number *e* of termination coupling circuit means in each said subgroup in said first switching stage for supplying information on said subscriber lines in PCM/TDM form, each said termination coupling circuit means having an input individually connected to a said subscriber line,

a number of *g.v* of TDM trunks, said trunks being individually connected to outputs of the said termination coupling circuit means in differing ones of said subgroups, each said trunk being constructed to carry a number *z* of time slots thereby forming a number *z.v.g* connection channels from said first to a second switching stage,

a first number g of TDM switching matrices in a second stage, each switching matrix having *v* inputs and *g* outputs, each said switching matrix having inputs connected to those of said TDM trunks connected to the said termination circuit means in a given group and

a second number *g* of TDM switching matrices in a third stage having *g* inputs, each of which is individually connected to an output from a said first TDM switching matrix, said third stage having outputs for connection to other switching networks.

4,045,618

DEVICE FOR SYNCHRONIZING A BINARY DATA TRAIN IN RELATION TO A REFERENCE TRAIN

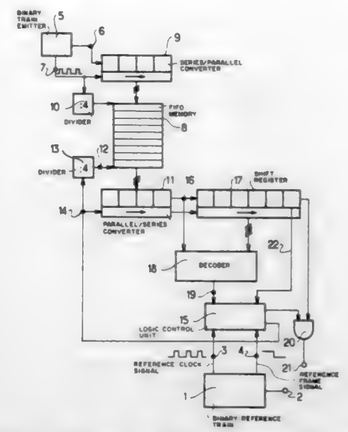
Jean-Louis Lagarde, Arpajon, and Gilles Gauriat, Paris, both of France, assignors to Compagnie Industrielle des Telecommunications CIT-ALCATEL S.A.

Filed Jan. 29, 1976, Ser. No. 653,637

Int. Cl.[2] H04L *7/00;* **H04J** *3/06*

U.S. Cl. 179—15 BS **2 Claims**

1. A device for synchronizing a binary data series train in relation to a reference train, the two trains having identical frequencies and being subdivided by predetermined locking bits into frames of identical lengths, the device comprising: a series/parallel-type first converter receiving the binary train in series and delivering this train, cut up randomly in words of *q* bits (*q* = 2, 3, . . .); a FIFO-type memory having *q* bits per memory cell therein and receiving words at a regular writing speed of 1/q of the frequency; a parallel/series-type second converter receiving the output of said memory; a decoder for detecting the predetermined locking bits from an output train



of said second converter; logic control means for receiving a pulse clock signal and frame synchronization signal of the reference train as well as the output of said decoder, for controlling the reading operation of said memory; and gate means for delivering the binary train to a synchronized output of the device.

4,045,619

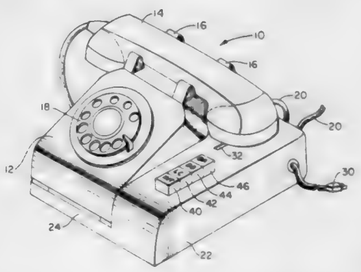
TELEPHONE CONTROL SYSTEM

Laurence P. Harrington, Arlington, Mass., assignor to Aristonics Corporation, Woburn, Mass.

Continuation-in-part of Ser. No. 558,962, March 17, 1975, abandoned. This application Oct. 14, 1975, Ser. No. 622,006

Int. Cl.[2] H04M *1/66*

U.S. Cl. 179—18 DA **29 Claims**



1. Apparatus for controlling the level of calling permitted through a telephone facility according to the authorization level of the particular user of the facility, the facility being of the type including at least one telephone set to be controlled and at least one telephone line capable of transmitting calls of varying levels to and from the telephone set, the telephone set being adapted for use by at least one user, said user being assigned a call authorization code that identifies the user and that represents the level of calling permitted for the user over the telephone line, said apparatus comprising:

A. means associated with each telephone set to be controlled for generating signals representing the call authorization code of the user;

B. means associated with each telephone set to be controlled

for generating signals representing the level of a call to be extended through the telephone set by the user;

C. means for switchably connecting the telephone set to the telephone line; and

D. control means including

i. means responsive to the user authorization code signals for establishing a predetermined maximum level of authorized telephone use for the user, and

ii. means responsive to the call level signals for activating said switchable means to disconnect the telephone set from the telephone line when the call to be extended by the user exceeds the user's predetermined maximum level.

4,045,620

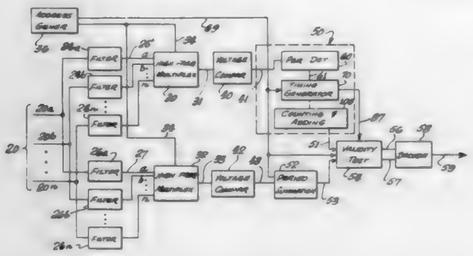
DIGITAL TONE DETECTOR

James E. Westbrook, Torrance, Calif., assignor to Conrac Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,622

Int. Cl.² H04M *1/50*

U.S. Cl. 179—84 VF **17 Claims**



1. Apparatus for discriminating multi-tone telephone signals, comprising

period means for detecting individual cycles of a received tone,

timing means responsive to the period means for producing for every *n* tone cycles a binary code representation of the time elapsed during N consecutive tone cycles, where N is larger than *n*,

and decoding means responsive jointly to a plurality of said code representations for identifying the frequency of the received tone.

4,045,621

RECORDING SYSTEM FOR A MULTICHANNEL RECORD DISC

Issao Ohwaki, Tokyo; Kohei Sasamura; Teruo Muraoka, both of Sagamihara, and Takaro Mori, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 421,268, Dec. 3, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,263

Claims priority, application Japan, Dec. 7, 1972, 47-122046; Dec. 14, 1972, 47-124799

Int. Cl.² G11B *3/00, 3/74*

U.S. Cl. 179—100.4 ST **1 Claim**

1. A multichannel record disc recording system comprising:

matrix means for forming a first sum signal and a first difference signal responsive to first and second channel signals, and for forming a second sum signal and a second difference signal responsive to third and fourth channel signals;

a first transmission path for receiving the first sum signal,

said first transmission path comprising first tracing distortion compensation means for imparting a complement of the distortion caused by the first sum signal, to thereby cancel the tracing distortion of the first sum signal, which distortion may be produced when a recorded signal is reproduced;

a second transmission path for receiving the first difference signal,

said second transmission path comprising first delay means for delaying the first difference signal, and first modulator means for angle-modulating a carrier signal responsive to the output signal of said first delay means to produce a first angle-modulated difference signal;

said first delay means imparting a delay to the first difference signal which complements the delay imparted by said first tracing distortion compensation means to the first sum signal passing therethrough;

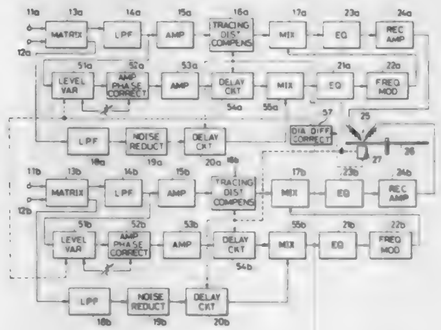
a third transmission path for receiving the second sum signal,

said third transmission path comprising second tracing distortion compensation means for imparting a complement of the distortion caused by the second sum signal to thereby cancel the tracing distortion of the second sum signal, which distortion may be produced when a recorded signal is reproduced;

a fourth transmission path for receiving the second difference signal,

said fourth transmission path comprising second delay means for delaying the second difference signal, and second modulator means for angle-modulating the carrier signal with the output signal of said second delay means to produce a second angle-modulated difference signal,

said second delay means imparting a delay to the second difference signal which complements the delay imparted by said second tracing distortion compensation means to the second sum signal passing therethrough;



mixing means for multiplexing the output signal of said first transmission path and the first angle-modulated difference signal, thereby producing a first multiplex signal, and for multiplexing the output signal of said third transmission path and the second angle-modulated difference signal, thereby producing a second multiplex signal;

means comprising a cutting stylus for recording the first and second multiplex signals respectively on the left and right walls of a single groove on a disc;

a fifth transmission path for receiving a part of the first sum signal,

said fifth transmission path comprising first correction means for correcting the received part of the first sum signal to cancel any phase modulation distortion which may be produced in the first angle-modulated difference signal responsive to the output signal of said first transmission path at the time when the recorded first multiplex signal is reproduced by means of a reproducing stylus;

a sixth transmission path for receiving a part of the second sum signal,

said sixth transmission path comprising second correction means for correcting the received part of the second sum signal to cancel any phase modulation distortion which may be produced in the second angle-modulated difference signal responsive to the output signal of said third transmission path at the time when the recorded second multiplex signal is reproduced by means of the reproducing stylus;

second mixing means in said second transmission path and disposed between said first delay means and said first modulator means,

said second mixing means mixing the output signal of said first delay means and the output signal of said first correction means, said first modulator means modulating the carrier signal responsive to the output of said second mixing means; and

third mixing means in said fourth transmission path and disposed between said second delay means and said second modulator means,

said third mixing means mixing the output signal of said second delay means and the output signal of said second correction means, said second modulator means modulating the carrier signal responsive to the output signal of said third mixing means.

4,045,622

METHOD OF MONITORING A NETWORK OF PERIPHERAL ELEMENTS HANDLED BY AN ELECTRONIC CONTROL UNIT

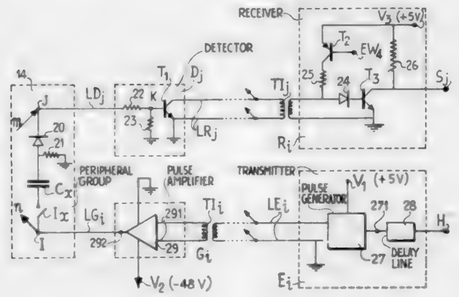
Gerard Le Cardonnel; Pierre Gravez, and René Marc Favre, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 2, 1976, Ser. No. 672,886

Claims priority, application France, Apr. 4, 1975, 75.10625

Int. Cl.² H04M *3/26*

U.S. Cl. 179—175.2 C **7 Claims**



1. A method of monitoring a network of *n* groups of *m* peripheral elements, *m* being an integer greater than 1 and *n* an integer greater than 2, said elements being handled by an electric control unit, said network being of the type in which the state of each element may be expressed in the form of a binary digit collected on each of *m* separate channels, wherein said method comprises:

transmitting along *n* two-wire channels test pulses recurring in a recurrence interval, corresponding test pulses on the *n* two-wire channels being staggered as a function of time relative to one another by an interval equal at most to the nth part of the recurrence interval of said test pulses, each two-wire channel comprising means for decoupling d.c. potentials;

translating the state of an element *j* (*j* = integer variable from 1 to *m*) of any one of the *n* groups of *m* elements in the form of a loop state or non-loop state of a two-wire line connecting the network of *n* groups of *m* elements to the control unit, each "loop" state being synchronous with a test pulse; and

using the loop states for stopping the transmission of pulses through a receiver (R_i), the non-loop states releasing the same transmission.

4,045,623

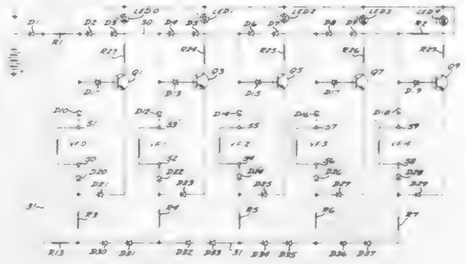
SHORT CIRCUIT INDICATOR FOR A TERMINATOR MATRIX

Luis Albert Arce, 5875 Obispo, Long Beach, Calif. 90805

Filed May 3, 1976, Ser. No. 682,398

Int. Cl.² H04M *3/22*

U.S. Cl. 179—175.2 R **11 Claims**



1. An electrical circuit for detecting electrical shorts among matrix terminal points in an electrical circuit termination framework having at least two opposing D.C voltage power supply bus lines, wherein said terminal points are arranged in pairs with the individual terminal points within each pair connected to opposite ones of said power supply bus lines and with a load connected across each pair of terminal points and with at least a first terminal point in each pair maintained at a unique voltage potential relative to corresponding first terminal points in other pairs under normal conditions, comprising: transistor means associated with each of said terminal pairs, each transistor means having the base connection to said first one of the terminal points in the associated pair and having a collector-emitter connection between the second one of the terminal points in the same associated pair and the other one of the two aforesaid power supply bus lines; and current indicating means responsive to the collector-emitter current of each of said transistor means to indicate changes in flow of current therethrough.

4,045,624

CONTINUOUS MONITORING IN CARRIER TELEPHONE SYSTEMS

Sidney Browne, Falls Church, Va., assignor to Carrier Telephone Corporation of America, Inc., Falls Church, Va.

Filed Apr. 2, 1976, Ser. No. 672,934

Int. Cl.² H04B *3/46*

U.S. Cl. 179—175.3 R **9 Claims**

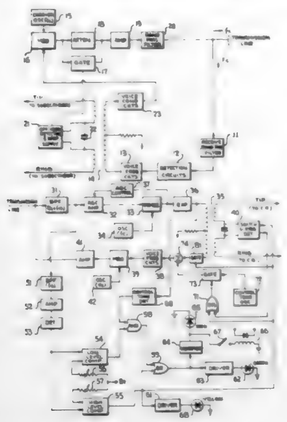
1. In a carrier telephone system of the type in which information is transmitted from a remote station to a local station as modulation of a first carrier frequency signal and information is transmitted from said local station to said remote station via a second carrier frequency signal, and in which there exists idle and busy operating modes, an arrangement for continuously monitoring operability of said system comprising:

means for transmitting said first carrier signal at a relatively high level during said busy mode and at a relatively low level during said idle mode;

means at said local station for detecting reception at said first carrier signal at said relatively low level;

means at said local station for detecting reception of said first carrier signal at said relatively high level; and

indicator means at said local station for providing a failure



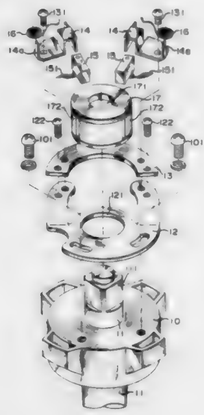
indication in the absence of reception of said first carrier signal at at least said relatively low level.

4,045,625

DISTRIBUTOR

Chin-Chin Tsai, 10, Lane 62, Te Kuang Street, Tainan, Taiwan, China /Taiwan

Filed Aug. 30, 1976, Ser. No. 718,546
Int. Cl.[2] H01H *19/00*; F02P *7/00*
U.S. Cl. 200—24 **3 Claims**



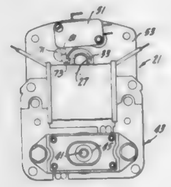
1. A rotary type distributor comprised of a central rotary shaft extending through a base means having a square collar provided on that extending end, a base plate disposed around said extending shaft end on said base means, a semicircular insulating ring disposed on said base plate, a rotary wheel of a non-conductive material keyed on the square collar of said rotary shaft and able to rotate in response to rotation of said shaft, said rotary wheel having a plurality of metal plates of equal length imbedded in the sides thereof in such a way that there is a gap provided between each two adjacent plates, two carriages having inverted U shaped portions, each carriage being disposed on said insulating ring and having an upwardly extending post on which is mounted a spring, two carbon brushes, each one of said brushes disposed in the inverted U shaped portion of one of said carriages and biased by said spring towards and in contact with the metal plates of the distributing wheel, the distance between the centers of the brush ends contacting said plates being less than the length of one of the plates, and the other ends of said brushes thereof not contacting the plates being connected by cables to positive and negative pole of an electrical source respectively, so that upon rotation of the wheel both carbon brushes come into contact with a single metal plate, setting up an electrical current, and upon further rotation of the wheel one of the gaps between the plates comes between the carbon brushes, causing the current to cease.

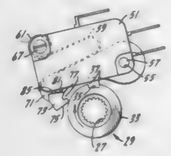
4,045,626

CAM-OPERATED MOTOR CONTROL SWITCH ASSEMBLY WITH IMPROVED AUXILIARY ACTUATOR FOR MOTOR CONTROL MICROSWITCH

Frank Holper, Cary, Ill., assignor to Original Equipment Motors, Crystal Lake, Ill.

Filed Dec. 29, 1975, Ser. No. 645,241
Int. Cl.[2] H01H *43/12, 3/20*; H02P *3/00*
U.S. Cl. 200—30 R **1 Claim**





1. An electric motor assembly in which the motor is intermittently operated through cycles of similar duration, in which an output shaft is connected to said motor through a gear train located in a housing, and in which a switch controlling a holding circuit for said motor is located in an enclosure,

an actuating member for said switch movable between a holding circuit closing position and a holding circuit open position,

said switch actuating member extending out of said switch enclosure,

a cam synchronously rotatable with said shaft,

said cam being contoured to permit said switch actuating member to move to the motor holding circuit open position when said shaft is at the end of each cycle and to move said actuating member to the motor holding circuit closed position during the remainder of said shaft cycle,

a pawl pivotally mounted on a pin extending outwardly from said gear train housing with said pawl positioned to contact both said cam and said switch actuating member,

said switch enclosure being mounted on said pin and being located outwardly of said pawl, and

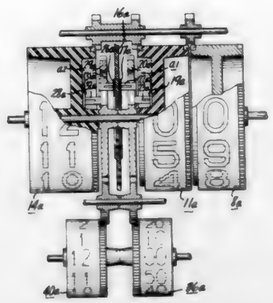
a U-shaped spring positioned between said gear housing and said switch enclosure, said spring engaging and biasing said pawl against said cam, said spring having a loop formed at the free end of one leg, a fastener extending through said switch enclosure and said loop to attach said switch enclosure and said spring to said gear train housing, the other leg of said U-shaped spring contacting said pawl.

4,045,627

SWITCHING MECHANISM FOR ALARMING TIME DETECTION IN AN ALARMING DEVICE

Kiyoshi Kitai, Tokyo; Masuo Ogihara, Chiba; Kouzo Sato, Chiba, and Nobuo Shinozaki, Chiba, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Apr. 4, 1975, Ser. No. 565,116
Claims priority, application Japan, Apr. 4, 1974, 49-38352
Int. Cl.[2] H01H *43/10*; G04B *23/10*; G04C *21/36*
U.S. Cl. 200—37 R **3 Claims**



1. An electrical switch device for detecting alarm times in an alarming device comprising: a one-piece switch part; first and second fixed switch parts each having a generally semi-ring shape and being disposed opposite and slightly spaced from one another to define a generally ring shape and being electrically insulated from each other by the slight spacing therebetween; an alarming circuit electrically connected to said first and second switch parts; first and second contact members each of which has a first contact part and a second contact part; a rotationally driven time wheel; a manually rotatable member settable to a desired angular position corresponding to the desired alarm time to be set; and alarm time detecting means engageable with said time wheel in accordance with the movement of said manually rotatable member and operable to detect the set alarm time; said one-piece switch part being fixed on one of said time wheel and alarm time detecting means and said first and second contact members being fixed on the other of said time wheel and alarm time detecting means; said first contact parts being disposed in superposed relation to and in engagement with said respective first and second fixed switch parts and said second contact parts being engageable with said one-piece switch part so that when said alarm time detecting means detects said set alarm time, said second contact parts are electrically connected with said one-piece switch part thereby electrically connecting said first and second fixed switch parts in series with said first and second contact members.

4,045,628

INTERLOCK FOR HANDLES OF ADJACENT CIRCUIT BREAKERS

John W. Schienda, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

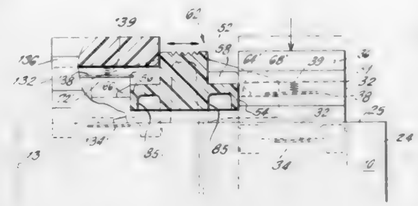
Filed Feb. 20, 1976, Ser. No. 659,670
Int. Cl.[2] H01H *9/26*
U.S. Cl. 200—50 C **13 Claims**

1. An interlock for preventing operation of one circuit breaker to the "on", contacts engaged position when an adjacent circuit breaker has been operated to the "on", contacts engaged position, wherein both adjacent circuit breakers are of the type having contact position controlling handles that are operated by pushing the handle of the circuit breaker into its casing, wherein the adjacent circuit breakers are aligned such that their corresponding terminals and handles are aligned in respective rows, and wherein the circuit breakers and their handles have front sides facing in the same direction and the handles of the adjacent circuit breakers each have a side facing toward a side of the handle of the other adjacent circuit breaker;

the interlock comprising:

a bar of a length to extend across the casing of each of the adjacent circuit breakers; said bar being located between the handles of the adjacent circuit breakers; said bar having opposite outwardly facing sides and being of a width between its said sides that is less than the distance between the spaced apart, facing sides of the handles of the adjacent circuit breakers, such that said bar is shiftable toward both handles of the adjacent circuit breakers;

said bar having opposite ends; at at least one said end of said bar is a pair of guide legs; one said guide leg of said pair of guide legs projects from each said bar side toward the respective circuit breaker at that said side of said bar; each said guide leg being shaped and positioned to rubbingly engage the front side of the handle of its respective circuit breaker and each said guide leg being of a length sufficient for enabling each said guide leg of said pair to continuously engage its respective circuit breaker handle front side throughout shifting of said interlock;



a respective handle motion obstructing leg located intermediate the length of said bar and projecting from each said side thereof; said handle motion obstructing legs being shiftable by shifting of said bar; each said handle motion obstructing leg being shiftable toward the circuit breaker handle on said side of said bar toward which that said handle motion obstructing leg extends; each said handle motion obstructing leg being so shaped and positioned as to block depression of the circuit breaker handle toward which that said leg extends;

said handle motion obstructing legs being of such length that when said bar is fully shifted toward and engages and is blocked from further shifting in that direction by one circuit breaker handle, said handle motion obstructing leg which is provided for blocking the handle of the other, adjacent circuit breaker is sufficiently away from that other circuit breaker handle as not to block depression of that handle.

4,045,629

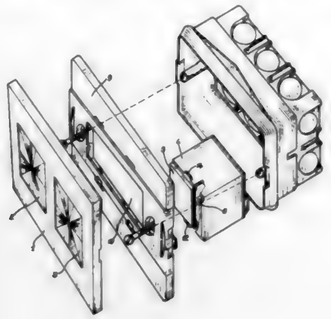
ELECTRICAL PROXIMITY SWITCH ARRANGEMENTS

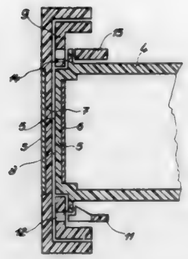
Alberto Anzani, Varese, Italy, assignor to Bassani Ticione S.p.A., Milan, Italy

Filed Apr. 8, 1975, Ser. No. 566,429
Claims priority, application Italy, Apr. 12, 1974, 21362/74
Int. Cl.[2] H01H *35/00, 9/00*
U.S. Cl. 200—52 R **7 Claims**

1. A proximity switch arrangement, comprising a support constituted of electrically-insulating material and having a front and a rear surface; a modular unit having a wall constituted of electrically-insulating material and facing said support; proximity switching means, including actuating means having an electrically-conductive touch plate fixedly mounted at said front surface of said support so as to remain substantially stationary relative to the latter when contacted by a user to thereby generate a signal indicative of such contact, detecting means having an electrically-conductive plate mounted at the inwardly-facing side of said wall which faces away from said support and operative for detecting said signal, and means

responsive to said detecting means for initiating transmission of said signal; mounting means for juxtaposing said plates in substantial spaced parallelism by mounting said unit on said supprt, to thereby form a capacitor with the electrically-





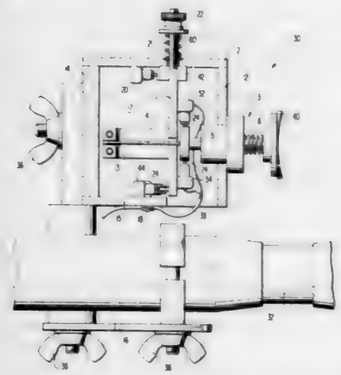
insulating materials serving as the dielectric, said electrically-insulating materials being operative for maintaining said plates apart and for maintaining said touch plate away from said transmission initiating means to thereby obtain maximum user safety.

4,045,630

CHIN ACTIVATED SWITCH

Charles J. McCarthy, Rockville; Steven Charles, and Daniel M. Eichenbaum, both of Bethesda, all of Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Sept. 8, 1975, Ser. No. 611,321
Int. Cl.[2] H01H *35/00, 25/04*
U.S. Cl. 200—52 R **8 Claims**



1. A device for controlling movement of an instrument along three orthogonal axes by movement of the chin of an operator, comprising:

a chin plate for placement against the chin of the operator;

motor means for driving the instrument along three orthogonal axes and controlled by the location of said chin plate; and

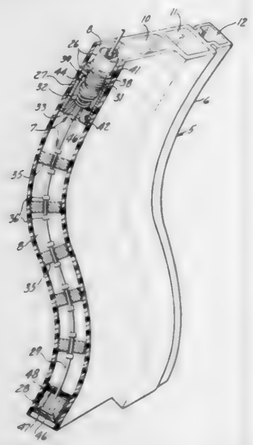
means for converting movements of said chin plate to signals for said motor means, comprising a pivot lever connected to and extending from said chin plate; a push rod lying within said pivot lever and extending from said chin plate, said push rod being sufficiently rigid to transmit push forces without buckling and being sufficiently flexible to bend; a rocker plate connected to said push rod and extending generally perpendicular thereto; support means to retain one end of said rocker plate stationary relative to movement of said chin plate, said push rod and said pivot lever; first switch means mounted on said support means adjacent said rocker plate for activating said motor means to move the instrument along one of the three orthogonal axes due to movement of said rocker plate; and second and third switch means lying on said rocker place adjacent said pivot lever for activating said motor means to move the instrument along two of the three orthogonal axes due to movement of said pivot lever in a direction parallel to the plane of said rocker plate.

4,045,631

TOUCH-SENSITIVE DOOR CONTROL SWITCH

Daryl L. Dann, Owosso, Mich., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Apr. 2, 1976, Ser. No. 672,871
Int. Cl.[2] H01H *3/16;* **E05F** *15/00*
U.S. Cl. 200—61.43 **8 Claims**



1. A touch-sensitive control device for mounting on a vehicle door comprising:

a resilient tubiform door-edge housing having longitudinally extending distal and proximal end surfaces at the ends of its transverse cross section and distal and proximal portions extending therealong of which the distal portion is flexible and warpable with respect to the proximal portion when the proximal portion is rigidly supported, said housing having a flexible wall defining its distal side which encloses a longitudinal passageway;

an electrical switch and switch-operating assembly received in said passageway comprising: a plurality of spacer blocks spaced at operating position generally uniformly along said passageway; a cable extending substantially the full length of the passageway centrally through said blocks; a normally resiliently closed switch comprising a

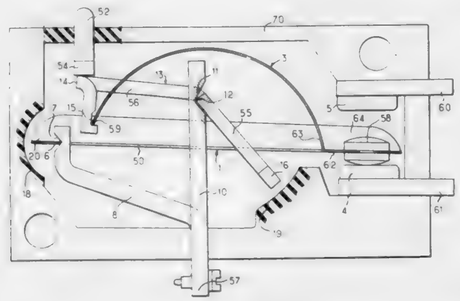
body supported in one end of the passageway, and an element movable within the body between positions for opening and closing an electrical circuit therethrough; anchor means fixed in the other end of said passageway gripping said cable; resilient and element-engaging means connected with a portion of said cable adjacent to the switch acting on the housing in the outward direction of said one passageway end to place the cable in a condition of continuous tension and to engage said element, and to hold said switch in one of said positions; and adjustable means in said assembly for adjusting said switch body and cable toward and away from each other while maintaining said cable under tension at undeflected condition of said distal housing portion, said body and cable being adjustable to a relative position to maintain said switch in said one position enabling said switch to assume the other of said positions upon a predetermined deflection of said distal portion of the housing and a corresponding shift in position of said cable portion.

4,045,632

QUICK MAKE AND BREAK SWITCH

Henri Pierrot, L'Isle d'Espagnac, France, assignor to La Telemecanique Electrique, France

Filed Dec. 19, 1975, Ser. No. 642,529
Claims priority, application France, Apr. 14, 1975, 75.11490
Int. Cl.[2] H01H *13/36*
U.S. Cl. 200—67 PK **3 Claims**



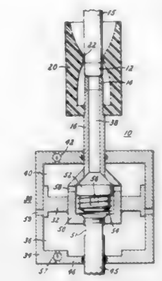
1. A quick make and break switch comprising, enclosed in a box: two fixed contacts and a movable contact; a fork-shaped support member having first and second branches located in a common plane and a lug connected to the said branches and forming a terminal for the movable contact; an inverter member carrying the movable contact and shaped as a comparatively rigid bracket having first and second ends and a longitudinal opening, said opening having first and second transverse edges, the first transverse edge being swivellingly supported at the end of said second branch remote from said lug; a rocking lever located in the said common plane, swivellingly supported on the end of the first branch remote from said lug and having on either side of the said first branch first and second arms respectively having first and second ends remote from the first branch; a push-button cooperating with the first end of the arms and placed above the first end of the inverter member whilst the second end of the arms is placed below the second end of the inverter member; a curved elastic blade having first and second ends respectively compressed between the first end of the arms and the second transverse edge of the opening, said elastic blade having a snap-on action on the inverter member for a predetermined position of the first end of said elastic blade, the second arm of the rocking lever being dimensioned and positioned, with respect to the inverter member end, for allowing mechanical engagement between the said second arm and the inverter member, after the first end of the elastic blade has passed beyond the said predetermined position.

4,045,633

GAS-BLAST ELECTRIC CIRCUIT INTERRUPTER OF THE PUFFER TYPE

Philip Barkan, Media, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed June 27, 1975, Ser. No. 591,204
Int. Cl.[2] H01H *33/70*
U.S. Cl. 200—148 A **11 Claims**



1. A gas-blast electric circuit interrupter of the puffer type comprising:

a. a pair of separable contacts,

b. means operable during circuit-interruption for moving one of said contacts relative to the other to separate said contacts and produce an arc therebetween in the region between said contacts, said arc developing arcing products varying in pressure generally as a direct function of the arcing current,

c. a piston positively coupled to said one contact,

d. means cooperating with said piston for defining:

d_1. a pumping space at one side of said piston adapted to contain arc-extinguishing gas that is compressed by motion of said piston during a contact-separating operation and

d_2. a working space at the opposite side of said piston from said pumping space in which pressurized gas is adapted to act upon said piston in a direction to aid contact-separating motion of said one contact,

e. means defining a blast passage through which gas compressed in said pumping space can flow into said arcing region to aid in extinguishing said arc, said blast passage extending from said pumping space to said arcing region via a path effectively bypassing said working space,

f. auxiliary passage means affording communication between said blast passage and said working space,

g. and valve means effective during a low-current interrupting operation:

g_1. to block flow through said auxiliary passage means and

g_2. to allow free communication between said pumping space and said blast passage, whereby during a low-current interrupting operation compressed gas from said pumping space can flow into said arcing region via said blast passage at a predetermined point during contact-separation,

h. said valve means being effective when the pressure of said arcing products in the arcing region is high during a high-current interrupting operation:

h_1. to allow flow through said auxiliary passage means into said working space, whereby during a high-current interrupting operation arcing products can increase the pressure in said working space, and

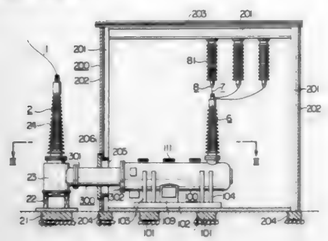
h_2. to block free communication between said pumping space and said blast passage, thereby decreasing contamination of the gas in said pumping space by said arcing products and reducing pressure build-up in said pumping space by said arcing products.

4,045,634

GAS INSULATED SWITCH-GEAR APPARATUS

Seizo Nakano; Kazuaki Oishi; Takehiro Kikuchi, all of Hitachi, and Syoetu Suda, Naka, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 13, 1976, Ser. No. 648,677
Claims priority, application Japan, Jan. 16, 1975, 50-6308
Int. Cl.[2] H01H *33/56*
U.S. Cl. 200—148 B **7 Claims**



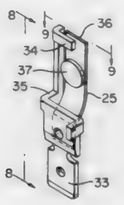
1. A gas insulated switch-gear apparatus comprising:
a gas insulated switch gear including power circuit breakers, disconnecting switches and earthing switches which are enclosed in earthed metallic vessels filled therein with insulating, arc-suppressing gas and electrically, mechanically associated with one another;
an input terminal and output terminal led out of said gas insulated switch-gear;
a switching house housing said gas insulated switch-gear;
a main bus bar insulatingly supported through insulators in said switching house; and
a connection bus bar connecting said main bus bar to one of the input terminal and the output terminal of said gas insulated switch-gear;
characterized in that:
a terminal bushing is provided separately of said switching house outside of the switching house and said terminal bushing is electrically connected to the other terminal of said gas insulated switch-gear by means of a gas insulated bus bar extending through the wall of said switching house.

4,045,635

ELECTRICAL SWITCH CONSTRUCTION AND IMPROVED OVERTRAVEL SWITCH BLADE THEREFOR AND METHOD OF MAKING THE SAME

Khiman K. Pursnani, Milford, and Roger P. Sepso, Stratford, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Jan. 22, 1976, Ser. No. 651,225
Int. Cl.[2] H01H *1/26*
U.S. Cl. 200—283 **18 Claims**



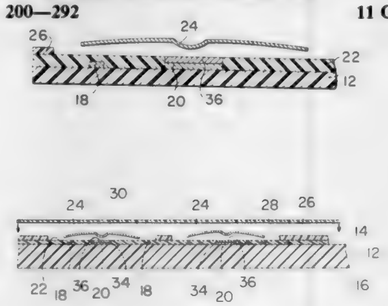
1. In an electrical switch construction having a housing means provided with an actuator for causing movement of a movable switch blade relative to an overtravel compensating fixed switch blade to effect an electrical switching operation, a rigid terminal being carried by said housing means and being secured to said fixed switch blade, said terminal having an extension thereof that is disposed in the path of movement of said fixed switch blade to limit movement of said fixed switch blade to limit movement thereof in one direction, said terminal having a first part thereof that is secured to said fixed switch blade and having a second part thereof that carries said extension thereof, said second part carrying said extension in a position to be out of the plane of said first part thereof, said fixed switch blade having opposed ends and having an electrical contact between said opposed ends thereof, the improvement wherein one of said ends of said fixed switch blade is secured to said first part of said terminal and the other of said ends is engageable with said extension of said terminal only at a point outboard of said contact.

4,045,636

KEYBOARD SWITCH ASSEMBLY HAVING PRINTED CIRCUIT BOARD WITH PLURAL LAYER EXPOSED CONTACTS AND UNDERSURFACE JUMPER CONNECTIONS

Alan C. Yoder, and John E. Weber, both of Fort Wayne, Ind., assignors to Bowmar Instrument Corporation, Fort Wayne, Ind.

Filed Jan. 28, 1976, Ser. No. 653,226
Int. Cl.[2] H01H *9/00;* **H05K** *1/00*
U.S. Cl. 200—292 **11 Claims**



1. In a keyboard switch assembly for electronic apparatus comprising an insulative member having opposite surfaces with a plurality of elongated solid metal conductors on one said surface thereof, at least some of said conductors having enlarged portions thereon, at least some of said enlarged portions being switch terminals, and switch elements cooperating with respective switch terminals; the improvement wherein each of said switch terminals has a coating of conductive ink thereon to provide a switch contact area.

4,045,637

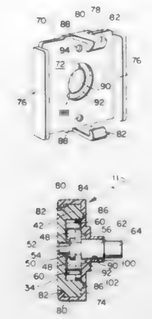
ELECTRICAL SWITCH ASSEMBLY HAVING TWO-PART HOUSING WITH COVER PART CONSISTING OF PLURAL FLANGES, INTERNAL ROTATION LIMIT STOP AND EXTERNAL BUSHING

Roland E. Mongeau, Cumberland, R.I., assignor to Tower Manufacturing Corporation, Providence, R.I.

Filed May 24, 1976, Ser. No. 689,520
Int. Cl.[2] H01H *21/04*
U.S. Cl. 200—303 **4 Claims**

1. In an electrical switch construction of the hollow-housing type having a recessed base of electrically insulative material and provided with a plurality of resilient contacts surrounding a rotatable contactor centered in said base and provided with a switch shaft upwardly projecting from said contactor whereby rotation of said shaft rotates said contactor through a limited turning radius so at to facilitate activation of varying electric circuits, said base having a bottom wall and surrounding upstanding side walls terminating in a peripheral face, the improvement comprising: and integral one-piece cover member formed of electrically insulative cover member formed of

electrically insulative material positioned in direct engagement solely with said recessed base so as to cooperatively form said hollow housing, said cover being of generally planar configuration including an internal face in opposition to said base and contacting said peripheral face of said base side walls, said cover having an external face, said cover having a generally centrally located opening therethrough, said shaft positioned through said opening and extending outwardly of said external face, limit integral with said cover and positioned in said internal face thereof and positioned about said opening to limit rotational movement of said shaft, mounting means integral



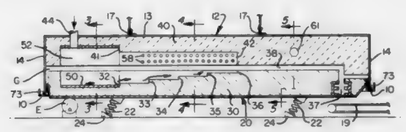
with said cover on said external face thereof for mounting said switch to a panel and means integral with said cover for attaching said cover to said base, said means for attaching said cover to said base comprising a pair of opposed arms inwardly directed towards said base from opposite edges of said cover, each of said arms having a detent for locking engagement with undercut portions provided on said base when said cover and base are assembled in face-to-face contact with each other and wherein those edges of said cover not provided with said opposed arms include an inwardly directed flange positioned in cooperative engagement with outer side wall portions of said base bottom wall.

4,045,638

CONTINUOUS FLOW HEAT TREATING APPARATUS USING MICROWAVES

Bing Chiang, 3413 Dunnington Road, Beltsville, Md. 20705, and Alfred F. Hoyte, 7734 16th St. NW., Washington, D.C. 20012

Filed Mar. 9, 1976, Ser. No. 665,195
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 A **12 Claims**



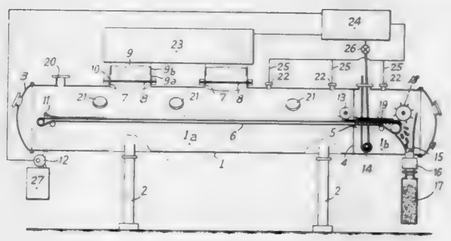
1. Electrical apparatus for heat treating particulate materials passing in bulk through the apparatus from an input end to an output end thereof, comprising:
a conveyor pan elongated in the direction of travel of the materials;
drive means operative to vibrate said pan and impart to it a motion to advance said materials in said direction of travel;
an elongated cover over said pan having side and end walls closely spaced with respect to said pan;
cover support means for supporting said cover above said pan;
refractory heat insulation lining said pan, the insulation nearly filling the pan at a portion thereof near said output end but leaving a narrow shallow material conveying trough, the insulation partially lining the pan at a portion thereof near said input end but leaving a wider and deeper trough, and the depth and width of the insulation gradually increasing from the input end to the output end so that the trough becomes progressively narrower and shallower as it passes through the portion of the pan intermediate the input and the output portion;
refractory heat insulation in the cover graduated to increase in thickness and width from the input end to said output end so that the insulation in the cover converges on the trough to form therewith an air space which becomes progressively smaller;
electric heater means in the air space located in said input and intermediate portions and directed to heat materials in the trough;
a microwave generator; and
waveguide means coupled to the generator and extending through the insulation and directed to impinge microwave onto materials in the portion of the trough near said output end.

4,045,639

CONTINUOUS MICROWAVE AND VACUUM DRYER

Nicolas Meisel, Epone, France, assignor to Food Processing Systems Corporation, Del.

Continuation-in-part of Ser. No. 432,814, Jan. 14, 1974, abandoned. This application Dec. 3, 1975, Ser. No. 637,420
Claims priority, application Switzerland, Jan. 16, 1973, 570/73
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 A **8 Claims**



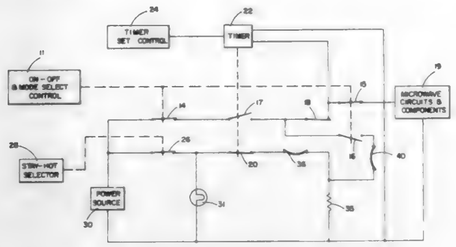
1. An apparatus for continuous microwave and vacuum drying a liquid containing material which comprises:
a. a housing forming a closed elongated space;
b. means for evacuating said closed space;
c. means impermeable to microwave energy for partitioning the closed space into first and second chambers, said partition having a slit therein;
d. an endless conveyor belt having a feeding end and a discharge end disposed longitudinally in the closed space and through the slit;
e. means for feeding on the belt a product containing a liquid to be evaporated;
f. at least one source of microwave energy fed into the first evacuated chamber through at least one adjustable microwave cavity at atmospheric pressure, microwave permeable but air tight membranes sealing the non-evacuated microwave cavity from said evacuated first chamber;
g. means disposed in the second chamber for absorbing microwaves which have passed through said slit; and
h. means for discharging the product from the apparatus.

4,045,640

STAY-HOT CONTROL FOR MICROWAVE OVEN

Raymond R. McQueen, Jr., Hacienda Heights, and Christian E. Buerki, Fullerton, both of Calif., assignors to Norris Industries Inc., Los Angeles, Calif.

Filed Dec. 8, 1975, Ser. No. 638,890
Int. Cl.[2] H05B *9/06*
U.S. Cl. 219—10.55 B **5 Claims**



1. In a microwave oven including microwave cooking circuit means, a power source, a timer and switch means for connecting the power source to the cooking circuit means for a predetermined time period in response to said timer, and an infra-red heating element, the improvement whereby means are provided for automatically keeping the oven hot when said predetermined time period has elapsed comprising:

a first ("stay-hot") switch interposed between said power source and said heating element,

a stay-hot selector for operating said first switch to provide stay-hot operation,

a second switch interposed between said power source and said heating element and in series with said first switch, said second switch being closed and said switch means for connecting the power source to the cooking circuit means being opened in response to said timer, when said predetermined time period has elapsed, and

thermostatic switch means interposed in series between said heating element and said power source for regulating the temperature of said heating element to a predetermined stay-hot temperature.

4,045,641

CONTROL SYSTEM FOR AN ELECTRO-EROSION MACHINE TOOL

Werner Ullmann, Locarno; Bernardo Ferroni, Ascona, and Gideon N. Levy, Losone, all of Switzerland, assignors to A.G. fur industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

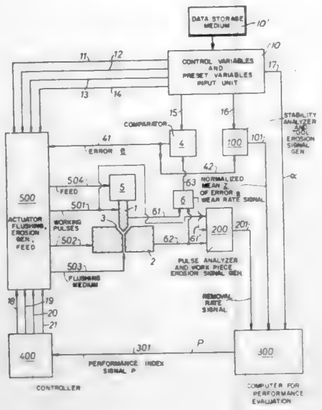
Filed Dec. 16, 1975, Ser. No. 641,241
Claims priority, application Switzerland, Feb. 20, 1975, 2110/75
Int. Cl.[2] B23P *1/08*
U.S. Cl. 219—69 C **7 Claims**

1. A control system for a machine tool of the kind in which electrical energy is passed across a working gap (3) between a tool electrode (1) and a workpiece (2) so as to machine the workpiece by eroding it, and having command means (10, 10') providing a signal indicative of a predetermined desired relationship between rate of erosion of the tool electrode and of the workpiece, respectively, the control system comprising:

tool erosion signal generator means (100) for forming a signal representative of the rate of erosion of the tool electrode (1);

workpiece erosion signal generator means (200) for forming a signal representative of the rate of erosion of the workpiece (2);

computer means (300) having first, second and third inputs (101, 201, 17) and an output (301), the first and second inputs (101, 201) respectively being connected to the outputs of the tool erosion signal generator means (100) and the workpiece erosion signal generator means (200) to receive the signals formed thereby, and the third input (17) being connected to the command means, (10, 10') to receive a signal representative of a factor (α) which indicates a predetermined desired relationship of the rate of erosion of the tool electrode to the rate of erosion of the workpiece, said computer means (300) being operable for combining



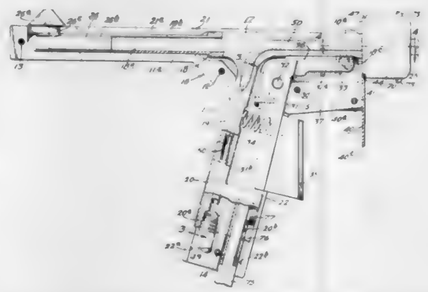
said tool erosion rate signal with said factor signal and said workpiece erosion rate signal with said factor signal to form, at its output (301), an output signal (P) which has a value within a limited range and which is is indicative of the correspondence between the actual relationship and the said desired relationship of the rate of erosion of the tool electrode to the rate of erosion of the workpiece.

4,045,642

ELECTRODE HOLDER

John J. Driscoll, 422 S. 18th St., Allentown, Pa. 18104

Filed Jan. 26, 1976, Ser. No. 652,186
Int. Cl.[2] B23K *9/16*
U.S. Cl. 219—70 **13 Claims**



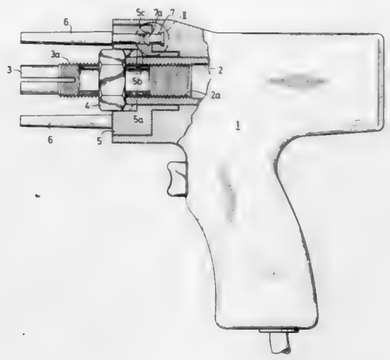
1. In a hand-held tool for use in working metal by means of an electric arc; said tool including barrel means adapted to contain an elongated electrode; pistol grip means depending from said barrel; means actuated by a trigger carried by said pistol grip for releasably clamping said electrode in said barrel means with an exposed length of the electrode extending axially forward beyond the front end of said barrel means; means in said pistol grip for supplying electrical energy to said electrode in said barrel means; and rotary nozzle means located at the front of said barrel means for flowing a gaseous medium along the exposed length of the electrode; said nozzle means including a head having orifice means for ejecting said gaseous medium therefrom, means mounting said head to the front of said barrel means for rotation coaxial therewith, means for supplying said gaseous medium under pressure to said head, and annular manifold means located intermediate said supply means and said orifice means to provide gas communication between said supply means and said orifices; the improvement wherein said head has a front wall with an electrode receiving aperture and a tubular wall extending rearwardly from said front wall and surrounding at least a portion of said barrel means, means providing an outer seal compressible radially between said tubular wall and said barrel means to prevent escape of said gaseous medium rearwardly from said manifold means, and means providing an inner seal compressible axially between the front wall of said head and said head mounting means to prevent escape of said gaseous medium inwardly from said manifold means.

4,045,643

BOLT WELDING GUN

Walter Burkert, Munich; Walter Hopfer, Otterfing, and Karl Grasmugg, Munich, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 5, 1976, Ser. No. 655,570
Claims priority, application Germany, Feb. 10, 1975, 2505517
Int. Cl.[2] B23K *11/04*
U.S. Cl. 219—98 **11 Claims**



1. Bolt welding gun comprising a gun body having a front end from which bolts and the like are welded to a workpiece, a slide-in unit mounted within the front end of said gun body, said slide-in unit includes an axially extending front tubular part located within the front end of said gun body, a tubular bolt holder disposed in threaded engagement with and extending forwardly from said front tubular part and extending forwardly of the front end of said gun body, and supporting legs extending forwardly from the front end of said gun body, wherein the improvement comprises a locking element in operative association with said tubular bolt holder for fixing the relative threaded engagement between said bolt holder and said front tubular part, said locking element being a threaded nut in threaded engagement with said bolt holder, and a rotatable control element having a common axis of rotation with said threaded nut being arranged to laterally enclose at least a portion of the axial extent of said locking element for preventing the rotation thereof.

4,045,644

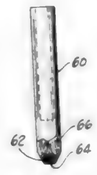
WELDING ELECTRODE AND METHOD OF MAKING

William M. Shafer, and Anil V. Nadkarni, both of Baltimore, Md., assignors to SCM Corporation, New York, N.Y.

Filed July 24, 1975, Ser. No. 598,844
Int. Cl.[2] B23K *11/30*
U.S. Cl. 219—119 **6 Claims**

1. A dispersion strengthened metal resistance welding electrode produced from consolidated dispersion strengthened metal extruded in an axial direction and having co-axial, anisotropic fibrous grain structure, the improvement comprising:

said resistance welding electrode having a welding tip portion wherein the grain structure is reorientated into a nonfibrous, isotropic grain structure formed by pressure-



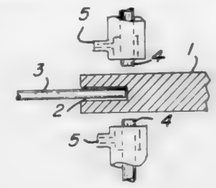
flowing said tip portion transversely to said axis to form the nonfibrous isotropic grain structure in said welding tip.

4,045,645

WELDING PROCESS FOR SLOTTED TUNGSTEN ROD

Robert S. White, Jr., Beverly, Mass., assignor to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 5, 1976, Ser. No. 664,342
Int. Cl.[2] B23K *11/16*
U.S. Cl. 219—118 **5 Claims**



1. In the process of connecting a refractory metal ribbon to a refractory metal rod having a diametrical slot at one end thereof, for embedment in a press seal of an electric lamp having a high silica glass envelope, the improvement which comprises inserting the ribbon into the slotted rod, making a first weld on the rod at about the internal end of the slot by closing a pair of electrodes thereon and passing electric current between the electrodes, and then making a second electric weld on the slotted portion of the rod at about the external end of the slot, the second weld closing the sides of the slot onto the ribbon.

4,045,646

POSITIONING FIXTURE FOR ROCK BIT WELDING

Carl Laurent Lichte, Dallas, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 409,209, Oct. 24, 1973, abandoned. This application May 29, 1975, Ser. No. 581,997
Int. Cl.[2] B23K *15/00*
U.S. Cl. 219—121 EB **4 Claims**

1. Apparatus for constructing a rotary rock bit by welding separate segments of the bit together with a beam of electrons along the seams between segments, said segments being positioned together in a composite with said seams being out of alignment with the central axis of the composite placing the gage cutting structure of the rock bit at the desired gage diameter, comprising:

a vacuum chamber;

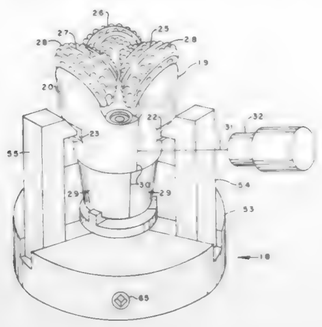
an electron beam gun for directing a beam of electrons into said vacuum chamber, said electron beam gun being connected to said vacuum chamber so that it will direct said electron beam into said vacuum chamber along a beam plane in a fixed position within said vacuum chamber;

means for urging said segments together into said composite with said gage cutting structure at the desired gage diame-

ter and the seams out of alignment with the central axis of the composite;

tilting means for tilting the composite of said segments about a first axis that will be parallel to said beam plane when said segments are in said vacuum chamber,

rotating means for rotating said composite of said segments about the central axis of the composite, said tilting means and said rotating means adapted to place a seam in a position where it would be parallel to said beam plane when said segments are in said vacuum chamber;



means for moving said composite of said segments laterally along a second axis that is perpendicular to said beam plane to place a seam in alignment with said beam plane when said segments are in said vacuum chamber;

means for moving said composite of said three segments into said vacuum chamber along said first axis thereby aligning a seam with said beam plane; and

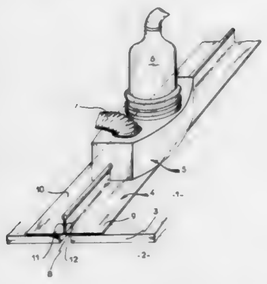
indexing means for indexing said segments through angular increments to sequentially bring additional seam planes into alignment with said beam plane.

4,045,647

FLUID TIGHT MOVABLE PASSAGE

Paul Thome, 8 rue Coutureau, Saint-Cloud Hauts-de-Seine, France

Filed Nov. 12, 1975, Ser. No. 631,403
Int. Cl.² B23K *9/00*
U.S. Cl. 219—121 EB **9 Claims**



1. A device for providing a vacuum-tight passage to a wall and displacing said passage along said wall following a predetermined rectilinear path, said device comprising

a flexible coupling comprising two static bands having an L-shape, symmetrically arranged with respect to said predetermined path, each band being provided with a first face and a second face perpendicular to each other, said first faces of said two bands being in permanent vacuum-tight connection with said wall on either side of said path, whereas said second faces face each other across said path and are deformable between a closed position wherein they are hermetically engaged with each other and an opened position wherein they are disengaged from each other;

a mobile chamber positioned astride said flexible coupling and displaceable along said predetermined path while in sliding sealing contact with the exposed surface of said bands across portions of said second faces in said closed position;

means to perform deformation of said bands inside said chamber from the closed position to the opened position near one end of the chamber and from the opened position to the closed position near another end of the chamber, thereby providing a passage through said flexible coupling inside said chamber;

removable clamping means for exercising a clamping action retaining the bands in the closed position of said flexible coupling outside the mobile chamber;

means for displacing said chamber with respect to said coupling along said path;

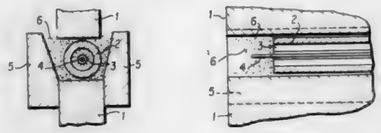
profiled guiding ribs formed on said second faces of said bands and cooperating guiding grooves of said mobile chamber for slidably and sealingly engaging said ribs, at least at the entrance and exit of the chamber.

4,045,648

AUTOMATIC ARC WELDING PROCESS USING A CONSUMABLE NOZZLE

Katsuro Iio, and Akiyoshi Osato, both of Kamakura, Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 376,367, July 5, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,606
Claims priority, application Japan, July 4, 1972, 47-66948; Oct. 20, 1972, 47-105653
Int. Cl.² B23K *25/00*
U.S. Cl. 219—137 R **15 Claims**



1. An automatic arc welding process for butt welding together two vertically disposed base materials with the welding line in a horizontal plane, characterized in that said process comprises the steps of:

placing backing materials upon opposite sides of said welding line,

placing a longitudinal horizontal disposed consumable nozzle, which is coated with an insulating material disposed therearound and has a hollow core portion, along a horizontal welding line between said base materials,

continuously feeding a horizontally disposed welding wire through said hollow core portion at a rate faster than said nozzle is being consumed; and

generating arcs from both the consumable nozzle and the continuously moving welding wire to achieve deep penetration and to prevent the forward flow of the molten metal toward the nozzle enabling the formation of a large amount of deeply penetrated deposited metal.

4,045,649

HOLDER FOR CARBON ARC ELECTRODES

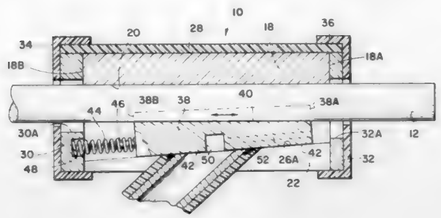
Paul B. Moss, Tulsa, and Gilbert L. Watson, Locust Grove, both of Okla., assignors to Paul B. Moss, Tulsa, Okla.

Filed Sept. 2, 1975, Ser. No. 609,705
Int. Cl.² B23K *9/28*
U.S. Cl. 219—143 **6 Claims**

1. A holder for a cylindrical carbon arc electrode, comprising:

an elongated body having a forward end and a rearward end, having an opening therethrough from the forward to the rearward end, and a slot in the bottom side communicating with the opening, the opening being configured in cross-section perpendicular the length of the body to provide an electrode engaging portion opposite said slot, and a slide block receiving portion spaced between said electrode receiving portion and said slot, the slide block receiving portion having opposed ledges to either side of said slot, the ledges being in a common plane tapering from one end of the body to the other;

an elongated slide block of electrically conducting material of length less than said body having a forward end and a rearward end, the slide block being slidably receivable in said body opening, the bottom thereof being in engagement with said ledges, the slide block having an electrode engaging upper surface having a lengthwise taper of the same angle as the taper of said ledges, the slide block being positioned in said body such that the electrode engaging surface is parallel with the electrode engaging portion of said body opening and such that the spacing therebetween varies according to the position of the slide block member;



spring means resiliently urging the slide block in the direction to reduce the spacing between said slide block electrode engaging surface and said body electrode engaging surface whereby an electrode positioned therebetween is securely retained; and

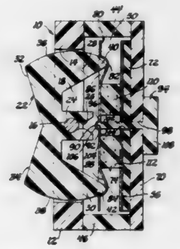
a current conducting member affixed to said slide block by which electrical conductivity can be had to an electrode received in said body.

4,045,650

JUMPER TOUCH SENSOR CURRENT SWITCHING DEVICE

Charles R. Nestor, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 29, 1976, Ser. No. 653,300
Int. Cl.² H01H *3/00*
U.S. Cl. 200—153 K **5 Claims**



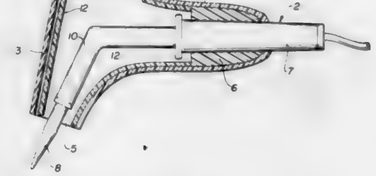
1. A printed circuit board switch comprising a housing having a cavity therein with a side opening, a cavity base, a planar printed circuit board having an end segment and a side extension, means forming spaced apart electrical conductor strips on said end segment and said side extension, means for electrically insulating said strips from each other and said housing, said end segment being juxtaposed with said cavity base and having a planar extent substantially congruous with that of said cavity base, said side extension being directed through said side opening for electrical connection of said conductor strips external of said housing, an electrically conductive contactor plate with straight unbent ends located within said cavity having a center pivot and contact ridges formed on said straight unbent ends thereof, a flexible pad of foamed electrical insulating material secured to the underside of said contactor plate and juxtaposed against said end segment to electrically insulate said plate from said conductor strips and actuator means bearing against said contactor plate to produce a neutral position compression of said pad, said actuator means being operative to shift said contactor plate into first and second pivoted positions to cause said contact ridges thereon to initially contact and then shift laterally of said conductor strips to produce a wiping action thereacross said pad yielding in shear to accommodate said lateral shift and in compression to produce an unbalanced force on said contactor plate for return thereof to a neutral position when said actuator means is released.

4,045,651

ELECTRICALLY HEATED SOLDERING DEVICE

Richard C. M. Koo, 845 39th Ave., San Francisco, Calif. 94121

Filed Jan. 28, 1976, Ser. No. 652,910
Int. Cl.² H05B *1/00;* **B23K** *3/04;* **B25G** *1/10*
U.S. Cl. 219—227 **3 Claims**



1. A soldering device comprising:

a housing made of heat insulating material, said housing having an open end, a closed end, and an intermediate opening, with the long axis of said housing including an obtuse angle and with the end opening and the intermediate opening being substantially aligned to provide with said housing a relatively straight, openended passageway and with the outer dimensions of said housing being so proportioned that the soldering device can beheld pencil-fashion with the portion of said housing between said open end and said intermediate opening grasped between the fingers and thumb of the hand with the portion of the housing between the intermediate opening and closed end resting on the back of the hand between the thumb and index finger;

an electrically operated heating means including a solder contacting element and electric conductive means within said housing and spaced from said housing with the solder contacting element protruding through the open end of said housing and the electric conductive means connected to said solder contacting element, spaced from the housing and being fixed within the closed end of the housing, with said electrically operated heating means including an obtuse angle and positioned substantially coaxial with said housing; and

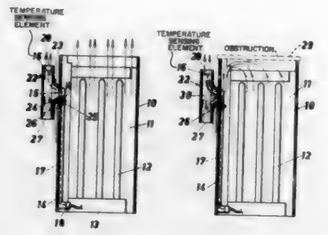
means to supply electrical energy to said electrically operated heating means.

4,045,652

DEVICE FOR PREVENTING OVERHEATING OF ELECTRIC APPARATUSES

Sven-Olof Janson, Svarvaregatan 6, Halmstad, Sweden (302 50)

Filed Sept. 3, 1975, Ser. No. 610,084
Claims priority, application Sweden, Sept. 4, 1974, 7409282
Int. Cl.[2] H05B *1/02;* **F24H** *3/00, 9/20*
U.S. Cl. 219—363 **3 Claims**



1. An apparatus for preventing overheating of electric heaters wherein said heater includes a casing having a front wall, a rear wall and side walls, a terminal block enclosed in said casing and a number of electric heating elements connected to and supported by said terminal block inside said casing, upper and lower apertures provided in said casing to define an air passage therethrough, said apparatus comprising:

an aperture formed in said casing at a position between said upper and lower openings;

an air channel arranged external to said casing between said upper and lower openings comprising a vertically disposed tube including an intermediate tube perpendicular to said vertically disposed tube, said intermediate tube forming a communication between said vertically disposed tube and said aperture for allowing said air channel to communicate via said aperture with said air passage of said casing;

a sensing body, arranged in said air channel at a position above said aperture, operatively connected to a switch means for controlling a power supply to said heating elements; and

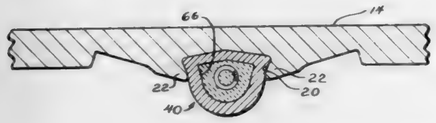
a flow duct, provided in said casing immediately below said aperture, for preventing, during normal operation of the electric apparatus, heated air from the interior of said casing from reaching said sensing body in said air channel through said aperture, said aperture and said flow duct being formed by a longitudinal slot in one wall of said casing, said aperture allowing heated air to flow over said sensing body in the event said upper opening is obstructed.

4,045,653

ELECTRIC COOKER WITH PRESS-STAKED HEATING ELEMENT AND METHOD OF MAKING THE SAME

LaVern G. Soper, Eau Claire, and Brent W. Dressel, Elk Mound, both of Wis., assignors to National Presto Industries, Inc., Eau Claire, Wis.

Filed June 28, 1976, Ser. No. 700,110
Int. Cl.[2] F27D *11/00*
U.S. Cl. 219—438 **9 Claims**



1. A method of staking a sheather electric heater element to the wall of a cooker comprising displacing metal from one side of the cooker wall to create an irregular channel with upstanding ribs along the two sides thereof, locating the sheathed heater element between the ribs and folding the ribs inwardly against the sides of the heater element therebetween while applying counter pressure to the opposite side of the cooker wall such that the confined portions of the heater element are conformed throughout their area to the thus engaged surfaces of the channel bottom and inner surfaces of the ribs.

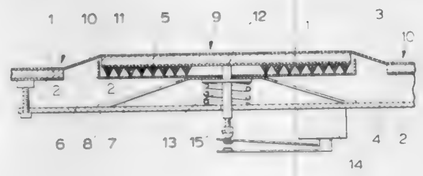
9. A electric cooker having a wall of wrought metal provided with an irregular channel in one side thereof, and a sheathed electric heater element fixed in said channel, the channel having a bottom wall of shallow vee-shape in cross-section located interiorly of the cooker wall, the heater element having laterally projecting portions along the length of its two sides adjacent its base, and ribs at each side of the channel which project outwardly of the cooker wall and have inner surfaces in overlying engagement with the sides of the sheathed heater element and their laterally projecting portions, the confined sides, laterally projecting portions and basee of the sheathed heater element being compressed to the shape of the engaging surface of the ribs and channel bottom throughout the surface area thereof.

4,045,654

ELECTRIC HOTPLATE WITH THERMOSTAT

Svein Eide, Sandnes, Norway, assignor to A/S Ardal og Sunndal Verk, Oslo, Norway

Filed Sept. 1, 1976, Ser. No. 719,506
Claims priority, application Norway, Sept. 2, 1975, 752999
Int. Cl.[2] H05B *3/68*
U.S. Cl. 219—449 **9 Claims**



1. A thermostatically controlled electric hotplate comprising:

a horizontally aligned heating plate formed of thermally expandable material;

an unheated zone surrounding said heating plate;

electric heating element means, positioned beneath said heating plate, for, upon energization of said electric heating element means, heating said heating plate to cause horizontal expansion thereof, said heating plate being capable of horizontal contraction upon deenergization of said electric heating element means;

bridge means, formed of flexible sheet material connecting said heating plate with said unheated zone, for transforming said horizontal expansion into upward vertical movement of said heating plate relative to said unheated zone and for transforming said horizontal contraction into downward vertical movement of said heating plate relative to said unheated zone;

a switch electrically coupled to said electric heating element means, said switch having a closed position causing energization of said electric heating element means and an open position causing deenergization of said electric heating element means; and

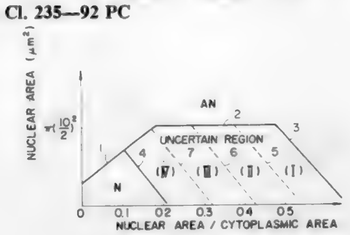
actuating member means, mechanically coupled to said heating plate and to said switch, for transmitting upward vertical movement of said heating plate to said switch to move said switch to said open position thereof and for transmitting downward vertical movement of said heating plate to said switch to move said switch to said closed position thereof.

4,045,655

AUTOMATIC CYTO-SCREENING DEVICE

Ryuichi Suzuki, Kokubunji, and Takaji Suzuki, Kashiwa, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation-in-part of Ser. No. 514,925, Oct. 15, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,381
Claims priority, application Japan, Oct. 15, 1973, 48-114819; Oct. 15, 1973, 48-114818; Oct. 22, 1973, 48-117962; Oct. 26, 1973, 48-119876; Jan. 30, 1974, 49-11886; June 24, 1974, 49-71333
Int. Cl.[2] G06M *11/04*
U.S. Cl. 235—92 PC **2 Claims**



1. An automatic cyto-screening device comprising

magnifying means for optically magnifying a sample including cells;

scanning means for scanning a magnified image of the sample;

a cell detector for detecting a cell in the magnified image from a video signal obtained from said scanning means; and

diagnosis logic means for obtaining a morphologic feature of the cell as a diagnosis parameter from said image signal based on an output from cell detector,

characterized in that said diagnosis logic means further comprises

an area calculating means for calculating the nuclear area, cytoplasmic area and area of the nucleus with a predetermined density;

means for calculating the nuclear area/cytoplasmic area ratio; and

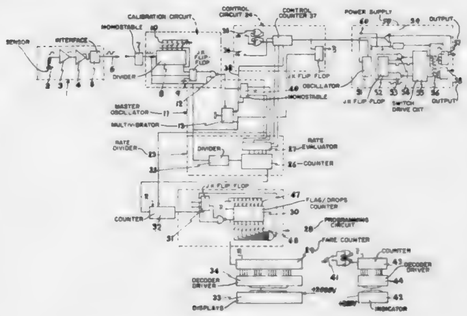
first classification means for determining to which region of a plurality of prescribed regions including normal abnormal, and uncertain prescribed regions the cell belongs based on said nuclear area and said ratio.

4,045,656

TAXIMETERS

Keith Scott, Auckland, New Zealand

Filed Mar. 5, 1976, Ser. No. 664,253
Int. Cl.[2] G07B *13/00*
U.S. Cl. 235—92 TC **4 Claims**



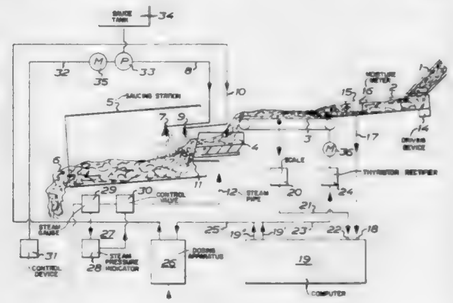
1. A taximeter for calculating a fare total from a predetermined combination of charges based on distance and/or time factors, said taximeter comprising a constant frequency oscillator adapted to emit a first pulse train; and a transducer adapted to emit a second pulse train proportional to the speed of the taxi; means for modifying said first pulse train to conform to the frequency of the said second pulse train when the frequency of said second pulse train exceeds a predetermined limit, said modifying means including a flip flop and a nand gate in circuit with said oscillator, said second electrical pulse train being applied in use to said flip flop, the output of which is connected to said nand gate and hence to said oscillator the output of which is fed back to said flip flop so that in use each pulse issuing from said oscillator fixes said flip flop in the reset state causing said nand gate to prevent said distance pulse train triggering said oscillator until said second pulse train exceeds a predetermined frequency whereupon more than one pulse from said second pulse train appears between two pulses of said first pulse train, the first of said pulses from said second pulse train setting said flip flop to prepare said nand gate to pass the second of said pulses from said second pulse train, which pulse then triggers said oscillator terminating the relaxation period thereof and causing a pulse in said first pulse train to issue from said oscillator conforming with said second pulse from said second pulse train, said taximeter including activation means adapted on operation to activate the taximeter, counting means for counting directly or indirectly the sum of pulses issuing from said time function and display means adapted to display the fare resulting from the sum of pulses counted by said counting means in a convenient form.

4,045,657

METHOD OF FACILITATING EXACT EVALUATION OR CONTROL OF THE PROCESSING OF A PRODUCT MASS, AND APPARATUS FOR CARRYING SAID METHOD INTO EFFECT

Erik Falke, Stockholm, Sweden, assignor to Svenska Tobaks Aktiebolaget, Sweden

Continuation-in-part of Ser. No. 476,262, June 4, 1975, abandoned. This application Dec. 30, 1975, Ser. No. 645,329
Claims priority, application Sweden, June 7, 1973, 7308021
Int. Cl.[2] G06F *15/46;* **A24B** *9/00*
U.S. Cl. 235—151.1 **11 Claims**



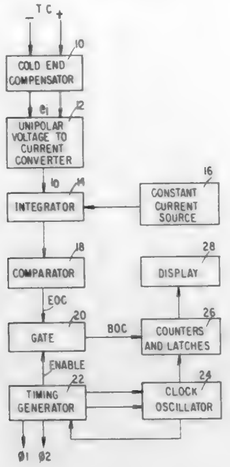
9. An apparatus for measuring the actual value of the weight and the moisture content of a product mass during transport of said mass from one location to another, said apparatus comprising at least one conveyor for conveying the mass, a moisture meter for continuously measuring the magnitude of a parameter related to the moisture content as a measure of the moisture of the mass, a weigher in close proximity to said moisture meter for continuously measuring the weight of the mass, a computer, and means for transmitting moisture and weight measuring set inputs and signals to said computer to make the computer establish thereby, on the basis of said measuring signals control signals related to the dry weight of the mass as demand signals for supplying at a location downstream of said conveyor additional material into the mass to desired values of the mass.

4,045,658

DIGITIZED LINEARIZING CORRECTION APPARATUS WITH FREQUENCY MODULATION

Veikko K. Peltola, and James M. Duros, both of Chicago, Ill., assignors to Alnor Instrument Co., Niles, Ill.

Filed Jan. 12, 1976, Ser. No. 648,463
Int. Cl.[2] H03B *3/04*
U.S. Cl. 235—151.3 **12 Claims**



1. A method of linearizing the output signals produced by an analog measuring instrument including the steps of:

converting each of said output signals into a time referenced signal;

generating clock pulses of a first frequency; counting said clock pulses;

changing said first frequency to a second frequency at least at a first predetermined count; and

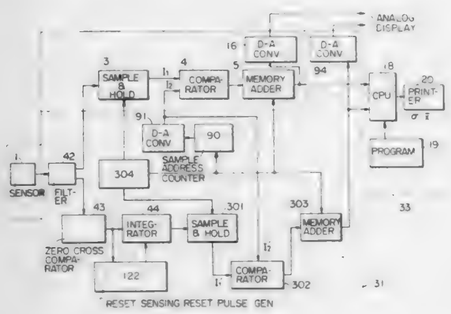
obtaining the number of clock pulses generated during the duration of said time referenced signal.

4,045,659

APPARATUS FOR THE EVALUATION OF YARN QUALITIES

Masatake Akagawa, Yachiyo, and Tsutomu Tamura, Oi, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 7, 1976, Ser. No. 674,828
Claims priority, application Japan, Apr. 7, 1975, 50-42056
Int. Cl.[2] G06G *7/66, 7/12*
U.S. Cl. 235—151.3 **4 Claims**



1. An apparatus for evaluating the characteristics of a continuous yarn, said apparatus comprising:

a. sensor means for sensing a property of the yarn and for producing a first signal in response thereto;

b. first circuit means coupled to said sensor means for receiving said first signal and for producing a second signal which is a function of the amplitude component frequency distribution of said first signal;

c. second circuit means coupled to said sensor means for receiving said first signal and for producing a third signal which is a function of the frequency component frequency distribution of said first signal; and

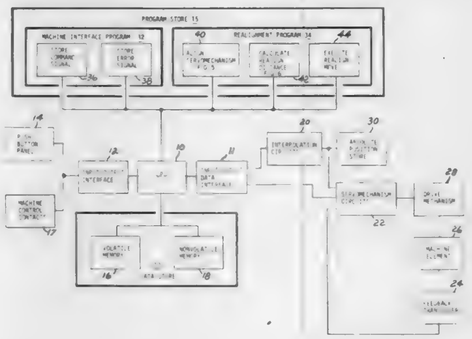
d. calculating means coupled to said first and second circuit means for receiving said second and third signals and for calculating the mean value and standard deviation of each of said signals.

4,045,660

METHOD AND APPARATUS FOR AUTOMATICALLY REALIGNING A MACHINE ELEMENT TO A PREDETERMINED POSITION AFTER POWER INTERRUPTION

William Robert Weisgerber, Springdale, and Ralph Charles Taylor, Westchester, both of Ohio, assignors to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Apr. 29, 1976, Ser. No. 681,573
Int. Cl.[2] G05B *19/18;* G06F *15/46*
U.S. Cl. 235—151.11 **15 Claims**



1. An apparatus for automatically realigning a machine element to a commanded position in response to a first signal representing an interruption of power to a drive mechanism connected to the machine element and a second signal representing a reapplication of power to the drive mechanism, said drive mechanism being controlled by a servomechanism circuit responding to a command signal representing the desired position of the machine element and producing a feedback signal representing the actual position of the machine element, the apparatus comprising:

a. means responsive to the servomechanism circuit and the first signal for detecting an error signal representing the displacement of the machine element after the power interruption;

b. means responsive to the detecting means for storing the error signal; and

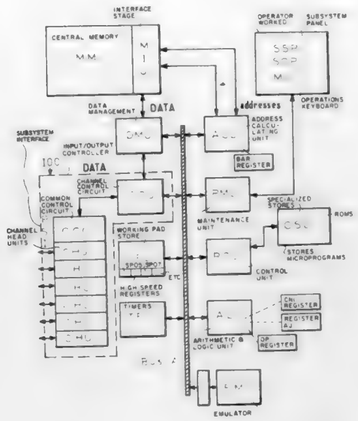
c. means responsive to the second signal and the error signal for producing a command signal to the servomechanism circuit to cause the machine element to move to the commanded position it had at the time of the interruption of power.

4,045,661

APPARATUS FOR DETECTING AND PROCESSING ERRORS

Pierre Gabriel Antoine, Palaiseau; Jean-Claude Marcel Cassonnet, Conflans-Ste-Honorine, and Daniel Rene Vinot, Villepreux, all of France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 23, 1975, Ser. No. 570,743
Claims priority, application France, Apr. 25, 1974, 74.14488
Int. Cl.[2] G06F *11/06*
U.S. Cl. 235—153 AC **3 Claims**



1. In a data processing system comprising a central processor including functional devices capable of executing instructions stored in a memory, and means for detecting errors, improved apparatus for handling the detected error, comprising:

a first register having a plurality of bit locations, each of said functional devices being connected to one of said bit locations so as to permit the location and detection of errors; and

a second register operatively connected to selected of said functional devices, which are subject to several types of error for determining in which of said functional devices the detected error has occurred.

4,045,662

SELF TESTING MONITORING APPARATUS FOR MULTIPLEXED DIGITAL INPUT SIGNALS

Joseph T. Scopaz, North Bergen, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Mar. 29, 1976, Ser. No. 671,203
Int. Cl.[2] G06F *11/00*
U.S. Cl. 235—153 A **8 Claims**

1. A monitor for monitoring a digital address signal and corresponding data signal, comprising:

means for providing a data parity signal;

means for providing a signal indicating a valid address transmission;

means for providing a signal corresponding to a predetermined bit of the data signal;

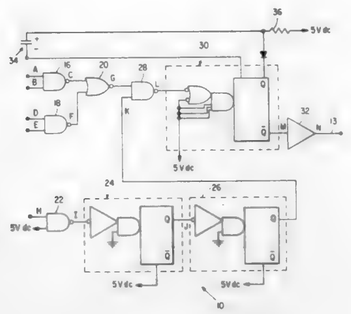
means for providing the address signal;

means for providing a data clock signal;

means for combining the data parity, valid address transmission, predetermined data bit and address signals and for providing a first signal;

means for providing a signal at a predetermined constant level;

means responsive to the data clock signal and the signal at the predetermined constant level for providing a second signal; and



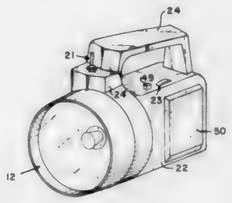
means responsive to the first and second signals for providing a monitor output signal.

4,045,663

RECHARGEABLE FLASHLIGHT ASSEMBLY

Danny J. Young, Tyler, Tex., assignor to James W. Fair, Tyler, Tex.

Filed June 16, 1976, Ser. No. 696,820
Int. Cl.[2] F21L *7/00;* H04B *1/08*
U.S. Cl. 240—10.6 CH **14 Claims**



1. A flashlight assembly comprising

a. a flashlight bulb,

b. a rechargeable battery for energizing said bulb,

c. circuitry for providing recharging of said battery, including a charger input, a current limiting resistor, and a light emitting diode for indicating when recharging is taking place,

d. circuitry means for selectively flashing said flashlight bulb or permitting continuous operation thereof, said circuitry means including an internal light source, a photocell for receiving light from said internal light source, and a first switch for selectively operatively connecting said internal light source to said battery to thereby provide flashing of said flashlight bulb, or to disconnect said internal light source from said battery whereby no flashing of said flashlight bulb occurs,

e. an accessory device powered by said battery,

f. a second switch for selectively operatively connecting said accessory device to said battery,

g. a casing operatively mounting and containing elements (a)–(f) above, and

h. a handle affixed to said casing for facilitating ready manipulation and utilization of said flashlight bulb and said accessory device.

4,045,664

LIGHTING FITTING PROVIDED WITH AT LEAST TWO-LOW-PRESSURE MERCURY VAPOR DISCHARGE LAMPS

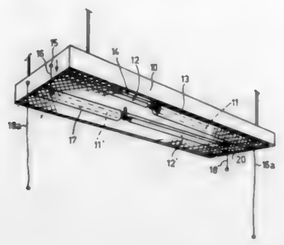
Louis Eugéne Vrenken, and Pieter Hendrik Broerse, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 31, 1972, Ser. No. 285,457

Claims priority, application Netherlands, Sept. 4, 1971, 7112208

Int. Cl.² F21V *11/18*

U.S. Cl. 240—46.03 **6 Claims**



1. An arrangement for providing illumination of selectable color value comprising:

a lighting fitting;

two low-pressure mercury vapor discharge lamps disposed within said fitting and having different color points, the color temperatures of the lamps being between 2500° and 7000° Kelvin, said lamps also having a color rendering index Ra8 of more than 80 and having a functional relationship wherein the line of connection between the color points of the two lamps in the color triangle located relative to the line of the black body is such that the color rendering index Ra8 of the combined light of the lamps radiating from the arrangement is more than 80;

and control means for adjusting the ratio of the light contributions of the two lamps to maintain an approximately constant lumen value of light radiated by said arrangement while modifying the spectral composition of the combined light of the lamps.

4,045,665

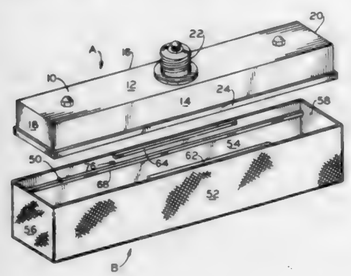
DIFFUSER ATTACHMENT FOR A FLUORESCENT LAMP FIXTURE

Harrison L. Williams, Euclid, and Detre M. Banhidy, Lakewood, both of Ohio, assignors to Preformed Line Products Co., Cleveland, Ohio

Filed June 25, 1975, Ser. No. 590,307

Int. Cl.² H05B *33/02*

U.S. Cl. 240—51.11 R **7 Claims**



1. In a self-contained fluorescent lamp fixture of the type having a box-like fixture body adapted to support a fluorescent light tube and receive its operative components in operative association with fixture mounting means wherein the fixture body has a pair of opposed sides between which an open end of said fixture body is defined and with each side including an outwardly protruding flange area having a predetermined width extending longitudinally therealong, a cover member of substantially U-shaped cross-sectional configuration including a base having integral legs extending substantially perpendicularly from the opposite sides thereof, said cover member being attached to said fixture body with said base spanning said open end of said fixture body and with said sides of said fixture body positioned between said legs and closely received thereagainst so that said legs define said flange areas, a light diffuser attachment for said fluorescent lamp fixture, said diffuser having a generally box-like configuration including a bottom wall, a pair of spaced apart side walls, a pair of spaced apart end walls and an open top end with at least said top end being dimensioned to be received over said flange areas on said fixture body; first and second diffuser locating and mounting beads disposed generally longitudinally along the inside of each diffuser side wall adjacent said open top end with said first and second beads laterally spaced apart from each other a distance slightly greater than the predetermined width of said flange areas so as to define a flange area receiving channel therebetween, said first and second beads extending over at least a portion of the length of said diffuser side walls; and, said diffuser side walls being formed so as to bow slightly arcuately inward toward each other such that the transverse distance between them at least generally midway between said end walls at least adjacent said open top end and said first and second beads is less than the transverse distance between the outside surfaces of said fixture body sides, said diffuser attachment being affixed to said fixture body by means of the flange areas of said sides being received in said receiving channels with at least the inwardly most bowed areas of said diffuser side walls applying a continuous clamping force against said fixture body sides, and with said flange areas received between said first and second beads on said sidewalls over a distance less than the longitudinal length of each said diffuser sidewalls.

4,045,666

HEADLAMPS

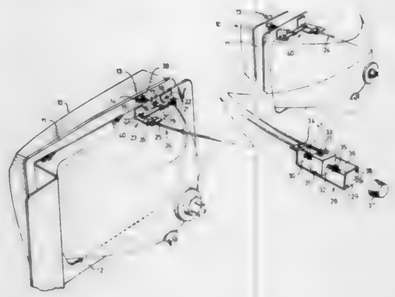
Roy Ernest Stringer, Birmingham, England, assignor to Chrysler United Kingdom Limited, London, England

Filed Dec. 29, 1975, Ser. No. 644,517

Claims priority, application United Kingdom, Jan. 6, 1975, 487/75

Int. Cl.² B60Q *1/06*

U.S. Cl. 240—61.8 **10 Claims**



1. An adjustable headlamp assembly for a motor vehicle comprising a headlamp, means for mounting the headlamp for tilting movement about a first axis extending normally to the direction in which the headlamp is focussed, resilient means for biassing the headlamp in one direction of tilt about said axis and a Bowden cable mechanism for pulling the headlamp in the opposite direction, said Bowden cable mechanism having an outer sheath with opposite ends, and an inner cable with opposite ends, means for anchoring the ends of the sheath against

movement, one end of the inner cable being connected to the headlamp at a location spaced from the axis about which the headlamp tilts and the other end of the inner cable being connected to an adjustment device disposed remote from the headlamp and adapted to be operated from the interior of the motor vehicle for adjusting the position of the inner cable with respect to the outer sheath, the adjustment device comprising an anchorage fixed on the cable, a mounting for the anchorage for supporting the anchorage for linear sliding movement so as to move the cable linearly and screw means engaged with the anchorage for adjusting the position of the anchorage with respect to the mounting with the headlamp being adjusted in relation to the rotation of the screw means.

4,045,667

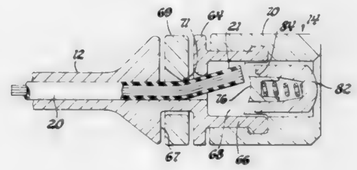
COLOR-SENSITIVE PHOTOELECTRIC CONTROL SYSTEM WITH FIBER OPTICS

Richard J. Hanson, Warren, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed May 26, 1976, Ser. No. 690,188

Int. Cl.² G01J *3/34*

U.S. Cl. 250—226 **3 Claims**



1. In a vehicle having a plurality of switching functions manually and remotely controlled at a control location, an optical control system comprising,

a light source,

a receiver sensing light from the light source,

a manually controlled optical selector at the control location intervening between the light source and the receiver for modifying the light spectrum sensed by the receiver, the selector comprising a plurality of different color filter means each effective when selected for modifying the illuminating light to provide a unique light spectrum corresponding to a given switching function, and

the receiver including a spectral analyzer responsive to the spectrum of the filtered light, and further including electrical switching means controlled by the analyzer to energize any of a plurality of switching functions corresponding to the selected spectrum, whereby the swtiching functions are controlled by manual selection of the color filter means.

4,045,668

METHOD AND APPARATUS FOR IMMISCIBLE LIQUIDS MEASUREMENT

Gillies D. Pitt, Harlow, and Philip W. Black, Bishops Stortford, both of England, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,338

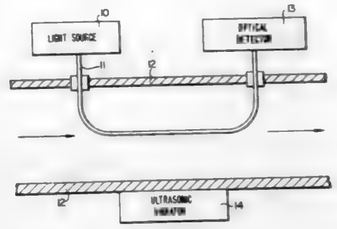
Claims priority, application United Kingdom, Aug. 21, 1975, 34778/75

Int. Cl.² G02B *5/14*

U.S. Cl. 250—227 **8 Claims**

1. A method of measuring the proportion of a first liquid dispersed in a lower refractive index second liquid with which the first is immiscible, comprising:

monitoring the optical attenuation through a length of optical attenuation through a length of optical fiber having an unclad region immersed in the liquids dispersion, said which unclad region having a refractive index greater



than that of the second liquid but not more than 0.1 greater than that of the first liquid.

4,045,669

ELECTRON MICROSCOPE

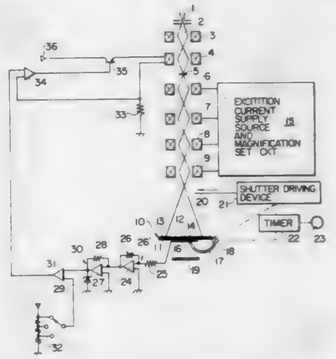
Shoji Kamimura, Katsuta, and Yasushi Saito, Mito, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1976, Ser. No. 712,664

Claims priority, application Japan, Aug. 13, 1975, 50-97566

Int. Cl.² H01J *37/26*

U.S. Cl. 250—311 **12 Claims**



1. An electron microscope comprising means to radiate an electron beam, means to condense said electron beam from the radiation means onto a specimen, means to magnify the electron beam having been transmitted through said specimen by condensing said electron beam onto said specimen, means to convert the magnified electron beam into a visual specimen image, means to detect said magnified electron beam and to convert it into an electric signal, and means to control the condensing means in response to said electric signal so that a quantity of electrons per unit area in said magnified electron beam is held substantially constant.

4,045,670

PORTABLE PRECISION RADIOMETER

Alan S. Anderson, Littleton, and John J. Cardarelli, Malden, both of Mass., assignors to Williamson Corporation, Concord, Mass.

Filed Sept. 24, 1976, Ser. No. 726,446

Int. Cl.² G01J *1/00*

U.S. Cl. 250—338 **8 Claims**

1. A portable, precision, non-contact temperature measuring radiometer comprising:

illuminated visual meter means for registering the temperature measured by said instrument;

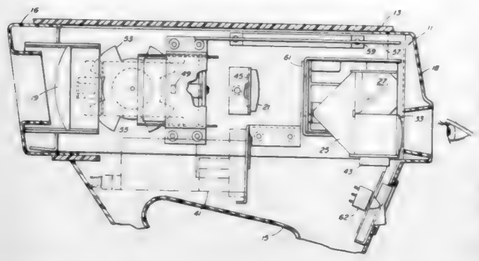
a detector responsive to infrared radiation;

an objective optical system for collecting both visible and

infrared radiation from a target, the temperature of which is to be measured, said objective system including a wavelength sensitive beam splitter for diverting infrared radiation toward said detector on a path separate from the visible radiation;

a viewing optical system coupled to said objective optical system and including a beam splitter for enabling an operator holding the instrument to view a target at which the instrument is directed and simultaneously read said meter means;

an optical chopper for periodically interrupting the incidence on said detector of infrared radiation from said target;



a controllable reference source for illuminating said detector during periods when infrared radiation from said target is blocked by said chopper;

a null balance electronic circuit responsive to the a.c. component of the signal provided by said detector for controlling the energization of said source to equalize the illumination of said detector by said source and said target and for actuating said meter to register as a function of the energization of said source; a battery pack for energizing said chopper and said null balance circuit together with said source and said meter; and

a lightweight portable housing for the aforesaid components.

4,045,671

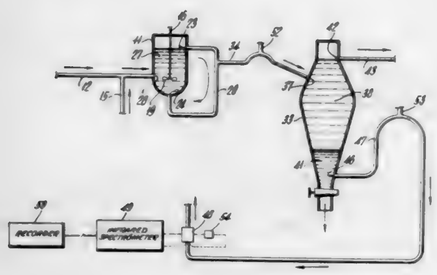
METHOD AND APPARATUS FOR CONTINUOUSLY MONITORING THE PRESENCE OF OIL IN WATER

Roger M. Dille; Merle H. Van Stavern, both of Richmond; Don L. Shull, Waynesboro, and David F. Gripshover, Richmond, all of Va., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,174

Int. Cl.[2] G01N *21/26*

U.S. Cl. 250—341 **8 Claims**



1. A system for continuously monitoring the presence of oil in water, comprising in combination

means for mixing a predetermined proportion of an oil-solvent with said water to form a chemical solution containing any oil therein, comprising means for combining streams of said water and said solvent in said predetermined proportions, and means for stirring said combined streams without producing a stable emulsion, also means for circulating said combined and stirred mixture,

means for diverting a portion of said circulating mixture,

a settling container for separating said diverted portion into said solution and said water,

said solvent does not have significant infrared absorbency at a predetermined infrared wavelength and has a different density from said water,

an infrared spectrometer for determining the presence of oil in said solution, and

means for flowing said separated solution past said infrared spectrometer.

4,045,672

APPARATUS FOR TOMOGRAPHY COMPRISING A PIN HOLE FOR FORMING A MICROBEAM OF X-RAYS

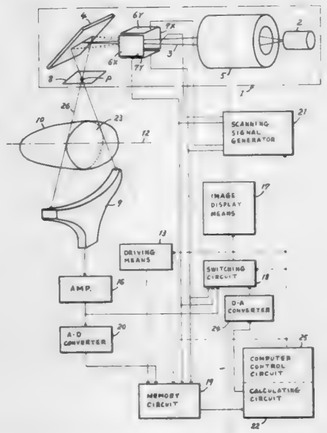
Eiji Watanabe, Akishima, Japan, assignor to Nihon Denshi Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 3, 1976, Ser. No. 720,409

Claims priority, application Japan, Sept. 11, 1975, 50-110230; Sept. 11, 1975, 50-110231; Dec. 19, 1975, 50-152074; Feb. 5, 1976, 51-11591; Feb. 28, 1976, 51-21711; Mar. 5, 1976, 51-23997

Int. Cl.[2] A61B *6/02*; G01N *23/08*; G03B *41/16*; H05G *1/30*

U.S. Cl. 250—360 **14 Claims**



1. An apparatus for obtaining a two dimensional display of the X-ray absorption distribution on a cross-sectional plane of an object comprising:

a. means for generating an electron beam,

b. means for focusing said electron beam on a target thereby generating X-radiation at the location of impingement,

c. a guide plate having a pin hole therein for forming and directing an X-ray microbeam onto the object,

d. means for scanning said electron beam over the surface of the target to cause the X-ray microbeam to correspondingly scan a cross-sectional plane of the object,

e. means for rotating said generating means, focusing means, guide plate and scanning means around the object,

f. means for detecting and measuring the intensity of the X-rays passed through the object,

g. a memory for memorizing the output of said detecting means along with the corresponding output signals from the scanning means and the rotating means,

h. means for calculating the absorption value at each micro matrix area on said cross-sectional plane from the data memorized in the memory, and

i. means for displaying said respective calculated absorption values two-dimensionally.

4,045,673

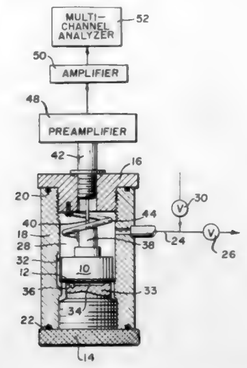
TEST CHAMBER FOR ALPHA SPECTROMETRY

Robert P. Larsen, Downers Grove, Ill., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 12, 1976, Ser. No. 685,589

Int. Cl.[2] G01T *1/20, 1/24*

U.S. Cl. 250—364 **5 Claims**



1. A test chamber for alpha spectrometry comprising:

a detector responsive to alpha radiation to generate therefrom an electrical signal;

means for supporting the detector in a fixed reproducible position;

means for disposing an alpha emitter an a metal planchet in reproducible close proximity to the detector;

means for maintaining the alpha emitter and the detector in a vacuum environment; and

means connected to the detector for coupling the electrical signal outside the vacuum environment.

4,045,674

DIAMONDS

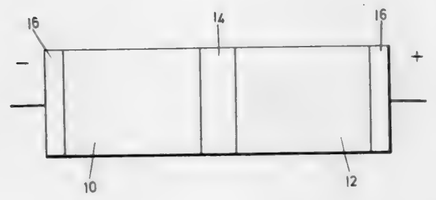
Leon Ampeir Vermeulen, 24, Ferreira Street, Discovery, Transvaal, South Africa

Filed Nov. 28, 1975, Ser. No. 636,144

Claims priority, application South Africa, Dec. 4, 1974, 74/7725

Int. Cl.[2] G01T *1/22*

U.S. Cl. 250—370 **11 Claims**



1. A method of causing an electrical current to flow through a body of type II*b* diamond which has been subjected to radiation so as to cause atomic displacements, including the steps of applying an electrical potential across the body and exposing the body to ionizing radiation while maintaining an electrical potential across the body.

4,045,675

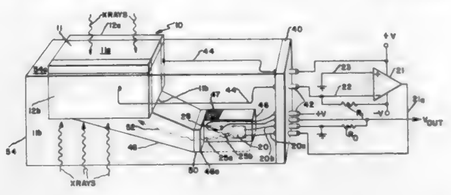
SOLID STATE RADIATION DETECTOR SYSTEM

Jack D. Kingsley, Schenectady, and Henry H. Woodbury, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed July 12, 1976, Ser. No. 704,416

Int. Cl.[2] G01T *1/24*

U.S. Cl. 250—370 **10 Claims**



1. A system for detecting the magnitude of a flux of externally produced radiation, comprising:

solid state radiation detector means for varying the magnitude of an electrical parameter responsive to the magnitude of a total incident flux of optical photons and externally produced radiation;

first means for generating a flux of optical photons incident on said detector means;

second means for causing the flux of said first means to vary responsive to changes in said electrical parameter to maintain the magnitude of said electrical parameter substantially constant at said detector means; and

third means for monitoring said optical flux of said first means to generate a system output having a magnitude proportional to the flux of said externally produced radiation.

4,045,676

DETERMINING ELEMENT CONCENTRATIONS IN SAMPLES

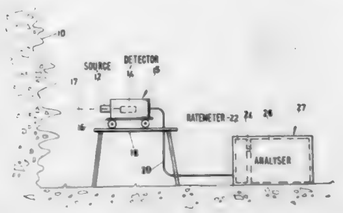
Rainer Rolle, Randburg, Transvaal, South Africa, assignor to Ortec Incorporated, Oak Ridge, Tenn.

Filed Mar. 13, 1975, Ser. No. 558,190

Claims priority, application South Africa, Mar. 15, 1974, 74/1707

Int. Cl.[2] G01N *23/20*

U.S. Cl. 250—272 **26 Claims**



1. A method of determining the concentration of an element in a sample which has a rough surface comprising the steps of:

A. irradiating at least one calibration sample of known concentration of the element to excite rdiation from the element in a known energy band characteristic of the element and

i. measuring such radiation to establish a relationship between the measured characteristic radiation and the concentration of the element, and

ii. measuring under substantially the same geometrical conditions of irradiation and detection as in step A.i., the rate of emission of detected radiation in a reference energy range, said reference energy range being relatively wide compared to said characteristic band such that the ratio of the characteristic radiation to reference

range radiation is small, such rate establishing a reference value for that range; and

B. irradiating the rough surfaced sample to be analyzed,

i. first measuring the rate of emission of detected radiation from that sample in said reference energy range, while varying the geometrical conditions of irradiation and detection until the measured rate of detected radiation in the reference energy range is equal to the established reference value, and

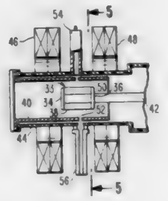
ii. then, under the same geometrical conditions for which said measured rate of detected radiation in the reference energy range equaled said established reference value in step B.i., measuring the excited radiation of that sample in only the characteristic band, and from such measurement and the established relationship, determining the concentration of the element in that sample.

4,045,677

INTENSE ION BEAM GENERATOR

Stanley Humphries, Jr., and Ravindra N. Sudan, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed June 11, 1976, Ser. No. 695,219
Int. Cl.[2] H01J *27/00*
U.S. Cl. 250—423 R **15 Claims**



1. The method of generating intense ion fluxes comprising:

providing an anode surface and a closely spaced cathode surface in a vacuum chamber, said anode surface being substantially transparent to electrons and including a material capable of forming a plasma;

maintaining said cathode surface at a ground reference potential;

applying a pulse voltage in the megavolt range to said anode to produce a plasma at the surface of said anode, said pulse having a duration approximately equal to or less than the time required for said plasma to form and to fill the gap between said cathode and said anode, said pulsed voltage producing an electric field which accelerates electrons from said cathode toward said anode and which accelerates ions formed in said plasma away from said anode;

applying a magnetic field along the cathode-anode axis to confine emitted electrons to the area of the cathode to prevent current loss; and

collecting the ions drawn out of said anode plasma, a voltage pulse of 130 nsec producing currents in excess of 5 kA.

4,045,678

MEDICAL RESTRAINT

Michael E. Rickard, 1324 Buena Vista, Pacific Grove, Calif. 93950

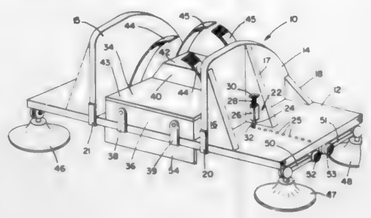
Continuation-in-part of Ser. No. 553,396, Feb. 27, 1975, abandoned. This application Dec. 16, 1976, Ser. No. 751,772
Int. Cl.[2] G03B *41/16*
U.S. Cl. 250—451 **16 Claims**

10. A restraint for holding a portion of a patient such as the head or a limb in a fixed position on an X-ray table for the taking of X-rays, said restraint comprising:

a platform having at least one laterally spaced pair of slot formed therein;

means for mounting the platform to the X-ray table including a plurality of elongate support elements, each of the support members having one end pivotally attached to the platform, the opposite end of each of the support elements having a suction cup pivotally attached thereto;

a padded surface overlying the platform intermediate the slots and attached to the platform, said padded surface adapted to receive and support the portion of the patient to be restrained thereupon;



a strap adapted to pass upwardly through the slots and around the portion of the patient to be restrained;

means for fastening the ends of the straps around the portion of the patient to be restrained; and

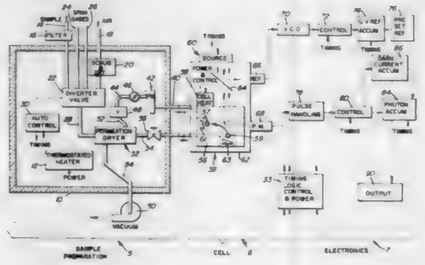
a pair of sidewalls attached to the platform on opposite sides of the padded surface, at least one of said sidewalls being movable with respect to the padded surface so that the portion of the patient to be restrained can be secured between said sidewalls.

4,045,679

FLUORESCENT GAS ANALYZER

Court Lone Wolfe, Pittsburgh, and Ronald Louis Krutz, N. Huntingdon, both of Pa., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 27, 1976, Ser. No. 690,595
Int. Cl.[2] G01N *21/38*
U.S. Cl. 250—461 R **59 Claims**



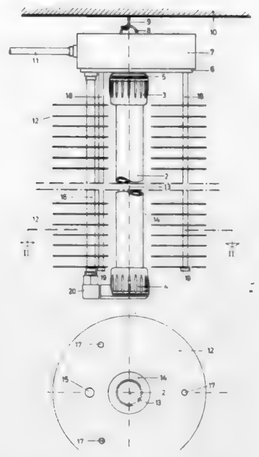
1. A method of determining the content of a first gas in a gas sample, comprising the steps of irradiating the sample with a predetermined amount of a selected radiant energy to cause the first gas only to fluoresce, measuring the time required to output said predetermined amount of energy, generating a digital value proportional to the fluorescence re-emitted by said irradiated sample while it is being irradiated by said selected radiation using digital counting means, generating a digital dark current correction value by counting pulses proportional to the dark current for a length of time substantially equal to said measured period of time while said gas sample is not being irradiated by said selected radiation, and subtracting the value of the dark current correction from the value of the fluorescence.

4,045,680

SHIELDING ARRANGEMENT FOR A ROD SHAPED UV RADIATOR

Alois Loher, Talblick 16, D-8451 Haselmuhl, Germany

Filed June 28, 1976, Ser. No. 700,732
Claims priority, application Germany, July 1, 1975, 2529166
Int. Cl.[2] G01J *1/00*
U.S. Cl. 250—504 **45 Claims**



1. In a shielding arrangement for a rod shaped UV radiator, comprising a plurality of shielding plates which are held parallel to each other at a predetermined spacing by a holding device, the improvement comprising:

a. the shielding plates being aperture disks each of which has a hole of a size at least large enough for leading the UV radiator through it in the direction of its rod axis;

b. the holes of all the individual aperture disks aligned axially with respect to each other; and

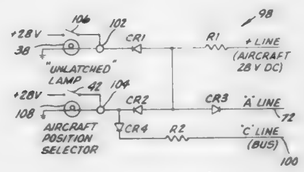
c. the aperture disks matched to each other with respect to their hole dimension ($2r$), their outside dimension (**2R**), their thickness (d) and their mutual spacing (a) in such a manner that UV light which emanates from a section of the UV radiator located between two adjacent aperture disks when the UV radiator is placed axially through the aligned holes issues with a small aperture angle (α) essentially only between these two adjacent aperture disks but not between other aperture disks.

4,045,681

CARGO TRANSFER LOGIC CIRCUITRY

Roger Boy de la Tour, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 528,170, Nov. 29, 1974, Pat. No. 3,958,165. This application Dec. 22, 1975, Ser. No. 643,608
Int. Cl.[2] H01H *19/64*
U.S. Cl. 307—113 **6 Claims**



1. In a cargo transfer shutoff system, vehicle selector and status circuit means comprising:

first diode means including an anode and a cathode;

first resistance means of a predetermined value connecting a positive voltage of predetermined value to said first diode anode;

first lamp means having a very low resistance value when unlit connecting said first diode cathode to ground;

first switch means connecting said first diode cathode to said positive voltage;

second diode means including an anode and a cathode, said first diode anode being connected to said second diode anode;

second lamp means having a very low resistance value when unlit connecting said second diode cathode to ground;

second switch means connecting said second diode cathode to said positive voltage, said first resistance means being of predetermined value to reduce current passing through it so that said first and second lamp means remain respectively unlit when said first and second switch means are open; and

third diode means including an anode and a cathode, said second diode anode being connected to said third diode anode and said third diode cathode being connected to an output lead,

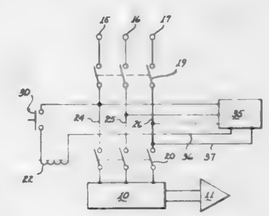
whereby when said second switch means is closed as a selector switch, said output lead is positive to indicate a closed status condition of said first switch means and is zero to indicate an open status condition thereof.

4,045,682

PHASE REVERSAL PROTECTION SYSTEM

Charles R. Poorbaugh, 1183 Kings Lane, and Gerald A. Rhoads, 1335 S. 8th Ave., both of Yuma, Ariz. 85364

Filed May 6, 1976, Ser. No. 683,788
Int. Cl.[2] H02H *3/26*
U.S. Cl. 307—127 **5 Claims**



1. In a three-phase drive motor system including a source of three-phase power wherein said motor is to rotate in only a predetermined rotational direction, means for preventing reverse rotation of said three-phase drive motor as a result of phase reversal of said power source comprising:

a. a three-phase control motor including three phase windings;

b. first, second and third switches each connected in series with a different one of the three phase windings of said three-phase control motor;

c. means connecting said three-phase control motor including said switches to said source of three-phase power to cause rotation of said control motor in a predetermined rotational direction when said drive motor rotates in said predetermined rotational direction;

d. a solenoid-operated switch, including a solenoid winding, connecting said source of three-phase power to the three-phase drive motor to energize said drive motor when said solenoid-operated switch is closed;

e. a fourth switch connected in series with said solenoid winding between two of the three phases of said source of three-phase power;

f. a cam plate having a run position and a stop position;

g. each of said first, second, third and fourth switches including actuating arms having a cam follower portion contacting said cam plate to close said switches when said cam

plate is in said run position and open said switches when said cam plate is in said stop position; and

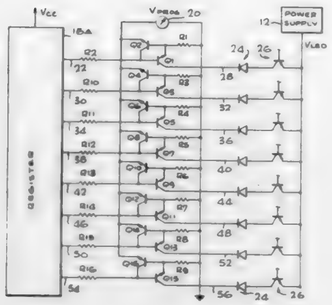
h. means connected to the shaft of said three-phase control motor for moving said cam plate from said run position to said stop position when said three-phase control motor rotates in a reverse direction.

4,045,683

DRIVE CIRCUIT WITH CONSTANT CURRENT

Fred William Erickson, Woodland Hills, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Filed Oct. 28, 1975, Ser. No. 626,251
Int. Cl.[2] H02V *9/02*
U.S. Cl. 307—157 **12 Claims**



1. A constant current drive circuit comprising:

a. first and second source means of electrical potential, said first and second electrical potentials being selectively determinable,

b. current clamping means electrically connected between said first and second source means of electrical potential drawing a determinable constant current, said current clamping means includes

1. bistable control means responsive to said first and second electrical potentials and establishing an electrical current therethrough,
2. a resistor, and
3. a selectively variable third source of electrical potential,
4. said resistor and third source of electrical potential connected in electrical parallel and responsive to said current established by said bistable control means to clamp the electrical level or value of said established current,

c. a controlled device electrically connected between said current clamping means and a selected one of said first and second source means of electrical potential drawing said determinable constant current, and

d. signal generating means selectively enabling and disabling said current clamping means so that the constant current drive circuit is selectively enabled and disabled.

4,045,684

INFORMATION TRANSFER BUS CIRCUIT WITH SIGNAL LOSS COMPENSATION

William Donovan Eads, and David Steven Maitland, both of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

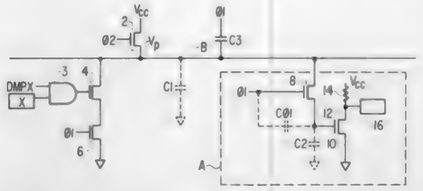
Filed Jan. 19, 1976, Ser. No. 650,344
Int. Cl.[2] H03K *17/16, 17/60, 19/08, 19/20*
U.S. Cl. 307—200 B **3 Claims**

1. An information transfer bus circuit for transferring data bits to a selected destination in response to a predetermined sequence of first and second clocking signals, the bus circuit comprising:

a bus line having an associated first inherent capacitance storing a voltage representing a signal applied to the bus line;

precharge means connected to the bus line and responsive to the second clocking signal, for precharging the bus line to a predetermined voltage level when the second clocking signal is activated;

at least one data gating means connected to the bus line and arranged for receiving the first clocking signal and a selected data bit to be transferred to the selected destination, said data gating means being operative for discharging the precharged bus line when the first clocking signal is activated and the selected data bit is in a first logic state, said data gating means being further operative for maintaining the predetermined voltage level to which the bus line has been precharged when the first clocking signal is



activated and the selected data bit is in a second logic state;

at least one destination circuit connected to the bus line for receiving the selected data bit to be transferred, said destination circuit including a transfer gate connected to the bus line, the transfer gate being arranged for receiving the first clocking signal, the transfer gate including a second inherent capacitance storing the voltage representing the signal applied to the bus line in response to the first clocking signal; and

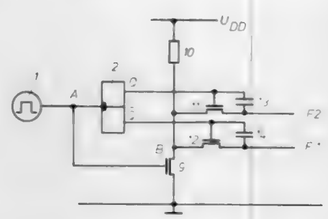
a voltage enhancement capacitor connected to the bus line for coupling the first clocking signal to the bus line, said voltage enhancement capacitor being operative for enhancing the average high and low voltage levels within the destination circuit.

4,045,685

MOS POWER STAGE FOR GENERATING NON-OVERLAPPING TWO-PHASE CLOCK SIGNALS

Wilfried W. Gehrig, Freiburg im Breisgau, Germany, assignor to ITT Industries, Incorporated, New York, N.Y.

Filed Oct. 29, 1976, Ser. No. 736,917
Claims priority, application Germany, Dec. 17, 1975, 2556735
Int. Cl.[2] H03K *1/18, 5/15, 5/156, 5/04*
U.S. Cl. 307—208 **6 Claims**



1. An MOS-power stage for generating non-overlapping two-phase clock signals from a first square wave signal having a pulse duty factor less than 0.5, comprising:

a power inverter coupled to said square wave signals;

first and second transistors each having a main current path coupled to the output of said power inverter;

first and second capacitors, said first transistor having a gate coupled to its main current path via said first capacitor, and said second transistor having a gate coupled to its main current path via said second capacitor; and

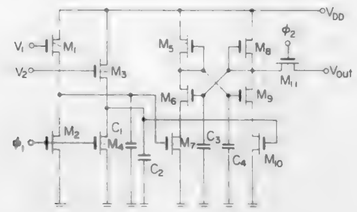
means for coupling the gate terminals of said first and second transistors to one of two inversely related auxiliary square wave signals, each having a pulse duty factor of 0.5 and a frequency equal to substantially half the frequency of said first square wave signal.

4,045,686

VOLTAGE COMPARATOR CIRCUIT

Kenzo Masuda, Tokorozawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 24, 1975, Ser. No. 634,773
Claims priority, application Japan, Nov. 25, 1974, 49-134297
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—355 **12 Claims**



1. A voltage comparator circuit comprising:

a pair of time constant circuits each of which includes variable impedance means and a capacitor, each of said variable impedance means being controlled by a respective input voltage,

a flip-flop circuit which is stabilized to predetermined values by comparisons of time variations of outputs of said time constant circuits, said flip-flop circuit including first and second inputs, each connected to a respective one of the pair of time constant circuits, and

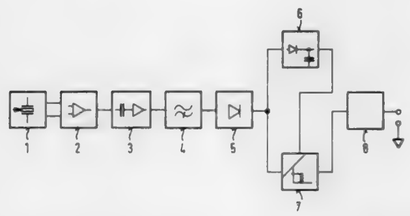
clock control means for enabling said flip-flop circuit to respond to the output of each time constant circuit in synchronism with a clock pulse.

4,045,687

CIRCUIT ARRANGEMENT FOR EVALUATING THE ELECTRICAL OUTPUT SIGNALS OF A DETECTOR FOR THICKNESS CHANGES IN A FUEL INJECTION LINE

Albert Maringer, Karlsruhe, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 20, 1976, Ser. No. 716,220
Claims priority, application Germany, Sept. 3, 1975, 2539194
Int. Cl.[2] H03K *5/20*
U.S. Cl. 307—358 **4 Claims**



1. Apparatus for evaluating the electrical output signals of a detector for thickness changes in a fuel injection line due to the influence of the injection process, such as the rapid pressure variations generated when an injection valve is closed, comprising:

a. the series connection of an a-c voltage amplifier responsive to said detected signals at its input, a highpass filter and a rectifier responsive to said a-c voltage output;

b. a peak value storage device having the output of said rectifier as its input;

c. a Schmitt trigger, also having as its input the output of said rectifier, the output of said peak value storage device being connected as a reference input to the Schmitt trigger; and

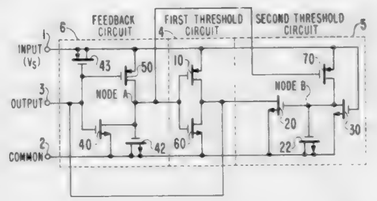
d. a one shot multivibrator connected to the output of said Schmitt trigger.

4,045,688

POWER-ON RESET CIRCUIT

Roger Green Stewart, Neshanic Station, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,253
Int. Cl.[2] H03K *17/22, 17/20, 21/32*
U.S. Cl. 307—251 **7 Claims**



1. In a switching circuit of the kind comprising a first threshold circuit responsive to an input voltage for producing at its output terminal an output voltage corresponding to that portion of said input voltage of greater than a given magnitude, a second threshold circuit having a threshold higher than the first threshold circuit and responsive also to said input voltage for clamping said output terminal to a point of reference voltage when said input voltage exceeds the threshold of said second threshold circuit and feedback means responsive to signals present on said output terminal for providing a control signal to said first threshold circuit for inactivating said first threshold circuit when said output terminal is clamped to said point of reference voltage, the improvement for inactivating said second threshold circuit subsequent to the inactivation of said first threshold circuit, comprising:

switch means coupled between said output terminal and said point of reference potential and responsive to said control signal for closing when said control signal is present; and

means in said second threshold circuit responsive also to said control signal for disabling said second threshold circuit when said control signal is present.

4,045,689

CIRCUIT FOR SQUARING THE TRANSFER CHARACTERISTICS OF A TTL GATE

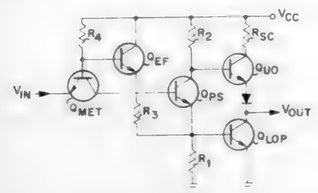
Gary W. Tietz, San Jose, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed June 1, 1976, Ser. No. 691,934
Int. Cl.[2] H03K *19/34*
U.S. Cl. 307—254 **7 Claims**

1. In a transistor switching gate having an input stage responsive to an input voltage, which input stage drives a phase splitter, two outputs of which phase splitter drive the bases of two output transistors joined together to derive an output voltage at the junction therebetween, the improvement for obtaining a relatively square transfer voltage characteristic at said output comprising:

an additional transistor connected as an emitter follower with its input coupled to said input stage and its output coupled to said phase splitter for supplying current to said

phase splitter to thereby bias said phase splitter off until said input voltage is high enough to turn on both said



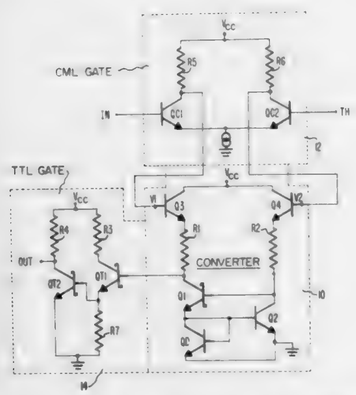
phase plitter and said output stage to thereby result in a substantially square voltage transfer characteristic.

4,045,690

HIGH SPEED DIFFERENTIAL TO TTL CONVERTER

Richard K. W. Tam, Poway, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Feb. 17, 1976, Ser. No. 658,705
Int. Cl.² H03K *5/20*
U.S. Cl. 307—260 **4 Claims**



1. A converter circuit for converting a differential signal of one circuit to a TTL gate compatible signal, said converter circuit comprising:

means for sensing the differential voltage level of said one circuit, said sensing means including first and second transistors each having base, output and common electrodes in which the base of each transistor is coupled to said one circuit for sensing the differential coltage signal developed therein;

means defining a current mirror circuit coupled to said sensing means; and

means coupled between said sensing means and said current mirror means for supplying a compatible signal to said TTL gate to turn said TTL gate on or off depending upon the differential voltage in said one circuit.

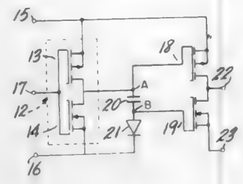
4,045,691

LEVEL SHIFT CIRCUIT

Kazuhiro Asano, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Sept. 21, 1976, Ser. No. 725,266
Claims priority, application Japan, Sept. 22, 1975, 50-114542
Int. Cl.² H03K *5/02, 3/353, 17/60*
U.S. Cl. 307—264 **4 Claims**

1. A level shift circuit comprising an inverter, means for supplying a first voltage to said inverter, means for applying an input pulse to said inverter, a condenser, a directional switching element, and first and second MOS-FETs, means connecting an output of said inverter to one terminal of said condenser and to the gate of said first MOS-FET, means connecting a second terminal of said condenser to the gate of said second MOS-FET and through said directional switching element to one terminal of said first voltage supply means, means connecting the source of said first MOS-FET to the other terminal of said first voltage supply means, means connecting the source of said second MOS-FET to a second voltage supply means, and means connecting the drains of both of said MOS-FETs to an output terminal.

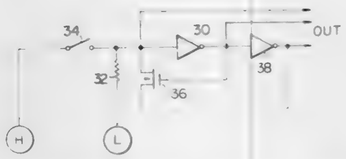


4,045,692

SOLID STATE BINARY LOGIC SIGNAL SOURCE FOR ELECTRONIC TIMEPIECE OR THE LIKE

Shigeru Morokawa, No. 325-43, Narahashi, Higashiyamato, Tokyo, and Fukuo Sekiya, No. 28-206-103, 4-chome, Midoricho, Tokorozawa, both of Japan

Filed Sept. 23, 1975, Ser. No. 615,850
Claims priority, application Japan, Sept. 30, 1974, 49-112592
Int. Cl.² H03K *3/353, 3/286, 17/04*; G04C *3/00*
U.S. Cl. 307—279 **3 Claims**



1. A solid state binary logic signal source for an electronic timepiece comprising:

a first voltage source;

a second voltage source;

an input resistor connected to said first voltage source;

a normally open switch connected to said second voltage source;

a first inverting amplifier having an input terminal connected to

said first and second voltage sources through said input resistor and said normally open switch, respectively, and an output terminal at which a first voltage equal to that of said second voltage source appears when said switch is open and a second voltage equal to that of said first voltage source appears when said switch is closed;

a second inverting amplifier having an input terminal connected to the output terminal of said first inverting amplifier and an output terminal; and

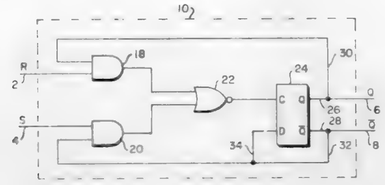
a field effect transistor connected between the input terminal of said first inverting amplifier and the output terminal of said second inverting amplifier and having a gate electrode connected to the output terminal of said first inverting amplifier, said field effect transistor being normally turned on in response to said first voltage appearing at the output terminal of said first inverting amplifier to provide a low impedance path between the input terminal of said first inverting amplifier and the output terminal of said second inverting amplifier, and said field effect transistor being turned off to provide a high impedance path between the input terminal of said first inverting amplifier and the output terminal of said second inverting amplifier in response to said second voltage appearing at the output terminal of said first inverting amplifier when said switch is closed.

4,045,693

NEGATIVE R-S TRIGGERED LATCH

Gary W. Ester, Redwood City, Calif., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed July 8, 1976, Ser. No. 703,404
Int. Cl.² H03K *3/286*
U.S. Cl. 307—291 **6 Claims**



1. A negative, edge-triggered R-S latch which provides predetermined outputs states for all R and S input conditions, said latch comprising:

an R-input;

an S-input;

a Q-output;

a Q-output;

pulse logic means having an output and having only R, S, Q, an Q-inputs; said pulse logic means logically combining said inputs to provide a binary output depending upon the states of the inputs; and

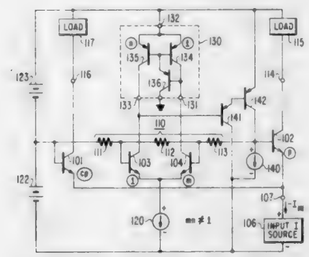
bistable means having as one input the Q-output and having as a second input the output of said pulse logic means, said bistable means being responsive only to the transitions between a first state and a second state of the binary output of said pulse logic means, said transitions changing the state of the Q and Q-outputs.

4,045,694

CURRENT DIVIDER

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 27, 1976, Ser. No. 690,654
Claims priority, application United Kingdom, Sept. 26, 1975, 39620/75
Int. Cl.² H03K *1/00*; G05F *3/08*
U.S. Cl. 307—296 R **4 Claims**



1. A current divider comprising:

means for supplying reference, bias and operating potentials:

first and second and third and fourth transistors, all being of the same basic semiconductor material and operated at substantially the same temperature, each having base and emitter electrodes with a base-emitter junction therebetween and having a collector electrode, said first and said second transistors being of the same conductivity types as each other, said third and said fourth transistors being of the same conductivity type as each other;

means connecting said third and said fourth transistors in an unbalanced differential-input, single-ended output amplifier configuration;

means for applying degenerative feedback to said amplifier configurations including:

a potential divider with an input port connected between the base electrodes of said first and said second transistors and with an output port connected between the base electrodes of said third and fourth transistors, including:

means for applying said bias potential to the end of the input port of said potential divider to which the base electrode of said first transistor is connected, and including:

means connecting the single-ended output of said amplifier configuration to the end of the input port of said potential divider to which the base electrode of said second transistor is connected;

a source of input current connected between said reference potential and an interconnection of the emitter electrodes of said first and said second transistors; and

means for applying operating potentials to the collector electrodes of said first and said second transistors, including

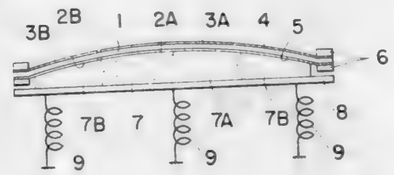
a load for conducting the collector current of one of said first and said second transistors as flows in response to said input current.

4,045,695

PIEZOELECTRIC ELECTRO-ACOUSTIC TRANSDUCER

Tadasi Itagaki; Kiyonori Iwama, and Toshikazu Yoshimi, all of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo and Tokorozawa Electronic Corporation, Tokorozawa, both of, Japan

Filed July 14, 1975, Ser. No. 595,631
Claims priority, application Japan, July 15, 1974, 49-81287; May 30, 1975, 50-64932
Int. Cl.² H01L *41/04*
U.S. Cl. 310—322 **2 Claims**



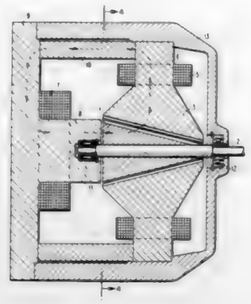
1. A piezoelectric electro-acoustic transducer comprising a flexible film of piezoelectric material; at least one first electrode provided on one side of said flexible film; a plurality of second electrodes provide on the other side of said flexible film and confronting said first electrode through said flexible film, thereby forming a piezoelectric diaphragm having at least two vibration areas thereon; and a support member supporting said piezoelectric diaphragm at the periphery thereof, wherein said support member is locally bent to form a curved portion the curvature of which differs from that of the remaining portion, and said curved and remaining support member portions correspond to respective first and second said vibration areas of said diaphragm, respectively, such that the differently curved support member portions impart different tensions to the vibration area corresponding to said curved portion and another vibration area corresponding to said remaining portion, respectively.

4,045,696

ROTOR STATOR ASSEMBLY FOR A LOW INERTIA STEPPING MOTOR

Heinz Lutz, W.i.S.-Breitenstein; Volker Zimmermann, Schoenaich, and Rainer Zuehlke, Warmbronn, all of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 9, 1975, Ser. No. 594,428
Claims priority, application Germany, July 13, 1975, 2433809
Int. Cl.[2] H02K *37/00*
U.S. Cl. 310—49 R **9 Claims**



1. A rotor stator assembly for increasing the torque-to-inertia ratio of a low inertia stepping motor including:

a motor housing;

a solid substantially conical magnetizable rotatably mounted rotor, the surface of which is toothed in the axial direction;

a stator structure including a plurality of inwardly extending poles having AC coils wound thereon and having axially toothed faces axially coextensive with said rotor and spacedly positioned for maintaining a uniform air gap about said rotor;

ring means magnetically connecting said stator poles and forming AC flux paths with said rotor;

nonrotatable core means, having a DC coil wound thereon, axially disposed from said rotor and forming a uniform air gap between the base of said rotor and a face of said core means for magnetizing said rotor;

said face having substantially the same cross sectional area as the base of said conical rotor;

a shaft mounted in bearing means in said housing and said nonrotatable core means for supporting said rotor;

magnetically conductive members connecting said stator stucture and said nonrotatable core means for forming a continuous DC flux path through the base of said rotor, the lateral area of said rotor, said stator structure, said magnetically conductive members and said nonrotatable core means.

4,045,697

PLASTIC CLOSURE CAP FOR ELECTRIC MOTOR

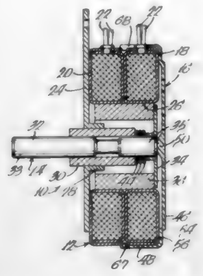
Joseph C. Folik, Hanover Park, Ill., assignor to Molon Motor & Coil Corporation, Rolling Meadows, Ill.

Filed July 29, 1974, Ser. No. 492,543
Int. Cl.[2] H02K *5/00*
U.S. Cl. 310—89 **6 Claims**

1. In an electric motor including a stator housing forming a stator cavity closed at one end, a bearing mounted in the stator housing, and a rotor having a shaft rotatably mounted in the bearing, the improvement comprising, in combination:

a snap-on resilient plastic closure for the other end of the stator cavity, said closure including a central disc portion closing the stator cavity;

a peripheral rim portion extending from said central disc portion for securing said closure to the motor, said peripheral rim portion carrying a radially-inwardly extending projection for engaging a portion of the motor to secure mechanically the closure thereto, said peripheral rim portion and projection being resilient whereby said closure may be slid over a portion of the stator housing and snapped in place;



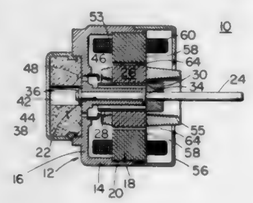
a thrust surface portion carried by said central disc portion and located on said central disc portion along the axis of the motor shaft, said thrust surface portion abutting the end of the motor shaft to locate the shaft axially and to limit end play or travel of the shaft.

4,045,698

SMALL AIR GAP MOTOR

Wayne J. Morrill, 3448 S. Washington Road, Fort Wayne, Ind. 46804

Continuation of Ser. No. 419,619, Nov. 28, 1973, abandoned. This application May 3, 1976, Ser. No. 682,453
Int. Cl.[2] H02K *17/00*
U.S. Cl. 310—166 **7 Claims**



1. In an electric motor having a stator core member with inwardly extending polar projections having inner ends defining a bore, and a rotor member rotatably mounted in said bore and having a peripheral surface defining radial air gaps with said inner ends, the improvement wherein said air gaps respectively have a radial width of from greater than about 0.001 inch to less than about 0.006 inch taken between said peripheral surface and said inner ends, the ratio of air gap width to rotor diameter being from greater than about 0.0009 to less than about 0.005.

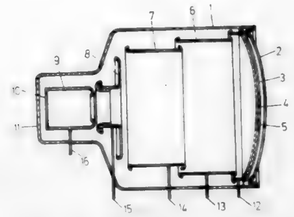
4,045,699

USE OF LIGHT-METAL PANES AS X-RAY TRANSMISSIVE WINDOWS

Stefan Günther, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 475,144, May 31, 1974, abandoned. This application Aug. 26, 1975, Ser. No. 607,874
Claims priority, application Germany, June 19, 1973, 2331210
Int. Cl.[2] H01J *35/00*
U.S. Cl. 313—59 **8 Claims**

1. In ray-penetrating windows for high-vacuum tubes, the use of X-ray penetrable window panes weldable into heavy-metal frames, said panes being each constituted of a layered plate formed of two integrally connected layers formed by rolling under high pressure, one said layer being a light-weight metal excluding beryllium having a density of less than 4.5 g/cm^3, and the other layer being a heavy-weight metal having a density of more than 4.5 g/cm^3, said heavy-weight metal being removed from the center of said light-weight metal layer



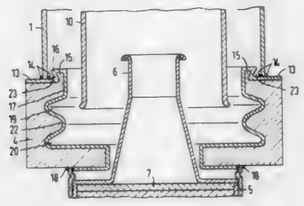
towards the edge region thereof and said light-weight metal layer being removed from the edge of said heavy-weight metal layer so as to form an overlapping two-layered portion, the heavy-weight metal edge providing a vacuum tight connection to said frames, said pane being insertable into said frames and said heavy-weight metal edge portion being weldable thereto.

4,045,700

X-RAY IMAGE INTENSIFIER

Peter Wulff, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 15, 1975, Ser. No. 641,015
Claims priority, application Germany, Dec. 23, 1974, 2461262
Int. Cl.[2] H01J *1/52*
U.S. Cl. 313—242 **4 Claims**



1. In an x-ray image intensifier having a vacuum-tight metal-ceramic tube including an interposed electrically insulating ceramic component **(4)**, an electrically weakly conductive layer **(17)** covering the surface of said ceramic component **(4)** at least on the side facing interiorly of said tube, the tube having first and second concentric metal cylinders **(1, 10)**, the first metal cylinder **(1)** having an end thereof butt-soldered to the ceramic component **(4)** and the second metal cylinder **(10)** being located inside said first metal cylinder **(1)** and inside of the ceramic component **(4)**, said ceramic component **(4)** being joined to said first metal cylinder **(1)** along a juncture line, and a raised bead **(15)** located on the ceramic component **(4)** along the juncture line of said first metal cylinder **(1)** with said ceramic component **(4)** and between said first and second metal cylinders **(1, 10)**.

4,045,701

SHADOW MASK SUPPORTED BY CATHODE RAY TUBE FACEPLATE

Lawrence W. Dougherty, Sleepy Hollow, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

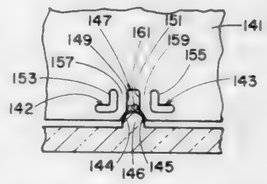
Filed Feb. 2, 1976, Ser. No. 654,130
Int. Cl.[2] H01J *29/02, 29/07, 31/20*
U.S. Cl. 313—408 **27 Claims**

1. In a color cathode ray tube, the combination comprising:

an approximately rectangular faceplate supporting on a concave inner surface thereof in a central region a phosphor screen comprising a pattern of red-emissive, blue-emissive and green-emissive phosphor element triads;

a lightweight, approximately rectangular shadow mask having a central portion which has a curvature related to the curvature of said faceplate inner surface and which contains a pattern of electron-transmissive apertures registerable with said pattern of phosphor triads, said mask having means providing substantial rigidity with respect to axes normal to the sides thereof, but providing for flexure of the mask with respect to its diagonals; and

a mask suspension system for establishing a predetermined spatial position of said mask relative to said inner surface of said faceplate, comprising four suspension means for mechanically coupling said mask to said faceplate, said suspension means being located one at each corner of the mask to permit the mask to flex about said diagonals and conform to the contour of the faceplate, all four of said suspension means having means effecting a predetermined spacing of the mask from said inner surface of said faceplate, three of said four suspension means also effecting an angularly rigid and precise coupling of said mask to said faceplate, said combination being characterized by:



each of said three suspension means comprising an integral modification of said faceplate inner surface which defines two angularly spaced, axially convergent engagement surface areas,

said mask having in each of three corner portions associated with said three suspension means, corner-located means for making angularly retentive, two-point engagement with said two angularly spaced engagement surface areas on one of said modifications of said faceplate, the resultant six-point engagement of said three corner-located means with said three integral modifications of said faceplate effecting said angularly rigid and precise coupling of said mask to said faceplate,

said combination including means for immovably holding on said faceplate said three corner-located means and a corner-located means on a fourth corner portion of the mask when said tube is assembled — including during thermal expansion and contraction of the mask, and

said mask corner portions each having means for providing high radial compliance therein such that upon thermal expansion of said mask, any radial loads imposed on the mask corners are purely radial and of insufficient magnitude to significantly deform the mask.

4,045,702

FLUORESCENT CHARACTER INDICATING TUBE

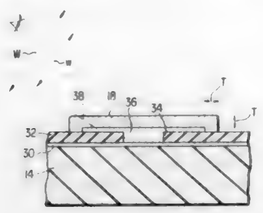
Osamu Yasutome, Taishi, and Mitsuo Takeda, Tokyo, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed June 18, 1976, Ser. No. 697,461
Claims priority, application Japan, June 18, 1975, 50-73876
Int. Cl.[2] H01J *1/72, 63/06*
U.S. Cl. 313—496 **4 Claims**

1. In a fluorescent character-indicating tube comprising an evacuated envelope including at least a partially transparent viewing window, an insulating base plate, a plurality of lead circuits printed on said base plate, a thin insulating layer having a plurality of pin holes printed on said lead circuits, a plurality of co-planar anode elements arranged on said insulating thin

layer in a predetermined form, and at least one elongated filament positioned above said anode elements for generating electrons, improved anode elements, each comprising:

an anode electrode segment printed on said thin insulating layer so as to be located on at least one of said pin holes in said thin insulating layer for electrically connecting said anode electrode segment to said lead circuit,



each said anode electrode segment having exposed top and side surfaces projecting from said thin insulating layer toward said filament; and,

a phosphor layer being deposited over the entire extent of the exposed top and side surfaces of said anode electrode segment.

4,045,703

FLAT ENVELOPE TYPE FLUORESCENT CHARACTER INDICATING TUBE WITH GETTER SHIELD PLATE

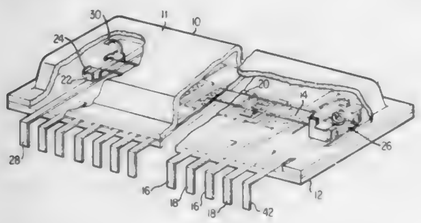
Yasamasu Mori; Kenzo Ashiuchi; Osamu Yasytome, all of Hyogoken, and Tagayasu Sawamura, Himejishi, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 664,395, March 5, 1976, abandoned. This application Dec. 13, 1976, Ser. No. 750,153

Claims priority, application Japan, Mar. 6, 1975, 50-26489

Int. Cl.[2] H01J *19/12, 19/70, 63/02*

U.S. Cl. 313—497 **7 Claims**



1. A flat envelope type fluorescent character indicating tube comprising:

a base plate;

an envelope cover having a transparent conductive film at least partially on its inner surface, said envelope cover being sealed with said base plate for constructing an evacuated envelope;

a plurality of digit indicating elements being arranged lengthwise on said base plate, each of said elements having a plurality of anode segments shaped to indicate predetermined indicia and a control grid for selecting the indicating digit location;

a getter source container;

a getter support structure located adjacent one end portion of said base plate and positioned thereon for supporting said getter source container and having a shield plate, said shield plate extending toward said inner surface of said envelope cover to minimize distribution of getter film toward the location of said digit element; and

at least one elongate filament being extended above said digit indicating elements, one end of said filament being secured to said getter support structure at a location beyond said shield plate.

4,045,704

MULTI-DIGIT FLUORESCENT DISPLAY TUBE WITH DIFFERENTLY SPACED PLANAR CONTROL GRID SECTIONS

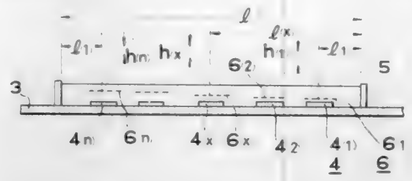
Takao Kishino, and Yukihiko Utamura, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K. K., Japan

Filed June 10, 1976, Ser. No. 694,666

Claims priority, application Japan, June 13, 1975, 50-79388; June 13, 1975, 50-79389

Int. Cl.[2] H01J *19/38, 19/42, 63/06*

U.S. Cl. 313—497 **9 Claims**



1. A multi-digit fluorescent display tube comprising:

a substrate;

a plurality of multi-digit indicating patterns arranged in a row in spaced side-by-side relationship along the longitudinal width of said substrates, each of said indicating patterns comprising a plurality of segmented anodes on which phosphor layers are deposited;

at least one electron emitting filament stretched along the longitudinal direction of said indicating patterns so as to be in parallel and opposite to each of said indicating patterns;

a control grid comprised of a plurality of planar sections disposed between said filament and said indicating patterns, said planar sections of said control grid being positioned at different distances with respect to said filament; whereby the perveance of each of said indicating patterns is adjusted so as to illuminate each of said indicating patterns in uniform brightness when said fluorescent display tube is energized by heating said filament with a direct current power source;

a light transparent evacuated sealed envelope in which the anodes, the filament and the control grid are disposed and through which the display may be viewed externally when the display tube is in operation.

4,045,705

ELECTRON BOMBARDED SEMICONDUCTOR DEVICE

David H. Smith, San Jose, and Richard I. Knight, Los Altos, both of Calif., assignors to Watkins-Johnson Company, Palo Alto, Calif.

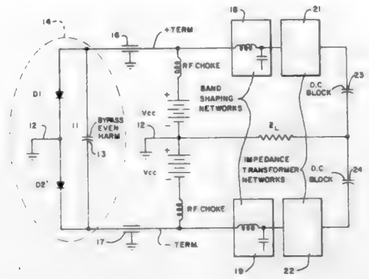
Filed June 17, 1976, Ser. No. 697,224

Int. Cl.[2] H01J *31/04*

U.S. Cl. 315—3 **4 Claims**

1. An electron bombarded semiconductor device having an evacuated envelope, an electron gun positioned at one end of said envelope to project an electron beam along said envelope in a predetermined path, and means responsive to an input signal for deflecting said beam from said path, the invention comprising: a target within said envelope comprising a pair of spaced semiconductor diode devices each having first and second regions of opposite conductivity types forming a p-n junction with a region adapted to receive said beam, said beam impinging between said devices when it is in said predetermined path and impinging a region of one or the other of said devices when deflected responsive to said input signal, said target including a common ground and means for connecting one region of each of said devices, but of opposite conductivity

type, to said common ground; a load having one terminal connected to said common ground and the other ac coupled to the other regions of said semiconductor diode devices and



means for applying a unidirectional voltage between said common ground and said other regions to reverse bias said diode devices.

4,045,706

ARRANGEMENT HAVING A TRAVELING-WAVE TUBE AND A CURRENT SUPPLY UNIT

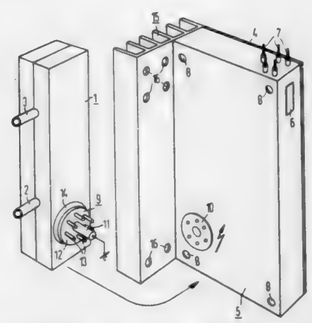
Erich Daffner, Ottobrunn, and Herbert Sarnezki, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 13, 1976, Ser. No. 686,138

Claims priority, application Germany, May 28, 1975, 2523689

Int. Cl.[2] H01J *25/34*

U.S. Cl. 315—3.5 **10 Claims**



1. An arrangement for modular directional radio systems comprising a traveling-wave tube mounted in a substantially parallelepiped tube housing with four longitudinal sides and two end sides having an HF plug outlet communicating with said tube and mounted in one of the sides of said housing, and a power unit mounted in a separate substantially parallelepiped power supply housing having a reciprocal plug socket mounted in said power supply housing communicating with said traveling-wave tube by means of said plug outlet, wherein all electrical connecting supply lines in said traveling-wave tube are connected to said plug outlet mounted in said tube housing and said plug outlet is enclosed by a sleeve means comprising an electrically conductive compressible material; all electrical connecting supply lines in said power supply unit directed to said traveling-wave tube are connected to said reciprocal plug socket; and, said sleeve means forming an electrically conductive high frequency seal around said outlet when the tube and power supply housings are interfaced, said sleeve means being compressed between said housings.

4,045,707

SYSTEM FOR THE POWER CONTROL OF HIGH VOLTAGE ELECTRON BEAM GENERATORS

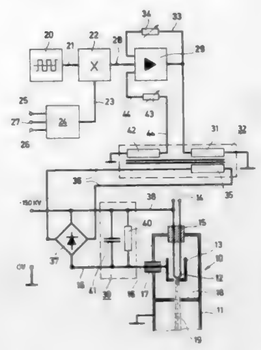
Thorn Gernot, Hanau am Main, and Thomas Friedric-Wilhelm, Niedermittlau, both of Germany, assignors to Leybold-Heraeus GmbH & Co. KG, Cologne, Germany

Filed Mar. 29, 1976, Ser. No. 671,631

Claims priority, application Germany, Apr. 4, 1975, 2514805

Int. Cl.[2] H05B *7/02;* **H01J** *37/30;* **B23K** *15/00*

U.S. Cl. 315—106 **2 Claims**



1. System for the power control of high voltage electron beam generators comprising a directly heated cathode and a control electrode associated with the cathode, said system having high voltage isolation transformer means with primary and secondary winding for supplying the control electrode with a control voltage, means preceding the isolation transformer means on the primary side for the generation of square wave pulses symmetrical with the null line, means responsive to the comparison of the actual beam current and a reference value for amplitude modulating the square wave pulses, said isolation transformer means being provided with a tertiary winding on the primary side, said primary winding receiving input from the output of amplifier means having one input connected with the output voltage of the tertiary winding and another input receptive of the modulated square wave pulses and rectifier bridge means connected across the secondary winding.

4,045,708

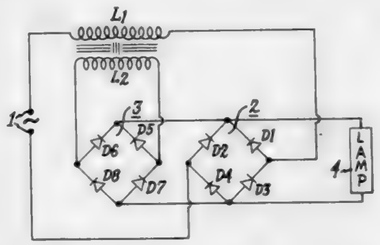
DISCHARGE LAMP BALLAST CIRCUIT

Wayne R. Neal, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,531

Int. Cl.[2] H05B *41/16;* **H02M** *5/06, 5/20*

U.S. Cl. 315—171 **11 Claims**



1. Electrical operating circuit comprising, in combination, a source of alternating current, current limiting reactance means comprising a first induction coil connected to said source of alternating current for applying alternating current to said first induction coil, an auxiliary induction coil inductively coupled

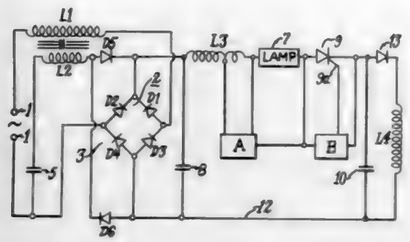
to said first induction coil, first full wave rectifier means connected to the output of said first induction coil, said first induction coil being connected in series between said source of alternating current and said first rectifier means, second full wave rectifier means connected to the output of said auxiliary induction coil, and load means connected to the combined outputs of said first and second rectifier means.

4,045,709

DISCHARGE LAMP OPERATING CIRCUIT

Don Morais, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed June 2, 1976, Ser. No. 692,078
Int. Cl.[2] H05B *41/30*
U.S. Cl. 315—205 **11 Claims**



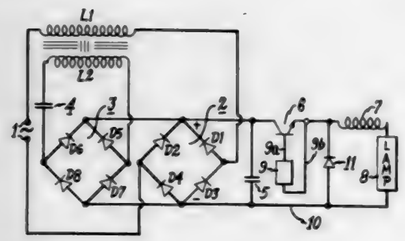
1. A lamp operating circuit comprising, in combination, DC supply means comprising input terminals for connection to an AC current source, current limiting reactance means comprising a first induction coil connected to said input terminals, an auxiliary induction coil inductively coupled to said first induction coil, first rectifier means connected to the output of said first induction coil, and second rectifier means connected to the output of said auxiliary induction coil, and a DC pulsing circuit connected to said first and second rectifier means and comprising a first inductor, unidirectional controlled switch means, and a capacitor connected in series with each other across said DC supply means, means for serially connecting a gaseous discharge lamp in said DC pulsing circuit, a second inductor of higher inductance than said first inductor connected across said capacitor and forming a discharge loop therewith, and control means connected to said unidirectional controlled switch means for intermittently operating the same at predetermined intervals, whereby DC pulses are applied to the gaseous discharge lamp for operation thereof and operation of the lamp during the starting interval is stabilized.

4,045,710

DISCHARGE LAMP OPERATING CIRCUIT

Wayne R. Neal, Hendersonville, N.C., assignor to General Electric Company, New York, N.Y.

Filed July 26, 1976, Ser. No. 708,520
Int. Cl.[2] H05B *41/16, 41/36*
U.S. Cl. 315—205 **7 Claims**



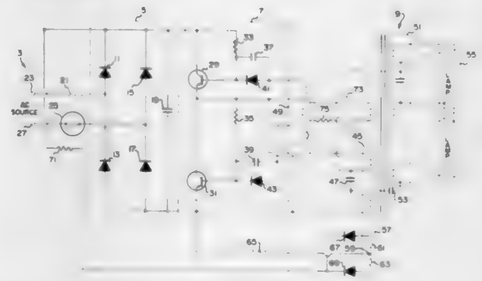
1. A lamp operating circuit comprising, in combination, a source of alternating current, current limiting reactance means comprising a first induction coil connected to said alternating current source, and auxiliary induction coil inductively coupled to said first induction coil, first rectifier means connected to the output of said first induction coil, said first induction coil being connected in series between said alternating current source and said first rectifier means, second rectifier means connected to the output of said auxiliary induction coil, and a DC pulsing circuit connected to said first and second rectifier means and comprising unidirectional controlled switch means and an inductor connected in series to said first and second rectifier means, means for serially connecting a gaseous discharge lamp in said DC pulsing circuit, diode means connected across the series connected inductor and lamp connecting means, and control means connected to said unidirectional controlled switch means for intermittently operating the same at predetermined intervals, whereby DC pulses are applied to the gaseous discharge lamp for operation thereof.

4,045,711

TUNED OSCILLATOR BALLAST CIRCUIT

Ira Jay Pitel, Williamsport, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 19, 1976, Ser. No. 668,485
Int. Cl.[2] H05B *37/02, 39/04, 41/36*
U.S. Cl. 315—209 R **13 Claims**



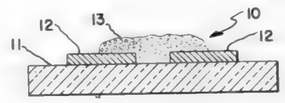
1. A tuned oscillator ballast circuit comprising:
a pulsed DC potential source;
oscillator means coupled to said pulsed DC potential source;
first inductive means including a first winding directly coupled to said oscillator means and in series connection with a charge storage means to form a series resonant circuit shunting said oscillator means;
second inductive means including a second winding directly connected to said oscillator means to provide drive signals therefor;
third inductive means including a third winding in shunt connection across said charge storage means of said series resonant circuit and coupled to lamp circuitry to form a load circuit;
fourth inductive means including a fourth winding inductively coupled to said first inductive means and directly connected by a pair of diodes to said pulsed DC potential source to effect clamping thereof at a given potential level whereby said given potential level is maintained despite open circuiting of said load circuit and increased current flow through said charge storage means; and
power factor correcting circuit means in the form of a capacitor shunting and an inductor coupling said pulsed DC potential source to an AC potential source.

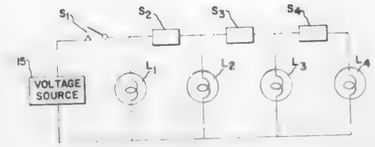
4,045,712

VOLTAGE RESPONSIVE SWITCHES AND METHODS OF MAKING

Arthur N. DeTommasi, Newtonville, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 554,724, March 3, 1975, Pat. No. 3,976,811.
This application Mar. 15, 1976, Ser. No. 666,606
Int. Cl.[2] H01C *7/10;* **F21K** *5/02*
U.S. Cl. 315—323 **6 Claims**





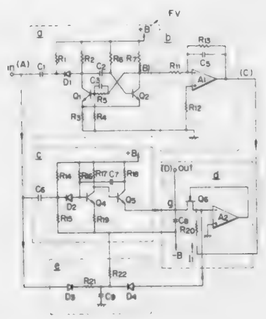
1. An irreversible voltage sensitive switch characterized by a first high resistance state of greater than approximately a megohm and a second low resistance state of less than approximately a hundred ohms, said switch comprising:
a pair of spaced electrodes on a support member; and
a mixture of a substantially pure grade copper powder having an oxidized outer surface and an organic binder overlying a portion of said spaced electrodes, the space therebetween and said support member, said mixture including approximately one part binder to two to five parts oxidized copper powder.

4,045,713

AUTOMATIC SWEEP CIRCUIT

Tadaaki Goto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,329
Claims priority, application Japan, Jan. 20, 1975, 50-8463
Int. Cl.[2] H01J *29/70, 29/72*
U.S. Cl. 315—391 **2 Claims**



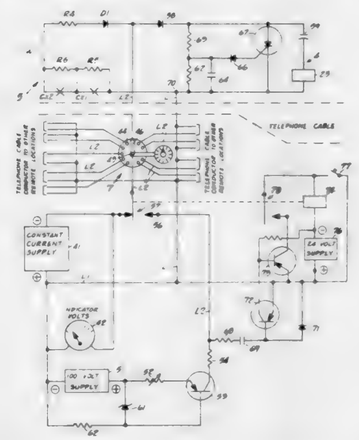
1. An automatic sweep circuit comprising:
frequency voltage converter circuit means connected to a source to receive therefrom an input signal, to generate input pulses, and to convert said pulses to a d.c. voltage proportional to the frequency of said input signal;
saw tooth wave generator means connected to said source for generating saw tooth waves when triggered by said input signal; and
variable resistance circuit means, connected to said frequency voltage converter means and to said saw tooth wave generator means, for controlling said saw tooth wave generator means by controlling the period of said saw tooth waves such that said saw tooth waves automatically follow said frequency of said input signal, said variable resistance circuit means comprising an operational amplifier having an input connected to said frequency voltage converter circuit means to receive therefrom said d.c. voltage and an output, and a field effect transistor serially connected between the output of said saw tooth wave generator means and said input of said operational amplifier, said field effect transistor having a gate connected to said output of said operational amplifier, the gate voltage of said field effect transistor thereby being controlled by said output of said operational amplifier.

4,045,714

REMOTE SWITCH CONTROL AND STATUS INDICATOR SYSTEM

Donald A. MacLeod, 6815 Ridgewood Drive, Oakland, Calif. 94611

Continuation of Ser. No. 493,343, July 31, 1974, abandoned, which is a continuation of Ser. No. 294,822, Oct. 7, 1972, abandoned. This application Apr. 8, 1975, Ser. No. 584,569
Int. Cl.[2] H01H *47/32*
U.S. Cl. 361—156 **9 Claims**



1. In a remote switch control and status indicator system for conductor lines for power distribution circuits,
a plurality of detector circuits,
a plurality of disconnect circuits,
an indicator circuit,
a power supply circuit for the disconnect circuits, selector means to connect the indicator circuit to a selected detector circuit,
means to connect at will said power supply circuit to a disconnect circuit selected by said selector means,
a fault detector switch in each detector circuit, means actuated by overcurrent in said conductor circuit to operate said fault detect switch to indicate a fault,
a disconnect switch in each disconnect circuit for breaking the circuit of said conductor lines, said disconnect switch normally closing said circuit of each conductor lines,
disconnect switch operating means related to said disconnect circuit and actuated by said power supply to operate each disconnect switch for alternately breaking and closing the circuit of said conductor lines whenever said power supply is connected to said disconnect circuit,
a status indicator switch in each detector circuit being responsive to the status of said disconnect switch,

a fault detector switch and a disconnect switch being provided at each of spaced stations along said conductor lines whereby through said selector means the fault in said conductor lines can be selectively indicated and whereby the circuit of said conductor lines can be opened or closed selectively by connecting said power circuit to the selected disconnect switch operating means.

said selector means being remote from said stations,

means to connect said circuits to said selector means for selective operation.

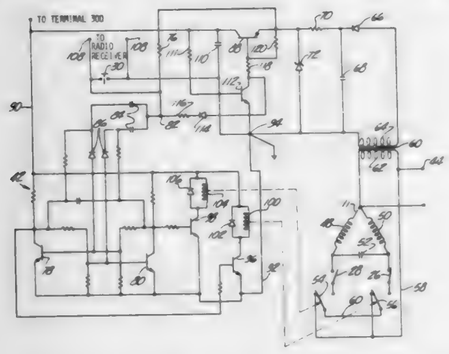
said fault detector switch and said status indicator switch being connected in said detector circuit and through said selector means to said indicator circuit so as to indicate the fault and the status of said switches in the selected detector circuit.

4,045,715

OPERATOR MOTOR CONTROL

Kenneth F. Umpleby, Ann Arbor, and Maurice R. Brackney, Warren, both of Mich., assignors to Multi-Elmac Company, Novi, Mich.

Filed June 16, 1975, Ser. No. 587,399
Int. Cl.[2] H02H *7/85*
U.S. Cl. 318—16 **14 Claims**



1. A selectively operable reversible power drive for closures which are movable between first and second limits of travel comprising; a reversible motive power source, first and second switch means for establishing first and second excitation circuits to said motive power source for causing operation thereof in respectively opposite directions, an electronic bistable circuit device having first and second output stages and responsive to successive applications of an input signal to alternately energize said stages, means operatively interconnecting said first and second stages with said first and second switch means, respectively, thereby to complementally control the conditions of said first and second switch means according to the energization of said stages, a regulated DC voltage source interconnected with said bistable electronic device, and selectively actuable signal generating means connected to the bistable circuit device for applying an input signal thereto with each actuation thereof.

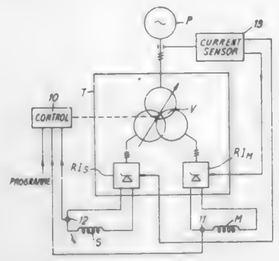
4,045,716

MAGNETIC FIELD SYSTEMS EMPLOYING A SUPERCONDUCTING D.C. FIELD COIL

Trevor Carlisle Bartram, Fossway, Newcastle upon Tyne NE6 2YD, and Paul Alexander Hazell, Ministry of Defence (Navy), D.G. Ships, Foxhill, Bath, Somerset, both of England

Continuation-in-part of Ser. No. 398,359, Sept. 18, 1973, abandoned. This application May 14, 1975, Ser. No. 577,506
Int. Cl.[2] H02P *7/34;* **H02J** *15/00*
U.S. Cl. 318—154 **12 Claims**

1. Equipment for transferring energy to or from a direct-current superconducting field coil to change the magnetic field produced by the coil, said equipment comprising a storage coil which is a direct-current superconducting coil generating a magnetic field when energized, energy transfer means interconnecting said field coil and said storage coil, said energy transfer means being electrically controllable to initiate energy



transfer between said field coil and said storage coil in either direction and to control the rate of such energy transfer, and electrical control means connected to said transfer means for the electrical control thereof in accordance with a predetermined program whereby to effect a desired transfer of energy between said coils.

4,045,717

BATTERY CHARGER

William H. Fallon, Parma, and William R. Schober, Avon Lake, both of Ohio, assignors to General Battery Corporation, Reading, Pa.

Continuation of Ser. No. 559,159, March 17, 1975, abandoned. This application Apr. 13, 1976, Ser. No. 676,475
Int. Cl.[2] H02J *7/02;* **G05F** *1/12*
U.S. Cl. 320—2 **2 Claims**



1. A battery charging circuit for charging a battery having an effective load capacitance, said circuit having a charging characteristic within predetermined limits, said characteristic being a functional dependence of charging voltage on amperes per predetermined unit of ampere hours, and said characteristic being substantially independent of the size of said battery, which charging circuit further comprises:

a. a pair of transformers connected in Scott-T configuration;

b. an input connecting means for connecting said transformer to a three phase line;

c. an output connecting means for connection to a first terminal of said battery comprising a separate secondary output winding and rectifier circuit, for each of said transformers;

d. a ferroresonant output circuit means associated with each of said transformers for normally maintaining said transformers in saturation, and for cooperating with said output connecting means to provide said charging characteristic,

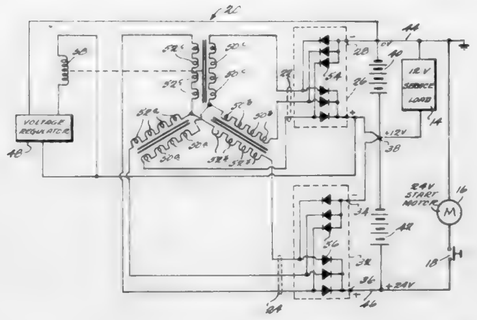
said means comprising a further transformer secondary winding with only a capacitance connected thereacross, said capacitance predetermined in combination with said effective load capacitance to maintain said charging characteristic within said predetermined limits.

4,045,718

MULTIPLE WINDING MULTIPLE VOLTAGE ALTERNATOR ELECTRICAL SUPPLY SYSTEM

Alden J. Gray, Ashfield, Mass., assignor to Maremont Corporation, Saco, Maine

Filed Apr. 2, 1975, Ser. No. 564,638
Int. Cl.[2] H02J *7/14;* **H02M** *7/00*
U.S. Cl. 320—17 **14 Claims**



4. A multiple voltage electrical supply system for use with a plurality of load circuits having differing d.c. input voltage requirements, said system comprising:

an alternator having a plurality of sets of generating windings producing a corresponding plurality of a.c. output voltages,

at least one of said sets of generating windings being formed of differently sized conductors than another of said sets of generating windings,

a plurality of rectifiers, each continuously connected with a respective one of said sets of generating windings, for rectifying said plurality of a.c. output voltages into a corresponding plurality of d.c. voltages,

a plurality of batteries continuously connected in series with one another, each of said batteries having two terminals,

a plurality of load circuits continuously connected across different pairs of said terminals of said series connected batteries so as to receive different d.c. voltages from said batteries,

conductor means continuously connecting each of said plurality of d.c. voltages from said plurality of rectifiers across two respectively associated terminals of an individual respectively associated one of said batteries,

said alternator having a magnetic flux conducting ferromagnetic core carrying said sets of generating windings and also having a field coil, the degree of excitation of which controls the total amount of magnetic flux passing through said core and the amplitude of the a.c. voltages induced in the windings of said sets of windings,

said windings being mounted on said core in such a manner that a substantially constant ratio of magnetic flux magnetically links each of the sets of windings when compared to one another, and

a single voltage regulator means responsive to the electrical output from a corresponding single one of said sets of generating windings for controlling the excitation of said field coil and maintaining the electrical output voltages from all of said sets of generating windings at substantially constant values without changing any electrical interconnections between said winding, rectifiers, batteries or load circuits

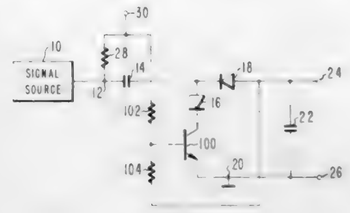
the relative construction, size and disposition of said sets of generating windings being effective to automatically maintain substantially constant output voltages from all sets of generating windings in response to regulation from said single voltage regulator means while, at the same time, automatically varying the charging current produced from said sets of generating windings as required by the respectively corresponding connected batteries.

4,045,719

REGULATED VOLTAGE SOURCE

William Ellsworth Salzer, Margate, Fla., assignor to RCA Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,985
Int. Cl.[2] H02M *7/217;* **G05F** *1/56*
U.S. Cl. 363—89 **12 Claims**



12. In an a-c to d-c conversion circuit of the type including first and second charge storage means, each having respective first and second terminals;

means for applying a a-c voltage, as referred to a reference potential, to the first terminal of said first charge storage means,

unidirectionally conductive means for selectively completing a connection between the second terminal of said first charge storage means and said reference potential such that said first charge storage means is supplied charge by excursions of said a-c signal in a sense to be conducted by said unidirectionally conduction means;

and means for transferring charge from said first to said second charge storage means during intervals when said first charge storage means is not being supplied charge, thereby developing an output voltage across said second charge storage means, the improvement wherein:

said unidirectionally conductive means include a voltage controlled switch responsive to control signal applied thereto, and

wherein said voltage source further includes feedback means, responsive to said output voltage for generating said control signal.

4,045,720

AUTOMATIC RESETTING TEMPERATURE CONTROLLED BATTERY CHANGING SYSTEM

Richard Bernard Alexandres, P.O. Box 1645, Mason City, Iowa 50401

Filed May 4, 1976, Ser. No. 683,162
Int. Cl.[2] H02J *7/04*
U.S. Cl. 320—35 **8 Claims**

1. A battery charging circuit comprising:

first and second terminals for connecting the charging circuit to a source of direct charging current and to one electrode of like polarity of a battery to be charged; and,

first and second current paths connected in parallel between said first and second terminals for selectively conducting current from said source of charging current to said one electrode of the battery,

said first current path including first and second switching means each having a normally closed position and an open position, said first switching means being actuated from the closed to the open position thereof in response to a

temperature of the battery being charged exceeding a predetermined value,

said second current path including means for actuating said second switching means from the closed to the open position thereof in response to current flow in said second current path exceeding a predetermined current value,



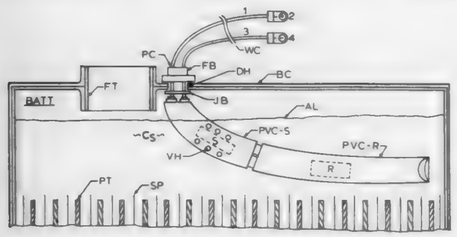
said second current path having a resistance to current flow such that, with said first and second switching means in the normally closed positions thereof, current flow through said second current path is less than said predetermined current value, said predetermined current value being exceeded in response to the opening of either of said switching means.

4,045,721

ELECTRO-CHEMICAL CONCENTRATION TRANSDUCER AND ITS USE TO MEASURE AND CONTROL ACID STRENGTH AND STORAGE BATTERY CHARGE

William H. Swain, 4662 Gleason Ave., Sarasota County, Fla. 33581

Filed Dec. 30, 1974, Ser. No. 537,704
Int. Cl.[2] H02J *7/00;* **G01N** *27/26*
U.S. Cl. 320—43 **15 Claims**



1. A transducer for sensing electrolyte concentration and producing an electric signal potential output proportional to a difference in concentration between a first electrolyte having a first concentration and a second similar electrolyte having a second concentration, comprising in combination;

a first electrode coupled to a first terminal and having a surface area in contact with said first electrolyte contained in a first container, and

a second electrode coupled to a second terminal and having a surface area in contact with said second electrolyte contained in a second container, and

an open joining container having a first end opening into said first container and a second end opening into said second container, and

adapted by construction means to be filled with an electrolyte to form a joining electrolyte making electrolytic connection with said first electrolyte at said first end and also making electrolytic connection with said second electrolyte at said second end to thereby establish a

direct electrolytic connection between said first and said second electrolytes so as to permit a measuring current considerably in excess of that conventionally associated with glass membrane half cell usage to flow through said joining electrolyte to said first and second electrolytes and said first and second electrodes to said first and second terminals,

said open joining container also constructed in elongated form wherein the ratio of the length to the square root of the effective cross-section area is greater than 10 so as to generally prevent mixing by unintentional passage therethrough of said first and said second electrolytes so that neither said first nor said second concentration is altered by more than an allowable amount during the useful life of said transducer.

9. A transducer for sensing electrolyte concentration and producing an electric signal potential output proportional to a difference in concentration between a first electrolyte having a first concentration and which may have large electric current flowing therein and a second similar electrolyte having a second concentration, comprising in combination;

a first electrode coupled to a first terminal and having a surface area in contact with said first electrolyte in a first container, and

a second electrode coupled to a second terminal and having a surface area in contact with said second electrolyte in a second container, and

a joining container having a first end opening into said first container and a second end opening into said second container, and

construction means whereby said first electrode is positioned in close proximity with and directly opposite said first end of said joining container so as to

thereby substantially reduce an extraneous potential across said terminals in the event of said large electric current in said first electrolyte,

said joining container adapted by construction means to be filled with an electrolyte to form a joining electrolyte making contact with and electrolytically connecting said first and second electrolytes so as to permit a

measuring current to flow through said joining electrolyte and said first and second electrolytes to said first and second electrodes and said first and second terminals under the stimulus of said potential,

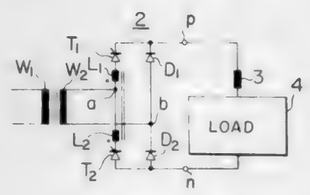
said joining container also having construction means to generally prevent mixing by unintentional passage therethrough of said first and said second electrolytes so that thereby neither said first nor said second concentration is altered by more than an allowable amount during the useful life of said transducer.

4,045,722

POWER CONVERTER SYSTEM

Kyozo Tachibana, Naka, Japan, assignor to Hitachi, Ltd., Japan

Filed Apr. 19, 1976, Ser. No. 678,175
Claims priority, application Japan, Apr. 28, 1975, 50-51864
Int. Cl.[2] H02M *7/155*
U.S. Cl. 363—126 **18 Claims**



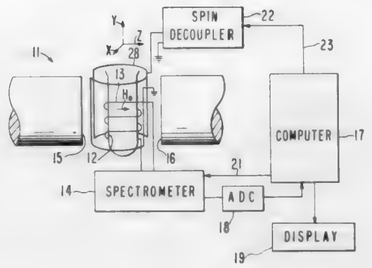
1. A power converter system for converting an alternating current into a desired power, comprising a transformer, a rectifier means including a combination of a plurality of rectifier elements, said rectifier means being connected through said transformer to said AC power supply, said AC power supply being utilized at the same time as a commutation power source for said rectifier elements, and a plurality of retardation coils connected in series with said rectifier elements at the AC power supply side of said rectifier means, said retardation coils being magnetically coupled with each other.

4,045,723

TWO DIMENSIONAL GYROMAGNETIC RESONANCE SPECTROSCOPY

Richard R. Ernst, Winterthur, Switzerland, assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 15, 1975, Ser. No. 640,364
Int. Cl.[2] G01R *33/08*
U.S. Cl. 324—.5 A **13 Claims**



1. In a method of gyromagnetic resonance two-dimensional spectroscopy, the steps of:

inducing a plurality of transient gyromagnetic resonances of a first group of gyromagnetic resonators coupled to a second group of gyromagnetic resonators within a sample of matter to be analyzed;

periodically and during only a portion of said transient gyromagnetic resonances of said first group of gyromagnetic resonators perturbing the interaction of the resonance of said first group of gyromagnetic resonators with the second group of resonators to derive a perturbed period of resonance and a coupled period of resonance during each transient resonance of said first group of resonators;

changing the duration of one of said perturbed and coupled periods of successive ones of said transient resonances of said first group of resonators; and

detecting the induced plurality of said transient gyromagnetic resonances of said first group, as a function of the changing duration of said one of said perturbed and coupled periods of said transient resonances of said first group of resonators to derive gyromagnetic resonance data about said first group of resonators from which to derive simplified gyromagnetic resonance spectral data.

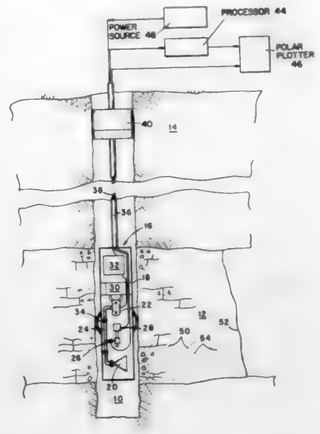
4,045,724

ELECTROMAGNETIC WAVE METHOD FOR MAPPING SUBTERRANEAN EARTH FORMATIONS

Lowell Z. Shuck; George E. Fasching, and Constantine A. Balanis, all of Morgantown, W. Va., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 6, 1976, Ser. No. 674,209
Int. Cl.[2] G01V *3/12, 3/18*
U.S. Cl. 324—6 **2 Claims**

1. A method for mapping anomalies in a subterranean coal bed prior to in situ gasification of the coal bed and for providing the description of the continually changing characteristics and position of a burn front resulting during the in situ gasification of the coal bed, comprising the steps of emplacing a highly directional electromagnetic wave transmitting means and an electromagnetic wave receiving means including a voltage standing wave ratio meter in each of a plurality of vertical directionally oriented bores penetrating the coal bed, transmitting electromagnetic waves at a different selected frequency up to 10,000 MHz over a selected azimuth angle in each of said bores for effecting a reflection of the electromagnetic waves upon encountering an electrical anomaly indicative of at least one of a solid-gas interface indicative of the burn front, a solid-liquid interface, and a solid-solid interface where the



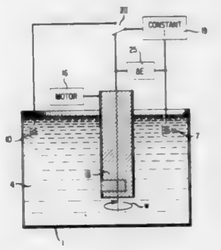
electrical properties of the solids defined in the solid-solid interface differ, and providing a polar plot of the magnitude of the reflected waves and the ratio of the power of the reflected waves to the power of the incident waves at each selected frequency and correlating the dielectric constant of the coal bed and tangent loss at each transmitted frequency with each other for providing the mapping of the anomlies in the coal bed and the description and position of the burn front in the coal bed.

4,045,725

ROTATING ASYMMETRIC ELECTRODE FOR MEASURING CHARACTERISTICS OF ELECTROCHEMICAL CELLS

Barry Miller, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 8, 1976, Ser. No. 665,091
Int. Cl.[2] G01N *27/42*
U.S. Cl. 324—30 B **7 Claims**



1. Apparatus for measuring characteristics of a cell containing an electrolyte and having at least a first electrode comprising:

an asymmetrically moving electrode;

means for passing a constant current through said cell and through said first electrode;

means for moving said asymmetrically moving electrode;

means for measuring the voltage between said first electrode and said asymmetrically moving electrode;

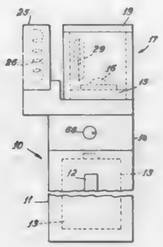
characterized in that said means for moving periodically varies the distance between said first electrode and said asymmetrically moving electrode thereby periodically varying the resistance and voltage between said first electrode and said asymmetrically moving electrode.

4,045,726

TOOL FOR MANUALLY TRIPPING A FAULT INDICATOR FOR HIGH VOLTAGE ELECTRIC POWER CIRCUITS AND RESETTING SAME

Edmund O. Schweitzer, Jr., 1002 Dundee Road, Northbrook, Ill. 60062

Filed July 6, 1976, Ser. No. 702,886
Int. Cl.[2] G01R *31/02, 19/16;* G08B *21/00*
U.S. Cl. 324—51 **5 Claims**



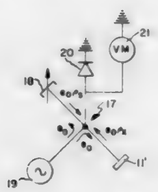
1. A test tool for a fault indicator having a magnetically operable reed switch arranged to be positioned generally parallel to the alternating magnetic field generated around a conductor by flow of alternating fault current therein to operate an indicator to fault indicating position and a circuit responsive to the voltage at which said conductor is energized to reset said indicator to non-fault indicating position including a test point, said test tool comprising a unitary structure including a winding having a longitudinal axis arranged to be placed generally parallel and juxtaposed to the longitudinal axis of said reed switch, a test point contact to engage said test point, means for energizing said winding with alternating current to generate a magnetic field for closing said reed switch to operate said indicator to said fault indicating position, and means for applying a voltage to said test point contact to energize said circuit to reset said indicator.

4,045,727

MICROWAVE PROXIMITY DETECTOR

Se Puan Yu, and Gary H. Glover, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 15, 1976, Ser. No. 667,271
Int. Cl.[2] G01R *27/04*
U.S. Cl. 324—58.5 B **12 Claims**



1. A non-contacting method of detecting the distance from a reference position to an object comprising the steps of

propagating incident microwave frequency electromagnetic waves through a transmission line to a microwave junction mounted at a reference position to essentially produce propagating reflected waves on one side of the junction and evanescent electromagnetic fields on the other side of the junction,

perturbing the evanescent electromagnetic fields with a resultant variation in a selected parameter of the reflected waves dependent on the linear separation between the reference position and an object in proximity to the microwave junction, and

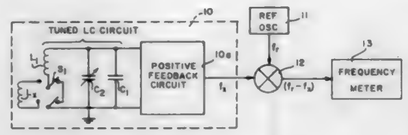
detecting the variation in the selected reflected wave parameter and generating an output indicative of the distance from the reference position to the object.

4,045,728

DIRECT READING INDUCTANCE METER

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Richard B. Kolbly, Barstow, Calif.

Filed Apr. 15, 1976, Ser. No. 677,351
Int. Cl.[2] G01R *27/26*
U.S. Cl. 324—59 **9 Claims**



1. Apparatus for direct measurement of the inductance exhibited by an element which is essentially inductive in a range below 3μH, comprising

means for generating a first alternating signal at a stable reference frequency, f_r,

means for generating a second alternating signal at an initial frequency, f_o, substantially equal to said reference frequency, said second signal generating means including an LC circuit tuned to resonance at said initial frequency f_o to control the frequency of said second signal, said LC circuit having an inductance at least approximately five times greater than said element,

switching means for connecting said element to be measured to said LC circuit to change the resonant frequency thereof to a frequency f_x,

means for mixing said first and second signals to obtain a third signal of a frequency equal to the difference between the frequencies f_r and f_x, and

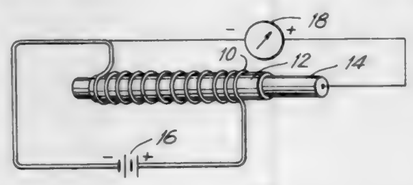
means for measuring the frequency of said third signal and for displaying the value of said element as a linear, function of the frequency of said third signal.

4,045,729

GAS DETECTOR

Jack C. Loh, 16 Beaufort St., White Plains, N.Y. 10607

Filed July 26, 1976, Ser. No. 708,459
Int. Cl.[2] G01N *57/00*
U.S. Cl. 324—71 SN **8 Claims**



1. A gas detector for sensing the presence of a gaseous medium comprising:

a helical coil for connection to a dc power source for generating an electromagnetic field and radiant heat;

a thin-walled tubular sleeve constructed of an active sensing material having current carriers responsive to an electromagnetic field and disposed in the magnetic and heating fields of said helical coil, said helical coil surrounding said thin-walled tubular sleeve and in contact therewith, said active sensing material being capable of generating a current in response to the current carriers in the presence of a magnetic field at a predetermined temperature; and

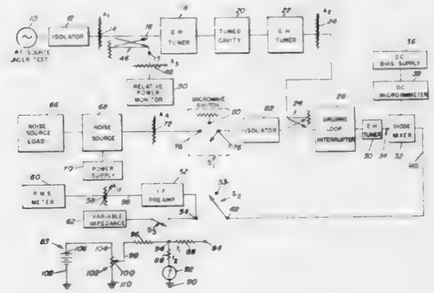
an electrode disposed in said thin-walled sleeve and in surface contact with said sleeve, so when current sensing element is connected between said electrode and one end of said coil, an electromagnetic current will be produced proportional to the concentration of the gas in contact with the outer surface of the sleeve.

4,045,730

INCREMENTAL METHOD AND SYSTEM FOR ABSOLUTE MEASUREMENT OF COHERENT POWER AT MILLIMETER AND SUBMILLIMETER WAVELENGTHS

Abraham Singer, Silver Spring, and Jan M. Minkowski, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 20, 1976, Ser. No. 688,440
Int. Cl.[2] G01R *19/00*
U.S. Cl. 324—76 R **10 Claims**



1. A method for measuring coherent rf power from an rf source having its output connected to a mixer and an i.f. preamplifier, the steps comprising:

measuring the noise factor of a system to which the source is connected;

measuring the noise factor of the i.f. pre-amplifier;

measuring the noise temperature ratio of the mixer;

measuring the i.f. conductance of the output of the mixer;

measuring the changes in dc current from the mixer as a result of changes in rf power from the source; and

calculating the absolute coherent rf power in accordance with

$$P_o = 50\,\frac{(\Delta I)^2\,F_T}{g_b(t + F_{IF} - 1)}$$

where

P_o is the rf power at the plane of the mixer;

ΔI is the change in dc current from the mixer;

F_T is system noise factor;

F_{IF} is the i.f. pre-amplifier noise factor;

g_b is i.f. conductance; and

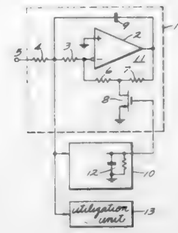
t is the noise temperature ratio of the mixer.

4,045,731

FILTER HAVING AN AUTOMATICALLY CONTROLLED VARIABLE CUT-OFF FREQUENCY

Takashi Tokunou; Shinichi Kouya, and Shigeki Akatsuka, all of Gyoda, Japan, assignors to Takeda Riken Kogyo Kabushikikaisha, Tokyo, Japan

Division of Ser. No. 525,807, Nov. 21, 1974, abandoned. This application Jan. 14, 1976, Ser. No. 649,124
Int. Cl.[2] G01R *23/02*
U.S. Cl. 324—78 F **9 Claims**



1. A measuring device for determining the period of an input signal independent of the frequencies of noise signals which may be superimposed on said input signal, comprising means for supplying the input signal whose period is to be measured to a filter apparatus which has an automatically controlled variable cut-off frequency, said filter apparatus comprising a filter circuit which includes a variable element the electrical parameter value of which may be controlled by application of an electrical control signal thereto, the cut-off frequency of said filter circuit being determined by the parameter value of said variable element and said filter circuit exhibiting a frequency cut-off characteristic having a declining portion; a level detector having its input connected to the output of said filter circuit for detecting a filtered output from said filter circuit the level of which varies with variations in the position of the frequency of the signal supplied to said filter circuit relative to the declining portion of the filter circuit cut-off characteristic due to the superimposition of differing frequency noise signals on the signal whose period is to be measured; means connected between the output of said detector and a control input of said variable element for supplying said detected level output as a control signal to said variable element thereby to control the cut-off frequency of said filter circuit in a manner operative to maintain said filtered output level at a given value; and a utilization circuit connected to the output of said filter circuit for receiving a filtered output of said input signal which has a level corresponding to said given value and from which noise signals having higher or lower frequencies than the frequency of the input signal are eliminated, said utilization circuit including means responsive to said filtered output for determining the period of said input signal.

4,045,732

DEVICE FOR SENSING THE OPERATIVE STATUS OF ELECTRICAL EQUIPMENT

Kenji Yashiro, and Yoshifumi Saeki, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

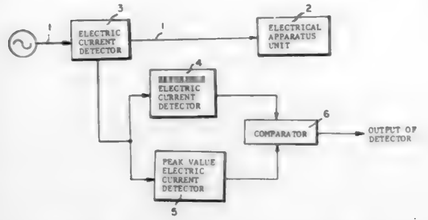
Filed Feb. 4, 1976, Ser. No. 655,157
Claims priority, application Japan, Sept. 2, 1975, 50-106392
Int. Cl.[2] G01R *19/16*
U.S. Cl. 324—133 **8 Claims**

1. A device for sensing the energization condition of an electrical apparatus including an AC-DC converter circuit from at least one power line for the apparatus, comprising:

first amplitude detector means responsive to the current in the power line for generating a mean value signal indicative of the mean value of said current;

second amplitude detector means responsive to the current

in the power line for generating a peak value signal indicative of the peak value of said current, the peak value signal being substantially greater in a first mode when the AC-DC converter is utilized than in a second mode when the converter is not utilized; and



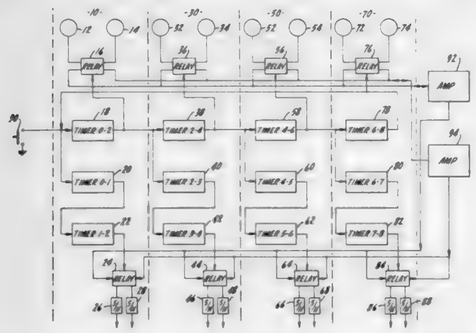
comparator means responsive to the mean value signal and peak value signal for indicating the existence of an energized condition for the electrical apparatus when there is greater than a selected ratio between the peak value and mean value signals.

4,045,733

MULTIPLEX CIRCUIT WITH TIME DELAY FOR STABILIZATION

Jerome J. Dolan, Evergreen Park, and Roy R. Rosenberger, Wheaton, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed July 6, 1976, Ser. No. 702,845
Int. Cl.[2] G01R *15/12*; H04Q *1/20*
U.S. Cl. 324—140 R **3 Claims**



1. A multiplex circuit for use with a plurality of measuring means which require a period of stabilization after activation, said circuit including a plurality of measuring stages, each stage having at least one measuring means, readout means and timing means, said timing means including first, second and third timers, said first and second timers having a common input with the output of said first timer being connected to a measuring means, the output of said second timer being connected to the input of said third timer, with the output of said third timer being connected to a readout means, the elapsed operating time of said first timer being equal to the sum of the operating times for said second and third timers, with said second timer activating said third timer a predetermined interval after turn-on of said first and second timers,

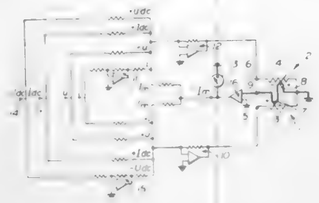
said measuring stages being connected in cascade, with the timing means of one stage being connected to activate the timing means of the successive stage.

4,045,734

DIFFERENTIAL THERMAL WATTMETER

Louis G. Cox, and Norbert L. Kusters, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed May 24, 1976, Ser. No. 689,643
Int. Cl.[2] G01R *21/02*
U.S. Cl. 324—142 **7 Claims**



1. A thermal wattmeter for determining active power corresponding to ac voltage and current components from proportionally representative ac signals u and i comprising:

two thermal converter means, each of said converter means having heater and sensor means for converting an input signal to a dc output signal;

means for connecting the outputs of the first and second converter means in opposition to provide a dc difference signal;

amplifier means coupled to said connecting means for generating a dc feedback signal I_m;

first source means for providing a predetermined adjustable dc reference signal I_{dc};

means for adding dc feedback signal I_m and the adjustable signal I_{dc} to produce a dc output signal I;

second source means for providing a predetermined dc reference signal U_{dc};

first means for coupling the sum of the ac signals u and i and the difference of the dc signals U_{dc} and I to one of the heater means; and

second means for coupling the difference of the ac signals u and i and the sum of the dc signals U_{dc} and I to the second heater means whereby the active power P_{ac} of the ac components is determined as a function of U_{dc}I.

4,045,735

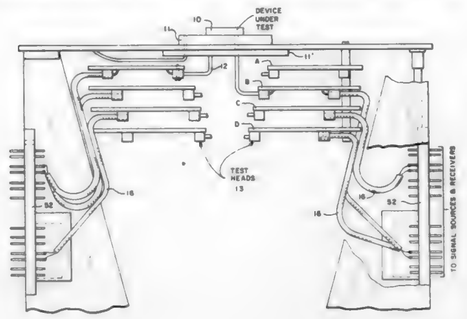
APPARATUS FOR TESTING ELECTRONIC DEVICES HAVING A HIGH DENSITY ARRAY OF PIN LEADS

John L. Worcester, Walnut Creek, and John C. Hubbs, Lafayette, both of Calif., assignors to E-H Research Laboratories, Inc., Oakland, Calif.

Filed Feb. 17, 1976, Ser. No. 658,302
Int. Cl.[2] G01R *31/26, 31/02*
U.S. Cl. 324—158 F **3 Claims**

1. Apparatus for testing electronic devices having a high density array of pin leads comprising: test socket means for receiving said pin leads and having a plurality of output leads each corresponding to one of said pin leads said ouptut leads having an array density corresponding to said pin lead density, each of said output leads having an inner conductor pair insulated from one another and an outer shield; a plurality of first switcing means in close proximity to said test socket means for selectively terminating said output leads in a predetermined characteristic impedance; signal sourcing and receiving means for sending and receiving pulses and d.c. signals; a plurality of leads having an inner conductor pair insulated from each other and an outer shield for connecting to said output leads at the locations of said plurality of first switching means; second

switching means for selectively connecting said signal sourcing and receiving means to said connecting leads and for short-



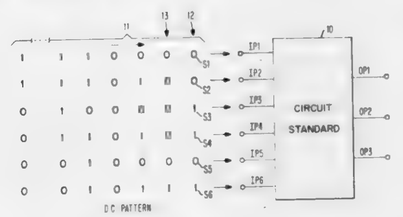
ing said inner conductor pairs to provide said characteristic impedance for said signal sourcing and receiving means.

4,045,736

METHOD FOR COMPOSING ELECTRICAL TEST PATTERNS FOR TESTING AC PARAMETERS IN INTEGRATED CIRCUITS

Robert Gordon Carpenter, and Chester C. Chao, both of Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Sept. 27, 1971, Ser. No. 184,145
Int. Cl.[2] G01R *31/22*
U.S. Cl. 324—158 R **14 Claims**



1. A method for composing electrical test patterns for testing AC parameters in integrated semiconductor circuits comprising:

applying to a plurality of input points in a standard of the circuit to be tested, the first increment of a bilevel DC electrical signal input pattern, the increments of which each comprise a plurality of parallel bilevel signals, each signal being respectively applied to one of said plurality of input points;

sensing, as at least one output point in said circuit standard, the bilevel output signal resulting from said input pattern increment;

changing the level of one of said parallel signals in said increment from its original level to the other of the two levels while maintaining the remaining parallel signals at their original levels;

determining whether said change in said input increment signal produces a corresponding change in one bilevel output signal;

if there is such a change in said output signal, storing, as part of said AC test pattern being composed, an increment comprising said bilevel DC increment in which said signal which produced the change is pulsed and the remaining signals are maintained at their original levels, said AC increment providing a test for the input point to which said pulsed signal is applied;

repeating said procedure by changing the level of different ones of said parallel signals in said input increment while maintaining the remaining signals at their original levels until one of said changes produces a corresponding output signal change and then recording and storing, as part of an AC test pattern, an increment in which the change producing signal is pulsed and the remaining signals are maintained at their original levels;

then applying to said plurality of input points, a second increment of said DC signal input pattern, and repeating said procedure of determining whether changing the level of different ones of the parallel signals in said second increment produces a corresponding output change, and then storing and recording an appropriate AC pattern increment in accordance with said procedure; and,

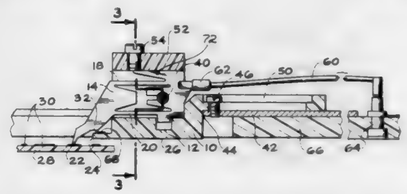
repeating said procedures of changing different ones of parallel signals in a sequence of applied DC input pattern increments until there is recorded and stored a plurality of the AC test pattern increments such that there is at least one AC pattern increment in which a pulsed signal is applied to each of the input points preselected to be AC tested.

4,045,737

INTEGRATED CIRCUIT PROBE

Charles Wheeler Coberly, No. 6 Oak Knoll Terrace, Pasadena, Calif. 91106

Filed Dec. 22, 1975, Ser. No. 643,298
Int. Cl.[2] G01R *1/06, 31/02*
U.S. Cl. 324—158 P **10 Claims**



1. In an apparatus for making pressure electrical connections at a plurality of precisely located points on an exposed circuit lying in substantially a single plane, the improvement comprising:

an insulative substrate having a linear groove extending from one surface a limited extent into the substrate, said groove being parallel to the edge of the substrate,

a plurality of generally-parallel sheet-like contacts of conductive spring material each having a key portion which is received edgewise within the groove and having edge portions extending beyond the edge of the substrate and outwardly thereof beyond an outer substrate surface; and

between and abutting each of said sheet-like contacts, a spacer of predetermined thickness and comprising a thin generally coextensive layer of dielectric insulating material;

said exposed circuit plane being located at the substrate edge such that the contact edge portions are resiliently urged substantially normally against respective portions of the circuit completing connection with collateral circuit apparatus.

4,045,738

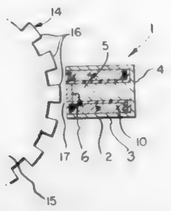
VARIABLE RELUCTANCE SPEED SENSOR OF INTEGRAL CONSTRUCTION UTILIZING A SHIELDED HIGH COERCIVE FORCE RARE EARTH MAGNET POSITIONED DIRECTLY ADJACENT THE SENSING ROTATING ELEMENT

Colby E. Buzzell, Wilmington, Mass., assignor to General Electric Company, Wilmington, Mass.

Filed Mar. 8, 1976, Ser. No. 665,047
Int. Cl.[2] G01P *3/48*
U.S. Cl. 324—174 **9 Claims**

1. A variable reluctance speed sensing device for measuring the speed of a moving element including, in combination:

a. a thin, disc shaped, rare earth permanent magnet of thickness L and diameter D for producing magnetic flux for passage through a moving member,
b. an integral housing formed of a ferromagnetic material to provide a return path for the magnetic flux, comprising:
1. wall means to provide a return flux path for the flux from said magnet after passage through a moving element,
2. a base member connecting said wall means,
3. a core member extending from said base and positioned



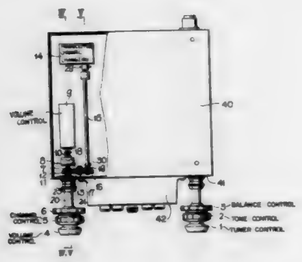
re-entrantly within said wall means for supporting said magnet at the free end thereof whereby said magnet may be positioned directly adjacent to a moving member to establish a flux path from said magnet across an air gap to a moving member and back through said housing; said re-entrant core member being positioned within said walls to shield said core and said magnet from external magnetic effects,
4. a sensing coil supported on said core member for producing a signal due to flux variations in said housing and said core due to a moving member.

4,045,739

COMBINED TRANSCEIVER AND RADIO UNIT

Kazuo Kawasaki, Kitakata, Japan, assignor to Nissan Denshi Kabushikigaisha, Omiya, Japan

Filed June 10, 1976, Ser. No. 694,602
Int. Cl.[2] F16H *35/18*
U.S. Cl. 325—15 **3 Claims**



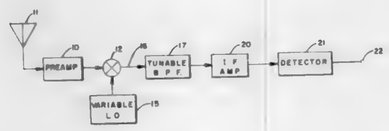
1. A combined transceiver and radio unit, incorporating a transceiver, having a channel changing mechanism, a radio, having a tuner, a tone control and a balance control, and a volume control, the transceiver, radio and volume control being enclosed in a common housing, having a front wall, for conjoint mounting, said unit comprising, in combination, said front wall being elongated and formed with an opening therethrough adjacent one end thereof and a slot therethrough adjacent the opposite end thereof; respective coaxial tuner, tone control and balance control shafts extending through said opening for connection to the tuner, the tone control and the balance control, respectively; respective operating knobs secured to the outer ends of said coaxial shafts, whereby the radio controls are conveniently grouped adjacent said one end of said front wall; a volume control shaft having an inner end connected to said volume control and having an outer end; a channel control shaft having an inner end connected to said channel changing mechanism and having an outer end; a tubular outer shaft extending through said slot and having inner and outer ends; gear means connecting the inner end of said tubular shaft to the outer end of said channel control shaft; an inner shaft extending coaxially through said tubular outer shaft and having inner and outer ends; coupling means connecting the inner end of said inner shaft to the outer end of said volume control shaft; and respective operating knobs secured to the outer ends of said coaxial tubular and inner shafts, whereby the transceiver channel control and the volume control are conveniently grouped adjacent said opposite end of said front wall.

4,045,740

METHOD FOR OPTIMIZING THE BANDWIDTH OF A RADIO RECEIVER

Kenneth L. Baker, Littleton, Colo., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1975, Ser. No. 625,807
Int. Cl.[2] H04B *1/16*
U.S. Cl. 325—427 **3 Claims**



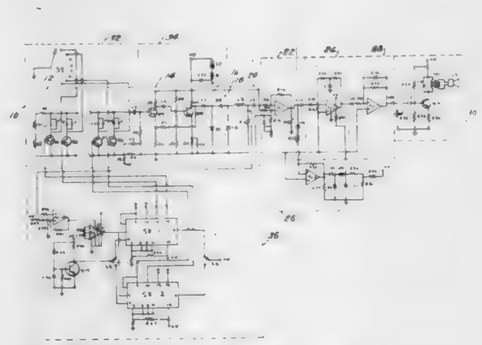
1. A method for optimizing the bandwidth of a radio receiver over a continuous range of input bit rate values, comprising the steps of:
determining the optimum intermediate frequency bandwidth for a given input data rate,
adjusting a constant Q continuously tunable bandwidth filter to a tuned frequency which is a predetermined multiple of the desired intermediate frequency bandwidth, and
adjusting the intermediate frequency until it is equal to the tuned frequency of the filter.

4,045,741

SCANNING RECEIVER FOR USE IN A TOUR GUIDE SYSTEM

John V. Missale, 48-16 47th St., New York, N.Y. 11377

Filed Sept. 26, 1974, Ser. No. 509,564
Int. Cl.[2] H04B *1/32*
U.S. Cl. 325—470 **9 Claims**



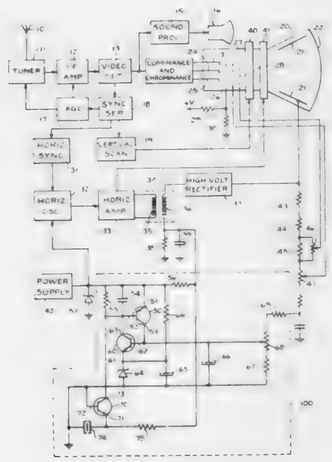
1. An improved portable radio receiver for receiving a plurality of preselected frequencies, said receiver comprising:
an antenna for receiving said pre-selected frequencies;
a tuning means comprising a tank-type resonant circuit including at least one inductance and at least a plurality of capacitance elements connected therewith, said tuning means being connected to said antenna;
a detecting means for detecting signals from said tuning means; and,
an audio transducer stage for producing an audio output in response to the output of said detecting means; and,
an automatic frequency selecting means for scanning said pre-selected frequencies and for automatically tuning said receiver to the first one of said pre-selected frequencies whose signal strength exceeds a predetermined amplitude, said automatic frequency selecting means including:
a level detector for providing a specified output whenever the amplitude of the signal received from the detecting means exceeds a predetermined threshold;
an oscillator having an input connected to the output of said level detector;
a counter circuit comprising a shift register having a plurality of outputs, each output corresponding to a stage of said shift register, said counter circuit having an input connected to the output of said oscillator;
a switching means comprising a plurality of switch means each having an input connected to one of said outputs of said counter circuit, said switching means comprising a plurality of field effect transistors, each of which is connected to one of said capacitive elements of said tank circuit, said switching means being connected in circuit with said tuning means; and,
a delay means for loading a beginning bit into said shift register after said receiver has been turned on.

4,045,742

HIGH VOLTAGE SHUTDOWN CIRCUIT RESPONSIVE TO EXCESSIVE BEAM CURRENT AND HIGH VOLTAGE

David H. Meehan, and George J. Tzakis, both of Chicago, Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 12, 1976, Ser. No. 675,680
Int. Cl.[2] H02H *7/20*
U.S. Cl. 328—9 **9 Claims**



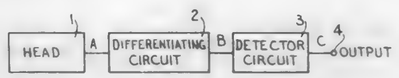
1. For use in a television receiver having a cathode ray tube display device in which one or more electron beams are directed to a viewing screen, means causing said beams to scan said screen, and high voltage generating means producing an electron accelerating potential for said cathode ray tube, high voltage shutdown means comprising:
high voltage detecting means producing a first error signal when said accelerating potential exceeds a predetermined voltage;
beam current detecting means producing a second error signal when the current of said electron beams exceeds a predetermined level; and
high voltage disabling means, coupled to said high voltage detecting means and said beam current detecting means, said high voltage disabling means including common fault means for rendering said high voltage generating means inoperative in response to either said first or second error signals.

4,045,743

DETECTOR CIRCUITS

Keith Francis Walker, Woking, England, assignor to Data Recording Instrument Company Limited, Staines, England

Filed Apr. 22, 1976, Ser. No. 679,243
Claims priority, application United Kingdom, Apr. 24, 1975, 16930/75
Int. Cl.[2] H03K *5/153*
U.S. Cl. 328—150 **5 Claims**



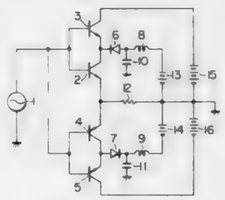
1. A waveform-level detector useable in conjunction with an applied waveform having positive and negative excursions relative to a neutral axis to produce an output indicative of significant excursions of the applied waveform across the axis, and a zone lying between a pair of reference levels one on each side of the axis, the detector including;
means responsive to changes in polarity of the waveform to produce a stylised waveform output first signals for all the axis crossings;
first pulse forming means responsive to the stylised output to produce a first pulse train output in which each axis crossing of the applied waveform is represented by a different pulse, the relative timings of the pulses in the first train corresponding to the relative timings of the axis crossings;
means for delaying the first pulse train to enable the pulses each to occur a predetermined time interval after that axis crossing to which it corresponds;
means for deriving second signals from the applied waveform in respect of each transition of the applied waveform across each zone laying between the pair of reference levels; and
means for combining the delayed final pulse train and the second signals thereby to produce delayed signal outputs only in respect of significant axis crossings.

4,045,744

LOW-FREQUENCY POWER AMPLIFIER

Tohru Sampei, Toyokawa, Japan, assignor to Hitachi, Ltd., Japan

Filed Oct. 21, 1976, Ser. No. 734,602
Claims priority, application Japan, Oct. 24, 1975, 50-127392
Int. Cl.[2] H03F *3/183*
U.S. Cl. 330—13 **7 Claims**



7. In an amplifier circuit of high efficiency for use as an

output circuit of an amplifier comprising a first transistor for amplifying an incoming input signal applied to a base of said first transistor, a load connected to an emitter of said first transistor, a second transistor of the same conductivity type as that of said first transistor having an emitter connected to a collector of said first transistor, means for supplying the incoming input signal to a base of said second transistor, a first power source, a diode connected between the collector of said first transistor and said first power source in a manner so that said diode is forward-biased by said first power source and operatively applies a collector bias voltage to the collector of said first transistor so long as the diode is conducting, a second power source for producing a voltage higher than that of said first power source, and means for connecting said second power source to a collector of said second transistor,

an improvement which comprises:

an impedance element connected in series to said diode and inserted in a circuit through which a collector current for said first transistor flows, whereby preventing a reverse current from flowing through said diode when said diode is cut off.

4,045,745

LOW-FREQUENCY POWER AMPLIFIER

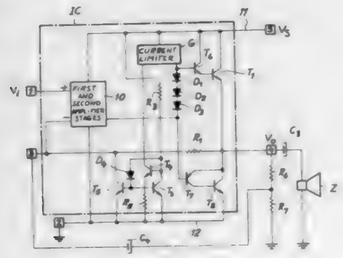
Carlo Cini, Cornaredo (Milan); Bruno Murari, Monza (Milan), and Mario Santi, Sedriano (Milan), all of Italy, assignors to SGS-ATES Componenti Elettronici S.p.A., Milan, Italy

Filed Mar. 31, 1976, Ser. No. 672,336

Claims priority, application Italy, Apr. 4, 1975, 21984/75

Int. Cl.[2] H03F *3/26*

U.S. Cl. 330—15 **2 Claims**



1. A power amplifier comprising:

an amplification network with several cascaded transistor stages including a first stage and a final stage, said first stage having a noninverting input terminal and an inverting input terminal;

an energizing circuit for said network including a supply terminal and a ground terminal connectable across a source of direct current;

a first power transistor and a second power transistor in said final stage connected between said supply terminal and said ground terminal, said power transistors being respectively provided with a collector and an emitter jointly connected to an output terminal, said power transistors having input circuits connected to said first stage;

a feedback resistor inserted between said output terminal and said inverting input terminal;

a first resistance substantially smaller than the magnitude of said feedback resistor connected to said output terminal;

a second resistance substantially smaller than said first resistance connected to said ground terminal and forming a junction with said first resistance;

a capacitor inserted between said inverting input terminal and said junction for substantially compensating the effect of supply-voltage fluctuations upon the voltage of said output terminal; and

a voltage-stabilizing circuit with a pair of twin transistors having interconnected bases and grounded emitters, one of said twin transistors having a collector tied to said inverting input terminal, the other of said twin transistors having a collector connected to said supply terminal via a direct-current path independent of said input circuits including a further resistor of a magnitude substantially exceeding said first resistance.

4,045,746

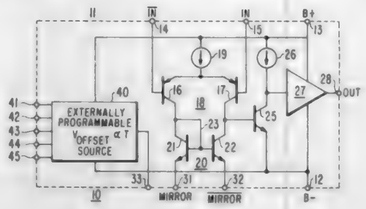
ADJUSTABLE GAIN CURRENT AMPLIFIERS

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,575

Int. Cl.[2] H03F *1/32, 3/45*

U.S. Cl. 330—23 **9 Claims**



1. A current mirror amplifier including:

an input terminal for receiving an input current;

an output terminal;

first and second transistors, each having base and emitter and collector electrodes and being operated within the confines of an integrated circuit at an absolute temperature substantially equal to T;

first conductive means connecting the collector electrode of said first transistor to said input terminal;

second conductive means connecting the collector electrode of said second transistor to said output terminal;

a collector-to-base feedback connection between the collector and base electrodes of said first transistor for adjusting the base potential of said first transistor to condition said first transistor to conduct as collector current substantially all of said input current; and

means for applying substantially the same potential to the base electrode of said second transistor as said collector-to-base feedback connection applies to the base electrode of said first transistor, said current mirror amplifier having in combination therewith, means for adjusting its current gain to values substantially independent of T, which means for adjusting its current gain consists of:

a source of adjustable offset voltage proportional to T applied between the emitter electrodes of said first and said second transistor.

4,045,747

COMPLEMENTARY FIELD EFFECT TRANSISTOR AMPLIFIER

Sheng Teng Hsu, Lawrenceville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed June 25, 1976, Ser. No. 699,849

Int. Cl.[2] H03F *3/16*

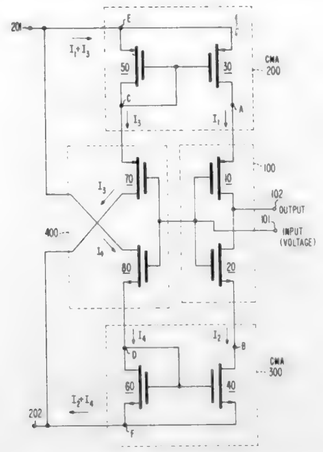
U.S. Cl. 330—35 **18 Claims**

16. An amplifier, comprising:

first and second field effect transistors of first and second conductivity types, respectively, each having source, gate and drain electrodes, said gate electrodes being connected to a signal input terminal, said drain electrodes being connected to a signal output terminal;

first and second complementary current mirror amplifiers each having input, common output terminals, said common terminals for receiving an operating voltage thereacross, said output terminals being connected to respective ones of said source electrodes; and

input means for supplying input currents to the input terminals of said current mirror amplifiers and for controlling



the ratio thereof in accordance with an input signal applied to said input signal terminal.

4,045,748

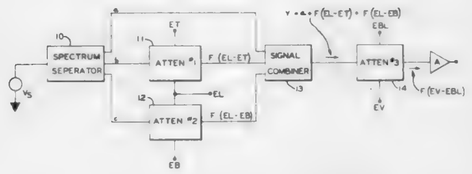
AUDIO CONTROL SYSTEM

Paul Filliman, Fort Wayne, Ind., assignor to The Magnavox Company, Fort Wayne, Ind.

Filed Dec. 19, 1975, Ser. No. 642,429

Int. Cl.[2] H03F *3/68*

U.S. Cl. 330—126 **8 Claims**



1. An audio control apparatus for controlling a signal comprising:

a. a plurality of frequency selective filters, said filters having a common input for receiving an audio signal;

b. a plurality of differential amplifiers for receiving said filter output signals each of said differential amplifiers providing biphase signal currents in response to an input voltage;

c. a plurality of attenuators for controlling said biphase signal currents produced by each of said differential amplifiers, said attenuators having a selectable attenuation level; and

d. means for combining said attenuator output signals to form a composite signal, said composite signal having a frequency spectrum dependent upon the relative attenuation levels provided by said attenuators.

4,045,749

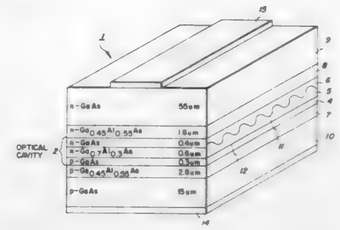
CORRUGATION COUPLED TWIN GUIDE LASER

Robert D. Burnham; Donald R. Scifres, both of Los Altos, and William Streifer, Palo Alto, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 24, 1975, Ser. No. 634,682

Int. Cl.[2] H01S *3/19*

U.S. Cl. 331—94.5 H **13 Claims**



1. An electrically pumped, distributed feedback, twin waveguide diode laser comprising:

a semiconductor body comprised of a plurality of contiguous layers of semiconductor material, one of said layers being the laser active region layer,

said active region layer being bounded on one side by a first layer and being bounded on another side by a second layer,

a third layer, said third layer being bound on one side by said second layer and being bounded on another side by a fourth layer,

said active region layer being of one conductivity type and one of the layers bounding said active region layer being of the other conductivity type such that a rectifying junction is provided between said active region layer and said one of the layers bounding said active region layer, carriers injected under forward bias across said rectifying junction undergoing radiative recombination in said active region layer to generate stimulated coherent radiation,

the material of said active region layer having a lower bandgap than the materials of both said first layer and said second layer such that confinement is provided for the carriers injected into said active region layer under forward bias,

the material of said third layer having a lower bandgap than the materials of both said second layer and said fourth layer such that the portion of said coherent radiation that spreads to said third layer is confined to said third layer,

one of said boundaries formed with said third layer being a non-planar boundary, said non-planar boundary providing a periodic perturbation of refractive index therealong which interacts with a portion of said radiation that spreads to said third layer to cause said portion of said radiation to be reflected by said periodic perturbation, said perturbation having a period such that said reflected radiation is in phase.

4,045,750

ELECTRICAL CABLE AND COUPLING ARRANGEMENT

Richard C. Marshall, Hertfordshire, England, assignor to Xerox Corporation, Stamford, Conn.

Filed May 20, 1976, Ser. No. 688,502

Claims priority, application United Kingdom, Oct. 16, 1975, 42422/75

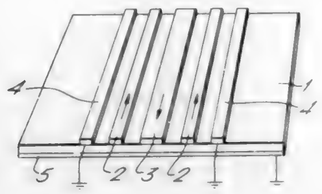
Int. Cl.[2] H03H *7/48, 1/00*

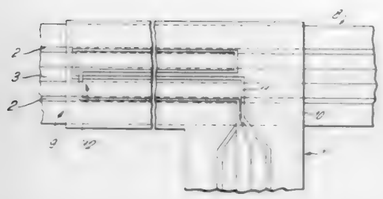
U.S. Cl. 333—6 **4 Claims**

1. An electrical cable having an adhesive coated surface portion, the cable comprising a continuous flat strip of flexible insulating material carrying:

a. a central first conductive strip and second and third con-

ductive strips on each side of and generally parallel to the first conductive strip in an electrically balanced configuration, the first conductive strip being for carrying current of one phase, the second and third conductive strips being for jointly carrying current of the opposite phase and each having a resistance per unit length which is twice the resistance per unit length of the first conductive strip, and





outermost fourth and fifth conductive strips on the outermost sides of and generally parallel to the second and third conductive strips, the fourth and fifth conductive strips being for connection to ground; and

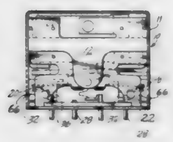
b. a conductive member spaced by the insulating material from the conductive strips, the conductive member constituting a ground plane for the cable.

4,045,751

ARC BARRIER FOR A RELAY SWITCH

John C. Schuessler, and David J. Tapp, both of West Covina, Calif., assignors to Leach Corporation, Los Angeles, Calif.

Filed Mar. 22, 1976, Ser. No. 669,212
Int. Cl.[2] H01H *9/30*
U.S. Cl. 335—201 **6 Claims**





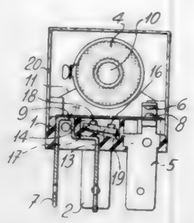
1. Apparatus for preventing arcing between the contacts and other conductive parts of a relay, comprising a molded housing of non-conductive material forming at least one substantially cubical space open on one end for receiving the relay contacts, one wall of the housing having an open slot extending from an edge at the open end, and a pair of spaced parallel retaining members having opposing clamping surfaces projecting toward each other, the housing being positioned between and in engagement with said surfaces, with the slotted wall extending laterally between the retaining members, the spacing between the clamping surfaces being slightly less than the width of the housing whereby the slotted wall of the housing is put in compression by the clamping members.

4,045,752

COMPACT ELECTROMAGNETIC RELAY, PARTICULARLY FOR AUTOMOTIVE VEHICLES

Domenico Frigo, Olmo (Venice), Italy, assignor to Fabbrica Italiana Accumulatori Motocarri Montecchio S.p.A. - F.I.-A.M.M., Montecchio Maggione (Venice), Italy

Filed Nov. 26, 1975, Ser. No. 635,635
Claims priority, application Italy, Jan. 31, 1975, 19827/75
Int. Cl.[2] H01H *9/02*
U.S. Cl. 335—202 **14 Claims**



1. An electromagnetic relay comprising:

a base;

an electromagnetic yoke mounted on said base;

an armature underneath said yoke normally resting on said base with freedom of vertical movement, said yoke having a pair of generally vertical legs terminating above said armature and forming therewith a pair of air gaps;

coil means on said yoke for magnetizing same to attract said armature toward said legs;

a first contact member of said base spacedly overlying said armature in the de-energized state of said yoke; and

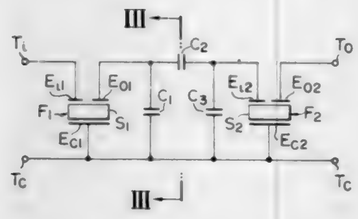
a second contact member on said base coacting with said first contact member, said first contact member being biased into a substantially horizontal normal position and being engageable by said armature of elevation into an alternate position relative to said second contact member upon energization of said yoke.

4,045,753

CERAMIC FILTER

Koji Arakawa, Kawagoe, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Apr. 29, 1976, Ser. No. 681,486
Claims priority, application Japan, May 9, 1975, 50-65008; May 13, 1975, 50-56935
Int. Cl.[2] H03H *9/26, 9/32, 9/20*
U.S. Cl. 333—72 **7 Claims**



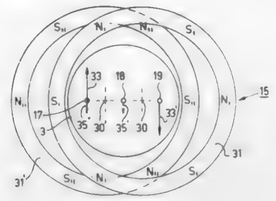
1. A ceramic filter including at least two three-terminal, dual-mode ceramic filter elements each having an input and an output and a ground connection, and a capacitive coupling circuit comprising first capacitive means connected between the input of one of said filter elements and the output of the other of said filter elements and second capacitive means connected between said first capacitive means and the respective ground connection.

4,045,754

ECCENTRICALLY MOUNTED SIX-POLE RINGS FOR A STATIC CONVERGENCE UNIT

Piet Gerard Joseph Barten, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 2, 1976, Ser. No. 646,046
Claims priority, application Netherlands, Mar. 13, 1977, 7502970
Int. Cl.[2] H01F *1/00*
U.S. Cl. 335—212 **6 Claims**



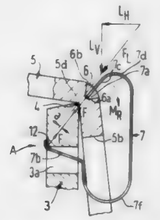
1. In combination with a color display tube having three electron guns arranged in a single plane, a device for the static convergence of electron beams generated by the electron guns, said device enclosing the neck of the color display tube and comprising at least two annular magnetic six-pole structures, which are arranged eccentrically with respect to the neck of the color display tube and to each other, the axis of rotation of a first of said magnetic structures being situated halfway between one outer electron beam and the central electron beam and the axis of the second magnetic structure being situated halfway between the central electron beam and the other electron outer beam.

4,045,755

ARMATURE MOUNTING MEANS FOR AN ELECTROMAGNETIC RELAY

Harry Schroëder, Unterhaching, and Martin Aidn, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 17, 1976, Ser. No. 751,807
Claims priority, application Germany, Dec. 22, 1975, 2558065
Int. Cl.[2] H01F *7/08*
U.S. Cl. 335—274 **7 Claims**



1. An electromagnetic relay comprising an armature having a first leg portion, a second leg portion extending at an angle to said first leg portion and a corner portion interconnecting said first and second leg portions, said corner portion having an inner surface and an outer surface, said inner surface having means forming a mounting edge and said outer surface having means forming a recess, a return pole piece having an outer surface disposed adjacent said second leg portion of said armature, an inner surface and means forming a supporting edge for receiving said mounting edge of said armature and for supporting said armature for pivotal movement, said second leg of said armature having means forming an aperture therein, and an elongated curved mounting spring for clamping said armature to said return pole piece and having a first end portion abutting said corner portion of said armature in said recess, a middle portion extending through said aperture and a second end portion disposed in spaced relation to said first end portion and abutting said return pole piece on said inner surface for biasing said mounting edge of said armature into abutting engagement with said supporting edge of said return pole piece, said mounting edge of said armature and said supporting edge of said return pole piece residing substantially between said first and second leg portions of said mounting spring.

4,045,756

SEGMENTED EXPANSION ABSORBER FOR LIFTING MAGNET

Armand G. Mueller, Elm Grove, Wis., assignor to Square D Company, Park Ridge, Ill.

Filed July 13, 1976, Ser. No. 704,907
Int. Cl.[2] H01F *7/20*
U.S. Cl. 335—292 **6 Claims**



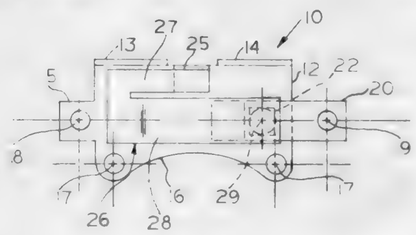
1. A lifting magnet, comprising: a magnet case having a sealed cavity; a magnet coil mounted within the cavity; potting compound encapsulating the magnet coil and substantially filling any remaining voids in the cavity; and means for absorbing the compressive forces acting upon the encapsulating compound due to expansion of the magnet coil during its operation, said means comprising individual hermetically sealed compartments serially connected to each other and each containing a predetermined volume of compressible fluid generally arranged and disposed to substantially surround the coil in order to provide a predetermined number of compartments, if none are punctured, providing a volume of compressible fluid in excess of said predetermined volume, whereby some segments can be disabled in the course of fabrication, assembly and encapsulation of the magnet and coil without rendering the entire absorbing means inoperative.

4,045,757

THERMOSTATIC SWITCH

Robert A. Johnson, Shelby, N.C., assignor to Fasco Industries, Inc., Boca Raton, Fla.

Filed May 3, 1976, Ser. No. 682,500
Int. Cl.[2] H01H *37/52*
U.S. Cl. 337—85 **3 Claims**



1. A thermostatic switch, comprising

a metal support having thereon a plane surface,

a generally J-shaped, bimetallic switch arm having a pair of spaced parallel, generally flat legs integral with each other at their inner ends, and movable relative to each other at their outer ends,

means for securing the outer end of one of said legs in elec-

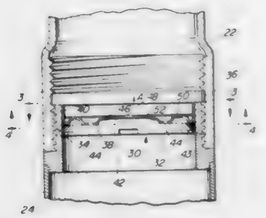
trical contact with said support and with said one leg supporting the other leg of said switch arm in spaced, confronting relation to said plane surface on said support,
a first metal contact mounted on said support beneath the outer end of said other leg of said switch arm,
a second metal contact secured to said outer end of said other leg for movement thereby to a closed position in which it engages said first metal contact, and to an open position in which it is spaced from said first contact,
means electrically insulating said first contact from said metal support, and means for connecting said metal support and said first contact in an electrical circuit to pass current from said circuit through said contacts and from one end to the other of said switch arm, when said contacts are engaged,
said one leg of said switch arm being substantially shorter and narrower than said other leg,
said switch arm having its high expansion side facing said plane surface of said support, and said shorter leg of said switch arm being operative to resist movement of said longer leg in a direction to move said second contact from its open to its closed position, and
the two legs of said switch arm being disposed substantially in a common plane when said contacts are engaged.

4,045,758

VALVE ARRANGEMENT FOR HIGH VOLTAGE FUSE

Bruce A. Biller, Chicago, and Henry W. Scherer, Mount Prospect, both of Ill., assignors to S&C Electric Company, Chicago, Ill.

Filed Nov. 11, 1976, Ser. No. 741,024
Int. Cl.[2] H01H *85/20*
U.S. Cl. 337—186 **14 Claims**



1. A valve arrangement for permitting one way atmospheric venting to the interior of a high voltage fuse comprising:
wall means for closing an open end of the fuse, said wall means having at least one opening therethrough communicating between the interior of the fuse and the atmosphere;
valve means cooperating with said wall means for sealing said at least one opening when the pressure within the interior of the fuse exceeds atmospheric pressure, and for opening said at least one opening in said wall means for permitting atmospheric venting to the interior of the fuse when the pressure within the interior of the fuse is less than atmospheric pressure.

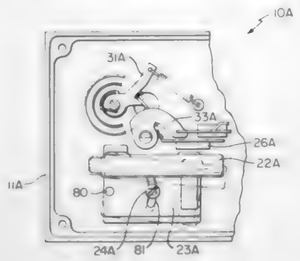
4,045,759

CUT-BACK THERMOSTAT CONSTRUCTION

Werner R. Bauer, Radnor, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 29, 1975, Ser. No. 644,611
Int. Cl.[2] H01H *37/62*
U.S. Cl. 337—301 **17 Claims**

1. A cut-back thermostat construction having a frame means, a timer means carried by said frame means, a thermostat arrangement carried by said frame means, movable actuator means carried by said frame means and being operatively associated with said thermostat arrangement to cut back the temperature setting thereof when said actuator means is moved from a first position thereof to a second position thereof, said timer means having cut-back means for engaging and moving said actuator means from said first position thereof to said second position thereof when a predetermined time is reached by said timer means whereby the temperature setting of said thermostat arrangement is cut back at said predetermined time, said thermostat arrangement comprising an electrical switch means carried by said frame means and a temperature responsive switch operator movably carried by said frame means for operating said switch means in accordance with sensed temperature, said actuator means cutting back said temperature



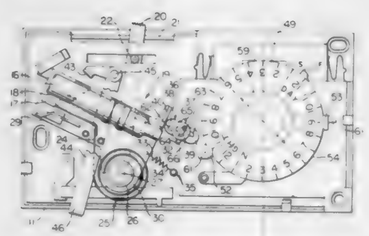
setting of said thermostat arrangement by adjusting said temmperature responsive switch operator relative to said switch means, and an adjustable cam being carried by said frame means and being operatively associated with said temperature responsive switch operator to set the same to provide said temperature setting of said thermostat arrangement, said switch operator having a cam follower operatively associated with said cam for following the adjustment thereof, said actuator means including a movable wedge member disposed between and in engagement with said cam follower and said cam.

4,045,760

CUT-BACK THERMOSTAT CONSTRUCTION

Edgar E. Marquis, Newtown, and William A. Knecht, New Hartford, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Dec. 29, 1975, Ser. No. 644,599
Int. Cl.[2] H01H *37/62*
U.S. Cl. 337—301 **20 Claims**



1. In a cut-back thermostat construction having a thermostat arrangement and a timer means carried by a frame means in such a manner that said timer means will cut-back the temperature setting of said thermostat arrangement by moving an electrical switch means of said thermostat arrangement relative to a temperature responsive switch operator of said thermostat arrangement when a predetermined time is reached by said timer means, said construction also having movable actuator means that is carried by said frame means and is operatively associated with said switch means to be adapted to cause a certain movement of said switch means relative to said switch operator when said actuator means is moved from a first position thereof to a second position thereof by said timer means when said predetermined time is reached by said timer means,

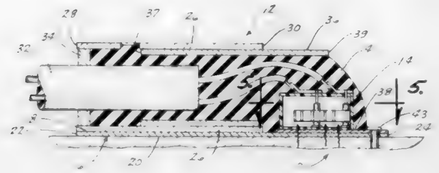
the improvement comprising adjustable means carried by said frame means and being separate from said actuator means for selecting the amount of movement of said switch means relative to said switch operator when said actuator means is moved from said first position thereof to said second position thereof whereby said adjustable means selects the cut-back temperature of said thermostat arrangement.

4,045,761

MOUNTING BRACKET FOR A HEAT DETECTOR SWITCH

Reuben E. Peterson, Fergus Falls, Minn., assignor to Jenoff, Incorporated, Fergus Falls, Minn.

Filed Feb. 9, 1976, Ser. No. 656,353
Int. Cl.[2] H01H *37/04, 37/56*
U.S. Cl. 337—372 **5 Claims**



1. In combination with a member requiring heat monitoring, comprising,
a first flat plate member having top and bottom surfaces and first and second ends,
a hollow tubular member mounted on the top surface of said first plate member, said tubular member having first and second ends,
a heat sensing means mounted on said first flat plate member adjacent said second end thereof,
an electrical wire means extending through said tubular member from said first end thereof and being electrically connected to said heat sensing means,
protective means extending over said heat sensing means for preventing damage thereto,
said first flat plate member being heat conductive,
means operatively mounting said first flat plate member to the member requiring heat monitoring,
said electrical wire means adapted to be operatively connected to a signal means which is activated by said heat sensing means when the member requiring heat monitoring reaches a predetermined temperature which is transmitted through said first plate member to said heat sensing means,
said heat sensing means having a second flat plate member mounted on the bottom thereof,
said second flat plate member having at least one opening formed therein, said first flat plate member having at least one opening formed therein which registers with the opening in said second flat plate member,
said mounting means comprising a connector means extending through the openings in said first and second plate members.

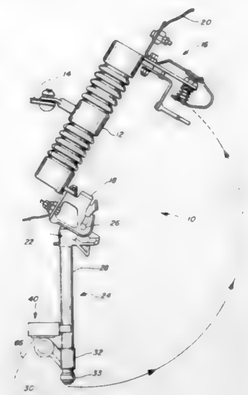
4,045,762

REMOTE CONTROL FUSE CLOSING DEVICE

John F. Foulkes, Elmhurst, Ill., assignor to S&C Electric Company, Chicago, Ill.

Filed Sept. 19, 1975, Ser. No. 615,061
Int. Cl.[2] H01H *37/76*
U.S. Cl. 337—401 **14 Claims**

1. A device for causing a switching element of an electrical switching device in an electrical circuit to move the switching element from a first position representative of a first circuit condition to a second position representative of a second circuit condition comprising:
rocket means for being ignited to generate propelling forces to move the switching element from the first position to the second position in response to ignition of said rocket means;



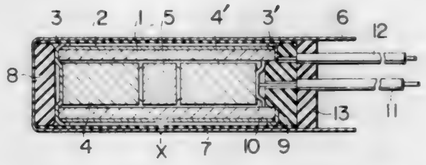
connector means connected to said rocket means for directly and disengageably attaching the rocket means to the switching element so that said rocket means disengages the switching element when the switching element moves to the second position; and
activating means for igniting the rocket means in response to remote actuation.

4,045,763

SEALED THERMOSTATIC HEATER

Mamoru Miyamoto, Neyagawa, and Kazuo Ishikawa, Kadoma, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 19, 1975, Ser. No. 633,230
Claims priority, application Japan, Nov. 20, 1974, 49-141083[U]; Jan. 20, 1975, 50-9624[U]
Int. Cl.[2] H01C *7/02*
U.S. Cl. 338—23 **4 Claims**



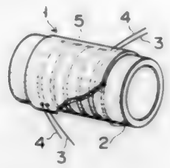
1. A sealed thermostatic heater comprising a ceramic tube having at least one PTC thermistor and at least two metallic radiators housed therein, said PTC thermistor being held by and between said radiators, said ceramic tube being sealed in a metal tube, and PTC thermistor and a heater in said metal tube being electrically connected in series.

4,045,764

GAS-SENSING MATERIAL

Noboru Ichinose, Yokohama; Yuji Yokomizo, Tokyo, and Masaki Katsura, Mitaka, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,575
Claims priority, application Japan, Oct. 15, 1974, 49-117715; Feb. 13, 1975, 50-17419
Int. Cl.² H01L *7/00*
U.S. Cl. 338—34 **8 Claims**



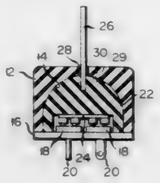
1. A gas-sensing material which comprises a sinter consisting essentially of 20 to 99.85 mol % of ZnO, 0.1 to 50 mol % of MgO and 0.05 to 30 mol % of Me_2O_3 wherein, Me is at least one element selected from the group consisting of gallium, boron, indium, iron, aluminum and chromium.

4,045,765

SLIDING RESISTOR

Masao Imamura, 18-15, 1-chome, Ikegami, Ota, Tokyo, Japan

Filed Jan. 19, 1977, Ser. No. 760,354
Claims priority, application Japan, Jan. 23, 1976, 51-7146[U]
Int. Cl.² H01C *10/38*
U.S. Cl. 338—176 **12 Claims**



1. A sliding resistor comprising:

a base plate provided with at least one resistance element connected to connectors;

a molded slider provided with a contact piece formed of a leaf spring and mounted on the bottom plane of the slider for abutment against the at least one resistance element, and a slider knob erected at the upper surface of the slider and adapted to permit the contact piece to slide in abutment against the at least one resistance element;

a molded case fixed to the surface of the base plate and provided with a groove in which the molded slider is slidably received, and a slit cut out along the axis of the case for communication with the groove, for guiding the sliding of the slider knob, the slider knob projecting upward from the slit and the molded slider being pressed against the inner wall of the molded case by a biassing force resulting from the leaf spring contact piece; and

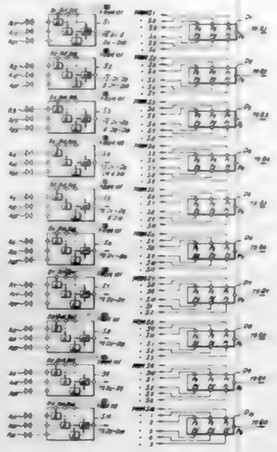
means for preventing the vertical joltings of the molded slider by causing it to contact with the inner wall of the groove of the molded case in a non-horizontal direction.

4,045,766

ULTRASONIC DETECTION SYSTEM

Masajiro Iida; Hideharu Morimatsu, both of Takarazuka; Itsuo Fukuoka, and Yoshinari Yoshida, both of Nishinomiya, all of Japan, assignors to Furuno Electric Company, Limited, Japan

Filed Jan. 21, 1976, Ser. No. 651,182
Claims priority, application Japan, Jan. 30, 1975, 50-13084
Int. Cl.² G01S *9/66, 7/62*
U.S. Cl. 340—1 R **3 Claims**



1. An ultrasonic detection system, comprising means for emitting an ultrasonic wave signal in all peripheral directions, a plurality of ultrasonic transducers arranged circularly at equal intervals for receiving said ultrasonic wave signals reflected back from said directions, a plurality of composite output circuits for combining the outputs of k ($k>1$) transducers which are successively adjoining in a predetermined circumferential direction to produce a plurality of directive composite outputs, and means for deriving said composite outputs sequentially in time division fashion for indications; said ultrasonic transducers being classified into m groups each consisting of n transducers which are successively adjoining in said circumferential direction, the number of said composite output circuits being designated as n, where m and n are integers greater than one and n is equal to or greater than k, n switching circuits each having m inputs connected respectively to the outputs of the j-th ($j = 1,2, \ldots n$) transducers of said m groups of transducers, said switching circuits being connected to said composite output circuits such that n sequential combinations of switching circuits each consisting of k switching circuits which are circulatingly adjoining in said circumferential direction are coupled sequentially to said composite output circuits, and control means for deriving n outputs at a time from said switching circuits which are circulatingly adjoining in said circumferential direction and, at the same time, shifting said n outputs one by one in said circumferential direction.

4,045,767

METHOD OF ULTRASONIC DATA COMMUNICATION AND APPARATUS FOR CARRYING OUT THE METHOD

Motohisa Nishihara, and Tetsuo Ito, both of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed Sept. 18, 1973, Ser. No. 398,474
Claims priority, application Japan, Sept. 20, 1972, 47-93622
Int. Cl.² G01V *1/00;* **H04B** *13/00, 15/00*
U.S. Cl. 340—5 R **9 Claims**

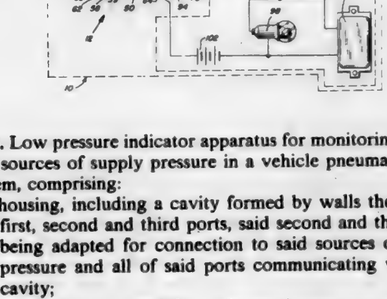
1. An ultrasonic data communication system comprising:

first means for generating at least three respectively different ultrasonic frequency signals;

second means, coupled to said first means, selectively encoding information to be transmitted in accordance with any selected one of the permutations of the possible sequences of the frequencies of said at least three respectively different ultrasonic frequency signals;

third means, coupled to said first means and said second means, for transmitting a selected permutation of said frequency signals, all of the frequency components of which define the information to be transmitted, by transmitting each frequency signal in its encoded order in the selected permutation for a prescribed period of time;

fourth means, for receiving the frequency signals transmitted by said third means;



fifth means, coupled to said fourth means, for separating the respective frequency signals making up the selected permutation received by said fourth means;

sixth means, coupled to said fifth means, for detecting the frequency components in said separated frequency signals, and

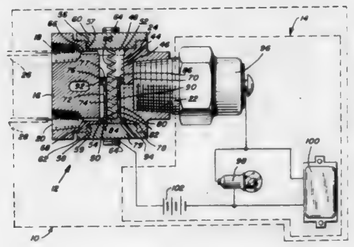
seventh means, coupled to said sixth means, for decoding said information in accordance with the order in which said frequency components have been detected by said sixth means.

4,045,768

LOW PRESSURE SELECTOR

Boleslaw M. Klimek, Des Plaines, Ill., assignor to The Echlin Manufacturing Company, Branford, Conn.

Filed Sept. 9, 1976, Ser. No. 721,818
Int. Cl.² B60T *17/22*
U.S. Cl. 340—52 C **18 Claims**



13. Low pressure indicator apparatus for monitoring at least two sources of supply pressure in a vehicle pneumatic brake system, comprising:

a housing, including a cavity formed by walls therein and first, second and third ports, said second and third ports being adapted for connection to said sources of supply pressure and all of said ports communicating with said cavity;

piston means mounted for reciprocating movement within said cavity between first and second positions in response to pressure appearing at said second and third ports, a drop in pressure appearing at said third port relative to pressure appearing at said second port causing said piston means to move to said first position and a drop in pressure appearing at said second port relative to pressure appearing at said third port causing said piston means to move to said second position, said piston means including sealing means for cooperation with said walls forming said cavity to permit communication between said first port and said third port and prevent communication between said first port and said second port when said piston means is in said first position and to permit communication between said first port and said second port and prevent communication between said first port and said third port when said piston means is in said second position; and

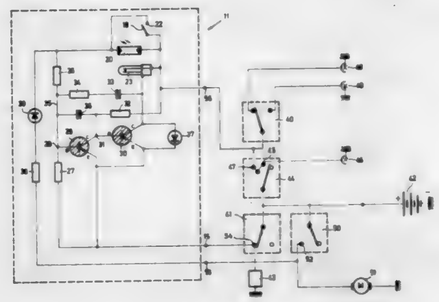
pressure responsive monitoring means connected to said third port for signaling reduction in pressure appearing at said third port below a preset minimum.

4,045,769

LIGHTING SYSTEMS FOR VEHICLES

Hermann Faller, Guetenbach, Germany, assignor to Faller OHG, Guetenbach, Germany

Filed Mar. 30, 1976, Ser. No. 671,934
Claims priority, application Germany, Apr. 3, 1975, 2514611
Int. Cl.² B60Q *1/26, 1/08*
U.S. Cl. 340—74 **21 Claims**



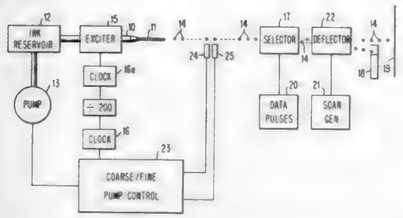
1. A light dependent device for use in a motor vehicle having regulation lights, a lighting circuit and an ignition switch, said device being operative to monitor the environmental light and the condition of the ignition switch and provide warning when the regulation lights on the vehicle should be switched on or off, said device comprising a light sensor and a switching element including a warning device, the light sensor being connected to the switching element which is adapted to be connected to the lighting circuit and ignition switch of the vehicle and, in use, to switch when the intensity of the light falling on the light sensor passes a level at which the regulation lights on the vehicle should be switched on, the warning device being arranged to be activated by the switching element (1) when the light intensity falls below said level with the ignition switch on and the regulation lights off, and (2) when the ignition switch is turned off with the regulation lights on; and to be deactivated by the switching element (1) when the light intensity exceeds said level with the ignition switch on and regulation lights off, (2) when the regulation lights are switched on with the ignition switch on and light intensity below said level, and (3) when the regulation lights are switched off with the ignition switch off.

4,045,770

METHOD AND APPARATUS FOR ADJUSTING THE VELOCITY OF INK DROPS IN AN INK JET PRINTER

Robert Walker Arnold, Glen Aubrey, and Thomas Tomasky, Endicott, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 11, 1976, Ser. No. 740,703
Int. Cl.[2] G01D 15/18
U.S. Cl. 346—75 12 Claims



1. In an ink jet printing apparatus, the combination comprising

jet forming means for projecting a continuous stream of ink drops along a path toward a print medium,

pump means connected to said jet stream forming means for supplying a liquid ink under pressure to said jet forming means,

a method for controlling the velocity of said ink drops comprising

determining the existence and direction of any velocity error in said ink drops,

effecting one or more coarse adjustments in a first direction in the pressure of said pump until a change in the direction of any velocity error occurs,

then effecting a predetermined number of consecutive coarse correction reversals in the pump pressure to produce toggling of any velocity error about a null point velocity condition,

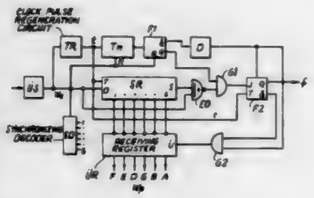
then effecting one or more fine adjustments in the pressure of said pump to said null point velocity condition after completion of said predetermined number of coarse correction reversals.

4,045,771

ENCODING AND DECODING DEVICE FOR ERROR-DETECTING TRANSMISSION SYSTEMS, IN PARTICULAR FOR REMOTE-CONTROL AND REMOTE-ACTUATION EQUIPMENTS

Heinz Loreck, Kronberg, Taunus, Germany, assignor to Helmut Leinfellner, Austria

Filed Jan. 22, 1976, Ser. No. 651,254
Claims priority, application Austria, Jan. 22, 1975, 451/75
Int. Cl.[2] G06F 11/00; G08C 25/00
U.S. Cl. 340—146.1 BA 14 Claims



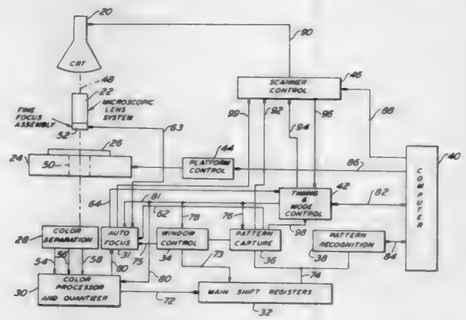
1. In an error detecting transmission system, for conveying information by means of pulse trains, of the type including an input transmitter, for the pulse train to be transmitted, incorporating a device for temporary storage and repetitive transmission of the pulse train to a transmission channel, and a receiver, receiving the pulse train from the transmission channel, incorporating a device for temporary storage of the first-received pulse train, and incorporating a comparator for comparing each received and temporarily stored pulse with the respective received associated pulse of the repeated pulse train, and incorporating a receiving register with an information output in which the information output is controlled as a function of the result of such comparison: the improvement comprising, in combination, a first shift register in said transmitter having a control input, a parallel word input and a serial word output; a second shift register in said receiver having a serial word input and serial word and parallel word outputs; said shift registers constituting said temporary storage devices; means supplying timing pulses to both shift registers to synchronize the same; said first shift register having an additional serial word input; an inverting element connecting the serial word output of said first shift register to said additional serial word input to produce a second, non-equivalent pulse train; the serial word output of said first shift register supplying pulse trains to said transmission channel, and the serial word input of said second shift register receiving pulse trains from said transmission channel; a comparator having a first input connected, in bypassing relation to said second shift register, to said transmission channel, and having a second input connected to the serial output of said second shift register; said receiving register connected to said parallel word output of said second shift register and operable to evaluate the transmitted data; and an error signal storage connected to the output of said comparator and to said receiving register; said comparator detecting transmission errors and transferring the same, as error signals, to said error signal storage; said error signal storage, upon receipt of an error signal, preventing evaluation of the transmitted data in said receiving register.

4,045,772

AUTOMATIC FOCUSING SYSTEM

John C. Bouton, Doylestown; Melvin E. Partin, Newtown Square, both of Pa., and Robert C. Hilghman, Willingboro, N.J., assignors to Geometric Data Corporation, Wayne, Pa.

Division of Ser. No. 465,390, April 29, 1974, Pat. No. 4,012,634.
This application Apr. 22, 1976, Ser. No. 679,259
Int. Cl.[2] G06K 9/08
U.S. Cl. 340—146.3 B 11 Claims



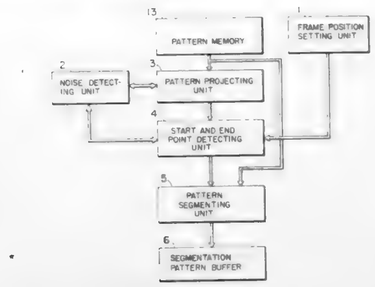
1. A pattern recognition system including scanning means for scanning a field including a plurality of patterns to be recognized and classified and an optical instrument for enabling scanning of said field, means responsive to said scanning means for generating a signal in accordance with the color density of the field scanned, means responsive to said signal for causing said scanning means to rescan an area of said field when one of said plurality of patterns is detected and means responsive to said signal during said rescan for moving said optical instrument to its optimum focus position before each one of said plurality of patterns is classified.

4,045,773

PATTERN SEGMENTING SYSTEM FOR A PATTERN RECOGNIZING DEVICE

Shozo Kadota; Yoshiji Fujimoto, both of Hachioji; Michio Yasuda, Koganei, and Mitsunori Oka, Hatano, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Nov. 13, 1975, Ser. No. 631,620
Claims priority, application Japan, Nov. 13, 1974, 49-129965
Int. Cl.[2] G06K 9/02
U.S. Cl. 340—146.3 SG 8 Claims



1. A pattern segmenting system comprising:

a memory for storing at least one information pattern;

first means for reading out the information pattern from said memory;

second means for detecting the start and end positions of at least one subpattern in the information pattern read out from said first means;

third means for calculating the center position of the subpattern in accordance with the start and end positions detected by said second means;

fourth means for storing the end position of a selected pattern frame;

fifth means for detecting whether or not the center position of the subpattern is within the selected pattern frame by comparing said center position with said end position of said selected pattern frame; and

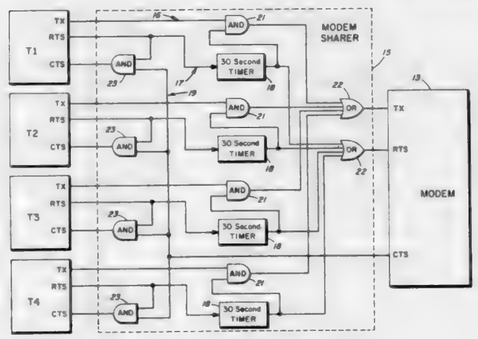
sixth means for segmenting the subpattern only when the center position of the subpattern is within the selected pattern frame and for regarding the frame as blank when the center position of the subpattern is outside the selected pattern frame.

4,045,774

MODEM SHARER

Guy E. Morrison, Columbia, Mo., assignor to Skei Corporation, Columbia, Mo.

Filed Sept. 20, 1976, Ser. No. 724,613
Int. Cl.[2] H04B 1/38; H04Q 5/00; G06F 3/00
U.S. Cl. 340—147 LP 13 Claims



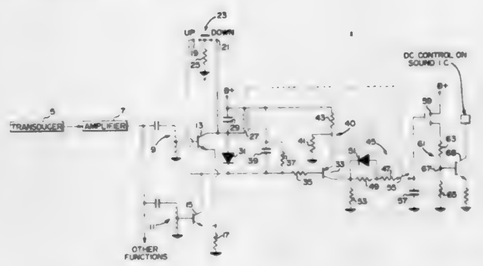
1. A modem sharer for connecting a plurality of remote terminals to a modem in a polled teleprocessing network, the modem sharer comprising: a plurality of request to send inputs for receiving signals from respective terminals when ready to transmit information; a plurality of transmitted data inputs for receiving the data to be transmitted from the respective terminals; request to send output means for associating with said modem and for transmitting a signal to said modem when a terminal provides an input signal to a request to send input; a transmitted data output for transmitting data from each of said terminals to said modem; a clear to send input for receiving a signal from said modem indicating that said modem is ready to send data, and for enabling the transmission of data from a terminal to said modem from a transmitted data input to a transmitted data output; and timer means for disenabling the transmission of data from a terminal to said modem after a predetermined time from the initiation of a signal on a request to send input.

4,045,775

CONTINUOUS DC CONTROL CIRCUIT

Daniel S. Pearce, LeRoy, N.Y., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Nov. 3, 1975, Ser. No. 628,097
Int. Cl.[2] H04N 9/12
U.S. Cl. 340—147 R 2 Claims



1. In a remote control for a television receiver, a continuous DC control circuit comprising:

a charge storage capacitor;

an FET having an isulated gate coupled to said charge storage capacitor and a source coupled to a voltage divider for providing an output in accordance with the potential level of said charge storage capacitor;

a charge and discharge circuit coupled to said charge storage capacitor, said circuit comprising a series connection of a first resistor, a parallel connected second resistor and a diode, and a third resistor connected to circuit ground;

a switching transistor coupled to said charge and discharge circuit, said transistor operating to provide first and second levels of potential to said charge and discharge circuit, thereby effecting different rates of charging and discharging said charge storage capacitor in accordance with said levels of applied potential;

a DC potential source; and

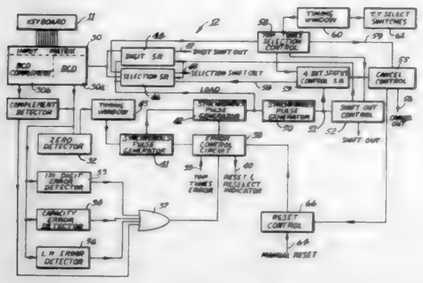
a control circuit coupled to said DC potential source and to said switching transistor for selectively altering the operation of said switching transistor in response to signals of a first and a second frequency.

4,045,776

ELECTRONIC PHONOGRAPH SELECTOR AND MEMORY SYSTEM

Robert W. Wheelwright, Tonawanda, and Peter E. Solender, Williamsville, both of N.Y., assignors to The Wurlitzer Company, Chicago, Ill.

Continuation of Ser. No. 467,208, May 6, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,441
Int. Cl.² G11B *19/08*
U.S. Cl. 340—162 **22 Claims**



1. In an electronic phonograph selector and memory system the combination comprising: a movable record carriage for carrying a plurality of record means and selectively placing each of said record means at a playing position where it will be played, first encoder means including output detector means associated with said movable record carriage for producing a binary coded output signal corresponding to the position of said movable record carriage, selection keyboard means to be manipulated by the user for the selection of a predetermined one of the plurality of record means of said movable record carriage, second encoder means coupled to said selection keyboard means for producing a predetermined binary code signal output from the actuation of said selection keyboard means, said predetermined binary code signal output corresponding to a given one of the plurality of said record means on said movable record carriage, and non-synchronous random access memory and control circuit means coupled to said first and second encoder means for receiving said binary coded output signal and said binary code signal output, respectively, and directly comparing these signals to produce a drive signal for transporting said movable record carriage and stopping said carriage when a predetermined comparison is formed and thereby to place a selected one of said record means at the playing position.

4,045,777

REMOTE CONTROL TRANSMITTER AND RECEIVER FOR USE WITH A TELEVISION RECEIVER

Eugene P. Mierzwinski, and David W. Worley, both of Fort Wayne, Ind., assignors to The Magnavox Company, Fort Wayne, Ind.

Filed Mar. 29, 1976, Ser. No. 671,205
Int. Cl.² H04B *9/00*; H04Q *9/00*
U.S. Cl. 340—168 B **22 Claims**

1. A remote control system including a remote transmitter and a receiver for remotely controlling a plurality of functions of a controlled apparatus, said transmitter comprising:

means for selecting one of said plurality of functions to be controlled;

means for generating pulse coded signals corresponding to selected functions;

means for generating function level control pulses, each function level control pulse representing an increment by which the level of the selected function is to be changed; and

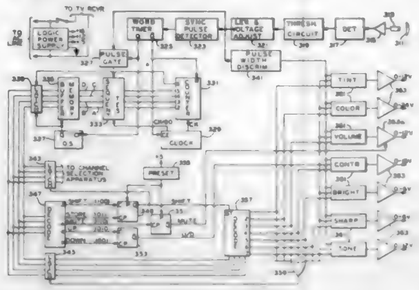
means for transmitting said pulse coded signals and said function level control pulses to said receiver;

said receiver comprising:

means for receiving transmitted pulse coded signals and function level control pulses;

a plurality of function level setting means corresponding to said plurality of remotely controlled functions;

means for identifying and decoding received pulse coded signals and for activating the function level setting means for the selected function; and



means for identifying received function level control pulses and gating them to the function level setting means for the selected function;

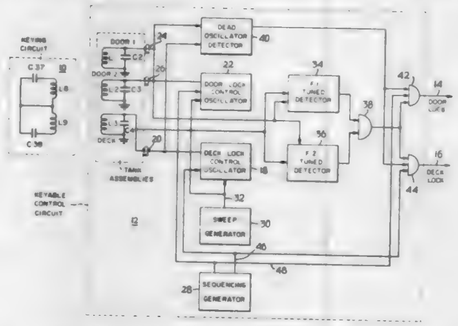
whereby the level of the selected function is changed in proportion to the number of received function level control pulses.

4,045,778

DUAL CHANNEL WIDE-BAND FREQUENCY MODULATED KEYABLE CONTROL CIRCUIT AND KEYING CIRCUIT THEREFOR

Carl E. Atkins, Montclair, and Francis A. McGuirk, Jr., Chatham, both of N.J., assignors to Wagner Electric Corporation, Parsippany, N.J.

Filed Feb. 23, 1976, Ser. No. 660,116
Int. Cl.² H04Q *9/10*; G08B *21/00*
U.S. Cl. 340—171 PF **12 Claims**



1. A keyable control circuit for use with a keying circuit having at least one resonant frequency comprising:

a. at least one oscillator;

b. means for connecting energy from said at least one oscillator to at least first and second spaced locations;

c. means for generating a first signal when a keying circuit having said at least one resonant frequency is coupled to any one of said at least first or second spaced locations;

d. means for generating a second signal when said first signal results from said keying circuit having at least one resonant frequency being coupled to said first location; and

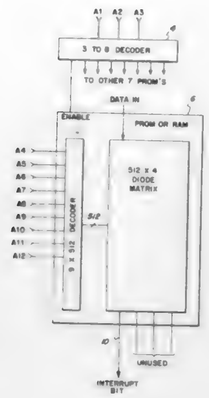
e. means for generating a third signal when said first signal results from said keying circuit having said at least one resonant frequency being coupled to said second location.

4,045,779

SELF-CORRECTING MEMORY CIRCUIT

Robert Eugene Markle, Rancho Palos Verdes, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 15, 1976, Ser. No. 666,825
Int. Cl.² G06F *11/10*; G11C *29/00*
U.S. Cl. 364—900 **5 Claims**



1. An improved circuit for loading into and for reading an addressed word having data from a memory having random access upon receipt of a command from a computer having a subroutine therefore, the memory having a defective bit per word wherein the improvement comprises:

a. interrupt means operative to receive the same address of the word to be loaded into the memory for recognition of a predetermined subset of stored addresses of bit defective words therein, and for generation of an error bit upon recognition of an address for transmittal to the computer for generating the command thereto to read out the words just loaded therein;

b. exclusive OR gate means operative to concurrently receive each of the bits of the given word read out from the memory and the word loaded therein at the same address for generating a respective signal upon receipt of unlike bits thereat for any given bit in the word indicating a defective bit therein that is the negation of the bit to be stored therein;

c. first gating means operative to have inputed thereto any signals generated by said exclusive OR gate means for generating a flag bit upon the receipt thereof indicating a logical complementing required of the word to be stored;

d. second gating means operative to have inputed thereto the word to be stored for outputing a signal that is a complemented representation thereof if the flag bit from said first gating means is received concurrently for storage in the memory of the word including the flag bit when present; and

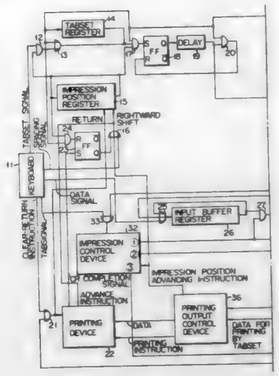
e. third gating means operative to have inputed thereto the word read from the memory for outputing a complemented representation thereof when the flag bit included in the word by said second gating means is concurrently present.

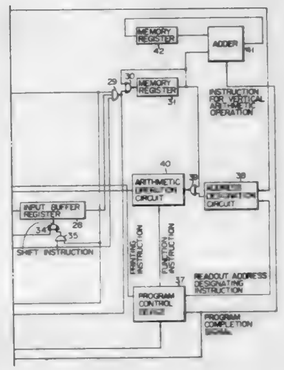
4,045,780

APPARATUS FOR ARITHMETICALLY PROCESSING BILL RECORDS

Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 465,725, April 30, 1974, abandoned, which is a continuation of Ser. No. 371,472, June 19, 1973, abandoned. This application July 24, 1975, Ser. No. 598,801
Int. Cl.² B41J *25/18*
U.S. Cl. 364—900 **7 Claims**





1. An apparatus for arithmetically processing bill records which comprises means for supplying numerical data; arithmetic operation means coupled to said means for supplying for arithmetically processing numerical data delivered from the means for supplying numerical data in accordance with the required type of arithmetic operation of numerical data being entered in a plurality of columns conforming to a given form of a bill; tabset signal input means for producing a plurality of tabset signals denoting boundaries between every adjacent column so as to determine a number of digits being impressed in respective columns conforming to said given form of a bill prior to supply of said numerical data; a tabset position memory register coupled to said tabset signal input means for storing a tabset signal issued from the tabset signal input means; a column signal generator coupled to said tabset position memory for giving forth a signal denoting the width of each column upon receipt of a tabset signal from said tabset position memory; first memory means coupled to said arithmetic operation means and to said column signal generator and having the same digit storing capacity as said tabset position memory and having its digit storing capacity divided in accordance with column width signals sent forth from the column signal generator for entering numerical data being recorded in the respective

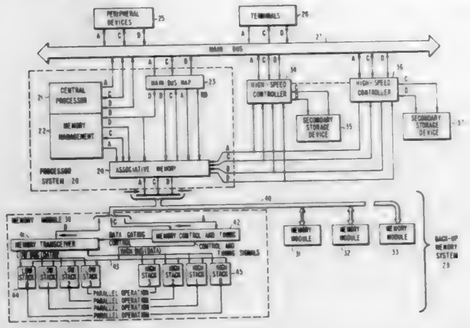
columns of a bill and results of arithmetic operation delivered from said arithmetic operation means in series in corresponding addresses of the first memory means; and printing means coupled to said first memory means for impressing numerical data stored in the first memory means in the corresponding columns of the bill.

4,045,781

MEMORY MODULE WITH SELECTABLE BYTE ADDRESSING FOR DIGITAL DATA PROCESSING SYSTEM

John V. Levy, Harvard; Thomas A. Northrup, Westford, and Robert Giggi, Peabody, all of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 13, 1976, Ser. No. 658,071
Int. Cl.[2] G06F 9/10
U.S. Cl. 364—200 **10 Claims**



1. A random access memory module for connection in a memory system in a digital data processing system wherein the memory system includes a bus, means for transmitting onto the bus binary signals including address signals, control signals, and data signals representing digital data, the control signals including a plurality of byte masking signals, and receiving means for receiving from the bus certain of the control signals, said random access memory module comprising:

A. data coupling means for receiving data signals from the bus,

B. addressable storage means including:

i. a plurality of addressable storage locations, and

ii. memory cycle control means for controlling memory cycles during which the digital data corresponding to the data signals from said data coupling means alters the digital data in identified ones of said addressable storage locations, the digital data at each said storage location being organized in digital bytes and each digital byte having a plurality of binary bit positions,

C. address decoding means responsive to the address signals transmitted over the bus for producing an enabling signal when the address signals identify a said storage location in said addressable storage means,

D. byte mask storage means for storing the byte masking signals received from the bus through said receiving means, each combination of byte masking signals designating a combination of digital bytes at the identified said storage location, and

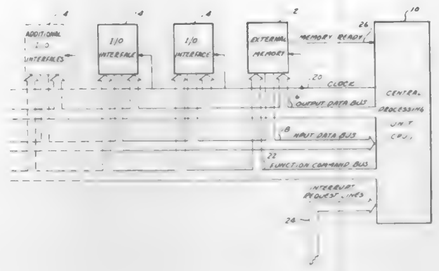
E. timing control means responsive to the enabling signal, to the contents of said byte mask storage means and to said receiving means for causing said memory cycle control means to initiate a memory cycle that alters simultaneously the binary bit positions in the digital bytes designated by the byte masking signals at the identified said storage location in accordance with data signals from said data coupling means.

4,045,782

MICROPROGRAMMED PROCESSOR SYSTEM HAVING EXTERNAL MEMORY

Terry M. Anderson, Minnetonka, and Reinhard Schumann, St. Paul, both of Minn., assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed Mar. 29, 1976, Ser. No. 671,730
Int. Cl.[2] G06F 9/16, 13/00
U.S. Cl. 364—200 **13 Claims**



1. A data processing system including a central processing unit and external memory, said central processing unit comprising:

an arithmetic logic unit having first and second inputs for receiving input data and an output for carrying output data therefrom;

a first group of registers and a second group of registers each having an input connected to said arithmetic logic unit output for receiving and storing data therefrom and an output for outputting stored data;

means for selectively connecting the output of one of said registers of said first group to said first input only and for connecting the output of one of said registers of said second group with said second input only of said arithmetic logic unit;

a read only memory, said memory having a plurality of addressable word locations each storing a control instruction, and having a plurality of outputs for supplying control signals in dependence upon the addressed word location;

first means for carrying signals outputted from said arithmetic logic unit and adapted to be applied to said external memory for addressing said external memory and for storing therein data outputted from said arithmetic logic unit;

second addressing means, independent of said first means, for addressing one of said word locations of said read only memory so as to output control signals therefrom, said second addressing means having a first operating mode for incrementally addressing said word locations in a predetermined sequence, and a second actuatable operating mode for addressing a selected one of said word locations in dependence upon the data outputted from said arithmetic logic unit;

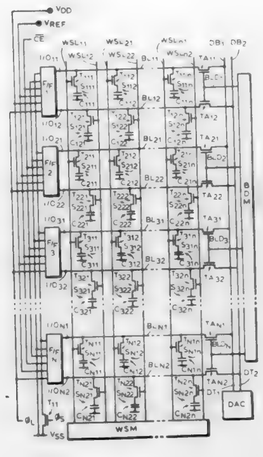
and mode control means for actuating said second addressing means from said first mode to said second mode in dependence upon the instructions represented by control signals supplied from given ones of said read only memory outputs.

4,045,783

MOS ONE TRANSISTOR CELL RAM HAVING DIVIDED AND BALANCED BIT LINES, COUPLED BY REGENERATIVE FLIP-FLOP SENSE AMPLIFIERS, AND BALANCED ACCESS CIRCUITRY

Robert Francis Harland, Stittsville, Canada, assignor to Standard Microsystems Corporation, Hauppauge, N.Y.

Filed Apr. 12, 1976, Ser. No. 676,066
Int. Cl.[2] G11C 11/40
U.S. Cl. 340—173 R **10 Claims**



1. A dynamic MOS memory having a plurality of storage elements arranged; as a matrix, in rows and columns, each of said storage elements comprising a MOS transistor connected in series with a storage capacitor means said memory further comprising:

a. a balanced data access circuit for reading the binary status of, or writing a binary signal in, any selected storage element, said access circuit having first and second complementary data terminals;

b. a balanced data access bus, having first and second complementary data bus lines, the first and second complementary data bus lines being respectively connected to the first and second complementary data terminals of the balanced data access circuit;

c. a plurality of regenerative flip-flop balanced sense amplifiers, each of said sense amplifiers having first and second input/output nodes;

d. a plurality of bit lines, each bit line being divided into a first and a second part, the MOS transistors of the storage elements corresponding to any one bit line being connected in substantially equal number to the first and second parts of said any one bit line, the first and second parts of any one bit line, being respectively connected to the first and second input/output nodes of the regenerative flip-flop balanced sense amplifier corresponding to said any one bit line, and extending, adjacent each other, from said sense amplifier to the balanced data access bus for respective connection through a first and a second MOS access transistor to the first and second complementary data bus lines;

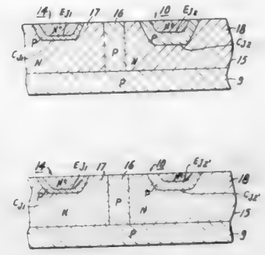
whereby, by turning ON the first and second MOS access transistors corresponding to a particular bit line, a substantially electrically balanced path is established from the first and second input/output nodes of the regenerative flip-flop balanced sense amplifier corresponding to said particular bit line to the first and second complementary data terminals of the balanced data access circuit.

4,045,784

PROGRAMMABLE READ ONLY MEMORY INTEGRATED CIRCUIT DEVICE

Hiroshi Mayumi; Yoshinobu Natsui, and Norio Kusunose, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,283
Claims priority, application Japan, Jan. 10, 1975, 50-5464
Int. Cl.[2] G11C 17/00, 11/40, 7/00
U.S. Cl. 340—173 SP **3 Claims**



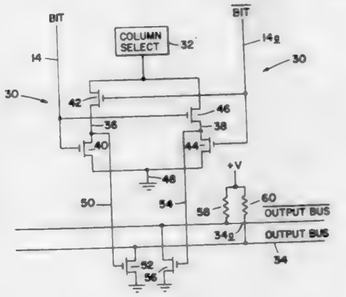
1. A read only memory integrated circuit device comprising a semiconductor substrate, a memory array including a column conductor and a first group of transistors serving as memory elements integrated on a surface of said semiconductor substrate, each of said transistors having emitter, base, and collector regions, said emitter region being connected to said column conductor, said base region being located below said emitter region and being at a floating potential, said collector region being located below said base region and forming the row of said memory array, and programming means including a second group of transistors integrated on said surface of said semiconductor substrate for applying a voltage between the emitter and collector regions of at least one selected transistor of said first group of transistors to reverse bias the emitter-base junction of said selected transistor, thereby to cause a short-circuit of said emitter-base junction, the base width of said first group of transistors exceeding that of said second group of transistors.

4,045,785

SENSE AMPLIFIER FOR STATIC MEMORY DEVICE

James William Kirkpatrick, Jr., Santa Clara, Calif., assignor to American Microsystems, Inc., Santa Clara, Calif.

Filed Nov. 5, 1975, Ser. No. 629,032
Int. Cl.[2] G11C 7/06
U.S. Cl. 340—173 R **3 Claims**



2. A static MOSFET memory device comprising:

an array of memory cells, each connected to one of a series of address lines and to a pair of complementary bit lines forming one of a series of bit columns;

a pair of complementary output bus lines connected through a pair of load elements to a constant voltage supply source;

pullup means for applying a constant direct current bias to the complementary bit lines of each said bit column;

a sense-amplifier for each said bit column, each said sense-amplifier comprising a pair of MOSFET signal transistors each having a source connected to ground potential and a drain connected to one of said output bus lines;

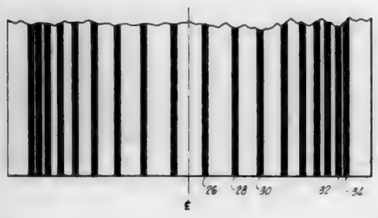
and a voltage translater section connected to said complementary bit lines of the bit column and to the gates of said MOSFET signal transistors for shifting the voltage levels on said bit lines to a lower level close to the threshold of said signal transistors.

4,045,786

MAGNETIC DOMAIN MEMORY DEVICE HAVING AN IMPROVED DRIVE COIL ARRANGEMENT

Fred S. Lee, Oklahoma City, and William F. Neu, Bethany, both of Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Sept. 3, 1974, Ser. No. 503,023
Int. Cl.² G11C *19/08*
U.S. Cl. 340—174 TF **2 Claims**



1. A magnetic domain memory device including substrates carrying domain materials, and independently energizable drive coils positioned to encompass said substrate for generating magnetic fields whose lines of force are parallel to the surface of said magnetic domain memory device, the improvement wherein:

each of said drive coils includes a plurality of individual adjacent conductors, the spacing between the individual conductors gradually increasing as the centerline of the coils is approached from opposite edges of the coil for providing a plateau in the distribution of said magnetic fields, thus maximizing the useful area in said substrate; and

said magnetic domain memory device further including means for energizing each of said coils for generating said magnetic fields.

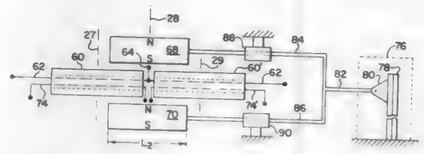
4,045,787

SENSORS FOR SENSING A PLURALITY OF PARAMETERS

Edward Frank Sidor, Lombard; Charles Carl Camillo, Western Springs, and Glenn W. Bowen, Northbrook, all of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed Mar. 18, 1976, Ser. No. 668,093
Int. Cl.² G08C *19/06*; H01F *21/06*
U.S. Cl. 340—197 **2 Claims**

1. A sensing device comprising first and second inductively wound magnetic cores having different inductance vs. ambient temperature characteristics so that the inductance vs. ambient temperature characteristics of the two cores intersect at a temperature which is to be sensed, a source of voltage coupled to said inductively would cores, sensing means coupled to said cores to detect when said inductances of said cores are approximately equal, permanent magnet means positionable adjacent said cores, and a temperature responsive control means responsive to a temperature condition other than said ambient temperature for positioning said magnet means relative to said cores.

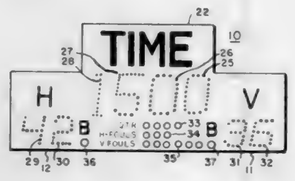


4,045,788

ALLPURPOSE PORTABLE SCOREBOARD

Joseph T. Castelli; Joseph J. Forrester, both of Pittsburgh, and Stephen Symosko, McDonald, all of Pa., assignors to Instrument Services, Inc., Bridgeville, Pa.

Filed Apr. 27, 1976, Ser. No. 680,962
Int. Cl.² G08B *23/00*
U.S. Cl. 340—323 R **18 Claims**



12. A portable scoring apparatus usable for a variety of sports comprising:

a first plurality of variable numerical displays for indicating selected one digit numbers;

automatic control means for operating said first plurality of variable numerical indicators as a clock which can count up and count down;

selector means connected to said automatic control means for selecting either up counting or down counting;

a second plurality of variable numerical displays for indicating selected one digit numbers;

manual control means for controlling said first and second plurality of variable numerical displays manually; and,

placard means containing descriptive material attachable to the scoreboard for adapting the scoreboard for use with a variety of sports.

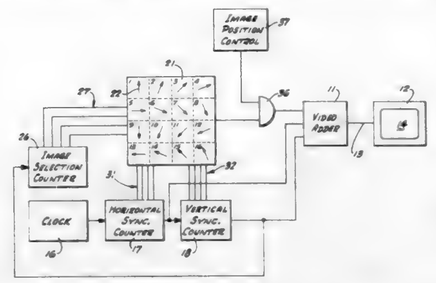
4,045,789

ANIMATED VIDEO IMAGE DISPLAY SYSTEM AND METHOD

Stephen D. Bristow, San Jose, Calif., assignor to Atari, Inc., Sunnyvale, Calif.

Filed Oct. 29, 1975, Ser. No. 626,664
Int. Cl.² H04N *7/02*; G06K *15/20*
U.S. Cl. 340—324 AD **17 Claims**

1. In a method of producing an animated image of a moving object on a video display screen, the steps of: storing digital data for a plurality of progressively different images of the object at individually addressable locations in a randomly accessible memory applying address signals to the memory to read the data for the images out of the memory, and displaying the images corresponding to the data from the memory at predetermined locations on the screen.

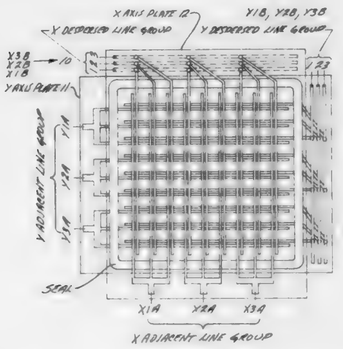


4,045,790

MATRIX DISCHARGE LOGIC DISPLAY SYSTEM

John W. V. Miller, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 22, 1975, Ser. No. 606,986
Int. Cl.² H01J *17/48*
U.S. Cl. 340—324 M **3 Claims**



1. A gas discharge display panel system comprising in combination

a gas discharge panel having an array of information display sites each information display site is a crosspoint of crossed electrode arrays, and each electrode in each of said arrays is split and multiplexable to define adjacent electrode line groupings and dispersed electrode line groupings each constructed to operate by matrix discharge logic whereby each information display site in said panel is constituted by at least a pair of positionally related cell sides, each cell side being positionally related to the other of said cell sides such that if at a given information display site one of the said related sides thereat has been erased, the erased side will be rewritten by influence of said positional relationship to a related cell side,

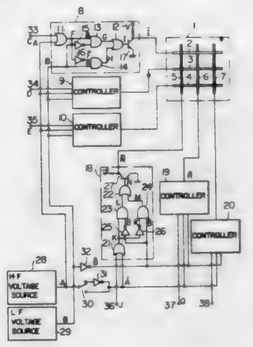
means for bulk writing information to a selected block of display sites in said panel, including means for supplying periodic sustainer potentials to said information display sites, said means for bulk writing further includes means connecting adjacent electrode lines of consecutive pairs to each other in groups and means connecting dispersed electrode lines of each pair in groups, said means for bulk writing includes address write and erase voltage pulse circuit means, and said address write voltage pulse circuit means is connected to supply address write voltage pulses to selected ones of said adjacent line groupings and address erase voltage pulses are selectively applied to all said conductor groupings.

4,045,791

APPARATUS FOR DRIVING LIQUID CRYSTAL DISPLAY DEVICE WHEREIN THE SIGNAL APPLIED THERETO IS VARIED IN ACCORDANCE WITH THE TEMPERATURE OF THE DEVICE

Masakazu Fukai, Nishinomiya; Seiichi Nagata, Sakai; Komei Asai, Hirakata, and Katsuji Hattori, Uji, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Division of Ser. No. 347,631, April 4, 1973, Pat. No. 3,921,162.
This application Oct. 3, 1975, Ser. No. 619,256
Claims priority, application Japan, Apr. 6, 1972, 47-34984
Int. Cl.² G09F *9/32*
U.S. Cl. 340—324 M **11 Claims**



1. Apparatus for driving a liquid crystal display device having a matrix structure including two flat substrates, a nematic liquid crystal layer and first and second groups of electrodes disposed respectively on opposite surfaces of said substrates, the electrodes of said first group, the electrodes of said second group and the liquid crystal layer interposed therebetween defining at least one electrode intersection, said apparatus comprising:

a. a plurality of first controllers, each of said first controllers having first, second and gating inputs and an output coupled to an associated electrode of said first group;

b. a plurality of second controllers, each of said second controllers having first, second and gating inputs and an output coupled to an associated electrode of said second group;

c. first and second pulse driving voltage means coupled to the first inputs of said first and second controllers respectively for applying pulse driving voltages having a predetermined frequency to selected electrodes of said first and second groups;

d. temperature detector means coupled to said liquid crystal display device for measuring the temperature adjacent said nematic liquid crystal layer, said temperature detector means changing the magnitudes of the voltages applied to all of the electrodes of said first and second groups in accordance with changes in the temperature of said liquid crystal layer;

e. first a. c. signal generating means coupled to the second inputs of said first and second controllers, said first a. c. signal generating means generating a first signal voltage having a frequency higher than that of said first and second pulse driving voltages; and

f. second a. c. signal generating means coupled to the gating inputs of said first and second controllers, said second a. c. signal generating means generating a second signal voltage having a frequency different from that of said first and second pulse driving means for controlling application of said pulse driving voltages and first a. c. signal to said first

and second groups of electrodes, dynamic scattering being produced in said liquid crystal layer at positions defined by the intersections of electrodes of said first and second groups to which pulse driving voltages have been applied and dynamic scattering being suppressed at the other electrode intersections, the temperature range wherein dynamic scattering is produced being widened as a result of the change in magnitude of the voltage applied to said electrodes as a function of the change in temperature of said liquid crystal layer.

4,045,792

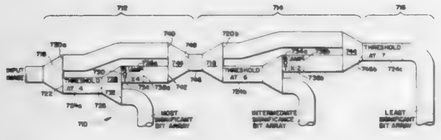
ANALOG TO DIGITAL CONVERTER FOR TWO-DIMENSIONAL RADIANT ENERGY ARRAY COMPUTERS

David H. Schaefer, Silver Spring, and James P. Strong, III, Upper Marlboro, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 468,614, May 8, 1974, Pat. No. 3,996,455. This application Feb. 13, 1976, Ser. No. 657,997

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **8 Claims**



1. A radiant energy array analog to digital converter stage for deriving a bit array of digital radiant energy signals representative of the amplitudes of an input radiant energy analog signal array and for deriving an output radiant energy analog signal array to serve as an input to succeeding stages comprising:

means for forming a digital radiant energy array which includes;

first duplicating means for receiving said input radiant energy analog signal array and forming a pair of duplicate input signal arrays therefrom,

thresholding means responsive to one of said duplicate input signal arrays wherein an output signal array of said thresholding device is less than a predetermined threshold level when said one of said duplicate input signal arrays is more than said predetermined threshold level and wherein said output signal array of said thresholding device is more than said predetermined threshold level when said one of said duplicate input signal arrays is less than said predetermined threshold level,

second duplicating means connected to said thresholding means for receiving said thresholding means output signal array and forming a pair of duplicate output signal arrays therefrom, and

gating means connected to said second duplicating means for receiving and inverting one of said duplicate output signal arrays,

means for relatively scaling the radiant energy signal levels of the input array and said digital array so that the radiant energy signal level carried by said digital array corresponds to said threshold level, and

means for adding the signals of said relatively scaled input and digital arrays at corresponding array positions to form the output analog array.

4,045,793

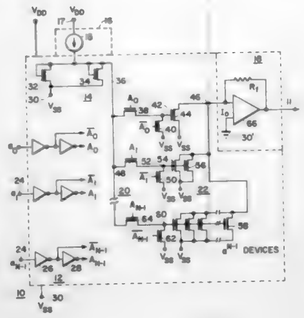
DIGITAL TO ANALOG CONVERTER

Jerry Dale Moench, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 29, 1975, Ser. No. 617,923

Int. Cl.² H03K *13/04*

U.S. Cl. 340—347 DA **4 Claims**



4. A digital to analog converter comprising:

N binary inputs for applying N signals representative of an N bit binary number to said digital to analog converter, N being an integer;

a first conductor for conducting an analog current representative of said N bit binary number;

N groups of FET electron control devices, each having a control electrode and two controlled electrodes thereof, each of said electron control devices being connected by means of its controlled electrodes to a reference voltage conductor and to said first conductor, the control electrodes of all electron control devices in each of said groups, respectively, being connected to the control electrodes of the other electron control devices in the same one of said groups, each of said groups, respectively, including 2^n of said electron control devices, wherein n has a separate integer value in the range $0 \leqq n \leqq (N-1)$ for each one of said groups, respectively;

reference means for generating a reference voltage which varies substantially at the same rate as the threshold voltage of said electron control devices; and

input means coupled to said N inputs and to said control electrodes of each of said groups of electron control devices and to said reference means for coupling said reference voltage to said control electrodes of each of said groups of electron control devices in response to said N signals.

4,045,794

ALARM INDICATING SYSTEM

Jun Ohta, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 23, 1976, Ser. No. 669,728

Claims priority, application Japan, Mar. 25, 1975, 50-35964; Oct. 9, 1975, 50-122779

Int. Cl.² G08B *19/00*

U.S. Cl. 340—414 **10 Claims**

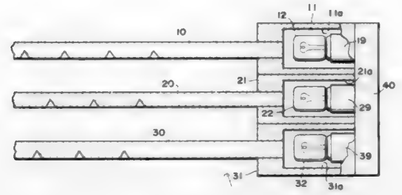
1. An alarm indicating system for indicating abnormalities occurring in specific objects having a functional importance according to a predetermined order of priority, comprising:

a plurality of layered indicator elements having respective alarm legends thereon and light sources connected to a power source;

a plurality of corresponding drive circuit means connected to said respective indicator elements for energizing said light sources;

a plurality of corresponding abnormality detectors connected to said respective drive circuit means for sensing the occurrence of abnormalities in operation of the respective objects;

each of said drive circuit means including a transistor having its collector connected to one of said light sources and its base connected to one of said abnormality detectors;



a priority assigning means connected between each of said drive circuit means for actuating said drive circuit means according to a predetermined order or priority given thereto; and

a failure checkup circuit means connected between said power source and said drive circuit means for applying individually checkup signals to said drive circuit means.

4,045,795

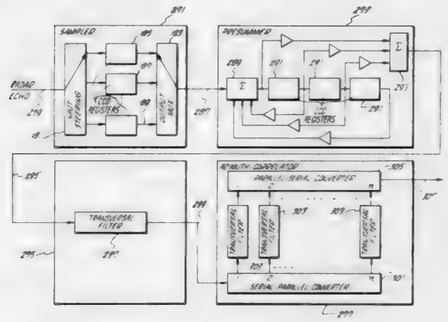
CHARGE-COUPLED DEVICE DATA PROCESSOR FOR AN AIRBORNE IMAGING RADAR SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Wayne E. Arens, Sierra Madre, Calif.

Filed June 23, 1975, Ser. No. 589,119

Int. Cl.² G01S *7/30, 9/02*

U.S. Cl. 343—5 CM **15 Claims**



1. A data processor for a synthetic aperture imaging radar system having a transmitter and receiver, said processor comprising:

a demultiplexer sampling the analog output signals from said receiver, each sample being a charge proportional to the output signal voltage amplitude, and sequentially connecting the samples to a plurality of output lines;

a charge-coupled device serial shift register connected to each output line of said demultiplexer for receiving the samples of voltage amplitudes at its input and storing them as charges proportional to their respective voltage amplitude samples;

a multiplexer with its inputs connected to respective outputs of said charge-coupled device shift registers for sequentially selecting the charges from the shift registers;

means for correlating each charge sample from said multiplexer with its respective range parameter; and

means for correlating the range identified charge samples with their respective azimuth parameter.

4,045,796

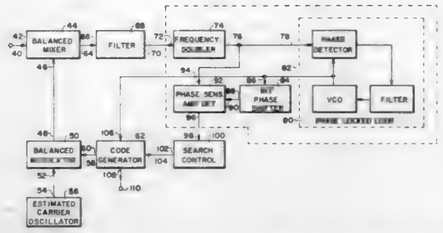
CORRELATION SYSTEM FOR PSEUDO-RANDOM NOISE SIGNALS

Arthur Jonathan Kline, Jr., Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 524,847, Nov. 18, 1974. This application Nov. 12, 1976, Ser. No. 741,443

Int. Cl.² G01S *9/56*

U.S. Cl. 343—6.5 R **18 Claims**



1. A system for correlation of a first coded digital signal having a clock frequency with an identical coded digital signal of unknown time delay which is bi-phase modulated on a suppressed carrier signal, without recovery of the suppressed carrier signal, comprising:

means for inverting alternate bits of the first coded digital signal for providing a PN* signal having a frequency component at one-half the clock frequency of the first coded signal;

means for generating an estimated carrier signal;

means for modulating said estimated carrier signal with said PN* signal;

means for mixing said modulated signal with the identical coded signal of unknown time delay;

means for squaring said mixed signal for providing a coded signal having a clock frequency equal to the clock frequency of the first coded signal; and

means for controlling the phase of the first coded signal with said squared signal for correlating the first coded signal with the identical coded signal of unknown time delay.

4,045,797

RADAR DOPPLER FREQUENCY MEASURING APPARATUS

Mark K. Krage, Romeo, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 5, 1975, Ser. No. 637,934

Int. Cl.² G01S *9/44*

U.S. Cl. 343—8 **2 Claims**

1. A doppler frequency measuring circuit for use with a radar system having an rf generator, a transmitter effective to transmit the rf signal toward an object and a receiver effective to detect the rf signal reflected from the object, the doppler frequency measuring circuit comprising:

A phase shifter coupled to the rf generator and effective to supply a delayed rf signal having a specified delay angle relative to the generated rf signal;

a first mixer effective to mix the generated rf signal and the detected rf signal and supply a first doppler signal;

a second mixer effective to mix the delayed rf signal and the detected rf signal and supply a second doppler signal;

logic means responsive to the first and second doppler signals for detecting zero level cross-overs of one of the first and second doppler signals, the logic means including means for preventing the detection of a zero cross-over of said one of the first or second doppler signals after detection of a zero cross-over thereof until the other one of the first and second doppler signals experiences a zero level cross-over; and

means for measuring the time duration between detected

zero level cross-overs of said one of the first and second doppler signals, the measured time duration representing the frequency of the first and second doppler signals, whereby the measurement of the frequency of the doppler signals is substantially unaffected by noise signals over a large doppler frequency bandwidth.

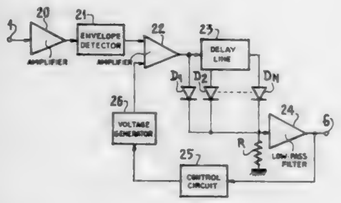
2. A doppler frequency measuring circuit for use with a radar system having an rf generator, a transmitter effective to transmit the rf signal toward an object and a receiver effective to detect the rf signal reflected from the object, the doppler frequency measuring circuit comprising:
- a phase shifter coupled to the rf generator and effective to supply a delayed rf signal having a specified delay angle relative to the generated rf signal;
- a first mixer effective to mix the generated rf signal and the detected rf signal and supply a first doppler signal;
- a second mixer effective to mix the delayed rf signal and the detected rf signal and supply a second doppler signal;
- a first comparator effective to generate a first digital signal having a transition between first and second states with each zero cross-over of the first doppler signal;
- a second comparator effective to generate a second digital signal having a transition between first and second states with each zero cross-over of the second doppler signal;
- a bi-stable multivibrator having first and second stable operating states;
- a first logic gate responsive to the first and second digital signals and effective to set the bi-stable multivibrator to one of the first and second stable operating states a point in time when a selected one of the states of each of the first and second digital signals exist simultaneously;
- a second logic gate responsive to the first and second digital signals and effective to reset the bi-stable multivibrator to the other one of the first and second stable operating states a point when neither of the selected one of the states of each of the first and second digital signals exits;
- and timing means effective to measure the time duration of at least one of the stable operating states of the bi-stable multivibrator, the measured time duration representing the frequency of the first and second doppler signals, whereby the measurement of the frequency of the doppler signals is substantially unaffected by noise signals over a large doppler frequency bandwidth.

4,045,798

BAND-COMPRESSION DEVICE

Roland Carre, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Jan. 6, 1976, Ser. No. 646,745
Claims priority, application France, Jan. 10, 1975, 75.00718
Int. Cl.² G01S *7/28*
U.S. Cl. 343—17.2 PC **4 Claims**



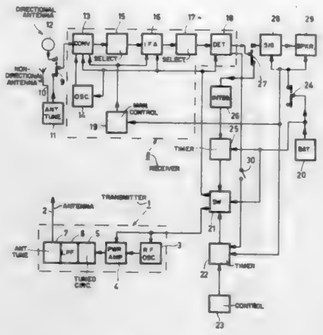
1. A band-compression device comprising an input terminal for receiving signals having a spectral width B, an output terminal for furnishing signals having a spectral width *b*, which is less than B, a variable-threshold gate of pass-band B, an amplifier circuit, a low-pass filter of pass-band *b*, and means for connecting said gate, circuit and filter in series between said input and output terminals with said gate connected to said input terminal and said filter connected to said output terminal, wherein said threshold gate comprises in series an envelope detector circuit, an amplifier-adder supplied with the output signal from a detector on one input and a reference voltage on another input, a tapped delay line connected to the output of the amplifier-adder, and an OR gate with diodes connected to the delay line tappings, the output of the OR-gate being connected to said amplifier circuit.

4,045,799

RADIO LOCATING UNIT FOR PERSONS IN DISTRESS

Fulvio Dapiran, Milan, Italy, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 15, 1975, Ser. No. 622,775
Claims priority, application Italy, Oct. 17, 1974, 28553/74
Int. Cl.² G01S *5/02*
U.S. Cl. 343—113 PT **3 Claims**



1. A radio locating unit for persons in distress comprising a radio signal transmitter provided with an aerial for the transmission of a radio signal with a predetermined frequency and a receiver provided with an omni-directional aerial for the receiving of signals with said predetermined frequency, characterized in that the receiver is further provided with a directional receiving aerial and a first change-over contact movable manually from a rest position at which the receiver input is connected to the omni-directional receiving aerial, so that the unit performs as a transceiver suited to respond to any call signal picked up by the receiver with an answer signal automatically transmitted by the transmitter, to an emergency position at which the receiver input is connected to the directional receiving aerial so that the receiver acts as a radio direction finder adapted to pick up answer signals, whereby the transmitter acts as call transmitter and thereby permitting the tracking and location of signal sources.

4,045,800

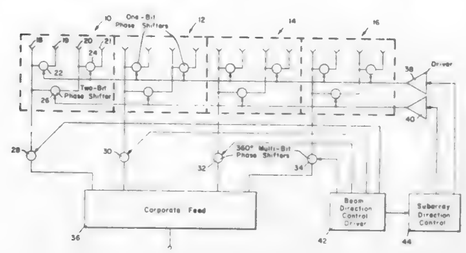
PHASE STEERED SUBARRAY ANTENNA

Raymond Tang, and Nam San Wong, both of Fullerton, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed May 22, 1975, Ser. No. 580,086
Int. Cl.² H01Q *3/26*
U.S. Cl. 343—854 **11 Claims**

1. A phasee steered subarray antenna having an input-output junction, said antenna comprising an array of radiating elements divided equally into a plurality of subarrays, each having no less than one pair of radiating elements; means coupled between said input-output junction and each of said subarrays for dividing the energy of a signal applied to said input-output junction equally among said subarrays whereby the beam pattern of said antenna array includes a narrow main beam with grating lobes on both sides thereof; means including a multi-bit phase shifter interconnected in series with each of said subarrays for determining the direction of said narrow main beam; and means responsive to said direction of said narrow main beam including no more than a one-bit phase shifter interconnected between each pair of radiating elements

in each of said subarrays for concurrently and individually stepping the direction of the beam patterns of each of said



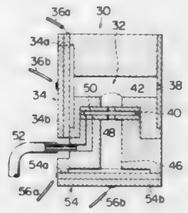
subarrays to a position to make the nulls on both sides thereof approximate the position of said grating lobes thereby to minimize the resultant amplitude thereof.

4,045,801

INK EJECTION HEAD FOR PRINTER

Kyuhachiro Iwasaki, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed May 26, 1976, Ser. No. 690,130
Claims priority, application Japan, June 3, 1975, 50-66895
Int. Cl.² G01D *15/16*
U.S. Cl. 346—140 R **8 Claims**



1. An ink ejection head defining:
- an ink ejection chamber;
- an ink ejection orifice communicating with the ink ejection chamber;
- an ink supply chamber;
- an ink supply orifice communicating the ink supply chamber with the ink ejection chamber;
- an ink inlet communicating with the ink supply chamber;
- a pressure chamber; and
- a pressure orifice communicating the pressure chamber with the ink supply chamber;
- the ink ejection head comprising means for reducing a volume of the pressure chamber for ink ejection.

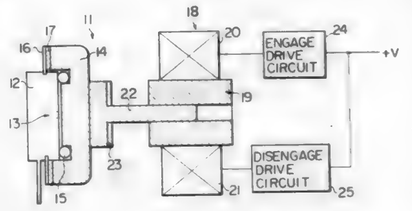
4,045,802

INK EJECTION PRINTING APPARATUS COMPRISING AUTOMATICALLY ACTUATED EJECTION ORIFICE CAP

Takao Fukazawa; Takuro Isayama; Kyuhachiro Iwasaki, and Hiromichi Komai, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed July 27, 1976, Ser. No. 709,021
Claims priority, application Japan, July 29, 1975, 50-92369; Nov. 13, 1975, 50-136483
Int. Cl.² G01D *15/18*
U.S. Cl. 346—140 R **15 Claims**

1. An ink ejection printing apparatus comprising:
- an ink ejection head formed with an ink ejection orifice;
- a cap movable between a disengaged position spaced from the ink ejection head and an engaged position in engagement with the ink ejection head hermetically sealing the ink ejection orifice;
- first biasing means urging the cap to the engaged position; and



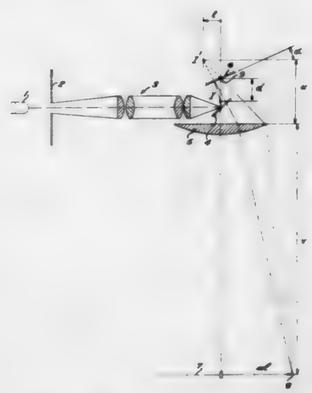
- second biasing means to move the cap to the disengaged position against a force of the first biasing means.

4,045,803

PHOTOCOMPOSING APPARATUS

Howard Raymond Baylis, East Grinstead, and Roger Alan Edwards, Crawley Down, both of England, assignors to The Monotype Corporation Limited, Salfords, England

Filed Aug. 1, 1975, Ser. No. 600,960
Claims priority, application United Kingdom, Aug. 6, 1974, 34656/74
Int. Cl.² B41B *13/00*
U.S. Cl. 354—5 **9 Claims**



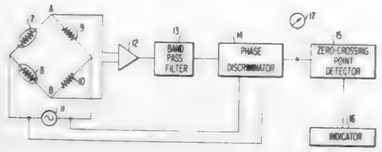
1. Photocomposing apparatus comprising a projection system for projecting optical images of characters selected from a matrix of master characters onto a photosensitive recording member, wherein the projection system includes: a mirror which is rotatable to displace projected optical images with respect to the recording member; a wide angle lens for focussing the projected optical images onto a substantially flat image recording plane coincident with the recording member; means for illuminating the character matrix and producing a light beam bearing images of the selected characters; and means for focussing said light beam to produce a first fixed image of the selected characters which provides, by the action of said rotatable mirror, a second image forming an object for the wide-angle lens which is selectively positionable in a substantially flat object plane.

4,045,804

FOCUS DETECTING DEVICE

Hideomi Takeda, and Kazuo Kikuchi, both of Tokyo, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1975, Ser. No. 629,433
Claims priority, application Japan, Nov. 7, 1974, 49-128384
Int. Cl.² G02B *23/02*
U.S. Cl. 354—25 **5 Claims**



1. In an apparatus of the type having a focusing lens movable relative to a focal plane F_0 for focusing light from a scene onto said focal plane and a system for developing an electrical signal indicative of an in-focus condition, the improvement comprising, first light sensing means positioned to sense light, after passing through said lens, in a plane which is positioned optically close to said lens relative to said focal plane F_0, second light sensing means positioned to sense light after passing through said lens, in a plane which is positioned optically further from said lens relative to said focal plane F_0, and a.c. circuit means, including said first and second light sensing means, for developing a.c. signal having an amplitude dependent upon the diferent amount of light sensed by said first and second sensing means and a phase dependent upon which one of said sensing means senses the greater amount of light, said a.c. circuit means comprising, a bridge network having four legs, said first and second sensing means being the first and second legs of said bridge circuit, and a pair of resistors being the third and fourth legs of said bridge circuit, means for applying an input a.c. voltage of a predetermined frequency between the junction of said first and second sensing means and the junction of said pair of resistors, the output terminals of said bridge circuit being taken between the junction of said first sensing means and one of said pair of resistors and the junction of said second sensing means and the other of said pair of resistors, a differential amplifier means having first and second input terminals, connected respectively to said output terminals of said bridge circuit, and an output terminal, and a bandpass filter connected to the output of said differential amplifier, said bandpass filter having a center frequency substantially the same as said predetermined frequency and being adapted to reject noise frequency caused by relatively slow movement of said apparatus as said lens is focused, said apparatus further comprising phase discriminator means responsive to said developed a.c. signal and said input a.c. voltage for generating an output signal having a voltage characteristic which is substantially zero when said apparatus is in focus and which increases rapidly at opposite polarities when said lens is too far or too close, respectively, to F_0 for an accurate in-focus condition.

4,045,805

AUTOMATIC FOCUSING APPARATUS

Mitsuru Saito, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 15, 1975, Ser. No. 641,040
Claims priority, application Japan, Dec. 19, 1974, 49-147258
Int. Cl.² G03B *7/08*
U.S. Cl. 354—25 **13 Claims**

1. Automatic focusing apparatus for an optical system which forms an image of an object on an image plane, comprising:

a. photoelectric means;

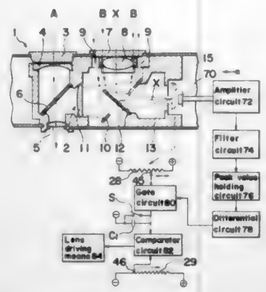
b. optical means for forming substantially the same image as that focused by said optical system on said image plane, said photoelectric means being so constructed to generate output signal continuously in response to brightness distribution in the image formed thereon by said optical means;

c. means for changing distance between said photoelectric means and said optical means;

d. means for generating an electric signal representative of said distance;

e. circuit means for holding peak value in the outputs of said photoelectric means;

f. storing means for storing said distance signal;



g. gate means for allowing said distance signal to enter said storing means only when said gate means is open;

h. first comparator means for comparing peak value held by said circuit means with output signal of said photoelectric means and for opening said gate means when a peak value larger than held one is detected; and

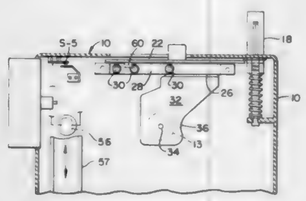
i. means for adjusting said optical system in accordance with distance signal finally stored in said storing means.

4,045,806

EXTENDED RANGE EXPOSURE CONTROL SYSTEM

Seymour Ellin, Brookline, and John R. Sharp, Squantum, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Aug. 23, 1976, Ser. No. 716,362
Int. Cl.² G03B *7/00, 9/04*
U.S. Cl. 354—37 **8 Claims**



7. In an exposure control system for photographic cameras having a shutter housing with a front wall mounting an objective lens, an externally accessible aperture plate mechanism slideable within the housing between a first position providing a reduced diaphragm stop and a second position providing a maximum relative lens aperture thereby providing an identical exposure parameter respectively for high and low speed films under the same scene light levels, a shutter, and a light sensitive circuit means having an RC timing network including a photoconductive cell exposed through the front housing wall to vary the operating speed of the shutter in accordance with the light level of the scene to be photographed, the improvement comprising:

means for mounting said aperture plate mechanism for movement to a third position also providing said maximum relative lens aperture; and

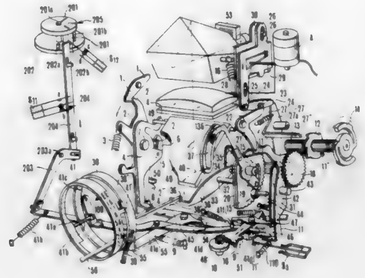
a switch engageable by said aperture plate mechanism in said third position to shift the light level exposure sensitivity of said circuit for proper exposure of said high-speed film at said maximum relative lens aperture under relatively dim levels of scene illumination.

4,045,807

AUTOMATIC EXPOSURE CONTROL APPARATUS WHICH PREVENTS SIMULTANEOUS DIAPHRAGM AND SHUTTER SPEED PRESELECTION

Fumio Ito; Tadashi Ito, both of Yokohama; Yasuo Isobe, Kawasaki, and Soichi Nakamoto, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 482,895, June 25, 1974, abandoned.
This application Dec. 5, 1975, Ser. No. 638,029
Claims priority, application Japan, June 27, 1973, 48-72398
Int. Cl.² G03B *7/08, 9/00*
U.S. Cl. 354—38 **6 Claims**



1. An exposure control apparatus for a camera adapted for automatic exposure by means of either a shutter speed preselection system or a diaphragm preselection system comprising:

a shutter speed setting member having a single automatic setting adjustment position and a plurality of manual setting adjustment positions and including a shutter speed control means being connected with said setting member;

a diaphragm setting member provided apart from said shutter speed setting member having a single automatic setting adjustment position and a plurality of manual setting adjustment positions, and including a diaphragm control means being connected with said setting member;

a first interference member fixed to said shutter speed setting member and rotatable to a predetermined adjustment position only when said diaphragm member is not in an automatic adjustment position; and

a second interference member mounted for sliding along a guide and capable of entering the path of rotation of said first interference member in association with the movement of a diaphragm setting member to its automatic adjustment position only when said shutter speed setting member is not in an automatic adjustment position, one of said two interference members interfering with the movement of the other member to said predetermined adjustment position and preventing said movement when said predetermined adjustment position is initially occupied by the former interference member.

4,045,808

CAMERA MOUNTED FLASH EXTENDER AND POWER PACK THEREFOR

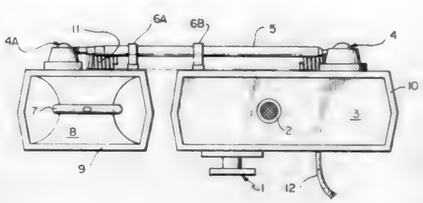
Dwayne L. King, 825 DeLucchi Lane No. 311, Reno, Nev. 89502

Continuation-in-part of Ser. No. 462,418, April 19, 1974, Pat. No. 3,893,145. This application June 2, 1975, Ser. No. 583,187
Int. Cl.² G03B *15/02*
U.S. Cl. 354—126 **5 Claims**

2. A photographic apparatus including in combination a telescopic extender means, coupling means for coupling a first end of said extender to a camera and flash illumination means coupled to a second end of said extender, the improvement comprising:

first ball joint means connecting said coupling means to said first end of said extender for pivotal movement about at least two mutually perpendicular axes passing substantially through said first end;

second ball joint means coupling said flash illumination means to said second end, said second ball joint means providing pivotal movement of said flash illumination means about at least two mutually perpendicular axes passing substantially through said second end;



said coupling means including a housing means connected between said camera and said first ball joint means for containing at least a power source for said flash illumination means;

first catch means disposed on said housing means for snapping engagement with said telescopic extender in a predetermined position of said extender; and

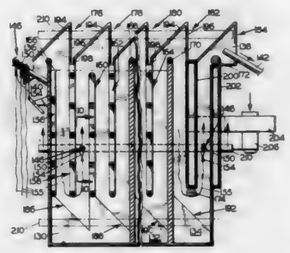
second catch means disposed on said flash illumination means for snapping engagement with said extender in a predetermined position of said flash illumination means.

4,045,809

PHOTOGRAPHIC FILM DEVELOPING APPARATUS

Richard D. Landers, Salem, Oreg., assignor to Kreonite, Inc., Wichita, Kans.

Filed July 2, 1974, Ser. No. 485,209
Int. Cl.² G03D *3/08*
U.S. Cl. 354—322 **6 Claims**



1. Photographic film processing apparatus, comprising:

a. means defining a series of adjacent, horizontally aligned chambers open at their upper ends, respectively, each of said chambers being adapted to contain a selected film-treating fluid agent;

b. a plurality of first unsymmetrical angular plates mounted at the bottoms of said chambers, respectively;

c. a plurality of second unsymmetrical angular plates mounted at the tops of said chambers in straddling relation across successive chambers, respectively;

d. at least one magnetic carriage arranged in one of said chambers;

e. releasable grip means mounted on said carriage for releasably gripping one end of a length of film, whereby the film is maintained in trailing relation to the carriage;

f. a permanent magnet arranged externally of said chambers, said permanent magnet being a horizontal bar magnet extending the length of said chambers; and

g. means for continuously displacing said permanent magnet

means vertically relative to said chambers, said second angular plates being so arranged that when the carriage is displaced upwardly toward the top of one chamber, it is displaced by the associated angular plate from the top of one chamber toward the top of the next successive chamber, thereby to effect transport of the carriage in succession through the chambers.

4,045,810

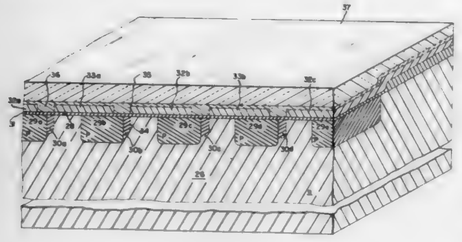
BUCKET-BRIGADE DELAY LINE HAVING REDUCED PARASITIC CAPACITANCES

Walter J. Butler, Scotia; Mark B. Barron, Camillus, both of N.Y.; Bruno F. Kurz, deceased, late of Niskayuna, N.Y., by Elizabeth Kurz-Beerli, executrix, also known as Elisabeth H. Kurz, Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 552,940, Feb. 25, 1975, Pat. No. 4,002,513. This application July 30, 1976, Ser. No. 710,021

Int. Cl.[2] H01L *29/78*; G11C *19/28*

U.S. Cl. 357—24 **3 Claims**



1. An MOS bucket-brigade delay line comprising

a semiconductor substrate of a first conductivity type,

a first plurality of laterally spaced apart regions of a second conductivity type, extending from one major surface of said substrate a first distance thereinto,

a layer of insulating material overlying said major surface of said substrate, and said first plurality of spaced apart regions,

a plurality laterally spaced apart refractory metal electrodes disposed on the surface of said layer of insulating material, one edge of each of which essentially overlaps one and only one of said spaced apart regions,

a second plurality of laterally spaced apart regions of said second conductivity type, each of which is contiguous with one of said first plurality of spaced apart regions and extending therefrom laterally towards the essentially non-overlapping edge of one of said refractory metal electrodes and extending into said substrate a distance less than said first distance.

4,045,811

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE INCLUDING AN ARRAY OF INSULATED GATE FIELD EFFECT TRANSISTORS

Andrew Gordon Francis Dingwall, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1975, Ser. No. 601,833

Int. Cl.[2] H01L *27/02, 27/10*

U.S. Cl. 357—41 **6 Claims**

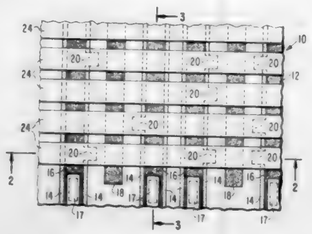
1. A monolithic integrated semiconductor device formed in a body of semiconductive material, initially of one type conductivity and having a surface, comprising:

a plurality of parallel, elongated regions of conductivity type opposite to that of said body in said body adjacent to said surface, said regions being arranged in pairs,

a lesser plurality of regions of said opposite type conductivity, each member of said lesser plurality of regions being disposed between the regions of a separate pair of the first-mentioned regions of opposite type conductivity,

insulating material on said surface over the spaces between said first-mentioned and second-mentioned regions of opposite type conductivity,

a plurality of conductive strips on said insulating material and extending transversely of said elongated regions of opposite type conductivity whereby a plurality of MOS transistors are defined at a plurality of locations in said semiconductor device, said second-mentioned regions of opposite type conductivity comprising the drain regions



of said transistors, said first-mentioned elongated regions comprising the source regions thereof and the spaces between said firstmentioned and said second-mentioned elongated regions of opposite type conductivity beneath said conductive strips comprising the conduction channel zones of said MOS transistors, and

means in said body in selected ones of said conduction channel zones for increasing the threshold potential of said selected ones of said conduction channel zones relative to the threshold potentials of unselected ones of said conduction channel zones.

4,045,812

COLOR TELEVISION RECORDING SYSTEM EMPLOYING FREQUENCY MODULATION AND PULSE WIDTH MODULATION

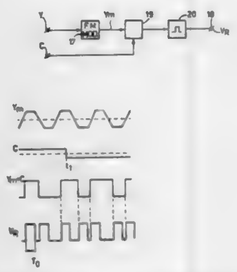
Leonardus Adrianus Johannes Verhoeven; Maarten Rutger De Haan, and Peter Johannes Michiel Janssen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 466,626, May 3, 1974, Pat. No. 3,982,272. This application Dec. 19, 1975, Ser. No. 642,293

Claims priority, application Netherlands, Feb. 13, 1974, 7401934

Int. Cl.[2] H04N *9/36, 5/79*

U.S. Cl. 358—4 **1 Claim**



1. A record carrier on which a color television signal having luminance and chrominance information is recorded with a low frequency chrominance signal having alternately from line to line two different single color components and a first carrier frequency modulated by the luminance information, said frequency modulated carrier being pulse-width modulated by the chrominance signal, said carrier comprising a pattern of blocks alternating with areas disposed along a track direction on said carrier, the blocks having a constant length in the track direction and representing the rising and falling edges of the frequency and pulse-width modulated first carrier.

4,045,813

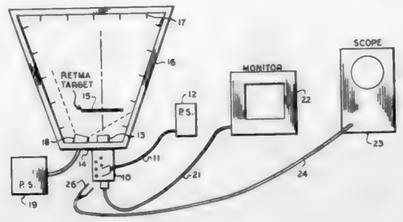
METHOD OF OPERATING VIDEO CAMERAS AND LIGHTS UNDERWATER

Richard F. Jones, Santa Barbara, Calif., assignor to General Aquadyne, Inc., Santa Barbara, Calif.

Filed July 10, 1975, Ser. No. 594,789

Int. Cl.[2] H04N *7/18*

U.S. Cl. 358—99 **7 Claims**



1. The method of operating a television camera and a light underwater wherein the light is adjacent to the camera and illuminates objects being imaged by the camera for the purpose of reducing reflections from foreground particles and dirt comprising:

a. adjusting the camera for clear image performance up to the point of signal clipping by exposure of the camera to a selected intensity of light of approximately the maximum expected to be encountered underwater;

b. adjusting the sensitivity of the camera within a range of five to ten times normal;

c. and utilizing a light source in the range of light equivalent to that delivered by reflectorized incandescent bulbs in the range of five to twenty-five watts.

4,045,814

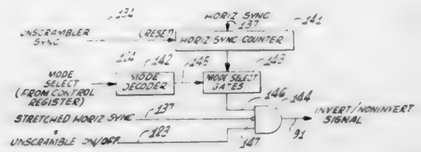
METHOD AND APPARATUS FOR SCRAMBLING AND UNSCRAMBLING COMMUNICATION SIGNALS

Albert F. Hartung, Woodland Hills; Frank W. Lehan, Santa Barbara; Charles T. Barooshian, Pacific Palisades, and Edward J. Zacharski, Malibu, all of Calif., assignors to System Development Corporation, Santa Monica, Calif.

Division of Ser. No. 388,439, Aug. 15, 1973, Pat. No. 3,919,462. This application Sept. 2, 1975, Ser. No. 609,572

Int. Cl.[2] H04N *1/44*

U.S. Cl. 358—124 **7 Claims**



1. For use with receivers in a subscription television system, a method of unscrambling television video signals scrambled by the inversion of portions corresponding to preselected lines in a television picture, comprising the steps of:

counting portions of the video signals corresponding to lines of the television picture in a counter having a plurality of digits;

inverting the video signals only when a particular digit of the counter is in a particular state;

receiving unscrambler mode selection signals encoded from time to time in vertical blanking intervals of the video signals; and

varying the selection of the particular digit from the counter in accordance with the received unscrambler mode selection signals, whereby selection of a digit of low significance in the counter results in frequency inversion of the video signals and selection of a digit of high significance in the counter results in less frequency inversion.

4,045,815

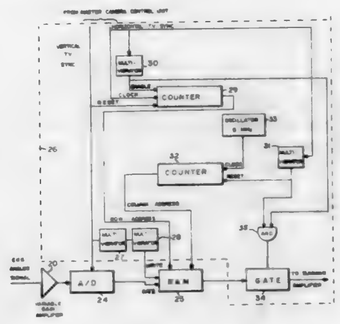
SYSTEM FOR COMBINING ANALOG AND IMAGE SIGNALS INTO A STANDARD VIDEO FORMAT

James M. Griffith, and Walter L. Henry, both of Bethesda, Md., assignors to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

Filed Feb. 4, 1976, Ser. No. 655,262

Int. Cl.[2] H04N *5/22*

U.S. Cl. 358—183 **11 Claims**



1. A system for combining at least one analog signal with video signals comprising:

an analog-to-digital converter having an analog signal input means and an enabling signal input means;

a random access memory having a data input means coupled to said analog-to-digital for receiving its digital output, said random access memory having a write input means, a row address input means and a column address input means;

a controlled gate circuit means having its data signal input means coupled to said random access memory for receiving its output, said gate circuit means having a control signal input means;

a source of vertical and horizontal sync signals;

first multivibrator means, second multivibrator means and third multivibrator means;

means coupling vertical sync signals from said source to said enabling signal input means of said analog-to-digital converter for enabling same upon occurrence of each vertical sync signal;

means coupling vertical sync signals from said source to an input of said first multivibrator means, said write input means of said random access memory being coupled to said first multivibrator means;

a first counter means having an enable input means, a clock input means and a reset input means, means for coupling vertical sync signals from said source to said reset input of said first counter means, means for coupling horizontal sync signals from said source to said clock input means of said first counter means, and means for coupling said enable input means of said first counter means to an output of said second multivibrator means, said second multivibrator means having its input means coupled to said source for receiving horizontal sync signals therefrom, and said row address input means of said random access

memory being coupled to said first counter means for receiving its output signals;

oscillator means;

a second counter means having a clock input means coupled to said oscillator means for receiving output signals therefrom and having reset input means coupled to said third multivibrator means for receiving output signals therefrom, said third multivibrator means having its input means coupled to said source for receiving vertical sync signals therefrom, and said column address input means of said random access memory being coupled to said second counter means for receiving its output signals;

logic circuit means having a first input coupled to said third multivibrator means for receiving its output signals and having a second input coupled to said second multivibrator means for receiving its output signals, said logic circuit having its output coupled to said control signal input means of said gate circuit means for enabling said gate circuit;

an additional source supplying video signals; and

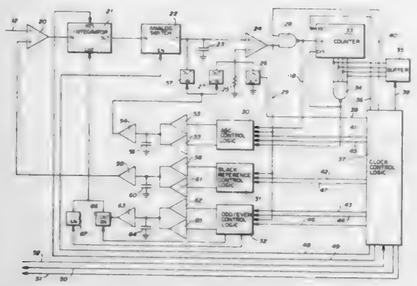
means coupled to said additional source and to said gate circuit means for combining signals therefrom.

4,045,816

AUTOMATIC CORRECTOR FOR FIXED PATTERN ODD/EVEN VIDEO NOISE

Ellis K. Cave, Garland, Tex., assignor to Recognition Equipment Incorporated, Dallas, Tex.

Filed Feb. 12, 1976, Ser. No. 657,646
Int. Cl.² H04N *3/12, 3/14*
U.S. Cl. 358—212 **13 Claims**



1. In a video signal conditioning system for a self-scanning array of photosensor cells including a pulse width modulating means, the combination which comprises:

a. charge accumulation means responsive to video pulses issuing from said pulse width modulating means for storing incremental charges to form a charge sum reflecting the average of differences between responses of adjacent photosensor cells of said array; and

b. pulse width correction means in electrical communication with said charge accumulation means for applying said charge sum to said pulse width modulating means to alter the pulse width of alternate ones of said video pulses.

4,045,817

SEMICONDUCTOR OPTICAL IMAGE SENSING DEVICE

Hirokuni Nakatani; Toru Takamura, both of Takatsuki, and Susumu Hashimoto, Katano, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Feb. 12, 1976, Ser. No. 657,697
Claims priority, application Japan, Feb. 20, 1975, 50-21633
Int. Cl.² H04N *3/14*; H03K *3/42*; H01J *39/12*; H03K *23/12*
U.S. Cl. 358—213 **7 Claims**

1. A semiconductor optical image sensing device comprising:

a power supply;

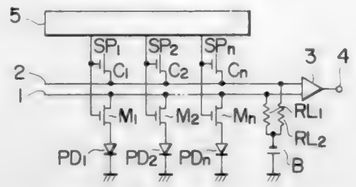
first and second load means;

a differential amplifier;

first and second output lines connected to said differential amplifier and to one terminal of said power supply through said first and second load means, respectively;

a plurality of MOS capacitors each having a current conducting electrode and a control electrode, each current conducting electrode of said MOS capacitors being connected to said second output line;

a plurality of photo-sensing devices, the number of photo-sensing diodes being at least equal to the number of MOS capacitors; and



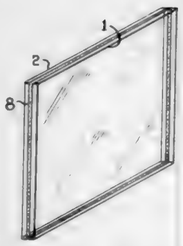
a plurality of MOS field effect transistors each having first and second current conducting electrodes and a control electrode, the number of MOS field effect transistors being at least equal to the number of MOS capacitors, said first current conducting electrode of each of said MOS field effect transistors being connected to said first output line, said second current conducting electrode of each of said MOS field effect transistors being connected to the other terminal of said power supply through a corresponding one of said photo-sensing devices respectively and the control electrode of each of said MOS field effect transistors being connected to the control electrode of the corresponding one of said MOS capacitors.

4,045,818

METHOD AND DEVICE FOR CONTROLLING RADIATION

George M. Wilhelm, 236 Stoneycliff Road, Centerville, Mass. 02632

Filed Nov. 28, 1975, Ser. No. 635,786
Int. Cl.² H04N *5/65*
U.S. Cl. 358—245 **13 Claims**



1. A lens device for controlling radiation emanating from a television receiving apparatus and controlling the production of electrostatic units without any distortion of the television picture comprising:

a. a first transparent plate;

b. a second transparent plate juxtaposed against the first transparent plate;

c. a composition consisting essentially of a thin transparent mineral oil film between the first and second transparent plates;

d. a means for sealing the edges between the first and second transparent plates whereby the mineral oil is sealed between the plates; and

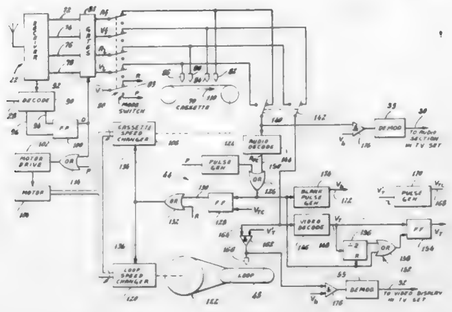
e. a means for attaching the lens device to the viewing surface of the television receiving apparatus.

4,045,819

VIDEO RECORDER AND PLAYBACK APPARATUS

Peter C. Goldmark, Stamford, Conn., assignor to Goldmark Communications Corporation, Stamford, Conn.

Division of Ser. No. 297,180, Oct. 13, 1972, Pat. No. 3,938,189.
This application Nov. 28, 1975, Ser. No. 636,316
Int. Cl.² H04N *5/79*
U.S. Cl. 360—8 **11 Claims**



1. An apparatus for playing back video still pcitures with associated audio for display and sound projection comprising

program storing means for storing video frames and associated audio frames;

a magnetic video frame storing loop having a track sized to store a still picture video frame;

means for recording on and playing back a video frame stored on said loop;

means for producing from the program storing means audio frame signals representative of audio associated with a video frame stored on said loop;

means for producing an audio end signal representative of the end of an audio frame associated with said stored video frame; and

means actuated by said audio end signal for transferring a video frame from said program storing means on said loop for playback with associated audio frame signals.

3. A method for transmitting, receiving and displaying still picture video programs comprising the steps of

transmitting a composite signal formed of a pluralitu of video frames and audio frames respectively associated with the video frames;

recording the composite signal on a magnetic medium;

playing back the recorded magnetic medium to generate audio frames and associated video frames therefrom;

transferring video frames being played back from the magnetic medium for storage on a magnetic loop; and

playing back the video frame stored on said loop for simultaneous display thereof with the projection of the associated audio frame being played back from the magnetic medium.

4,045,820

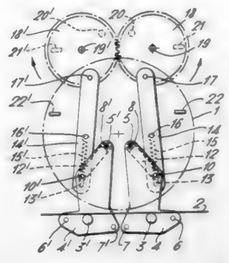
DEVICE FOR POSITIONING AND GUIDING A MAGNETIC TAPE AROUND THE DRUM OF A ROTARY HEAD ASSEMBLY

Theophiel Clement Jozef Lodewijk Staar, Kraainem, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed July 29, 1975, Ser. No. 600,091
Claims priority, application France, Aug. 5, 1974, 74.27182
Int. Cl.² G11B *15/66*
U.S. Cl. 360—85 **8 Claims**

1. In apparatus for positioning and guiding magnetic tape around the drum of a rotary head assembly in a recording and/or reproducing mechanism having at least two guide fingers for guiding the magnetic tape and mounted for movement between a retracted position where the guide fingers engage the magnetic tape in a self-contained cartridge, and an advanced position where the guide fingers dispose the tape along a predetermined helical path on the drum surface, the improvement comprising

self-locking means for holding the guide fingers in the advanced position against normal retracting forces exerted on said fingers by the tape moving thereover, and means for permitting limited retracting movement of said fingers in response to excessive retracting forces exerted on said fingers during abnormal tape movement.

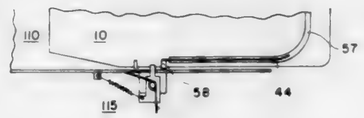


4,045,821

TAPE CARTRIDGE HAVING A SHUTTER WITH SELF LOCKING FUNCTION

Hiroshi Fujikura, Fujisawa, Japan, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,398
Claims priority, application Japan, Aug. 29, 1975, 50-104075
Int. Cl.² G11B *23/04*
U.S. Cl. 360—132 **15 Claims**



1. A tape cartridge comprising a hollow container with a given exterior outline and having a tape receiving cavity for storing a tape therein, a peripheral wall of the container having at least one aperture means for receiving an external tape operating member for the tape in the container, a shutter guide extending across said aperture means along edges of said peripheral wall, a shutter slidable in said shutter guide along said peripheral wall between a closed position wherein said aperture means is covered and an opened position wherein said aperture means is exposed;

the improvement being characterized by:

a flexible bifurcated member attached to an outwardly facing surface of said shutter such that its bifurcated ends form free ends and having a longitudinal axis parallel to the direction of sliding movement of said shutter;

bifurcated member guide means in said peripheral wall for guiding said bifurcated member along the edges of said peripheral wall as said shutter slides;

outwardly projecting pawls disposed at the free ends of said bifurcated member and projecting towards said bifurcated member guide means; and

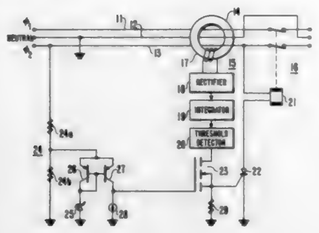
said bifurcated member guide means having recesses for engagingly receiving said pawls to inhibit movement of said shutter towards said opened position when said shutter is in said closed position.

4,045,822

GROUND FAULT INTERRUPTER APPARATUS

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,456
Int. Cl.[2] H02H *3/28*
U.S. Cl. 361—45 **6 Claims**



1. In a ground fault interrupter apparatus for use with a plurality of a-c line conductors, connecting an a-c generator to a load, which apparatus has an electromechanical relay switch for interrupting flow through said a-c line conductors responsive to application of an actuating current; an actuating signal supply dependent on potential between a pair of said a-c line conductors; a controlled rectifier means having a controlled conduction path which selectively connects said actuating signal supply to said relay switch for causing said actuating current to flow and having a gate electrode; differential current sensing means for providing a transformed imbalance current when currents flowing from the generator to the load differ from currents returning from the load to the generator; means for rectifying said imbalance current to obtain a rectified signal; means for integrating said rectified signal to obtain an integrated signal; and threshold detecting means for detecting when said integrated signal exceeds a threshold value to provide a gate signal to the gate electrode of said controlled rectifier means to initiate conduction in its controlled conduction path, the improvement comprising:

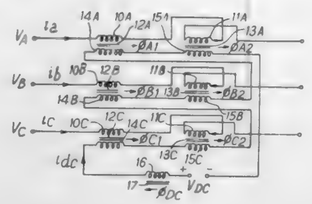
means for inhibiting the application of gate signal to said controlled rectifier means during the rapidly collapsing portions of the actuating signal.

4,045,823

CURRENT LIMITING DEVICES FOR ALTERNATING CURRENT SYSTEMS

Kenneth Charles Parton, Sutton Coldfield, England, assignor to Reyrolle Parsons Limited, Newcastle upon Tyne, England

Filed Jan. 14, 1976, Ser. No. 648,980
Claims priority, application United Kingdom, Jan. 17, 1975, 2027/75; Jan. 20, 1975, 2481/75; Oct. 3, 1975, 40629/75
Int. Cl.[2] G05F *1/04*
U.S. Cl. 361—58 **16 Claims**



1. A current-limiting device for an alternating current system comprising for each phase of the system at least two iron-cored saturable reactors, each reactor having an alternating current winding and a direct current super-conducting bias winding, the bias winding being capable of maintaining the core of the reactor saturated under full load alternating current conditions, the alternating current windings in each phase being so arranged and connected that under full load conditions a change in the level of saturation in any one reactor core relative to the bias level due to the bias winding alone is accompanied by a compensating change in saturation level in another core or cores, current limiting occurring when on each half-cycle one or other of the cores is forced out of saturation.

DESIGN PATENTS

GRANTED AUGUST 30, 1976

ERRATA

For CLASS	See PATENT NO.
014–011	245,627
014–093	245,628
011–154	245,643

245,546
DIAPER COVER
Yoshizo Okuda, 3-16 Gakuenkita 1-chome, Nara, Nara, Japan
Filed Feb. 20, 1976, Ser. No. 659,711
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—10



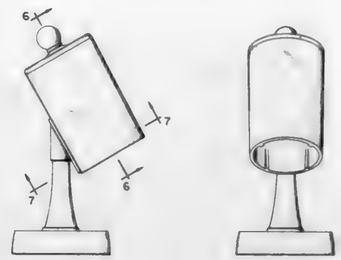
245,547
BRASSIERE
Madeline Surace, New York, N.Y., assignor to Qismet, Ltd., New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,893
Term of patent 14 years
Int. Cl. D2—*01*
U.S. Cl. D2—24



245,548
TATTING SHUTTLE
Lael Morgan, P.O. Box 4-EEE, Anchorage, Alaska 99509
Filed Dec. 2, 1975, Ser. No. 636,976
Term of patent 14 years
Int. Cl. D15—*06*
U.S. Cl. D3—19 A



245,549
CUP DISPENSER
Jerry A. Brown, 4014 San Jose Drive, Greenwood, Ind. 46142
Filed Aug. 6, 1976, Ser. No. 712,243
Term of patent 14 years
Int. Cl. D6—*04*; D9—*99*
U.S. Cl. D6—25



245,550
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 693,089
The portion of the term of this patent subsequent to Aug. 30, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69



245,551
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 692,965
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72



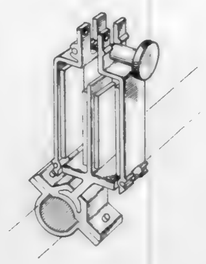
245,552
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 692,966
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75



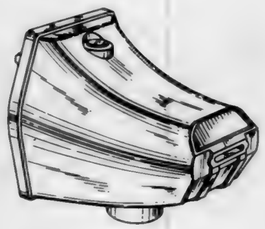
245,553
CHAIR
Robert De Fuccio, Pennsburg, Pa., assignor to Stow & Davis Furniture Company, Grand Rapids, Mich.
Filed June 4, 1976, Ser. No. 693,088
The portion of the term of this patent subsequent to Aug. 30, 1991, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75



245,554
SKI CLAMP
Uri Surkin, 5843 N. Ranchito, Van Nuys, Calif. 91401, and Ludwig Surkin, 6501 Drexel Ave., Los Angeles, Calif. 90048
Filed Nov. 24, 1976, Ser. No. 744,767
Term of patent 14 years
Int. Cl. D6—*99*; D8—*99*
U.S. Cl. D6—85



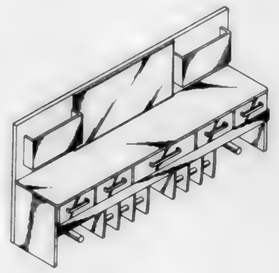
245,555
DISPENSER FOR HOT SHAVING LATHER
Samuel L. McNair, Kansas City, Mo., assignor to Dazey Products Company, Kansas City, Mo.
Filed Feb. 27, 1976, Ser. No. 662,032
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D6—95



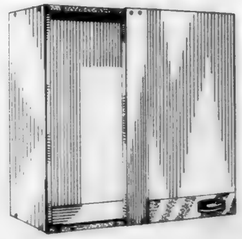
245,556
NOZZLE HOLDER FOR GARDEN HOSE
Jeanne M. Meyer, 833 S. Ivy Drive, Lake Arrowhead, Calif. 92352
Filed Nov. 3, 1975, Ser. No. 628,052
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D6—112



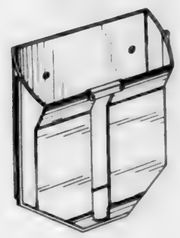
245,557
VALET RACK
John A. Wiser, P.O. Box 192, Liberty, Tex. 77575
Filed Mar. 29, 1976, Ser. No. 671,351
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—117



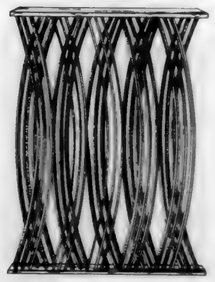
245,558
KITCHEN CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,425
Claims priority, application United Kingdom, Apr. 14, 1975, 970690/75
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—130



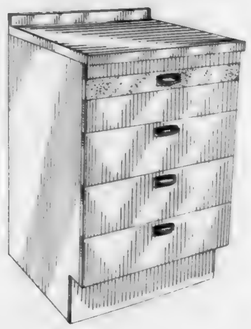
245,559
MOUNTABLE HOLDER FOR A BAG CONTAINING A FLUENT SUBSTANCE
William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.
Filed June 10, 1976, Ser. No. 694,905
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—131



245,560
ROOM DIVIDER
Richard Walton Enners, 9 Barbara Terrace, Middletown, N.J. 07748
Filed Oct. 21, 1975, Ser. No. 624,461
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—139



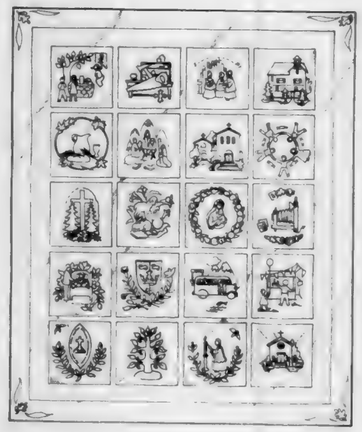
245,561
KITCHEN BASE CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,424
Claims priority, application United Kingdom, Apr. 14, 1975, 970694/75
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—166



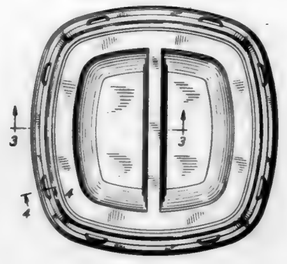
245,562
KITCHEN CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,427
Claims priority, application United Kingdom, Apr. 14, 1975, 970688/75
Term of patent 3½ years
Int. Cl. D6—*04*
U.S. Cl. D6—170



245,563
QUILT
Patricia L. Devin, 1933 Mandeville Canyon Road, Los Angeles, Calif. 90049
Filed May 18, 1976, Ser. No. 687,441
Term of patent 14 years
Int. Cl. D6—*13*
U.S. Cl. D6—260



245,564
COVER FOR A PLATE
Richard Lewis Blanchard, St. Charles, Ill., assignor to American Can Company, Greenwich, Conn.
Filed Mar. 14, 1975, Ser. No. 558,459
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—40



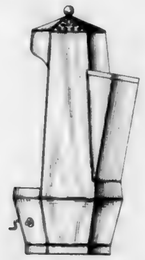


245,565
STRAINER
Fred S. Steiner, Woodmere, and Morison S. Cousins, Plainview, both of N.Y., assignors to Bonny Products, Inc., Hewlett, N.Y.
Filed June 7, 1976, Ser. No. 693,291
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—47



245,566
ROTISSERIE COOKER
Chris P. Tomaras, 5450 N. Winthrop Ave., Apt. 405, Chicago, Ill. 60640
Filed Aug. 13, 1975, Ser. No. 604,459
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—110

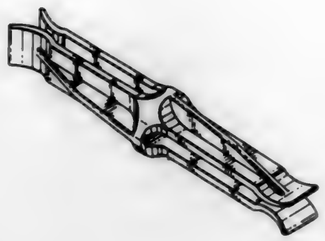




245,567
DISPOSAL FIGURINE
Lee V. Burns, 2118 Canada Blvd., Glendale, Calif. 91208
Filed Oct. 10, 1975, Ser. No. 621,362
Term of patent 14 years
Int. Cl. D7—*07*
U.S. Cl. D7—194



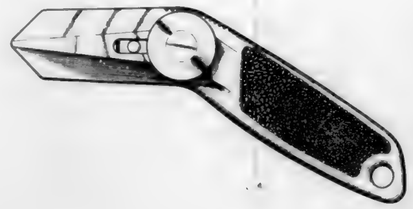
245,568
CLOTHES PEG
William Joel Reginald Edlin, R.D. 2, Sharp Road, Katikati, Bay of Plenty, New Zealand
Filed Jan. 5, 1976, Ser. No. 646,471
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D7—198



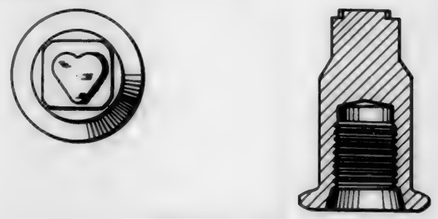
245,569
SHEARS
William C. Ferguson, Denville, N.J., assignor to Cooper Industries, Houston, Tex.
Filed Sept. 29, 1975, Ser. No. 617,317
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—57



245,570
RETRACTABLE BLADE KNIFE
Robert F. West, Simsbury, and Sylvester W. Bies, Bloomfield, both of Conn., assignors to The Stanley Works, New Britain, Conn.
Filed July 1, 1976, Ser. No. 701,852
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



245,571
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 620,333, Oct. 7, 1975. This application Sept. 3, 1976, Ser. No. 720,452
Claims priority, application Japan, Jan. 7, 1975, 50-27832
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397



245,572
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 620,334, Oct. 7, 1975. This application Sept. 3, 1976, Ser. No. 720,453
Claims priority, application Japan, Jan. 7, 1975, 50-27833
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397



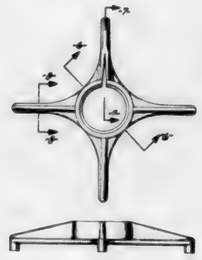
245,573
CAP NUT
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Division of Ser. No. 620,337, Oct. 7, 1975. This application Sept. 3, 1976, Ser. No. 720,455
Claims priority, application Japan, Jan. 7, 1975, 50-27833
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397



245,574
SLEEVE ANCHOR FOR A SANDWICH PANEL
Peter D. Courtois, Oceanside, Calif., and Charles J. Sharav, Chicago, Ill., assignors to Superior Concrete Accessories, Inc.
Filed Nov. 5, 1975, Ser. No. 629,039
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—385



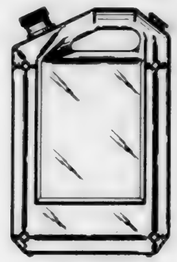
245,575
ELECTRICAL OUTLET GUARD
Jerry C. Frinzel, Sacramento, and Robert H. Britschgi, Fair Oaks, both of Calif., assignors to Robert H. Britschgi, Fair Oaks, Calif.
Filed Oct. 6, 1975, Ser. No. 619,841
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—499



245,576
BOTTLE
Ralph A. Muscatiello, Norwood, and Kent M. Wright, Sudbury, both of Mass., assignors to The Gillette Company, Boston, Mass.
Filed July 14, 1975, Ser. No. 595,664
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—2



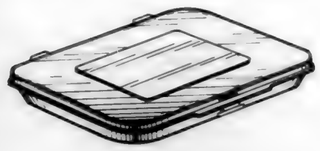
245,577
JUG OR THE LIKE
Wyne M. Smythe, 6417 Bandini Blvd., City of Commerce, Calif. 90040
Filed Aug. 13, 1976, Ser. No. 714,169
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—52



245,578
PACKAGING CAPSULE
Richard James Klingaman, Darien, Conn., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Feb. 26, 1976, Ser. No. 661,674
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—171



245,579
PACKAGING CONTAINER
Donald K. Jewell, Naperville, Ill., assignor to Restaurant Technology, Inc., Oak Brook, Ill.
Filed Apr. 3, 1975, Ser. No. 564,614
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—231



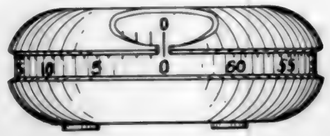
245,580
PACKAGING CONTAINER
Lars Göran Larsson, and Richard Leroy Bruke, both of Malmo, Sweden, assignors to Aktiebolaget Platmanufaktur, Malmo, Sweden
Filed July 25, 1974, Ser. No. 491,803
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—237



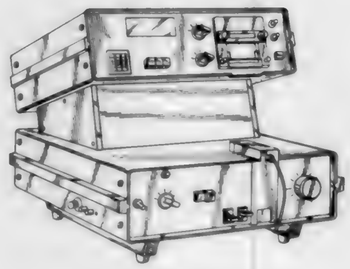
245,581
CLOCK
Virgil Thrasher, Santa Cruz, Calif., assignor to Lucid Lines, Inc., Culver City, Calif.
Filed Dec. 30, 1975, Ser. No. 645,465
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—9



245,582
KITCHEN TIMER OR SIMILAR ARTICLE
Dana W. Mox, Elk Grove Village, Ill., assignor to Hanson Limited, Sligo, Ireland
Filed Feb. 25, 1976, Ser. No. 661,375
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—40



245,583
PHOTOMETRIC ANALYSIS APPARATUS
Enzo Sergio Mannucci, Siena, Italy, assignor to Istituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A., Siena, Italy
Filed May 4, 1976, Ser. No. 683,229
Claims priority, application Italy, Nov. 7, 1975, 11830/75
Term of patent 14 years
Int. Cl. D24—*02*; D10—*04*
U.S. Cl. D10—46



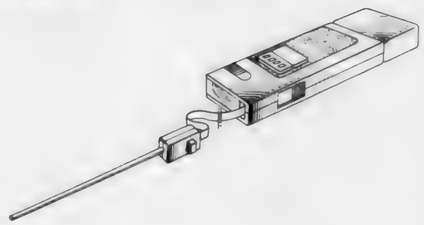
245,584
RADIATION DETECTOR
David C. Byram, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Oct. 18, 1974, Ser. No. 515,913
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—47



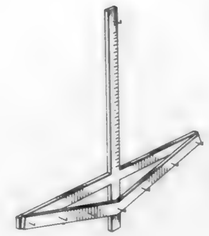
245,585
MOISTURE METER OR SIMILAR ARTICLE
Dorothea Bru, Locust Valley, N.Y., assignor to Aldermaston Inc., Glen Cove, N.Y.
Filed Feb. 18, 1976, Ser. No. 659,065
Term of patent 3½ years
Int. Cl. D10—*04*
U.S. Cl. D10—56



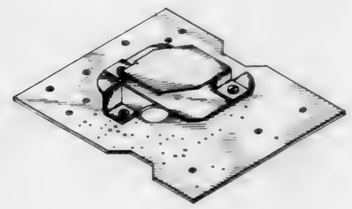
245,586
TEMPERATURE SENSING MECHANISM OR SIMILAR ARTICLE
John F. McGlynn, Valhalla, N.Y.; Robert Doernberg, and Phillip Brookshire, both of Cincinnati, Ohio, assignors to IPCO Hospital Supply Corporation, White Plains, N.Y.
Filed Apr. 14, 1975, Ser. No. 567,749
Term of patent 14 years
Int. Cl. D10—04
U.S. Cl. D10—57



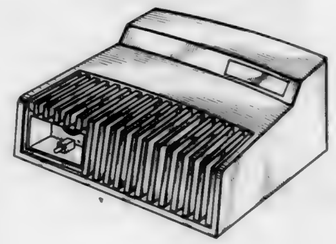
245,587
MEASURING GAUGE AND TOOL FOR MACRAME CORD OR THE LIKE
Robert M. Chaves, 5644 W. Monte Cristo, Glendale, Ariz. 85306
Filed Nov. 6, 1975, Ser. No. 629,408
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71



245,588
IONIZATION SENSOR FOR SMOKE DETECTOR
Henri H. Hoge, 2209 Crest Road, Baltimore, Md. 21209
Filed Mar. 2, 1976, Ser. No. 663,219
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121



245,589
CABINET FOR INTRUDER DETERRENT
James H. Ott, 2375 Covington Road, Apt. 415, Akron, Ohio 44313
Filed Oct. 14, 1976, Ser. No. 732,386
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121



245,590
FINGER RING
Robert C. Laidlaw, Mission Viejo, Calif., assignor to Josten's, Minneapolis, Minn.
Filed Dec. 29, 1975, Ser. No. 644,755
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—36



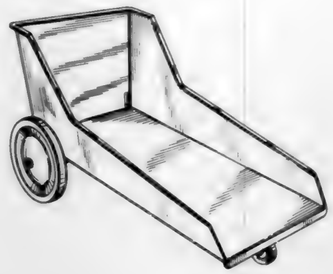
245,591
PENDANT
Fred Rieger, Jr., 42 Todd Drive, East Glen Head, N.Y. 11545, and Fred Kibler, 227-08 64th Ave., Bayside, N.Y. 11364
Filed Mar. 24, 1976, Ser. No. 669,850
Term of patent 7 years
Int. Cl. D11—*01*
U.S. Cl. D11—44



245,592
COMBINED GOLF CAR AND REMOVABLE CANOPY THEREFOR
William G. Davidson, Elm Grove, Wis., assignor to AMF Incorporated, White Plains, N.Y.
Filed Dec. 31, 1975, Ser. No. 645,797
Term of patent 14 years
Int. Cl. D12—*14*
U.S. Cl. D12—16



245,593
MANUALLY PROPELLED AND STEERED CART FOR INVALID CHILDREN
Carol Halpern, 14 Willowbrook Lane, Freeport, N.Y. 11520
Filed June 24, 1976, Ser. No. 699,362
Term of patent 14 years
Int. Cl. D12—*02, 12*
U.S. Cl. D12—26



245,594
DOCUMENT HANDLING CART OR SIMILAR ARTICLE
John F. Graham, Sudbury, Mass., and Donald D. Kelemen, Norman, Okla., assignors to Honeywell Information Systems Inc., Waltham, Mass.
Filed June 4, 1976, Ser. No. 693,031
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—30

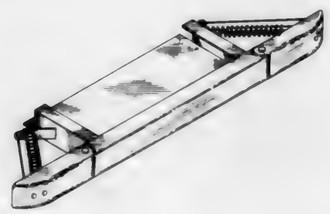
245,595
HAND CART FOR CARRYING A DOOR
Frank W. Johnson, 870 Diablo Road, Danville, Calif. 94526
Filed Oct. 19, 1976, Ser. No. 733,781
Term of patent 14 years
Int. Cl. D12—*02*
U.S. Cl. D12—34



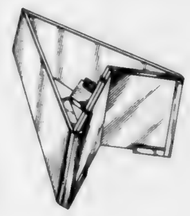
245,596
BICYCLE RACK
Alan B. Cohen, 901 W. Davis St., Ann Arbor, Mich. 48103; Robert S. Marx, 3570 Green Briar Blvd., Ann Arbor, Mich. 48105; Mary Kalmes, 1221 Marsac, Bay City, Mich. 48706, and Peter Anders, 801 Linwood Drive, Midland, Mich. 48640
Filed Sept. 26, 1975, Ser. No. 617,015
Term of patent 14 years
Int. Cl. D8—*99*
U.S. Cl. D12—115



245,597
BUMPER
Lawrence A. Gee, and Delbert L. Draisey, both of 6627 196th, Lynnwood, Wash. 98036
Filed July 26, 1976, Ser. No. 708,413
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—169



245,598
REAR VIEW MIRROR FOR VEHICLES
Agapito P. Balduman, Calvary Heights, Forestville, Md. 20028
Filed Nov. 15, 1976, Ser. No. 741,736
Term of patent 14 years
Int. Cl. D21—*16*
U.S. Cl. D12—187



245,599
WHEEL
John Robert de Vries, Geldrop, Netherlands, assignor to AB Volvo, Gothenburg, Sweden
Filed Aug. 26, 1976, Ser. No. 717,867
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—211



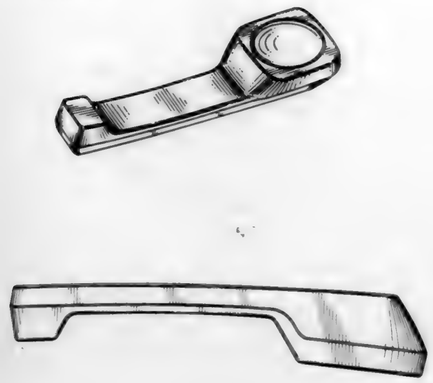
245,600
WHEEL BALANCE WEIGHT
Donald G. Hodge, assignor to Hodge Manufacturing Corp., Murfreesboro, Tenn.
Filed Dec. 17, 1975, Ser. No. 641,533
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—213



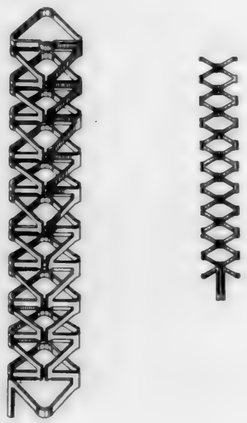
245,601
WHEEL BALANCE WEIGHT
Donald G. Hodge, P. O. Box 1361, Murfreesboro, Tenn. 37130
Filed Dec. 17, 1975, Ser. No. 641,754
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—213



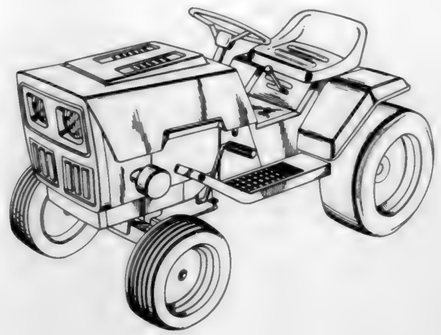
245,602
TELEPHONE STATION HANDSET
Donald Michael Genaro, Haworth; John Alfons Meyerle, Manasquan, both of N.J.; Gordon Elliot Sylvester, Jamaica, N.Y., and Alvin Richard Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 30, 1976, Ser. No. 718,852
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—63



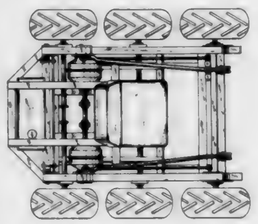
245,603
ANTENNA ELEMENT
Kazuhisa Satoh, 24-10-1, Megurohoncho, Meguro, Tokyo, Japan
Filed Mar. 9, 1976, Ser. No. 665,184
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—90

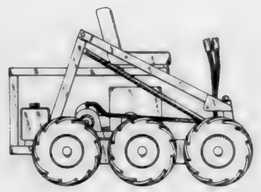


245,604
GARDEN TRACTOR
Larry Monroe Cognata, Nashville, and Richard D. Williams, Brentwood, both of Tenn., assignors to The Murray Ohio Manufacturing Company, Brentwood, Tenn.
Filed Mar. 19, 1976, Ser. No. 668,810
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—23

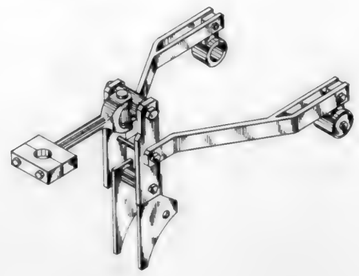


245,605
MULTIPURPOSE TRACTOR HAVING A FRONT ADJUSTABLE TOOL SUPPORT
Rudolph H. Wittke, 1930 Franklin St., Waterloo, Iowa 50703
Filed May 4, 1976, Ser. No. 683,164
Term of patent 14 years
Int. Cl. D15—*04*
U.S. Cl. D15—23

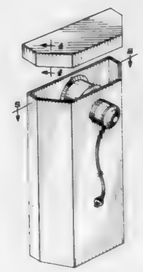




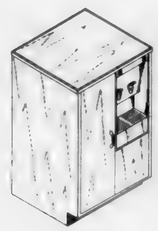
245,606
LOAD TRANSFER APPARATUS FOR CONNECTING A TRACTOR AND A TRAILER
Willard R. Williams, Naturita, Colo., assignor to Williams, Inc., Naturita, Colo.
Filed Dec. 18, 1975, Ser. No. 641,889
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—28



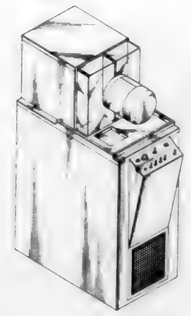
245,607
CYCLE CHAIN CLEANING DEVICE
Jade Del Morrical, 1715 W. Libby St., Phoenix, Ariz. 85023
Filed Feb. 24, 1976, Ser. No. 660,836
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D15—34



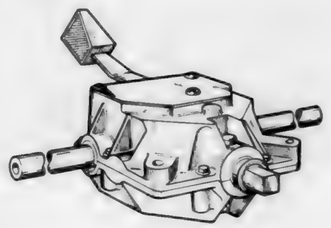
245,608
WATER DISPENSER
William V. Murphy, Philadelphia, Pa., assignor to Refreshment Machinery, Incorporated, Warminster, Pa.
Filed Sept. 22, 1975, Ser. No. 615,314
Term of patent 14 years
Int. Cl. D15—*08;* D23—*99*
U.S. Cl. D15—115



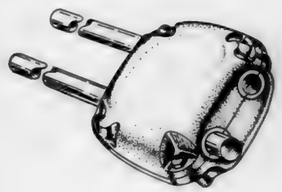
245,609
DRILLING MACHINE
Edgar P. Freer, 7000 Scarborough Peak Drive, Canoga Park, Calif. 91307
Filed Mar. 5, 1976, Ser. No. 664,365
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—132



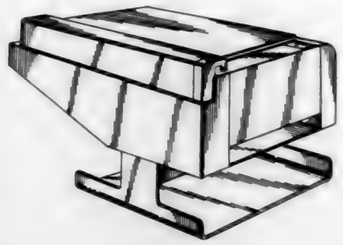
245,610
SMALL TRANSMISSION
Ronald N. Jones, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredericktown, Ohio
Filed Apr. 22, 1976, Ser. No. 679,181
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—149



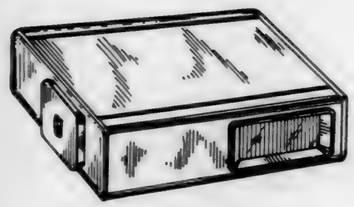
245,611
REVERSING GEAR BOX
Ronald N. Jones, Fredericktown, Ohio, assignor to The J. B. Foote Foundry Co., Fredricktown, Ohio
Filed Apr. 22, 1976, Ser. No. 679,371
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—149



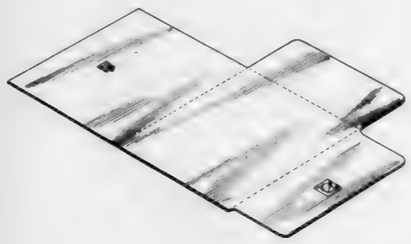
245,612
ELECTROPHOTO COPIER
Karl Gustav Zeuthen, Gentofte, Denmark, assignor to Zeuthen & Aagaard A/S, Glostrup, Denmark
Filed Apr. 10, 1975, Ser. No. 567,003
Claims priority, application Denmark, Oct. 15, 1974, 776/74
Term of patent 14 years
Int. Cl. D16—*3*
U.S. Cl. D16—31



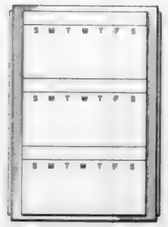
245,613
STROBE
Cooper C. Woodring, Plandome; Ronald Emmerling, New City, both of N.Y., and Michael Boehm, Green Farms, Conn., assignors to J. C. Penney Company, Inc., New York, N.Y.
Division of Ser. No. 483,395, June 26, 1974, Pat. No. D241,167.
This application Mar. 1, 1976, Ser. No. 662,828
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D16—42

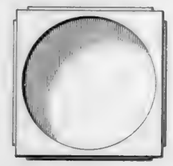


245,614
BLANK FOR AN ENVELOPE
David M. Meeker, Saratoga, Calif., assignor to Champion International Corporation, Stamford, Conn.
Filed Jan. 22, 1976, Ser. No. 651,523
Term of patent 14 years
Int. Cl. D19—*01*
U.S. Cl. D19—3



245,615
COMBINED PENCIL WELL AND CALENDAR HOLDER
Robert C. Burroughs, Gaithersburg, Md., assignor to Robert C. Burroughs
Filed June 19, 1975, Ser. No. 588,218
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—85

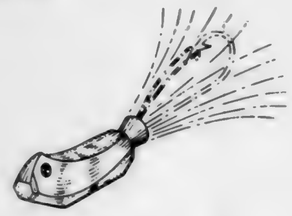




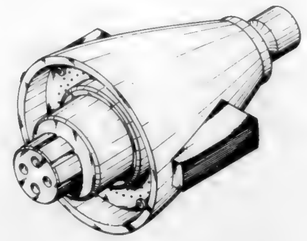
245,616
FISHING LURE
Hugh Stewart, Jr., 112 Pine, Scottsboro, Ala. 35768
Filed Sept. 16, 1976, Ser. No. 723,737
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—28



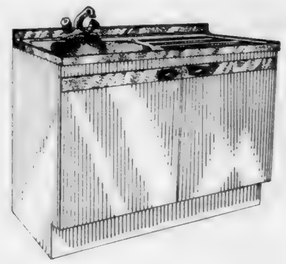
245,617
FISHING JIG
Arlie Spivey, 713 Bahama St., Palm Bay, Fla. 32905
Filed Mar. 7, 1977, Ser. No. 775,194
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—27



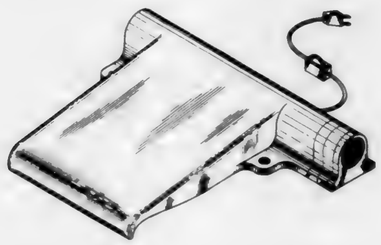
245,618
SHOWERHEAD
Emilie H. Pitman, 16015-35th Northeast, Seattle, Wash. 98155
Filed Aug. 20, 1976, Ser. No. 716,076
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—35



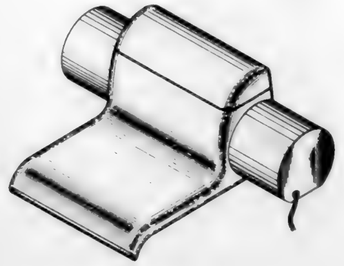
245,619
KITCHEN SINK CABINET
George Henry Robinson, Liverpool, England, assignor to Hygena Limited, Liverpool, England
Filed Oct. 10, 1975, Ser. No. 621,426
Claims priority, application United Kingdom, Apr. 14, 1975, 97068/75
Term of patent 3½ years
Int. Cl. D23—*02*
U.S. Cl. D23—59



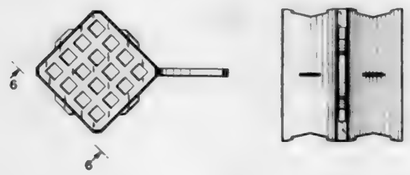
245,620
VENTILATOR FOR A WATER CLOSET
Lambert D. Berry, Rte. 1, Box 232, Silverdale, Wash. 98383
Filed May 24, 1976, Ser. No. 689,138
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



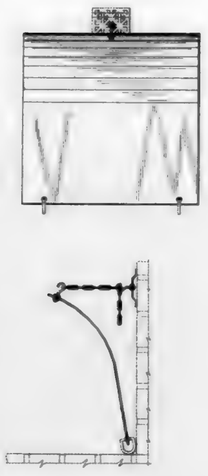
245,621
VENTILATOR FOR A WATER CLOSET
Lambert D. Berry, Rte. 1, Box 232, Silverdale, Wash. 98383
Filed Sept. 30, 1976, Ser. No. 728,450
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



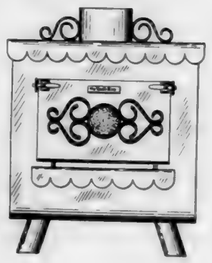
245,622
CHARCOAL FIRE STARTER
Duane L. Storandt, 12 Hanley Downs, St. Louis, Mo. 63117
Filed Aug. 31, 1976, Ser. No. 719,171
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—90.1



245,623
THERMAL DEFLECTOR FOR FIREPLACES
James Harlan Jenkins, 6010 N. 26th St., Arlington, Va. 22207
Filed Dec. 22, 1975, Ser. No. 642,737
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—94



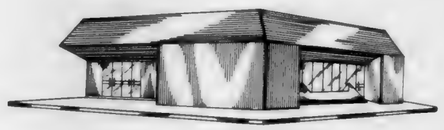
245,624
WOOD BURNING HEATING STOVE
Kendrick H. McIntire, Rte. 2, Box 1000, and John E. McIntire, Rte. 2, Box 151-A, both of Aurora, Oreg. 97002
Filed Nov. 3, 1975, Ser. No. 628,565
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—105



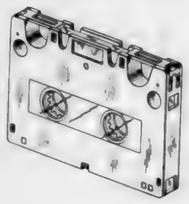
245,625
BIOLOGICAL REACTION FILTER FOR MEDICAL ANALYSIS
Jean Léon Paul Marie Benoit, 74 rue du Fort, St. Irenee, Rhone, France
Filed July 13, 1976, Ser. No. 704,885
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21



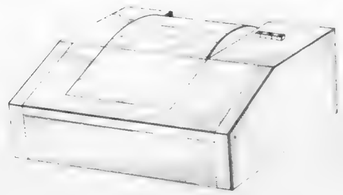
245,626
BUILDING FOR FAST FOOD RESTAURANT OR THE LIKE
Raymond Poelvoorde, New York, N.Y., assignor to Hardee's Food Systems, Inc., Rocky Mount, N.C.
Filed Jan. 29, 1976, Ser. No. 653,525
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—25



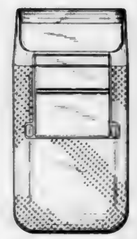
245,627
TAPE CASSETTE
Yoshio Kishi, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed June 25, 1976, Ser. No. 699,980
Claims priority, application Japan, Dec. 27, 1975, 50-51656
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—11



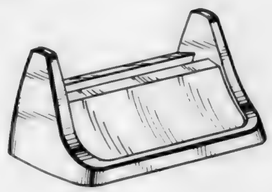
245,628
SOUND REDUCING COVER FOR TELEPRINTER OR THE LIKE
Berndt Ebbe Frick, Herrgardsvagen 9, 135 00 Tyreso, Sweden
Filed Jan. 28, 1975, Ser. No. 544,767
Claims priority, application Sweden, Aug. 5, 1974, 741241
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—93



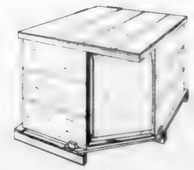
245,629
DRY SHAVER
Roland Ullmann, Hausen, Germany, assignor to Braun Aktiengesellschaft, Kronberg, Taunus, Germany
Filed Nov. 21, 1975, Ser. No. 634,172
Claims priority, application Germany, June 5, 1975, 73 MR 8363
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—49



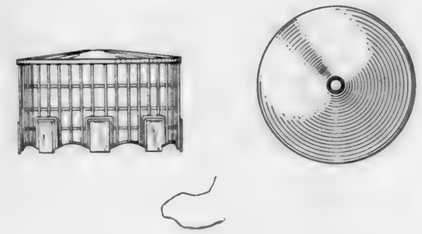
245,630
BLADE GUARD FOR HAIR TRIMMING AND CLIPPING APPARATUS
Robert O. Ernest, Oak Park, Ill., assignor to Sunbeam Corporation, Chicago, Ill.
Filed Dec. 31, 1975, Ser. No. 645,629
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—54



245,631
DOGHOUSE
Charles M. Conner, and Kurt G. Ladwig, both of 9440 Harwin, Suite E, Houston, Tex. 77036
Filed Sept. 19, 1975, Ser. No. 615,170
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



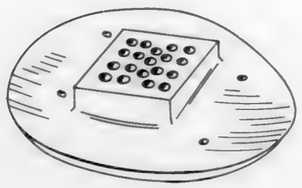
245,632
POULTRY CAGE
Gerald L. Kitson, 9709 Belding Road NE., Rockford, Mich. 49341
Division of Ser. No. 482,373, June 24, 1974, Pat. No. D241,254.
This application Aug. 30, 1976, Ser. No. 718,571
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



245,633
CASKET HANDLE
Bennie R. Johnson, Connersville, Ind., assignor to National Metal Products Co. Inc.
Filed Feb. 2, 1976, Ser. No. 654,390
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D31—11



245,634
GOLF CLUB SOLE PLATE
Roy Alexander Churchward, 6444-19th Ave. S., Richfield, Minn. 55423
Filed Nov. 6, 1975, Ser. No. 629,307
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 GC



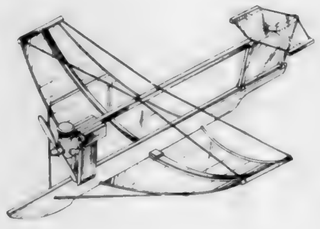
245,635
COMBINED GOLF BALL AND MODEL AIRCRAFT ENGINE NOVELTY DEVICE
John M. Campbell, 866 S. 1100 East, Salt Lake City, Utah 84120
Filed Nov. 17, 1975, Ser. No. 632,351
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 QQ



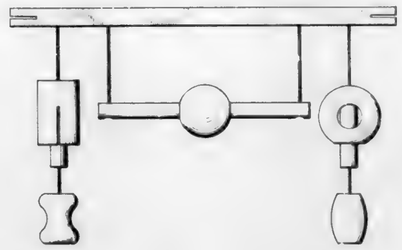
245,636
TENNIS RACKET FRAME
Ralph Vincent Sawyer, Rumford, R.I., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 18, 1976, Ser. No. 668,155
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



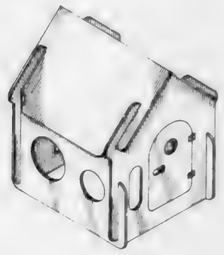
245,637
TOY AIRPLANE
Harvey H. Jewett, 347 Ram Court SE., Olympia, Wash. 98503
Filed Nov. 29, 1974, Ser. No. 528,056
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 HH



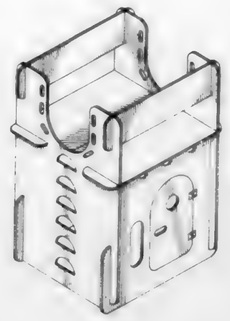
245,638
CRADLE GYM
Kerstin Margaretha Hagland-Ahrnborg, Falun, Sweden, assignor to Brio Toy AB, Sweden
Filed Dec. 24, 1975, Ser. No. 644,059
Claims priority, application Sweden, June 30, 1975, 751314
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 J



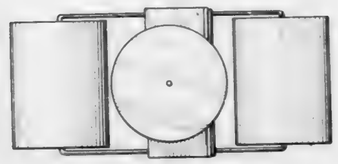
245,639
TOY HOUSE
Elmer C. Powell, Jr., 804 W. Colorado, Dallas, Tex. 75208
Filed May 10, 1976, Ser. No. 684,712
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



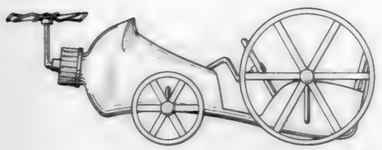
245,640
TOY FORT
Elmer C. Powell, Jr., 804 W. Colorado, Dallas, Tex. 75208
Filed May 10, 1976, Ser. No. 684,857
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



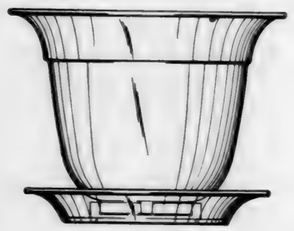
245,641
TOY VEHICLE OR THE LIKE
Ross Young, 5404 S. Bishop, Chicago, Ill. 60609
Filed May 27, 1976, Ser. No. 690,693
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



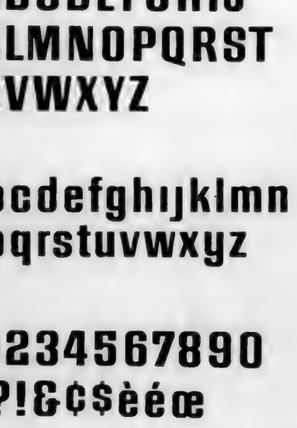
245,642
TOY VEHICLE OR THE LIKE
Ross Young, 5404 S. Bishop, Chicago, Ill. 60609
Filed May 27, 1976, Ser. No. 690,694
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 AJ



245,643
COMBINED FLOWER POT AND TRAY THEREFOR
John Orfei, 14 Ravena St., Revere, Mass. 02151
Filed Jan. 22, 1976, Ser. No. 651,501
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—154



245,644
FONT OF TYPE
Jack E. Pollard, San Francisco, Calif., assignor to Transamerica Corporation
Filed Oct. 28, 1975, Ser. No. 626,153
Term of patent 14 years
Int. Cl. D18—*03*
U.S. Cl. D64—12 B



245,645
COMBINED HANDBAG AND DETACHABLE FITTED CLUTCH
Constantine Casser, Port Washington, N.Y., assignor to Amba Marketing Systems, Inc., Greenwich, Conn.
Filed Apr. 14, 1975, Ser. No. 567,710
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D87—3 F



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TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF AUGUST, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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Aureli, William D., to Scovill Manufacturing Company. Waistband fastener having substantially identical parts. 4,044,433, Cl. 24-227.000.

Austin, Walter H. Card storage and dispensing device. 4,045,102, Cl. 312-61.000.

Automobiles Peugeot: *See—*
Lemonnier, Jean-Yves; and Chatelain, Lucien, 4,045,521, Cl. 261-41.00R.

Automotive Products Company Ltd.: *See—*
Parsons, David; and Leigh-Monstevens, Keith Vernon, 4,044,873, Cl. 192-106.200.

Avcin, France, to Hirtenberger Patronen-, Zundhutchen- und Metallwarenfabrik Aktiengesellschaft. Jacketless hunting bullet with rollback cutting flags. 4,044,685, Cl. 102-91.000.

Avco Corporation: *See—*
Crimi, Peter, 4,045,146, Cl. 416-1.000.
Debolt, Harold E., 4,045,597, Cl. 427-248.00A.

Averette, Julius P., Jr.: *See—*
Harris, Rano J., Sr.; Harris, Rano J., Jr.; and Averette, Julius P., Jr., 4,044,616, Cl. 73-422.0GC.

Avicon, Inc.: *See—*
Battista, Orlando A.; and Ward, Richard L., 4,045,238, Cl. 106-122.000.

Avrillon, Rene; and Defives, Daniel, to Institut Francais du Petrole. Process for regenerating lubricating oils. 4,045,330, Cl. 208-180.000.

Avtex Fibers Inc.: *See—*
Knopka, William N., 4,045,513, Cl. 260-860.000.

Axt, Wallis C.: *See—*
D'Haem, Marcel P.; and Axt, Wallis C., 4,044,625, Cl. 74-558.500.

Ayusawa, Masatake: *See—*
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, 4,045,178, Cl. 23-254.00E.

Azemar, Michel; and Viglecca, Lucien, to Rhone-Poulenc Industries. Autoclave. 4,045,185, Cl. 23-290.000.

B-Line Systems, Inc.: *See—*
Kowalski, Joseph W., 4,044,428, Cl. 24-16.00R.

Babayan, Eduard P.; and Rourke, Michael H., to Hitco. Polyurethane and composite thereof. 4,045,527, Cl. 264-46.700.

Babcock, Henry Nash: *See—*
Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry Nash, 4,045,237, Cl. 106-89.000.

Babcock & Wilcox Company, The: *See—*
Feldstein, Joel Gary; and Martin, Jeffrey Forsha, 4,044,798, Cl. 138-90.000.

Babunovic, Momir; and Whitlock, Donald E., to Barry-Wehmiller Company. Label removal apparatus for container washing machines. 4,044,783, Cl. 134-73.000.

Baczuk, Robert J., to United States of America, Navy. Molecular sieve containing stabilization system for urethane - crosslinked double base propellant. 4,045,261, Cl. 149-19.800.

Badische Anilin- & Soda-Fabrik Aktiengesellschaft: *See—*
Kniese, Wilhelm; and Nienburg, Hans Juergen, 4,045,492, Cl. 260-604.0HF.

Baggs, Burton D., Jr.: *See—*
Smith, Alexander; and Baggs, Burton D., Jr., 4,044,841, Cl. 172-72.000.

Bailey Meter Company: *See—*
Warrick, James C., 4,044,651, Cl. 91-47.000.

Bakel, Adrianus Maria Van; and Fransen, Jan Josephus Bernardus, to U.S. Philips Corporation. Getter for use in the manufacture of an electric discharge tube. 4,045,367, Cl. 252-181.400.

Baker, Don R., to Stauffer Chemical Company. Diphenyl ether amides. 4,045,208, Cl. 71-95.000.

Baker International Corporation: *See—*
Crowe, Talmadge L., 4,044,826, Cl. 166-120.000.
Richard, Charles A.; and Barbee, John Philip, 4,044,832, Cl. 166-278.000.

Baker, Jerry D.: *See—*
Meyer, Harry W., deceased; Baker, Jerry D.; and Ceckler, William H., 4,045,216, Cl. 75-84.000.

Baker, Kenneth L., to United States of America, Army. Method for optimizing the bandwidth of a radio receiver. 4,045,740, Cl. 325-427.000.

Baker, Robert W.: *See—*
Remaley, Edward G.; Baker, Robert W.; and Meyer, Raymond J., 4,045,599, Cl. 427-333.000.

Baker, Woodrow A. Apparatus for filling containers with dehydrated agglomerates. 4,044,803, Cl. 141-34.000.

Balanis, Constantine A.: *See—*
Shuck, Lowell Z.; Fasching, George E.; and Balanis, Constantine A., 4,045,724, Cl. 324-6.000.

Balaz, Alexander, to Quaker Oats Company, The. Apparatus for making a marbled meat food product. 4,044,661, Cl. 99-355.000.

Baldwin, Henry Clay, III. Cold therapeutic package. 4,044,773, Cl. 128-402.000.

Bancroft, Lewis Clinton: *See—*
Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, 4,045,544, Cl. 423-607.000.

Banhidy, Detre M.: *See—*
Williams, Harrison L.; and Banhidy, Detre M., 4,045,665, Cl. 240-51.11R.

Banks, William P.; and Martin, Larry D., to Halliburton Company. Passivating metal surfaces. 4,045,253, Cl. 148-6.14R.

Barak, Amitzur Z., to United States of America, Energy Research and Development Administration. Solar collector with altitude tracking. 4,044,752, Cl. 126-270.000.

Barbee, John Philip: *See—*
Richard, Charles A.; and Barbee, John Philip, 4,044,832, Cl. 166-278.000.

Barber, Randy B.: *See—*
Rapoport, Henry; and Barber, Randy B., 4,045,440, Cl. 260-285.000.

Barbier, Georges, to Commissariat a l'Energie Atomique. Method and a device for thermal monitoring of a nuclear reactor core. 4,045,282, Cl. 176-19.00R.

Barchewitz, Ekkehard: *See—*
Baumgaertner, Heinrich; and Barchewitz, Ekkehard, 4,045,285, Cl. 176-39.000.

Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, to Hauni-Werke Korber & Co. KG. Apparatus for making composite filter plugs. 4,044,659, Cl. 93-77.0FT.

Barecki, Chester J.; and Wilkerson, Larry A., to American Seating Company. Fastening system for removable seat insert. 4,045,080, Cl. 297-283.000.

Barkan, Philip, to General Electric Company. Gas-blast electric circuit interrupter of the puffer type. 4,045,633, Cl. 200-148.00A.

Barney Knitting Machinery Co., Inc.: *See—*
Lombardi, Anthony Joseph, 4,045,272, Cl. 156-380.000.

Baron, George B., to Marion Power Shovel Company, Inc. Specific linkage arrangement for bucket control. 4,044,903, Cl. 214-138.00R.

Barooshian, Charles T.: *See—*
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 4,045,814, Cl. 358-124.000.

Barowski, Gerhard; Keller, Wolfgang; and Schroetter, Gerhard, to Siemens Aktiengesellschaft. Support device for use in a crucible-free floating zone melting apparatus. 4,045,183, Cl. 23-273.0SP.

Barrington, Claud C.: *See—*
Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., 4,044,749, Cl. 125-23.00R.

Barron, James Elliott, to Magnatex Corporation. Tufting button. 4,044,412, Cl. 5-356.000.

Barron, Mark B.: *See—*
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.

Barrows, Albert G., to Bogiovanni, John P. Building panel. 4,044,520, Cl. 52-309.120.

Barrus, Donald Martin: *See—*
Noyes, Richard Croissant; Dupen, Clive Frederick George; Barrus, Donald Martin; and Siegel, Edward Arnold, 4,045,283, Cl. 176-35.000.

Barrus, Gordon Brent; and Emenaker, Leo Joseph, to Printronix, Inc. Print hammer mechanism. 4,044,668, Cl. 101-93.040.

Barry-Wehmiller Company: *See—*
Babunovic, Momir; and Whitlock, Donald E., 4,044,783, Cl. 134-73.000.

Bartell, Dwight O.: *See—*
Smashey, Russell W.; and Bartell, Dwight O., 4,044,815, Cl. 164-35.000.

Bartell, John B.: *See—*
Stohlquist, Roger H.; and Bartell, John B., 4,045,275, Cl. 156-521.000.

Barten, Piet Gerard Joseph, to U.S. Philips Corporation. Eccentrically mounted six-pole rings for a static convergence unit. 4,045,754, Cl. 335-212.000.

Barth, Wayne E., to Pfizer Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,045,436, Cl. 544-23.000.

Barth, Wayne E., to Pfizer, Inc. 4-(Tetrazol-5-yl)-Δ^3-cephem compounds. 4,045,437, Cl. 544-17.000.

Bartram, Trevor Carlisle; and Hazell, Paul Alexander. Magnetic field systems employing a superconducting D.C. field coil. 4,045,716, Cl. 318-154.000.

Basel, Donald R.; and Kawolics, Raymond P. Pinch tube valve. 4,044,989, Cl. 251-7.000.

BASF Aktiengesellschaft: *See—*
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.
Tartter, Arnold, 4,045,424, Cl. 260-147.000.

BASF Wyandotte Corporation: *See—*
Boggs, Frank, Jr., 4,045,323, Cl. 204-266.000.
Login, Robert B., 4,045,510, Cl. 260-830.00P.

Bassani Ticione S.p.A.: *See—*
Anzani, Alberto, 4,045,629, Cl. 200-52.00R.

Bassinger, Grey: *See—*
Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, 4,044,844, Cl. 173-73.000.

Bassinger, Ross: *See—*
Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, 4,044,844, Cl. 173-73.000.

Bassinger Tool Enterprises, Ltd.: *See—*
Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, 4,044,844, Cl. 173-73.000.

Bastien, Jean: *See—*
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.

Battelle Memorial Institute: *See—*
Trumbull, Harold E.; and Poeth, Dean F., 4,044,904, Cl. 214-152.000.

Battista, Orlando A.; and Ward, Richard L., to Avicon, Inc. Regenerated cellulose sponge. 4,045,238, Cl. 106-122.000.

Bauer, Artur: *See—*
Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, 4,044,898, Cl. 214-18.00N.

Bauer, Fritz, to Suspa Federungstechnik Fritz Bauer & Sohne OHG. Gas spring. 4,045,008, Cl. 267-120.000.

Bauer, Werner R., to Robertshaw Controls Company. Cut-back thermostat construction. 4,045,759, Cl. 337-301.000.

Bauman, Thomas G.: *See—*
Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., 4,044,487, Cl. 42-16.000.

Baumgaertner, Heinrich; and Barchewitz, Ekkehard, to Hochtemperatur-Reactorbau GmbH. Plant for the production of hydrogen through utilization of heat energy obtained from a gas-cooled nuclear reactor. 4,045,285, Cl. 176-39.000.

Bayer Aktiengesellschaft: *See—*
Arlt, Dieter, 4,045,447, Cl. 260-307.00F.
Arlt, Dieter, 4,045,481, Cl. 260-566.00D.
Bock, Manfred; Uerdingen, Walter; and Pedain, Josef, 4,045,462, Cl. 260-453.0AP.
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, 4,045,382, Cl. 260-4.00R.
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, 4,045,457, Cl. 260-381.000.
Hamprecht, Rainer, 4,045,430, Cl. 260-208.000.
Judat, Artur; Judat, Helmut; and Grah, Gerd, 4,045,190, Cl. 55-93.000.
Klein, Alfons; and Wedemeyer, Karlfried, 4,045,499, Cl. 260-621.00R.
Kleinstuck, Roland, 4,045,460, Cl. 260-448.80R.
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H.
Krall, Hermann-Dieter; and Schwarz, Hans-Helmut, 4,045,486, Cl. 260-566.00R.
Kutzbach, Carl; Arens, Alfred; and Schmidt-Kastner, Gunter, 4,045,552, Cl. 424-94.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.
Schwickart, Karl-Josef; and Sesterhenn, Lothar, 4,045,325, Cl. 204-286.000.
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,045,496, Cl. 260-613.00D.
Vogel, Axel, 4,045,455, Cl. 260-369.000.

Baylis, Howard Raymond; and Edwards, Roger Alan, to Monotype Corporation Limited, The. Photocomposing apparatus. 4,045,803, Cl. 354-5.000.

BBC Brown Boveri & Company Limited: *See—*
Hohn, Alfred, 4,044,561, Cl. 60-657.000.

Beale, Julian Robert Anthony: *See—*
Shannon, John Martin; and Beale, Julian Robert Anthony, 4,045,248, Cl. 148-1.500.

Bean, Lloyd F., to Xerox Corporation. Method of reproducing color highlighted documents. 4,045,219, Cl. 96-1.200.

Beauchet, Jean, to Societe Nouvelle de Roulements. Concentric antifriction bearing assembly. 4,045,100, Cl. 308-183.000.

Bechem, Hannelore: *See—*
Bechem, Karl-Gunther, 4,045,088, Cl. 299-31.000.

Bechem, Karl-Gunther, to Bechem, Hannelore; and Binnewies, Ingrid. Oscillating disk thin seam mining machine with steering. 4,045,088, Cl. 299-31.000.

Beck, Dieter: *See—*
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.

Beck, James R.; and Yahner, Joseph A., to Eli Lilly and Company. 3-Cyanoalkylthio- or 3-alkoxycarbonylmethylthio-2,6-di-nitroanilines. 4,045,466, Cl. 260-465.00E.

Becker, Mitchell; and Valbert, Jon R., to Halcon International, Inc. Process for the recovery of alkylene glycols. 4,045,294, Cl. 203-69.000.

Becker & Van Hullen, Niederrheinische Maschinen Fabrik: *See—*
Lange, Wolfgang; and Schafer, Werner, 4,045,274, Cl. 156-492.000.

Beckman Instruments, Inc.: *See—*
Sternberg, James C., 4,045,296, Cl. 195-103.50R.

Beckman, Paul, to IPCO Hospital Supply Corporation. Thermometer. 4,044,614, Cl. 73-371.000.

Belden Corporation: *See—*
Torgerson, Duane E., 4,045,611, Cl. 174-121.0SR.

Bell Fibre Products Corporation: *See—*
Geschwender, Robert C., 4,045,268, Cl. 156-197.000.

Bell Helmets Inc.: *See—*
Lewicki, Lester R.; and Santacroce, James D., 4,044,400, Cl. 2-421.000.

Bell & Howell Company: *See—*
Watson, Charles J.; and Langrehr, Larry L., 4,045,136, Cl. 355-83.000.

Bell Telephone Laboratories, Incorporated: *See—*
James, Dennis Bryan; Liu, Chao Kai; and Smith, Douglas Charles, 4,045,615, Cl. 179-1.0CN.
Miller, Barry, 4,045,725, Cl. 324-30.00B.

Belsky, Valentin Innokentievich: *See—*
Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich, 4,045,006, Cl. 266-149.000.

Bendix Corporation, The: *See—*
Scopaz, Joseph T., 4,045,662, Cl. 235-153.00A.

Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, to Bureau de Recherches Geologiques et Minieres. Mechanical method for separating fractions of incinerated urban refuse or similar industrial refuse. 4,044,956, Cl. 241-24.000.

Beneke, Wolfgang. Device for the pneumatic feeding of a quantity of cards. 4,045,091, Cl. 302-28.000.

Bengt Lundin AB: *See—*
Kramming, Erik, 4,044,890, Cl. 206-493.000.

Bennes Marrel: *See—*
Tardy, Maurice; and Paulet, Jean, 4,044,795, Cl. 137-625.600.

Benson, Glendon M., to New Process Industries, Inc. Thermal oscillator. 4,044,558, Cl. 60-520.000.

Benson, Herbert L., Jr., to Shell Oil Company. Isomerization of paraffinic hydrocarbons with fused salt complex of aluminum halide and manganous halide deposited on a carrier. 4,045,509, Cl. 260-683.750.

Benthin, Frank: *See—*
Eckstein, Wolfgang; and Benthin, Frank, 4,045,192, Cl. 55-222.000.

Benz & Hilgers GmbH.: *See—*
Reinecke, Guenter, 4,044,896, Cl. 214-8.50H.

Berger, Erich, to U.S. Philips Corporation. Slipping coupling for a recording and/or playback apparatus. 4,044,868, Cl. 192-12.00B.

Berger, Henry F. Chemical mixing and pumping apparatus. 4,045,004, Cl. 259-4.00R.

Berger, Jacob E. Tissue specimen container. 4,045,291, Cl. 195-127.000.

Berlin, Alla Markovna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Bernardi, Carl E., to National Semiconductor Corporation. Method and apparatus for plating the posts of a semiconductor chip header. 4,045,321, Cl. 204-202.000.

Bernardin, Leo J.: *See—*
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., 4,044,766, Cl. 128-285.000.

Bernasconi, Raymond: *See—*
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.

Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, to AB Hassle. Substituted 2-[pyridylalkylenesulfinyl]-benzimidazoles with gastric acid secretion inhibiting effects. 4,045,563, Cl. 424-263.000.

Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, to AB Hassle. Benzimidazole derivatives useful as gastric acid secretion inhibitors. 4,045,564, Cl. 424-263.000.

Bettens, Jean-Paul, to Modulo S.A. Kit with male and female elements having deformable gripping means. 4,044,497, Cl. 46-17.000.

Betz Laboratories, Inc.: *See—*
Lange, K. Robert, 4,045,244, Cl. 134-22.00R.

Beveridge, John, to Metal Box Limited. Containers having protective opening edges. 4,044,916, Cl. 220-270.000.

Bhardwaj, Mahesh C.; and Englert, William J., to PPG Industries, Inc. Composite seal for a glass forming chamber. 4,045,203, Cl. 65-182.00R.

Bhutani, Sudhir K.; and Nichols, Willard A., to Olin Corporation. Process for producing high purity para-chlorobenzotrifluoride. 4,045,502, Cl. 260-651.00F.

Bianchi, Giuseppe, to I.GE.Co. Z.r.l. Cellular cement composition. 4,045,236, Cl. 106-88.000.

Bianchi, Thomas A., to Eastman Kodak Company. Method for making o- and p- haloalkyl styrenes. 4,045,501, Cl. 260-651.00R.

Biberg, Odd Bjorn. Machine for forming trenches for pipelines or the like in the sea bed. 4,044,566, Cl. 61-72.400.

Bicosa Societe de Recherches: *See—*
de Mere, Henri Edouard Courier, 4,044,681, Cl. 102-70.20R.

Bidwell, Jan Ivan; Adams, Roger William; and Jepson, Walter Brian, to English Clavs Lovering Pochin & Company, Limited. Treatment of clay minerals. 4,045,235, Cl. 106-72.000.

Bien, Hans-Samuel: *See—*
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, 4,045,457, Cl. 260-381.000.

Bierer, William F. Patient transport with oxygen supply. 4,045,044, Cl. 280-87.02R.

Biesecker, Frederick S., to Ranco Incorporated. Method and apparatus for controlling air-conditioning systems. 4,044,823, Cl. 165-16.000.

Biller, Bruce A.; and Scherer, Henry W., to S&C Electric Company. Valve arrangement for high voltage fuse. 4,045,758, Cl. 337-186.000.

Billgren, Karl Lennart. Air terminal building. 4,044,516, Cl. 52-174.000.

Billi, S.p.A.: *See—*
Micheletti, Arrigo, 4,044,574, Cl. 66-187.000.

Billings Energy Corporation: *See—*
Campbell, Barrie C., 4,045,303, Cl. 204-24.000.

Bing, Bari; and Sloan, Barbara S. Clasp for jewelry chain. 4,044,430, Cl. 24-201.00R.

Binnewies, Ingrid: *See—*
Bechem, Karl-Gunther, 4,045,088, Cl. 299-31.000.

Bird, Forrest M. Ventilator and method. 4,044,763, Cl. 128-145.800.

bison-Werke Bahre & Greten GmbH & Co. KG: *See—*
Greten, Berndt, 4,045,531, Cl. 264-113.000.

Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., to Caterpillar Tractor Co. Fluoroelastomer-polyacrylate based friction material. 4,045,402, Cl. 260-42.180.

Black and Decker Manufacturing Company, The: *See—*
Lessig, William Ralph, III, 4,044,532, Cl. 56-10.500.

Black, James Harold; and Stant, Vernon C., to American Brands, Inc. Method and apparatus for forming sealed packages. 4,044,528, Cl. 53-192.000.

Black, Philip W.: *See—*
Pitt, Gillies D.; and Black, Philip W., 4,045,668, Cl. 250-227.000.

Blades, John D.: *See—*
Hou, Shou L.; and Blades, John D., 4,044,671, Cl. 101-129.000.

Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., to Xonics, Inc. Electrostatic fountain developer. 4,044,718, Cl. 118-647.000.

Blakely, Stephen W., to Olin Corporation. Quick-connect coupling. 4,045,055, Cl. 285-33.000.

Blazevic, Nikola: *See—*
Kajfez, Franjo; Blazevic, Nikola; and Sunjic, Vitomir, 4,045,569, Cl. 424-274.000.

Blechen, Frederick C.; and Roberts, Lloyd L., to McDonnell Douglas Corporation. Aircraft speed command system. 4,044,975, Cl. 244-181.000.

Blondeel, Eric Jozef, to AGFA-GEVAERT N.V. Fluid bearing. 4,045,098, Cl. 308-9.000.

Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, to Electricite de France (Service National); and Pechiney Ugine Kuhlmann. Molten fuel-salt reactor. 4,045,286, Cl. 176-49.000.

Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, to Coal Industry (Patents) Limited. Cellular material. 4,045,380, Cl. 260-2.5HA.

Bock, Manfred; Uerdingen, Walter; and Pedain, Josef, to Bayer Aktiengesellschaft. Bicyclic triisocyanates. 4,045,462, Cl. 260-453.0AP.

Bodor, Nicolae S.: *See—*
Kaminski, James J.; and Bodor, Nicolae S., 4,045,578, Cl. 424-311.000.

Boehme, Detlef R.: *See—*
Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.

Boehmer, Georg, to Siemens Aktiengesellschaft. Apparatus for advancing a ribbon in office typewriters, teleprinters, data printers and the like. 4,044,883, Cl. 197-151.000.

Boeing Company, The: *See—*
Eisner, Steve; and Powell, James LeRoy, 4,045,356, Cl. 225-2.000.
Moorehead, James R., 4,044,973, Cl. 244-54.000.
Vermilye, Michael Lee, 4,044,550, Cl. 60-39.09R.

Boggs, Frank, Jr., to BASF Wyandotte Corporation. Anolyte sealing, electrical insulating for electrolytic cells. 4,045,323, Cl. 204-266.000.

Bogiovanni, John P.: *See—*
Barrows, Albert G., 4,044,520, Cl. 52-309.120.

Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,044,840, Cl. 172-59.000.

Bonderman, Dean P.: *See—*
Proksch, Gary J.; and Bonderman, Dean P., 4,045,176, Cl. 23-230.00B.

Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., to Gulf Research & Development Company. Hydrodesulfurization apparatus with upstaged reactor zones. 4,045,182, Cl. 23-288.00R.

Booher, Howard, to Bruce, Robert J.; and Tate, Mark T., part interest to each. Horizontally discharging semi-trailer. 4,044,899, Cl. 214-82.000.

Bordelon, Lewis O. Protective device. 4,044,922, Cl. 222-183.000.

Borden Chemical Company (Canada) Limited, The: *See—*
Chiu, Shui-Tung; and Turko, William Melvin, 4,045,595, Cl. 427-202.000.

Borg, John P. Automatic electrical plug release. 4,045,106, Cl. 339-45.00R.

Borg-Warner Corporation: *See—*
Fogelberg, Mark John, 4,044,870, Cl. 192-89.00W.

Bornert, Paul, to Air-Industrie. Installations for washing a polluted gas. 4,045,524, Cl. 261-112.000.

Bos, Jules; and von der Kall, Gunter, to U.S. Philips Corporation. Method of and device for grinding grooves. 4,044,509, Cl. 51-206.00P.

Bottai, Gabriele: *See—*
Piccolo, Luigi; Bottai, Gabriele; Paolinelli, Antonio; and La Rovere, Angelo, 4,045,205, Cl. 71-31.000.

Bottum, Edward W.; and Rockwell, Frank H., to Refrigeration Research, Inc. Solar heating system component. 4,044,948, Cl. 237-1.00A.

Boucher, Raymond W.; and Ziegler, William H., Jr., to Hedstrom Co. Foldable child walker. 4,045,045, Cl. 280-87.02W.

Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., to Geometric Data Corporation. Automatic focusing system. 4,045,772, Cl. 340-146.30B.

Bowe, Bohler & Weber KG Maschinenfabrik: *See—*
Fuhring, Heinrich; and Sieber, Johannes Helmut, 4,045,174, Cl. 8-142.000.

Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., to HydroTech International, Inc. Concrete removal tool. 4,044,749, Cl. 125-23.00R.

Bowen, Glenn W.: *See—*
Sidor, Edward Frank; Camillo, Charles Carl; and Bowen, Glenn W., 4,045,787, Cl. 340-197.000.

Bowmar Instrument Corporation: *See—*
Yoder, Alan C.; and Weber, John E., 4,045,636, Cl. 200-292.000.

Box, Theodor M. Collapsible crate. 4,044,910, Cl. 220-7.000.

Boy de la Tour, Roger, to McDonnell Douglas Corporation. Cargo transfer logic circuitry. 4,045,681, Cl. 307-113.000.

Boyce, Clive B. C.: *See—*
Searle, Robert J. G.; and Boyce, Clive B. C., 4,045,575, Cl. 424-305.000.

Boyd, Dennis; and Porter, George, to Gallaher Limited. Synthetic smoking product. 4,044,777, Cl. 131-2.000.

Boyertown Burial Casket Company: *See—*
Acton, Hugh, 4,044,435, Cl. 27-2.000.

Brackney, Maurice R.: *See—*
Umpleby, Kenneth F.; and Brackney, Maurice R., 4,045,715, Cl. 318-16.000.

Bradley, James B., Jr. Ophthalmic device and method. 4,045,137, Cl. 351-132.000.

Bradshaw, John O. Timed pet food dispenser. 4,044,722, Cl. 119-51.130.

Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, to Bayer Aktiengesellschaft. Molding materials based on polyvinyl chloride and polyphenylene oxide. 4,045,382, Cl. 260-4.00R.

Brand, Derek A.: *See—*
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., 4,044,660, Cl. 99-326.000.

Brandon, William D.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.

Bratthall, Lars, to Stal-Laval Apparat AB. Apparatus for measuring fouling on the inside of a heat-exchanger tube. 4,044,605, Cl. 73-61.200.

Braun, Anton. Machine drive mechanism. 4,044,618, Cl. 74-29.000.

Bream, John Bernard, to Sandoz Ltd. 3-Amino-1-phenyl-1h,5h,-benzo-2,4-thiazepines. 4,045,572, Cl. 424-275.000.

Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, to Peter Smith Associates (Carpet Importers) Limited; and Collie Carpets Limited. Carpeting having stiff fibers. 4,045,605, Cl. 428-88.000.

Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo, to Marvin Glass & Associates. Bowling alley game. 4,045,024, Cl. 273-43.00A.

Breunkink, Bernard: *See—*
Brinkman, Willem; and Breunkink, Bernard, 4,044,745, Cl. 123-139.00E.

Brewer, Charles A.; and Brewer, Richard A. Surfboard with adjustable fin. 4,044,416, Cl. 9-310.00E.

Brewer, Richard A.: *See—*
Brewer, Charles A.; and Brewer, Richard A., 4,044,416, Cl. 9-310.00E.

Bridendall, Philip R., Jr., to Olin Corporation. Connection means for anode posts in diaphragm cells. 4,045,322, Cl. 204-263.000.

Bridgestone Tire Company Limited: *See—*
Taniguchi, Motoaki; and Iwata, Toyomi, 4,044,810, Cl. 152-209.00R.

Bridigum, Robert J., to Westinghouse Air Brake Company. Dynamic blending with a spring-applied fluid pressure released service brake including cojoint spring and fluid pressure emergency feature. 4,045,093, Cl. 303-3.000.

Briggs, Warren Stanley: *See—*
Warthen, John Lawrence; Briggs, Warren Stanley; and Paggen, Marvin Vernon, 4,045,372, Cl. 252-463.000.

Brink, Andries; Stander, Adriaan Hendrikus; and Dry, Leonard James, to South African Coal, Oil & Gas Corporation Limited. Carbonaceous material. 4,045,187, Cl. 44-1.00B.

Brinkman, Willem; and Breunkink, Bernard, to Holec, N.V. Injector pump. 4,044,745, Cl. 123-139.00E.

Bristow, Stephen D., to Atari, Inc. Animated video image display system and method. 4,045,789, Cl. 340-324.0AD.

British Leyland UK Limited: *See—*
Longstaff, Kenneth, 4,044,747, Cl. 123-148.00E.

British Petroleum Company Limited, The: *See—*
Forbes, Eric Simon; and Reid, Angus Joseph Dickson, 4,045,332, Cl. 208-323.000.

Brodmann, George L.; and Schlatter, Carl Nelson, to PPG Industries, Inc. Solvent finishing of fiber glass fabrics. 4,045,601, Cl. 427-381.000.

Broerse, Pieter Hendrik: *See—*
Vrenken, Louis Eugene; and Broerse, Pieter Hendrik, 4,045,664, Cl. 240-46.030.

Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., to Lummus Company, The. Coupling process. 4,045,504, Cl. 260-669.00R.

Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, to Produits Chimiques Ugine Kuhlmann. Chromium complexes of phenylazopyrazolyl or phenylazonaphthol dyestuffs and acetylacetone. 4,045,423, Cl. 260-147.000.

Brown, Donald J., to Knox Manufacturing Co. Control device to position projection screen for viewing. 4,045,123, Cl. 350-117.000.

Brown, Francis Barton; and Erickson, John W., to Kobe, Inc. Centrifugal separator and system. 4,044,943, Cl. 233-19.00A.

Brown, Frank J., to United Technology, Inc. Abrasion resistant boot. 4,045,072, Cl. 294-74.000.

Brown, Ivan Richard: *See—*
Lyon, Garnet Rexford; and Brown, Ivan Richard, 4,044,650, Cl. 90-14.000.

Browne, Sidney, to Carrier Telephone Corporation of America, Inc. Continuous monitoring in carrier telephone systems. 4,045,624, Cl. 179-175.30R.

Brownell, James R.: *See—*
Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., 4,044,592, Cl. 72-462.000.

Bruce, Robert J.: *See—*
Booher, Howard, 4,044,899, Cl. 214-82.000.

Bruinsma, Bote G. Short span tensile tester system. 4,044,595, Cl. 73-95.000.

Bruni, Maurice; and Seris, Georges, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude. Method for preparing fuel mixtures for torches and burners. 4,045,189, Cl. 48-190.000.

Brunnert, Stig Erik, to Saab-Scania AB. Valve mechanisms. 4,044,913, Cl. 220-86.00R.

Brutting, Eugen, to EB Sport International GmbH vormals; and Heiner Stuhfauth GmbH. Shell sole. 4,044,479, Cl. 36-32.00R.

Bryan, Clifford Chandler, to Samcoe Holding Corporation. Apparatus for processing sweater sections and the like. 4,044,434, Cl. 26-18.500.

Buchheit, Otto K., to Moeller & Neumann GmbH. Entry rollerway for a cooling bed for elongate rolled stock. 4,044,585, Cl. 72-201.000.

Buckley, Clair S. One-way brake for wheel chairs. 4,045,047, Cl. 280-242.0WC.

Budd Company, The: *See—*
Eggert, Walter S., Jr., 4,044,689, Cl. 105-221.00R.

Budnitsky, Gennady Alfeevich: *See—*
Serkov, Arkady Trofimovich; Budnitsky, Gennady Alfeevich; Sokolovsky, Boris Matveevich; and Lezhnev, Vyacheslav Kapitonovich, 4,045,532, Cl. 264-196.000.

Budoff, Hyman, to Hybud Equipmen: Corporation. System and method for the handling of solid waste. 4,044,664, Cl. 100-48.000.

Budrys, Vitolis: *See—*
Erickson, John W.; and Budrys, Vitolis, 4,045,145, Cl. 415-89.000.

Buerki, Christian E.: *See—*
McQueen, Raymond R., Jr.; and Buerki, Christian E., 4,045,640, Cl. 219-10.55B.

Bugarcic, Helmut, to Linke-Hofmann-Busch GmbH. Truck for the common pivotal support of two car bodies. 4,044,687, Cl. 105-4.00R.

Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,045,170, Cl. 8-11.000.

Bulbenko, George F.; and Woodbridge, Joseph Eliot, to Princeton Biomedix Incorporated. Diagnostic method and compounds for use therewith. 4,045,290, Cl. 195-99.000.

Bumgardner, Jon H., to United States of America, Navy. Means for near real time C-W laser source characterization. 4,045,140, Cl. 356-141.000.

Bunce, Roger Abraham, to Secretary of State for Social Services. Temperature control apparatus for use in investigating specimens. 4,045,179, Cl. 23-259.000.

Bundy, Gordon L., to Upjohn Company, The. PG-type 1,15-lactones. 4,045,449, Cl. 260-340.200.

Bunnell, Edward Dennman, to AMP Incorporated. Apparatus for inserting wires into terminals in modular type connector. 4,044,451, Cl. 29-566.400.

Burd, John W.; Stone, Bobbie D.; Tucker, William F.; and Gupta, Kedar P., to Monsanto Company. Apparatus for zone refining. 4,045,181, Cl. 23-273.00R.

Burdick, Robert C. Propeller hub reflector holder. 4,045,122, Cl. 350-97.000.

Bureau de Recherches Geologiques et Minieres: *See—*
Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, 4,044,956, Cl. 241-24.000.

Burg, Karlheinz: *See—*
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.

Burgess Industries Incorporated: *See—*
Halter, Edmund John, 4,045,057, Cl. 285-49.000.

Burke, Roger A., to Hughes Aircraft Company. Watch module construction. 4,044,542, Cl. 58-23.00R.

Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, to Hilti Aktiengesellschaft. Bolt welding gun. 4,045,643, Cl. 219-98.000.

Burkhart, Merle Keith: *See—*
Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, 4,044,906, Cl. 214-506.000.

Burlingame, Richard D., to Luria Brothers & Co., Inc. High-grade metallic products. 4,044,459, Cl. 29-614.000.

Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, to Xerox Corporation. Corrugation coupled twin guide laser. 4,045,749, Cl. 331-94.50H.

Burroughs Corporation: *See—*
Gibbs, Stephen R.; and Chow, Kuen, 4,045,302, Cl. 204-15.000.
Tam, Richard K. W., 4,045,690, Cl. 307-260.000.

Burt, George A., Jr.; and Neill, William M., to International Paper Company. Machine for handling sheet material. 4,044,641, Cl. 83-341.000.

Burton, Paul F., to Dixie-Narco, Inc. Multiple column vending machine malfunction lockout circuit. 4,044,877, Cl. 194-10.000.

Buschfeld, Adolf, to Deutsche Texaco Aktiengesellschaft. Process for preparing low viscosity fatty acid-modified polyesters. 4,045,391, Cl. 260-22.0EP.

Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and by Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, to General Electric Company. Bucket-brigade delay line having reduced parasitic capacitances. 4,045,810, Cl. 357-24.000.

Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, to Jenoptik Jena G.m.b.H. III(A)-(VB) Type luminescent diode. 4,045,257, Cl. 148-171.000.

Butuzov, Alexei Vasilievich: *See—*
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly, 4,044,801, Cl. 139-436.000.

Buxton, Jarvis Cathralle: *See—*
Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, 4,045,076, Cl. 296-39.00A.

Buzzell, Colby E., to General Electric Company. Variable reluctance speed sensor of integral construction utilizing a shielded high coercive force rare earth magnet positioned directly adjacent the sensing rotating element. 4,045,738, Cl. 324-174.000.

Byrne, Charles H., to General Foods Corporation. Interruptible time-temperature indicator. 4,044,707, Cl. 116-114.500.

Bytzek, Max: *See—*
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, 4,045,239, Cl. 106-147.000.

C. M. Systems, Incorporated: *See—*
Heffron, Allan J.; and Kennedy, Leverne H., 4,044,638, Cl. 82-9.000.

C. van der Lely N. V.: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,044,840, Cl. 172-59.000.

Cadbury Limited: *See—*
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,045,583, Cl. 426-241.000.

Caffarella, Thomas E.; Radda, George J.; and Watts, David J., to American Atomics Corporation. Method and apparatus for subdividing a gas filled glass tube. 4,045,201, Cl. 65-105.000.

Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno. Apparatus for yarn storing and feeding to yarn using machines. 4,044,962, Cl. 242-47.050.

California Institute of Technology: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,045,352, Cl. 210-500.00M.

Callahan, William B.; and Coe, B. Frank, to Du Pont de Nemours, E. I., and Company. Alkyd resin manufacturing process by using water or steam to reverse or retard gelation. 4,045,392, Cl. 260-22.00R.

Camillo, Charles Carl: *See—*
Sidor, Edward Frank; Camillo, Charles Carl; and Bowen, Glenn W., 4,045,787, Cl. 340-197.000.

Campbell, Barrie C., to Billings Energy Corporation. Process of electroplating porous substrates. 4,045,303, Cl. 204-24.000.

Campbell, Duncan Paul. Nozzle. 4,044,954, Cl. 239-458.000.

Campbell, Gaylord K. Chocks. 4,044,976, Cl. 248-1.000.

Canada, Her Majesty the Queen in right of: *See—*
Hart, John A. H., 4,045,609, Cl. 428-253.000.

Canadian Patents and Development Limited: *See—*
Cox, Louis G.; and Kusters, Norbert L., 4,045,734, Cl. 324-142.000.

Canon Denshi Kabushiki Kaisha: *See—*
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.

Canon Kabushiki Kaisha: *See—*
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.
Momiyama, Kikuo, 4,045,128, Cl. 350-216.000.
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.

Canonica, Luigi: *See—*
Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, 4,045,555, Cl. 424-174.000.

Cantaluppi, Angelo, to S.A.E.S. Getters S.p.A. Silver-based catalytic composition for the oxidation of ethylene to ethylene oxide and methanol to formaldehyde. 4,045,369, Cl. 252-432.000.

Capps, Frank R.: *See—*
Strickland, James K.; Capps, Frank R.; Nekola, Todd B.; and Fremer, William A., 4,044,986, Cl. 249-216.000.

Cardarelli, John J.: *See—*
Anderson, Alan S.; and Cardarelli, John J., 4,045,670, Cl. 250-338.000.

Cares, William Ronald, to Petro-Tex Chemical Corporation. Catalyst for the depolymerization of lower polymers of isobutene. 4,045,370, Cl. 252-458.000.

Carlson, Arne, to Stal-Laval Turbin AB. Method of installation of large capacity gas-turbine powered electrical generating machinery. 4,044,442, Cl. 29-156.40R.

Carlson, Curtis Raymond, to RCA Corporation. Analog optical block processor. 4,045,133, Cl. 355-1.000.

Carlsson, Stig Ake Ingemar: *See—*
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.

Carnation Company: *See—*
Petrowski, Gary E.; Wolcott, John M.; and Ortiz, Erlinda P., 4,045,589, Cl. 426-609.000.

Carpenter, Robert Gordon; and Chao, Chester C., to International Business Machines Corporation. Method for composing electrical test patterns for testing AC parameters in integrated circuits. 4,045,736, Cl. 324-158.00R.

Carre, Roland, to Thomson-CSF. Band-compression device. 4,045,798, Cl. 343-17.2PC.

Carrier Corporation: *See—*
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,044,914, Cl. 220-93.000.
Liberman, Harvey W.; and Salyers, John C., 4,044,905, Cl. 214-152.000.

Carrier Telephone Corporation of America, Inc.: *See—*
Browne, Sidney, 4,045,624, Cl. 179-175.30R.

Carriere, James L. Credit card transfer assembly. 4,045,053, Cl. 282-22.00R.

Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., to Gulf & Western Manufacturing Company. Coining die assembly. 4,044,592, Cl. 72-462.000.

Caruso, Albert P. Holster belt. 4,044,929, Cl. 224-2.00B.

Casio Computer Co., Ltd.: *See—*
Kashio, Toshio, 4,045,780, Cl. 364-900.000.

Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, to Hoffmann-La Roche Inc. 9,10-Seco-steroid preparation. 4,045,490, Cl. 260-590.0FA.

Cassonnet, Jean-Claude Marcel: *See—*
Antoine, Pierre Gabriel; Cassonnet, Jean-Claude Marcel; and Vinot, Daniel Rene, 4,045,661, Cl. 235-153.0AC.

Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, to Instrument Services, Inc. Allpurpose portable scoreboard. 4,045,788, Cl. 340-323.00R.

Catelli, Pietro. Tubular back supported child carrier. 4,044,931, Cl. 224-6.000.

Caterpillar Tractor Co.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.
Cruthis, Robert Duane; and Mills, Robert Samuel, 4,044,692, Cl. 105-368.00R.
Eftefield, Larry G.; and Lukavich, Paul J., 4,044,481, Cl. 37-141.00T.
Feucht, Dennis D., 4,044,977, Cl. 248-7.000.
Stedman, Robert Norris, 4,044,480, Cl. 37-8.000.

Caton, Michael Peter Lear; and Parker, Trevor, to May & Baker Limited. Cyclopentane derivatives. 4,045,467, Cl. 260-468.00D.

Cavalla, John Frederick; and Archibald, John Leheup, to John Wyeth & Brother Limited. Benzamido piperidines. 4,045,444, Cl. 260-293.580.

Cave, Ellis K., to Recognition Equipment Incorporated. Automatic corrector for fixed pattern odd/even video noise. 4,045,816, Cl. 358-212.000.

Caverly, Warren R. Sand bag filling apparatus. 4,044,921, Cl. 222-74.000.

Cavitron Corporation: *See—*
Clarke, Robert Alfred; Kuhl, Peter J.; and Paschke, Richard H., 4,045,271, Cl. 156-366.000.

Ceckler, William H.: *See—*
Meyer, Harry W., deceased; Baker, Jerry D.; and Ceckler, William H., 4,045,216, Cl. 75-84.000.

Cerutti, Bernard C.: *See—*
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.

Chai, Hi Dong; and Pawletko, Joseph Paul, to International Business Machines Corporation. Serial printer with linear motor drive. 4,044,881, Cl. 197-82.000.

Chambers, Robert V.: *See—*
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,044,806, Cl. 144-309.0AC.

Chambliss, Joni: *See—*
Linkow, Leonard I.; and Chambliss, Joni, 4,044,467, Cl. 32-10.00A.

Champion International Corporation: *See—*
Hartman, Seymour, 4,045,386, Cl. 260-17.200.

Chan, Jimmy H.: *See—*
Mihailovski, Alexander; and Chan, Jimmy H., 4,045,471, Cl. 260-471.00A.

Chan, Ka-Kong; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Optically active alcohols and lower esters thereof. 4,045,475, Cl. 260-488.00H.

Chandramouli, Pitchaiya: *See—*
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,045,411, Cl. 260-59.00R.

Chao, Chester C.: *See—*
Carpenter, Robert Gordon; and Chao, Chester C., 4,045,736, Cl. 324-158.00R.

Charles, Steven: *See—*
McCarthy, Charles J.; Charles, Steven; and Eichenbaum, Daniel M., 4,045,630, Cl. 200-52.00R.

Chartet, Andre, to Societe Anonyme des Usines Chausson. Method for assembling tubes and tube plates and product resulting therefrom. 4,044,443, Cl. 29-157.400.

Chase Brass & Copper Co., Incorporated: *See—*
Varga, William J., 4,044,817, Cl. 164-138.000.

Chase, Willis E. Musical instrument circuit providing celeste and vibrato effects. 4,044,643, Cl. 84-1.240.

Chatelain, Lucien: *See—*
Lemonnier, Jean-Yves; and Chatelain, Lucien, 4,045,521, Cl. 261-41.00R.

Chem Systems Inc.: *See—*
Sherwin, Martin B.; and Huang, I-Der, 4,045,477, Cl. 260-497.00R.

Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich. Apparatus for continuous vacuum-refining of metals. 4,045,006, Cl. 266-149.000.

Chevron Research Company: *See—*
Reed, Marion G., 4,045,357, Cl. 252-8.50A.
Simic, Milutin; and Sweeney, William A., 4,045,506, Cl. 260-677.00A.

Cheyka, Lyudmila Karlo: *See—*
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.

Chiang, Bing; and Hoyte, Alfred F. Continuous flow heat treating apparatus using microwaves. 4,045,638, Cl. 219-10.55A.

Chicago Pneumatic Tool Company: *See—*
D'Haem, Marcel P.; and Axt, Wallis C., 4,044,625, Cl. 74-558.500.

Chiu, Richard H.: *See—*
Stavovy, Alexander B.; and Chiu, Richard H., 4,044,598, Cl. 73-7.000.

Chiu, Shui-Tung; and Turko, William Melvin, to Borden Chemical Company (Canada) Limited, The. Coating wood surface by vinyl-modified lignocellulosic particles. 4,045,595, Cl. 427-202.000.

Chopdekar, Vilas M.; and Davis, William R., to M&T Chemicals Inc. Method for preparing triogranophosphines. 4,045,494, Cl. 260-606.50P.

Chore-Time Equipment, Inc.: *See—*
Swartzendruber, Ray E., 4,044,920, Cl. 222-58.000.

Chow, Kuen: *See—*
Gibbs, Stephen R.; and Chow, Kuen, 4,045,302, Cl. 204-15.000.

Christiansen, Soren Bent, to F. L. Smidth & Co. Method of burning granular or pulverulent raw material and kiln plant therefor. 4,045,162, Cl. 432-14.000.

Christman, Robert D.: *See—*
Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., 4,045,182, Cl. 23-288.00R.

Chromax Limited: *See—*
Jackson, John Maxwell, 4,044,667, Cl. 101-38.00R.

Chrysler United Kingdom Limited: *See—*
Stringer, Roy Ernest, 4,045,666, Cl. 240-61.800.

Chu, Gordon P. K.; Shinn, Dennis B.; and Waymouth, John F., to GTE Sylvania Incorporated. Photoflash lamp. 4,045,156, Cl. 431-95.00R.

Chumaevskaya, Alla Nikolaevna: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr

Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Ciba-Geigy Corporation: *See—*
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 4,045,570, Cl. 424-275.000.
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, 4,045,459, Cl. 260-448.80R.
Gosteli, Jacques, 4,045,520, Cl. 260-985.000.
Stephen, John F., 4,045,404, Cl. 260-45.80N.
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,045,518, Cl. 260-927.00R.

Cincinnati Milacron Inc.: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 4,045,550, Cl. 424-70.000.
Weisgerber, William Robert; and Taylor, Ralph Charles, 4,045,660, Cl. 235-151.110.

Cini, Carlo; Murari, Bruno; and Santi, Mario, to SGS-ATES Componenti Elettronici S.p.A. Low-frequency power amplifier. 4,045,745, Cl. 330-15.000.

City Tank Corporation: *See—*
McKenzie, Roland W., 4,044,791, Cl. 137-493.900.

Clabburn, Robin J. T., to Raychem Limited. Recoverable article with outwardly extending hollow heat flanges; kit including such article and a cylindrical substrate; and method of making such article. 4,045,604, Cl. 428-36.000.

Claisse, Fernand. Fusion and casting machine. 4,045,202, Cl. 65-178.000.

Clark, Kenneth M., to Deutsch Company Electronic Components Division, The. Optical fiber connector. 4,045,121, Cl. 350-96.00C.

Clarke, John Michael. Reciprocating piston machine. 4,044,629, Cl. 74-579.00E.

Clarke, Robert Alfred; Kuhl, Peter J.; and Paschke, Richard H., to Cavitron Corporation. Ultrasonic method and apparatus for manufacturing brassiere tapes. 4,045,271, Cl. 156-366.000.

Claxton, William E.; and Holden, Harold C., to Firestone Tire & Rubber Company, The. Tire cure and heat transfer simulator. 4,044,600, Cl. 73-15.00R.

Clayton Manufacturing Company: *See—*
Asmus, Carl J., 4,044,609, Cl. 73-117.000.

Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. 1-Dimethylamino-2,4-diphenyl-1-butene-3,4-dione. 4,045,487, Cl. 260-570.50C.

Clemence, Francois; and Le Martret, Odile, to Roussel Uclaf. 2-Alkyl-5-thiazole-carboxylic acid derivatives in hypolipemiant compositions. 4,045,567, Cl. 424-270.000.

Cless, Gerhard; and Kaplan, Edward L., to Extel Corporation. Tape punch machine. 4,044,946, Cl. 234-39.000.

Clinton, Daniel J.: *See—*
Shine, Alfred C., 4,045,078, Cl. 269-324.000.

Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, to Sandoz Ltd. 2,3-Dihydrobenzofuran-2-one derivatives. 4,045,573, Cl. 424-279.000.

Coal Industry (Patents) Limited: *See—*
Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, 4,045,380, Cl. 260-2.5HA.
Monks, Harry, 4,045,083, Cl. 299-1.000.

Coberly, Charles Wheeler. Integrated circuit probe. 4,045,737, Cl. 324-158.00P.

Cockshott, Ian Derek: *See—*
Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, 4,044,404, Cl. 3-19.000.

Coe, B. Frank: *See—*
Callahan, William B.; and Coe, B. Frank, 4,045,392, Cl. 260-22.00R.

Cohen, Arnold, to Jones & Vining, Incorporated. Molding footwear lasts. 4,044,417, Cl. 12-146.00L.

Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, to Hoffmann-La Roche Inc. Steroid total synthesis process utilizing a cyanoalkyl A-ring precursor. 4,045,452, Cl. 260-345.90S.

Cohn, Charles C. Cigarettes. 4,044,778, Cl. 131-4.00A.

Coleman, Joe E.: *See—*
Jessup, Robert L.; and Coleman, Joe E., 4,044,829, Cl. 166-264.000.

Coleman, Michael G.; and Pryor, Robert A., to Motorola, Inc. Solar cell package. 4,045,245, Cl. 136-89.00C.

Colgate-Palmolive Company: *See—*
Gerecht, John Fred, 4,045,549, Cl. 424-60.000.
Ramachandran, Pallassana, 4,045,358, Cl. 252-8.600.

Colin, Dennis P.: *See—*
Pearlman, Alan R.; and Colin, Dennis P., 4,044,642, Cl. 84-1.100.

Collie Carpets Limited: *See—*
Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, 4,045,605, Cl. 428-88.000.

Collins, Robert Lee: *See—*
Gaumont, Richard J.; Wolfe, Maurice Leonard; and Collins, Robert Lee, 4,044,900, Cl. 214-86.00A.

Combustion Engineering, Inc.: *See—*
Noyes, Richard Croissant; Dupen, Clive Frederick George; Barrus, Donald Martin; and Siegel, Edward Arnold, 4,045,283, Cl. 176-35.000.
Seaton, William Wayne, 4,044,927, Cl. 222-604.000.

Combustion Research Corporation: *See—*
Johnson, Arthur C. W., 4,044,751, Cl. 126-91.00A.

Commissariat a l'Energie Atomique: *See—*
Barbier, Georges, 4,045,282, Cl. 176-19.00R.
Gugenberger, Rene; and Martin, Roger, 4,044,825, Cl. 165-165.000.

Compagnie Francaise des Petroles: *See—*
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.

Compagnie Generale Pour Les Developpements Operationnels: *See—*
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.

Compagnie Honeywell Bull (Societe Anonyme): *See—*
Antoine, Pierre Gabriel; Cassonnet, Jean-Claude Marcel; and Vinot, Daniel Rene, 4,045,661, Cl. 235-153.0AC.

Compagnie Industrielle des Telecommunications CIT-ALCATEL S.A.: *See—*
Lagarde, Jean-Louis; and Gauriat, Gilles, 4,045,618, Cl. 179-15.0BS.

Compagnie Maritime D'Expertises: *See—*
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.

Conner, William R., Jr., to Stahl-Urban Company. Apparatus for joining plies of material such as textile fabric. 4,044,698, Cl. 112-121.120.

Connor, David T.; and von Strandtmann, Maximilian, to Warner-Lambert Company. 2-(Methylthio)naphtho[1,3-bc]pyran-3(2H)-one. 4,045,451, Cl. 260-345.200.

Conrac Corporation: *See—*
Westbrook, James E., 4,045,620, Cl. 179-84.0VF.

Consolidated Controls Corporation: *See—*
Jukoff, David, 4,044,992, Cl. 251-126.000.
Waller, Henry A., 4,044,991, Cl. 251-122.000.

Container Corporation of America: *See—*
Helms, C. R., 4,044,940, Cl. 229-40.000.

Contois, Lawrence E.; Fox, Charles J.; and Stahr, Richard W., to Eastman Kodak Company. Low color photoconductive insulating compositions comprising nitrogen-free photoconductor and benzopyrilium sensitizer. 4,045,220, Cl. 96-1.600.

Convent, Bernard, to Monsanto Company. Synergistic herbicidal composition comprising N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and methabenzthiazuron. 4,045,206, Cl. 71-90.000.

Convent, Bernard, to Monsanto Company. Synergistic herbicidal composition comprising N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and pyrazon. 4,045,207, Cl. 71-92.000.

Convent, Bernard, to Monsanto Company. Synergistic herbicidal composition comprising N-(butoxymethyl)-6'-tert-butyl-2-chloro-o-acetotoluidide and N-(3-chloro-4-methyl phenyl)-N',N'-dimethylurea. 4,045,210, Cl. 71-120.000.

Cooksley, Ralph D. Water purification apparatus and method. 4,045,293, Cl. 203-10.000.

Coombs, Donald L.; and Hollis, Richard E., to International Telephone and Telegraph Corporation. Burner assembly. 4,045,158, Cl. 431-123.000.

Cor Tech Research Limited: *See—*
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, 4,045,411, Cl. 260-59.00R.

Corbin, Terry; and Zytkovicz, Duane J., to Medtronic, Inc. Percutaneously inserted spinal cord stimulation lead. 4,044,774, Cl. 128-404.000.

Cornell Research Foundation, Inc.: *See—*
Humphries, Stanley, Jr.; and Sudan, Ravindra N., 4,045,677, Cl. 250-423.00R.

Corrigan, Francis R., to General Electric Company. Method for producing large soft hexagonal boron nitride particles. 4,045,186, Cl. 23-295.00R.

Coster, Theo M. S. Marker board. 4,045,013, Cl. 273-136.00F.

Cottingham, James G., to United States of America, Energy Research and Development Administration. Hydride heat pump. 4,044,819, Cl. 165-1.000.

Cox, Fred L.; Crump, Steve; and Hice, Phate, to Silver Creek Minerals Corporation. Method and apparatus for stripping, cleaning and treating surfaces. 4,044,507, Cl. 51-424.000.

Cox, John William Andrew, to Macleisure Limited. Games practice net and protective screen. 4,045,032, Cl. 273-181.00F.

Cox, Louis G.; and Kusters, Norbert L., to Canadian Patents and Development Limited. Differential thermal wattmeter. 4,045,734, Cl. 324-142.000.

Coyer, Robert G.: *See—*
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.

Craft, Carl R. Hay handler. 4,044,907, Cl. 214-506.000.

Crankshaft Machine Company: *See—*
Heffron, Allan J.; and Kennedy, Leverne H., 4,044,638, Cl. 82-9.000.

Crask, Geoffrey J., to Hydril Company. Tilt detector and system. 4,044,473, Cl. 33-333.000.

Crawford, Edward N., to ACF Industries, Incorporated. Diaphragm actuated valves. 4,044,788, Cl. 137-117.000.

Creusot-Loire: *See—*
Abrial, Lucien, 4,045,168, Cl. 432-247.000.
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.
Leroy, Pierre; Morlet, Jean Georges; and Saleil, Jean, 4,045,215, Cl. 75-82.000.

Crimi, Peter, to Avco Corporation. Helicopter rotor blade. 4,045,146, Cl. 416-1.000.

Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., to Itek Corporation. Solar collector automatic freeze protection system. 4,044,754, Cl. 126-271.000.

Crowe, Talmadge L., to Baker International Corporation. Retrievable well packers. 4,044,826, Cl. 166-120.000.

Crump, Steve: *See—*
Cox, Fred L.; Crump, Steve; and Hice, Phate, 4,044,507, Cl. 51-424.000.

Cruthis, Robert Duane; and Mills, Robert Samuel, to Caterpillar Tractor Co. Railroad car vehicle stowing device. 4,044,692, Cl. 105-368.00R.

CSE Corporation: *See—*
McNally, Frank X., 4,045,177, Cl. 23-254.00E.

Cummins Enterprises: *See—*
Cummins, Victor, 4,044,980, Cl. 248-13.000.

Cummins, Victor, to Cummins Enterprises. Collapsible desktop stand for portable electronic calculator. 4,044,980, Cl. 248-13.000.

Cunningham, Hugh, to PPG Industries, Inc. Cell liquor emission control. 4,045,324, Cl. 204-268.000.

Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, to Gulf Research & Development Company. Method of oligomerizing 1-olefins. 4,045,507, Cl. 260-683.15B.

Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, to Gulf Research & Development Company. Method of making alpha-olefin oligomers. 4,045,508, Cl. 260-683.15B.

Curp, Russell W., to SSP Agricultural Equipment, Inc. Tiltable wind machine for use on variable terrain. 4,045,147, Cl. 416-100.000.

Curtis, Gerald B.: *See—*
Moore, Robert J.; and Curtis, Gerald B., 4,045,263, Cl. 156-64.000.

Cutler, Royal A.; and Schalit, Samuel, to Sterling Drug Inc. Amidinoureas and amidinothioureas. 4,045,483, Cl. 260-552.00R.

Cuvillier, Roger O.: *See—*
Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, 4,044,956, Cl. 241-24.000.

Cycles-Peugeot: *See—*
Fourrey, Francois, 4,045,043, Cl. 280-79.300.

D. B. A.: *See—*
Guillon, Marcel F., 4,044,654, Cl. 91-499.000.

Daffner, Erich; and Sarnezki, Herbert, to Siemens Aktiengesellschaft. Arrangement having a traveling-wave tube and a current supply unit. 4,045,706, Cl. 315-3.500.

Dahms, Ronald H., to Monsanto Company. Resole resin binder composition. 4,045,398, Cl. 260-29.300.

Dai Nippon Printing Co., Ltd.: *See—*
Satoshi, Takeuchi, 4,045,312, Cl. 204-129.650.

Daicel Ltd.: *See—*
Ishii, Masaichi; and Mihara, Kazuo, 4,044,418, Cl. 15-104.06A.

Daigle Aqua Inc.: *See—*
Daigle, Rosaire, 4,045,060, Cl. 285-369.000.

Daigle, Rosaire, to Daigle Aqua Inc. Pipe retainer joints. 4,045,060, Cl. 285-369.000.

Daimler-Benz Aktiengesellschaft: *See—*
Florus, Hans-Jorg; Grossner, Horst; and Weiger, Gunter, 4,044,634, Cl. 74-866.000.
Wilfert, Karl; Schmid, Walter; and Jambor, Arno, 4,045,052, Cl. 280-701.000.
Worner, Gunter, 4,044,874, Cl. 192-106.200.

Daimon, Nobutoshi; and Izawa, Toichiro. Synthetic taeniolite and process of producing the same. 4,045,241, Cl. 106-306.000.

Danieli, Bruno: *See—*
Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, 4,045,555, Cl. 424-174.000.

Danieliants, Armais Avakovich: *See—*
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.

Danielsson, Hans: *See—*
Ekholm, Rolf; and Danielsson, Hans, 4,044,893, Cl. 214-1.0PB.

Dann, Daryl L., to Midland-Ross Corporation. Touch-sensitive door control switch. 4,045,631, Cl. 200-61.430.

Danon, Joseph S.: *See—*
Wolfe, Denis G.; and Danon, Joseph S., 4,045,155, Cl. 431-42.000.

Danyel S.A.S.: *See—*
Invernati, Carlo, 4,044,646, Cl. 84-435.000.

Dapiran, Fulvio, to U.S. Philips Corporation. Radio locating unit for persons in distress. 4,045,799, Cl. 343-113.0PT.

Dart Industries Inc.: *See—*
Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, 4,045,339, Cl. 210-45.000.
Lancy, Leslie Emery, 4,045,171, Cl. 8-74.000.

Dat-Xuong, Nguyen: *See—*
Le Pecq, Jean Bernard; Paoletti, Claude; and Dat-Xuong, Nguyen, 4,045,565, Cl. 424-263.000.

Data Recording Instrument Company Limited: *See—*
Walker, Keith Francis, 4,045,743, Cl. 328-150.000.

Dauberger, George R., to Midland-Ross Corporation. Cover for electrical floor boxes. 4,044,908, Cl. 220-3.800.

Dauten S.A.: *See—*
Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, 4,045,555, Cl. 424-174.000.

Davidson, Albin A.: *See—*
Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., 4,044,594, Cl. 73-67.80S.

Davidson, Charles Patrick Duncan: *See—*
Lewis, Frank; and Davidson, Charles Patrick Duncan, 4,044,852, Cl. 180-68.500.
Shaw, Leslie Thomas; and Davidson, Charles Patrick Duncan, 4,044,851, Cl. 180-33.00C.

Davidson, Donald H.: *See—*
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.

Davis, Bernard H.; Mack, Rollin T.; and Miyasaki, Kenneth, to H. H. Robertson Company. Method and apparatus for tacking a honeycomb core to a base sheet. 4,045,267, Cl. 156-197.000.

Davis, Dwight E.; and Foster, Stephen J., to General Atomic Company. Blending device. 4,045,005, Cl. 259-36.000.

Davis, Larry: *See—*
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,045,448, Cl. 260-326.50B.

Davis, William R.: *See—*
Chopdekar, Vilas M.; and Davis, William R., 4,045,494, Cl. 260-606.50P.

Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, to Portland Wire & Iron Works. System for removably securing sound-proofing material to a construction vehicle. 4,045,076, Cl. 296-39.00A.

Day, Ray E.: *See—*
Day, Stanley R.; and Day, Ray E., 4,044,534, Cl. 56-13.300.

Day, Stanley R.; and Day, Ray E. Lawn mower. 4,044,534, Cl. 56-13.300.

De Limon Fluhme & Co.: *See—*
Saretzky, Horst, 4,044,924, Cl. 222-250.000.

Deal, Clarence D., to Electromeasures, Inc. Grain moisture measurement probe. 4,044,607, Cl. 73-73.000.

Debolt, Harold E., to Avco Corporation. Process for modifying amorphous carbon filaments. 4,045,597, Cl. 427-248.00A.

Decel Corporation: *See—*
Appleman, Milo D.; and DeSantis, Stanislao A., 4,045,585, Cl. 426-331.000.

Dechelette, Helen, to AMP Incorporated. Method of manufacturing an electrical connector. 4,045,114, Cl. 339-210.00M.

de Corlieu, Guy; and Reymond, Jean-Claude, to Thomson-CSF. Coupler for optical communication system. 4,045,120, Cl. 350-96.00C.

Deeks, Ronald George. Railway tank hopper car. 4,044,690, Cl. 105-247.000.

Deere & Company: *See—*
Dodd, Wesley Lamar, 4,044,804, Cl. 144-34.00E.
Haverdink, Virgil Dean, 4,044,837, Cl. 171-58.000.

Defives, Daniel: *See—*
Avrillon, Rene; and Defives, Daniel, 4,045,330, Cl. 208-180.000.

Deguchi, Akio, to Mitsubishi Jukogyo Kabushiki Kaisha. Method for toughening treatment of metallic material. 4,045,254, Cl. 148-12.00R.

De Haan, Maarten Rutger: *See—*
Verhoeven, Leonardus Adrianus Johannes; De Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, 4,045,812, Cl. 358-4.000.

Deike, Robert F., to Foresight Industries. Earth anchor. 4,044,513, Cl. 52-163.000.

Deisting, Horst, to Adrema Pitney Bowes GmbH. Printing device having a sliding carriage. 4,044,675, Cl. 101-269.000.

Dekker, Donald Allen, to Attwood Corporation. Boat steering wheel. 4,044,624, Cl. 74-552.000.

Del Guercio, Louis R. M.: *See—*
Szabo, Anthony W.; and Del Guercio, Louis R. M., 4,044,764, Cl. 128-214.00F.

Delta Plastics Limited: *See—*
Kuhne, Kurt Anton; and Wassilieff, Alexander, 4,044,665, Cl. 101-21.000.

de Mere, Henri Edouard Courier, to Bicosa Societe de Recherches. Control circuit for the conduction of an electronic switch. 4,044,681, Cl. 102-70.20R.

Demmin, Timothy R.: *See—*
Rogic, Milorad M.; Swerdloff, Michael D.; and Demmin, Timothy R., 4,045,422, Cl. 260-143.000.

Demoute, Jean-Pierre: *See—*
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,045,209, Cl. 71-98.000.

Deno, Norman C., to Fats and Proteins Research Foundation, Inc. Method of hydroxylation. 4,045,498, Cl. 260-617.00R.

Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, to Agence Nationale de Valorisation de la Recherche (ANVAR). Electrochemical gage for measuring partial pressures of oxygen. 4,045,319, Cl. 204-195.00S.

D'Errico, Joseph, to Howmedica, Inc. Implantable joint prosthesis. 4,044,403, Cl. 3-1.913.

Desai, Nitin Vithalbhai: *See—*
Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, 4,045,318, Cl. 204-192.00E.

DeSantis, Stanislao A.: *See—*
Appleman, Milo D.; and DeSantis, Stanislao A., 4,045,585, Cl. 426-331.000.

DeSoto, Inc.: *See—*
Aeschliman, Eugene, 4,044,700, Cl. 112-217.100.

DeTommasi, Arthur N., to General Electric Company. Voltage responsive switches and methods of making. 4,045,712, Cl. 315-323.000.

Deutsch Company Electronic Components Division, The: *See—*
Clark, Kenneth M., 4,045,121, Cl. 350-96.00C.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Asinger, Friedrich; Offermanns, Heribert; and Gulzek, Karl-Heinz, 4,045,479, Cl. 260-534.00S.

Deutsche Texaco Aktiengesellschaft: *See—*
Buschfeld, Adolf, 4,045,391, Cl. 260-22.0EP.

de Versterre, William I.: *See—*
Worden, Donald A.; de Versterre, William I.; and Petry, Henry Alfred, 4,044,580, Cl. 72-21.000.

DeVitto, Ronald Robert: *See—*
Raudys, Vytas Andrew; and DeVitto, Ronald Robert, 4,044,450, Cl. 29-509.000.

DeVone, James Milton. Convertra-bike top. 4,045,077, Cl. 296-78.100.
DewEze Mfg., Inc.: *See—*
Hostetler, Dewey L., 4,044,963, Cl. 242-54.00R.
D'Haem, Marcel P.; and Axt, Wallis C., to Chicago Pneumatic Tool Company. Vibration isolating hand grip for shank of a percussive chisel. 4,044,625, Cl. 74-558.500.
Digital Equipment Corporation: *See—*
Levy, John V.; Northrup, Thomas A.; and Giggi, Robert, 4,045,781, Cl. 364-200.000.
Dille, Roger M.; Van Stavern, Merle H.; Shull, Don L.; and Gripshover, David F., to Texaco Inc. Method and apparatus for continuously monitoring the presence of oil in water. 4,045,671, Cl. 250-341.000.
Dingwall, Andrew Gordon Francis, to RCA Corporation. Method of making a semiconductor device. 4,045,250, Cl. 148-1.500.
Dingwall, Andrew Gordon Francis, to RCA Corporation. Semiconductor integrated circuit device including an array of insulated gate field effect transistors. 4,045,811, Cl. 357-41.000.
Disosway, Mark D., III; and Sheldrake, Leonard J., to General Motors Corporation. Electric cranking motor automatic disconnect and lockout circuit. 4,045,062, Cl. 290-38.00R.
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., to Texas Instruments Incorporated. Modular, magnetically-coupled drive for a cryogenic refrigerator. 4,044,567, Cl. 62-6.000.
Dixie-Narco, Inc.: *See—*
Burton, Paul F., 4,044,877, Cl. 194-10.000.
Doane, William M.: *See—*
Fanta, George F.; and Doane, William M., 4,045,387, Cl. 260-17.4GC.
Dockerty, Robert Charles: *See—*
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,044,452, Cl. 29-571.000.
Dr. Ing. h.c.F. Porsche Aktiengesellschaft: *See—*
Dorsch, Heinz; and Weber, Julius, 4,044,560, Cl. 60-601.000.
Dodd, Wesley Lamar, to Deere & Company. Tree shearer. 4,044,804, Cl. 144-34.00E.
Dodgen Industries, Inc.: *See—*
Dodgen, John N., 4,044,999, Cl. 254-45.000.
Dodgen, John N., to Dodgen Industries, Inc. Camper jack. 4,044,999, Cl. 254-45.000.
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, to Minolta Camera Kabushiki Kaisha. Electrophotographic copying apparatus with retractable image transfer roller means. 4,045,135, Cl. 355-11.000.
Dolan, Jerome J.; and Rosenberger, Roy R., to Nalco Chemical Company. Multiplex circuit with time delay for stabilization. 4,045,733, Cl. 324-140.00R.
DoMinh, Thap, to Eastman Kodak Company. Process of amplifying image in image recording layer by releasing reactant from image forming layer containing cobalt(III)complex. 4,045,221, Cl. 96-29.00R.
Donaher, Charles Joseph: *See—*
Lee, James C. K.; and Donaher, Charles Joseph, 4,045,105, Cl. 339-17.0CF.
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, to Ciba-Geigy Corporation. Heterocyclic S-imino-S-oxides. 4,045,570, Cl. 424-275.000.
Dorman, Linneaus C., to Dow Chemical Company, The. Method for forming an amide bond between a latex and protein. 4,045,384, Cl. 260-8.000.
Dorsch, Heinz; and Weber, Julius, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Air pressure regulator arrangement for an internal combustion. 4,044,560, Cl. 60-601.000.
Doss, Rainer: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Double Envelope Corporation: *See—*
Sherwood, Jack Edward, 4,044,942, Cl. 229-73.000.
Doucet, Laurent. Attachment for offset duplicating machine. 4,044,666, Cl. 101-76.000.
Dougherty, Lawrence W., to Zenith Radio Corporation. Shadow mask supported by cathode ray tube faceplate. 4,045,701, Cl. 313-408.000.
Douri, Hisashi, to Yoshida Kogyo Kabushiki Kaisha. Apparatus for attaching end stops to fastener stringers with a safety stop function. 4,044,445, Cl. 29-706.000.
Douros, John D., Jr.; and Warder, Ira T., Jr., to Gates Rubber Company, The. Beneficiation of uric acid from natural products. 4,045,582, Cl. 426-69.000.
Dow Chemical Company, The: *See—*
Dorman, Linneaus C., 4,045,384, Cl. 260-8.000.
Hurst, Robert E.; and Lunsford, Charles L., 4,044,563, Cl. 61-35.000.
Plepys, Raymond A., 4,045,410, Cl. 260-52.000.
Swearingen, Charles C.; and Sheptak, Nicholas, 4,045,607, Cl. 428-200.000.
Dragerwerk Aktiengesellschaft: *See—*
Eckstein, Wolfgang; and Benthin, Frank, 4,045,192, Cl. 55-222.000.
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, to Schering Aktiengesellschaft. Method of adhering textiles with a polyamide melt adhesive. 4,045,389, Cl. 260-18.00N.
Dressel, Brent W.: *See—*
Soper, LaVern G.; and Dressel, Brent W., 4,045,653, Cl. 219-438.000.
Dresser Industries, Inc.: *See—*
Lichte, Carl Laurent, 4,045,646, Cl. 219-121.0EB.
Driscoll, John J. Electrode holder. 4,045,642, Cl. 219-70.000.
Drori, Mordeki. Self-flushing filter. 4,045,345, Cl. 210-107.000.
Drummond, Warren W., to PPG Industries, Inc. Method of preparing glass strand and novel glass strand packages. 4,045,195, Cl. 65-2.000.
Dry, Leonard James: *See—*
Brink, Andries; Stander, Adriaan Hendrikus; and Dry, Leonard James, 4,045,187, Cl. 44-1.00B.
DSO "Stara Planina": *See—*
Urmanov, Urman Alexandrov, 4,045,528, Cl. 264-69.000.
Dubell, Robert L.: *See—*
Green, Robert C.; and Dubell, Robert L., 4,045,328, Cl. 208-8.000.
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob, to General Tire & Rubber Company, The. Laminated pneumatic tire. 4,044,811, Cl. 152-354.000.
Dufrene, Alex. Collar locating apparatus. 4,044,470, Cl. 33-125.00R.
dun-Rite Erectors, Inc.: *See—*
Pynsky, Raymond F., 4,044,891, Cl. 209-73.000.
Duncan, John J.; and Kirjanov, Alexander, to GAF Corporation. Textile soil release composition and method. 4,045,172, Cl. 8-115.700.
Dunstan, James W., to Acorn Building Components, Inc. System for transporting and storing long extrusions. 4,045,071, Cl. 294-67.00R.
Dupen, Clive Frederick George: *See—*
Noyes, Richard Croissant; Dupen, Clive Frederick George; Barrus, Donald Martin; and Siegel, Edward Arnold, 4,045,283, Cl. 176-35.000.
duPont, Anthony A. Process for the preparation of hydrogen. 4,045,546, Cl. 423-657.000.
Du Pont de Nemours, E. I., and Company: *See—*
Callahan, William B.; and Coe, B. Frank, 4,045,392, Cl. 260-22.00R.
Fuchs, Julius Jakob, 4,045,473, Cl. 260-482.00C.
Hunter, Frank Ray, 4,045,425, Cl. 260-163.000.
Nazarenko, Nicholas; and Seidel, William Carl, 4,045,495, Cl. 260-606.50B.
Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, 4,045,544, Cl. 423-607.000.
Durable Packaging Corporation: *See—*
Ulrich, Lawrence Walter; and Walker, Connie Wayne, 4,044,527, Cl. 53-137.000.
Durichen, Klaus: *See—*
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.
Duros, James M.: *See—*
Peltola, Veikko K.; and Duros, James M., 4,045,658, Cl. 235-151.300.
Duval Corporation: *See—*
Adams, Ben E.; and Gidak, Edward J., Jr., 4,045,335, Cl. 209-166.000.
Dwivedi, Basant K.: *See—*
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,045,581, Cl. 426-3.000.
Dyess, Lonnie V. Game target with adjustable pins. 4,045,028, Cl. 273-104.000.
Dynamit Nobel Aktiengesellschaft: *See—*
Klein, Gerd; and Schmoll, Kurt, 4,045,385, Cl. 260-15.000.
E-H Research Laboratories, Inc.: *See—*
Worcester, John L.; and Hubbs, John C., 4,045,735, Cl. 324-158.00F.
E. I. Du Ponte de Nemours and Company: *See—*
Uyeda, Roy Teruyuki, 4,045,432, Cl. 260-239.00B.
Eads, William Donovan; and Maitland, David Steven, to Hewlett-Packard Company. Information transfer bus circuit with signal loss compensation. 4,045,684, Cl. 307-200.00B.
Earth Chemical Company, Limited: *See—*
Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, 4,044,495, Cl. 43-121.000.
Eastgate, Harold F., to Laser Bioapplications. Flexible laser waveguide. 4,045,119, Cl. 350-96.0LM.
Eastman Kodak Company: *See—*
Bianchi, Thomas A., 4,045,501, Cl. 260-651.00R.
Contois, Lawrence E.; Fox, Charles J.; and Stahr, Richard W., 4,045,220, Cl. 96-1.600.
DoMinh, Thap, 4,045,221, Cl. 96-29.00R.
Fagerburg, David R., 4,045,431, Cl. 260-22.00D.
Phillips, Bobby M.; and Gregory, Dale R., 4,045,529, Cl. 264-75.000.
Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, 4,045,229, Cl. 96-84.0UV.
Eaton, Bryan, to Fram Corporation. Cannister purge valve assembly. 4,044,743, Cl. 123-136.000.
Eaton Corporation: *See—*
Yip, James K., 4,044,786, Cl. 137-101.000.
EB Sport International GmbH vormals: *See—*
Brutting, Eugen, 4,044,479, Cl. 36-32.00R.
Ebata, Hiroyuki, to Yoshida Kogyo Kabushiki Kaisha. Net jointing structure. 4,044,432, Cl. 24-205.16R.
Ebenstein, Ruth B. Resilient hand loom grid. 4,044,437, Cl. 28-151.000.
Eberhardt, Roland C.: *See—*
Taylor, Gary Burton; and Eberhardt, Roland C., 4,045,046, Cl. 280-87.04A.
Echlin Manufacturing Company, The: *See—*
Klimek, Boleslaw M., 4,045,768, Cl. 340-52.00C.
Eckstein, Wolfgang; and Benthin, Frank, to Dragerwerk Aktiengesellschaft. Mobile filtering apparatus for keeping patients under aseptic conditions. 4,045,192, Cl. 55-222.000.
Econo-Therm Energy Systems Corporation: *See—*
Nobles, Elon J., 4,044,820, Cl. 165-2.000.

Edwards, Kenneth L.: *See—*
White, Russell L.; and Edwards, Kenneth L., 4,045,308, Cl. 204-67.000.
Edwards, Nigel, to National Research Development Corporation. Laryngeal prosthesis. 4,044,402, Cl. 3-1.300.
Edwards, Ralph R.: *See—*
McCluskey, John R.; and Edwards, Ralph R., 4,045,003, Cl. 256-59.000.
Edwards, Roger Alan: *See—*
Baylis, Howard Raymond; and Edwards, Roger Alan, 4,045,803, Cl. 354-5.000.
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, to American Hoechst Corporation. Pyrrolo[2,1-c][1,4]benzoxazepine and benzoxazocine derivatives. 4,045,448, Cl. 260-326.50B.
Eftefield, Larry G.; and Lukavich, Paul J., to Caterpillar Tractor Co. Reversible blade bit. 4,044,481, Cl. 37-141.00T.
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., to Sears Manufacturing Co. Seat having back rest with different pivots for tilting and for folding level. 4,045,082, Cl. 297-357.000.
Eggert, Walter S., Jr., to Budd Company, The. Resiliently railway truck suspension. 4,044,689, Cl. 105-221.00R.
Eichenbaum, Daniel M.: *See—*
McCarthy, Charles J.; Charles, Steven; and Eichenbaum, Daniel M., 4,045,630, Cl. 200-52.00R.
Eide, Svein, to A/S Ardal og Sunndal Verk. Electric hotplate with thermostat. 4,045,654. Cl. 219-449.000.
Eilingsfeld, Heinz: *See—*
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.
Eiring, Karl: *See—*
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.
Eisner, Steve; and Powell, James LeRoy, to Boeing Company, The. Fracturing agent. 4,045,356, Cl. 225-2.000.
Eitel, Jay M., to General Cable Corporation. Aerial lifting equipment. 4,044,902, Cl. 214-132.000.
Ekholm, Rolf; and Danielsson, Hans, to AB Hammars Mekaniska Verkstad. Device for lifting pieces of lumber. 4,044,893, Cl. 214-1.0PB.
Ela, Roger B.: *See—*
McDonald, Donald C.; Ela, Roger B.; and Whittaker, Francis E., 4,044,894, Cl. 214-1.0QD.
Elco Corporation, The: *See—*
Lee, Donald A.; and Korosec, Philip S., 4,045,363, Cl. 252-49.500.
Elder, Decker Kuykendall: *See—*
Taller, Robert Arthur; and Elder, Decker Kuykendall, 4,045,474, Cl. 260-484.00A.
Electricite de France (Service National): *See—*
Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, 4,045,286, Cl. 176-49.000.
Electromeasures, Inc.: *See—*
Deal, Clarence D., 4,044,607, Cl. 73-73.000.
Electroplating Engineers of Japan, Ltd.: *See—*
Tezuka, Junichi, 4,045,304, Cl. 204-49.000.
Eli Lilly and Company: *See—*
Beck, James R.; and Yahner, Joseph A., 4,045,466, Cl. 260-465.00E.
Koppel, Gary A., 4,045,435, Cl. 544-28.000.
Eller, Robert: *See—*
Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,044,816, Cl. 164-63.000.
Ellin, Seymour; and Sharp, John R., to Polaroid Corporation. Extended range exposure control system. 4,045,806, Cl. 354-37.000.
Elliott, John, to Acme Marls Limited. Muffled kiln cars. 4,045,167, Cl. 432-241.000.
Elmer, Arthur Ernest Henry. Automotive cooling fan drive including friction clutch. 4,044,729, Cl. 123-41.120.
Elmore, John E. Sanitary diversion valve. 4,044,789, Cl. 137-367.000.
Emenaker, Leo Joseph: *See—*
Barrus, Gordon Brent; and Emenaker, Leo Joseph, 4,044,668, Cl. 101-93.040.
Emmons, Oren L. Attachment means for screen or storm window. 4,044,813, Cl. 160-369.000.
Endo, Katutoshi: *See—*
Fujimura, Itaru; and Endo, Katutoshi, 4,045,217, Cl. 96-1.0LY.
Engeling, Charles F.; and Staubly, Ralph F. Combined heat-exchanger and supplemental air circulator for hot-air furnaces. 4,044,950, Cl. 237-55.000.
Engelking, Frederick S.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.
England, Will Clarke. Multirotary energy conversion valve. 4,044,562, Cl. 60-721.000.
Englert, William J.: *See—*
Bhardwaj, Mahesh C.; and Englert, William J., 4,045,203, Cl. 65-182.00R.
English Clavs Lovering Pochin & Company, Limited: *See—*
Bidwell, Jan Ivan; Adams, Roger William; and Jepson, Walter Brian, 4,045,235, Cl. 106-72.000.
Entreprise de Recherches et d'Activites Petrolieres: *See—*
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.
Enzinger, Hans Joachim; and Fechner, Hans, to Feldmuhle Anlagen und Produktionsgesellschaft mit beschrankter Haftung. Method of making laminar material having a base of bonded wood particles. 4,045,262, Cl. 156-62.200.
Erickson, Bruce G., to American Microsystems, Inc. Frequency tuning system with visual display. 4,044,597, Cl. 73-6.000.
Erickson, Fred William, to Litton Systems, Inc. Drive circuit with constant current. 4,045,683, Cl. 307-157.000.
Erickson, John W.; and Budrys, Vitolis, to Kobe, Inc. Pitot pump with turbulence elimination. 4,045,145, Cl. 415-89.000.
Erickson, John W.: *See—*
Brown, Francis Barton; and Erickson, John W., 4,044,943, Cl. 233-19.00A.
Ernst, Richard R., to Varian Associates, Inc. Two dimensional gyromagnetic resonance spectroscopy. 4,045,723, Cl. 324-.5OA.
Eross, Bela, to Instrumentation Industries, Inc. Slip-proof coupling device. 4,045,058, Cl. 285-119.000.
Erwin, John R.: *See—*
Staub, Anthony F.; Staub, Norman T.; and Erwin, John R., 4,045,025, Cl. 273-73.00F.
Eskeli, Michael. Heat exchanger. 4,044,824, Cl. 165-88.000.
Ester, Gary W., to GTE Automatic Electric Laboratories Incorporated. Negative R-S triggered latch. 4,045,693, Cl. 307-291.000.
Estradier, Francoise: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,045,170, Cl. 8-11.000.
Etablissement Public dit: Agence Nationale de Valorisation de la Recherche (ANVAR): *See—*
Le Pecq, Jean Bernard; Paoletti, Claude; and Dat-Xuong, Nguyen, 4,045,565, Cl. 424-263.000.
Etat Francias: *See—*
Farges, Guy, 4,045,125, Cl. 350-166.000.
Etherington, Clifford: *See—*
Green, Derek; Pardoe, John Alan; and Etherington, Clifford, 4,044,587, Cl. 72-261.000.
Ethyl Corporation: *See—*
Ashby, Eugene C., 4,045,545, Cl. 423-644.000.
Wright, William E., 4,045,519, Cl. 260-976.000.
Etudes et Fabrications: *See—*
Lemaire, Roland, 4,044,959, Cl. 242-25.00A.
Lemaire, Roland, 4,044,960, Cl. 242-25.00A.
Etudes Petrolieres Marines: *See—*
Lecordier, Michel G., 4,045,035, Cl. 277-34.300.
Everhart, John R., to Renfro Corporation. Apparatus and method for forming yarn balls. 4,044,438, Cl. 28-147.000.
Evers, William J.; and Heinsohn, Howard H., Jr., to International Flavors & Fragrances Inc. α-Oxy(oxo) sulfides and ethers. 4,045,491, Cl. 260-594.000.
Evers, William John: *See—*
Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, 4,045,587, Cl. 426-533.000.
Extel Corporation: *See—*
Cless, Gerhard; and Kaplan, Edward L., 4,044,946, Cl. 234-39.000.
Exxon Research and Engineering Company: *See—*
Green, Robert C.; and Dubell, Robert L., 4,045,328, Cl. 208-8.000.
Stenmark, Donald G.; and Heinrich, Raymond L., 4,045,401, Cl. 260-42.180.
Wheelock, Kenneth S.; and Say, Geoffrey R., 4,045,371, Cl. 252-462.000.
F. L. Smidth & Co.: *See—*
Christiansen, Soren Bent, 4,045,162, Cl. 432-14.000.
Fa. Moebus KG.: *See—*
Moebus, Bernhard; Larch, Gerhard; and Friedrich, Rudolf, 4,044,944, Cl. 233-20.00A.
Fabbrica Italiana Accumulatori Motocarri Montecchio S.p.A. - F.I.A.M.M.: *See—*
Frigo, Domenico, 4,045,752, Cl. 335-202.000.
Fabricated Plastics Limited: *See—*
Halliday, George Andrew, 4,045,193, Cl. 55-257.0PV.
Fagerburg, David R., to Eastman Kodak Company. Flexible polyester having a melting point of at least 140° C. 4,045,431, Cl. 260-22.00D.
Fails, Hershell W. Deer stand and game carrier. 4,045,040, Cl. 280-1.500.
Fair, James W.: *See—*
Young, Danny J., 4,045,663, Cl. 240-10.6CH.
Fairfield Fiberglass Inc.: *See—*
Rubin, Philip N.; and Fleming, Michael, 4,044,514, Cl. 52-169.700.
Falk Corporation, The: *See—*
Wellauer, Edward J.; and Strommen, John A., 4,044,572, Cl. 64-15.00B.
Falke, Erik, to Svenska Tobaks Aktiebolaget. Method of facilitating exact evaluation or control of the processing of a product mass, and apparatus for carrying said method into effect. 4,045,657, Cl. 235-151.100.
Faller, Hermann, to Faller OHG. Lighting systems for vehicles. 4,045,769, Cl. 340-74.000.
Faller OHG: *See—*
Faller, Hermann, 4,045,769, Cl. 340-74.000.
Fallon, William H.; and Schober, William R., to General Battery Corporation. Battery charger. 4,045,717, Cl. 320-2.000.
Fanta, George F.; and Doane, William M., to United States of America, Agriculture. Highly absorbent polymeric compositions derived from flour. 4,045,387, Cl. 260-17.4GC.
Fanta, Wayne I.; and Shulman, Joel I., to Procter & Gamble Company, The. Insecticidal esters of spiro carboxylic acids. 4,045,469, Cl. 260-469.000.
Farges, Guy, to Etat Francias. Band filters for use in protective glasses. 4,045,125, Cl. 350-166.000.
Farragher, Anthony L.: *See—*
Kwantes, Arien; Gautier, Pieter A.; and Farragher, Anthony L., 4,045,379, Cl. 260-2.20R.

Farzaliev, Mazakhir Gamza Ogly: *See—*
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly, 4,044,801, Cl. 139-436.000.

Fasching, George E.: *See—*
Shuck, Lowell Z.; Fasching, George E.; and Balanis, Constantine A., 4,045,724, Cl. 324-6.000.

Fasco Industries, Inc.: *See—*
Johnson, Robert A., 4,045,757, Cl. 337-85.000.

Fast, Arlo W. Floating fish rearing system. 4,044,720, Cl. 119-3.000.

Fats and Proteins Research Foundation, Inc.: *See—*
Deno, Norman C., 4,045,498, Cl. 260-617.00R.

Favre, Rene Marc: *See—*
Le Cardonnel, Gerard; Gravez, Pierre; and Favre, Rene Marc, 4,045,622, Cl. 179-175.20C.

Fechner, Hans: *See—*
Enzinger, Hans Joachim; and Fechner, Hans, 4,045,262, Cl. 156-62.200.

Federal Laboratories, Inc.: *See—*
Gaggini, Guido John; and Gould, Eugene Lawrence, 4,044,684, Cl. 102-90.000.

Feldman, Harold P., to United States of America, Navy. Cable brake and lock. 4,044,863, Cl. 188-65.100.

Feldmuhle Anlagen und Produktionsgesellschaft mit beschrankter Haftung: *See—*
Enzinger, Hans Joachim; and Fechner, Hans, 4,045,262, Cl. 156-62.200.

Feldstein, Joel Gary; and Martin, Jeffrey Forsha, to Babcock & Wilcox Company, The. Adhesive bonded hydrotest plug and method for using the same. 4,044,798, Cl. 138-90.000.

Felicetta, Vincent F.: *See—*
Wenzel, Donald E.; and Felicetta, Vincent F., 4,045,421, Cl. 260-124.00R.

Fenwick, John Thomas Francis: *See—*
Start, David Gordon Preston; and Fenwick, John Thomas Francis, 4,045,260, Cl. 149-2.000.

Ferrari, Giorgio; Canonica, Luigi; and Danieli, Bruno, to Dauten S.A. Method for the photostabilization of polyhydroxylated sterols and stabilized biological insecticidal product obtained thereby. 4,045,555, Cl. 424-174.000.

Ferrary, Ferdinand F.; Johnson, Herman T.; and Hudson, John H., to AMF Incorporated. Method and apparatus for separating lighter and heavier portions of threshed tobacco. 4,045,334, Cl. 209-141.000.

Ferri, Johann Walter, to Luwa AG. Apparatus for cleaning air. 4,045,194, Cl. 55-290.000.

Ferroni, Bernardo: *See—*
Ullmann, Werner; Ferroni, Bernardo; and Levy, Gideon N., 4,045,641, Cl. 219-69.00C.

Feucht, Dennis D., to Caterpillar Tractor Co. Bushing type mount with triple spring rate. 4,044,977, Cl. 248-7.000.

F'Geppert, Erwin, to United States of America, Army. Transmission. 4,044,620, Cl. 74-190.000.

Fiala, Dennison F.: *See—*
Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry Nash, 4,045,237, Cl. 106-89.000.

Fiat-Allis Construction Machinery, Inc.: *See—*
Hawk, Dale Wyatt, 4,045,050, Cl. 280-492.000.

Fichet-Bauche: *See—*
Guiraud, Francois, 4,044,578, Cl. 70-366.000.

Ficht, Paulette Gisele: *See—*
Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, 4,045,423, Cl. 260-147.000.

Fierro, Mary M. Decorative article forming support. 4,045,061, Cl. 289-18.000.

Fife, Clemens L., to Raymond Lee Organization, Inc., The. Paint bucket holder. 4,045,069, Cl. 294-31.200.

Figiel, Francis J., to Allied Chemical Corporation. Azeotrope-like compositions of trichloro-trifluoroethane, acetonitrile and acetone. 4,045,365, Cl. 252-141.000.

Figiel, Francis J., to Allied Chemical Corporation. Azeotrope-like compositions of trichlorotrifluoroethane, nitromethane and acetone. 4,045,366, Cl. 252-171.000.

Fildes, Francis James Thomas: *See—*
Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, 4,044,404, Cl. 3-19.000.

Filliman, Paul, to Magnavox Company, The. Audio control system. 4,045,748, Cl. 330-126.000.

Filtrox Maschinenbau AG: *See—*
Strub, Fritz, 4,045,348, Cl. 210-230.000.

Finke, Manfred; Kleiner, Hans-Jerg; and Lohmar, Elmar, to Hoechst Aktiengesellschaft. Process for preparing 1,2-oxa-phospholanes. 4,045,480, Cl. 260-545.00P.

Firestone Tire & Rubber Company, The: *See—*
Claxton, William E.; and Holden, Harold C., 4,044,600, Cl. 73-15.00R.

Fischer, Artur; and Fischer, Klaus, to Fischer, Artur. Method and arrangement for anchoring an object to a support structure. 4,044,512, Cl. 52-127.000.

Fischer, Hanspeter: *See—*
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, 4,045,459, Cl. 260-448.80R.

Fischer, Klaus: *See—*
Fischer, Artur; and Fischer, Klaus, 4,044,512, Cl. 52-127.000.

Fischer, Larry J.; and McNellis, Terrence J. Roof insulation support system. 4,044,521, Cl. 52-404.000.

Fischer, Paul W.; and Scheffel, John W., to Union Oil Company of California. Inhibiting wax deposition from a wax-containing oil. 4,045,360, Cl. 252-8.300.

Fischer, Robert B., to Ingersoll-Rand Company. Chrome steel casting alloy. 4,045,256, Cl. 148-36.000.

Fisher, Norman Ernest: *See—*
Waimsley, Robert Edwin; Oliver, Robert; and Fisher, Norman Ernest, 4,044,589, Cl. 72-341.000.

Fisher, Robert J. Inflatable luggage. 4,044,867, Cl. 190-43.000.

Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, to Allied Chemical Corporation. Process for melt-spinning synthetic fibers. 4,045,534, Cl. 264-237.000.

Fitzpatrick, Robert E. Animal feeding apparatus. 4,044,723, Cl. 119-61.000.

Flanigen, Edith M.: *See—*
Hill, David C.; and Flanigen, Edith M., 4,045,593, Cl. 427-59.000.

Flannery, John B.: *See—*
Pollack, Joel M.; and Flannery, John B., 4,045,124, Cl. 350-160.0LC.

Fleisch, William F.; and Pousche, Walter. Easy-to-assemble structure. 4,045,090, Cl. 297-440.000.

Fleming, Charles W.: *See—*
Worick, Richard A., 4,044,842, Cl. 172-314.000.

Fleming, Michael: *See—*
Rubin, Philip N.; and Fleming, Michael, 4,044,514, Cl. 52-169.700.

Flex-O-Lators, Inc.: *See—*
Patrick, John H., 4,044,436, Cl. 27-12.000.

Florus, Hans-Jorg; Grossner, Horst; and Weiger, Gunter, to Daimler-Benz Aktiengesellschaft. Installation for automatic shifting of change-speed gears. 4,044,634, Cl. 74-866.000.

FMC Corporation: *See—*
Larsen, Gregory J., 4,044,422, Cl. 15-340.000.
Williams, Michael R.; and McDonald, Dean T., 4,044,952, Cl. 239-165.000.

Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, to Ciba-Geigy Corporation. Agent for the regulation of plant growth. 4,045,459, Cl. 260-448.80R.

Fogelberg, Mark John, to Borg-Warner Corporation. Automatic four-wheel drive transfer case. 4,044,870, Cl. 192-89.00W.

Foley, Charles F.; and Halberstadt, Lewis J. Fish tank construction. 4,044,721, Cl. 119-5.000.

Folik, Joseph C., to Molon Motor & Coil Corporation. Plastic closure cap for electric motor. 4,045,697, Cl. 310-89.000.

Fong, Jaan-Jiue; and Hsu, Grace F., to Minnesota Mining and Manufacturing Company. Cadmium electroplating bath and process. 4,045,305, Cl. 204-50.00R.

Food Processing Systems Corporation: *See—*
Meisel, Nicolas, 4,045,639, Cl. 219-10.55A.

Forbes, Eric Simon; and Reid, Angus Joseph Dickson, to British Petroleum Company Limited, The. Solvent extraction. 4,045,332, Cl. 208-323.000.

Ford, John L. Armboard. 4,045,011, Cl. 269-328.000.

Ford Motor Company: *See—*
Lewis, John A., 4,044,734, Cl. 123-119.00A.

Foresight Industries: *See—*
Deike, Robert F., 4,044,513, Cl. 52-163.000.

Forrester, Joseph J.: *See—*
Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, 4,045,788, Cl. 340-323.00R.

Forsgren, Ernst Erik, to Sundin, Anders Eric, a part interest. Method and machine for packing wood chips. 4,044,525, Cl. 53-24.000.

Foster, Stephen J.: *See—*
Davis, Dwight E.; and Foster, Stephen J., 4,045,005, Cl. 259-36.000.

Foulkes, John F., to S&C Electric Company. Remote control fuse closing device. 4,045,762, Cl. 337-401.000.

Fourrey, Francois, to Cycles-Peugeot. Transport and display trolleys. 4,045,043, Cl. 280-79.300.

Fox, Charles J.: *See—*
Contois, Lawrence E.; Fox, Charles J.; and Stahr, Richard W., 4,045,220, Cl. 96-1.600.

Fox, Sam. Crab trap. 4,044,493, Cl. 43-105.000.

Fram Corporation: *See—*
Eaton, Bryan, 4,044,743, Cl. 123-136.000.

Francis, Orville, to Indian Head, Inc. Retractable plasma container holder. 4,044,983, Cl. 248-293.000.

Fransen, Jan Josephus Bernardus: *See—*
Bakel, Adrianus Maria Van; and Fransen, Jan Josephus Bernardus, 4,045,367, Cl. 252-181.400.

Franzmann, Rainer. Device for continous pitch variation of stringed instruments. 4,044,645, Cl. 84-313.000.

Frederick, Richard. Adjustable honing template. 4,044,508, Cl. 51-165.930.

Fremer, William A.: *See—*
Strickland, James K.; Capps, Frank R.; Nekola, Todd B.; and Fremer, William A., 4,044,986, Cl. 249-216.000.

Frenkel, Boris Ovseevich: *See—*
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.

Fried, John H.; and Harrison, Ian T., to Syntex Corporation. Naphthyl acetaldehyde derivatives; methods of use thereof; and processes for the preparation thereof. 4,045,485, Cl. 260-566.00A.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See—*
Wetzel, Rolf; and Radke, Dietrich, 4,045,214, Cl. 75-60.000.

Friedric-Wilhelm, Thomas: *See—*
Gernot, Thorn; and Friedric-Wilhelm, Thomas, 4,045,707, Cl. 315-106.000.

Friedrich, Rudolf: *See—*
Moebus, Bernhard; Larch, Gerhard; and Friedrich, Rudolf, 4,044,944, Cl. 233-20.00A.

Frigo, Domenico, to Fabbrica Italiana Accumulatori Motocarri Montecchio S.p.A. - F.I.A.M.M. Compact electromagnetic relay, particularly for automotive vehicles. 4,045,752, Cl. 335-202.000.

Frohmader, Sigrun: *See—*
Ziegler, Gunther; Frohmader, Sigrun; and Wilhelm, Manfred, 4,044,456, Cl. 29-599.000.

Frydryk, John, to Johnson & Johnson. Seed bed cover with improved, reinforced edge sections. 4,044,501, Cl. 47-26.000.

Fuchs, Julius Jakob, to Du Pont de Nemours, E. I., and Company. Alkoxycarbonylisourea isocyanates. 4,045,473, Cl. 260-482.00C.

Fuchshuber, Peter Werner: *See—*
Rychen, Niklaus; and Fuchshuber, Peter Werner, 4,044,727, Cl. 122-449.000.

Fuhring, Heinrich; and Sieber, Johannes Helmut, to Bowe, Bohler & Weber KG Maschinenfabrik. Method of cleaning textiles. 4,045,174, Cl. 8-142.000.

Fuji Kogyo Co., Ltd.: *See—*
Ohmura, Ryuichi, 4,044,488, Cl. 43-23.000.

Fuji Photo Film Co., Ltd.: *See—*
Hara, Hiroshi; and Miyazako, Takushi, 4,045,226, Cl. 96-60.00R.
Ikenoue, Shinpei; and Mizuki, Eiichi, 4,045,227, Cl. 96-61.00R.
Shimamura, Isao; and Nakamura, Koichi, 4,045,225, Cl. 96-60.00R.
Shinozaki, Fumiaki; Ikeda, Tomoaki; and Tsuboi, Masayoshi, 4,045,222, Cl. 96-33.000.

Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, to Hitachi, Ltd. Heat transfer pipe. 4,044,797, Cl. 138-38.000.

Fujikura, Hiroshi, to International Business Machines Corporation. Tape cartridge having a shutter with self locking function. 4,045,821, Cl. 360-132.000.

Fujimori, Noboru: *See—*
Koitabashi, Takeo; Akamatsu, Hideo; and Fujimori, Noboru, 4,045,230, Cl. 96-100.00R.

Fujimoto, Yoshiji: *See—*
Kadota, Shozo; Fujimoto, Yoshiji; Yasuda, Michio; and Oka, Mitsunori, 4,045,773, Cl. 340-146.3SG.

Fujimura, Itaru; and Endo, Katutoshi, to Ricoh Company, Ltd. Developing process for electrophotography. 4,045,217, Cl. 96-1.0LY.

Fujimura, Sigel: *See—*
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.

Fujimura, Takeo: *See—*
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.

Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, to Mitsubishi Precision Company, Ltd. Training machine for keyboards. 4,044,475, Cl. 35-6.000.

Fujita, Masao: *See—*
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,045,551, Cl. 424-76.000.

Fujitsu Limited: *See—*
Yamada, Seiichi; and Murakawa, Kyohei, 4,045,412, Cl. 264-63.000.

Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, to Matsushita Electric Industrial Co., Ltd. Apparatus for driving liquid crystal display device wherein the signal applied thereto is varied in accordance with the temperature of the device. 4,045,791, Cl. 340-324.00M.

Fukano, Kazuyuki: *See—*
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, 4,045,353, Cl. 210-502.000.

Fukasawa, Akira: *See—*
Yamada, Eiji; Fukasawa, Akira; and Masaki, Shinzaburo, 4,045,454, Cl. 260-369.000.

Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, to Ricoh Company, Ltd. Ink ejection printing apparatus comprising automatically actuated ejection orifice cap. 4,045,802, Cl. 346-140.00R.

Fukuchi, Sakae: *See—*
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.

Fukuda, Takeshi: *See—*
Itoh, Kunio; and Fukuda, Takeshi, 4,045,390, Cl. 260-18.00S.

Fukuoka, Itsuo: *See—*
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,045,766, Cl. 340-1.00R.

Fuller, Willard A., to Hooker Chemicals & Plastics Corporation. Production of chlorine dioxide. 4,045,542, Cl. 423-478.000.

Furst, Andor: *See—*
Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, 4,045,490, Cl. 260-590.0FA.

Furuno Electric Company, Limited: *See—*
Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,045,766, Cl. 340-1.00R.

Futaba Denshi Kogyo K. K.: *See—*
Kishino, Takao; and Utamura, Yukihiko, 4,045,704, Cl. 313-497.000.

G. D. Searle & Co.: *See—*
Mueller, Richard A., 4,045,442, Cl. 260-293.580.

GAF Corporation: *See—*
Duncan, John J.; and Kirjanov, Alexander, 4,045,172, Cl. 8-115.700.

Gaggini, Guido John; and Gould, Eugene Lawrence, to Federal Laboratories, Inc. Aerosol projectile for lachrymating material. 4,044,684, Cl. 102-90.000.

Gaiardelli, Giuseppe. Pneumatic cleaner particularly for cleaning elements of textile machinery. 4,044,423, Cl. 15-345.000.

Gaines, Robert W.; Fiala, Dennison F.; and Babcock, Henry Nash, to U.S. Grout Corporation. Cementitious compositions having fast-setting properties and inhibited shrinkage. 4,045,237, Cl. 106-89.000.

Gallaher Limited: *See—*
Boyd, Dennis; and Porter, George, 4,044,777, Cl. 131-2.000.

Garberg, Lars Erik: *See—*
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.

Gardner, Jack C., to Glasrock Products, Inc. Foam generating dispenser having a movable and stationary porous element. 4,044,923, Cl. 222-190.000.

Garrett Corporation, The: *See—*
Lewis, Leon David; Wiher, Wilfried; and Parker, Warde L., 4,044,652, Cl. 91-368.000.

Garrett, Donald E., to Occidental Oil Shale, Inc. Fracturing of pillars for enhancing recovery of oil from in situ oil shale retort. 4,045,085, Cl. 299-2.000.

Garrison, Harold Keith: *See—*
Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, 4,044,906, Cl. 214-506.000.

Gates Rubber Company, The: *See—*
Douros, John D., Jr.; and Warder, Ira T., Jr., 4,045,582, Cl. 426-69.000.
Higbee, Charles D.; and Stevens, Bennie A., 4,044,799, Cl. 138-125.000.

Gaumont, Richard J.; Wolfe, Maurice Leonard; and Collins, Robert Lee, to West Manufacturing & Towing Equipment Inc. Automobile towing device. 4,044,900, Cl. 214-86.00A.

Gauriat, Gilles: *See—*
Lagarde, Jean-Louis; and Gauriat, Gilles, 4,045,618, Cl. 179-15.0BS.

Gautier, Pieter A.: *See—*
Kwantes, Arien; Gautier, Pieter A.; and Farragher, Anthony L., 4,045,379, Cl. 260-2.20R.

Gazuit, Georges, to Zelant, Gazuit. Tire upper-bead positioning device for use in a curing press. 4,045,150, Cl. 425-58.000.

Gehrig, Wilfried W., to ITT Industries, Incorporated. MOS power stage for generating non-overlapping two-phase clock signals. 4,045,685, Cl. 307-208.000.

Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, to Bayer Aktiengesellschaft. Anthraquinone dyestuffs. 4,045,457, Cl. 260-381.000.

Gehrmann, Klaus: *See—*
Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, 4,045,295, Cl. 203-79.000.

Geisinger, Wolfgang. Container handle. 4,045,070, Cl. 294-31.200.

Gejyo, Tetsuo: *See—*
Sakurai, Yo; Obayashi, Hidehito; and Gejyo, Tetsuo, 4,044,601, Cl. 73-23.000.

General Aquadyne, Inc.: *See—*
Jones, Richard F., 4,045,813, Cl. 358-99.000.

General Atomic Company: *See—*
Davis, Dwight E.; and Foster, Stephen J., 4,045,005, Cl. 259-36.000.

General Battery Corporation: *See—*
Fallon, William H.; and Schober, William R., 4,045,717, Cl. 320-2.000.

General Cable Corporation: *See—*
Eitel, Jay M., 4,044,902, Cl. 214-132.000.
Stevenson, Robert E., 4,044,856, Cl. 182-2.000.

General Dynamics Corporation: *See—*
Lingley, Richard C.; and Smith, Milburn R., 4,044,974, Cl. 244-161.000.
Maudal, Inge, 4,044,970, Cl. 244-3.220.
Piesik, Edward T., 4,044,648, Cl. 89-1.800.

General Electric Company: *See—*
Armijo, Joseph Sam, 4,045,288, Cl. 176-82.000.
Barkan, Philip, 4,045,633, Cl. 200-148.00A.
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.
Buzzell, Colby E., 4,045,738, Cl. 324-174.000.
Corrigan, Francis R., 4,045,186, Cl. 23-295.00R.
DeTommasi, Arthur N., 4,045,712, Cl. 315-323.000.
Kingsley, Jack D.; and Woodbury, Henry H., 4,045,675, Cl. 250-370.000.
Lever, Ray C.; and Wilkus, Edward V., 4,045,403; Cl. 260-42.420.
Morais, Don, 4,045,709, Cl. 315-205.000.
Neal, Wayne R., 4,045,708, Cl. 315-171.000.
Neal, Wayne R., 4,045,710, Cl. 315-205.000.
Smashey, Russell W.; and Bartell, Dwight O., 4,044,815, Cl. 164-35.000.
Wilder, Frank A., 4,044,649, Cl. 89-33.0BB.
Yu, Se Puan; and Glover, Gary H., 4,045,727, Cl. 324-58.50B.
Ziemba, Richard T., 4,044,680, Cl. 102-70.20R.

General-Electro Mechanical Corporation: *See*—
Anselmo, Dario, 4,044,462, Cl. 29-809.000.
General Foods Corporation: *See*—
Byrne, Charles H., 4,044,707, Cl. 116-114.500.
Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James, 4,045,586, Cl. 426-387.000.
General Motors Corporation: *See*—
Abu-Akeel, Abdulhadi K.; and Rieck, Gerald C., 4,044,861, Cl. 188-1.00B.
Arlauskas, Alfonsas; and Loose, Richard D., 4,045,079, Cl. 297-216.000.
Disosway, Mark D., III; and Sheldrake, Leonard J., 4,045,062, Cl. 290-38.00R.
Hanson, Richard J., 4,045,667, Cl. 250-226.000.
Hodes, Isidore, 4,045,212, Cl. 75-40.000.
Irwin, Clarence C., 4,045,048, Cl. 280-278.000.
Krage, Mark K., 4,045,797, Cl. 343-8.000.
Nelson, Robert E.; and Pieper, Keith A., 4,044,551, Cl. 60-39.140.
Nestor, Charles R., 4,045,650, Cl. 200-153.00K.
Pees, James M., 4,045,009, Cl. 267-139.000.
Rodondi, Andrew F.; and Hommer, Martin H., 4,045,112, Cl. 339-99.00R.
Vaught, John M., 4,044,553, Cl. 60-39.230.
West, Gene A., 4,044,552, Cl. 60-39.16S.
West, Gene A., 4,044,554, Cl. 60-39.28T.
Zander, Robert W., 4,044,627, Cl. 74-574.000.
General Tire & Rubber Company, The: *See*—
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob, 4,044,811, Cl. 152-354.000.
Kuan, Tiong H.; and Sommer, John G., 4,045,362, Cl. 252-14.000.
Geometric Data Corporation: *See*—
Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., 4,045,772, Cl. 340-146.30B.
Georg Fischer Aktiengesellschaft: *See*—
Heiss, Wolfgang, 4,044,938, Cl. 226-168.000.
Georgia-Pacific Corporation: *See*—
Wenzel, Donald E.; and Felicetta, Vincent F., 4,045,421, Cl. 260-124.00R.
Geraci, James Leonard, to Xomed, Inc. Drape for operating microscope. 4,045,118, Cl. 350-61.000.
Gerecht, John Fred, to Colgate-Palmolive Company. Sulfonium salt substantive sunscreen compositions. 4,045,549, Cl. 424-60.000.
Germani, Cesare, to Omita S.p.A. Loom with shuttles. 4,044,800, Cl. 139-341.000.
Gernot, Thorn; and Friedric-Wilhelm, Thomas, to Leybold-Heraeus GmbH & Co. KG. System for the power control of high voltage electron beam generators. 4,045,707, Cl. 315-106.000.
Gerrard, Alan Joseph, to Lucas Industries Limited. Burner assembly for an inlet manifold of an internal combustion engine. 4,044,740, Cl. 123-122.00G.
Geschwender, Robert C., to Bell Fibre Products Corporation; and Geschwender, Robert C., part interest to each. Mastic composition and composite structural panels formed therefrom. 4,045,268, Cl. 156-197.000.
Gestetner Limited: *See*—
Maynard, Michael, 4,044,670, Cl. 101-128.100.
Gewerkschaft Eisenhutte Westfalia: *See*—
Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, 4,045,089, Cl. 299-43.000.
Stuckmann, Dieter, 4,044,565, Cl. 61-41.00A.
Ghany, Michael. Candle making apparatus. 4,044,985, Cl. 249-205.000.
Ghayouran, Bahman. Auto-transfusion torniquet appliance and method of utilizing the same to control flow of blood through a blood vessel. 4,044,759, Cl. 128-24.00R.
Ghigini, Rino. Electric sphygmomanometer. 4,044,615, Cl. 73-391.000.
Gibbs, Stephen R.; and Chow, Kuen, to Burroughs Corporation. Multilevel metallization process. 4,045,302, Cl. 204-15.000.
Gidak, Edward J., Jr.: *See*—
Adams, Ben E.; and Gidak, Edward J., Jr., 4,045,335, Cl. 209-166.000.
Giese, Alice F., executrix: *See*—
Giese, Elroy J., deceased, 4,044,998, Cl. 251-331.000.
Giese, Elroy J., deceased (by Giese, Alice F., executrix), to Tomlinson Industries, Inc. Web tip seat cup. 4,044,998, Cl. 251-331.000.
Giesselmann, Hannes; and Rendahl, Karl Ingvar Fredrik, to Husqvarna Aktiebolag. Sewing machine frame with presser foot and needle bar unit. 4,044,701, Cl. 112-259.000.
Giggi, Robert: *See*—
Levy, John V.; Northrup, Thomas A.; and Giggi, Robert, 4,045,781, Cl. 364-200.000.
Gill, Chester C. Trailer direction indicator. 4,044,706, Cl. 116-31.000.
Gillespie, Richard Lee; and Melin, Arthur Kelso, to Wham-O Mfg. Co. Jai alai apparatus. 4,045,026, Cl. 273-96.00R.
Gillis, Robert E.: *See*—
Hamilton, Robert W.; and Gillis, Robert E., 4,044,756, Cl. 128-2.00N.
Girard, Gerald H. Quick release for waders. 4,044,478, Cl. 36-1.500.
Girdjev, Georgi Petrov: *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.
Glacier Metal Company Limited, The: *See*—
Morrison, William Craig, 4,044,441, Cl. 29-149.50R.
Glas, Lars-Olof: *See*—
Morawetz, Ernst; and Glas, Lars-Olof, 4,044,949, Cl. 237-1.00A.
Glasrock Products, Inc.: *See*—
Gardner, Jack C., 4,044,923, Cl. 222-190.000.
Glover, Gary H.: *See*—
Yu, Se Puan; and Glover, Gary H., 4,045,727, Cl. 324-58.50B.
Gluecksmann, Alfred: *See*—
Marans, Nelson Samuel; and Gluecksmann, Alfred, 4,045,396, Cl. 260-29.2TN.
Glynn, Paul Anthony: *See*—
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,045,583, Cl. 426-241.000.
Goerens, Robert L., to Uniroyal Luxembourg S.A. Aerodynamic ring travelers for yarn twisters. 4,044,539, Cl. 57-125.000.
Goettl, Adam D. Evaporative cooler with superimposed disposable pad assemblies. 4,045,523, Cl. 261-97.000.
Gokyu, Isao, to Nippon Concrete Industries Co., Ltd. Method of making reinforcements for concrete. 4,044,640, Cl. 83-42.000.
Goldmark Communications Corporation: *See*—
Goldmark, Peter C., 4,045,819, Cl. 360-8.000.
Goldmark, Peter C., to Goldmark Communications Corporation. Video recorder and playback apparatus. 4,045,819, Cl. 360-8.000.
Goldstein, David; Pless, William C.; Shapiro, Michael; Spencer, Dana; and Starr, Leland E., Jr., to United States of America, Navy. Test system for evaluation of armors using duplicate fragments. 4,044,599, Cl. 73-12.000.
Gomiero, Valeriano. Swivel hitch structure. 4,045,143, Cl. 403-102.000.
Gony, Jean-Noel: *See*—
Benedetto, Alexandre; Cuvillier, Roger O.; and Gony, Jean-Noel, 4,044,956, Cl. 241-24.000.
Goodman, Manuel; and Jaremus, Boubene M. Pressurized fluid powered horn. 4,044,712, Cl. 116-142.0FP.
Goranson, Paul L.: *See*—
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,044,914, Cl. 220-93.000.
Gorr, Theodor Wilhelm, to Zeuthen & Aagaard A/S. Printing machine, in particular an office offset machine with means for pre-curving the master. 4,044,672, Cl. 101-132.500.
Gosteli, Jacques, to Ciba-Geigy Corporation. Process for the manufacture of thioformamido-phosphono-acetates. 4,045,520, Cl. 260-985.000.
Goto, Makoto: *See*—
Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, 4,045,450, Cl. 260-343.600.
Goto, Tadaaki, to Trio Kabushiki Kaisha. Automatic sweep circuit. 4,045,713, Cl. 315-391.000.
Gould, Eugene Lawrence: *See*—
Gaggini, Guido John; and Gould, Eugene Lawrence, 4,044,684, Cl. 102-90.000.
Grah, Gerd: *See*—
Judat, Artur; Judat, Helmut; and Grah, Gerd, 4,045,190, Cl. 55-93.000.
Grajnert, Zbigniew. Trap for flying insects and bugs. 4,044,494, Cl. 43-119.000.
Granges Essem Aktiebolag: *See*—
Wallin, Jan-Olof, 4,044,969, Cl. 242-107.40A.
Grant, Geoffrey F.; and Nicks, Robert W. No-line tennis court. 4,045,022, Cl. 273-29.00R.
Grasmugg, Karl: *See*—
Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, 4,045,643, Cl. 219-98.000.
Graul, Juergen; and Murrmann, Helmuth, to Siemens Aktiengesellschaft. Process for producing an inversely operated transistor. 4,045,251, Cl. 148-1.500.
Gravez, Pierre: *See*—
Le Cardonnel, Gerard; Gravez, Pierre; and Favre, Rene Marc, 4,045,622, Cl. 179-175.20C.
Gray, Alden J., to Maremont Corporation. Multiple winding multiple voltage alternator electrical supply system. 4,045,718, Cl. 320-17.000.
Greber, Gerd: *See*—
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, 4,045,459, Cl. 260-448.80R.
Green, David L., to Pacer Systems, Inc. Omnidirectional speed cockpit display. 4,044,709, Cl. 116-129.00F.
Green, Derek; Pardoe, John Alan; and Etherington, Clifford, to United Kingdom Atomic Energy Authority. Forming of materials by extrusion. 4,044,587, Cl. 72-261.000.
Green, Robert C.; and Dubell, Robert L., to Exxon Research and Engineering Company. Production of hydrogenated coal liquids. 4,045,328, Cl. 208-8.000.
Green, Sidney Joseph: *See*—
Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, 4,044,828, Cl. 166-250.000.
Greene, Edwin R.; and Greene, Rodney F. Animal dryer. 4,044,474, Cl. 34-86.000.
Greene, Rodney F.: *See*—
Greene, Edwin R.; and Greene, Rodney F., 4,044,474, Cl. 34-86.000.
Greenfield, Harold: *See*—
Malz, Russell E., Jr.; Amidon, Roger W.; and Greenfield, Harold, 4,045,484, Cl. 260-561.00H.
Greenwald, Harry; and Iglio, Salvatore, to Walter Kidde & Company, Inc. Removable funnel for a coin operated apparatus. 4,044,875, Cl. 194-1.00K.
Gregory, Dale R.: *See*—
Phillips, Bobby M.; and Gregory, Dale R., 4,045,529, Cl. 264-75.000.

Grenon, Michel: *See*—
Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, 4,045,286, Cl. 176-49.000.
Greten, Berndt, to bison-Werke Bahre & Greten GmbH & Co. KG. Process for the production of chipboards and the like. 4,045,531, Cl. 264-113.000.
Gribova, Irina Alexandrovna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Griebsch, Eugen: *See*—
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, 4,045,389, Cl. 260-18.00N.
Griffin, Clyde C.: *See*—
Griffin, J. Curtis; and Griffin, Clyde C., 4,045,066, Cl. 294-5.500.
Griffin, J. Curtis; and Griffin, Clyde C., to Harrington Manufacturing Company. Bulk tobacco container. 4,045,066, Cl. 294-5.500.
Griffith, James M.; and Henry, Walter L., to United States of America, Health, Education and Welfare. System for combining analog and image signals into a standard video format. 4,045,815, Cl. 358-183.000.
Griffith, James R.; and O'Rear, Jacques G., to United States of America, Navy. Fluoro-anhydride curing agents and precursors thereof for fluorinated epoxy resins. 4,045,408, Cl. 260-47.0EA.
Griffith, Robert G., to Youngstown Sheet and Tube Company. Work guide for pipe reeling machines and the like and process for treating the same. 4,044,582, Cl. 72-97.000.
Grigorov, Ivaylo Yanev: *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.
Gripshover, David F.: *See*—
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Griswold, James L. Trench shoring assembly with corner guard accessory. 4,044,564, Cl. 61-41.00A.
Gronholz, Donald D. Router guide unit. 4,044,805, Cl. 144-134.00D.
Gros, Hermann, to Motoren- und Turbinen-Union Friedrichshafen GmbH. Release stop for disc clutch. 4,044,869, Cl. 192-48.910.
Grossner, Horst: *See*—
Florus, Hans-Jorg; Grossner, Horst; and Weiger, Gunter, 4,044,634, Cl. 74-866.000.
Grovesteen, William R.: *See*—
Le Boeuf, Albert R.; and Grovesteen, William R., 4,045,547, Cl. 424-28.000.
Grunberg, Emanuel: *See*—
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,045,487, Cl. 260-570.50C.
Grycel, Felix John, III. Boat construction and mold. 4,044,414, Cl. 9-6.00R.
GTE Automatic Electric Laboratories Incorporated: *See*—
Ester, Gary W., 4,045,693, Cl. 307-291.000.
GTE Sylvania Incorporated: *See*—
Chu, Gordon P. K.; Shinn, Dennis B.; and Waymouth, John F., 4,045,156, Cl. 431-95.00R.
Pearce, Daniel S., 4,045,775, Cl. 340-147.00R.
Pitel, Ira Jay, 4,045,711, Cl. 315-209.00R.
White, Robert S., Jr., 4,045,645, Cl. 219-118.000.
Guardpack, Incorporated: *See*—
Ramsey, John W., Jr., 4,044,693, Cl. 105-468.000.
Guerette, Marcel, to Moody Si Ltd. Mobile ladder. 4,044,857, Cl. 182-17.000.
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., to Rohm and Haas Company. Polyacrylic hot melt adhesives. 4,045,517, Cl. 260-901.000.
Guerrico Echevarria, Nicolas, to Plasticos Mel S.A. Tightening and sealing device. 4,044,809, Cl. 151-19.00R.
Gugenberger, Rene; and Martin, Roger, to Commissariat a l'Energie Atomique. Heat exchanger for high temperature. 4,044,825, Cl. 165-165.000.
Guichon, Lawrence Joseph Charles. Round bale feeder. 4,044,967, Cl. 242-86.50R.
Guillon, Marcel F., to D. B. A. Hydraulic engine. 4,044,654, Cl. 91-499.000.
Guiraldenq, Pierre; Treheux, Daniel; and Marchive, Daniel, to Agence Nationale de Valorisation de la Recherche (ANVAR). Superficial treatment of steel. 4,045,596, Cl. 427-229.000.
Guiraud, Francois, to Fichet-Bauche. Safety lock. 4,044,578, Cl. 70-366.000.
Guiset, Jacques. Artificial bladder. 4,044,401, Cl. 3-1.000.
Gulf Oil Corporation: *See*—
Sinclair, Richard G., 4,045,418, Cl. 260-78.30R.
Gulf Research & Development Company: *See*—
Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., 4,045,182, Cl. 23-288.00R.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,507, Cl. 260-683.15B.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,508, Cl. 260-683.15B.
Innes, Robert A.; and Perrotta, Anthony J., 4,045,373, Cl. 252-469.000.
Somers, Allen E., 4,045,333, Cl. 208-327.000.
Gulf & Western Manufacturing Company: *See*—
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Gulzek, Karl-Heinz: *See*—
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Gunther, Stefan, to Siemens Aktiengesellschaft. Use of light-metal panes as X-ray transmissive windows. 4,045,699, Cl. 313-59.000.
Gupta, Kedar P.: *See*—
Burd, John W.; Stone, Bobbie D.; Tucker, William F.; and Gupta, Kedar P., 4,045,181, Cl. 23-273.00R.
Gureeva, Galina Ilinichna: *See*—
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Guthrie, James Leverette; and Kehr, Clifton Leroy, to W. R. Grace & Co. Urethane polythiols. 4,045,472, Cl. 260-471.00C.
Gutjahr, Erwin, to Karl Handle & Sohne Maschinenfabrik und Eisengiesserei. Edge mill. 4,044,958, Cl. 241-126.000.
Gutweiler, Klemens: *See*—
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.
H. H. Robertson Company: *See*—
Davis, Bernard H.; Mack, Rollin T.; and Miyasaki, Kenneth, 4,045,267, Cl. 156-197.000.
Habert, William C.; and Jawanda, Jasjit S., to Uniroyal, Inc. Pneumatic tire building drum. 4,045,277, Cl. 156-417.000.
Haefliger, Walter: *See*—
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,045,573, Cl. 424-279.000.
Hagen, William F., to Turbo Refrigerating Company. Space heating and cooling system. 4,044,568, Cl. 62-73.000.
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, to Roussel Uclaf. Substituted ureas as herbicides. 4,045,209, Cl. 71-98.000.
Haines, Allan D., to National Machinery Co., The. High speed ball header. 4,044,588, Cl. 72-337.000.
Halberstadt, Lewis J.: *See*—
Foley, Charles F.; and Halberstadt, Lewis J., 4,044,721, Cl. 119-5.000.
Halcon International, Inc.: *See*—
Becker, Mitchell; and Valbert, Jon R., 4,045,294, Cl. 203-69.000.
Onsager, Olav T.; and Szecsi, Peter L., 4,045,500, Cl. 260-635.00H.
Winnick, Charles N., 4,045,419, Cl. 260-681.000.
Hall, John B.: *See*—
Wiegers, Wilhelmus Johannen; and Hall, John B., 4,045,489, Cl. 260-586.00C.
Hall, John Ives, to Smith & Nephew Research Limited. Orthopaedic bandage. 4,044,761, Cl. 128-90.000.
Halliburton Company: *See*—
Banks, William P.; and Martin, Larry D., 4,045,253, Cl. 148-6.14R.
Jessup, Robert L.; and Coleman, Joe E., 4,044,829, Cl. 166-264.000.
Halliday, George Andrew, to Fabricated Plastics Limited. Cooling tower design. 4,045,193, Cl. 55-257.0PV.
Halter, Edmund John, to Burgess Industries Incorporated. Vibration barrier/structural connector for conduits and the like. 4,045,057, Cl. 285-49.000.
Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, to Nippon Seisen, Co., Ltd. Method of simultaneously drawing a number of wire members. 4,044,447, Cl. 29-419.00R.
Hamar, Martin R. Apparatus for hard mounting an optical member to a rigid base. 4,045,129, Cl. 350-321.000.
Hamilton, Robert W.; and Gillis, Robert E. Phosphene generator device. 4,044,756, Cl. 128-2.00N.
Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Inking mechanism. 4,044,677, Cl. 101-348.000.
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, to Hoechst Aktiengesellschaft. Process for the production of thermoplastic synthetic materials and plastic shaping materials of chemically modified protein and a chemical plasticizer and including a bisacrylamide or bismethacrylamide. 4,045,239, Cl. 106-147.000.
Hammond, Theodore A. Fail-safe gravity conveyor. 4,044,876, Cl. 193-35.0SS.
Hamprecht, Rainer, to Bayer Aktiengesellschaft. Conversion of o-halogenoazo compound to o-cyanoazo compound by reaction with a zinc cyanide. 4,045,430, Cl. 260-208.000.
Hanemann, Horst J.: *See*—
Loveland, Winton; and Hanemann, Horst J., 4,045,273, Cl. 156-486.000.
Hansen, Richard. Inventory control board. 4,044,710, Cl. 116-133.000.
Hanson, Douglas R. Pan cleaning apparatus. 4,044,420, Cl. 15-304.000.
Hanson, Richard J., to General Motors Corporation. Color-sensitive photoelectric control system with fiber optics. 4,045,667, Cl. 250-226.000.

Hara, Hiroshi; and Miyazako, Takushi, to Fuji Photo Film Co., Ltd. Image forming process by color intensification. 4,045,226, Cl. 96-60.00R.

Haraguchi, Youichiro: *See—*
Urai, Muneharu; Kogure, Koji; and Haraguchi, Youichiro, 4,044,715, Cl. 118-50.000.

Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, to Kzm "D. Blagoev". Fluidized-bed reactor for carrying out chemical reactions between liquids and solid granulated substances. 4,045,184, Cl. 23-283.000.

Hard, Robert A.: *See—*
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.

Hardinge Brothers, Inc.: *See—*
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Hardt, Dietrich: *See—*
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, 4,045,382, Cl. 260-4.00R.

Hardy, Robert Allis, Jr.; and Quinones, Nicanor Quinones, to American Cyanamid Company. 11-(4-Piperidyl)dibenzo-diazepines. 4,045,445, Cl. 260-293.590.

Hargraves, William J. Compact portable self-contained aerobic digestion toilet. 4,044,406, Cl. 4-10.000.

Hargreaves, Clifford McDonald, to U.S. Philips Corporation. Heat insulation system. 4,044,911, Cl. 220-9.0LG.

Harland, Robert Francis, to Standard Microsystems Corporation. MOS one transistor cell RAM having divided and balanced bit lines, coupled by regenerative flip-flop sense amplifiers, and balanced access circuitry. 4,045,783, Cl. 340-173.00R.

Harrington, Laurence P., to Aristonics Corporation. Telephone control system. 4,045,619, Cl. 179-18.0DA.

Harrington Manufacturing Company: *See—*
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Harris Corporation: *See—*
Sanders, Thomas J., 4,045,259, Cl. 148-188.000.

Harris, Ellsworth L., Jr. Smoking pipe sling. 4,044,932, Cl. 224-26.00R.

Harris, Jesse W.; Bassinger, Ross; and Bassinger, Grey, to Bassinger Tool Enterprises, Ltd. Impact drilling tool. 4,044,844, Cl. 173-73.000.

Harris, Rano J., Jr.: *See—*
Harris, Rano J., Sr.; Harris, Rano J., Jr.; and Averette, Julius P., Jr., 4,044,616, Cl. 73-422.0GC.

Harris, Rano J., Sr.; Harris, Rano J., Jr.; and Averette, Julius P., Jr. Automatic fluid injector. 4,044,616, Cl. 73-422.0GC.

Harris, Richard T., to Sismore, William W., a part interest. Tube traveler. 4,044,444, Cl. 29-727.000.

Harrison, Ian T.: *See—*
Fried, John H.; and Harrison, Ian T., 4,045,485, Cl. 260-566.00A.

Hart, John A. H., to Canada, Her Majesty the Queen in right of. Gas resistant foam materials. 4,045,609, Cl. 428-253.000.

Hart, Thomas Brian: *See—*
Parkes, David M.; and Hart, Thomas Brian, 4,045,086, Cl. 299-17.000.

Hartman, Seymour, to Champion International Corporation. Alkali-treated bark extended tannin-aldehyde resinous adhesives. 4,045,386, Cl. 260-17.200.

Hartsough, Lloyd Bruce: *See—*
Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,044,782, Cl. 132-7.000.

Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., to System Development Corporation. Method and apparatus for scrambling and unscrambling communication signals. 4,045,814, Cl. 358-124.000.

Haruki, Tatsuro; and Hayashi, Yoshiro, to Shimadzu Seisakusho Ltd. Chromatograph. 4,044,593, Cl. 73-23.100.

Harvey, Thomas G., Jr. Pumping ratchet winch. 4,045,001, Cl. 254-164.000.

Harza, Richard D. Refuse disposal apparatus. 4,044,569, Cl. 62-341.000.

Hasebe, Shinji: *See—*
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.

Hashimoto, Susumu: *See—*
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Hashimoto, Tsutomu: *See—*
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, 4,045,353, Cl. 210-502.000.

Hattler, Louis R.: *See—*
Menon, Sukumaran K.; and Hattler, Louis R., 4,045,163, Cl. 432-59.000.

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Hauni-Werke Korber & Co. KG: *See—*
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.

Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, to Gewerkschaft Eisenhutte Westfalia. Apparatus for controlling the position of a mining machine. 4,045,089, Cl. 299-43.000.

Hauser, Daniel: *See—*
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,045,573, Cl. 424-279.000.

Haverberg Auto Laundry Equipment Co. Inc.: *See—*
Van Brakel, Russel A., 4,044,686, Cl. 104-172.00B.

Haverdink, Virgil Dean, to Deere & Company. Cleaner for root crop harvester conveyor. 4,044,837, Cl. 171-58.000.

Haviv, Fortuna; and Patchornik, Abraham, to Yeda Research and Development Co. Ltd. Cephalosporin antibiotics. 4,045,438, Cl. 544-29.000.

Hawk, Dale Wyatt, to Fiat-Allis Construction Machinery, Inc. Articulated vehicle tilt limiting apparatus. 4,045,050, Cl. 280-492.000.

Hawkins, John L.: *See—*
Langenbach, Jack E.; and Hawkins, John L., 4,045,109, Cl. 339-75.00M.

Hayashi, Gentaro; Yamamoto, Kenji; and Yamamoto, Yasakao, to Sanyo Electric Co., Ltd. Balancing ring of centrifugal extractor. 4,044,626, Cl. 74-573.00F.

Hayashi, Masamichi: *See—*
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, 4,045,135, Cl. 355-11.000.

Hayashi, Yoshiro: *See—*
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Hayashibara Biochemical Laboratories, Inc.: *See—*
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.
Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, 4,045,388, Cl. 260-17.4ST.

Hayes International Corporation: *See—*
McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., 4,044,555, Cl. 60-264.000.

Hazell, Paul Alexander: *See—*
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Hecking, Ludger: *See—*
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Hedberg, Frederick L.: *See—*
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Hedstrom Co.: *See—*
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Heffley, Russell H., Jr. Game apparatus. 4,045,023, Cl. 273-35.00B.

Heffron, Allan J.; and Kennedy, Leverne H., to Crankshaft Machine Company; and C. M. Systems, Incorporated. Crankshaft machine stock and chuck apparatus. 4,044,638, Cl. 82-9.000.

Heggestuen, James E. Smoking device. 4,044,781, Cl. 131-173.000.

Heidelberger Druckmaschinen Aktiengesellschaft: *See—*
Junghans, Rudi, 4,044,673, Cl. 101-148.000.

Heilman, William J.: *See—*
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,507, Cl. 260-683.15B.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,508, Cl. 260-683.15B.

Heilmann & Littmann Bau-Aktiengesellschaft: *See—*
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Heiner Stuhfauth GmbH: *See—*
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Heinrich, Raymond L.: *See—*
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Heinsohn, Howard H., Jr.: *See—*
Evers, William J.; and Heinsohn, Howard H., Jr., 4,045,491, Cl. 260-594.000.

Heinzer, Jorg: *See—*
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Heiss, Wolfgang, to Georg Fischer Aktiengesellschaft. Wire coil guiding device for wire treatment apparatus. 4,044,938, Cl. 226-168.000.

Heller, Henry B.: *See—*
Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., 4,045,314, Cl. 204-151.000.

Helms, C. R., to Container Corporation of America. Wrapper blank. 4,044,940, Cl. 229-40.000.

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Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, 4,045,319, Cl. 204-195.00S.

Henry, Vincent I.: *See—*
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Henry, Walter L.: *See—*
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Hens, Karel: *See—*
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Henson, Jimmy B., to Milliken Research Corporation. Coating method and apparatus. 4,045,598, Cl. 427-296.000.

Henze, Walter J.; and Thein, San, to Penn Fishing Tackle Mfg. Co. Trolling apparatus. 4,044,489, Cl. 43-27.400.

Heraeus Quarzschmelze GmbH: *See—*
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Hercules Incorporated: *See—*
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Hermansen, Ralph David: *See—*
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Herrling, Siegfried: *See—*
Schwertner, Eberhard; and Herrling, Siegfried, 4,045,556, Cl. 424-177.000.

Herrmann, Werner Martin: *See—*
Itil, Turan M.; and Herrmann, Werner Martin, 4,045,562, Cl. 424-261.000.

Hertzog, Richard Ross, to Allied Chemical Corporation. Process for the synthesis of ammonium nitrite. 4,045,540, Cl. 423-385.000.

Herzog, Helmut: *See—*
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Heseltine, Donald Warren: *See—*
Weber, Wayne Woodrow, II; and Heseltine, Donald Warren, 4,045,229, Cl. 96-84.0UV.

Hess, Hans-Jurgen E.; and Schaaf, Thomas K., to Pfizer Inc. Cyanoprostaglandins. 4,045,465, Cl. 260-464.000.

Hess, Lawrence George, to Union Carbide Corporation. Viscosity stabilization of vicinal acryloxy hydroxyl derivatives of linseed oil with N-alkylmorpholines. 4,045,394, Cl. 260-23.0AR.

Hesston Corporation: *See—*
Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, 4,044,906, Cl. 214-506.000.
Stoessel, Herman V.; and Prichard, Daniel R., 4,044,557, Cl. 60-420.000.

Hewitt, William T., Jr. Picture framing method and kit. 4,045,266, Cl. 156-91.000.

Hewlett-Packard Company: *See—*
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Hice, Phate: *See—*
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Higashi, Fukuji: *See—*
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Higbee, Charles D.; and Stevens, Bennie A., to Gates Rubber Company, The. Cellular wall hose and method for making same. 4,044,799, Cl. 138-125.000.

Higgs, Kenneth O.; and Marsch, Lawrence F., to Texaco Inc. Consistometer with internal calibration means. 4,044,602, Cl. 73-59.000.

Higgs, Kenneth O.; and Marsch, Lawrence F., to Texaco Inc. Consistometer with automatic shut-down. 4,044,603, Cl. 73-59.000.

Hikosaka, Takashi: *See—*
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Hilghman, Robert C.: *See—*
Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., 4,045,772, Cl. 340-146.30B.

Hill, David C.; and Flanigen, Edith M., to Union Carbide Corporation. Method for producing moisture resistant electrodes. 4,045,593, Cl. 427-59.000.

Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, to International Business Machines Corporation. Multiple ball element wafer breaking apparatus. 4,044,937, Cl. 225-97.000.

Hillenbrand, George C. Container for flowers. 4,044,502, Cl. 47-41.120.

Hiller, Dale Murray: *See—*
Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, 4,045,544, Cl. 423-607.000.

Hills-McCanna Company: *See—*
Priese, Werner K., 4,044,994, Cl. 251-172.000.

Hilti Aktiengesellschaft: *See—*
Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, 4,045,643, Cl. 219-98.000.
Rumpp, Gerhard; Kruger, Wilm; and Schǫlz, Dieter, 4,044,845, Cl. 175-409.000.

Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, to RCA Corporation. Method of transferring a surface relief pattern from a poly(olefin sulfone) layer to a metal layer. 4,045,318, Cl. 204-192.00E.

Hindes Limited: *See—*
Merchill, Geoffrey Leonard, 4,044,724, Cl. 119-83.000.

Hiraki, Masahiro: *See—*
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.

Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, to Hitachi, Ltd. Process for decontaminating gas containing radioactive iodine. 4,045,539, Cl. 423-240.000.

Hirasawa, Koichi: *See—*
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, 4,044,736, Cl. 123-119.00F.

Hirata, Yasuo: *See—*
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, 4,045,614, Cl. 178-69.100.

Hirschey, Kenneth A. Fuel additives for internal combustion engines. 4,045,188, Cl. 44-56.000.

Hirtenberger Patronen-, Zundhutchen- und Metallwarenfabrik Aktiengesellschaft: *See—*
Avcin, France, 4,044,685, Cl. 102-91.000.

Hitachi, Ltd.: *See—*
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.
Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, 4,045,539, Cl. 423-240.000.
Hotta, Atsuo, 4,045,249, Cl. 148-1.500.
Kadota, Shozo; Fujimoto, Yoshiji; Yasuda, Michio; and Oka, Mitsunori, 4,045,773, Cl. 340-146.3SG.
Kamimura, Shoji; and Saito, Yasushi, 4,045,669, Cl. 250-311.000.
Kaneko, Takashi; and Iwasaka, Tatsuo, 4,044,860, Cl. 187-29.00R.
Masuda, Kenzo, 4,045,686, Cl. 307-355.000.
Moriyama, Shigeo; and Kawamura, Yoshio, 4,045,141, Cl. 356-156.000.
Nakano, Seizo; Oishi, Kazuaki; Kikuchi, Takehiro; and Suda, Syoetu, 4,045,634, Cl. 200-148.00B.
Nishihara, Motohisa; and Ito, Tetsuo, 4,045,767, Cl. 340-5.00R.
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.
Sakurai, Yo; Obayashi, Hidehito; and Gejyo, Tetsuo, 4,044,601, Cl. 73-23.000.
Sampei, Tohru, 4,045,744, Cl. 330-13.000.
Shimizu, Tsuyoshi; and Tabata, Katsuhiro, 4,044,984, Cl. 249-95.000.
Suda, Seiji, 4,044,733, Cl. 123-117.00R.
Suzuki, Ryuichi; and Suzuki, Takaji, 4,045,655, Cl. 235-92.0PC.
Tachibana, Kyozo, 4,045,722, Cl. 363-126.000.
Yamazaki, Eiichi; and Kanai, Hiromi, 4,045,224, Cl. 96-36.100.

Hitco: *See—*
Babayan, Eduard P.; and Rourke, Michael H., 4,045,527, Cl. 264-46.700.

Hitzman, Donald O., to Phillips Petroleum Company. Integrated fermentation-photosynthesis biomass process. 4,044,500, Cl. 47-1.400.

Hlaban, James J.: *See—*
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., 4,044,766, Cl. 128-285.000.

Hochtemperatur-Reactorbau GmbH.: *See—*
Baumgaertner, Heinrich; and Barchewitz, Ekkehard, 4,045,285, Cl. 176-39.000.

Hocker, Jurgen: *See—*
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H.

Hodes, Isidore, to General Motors Corporation. Method of operation of a cupola. 4,045,212, Cl. 75-40.000.

Hodge, John S. Building structure. 4,044,518, Cl. 52-301.000.

Hodges, Newton John: *See—*
Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, 4,045,380, Cl. 260-2.5HA.

Hoechst Aktiengesellschaft: *See—*
Finke, Manfred; Kleiner, Hans-Jerg; and Lohmar, Elmar, 4,045,480, Cl. 260-545.00P.
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, 4,045,239, Cl. 106-147.000.
Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, 4,045,428, Cl. 260-198.000.
Mengler, Helmut, 4,045,169, Cl. 8-1.00W.
Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, 4,045,295, Cl. 203-79.000.
Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, 4,045,415, Cl. 260-67.0FP.

Hoffmann-La Roche Inc.: *See—*
Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, 4,045,490, Cl. 260-590.0FA.
Chan, Ka-Kong; and Saucy, Gabriel, 4,045,475, Cl. 260-488.00H.
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,045,487, Cl. 260-570.50C.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,045,452, Cl. 260-345.90S.
Koff, Arnold, 4,045,383, Cl. 260-8.000.
Rosenberger, Michael, 4,045,476, Cl. 260-488.00R.

Hohn, Alfred, to BBC Brown Boveri & Company Limited. Steam turbine having bearing structures lubricated with steam condensate in recirculating system. 4,044,561, Cl. 60-657.000.

Holden, Harold C.: *See—*
Claxton, William E.; and Holden, Harold C., 4,044,600, Cl. 73-15.00R.

Holec, N.V.: *See—*
Brinkman, Willem; and Breunkink, Bernard, 4,044,745, Cl. 123-139.00E.

Holiday Rambler Corporation: *See—*
Klingler, Richard, 4,044,410, Cl. 5-9.00R.

Hollingsead-Pryor Enterprises, Inc.: *See—*
Hollingsead, Robert A.; and Pryor, Clyde Robert, 4,044,515, Cl. 52-173.00R.

Hollingsead, Robert A.; and Pryor, Clyde Robert, to Hollingsead-Pryor Enterprises, Inc. Gasket for an avionic tray. 4,044,515, Cl. 52-173.00R.

Hollis, Richard E.: *See—*
Coombs, Donald L.; and Hollis, Richard E., 4,045,158, Cl. 431-123.000.

Holper, Frank, to Original Equipment Motors. Cam-operated motor control switch assembly with improved auxiliary actuator for motor control microswitch. 4,045,626, Cl. 200-30.00R.

Holstead, Robert D.: *See—*
Wyman, Charles E.; and Holstead, Robert D., 4,045,354, Cl. 210-523.000.

Holub, Arnold Emeral. Tractor-mounted scraper. 4,044,843, Cl. 172-802.000.

Hommer, Martin H.: *See—*
Rodondi, Andrew F.; and Hommer, Martin H., 4,045,112, Cl. 339-99.00R.

Honeywell Inc.: *See—*
Lee, Tzuo-Chang, 4,045,115, Cl. 350-3.500.
Spethmann, Donald H., 4,044,947, Cl. 236-13.000.

Honeywell Information Systems Inc.: *See—*
Lee, Fred S.; and Neu, William F., 4,045,786, Cl. 340-174.0TF.

Hood, Harry N. Vertically slotted strainer. 4,044,409, Cl. 4-292.000.

Hooker Chemicals & Plastics Corporation: *See—*
Fuller, Willard A., 4,045,542, Cl. 423-478.000.

Hoover Ball and Bearing Company: *See—*
Nichols, Dwight E., 4,044,912, Cl. 220-63.00R.

Hopfer, Walter: *See—*
Burkert, Walter; Hopfer, Walter; and Grasmugg, Karl, 4,045,643, Cl. 219-98.000.

Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., to Carrier Corporation. Refuse container. 4,044,914, Cl. 220-93.000.

Hopp, Philip, to Hopp Press, Inc., The. Display sign with edge attaching flange members. 4,044,485, Cl. 40-324.000.

Hopp Press, Inc., The: *See—*
Hopp, Philip, 4,044,485, Cl. 40-324.000.

Horlacher, Albert F., to Lock-A-Bike, Inc. Anti-theft device for portable apparatus. 4,044,577, Cl. 70-234.000.

Horowski, Reinhard: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Horst, William R.; McNaughton, James L.; and Mort, Charles F., to NCR Corporation. Method of fabricating diffraction grating masters and apparatus therefor. 4,044,939, Cl. 228-176.000.

Horstmann, Harald: *See—*
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.

Hoshide, Itsuo, to Teijin Seiki Company Limited. Arrangement of strand twisting apparatuses. 4,044,538, Cl. 57-62.000.

Hostetler, Dewey L., to DewEze Mfg., Inc. Round bale loader, unloader and unroller. 4,044,963, Cl. 242-54.00R.

Hotta, Atsuo, to Hitachi, Ltd. Oxide film isolation process. 4,045,249, Cl. 148-1.500.

Hou, Shou L.; and Blades, John D., to Addressograph-Multigraph Corporation. Duplicating apparatus employing modulator screen cylinder. 4,044,671, Cl. 101-129.000.

Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel: *See—*
Preuss, Arnfried, 4,044,613, Cl. 73-362.0AR.

Howard, George W., to Leisure Manufacturing Co., Inc. Airstream deflector for trailer-tow vehicle combinations. 4,045,074, Cl. 296-1.00S.

Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James, to General Foods Corporation. Soluble coffee of improved stability and flavor. 4,045,586, Cl. 426-387.000.

Howmedica, Inc.: *See—*
D'Errico, Joseph, 4,044,403, Cl. 3-1.913.

Hoyte, Alfred F.: *See—*
Chiang, Bing; and Hoyte, Alfred F., 4,045,638, Cl. 219-10.55A.

Hrishikesan, Kizhakke G., to Reynolds Metals Company. Process for recovering soda and alumina values from red mud. 4,045,537, Cl. 423-119.000.

Hsu, Grace F.: *See—*
Fong, Jaan-Jiue; and Hsu, Grace F., 4,045,305, Cl. 204-50.00R.

Hsu, Sheng Teng, to RCA Corporation. Complementary field effect transistor amplifier. 4,045,747, Cl. 330-35.000.

Hsueh, Limin: Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., to Kennecott Copper Corporation. In-situ mining of copper and nickel. 4,045,084, Cl. 299-4.000.

Huang, I-Der: *See—*
Sherwin, Martin B.; and Huang, I-Der, 4,045,477, Cl. 260-497.00R.

Hubbs, John C.: *See—*
Worcester, John L.; and Hubbs, John C., 4,045,735, Cl. 324-158.00F.

Huber, Peter: *See—*
Sommer, Oswin; Huber, Peter; and Strasser, Alois, 4,045,602, Cl. 427-386.000.

Hudson, John H.: *See—*
Ferrary, Ferdinand F.; Johnson, Herman T.; and Hudson, John H., 4,045,334, Cl. 209-141.000.

Hudson, William Ronald, to Milford-Astor Limited. Printing mechanism. 4,044,676, Cl. 101-297.000.

Huff, Ray V.: *See—*
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.

Huggins, James A. Gas humidification apparatus. 4,045,525, Cl. 261-124.000.

Hughes Aircraft Company: *See—*
Burke, Roger A., 4,044,542, Cl. 58-23.00R.
Tang, Raymond; and Wong, Nam San, 4,045,800, Cl. 343-854.000.

Humbert, Kingsley E., Jr., to Wix Corporation. Filter with multiple attaching means. 4,045,349, Cl. 210-232.000.

Humphries, Stanley, Jr.; and Sudan, Ravindra N., to Cornell Research Foundation, Inc. Intense ion beam generator. 4,045,677, Cl. 250-423.00R.

Hunger, Klaus: *See—*
Meininger, Fritz; Hunger, Klaus; and Springer, Hartmut, 4,045,428, Cl. 260-198.000.

Hunter, Frank Ray, to Du Pont de Nemours, E. I., and Company. Crystalline azopyrazolone acid dye. 4,045,425, Cl. 260-163.000.

Huntington Mechanical Laboratories, Inc.: *See—*
Alton, Lynn J., 4,044,918, Cl. 220-314.000.

Hurst, Robert E.; and Lunsford, Charles L., to Dow Chemical Company, The. Subsidence control. 4,044,563, Cl. 61-35.000.

Husen, William C.: *See—*
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.

Husqvarna Aktiebolag: *See—*
Giesselmann, H[illegible] and Rendahl, Karl Ingvar Fredrik, 4,044,701, Cl. 1[illegible].000.

Hutson, Thomas, Jr.; and Kraus, Wayne P., to Phillips Petroleum Company. Alkyl fluoride storage stabilization and alkylation with stored alkyl fluoride. 4,045,503, Cl. 260-652.50P.

Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., to Remington Arms Company, Inc. Rotary port cover. 4,044,487, Cl. 42-16.000.

Hutton, Thomas W.: *See—*
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., 4,045,517, Cl. 260-901.000.

Hybud Equipment Corporation: *See—*
Budoff, Hyman, 4,044,664, Cl. 100-48.000.

Hydril Company: *See—*
Crask, Geoffrey J., 4,044,473, Cl. 33-333.000.
Mott, James D., 4,044,835, Cl. 166-322.000.

Hydrocarbon Research, Inc.: *See—*
Johanson, Edwin S.; and Wolk, Ronald H., 4,045,329, Cl. 208-10.000.

HydroTech International, Inc.: *See—*
Arnold, James F., 4,045,054, Cl. 285-18.000.
Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., 4,044,749, Cl. 125-23.00R.

I.GE.Co. Z.r.l.: *See—*
Bianchi, Giuseppe, 4,045,236, Cl. 106-88.000.

I-T-E Imperial Corporation: *See—*
Schienda, John W., 4,045,628, Cl. 200-50.00C.

Iacono, Frederick Della, to Kings Electronics Company, Inc. Connector safety tip. 4,045,113, Cl. 339-111.000.

Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, to Tokyo Shibaura Electric Co., Ltd. Gas-sensing material. 4,045,764, Cl. 338-34.000.

Iga, Atsushi: *See—*
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, 4,045,178, Cl. 23-254.00E.

Igarashi, Jun; Koga, Tadao; and Ueda, Satoshi, to Yaesu Rehabili Co., Ltd. Foldable wheel chair. 4,045,051, Cl. 280-644.000.

Iglio, Salvatore: *See—*
Greenwald, Harry; and Iglio, Salvatore, 4,044,875, Cl. 194-1.00K.

Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, to Furuno Electric Company, Limited. Ultrasonic detection system. 4,045,766, Cl. 340-1.00R.

Iida, Yozo, to Nippon Kogaku, K.K. Film rewinding device for movie camera. 4,045,132, Cl. 352-91.00C.

Iio, Katsuro; and Osato, Akiyoshi, to Kobe Steel, Limited. Automatic arc welding process using a consumable nozzle. 4,045,648, Cl. 219-137.00R.

Ikeda, Morio, to Teijin Limited. Process for producing textured polyester multifilament yarn. 4,044,541, Cl. 57-157.0TS.

Ikeda, Tomoaki: *See—*
Shinozaki, Fumiaki; Ikeda, Tomoaki; and Tsuboi, Masayoshi, 4,045,222, Cl. 96-33.000.

Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, to Kabushiki Kaisha Daini Seikosha. Switching mechanism of an electronic wrist watch. 4,044,543, Cl. 58-23.00R.

Ikenoue, Shinpei; and Mizuki, Eiichi, to Fuji Photo Film Co., Ltd. Method for stabilizing silver halide photographic material. 4,045,227, Cl. 96-61.00R.

Illinois Tool Works Inc.: *See—*
Sidor, Edward Frank; Camillo, Charles Carl; and Bowen, Glenn W., 4,045,787, Cl. 340-197.000.

Imamura, Masao. Sliding resistor. 4,045,765, Cl. 338-176.000.

Imasco Limited: *See—*
Lafleur, Roger, 4,044,526, Cl. 53-26.000.

Imoehl, Wolfgang: *See—*
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, 4,045,389, Cl. 260-18.00N.

Imon, Kazutoshi, to Kabushiki Kaisha Komatsu Seisakusho. Steering control apparatus for use in endless track type tractors and control valve for use therewith. 4,044,849, Cl. 180-6.700.

Imperial Chemical Industries Limited: *See—*
Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, 4,044,404, Cl. 3-19.000.
Preston, John; and Reeve, Austin John, 4,045,439, Cl. 260-250.00C.

Inada, Masami; and Kitamura, Kazuhiko, to Aisin Seiki Kabushiki Kaisha. Pneumatic control system and pressure responsive valve assembly therefor. 4,044,732, Cl. 123-117.00A.

Indian Head, Inc.: *See—*
Francis, Orville, 4,044,983, Cl. 248-293.000.

Ingersoll-Rand Company: *See—*
Fischer, Robert B., 4,045,256, Cl. 148-36.000.

Ingram, Alexander John. Fishing lure. 4,044,492, Cl. 43-42.280.

Innami, Tamio: *See—*
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.

Innes, Robert A.; and Perrotta, Anthony J., to Gulf Research & Development Company. Oxidation catalysts and process for preparing same. 4,045,373, Cl. 252-469.000.

Inoue, Shuji: *See—*
Isaka, Tsutomu; Inoue, Shuji; and Arakawa, Kunihiko, 4,045,515, Cl. 260-897.00A.

Institut Francais du Petrole: *See—*
Avrillon, Rene; and Defives, Daniel, 4,045,330, Cl. 208-180.000.
Provost, Roger, 4,044,717, Cl. 118-629.000.
Rabilloud, Guy; and Sillion, Bernard, 4,045,414, Cl. 260-65.000.

Instrument Services, Inc.: *See—*
Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, 4,045,788, Cl. 340-323.00R.

Instrumentation Industries, Inc.: *See—*
Eross, Bela, 4,045,058, Cl. 285-119.000.

International Business Machines Corporation: *See—*
Abbas, Shakir Ahmed; and Dockerty, Robert Charles, 4,044,452, Cl. 29-571.000.
Arnold, Robert Walker; and Tomasky, Thomas, 4,045,770, Cl. 346-75.000.
Carpenter, Robert Gordon; and Chao, Chester C., 4,045,736, Cl. 324-158.00R.
Chai, Hi Dong; and Pawletko, Joseph Paul, 4,044,881, Cl. 197-82.000.
Fujikura, Hiroshi, 4,045,821, Cl. 360-132.000.
Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, 4,044,937, Cl. 225-97.000.
Lutz, Heinz; Zimmermann, Volker; and Zuehlke, Rainer, 4,045,696, Cl. 310-49.00R.
Maddocks, Fred Sterns, 4,045,594, Cl. 427-89.000.
Magdo, Ingrid E., 4,044,454, Cl. 29-578.000.
Martin, Blair Robertson, 4,044,880, Cl. 197-18.000.

International Flavors & Fragrances Inc.: *See—*
Evers, William J.; and Heinsohn, Howard H., Jr., 4,045,491, Cl. 260-594.000.
Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, 4,045,587, Cl. 426-533.000.
Schreiber, William L.; and Pittet, Alan O., 4,045,497, Cl. 260-615.00A.
Wiegers, Wilhelmus Johannen; and Hall, John B., 4,045,489, Cl. 260-586.00C.

International Nickel Company, Inc., The: *See—*
Mercer, David L., 4,045,541, Cl. 423-417.000.

International Paper Company: *See—*
Burt, George A., Jr.; and Neill, William M., 4,044,641, Cl. 83-341.000.

International Telephone and Telegraph Corporation: *See—*
Coombs, Donald L.; and Hollis, Richard E., 4,045,158, Cl. 431-123.000.
Langenbach, Jack E.; and Hawkins, John L., 4,045,109, Cl. 339-75.00M.
Peterson, Carl W., 4,045,111, Cl. 339-97.00R.
Pitt, Gillies D.; and Black, Philip W., 4,045,668, Cl. 250-227.000.

INTERx Research Corporation: *See—*
Kaminski, James J.; and Bodor, Nicolae S., 4,045,578, Cl. 424-311.000.

Invernati, Carlo, to Danyel S.A.S. Supporting and pivot device made of plastic for keys of pianos, electronic organs and the like. 4,044,646, Cl. 84-435.000.

IPCO Hospital Supply Corporation: *See—*
Beckman, Paul, 4,044,614, Cl. 73-371.000.

Ireland, Henry R.; Peters, Alan W.; and Stein, Thomas R., to Mobil Oil Corporation. Method for upgrading a Fischer-Tropsch light oil. 4,045,505, Cl. 260-673.000.

Irwin, Clarence C., to General Motors Corporation. Trailing arm cambering vehicle with stabilizer linkage having locking means for parking and stowage. 4,045,048, Cl. 280-278.000.

Isaka, Tsutomu; Inoue, Shuji; and Arakawa, Kunihiko, to Toyo Boseki Kabushiki Kaisha. Film of good tear property on impact. 4,045,515, Cl. 260-897.00A.

Isayama, Takuro: *See—*
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.

Ishida, Kunio, to Tokico Ltd. Method for filling gas into gas spring. 4,044,866, Cl. 188-322.000.

Ishigaki Kiko Co., Ltd.: *See—*
Yokota, Ittshu, 4,045,344, Cl. 210-106.000.

Ishii, Masaichi; and Mihara, Kazuo, to Daicel Ltd. Tube scrubbing apparatus. 4,044,418, Cl. 15-104.06A.

Ishikawa, Fumio: *See—*
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.

Ishikawa, Kazuo: *See—*
Miyamoto, Mamoru; and Ishikawa, Kazuo, 4,045,763, Cl. 338-23.000.

Isii, Masami: *See—*
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.

Isobe, Yasuo: *See—*
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.

Isteri, Pauli Henrik. Method and device for oxygenating water with vibrations and under pressure strokes. 4,045,336, Cl. 210-15.000.

Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, to Pioneer Electronic Corporation; and Tokorozawa Electronic Corporation. Piezoelectric electro-acoustic transducer. 4,045,695, Cl. 310-322.000.

Itek Corporation: *See—*
Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., 4,044,754, Cl. 126-271.000.

Itil, Turan M.; and Herrmann, Werner Martin, to Schering Aktiengesellschaft. Lisuride and physiologically acceptable salts thereof to achieve psychic energizer effects. 4,045,562, Cl. 424-261.000.

Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, to Canon Kabushiki Kaisha. Automatic exposure control apparatus which prevents simultaneous diaphragm and shutter speed preselection. 4,045,807, Cl. 354-38.000.

Ito, Tadashi: *See—*
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.

Ito, Tetsuo: *See—*
Nishihara, Motohisa; and Ito, Tetsuo, 4,045,767, Cl. 340-5.00R.

Itoh, Kunio; and Fukuda, Takeshi, to Shin-Etsu Chemical Co., Ltd. Silicone rubber compositions. 4,045,390, Cl. 260-18.00S.

Itoh, Masaaki: *See—*
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.

Itoh, Tsunehiro: *See—*
Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, 4,044,447, Cl. 29-419.00R.

ITT Industries, Incorporated: *See—*
Gehrig, Wilfried W., 4,045,685, Cl. 307-208.000.

Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, to Sumitomo Chemical Company, Limited. Thermoplastic resin composition comprising methyl methacrylate resins and a polycarbonate. 4,045,514, Cl. 260-873.000.

Iwama, Kiyonori: *See—*
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,045,695, Cl. 310-322.000.

Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, to Nippon Carbon Co., Ltd.; and Japan Atomic Energy Research Institute. Process for the preparation of graphite-clad nuclear fuel rods. 4,045,526, Cl. 264-.500.

Iwasaka, Tatsuo: *See—*
Kaneko, Takashi; and Iwasaka, Tatsuo, 4,044,860, Cl. 187-29.00R.

Iwasaki, Hiroshi: *See—*
Kondo, Mitsura; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,045,458, Cl. 260-393.000.

Iwasaki, Kyuhachiro, to Ricoh Company, Ltd. Ink ejection head for printer. 4,045,801, Cl. 346-140.00R.

Iwasaki, Kyuhachiro: *See—*
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.

Iwata, Toyomi: *See—*
Taniguchi, Motoaki; and Iwata, Toyomi, 4,044,810, Cl. 152-209.00R.

Izawa, Toichiro: *See—*
Daimon, Nobutoshi; and Izawa, Toichiro, 4,045,241, Cl. 106-306.000.

J. M. Huber Corporation: *See—*
Wason, Satish K.; and van der Heem, Peter, 4,045,240, Cl. 106-288.00B.

J. Walter AG: *See—*
Walter, Josef, 4,045,042, Cl. 280-79.10R.

Jacks, Roy T., to U.S. Manufacturing Corporation. Torsional damper. 4,044,628, Cl. 74-574.000.

Jackson, John Lambert: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,045,566, Cl. 424-267.000.

Jackson, John Maxwell, to Chromax Limited. Mandrels for supporting containers with negative and positive air pressure. 4,044,667, Cl. 101-38.00R.

Jackson, Melvin R., to United States of America, National Aeronautics and Space Administration. Directionally solidified eutectic $\gamma+\beta$ nickel-base superalloys. 4,045,255, Cl. 148-32.000.

Jacobs, Alfred G. Athletic mouthguard. 4,044,762, Cl. [illegible]136.000.

Jacobs, Brigitte: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.

Jacobs, Klaus: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.

Jacobsen, Theodor: *See—*
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.

Jagenberg Werke AG: *See—*
Vetten, Wilhelm, 4,044,656, Cl. 93-44.1GT.

Jagenberg Werke Aktiengesellschaft: *See—*
Zodrow, Rudolf, 4,045,276, Cl. 156-571.000.

Jago, Donald F.: *See—*
Jones, Richard E.; and Jago, Donald F., 4,044,714, Cl. 118-24.000.
Jones, Richard E.; and Jago, Donald F., 4,045,584, Cl. 426-289.000.

Jakob, Hans, to Maschinenfabrik Goebel GmbH. Adjustable folding apparatus for zigzag folding. 4,045,012, Cl. 270-79.000.

Jambor, Arno: *See—*
Wilfert, Karl; Schmid, Walter; and Jambor, Arno, 4,045,052, Cl. 280-701.000.

James A. Jobling & Company Limited: *See—*
Obersby, Derek; and Allen, Thomas Kenneth, 4,044,936, Cl. 225-2.000.

James, Dennis Bryan; Liu, Chao Kai; and Smith, Douglas Charles, to Bell Telephone Laboratories, Incorporated. Monobus interface circuit using opto-coupled hybrids. 4,045,615, Cl. 179-1.0CN.

Jamieson, Robert S. High efficiency aerodynamic sail system for boats, and method for sailing. 4,044,702, Cl. 114-102.000.

Jamison, Leon L., to Raymond Lee Organization, Inc., The, a part interest. Aerial distress marker. 4,044,711, Cl. 116-124.00B.

Janson, Sven-Olof. Device for preventing overheating of electric apparatuses. 4,045,652, Cl. 219-363.000.

Janssen, Hendrik Jan Jacob: *See—*
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob, 4,044,811, Cl. 152-354.000.

Janssen, Peter Johannes Michiel: *See—*
Verhoeven, Leonardus Adrianus Johannes; De Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, 4,045,812, Cl. 358-4.000.

Japan Atomic Energy Research Institute: *See—*
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.

Jaremus, Boubene M.: *See—*
Goodman, Manuel; and Jaremus, Boubene M., 4,044,712, Cl. 116-142.0FP.

Jawanda, Jasjit S.: *See—*
Habert, William C.; and Jawanda, Jasjit S., 4,045,277, Cl. 156-417.000.

Jaworski, Eugene: *See—*
Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo, 4,045,024, Cl. 273-43.00A.

Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, to Cadbury Limited. Method of manufacturing a chocolate product. 4,045,583, Cl. 426-241.000.

Jenoff, Incorporated: *See—*
Peterson, Reuben E., 4,045,761, Cl. 337-372.000.

Jenoptik Jena G.m.b.H.: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.

Jeno's, Inc.: *See—*
Jones, Richard E.; and Jago, Donald F., 4,044,714, Cl. 118-24.000.
Jones, Richard E.; and Jago, Donald F., 4,045,584, Cl. 426-289.000.

Jepson, Walter Brian: *See—*
Bidwell, Jan Ivan; Adams, Roger William; and Jepson, Walter Brian, 4,045,235, Cl. 106-72.000.

Jernstrom, Hans. Bubble blower. 4,044,496, Cl. 46-7.000.

Jero, John P.: *See—*
Bjerk, Roger O.; Brandon, William D.; Engelking, Frederick S.; and Jero, John P., 4,045,402, Cl. 260-42.180.

Jervis B. Webb Company: *See—*
Melke, George A., 4,044,853, Cl. 180-98.000.

Jessup, Robert L.; and Coleman, Joe E., to Halliburton Company. Method and apparatus for annulus pressure responsive circulation and tester valve manipulation. 4,044,829, Cl. 166-264.000.

Jidosha Kiki Co., Ltd.: *See—*
Yanagawa, Itiro; and Suzuki, Isao, 4,045,094, Cl. 303-22.00R.

Jofs, Jar-Erik, to Oy Wiik & Hoglund Ab. Method of and apparatus for making a non-slip plastics film. 4,045,270, Cl. 156-229.000.

Joh. Vaillant K.G.: *See—*
Reichmann, Horst, 4,044,726, Cl. 122-33.000.

Johansen, Randulf Inge, to A/S Trondhjems Nagle & Spigerfabrik. Method for in situ determination of concrete strength. 4,044,608, Cl. 73-88.00C.

Johanson, Edwin S.; and Wolk, Ronald H., to Hydrocarbon Research, Inc. Coal hydrogenation with selective recycle of liquid to reactor. 4,045,329, Cl. 208-10.000.

John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,045,566, Cl. 424-267.000.
Cavalla, John Frederick; and Archibald, John Leheup, 4,045,444, Cl. 260-293.580.

Johns-Manville Corporation: *See—*
Meserole, Robert Henry, 4,044,581, Cl. 72-68.000.

Johnson, Arthur C. W., to Combustion Research Corporation. Radiant energy heating system with power exhaust and excess air inlet. 4,044,751, Cl. 126-91.00A.

Johnson Controls, Inc.: *See—*
Matthews, Russell Byron, 4,044,794, Cl. 137-613.000.

Johnson, Herman T.: *See—*
Ferrary, Ferdinand F.; Johnson, Herman T.; and Hudson, John H., 4,045,334, Cl. 209-141.000.

Johnson, John H.: *See—*
Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., 4,045,297, Cl. 195-103.50R.

Johnson & Johnson: *See—*
Frydryk, John, 4,044,501, Cl. 47-26.000.
Mesek, Frederick K.; and Repke, Virginia L., 4,044,768, Cl. 128-287.000.
Tritsch, Ludwig, 4,044,767, Cl. 128-287.000.

Johnson, Larry K., to Lawrence Brothers, Inc. Releasable door stop and strike plate assembly for a bidirectional swinging door. 4,045,065, Cl. 292-341.170.

Johnson, Robert A., to Fasco Industries, Inc. Thermostatic switch. 4,045,757, Cl. 337-85.000.

Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, to Terra Tek, Inc. Process for direct measurement of the orientation of hydraulic fractures. 4,044,828, Cl. 166-250.000.

Jones, Christopher Robin: *See—*
Williams, Malcolm; and Jones, Christopher Robin, 4,044,738, Cl. 123-119.00A.

Jones, Richard E.; and Jago, Donald F., to Jeno's, Inc. Food product coating apparatus. 4,044,714, Cl. 118-24.000.

Jones, Richard E.; and Jago, Donald F., to Jeno's, Inc. Food product coating apparatus and method. 4,045,584, Cl. 426-289.000.

Jones, Richard F., to General Aquadyne, Inc. Method of operating video cameras and lights underwater. 4,045,813, Cl. 358-99.000.

Jones, Robert K.; and Sue, Harry, to Teletype Corporation. Starting product for the production of a read-only memory and a method of producing it and the read-only memory. 4,045,310, Cl. 204-129.400.

Jones & Vining, Incorporated: *See—*
Cohen, Arnold, 4,044,417, Cl. 12-146.00L.

Josef Haamann, Hebe-und Transporttechnik, Firma: *See—*
Mai, Erich, 4,045,000, Cl. 254-45.000.

Judah, Kenneth C.: *See—*
Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.

Judat, Artur; Judat, Helmut; and Grah, Gerd, to Bayer Aktiengesellschaft. Method for regulating the flow of liquid through mass transfer columns. 4,045,190, Cl. 55-93.000.

Judat, Helmut: *See—*
Judat, Artur; Judat, Helmut; and Grah, Gerd, 4,045,190, Cl. 55-93.000.

Jue, John. Shrub trimming guide. 4,044,472, Cl. 33-174.00G.

Jukoff, David, to Consolidated Controls Corporation. High energy loss fluid flow control device. 4,044,992, Cl. 251-126.000.

Junggren, Ulf Krister: *See—*
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,563, Cl. 424-263.000.
Berntsson, Peder Bernhard; Carlsson, Stig Ake Ingemar; Garberg, Lars Erik; Junggren, Ulf Krister; Sjostrand, Sven Erik; and von Wittken Sundell, Gunhild Wika, 4,045,564, Cl. 424-263.000.

Junghans, Rudi, to Heidelberger Druckmaschinen Aktiengesellschaft. Dampening unit for offset printing machines. 4,044,673, Cl. 101-148.000.

Kabachnik, Martin Izrailevich: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Kabushiki Kaisha Daini Seikosha: *See—*
Asano, Kazuhiro, 4,045,691, Cl. 307-264.000.
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.
Koike, Mitsuo, 4,044,546, Cl. 58-50.00R.
Kusumoto, Yasuo, 4,044,547, Cl. 58-85.500.
Yagi, Kenjiro; and Asano, Kazuhiro, 4,044,544, Cl. 58-23.00R.

Kabushiki Kaisha Komatsu Seisakusho: *See—*
Imon, Kazutoshi, 4,044,849, Cl. 180-6.700.

Kabushiki Kaisha Negishi Kobyo Kenkyusho: *See—*
Negishi, Eizaburo; and Negishi, Masanori, 4,044,537, Cl. 57-58.890.

Kabushiki Kaisha Toyota Chuo Kenkyusho: *See—*
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.

Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., to Kimberly-Clark Corporation. Compressed catamenial tampons with improved capabilities for absorbing menstrual fluids. 4,044,766, Cl. 128-285.000.

Kadota, Shozo; Fujimoto, Yoshiji; Yasuda, Michio; and Oka, Mitsunori, to Hitachi, Ltd. Pattern segmenting system for a pattern recognizing device. 4,045,773, Cl. 340-146.3SG.

Kaegi, Emil M.: *See—*
Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., 4,044,718, Cl. 118-647.000.

Kahn, Henry. Handle for cutting and abrading instruments useful in the practice of endodontia. 4,044,468, Cl. 32-57.000.

Kaiser Aluminum & Chemical Corporation: *See—*
Ring, Terry A., 4,045,234, Cl. 106-62.000.
Schroter, Richard C., 4,044,517, Cl. 52-248.000.

Kaiser, Reinhold, to Licentia Patent-Verwaltungs-GmbH. Method of manufacturing a semiconductor device. 4,045,258, Cl. 148-187.000.

Kaiser Resources Ltd.: *See—*
Parkes, David M.; and Hart, Thomas Brian, 4,045,086, Cl. 299-17.000.

Kajfez, Franjo; Blazevic, Nikola; and Sunjic, Vitomir. Optically active 1,4-benzodiazepines and process for use as a tranquilizer. 4,045,569, Cl. 424-274.000.

Kaleel, Jack T. Arabic bread oven. 4,045,166, Cl. 432-146.000.

Kalkowski, Kurt Ulrich. Protective cover for an electric range. 4,045,606, Cl. 428-174.000.

Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, to L'Oreal. Hair dye composition containing an indoaniline. 4,045,170, Cl. 8-11.000.

Kamimura, Shoji; and Saito, Yasushi, to Hitachi, Ltd. Electron microscope. 4,045,669, Cl. 250-311.000.

Kaminski, James J.; and Bodor, Nicolae S., to INTERx Research Corporation. N-chloro-amino acid derivatives exhibiting antibacterial activity. 4,045,578, Cl. 424-311.000.

Kanai, Hiromi: *See—*
Yamazaki, Eiichi; and Kanai, Hiromi, 4,045,224, Cl. 96-36.100.

Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi, to Matsushita Electric Industrial Co., Ltd. Expendable oceanography probe. 4,044,611, Cl. 73-170.00A.

Kandakov, Gennady Petrovich; Matveev, Georgy Vasilievich; and Miller, Viktor Yakovlevich. Expansion compensator for pipelines. 4,045,056, Cl. 285-41.000.

Kane, Robert J. Pool models. 4,044,477, Cl. 35-49.000.

Kaneko, Takashi; and Iwasaka, Tatsuo, to Hitachi, Ltd. Elevator traffic demand detector. 4,044,860, Cl. 187-29.00R.

Kanner, Bernard: *See—*
Prokai, Bela; and Kanner, Bernard, 4,045,381, Cl. 260-2.5AH.

Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Kondo, Mitsura; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,045,458, Cl. 260-393.000.

Kaplan, Edward L.: *See—*
Cless, Gerhard; and Kaplan, Edward L., 4,044,946, Cl. 234-39.000.

Karasev, Alexandr Konstantinovich: *See—*
Mikhailov, Viktor Vasilievich; Litver, Semen Lvovich; and Karasev, Alexandr Konstantinovich, 4,045,533, Cl. 264-228.000.

Karasudani, Yasuo, to Tokico Ltd. Disc brake. 4,044,864, Cl. 188-73.300.

Karayannis, Panayotis, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Ignition current generator for an electrical projectile fuze. 4,044,682, Cl. 102-70.2GA.

Karl Handle & Sohne Maschinenfabrik und Eisengiesserei: *See—*
Gutjahr, Erwin, 4,044,958, Cl. 241-126.000.

Karlsson, Ronny, to Siemens Aktiengesellschaft. Sheet film magazine for an X-ray film exchanger. 4,045,014, Cl. 271-8.00R.

Kashio, Toshio, to Casio Computer Co., Ltd. Apparatus for arithmetically processing bill records. 4,045,780, Cl. 364-900.000.

Kato, Tetsuji, to Mitsubishi Rayon Co., Ltd. System for cutting pieces from a traveling strip of sheet material. 4,044,639, Cl. 83-7.000.

Kato, Yasuyuki: *See—*
Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, 4,045,514, Cl. 260-873.000.

Katori, Kunihiko; Nagai, Hiroshi; and Shiiki, Zenya, to Kureha Kagaku Kogyo Kabushiki Kaisha; and Toyo Boseki Kabushiki Kaisha. Process for production of activated carbon spheres. 4,045,368, Cl. 252-421.000.

Katsube, Junki: *See—*
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,045,560, Cl. 424-248.400.

Katsuhiko, Motosugi: *See—*
Masaaki, Noguchi; Yukiyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, 4,044,730, Cl. 123-75.00B.

Katsura, Masaki: *See—*
Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, 4,045,764, Cl. 338-34.000.

Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, to International Flavors & Fragrances Inc. Foodstuff flavoring methods and compositions. 4,045,587, Cl. 426-533.000.

Katzmark, Peter C. Aerodynamic orificed disc. 4,045,029, Cl. 273-106.00B.

Kawamoto, Isao: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

Kawamura, Yoshio: *See—*
Moriyama, Shigeo; and Kawamura, Yoshio, 4,045,141, Cl. 356-156.000.

Kawanishi, Yasuhiro: *See—*
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.

Kawasaki, Kazuo, to Nissan Denshi Kabushikigaisha. Combined transceiver and radio unit. 4,045,739, Cl. 325-15.000.

Kawolics, Raymond P.: *See—*
Basel, Donald R.; and Kawolics, Raymond P., 4,044,989, Cl. 251-7.000.

Kaye, Marie: *See—*
Kaye, Ronald Swynerton, 4,044,746, Cl. 123-139.0AV.

Kaye, Ronald Swynerton, to Kaye, Marie, a part interest. Fuel control device. 4,044,746, Cl. 123-139.0AV.

Keefer, James J. Internal combustion engine fuel economizer system. 4,044,744, Cl. 123-136.000.

Kehr, Clifton Leroy: *See—*
Guthrie, James Leverette; and Kehr, Clifton Leroy, 4,045,472, Cl. 260-471.00C.

Kehr, Wolfgang: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Keller Corporation, The: *See—*
Keller, Leonard J., 4,045,092, Cl. 302-66.000.

Keller, Leonard J., to Keller Corporation, The. Fuel composition and method of manufacture. 4,045,092, Cl. 302-66.000.

Keller, Wolfgang, to Siemens Aktiengesellschaft. Method and apparatus for floating melt zone of semiconductor crystal rods. 4,045,278, Cl. 156-602.000.

Keller, Wolfgang: *See—*
Barowski, Gerhard; Keller, Wolfgang; and Schroetter, Gerhard, 4,045,183, Cl. 23-273.0SP.

Kellett, William B., to Pako Corporation. Roll holder for photographic processors. 4,044,964, Cl. 242-58.000.

Kelly, Donald A. Rotary closed series cycle engine system. 4,044,559, Cl. 60-525.000.

Kelly, James G., to American Brands, Inc. Apparatus for total blend expansion. 4,044,780, Cl. 131-135.000.

Kelly, Ralph; and Ritter, Edmond Jean, to Cincinnati Milacron Inc. Skin protective compositions. 4,045,550, Cl. 424-70.000.

Kemira Oy: *See—*
Renvall, Ilkka; and Mattila, Tapio, 4,045,453, Cl. 260-347.400.

Kendall Company, The: *See—*
McWhorter, Daniel M.; and Patel, Bhupendra C., 4,044,757, Cl. 128-2.00A.
Patel, Bhupendra C., 4,044,758, Cl. 128-2.00A.

Kennametal Inc.: *See—*
Kennicott, Wilbur L., 4,044,655, Cl. 92-258.000.

Kennecott Copper Corporation: *See—*
Hsueh, Limin; Hard, Robert A.; Davidson, Donald H.; and Huff, Ray V., 4,045,084, Cl. 299-4.000.

Kennedy, Ambrose: *See—*
Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, 4,044,937, Cl. 225-97.000.

Kennedy, Leverne H.: *See—*
Heffron, Allan J.; and Kennedy, Leverne H., 4,044,638, Cl. 82-9.000.

Kennicott, Wilbur L., to Kennametal Inc. High pressure plunger and method of manufacture. 4,044,655, Cl. 92-258.000.

Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, to Schering Aktiengesellschaft. D-Homo-20-ketopregnanes. 4,045,574, Cl. 424-303.000.

Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., to Otis Engineering Corporation. Apparatus for treating wells. 4,044,827, Cl. 166-133.000.

Keske, Robert G.; and Stephens, James R., to Standard Oil Company (Indiana). Process for preparing amideimide polymers in the presence of alcoholic solvent. 4,045,407, Cl. 260-47.0CP.

Khan, Mohammed Moiz Uddin: *See—*
Jeffery, Maurice Stanley; Glynn, Paul Anthony; and Khan, Mohammed Moiz Uddin, 4,045,583, Cl. 426-241.000.

Kieger, Roger: *See—*
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.

Kiener, Heinz, to SKF Industrial Trading and Development Company, B. V. Hydraulically operated clutch release bearing. 4,044,871, Cl. 192-91.00A.

Kieslich, Klaus: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Kikubu, Kaoru: *See—*
Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, 4,044,447, Cl. 29-419.00R.

Kikuchi, Kazuo: *See—*
Takeda, Hideomi; and Kikuchi, Kazuo, 4,045,804, Cl. 354-25.000.

Kikuchi, Takehiro: *See—*
Nakano, Seizo; Oishi, Kazuaki; Kikuchi, Takehiro; and Suda, Syoetu, 4,045,634, Cl. 200-148.00B.

Kilgus, Donald C., deceased; and by Kilgus, Marjorie M., executrix. Vehicle tie-down system for rail cars. 4,044,691, Cl. 105-368.00T.

Kilgus, Marjorie M., executrix: *See—*
Kilgus, Donald C., deceased; and Kilgus, Marjorie M., executrix, 4,044,691, Cl. 105-368.00T.

Kim, Dong Wha: *See—*
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.

Kimberly-Clark Corporation: *See—*
Kaczmarzyk, Leonard M.; Hlaban, James J.; and Bernardin, Leo J., 4,044,766, Cl. 128-285.000.

Kimura, Hideyuki: *See—*
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.

Kimura, Takeshi: *See—*
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.

King, Arthur Shelley. Suspended solids extraction system and method. 4,045,326, Cl. 204-299.00R.

King, Dwayne L. Camera mounted flash extender and power pack therefor. 4,045,808, Cl. 354-126.000.

Kings Electronics Company, Inc.: *See*—
Iacono, Frederick Della, 4,045,113, Cl. 339-111.000.
Kingsley, Jack D.; and Woodbury, Henry H., to General Electric Company. Solid state radiation detector system. 4,045,675, Cl. 250-370.000.
Kinney, C. Mills, Jr., to Wire Conveyor Belts, Inc. Method and apparatus for making elongated flat wire coils. 4,044,583, Cl. 72-137.000.
Kinoshita, Yoshiaki: *See*—
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, 4,045,341, Cl. 210-45.000.
Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, to Alps Pharmaceutical Ind. Co., Ltd. Optical resolution of DL-pantolactone. 4,045,450, Cl. 260-343.600.
Kiovsky, Thomas E.; and Wald, Milton M., to Shell Oil Company. High temperature methanation with molten salt-based catalyst systems. 4,045,461, Cl. 260-449.00M.
Kirchmayr, Rudolf: *See*—
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,045,518, Cl. 260-927.00R.
Kirjanov, Alexander: *See*—
Duncan, John J.; and Kirjanov, Alexander, 4,045,172, Cl. 8-115.700.
Kirkpatrick, James William, Jr., to American Microsystems, Inc. Sense amplifier for static memory device. 4,045,785, Cl. 340-173.00R.
Kisfaludy, Lajos: *See*—
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.
Kishino, Takao; and Utamura, Yukihiko, to Futaba Denshi Kogyo K. K. Multi-digit fluorescent display tube with differently spaced planar control grid sections. 4,045,704, Cl. 313-497.000.
Kita, Kazuharu, to Senyo Kiko Kabushiki Kaisha. Monorail transport apparatus. 4,044,688, Cl. 105-30.000.
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kouzo; and Shinozaki, Nobuo, to Seiko Koki Kabushiki Kaisha. Switching mechanism for alarming time detection in an alarming device. 4,045,627, Cl. 200-37.00R.
Kitamura, Kazuhiko: *See*—
Inada, Masami; and Kitamura, Kazuhiko, 4,044,732, Cl. 123-117.00A.
Kjaergaard, Knud, to Odin Clorius A/S. Diaphragm operated pressure regulator. 4,044,792, Cl. 137-505.220.
Kleeberg, Wolfgang: *See*—
Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, 4,045,223, Cl. 96-35.100.
Klein, Alfons; and Wedemeyer, Karlfried, to Bayer Aktiengesellschaft. Process for the preparation of 1,1,3,3-substituted hydroxy indanes. 4,045,499, Cl. 260-621.00R.
Klein, Elias: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,045,352, Cl. 210-500.00M.
Klein, Gerd; and Schmoll, Kurt, to Dynamit Nobel Aktiengesellschaft. Free-flowing urea resin compositions with silane or siloxane additive added before hardening. 4,045,385, Cl. 260-15.000.
Klein, Herman C., to McDonnell Douglas Corporation. Transilluminated dial presentation. 4,044,708, Cl. 116-129.00P.
Kleiner, Hans-Jerg: *See*—
Finke, Manfred; Kleiner, Hans-Jerg; and Lohmar, Elmar, 4,045,480, Cl. 260-545.00P.
Kleinstuck, Roland, to Bayer Aktiengesellschaft. Preparation of aminoalkylsilanes. 4,045,460, Cl. 260-448.80R.
Klendauer, Wolfgang: *See*—
Hammer, Klaus-Dieter; Klendauer, Wolfgang; and Bytzek, Max, 4,045,239, Cl. 106-147.000.
Klimek, Boleslaw M., to Echlin Manufacturing Company, The. Low pressure selector. 4,045,768, Cl. 340-52.00C.
Kline, Arthur Jonathan, Jr., to Motorola, Inc. Correlation system for pseudo-random noise signals. 4,045,796, Cl. 343-6.50R.
Kline, William Mathes, to Medical Evaluation Devices and Instruments Corporation. Flexible tube for intra-venous feeding. 4,044,765, Cl. 128-214.400.
Klingenberg, Oystein F., to A. S. Skarpenord. Galvanic anode. 4,045,320, Cl. 204-197.000.
Klingler, Richard, to Holiday Rambler Corporation. Combination bunk bed and seat. 4,044,410, Cl. 5-9.00R.
Klotzer, Sieghart: *See*—
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.
Knake, Ronald W.: *See*—
Thomas, Everett A.; and Knake, Ronald W., 4,045,233, Cl. 106-57.000.
Knapp, Paul William, Jr., to American Cyanamid Company. Alkyl allophanates, method for preparation and fungicidal use of the same. 4,045,470, Cl. 260-470.000.
Knawa, Robert L.: *See*—
Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., 4,045,289, Cl. 176-87.000.
Knecht, William A.: *See*—
Marquis, Edgar E.; and Knecht, William A., 4,045,760, Cl. 337-301.000.
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, to Bayer Aktiengesellschaft. Asymmetric, semipermeable membranes of cyclic polyureas. 4,045,337, Cl. 210-23.00H.
Kniese, Wilhelm; and Nienburg, Hans Juergen, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Manufacture of aldehydes and alcohols. 4,045,492, Cl. 260-604.0HF.
Knight, Richard I.: *See*—
Smith, David H.; and Knight, Richard I., 4,045,705, Cl. 315-3.000.
Knopka, William N., to Avtex Fibers Inc. Ethylene 2,6-naphthalene dicarboxylated-alkylene-2,5 dibromoterephthalate flame-retardant copolyesters. 4,045,513, Cl. 260-860.000.
Knox Manufacturing Co.: *See*—
Brown, Donald J., 4,045,123, Cl. 350-117.000.
Knudsen, David S. Container closed by a membrane type seal. 4,044,941, Cl. 229-43.000.
Kobayashi, Fumio, to Sansui Electric Co., Inc. Loudspeaker device. 4,044,855, Cl. 181-151.000.
Kobe, Inc.: *See*—
Brown, Francis Barton; and Erickson, John W., 4,044,943, Cl. 233-19.00A.
Erickson, John W.; and Budrys, Vitolis, 4,045,145, Cl. 415-89.000.
Kobe Steel, Limited: *See*—
Iio, Katsuro; and Osato, Akiyoshi, 4,045,648, Cl. 219-137.00R.
Koch, Friedrich-Karl; and Schneiders, Hugo, to Peltzer & Ehlers. Device for controlling auxiliary means arranged in the reciprocating carriage of single or multistage presses. 4,044,619, Cl. 74-53.000.
Koch, Ulrich H.: *See*—
Matousek, Stephen; and Koch, Ulrich H., 4,044,631, Cl. 74-606.00R.
Kodaira, Heiichi. Valve means. 4,044,996, Cl. 251-229.000.
Koff, Arnold, to Hoffmann-La Roche Inc. Stable emulsions and improved temperature monitoring films prepared therefrom. 4,045,383, Cl. 260-8.000.
Kofman, Natalia Monovna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Koga, Tadao: *See*—
Igarashi, Jun; Koga, Tadao; and Ueda, Satoshi, 4,045,051, Cl. 280-644.000.
Kogure, Koji: *See*—
Urai, Muneharu; Kogure, Koji; and Haraguchi, Youichiro, 4,044,715, Cl. 118-50.000.
Kohlstette, Werner; and Pautsch, Gunthard, to Westfalia Separator AG. Self-cleaning centrifugal separator having a main piston valve defining one side of the separating chamber and connected to at least one auxiliary piston valve. 4,044,945, Cl. 233-20.00A.
Kohno, Yoshio: *See*—
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, 4,044,540, Cl. 57-153.000.
Koike, Mitsuo, to Kabushiki Kaisha Daini Seikosha. Digital liquid crystal electronic timepiece with color coded display. 4,044,546, Cl. 58-50.00R.
Koitabashi, Takeo; Akamatsu, Hideo; and Fujimori, Noboru, to Konishiroku Photo Industry Co., Ltd. Light-sensitive super-sensitized silver halide color photographic materials. 4,045,230, Cl. 96-100.00R.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, 4,045,614, Cl. 178-69.100.
Kolbly, Richard B.: *See*—
United States of America, National Aeronautics and Space Administration; and Kolbly, Richard B., 4,045,728, Cl. 324-59.000.
Kolkka, Toivo I. Rock heater for sauna. 4,044,755, Cl. 126-344.000.
Kolodziej, Alojzy Antoni, to Ronson Corporation. Method and apparatus for forming a helical cutter strip for a dry shaver assembly. 4,044,636, Cl. 76-104.00R.
Kolonia, Robert A. Splitting assembly. 4,044,808, Cl. 145-2.00R.
Komai, Hiromichi: *See*—
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.
Komai, Hiromu: *See*—
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.
Komai, Takeshi: *See*—
Matsuyama, Kazuo; and Komai, Takeshi, 4,045,463, Cl. 260-453.0RZ.
Komarov, Jury Ivanovich: *See*—
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly, 4,044,801, Cl. 139-436.000.
Komatu, Masao, to Koshi Arita. Highly electron-conductive composition. 4,045,375, Cl. 252-519.000.
Kondo, Mitsura; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, to Kanzaki Paper Manufacturing Co., Ltd. Process for preparing triarylmethane derivatives. 4,045,458, Cl. 260-393.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Koitabashi, Takeo; Akamatsu, Hideo; and Fujimori, Noboru, 4,045,230, Cl. 96-100.00R.
Konus-Kessel Gesellschaft fur Warmetechnik mbH & Co. KG: *See*—
Rychen, Niklaus; and Fuchshuber, Peter Werner, 4,044,727, Cl. 122-449.000.
Koo, Richard C. M. Electrically heated soldering device. 4,045,651, Cl. 219-227.000.

Koppel, Gary A., to Eli Lilly and Company. Preparation of cephalosporin ethers. 4,045,435, Cl. 544-28.000.
Koppers Company, Inc.: *See*—
Adams, Donald N., 4,044,630, Cl. 74-600.000.
Powell, Russell A., 4,044,612, Cl. 73-341.000.
Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, to Dart Industries Inc. Waste treatment of fluoroborate solutions. 4,045,339, Cl. 210-45.000.
Korosec, Philip S.: *See*—
Lee, Donald A.; and Korosec, Philip S., 4,045,363, Cl. 252-49.500.
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna. Antifriction self-lubricating material. 4,045,400, Cl. 260-37.00N.
Korshunov, Evgeny Alexeevich. Mill for rolling continuously cast ingot. 4,044,584, Cl. 72-214.000.
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, to Toyo Soda Manufacturing Co., Ltd. High-energy radiation induced polymerization on a chromatographic solid support. 4,045,353, Cl. 210-502.000.
Kosgegi Leather & Vinyl Products, Inc.: *See*—
Artz, Kenneth W., 4,044,933, Cl. 224-26.00R.
Koshi Arita: *See*—
Komatu, Masao, 4,045,375, Cl. 252-519.000.
Koutsky, L. John: *See*—
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., 4,045,082, Cl. 297-357.000.
Kouya, Shinichi: *See*—
Tokunou, Takashi; Kouya, Shinichi; and Akatsuka, Shigeki, 4,045,731, Cl. 324-78.00F.
Kowalski, Joseph W., to B-Line Systems, Inc. Conduit clamp. 4,044,428, Cl. 24-16.00R.
Kraftwerk Union Aktiengesellschaft: *See*—
Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, 4,044,898, Cl. 214-18.00N.
Krage, Mark K., to General Motors Corporation. Radar doppler frequency measuring apparatus. 4,045,797, Cl. 343-8.000.
Krahn, Wilhelm, to Optische Werke G. Rodenstock. Apparatus for the perimetric testing of the visual field of the human eye. 4,045,130, Cl. 351-24.000.
Krall, Hermann-Dieter; and Schwarz, Hans-Helmut, to Bayer Aktiengesellschaft. Process for preparing azomethines. 4,045,486, Cl. 260-566.00R.
Kramming, Erik, to Bengt Lundin AB. Method of storing handle bags. 4,044,890, Cl. 206-493.000.
Krasnov, Alexandr Petrovich: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Kraus, Wayne P.: *See*—
Hutson, Thomas, Jr.; and Kraus, Wayne P., 4,045,503, Cl. 260-652.50P.
Krauss-Maffei Aktiengesellschaft: *See*—
Ratheiser, Heinz, 4,045,154, Cl. 425-467.000.
Krautkramer-Branson, Incorporated: *See*—
Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., 4,044,594, Cl. 73-67.80S.
Kreiss, Joel S. Target in a bowl or urinal to attract the attention of urinating human males. 4,044,405, Cl. 4-1.000.
Krenzer, John: *See*—
Wu, Chin Ching; and Krenzer, John, 4,045,446, Cl. 260-294.80C.
Kreonite, Inc.: *See*—
Landers, Richard D., 4,045,809, Cl. 354-322.000.
Kresge, A. Norman: *See*—
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,507, Cl. 260-683.15B.
Cupples, Barrett L.; Heilman, William J.; and Kresge, A. Norman, 4,045,508, Cl. 260-683.15B.
Kressin, Wayne F.: *See*—
Peterson, Harold J.; and Kressin, Wayne F., 4,045,152, Cl. 425-419.000.
Krevenas, Paul; and Milne, David Graeme, to N L Industries, Inc. Rust resistant latex paint primer for metal surfaces. 4,045,393, Cl. 260-23.00R.
Kristenson, Kerstin Elisabeth; and Simonsson, Sven Bertil, to Aktiebolaget Electrolux. Combination dust container and latching means for a vacuum cleaner. 4,044,421, Cl. 15-339.000.
Krongauz, Evgenia Semenovna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Krueger, Kenneth Keith; and Pavlov, Todor, to Shiley Laboratories, Inc. Relief valve. 4,044,793, Cl. 137-612.100.
Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., to Krueger, Theodore H. Formation of metal parts. 4,044,816, Cl. 164-63.000.
Krug, Herbert A. Balanced bi-directional stretch knit fabric. 4,044,575, Cl. 66-192.000.
Kruger, Wilm: *See*—
Rumpp, Gerhard; Kruger, Wilm; and Scholz, Dieter, 4,044,845, Cl. 175-409.000.
Krutz, Ronald Louis: *See*—
Wolfe, Court Lone; and Krutz, Ronald Louis, 4,045,679, Cl. 250-461.00R.
Kuan, Tiong H.; and Sommer, John G., to General Tire & Rubber Company, The. Deflated tire lubricant. 4,045,362, Cl. 252-14.000.
Kuballa, Siegfried: *See*—
Vorbach, Guenther; and Kuballa, Siegfried, 4,044,453, Cl. 29-574.000.
Kubota, Yasuna, to Taimei Kinzoku Kabushiki Kaisha. Valve. 4,044,995, Cl. 251-188.000.
Kuchiba, Kensuke: *See*—
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, 4,045,374, Cl. 252-517.000.
Kugler, Florian: *See*—
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.
Kuhl, Peter J.: *See*—
Clarke, Robert Alfred; Kuhl, Peter J.; and Paschke, Richard H., 4,045,271, Cl. 156-366.000.
Kuhn, Eberhard: *See*—
Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, 4,045,223, Cl. 96-35.100.
Kuhne, Kurt Anton; and Wassilieff, Alexander, to Delta Plastics Limited. Printing machines. 4,044,665, Cl. 101-21.000.
Kulesza, Ralph J.: *See*—
Meyer, Burton C.; and Kulesza, Ralph J., 4,044,505, Cl. 51-5.00B.
Kunath, Helfrid, to U.S. Philips Corporation. Matrix printer head having a removable assembly. 4,044,878, Cl. 197-1.00R.
Kunde, Donald M.; and Lagrimanta, Frank M., to Prado Verde, Inc. Method for applying a liquid filler to lenses in glasses frames. 4,045,138, Cl. 351-178.000.
Kupcikevicius, Vytautas; and Mika, Anton LeRoy, to Union Carbide Corporation. Stuffing apparatus. 4,044,426, Cl. 17-49.000.
Kupf, Lubomir; and Mursec, Mirko, to Statni Vyzkumny Ustav Materialu. Filter assembly made of thermoplastic materials. 4,045,350, Cl. 210-232.000.
Kuramochi, Koujirou; and Ohnuma, Kiyoshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic torque converter with a lock-up clutch. 4,044,556, Cl. 60-361.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Katori, Kunihiko; Nagai, Hiroshi; and Shiiki, Zenya, 4,045,368, Cl. 252-421.000.
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, to Ono Pharmaceutical Company. 16-Cyclobutyl-prostaglandins. 4,045,468, Cl. 260-468.00D.
Kurtz, Joel. Sailboat control apparatus. 4,044,703, Cl. 114-143.000.
Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz: *See*—
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.
Kurz, Bruno F., deceased: *See*—
Butler, Walter J.; Barron, Mark B.; Kurz, Bruno F., deceased; and Kurz-Beerli, Elizabeth, executrix, also known as Elisabeth H. Kurz, 4,045,810, Cl. 357-24.000.
Kurz, Milton. Warp-knitted fabrics. 4,044,576, Cl. 66-193.000.
Kusatsu, Noriaki: *See*—
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, 4,044,540, Cl. 57-153.000.
Kusel Equipment Company: *See*—
Peterson, Harold J.; and Kressin, Wayne F., 4,045,152, Cl. 425-419.000.
Kuster, Jurgen; and Schlosser, Hermann, to Seitz-Werke GmbH. Method and apparatus for filtering. 4,045,342, Cl. 210-81.000.
Kusters, Norbert L.: *See*—
Cox, Louis G.; and Kusters, Norbert L., 4,045,734, Cl. 324-142.000.
Kusumoto, Yasuo, to Kabushiki Kaisha Daini Seikosha. Time adjusting system for an electronic timepiece. 4,044,547, Cl. 58-85.500.
Kusunose, Norio: *See*—
Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, 4,045,784, Cl. 340-173.0SP.
Kutzbach, Carl; Arens, Alfred; and Schmidt-Kastner, Gunter, to Bayer Aktiengesellschaft. Protease-free proteins, and methods of manufacturing and using the same. 4,045,552, Cl. 424-94.000.
Kwantes, Arien; Gautier, Pieter A.; and Farragher, Anthony L., to Shell Oil Company. Process for preparation of modified ion-exchange resin. 4,045,379, Cl. 260-2.20R.
Kzm "D. Blagoev": *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milehov, Assen Parvanov; Starev,

Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.

L. & C. Steinmuller G.m.b.H: *See*—
Sturmer, Horst; and Schweim, Klaus, 4,044,522, Cl. 52-599.000.

La Telemecanique Electrique: *See*—
Pierrot, Henri, 4,045,632, Cl. 200-67.0PK.

Laas, William: *See*—
Worick, Richard A., 4,044,842, Cl. 172-314.000.

LaCroce, Leonard Thomas; and Radtke, Charles Stephan, to American Can Company. Container end closure. 4,044,915, Cl. 220-270.000.

Lafleur, Roger, to Imasco Limited. Method and apparatus for packaging tubular articles. 4,044,526, Cl. 53-26.000.

Lagarde, Jean-Louis; and Gauriat, Gilles, to Compagnie Industrielle des Telecommunications CIT-ALCATEL S.A. Device for synchronizing a binary data train in relation to a reference train. 4,045,618, Cl. 179-15.0BS.

Lagrimanta, Frank M.: *See*—
Kunde, Donald M.; and Lagrimanta, Frank M., 4,045,138, Cl. 351-178.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des procedes Georges Claude: *See*—
Bruni, Maurice; and Seris, Georges, 4,045,189, Cl. 48-190.000.

Lam, Hsiao-ling; and Teach, Eugene G., to Stauffer Chemical Company. Certain formamidine dithiophosphates and phosphonates and their use as insecticides. 4,045,557, Cl. 424-200.000.

Lancy, Leslie Emery, to Dart Industries Inc. Treatment of dye wastes. 4,045,171, Cl. 8-74.000.

Landers, Richard D., to Kreonite, Inc. Photographic film developing apparatus. 4,045,809, Cl. 354-322.000.

Lange, K. Robert, to Betz Laboratories, Inc. Removal of microbiological deposits. 4,045,244, Cl. 134-22.00R.

Lange, Wolfgang; and Schafer, Werner, to Becker & Van Hullen, Niederrheinische Maschinen Fabrik. Apparatus for surface treatment of wooden panels. 4,045,274, Cl. 156-492.000.

Langenbach, Jack E.; and Hawkins, John L., to International Telephone and Telegraph Corporation. Electronic packaging assembly. 4,045,109, Cl. 339-75.00M.

Langrehr, Larry L.: *See*—
Watson, Charles J.; and Langrehr, Larry L., 4,045,136, Cl. 355-83.000.

Lapp, Otto: *See*—
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.

Larch, Gerhard: *See*—
Moebus, Bernhard; Larch, Gerhard; and Friedrich, Rudolf, 4,044,944, Cl. 233-20.00A.

Larkin, Sam. Apparatus for forming sand molds. 4,044,818, Cl. 164-172.000.

La Rovere, Angelo: *See*—
Piccolo, Luigi; Bottai, Gabriele; Paolinelli, Antonio; and La Rovere, Angelo, 4,045,205, Cl. 71-31.000.

Larsen, Donald W., to W. R. Grace & Co. Curable polyene-polythiol compounds and methods for preparation and curing. 4,045,317, Cl. 204-159.230.

Larsen, Gregory J., to FMC Corporation. Sweeper pickup hood with air lock. 4,044,422, Cl. 15-340.000.

Larsen, Ole Arvid. Combined, adjustable airing valve and fire protection valve. 4,044,785, Cl. 137-75.000.

Larsen, Robert P., to United States of America, Energy Research and Development Administration. Test chamber for alpha spectrometry. 4,045,673, Cl. 250-364.000.

La Russa, Joseph A. Wide angle optical imaging system. 4,045,116, Cl. 350-21.000.

Laser Bioapplications: *See*—
Eastgate, Harold F., 4,045,119, Cl. 350-96.0LM.

Lasher, Jordan S.: *See*—
Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., 4,045,182, Cl. 23-288.00R.

Lavanish, Jerome M.: *See*—
Sare, Edward J.; and Lavanish, Jerome M., 4,045,538, Cl. 423-240.000.

Lawrence Brothers, Inc.: *See*—
Johnson, Larry K., 4,045,065, Cl. 292-341.170.

Layher, Eberhard. Frame structure, particularly scaffolding. 4,044,523, Cl. 52-638.000.

Leach Corporation: *See*—
Schuessler, John C.; and Tapp, David J., 4,045,751, Cl. 335-201.000.

Le Bel, John Paul. Protection means for manually operated dead bolt lock. 4,044,579, Cl. 70-416.000.

Le Blanc, Lester Robert; and Middleton, Foster Hugh. Sensing thickness of a thin body disposed between two diverse surfaces. 4,044,606, Cl. 73-67.700.

Le Boeuf, Albert R.; and Grovesteen, William R., to Warner-Lambert Company. Fabrication of soft contact lens and composition therefor. 4,045,547, Cl. 424-28.000.

Le Cardonnel, Gerard; Gravez, Pierre; and Favre, Rene Marc, to Thomson-CSF. Method of monitoring a network of peripheral elements handled by an electronic control unit. 4,045,622, Cl. 179-175.20C.

Lecordier, Michel G., to Compagnie Francaise des Petroles; Etudes Petrolieres Marines; Ateliers et Chantiers de Bretagne; Compagnie Maritime D'Expertises; Compagnie Generale Pour Les Developpements Operationnels; and Entreprise de Recherches et d'Activites Petrolieres. Inflatable lip seal for pipes. 4,045,035, Cl. 277-34.300.

Lee, Donald A.; and Korosec, Philip S., to Elco Corporation, The. Invert emulsions of improved extreme pressure properties. 4,045,363, Cl. 252-49.500.

Lee, Fred S.; and Neu, William F., to Honeywell Information Systems Inc. Magnetic domain memory device having an improved drive coil arrangement. 4,045,786, Cl. 340-174.0TF.

Lee, James C. K.; and Donaher, Charles Joseph, to Advanced Memory Systems, Inc. Interconnected leadless package receptacle. 4,045,105, Cl. 339-17.0CF.

Lee, Robert W. Differential drives including flexible interconnecting drive elements. 4,044,633, Cl. 74-750.00R.

Lee, Ta-Jyh: *See*—
Smith, Robert L.; and Lee, Ta-Jyh, 4,045,558, Cl. 424-232.000.

Lee, Tzuo-Chang, to Honeywell Inc. Optics for multi-track holographic tape recorder. 4,045,115, Cl. 350-3.500.

Lee Wilson Engineering Company, Inc.: *See*—
Michels, Norman C., 4,045,160, Cl. 431-348.000.

Legan, Robert W., to Shintech Incorporated. Photochemical process for decontaminating gaseous or vaporous streams. 4,045,316, Cl. 204-158.00R.

Lehan, Frank W.: *See*—
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 4,045,814, Cl. 358-124.000.

Leigh-Monstevens, Keith Vernon: *See*—
Parsons, David; and Leigh-Monstevens, Keith Vernon, 4,044,873, Cl. 192-106.200.

Leimgruber, Willy: *See*—
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,045,487, Cl. 260-570.50C.

Leinfellner, Helmut: *See*—
Loreck, Heinz, 4,045,771, Cl. 340-146.1BA.

Leisure Manufacturing Co., Inc.: *See*—
Howard, George W., 4,045,074, Cl. 296-1.00S.

Lemaire, Roland, to Etudes et Fabrications. Process and apparatus to wind continuously thread on a succession of reels. 4,044,959, Cl. 242-25.00A.

Lemaire, Roland, to Etudes et Fabrications. Process and apparatus to wind thread on a succession of reels. 4,044,960, Cl. 242-25.00A.

Le Martret, Odile: *See*—
Clemence, Francois; and Le Martret, Odile, 4,045,567, Cl. 424-270.000.

Lemmo, Patrick V. Hedge trimmer. 4,044,979, Cl. 248-13.000.

Lemonnier, Jean-Yves; and Chatelain, Lucien, to Regie Nationale des Usines Renault; and Automobiles Peugeot. Carburettor enriching device. 4,045,521, Cl. 261-41.00R.

Le Neve, Randall Jay: *See*—
Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, 4,045,076, Cl. 296-39.00A.

Le Pecq, Jean Bernard; Paoletti, Claude; and Dat-Xuong, Nguyen, to Etablissement Public dit: Agence Nationale de Valorisation de la Recherche (ANVAR). 9-Hydroxy ellipticine. 4,045,565, Cl. 424-263.000.

Lerner, Jack. Combined camera lens cap and lens shade. 4,045,117, Cl. 350-60.000.

Leroy, Pierre; and Sprunck, Emile, to Sprunck, Emile. Blast pipe for metallurgical converters. 4,045,007, Cl. 266-268.000.

Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, to Creusot-Loire; and Societe Lorraine de Laminage Continu-Sollac. Method of injecting a powder containing carbon into a metal bath. 4,045,213, Cl. 75-48.000.

Leroy, Pierre; Morlet, Jean Georges; and Saleil, Jean, to Creusot-Loire. Method of refining mattes containing nickel. 4,045,215, Cl. 75-82.000.

Lessig, William Ralph, III, to Black and Decker Manufacturing Company, The. Two-motion switch for cordless lawnmower. 4,044,532, Cl. 56-10.500.

Lever Brothers Company: *See*—
Wieske, Theophil, 4,045,588, Cl. 426-607.000.

Lever, Ray C.; and Wilkus, Edward V., to General Electric Company. Method of compounding thermo-plastic polymeric materials and fillers. 4,045,403, Cl. 260-42.420.

Levy, Gideon N.: *See*—
Ullmann, Werner; Ferroni, Bernardo; and Levy, Gideon N., 4,045,641, Cl. 219-69.00C.

Levy, John V.; Northrup, Thomas A.; and Giggi, Robert, to Digital Equipment Corporation. Memory module with selectable byte addressing for digital data processing system. 4,045,781, Cl. 364-200.000.

Lewalter, Jurgen: *See*—
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H.

Lewicki, Lester R.; and Santacroce, James D., to Bell Helmets Inc. Helmet retention system. 4,044,400, Cl. 2-421.000.

Lewis, Frank; and Davidson, Charles Patrick Duncan, to Lucas Industries Limited. Electrically assisted cycle. 4,044,852, Cl. 180-68.500.

Lewis, John A., to Ford Motor Company. Exhaust gas recirculation valve malfunction indicator apparatus. 4,044,734, Cl. 123-119.00A.

Lewis, Leon David; Wiher, Wilfried; and Parker, Warde L., to Garrett Corporation, The. Electrohydraulic proportional actuator apparatus. 4,044,652, Cl. 91-368.000.

Leybold-Heraeus GmbH & Co. KG: *See*—
Gernot, Thorn; and Friedric-Wilhelm, Thomas, 4,045,707, Cl. 315-106.000.

Lezhnev, Vyacheslav Kapitonovich: *See*—
Serkov, Arkady Trofimovich; Budnitsky, Gennady Alfeevich; Sokolovsky, Boris Matveevich; and Lezhnev, Vyacheslav Kapitonovich, 4,045,532, Cl. 264-196.000.

Liberman, Harvey W.; and Salyers, John C., to Carrier Corporation.

Methods and apparatus for transferring refuse. 4,044,905, Cl. 214-152.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Kaiser, Reinhold, 4,045,258, Cl. 148-187.000.

Lichte, Carl Laurent, to Dresser Industries, Inc. Positioning fixture for rock bit welding. 4,045,646, Cl. 219-121.0EB.

Lidov, Arthur, to Spokeless Wheel Patent Proceeds Partnership, The. Spokeless wheel and shroud therefor. 4,045,096, Cl. 305-7.000.

Life Savers, Inc.: *See*—
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,045,581, Cl. 426-3.000.

Linder, Henry C. Method and apparatus for processing fuel into an internal combustion engine. 4,044,742, Cl. 123-122.00E.

Lindner, Horst, to Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.). Composite piston with protection of the fastening screws against corrosion by a coolant. 4,044,731, Cl. 123-90.350.

Lingle, Cleo M. Fastening means for frameless insulating panels. 4,044,511, Cl. 52-127.000.

Lingley, Richard C.; and Smith, Milburn R., to General Dynamics Corporation. Closed cradle space vehicle support and deployment system. 4,044,974, Cl. 244-161.000.

Linke-Hofmann-Busch GmbH: *See*—
Bugarcic, Helmut, 4,044,687, Cl. 105-4.00R.

Linkow, Leonard I.; and Chambliss, Joni. Symphyseal-rami edosteal implant. 4,044,467, Cl. 32-10.00A.

Litton Systems, Inc.: *See*—
Erickson, Fred William, 4,045,683, Cl. 307-157.000.
Smith, Jack Edward, 4,045,059, Cl. 285-181.000.

Litver, Semen Lvovich: *See*—
Mikhailov, Viktor Vasilievich; Litver, Semen Lvovich; and Karasev, Alexandr Konstantinovich, 4,045,533, Cl. 264-228.000.

Liu, Chao Kai: *See*—
James, Dennis Bryan; Liu, Chao Kai; and Smith, Douglas Charles, 4,045,615, Cl. 179-1.0CN.

Lochte, Glen E.: *See*—
Bowen, Burlie R.; Barrington, Claud C.; Ames, Thomas J.; and Lochte, Glen E., 4,044,749, Cl. 125-23.00R.

Lock-A-Bike, Inc.: *See*—
Horlacher, Albert F., 4,044,577, Cl. 70-234.000.

Loffler, Bernhard: *See*—
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.

Login, Robert B., to BASF Wyandotte Corporation. Method for providing polymers with durable improved properties. 4,045,510, Cl. 260-830.00P.

Loh, Jack C. Gas detector. 4,045,729, Cl. 324-71.0SN.

Loher, Alois. Shielding arrangement for a rod shaped UV radiator. 4,045,680, Cl. 250-504.000.

Lohmann, Dieter: *See*—
Foery, Werner; Fischer, Hanspeter; Lohmann, Dieter; and Greber, Gerd, 4,045,459, Cl. 260-448.80R.

Lohmar, Elmar: *See*—
Finke, Manfred; Kleiner, Hans-Jerg; and Lohmar, Elmar, 4,045,480, Cl. 260-545.00P.

Lombardi, Anthony Joseph, to Barney Knitting Machinery Co., Inc. Apparatus for sealing plastic films and the like. 4,045,272, Cl. 156-380.000.

Longstaff, Kenneth, to British Leyland UK Limited. Spark ignition engine. 4,044,747, Cl. 123-148.00E.

Loos, Theodore G. Continuous plug gauger for container openings. 4,044,892, Cl. 209-73.000.

Loose, Richard D.: *See*—
Arlauskas, Alfonsas; and Loose, Richard D., 4,045,079, Cl. 297-216.000.

L'Oreal: *See*—
Kalopissis, Gregoire; Bugaut, Andree; and Estradier, Francoise, 4,045,170, Cl. 8-11.000.

Loreck, Heinz, to Leinfellner, Helmut. Encoding and decoding device for error-detecting transmission systems, in particular for remote-control and remote-actuation equipments. 4,045,771, Cl. 340-146.1BA.

Loth, John Lodewyk. Wind energy concentrators. 4,045,144, Cl. 415-1.000.

Lova, Angelo, to Manifattura Magni Dante & C., S.p.A. Device for the mechanical insertion of cursors onto open slide fasteners, already applied on garments. 4,044,461, Cl. 29-768.000.

Loveland, Winton; and Hanemann, Horst J. Tape cutter protective guard means for carton sealing machine tape applying mechanism. 4,045,273, Cl. 156-486.000.

Lovisa, Peter R.: *See*—
Tausanovitch, Dusan; Lovisa, Peter R.; and Lovisa, Tullio E., 4,044,987, Cl. 249-219.00W.

Lovisa, Tullio E.: *See*—
Tausanovitch, Dusan; Lovisa, Peter R.; and Lovisa, Tullio E., 4,044,987, Cl. 249-219.00W.

Lucas Electrical Company Limited: *See*—
Williams, Malcolm; and Jones, Christopher Robin, 4,044,738, Cl. 123-119.00A.

Lucas Industries Limited: *See*—
Gerrard, Alan Joseph, 4,044,740, Cl. 123-122.00G.
Lewis, Frank; and Davidson, Charles Patrick Duncan, 4,044,852, Cl. 180-68.500.

Luce, Yves. Volumetric meter. 4,044,596, Cl. 73-260.000.

Lucus Industries Limited: *See*—
Shaw, Leslie Thomas; and Davidson, Charles Patrick Duncan, 4,044,851, Cl. 180-33.00C.

Ludder, Rodney E., to Maryland Cup Corporation. Long-skirted paper and plastic lid for food containers and the like. 4,044,484, Cl. 40-306.000.

Ludwig Industries: *See*—
Ludwig, William F.; and Mikosz, Daniel S., 4,045,264, Cl. 156-63.000.

Ludwig, William F.; and Mikosz, Daniel S., to Ludwig Industries. Method of manufacturing plastic shells for drums. 4,045,264, Cl. 156-63.000.

Luedders, Wilmer Louis; and Wetzel, Thomas Andrew, to Procter & Gamble Company, The. Aerosol antiperspirant containing emollients. 4,045,548, Cl. 424-47.000.

Luigi Stoppani di P Stoppani & C.: *See*—
Perrone, Diego, 4,045,340, Cl. 210-45.000.

Lukavich, Paul J.: *See*—
Eftefield, Larry G.; and Lukavich, Paul J., 4,044,481, Cl. 37-141.00T.

Lummus Company, The: *See*—
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 4,045,504, Cl. 260-669.00R.

Lundblad, Leif Jorgen Ingemar. Method of and an apparatus for collecting valuable sheet-shaped objects. 4,045,017, Cl. 271-181.000.

Lunsford, Charles L.: *See*—
Hurst, Robert E.; and Lunsford, Charles L., 4,044,563, Cl. 61-35.000.

Luria Brothers & Co., Inc.: *See*—
Burlingame, Richard D., 4,044,459, Cl. 29-614.000.

Luther, Harald Johan, to Almedahls Aktiebolag. Rotary screen mounting device. 4,044,669, Cl. 101-127.100.

Lutz, Heinz; Zimmermann, Volker; and Zuehlke, Rainer, to International Business Machines Corporation. Rotor stator assembly for a low inertia stepping motor. 4,045,696, Cl. 310-49.00R.

Luwa AG: *See*—
Ferri, Johann Walter, 4,045,194, Cl. 55-290.000.

Luz, Rudolf, to Maschinenfabrik Schweiter AG. Multiple-unit spooling machine with yarn traverse mechanism. 4,044,961, Cl. 242-35.50R.

Lyon, Garnet Rexford; and Brown, Ivan Richard, to Hardinge Brothers, Inc. Milling attachment for a lathe. 4,044,650, Cl. 90-14.000.

M&T Chemicals Inc.: *See*—
Chopdekar, Vilas M.; and Davis, William R., 4,045,494, Cl. 260-606.50P.

MacDonald, James E., to Pennsylvania Coke Technology, Inc. Smokeless non-recovery type coke oven. 4,045,299, Cl. 202-93.000.

Mack, Rollin T.: *See*—
Davis, Bernard H.; Mack, Rollin T.; and Miyasaki, Kenneth, 4,045,267, Cl. 156-197.000.

Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, to Life Savers, Inc. Long-lasting mint-flavored chewing gum. 4,045,581, Cl. 426-3.000.

Mackenzie, Harold B.; and Anderson, Ingvar G., to New Life Foundation. Multi-stage pneumatic municipal solid waste separation and recovery of a plurality of classifications. 4,044,695, Cl. 110-8.00P.

Mackie, David M., to MacMillan Bloedel Limited. Alkaline pulping of lignocellulosic material with amine and nitrate pretreatment. 4,045,280, Cl. 162-65.000.

MacLeay, Ronald E.: *See*—
Sheppard, Chester S.; and MacLeay, Ronald E., 4,045,426, Cl. 260-174.000.
Sheppard, Chester S.; and MacLeay, Ronald E., 4,045,427, Cl. 260-192.000.

Macleisure Limited: *See*—
Cox, John William Andrew, 4,045,032, Cl. 273-181.00F.

MacLeod, Donald A. Remote switch control and status indicator system. 4,045,714, Cl. 361-156.000.

MacMillan Bloedel Limited: *See*—
Mackie, David M., 4,045,280, Cl. 162-65.000.

Maddocks, Fred Sterns, to International Business Machines Corporation. Planar insulation of conductive patterns by chemical vapor deposition and sputtering. 4,045,594, Cl. 427-89.000.

Magdo, Ingrid E., to International Business Machines Corporation. Method for forming integrated circuit regions defined by recessed dielectric isolation. 4,044,454, Cl. 29-578.000.

Mages, Bernhard: *See*—
Rock, Erich; and Mages, Bernhard, 4,045,097, Cl. 308-3.800.

Magnatex Corporation: *See*—
Barron, James Elliott, 4,044,412, Cl. 5-356.000.

Magnavox Company, The: *See*—
Filliman, Paul, 4,045,748, Cl. 330-126.000.
Mierzwinski, Eugene P.; and Worley, David W., 4,045,777, Cl. 340-168.00B.
Richter, Robert Horace, 4,044,981, Cl. 248-119.00R.

Mai, Erich, to Josef Haamann, Hebe-und Transporttechnik, Firma. Rack jack. 4,045,000, Cl. 254-45.000.

Mainski, Albert: *See*—
Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Aibert, 4,045,295, Cl. 203-79.000.

Maitland, David Steven: *See*—
Eads, William Donovan; and Maitland, David Steven, 4,045,684, Cl. 307-200.00B.

Malz, Russell E., Jr.; Amidon, Roger W.; and Greenfield, Harold, to Uniroyal, Inc. Process for preparing N'-methyl acethydrazide. 4,045,484, Cl. 260-561.00H.

Mamatsashvili, Georgy Viktorovich: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia

Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Manifattura Magni Dante & C., S.p.A.: *See*—
Lova, Angelo, 4,044,461, Cl. 29-768.000.

Manska, Wayne E., to Moody, Ronald R. Device for intercepting and deflecting a moving body. 4,045,027, Cl. 273-96.00R.

Mansky, Michael Herman: *See*—
Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James, 4,045,586, Cl. 426-387.000.

Marans, Nelson Samuel; and Gluecksmann, Alfred, to W. R. Grace & Co. Flame retardant permanent press. 4,045,396, Cl. 260-29.2TN.

Marchello, John L.; and Trotter, Gerald F. Protective nose shield for race horses and the like. 4,044,531, Cl. 54-80.000.

Marchive, Daniel: *See*—
Guiraldenq, Pierre; Treheux, Daniel; and Marchive, Daniel, 4,045,596, Cl. 427-229.000.

Marcus, Erich: *See*—
Robson, John Howard; and Marcus, Erich, 4,045,416, Cl. 260-77.5CR.

Maremont Corporation: *See*—
Gray, Alden J., 4,045,718, Cl. 320-17.000.

Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Device for tilting sewing machine hooks to facilitate threading. 4,044,699, Cl. 112-200.000.

Margotte, Dieter: *See*—
Braese, Hans-Eberhard; Adelmann, Siegfried; Hardt, Dietrich; Margotte, Dieter; and Vernaleken, Hugo, 4,045,382, Cl. 260-4.00R.

Marincek, Frank M. Sewage disposal plant with evaporation/incineration means. 4,044,696, Cl. 110-9.00E.

Maringer, Albert, to Siemens Aktiengesellschaft. Circuit arrangement for evaluating the electrical output signals of a detector for thickness changes in a fuel injection line. 4,045,687, Cl. 307-358.000.

Marion Power Shovel Company, Inc.: *See*—
Baron, George B., 4,044,903, Cl. 214-138.00R.

Marker, Leon F.: *See*—
Dudek, Thomas J.; Marker, Leon F.; and Janssen, Hendrik Jan Jacob, 4,044,811, Cl. 152-354.000.

Markle, Robert Eugene, to Xerox Corporation. Self-correcting memory circuit. 4,045,779, Cl. 364-900.000.

Marotta Scientific Controls, Inc.: *See*—
Worden, Donald A.; de Versterre, William I.; and Petry, Henry Alfred, 4,044,580, Cl. 72-21.000.

Marquis, Edgar E.; and Knecht, William A., to Robertshaw Controls Company. Cut-back thermostat construction. 4,045,760, Cl. 337-301.000.

Marsch, Lawrence F.: *See*—
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,602, Cl. 73-59.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,603, Cl. 73-59.000.

Marsh, Jeanette B. Educational methods and devices. 4,044,476, Cl. 35-35.00J.

Marshall, Richard C., to Xerox Corporation. Electrical cable and coupling arrangement. 4,045,750, Cl. 333-6.000.

Martin, Blair Robertson, to International Business Machines Corporation. High speed wheel printer and method of operation. 4,044,880, Cl. 197-18.000.

Martin, Edward J.; and Minkevitch, Joseph M. Axial compression powder dispenser. 4,044,836, Cl. 169-30.000.

Martin, Graham Ernest; Cockshott, Ian Derek; and Fildes, Francis James Thomas, to Imperial Chemical Industries Limited. Fibrillar lining for prosthetic device. 4,044,404, Cl. 3-19.000.

Martin, Jay Robert, to Union Carbide Corporation. Radioactive krypton gas separation. 4,045,191, Cl. 55-179.000.

Martin, Jeffrey Forsha: *See*—
Feldstein, Joel Gary; and Martin, Jeffrey Forsha, 4,044,798, Cl. 138-90.000.

Martin, Larry D.: *See*—
Banks, William P.; and Martin, Larry D., 4,045,253, Cl. 148-6.14R.

Martin, Roger: *See*—
Gugenberger, Rene; and Martin, Roger, 4,044,825, Cl. 165-165.000.

Martini, Joseph A.: *See*—
Morin, Wilfred F.; and Martini, Joseph A., 4,044,519, Cl. 52-304.000.

Marvin Glass & Associates: *See*—
Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo, 4,045,024, Cl. 273-43.00A.
Meyer, Burton C.; and Kulesza, Ralph J., 4,044,505, Cl. 51-5.00R.
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., 4,044,660, Cl. 99-326.000.

Maryland Cup Corporation: *See*—
Ludder, Rodney E., 4,044,484, Cl. 40-306.000.

Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Method of making stretchable and compressible elongate member. 4,045,592, Cl. 427-45.000.

Masaaki, Noguchi; Yukiyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Auxiliary combustion chamber for an internal combustion engine. 4,044,730, Cl. 123-75.00B.

Masaki, Shinzaburo: *See*—
Yamada, Eiji; Fukasawa, Akira; and Masaki, Shinzaburo, 4,045,454, Cl. 260-369.000.

Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft (M.A.N.): *See*—
Lindner, Horst, 4,044,731, Cl. 123-90.350.

Maschinenfabrik Goebel GmbH: *See*—
Jakob, Hans, 4,045,012, Cl. 270-79.000.

Maschinenfabrik Schweiter AG: *See*—
Luz, Rudolf, 4,044,961, Cl. 242-35.50R.

Masuda, Kenzo, to Hitachi, Ltd. Voltage comparator circuit. 4,045,686, Cl. 307-355.000.

Masuda, Shigeyuki: *See*—
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.

Masuyama, Toshio: *See*—
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.

Mathisrud, Jon A.: *See*—
Ocel, John J.; Ocel, Donald J.; and Mathisrud, Jon A., 4,044,770, Cl. 128-304.000.

Matilainen, Waltteri. Automatic zeroing of scales with digital display. 4,044,846, Cl. 177-165.000.

Matousek, Stephen; and Koch, Ulrich H., to Whitney Research Tool Company. Rotary actuator. 4,044,631, Cl. 74-606.00R.

Matsubara, Masaki, to Olympus Optical Co., Ltd. Enlarging lens system. 4,045,127, Cl. 350-210.000.

Matsugasako, Kenji: *See*—
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, 4,044,540, Cl. 57-153.000.

Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, to Kabushiki Kaisha Toyota Chuo Kenkyusho; and Aisin Seiki Kabushiki Kaisha. Process for making a minute hole. 4,045,311, Cl. 204-129.550.

Matsui, Toshikazu: *See*—
Nakajima, Takanobu; Matsui, Toshikazu; and Aizawa, Tatsuo, 4,045,165, Cl. 432-60.000.

Matsumoto, Noboru: *See*—
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, 4,044,739, Cl. 123-119.00A.

Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Fertilizer composition. 4,045,204, Cl. 71-11.000.

Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, to Sumitomo Chemical Company, Limited; and Hayashibara Biochemical Laboratories, Inc. Resin composition of hydrophilic pullulan, hydrophobic thermoplastic resin, and plasticizer. 4,045,388, Cl. 260-17.4ST.

Matsushita Electric Industrial Co., Ltd.: *See*—
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, 4,045,791, Cl. 340-324.00M.
Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi, 4,044,611, Cl. 73-170.00A.
Miyamoto, Mamoru; and Ishikawa, Kazuo, 4,045,763, Cl. 338-23.000.
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, 4,045,374, Cl. 252-517.000.
Noma, Shinichi; and Ohshima, Nobumasa, 4,045,327, Cl. 204-299.00R.
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, 4,045,178, Cl. 23-254.00E.
Shimizu, Teruo, 4,044,545, Cl. 58-42.500.

Matsushita Electronics Corporation: *See*—
Nakatani, Hirokuni; Takamura, Toru; and Hashimoto, Susumu, 4,045,817, Cl. 358-213.000.

Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, to Nippon Kokan Kabushiki Kaisha. Method for controlling combustion in coke oven battery. 4,045,292, Cl. 201-1.000.

Matsuyama, Kazuo; and Komai, Takeshi, to Nippon Oil and Fats Co., Ltd. Peroxyesters of sorbic acid. 4,045,463, Cl. 260-453.0RZ.

Matthews, John C. Anti-ejection system for control rod drives. 4,044,622, Cl. 74-424.80R.

Matthews, Russell Byron, to Johnson Controls, Inc. Slow-opening gas valve. 4,044,794, Cl. 137-613.000.

Mattila, Tapio: *See*—
Renvall, Ilkka; and Mattila, Tapio, 4,045,453, Cl. 260-347.400.

Matveev, Georgy Vasilievich: *See*—
Kandakov, Gennady Petrovich; Matveev, Georgy Vasilievich; and Miller, Viktor Yakovlevich, 4,045,056, Cl. 285-41.000.

Matzner, Markus: *See*—
Young, Robert Hayward; and Matzner, Markus, 4,045,180, Cl. 23-260.000.

Maudal, Inge, to General Dynamics Corporation. Integrated thrust vector aerodynamic control surface. 4,044,970, Cl. 244-3.220.

Maune, Neil F., to Profile Systems, Inc. Frame concealed exteriorly opening operating sash. 4,044,503, Cl. 49-400.000.

Maurino, William J.; and Putzer, Raymond M., to Precision Flexmold, Inc. Molding apparatus including one-piece flexible mold and means to restrict the deformation of the mold. 4,045,153, Cl. 425-440.000.

Maxted, Wesley R., to Rapistan Incorporated. Conveyor sorting and orienting system. 4,044,897, Cl. 214-11.00R.

Maxwell, Clifford J., to Olin Corporation. Use of hydroquinone in polyurethane foams containing halogenated phosphate polyester additives. 4,045,378, Cl. 260-2.5AJ.

May & Baker Limited: *See*—
Caton, Michael Peter Lear; and Parker, Trevor, 4,045,467, Cl. 260-468.00D.

Maynard, Michael, to Gestetner Limited. Stencil duplicator. 4,044,670, Cl. 101-128.100.

Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, to Nippon Electric Co., Ltd. Programmable read only memory integrated circuit device. 4,045,784, Cl. 340-173.0SP.

Mazaeva, Irina Sergeevna: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Mazzetti, Flavio J. Multi-stage sampler for flowing material. 4,044,617, Cl. 73-424.000.

McCarthy, Charles J.; Charles, Steven; and Eichenbaum, Daniel M., to United States of America, Health, Education and Welfare. Chin activated switch. 4,045,630, Cl. 200-52.00R.

McCluskey, John R.; and Edwards, Ralph R. Support devices for stanchions. 4,045,003, Cl. 256-59.000.

McCollum, Robert W.: *See*—
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., 4,044,827, Cl. 166-133.000.

McCord Corporation: *See*—
Vogel, John D., 4,044,953, Cl. 239-229.000.

McDonald, Dean T.: *See*—
Williams, Michael R.; and McDonald, Dean T., 4,044,952, Cl. 239-165.000.

McDonald, Donald C.; Ela, Roger B.; and Whittaker, Francis E., to Walker Magnetics Group, Inc. Load tilting magnetic lift. 4,044,894, Cl. 214-1.0QD.

McDonnell Douglas Corporation: *See*—
Blechen, Frederick C.; and Roberts, Lloyd L., 4,044,975, Cl. 244-181.000.
Boy de la Tour, Roger, 4,045,681, Cl. 307-113.000.
Klein, Herman C., 4,044,708, Cl. 116-129.00P.
Ostroff, Harold H., 4,044,683, Cl. 102-90.000.
Rodrigue, Normand N., 4,044,790, Cl. 137-465.000.

McDowell-Wellman Engineering Co.: *See*—
Mercer, James R., 4,044,925, Cl. 222-263.000.

McGregor, Daniel P.: *See*—
McGregor, John C., Sr.; McGregor, Daniel P.; and McGregor, James B., 4,044,621, Cl. 74-243.00R.

McGregor, James B.: *See*—
McGregor, John C., Sr.; McGregor, Daniel P.; and McGregor, James B., 4,044,621, Cl. 74-243.00R.

McGregor, John C., Sr.; McGregor, Daniel P.; and McGregor, James B. Sprocket structure and chain guard. 4,044,621, Cl. 74-243.00R.

McGuirk, Francis A., Jr.: *See*—
Atkins, Carl E.; and McGuirk, Francis A., Jr., 4,045,778, Cl. 340-171.0PF.

McKenzie, Roland W., to City Tank Corporation. Valve assembly. 4,044,791, Cl. 137-493.900.

McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., to Hayes International Corporation. Rear section of jet power plant installations. 4,044,555, Cl. 60-264.000.

McNally, Frank X., to CSE Corporation. Apparatus for detecting combustible gases. 4,045,177, Cl. 23-254.00E.

McNaughton, James L.: *See*—
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,044,939, Cl. 228-176.000.

McNellis, Terrence J.: *See*—
Fischer, Larry J.; and McNellis, Terrence J., 4,044,521, Cl. 52-404.000.

McNichols, Larry A., to Medtronic, Inc. Implantable receiver circuit. 4,044,775, Cl. 128-421.000.

McQueen, Raymond R., Jr.; and Buerki, Christian E., to Norris Industries Inc. Stay-hot control for microwave oven. 4,045,640, Cl. 219-10.55B.

McVeigh, James H., to Xerox Corporation. Method for electrostatically producing a color accented photocopy. 4,045,218, Cl. 96-1.200.

McWhorter, Daniel M.; and Patel, Bhupendra C., to Kendall Company, The. Cholangiography device and method. 4,044,757, Cl. 128-2.00A.

"Meci" Materiel Electrique de Controle et Industriel: *See*—
Renet, Claude, 4,045,300, Cl. 204-1.00T.

Medical Evaluation Devices and Instruments Corporation: *See*—
Kline, William Mathes, 4,044,765, Cl. 128-214.400.

Medtronic, Inc.: *See*—
Corbin, Terry; and Zytkovicz, Duane J., 4,044,774, Cl. 128-404.000.
McNichols, Larry A., 4,044,775, Cl. 128-421.000.

Meehan, David H.; and Tzakis, George J., to Zenith Radio Corporation. High voltage shutdown circuit responsive to excessive beam current and high voltage. 4,045,742, Cl. 328-9.000.

Meier, Gerald H.: *See*—
Worick, Richard A., 4,044,842, Cl. 172-314.000.

Meier, Werner: *See*—
Cassal, Jean-Marie; Furst, Andor; and Meier, Werner, 4,045,490, Cl. 260-590.0FA.

Meminger, Fritz; Hunger, Klaus; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Water-soluble reactive naphthylazonaphthyl dyestuffs. 4,045,428, Cl. 260-198.000.

Meisel, Nicolas, to Food Processing Systems Corporation. Continuous microwave and vacuum dryer. 4,045,639, Cl. 219-10.55A.

Melin, Arthur Kelso: *See*—
Gillespie, Richard Lee; and Melin, Arthur Kelso, 4,045,026, Cl. 273-96.00R.

Melke, George A., to Jervis B. Webb Company. Driverless vehicle and guidance system. 4,044,853, Cl. 180-98.000.

Meng, Karl: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.

Mengler, Helmut, to Hoechst Aktiengesellschaft. 3-[3',4'-Dichloro-6'-alkyl-phenyl]-Δ 2-pyrazoline derivatives and their use as optical brighteners. 4,045,169, Cl. 8-1.00W.

Menon, Sukumaran K.; and Hattler, Louis R., to Xerox Corporation. Heated fuser release agent container. 4,045,163, Cl. 432-59.000.

Mercer, David L., to International Nickel Company, Inc., The. Carbonylation process. 4,045,541, Cl. 423-417.000.

Mercer, James R., to McDowell-Wellman Engineering Co. Screw feeder for injection molding machine. 4,044,925, Cl. 222-263.000.

Merchill, Geoffrey Leonard, to Hindes Limited. Grooming and dispensing brush head. 4,044,724, Cl. 119-83.000.

Merck & Co., Inc.: *See*—
Smith, Robert L.; and Lee, Ta-Jyh, 4,045,558, Cl. 424-232.000.

Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, to BASF Aktiengesellschaft. Manufacture of anthraquinones. 4,045,456, Cl. 260-369.000.

Mesek, Frederick K.; and Repke, Virginia L., to Johnson & Johnson. Diaper with split puff bonded facing. 4,044,768, Cl. 128-287.000.

Meserole, Robert Henry, to Johns-Manville Corporation. Thin-walled metal duct having integral reinforced ends for joining and method and apparatus for its manufacture. 4,044,581, Cl. 72-68.000.

Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag: *See*—
Rahmstorf, Dietmar, 4,044,498, Cl. 46-116.000.

Metal Box Limited: *See*—
Beveridge, John, 4,044,916, Cl. 220-270.000.

Metallurgie Hoboken-Overpelt: *See*—
Wens, Karel; Tobback, Hubert; and Hens, Karel, 4,045,301, Cl. 204-12.000.

Meyer, Burton C.; and Kulesza, Ralph J., to Marvin Glass & Associates. Etching device for glass or other etchable surfaces. 4,044,505, Cl. 51-5.00R.

Meyer, Elizabeth Jane, executrix: *See*—
Meyer, Harry W., deceased; Baker, Jerry D.; and Ceckler, William H., 4,045,216, Cl. 75-84.000.

Meyer, Harry W., deceased (by Meyer, Elizabeth Jane, executrix); Baker, Jerry D.; and Ceckler, William H., to Amax Inc. Direct reduction of molybdenum oxide to substantially metallic molybdenum. 4,045,216, Cl. 75-84.000.

Meyer, Raymond J.: *See*—
Remaley, Edward G.; Baker, Robert W.; and Meyer, Raymond J., 4,045,599, Cl. 427-333.000.

Micheletti, Arrigo, to Billi, S.p.A. Method of closing the toe opening of a knit stocking or the like. 4,044,574, Cl. 66-187.000.

Michels, Norman C., to Lee Wilson Engineering Company, Inc. Flat-flame gas burner. 4,045,160, Cl. 431-348.000.

Michelson, Gunnar P., to NCR Corporation. Document deskewing apparatus. 4,045,018, Cl. 271-251.000.

Micro Consultants, Limited: *See*—
Walker, Ian Clive, 4,045,613, Cl. 178-69.100.

Middleton, Foster Hugh: *See*—
Le Blanc, Lester Robert; and Middleton, Foster Hugh, 4,044,606, Cl. 73-67.700.

Midland-Ross Corporation: *See*—
Amsler, David C.; and Wagner, William E., 4,044,909, Cl. 220-3.800.
Dann, Daryl L., 4,045,631, Cl. 200-61.430.
Dauberger, George R., 4,044,908, Cl. 220-3.800.

Mierzwinski, Eugene P.; and Worley, David W., to Magnavox Company, The. Remote control transmitter and receiver for use with a television receiver. 4,045,777, Cl. 340-168.00B.

Miesen, Ernest: *See*—
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.

Mihailovski, Alexander; and Chan, Jimmy H., to Stauffer Chemical Company. Process for preparing N-carbamoyl ethyl oxanilates. 4,045,471, Cl. 260-471.00A.

Mihara, Kazuo: *See*—
Ishii, Masaichi; and Mihara, Kazuo, 4,044,418, Cl. 15-104.06A.

Mika, Anton LeRoy: *See*—
Kupcikevicius, Vytautas; and Mika, Anton LeRoy, 4,044,426, Cl. 17-49.000.

Mikhailov, Viktor Vasilievich; Litver, Semen Lvovich; and Karasev, Alexandr Konstantinovich. Method of manufacturing prestressed reinforced concrete articles. 4,045,533, Cl. 264-228.000.

Mikosz, Daniel S.: *See*—
Ludwig, William F.; and Mikosz, Daniel S., 4,045,264, Cl. 156-63.000.

Milenov, Assen Parvanov: *See*—
Haralampiev, Georgi Alexandrov; Girdjev, Georgi Petrov; Cheyka, Lyudmila Karlo; Milenov, Assen Parvanov; Starev, Lyuben Rangelov; Abrashev, Georgi Ivanov; and Grigorov, Ivaylo Yanev, 4,045,184, Cl. 23-283.000.

Milford-Astor Limited: *See*—
Hudson, William Ronald, 4,044,676, Cl. 101-297.000.

Miller, Barry, to Bell Telephone Laboratories, Incorporated. Rotating asymmetric electrode for measuring characteristics of electrochemical cells. 4,045,725, Cl. 324-30.00B.

Miller, Charles G.: *See—*
United States of America, National Aeronautics and Space Administration; and Miller, Charles G., 4,044,821, Cl. 165-2.000.
Miller, Errol S. Multi-purpose load winch. 4,045,002, Cl. 254-164.000.
Miller, Gerald R. Saucer boat. 4,044,704, Cl. 115-12.00R.
Miller, Howard I. Pet collar. 4,044,725, Cl. 119-106.000.
Miller, Jeanette Mary; and Miller, Robert Eric, to Miller, Victoria Alice; and Miller, Timothy Robert, part interest to each. Supports for cameras. 4,044,982, Cl. 248-183.000.
Miller, John J.: *See—*
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., 4,045,517, Cl. 260-901.000.
Miller, John W. V., to Owens-Illinois, Inc. Matrix discharge logic display system. 4,045,790, Cl. 340-324.00M.
Miller, Robert Eric: *See—*
Miller, Jeanette Mary; and Miller, Robert Eric, 4,044,982, Cl. 248-183.000.
Miller, Timothy Robert: *See—*
Miller, Jeanette Mary; and Miller, Robert Eric, 4,044,982, Cl. 248-183.000.
Miller, Victoria Alice: *See—*
Miller, Jeanette Mary; and Miller, Robert Eric, 4,044,982, Cl. 248-183.000.
Miller, Viktor Yakovlevich: *See—*
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Miller, William Albert: *See—*
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Milliken Research Corporation: *See—*
Henson, Jimmy B., 4,045,598, Cl. 427-296.000.
Riddle, Dennis L., 4,044,716, Cl. 118-50.000.
Mills, Maurice T.: *See—*
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,044,806, Cl. 144-309.0AC.
Mills, Robert Samuel: *See—*
Cruthis, Robert Duane; and Mills, Robert Samuel, 4,044,692, Cl. 105-368.00R.
Milne, David Graeme: *See—*
Krevenas, Paul; and Milne, David Graeme, 4,045,393, Cl. 260-23.00R.
Milzner, Karlheinz: *See—*
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Minkevitch, Joseph M.: *See—*
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Minkowski, Jan M.: *See—*
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Minnesota Mining and Manufacturing Company: *See—*
Fong, Jaan-Jiue; and Hsu, Grace F., 4,045,305, Cl. 204-50.00R.
Minolta Camera Kabushiki Kaisha: *See—*
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, 4,045,135, Cl. 355-11.000.
Saito, Mitsuru, 4,045,805, Cl. 354-25.000.
Missale, John V. Scanning receiver for use in a tour guide system. 4,045,741, Cl. 325-470.000.
Mita Industrial Co., Ltd.: *See—*
Nakajima, Takanobu; Matsui, Toshikazu; and Aizawa, Tatsuo, 4,045,165, Cl. 432-60.000.
Mitchard, John M., to Union Camp Corporation. Apparatus for folding panels of carton blank. 4,044,658, Cl. 93-49.00R.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Nishi, Atsuyoshi; and Yashiro, Katuo, 4,045,159, Cl. 431-328.000.
Mitsubishi Heavy Industries, Ltd.: *See—*
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Deguchi, Akio, 4,045,254, Cl. 148-12.00R.
Mitsubishi Precision Company, Ltd.: *See—*
Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, 4,044,475, Cl. 35-6.000.
Mitsubishi Rayon Co., Ltd.: *See—*
Kato, Tetsuji, 4,044,639, Cl. 83-7.000.
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Mitsumori, Nobuo; Takeda, Chikahiro; and Miyasako, Hideichi, to Nippon Shinyaku Company, Limited. Method of treating silver impregnated activated carbon. 4,045,553, Cl. 424-132.000.
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas control valve. 4,044,739, Cl. 123-119.00A.
Miyake, Makoto: *See—*
Kondo, Mitsura; Yasui, Kiyoshi; Miyake, Makoto; Iwasaki, Hiroshi; and Shiraishi, Tetsuo, 4,045,458, Cl. 260-393.000.
Miyamatsu, Tokuhisa: *See—*
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, to Mitsubishi Rayon Co., Ltd.; and Mitsubishi Heavy Industries, Ltd. Method of removing scale-forming substances from hot water system. 4,045,338, Cl. 210-36.000.
Miyamoto, Mamoru; and Ishikawa, Kazuo, to Matsushita Electric Industrial Co., Ltd. Sealed thermostatic heater. 4,045,763, Cl. 338-23.000.
Miyao, Saisei: *See—*
Nagano, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko, 4,045,279, Cl. 162-25.000.
Miyasaki, Kenneth: *See—*
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Mlavsky, Abraham I.; and Winston, Roland, to Mobil Tyco Solar Energy Corporation. Solar cells with concentrators. 4,045,246, Cl. 136-89.0PC.
Moba Holding Barneveld B.V.: *See—*
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Mobil Oil Corporation: *See—*
Ireland, Henry R.; Peters, Alan W.; and Stein, Thomas R., 4,045,505, Cl. 260-673.000.
Olson, Robert H., 4,044,919, Cl. 221-63.000.
Mobil Tyco Solar Energy Corporation: *See—*
Mlavsky, Abraham I.; and Winston, Roland, 4,045,246, Cl. 136-89.0PC.
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Moebus, Bernhard; Larch, Gerhard; and Friedrich, Rudolf, to Fa. Moebus KG. Centrifuge. 4,044,944, Cl. 233-20.00A.
Moeller, Guido. Internal combustion engine. 4,044,728, Cl. 123-18.00A.
Moeller & Neumann GmbH: *See—*
Buchheit, Otto K., 4,044,585, Cl. 72-201.000.
Moench, Jerry Dale, to Motorola, Inc. Digital to analog converter. 4,045,793, Cl. 340-347.0DA.
Moertel, George B., to Textron Inc. Slide fastener and method and apparatus of manufacture. 4,044,431, Cl. 24-205.13C.
Moisar, Erik: *See—*
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.
Mold, Donald F.; and Rice, Ronald G., to Owens-Illinois, Inc. Method of making a recuperator structure by crystallization. 4,045,199, Cl. 65-33.000.
Molins Limited: *See—*
Preston, Edward George; and Rakowicz, Jan Antoni, 4,044,779, Cl. 131-21.00R.
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, to Polysius AG. Rotary kiln having a planetary row of cooler tubes. 4,045,161, Cl. 432-80.000.
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, to Bayer Aktiengesellschaft. Pyrazol-5-ones. 4,045,571, Cl. 424-273.00P.
Molon Motor & Coil Corporation: *See—*
Folik, Joseph C., 4,045,697, Cl. 310-89.000.
Momiyama, Kikuo, to Canon Kabushiki Kaisha. Telephoto objective. 4,045,128, Cl. 350-216.000.
Monarch Marking Systems, Inc.: *See—*
Hamisch, Paul H., Jr., 4,044,677, Cl. 101-348.000.
Mongeau, Roland E., to Tower Manufacturing Corporation. Electrical switch assembly having two-part housing with cover part consisting of plural flanges, internal rotation limit stop and external bushing. 4,045,637, Cl. 200-303.000.
Monks, Harry, to Coal Industry (Patents) Limited. Longwall mining machine with haulage motor sensed pressure controlled rail brake. 4,045,083, Cl. 299-1.000.
Monogram Industries, Inc.: *See—*
Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., 4,045,314, Cl. 204-151.000.
Monotype Corporation Limited, The: *See—*
Baylis, Howard Raymond; and Edwards, Roger Alan, 4,045,803, Cl. 354-5.000.
Monsanto Company: *See—*
Burd, John W.; Stone, Bobbie D.; Tucker, William F.; and Gupta, Kedar P., 4,045,181, Cl. 23-273.00R.
Convent, Bernard, 4,045,206, Cl. 71-90.000.
Convent, Bernard, 4,045,207, Cl. 71-92.000.
Convent, Bernard, 4,045,210, Cl. 71-120.000.
Dahms, Ronald H., 4,045,398, Cl. 260-29.300.
Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., 4,045,297, Cl. 195-103.50R.
Wyman, Charles E.; and Holstead, Robert D., 4,045,354, Cl. 210-523.000.
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., to Marvin Glass & Associates. Automatic toaster. 4,044,660, Cl. 99-326.000.
Moody, Ronald R.: *See—*
Manska, Wayne E., 4,045,027, Cl. 273-96.00R.
Moody Si Ltd.: *See—*
Guerette, Marcel, 4,044,857, Cl. 182-17.000.
Moore, Kenneth C. Corn kernel cutter. 4,044,776, Cl. 130-9.00D.
Moore, Robert J.; and Curtis, Gerald B. Control of roofing procedure. 4,045,263, Cl. 156-64.000.
Moorehead, James R., to Boeing Company, The. Nacelle assembly and mounting structures for a turbofan jet propulsion engine. 4,044,973, Cl. 244-54.000.
Morais, Don, to General Electric Company. Discharge lamp operating circuit. 4,045,709, Cl. 315-205.000.

Moran, Henry W.: *See—*
Welstead, William J., Jr.; and Moran, Henry W., 4,045,576, Cl. 424-309.000.
Morawetz, Ernst; and Glas, Lars-Olof. Heat storage system. 4,044,949, Cl. 237-1.00A.
Morgan, Charles R., to W. R. Grace & Co. Solid curable polyene compositions containing a polythiol. 4,045,516, Cl. 260-886.000.
Mori, Takaro: *See—*
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, 4,045,621, Cl. 179-100.4ST.
Mori, Yasamasu; Ashiuchi, Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, to Tokyo Shibaura Electric Co., Ltd. Flat envelope type fluorescent character indicating tube with getter shield plate. 4,045,703, Cl. 313-497.000.
Morikawa, Atsuko: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.
Morimatsul, Hideharu: *See—*
Iida, Masajiro; Morimatsul, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,045,766, Cl. 340-1.00R.
Morin, Bernard. Turbine. 4,045,148, Cl. 416-84.000.
Morin, Wilfred F.; and Martini, Joseph A. Insulated double glass window assembly. 4,044,519, Cl. 52-304.000.
Moriyama, Shigeo; and Kawamura, Yoshio, to Hitachi, Ltd. Photoelectric microscope. 4,045,141, Cl. 356-156.000.
Morizane, Fukuichi: *See—*
Iwahashi, Shunji; Morizane, Fukuichi; and Kato, Yasuyuki, 4,045,514, Cl. 260-873.000.
Morlet, Jean Georges: *See—*
Leroy, Pierre; Morlet, Jean Georges; and Saleil, Jean, 4,045,215, Cl. 75-82.000.
Morokawa, Shigeru; and Sekiya, Fukuo. Solid state binary logic signal source for electronic timepiece or the like. 4,045,692, Cl. 307-279.000.
Morrill, Wayne J. Small air gap motor. 4,045,698, Cl. 310-166.000.
Morris, James F., to United States of America, National Aeronautics and Space Administration. Thermocouples of tantalum and rhenium alloys for more stable vacuum-high temperature performance. 4,045,247, Cl. 136-240.000.
Morrison, Guy E., to Skei Corporation. Modem sharer. 4,045,774, Cl. 340-147.0LP.
Morrison, Howard J.: *See—*
Montague, Douglas P.; Brand, Derek A.; and Morrison, Howard J., 4,044,660, Cl. 99-326.000.
Morrison, William Craig, to Glacier Metal Company Limited, The. Bearings. 4,044,441, Cl. 29-149.50R.
Mort, Charles F.: *See—*
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,044,939, Cl. 228-176.000.
Morton, William G. Safety helmet with individualized head-contoured inter-liner. 4,044,399, Cl. 2-414.000.
Mosch, Alfred. Warning device. 4,044,482, Cl. 40-129.00C.
Moser, Rabin, to Xerox Corporation. Use of silicone oil as a polyethylene oxidation retardant in a toner image fusing apparatus. 4,045,164, Cl. 432-60.000.
Moss, Paul B.; and Watson, Gilbert L., to Moss, Paul B. Holder for carbon arc electrodes. 4,045,649, Cl. 219-143.000.
Mosterd, Jacob Hendrik, to Moba Holding Barneveld B.V. Device for displacing an egg-tray. 4,045,073, Cl. 294-87.00A.
Motoren- und Turbinen-Union Friedrichshafen GmbH: *See—*
Gros, Hermann, 4,044,869, Cl. 192-48.910.
Motorola, Inc.: *See—*
Coleman, Michael G.; and Pryor, Robert A., 4,045,245, Cl. 136-89.00C.
Kline, Arthur Jonathan, Jr., 4,045,796, Cl. 343-6.50R.
Moench, Jerry Dale, 4,045,793, Cl. 340-347.0DA.
Mott, James D., to Hydril Company. Subsurface well apparatus having improved operator means and method for using same. 4,044,835, Cl. 166-322.000.
Moutou, Paul Cyril, to Thomson-CSF. Method of manufacturing a semiconductor structure for microwave operation, including a very thin insulating or weakly doped layer. 4,045,252, Cl. 148-1.500.
Mueller, Armand G., to Square D Company. Segmented expansion absorber for lifting magnet. 4,045,756, Cl. 335-292.000.
Mueller, Richard A., to G. D. Searle & Co. 1-(Substituted amino)alkanoyl-2-(dibenzoxazepine-10-carbonyl)hydrazines and derivatives thereof. 4,045,442, Cl. 260-293.580.
Muhle, Herbert; Milzner, Karlheinz; and Reisser, Fritz, to Sandoz Ltd. Pesticidal pyrimidinyl phosphorus esters. 4,045,561, Cl. 424-251.000.
Muhlich, Albert: *See—*
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,045,198, Cl. 65-33.000.
Muller, Jean-Claude: *See—*
Leroy, Pierre; Bastien, Jean; Muller, Jean-Claude; and Kieger, Roger, 4,045,213, Cl. 75-48.000.
Multi-Elmac Company: *See—*
Umpleby, Kenneth F.; and Brackney, Maurice R., 4,045,715, Cl. 318-16.000.
Munk, Miner N.: *See—*
Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.
Muntz, Eric P.: *See—*
Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., 4,044,718, Cl. 118-647.000.
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, to Yamanouchi Pharmaceutical Co. Ltd. 4-(3-Isopropylamino-2-hydroxypropoxy indene. 4,045,482, Cl. 260-570.700.
Murakawa, Kyohei: *See—*
Yamada, Seiichi; and Murakawa, Kyohei, 4,045,412, Cl. 264-63.000.
Muramatsu, Yukihiko: *See—*
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, 4,044,739, Cl. 123-119.00A.
Muraoka, Teruo: *See—*
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, 4,045,621, Cl. 179-100.4ST.
Murari, Bruno: *See—*
Cini, Carlo; Murari, Bruno; and Santi, Mario, 4,045,745, Cl. 330-15.000.
Murase, Kiyoshi: *See—*
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.
Murata, Atsunobu: *See—*
Matsui, Masao; Murata, Atsunobu; Isii, Masami; and Komai, Hiromu, 4,045,311, Cl. 204-129.550.
Murrmann, Helmuth: *See—*
Graul, Juergen; and Murrmann, Helmuth, 4,045,251, Cl. 148-1.500.
Mursec, Mirko: *See—*
Kupf, Lubomir; and Mursec, Mirko, 4,045,350, Cl. 210-232.000.
Muryobayashi, Takashi: *See—*
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, 4,045,468, Cl. 260-468.00D.
Mussulman, Charles E. Piano. 4,044,644, Cl. 84-207.000.
N L Industries, Inc.: *See—*
Krevenas, Paul; and Milne, David Graeme, 4,045,393, Cl. 260-23.00R.
Thomas, Everett A.; and Knake, Ronald W., 4,045,233, Cl. 106-57.000.
N. V. Weefautomaten Picanol: *See—*
Steverlynck, Patrick A., 4,044,802, Cl. 139-449.000.
Nadkarni, Anil V.: *See—*
Shafer, William M.; and Nadkarni, Anil V., 4,045,644, Cl. 219-119.000.
Nafziger, Joel L. Animal waste treatment system. 4,045,522, Cl. 261-93.000.
Nagahara, Yasumori: *See—*
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.
Nagai, Hiroshi: *See—*
Katori, Kunihiko; Nagai, Hiroshi; and Shiiki, Zenya, 4,045,368, Cl. 252-421.000.
Nagakita, Shigeo: *See—*
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.
Nagano, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko to Toyo Pulp Co., Ltd. Process for the manufacture of pulp using sodium carbonate and oxygen. 4,045,279, Cl. 162-25.000.
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, to Matsushita Electric Industrial Co., Ltd. Zinc oxide voltage-nonlinear resistor. 4,045,374, Cl. 252-517.000.
Nagata, Seiichi: *See—*
Fukai, Masakazu; Nagata, Seiichi; Asai, Komei; and Hattori, Katsuji, 4,045,791, Cl. 340-324.00M.
Nakada, Katsuo, to Yoshida Kogyo Kabushiki Kaisha. Sash window with weathertight sealing means. 4,044,504, Cl. 49-425.000.
Nakai, Hisao: *See—*
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, 4,045,468, Cl. 260-468.00D.
Nakajima, Masaya: *See—*
Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi, 4,044,611, Cl. 73-170.00A.
Nakajima, Takanobu; Matsui, Toshikazu; and Aizawa, Tatsuo, to Mita Industrial Co., Ltd. Contact heat fixing device. 4,045,165, Cl. 432-60.000.
Nakajima, Yosiharu, to Okuma Machinery Works Ltd. Cam mechanism for circular knitting machine. 4,044,573, Cl. 66-57.000.
Nakamoto, Soichi: *See—*
Ito, Fumio; Ito, Tadashi; Isobe, Yasuo; and Nakamoto, Soichi, 4,045,807, Cl. 354-38.000.
Nakamura, Koichi: *See—*
Shimamura, Isao; and Nakamura, Koichi, 4,045,225, Cl. 96-60.00R.
Nakane, Hisashi: *See—*
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, 4,045,231, Cl. 96-115.00P.
Nakano, Seizo; Oishi, Kazuaki; Kikuchi, Takehiro; and Suda, Syoetu, to Hitachi, Ltd. Gas insulated switch-gear apparatus. 4,045,634, Cl. 200-148.00B.
Nakao, Hideyuki: *See—*
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.
Nakatani, Hirokuni; Takamura, Toru; and Hashimoto, Susumu, to Matsushita Electronics Corporation. Semiconductor optical image sensing device. 4,045,817, Cl. 358-213.000.

Nakatani, Seiichi: *See*—
Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, 4,045,178, Cl. 23-254.00E.

Nakayama, Wataru: *See*—
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.

Nalco Chemical Company: *See*—
Dolan, Jerome J.; and Rosenberger, Roy R., 4,045,733, Cl. 324-140.00R.

Namioka, Hisao: *See*—
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.

Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, to Abbott Laboratories. Antibiotic XK-62-2 and process for production thereof. 4,045,298, Cl. 195-80.00R.

Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, to Abbott Laboratories. Antibiotics designated XK-88 series. 4,045,610, Cl. 536-17.000.

Narita, Hitoshi: *See*—
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.

Naryshkin, Jury Anatolievich: *See*—
Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich, 4,045,006, Cl. 266-149.000.

National Machinery Co., The: *See*—
Haines, Allan D., 4,044,588, Cl. 72-337.000.

National Presto Industries, Inc.: *See*—
Soper, LaVern G.; and Dressel, Brent W., 4,045,653, Cl. 219-438.000.

National Research Development Corporation: *See*—
Edwards, Nigel, 4,044,402, Cl. 3-1.300.

National Semiconductor Corporation: *See*—
Bernardi, Carl E., 4,045,321, Cl. 204-202.000.
Tietz, Gary W., 4,045,689, Cl. 307-254.000.

Natsui, Yoshinobu: *See*—
Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, 4,045,784, Cl. 340-173.0SP.

Nausedas, Joseph Anthony, to Union Carbide Corporation. Product stuffing apparatus and method. 4,044,425, Cl. 17-35.000.

Nazarenko, Nicholas; and Seidel, William Carl, to Du Pont de Nemours, E. I., and Company. Process for the preparation of triarylboranes. 4,045,495, Cl. 260-606.50B.

NCR Corporation: *See*—
Horst, William R.; McNaughton, James L.; and Mort, Charles F., 4,044,939, Cl. 228-176.000.
Michelson, Gunnar P., 4,045,018, Cl. 271-251.000.

Neal, Wayne R., to General Electric Company. Discharge lamp ballast circuit. 4,045,708, Cl. 315-171.000.

Neal, Wayne R., to General Electric Company. Discharge lamp operating circuit. 4,045,710, Cl. 315-205.000.

Nebzydoski, John W.: *See*—
Rubin, Isaac D.; and Nebzydoski, John W., 4,045,376, Cl. 252-56.00S.

Neetz, Michael A.: *See*—
Wieder, Rodney L.; Neetz, Michael A.; and Sell, Earl O., 4,045,067, Cl. 294-15.000.

Negishi, Eizaburo; and Negishi, Masanori, to Kabushiki Kaisha Negishi Kobyo Kenkyusho. Spinning method and apparatus therefor. 4,044,537, Cl. 57-58.890.

Negishi, Masanori: *See*—
Negishi, Eizaburo; and Negishi, Masanori, 4,044,537, Cl. 57-58.890.

Negoro, Sentaro: *See*—
Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, 4,044,495, Cl. 43-121.000.

Neill, William M.: *See*—
Burt, George A., Jr.; and Neill, William M., 4,044,641, Cl. 83-341.000.

Nekola, Todd B.: *See*—
Strickland, James K.; Capps, Frank R.; Nekola, Todd B.; and Fremer, William A., 4,044,986, Cl. 249-216.000.

Nelson, Eldrid W.: *See*—
Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., 4,044,594, Cl. 73-67.80S.

Nelson, James Irwin. Ball pick-up, storage, and individual delivery device. 4,045,068, Cl. 294-19.00A.

Nelson, Robert E.; and Pieper, Keith A., to General Motors Corporation. Stagnation sensing control. 4,044,551, Cl. 60-39.140.

Nestler, Gerhard: *See*—
Merger, Franz; Jacobsen, Theodor; Eilingsfeld, Heinz; Miesen, Ernest; and Nestler, Gerhard, 4,045,456, Cl. 260-369.000.

Nestor, Charles R., to General Motors Corporation. Jumper touch sensor current switching device. 4,045,650, Cl. 200-153.00K.

Neu, William F.: *See*—
Lee, Fred S.; and Neu, William F., 4,045,786, Cl. 340-174.0TF.

New England Business Service, Inc.: *See*—
Rowbottam, Francis W., 4,044,548, Cl. 58-125.00C.

New Life Foundation: *See*—
Mackenzie, Harold B.; and Anderson, Ingvar G., 4,044,695, Cl. 110-8.00P.

New Process Industries, Inc.: *See*—
Benson, Glendon M., 4,044,558, Cl. 60-520.600.

NHK Spring Co., Ltd.: *See*—
Ueno, Kiyoshi, 4,045,081, Cl. 297-317.000.

Nichols, Dwight E., to Hoover Ball and Bearing Company. Lined container for storing and transporting thick viscous substances such as grease having anti-clogging liner support. 4,044,912, Cl. 220-63.00R.

Nichols, Willard A.: *See*—
Bhutani, Sudhir K.; and Nichols, Willard A., 4,045,502, Cl. 260-651.00F.

Nickol, Stephen L., to Suntech, Inc. Minimum energy process for preparing block copolymers of polyamides. 4,045,511, Cl. 260-857.0TW.

Nickol, Stephen L.: *See*—
Thompson, Robert M.; and Nickol, Stephen L., 4,045,512, Cl. 260-857.0TW.

Nicks, Robert W.: *See*—
Grant, Geoffrey F.; and Nicks, Robert W., 4,045,022, Cl. 273-29.00R.

Niemann, Helmut: *See*—
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.

Nienburg, Hans Juergen: *See*—
Kniese, Wilhelm; and Nienburg, Hans Juergen, 4,045,492, Cl. 260-604.0HF.

Nihon Denshi Kabushiki Kaisha: *See*—
Watanabe, Eiji, 4,045,672, Cl. 250-360.000.

Niigata, Kunihiro: *See*—
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.

Nilsson, Bo Nils: *See*—
Oldaeus, Karl Olof; Tordenmalm, Osten Lars; and Nilsson, Bo Nils, 4,044,610, Cl. 73-133.00R.

Nippon Carbon Co., Ltd.: *See*—
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.

Nippon Concrete Industries Co., Ltd.: *See*—
Gokyu, Isao, 4,044,640, Cl. 83-42.000.

Nippon Electric Co., Ltd.: *See*—
Mayumi, Hiroshi; Natsui, Yoshinobu; and Kusunose, Norio, 4,045,784, Cl. 340-173.0SP.

Nippon Kogaku, K.K.: *See*—
Iida, Yozo, 4,045,132, Cl. 352-91.00C.
Watanabe, Sakuji, 4,045,142, Cl. 356-223.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Matsushita, Taro; Hiraki, Masahiro; Fujimura, Takeo; and Hasebe, Shinji, 4,045,292, Cl. 201-1.000.

Nippon Oil and Fats Co., Ltd.: *See*—
Matsuyama, Kazuo; and Komai, Takeshi, 4,045,463, Cl. 260-453.0RZ.

Nippon Seisen, Co., Ltd.: *See*—
Hamada, Koichi; Kikubu, Kaoru; and Itoh, Tsunehiro, 4,044,447, Cl. 29-419.00R.

Nippon Shinyaku Company, Limited: *See*—
Mitsumori, Nobuo; Takeda, Chikahiro; and Miyasako, Hideichi, 4,045,553, Cl. 424-132.000.

Nippondenso Co., Ltd.: *See*—
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, 4,044,739, Cl. 123-119.00A.

Nirschl, Joseph P.: *See*—
Watt, David M., Jr.; and Nirschl, Joseph P., 4,045,361, Cl. 252-8.800.

Nishi, Atsuyoshi; and Yashiro, Katuo, to Mitsubishi Denki Kabushiki Kaisha. Combustion apparatus. 4,045,159, Cl. 431-328.000.

Nishi, Kunio: *See*—
Nagasawa, Masahiro; Wakahata, Yasuo; Kuchiba, Kensuke; Nishi, Kunio; and Abe, Hiroshi, 4,045,374, Cl. 252-517.000.

Nishida, Isamu: *See*—
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.

Nishihara, Motohisa; and Ito, Tetsuo, to Hitachi, Ltd. Method of ultrasonic data communication and apparatus for carrying out the method. 4,045,767, Cl. 340-5.00R.

Nishimura, Akira; Akamatsu, Hiroshi; Negoro, Sentaro; and Yoshida, Yasutoshi, to Earth Chemical Company, Limited. Device for capturing cockroaches. 4,044,495, Cl. 43-121.000.

Nishimura, Satomu, to Toyota Jidosha Kogyo Kabushiki Kaisha. Exhaust gas control valve. 4,044,737, Cl. 123-119.00A.

Nissan Denshi Kabushikigaisha: *See*—
Kawasaki, Kazuo, 4,045,739, Cl. 325-15.000.

Nissan Motor Company, Limited: *See*—
Okada, Yasumasa, 4,045,064, Cl. 292-125.000.

Nissei Plastics Industrial Co., Ltd.: *See*—
Aoki, Katashi, 4,044,653, Cl. 91-392.000.

Nissen Corporation: *See*—
Nissen, George P., 4,045,021, Cl. 272-65.000.

Nissen, George P., to Nissen Corporation. Trampoline apparatus for use in connection with tumbling and the like. 4,045,021, Cl. 272-65.000.

Nittetu Chemical Engineering Ltd.: *See*—
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, 4,045,341, Cl. 210-45.000.

Nobles, Elon J., to Econo-Therm Energy Systems Corporation. Method and apparatus for preheating combustion air while cooling a hot process gas. 4,044,820, Cl. 165-2.000.

Noma, Shinichi; and Ohshima, Nobumasa, to Matsushita Electric Industrial Co., Ltd. Electrophoretic matrix panel. 4,045,327, Cl. 204-299.00R.

Norris Industries Inc.: *See*—
McQueen, Raymond R., Jr.; and Buerki, Christian E., 4,045,640, Cl. 219-10.55B.

Norsk Hydro a.s: *See*—
Andersen, Jens Arvid, 4,045,309, Cl. 204-67.000.

Northrup, Thomas A.: *See*—
Levy, John V.; Northrup, Thomas A.; and Giggi, Robert, 4,045,781, Cl. 364-200.000.

Norwood, Orin Wyatt: *See*—
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.

Novikov, Jury Petrovich: *See*—
Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich, 4,045,006, Cl. 266-149.000.

Noyes, Richard Croissant; Dupen, Clive Frederick George; Barrus, Donald Martin; and Siegel, Edward Arnold, to Combustion Engineering, Inc. Control rod and/or instrument tree assembly. 4,045,283, Cl. 176-35.000.

Obayashi, Hidehito: *See*—
Sakurai, Yo; Obayashi, Hidehito; and Gejyo, Tetsuo, 4,044,601, Cl. 73-23.000.

Obenshain, David Noel, to Westvaco Corporation. Hollow core chucking device. 4,045,038, Cl. 279-2.00R.

Obersby, Derek; and Allen, Thomas Kenneth, to James A. Jobling & Company Limited. Glass tube cutting. 4,044,936, Cl. 225-2.000.

O'Brien, John: *See*—
Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,044,816, Cl. 164-63.000.

Occidental Oil Shale, Inc.: *See*—
Garrett, Donald E., 4,045,085, Cl. 299-2.000.

Ocel, Donald J.: *See*—
Ocel, John J.; Ocel, Donald J.; and Mathisrud, Jon A., 4,044,770, Cl. 128-304.000.

Ocel, John J.; Ocel, Donald J.; and Mathisrud, Jon A., to Ocelco, Inc. Ear curette. 4,044,770, Cl. 128-304.000.

Ocelco, Inc.: *See*—
Ocel, John J.; Ocel, Donald J.; and Mathisrud, Jon A., 4,044,770, Cl. 128-304.000.

Odin Clorius A/S: *See*—
Kjaergaard, Knud, 4,044,792, Cl. 137-505.220.

Offermanns, Heribert: *See*—
Asinger, Friedrich; Offermanns, Heribert; and Gulzek, Karl-Heinz, 4,045,479, Cl. 260-534.00S.

Ogawa & Co., Ltd.: *See*—
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,045,551, Cl. 424-76.000.

Ogawa, Syouzou: *See*—
Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, 4,044,570, Cl. 62-419.000.

Ogihara, Masuo: *See*—
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kouzo; and Shinozaki, Nobuo, 4,045,627, Cl. 200-37.00R.

Ohara, Nobuo: *See*—
Ikehata, Yukio; Ohara, Nobuo; Kawanishi, Yasuhiro; Masuda, Shigeyuki; Nishida, Isamu; and Nakao, Hideyuki, 4,044,543, Cl. 58-23.00R.

Ohdan, Kyoji: *See*—
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Adachi, Fumio, 4,045,478, Cl. 260-530.00N.

Ohmori, Hitoshi, to Rank Xerox Ltd. Developing apparatus in electrocopying machines. 4,044,719, Cl. 118-652.000.

Ohmura, Ryuichi, to Fuji Kogyo Co., Ltd. Rod chucking handle for a fishing rod. 4,044,488, Cl. 43-23.000.

Ohnuma, Kiyoshi: *See*—
Kuramochi, Koujirou; and Ohnuma, Kiyoshi, 4,044,556, Cl. 60-361.000.

Ohorodnik, Alexander: *See*—
Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, 4,045,295, Cl. 203-79.000.

Ohshima, Nobumasa: *See*—
Noma, Shinichi; and Ohshima, Nobumasa, 4,045,327, Cl. 204-299.00R.

Ohta, Jun, to Toyota Jidosha Kogyo Kabushiki Kaisha. Alarm indicating system. 4,045,794, Cl. 340-414.000.

Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, to Victor Company of Japan, Ltd. Recording system for a multichannel record disc. 4,045,621, Cl. 179-100.4ST.

Oishi, Kazuaki: *See*—
Nakano, Seizo; Oishi, Kazuaki; Kikuchi, Takehiro; and Suda, Syoetu, 4,045,634, Cl. 200-148.00B.

Oka, Mitsunori: *See*—
Kadota, Shozo; Fujimoto, Yoshiji; Yasuda, Michio; and Oka, Mitsunori, 4,045,773, Cl. 340-146.3SG.

Okachi, Ryo: *See*—
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

Okada, Osamu: *See*—
Doi, Yasuhiko; Yamamoto, Shunji; Okada, Osamu; Hikosaka, Takashi; and Hayashi, Masamichi, 4,045,135, Cl. 355-11.000.

Okada, Yasumasa, to Nissan Motor Company, Limited. Latch mechanism. 4,045,064, Cl. 292-125.000.

Okinaka, Hideyuki; Iga, Atsushi; Ayusawa, Masatake; Yamaguchi, Masatugu; Nakatani, Seiichi; and Yagami, Toshiaki, to Matsushita Electric Industrial Co., Ltd. Reducing gas sensor. 4,045,178, Cl. 23-254.00E.

Okuda, Toshio: *See*—
Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, 4,045,450, Cl. 260-343.600.

Okuma Machinery Works Ltd.: *See*—
Nakajima, Yosiharu, 4,044,573, Cl. 66-57.000.

Oldaeus, Karl Olof; Tordenmalm, Osten Lars; and Nilsson, Bo Nils, to Akermans Verkstad AB. Excavators. 4,044,610, Cl. 73-133.00R.

Olin Corporation: *See*—
Bhutani, Sudhir K.; and Nichols, Willard A., 4,045,502, Cl. 260-651.00F.
Blakely, Stephen W., 4,045,055, Cl. 285-33.000.
Bridendall, Philip R., Jr., 4,045,322, Cl. 204-263.000.
Maxwell, Clifford J., 4,045,378, Cl. 260-2.5AJ.

Oliver, Lary Hester: *See*—
Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, 4,045,076, Cl. 296-39.00A.

Oliver, Robert: *See*—
Waimsley, Robert Edwin; Oliver, Robert; and Fisher, Norman Ernest, 4,044,589, Cl. 72-341.000.

Olsen, Emil M. Spring retainer for electric plugs. 4,045,108, Cl. 339-75.00P.

Olson, Robert H., to Mobil Oil Corporation. Thermoplastic bag dispensing assembly. 4,044,919, Cl. 221-63.000.

Olympus Optical Co., Ltd.: *See*—
Matsubara, Masaki, 4,045,127, Cl. 350-210.000.

Omita S.p.A.: *See*—
Germani, Cesare, 4,044,800, Cl. 139-341.000.

O'Neal, Larry. Venting valve for inflatable dock seals. 4,044,510, Cl. 52-2.000.

Ono, Minoru; Fukuchi, Sakae; Ogawa, Syouzou; Ishikawa, Fumio; and Nagakita, Shigeo, to Hitachi, Ltd. Refrigerator. 4,044,570, Cl. 62-419.000.

Ono Pharmaceutical Company: *See*—
Kurono, Masayasu; Nakai, Hisao; and Muryobayashi, Takashi, 4,045,468, Cl. 260-468.00D.

Onsager, Olav T.; and Szecsi, Peter L., to Halcon International, Inc. Preparation of ethylene glycol. 4,045,500, Cl. 260-635.00H.

Opletal, Josef, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen. Apparatus for orienting a flat workpiece. 4,044,884, Cl. 198-415.000.

Optische Werke G. Rodenstock: *See*—
Krahn, Wilhelm, 4,045,130, Cl. 351-24.000.

O'Rear, Jacques G.: *See*—
Griffith, James R.; and O'Rear, Jacques G., 4,045,408, Cl. 260-47.0EA.

Orentreich, Seymour; and Vogelman, Joseph. Cosmetic container including integrated lens structure. 4,044,889, Cl. 206-459.000.

Original Equipment Motors: *See*—
Holper, Frank, 4,045,626, Cl. 200-30.00R.

Orlov, Gennady Ivanovich: *See*—
Cherednichenko, Vladimir Semenovich; Belsky, Valentin Innokentievich; Orlov, Gennady Ivanovich; Naryshkin, Jury Anatolievich; and Novikov, Jury Petrovich, 4,045,006, Cl. 266-149.000.

Ortec Incorporated: *See*—
Rolle, Rainer, 4,045,676, Cl. 250-272.000.

Ortiz, Erlinda P.: *See*—
Petrowski, Gary E.; Wolcott, John M.; and Ortiz, Erlinda P., 4,045,589, Cl. 426-609.000.

Osato, Akiyoshi: *See*—
Ito, Katsuro; and Osato, Akiyoshi, 4,045,648, Cl. 219-137.00R.

Ostroff, Harold H., to McDonnell Douglas Corporation. Heat generator. 4,044,683, Cl. 102-90.000.

Otis Engineering Corporation: *See*—
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., 4,044,827, Cl. 166-133.000.

Otomegawa, Eiichi: *See*—
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, 4,045,231, Cl. 96-115.00P.

Ottmar, Peter H.: *See*—
Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., 4,044,754, Cl. 126-271.000.

Outboard Marine Corporation: *See*—
Wick, Gerald H., 4,044,533, Cl. 56-11.300.

Overpeck, Max E.: *See*—
Pope, James W.; and Overpeck, Max E., 4,045,039, Cl. 279-123.000.

Owens-Corning Fiberglas Corporation: *See*—
Marzocchi, Alfred, 4,045,592, Cl. 427-45.000.

Owens-Illinois, Inc.: *See*—
Miller, John W. V., 4,045,790, Cl. 340-324.00M.
Mold, Donald F.; and Rice, Ronald G., 4,045,199, Cl. 65-33.000.
Salisbury, Charles W., 4,045,200, Cl. 65-42.000.

Owens, William T.; Davidson, Albin A.; and Nelson, Eldrid W., to Krautkramer-Branson, Incorporated. Ultrasonic track testing carriage. 4,044,594, Cl. 73-67.80S.

Oy Wiik & Hoglund Ab: *See*—
Jofs, Jar-Erik, 4,045,270, Cl. 156-229.000.

Pacer Systems, Inc.: *See—*
Green, David L., 4,044,709, Cl. 116-129.00F.

Pagano, Victor H.; and Tasdemiroglu, Server, to United States of America, Army. Laminated armor-piercing projectile. 4,044,679, Cl. 102-52.000.

Paggen, Marvin Vernon: *See—*
Warthen, John Lawrence; Briggs, Warren Stanley; and Paggen, Marvin Vernon, 4,045,372, Cl. 252-463.000.

Pako Corporation: *See—*
Kellett, William B., 4,044,964, Cl. 242-58.000.

Palenschat, Dieter: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Palosi, Eva: *See—*
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.

Paoletti, Claude: *See—*
Le Pecq, Jean Bernard; Paoletti, Claude; and Dat-Xuong, Nguyen, 4,045,565, Cl. 424-263.000.

Paolinelli, Antonio: *See—*
Piccolo, Luigi; Bottai, Gabriele; Paolinelli, Antonio; and La Rovere, Angelo, 4,045,205, Cl. 71-31.000.

Paolino, Vincent J. Golf equipment storage device. 4,045,103, Cl. 312-198.000.

Papajohn, Elissa D. Panty with sanitary napkin holder. 4,044,769, Cl. 128-288.000.

Paraskos, John A.: *See—*
Bonnell, William S.; Christman, Robert D.; Lasher, Jordan S.; Paraskos, John A.; and Yanik, Stephen J., 4,045,182, Cl. 23-288.00R.

Pardoe, John Alan: *See—*
Green, Derek; Pardoe, John Alan; and Etherington, Clifford, 4,044,587, Cl. 72-261.000.

Parker, Trevor: *See—*
Caton, Michael Peter Lear; and Parker, Trevor, 4,045,467, Cl. 260-468.00D.

Parker, Warde L.: *See—*
Lewis, Leon David; Wiher, Wilfried; and Parker, Warde L., 4,044,652, Cl. 91-368.000.

Parkes, David M.; and Hart, Thomas Brian, to Kaiser Resources Ltd. Pumpable product hydraulic mining apparatus and method. 4,045,086, Cl. 299-17.000.

Parkinson, Dean Burton. Printing ink compositions for jet printing on glazed ceramic surfaces. 4,045,397, Cl. 260-29.300.

Parkinson, Harold B., to Topar Products Corporation. Printing ink composition. 4,045,232, Cl. 106-28.000.

Parsons, David; and Leigh-Monstevens, Keith Vernon, to Automotive Products Company Ltd. Driven plates for friction clutches. 4,044,873, Cl. 192-106.200.

Partin, Melvin E.: *See—*
Bouton, John C.; Partin, Melvin E.; and Hilghman, Robert C., 4,045,772, Cl. 340-146.30B.

Parton, Kenneth Charles, to Reyrolle Parsons Limited. Current limiting devices for alternating current systems. 4,045,823, Cl. 361-58.000.

Paschelke, Gert: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Paschke, Richard H.: *See—*
Clarke, Robert Alfred; Kuhl, Peter J.; and Paschke, Richard H., 4,045,271, Cl. 156-366.000.

Pasqualini, Ugo; and Russo, Giovanni. Device especially for endoosseous implantation. 4,044,466, Cl. 32-10.00A.

Passerini, Pier Enrico: *See—*
Segale, Luigi; and Passerini, Pier Enrico, 4,044,524, Cl. 53-22.00A.

Patchornik, Abraham: *See—*
Haviv, Fortuna; and Patchornik, Abraham, 4,045,438, Cl. 544-29.000.

Patel, Bhupendra C., to Kendall Company, The. Cholangiography device and method. 4,044,758, Cl. 128-2.00A.

Patel, Bhupendra C.: *See—*
McWhorter, Daniel M.; and Patel, Bhupendra C., 4,044,757, Cl. 128-2.00A.

Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H.: *See—*
Reiber, Hans, 4,045,530, Cl. 264-92.000.

Patrick, John H., to Flex-O-Lators, Inc. Casket suspension. 4,044,436, Cl. 27-12.000.

Pattyn, Herman Alberik: *See—*
Vanassche, Willy Joseph; Pattyn, Herman Alberik; Lapp, Otto; Klotzer, Sieghart; and Moisar, Erik, 4,045,228, Cl. 96-64.000.

Paulet, Jean: *See—*
Tardy, Maurice; and Paulet, Jean, 4,044,795, Cl. 137-625.600.

Pautsch, Gunthard: *See—*
Kohlstette, Werner; and Pautsch, Gunthard, 4,044,945, Cl. 233-20.00A.

Pavlov, Todor: *See—*
Krueger, Kenneth Keith; and Pavlov, Todor, 4,044,793, Cl. 137-612.100.

Pawletko, Joseph Paul: *See—*
Chai, Hi Dong; and Pawletko, Joseph Paul, 4,044,881, Cl. 197-82.000.

Payne, Bobby L., to Rodco, Inc. Method of treating sucker rod. 4,045,591, Cl. 427-37.000.

Peake, Cecil Vowe. Mining apparatus. 4,045,087, Cl. 299-31.000.

Pearce, Daniel S., to GTE Sylvania Incorporated. Continuous DC control circuit. 4,045,775, Cl. 340-147.00R.

Pearlman, Alan R.; and Colin, Dennis P., to ARP Instruments, Inc. Touch sensitive polyphonic musical instrument. 4,044,642, Cl. 84-1.100.

Pearson, Raymond H. Deodorizing accessary for water closets. 4,044,408, Cl. 4-213.000.

Pearson, Stephen C., to Hercules Incorporated. Cationic polymer prepared from dicyandiamide, a polyamide, a dialkylamine, and an epoxide. 4,045,377, Cl. 260-2.0BP.

Pechiney Ugine Kuhlmann: *See—*
Blum, Jacques Marcel; Grenon, Michel; and Ventre, Edmond, 4,045,286, Cl. 176-49.000.

Pedain, Josef: *See—*
Bock, Manfred; Uerdingen, Walter; and Pedain, Josef, 4,045,462, Cl. 260-453.0AP.

Pees, James M., to General Motors Corporation. Energy absorbing unit with improved control valve. 4,045,009, Cl. 267-139.000.

Peltola, Veikko K.; and Duros, James M., to Alnor Instrument Co. Digitized linearizing correction apparatus with frequency modulation. 4,045,658, Cl. 235-151.300.

Peltzer & Ehlers: *See—*
Koch, Friedrich-Karl; and Schneiders, Hugo, 4,044,619, Cl. 74-53.000.

Penick, Walter L., Jr.: *See—*
Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., 4,045,314, Cl. 204-151.000.

Penland, Jerry Lee: *See—*
Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, 4,045,339, Cl. 210-45.000.

Penn Fishing Tackle Mfg. Co.: *See—*
Henze, Walter J.; and Thein, San, 4,044,489, Cl. 43-27.400.

Pennsylvania Coke Technology, Inc.: *See—*
MacDonald, James E., 4,045,299, Cl. 202-93.000.

Pennwalt Corporation: *See—*
Sheppard, Chester S.; and MacLeay, Ronald E., 4,045,426, Cl. 260-174.000.
Sheppard, Chester S.; and MacLeay, Ronald E., 4,045,427, Cl. 260-192.000.

Pennzoil Company: *See—*
Sardisco, John B., 4,045,543, Cl. 423-482.000.

Perkins, Lee E. Apparatus and method for controlling the flow of fluids from a well bore. 4,044,834, Cl. 166-314.000.

Perrone, Diego, to Luigi Stoppani di P Stoppani & C. Method for recovering and exploiting waste of the chromic anhydride production. 4,045,340, Cl. 210-45.000.

Perrotta, Anthony J.: *See—*
Innes, Robert A.; and Perrotta, Anthony J., 4,045,373, Cl. 252-469.000.

Peter Smith Associates (Carpet Importers) Limited: *See—*
Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, 4,045,605, Cl. 428-88.000.

Peters, Alan W.: *See—*
Ireland, Henry R.; Peters, Alan W.; and Stein, Thomas R., 4,045,505, Cl. 260-673.000.

Peters, Frederick E. Tennis racquet and ball carrier for bicycles. 4,044,934, Cl. 224-36.000.

Peters Machinery Company: *See—*
Rose, Edward; and Roth, Robert A., 4,044,885, Cl. 198-419.000.

Peterson, Carl M. Sink strainer device. 4,045,351, Cl. 210-238.000.

Peterson, Carl W., to International Telephone and Telegraph Corporation. Electrical termination device and method. 4,045,111, Cl. 339-97.00R.

Peterson, Clinton B. Cabinet structure and method of construction. 4,045,104, Cl. 312-257.00R.

Peterson, Harold J.; and Kressin, Wayne F., to Kusel Equipment Company. Apparatus for making cheese. 4,045,152, Cl. 425-419.000.

Peterson, Jerald G. Transportable folding crib. 4,044,411, Cl. 5-99.00A.

Peterson, Oscar Fredrick Allan. Yardage counter attachment for golf carts and the like. 4,044,471, Cl. 33-141.00R.

Peterson, Reuben E., to Jenoff, Incorporated. Mounting bracket for a heat detector switch. 4,045,761, Cl. 337-372.000.

Peterson, Robert J., to American Can Company. Silencer device for industrial burners. 4,045,157, Cl. 431-114.000.

Petro-Tex Chemical Corporation: *See—*
Cares, William Ronald, 4,045,370, Cl. 252-458.000.

Petroski, Daniel J. Hand gun holster. 4,044,930, Cl. 224-2.00C.

Petrowski, Gary E.; Wolcott, John M.; and Ortiz, Erlinda P., to Carnation Company. Fat emulsion product and process for producing the same. 4,045,589, Cl. 426-609.000.

Petry, Henry Alfred: *See—*
Worden, Donald A.; de Versterre, William I.; and Petry, Henry Alfred, 4,044,580, Cl. 72-21.000.

Petzoldt, Karl: *See—*
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.

Pfaffli, Paul, to Sandoz Ltd. Organic compounds. 4,045,443, Cl. 260-293.530.

Pfizer Inc.: *See—*
Barth, Wayne E., 4,045,436, Cl. 544-23.000.
Barth, Wayne E., 4,045,437, Cl. 544-17.000.
Hess, Hans-Jurgen E.; and Schaaf, Thomas K., 4,045,465, Cl. 260-464.000.
Sarges, Reinhard, 4,045,488, Cl. 260-576.000.

Phan, Chi Quy, to Thomson-Brandt. Method of making refrigerating units and the like and product thereof. 4,044,449, Cl. 29-460.000.

Pharmacia Aktiebolag: *See—*
Agback, Karl Hubert, 4,045,429, Cl. 260-207.000.

Pharris, Jack W., to Walcott, Ruth, a part interest. High speed, long range turbo-jet aircraft. 4,044,971, Cl. 244-7.00R.

Phelps Dodge Corporation: *See—*
Powers, Richard Mather, 4,045,211, Cl. 75-21.000.

Phillips, Bobby M.; and Gregory, Dale R., to Eastman Kodak Company. Process for making producer-colored fibers, yarns, films and related products. 4,045,529, Cl. 264-75.000.

Phillips, David E., to Simplimatic Engineering Co. Apparatus for guiding and cushioning a plurality of articles as they move into a container. 4,044,530, Cl. 53-248.000.

Phillips Petroleum Company: *See—*
Hitzman, Donald O., 4,044,500, Cl. 47-1.400.
Hutson, Thomas, Jr.; and Kraus, Wayne P., 4,045,503, Cl. 260-652.50P.
Volz, Herbert A., 4,044,833, Cl. 166-307.000.

Piccolo, Luigi; Bottai, Gabriele; Paolinelli, Antonio; and La Rovere, Angelo, to Societa Italiana Resine S.I.R. S.p.A. Method for the manufacture of soil modifiers from waste material of the manufacture of titanium dioxide. 4,045,205, Cl. 71-31.000.

Pieper, Keith A.: *See—*
Nelson, Robert E.; and Pieper, Keith A., 4,044,551, Cl. 60-39.140.

Pierrot, Henri, to La Telemecanique Electrique. Quick make and break switch. 4,045,632, Cl. 200-67.0PK.

Piesik, Edward T., to General Dynamics Corporation. Rocket exhaust plenum flow control apparatus. 4,044,648, Cl. 89-1.800.

Pilling, Arnold V.: *See—*
McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., 4,044,555, Cl. 60-264.000.

Pioneer Electronic Corporation: *See—*
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,045,695, Cl. 310-322.000.
Yashiro, Kenji; and Saeki, Yoshifumi, 4,045,732, Cl. 324-133.000.

Pippert, Aaron J., to Utex Industries, Inc. Packing. 4,045,037, Cl. 277-205.000.

Pitel, Ira Jay, to GTE Sylvania Incorporated. Tuned oscillator ballast circuit. 4,045,711, Cl. 315-209.00R.

Pitney-Bowes, Inc.: *See—*
Wu, Bosco, 4,044,847, Cl. 177-210.00R.

Pitt, Gillies D.; and Black, Philip W., to International Telephone and Telegraph Corporation. Method and apparatus for immiscible liquids measurement. 4,045,668, Cl. 250-227.000.

Pittet, Alan O.: *See—*
Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, 4,045,587, Cl. 426-533.000.
Schreiber, William L.; and Pittet, Alan O., 4,045,497, Cl. 260-615.00A.

Plasticos Mel S.A.: *See—*
Guerrico Echevarria, Nicolas, 4,044,809, Cl. 151-19.00R.

Plepys, Raymond A., to Dow Chemical Company, The. Carboxylated diphenylether-formaldehyde copolymer resins and their preparation. 4,045,410, Cl. 260-52.000.

Pless, William C.: *See—*
Goldstein, David; Pless, William C.; Shapiro, Michael; Spencer, Dana; and Starr, Leland E., Jr., 4,044,599, Cl. 73-12.000.

Poeth, Dean F.: *See—*
Trumbull, Harold E.; and Poeth, Dean F., 4,044,904, Cl. 214-152.000.

Polaroid Corporation: *See—*
Ellin, Seymour; and Sharp, John R., 4,045,806, Cl. 354-37.000.

Poliniak, Eugene Samuel: *See—*
Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, 4,045,318, Cl. 204-192.00E.

Pollack, Joel M.; and Flannery, John B., to Xerox Corporation. Bistable deflection system. 4,045,124, Cl. 350-160.0LC.

Polysius AG: *See—*
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.

Pontarella, Armand. Tendon shield and method of making the same. 4,044,760, Cl. 128-82.000.

Poorbaugh, Charles R.; and Rhoads, Gerald A. Phase reversal protection system. 4,045,682, Cl. 307-127.000.

Pope, James W.; and Overpeck, Max E., to Wallace Murray Corporation. Adjustable clamping jaw for chucks. 4,045,039, Cl. 279-123.000.

Porner, Horst: *See—*
Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, 4,044,898, Cl. 214-18.00N.

Porter, George: *See—*
Boyd, Dennis; and Porter, George, 4,044,777, Cl. 131-2.000.

Portland Wire & Iron Works: *See—*
Day, Lloyd Franklin, Sr.; Buxton, Jarvis Cathralle; Oliver, Lary Hester; and Le Neve, Randall Jay, 4,045,076, Cl. 296-39.00A.

Posey, Donald L. Multi-function measuring instrument. 4,044,469, Cl. 33-102.000.

Posso, Patrick P., to Societe Anonyme dite: GEFITEC S.A. Magnetic tape reel for computer. 4,044,965, Cl. 242-71.800.

Potter, John Thomas. Fish lure. 4,044,491, Cl. 43-42.220.

Pousche, Walter: *See—*
Fleisch, William F.; and Pousche, Walter, 4,045,090, Cl. 297-440.000.

Powderley, John, to USM Corporation. Blind rivet and improved method of blind riveting. 4,044,591, Cl. 72-391.000.

Powell, B. J.: *See—*
Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., 4,044,806, Cl. 144-309.0AC.

Powell, James LeRoy: *See—*
Eisner, Steve; and Powell, James LeRoy, 4,045,356, Cl. 225-2.000.

Powell, Russell A., to Koppers Company, Inc. Probe for obtaining gas samples from a shaft furnace. 4,045,612, Cl. 73-341.000.

Powers, Richard Mather, to Phelps Dodge Corporation. Method for increasing radiant heat transfer from hot gases. 4,045,211, Cl. 75-21.000.

PPG Industries, Inc.: *See—*
Bhardwaj, Mahesh C.; and Englert, William J., 4,045,203, Cl. 65-182.00R.
Brodmann, George L.; and Schlatter, Carl Nelson, 4,045,601, Cl. 427-381.000.
Cunningham, Hugh, 4,045,324, Cl. 204-268.000.
Drummond, Warren W., 4,045,195, Cl. 65-2.000.
Sare, Edward J.; and Lavanish, Jerome M., 4,045,538, Cl. 423-240.000.
Schaefer, William L., 4,045,196, Cl. 65-2.000.
Tsai, Yih-Wan; Sensi, John E.; and Henry, Vincent I., 4,045,197, Cl. 65-27.000.
Wallace, John F., 4,045,536, Cl. 264-327.000.

Prado Verde, Inc.: *See—*
Kunde, Donald M.; and Lagrimanta, Frank M., 4,045,138, Cl. 351-178.000.

Pragnell, Robert James: *See—*
Blunt, Geoffrey Vincent Dallow; Hodges, Newton John; and Pragnell, Robert James, 4,045,380, Cl. 260-2.5HA.

Precision Flexmold, Inc.: *See—*
Maurino, William J.; and Putzer, Raymond M., 4,045,153, Cl. 425-440.000.

Preformed Line Products Co.: *See—*
Williams, Harrison L.; and Banhidy, Detre M., 4,045,665, Cl. 240-51.11R.

Preisenhammer, Peter, to Saurer-Allma GmbH Allgauer Maschinenbau. Toggle-lever power amplifier. 4,044,623, Cl. 74-520.000.

Preston, Edward George; and Rakowicz, Jan Antoni, to Molins Limited. Manufacture of filter-tipped cigarettes. 4,044,779, Cl. 131-21.00R.

Preston, John; and Reeve, Austin John, to Imperial Chemical Industries Limited. 6-Substituted-4-hydroxycinnolin-3-yl carboxylic acids and esters thereof. 4,045,439, Cl. 260-250.00C.

Preuss, Arnfried, to Howaldtswerke-Deutsche Werft Aktiengesellschaft Hamburg und Kiel. Direct reading temperature measuring bridge circuit. 4,044,613, Cl. 73-362.0AR.

Prichard, Daniel R.: *See—*
Stoessel, Herman V.; and Prichard, Daniel R., 4,044,557, Cl. 60-420.000.

Priese, Werner K., to Hills-McCanna Company. Pressure loaded sealing arrangement. 4,044,994, Cl. 251-172.000.

Prince, Luther T., Jr., to Ault Incorporated. Method of making a power-pack assembly. 4,044,458, Cl. 29-605.000.

Princeton Biomedix Incorporated: *See—*
Bulbenko, George F.; and Woodbridge, Joseph Eliot, 4,045,290, Cl. 195-99.000.

Printronix, Inc.: *See—*
Barrus, Gordon Brent; and Emenaker, Leo Joseph, 4,044,668, Cl. 101-93.040.

Procter & Gamble Company, The: *See—*
Adrion, David Martin; and Hartsough, Lloyd Bruce, 4,044,782, Cl. 132-7.000.
Fanta, Wayne I.; and Shulman, Joel I., 4,045,469, Cl. 260-469.000.
Luedders, Wilmer Louis; and Wetzel, Thomas Andrew, 4,045,548, Cl. 424-47.000.
Watt, David M., Jr.; and Nirschl, Joseph P., 4,045,361, Cl. 252-8.800.
Weigle, Dwight Carl, 4,045,590, Cl. 426-656.000.

Produits Chimiques Ugine Kuhlmann: *See—*
Brouard, Claude Marie Henri Emile; and Ficht, Paulette Gisele, 4,045,423, Cl. 260-147.000.

Profile Systems, Inc.: *See—*
Maune, Neil F., 4,044,503, Cl. 49-400.000.

Prokai, Bela; and Kanner, Bernard, to Union Carbide Corporation. Organosilicone polymers. 4,045,381, Cl. 260-2.5AH.

Proksch, Gary J.; and Bonderman, Dean P. Preparation of optically clear serum. 4,045,176, Cl. 23-230.00B.

Properzi, Giulio. Continuous rolling mill. 4,044,586, Cl. 72-224.000.

Provost, Roger, to Institut Francais du Petrole. Apparatus for coating a surface with a pulverulent product. 4,044,717, Cl. 118-629.000.

Pryor, Clyde Robert: *See—*
Hollingsead, Robert A.; and Pryor, Clyde Robert, 4,044,515, Cl. 52-173.00R.

Pryor, Robert A.: *See—*
Coleman, Michael G.; and Pryor, Robert A., 4,045,245, Cl. 136-89.00C.

Pulver, Donald W. Automobile body frame and envelope construction. 4,045,075, Cl. 296-28.00J.

Punsmann, Josef; and Hecking, Ludger, to A. Friedr. Flender & Co. Coupling the switching of which is dependent on the rotational speed. 4,044,872, Cl. 192-103.00A.

Pursnani, Khiman K.; and Sepso, Roger P., to Robertshaw Controls Company. Electrical switch construction and improved overtravel switch blade therefor and method of making the same. 4,045,635, Cl. 200-283.000.

Putzer, Raymond M., to Resment Inc. Method of casting compositions in elastomeric molds. 4,045,535, Cl. 264-313.000.
Putzer, Raymond M.: *See—*
Maurino, William J.; and Putzer, Raymond M., 4,045,153, Cl. 425-440.000.
Pynsky, Raymond F., to dun-Rite Erectors, Inc. Can testing conveyor. 4,044,891, Cl. 209-73.000.
Quaker Oats Company, The: *See—*
Balaz, Alexander, 4,044,661, Cl. 99-355.000.
Quinones, Nicanor Quinones: *See—*
Hardy, Robert Allis, Jr.; and Quinones, Nicanor Quinones, 4,045,445, Cl. 260-293.590.
R. G. Dixon & Company Limited: *See—*
Wilkins, John Thomas, 4,044,848, Cl. 180-6.500.
Rabilloud, Guy; and Sillion, Bernard, to Institut Francais du Petrole. New di-substituted meta-terphenyl compounds and resulting polymers. 4,045,414, Cl. 260-65.000.
Radda, George J.: *See—*
Caffarella, Thomas E.; Radda, George J.; and Watts, David J., 4,045,201, Cl. 65-105.000.
Radke, Dietrich: *See—*
Wetzel, Rolf; and Radke, Dietrich, 4,045,214, Cl. 75-60.000.
Radler, Richard W., Jr., to Xerox Corporation. Possible active matrix polymers. 4,045,413, Cl. 260-63.00R.
Radtke, Charles Stephan: *See—*
LaCroce, Leonard Thomas; and Radtke, Charles Stephan, 4,044,915, Cl. 220-270.000.
Rahmstorf, Dietmar, to Messrs. BIG Spielwarenfabrik Dipl.-Ing. Ernst A. Bettag. Toy animal figures with interchangeable saddle and center body part. 4,044,498, Cl. 46-116.000.
Rakowicz, Jan Antoni: *See—*
Preston, Edward George; and Rakowicz, Jan Antoni, 4,044,779, Cl. 131-21.00R.
Ramachandran, Pallassana, to Colgate Palmolive Company. Softener and bleaching composition. 4,045,358, Cl. 252-8.600.
Ramsey, John W., Jr., to Guardpack, Incorporated. Inflatable dunnage with tie-downs. 4,044,693, Cl. 105-468.000.
Ranco Incorporated: *See—*
Biesecker, Frederick S., 4,044,823, Cl. 165-16.000.
Rank Xerox Ltd.: *See—*
Ohmori, Hitoshi, 4,044,719, Cl. 118-652.000.
Rapistan Incorporated: *See—*
Maxted, Wesley R., 4,044,897, Cl. 214-11.00R.
Rapoport, Henry; and Barber, Randy B., to United States of America, Health, Education and Welfare. Method of producing thebaine from codeine and oripavine from morphine. 4,045,440, Cl. 260-285.000.
Rasdall, Milton: *See—*
Worick, Richard A., 4,044,842, Cl. 172-314.000.
Rasi-Zade, Artur Tair ogly: *See—*
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.
Rasmussen, Claus Lowe, to Schublich A/S. Printing cylinder for printing machines. 4,044,678, Cl. 101-378.000.
Rassmann, Christoph: *See—*
Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, 4,045,089, Cl. 299-43.000.
Ratheiser, Heinz, to Krauss-Maffei Aktiengesellschaft. Die for extruding large-diameter tubing. 4,045,154, Cl. 425-467.000.
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, to Heraeus Quarzschmelze GmbH. Method of preparing a foreproduct for the production of an optical lightconductor. 4,045,198, Cl. 65-33.000.
Raudys, Vytas Andrew; and DeVitto, Ronald Robert, to Union Carbide Corporation. Apparatus and method for providing hanger-clip closures for casings. 4,044,450, Cl. 29-509.000.
Ravenhall, Richard, to United States of America, National Aeronautics and Space Administration. Platform for a swing root turbomachinery blade. 4,045,149, Cl. 416-135.000.
Raychem Corporation: *See—*
Troy, Michael, 4,045,612, Cl. 174-136.000.
Raychem Limited: *See—*
Clabburn, Robin J. T., 4,045,604, Cl. 428-36.000.
Raymond Lee Organization, Inc., The: *See—*
Fife, Clemens L., 4,045,069, Cl. 294-31.200.
Jamison, Leon L., 4,044,711, Cl. 116-124.00B.
RCA Corporation: *See—*
Ahmed, Adel Abdel Aziz, 4,045,694, Cl. 307-296.00R.
Carlson, Curtis Raymond, 4,045,133, Cl. 355-1.000.
Dingwall, Andrew Gordon Francis, 4,045,250, Cl. 148-1.500.
Dingwall, Andrew Gordon Francis, 4,045,811, Cl. 357-41.000.
Himics, Richard Joseph; Desai, Nitin Vithalbhai; and Poliniak, Eugene Samuel, 4,045,318, Cl. 204-192.00E.
Hsu, Sheng Teng, 4,045,747, Cl. 330-35.000.
Salzer, William Ellsworth, 4,045,719, Cl. 363-89.000.
Schade, Otto Heinrich, Jr., 4,045,822, Cl. 361-45.000.
Stewart, Roger Green, 4,045,688, Cl. 307-251.000.
Wheatley, Carl Franklin, Jr., 4,045,746, Cl. 330-23.000.
Reardon, John: *See—*
McLoughlin, William G.; Pilling, Arnold V.; Reardon, John; and Addison, William E., 4,044,555, Cl. 60-264.000.
Reardon, Paul J.: *See—*
Strauss, Bruce P.; Reardon, Paul J.; and Remsbottom, Robert H., 4,044,457, Cl. 29-599.000.
Recognition Equipment Incorporated: *See—*
Cave, Ellis K., 4,045,816, Cl. 358-212.000.
Reed, Marion G., to Chevron Research Company. Hydroxy-aluminum based drilling fluid. 4,045,357, Cl. 252-8.50A.
Reents, Margaret J.: *See—*
Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., 4,045,297, Cl. 195-103.50R.
Reeve, Austin John: *See—*
Preston, John; and Reeve, Austin John, 4,045,439, Cl. 260-250.00C.
Refrigeration Research, Inc.: *See—*
Bottum, Edward W.; and Rockwell, Frank H., 4,044,948, Cl. 237-1.00A.
Regie Nationale des Usines Renault: *See—*
Lemonnier, Jean-Yves; and Chatelain, Lucien, 4,045,521, Cl. 261-41.00R.
Rehn, Johnny: *See—*
Andersson, Lars; Rehn, Johnny; and Torstenfelt, Ragnar, 4,045,099, Cl. 308-36.000.
Reiber, Hans, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen m.b.H. Method of manufacturing shatterproof combustion type photoflash lamps. 4,045,530, Cl. 264-92.000.
Reichert, Donald G., to ABC Packaging Machine Corporation. Case erector. 4,044,657, Cl. 93-49.00M.
Reichmann, Horst, to Joh. Vaillant K.G. Circulating water heater. 4,044,726, Cl. 122-33.000.
Reid, Angus Joseph Dickson: *See—*
Forbes, Eric Simon; and Reid, Angus Joseph Dickson, 4,045,332, Cl. 208-323.000.
Reinecke, Guenter, to Benz & Hilgers GmbH. Apparatus for discharging stacked articles in discrete groups. 4,044,896, Cl. 214-8.50H.
Reisser, Fritz: *See—*
Muhle, Herbert; Milzner, Karlheinz; and Reisser, Fritz, 4,045,561, Cl. 424-251.000.
Remaley, Edward G.; Baker, Robert W.; and Meyer, Raymond J., to Aluminum Company of America. Low temperature sealing of anodized aluminum. 4,045,599, Cl. 427-333.000.
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, to California Institute of Technology. Ion-exchange hollow fibers. 4,045,352, Cl. 210-500.00M.
Remington Arms Company, Inc.: *See—*
Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., 4,044,487, Cl. 42-16.000.
Remsbottom, Robert H.: *See—*
Strauss, Bruce P.; Reardon, Paul J.; and Remsbottom, Robert H., 4,044,457, Cl. 29-599.000.
Rendahl, Karl Ingvar Fredrik: *See—*
Giesselmann, Hannes; and Rendahl, Karl Ingvar Fredrik, 4,044,701, Cl. 112-259.000.
Renet, Claude, to "Meci" Materiel Electrique de Controle et Industriel. Method for reducing the response time in oxygen measuring probes. 4,045,300, Cl. 204-1.00T.
Renfro Corporation: *See—*
Everhart, John R., 4,044,438, Cl. 28-147.000.
Rengo Co., Ltd.: *See—*
Tokuno, Masateru, 4,044,901, Cl. 214-89.000.
Renvall, Ilkka; and Mattila, Tapio, to Kemira Oy. Method for producing 5-nitro-2-furfuryl acetate. 4,045,453, Cl. 260-347.400.
Repke, Virginia L.: *See—*
Mesek, Frederick K.; and Repke, Virginia L., 4,044,768, Cl. 128-287.000.
Resment Inc.: *See—*
Putzer, Raymond M., 4,045,535, Cl. 264-313.000.
Reymond, Jean-Claude: *See—*
de Corlieu, Guy; and Reymond, Jean-Claude, 4,045,120, Cl. 350-96.00C.
Reynolds Metals Company: *See—*
Hrishikesan, Kizhakke G., 4,045,537, Cl. 423-119.000.
Reyrolle Parsons Limited: *See—*
Parton, Kenneth Charles, 4,045,823, Cl. 361-58.000.
Rheinstahl Aktiengesellschaft: *See—*
Schafer, Heinrich, 4,045,101, Cl. 308-194.000.
Rhoads, Gerald A.: *See—*
Poorbaugh, Charles R.; and Rhoads, Gerald A., 4,045,682, Cl. 307-127.000.
Rhone-Poulenc Industries: *See—*
Azemar, Michel; and Vigliecca, Lucien, 4,045,185, Cl. 23-290.000.
Rice, Ronald G.: *See—*
Mold, Donald F.; and Rice, Ronald G., 4,045,199, Cl. 65-33.000.
Richard, Charles A.; and Barbee, John Philip, to Baker International Corporation. Concentric gravel pack with crossover tool and method of gravel packing. 4,044,832, Cl. 166-278.000.
Richards, Harvey J.; and Trivedi, Bhupendra C., to Ashland Oil, Inc. 7-(Alpha-methyl-alpha-alkenyl)substituted 8-hydroxyquinolines and process for the preparation thereof. 4,045,441, Cl. 260-289.0XA.
Richards, Willie James: *See—*
Howland, Robert Franklin; Mansky, Michael Herman; and Richards, Willie James, 4,045,586, Cl. 426-387.000.
Richter, Ferdinand Joseph, to American Cyanamid Company. Iodophor soap tissues. 4,045,364, Cl. 252-106.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See—*
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.
Richter, Robert Horace, to Magnavox Company, The. Paperboard pallet. 4,044,981, Cl. 248-119.00R.
Rickard, Michael E. Medical restraint. 4,045,678, Cl. 250-451.000.

Ricoh Company, Ltd.: *See—*
Fujimura, Itaru; and Endo, Katutoshi, 4,045,217, Cl. 96-1.0LY.
Fukazawa, Takao; Isayama, Takuro; Iwasaki, Kyuhachiro; and Komai, Hiromichi, 4,045,802, Cl. 346-140.00R.
Iwasaki, Kyuhachiro, 4,045,801, Cl. 346-140.00R.
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.
Riddle, Dennis L., to Milliken Research Corporation. Vacuum slot coating apparatus. 4,044,716, Cl. 118-50.000.
Rieck, Gerald C.: *See—*
Abu-Akeel, Abdulhadi K.; and Rieck, Gerald C., 4,044,861, Cl. 188-1.00B.
Riegel, Herbert: *See—*
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 4,045,504, Cl. 260-669.00R.
Ring, Terry A., to Kaiser Aluminum & Chemical Corporation. Process for producing high density sintered alumina. 4,045,234, Cl. 106-62.000.
Risser, Roger L.; and Shriver, Joe E., to Sperry Rand Corporation Wheel adjustment mechanism for a forage blower. 4,045,041, Cl. 280-43.170.
Ritter, Edmond Jean: *See—*
Kelly, Ralph; and Ritter, Edmond Jean, 4,045,550, Cl. 424-70.000
Ritzert, Chalmer John: *See—*
Korenowski, Theodore Frank; Penland, Jerry Lee; and Ritzert, Chalmer John, 4,045,339, Cl. 210-45.000.
Riverbank Laboratories, Inc.: *See—*
Wohlert, Andrew M., 4,045,243, Cl. 134-1.000.
Robbins, William L.: *See—*
Krueger, Theodore H.; Eller, Robert; O'Brien, John; and Robbins, William L., 4,044,816, Cl. 164-63.000.
Robert Brendle & Cie.: *See—*
Strahm, Anton, 4,044,590, Cl. 72-342.000.
Roberts, Lloyd L.: *See—*
Blechen, Frederick C.; and Roberts, Lloyd L., 4,044,975, Cl. 244-181.000.
Roberts, William, to Siragusa, Ross D. Outboard motor mounting assembly and servo mechanism therefor. 4,044,705, Cl. 115-41.0HT.
Robertshaw Controls Company: *See—*
Bauer, Werner R., 4,045,759, Cl. 337-301.000.
Marquis, Edgar E.; and Knecht, William A., 4,045,760, Cl. 337-301.000.
Pursnani, Khiman K.; and Sepso, Roger P., 4,045,635, Cl. 200-283.000.
Wolfe, Denis G.; and Danon, Joseph S., 4,045,155, Cl. 431-42.000
Robinson, Paul E., to Sabco Limited. Mop wringer. 4,044,419, Cl. 15-119.00A.
Robson, John Howard; and Marcus, Erich, to Union Carbide Corporation. Amine acrylate addition reaction product compositions 4,045,416, Cl. 260-77.5CR.
Roby, Ray I., to Roby's Enterprises, Inc. Adhesive composition. 4,045,395, Cl. 260-28.5AS.
Roby's Enterprises, Inc.: *See—*
Roby, Ray I., 4,045,395, Cl. 260-28.5AS.
Rock, Erich; and Mages, Bernhard. Pull-out guide. 4,045,097, Cl. 308-3.800.
Rockwell, Frank H.: *See—*
Bottum, Edward W.; and Rockwell, Frank H., 4,044,948, Cl. 237-1.00A.
Rockwell International Corporation: *See—*
Schelat, Thomas A., 4,044,997, Cl. 251-328.000.
Sutherland, Ray, 4,044,787, Cl. 137-107.000.
Rockwell-Rimoldi S.p.A.: *See—*
Marforio, Nerino, 4,044,699, Cl. 112-200.000.
Rod, Robert L.; Penick, Walter L., Jr.; and Heller, Henry B., to Monogram Industries, Inc. Waste evaporation disposal system. 4,045,314, Cl. 204-151.000.
Rodco, Inc.: *See—*
Payne, Bobby L., 4,045,591, Cl. 427-37.000
Rodondi, Andrew F.; and Hommer, Martin H., to General Motors Corporation. Unitary insulator housing with secondary latch means and electrical connector utilizing same. 4,045,112, Cl. 339-99.00R
Rodrigue, Normand N., to McDonnell Douglas Corporation. Self re-arming valve. 4,044,790, Cl. 137-465.000.
Rogers, Alan Barde, to Armour and Company. Process for pasteurizing raw poultry. 4,045,579, Cl. 426-327.000.
Rogers Corporation: *See—*
Ankrom, Albert M.; and Vernon, John T., 4,044,427, Cl. 19-97.000
Rogic, Milorad M.; Swerdloff, Michael D.; and Demmin, Timothy R., to Allied Chemical Corporation. Synthesis of α-nitrosoketal dimers 4,045,422, Cl. 260-143.000.
Rohm and Haas Company: *See—*
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., 4,045,517, Cl. 260-901.000
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. 1,3,4,5-Tetrahydro-2H-1,4-benzodiazepin-2-ones. 4,045,433, Cl. 260-239.30D.
Rolle, Rainer, to Ortec Incorporated. Determining element concentrations in samples. 4,045,676, Cl. 250-272.000.
Romagnolo, Gerard, to Ugine Carbone. Cutting plate with chip breakers. 4,044,439, Cl. 29-95.00R.
Roman, Steven A., to Shell Oil Company. Esters of nitro(tetrahydro-2H-1,3-thiazin-2-ylidene)acetic acids. 4,045,434, Cl. 542-413.000
Roman, Steven A., to Shell Oil Company. Use as insecticides of esters of nitro(tetrahydro-2H-1,3-thiazin-2-ylidene)acetic acids. 4,045,559, Cl. 424-246.000.
Romano, Ugo; and Tesei, Renato, to Anic, S.p.A. Process for the preparation of aromatic carbonates. 4,045,464, Cl. 260-463.000.
Ronson Corporation: *See—*
Kolodziej, Alojzy Antoni, 4,044,636, Cl. 76-104.00R.
Root, Ernest F.: *See—*
Cronin, Paul W.; Ottmar, Peter H.; Root, Ernest F.; and Simmons, Harry M., 4,044,754, Cl. 126-271.000.
Ropp, Dale R.: *See—*
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., 4,045,082, Cl. 297-357.000.
Rose, Edward; and Roth, Robert A., to Peters Machinery Company. Method and apparatus for counting and loading items, particularly cookies, into packages and the like. 4,044,885, Cl. 198-419.000
Rosenberger, Michael, to Hoffmann-La Roche Inc. 1-(2,6,6-Trimethyl-3-hydroxy or lower alkanoyloxycyclohexen-1-yl)-3-methyl-4-penten-1-yn-3-ol compound. 4,045,476, Cl. 260-488.00R.
Rosenberger, Michael: *See—*
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,045,452, Cl. 260-345.90S.
Rosenberger, Roy R.: *See—*
Dolan, Jerome J.; and Rosenberger, Roy R., 4,045,733, Cl. 324-140.00R.
Rosenkranz, Hans Jurgen: *See—*
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H
Rosewell, Michael P. Nuclear reactor fuel containment safety structure 4,045,284, Cl. 176-38.000.
Roth, Robert A.: *See—*
Rose, Edward; and Roth, Robert A., 4,044,885, Cl. 198-419.000.
Rounds, Hugh G.: *See—*
Schoenrock, Karlheinz W. R.; and Rounds, Hugh G., 4,045,242, Cl. 127-50.000.
Rourke, Michael H.: *See—*
Babayan, Eduard P.; and Rourke, Michael H., 4,045,527, Cl. 264-46.700.
Roussel Uclaf: *See—*
Clemence, Francois; and Le Martret, Odile, 4,045,567, Cl. 424-270.000.
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,045,209, Cl. 71-98.000.
Rowbottam, Francis W., to New England Business Service, Inc. Time indicating apparatus and transmission mechanism therefor. 4,044,548, Cl. 58-125.00C.
Rowland, Stanley P., to United States of America, Agriculture. Textiles flame retarded with hydroxymethylphosphorus compounds in combination with poly(ethyleneureas) and poly(N-methylolethyleneureas). 4,045,173, Cl. 8-116.00P.
Rowlands, Kenneth C.: *See—*
Hutton, James C.; Bauman, Thomas G.; and Rowlands, Kenneth C., 4,044,487, Cl. 42-16.000.
Rubin, Isaac D.; and Nebzydoski, John W., to Texaco Inc. Synthetic turbine oils. 4,045,376, Cl. 252-56.00S.
Rubin, Philip N.; and Fleming, Michael, to Fairfield Fiberglass Inc. In ground swimming pool framework. 4,044,514, Cl. 52-169.700.
Rubner, Roland; Kleeberg, Wolfgang; and Kuhn, Eberhard, to Siemens Aktiengesellschaft. Method for the preparation of layer structures. 4,045,223, Cl. 96-35.100.
Rudolph, Hans: *See—*
Knickel, Birger; Rudolph, Hans; Hocker, Jurgen; Lewalter, Jurgen; and Rosenkranz, Hans Jurgen, 4,045,337, Cl. 210-23.00H
Rumpp, Gerhard; Kruger, Wilm; and Scholz, Dieter, to Hilti Aktiengesellschaft. Drilling tool with a two part input unit. 4,044,845, Cl. 175-409.000.
Russ, Daniel G., to Telectro-Mek, Inc. Portable contaminated fuel detector with tiered deck. 4,044,604, Cl. 73-61.00R.
Russ, Daniel G., to Telectro-Mek, Inc. Compact portable contaminated fuel detector with hand-operated pump. 4,045,139, Cl. 356-36.000
Russo, Giovanni: *See—*
Pasqualini, Ugo; and Russo, Giovanni, 4,044,466, Cl. 32-10.00A.
Ryason, Porter R.: *See—*
United States of America, National Aeronautics and Space Administration; and Ryason, Porter R., 4,045,315, Cl. 204-157.10R
Rychen, Niklaus; and Fuchshuber, Peter Werner, to Konus-Kessel Gesellschaft fur Warmetechnik mbH & Co. KG. Apparatus for heating a heat transfer fluid protected against overheating. 4,044,727, Cl. 122-449.000.
S.A.E.S. Getters S.p.A.: *See—*
Cantaluppi, Angelo, 4,045,369, Cl. 252-432.000
S&C Electric Company: *See—*
Biller, Bruce A.; and Scherer, Henry W., 4,045,758, Cl 337-186.000.
Foulkes, John F., 4,045,762, Cl. 337-401.000.
Saab-Scania AB: *See—*
Brunnert, Stig Erik, 4,044,913, Cl. 220-86.00R
Sabco Limited: *See—*
Robinson, Paul E., 4,044,419, Cl. 15-119.00A.
Saeki, Yoshifumi: *See—*
Yashiro, Kenji; and Saeki, Yoshifumi, 4,045,732, Cl. 324-133.000
Saeki, Yoshito: *See—*
Ueno, Yasuhiko; Saeki, Yoshito; Akiyama, Takuya; and Fujita, Masao, 4,045,551, Cl. 424-76.000.
Saffren, Melvin M.: *See—*
United States of America, National Aeronautics and Space Administration; and Saffren, Melvin M., 4,045,359, Cl. 250-527.000

Saito, Mitsuo: *See—*
Kinugasa, Akikazu; Okuda, Toshio; Goto, Makoto; and Saito, Mitsuo, 4,045,450, Cl. 260-343.600.

Saito, Mitsuru, to Minolta Camera Kabushiki Kaisha. Automatic focusing apparatus. 4,045,805, Cl. 354-25.000.

Saito, Teruo: *See—*
Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, 4,045,388, Cl. 260-17.4ST.

Saito, Toru: *See—*
Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, 4,045,539, Cl. 423-240.000.

Saito, Yasushi: *See—*
Kamimura, Shoji; and Saito, Yasushi, 4,045,669, Cl. 250-311.000.

Saitoi, Takeji: *See—*
Urai, Muneharu; Kogure, Koji; and Haraguchi, Youichiro, 4,044,715, Cl. 118-50.000.

Sakaedani, Yoshiyasu: *See—*
Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, 4,044,475, Cl. 35-6.000.

Sakai, Katsuo: *See—*
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.

Sakamoto, Koji: *See—*
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, 4,045,134, Cl. 355-3.00R.

Sakoda, Tom Kenzo: *See—*
Breslow, Jeffrey D.; Jaworski, Eugene; and Sakoda, Tom Kenzo, 4,045,024, Cl. 273-43.00A.

Sakurai, Yo; Obayashi, Hidehito; and Gejyo, Tetsuo, to Hitachi, Ltd. Smoke and gas sensor element. 4,044,601, Cl. 73-23.000.

Saladin, Emil: *See—*
Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, 4,045,518, Cl. 260-927.00R.

Saleil, Jean: *See—*
Leroy, Pierre; Morlet, Jean Georges; and Saleil, Jean, 4,045,215, Cl. 75-82.000.

Salisbury, Charles W., to Owens-Illinois, Inc. Method of forming glass substrates with pre-attached sealing media. 4,045,200, Cl. 65-42.000.

Salyers, John C.: *See—*
Hopkins, Donald J.; Salyers, John C.; and Goranson, Paul L., 4,044,914, Cl. 220-93.000.
Liberman, Harvey W.; and Salyers, John C., 4,044,905, Cl. 214-152.000.

Salzer, William Ellsworth, to RCA Corporation. Regulated voltage source. 4,045,719, Cl. 363-89.000.

Samcoe Holding Corporation: *See—*
Bryan, Clifford Chandler, 4,044,434, Cl. 26-18.500.

Samoilov, Jury Alexandrovich: *See—*
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.

Sampei, Tohru, to Hitachi, Ltd. Low-frequency power amplifier. 4,045,744, Cl. 330-13.000.

Sanders, Thomas J., to Harris Corporation. Process for fabricating diffused complementary field effect transistors. 4,045,259, Cl. 148-188.000.

Sandoz Ltd.: *See—*
Bream, John Bernard, 4,045,572, Cl. 424-275.000.
Closse, Annemarie; Haefliger, Walter; and Hauser, Daniel, 4,045,573, Cl. 424-279.000.
Muhle, Herbert; Milzner, Karlheinz; and Reisser, Fritz, 4,045,561, Cl. 424-251.000.
Pfaffli, Paul, 4,045,443, Cl. 260-293.530.

Sansui Electric Co., Inc.: *See—*
Kobayashi, Fumio, 4,044,855, Cl. 181-151.000.

Santacroce, James D.: *See—*
Lewicki, Lester R.; and Santacroce, James D., 4,044,400, Cl. 2-421.000.

Santi, Mario: *See—*
Cini, Carlo; Murari, Bruno; and Santi, Mario, 4,045,745, Cl. 330-15.000.

Sanyo Electric Co., Ltd.: *See—*
Hayashi, Gentaro; Yamamoto, Kenji; and Yamamoto, Yasakao, 4,044,626, Cl. 74-573.00F.

Sardella, Louis M., to Wm. C. Staley Machinery Corporation. Rotary feeder for paperboard blanks. 4,045,015, Cl. 271-112.000.

Sardisco, John B., to Pennzoil Company. Production of potassium sulfate and hydrogen chloride. 4,045,543, Cl. 423-482.000.

Sare, Edward J.; and Lavanish, Jerome M., to PPG Industries, Inc. Catalytic oxidation of vinyl chloride. 4,045,538, Cl. 423-240.000.

Saretzky, Horst, to De Limon Fluhme & Co. Adjustable progressive distributor valve. 4,044,924, Cl. 222-250.000.

Sarges, Reinhard, to Pfizer Inc. Aminophenyltetralin compounds. 4,045,488, Cl. 260-576.000.

Sarnezki, Herbert: *See—*
Daffner, Erich; and Sarnezki, Herbert, 4,045,706, Cl. 315-3.500.

Sasamura, Kohei: *See—*
Ohwaki, Isao; Sasamura, Kohei; Muraoka, Teruo; and Mori, Takaro, 4,045,621, Cl. 179-100.4ST.

Sasgen, Anthony M. Door stop. 4,044,424, Cl. 16-85.000.

Sato, Hiromi: *See—*
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,045,560, Cl. 424-248.400.

Sato, Kouzo: *See—*
Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kouzo; and Shinozaki, Nobuo, 4,045,627, Cl. 200-37.00R.

Sato, Seiji: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.

Sato, Tomoyasu: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
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Satoshi, Takeuchi, to Dai Nippon Printing Co., Ltd. Method for the electrolytic etching of metal workpiece. 4,045,312, Cl. 204-129.650.

Saucy, Gabriel: *See—*
Chan, Ka-Kong; and Saucy, Gabriel, 4,045,475, Cl. 260-488.00H.
Cohen, Noal; Rosenberger, Michael; and Saucy, Gabriel, 4,045,452, Cl. 260-345.90S.

Saurer-Allma GmbH Allgauer Maschinenbau: *See—*
Preisenhammer, Peter, 4,044,623, Cl. 74-520.000.

Savage, Donald D.; Chambers, Robert V.; and Mills, Maurice T., to Powell, B. J., a part interest. Tree processing machine. 4,044,806, Cl. 144-309.0AC.

Savarese, Joseph. Apparatus for continuous cheese making. 4,044,662, Cl. 99-460.000

Savarimuthu, Sundar. Vehicle suction brake. 4,044,862, Cl. 188-5.000.

Savio, Ermanno: *See—*
Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno, 4,044,962, Cl. 242-47.050.

Sawamura, Tagayasu: *See—*
Mori, Yasamasu; Ashiuchi, Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, 4,045,703, Cl. 313-497.000.

Say, Geoffrey R.: *See—*
Wheelock, Kenneth S.; and Say, Geoffrey R., 4,045,371, Cl. 252-462.000.

Schaaf, Thomas K.: *See—*
Hess, Hans-Jurgen E.; and Schaaf, Thomas K., 4,045,465, Cl. 260-464.000.

Schabert, Hans-Peter; Porner, Horst; and Bauer, Artur, to Kraftwerk Union Aktiengesellschaft. Reactor fuel assembly lock transport. 4,044,898, Cl. 214-18.00N.

Schachter, Herbert I. Method of mounting prefabricated contacts for printed circuit card connectors. 4,044,460, Cl. 29-628.000.

Schachter, Herbert I. Prefabricated contacts for printed circuit card connectors. 4,044,888, Cl. 206-330.000.

Schade, Otto Heinrich, Jr., to RCA Corporation. Ground fault interrupter apparatus. 4,045,822, Cl. 361-45.000.

Schaefer, David H.; and Strong, James P., III, to United States of America, National Aeronautics and Space Administration. Analog to digital converter for two-dimensional radiant energy array computers. 4,045,792, Cl. 340-347.0AD.

Schaefer, William L., to PPG Industries, Inc. Method and apparatus for chopping glass strands. 4,045,196, Cl. 65-2.000.

Schafer, Heinrich, to Rheinstahl Aktiengesellschaft. Mounting for multi-worms in transmissions for driving multi-worm presses for processing synthetic material. 4,045,101, Cl. 308-194.000.

Schafer, Stefan; Ohorodnik, Alexander; Gehrmann, Klaus; and Mainski, Albert, to Hoechst Aktiengesellschaft. Purification of sulfuric acid containing acetic acid. 4,045,295, Cl. 203-79.000.

Schafer, Werner: *See—*
Lange, Wolfgang; and Schafer, Werner, 4,045,274, Cl. 156-492.000.

Schalit, Samuel: *See—*
Cutler, Royal A.; and Schalit, Samuel, 4,045,483, Cl. 260-552.00R.

Schaub, Wolfgang: *See—*
Effland, Richard C.; Davis, Larry; and Schaub, Wolfgang, 4,045,448, Cl. 260-326.50B.

Scheffel, John W.: *See—*
Fischer, Paul W.; and Scheffel, John W., 4,045,360, Cl. 252-8.300.

Scheibler Peltzer & Co.: *See—*
Schneider, Axel, 4,044,966, Cl. 242-77.100.

Schelat, Thomas A., to Rockwell International Corporation. Seat ring notch for gate valve guide rail. 4,044,997, Cl. 251-328.000.

Schenker, Karl: *See—*
Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, 4,045,580, Cl. 424-330.000.

Scherer, Henry W.: *See—*
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Schering Aktiengesellschaft: *See—*
Drawert, Manfred; Griebsch, Eugen; and Imoehl, Wolfgang, 4,045,389, Cl. 260-18.00N.
Itil, Turan M.; and Herrmann, Werner Martin, 4,045,562, Cl. 424-261.000.
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.
Senge, Gerd; and Voss, Gunter, 4,045,306, Cl. 204-55.00R.

Schienda, John W., to I-T-E Imperial Corporation. Interlock for handles of adjacent circuit breakers. 4,045,628, Cl. 200-50.00C.

Schiess, Georg; and Heinzer, Jorg. Circular cutting device. 4,044,464, Cl. 30-164.900.

Schindler, Harvey D.: *See—*
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 4,045,504, Cl. 260-669.00R.

Schlatter, Carl Nelson: *See—*
Brodmann, George L.; and Schlatter, Carl Nelson, 4,045,601, Cl. 427-381.000.

Schleich, Josef; and Zwisler, Hans, to Heilmann & Littmann Bau-Aktiengesellschaft. Clarification plant. 4,045,355, Cl. 210-532.00R.

Schlichte, Max, to Siemens Aktiengesellschaft. Telecommunication switching network having a multistage reversed trunking arrangement. 4,045,617, Cl. 179-15.0AT.

Schloss, Benjamin. Apparatus for cardiovascular conditioning and other physiological purposes. 4,044,772, Cl. 128-371.000.

Schlosser, Hermann: *See—*
Kuster, Jurgen; and Schlosser, Hermann, 4,045,342, Cl. 210-81.000.

Schlusener, Horst: *See—*
Hauschopp, Alois; Schlusener, Horst; and Rassmann, Christoph, 4,045,089, Cl. 299-43.000.

Schmid, Erich: *See—*
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 4,045,570, Cl. 424-275.000.

Schmid, Walter: *See—*
Wilfert, Karl; Schmid, Walter; and Jambor, Arno, 4,045,052, Cl. 280-701.000.

Schmidt-Kastner, Gunter: *See—*
Kutzbach, Carl; Arens, Alfred; and Schmidt-Kastner, Gunter, 4,045,552, Cl. 424-94.000.

Schmitt, Marvin G., to AMI Industries, Inc. Power steering system for heavy load dollies. 4,044,854, Cl. 180-140.000.

Schmitz, Reinold: *See—*
Gehrke, Gunter; Schmitz, Reinold; Bien, Hans-Samuel; and Herzog, Helmut, 4,045,457, Cl. 260-381.000.

Schmoll, Kurt: *See—*
Klein, Gerd; and Schmoll, Kurt, 4,045,385, Cl. 260-15.000.

Schneider, Axel, to Scheibler Peltzer & Co. Take-up frame for pile fabric. 4,044,966, Cl. 242-77.100.

Schneider, Richard S.: *See—*
Soffer, Michael J.; and Schneider, Richard S., 4,045,420, Cl. 260-112.00R.

Schneiders, Hugo: *See—*
Koch, Friedrich-Karl; and Schneiders, Hugo, 4,044,619, Cl. 74-53.000.

Schober, William R.: *See—*
Fallon, William H.; and Schober, William R., 4,045,717, Cl. 320-2.000.

Schoenholz, Daniel: *See—*
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,045,581, Cl. 426-3.000.

Schoenrock, Karlheinz W. R.; and Rounds, Hugh G., to Amalgamated Sugar Company, The. Process for the purification of sugarbeet juice and the reduction of lime salts therein. 4,045,242, Cl. 127-50.000.

Schold, George R. Apparatus for dispersing finely divided solid particles in a liquid vehicle. 4,044,957, Cl. 241-46.110.

Scholz, Dieter: *See—*
Rumpp, Gerhard; Kruger, Wilm; and Scholz, Dieter, 4,044,845, Cl. 175-409.000.

Schrag, Thomas Gene; Burkhart, Merle Keith; and Garrison, Harold Keith, to Hesston Corporation. Multiple round bale mover. 4,044,906, Cl. 214-506.000.

Schreiber, William L.; and Pittet, Alan O., to International Flavors & Fragrances Inc. Processes for producing alkenals and intermediates therefor. 4,045,497, Cl. 260-615.00A.

Schroeder, Harry; and Aidn, Martin, to Siemens Aktiengesellschaft. Armature mounting means for an electromagnetic relay. 4,045,755, Cl. 335-274.000.

Schroetter, Gerhard: *See—*
Barowski, Gerhard; Keller, Wolfgang; and Schroetter, Gerhard, 4,045,183, Cl. 23-273.0SP.

Schroter, Richard C., to Kaiser Aluminum & Chemical Corporation. Insulated tank jacketing system. 4,044,517, Cl. 52-248.000.

Schublich A/S: *See—*
Rasmussen, Claus Lowe, 4,044,678, Cl. 101-378.000.

Schuessler, John C.; and Tapp, David J., to Leach Corporation. Arc barrier for a relay switch. 4,045,751, Cl. 335-201.000.

Schultz, Arthur Harry. Bubble-making apparatus and means for attachment to a bicycle. 4,045,049, Cl. 280-289.00R.

Schuman, Cary. Golf putting aid. 4,045,033, Cl. 273-188.00R.

Schumann, Reinhard: *See—*
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Schwarz, Hans-Helmut: *See—*
Krall, Hermann-Dieter; and Schwarz, Hans-Helmut, 4,045,486, Cl. 260-566.00R.

Schweim, Klaus: *See—*
Sturmer, Horst; and Schweim, Klaus, 4,044,522, Cl. 52-599.000.

Schweitzer, Edmund O., Jr. Tool for manually tripping a fault indicator for high voltage electric power circuits and resetting same. 4,045,726, Cl. 324-51.000.

Schwerdtel, Wulf: *See—*
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Schwertner, Eberhard; and Herrling, Siegfried. Dipeptide derivatives, process for manufacture and pharmaceutical preparations. 4,045,556, Cl. 424-177.000.

Schwickart, Karl-Josef; and Sesterhenn, Lothar, to Bayer Aktiengesellschaft. Membrane seal for electrolysis plate and frame assemblies. 4,045,325, Cl. 204-286.000.

Scifres, Donald R.: *See—*
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,045,749, Cl. 331-94.50H.

SCM Corporation: *See—*
Shafer, William M.; and Nadkarni, Anil V., 4,045,644, Cl. 219-119.000.

Scopaz, Joseph T., to Bendix Corporation, The. Self testing monitoring apparatus for multiplexed digital input signals. 4,045,662, Cl. 235-153.00A.

Scott, Blayney J. Downrigger for trolling. 4,044,968, Cl. 242-106.000.

Scott, Keith. Taximeters. 4,045,656, Cl. 235-92.0TC.

Scovill Manufacturing Company: *See—*
Aureli, William D., 4,044,433, Cl. 24-227.000.

Sealed Power Corporation: *See—*
Shunta, Rudolph C., 4,045,036, Cl. 277-138.000.

Searle, Robert J. G.; and Boyce, Clive B. C., to Shell Oil Company. Thioamide pesticides. 4,045,575, Cl. 424-305.000.

Sears Manufacturing Co.: *See—*
Egert, Allen C.; Koutsky, L. John; and Ropp, Dale R., 4,045,082, Cl. 297-357.000.

Seaton, William Wayne, to Combustion Engineering, Inc. Ladle with axis of rotation through discharge spout. 4,044,927, Cl. 222-604.000.

Secretary of State for Social Services: *See—*
Bunce, Roger Abraham, 4,045,179, Cl. 23-259.000.

Segale, Luigi; and Passerini, Pier Enrico. Method of packaging products to be preserved under vacuum or atmosphere of suitable gases. 4,044,524, Cl. 53-22.00A.

Segerman, Morton. Tray for string jewelry items. 4,044,446, Cl. 29-241.000.

Seidel, William Carl: *See—*
Nazarenko, Nicholas; and Seidel, William Carl, 4,045,495, Cl. 260-606.50B.

Seidensticker, Ralph W.; Knawa, Robert L.; Cerutti, Bernard C.; Snyder, Charles R.; Husen, William C.; and Coyer, Robert G., to United States of America, Energy Research and Development Administration. Nuclear reactor containment structure with continuous ring tunnel at grade. 4,045,289, Cl. 176-87.000.

Seidov, Gasan Neimat ogly: *See—*
Arzumanov, Suren Akopovich; Danieliants, Armais Avakovich; Aliverdizade, Kerim Salim ogly; Seidov, Gasan Neimat ogly; Rasi-Zade, Artur Tair ogly; Frenkel, Boris Ovseevich; and Samoilov, Jury Alexandrovich, 4,044,988, Cl. 251-1.00A.

Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, to Bayer Aktiengesellschaft. Process for the hydroxylation of phenols and phenol ethers in the nucleus. 4,045,496, Cl. 260-613.00D.

Seiko Koki Kabushiki Kaisha: *See—*
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Seitz-Werke GmbH: *See—*
Kuster, Jurgen; and Schlosser, Hermann, 4,045,342, Cl. 210-81.000.

Sekiya, Fukuo: *See—*
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Selcuk, M. Kudret: *See—*
United States of America, National Aeronautics and Space Administration; and Selcuk, M. Kudret, 4,044,753, Cl. 126-271.000.

Sell, Earl O.: *See—*
Wieder, Rodney L.; Neetz, Michael A.; and Sell, Earl O., 4,045,067, Cl. 294-15.000.

Sender, Wilfred E. System for handling structural members. 4,044,886, Cl. 198-488.000.

Senge, Gerd; and Voss, Gunter, to Schering Aktiengesellschaft. Electroplating zinc and bath therefor. 4,045,306, Cl. 204-55.00R.

Sensi, John E.: *See—*
Tsai, Yih-Wan; Sensi, John E.; and Henry, Vincent I., 4,045,197, Cl. 65-27.000.

Senyo Kiko Kabushiki Kaisha: *See—*
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Setsuro, Sekiya: *See—*
Masaaki, Noguchi; Yukiyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, 4,044,730, Cl. 123-75.00B.

Sextro, Gunter; Burg, Karlheinz; Gutweiler, Klemens; and Durichen, Klaus, to Hoechst Aktiengesellschaft. Process for preparing copolymers of trioxane. 4,045,415, Cl. 260-67.0FP.

SGS-ATES Componenti Elettronici S.p.A.: *See—*
Cini, Carlo; Murari, Bruno; and Santi, Mario, 4,045,745, Cl. 330-15.000.

Shafer, William M.; and Nadkarni, Anil V., to SCM Corporation. Welding electrode and method of making. 4,045,644, Cl. 219-119.000.

Shannon, John Martin; and Beale, Julian Robert Anthony, to U.S. Philips Corporation. Making Schottky barrier devices. 4,045,248, Cl. 148-1.500.

Shapiro, Michael: *See—*
Goldstein, David; Pless, William C.; Shapiro, Michael; Spencer, Dana; and Starr, Leland E., Jr., 4,044,599, Cl. 73-12.000.
Sharp, John R.: *See—*
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Disosway, Mark D., III; and Sheldrake, Leonard J., 4,045,062, Cl 290-38.00R.
Shell Oil Company: *See—*
Benson, Herbert L., Jr., 4,045,509, Cl. 260-683.750.
Kiovsky, Thomas E.; and Wald, Milton M., 4,045,461, Cl. 260-449.00M.
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Boehmer, Georg, 4,044,883, Cl. 197-151.000.
Daffner, Erich; and Sarnezki, Herbert, 4,045,706, Cl. 315-3.500.
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Hall, John Ives, 4,044,761, Cl. 128-90.000.
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Smith, Teddy Van, 4,045,603, Cl. 428-2.000.
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Stephens, Hugh. Automotive battery carriers. 4,044,935, Cl. 224-45.00F.
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Stewart, Roger Green, to RCA Corporation. Power-on reset circuit. 4,045,688, Cl. 307-251.000.
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Stockman, Richard Franklin, to Air Preheater Company, Inc., The. Horizontal modular inter-gasket seal. 4,044,822, Cl. 165-9.000.

Stoessel, Herman V.; and Prichard, Daniel R., to Hesston Corporation. Feed rolls having automatic speed control. 4,044,557, Cl. 60-420.000.
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Stohlquist, Roger H.; and Bartell, John B. Machine for applying tapes to moving product. 4,045,275, Cl. 156-521.000.
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Summerfield, Francis, to Alvasum (Aseptic) Limited. Flexible tubular members and valves incorporating such members. 4,044,990, Cl. 251-8.000.
Summers, Christopher Edward: *See—*
Breens, Leon Frank Haddon; Armitage, Dennis Lockhart; and Summers, Christopher Edward, 4,045,605, Cl. 428-88.000.
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. 2-Morpholine containing methano or ethano anthracene compounds. 4,045,560, Cl. 424-248.400.
Sundin, Anders Eric: *See—*
Forsgren, Ernst Erik, 4,044,525, Cl. 53-24.000.
Sunjic, Vitomir: *See—*
Kajfez, Franjo; Blazevic, Nikola; and Sunjic, Vitomir, 4,045,569, Cl. 424-274.000.
Suntech, Inc.: *See—*
Nickol, Stephen L., 4,045,511, Cl. 260-857.0TW.
Thompson, Robert M.; and Nickol, Stephen L., 4,045,512, Cl. 260-857.0TW.
Suspa Federungstechnik Fritz Bauer & Sohne OHG: *See—*
Bauer, Fritz, 4,045,008, Cl. 267-120.000.
Sutherland, Byron, to Walker-Hall-Sears, Inc. Multi-contact connectors with identical contacts. 4,045,107, Cl. 339-48.000.
Sutherland, Ray, to Rockwell International Corporation. Backflow preventer and relief valve assembly. 4,044,787, Cl. 137-107.000.
Suzuki, Hiroo; and Takada, Isao, to Toyo Ink Mfg. Co., Ltd. Curable aqueous coating composition. 4,045,399, Cl. 260-29.60N.
Suzuki, Isao: *See—*
Yanagawa, Itiro; and Suzuki, Isao, 4,045,094, Cl. 303-22.00R.
Suzuki, Kenichi: *See—*
Umemura, Sumio; Ohdan, Kyoji; Suzuki, Kenichi; and Adachi, Fumio, 4,045,478, Cl. 260-530.00N.
Suzuki, Ryuichi; and Suzuki, Takaji, to Hitachi, Ltd. Automatic cytoscreening device. 4,045,655, Cl. 235-92.0PC.
Suzuki, Shigeru; Nagahara, Yasumori; Sakamoto, Koji; and Sakai, Katsuo, to Ricoh Company, Ltd. Photosensitive member for use in electrophotographic apparatus and method of manufacturing the same. 4,045,134, Cl. 355-3.00R.
Suzuki, Takaji: *See—*
Suzuki, Ryuichi; and Suzuki, Takaji, 4,045,655, Cl. 235-92.0PC.
Svenska Tobaks Aktiebolaget: *See—*
Falke, Erik, 4,045,657, Cl. 235-151.100.
Sverre Munck A/S: *See—*
Vikre, Lauritz, 4,044,858, Cl. 182-82.000.
Swain, William H. Electro-chemical concentration transducer and its use to measure and control acid strength and storage battery charge. 4,045,721, Cl. 320-43.000.
Swainson, Ralph V. Pipe tobacco tamper and method. 4,044,807, Cl. 131-243.000.
Swanson, Eugene Addison: *See—*
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.
Swanson, Morton C. No till seed drill. 4,044,697, Cl. 111-66.000.
Swanstrom, Paul W. Remotely operated window shutters. 4,044,812, Cl. 160-206.000.
Swartzendruber, Ray E., to Chore-Time Equipment, Inc. Load cell and control for bulk bin. 4,044,920, Cl. 222-58.000.
Swaskey, Henry S. Basement sewer trap. 4,045,346, Cl. 210-164.000.
Swearingen, Charles C.; and Sheptak, Nicholas, to Dow Chemical Company, The. Cable shielding tape. 4,045,607, Cl. 428-200.000.
Sweeney, William A.: *See—*
Simic, Milutin; and Sweeney, William A., 4,045,506, Cl. 260-677.00A.
Swerdloff, Michael D.: *See—*
Rogic, Milorad M.; Swerdloff, Michael D.; and Demmin, Timothy R., 4,045,422, Cl. 260-143.000.
Swingley, Wayne. Fuel vapor generator. 4,044,741, Cl. 123-122.0AB.
Swodenk, Wolfgang: *See—*
Seifert, Hermann; Waldmann, Helmut; Schwerdtel, Wulf; and Swodenk, Wolfgang, 4,045,496, Cl. 260-613.00D.
Swolfs, Henri Samuel: *See—*
Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, 4,044,828, Cl. 166-250.000.
Symosko, Stephen: *See—*
Castelli, Joseph T.; Forrester, Joseph J.; and Symosko, Stephen, 4,045,788, Cl. 340-323.00R.
Syntex Corporation: *See—*
Fried, John H.; and Harrison, Ian T., 4,045,485, Cl. 260-566.00A.
Syntex (U.S.A.) Inc.: *See—*
Walker, Keith A. M., 4,045,568, Cl. 424-273.000.
System Development Corporation: *See—*
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 4,045,814, Cl. 358-124.000.
Syva Company: *See—*
Soffer, Michael J.; and Schneider, Richard S., 4,045,420, Cl. 260-112.00R.
Szabo, Anthony W.; and Del Guercio, Louis R. M. Fluid infusion apparatus. 4,044,764, Cl. 128-214.00F.
Sze, Morgan C.: *See—*
Brooks, Maurice E.; Riegel, Herbert; Schindler, Harvey D.; and Sze, Morgan C., 4,045,504, Cl. 260-669.00R.
Szeberenyi, Szabolcs: *See—*
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.
Szecsi, Peter L.: *See—*
Onsager, Olav T.; and Szecsi, Peter L., 4,045,500, Cl. 260-635.00H.
Szporny, Laszlo: *See—*
Rohricht, Julia; Kisfaludy, Lajos; Urogdi, Laszlo; Palosi, Eva; Szeberenyi, Szabolcs; and Szporny, Laszlo, 4,045,433, Cl. 260-239.30D.
Tabata, Katsuhiro: *See—*
Shimizu, Tsuyoshi; and Tabata, Katsuhiro, 4,044,984, Cl. 249-95.000.
Tabuchi, Katumi: *See—*
Kaname, Yuichi; Nakajima, Masaya; and Tabuchi, Katumi, 4,044,611, Cl. 73-170.00A.
Tachibana, Kyozo, to Hitachi, Ltd. Power converter system. 4,045,722, Cl. 363-126.000.

Tachikawa, Shiro: *See—*
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.
Taimei Kinzoku Kabushiki Kaisha: *See—*
Kubota, Yasuna, 4,044,995, Cl. 251-188.000.
Tajima, Eiichi; and Yamamoto, Kaname, to Tajima Roofing Co., Ltd. Combined application process of thermal insulation and built-up roofing or waterproofing. 4,045,265, Cl. 156-71.000.
Tajima Roofing Co., Ltd.: *See—*
Tajima, Eiichi; and Yamamoto, Kaname, 4,045,265, Cl. 156-71.000.
Takada, Isao: *See—*
Suzuki, Hiroo; and Takada, Isao, 4,045,399, Cl. 260-29.60N.
Takahashi, Kenryu. Spreadable anchor assembly. 4,044,647, Cl. 85-72.000.
Takahashi, Toshio: *See—*
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, 4,045,614, Cl. 178-69.100.
Takahata, Fumio; Takahashi, Toshio; and Hirata, Yasuo, to Kokusai Denshin Denwa Kabushiki Kaisha. System for controlling polarity state of start-stop telegraph signal train. 4,045,614, Cl. 178-69.100.
Takamoku, Hidetoshi: *See—*
Miyamoto, Haruo; Miyamatsu, Tokuhisa; Shirakawa, Seiichi; and Takamoku, Hidetoshi, 4,045,338, Cl. 210-36.000.
Takamura, Toru: *See—*
Nakatani, Hirokuni; Takamura, Toru; and Hashimoto, Susumu, 4,045,817, Cl. 358-213.000.
Takasawa, Seigo: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,610, Cl. 536-17.000.
Takase, Muneaki, to Zenyaku Kogyo Kabushiki Kaisha. Tumbing apparatus. 4,044,713, Cl. 118-19.000.
Takeda, Chikahiro: *See—*
Mitsumori, Nobuo; Takeda, Chikahiro; and Miyasako, Hideichi, 4,045,553, Cl. 424-132.000.
Takeda, Hideomi; and Kikuchi, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Focus detecting device. 4,045,804, Cl. 354-25.000.
Takeda, Katsuhiko: *See—*
Nagano, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko, 4,045,279, Cl. 162-25.000.
Takeda, Mitsuo: *See—*
Yasutome, Osamu; and Takeda, Mitsuo, 4,045,702, Cl. 313-496.000.
Takeda Riken Kogyo Kabushikikaisha: *See—*
Tokunou, Takashi; Kouya, Shinichi; and Akatsuka, Shigeki, 4,045,731, Cl. 324-78.00F.
Takenaka, Toichi: *See—*
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.
Takeshima, Masaki: *See—*
Hirano, Mikio; Takeshima, Masaki; Saito, Toru; and Shimozato, Atou, 4,045,539, Cl. 423-240.000.
Taketa, Jun A. Method and apparatus for refacing an abrasive wheel. 4,044,506, Cl. 51-5.00D.
Taller, Robert Arthur; and Elder, Decker Kuykendall, to Union Carbide Corporation. Low viscosity poly(epoxide-caprolactone) polyols. 4,045,474, Cl. 260-484.00A.
Tam, Richard K. W., to Burroughs Corporation. High speed differential to TTL converter. 4,045,690, Cl. 307-260.000.
Tamura, Tsutomu: *See—*
Akagawa, Masatake; and Tamura, Tsutomu, 4,045,659, Cl. 235-151.300.
Tanaka, Isao: *See—*
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, 4,045,341, Cl. 210-45.000.
Tang, Raymond; and Wong, Nam San, to Hughes Aircraft Company. Phase steered subarray antenna. 4,045,800, Cl. 343-854.000.
Taniguchi, Motoaki; and Iwata, Toyomi, to Bridgestone Tire Company Limited. Pneumatic tire for airplanes. 4,044,810, Cl. 152-209.00R.
Tapp, David J.: *See—*
Schuessler, John C.; and Tapp, David J., 4,045,751, Cl. 335-201.000.
Tardy, Maurice; and Paulet, Jean, to Bennes Marrel. Selective and proportional hydraulic remote control device, in particular for handling and public work gears. 4,044,795, Cl. 137-625.600.
Tartter, Arnold, to BASF Aktiengesellschaft. Salt of a sulfonic acid substituted 1:2 metal complex dye with a basic dye and an amine. 4,045,424, Cl. 260-147.000.
Tasdemiroglu, Server: *See—*
Pagano, Victor H.; and Tasdemiroglu, Server, 4,044,679, Cl. 102-52.000.
Tasset, Francis: *See—*
Deportes, Charles Henri; Henault, Marc Patrice Sylvain; Tasset, Francis; and Vitter, Gerard Raymond Robert, 4,045,319, Cl. 204-195.00S.
Tate, Mark T.: *See—*
Booher, Howard, 4,044,899, Cl. 214-82.000.
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Device for controlling a choke valve in a carburetor. 4,044,736, Cl. 123-119.00F.
Tausanovitch, Dusan; Lovisa, Peter R.; and Lovisa, Tullio E. Externally controlled spreader system. 4,044,987, Cl. 249-219.00W.
Taylor, Gary Burton; and Eberhardt, Roland C. Skateboard wheel assembly. 4,045,046, Cl. 280-87.04A.
Taylor, Ralph Charles: *See—*
Weisgerber, William Robert; and Taylor, Ralph Charles, 4,045,660, Cl. 235-151.110.
Teach, Eugene G.: *See—*
Lam, Hsiao-ling; and Teach, Eugene G., 4,045,557, Cl. 424-200.000.
Teche, Andre: *See—*
Hainaut, Daniel; Demoute, Jean-Pierre; and Teche, Andre, 4,045,209, Cl. 71-98.000.
Teijin Limited: *See—*
Ikeda, Morio, 4,044,541, Cl. 57-157.0TS.
Teijin Seiki Company Limited: *See—*
Hoshide, Itsuo, 4,044,538, Cl. 57-62.000.
Telectro-Mek, Inc.: *See—*
Russ, Daniel G., 4,044,604, Cl. 73-61.00R.
Russ, Daniel G., 4,045,139, Cl. 356-36.000.
Teletype Corporation: *See—*
Jones, Robert K.; and Sue, Harry, 4,045,310, Cl. 204-129.400.
Temple, Fred, to Westinghouse Air Brake Company. Emergency portion for brake control valve. 4,045,095, Cl. 303-37.000.
Terra Tek, Inc.: *See—*
Jones, Arfon Harry; Swolfs, Henri Samuel; and Green, Sidney Joseph, 4,044,828, Cl. 166-250.000.
Tesei, Renato: *See—*
Romano, Ugo; and Tesei, Renato, 4,045,464, Cl. 260-463.000.
Texaco Inc.: *See—*
Allen, Joseph C., 4,044,831, Cl. 166-275.000.
Dille, Roger M.; Van Stavern, Merle H.; Shull, Don L.; and Gripshover, David F., 4,045,671, Cl. 250-341.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,602, Cl. 73-59.000.
Higgs, Kenneth O.; and Marsch, Lawrence F., 4,044,603, Cl. 73-59.000.
Rubin, Isaac D.; and Nebzydoski, John W., 4,045,376, Cl. 252-56.00S.
Texas Instruments Incorporated: *See—*
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., 4,044,567, Cl. 62-6.000.
Textron Inc.: *See—*
Moertel, George B., 4,044,431, Cl. 24-205.13C.
Tezuka, Junichi, to Electroplating Engineers of Japan, Ltd. High speed nickel plating method using insoluble anode. 4,045,304, Cl. 204-49.000.
Thein, San: *See—*
Henze, Walter J.; and Thein, San, 4,044,489, Cl. 43-27.400.
Thomas, Everett A.; and Knake, Ronald W., to N L Industries, Inc. Refractory composition and method for preparation. 4,045,233, Cl. 106-57.000.
Thomas, Lewis P. Golf club weighted attachment. 4,045,034, Cl. 273-194.00B.
Thome, Paul. Fluid tight movable passage. 4,045,647, Cl. 219-121.0EB.
Thompson, Robert M.; and Nickol, Stephen L., to Suntech, Inc. Melt blending polyamide process. 4,045,512, Cl. 260-857.0TW.
Thomson-Brandt: *See—*
Phan, Chi Quy, 4,044,449, Cl. 29-460.000.
Thomson-CSF: *See—*
Carre, Roland, 4,045,798, Cl. 343-17.2PC.
de Corlieu, Guy; and Reymond, Jean-Claude, 4,045,120, Cl. 350-96.00C.
Le Cardonnel, Gerard; Gravez, Pierre; and Favre, Rene Marc, 4,045,622, Cl. 179-175.20C.
Moutou, Paul Cyril, 4,045,252, Cl. 148-1.500.
Thomson, Walter Grey: *See—*
Hill, Thomas; Kennedy, Ambrose; and Thomson, Walter Grey, 4,044,937, Cl. 225-97.000.
Tietjens, Eduard Willem, to U.S. Philips Corporation. Shaving apparatus with a holder for a cutting element. 4,044,463, Cl. 30-34.200.
Tietz, Gary W., to National Semiconductor Corporation. Circuit for squaring the transfer characteristics of a TTL gate. 4,045,689, Cl. 307-254.000.
Tii Corporation: *See—*
Armstrong, Edward T., 4,045,347, Cl. 210-199.000.
Time Data Corporation: *See—*
Sloane, Edwin A., 4,045,616, Cl. 179-1.0SA.
Titov, Dmitry Vladimirovich; Komarov, Jury Ivanovich; Butuzov, Alexei Vasilievich; and Farzaliev, Mazakhir Gamza Ogly. Weft thread beat-up mechanism for travelling wave shedding looms. 4,044,801, Cl. 139-436.000.
Tobback, Hubert: *See—*
Wens, Karel; Tobback, Hubert; and Hens, Karel, 4,045,301, Cl. 204-12.000.
Tobias, Samuel F.: *See—*
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., 4,044,567, Cl. 62-6.000.
Tobita, Tutomu: *See—*
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, to Tokyo Ohka Kogyo Kabushiki Kaisha. Photosensitive resin composition for flexographic printing plates. 4,045,231, Cl. 96-115.00P.
Todd, Robert A. Friction facing with porous sheet base. 4,045,608, Cl. 428-251.000.
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, to Toray Industries, Inc. Elastomer coated carbon filament

reinforcing yarn or cord, method and article. 4,044,540, Cl. 57-153.000.
Tokico Ltd.: *See—*
Ishida, Kunio, 4,044,866, Cl. 188-322.000.
Karasudani, Yasuo, 4,044,864, Cl. 188-73.300.
Toko, Inc.: *See—*
Arakawa, Koji, 4,045,753, Cl. 333-72.000.
Tokorozawa Electronic Corporation: *See—*
Itagaki, Tadasi; Iwama, Kiyonori; and Yoshimi, Toshikazu, 4,045,695, Cl. 310-322.000.
Tokuno, Masateru, to Rengo Co., Ltd. Goods discharging apparatus. 4,044,901, Cl. 214-89.000.
Tokunou, Takashi; Kouya, Shinichi; and Akatsuka, Shigeki, to Takeda Riken Kogyo Kabushikikaisha. Filter having an automatically controlled variable cut-off frequency. 4,045,731, Cl. 324-78.00F.
Tokyo Ohka Kogyo Kabushiki Kaisha: *See—*
Toda, Hiroyuki; Otomegawa, Eiichi; Aoyama, Toshimi; and Nakane, Hisashi, 4,045,231, Cl. 96-115.00P.
Tokyo Shibaura Electric Co., Ltd.: *See—*
Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, 4,045,764, Cl. 338-34.000.
Mori, Yasamasu; Ashiuchi, Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, 4,045,703, Cl. 313-497.000.
Yasutome, Osamu; and Takeda, Mitsuo, 4,045,702, Cl. 313-496.000.
Tolasch, Gerhard: *See—*
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.
Toler, Jacob A. Whirl toy. 4,044,499, Cl. 46-228.000.
Tomasky, Thomas: *See—*
Arnold, Robert Walker; and Tomasky, Thomas, 4,045,770, Cl. 346-75.000.
Tomlinson Industries, Inc.: *See—*
Giese, Elroy J., deceased, 4,044,998, Cl. 251-331.000.
Topar Products Corporation: *See—*
Parkinson, Harold B., 4,045,232, Cl. 106-28.000.
Toray Industries, Inc.: *See—*
Toki, Masamichi; Kusatsu, Noriaki; Kohno, Yoshio; and Matsugasako, Kenji, 4,044,540, Cl. 57-153.000.
Tordenmalm, Osten Lars: *See—*
Oldaeus, Karl Olof; Tordenmalm, Osten Lars; and Nilsson, Bo Nils, 4,044,610, Cl. 73-133.00R.
Torgerson, Duane E., to Belden Corporation. Hermetic lead wire. 4,045,611, Cl. 174-121.0SR.
Torstenfelt, Ragnar: *See—*
Andersson, Lars; Rehn, Johnny; and Torstenfelt, Ragnar, 4,045,099, Cl. 308-36.000.
Tourunen, Pekka Tapio, to AB Mecman. Hydraulic shock absorber. 4,044,865, Cl. 188-287.000.
Tower Manufacturing Corporation: *See—*
Mongeau, Roland E., 4,045,637, Cl. 200-303.000.
Townsend, Raymond. Occupant-propelled round about. 4,045,020, Cl. 272-33.00R.
Toyo Boseki Kabushiki Kaisha: *See—*
Isaka, Tsutomu; Inoue, Shuji; and Arakawa, Kunihiko, 4,045,515, Cl. 260-897.00A.
Katori, Kunihiko; Nagai, Hiroshi; and Shiiki, Zenya, 4,045,368, Cl. 252-421.000.
Toyo Ink Mfg. Co., Ltd.: *See—*
Suzuki, Hiroo; and Takada, Isao, 4,045,399, Cl. 260-29.60N.
Toyo Pulp Co., Ltd.: *See—*
Nagano, Tadashi; Miyao, Saisei; and Takeda, Katsuhiko, 4,045,279, Cl. 162-25.000.
Toyo Soda Manufacturing Co., Ltd.: *See—*
Kosaka, Yujiro; Uemura, Masaru; Hashimoto, Tsutomu; and Fukano, Kazuyuki, 4,045,353, Cl. 210-502.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Kuramochi, Koujirou; and Ohnuma, Kiyoshi, 4,044,556, Cl. 60-361.000.
Masaaki, Noguchi; Yukiyasu; Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, 4,044,730, Cl. 123-75.00B.
Miura, Motohisa; Muramatsu, Yukihiko; and Matsumoto, Noboru, 4,044,739, Cl. 123-119.00A.
Nishimura, Satomu, 4,044,737, Cl. 123-119.00A.
Ohta, Jun, 4,045,794, Cl. 340-414.000.
Sumiyoshi, Masaharu, 4,044,735, Cl. 123-119.00A.
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, 4,044,736, Cl. 123-119.00F.
Treber, Norbert: *See—*
Rau, Karlheinz; Muhlich, Albert; Simmat, Fritz; and Treber, Norbert, 4,045,198, Cl. 65-33.000.
Treheux, Daniel: *See—*
Guiraldenq, Pierre; Treheux, Daniel; and Marchive, Daniel, 4,045,596, Cl. 427-229.000.
Trevillyan, Alvin E., to Standard Oil Company (Indiana). Hydroformylation of olefins. 4,045,493, Cl. 260-604.0HF.
Trio Kabushiki Kaisha: *See—*
Goto, Tadaaki, 4,045,713, Cl. 315-391.000.
Tritsch, Ludwig, to Johnson & Johnson. Tab fastener having two tape segments attached to each other and to diaper. 4,044,767, Cl. 128-287.000.
Trivedi, Bhupendra C.: *See—*
Richards, Harvey J.; and Trivedi, Bhupendra C., 4,045,441, Cl. 260-289.0XA.
Trotter, Gerald F.: *See—*
Marchello, John L.; and Trotter, Gerald F., 4,044,531, Cl. 54-80.000.
Troy, Michael, to Raychem Corporation. Splice case housing. 4,045,612, Cl. 174-136.000.
Trumbull, Harold E.; and Poeth, Dean F., to Battelle Memorial Institute. Method of feeding particles from a first region to a second region. 4,044,904, Cl. 214-152.000.
Tsai, Chin-Chin. Distributor. 4,045,625, Cl. 200-24.000.
Tsai, Yih-Wan; Sensi, John E.; and Henry, Vincent I., to PPG Industries, Inc. Glassmaking furnace employing heat pipes for preheating glass batch. 4,045,197, Cl. 65-27.000.
Tsuboi, Masayoshi: *See—*
Shinozaki, Fumiaki; Ikeda, Tomoaki; and Tsuboi, Masayoshi, 4,045,222, Cl. 96-33.000.
Tsuji, Akio: *See—*
Fujisawa, Kenzo; Sakaedani, Yoshiyasu; and Tsuji, Akio, 4,044,475, Cl. 35-6.000.
Tsuji, Kozo: *See—*
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.
Matsunaga, Hiroomi; Tsuji, Kozo; and Saito, Teruo, 4,045,388, Cl. 260-17.4ST.
Tsunoda, Atsuo: *See—*
Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, 4,044,455, Cl. 29-592.000.
Tsuruta, Hidemasa; Kinoshita, Yoshiaki; and Tanaka, Isao, to Nittetu Chemical Engineering Ltd. Method for the disposal of waste water containing ammonium ions, sulfate ions and organic substances. 4,045,341, Cl. 210-45.000.
Tucker, Dalton R. Clamp assembly with guide means for removing selected arc length of clamped ring for size reduction. 4,044,413, Cl. 7-3.00R.
Tucker, William F.: *See—*
Burd, John W.; Stone, Bobbie D.; Tucker, William F.; and Gupta, Kedar P., 4,045,181, Cl. 23-273.00R.
Turbo Refrigerating Company: *See—*
Hagen, William F., 4,044,568, Cl. 62-73.000.
Turko, William Melvin: *See—*
Chiu, Shui-Tung; and Turko, William Melvin, 4,045,595, Cl. 427-202.000.
Turley, Bernard C., to Aluminum Company of America. Structure for switching electrical current and cell comprising same. 4,045,307, Cl. 204-64.000.
Turri, Eugenio: *See—*
Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno, 4,044,962, Cl. 242-47.050.
Tzakis, George J.: *See—*
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Hill, David C.; and Flanigen, Edith M., 4,045,593, Cl. 427-59.000.
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Robson, John Howard; and Marcus, Erich, 4,045,416, Cl. 260-77.5CR.
Taller, Robert Arthur; and Elder, Decker Kuykendall, 4,045,474, Cl. 260-484.00A.
Young, Robert Hayward; and Matzner, Markus, 4,045,180, Cl 23-260.000.
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Malz, Russell E., Jr.; Amidon, Roger W.; and Greenfield, Harold, 4,045,484, Cl. 260-561.00H.
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Green, Derek; Pardoe, John Alan; and Etherington, Clifford, 4,044,587, Cl. 72-261.000.
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Rowland, Stanley P., 4,045,173, Cl. 8-116.00P.
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Baker, Kenneth L., 4,045,740, Cl. 325-427.000.
F'Geppert, Erwin, 4,044,620, Cl. 74-190.000.
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Singer, Abraham; and Minkowski, Jan M., 4,045,730, Cl. 324-76.00R.
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Barak, Amitzur Z., 4,044,752, Cl. 126-270.000.
Cottingham, James G., 4,044,819, Cl. 165-1.000.
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Kolbly, Richard B. Direct reading inductance meter. 4,045,728, Cl. 324-59.000.
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Saffren, Melvin M. Apparatus for photon excited catalysis 4,045,359, Cl. 250-527.000.
Selcuk, M. Kudret. Solar energy collection system. 4,044,753, Cl. 126-271.000.
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Jackson, Melvin R., 4,045,255, Cl. 148-32.000.
Morris, James F., 4,045,247, Cl. 136-240.000.
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Schaefer, David H.; and Strong, James P., III, 4,045,792, Cl. 340-347.0AD.
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Bumgardner, Jon H., 4,045,140, Cl. 356-141.000.
Feldman, Harold P., 4,044,863, Cl. 188-65.100.
Goldstein, David; Pless, William C.; Shapiro, Michael; Spencer, Dana; and Starr, Leland E., Jr., 4,044,599, Cl. 73-12.000.
Griffith, James R.; and O'Rear, Jacques G., 4,045,408, Cl. 260-47.0EA.
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Barten, Piet Gerard Joseph, 4,045,754, Cl. 335-212.000.
Berger, Erich, 4,044,868, Cl. 192-12.00B.
Bos, Jules; and von der Kall, Gunter, 4,044,509, Cl. 51-206.00P.
Dapiran, Fulvio, 4,045,799, Cl. 343-113.0PT.
Hargreaves, Clifford McDonald, 4,044,911, Cl. 220-9.0LG.
Kunath, Helfrid, 4,044,878, Cl. 197-1.00R.
Shannon, John Martin; and Beale, Julian Robert Anthony, 4,045,248, Cl. 148-1.500.
Tietjens, Eduard Willem, 4,044,463, Cl. 30-34.200.
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Vrenken, Louis Eugene; and Broerse, Pieter Hendrik, 4,045,664, Cl. 240-46.030.
United Technology, Inc.: *See—*
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Yen, Teh Fu; and Wen, Chaur-Shyong, 4,045,313, Cl. 204-131.000.
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Bundy, Gordon L., 4,045,449, Cl. 260-340.200.
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USM Corporation: *See—*
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Uyeda, Roy Teruyuki, to E. I. Du Ponte de Nemours and Company. Antidepressant 1,1a,6,10b-tetrahydrodibenzo[a,e]cyclopropa[c]-cyclohepten-6-substituted oximes. 4,045,432, Cl. 260-239.00B.
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Van Brakel, Russel A., to Haverberg Auto Laundry Equipment Co. Inc. Reduced length vehicle conveyor. 4,044,686, Cl. 104-172.00B.
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Van Holten, James Wilbur. Gun sight mounting. 4,044,486, Cl. 42-1.0ST.
Van Huisen, Allen T. Multiple-completion geothermal energy production systems. 4,044,830, Cl. 166-267.000.
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Varga, William J., to Chase Brass & Copper Co., Incorporated. Continuous casting method using graphite mold impregnated with unsaturated drying oil. 4,044,817, Cl. 164-138.000.
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Achener, Pierre Y.; Boehme, Detlef R.; Judah, Kenneth C.; and Munk, Miner N., 4,045,343, Cl. 210-101.000.
Ernst, Richard R., 4,045,723, Cl. 324-.5OA.
Wheeler, William R., 4,044,993, Cl. 251-158.000.
Vasishth, Ramesh C.; and Chandramouli, Pitchaiya, to Cor Tech Research Limited. Mobile room-temperature stable acid catalyzed phenol formaldehyde resin compositions. 4,045,411, Cl. 260-59.00R
Vaught, John M., to General Motors Corporation. Variable geometry swirler. 4,044,553, Cl. 60-39.230.
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Opletal, Josef, 4,044,884, Cl. 198-415.000.
Vella, James. Closure element for a container. 4,044,917, Cl 220-288.000.
Velsicol Chemical Corporation: *See—*
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Wu, Chin Ching; and Krenzer, John, 4,045,446, Cl. 260-294.80C
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Verhoeven, Leonardus Adrianus Johannes; De Haan, Maarten Rutger; and Janssen, Peter Johannes Michiel, to U.S. Philips Corporation. Color television recording system employing frequency modulation and pulse width modulation. 4,045,812, Cl. 358-4.000

Vering, Antonius: *See*—
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.
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Villanueva, Eliseo Herrando. Continuous cutting machine for stone and building materials. 4,044,748, Cl. 125-13.00R.
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Vogel, Axel, to Bayer Aktiengesellschaft. Process for separating 1,5-dinitroanthraquinone and 1,8-dinitroanthraquinone from dinitroanthraquinone mixtures. 4,045,455, Cl. 260-369.000.
Vogel, John D., to McCord Corporation. Cage for flailing tube. 4,044,953, Cl. 239-229.000.
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Vorobiev, Vladimir Dmitrievich: *See*—
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.
Voss, David Lehmann; Miller, William Albert; and Hermansen, Ralph David, to Sierracin Corporation. Transparent formable polyurethane polycarbonate lamination. 4,045,269, Cl. 156-221.000.
Voss, Gunter: *See*—
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Vrenken, Louis Eugene; and Broerse, Pieter Hendrik, to U.S. Philips Corporation. Lighting fitting provided with at least two-low-pressure mercury vapor discharge lamps. 4,045,664, Cl. 240-46.030.
W. R. Grace & Co.: *See*—
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Larsen, Donald W., 4,045,317, Cl. 204-159.230.
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Morgan, Charles R., 4,045,516, Cl. 260-886.000.
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Wolfe, Court Lone; and Krutz, Ronald Louis, 4,045,679, Cl. 250-461.00R.
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Walker, Ian Clive, to Micro Consultants, Limited. Digital storage systems. 4,045,613, Cl. 178-69.100.
Walker, Keith A. M., to Syntex (U.S.A.) Inc. Derivatives of substituted N-alkyl imidazoles. 4,045,568, Cl. 424-273.000.
Walker, Keith Francis, to Data Recording Instrument Company Limited. Detector circuits. 4,045,743, Cl. 328-150.000.
Walker Magnetics Group, Inc.: *See*—
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Wallace, John F., to PPG Industries, Inc. Method of casting bismuth, silicon and silicon alloys. 4,045,536, Cl. 264-327.000.
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Wallin, Jan-Olof, to Granges Essem Aktiebolag. Locking mechanism for vehicle safety belts. 4,044,969, Cl. 242-107.40A.
Wallis, Bernard J. Lubricating means for gas-operated cylinders. 4,044,859, Cl. 184-18.000.
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Walter Kidde & Company, Inc.: *See*—
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Wannag, Arne T. Forceps made in one piece. 4,044,771, Cl. 128-354.000.
Ward, John W., to Union Oil Company of California. Demetallization and desulfurization of petroleum feed-stocks with manganese on alumina catalysts. 4,045,331, Cl. 208-213.000.
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Warrick, James C., to Bailey Meter Company. Pneumatic function generator assembly. 4,044,651, Cl. 91-47.000.
Warthen, John Lawrence; Briggs, Warren Stanley; and Paggen, Marvin Vernon, to W. R. Grace & Co. Control of physical properties of alumina extrudates. 4,045,372, Cl. 252-463.000.
Wason, Satish K.; and van der Heem, Peter, to J. M. Huber Corporation. Amorphous precipitated siliceous pigments and methods for their production. 4,045,240, Cl. 106-288.00B.
Wassermann, Eberhard, to Sulzer Bros. (U.K.) Limited. Method for preventing web rewetting. 4,045,281, Cl. 162-214.000.
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Kuhne, Kurt Anton; and Wassilieff, Alexander, 4,044,665, Cl. 101-21.000.
Watanabe, Eiji, to Nihon Denshi Kabushiki Kaisha. Apparatus for tomography comprising a pin hole for forming a microbeam of X-rays. 4,045,672, Cl. 250-360.000.
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Watanabe, Kenji. Clothes hanger particularly for skirt, slacks and the like. 4,044,928, Cl. 223-96.000.
Watanabe, Masashi: *See*—
Matsunaga, Hiroomi; Fujimura, Sigel; Namioka, Hisao; Tsuji, Kozo; and Watanabe, Masashi, 4,045,204, Cl. 71-11.000.
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Watanabe, Satoshi; Tsunoda, Atsuo; Kimura, Takeshi; and Narita, Hitoshi, to Canon Kabushiki Kaisha; and Canon Denshi Kabushiki Kaisha. Method of making a printing hammer unit. 4,044,455, Cl. 29-592.000.
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Smith, David H.; and Knight, Richard I., 4,045,705, Cl. 315-3.000.
Watson, Charles J.; and Langrehr, Larry L., to Bell & Howell Company. Control system for photographic film printers. 4,045,136, Cl. 355-83.000.
Watson, Gilbert L.: *See*—
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Watt, David M., Jr.; and Nirschl, Joseph P., to Procter & Gamble Company, The. Fabric conditioning compositions. 4,045,361, Cl. 252-8.800.
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Caffarella, Thomas E.; Radda, George J.; and Watts, David J., 4,045,201, Cl. 65-105.000.
Waymouth, John F.: *See*—
Chu, Gordon P. K.; Shinn, Dennis B.; and Waymouth, John F., 4,045,156, Cl. 431-95.00R.
Weber, John E.: *See*—
Yoder, Alan C.; and Weber, John E., 4,045,636, Cl. 200-292.000.
Weber, Julius: *See*—
Dorsch, Heinz; and Weber, Julius, 4,044,560, Cl. 60-601.000.
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Wedemeyer, Karlfried: *See*—
Klein, Alfons; and Wedemeyer, Karlfried, 4,045,499, Cl. 260-621.00R.
Weedon, Gene Clyde: *See*—
Fisher, William Bernard; Kim, Dong Wha; Norwood, Orin Wyatt; Showers, John Walter; Swanson, Eugene Addison; and Weedon, Gene Clyde, 4,045,534, Cl. 264-237.000.
Weeks, Lloyd E.; Johnson, John H.; and Reents, Margaret J., to Monsanto Company. Triglycerides determination method. 4,045,297, Cl. 195-103.50R.
Wehinger, Egbert: *See*—
Moller, Eike; Meng, Karl; Wehinger, Egbert; and Horstmann, Harald, 4,045,571, Cl. 424-273.00P.
Weigele, Manfred: *See*—
Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,045,487, Cl. 260-570.50C.
Weiger, Gunter: *See*—
Florus, Hans-Jorg; Grossner, Horst; and Weiger, Gunter, 4,044,634, Cl. 74-866.000.
Weigle, Dwight Carl, to Procter & Gamble Company, The. Meat analog from agglomerated protein. 4,045,590, Cl. 426-656.000.
Weinke, Robert; and Wiesmeier, Georg, to Siemens Aktiengesellschaft. Apparatus for moving a printer carriage. 4,044,882, Cl. 197-82.000.
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Weldotron Corporation: *See*—
Zelnick, Seymour, 4,044,529, Cl. 53-198.00R.
Welkowsky, Murray S.: *See*—
Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., 4,044,718, Cl. 118-647.000.
Wellauer, Edward J.; and Strommen, John A., to Falk Corporation, The. Serpentine grid flexible coupling. 4,044,572, Cl. 64-15.00B.
Welstead, William J., Jr.; and Moran, Henry W., to A. H. Robins Company, Incorporated. Anti-inflammatory methods using 2-amino-3-(5- and 6-)benzoylphenylacetic acids, esters and metal salts thereof and the compounds. 4,045,576, Cl. 424-309.000.
Wen, Chaur-Shyong: *See*—
Yen, Teh Fu; and Wen, Chaur-Shyong, 4,045,313, Cl. 204-131.000.
Wens, Karel; Tobback, Hubert; and Hens, Karel, to Metallurgie Hoboken-Overpelt. Electrolytic deposition of metals. 4,045,301, Cl. 204-12.000.
Wenzel, Donald E.; and Felicetta, Vincent F., to Georgia-Pacific Corporation. Lignin dispersant. 4,045,421, Cl. 260-124.00R.
Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Karayannis, Panayotis, 4,044,682, Cl. 102-70.2GA.
West, Gene A., to General Motors Corporation. Gas turbine engine synchronous speed detector. 4,044,552, Cl. 60-39.16S.
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West Manufacturing & Towing Equipment Inc.: *See*—
Gaumont, Richard J.; Wolfe, Maurice Leonard; and Collins, Robert Lee, 4,044,900, Cl. 214-86.00A.
Westbrook, James E., to Conrac Corporation. Digital tone detector. 4,045,620, Cl. 179-84.0VF.
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Kohlstette, Werner; and Pautsch, Gunthard, 4,044,945, Cl. 233-20.00A.
Westinghouse Air Brake Company: *See*—
Bridigum, Robert J., 4,045,093, Cl. 303-3.000.
Temple, Fred, 4,045,095, Cl. 303-37.000.
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Obenshain, David Noel, 4,045,038, Cl. 279-2.00R.
Wetzel, Rolf; and Radke, Dietrich, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Method for producing steel. 4,045,214, Cl. 75-60.000.
Wetzel, Thomas Andrew: *See*—
Luedders, Wilmer Louis; and Wetzel, Thomas Andrew, 4,045,548, Cl. 424-47.000.
Wham-O Mfg. Co.: *See*—
Gillespie, Richard Lee; and Melin, Arthur Kelso, 4,045,026, Cl. 273-96.00R.
Wheatley, Carl Franklin, Jr., to RCA Corporation. Adjustable gain current amplifiers. 4,045,746, Cl. 330-23.000.
Wheeler, William R., to Varian Associates, Inc. High vacuum gate valve. 4,044,993, Cl. 251-158.000.
Wheelock, Kenneth S.; and Say, Geoffrey R., to Exxon Research and Engineering Company. Process for preparing a gas desulfurization sorbent. 4,045,371, Cl. 252-462.000.
Wheelwright, Robert W.; and Solender, Peter E., to Wurlitzer Company, The. Electronic phonograph selector and memory system. 4,045,776, Cl. 340-162.000.
Whicker, Stephen L.: *See*—
Dix, Robert M.; Tobias, Samuel F.; and Whicker, Stephen L., 4,044,567, Cl. 62-6.000.
White, Robert S., Jr., to GTE Sylvania Incorporated. Welding process for slotted tungsten rod. 4,045,645, Cl. 219-118.000.
White, Russell L.; and Edwards, Kenneth L., to Aluminum Company of America. Bath level set point control in an electrolytic cell and method of operating same. 4,045,308, Cl. 204-67.000.
Whitlock, Donald E.: *See*—
Babunovic, Momir; and Whitlock, Donald E., 4,044,783, Cl. 134-73.000.
Whitney Research Tool Company: *See*—
Matousek, Stephen; and och, Ulrich H., 4,044,631, Cl. 74-606.00R.
Whittaker, Francis E.: *See*—
McDonald, Donald C.; Ela, Roger B.; and Whittaker, Francis E., 4,044,894, Cl. 214-1.0QD.
Wick, Gerald H., to Outboard Marine Corporation. Lawn mower blade clutch and brake. 4,044,533, Cl. 56-11.300.
Wiechert, Rudolf: *See*—
Kerb, Ulrich; Wiechert, Rudolf; Kieslich, Klaus; Petzoldt, Karl; Wachtel, Helmut; Palenschat, Dieter; Horowski, Reinhard; Paschelke, Gert; and Kehr, Wolfgang, 4,045,574, Cl. 424-303.000.
Wieder, Rodney L.; Neetz, Michael A.; and Sell, Earl O. Apparatus and method for handling garment hangers. 4,045,067, Cl. 294-15.000.
Wiegers, Wilhelmus Johannen; and Hall, John B., to International Flavors & Fragrances Inc. Process for producing cis-jasmone. 4,045,489, Cl. 260-586.00C.
Wiese, Wolfgang: *See*—
Bardenhagen, Dietrich; Niemann, Helmut; Steiniger, Wolfgang; Tolasch, Gerhard; and Wiese, Wolfgang, 4,044,659, Cl. 93-77.0FT.
Wieske, Theophil, to Lever Brothers Company. Margarine fat. 4,045,588, Cl. 426-607.000.
Wiesmeier, Georg: *See*—
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Wiher, Wilfried: *See*—
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Wilder, Frank A., to General Electric Company. Conveyor mechanism. 4,044,649, Cl. 89-33.0BB.
Wildhaber, Ernest. Flexing-disk coupling. 4,044,571, Cl. 64-13.000.

Wildhaber, Ernest. Twin channel reduction drive with electric motor. 4,044,632, Cl. 74-665.00G.

Wilfert, Karl; Schmid, Walter; and Jambor, Arno, to Daimler-Benz Aktiengesellschaft. Passenger motor vehicle. 4,045,052, Cl. 280-701.000.

Wilhelm, George M. Method and device for controlling radiation. 4,045,818, Cl. 358-245.000.

Wilhelm, Manfred: *See—*
Ziegler, Gunther; Frohmader, Sigrun; and Wilhelm, Manfred, 4,044,456, Cl. 29-599.000.

Wilhelm, Max; Bernasconi, Raymond; Storni, Angelo; Beck, Dieter; and Schenker, Karl, to Ciba-Geigy Corporation. Pharmaceutical preparation using 9-(2-hydroxy-3-amino-propyl)-9,10-dihydro-9,10-ethano-anthracenes as antidepressants. 4,045,580, Cl. 424-330.000.

Wilkerson, Larry A.: *See—*
Barecki, Chester J.; and Wilkerson, Larry A., 4,045,080, Cl. 297-283.000.

Wilkins, John Thomas, to R. G. Dixon & Company Limited. Floor treating machines. 4,044,848, Cl. 180-6.500.

Wilkus, Edward V.: *See—*
Lever, Ray C.; and Wilkus, Edward V., 4,045,403, Cl. 260-42.420.

Wm. C. Staley Machinery Corporation: *See—*
Sardella, Louis M., 4,045,015, Cl. 271-112.000.

Williams, Cole C. Display device and method of making same. 4,044,483, Cl. 40-152.000.

Williams, Gary E., to Armstrong Cork Company. Method of inhibiting plasticizer migration from plasticized poly(vinyl chloride) substrates. 4,045,600, Cl. 427-379.000.

Williams, Harrison L.; and Banhidy, Detre M., to Preformed Line Products Co. Diffuser attachment for a fluorescent lamp fixture. 4,045,665, Cl. 240-51.11R.

Williams, James F. Boat motor display and work stand. 4,044,978, Cl. 248-13.000.

Williams, Malcolm; and Jones, Christopher Robin, to Lucas Electrical Company Limited. Pollution control arrangements for engines. 4,044,738, Cl. 123-119.00A.

Williams, Michael R.; and McDonald, Dean T., to FMC Corporation. Folding boom. 4,044,952, Cl. 239-165.000.

Williamson Corporation: *See—*
Anderson, Alan S.; and Cardarelli, John J., 4,045,670, Cl. 250-338.000.

Williston, David Wyckoff; Bancroft, Lewis Clinton; and Hiller, Dale Murray, to Du Pont de Nemours, E. I., and Company. Process for the preparation of ferromagnetic chromium dioxide. 4,045,544, Cl. 423-607.000.

Wilson, Richard Arnold: *See—*
Katz, Ira; Pittet, Alan O.; Wilson, Richard Arnold; and Evers, William John, 4,045,587, Cl. 426-533.000.

Winnick, Charles N., to Halcon International, Inc. Chemical process for producing isoprene by pyrolysis of allylic esters. 4,045,419, Cl. 260-681.000.

Winsor, Malcolm C. Wheelchair. 4,044,850, Cl. 180-9.20C.

Winston, Roland: *See—*
Mlavsky, Abraham I.; and Winston, Roland, 4,045,246, Cl. 136-89.0PC.

Wire Conveyor Belts, Inc.: *See—*
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Witzel, Frank: *See—*
Mackay, Donald A. M.; Witzel, Frank; Dwivedi, Basant K.; and Schoenholz, Daniel, 4,045,581, Cl. 426-3.000.

Wix Corporation: *See—*
Humbert, Kingsley E., Jr., 4,045,349, Cl. 210-232.000.

Wohlert, Andrew M., to Riverbank Laboratories, Inc. Carbon paper recycling system. 4,045,243, Cl. 134-1.000.

Wolcott, John M.: *See—*
Petrowski, Gary E.; Wolcott, John M.; and Ortiz, Erlinda P., 4,045,589, Cl. 426-609.000.

Wolfe, Court Lone; and Krutz, Ronald Louis, to W. R. Grace & Co. Fluorescent gas analyzer. 4,045,679, Cl. 250-461.00R.

Wolfe, Denis G.; and Danon, Joseph S., to Robertshaw Controls Company. Burner system with absorbent carbon flame responsive switch. 4,045,155, Cl. 431-42.000.

Wolfe, Maurice Leonard: *See—*
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Wolk, Ronald H.: *See—*
Johanson, Edwin S.; and Wolk, Ronald H., 4,045,329, Cl. 208-10.000.

Wong, Nam San: *See—*
Tang, Raymond; and Wong, Nam San, 4,045,800, Cl. 343-854.000.

Wood, Bruce G. Surfboard leash. 4,044,415, Cl. 9-310.00E.

Woodbridge, Joseph Eliot: *See—*
Bulbenko, George F.; and Woodbridge, Joseph Eliot, 4,045,290, Cl. 195-99.000.

Woodbury, Henry H.: *See—*
Kingsley, Jack D.; and Woodbury, Henry H., 4,045,675, Cl. 250-370.000.

Wooldridge, Darrel M., to American Tractor Equipment Corporation. Automatic control for ripper tool. 4,044,838, Cl. 172-2.000.

Worcester, John L.; and Hubbs, John C., to E-H Research Laboratories, Inc. Apparatus for testing electronic devices having a high density array of pin leads. 4,045,735, Cl. 324-158.00F.

Worden, Donald A.; de Versterre, William I.; and Petry, Henry Alfred, to Marotta Scientific Controls, Inc. Rolling mill gap sensor. 4,044,580, Cl. 72-21.000.

Worick, Richard A., to Fleming, Charles W.; Meier, Gerald H.; Rasdall, Milton; and Laas, William. Flexible multi-section implement. 4,044,842, Cl. 172-314.000.

Worley, David W.: *See—*
Mierzwinski, Eugene P.; and Worley, David W., 4,045,777, Cl. 340-168.00B.

Worner, Gunter, to Daimler-Benz Aktiengesellschaft. Clutch disc with plural friction dampers. 4,044,874, Cl. 192-106.200.

Wright, William E., to Ethyl Corporation. Process for preparing dialkylphosphites. 4,045,519, Cl. 260-976.000.

Wroblewski, Jerome J.: *See—*
Carrieri, Louis F.; Brownell, James R.; Helrigel, Robert A.; Ward, Roderick K.; and Wroblewski, Jerome J., 4,044,592, Cl. 72-462.000.

WSW Stahl- und Wasserbau GmbH Selm: *See—*
Stog, Wilhelm, 4,044,887, Cl. 198-526.000.

Wu, Bosco, to Pitney-Bowes, Inc. Weighing system with a moire optoelectronic transducer. 4,044,847, Cl. 177-210.00R.

Wu, Chin Ching; and Krenzer, John, to Velsicol Chemical Corporation. 1-Benzothiazolyl-5-pyridylcarbonyloxyimidazolidinones. 4,045,446, Cl. 260-294.80C.

Wulff, Peter, to Siemens Aktiengesellschaft. X-ray image intensifier. 4,045,700, Cl. 313-242.000.

Wurlitzer Company, The: *See—*
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Wurr, Jurgen: *See—*
Mollenkopf, Hans; Wurr, Jurgen; Vering, Antonius; Loffler, Bernhard; and Eiring, Karl, 4,045,161, Cl. 432-80.000.

Wylie, Glenn John. Cheque writing desk and control system. 4,044,694, Cl. 108-28.000.

Wyman, Charles E.; and Holstead, Robert D., to Monsanto Company. Device for separation of liquid from paste or semi-solid. 4,045,354, Cl. 210-523.000.

Xerox Corporation: *See—*
Amort, Andrew L., 4,045,016, Cl. 271-155.000.
Bean, Lloyd F., 4,045,219, Cl. 96-1.200.
Burnham, Robert D.; Scifres, Donald R.; and Streifer, William, 4,045,749, Cl. 331-94.50H.
Markle, Robert Eugene, 4,045,779, Cl. 364-900.000.
Marshall, Richard C., 4,045,750, Cl. 333-6.000.
McVeigh, James H., 4,045,218, Cl. 96-1.200.
Menon, Sukumaran K.; and Hattler, Louis R., 4,045,163, Cl. 432-59.000.
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Pollack, Joel M.; and Flannery, John B., 4,045,124, Cl. 350-160.0LC.
Radler, Richard W., Jr., 4,045,413, Cl. 260-63.00R.

Xomed, Inc.: *See—*
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Xonics, Inc.: *See—*
Blake, Stephen D.; Kaegi, Emil M.; Muntz, Eric P.; and Welkowsky, Murray S., 4,044,718, Cl. 118-647.000.

Yaesu Rehabili Co., Ltd.: *See—*
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Yagami, Toshiaki: *See—*
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Yagi, Kenjiro; and Asano, Kazuhiro, to Kabushiki Kaisha Daini Seikosha. Electronic timepiece. 4,044,544, Cl. 58-23.00R.

Yahner, Joseph A.: *See—*
Beck, James R.; and Yahner, Joseph A., 4,045,466, Cl. 260-465.00E.

Yamada, Eiji; Fukasawa, Akira; and Masaki, Shinzaburo, to Sumitomo Chemical Company, Limited. Production of 1-nitroanthraquinone and 1-aminoanthraquinone. 4,045,454, Cl. 260-369.000.

Yamada, Seiichi; and Murakawa, Kyohei, to Fujitsu Limited. Alumina substrate and method of manufacturing same. 4,045,412, Cl. 264-63.000.

Yamaguchi, Masatugu: *See—*
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Yamamoto, Hisao: *See—*
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Yamamoto, Kaname: *See—*
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Yamamoto, Kenji: *See—*
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Yamamoto, Mitsuyoshi: *See—*
Nara, Takashi; Takasawa, Seigo; Okachi, Ryo; Kawamoto, Isao; Yamamoto, Mitsuyoshi; Sato, Seiji; Sato, Tomoyasu; and Morikawa, Atsuko, 4,045,298, Cl. 195-80.00R.
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Yamamoto, Shunji: *See—*
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Yamamoto, Yasakao: *See—*
Hayashi, Gentaro; Yamamoto, Kenji; and Yamamoto, Yasakao, 4,044,626, Cl. 74-573.00F.

Yamanouchi Pharmaceutical Co. Ltd.: *See—*
Murakami, Masuo; Murase, Kiyoshi; Niigata, Kunihiro; Tachikawa, Shiro; and Takenaka, Toichi, 4,045,482, Cl. 260-570.700.

Yamazaki, Eiichi; and Kanai, Hiromi, to Hitachi, Ltd. Method for making phosphor screen for black matrix type color picture tube using two light sources. 4,045,224, Cl. 96-36.100.

Yamazaki, Noboru; and Higashi, Fukuji, to Sumitomo Chemical Company, Limited. Production of aromatic polyamides. 4,045,417, Cl. 260-78.00A.

Yamazoe, Hiroshi: *See—*
Iwamoto, Kazumi; Tobita, Tutomu; Masuyama, Toshio; and Yamazoe, Hiroshi, 4,045,526, Cl. 264-.500.

Yanagawa, Itiro; and Suzuki, Isao, to Jidosha Kiki Co., Ltd. Relay valve combined with a load-sensing proportion valve. 4,045,094, Cl. 303-22.00R.

Yanagida, Takehiko: *See—*
Fujie, Kunio; Itoh, Masaaki; Innami, Tamio; Kimura, Hideyuki; Nakayama, Wataru; and Yanagida, Takehiko, 4,044,797, Cl. 138-38.000.

Yanik, Stephen J.: *See—*
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Yashiro, Katuo: *See—*
Nishi, Atsuyoshi; and Yashiro, Katuo, 4,045,159, Cl. 431-328.000.

Yashiro, Kenji; and Saeki, Yoshifumi, to Pioneer Electronic Corporation. Device for sensing the operative status of electrical equipment. 4,045,732, Cl. 324-133.000.

Yasuda, Michio: *See—*
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Yasui, Kiyoshi: *See—*
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Yasutome, Osamu; and Takeda, Mitsuo, to Tokyo Shibaura Electric Co., Ltd. Fluorescent character indicating tube. 4,045,702, Cl. 313-496.000.

Yasytome, Osamu: *See—*
Mori, Yasamasu; Ashiuchi, Kenzo; Yasytome, Osamu; and Sawamura, Tagayasu, 4,045,703, Cl. 313-497.000.

Yeda Research and Development Co. Ltd.: *See—*
Haviv, Fortuna; and Patchornik, Abraham, 4,045,438, Cl. 544-29.000.

Yen, Shiao-Ping S.: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Klein, Elias, 4,045,352, Cl. 210-500.00M.

Yen, Teh Fu; and Wen, Chaur-Shyong, to University of Southern California, The. Electrolytic recovery from bituminous materials. 4,045,313, Cl. 204-131.000.

Yip, James K., to Eaton Corporation. Load sensing steering system with dual power source. 4,044,786, Cl. 137-101.000.

Yoder, Alan C.; and Weber, John E., to Bowmar Instrument Corporation. Keyboard switch assembly having printed circuit board with plural layer exposed contacts and undersurface jumper connections. 4,045,636, Cl. 200-292.000.

Yokomizo, Yuji: *See—*
Ichinose, Noboru; Yokomizo, Yuji; and Katsura, Masaki, 4,045,764, Cl. 338-34.000.

Yokota, Ittshu, to Ishigaki Kiko Co., Ltd., a part interest. Apparatus for treating waste water. 4,045,344, Cl. 210-106.000.

Yoshida Kogyo Kabushiki Kaisha: *See—*
Douri, Hisashi, 4,044,445, Cl. 29-706.000.
Ebata, Hiroyuki, 4,044,432, Cl. 24-205.16R.
Nakada, Katsuo, 4,044,504, Cl. 49-425.000.

Yoshida, Toshiro: *See—*
Tateno, Hidenori; Yoshida, Toshiro; and Hirasawa, Koichi, 4,044,736, Cl. 123-119.00F.

Yoshida, Yasutoshi: *See—*
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Yoshida, Yoshinari: *See—*
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Yoshimi, Toshikazu: *See—*
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Young, Carter R.: *See—*
Kerzee, Richard; McCollum, Robert W.; and Young, Carter R., 4,044,827, Cl. 166-133.000.

Young, Danny J., to Fair, James W. Rechargeable flashlight assembly. 4,045,663, Cl. 240-10.6CH.

Young, Robert Hayward; and Matzner, Markus, to Union Carbide Corporation. Apparatus for copolymerizing gaseous monomers. 4,045,180, Cl. 23-260.000.

Young, Robert S.: *See—*
Young, Walter M.; and Young, Robert S., 4,044,490, Cl. 43-42.060.

Young, Walter M.; and Young, Robert S. Fishing lure. 4,044,490, Cl. 43-42.060.

Youngstown Sheet and Tube Company: *See—*
Griffith, Robert G., 4,044,582, Cl. 72-97.000.

Yu, Se Puan; and Glover, Gary H., to General Electric Company. Microwave proximity detector. 4,045,727, Cl. 324-58.50B.

Yukiyasu, Tanaka: *See—*
Masaaki, Noguchi; Yukiyasu, Tanaka; Setsuro, Sekiya; and Katsuhiko, Motosugi, 4,044,730, Cl. 123-75.00B.

Zabelnikov, Nikolai Sergeevich: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Zacharski, Edward J.: *See—*
Hartung, Albert F.; Lehan, Frank W.; Barooshian, Charles T.; and Zacharski, Edward J., 4,045,814, Cl. 358-124.000.

Zakharov, Leonid Sergeevich: *See—*
Korshak, Vasily Vladimirovich; Gribova, Irina Alexandrovna; Kabachnik, Martin Izrailevich; Krasnov, Alexandr Petrovich; Chumaevskaya, Alla Nikolaevna; Vinogradova, Olga Vladimirovna; Vinogradova, Svetlana Vasilievna; Krongauz, Evgenia Semenovna; Berlin, Alla Markovna; Vinogradov, Alexandr Vasilievich; Gureeva, Galina Ilinichna; Zakharov, Leonid Sergeevich; Vorobiev, Vladimir Dmitrievich; Mazaeva, Irina Sergeevna; Mamatsashvili, Georgy Viktorovich; Zabelnikov, Nikolai Sergeevich; and Kofman, Natalia Monovna, 4,045,400, Cl. 260-37.00N.

Zander, Robert W., to General Motors Corporation. Viscous damper for smoothing torsional and bending vibrations in rotating shafts. 4,044,627, Cl. 74-574.000.

Zazzara, Joseph R. Dough forming and cutting machine. 4,045,151, Cl. 425-297.000.

Zdanowski, Richard E.: *See—*
Guerin, John D.; Hutton, Thomas W.; Miller, John J.; and Zdanowski, Richard E., 4,045,517, Cl. 260-901.000.

Zehe, Alfred: *See—*
Butter, Ehrenfried; Jacobs, Brigitte; Jacobs, Klaus; Unger, Konrad; Zehe, Alfred; Doss, Rainer; and Kugler, Florian, 4,045,257, Cl. 148-171.000.

Zeigler, Kenneth H. Barbeque blower. 4,044,750, Cl. 126-25.00B.

Zelant, Gazuit: *See—*
Gazuit, Georges, 4,045,150, Cl. 425-58.000.

Zelnick, Seymour, to Weldotron Corporation. Pallet stretch-wrap apparatus. 4,044,529, Cl. 53-198.00R.

Zenith Radio Corporation: *See—*
Dougherty, Lawrence W., 4,045,701, Cl. 313-408.000.
Meehan, David H.; and Tzakis, George J., 4,045,742, Cl. 328-9.000.

Zenyaku Kogyo Kabushiki Kaisha: *See—*
Takase, Muneaki, 4,044,713, Cl. 118-19.000.

Zeuthen & Aagaard A/S: *See—*
Gorr, Theodor Wilhelm, 4,044,672, Cl. 101-132.500.

Ziegler, Gunther; Frohmader, Sigrun; and Wilhelm, Manfred, to Siemens Aktiengesellschaft. Method for the manufacture of a superconductor with a superconductive intermetallic compound of at least two elements. 4,044,456, Cl. 29-599.000.

Ziegler, William H., Jr.: *See—*
Boucher, Raymond W.; and Ziegler, William H., Jr., 4,045,045, Cl. 280-87.02W.

Ziemba, Richard T., to General Electric Company. Remotely controlled electronic fuze. 4,044,680, Cl. 102-70.20R.

Zimmermann, Volker: *See—*
Lutz, Heinz; Zimmermann, Volker; and Zuehlke, Rainer, 4,045,696, Cl. 310-49.00R.

Zocher, Josef, to Singer Company, The. Method of finless cold forming of sewing machine needle. 4,044,814, Cl. 163-5.000.

Zodrow, Rudolf, to Jagenberg Werke Aktiengesellschaft. Apparatus for applying foil labels to containers. 4,045,276, Cl. 156-571.000.

Zondler, Helmut; Saladin, Emil; and Kirchmayr, Rudolf, to Ciba-Geigy Corporation. 1,2-Oxaphospholanes. 4,045,518, Cl. 260-927.00R.

Zuehlke, Rainer: *See—*
Lutz, Heinz; Zimmermann, Volker; and Zuehlke, Rainer, 4,045,696, Cl. 310-49.00R.

Zust, Armin: *See—*
Dorhofer, Gunther; Heckendorn, Roland; Schmid, Erich; Storni, Angelo; and Zust, Armin, 4,045,570, Cl. 424-275.000.

Zwick, Eugene B. Low emission combustion process and apparatus. 4,044,549, Cl. 60-39.020.

Zwisler, Hans: *See—*
Schleich, Josef; and Zwisler, Hans, 4,045,355, Cl. 210-532.00R.

Zytkovicz, Duane J.: *See—*
Corbin, Terry; and Zytkovicz, Duane J., 4,044,774, Cl. 128-404.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 30TH DAY OF AUGUST, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aono, Toshiaki: *See—*
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Bloom, Carl, to Worthington Compressors, Inc. Compact housing for rotary compressor system. Re. 29,378, Cl. 55-473.000.

Boschen, Henry C., Jr., to Global Marine, Inc. Method and apparatus for mooring floating vessels. Re. 29,373, Cl. 114-293.000.

Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., to International Business Machines Corporation. Recording apparatus for magnetic disks using both sides of the disk. Re. 29,380, Cl. 360-105.000.

Caton, George, to Yorkshire Switchgear and Engineering Co., Limited. Electrical switchgear with primary and secondary switch means associated with current transformer. Re. 29,381, Cl. 361-337.000.

Fuji Photo Film Co., Ltd.: *See—*
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Furutachi, Nobuo: *See—*
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Global Marine, Inc.: *See—*
Boschen, Henry C., Jr., Re. 29,373, Cl. 114-293.000.

Hirose, Takeshi: *See—*
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Hiszpanski, Jan A., to Imperial-Eastman Corporation. Welded sleeve fitting. Re. 29,376, Cl. 285-169.000.

Imperial-Eastman Corporation: *See—*
Hiszpanski, Jan A., Re. 29,376, Cl. 285-169.000.

International Business Machines Corporation: *See—*
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Ishiguro, Shoji: *See—*
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

Johns-Manville Corporation: *See—*
Thiele, William Charles, Re. 29,375, Cl. 138-141.000.

Just, Franklin H.; Powell, Brent L.; and Waters, John A., to Just, Franklin H.; and Waters, John A. Solid state ignition circuitry. Re. 29,374, Cl. 123-148.0CC.

Katsuyama, Harumi: *See—*
Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, Re. 29,379, Cl. 96-74.000.

O'Brien, Theodore Earl, to Patco Packing Limited. Apparatus for automatically stacking and compressing batts of compressible material. Re. 29,372, Cl. 100-49.000.

O'Brill, Robert. Frangible concrete-joint sealant package. Re. 29,377, Cl. 404-48.000.

Patco Packing Limited: *See—*
O'Brien, Theodore Earl, Re. 29,372, Cl. 100-49.000.

Powell, Brent L.: *See—*
Just, Franklin H.; Powell, Brent L.; and Waters, John A., Re. 29,374, Cl. 123-148.0CC.

Shiba, Keisuke; Furutachi, Nobuo; Katsuyama, Harumi; Hirose, Takeshi; Aono, Toshiaki; and Ishiguro, Shoji, to Fuji Photo Film Co., Ltd. Color photographic light-sensitive material. Re. 29,379, Cl. 96-74.000.

Steele, Steven G.: *See—*
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Thiele, William Charles, to Johns-Manville Corporation. Laminated polymeric articles and process for the production thereof. Re. 29,375, Cl. 138-141.000.

Waters, John A.: *See—*
Just, Franklin H.; Powell, Brent L.; and Waters, John A., Re. 29,374, Cl. 123-148.0CC.

Wentink, William S.: *See—*
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Wheeler, Stephen E.: *See—*
Castrodale, Daniel O.; Steele, Steven G.; Wentink, William S.; and Wheeler, Stephen E., Re. 29,380, Cl. 360-105.000.

Worthington Compressors, Inc.: *See—*
Bloom, Carl, Re. 29,378, Cl. 55-473.000.

Yorkshire Switchgear and Engineering Co., Limited: *See—*
Caton, George, Re. 29,381, Cl. 361-337.000.

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree. 4,095, 8-30-77, Cl. 41.000.

Hilltop Orchards & Nurseries, Inc.: *See—*
Simmons, Dan E., 4,096, Cl. 34.000.

Reedley Nursery, Inc.: *See—*
Anderson, Frederic W., 4,095, Cl. 41.000.

Simmons, Dan E., to Hilltop Orchards & Nurseries, Inc. Apple tree. 4,096, 8-30-77, Cl. 34.000.

LIST OF DESIGN PATENTEES

AB Volvo: *See—*
de Vries, John Robert, 245,599, Cl. D12-211.000.

Aktiebolaget Platmanufaktur: *See—*
Larsson, Lars Goran; and Bruke, Richard Leroy, 245,580, Cl. D9-237.000.

Aldermaston Inc.: *See—*
Bru, Dorothea, 245,585, Cl. D10-56.000.

Amba Marketing Systems, Inc.: *See—*
Casser, Constantine, 245,645, Cl. D87-3.00F.

American Can Company: *See—*
Blanchard, Richard Lewis, 245,564, Cl. D7-40.000.

AMF Incorporated: *See—*
Davidson, William G., 245,592, Cl. D12-16.000.

Anders, Peter: *See—*
Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter, 245,596, Cl. D12-115.000.

Balduman, Agapito P. Rear view mirror for vehicles. 245,598, 8-30-77, Cl. D12-187.000.

Bell Telephone Laboratories, Incorporated: *See—*
Genaro, Donald Michael; Meyerle, John Alfons; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, 245,602, Cl. D14-63.000.

Benoit, Jean Leon Paul Marie. Biological reaction filter for medical analysis. 245,625, 8-30-77, Cl. D24-21.000.

Berry, Lambert D. Ventilator for a water closet. 245,620, 8-30-77, Cl. D23-71.000.

Berry, Lambert D. Ventilator for a water closet. 245,621, 8-30-77, Cl. D23-71.000.

Bies, Sylvester W.: *See—*
West, Robert F.; and Bies, Sylvester W., 245,570, Cl. D8-99.000.

Blanchard, Richard Lewis, to American Can Company. Cover for a plate. 245,564, 8-30-77, Cl. D7-40.000.

Boehm, Michael: *See—*
Woodring, Cooper C.; Emmerling, Ronald; and Boehm, Michael, 245,613, Cl. D16-42.000.

Bonny Products, Inc.: *See—*
Steiner, Fred S.; and Cousins, Morison S., 245,565, Cl. D7-47.000.

Braun Aktiengesellschaft: *See—*
Ullmann, Roland, 245,629, Cl. D28-49.000.

Brio Toy AB: *See—*
Hagland-Ahrnborg, Kerstin Margaretha, 245,638, Cl. D34-15.00J.

Britschgi, Robert H.: *See—*
Frinzel, Jerry C.; and Britschgi, Robert H., 245,575, Cl. D8-499.000.

Brookshire, Phillip: *See—*
McGlynn John F.; Doernberg, Robert; and Brookshire, Phillip, 245,586, Cl. D10-57.000.

Brown, Jerry A. Cup dispenser. 245,549, 8-30-77, Cl. D6-25.000.

Bru, Dorothea, to Aldermaston Inc. Moisture meter or similar article. 245,585, 8-30-77, Cl. D10-56.000.

Bruke, Richard Leroy: *See—*
Larsson, Lars Goran; and Bruke, Richard Leroy, 245,580, Cl. D9-237.000.

Burns, Lee V. Disposal figurine. 245,567, 8-30-77, Cl. D7-194.000.

Burroughs, Robert C., to Burroughs, Robert C. Combined pencil well and calendar holder. 245,615, 8-30-77, Cl. D19-85.000.

Byram, David C., to Minnesota Mining and Manufacturing Company. Radiation detector. 245,584, 8-30-77, Cl. D10-47.000.

Campbell, John M. Combined golf ball and model aircraft engine novelty device. 245,635, 8-30-77, Cl. D34-5.0QQ.

Casser, Constantine, to Amba Marketing Systems, Inc. Combined handbag and detachable fitted clutch. 245,645, 8-30-77, Cl. D87-3.00F.

Champion International Corporation: *See—*
Meeker, David M., 245,614, Cl. D19-3.000.

Chaves, Robert M. Measuring gauge and tool for macrame card or the like. 245,587, 8-30-77, Cl. D10-71.000.

Churchward, Roy Alexander. Golf club sole plate. 245,634, 8-30-77, Cl. D34-5.0GC.

Cognata, Larry Monroe; and Williams, Richard D., to Murray Ohio Manufacturing Company, The. Garden tractor. 245,604, 8-30-77, Cl. D15-23.000.

Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter. Bicycle rack. 245,596, 8-30-77, Cl. D12-115.000.

Colgate-Palmolive Company: *See—*
Klingaman, Richard James, 245,578, Cl. D9-171.000.
Sawyer, Ralph Vincent, 245,636, Cl. D34-5.0ST.

Conner, Charles M.; and Ladwig, Kurt G. Doghouse. 245,631, 8-30-77, Cl. D30-1.000.

Cooper Industries: *See—*
Ferguson, William C., 245,569, Cl. D8-57.000.

Courtois, Peter D.; and Sharav, Charles J., to Superior Concrete Accessories, Inc. Sleeve anchor for a sandwich panel. 245,574, 8-30-77, Cl. D8-385.000.

Cousins, Morison S.: *See—*
Steiner, Fred S.; and Cousins, Morison S., 245,565, Cl. D7-47.000.

Davidson, William G., to AMF Incorporated. Combined golf car and removable canopy therefor. 245,592, 8-30-77, Cl. D12-16.000.

Dazey Products Company: *See—*
McNair, Samuel L., 245,555, Cl. D6-95.000.

DeFuccio, Robert, to Stow & Davis Furniture Company. Chair. 245,550, 8-30-77, Cl. D6-69.000.

De Fuccio, Robert, to Stow & Davis Furniture Company. Chair. 245,551, 8-30-77, Cl. D6-72.000.

De Fuccio, Robert, to Stow & Davis Furniture Company. Chair. 245,552, 8-30-77, Cl. D6-75.000.

De Fuccio, Robert, to Stow & Davis Furniture Company. Chair. 245,553, 8-30-77, Cl. D6-75.000.

Devin, Patricia L. Quilt. 245,563, 8-30-77, Cl. D6-260.000.

de Vries, John Robert, to AB Volvo. Wheel. 245,599, 8-30-77, Cl. D12-211.000.

Doernberg, Robert: *See—*
McGlynn, John F.; Doernberg, Robert; and Brookshire, Phillip, 245,586, Cl. D10-57.000.

Draisey, Delbert L.: *See—*
Gee, Lawrence A.; and Draisey, Delbert L., 245,597, Cl. D12-169.000.

Edlin, William Joel Reginald. Clothes peg. 245,568, 8-30-77, Cl. D7-198.000.

Emmerling, Ronald: *See—*
Woodring, Cooper C.; Emmerling, Ronald; and Boehm, Michael, 245,613, Cl. D16-42.000.

Enners, Richard Walton. Room divider. 245,560, 8-30-77, Cl. D6-139.000.

Ernest, Robert O., to Sunbeam Corporation. Blade guard for hair trimming and clipping apparatus. 245,630, 8-30-77, Cl. D28-54.000.

Ferguson, William C., to Cooper Industries. Shears. 245,569, 8-30-77, Cl. D8-57.000.

Freer, Edgar P. Drilling machine. 245,609, 8-30-77, Cl. D15-132.000.

Frick, Berndt Ebbe. Sound reducing cover for teleprinter or the like. 245,628, 8-30-77, Cl. D14-93.000.

Frinzel, Jerry G.; and Britschgi, Robert H., to Britschgi, Robert H. Electrical outlet guard. 245,575, 8-30-77, Cl. D8-499.000.

Gee, Lawrence A.; and Draisey, Delbert L. Bumper. 245,597, 8-30-77, Cl. D12-169.000.

Genaro, Donald Michael; Meyerle, John Alfons; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, to Bell Telephone Laboratories, Incorporated. Telephone station handset. 245,602, 8-30-77, Cl. D14-63.000.

Gillette Company, The: *See—*
Muscatiello, Ralph A.; and Wright, Kent M., 245,576, Cl. D9-2.000.

Graham, John F.; and Kelemen, Donald D. Document handling cart or similar article. 245,594, 8-30-77, Cl. D12-30.000.

Hagland-Ahrnborg, Kerstin Margaretha, to Brio Toy AB. Cradle gym. 245,638, 8-30-77, Cl. D34-15.00J.

Halpern, Carol. Manually propelled and steered cart for invalid children. 245,593, 8-30-77, Cl. D12-26.000.

Hanson Limited: *See—*
Mox, Dana W., 245,582, Cl. D10-40.000.

Hardee's Food Systems, Inc.: *See—*
Poelvoorde, Raymond, 245,626, Cl. D25-25.000.

Hodge, Donald G. Wheel balance weight. 245,600, 8-30-77, Cl. D12-215.000.

Hodge, Donald G. Wheel balance weight. 245,601, 8-30-77, Cl. D12-213.000.

Hoge, Henri H. Ionization sensor for smoke detector. 245,588, 8-30-77, Cl. D10-121.000.

Hygena Limited: *See—*
Robinson, George Henry, 245,558, Cl. D6-130.000.
Robinson, George Henry, 245,561, Cl. D6-166.000.
Robinson, George Henry, 245,562, Cl. D6-170.000.
Robinson, George Henry, 245,619, Cl. D23-59.000.

Instituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A.: *See—*
Mannucci, Enzo Sergio, 245,583, Cl. D10-46.000.

IPCO Hospital Supply Corporation: *See—*
McGlynn, John F.; Doernberg, Robert; and Brookshire, Phillip, 245,586, Cl. D10-57.000.

J. B. Foote Foundry Co., The: *See—*
Jones, Ronald N., 245,610, Cl. D15-149.000.
Jones, Ronald N., 245,611, Cl. D15-149.000.

J. C. Penney Company, Inc.: *See—*
Woodring, Cooper C.; Emmerling, Ronald; and Boehm, Michael, 245,613, Cl. D16-42.000.

Jenkins, James Harlan. Thermal deflector for fireplaces. 245,623, 8-30-77, Cl. D23-94.000.

Jewell, Donald K., to Restaurant Technology, Inc. Packaging container. 245,579, 8-30-77, Cl. D9-231.000.

Jewett, Harvey H. Toy airplane. 245,637, 8-30-77, Cl. D34-15.0HH.

Johnson, Bennie R., to National Metal Products Co. Inc. Casket handle. 245,633, 8-30-77, Cl. D31-11.000.

Johnson, Frank W. Hand cart for carrying a door. 245,595, 8-30-77, Cl. D12-34.000.

Jones, Ronald N., to J. B. Foote Foundry Co., The. Small transmission. 245,610, 8-30-77, Cl. D15-149.000.

Jones, Ronald N., to J. B. Foote Foundry Co., The. Reversing gear box. 245,611, 8-30-77, Cl. D15-149.000.

Josten's: *See—*
Laidlaw, Robert C., 245,590, Cl. D11-36.000.

Kabushiki Kaisha Izumi Seisakusho: *See—*
Ono, Toru, 245,571, Cl. D8-397.000.
Ono, Toru, 245,572, Cl. D8-397.000.
Ono, Toru, 245,573, Cl. D8-397.000.

Kalmes, Mary: *See—*
Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter, 245,596, Cl. D12-115.000.

Kelemen, Donald D.: *See—*
Graham, John F.; and Kelemen, Donald D., 245,594, Cl. D12-30.000.

Kibler, Fred: *See—*
Rieger, Fred, Jr.; and Kibler, Fred, 245,591, Cl. D11-44.000.

Kishi, Yoshio, to Sony Corporation. Tape cassette. 245,627, 8-30-77, Cl. D14-11.000.

Kitson, Gerald L. Poultry cage. 245,632, 8-30-77, Cl. D30-1.000.

Klingaman, Richard James, to Colgate-Palmolive Company. Packaging capsule. 245,578, 8-30-77, Cl. D9-171.000.

Ladwig, Kurt G.: *See—*
Conner, Charles M.; and Ladwig, Kurt G., 245,631, Cl. D30-1.000.

Laidlaw, Robert C., to Josten's. Finger ring. 245,590, 8-30-77, Cl. D11-36.000.

Larsson, Lars Goran; and Bruke, Richard Leroy, to Aktiebolaget Platmanufaktur. Packaging container. 245,580, 8-30-77, Cl. D9-237.000.

Lucid Lines, Inc.: *See—*
Thrasher, Virgil, 245,581, Cl. D10-9.000.

Mannucci, Enzo Sergio, to Instituto Sieroterapico e Vaccinogeno Toscano "Sclavo" S.p.A. Photometric analysis apparatus. 245,583, 8-30-77, Cl. D10-46.000.

Marx, Robert S.: *See—*
Cohen, Alan B.; Marx, Robert S.; Kalmes, Mary; and Anders, Peter, 245,596, Cl. D12-115.000.

McGlynn, John F.; Doernberg, Robert; and Brookshire, Phillip, to IPCO Hospital Supply Corporation. Temperature sensing mechanism or similar article. 245,586, 8-30-77, Cl. D10-57.000.

McIntire, John E.: *See—*
McIntire, Kendrick H.; and McIntire, John E., 245,624, Cl. D23-105.000.

McIntire, Kendrick H.; and McIntire, John E. Wood burning heating stove. 245,624, 8-30-77, Cl. D23-105.000.

McNair, Samuel L., to Dazey Products Company. Dispenser for hot shaving lather. 245,555, 8-30-77, Cl. D6-95.000.

Meeker, David M., to Champion International Corporation. Blank for an envelope. 245,614, 8-30-77, Cl. D19-3.000.

Meyer, Jeanne M. Nozzle holder for garden hose. 245,556, 8-30-77, Cl. D6-112.000.
Meyerle, John Alfons: *See*—
Genaro, Donald Michael; Meyerle, John Alfons; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, 245,602, Cl. D14-63.000.
Minnesota Mining and Manufacturing Company: *See*—
Byram, David C., 245,584, Cl. D10-47.000.
Morgan, Lael. Tatting shuttle. 245,548, 8-30-77, Cl. D3-19.00A.
Morrical, Jade Del. Cycle chain cleaning device. 245,607, 8-30-77, Cl. D15-34.000.
Mox, Dana W., to Hanson Limited. Kitchen timer or similar article. 245,582, 8-30-77, Cl. D10-40.000.
Murphy, William V., to Refreshment Machinery, Incorporated. Water dispenser. 245,608, 8-30-77, Cl. D15-115.000.
Murray Ohio Manufacturing Company, The: *See*—
Cognata, Larry Monroe; and Williams, Richard D., 245,604, Cl. D15-23.000.
Muscatiello, Ralph A.; and Wright, Kent M., to Gillette Company, The. Bottle. 245,576, 8-30-77, Cl. D9-2.000.
National Metal Products Co. Inc.: *See*—
Johnson, Bennie R., 245,633, Cl. D31-11.000.
Okuda, Yoshizo. Diaper cover. 245,546, 8-30-77, Cl. D2-10.000.
Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Cap nut. 245,571, 8-30-77, Cl. D8-397.000.
Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Cap nut. 245,572, 8-30-77, Cl. D8-397.000.
Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Cap nut. 245,573, 8-30-77, Cl. D8-397.000.
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ISSUED AUGUST 30, 1977

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52 R 4,045,629
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61.43 4,045,631
67 PK 4,045,632
148 A 4,045,633
148 B 4,045,634
153 K 4,045,650
283 4,045,635
292 4,045,636
303 4,045,637

CLASS 201

1 4,045,292

CLASS 202

93 4,045,299

CLASS 203

10 4,045,293
69 4,045,294
79 4,045,295

CLASS 204

1 T 4,045,300
12 4,045,301
15 4,045,302
24 4,045,303
49 4,045,304
50 R 4,045,305
55 R 4,045,306
64 4,045,307
67 4,045,308
4,045,309
129.4 4,045,310
129.55 4,045,311
129.65 4,045,312
131 4,045,313
151 4,045,314
157.1 R 4,045,315
158 R 4,045,316
159.23 4,045,317
192 E 4,045,318
195 S 4,045,319
197 4,045,320
202 4,045,321
263 4,045,322
266 4,045,323
268 4,045,324
286 4,045,325
299 R 4,045,326
4,045,327

CLASS 206

330 4,044,888
459 4,044,889
493 4,044,890

CLASS 208

8 4,045,328
10 4,045,329
180 4,045,330
213 4,045,331
323 4,045,332
327 4,045,333

CLASS 209

73 4,044,891
4,044,892
141 4,045,334
166 4,045,335

CLASS 210

15 4,045,336
23 H 4,045,337
36 4,045,338
45 4,045,339
4,045,340
4,045,341
81 4,045,342
101 4,045,343
106 4,045,344
107 4,045,345
164 4,045,346
199 4,045,347
230 4,045,348
232 4,045,349
4,045,350
238 4,045,351
500 M 4,045,352
502 4,045,353
523 4,045,354
532 R 4,045,355

CLASS 214

1 PB 4,044,893
1 QD 4,044,894
2.5 4,044,895
8.5 H 4,044,896
11 R 4,044,897
18 N 4,044,898
82 4,044,899
86 A 4,044,900
89 4,044,901
132 4,044,902
138 R 4,044,903
152 4,044,904
4,044,905
506 4,044,906
4,044,907

CLASS 219

10.55 A 4,045,638
4,045,639
10.55 B 4,045,640
69 C 4,045,641
70 4,045,642
98 4,045,643
118 4,045,645
119 4,045,644
121 EB 4,045,646
4,045,647
137 R 4,045,648
143 4,045,649
227 4,045,651
363 4,045,652
438 4,045,653
449 4,045,654

CLASS 220

3.8 4,044,908
4,044,909
7 4,044,910
9 LG 4,044,911
63 R 4,044,912
86 R 4,044,913
93 4,044,914
270 4,044,915
4,044,916
288 4,044,917
314 4,044,918

CLASS 221

63 4,044,919

CLASS 222

58 4,044,920
74 4,044,921
183 4,044,922
190 4,044,923
250 4,044,924
263 4,044,925
409 4,044,926
604 4,044,927

CLASS 223

96 4,044,928

CLASS 224

2 B 4,044,929
2 C 4,044,930
6 4,044,931
26 R 4,044,932
4,044,933
36 4,044,934
45 F 4,044,935

CLASS 225

2 4,044,936
4,045,356
97 4,044,937

CLASS 226

168 4,044,938

CLASS 228

176 4,044,939

CLASS 229

40 4,044,940
43 4,044,941
73 4,044,942

CLASS 233

19 A 4,044,943
20 A 4,044,944
4,044,945

CLASS 234

39 4,044,946

CLASS 235

92 PC 4,045,655
92 TC 4,045,656
151.1 4,045,657
151.11 4,045,660
151.3 4,045,658
4,045,659
153 A 4,045,662
153 AC 4,045,661

CLASS 236

13 4,044,947

CLASS 237

1 A 4,044,948
4,044,949
55 4,044,950

CLASS 239

1 4,044,951
165 4,044,952
229 4,044,953
458 4,044,954

CLASS 240

10.6 CH 4,045,663
46.03 4,045,664
51.11 R 4,045,665
61.8 4,045,666

CLASS 241

14 4,044,955
24 4,044,956
46.11 4,044,957
126 4,044,958

CLASS 242

25 A 4,044,959
4,044,960
35.5 R 4,044,961
47.05 4,044,962
54 R 4,044,963
58 4,044,964
71.8 4,044,965
77.1 4,044,966
86.5 R 4,044,967
106 4,044,968
107.4 A 4,044,969

CLASS 244

3.22 4,044,970
7 R 4,044,971
12.2 4,044,972
54 4,044,973
161 4,044,974
181 4,044,975

CLASS 248

1 4,044,976
7 4,044,977
13 4,044,978
4,044,979
4,044,980
119 R 4,044,981
183 4,044,982
293 4,044,983

CLASS 249

95 4,044,984
205 4,044,985
216 4,044,986
219 W 4,044,987

CLASS 250

226 4,045,667
227 4,045,668
272 4,045,676
311 4,045,669
338 4,045,670
341 4,045,671
360 4,045,672
364 4,045,673
370 4,045,674
4,045,675
423 R 4,045,677
451 4,045,678
461 R 4,045,679
504 4,045,680
527 4,045,359

CLASS 251

1 A 4,044,988
7 4,044,989
8 4,044,990
122 4,044,991
126 4,044,992
158 4,044,993
172 4,044,994
188 4,044,995
229 4,044,996
328 4,044,997
331 4,044,998

CLASS 252

8.3 4,045,360
8.5 A 4,045,357
8.6 4,045,358
8.8 4,045,361
14 4,045,362
49.5 4,045,363
56 S 4,045,376
106 4,045,364
141 4,045,365
171 4,045,366
181.4 4,045,367
421 4,045,368
432 4,045,369
458 4,045,370
462 4,045,371
463 4,045,372
469 4,045,373
517 4,045,374

519 4,045,375

CLASS 254

45 4,044,999
4,045,000
164 4,045,001
4,045,002

CLASS 256

59 4,045,003

CLASS 259

4 R 4,045,004
36 4,045,005

CLASS 260

2 BP 4,045,377
2.2 R 4,045,379
2.5 AH 4,045,381
2.5 AJ 4,045,378
2.5 HA 4,045,380
4 R 4,045,382
8 4,045,383
4,045,384
15 4,045,385
17.2 4,045,386
17.4 GC 4,045,387
17.4 ST 4,045,388
18 N 4,045,389
18 S 4,045,390
22 D 4,045,431
22 EP 4,045,391
22 R 4,045,392
23 AR 4,045,394
23 R 4,045,393
28.5 AS 4,045,395
29.2 TN 4,045,396
29.3 4,045,397
4,045,398
29.6 N 4,045,399
37 N 4,045,400
42.18 4,045,401
4,045,402
42.42 4,045,403
45.75 R 4,045,405
4,045,406
45.8 N 4,045,404
47 CP 4,045,407
47 EA 4,045,408
49 4,045,409
52 4,045,410
59 R 4,045,411
63 R 4,045,413
65 4,045,414
67 FP 4,045,415
77.5 CR 4,045,416
78 A 4,045,417
78.3 R 4,045,418
112 R 4,045,420
124 R 4,045,421
143 4,045,422
147 4,045,423
4,045,424
163 4,045,425
174 4,045,426
192 4,045,427
198 4,045,428
207 4,045,429
208 4,045,430
239 B 4,045,432
239.3 D 4,045,433
250 C 4,045,439
285 4,045,440
289 XA 4,045,441
293.53 4,045,443
293.58 4,045,442
4,045,444
293.59 4,045,445
294.8 C 4,045,446
307 F 4,045,447
326.5 B 4,045,448
340.2 4,045,449
343.6 4,045,450
345.2 4,045,451
345.9 S 4,045,452
347.4 4,045,453
369 4,045,454
4,045,455
4,045,456
381 4,045,457
393 4,045,458
448.8 R 4,045,459
4,045,460
449 M 4,045,461
453 AP 4,045,462
453 RZ 4,045,463
463 4,045,464
464 4,045,465
465 E 4,045,466
468 D 4,045,467
4,045,468
469 4,045,469
470 4,045,470
471 A 4,045,471
471 C 4,045,472
482 C 4,045,473
484 A 4,045,474
488 H 4,045,475
488 R 4,045,476
497 R 4,045,477
530 N 4,045,478
534 S 4,045,479
545 P 4,045,480
552 R 4,045,483
561 H 4,045,484
566 A 4,045,485
566 D 4,045,481
566 R 4,045,486
570.5 C 4,045,487
570.7 4,045,482
576 4,045,488
586 C 4,045,489
590 FA 4,045,490
594 4,045,491
604 HF 4,045,492
4,045,493
606.5 B 4,045,495
606.5 P 4,045,494
613 D 4,045,496
615 A 4,045,497
617 R 4,045,498
621 R 4,045,499
635 H 4,045,500
651 F 4,045,502
651 R 4,045,501
652.5 P 4,045,503
669 R 4,045,504
673 4,045,505
677 A 4,045,506
681 4,045,419
683.15 B 4,045,507
4,045,508
683.75 4,045,509
830 P 4,045,510
857 TW 4,045,511
4,045,512
860 4,045,513
873 4,045,514
886 4,045,516
897 A 4,045,515
901 4,045,517
927 R 4,045,518
976 4,045,519
985 4,045,520

CLASS 261

41 R 4,045,521
93 4,045,522
97 4,045,523
112 4,045,524
124 4,045,525

CLASS 264

.5 4,045,526
46.7 4,045,527
63 4,045,412
69 4,045,528
75 4,045,529
92 4,045,530
113 4,045,531
196 4,045,532
228 4,045,533
237 4,045,534
313 4,045,535
327 4,045,536

CLASS 266

149 4,045,006
268 4,045,007

CLASS 267

120 4,045,008
139 4,045,009

CLASS 269

315 4,045,010
324 4,045,078
328 4,045,011

CLASS 270

79 4,045,012

CLASS 271

8 R 4,045,014
112 4,045,015
155 4,045,016
181 4,045,017
251 4,045,018

CLASS 272

1 A 4,045,019
33 R 4,045,020
65 4,045,021

CLASS 273

29 R 4,045,022
35 B 4,045,023
43 A 4,045,024
73 F 4,045,025
96 R 4,045,026
4,045,027
104 4,045,028
106 B 4,045,029
131 AB 4,045,030
134 AT 4,045,031
136 F 4,045,013
181 F 4,045,032
188 R 4,045,033
194 B 4,045,034

CLASS 277

34.3 4,045,035
138 4,045,036
205 4,045,037

CLASS 279

2 R 4,045,038
123 4,045,039

CLASS 280

1.5 4,045,040
43.17 4,045,041
79.1 R 4,045,042
79.3 4,045,043
87.02 R 4,045,044
87.02 W 4,045,045
87.04 A 4,045,046
242 WC 4,045,047
278 4,045,048
289 R 4,045,049
492 4,045,050
644 4,045,051
701 4,045,052

CLASS 282

22 R 4,045,053

CLASS 285

18 4,045,054
33 4,045,055
41 4,045,056
49 4,045,057
119 4,045,058
169 Re.29,376
181 4,045,059
369 4,045,060

CLASS 289

18 4,045,061

CLASS 290

38 R 4,045,062

CLASS 292

110 4,045,063
125 4,045,064
341.17 4,045,065

CLASS 294

5.5 4,045,066
15 4,045,067
19 A 4,045,068
31.2 4,045,069
4,045,070
67 R 4,045,071
74 4,045,072
87 A 4,045,073

CLASS 296

1 S 4,045,074
28 J 4,045,075
39 A 4,045,076
78.1 4,045,077

CLASS 297

216 4,045,079
283 4,045,080
317 4,045,081
357 4,045,082
440 4,045,090

CLASS 299

1 4,045,083
2 4,045,085
4 4,045,084
17 4,045,086
31 4,045,087
4,045,088
43 4,045,089

CLASS 302

28 4,045,091
66 4,045,092

CLASS 303

3 4,045,093
22 R 4,045,094
37 4,045,095

CLASS 305

7 4,045,096

CLASS 307

113 4,045,681
127 4,045,682
157 4,045,683
200 B 4,045,684
208 4,045,685
251 4,045,688
254 4,045,689
260 4,045,690
264 4,045,691
279 4,045,692
291 4,045,693
296 R 4,045,694
355 4,045,686
358 4,045,687

CLASS 308

3.8 4,045,097
9 4,045,098
36 4,045,099
183 4,045,100
194 4,045,101

CLASS 310

40 R 4,045,696
89 4,045,697
166 4,045,698
322 4,045,695

CLASS 312

61 4,045,102
198 4,045,103
257 R 4,045,104

CLASS 313

59 4,045,699
242 4,045,700
408 4,045,701
496 4,045,702
497 4,045,703
4,045,704

CLASS 315

3 4,045,705
3.5 4,045,706
106 4,045,707
171 4,045,708
205 4,045,709
4,045,710
209 R 4,045,711
323 4,045,712
391 4,045,713

CLASS 318

16 4,045,715
154 4,045,716

CLASS 320

2 4,045,717
17 4,045,718
35 4,045,720
43 4,045,721

CLASS 324

6 4,045,724
.5 A 4,045,723
30 B 4,045,725
51 4,045,726
58.5 B 4,045,727
59 4,045,728
71 SN 4,045,729
76 R 4,045,730
78 F 4,045,731
133 4,045,732
140 R 4,045,733
142 4,045,734
158 F 4,045,735
158 P 4,045,737
158 R 4,045,736
174 4,045,738

CLASS 325

15 4,045,739
427 4,045,740
470 4,045,741

CLASS 328

9 4,045,742
150 4,045,743

CLASS 330

13 4,045,744
15 4,045,745
23 4,045,746
35 4,045,747
126 4,045,748

CLASS 331

94.5 H 4,045,749

CLASS 333

6 4,045,750
72 4,045,753

CLASS 335

201 4,045,751
202 4,045,752
212 4,045,754
274 4,045,755
292 4,045,756

CLASS 337

85 4,045,757
186 4,045,758
301 4,045,759
4,045,760
372 4,045,761
401 4,045,762

CLASS 338

23 4,045,763
34 4,045,764
176 4,045,765

CLASS 339

17 CF 4,045,105
45 R 4,045,106
48 4,045,107
75 M 4,045,109
75 P 4,045,108
91 R 4,045,110
97 R 4,045,111
99 R 4,045,112
111 4,045,113
210 M 4,045,114

CLASS 340

1 R 4,045,766
5 R 4,045,767
52 C 4,045,768
74 4,045,769
146.1 BA 4,045,771
146.3 B 4,045,772
146.3 SG 4,045,773
147 LP 4,045,774
147 R 4,045,775
162 4,045,776
168 B 4,045,777
171 PF 4,045,778
173 R 4,045,783
4,045,785
173 SP 4,045,784
174 TF 4,045,786
197 4,045,787
323 R 4,045,788
324 AD 4,045,789
324 M 4,045,790
4,045,791
347 AD 4,045,792
347 DA 4,045,793
414 4,045,794

CLASS 343

5 CM 4,045,795
6.5 R 4,045,796
8 4,045,797
17.2 PC 4,045,798
113 PT 4,045,799
854 4,045,800

CLASS 346

75 4,045,770
140 R 4,045,801
4,045,802

CLASS 350

3.5 4,045,115
21 4,045,116
60 4,045,117
61 4,045,118
96 C 4,045,120
4,045,121
96 LM 4,045,119
97 4,045,122
117 4,045,123
160 LC 4,045,124
166 4,045,125
175 ML 4,045,126
210 4,045,127
216 4,045,128
321 4,045,129

CLASS 351

24 4,045,130
52 4,045,131
132 4,045,137
178 4,045,138

CLASS 352

91 C 4,045,132

CLASS 354

5 4,045,803
25 4,045,804
4,045,805
37 4,045,806
38 4,045,807
126 4,045,808
322 4,045,809

CLASS 355

1 4,045,133
3 R 4,045,134
11 4,045,135
83 4,045,136

CLASS 356

36 4,045,139
141 4,045,140
156 4,045,141
223 4,045,142

CLASS 357

24 4,045,810
41 4,045,811

CLASS 358

4 4,045,812
99 4,045,813
124 4,045,814
183 4,045,815
212 4,045,816
213 4,045,817
245 4,045,818

CLASS 360

8 4,045,819
85 4,045,820
105 Re.29,380
132 4,045,821

CLASS 361

45 4,045,822
58 4,045,823
156 4,045,714
337 Re.29,381

CLASS 363

89 4,045,719
126 4,045,722

CLASS 364

200 4,045,781
4,045,782
900 4,045,779
4,045,780

CLASS 403

102 4,045,143

CLASS 404

48 Re.29,377

CLASS 415

1 4,045,144
89 4,045,145

CLASS 416

1 4,045,146
84 4,045,148
100 4,045,147
135 4,045,149

CLASS 423

119 4,045,537
240 4,045,538
4,045,539
385 4,045,540
417 4,045,541
478 4,045,542
482 4,045,543
607 4,045,544
644 4,045,545
657 4,045,546

CLASS 424

28 4,045,547
47 4,045,548
60 4,045,549
70 4,045,550
76 4,045,551
94 4,045,552
132 4,045,553
164 4,045,554
174 4,045,555
177 4,045,556
200 4,045,557
232 4,045,558
246 4,045,559
248.4 4,045,560
251 4,045,561
261 4,045,562
263 4,045,563
4,045,564
4,045,565
267 4,045,566
270 4,045,567
273 4,045,568
273 P 4,045,571
274 4,045,569
275 4,045,570
4,045,572
279 4,045,573
303 4,045,574
305 4,045,575
309 4,045,576
311 4,045,577
4,045,578
330 4,045,580

CLASS 425

58 4,045,150
297 4,045,151
419 4,045,152
440 4,045,153
467 4,045,154

CLASS 426

3 4,045,581
69 4,045,582
241 4,045,583
289 4,045,584
327 4,045,579

CLASSIFICATION OF PATENTS

331	4,045,585	59	4,045,593	386	4,045,602	253	4,045,609		CLASS 432	247	4,045,168
387	4,045,586	89	4,045,594		CLASS 428		CLASS 431	14	4,045,162		CLASS 536
533	4,045,587	202	4,045,595	2	4,045,603	42	4,045,155	59	4,045,163	17	4,045,610
607	4,045,588	229	4,045,596	36	4,045,604	95 R	4,045,156	60	4,045,164		CLASS 542
609	4,045,589	248 A	4,045,597	88	4,045,605	114	4,045,157		4,045,165	413	4,045,434
656	4,045,590	296	4,045,598	174	4,045,606	123	4,045,158	80	4,045,161		CLASS 544
	CLASS 427	333	4,045,599	200	4,045,607	328	4,045,159	146	4,045,166	17	4,045,437
37	4,045,591	379	4,045,600	251	4,045,608	348	4,045,160	241	4,045,167	23	4,045,436
45	4,045,592	381	4,045,601							28	4,045,435
										29	4,045,438

CLASSIFICATION OF DESIGNS

D2—	10	245,546		260	245,563		237	245,580		115	245,596			245,611	D28—	49	245,629
	24	245,547	D7—	40	245,564	D10—	9	245,581		169	245,597	D16—	31	245,612		54	245,630
D3—	19 A	245,548		47	245,565		40	245,582		187	245,598		42	245,613	D30—	1	245,631
D6—	25	245,549		110	245,566		46	245,583		211	245,599	D19—	3	245,614			245,632
	69	245,550		194	245,567		47	245,584		213	245,600		85	245,615	D31—	11	245,633
	72	245,551		198	245,568		56	245,585			245,601	D22—	27	245,617	D34—	5 GC	245,634
	75	245,552	D8—	57	245,569		57	245,586	D14—	11	245,627		28	245,616		5 QQ	245,635
		245,553		99	245,570		71	245,587		63	245,602	D23—	35	245,618		5 ST	245,636
	85	245,554		385	245,574		121	245,588		90	245,603		59	245,619		15 AJ	245,641
	95	245,555		397	245,571			245,589		93	245,628		71	245,620			245,642
	112	245,556			245,572	D11—	36	245,590	D15—	23	245,604			245,621		15 HH	245,637
	117	245,557			245,573		44	245,591			245,605		90.1	245,622		15 J	245,638
	130	245,558		499	245,575		154	245,643		28	245,606		94	245,623		15 LL	245,639
	131	245,559	D9—	2	245,576	D12—	16	245,592		34	245,607		105	245,624			245,640
	139	245,560		52	245,577		26	245,593		115	245,608			245,625	D64—	12 B	245,644
	166	245,561		171	245,578		30	245,594		132	245,609	D24—	21	245,626	D87—	3 F	245,645
	170	245,562		231	245,579		34	245,595		149	245,610	D25—	25				

CLASSIFICATION OF PLANTS

P.—	34	4,096		41	4,095						

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,044,555		4,044,790		4,045,314		4,045,028		4,045,259		4,045,264
	4,045,045		4,044,793		4,045,315		4,045,138		4,045,719		4,045,275
4 :	4,044,446		4,044,821		4,045,321		4,045,684		4,045,721		4,045,284
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	4,045,201		4,044,854		4,045,352		4,044,520		4,045,545		4,045,407
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	4,045,245		4,044,867		4,045,359		4,044,817	17 :	Re.29,376		4,045,446
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1 :	245,616		245,595		245,642	29 :	245,555		245,645		245,604
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	245,590		245,641		245,634						

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U. S. GOVERNMENT PRINTING OFFICE : O - 1977

U. S.
OFFICIAL GAZETTE
UNITED STATES
PATENT OFFICE

VOL. 961
AUGUST
1977

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